COMPREHENSIVE AGREEMENT

BETWEEN

HAMPTON ROADS SANITATION DISTRICT

AND

BURNS & MCDONNELL ENGINEERING COMPANY, INC.

This Comprehensive Agreement ("Agreement") is made and entered into by and between the Hampton Roads Sanitation District, a political subdivision of the Commonwealth of Virginia ("HRSD" or "Owner"), and Burns & McDonnell Engineering Company, Inc., a Missouri corporation authorized to do business in the Commonwealth of Virginia ("Private Entity"). Owner and Private Entity are each a "Party" and collectively, the "Parties." The Agreement will be effective on the date it is signed by the last signatory required below (the "Effective Date"). Unless otherwise defined in this Agreement, capitalized terms shall have the definitions stated in the General Conditions attached hereto and incorporated as a Contract Document.

RECITALS

1. HRSD provides sewer conveyance and treatment services for twenty (20) cities and counties in Southeastern Virginia. Working closely with the U.S. Environmental Protection Agency, Virginia Department of Environmental Quality, and local communities, HRSD has embarked on an extensive program to reduce sanitary sewer overflows in the region. As part of this program, HRSD will conduct extensive efforts including studies, design, and construction on HRSD's sewer system and on the sewer systems owned and operated by various localities, governmental authorities, and private property owners in the region. A critical component of these efforts is HRSD's High Priority Inflow and Infiltration Reduction Program (the "Program").

2. The design-bid-build project delivery method utilizing competitive bidding is the default method of procurement for construction in Virginia; however, this process will not provide the desired outcome for the Program, which requires many complex, interrelated, and geographically diverse projects. Additionally, because the type, location, amount, and scope of construction activities cannot be initially predicted, the Program requires a project delivery team led by an engineering firm that can directly contract with construction firms, as necessary, to complete this work.

3. Consequently, HRSD selected the Public-Private Education Facilities and Infrastructure Act of 2002 (Virginia Code § 56-575.1. et seq.) (the "PPEA") as its method for developing, contracting for, and implementing the Program.

4. The HRSD Commission (the "Commission") has adopted guidelines for implementation of the PPEA, which were last revised July 22, 2025 and are found in Appendix G of the HRSD Procurement Policy. On February 27, 2024 the Commission, adopted findings and

supplemental guidelines for the solicitation and evaluation of proposals related to the Program under the PPEA (collectively, the "Guidelines").

5. Consistent with the Guidelines, HRSD solicited proposals through a two-phase Request for Proposals under the PPEA for the Program.

6. In accordance with Virginia Code § 56-575.17(B) and the Guidelines, HRSD held a duly noticed public hearing on May 28, 2024, on the conceptual proposals received for the Program.

7. Following the review and analysis of proposals consistent with the Guidelines, HRSD selected Private Entity for negotiation of an interim agreement for preliminary design of the Program.

8. Due to the complex, large, phased, and long-term nature of the Program, an interim agreement was necessary to negotiate a fair and reasonable price for the first phase of the Program, the completion, or partial completion, of which is necessary to provide information critical to the negotiation of a fair and reasonable price for succeeding phases under this Comprehensive Agreement.

9. The Parties previously entered into an interim agreement pursuant to Virginia Code § 56-575.9:1, which was approved by the Commission on August 27, 2024 and executed September 30, 2024 (the "Interim Agreement"), relating to the Program, consistent with the PPEA, other applicable law, the Guidelines, Private Entity's proposal, and discussions between representatives of HRSD and Private Entity.

10. On March 25, 2025, the Commission approved an amendment to the Interim Agreement to extend its term by 180 days to allow the services described in the incorporated Scope of Work to be completed (the "First Amendment").

11. The Parties subsequently amended the Interim Agreement effective as June 4, 2025, to update the scope of work, include additional subtasks, and provide additional necessary funds for the completion of the amended Interim Agreement services (the "Second Amendment" and together with the Interim Agreement and the First Amendment, the "Amended Interim Agreement").

12. HRSD, concluding that the design and construction of the Program is feasible and cost-effective, has selected Private Entity for the negotiation of this Comprehensive Agreement (the "Agreement") under the PPEA to address the completion of planning, design, construction, and commissioning of the Program and other related services without further procurement.

13. The Parties negotiated this Agreement consistent with the PPEA, other applicable law, the Guidelines, Private Entity's proposals, and discussions between representatives of HRSD and Private Entity.

14. The Parties acknowledge and agree that this Agreement, including the General Conditions (as defined below), is the Comprehensive Agreement for the Program pursuant to

Virginia Code § 56-575.9 and allows for the development and operation of phases and segments of the Program through HRSD's approval of Project Packages.

15. This Agreement supersedes the Amended Interim Agreement and any other prior agreements and understandings between the Parties and establishes the comprehensive terms for the design and construction of the Program in accordance with the PPEA and the Guidelines.

16. Having considered this Agreement and other information, HRSD has determined that the Program to be designed and constructed pursuant to this Agreement serves the public purpose of the PPEA under the criteria set forth in Virginia Code § 56-575.4(C).

17. In accordance with the Guidelines and Virginia Code § 56-575.17(C), prior to entering into the Agreement, HRSD made this Agreement publicly available in a manner provided in Virginia Code § 56-575.17(A).

18. At its meeting on [_____] [_____], 2025, the Commission approved this Agreement and authorized the [Officer] to execute the Agreement on behalf of HRSD.

NOW, THEREFORE, in consideration of the Recitals set forth above, which are incorporated into the Agreement as if restated herein, and good and valuable consideration as set forth below, the receipt and sufficiency of which is hereby acknowledged, the Parties agree as follows:

ARTICLE 1 – THE PROGRAM

1.01 General Description of the Program Work

The goal of the Program is to reduce capacity-related sanitary sewer overflows through the cost-effective reduction of inflow and infiltration within Locality basins identified by Private Entity based on the results of flow monitoring and conceptual study work of the projects contained in the Comprehensive I/I Reduction Program Plan prepared by Private Entity as part of the Amended Interim Agreement and approved by Owner. Work shall include, but not be limited to, engineering planning and design, procurement of materials and equipment, construction, testing, and commissioning of all elements necessary to rehabilitate and replace gravity sewers with structural defects that contribute to inflow and infiltration. Private Entity shall provide Design Professional and Construction Services and other support services necessary to plan, design, and construct multiple sanitary sewer rehabilitation and replacement projects.

1.02 Program Management

Given the significant geographic area covered by the Program and the unique challenges presented by fluid environmental conditions, the Work will be developed and completed in phases and segments separated into discreet Projects that together constitute the Program, all governed by this Agreement. This approach will permit the Owner to efficiently monitor the progress and outcomes of the Program in real time, evaluate their cost-effectiveness, and adjust the individual Project Packages as required within the Program to ensure that the costs remain as approved in this Agreement. Each Project will be contained within a written Project Package developed by the Private Entity and approved by the Owner's Authorized Representative.

Authorized Representatives: Owner and Private Entity each hereby designates a specific individual authorized to act as representative with respect to the performance of responsibilities under this Agreement. Such an individual shall have authority to approve Project Packages, transmit instructions, receive formal notices, receive information, and render decisions relative to this Agreement on behalf of the respective party that the individual represents.

1. Owner's Authorized Representative:

Bruce Husselbee, Chief Engineer
1434 Air Rail Avenue,
Virginia Beach, Virginia 23455
(757) 460-7012
bhusselbee@hrsd.com

2. Private Entity's Authorized Representative:

John J. Pruss, PE ENV SP
Director of Program Management, Water
Burns & McDonnell
1317 Executive Blvd. Suite 300 Chesapeake, VA 23320
Direct: 816-627-4772
jjpruss@burnsmcd.com

Engineer: Private Entity shall be the Engineer and shall directly perform the Design Professional Services, as well as subcontract with other Project Design Professionals through Design Agreements for performance of some Design Professional Services related to the Project.

1.03 Maximum Agreement Price for the Program

The Program's Maximum Agreement Price is the total budgetary amount authorized by the Owner for the Private Entity to complete the planning, design, construction, post-construction flow monitoring and performance assessment of the Projects within gravity sanitary sewer systems as described in the Private Entity's Comprehensive I/I Reduction Program Plan prepared as part of the Amended Interim Agreement and approved by Owner. The Program's Maximum Agreement Price is $154,215,840.

1.04 Completion of the Program

A. The Parties agree that the Program will be Functionally Complete on or before December 31, 2029. The term "Functionally Complete" shall mean the Private Entity's completion of all authorized Work in each category as documented in the Comprehensive I/I Reduction Program Plan, and identified to be cost-effective and approved by Owner, except as may be modified thereafter for any reason and approved by Owner.

1.05 Agreement Times

A. **Term of Agreement.** The term of this Agreement shall commence on the Effective Date and shall continue until all obligations under this Agreement have been properly

and fully performed by the Private Entity, including but not limited to, completion of the Work, resolution of all claims, and expiration of all warranty or correction periods.

B. **Substantial Completion of all Construction Work for the Program.** On or before December 31, 2028, the Private Entity will achieve Substantial Completion for all Project Packages involving Construction as approved by Owner for the Program.

C. **Time is of the Essence.** Meeting the requirements of Paragraphs 1.04.A and 1.05.B of this Agreement are of critical importance to HRSD; therefore, all time limits for Private Entity's attainment of Milestones for Design Submittals necessary for Construction, and for Substantial Completion and Final Completion of the Work contained in Project Packages, are of the essence for the Agreement.

1.06 Program Progress Schedule

The Private Entity shall develop and maintain a detailed progress schedule and progress charts for the Program, acceptable to the Owner, which shall graphically depict the sequence of all Projects, including design, procurement, construction, testing, and commissioning, and shall show the critical path to completion of the Program in accordance with Paragraph 1.04 of this Agreement. The progress schedule for the Program shall be updated regularly and submitted to the Owner for review and approval.

ARTICLE 2 – PROJECT PACKAGES

2.01 Content of Project Packages.

The Program authorized by this Agreement shall consist of multiple, individual Projects undertaken in a phased and segmented manner. This Agreement explicitly contemplates the administrative approval of Projects through mutually-agreeable Project Packages, which shall describe the specific scope of Work, Contract Times, and Contract Price for each individual Project. Each Project Package shall contain, at a minimum:

- A detailed Scope of Work for a specific Project or that relates to the overall Program.
- The Contract Times for Substantial Completion and Final Completion of the Work.
- The Contract Price, which shall be structured as defined in Article 2 of this Agreement and consistent with the General Conditions.
- A basis of compensation for progress payments for the Work.
- Provisions for Project-specific Liquidated Damages, if applicable.

2.02 Approval of Project Packages

Private Entity shall not commence Work on a Project until a Project Package has been approved in accordance with this Agreement. Each Project Package shall be issued by the Owner in its sole

discretion and approved by the Authorized Representative of each Party, or their designee. Upon approval, each Project Package, being explicitly contemplated herein as a part of the Program, shall be governed by, incorporated into, and become a part of this Agreement without amendment.

2.03 Contract Price for a Project Package

Subject to the Maximum Agreement Price, Owner shall pay Private Entity a Contract Price for completion of the Work governed by this Agreement in accordance with the Project Packages. The Contract Price will be established in each Project Package. Unless stated as a Stipulated Price, Private Entity will develop the Contract Price in an open-book format and share details with the Owner to demonstrate how the Contract Price was developed.

A. Method of Determination of Contract Price. The Contract Price for each Project shall be established as a Stipulated Price, Cost Reimbursement Plus Fee Not-to-Exceed Amount, or Contract Cost Limit (CCL), which will not be exceeded absent a Change Order or a Work Change Directive. Documents used as a basis for the Contract Price shall be identified in each Project Package. Private Entity does not guarantee any specific line item provided as part of the CCL and has the sole discretion to apply payment due to overruns in one line item to savings due to underruns in any other line item. Private Entity agrees, however, that it will be responsible for paying all costs of completing the Work, which exceeds the CCL, as adjusted in accordance with the Contract Documents. Components of Contract Price for a Project package may include:

1. *Fee plus Cost of Work.* When using the CCL method, the Contract Price will be equal to the Private Entity's Fee, which will be established by the Parties in each Project Package, plus the Cost of the Work (as defined in Paragraph 12.01.B of the General Conditions).

2. *Contingency.* The CCL will include a contingency, the amount of which will be established in each Project Package. The contingency is available for Private Entity's exclusive use for unanticipated costs it has incurred that are not the basis for a Change Order under the Contract Documents. By way of example, and not as a limitation, such costs may include: (a) trade buy-out differentials; (b) overtime or acceleration; (c) escalation of materials; (d) correction of defective, damaged or nonconforming Work, design errors or omissions, however caused; provided, Private Entity shall exercise commercially reasonable efforts to obtain recovery from its Construction Subcontractors and credit Owner if recovery is obtained (e) Construction Subcontractor defaults; or (f) those events under Paragraph 4.04 of the General Conditions that result in an extension of the Contract Time but do not result in an increase in the Contract Price. The contingency is not available to Owner for any reason, including changes in scope or any other item which would enable Private Entity to increase the CCL under the Contract Documents. Private Entity shall provide Owner notice of all anticipated charges against the contingency and shall provide Owner as part of the monthly project status report an accounting of the contingency, including all reasonably foreseen uses or potential uses of the contingency in the upcoming three (3) months. Private Entity agrees that with respect to any expenditure from the contingency relating to a Construction

Subcontractor default or an event for which insurance or bond may provide reimbursement, Private Entity will in good faith exercise reasonable steps to obtain performance from the Construction Subcontractor and/or recovery from any surety or insurance company prior to use of the contingency. Private Entity agrees that if Private Entity is subsequently reimbursed for said costs, then said recovery will be credited back to the contingency.

3. *Cost Reimbursement Plus Fee Not-To-Exceed Amount*. When a CCL is not used, the Contract Price will be equal to the Cost of the Work plus the Private Entity's fee. The Contact Price will establish a Not-to-Exceed amount without Change Order authorization. No contingency will be included in the Cost of the Work when using a cost reimbursement plus fee compensation method. If Private Entity anticipates that the Work will exceed the established Not-to-Exceed amount, and prior to such time that it is exceeded, Private Entity shall contact Owner to discuss whether a Change Order is necessary for a revised Scope of Work, a Contract Price increase, or both.

B. **Adjustments to Contract Price for a Project Package.** The Contract Price for a Project may only be adjusted by a Change Order executed by both Parties in accordance with the provisions of this Agreement and the General Conditions.

2.04 Contract Time for a Project Package

A. **Contract Times:** The Contract Times for Substantial Completion and Final Completion for each individual Project shall be specified in the corresponding Project Package. Specific Milestones and their associated dates shall be detailed in a Project progress schedule, to be developed by the Private Entity and approved by the Owner.

B. **Delays and Suspensions:** Provisions for delays to the Work and adjustments to the Contract Times and Contract Price due to delays and suspensions shall be governed by the General Conditions.

C. **Construction Schedule and Progress Charts:** The Private Entity shall develop and maintain a detailed progress schedule and progress charts for each Project, acceptable to the Owner, which shall graphically depict the sequence of all Work activities, including design, procurement, construction, testing, and commissioning, and shall show the critical path to Final Completion. The Project progress schedule shall be updated regularly and submitted to the Owner for review and approval.

ARTICLE 3 – DAMAGES

3.01 Liquidated Damages for Delay

Private Entity and Owner recognize that time is of the essence as stated in Paragraph 1.05 of this Agreement, and that Owner may suffer financial and other losses if the Work for an individual Project is not completed prior to the date specified in the applicable Project Package, plus any extensions thereof allowed in accordance with this Comprehensive Agreement, and Milestones, if applicable, are not achieved within the times specified, plus any extensions

thereof allowed in accordance with this Agreement. The Parties also recognize the delays, expense, and difficulties involved in proving in a lawsuit the actual loss suffered by Owner if the Work and Milestones, if applicable, are not completed on time. Accordingly, instead of requiring any such proof, Owner and Private Entity agree that liquidated damages may be established as part of a Project Package for delay (but not as a penalty). The total aggregate amount of liquidated damages payable by Private Entity under a Project Package shall not exceed **3%** of the applicable Contract Price.

3.02 Consequential or Special Damages

A. Private Entity shall reimburse Owner (1) as special damages, for any fines or penalties imposed on Owner as a result of the Private Entity's failure to attain a Functionally Complete Program on or before December 31, 2029 ("Special Damages"), and (2) for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after December 31, 2029 until the Program is Functionally Complete ("Consequential Damages"). The total amount for Special Damages and Consequential Damages shall not exceed $2,000,000.

B. After Private Entity achieves Substantial Completion for each Project, if Private Entity shall neglect, refuse, or fail to complete the remaining Work authorized by HRSD within the Contract Times established in the Project Package, Private Entity shall reimburse Owner for the actual costs reasonably incurred by Owner for engineering, construction, observation, inspection, and administrative services needed after the Contract Times have expired, until the Work has achieved Final Completion. ("Final Consequential Damages").

C. The Special Damages, Consequential Damages, and Final Consequential Damages imposed in this Paragraph 3.02 are supplemental to any liquidated damages for delayed completion established in a Project Package.

3.03 Limitation on Liability

Except as expressly provided for in this Agreement, Private Entity will have no liability for any special, indirect, punitive, liquidated, or consequential damages.

In consideration for the mutually negotiated pricing and payment provisions, and terms and conditions contained in this Agreement, the total aggregate liability of Private Entity, its officers, directors, shareholders, employees, agents, subcontractors and suppliers, and any of them to Owner and Owner's personnel, and anyone claiming by, through or under Owner or Owner's personnel, for any and all claims losses, liability, costs, expenses, or damages whatsoever arising out of, resulting from, or in any way related to the Work or this Agreement shall not exceed the total Contract Price paid to Private Entity under the applicable Contract under which such liability arose.

Notwithstanding anything to the contrary in this Agreement, all limitations of liability specifically expressed in this Agreement shall apply to all claims, causes of actions, theories of recovery, and demands at law, equity, or otherwise, including but not limited to breach of contract, breach of warranty, strict liability, products liability, and negligence of any degree. Such limitations and

waivers shall not apply to Private Entity's indemnity obligations under this Agreement for third-party property damage, bodily injury, or death, nor to either Party's fraud or willful misconduct.

ARTICLE 4 – PAYMENT PROCEDURES

4.01 Submittal and Processing of Payments

Private Entity shall submit Applications for Payment in accordance with the General Conditions. Owner will process Applications for Payment as provided in the General Conditions.

4.02 Progress Payments; Retainage

Owner shall make progress payments on account of the Contract Price on the basis of Private Entity's Applications for Payment during performance of the Work as provided in the General Conditions, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of this Agreement. All such payments for Construction will be measured by the Schedule of Values established in the applicable Project Package as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, a manner otherwise consistent with Article 14.01 of the General Conditions. Payment retainage shall be as follows:

A. **Prior to Substantial Completion:** Progress payments will be made in an amount equal to **ninety-five percent** of Work completed (with the balance being retainage); and **ninety-five percent** of cost of materials and equipment not incorporated in the Work but delivered, suitably stored, and accompanied by documentation satisfactory to Owner as provided in the General Conditions (with the balance being retainage).

B. **Upon Substantial Completion:** Upon Substantial Completion of a Project, the retainage shall be further reduced to **two percent**, or such lesser amount necessary to assure Final Completion, as determined by the Owner. The determination of any such reduction shall be at the sole discretion of the Owner.

C. **At Final Completion:** Subject to any set-off, the Owner will release any remaining retainage to Private Entity as part of Final Payment.

D. **No Retainage on Professional Services:** Notwithstanding the provisions above, no retainage shall be withheld with respect to the portion of an Application for Payment pertaining to engineering, design, and other professional services.

4.03 Diversity Procurement

The Private Entity, Project Design Professionals, Construction Subcontractors, and Suppliers are encouraged to provide the participation of small, women-owned, and minority-owned businesses, service-disabled veteran-owned businesses, or disadvantaged business enterprises in this Agreement. With each monthly Application for Payment, the Private Entity shall document in accordance with Paragraph 14.01.B.2.g of the General Conditions.

ARTICLE 5 – REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

5.01 Private Entity's Representations

A. To induce Owner to enter into this Agreement and approve each subsequent Project Package, Private Entity makes the following representations with respect to the Work to be performed under this Agreement:

1. Private Entity has provided its social security number or federal employer identification number in Owner's Online Oracle Enterprise Resource Planning (ERP) system.

2. Private Entity has examined and carefully studied the Contract Documents, any data, and reference items identified in the Contract Documents.

3. Private Entity has become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work subject to this Agreement.

4. Private Entity is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Program, the Project, and the Work.

5. Private Entity has carefully studied the reports, if any, of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings, if any, of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Contract Documents, with respect to the Technical Data in such reports and drawings.

6. Private Entity has carefully studied the reports and drawings, if any, relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Contract Documents, with respect to Technical Data in such reports and drawings.

7. Private Entity has considered the information known to Private Entity itself, and to Construction Subcontractors and Project Design Professionals that Private Entity has selected as of the Effective Date of this Agreement and the Effective Date of the Contract for each Project Package; information commonly known to design professionals, private entities, and contractors doing business in the locality of the Site; the Contract Documents; and the Site-related reports and drawings, if any, identified in the Contract Documents or otherwise made available to Private Entity, with respect to the effect of such information, observations, and documents on (a) the cost, progress, and performance of the portion of the Work subject to this Agreement and each Project Package; and (b) Private Entity's safety precautions and programs.

8. Private Entity is aware of the general nature of work to be performed by Owner and others at the Site that relates to the portion of the Work subject to this Agreement as indicated in the Contract Documents.

9. Private Entity has submitted online discussion(s) through Owner's Online Oracle ERP system as written notice of all conflicts, errors, ambiguities, or discrepancies that Private Entity has discovered in the Contract Documents and of discrepancies between Site conditions and the Contract Documents and confirms that the written resolution by Owner is acceptable to Private Entity.

10. Private Entity has determined that the Contract Documents are sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the portion of the Work subject to this Agreement.

11. Private Entity's entry into this Agreement constitutes an incontrovertible representation by Private Entity that without exception all prices in the Agreement are premised upon performing and furnishing the portion of the Work subject to this Agreement as required by the Contract Documents.

12. Private Entity is organized or authorized to transact business in the Commonwealth of Virginia in accordance with Virginia Code Title 13.1 and/or Title 50. Private Entity shall not allow its existence to lapse or its certificate of authority or registration to transact business in the Commonwealth of Virginia, if so, required under Virginia Code Title 13.1 and/or Title 50, to be revoked or cancelled at any time during the term of this Agreement. If the Private Entity fails to remain in compliance with the provisions of this Paragraph 5.01.A.12, Owner reserves the right to cancel this Agreement.

13. Private Entity does not, and shall not during the performance of the Agreement, knowingly employ an unauthorized alien as defined in the Federal Immigration Reform and Control Act of 1986, in accordance with Virginia Code § 2.2-4311.1.

14. The Private Entity represents and warrants that the person signing this Agreement and subsequent Project Packages on behalf of Private Entity has the authorization and legal authority to bind Private Entity. Private Entity shall provide evidence of such legal authority within three (3) business days of a request by the Owner and agrees to take necessary corrective action to provide an effective and binding signature and ratify the Agreement or any Project Package.

5.02 Private Entity's Certifications

A. Private Entity certifies that it has not engaged, nor will it engage, in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Agreement or any Project Package. For the purposes of this Paragraph 5.02:

1. "Corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the Proposal process or in the execution of the Agreement or any Project Package.

2. "Fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the Proposal process or the execution of the Agreement or any Project Package to the detriment of Owner, (b) to establish Proposal or any Contract Price

at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.

3. "Collusive practice" means a scheme or arrangement between 2 or more Proposers, with or without the knowledge of Owner, a purpose of which is to establish Proposal or Contract prices at artificial, non-competitive levels.

4. "Coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the Proposal process or affect execution of the Agreement or any Project Package.

ARTICLE 6 CONTRACT DOCUMENTS AND ORDER OF PRECEDENCE

6.01 Contents

The Contract Documents consist of the following, which are attached to this Agreement (except as expressly noted):

A. This Agreement

B. General Conditions

C. Exhibits to this Agreement (enumerated as follows):

1. Exhibit A – Private Entity's Comprehensive I/I Reduction Program Plan

2. Exhibit B – Form Project Package

3. Exhibit C – Owner's Regional Hydraulic Model (not attached) (Conceptual Document per General Condition 1.01.A.7)

D. The following which may be delivered or issued on or after the Effective Date of this Agreement and are not attached hereto:

1. Project Packages

2. Change Orders (if applicable)

3. Insurance Certificates

4. Construction Drawings

5. Construction Specifications.

6. Performance Bond

7. Payment Bond

8. Other documents contemplated as Contract Documents by the General Conditions.

6.02 Article Exclusive

A. There are no Contract Documents other than those listed above in this Article 6.

B. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

6.03 Order of Precedence

In the event of any conflict, ambiguity, or inconsistency among the Contract Documents, the order of precedence shall be as follows, with the highest precedence given to the first listed document:

A. This Comprehensive Agreement (including all articles and exhibits, except as noted below).

B. Project Packages (later dated documents having precedence over earlier dated documents).

C. General Conditions.

ARTICLE 7 – DEFAULT AND TERMINATION PROVISIONS

7.02 Default and Opportunity to Cure

The Parties will utilize the provisions in Paragraphs 15.02 and 15.04 of the General Conditions for providing any notice of default, and the opportunity for the non-defaulting Party to cure, under the Agreement.

7.03 Termination of Agreement

A. Suspension of Work or termination of the Agreement shall be in accordance with Article 15 of the General Conditions.

B. Execution of this Agreement and the performance of any services provided hereunder shall not require or bind the Owner to approve Project Packages. The Owner may, in its sole discretion, elect to cancel the Program or any Project and compensate the Private Entity as provided for in Paragraph 15.03 of the General Conditions.

C. If the Agreement is terminated, all Project Packages approved in accordance with this Agreement shall also be considered terminated as of that same date.

ARTICLE 8 – MISCELLANEOUS

8.01 Assignment of Agreement: No assignment by a Party of any rights under or interests in the Agreement will be binding on the other Party without the written consent of the Party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless

specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Agreement.

8.02 **Successors and Assigns**: Owner and Private Entity each binds itself, its successors, assigns, and legal representatives to the other Party, and its successors, assigns, and legal representatives, in respect to all covenants, agreements, and obligations contained in the Agreement.

8.03 **Severability**: Any provision or part of the Agreement held to be void or unenforceable under any applicable law or regulations shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Private Entity, who agree that the Agreement shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

8.04 **Permission to Use HRSD Name and Social Media Release**: The Private Entity or any of its employees or agents shall not use HRSD's name, logo, proprietary information, or site photographs in any format for any personal or professional marketing or public relations material or social media use without prior review and approval from the Owner. These materials include, but are not limited to, advertisements, news releases, published articles, customer lists, social media posts, advertorials or any other promotional purposes. Owner's Director of Communications shall be provided with any material to be shared with the public at least 7 business days prior to the planned release of the information.

8.05 **Public Contracting:** This Agreement constitutes a contact for construction and architectural or engineering services under Virginia Code §§ 2.2-4340.1, 2.2-4340.2 and is subject to Ethics in Public Contracting provisions (Virginia Code § 2.2-4367 *et seq.*).

8.06 **Subject to Appropriation:** The Owner's obligations under this Agreement are subject to the availability of appropriations by the Owner's governing body and the Owner's ability to secure necessary financing for the Program.

8.07 **Construction of Agreement:** This Agreement shall not be construed in favor of or against either Party, but shall be construed according to its fair meaning as if both Parties jointly prepared the Agreement.

8.08 **Amendment**: This Agreement may only be amended by a writing signed by the Parties following approval by the HRSD Commission and in accordance with the requirements of the PPEA. Approval of Project Packages, Change Orders, Work Directives, and other documents contemplated by this Agreement shall not be considered amendments.

8.09 **Counterparts:** This Agreement may be executed in one or more counterparts, which execution may be by electronic or facsimile signature, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

8.10 Entire Agreement: This Agreement, together with the other Contract Documents, including all attachments and exhibits, constitutes the entire agreement between the Parties with respect to the Program and supersedes all prior negotiations, representations, or agreements, either written or oral, including the Amended Interim Agreement.

[SIGNATURES FOLLOW]

IN WITNESS WHEREOF, the Parties hereto have executed this Comprehensive Agreement as of the date of final signature below.

Hampton Roads Sanitation District	**Burns & McDonnell Engineering Company, Inc.**
By: _____	By: _____
Name: _____	Name: _____
Title: _____	Title: _____
Date: _____	Date: _____

HIGH PRIORITY INFLOW & INFILTRATION REDUCTION PROGRAM
COMPREHENSIVE AGREEMENT
GENERAL CONDITIONS OF THE CONTRACT
BETWEEN OWNER AND DESIGN-BUILDER

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GENERAL CONDITIONS OF THE CONTRACT BETWEEN OWNER AND DESIGN-BUILDER

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Contract Documents and printed with initial capital letters, the following terms have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Application for Payment:* The form which is to be used by Design-Builder during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

2. *Authorized Representative:* The individual designated by a party to represent it with respect to each Contract, as indicated in the Agreement.

3. *Bonds:* Performance and payment bonds and other instruments of security.

4. *Change Order:* A document which is signed by Design-Builder and Owner and authorizes an addition, deletion, or revision in the Work, or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.

5. *Claim:* A demand or assertion by Owner or Design-Builder seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A request or proposal for a Change Order is not a Claim.

6. *Comprehensive Agreement or Agreement:* The written instrument pursuant to and satisfying the requirements of Virginia Code § 56-575.9 executed by Owner and Private Entity, that sets forth the Maximum Agreement Price, compensation methods, and schedule for the Program, and identifies the parties, and designates the specific items that are Contract Documents.

7. *Conceptual Documents:* The documents prepared by or for the Owner to describe the Work to be performed, issued to Proposers during the design-builder selection process, and expressly identified in the Agreement.

8. *Constituent of Concern:* Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. (“CERCLA”); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5101 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. (“RCRA”); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.;

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or (g) any other Laws or Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

9. *Construction:* The part of the Work that consists generally of making physical improvements at the Site, and is the result of performing or furnishing of labor, the furnishing and incorporating of materials and equipment into the Work (including any correction of defective Construction), and the furnishing of services (other than Design Professional Services) and documents, all as required by the Contract Documents and Construction Drawings and Construction Specifications, as duly modified.

10. *Construction Drawings:* Documents prepared by or for Design-Builder, and approved by Owner for purposes of allowing Design-Builder to proceed with the Construction or specific portions of the Construction, and consisting of drawings, diagrams, illustrations, schedules, and other data that graphically show the scope, extent, and character of the Construction (or specific portions of the Construction) to be performed by or for Design-Builder. Construction Drawings make up a portion of the Contract Documents.

11. *Construction Specifications:* Documents prepared by or for Design-Builder, and approved by Owner for purposes of allowing Design-Builder to proceed with the Construction or a specific portion of the Construction, and consisting of written requirements for materials, equipment, systems, standards, workmanship, and administrative procedures as applied to the Construction (or a specific portion of the Construction). Construction Specifications make up a portion of the Contract Documents.

12. *Construction Subcontract:* A written agreement between Design-Builder and a Construction Subcontractor for provision of all or a portion of the Construction, and any delegated Design Professional Services.

13. *Construction Subcontractor:* An individual or entity (other than a Supplier) having a direct contract with Private Entity or with any other Construction Subcontractor for any Design Professional Services or the performance of a part of the Construction, or performing any Design Professional Services or Construction for a Project, including as a consultant, subconsultant, or otherwise.

14. *Contract:* A Project Package executed by Owner and Design-Builder concerning the Work to be performed for a Project.

15. *Contract Cost Limit (CCL):* The Contract Price, or part thereof, established as a guaranteed maximum price for the cost of the Work, or portion thereof. Such CCL, if agreed to by the parties in a Contract, will be established using generally recognized methods for design-build contracting, including detailed accounting for design services; pre-construction services; cost of the Work; general and administrative costs (overhead); contingency; cost allowance; and profit.

16. *Contract Documents:* The Agreement, General Conditions, applicable Contract, and those items so designated as Contract Documents in the Agreement, that may be supplemented in the Contract for the scope of Work to be performed for a Project.

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17. *Contract Price:* The money identified in each Contract that Owner has agreed to pay Design-Builder for completion of the Work in accordance with the Contract Documents.

18. *Contract Times:* The number of days or the dates stated in each Contract to (a) achieve Milestones, if any; (b) achieve Substantial Completion, if applicable; and (c) complete the Work to be performed for a Project.

19. *Design Agreement:* A written agreement between Design-Builder and a design firm or entity for provision of Design Professional Services.

20. *Design-Builder (Private Entity):* The terms Design-Builder and Private Entity shall be used interchangeably and shall mean the individual or entity with which Owner has contracted for performance of the Work, as designated in the Agreement.

21. *Design Professional Services:* That part of the Work comprised of the furnishing of engineering, surveying, architecture, and other design services as set forth in a mutually agreed Contract, which may include, but not limited to providing research, analysis, and conclusions regarding engineering and related matters; exercising professional judgment with respect to technical issues; the preparation of plans, reports, calculations, models, schematics, drawings, specifications, Design Submittals, the Construction Drawings, Construction Specifications, and other instruments of service; other services included in the Contract Documents and required to be performed by or under the responsible charge of licensed design professionals; and the review of shop drawings, observation of construction, response to requests for information or interpretation, analysis of the technical aspects of Change Orders, and other engineering and related professional services provided by or for licensed design professionals during Construction.

22. *Design Submittal:* A Submittal that, pursuant to Laws and Regulations or the Contract Documents, must be prepared by or under the supervision of a licensed engineer or other licensed design professional, including drawings, specifications, Construction Drawings, Construction Specifications, and revisions to such documents (but not including Record Documents).

23. *Effective Date of the Contract:* The date the Contract has been both approved by Owner and accepted by Private Entity in Owner's Primavera Unifier document management platform, on which each Contract becomes effective.

24. *Engineer:* Private Entity shall be the Engineer and shall directly perform the Design Professional Services, as well as subcontract with other Project Design Professionals through Design Agreements for performance of Design Professional Services related to the Project.

25. *Field Order:* A written order issued by Owner which orders minor changes in the Work, but which does not involve a change in the Contract Price or the Contract Times.

26. *Final Completion:* The date on which all Work as specified in a Contract is complete as identified in the Contract Documents.

27. *General Conditions:* These Modified Standard General Conditions of the Contract between Owner and Design-Builder.

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28. *Hazardous Environmental Condition:* The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.

29. *HRPDC:* Hampton Roads Planning District Commission.

30. *HRSD:* Hampton Roads Sanitation District. This term shall be synonymous and interchangeable with the term "Owner."

31. *Laws and Regulations; Laws or Regulations:* Any and all applicable laws, statutes, rules, regulations, ordinances, binding resolutions, codes, decrees, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

32. *Liens:* Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

33. *Locality:* Each City, County, or Town that is the subject of a portion of the Work and constitutes an "affected jurisdiction" as defined by Va. Code § 56-575.1.

34. *Maximum Agreement Price:* The total not-to-exceed amount for the Program established and defined in the Agreement.

35. *Milestone:* A principal event in the performance of the Work that the Contract requires Design-Builder to achieve by an intermediate completion date or by a time prior to Substantial Completion of Construction.

36. *Operator:* An entity, including HRSD or a Locality, or private landowner that is identified in a Contract and that owns or operates assets that are part or all of a Project.

37. *Owner:* The individual or entity with which Design-Builder has contracted regarding the Work, and which has agreed to pay Design-Builder for the performance of the Work, pursuant to the terms of the Contract. This term shall be synonymous and interchangeable with the term "HRSD."

38. *Owner's Consultant (Owner's Advisor):* The terms Owner's Consultant and Owner's Advisor shall be used interchangeably and shall mean an individual or entity with which the Owner has contracted to furnish services (typically including planning, preparation of Conceptual Documents, and advisory services) to Owner with respect to a Project, and which is identified as such in the Contract.

39. *Program:* The High Priority Inflow and Infiltration Reduction Program governed by the Agreement and of which each Project and Contract is a part.

40. *Project:* The total undertaking to be accomplished for Owner by Design-Builder and its subcontractors with respect to a Contract, and may include planning, study, design, construction, testing, start-up, and commissioning, as set forth in the scope of Work to be performed under the Contract Documents.

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41. *Project Design Professionals:* The Engineer and any other independent entities or individuals, or employees of Design-Builder, engaged by Design-Builder or a Construction Subcontractor to provide Design Professional Services with respect to a portion of the Work.

42. *Project Package:* A written instrument executed by Owner and Private Entity in accordance with the Agreement containing a specific scope of Work, Contract Price, and Contract Times, and other relevant Contract Documents for a Project within the overall Program.

43. *Record Documents:* The record copy of all Construction Drawings, Construction Specifications, Change Orders, Work Change Directives, and approved Submittals maintained by Design-Builder at the Site, including any annotations to such documents made by Design-Builder during Construction.

44. *Record Drawings and Record Specifications:* Documents depicting the completed Project, or a specific portion of the completed Project, based on or comprised of the Record Documents delivered to Owner by Design-Builder at the completion of the Construction.

45. *Request for Change in Scope:* A document which is signed by Owner's Consultant and/or Private Entity, which requests a change or changes to the Work.

46. *Schedule of Values:* A schedule, prepared and maintained by Design-Builder, allocating portions of the Contract Price to various portions of the Work that pertain to construction, and used as the basis for reviewing Design-Builder's Applications for Payment.

47. *Site:* Lands or areas indicated in the Contract Documents as being furnished by Owner upon which Construction is to be performed, including rights-of-way and easements, right-of-entry agreements, and such other lands furnished by Owner which are designated for use of Design-Builder.

48. *Site Representative:* A representative of Owner or an Operator at the Site, as indicated in Paragraph 10.05.

49. *Stipulated Price:* The Contract Price, or part thereof, established as a lump sum amount for the Work, or part thereof.

50. *Submittal*: A written or graphic document, prepared by or for Design-Builder, which the Contract Documents require the Design-Builder to submit to the Owner. Submittals may include reports, preliminary drawings and specifications, cost estimates, proposed Construction Drawings and Construction Specifications, progress schedules, cash flow projections, Schedules of Values, shop drawings, product data, samples, delegated designs, certifications, proposed modifications to the Construction Drawings and Construction Specifications, results of tests and evaluations, results of source quality control testing and inspections, results of field or Site quality control testing and evaluations, sustainable design information, information on special procedures, operations and maintenance data, sustainable design closeout information, record documents, records of spare parts and extra stock materials, and other such documents required by the Contract Documents. Submittals, whether approved or accepted by

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Owner or not, are not Contract Documents. Claims, notices, Change Orders, Applications for Payment, and requests for information/interpretation are not Submittals.

51. *Substantial Completion:* The time at which the Construction (or a specified part thereof) has progressed to the point where it is sufficiently complete, in accordance with the Contract Documents, so that the Construction (or the specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Construction refer to Substantial Completion thereof. Substantial Completion is further defined as (a) that degree of completion of a Project's operating facilities or systems sufficient to provide the Operator with benefit from the full time, uninterrupted, continuous operation of the Work; and (b) all required functional, performance and acceptance or startup testing has been successfully demonstrated for all components, devices, equipment, and instrumentation and control to the satisfaction of the Owner and Operator in accordance with the requirements of the Construction Specifications; and (c) all inspections required have been completed and identified conditions corrected. Specific items of Work which shall be completed prior to declaration of Substantial Completion for the Construction (or a specified portion thereof) include, but are not limited to, the following:

    1. Conformance with all training services requirements, unless specified for post-startup period.

    2. Correction of all state, local, and other regulatory agencies defective work lists related to the Work.

    3. Submittals have been received and approved by the Owner including, but not necessarily limited to, the following:

        a. Operation and maintenance manuals, including service and maintenance agreements.

        b. Equipment data forms.

        c. Manufacturers' certificates of proper installation.

        d. Factory test reports.

    4. All special accessories have been provided that are required to place each item of equipment in full operation. These special accessory items include, but are not limited to, specified spare parts, test equipment, adequate oil and grease or other lubrication, air filters, light bulbs, fuses, special tools, valve operators, and other expendable items required for startup and operation of the operating facilities or systems as a whole.

    5. All additional warranty or insurance coverage requirements have been provided.

52. *Supplier:* A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Design-Builder or with any Construction Subcontractor to furnish materials or equipment to be incorporated in the Work by Design-Builder or a Construction Subcontractor, and any lessor of rental equipment used by Design-Builder or a

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Construction Subcontractor during Construction at the Site.

53. *Technical Data:* Data provided by a Locality contained in flow monitoring data or reports, sanitary sewer evaluation surveys, boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding (a) subsurface conditions at the Site, (b) physical conditions relating to existing surface or subsurface structures at the Site, including Underground Facilities that are the subject of such data and the Work (except Underground Facilities that are not the subject of such data and the Work), or (c) environmental conditions at the Site, that are set forth in any geotechnical or environmental report prepared for a Project and relied upon by Design-Builder in agreeing to a price (either stipulated, or a Contract Cost Limit) that includes Construction.

54. *Underground Facilities:* All underground lines, pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems, including but not limited to those that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, fire or police signal systems, or traffic or other control systems; and any encasements containing such facilities or systems.

55. *Underground Facilities Data:* Information and data shown or indicated in the Contract Documents or otherwise provided to Design-Builder by Owner with respect to existing Underground Facilities at or adjacent to the Site.

56. *Unit Price Work:* Work to be paid for on the basis of unit prices.

57. *Work:* The design and construction, or the various separately identifiable parts thereof, as described in a Contract, that are required to be performed or furnished by Private Entity under the Contract Documents. Work may include performing or furnishing Design Professional Services and Construction required by the Contract Documents and all labor, services, and documentation necessary to produce such Design Professional Services and Construction; furnishing, installing, and incorporating all materials and equipment into such Construction; and related services such as testing, start-up, commissioning, training, and monitoring, all as required by the Contract Documents.

58. *Work Change Directive:* A written directive to Design-Builder, issued on or after the Effective Date of the Contract, signed by Owner, ordering an addition, deletion or revision in the Work.

1.02 *Terminology*

A. The words and terms discussed in Paragraph 1.02.B are not defined terms that require initial capital letters, but when used in the Contract Documents have the indicated meanings.

B. *Intent of Certain Terms or Adjectives:*

1. The word “day” shall constitute a calendar day of 24 hours measured from midnight to the next midnight.

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2. The word "defective," when modifying the word "Construction" refers to Construction that does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to Owner's final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion, except damage caused by Design-Builder, Construction Subcontractors, or Suppliers or any other individual for whom Design-Builder is responsible) in fulfilling the warranty obligations in Section 7.18.A, provided that the defect was not caused by Owner.

3. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

4. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials or equipment or equipment complete and ready for intended use.

5. The words "perform" or "provide" when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

6. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Design-Builder, "provide" is implied.

7. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with that meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. *Performance and Payment Bonds:* Within 10 business days of execution of a Contract including Construction, or an amendment to a Contract to include Construction, Contractor shall electronically submit to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).

B. *Evidence of Contractor's Insurance:* When the Contractor submits an executed Contract to Owner electronically, Contractor shall also electronically submit to Owner certificates of insurance and relevant endorsements required to be provided by Contractor in accordance with Article 6, except to the extent the General Conditions expressly establish other dates for delivery of certificates of insurance.

C. *Evidence of Owner's Insurance:* After receipt of electronic approval of the Contract and electronic submittal of all required bonds and insurance documentation, Owner shall promptly provide an electronic copy to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

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2.02 Intentionally Omitted.

2.03 *Conceptual Documents*

A. Design-Builder's Review of Conceptual Documents:

1. Design-Builder acknowledges that the Conceptual Documents furnished by Owner are preliminary and incomplete, and subject to stated limitations and reservations. Design-Builder may rely on the accuracy of the Conceptual Documents and any Technical Data provided by a Locality, except to the extent inconsistent with information known by Design-Builder. Design-Builder will review the contents and suitability of any Technical Data provided by a Locality and collect supplemental data as required by the scope of Work for a Project.

2. Design-Builder shall promptly report in writing to Owner any conflict, error, ambiguity, or discrepancy that Design-Builder may discover in the Conceptual Documents, whether during such review or at any later point.

3. Upon receipt of a report from Design-Builder that there is a conflict, error, ambiguity, or discrepancy in the Conceptual Documents, Owner shall either provide a written interpretation, clarification, or correction to Design-Builder, or authorize Design-Builder to correct or resolve the issue under a Change Order providing an equitable adjustment in Contract Times or Contract Price, or both.

4. Design-Builder shall not proceed with any Work affected by a reported conflict, error, ambiguity, or discrepancy in the Conceptual Documents until the issue is resolved.

B. Owner shall not be responsible for any deficiency in the Conceptual Documents that Design-Builder does not discover or report to Owner.

C. Subject to the foregoing review and reporting obligations, Design-Builder may use the Conceptual Documents as a partial basis for performing or furnishing Design Professional Services, including the preparation of Design Submittals such as the Construction Drawings and Construction Specifications, but despite any such use of the Conceptual Documents the Design-Builder nonetheless shall be responsible to Owner for the quality and soundness of the Design Professional Services.

2.04 *Before Starting the Work that Involves Construction*

A. *Preliminary Schedules:* Within 10 days after commencement of the Contract Times (unless otherwise specified in the Contract Documents), Design-Builder shall submit the following to Owner for Owner's timely review related to each Project Package:

1. A preliminary progress schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. A preliminary schedule of Submittals (including Design Submittals) which will list each required Submittal and the times for submitting, reviewing, and processing each Submittal;

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3. A preliminary Schedule of Values for all of the Work which will include construction quantities and prices of items which when added together equal the Contract Price and subdivides the Work into the component parts of construction in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work; and

4. A preliminary cash flow projection estimating that portion of the Contract Price to be due during each month of performance.

2.05 *Authorized Representatives*

A. The Authorized Representative for each party has been designated in the Agreement. A party may change its Authorized Representative at any time by giving notice to the other party of the name, mailing and delivery addresses, e-mail address, and telephone numbers of the new Authorized Representative.

2.06 *Initial Conference*

A. Within 20 days after the Contract Times start to run, Design-Builder will arrange a conference attended by Owner and Design-Builder and others as appropriate to establish a working understanding among the parties as to the Work and to discuss the design concepts, schedules referred to in Paragraph 2.04.A, procedures for handling Submittals, access to the Site, processing Applications for Payment, maintaining required records, and other matters.

2.07 *Review of Schedules*

A. Not less than 10 days before submission of the first Application for Payment (unless otherwise provided in the Contract Documents), Design-Builder will arrange a conference attended by Design-Builder, Owner, and others as appropriate to review and discuss the schedules submitted in accordance with Paragraph 2.04.A. Design-Builder shall have an additional 10 days after the conference to make corrections and adjustments and to complete and resubmit the schedules for Owner's acceptance. No progress payment shall be made to Private Entity until Private Entity updates and submits schedules that comply with the following requirements:

1. Design-Builder's progress schedule shall provide an orderly progression of the Work to completion within any specified Milestones and the Contract Times.

2. Design-Builder's schedule of Submittals shall provide a workable arrangement for submitting, reviewing, and processing Submittals in accordance with Article 8.

3. Design-Builder's Schedule of Values shall provide a reasonable allocation of the Contract Price to component parts of the Work.

2.08 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner and Design-Builder may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Submittals, in electronic or digital

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format, either directly, or through access to a secure Project website.

B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner and Design-Builder shall jointly develop such protocols.

C. Unless expressly stated otherwise in the Contract Documents, Private Entity shall provide documents in accordance with HRSD's Design and Construction Standards.

D. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Contract Documents*

A. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.

B. It is the intent of the Contract Documents to require the design and construction of finally completed Projects in satisfaction of a Functionally Complete (defined in Agreement Paragraph 1.04) Program consistent with the Agreement.

C. Design-Builder shall prepare or furnish Construction Drawings and Construction Specifications that are in accord with the Contract Documents and that describe a functionally complete Project to be constructed in accordance with such Construction Drawings and Construction Specifications, as duly modified.

D. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral, concerning the Work set forth in the Contract.

E. Design-Builder will furnish or perform all labor, documentation, services (including professional services), materials, and equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result whether or not specifically called, for at no additional cost to Owner.

3.02 *Reference Standards*

A. *Standards, Specifications, Codes, Laws or Regulations:*

1. Reference to standards, specifications, manuals or codes of any technical society, organization or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect on the Effective Date of the Contract except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual, or code, or instruction of a Supplier, shall be effective to change the duties and responsibilities of Owner, Design-

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Builder, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall it be effective to assign to Owner or its officers, directors, members, partners, employees, agents, consultants, or subcontractors any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3. All Work shall be performed and completed in conformance with the latest version of the Locality standards, HRPDC standards, or HRSD standards, in that order or priority. If Work to be performed is not covered by one of these sources, then the Private Entity shall suggest a product, approach, etc. to Owner, and obtain the written approval of Owner prior to commencing that portion of the Work.

3.03 *Resolving Discrepancies*

A. Intentionally Omitted.

B. Intentionally Omitted.

C. If there is a discrepancy between (1) the Contract Documents and (2) the Construction Drawings and Construction Specifications, the Contract Documents will control unless Design-Builder gave notice of the discrepancy in a Submittal, and Owner approved the Submittal, pursuant to the provisions of Article 8.

3.04 *Ownership and Reuse of Documents*

A. All documents prepared for or furnished to Owner by Design-Builder pursuant to the Contract Documents (including but not limited to Design Submittals) are instruments of service. With respect to such documents:

1. Design-Builder shall have and retain the ownership, title, and property rights, including copyright, patent, intellectual property, and common law rights, in the documents. Design-Builder permanently and irrevocably grants to Owner a royalty-free, nonexclusive, non-transferable license to use all Submittals which are prepared in the performance of the Work by Design-Builder and by its subconsultants including the right to reproduce, copy, distribute and display by Owner, at its discretion, for a Project, subject to the limitations in this Paragraph 3.04. The license and all rights which inure to Owner shall survive the termination or disengagement of either Design-Builder or its subconsultants, or both, from the Work, whether such termination or disengagement is voluntary or otherwise. All contracts entered into between Design-Builder and its subconsultants in furtherance of the Work shall incorporate the provisions of this paragraph by reference or contain an identical provision granting Owner such royalty-free, nonexclusive, non-transferable license.

2. During the course of a Project, Design-Builder will provide copies of Design Submittals to Owner for purposes of review and comment. Owner may provide copies of Design Submittals to Operators for purpose of review and comment and retain copies of such documents for its records.

3. Owner and Operator may use its copy of the Record Drawings and Record Specifications

for Owner's or Operator's purposes in operating and maintaining the constructed facilities.

4. Upon termination of the Agreement or a Contract, whether by Owner for cause or convenience pursuant to Article 15 or otherwise, Owner shall receive a limited, non-exclusive license to use any completed Design Submittals in continuing a Project, subject to the limitations in this Paragraph 3.04.

5. The documents prepared or furnished by Design-Builder under a Contract, regardless of ownership, transfer, license, completion status, or termination of the Agreement or a Contract, are for Design-Builder's use, and are not intended or represented to be suitable for use on a Project by Owner, or Operator or any party other than Design-Builder, or for reuse by Owner or Operator or others on extensions of a Project or on any other project, except as otherwise stated in a Contract. Any use or reuse by Owner or Operator or others on their behalf will be at Owner and Operator's sole risk, and without liability or legal exposure to Design-Builder, the Project Design Professionals, or their subconsultants.

B. Sewer system asset data and performance data collected by Design-Builder during performance of Sanitary Sewer Evaluation Survey investigations will be submitted to Owner for informational purposes only. Owner may provide copies of the sewer system asset and performance data submittals to Operator for review and to retain copies of such documents for Operator's records, at no cost to Owner or Operator.

Any use or reuse of this sewer asset data by Owner or Operator or others on their behalf will be at their sole risk, and without liability or legal exposure to Design-Builder, the Project Design Professionals, or their subconsultants.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times*

A. The Contract Times will commence to run on the Effective Date of the Contract, unless otherwise agreed by the parties as part of the Contract.

4.02 *Starting the Work*

A. Private Entity shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

4.03 *Progress Schedule*

A. Owner may rely on the progress schedule established in accordance with Paragraph 2.04, as duly adjusted, in planning and conducting ongoing operations and other work at the Site.

B. Design-Builder shall adhere to the progress schedule established in accordance with Paragraph 2.04 as it may be adjusted from time to time, as provided below:

1. Design-Builder shall submit to Owner proposed adjustments in the progress schedule that will not change the Contract Times (or Milestones). Owner shall accept such adjustments

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provided that Owner, in planning and conducting ongoing operations and other work at the Site, has not reasonably relied on the schedule element that is proposed to be adjusted. If Owner has so relied, then Owner and Design-Builder shall promptly meet and seek a resolution that addresses the objectives of both parties, or adjust the Contract Price.

2. Design-Builder shall submit proposed adjustments in the progress schedule that will change the Contract Times (including Milestones) in accordance with the requirements of Paragraph 11.06. Such adjustments may only be made by a Change Order.

C. *Continuing the Work:* Design-Builder shall continue the Work and adhere to the progress schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as Design-Builder and Owner may otherwise agree in writing.

4.04 *Delays in Design-Builder's Progress*

A. If Owner or other contractors performing work at or adjacent to the Site by arrangement with the Owner or anyone for whom Owner is responsible delays, disrupts, or interferes with the performance or progress of the Work, then Design-Builder shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Design-Builder's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Design-Builder's ability to complete the Work within the Contract Times.

B. Design-Builder shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference within the control of Design-Builder. Delay, disruption, and interference attributable to and within the control of a Project Design Professional, Construction Subcontractor, or Supplier shall be deemed to be delays within the control of Design-Builder.

C. If Design-Builder's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Design-Builder, and those for which they are responsible, then Design-Builder shall be entitled to an equitable adjustment in Contract Times. Design-Builder's entitlement to such an adjustment of the Contract Times is conditioned on such adjustment being essential to Design-Builder's ability to complete the Work within the Contract Times. Such an adjustment shall be Design-Builder's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph except as provided herein. If Design-Builder's performance or progress is delayed, disrupted, or interfered with by unanticipated causes as set forth above for 30 days or more, Design-Builder shall notify Owner. Design-Builder and Owner shall meet to determine collaboratively whether and how to reschedule and/or rescope such aspect of the Project to permit the Work to continue without delay. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;

2. Abnormal weather conditions;

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3. Acts or failures to act of utility owners, or Operator (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 9); and

4. Acts of war or terrorism.

D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.

E. Paragraph 9.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

F. Design-Builder shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference in the performance or completion of any identifiable portion of the Work if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Design-Builder related to that identifiable portion of the Work.

G. If Design-Builder seeks an adjustment in Contract Price or Contract Times under this paragraph, Design-Builder shall submit a request for a Change Order to Owner within 30 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Design-Builder of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Design-Builder will have to comply in performing the Work. Design-Builder shall be entitled to an equitable adjustment in the Contract Times if Owner fails to provide Design-Builder with access to the Site necessary for Design-Builder to perform the Work. If Owner is not able to provide Design-Builder with access to the Site necessary for Design-Builder to perform the Work for 30 or more days, Design-Builder shall notify Owner. Design-Builder and Owner shall meet to determine collaboratively whether and how to reschedule and/or rescope such aspect of the Project to permit the Work to continue without delay.

B. Upon reasonable written request, Owner shall furnish Design-Builder with a current statement of record legal title and legal description of the lands upon which the Construction is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws or Regulations.

C. Design-Builder shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

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A. *Limitation on Use of Site and Other Areas:*

1. Design-Builder shall confine construction equipment, the storage of materials and equipment, and the operations of construction workers to the Site and other areas permitted by Laws or Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Design-Builder shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any adjacent land or areas, resulting from the performance of the Work.

2. If a claim for bodily injury (including death) of a third party or damage to third-party property arises out of the negligence of the Private Entity or those for which Private Entity is responsible, including Construction Subcontractors, Private Entity shall:

a. take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise;

b. inform the Owner in writing of any and all claims within 7 calendar days of notification by a third party;

c. promptly attempt to settle the claim within 60 calendar days through negotiations, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law.

3. Intentionally Omitted.

B. *Removal of Debris:* During the performance of the Construction, Design-Builder shall keep the premises free from accumulations of waste materials, rubbish, and other debris resulting from the Construction. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws or Regulations.

C. *Cleaning:* Private Entity shall clean their work zone daily as required by their Right-of-Way permit if working in the right-of-way, but shall not leave equipment, debris, or materials at the Site that may endanger the health, safety, or welfare of the motoring public or residents. If Work is performed on private property, the work zone shall be cleaned according to the terms of the Right of Entry or agreement between the property owner and Owner.

D. *Loading Structures:* Design-Builder shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Design-Builder subject any part of the Construction or adjacent property to stresses or pressures that will endanger it.

5.03 *Intentionally Omitted.*

5.04 *Differing Site Conditions*

A. Design-Builder may rely on the accuracy of the Technical Data with respect to subsurface conditions at the Site unless Design-Builder becomes aware of or encounters subsurface conditions that differ materially from the Technical Data. Design-Builder shall promptly, and before the conditions are disturbed, give a written notice to Owner of (i) subsurface or latent physical conditions at the Site (whether discovered during investigation of the Site or during

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Construction) which differ materially from those indicated in the Contract Documents, or in any Technical Data, or (ii) unknown physical conditions at the Site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inherent in work of the character called for by the Contract Documents.

1. No reports of explorations or tests of subsurface conditions at or adjacent to the Site, or drawings of physical conditions relating to existing surface or subsurface structures at the Site, are known to Owner.

2. During, and as part of, the Design Professional Services, Private Entity shall make provisions to obtain additional information regarding subsurface and physical conditions as they specifically relate to the Site and for proper planning, design and construction of the Work.

B. Owner will investigate the Site conditions promptly after receiving the notice. Design-Builder shall supplement the notice by promptly submitting to Owner any additional information regarding schedule and cost impacts, and a specific request for a Change Order. Owner shall then make a determination regarding the site condition and the impact, if any, on Contract Price and Contract Times. If the conditions do materially so differ and cause an increase or decrease in the Design-Builder's cost of, or the time required for, performing any part of the Work, whether or not changed as a result of the conditions, an equitable adjustment shall be made under this clause and the Contract Price or Times modified in writing by Change Order in accordance with Article 11.

C. No request by Design-Builder for an equitable adjustment under this Paragraph 5.04 shall be allowed unless Design-Builder has given the written notice required.

D. The provisions of this Paragraph 5.04 are not intended to apply to a Hazardous Environmental Condition or Underground Facility uncovered or revealed at the Site.

5.05 *Underground Facilities*

A. *Procedure for Identifying Underground Facilities:* Promptly after the Effective Date of the Contract, Design-Builder shall review the Underground Facilities Data furnished by Owner and use ASCE 38, "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data," as a basis for establishing a procedure ("Underground Facilities Procedure") for the further identification, investigation, and mapping of Underground Facilities at or adjacent to the Site. Design-Builder shall establish and use the Underground Facilities Procedure to aid in the provision of Design Professional Services and the performance of Construction, and to reduce and manage risks associated with Underground Facilities. Such Underground Facilities Procedure shall take into account the Site and the nature of the Project.

1. The Underground Facilities Procedure shall include a plan to keep Underground Facilities information current as Design-Builder proceeds with the provision of Design Professional Services, and to add new or relocated Underground Facilities information to the base utility or Site drawings.

2. To manage the potential impact of design changes on Underground Facilities, Design-Builder shall modify or reapply the Underground Facilities Procedure as the design

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progresses and changes.

B. *Design-Builder's Responsibilities:* Unless otherwise expressly provided in the Contract, Design-Builder shall have full responsibility for the following; and, subject to the provisions of Paragraphs 5.05.C, D, and E, the cost of all of the following will be included in the Contract Price:

1. Establishing and executing the Underground Facilities Procedure referred to in Paragraph 5.05.A, including updating, modification, and reapplication duties;

2. Plan, sequence and communicate the Work with the owners (including Owner) of such Underground Facilities, during the provision of Design Professional Services and Construction; Verifying the actual location of specific Underground Facilities through exposure, as needed for the Design Professional Services;

3. Complying with applicable state and local utility damage prevention Laws and Regulations during Construction; and

4. The safety and protection of all existing Underground Facilities at the Site, and repairing any damage to such Underground Facilities resulting from the Construction, subject to the provisions of Paragraph 5.05.D.

C. *Results of Design-Builder's Execution of Underground Facilities Procedure:* If, during the execution of the Underground Facilities Procedure referred to in Paragraph 5.05.A, the Design-Builder identifies an Underground Facility that was not shown or indicated in the Underground Facilities Data, or was not shown or indicated with reasonable accuracy, causing an increase or decrease in the Design-Builder's cost of, or the time required for, providing Design Professional Services or performing the Construction, then Design-Builder shall submit to Owner a request for a Change Order seeking an equitable adjustment to the Contract Price or Times under this clause. Such request shall be made within 30 days of the identification of the Underground Facility in question.

D. *Underground Facility Found During Construction*: If Design-Builder believes that an Underground Facility that is uncovered, exposed, or revealed at the Site during Construction was not shown or indicated in the Underground Facilities Data, or was not shown or indicated with reasonable accuracy, and also that such Underground Facility was not identified or mapped with reasonable accuracy despite Design-Builder's adequate establishment and execution of the Underground Facilities Procedure referred to in Paragraph 5.05.A, then Design-Builder shall promptly give written notice to Owner, and supplement the notice by submitting to Owner a request for a Change Order seeking an equitable adjustment to the Contract Price or Times under this clause. Such request shall be made within 30 days of the uncovering or revealing of the Underground Facility in question.

1. *Owner's Review:* Owner will investigate the Underground Facility found during Construction promptly after receiving the notice. If Owner concurs with Design-Builder that the Underground Facility that is uncovered, exposed, or revealed at the Site was not shown or indicated in the Underground Facilities Data, or was not shown or indicated with reasonable accuracy, and further was not identified or mapped with reasonable accuracy despite Design-Builder's adequate establishment and execution of the

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Underground Facilities Procedure referred to in Paragraph 5.05.A, causing an increase or decrease in the Design-Builder's cost of, or the time required for, performing any part of the Work, whether or not changed as a result of the actual location, then an equitable adjustment shall be made under this clause and the Contract Price or Times modified in writing by Change Order in accordance with Article 11. If Owner does not concur with Design-Builder, then Owner shall so indicate in writing, with a specific explanation of the reason for non-concurrence.

2. No request by Design-Builder for an equitable adjustment under Paragraph 5.05.D shall be allowed unless Design-Builder has given the written notice required.

E. *Inadequate Establishment or Execution of Underground Facilities Procedure:* If Design-Builder does not establish an Underground Facilities Procedure that is (1) adequate for the Site and the nature of the Project and (2) consistent with the guidelines set forth in ASCE 38, "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data," or Design-Builder does not adequately execute a duly established Underground Facilities Procedure, then Design-Builder shall bear all costs associated with the presence of an Underground Facility that was not identified or located with reasonable accuracy, including but not limited to delay, redesign, relocation, and increased Construction costs, if such Underground Facility would have been identified and located with reasonable accuracy by an adequate and properly executed Underground Facilities Procedure that was consistent with ASCE 38.

5.06 *Hazardous Environmental Conditions at Site*

A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner.

B. Design-Builder shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

C. Design-Builder shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Design-Builder, Project Design Professionals, Construction Subcontractors, Suppliers, or anyone else for whom Design-Builder is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

D. If Design-Builder encounters, uncovers, or reveals a Hazardous Environmental Condition (whether during Site investigation or during Construction) whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Design-Builder or anyone for whom Design-Builder is responsible creates a Hazardous Environmental Condition as set forth in paragraph C, then Design-Builder shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.16); and (3) notify Owner (and promptly thereafter confirm such notice in writing). Owner shall promptly determine whether to retain a qualified expert to evaluate such condition or take corrective action, if any, and take such actions as are necessary to permit Owner to timely

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obtain required permits and provide Design-Builder the written notice required by Paragraph 5.06.E. If Design-Builder or anyone for whom Design-Builder is responsible created the Hazardous Environmental Condition in question as set forth in paragraph C, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

E. Design-Builder shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Design-Builder either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

F. If after receipt of such written notice Design-Builder does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then the portion of the Work that is in the area affected by such condition shall be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 9.

G. Intentionally Omitted.

H. To the fullest extent permitted by Laws and Regulations, Design-Builder shall indemnify and hold harmless Owner and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the Design-Builder's failure to control, contain, or remove a Constituent of Concern brought to the Site by Design-Builder or by anyone for whom Design-Builder is responsible, or to a Hazardous Environmental Condition created by Design-Builder or by anyone for whom Design-Builder is responsible. Nothing in this Paragraph 5.06.H shall obligate Deign-Builder to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

I. HRSD is required in accordance with 29 CFR 1910.1200, to inform Private Entity personnel that HRSD facilities have hazardous chemicals on site. HRSD and Private Entity personnel may be exposed to these hazardous chemicals while working at HRSD facilities. A written Hazard Communication Program has been developed to inform personnel of the specific hazardous chemicals at the HRSD facility and the related safety information including protective measures, special precautions and emergency procedures to be observed. The Hazard Communication Program including Safety Data Sheets for each hazardous chemical at the HRSD facility will be reviewed with the Private Entity after the Effective Date of the Contract. It is the responsibility of the Private Entity to request a meeting with representatives of HRSD's Safety Division and/or HRSD facility staff to review this program prior to beginning any on-site efforts at the HRSD facility or facilities impacted by a Project. The Private Entity is responsible for communicating the information contained in the Hazard Communication Program to their personnel and subcontractors working at the HRSD facility.

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ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

A. For a Contract that includes Construction, or an amendment to a Contract to include Construction, Private Entity shall furnish a performance bond and a payment bond, each in an amount equal to the Contract Price within 10 business days of execution of the Contract, or the amendment to a Contract to include Construction. These bonds shall remain in effect until one year after the date when final payment becomes due on the applicable Contract, or until completion of the correction period of the applicable Contract specified in Paragraph 14.08, whichever is later, except as provided otherwise by Laws or Regulations, the General Conditions, or other specific provisions of the applicable Contract. The performance bond may be provided at a later date agreed to by the Owner as part of a Contract, but shall be provided prior to the beginning of any Work involving Construction. Private Entity shall also furnish a bond rider for the performance bond and payment bond within 10 business days of approval of a Change Order amending the Contract Price of a Contract.

B. All bonds shall be in the form prescribed herein except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

C. Design-Builder shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.

D. If the surety on a bond furnished by Design-Builder is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Design-Builder shall promptly notify Owner and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.

E. If Design-Builder has failed to obtain a required bond, Owner may exclude the Design-Builder from the Site and exercise Owner's termination rights under Article 15.

F. Upon request to either Owner or Design-Builder from any Construction Subcontractor, Project Design Professional, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, the recipient of the request shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

A. Owner and Design-Builder shall obtain and maintain insurance as required in this Article.

B. All insurance required herein to be purchased and maintained by Owner or Design-Builder

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shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Except as provided below, all companies that provide insurance policies required herein shall have an A.M. Best rating of A-VII or better.

1. Private Entity may obtain workers' compensation insurance from an insurance company that has not been rated by A.M. Best, provided that such company (a) is domiciled in the state in which the Project is located, (b) is certified or authorized as a workers' compensation insurance provider by the appropriate state agency having jurisdiction, and (c) has been accepted to provide workers' compensation insurance for similar projects by the state within the last 12 months.

C. Commercial General Liability, Automobile Liability, Excess/Umbrella Liability, and Contractor's Pollution Liability insurance policies providing additional insured coverage and required herein to be purchased and maintained by Design-Builder shall be primary and without contribution by insurance of the same type and form maintained by Owner.

D. Alternative forms of insurance coverage, including but not limited to self-insurance and "Occupational Accident and Excess Employer's Indemnity Policies," are not sufficient to meet these insurance requirements.

E. Design-Builder shall require (a) its Construction Subcontractors and Engineer (and any other Project Design Professional that is an independent individual or entity) to purchase and maintain commercial general liability, automobile liability, workers' compensation, employer's liability, professional liability (as applicable), and umbrella or excess liability insurance, and (b) its Construction Subcontractors to purchase and maintain contractor's pollution liability insurance. Design-Builder shall use commercially reasonable efforts to contractually require all such insurance to meet the same requirements for the applicable category of insurance established herein.

1. The Private Entity shall ensure that all Construction Subcontractors carry all applicable category of insurance; however, Owner does not specify required limits.

F. Private Entity shall deliver to Owner, with copies to each additional insured (as identified in this Article or the Contract), certificates of insurance (including copies of relevant endorsements) establishing that Private Entity has obtained and is maintaining the policies, coverages, and endorsements required herein.

G. Owner shall deliver to Design-Builder, with copies to each additional insured (as identified in this Article, or in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner herein (if any). Upon request by Design-Builder or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

H. Failure of Owner or Design-Builder to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Design-

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Builder to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

I. If either party does not purchase or maintain all of the insurance required of such party herein, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

J. If Design-Builder has failed to obtain and maintain required insurance, Owner may exclude the Design-Builder from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 15.

K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.

L. Owner does not represent that insurance coverage and limits established herein necessarily will be adequate to protect Design-Builder or Design-Builder's interests.

M. The insurance and insurance limits required herein of Design-Builder are not intended to be construed as sufficient to protect Design-Builder from liability during their performance under a Contract.

6.03 *Design-Builder's Insurance*

A. *Workers' Compensation and Employer's Liability:* Design-Builder shall purchase and maintain workers' compensation and employer's liability insurance for:

1. Claims under workers' compensation, disability benefits, and other similar employee benefit acts.

2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).

3. Claims for damages because of bodily injury, occupational sickness or disease, or death of Design-Builder's employees(by stop-gap endorsement in monopolistic worker's compensation states).

4. Foreign voluntary worker compensation (if applicable).

B. *Commercial General Liability—Claims Covered:* Design-Builder shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Design-Builder, on an occurrence basis, against:

1. Claims for damages because of bodily injury, sickness or disease, or death of any person other than Design-Builder's employees.

2. Claims for damages insured by reasonably available personal or advertising injury liability coverage.

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3. Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

4. Contractual Liability.

C. *Commercial General Liability— Content:* Private Entity's commercial liability policy shall be written on an occurrence basis and include the following coverages and endorsements:

1. Products and completed operations coverage:

a. Such insurance shall be maintained for one year after completion of the Work.

b. Design-Builder shall furnish Owner and each other additional insured (as identified herein or in the Contract) evidence of continuation of such insurance at completion of the Work and for one year thereafter.

2. Blanket contractual liability coverage, to the extent permitted by law.

3. Property damage coverage.

4. Severability of interests and no insured-versus-insured or cross-liability exclusions. Insured- versus-insured and cross liability exclusions do not apply to Owner.

5. Intentionally Omitted.

6. Personal and advertising injury coverage.

7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 07 04 and CG 20 37 07 04, or their equivalent.

8. Intentionally Omitted.

9. The General Aggregate Limits will apply per project. No other project or claims unrelated to the Project shall have an effect on the General Aggregate Limits of the Design-Builder's commercial liability policy provided herein.

D. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, shall not include any of the following:

1. Any modification of the ISO definition of "insured contract".

2. Any exclusion for water intrusion or water damage.

3. Any provisions resulting in the erosion of insurance limits by defense costs.

4. Any exclusion of coverage relating to earth subsidence or movement.

5. Any exclusion for the insured's vicarious liability, strict liability, or statutory liability.

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6. Any limitation or exclusion based on the nature of Design-Builder's work.

7. Any professional liability exclusion broader in effect than ISO form CG 22 80 04 13 or equivalent.

E. *Automobile liability:* Design-Builder shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage caused by the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.

F. *Umbrella or excess liability:* Design-Builder shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall be procured on a "coverage as broad as" basis as to each and every one of the underlying policies. Design-Builder may meet the combined limits of insurance (underlying policy plus applicable umbrella or excess) specified for employer's liability, commercial general liability, and automobile liability through the primary policies alone, or through combinations of the primary insurance policies and an umbrella or excess liability policy with coverage as broad as the underlying policy, as specified herein.

G. *Contractor's pollution liability insurance:* Design-Builder shall purchase and maintain a policy covering third party injury and property damage claims, including cleanup costs, as a result of pollution conditions arising from Design-Builder's operations and completed operations. This insurance shall be maintained for three years after completion of the Work. If written on a "claims made" basis, the retroactive date will pre-date the commencement of the Work.

H. *Additional Insureds Ongoing and Completed Operations, and Waiver of Subrogation*: The Private Entity's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner, as well as any applicable Owner's Consultant(s) and Operators (to the extent caused in whole or in part by the Work and as their interests may appear) which shall be listed in each Contract; include coverage for their respective officers, directors, members, partners, and employees or each and any of all such additional insureds; and the additional insureds insurance afforded to Owner, as well as any applicable Owner's Consultant(s) and Operators (to the extent caused in whole or in part by the Work and as their interests may appear) which shall be listed in each Contract, shall provide primary coverage for claims covered thereby (including as applicable those caused by both Private Entity's ongoing and completed operations) on a non-contributory basis to insurance of the same type and form maintained by Owner and Operators (except for Automobile Liability). Where not prohibited by law the Private Entity's commercial general liability, automobile liability, umbrella or excess, and workers compensation policies and employer's liability shall include a waiver of subrogation endorsement in favor of the Owner, as well as any applicable Owner's Consultant(s) and Operators (to the extent caused in whole or in part by the Work and as their interests may appear) which shall be listed in each Contract. Private Entity shall obtain all necessary endorsement to support these requirements. The additional insureds shall include the following:

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1. Owner: Hampton Roads Sanitation District
   1434 Air Rail Avenue
   Virginia Beach, Virginia 23455

2. Operators (to the extent caused in whole or in part by the Work and as their interests may appear) which shall be listed in each Contract.

3. Owner's Consultant(s) (to the extent caused in whole or in part by the Work and as their interests may appear) which shall be listed in each Contract.

I. *Professional liability insurance:*

1. Private Entity shall be responsible for purchasing and maintaining professional liability insurance with limits equal to $2,000,000 per claim and in the aggregate. This insurance shall provide protection against claims during performance of professional design or related services, and caused by a negligent act, error, or omission for which Private Entity is legally liable.

2. If in the performance of a Contract any Design Professional Services, or other professional engineering or similar services, are to be performed by an independent design professional, under direct contract to Design-Builder or at any lower contractual tier, then Design-Builder shall be responsible for assuring that such independent design professional purchases and maintains professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the independent design professional is legally liable.

3. If a Construction Subcontractor ~~at any tier~~ will provide or furnish design, engineering, or other similar professional services under a Contract, as the result of a delegation of professional design responsibilities or otherwise, then Design-Builder shall assure that such Construction Subcontractor purchases and maintains applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable.

4. Any professional liability insurance required herein shall be maintained throughout the duration of a Contract and for three years after completion of the Work. For each claims-made professional liability policy furnished and maintained to satisfy the requirements of this Paragraph 6.03.I, the retroactive date on the policy shall pre-date the commencement of furnishing services on the Project.

J. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:

1. Include the specific coverages provide in this Article.

2. Be written for the stated limits of coverage provided in this Article and in the Contract, or required by Laws or Regulations, whichever is greater.

3. Contain a provision or endorsement that the coverage afforded will not be canceled or renewal refused until at least 30 calendar days prior written notice has been given to

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Private Entity (10 calendar days Non-Payment). Design-Builder shall provide notice of revisions that would alter what has been contractually agreed to herein. Within 3 days of receipt of any such written notice, Design-Builder shall provide a copy of the notice to Owner and each other insured under the policy.

4. Remain in effect for three years after completion of the Work and Design-Builder's departure from the Site (and longer if expressly required elsewhere herein), and at all times thereafter when Design-Builder may be correcting, removing, or replacing defective Construction as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.

5. Provide applicable protection from claims caused by the Work, whether such performance is by Design-Builder or done on Design-Builder's behalf.

K. The required limits for commercial general liability and automobile liability must be met by the primary policies, and not by reference to excess or umbrella insurance provided in other policies.

L. The limits of liability for the insurance required by Paragraph 6.03 of the General Conditions for the Private Entity shall provide coverage for the following amounts:

1. Workers' Compensation and Employer's Liability under Paragraph 6.03.A of the General Conditions in the amounts below or greater where required by Laws or Regulations:

State: Virginia	Statutory
Federal, if applicable (e.g., Longshoreman's):	Statutory
Jones Act coverage, if applicable:	Statutory
Employer's Liability:	
Bodily injury, each accident	$ 100,000
Bodily injury by disease, each employee	$ 100,000
Bodily injury/disease aggregate	$ 500,000
Voluntary Worker Compensation:	Statutory

2. Commercial General Liability under Paragraphs 6.03.B, 6.03.C, and 6.03.D of the General Conditions:

General Aggregate:	$ 4,000,000
Products – Completed Operations Aggregate:	$ 4,000,000
Personal and Advertising Injury:	$ 2,000,000

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Each Occurrence (Bodily Injury and Property Damage): $ 2,000,000

Damage to Rented Premises (Fire Damage): $ 100,000

Medical Expenses (Any one person): $ 5,000

3. Automobile Liability under Paragraph 6.03.E of the General Conditions:

   Each Accident Combined Single Limit of: $ 2,000,000

4. Umbrella or Excess Liability under Paragraph 6.03.F of the General Conditions:

   Per Occurrence: $ 8,000,000

   General Aggregate: $ 8,000,000

5. Contractor's Pollution Liability insurance under Paragraph 6.03.G of the General Conditions:

   Each Claim: $ 2,000,000

   General Aggregate: $ 2,000,000

6. Contractor's Professional Liability/Errors and Omissions under Paragraph 6.03.I of the General Conditions:

   Each Claim: $ 2,000,000

   General Aggregate: $ 2,000,000

7. *Unmanned Aerial Vehicle Liability Insurance:* If Private Entity uses unmanned aerial vehicles (UAV – commonly referred to as drones) at the Site or in support of any aspect of the Work, Private Entity shall obtain UAV liability insurance in the amounts stated; include Owner, as well as any applicable Owner's Consultant(s) and Operators (to the extent caused in whole or in part by the Work and as their interests may appear) which shall be listed in each Contract, as additional insureds; and provide a certificate to Owner confirming Private Entity's compliance with this requirement. Such insurance will provide coverage for property damage, bodily injury or death, and invasion of privacy. Private Entity shall use commercially reasonable efforts to contractually require any subcontractors using UAV's carry the required liability insurance and provide the same additional insured protections:

   Each Claim: $ 1,000,000

   General Aggregate: $ 1,000,000

8. *Additional Coverages:* In the event a vessel or barge is used in execution of a Contract, Private Entity shall use commercially reasonable efforts to contractually require the owner or operator of all owned and non-owned vessels or barges to be insured; including crew coverage. Hull insurance shall be carried for the full value of replacement. Owner,

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as well as any applicable Owner's Consultant(s) and Operator (to the extent caused in whole or in part by the Work and as their interests may appear) which shall be listed in each Contract, shall be included as additional insureds on all watercraft insurance coverage:

Protection and Indemnity: $ 1,000,000

If operations under a Contract involve the use of owned or non-owned aircraft or watercraft, Private Entity shall use commercially reasonable efforts to contractually require the owner or operator to provide coverage for bodily injury and property damage arising out of ownership, maintenance, use, or entrustment, thereof as follows:

General Aggregate: $ 2,000,000

Each Occurrence (Bodily Injury and Property Damage): $ 1,000,000

6.04 *Owner's Liability Insurance*

A. In addition to the liability insurance required to be provided by Design-Builder, the Owner, at Owner's option and expense, may purchase and maintain Owner's own liability insurance to protect Owner against claims which may arise with respect to the Project.

B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Design-Builder, and Design-Builder cannot rely upon Owner's liability policies for any of Design-Builder's obligations to the Owner or third parties.

6.05 *Property Insurance*

A. Builder's Risk: For a Contract that includes Construction, or an amendment to a Contract to include Construction, prior to mobilization and/or delivery of any materials or equipment to the Site, Private Entity shall purchase and maintain builder's risk insurance upon the Work in the amount of the full insurable replacement cost thereof (subject to such deductible amounts) until Substantial Completion based on what is commercially and reasonably available in the insurance marketplace at the time of placement. Should any portion of the Work be deemed uninsurable and/or insurance unobtainable under the all-risk builder's risk policy Private Entity and Owner will work together to develop a mutually acceptable solution to insure the risk of loss to property. This insurance shall:

1. Include the Owner and Operator as additional insured, and all Construction Subcontractors and Owner's subcontractors of every tier, including suppliers, vendors, manufacturers, architects, and engineers, to be insured under such builder's risk policy, as additional insureds as their interest appear while on the Site.

2. Be written on a builder's risk "all risk" policy form that shall include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment to be incorporated into the Work stored and in transit, and shall insure against the following perils or causes of loss: fire; lightning; windstorm; hail; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition and increased cost of construction occasioned by

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enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the General Conditions.

3. Cover, as insured property, the following: (a) the Work (including but not limited to all buildings, structures, foundations, excavations, underground property, pilings, underground pipes, flues, drains, wiring, cables, and the like) and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of a Contract; and (c) temporary works which are not intended to form part of the permanent Work but which are intended to provide working access to the Site, or to the Work, or which are intended to provide temporary support for the Work, Including scaffolding, form work, fences, shoring, lighting, cribbing, falsework, and temporary structures

4. Cover expenses incurred in the repair or replacement of any insured property (soft costs that cover expediting and extra expenses associated with a loss).

5. Extend to cover damage or loss to insured property to be incorporated into the Work while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).

6. Extend to cover damage or loss to insured property to be incorporated into the Work while in transit.

7. Intentionally Omitted.

8. Provide for the waiver of claims and waiver of the insurer's subrogation rights, as set forth in Paragraph 6.06.

9. Provide primary coverage for all losses and damages caused by the perils or causes of loss covered.

10. Not include a co-insurance clause or show coinsurance as 'nil'.

11. Include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.

12. Intentionally Omitted.

13. Be maintained in effect, subject to the provisions herein regarding Substantial Completion until the Work is complete.

B. Notice of Cancellation or Change: All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or renewal refused until at least 30 calendar days prior written notice (10 calendar days non-payment) has been given to the purchasing policyholder. Within 3 days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured. Design-Builder shall provide notice of revisions that would alter

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what we have contractually agreed to herein on the Builder's Risk policy.

C. *Deductibles:* The Private Entity shall be responsible for all policy deductibles on Builder's Risk insurance.

D. Intentionally Omitted.

E. *Additional Insurance:* If Design-Builder elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Design-Builder's expense.

F. *Insurance of Other Property:* If the express insurance provisions of a Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Design-Builder, a Construction Subcontractor, or an employee of Design-Builder or a Construction Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

G. Intentionally Omitted.

6.06 *Waiver of Rights*

A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against any Project Design Professional or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Design-Builder waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Construction; and, in addition, waive all such rights against the Project Design Professionals, their consultants, all Construction Subcontractors, all individuals or entities identified in the General Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Design-Builder as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Owner waives all rights against Design-Builder, the Project Design Professionals, and the Construction Subcontractors, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:

1. Loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Construction caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. Loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property

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insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 14.04, after Substantial Completion pursuant to Paragraph 14.03, or after final payment pursuant to Paragraph 14.06.

C. Any insurance policy maintained by Owner covering any loss, damage, or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that the insured is allowed to waive the insurer's rights of subrogation against Design-Builder, Project Design Professionals, Construction Subcontractors, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, in a written contract executed prior to the loss, damage, or consequential loss.

6.07 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall give notice to such other insureds that adjustment and settlement of a claim is in progress.

B. Proceeds for such insured property losses may be made payable by the insurer to the named insured that purchased the policy in its own right. Any such proceeds shall be used for the benefit of the applicable Project.

ARTICLE 7 – DESIGN-BUILDER'S RESPONSIBILITIES

7.01 *Design Professional Services*

A. Design-Builder shall provide the Design Professional Services pursuant to the Comprehensive Agreement and as mutually agreed in a Contract.

B. *Standard of Care:* The standard of care for all Design Professional Services performed or furnished by Design-Builder under the Contract Documents will be the care and skill ordinarily used by members of the subject profession practicing under similar circumstances at the same time and in the same locality. If Owner discovers any Design Professional Services that do not meet such standard of care within one (1) year from completion of the Design Professional Services, Owner shall notify Design-Builder in writing and provide Design-Builder an opportunity to reperform and correct such Design Professional Services.

7.02 *Construction*

A. Design-Builder shall perform and furnish the Construction pursuant to the Comprehensive Agreement Contract Documents, the Construction Drawings, and the Construction Specifications, as duly modified.

B. Design-Builder shall keep Owner advised as to the progress of the Construction.

7.03 *Supervision and Superintendence of Construction*

A. Design-Builder shall supervise, inspect, and direct the Construction competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to provide the Construction in accordance with the Contract Documents. Design-

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Builder shall be solely responsible for the means, methods, techniques, sequences, and procedures of Construction.

B. At all times during the progress of Construction, the Design-Builder shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Owner's written consent, not to be unreasonably withheld.

7.04 *Labor; Working Hours*

A. Design-Builder shall provide competent, suitably qualified personnel to perform the Work as required by the Contract Documents. Design-Builder shall at all times maintain good discipline and order at the Site. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise indicated in the Contract Documents, and in the absence of any Laws or Regulations to the contrary, all Construction at the Site shall be performed during regular working hours. Private Entity will not perform Work on any legal holiday. Private Entity may perform Construction at the Site outside regular working hours or on a legal holiday only with Owner's written consent, which will not be unreasonably withheld, and approval of the Operator.

1. Regular working hours will be Monday through Friday between 7:00 am and 7:00 pm, unless otherwise approved by HRSD or required by the Locality where work is occurring.

B. Private Entity acknowledges and agrees that the Owner selected the Private Entity for award of the Agreement and each Contract, in part, because of the special qualifications of Private Entity's key personnel. Private Entity shall not reassign or transfer key personnel to other duties or positions such that they are no longer available to provide the Owner with the expertise, experience, judgment, and personal attention at the level proposed without first notifying the Owner to proposed reassignment or transfer. The Owner shall have the right to interview and review the qualifications for acceptance of any proposed change in key personnel which will not be unreasonably denied.

7.05 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Design-Builder shall furnish or cause to be furnished and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified by Owner or in the Construction Drawings or Construction Specifications, and unless specified otherwise shall be new and of good quality. All warranties and guarantees specifically called for by the Contract Documents shall expressly run to the benefit of Owner. If required by Owner, Design-Builder shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise provided in the Contract Documents.

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7.06 *"Or Equals" and Substitutions*

B. If an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, then during the preparation of the proposed Construction Drawings and Construction Specifications, the Design-Builder may request that Owner authorize the use of other items of material or equipment, or items from other proposed suppliers, by including the proposed items in the proposed Construction Drawings or Construction Specifications, with required notice to Owner that the Submittal contains a variation from the Contract Documents. Owner in its sole discretion may approve the use of the item if Owner determines that the item is functionally equal to that named and sufficiently similar so that no change in related Work will be required, taking into consideration whether the item:

1. Is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2. Will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;

3. Has a proven record of performance and availability of responsive service; and

4. Is not objectionable.

C. *Effect of Owner's Determination:* Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.

D. *Substitutes:* During the preparation of the proposed Construction Drawings and Construction Specifications, the Design-Builder may propose a substitute to an item of material or equipment that is required to be furnished by the Contract Documents. Any such proposal shall be made in a transmittal to Owner that is separate from and independent of any Design Submittals. The proposal shall describe the advantages, disadvantages, and changes in Contract Price or Contract Time associated with the proposed substitute. Approval of the proposed substitute shall be at Owner's sole discretion. If approved, the substitute item shall be incorporated in the Construction Drawings and Construction Specifications.

E. *Design Professional Review:* Before Design-Builder transmits its proposal to Owner, the Project Design Professional that designed the portion of the Work affected by the proposed "or equal" or substitute shall review and approve the proposal.

F. *Construction Drawings and Construction Specifications:* "Or equal" or substitute proposals with respect to items of material or equipment that are required in the Construction Drawings and Construction Specifications shall be considered proposed modifications of the Construction Drawings and Construction Specifications, and shall be governed by the provisions of Paragraph 8.02.H.

7.07 *Concerning Project Design Professionals, Construction Subcontractors, Suppliers, and Others*

A. Design-Builder may retain Project Design Professionals, Construction Subcontractors, and

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Suppliers for the performance of parts of the Work. Such Project Design Professionals, Construction Subcontractors, and Suppliers must be acceptable to Owner.

B. Design-Builder shall retain specific Project Design Professionals, Construction Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required to do so by the Contract Documents as of the Effective Date.

C. Prior to entry into any binding Design Agreement, Construction Subcontract, or purchase order, Design-Builder shall submit to Owner the identity of the proposed Project Design Professional, Construction Subcontractor, or Supplier (unless Owner has already deemed such proposed contractual party acceptable, during the Project Package approval process or otherwise). Such proposed contractual party shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.

D. Owner may require the replacement of any Project Design Professional, Construction Subcontractor, Supplier, or other entity retained by Design-Builder to perform any part of the Work solely on the basis of substantive, reasonable objection after due investigation. Design-Builder shall submit an acceptable replacement for the rejected Project Design Professional, Construction Subcontractor, Supplier, or other entity.

E. If Owner requires the replacement of any Project Design Professional, Construction Subcontractor, Supplier, or other entity retained by Design-Builder to perform any part of the Work, then Design-Builder shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement.

F. No acceptance by Owner or Engineer or of any Project Design Professional, Construction Subcontractor, Supplier, or other entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

G. As between Design-Builder and Owner, Design-Builder shall be fully responsible to Owner for all acts and omissions of the Project Design Professionals, Construction Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work, just as Design-Builder is responsible for Design-Builder's own acts and omissions.

H. Design-Builder shall be solely responsible for scheduling and coordinating the services and work of the Project Design Professionals, Construction Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.

I. Design-Builder shall restrict all Project Design Professionals, Construction Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating directly with Owner, except in case of an emergency or a matter involving public health, safety, or welfare, or as otherwise expressly allowed herein.

J. Owner may furnish to any Project Design Professional, Construction Subcontractor, or Supplier, to the extent practicable, information about amounts paid to Design-Builder on account of Work performed for Design-Builder by the requesting party.

K. Nothing in the Contract Documents:

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1. Shall create for the benefit of any Project Design Professional, Construction Subcontractor, Supplier, or other third-party individual or entity any contractual relationship between Owner and such third-party individual or entity; nor

2. Shall create any obligation on the part of Owner to pay or to see to the payment of any money due any Project Design Professional, Construction Subcontractor, Supplier, or other third-party individual or entity except as may otherwise be required by Laws and Regulations.

7.08 *Patent Fees and Royalties*

A. Design-Builder shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Conceptual Documents or other Contract Documents for use in the performance of the Construction, and if to the actual knowledge of Owner its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, then Owner has disclosed the existence of such rights to Design-Builder in the Conceptual Documents or other Contract Documents.

B. To the fullest extent permitted by Laws or Regulations, Design-Builder shall indemnify and hold harmless Owner and Owner's Consultant, and the officers, directors, partners, employees or agents, and other consultants of each and any of them from and against all claims, costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) to the extent caused by infringement of patent rights or copyrights by Design-Builder, any Construction Subcontractor, or any of their officers, directors, partners, employees or agents, and other consultants incident to the use in the performance of the Work or resulting from the specification or incorporation in the Work of any invention, design, process, product or device, except those required by the Contract Documents.

C. Intentionally Omitted.

7.09 *Permits and Utility Charges*

A. The Private Entity is responsible for obtaining and paying for any and all permits, licenses, certificates of occupancy, and approvals of governmental authorities having jurisdiction over the Work.

B. Design-Builder shall pay all charges of utility owners for temporary service to the Work. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work, and for capital costs related thereto.

7.10 *Taxes*

A. Design-Builder shall pay all sales, consumer, use, and other similar taxes required to be paid by Design-Builder in accordance with the Laws or Regulations of the place of the Project which are applicable during the performance of the Work.

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7.11 *Laws and Regulations*

A. Design-Builder shall give all notices required by and comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, Owner shall not be responsible for monitoring Design-Builder's compliance with any Laws or Regulations.

B. If Design-Builder performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Design-Builder shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work.

C. Changes in Laws or Regulations that occur after the date on which the Design-Builder committed to the Contract Price (whether by negotiation or making an offer or proposal) and affect the cost or time of performance shall be the subject of an equitable change in Contract Price or Contract Times.

7.12 *Record Documents*

A. Design-Builder shall maintain the Record Documents in good order, in a safe place at the Site. Design-Builder shall annotate the Record Documents to show all changes and clarifications made (whether in the field or otherwise) during performance of Construction. The Record Documents, as annotated, will be available to Owner for reference. After Substantial Completion and prior to Final Completion of the Work, the Private Entity shall provide Record Documents and other required information to the Owner within 30 days after being completed in accordance with the terms and conditions of the Contract Documents.

B. After receipt and review of the Record Documents from Design-Builder upon completion of Construction, the Owner and Operator may comment on any possible inaccuracies. After Owner and Design-Builder collaboratively address any such comments, the Record Documents shall be deemed to be Record Drawings and Record Specifications.

C. The Record Drawings and Record Specifications are Contract Documents, and are binding upon Design-Builder with respect to its obligations to comply with the Contract Documents, including but not limited to correction period responsibilities and warranty obligations.

7.13 *Safety and Protection*

A. Design-Builder shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Construction Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Design-Builder shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. All persons on the Site or who may be affected by the Work;

2. All the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. Other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Facilities not designated for removal, relocation, or replacement in the course of Construction.

B. Design-Builder shall comply with applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Design-Builder shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

C. Design-Builder shall comply with the following Owner and Operator safety programs, as applicable to the Work: Owner's Design and Construction Standards, latest version, is available for review at https://www.hrsd.com/standards. Operator safety programs may be defined in their published Operator-specific standards or in the latest version of the Hampton Roads Regional Construction Standards, which is available for review at: https://www.hrpdcva.gov/556/Hampton-Roads-Regional-Construction-Stan. The order of precedence for Owner and Operator safety programs shall be as stated for Reference Standards in Article 3.02.A.3.

D. Design-Builder shall inform Owner of the specific requirements of Design-Builder's safety program with which Owner and its employees and representatives must comply while at the Site.

E. All damage, injury, or loss to any property referred to in Paragraph 7.13.A.2 or 7.13.A.3 caused, directly or indirectly, in whole or in part, by Design-Builder, any Construction Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Design-Builder.

F. Design-Builder's duties and responsibilities for safety and for protection of the Construction shall continue until such time as all the Work is completed, Owner has issued a notice to Design-Builder in accordance with Paragraph 14.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion), and Design-Builder has left the Site.

G. Design-Builder's duties and responsibilities for safety and protection shall resume whenever Design-Builder or any Construction Subcontractor, Supplier, or other representative returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Safety Representative*

A. Design-Builder shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

B. Safety Representatives from both the Owner and Private Entity shall coordinate efforts as

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necessary to assure a safe work environment for their respective facilities and/or equipment impacted by the Work. This in no way relieves the Private Entity of their responsibility for initiating, maintaining and supervising all safety precautions and programs in connection with the Work as specified in Paragraph 7.13 of the General Conditions.

7.15 *Hazard Communication Programs*

A. Design-Builder shall be responsible for coordinating any exchange of safety data sheets or other hazard communication information required to be made available to or exchanged between or among any Construction Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work at the Site in accordance with Laws or Regulations.

7.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Design-Builder is obligated to act to prevent threatened damage, injury or loss. Design-Builder shall give Owner prompt written notice if Design-Builder believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If a change in the Contract Documents is required because of the action taken by Design-Builder in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.17 *Post-Construction Phase*

A. If set forth in a mutually agreed scope of Work, Design-Builder shall:

1. Provide assistance in connection with the start-up and testing of any equipment or system.

2. Assist Owner in training staff to operate and maintain the Work.

7.18 *Design-Builder's General Warranty and Guarantee*

A. Design-Builder warrants and guarantees to Owner that Design-Builder will perform and complete the Construction as required by the Contract Documents, and that all Construction will be in accordance with the Contract Documents, the Construction Drawings, and the Construction Specifications (as duly modified in accordance with the Contract), and will not be defective. Design-Builder shall repair or reperform, at its sole cost and expense, all defective Construction that is discovered and called to Design-Builder's attention by Owner prior to the expiration of one (1) year after Substantial Completion of the Work as provided in Section 14.08. This repair and reperformance obligation is Design-Builder's exclusive liability and Owner's sole remedy with respect to the quality of the Work, both only as to defective Construction. EXCEPT AS PROVIDED IN THE CONTRACT, THERE ARE NO WARRANTIES OR GUARANTEES, EXPRESSED OR IMPLIED, WITH RESPECT TO THE WORK OR SERVICES, AND CONTRACTOR DISCLAIMS ANY IMPLIED WARRANTIES OR WARRANTIES IMPOSED BY LAW, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

B. Design-Builder's warranty and guarantee hereunder excludes defects or damage caused by:

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1. Abuse, modification or improper maintenance or operation by persons other than Design-Builder, Construction Subcontractors, or Suppliers or any other individual for whom Design-Builder is responsible; or

2. Normal wear and tear under normal usage.

3. Acts of God, flood, hurricane, tornado, or other event of force majeure.

C. None of the following will constitute an acceptance by Owner of Work that is not in accordance with the Contract Documents or a release of Design-Builder's obligation to perform the Work in accordance with the Contract Documents, unless expressly stated otherwise in writing:

1. Observations by Owner;

2. The making of any progress or final payment;

3. The issuance of a certificate of Substantial Completion;

4. Use or occupancy of the Work or any part thereof by Owner;

5. Any review and approval of a Submittal;

6. Any inspection, test, or approval by others; or

7. Any correction of defective Construction by Owner.

7.19 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of the Private Entity under the Contract or otherwise, Private Entity shall indemnify and hold harmless Owner, Owner's Consultant, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs losses, damages and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to, damage to or destruction of tangible property (other than Work itself) including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Private Entity, a Project Design Professional, or any Construction Subcontractor, Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.

B. In any and all claims or actions against Owner, Owner's Consultant, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Design-Builder, a Project Design Professional, any Construction Subcontractor, any Supplier, any individual or entity directly or indirectly employed or retained by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under

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Paragraph 7.19.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Design-Builder, a Project Design Professional, or any Construction Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Design-Builder under Paragraph 7.19.A shall not extend to the liability of Owner's Consultant, other consultants or design professionals of Owner, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, designs, or specifications.

7.20 *Submittals Using Project Management Software*

A. Private Entity, shall submit the following information and documentation using the HRSD Project Management Software (Oracle Enterprise Resource Planning (ERP) and Unifier systems):

1. Pay applications.

2. Shop Drawings, Operations and Maintenance (O&M) Manuals, and Material and Spare Parts Turnover forms.

3. Certificate of Substantial Completion.

4. Other forms and Submittals as mutually agreed upon.

B. Private Entity personnel shall attend HRSD training to implement usage of software.

ARTICLE 8 – SUBMITTALS

8.01 *Design-Builder's Preparation of Submittals*

A. Design Submittals shall be prepared by Project Design Professionals, on behalf of Design-Builder.

B. The appropriate Project Design Professional shall review and approve each Submittal (including but not limited to all Design Submittals), other than those Submittals not involving technical or engineering matters, before Design-Builder's transmittal of such Submittal to Owner. Such review and approval shall account for the following, as appropriate:

1. That any items covered by such Submittal will, after installation or incorporation in the Construction, comply with the information and requirements in the Contract Documents and the Construction Drawings and Construction Specifications, as duly modified, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents, Construction Drawings, and Construction Specifications, as duly modified.

2. That if the Submittal includes any proposed modification of the Contract Documents, Construction Drawings, or Construction Specifications, or any proposed variation from the requirements of such documents, such proposed modification or variation is acceptable

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based on the standards of the engineering profession (or other applicable design profession), and if implemented will be supported by signing or sealing by a licensed design professional, as necessary.

C. Before Design-Builder's transmittal of a Submittal to Owner, the Design-Builder shall, as applicable:

1. Review and coordinate the Submittal with other Submittals and with the requirements of the Work, the Contract Documents, the Construction Drawings, and the Construction Specifications, as duly modified;

2. Determine and verify all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal, and confirm that the Submittal is complete with respect to all related data included in the Submittal;

3. Determine and verify the suitability of proposed materials and equipment with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation; and

4. Determine and verify all information relative to Design-Builder's responsibilities for the means, methods, techniques, sequences, and procedures of construction, and for safety precautions and programs incident thereto.

D. Design-Builder shall give Owner specific written notice of any proposed modification of the Contract Documents, Construction Drawings, or Construction Specifications, and any variations that a Submittal may have from the requirements of the Contract Documents, Construction Drawings, and Construction Specifications, as duly modified. This notice shall be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Submittal in drawing form, by a specific notation made on the drawing itself.

E. Each Submittal shall bear a stamp or specific written certification by Design-Builder that it has satisfied its obligations under the Contract Documents with respect to preparation of the Submittal, and that Design-Builder approves the Submittal.

F. All Submittals must be acceptable based on compliance with form and content requirements of the Contract Documents. Design-Builder shall submit Design Submittals for Owner's review and approval. Other Submittals shall not require express approval, except as indicated in the General Conditions or elsewhere in the Contract Documents.

8.02 *Owner's Review of Submittals*

A. Owner will review all Submittals, and may comment on any Submittal. Any response to a Submittal by Owner shall be in accordance with the schedule of required Submittals accepted by Owner as required by Paragraph 2.07, and the provisions of the Contract Documents.

B. For those Submittals requiring Owner's review and approval, Owner's response will be in writing and will indicate either that Owner approves the Submittal or rejects the Submittal. Owner may also include comments regarding the approved or rejected Submittal. For those Submittals that do not require approval, the Submittal shall be deemed acceptable to Owner

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unless Owner responds with a timely objection or adverse comment.

C. Unless a specific provision of the Contract Documents expressly provides otherwise, Owner's review of a Submittal will be to determine if the Submittal complies with and is consistent with the Contract Documents. If Owner concludes that a Submittal requiring approval complies with and is consistent with the Contract Documents, the Owner shall approve such Submittal.

D. Owner's approval, rejection, or acceptance of a Submittal will not extend to the means, methods, techniques, sequences, or procedures of Construction, or to safety precautions or programs incident thereto.

E. Owner's review, comments, approval, rejection, or acceptance of Submittals shall not relieve Design-Builder from responsibility for (1) performance of the Work in accordance with the Contract Documents, (2) the scheduling and progress of the Work, (3) the means, methods, sequences, techniques, and procedures of Construction, and safety precautions and programs incident thereto, or (4) any variation from the requirements of the Contract Documents, unless Design-Builder has in a separate written communication at the time of submission called Owner's attention to each such variation, and Owner has given written approval of each such variation; nor shall Owner's review, comments, approval, rejection, or acceptance of a Submittal impose any such responsibility on Owner.

F. Construction tasks and expenditures by Design-Builder prior to Owner's review and approval or acceptance of any Submittal will be at the sole risk of Design-Builder.

G. In reviewing, approving, rejecting, accepting, or commenting on any Design Submittal, Owner does not assume responsibility for the design, for any deficiencies in the Design Submittal or in the Design Professional Services by which they were prepared, or for constructability, cost, or schedule problems that may arise in connection with the Design Submittal.

H. The parties acknowledge that Design-Builder's design responsibilities continue after commencement of Construction. During the course of Construction, the Design-Builder may propose modifications to the Construction Drawings and Construction Specifications. Owner shall approve such proposed modifications if (1) they comply with and are consistent with the Contract Documents, (2) Design-Builder has demonstrated that the modification is minor in character, or will not be detrimental to the quality and function of the Work, (3) the appropriate Project Design Professional has reviewed and approved the proposed modification with respect to any technical or engineering matters, and (4) Owner has not relied on the previously-approved Construction Drawings and Construction Specifications, such that the proposed modification would be detrimental to the Owner's interests. At its option, Owner may also approve more substantial or divergent proposed modifications, provided that the appropriate Project Design Professional has reviewed and approved the proposed modification with respect to any technical or engineering matters.

8.03 Design Submittals provided by Owner

A. Owner may provide a Design Submittal prepared by others on-behalf of HRSD or an Operator to Private Entity to complete construction of Work within the Site of a Project selected by Owner. Private Entity shall complete Construction (or specific portions of the Construction)

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using Owner-provided construction specifications and construction drawings, diagrams, illustrations, schedules, and other data that graphically show the scope, extent, and character of the Construction (or specific portions of the Construction) to be performed by or for Private Entity. The Design Submittal provided by Owner shall make up a portion of the Contract Documents for the appropriate Project Package. Private Entity shall use and rely upon the Design Submittal provided by Owner in performing the Work without independent verification of the accuracy or completeness of the Design Submittal and shall not be responsible for any errors or omissions in the Design Submittal provided by Owner. If an Owner-provided Design Submittal is not part of a Contract, Private Entity shall be entitled to the execution of a Change Order to cover changes in the Contract Price or Contract Times which are agreed to by the parties. In addition, Private Entity shall be entitled to the execution of a Change Order to the extent the Contract Times or Contract Price are impacted by errors or omissions in the Design Submittal provided by Owner.

ARTICLE 9 – OTHER CONSTRUCTION

9.01 *Other Work*

A. In addition to and apart from the Work to be performed and furnished by Design-Builder under the Contract Documents, the Owner may perform other construction work at or adjacent to the Site during the course of a Project. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Design-Builder written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work at or adjacent to the Site, Owner shall provide such information to Design-Builder.

C. Design-Builder shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and to Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Design-Builder shall do all cutting, fitting, and patching of the Construction that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Design-Builder shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Design-Builder may cut or alter others' work with the written consent of Owner and the others whose work will be affected.

D. If the proper execution or results of any part of the Construction depends upon work performed by others under this Article 9, Design-Builder shall visually inspect such other work and promptly report to Owner in writing any delays, or observed defects or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of the Construction. Design-Builder's failure to so report will constitute an acceptance of such other work as fit and proper for integration with the Construction, except for latent defects and deficiencies in such other work. Design-Builder shall be entitled to an equitable adjustment to

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the Contract Times and may be given an equitable adjustment in Contract Price to the extent performance of the Work is delayed or otherwise impacted by other work performed by Owner's other contractors.

9.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, Owner shall coordinate such work with the Design-Builder's Work and the following will be set forth in the Contract applicable to that Site or provided to Design-Builder prior to the start of any such other work:

1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. An itemization of the specific matters to be covered by such authority and responsibility; and

3. The extent of such authority and responsibilities.

B. If a Contract does not identify the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors, Owner shall have sole authority and responsibility for such coordination.

9.03 *Legal Relationships*

A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner or Owner's employees any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Construction or to the property of Design-Builder or the Construction Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Construction, through actions or inaction, then Design-Builder shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both, as the Owner reasonably determines is appropriate. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Design-Builder in the Contract Documents, and any provisions in Laws or Regulations concerning utility action or inaction, or related remedies. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Design-Builder assigning to Owner all Design-Builder's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Design-Builder's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Design-Builder's ability to complete the Work within the Contract Times.

B. Design-Builder shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Design-Builder fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Design-Builder, and assign to such other contractor or utility owner the Owner's contractual rights

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against Design-Builder with respect to the breach of the obligations set forth in this paragraph.

C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Design-Builder shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Design-Builder's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Design-Builder.

D. If Design-Builder damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Design-Builder's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Design-Builder's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Design-Builder or Owner, then Design-Builder shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and its officers, directors, members, partners, employees, agents, consultants and subcontractors from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

9.04 Claims Between Contractors

A. Should Private Entity cause damage to the work or property of any other contractor at the Site, or should any claim arising out of Private Entity's performance of the Work at the Site be made by any other contractor against Private Entity or Owner, Private Entity shall promptly attempt to settle with such other contractor by agreement, or to otherwise resolve the dispute by arbitration or at law.

B. Private Entity shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and the officers, directors, partners, employees, agents and other consultants and construction subcontractors of each and any of them from and against all claims, costs, losses and damages (including, but not limited to, reasonable fees and charges of engineers, architects, attorneys, and other professionals and court and arbitration costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any other contractor against Owner to the extent said claim is based on or arises out of Private Entity's performance of the Work. Should another contractor, not under the control of the Owner, cause damage to the Work or property of Private Entity or should the performance of work by any other contractor, not under the control of the Owner, at the Site give rise to any other Claim, Private Entity shall not institute any action, legal or equitable, against Owner or permit any action to be maintained and continued in its name or for its benefit in any court or before any arbiter which seeks to impose liability on or to recover damages from Owner on account of any such damage or Claim.

C. If Private Entity is delayed at any time in performing or furnishing Work by any act or negligence of another contractor, not under the control of the Owner, the provisions of

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Section 4.04.C shall apply. If Owner and Private Entity are unable to agree as to the extent of any adjustment in Contract Times attributable thereto, Private Entity may make a Claim for an extension of times in accordance with Article 11.

ARTICLE 10 – OWNER'S RESPONSIBILITIES

10.01 *General*

A. Owner shall do the following in a timely manner so as not to delay the services of Design-Builder:

1. Intentionally Omitted.

2. Make payments to Design-Builder promptly when they are due, as provided in Paragraph 14.01 and 14.06;

3. Furnish the Site as set forth in Paragraph 5.01; arrange for safe access to and make all provisions for Design-Builder to enter upon public and private property as may reasonably be required for Design-Builder to perform Work under the Contract.

4. Intentionally Omitted.

5. Provide information known to Owner relating to the presence of materials and substances at the Site that could create a Hazardous Environmental Condition.

B. Intentionally Omitted.

C. Recognizing and acknowledging that Design-Builder's services and expertise do not include the following services, Owner shall furnish or obtain, as required by the Owner for the Agreement and each Project:

1. Accounting, bond and financial advisory (including, if applicable, "municipal advisor" services as described in Section 975 of the Dodd-Frank Wall Street Reform and Consumer Protection Act (2010) and the municipal advisor registration rules issued by the Securities and Exchange Commission), independent cost estimating, and insurance counseling services.

2. Legal services with regard to issues pertaining to the Agreement, a Contract, or a Project as Owner requires.

3. Such auditing services as Owner requires to review cost submittals or ascertain how or for what purpose Design-Builder has used the money paid.

D. Intentionally Omitted.

10.02 *Insurance*

A. Owner's responsibilities with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

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10.03 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Design-Builder's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Design-Builder to comply with Laws or Regulations applicable to the furnishing or performance of the Work. Owner will not be responsible for Design-Builder's failure to perform the Work in accordance with the Contract Documents.

10.04 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility with respect to undisclosed Hazardous Environmental Conditions uncovered or revealed at the Site is set forth in Paragraph 5.06.

10.05 *Site Representative*

A. Owner and an Operator may furnish a Site Representative to observe the performance of Construction. The duties, responsibilities and limitations of authority of any such Site Representative and assistants will be as provided in the General Conditions or Contract Documents.

10.06 *Owner's Consultants and Managers*

A. Owner's Consultant, if any, is identified in the Agreement or Contract.

B. Owner shall advise Design-Builder of the identity and scope of services of any other independent consultants or managers retained by Owner to perform or furnish services in regard to a Project, including, but not limited to, cost estimating, project peer review, value engineering, constructability review, program management, project management, or contract administration.

C. Neither Owner's Consultant, a Site Representative, nor any other consultant or manager retained by Owner, has any duties, responsibilities, or authorities with respect to Design-Builder, unless expressly provided in the General Conditions or a Contract. Owner's Consultant and such other consultants and managers shall not supervise, direct, or have control or authority over, nor be responsible for, Design-Builder's means, methods, techniques, sequences, or procedures of construction or the safety precautions and programs incident thereto, or for any failure of Design-Builder to comply with Laws or Regulations applicable to the furnishing or performance of the Work; and will not be responsible for Design-Builder's failure to perform the Work in accordance with the Contract Documents.

10.07 *Safety Programs*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Design-Builder's safety programs of which Owner has been informed pursuant to Paragraph 7.13.D.

B. Owner shall inform Design-Builder of any specific requirements of safety or security programs that are applicable to Design-Builder while at the Site.

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10.08 *Intentionally Omitted*

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended or supplemented by a Change Order or a Work Change Directive.

1. *Change Orders:* If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.

2. *Work Change Directives*: The Work modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order. When a Work Change Directive is issued, the parties will promptly meet to attempt to negotiate the Work Change Directive's effect, if any, on the Contract Times and Contract Price. The effect, if any, on Contract Times and Contract Price, together with the Work Change Directive's addition, deletion, or revision to the Work, will be set forth in a subsequently issued Change Order.

3. *Field Orders*: Owner may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and Private Entity, which shall perform the Work involved promptly. If Private Entity believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Private Entity shall submit a Change Proposal as provided herein.

B. Either Owner or Design-Builder may propose or request a Change Order. With respect to certain events, the General Conditions may indicate specific times in which such requests or proposals must be submitted to the other party. With respect to all other events, the request or proposal shall be submitted to the other party within 30 days of the event giving rise to the request or proposal.

11.02 *Authorized Changes in the Work*

A. Without invalidating a Contract and without notice to any surety, and notwithstanding any other provision of such Contract, Owner may, at any time or from time to time, order or authorize additions, deletions, or revisions in the Work within the general scope of such Contract. Such changes may be accomplished by a Change Order if Owner and Design-Builder have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Design-Builder shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate

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Design-Builder to undertake work that Design-Builder reasonably concludes cannot be performed in a manner consistent with Design-Builder's safety or professional obligations under the Contract Documents or Laws and Regulations.

B. Changes in the Work requested by the Owner will be documented by Owner or the Owner's Consultant through the use of a Request for Change in Scope. This document will be prepared by the Owner or Owner's Consultant and shall describe the proposed changes. If prepared by the Owner's Consultant, the document shall be signed by the Owner's Consultant and Private Entity and provided to the Owner for information.

11.03 *Unauthorized Changes in the Work*

A. Design-Builder shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any Work performed that is not required by the Contract Documents, as duly amended, except in the case of an emergency as provided in Paragraph 7.16, or in the case of uncovering Construction as provided in Paragraph 13.03.A.3.

11.04 *Changes Involving the Design*

A. To the extent a change, whether proposed by Design-Builder or Owner, ordered by Owner, or set forth in a proposed Change Order or in a Work Change Directive, involves the design (as set forth in the Construction Drawings, Construction Specifications, or otherwise) or other engineering or technical matters, such changes must be reviewed and approved by the applicable Project Design Professional. The review and approval may occur at the time the change occurs, or as part of Design-Builder's provision of Professional Design Services in response to the change.

11.05 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Claim regarding an adjustment in the Contract Price shall be presented by written notice to the other party in accordance with Paragraph 16.01.

B. If the Contract Price is based on cost of the Work, then the provisions in the Comprehensive Agreement regarding cost of the Work and changes in the Design-Builder's fee and Contract Price apply.

C. The value of any Work covered by a Change Order or of any adjustment in the Contract Price will be determined as follows:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 12.02); or

2. Where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed Stipulated Price (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.05.D); or

3. Where the Work involved is not covered by unit prices contained in the Contract Documents, and agreement to a Stipulated Price is not reached under Paragraph

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11.05.C.2, then on the basis of the cost of the work for price adjustments (determined as provided in the cost of the work provisions in the Comprehensive Agreement, if applicable, or in Paragraph 12.01), plus a Design-Builder's Fee for overhead and profit (determined as provided in Paragraph 11.05.D).

D. *Design-Builder's Fee:* The Design-Builder's fee for overhead and profit on Change Orders

shall be determined as follows:

1. A mutually acceptable fixed fee; or

2. If a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

   a. For costs incurred under Paragraphs 12.01.B.1.a. and 12.01.B.2, the Design-Builder's fee shall be 15 percent;

   b. For costs incurred under Paragraph 12.01.B.3, 12.01.B.4, 12.01.B.5, and 12.01.B.6, the Design-Builder's fee shall be 5 percent;

   c. With respect to Construction Subcontracts, where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of the Parties is that the Design-Builder's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraph 12.01 by the subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Design-Builder itself, and to any Construction Subcontractors of a tier higher than that of the Construction Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Construction Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Construction Subcontractor that actually performs the Work;

   d. Intentionally Omitted.

   e. No fee will be payable on the basis of costs itemized in Paragraph 12.01.B.7 or 12.01.C;

   f. The amount of credit to be allowed by Design-Builder to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Design-Builder's fee by an amount equal to 5 percent of such net decrease; and

   g. When both additions and credits are involved in any one change, the adjustments in Design-Builder's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.05.D.2.a through 11.05.D.2.e, inclusive.

11.06 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Claim regarding an

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adjustment of the Contract Times shall be presented by written notice to the other party pursuant to Paragraph 16.01.

B. Design-Builder's entitlement to an adjustment of the Contract Times under the Contract Documents is conditioned on such adjustment being essential to Design-Builder's ability to complete the Work within the Contract Times.

11.07 *Execution of Change Orders*

A. Owner and Design-Builder shall execute appropriate Change Orders covering:

1. Changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. Changes in Contract Price resulting from an Owner set-off, unless Design-Builder has duly contested such set-off;

3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's correction of defective Work under Paragraph 13.05 or Owner's acceptance of defective Work under Paragraph 13.07, or (c) agreed to by the parties (all subject to the need for review and approval by the applicable Project Design Professional pursuant to Paragraph 11.04); and

4. Changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Article 16.

B. Intentionally Omitted.

11.08 *Notice to Sureties*

A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be Design-Builder's responsibility. The amount of each applicable Bond will be adjusted to reflect the effect of any such change.

11.09 *Claims*

A. *Notice:* If Owner and Private Entity are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or an adjustment of the Contract Times that should be allowed as a result of any order of Owner pursuant to Paragraph 11.02.A or other occurrence for which the Contract Documents provide that such adjustment(s) may be made, a Claim may be made therefor. Written notice of intent to make such a Claim shall be submitted to the other party promptly and in no event more than 15 calendar days after the start of the occurrence or event giving rise to the Claim.

B. *Documentation:* Substantiating documentation shall be submitted by the claiming party within 30 calendar days after delivery of the notice required by Paragraph 11.09.A.

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C. *Decision:* The other party shall render a decision on the Claim no more than 30 calendar days after the receipt of the substantiating documentation required by Paragraph 11.09.B. This decision will be final and binding unless the claiming party gives notice of intention to exercise its rights under Article 16 within 30 calendar days of receipt of the decision and exercises such rights within 30 calendar days of giving the notice of intent.

D. *Time Limit Extension:* The time limits of Paragraphs 11.09.B and 11.09.C may be extended by mutual agreement.

ARTICLE 12 – COST OF THE WORK ADJUSTMENTS; UNIT PRICE WORK

12.01 *Cost of the Work*

A. *Costs of the Work Adjustment:* When the price of Work covered by a Change Order or an adjustment in Contract Price is to be determined on the basis of Cost of the Work, the Cost of the Work adjustment means the sum of all costs necessarily incurred and paid by Design-Builder in the proper performance of the specific portion of the Work. The costs to be reimbursed to Design-Builder will be only those additional or incremental costs required because of the change of the Work or because of the event giving rise to the adjustment. If the Agreement contains Cost of the Work provisions, such provisions shall govern in determining the Cost of the Work for Change Order or adjustment purposes. If the Agreement does not contain Cost of the Work provisions, then the provisions in Paragraph 12.01 shall apply.

B. *Costs Included:* The Cost of the Work adjustment does not include any of the costs itemized in Paragraph 12.01.C, and shall include only the following items with respect to the subject Work:

1. Payroll costs for employees in the direct employ of Design-Builder in the performance of the subject Work, under schedules of job classifications agreed upon by Owner and Design-Builder in advance of such performance.

    a. Such employees shall include without limitation superintendents, foremen, and other personnel employed full-time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the subject Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation, and holiday pay applicable thereto. The expenses of performing the subject Work outside the hours or days permitted by a Contract shall be included in the above to the extent such performance of Work is authorized by Owner.

    b. Such employees shall also include engineers, engineering technicians, architects, and others providing Design Professional Services as employees of Design-Builder. For purposes of this Paragraph 12.01.B.1.b, Design-Builder shall be entitled to payment for such employees an amount as mutually agreed in a rate sheet as designated in the Agreement, for services in the performance of the subject Work.

2. Cost of all materials and equipment furnished and incorporated in the subject Work,

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including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Design-Builder unless Owner deposits funds with Design-Builder with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Design-Builder shall make provisions so that they may be obtained.

3. Cost of permits obtained by Design-Builder.

4. Payments made by Design-Builder to Construction Subcontractors for subject Work performed or furnished by such Construction Subcontractors. If any subcontract provides that the Construction Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Construction Subcontractor's Cost of the Work and fee shall be determined in the same manner as Design-Builder's Cost of the Work and fee.

5. Payments made by Design-Builder for Design Professional Services provided or furnished with respect to the subject Work under a Design Agreement.

6. Costs of special consultants (not including Project Design Professionals), including but not limited to testing laboratories, attorneys, and accountants, retained for services specifically related to the subject Work.

7. Supplemental costs including the following items:

    a. The proportion of necessary transportation, travel, and subsistence expenses of Design-Builder's employees incurred in discharge of duties connected with the Work.

    b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the Site and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed that remain the property of Design-Builder.

    c. Construction Equipment and Machinery:

        1) Rentals of all construction equipment and machinery, and the parts thereof in accordance with rental agreements approved by Owner, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

        2) Costs for equipment and machinery owned by Private Entity will be paid at a rate not to exceed that shown for such equipment in the Rental Rate Blue Book for Construction Equipment. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs. Costs will include the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, shall cease to accrue when the use

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thereof is no longer necessary for the changed Work. Equipment or machinery with a value of less than $1,000 will be considered small tools.

d. Sales, consumer, use, and other similar taxes related to the subject Work, and for which Design-Builder is liable, imposed by Laws or Regulations.

e. Deposits lost for causes other than negligence of Design-Builder, any Construction Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses, damages, and related expenses caused by damage to the subject Work not compensated by insurance or otherwise, sustained by Design-Builder in connection with the furnishing and performance of the Work provided they have resulted from causes other than the negligence of Design-Builder, any Construction Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Design-Builder's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site, as applicable to the subject Work.

h. Minor expenses such as long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. Cost of premiums for all Bonds and insurance Design-Builder is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Design-Builder's officers, executives, principals (of partnerships and sole proprietorships), general managers, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Design-Builder whether at the Site or in Design-Builder's principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 12.01.B.1, all of which are to be considered administrative costs covered by the Design-Builder's fee.

2. Expenses of Design-Builder's principal and branch offices other than Design-Builder's office at the Site.

3. Any part of Design-Builder's capital expenses, including interest on Design-Builder's capital employed for the subject Work and charges against Design-Builder for delinquent payments.

4. Costs due to the negligence of Design-Builder, any Construction Subcontractor, Engineer or other Project Design Professionals, or anyone directly or indirectly employed by any of

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them or for whose acts any of them may be liable, including but not limited to the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind, and the costs of any item not specifically and expressly included in Paragraph 12.01.B.

D. *Design-Builder's Fee*: When the value of the Work covered by a Change Order is determined on the basis of Cost of the Work, Design-Builder's fee shall be determined as set forth in Paragraph 11.05.D.

E. *Documentation:* Whenever the cost of any Work is to be determined pursuant to Paragraph 12.01.B and 12.01.C, Design-Builder will establish and maintain cost records in accordance with generally accepted accounting practices and submit in a form acceptable to Owner an itemized cost breakdown together with supporting data.

12.02 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all of Unit Price Work an amount equal to the sum of the established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Design-Builder will be made by Owner.

B. If Design-Builder's compensation is based on Cost of the Work, the Contract will not include compensation under unit prices unless expressly stated otherwise.

C. Each unit price will be deemed to include an amount considered by Design-Builder to be adequate to cover Design-Builder's overhead and profit for each separately identified item.

D. Design-Builder or Owner may seek an adjustment in the Contract Price if:

1. The quantity of any item of Unit Price Work performed by Design-Builder differs materially and significantly from the estimated quantity of such item indicated in the Agreement;

2. Such an adjustment would not duplicate, and is coordinated with, any other related adjustments of Contract Price; and

3. Design-Builder has incurred additional expense, or less expense, as a result of the variation in quantity.

12.03 *Cash Allowances*

A. The Contract Price includes all allowances so named in the Contract Documents. Private Entity shall cause the Work so covered to be performed for such sums as may be acceptable to Owner. Private Entity agrees that:

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1. The allowances include the cost to Private Entity (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. Except as set forth in the Contract Documents, Private Entity's costs for unloading and handling on the Site, labor, installation costs, overhead, profit, and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

B. Prior to final payment, an appropriate Change Order will be issued to reflect actual amounts due Private Entity on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE CONSTRUCTION

13.01 *Access to Construction*

A. Owner, Owner's Consultant, Site Representatives, and other representatives and personnel of Owner or Operator, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Construction at reasonable times for their observation, inspecting, and testing. Design-Builder shall provide them proper and safe conditions for such access and advise them of Design-Builder's Site safety procedures and programs so that they may comply therewith as applicable.

13.02 *Tests, Inspections, and Approvals*

A. Design-Builder shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. By the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. By Laws and Regulations, unless the Contract Documents or Laws and Regulations expressly allocate responsibility for a specific inspection or test to Owner;

3. To attain Owner's acceptance of materials or equipment to be incorporated in the Construction;

4. By manufacturers of equipment furnished under the Contract Documents;

5. To meet the requirements of the Construction Drawings and Construction Specifications;

6. For testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Construction; and

7. For acceptance of materials, mix designs, or equipment submitted for approval prior to Design-Builder's purchase thereof for incorporation in the Construction.

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B. Owner shall be responsible for arranging, obtaining, and paying for all inspections and tests expressly required by the Contract Documents or Laws and Regulations to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Construction shall be governed by the provisions of Paragraph 13.03.

C. All inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Design-Builder.

D. If the Contract Documents require the Construction (or part thereof) to be approved by Owner or another designated individual or entity, then Design-Builder shall assume full responsibility for arranging and obtaining such approvals.

E. Design-Builder shall give Owner reasonable notice of the planned schedule for all required inspections, tests, and approvals.

F. Design-Builder shall give Owner timely notice of readiness of the Construction (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

G. Each party shall provide the other with copies of any certificates of inspection or approval obtained with respect to tests and inspections.

H. Both parties may rely on the results of inspections and tests, performed pursuant to this paragraph and the governing provisions of the Contract Documents, Laws and Regulations, and the Construction Drawings and Construction Specifications.

I. If any Construction (or the construction work of others) that is required to be inspected, tested, or approved is covered by Design-Builder without written concurrence of Owner, then Design-Builder shall, if requested by Owner, uncover such Construction for observation. Such uncovering shall be at Design-Builder's expense unless Design-Builder has given Owner timely notice of Design-Builder's intention to cover the same and Owner has not acted with reasonable promptness in response to such notice.

13.03 *Uncovering Construction*

A. If Owner considers it necessary or advisable that covered Construction be observed by Owner or inspected or tested by others, then Design-Builder, at Owner's request, shall uncover, expose or otherwise make available for observation, inspection, or testing, as Owner may require, that portion of the Construction in question, furnishing all necessary labor, material, and equipment.

1. If the Construction had been covered contrary to the written request of Owner or a requirement of the Contract Documents, then uncovering it for Owner's observation and re-covering it shall be at Design-Builder's expense, regardless of whether it is defective.

2. If it is found that the covered Construction is defective, Design-Builder shall pay all costs and damages caused by or resulting from such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement, re-covering, or reconstruction (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals, all court or arbitration or other dispute resolution costs, and all costs

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of repair or replacement of work of others).

3. If the covered Construction is not found to be defective, Design-Builder shall be allowed an increase in the Contract Price or an extension of the Contract Times (or Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, re-covering, and reconstruction, subject to the provisions of Paragraph 13.03.A.1.

13.04 *Defective Construction*

A. It is Design-Builder's obligation to assure that the Construction is not defective.

B. Owner shall give Design-Builder prompt written notice of all defective Construction of which Owner has actual knowledge. Owner may reject, accept, or correct defective Construction.

C. Promptly after receipt of written notice of defective Construction, unless Owner expressly indicates that it will accept the defective Construction, Design-Builder shall correct all such defective Construction, whether or not fabricated, installed, or completed; or, if Owner has rejected the defective Construction, remove it from the Project and replace it with Construction that is not defective.

D. When correcting defective Construction, Design-Builder shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Construction.

13.05 *Owner May Correct Defective Construction*

A. If Design-Builder fails within a reasonable time after written notice from Owner to correct defective Construction or to remove and replace rejected Construction, or if Design-Builder fails to perform the Construction in accordance with the Contract Documents, or if Design-Builder fails to comply with any other provision of the Contract Documents, Owner may, after 7 days' written notice to Design-Builder, correct and remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.05 Owner shall proceed expeditiously. In connection with such corrective and remedial action, Owner may exclude Design-Builder from all or part of the Site, take possession of all or part of the Construction, and suspend Design-Builder's services related thereto, and incorporate in the Construction all materials and equipment stored at the Site or for which Owner has paid Design-Builder but which are stored elsewhere. Design-Builder shall allow Owner, Owner's Consultant, Site Representatives, and Owner's other representatives, agents, employees, and contractors, access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

13.06 *Costs*

A. Design-Builder shall bear all costs arising out of or relating to the correction, removal, or replacement of defective Construction, including but not limited to repair of adjacent Work or property; delay costs and impacts; fees and charges of engineers, architects, attorneys, and other professionals; and all court, arbitration, or other dispute resolution costs.

B. All costs, losses, and damages (included but not limited to fees and charges of engineers, architects, attorneys and other professionals, all court or arbitration or other dispute

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resolution costs, and all costs of repair or replacement of work of others) incurred or sustained by Owner in exercising its rights and remedies arising from defective Construction under this Article will be charged against Design-Builder, by set-off against payment or otherwise.

C. Design-Builder shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Work attributable to defective Construction.

13.07 *Owner's Acceptance of Defective Construction*

A. If, instead of requiring correction or removal and replacement of defective Construction, Owner prefers to accept it, Owner may do so. If such acceptance is proposed prior to final payment, it shall be subject to confirmation by the applicable Project Design Professional that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety. Design-Builder shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Construction. If any such acceptance occurs prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents, and Owner shall be entitled to an appropriate decrease in the Contract Price reflecting the diminished value of the Construction so accepted.

13.08 *Owner May Stop Construction*

A. If Construction is defective, or Design-Builder fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform Construction in such a way that the completed Construction will conform to the Contract Documents, Owner may order Design-Builder to stop Construction or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop Construction will not give rise to any duty on the part of Owner to exercise this right for the benefit of Design-Builder or any other party.

ARTICLE 14 – PAYMENTS TO DESIGN-BUILDER; COMPLETION

14.01 *Progress Payments*

A. *Basis for Progress Payments:* The Schedule of Values, rate sheet exhibits, Stipulated Price, Cost Reimbursement Not-to-Exceed Amount, or Contract Cost Limit, as applicable, established and approved by the Owner as provided in the Contract, will serve as the basis for progress payments. Progress payments on account of Unit Price Work will be based on the number of units completed.

B. *Application for Progress Payment:* On or about the date established in the Contract for submission of each application for progress payment (but not more often than once a month), Design-Builder shall submit to Owner for review an Application for Payment filled out and signed by Design-Builder covering the Work completed as of the date indicated on the Application and accompanied by supporting documentation consisting of the following:

1. Cover page providing a summary of total Program cost to include amount due, previously

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amount paid, and remaining budget within the Maximum Agreement Price.

2. Application for Payment:

   a. Use the Owner standard forms and verify additional requirements when billing Program Management activities, Design Professional Services, and Construction Work.

   b. Detailed progress report as described in HRSD's Design and Construction Standards.

   c. Back up documentation for the Work performed and all incurred expenses. Design-Builder to confirm with Owner the specifics on the required supporting documentation.

   d. Project forecast spending graph in accordance with Owner Design and Construction Standards.

   e. Updated Project schedule.

   f. Backup documentation for additional services (if applicable).

   g. Diversity Procurement Statement using Owner's standard form.

3. A separate monthly application for progress payment shall be made for Work performed by Private Entity in which the Contract Documents include a Design Submittal provided by Owner as indicated in Paragraph 8.03.

C. *Payment of Obligations:*

1. Beginning with the second Application for Payment, each Application shall include an affidavit of Design-Builder stating that all previous progress payments received on account of the Work have been applied on account to discharge Design-Builder's legitimate obligations associated with prior Applications for Payment.

2. If Design-Builder contends that it has withheld payment of underlying obligations for good cause, then Design-Builder shall inform Owner of the identity of the entity from which Design-Builder has withheld payment, the amount of the withholding, and the reason for the withholding.

D. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

E. *Review of Applications*: Progress payments shall be made by the Owner to the Private Entity according to the following procedure:

1. No more than 30 calendar days after presentation of the Application for Payment to Owner, the amount recommended, with concurrence from Owner's Consultant, will become due and will be paid by Owner to Private Entity.

2. If Owner should fail to pay Private Entity at the time the payment of any amount becomes

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due, then Private Entity may, at any time thereafter, upon serving written notice that he will stop the Work within 7 calendar days after receipt of the notice by Owner, and after such 7-day period, stop the Work until payment of the amount owing has been received. Written notice shall be deemed to have been duly served if sent by certified mail to the last known business address of Owner.

3. No Progress Payment nor any partial or entire use or occupancy of a Project by Owner or Operator shall constitute an acceptance of any Work not in accordance with the Contract Documents

F. Intentionally Omitted.

G. *Reduction in or Refusal to Make Payment:*

1. Owner may impose a set-off against the whole or any part of any such payment, or nullify any previous payment because of subsequently discovered evidence or the results of subsequent inspections or tests, to the extent that is reasonably necessary to protect Owner from loss because:

a. Claims have been made against Owner on account of Design-Builder's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Design-Builder's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from breach of warranty, workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

b. Design-Builder has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

c. Design-Builder has failed to provide and maintain required bonds or insurance;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Design-Builder is responsible;

e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

f. The Construction is defective, requiring correction or replacement;

g. Owner has been required to correct defective Construction in accordance with Paragraph 13.05, or has accepted defective Construction pursuant to Paragraph 13.07;

h. The Contract Price has been reduced by Change Orders;

i. An event that would constitute a default by Design-Builder and therefore justify a termination for cause has occurred;

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j. Liquidated damages have accrued under the Contract Documents as a result of Private Entity's failure to achieve Milestones, if any, Substantial Completion, Final Completion of the Work, or performance requirements, as applicable;

k. Liens have been filed in connection with the Work, except where Design-Builder has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such liens; or

l. There are other items entitling Owner to a set off against the amount recommended.

2. If Owner imposes any set-off against payment, Owner will give Design-Builder immediate written notice stating the reasons for such action and the specific amount of the reduction, and promptly pay Design-Builder any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Design-Builder the amount so withheld, or any adjustment thereto agreed to by Owner and Design-Builder, if Design-Builder remedies the reasons for such action. The reduction imposed shall be binding on Design-Builder unless it duly presents a written notice of Claim contesting the reduction.

H. Within 7 calendar days of each payment by Owner to Design-Builder under this Agreement, Design-Builder shall either:

1. Pay the Construction Subcontractor for the proportionate share of the total payment received, attributable to the Work performed by the Subcontractor; or

2. Notify the Owner in writing of the intention to withhold all or part of the Subcontractor's payment with the reason for nonpayment.

Design-Builder shall pay interest to its Construction Subcontractors on all amounts owed by the Design Builder that remain unpaid 7 calendar days after receipt of the Design-Builder of payment from Owner for Work performed by the Construction Subcontractor, except of amounts withheld as allowed above and unless otherwise provided under the terms of this Agreement. Unless otherwise provided under the terms of this Agreement, interest shall accrue at the rate of 1 percent per month. Design-Builder's obligation to pay an interest charge to a Construction Subcontractor pursuant to the payment clause in this paragraph shall not be construed to be an obligation of HRSD. A Change Order, contract modification, or cost reimbursement claim shall not include any amounts for reimbursement of such interest charges.

Design-Builder shall include in each of its subcontracts a provision requiring each Construction Subcontractor to include or otherwise be subject to the same payment and interest requirements set forth in this paragraph.

I. In the event that Design-Builder has not received payment from HRSD for Construction performed by a Construction Subcontractor under such Contract, Design-Builder is obligated to pay the Construction Subcontractor for the entire amount owed to such Construction Subcontractor and to pay such Construction Subcontractor within 60 days of the receipt of an invoice following satisfactory completion of the work for which the Construction Subcontractor has invoiced. Design-Builder shall not be liable for amounts otherwise reducible due to the Construction Subcontractor's noncompliance with the terms of the

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Agreement or a Contract. However, in the event that Design-Builder withholds all or a part of the amount invoiced by the Construction Subcontractor under the terms of the Agreement or a Contract, Design-Builder shall notify the Construction Subcontractor within 50 days of the receipt of such invoice, in writing, of its intention to withhold all or a part of the Construction Subcontractor's payment with the reason for nonpayment, specifically identifying the contractual noncompliance, the dollar amount being withheld, and the lower-tier Construction Subcontractor responsible for the contractual noncompliance. Payment by HRSD shall not be a condition precedent to payment to any lower-tier Construction Subcontractor, regardless of Design-Builder's receiving payment for amounts owed to Design-Builder. Any provision in a Contract or subcontract providing for Construction contrary to this paragraph shall be unenforceable.

J. Each Application for Payment shall require (i) individual contractors to provide their social security numbers and (ii) proprietorships, partnerships, and corporations to provide their federal employer identification numbers.

14.02 *Design-Builder's Warranty of Title*

A. Design-Builder warrants and guarantees that title to all Construction, materials, and equipment covered by any Application for Payment, whether already incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.03 *Substantial Completion*

A. When Design-Builder considers the Work ready for its intended use, Design-Builder shall notify Owner in writing that the Work is substantially complete (except for items specifically listed by Design-Builder as incomplete) and request that Owner issue a certificate of Substantial Completion. Promptly thereafter, Owner, Operator, and Design-Builder shall make an inspection of the Work, including the timely review of applicable post-construction data to determine the status of completion. If Owner does not consider the Work substantially complete, Owner will notify Design-Builder in writing giving the reasons therefor.

B. If Owner considers the Work substantially complete:

1. Owner, Operator, and Design-Builder will confer regarding Owner, or an Operator's use or occupancy of the Work following Substantial Completion, review the builder's risk certificate coverage amount for the Work that is Substantially Complete, and confirm the transition to coverage of the Work that is Substantially Complete under a permanent property insurance policy held by Owner or an Operator. Unless Owner and Design-Builder agree otherwise in writing, Design Builder shall not bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Operator's use or occupancy of the Work (except damage caused by Design-Builder, Construction Subcontractors, or Suppliers or any other individual for whom Design-Builder is responsible in fulfilling the warranty obligations in Section 7.18.A).

2. Owner will prepare and deliver to Design-Builder a certificate of Substantial Completion which shall fix the date of Substantial Completion. Owner shall attach to the certificate a punch list of items to be completed or corrected before final payment.

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3. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Owner or its representatives, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, shall be paid by Private Entity to Owner. If Private Entity does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off, in accordance with Paragraph 14.01.G of the General Conditions, against payments due under Article 14 of the General Conditions.

C. After Substantial Completion the Design-Builder shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Design-Builder may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

D. Owner shall have the right to exclude Design-Builder from the Site after the date of Substantial Completion subject to allowing Design-Builder reasonable access to remove its property and complete or correct items on the punch list.

14.04 *Partial Use or Occupancy*

A. Prior to Substantial Completion of all the Work for a Project, Owner or an Operator, as appropriate, may use or occupy any substantially completed part of the Construction which (1) has specifically been identified in the Contract Documents, or (2) Owner and Design-Builder agree constitute a separately functioning and usable part of the Construction that can be used by Owner or an Operator for its intended purpose without significant interference with Design-Builder's performance of the remainder of the Construction for a Project, subject to the following:

1. Owner at any time may request Design-Builder in writing to permit Owner, or an Operator to use or occupy any such part of the Construction that Owner, upon consultation with Operator, believes to be ready for its intended use and substantially complete. If Design-Builder agrees that such part of the Work is substantially complete, Design-Builder and Owner will follow the procedures of Paragraph 14.03 for that part of the Construction.

2. Design-Builder at any time may notify Owner in writing that Design-Builder considers any such part of the Work ready for its intended use and substantially complete and request Owner to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Operator, and Design-Builder shall make an inspection of that part of the Work to determine its status of completion. If Owner, upon consultation with Operator, does not consider that part of the Work to be substantially complete, Owner will notify Design-Builder in writing giving the reasons therefor. If Owner, upon consultation with Operator, considers that part of the Work to be substantially complete, the provisions of Paragraph 14.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy of part of the Construction will be accomplished prior to compliance with the requirements of Paragraph 6.05 regarding property insurance.

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14.05 *Final Inspection*

A. Upon written notice from Design-Builder that the entire Work or an agreed portion thereof is complete, Owner and Operator will make a final inspection with Design-Builder and will notify Design-Builder in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Design-Builder shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.06 *Final Payment*

A. *Application for Payment:*

1. After Design-Builder has completed all such corrections to the satisfaction of Owner and delivered in accordance with the Contract Documents all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance, certificates of inspection, and Record Documents, Design-Builder may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (unless previously delivered) by:

a. All documentation called for in the Contract Documents;

b. Consent of the surety, if any, to final payment;

c. Satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment;

d. A list of all disputes that Design-Builder believes are unsettled; and

e. Complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of such releases or waivers of Liens specified in Paragraph 14.06.A.2, and as approved by Owner, Design-Builder may furnish receipts or releases in full and an affidavit of Design-Builder that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed, and (b) all payrolls, material and equipment bills and other indebtedness connected with the Work for which Owner might in any way be responsible, or which in any way might result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Project Design Professional, Construction Subcontractor, or Supplier fails to furnish such a release or receipt in full, Design-Builder may furnish a Bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Final Payment and Acceptance:* If Owner is satisfied that the Work has been completed and Design-Builder's other obligations under the Contract Documents have been fulfilled, Owner will, within 10 days after receipt of the final Application for Payment, give written notice to Design-Builder that the Work is acceptable. Otherwise, Owner will return the Application to Design-Builder, indicating in writing the reasons for refusing to process final payment, in which case Design-Builder shall make the necessary corrections and resubmit the Application.

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C. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment.

D. *Payment Becomes Due*: The amount will become due and will be paid by Owner to Design-Builder 30 days after the presentation to Owner of the acceptable Application and accompanying documentation, in appropriate form and substance and with Owner's notice of acceptability.

14.07 *Waiver of Claims*

A. The making of final payment will not constitute a waiver by Owner of claims or rights against Design-Builder. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.05, from Design-Builder's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from unresolved disputes or Claims presented by Owner, or from Design-Builder's continuing obligations under the Contract.

B. The acceptance of final payment by Design-Builder will constitute a waiver by Design-Builder of all claims and rights against Owner other than those pending matters that have been duly submitted to dispute resolution under the provisions of Article 16.

14.08 *Correction Period*

A. If within one year after the date of Substantial Completion of the entire Work or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Construction is found to be defective, Design-Builder shall promptly, without cost to Owner and in accordance with Owner's written instructions, (1) correct such defective Construction, or, if it has been rejected by Owner, remove it from the Site and replace it with Construction that is not defective, and (2) satisfactorily correct or remove and replace any damage to other Construction or the work of others resulting therefrom. If Design-Builder does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Construction corrected or the rejected Construction removed and replaced, and all costs, losses, and damages caused by or resulting from such removal and replacement (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals, all court or arbitration or other dispute resolution costs, and all costs of repair or replacement of work of others) will be paid by Design-Builder.

B. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Conceptual Documents.

C. Where defective Construction (and damage to other Construction resulting therefrom) has been corrected, or removed or replaced, under this Paragraph 14.08, the correction period hereunder with respect to such Construction will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed not to exceed two (2) years from Substantial Completion.

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ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 days by notice in writing to Design-Builder, which will fix the date on which Work will be resumed. Design-Builder shall resume the Work on the date so fixed. Design-Builder shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events justifies termination for cause:

1. Design-Builder's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the progress schedule as duly adjusted).

2. Design-Builder's disregard of Laws or Regulations of any public body having jurisdiction.

3. Design-Builder's violation in any substantial way of provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occurs, Owner may, after giving Design-Builder (and the surety, if any) 7 days' written notice, terminate the services of Design-Builder, take possession of any completed Design Submittals prepared by or for Design-Builder (subject to the limited license and indemnification provisions of Paragraph 3.04), exclude Design-Builder from the Site, take possession of the Work, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Design-Builder but which are stored elsewhere, and finish the Work as Owner may deem expedient. In such case Design-Builder shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all costs, losses and damages sustained by Owner arising out of or resulting from completing the Work (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) such excess will be paid to Design-Builder. If such costs, losses and damages exceed such unpaid balance, Design-Builder shall pay the difference to Owner. Such costs, losses and damages incurred by Owner will be incorporated in a Change Order. When exercising any rights or remedies under this paragraph Owner shall not be required to obtain the lowest price for the Work performed.

C. Notwithstanding Paragraph 15.02.B, Design-Builder's services will not be terminated if Design-Builder begins, within 7 days of receipt of notice of intent to terminate, to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

D. Where Design-Builder's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Design-Builder then existing or which may thereafter accrue. Any retention or payment of moneys due Design-Builder by Owner will not release Design-Builder from liability.

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15.03 *Owner May Terminate for Convenience*

A. Upon 7 days' written notice to Design-Builder, Owner may, without cause and without prejudice to any other right or remedy of Owner, elect to terminate the Contract. In such case, Design-Builder shall be paid (without duplication of any items) for:

1. Completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. Expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. Amounts paid in settlement of terminated contracts with Project Design Professionals, Construction Subcontractors, Suppliers and others (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs incurred in connection with such terminated contracts); and

4. Reasonable expenses directly attributable to termination.

B. Design-Builder shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Design-Builder May Stop Work or Terminate*

A. If, through no act or fault of Design-Builder, the Work is suspended for a period of more than 90 days by Owner or under an order of court or other public authority, Owner fails to act on any Application for Payment within 30 days after it is submitted, or Owner fails for 30 days to pay Design-Builder any sum finally determined to be due, then Design-Builder may, upon 7 days' written notice to Owner, and provided Owner does not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.A. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Owner has failed for 30 days to pay Design-Builder any sum finally determined to be due, Design-Builder may upon 7 days' written notice to Owner stop the Work until payment is made of all such amounts due Design-Builder, including interest thereon. The provisions of this paragraph are not intended to preclude Design-Builder from obtaining an increase in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Design-Builder's stopping Work as permitted by this paragraph.

ARTICLE 16 – DISPUTES

16.01 *Methods and Procedures*

A. Owner's action under Paragraph 11.09.C or a denial pursuant to Paragraphs 11.09.C shall become final and binding 30 calendar days after receipt of written notice of Owner's action or decision unless, within that time period, Owner or Private Entity gives to the other party

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written notice of intent to submit the Claim to a process of bilateral negotiations as set forth below.

B. Within 30 calendar days of the delivery of such notice, Owner and Private Entity shall meet and confer regarding the Claim. A good-faith effort to negotiate resolution shall be made by both parties.

C. If the negotiations are unsuccessful, management representatives of Owner and Private Entity at least one tier above the individuals who met initially shall meet, confer, and negotiate within 45 calendar days of the closure of the unsuccessful negotiations.

D. If the claim is not resolved by negotiation, either Owner or Private Entity may request within 10 calendar days of termination of negotiations non-binding mediation of any Claim submitted for a decision under Paragraph 11.09 before such decision becomes final and binding. If both parties agree to mediation inwriting within 10 calendar days, the mediation will proceed and be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 11.09.

E. Owner and Private Entity shall participate in the mediation process in good faith. The process shall be concluded within 60 calendar days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

F. If the Claim is not resolved by negotiation and mediation, Owner's action under Paragraph 11.09 or a denial pursuant to Paragraphs 11.09 shall become final and binding 30 calendar days after termination of the mediation unless, within that time period, Owner or Private Entity:

1. gives to the other party written notice of intent to submit the Claim to a court of competent jurisdiction, or

2. agrees with the other party in writing to submit the Claim to another dispute resolution process, or

3. agrees with the other party in writing to extend the time for commencing a claim in court or in another dispute resolution process.

G. Notwithstanding any applicable statute of limitations, a party giving notice under Paragraph 16.01 shall commence an action on the Claim within 6 months of said notice. Failure to do so shall result in the Claim being time-barred and Owner's action or denial shall become final and binding.

ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice to the other party, it will be deemed to have been validly given if delivered to the Authorized

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Representative of the other party:

1. In person, by a commercial courier service or otherwise; or

2. By registered or certified mail, postage prepaid; or

3. By e-mail, with the words "Formal Notice by <Party Name>" or similar in the e-mail's subject line and follow up within 7 calendar days as listed in subparagraph 17.01.A.1 or 17.01.A.2.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

A. Unless expressly stated otherwise in this Contract, the duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, or waiver of, any rights and remedies available to any or all of them which are otherwise imposed or available by:

1. Laws or Regulations; or

2. Intentionally Omitted.

3. Other provisions of the Contract.

B. The provisions of Paragraph 17.03.A will be as effective as if repeated specifically in the Contract in connection with each particular duty, obligation, right and remedy to which they apply.

17.04 *Limitation of Damages*

A. With respect to a Contract and any and all Claims and other matters at issue, neither party shall be liable to the other party for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained on or in connection with any other Project or anticipated Project.

17.05 *No Waiver*

A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of a Contract.

17.06 *Survival of Obligations*

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A. All representations, indemnifications, warranties and guarantees made in, required by or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion and acceptance of the Work and termination or completion of the Contract.

17.07 *Controlling Law*

A. The Contract Documents will be construed in accordance with, and governed by the laws of the Commonwealth of Virginia without respect to conflict of laws principles.

B. Any formal proceedings shall be instituted in the Circuit Court of the City of Virginia Beach, Virginia, or the United States District Court for the Eastern District of Virginia, Norfolk Division.

17.08 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

ARTICLE 18 – STATUTORY REQUIREMENTS

18.01 *The Public-Private Education Facilities and Infrastructure Act of 2002 (Va. Code § 56-575.1 et seq.) (the "PPEA").*

A. The Agreement is subject to the PPEA and the requirements thereof are incorporated into the General Conditions by reference and shall be binding on the parties as if fully restated herein.

B. Nothing in the Agreement or a Contract shall be construed as or deemed a waiver of the sovereign immunity of the Owner or any Operator or any affected local jurisdiction or any officer or employee thereof with respect to the participation in, or approval of all or any part of the Program or a Project or its operation, including but not limited to interconnection of the Project with any other infrastructure or project.

18.02 *Public Contract Provisions*

A. During the performance of the Agreement, the Private Entity agrees as follows:

1. The Private Entity will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability, or other basis prohibited by state law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the Private Entity. The Private Entity agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

2. The Private Entity, in all solicitations or advertisements for employees placed by or on behalf of the Private Entity, will state that such Private Entity is an equal opportunity employer.

3. Notices, advertisements and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting the requirements of this

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section.

B. The Private Entity will include the provisions of the foregoing paragraphs 18.02.A.1, 18.02.A.2 and 18.02.A.3 in every subcontract or purchase order of over $10,000, so that the provisions will be binding upon each Construction Subcontractor or vendor.

C. During the performance of the Agreement, the Private Entity agrees to (i) provide a drug-free workplace for Private Entity's employees; (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in Private Entity's workplace and specifying the actions that will be taken against employees for violations of such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of Private Entity that Private Entity maintains a drug-free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over $10,000, so that the provisions will be binding upon each subcontractor or vendor, including Construction Subcontractors. For the purposes of this paragraph, "drug-free workplace" means the Site for the performance of Work done in connection with a Contract awarded to Private Entity, the employees of whom are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during the performance of a Contract.

D. If required, Design-Builder's compliance with Executive Order 11246 (Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity) and the regulations in 41 CFR part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals.

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HRSD

Sustainable, Innovative Wastewater Treatment

COMPREHENSIVE I/I REDUCTION PROGRAM PLAN

September 16, 2025

'Reducing Rainwater in the Sanitary Sewer System'
For the High Priority Inflow & Infiltration Reduction Program

CIP GN02030

BURNS McDONNELL Hazen rjn Brown AND Caldwell WRA THE Miles AGENCY NICHE MARKETING AND PUBLIC RELATIONS

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List of Abbreviations

AAR	Alternative Analysis Report
AB	Army Base Treatment Plant
ADF	Average Dry Weather Flow
AT	Atlantic Treatment Plant
BH	Boat Harbor Treatment Plant
BSF	Base Sewer Flow
CA/CI	Construction Administration and Inspection
CCTV	Closed Circuit Television
CIP	Capital Improvement Program
EPA	Environmental Protection Agency
FM	Force Main
GIS	Geographic Information System
GM	Gravity Main
GPD	Gallons per Day
GPAD	Gallons per Acre per Day
GPM	Gallons per Minute
HP	Horsepower
HPP	High-Priority Projects
HPII	High-Priority I/I
HPIIRP	High-Priority I/I Reduction Program
HRSD	Hampton Roads Sanitation District
HSAID	Basin Identifier in RHM
I/I	Inflow and Infiltration
IP	Integrated Plan
JR	James River Treatment Plant
LF	Linear Feet
LHM	Locality Hydraulic Models
LS	Lift Station
LOS	Level of Service
MACP	Manhole Assessment Certification Program
MG	Million Gallons
MGD	Million Gallons per Day
NA	Nansemond Treatment Plant
NASSCO	National Association of Sewer Service Companies
NSF	Non-Single Family
PACP	Pipeline Assessment Certification Program
PER	Preliminary Engineering Report
PRS	Pressure Reducing Station
PS	Pump Station
PVC	Polyvinyl Chloride
RHM	Regional Hydraulic Model
RP	HRSD Rehab Action Plan
R/R	Rehabilitation and Replacement
RDII	Rainfall-derived Inflow & Infiltration
RTS	Regional Technical Standards
RWWMP	Regional Wet Weather Management Plan
SFR	Single Family Residential
SSES	Sanitary Sewer Evaluation Survey
SSO	Sanitary Sewer Overflow
STP	Sewer Treatment Plant
SWIFT	Sustainable Water Initiative for Tomorrow Program
TMDL	Total Maximum Daily Load
TP	Treatment Plant
VA DEQ	Virginia Department of Environmental Quality
VBMP	Virginia Base Mapping Program
VF	Vertical Feet
VIP	Virginia Initiative Treatment Plant
WB	Williamsburg Treatment Plant
YR	York River Treatment Plant

Executive Summary

HRSD has procured the Burns & McDonnell Team (BMcD Team) through the Public-Private Education Facilities and Infrastructure Act (PPEA) of 2002 approval process to reduce infiltration and inflow (I/I) in the regional wastewater system. This work is being completed as part of HRSD's Consent Decree with the Commonwealth of Virginia Department of Environmental Quality (DEQ) and the United States Environmental Protection Agency (EPA) to reduce sanitary sewer overflows (SSOs) through an EPA-approved Regional Wet Weather Management Plan (RWWMP). The RWWMP includes both capacity improvement projects (e.g., pumping facilities and larger pipelines) as well as I/I reduction projects to reduce peak flow in the system. Together, these projects were called the High Priority Projects (HPPs) in the RWWMP. HRSD selected the BMcD Team to evaluate 19 Locality sewer basins identified in the RWWMP as I/I Reduction HPPs using updated flow data and other system information, to propose alternate basins to replace any of the 19 original basins if warranted, and to cost-effectively rehabilitate the public and private sanitary sewer assets in these basins. This effort to address these I/I basins in the RWWMP is being called the High Priority I/I Reduction Program (HPIIRP).

The PPEA contracting process begins with an Interim Agreement to start initial evaluations and then proceeds to a Comprehensive Agreement where a defined cost and scope of work are agreed upon. The purpose of this Comprehensive I/I Reduction Plan (Plan) document is three-fold:

1. Provide documentation of the BMcD Team's efforts during the Interim Agreement ~~Phase~~ to assess the suitability of the 19 high-priority I/I reduction basins initially identified by HRSD to be included in the HPIIRP and the team's proposed working set of prioritized basins to be further evaluated within the Comprehensive Agreement of the HPIIRP,
2. Provide an estimated total cost to complete the proposed I/I reduction projects and an updated cost for the other RWWMP capacity improvements, and
3. Provide a comparison of the costs from the original RWWMP to the updated estimate.

After HRSD's initial submittal in 2017, a revised RWWMP was submitted in June 2020 and approved by EPA in 2022 which included projects totaling $410 million in two rounds of HPPs. These planning level costs were developed in 2016 for the 2017 submittal and no revision was made to them for the 2020 RWWMP. The first round of HPPs is required to be completed by December 31, 2028, when a re-evaluation of the system can then take place to finalize the definition of second round projects to be completed by 2040 (referred to as the Adaptive Management Plan). Based on the RWWMP modeling, the full set of HPPs (along with all the other system improvements being implemented by HRSD and the Localities through 2040) are projected to reduce modeled SSO volume by a total of 69% from the original baseline used for the RWWMP (using the approved 5-year event in the RWWMP). Through the Sixth Amendment to the Consent Decree, HRSD has rescheduled the RWWMP to move all of the I/I reduction projects from Round 2 into the first group to be completed by the end of 2028-

The RWWMP included 22 basins for I/I reduction that will be beneficial for reducing SSOs and also reducing the size of other associated capacity improvements required in the RWWMP. Of these 22 basins, 19 were tasked to the BMcD Team under the HPIIRP with the remaining three in Portsmouth (PORT-01, PORT-02, and PORT-04) being completed under a separate effort.

While the HPIIRP will be conducting an updated cost-effectiveness analysis for the I/I reduction projects as well as developing an Adaptive Management Plan for all future capacity projects, this

document provides a revised budgetary estimate for currently planned efforts ahead of the results of that work. These estimates are based on the assumptions and details that went into the project definitions from the 2017 RWWMP, which included rehabilitation of both publicly and privately owned sanitary sewer assets. This document provides details of the following:

- Rehabilitation/Replacement Scope Development. Criteria for determining I/I Reduction Plan type (Comprehensive, Data-Driven, or General), and assets that were included in the scope of rehabilitation/replacement (R/R).
- Basin Selection. Approach and criteria for inclusion of specific sanitary sewer basins in the I/I Reduction Program. Identification of basins where cost-effective I/I reduction is anticipated.
- Sanitary Sewer System Evaluation Data. Description of data sources previously used in the development of the I/I Reduction Program scope.
- I/I Reduction Estimate. Methodology for estimating the 10-year peak I/I reduction based on the I/I Reduction Plan type, flow characteristics and basin composition.

Basin-specific I/I Reduction Plans were previously developed for each basin included in the RWWMP based on the type of rehabilitation/replacement (R/R) approach. The selected approach was dependent on available condition data and basin leakiness -- estimated by I/I density in gallons per acre per day (gpad). The plan type determined the quantity of infrastructure R/R assumed for each basin, which formed the basis of the I/I reduction and cost estimates. Three types of R/R plan approaches were considered:

1. Comprehensive – Includes complete R/R of the basin
2. Data-Driven – Targets specific types of defects identified during SSES
3. General – Used when the I/I flows did not warrant Comprehensive R/R but insufficient SSES data was available for a Data-Driven approach

Program Basin Selections

An analysis of the assigned 19 basins was conducted by the BMcD Team including extensive flow monitoring as well as the identification and review of potential alternate basins to replace any of the original 19 basins, if needed. Flow monitoring was conducted in these 19 basins as well as alternate basins identified starting in October 2024. It was quickly determined that many of the HPP basins were not as leaky as the Locality-provided wet weather flow parameters indicated. The BMcD Team analyzed the flow data and developed new RTK hydrologic flow parameters, which were used to calculate the 10-year peak flow. A 10-year normalization was used throughout development of the RWWMP before it was decided what level of service would be provided for the final RWWMP (e.g., 2-year, 5-year, 10-year). HRSD and the Localities both used it as a normalized scale to evaluate wet weather flow data and determine the proposed I/I reduction targets in the original RWWMP plan.

As seen in Table ES-1, many of the original 19 HPP basins assigned to the HPIIRP were found to have a current 10-year peak flow that was lower than the target value in the RWWMP. Based on this updated flow monitoring data, Basins 1, 2, 3, 4, 6, 7, 8, and 19 were eliminated from further consideration in the HPIIRP due to lack of sufficient I/I to target for removal.

Table ES-1. Comparison of Original to Updated Peak I/I 10-Year Flow and I/I Density Values

				Original RWWMP Values			Updated 2024/2025 Values	
No.	Rehab Area ReferenceID	Locality	TP	Pre-Rehab Peak I/I, 10-yr (MGD)	Pre-Rehab I/I Density (GPAD)	Target Post-Rehab, 10-yr Peak (MGD)	Pre-Rehab Estimated 10-yr Peak I/I (MGD)	Pre-Rehab Estimated I/I Density (GPAD)
1	CHES-032	CHES	AT	0.90	6,100	0.65	0.46	3,000
2	CHES-047	CHES	AT	0.78	7,300	0.43	0.12	1,100
3	CHES-067	CHES	AT	6.01	20,500	2.29	1.92	8,400
4	CHES-111	CHES	AT	0.96	7,300	0.60	0.42	2,700
5	CHES-016	CHES	NA	5.71	20,400	2.50	1.98	8,100
6	CHES-018	CHES	NA	3.00	9,200	1.24	1.23	3,900
7	CHES-026	CHES	NA	1.56	31,400	0.63	0.15	4,300
8	CHES-227	CHES	NA	0.67	6,000	0.43	0.34	2,800
9	NORF-H-106	NORF	VIP	0.63	12,800	0.47	*	*
10	NORF-H106-G1	NORF	VIP	1.07	12,900	0.68	0.56	9,000
11	NORF-H-113	NORF	VIP	0.97	15,900	0.52	0.56	9,100
12	NORF-H113-G1	NORF	VIP	0.78	31,900	0.29	0.13**	4,500**
13	NORF-H113-G2	NORF	VIP	0.66	32,000	0.23	0.13**	4,500**
14	NEWP-WCPSA001575	NEWP	JR	2.33	16,000	1.21	3.17	15,400
15	NEWP-WCPSA001600	NEWP	JR	2.53	24,100	1.18	2.53	16,000
16	YORK-001	YORK	WB	0.62	5,500	0.33	0.89	8,400
17	YORK-003	YORK	WB	1.44	5,500	0.77	1.96	9,700
18	YORK-006	YORK	WB	3.21	11,900	1.16	1.28	4,500
19	YORK-229-2	YORK	WB	2.00	13,700	0.81	0.16	1,200

* NORF-H-106 is the area containing the Norfolk Zoo. Flow monitoring since November 2024 has not revealed high flows during wet weather events

** NORF-H-113-G1 and NORF-H-113-G2 were monitored together in 2024/25. Given the approximately similar size of each area, peak flows were split 50/50 and densities were the same.

Color codes
Estimated lower than RWWMP Target Post-Rehab
Estimated between RWWMP Pre-Rehab and Post-Rehab
Estimated larger than RWWMP Target Post-Rehab

SSO and Model Data

In addition to those HPP basins identified above with lower-than-expected peak flows based on flow monitoring data, several basins were also eliminated based on new information collected since the RWWMP development related to other HRSD and Locality capacity improvements. Five HPP basins (numbers 9 through 13 in Table ES-1) in Norfolk are in the vicinity of the HRSD City Park and

Luxembourg Avenue Pump Stations. Following HRSD upgrades to these stations and the revised wet weather flows, hydraulic modeling of the system indicated that pursuing I/I reduction in these basins was not necessary.

Similarly, two City of Newport News pump station basins that were shown to have model-predicted SSOs in the RWWMP (numbers 14 and 15 in Table ES-1) were updated with new pump curves provided by the City. Once these new curves were added to HRSD's model, the projected SSOs were eliminated; thus, these basins were eliminated from the HPIIRP.

New Alternate Basin Selection

As many of the original 19 HPP basins no longer require I/I reduction, the BMcD Team identified new alternate basins for inclusion in the HPIIRP. The process used basins from the RWWMP that were not included in the HPP set of 22 basins and had both modeled SSOs and observed SSOs. Thirteen alternate basins were identified for further evaluation and ranking.

The following criteria were developed for prioritizing the remaining basins from the original 19 and the proposed alternate basins for inclusion in the HPIIRP:

- Contributes to SSOs in the 2017 Baseline (Locked) model
- Contributes to Observed SSOs Since 2017
- New Flow Data Shows High I/I
- No Capacity Changes to Resolve RWWMP SSOs
- Low Unit Cost of I/I Reduction
- Helps Reduce the Need/Size for Other Planned Capacity Projects

These criteria were compared and ranked against each other using a pairwise comparison process and these weightings were then used for the final basin scoring in the BMcD Team's prioritization process. Table ES-2 shows the Weighted Score for each basin and characterizes the basin as either an original High Priority Project (HPP) or an Alternate (ALT) basin. The 2025 Adjusted Cost is based on the updated values described in this document. The "Cumulative Cost Sum" adds all the basins costs in Weighted Score order up to that point.

Table ES-2. Basin Prioritization

Basin ID	Locality	TP	Original Basin Category	In HPIIRP	Weighted Score	2025 Adjusted Cost, $M	Cumulative Cost Sum, $M
PORT-10	PORT	VIP	ALT	Yes	**120.0**	$23.51	$23.51
JCSA-LSA3-8	JCSA	WB	ALT	Yes	**97.0**	$51.21	$74.72
JCSA-LSA3-1	JCSA	WB	ALT	Yes	**89.7**	$65.97	$140.69
JCSA-LSA5-4	JCSA	WB	ALT	Yes	**82.8**	$7.13	$147.82
JCSA-LSA3-6	JCSA	WB	ALT	Yes	**79.0**	$28.22	$176.04
YORK-003	YORK	WB	HPP	Yes	**77.5**	$11.32	$187.36
YORK-006	YORK	WB	HPP	Yes	**71.8**	$38.64	$226.00
CHES-016	CHES	NA	HPP	Maybe	**71.3**	$36.27	$262.27

Table ES-2. Basin Prioritization							
Basin ID	Locality	TP	Original Basin Category	In HPIIRP	Weighted Score	2025 Adjusted Cost, $M	Cumulative Cost Sum, $M
SUFF-146	SUFF	NA	ALT	Maybe	69.7	$14.53	$276.80
SUFF-048	SUFF	NA	ALT	No	68.0	$73.50	$350.30
CHES-919-G1	CHES	VIP	ALT	No	66.5	$18.74	$369.04
CHES-018	CHES	NA	HPP	No	64.3	$42.98	$412.02
YORK-001	YORK	WB	HPP	No	60.2	$10.32	$422.34
CHES-067	CHES	AT	HPP	No	58.8	$30.64	$452.98
CHES-089	CHES	NA	ALT	No	55.2	$13.47	$466.45
JCSA-LSA6-8	JCSA	WB	ALT	No	53.0	N/A	$466.45
NEWP-WCPSA001180	NEWP	JT	ALT	No	47.0	$11.60	$478.05
WILL-H-229	WILL	WB	ALT	No	46.3	N/A	$478.05
CHES-104	CHES	AT	ALT	No	37.7	N/A	$478.05
NEWP-WCPSA001600	NEWP	JR	HPP	No	34.3	$18.66	$496.71
NEWP-WCPSA001575	NEWP	JR	HPP	No	34.0	$20.16	$516.87
NORF-H-113	NORF	VIP	HPP	No	28.7	$5.97	$522.84
NORF-H106-G1	NORF	VIP	HPP	No	22.7	$6.04	$528.88

It should be noted that these conceptual-level budgetary costs are based on the original RWWMP approach to developing the basin specific I/I Reduction Plans, including rehabilitation or replacement of both public and private sewer assets. No changes to the scope of assets included in the I/I Reduction Plans or the I/I reduction targets from the RWWMP (based on updated flow monitoring data) have been made, except for refinement of the JCSA-LSA3-8 plan based on collected sanitary sewer evaluation data. Because this document was completed prior to the detailed cost-effectiveness analysis planned as part of the HPIIRP, there will likely be changes proposed from the original R/R scope using updated flow and SSES data which could reduce or increase the assets planned for R/R.

Using the original assumptions built into the 2017 RWWMP and updating the costs to reflect 2025 basis, the following Table ES-3 provides the basins level costs.

Table ES-3. I/I Reduction Plan Costs – RWWMP R/R Assumptions, 2025 Costs							
Rehab Area Reference ID	Investigation Subtotal Cost, $M	Asset Rehab Cost, $M	Pavement Restoration, $M	Construction Management & Inspection, $M	Engineering $M	Contingency $M	Total I/I Reduction Plan Cost Estimate, $M
PORT-10	$0.89	$13.90	$0.92	$1.33	$2.53	$3.93	423.51
JCSA-LSA3-8	$1.08	$30.11	$3.15	$2.99	$5.29	$8.59	$51.21
JCSA-LSA3-1	$1.52	$38.76	$3.68	$3.82	$7.19	$10.99	$65.97
JCSA-LSA3-6	$0.32	$4.24	$0.23	$0.40	$0.75	$1.20	$7.13
JCSA-LSA5-4	$0.35	$16.43	$2.16	$1.67	$2.86	$4.74	$28.22
YORK-003	$0.40	$6.75	$0.45	$0.65	$1.18	$1.90	$11.32
YORK-006	$0.85	$22.71	$2.34	$2.25	$4.00	$6.48	$38.64
Subtotal	$5.42	$132.91	$12.93	$13.13	$23.81	$37.82	**$226.01**
Additional Basins (held in reserve)							
CHES-016	$1.02	$21.05	$1.99	$2.07	$4.12	$6.02	$36.27
SUFF-146	$0.29	$8.66	$0.75	$0.85	$1.55	$2.43	$14.53
Subtotal	$1.31	$29.71	$2.75	$2.92	$5.67	$8.44	**$50.80**
Total	$6.73	$162.62	$15.68	$16.05	$29.47	$46.26	**$276.81**

The original assumptions used for development of the I/I Reduction Plans were evaluated by the BMcD Team and it was determined that there is likely conservatism built in that warrants revision. Table ES-4 identifies changes recommended for R/R plan cost development in the selected basins shown in bold.

Table ES-4. Criteria for I/I Reduction Plan Types				
Criteria	2017		2025	
	Comprehensive Approach	Data-Driven Approach	Comprehensive Approach	Data-Driven Approach
Replacement to Rehabilitation Ratio For Mainlines and MHs	70/30 Replacement/ Rehabilitation	50/50 Replacement/ Rehabilitation	**25/75** Replacement/ Rehabilitation	**25/75** Replacement/ Rehabilitation
Replacement to Rehabilitation Ratio For Public Lateral	70/30 Replacement/ Rehabilitation	50/50 Replacement/ Rehabilitation	**40/60** Replacement/ Rehabilitation	**40/60** Replacement/ Rehabilitation
Single Family Private R/R [1]	Target 100%	SF laterals included in scope based on known defects or when connected to scoped public pipe	**None**	**None**

[1] *For cost estimate, an assumption of 70% participation rate and 25% failure rate was applied to the targeted % of assets.*

After applying the revised assumptions shown in Table ES-4 and updating the costs to reflect 2025 basis, the following Table ES-5 provides the modified basins level costs.

Table ES-5. I/I Reduction Plan Costs – Revised R/R Assumptions, 2025 Costs

Rehab Area Reference ID	Investigation Subtotal Cost[1], $M	Asset Rehab Cost, $M	Pavement Restoration $M	Construction Management & Inspection, $M	Engineering, $M	Contingency, $M	Total I/I Reduction Plan Cost Estimate, $M
PORT-10	$0.10	$10.89	$0.50	$1.02	$1.83	$2.87	$17.21
JCSA-LSA3-8	$0.00	$18.99	$1.19	$1.82	$3.03	$5.05	$30.07
JCSA-LSA3-1	$0.41	$26.12	$1.54	$2.49	$4.68	$7.02	$42.26
JCSA-LSA3-6	$0.00	$3.16	$0.11	$0.29	$0.49	$0.82	$4.88
JCSA-LSA5-4	$0.00	$10.01	$0.79	$0.97	$1.62	$2.70	$16.09
YORK-003	$0.00	$5.29	$0.23	$0.50	$0.83	$1.38	$8.22
YORK-006	$0.00	$14.67	$0.86	$1.40	$2.33	$3.88	$23.13
Subtotal	$0.52	$89.13	$5.21	$8.49	$14.80	$23.71	**$141.86**
Additional Basins (held in reserve)							
CHES-016	$0.48	$14.91	$0.82	$1.42	$2.87	$4.06	$24.56
SUFF-146	$0.08	$5.72	$0.35	$0.55	$1.00	$1.54	$9.22
Subtotal	$0.56	$20.63	$1.17	$1.96	$3.86	$5.59	**$33.79**
Total	$1.08	$109.76	$6.38	$10.45	$18.66	$29.31	**$175.64**

[1] Due to ongoing SSES efforts within public assets as part of the HPIIRP, additional investigation costs are included for NSF only

The remainder of the costs presented in this Executive Summary reflect the 2025 costs using the revised assumptions.

The seven basins with the highest priority ranking are proposed for inclusion in the HPIIRP (highlighted in blue in Table ES-6 below). Four of the seven basins are in James City Service Authority (JCSA), which is an area of high growth in HRSD's service area with many documented capacity-related SSOs. Pending results of the BMcD Team's cost-effective analyses, sewer R/R projects to reduce I/I within these prioritized basins will proceed through design and construction to the extent this work remains to be cost-effective relative to the cost of alternative capacity improvements. The data presented in Table ES-6 is based on historical asset data (from the Localities) and will be updated through the HPIIRP during SSES investigations. The data for JCSA-LSA3-8 has been updated based on the new I/I Reduction Plan developed for that basin.
The two yellow-highlighted basins are proposed for further evaluation and held in reserve as potential substitute or supplemental projects if any of the top seven projects are determined less desirable during the cost-effective analysis, preliminary design, or detailed design phases of the HPIIRP. The BMcD Team plans to perform additional SSO analyses to identify additional Alternate basins for possible addition to the HPIIRP under the Comprehensive Agreement or to HRSD's future Adaptive Management Plan.

Table ES-6. Prioritized Basins Proposed for Further Evaluation

Rehab Area ReferenceID	HPP/ALT	Public Gravity Length, FT	Public Lateral Length, FT	Public MHs	Private NSF Gravity Length, FT	Private NSF MHs
PORT-10	ALT	71,758	36,625	257	14,744	25
JCSA-LSA3-8	ALT	54,409	14,900	307	7,333	41
JCSA-LSA3-1	ALT	62,204	17,275	362	23,530	125
JCSA-LSA5-4	ALT	35,622	4,150	143	8,259	37
JCSA-LSA3-6	ALT	24,345	9,025	124	1,131	6
YORK-003	HPP	31,512	9,575	136	6,110	37
YORK-006	HPP	38,620	17,175	211	0	0
CHES-016	HPP	30,358	12,975	119	19,815	90
SUFF-146	ALT	14,295	4,325	71	4,733	21
TOTAL		363,123	126,025	1,730	85,655	382

I/I Reduction Plan Revisions

At the beginning of work on the HPIIRP, the intention for the Comprehensive I/I Reduction Plan was to collect SSES data from each of the basins assigned a 'General' R/R plan type in the 2017 RWWMP and reclassify them as either Comprehensive or Data-Driven basins; thus allowing more data-driven costs and I/I reduction targets to be developed. Costs for all basins would also be adjusted from 2017 to 2025 dollars. However, after establishing the revised set of prioritized basins, only one of the seven (JCSA-LSA3-8) was a 'General' basin in the RWWMP that required collection of additional SSES for development of this Comprehensive I/I Reduction Plan. Temporary wastewater flow meters were installed within JCSA sewer systems and flow data from these temporary meters were used to develop updated wet-weather flow parameters. Analysis of JCSA-LSA3-8 data for a flow monitoring period from November 2024 through May 2025 is detailed in the following Table ES-7.

Table ES-7. JCSA-LSA3-8 Total Basin Pre-Rehabilitation Sewer Flow Characteristics	
Associated Treatment Plant	WB
Sewered Area, Acres	442.6
Flow Monitored or Associated Parameters	Flow Monitored
Base Sewer Flow, GPD	81,800
Dry Weather Infiltration (DWI), GPD	29,700
10-Year Peak I/I, GPD	4,567,000
10-Year Peak Flow, GPD	4,678,500
I/I Density, GPAD	10,319

SSES Investigation

SSES investigations and analysis are in progress for the nine HPIIRP basins as of the date of this Plan. Collected field data will be utilized for future cost-effective analyses and updates to each basin's rehabilitation scope of work and will inform future design efforts. Condition assessment summaries and re-evaluated R/R identification will be addressed in further detail in the Preliminary I/I Reduction Plan documentation for each HPIIRP basin.

Internal sewer and manhole inspections were completed between March and May 2025 throughout public assets for JSCA-LSA3-8. Detailed defect information from recent condition assessments for this service area will be used to perform a cost-effective analysis and the results incorporated into a refined rehabilitation scope, which will be documented in a Preliminary I/I Reduction Plan for this basin.

For planning purposes and the development of this Comprehensive I/I Reduction Plan, JCSA-LSA3-8 met the minimum GPAD threshold requirements for a Comprehensive R/R plan type. Asset R/R quantities, I/I removal targets, and cost assumptions are based on the same approach used to develop the RWWMP which includes addressing all public assets with previously noted revisions applied to the assumptions of asset repair to rehabilitation ratios.

Table ES-8 presents the R/R planning estimates that were derived using the Comprehensive scoping approach for JCSA-LSA3-8. These numbers are inclusive of 2025 assumption revisions for asset repair to replacement ratios.

Table ES-8. JCSA-LSA3-8 Post-Rehabilitation I/I Reduction Estimate and Cost-Effectiveness

	Public Sewer System R/R	Private Single Family Lateral R/R	Private Non-Single Family R/R	Total
Major Inflow Sources in R/R Scope	Yes	Unknown	Unknown	
Percent of System in R/R Scope	100%	0%	0%	
Estimated Peak 10-Year I/I, GPD	3,035,901	1,166,382	364,717	4,567,000
Peak Flow Reduction Target, GPD	2,125,131	0	NA	2,125,131
Estimated Peak Flow Reduction, Percent of Peak I/I Allocated to Asset Type	70%	0%	0%	47%
Estimated Investigation, Design and Construction Costs	$30,070,900	$0	$0	$30,070,900
I/I Removal Cost-Effectiveness, $/GPD Removed	$14.15	NA	NA	$14.15

Updated RWWMP Cost Estimate

The original 2017 and revised 2020 RWWMP documents included cost estimates that were developed in 2016 using information available at the time. Since then, inflationary pricing, increases post-COVID, and general escalation have caused the 2016 estimates to be significantly less than likely current costs. This Plan includes revised 2025 planning level (AACE Class 5) construction cost estimates adjusted based on a combination of Hampton Roads area project experience, bid tabs, local cost index, CCI, and comparisons to construction data from the Mid-Atlantic Region and surrounding states.

These revisions were applied to the basins included in the HPIIRP as well as the RWWMP Capacity Projects to provide HRSD with a complete picture of the RWWMP costs. No changes were made to

the list of capacity projects unless the project has already been started or known to be unnecessary (e.g., upsizing a Chesapeake force main to 10" when it has been recently found in the field to be 10"). There are a small number of Locality capacity improvements that overlap with basins that have been eliminated from the HPIIRP. The need for these projects will need to be evaluated in the Adaptive Management Plan. As part of the future design process and the Adaptive Management Plan for capacity projects, HRSD will need to refine the scopes of individual elements and/or repackage contiguous projects.

Capital cost for High-Priority Project capacity improvements (non-I/I projects) in 2025 dollars is estimated at $659 million. A breakdown of anticipated spending by asset type is outlined in Table ES-9.

Table ES-9. High-Priority Capacity Improvement Projects by Asset Type

Asset Type	Round 1		Round 2	
	Cost ($M)	% of Total HPP Capacity Improvements	Cost ($M)	% of Total HPP Capacity Improvements
PRS	$107.7	16.4%	$126.9	19.3%
Storage	$25.7	3.9%	$55.1	8.4%
HRSD Pump Station	$0.0	0.0%	$173.8	26.4%
HRSD Force Main	$0.0	0.0%	$64.0	9.7%
HRSD Gravity Main	$0.0	0.0%	$39.8	6.0%
Locality Pump Station	$0.0	0.0%	$53.6	8.1%
Locality Force Main	$0.0	0.0%	$1.1	0.2%
Locality Gravity Main	$1.2	0.2%	$10.0	1.5%
Total	$134.6	20.4%	$524.2	79.6%

HPIIRP Design and Construction Cost Estimate

For each basin included in the overall RWWMP program, a scope of R/R work was developed to estimate planning level costs and I/I reduction. A mixture of rehabilitation and replacement activities were included within each basin-specific reduction plan. Costs were assigned in each plan and included ancillary items like bypass pumping, restoration, traffic control, engineering at 15%, construction inspection and admin at 9%, and a contingency of 25%. This level of contingency is for planning-level projects and would be refined through more detailed design.

Table ES-10 identifies the priority project areas currently proposed by the BMcD Team for inclusion in the HPIIRP. Additional details can be referenced in the Catchment-Specific I/I Reduction Plans provided in Appendix A. As part of the future design process for these projects, rehabilitation scopes of work and costs will be revised based on the SSES condition information currently being collected. Actual completed costs could vary significantly from the costs shown in Table ES-7 based on the actual scope of work for R/R of public and private sewer system assets.

Table ES-10. HPIIRP Proposed Basin Cost Estimate										
Rehab Area Reference ID	Locality	TP	Plan Type	Basin Selection Category	Percent of System in R/R Scope			2025 Adjusted Planning Level Costs		
					Public Sewer Assets	Private SF Lateral	Private NSF Assets	Public Assets ($Million)	Private Assets ($Million)	Total ($Million)
PORT-10	PORT	VIP	Data-Driven	ALT	35%	0%	49%	15.6	1.6	17.2
JCSA-LSA3-8	JCSA	WB	Comprehensive	ALT	100%	0%	0%	30.1	0.0	30.1
JCSA-LSA3-1	JCSA	WB	Comprehensive	ALT	100%	0%	49%	34.8	7.4	42.3
JCSA-LSA3-6	JCSA	WB	Data-Driven	ALT	34%	0%	0%	4.9	0.0	4.9
JCSA-LSA5-4	JCSA	WB	Comprehensive	ALT	100%	0%	0%	16.1	0.0	16.1
YORK-003	YORK	WB	Data-Driven	HPP	43%	0%	0%	8.2	0.0	8.2
YORK-006	YORK	WB	Comprehensive	HPP	100%	0%	0%	23.1	0.0	23.1
							Subtotal	$132.8	$9.0	$141.9
Additional Basins (held in reserve)										
CHES-016	CHES	NA	Comprehensive	HPP	100%	0%	49%	17.7	6.9	24.6
SUFF-146	SUFF	NA	Comprehensive	ALT	100%	0%	49%	8.1	1.2	9.2
							Subtotal	$25.7	$8.1	$33.8
							Total	**$158.6**	**$17.1**	**$175.6**

The total estimated cost for the top seven priority basins is approximately $142M and includes about $9M for rehabilitation of private sewer assets on NSF properties. Our Team's current strategy for private property I/I reduction focuses on targeting select NSF private properties in the proposed priority basins. Future consideration to pursue single-family I/I reduction will depend on the overall effectiveness of completed R/R work on public sewers and private NSF properties and may be included in the HRSD's Adaptive Management Plan.

Overall RWWMP Cost Update

The updated RWWMP costs presented herein represent only a portion of HRSD's compliance program costs and would be in addition to the original Consent Decree Interim System Improvement projects, Rehabilitation Action Plan projects, SWIFT-related projects, and any work associated with plant closures to meet nutrient permit limits (Chesapeake Elizabeth Treatment Plant closure and the mid-2026 closure of the Boat Harbor Treatment Plant). Table ES-11 provides a summary of the updated RWWMP costs split between project type and comparing the original 2017 estimate to the updated values. Note that the Locality I/I reduction costs include estimated costs for the additional two basins in Portsmouth (PORT-02/04) not included in the HPIIRP budget provided by HRSD.

Table ES-11. Costs by Project Type (2025 $)

	2017		2025	
Project Type	Round 1 Cost ($M)	Round 2 Cost ($M)	Round 1 Cost ($M)	Round 2 Cost ($M)
HRSD Conveyance	$17.7	$36.7	$0.00	$103.83
HRSD PS	$35.2	$24.4	$0.00	$173.78
Locality Conveyance	$3.9	$1.1	$1.23	$11.10
Locality I/I*	$86.5	$66.6	$152.36	$0.00
Locality PS	$12.6	$7.6	$0.00	$53.59
PRS	$13.0	$32.6	$107.74	$126.86
Storage	$38.8	$33.5	$25.65	$55.09
Total	**$207.7**	**$202.4**	**$286.98**	**$524.24**

*Includes $10.5 million for Port-02/04 I/I reduction project not included in HPIIRP

Preliminary Implementation Schedule

Implementation of the seven proposed HPIIRP I/I reduction projects has been planned in phases, progressively increasing the level of detail the closer to the execution of each phase as information becomes available. A detailed Gantt chart schedule is provided in Appendix B. This program schedule is based on the quantities of R/R work derived from the revised I/I reduction scope assumptions and is subject to change based on the results of the cost-effective evaluation performed for each project basin. Table ES-12 Identifies the four major milestone completion dates for each basin as follows:

- Complete SSES – All SSES field work within the seven proposed project basins and two project basins held in reserve, consisting of sewer closed-circuit televised inspections, manhole inspections, and smoke testing is scheduled to be completed by mid-November 2025. Inspection of private sewer systems on NSF private property associated with the nine project basins is currently scheduled to be completed by December 2025.
- Complete Preliminary I/I Reduction Plan – This effort will include review and analysis of SSES data, completion of a cost effectiveness evaluation, modeling to confirm the I/I reduction target, and development of a rehabilitation plan to meet the I/I reduction target within the seven proposed project basins and two project basins held in reserve. The preliminary I/I reduction plans for all seven proposed project basins and two project basins held in reserve are currently scheduled to be completed by March 2026.

- Complete Final Design – The design for each basin will be advanced to a level required to obtain permits and provide the rehabilitation contractors sufficient detail to bid and construct the quantity of work determined to be cost-effective in accordance with the Preliminary I/I Reduction Plan. Final design of all seven proposed project basins is currently scheduled to be completed by June 2026.
- Substantial Completion of Construction – All rehabilitation work has been completed and tested, although some ancillary surface restoration work may remain. Final completion and acceptance from the Locality would be expected within 2 months of the Substantial Completion date. Substantial completion of assumed sewer R/R work within all seven proposed project basins is currently scheduled to be achieved by November 2028.

Table ES-12. HPIIRP Preliminary Schedule

Basin	Complete SSES	Complete Preliminary I/I Reduction Plan	Complete Final Design	Complete Construction
JCSA-LSA3-8	7/8/25	10/28/25	1/26/26	1/27/28
PORT-10	9/19/25	1/12/26	5/26/26	10/23/28
JCSA-LSA3-6	7/25/25	10/28/25	1/26/26	1/27/26
JCSA-LSA3-1	9/5/25	12/16/25	4/21/26	9/5/28
JCSA-LSA5-4	9/26/25	12/16/25	3/2/26	1/20/27
YORK-003	10/10/25	1/27/26	3/23/26	6/24/27
YORK-006	10/24/25	1/27/26	4/14/26	10/4/28
CHES-016	11/7/25	1/27/26	NA	NA
SUFF-146	11/14/25	2/24/26	NA	NA

Post-construction program management services including post-construction flow monitoring and data analyses will be performed to determine the amount of I/I reduction and SSO volume reduction achieved using the mini-models developed for each project basin. In addition, adaptive management planning services, including system-wide flow monitoring and data analyses, and hydraulic modeling services will be performed to assist HRSD with updating and recalibrating it's system-wide RHMs and to develop an adaptive management plan that defines the capacity projects needed to achieve 69% SSO volume reduction. These post-construction and system planning services will be scheduled to be completed by March 2030 to enable HRSD to submittal its adaptive management plan to EPA by March 31, 2030 as required by Consent Decree.

Establishment of HPIRP Budget for Comprehensive Agreement

In addition to the design and construction costs discussed above for the implementation of I/I reduction work in the seven proposed project basins based on the revised assumptions for development of the I/I Reduction Plans, there are additional programmatic and construction management efforts necessary to successfully implement this work in a consistent, high-quality, cost-effective manner and to also thoroughly define the remaining capacity projects that are needed (along with all the other system improvements being implemented by HRSD and the Localities through 2040) to achieve a 69% SSO volume reduction required by HRSD's Consent Decree. These additional efforts are listed below for inclusion in HRSD's total budget for the HPIIRP.

1. Program management services, including continuation of program administration and controls, flow monitoring, SSES field work, hydraulic mini-model development, cost-effective evaluations to quantify the amount of cost-effective R/R in each project basin, development of a preliminary I/I reduction plan for each basin and support programmatic delivery of design and construction of R/R work within seven proposed project basins. These services would be provided from September 2025 through the completion of construction in 2028.
2. Construction cost for the PORT-02/04 I/I Reduction Project as determined by the Brown and Caldwell design. HRSD has decided to add the construction of this project to the HPIIRP to gain efficiencies of a programmatic project delivery approach.
3. Design-Builder fee consisting of 7 percent for design professional services and 9 percent for construction of R/R work in each project basin. It is assumed the construction work is performed at-risk with a contract cost limit being required by HRSD for each project.
4. Post-construction program management services, including program administration and controls, post-construction flow monitoring and data analyses, and updating of the mini-models to determine the amount of I/I reduction and SSO volume reduction achieved in each project basin.
5. Adaptive management programmatic services, including program administration and controls, additional system-wide flow monitoring and data analyses, hydraulic modeling services to assist HRSD with updating and recalibrating it's RHM to be used to define capacity projects needed to achieve 69% SSO volume reduction, and system planning services to assist HRSD with developing an Adaptive Management Plan for submittal to EPA.

Preliminary budgetary costs for these additional efforts are summarized in Table ES-13 along with the preliminary design and construction costs for R/R work in the seven HPIIRP project basins and the PORT-02/04 basin. The total program cost through post-construction flow monitoring is $192.8 million.

HRSD's current CIP budget for the HPIIRP is $143,715,840 and for the Port-02/04 I/I Reduction Project is $10,500,000, for a combined total CIP budget of $154,215,840. This combined total CIP budget represents the initial budget to be included in the Comprehensive Agreement to fund the completion of planning and programmatic delivery of design and R/R work in the project basins, the design and construction of cost-effective I/I reduction sewer R/R work, a 15 percent Owner-controlled contingency, and post-construction flow monitoring to determine I/I and SSO reduction achieved, as shown in Table ES-14.

The difference between HRSD's current total CIP budget of $154,215,840 and the total projected cost of $192.8M for sewer R/R work and post-construction flow monitoring will be addressed by HRSD upon the completion of BMcD Team's cost-effective evaluations which will determine the extent of I/I reduction work to be completed in each project basin in lieu of alternative capacity improvements. Similarly, the funding of adaptive management programmatic services for the completion of system-wide flow monitoring and data analyses, along with the updating and recalibration of HRSD's RHM and the development of an Adaptive Management Plan will be addressed by HRSD in the future, as needed.

Table ES-13. Establishment of HPIIRP Budget		
Work Category	**Work Description**	**Preliminary Budgetary Cost $ Million (2025 Dollars)**
Design and Construction of 7 Project Basins	Based on revised assumptions for development of the I/I Reduction Plans	$141.9
PORT-02/04 Construction Costs	Based on Brown and Caldwell design	$10.5
Program Management Services	Continuation of planning and programmatic delivery of design and R/R work in the project basins	$23.2
Design-Builder Fee	At-Risk Work based on Contract Cost Limit required by HRSD for construction work	$11.6
	Preliminary Program Costs through Construction - Subtotal	**$187.2**
Post-Construction Program Management Service	Flow monitoring and data analyses and updating of mini-models to determine I/I and SSO reduction achieved	$5.6
	Preliminary Program Costs through Post-Construction Flow Monitoring - Subtotal	**$192.8**
Adaptive management programmatic Services	Flow monitoring and data analyses, and updating and recalibration of RHM and development of Adaptive Management Plan	$32.0
	Total HPIIRP Budget Estimate	**$224.8**

Table ES-14. Projected Spend of HRSD's Current CIP Budget for HPIIRP		
Budget/Cost Elements	**Preliminary Budgetary Cost $ Million (2025 Dollars)**	**Cumulative Total**
HRSD Current CIP Budget for HPIIRP	$143,715,840	$143,715,840
HRSD Current CIP Budget for PORT-02/04 Construction	$10,500,000	$10,500,000
Subtotal HRSD CIP Budget	**$154,215,840**	**$154,215,840**
Less 15% Owner- Controlled Contingency (exclusive of Port -02/04)	$21,557,376	$132,658,464
Less Program Management Services - Continuation of planning and programmatic delivery of design and R/R work in the project basins	$23,219,100	$109,439,364
Less Design and Construction of Cost-effective I/I Reduction R/R Work with 25% Contingency	$95,923,900	$13,515,464
Less Design-Builder Fee for At-Risk Work Assuming Contract Cost Limit required by HRSD for construction work	$7,865,764	$5,649,700
Less Post-construction flow monitoring and data analyses and updating of mini-models to determine I/I and SSO reduction achieved	$5,649,700	$0

Section 1

Introduction

1.1 RWWMP Background

Since prior to 2007, HRSD has been working with the Commonwealth of Virginia Department of Environmental Quality (DEQ) and the United States Environmental Protection Agency (EPA) to fulfill regulatory compliance requirements to benefit public health and the environment. The original 2007 Special Order by Consent (SOC) and the 2010 Consent Decree included a process for HRSD, working with the Hampton Roads localities, to evaluate the condition and capacity of the wastewater collection, transmission, and treatment facilities, and to develop a long-term rehabilitation action plan and wet weather management plan.

In August of 2016, an Alternative Analysis Report (AAR) was submitted to the EPA and DEQ as part of this process. In the AAR, three Levels of Service (LOS) were considered with capacity improvement solution sets and cost estimates developed for each: the 2-year, 5-year, and 10-year peak flow recurrence. These solution sets included both capacity improvement projects, such as pressure reducing stations, wet weather storage facilities, and larger diameter pipelines, as well as infiltration/inflow (I/I) projects to reduce the amount of peak flow in the system. Following the AAR, capacity improvements and the scope of the I/I reduction program were optimized for cost-effective implementation at the selected level of service. The objective of the optimization effort was to find an efficient way to provide the desired capacity while reducing plan cost and providing other benefits. Cost effectiveness was based on estimated values for both I/I reduction and transmission/treatment.

The initial Regional Wet Weather Management Plan (RWWMP) was submitted in September 2017 and included nearly $2 billion in capacity improvements and I/I reduction projects spread across the metro HRSD service area. An update to the original plan followed shortly after the initial submittal and was reflected in the Fourth Amendment to the Consent Decree. This required HRSD to identify High-Priority Projects (HPPs) to be implemented as part of a reduced Regional Wet Weather Management Plan (RWWMP) to be completed in parallel with HRSD's Sustainable Water Initiative for Tomorrow (SWIFT) Program to reduce nutrient loads to the Chesapeake Bay. HRSD developed an approach to identify the highest-priority system improvements with the greatest relative environmental benefit. The HPPs include both capacity improvement projects (e.g., pumping facilities and larger pipelines) as well as I/I reduction projects to reduce peak flow in the system.

A revised RWWMP Plan was submitted in June 2020 and approved in 2022 that carries forward the same principles of the September 2017 submittal but focuses on a smaller selection of RWWMP projects totaling $410 million (per original 2016 cost estimating) in two rounds of HPPs. The first set is to be completed by December 31, 2028, when a re-evaluation of the system can take place to refine and finalize the second round to be completed by 2040 (referred to as the Adaptive Management Plan). Based on the RWWMP modeling, the full set of HPPs (along with all the other system improvements being implemented by HRSD and the Localities through 2040) are projected to reduce modeled SSO volume by a total of 69% from the original baseline model used for the RWWMP (using the approved 5-year event in the RWWMP).

The HPPs included 22 basins for I/I reduction that will be beneficial for reducing SSOs and also reducing the size of other downstream capacity improvements required in the RWWMP. Of these 22

basins, 19 were tasked to the Burns & McDonnell Team (BMcD Team) as part of the HPIIRP with the remaining three in Portsmouth (PORT-01, PORT-02, and PORT-04) being designed under a separate effort.

The purpose of this Comprehensive I/I Plan (Plan) is three-fold:

1. Provide documentation of the BMcD Team's efforts during the Interim Agreement to assess the suitability of the 19 high-priority basins initially identified by HRSD to be included in the HPIIRP and the team's proposed working set of prioritized basins to be further evaluated within the Comprehensive Agreement of the HPIIRP,
2. Provide an estimated total cost to complete the proposed I/I projects and an updated cost for the other RWWMP capacity improvements, and
3. Provide a comparison of the costs from the original RWWMP to an updated estimate.

The remainder of Section 1 will focus on the assumptions and details that went into the I/I project definition and eventually lead to the cost estimate for the work. Nearly all of this remaining section is describing the original RWWMP from 2017 which included rehabilitation of both publicly and privately owned sanitary sewer assets. These approaches may change as the I/I work is implemented but was included in the original assumptions. The next sections will provide details on the following:

- Rehabilitation/Replacement Scope Development. Criteria for determining I/I Reduction Plan type (Comprehensive, Data-Driven or General), and assets that were included in the scope of rehabilitation/replacement (R/R).
- Basin Selection. Approach and criteria for inclusion of specific sanitary sewer basins in the I/I Reduction Program. Identification of basins where cost-effective I/I reduction is anticipated.
- Sanitary Sewer System Evaluation Data. Description of data sources used in the development of the I/I Reduction Program scope.
- I/I Reduction Estimate. Methodology for estimating the 10-year peak I/I reduction based on the I/I Reduction Plan type, flow characteristics and basin composition.

1.2 I/I Reduction Plan Types

Basin-Specific I/I Reduction Plans were developed for each rehab area included in the RWWMP based on the type of R/R approach. The selected approach was dependent on available condition data and basin leakiness, estimated by I/I density in gallons per acre per day (gpad) at the 10-year peak flow recurrence. The rehabilitation plan type determined the quantity of infrastructure R/R assumed for each basin, which formed the basis of the I/I reduction and cost estimates. The type of rehabilitation plan approaches considered are described below:

1. **Comprehensive R/R** – This approach was utilized in the leakiest basins with program funding to rehabilitate/replace all public sanitary sewer assets and leaky single-family private laterals. A maximum reduction of 70% of I/I associated with the scoped assets was assumed using this approach. Non-single-family (i.e., multi-family and commercial properties), or NSF, assets were included on a selective basis. A participation rate of 70% was assumed for the identified single-family and non-single-family infrastructure improvements.

2. **Data-Driven R/R** – This approach was used when CCTV/condition data existed for at least 25% of the basin assets to facilitate scoping of assets for R/R based on documented defects. I/I reduction was targeted to all qualifying defects and cost were estimated as a function of the specific assets identified in the R/R scope. Single-family laterals connected to scoped assets and select non-single-family assets, were included in the planning scope.
3. **General R/R** – The general approach was used if a basin I/I density was above the minimum threshold, but below the comprehensive threshold, and sufficient CCTV data was not available for a data-driven R/R scope. Percentages of system in the R/R scope and corresponding I/I reduction were developed as a function of I/I density for each wastewater treatment plant service area. This approach assumed a minimum of 30% of the public system assets would be included in the R/R scope, with a corresponding 21% I/I reduction. The percentage R/R and I/I reduction was scaled to 100% of the public assets and 70% I/I reduction, based on the minimum and comprehensive I/I density thresholds.

Funding estimates included future SSES activities for all I/I reduction basins prior to rehabilitation design. A general workflow logic applied for rehabilitation scope planning is indicated in Figure 1-1.

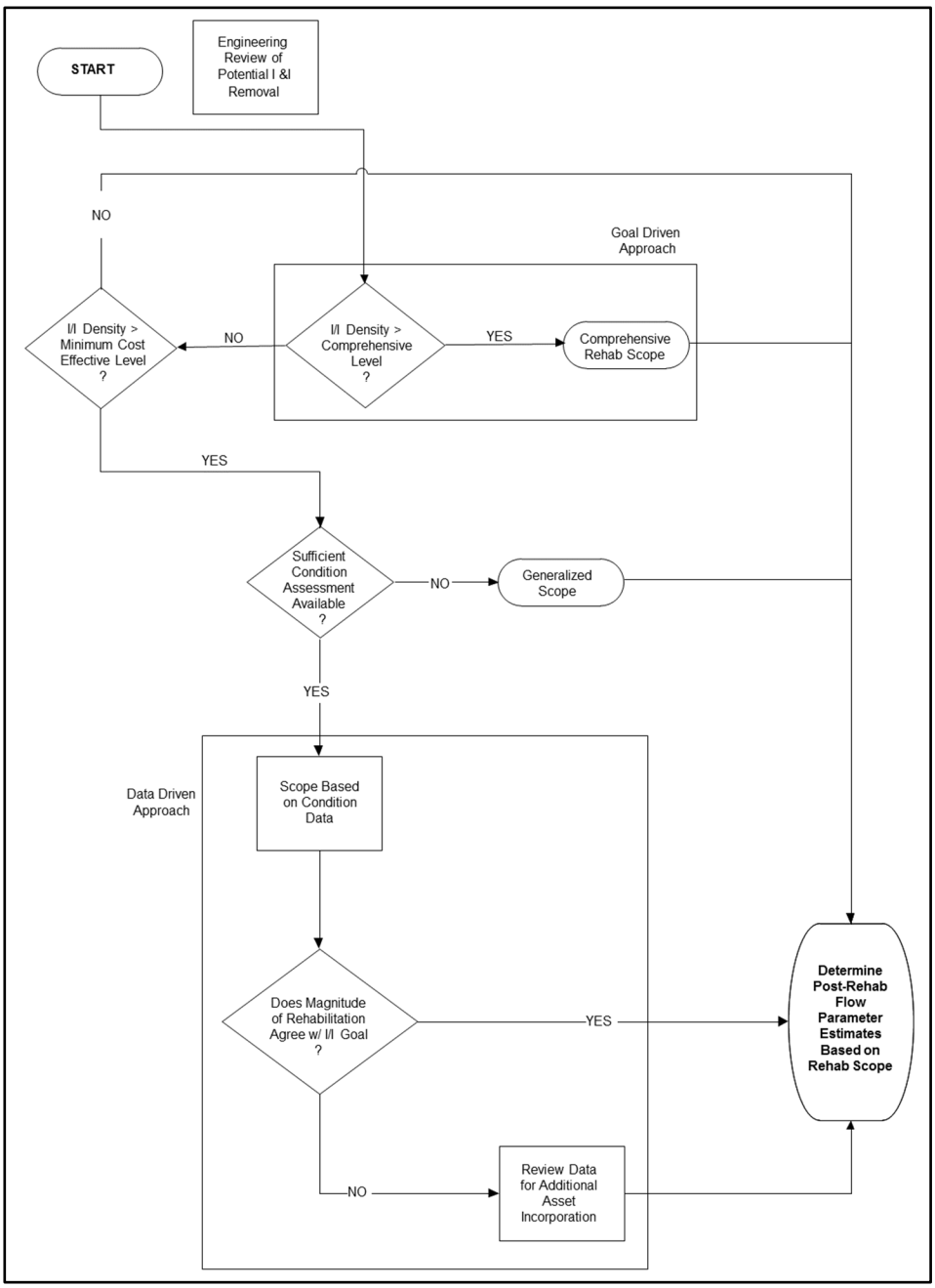


Figure 1-1. Workflow Logic for I/I Reduction Program Planning

1.3 I/I Reduction Targets and Planning Level Costs

The original 2017 RWWMP included 191 basins for I/I reduction and the 22 HPPs were chosen from this set. In general, this larger set provides the options of where HRSD could perform I/I reduction cost-effectively. Table 1-1 summarizes the estimated I/I reduction to be achieved by Treatment Plant (TP) service area for all 191 basins from the original plan. The I/I work in these 191 basins had an estimated cost of $852 million based on 2016 pricing.

Table 1-1. Summary of I/I Reduction Program by TP Service Area

		Public		Private		Total	
Treatment Plant	Number of I/I Reduction Areas in Program	I/I Reduction (mgd)	Cost ($Million)	I/I Reduction (mgd)	Cost ($Million)	I/I Reduction (mgd)	Cost ($Million)
Army Base	0	0	$0	0.0	$0	0.0	$0
Atlantic	45	18.0	$141.3	9.2	$35.2	27.2	$176.5
Boat Harbor	28	7.7	$59.8	2.2	$6.6	9.9	$66.4
James River	16	4.8	$37.9	1.9	$6.7	6.7	$44.6
Nansemond	20	12.9	$112.5	5.5	$23.1	18.4	$135.6
VIP	50	34.3	$262.9	7.3	$22.7	41.6	$285.6
Williamsburg	26	14.2	$108.4	4.2	$15.4	18.4	$123.8
York River	6	1.7	$17.4	0.9	$2.4	2.6	$19.8
Total	**191**	**93.6**	**$740.2**	**31.2**	**$112.1**	**124.8**	**$852.3**

Basin-Specific I/I Reduction Plans were developed for all 191 basins included in the 2017 RWWMP I/I Reduction Program. These plans provide the following planning level program information:

- Area Characteristics
- Summary of Available Condition Assessment and Flow Monitoring Data
- Selected Rehabilitation Planning Approach
- Scope of Planned Rehabilitation
- Summary of Locality Implemented Rehabilitation and Post-Rehabilitation Flow Monitoring
- Estimated Investigation and Rehabilitation Costs
- System Performance and Estimated Post-Rehabilitation Peak Flow

Figures 1-2 and 1-3 provide a graphic representation of the I/I reduction areas for North Shore and South Shore, respectively.

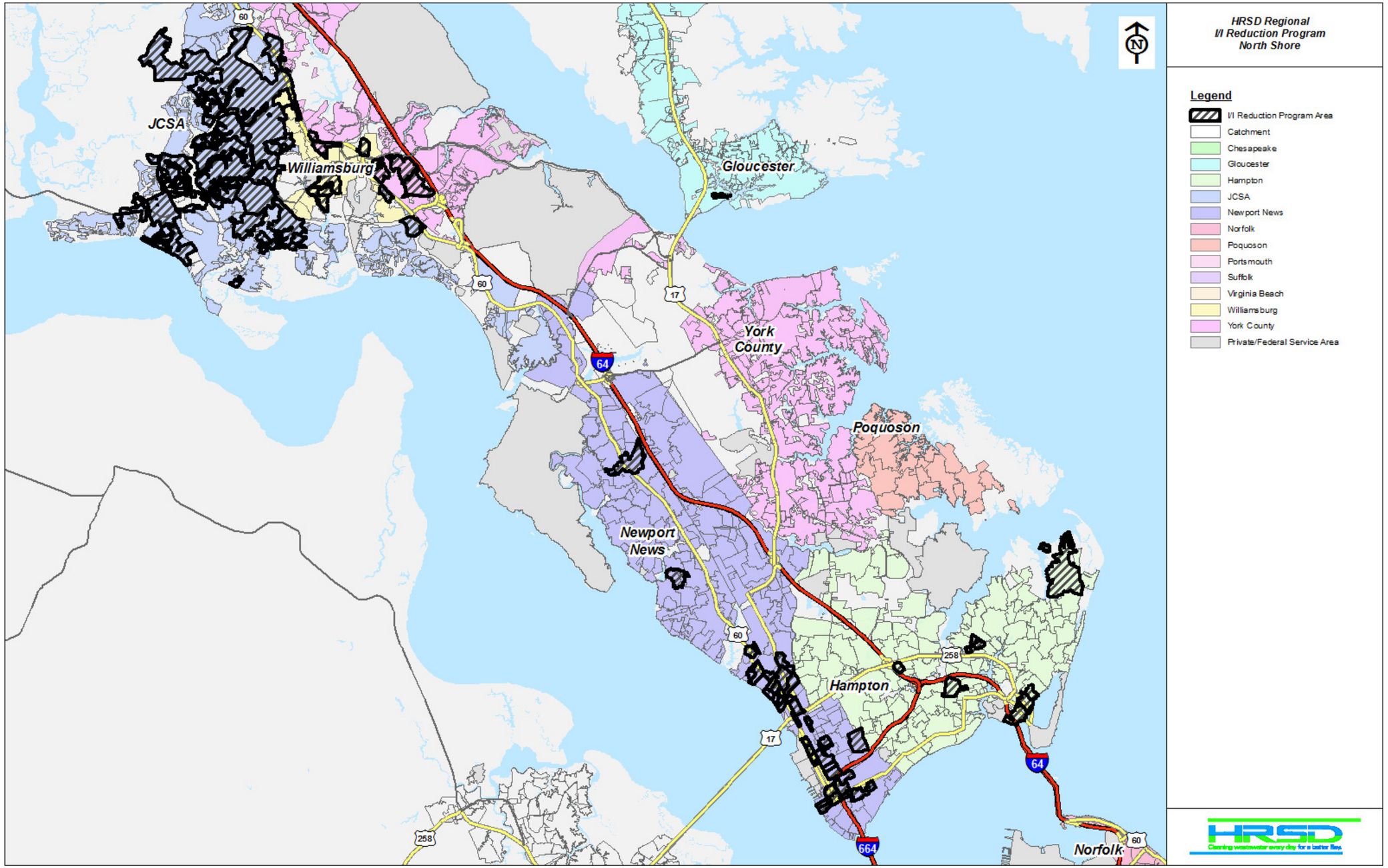


Figure 1-2. Planned North Shore I/I Reduction Program Areas

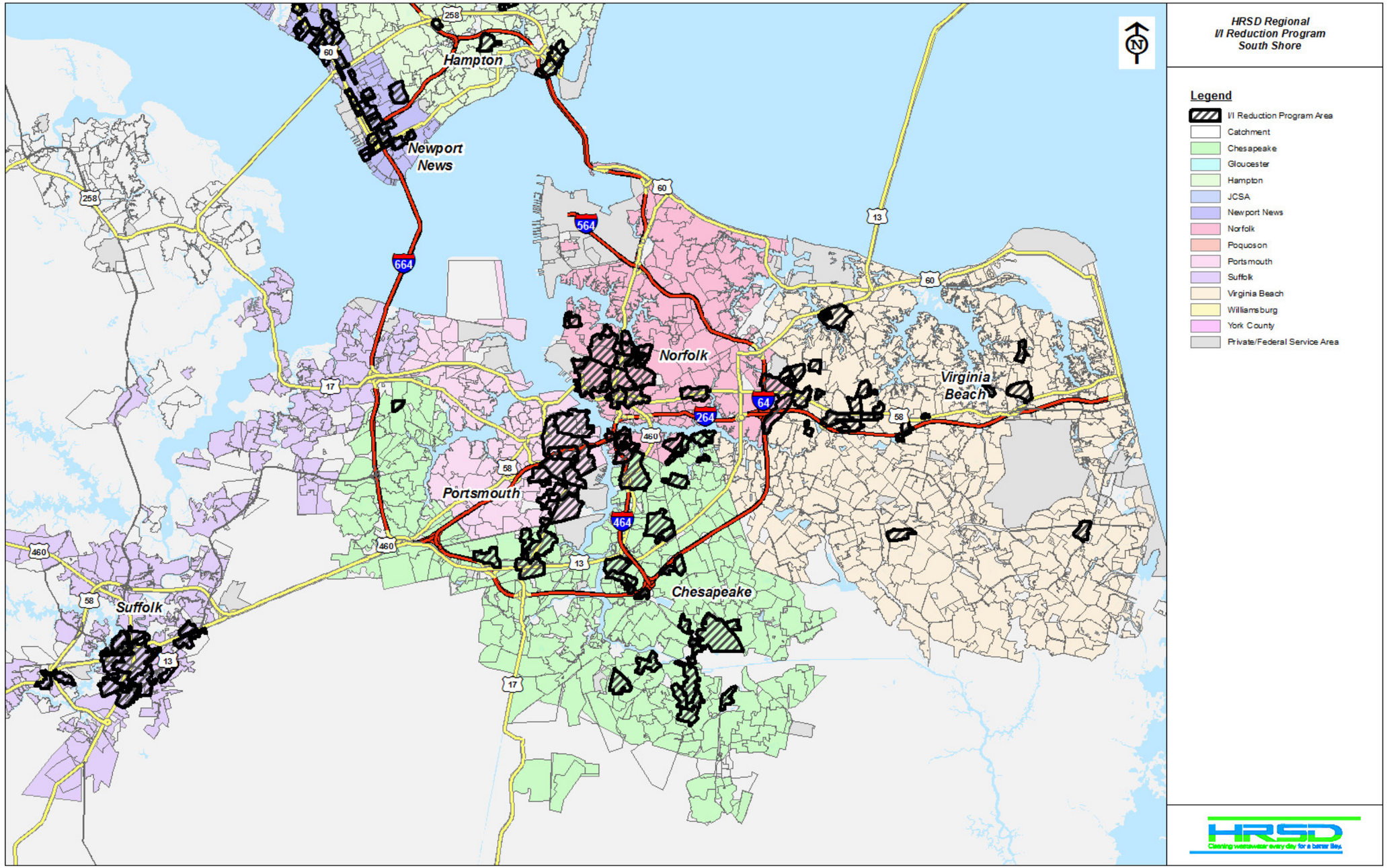


Figure 1-3. Planned South Shore I/I Reduction Program Areas

1.4 RWWMP Basin Selection

An analysis was conducted to determine thresholds where I/I reduction was likely to be more cost-effective than conveyance and treatment of I/I. The review was conducted on a TP service area basis to account for varying conveyance and treatment capacity and cost, and peak flow characteristics within the service area. The analysis identified an optimal combination of I/I removal in conjunction with system capacity improvements based on the 10-year peak flow recurrence with moderate 2030 growth. The 10-year peak flow value was used as a normalization value since the beginning of the compliance program in 2007. It was unclear what level of service might be selected and a single normalized approach was necessary between HRSD and the Localities. The 10-year peak flows are based on long term simulation results using the wet weather hydrologic parameters.

The analysis assumed that the higher the I/I density in a basin (in gallons per sewered acre per day, or gpad), the lower the unit cost of I/I removal. Minimum I/I densities were established for each TP service area based on the cost-effective evaluation, as shown in Table 1-2. Basins below the minimum I/I density were not included in the 2017 RWWMP. Comprehensive rehabilitation/ replacement (R/R) was planned for mitigating I/I in the leakiest basin, as indicated by the Comprehensive gpad level in Table 1-2. Approximately 500 basins across the regional system were evaluated to determine if they met the criteria for cost-effective I/I abatement. I/I reduction targets and cost estimates were initially developed for all basins that met the criteria in Table 1-2.

During development of the RWWMP, HRSD met with each of the Localities to review the list of proposed basins. The Localities provided input on numerous basins from the larger list of 500 and many were eliminated based on Locality-knowledge. In addition, basins were eliminated from the Program for one of the following reasons:

- Locality recommended removal because peak I/I estimates did not match operational experience
- Recent flow data reduced peak I/I below the Program threshold
- Estimated I/I reduction was below 50,000 gpd
- The unit cost of I/I removal was considered excessive (greater than $15/gpd removed using the planning level costs available at the time in 2014-2015).
- Optimization process

Following this effort in 2015, 287 areas were selected, and these were optimized in 2017 to a total of 191 areas for inclusion in the I/I Reduction Program projections across the entire regional service area.

Table 1-2. HRSD I/I Reduction Program Basin Selection Criteria

	I/I Density, 10-Year Peak I/I gpad	
TP	**Minimum**	**Comprehensive Level**
Army Base	7,900	12,000
Atlantic	5,200	12,000
Boat Harbor	8,600	19,000
James River	6,500	16,000
Nansemond	3,500	8,000
VIP	8,700	20,000
Williamsburg	3,600	9,800
York River	3,400	7,500

1.5 Sanitary Sewer System Evaluation Data

Available sanitary sew er condition data and field investigation results were provided by each Locality to facilitate R/R planning during development of the RWWMP. Condition assessment data included smoke testing, night flow isolation, manhole inspections, CCTV, historical system records and rehabilitation documentation. Table 1-3 provides a summary of the CCTV, manhole, and smoke test data received from the Localities for the basins that were evaluated under the RWWMP I/I Reduction Program.

In several cases, Localities provided non-compliant PACP or MACP data. Generally, this was the result of condition assessments performed using a non-NASSCO inspection approach (including condition rankings developed by the Localities). These inspection methods typically identified significant inflow, structural, and operational defects; and were considered valid reference data for rehabilitation plan development.

Table 1-3. Locality-Provided SSES Data Summary

Locality	CCTV (LF)	% of Public Gravity Pipe Assets CCTV'd[1]	Manhole Inspections/ Checks[2]	% of Public Manholes Inspected/ Checked[2]	Smoke Test (Count of Records)
Chesapeake	617,080	17%	18,344	100%	755
Gloucester	0	0%	560	99%	2
Hampton	185,615	8%	948	8%	324
JCSA	417,156	22%	7,023	67%	1,426
Newport News	418,024	17%	14,683	100%	818
Norfolk	122,105	3%	6,355	33%	2,013
Poquoson	97,916	29%	1,354	80%	31
Portsmouth	497,451	25%	9,981	100%	572
Suffolk	304,194	22%	9,209	100%	752
Virginia Beach	1,920,700	30%	19,417	59%	2,148
Williamsburg	91,915	37%	1,218	87%	0
York County	338,761	27%	6,135	99%	174
Total	**5,011,477**	**20%**	**95,281**	**70%**	**9,015**

1. Public manhole and gravity main information from 2015 Locality GIS submittals; inclusive of active locality owned assets only

2. May include multiple inspection records for individual assets

HRSD collected additional SSES data in 55 select basins in 2014 and 2015 to supplement data gaps in basins with significant I/I. Table 1-4 provides a summary of the data collected.

Table 1-4. HRSD SSES Data Summary

Locality	CCTV (Linear Feet)	Manhole Inspections (Count)	Smoke Test (Linear Feet)
Chesapeake	22,955	249	13,824

Table 1-4. HRSD SSES Data Summary			
Locality	CCTV (Linear Feet)	Manhole Inspections (Count)	Smoke Test (Linear Feet)
James City County	5,798	0	0
Newport News	11,798	0	0
Norfolk	139,883	2,171	656,372
Portsmouth	36,029	71	17,070
Suffolk	42,484	0	0
Virginia Beach	0	201	29,504
York County	9,858	0	0
Total	**268,788**	**2,692**	**716,769**

SSES data that was compiled into an InfoNet database and, where feasible and of sufficient extent, utilized to develop the R/R scope of work.

1.6 Rehabilitation/Replacement Scope Development

1.6.1 Plan Types and R/R Scoping Logic

Basin-Specific I/I Reduction Plans were developed for each selected basin based on the available condition data and basin I/I density in gallons per acre per day at the 10-year peak flow recurrence. The rehabilitation plan type determined the quantity of infrastructure R/R assumed for each basin, which formed the basis of the I/I reduction and cost estimates included in the RWWMP. The I/I Reduction Plan types were:

- Comprehensive
- General
- Data-Driven

For each area included in the Program, a scope of R/R work was developed to estimate planning-level costs and I/I reduction. Table 1-5 provides an overview of the R/R scoping logic. Additional details regarding the R/R scope assumptions for each plan type are provided in this section. Details on the cost-effectiveness analysis used during the RWWMP can be found in the original 2017 plan. It was based on the cost to transport and treat flow versus I/I reduction at the treatment plant service area level.

Table 1-5. Criteria for I/I Reduction Plan Types			
Criteria	Comprehensive Approach	Data-Driven Approach	General Approach
SSES Data Availability	Any amount of SSES data was acceptable for planning	Smoke Testing and MH Inspection Data Greater than 75% of Basin and CCTV Greater than 25% of Basin	CCTV Less than 25% of Basin
Basin Leakiness	Basin leakiness > cost effective and comprehensive gpad	Basin leakiness > cost effective gpad threshold for the TP service area	

Table 1-5. Criteria for I/I Reduction Plan Types			
Criteria	**Comprehensive Approach**	**Data-Driven Approach**	**General Approach**
	thresholds for the TP service area		
Assumed Replacement to Rehabilitation Ratio used for Budgetary Cost Estimate	70/30 Replacement/Rehabilitation	50/50 Replacement/Rehabilitation	50/50 Replacement/Rehabilitation
Public R/R	100%	Manholes, pipes, and public laterals included based on known defects. Manholes and public laterals also included if they were connected to a scoped public pipe	Sliding scale for R/R scope based on I/I density
Single Family Private R/R [1]	Target 100%	SF laterals included in scope based on known defects or when connected to scoped public pipe	Target equal to % Public R/R
NSF R/R [2]	May apply to any of the three scoping approaches Target 100% NSF assets within parcels >1acre if one of the following conditions is met: • Top 30% of Leakiest Basin in TP service area • Private NSF Equivalent Length >50% of total assets in basin		

[1] For cost estimate, an assumption of 70% participation rate and 25% failure rate was applied to the targeted % of assets.

[2] For cost estimate, an assumption of 70% participation rate and 70% failure rate was applied to the targeted % of assets. An R/R ratio of 50/50 was applied to NSF assets for all plan types.

In cases where the Locality had completed rehabilitation in a selected basin sufficient to address the I/I target estimated for the I/I Reduction Program, the basin was excluded from program funding estimates. These basins were incorporated in the RWWMP modeling with post-rehabilitation flow parameters and were not considered part of the final selection for the RWWMP I/I Reduction Program.

1.6.1.1 Comprehensive Scope Development

This approach was utilized in the leakiest basins and programmed funding to rehabilitate/replace all public sanitary sewer assets and accessible single-family private laterals. A maximum reduction of 70 percent of I/I associated with the scoped assets was assumed using this approach. Non-single-family (i.e., multi-family and commercial properties) assets were included on a select basis.

Public System. A replacement versus repair ratio of 70/30 for public assets was presumed in basins where comprehensive R/R was planned. This assumption reflects a realistic construction approach for significant contiguous system R/R, considering basin-wide comprehensive R/R was only applied to the leakiest basins by TP service area (i.e., where the cost-effective I/I reduction target was greater than 60 percent).

Private Single-Family Laterals. The assumption was that all private single-family laterals in the basin will be targeted; however, for cost estimating purposes, a homeowner participation rate of 70 percent was assumed. This was based on experience with the HRSD pilot programs for private system rehabilitation. It was further assumed that 25 percent of those participating would have failures requiring R/R. This approach may change in the HPIIRP; however, the costs were included for consistency with the RWWMP development.

Previously Rehabilitated Assets. Throughout the course of SSES activities, some Localities have made efforts to rehabilitate identified sewer system defects through various ongoing programs specific to each Locality (i.e., prompt repairs, I/I abatement, capital improvements, etc.) The Basin Specific I/I Reduction Plans detail the extent to which previous rehabilitation efforts were considered in the cost estimate.

1.6.1.2 Data-Driven Scope Development

This approach was used when at least 25 percent of the basin has available CCTV/condition data to facilitate scoping of assets for R/R based on documented defects. I/I reduction and costs were estimated as a function of the specific assets identified in the rehabilitation scope. Single family laterals connected to scoped public assets, and select non-single-family assets (based on criteria in Table 1-5), were included in the planning scope.

Table 1-6 summarizes defects that resulted in the associated asset being scoped for R/R. Note that quick score and non-NASSCO defect assignments were only used in the absence of specific PACP and MACP data.

Table 1-6. Gravity Sewer System Qualifying Defects Included in the R/R Scope

Defect Type	Qualifier/Description
Structural Pipe Defect	Qualifying PACP Defect Quick Score Rating >1 Qualifying Defect Recorded in Non-NASSCO Format
O&M Pipe Defect	Qualifying PACP Defect Quick Score Rating >1 Qualifying Defect Recorded in Non-NASSCO Format
Structural Manhole Defect	Qualifying MACP Defect Quick Score Rating >1 Qualifying Defect Recorded in Non-NASSCO Format
O&M Manhole Defect	Qualifying MACP Defect Quick Score Rating >1 Qualifying Defect Recorded in Non-NASSCO Format
Unresolved Dye Test	Dye tests for which a positive dye test has been recorded but the defect remains unaddressed or where the exact nature of the defect has not been identified.
Unresolved smoke test results	A positive smoke test was recorded, and the defect cannot be remedied by manhole insert, clean out cap, or plug replacement.

The following protocols were used to develop the R/R scope for public sanitary sewer assets. These protocols were not intended to commit to a specific rehabilitation method for a given asset or defect.

- For pipe defects, the whole asset, from upstream to downstream manhole, was included in the R/R scope (i.e., no point repairs).
- Manholes with qualifying defects included in the R/R scope.
- Pipes and manholes located between pipe segments scoped for whole asset R/R were included in the scope, regardless of condition based on previous concerns for skipping intermediate segments.
- Defective mainline cleanouts, or mainline cleanouts connected to pipes being replaced, were scoped to be replaced with manholes.

- Laterals connected to pipelines scoped for whole asset R/R, were included in the scope for replacement. For cost estimating purposes, laterals were assumed to be located at 50-foot intervals along each segment of pipe. Defective laterals, not otherwise associated with whole asset R/R, were included in the scope for replacement. Laterals included in the scope were assumed to be replaced, rather than repaired, for cost estimating purposes.
- Unless supported by other evidence, unresolved positive smoke tests and dye tests were assumed to be a lateral defect and scoped for replacement.
- Missing or defective lateral cleanout caps and plugs were assumed to require a whole cleanout assembly replacement, rather than replacing a single cap or plug, so that the new cleanout assembly will conform to current standard sizes.
- Assets with issue documentation from supplemental Locality records were included in R/R scope.

Previously Rehabilitated Assets. Defects that had been remedied after condition assessment was performed were excluded from the data-driven R/R scope of work, unless it was determined that the rehabilitation effort did not adequately address the identified defect. Table 1-7 provides guidelines on how previously rehabilitated assets were addressed in the R/R scope.

Table 1-7. Previous Rehabilitation Activities

Activity	Remove from R/R Scope?
Whole Pipe Segment Replacement	Yes
Pipe Defect Point Repair	Yes, if it could be confirmed that repair addressed all qualifying defects
Manhole Replacement	Yes, unless manhole is located between pipe segments scoped for whole asset R/R and must be replaced
Manhole Repair	Yes, if repair addressed all qualifying defects AND manhole is not located between pipe segments scoped for whole asset R/R
Manhole Insert Installation	No
Broken Cleanout Cap Replacement	Yes, unless cleanout cap is connected to pipe scoped for whole asset R/R

1.6.1.3 General Scope Development

The general approach was used if a basin I/I density was above the minimum threshold, but below the comprehensive threshold (refer to Table 1-2), and sufficient CCTV was not available for a data-driven R/R scope. Percentages of system in the R/R scope and corresponding I/I reductions were developed as a function of I/I density for each wastewater treatment plant service area as shown in Figure 1-4.

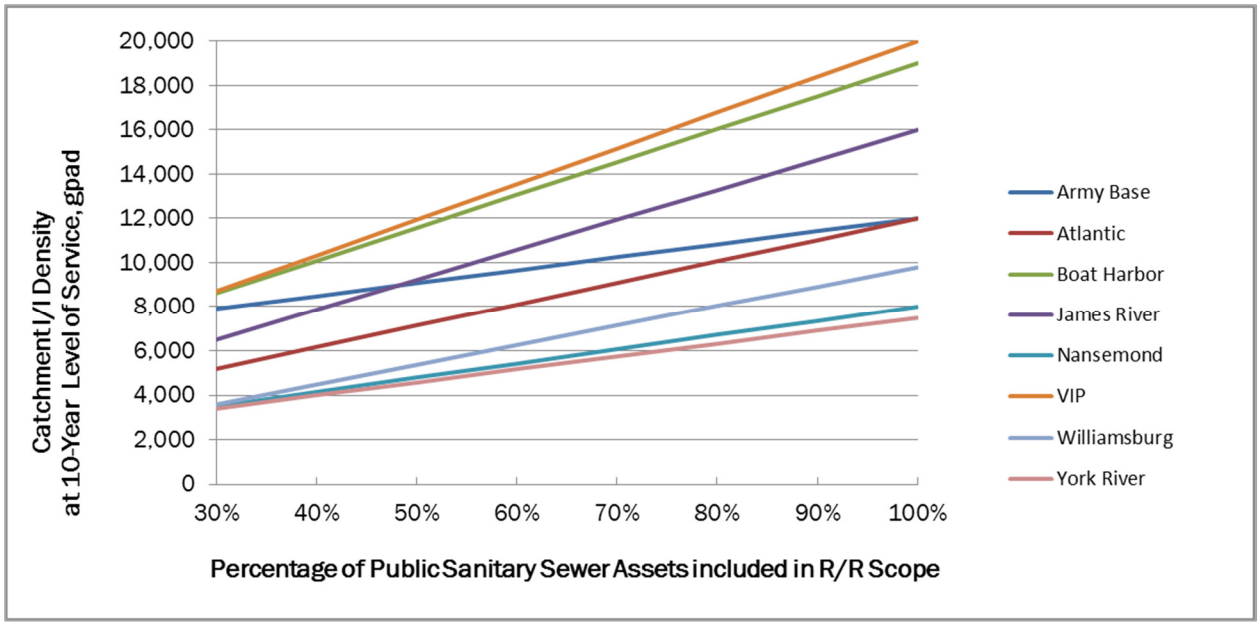


Figure 1-4. Approach for Determining R/R Extent for General I/I Reduction Plans

This approach assumed a minimum of 30 percent of the public system assets would be included in the R/R scope with a corresponding 21 percent I/I reduction. The percentage R/R and I/I reduction was scaled to 100 percent of the public assets and 70 percent I/I reduction as shown in Figure 1-5. These are planning level assumptions based on historical I/I reduction programs across the country and are understood to be inexact at the individual basin level but generally correct at the complete system level.

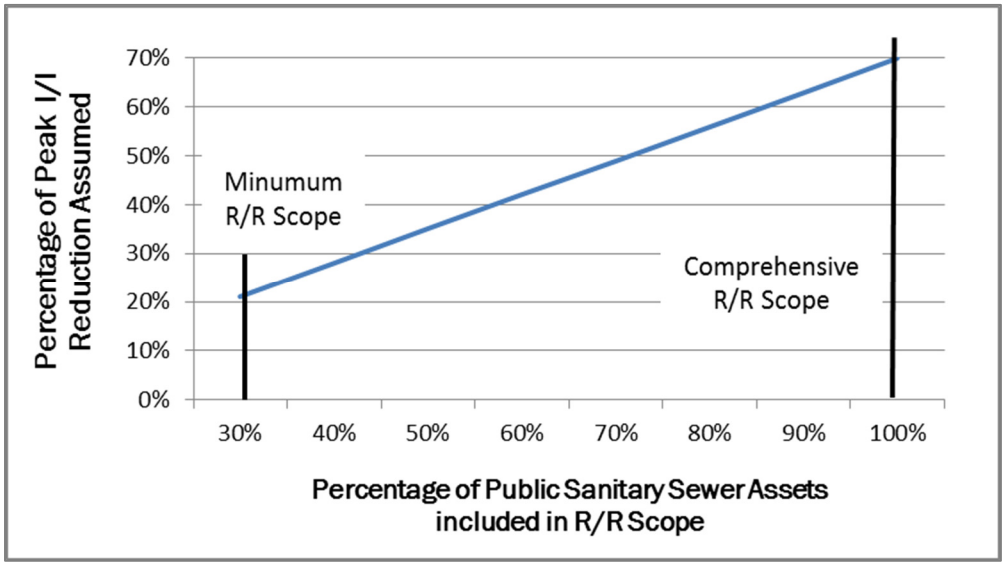


Figure 1-5. Basis of Peak I/I Reduction for General Approach Plans

Public System. The percentage of the public system planned for R/R was a function of the I/I density in gpad (basin leakiness). A minimum of 30 percent public asset R/R was assumed for basins that met the minimum I/I density for cost-effective abatement. The percent assets in the R/R scope

followed the sliding scale up to 100 percent asset R/R at comprehensive levels shown in Table 1-2. Figure 1-4 depicts the sliding scale for R/R in each TP service area. The cost estimates include funding for SSES to identify the actual rehabilitation work needed representing approximately 3.4% of the total program cost.

Private Single Family Lateral R/R. The R/R goal scope assumed an equivalent percentage of private laterals and the percentage of public R/R. For cost estimating purposes, a homeowner participation rate of 70 percent was assumed, as well as a failure rate of 25 percent of participating laterals.

Previously Rehabilitated Assets. For general scopes, previous rehabilitation efforts were not considered in the scope or cost estimate. It was assumed future SSES and pre-design activities will focus the R/R scope of work and determine whether the identified defect has been appropriately remedied.

1.6.2 Private Non-Single Family (NSF) R/R

R/R of private NSF assets was assigned independently from the scoping approaches described above. NSF R/R was only prescribed for parcels greater than one acre within basins selected for the I/I Reduction Program. For cost estimating purposes, a 70 percent participation rate (based on previous experience with the HRSD pilot programs) was assumed for included NSF parcels, with a failure rate of 70 percent of participating assets. A rehabilitation to replacement ratio of 50/50 was assumed for NSF assets.

A basin qualified for NSF R/R if either of the following was true:

- The basin was within the top 30 percent of leakiest basins (in gpad) within the TP Service Area. See Table 1-8 for threshold values by TP.
- Private NSF Equivalent Length was greater than 50 percent of assets within the basin. Judgment was used in determining whether NSF R/R was included where Private NSF Equivalent Length was between 40 percent and 50 percent of assets within the basin.

Table 1-8. I/I Density Threshold for NSF R/R

TP	NSF gpad Cutoff
Army Base	9,900
Atlantic	12,400
Boat Harbor	18,950
James River	13,700
Nansemond	7,780
VIP	19,100
Williamsburg	9,200
York River	7,800

1.7 I/I Reduction Estimate

1.7.1 Approach

This section describes the basis for the I/I reduction estimates developed to support the RWWMP. The proposed I/I reduction for each basin was proportional to the equivalent length of assets

identified in the R/R scope of work. The equivalent length approach allocated I/I to pipes and manholes using a standard unit based on the concept that asset surface area is a key indicator of the potential of I/I. Equivalent lengths of public and private sanitary sewer were developed from best available Geographic Information System (GIS) data. Estimates of sanitary sewer lengths were developed for NSF parcels based on parcel size, number of buildings and other relevant factors.

Peak I/I at the 10-year recurrence flow were allocated to public and private assets in each basin (including single-family and non-single-family) based on the respective equivalent length of each type of asset in the basin. For example, if the public equivalent length value is 75 percent of the overall equivalent length for the basin then the public peak I/I contribution was assumed to be 75 percent. Figure 1-6 presents an example of a peak I/I hydrograph broken down into public and private components.

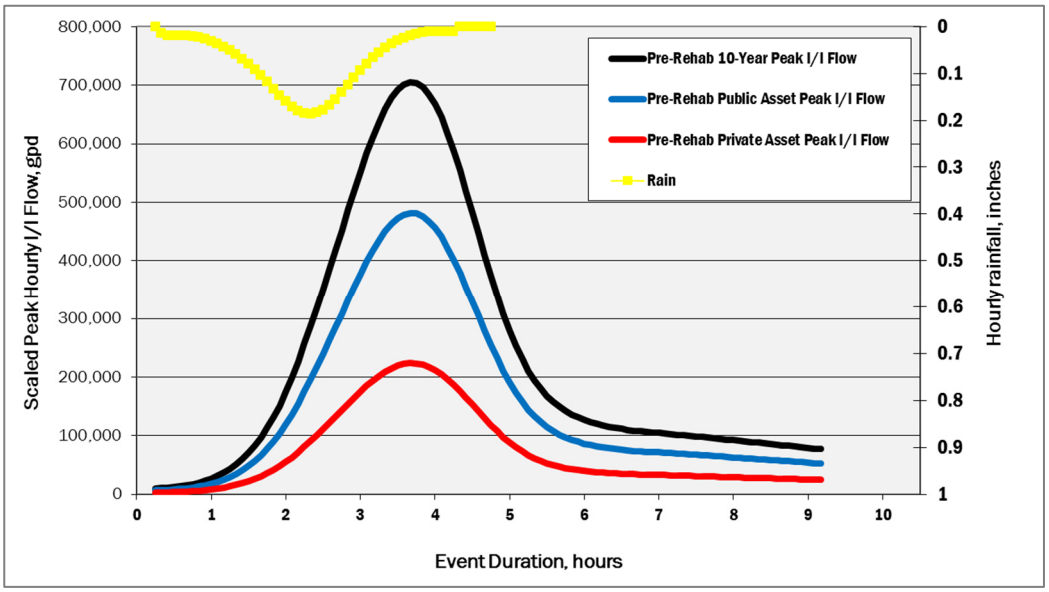


Figure 1-6. Example 10-Year Peak I/I Flow Hydrograph

An Excel tool was developed that used the existing conditions of the HRSD Regional Hydraulic Model RTK flow parameters and representative 10-year synthetic event to simulate the peak I/I flow for each basin. The tool was used to estimate the post-rehabilitation peak I/I flow reduction and associated RTK flow parameters based on either the scoped assets (in the case of data-driven scopes) or percent of planned R/R (for comprehensive and general scopes).

The tool used public/private asset allocations to decompose the R-value for the basin into respective contributions to the overall rainfall derived infiltration and inflow (RDII). Post-rehabilitation R-values were determined by reducing the decomposed pre-rehab R-values using the flow reduction estimating strategies described above. The R-values were then combined to obtain a single post-rehabilitation R-value for the basin. I/I reduction values were determined by comparing the hydrograph peak hourly flow values generated with the pre- and post-rehab flow R-values. Note that T and K flow parameters remained constant through this process.

1.7.2 Equivalent Length Assumptions

For assets lacking size and/or dimension data, the following assumptions were made to facilitate the equivalent length calculations. These assumptions were made based on system-wide averages.

- The equivalent length for public manholes was assumed to be 26.5 feet per manhole. The equivalent length was based on the assumption that a typical manhole is 4-foot diameter and a depth of 6.6 feet. The depth assumption was taken from a sampling of available Locality data. A 12-inch diameter pipe with a length of 26.5 feet would have the same surface area as a manhole with the assumed dimensions.
- Publicly owned mainline cleanouts were not included in equivalent length calculations and no peak I/I was allocated to them, as they generally are not a significant source of I/I. Therefore, no I/I reduction credit will be taken for the replacement of mainline cleanouts.
- Public lateral equivalent length calculations assumed that each parcel has a public side lateral length of 25 feet and diameter of 6 inches for single-family parcels, and 8 inches for NSF parcels.
- Private asset calculations depended on a number of factors, including parcel area and classification (i.e., single-family, multi-family, or commercial), vacancy classification, and the number of buildings on the parcel. Table 1-9 presents the assumptions used for private infrastructure equivalent length calculations. These equations were developed empirically as part of the RWWMP development.

Table 1-9. Private Infrastructure Equivalent Length Assumptions

Asset Type	Private Single Family	Private Non-Single Family < 1 Acre	Private Non-Single Family > 1 Acre
Gravity System Length, Feet	NA	Multi-Family Parcels N/A	Multi-Family Parcels Max Calculation Area = 15 acres Diameter = 8 inches Length = (126.2 x Parcel Area) + 208.9
		Commercial Parcels Diameter = 6 inches Length = (242.2 x Parcel Area) + 34.8	Commercial Parcels Max Calculation Area = 15 acres Diameter = 8 inches Length = (68.3 x Parcel Area) + 208.7
Lateral Length, Feet	Diameter = 4 inches Length = (58.1 x Parcel Area) + 19.8 Length ranges from 25 to 120 ft. Max Calculation Area = 1.7 acres	Multi-Family Parcels Diameter = 6 inches Length = 40 ft. per building located within parcel	Multi-Family Parcels Diameter = 6 inches Length = 40 ft. per building located within parcel
		Commercial Parcels N/A	Commercial Parcels Diameter = 8 inches Length = 40 ft. per building located within parcel if building count >1
Manhole Length, Feet	NA	N/A	Multi-Family Parcels Manhole Spacing = 150 ft. Manhole Depth = 5 ft. Manhole Diameter = 48 inches
Manhole Length, Feet			Commercial Parcels Manhole Spacing = 200 ft. Manhole Depth = 5 ft. Manhole Diameter = 48 inches

1.7.3 I/I Reduction Assumptions by Plan Type

The peak I/I reduction estimate was determined for each R/R plan type based on the different scoping approaches. Assumptions used to estimate the peak I/I reduction associated with the corresponding rehabilitation scope for each R/R plan type are described above in this section. Estimation of I/I reduction for private NSF assets was not unique to R/R plan type. A universal set of rules was employed across all three R/R plan types.

1.7.3.1 Comprehensive I/I Reduction

Public I/I – I/I reduction assumes that 70 percent of the I/I associated with public sewer assets in the basin would be mitigated through rehabilitation.

Private Single-Family I/I – A participation rate of 70 percent was assumed, with an I/I removal efficiency of 70 percent. Therefore, 49 percent reduction of peak I/I allocated to single family residential (SFR) laterals was estimated in comprehensive I/I Reduction Plans.

1.7.3.2 General I/I Reduction

Public I/I - For general scopes, a minimum of 30 percent public asset R/R was assumed, up to a maximum of 90 percent. If a basin exceeded 90 percent R/R based on I/I density, comprehensive rehabilitation was assumed. It was assumed that I/I reduction targets would be achieved within the assets included in the R/R scope, which would be defined through predesign investigations. The sliding scale of percent assets in the R/R scope to I/I reduction shown in Table 1-10 was used to develop post-rehabilitation peak I/I flows.

Table 1-10. I/I Reduction Based on % R/R

% R/R	Corresponding Peak I/I Flow Reduction
30%	21%
40%	28%
50%	35%
60%	42%
70%	49%
80%	56%
90%	63%

Private Single-Family I/I–The same portion of percent public R/R was applied to SFR lateral R/R. However, a realistic participation rate of 70 percent was assumed. An I/I removal efficiency of 70 percent was applied to the participating laterals, allowing for up to 49 percent reduction of peak I/I allocated to SFR laterals.

1.7.3.3 Data-Driven I/I Reduction

Public I/I –Quantification of flow reduction for R/R of specific assets was determined according to the portion of the system that has been scoped for rehabilitation. In general, rehabilitation for the basin's gravity assets consisted of those assets that were identified during the condition assessment as having qualifying defects. The percent equivalent length of assets scoped for R/R relative to the total equivalent length multiplied by an I/I removal efficiency of 70 percent was used to determine the I/I reduction.

Identified Inflow-Specific R/R – When sharp and quick responses to rainfall were depicted in the hydrograph of modeled flow, it suggests that probable causes are inflow sources. Basins with a

significant number of these defects identified had additional flow reduction applied to the fast response component of the public portion of the peak I/I hydrograph. The additional I/I reduction was equal to a 50 percent reduction of the R1 flow parameter.

Private Single-Family I/I – SFR laterals connected to scoped pipes were included in the scope, with a 70 percent participation rate applied, and a 70 percent I/I removal efficiency.

1.7.3.4 Private NSF I/I Reduction

If a basin qualified for NSF R/R, the I/I reduction was calculated utilizing a 70 percent participation rate for NSF parcels identified in the R/R scope. Table 1-11 presents the anticipated I/I reduction resulting from NSF R/R, which was applied to the peak I/I allocated to NSF parcels (based on equivalent length).

Table 1-11. NSF I/I Reduction % by Basin I/I Density

Peak I/I Density (gpad)	Rank	% Reduction
< 3000	Low	30%
> 3,000 but < 8,000	Medium	0.008x + 6 where x = Peak I/I Density (gpad)
> 8000	High	70%

Section 2
Program Basin Selections

As mentioned in the Introduction, twenty-two (22) basins were identified in the list of HPPs for the RWWMP. Upon selection of the BMcD Team for the HPIIRP by HRSD, an analysis of the assigned 19 basins was conducted including extensive flow monitoring as well as the identification and review of potential alternate basins to replace any of the original 19 basins, if needed.

2.1 RWWMP Overflow Summaries

The goal of the HPPs is to reduce the system wet weather SSO volume and this was planned to be assessed by identifying the effect of the projects on reducing the 5-year modeled SSO volume. In identifying potential alternate basins, a reasonable starting point focused on locations where the HRSD RHMs show larger wet weather SSO volumes to occur.

In 2016, baseline SSO locations and volumes were identified by HRSD using the MIKE URBAN Regional Hydraulic Model (RHM). This effort was conducted during the RWWMP development using:

- A 4-hour rain event corresponding to a 5-year peak flow event
- Infrastructure in place at the time or under construction (i.e., no future RWWMP projects were included in the model)

Figure 2-1 indicates the locations of SSOs from the RHM capacity analysis conducted by HRSD in 2016 throughout the HRSD service area for a 5-year peak flow event. Baseline modeled SSO locations and volumes were used as a basis of project impact assessment for both identifying the original 2017/2019 HPPs by HRSD and the 2024/2025 alternate I/I reduction project areas by the BMcD Team.

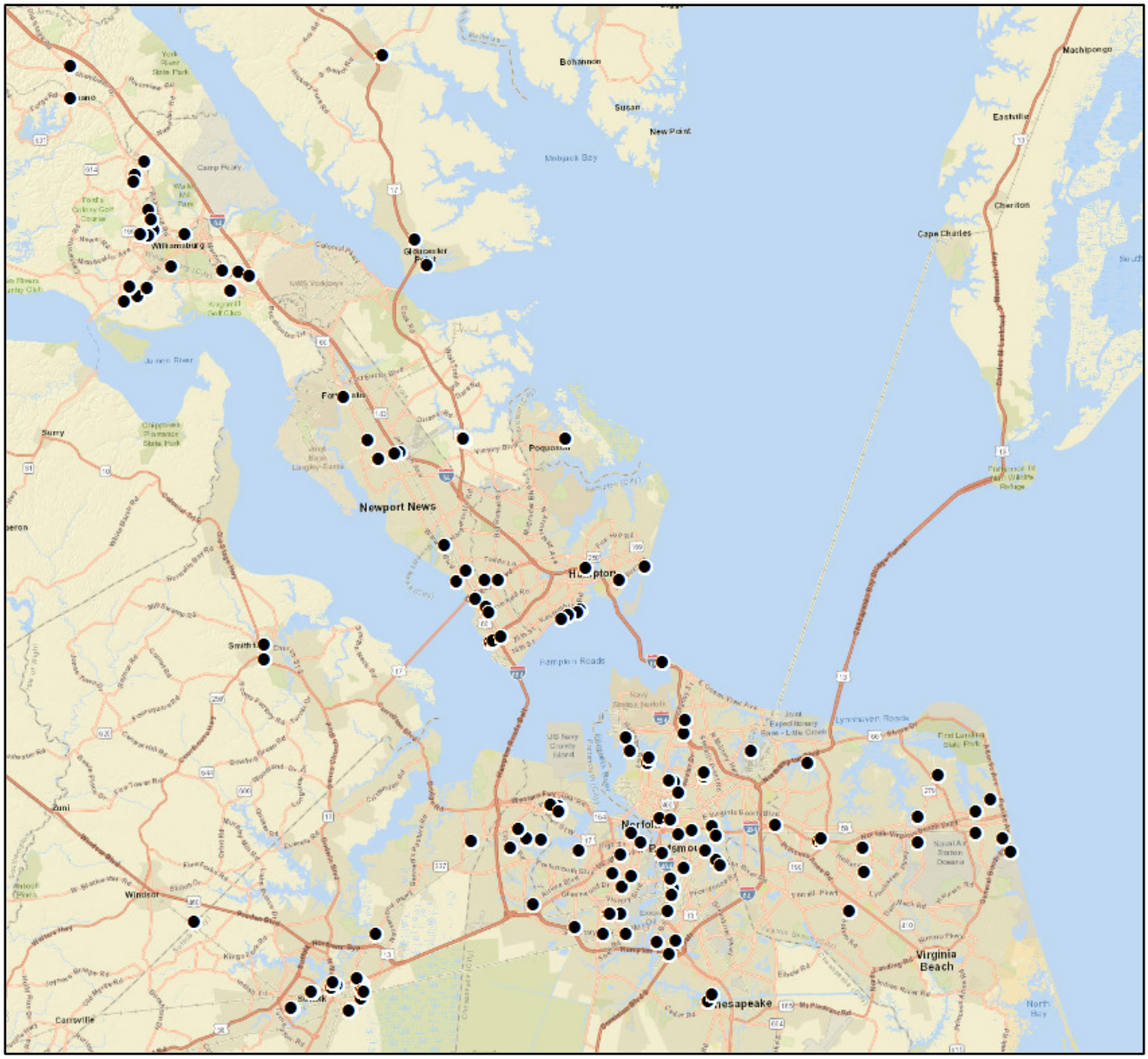


Figure 2-1. 2016 Baseline Modeled SSO Locations for 5-Year Event

2.2 High-Priority Project Test Groups

Prioritization criteria for system improvements were established during the development of the RWWMP to support an objective and rational project selection process across HRSD's service area, subsequently included in the Consent Decree. The evaluation method was consistent with EPA's 2012 integrated planning framework memo, which allowed prioritization of the projects that provide the most human health and environmental benefit first (this memo became law in 2019 under the Water Infrastructure Improvement Act).

During development of the RWWMP, capacity improvement and I/I reduction elements were grouped (Test Groups) for analysis based on infrastructure connectivity, hydraulic interactions, and potential

impact on location-critical baseline SSOs. Resulting High-Priority Project Test Groups were then analyzed through a series of simulations to estimate a total potential volume reduction against baseline overflows. Model results served as the basis of relative comparison between test groups for SSO volume reduction criteria as well as providing a correlation to baseline SSOs for location ranking. Over 100 Test Groups were evaluated independently during RWWMP development.

Beyond volume reduction, other criteria were evaluated for each Test Group to consider the proximity of the SSO to sensitive areas as well as the I/I reduction potential. These criteria were applied to screen the Test Groups for the largest beneficial environmental impact:

<table>
<tr><th colspan="4">Criteria</th><th>Weight</th></tr>
<tr><td>1</td><td colspan="3">SSO Volume Reduction (Gallons)</td><td>0.5</td></tr>
<tr><td rowspan="6">2</td><td rowspan="6">Project Location-within 1,000 ft. or within drainage area</td><td>Tier 1</td><td>Proximity to water used for public beaches</td><td rowspan="6">0.3</td></tr>
<tr><td rowspan="3">Tier 2</td><td>Proximity to public surface drinking water sources</td></tr>
<tr><td>Proximity to open shellfish grounds</td></tr>
<tr><td>Benefits “high priority” waters</td></tr>
<tr><td rowspan="2">Tier 3</td><td>Drains to bacteria impaired or bacteria TMDL watershed</td></tr>
<tr><td>Reduces I/I to treatment plants with affected shellfish grounds (AB, JR, VIP)</td></tr>
<tr><td>3</td><td colspan="3">I/I Reduction (peak gallons per day)</td><td>0.2</td></tr>
</table>

The scoring that came out of this effort drove the selection of the Round 1 and Round 2 projects identified in the EPA-approved RWWMP.

2.3 I/I Reduction Basin Statistics

The Round 1 and Round 2 RWWMP projects included 22 basins for I/I reduction, 19 of which were assigned to the HPIIRP. The remaining three basins in Portsmouth (PORT-01, PORT-02, and PORT-04) had been previously slated for investigation and rehabilitation through a separate contract. The summary statistics for the 19 original basins in the HPIIRP are listed in Table 2-1 and include the basin ID, associated treatment plant, I/I reduction plan type, the original cost estimate from 2016, the peak flow in gallons per day (GPD), the proposed I/I reduction target, the estimated I/I density measured in gallons per acre per day (GPAD), and the model-predicted SSO volume reduction. The I/I density represented in gallons per acre per day is an indicator of how leaky the basin is, with values above 5,000 generally considered possibly worthy of I/I reduction activities. Total public sewer length is provided to give scale to each basin size and was used as a component to develop the original cost estimates. The SSO Reduction is for the entire Test Group and some of the basins are in the same Test Group (e.g., CHES-032, 047, 067, and 111).

Table 2-1. Statistics for 19 Original Basins per RWWMP Included in the HPIIRP (2016 Data)												
No.	Rehab Area Reference ID	Locality	Service Area	I/I Reduction Plan Type	I/I Reduction Plan Cost Estimate*	Pre-Rehab Peak I/I, 10-yr MGD	I/I Reduction Plan Removal Target, %	Target Post-Rehab, 10-yr Peak MGD	Pre-Rehab I/I Density (GPAD)	HPP Test Group ID	SSO Reduction	Total Public Sewer, Ft
1	CHES-016	CHES	NA	Comprehensive	$15.40	5.71	56%	3.21	20,384	NA-08	450,883	30,358
2	CHES-018	CHES	NA	Comprehensive	$18.06	3.00	59%	1.76	9,107	NA-08	450,883	40,862
3	CHES-026	CHES	NA	Comprehensive	$4.41	1.56	60%	0.93	31,337	NA-04	223,704	7,591
4	CHES-032	CHES	AT	General	$3.45	0.90	28%	0.25	6,001	AT-02	641,048	21,123
5	CHES-047	CHES	AT	Data-Driven	$2.65	0.78	45%	0.35	7,247	AT-02	641,048	10,384
6	CHES-067	CHES	AT	Comprehensive	$12.82	6.01	62%	3.73	20,488	AT-02	641,048	30,885
7	CHES-111	CHES	AT	General	$4.74	0.96	38%	0.37	7,246	AT-02	641,048	23,039
8	CHES-227	CHES	NA	Data-Driven	$2.70	0.67	36%	0.24	5,987	NA-08	450,883	13,661
9	NEWP-WCPSA001575	NEWP	JR	General	$8.86	2.33	48%	1.13	15,957	JR-06	128,565	28,774
10	NEWP-WCPSA001600	NEWP	JR	Comprehensive	$7.74	2.53	53%	1.35	24,090	JR-06	12,565	17,781
11	NORF-H-106	NORF	VIP	General	$0.80	0.63	25%	0.16	12,757	VIP-29	188,896	4,799
12	NORF-H106-G1	NORF	VIP	General	$2.70	1.07	37%	0.39	12,879	VIP-29	188,896	11,497
13	NORF-H-113	NORF	VIP	General	$4.63	0.97	47%	0.45	15,815	VIP-21	135,658	17,489
14	NORF-H113-G1	NORF	VIP	Comprehensive	$2.54	0.78	62%	0.49	31,869	VIP-21	135,658	5,777
15	NORF-H113-G2	NORF	VIP	General	$1.71	0.66	65%	0.43	31,933	VIP-21	135,658	4,655
16	YORK-001	YORK	WB	Comprehensive	$4.24	0.62	46%	0.28	5,460	WB-13	234,795	11,592
17	YORK-003	YORK	WB	Data-Driven	$4.93	1.44	47%	0.67	5,456	WB-13	234,795	24,920
18	YORK-006	YORK	WB	Comprehensive	$16.30	3.21	64%	2.05	11,886	WB-13	234,795	38,620
19	YORK-229-2	YORK	WB	Comprehensive	$7.72	2.00	60%	1.19	13,644	WB-03	71,334	17,032
Total					**$118.69**	**35.83**		**19.43**				**360,839**

*2016 cost basis

2.4 Flow Monitoring

Flow data used for the RWWMP hydrologic calibrations were collected by the Localities and HRSD. Due to a variety of factors, many basins were not directly flow monitored. In some cases, associated parameters were used from a nearby, and assumed similar, basin to allow the development of wet weather flow parameters (RTK values) and calibration of the Locality Hydraulic Models (LHMs) and RHM. For other basins that were not directly monitored, less reliable sources like algorithms based on pump station operation, or force main flow meters that cannot capture the actual peak flows, were used to develop RTKs. However, high-quality flow data is essential for accurate hydrologic

calibrations and reliable peak flow projections, which are crucial for planning and managing SSO reduction through sewer infrastructure rehabilitation. Thus, one of the first activities performed by the BMcD Team under the HPIIRP was the installation of flow monitors and flow data analysis for the assigned 19 HPP basins. After several rain events were observed, hydrologic flow parameters were developed for each basin and the 10-year peak flow was calculated using long-term simulation modeling. A 10-year normalization was used in the original RWWMP before it was decided what level of service would be provided for the final RWWMP (e.g., 2-year, 5-year, 10-year). HRSD and the Localities both used it as a normalized scale to evaluate wet weather flow data and determine the proposed I/I reduction targets in the original RWWMP plan.

As seen in Table 2-2, many of the original 19 HPP basins assigned to the HPIIRP were found to have a current 10-year peak flow that was lower than the target value in the RWWMP. Based on this updated flow monitoring data, Basins 1, 2, 3, 4, 6, 7, 8, and 19 were eliminated from further consideration in the HPIIRP due to lack of sufficient I/I to target for removal.

Table 2-2. Comparison of Original to Updated Peak I/I 10-Year Flow and I/I Density Values

				Original RWWMP Values			Updated 2024/2025 Values	
No.	Rehab Area Reference ID	Locality	TP	Pre-Rehab Peak I/I, 10-yr (MGD)	Pre-Rehab I/I Density (GPAD)	Target Post-Rehab, 10-yr Peak (MGD)	Pre-Rehab Estimated 10-yr Peak I/I (MGD)	Pre-Rehab Estimated I/I Density (GPAD)
1	CHES-032	CHES	AT	0.90	6,100	0.65	0.46	3,000
2	CHES-047	CHES	AT	0.78	7,300	0.43	0.12	1,100
3	CHES-067	CHES	AT	6.01	20,500	2.29	1.92	8,400
4	CHES-111	CHES	AT	0.96	7,300	0.60	0.42	2,700
5	CHES-016	CHES	NA	5.71	20,400	2.50	1.98	8,100
6	CHES-018	CHES	NA	3.00	9,200	1.24	1.23	3,900
7	CHES-026	CHES	NA	1.56	31,400	0.63	0.15	4,300
8	CHES-227	CHES	NA	0.67	6,000	0.43	0.34	2,800
9	NORF-H-106*	NORF	VIP	0.63	12,800	0.47	*	*
10	NORF-H106-G1	NORF	VIP	1.07	12,900	0.68	0.56	9,000
11	NORF-H-113	NORF	VIP	0.97	15,900	0.52	0.56	9,100
12	NORF-H113-G1**	NORF	VIP	0.78	31,900	0.29	0.13**	4,500**
13	NORF-H113-G2**	NORF	VIP	0.66	32,000	0.23	0.13**	4,500**
14	NEWP-WCPSA001575	NEWP	JR	2.33	16,000	1.21	3.17	15,400
15	NEWP-WCPSA001600	NEWP	JR	2.53	24,100	1.18	2.53	16,000
16	YORK-001	YORK	WB	0.62	5,500	0.33	0.89	8,400
17	YORK-003	YORK	WB	1.44	5,500	0.77	1.96	9,700

				Original RWWMP Values			Updated 2024/2025 Values	
No.	Rehab Area Reference ID	Locality	TP	Pre-Rehab Peak I/I, 10-yr (MGD)	Pre-Rehab I/I Density (GPAD)	Target Post-Rehab, 10-yr Peak (MGD)	Pre-Rehab Estimated 10-yr Peak I/I (MGD)	Pre-Rehab Estimated I/I Density (GPAD)
18	YORK-006	YORK	WB	3.21	11,900	1.16	1.28	4,500
19	YORK-229-2	YORK	WB	2.00	13,700	0.81	0.16	1,200

* NORF-H-106 is the area containing the Norfolk Zoo. Flow monitoring since November 2024 has not revealed high flows during wet weather events

** NORF-H-113-G1 and NORF-H-113-G2 were monitored together in 2024/25. Given the approximate similar size of each area, peak flows were split 50/50 and densities were the same.

Color codes
Estimated lower than RWWMP Target Post-Rehab
Estimated between RWWMP Pre-Rehab and Post-Rehab
Estimated larger than RWWMP Target Post-Rehab

2.5 SSO and Model Data

In addition to those HPP basins identified above with lower-than-expected peak flows based on flow monitoring data, several basins were also eliminated based on new information collected since the RWWMP development related to other HRSD and Locality capacity improvements.

The five HPP basins (numbers 9 through 13 in Table 2-2) in Norfolk are in the vicinity of the HRSD City Park and Luxembourg Avenue Pump Stations. Both facilities are being upgraded as part of HRSD's Rehabilitation Action Plan (RAP), and although the original requirements of the RAP were focused on condition issues and not capacity, the new pumps being installed at these locations are capable of pumping against higher system pressures. With these new pumps and the lower-than-anticipated flows from the recent flow monitoring, model-predicted SSOs were eliminated. Combined with the lack of reported SSOs in these areas, pursuing I/I reduction in these basins was determined not to be necessary.

Similarly, two City of Newport News pump station basins that were shown to have model-predicted SSOs in the RWWMP (numbers 14 and 15 in Table 2-2) were updated with new pump curves provided by the City. Once these new curves were added to the model, the projected SSOs were eliminated. During discussions with HRSD a concern was raised whether the I/I contribution from these basins may affect SSOs in other nearby basins, including HRSD's Morrison Pump Station. Based on the latest RHM modeling of the area, no additional SSOs were identified and pursuing I/I reduction in these Newport News basins was determined not to be necessary.

2.6 Strategy for New Alternate Basin Selection

This section outlines the overall process used by the BMcD Team for selecting new alternate basins for inclusion in the HPIIRP, including project review target criteria and basin selection methodology. This process was completed in two steps: first, identify the potential candidate project areas based

on a set of project review criteria, and then prioritize those alternate basins for potential inclusion in the HPIIRP.

2.6.1 Project Review Target Criteria

The following criteria were established to select alternate basins based on factors such as location of SSOs, existing infrastructure conditions, and potential I/I reduction impact.

Primary Project Review Target Criteria

HPP Test Groups with I/I reduction
- I/I reduction only groupings where practical
- Sort descending on total SSO reduction achieved
- Review where SSO impacts > 100,000 gal

Secondary Project Review Target Criteria

I/I Reduction Area Statistics
- Basins with larger total peak I/I MGD
- Greater leakiness - 10-yr peak flow density in gal/acre/day (gpad)
- Review SSO reduction potential (Test Group simulations)
- Consider flow parameter basis (monitored or by association)

These criteria were applied to the original I/I reduction basins to develop the candidate list of alternate basins detailed in the next section.

2.7 New Alternate Basins

Thirteen alternate basins were identified using the above criteria and are listed in Table 2-3. The table provides the Rehab Area ReferenceID, details of the rationale for basin inclusion in the final selection, the SSO reduction value from the original RWWMP Test Group modeling, and the estimated I/I rehabilitation cost. The original I/I reduction plans (and their associated costs) were developed in 2015-2016 based on nationally sourced bid tabulations. Since that time, COVID, inflation, and local construction market limitations have driven up costs significantly and the 2016 estimates were increased by a factor of approximately 2.5 based on recent 2025 bid tabulations from HRSD and others in the region for HRSD's consideration.

Table 2-3. Alternate Basins Identified for Evaluation

Rehab Area Reference ID	Details	Potential additional SSO reduction impact (gal)
CHES-089	Incremental SSO volume reduction outside of existing HPP impacts	160,000

Rehab Area Reference ID	Details	Potential additional SSO reduction impact (gal)
CHES-919-G1	A flow reduction in this area would be beneficial to sizing at the future State St PRS. It is currently scoped as a data driven rehab plan with a targeted ~2 mgd reduction in 10yr peak II. This basin was modeled, for HPP prioritization purposes, in a group with Park Ave GM and PS Improvements. Those capacity projects were included in an existing HRSD CIP. An individual SSO reduction volume is not available for the I/I reduction effort in isolation.	-
SUFF-048	For SUFF-048 only, approximately 190,000 gallons of SSO reduction not identified by any HPP. Note there is some flow rerouting in this area since the initial model assessment. May warrant further clarification. Large basin - Rehab scope may be able to be narrowed based on micro-flow monitoring results.	190,000
SUFF-146	For SUFF-146 only, approximately 90,000 gallons of SSO reduction not identified by any HPP. May need to flow monitor upstream area SUFF-063	90,000
JCSA-LSA-3-1	SSO reduction primarily impacted at the basin pump station. Peak flow reduction in this area should augment SSO reduction impacts from the future Williamsburg PRS and Storage project. This basin is currently scoped as a comprehensive rehab area with a targeted ~4mgd reduction in 10yr peak II.	300,000
JCSA-LSA-3-6	Receives flow from JCSA-LSA-3-8 but appears to be leaky on its own. Flow lifted to JCSA-LSA-3-3 which contributes to proposed Williamsburg Crossing PRS and Tank. Numerous observed SSOs.	134,000
JCSA-LSA-3-8	Flows to JCSA-LSA-3-6 and then lifted to JCSA-LSA-3-3 which contributes to proposed Williamsburg Crossing PRS and Tank. Numerous observed SSOs.	210,000
NEWP-WCPSA-001180	SSO reduction impact would largely be at the basin pump station, NEWP-PS-049. This basin is currently scoped as a data-driven plan with a targeted ~1 mgd reduction in 10yr peak II. SSO volume reduction for this basin is isolated and does not necessarily impact other capacity improvements with the James River TP area.	65,000
PORT-010	This area was identified for having one of the largest I/I densities near 16,700 gpad and a large potential SSO reduction of about 600,000 gal. There is overlap with the SSO locations impacted by Camden Ave PS Improvements, an existing HPP in Portsmouth. Camden PS upgrade outperforms the SSO reduction for the PORT-10 area. However, it could reduce the peak capacity needed at the new Camden PS	600,000
WILL-005	This area was not independently modeled for SSO reduction impacts during initial HPP assessment. However, it was part of 2015 HRSD temporary flow monitoring and has notable peak flow contributions to HRSD 229. This could be a good candidate to replace YORK-229-2 I/I reduction, if necessary. It is currently scoped as a comprehensive rehab area with a targeted ~1 mgd in 10yr peak II reduction. If model input has been significantly updated in this general area since the initial baseline capacity assessment, verifying the magnitude of the modeled SSO should occur prior to rehab efforts.	N/A
JCSA-LSA5-4	Identified by JCSA as an area with significant I/I as well as observed SSOs. The lift station was not part of the Regional Hydraulic Model so no modeled SSOs were originally identified. An I/I Reduction Plan was developed early in the RWWMP program but not included in the final RWWMP.	235,000

Rehab Area Reference ID	Details	Potential additional SSO reduction impact (gal)
JCSA-LSA6-8	Identified by JCSA as an area with significant number of observed SSOs and high I/I. No data was available on cost or SSO volume reduction impact.	N/A
CHES-104	Identified by Chesapeake as an area with high I/I. No data was available on cost or SSO volume reduction impact.	N/A

Figure 2-2 identifies the geographic locations of these identified alternate basins.

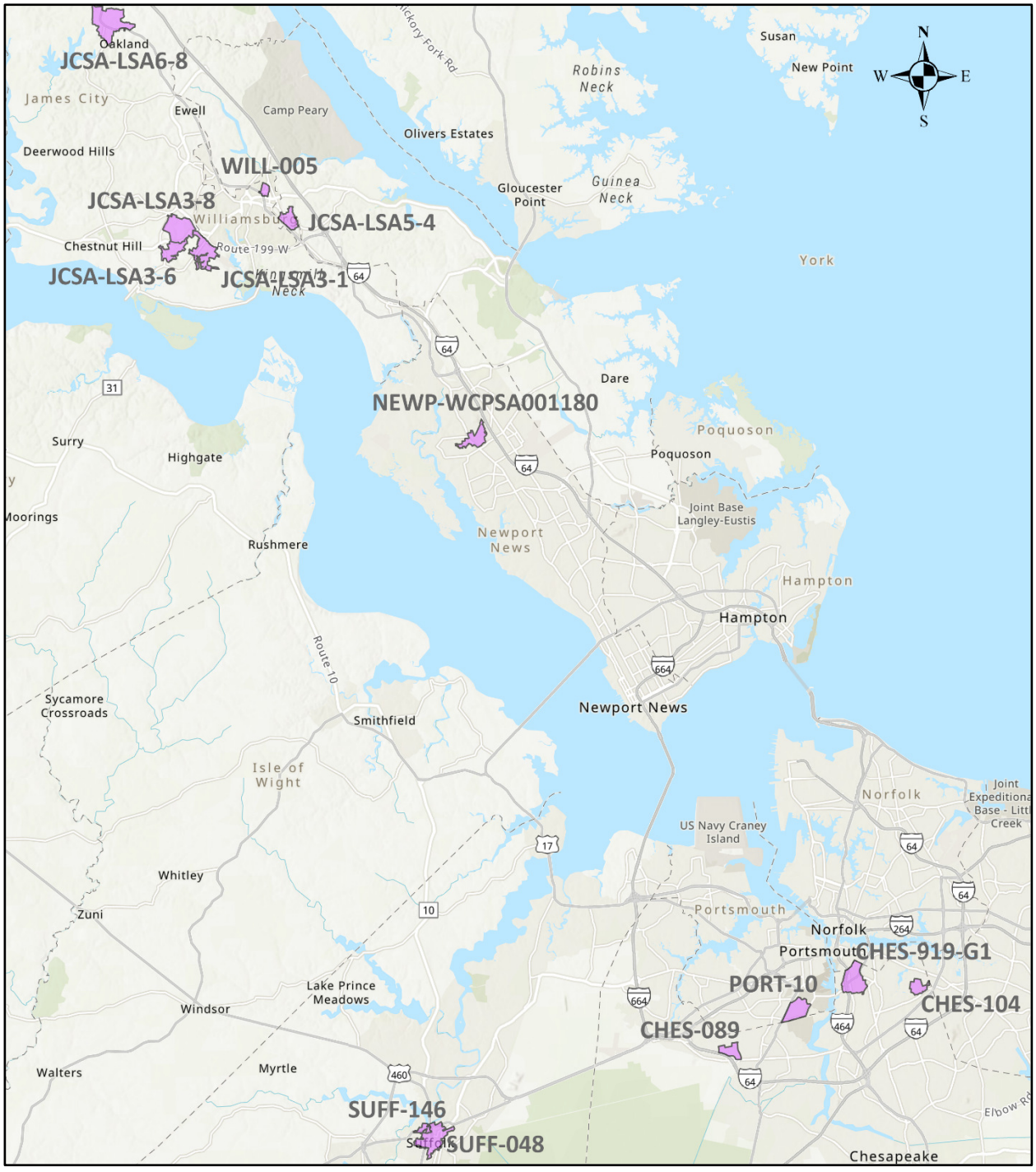


Figure 2-2. Alternate Basins for I/I Reduction

After the alternate basins were selected for further consideration, they were compared against the remaining, original HPP basins. The following criteria were developed for the remaining basins from the original 19 HPP basins and the proposed alternate basins for inclusion in the HPIIRP:

- Contributes to SSOs in the 2017 Locked (Baseline) Model – When the RWWMP was developed, each of the projects was tested to determine the estimated modeled SSO volume reduction. In some cases, these SSO volume reductions were just from the I/I reduction work, and in others, the volume reduction required both I/I reduction and capacity improvements. Based on the amount of potential modeled SSO volume reduction from the Test Groups, each of the basins was scored on a relative scale of 1 to 3, with 3 being more volume reduction.
- Contributes to Observed SSOs Since 2017 – The historical records of reported wet weather capacity-related SSOs were analyzed to determine if any had occurred since 2017 either in each basin or elsewhere as a result of I/I from the basin due to hydraulic connectivity. The number of reported/observed SSOs was used to score each basin on a relative scale of 0 to 3, with 3 being a higher number of SSOs observed.
- New Flow Data Shows High I/I – Based on recent flow monitoring (except in the case of JCSA 3-1 where historical data was used), each basin was rated on a 1 to 3 scale from less leaky to more leaky. Several basins marked as N/A did not have flow data available.
- Original HPP Project – Some consideration was given to projects that were part of the original 19 HPIIRP areas. This was a binary choice of 0 or 1 if the project was part of the original HPP group.
- No Capacity Changes to Resolve RWWMP SSOs – In some locations, new work (not related to the RWWMP projects) has been completed by either a Locality or HRSD that has reduced or eliminated the original modeled SSOs. An example would be the HRSD upgrade to City Park Pump Station, which has eliminated the modeled SSO in that area. The scoring for this was binary 0 or 1 if there was no project that has reduced the modeled SSOs in that area.
- Low Unit Cost of I/I Reduction – Using the original RWWMP projected I/I reduction targets and cost estimates (adjusted to 2025), the dollars per gallon of I/I removed was calculated for each basin. This value is only based on the cost effectiveness work completed as part of the RWWMP. Each basin was scored on a relative scale from 0 to 3 with 3 being lower $/gallon of I/I removal projection.
- Helps Reduce Need/Size of Other Planned Projects – Consideration was given to alternate project areas where a reduction in I/I would positively impact the need for and sizing of future planned capacity projects. An example would be the PORT-10 basin being upstream of the Camden Avenue Pump Station, which will require an upgrade as part of the HPP Group 2. Any flow reduced from PORT-10 will allow Camden Avenue Pump Station to be smaller in capacity and lower cost. A relative scale was applied to each basin from 0 to 2 with 2 being a basin that would have a significant impact.

These seven criteria were compared and ranked against each other using a pairwise comparison process as shown below in Table 2-4. These weightings were then used for the final basin scoring in our Team's prioritization process. This pairwise comparison evaluates each criteria against each of the other six criteria using a scale of 1 to 5 with 1 representing the criteria is much LESS important than the other and 5 representing much MORE important than the other. Only the yellow squares are filled out with the opposite value calculated in the other half of the table (e.g., "Contributes to Observed SSOs" scored a 5 compared to "Original HPP" meaning it is much more important and the opposite value to a 5 is a 1 meaning "Original HPP" is much less important than "Contributes to Observed SSOs").

Table 2-4. Pairwise Comparison of Selection Criteria

	Contributes to SSOs in Locked Model	Contributes to Observed SSOs	Leakiness Based on Flow Data	Original HPP	No Capacity Related Changes to Resolve RWWMP SSO	Cost Per Unit of I/I Reduction	Helps Reduce Need/Size of Other Planned Projects Capacity Needs	Rating	Ranking
Contributes to SSOs in Locked Model		2	2	5	1	2	3	15	6
Contributes to Observed SSOs	4		5	5	1	4	4	23	2
Leakiness Based on Flow Data	4	1		5	1	3	3	17	4
Original HPP	1	1	1		1	1	1	6	7
No Capacity Related Changes to Resolve RWWMP SSO	5	5	5	5		5	5	30	1
Cost Per Unit of I/I Reduction	4	2	3	5	1		3	18	3
Helps Reduce Need/Size of Other Planned Projects	3	2	3	5	1	3		17	4

The rating for each criterion from the pairwise comparison above was then applied to the scores in Table 2-5 to calculate a total Weighted Score for each basin and to prioritize the alternate basins for inclusion in the HPIIRP. The fourth column of Table 2-5 characterizes the basin as either an original High Priority Project (HPP) and an Alternate (ALT) basin. The “Cumulative Cost Sum” adds all the basins costs in Weighted Score order up to that point.

Table 2-5. Basin Prioritization

Basin ID	Loc	TP	Original Basin Category	In HPIIRP	Contrib to SSOs in 2017 Locked Model	Contributes to Observed SSOs since 2017	New Flow Data Shows High I/I	Original HPP Project	No Locality Capacity Changes to Resolve RWWMP SSO	Low Unit Cost of I/I Reduction	Helps Reduce Need/Size of Other Planned Projects	Weighted Score	Public Sewer LF	2025 Adjusted Cost, $M	Cumulative Cost Sum, $M
PORT-10	PORT	VIP	ALT	Yes	3	3	3	0	1	3	2	120.0	71,758	$23.51	$23.51
JCSA-LSA3-8	JCSA	WB	ALT	Yes	2	3	3	0	1		2	97.0	54,409	$51.21	$74.72
JCSA-LSA3-1	JCSA	WB	ALT	Yes	2	2	2	0	1	1	2	89.7	62,204	$65.97	$140.69
JCSA-LSA5-4	JCSA	WB	ALT	Yes	2	3	2	0	1		1	82.8	35,622	$28.22	$168.91
JCSA-LSA3-6	JCSA	WB	ALT	Yes	1	2	1	0	1	1	2	79.0	24,345	$7.13	$176.04
YORK-003	YORK	WB	HPP	Yes	2		3	1	1	1	1	77.5	31,512	$11.32	$187.36
YORK-006	YORK	WB	HPP	Yes	2		2	1	1	1	1	71.8	38,620	$38.64	$226.00
CHES-016	CHES	NA	HPP	Maybe	2	1	1	1	1	2		71.3	30,358	$36.27	$262.27
SUFF-146	SUF F	NA	ALT	Maybe	1	3	1	0	1	1	0	69.7	14,295	$14.53	$276.80
SUFF-048	SUF F	NA	ALT	No	3		3	0	1	1	0	68.0	72,809	$73.50	$350.30
CHES-919-G1	CHES	VIP	ALT	No	2		N/A	0	1	3	1	66.5	66,445	$18.74	$369.04
CHES-018	CHES	NA	HPP	No	3	1	1	1	1	0	0	64.3	40,862	$42.98	$412.02
YORK-001	YORK	WB	HPP	No	2		1	1	1	0	1	60.2	11,592	$10.32	$422.34
CHES-067	CHES	AT	HPP	No	3		2	1	0	3	1	58.8	30,885	$30.64	$452.98

Table 2-5. Basin Prioritization

Basin ID	Loc	TP	Original Basin Category	In HPIIRP	Contrib to SSOs in 2017 Locked Model	Contributes to Observed SSOs since 2017	New Flow Data Shows High I/I	Original HPP Project	No Locality Capacity Changes to Resolve RWWMP SSO	Low Unit Cost of I/I Reduction	Helps Reduce Need/Size of Other Planned Projects	Weighted Score	Public Sewer LF	2025 Adjusted Cost, $M	Cumulative Cost Sum, $M
CHES-089	CHES	NA	ALT	No	1		1	0	1	1	1	55.2	8,828	$13.47	$466.45
JCSA-LSA6-8	JCSA	WB	ALT	No		3	N/A	0	1	0	0	53.0	Small	N/A	$466.45
NEWP-WCPSA001180	NEWP	JT	ALT	No	1		N/A	0	1	2	0	47.0	19,906	$11.60	$478.05
WILL-H-229	WILL	WB	ALT	No	1		2	0	1	0	0	46.3	67,729	N/A	$478.05
NEWP-WCPSA001600	NEWP	JR	HPP	No	1	1	2	1	0	2	0	42.0	17,781	$18.66	$496.71
NEWP-WCPSA001575	NEWP	JR	HPP	No	1	1	3	1	0	1	0	41.7	28,774	$20.16	$516.87
CHES-104	CHES	AT	ALT	No		1	N/A	0	1	0	0	37.7		N/A	$516.87
NORF-H-113	NORF	VIP	HPP	No	1		1	1	0	2	0	28.7	17,489	$5.97	$522.84
NORF-H106-G1	NORF	VIP	HPP	No	1		1	1	0	1	0	22.7	11,497	$6.04	$528.88

The seven top-ranked basins identified for inclusion in the HPIIRP have a total I/I reduction budget of approximately $226 M. It should be noted that these conceptual-level budgetary costs are based on the original RWWMP approach to developing the basin specific I/I Reduction Plans, including rehabilitation or replacement of both public and private sewer assets. No changes to the scope of assets included in the I/I Reduction Plans and the I/I reduction targets from the RWWMP (based on updated flow monitoring data) have been made, except for refinement of the JCSA-LSA3-8 plan based on collected sanitary sewer evaluation data. Because this document was completed prior to the detailed cost-effectiveness analysis planned as part of the HPIIRP, there will likely be changes proposed from the original R/R scope using updated flow and SSES data which could reduce (or increase) the assets planned for R/R.

Using the original assumptions built into the 2017 RWWMP and updating the costs to reflect 2025 basis, the following Table 2-6 provides the basins level costs.

Table 2-6. I/I Reduction Plan Costs – RWWMP R/R Assumptions, 2025 Costs

Rehab Area Reference ID	Investigation Subtotal Cost, $M	Asset Rehab Cost, $M	Pavement Restoration, $M	Construction Management & Inspection, $M	Engineering $M	Contingency $M	Total I/I Reduction Plan Cost Estimate, $M
PORT-10	$0.89	$13.90	$0.92	$1.33	$2.53	$3.93	423.51
JCSA-LSA3-8	$1.08	$30.11	$3.15	$2.99	$5.29	$8.59	$51.21
JCSA-LSA3-1	$1.52	$38.76	$3.68	$3.82	$7.19	$10.99	$65.97
JCSA-LSA3-6	$0.32	$4.24	$0.23	$0.40	$0.75	$1.20	$7.13
JCSA-LSA5-4	$0.35	$16.43	$2.16	$1.67	$2.86	$4.74	$28.22
YORK-003	$0.40	$6.75	$0.45	$0.65	$1.18	$1.90	$11.32
YORK-006	$0.85	$22.71	$2.34	$2.25	$4.00	$6.48	$38.64
Subtotal	**$5.42**	**$132.91**	**$12.93**	**$13.13**	**$23.81**	**$37.82**	**$226.01**
Additional Basins (held in reserve)							
CHES-016	$1.02	$21.05	$1.99	$2.07	$4.12	$6.02	$36.27
SUFF-146	$0.29	$8.66	$0.75	$0.85	$1.55	$2.43	$14.53
Subtotal	**$1.31**	**$29.71**	**$2.75**	**$2.92**	**$5.67**	**$8.44**	**$50.80**
Total	**$6.73**	**$162.62**	**$15.68**	**$16.05**	**$29.47**	**$46.26**	**$276.81**

The original assumptions used for development of the I/I Reduction Plans were evaluated by the BMcD Team and it was determined that there is likely conservatism built in that warrants revision. Table 2-7 below identifies changes recommended for cost development in the selected basins shown in bold.

Table 2-7. Criteria for I/I Reduction Plan Types				
Criteria	**2017 Comprehensive Approach**	**2017 Data-Driven Approach**	**2025 Comprehensive Approach**	**2025 Data-Driven Approach**
Assumed Replacement to Rehabilitation Ratio used for Budgetary Cost Estimate For Mainlines and MHs	70/30 Replacement/ Rehabilitation	50/50 Replacement/Rehabilitation	**25/75** Replacement/ Rehabilitation	**25/75** Replacement/Rehabilitation
Assumed Replacement to Rehabilitation Ratio used for Budgetary Cost Estimate For Public Lateral	70/30 Replacement/ Rehabilitation	50/50 Replacement/Rehabilitation	**40/60** Replacement/ Rehabilitation	**40/60** Replacement/Rehabilitation
Single Family Private R/R [1]	Target 100%	SF laterals included in scope based on known defects or when connected to scoped public pipe	**None**	**None**

[1] *For cost estimate, an assumption of 70% participation rate and 25% failure rate was applied to the targeted % of assets.*

After applying the revised assumptions shown in Table 2-7 and updating the costs for top nine basins to reflect 2025 basis, the following Table 2-8 provides the basins level costs.

Table 2-8. I/I Reduction Plan Costs – Revised R/R Assumptions, 2025 Costs							
Rehab Area Reference ID	**Investigation Subtotal Cost[1], $M**	**Asset Rehab Cost, $M**	**Pavement Restoration $M**	**Construction Management & Inspection, $M**	**Engineering $M**	**Contingency $M**	**Total I/I Reduction Plan Cost Estimate, $M**
PORT-10	$0.10	$10.89	$0.50	$1.02	$1.83	$2.87	$17.21
JCSA-LSA3-8	$0.00	$18.99	$1.19	$1.82	$3.03	$5.05	$30.07
JCSA-LSA3-1	$0.41	$26.12	$1.54	$2.49	$4.68	$7.02	$42.26
JCSA-LSA3-6	$0.00	$3.16	$0.11	$0.29	$0.49	$0.82	$4.88
JCSA-LSA5-4	$0.00	$10.01	$0.79	$0.97	$1.62	$2.70	$16.09
YORK-003	$0.00	$5.29	$0.23	$0.50	$0.83	$1.38	$8.22
YORK-006	$0.00	$14.67	$0.86	$1.40	$2.33	$3.88	$23.13
Subtotal	**$0.52**	**$89.13**	**$5.21**	**$8.49**	**$14.80**	**$23.71**	**$141.86**
Additional Basins (held in reserve)							
CHES-016	$0.48	$14.91	$0.82	$1.42	$2.87	$4.06	$24.56
SUFF-146	$0.08	$5.72	$0.35	$0.55	$1.00	$1.54	$9.22
Subtotal	**$0.56**	**$20.63**	**$1.17**	**$1.96**	**$3.86**	**$5.59**	**$33.79**
Total	**$1.08**	**$109.76**	**$6.38**	**$10.45**	**$18.66**	**$29.31**	**$175.64**

[1] **Due to ongoing SSES efforts within public assets as part of the HPIIRP, additional investigation costs are included for NSF only**

The remainder of the costs presented in this document reflect the 2025 costs using the revised assumptions shown in Table 2-8.

The seven top basins with the highest priority ranking are proposed for inclusion in the HPIIRP (highlighted in blue in Table 2-6 below). Four of the seven basins are in JCSA, which is an area of high growth in HRSD's service area with many documented capacity-related SSOs. Pending results of the BMcD Team's cost-effective analyses, sewer rehabilitation projects within these prioritized basins will proceed through design and construction to the extent this work remains to be cost-effective relative to the cost of alternative capacity improvements.

The two yellow highlighted basins are proposed for further evaluation and held in reserve as potential substitute or supplemental projects if any of the top seven projects are determined less desirable during the cost-effective analysis, preliminary design, or detailed design phases of the HPIIRP. SSES activities are currently being completed in all nine basins.

Table 2-9. Prioritized Basins Proposed for Further Evaluation

Rehab Area ReferenceID	HPP/ALT	Plan Type	Public Gravity Length, FT	Public Lateral Length, FT	Public MHs	Public Mainline Cleanouts	Private SF Lateral Length, FT	Private NSF Gravity Length, FT	Private NSF Lateral Length, FT	Private NSF MHs
PORT-10	ALT	Data-Driven	71,758	36,625	257	43	37,366	14,744	760	25
JCSA-LSA3-8	ALT	Comprehensive	54,409	14,900	307	3	29,995	7,333	960	41
JCSA-LSA3-1	ALT	Comprehensive	62,204	17,275	362	5	28,377	23,530	6,560	125
JCSA-LSA5-4	ALT	Comprehensive	35,622	4,150	143	0	4,742	8,259	1,840	37
JCSA-LSA3-6	ALT	Data-Driven	24,345	9,025	124	0	19,048	1,131	80	6
YORK-003*	HPP	Data-Driven	31,512	9,575	136	0	15,354	6,110	640	37
YORK-006*	HPP	Comprehensive	38,620	17,175	211	0	25,241	0	0	0
CHES-016*	HPP	Comprehensive	30,358	12,975	119	34	14,711	19,815	14,040	90
SUFF-146	ALT	Comprehensive	14,295	4,325	71	6	4,971	4,733	200	21

**Original HPP Basin*

The BMcD Team will continue to evaluate historical Locality SSO data in an effort to identify additional alternate project areas for HRSD's consideration to be added to the HPIIRP and held in reserve as supplemental project areas. These additional alternate basins will be considered and prioritized based on review of SSO data and the proximity of SSOs relative to each alternate basin with significant I/I. Alternate project areas held in reserve will only be advanced through design and construction if HPIIRP budget is forecast to remain and HRSD approves. This may lead to reprioritizing the current list of basins in the future based on cost-effective analyses results. Further RHM refinements and additional flow monitoring data would be useful to validate the basin selection list and further improve HRSD's understanding of the baseline SSO volume and reduction opportunities.

Several of the top priority basins are in close proximity to others and the BMcD Team is considering the benefit of bundling these project areas during the cost-effective evaluations and design phase to

optimize the impact of this work on SSO reduction. For example, JCSA-LSA3-8 is a lift station basin that discharges into the gravity collection system of JCSA-LSA3-6 which in turn is lifted into JCSA-LSA3-3. Another basin on the list, JCSA-LSA3-1 discharges near the discharge point for JCSA-LSA3-3. By evaluating these basins together, there may be an opportunity to balance I/I reduction efforts and achieve the SSO reduction goals more cost effectively.

Section 3

I/I Reduction Plan Revisions

At the beginning of work on the HPIIRP, the intention for the Comprehensive I/I Reduction Plan was to collect SSES data within each of the basins assigned a 'General' R/R approach in the 2017 RWWMP and reclassify them as either Comprehensive or Data-Driven basins; thus allowing more data-driven costs and I/I reduction targets to be developed. Costs for all basins would also be adjusted from 2017 to 2025 dollars.

As discussed in Section 2, the HPIIRP flow monitoring and analysis of rain events indicated a lack of significant I/I response in many of the 19 basins. After establishing the revised set of prioritized basins, only one of the seven (JCSA-LSA3-8) was a 'General' basin in the RWWMP that required collection of additional SSES for development of this Comprehensive I/I Reduction Plan. Updates to the planning level I/I reduction rehabilitation approach for this basin are discussed in this section.

Table 3-1 presents the action taken during the development of this Comprehensive I/I Reduction Program Plan for the original HPP basins and the alternate basins identified. Statistics from I/I Reduction Plans are intended for planning purposes only and will be superseded by a refined, pre-design cost-effective analyses and preliminary engineering efforts.

Table 3-1. High-Priority I/I Reduction Basins and Alternate Candidates

Area ID	Locality	TP	RWWMP Plan Type	Category	HPIIRP Inclusion	Planning Action
CHES-016	CHES	NA	Comprehensive	HPP	Maybe	Update planning level costs
CHES-018	CHES	NA	Comprehensive	HPP	No	None
CHES-067	CHES	AT	Comprehensive	HPP	No	None
CHES-089	CHES	NA	Comprehensive	ALT	No	None
CHES-104	CHES	AT	N/A	ALT	No	None
CHES-919-G1	CHES	VIP	Data-Driven	ALT	No	None
JCSA-LSA3-1	JCSA	WB	Comprehensive	ALT	Yes	Update planning level costs
JCSA-LSA3-6	JCSA	WB	Data-Driven	ALT	Yes	Update planning level costs
JCSA-LSA3-8	JCSA	WB	General	ALT	Yes	Apply recently collected field information to rescope I/I reduction effort to a more informed Plan Type; Update planning level cost estimates
JCSA-LSA5-4	JCSA	WB	Comprehensive	ALT	Yes	Update planning level costs
JCSA-LSA6-8	JCSA	WB	N/A	ALT	No	None
NEWP-WCPSA001180	NEWP	JT	Data-Driven	ALT	No	None
NEWP-WCPSA001575	NEWP	JR	General	HPP	No	None
NEWP-WCPSA001600	NEWP	JR	Comprehensive	HPP	No	None
NORF-H106-G1	NORF	VIP	General	HPP	No	None

Table 3-1. High-Priority I/I Reduction Basins and Alternate Candidates						
Area ID	Locality	TP	RWWMP Plan Type	Category	HPIIRP Inclusion	Planning Action
NORF-H-113	NORF	VIP	General	HPP	No	None
PORT-10	PORT	VIP	Data-Driven	ALT	Yes	Update planning level costs
SUFF-048	SUFF	NA	Comprehensive	ALT	No	None
SUFF-146	SUFF	NA	Comprehensive	ALT	Maybe	Update planning level costs
WILL-H-229	WILL	WB	N/A	ALT	No	None
YORK-001	YORK	WB	Comprehensive	HPP	No	None
YORK-003	YORK	WB	Data-Driven	HPP	Yes	Update planning level costs
YORK-006	YORK	WB	Comprehensive	HPP	Yes	Update planning level costs

3.1 Flow Monitoring and Model Parameters

Temporary wastewater flow meters were installed within Locality sewer systems beginning in November 2024 to collect information for HPIIRP identified areas. Flow data from these temporary meters were used to develop updated wet weather flow parameters for the monitored Locality service areas.

Analysis of JCSA-LSA3-8 data included a rain event evaluation period from November 2024 through May 2025. Tables 3-2 and 3-3 outline the revised RTK parameters developed for JCSA-LSA3-8-001 and JCSA-LSA3-8-002. Graphic representation of these values is provided in Figures 3-1 and 3-2.

Table 3-2. JCSA-LSA3-8-001 Pre-Rehabilitation Hydrologic Parameters			
	R	T, Hours	K
Triangle 1	0.005	1.2	4
Triangle 2	0.01	2	6
Triangle 3	0.015	6	12

Table 3-3. JCSA-LSA3-8-002 Pre-Rehabilitation Hydrologic Parameters			
	R	T, Hours	K
Triangle 1	0.002	2	4
Triangle 2	0.045	1.5	6
Triangle 3	0.06	4	12

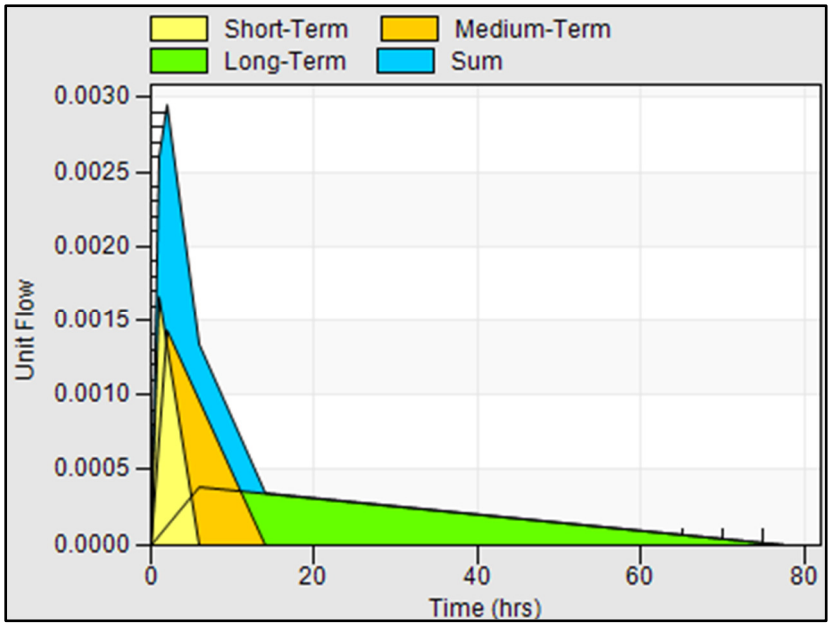


Figure 3-1. RDII Hydrograph, JCSA-LSA3-8-001

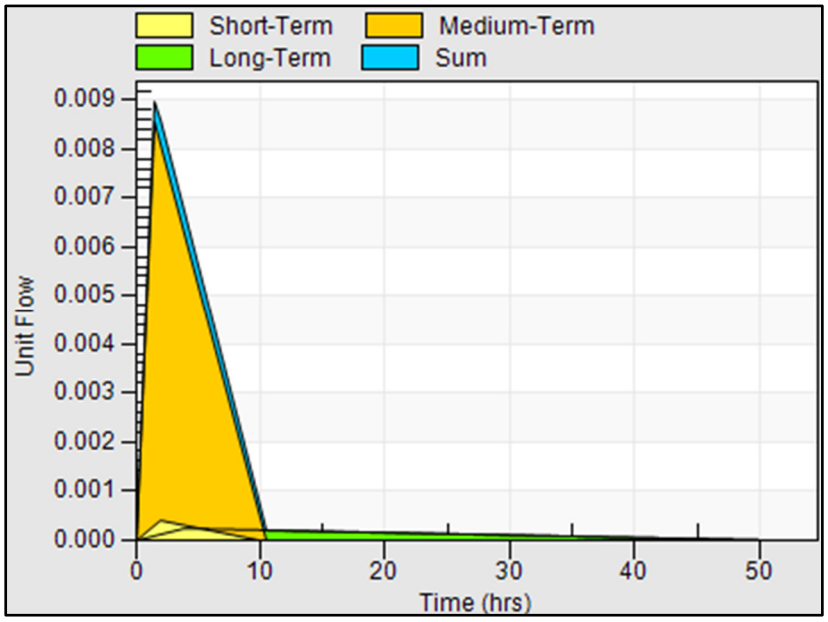


Figure 3-2. RDII Hydrograph, JCSA-LSA3-8-002

3.1.1 Development of Target Peak Flows

The hydrologic model is based on flow parameters developed at the basin level. Target peak hourly flows with 2-, 5-, and 10-year recurrence were determined by performing long-term hydrologic simulations using more than 60 years of hourly rainfall data from Norfolk International Airport. The historical rainfall record was applied to simulate years of hourly flows in the hydrologic model including base sanitary, rainfall dependent inflow and infiltration, and time varying groundwater.

A statistical analysis was then conducted using a Log Pearson Type III approach to identify peak flows. The outcome of the long-term hydrologic simulations was determination of the target peak flow for the 2-, 5-, and 10-year recurrence.

Figure 3-3 and Table 3-4 outline the results of the long-term statistical analysis for JCSA-LSA3-8.

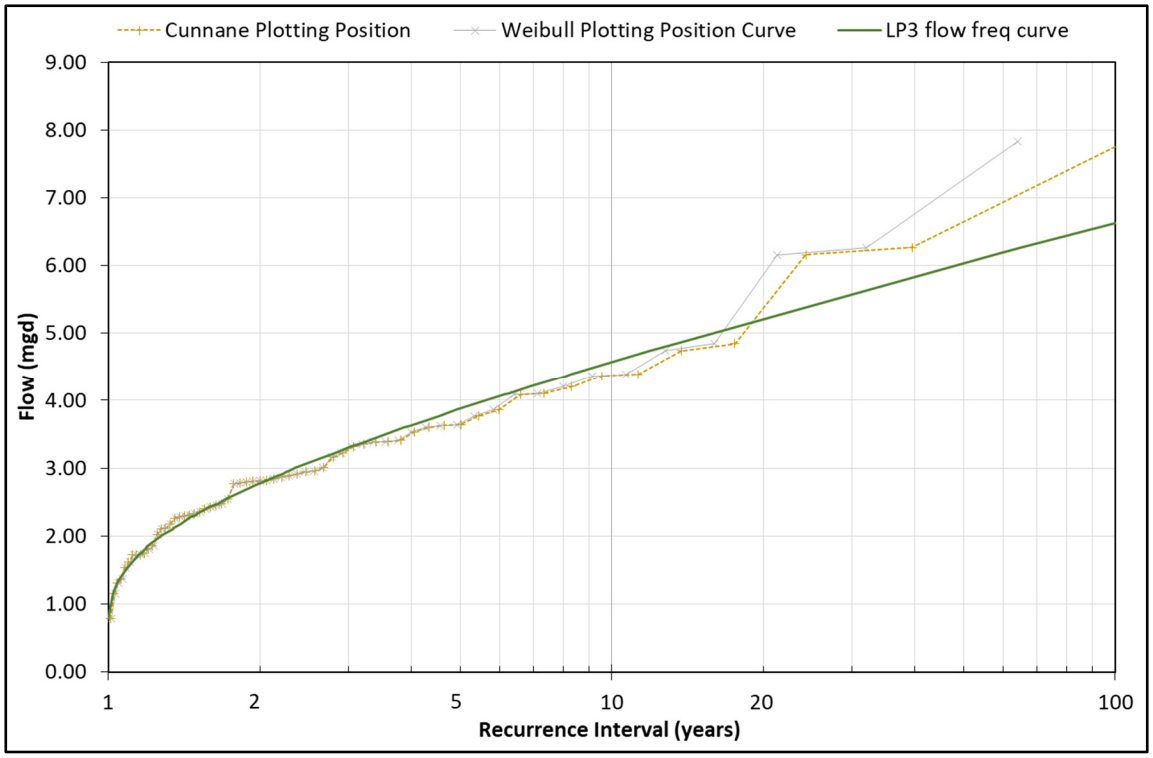


Figure 3-3. JCSA-LSA3-8 Peak Hourly Flow Recurrence Interval

Table 3-4. JCSA-LSA3-8 Total Basin Peak Hourly Flow

Return Period, Years	Peak Hourly Flow, mgd
2	2.77
5	3.87
10	4.57

3.1.2 Basin Flow Characteristics

Table 3-5 depicts the basin hydrologic characteristics as derived from 2025 flow monitoring data collected at meter locations within basin JCSA-LSA3-8. The 10-year peak flow was derived from hydrographs generated by applying the RTK hydrologic parameters to a 4-hour design storm event, considered representative of a rain event that would induce regional 10-year flow conditions. Long term statistical simulations were then analyzed to compare 10-year Log Pearson III (LPIII) return flows to the peak flows resulting from the design event to obtain a scaling factor. This scaling factor was then used to modify the design event hydrograph to present the pre-rehabilitation 10-year flow conditions.

Table 3-5. JCSA-LSA3-8 Total Basin Pre-Rehabilitation Sewer Flow Characteristics	
Associated Treatment Plant	WB
Sewered Area, Acres	442.6
Flow Monitored or Associated Parameters	Flow Monitored
Base Sewer Flow, GPD	81,800
Dry Weather Infiltration (DWI), GPD	29,700
10-Year Peak I/I, GPD	4,567,000
10-Year Peak Flow, GPD	4,678,500
I/I Density, GPAD	10,319

3.2 SSES Investigation

SSES investigations and analysis are in progress within each of the nine HPIIRP targeted basins as of the date of this Plan. Collected field data will be utilized for future cost-effective analyses and updates to each basin's rehabilitation scope of work and will inform future design efforts. Condition assessment summaries and re-evaluated R/R identification will be addressed in further detail in the Preliminary I/I Reduction Plan documentation for each HPIIRP basin.

Internal sewer and manhole inspections were conducted between March and May 2025 throughout public assets for JSCA-LSA3-8. Detailed defect information from recent condition assessment for this service area will be used to perform a cost-effective analysis and the results incorporated into a refined rehabilitation scope, which will be documented in a Preliminary I/I Reduction Plan for this basin. For planning purposes and the development of this Comprehensive I/I Reduction Plan, JCSA-LSA3-8 met GPAD threshold requirements for a Comprehensive R/R approach. Asset R/R quantities, I/I removal targets, and cost assumptions are based on an approach that includes addressing all public assets.

3.3 Updated Rehabilitation Plan, JCSA-LSA3-8

The Comprehensive Scoping Approach has been applied for JCSA-LSA3-8 due to the relative density of I/I within the area (as expressed in gallons per acre per day). The comprehensive approach estimates funding to address all public assets in the R/R scope and establishes a target I/I reduction of 70% of the public portion of existing peak I/I. No costs for R/R associated with private Non-Single Family assets (NSF) were included in the cost estimate for this basin.

Table 3-6 presents the R/R planning estimates that were derived using the Comprehensive Scoping Approach for JCSA-LSA3-8. These numbers are inclusive of 2025 assumption revisions for asset repair to replacement ratios.

Table 3-6. JCSA-LSA3-8 Post-Rehabilitation I/I Reduction Estimate and Cost-Effectiveness				
	Public Sewer System R/R	Private Single Family Lateral R/R	Private Non-Single Family R/R	Total
Major Inflow Sources in R/R Scope	Yes	Unknown	Unknown	NA
Percent of System in R/R Scope	100%	0%	0%	NA

Table 3-6. JCSA-LSA3-8 Post-Rehabilitation I/I Reduction Estimate and Cost-Effectiveness				
	Public Sewer System R/R	Private Single Family Lateral R/R	Private Non-Single Family R/R	Total
Estimated Peak 10-Year I/I, GPD	3,035,901	1,166,382	364,717	4,567,000
Peak Flow Reduction Target, GPD	2,125,131	0	NA	2,125,131
Estimated Peak Flow Reduction, Percent of Peak I/I Allocated to Asset Type	70%	0%	0%	47%
Estimated Investigation, Design and Construction Costs	$30,070,900	$0	$0	$30,070,900
I/I Removal Cost-Effectiveness, $/GPD Removed	$14.15	NA	NA	$14.15

3.4 HPII Program I/I Reduction Projections

Targets for I/I reduction were identified for every basin in the 2017 RWWMP. Table 3-7 identifies these original potential I/I reduction targets for public and private sewers combined within the selected HPIIRP areas, with the exception of JCSA-LSA3-8. The remaining basins will be updated during completion of the HPIIRP cost-effectiveness analysis.

JCSA-LSA3-8 was the single remaining basin that had been initially scoped under 'General' rehab plan methodology. Flow characteristics for this one basin were estimated utilizing flow monitoring data collected by the BMcD Team and HRSD's updated 2025 model in order to determine a more informed I/I reduction plan type for the JCSA-LSA3-8 basin. Hydrologic characteristics for all remaining plan areas were based on the Flow Parameter Database and RHM available during development of the RWWMP. Updated flow monitoring is currently being collected by the BMcD Team and will be applied to refine I/I reduction targets as part of developing Preliminary I/I Reduction Plans.

Table 3-7. HPIIRP Regional I/I Reduction Program Area List						
I/I Reduction Plan Area ID	I/I Reduction Plan Type	TP	Pre-Rehab 10-yr Peak I/I, MGD	I/I Reduction Removal Target, %	I/I Reduction Removal Target, MGD	Target Post-Rehab, 10-yr Peak I/I, MGD
PORT-10	Data-Driven	VIP	6.937	33%	2.316	4.621
JCSA-LSA3-8	Comprehensive	WB	4.567	47%	2.125	2.442
JCSA-LSA3-1	Comprehensive	WB	6.595	51%	3.334	3.261
JCSA-LSA3-6	Data-Driven	WB	1.791	15%	0.272	1.518
JCSA-LSA5-4	Comprehensive	WB	1.333	51%	0.685	0.649
YORK-003	Data-Driven	WB	1.443	50%	0.589	0.854
YORK-006	Comprehensive	WB	3.208	33%	1.592	1.617
		Subtotal	**25.874**	**42%**	**10.913**	**14.961**
Additional Basins (held in reserve)						
CHES-016	Comprehensive	NA	5.712	49%	2.787	2.925
SUFF-146	Comprehensive	NA	1.378	53%	0.724	0.654
		Subtotal	**7.090**	**50%**	**3.512**	**3.578**

Table 3-7. HPIIRP Regional I/I Reduction Program Area List						
I/I Reduction Plan Area ID	I/I Reduction Plan Type	TP	Pre-Rehab 10-yr Peak I/I, MGD	I/I Reduction Removal Target, %	I/I Reduction Removal Target, MGD	Target Post-Rehab, 10-yr Peak I/I, MGD
		Total	32.964	44%	14.424	18.540

Section 4
RWWMP Capacity Improvement Cost Estimate

4.1 Methodology

Cost estimation was performed at a planning level representing concept study/feasibility level work. Primary cost development categories for capacity improvements are as follows:

- Storage Facilities were estimated based on a price per million gallons of storage.
- Pumping systems were estimated based on a unit cost per horsepower of installed maximum capacity.
- Regional Capacity Conveyance Improvements - For capacity-related projects on HRSD regional force main and gravity main pipelines, a cost model was developed based on construction unit prices from local bid tabulations for regional projects. The use of unit prices required assumptions on the means and methods to address various construction conditions as well as asset physical characteristic data such as pipe size, length, depth, number of assets, etc.
- Locality Capacity Conveyance Improvements - For capacity-related projects on locality force main and gravity main pipelines, representative costs were developed based on an all-in unit price per foot of pipe.

As part of the future design process for capacity projects, HRSD will refine the scopes of individual elements and/or repackage contiguous projects. These costs are planning level estimates (AACE Class 5) only based on similar regional construction projects and actual completed costs will vary. Several of the projects are already progressed far enough into design or construction that a detailed cost estimate is available and these values were used.

Construction cost estimates were reviewed and adjusted based on a combination of Hampton Roads area project experience, bid tabs, local cost index, CCI, and comparisons to construction data from the Mid-Atlantic Region and surrounding states.

These revisions were applied to the RWWMP Capacity Projects to provide HRSD with a complete picture of the RWWMP costs. No changes were made to the list of capacity projects unless the project has already been started or known to be unnecessary (e.g., upsizing a Chesapeake force main to 10” when it has been recently found in the field to be 10”). There are a small number of Locality capacity improvements that overlap with basins that have been eliminated from the HPIIRP. The need for these projects will need to be evaluated in the Adaptive Management Plan. As part of the future design process and the Adaptive Management Plan for capacity projects, HRSD will need to refine the scopes of individual elements and/or repackage contiguous projects.

4.1.1 Pumping Systems

Pumping systems, including HRSD regional pressure-reducing stations as well as Locality and HRSD regional wastewater pump stations, were estimated based on a unit cost per horsepower of installed maximum capacity. Horsepower was calculated using the flow and head at the facility as determined by the modeling. For the purposes of this cost estimate update, no revisions to the 2017 IP/RWWMP modeled values have been incorporated.

Assumed power efficiencies are as follows:

- 45 percent for PS
- 65 percent for PRS

Cost estimates were reviewed and adjusted based on HRSD project experience. Example cost projections for pump station and PRS project types are listed in Tables 4-1 and 4-2. Land acquisition cost at $300,000 per acre was included for updated RWWMP project estimates.

Table 4-1. Example PS Construction Costs

Horsepower	2025 Cost
50	$2,042,000
100	$3,833,000
200	$7,416,000
400	$14,583,000
600	$21,749,000

Table 4-2. Example PRS Construction Costs

Horsepower	2025 Cost
100	$23,367,000
200	$28,066,000
400	$37,463,000
600	$46,861,000
800	$56,259,000

4.1.2 Storage Facilities

Storage facility costs were assigned a variable cost per gallon of storage that declines inversely to total storage capacity. These costs include storage tanks, odor control, tank cleaning appurtenances, and pipeline improvements onsite.

Land acquisition was included at $300,000 per acre with an estimated site area requirement for each project. Tables 4-3 and 4-4 outline assumptions applied to estimate property size and tank construction, respectively.

Table 4-3. Storage Site Area Requirements

Size (mg)	Conceptual Site Area (sq. ft.)
0.5	32,400
3	121,500
5	181,500
10	302,500

Table 4-4. Storage Tank Construction Cost

Size (MG)	2025 Assumed Unit Cost/MG
0.5	$3,400,000
2	$2,720,000
5	$2,040,000
10	$1,700,000

Pumping facilities associated with storage facility operations were assessed using the pump station cost methodology previously described; however, horsepower requirements for these pumps were calculated assuming a higher efficiency of 65 percent due to the focused equipment use.

Horsepower requirements for each facility are estimated based on head and typical flow rates determined through long-term simulations. Example costs of storage facilities and associated pumping costs are listed in Table 4-5 below.

A tank aesthetics premium of 25 percent is also included in the final cost estimates for storage facilities to account for potential architectural treatments and other site improvements. This premium assumption was applied to all storage facilities. Some sites will require more aesthetic treatment and some less.

Table 4-5. Example Storage Facility Construction Costs (2025)						
Size (mg)	Tank Cost	Conceptual Site Area Cost	Estimated Horsepower	Pump Cost	Aesthetics Premium	Storage Facility Subtotal Cost
1	$2,994,000	$399,000	50	$2,042,000	$1,359,000	$6,794,000
2	$5,032,000	$592,000	60	$2,400,000	$2,006,000	$10,030,000
3	$6,949,000	$785,000	110	$4,192,000	$2,982,000	$14,908,000
4	$8,744,000	$978,000	170	$6,341,000	$4,016,000	$20,079,000

4.1.3 Conveyance Improvements

4.1.3.1 HRSD Capacity Solutions

During development of the RWWMP, HRSD regional capacity projects involving force mains and gravity mains were estimated using a cost model that included construction materials, labor, equipment and all aspects of project procurement including pre-planning, design, pre-construction and construction. Additional information for assumptions and unit prices applied to the cost model can be referenced in Appendix C.

Each individual project was reviewed and assigned potential project specific construction line items including, but not limited to:

- Surveying
- Mobilization
- traffic control
- dewatering
- bypassing
- erosion/sedimentation control
- demolition
- excavation
- pipe installation
- jack and bore
- sewer connections
- line stops, valves
- pipe fittings
- appurtenance
- paving and site restoration

In certain cases, special project-specific considerations were added for:

- paralleling existing lines
- acquisition of new easements
- directional drilling
- sacrificial sheet piling
- construction involving wetlands and aerial crossings
- Inverted siphon lines were estimated separately from other gravity line project estimates. Each inverted siphon was assumed to require three parallel barrels, one for dry weather and two additional to accommodate wet weather flow. Due to specific project unknowns, a conservative unit price of $10,000/LF was applied to the replacement lengths.

4.1.3.2 LHM Capacity Solutions

Tables 4-6 through 4-8 outline unit prices used in the development of cost estimates for capacity improvements to Locality force main and gravity main infrastructure. Representative costs were applied based on a unit price per foot of pipe.

Pipe replacement costs included mobilization, traffic control, bypass pumping up to 2 mgd for pipes less than 24-inch diameter and 4 mgd for pipes greater than 24-inch, demolition, excavation, fill and compaction. Pavement restoration costs include milling and surface restoration for the length of the pipe being replaced. In the absence of specific information, two lanes were included in pavement

restoration estimates. Force main linear footage costs also included valves, bends, air vents and tees.

Table 4-6. Locality Gravity Asset Unit Construction Costs 2025

Item Description	Unit Price
Manhole Replacement	$24,000 EA (up to 10ft depth) +$1,450/VLF >10ft
Public Lateral Replacement (up to 25ft length)	$7,100 EA
Pipe Replacement Up to 10 ft. Depth, applied to pipes less than 15" Dia	$448/ft. + $35 in-dia/LF (>10" dia)
Pipe Replacement 10 – 15 ft. Depth, applied to pipes between 15 and 18" Dia	$780/ft. + $44 in-dia/LF
Pipe Replacement Depth >15 ft., applied to pipes greater than 18" Dia	$1,162/ft. + $50 in-dia/LF

Table 4-7. Locality Force Main Unit Construction Costs 2025

Diameter (inch)	Cost
4	$342
6	$464
8	$704
10	$1024
12	$1105
14	$1408

Table 4-8. Restoration Unit Construction Costs 2025

Item Description	Unit Price
Pavement Restoration	$225,000 Lane-Mile
Curb and Gutter Replacement	$65/LF
General Site Restoration	$14/LF

4.2 Updated RWWMP Capacity Project Costs

No additional costs were included for Locality gravity main capacity improvements that fell within a comprehensive I/I reduction plan project area. These elements were included in the respective I/I reduction grouping with a zero-dollar value to track the requirement for a pipe size increase.

RWWMP projects, with full scope overlap of an existing HRSD Rehab Action Plan (RP) or CIP project at the time of RWWMP development, were assigned a zero-dollar cost to avoid double counting expenditures for affordability analysis considerations. Changes to project overlap have not yet been re-evaluated with current HRSD CIP information.

4.2.1 Engineering and Construction Administration/Inspection

Engineering costs were estimated to be 15 percent of capacity project construction costs. Construction administration and inspection (CA/CI) were estimated to be 9 percent of construction costs for all project types.

4.2.2 Contingency

Contingency was estimated to be 25 percent of the construction cost for capacity improvement projects within the RWWMP. This level of contingency is for planning-level projects and would be refined through more detailed design.

4.2.3 HPP Capacity Improvement Cost Summary

Capital costs for High-Priority Project implementation, inclusive of capacity improvements only, is estimated at $659 million. A breakdown of anticipated spending by asset type is outlined in Table 4-9.

Table 4-9. High-Priority Capacity Improvement Projects by Asset Type

Asset Type	Round 1		Round 2	
	Cost ($M)	% of Total HPP Capacity Improvements	Cost ($M)	% of Total HPP Capacity Improvements
PRS	$107.7	16.4%	$126.9	19.3%
Storage	$25.7	3.9%	$55.1	8.4%
HRSD Pump Station	$0.0	0.0%	$173.8	26.4%
HRSD Force Main	$0.0	0.0%	$64.0	9.7%
HRSD Gravity Main	$0.0	0.0%	$39.8	6.0%
Locality Pump Station	$0.0	0.0%	$53.6	8.1%
Locality Force Main	$0.0	0.0%	$1.1	0.2%
Locality Gravity Main	$1.2	0.2%	$10.0	1.5%
Total	$134.6	20.4%	$524.2	79.6%

A more detailed listing of identified capacity improvements for Round 1 and 2 HP projects is provided in Table 4-10.

Table 4-10. High-Priority Project Capacity Improvement Cost Summary

Modified HPP Round	HPP Test Group	RWWMP Project ID	Asset Type	Element Name	General Description	2025 Capacity Capital Cost Estimate ($M)
1	BH-02_S	BH-RWWMP-01	Storage	14th St Storage	Install new 4.3 MG storage tank / Unnecessary as project replaced with BHTP closure	$0.00
1	YR-04	JR-RWWMP-02	PRS	Tabb PRS	Install new PRS with 80 ft. of assistance - New Location	$33.42
1	YR-04	JR-RWWMP-02	Storage	Tabb Storage	Install new 1 MG storage tank	$8.12
1	JR-04	JR-RWWMP-04	PRS	Lucas Creek PRS	Upgrade PRS to 65 ft. of assistance - Existing Location	$27.60
1	NA-08	NA-RWWMP-01	HRSD Force Main	Jumper FM CHES-PS-041	150 LF of 16" Jumper FM; d/s of CHES-PS-41; along Canal Drive to S. Military Hwy; project represented w/ $0 due to overlap with existing CIP	$0.00
1	VIP-05_06_07	NA-RWWMP-03	PRS	Wilroy PRS	Install new PRS with 80 ft of assistance - New Location	$46.72
1	VIP-05_06_07	NA-RWWMP-03	Storage	Wilroy Storage	Install new 2.9 MG storage tank	$17.16
1	WB-13	WB-RWWMP-19	Storage	Lodge Rd Extended WW	Extended wet well storage at Lodge Rd PS	$0.37
1	NA	JR-RWWMP-11	Locality Gravity Main	NEWP-013 GM Improvement	Install 910 LF of 12" GM; Sourced from LHM This was bundled in the RWWMP with NEWP-WCPSA001575 General I/I Reduction Plan. This basin is not	$1.23

Table 4-10. High-Priority Project Capacity Improvement Cost Summary

Modified HPP Round	HPP Test Group	RWWMP Project ID	Asset Type	Element Name	General Description	2025 Capacity Capital Cost Estimate ($M)
					currently included in proposed HPIIRP reduction efforts. Recommend modeling new RTKs to verify if capacity upgrade is still necessary.	
1	NA	NA-RWWMP-01	Locality Gravity Main	CHES-016 GM Improvement	Install 320 LF of 12" GM; Sourced from LHM This was in the RWWMP with $0 because it was bundled with the CHES-016 Comprehensive I/I Reduction Plan. Tracking this improvement in the event CHES-016 is not pursued for rehab under HPIIRP	$0
1	NA	WB-RWWMP-07	Locality Gravity Main	YORK-006 GM Improvement	Upgrade Influent pipe to wet well; YORK-PS-006; Sourced from LHM This was in the RWWMP with $0 because it was bundled with the YORK-006 Comprehensive I/I Reduction Plan. YORK-006 is currently proposed for rehab under HPIIRP	$0
2	AT-02	AT-RWWMP-01	Locality Force Main	CHES-PS-067 FM	Install 1,930 lf of 10" Discharge force main downstream of Chesapeake Pump Station 067 (114 Mann Dr.)/ Project unnecessary as existing pipe was found to be 10”	$0
2	AT-02	AT-RWWMP-01	Locality PS	CHES-PS-072	CHES Pump Station 072; 100 Tilden Ave; remodel with new RTKs to verify capacity upsize is still necessary	$0.48
2	AT-05	AT-RWWMP-06	HRSD Force Main	Birdneck - General Booth Blvd. FM - I	Parallel a new 42" with existing 42" (54" Equivalent) - Install 5,310 LF along General Booth Blvd. from easement connection North of Berknor Drive to Dam Neck Road.	$14.28
2	AT-05	AT-RWWMP-06	HRSD Force Main	Birdneck - General Booth Blvd. FM - II	Parallel a new 42" with existing 42" (54" Equivalent) - Install 11,500 lf new FM along Birdneck Road from Owl Creek Golf Course to General Booth Blvd.	$34.73
2	AT-05	AT-RWWMP-06	HRSD Force Main	Birdneck - General Booth Blvd. FM - III	Parallel a new 42" with existing 42" (54" Equivalent) - 3,000 LF Along Birdneck Road from Southern Blvd to Owl Creek Golf Course	$11.87
2	BH-02_S	BH-RWWMP-01	HRSD Gravity Main	Claremont Ave GM Improvement -I	Upgrade 6,490 LF to 42" GM	$15.43

Table 4-10. High-Priority Project Capacity Improvement Cost Summary

Modified HPP Round	HPP Test Group	RWWMP Project ID	Asset Type	Element Name	General Description	2025 Capacity Capital Cost Estimate ($M)
2	BH-02_S	BH-RWWMP-01	HRSD Gravity Main	Claremont Ave GM Improvement -II	Upgrade 2,180 LF of 24" GM to 36" GM	$4.26
2	BH-02_S	BH-RWWMP-01	HRSD Gravity Main	Claremont Siphon - Chesapeake Ave and Robinson Rd	Upgrade 70 lf of 42" inverted siphon along Chesapeake Avenue upstream of NS-PS-208	$3.13
2	BH-02_S	BH-RWWMP-01	HRSD Gravity Main	Claremont Siphon - Indian River	Upgrade 70 lf of 42" inverted siphon along Chesapeake Avenue upstream of NS-PS-208	$3.13
2	BH-02_S	BH-RWWMP-01	HRSD PS	Claremont PS	NS-PS-208	$37.75
2	BH-04	BH-RWWMP-04	Storage	58th St Storage	Install new 2.5 MG storage tank	$18.28
2	BH-05	BH-RWWMP-07	HRSD PS	Newmarket Creek PS	NS-PS-219	$21.19
2	BH-05	BH-RWWMP-08	HRSD Gravity Main	Mercury Blvd and Newmarket GM Improvement - I	Install 3,090 LF of 30” GM; Gravity main u/s of Newmarket Creek PS	$5.30
2	BH-05	BH-RWWMP-08	HRSD Gravity Main	Mercury Blvd and Newmarket GM Improvement - II	Install 3,780 LF of 36” GM	$7.31
2	NA-03	NA-RWWMP-12	HRSD Gravity Main	Cedar Lane PS GM Improvement	Upgrade 910 LF from 18" to 24" GM upstream of Cedar Lane PS	$1.23
2	NA-03	NA-RWWMP-14	HRSD PS	Cedar Lane PS	SS-PS-104	$42.02
2	NA-04	NA-RWWMP-16	PRS	Western Branch PRS	Install new PRS with 80 ft of assistance - New Location	$34.12
2	NA-04	NA-RWWMP-19	Locality PS	CHES-PS-046	CHES Pump Station 046; 3733 Cannon Point Dr	$3.58
2	NA-04	NA-RWWMP-19	Locality PS	CHES-PS-069	CHES Pump Station 069; 4224 Meadowood Dr	$5.71
2	VIP-29	VIP-RWWMP-03	HRSD PS	City Park PS	SS-PS-106; project represented w/ $0 in RWWMP due to overlap with existing CIP under construction	$0.00
2	VIP-05_06_07	VIP-RWWMP-04	HRSD PS	Camden Ave. PS	SS-PS-146	$67.11
2	VIP-05_06_07	VIP-RWWMP-04	Locality Gravity Main	Camden Ave. GM Improvement - I	Upgrade 1,670 LF of 12" GM to 15" GM Revisions to this scope have been proposed as a finding of the VIP Port I/I project. Model results, scope, and costs are recommended for review during pre-design.	$1.97
2	VIP-05_06_07	VIP-RWWMP-04	Locality Gravity Main	Camden Ave. GM Improvement - II	Upgrade 2,170 LF of 17" GM to 21" GM and 370 LF of 15" GM to 18" GM	$2.78
2	VIP-05_06_07	VIP-RWWMP-04	Locality PS	PORT-PS-002	PORT Pump Station 002; Glasgow Street PS	$12.65
2	VIP-05_06_07	VIP-RWWMP-04	Locality PS	PORT-PS-008	PORT Pump Station 008; Clifford Street PS	$21.19
2	VIP-11	VIP-RWWMP-05	PRS	State St PRS	Install new PRS with 35ft of assistance - New Location	$36.22
2	VIP-11	VIP-RWWMP-05	Storage	State Street Storage	Install new 2.3 MG storage tank	$13.48

Table 4-10. High-Priority Project Capacity Improvement Cost Summary

Modified HPP Round	HPP Test Group	RWWMP Project ID	Asset Type	Element Name	General Description	2025 Capacity Capital Cost Estimate ($M)
2	VIP-08	VIP-RWWMP-12	Storage	May Ave Storage	Install new 1.9 MG storage tank	$11.87
2	VIP-09	VIP-RWWMP-13	HRSD PS	Willoughby Ave PS	SS-PS-132	$5.71
2	VIP-09	VIP-RWWMP-14	HRSD Force Main	Victoria Ave FM	Install 1,100 LF of 12" FM Immediately d/s from NORF PS-149, along Victoria Ave and Norchester Ave to I-264.	$1.06
2	VIP-09	VIP-RWWMP-14	Locality PS	NORF-PS-149	NORF Pump Station 149	$9.98
2	WB-04	WB-RWWMP-02	HRSD Force Main	Williamsburg Crossing FM	Install 2,090 LF of 24" FM; Routing Jamestown Rd flow to co-located Tank/PRS (Williamsburg Crossing)	$3.17
2	WB-04	WB-RWWMP-02	PRS	Williamsburg Crossing PRS	Install new PRS with 80 ft of assistance - New Location	$56.52
2	WB-04	WB-RWWMP-02	Storage	Williamsburg Crossing Storage	Install 1.8 MG Storage Tank	$11.46
2	NA	AT-RWWMP-01	Locality Gravity Main	CHES-067 GM Improvement - I	Install 280 LF of 12" GM; Sourced from LHM This was in the RWWMP with $0 because it was bundled with the CHES-067 Comprehensive I/I Reduction Plan. Costs are identified here for tracking purposes as this basin is not currently part of proposed HPIIRP reduction efforts. Recommend modeling new RTKs to verify if capacity upgrade is still necessary.	$0.43
2	NA	AT-RWWMP-01	Locality Gravity Main	CHES-067 GM Improvement - II	Install 2,760 LF of 16" GM; Sourced from LHM This was in the RWWMP with $0 because it was bundled with the CHES-067 Comprehensive I/I Reduction Plan. Costs are identified here for tracking purposes as this basin is not currently part of proposed HPIIRP reduction efforts. Recommend modeling new RTKs to verify if capacity upgrade is still necessary.	$4.85
					Total	$659

Section 5

I/I Reduction Program Cost Estimate

5.1 Methodology

Cost estimates for targeted basins in the RWWMP were developed with unit price structures similar to those outlined for Locality capacity conveyance improvements. Assumptions for developing budgetary investigation, design and R/R costs to support the I/I Reduction Program were based on costs per foot of rehabilitation/replacement, number of manholes, SSES/investigation costs, and pavement restoration.

For each basin included in the overall RWWMP program, a scope of R/R work was developed to estimate planning level costs and I/I reduction. A mixture of rehabilitation and replacement activities were included within each basin-specific reduction plan.

5.1.1 SSES Activities

Given the timeframe of RWWMP implementation, it was anticipated that additional SSES activities would be required as part of predesign for system repairs in relation to I/I Reduction efforts. Associated SSES costs are included in each basin-specific I/I Reduction Plan, regardless of the amount of data previously collected in that basin. This was intended to confirm potential sources of I/I are identified and support subsequent design activities.

Costs associated with SSES activities are based on the number of assets within the basin and assumed 100% of public pipes will be smoke tested and CCTV inspected and 100% of public manholes will be inspected.

Monitoring and condition assessment costs were included in the development of the HRSD I/I Reduction Program initially outlined in the RWWMP.

5.1.2 Construction

Table 5-1 below includes unit prices used in the development of the planning estimates, expressed in local 2025 dollars. Construction cost estimates were reviewed and adjusted based on a combination of Hampton Roads area project experience, previous bid tabs, local cost index, CCI, and comparisons to construction data from the Mid-Atlantic Region and surrounding states.

Table 5-1. R/R Unit Costs

Item Description	Unit Price
Manhole Rehab	$15,900 EA
Manhole Replace	$24,000 EA
Public Lateral Replacement (up to 25ft length)	$7,100 EA
Private Lateral Replacement (up to 40ft Length)	$4,800 EA
Private Lateral Rehabilitation (up to 40ft Length)	$180/LF
Pipe Rehabilitation (Pipe Dia >6" to <= 15")	$9.5 in-dia/ft.

Table 5-1. R/R Unit Costs	
Item Description	**Unit Price**
Pipe Rehabilitation (Pipe Dia >15" to <24")	$10.4 in-dia/ft.
Pipe Rehabilitation (Pipe Dia >=24")	$11.1 in-dia/ft.
Pipe Replacement Up to 10 ft. Depth, applied to pipes less than 15” Dia	$448 + $35 in-dia/LF (> 10" dia)
Pipe Replacement 10 – 15 ft. Depth, applied to pipes between 15 and 18” Dia	$780 + $44 in-dia/LF (>15” dia)
Pipe Replacement (Depth >15 ft., applied to pipes greater than 18” Dia	$1162 + $50 in-dia/LF (>18” dia)
Pavement Restoration	$225,000 Lane-Mile

Pipe rehabilitation costs include lining, cleaning, pre- and post CCTV inspection, traffic control; bypass pumping up to 2 mgd for pipes less than 24-inch diameter.

Pipe replacement costs include mobilization; traffic control; bypass pumping up to 2 mgd for pipes less than 24-inch diameter and 4 mgd for pipes greater than 24-inch; demolition, excavation, fill and compaction.

Pavement restoration costs exclude milling and surface restoration. Each Locality may have unique requirements that affect cost but that should be addressable through the contingency budget for this work. Pavement restoration calculations assumed that only the length associated with replaced portion of pipe will require pavement restoration. Lane-Miles were calculated using the following equation:

Lane-Miles = Length of pipe scoped for replacement (ft.) x number of lanes / 5,280 ft. per mile

For general and comprehensive plans, the number of lanes was assumed to be 2 in the absence of specific information. Lane miles for data driven scopes were calculated using the specific R/R scoped pipes in conjunction with road centerline data from the Virginia Base Mapping Program (VBMP). A buffer of 25 ft. was used to intersect the road centerline with the gravity main targeted for replacement to estimate the length of pipe under the roadway. The number of lanes to restore was estimated based on the assumptions in Table 5-2.

Table 5-2 VBMP Lane Assumptions	
Road Section Speed Limit	**Lanes to Restore**
<35 mph	2
Between 35 mph and 45 mph	3
> 45 mph	4

5.1.3 Engineering and Construction Administration/Inspection

For I/I reduction projects, engineering costs were estimated to be 15% of construction costs for public assets and 25% for private infrastructure. Construction administration and inspection were estimated to be 9% of construction costs for all project types.

5.1.4 Contingency

Contingency was estimated to be 25% of the construction cost for I/I reduction improvement projects within the RWWMP. This level of contingency is for planning-level projects and would be refined through more detailed design.

5.2 VIP SA I/I Reduction Portsmouth

The only I/I reduction work that is included in the RWWMP but not part of the HPIIRP are the basins in Portsmouth that are assigned to Brown and Caldwell through a separate contract with HRSD. This includes work as follows:

- PORT-01 Comprehensive I/I Reduction Plan
- PORT-02 General I/I Reduction Plan
- PORT-04 General I/I Reduction Plan
- PORT-04-LOP65-1 Data-Driven I/I Reduction Plan
- PORT-04-LOP65-2 Data-Driven I/I Reduction Plan
- PORT-04-LOP65-3 Data-Driven I/I Reduction Plan

A draft Preliminary Engineering Report was recently completed in June 2025 that used many of the same concepts and costs to develop program level costs. During evaluation of these basins, the PORT-01 basin was rehabilitated by the City of Portsmouth and no additional work was needed. In addition, the proposed work for the three PORT-04 basins was modified to focus on inflow driven defects with a Locality gravity main capacity improvement providing the remainder of the SSO reductions.

Table 5-3 provides the current estimated costs for this work compared to the original RWWMP cost.

Table 5-3. Portsmouth I/I Basin Costs

Sewer Area	RWWMP Plan Type	2017 Cost w/25% Contingency ($M)	2025 Cost w/25% Contingency ($M)
PORT-01	Comprehensive	$0.7	$0.0
PORT-02	General	$14.9	$9.3
PORT-04	Inclusive of 4 rehab areas; 1 General and 3 Data-Driven	$11.3	$1.2
TOTAL	NA	$26.9	$10.5

5.3 HPIIRP I/I Reduction Program Costs

5.3.1 HPIIRP I/I Reduction Cost Summary

Of the original 19 High-Priority I/I Reduction Basins, only 3 are currently proposed for further evaluation by the BMcD Team. Screening of additional alternate project areas resulted in a proposed selection of six additional basins as potential targets for I/I and SSO volume reduction.

Table 5-4 identifies the priority project areas currently proposed by the BMcD Team for inclusion in the HPIIRP. Adjusted costs were developed using the same methodology as the original 19 HPPs and are intended as planning level estimates only based on the assumptions identified above for each

plan type. Additional detail can be referenced in the Catchment-Specific I/I Reduction Plans provided in Appendix A.

As part of the future design process for these projects, rehabilitation scopes of work and costs will be revised based on the SSES condition information currently being collected. Actual completed costs could vary significantly from the costs shown in Table 5-4 based on the actual scope of work for R/R of public and private sewer system assets.

Table 5-4. HPII Proposed Basin Cost Estimate

Rehab Area Reference ID	Locality	TP	Plan Type	Basin Selection Category	Percent of System in R/R Scope		2025 Adjusted Planning Level Costs (Revised R/R Assumptions, 2025 Costs)			
					Public Sewer Assets	Private SF Lateral	Private NSF Assets	Public Assets ($Million)	Private Assets ($Million)	Total ($Million)
PORT-10	PORT	VIP	Data-Driven	ALT	35%	0%	49%	$15.6	$1.6	$17.2
JCSA-LSA3-8	JCSA	WB	Comprehensive	ALT	100%	0%	0%	$30.1	$0.0	$30.1
JCSA-LSA3-1	JCSA	WB	Comprehensive	ALT	100%	0%	49%	$34.8	$7.4	$42.3
JCSA-LSA3-6	JCSA	WB	Data-Driven	ALT	34%	0%	0%	$4.9	$0.0	$4.9
JCSA-LSA5-4	JCSA	WB	Comprehensive	ALT	100%	0%	0%	$16.1	$0.0	$16.1
YORK-003	YORK	WB	Data-Driven	HPP	43%	0%	0%	$8.2	$0.0	$8.2
YORK-006	YORK	WB	Comprehensive	HPP	100%	0%	0%	$23.1	$0.0	$23.1
							Subtotal	**$132.8**	**$9.0**	**$141.9**
Additional Basins (held in reserve)										
CHES-016	CHES	NA	Comprehensive	HPP	100%	0%	49%	$17.7	$6.9	$24.6
SUFF-146	SUFF	NA	Comprehensive	ALT	100%	0%	49%	$8.1	$1.2	$9.2
							Subtotal	**$25.7**	**$8.1**	**$33.8**
							Total	**$158.6**	**$17.1**	**$175.6**

The total estimated cost for the top seven priority basins is approximately $142 million dollars and includes about $9M for rehabilitation of private sewer assets on NSF properties. Our team's current strategy for private property I/I reduction focuses on targeting select NSF private properties in the proposed priority basins. Approximately 355 NSF private properties have been identified to perform private sewer SSES investigations to identify potential inflow sources. Future consideration to pursue single-family I/I reduction will depend on the overall effectiveness of completed R/R work on public sewers and private NSF properties and may be included in the HRSD's Adaptive Management Plan.

Section 6

RWWMP Cost Update

The updated RWWMP costs for each project (capacity-related and proposed I/I reduction) have been estimated in the previous sections and represent a portion of HRSD compliance program costs. These updated costs would be in addition to the original Consent Decree Interim System Improvement projects, Rehabilitation Action Plan projects, SWIFT-related projects, and any work associated with plant closures to meet nutrient permit limits (Chesapeake Elizabeth Treatment Plant closure and the mid-2026 closure of the Boat Harbor Treatment Plant).

With including the proposed I/I Reduction Projects identified in this plan into Round 1 of the High Priority Projects, the total cost and split is as follows:

Table 6-1. Costs by HPP Round

HPP Round	2017 Cost ($M)	2025 Cost ($M)
1	$207.70	$287.0
2	$202.40	$524.2
Total	**$410.10**	**$811..2**

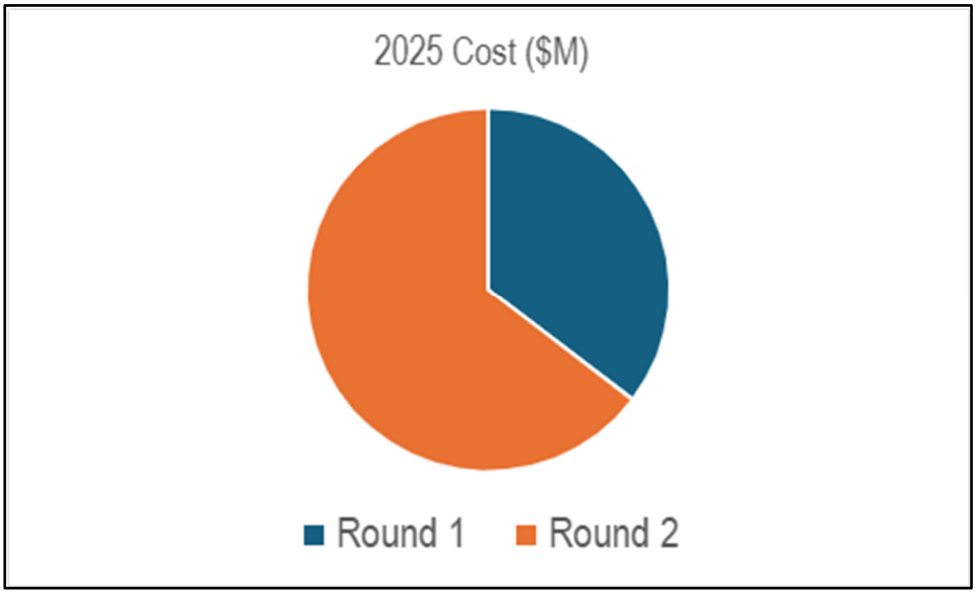


Figure 6-1. Cost by HPP Round

This work is spread across HRSD's service area impacting all the treatment plant service areas with the exception of the Army Base Treatment Plant as follows:

Table 6-2. Costs by Treatment Plant Service Area

TP	2017 Cost ($M)	2025 Cost ($M)
AT	$51.62	$66.64
BH	$74.94	$115.77
JR	$30.29	$28.83
NA	$83.74	$150.53
VIP	$106.09	$211.74
WB	$53.41	$196.17
YR	$10.06	$41.54
Total	**$410.15**	**$811.22**

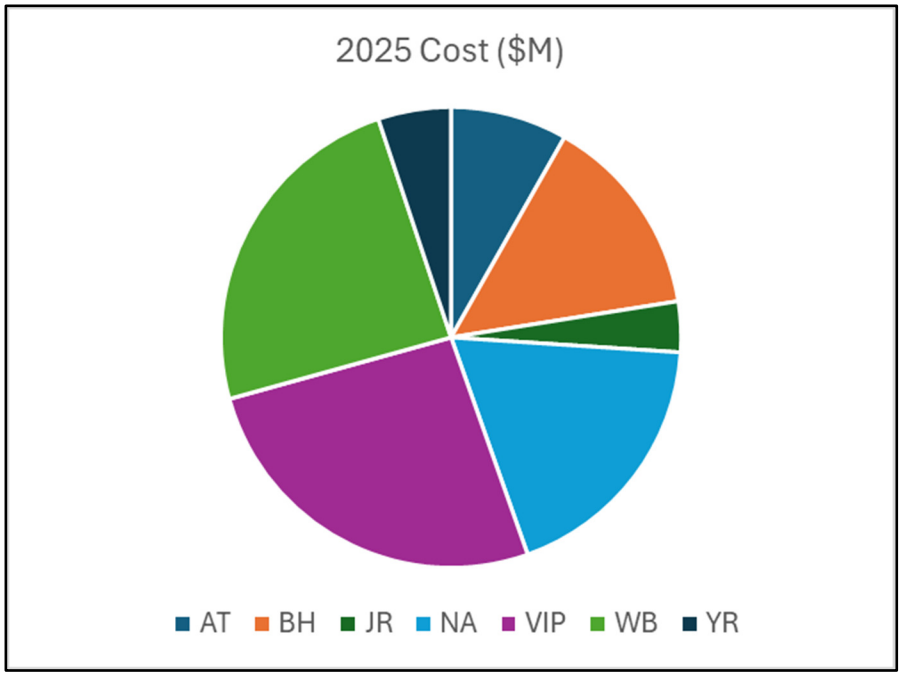


Figure 6-2. Cost by Treatment Plant Service Area

Each of the project types in the RWWMP is totaled in Table 6-3 with the highest total cost for HRSD Locality I/I reduction, PRS construction, and HRSD pump station construction. These three types account for nearly 75% of the total RWWMP projected costs. Note that the Locality I/I costs include estimated costs for the additional two basins in Portsmouth (PORT-02/04) not included in the HPIIRP budget.

Table 6-3. Costs by Project Type (2025 $)				
	2017		2025	
Project Type	Round 1 Cost ($M)	Round 2 Cost ($M)	Round 1 Cost ($M)	Round 2 Cost ($M)
HRSD Conveyance	$17.7	$36.7	$0.00	$103.83
HRSD PS	$35.2	$24.4	$0.00	$173.78
Locality Conveyance	$3.9	$1.1	$1.23	$11.10
Locality I/I	$86.5	$66.6	$152.36*	$0.00
Locality PS	$12.6	$7.6	$0.00	$53.59
PRS	$13.0	$32.6	$107.74	$126.86
Storage	$38.8	$33.5	$25.65	$55.09
Total	**$207.7**	**$202.4**	**$286.98**	**$524.24**

*includes $10.5M for I/I reduction work in PORT-02/04

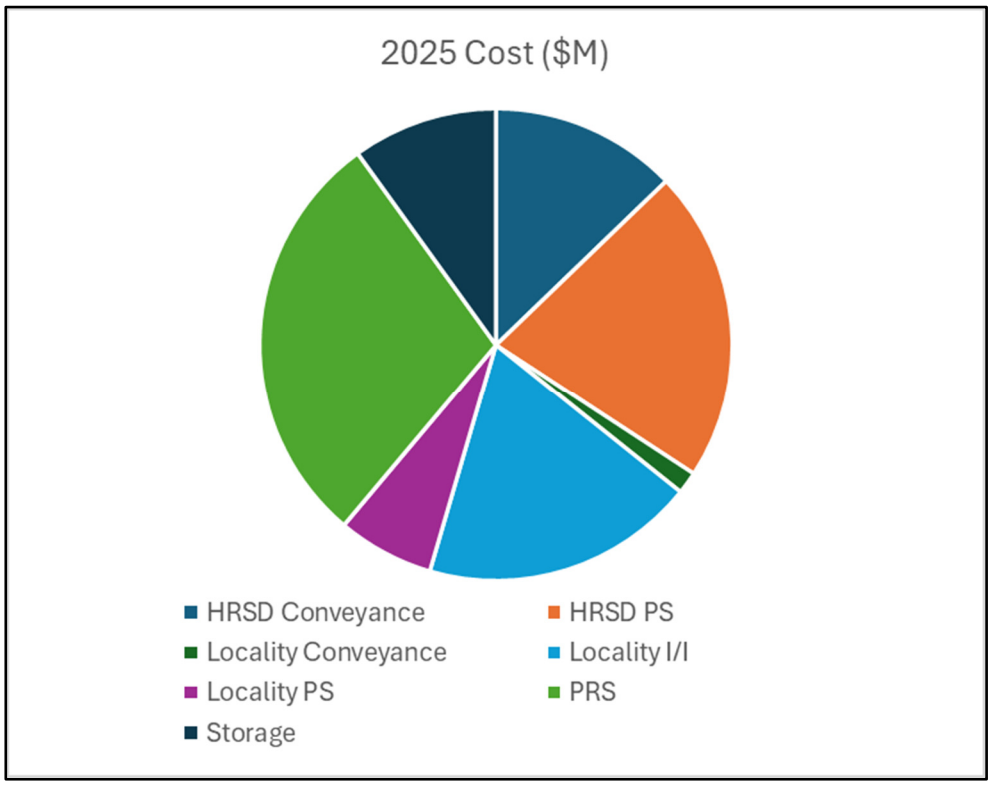


Figure 6-3. Cost by Project Type

Section 7

Preliminary Implementation Schedule

Implementation of the seven proposed HPIIRP projects has been planned in phases, progressively increasing the level of detail the closer to the execution of each phase as information becomes available. A proposed project will be replaced or supplemented with an alternate project area if the results of our cost-effective analysis do not justify proceeding forward with sewer rehabilitation work to the extent associated with the rehabilitation plan type initially selected. With this in mind, the current preliminary implementation schedule containing the seven proposed project areas and two project areas held in reserve, along with actualized activity dates from the start of the HPIIRP through July 31, 2025 is provided in Appendix B. This program schedule is based on the quantities of R/R work derived from the revised I/I reduction scope assumptions and is subject to change based on the results of the cost-effective evaluation performed for each project basin.

The actual proposed scope of work for each project area will be developed and an estimate of R/R work quantities and costs will be developed as part of the cost-effective evaluation performed by the BMcD Team and documented in a Preliminary I/I Reduction Plan. HRSD will review and approve each project's Preliminary I/I Reduction Plan before moving into the detailed design phase.

The current implementation schedule for the seven proposed basins has four distinct milestone dates specific to sewer asset condition assessment and the design and construction of the rehabilitation work:

- Complete SSES – All SSES field work within the seven proposed project basins and two project basins held in reserve, consisting of sewer closed-circuit televised inspections, manhole inspections, and smoke testing is scheduled to be completed by mid-November 2025. Inspection of private sewer systems on NSF private property associated with the nine project basins is anticipated to be completed by December 2025.
- Complete Preliminary I/I Reduction Plan – This effort will include review and analysis of SSES data, completion of a cost-effective evaluation, modeling to confirm the I/I reduction target, and development of a rehabilitation plan to meet the I/I reduction target. The preliminary I/I reduction plans for all seven proposed project basins and two project basins held in reserve are scheduled to be completed by March 2026.
- Complete Final Design – The final design for each basin will be advanced to a level required to obtain permits and provide the rehabilitation contractors sufficient detail to bid and construct the quantity of R/R work determined to be cost-effective in accordance with the Preliminary I/I Reduction Plan. Final design of all seven proposed project basins is scheduled to be completed by June 2026.
- Substantial Completion of Construction – All rehabilitation work has been completed and tested, although some ancillary surface restoration work may remain. Final completion and acceptance from the Locality would be expected within 2 months of the Substantial Completion date. Substantial completion of sewer R/R work within all seven proposed project basins is scheduled to be achieved by November 2028. The duration of construction activities is currently proportionate to the total length of public sewers in each project basin

and will be revised based on the total quantity of R/R work determined to be cost-effective in accordance with the Preliminary I/I Reduction Plan.

Table 7-1 provides the scheduled milestone dates for the Work Anticipated under the HPIIRP.

Table 7-1. HPIIRP Schedule

Basin	Complete SSES	Complete Preliminary I/I Reduction Plan	Complete Final Design	Complete Construction
JCSA-LSA3-8	7/8/25	10/28/25	1/26/26	1/27/28
PORT-10	9/19/25	1/12/26	5/26/26	10/23/28
JCSA-LSA3-6	7/25/25	10/28/25	1/26/26	1/27/26
JCSA-LSA3-1	9/5/25	12/16/25	4/21/26	9/5/28
JCSA-LSA5-4	9/26/25	12/16/25	3/2/26	1/20/27
YORK-003	10/10/25	1/27/26	3/23/26	6/24/27
YORK-006	10/24/25	1/27/26	4/14/26	10/4/28
CHES-016	11/7/25	1/27/26	NA	NA
SUFF-146	11/14/25	2/24/26	NA	NA

Post-construction program management services including post-construction flow monitoring and data analyses will be performed to determine the amount of I/I reduction and SSO volume reduction achieved using the mini-models developed for each project basin. In addition, adaptive management planning services, including system-wide flow monitoring and data analyses, and hydraulic modeling services will be performed to assist HRSD with updating and recalibrating it's system-wide RHMs and to develop an adaptive management plan that defines the capacity projects needed to achieve 69% SSO volume reduction. These post-construction and system planning services will be scheduled to be completed by March 2030 to enable HRSD to submittal its adaptive management plan to EPA by March 31, 2030 as required by Consent Decree.

Section 8

Establishment of HPIRP Budget for Comprehensive Agreement

In addition to the design and construction costs discussed above for the implementation of I/I reduction work in the seven proposed project basins based on the revised assumptions for development of the I/I Reduction Plans, there are additional programmatic and construction management efforts necessary to successfully implement this work in a consistent, high-quality, cost-effective manner and to also thoroughly define the remaining capacity projects that are needed (along with all the other system improvements being implemented by HRSD and the Localities through 2040) to achieve a 69% SSO volume reduction required by HRSD's Consent Decree. These additional efforts are listed below and should be included in HRSD's total budget for the HPIIRP.

1. Program management services, including continuation of program administration and controls, flow monitoring, SSES field work, hydraulic mini-model development, cost-effective evaluations to quantify the amount of cost-effective R/R in each project basin, development of a preliminary I/I reduction plan for each basin and to support programmatic delivery of design and construction of R/R work within seven proposed project basins. These services would be provided from September 2025 through the completion of construction in 2028.
2. Construction costs for I/I reduction in the PORT-02/04 basins as determined by the Brown and Caldwell design.
3. Design-Builder fee consisting of 7 percent for design professional services and 9 percent for construction of R/R work in each project basin. It is assumed the construction work is performed at-risk with a contract cost limit being required by HRSD for each project.
4. Post-construction program management services, including program administration and controls, post-construction flow monitoring and data analyses, and updating of the mini-models to determine the amount of I/I reduction and SSO volume reduction achieved in each project basin. It is assumed flows will be updated in the mini-models based on data collected by 90 flow monitors and pump station drawdown tests at 26 stations to characterize performance.
5. Adaptive management programmatic services, including program administration and controls, additional system-wide flow monitoring and data analyses, hydraulic modeling services to assist HRSD with updating and recalibrating it's RHM to be used to define capacity projects needed to achieve 69% SSO volume reduction, and system planning services to assist HRSD with developing an Adaptive Management Plan for submittal to EPA. A full RHM update is assumed using 450 flow monitoring sites and drawdown tests at 600 pump stations.

Preliminary budgetary costs for these additional efforts are summarized in Table 8-1 along with the preliminary design and construction costs for R/R work in the seven HPIIRP project basins and the PORT-02/04 basin. The total program cost through post-construction flow monitoring is $192.8

million. The primary work elements and associated cost considerations used to develop the preliminary budgetary costs for the HPIIRP are included in Appendix C.

HRSD's current CIP budget for the HPIIRP is $143,715,840 and for the Port-02/04 I/I Reduction Project is $10,500,000, for a combined total CIP budget of $154,215,840. This combined total CIP budget represents the initial budget to be included in the Comprehensive Agreement to fund the completion of planning and programmatic delivery of design and R/R work in the project basins, the design and construction of cost-effective I/I reduction sewer R/R work, a 15 percent Owner-controlled contingency, and post-construction flow monitoring to determine I/I and SSO reduction achieved, as shown in Table 8-2.

The difference between HRSD's current total CIP budget of $154,215,840 and the total projected cost of $192.8M for sewer R/R work and post-construction flow monitoring will be addressed by HRSD upon the completion of BMcD Team's cost-effective evaluations which will determine the extent of I/I reduction work to be completed in each project basin in lieu of alternative capacity improvements. Similarly, the funding of adaptive management programmatic services for the completion of system-wide flow monitoring and data analyses, along with the updating and recalibration of HRSD's RHM and the development of an Adaptive Management Plan will be addressed by HRSD in the future, as needed.

Table 8-1. Establishment of HPIIRP Budget

Work Category	Work Description	Preliminary Budgetary Cost $ Million (2025 Dollars)
Design and Construction of 7 Project Basins	Based on revised assumptions for development of the I/I Reduction Plans	$141.9
PORT-02/04 Construction Costs	Based on Brown and Caldwell design	$10.5
Program Management Services	Continuation of planning and programmatic delivery of design and R/R work in the project basins	$23.2
Design-Builder Fee	At-Risk Work based on Contract Cost Limit required by HRSD for construction work	$11.6
	Program costs through Construction - Subtotal	**$187.2**
Post-Construction Program Management Service	Flow monitoring and data analyses and updating of mini-models to determine I/I and SSO reduction achieved	$5.6
	Preliminary program costs through Post-Construction Flow Monitoring - Subtotal	**$192.8**
Adaptive Management Programmatic Services	Flow monitoring and data analyses, and updating and recalibration of RHM and development of Adaptive Management Plan	$32.0
	Total HPIIRP Budget Estimate	**$224.8**

Table 8-2. Projected Spend of HRSD's Current CIP Budget for HPIIRP		
Budget/Cost Elements	**Preliminary Budgetary Cost $ Million (2025 Dollars)**	**Cumulative Total**
HRSD Current CIP Budget for HPIIRP	$143,715,840	$143,715,840
HRSD Current CIP Budget for PORT-02/04 Construction	$10,500,000	$10,500,000
Subtotal HRSD CIP Budget	**$154,215,840**	**$154,215,840**
Less 15% Owner- Controlled Contingency (exclusive of Port-02/04)	$21,557,376	$132,658,464
Less Program Management Services - Continuation of planning and programmatic delivery of design and R/R work in the project basins	$23,219,100	$109,439,364
Less Design and Construction of Cost-effective I/I Reduction R/R Work with 25% Contingency	$95,923,900	$13,515,464
Less Design-Builder Fee for At-Risk Work Assuming Contract Cost Limit required by HRSD for construction work	$7,865,764	$5,649,700
Less Post-construction flow monitoring and data analyses and updating of mini-models to determine I/I and SSO reduction achieved	$5,649,700	$0

Appendix A: Planning Level I/I Reduction Plans

CHES-016
JCSA-LSA3-1
JCSA-LSA-3-6
JCSA-LSA-3-8
JCSA-LSA5-4
PORT-10
SUFF-146
YORK-003
YORK-006

Catchment Specific
I/I Reduction Plan

Rehab Area ID: CHES-016
Catchment HSAID: CHES-016
Location: Chesapeake, Virginia
Plan Type: Comprehensive

Prepared for
HRSD
March 2016
Cost Revised August 2025
R/R Assumptions Revised August 2025

Brown AND Caldwell
301 Bendix Road, Suite 400
Virginia Beach, VA 23452

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1. Summary

This Inflow and Infiltration (I/I) Reduction Plan (Plan) provides a basis for planning future field investigation, design, construction and I/I reduction associated with the rehabilitation/replacement (R/R) of the sanitary sewer in Catchment CHES-016. The purpose of this Plan is to provide a conceptual level assessment of the anticipated R/R scope and cost, and a quantification of the resulting I/I reduction that can be expected in this catchment. The following information is provided herein:

- Catchment overview
- Summary of available condition assessment data
- Previous rehabilitation activities (if available)
- Basis for R/R scope and estimated costs
- Flow characterization and post-rehabilitation I/I reduction estimate.

The *HRSD RWWMP Sanitary Sewer I/I Reduction Plan Framework* (Brown and Caldwell, March 2016) documents definitions and basic assumptions associated with the development of this planning document. The 2025 Comprehensive II Reduction Plan, developed as part of the High-Priority I/I Reduction Program (HPIIRP), includes revisions to some of these original assumptions to further refine planning level project estimates.

The Comprehensive Scoping Approach has been applied for this catchment due to the relative density of I/I in the catchment (as expressed in gallons per acre per day). The comprehensive approach estimates funding to address all public assets in the R/R scope. The approach establishes a target I/I reduction of 70% of the public portion of existing peak I/I.

Private assets associated with Non-Single Family (NSF) parcels greater than one acre were included in the R/R and I/I reduction estimate for this catchment.

Table 1 presents the R/R planning estimates that were derived using the Comprehensive Scoping Approach for this catchment.

Table 1. Post-Rehabilitation I/I Reduction Estimate and Cost-Effectiveness

	Public Sewer System R/R	Private Single Family Lateral R/R	Private Non-Single Family R/R	Total
Major Inflow Sources in R/R Scope	Yes	Unknown	Unknown	
Percent of System in R/R Scope	100%	0%	49%	
Estimated Peak 10-Year I/I, GPD	2,725,208	862,409	2,124,499	5,712,116
Peak Flow Reduction Target, GPD	1,907,646	0	879,614	2,787,260
Target Peak Flow Reduction, Percent of Available I/I by Asset Type	70%	0%	41%	49%
Estimated Investigation, Design and Construction Costs	$17,665,300	$0	$6,895,700	$24,561,000
I/I Removal Cost-Effectiveness, $/GPD Removed	$9.26	NA	$7.84	$8.81

2. Catchment Location and Asset Inventory

Catchment CHES-016 is located in North Central Chesapeake. The predominant land use is single family residential and commercial. This catchment does not receive flow from any upstream catchments, and flows via gravity to the terminal Pump Station CHES-PS-016.

Table 2 presents the inventory of known publicly owned gravity collection pipes, manholes, and laterals in CHES-016. Additionally, Private Single Family and Private NSF sanitary sewer assets were estimated using assumptions and GIS to approximate the distribution of peak I/I flow across asset types.

Table 2. System Characteristics, Catchment CHES-016

	Public[1]	Private Single Family	Private Non Single Family	Private Non Single Family > 1 Acre	Total
Gravity System Length, Feet	30,358	NA	19,815	14,196	50,173
Lateral Length, Feet[2]	12,975	14,711	14,040	14,040	41,726
Number of Mainline Cleanouts	34	NA	NA	NA	34
Number of Manholes	119	NA	90	90	209
Equivalent Length, Feet	46,487	14,711	36,240	30,621	97,437
I/I Distribution %	48%	15%	37%	31%	100%

1. Public manhole and gravity main information from Locality GIS submittals dated October 2014

2. See I/I Reduction Plan Framework for details on the calculation of lateral length and equivalent length

3. Summary of SSES Activities

Asset specific condition assessment data in this catchment were not utilized in development of the R/R scope of work because comprehensive rehabilitation was assumed. However, Table 3 provides a summary of previous condition assessment data available as of the 2016 original date of this report. Condition data may include the results of smoke testing, night flow isolations, manhole inspections, CCTV, and historical records. Condition findings are presented graphically in Figure 2.

HPIIRP assessment activities, in progress in 2025, are not included in this report. New field data will be applied in the near-term future to develop updated I/I rehabilitation scopes and inform design efforts.

Note that the sanitary sewer information shown in the figure, including sewer mains, manholes and catchment boundaries, was provided to HRSD by each Locality. Localities continue to refine this information, and future activities within this catchment should incorporate the most recent data available at that time. Further, revisions to Locality GIS information may alter the R/R scope and/or I/I reduction estimate presented in this Plan.

Table 3. Public Sewer System Condition Data Summary

SSES Investigation	Percent of Catchment Investigated
Smoke Testing	100%
Manhole Inspections/Checks	100%
CCTV	16%

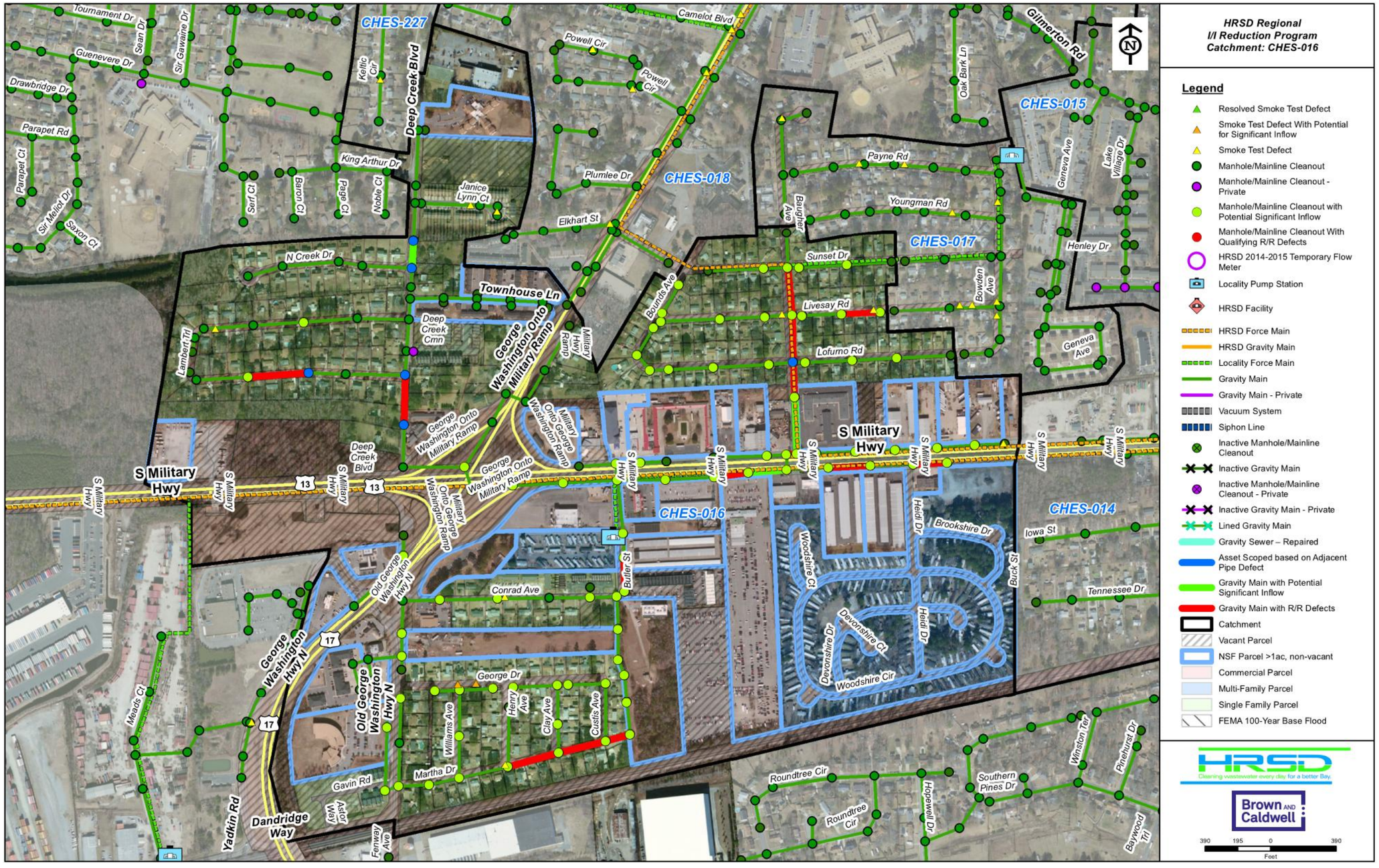


Figure 1. CHES-016 Existing Asset Condition Data Summary

The above Map is for general reference only, and should not be relied upon for design efforts.

4. Catchment Flow Characteristics

Flow monitoring was conducted by The City of Chesapeake at Pump Station CHES-PS-016 using an algorithm, pump start/stop times, and wet well levels from installed data loggers. The rainfall events that were used to calibrate RTK hydrologic parameters for this catchment occurred between April 2008 and December 2008.

Tables 4 and 5 depict the catchment hydrologic characteristics as represented in the Flow Parameter Database and RHM. The 10-year peak flow was derived from hydrographs generated by applying the RTK hydrologic parameters to a 4-hour design storm event, considered representative of a rain event that would induce regional 10-year flow conditions. For each catchment, long term statistical simulations have been analyzed to compare 10-year Log Pearson III (LPIII) return flows to the peak flows resulting from the design event to obtain a scaling factor. This scaling factor was then used to modify the design event hydrograph to present the pre-rehabilitation 10-year peak flow conditions for this catchment. Figure 2 presents the pre-rehabilitation 10-year peak I/I flow hydrograph for the catchment as represented by the HRSD 10-year design storm with scaling factors applied.

Table 4. Catchment CHES-016 Pre-Rehabilitation Sewer Flow Characteristics

Associated Treatment Plant	Nansemond
Sewered Area, Acres	280
Flow Monitored or Associated Parameters	Flow Monitored
Base Sewer Flow, GPD	50,083
Dry Weather Infiltration (DWI), GPD	3,027
10 Year Peak I/I, GPD	5,712,116
10 Year Peak Flow, GPD	5,765,226
I/I Density, GPAD	20,384

Table 5. Pre-Rehabilitation Hydrologic Parameters

	R	T, Hours	K
Triangle 1	0.0097	0.645	0.604
Triangle 2	0.0110	1.588	0.787
Triangle 3	0.0058	4.225	4.994

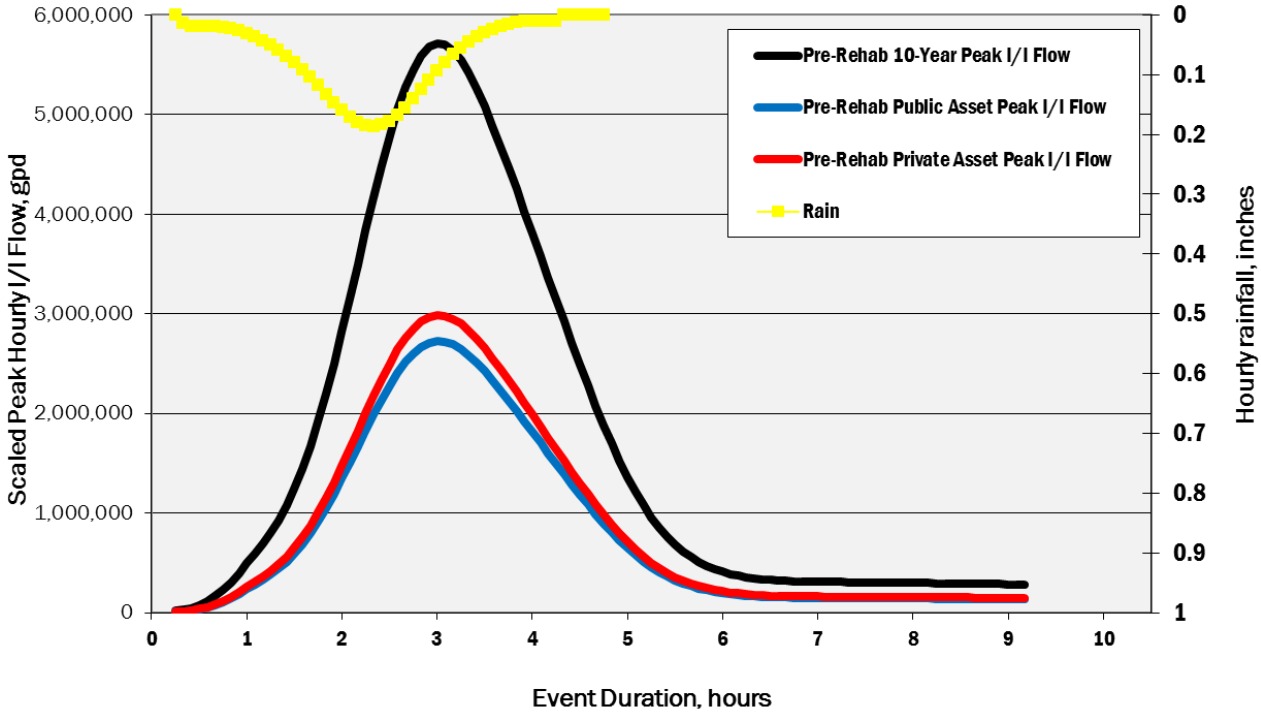


Figure 2. 10-Year Peak I/I Flow Hydrograph for CHES-016

5. Summary of Prior Rehabilitation Activities

Table 6 summarizes recent known corrective actions and rehabilitation activities undertaken by the locality within this catchment as of 2016. This information is for reference only. For Comprehensive approach I/I reduction plans, defects that have been remedied have not been considered in development of post-rehabilitation I/I reduction estimates or development of the R/R scope of work, unless post-rehabilitation flow monitoring data were available at the time of this report. It is assumed that future investigations will determine whether these actions have resulted in the removal of I/I entering the system, and this will be accounted for in pre-design activities.

Table 6. Prior Rehabilitation Catchment Activity

Facility ID/Project Name	Location	Corrective Action Description	Completion Date
Abatement Activities	12% of the Catchment	Manhole Inserts Installed	Completion Date Unknown
Prompt Repairs	Throughout Catchment	3 Lateral Repairs	Completion Date Unknown

6. R/R Cost Estimate

For this catchment, the R/R costs assume comprehensive rehabilitation of public pipes, public manholes and public sewer laterals. Original assumptions used to derive the single-family residential and NSF component of the rehabilitation plan are described in the 2016 *I/I Reduction Plan Framework.*

The 2025 *Comprehensive II Reduction Plan* was developed as part of the HPIIRP and included revisions to RWWMP assumptions in order to provide estimates reflective of currently ongoing field investigations and observed impacts to potential rehabilitation scope. Assumption modifications included:

- Private SF laterals are not included in rehab scope
- Due to active SSES efforts within public assets, additional investigation costs included for NSF only
- Public Side Lateral Replacement/Rehabilitation ratio of 40%/60% assumed for all plan types
- Public asset Replacement/Rehabilitation ratio of 25%/75% assumed for all plan types

Planning level cost estimates have been updated to reflect 2025 unit prices with the anticipated R/R scope of work. Section 5 of the 2025 Comprehensive II Reduction Plan summarizes the basis of the revised R/R cost estimate. These costs are planning-level estimates only and actual completed costs will vary.

Table 7. Estimated Predesign Investigation, Design and Construction Costs, Catchment CHES-016

Category	Quantity in R/R Scope	Estimated Cost, $
NSF Private Assets		
Pre-Design SSES, Feet[1]	19,765	$483,900
Private NSF Sewer R/R, Feet	6,956	$1,822,500
Private NSF Lateral R/R, Feet	6,880	$1,031,900
Private NSF Manhole R/R, count	44	$877,800
Pavement Restoration, Lane-Miles	1	$148,200
Engineering and Contingency	NA	$2,531,400
Total NSF R/R		**$6,895,700**
Private SF Lateral R/R, feet		
Footage of SF Lateral in R/R Scope	0	NA
Pre-Rehab Investigation, Feet[2]	0	$0
Private SF Lateral Replacement, Feet[3]	0	$0
Engineering and Contingency	NA	$0
Total SF Lateral R/R		**$0**
Public Sewer System Assets		
Pre-Design SSES, Feet	NA	$0
Public Sewer R/R, feet	30,358	$5,563,100
Public Lateral R/R, feet	12,975	$2,875,300
Manhole R/R, count	153	$2,742,500
Pavement Restoration, Lane-Miles	3	$675,000
Public Sewer System R/R Cost Subtotal	NA	$11,855,900
Engineering and Contingency	NA	$5,809,400
Total Public Asset R/R		**$17,665,300**
Total Rehab Plan		**$24,561,000**

Notes:

1. Includes Flow Monitoring and Inspection

2. Assumes 70% participation based on total length of laterals in R/R scope

3. Assumes 25% failure rate for tested laterals

7. Post Rehabilitation I/I Reduction Target

I/I was proportioned to public sewer assets, single family residential laterals, and NSF sanitary sewer assets in accordance with the equivalent length of assets shown on Table 2. Post-rehabilitation I/I reduction was estimated for the percentage of assets included in the R/R scope as described in the *I/I Reduction Plan Framework* document. Table 8 summarizes the I/I reduction target and post-rehabilitation 10-year peak I/I flow for this catchment.

It is assumed that current flow data, I/I abatement, and rehabilitation activities will be reviewed and updated during predesign activities to confirm assumptions in this planning document.

Table 8. Post-Rehabilitation I/I Reduction Estimate

	Public Sewer System	Private Single Family Laterals	Private Non-Single Family
Percent of System assumed in R/R Scope	100%	0%	49%
10-Year Peak I/I, GPD	2,725,208	862,409	2,124,499
Estimated 10-Year Peak I/I Flow Reduction, GPD	1,907,646	0	879,614
Estimated 10-Year Peak I/I Post-Rehab Flow, GPD	817,562	862,409	1,244,885
Total 10-Year Peak I/I Reduction Target	2,787,260 GPD (49%)		
Total 10-Year Peak I/I Post-Rehab Flow Target, GPD	2,924,856		

8. References

This Plan was developed based on information provided in the sources referenced below.

1. City of Chesapeake, CCTV database files “Ches_PACP_DBs”, provided July 2014
2. City of Chesapeake, “Condition Assessment Data” geodatabase, provided February 2014
3. Draft City of Chesapeake Condition Assessment Report & Rehabilitation Plan Sewer Basin 16, Greeley and Hansen, no report date specified
4. City of Chesapeake Locality Hydraulic Model Capacity Assessment, Greeley and Hansen, July 31, 2012
5. City of Chesapeake Hydraulic Model Report, Greeley and Hansen, December 15, 2011
6. City of Chesapeake Flow Evaluation Report, Greeley and Hansen, June 26, 2009
7. City of Chesapeake Sanitary Sewer Evaluation Survey (SSES) Plan Report, Greeley and Hansen, June 26, 2009
8. Flow Parameter Database developed by Localities, compiled by CDM-Smith, November 2015
9. Regional GIS Database, October 2014

9. Limitations

This document was prepared solely for HRSD in accordance with professional standards at the time the services were performed and in accordance with the contract between HRSD and Brown and Caldwell dated April 22, 2014. This document is governed by the specific scope of work authorized

by HRSD; it is not intended to be relied upon by any other party. We have relied on information or instructions provided by HRSD and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Catchment Specific
I/I Reduction Plan

Rehab Area ID: JCSA-LSA3-1
Catchment HSAID: JCSA-003-1
Location: James City County, Virginia
Plan Type: Comprehensive

Prepared for
HRSD
March 2016
Cost Revision August 2025
R/R Assumptions Revised August 2025

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1. Summary

This Inflow and Infiltration (I/I) Reduction Plan (Plan) provides a basis for planning future field investigation, design, construction and I/I reduction associated with the rehabilitation/replacement (R/R) of the sanitary sewer in Catchment JCSA-003-1. The purpose of this Plan is to provide a conceptual level assessment of the anticipated R/R scope and cost, and a quantification of the resulting I/I reduction that can be expected in this catchment. The following information is provided herein:

- Catchment overview
- Summary of available condition assessment data
- Previous rehabilitation activities (if available)
- Basis for R/R scope and estimated costs
- Flow characterization and post-rehabilitation I/I reduction estimate.

The *HRSD RWWMP Sanitary Sewer I/I Reduction Plan Framework* (Brown and Caldwell, March 2016) documents definitions and basic assumptions associated with the development of this planning document. The 2025 Comprehensive II Reduction Plan, developed as part of the High-Priority I/I Reduction Program (HPIIRP), includes revisions to some of these original assumptions to further refine planning level project estimates.

The Comprehensive Scoping Approach has been applied for this catchment due to the relative density of I/I in the catchment (as expressed in gallons per acre per day). The comprehensive approach estimates funding to address all public assets in the R/R scope. The approach establishes a target I/I reduction of 70% of the public portion of existing peak I/I.

Private assets associated with Non-Single Family (NSF) parcels greater than one acre were included in the R/R scope of work.

Table 1 presents the R/R planning estimates that were derived using the Comprehensive Scoping Approach for this catchment.

Table 1. Post-Rehabilitation I/I Reduction Estimate and Cost-Effectiveness

	Public Sewer System R/R	Private Single Family Lateral R/R	Private Non-Single Family R/R	Total
Major Inflow Sources in R/R Scope	Yes	Unknown	Unknown	
Percent of System in R/R Scope	100%	0%	49%	
Estimated Peak 10-Year I/I, GPD	3,894,122	1,240,588	1,460,320	6,595,030
Peak Flow Reduction Target, GPD	2,725,885	0	608,580	3,334,465
Target Peak Flow Reduction, Percent of Available I/I by Asset Type	70%	0%	42%	51%
Estimated Investigation, Design and Construction Costs	$34,846,100	$0	$7,411,700	$42,257,800
I/I Removal Cost-Effectiveness, $/GPD Removed	$12.78	NA	$12.18	$12.67

2. Catchment Location and Asset Inventory

Catchment JCSA-003-1 is located in Southern James City County. The predominant land use is high density residential and commercial. This catchment receives flow from upstream catchment JCSA-

007-5, JCSA-003-5, JCSA-008-1, and JCSA-004-5, via locality lift station and force main. Catchment JCSA-003-1 flows via gravity to terminal station JCSA-PS-003-1. Table 2 presents the inventory of known publicly owned gravity collection pipes, manholes, and laterals in JCSA-003-1. Additionally, Private Single Family and Private NSF sanitary sewer assets were estimated using assumptions and GIS to approximate the distribution of peak I/I flow across asset types.

Table 2. System Characteristics, Catchment JCSA-003-1

	Public[1]	Private Single Family	Private Non Single Family	Private Non Single Family > 1 Acre	Total
Gravity System Length, Feet	62,204	NA	23,530	18,536	85,734
Lateral Length, Feet[2]	17,275	28,377	6,560	6,560	52,212
Number of Mainline Cleanouts	5	NA	NA	NA	5
Number of Manholes	362	NA	125	125	487
Equivalent Length, Feet	89,072	28,377	33,403	28,409	150,851
I/I Distribution %	59%	19%	22%	19%	100%

1. Public manhole and gravity main information from Locality GIS submittals dated October 2014

2. See I/I Reduction Plan Framework for details on the calculation of lateral length and equivalent length

3. Summary of SSES Activities

Asset specific condition assessment data in this catchment were not utilized in development of the R/R scope of work because comprehensive rehabilitation was assumed. However, Table 3 provides a summary of previous condition assessment data available as of the 2016 original date of this report. Condition data may include the results of smoke testing, night flow isolations, manhole inspections, CCTV, and historical records. Condition findings are presented graphically in Figure 2.

HPIIRP assessment activities, in progress in 2025, are not included in this report. New field data will be applied in the near-term future to develop updated I/I rehabilitation scopes and inform design efforts.

Note that the sanitary sewer information shown in the figure, including sewer mains, manholes and catchment boundaries, was provided to HRSD by each Locality. Localities continue to refine this information, and future activities within this catchment should incorporate the most recent data available at that time. Further, revisions to Locality GIS information may alter the R/R scope and/or I/I reduction estimate presented in this Plan.

Table 3. Public Sewer System Condition Data Summary

SSES Investigation	Percent of Catchment Investigated
Smoke Testing	100%
Manhole Inspections/Checks	88%
CCTV	58%

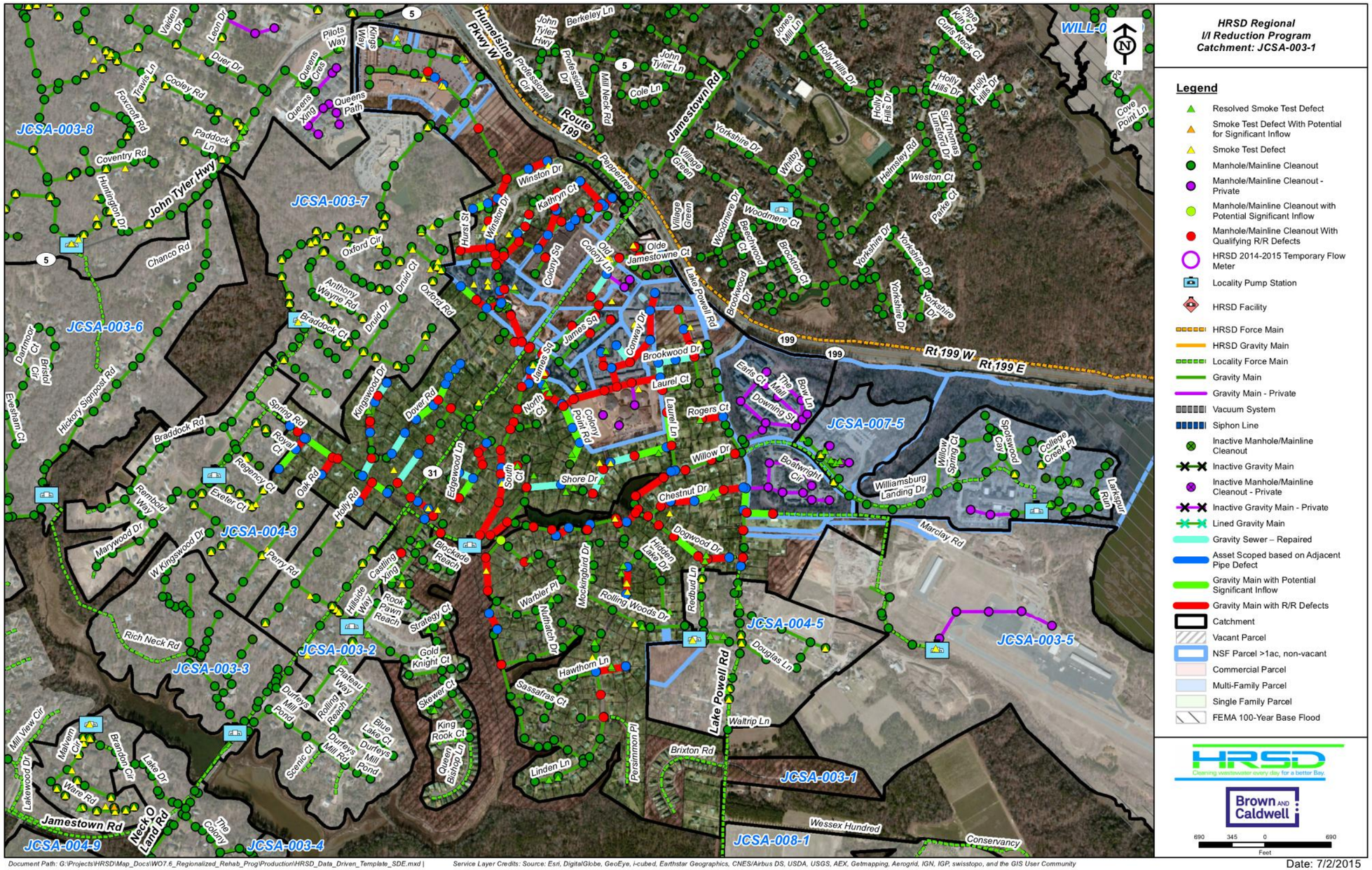


Figure 1. JCSA-003-1 Existing Asset Condition Data Summary

The above Map is for general reference only, and should not be relied upon for design efforts.

4. Catchment Flow Characteristics

Flow monitoring was conducted by JCSA at Pump Station JCSA-PS-003-1 using a temporary flow meter. The rainfall events that were used to calibrate RTK hydrologic parameters for this catchment occurred between June 2008 and September 2008.

Tables 4 and 5 depict the catchment hydrologic characteristics as represented in the Flow Parameter Database and RHM. The 10-year peak flow was derived from hydrographs generated by applying the RTK hydrologic parameters to a 4-hour design storm event, considered representative of a rain event that would induce regional 10-year flow conditions. For each catchment, long term statistical simulations have been analyzed to compare 10-year Log Pearson III (LPIII) return flows to the peak flows resulting from the design event to obtain a scaling factor. This scaling factor was then used to modify the design event hydrograph to present the pre-rehabilitation 10-year peak flow conditions for this catchment. Figure 2 presents the pre-rehabilitation 10-year peak I/I flow hydrograph for the catchment as represented by the HRSD 10-year design storm with scaling factors applied.

Table 4. Catchment JCSA-003-1 Pre-Rehabilitation Sewer Flow Characteristics

Associated Treatment Plant	WB
Sewered Area, Acres	391.4
Flow Monitored or Associated Parameters	Flow Monitored
Base Sewer Flow, GPD	197,568
Dry Weather Infiltration (DWI), GPD	0
10 Year Peak I/I, GPD	6,595,030
10 Year Peak Flow, GPD	6,792,598
I/I Density, GPAD	16,848

Table 5. Pre-Rehabilitation Hydrologic Parameters

	R	T, Hours	K
Triangle 1	0.0084	0.6000	0.600
Triangle 2	0.0092	1.800	1.200
Triangle 3	0.0150	4.000	3.700

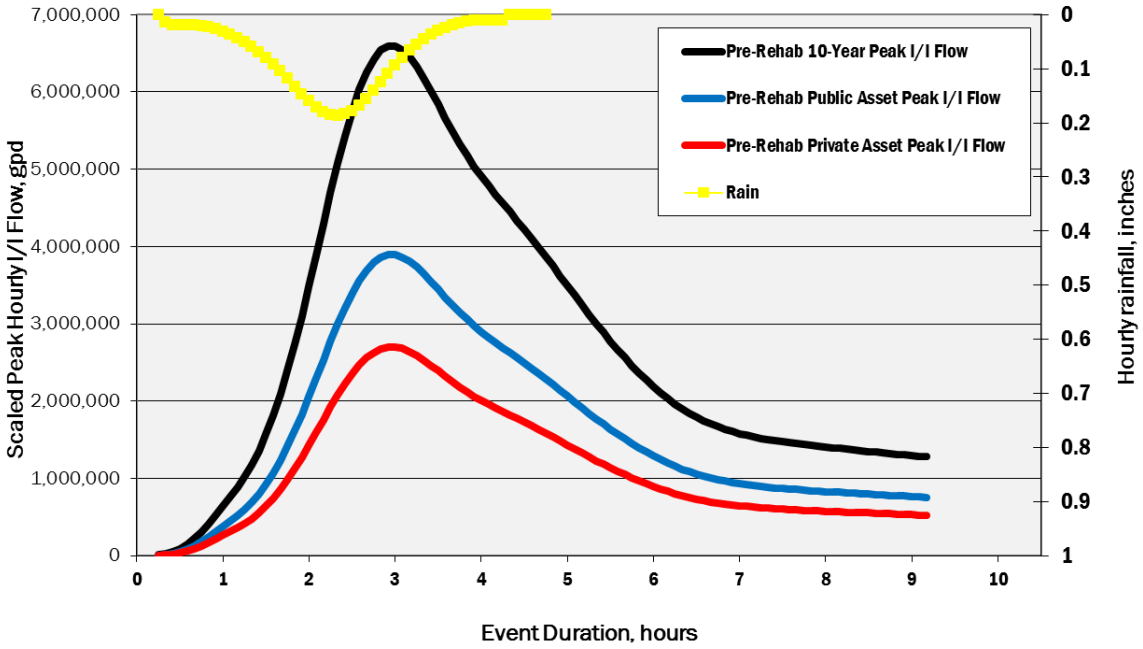


Figure 2. 10-Year Peak I/I Flow Hydrograph for JCSA-003-1

5. Summary of Prior Rehabilitation Activities

Table 6 summarizes recent known corrective actions and rehabilitation activities undertaken by the locality within this catchment as of 2016. This information is for reference only. For Comprehensive approach I/I reduction plans, defects that have been remedied have not been considered in development of post-rehabilitation I/I reduction estimates or development of the R/R scope of work, unless post-rehabilitation flow monitoring data were available at the time of this report. It is assumed that future investigations will determine whether these actions have resulted in the removal of I/I entering the system, and this will be accounted for in pre-design activities.

Table 6. Prior Rehabilitation Catchment Activity

Facility ID/Project Name	Location	Corrective Action Description	Completion Date
Unknown	Throughout Catchment	17 Pipe Segments Repaired	Unknown

6. R/R Cost Estimate

For this catchment, the R/R costs assume comprehensive rehabilitation of public pipes, public manholes and public sewer laterals. Original assumptions used to derive the single-family residential and NSF component of the rehabilitation plan are described in the 2016 *I/I Reduction Plan Framework*.

The 2025 *Comprehensive II Reduction Plan* was developed as part of the HPIIRP and included revisions to RWWMP assumptions in order to provide estimates reflective of currently ongoing field investigations and observed impacts to potential rehabilitation scope. Assumption modifications included:

- Private SF laterals are not included in rehab scope
- Due to active SSES efforts within public assets, additional investigation costs included for NSF only

- Public Side Lateral Replacement/Rehabilitation ratio of 40%/60% assumed for all plan types
- Public asset Replacement/Rehabilitation ratio of 25%/75% assumed for all plan types

Planning level cost estimates have been updated to reflect 2025 unit prices with the anticipated R/R scope of work. Section 5 of the 2025 Comprehensive II Reduction Plan summarizes the basis of the revised R/R cost estimate. These costs are planning-level estimates only and actual completed costs will vary.

Table 7. Estimated Predesign Investigation, Design and Construction Costs, Catchment JCSA-003-1

Category	Quantity in R/R Scope	Estimated Cost, $
NSF Private Assets		
Pre-Design SSES, Feet[1]	17,567	$412,400
Private NSF Sewer R/R, Feet	9,083	$2,379,700
Private NSF Lateral R/R, Feet	3,214	$482,200
Private NSF Manhole R/R, count	61	$1,217,000
Pavement Restoration, Lane-Miles	0.9	$193,500
Engineering and Contingency	NA	$2,726,900
Total NSF R/R		**$7,411,700**
Private SF Lateral R/R, feet		
Footage of SF Lateral in R/R Scope	0	NA
Pre-Rehab Investigation, Feet[2]	0	$0
Private SF Lateral Replacement, Feet[3]	0	$0
Engineering and Contingency	NA	$0
Total SF Lateral R/R		**$0**
Public Sewer System Assets		
Pre-Design SSES, Feet	NA	$0
Public Sewer R/R, feet	62,204	$11,630,000
Public Lateral R/R, feet	17,275	$3,828,100
Manhole R/R, count	367	$6,578,500
Pavement Restoration, Lane-Miles	6	$1,350,000
Public Sewer System R/R Cost Subtotal	NA	$23,386,600
Engineering and Contingency	NA	$11,459,500
Total Public Asset R/R		**$34,846,100**
Total Rehab Plan		**$42,257,800**

Notes:

1. Includes Flow Monitoring and Inspection

2. Assumes 70% participation based on total length of laterals in R/R scope

3. Assumes 25% failure rate for tested laterals

7. Post Rehabilitation I/I Reduction Target

I/I was proportioned to public sewer assets, single family residential laterals, and NSF sanitary sewer assets in accordance with the equivalent length of assets shown on Table 2. Post-rehabilitation I/I reduction was estimated for the percentage of assets included in the R/R scope as described in the *I/I Reduction Plan Framework* document. Table 8 summarizes the I/I reduction target and post-rehabilitation 10-year peak I/I flow for this catchment.

It is assumed that current flow data, I/I abatement, and rehabilitation activities will be reviewed and updated during predesign activities to confirm assumptions in this planning document.

Table 8. Post-Rehabilitation I/I Reduction Estimate

	Public Sewer System	Private Single Family Laterals	Private Non-Single Family
Percent of System assumed in R/R Scope	100%	0%	49%
10-Year Peak I/I, GPD	3,894,122	1,240,588	1,460,320
Estimated 10-Year Peak I/I Flow Reduction, GPD	2,725,885	0	608,580
Estimated 10-Year Peak I/I Post-Rehab Flow, GPD	1,168,237	1,240,588	851,740
Total 10-Year Peak I/I Reduction Target	3,334,465 GPD (51%)		
Total 10-Year Peak I/I Post-Rehab Flow Target, GPD	3,260,565		

8. References

This Plan was developed based on information provided in the sources referenced below.

1. JCSA, CCTV database files “hrsdcctv”, provided by JCSA, January 2014
2. JCSA, “Condition Assessment Data” geodatabase, provided January 2014
3. JCSA Capacity Assessment Report, James City Service Authority, 2012
4. JCSA Flow Evaluation Report, James City Service Authority, May 26, 2009
5. JCSA Sanitary Sewer Evaluation Survey (SSES) Basin Assessment, JCSA, June, 2009
6. Flow Parameter Database developed by Localities, compiled by CDM-Smith, November 2015
7. Regional GIS Database, October 2014
8. Updated Catchment GIS Database, compiled by CDM-Smith, May 2015

9. Limitations

This document was prepared solely for HRSD in accordance with professional standards at the time the services were performed and in accordance with the contract between HRSD and Brown and Caldwell dated April 22, 2014. This document is governed by the specific scope of work authorized by HRSD; it is not intended to be relied upon by any other party. We have relied on information or instructions provided by HRSD and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Catchment Specific
I/I Reduction Plan

Rehab Area ID: JCSA-LSA3-6
Catchment HSAID: JCSA-003-6
Location: James City County, Virginia
Plan Type: Data Driven

Prepared for
HRSD
March 2016
Cost Revised August 2025
R/R Assumptions Revised August 2025

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1. Summary

This Inflow and Infiltration (I/I) Reduction Plan (Plan) provides a basis for planning future field investigation, design, construction and I/I reduction associated with the rehabilitation/replacement (R/R) of the sanitary sewer in Catchment JCSA-003-6. The purpose of this Plan is to provide a conceptual level assessment of the anticipated R/R scope and cost, and a quantification of the resulting I/I reduction that can be expected in this catchment. The following information is provided herein:

- Catchment overview
- Summary of available condition assessment data
- Previous rehabilitation activities (if available)
- Basis for R/R scope and estimated costs
- Flow characterization and post-rehabilitation I/I reduction estimate.

The *HRSD RWWMP Sanitary Sewer I/I Reduction Plan Framework* (Brown and Caldwell, March 2016) documents definitions and basic assumptions associated with the development of this planning document. The 2025 Comprehensive II Reduction Plan, developed as part of the High-Priority I/I Reduction Program (HPIIRP), includes revisions to some of these original assumptions to further refine planning level project estimates.

The Data Driven Scoping Approach has been used for this catchment. The Data Driven Approach was employed when asset condition data were sufficient to identify system defects and estimate an I/I reduction target for the catchment.

This catchment did not meet the criteria for Private Non-Single Family (NSF) R/R, therefore no NSF sanitary sewer assets were included in the R/R cost estimate. Table 1 presents the R/R planning estimates that are derived using the Data Driven Scoping Approach for this catchment.

Table 1. Post-Rehabilitation I/I Reduction Estimate and Cost-Effectiveness

	Public Sewer System R/R	Private Single Family Lateral R/R	Private Non-Single Family R/R	Total
Major Inflow Sources in R/R Scope	Yes	Unknown	Unknown	
Percent of System in R/R Scope	34%	0%	0%	
Estimated Peak 10-Year I/I, GPD	1,150,008	597,574	42,996	1,790,578
Peak Flow Reduction Target, GPD	272,197	0	0	272,197
Target Peak Flow Reduction, Percent of Available I/I by Asset Type	24%	0%	0%	15%
Estimated Investigation, Design and Construction Costs	$4,881,200	$0	$0	$4,881,200
I/I Removal Cost-Effectiveness, $/GPD Removed	$17.93	NA	NA	$17.93

2. Catchment Location and Asset Inventory

Catchment JCSA-003-6 is located in southwest Williamsburg. The primary land use is medium density residential. This catchment receives flow from upstream catchment JCSA-003-8 via locality lift station and force main. Catchment JCSA-003-6 discharges to a gravity main in the downstream catchment JCSA-003-3 via locality lift station and force main.

Table 2 presents the inventory of known public gravity collection pipes, manholes, and laterals. Additionally, Private Single Family and Non-Single Family (NSF) sanitary sewer assets were estimated using assumptions and GIS to approximate the distribution of peak I/I flow across asset types.

Table 2. System Characteristics, Catchment JCSA-003-6

	Public[1]	Private Single Family	Private Non Single Family	Private Non Single Family > 1 Acre	Total
Gravity System Length, Feet	24,345	NA	1,131	949	25,477
Lateral Length, Feet	9,025	19,048	80	80	28,153
Number of Mainline Cleanouts	0	NA	NA	NA	0
Number of Manholes	124	NA	6	6	130
Equivalent Length, Feet[2]	36,656	19,048	1,370	1,188	57,075
I/I Distribution %	64%	33%	2%	2%	100%

1. Public manhole and gravity main information from Locality GIS submittals dated October 2014

2. See I/I Reduction Plan Framework for details on the calculation of lateral length and equivalent length

3. Summary of SSES Activities

Where available, condition assessment data were provided by the locality to facilitate R/R planning. Condition data may include the results of smoke testing, night flow isolations, manhole inspections, CCTV, and historical records, and prompt repair documentation. Table 3 provides a summary of available condition assessment data as of 2016. A summary of available condition data is presented graphically in Figure 2.

Table 3. Public Sewer System Condition Data Summary

SSES Investigation	Percent of Catchment Investigated
Smoke Testing	100%
Manhole Inspections/Checks	82%
CCTV	46%

Condition assessment data in this catchment were deemed sufficient to facilitate data-driven rehabilitation planning. The R/R scope and estimated costs presented in Section 6 were developed based on the previously available condition data.

HPIIRP assessment activities, in progress in 2025, are not included in this report. New field data will be applied in the near-term future to develop updated I/I rehabilitation scopes and inform design efforts.

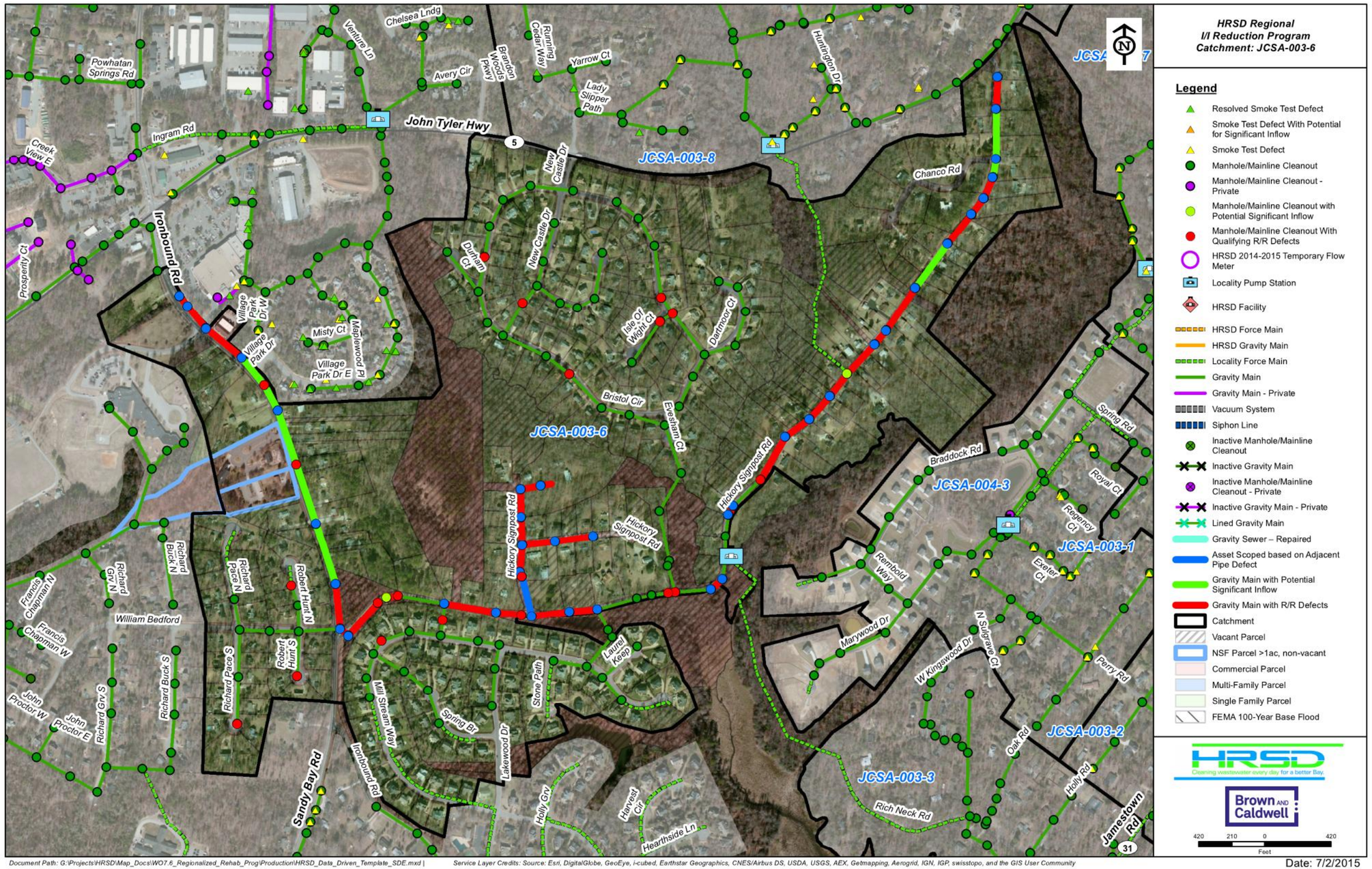


Figure 1. Existing Asset Condition Data Summary, JCSA-003-6

The above Map is for general reference only, and should not be relied upon for design efforts.

4. Catchment Flow Characteristics

Flow monitoring was conducted by JCSA at Pump Station JCSA-PS-003-6 using an algorithm to relate flow to pump speed and pressure. Tables 4 and 5 depict the catchment hydrologic characteristics as represented in the Flow Parameter Database and RHM.

The 10-year peak flow was derived from hydrographs generated by applying the RTK hydrologic parameters to a 4-hour design storm event, considered representative of a rain event that would induce regional 10-year flow conditions. For each catchment, long term statistical simulations have been analyzed to compare 10-year Log Pearson III (LPIII) return flows to the peak flows resulting from the design event to obtain a scaling factor. This scaling factor was then used to modify the design event hydrograph to present the pre-rehabilitation 10-year peak flow conditions for this catchment. Figure 2 presents the pre-rehabilitation 10-year peak I/I flow hydrograph for the catchment as represented by the HRSD 10-year design storm with scaling factors applied.

Table 4. Sewer Flow Characteristics, JCSA-003-6

Associated Treatment Plant	Williamsburg
Sewered Area, Acres	252.9
Flow Monitored or Associated Parameters	Flow Monitored
Base Sewer Flow, GPD	31,493
Dry Weather Infiltration (DWI), GPD	0
10-Year Peak I/I, GPD	1,790,578
10-Year Peak Flow, GPD	1,822,071
I/I Density, GPAD	7,080

Table 5. Pre-Rehabilitation Hydrologic Parameters

	R	T, Hours	K
Triangle 1	0.0063	1.700	1.000
Triangle 2	0.0052	3.400	2.700
Triangle 3	0.0037	5.000	5.000

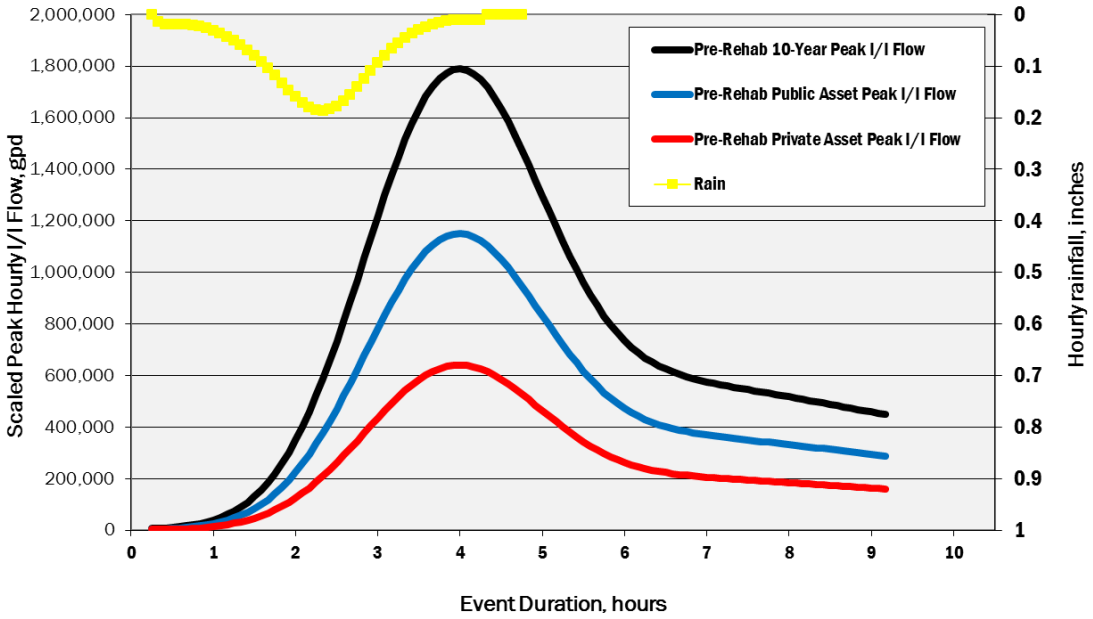


Figure 2. 10-Year Peak I/I Flow Hydrograph for JCSA-003-6

5. Summary of Prior Rehabilitation Activities

Table 6 summarizes known corrective actions and rehabilitation activities undertaken by the locality within this catchment as of 2016. Assets with defects that were remedied after the date of original flow monitoring and/or SSES efforts were not included in the R/R scope and cost estimate. Inflow abatement activities (i.e., installation of manhole inserts and/or cleanout caps) were not considered adequate repair methods to fully address identified defects. However, these measures may have reduced the I/I since the initial flow monitoring, and the effectiveness should be evaluated as part of pre-design activities.

Table 6. Prior Rehabilitation Catchment Activity

Facility ID/Project Name	Location	Corrective Action Description	Completion Date
NA	NA	NA	NA

6. R/R Scope and Cost Estimate

For this catchment, the R/R scope and cost estimate was driven by condition data which identify sanitary sewer assets that are likely to contribute I/I to the regional sanitary sewer system. Original assumptions used to derive the single-family residential and NSF component of the rehabilitation plan are described in the 2016 *I/I Reduction Plan Framework.*

The 2025 *Comprehensive II Reduction Plan* was developed as part of the HPIIRP and included revisions to RWWMP assumptions in order to provide estimates reflective of currently ongoing field investigations and observed impacts to potential rehabilitation scope. Assumption modifications included:

- Private SF laterals are not included in rehab scope
- Due to active SSES efforts within public assets, additional investigation costs included for NSF only
- Public Side Lateral Replacement/Rehabilitation ratio of 40%/60% assumed for all plan types
- Public asset Replacement/Rehabilitation ratio of 25%/75% assumed for all plan types

Planning level cost estimates have been updated to reflect 2025 unit prices with the assumed R/R scope of work. Section 5 of the 2025 Comprehensive II Reduction Plan summarizes the basis of the revised R/R cost estimate. These costs are planning-level estimates only and actual completed costs will vary.

Table 7. Estimated Predesign Investigation, Design and Construction Costs, JCSA-003-6

Category	Quantity in R/R Scope	Estimated Cost, $
NSF Private Assets		
Pre-Design SSES, Feet[1]	NA	NA
Private NSF Sewer R/R, Feet	NA	NA
Private NSF Lateral R/R, Feet	NA	NA
Private NSF Manhole R/R, count	NA	NA
Pavement Restoration, Lane-Miles	NA	NA
Engineering and Contingency	NA	NA
Total NSF R/R		**$0**
Private SF Lateral R/R, feet		
Footage of SF Lateral in R/R Scope	0	NA
Pre-Rehab Investigation, Feet[2]	0	$0
Private SF Lateral Replacement, Feet[3]	0	$0
Engineering and Contingency	NA	$0
Total SF Lateral R/R		**$0**
Public Sewer System Assets		
Pre-Design SSES, Feet	NA	$0
Public Sewer R/R, feet	8,456	$1,579,600
Public Lateral R/R, feet	2,375	$526,300
Manhole R/R, count	59	$1,057,600
Pavement Restoration, Lane-Miles	0.5	$112,500
Public Sewer System R/R Cost Subtotal	NA	$3,276,000
Engineering and Contingency	NA	$1,605,200
Total Public Asset R/R		**$4,881,200**
Total Rehab Plan		**$4,881,200**

Notes:

1. Includes Flow Monitoring and Inspection

2. Assumes 70% participation based on total length of laterals in R/R scope

3. Assumes 25 percent failure rate for tested laterals

7. Post Rehabilitation I/I Reduction

I/I is proportioned to public sewer assets, single family residential laterals, and NSF sanitary sewer assets in accordance with the equivalent length of assets shown on Table 2. Post-rehabilitation I/I reduction is estimated for the percentage of assets included in the R/R scope as described in the HRSD RWWMP Rehabilitation Framework document. Table 8 summarizes the estimated I/I reduction and post-rehabilitation 10-year peak I/I flow for this catchment.

Table 8. Post-Rehabilitation I/I Reduction Estimate

	Public Sewer System	Private Single Family Laterals	Private Non-Single Family
Percent of System assumed in R/R Scope	34%	0%	0%
10-Year Peak I/I, GPD	1,150,008	597,574	42,996
Estimated 10-Year Peak I/I Flow Reduction, GPD	272,197	0	0
Estimated 10-Year Peak I/I Post-Rehab Flow, GPD	877,811	597,574	42,996
Total 10-Year Peak I/I Reduction Target	272,197 GPD (15%)		
Total 10-Year Peak I/I Post-Rehab Flow Target, GPD	1,518,381		

8. References

This Plan was developed based on information provided in the sources referenced below.

1. JCSA, CCTV database files “hrsdcctv”, provided by JCSA, January 2014
2. JCSA, “Condition Assessment Data” geodatabase, provided January 2014
3. JCSA Capacity Assessment Report, James City Service Authority, 2012
4. JCSA Flow Evaluation Report, James City Service Authority, May 26, 2009
5. JCSA Sanitary Sewer Evaluation Survey (SSES) Basin Assessment, JCSA, June, 2009
6. Flow Parameter Database developed by Localities, compiled by CDM-Smith, November 2015
7. Regional GIS Database, October 2014
8. Updated Catchment GIS Database, compiled by CDM-Smith, May 2015

9. Limitations

This document was prepared solely for HRSD in accordance with professional standards at the time the services were performed and in accordance with the contract between HRSD and Brown and Caldwell dated April 22, 2014. This document is governed by the specific scope of work authorized by HRSD; it is not intended to be relied upon by any other party. We have relied on information or instructions provided by HRSD and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Catchment Specific
I/I Reduction Plan

Catchment HSAID: JCSA-003-8
Location: James City County, Virginia
Plan Type: Comprehensive

Prepared for
HRSD
March 2016
Cost, Flow, and Plan Type Revision August 2025
R/R Assumptions Revised August 2025

Brown AND Caldwell
301 Bendix Road, Suite 400
Virginia Beach, VA 23452

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1. Summary

This Inflow and Infiltration (I/I) Reduction Plan (Plan) provides a basis for planning future field investigation, design, construction and I/I reduction associated with the rehabilitation/replacement (R/R) of the sanitary sewer in Catchment JCSA-003-8. The purpose of this Plan is to provide a conceptual level assessment of the anticipated R/R scope and cost, and a quantification of the resulting I/I reduction that can be expected in this catchment. The following information is provided herein:

- Catchment overview
- Summary of available condition assessment data
- Previous rehabilitation activities (if available)
- Basis for R/R scope and estimated costs
- Flow characterization and post-rehabilitation I/I reduction estimate.

The *HRSD RWWMP Sanitary Sewer I/I Reduction Plan Framework* (Brown and Caldwell, March 2016) documents definitions and basic assumptions associated with the development of this planning document. The 2025 Comprehensive II Reduction Plan, developed as part of the High-Priority I/I Reduction Program (HPIIRP), includes revisions to some of these original assumptions to further refine planning level project estimates.

The Comprehensive Scoping Approach has been applied for this catchment due to the relative density of I/I within the area (as expressed in gallons per acre per day). The comprehensive approach estimates funding to address all public assets in the R/R scope. The approach establishes a target I/I reduction of 70% of the public portion of existing peak I/I.

This catchment did not meet the criteria for R/R associated with private Non-Single Family assets (NSF), therefore there were no NSF assets included in the R/R cost estimate.

Table 1 presents the R/R planning estimates that were derived using the Comprehensive Scoping Approach for this catchment.

Table 1. Post-Rehabilitation I/I Reduction Estimate and Cost-Effectiveness

	Public Sewer System R/R	Private Single Family Lateral R/R	Private Non-Single Family R/R	Total
Major Inflow Sources in R/R Scope	Yes	Unknown	Unknown	
Percent of System in R/R Scope	100%	0%	0%	
Estimated Peak 10-Year I/I, GPD	3,035,901	1,166,382	364,717	4,567,000
Peak Flow Reduction Target, GPD	2,125,131	0	NA	2,125,131
Estimated Peak Flow Reduction, Percent of Peak I/I Allocated to Asset Type	70%	0%	0%	47%
Estimated Investigation, Design and Construction Costs	$30,070,900	$0	$0	$30,070,900
I/I Removal Cost-Effectiveness, $/GPD Removed	$14.15	NA	NA	$14.15

2. Catchment Location and Asset Inventory

Catchment JCSA-003-8 is located in Western Williamsburg. The primary land use is medium density residential. This catchment does not receive flow from any upstream catchments and is pumped via locality force main to a gravity main in the downstream catchment JCSA-003-6.

Table 2 presents the inventory of known publicly owned gravity collection pipes, manholes, and laterals. Additionally, Private Single Family and Private NSF sanitary sewer assets were estimated using assumptions and GIS to approximate the distribution of peak I/I across asset types.

Note that the sanitary sewer information, including sewer mains, manholes and catchment boundaries, was provided to HRSD by each Locality. Localities continue to refine this information, and future activities within this catchment should incorporate the most recent data available at that time. Future revisions to Locality GIS information may alter the R/R scope and/or I/I reduction estimate presented in this Plan.

Table 2. System Characteristics, Catchment JCSA-003-8

	Public[1]	Private Single Family	Private Non Single Family	Private Non Single Family > 1 Acre	Total
Gravity System Length, Feet[1]	55,038	NA	7,333	6,879	62,371
Lateral Length, Feet[2]	14,900	29,995	960	960	45,855
Number of Mainline Cleanouts		NA	NA	NA	
Number of Manholes	307	NA	41	41	348
Equivalent Length, Feet	78,073	29,995	9,379	8,926	117,448
I/I Distribution %	66%	26%	8%	8%	100%

1. Public manhole and gravity main information from Locality GIS submittals; inclusive of active locality owned assets only

2. See I/I Reduction Plan Framework for details on the calculation of lateral length and equivalent length

3. Summary of SSES Activities

Asset specific condition assessment data in this catchment was not utilized in development of the R/R scope of work because comprehensive rehabilitation was assumed. Recent CCTV and MACP Inspections were conducted between March and May 2025 throughout public assets for JSCA-LSA3-8. Detailed defect information from updated condition assessments for this service area will be used to inform future design efforts. Condition assessment summaries and re-evaluated R/R identification will be addressed in further detail in the Preliminary I/I Reduction Plan documentation.

Table 3. Public Sewer System Condition Data Summary

SSES Investigation	2016 Percent Investigated[1]	2025 Percent Investigated[1]
Smoke Testing	100%	N/A
Manhole Inspections/Checks	86%	100%
CCTV	36%	98%

1. Inclusive of Active Locality owned assets only

4. Catchment Flow Characteristics

Flow monitoring was initially conducted by JCSA at Pump Station JCSA-PS-003-8 using an algorithm to relate flow to pump speed and pressure. As part of the High-Priority I/I Reduction Program and pre-design efforts, revised flow monitoring for this catchment was conducted by HRSD in 2025, using temporary gravity flow meters.

Table 4 depicts the revised catchment hydrologic characteristics developed for JCSA-003-8. Updated RTK parameters for the 2025 temporary flow meters, JCSA-LSA3-8-001 and JCSA-LSA3-8-002, are outlined in Tables 5 and 6. The 10-year peak flow was derived from hydrographs generated by applying the RTK hydrologic parameters to a 4-hour design storm event, considered representative of a rain event that would induce regional 10-year flow conditions. For each catchment, long term statistical simulations have been analyzed to compare 10-year Log Pearson III (LPIII) return flows to the peak flows resulting from the design event to obtain a scaling factor. This scaling factor was then used to modify the design event hydrograph to present the pre-rehabilitation 10-year peak flow conditions for this catchment.

Table 4. Catchment JCSA-003-8 Pre-Rehabilitation Sewer Flow Characteristics

Associated Treatment Plant	Williamsburg
Sewered Area, Acres	442.6
Flow Monitored or Associated Parameters	Flow Monitored
Base Sewer Flow, GPD	81,800
Dry Weather Infiltration (DWI), GPD	29,700
10 Year Peak I/I, GPD	4,567,000
10 Year Peak Flow, GPD	4,678,500
I/I Density, GPAD	10,319

Table 5. JCSA-LSA3-8-001 Pre-Rehabilitation Hydrologic Parameters

	R	T, Hours	K
Triangle 1	0.005	1.2	4
Triangle 2	0.01	2	6
Triangle 3	0.015	6	12

Table 6. JCSA-LSA3-8-002 Pre-Rehabilitation Hydrologic Parameters

	R	T, Hours	K
Triangle 1	0.002	2	4
Triangle 2	0.045	1.5	6
Triangle 3	0.06	4	12

5. Summary of Prior Rehabilitation Activities

Table 6 summarizes recent known corrective actions and rehabilitation activities undertaken by the locality within this catchment as of 2016. This information is for reference only. For Comprehensive approach I/I reduction plans, defects that have been remedied have not been considered in development of post-rehabilitation I/I reduction estimates or development of the R/R scope of work. It is assumed that pre-design activities will determine current system condition and whether these past rehabilitation actions have resulted in the removal of I/I entering the system.

Table 7. Prior Rehabilitation Catchment Activity

Facility ID/Project Name	Location	Corrective Action Description	Completion Date
Abatement Activities	9 Locations	Cleanout Cap Installed	2012
Prompt Repairs	9 Locations	Manhole Repairs – Grout Leaks	2012
Point Repairs	133 Ferncliff Drive	Pipe Repair 160 LF Segment	2012

6. R/R Cost Estimate

For this catchment, the R/R costs assume comprehensive rehabilitation of public pipes, public manholes and public sewer laterals. Original assumptions used to derive the single-family residential and NSF component of the rehabilitation plan are described in the 2016 *I/I Reduction Plan Framework.*

The 2025 *Comprehensive II Reduction Plan* was developed as part of the HPIIRP and included revisions to RWWMP assumptions in order to provide estimates reflective of currently ongoing field investigations and observed impacts to potential rehabilitation scope. Assumption modifications included:

- Private SF laterals are not included in rehab scope
- Due to active SSES efforts within public assets, additional investigation costs included for NSF only
- Public Side Lateral Replacement/Rehabilitation ratio of 40%/60% assumed for all plan types
- Public asset Replacement/Rehabilitation ratio of 25%/75% assumed for all plan types

Planning level cost estimates have been updated to reflect 2025 unit prices with the anticipated R/R scope of work. Section 5 of the 2025 Comprehensive II Reduction Plan summarizes the basis of the revised R/R cost estimate. These costs are planning-level estimates only and actual completed costs will vary.

Table 8. Estimated Predesign Investigation, Design & Construction Costs, Catchment JCSA-003-8

Category	Quantity in R/R Scope	Estimated Cost, $
NSF Private Assets		
Pre-Design SSES, Feet[1]	NA	NA
Private NSF Sewer R/R, Feet	NA	NA
Private NSF Lateral R/R, Feet	NA	NA
Private NSF Manhole R/R, count	NA	NA
Pavement Restoration, Lane-Miles	NA	NA
Engineering and Contingency	NA	NA
Total NSF R/R		**$0**

Table 8. Estimated Predesign Investigation, Design & Construction Costs, Catchment JCSA-003-8		
Category	Quantity in R/R Scope	Estimated Cost, $
Private SF Lateral R/R, feet		
Footage of SF Lateral in R/R Scope	0	NA
Pre-Rehab Investigation, Feet[2]	0	$0
Private SF Lateral Replacement, Feet[3]	0	$0
Engineering and Contingency	NA	$0
Total SF Lateral R/R		**$0**
Public Sewer System Assets		
Pre-Design SSES, Feet	NA	$0
Public Sewer R/R, feet	55,038	$10,184,500
Public Lateral R/R, feet	14,900	$3,301,800
Manhole R/R, count	307	$5,503,000
Pavement Restoration, Lane-Miles	5.3	$1,192,500
Public Sewer System R/R Cost Subtotal		$20,181,800
Engineering and Contingency		$9,889,100
Total Public Asset R/R		**$30,070,900**
Total Rehab Plan		**$30,070,900**

Notes:

1. Includes Flow Monitoring and Inspection

2. Assumes 70% participation based on total length of laterals in R/R scope

3. Assumes 25% failure rate for tested laterals

7. Post Rehabilitation I/I Reduction Target

I/I was proportioned to public sewer assets, single family residential laterals, and NSF sanitary sewer assets in accordance with the equivalent length of assets shown on Table 2. Post-rehabilitation I/I reduction was estimated for the percentage of assets included in the R/R scope as described in the *I/I Reduction Plan Framework* document. Table 9 summarizes the I/I reduction target and post-rehabilitation 10-year peak I/I flow for this catchment.

It is assumed that current flow data, I/I abatement, and rehabilitation activities will be reviewed and updated during predesign activities to confirm assumptions in this planning document.

Table 9. Post-Rehabilitation I/I Reduction Estimate			
	Public Sewer System	Private Single Family Lateral	Private Non-Single Family
Percent of System assumed in R/R Scope	100%	0%	0%
10-Year Peak I/I, GPD	3,035,901	1,166,382	364,717
Estimated 10-Year Peak I/I Flow Reduction, GPD	2,125,131		0
Estimated 10-Year Peak I/I Post-Rehab Flow, GPD	910,770	1,166,382	364,717
Total 10-Year Peak I/I Reduction Target	2,125,131 GPD (47%)		
Total 10-Year Peak I/I Post-Rehab Flow Target, GPD	2,441,869		

8. References

This Plan was developed based on information provided in the sources referenced below.

1. JCSA, CCTV database files “hrsdcctv”, provided by JCSA, January 2014
2. JCSA, “Condition Assessment Data” geodatabase, provided January 2014
3. JCSA Capacity Assessment Report, James City Service Authority, 2012
4. JCSA Flow Evaluation Report, James City Service Authority, May 26, 2009
5. JCSA Sanitary Sewer Evaluation Survey (SSES) Basin Assessment, JCSA, June, 2009
6. Flow Parameter Database developed by Localities, compiled by CDM-Smith, November 2015
7. Regional GIS Database, October 2014
8. Updated Catchment GIS Database, compiled by CDM-Smith, May 2015
9. Updated RTK Parameters June 2025, Burns and McDonnell
10. PACP and MACP databases June 2025, Burns and McDonnell

9. Limitations

This document was prepared solely for HRSD in accordance with professional standards at the time the services were performed and in accordance with the contract between HRSD and Brown and Caldwell dated April 22, 2014. This document is governed by the specific scope of work authorized by HRSD; it is not intended to be relied upon by any other party. We have relied on information or instructions provided by HRSD and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Catchment Specific
I/I Reduction Plan

Catchment HSAID: YORK-JCSA-005-4
Location: York County, Virginia
Plan Type: Comprehensive

Prepared for
HRSD
March 2016
Cost Revised August 2025
R/R Assumptions Revised August 2025

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1. Summary

This Inflow and Infiltration (I/I) Reduction Plan (Plan) provides a basis for planning future field investigation, design, construction and I/I reduction associated with the rehabilitation/replacement (R/R) of the sanitary sewer in Catchment YORK-JCSA-005-4. The purpose of this Plan is to provide a conceptual level assessment of the anticipated R/R scope and cost, and a quantification of the resulting I/I reduction that can be expected in this catchment. The following information is provided herein:

- Catchment overview
- Summary of available condition assessment data
- Previous rehabilitation activities (if available)
- Basis for R/R scope and estimated costs
- Flow characterization and post-rehabilitation I/I reduction estimate.

The *HRSD RWWMP Sanitary Sewer I/I Reduction Plan Framework* (Brown and Caldwell, March 2016) documents definitions and basic assumptions associated with the development of this planning document. The 2025 Comprehensive II Reduction Plan, developed as part of the High-Priority I/I Reduction Program (HPIIRP), includes revisions to some of these original assumptions to further refine planning level project estimates.

The Comprehensive Scoping Approach has been applied for this catchment due to the relative density of I/I in the catchment (as expressed in gallons per acre per day). The comprehensive approach estimates funding to address all public assets in the R/R scope. The approach establishes a target I/I reduction of 70% of the public portion of existing peak I/I.

This catchment did not meet the criteria for R/R associated with private Non-Single Family assets (NSF), therefore no NSF assets were included in the R/R cost estimate.

Table 1 presents the R/R planning estimates that were derived using the Comprehensive Scoping Approach for this catchment.

Table 1. Post-Rehabilitation I/I Reduction Estimate and Cost-Effectiveness

	Public Sewer System R/R	Private Single Family Lateral R/R	Private Non-Single Family R/R	Total
Major Inflow Sources in R/R Scope	Yes	Unknown	Unknown	
Percent of System in R/R Scope	100%	0%	0%	
Estimated Peak 10-Year I/I, GPD	978,100	106,480	248,760	1,333,340
Peak Flow Reduction Target, GPD	684,670	0	NA	736,845
Estimated Peak Flow Reduction, Percent of Peak I/I Allocated to Asset Type	70%	0%	0%	51%
Estimated Investigation, Design and Construction Costs	$16,089,300	$0	$0	$16,089,300
I/I Removal Cost-Effectiveness, $/GPD Removed	$23.50	NA	NA	$16.10

2. Catchment Location and Asset Inventory

Catchment YORK-JCSA-005-4 is located in east York County. The primary land use is medium density residential and commercial. This catchment receives flow from upstream catchment YORK-001, and flows via lift station and force main to the HRSD Lodge Road Pump Station.

Table 2 presents the inventory of known publicly owned gravity collection pipes, manholes, and laterals in YORK-JCSA-005-4. Additionally, Private Single Family and Private NSF sanitary sewer assets were estimated using assumptions and GIS to approximate the distribution of peak I/I flow across asset types.

Table 2. System Characteristics, Catchment YORK-JCSA-005-4

	Public[1]	Private Single Family	Private Non Single Family	Private Non Single Family > 1 Acre	Total
Gravity System Length, Feet	35,622	NA	8,259	5,788	43,881
Lateral Length, Feet[2]	4,150	4,742	1,840	1,840	10,732
Number of Mainline Cleanouts		NA	NA	NA	
Number of Manholes	143	NA	37	37	180
Equivalent Length, Feet	43,562	4,742	11,079	8,608	59,383
I/I Distribution %	73%	8%	19%	14%	100%

1. Public manhole and gravity main information from Locality GIS submittals dated October 2014

2. See I/I Reduction Plan Framework for details on the calculation of lateral length and equivalent length

3. Summary of SSES Activities

Asset specific condition assessment data in this catchment were not utilized in development of the R/R scope of work because comprehensive rehabilitation was assumed. However, Table 3 provides a summary of previous condition assessment data available as of the 2016 original date of this report. Condition data may include the results of smoke testing, night flow isolations, manhole inspections, CCTV, and historical records. Condition findings are presented graphically in Figure 2.

HPIIRP assessment activities, in progress in 2025, are not included in this report. New field data will be applied in the near-term future to develop updated I/I rehabilitation scopes and inform design efforts.

Note that the sanitary sewer information shown in the figure, including sewer mains, manholes and catchment boundaries, was provided to HRSD by each Locality. Localities continue to refine this information, and future activities within this catchment should incorporate the most recent data available at that time. Further, revisions to Locality GIS information may alter the R/R scope and/or I/I reduction estimate presented in this Plan.

Table 3. Public Sewer System Condition Data Summary

SSES Investigation	Percent of Catchment Investigated
Smoke Testing	100%
Manhole Inspections/Checks	76%
CCTV	18%

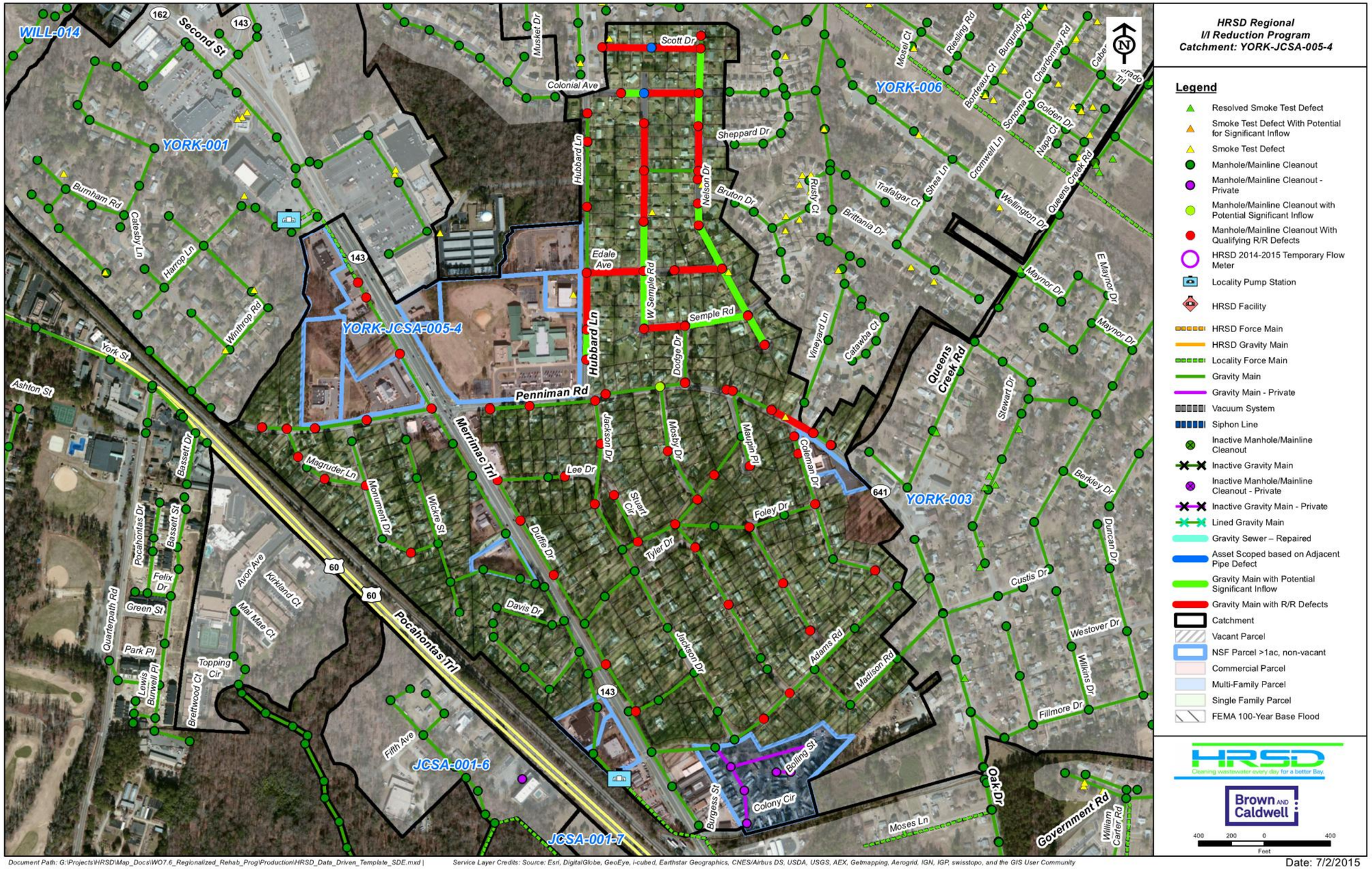


Figure 1. YORK-JCSA-005-4 Existing Asset Condition Data Summary

The above Map is for general reference only, and should not be relied upon for design efforts.

4. Catchment Flow Characteristics

Flow monitoring for this catchment was conducted in 2008 using temporary gravity flow meters. Tables 4 and 5 depict the catchment hydrologic characteristics as represented in the Flow Parameter Database and RHM.

Tables 4 and 5 depict the catchment hydrologic characteristics as represented in the Flow Parameter Database and RHM. The 10-year peak flow was derived from hydrographs generated by applying the RTK hydrologic parameters to a 4-hour design storm event, considered representative of a rain event that would induce regional 10-year flow conditions. For each catchment, long term statistical simulations have been analyzed to compare 10-year Log Pearson III (LPIII) return flows to the peak flows resulting from the design event to obtain a scaling factor. This scaling factor was then used to modify the design event hydrograph to present the pre-rehabilitation 10-year peak flow conditions for this catchment. Figure 2 presents the pre-rehabilitation 10-year peak I/I flow hydrograph for the catchment as represented by the HRSD 10-year design storm with scaling factors applied.

Table 4. Catchment YORK-JCSA-005-4 Pre-Rehabilitation Sewer Flow Characteristics

Associated Treatment Plant	Williamsburg
Sewered Area, Acres	249.4
Flow Monitored or Associated Parameters	Flow Monitored
Base Sewer Flow, GPD	78,057
Dry Weather Infiltration (DWI), GPD	1
10 Year Peak I/I, GPD	1,333,340
10 Year Peak Flow, GPD	1,411,398
I/I Density, GPAD	5,347

Table 5. Pre-Rehabilitation Hydrologic Parameters

	R	T, Hours	K
Triangle 1	0.0018	1.400	1.000
Triangle 2	0.0049	2.400	2.800
Triangle 3	0.0127	4.700	5.700

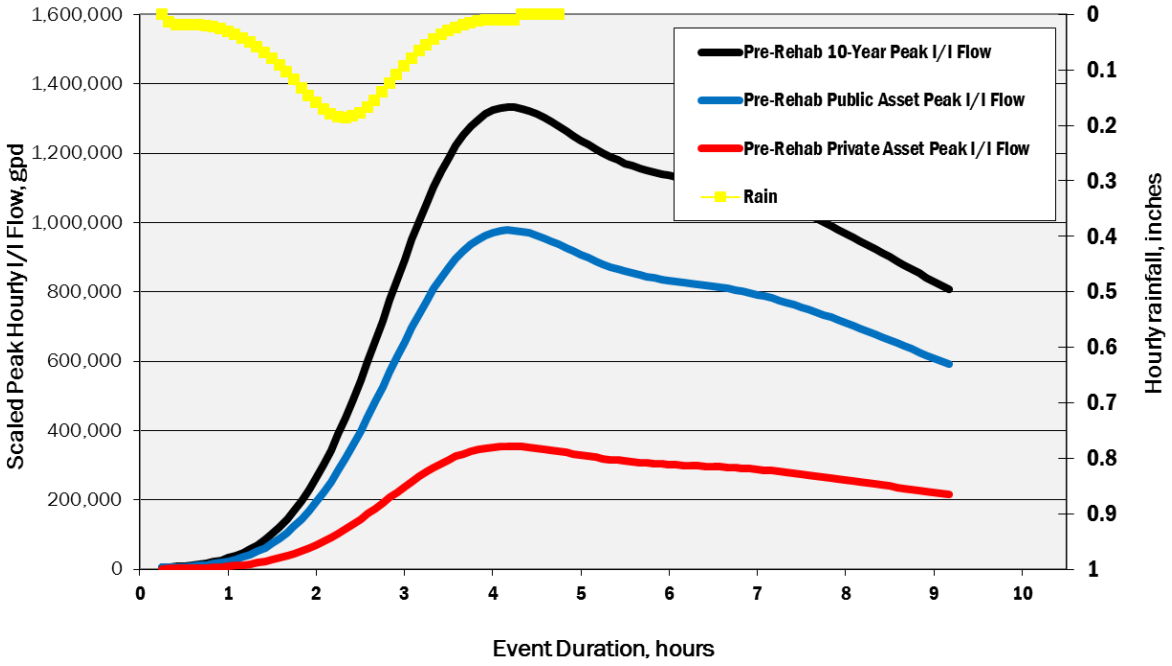


Figure 2. 10-Year Peak I/I Flow Hydrograph for YORK-JCSA-005-4

5. Summary of Prior Rehabilitation Activities

Table 6 summarizes recent known corrective actions and rehabilitation activities undertaken by the locality within this catchment as of 2016. This information is for reference only. For Comprehensive approach I/I reduction plans, defects that have been remedied have not been considered in development of post-rehabilitation I/I reduction estimates or development of the R/R scope of work, unless post-rehabilitation flow monitoring data were available at the time of this report. It is assumed that future investigations will determine whether these actions have resulted in the removal of I/I entering the system, and this will be accounted for in pre-design activities.

The 10-year peak I/I flow presented in this report was developed prior to the activities presented in Table 6. Post-rehabilitation flow monitoring has not been conducted in this catchment as of the date of this report.

Table 6. Prior Rehabilitation Catchment Activity

Facility ID/Project Name	Location	Corrective Action Description	Completion Date
NA	NA	NA	NA

6. R/R Cost Estimate

For this catchment, the R/R costs assume comprehensive rehabilitation of public pipes, public manholes and public sewer laterals. Original assumptions used to derive the single-family residential and NSF component of the rehabilitation plan are described in the 2016 *I/I Reduction Plan Framework.*

The 2025 *Comprehensive II Reduction Plan* was developed as part of the HPIIRP and included revisions to RWWMP assumptions in order to provide estimates reflective of currently ongoing field investigations and observed impacts to potential rehabilitation scope. Assumption modifications included:

- Private SF laterals are not included in rehab scope
- Due to active SSES efforts within public assets, additional investigation costs included for NSF only
- Public Side Lateral Replacement/Rehabilitation ratio of 40%/60% assumed for all plan types
- Public asset Replacement/Rehabilitation ratio of 25%/75% assumed for all plan types

Planning level cost estimates have been updated to reflect 2025 unit prices with the anticipated R/R scope of work. Section 5 of the 2025 Comprehensive II Reduction Plan summarizes the basis of the revised R/R cost estimate. These costs are planning-level estimates only and actual completed costs will vary.

Table 7. Estimated Predesign Investigation, Design and Construction Costs, Catchment YORK-JCSA-005-4

Category	Quantity in R/R Scope	Estimated Cost, $
NSF Private Assets		
Pre-Design SSES, Feet1	NA	NA
Private NSF Sewer R/R, Feet	NA	NA
Private NSF Lateral R/R, Feet	NA	NA
Private NSF Manhole R/R, count	NA	NA
Pavement Restoration, Lane-Miles	NA	NA
Engineering and Contingency		NA
Total NSF R/R		**$0**
Private SF Lateral R/R, feet		
Footage of SF Lateral in R/R Scope	0	NA
Pre-Rehab Investigation, Feet[2]	0	$0
Private SF Lateral Replacement, Feet[3]	0	$0
Engineering and Contingency	NA	$0
Total SF Lateral R/R		**$0**
Public Sewer System Assets		
Pre-Design SSES, Feet	NA	$0
Public Sewer R/R, feet	35,622	$6,527,800
Public Lateral R/R, feet	4,150	$919,600
Manhole R/R, count	143	$2,563,300
Pavement Restoration, Lane-Miles	3.5	$787,500
Public Sewer System R/R Cost Subtotal		$10,798,200
Engineering and Contingency		$5,291,100
Total Public Asset R/R		**$16,089,300**
Total Rehab Plan		**$16,089,300**

Notes:

1. Includes Flow Monitoring and Inspection

2. Assumes 70% participation based on total length of laterals in R/R scope

3. Assumes 25% failure rate for tested laterals

7. Post Rehabilitation I/I Reduction Target

I/I was proportioned to public sewer assets, single family residential laterals, and NSF sanitary sewer assets in accordance with the equivalent length of assets shown on Table 2. Post-rehabilitation I/I reduction was estimated for the percentage of assets included in the R/R scope as described in the *I/I Reduction Plan Framework* document. Table 8 summarizes the I/I reduction target and post-rehabilitation 10-year peak I/I flow for this catchment.

It is assumed that current flow data, I/I abatement, and rehabilitation activities will be reviewed and updated during predesign activities to confirm assumptions in this planning document

Table 8. Post-Rehabilitation I/I Reduction Estimate

	Public Sewer System	Private Single Family Lateral	Private Non-Single Family
Percent of System assumed in R/R Scope	100%	70%	0%
10-Year Peak I/I, GPD	978,100	106,480	248,760
Estimated 10-Year Peak I/I Flow Reduction, GPD	684,670	0	0
Estimated 10-Year Peak I/I Post-Rehab Flow, GPD	293,430	106,480	248,760
Total 10-Year Peak I/I Reduction Target	684,670 GPD (51%)		
Total 10-Year Peak I/I Post-Rehab Flow Target, GPD	648,670		

8. References

This Plan was developed based on information provided in the sources referenced below.

1. York County, “Flow Evaluation Report”, May 2009
2. York County, “YorkCountySmokeTesting database.mdb”, February 2014
3. York County, “YC 005 County of York SSES JCC_PACP.mdb”, February 2014
4. Regional GIS Database, October 2014
5. Flow Parameter Database developed by Localities, compiled by CDM-Smith, November 2015
6. Updated Catchment GIS Database, compiled by CDM-Smith, June 2015

9. Limitations

This document was prepared solely for HRSD in accordance with professional standards at the time the services were performed and in accordance with the contract between HRSD and Brown and Caldwell dated April 22, 2014. This document is governed by the specific scope of work authorized by HRSD; it is not intended to be relied upon by any other party. We have relied on information or instructions provided by HRSD and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Catchment Specific
I/I Reduction Plan

Rehab Area ID: PORT-10
Catchment HSAID: PORT-010
Location: Portsmouth, Virginia
Plan Type: Data Driven

Prepared for
HRSD
March 2016
Cost Revised August 2025
R/R Assumptions Revised August 2025

Brown AND Caldwell
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1. Summary

This Inflow and Infiltration (I/I) Reduction Plan provides a basis for planning future field investigation, design, construction and I/I reduction associated with the rehabilitation/replacement (R/R) of the sanitary sewer in Catchment PORT-010. The purpose of this Plan is to provide a conceptual level assessment of the anticipated R/R scope and cost, and a quantification of the resulting I/I reduction that can be expected in this catchment. The following information is provided herein:

- Catchment overview
- Summary of available condition assessment data
- Previous rehabilitation activities (if available)
- Basis for R/R scope and estimated costs
- Flow characterization and post-rehabilitation I/I reduction estimate.

The *HRSD RWWMP Sanitary Sewer I/I Reduction Plan Framework* (Brown and Caldwell, March 2016) documents definitions and basic assumptions associated with the development of this planning document. The 2025 Comprehensive II Reduction Plan, developed as part of the High-Priority I/I Reduction Program (HPIIRP), includes revisions to some of these original assumptions to further refine planning level project estimates.

The Data Driven Scoping Approach has been used for this catchment. The Data Driven Approach was employed when asset condition data were sufficient to identify system defects and estimate an I/I reduction target for the catchment.

Private Non-Single Family (NSF) assets were included in the R/R and I/I reduction estimate for this catchment.

Table 1 presents the R/R planning estimates that are derived using the Data Driven Scoping Approach for this catchment.

Table 1. Post-Rehabilitation I/I Reduction Estimate and Cost-Effectiveness

	Public Sewer System R/R	Private Single Family Lateral R/R	Private Non-Single Family R/R	Total
Major Inflow Sources in R/R Scope	Yes	Unknown	Unknown	
Percent of System in R/R Scope	35%	0%	49%	
Estimated Peak 10-Year I/I, GPD	4,735,857	1,536,195	664,632	6,936,684
Peak Flow Reduction Target, GPD	2,196,622	0	119,443	2,316,065
Target Peak Flow Reduction, Percent of Available I/I by Asset Type	46%	0%	18%	33%
Estimated Investigation, Design and Construction Costs	$15,590,300	$0	$1,619,300	$17,209,600
I/I Removal Cost-Effectiveness, $/GPD Removed	$7.1	NA	$13.56	$7.43

2. Catchment Location and Asset Inventory

Catchment PORT-010 is located in southeastern Portsmouth. The primary land use is high density residential. This catchment receives flow from upstream catchment PORT-012 via locality lift station PORT-PS-012 and force main. Catchment PORT-010 flows via gravity to lift station PORT-PS-010, then discharges to a manhole in the downstream gravity catchment PORT-H-146-G003.

Table 2 presents the inventory of known public gravity collection pipes, manholes, and laterals. Additionally, Private Single Family and Non-Single Family (NSF) sanitary sewer assets were estimated using assumptions and GIS to approximate the distribution of peak I/I flow across asset types.

Table 2. System Characteristics, Catchment PORT-010

	Public[1]	Private Single Family	Private Non Single Family	Private Non Single Family > 1 Acre	Total
Gravity System Length, Feet	71,758	NA	14,744	4,507	86,501
Lateral Length, Feet	36,625	37,366	760	760	74,751
Number of Mainline Cleanouts	43	NA	NA	NA	43
Number of Manholes	257	NA	25	25	282
Equivalent Length, Feet[2]	115,193	37,366	16,166	5,929	168,725
I/I Distribution %	68%	22%	10%	4%	100%

1. Public manhole and gravity main information from Locality GIS submittals dated October 2014

2. See I/I Reduction Plan Framework for details on the calculation of lateral length and equivalent length

3. Summary of SSES Activities

Where available, condition assessment data were provided by the locality to facilitate R/R planning. Condition data may include the results of smoke testing, night flow isolations, manhole inspections, CCTV, and historical records, and prompt repair documentation. Table 3 provides a summary of available condition assessment data as of 2016. A summary of available condition data is presented graphically in Figure 2.

Table 3. Public Sewer System Condition Data Summary

SSES Investigation	Percent of Catchment Investigated
Smoke Testing	100%
Manhole Inspections/Checks	100%
CCTV	48%

Condition assessment data in this catchment were deemed sufficient to facilitate data-driven rehabilitation planning. The R/R scope and estimated costs presented in Section 6 were developed based on the available condition data in 2016.

HPIIRP assessment activities, in progress in 2025, are not included in this report. New field data will be applied in the near-term future to develop updated I/I rehabilitation scopes and inform design efforts.



Figure 1. Existing Asset Condition Data Summary, PORT-010

The above Map is for general reference only, and should not be relied upon for design efforts.

4. Catchment Flow Characteristics

Flow monitoring was conducted by The City of Portsmouth at Pump Station PORT-PS-010 using a pump run time data logger in conjunction with an algorithm developed to estimate influent flow based on pump run time and wet well operating volumes. The rainfall events that were used to calibrate RTK hydrologic parameters for this catchment occurred between April 2008 and September 2008.

Tables 4 and 5 depict the catchment hydrologic characteristics as represented in the Flow Parameter Database and RHM.

The 10-year peak flow was derived from hydrographs generated by applying the RTK hydrologic parameters to a 4-hour design storm event, considered representative of a rain event that would induce regional 10-year flow conditions. For each catchment, long term statistical simulations have been analyzed to compare 10-year Log Pearson III (LPIII) return flows to the peak flows resulting from the design event to obtain a scaling factor. This scaling factor was then used to modify the design event hydrograph to present the pre-rehabilitation 10-year peak flow conditions for this catchment. Figure 2 presents the pre-rehabilitation 10-year peak I/I flow hydrograph for the catchment as represented by the HRSD 10-year design storm with scaling factors applied.

Table 4. Sewer Flow Characteristics, PORT-010

Associated Treatment Plant	VIP
Sewered Area, Acres	348.4
Flow Monitored or Associated Parameters	Flow Monitored
Base Sewer Flow, GPD	232,661
Dry Weather Infiltration (DWI), GPD	50,963
10-Year Peak I/I, GPD	6,936,684
10-Year Peak Flow, GPD	7,220,308
I/I Density, GPAD	19,911

Table 5. Pre-Rehabilitation Hydrologic Parameters

	R	T, Hours	K
Triangle 1	0.0230	2.130	5.636
Triangle 2	0.0305	6.887	2.381
Triangle 3	0.0715	13.077	3.867

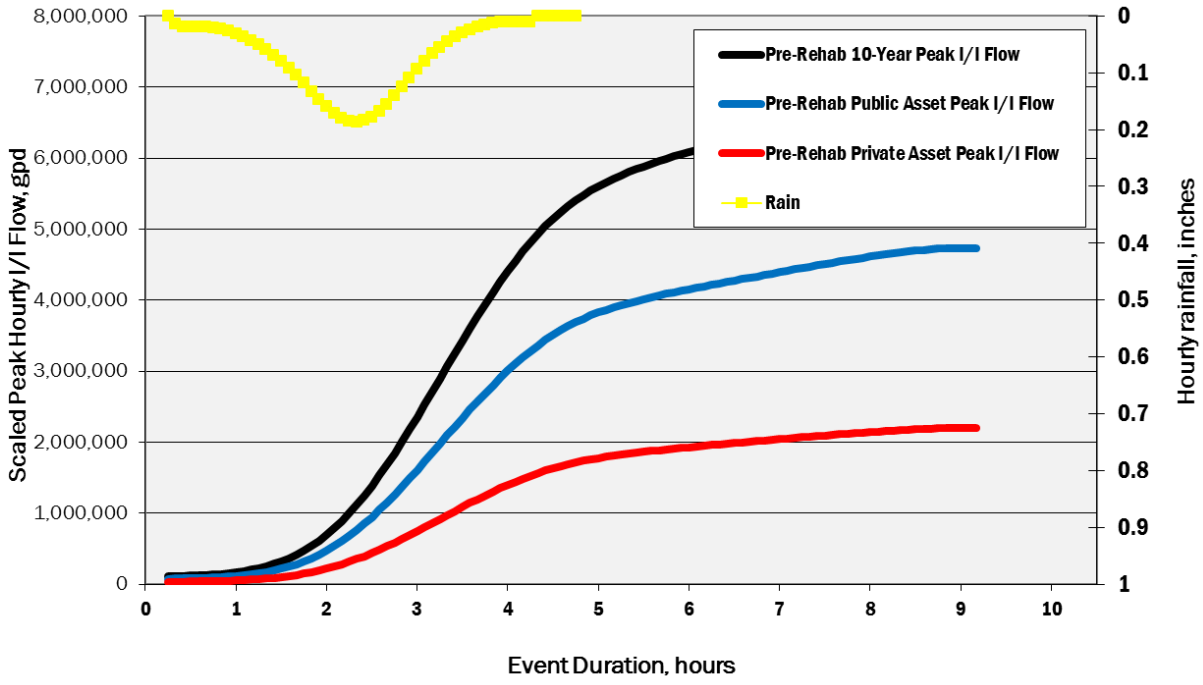


Figure 2. 10-Year Peak I/I Flow Hydrograph for PORT-010

5. Summary of Prior Rehabilitation Activities

Table 6 summarizes known corrective actions and rehabilitation activities undertaken by the locality within this catchment as of 2016. Assets with defects that were remedied after the date of flow monitoring and/or SSES efforts were not included in the R/R scope and cost estimate. Inflow abatement activities (i.e., installation of manhole inserts and/or cleanout caps) were not considered adequate repair methods to fully address identified defects. However, these measures may have reduced the I/I since the initial flow monitoring, and the effectiveness should be evaluated as part of pre-design activities.

Approximately 5,436 feet of mainline sewer was rehabilitated after the date of the original flow monitoring and SSES. I/I reduction was estimated for this repair and included in the post-rehabilitation flow estimate.

Table 6. Prior Rehabilitation Catchment Activity

Facility ID/Project Name	Location	Corrective Action Description	Completion Date
Sewer Repair Projects	Burtis St	Replaced 1665 LF of Pipe, replaced all laterals, and rehabbed all manholes	5/2009
Sewer Repair Projects	Alden Ave and Abbot Place	Replaced 230 LF on Abbott from MH9636- MH9692, Replaced Lateral on Abbott for Craddock Middle School, Replaced 2 Laterals on Alden Ave, Lined by CIP- 400 LF on Alden from MH9682- MH9731	4/2010
Sewer Repair Projects	Kennedy Dr/Axson St/Afton Pkwy	Replaced Lateral at Afton Parkway & Paul Jones St, Replaced Lateral on Kennedy 80', Lined by CIP- 595 LF from MH 9944- MH10061	3/2010
Sewer Repair Projects	Morris St	Not completed in GIS due to connectivity issues; Spot Repair 15 LF, Replaced 2	2/2010

Table 6. Prior Rehabilitation Catchment Activity			
Facility ID/Project Name	Location	Corrective Action Description	Completion Date
		Laterals, Lined by CIP- 260 LF from MH10428- MH1970	
Sewer Repair Projects	Oakcrest St and Paul Jones St	Not completed in GIS; Spot Repair 30 LF	3/2010
Sewer Repair Projects	Morris St and Afton Pkwy	Spot Repair 15 LF Lined by CIP- 115 LF from MH10109- MH 10163	5/2010
Sewer Repair Projects	60 Bainbridge Ave	Lined by CIP- 250 LF from MH 9908 to MH 9876, replaced 3 laterals	12/2010
Sewer Repair Projects	Gillis Rd and Nicholson St	Not completed in GIS; Replaced 2 Laterals, Spot Repair 15 LF	10/2010
Sewer Repair Projects	50 Cushing	Lined by CIP- 289 LF from MH 9898 to MH 9828	8/2010
Sewer Repair Projects	40 Prospect Pkwy	Repair Sag - 20 Ft, Lined By CIP- 265 LF- MH 10105- MH 10028	10/2011
Sewer Repair Projects	100 Afton Pkwy	Lined by CIP- 140 LF from MH 10107- MH 10118, Replaced Lateral	2/2012
Sewer Repair Projects	50 Decatur St	Lined by CIP- 265 LF from MH 9930- MH 9991, Replaced (1) lateral	2/2012
Sewer Repair Projects	70 & 80 Farragut St	Replaced 322 LF Pipe, Replaced 2 MHs, Rehabilitated 1 MH, and Replaced 12 Laterals	6/2013
Sewer Repair Projects	Prospect Pkwy and Afton Pkwy	Lined by CIPP- 270 LF from MH 10028- MH 9954, Replace 4 Laterals	3/2014
Sewer Repair Projects	Gillis Rd and Afton Pkwy	Spot Repair- Replaced 15 LF, Lined By CIPP- 265 LF from MH 10060- MH 10143	5/2014
Sewer Repair Projects	20 Prospect Pkwy	Spot Repair- Replaced 15 LF, Lined by CIPP- 335 LF from MH 9824- MH 9900	5/2014

6. R/R Scope and Cost Estimate

For this catchment, the R/R scope and cost estimate was driven by condition data which identify sanitary sewer assets that are likely to contribute I/I to the regional sanitary sewer system. Original assumptions used to derive the single-family residential and NSF component of the rehabilitation plan are described in the 2016 *I/I Reduction Plan Framework.*

The 2025 *Comprehensive II Reduction Plan* was developed as part of the HPIIRP and included revisions to RWWMP assumptions in order to provide estimates reflective of currently ongoing field investigations and observed impacts to potential rehabilitation scope. Assumption modifications included:

- Private SF laterals are not included in rehab scope
- Due to active SSES efforts within public assets, additional investigation costs included for NSF only
- Public Side Lateral Replacement/Rehabilitation ratio of 40%/60% assumed for all plan types
- Public asset Replacement/Rehabilitation ratio of 25%/75% assumed for all plan types

Planning level cost estimates have been updated to reflect 2025 unit prices with the anticipated R/R scope of work. Section 5 of the 2025 Comprehensive II Reduction Plan summarizes the basis of the revised R/R cost estimate. These costs are planning-level estimates only and actual completed costs will vary.

Table 7. Estimated Predesign Investigation, Design and Construction Costs, PORT-010		
Category	Quantity in R/R Scope	Estimated Cost, $
NSF Private Assets		
Pre-Design SSES, Feet[1]	3,687	$103,300
Private NSF Sewer R/R, Feet	2,208	$578,600
Private NSF Lateral R/R, Feet	372	$55,900
Private NSF Manhole R/R, count	12	$239,400
Pavement Restoration, Lane-Miles	0.2	$47,100
Engineering and Contingency	NA	$595,000
Total NSF R/R		**$1,619,300**
Private SF Lateral R/R, feet		
Footage of SF Lateral in R/R Scope	0	NA
Pre-Rehab Investigation, Feet[2]	0	$0
Private SF Lateral Replacement, Feet[3]	0	$0
Engineering and Contingency	NA	$0
Total SF Lateral R/R		**$0**
Public Sewer System Assets		
Pre-Design SSES, Feet	NA	$484,600
Public Sewer R/R, feet	23,432	$6,900,800
Public Lateral R/R, feet	13,425	$3,114,600
Manhole R/R, count	133	$2,653,400
Pavement Restoration, Lane-Miles	2	$450,000
Public Sewer System R/R Cost Subtotal	NA	$10,463,300
Engineering and Contingency	NA	$5,127,000
Total Public Asset R/R		**$15,590,300**
Total Rehab Plan		**$17,209,600**

Notes:

1. Includes Flow Monitoring and Inspection

2. Assumes 70% participation based on total length of laterals in R/R scope

3. Assumes 25 percent failure rate for tested laterals

7. Post Rehabilitation I/I Reduction

I/I is proportioned to public sewer assets, single family residential laterals, and NSF sanitary sewer assets in accordance with the equivalent length of assets shown on Table 2. Post-rehabilitation I/I reduction is estimated for the percentage of assets included in the R/R scope as described in the HRSD RWWMP Rehabilitation Framework document. Table 8 summarizes the estimated I/I reduction and post-rehabilitation 10-year peak I/I flow for this catchment.

In this catchment, assets were determined to have defects with the potential to contribute significant inflow to the system (shown on Figure 2). Therefore, inflow reduction was assumed in the post-rehabilitation I/I target to account for the planned correction of these sources of inflow.

Table 8. Post-Rehabilitation I/I Reduction Estimate

	Public Sewer System	Private Single Family Laterals	Private Non-Single Family
Percent of System assumed in R/R Scope	35%	0%	49%
10-Year Peak I/I, GPD	4,735,857	1,536,195	664,632
Estimated 10-Year Peak I/I Flow Reduction, GPD	2,196,622	0	119,443
Estimated 10-Year Peak I/I Post-Rehab Flow, GPD	2,539,235	1,536,195	545,189
Total 10-Year Peak I/I Reduction Target	2,316,065 GPD (33%)		
Total 10-Year Peak I/I Post-Rehab Flow Target, GPD	4,620,619		

8. References

This Plan was developed based on information provided in the sources referenced below.

1. City of Portsmouth Condition Assessment Report, Greeley and Hansen, no date provided
2. City of Portsmouth, “Hydraulic Model Report”, Greeley and Hansen, December 15, 2011
3. City of Portsmouth, “PORT HybridPlanDataRequest Addtl.xlsx”, provided March 2014. Contains flow monitoring status for all Portsmouth catchments.
4. City of Portsmouth, CCTV Files provided as individual Access databases, provided July 2014
5. City of Portsmouth, “MH Check Geodatabase”, provided July 2014
6. City of Portsmouth, excerpts of “Special Order by Consent Annual Report” for years FY 2009 through FY 2014, Greeley and Hansen, 2009 through 2014.
7. Flow Parameter Database developed by Localities, compiled by CDM-Smith, November 2015
8. Regional GIS Database, October 2014
9. Updated Catchment GIS Database, compiled by CDM-Smith, June 2015

9. Limitations

This document was prepared solely for HRSD in accordance with professional standards at the time the services were performed and in accordance with the contract between HRSD and Brown and Caldwell dated April 22, 2014. This document is governed by the specific scope of work authorized by HRSD; it is not intended to be relied upon by any other party. We have relied on information or instructions provided by HRSD and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Catchment Specific
I/I Reduction Plan

Rehab Area ID: SUFF-146
Catchment SAID: SUFF-146
Location: Suffolk, Virginia
Plan Type: Comprehensive

Prepared for
HRSD
March 2016
Cost Revised August 2025
R/R Assumptions Revised August 2025

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1. Summary

This Inflow and Infiltration (I/I) Reduction Plan (Plan) provides a basis for planning future field investigation, design, construction and I/I reduction associated with the rehabilitation/replacement (R/R) of the sanitary sewer in Catchment SUFF-146. The purpose of this Plan is to provide a conceptual level assessment of the anticipated R/R scope and cost, and a quantification of the resulting I/I reduction that can be expected in this catchment. The following information is provided herein:

- Catchment overview
- Summary of available condition assessment data
- Previous rehabilitation activities (if available)
- Basis for R/R scope and estimated costs
- Flow characterization and post-rehabilitation I/I reduction estimate.

The *HRSD RWWMP Sanitary Sewer I/I Reduction Plan Framework* (Brown and Caldwell, March 2016) documents definitions and basic assumptions associated with the development of this planning document. The 2025 Comprehensive II Reduction Plan, developed as part of the High-Priority I/I Reduction Program (HPIIRP), includes revisions to some of these original assumptions to further refine planning level project estimates.

The Comprehensive Scoping Approach has been applied for this catchment due to the relative density of I/I in the catchment (as expressed in gallons per acre per day). The comprehensive approach estimates funding to address all public assets in the R/R scope. The approach establishes a target I/I reduction of 70% of the public portion of existing peak I/I.

Private assets associated with Non-Single Family (NSF) parcels greater than one acre are included in the R/R cost estimate.

Table 1 presents the R/R planning estimates that were derived using the Comprehensive Scoping Approach for this catchment.

Table 1. Post-Rehabilitation I/I Reduction Estimate and Cost-Effectiveness

	Public Sewer System R/R	Private Single Family Lateral R/R	Private Non-Single Family R/R	Total
Major Inflow Sources in R/R Scope	Yes	Unknown	Unknown	
Percent of System in R/R Scope	100%	0%	49%	
Estimated Peak 10-Year I/I, GPD	912,328	221,197	244,275	1,377,800
Peak Flow Reduction Target, GPD	638,629	0	85,636	724,265
Estimated Peak Flow Reduction, Percent of Peak I/I Allocated to Asset Type	70%	0%	35%	53%
Estimated Investigation, Design and Construction Costs	$8,067,800	$0	$1,156,700	$9,224,500
I/I Removal Cost-Effectiveness, $/GPD Removed	$12.63	N/A	$13.51	$12.74

2. Catchment Location and Asset Inventory

Catchment SUFF-146 is located in Northwestern Suffolk and services a mix of residential and commercial areas. It is located near the intersection of North Main Street and Prentis Street, south of the Nansemond River.

This catchment receives flow from upstream catchments SUFF-003 and SUFF-006 via gravity before discharging to its terminal station SUFF-PS-146.

Table 2 presents the inventory of known publicly owned gravity collection pipes, manholes, and laterals in SUFF-146. Additionally, Private Single Family and Private NSF sanitary sewer assets were estimated using assumptions and GIS to approximate the distribution of peak I/I flow across asset types.

Table 2. System Characteristics, Catchment SUFF-146

	Public[1]	Private Single Family	Private Non Single Family	Private Non Single Family > 1 Acre	Total
Gravity System Length, Feet	14,295	NA	4,733	3,171	19,028
Lateral Length, Feet[2]	4,325	4,971	200	200	9,496
Number of Mainline Cleanouts	6	NA	NA	NA	6
Number of Manholes	71	NA	21	21	92
Equivalent Length, Feet	20,502	4,971	5,489	3,927	30,962
I/I Distribution %	66%	16%	18%	13%	100%

1. Public manhole and gravity main information from Locality GIS submittals dated October 2014

2. See I/I Reduction Plan Framework for details on the calculation of lateral length and equivalent length

3. Summary of SSES Activities

Asset specific condition assessment data in this catchment were not utilized in development of the R/R scope of work because comprehensive rehabilitation was assumed. However, Table 3 provides a summary of previous condition assessment data available as of the 2016 original date of this report. Condition data may include the results of smoke testing, night flow isolations, manhole inspections, CCTV, and historical records. Condition findings are presented graphically in Figure 2.

HPIIRP assessment activities, in progress in 2025, are not included in this report. New field data will be applied in the near-term future to develop updated I/I rehabilitation scopes and inform design efforts.

Note that the sanitary sewer information shown in the figure, including sewer mains, manholes and catchment boundaries, was provided to HRSD by each Locality. Localities continue to refine this information, and future activities within this catchment should incorporate the most recent data available at that time. Further, revisions to Locality GIS information may alter the R/R scope and/or I/I reduction estimate presented in this Plan.

Table 3. Public Sewer System Condition Data Summary

SSES Investigation	Percent of Catchment Investigated
Smoke Testing	100%
Manhole Inspections/Checks	100%
CCTV	17%



Figure 1. SUFF-146 Existing Asset Condition Data Summary

The above Map is for general reference only, and should not be relied upon for design efforts.

4. Catchment Flow Characteristics

Flow monitoring was conducted by the City of Suffolk at Pump Station SUFF-PS-146. Flow parameters were developed based on the total flow observed at terminal station and distributed to the upstream catchments. Tables 4 and 5 depict the catchment hydrologic characteristics as represented in the Flow Parameter Database and RHM.

The 10-year peak flow was derived from hydrographs generated by applying the RTK hydrologic parameters to a 4-hour design storm event, considered representative of a rain event that would induce regional 10-year flow conditions. For each catchment, long term statistical simulations have been analyzed to compare 10-year Log Pearson III (LPIII) return flows to the peak flows resulting from the design event to obtain a scaling factor. This scaling factor was then used to modify the design event hydrograph to present the pre-rehabilitation 10-year peak flow conditions for this catchment. Figure 2 presents the pre-rehabilitation 10-year peak I/I flow hydrograph for the catchment as represented by the HRSD 10-year design storm with scaling factors applied.

Table 4. Catchment SUFF-146 Pre-Rehabilitation Sewer Flow Characteristics

Associated Treatment Plant	Nansemond
Sewered Area, Acres	94.1
Flow Monitored or Associated Parameters	Flow Monitored
Base Sewer Flow, GPD	43,589
Dry Weather Infiltration (DWI), GPD	0
10 Year Peak I/I, GPD	1,377,800
10 Year Peak Flow, GPD	1,421,389
I/I Density, GPAD	14,636

Table 5. Pre-Rehabilitation Hydrologic Parameters

	R	T, Hours	K
Triangle 1	0.0074	1.115	1.674
Triangle 2	0.0132	2.728	1.068
Triangle 3	0.1064	10.276	19.261

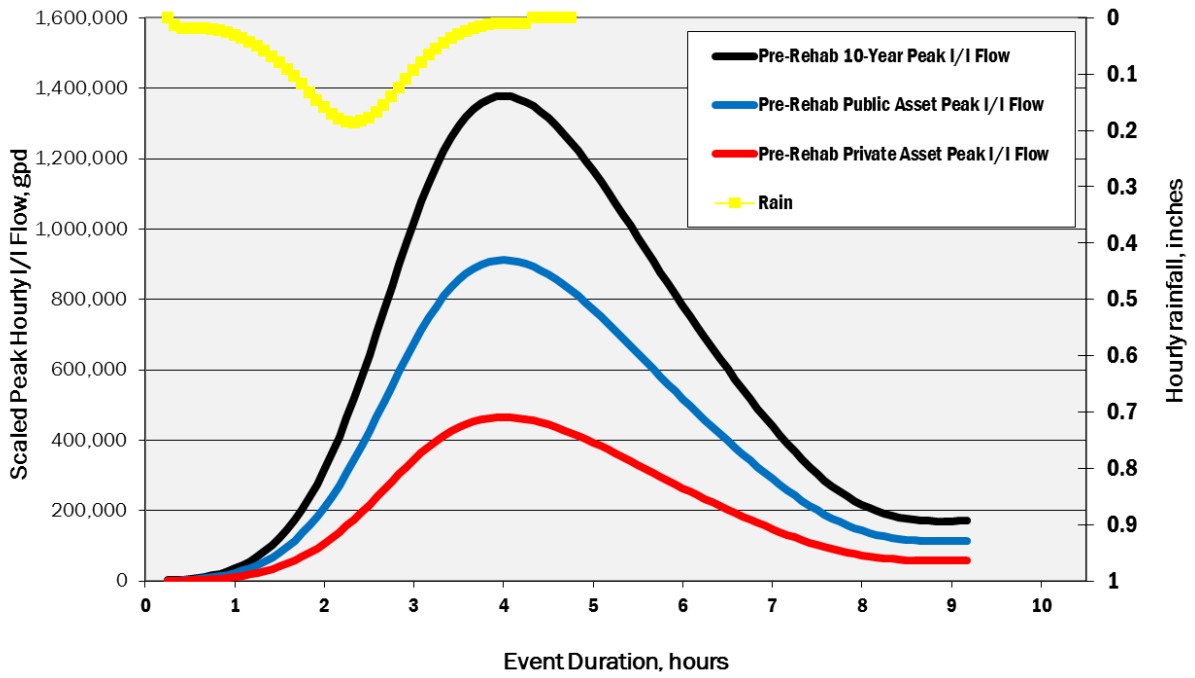


Figure 2. 10-Year Peak I/I Flow Hydrograph for SUFF-146

5. Summary of Prior Rehabilitation Activities

Table 6 summarizes recent known corrective actions and rehabilitation activities undertaken by the locality within this catchment as of 2016. This information is for reference only. For Comprehensive approach I/I reduction plans, defects that have been remedied have not been considered in development of post-rehabilitation I/I reduction estimates or development of the R/R scope of work, unless post-rehabilitation flow monitoring data were available at the time of this report. It is assumed that future investigations will determine whether these actions have resulted in the removal of I/I entering the system, and this will be accounted for in pre-design activities.

Table 6. Prior Rehabilitation Catchment Activity

Facility ID/Project Name	Location	Corrective Action Description	Completion Date
Abatement Activities	10% of Manholes	Watertight Manhole Inserts	2009

6. R/R Cost Estimate

For this catchment, the R/R costs assume comprehensive rehabilitation of public pipes, public manholes and public sewer laterals. Original assumptions used to derive the single-family residential and NSF component of the rehabilitation plan are described in the 2016 *I/I Reduction Plan Framework.*

The 2025 *Comprehensive II Reduction Plan* was developed as part of the HPIIRP and included revisions to RWWMP assumptions in order to provide estimates reflective of currently ongoing field investigations and observed impacts to potential rehabilitation scope. Assumption modifications included:

- Private SF laterals are not included in rehab scope

- Due to active SSES efforts within public assets, additional investigation costs included for NSF only
- Public Side Lateral Replacement/Rehabilitation ratio of 40%/60% assumed for all plan types
- Public asset Replacement/Rehabilitation ratio of 25%/75% assumed for all plan types

Planning level cost estimates have been updated to reflect 2025 unit prices with the anticipated R/R scope of work. Section 5 of the 2025 Comprehensive II Reduction Plan summarizes the basis of the revised R/R cost estimate. These costs are planning-level estimates only and actual completed costs will vary.

Table 7. Estimated Predesign Investigation, Design and Construction Costs, Catchment SUFF-146

Category	Quantity in R/R Scope	Estimated Cost, $
NSF Private Assets		
Pre-Design SSES, Feet[1]	2,360	$77,500
Private NSF Sewer R/R, Feet	1,554	$407,100
Private NSF Lateral R/R, Feet	98	$14,700
Private NSF Manhole R/R, count	10	$199,500
Pavement Restoration, Lane-Miles	0.15	$33,100
Engineering and Contingency	NA	$424,800
Total NSF R/R		**$1,156,700**
Private SF Lateral R/R, feet		
Footage of SF Lateral in R/R Scope	0	NA
Pre-Rehab Investigation, Feet[2]	0	$0
Private SF Lateral Replacement, Feet[3]	0	$0
Engineering and Contingency	NA	$0
Total SF Lateral R/R		**$0**
Public Sewer System Assets		
Pre-Design SSES, Feet	NA	$0
Public Sewer R/R, feet	14,295	$2,761,000
Public Lateral R/R, feet	4,325	$958,400
Manhole R/R, count	77	$1,380,200
Pavement Restoration, Lane-Miles	1.4	$315,000
Public Sewer System R/R Cost Subtotal	NA	$5,414,600
Engineering and Contingency	NA	$2,653,200
Total Public Asset R/R		**$8,067,800**
Total Rehab Plan		**$9,224,500**

Notes:

1. Includes Flow Monitoring and Inspection

2. Assumes 70% participation based on total length of laterals in R/R scope

3. Assumes 25% failure rate for tested laterals

7. Post Rehabilitation I/I Reduction Target

I/I was proportioned to public sewer assets, single family residential laterals, and NSF sanitary sewer assets in accordance with the equivalent length of assets shown on Table 2. Post-rehabilitation I/I reduction was estimated for the percentage of assets included in the R/R scope as described in the *I/I Reduction Plan Framework* document. Table 8 summarizes the I/I reduction target and post-rehabilitation 10-year peak I/I flow for this catchment.

It is assumed that current flow data, I/I abatement, and rehabilitation activities will be reviewed and updated during predesign activities to confirm assumptions in this planning document.

Table 8. Post-Rehabilitation I/I Reduction Estimate

	Public Sewer System	Private Single Family Lateral	Private Non-Single Family
Percent of System assumed in R/R Scope	100%	0%	49%
10-Year Peak I/I, GPD	912,328	221,197	244,275
Estimated 10-Year Peak I/I Flow Reduction, GPD	638,629	0	85,636
Estimated 10-Year Peak I/I Post-Rehab Flow, GPD	273,699	221,197	158,639
Total 10-Year Peak I/I Reduction Target	724,265 GPD (53%)		
Total 10-Year Peak I/I Post-Rehab Flow Target, GPD	653,535		

8. References

This Plan was developed based on information provided in the sources referenced below.

1. City of Suffolk Flow Evaluation Report, CH2MHILL, May 2009
2. City of Suffolk Updated SSES Plan, CH2MHILL, August 2010
3. City of Suffolk Program Report No. 20 Suffolk Model Documentation, CH2MHill and URS, December 2011
4. City of Suffolk Capacity Assessment Report, CH2MHILL, July 2012
5. City of Suffolk Condition Assessment Report, CH2MHILL, August 2012
6. Flow Parameter Database developed by Localities, compiled by CDM-Smith, November 2015
7. Regional GIS Database, October 2014

9. Limitations

This document was prepared solely for HRSD in accordance with professional standards at the time the services were performed and in accordance with the contract between HRSD and Brown and Caldwell dated April 22, 2014. This document is governed by the specific scope of work authorized by HRSD; it is not intended to be relied upon by any other party. We have relied on information or instructions provided by HRSD and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Catchment Specific
I/I Reduction Plan

Rehab Area ID: YORK-003
Catchment HSAID: YORK-003
Location: York County, Virginia
Plan Type: Data Driven

Prepared for
HRSD
March 2016
Cost Revised August 2025
R/R Assumptions Revised August 2025

Brown AND Caldwell
301 Bendix Road, Suite 400
Virginia Beach, VA 23452

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1. Summary

This Inflow and Infiltration (I/I) Reduction Plan (Plan) provides a basis for planning future field investigation, design, construction and I/I reduction associated with the rehabilitation/replacement (R/R) of the sanitary sewer in Catchment YORK-003. The purpose of this Plan is to provide a conceptual level assessment of the anticipated R/R scope and cost, and a quantification of the resulting I/I reduction that can be expected in this catchment. The following information is provided herein:

- Catchment overview
- Summary of available condition assessment data
- Previous rehabilitation activities (if available)
- Basis for R/R scope and estimated costs
- Flow characterization and post-rehabilitation I/I reduction estimate.

The *HRSD RWWMP Sanitary Sewer I/I Reduction Plan Framework* (Brown and Caldwell, March 2016) documents definitions and basic assumptions associated with the development of this planning document. The 2025 Comprehensive II Reduction Plan, developed as part of the High-Priority I/I Reduction Program (HPIIRP), includes revisions to some of these original assumptions to further refine planning level project estimates.

The Data Driven Scoping Approach has been used for this catchment. The Data Driven Approach was employed when asset condition data were sufficient to identify system defects and estimate an I/I reduction target for the catchment.

This catchment did not meet the criteria for Private Non-Single Family (NSF) R/R, therefore no NSF sanitary sewer assets were included in the R/R cost estimate.

Table 1 presents the R/R planning estimates that are derived using the Data Driven Scoping Approach for this catchment.

Table 1. Post-Rehabilitation I/I Reduction Estimate and Cost-Effectiveness

	Public Sewer System R/R	Private Single Family Lateral R/R	Private Non-Single Family R/R	Total
Major Inflow Sources in R/R Scope	Yes	Unknown	Unknown	
Percent of System in R/R Scope	43%	0%	0%	
Estimated Peak 10-Year I/I, GPD	951,560	326,909	164,608	1,443,078
Peak Flow Reduction Target, GPD	588,871	0	0	588,871
Target Peak Flow Reduction, Percent of Available I/I by Asset Type	62%	0%	0%	41%
Estimated Investigation, Design and Construction Costs	$8,223,300	$0	$0	$8,223,300
I/I Removal Cost-Effectiveness, $/GPD Removed	$13.96	NA	NA	$13.96

2. Catchment Location and Asset Inventory

Catchment YORK-003 is located in Central Western York County. The primary land use is medium density residential and commercial. This catchment does not receive flow from any upstream catchments, and flows via gravity to lift station York-PS-003.

Table 2 presents the inventory of known public gravity collection pipes, manholes, and laterals. Additionally, Private Single Family and Non-Single Family (NSF) sanitary sewer assets were estimated using assumptions and GIS to approximate the distribution of peak I/I flow across asset types.

Table 2. System Characteristics, Catchment YORK-003

	Public[1]	Private Single Family	Private Non Single Family	Private Non Single Family > 1 Acre	Total
Gravity System Length, Feet	31,512	NA	6,110	5,951	37,622
Lateral Length, Feet	9,575	15,354	640	640	25,569
Number of Mainline Cleanouts	0	NA	NA	NA	0
Number of Manholes	136	NA	37	37	173
Equivalent Length, Feet[2]	44,691	15,354	7,731	7,571	67,775
I/I Distribution %	66%	23%	11%	11%	100%

1. Public manhole and gravity main information from Locality GIS submittals dated October 2014

2. See I/I Reduction Plan Framework for details on the calculation of lateral length and equivalent length

3. Summary of SSES Activities

Where available, condition assessment data were provided by the locality to facilitate R/R planning. Condition data may include the results of smoke testing, night flow isolations, manhole inspections, CCTV, and historical records, and prompt repair documentation. Table 3 provides a summary of available condition assessment data as of 216. A summary of available condition data is presented graphically in Figure 2.

Table 3. Public Sewer System Condition Data Summary

SSES Investigation	Percent of Catchment Investigated
Smoke Testing	100%
Manhole Inspections/Checks	99%
CCTV	37%

Condition assessment data in this catchment were deemed sufficient to facilitate data-driven rehabilitation planning. The R/R scope and estimated costs presented in Section 6 were developed based on the available condition data.

HPIIRP assessment activities, in progress in 2025, are not included in this report. New field data will be applied in the near-term future to develop updated I/I rehabilitation scopes and inform design efforts.

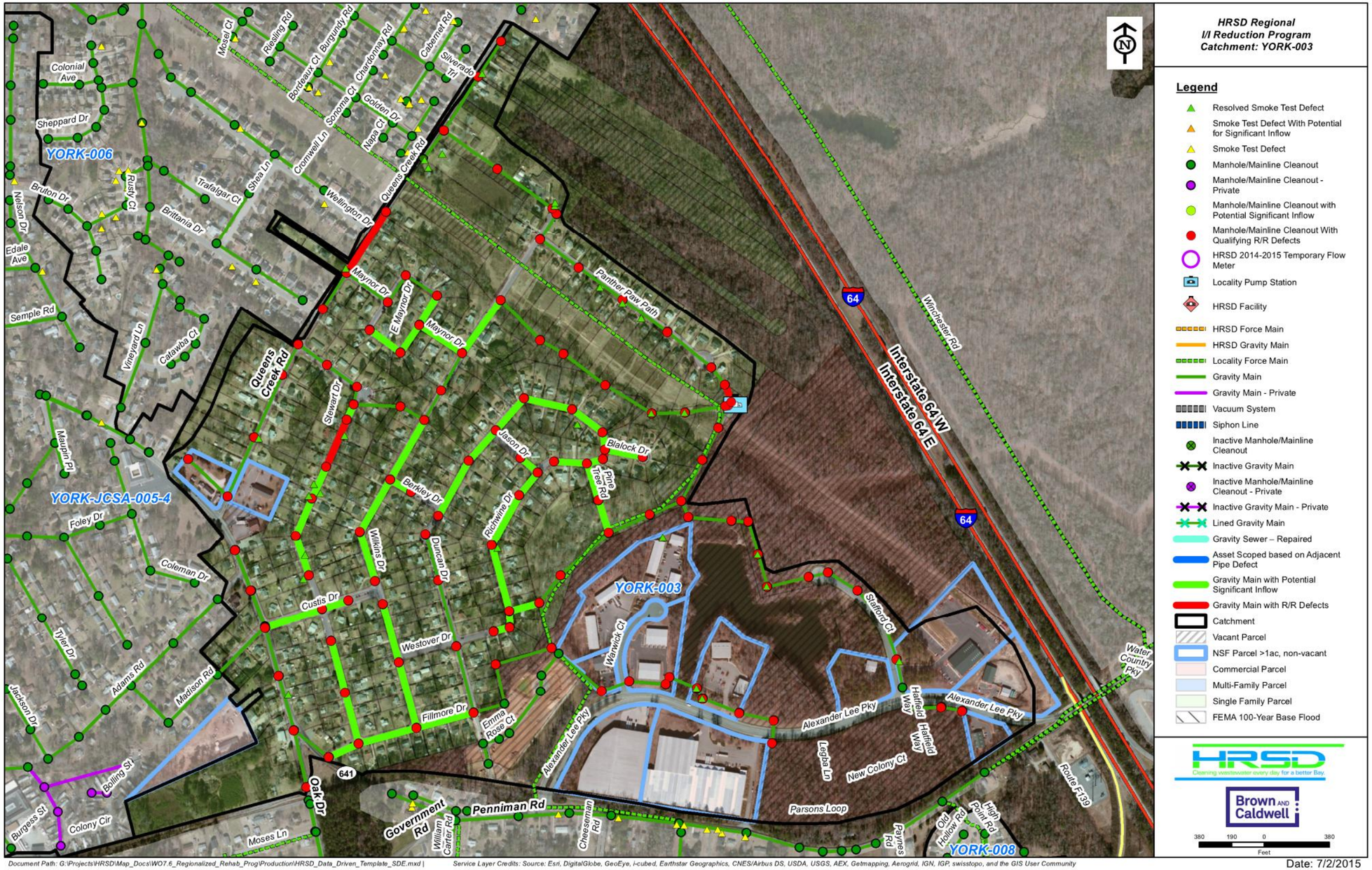


Figure 1. Existing Asset Condition Data Summary, YORK-003

The above Map is for general reference only, and should not be relied upon for design efforts.

4. Catchment Flow Characteristics

Flow monitoring was conducted by York County at lift station YORK-PS-003. The temporary flow monitor was installed in May 2008 on the pump station discharge manifold. Flows were updated in May 2015 by York County. Tables 4 and 5 depict the catchment hydrologic characteristics as represented in the Flow Parameter Database and RHM.

The 10-year peak flow was derived from hydrographs generated by applying the RTK hydrologic parameters to a 4-hour design storm event, considered representative of a rain event that would induce regional 10-year flow conditions. For each catchment, long term statistical simulations have been analyzed to compare 10-year Log Pearson III (LPIII) return flows to the peak flows resulting from the design event to obtain a scaling factor. This scaling factor was then used to modify the design event hydrograph to present the pre-rehabilitation 10-year peak flow conditions for this catchment. Figure 2 presents the pre-rehabilitation 10-year peak I/I flow hydrograph for the catchment as represented by the HRSD 10-year design storm with scaling factors applied.

Table 4. Sewer Flow Characteristics, YORK-003

Associated Treatment Plant	Williamsburg
Sewered Area, Acres	264.5
Flow Monitored or Associated Parameters	Flow Monitored
Base Sewer Flow, GPD	35,294
Dry Weather Infiltration (DWI), GPD	0
10-Year Peak I/I, GPD	1,443,078
10-Year Peak Flow, GPD	1,478,372
I/I Density, GPAD	5,456

Table 5. Pre-Rehabilitation Hydrologic Parameters

	R	T, Hours	K
Triangle 1	0.0070	1.000	5.000
Triangle 2	0.0030	6.000	1.500
Triangle 3	0.0140	10.000	6.500

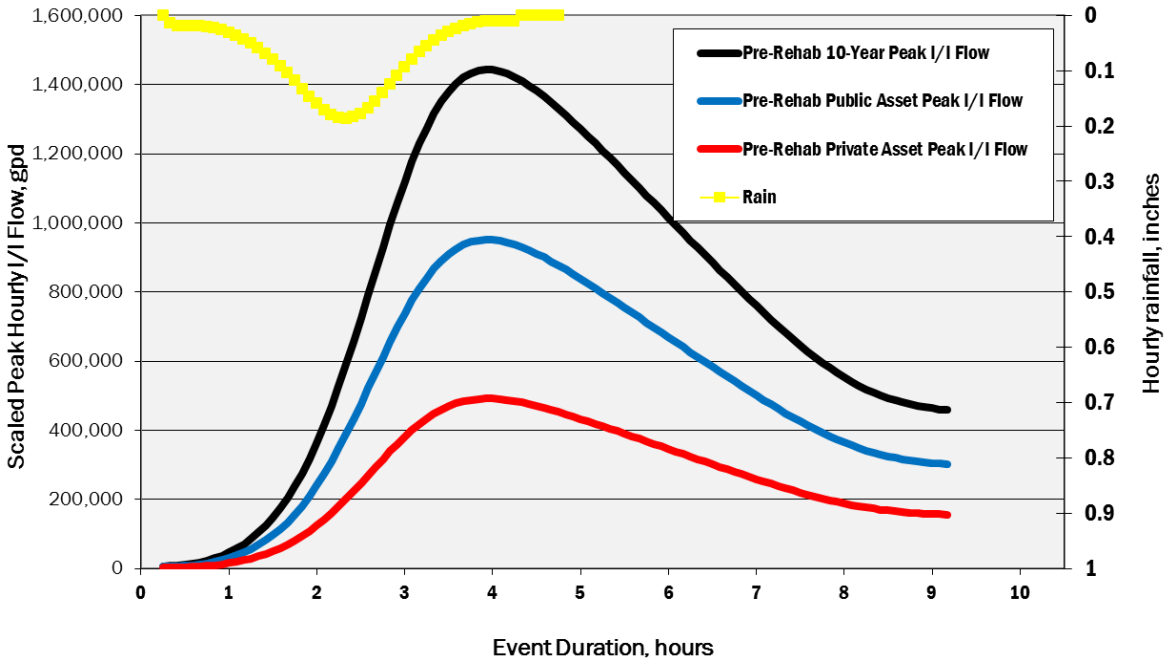


Figure 2. 10-Year Peak I/I Flow Hydrograph for YORK-003

5. Summary of Prior Rehabilitation Activities

Table 6 summarizes known corrective actions and rehabilitation activities undertaken by the locality within this catchment as of 2016. Assets with defects that were remedied after the date of flow monitoring and/or SSES efforts were not included in the R/R scope and cost estimate. Inflow abatement activities (i.e., installation of manhole inserts and/or cleanout caps) were not considered adequate repair methods to fully address identified defects. However, these measures may have reduced the I/I since the initial flow monitoring, and the effectiveness should be evaluated as part of pre-design activities.

The 10-year peak I/I flow presented in this report was developed prior to the activities presented in Table 6.

Table 6. Prior Rehabilitation Catchment Activity

Facility ID/Project Name	Location	Corrective Action Description	Completion Date
Abatement Activities	Throughout Catchment	Cleanout Caps and Manhole Inserts Installed	2011

6. R/R Scope and Cost Estimate

For this catchment, the R/R scope and cost estimate was driven by condition data which identify sanitary sewer assets that are likely to contribute I/I to the regional sanitary sewer system. Original assumptions used to derive the single-family residential and NSF component of the rehabilitation plan are described in the 2016 *I/I Reduction Plan Framework.*

The 2025 *Comprehensive II Reduction Plan* was developed as part of the HPIIRP and included revisions to RWWMP assumptions in order to provide estimates reflective of currently ongoing field investigations and observed impacts to potential rehabilitation scope. Assumption modifications included:

- Private SF laterals are not included in rehab scope
- Due to active SSES efforts within public assets, additional investigation costs included for NSF only

- Public Side Lateral Replacement/Rehabilitation ratio of 40%/60% assumed for all plan types
- Public asset Replacement/Rehabilitation ratio of 25%/75% assumed for all plan types

Planning level cost estimates have been updated to reflect 2025 unit prices with the anticipated R/R scope of work. Section 5 of the 2025 Comprehensive II Reduction Plan summarizes the basis of the revised R/R cost estimate. These costs are planning-level estimates only and actual completed costs will vary.

Table 7. Estimated Predesign Investigation, Design and Construction Costs, YORK-003

Category	Quantity in R/R Scope	Estimated Cost, $
NSF Private Assets		
Pre-Design SSES, Feet[1]	NA	NA
Private NSF Sewer R/R, Feet	NA	NA
Private NSF Lateral R/R, Feet	NA	NA
Private NSF Manhole R/R, count	NA	NA
Pavement Restoration, Lane-Miles	NA	NA
Engineering, CACI, and Contingency	NA	NA
Total NSF R/R		**$0**
Private SF Lateral R/R, feet		
Footage of SF Lateral in R/R Scope	0	NA
Pre-Rehab Investigation, Feet[2]	0	$0
Private SF Lateral Replacement, Feet[3]	0	$0
Engineering, CACI, and Contingency	NA	$0
Total SF Lateral R/R		**$0**
Public Sewer System Assets		
Pre-Design SSES, Feet	NA	$0
Public Sewer R/R, feet	10,750	$1,969,800
Public Lateral R/R, feet	5,375	$1,191,100
Manhole R/R, count	119	$2,133,100
Pavement Restoration, Lane-Miles	1	$225,000
Public Sewer System R/R Cost Subtotal	NA	$5,519,000
Engineering, CACI, and Contingency	NA	$2,704,300
Total Public Asset R/R		**$8,223,300**
Total Rehab Plan		**$8,223,300**

Notes:

1. Includes Flow Monitoring and Inspection

2. Assumes 70% participation based on total length of laterals in R/R scope

3. Assumes 25 percent failure rate for tested laterals

7. Post Rehabilitation I/I Reduction

I/I is proportioned to public sewer assets, single family residential laterals, and NSF sanitary sewer assets in accordance with the equivalent length of assets shown on Table 2. Post-rehabilitation I/I reduction is estimated for the percentage of assets included in the R/R scope as described in the HRSD RWWMP Rehabilitation Framework document. Table 8 summarizes the estimated I/I reduction and post-rehabilitation 10-year peak I/I flow for this catchment.

In this catchment, assets were determined to have defects with the potential to contribute significant inflow to the system (shown on Figure 2). Therefore, inflow reduction was assumed in the post-rehabilitation I/I target to account for the planned correction of these sources of inflow.

Table 8. Post-Rehabilitation I/I Reduction Estimate

	Public Sewer System	Private Single Family Laterals	Private Non-Single Family
Percent of System assumed in R/R Scope	43%	0%	0%
10-Year Peak I/I, GPD	951,560	326,909	164,608
Estimated 10-Year Peak I/I Flow Reduction, GPD	588,871	0	0
Estimated 10-Year Peak I/I Post-Rehab Flow, GPD	362,689	326,909	164,608
Total 10-Year Peak I/I Reduction Target	588,871 GPD (41%)		
Total 10-Year Peak I/I Post-Rehab Flow Target, GPD	854,207		

8. References

This Plan was developed based on information provided in the sources referenced below.

1. York County, “Flow Evaluation Report”, May 2009
2. York County, “YorkCountySmokeTesting database.mdb”, February 2014
3. York County, “YC 005 County of York SSES PS 03_PACP.mdb”, February 2014
4. York County, “Condition Assessment Pinetree Road Sta.#003”, Environmental and Development Services, no date provided
5. Regional GIS Database, October 2014
6. Flow Parameter Database developed by Localities, compiled by CDM-Smith, November 2015

9. Limitations

This document was prepared solely for HRSD in accordance with professional standards at the time the services were performed and in accordance with the contract between HRSD and Brown and Caldwell dated April 22, 2014. This document is governed by the specific scope of work authorized by HRSD; it is not intended to be relied upon by any other party. We have relied on information or instructions provided by HRSD and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Catchment Specific
I/I Reduction Plan

Rehab Area ID: YORK-006
Catchment HSAID: YORK-006
Location: York County, Virginia
Plan Type: Comprehensive

Prepared for
HRSD
March 2016
Cost Revised August 2025
R/R Assumptions Revised August 2025

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1. Summary

This Inflow and Infiltration (I/I) Reduction Plan (Plan) provides a basis for planning future field investigation, design, construction and I/I reduction associated with the rehabilitation/replacement (R/R) of the sanitary sewer in Catchment YORK-006. The purpose of this Plan is to provide a conceptual level assessment of the anticipated R/R scope and cost, and a quantification of the resulting I/I reduction that can be expected in this catchment. The following information is provided herein:

- Catchment overview
- Summary of available condition assessment data
- Previous rehabilitation activities (if available)
- Basis for R/R scope and estimated costs
- Flow characterization and post-rehabilitation I/I reduction estimate.

The *HRSD RWWMP Sanitary Sewer I/I Reduction Plan Framework* (Brown and Caldwell, March 2016) documents definitions and basic assumptions associated with the development of this planning document. The 2025 Comprehensive II Reduction Plan, developed as part of the High-Priority I/I Reduction Program (HPIIRP), includes revisions to some of these original assumptions to further refine planning level project estimates.

The Comprehensive Scoping Approach has been applied for this catchment due to the relative density of I/I in the catchment (as expressed in gallons per acre per day). The comprehensive approach estimates funding to address all public assets in the R/R scopes. The approach establishes a target I/I reduction of 70% of the public portion of existing peak I/I.

This catchment did not meet the criteria for R/R associated with private Non-Single Family assets (NSF), therefore no NSF assets were included in the R/R cost estimate.

Table 1 presents the R/R planning estimates that were derived using the Comprehensive Scoping Approach for this catchment.

Table 1. Post-Rehabilitation I/I Reduction Estimate and Cost-Effectiveness

	Public Sewer System R/R	Private Single Family Lateral R/R	Private Non-Single Family R/R	Total
Major Inflow Sources in R/R Scope	Yes	Unknown	Unknown	
Percent of System in R/R Scope	100%	0%	0%	
Estimated Peak 10-Year I/I, GPD	2,273,579	934,845	0	3,208,424
Peak Flow Reduction Target, GPD	1,591,505	0	NA	1,591,505
Target Peak Flow Reduction, Percent of Available I/I by Asset Type	70%	0%	0%	50%
Estimated Investigation, Design and Construction Costs	$23,125,200	$0	$0	$23,125,200
I/I Removal Cost-Effectiveness, $/GPD Removed	$14.53	NA	NA	$14.53

2. Catchment Location and Asset Inventory

Catchment YORK-006 is located in South Western York County. The predominant land use is medium density residential and commercial. This catchment receives flow from upstream

catchments YORK-005, YORK-007 and York-065 via lift station and force main, and discharges to gravity pipe in the downstream catchment YORK-JCSA-005-4 via lift station force main.

Table 2 presents the inventory of known publicly owned gravity collection pipes, manholes, and laterals in YORK-006. Additionally, Private Single Family and Private NSF sanitary sewer assets were estimated using assumptions and GIS to approximate the distribution of peak I/I flow across asset types.

Table 2. System Characteristics, Catchment YORK-006

	Public[1]	Private Single Family	Private Non Single Family	Private Non Single Family > 1 Acre	Total
Gravity System Length, Feet	38,620	NA	NA	NA	38,620
Lateral Length, Feet[2]	17,175	25,241	NA	NA	42,416
Number of Mainline Cleanouts	0	NA	NA	NA	0
Number of Manholes	211	NA	NA	NA	211
Equivalent Length, Feet	61,386	25,241	NA	NA	86,627
I/I Distribution %	71%	29%	0%	0%	100%

1. Public manhole and gravity main information from Locality GIS submittals dated October 2014

2. See I/I Reduction Plan Framework for details on the calculation of lateral length and equivalent length

3. Summary of SSES Activities

Asset specific condition assessment data in this catchment were not utilized in development of the R/R scope of work because comprehensive rehabilitation was assumed. However, Table 3 provides a summary of previous condition assessment data available as of the 2016 original date of this report. Condition data may include the results of smoke testing, night flow isolations, manhole inspections, CCTV, and historical records. Condition findings are presented graphically in Figure 2.

HPIIRP assessment activities, in progress in 2025, are not included in this report. New field data will be applied in the near-term future to develop updated I/I rehabilitation scopes and inform design efforts.

Note that the sanitary sewer information shown in the figure, including sewer mains, manholes and catchment boundaries, was provided to HRSD by each Locality. Localities continue to refine this information, and future activities within this catchment should incorporate the most recent data available at that time. Further, revisions to Locality GIS information may alter the R/R scope and/or I/I reduction estimate presented in this Plan.

Table 3. Public Sewer System Condition Data Summary

SSES Investigation	Percent of Catchment Investigated
Smoke Testing	100%
Manhole Inspections/Checks	100%
CCTV	64%



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Date: 7/2/2015

Figure 1. YORK-006 Existing Asset Condition Data Summary

The above Map is for general reference only, and should not be relied upon for design efforts.

4. Catchment Flow Characteristics

Flow monitoring was conducted by York County at lift station YORK-006. A temporary flow monitor was installed in May 2008 on the pump station discharge manifold.

Tables 4 and 5 depict the catchment hydrologic characteristics as represented in the Flow Parameter Database and RHM. The 10-year peak flow was derived from hydrographs generated by applying the RTK hydrologic parameters to a 4-hour design storm event, considered representative of a rain event that would induce regional 10-year flow conditions. For each catchment, long term statistical simulations have been analyzed to compare 10-year Log Pearson III (LPIII) return flows to the peak flows resulting from the design event to obtain a scaling factor. This scaling factor was then used to modify the design event hydrograph to present the pre-rehabilitation 10-year peak flow conditions for this catchment. Figure 2 presents the pre-rehabilitation 10-year peak I/I flow hydrograph for the catchment as represented by the HRSD 10-year design storm with scaling factors applied.

Table 4. Catchment YORK-006 Pre-Rehabilitation Sewer Flow Characteristics

Associated Treatment Plant	Williamsburg
Sewered Area, Acres	269.9
Flow Monitored or Associated Parameters	Flow Monitored
Base Sewer Flow, GPD	83,635
Dry Weather Infiltration (DWI), GPD	0
10 Year Peak I/I, GPD	3,208,424
10 Year Peak Flow, GPD	3,292,059
I/I Density, GPAD	11,886

Table 5. Pre-Rehabilitation Hydrologic Parameters

	R	T, Hours	K
Triangle 1	0.0138	1.000	3.000
Triangle 2	0.0092	5.000	5.000
Triangle 3	0.0000	0.000	0.000

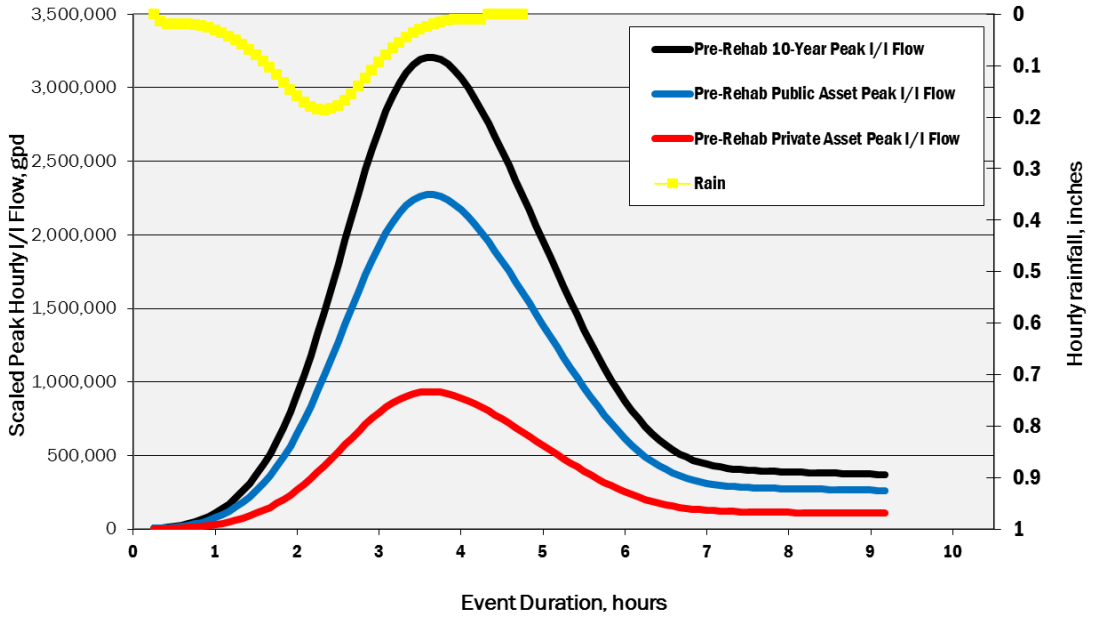


Figure 2. 10-Year Peak I/I Flow Hydrograph for YORK-006

5. Summary of Prior Rehabilitation Activities

Table 6 summarizes recent known corrective actions and rehabilitation activities undertaken by the locality within this catchment as of 2016. This information is for reference only. For Comprehensive approach I/I reduction plans, defects that have been remedied have not been considered in development of post-rehabilitation I/I reduction estimates or development of the R/R scope of work, unless post-rehabilitation flow monitoring data were available at the time of this report. It is assumed that future investigations will determine whether these actions have resulted in the removal of I/I entering the system, and this will be accounted for in pre-design activities.

Table 6. Prior Rehabilitation Catchment Activity

Facility ID/Project Name	Location	Corrective Action Description	Completion Date
NA	NA	NA	NA

6. R/R Cost Estimate

For this catchment, the R/R costs assume comprehensive rehabilitation of public pipes, public manholes and public sewer laterals. Original assumptions used to derive the single-family residential and NSF component of the rehabilitation plan are described in the 2016 *I/I Reduction Plan Framework.*

The 2025 *Comprehensive II Reduction Plan* was developed as part of the HPIIRP and included revisions to RWWMP assumptions in order to provide estimates reflective of currently ongoing field investigations and observed impacts to potential rehabilitation scope. Assumption modifications included:

- Private SF laterals are not included in rehab scope
- Due to active SSES efforts within public assets, additional investigation costs included for NSF only
- Public Side Lateral Replacement/Rehabilitation ratio of 40%/60% assumed for all plan types

- Public asset Replacement/Rehabilitation ratio of 25%/75% assumed for all plan types

Planning level cost estimates have been updated to reflect 2025 unit prices with the anticipated R/R scope of work. Section 5 of the 2025 Comprehensive II Reduction Plan summarizes the basis of the revised R/R cost estimate. These costs are planning-level estimates only and actual completed costs will vary.

Table 7. Estimated Predesign Investigation, Design and Construction Costs, Catchment YORK-006

Category	Quantity in R/R Scope	Estimated Cost, $
NSF Private Assets		
Pre-Design SSES, Feet[1]	NA	NA
Private NSF Sewer R/R, Feet	NA	NA
Private NSF Lateral R/R, Feet	NA	NA
Private NSF Manhole R/R, count	NA	NA
Pavement Restoration, Lane-Miles	NA	NA
Engineering and Contingency	NA	NA
Total NSF R/R		**$0**
Private SF Lateral R/R, feet		
Footage of SF Lateral in R/R Scope	0	NA
Pre-Rehab Investigation, Feet[2]	0	$0
Private SF Lateral Replacement, Feet[3]	0	$0
Engineering and Contingency	NA	$0
Total SF Lateral R/R		**$0**
Public Sewer System Assets		
Pre-Design SSES, Feet	NA	$0
Public Sewer R/R, feet	38,620	$7,077,100
Public Lateral R/R, feet	17,175	$3,806,000
Manhole R/R, count	211	$3,782,200
Pavement Restoration, Lane-Miles	3.8	$855,000
Public Sewer System R/R Cost Subtotal	NA	$15,520,300
Engineering and Contingency	NA	$7,604,900
Total Public Asset R/R		**$23,125,200**
Total Rehab Plan		**$23,125,200**

Notes:

1. Includes Flow Monitoring and Inspection

2. Assumes 70% participation based on total length of laterals in R/R scope

3. Assumes 25% failure rate for tested laterals

7. Post Rehabilitation I/I Reduction Target

I/I was proportioned to public sewer assets, single family residential laterals, and NSF sanitary sewer assets in accordance with the equivalent length of assets shown on Table 2. Post-rehabilitation I/I reduction was estimated for the percentage of assets included in the R/R scope as described in the *I/I Reduction Plan Framework* document. Table 8 summarizes the I/I reduction target and post-rehabilitation 10-year peak I/I flow for this catchment.

It is assumed that current flow data, I/I abatement, and rehabilitation activities will be reviewed and updated during predesign activities to confirm assumptions in this planning document.

Table 8. Post-Rehabilitation I/I Reduction Estimate

	Public Sewer System	Private Single Family Laterals	Private Non-Single Family
Percent of System assumed in R/R Scope	100%	0%	0%
10-Year Peak I/I, GPD	2,273,579	934,845	0
Estimated 10-Year Peak I/I Flow Reduction, GPD	1,591,505	0	0
Estimated 10-Year Peak I/I Post-Rehab Flow, GPD	682,074	934,845	0
Total 10-Year Peak I/I Reduction Target	1,591,505 GPD (50%)		
Total 10-Year Peak I/I Post-Rehab Flow Target, GPD	1,616,919		

8. References

This Plan was developed based on information provided in the sources referenced below.

1. York County, “Flow Evaluation Report”, May 2009
2. York County, “YorkCountySmokeTesting database.mdb”, February 2014
3. York County, “YC 005 County of York SSES PS 06_PACP.mdb”, February 2014
4. York County, “Condition Assessment Hickory Hills Sta.#006”, Environmental and Development Services, no date provided
5. Regional GIS Database, October 2014
6. Flow Parameter Database developed by Localities, compiled by CDM-Smith, November 2015

9. Limitations

This document was prepared solely for HRSD in accordance with professional standards at the time the services were performed and in accordance with the contract between HRSD and Brown and Caldwell dated April 22, 2014. This document is governed by the specific scope of work authorized by HRSD; it is not intended to be relied upon by any other party. We have relied on information or instructions provided by HRSD and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

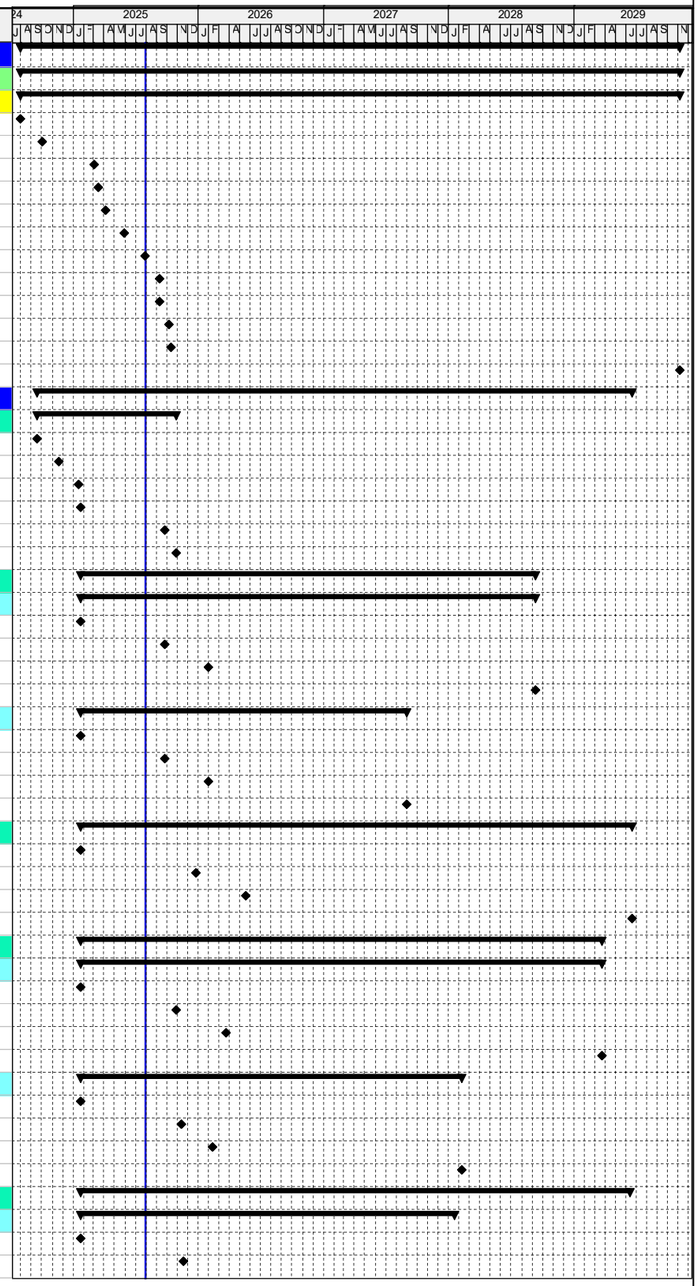
Appendix B: Implementation Schedule

Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
1	**HRSD - High Priority I/I Reduction PDB Program**		1338		35	01-Aug-24 A	06-Nov-29	31-Jul-25	31-Dec-29
2	**MILESTONES**		1338		35	01-Aug-24 A	06-Nov-29	31-Jul-25	31-Dec-29
3	**GENERAL**		1338		35	01-Aug-24 A	06-Nov-29	31-Jul-25	31-Dec-29
4	MIL-GEN-1000	Start at Risk	0	100%		01-Aug-24 A		31-Jul-25	
5	MIL-GEN-1010	Interim Agreement Notice to Proceed	0	100%		02-Oct-24 A		31-Jul-25	
6	MIL-GEN-1040	Submit Conceptual I/I Reduction Plan Outline to HRSD	0	100%			03-Mar-25 A		31-Jul-25
7	MIL-GEN-1060	Host Meeting for Conceptual I/I Reduction Plan Outline	0	100%			14-Mar-25 A		31-Jul-25
8	MIL-GEN-1050	Submit Program Execution Plan to HRSD	0	100%			04-Apr-25 A		29-Apr-26
9	MIL-GEN-1070	Start Negotiations of Comprehensive Agreement (T&C's, Insurance, Scope)	0	100%		30-May-25 A		18-Dec-25	
10	MIL-GEN-1080	Submit Conceptual I/I Reduction Plan to HRSD	0	100%			29-Jul-25 A		07-Jan-26
11	MIL-GEN-1090	Finish Negotiations of Comprehensive Agreement (T&C's, Insurance, Scope)	0	0%	77		09-Sep-25		30-Dec-25
12	MIL-GEN-1100	Submit Draft-Final Comp. Agreement for HRSD Commission Approval	0	0%	8		10-Sep-25		22-Sep-25
13	MIL-GEN-1110	Submit Final Comprehensive Agreement for HRSD Execution	0	0%	67		07-Oct-25		14-Jan-26
14	MIL-GEN-1020	Comprehensive Agreement Notice to Proceed	0	0%	67		14-Oct-25		21-Jan-26
15	MIL-GEN-1030	HPIIRP PDB Program Finish	0	0%	35		06-Nov-29*		28-Dec-29
16	**WORKSHOPS**		1160		134	16-Sep-24 A	18-Jun-29	09-Sep-25	31-Dec-29
17	**GENERAL**		237		57	16-Sep-24 A	28-Oct-25	09-Sep-25	21-Jan-26
18	MIL-GEN-WS-1010	Host Workshop with HRSD Public Outreach Group	0	100%			16-Sep-24 A		07-Oct-25
19	MIL-GEN-WS-1000	Host Workshop(s) to Present Findings from Data Review	0	100%			20-Nov-24 A		16-Oct-25
20	MIL-GEN-WS-1020	Host Field Training Workshops with SSES Subcontractors	0	100%			17-Jan-25 A		09-Sep-25
21	MIL-GEN-WS-1030	Host Workshop on Private I/I Reduction Options	0	100%			22-Jan-25 A		02-Jan-26
22	MIL-GEN-WS-1050	Host Workshop to Present Manual, Rehab Technologies, Costs, etc.	0	0%	80		25-Sep-25		21-Jan-26
23	MIL-GEN-WS-1040	Host Workshop with HRSD on Model Strategy & Protocol Document	0	0%	39		28-Oct-25		23-Dec-25
24	**PHASE 1A (JCSA-LSA-3-8 & JCSA-LSA3-6)**		940		329	22-Jan-25 A	11-Sep-28	06-Oct-25	31-Dec-29
25	**JCSA-LSA3-8**		940		129	22-Jan-25 A	11-Sep-28	06-Oct-25	15-Mar-29
26	MIL-PH1A-WS-1030	JCSA-LSA3-8 - Host Workshop of Basin Specific Condition Data Collection Plans	0	100%			22-Jan-25 A		06-Oct-25
27	MIL-PH1A-WS-1020	JCSA-LSA3-8 - Host Preliminary I/I Reduction Plan Workshop	0	0%	62		25-Sep-25		23-Dec-25
28	MIL-PH1A-WS-1000	JCSA-LSA3-8 - Host Workshop of Work Package	0	0%	46		29-Jan-26		03-Apr-26
29	MIL-PH1A-WS-1010	JCSA-LSA3-8 - Host Workshop on I/I Reduction Effectiveness	0	0%	129		11-Sep-28		15-Mar-29
30	**JCSA-LSA3-6**		617		589	22-Jan-25 A	01-Sep-27	06-Feb-26	31-Dec-29
31	MIL-PH1A-WS-1080	JCSA-LSA3-6 - Host Workshop of Basin Specific Condition Data Collection Plans	0	100%			22-Jan-25 A		31-Dec-29
32	MIL-PH1A-WS-1090	JCSA-LSA3-6 - Host Preliminary I/I Reduction Plan Workshop	0	0%	93		25-Sep-25		06-Feb-26
33	MIL-PH1A-WS-2000	JCSA-LSA3-6 - Host Workshop of Work Package	0	0%	91		29-Jan-26		08-Jun-26
34	MIL-PH1A-WS-2010	JCSA-LSA3-6 - Host Workshop on I/I Reduction Effectiveness	0	0%	589		01-Sep-27		28-Dec-29
35	**PHASE 1B (PORT-10)**		1135		134	22-Jan-25 A	18-Jun-29	06-Oct-25	28-Dec-29
36	MIL-PH1B-WS-1000	PORT-10 - Host Workshop of Basin Specific Condition Data Collection Plans	0	100%			22-Jan-25 A		06-Oct-25
37	MIL-PH1B-WS-1010	PORT-10 - Host Preliminary I/I Reduction Plan Workshop	0	0%	35		23-Dec-25		13-Feb-26
38	MIL-PH1B-WS-1020	PORT-10 - Host Workshop of Work Package	0	0%	35		18-May-26		08-Jul-26
39	MIL-PH1B-WS-1030	PORT-10 - Host Workshop on I/I Reduction Effectiveness	0	0%	134		18-Jun-29		28-Dec-29
40	**PHASE 2 (JCSA-LSA3-1 & JCSA-LSA5-4)**		1012		194	22-Jan-25 A	23-Mar-29	02-Mar-26	31-Dec-29
41	**JCSA-LSA3-1**		1012		194	22-Jan-25 A	23-Mar-29	12-Mar-26	31-Dec-29
42	MIL-PH2-WS-1000	JCSA-LSA3-1 - Host Workshop of Basin Specific Condition Data Collection Plans	0	100%			22-Jan-25 A		31-Dec-29
43	MIL-PH2-WS-1010	JCSA-LSA3-1 - Host Preliminary I/I Reduction Plan Workshop	0	0%	94		27-Oct-25		12-Mar-26
44	MIL-PH2-WS-1020	JCSA-LSA3-1 - Host Workshop of Work Package	0	0%	94		23-Mar-26		04-Aug-26
45	MIL-PH2-WS-1030	JCSA-LSA3-1 - Host Workshop on I/I Reduction Effectiveness	0	0%	194		23-Mar-29		28-Dec-29
46	**JCSA-LSA5-4**		725		481	22-Jan-25 A	07-Feb-28	02-Mar-26	31-Dec-29
47	MIL-PH2-WS-1040	JCSA-LSA5-4 - Host Workshop of Basin Specific Condition Data Collection Plans	0	100%			22-Jan-25 A		31-Dec-29
48	MIL-PH2-WS-1050	JCSA-LSA5-4 - Host Preliminary I/I Reduction Plan Workshop	0	0%	75		11-Nov-25		02-Mar-26
49	MIL-PH2-WS-1060	JCSA-LSA5-4 - Host Workshop of Work Package	0	0%	103		10-Feb-26		07-Jul-26
50	MIL-PH2-WS-1070	JCSA-LSA5-4 - Host Workshop on I/I Reduction Effectiveness	0	0%	481		07-Feb-28		28-Dec-29
51	**PHASE 3 (YORK-003 & YORK-006)**		1068		138	22-Jan-25 A	12-Jun-29	26-Mar-26	31-Dec-29
52	**YORK-003**		710		496	22-Jan-25 A	17-Jan-28	26-Mar-26	31-Dec-29
53	MIL-PH3-WS-1000	YORK-003 - Host Workshop of Basin Specific Condition Data Collection Plans	0	100%			22-Jan-25 A		31-Dec-29
54	MIL-PH3-WS-1010	YORK-003 - Host Preliminary I/I Reduction Plan Workshop	0	0%	88		18-Nov-25		26-Mar-26



Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

HRSD
Sustainable, Innovative Wastewater Treatment

HRSD - HIGH PRIORITY I/I REDUCTION PDB PROGRAM

BURNS McDONNELL

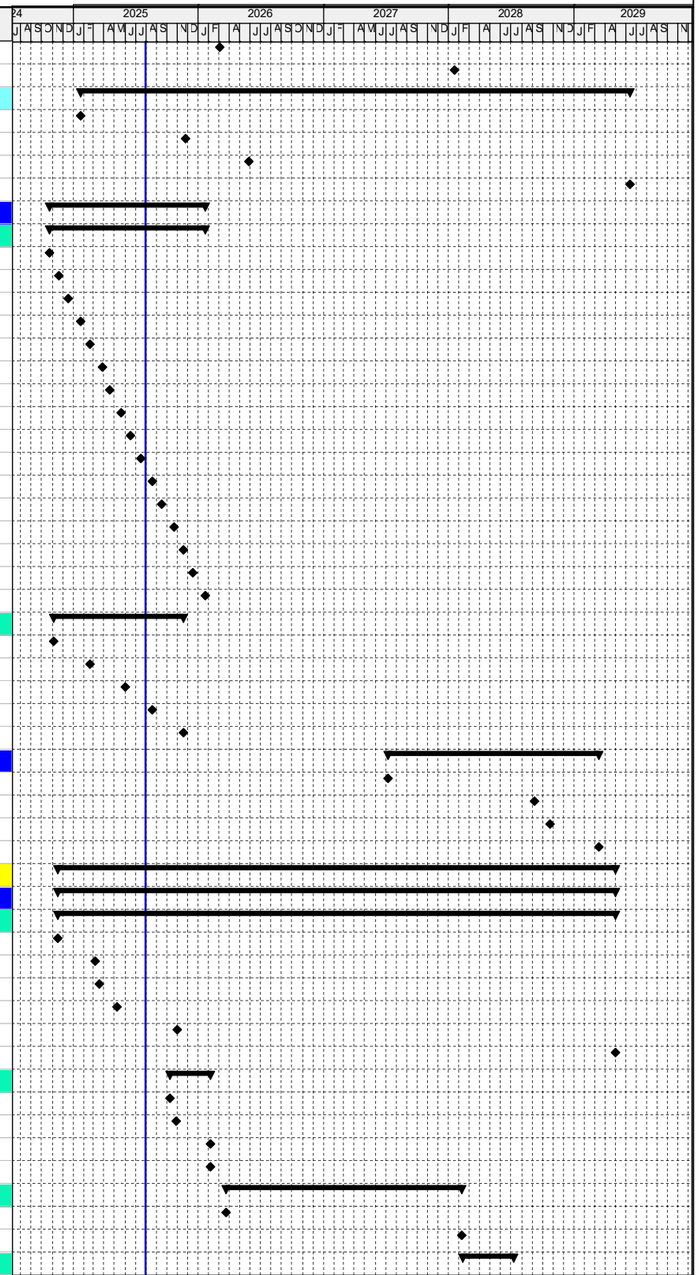
Date	Revision	Checked	Approved
27-May-25	MASTER SCHEDULE APR 2025 UPDATE	BPJ/JKC	
26-Jun-25	MASTER SCHEDULE MAY 2025 UPDATE	BPJ/JKC	
17-Jul-25	MASTER SCHEDULE JUN 2025 UPDATE	BPJ/JKC	
20-Aug-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	
16-Sep-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	

Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
55	MIL-PH3-WS-1020	YORK-003 - Host Workshop of Work Package	0	0%	95		03-Mar-26		16-Jul-26
56	MIL-PH3-WS-1030	YORK-003 - Host Workshop on I/I Reduction Effectiveness	0	0%	146		17-Jan-28		10-Aug-28
57	**YORK-006**		1068		138	22-Jan-25 A	12-Jun-29	05-Apr-27	31-Dec-29
58	MIL-PH3-WS-1040	YORK-006 - Host Workshop of Basin Specific Condition Data Collection Plans	0	100%			22-Jan-25 A		31-Dec-29
59	MIL-PH3-WS-1050	YORK-006 - Host Preliminary I/I Reduction Plan Workshop	0	0%	343		25-Nov-25		05-Apr-27
60	MIL-PH3-WS-1060	YORK-006 - Host Workshop of Work Package	0	0%	304		28-May-26		09-Aug-27
61	MIL-PH3-WS-1070	YORK-006 - Host Workshop on I/I Reduction Effectiveness	0	0%	138		12-Jun-29		28-Dec-29
62	**MEETINGS**		287		1001	23-Oct-24 A	21-Jan-26	20-Aug-25	31-Dec-29
63	**MONTHLY PROGRESS STATUS MEETINGS**		287		1001	23-Oct-24 A	21-Jan-26	20-Aug-25	31-Dec-29
64	MIL-PSM-1000	HRSD Monthly Progress Status Meeting - 1	0	100%		23-Oct-24 A		20-Aug-25	
65	MIL-PSM-1010	HRSD Monthly Progress Status Meeting - 2	0	100%		20-Nov-24 A		31-Dec-29	
66	MIL-PSM-1020	HRSD Monthly Progress Status Meeting - 3	0	100%		18-Dec-24 A		31-Dec-29	
67	MIL-PSM-1030	HRSD Monthly Progress Status Meeting - 4	0	100%		22-Jan-25 A		31-Dec-29	
68	MIL-PSM-1040	HRSD Monthly Progress Status Meeting - 5	0	100%		19-Feb-25 A		31-Dec-29	
69	MIL-PSM-1050	HRSD Monthly Progress Status Meeting - 6	0	100%		26-Mar-25 A		31-Dec-29	
70	MIL-PSM-1060	HRSD Monthly Progress Status Meeting - 7	0	100%		16-Apr-25 A		31-Dec-29	
71	MIL-PSM-1070	HRSD Monthly Progress Status Meeting - 8	0	100%		21-May-25 A		31-Dec-29	
72	MIL-PSM-1080	HRSD Monthly Progress Status Meeting - 9	0	100%		18-Jun-25 A		31-Dec-29	
73	MIL-PSM-1090	HRSD Monthly Progress Status Meeting - 10	0	100%		16-Jul-25 A		31-Dec-29	
74	MIL-PSM-1100	HRSD Monthly Progress Status Meeting - 11	0	100%		20-Aug-25 A		31-Dec-29	
75	MIL-PSM-1110	HRSD Monthly Progress Status Meeting - 12	0	0%	0	17-Sep-25*		17-Sep-25	
76	MIL-PSM-1120	HRSD Monthly Progress Status Meeting - 13	0	0%	0	22-Oct-25*		22-Oct-25	
77	MIL-PSM-1130	HRSD Monthly Progress Status Meeting - 14	0	0%	0	19-Nov-25*		19-Nov-25	
78	MIL-PSM-1140	HRSD Monthly Progress Status Meeting - 15	0	0%	0	17-Dec-25*		17-Dec-25	
79	MIL-PSM-1150	HRSD Monthly Progress Status Meeting - 16	0	0%	0	21-Jan-26*		21-Jan-26	
80	**QUARTERLY STEERING MEETINGS**		141		1043	05-Nov-24 A	18-Nov-25	18-Nov-25	31-Dec-29
81	MIL-PSM-1210	HRSD 2025 Steering Committee Meeting 1	0	100%		05-Nov-24 A		31-Dec-29	
82	MIL-PSM-1170	HRSD 2025 Steering Committee Meeting 2	0	100%		18-Feb-25 A		31-Dec-29	
83	MIL-PSM-1180	HRSD 2025 Steering Committee Meeting 3	0	100%		02-Jun-25 A		31-Dec-29	
84	MIL-PSM-1190	HRSD 2025 Steering Committee Meeting 4	0	100%		19-Aug-25 A		31-Dec-29	
85	MIL-PSM-1200	HRSD 2025 Steering Committee Meeting 5	0	0%	0	18-Nov-25*		18-Nov-25	
86	**ADAPTIVE MANAGEMENT PLAN**		430		200	07-Jul-27	15-Mar-29	01-Jun-28	28-Dec-29
87	MIL-AMP-GEN-1000	Draft Adaptive Management Plan Start	0	0%	230	07-Jul-27		01-Jun-28	
88	MIL-AMP-GEN-1010	Draft Adaptive Management Plan Finish	0	0%	230		08-Sep-28		06-Aug-29
89	MIL-AMP-GEN-1020	Final Adaptive Management Plan Start	0	0%	245	23-Oct-28		10-Oct-29	
90	MIL-AMP-GEN-1030	Final Adaptive Management Plan Finish	0	0%	200		15-Mar-29		28-Dec-29
91	**PHASE 1A (JCSA-LSA3-8 & JCSA-LSA3-6)**		1120		168	18-Nov-24 A	30-Apr-29	25-Sep-25	31-Dec-29
92	**JCSA-LSA3-8**		1120		168	18-Nov-24 A	30-Apr-29	25-Sep-25	28-Dec-29
93	**SSES DATA COLLECTION & FLOW MONITORING**		1120		168	18-Nov-24 A	30-Apr-29	25-Sep-25	28-Dec-29
94	MIL-PH1A-1000	JCSA-LSA3-8 - Long Term Flow Monitoring Start	0	100%		18-Nov-24 A		13-Apr-26	
95	MIL-PH1A-1010	JCSA-LSA3-8 - SSES Data Collection Start	0	100%		05-Mar-25 A		25-Sep-25	
96	MIL-PH1A-1020	JCSA-LSA3-8 - Short Term Flow Monitoring Start	0	100%		18-Mar-25 A		11-Feb-26	
97	MIL-PH1A-1030	JCSA-LSA3-8 - SSES Data Collection Finish	0	100%			08-May-25 A		25-Sep-25
98	MIL-PH1A-1040	JCSA-LSA3-8 - Short Term Flow Monitoring Finish	0	0%	105		30-Oct-25		01-Apr-26
99	MIL-PH1A-1130	JCSA-LSA3-8 - Long Term Flow Monitoring Finish	0	0%	168		30-Apr-29		28-Dec-29
100	**DESIGN**		81		46	09-Oct-25	05-Feb-26	23-Dec-25	10-Apr-26
101	MIL-PH1A-1050	JCSA-LSA3-8 - Preliminary I/I Reduction Plan Finish	0	0%	52		09-Oct-25		23-Dec-25
102	MIL-PH1A-1060	JCSA-LSA3-8 - Final Design Start	0	0%	46	29-Oct-25		07-Jan-26	
103	MIL-PH1A-1070	JCSA-LSA3-8 - HRSD Approval of Work Package	0	0%	46		05-Feb-26		10-Apr-26
104	MIL-PH1A-1080	JCSA-LSA3-8 - Final Design Finish	0	0%	46		05-Feb-26		10-Apr-26
105	**CONSTRUCTION**		478		39	24-Mar-26	09-Feb-28	19-Jun-26	04-Apr-28
106	MIL-PH1A-1090	JCSA-LSA3-8 - Construction Start	0	0%	62	24-Mar-26		19-Jun-26	
107	MIL-PH1A-1100	JCSA-LSA3-8 - Construction Finish	0	0%	39		09-Feb-28		04-Apr-28
108	**POST CONSTRUCTION**		105		39	10-Feb-28	07-Jul-28	05-Apr-28	31-Aug-28



Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

HRSD
Sustainable, Innovative Wastewater Treatment

BURNS McDONNELL

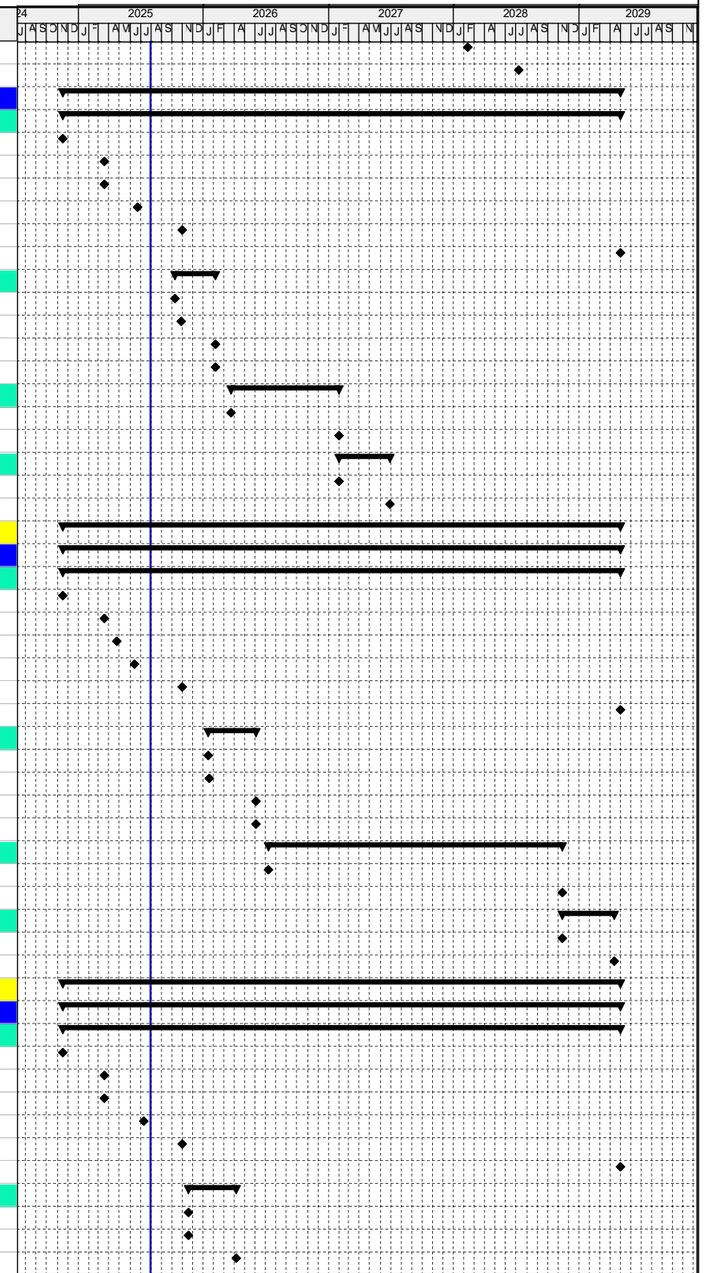
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17-Jul-25	MASTER SCHEDULE JUN 2025 UPDATE	BPJ/JKC	
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Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
109	MIL-PH1A-1110	JCSA-LSA3-8 - Post Construction Flow Monitoring Start (Less Permanent)	0	0%	39	10-Feb-28		05-Apr-28	
110	MIL-PH1A-1120	JCSA-LSA3-8 - Post Construction Flow Monitoring Finish (Less Permanent)	0	0%	39		07-Jul-28		31-Aug-28
111	JCSA-LSA3-6		1120		168	18-Nov-24 A	30-Apr-29	27-Feb-26	31-Dec-29
112	SSES DATA COLLECTION & FLOW MONITORING		1120		168	18-Nov-24 A	30-Apr-29	13-Apr-26	31-Dec-29
113	MIL-PH1A-WS-2270	JCSA-LSA3-6 - Long Term Flow Monitoring Start	0	100%		18-Nov-24 A		13-Apr-26	
114	MIL-PH1A-WS-2260	JCSA-LSA3-6 - SSES Data Collection Start	0	100%		17-Mar-25 A		31-Dec-29	
115	MIL-PH1A-WS-2280	JCSA-LSA3-6 - Short Term Flow Monitoring Start	0	100%		18-Mar-25 A		28-Dec-29	
116	MIL-PH1A-WS-2240	JCSA-LSA3-6 - SSES Data Collection Finish	0	100%			24-Jun-25 A		31-Dec-29
117	MIL-PH1A-WS-2250	JCSA-LSA3-6 - Short Term Flow Monitoring Finish	0	0%	1055		30-Oct-25		28-Dec-29
118	MIL-PH1A-WS-2290	JCSA-LSA3-6 - Long Term Flow Monitoring Finish	0	0%	168		30-Apr-29		28-Dec-29
119	DESIGN		81		91	10-Oct-25	05-Feb-26	27-Feb-26	15-Jun-26
120	MIL-PH1A-WS-2190	JCSA-LSA3-6 - Preliminary I/I Reduction Plan Finish	0	0%	97		10-Oct-25		27-Feb-26
121	MIL-PH1A-WS-2200	JCSA-LSA3-6 - Final Design Start	0	0%	103	29-Oct-25		27-Mar-26	
122	MIL-PH1A-WS-2160	JCSA-LSA3-6 - HRSD Approval - Work Package Development	0	0%	91		05-Feb-26		15-Jun-26
123	MIL-PH1A-WS-2210	JCSA-LSA3-6 - Final Design Finish	0	0%	91		05-Feb-26		15-Jun-26
124	CONSTRUCTION		218		84	24-Mar-26	01-Feb-27	22-Feb-27	28-May-27
125	MIL-PH1A-WS-2220	JCSA-LSA3-6 - Construction Start	0	0%	232	24-Mar-26		22-Feb-27	
126	MIL-PH1A-WS-2170	JCSA-LSA3-6 - Construction Finish	0	0%	84		01-Feb-27		28-May-27
127	POST CONSTRUCTION		105		84	02-Feb-27	29-Jun-27	01-Jun-27	27-Oct-27
128	MIL-PH1A-WS-2230	JCSA-LSA3-6 - Post Construction Flow Monitoring Start (Less Permanent)	0	0%	84	02-Feb-27		01-Jun-27	
129	MIL-PH1A-WS-2180	JCSA-LSA3-6 - Post Construction Flow Monitoring Finish (Less Permanent)	0	0%	84		29-Jun-27		27-Oct-27
130	PHASE 1B (PORT-10)		1120		168	18-Nov-24 A	30-Apr-29	19-Sep-25	28-Dec-29
131	PORT-10		1120		168	18-Nov-24 A	30-Apr-29	19-Sep-25	28-Dec-29
132	SSES DATA COLLECTION & FLOW MONITORING		1120		168	18-Nov-24 A	30-Apr-29	19-Sep-25	28-Dec-29
133	MIL-PH1B-1000	PORT-10 - Long Term Flow Monitoring Start	0	100%		18-Nov-24 A		13-Apr-26	
134	MIL-PH1B-1020	PORT-10 - Short Term Flow Monitoring Start	0	100%		18-Mar-25 A		21-Jan-26	
135	MIL-PH1B-1010	PORT-10 - SSES Data Collection Start	0	100%		23-Apr-25 A		19-Sep-25	
136	MIL-PH1B-1030	PORT-10 - SSES Data Collection Finish	0	100%			13-Jun-25 A		19-Sep-25
137	MIL-PH1B-1040	PORT-10 - Short Term Flow Monitoring Finish	0	0%	55		30-Oct-25		21-Jan-26
138	MIL-PH1B-1050	PORT-10 - Long Term Flow Monitoring Finish	0	0%	168		30-Apr-29		28-Dec-29
139	DESIGN		96		35	16-Jan-26	02-Jun-26	06-Mar-26	22-Jul-26
140	MIL-PH1B-1060	PORT-10 - Preliminary I/I Reduction Plan Finish	0	0%	35		16-Jan-26		06-Mar-26
141	MIL-PH1B-1070	PORT-10 - Final Design Start	0	0%	35	19-Jan-26		09-Mar-26	
142	MIL-PH1B-1090	PORT-10 - HRSD Approval - Work Package Development	0	0%	35		02-Jun-26		22-Jul-26
143	MIL-PH1B-1080	PORT-10 - Final Design Finish	0	0%	35		02-Jun-26		22-Jul-26
144	CONSTRUCTION		598		35	09-Jul-26	13-Nov-28	01-Oct-26	05-Jan-29
145	MIL-PH1B-1100	PORT-10 - Construction Start	0	0%	59	09-Jul-26		01-Oct-26	
146	MIL-PH1B-1110	PORT-10 - Construction Finish	0	0%	35		13-Nov-28		05-Jan-29
147	POST CONSTRUCTION		105		35	14-Nov-28	13-Apr-29	08-Jan-29	04-Jun-29
148	MIL-PH1B-1120	PORT-10 - Post Construction Flow Monitoring Start (Less Permanent)	0	0%	35	14-Nov-28		08-Jan-29	
149	MIL-PH1B-1130	PORT-10 - Post Construction Flow Monitoring Finish (Less Permanent)	0	0%	35		13-Apr-29		04-Jun-29
150	PHASE 2 (JCSA-LSA3-1 & JCSA-LSA5-4)		1120		168	18-Nov-24 A	30-Apr-29	03-Dec-25	28-Dec-29
151	JCSA-LSA3-1		1120		168	18-Nov-24 A	30-Apr-29	03-Dec-25	28-Dec-29
152	SSES DATA COLLECTION & FLOW MONITORING		1120		168	18-Nov-24 A	30-Apr-29	03-Dec-25	28-Dec-29
153	MIL-PH2-1000	JCSA-LSA3-1 - Long Term Flow Monitoring Start	0	100%		18-Nov-24 A		13-Apr-26	
154	MIL-PH2-1030	JCSA-LSA3-1 - SSES Data Collection Start	0	100%		17-Mar-25 A		03-Dec-25	
155	MIL-PH2-1010	JCSA-LSA3-1 - Short Term Flow Monitoring Start	0	100%		18-Mar-25 A		11-Jun-26	
156	MIL-PH2-1040	JCSA-LSA3-1 - SSES Data Collection Finish	0	100%			10-Jul-25 A		03-Dec-25
157	MIL-PH2-1020	JCSA-LSA3-1 - Short Term Flow Monitoring Finish	0	0%	155		30-Oct-25		11-Jun-26
158	MIL-PH2-1050	JCSA-LSA3-1 - Long Term Flow Monitoring Finish	0	0%	168		30-Apr-29		28-Dec-29
159	DESIGN		96		94	17-Nov-25	06-Apr-26	02-Apr-26	18-Aug-26
160	MIL-PH2-1060	JCSA-LSA3-1 - Preliminary I/I Reduction Plan Finish	0	0%	94		17-Nov-25		02-Apr-26
161	MIL-PH2-1070	JCSA-LSA3-1 - Final Design Start	0	0%	94	18-Nov-25		03-Apr-26	
162	MIL-PH2-1090	JCSA-LSA3-1 - HRSD Approval - Work Package Development	0	0%	94		06-Apr-26		18-Aug-26



Primary Baseline
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HRSD
Sustainable, Innovative Wastewater Treatment

HRSD - HIGH PRIORITY I/I REDUCTION PDB PROGRAM

BURNS McDONNELL

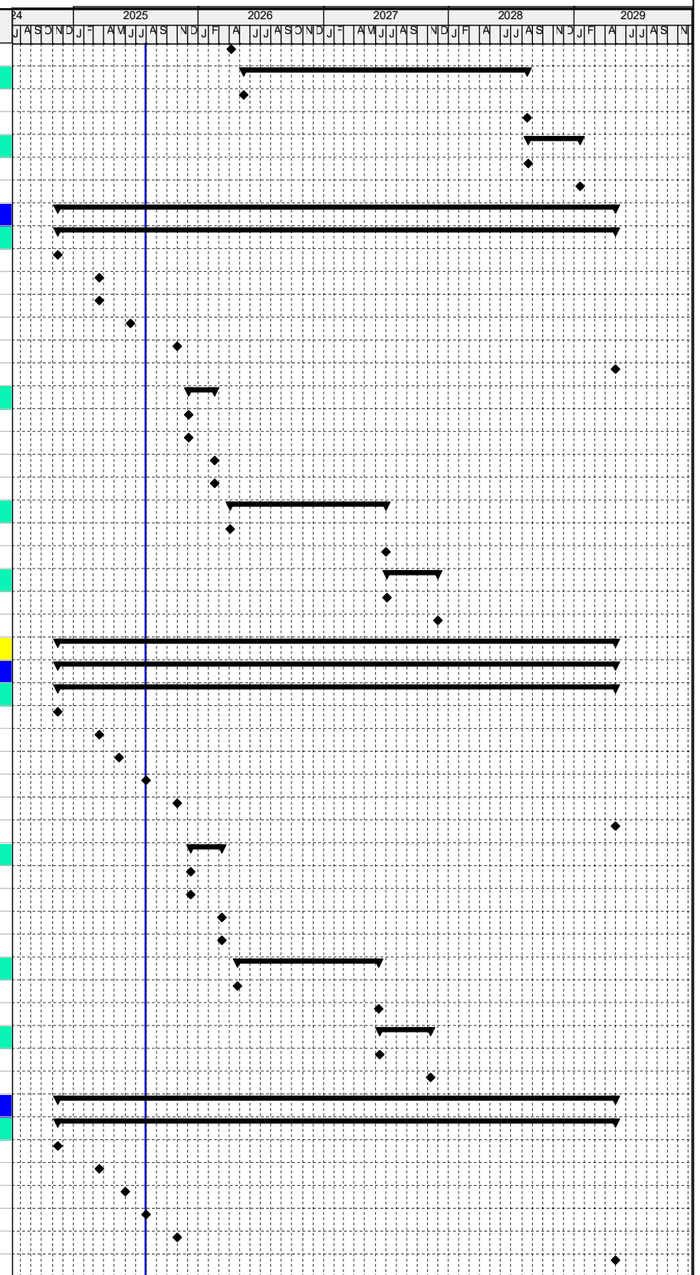
Date	Revision	Checked	Approved
27-May-25	MASTER SCHEDULE APR 2025 UPDATE	BPJ/JKC	
26-Jun-25	MASTER SCHEDULE MAY 2025 UPDATE	BPJ/JKC	
17-Jul-25	MASTER SCHEDULE JUN 2025 UPDATE	BPJ/JKC	
20-Aug-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	
16-Sep-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	

Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
163	MIL-PH2-1080	JCSA-LSA3-1 - Final Design Finish	0	0%	94		06-Apr-26		18-Aug-26
164	CONSTRUCTION		578		94	12-May-26	18-Aug-28	27-Oct-26	04-Jan-29
165	MIL-PH2-1100	JCSA-LSA3-1 - Construction Start	0	0%	117	12-May-26		27-Oct-26	
166	MIL-PH2-1110	JCSA-LSA3-1 - Construction Finish	0	0%	94		18-Aug-28		04-Jan-29
167	POST CONSTRUCTION		105		94	21-Aug-28	19-Jan-29	05-Jan-29	01-Jun-29
168	MIL-PH2-1120	JCSA-LSA3-1 - Post Construction Flow Monitoring Start (Less Permanent)	0	0%	94	21-Aug-28		05-Jan-29	
169	MIL-PH2-1130	JCSA-LSA3-1 - Post Construction Flow Monitoring Finish (Less Permanent)	0	0%	94		19-Jan-29		01-Jun-29
170	JCSA-LSA5-4		1120		168	18-Nov-24 A	30-Apr-29	10-Dec-25	28-Dec-29
171	SSES DATA COLLECTION & FLOW MONITORING		1120		168	18-Nov-24 A	30-Apr-29	10-Dec-25	28-Dec-29
172	MIL-PH2-WS-2130	JCSA-LSA5-4 - Long Term Flow Monitoring Start	0	100%		18-Nov-24 A		13-Apr-26	
173	MIL-PH2-WS-2120	JCSA-LSA5-4 - SSES Data Collection Start	0	100%		17-Mar-25 A		10-Dec-25	
174	MIL-PH2-WS-2140	JCSA-LSA5-4 - Short Term Flow Monitoring Start	0	100%		18-Mar-25 A		28-Dec-29	
175	MIL-PH2-WS-2100	JCSA-LSA5-4 - SSES Data Collection Finish	0	100%			16-Jun-25 A		10-Dec-25
176	MIL-PH2-WS-2110	JCSA-LSA5-4 - Short Term Flow Monitoring Finish	0	0%	1055		30-Oct-25		28-Dec-29
177	MIL-PH2-WS-2150	JCSA-LSA5-4 - Long Term Flow Monitoring Finish	0	0%	168		30-Apr-29		28-Dec-29
178	DESIGN		51		103	03-Dec-25	17-Feb-26	21-Apr-26	14-Jul-26
179	MIL-PH2-WS-2050	JCSA-LSA5-4 - Preliminary I/I Reduction Plan Finish	0	0%	96		03-Dec-25		21-Apr-26
180	MIL-PH2-WS-2060	JCSA-LSA5-4 - Final Design Start	0	0%	103	04-Dec-25		01-May-26	
181	MIL-PH2-WS-2020	JCSA-LSA5-4 - HRSD Approval - Work Package Development	0	0%	103		17-Feb-26		14-Jul-26
182	MIL-PH2-WS-2070	JCSA-LSA5-4 - Final Design Finish	0	0%	103		17-Feb-26		14-Jul-26
183	CONSTRUCTION		318		96	03-Apr-26	02-Jul-27	05-Apr-27	17-Nov-27
184	MIL-PH2-WS-2080	JCSA-LSA5-4 - Construction Start	0	0%	254	03-Apr-26		05-Apr-27	
185	MIL-PH2-WS-2030	JCSA-LSA5-4 - Construction Finish	0	0%	96		02-Jul-27		17-Nov-27
186	POST CONSTRUCTION		105		96	06-Jul-27	01-Dec-27	18-Nov-27	18-Apr-28
187	MIL-PH2-WS-2090	JCSA-LSA5-4 - Post Construction Flow Monitoring Start (Less Permanent)	0	0%	96	06-Jul-27		18-Nov-27	
188	MIL-PH2-WS-2040	JCSA-LSA5-4 - Post Construction Flow Monitoring Finish (Less Permanent)	0	0%	96		01-Dec-27		18-Apr-28
189	PHASE 3 (YORK-003 & YORK-006)		1120		168	18-Nov-24 A	30-Apr-29	26-Dec-25	31-Dec-29
190	YORK-003		1120		168	18-Nov-24 A	30-Apr-29	13-Apr-26	31-Dec-29
191	SSES DATA COLLECTION & FLOW MONITORING		1120		168	18-Nov-24 A	30-Apr-29	13-Apr-26	31-Dec-29
192	MIL-PH3-1000	YORK-003 - Long Term Flow Monitoring Start	0	100%		18-Nov-24 A		13-Apr-26	
193	MIL-PH3-1010	YORK-003 - Short Term Flow Monitoring Start	0	100%		18-Mar-25 A		28-Dec-29	
194	MIL-PH3-1030	YORK-003 - SSES Data Collection Start	0	100%		15-May-25 A		31-Dec-29	
195	MIL-PH3-1040	YORK-003 - SSES Data Collection Finish	0	100%			31-Jul-25 A		31-Dec-29
196	MIL-PH3-1020	YORK-003 - Short Term Flow Monitoring Finish	0	0%	1055		30-Oct-25		28-Dec-29
197	MIL-PH3-1050	YORK-003 - Long Term Flow Monitoring Finish	0	0%	168		30-Apr-29		28-Dec-29
198	DESIGN		61		95	10-Dec-25	10-Mar-26	16-Apr-26	23-Jul-26
199	MIL-PH3-1060	YORK-003 - Preliminary I/I Reduction Plan Finish	0	0%	88		10-Dec-25		16-Apr-26
200	MIL-PH3-1070	YORK-003 - Final Design Start	0	0%	95	11-Dec-25		28-Apr-26	
201	MIL-PH3-1090	YORK-003 - HRSD Approval - Work Package Development	0	0%	95		10-Mar-26		23-Jul-26
202	MIL-PH3-1080	YORK-003 - Final Design Finish	0	0%	95		10-Mar-26		23-Jul-26
203	CONSTRUCTION		288		88	24-Apr-26	11-Jun-27	01-Oct-26	15-Oct-27
204	MIL-PH3-1100	YORK-003 - Construction Start	0	0%	111	24-Apr-26		01-Oct-26	
205	MIL-PH3-1110	YORK-003 - Construction Finish	0	0%	88		11-Jun-27		15-Oct-27
206	POST CONSTRUCTION		105		88	14-Jun-27	09-Nov-27	18-Oct-27	16-Mar-28
207	MIL-PH3-1120	YORK-003 - Post Construction Flow Monitoring Start (Less Permanent)	0	0%	88	14-Jun-27		18-Oct-27	
208	MIL-PH3-1130	YORK-003 - Post Construction Flow Monitoring Finish (Less Permanent)	0	0%	88		09-Nov-27		16-Mar-28
209	YORK-006		1120		168	18-Nov-24 A	30-Apr-29	26-Dec-25	28-Dec-29
210	SSES DATA COLLECTION & FLOW MONITORING		1120		168	18-Nov-24 A	30-Apr-29	26-Dec-25	28-Dec-29
211	MIL-PH3-WS-1190	YORK-006 - Long Term Flow Monitoring Start	0	100%		18-Nov-24 A		13-Apr-26	
212	MIL-PH3-WS-1200	YORK-006 - Short Term Flow Monitoring Start	0	100%		18-Mar-25 A		28-Dec-29	
213	MIL-PH3-WS-1180	YORK-006 - SSES Data Collection Start	0	100%		02-Jun-25 A		26-Dec-25	
214	MIL-PH3-WS-1160	YORK-006 - SSES Data Collection Finish	0	100%			31-Jul-25 A		26-Dec-25
215	MIL-PH3-WS-1170	YORK-006 - Short Term Flow Monitoring Finish	0	0%	1055		30-Oct-25		28-Dec-29
216	MIL-PH3-WS-1210	YORK-006 - Long Term Flow Monitoring Finish	0	0%	168		30-Apr-29		28-Dec-29



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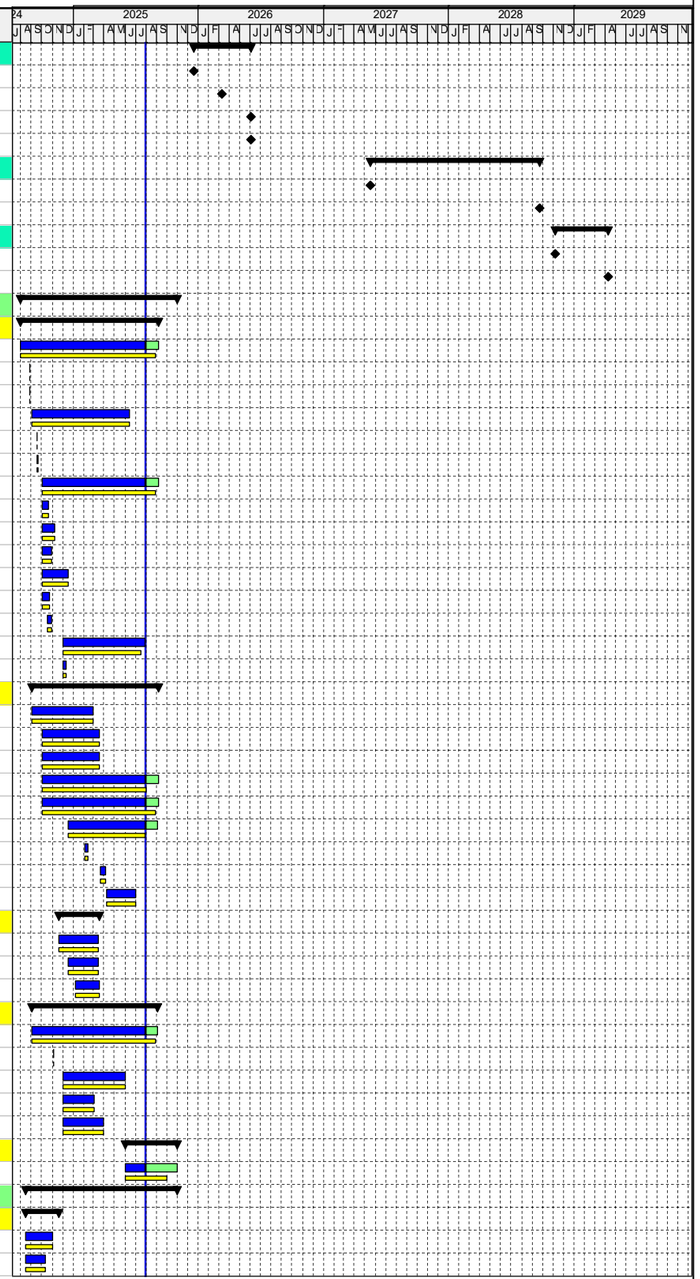
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BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

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#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
217	**DESIGN**		117		304	17-Dec-25	04-Jun-26	10-May-27	16-Aug-27
218	MIL-PH3-WS-1110	YORK-006 - Preliminary I/I Reduction Plan Finish	0	0%	353		17-Dec-25		10-May-27
219	MIL-PH3-WS-1120	YORK-006 - Final Design Start	0	0%	304	11-Mar-26		20-May-27	
220	MIL-PH3-WS-1080	YORK-006 - HRSD Approval - Work Package Development	0	0%	304		04-Jun-26		16-Aug-27
221	MIL-PH3-WS-1130	YORK-006 - Final Design Finish	0	0%	304		04-Jun-26		16-Aug-27
222	**CONSTRUCTION**		343		171	18-May-27	21-Sep-28	23-Feb-28	24-May-29
223	MIL-PH3-WS-1140	YORK-006 - Construction Start	0	0%	194	18-May-27		23-Feb-28	
224	MIL-PH3-WS-1090	YORK-006 - Construction Finish	0	0%	171		21-Sep-28		24-May-29
225	**POST CONSTRUCTION**		105		138	08-Nov-28	09-Apr-29	25-May-29	23-Oct-29
226	MIL-PH3-WS-1150	YORK-006 - Post Construction Flow Monitoring Start (Less Permanent)	0	0%	138	08-Nov-28		25-May-29	
227	MIL-PH3-WS-1100	YORK-006 - Post Construction Flow Monitoring Finish (Less Permanent)	0	0%	138		09-Apr-29		23-Oct-29
228	**TASK SERIES 100 - PROGRAMMATIC ACTIVITIES**		296		1055	01-Aug-24 A	30-Oct-25	31-Jul-25	31-Dec-29
229	**TASK 101 - PROGRAM MANAGEMENT & MOBILIZATION**		296		1094	01-Aug-24 A	05-Sep-25	31-Jul-25	31-Dec-29
230	TS100-101-1000	Strategic Planning, Coordination, & Oversight of Services	160	90%	44	01-Aug-24 A	05-Sep-25	02-Oct-25	06-Nov-25
231	TS100-101-1120	BMcD Team Kickoff Meeting	5	100%		27-Aug-24 A	27-Aug-24 A	31-Jul-25	31-Jul-25
232	TS100-101-1130	BMcD Team Partnering Session	5	100%		27-Aug-24 A	27-Aug-24 A	31-Jul-25	31-Jul-25
233	TS100-101-1010	Prepare & Execute Subcontractor Agreements	43	100%		03-Sep-24 A	13-Jun-25 A	14-Oct-25	14-Oct-25
234	TS100-101-1020	Conduct Program Team & HRSD - Team Kickoff Mtgs	43	100%		16-Sep-24 A	16-Sep-24 A	31-Jul-25	31-Jul-25
235	TS100-101-1040	Participate in Program Partnering Sessions	3	100%		17-Sep-24 A	19-Sep-24 A	31-Jul-25	31-Jul-25
236	TS100-101-1050	Lead & Monitor Program Management Services	253	90%	194	02-Oct-24 A	05-Sep-25	06-May-26	11-Jun-26
237	TS100-101-1060	Mobilize Program Team & Setup Program Office	42	100%		02-Oct-24 A	20-Oct-24 A	09-Sep-25	09-Sep-25
238	TS100-101-1070	Establish Program Charter, Objectives, Strategies, & CSFs	42	100%		02-Oct-24 A	08-Nov-24 A	02-Oct-25	02-Oct-25
239	TS100-101-1080	Identify Program Stakeholders & Roles/Responsibilities	42	100%		02-Oct-24 A	28-Oct-24 A	18-Dec-25	18-Dec-25
240	TS100-101-1090	Develop 30/60/90/120 Day Program Commencement Plan	42	100%		02-Oct-24 A	18-Dec-24 A	02-Oct-25	02-Oct-25
241	TS100-101-1100	Finalize HRSD & BMcD Team Org & Roles	42	100%		02-Oct-24 A	23-Oct-24 A	23-Dec-25	23-Dec-25
242	TS100-101-1030	Identify Accounting Structure, Reporting, & Invoicing	63	100%		17-Oct-24 A	28-Oct-24 A	02-Oct-25	02-Oct-25
243	TS100-101-1110	Review Budgetary Program & Phase 1 Project Costs	55	100%		02-Dec-24 A	30-Jul-25 A	07-Nov-25	07-Nov-25
244	TS100-101-1140	Provide Procore Training to HRSD	7	100%		02-Dec-24 A	10-Dec-24 A	31-Dec-29	31-Dec-29
245	**TASK 102 - PROGRAM EXECUTION PLAN**		160		163	03-Sep-24 A	05-Sep-25	24-Sep-25	29-Apr-26
246	TS100-102-1000	Define HRSD Org Struct/Staff, Roles/Responsibilities	43	100%		03-Sep-24 A	28-Feb-25 A	21-Jan-26	21-Jan-26
247	TS100-102-1010	Commence Development of Draft Program Execution Plan	100	100%		02-Oct-24 A	19-Mar-25 A	24-Sep-25	24-Sep-25
248	TS100-102-1020	Establish Schedule for Steering Committee Mtgs	42	100%		02-Oct-24 A	18-Mar-25 A	24-Sep-25	24-Sep-25
249	TS100-102-1030	Commence Development of Program Mgmt Policy, Practices, & Processes	100	90%	44	02-Oct-24 A	05-Sep-25	02-Oct-25	06-Nov-25
250	TS100-102-1050	Commence Development of QA/QC Processes	60	80%	44	02-Oct-24 A	05-Sep-25	02-Oct-25	06-Nov-25
251	TS100-102-1040	Commence Development of Methodologies, Tech Tools, & HRSD Decision Pts	42	80%	145	16-Dec-24 A	04-Sep-25	26-Feb-26	01-Apr-26
252	TS100-102-1060	Incorporate Program Controls Plan	2	100%		03-Feb-25 A	12-Feb-25 A	04-Dec-25	04-Dec-25
253	TS100-102-1070	Program Execution Plan Internal Review & Submit to HRSD	10	100%		20-Mar-25 A	04-Apr-25 A	21-Jan-26	21-Jan-26
254	TS100-102-1080	Program Execution Plan HRSD Review	10	100%		07-Apr-25 A	03-Jul-25 A	29-Apr-26	29-Apr-26
255	**TASK 103 - PROGRAM & PROJECT CONTROLS**		97			21-Nov-24 A	19-Mar-25 A	24-Sep-25	17-Nov-25
256	TS100-103-1000	Review HRSD's Technology Tools	30	100%		21-Nov-24 A	14-Mar-25 A	17-Nov-25	17-Nov-25
257	TS100-103-1010	Commence Development of Technologies Data Integration Plan	30	100%		16-Dec-24 A	14-Mar-25 A	21-Oct-25	21-Oct-25
258	TS100-103-1020	Commence Development of a Project Controls Plan	30	100%		09-Jan-25 A	19-Mar-25 A	24-Sep-25	24-Sep-25
259	**TASK 104 - STAKEHOLDER ENGAGEMENT & PUBLIC OUTREACH**		180		95	03-Sep-24 A	05-Sep-25	07-Oct-25	21-Jan-26
260	TS100-104-1000	Participate in Stakeholder Mtgs & Support HRSD Coordination	180	90%	95	03-Sep-24 A	05-Sep-25	12-Dec-25	21-Jan-26
261	TS100-104-1010	Host Workshop with HRSD Public Outreach Group	1	100%		06-Nov-24 A	06-Nov-24 A	07-Oct-25	07-Oct-25
262	TS100-104-1020	Prepare & Submit Stakeholder Engagement Plan	40	100%		02-Dec-24 A	03-Jun-25 A	07-Oct-25	07-Oct-25
263	TS100-104-1030	Support HRSD Development of a Program Website & Content	30	100%		02-Dec-24 A	03-Mar-25 A	31-Dec-25	31-Dec-25
264	TS100-104-1040	Assist HRSD Create & Implement Public Information Strategy	20	100%		02-Dec-24 A	31-Mar-25 A	07-Oct-25	07-Oct-25
265	**TASK 105 - HRSD CONSENT DECREE PROGRAM REVIEW**		65		1055	02-Jun-25 A	30-Oct-25	26-Sep-29	28-Dec-29
266	TS100-105-1000	HRSD Consent Decree Program Review	65	65%	1055	02-Jun-25 A	30-Oct-25	26-Sep-29	28-Dec-29
267	**TASK SERIES 200 - EXISTING DATA REVIEW & FIELD INVESTIGATIONS**		251		54	15-Aug-24 A	31-Oct-25	02-Sep-25	21-Jan-26
268	**TASK 201 - REVIEW EXISTING DATA & DEVELOP DATA COLLECTION PLANS**		69			15-Aug-24 A	20-Nov-24 A	16-Oct-25	22-Dec-25
269	TS200-201-1000	Review Strategy & Approach for Phase 1 I/I Projects	56	100%		15-Aug-24 A	01-Nov-24 A	22-Dec-25	22-Dec-25
270	TS200-201-1010	Assess Alternative Areas to Original High-Priority Projects	40	100%		15-Aug-24 A	10-Oct-24 A	22-Dec-25	22-Dec-25



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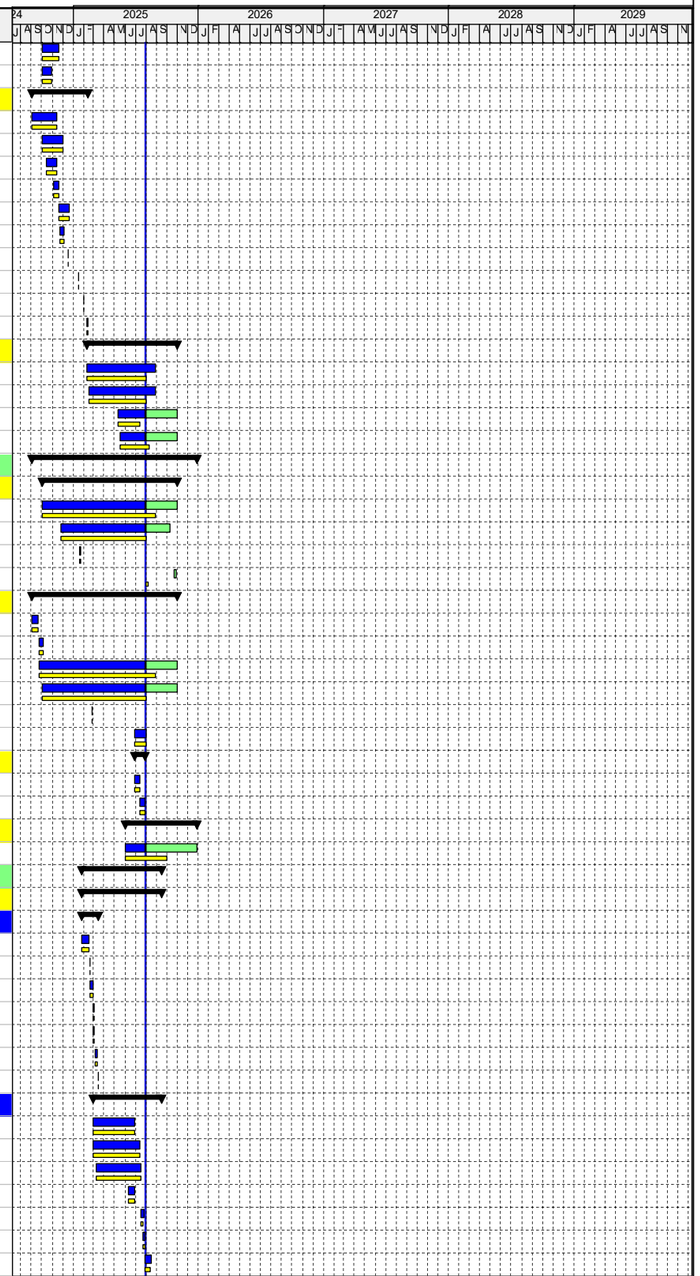
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Project Name : HRSD - High Priority I/I Reduction PDB Program
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HRSD - PROGRAM MASTER SCHEDULE JULY 2025

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#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
271	TS200-201-1020	Host Workshop(s) to Present Findings from Data Review	36	100%		02-Oct-24 A	20-Nov-24 A	16-Oct-25	16-Oct-25
272	TS200-201-1030	Determine Locality Permitting Requirements	20	100%		02-Oct-24 A	29-Oct-24 A	16-Oct-25	16-Oct-25
273	**TASK 202 - FIELD DATA COLLECTION PROGRAM**		129			03-Sep-24 A	11-Feb-25 A	02-Sep-25	11-Dec-25
274	TS200-202-1000	Prepare Protocols for Flow & Rainfall Monitoring & SSES	44	100%		03-Sep-24 A	14-Nov-24 A	09-Sep-25	09-Sep-25
275	TS200-202-1010	Review & Revise Data Collection Forms	23	100%		02-Oct-24 A	02-Dec-24 A	11-Dec-25	11-Dec-25
276	TS200-202-1080	Prepare & Distribute Flow Monitoring Information Packets for Localities	20	100%		16-Oct-24 A	15-Nov-24 A	02-Sep-25	02-Sep-25
277	TS200-202-1020	Define Data Structure & Packaging within Clarity	10	100%		04-Nov-24 A	21-Nov-24 A	11-Dec-25	11-Dec-25
278	TS200-202-1070	Prepare & Distribute SSES Information Packets for Localities	15	100%		20-Nov-24 A	20-Dec-24 A	09-Sep-25	09-Sep-25
279	TS200-202-1040	Provide Clarity Access & Training - Internal	5	100%		22-Nov-24 A	05-Dec-24 A	09-Sep-25	09-Sep-25
280	TS200-202-1050	Provide Clarity Access & Training - HRSD	1	100%		18-Dec-24 A	18-Dec-24 A	06-Oct-25	06-Oct-25
281	TS200-202-1030	Host Field Training Kickoff Meeting with Dukes for SSES CCTV Inspections	5	100%		17-Jan-25 A	17-Jan-25 A	09-Sep-25	09-Sep-25
282	TS200-202-1060	Provide Clarity Access & Training - Localities	1	100%		31-Jan-25 A	31-Jan-25 A	06-Oct-25	06-Oct-25
283	TS200-202-1090	Host Field Training Kickoff Meeting with Dukes for SSES Manhole Inspections	5	100%		11-Feb-25 A	11-Feb-25 A	09-Sep-25	09-Sep-25
284	**TASK 203 - DISTRIBUTED TEMPERATURE SENSING (DTS)**		129		54	10-Feb-25 A	31-Oct-25	16-Oct-25	21-Jan-26
285	TS200-203-1000	Develop Strategy for Deploying DTS	15	100%		10-Feb-25 A	29-Aug-25 A	16-Oct-25	16-Oct-25
286	TS200-203-1010	Develop Field Plans for DTS Studies	30	100%		17-Feb-25 A	29-Aug-25 A	16-Oct-25	16-Oct-25
287	TS200-203-1020	Develop DTS Data-Based Reports	30	90%	54	12-May-25 A	31-Oct-25	16-Oct-25	21-Jan-26
288	TS200-203-1030	Develop Plan for Post-Rehab DTS Monitoring	20	90%	54	19-May-25 A	31-Oct-25	16-Oct-25	21-Jan-26
289	**TASK SERIES 300 - TIME SERIES DATA ANALYSIS & MODELING**		294		117	03-Sep-24 A	26-Dec-25	26-Sep-25	11-Jun-26
290	**TASK 301 - REGIONAL HYDRAULIC MODEL STRATEGY DOCUMENT & WORKSHOP**		273		41	02-Oct-24 A	31-Oct-25	26-Sep-25	02-Jan-26
291	TS300-301-1000	Review Current RHM's	40	95%	41	02-Oct-24 A	31-Oct-25	26-Sep-25	02-Jan-26
292	TS300-301-1010	Prepare Model Strategy & Protocol Document	40	15%	39	27-Nov-24 A	09-Oct-25	26-Sep-25	04-Dec-25
293	TS300-301-1030	Host Regional Hydraulic Models Update Workshop with HRSD	5	100%		21-Jan-25 A	21-Jan-25 A	04-Dec-25	04-Dec-25
294	TS300-301-1020	Host Workshop with HRSD on Model Strategy & Protocol Document	5	0%	39	22-Oct-25	28-Oct-25	17-Dec-25	23-Dec-25
295	**TASK 302 - TIME SERIES ANALYSIS & RTK DEVELOPMENT**		274		120	03-Sep-24 A	31-Oct-25	17-Oct-25	23-Apr-26
296	TS300-302-1000	Import Existing Time Series Data into HazenQ	14	100%		03-Sep-24 A	20-Sep-24 A	17-Oct-25	17-Oct-25
297	TS300-302-1010	Review Early Data in HazenQ Perform Quality Review	10	100%		23-Sep-24 A	04-Oct-24 A	17-Oct-25	17-Oct-25
298	TS300-302-1020	Conduct On-Going Reviews of R-Values & RTKs	260	80%	55	23-Sep-24 A	30-Oct-25	17-Oct-25	21-Jan-26
299	TS300-302-1030	Review Protocol to Analyze Pre & Post Flow Data	42	95%	120	02-Oct-24 A	31-Oct-25	22-Jan-26	23-Apr-26
300	TS300-302-1040	Host Workshop 1 for RTK Development for Newport News	5	100%		26-Feb-25 A	26-Feb-25 A	22-Jan-26	22-Jan-26
301	TS300-302-1050	Host Workshop 2 for RTK Development for Newport News	23	100%		30-Jun-25 A	31-Jul-25 A	22-Jan-26	22-Jan-26
302	**TASK -303 - LOCAL HYDRAULIC MODEL ASSESSMENTS**		20			30-Jun-25 A	28-Jul-25 A	11-Nov-25	11-Nov-25
303	TS300-303-1000	Review Current Status of Existing LHMs	10	100%		30-Jun-25 A	14-Jul-25 A	11-Nov-25	11-Nov-25
304	TS300-303-1010	Review LHMs and Determine Model Refinements	10	100%		15-Jul-25 A	28-Jul-25 A	11-Nov-25	11-Nov-25
305	**TASK 304 - SUPPORT UPDATE OF REGIONAL HYDRAULIC MODEL**		65		117	02-Jun-25 A	26-Dec-25	19-Jan-26	11-Jun-26
306	TS300-304-1000	Support Update of RHM	65	40%	117	02-Jun-25 A	26-Dec-25	19-Jan-26	11-Jun-26
307	**TASK SERIES 400 - CONCEPTUAL I/I REDUCTION PROGRAM PLAN**		140		76	27-Jan-25 A	16-Sep-25	31-Jul-25	07-Jan-26
308	**TASK 401 - CONCEPTUAL I/I REDUCTION PROGRAM**		140		76	27-Jan-25 A	16-Sep-25	31-Jul-25	07-Jan-26
309	**CONCEPTUAL I/I REDUCTION PLAN OUTLINE**		69			27-Jan-25 A	14-Mar-25 A	31-Jul-25	31-Jul-25
310	TS400-401-1010	Develop & Submit Draft Conceptual I/I Reduction Plan Outline for Internal Review	20	100%		27-Jan-25 A	17-Feb-25 A	31-Jul-25	31-Jul-25
311	TS400-401-1080	Internal Review of Draft Conceptual I/I Reduction Plan Outline	1	100%		18-Feb-25 A	18-Feb-25 A	31-Jul-25	31-Jul-25
312	TS400-401-1090	Incorporate Comments of Draft Conceptual I/I Reduction Plan Outline & Submit for Final Internal Review	8	100%		19-Feb-25 A	28-Feb-25 A	31-Jul-25	31-Jul-25
313	TS400-401-1100	Final Internal Review of Conceptual I/I Reduction Plan Outline & Submit to HRSD	2	100%		28-Feb-25 A	03-Mar-25 A	31-Jul-25	31-Jul-25
314	TS400-401-1110	HRSD Review of Conceptual I/I Reduction Plan Outline	3	100%		28-Feb-25 A	04-Mar-25 A	31-Jul-25	31-Jul-25
315	TS400-401-1160	Incorporate HRSD Comments & Submit Final Conceptual I/I Reduction Plan Outline	5	100%		05-Mar-25 A	11-Mar-25 A	31-Jul-25	31-Jul-25
316	TS400-401-1120	Host Meeting for Conceptual I/I Reduction Plan Outline	1	100%		14-Mar-25 A	14-Mar-25 A	31-Jul-25	31-Jul-25
317	**CONCEPTUAL I/I REDUCTION PLAN**		132		76	28-Feb-25 A	16-Sep-25	09-Sep-25	07-Jan-26
318	TS400-401-1020	Prepare Conceptual Design Level OPCC	40	100%		28-Feb-25 A	30-Jun-25 A	09-Sep-25	09-Sep-25
319	TS400-401-1050	Prepare Conceptual Implementation Schedule	40	100%		28-Feb-25 A	15-Jul-25 A	09-Sep-25	09-Sep-25
320	TS400-401-1030	Develop & Submit Draft Conceptual I/I Reduction Plan for Internal Review	49	100%		10-Mar-25 A	16-Jul-25 A	09-Sep-25	09-Sep-25
321	TS400-401-1180	Update Rehab/Replace Plan for Project(s) from "General" Status	19	100%		10-Jun-25 A	30-Jun-25 A	09-Sep-25	09-Sep-25
322	TS400-401-1130	Internal Review of Draft Conceptual I/I Reduction Plan	5	100%		18-Jul-25 A	25-Jul-25 A	09-Sep-25	09-Sep-25
323	TS400-401-1140	Incorporate Comments of Draft Conceptual I/I Reduction Plan & Submit to HRSD	5	100%		23-Jul-25 A	29-Jul-25 A	09-Sep-25	09-Sep-25
324	TS400-401-1060	HRSD Review of Conceptual I/I Reduction Plan	12	100%		29-Jul-25 A	15-Aug-25 A	09-Sep-25	09-Sep-25



Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

HRSD
Sustainable, Innovative Wastewater Treatment

BURNS McDONNELL

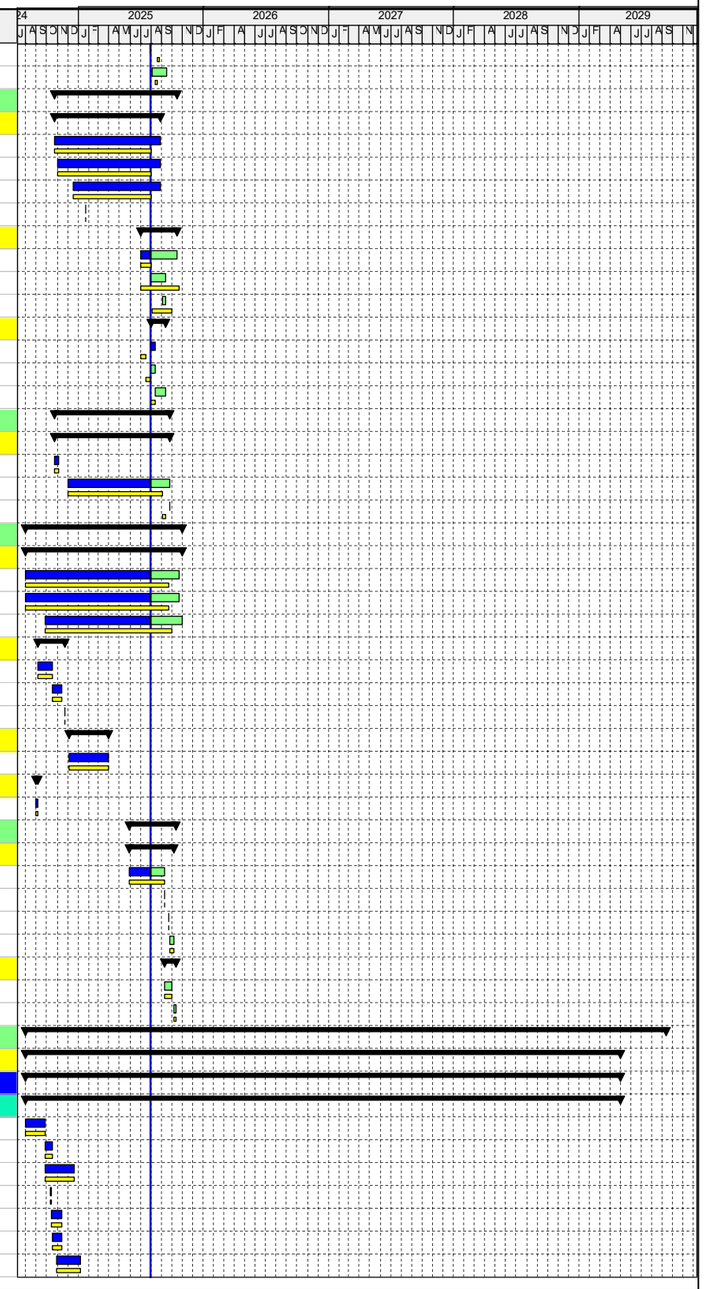
Date	Revision	Checked	Approved
27-May-25	MASTER SCHEDULE APR 2025 UPDATE	BPJ/JKC	
26-Jun-25	MASTER SCHEDULE MAY 2025 UPDATE	BPJ/JKC	
17-Jul-25	MASTER SCHEDULE JUN 2025 UPDATE	BPJ/JKC	
20-Aug-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	
16-Sep-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	

Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
325	TS400-401-1170	Host Workshop for Conceptual I/I Reduction Plan	5	100%		30-Jul-25 A	30-Jul-25 A	07-Jan-26	07-Jan-26
326	TS400-401-1070	Incorporate HRSD Comments & Submit Final Conceptual I/I Reduction Plan	16	70%	76	06-Aug-25 A	16-Sep-25	21-Nov-25	06-Jan-26
327	**TASK SERIES 500 - PRIVATE I/I REDUCTION PROGRAM**		289		74	25-Oct-24 A	17-Oct-25	30-Oct-25	04-Feb-26
328	**TASK 501 - PROGRAM STRATEGY DEVELOPMENT**		117			25-Oct-24 A	29-Aug-25 A	02-Jan-26	22-Jan-26
329	TS500-501-1030	Develop Inflow Reduction Strategy	60	100%		25-Oct-24 A	29-Aug-25 A	02-Jan-26	02-Jan-26
330	TS500-501-1000	Review Private Property Policies & Program	42	100%		01-Nov-24 A	29-Aug-25 A	22-Jan-26	22-Jan-26
331	TS500-501-1010	Review HRSD Efforts to Address Federal Facilities Inflows	10	100%		18-Dec-24 A	29-Aug-25 A	22-Jan-26	22-Jan-26
332	TS500-501-1020	Host Workshop on Private I/I Reduction Options	5	100%		22-Jan-25 A	22-Jan-25 A	02-Jan-26	02-Jan-26
333	**TASK 502 - PROGRAM DEVELOPMENT WITHIN EACH LOCALITY**		99		74	02-Jul-25 A	17-Oct-25	30-Oct-25	04-Feb-26
334	TS500-502-1000	Review Locality Sewer Use Ordinances	21	40%	64	02-Jul-25 A	17-Oct-25	30-Oct-25	21-Jan-26
335	TS500-502-1030	Perform Cost-Effective Analysis for Private Inflow Sources	79	0%	99	31-Jul-25 A	12-Sep-25	19-Dec-25	04-Feb-26
336	TS500-502-1010	Commence Development of Standard Construction Details	7	0%	89	04-Sep-25	12-Sep-25	13-Jan-26	21-Jan-26
337	**TASK 503 - NON-SINGLE FAMILY LEGAL PROPERTY OWNER DETERMINATION**		30		70	31-Jul-25 A	11-Sep-25	07-Nov-25	19-Dec-25
338	TS500-503-1000	Identify Legal Property Owner(s) of Each NSF Property	10	100%		31-Jul-25 A	13-Aug-25 A	07-Nov-25	07-Nov-25
339	TS500-503-1010	Contact Localities to Obtain Private Sewer Asset Information	10	0%	70	31-Jul-25	13-Aug-25	07-Nov-25	20-Nov-25
340	TS500-503-1020	Characterize Private Sewer System Assets for up to 20 NSF Properties & Assemble Collected Info	10	10%	70	28-Aug-25 A	11-Sep-25	21-Nov-25	19-Dec-25
341	**TASK SERIES 600 - PRELIMINARY I/I REDUCTION PLANS**		234		80	24-Oct-24 A	25-Sep-25	21-Nov-25	21-Jan-26
342	**TASK 601 - SEWER REHABILITATION BEST PRACTICES & COST MANUAL/HPDC STANDARDS**		234		80	24-Oct-24 A	25-Sep-25	21-Nov-25	21-Jan-26
343	TS600-601-1010	Revision of HRPDC Regional Construction Standards	20	100%		24-Oct-24 A	06-Nov-24 A	21-Jan-26	21-Jan-26
344	TS600-601-1000	CEA Guidance Document	100	50%	80	02-Dec-24 A	25-Sep-25	21-Nov-25	21-Jan-26
345	TS600-601-1020	Host Workshop to Present Manual, Rehab Technologies, Costs, etc.	1	0%	80	25-Sep-25	25-Sep-25	21-Jan-26	21-Jan-26
346	**TASK SERIES 700 - PRECONSTRUCTION SUPPORT ACTIVITIES**		145		55	01-Aug-24 A	30-Oct-25	09-Sep-25	21-Jan-26
347	**TASK 701 - SUBCONTRACTOR OUTREACH**		145		55	01-Aug-24 A	30-Oct-25	17-Oct-25	21-Jan-26
348	TS700-701-1010	Confirm Contractor Capabilities & Capacity	40	85%	61	01-Aug-24 A	22-Oct-25	27-Oct-25	21-Jan-26
349	TS700-701-1020	Assist Contractors with Vendor Registration	30	85%	61	01-Aug-24 A	22-Oct-25	27-Oct-25	21-Jan-26
350	TS700-701-1000	Conduct Outreach Program	60	85%	55	26-Sep-24 A	30-Oct-25	17-Oct-25	21-Jan-26
351	**TASK 702 - SELECTION OF SSES SUBCONTRACTORS**		45			06-Sep-24 A	22-Nov-24 A	09-Sep-25	09-Sep-25
352	TS700-702-1000	Establish Scale of Initial SSES Field Data Collection & Schedule	30	100%		06-Sep-24 A	17-Oct-24 A	09-Sep-25	09-Sep-25
353	TS700-702-1010	Prepare RFQ/P & Obtain SSES & Flow Monitoring Subcontractor Pricing	10	100%		18-Oct-24 A	15-Nov-24 A	09-Sep-25	09-Sep-25
354	TS700-702-1020	Present Pricing Information to HRSD for Subcontractor Selection	5	100%		22-Nov-24 A	22-Nov-24 A	09-Sep-25	09-Sep-25
355	**TASK 703 - COST METRIC VERIFICATION FOR COST EFFECTIVENESS ANALYSIS**		43			06-Dec-24 A	31-Mar-25 A	25-Sep-25	25-Sep-25
356	TS700-703-1000	Gather Local Market Information / Historical Pricing / Prelim Contractor ROM Rates	43	100%		06-Dec-24 A	31-Mar-25 A	25-Sep-25	25-Sep-25
357	**TASK 704 - SAFETY PROGRAM**		10			30-Aug-24 A	04-Sep-24 A	09-Sep-25	09-Sep-25
358	TS700-704-1000	Develop Safety Program for Flow Monitoring, SSES, & Early Out Work	10	100%		30-Aug-24 A	04-Sep-24 A	09-Sep-25	09-Sep-25
359	**TASK SERIES 800 - COMPREHENSIVE AGREEMENT**		96		67	30-May-25 A	14-Oct-25	31-Jul-25	21-Jan-26
360	**TASK 801 - DEVELOP COMPREHENSIVE AGREEMENT**		91		67	30-May-25 A	07-Oct-25	31-Jul-25	14-Jan-26
361	TS800-801-1000	Negotiations of Comprehensive Agreement (T&C's, Insurance, Scope)	51	60%	0	30-May-25 A	09-Sep-25	31-Jul-25	09-Sep-25
362	TS800-801-1020	Submit Draft-Final Comp. Agreement for HRSD Commission Approval	1	0%	0	10-Sep-25	10-Sep-25*	10-Sep-25	10-Sep-25
363	TS800-801-1030	HRSD Commission Meeting to Approve Comprehensive Agreement	1	0%	0	23-Sep-25	23-Sep-25*	23-Sep-25	23-Sep-25
364	TS800-801-1010	Submit Final Comprehensive Agreement for HRSD Execution	10	0%	67	24-Sep-25	07-Oct-25	31-Dec-25	14-Jan-26
365	**TASK 802 - SUBCONTRACTOR AGREEMENTS**		25		67	10-Sep-25	14-Oct-25	22-Dec-25	21-Jan-26
366	TS800-802-1000	Prepare Subcontractor Agreements	15	0%	72	10-Sep-25	30-Sep-25	22-Dec-25	14-Jan-26
367	TS800-802-1010	Execute Subcontractor Agreements	5	0%	67	08-Oct-25	14-Oct-25	15-Jan-26	21-Jan-26
368	**PROJECT EXECUTION**		1299		74	01-Aug-24 A	12-Sep-29	02-Sep-25	28-Dec-29
369	**PHASE 1A (JCSA-LSA3-8 & JCSA-LSA3-6)**		1205		22	01-Aug-24 A	30-Apr-29	02-Sep-25	31-May-29
370	**JCSA-LSA3-8**		1205		22	01-Aug-24 A	30-Apr-29	02-Sep-25	31-May-29
371	**DATA COLLECTION & ANALYSIS**		1205		22	01-Aug-24 A	30-Apr-29	02-Sep-25	31-May-29
372	P1A-JCSA3-8-1000	JCSA-LSA3-8 - Review Existing Flow & SSES Data	40	100%		01-Aug-24 A	26-Sep-24 A	02-Sep-25	02-Sep-25
373	P1A-JCSA3-8-1010	JCSA-LSA3-8 - Develop Basin Specific Condition Data Collection Plans	20	100%		27-Sep-24 A	18-Oct-24 A	09-Sep-25	09-Sep-25
374	P1A-JCSA3-8-1020	JCSA-LSA3-8 - Develop Basin Specific Flow Metering Plan	20	100%		27-Sep-24 A	20-Dec-24 A	02-Sep-25	02-Sep-25
375	P1A-JCSA3-8-1030	JCSA-LSA3-8 - Owner Approval of Flow Metering Pricing	5	100%		12-Oct-24 A	15-Oct-24 A	02-Sep-25	02-Sep-25
376	P1A-JCSA3-8-1040	JCSA-LSA3-8 - Conduct Flow Monitoring Information Meetings with Localities As Needed	5	100%		16-Oct-24 A	15-Nov-24 A	02-Sep-25	02-Sep-25
377	P1A-JCSA3-8-1050	JCSA-LSA3-8 - SSES Condition Data Qualifications Evaluations & Pricing	10	100%		18-Oct-24 A	15-Nov-24 A	09-Sep-25	09-Sep-25
378	P1A-JCSA3-8-1060	JCSA-LSA3-8 - Pre-Construction Flow Monitoring Site Investigations & Installations	20	100%		29-Oct-24 A	06-Jan-25 A	02-Sep-25	02-Sep-25



Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

HRSD
Sustainable, Innovative Wastewater Treatment

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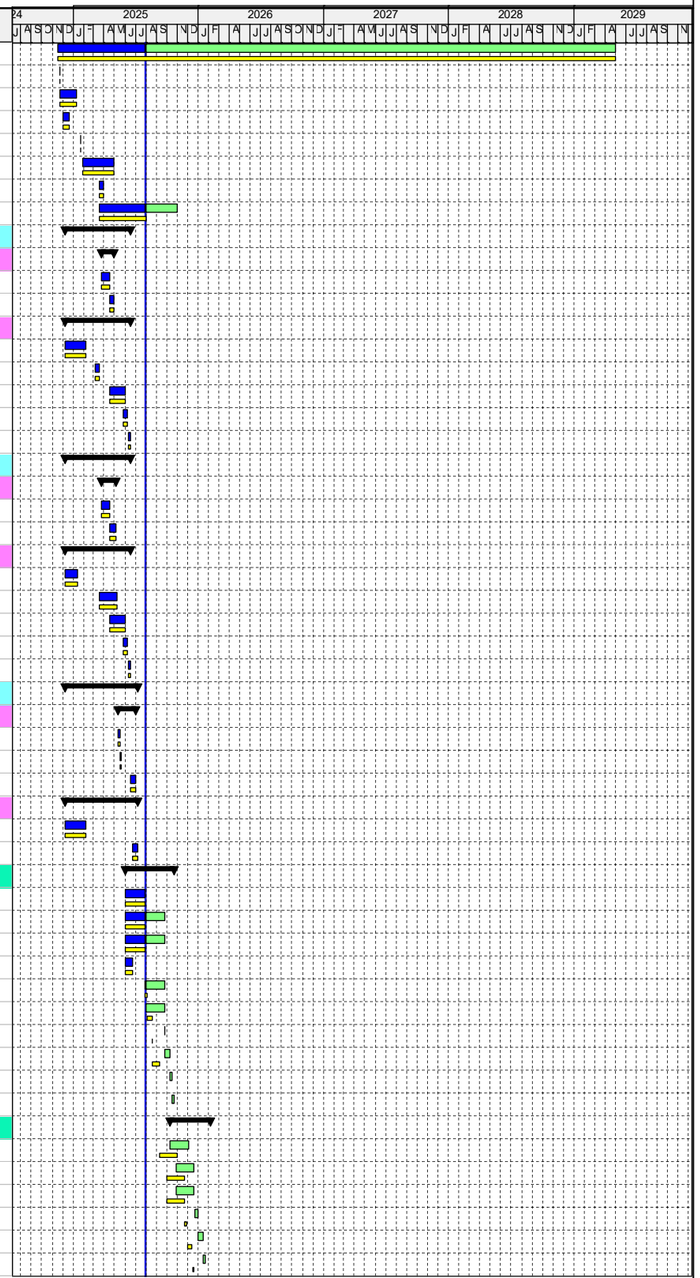
Date	Revision	Checked	Approved
27-May-25	MASTER SCHEDULE APR 2025 UPDATE	BPJ/JKC	
26-Jun-25	MASTER SCHEDULE MAY 2025 UPDATE	BPJ/JKC	
17-Jul-25	MASTER SCHEDULE JUN 2025 UPDATE	BPJ/JKC	
20-Aug-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	
16-Sep-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	

Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
379	P1A-JCSA3-8-1070	JCSA-LSA3-8 - Flow Monitoring - Long Term	1120	25%	22	18-Nov-24 A	30-Apr-29*	02-Sep-25	31-May-29
380	P1A-JCSA3-8-1080	JCSA-LSA3-8 - Owner Approval of SSES Subcontracor Inspection Costs	5	100%		22-Nov-24 A	22-Nov-24 A	09-Sep-25	09-Sep-25
381	P1A-JCSA3-8-1090	JCSA-LSA3-8 - Pre-Construction Rain Gauges Site Investigations & Installations	5	100%		22-Nov-24 A	10-Jan-25 A	27-Oct-25	27-Oct-25
382	P1A-JCSA3-8-1110	JCSA-LSA3-8 - Submittal of Flow Metering Plan to HRSD	15	100%		02-Dec-24 A	20-Dec-24 A	24-Oct-25	24-Oct-25
383	P1A-JCSA3-8-1160	JCSA-LSA3-8 - Host Workshop of Basin Specific Condition Data Collection Plans	5	100%		22-Jan-25 A	22-Jan-25 A	09-Sep-25	09-Sep-25
384	P1A-JCSA3-8-1170	JCSA-LSA3-8 - Conduct SSES information Meetings with Localities As Needed	10	100%		28-Jan-25 A	30-Apr-25 A	09-Sep-25	09-Sep-25
385	P1A-JCSA3-8-1220	JCSA-LSA3-8 - Time Series Analysis & RTK Development	10	100%		18-Mar-25 A	31-Mar-25 A	25-Sep-25	25-Sep-25
386	P1A-JCSA3-8-1230	JCSA-LSA3-8 - Pre-Construction Flow Monitoring - Short Term	60	90%	39	18-Mar-25 A	30-Oct-25	25-Sep-25	29-Dec-25
387	**SSES MH INSPECTIONS**		137			09-Dec-24 A	16-Jun-25 A	09-Sep-25	13-Oct-25
388	**PUBLIC OUTREACH**		46			24-Mar-25 A	30-Apr-25 A	09-Sep-25	09-Sep-25
389	P1A-JCSA3-8-1100	JCSA-LSA3-8 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		24-Mar-25 A	16-Apr-25 A	09-Sep-25	09-Sep-25
390	P1A-JCSA3-8-1180	JCSA-LSA3-8 - Notify Public of Upcoming SSES Activities	5	100%		16-Apr-25 A	30-Apr-25 A	09-Sep-25	09-Sep-25
391	**MH INSPECTIONS**		132			09-Dec-24 A	16-Jun-25 A	09-Sep-25	13-Oct-25
392	P1A-JCSA3-8-1130	JCSA-LSA3-8 - SSES Manhole Inspections Contractor Award & NTP	10	100%		09-Dec-24 A	06-Feb-25 A	09-Sep-25	09-Sep-25
393	P1A-JCSA3-8-1210	JCSA-LSA3-8 - SSES Data Collection & Upload - Manhole Inspections (Duke's)	31	100%		05-Mar-25 A	19-Mar-25 A	09-Sep-25	09-Sep-25
394	P1A-JCSA3-8-1250	JCSA-LSA3-8 - RJN Pushes Video to SewerAI & Performs QA/QC & Submits NASSCO Deliverables to ShareFile Fold	20	100%		16-Apr-25 A	02-Jun-25 A	09-Sep-25	09-Sep-25
395	P1A-JCSA3-8-1280	JCSA-LSA3-8 - BMcD Performs QA/QC, Updates GIS Connectivity & Attributes, & Runs Rehab Decision Model	5	100%		27-May-25 A	09-Jun-25 A	09-Sep-25	09-Sep-25
396	P1A-JCSA3-8-1310	JCSA-LSA3-8 - RJN Uploads Data & Corrected GIS to Clarity & NASSCO Deliverables to ShareFile Folder	5	100%		10-Jun-25 A	16-Jun-25 A	13-Oct-25	13-Oct-25
397	**SSES CCTV INSPECTIONS**		137			09-Dec-24 A	16-Jun-25 A	09-Sep-25	24-Nov-25
398	**PUBLIC OUTREACH**		46			24-Mar-25 A	06-May-25 A	24-Nov-25	24-Nov-25
399	P1A-JCSA3-8-1120	JCSA-LSA3-8 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		24-Mar-25 A	16-Apr-25 A	24-Nov-25	24-Nov-25
400	P1A-JCSA3-8-1190	JCSA-LSA3-8 - Notify Public of Upcoming SSES Activities	5	100%		16-Apr-25 A	06-May-25 A	24-Nov-25	24-Nov-25
401	**CCTV INSPECTIONS**		96			09-Dec-24 A	16-Jun-25 A	09-Sep-25	13-Oct-25
402	P1A-JCSA3-8-1150	JCSA-LSA3-8 - SSES CCTV Inspections (Mains) Award & NTP	10	100%		09-Dec-24 A	13-Jan-25 A	09-Sep-25	09-Sep-25
403	P1A-JCSA3-8-1200	JCSA-LSA3-8 - SSES Data Collection - CCTV Inspections (Mains)	40	100%		19-Mar-25 A	08-May-25 A	09-Sep-25	09-Sep-25
404	P1A-JCSA3-8-1260	JCSA-LSA3-8 - RJN Pushes Video to SewerAI & Performs QA/QC & Submits NASSCO Deliverables to ShareFile Fold	20	100%		16-Apr-25 A	02-Jun-25 A	09-Sep-25	09-Sep-25
405	P1A-JCSA3-8-1270	JCSA-LSA3-8 - BMcD Performs QA/QC, Updates GIS Connectivity & Attributes, & Runs Rehab Decision Model	5	100%		27-May-25 A	09-Jun-25 A	09-Sep-25	09-Sep-25
406	P1A-JCSA3-8-1290	JCSA-LSA3-8 - RJN Uploads Data & Corrected GIS to Clarity & NASSCO Deliverables to ShareFile Folder	5	100%		10-Jun-25 A	16-Jun-25 A	13-Oct-25	13-Oct-25
407	**SSES SMOKE TESTING**		112			09-Dec-24 A	08-Jul-25 A	17-Feb-26	17-Feb-26
408	**PUBLIC OUTREACH**		17			12-May-25 A	03-Jul-25 A	17-Feb-26	17-Feb-26
409	P1A-JCSA3-8-1240	JCSA-LSA3-8 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	7	100%		12-May-25 A	16-May-25 A	17-Feb-26	17-Feb-26
410	P1A-JCSA3-8-1300	JCSA-LSA3-8 - Distribute Notification Letters	1	100%		19-May-25 A	19-May-25 A	17-Feb-26	17-Feb-26
411	P1A-JCSA3-8-1320	JCSA-LSA3-8 - Distribute Door Hangers (48 Hrs Prior to Work)	6	100%		18-Jun-25 A	03-Jul-25 A	17-Feb-26	17-Feb-26
412	**SMOKE TESTING**		112			09-Dec-24 A	08-Jul-25 A	17-Feb-26	17-Feb-26
413	P1A-JCSA3-8-1140	JCSA-LSA3-8 - SSES Smoke Testing Contractor Award & NTP	10	100%		09-Dec-24 A	05-Feb-25 A	17-Feb-26	17-Feb-26
414	P1A-JCSA3-8-1340	JCSA-LSA3-8 - SSES Data Collection - Smoke Testing & Cleanout Inspections	12	100%		23-Jun-25 A	08-Jul-25 A	17-Feb-26	17-Feb-26
415	**PRELIMINARY I/I REDUCTION PLAN**		101		79	03-Jun-25 A	23-Oct-25	25-Sep-25	17-Feb-26
416	P1A-JCSA3-8-1330	JCSA-LSA3-8 - Condition Data Review & Rehabilitation Categorization	40	100%		03-Jun-25 A	29-Jul-25 A	25-Sep-25	25-Sep-25
417	P1A-JCSA3-8-1350	JCSA-LSA3-8 - I/I Reduction Strategy Alternatives Development	40	90%	39	03-Jun-25 A	24-Sep-25	25-Sep-25	18-Nov-25
418	P1A-JCSA3-8-1360	JCSA-LSA3-8 - Cost-Effective Evaluation	40	75%	39	03-Jun-25 A	24-Sep-25	25-Sep-25	18-Nov-25
419	P1A-JCSA3-8-1690	JCSA-LSA3-8 - Validation of SSO's Using Updated RTK's	15	100%		03-Jun-25 A	23-Jun-25 A	25-Sep-25	25-Sep-25
420	P1A-JCSA3-8-1370	JCSA-LSA3-8 - Compare Against RHM	40	50%	39	30-Jul-25 A	24-Sep-25	25-Sep-25	18-Nov-25
421	P1A-JCSA3-8-1380	JCSA-LSA3-8 - Correction to Cost Effective Evaluation After RHM Comparison	40	50%	39	06-Aug-25 A	24-Sep-25	25-Sep-25	18-Nov-25
422	P1A-JCSA3-8-1390	JCSA-LSA3-8 & JCSA-LSA3-6 - Host Preliminary I/I Reduction Plan Workshop	1	0%	39	25-Sep-25	25-Sep-25	19-Nov-25	19-Nov-25
423	P1A-JCSA3-8-1400	JCSA-LSA3-8 - Develop Preliminary I/I Reduction Plan	10	0%	52	26-Sep-25	09-Oct-25	10-Dec-25	23-Dec-25
424	P1A-JCSA3-8-1700	JCSA-LSA3-8 - Submission of Contract to HRSD for Review	5	0%	79	10-Oct-25	16-Oct-25	04-Feb-26	10-Feb-26
425	P1A-JCSA3-8-1710	JCSA-LSA3-8 - HRSD Review & Approval of Contract	5	0%	79	17-Oct-25	23-Oct-25	11-Feb-26	17-Feb-26
426	**DESIGN**		81		46	10-Oct-25	05-Feb-26	26-Dec-25	10-Apr-26
427	P1A-JCSA3-8-1420	JCSA-LSA3-8 - SSES Data Collection - CCTV Inspections (Laterals)	37	0%	52	10-Oct-25	02-Dec-25	26-Dec-25	17-Feb-26
428	P1A-JCSA3-8-1410	JCSA-LSA3-8 - Work Package 1A Development & Submit for Internal Review (Start at Risk)	37	0%	39	29-Oct-25	19-Dec-25	26-Dec-25	17-Feb-26
429	P1A-JCSA3-8-1430	JCSA-LSA3-8 - Permitting & Easement Acquisition	37	0%	39	29-Oct-25	19-Dec-25	26-Dec-25	17-Feb-26
430	P1A-JCSA3-8-1440	JCSA-LSA3-8 - Internal Review of Work Package 1A Draft	5	0%	39	22-Dec-25	30-Dec-25	18-Feb-26	24-Feb-26
431	P1A-JCSA3-8-1450	JCSA-LSA3-8 - Incorporate Comments & Submit Work Package 1A for Final Internal Review	10	0%	39	31-Dec-25	14-Jan-26	25-Feb-26	10-Mar-26
432	P1A-JCSA3-8-1490	JCSA-LSA3-8 - Final Internal Review of Work Package 1A & Submit for Owner Review	5	0%	46	15-Jan-26	21-Jan-26	20-Mar-26	26-Mar-26



Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

HRSD
Sustainable, Innovative Wastewater Treatment

HRSD - HIGH PRIORITY I/I REDUCTION PDB PROGRAM

BURNS McDONNELL

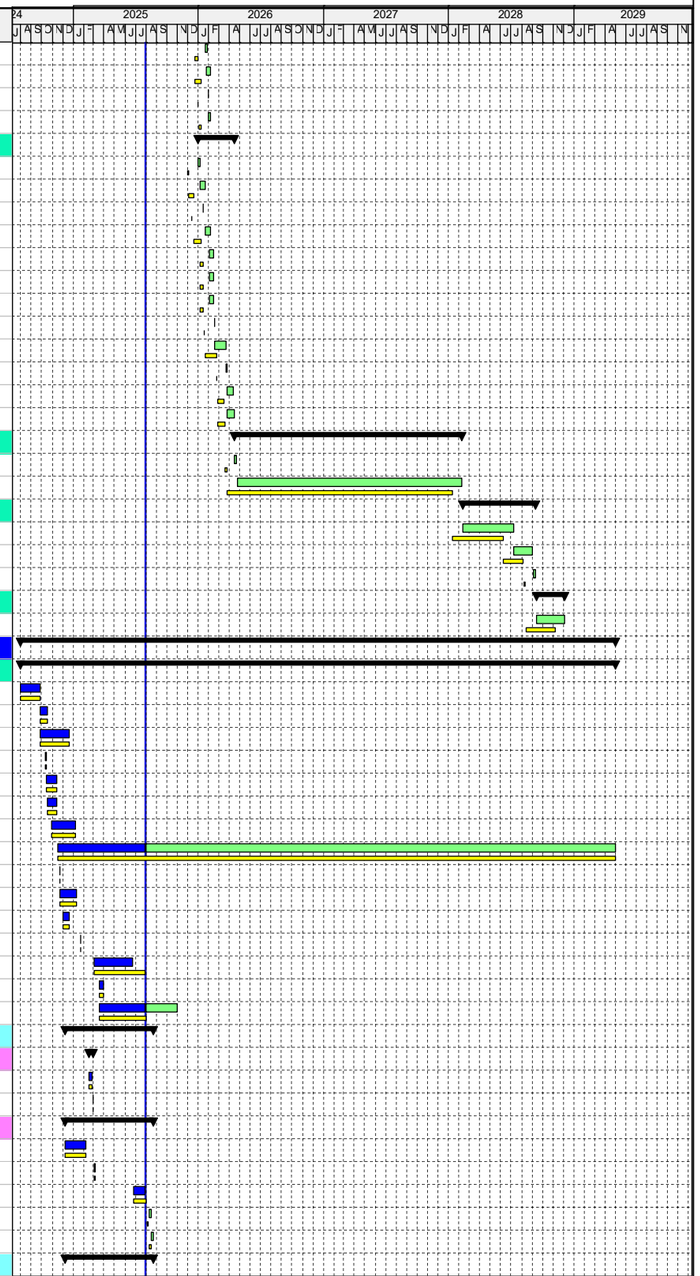
Date	Revision	Checked	Approved
27-May-25	MASTER SCHEDULE APR 2025 UPDATE	BPJ/JKC	
26-Jun-25	MASTER SCHEDULE MAY 2025 UPDATE	BPJ/JKC	
17-Jul-25	MASTER SCHEDULE JUN 2025 UPDATE	BPJ/JKC	
20-Aug-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	
16-Sep-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	

Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
433	P1A-JCSA3-8-1510	JCSA-LSA3-8 - Owner Review of Work Package 1A	5	0%	46	22-Jan-26	28-Jan-26	27-Mar-26	02-Apr-26
434	P1A-JCSA3-8-1520	JCSA-LSA3-8 - Work Package Development - IFC	10	0%	46	23-Jan-26	05-Feb-26	30-Mar-26	10-Apr-26
435	P1A-JCSA3-8-1530	JCSA-LSA3-8 - Host Workshop of Work Package 1A	1	0%	46	29-Jan-26	29-Jan-26	03-Apr-26	03-Apr-26
436	P1A-JCSA3-8-1540	JCSA-LSA3-8 - Incorporate Owner Comments & Finalize Work Package 1A	5	0%	46	30-Jan-26	05-Feb-26	06-Apr-26	10-Apr-26
437	**PROCUREMENT/SUBCONTRACTING**		76		39	31-Dec-25	16-Apr-26	25-Feb-26	11-Jun-26
438	P1A-JCSA3-8-1460	JCSA-LSA3-8 - Prepare Final Design Documents & Solicit Subcontractor Pricing	4	0%	39	31-Dec-25	06-Jan-26	25-Feb-26	02-Mar-26
439	P1A-JCSA3-8-1470	JCSA-LSA3-8 - Pre-Negotiation of Subcontractor Unit Pricing	10	0%	39	07-Jan-26	20-Jan-26	03-Mar-26	16-Mar-26
440	P1A-JCSA3-8-1480	JCSA-LSA3-8 - Pre-Proposal Subcontractor Meetings	1	0%	43	14-Jan-26	14-Jan-26	16-Mar-26	16-Mar-26
441	P1A-JCSA3-8-1500	JCSA-LSA3-8 - Confirm Final Construction Pricing	12	0%	39	21-Jan-26	05-Feb-26	17-Mar-26	01-Apr-26
442	P1A-JCSA3-8-1550	JCSA-LSA3-8 - Formal Risk Review Associated with Construction Pricing (BMcD)	10	0%	39	02-Feb-26	13-Feb-26	27-Mar-26	09-Apr-26
443	P1A-JCSA3-8-1560	JCSA-LSA3-8 - Technical & Commerical Evaluation (BMcD)	10	0%	39	02-Feb-26	13-Feb-26	27-Mar-26	09-Apr-26
444	P1A-JCSA3-8-1570	JCSA-LSA3-8 - Executive Pricing Review (BMcD)	10	0%	39	02-Feb-26	13-Feb-26	27-Mar-26	09-Apr-26
445	P1A-JCSA3-8-1580	JCSA-LSA3-8 - Host Workshop for HRSD Approval of GMP	1	0%	39	16-Feb-26	16-Feb-26	10-Apr-26	10-Apr-26
446	P1A-JCSA3-8-1590	JCSA-LSA3-8 - Award & NTP to Subcontractors	25	0%	39	17-Feb-26	23-Mar-26	13-Apr-26	15-May-26
447	P1A-JCSA3-8-1600	JCSA-LSA3-8 - Pre-Construction Meeting	1	0%	39	24-Mar-26	24-Mar-26	18-May-26	18-May-26
448	P1A-JCSA3-8-1610	JCSA-LSA3-8 - Subcontractors Prepare & Submit Submittals for Approval	15	0%	39	25-Mar-26	14-Apr-26	19-May-26	09-Jun-26
449	P1A-JCSA3-8-1620	JCSA-LSA3-8 - Review & Approve Submittals	15	0%	39	27-Mar-26	16-Apr-26	21-May-26	11-Jun-26
450	**CONSTRUCTION**		460		39	17-Apr-26	09-Feb-28	12-Jun-26	04-Apr-28
451	P1A-JCSA3-8-1630	JCSA-LSA3-8 - Construction Mobilization	5	0%	39	17-Apr-26	23-Apr-26	12-Jun-26	18-Jun-26
452	P1A-JCSA3-8-1640	JCSA-LSA3-8 - Work Package Construction	455	0%	39	24-Apr-26	09-Feb-28	19-Jun-26	04-Apr-28
453	**POST CONSTRUCTION**		150		39	10-Feb-28	11-Sep-28	05-Apr-28	03-Nov-28
454	P1A-JCSA3-8-1650	JCSA-LSA3-8 - Post Construction Flow Monitoring	105	0%	39	10-Feb-28	07-Jul-28	05-Apr-28	31-Aug-28
455	P1A-JCSA3-8-1660	JCSA-LSA3-8 - I/I Reduction Effectiveness Analysis	40	0%	39	10-Jul-28	01-Sep-28	01-Sep-28	27-Oct-28
456	P1A-JCSA3-8-1670	JCSA-LSA3-8 - Host Workshop on I/I Reduction Effectiveness	5	0%	39	05-Sep-28	11-Sep-28	30-Oct-28	03-Nov-28
457	**PHASE 1A PROJECT CONTINGENCY**		60		39	12-Sep-28	05-Dec-28	06-Nov-28	01-Feb-29
458	P1A-JCSA3-8-1680	JCSA-LSA3-8 - Weather Contingency	60	0%	39	12-Sep-28	05-Dec-28	06-Nov-28	01-Feb-29
459	**JCSA-LSA3-6**		1205		22	01-Aug-24 A	30-Apr-29	02-Sep-25	31-May-29
460	**DATA COLLECTION & ANALYSIS**		1205		22	01-Aug-24 A	30-Apr-29	02-Sep-25	31-May-29
461	P1A-JCSA-3-6-1000	JCSA-LSA3-6 - Review Existing Flow & SSES Data	40	100%		01-Aug-24 A	26-Sep-24 A	02-Sep-25	02-Sep-25
462	P1A-JCSA-3-6-1010	JCSA-LSA3-6 - Develop Basin Specific Condition Data Collection Plans	20	100%		27-Sep-24 A	18-Oct-24 A	09-Sep-25	09-Sep-25
463	P1A-JCSA-3-6-1020	JCSA-LSA3-6 - Develop Basin Specific Flow Metering Plan	20	100%		27-Sep-24 A	20-Dec-24 A	02-Sep-25	02-Sep-25
464	P1A-JCSA-3-6-1030	JCSA-LSA3-6 - Owner Approval of Flow Metering Pricing	5	100%		12-Oct-24 A	15-Oct-24 A	02-Sep-25	02-Sep-25
465	P1A-JCSA-3-6-1040	JCSA-LSA3-6 - Conduct Flow Monitoring Information Meetings with Localities As Needed	5	100%		16-Oct-24 A	15-Nov-24 A	02-Sep-25	02-Sep-25
466	P1A-JCSA-3-6-1050	JCSA-LSA3-6 - SSES Condition Data Qualifications Evaluations & Pricing	10	100%		18-Oct-24 A	15-Nov-24 A	09-Sep-25	09-Sep-25
467	P1A-JCSA-3-6-1060	JCSA-LSA3-6 - Pre-Construction Flow Monitoring Site Investigations & Installations	20	100%		29-Oct-24 A	06-Jan-25 A	02-Sep-25	02-Sep-25
468	P1A-JCSA-3-6-1070	JCSA-LSA3-6 - Flow Monitoring - Long Term	1120	25%	22	18-Nov-24 A	30-Apr-29*	02-Sep-25	31-May-29
469	P1A-JCSA-3-6-1080	JCSA-LSA3-6 - Owner Approval of SSES Subcontracor Inspection Costs	5	100%		22-Nov-24 A	22-Nov-24 A	09-Sep-25	09-Sep-25
470	P1A-JCSA-3-6-1090	JCSA-LSA3-6 - Pre-Construction Rain Gauges Site Investigations & Installations	5	100%		22-Nov-24 A	10-Jan-25 A	27-Oct-25	27-Oct-25
471	P1A-JCSA-3-6-1100	JCSA-LSA3-6 - Submittal of Flow Metering Plan to HRSD	15	100%		02-Dec-24 A	20-Dec-24 A	24-Oct-25	24-Oct-25
472	P1A-JCSA-3-6-1140	JCSA-LSA3-6 - Host Workshop of Basin Specific Condition Data Collection Plans	5	100%		22-Jan-25 A	22-Jan-25 A	25-Sep-25	25-Sep-25
473	P1A-JCSA-3-6-1180	JCSA-LSA3-6 - Conduct SSES information Meetings with Localities As Needed	10	100%		03-Mar-25 A	24-Jun-25 A	25-Sep-25	25-Sep-25
474	P1A-JCSA-3-6-1190	JCSA-LSA3-6 - Time Series Analysis & RTK Development	10	100%		18-Mar-25 A	31-Mar-25 A	13-Oct-25	13-Oct-25
475	P1A-JCSA-3-6-1200	JCSA-LSA3-6 - Pre-Construction Flow Monitoring - Short Term	60	80%	52	18-Mar-25 A	30-Oct-25	13-Oct-25	16-Jan-26
476	**SSES MH INSPECTIONS**		103		92	09-Dec-24 A	22-Aug-25	25-Sep-25	06-Jan-26
477	**PUBLIC OUTREACH**		20			17-Feb-25 A	28-Feb-25 A	25-Sep-25	25-Sep-25
478	P1A-JCSA-3-6-1150	JCSA-LSA3-6 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		17-Feb-25 A	26-Feb-25 A	25-Sep-25	25-Sep-25
479	P1A-JCSA-3-6-1160	JCSA-LSA3-6 - Notify Public of Upcoming SSES Activities	5	100%		27-Feb-25 A	28-Feb-25 A	25-Sep-25	25-Sep-25
480	**MH INSPECTIONS**		103		92	09-Dec-24 A	22-Aug-25	25-Sep-25	06-Jan-26
481	P1A-JCSA-3-6-1110	JCSA-LSA3-6 - SSES Manhole Inspections Contractor Award & NTP	10	100%		09-Dec-24 A	06-Feb-25 A	25-Sep-25	25-Sep-25
482	P1A-JCSA-3-6-1170	JCSA-LSA3-6 - SSES Data Collection & Upload - Manhole Inspections (Duke's)	5	100%		03-Mar-25 A	06-Mar-25 A	25-Sep-25	25-Sep-25
483	P1A-JCSA-3-6-1250	JCSA-LSA3-6 - RJN Pushes Video to SewerAI & Performs QA/QC & Submits NASSCO Deliverables to ShareFile Fold	20	100%		25-Jun-25 A	30-Jul-25 A	25-Sep-25	25-Sep-25
484	P1A-JCSA-3-6-1280	JCSA-LSA3-6 - BMcD Performs QA/QC, Updates GIS Connectivity & Attributes, & Runs Rehab Decision Model	5	0%	40	11-Aug-25	15-Aug-25	06-Oct-25	13-Oct-25
485	P1A-JCSA-3-6-1310	JCSA-LSA3-6 - RJN Uploads Data & Corrected GIS to Clarity & NASSCO Deliverables to ShareFile Folder	5	0%	92	18-Aug-25	22-Aug-25	30-Dec-25	06-Jan-26
486	**SSES CCTV INSPECTIONS**		103		92	09-Dec-24 A	22-Aug-25	25-Sep-25	06-Jan-26



Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

HRSD
Sustainable, Innovative Wastewater Treatment

HRSD - HIGH PRIORITY I/I REDUCTION PDB PROGRAM

BURNS McDONNELL

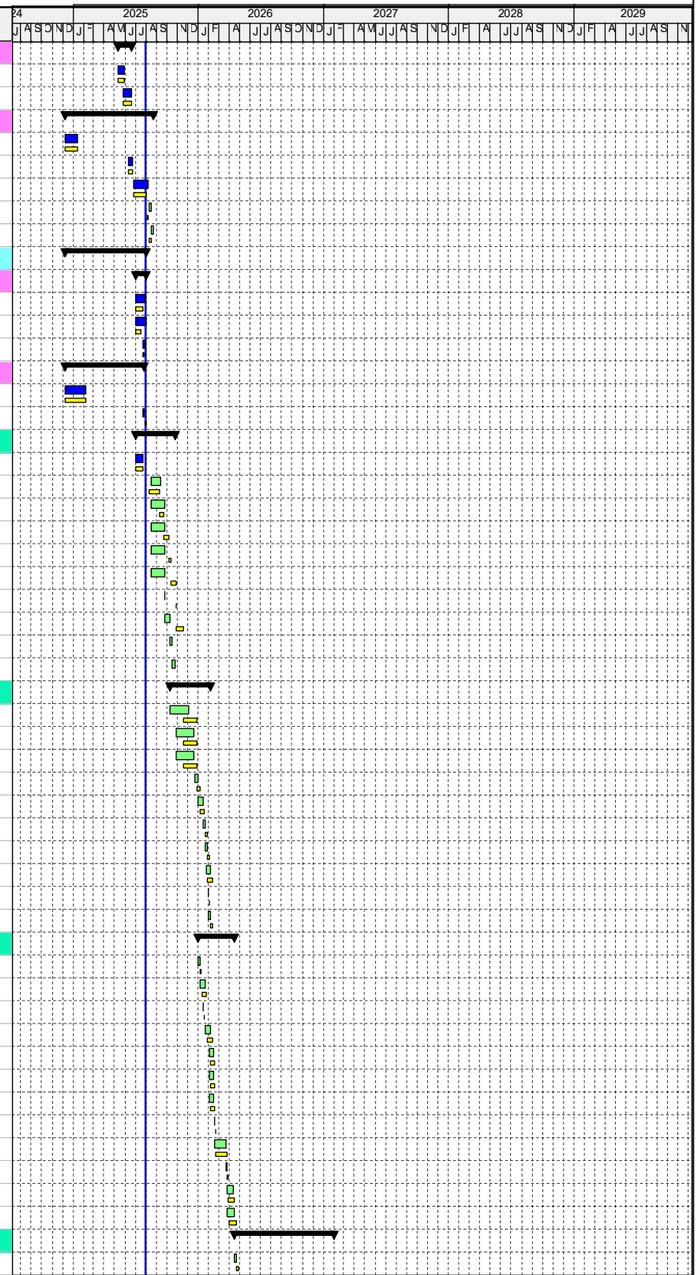
Date	Revision	Checked	Approved
27-May-25	MASTER SCHEDULE APR 2025 UPDATE	BPJ/JKC	
26-Jun-25	MASTER SCHEDULE MAY 2025 UPDATE	BPJ/JKC	
17-Jul-25	MASTER SCHEDULE JUN 2025 UPDATE	BPJ/JKC	
20-Aug-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	
16-Sep-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	

Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
487	**PUBLIC OUTREACH**		15			12-May-25 A	19-Jun-25 A	25-Sep-25	25-Sep-25
488	P1A-JCSA-3-6-1210	JCSA-LSA3-6 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		12-May-25 A	30-May-25 A	25-Sep-25	25-Sep-25
489	P1A-JCSA-3-6-1230	JCSA-LSA3-6 - Notify Public of Upcoming SSES Activities	5	100%		26-May-25 A	19-Jun-25 A	25-Sep-25	25-Sep-25
490	**CCTV INSPECTIONS**		103		92	09-Dec-24 A	22-Aug-25	25-Sep-25	06-Jan-26
491	P1A-JCSA-3-6-1130	JCSA-LSA3-6 - SSES CCTV Inspections (Mains) Award & NTP	10	100%		09-Dec-24 A	13-Jan-25 A	25-Sep-25	25-Sep-25
492	P1A-JCSA-3-6-1240	JCSA-LSA3-6 - SSES Data Collection - CCTV Inspections (Mains)	15	100%		10-Jun-25 A	24-Jun-25 A	25-Sep-25	25-Sep-25
493	P1A-JCSA-3-6-1260	JCSA-LSA3-6 - RJN Pushes Video to SewerAI & Performs QA/QC & Submits NASSCO Deliverables to ShareFile Fold	20	100%		25-Jun-25 A	08-Aug-25 A	25-Sep-25	25-Sep-25
494	P1A-JCSA-3-6-1290	JCSA-LSA3-6 - BMcD Performs QA/QC, Updates GIS Connectivity & Attributes, & Runs Rehab Decision Model	5	0%	40	11-Aug-25	15-Aug-25	06-Oct-25	13-Oct-25
495	P1A-JCSA-3-6-1320	JCSA-LSA3-6 - RJN Uploads Data & Corrected GIS to Clarity & NASSCO Deliverables to ShareFile Folder	5	0%	92	18-Aug-25	22-Aug-25	30-Dec-25	06-Jan-26
496	**SSES SMOKE TESTING**		66			09-Dec-24 A	31-Jul-25 A	13-Mar-26	19-Mar-26
497	**PUBLIC OUTREACH**		17			02-Jul-25 A	31-Jul-25 A	13-Mar-26	19-Mar-26
498	P1A-JCSA-3-6-1270	JCSA-LSA3-6 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		02-Jul-25 A	29-Jul-25 A	13-Mar-26	13-Mar-26
499	P1A-JCSA-3-6-1330	JCSA-LSA3-6 - Distribute Notification Letters	1	100%		03-Jul-25 A	31-Jul-25 A	13-Mar-26	13-Mar-26
500	P1A-JCSA-3-6-1340	JCSA-LSA3-6 - Distribute Door Hangers (48 Hrs Prior to Work)	2	100%		24-Jul-25 A	29-Jul-25 A	19-Mar-26	19-Mar-26
501	**SMOKE TESTING**		66			09-Dec-24 A	25-Jul-25 A	19-Mar-26	19-Mar-26
502	P1A-JCSA-3-6-1120	JCSA-LSA3-6 - SSES Smoke Testing Contractor Award & NTP	10	100%		09-Dec-24 A	05-Feb-25 A	19-Mar-26	19-Mar-26
503	P1A-JCSA-3-6-1350	JCSA-LSA3-6 - SSES Data Collection - Smoke Testing & Cleanout Inspections	5	100%		22-Jul-25 A	25-Jul-25 A	19-Mar-26	19-Mar-26
504	**PRELIMINARY I/I REDUCTION PLAN**		60		92	02-Jul-25 A	24-Oct-25	13-Oct-25	06-Mar-26
505	P1A-JCSA-3-6-1220	JCSA-LSA3-6 - Validation of SSO's Using Updated RTK's	15	100%		02-Jul-25 A	23-Jul-25 A	13-Oct-25	13-Oct-25
506	P1A-JCSA-3-6-1300	JCSA-LSA3-6 - Condition Data Review & Rehabilitation Categorization	19	0%	40	18-Aug-25 A	12-Sep-25	13-Oct-25	07-Nov-25
507	P1A-JCSA-3-6-1360	JCSA-LSA3-6 - I/I Reduction Strategy Alternatives Development	19	90%	40	18-Aug-25 A	24-Sep-25	13-Oct-25	18-Nov-25
508	P1A-JCSA-3-6-1370	JCSA-LSA3-6 - Cost-Effective Evaluation	19	50%	40	18-Aug-25 A	24-Sep-25	13-Oct-25	18-Nov-25
509	P1A-JCSA-3-6-1380	JCSA-LSA3-6 - Compare Against RHM	19	50%	40	18-Aug-25 A	24-Sep-25	13-Oct-25	18-Nov-25
510	P1A-JCSA-3-6-1390	JCSA-LSA3-6 - Correction to Cost Effective Evaluation After RHM Comparison	19	50%	40	18-Aug-25 A	24-Sep-25	13-Oct-25	18-Nov-25
511	P1A-JCSA-3-6-1400	JCSA-LSA3-6 & JCSA-LSA3-8 - Host Preliminary I/I Reduction Plan Workshop	0	0%	40	25-Sep-25	25-Sep-25	19-Nov-25	19-Nov-25
512	P1A-JCSA-3-6-1410	JCSA-LSA3-6 - Develop Preliminary I/I Reduction Plan	10	0%	92	26-Sep-25	10-Oct-25	09-Feb-26	20-Feb-26
513	P1A-JCSA-3-6-1700	JCSA-LSA3-6 - Submission of Contract to HRSD for Review	5	0%	92	10-Oct-25	17-Oct-25	23-Feb-26	27-Feb-26
514	P1A-JCSA-3-6-1710	JCSA-LSA3-6 - HRSD Review & Approval of Contract	5	0%	92	17-Oct-25	24-Oct-25	02-Mar-26	06-Mar-26
515	**DESIGN**		81		91	10-Oct-25	05-Feb-26	02-Mar-26	15-Jun-26
516	P1A-JCSA-3-6-1430	JCSA-LSA3-6 - SSES Data Collection - CCTV Inspections (Laterals)	37	0%	97	10-Oct-25	03-Dec-25	02-Mar-26	21-Apr-26
517	P1A-JCSA-3-6-1420	JCSA-LSA3-6 - Work Package Development & Submit for Internal Review	37	0%	84	29-Oct-25	19-Dec-25	02-Mar-26	21-Apr-26
518	P1A-JCSA-3-6-1440	JCSA-LSA3-6 - Permitting & Easement Acquisition	37	0%	84	29-Oct-25	19-Dec-25	02-Mar-26	21-Apr-26
519	P1A-JCSA-3-6-1450	JCSA-LSA3-6 - Internal Review of Work Package Draft	5	0%	84	22-Dec-25	30-Dec-25	22-Apr-26	28-Apr-26
520	P1A-JCSA-3-6-1460	JCSA-LSA3-6 - Incorporate Comments & Submit Work Package for Final Internal Review	10	0%	84	31-Dec-25	14-Jan-26	29-Apr-26	12-May-26
521	P1A-JCSA-3-6-1500	JCSA-LSA3-6 - Final Internal Review of Work Package & Submit for Owner Review	5	0%	91	15-Jan-26	21-Jan-26	22-May-26	29-May-26
522	P1A-JCSA-3-6-1520	JCSA-LSA3-6 - Owner Review of Work Package	5	0%	91	22-Jan-26	28-Jan-26	01-Jun-26	05-Jun-26
523	P1A-JCSA-3-6-1530	JCSA-LSA3-6 - Work Package Development - IFC	10	0%	91	23-Jan-26	05-Feb-26	02-Jun-26	15-Jun-26
524	P1A-JCSA-3-6-1540	JCSA-LSA3-6 - Host Workshop of Work Package	1	0%	91	29-Jan-26	29-Jan-26	08-Jun-26	08-Jun-26
525	P1A-JCSA-3-6-1550	JCSA-LSA3-6 - Incorporate Owner Comments & Finalize Work Package	5	0%	91	30-Jan-26	05-Feb-26	09-Jun-26	15-Jun-26
526	**PROCUREMENT/SUBCONTRACTING**		76		84	31-Dec-25	16-Apr-26	29-Apr-26	14-Aug-26
527	P1A-JCSA-3-6-1470	JCSA-LSA3-6 - Prepare Final Design Documents & Solicit Subcontractor Pricing	4	0%	84	31-Dec-25	06-Jan-26	29-Apr-26	04-May-26
528	P1A-JCSA-3-6-1480	JCSA-LSA3-6 - Pre-Negotiation of Subcontractor Unit Pricing	10	0%	84	07-Jan-26	20-Jan-26	05-May-26	18-May-26
529	P1A-JCSA-3-6-1490	JCSA-LSA3-6 - Pre-Proposal Subcontractor Meetings	1	0%	88	14-Jan-26	14-Jan-26	18-May-26	18-May-26
530	P1A-JCSA-3-6-1510	JCSA-LSA3-6 - Confirm Final Construction Pricing	12	0%	84	21-Jan-26	05-Feb-26	19-May-26	04-Jun-26
531	P1A-JCSA-3-6-1560	JCSA-LSA3-6 - Formal Risk Review Associated with Construction Pricing (BMcD)	10	0%	84	02-Feb-26	13-Feb-26	01-Jun-26	12-Jun-26
532	P1A-JCSA-3-6-1570	JCSA-LSA3-6 - Technical & Commerical Evaluation (BMcD)	10	0%	84	02-Feb-26	13-Feb-26	01-Jun-26	12-Jun-26
533	P1A-JCSA-3-6-1580	JCSA-LSA3-6 - Executive Pricing Review (BMcD)	10	0%	84	02-Feb-26	13-Feb-26	01-Jun-26	12-Jun-26
534	P1A-JCSA-3-6-1590	JCSA-LSA3-6 - Host Workshop for HRSD Approval of GMP	1	0%	84	16-Feb-26	16-Feb-26	15-Jun-26	15-Jun-26
535	P1A-JCSA-3-6-1600	JCSA-LSA3-6 - Award & NTP to Subcontractors	25	0%	84	17-Feb-26	23-Mar-26	16-Jun-26	21-Jul-26
536	P1A-JCSA-3-6-1610	JCSA-LSA3-6 - Pre-Construction Meeting	1	0%	84	24-Mar-26	24-Mar-26	22-Jul-26	22-Jul-26
537	P1A-JCSA-3-6-1620	JCSA-LSA3-6 - Subcontractors Prepare & Submit Submittals for Approval	15	0%	84	25-Mar-26	14-Apr-26	23-Jul-26	12-Aug-26
538	P1A-JCSA-3-6-1630	JCSA-LSA3-6 - Review & Approve Submittals	15	0%	84	27-Mar-26	16-Apr-26	27-Jul-26	14-Aug-26
539	**CONSTRUCTION**		200		84	17-Apr-26	01-Feb-27	17-Aug-26	28-May-27
540	P1A-JCSA-3-6-1640	JCSA-LSA3-6 - Construction Mobilization	5	0%	84	17-Apr-26	23-Apr-26	17-Aug-26	21-Aug-26



Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

HRSD
Sustainable, Innovative Wastewater Treatment

HRSD - HIGH PRIORITY I/I REDUCTION PDB PROGRAM

BURNS McDONNELL

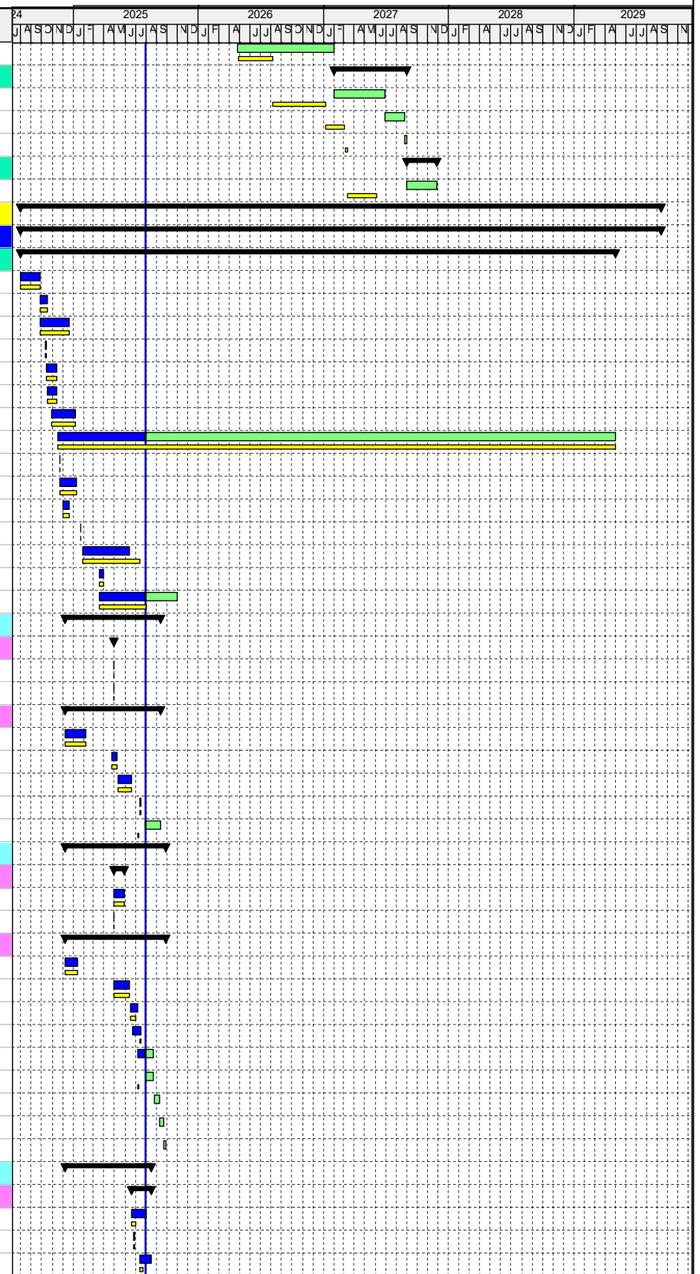
Date	Revision	Checked	Approved
27-May-25	MASTER SCHEDULE APR 2025 UPDATE	BPJ/JKC	
26-Jun-25	MASTER SCHEDULE MAY 2025 UPDATE	BPJ/JKC	
17-Jul-25	MASTER SCHEDULE JUN 2025 UPDATE	BPJ/JKC	
20-Aug-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	
16-Sep-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	

Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
541	P1A-JCSA-3-6-1650	JCSA-LSA3-6 - Work Package Construction	195	0%	84	24-Apr-26	01-Feb-27	24-Aug-26	28-May-27
542	POST CONSTRUCTION		150		84	02-Feb-27	01-Sep-27	01-Jun-27	04-Jan-28
543	P1A-JCSA-3-6-1660	JCSA-LSA3-6 - Post Construction Flow Monitoring	105	0%	84	02-Feb-27	29-Jun-27	01-Jun-27	27-Oct-27
544	P1A-JCSA-3-6-1670	JCSA-LSA3-6 - I/I Reduction Effectiveness Analysis	40	0%	84	30-Jun-27	25-Aug-27	28-Oct-27	27-Dec-27
545	P1A-JCSA-3-6-1680	JCSA-LSA3-6 - Host Workshop on I/I Reduction Effectiveness	5	0%	84	26-Aug-27	01-Sep-27	28-Dec-27	04-Jan-28
546	PHASE 1A PROJECT CONTINGENCY		60		84	02-Sep-27	26-Nov-27	05-Jan-28	28-Mar-28
547	P1A-JCSA-3-6-1690	JCSA-LSA3-6 - Weather Contingency	60	0%	84	02-Sep-27	26-Nov-27	05-Jan-28	28-Mar-28
548	PHASE 1B (PORT-10)		1299		35	01-Aug-24 A	12-Sep-29	02-Sep-25	31-Oct-29
549	PORT-10		1299		35	01-Aug-24 A	12-Sep-29	02-Sep-25	31-Oct-29
550	DATA COLLECTION & ANALYSIS		1205		22	01-Aug-24 A	30-Apr-29	02-Sep-25	31-May-29
551	P1B-PORT-10-1000	PORT-10 - Review Existing Flow & SSES Data	40	100%		01-Aug-24 A	26-Sep-24 A	02-Sep-25	02-Sep-25
552	P1B-PORT-10-1010	PORT-10 - Develop Basin Specific Condition Data Collection Plans	20	100%		27-Sep-24 A	18-Oct-24 A	09-Sep-25	09-Sep-25
553	P1B-PORT-10-1020	PORT-10 - Develop Basin Specific Flow Metering Plan	20	100%		27-Sep-24 A	20-Dec-24 A	02-Sep-25	02-Sep-25
554	P1B-PORT-10-1030	PORT-10 - Owner Approval of Flow Metering Pricing	5	100%		12-Oct-24 A	15-Oct-24 A	02-Sep-25	02-Sep-25
555	P1B-PORT-10-1040	PORT-10 - Conduct Flow Monitoring Information Meetings with Localities As Needed	5	100%		16-Oct-24 A	15-Nov-24 A	02-Sep-25	02-Sep-25
556	P1B-PORT-10-1050	PORT-10 - SSES Condition Data Qualifications Evaluations & Pricing	10	100%		18-Oct-24 A	15-Nov-24 A	09-Sep-25	09-Sep-25
557	P1B-PORT-10-1060	PORT-10 - Pre-Construction Flow Monitoring Site Investigations & Installations	20	100%		29-Oct-24 A	06-Jan-25 A	02-Sep-25	02-Sep-25
558	P1B-PORT-10-1070	PORT-10 - Flow Monitoring - Long Term	1120	25%	22	18-Nov-24 A	30-Apr-29*	02-Sep-25	31-May-29
559	P1B-PORT-10-1080	PORT-10 - Owner Approval of SSES Subcontracor Inspection Costs	5	100%		22-Nov-24 A	22-Nov-24 A	09-Sep-25	09-Sep-25
560	P1B-PORT-10-1090	PORT-10 - Pre-Construction Rain Gauges Site Investigations & Installations	5	100%		22-Nov-24 A	10-Jan-25 A	27-Oct-25	27-Oct-25
561	P1B-PORT-10-1110	PORT-10 - Submittal of Flow Metering Plan to HRSD	15	100%		02-Dec-24 A	20-Dec-24 A	24-Oct-25	24-Oct-25
562	P1B-PORT-10-1160	PORT-10 - Host Workshop of Basin Specific Condition Data Collection Plans	5	100%		22-Jan-25 A	22-Jan-25 A	19-Sep-25	19-Sep-25
563	P1B-PORT-10-1170	PORT-10 - Conduct SSES information Meetings with Localities As Needed	10	100%		28-Jan-25 A	13-Jun-25 A	19-Sep-25	19-Sep-25
564	P1B-PORT-10-1220	PORT-10 - Time Series Analysis & RTK Development	10	100%		18-Mar-25 A	31-Mar-25 A	05-Dec-25	05-Dec-25
565	P1B-PORT-10-1230	PORT-10 - Pre-Construction Flow Monitoring - Short Term	60	80%	89	18-Mar-25 A	30-Oct-25	05-Dec-25	10-Mar-26
566	SSES MH INSPECTIONS		168		99	09-Dec-24 A	11-Sep-25	19-Sep-25	04-Feb-26
567	PUBLIC OUTREACH		23			30-Apr-25 A	30-Apr-25 A	28-Nov-25	28-Nov-25
568	P1B-PORT-10-1180	PORT-10 - Notify Public of Upcoming SSES Activities	23	100%		30-Apr-25 A	30-Apr-25 A	28-Nov-25	28-Nov-25
569	P1B-PORT-10-1100	PORT-10 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	4	100%		30-Apr-25 A	30-Apr-25 A	28-Nov-25	28-Nov-25
570	MH INSPECTIONS		168		99	09-Dec-24 A	11-Sep-25	19-Sep-25	04-Feb-26
571	P1B-PORT-10-1130	PORT-10 - SSES Manhole Inspections Contractor Award & NTP	10	100%		09-Dec-24 A	06-Feb-25 A	19-Sep-25	19-Sep-25
572	P1B-PORT-10-1210	PORT-10 - SSES Data Collection & Upload - Manhole Inspections (Duke's)	31	100%		23-Apr-25 A	09-May-25 A	19-Sep-25	19-Sep-25
573	P1B-PORT-10-1250	PORT-10 - RJN Pushes Video to SewerAI & Performs QA/QC & Submits NASSCO Deliverables to ShareFile Folder	20	100%		12-May-25 A	20-Jun-25 A	10-Nov-25	10-Nov-25
574	P1B-PORT-10-1330	PORT-10 - RJN Uploads Data & Corrected GIS to Clarity & NASSCO Deliverables to ShareFile Folder	5	100%		14-Jul-25 A	17-Jul-25 A	04-Feb-26	04-Feb-26
575	P1B-PORT-10-1310	PORT-10 - BMcD Performs QA/QC, Updates GIS Connectivity & Attributes, & Runs Rehab Decision Model	5	10%	71	30-Jul-25 A	11-Sep-25	10-Nov-25	22-Dec-25
576	SSES CCTV INSPECTIONS		169		86	09-Dec-24 A	29-Sep-25	19-Sep-25	03-Feb-26
577	PUBLIC OUTREACH		23			30-Apr-25 A	30-May-25 A	30-Oct-25	30-Oct-25
578	P1B-PORT-10-1190	PORT-10 - Notify Public of Upcoming SSES Activities	16	100%		30-Apr-25 A	30-May-25 A	30-Oct-25	30-Oct-25
579	P1B-PORT-10-1120	PORT-10 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	4	100%		30-Apr-25 A	30-Apr-25 A	30-Oct-25	30-Oct-25
580	CCTV INSPECTIONS		169		86	09-Dec-24 A	29-Sep-25	19-Sep-25	03-Feb-26
581	P1B-PORT-10-1150	PORT-10 - SSES CCTV Inspections (Mains) Award & NTP	10	100%		09-Dec-24 A	13-Jan-25 A	19-Sep-25	19-Sep-25
582	P1B-PORT-10-1200	PORT-10 - SSES Data Collection - CCTV Inspections (Mains)	40	100%		30-Apr-25 A	13-Jun-25 A	19-Sep-25	19-Sep-25
583	P1B-PORT-10-1260	PORT-10 - RJN Pushes Video to SewerAI & Performs QA/QC & Submits NASSCO Deliverables to ShareFile Folder	25	100%		16-Jun-25 A	07-Jul-25 A	09-Oct-25	09-Oct-25
584	P1B-PORT-10-1320	PORT-10 - RJN Uploads Data & Corrected GIS to Clarity & NASSCO Deliverables to ShareFile Folder	5	100%		23-Jun-25 A	18-Jul-25 A	03-Feb-26	03-Feb-26
585	P1B-PORT-10-1740	PORT-10 - City of Portsmouth Pipe Remediation	30	70%	49	07-Jul-25 A	22-Aug-25	09-Oct-25	31-Oct-25
586	P1B-PORT-10-1290	PORT-10 - BMcD Performs QA/QC, Updates GIS Connectivity & Attributes, & Runs Rehab Decision Model	5	10%	84	31-Jul-25 A	22-Aug-25	28-Nov-25	22-Dec-25
587	P1B-PORT-10-1720	PORT-10 - Additional SSES Data Collection - CCTV Inspections (Mains)	10	0%	49	25-Aug-25	08-Sep-25	03-Nov-25	14-Nov-25
588	P1B-PORT-10-1730	PORT-10 - RJN Pushes Video to SewerAI & Performs QA/QC & Submits NASSCO Deliverables to ShareFile Folder	10	0%	49	09-Sep-25	22-Sep-25	17-Nov-25	01-Dec-25
589	P1B-PORT-10-1750	PORT-10 - BMcD Performs QA/QC, Updates GIS Connectivity & Attributes, & Runs Rehab Decision Model	5	0%	49	23-Sep-25	29-Sep-25	02-Dec-25	08-Dec-25
590	SSES SMOKE TESTING		125		148	09-Dec-24 A	15-Aug-25	03-Mar-26	11-Mar-26
591	PUBLIC OUTREACH		37			20-Jun-25 A	15-Aug-25 A	03-Mar-26	03-Mar-26
592	P1B-PORT-10-1270	PORT-10 - Distribute Notification Letters	1	100%		20-Jun-25 A	01-Aug-25 A	03-Mar-26	03-Mar-26
593	P1B-PORT-10-1240	PORT-10 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		25-Jun-25 A	30-Jun-25 A	03-Mar-26	03-Mar-26
594	P1B-PORT-10-1280	PORT-10 - Distribute Door Hangers (48 Hrs Prior to Work)	9	100%		14-Jul-25 A	15-Aug-25 A	03-Mar-26	03-Mar-26



Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

HRSD
Sustainable, Innovative Wastewater Treatment

HRSD - HIGH PRIORITY I/I REDUCTION PDB PROGRAM

BURNS McDONNELL

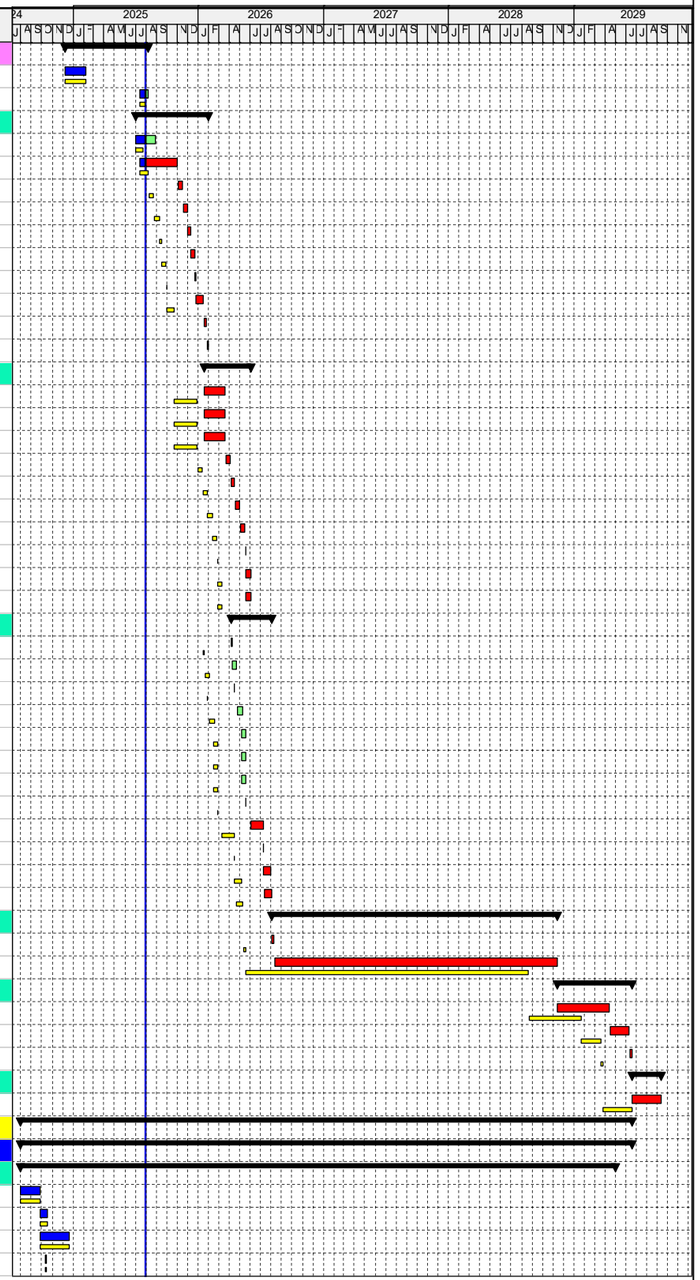
Date	Revision	Checked	Approved
27-May-25	MASTER SCHEDULE APR 2025 UPDATE	BPJ/JKC	
26-Jun-25	MASTER SCHEDULE MAY 2025 UPDATE	BPJ/JKC	
17-Jul-25	MASTER SCHEDULE JUN 2025 UPDATE	BPJ/JKC	
20-Aug-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	
16-Sep-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	

Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
595	**SMOKE TESTING**		125		148	09-Dec-24 A	08-Aug-25	03-Mar-26	11-Mar-26
596	P1B-PORT-10-1140	PORT-10 - SSES Smoke Testing Contractor Award & NTP	10	100%		09-Dec-24 A	05-Feb-25 A	03-Mar-26	03-Mar-26
597	P1B-PORT-10-1300	PORT-10 - SSES Data Collection - Smoke Testing & Cleanout Inspections	11	80%	148	14-Jul-25 A	08-Aug-25	03-Mar-26	11-Mar-26
598	**PRELIMINARY I/I REDUCTION PLAN**		140		35	02-Jul-25 A	30-Jan-26	19-Sep-25	20-Mar-26
599	P1B-PORT-10-1690	PORT-10 - Validation of SSO's Using Updated RTK's	15	25%	89	02-Jul-25 A	29-Aug-25	05-Dec-25	08-Jan-26
600	P1B-PORT-10-1340	PORT-10 - Condition Data Review & Rehabilitation Categorization	20	25%	35	14-Jul-25 A	31-Oct-25	19-Sep-25	22-Dec-25
601	P1B-PORT-10-1350	PORT-10 - I/I Reduction Strategy Alternatives Development	10	0%	35	03-Nov-25	14-Nov-25	23-Dec-25	08-Jan-26
602	P1B-PORT-10-1360	PORT-10 - Cost-Effective Evaluation	10	0%	35	17-Nov-25	01-Dec-25	09-Jan-26	22-Jan-26
603	P1B-PORT-10-1370	PORT-10 - Compare Against RHM	5	0%	35	02-Dec-25	08-Dec-25	23-Jan-26	29-Jan-26
604	P1B-PORT-10-1380	PORT-10 - Correction to Cost Effective Evaluation After RHM Comparison	10	0%	35	09-Dec-25	22-Dec-25	30-Jan-26	12-Feb-26
605	P1B-PORT-10-1390	PORT-10 - Host Preliminary I/I Reduction Plan Workshop	1	0%	35	23-Dec-25	23-Dec-25	13-Feb-26	13-Feb-26
606	P1B-PORT-10-1400	PORT-10 - Develop Preliminary I/I Reduction Plan	15	0%	35	26-Dec-25	16-Jan-26	16-Feb-26	06-Mar-26
607	P1B-PORT-10-1700	PORT-10 - Submission of Contract to HRSD for Review & Approval	5	0%	35	19-Jan-26	23-Jan-26	09-Mar-26	13-Mar-26
608	P1B-PORT-10-1710	PORT-10 - HRSD Review & Approval of Contract	5	0%	35	26-Jan-26	30-Jan-26	16-Mar-26	20-Mar-26
609	**DESIGN**		96		35	19-Jan-26	02-Jun-26	09-Mar-26	22-Jul-26
610	P1B-PORT-10-1410	PORT-10 - Work Package 1B Development & Submit for Internal Review	45	0%	35	19-Jan-26	20-Mar-26	09-Mar-26	08-May-26
611	P1B-PORT-10-1420	PORT-10 - SSES Data Collection - CCTV Inspections (Laterals)	45	0%	35	19-Jan-26	20-Mar-26	09-Mar-26	08-May-26
612	P1B-PORT-10-1430	PORT-10 - Permitting & Easement Acquisition	45	0%	35	19-Jan-26	20-Mar-26	09-Mar-26	08-May-26
613	P1B-PORT-10-1440	PORT-10 - Internal Review of Work Package 1B Draft	10	0%	35	23-Mar-26	03-Apr-26	11-May-26	22-May-26
614	P1B-PORT-10-1450	PORT-10 - Incorporate Comments & Submit Work Package 1B for Final Internal Review	10	0%	35	06-Apr-26	17-Apr-26	26-May-26	08-Jun-26
615	P1B-PORT-10-1490	PORT-10 - Final Internal Review of Work Package 1B & Submit for Owner Review	10	0%	35	20-Apr-26	01-May-26	09-Jun-26	22-Jun-26
616	P1B-PORT-10-1510	PORT-10 - Owner Review of Work Package 1B	10	0%	35	04-May-26	15-May-26	23-Jun-26	07-Jul-26
617	P1B-PORT-10-1530	PORT-10 - Host Workshop of Work Package 1B	1	0%	35	18-May-26	18-May-26	08-Jul-26	08-Jul-26
618	P1B-PORT-10-1520	PORT-10 - Work Package Development - IFC	10	0%	35	19-May-26	02-Jun-26	09-Jul-26	22-Jul-26
619	P1B-PORT-10-1540	PORT-10 - Incorporate Owner Comments & Finalize Work Package 1B	10	0%	35	19-May-26	02-Jun-26	09-Jul-26	22-Jul-26
620	**PROCUREMENT/SUBCONTRACTING**		84		35	06-Apr-26	03-Aug-26	05-Jun-26	22-Sep-26
621	P1B-PORT-10-1460	PORT-10 - Prepare Final Design Documents & Solicit Subcontractor Pricing	4	0%	43	06-Apr-26	09-Apr-26	05-Jun-26	10-Jun-26
622	P1B-PORT-10-1470	PORT-10 - Pre-Negotiation of Subcontractor Unit Pricing	10	0%	43	10-Apr-26	23-Apr-26	11-Jun-26	24-Jun-26
623	P1B-PORT-10-1480	PORT-10 - Pre-Proposal Subcontractor Meetings	1	0%	47	17-Apr-26	17-Apr-26	24-Jun-26	24-Jun-26
624	P1B-PORT-10-1500	PORT-10 - Confirm Final Construction Pricing	12	0%	43	24-Apr-26	11-May-26	25-Jun-26	13-Jul-26
625	P1B-PORT-10-1550	PORT-10 - Formal Risk Review Associated with Construction Pricing (BMcD)	10	0%	43	06-May-26	19-May-26	08-Jul-26	21-Jul-26
626	P1B-PORT-10-1560	PORT-10 - Technical & Commerical Evaluation (BMcD)	10	0%	43	06-May-26	19-May-26	08-Jul-26	21-Jul-26
627	P1B-PORT-10-1570	PORT-10 - Executive Pricing Review (BMcD)	10	0%	43	06-May-26	19-May-26	08-Jul-26	21-Jul-26
628	P1B-PORT-10-1580	PORT-10 - Host Workshop for HRSD Approval of GMP	1	0%	43	20-May-26	20-May-26	22-Jul-26	22-Jul-26
629	P1B-PORT-10-1590	PORT-10 - Award & NTP to Subcontractors	25	0%	35	03-Jun-26	08-Jul-26	23-Jul-26	26-Aug-26
630	P1B-PORT-10-1600	PORT-10 - Pre-Construction Meeting	1	0%	35	09-Jul-26	09-Jul-26	27-Aug-26	27-Aug-26
631	P1B-PORT-10-1610	PORT-10 - Subcontractors Prepare & Submit Submittals for Approval	15	0%	35	10-Jul-26	30-Jul-26	28-Aug-26	18-Sep-26
632	P1B-PORT-10-1620	PORT-10 - Review & Approve Submittals	15	0%	35	14-Jul-26	03-Aug-26	01-Sep-26	22-Sep-26
633	**CONSTRUCTION**		580		35	04-Aug-26	13-Nov-28	23-Sep-26	05-Jan-29
634	P1B-PORT-10-1630	PORT-10 - Construction Mobilization	5	0%	35	04-Aug-26	10-Aug-26	23-Sep-26	29-Sep-26
635	P1B-PORT-10-1640	PORT-10 - Work Package Construction	575	0%	35	11-Aug-26	13-Nov-28	30-Sep-26	05-Jan-29
636	**POST CONSTRUCTION**		150		35	14-Nov-28	18-Jun-29	08-Jan-29	07-Aug-29
637	P1B-PORT-10-1650	PORT-10 - Post Construction Flow Monitoring	105	0%	35	14-Nov-28	13-Apr-29	08-Jan-29	04-Jun-29
638	P1B-PORT-10-1660	PORT-10 - I/I Reduction Effectiveness Analysis	40	0%	35	16-Apr-29	11-Jun-29	05-Jun-29	31-Jul-29
639	P1B-PORT-10-1670	PORT-10 - Host Workshop on I/I Reduction Effectiveness	5	0%	35	12-Jun-29	18-Jun-29	01-Aug-29	07-Aug-29
640	**PHASE 1B PROJECT CONTINGENCY**		60		35	19-Jun-29	12-Sep-29	08-Aug-29	31-Oct-29
641	P1B-PORT-10-1680	PORT-10 - Weather Contingency	60	0%	35	19-Jun-29	12-Sep-29	08-Aug-29	31-Oct-29
642	**PHASE 2 (JCSA-LSA3-1 & JCSA-LSA5-4)**		1239		94	01-Aug-24 A	18-Jun-29	02-Sep-25	30-Oct-29
643	**JCSA-LSA3-1**		1239		94	01-Aug-24 A	18-Jun-29	02-Sep-25	30-Oct-29
644	**DATA COLLECTION & ANALYSIS**		1205		22	01-Aug-24 A	30-Apr-29	02-Sep-25	31-May-29
645	P2-JCSA-3-1-1000	JCSA-LSA3-1 - Review Existing Flow & SSES Data	40	100%		01-Aug-24 A	26-Sep-24 A	02-Sep-25	02-Sep-25
646	P2-JCSA-3-1-1010	JCSA-LSA3-1 - Develop Basin Specific Condition Data Collection Plans	20	100%		27-Sep-24 A	18-Oct-24 A	09-Sep-25	09-Sep-25
647	P2-JCSA-3-1-1020	JCSA-LSA3-1 - Develop Basin Specific Flow Metering Plan	20	100%		27-Sep-24 A	20-Dec-24 A	02-Sep-25	02-Sep-25
648	P2-JCSA-3-1-1030	JCSA-LSA3-1 - Owner Approval of Flow Metering Pricing	5	100%		12-Oct-24 A	15-Oct-24 A	02-Sep-25	02-Sep-25



Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

HRSD
Sustainable, Innovative Wastewater Treatment

HRSD - HIGH PRIORITY I/I REDUCTION PDB PROGRAM

BURNS McDONNELL

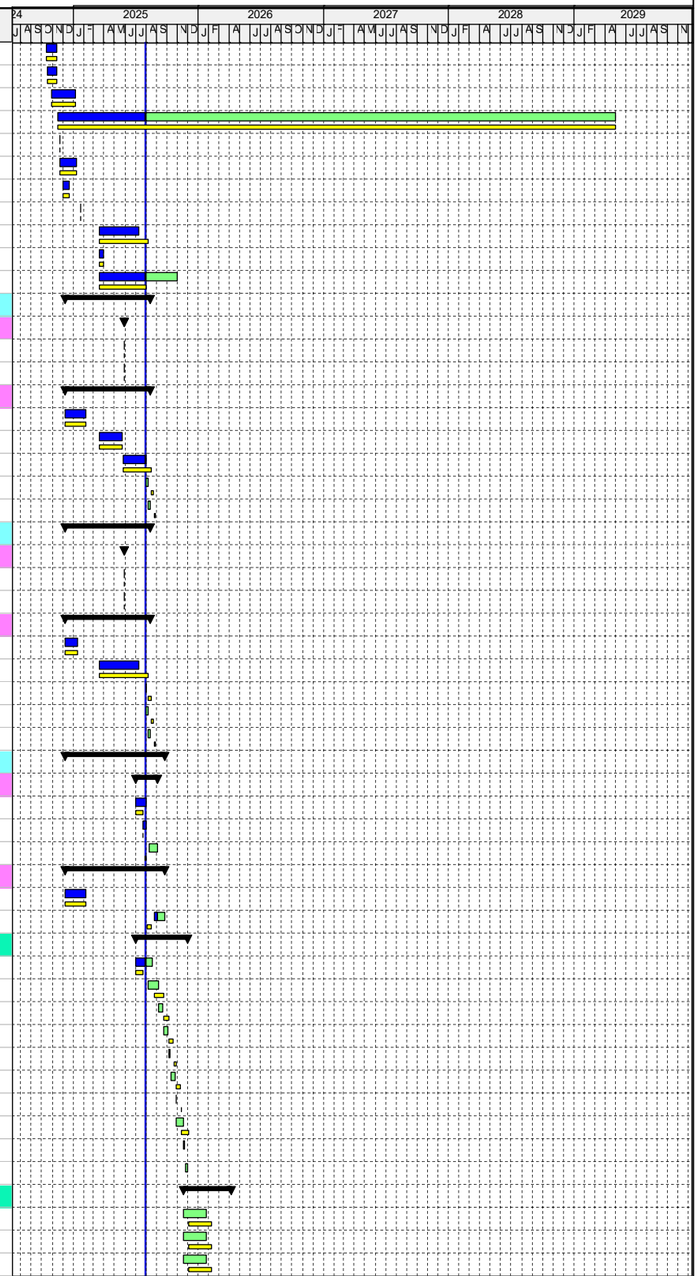
Date	Revision	Checked	Approved
27-May-25	MASTER SCHEDULE APR 2025 UPDATE	BPJ/JKC	
26-Jun-25	MASTER SCHEDULE MAY 2025 UPDATE	BPJ/JKC	
17-Jul-25	MASTER SCHEDULE JUN 2025 UPDATE	BPJ/JKC	
20-Aug-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	
16-Sep-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	

Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
649	P2-JCSA-3-1-1040	JCSA-LSA3-1 - Conduct Flow Monitoring Information Meetings with Localities As Needed	5	100%		16-Oct-24 A	15-Nov-24 A	02-Sep-25	02-Sep-25
650	P2-JCSA-3-1-1050	JCSA-LSA3-1 - SSES Condition Data Qualifications Evaluations & Pricing	10	100%		18-Oct-24 A	15-Nov-24 A	09-Sep-25	09-Sep-25
651	P2-JCSA-3-1-1060	JCSA-LSA3-1 - Pre-Construction Flow Monitoring Site Investigations & Installations	20	100%		29-Oct-24 A	06-Jan-25 A	02-Sep-25	02-Sep-25
652	P2-JCSA-3-1-1070	JCSA-LSA3-1 - Flow Monitoring - Long Term	1120	100%	22	18-Nov-24 A	30-Apr-29*	02-Sep-25	31-May-29
653	P2-JCSA-3-1-1080	JCSA-LSA3-1 - Owner Approval of SSES Subcontracor Inspection Costs	5	100%		22-Nov-24 A	22-Nov-24 A	09-Sep-25	09-Sep-25
654	P2-JCSA-3-1-1090	JCSA-LSA3-1 - Pre-Construction Rain Gauges Site Investigations & Installations	5	100%		22-Nov-24 A	10-Jan-25 A	27-Oct-25	27-Oct-25
655	P2-JCSA-3-1-1110	JCSA-LSA3-1 - Submittal of Flow Metering Plan to HRSD	15	100%		02-Dec-24 A	20-Dec-24 A	24-Oct-25	24-Oct-25
656	P2-JCSA-3-1-1160	JCSA-LSA3-1 - Host Workshop of Basin Specific Condition Data Collection Plans	5	100%		22-Jan-25 A	22-Jan-25 A	25-Sep-25	25-Sep-25
657	P2-JCSA-3-1-1170	JCSA-LSA3-1 - Conduct SSES information Meetings with Localities As Needed	10	100%		17-Mar-25 A	10-Jul-25 A	24-Nov-25	24-Nov-25
658	P2-JCSA-3-1-1220	JCSA-LSA3-1 - Time Series Analysis & RTK Development	10	100%		18-Mar-25 A	31-Mar-25 A	26-Dec-25	26-Dec-25
659	P2-JCSA-3-1-1230	JCSA-LSA3-1 - Pre-Construction Flow Monitoring - Short Term	60	80%	102	18-Mar-25 A	30-Oct-25	26-Dec-25	27-Mar-26
660	**SSES MH INSPECTIONS**		96		110	09-Dec-24 A	13-Aug-25	24-Nov-25	21-Jan-26
661	**PUBLIC OUTREACH**		20			30-May-25 A	30-May-25 A	24-Nov-25	24-Nov-25
662	P2-JCSA-3-1-1180	JCSA-LSA3-1 - Notify Public of Upcoming SSES Activities	5	100%		30-May-25 A	30-May-25 A	24-Nov-25	24-Nov-25
663	P2-JCSA-3-1-1100	JCSA-LSA3-1 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		30-May-25 A	30-May-25 A	24-Nov-25	24-Nov-25
664	**MH INSPECTIONS**		96		110	09-Dec-24 A	13-Aug-25	24-Nov-25	21-Jan-26
665	P2-JCSA-3-1-1130	JCSA-LSA3-1 - SSES Manhole Inspections Contractor Award & NTP	10	100%		09-Dec-24 A	06-Feb-25 A	24-Nov-25	24-Nov-25
666	P2-JCSA-3-1-1210	JCSA-LSA3-1 - SSES Data Collection & Upload - Manhole Inspections (Duke's)	10	100%		17-Mar-25 A	23-May-25 A	24-Nov-25	24-Nov-25
667	P2-JCSA-3-1-1250	JCSA-LSA3-1 - RJN Pushes Video to SewerAI & Performs QA/QC & Submits NASSCO Deliverables to ShareFile Fold	20	100%	82	26-May-25 A	31-Jul-25	24-Nov-25	24-Nov-25
668	P2-JCSA-3-1-1280	JCSA-LSA3-1 - BMcD Performs QA/QC, Updates GIS Connectivity & Attributes, & Runs Rehab Decision Model	5	0%	82	31-Jul-25	06-Aug-25	25-Nov-25	02-Dec-25
669	P2-JCSA-3-1-1310	JCSA-LSA3-1 - RJN Uploads Data & Corrected GIS to Clarity & NASSCO Deliverables to ShareFile Folder	5	0%	110	07-Aug-25	13-Aug-25	15-Jan-26	21-Jan-26
670	**SSES CCTV INSPECTIONS**		98		151	09-Dec-24 A	14-Aug-25	25-Sep-25	23-Mar-26
671	**PUBLIC OUTREACH**		20			30-May-25 A	30-May-25 A	23-Mar-26	23-Mar-26
672	P2-JCSA-3-1-1190	JCSA-LSA3-1 - Notify Public of Upcoming SSES Activities	5	100%		30-May-25 A	30-May-25 A	23-Mar-26	23-Mar-26
673	P2-JCSA-3-1-1120	JCSA-LSA3-1 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		30-May-25 A	30-May-25 A	23-Mar-26	23-Mar-26
674	**CCTV INSPECTIONS**		98		109	09-Dec-24 A	14-Aug-25	25-Sep-25	21-Jan-26
675	P2-JCSA-3-1-1150	JCSA-LSA3-1 - SSES CCTV Inspections (Mains) Award & NTP	10	100%		09-Dec-24 A	13-Jan-25 A	25-Sep-25	25-Sep-25
676	P2-JCSA-3-1-1200	JCSA-LSA3-1 - SSES Data Collection - CCTV Inspections (Mains)	40	100%		17-Mar-25 A	10-Jul-25 A	25-Sep-25	25-Sep-25
677	P2-JCSA-3-1-1260	JCSA-LSA3-1 - RJN Pushes Video to SewerAI & Performs QA/QC & Submits NASSCO Deliverables to ShareFile Fold	11	100%	81	01-Aug-25 A	01-Aug-25	24-Nov-25	24-Nov-25
678	P2-JCSA-3-1-1270	JCSA-LSA3-1 - BMcD Performs QA/QC, Updates GIS Connectivity & Attributes, & Runs Rehab Decision Model	5	0%	81	01-Aug-25	07-Aug-25	25-Nov-25	02-Dec-25
679	P2-JCSA-3-1-1290	JCSA-LSA3-1 - RJN Uploads Data & Corrected GIS to Clarity & NASSCO Deliverables to ShareFile Folder	5	0%	109	08-Aug-25	14-Aug-25	15-Jan-26	21-Jan-26
680	**SSES SMOKE TESTING**		86		135	09-Dec-24 A	25-Sep-25	12-Feb-26	08-Apr-26
681	**PUBLIC OUTREACH**		32		135	02-Jul-25 A	04-Sep-25	12-Feb-26	18-Mar-26
682	P2-JCSA-3-1-1240	JCSA-LSA3-1 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		02-Jul-25 A	01-Aug-25 A	12-Feb-26	12-Feb-26
683	P2-JCSA-3-1-1300	JCSA-LSA3-1 - Distribute Notification Letters	1	100%		24-Jul-25 A	01-Aug-25 A	12-Feb-26	12-Feb-26
684	P2-JCSA-3-1-1320	JCSA-LSA3-1 - Distribute Door Hangers (48 Hrs Prior to Work)	2	70%	135	22-Aug-25 A	04-Sep-25	24-Feb-26	18-Mar-26
685	**SMOKE TESTING**		86		135	09-Dec-24 A	25-Sep-25	19-Mar-26	08-Apr-26
686	P2-JCSA-3-1-1140	JCSA-LSA3-1 - SSES Smoke Testing Contractor Award & NTP	10	100%		09-Dec-24 A	05-Feb-25 A	19-Mar-26	19-Mar-26
687	P2-JCSA-3-1-1340	JCSA-LSA3-1 - SSES Data Collection - Smoke Testing & Cleanout Inspections	10	40%	135	25-Aug-25 A	25-Sep-25	19-Mar-26	08-Apr-26
688	**PRELIMINARY I/I REDUCTION PLAN**		86		94	02-Jul-25 A	01-Dec-25	03-Dec-25	15-Apr-26
689	P2-JCSA-3-1-1690	JCSA-LSA3-1 - Validation of SSO's Using Updated RTK's	15	25%	102	02-Jul-25 A	20-Aug-25	26-Dec-25	16-Jan-26
690	P2-JCSA-3-1-1330	JCSA-LSA3-1 - Condition Data Review & Rehabilitation Categorization	20	0%	81	08-Aug-25	05-Sep-25	03-Dec-25	02-Jan-26
691	P2-JCSA-3-1-1350	JCSA-LSA3-1 - I/I Reduction Strategy Alternatives Development	10	0%	81	08-Sep-25	19-Sep-25	05-Jan-26	16-Jan-26
692	P2-JCSA-3-1-1360	JCSA-LSA3-1 - Cost-Effective Evaluation	10	0%	81	22-Sep-25	03-Oct-25	19-Jan-26	30-Jan-26
693	P2-JCSA-3-1-1370	JCSA-LSA3-1 - Compare Against RHM	5	0%	94	06-Oct-25	10-Oct-25	19-Feb-26	25-Feb-26
694	P2-JCSA-3-1-1380	JCSA-LSA3-1 - Correction to Cost Effective Evaluation After RHM Comparison	10	0%	94	13-Oct-25	24-Oct-25	26-Feb-26	11-Mar-26
695	P2-JCSA-3-1-1390	JCSA-LSA3-1 - Host Preliminary I/I Reduction Plan Workshop	1	0%	94	27-Oct-25	27-Oct-25	12-Mar-26	12-Mar-26
696	P2-JCSA-3-1-1400	JCSA-LSA3-1 - Develop Preliminary I/I Reduction Plan	15	0%	94	28-Oct-25	17-Nov-25	13-Mar-26	02-Apr-26
697	P2-JCSA-3-1-1700	JCSA-LSA3-1 - Submission of Contract to HRSD for Review & Approval	5	0%	94	17-Nov-25	21-Nov-25	02-Apr-26	08-Apr-26
698	P2-JCSA-3-1-1710	JCSA-LSA3-1 - HRSD Review & Approval of Contract	5	0%	94	24-Nov-25	01-Dec-25	09-Apr-26	15-Apr-26
699	**DESIGN**		96		94	18-Nov-25	06-Apr-26	03-Apr-26	18-Aug-26
700	P2-JCSA-3-1-1410	JCSA-LSA3-1 - Work Package Development & Submit for Internal Review	45	0%	94	18-Nov-25	23-Jan-26	03-Apr-26	05-Jun-26
701	P2-JCSA-3-1-1420	JCSA-LSA3-1 - SSES Data Collection - CCTV Inspections (Laterals)	45	0%	94	18-Nov-25	23-Jan-26	03-Apr-26	05-Jun-26
702	P2-JCSA-3-1-1430	JCSA-LSA3-1 - Permitting & Easement Acquisition	45	0%	94	18-Nov-25	23-Jan-26	03-Apr-26	05-Jun-26



Primary Baseline
Actual Work
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Critical Remaining Work
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Summary

HRSD
Sustainable, Innovative Wastewater Treatment

HRSD - HIGH PRIORITY I/I REDUCTION PDB PROGRAM

BURNS McDONNELL

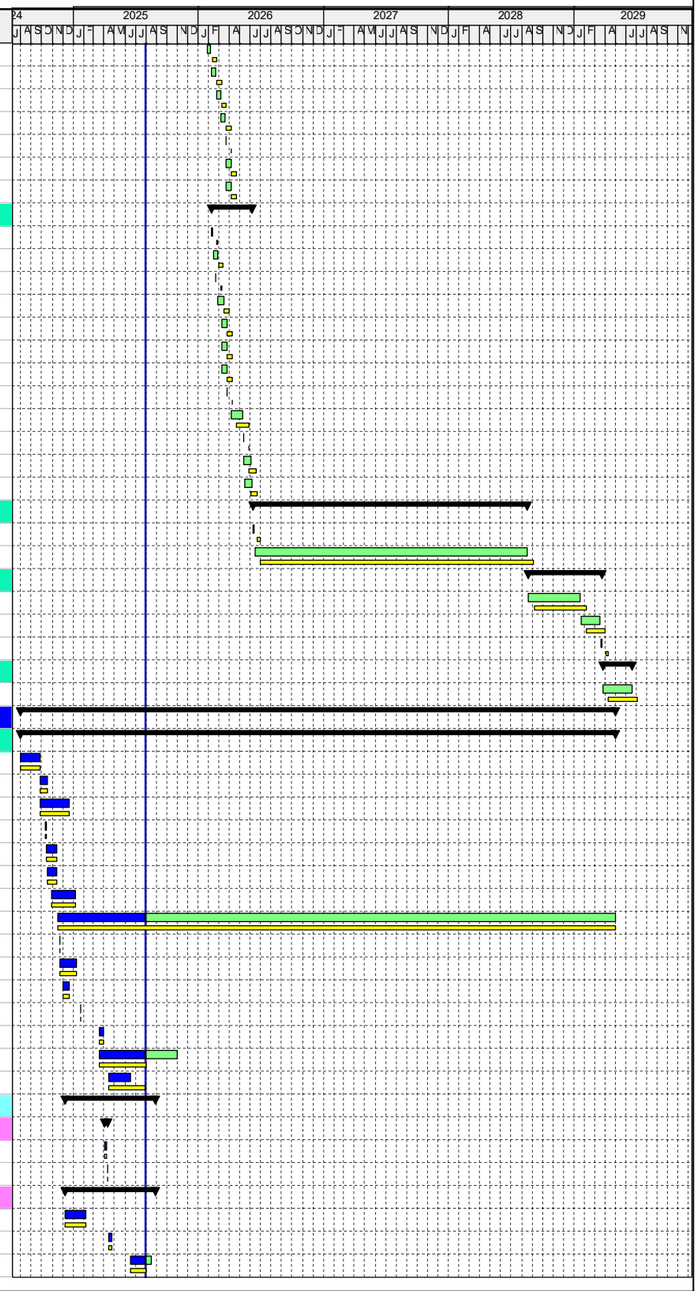
Date	Revision	Checked	Approved
27-May-25	MASTER SCHEDULE APR 2025 UPDATE	BPJ/JKC	
26-Jun-25	MASTER SCHEDULE MAY 2025 UPDATE	BPJ/JKC	
17-Jul-25	MASTER SCHEDULE JUN 2025 UPDATE	BPJ/JKC	
20-Aug-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	
16-Sep-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	

Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
703	P2-JCSA-3-1-1440	JCSA-LSA3-1 - Internal Review of Work Package Draft	10	0%	94	26-Jan-26	06-Feb-26	08-Jun-26	19-Jun-26
704	P2-JCSA-3-1-1450	JCSA-LSA3-1 - Incorporate Comments & Submit Work Package for Final Internal Review	10	0%	94	09-Feb-26	20-Feb-26	22-Jun-26	06-Jul-26
705	P2-JCSA-3-1-1490	JCSA-LSA3-1 - Final Internal Review of Work Package & Submit for Owner Review	10	0%	94	23-Feb-26	06-Mar-26	07-Jul-26	20-Jul-26
706	P2-JCSA-3-1-1510	JCSA-LSA3-1 - Owner Review of Work Package	10	0%	94	09-Mar-26	20-Mar-26	21-Jul-26	03-Aug-26
707	P2-JCSA-3-1-1530	JCSA-LSA3-1 - Host Workshop of Work Package	1	0%	94	23-Mar-26	23-Mar-26	04-Aug-26	04-Aug-26
708	P2-JCSA-3-1-1520	JCSA-LSA3-1 - Work Package Development - IFC	10	0%	94	24-Mar-26	06-Apr-26	05-Aug-26	18-Aug-26
709	P2-JCSA-3-1-1540	JCSA-LSA3-1 - Incorporate Owner Comments & Finalize Work Package	10	0%	94	24-Mar-26	06-Apr-26	05-Aug-26	18-Aug-26
710	**PROCUREMENT/SUBCONTRACTING**		84		94	09-Feb-26	05-Jun-26	02-Jul-26	19-Oct-26
711	P2-JCSA-3-1-1460	JCSA-LSA3-1 - Prepare Final Design Documents & Solicit Subcontractor Pricing	4	0%	102	09-Feb-26	12-Feb-26	02-Jul-26	08-Jul-26
712	P2-JCSA-3-1-1470	JCSA-LSA3-1 - Pre-Negotiation of Subcontractor Unit Pricing	10	0%	102	13-Feb-26	26-Feb-26	09-Jul-26	22-Jul-26
713	P2-JCSA-3-1-1480	JCSA-LSA3-1 - Pre-Proposal Subcontractor Meetings	1	0%	106	20-Feb-26	20-Feb-26	22-Jul-26	22-Jul-26
714	P2-JCSA-3-1-1500	JCSA-LSA3-1 - Confirm Final Construction Pricing	12	0%	102	27-Feb-26	16-Mar-26	23-Jul-26	07-Aug-26
715	P2-JCSA-3-1-1550	JCSA-LSA3-1 - Formal Risk Review Associated with Construction Pricing (BMcD)	10	0%	102	11-Mar-26	24-Mar-26	04-Aug-26	17-Aug-26
716	P2-JCSA-3-1-1560	JCSA-LSA3-1 - Technical & Commerical Evaluation (BMcD)	10	0%	102	11-Mar-26	24-Mar-26	04-Aug-26	17-Aug-26
717	P2-JCSA-3-1-1570	JCSA-LSA3-1 - Executive Pricing Review (BMcD)	10	0%	102	11-Mar-26	24-Mar-26	04-Aug-26	17-Aug-26
718	P2-JCSA-3-1-1580	JCSA-LSA3-1 - Host Workshop for HRSD Approval of GMP	1	0%	102	25-Mar-26	25-Mar-26	18-Aug-26	18-Aug-26
719	P2-JCSA-3-1-1590	JCSA-LSA3-1 - Award & NTP to Subcontractors	25	0%	94	07-Apr-26	11-May-26	19-Aug-26	23-Sep-26
720	P2-JCSA-3-1-1600	JCSA-LSA3-1 - Pre-Construction Meeting	1	0%	94	12-May-26	12-May-26	24-Sep-26	24-Sep-26
721	P2-JCSA-3-1-1610	JCSA-LSA3-1 - Subcontractors Prepare & Submit Submittals for Approval	15	0%	94	13-May-26	03-Jun-26	25-Sep-26	15-Oct-26
722	P2-JCSA-3-1-1620	JCSA-LSA3-1 - Review & Approve Submittals	15	0%	94	15-May-26	05-Jun-26	29-Sep-26	19-Oct-26
723	**CONSTRUCTION**		560		94	08-Jun-26	18-Aug-28	20-Oct-26	04-Jan-29
724	P2-JCSA-3-1-1630	JCSA-LSA3-1 - Construction Mobilization	5	0%	94	08-Jun-26	12-Jun-26	20-Oct-26	26-Oct-26
725	P2-JCSA-3-1-1640	JCSA-LSA3-1 - Work Package Construction	555	0%	94	15-Jun-26	18-Aug-28	27-Oct-26	04-Jan-29
726	**POST CONSTRUCTION**		150		94	21-Aug-28	23-Mar-29	05-Jan-29	06-Aug-29
727	P2-JCSA-3-1-1650	JCSA-LSA3-1 - Post Construction Flow Monitoring	105	0%	94	21-Aug-28	19-Jan-29	05-Jan-29	01-Jun-29
728	P2-JCSA-3-1-1660	JCSA-LSA3-1 - I/I Reduction Effectiveness Analysis	40	0%	94	22-Jan-29	16-Mar-29	04-Jun-29	30-Jul-29
729	P2-JCSA-3-1-1670	JCSA-LSA3-1 - Host Workshop on I/I Reduction Effectiveness	5	0%	94	19-Mar-29	23-Mar-29	31-Jul-29	06-Aug-29
730	**PHASE 2 PROJECT CONTINGENCY**		60		94	26-Mar-29	18-Jun-29	07-Aug-29	30-Oct-29
731	P2-JCSA-3-1-1680	JCSA-LSA3-1 - Weather Contingency	60	0%	94	26-Mar-29	18-Jun-29	07-Aug-29	30-Oct-29
732	**JCSA-LSA5-4**		1205		22	01-Aug-24 A	30-Apr-29	02-Sep-25	31-May-29
733	**DATA COLLECTION & ANALYSIS**		1205		22	01-Aug-24 A	30-Apr-29	02-Sep-25	31-May-29
734	P2-JCSA-5-4-1000	JCSA-LSA5-4 - Review Existing Flow & SSES Data	40	100%		01-Aug-24 A	26-Sep-24 A	02-Sep-25	02-Sep-25
735	P2-JCSA-5-4-1010	JCSA-LSA5-4 - Develop Basin Specific Condition Data Collection Plans	20	100%		27-Sep-24 A	18-Oct-24 A	09-Sep-25	09-Sep-25
736	P2-JCSA-5-4-1020	JCSA-LSA5-4 - Develop Basin Specific Flow Metering Plan	20	100%		27-Sep-24 A	20-Dec-24 A	02-Sep-25	02-Sep-25
737	P2-JCSA-5-4-1030	JCSA-LSA5-4 - Owner Approval of Flow Metering Pricing	5	100%		12-Oct-24 A	15-Oct-24 A	02-Sep-25	02-Sep-25
738	P2-JCSA-5-4-1040	JCSA-LSA5-4 - Conduct Flow Monitoring Information Meetings with Localities As Needed	5	100%		16-Oct-24 A	15-Nov-24 A	02-Sep-25	02-Sep-25
739	P2-JCSA-5-4-1050	JCSA-LSA5-4 - SSES Condition Data Qualifications Evaluations & Pricing	10	100%		18-Oct-24 A	15-Nov-24 A	09-Sep-25	09-Sep-25
740	P2-JCSA-5-4-1060	JCSA-LSA5-4 - Pre-Construction Flow Monitoring Site Investigations & Installations	20	100%		29-Oct-24 A	06-Jan-25 A	02-Sep-25	02-Sep-25
741	P2-JCSA-5-4-1070	JCSA-LSA5-4 - Flow Monitoring - Long Term	1120	25%	22	18-Nov-24 A	30-Apr-29*	02-Sep-25	31-May-29
742	P2-JCSA-5-4-1080	JCSA-LSA5-4 - Owner Approval of SSES Subcontracor Inspection Costs	5	100%		22-Nov-24 A	22-Nov-24 A	09-Sep-25	09-Sep-25
743	P2-JCSA-5-4-1090	JCSA-LSA5-4 - Pre-Construction Rain Gauges Site Investigations & Installations	5	100%		22-Nov-24 A	10-Jan-25 A	27-Oct-25	27-Oct-25
744	P2-JCSA-5-4-1110	JCSA-LSA5-4 - Submittal of Flow Metering Plan to HRSD	15	100%		02-Dec-24 A	20-Dec-24 A	24-Oct-25	24-Oct-25
745	P2-JCSA-5-4-1160	JCSA-LSA5-4 - Host Workshop of Basin Specific Condition Data Collection Plans	5	100%		22-Jan-25 A	22-Jan-25 A	25-Sep-25	25-Sep-25
746	P2-JCSA-5-4-1220	JCSA-LSA5-4 - Time Series Analysis & RTK Development	10	100%		18-Mar-25 A	31-Mar-25 A	01-Dec-25	01-Dec-25
747	P2-JCSA-5-4-1230	JCSA-LSA5-4 - Pre-Construction Flow Monitoring - Short Term	60	80%	85	18-Mar-25 A	30-Oct-25	01-Dec-25	04-Mar-26
748	P2-JCSA-5-4-1170	JCSA-LSA5-4 - Conduct SSES information Meetings with Localities As Needed	10	100%		14-Apr-25 A	16-Jun-25 A	25-Sep-25	25-Sep-25
749	**SSES MH INSPECTIONS**		108		98	09-Dec-24 A	29-Aug-25	25-Sep-25	21-Jan-26
750	**PUBLIC OUTREACH**		20			01-Apr-25 A	11-Apr-25 A	25-Sep-25	25-Sep-25
751	P2-JCSA-5-4-1100	JCSA-LSA5-4 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		01-Apr-25 A	09-Apr-25 A	25-Sep-25	25-Sep-25
752	P2-JCSA-5-4-1180	JCSA-LSA5-4 - Notify Public of Upcoming SSES Activities	5	100%		10-Apr-25 A	11-Apr-25 A	25-Sep-25	25-Sep-25
753	**MH INSPECTIONS**		108		98	09-Dec-24 A	29-Aug-25	25-Sep-25	21-Jan-26
754	P2-JCSA-5-4-1130	JCSA-LSA5-4 - SSES Manhole Inspections Contractor Award & NTP	10	100%		09-Dec-24 A	06-Feb-25 A	25-Sep-25	25-Sep-25
755	P2-JCSA-5-4-1210	JCSA-LSA5-4 - SSES Data Collection & Upload - Manhole Inspections (Duke's)	5	100%		14-Apr-25 A	24-Apr-25 A	25-Sep-25	25-Sep-25
756	P2-JCSA-5-4-1250	JCSA-LSA5-4 - RJN Pushes Video to SewerAI & Performs QA/QC & Submits NASSCO Deliverables to ShareFile Fold	20	20%	75	17-Jun-25 A	15-Aug-25	14-Nov-25	02-Dec-25



Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

HRSD
Sustainable, Innovative Wastewater Treatment

HRSD - HIGH PRIORITY I/I REDUCTION PDB PROGRAM

BURNS McDONNELL

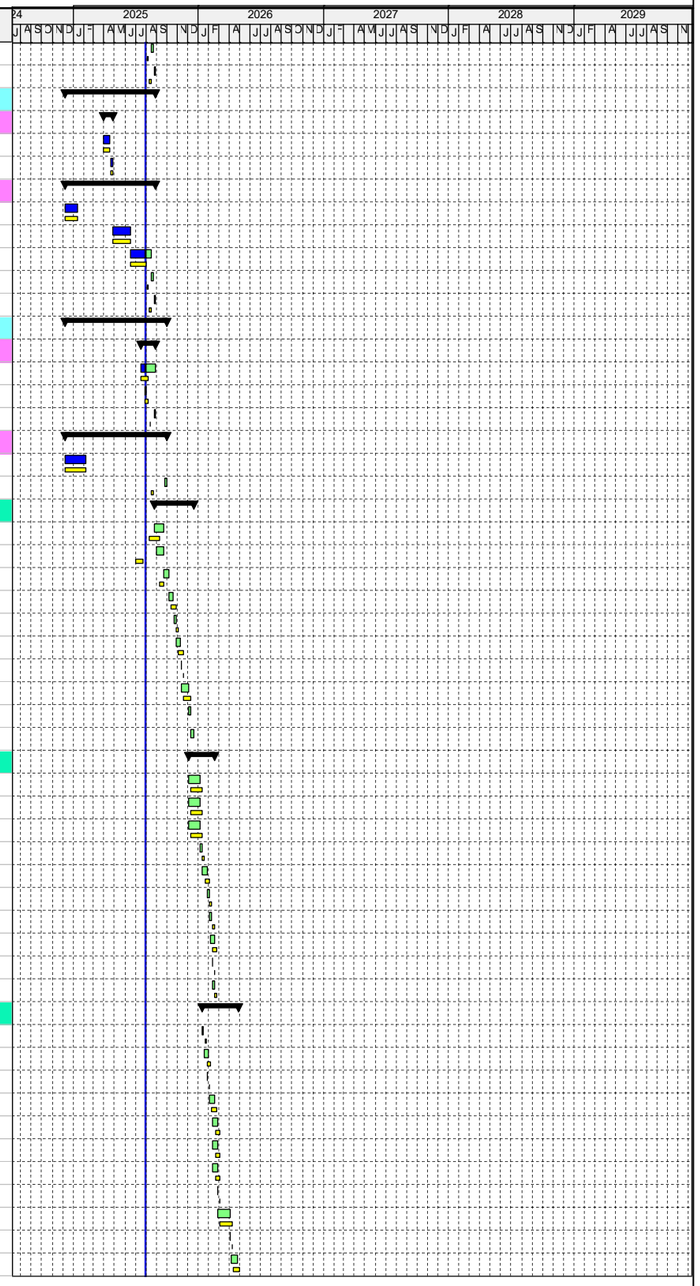
Date	Revision	Checked	Approved
27-May-25	MASTER SCHEDULE APR 2025 UPDATE	BPJ/JKC	
26-Jun-25	MASTER SCHEDULE MAY 2025 UPDATE	BPJ/JKC	
17-Jul-25	MASTER SCHEDULE JUN 2025 UPDATE	BPJ/JKC	
20-Aug-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	
16-Sep-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	

Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
757	P2-JCSA-5-4-1280	JCSA-LSA5-4 - BMcD Performs QA/QC, Updates GIS Connectivity & Attributes, & Runs Rehab Decision Model	5	0%	75	18-Aug-25	22-Aug-25	03-Dec-25	09-Dec-25
758	P2-JCSA-5-4-1310	JCSA-LSA5-4 - RJN Uploads Data & Corrected GIS to Clarity & NASSCO Deliverables to ShareFile Folder	5	0%	98	25-Aug-25	29-Aug-25	15-Jan-26	21-Jan-26
759	**SSES CCTV INSPECTIONS**		108		98	09-Dec-24 A	29-Aug-25	14-Nov-25	21-Jan-26
760	**PUBLIC OUTREACH**		20			31-Mar-25 A	25-Apr-25 A	14-Nov-25	14-Nov-25
761	P2-JCSA-5-4-1120	JCSA-LSA5-4 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		31-Mar-25 A	18-Apr-25 A	14-Nov-25	14-Nov-25
762	P2-JCSA-5-4-1190	JCSA-LSA5-4 - Notify Public of Upcoming SSES Activities	5	100%		21-Apr-25 A	25-Apr-25 A	14-Nov-25	14-Nov-25
763	**CCTV INSPECTIONS**		108		98	09-Dec-24 A	29-Aug-25	14-Nov-25	21-Jan-26
764	P2-JCSA-5-4-1150	JCSA-LSA5-4 - SSES CCTV Inspections (Mains) Award & NTP	10	100%		09-Dec-24 A	13-Jan-25 A	14-Nov-25	14-Nov-25
765	P2-JCSA-5-4-1200	JCSA-LSA5-4 - SSES Data Collection - CCTV Inspections (Mains)	40	100%		28-Apr-25 A	16-Jun-25 A	14-Nov-25	14-Nov-25
766	P2-JCSA-5-4-1260	JCSA-LSA5-4 - RJN Pushes Video to SewerAI & Performs QA/QC & Submits NASSCO Deliverables to ShareFile Fold	20	20%	75	17-Jun-25 A	15-Aug-25	14-Nov-25	02-Dec-25
767	P2-JCSA-5-4-1270	JCSA-LSA5-4 - BMcD Performs QA/QC, Updates GIS Connectivity & Attributes, & Runs Rehab Decision Model	5	0%	75	18-Aug-25	22-Aug-25	03-Dec-25	09-Dec-25
768	P2-JCSA-5-4-1290	JCSA-LSA5-4 - RJN Uploads Data & Corrected GIS to Clarity & NASSCO Deliverables to ShareFile Folder	5	0%	98	25-Aug-25	29-Aug-25	15-Jan-26	21-Jan-26
769	**SSES SMOKE TESTING**		108		135	09-Dec-24 A	01-Oct-25	12-Mar-26	14-Apr-26
770	**PUBLIC OUTREACH**		32		155	17-Jul-25 A	29-Aug-25	12-Mar-26	10-Apr-26
771	P2-JCSA-5-4-1240	JCSA-LSA5-4 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	50%	155	17-Jul-25 A	29-Aug-25	12-Mar-26	10-Apr-26
772	P2-JCSA-5-4-1300	JCSA-LSA5-4 - Distribute Notification Letters	1	100%		30-Jul-25 A	01-Aug-25 A	12-Mar-26	12-Mar-26
773	P2-JCSA-5-4-1320	JCSA-LSA5-4 - Distribute Door Hangers (48 Hrs Prior to Work)	2	90%	155	28-Aug-25 A	27-Aug-25	07-Apr-26	08-Apr-26
774	**SMOKE TESTING**		108		135	09-Dec-24 A	01-Oct-25	09-Apr-26	14-Apr-26
775	P2-JCSA-5-4-1140	JCSA-LSA5-4 - SSES Smoke Testing Contractor Award & NTP	10	100%		09-Dec-24 A	05-Feb-25 A	09-Apr-26	09-Apr-26
776	P2-JCSA-5-4-1340	JCSA-LSA5-4 - SSES Data Collection - Smoke Testing & Cleanout Inspections	4	0%	135	26-Sep-25	01-Oct-25	09-Apr-26	14-Apr-26
777	**PRELIMINARY I/I REDUCTION PLAN**		81		75	25-Aug-25	17-Dec-25	10-Dec-25	06-Apr-26
778	P2-JCSA-5-4-1330	JCSA-LSA5-4 - Condition Data Review & Rehabilitation Categorization	20	0%	75	25-Aug-25	22-Sep-25	10-Dec-25	09-Jan-26
779	P2-JCSA-5-4-1690	JCSA-LSA5-4 - Validation of SSO's Using Updated RTK's	15	0%	85	02-Sep-25	22-Sep-25	05-Jan-26	23-Jan-26
780	P2-JCSA-5-4-1350	JCSA-LSA5-4 - I/I Reduction Strategy Alternatives Development	10	0%	75	23-Sep-25	06-Oct-25	12-Jan-26	23-Jan-26
781	P2-JCSA-5-4-1360	JCSA-LSA5-4 - Cost-Effective Evaluation	10	0%	75	07-Oct-25	20-Oct-25	26-Jan-26	06-Feb-26
782	P2-JCSA-5-4-1370	JCSA-LSA5-4 - Compare Against RHM	5	0%	75	21-Oct-25	27-Oct-25	09-Feb-26	13-Feb-26
783	P2-JCSA-5-4-1380	JCSA-LSA5-4 - Correction to Cost Effective Evaluation After RHM Comparison	10	0%	75	28-Oct-25	10-Nov-25	16-Feb-26	27-Feb-26
784	P2-JCSA-5-4-1390	JCSA-LSA5-4 - Host Preliminary I/I Reduction Plan Workshop	1	0%	75	11-Nov-25	11-Nov-25	02-Mar-26	02-Mar-26
785	P2-JCSA-5-4-1400	JCSA-LSA5-4 - Develop Preliminary I/I Reduction Plan	15	0%	75	12-Nov-25	03-Dec-25	03-Mar-26	23-Mar-26
786	P2-JCSA-5-4-1700	JCSA-LSA5-4 - Submission of Contract to HRSD for Review & Approval	5	0%	75	04-Dec-25	10-Dec-25	24-Mar-26	30-Mar-26
787	P2-JCSA-5-4-1710	JCSA-LSA5-4 - HRSD Review & Approval of Contract	5	0%	75	11-Dec-25	17-Dec-25	31-Mar-26	06-Apr-26
788	**DESIGN**		51		103	04-Dec-25	17-Feb-26	22-Apr-26	14-Jul-26
789	P2-JCSA-5-4-1410	JCSA-LSA5-4 - Work Package Development & Submit for Internal Review	20	0%	96	04-Dec-25	05-Jan-26	22-Apr-26	19-May-26
790	P2-JCSA-5-4-1420	JCSA-LSA5-4 - SSES Data Collection - CCTV Inspections (Laterals)	20	0%	96	04-Dec-25	05-Jan-26	22-Apr-26	19-May-26
791	P2-JCSA-5-4-1430	JCSA-LSA5-4 - Permitting & Easement Acquisition	20	0%	96	04-Dec-25	05-Jan-26	22-Apr-26	19-May-26
792	P2-JCSA-5-4-1440	JCSA-LSA5-4 - Internal Review of Work Package Draft	5	0%	96	06-Jan-26	12-Jan-26	20-May-26	27-May-26
793	P2-JCSA-5-4-1450	JCSA-LSA5-4 - Incorporate Comments & Submit Work Package for Final Internal Review	10	0%	96	13-Jan-26	26-Jan-26	28-May-26	10-Jun-26
794	P2-JCSA-5-4-1490	JCSA-LSA5-4 - Final Internal Review of Work Package & Submit for Owner Review	5	0%	103	27-Jan-26	02-Feb-26	22-Jun-26	26-Jun-26
795	P2-JCSA-5-4-1510	JCSA-LSA5-4 - Owner Review of Work Package	5	0%	103	03-Feb-26	09-Feb-26	29-Jun-26	06-Jul-26
796	P2-JCSA-5-4-1520	JCSA-LSA5-4 - Work Package Development - IFC	10	0%	103	04-Feb-26	17-Feb-26	30-Jun-26	14-Jul-26
797	P2-JCSA-5-4-1530	JCSA-LSA5-4 - Host Workshop of Work Package	1	0%	103	10-Feb-26	10-Feb-26	07-Jul-26	07-Jul-26
798	P2-JCSA-5-4-1540	JCSA-LSA5-4 - Incorporate Owner Comments & Finalize Work Package	5	0%	103	11-Feb-26	17-Feb-26	08-Jul-26	14-Jul-26
799	**PROCUREMENT/SUBCONTRACTING**		76		96	13-Jan-26	28-Apr-26	28-May-26	14-Sep-26
800	P2-JCSA-5-4-1460	JCSA-LSA5-4 - Prepare Final Design Documents & Solicit Subcontractor Pricing	4	0%	96	13-Jan-26	16-Jan-26	28-May-26	02-Jun-26
801	P2-JCSA-5-4-1470	JCSA-LSA5-4 - Pre-Negotiation of Subcontractor Unit Pricing	10	0%	96	19-Jan-26	30-Jan-26	03-Jun-26	16-Jun-26
802	P2-JCSA-5-4-1480	JCSA-LSA5-4 - Pre-Proposal Subcontractor Meetings	1	0%	100	26-Jan-26	26-Jan-26	16-Jun-26	16-Jun-26
803	P2-JCSA-5-4-1500	JCSA-LSA5-4 - Confirm Final Construction Pricing	12	0%	96	02-Feb-26	17-Feb-26	17-Jun-26	02-Jul-26
804	P2-JCSA-5-4-1550	JCSA-LSA5-4 - Formal Risk Review Associated with Construction Pricing (BMcD)	10	0%	96	12-Feb-26	25-Feb-26	29-Jun-26	13-Jul-26
805	P2-JCSA-5-4-1560	JCSA-LSA5-4 - Technical & Commerical Evaluation (BMcD)	10	0%	96	12-Feb-26	25-Feb-26	29-Jun-26	13-Jul-26
806	P2-JCSA-5-4-1570	JCSA-LSA5-4 - Executive Pricing Review (BMcD)	10	0%	96	12-Feb-26	25-Feb-26	29-Jun-26	13-Jul-26
807	P2-JCSA-5-4-1580	JCSA-LSA5-4 - Host Workshop for HRSD Approval of GMP	1	0%	96	26-Feb-26	26-Feb-26	14-Jul-26	14-Jul-26
808	P2-JCSA-5-4-1590	JCSA-LSA5-4 - Award & NTP to Subcontractors	25	0%	96	27-Feb-26	02-Apr-26	15-Jul-26	18-Aug-26
809	P2-JCSA-5-4-1600	JCSA-LSA5-4 - Pre-Construction Meeting	1	0%	96	03-Apr-26	03-Apr-26	19-Aug-26	19-Aug-26
810	P2-JCSA-5-4-1610	JCSA-LSA5-4 - Subcontractors Prepare & Submit Submittals for Approval	15	0%	96	06-Apr-26	24-Apr-26	20-Aug-26	10-Sep-26



Primary Baseline
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HRSD - HIGH PRIORITY I/I REDUCTION PDB PROGRAM

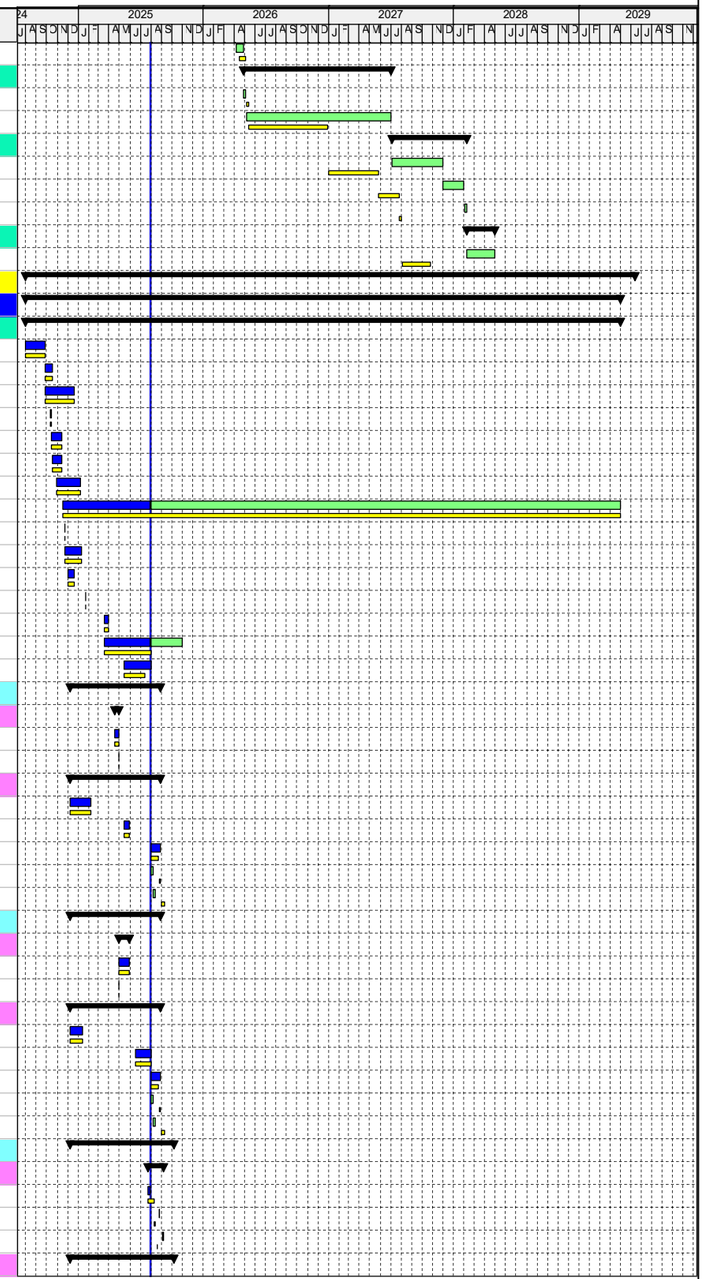
Date	Revision	Checked	Approved
27-May-25	MASTER SCHEDULE APR 2025 UPDATE	BPJ/JKC	
26-Jun-25	MASTER SCHEDULE MAY 2025 UPDATE	BPJ/JKC	
17-Jul-25	MASTER SCHEDULE JUN 2025 UPDATE	BPJ/JKC	
20-Aug-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	
16-Sep-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	

Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
811	P2-JCSA-5-4-1620	JCSA-LSA5-4 - Review & Approve Submittals	15	0%	96	08-Apr-26	28-Apr-26	24-Aug-26	14-Sep-26
812	CONSTRUCTION		300		96	29-Apr-26	02-Jul-27	15-Sep-26	17-Nov-27
813	P2-JCSA-5-4-1630	JCSA-LSA5-4 - Construction Mobilization	5	0%	96	29-Apr-26	05-May-26	15-Sep-26	21-Sep-26
814	P2-JCSA-5-4-1640	JCSA-LSA5-4 - Work Package Construction	295	0%	96	06-May-26	02-Jul-27	22-Sep-26	17-Nov-27
815	POST CONSTRUCTION		150		96	06-Jul-27	07-Feb-28	18-Nov-27	21-Jun-28
816	P2-JCSA-5-4-1650	JCSA-LSA5-4 - Post Construction Flow Monitoring	105	0%	96	06-Jul-27	01-Dec-27	18-Nov-27	18-Apr-28
817	P2-JCSA-5-4-1660	JCSA-LSA5-4 - I/I Reduction Effectiveness Analysis	40	0%	96	02-Dec-27	31-Jan-28	19-Apr-28	14-Jun-28
818	P2-JCSA-5-4-1670	JCSA-LSA5-4 - Host Workshop on I/I Reduction Effectiveness	5	0%	96	01-Feb-28	07-Feb-28	15-Jun-28	21-Jun-28
819	PHASE 2 PROJECT CONTINGENCY		60		96	08-Feb-28	01-May-28	22-Jun-28	15-Sep-28
820	P2-JCSA-5-4-1680	JCSA-LSA5-4 - Weather Contingency	60	0%	96	08-Feb-28	01-May-28	22-Jun-28	15-Sep-28
821	PHASE 3 (YORK-003 & YORK-006)		1235		138	01-Aug-24 A	12-Jun-29	02-Sep-25	28-Dec-29
822	YORK-003		1205		22	01-Aug-24 A	30-Apr-29	02-Sep-25	31-May-29
823	DATA COLLECTION & ANALYSIS		1205		22	01-Aug-24 A	30-Apr-29	02-Sep-25	31-May-29
824	P3-YORK-003-1000	YORK-003 - Review Existing Flow & SSES Data	40	100%		01-Aug-24 A	26-Sep-24 A	02-Sep-25	02-Sep-25
825	P3-YORK-003-1010	YORK-003 - Develop Basin Specific Condition Data Collection Plans	20	100%		27-Sep-24 A	18-Oct-24 A	09-Sep-25	09-Sep-25
826	P3-YORK-003-1020	YORK-003 - Develop Basin Specific Flow Metering Plan	20	100%		27-Sep-24 A	20-Dec-24 A	02-Sep-25	02-Sep-25
827	P3-YORK-003-1030	YORK-003 - Owner Approval of Flow Metering Pricing	5	100%		12-Oct-24 A	15-Oct-24 A	02-Sep-25	02-Sep-25
828	P3-YORK-003-1040	YORK-003 - Conduct Flow Monitoring Information Meetings with Localities As Needed	5	100%		16-Oct-24 A	15-Nov-24 A	02-Sep-25	02-Sep-25
829	P3-YORK-003-1050	YORK-003 - SSES Condition Data Qualifications Evaluations & Pricing	10	100%		18-Oct-24 A	15-Nov-24 A	09-Sep-25	09-Sep-25
830	P3-YORK-003-1060	YORK-003 - Pre-Construction Flow Monitoring Site Investigations & Installations	20	100%		29-Oct-24 A	06-Jan-25 A	02-Sep-25	02-Sep-25
831	P3-YORK-003-1070	YORK-003 - Flow Monitoring - Long Term	1120	25%	22	18-Nov-24 A	30-Apr-29*	02-Sep-25	31-May-29
832	P3-YORK-003-1080	YORK-003 - Owner Approval of SSES Subcontracor Inspection Costs	5	100%		22-Nov-24 A	22-Nov-24 A	09-Sep-25	09-Sep-25
833	P3-YORK-003-1090	YORK-003 - Pre-Construction Rain Gauges Site Investigations & Installations	5	100%		22-Nov-24 A	10-Jan-25 A	27-Oct-25	27-Oct-25
834	P3-YORK-003-1110	YORK-003 - Submittal of Flow Metering Plan to HRSD	15	100%		02-Dec-24 A	20-Dec-24 A	24-Oct-25	24-Oct-25
835	P3-YORK-003-1160	YORK-003 - Host Workshop of Basin Specific Condition Data Collection Plans	5	100%		22-Jan-25 A	22-Jan-25 A	17-Nov-25	17-Nov-25
836	P3-YORK-003-1220	YORK-003 - Time Series Analysis & RTK Development	10	100%		18-Mar-25 A	31-Mar-25 A	08-Dec-25	08-Dec-25
837	P3-YORK-003-1230	YORK-003 - Pre-Construction Flow Monitoring - Short Term	60	80%	90	18-Mar-25 A	30-Oct-25	08-Dec-25	11-Mar-26
838	P3-YORK-003-1170	YORK-003 - Conduct SSES information Meetings with Localities As Needed	22	100%		15-May-25 A	31-Jul-25 A	17-Nov-25	17-Nov-25
839	SSES MH INSPECTIONS		112		110	09-Dec-24 A	28-Aug-25	17-Nov-25	21-Jan-26
840	PUBLIC OUTREACH		15			17-Apr-25 A	30-Apr-25 A	17-Nov-25	17-Nov-25
841	P3-YORK-003-1100	YORK-003 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		17-Apr-25 A	30-Apr-25 A	17-Nov-25	17-Nov-25
842	P3-YORK-003-1180	YORK-003 - Notify Public of Upcoming SSES Activities	5	100%		30-Apr-25 A	30-Apr-25 A	17-Nov-25	17-Nov-25
843	MH INSPECTIONS		112		110	09-Dec-24 A	28-Aug-25	17-Nov-25	21-Jan-26
844	P3-YORK-003-1130	YORK-003 - SSES Manhole Inspections Contractor Award & NTP	10	100%		09-Dec-24 A	06-Feb-25 A	17-Nov-25	17-Nov-25
845	P3-YORK-003-1210	YORK-003 - SSES Data Collection & Upload - Manhole Inspections (Duke's)	11	100%		15-May-25 A	30-May-25 A	17-Nov-25	17-Nov-25
846	P3-YORK-003-1250	YORK-003 - RJN Pushes Video to SewerAI & Performs QA/QC & Submits NASSCO Deliverables to ShareFile Folder	26	100%		31-Jul-25 A	28-Aug-25 A	10-Dec-25	10-Dec-25
847	P3-YORK-003-1280	YORK-003 - BMcD Performs QA/QC, Updates GIS Connectivity & Attributes, & Runs Rehab Decision Model	5	0%	92	31-Jul-25	06-Aug-25	10-Dec-25	16-Dec-25
848	P3-YORK-003-1310	YORK-003 - RJN Uploads Data & Corrected GIS to Clarity & NASSCO Deliverables to ShareFile Folder	5	0%	110	07-Aug-25	13-Aug-25	15-Jan-26	21-Jan-26
849	SSES CCTV INSPECTIONS		112		110	09-Dec-24 A	28-Aug-25	10-Dec-25	21-Jan-26
850	PUBLIC OUTREACH		20			30-Apr-25 A	28-May-25 A	10-Dec-25	10-Dec-25
851	P3-YORK-003-1190	YORK-003 - Notify Public of Upcoming SSES Activities	5	100%		30-Apr-25 A	28-May-25 A	10-Dec-25	10-Dec-25
852	P3-YORK-003-1120	YORK-003 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		30-Apr-25 A	30-Apr-25 A	10-Dec-25	10-Dec-25
853	CCTV INSPECTIONS		112		110	09-Dec-24 A	28-Aug-25	10-Dec-25	21-Jan-26
854	P3-YORK-003-1150	YORK-003 - SSES CCTV Inspections (Mains) Award & NTP	10	100%		09-Dec-24 A	13-Jan-25 A	10-Dec-25	10-Dec-25
855	P3-YORK-003-1200	YORK-003 - SSES Data Collection - CCTV Inspections (Mains)	10	100%		17-Jun-25 A	31-Jul-25 A	10-Dec-25	10-Dec-25
856	P3-YORK-003-1260	YORK-003 - RJN Pushes Video to SewerAI & Performs QA/QC & Submits NASSCO Deliverables to ShareFile Folder	26	100%		31-Jul-25 A	28-Aug-25 A	10-Dec-25	10-Dec-25
857	P3-YORK-003-1270	YORK-003 - BMcD Performs QA/QC, Updates GIS Connectivity & Attributes, & Runs Rehab Decision Model	5	0%	92	31-Jul-25	06-Aug-25	10-Dec-25	16-Dec-25
858	P3-YORK-003-1290	YORK-003 - RJN Uploads Data & Corrected GIS to Clarity & NASSCO Deliverables to ShareFile Folder	5	0%	110	07-Aug-25	13-Aug-25	15-Jan-26	21-Jan-26
859	SSES SMOKE TESTING		113		135	09-Dec-24 A	08-Oct-25	10-Mar-26	21-Apr-26
860	PUBLIC OUTREACH		33		153	22-Jul-25 A	05-Sep-25	10-Mar-26	14-Apr-26
861	P3-YORK-003-1240	YORK-003 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		22-Jul-25 A	29-Jul-25 A	10-Mar-26	10-Mar-26
862	P3-YORK-003-1300	YORK-003 - Distribute Notification Letters	1	100%	153	25-Aug-25 A	25-Aug-25	02-Apr-26	02-Apr-26
863	P3-YORK-003-1320	YORK-003 - Distribute Door Hangers (48 Hrs Prior to Work)	2	0%	153	04-Sep-25	05-Sep-25	13-Apr-26	14-Apr-26
864	SMOKE TESTING		113		135	09-Dec-24 A	08-Oct-25	15-Apr-26	21-Apr-26



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BURNS McDONNELL

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#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
865	P3-YORK-003-1140	YORK-003 - SSES Smoke Testing Contractor Award & NTP	10	100%		09-Dec-24 A	05-Feb-25 A	15-Apr-26	15-Apr-26
866	P3-YORK-003-1340	YORK-003 - SSES Data Collection - Smoke Testing & Cleanout Inspections	5	0%	135	02-Oct-25	08-Oct-25	15-Apr-26	21-Apr-26
867	PRELIMINARY I/I REDUCTION PLAN		98		88	07-Aug-25	26-Dec-25	17-Dec-25	30-Apr-26
868	P3-YORK-003-1330	YORK-003 - Condition Data Review & Rehabilitation Categorization	20	0%	92	07-Aug-25	04-Sep-25	17-Dec-25	16-Jan-26
869	P3-YORK-003-1690	YORK-003 - Validation of SSO's Using Updated RTK's	15	0%	90	02-Sep-25	22-Sep-25	12-Jan-26	30-Jan-26
870	P3-YORK-003-1350	YORK-003 - I/I Reduction Strategy Alternatives Development	10	0%	92	05-Sep-25	18-Sep-25	19-Jan-26	30-Jan-26
871	P3-YORK-003-1360	YORK-003 - Cost-Effective Evaluation	10	0%	75	14-Oct-25	27-Oct-25	02-Feb-26	13-Feb-26
872	P3-YORK-003-1370	YORK-003 - Compare Against RHM	5	0%	88	28-Oct-25	03-Nov-25	05-Mar-26	11-Mar-26
873	P3-YORK-003-1380	YORK-003 - Correction to Cost Effective Evaluation After RHM Comparison	10	0%	88	04-Nov-25	17-Nov-25	12-Mar-26	25-Mar-26
874	P3-YORK-003-1390	YORK-003 - Host Preliminary I/I Reduction Plan Workshop	1	0%	88	18-Nov-25	18-Nov-25	26-Mar-26	26-Mar-26
875	P3-YORK-003-1400	YORK-003 - Develop Preliminary I/I Reduction Plan	15	0%	88	19-Nov-25	10-Dec-25	27-Mar-26	16-Apr-26
876	P3-YORK-003-1700	YORK-003 - Submission of Contract to HRSD for Review & Approval	5	0%	88	11-Dec-25	17-Dec-25	17-Apr-26	23-Apr-26
877	P3-YORK-003-1710	YORK-003 - HRSD Review & Approval of Contract	5	0%	88	18-Dec-25	26-Dec-25	24-Apr-26	30-Apr-26
878	DESIGN		61		95	11-Dec-25	10-Mar-26	17-Apr-26	23-Jul-26
879	P3-YORK-003-1410	YORK-003 - Work Package Development & Submit for Internal Review	30	0%	88	11-Dec-25	26-Jan-26	17-Apr-26	29-May-26
880	P3-YORK-003-1420	YORK-003 - SSES Data Collection - CCTV Inspections (Laterals)	30	0%	88	11-Dec-25	26-Jan-26	17-Apr-26	29-May-26
881	P3-YORK-003-1430	YORK-003 - Permitting & Easement Acquisition	30	0%	88	11-Dec-25	26-Jan-26	17-Apr-26	29-May-26
882	P3-YORK-003-1440	YORK-003 - Internal Review of Work Package Draft	5	0%	88	27-Jan-26	02-Feb-26	01-Jun-26	05-Jun-26
883	P3-YORK-003-1450	YORK-003 - Incorporate Comments & Submit Work Package for Final Internal Review	10	0%	88	03-Feb-26	16-Feb-26	08-Jun-26	19-Jun-26
884	P3-YORK-003-1490	YORK-003 - Final Internal Review of Work Package & Submit for Owner Review	5	0%	95	17-Feb-26	23-Feb-26	01-Jul-26	08-Jul-26
885	P3-YORK-003-1510	YORK-003 - Owner Review of Work Package	5	0%	95	24-Feb-26	02-Mar-26	09-Jul-26	15-Jul-26
886	P3-YORK-003-1520	YORK-003 - Work Package Development - IFC	10	0%	95	25-Feb-26	10-Mar-26	10-Jul-26	23-Jul-26
887	P3-YORK-003-1530	YORK-003 - Host Workshop of Work Package	1	0%	95	03-Mar-26	03-Mar-26	16-Jul-26	16-Jul-26
888	P3-YORK-003-1540	YORK-003 - Incorporate Owner Comments & Finalize Work Package	5	0%	95	04-Mar-26	10-Mar-26	17-Jul-26	23-Jul-26
889	PROCUREMENT/SUBCONTRACTING		76		88	03-Feb-26	19-May-26	08-Jun-26	23-Sep-26
890	P3-YORK-003-1460	YORK-003 - Prepare Final Design Documents & Solicit Subcontractor Pricing	4	0%	88	03-Feb-26	06-Feb-26	08-Jun-26	11-Jun-26
891	P3-YORK-003-1470	YORK-003 - Pre-Negotiation of Subcontractor Unit Pricing	10	0%	88	09-Feb-26	20-Feb-26	12-Jun-26	25-Jun-26
892	P3-YORK-003-1480	YORK-003 - Pre-Proposal Subcontractor Meetings	1	0%	92	16-Feb-26	16-Feb-26	25-Jun-26	25-Jun-26
893	P3-YORK-003-1500	YORK-003 - Confirm Final Construction Pricing	12	0%	88	23-Feb-26	10-Mar-26	26-Jun-26	14-Jul-26
894	P3-YORK-003-1550	YORK-003 - Formal Risk Review Associated with Construction Pricing (BMcD)	10	0%	88	05-Mar-26	18-Mar-26	09-Jul-26	22-Jul-26
895	P3-YORK-003-1560	YORK-003 - Technical & Commerical Evaluation (BMcD)	10	0%	88	05-Mar-26	18-Mar-26	09-Jul-26	22-Jul-26
896	P3-YORK-003-1570	YORK-003 - Executive Pricing Review (BMcD)	10	0%	88	05-Mar-26	18-Mar-26	09-Jul-26	22-Jul-26
897	P3-YORK-003-1580	YORK-003 - Host Workshop for HRSD Approval of GMP	1	0%	88	19-Mar-26	19-Mar-26	23-Jul-26	23-Jul-26
898	P3-YORK-003-1590	YORK-003 - Award & NTP to Subcontractors	25	0%	88	20-Mar-26	23-Apr-26	24-Jul-26	27-Aug-26
899	P3-YORK-003-1600	YORK-003 - Pre-Construction Meeting	1	0%	88	24-Apr-26	24-Apr-26	28-Aug-26	28-Aug-26
900	P3-YORK-003-1610	YORK-003 - Subcontractors Prepare & Submit Submittals for Approval	15	0%	88	27-Apr-26	15-May-26	31-Aug-26	21-Sep-26
901	P3-YORK-003-1620	YORK-003 - Review & Approve Submittals	15	0%	88	29-Apr-26	19-May-26	02-Sep-26	23-Sep-26
902	CONSTRUCTION		270		88	20-May-26	11-Jun-27	24-Sep-26	15-Oct-27
903	P3-YORK-003-1630	YORK-003 - Construction Mobilization	5	0%	88	20-May-26	27-May-26	24-Sep-26	30-Sep-26
904	P3-YORK-003-1640	YORK-003 - Work Package Construction	265	0%	88	28-May-26	11-Jun-27	01-Oct-26	15-Oct-27
905	POST CONSTRUCTION		150		88	14-Jun-27	17-Jan-28	18-Oct-27	18-May-28
906	P3-YORK-003-1650	YORK-003 - Post Construction Flow Monitoring	105	0%	88	14-Jun-27	09-Nov-27	18-Oct-27	16-Mar-28
907	P3-YORK-003-1660	YORK-003 - I/I Reduction Effectiveness Analysis	40	0%	88	10-Nov-27	10-Jan-28	17-Mar-28	11-May-28
908	P3-YORK-003-1670	YORK-003 - Host Workshop on I/I Reduction Effectiveness	5	0%	88	11-Jan-28	17-Jan-28	12-May-28	18-May-28
909	PHASE 3 PROJECT CONTINGENCY		60		88	18-Jan-28	10-Apr-28	19-May-28	14-Aug-28
910	P3-YORK-003-1680	YORK-003 - Weather Contingency	60	0%	88	18-Jan-28	10-Apr-28	19-May-28	14-Aug-28
911	YORK-006		1235		138	01-Aug-24 A	12-Jun-29	02-Sep-25	28-Dec-29
912	DATA COLLECTION & ANALYSIS		1205		22	01-Aug-24 A	30-Apr-29	02-Sep-25	31-May-29
913	P3-YORK-006-1000	YORK-006 - Review Existing Flow & SSES Data	40	100%		01-Aug-24 A	26-Sep-24 A	02-Sep-25	02-Sep-25
914	P3-YORK-006-1010	YORK-006 - Develop Basin Specific Condition Data Collection Plans	20	100%		27-Sep-24 A	18-Oct-24 A	09-Sep-25	09-Sep-25
915	P3-YORK-006-1020	YORK-006 - Develop Basin Specific Flow Metering Plan	20	100%		27-Sep-24 A	20-Dec-24 A	02-Sep-25	02-Sep-25
916	P3-YORK-006-1030	YORK-006 - Owner Approval of Flow Metering Pricing	5	100%		12-Oct-24 A	15-Oct-24 A	02-Sep-25	02-Sep-25
917	P3-YORK-006-1040	YORK-006 - Conduct Flow Monitoring Information Meetings with Localities As Needed	5	100%		16-Oct-24 A	15-Nov-24 A	02-Sep-25	02-Sep-25
918	P3-YORK-006-1050	YORK-006 - SSES Condition Data Qualifications Evaluations & Pricing	10	100%		18-Oct-24 A	15-Nov-24 A	09-Sep-25	09-Sep-25



Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

HRSD
Sustainable, Innovative Wastewater Treatment

HRSD - HIGH PRIORITY I/I REDUCTION PDB PROGRAM

BURNS McDONNELL

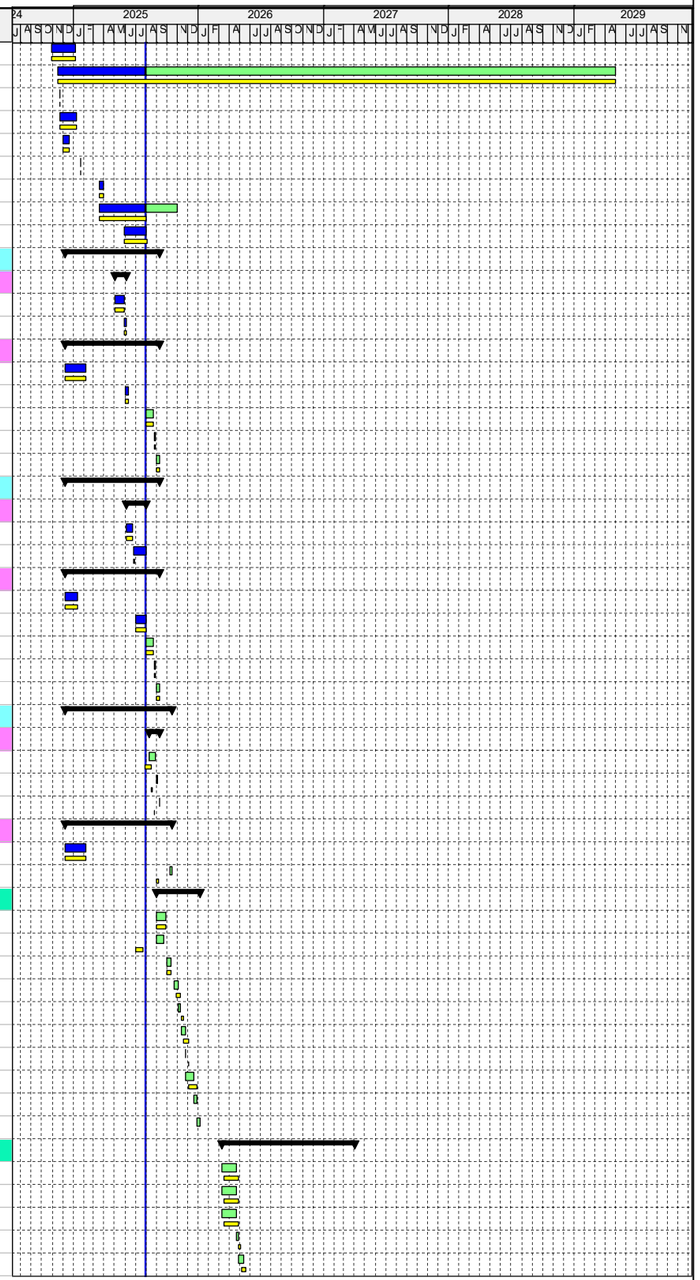
Date	Revision	Checked	Approved
27-May-25	MASTER SCHEDULE APR 2025 UPDATE	BPJ/JKC	
26-Jun-25	MASTER SCHEDULE MAY 2025 UPDATE	BPJ/JKC	
17-Jul-25	MASTER SCHEDULE JUN 2025 UPDATE	BPJ/JKC	
20-Aug-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	
16-Sep-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	

Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
919	P3-YORK-006-1060	YORK-006 - Pre-Construction Flow Monitoring Site Investigations & Installations	20	100%		29-Oct-24 A	06-Jan-25 A	02-Sep-25	02-Sep-25
920	P3-YORK-006-1070	YORK-006 - Flow Monitoring - Long Term	1120	25%	22	18-Nov-24 A	30-Apr-29*	02-Sep-25	31-May-29
921	P3-YORK-006-1080	YORK-006 - Owner Approval of SSES Subcontracor Inspection Costs	5	100%		22-Nov-24 A	22-Nov-24 A	09-Sep-25	09-Sep-25
922	P3-YORK-006-1090	YORK-006 - Pre-Construction Rain Gauges Site Investigations & Installations	5	100%		22-Nov-24 A	10-Jan-25 A	27-Oct-25	27-Oct-25
923	P3-YORK-006-1100	YORK-006 - Submittal of Flow Metering Plan to HRSD	15	100%		02-Dec-24 A	20-Dec-24 A	24-Oct-25	24-Oct-25
924	P3-YORK-006-1130	YORK-006 - Host Workshop of Basin Specific Condition Data Collection Plans	5	100%		22-Jan-25 A	22-Jan-25 A	17-Nov-25	17-Nov-25
925	P3-YORK-006-1140	YORK-006 - Time Series Analysis & RTK Development	10	100%		18-Mar-25 A	31-Mar-25 A	15-Dec-25	15-Dec-25
926	P3-YORK-006-1150	YORK-006 - Pre-Construction Flow Monitoring - Short Term	60	80%	95	18-Mar-25 A	30-Oct-25	15-Dec-25	18-Mar-26
927	P3-YORK-006-1170	YORK-006 - Conduct SSES information Meetings with Localities As Needed	37	100%		30-May-25 A	31-Jul-25 A	17-Nov-25	17-Nov-25
928	**SSES MH INSPECTIONS**		113		93	09-Dec-24 A	08-Sep-25	17-Nov-25	21-Jan-26
929	**PUBLIC OUTREACH**		15			02-May-25 A	05-Jun-25 A	17-Nov-25	17-Nov-25
930	P3-YORK-006-1160	YORK-006 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		02-May-25 A	30-May-25 A	17-Nov-25	17-Nov-25
931	P3-YORK-006-1210	YORK-006 - Notify Public of Upcoming SSES Activities	5	100%		30-May-25 A	05-Jun-25 A	17-Nov-25	17-Nov-25
932	**MH INSPECTIONS**		113		93	09-Dec-24 A	08-Sep-25	17-Nov-25	21-Jan-26
933	P3-YORK-006-1110	YORK-006 - SSES Manhole Inspections Contractor Award & NTP	10	100%		09-Dec-24 A	06-Feb-25 A	17-Nov-25	17-Nov-25
934	P3-YORK-006-1250	YORK-006 - SSES Data Collection & Upload - Manhole Inspections (Duke's)	21	100%		02-Jun-25 A	11-Jun-25 A	17-Nov-25	17-Nov-25
935	P3-YORK-006-1260	YORK-006 - RJN Pushes Video to SewerAI & Performs QA/QC & Submits NASSCO Deliverables to ShareFile Folder	17	0%	80	31-Jul-25	22-Aug-25	21-Nov-25	16-Dec-25
936	P3-YORK-006-1290	YORK-006 - BMcD Performs QA/QC, Updates GIS Connectivity & Attributes, & Runs Rehab Decision Model	5	0%	80	25-Aug-25	29-Aug-25	17-Dec-25	23-Dec-25
937	P3-YORK-006-1300	YORK-006 - RJN Uploads Data & Corrected GIS to Clarity & NASSCO Deliverables to ShareFile Folder	5	0%	93	02-Sep-25	08-Sep-25	15-Jan-26	21-Jan-26
938	**SSES CCTV INSPECTIONS**		113		93	09-Dec-24 A	08-Sep-25	20-Nov-25	21-Jan-26
939	**PUBLIC OUTREACH**		20			04-Jun-25 A	31-Jul-25 A	20-Nov-25	20-Nov-25
940	P3-YORK-006-1190	YORK-006 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		04-Jun-25 A	24-Jun-25 A	20-Nov-25	20-Nov-25
941	P3-YORK-006-1220	YORK-006 - Notify Public of Upcoming SSES Activities	5	100%		25-Jun-25 A	31-Jul-25 A	20-Nov-25	20-Nov-25
942	**CCTV INSPECTIONS**		113		93	09-Dec-24 A	08-Sep-25	21-Nov-25	21-Jan-26
943	P3-YORK-006-1120	YORK-006 - SSES CCTV Inspections (Mains) Award & NTP	10	100%		09-Dec-24 A	13-Jan-25 A	21-Nov-25	21-Nov-25
944	P3-YORK-006-1270	YORK-006 - SSES Data Collection - CCTV Inspections (Mains)	21	100%		02-Jul-25 A	31-Jul-25 A	21-Nov-25	21-Nov-25
945	P3-YORK-006-1280	YORK-006 - RJN Pushes Video to SewerAI & Performs QA/QC & Submits NASSCO Deliverables to ShareFile Folder	17	0%	80	31-Jul-25	22-Aug-25	21-Nov-25	16-Dec-25
946	P3-YORK-006-1310	YORK-006 - BMcD Performs QA/QC, Updates GIS Connectivity & Attributes, & Runs Rehab Decision Model	5	0%	80	25-Aug-25	29-Aug-25	17-Dec-25	23-Dec-25
947	P3-YORK-006-1330	YORK-006 - RJN Uploads Data & Corrected GIS to Clarity & NASSCO Deliverables to ShareFile Folder	5	0%	93	02-Sep-25	08-Sep-25	15-Jan-26	21-Jan-26
948	**SSES SMOKE TESTING**		118		135	09-Dec-24 A	15-Oct-25	23-Mar-26	28-Apr-26
949	**PUBLIC OUTREACH**		22		155	11-Aug-25 A	10-Sep-25	23-Mar-26	21-Apr-26
950	P3-YORK-006-1200	YORK-006 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	50%	155	11-Aug-25 A	29-Aug-25	23-Mar-26	10-Apr-26
951	P3-YORK-006-1230	YORK-006 - Distribute Notification Letters	1	0%	155	02-Sep-25	02-Sep-25	13-Apr-26	13-Apr-26
952	P3-YORK-006-1240	YORK-006 - Distribute Door Hangers (48 Hrs Prior to Work)	2	0%	155	09-Sep-25	10-Sep-25	20-Apr-26	21-Apr-26
953	**SMOKE TESTING**		118		135	09-Dec-24 A	15-Oct-25	22-Apr-26	28-Apr-26
954	P3-YORK-006-1180	YORK-006 - SSES Smoke Testing Contractor Award & NTP	10	100%		09-Dec-24 A	05-Feb-25 A	22-Apr-26	22-Apr-26
955	P3-YORK-006-1360	YORK-006 - SSES Data Collection - Smoke Testing & Cleanout Inspections	5	0%	135	09-Oct-25	15-Oct-25	22-Apr-26	28-Apr-26
956	**PRELIMINARY I/I REDUCTION PLAN**		86		343	02-Sep-25	05-Jan-26	26-Dec-25	10-May-27
957	P3-YORK-006-1320	YORK-006 - Condition Data Review & Rehabilitation Categorization	20	0%	80	02-Sep-25	29-Sep-25	26-Dec-25	23-Jan-26
958	P3-YORK-006-1690	YORK-006 - Validation of SSO's Using Updated RTK's	15	0%	95	02-Sep-25	22-Sep-25	19-Jan-26	06-Feb-26
959	P3-YORK-006-1340	YORK-006 - I/I Reduction Strategy Alternatives Development	10	0%	80	30-Sep-25	13-Oct-25	26-Jan-26	06-Feb-26
960	P3-YORK-006-1350	YORK-006 - Cost-Effective Evaluation	10	0%	75	21-Oct-25	03-Nov-25	09-Feb-26	20-Feb-26
961	P3-YORK-006-1370	YORK-006 - Compare Against RHM	5	0%	343	04-Nov-25	10-Nov-25	15-Mar-27	19-Mar-27
962	P3-YORK-006-1380	YORK-006 - Correction to Cost Effective Evaluation After RHM Comparison	10	0%	343	11-Nov-25	24-Nov-25	22-Mar-27	02-Apr-27
963	P3-YORK-006-1390	YORK-006 - Host Preliminary I/I Reduction Plan Workshop	1	0%	343	25-Nov-25	25-Nov-25	05-Apr-27	05-Apr-27
964	P3-YORK-006-1400	YORK-006 - Develop Preliminary I/I Reduction Plan	15	0%	343	26-Nov-25	17-Dec-25	06-Apr-27	26-Apr-27
965	P3-YORK-006-1700	YORK-006 - Submission of Contract to HRSD for Review & Approval	5	0%	343	18-Dec-25	26-Dec-25	27-Apr-27	03-May-27
966	P3-YORK-006-1710	YORK-006 - HRSD Review & Approval of Contract	5	0%	343	29-Dec-25	05-Jan-26	04-May-27	10-May-27
967	**DESIGN**		270		95	11-Mar-26	01-Apr-27	11-May-27	16-Aug-27
968	P3-YORK-006-1410	YORK-006 - Work Package Development & Submit for Internal Review	30	0%	297	11-Mar-26	21-Apr-26	11-May-27	22-Jun-27
969	P3-YORK-006-1420	YORK-006 - SSES Data Collection - CCTV Inspections (Laterals)	30	0%	297	11-Mar-26	21-Apr-26	11-May-27	22-Jun-27
970	P3-YORK-006-1430	YORK-006 - Permitting & Easement Acquisition	30	0%	297	11-Mar-26	21-Apr-26	11-May-27	22-Jun-27
971	P3-YORK-006-1440	YORK-006 - Internal Review of Work Package Draft	5	0%	297	22-Apr-26	28-Apr-26	23-Jun-27	29-Jun-27
972	P3-YORK-006-1450	YORK-006 - Incorporate Comments & Submit Work Package for Final Internal Review	10	0%	297	29-Apr-26	12-May-26	30-Jun-27	14-Jul-27



Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

HRSD
Sustainable, Innovative Wastewater Treatment

BURNS McDONNELL

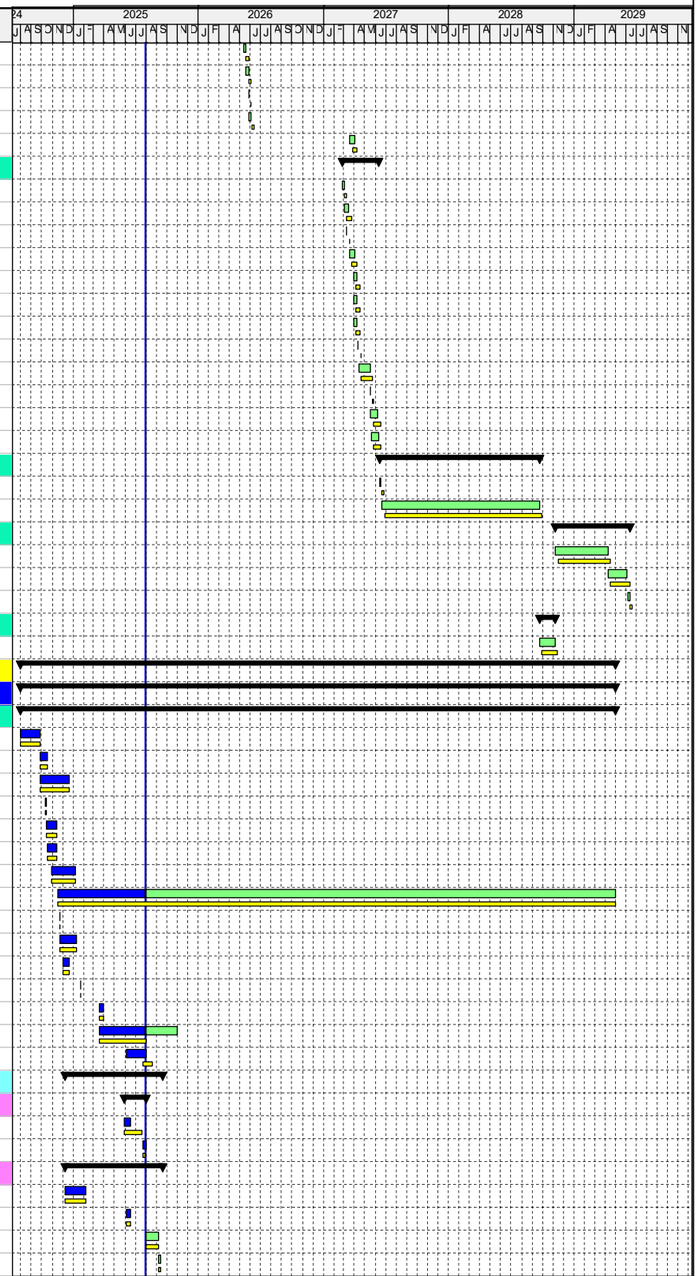
Date	Revision	Checked	Approved
27-May-25	MASTER SCHEDULE APR 2025 UPDATE	BPJ/JKC	
26-Jun-25	MASTER SCHEDULE MAY 2025 UPDATE	BPJ/JKC	
17-Jul-25	MASTER SCHEDULE JUN 2025 UPDATE	BPJ/JKC	
20-Aug-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	
16-Sep-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	

Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
973	P3-YORK-006-1490	YORK-006 - Final Internal Review of Work Package & Submit for Owner Review	5	0%	304	13-May-26	19-May-26	26-Jul-27	30-Jul-27
974	P3-YORK-006-1510	YORK-006 - Owner Review of Work Package	5	0%	304	20-May-26	27-May-26	02-Aug-27	06-Aug-27
975	P3-YORK-006-1530	YORK-006 - Host Workshop of Work Package	1	0%	304	28-May-26	28-May-26	09-Aug-27	09-Aug-27
976	P3-YORK-006-1540	YORK-006 - Incorporate Owner Comments & Finalize Work Package	5	0%	304	29-May-26	04-Jun-26	10-Aug-27	16-Aug-27
977	P3-YORK-006-1520	YORK-006 - Work Package Development - IFC	10	0%	95	19-Mar-27	01-Apr-27	03-Aug-27	16-Aug-27
978	PROCUREMENT/SUBCONTRACTING		76		88	25-Feb-27	11-Jun-27	30-Jun-27	15-Oct-27
979	P3-YORK-006-1460	YORK-006 - Prepare Final Design Documents & Solicit Subcontractor Pricing	4	0%	88	25-Feb-27	02-Mar-27	30-Jun-27	06-Jul-27
980	P3-YORK-006-1470	YORK-006 - Pre-Negotiation of Subcontractor Unit Pricing	10	0%	88	03-Mar-27	16-Mar-27	07-Jul-27	20-Jul-27
981	P3-YORK-006-1480	YORK-006 - Pre-Proposal Subcontractor Meetings	1	0%	92	10-Mar-27	10-Mar-27	20-Jul-27	20-Jul-27
982	P3-YORK-006-1500	YORK-006 - Confirm Final Construction Pricing	12	0%	88	17-Mar-27	01-Apr-27	21-Jul-27	05-Aug-27
983	P3-YORK-006-1550	YORK-006 - Formal Risk Review Associated with Construction Pricing (BMcD)	10	0%	88	29-Mar-27	09-Apr-27	02-Aug-27	13-Aug-27
984	P3-YORK-006-1560	YORK-006 - Technical & Commerical Evaluation (BMcD)	10	0%	88	29-Mar-27	09-Apr-27	02-Aug-27	13-Aug-27
985	P3-YORK-006-1570	YORK-006 - Executive Pricing Review (BMcD)	10	0%	88	29-Mar-27	09-Apr-27	02-Aug-27	13-Aug-27
986	P3-YORK-006-1580	YORK-006 - Host Workshop for HRSD Approval of GMP	1	0%	88	12-Apr-27	12-Apr-27	16-Aug-27	16-Aug-27
987	P3-YORK-006-1590	YORK-006 - Award & NTP to Subcontractors	25	0%	88	13-Apr-27	17-May-27	17-Aug-27	21-Sep-27
988	P3-YORK-006-1600	YORK-006 - Pre-Construction Meeting	1	0%	88	18-May-27	18-May-27	22-Sep-27	22-Sep-27
989	P3-YORK-006-1610	YORK-006 - Subcontractors Prepare & Submit Submittals for Approval	15	0%	88	19-May-27	09-Jun-27	23-Sep-27	13-Oct-27
990	P3-YORK-006-1620	YORK-006 - Review & Approve Submittals	15	0%	88	21-May-27	11-Jun-27	27-Sep-27	15-Oct-27
991	CONSTRUCTION		325		88	14-Jun-27	21-Sep-28	18-Oct-27	29-Jan-29
992	P3-YORK-006-1630	YORK-006 - Construction Mobilization	5	0%	88	14-Jun-27	18-Jun-27	18-Oct-27	22-Oct-27
993	P3-YORK-006-1640	YORK-006 - Work Package Construction	320	0%	88	21-Jun-27	21-Sep-28	25-Oct-27	29-Jan-29
994	POST CONSTRUCTION		150		138	08-Nov-28	12-Jun-29	25-May-29	28-Dec-29
995	P3-YORK-006-1650	YORK-006 - Post Construction Flow Monitoring	105	0%	138	08-Nov-28	09-Apr-29	25-May-29	23-Oct-29
996	P3-YORK-006-1660	YORK-006 - I/I Reduction Effectiveness Analysis	40	0%	138	10-Apr-29	05-Jun-29	24-Oct-29	19-Dec-29
997	P3-YORK-006-1670	YORK-006 - Host Workshop on I/I Reduction Effectiveness	5	0%	138	06-Jun-29	12-Jun-29	20-Dec-29	28-Dec-29
998	PHASE 3 PROJECT CONTINGENCY		33		88	22-Sep-28	07-Nov-28	30-Jan-29	15-Mar-29
999	P3-YORK-006-1680	YORK-006 - Weather Contingency	33	0%	88	22-Sep-28	07-Nov-28	30-Jan-29	15-Mar-29
1000	ALTERNATIVES (YORK-006, CHES-016, SUFF-146)		1205		22	01-Aug-24 A	30-Apr-29	02-Sep-25	31-May-29
1001	CHES-016		1205		22	01-Aug-24 A	30-Apr-29	02-Sep-25	31-May-29
1002	DATA COLLECTION & ANALYSIS		1205		22	01-Aug-24 A	30-Apr-29	02-Sep-25	31-May-29
1003	ALT-CHES-016-1000	CHES-016 - Review Existing Flow & SSES Data	40	100%		01-Aug-24 A	26-Sep-24 A	02-Sep-25	02-Sep-25
1004	ALT-CHES-016-1010	CHES-016 - Develop Basin Specific Condition Data Collection Plans	20	100%		27-Sep-24 A	18-Oct-24 A	09-Sep-25	09-Sep-25
1005	ALT-CHES-016-1020	CHES-016 - Develop Basin Specific Flow Metering Plan	20	100%		27-Sep-24 A	20-Dec-24 A	02-Sep-25	02-Sep-25
1006	ALT-CHES-016-1030	CHES-016 - Owner Approval of Flow Metering Pricing	5	100%		12-Oct-24 A	15-Oct-24 A	02-Sep-25	02-Sep-25
1007	ALT-CHES-016-1040	CHES-016 - Conduct Flow Monitoring Information Meetings with Localities As Needed	5	100%		16-Oct-24 A	15-Nov-24 A	02-Sep-25	02-Sep-25
1008	ALT-CHES-016-1050	CHES-016 - SSES Condition Data Qualifications Evaluations & Pricing	10	100%		18-Oct-24 A	15-Nov-24 A	09-Sep-25	09-Sep-25
1009	ALT-CHES-016-1060	CHES-016 - Pre-Construction Flow Monitoring Site Investigations & Installations	20	100%		29-Oct-24 A	06-Jan-25 A	02-Sep-25	02-Sep-25
1010	ALT-CHES-016-1070	CHES-016 - Flow Monitoring - Long Term	1120	25%	22	18-Nov-24 A	30-Apr-29*	02-Sep-25	31-May-29
1011	ALT-CHES-016-1080	CHES-016 - Owner Approval of SSES Subcontracor Inspection Costs	5	100%		22-Nov-24 A	22-Nov-24 A	09-Sep-25	09-Sep-25
1012	ALT-CHES-016-1090	CHES-016 - Pre-Construction Rain Gauges Site Investigations & Installations	5	100%		22-Nov-24 A	10-Jan-25 A	27-Oct-25	27-Oct-25
1013	ALT-CHES-016-1100	CHES-016 - Submittal of Flow Metering Plan to HRSD	15	100%		02-Dec-24 A	20-Dec-24 A	24-Oct-25	24-Oct-25
1014	ALT-CHES-016-1110	CHES-016 - Host Workshop of Basin Specific Condition Data Collection Plans	5	100%		22-Jan-25 A	22-Jan-25 A	17-Nov-25	17-Nov-25
1015	ALT-CHES-016-1120	CHES-016 - Time Series Analysis & RTK Development	10	100%		18-Mar-25 A	31-Mar-25 A	22-Dec-25	22-Dec-25
1016	ALT-CHES-016-1130	CHES-016 - Pre-Construction Flow Monitoring - Short Term	60	80%	100	18-Mar-25 A	30-Oct-25	22-Dec-25	25-Mar-26
1017	ALT-CHES-016-1190	CHES-016 - Conduct SSES information Meetings with Localities As Needed	40	100%		06-Jun-25 A	31-Jul-25 A	17-Nov-25	17-Nov-25
1018	SSES MH INSPECTIONS		122		84	09-Dec-24 A	19-Sep-25	17-Nov-25	21-Jan-26
1019	PUBLIC OUTREACH		41			30-May-25 A	31-Jul-25 A	17-Nov-25	17-Nov-25
1020	ALT-CHES-016-1150	CHES-016 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		30-May-25 A	17-Jun-25 A	17-Nov-25	17-Nov-25
1021	ALT-CHES-016-1210	CHES-016 - Notify Public of Upcoming SSES Activities	5	100%		22-Jul-25 A	31-Jul-25 A	17-Nov-25	17-Nov-25
1022	MH INSPECTIONS		122		84	09-Dec-24 A	19-Sep-25	17-Nov-25	21-Jan-26
1023	ALT-CHES-016-1140	CHES-016 - SSES Manhole Inspections Contractor Award & NTP	10	100%		09-Dec-24 A	06-Feb-25 A	17-Nov-25	17-Nov-25
1024	ALT-CHES-016-1260	CHES-016 - SSES Data Collection & Upload - Manhole Inspections (Duke's)	10	100%		06-Jun-25 A	17-Jun-25 A	17-Nov-25	17-Nov-25
1025	ALT-CHES-016-1280	CHES-016 - RJN Pushes Video to SewerAI & Performs QA/QC & Submits NASSCO Deliverables to ShareFile Folder	26	0%	76	31-Jul-25	05-Sep-25	17-Nov-25	23-Dec-25
1026	ALT-CHES-016-1310	CHES-016 - BMcD Performs QA/QC, Updates GIS Connectivity & Attributes, & Runs Rehab Decision Model	5	0%	76	08-Sep-25	12-Sep-25	26-Dec-25	02-Jan-26



Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

HRSD
Sustainable, Innovative Wastewater Treatment

HRSD - HIGH PRIORITY I/I REDUCTION PDB PROGRAM

BURNS McDONNELL

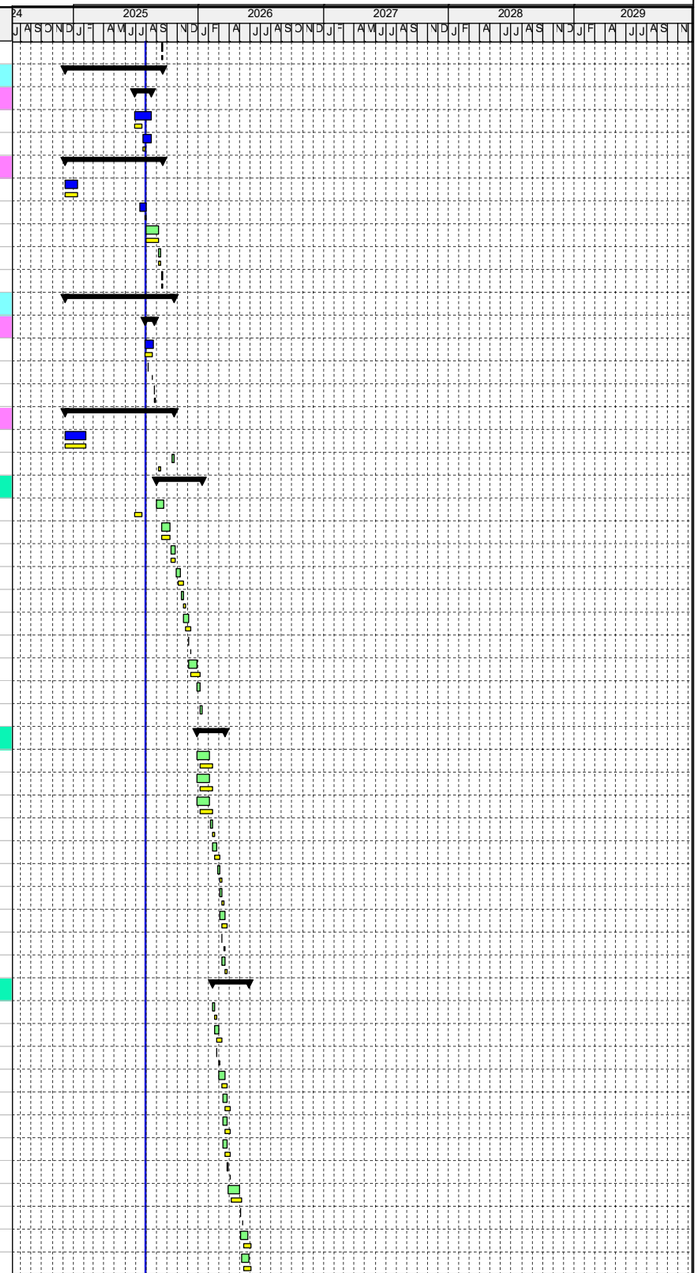
Date	Revision	Checked	Approved
27-May-25	MASTER SCHEDULE APR 2025 UPDATE	BPJ/JKC	
26-Jun-25	MASTER SCHEDULE MAY 2025 UPDATE	BPJ/JKC	
17-Jul-25	MASTER SCHEDULE JUN 2025 UPDATE	BPJ/JKC	
20-Aug-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	
16-Sep-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	

Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
1027	ALT-CHES-016-1330	CHES-016 - RJN Uploads Data & Corrected GIS to Clarity & NASSCO Deliverables to ShareFile Folder	5	0%	84	15-Sep-25	19-Sep-25	15-Jan-26	21-Jan-26
1028	SSES CCTV INSPECTIONS		122		84	09-Dec-24 A	19-Sep-25	17-Nov-25	21-Jan-26
1029	PUBLIC OUTREACH		20			30-Jun-25 A	15-Aug-25 A	17-Nov-25	17-Nov-25
1030	ALT-CHES-016-1180	CHES-016 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		30-Jun-25 A	15-Aug-25 A	17-Nov-25	17-Nov-25
1031	ALT-CHES-016-1220	CHES-016 - Notify Public of Upcoming SSES Activities	5	100%		22-Jul-25 A	15-Aug-25 A	17-Nov-25	17-Nov-25
1032	CCTV INSPECTIONS		122		84	09-Dec-24 A	19-Sep-25	17-Nov-25	21-Jan-26
1033	ALT-CHES-016-1170	CHES-016 - SSES CCTV Inspections (Mains) Award & NTP	10	100%		09-Dec-24 A	13-Jan-25 A	17-Nov-25	17-Nov-25
1034	ALT-CHES-016-1230	CHES-016 - SSES Data Collection - CCTV Inspections (Mains)	4	100%		15-Jul-25 A	31-Jul-25 A	17-Nov-25	17-Nov-25
1035	ALT-CHES-016-1290	CHES-016 - RJN Pushes Video to SewerAI & Performs QA/QC & Submits NASSCO Deliverables to ShareFile Folder	26	0%	76	31-Jul-25	05-Sep-25	17-Nov-25	23-Dec-25
1036	ALT-CHES-016-1300	CHES-016 - BMcD Performs QA/QC, Updates GIS Connectivity & Attributes, & Runs Rehab Decision Model	5	0%	76	08-Sep-25	12-Sep-25	26-Dec-25	02-Jan-26
1037	ALT-CHES-016-1320	CHES-016 - RJN Uploads Data & Corrected GIS to Clarity & NASSCO Deliverables to ShareFile Folder	5	0%	84	15-Sep-25	19-Sep-25	15-Jan-26	21-Jan-26
1038	SSES SMOKE TESTING		123		135	09-Dec-24 A	22-Oct-25	02-Apr-26	05-May-26
1039	PUBLIC OUTREACH		20		170	30-Jul-25 A	26-Aug-25	02-Apr-26	28-Apr-26
1040	ALT-CHES-016-1200	CHES-016 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		30-Jul-25 A	22-Aug-25 A	02-Apr-26	02-Apr-26
1041	ALT-CHES-016-1240	CHES-016 - Distribute Notification Letters	1	0%	170	07-Aug-25	07-Aug-25	09-Apr-26	09-Apr-26
1042	ALT-CHES-016-1250	CHES-016 - Distribute Door Hangers (48 Hrs Prior to Work)	2	0%	170	25-Aug-25	26-Aug-25	27-Apr-26	28-Apr-26
1043	SMOKE TESTING		123		135	09-Dec-24 A	22-Oct-25	29-Apr-26	05-May-26
1044	ALT-CHES-016-1160	CHES-016 - SSES Smoke Testing Contractor Award & NTP	10	100%		09-Dec-24 A	05-Feb-25 A	29-Apr-26	29-Apr-26
1045	ALT-CHES-016-1270	CHES-016 - SSES Data Collection - Smoke Testing & Cleanout Inspections	5	0%	135	16-Oct-25	22-Oct-25	29-Apr-26	05-May-26
1046	PRELIMINARY I/I REDUCTION PLAN		91		75	02-Sep-25	12-Jan-26	05-Jan-26	27-Apr-26
1047	ALT-CHES-016-1690	CHES-016 - Validation of SSO's Using Updated RTK's	15	0%	100	02-Sep-25	22-Sep-25	26-Jan-26	13-Feb-26
1048	ALT-CHES-016-1340	CHES-016 - Condition Data Review & Rehabilitation Categorization	20	0%	76	15-Sep-25	10-Oct-25	05-Jan-26	30-Jan-26
1049	ALT-CHES-016-1350	CHES-016 - I/I Reduction Strategy Alternatives Development	10	0%	76	13-Oct-25	24-Oct-25	02-Feb-26	13-Feb-26
1050	ALT-CHES-016-1360	CHES-016 - Cost-Effective Evaluation	10	0%	75	28-Oct-25	10-Nov-25	16-Feb-26	27-Feb-26
1051	ALT-CHES-016-1370	CHES-016 - Compare Against RHM	5	0%	75	11-Nov-25	17-Nov-25	02-Mar-26	06-Mar-26
1052	ALT-CHES-016-1380	CHES-016 - Correction to Cost Effective Evaluation After RHM Comparison	10	0%	75	18-Nov-25	02-Dec-25	09-Mar-26	20-Mar-26
1053	ALT-CHES-016-1390	CHES-016 - Host Preliminary I/I Reduction Plan Workshop	1	0%	75	03-Dec-25	03-Dec-25	23-Mar-26	23-Mar-26
1054	ALT-CHES-016-1400	CHES-016 - Develop Preliminary I/I Reduction Plan	15	0%	75	04-Dec-25	26-Dec-25	24-Mar-26	13-Apr-26
1055	ALT-CHES-016-1700	CHES-016 - Submission of Contract to HRSD for Review & Approval	5	0%	75	29-Dec-25	05-Jan-26	14-Apr-26	20-Apr-26
1056	ALT-CHES-016-1710	CHES-016 - HRSD Review & Approval of Contract	5	0%	75	06-Jan-26	12-Jan-26	21-Apr-26	27-Apr-26
1057	DESIGN		57		82	29-Dec-25	18-Mar-26	14-Apr-26	14-Jul-26
1058	ALT-CHES-016-1410	CHES-016 - Work Package Development & Submit for Internal Review	26	0%	75	29-Dec-25	03-Feb-26	14-Apr-26	19-May-26
1059	ALT-CHES-016-1420	CHES-016 - SSES Data Collection - CCTV Inspections (Laterals)	26	0%	75	29-Dec-25	03-Feb-26	14-Apr-26	19-May-26
1060	ALT-CHES-016-1430	CHES-016 - Permitting & Easement Acquisition	26	0%	75	29-Dec-25	03-Feb-26	14-Apr-26	19-May-26
1061	ALT-CHES-016-1440	CHES-016 - Internal Review of Work Package Draft	5	0%	75	04-Feb-26	10-Feb-26	20-May-26	27-May-26
1062	ALT-CHES-016-1450	CHES-016 - Incorporate Comments & Submit Work Package for Final Internal Review	10	0%	75	11-Feb-26	24-Feb-26	28-May-26	10-Jun-26
1063	ALT-CHES-016-1490	CHES-016 - Final Internal Review of Work Package & Submit for Owner Review	5	0%	82	25-Feb-26	03-Mar-26	22-Jun-26	26-Jun-26
1064	ALT-CHES-016-1510	CHES-016 - Owner Review of Work Package	5	0%	82	04-Mar-26	10-Mar-26	29-Jun-26	06-Jul-26
1065	ALT-CHES-016-1520	CHES-016 - Work Package Development - IFC	10	0%	82	05-Mar-26	18-Mar-26	30-Jun-26	14-Jul-26
1066	ALT-CHES-016-1530	CHES-016 - Host Workshop of Work Package	1	0%	82	11-Mar-26	11-Mar-26	07-Jul-26	07-Jul-26
1067	ALT-CHES-016-1540	CHES-016 - Incorporate Owner Comments & Finalize Work Package	5	0%	82	12-Mar-26	18-Mar-26	08-Jul-26	14-Jul-26
1068	PROCUREMENT/SUBCONTRACTING		76		75	11-Feb-26	28-May-26	28-May-26	14-Sep-26
1069	ALT-CHES-016-1460	CHES-016 - Prepare Final Design Documents & Solicit Subcontractor Pricing	4	0%	75	11-Feb-26	16-Feb-26	28-May-26	02-Jun-26
1070	ALT-CHES-016-1470	CHES-016 - Pre-Negotiation of Subcontractor Unit Pricing	10	0%	75	17-Feb-26	02-Mar-26	03-Jun-26	16-Jun-26
1071	ALT-CHES-016-1480	CHES-016 - Pre-Proposal Subcontractor Meetings	1	0%	79	24-Feb-26	24-Feb-26	16-Jun-26	16-Jun-26
1072	ALT-CHES-016-1500	CHES-016 - Confirm Final Construction Pricing	12	0%	75	03-Mar-26	18-Mar-26	17-Jun-26	02-Jul-26
1073	ALT-CHES-016-1550	CHES-016 - Formal Risk Review Associated with Construction Pricing (BMcD)	10	0%	75	13-Mar-26	26-Mar-26	29-Jun-26	13-Jul-26
1074	ALT-CHES-016-1560	CHES-016 - Technical & Commerical Evaluation (BMcD)	10	0%	75	13-Mar-26	26-Mar-26	29-Jun-26	13-Jul-26
1075	ALT-CHES-016-1570	CHES-016 - Executive Pricing Review (BMcD)	10	0%	75	13-Mar-26	26-Mar-26	29-Jun-26	13-Jul-26
1076	ALT-CHES-016-1580	CHES-016 - Host Workshop for HRSD Approval of GMP	1	0%	75	27-Mar-26	27-Mar-26	14-Jul-26	14-Jul-26
1077	ALT-CHES-016-1590	CHES-016 - Award & NTP to Subcontractors	25	0%	75	30-Mar-26	01-May-26	15-Jul-26	18-Aug-26
1078	ALT-CHES-016-1600	CHES-016 - Pre-Construction Meeting	1	0%	75	04-May-26	04-May-26	19-Aug-26	19-Aug-26
1079	ALT-CHES-016-1610	CHES-016 - Subcontractors Prepare & Submit Submittals for Approval	15	0%	75	05-May-26	26-May-26	20-Aug-26	10-Sep-26
1080	ALT-CHES-016-1620	CHES-016 - Review & Approve Submittals	15	0%	75	07-May-26	28-May-26	24-Aug-26	14-Sep-26



Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

HRSD
Sustainable, Innovative Wastewater Treatment

HRSD - HIGH PRIORITY I/I REDUCTION PDB PROGRAM

BURNS McDONNELL

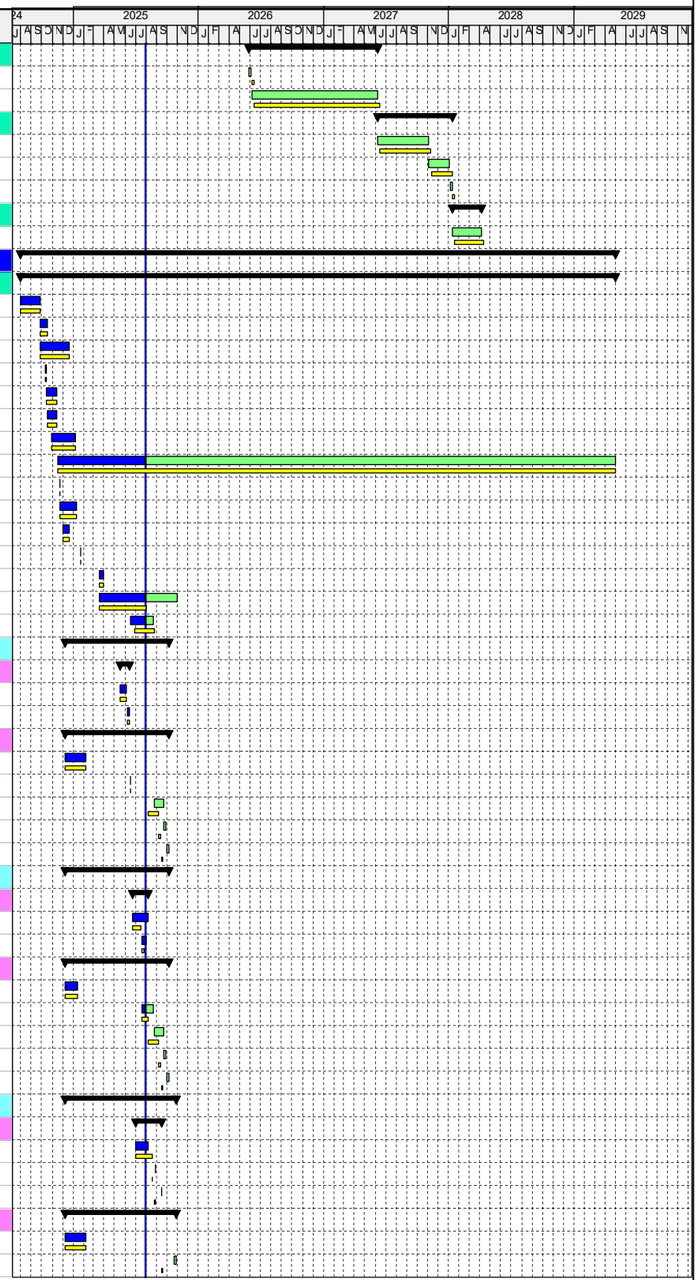
Date	Revision	Checked	Approved
27-May-25	MASTER SCHEDULE APR 2025 UPDATE	BPJ/JKC	
26-Jun-25	MASTER SCHEDULE MAY 2025 UPDATE	BPJ/JKC	
17-Jul-25	MASTER SCHEDULE JUN 2025 UPDATE	BPJ/JKC	
20-Aug-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	
16-Sep-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	

Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
1081	CONSTRUCTION		260		75	29-May-26	07-Jun-27	15-Sep-26	22-Sep-27
1082	ALT-CHES-016-1630	CHES-016 - Construction Mobilization	5	0%	75	29-May-26	04-Jun-26	15-Sep-26	21-Sep-26
1083	ALT-CHES-016-1640	CHES-016 - Work Package Construction	255	0%	75	05-Jun-26	07-Jun-27	22-Sep-26	22-Sep-27
1084	POST CONSTRUCTION		150		190	08-Jun-27	11-Jan-28	08-Mar-28	06-Oct-28
1085	ALT-CHES-016-1650	CHES-016 - Post Construction Flow Monitoring	105	0%	190	08-Jun-27	03-Nov-27	08-Mar-28	03-Aug-28
1086	ALT-CHES-016-1660	CHES-016 - I/I Reduction Effectiveness Analysis	40	0%	190	04-Nov-27	04-Jan-28	04-Aug-28	29-Sep-28
1087	ALT-CHES-016-1670	CHES-016 - Host Workshop on I/I Reduction Effectiveness	5	0%	190	05-Jan-28	11-Jan-28	02-Oct-28	06-Oct-28
1088	ALTERNATE 1 PROJECT CONTINGENCY		60		190	12-Jan-28	04-Apr-28	09-Oct-28	04-Jan-29
1089	ALT-CHES-016-1680	CHES-016 - Weather Contingency	60	0%	190	12-Jan-28	04-Apr-28	09-Oct-28	04-Jan-29
1090	SUFF-146		1205		22	01-Aug-24 A	30-Apr-29	02-Sep-25	31-May-29
1091	DATA COLLECTION & ANALYSIS		1205		22	01-Aug-24 A	30-Apr-29	02-Sep-25	31-May-29
1092	ALT-SUFF-146-1000	SUFF-146 - Review Existing Flow & SSES Data	40	100%		01-Aug-24 A	26-Sep-24 A	02-Sep-25	02-Sep-25
1093	ALT-SUFF-146-1010	SUFF-146 - Develop Basin Specific Condition Data Collection Plans	20	100%		27-Sep-24 A	18-Oct-24 A	09-Sep-25	09-Sep-25
1094	ALT-SUFF-146-1020	SUFF-146 - Develop Basin Specific Flow Metering Plan	20	100%		27-Sep-24 A	20-Dec-24 A	02-Sep-25	02-Sep-25
1095	ALT-SUFF-146-1030	SUFF-146 - Owner Approval of Flow Metering Pricing	5	100%		12-Oct-24 A	15-Oct-24 A	02-Sep-25	02-Sep-25
1096	ALT-SUFF-146-1040	SUFF-146 - Conduct Flow Monitoring Information Meetings with Localities As Needed	5	100%		16-Oct-24 A	15-Nov-24 A	02-Sep-25	02-Sep-25
1097	ALT-SUFF-146-1050	SUFF-146 - SSES Condition Data Qualifications Evaluations & Pricing	10	100%		18-Oct-24 A	15-Nov-24 A	09-Sep-25	09-Sep-25
1098	ALT-SUFF-146-1060	SUFF-146 - Pre-Construction Flow Monitoring Site Investigations & Installations	20	100%		29-Oct-24 A	06-Jan-25 A	02-Sep-25	02-Sep-25
1099	ALT-SUFF-146-1070	SUFF-146 - Flow Monitoring - Long Term	1120	25%	22	18-Nov-24 A	30-Apr-29*	02-Sep-25	31-May-29
1100	ALT-SUFF-146-1080	SUFF-146 - Owner Approval of SSES Subcontracor Inspection Costs	5	100%		22-Nov-24 A	22-Nov-24 A	09-Sep-25	09-Sep-25
1101	ALT-SUFF-146-1090	SUFF-146 - Pre-Construction Rain Gauges Site Investigations & Installations	5	100%		22-Nov-24 A	10-Jan-25 A	27-Oct-25	27-Oct-25
1102	ALT-SUFF-146-1100	SUFF-146 - Submittal of Flow Metering Plan to HRSD	15	100%		02-Dec-24 A	20-Dec-24 A	24-Oct-25	24-Oct-25
1103	ALT-SUFF-146-1110	SUFF-146 - Host Workshop of Basin Specific Condition Data Collection Plans	5	100%		22-Jan-25 A	22-Jan-25 A	12-Nov-25	12-Nov-25
1104	ALT-SUFF-146-1120	SUFF-146 - Time Series Analysis & RTK Development	10	100%		18-Mar-25 A	31-Mar-25 A	04-Feb-26	04-Feb-26
1105	ALT-SUFF-146-1130	SUFF-146 - Pre-Construction Flow Monitoring - Short Term	60	80%	130	18-Mar-25 A	30-Oct-25	04-Feb-26	06-May-26
1106	ALT-SUFF-146-1190	SUFF-146 - Conduct SSES information Meetings with Localities As Needed	18	50%	90	16-Jun-25 A	22-Aug-25	08-Dec-25	02-Jan-26
1107	SSES MH INSPECTIONS		133		73	09-Dec-24 A	06-Oct-25	08-Dec-25	21-Jan-26
1108	PUBLIC OUTREACH		20			19-May-25 A	13-Jun-25 A	08-Dec-25	08-Dec-25
1109	ALT-SUFF-146-1150	SUFF-146 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		19-May-25 A	06-Jun-25 A	08-Dec-25	08-Dec-25
1110	ALT-SUFF-146-1210	SUFF-146 - Notify Public of Upcoming SSES Activities	5	100%		09-Jun-25 A	13-Jun-25 A	08-Dec-25	08-Dec-25
1111	MH INSPECTIONS		133		73	09-Dec-24 A	06-Oct-25	08-Dec-25	21-Jan-26
1112	ALT-SUFF-146-1140	SUFF-146 - SSES Manhole Inspections Contractor Award & NTP	10	100%		09-Dec-24 A	06-Feb-25 A	08-Dec-25	08-Dec-25
1113	ALT-SUFF-146-1260	SUFF-146 - SSES Data Collection & Upload - Manhole Inspections (Duke's)	5	100%		16-Jun-25 A	18-Jun-25 A	08-Dec-25	08-Dec-25
1114	ALT-SUFF-146-1280	SUFF-146 - RJN Pushes Video to SewerAI & Performs QA/QC & Submits NASSCO Deliverables to ShareFile Folder	20	0%	73	25-Aug-25	22-Sep-25	08-Dec-25	07-Jan-26
1115	ALT-SUFF-146-1310	SUFF-146 - BMcD Performs QA/QC, Updates GIS Connectivity & Attributes, & Runs Rehab Decision Model	5	0%	73	23-Sep-25	29-Sep-25	08-Jan-26	14-Jan-26
1116	ALT-SUFF-146-1330	SUFF-146 - RJN Uploads Data & Corrected GIS to Clarity & NASSCO Deliverables to ShareFile Folder	5	0%	73	30-Sep-25	06-Oct-25	15-Jan-26	21-Jan-26
1117	SSES CCTV INSPECTIONS		133		73	09-Dec-24 A	06-Oct-25	12-Nov-25	21-Jan-26
1118	PUBLIC OUTREACH		22			24-Jun-25 A	08-Aug-25 A	05-Dec-25	05-Dec-25
1119	ALT-SUFF-146-1180	SUFF-146 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		24-Jun-25 A	08-Aug-25 A	05-Dec-25	05-Dec-25
1120	ALT-SUFF-146-1220	SUFF-146 - Notify Public of Upcoming SSES Activities	5	100%		21-Jul-25 A	01-Aug-25 A	05-Dec-25	05-Dec-25
1121	CCTV INSPECTIONS		133		73	09-Dec-24 A	06-Oct-25	12-Nov-25	21-Jan-26
1122	ALT-SUFF-146-1170	SUFF-146 - SSES CCTV Inspections (Mains) Award & NTP	10	100%		09-Dec-24 A	13-Jan-25 A	12-Nov-25	12-Nov-25
1123	ALT-SUFF-146-1230	SUFF-146 - SSES Data Collection - CCTV Inspections (Mains)	14	75%	73	21-Jul-25 A	22-Aug-25	12-Nov-25	05-Dec-25
1124	ALT-SUFF-146-1290	SUFF-146 - RJN Pushes Video to SewerAI & Performs QA/QC & Submits NASSCO Deliverables to ShareFile Folder	20	0%	73	25-Aug-25	22-Sep-25	08-Dec-25	07-Jan-26
1125	ALT-SUFF-146-1300	SUFF-146 - BMcD Performs QA/QC, Updates GIS Connectivity & Attributes, & Runs Rehab Decision Model	5	0%	73	23-Sep-25	29-Sep-25	08-Jan-26	14-Jan-26
1126	ALT-SUFF-146-1320	SUFF-146 - RJN Uploads Data & Corrected GIS to Clarity & NASSCO Deliverables to ShareFile Folder	5	0%	73	30-Sep-25	06-Oct-25	15-Jan-26	21-Jan-26
1127	SSES SMOKE TESTING		128		390	09-Dec-24 A	29-Oct-25	22-Mar-27	13-May-27
1128	PUBLIC OUTREACH		35		415	01-Jul-25 A	17-Sep-25	22-Mar-27	06-May-27
1129	ALT-SUFF-146-1200	SUFF-146 - Prepare Upcoming Notifications to Public of SSES Activities & Update Social Media	15	100%		01-Jul-25 A	08-Aug-25 A	22-Mar-27	22-Mar-27
1130	ALT-SUFF-146-1240	SUFF-146 - Distribute Notification Letters	1	0%	415	28-Aug-25	28-Aug-25	19-Apr-27	19-Apr-27
1131	ALT-SUFF-146-1250	SUFF-146 - Distribute Door Hangers (48 Hrs Prior to Work)	2	0%	415	16-Sep-25	17-Sep-25	05-May-27	06-May-27
1132	SMOKE TESTING		128		390	09-Dec-24 A	29-Oct-25	07-May-27	13-May-27
1133	ALT-SUFF-146-1160	SUFF-146 - SSES Smoke Testing Contractor Award & NTP	10	100%		09-Dec-24 A	05-Feb-25 A	07-May-27	07-May-27
1134	ALT-SUFF-146-1270	SUFF-146 - SSES Data Collection - Smoke Testing & Cleanout Inspections	5	0%	390	23-Oct-25	29-Oct-25	07-May-27	13-May-27



Primary Baseline
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HRSD
Sustainable, Innovative Wastewater Treatment

HRSD - HIGH PRIORITY I/I REDUCTION PDB PROGRAM

BURNS McDONNELL

Date	Revision	Checked	Approved
27-May-25	MASTER SCHEDULE APR 2025 UPDATE	BPJ/JKC	
26-Jun-25	MASTER SCHEDULE MAY 2025 UPDATE	BPJ/JKC	
17-Jul-25	MASTER SCHEDULE JUN 2025 UPDATE	BPJ/JKC	
20-Aug-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	
16-Sep-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	

Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
1135	**PRELIMINARY I/I REDUCTION PLAN**		101		331	02-Sep-25	26-Jan-26	16-Apr-26	13-May-27
1136	ALT-SUFF-146-1690	SUFF-146 - Validation of SSO's Using Updated RTK's	15	0%	173	02-Sep-25	22-Sep-25	07-May-26	28-May-26
1137	ALT-SUFF-146-1340	SUFF-146 - Condition Data Review & Rehabilitation Categorization	20	0%	138	30-Sep-25	27-Oct-25	16-Apr-26	13-May-26
1138	ALT-SUFF-146-1350	SUFF-146 - I/I Reduction Strategy Alternatives Development	10	0%	138	28-Oct-25	10-Nov-25	14-May-26	28-May-26
1139	ALT-SUFF-146-1360	SUFF-146 - Cost-Effective Evaluation	10	0%	138	11-Nov-25	24-Nov-25	29-May-26	11-Jun-26
1140	ALT-SUFF-146-1370	SUFF-146 - Compare Against RHM	5	0%	331	25-Nov-25	02-Dec-25	18-Mar-27	24-Mar-27
1141	ALT-SUFF-146-1380	SUFF-146 - Correction to Cost Effective Evaluation After RHM Comparison	10	0%	331	03-Dec-25	16-Dec-25	25-Mar-27	07-Apr-27
1142	ALT-SUFF-146-1390	SUFF-146 - Host Preliminary I/I Reduction Plan Workshop	1	0%	331	17-Dec-25	17-Dec-25	08-Apr-27	08-Apr-27
1143	ALT-SUFF-146-1400	SUFF-146 - Develop Preliminary I/I Reduction Plan	15	0%	331	18-Dec-25	12-Jan-26	09-Apr-27	29-Apr-27
1144	ALT-SUFF-146-1700	SUFF-146 - Submission of Contract to HRSD for Review & Approval	5	0%	331	13-Jan-26	19-Jan-26	30-Apr-27	06-May-27
1145	ALT-SUFF-146-1710	SUFF-146 - HRSD Review & Approval of Contract	5	0%	331	20-Jan-26	26-Jan-26	07-May-27	13-May-27
1146	**DESIGN**		307		82	13-Jan-26	26-Mar-27	30-Apr-27	22-Jul-27
1147	ALT-SUFF-146-1410	SUFF-146 - Work Package Development & Submit for Internal Review	20	0%	331	13-Jan-26	09-Feb-26	30-Apr-27	27-May-27
1148	ALT-SUFF-146-1420	SUFF-146 - SSES Data Collection - CCTV Inspections (Laterals)	20	0%	331	13-Jan-26	09-Feb-26	30-Apr-27	27-May-27
1149	ALT-SUFF-146-1430	SUFF-146 - Permitting & Easement Acquisition	20	0%	331	13-Jan-26	09-Feb-26	30-Apr-27	27-May-27
1150	ALT-SUFF-146-1440	SUFF-146 - Internal Review of Work Package Draft	5	0%	331	10-Feb-26	16-Feb-26	28-May-27	04-Jun-27
1151	ALT-SUFF-146-1450	SUFF-146 - Incorporate Comments & Submit Work Package for Final Internal Review	10	0%	331	17-Feb-26	02-Mar-26	07-Jun-27	18-Jun-27
1152	ALT-SUFF-146-1490	SUFF-146 - Final Internal Review of Work Package & Submit for Owner Review	5	0%	338	03-Mar-26	09-Mar-26	30-Jun-27	07-Jul-27
1153	ALT-SUFF-146-1510	SUFF-146 - Owner Review of Work Package	5	0%	338	10-Mar-26	16-Mar-26	08-Jul-27	14-Jul-27
1154	ALT-SUFF-146-1530	SUFF-146 - Host Workshop of Work Package	1	0%	338	17-Mar-26	17-Mar-26	15-Jul-27	15-Jul-27
1155	ALT-SUFF-146-1540	SUFF-146 - Incorporate Owner Comments & Finalize Work Package	5	0%	338	18-Mar-26	24-Mar-26	16-Jul-27	22-Jul-27
1156	ALT-SUFF-146-1520	SUFF-146 - Work Package Development - IFC	10	0%	82	15-Mar-27	26-Mar-27	09-Jul-27	22-Jul-27
1157	**PROCUREMENT/SUBCONTRACTING**		76		75	19-Feb-27	07-Jun-27	07-Jun-27	22-Sep-27
1158	ALT-SUFF-146-1460	SUFF-146 - Prepare Final Design Documents & Solicit Subcontractor Pricing	4	0%	75	19-Feb-27	24-Feb-27	07-Jun-27	10-Jun-27
1159	ALT-SUFF-146-1470	SUFF-146 - Pre-Negotiation of Subcontractor Unit Pricing	10	0%	75	25-Feb-27	10-Mar-27	11-Jun-27	24-Jun-27
1160	ALT-SUFF-146-1480	SUFF-146 - Pre-Proposal Subcontractor Meetings	1	0%	79	04-Mar-27	04-Mar-27	24-Jun-27	24-Jun-27
1161	ALT-SUFF-146-1500	SUFF-146 - Confirm Final Construction Pricing	12	0%	75	11-Mar-27	26-Mar-27	25-Jun-27	13-Jul-27
1162	ALT-SUFF-146-1550	SUFF-146 - Formal Risk Review Associated with Construction Pricing (BMcD)	10	0%	75	23-Mar-27	05-Apr-27	08-Jul-27	21-Jul-27
1163	ALT-SUFF-146-1560	SUFF-146 - Technical & Commerical Evaluation (BMcD)	10	0%	75	23-Mar-27	05-Apr-27	08-Jul-27	21-Jul-27
1164	ALT-SUFF-146-1570	SUFF-146 - Executive Pricing Review (BMcD)	10	0%	75	23-Mar-27	05-Apr-27	08-Jul-27	21-Jul-27
1165	ALT-SUFF-146-1580	SUFF-146 - Host Workshop for HRSD Approval of GMP	1	0%	75	06-Apr-27	06-Apr-27	22-Jul-27	22-Jul-27
1166	ALT-SUFF-146-1590	SUFF-146 - Award & NTP to Subcontractors	25	0%	75	07-Apr-27	11-May-27	23-Jul-27	26-Aug-27
1167	ALT-SUFF-146-1600	SUFF-146 - Pre-Construction Meeting	1	0%	75	12-May-27	12-May-27	27-Aug-27	27-Aug-27
1168	ALT-SUFF-146-1610	SUFF-146 - Subcontractors Prepare & Submit Submittals for Approval	15	0%	75	13-May-27	03-Jun-27	30-Aug-27	20-Sep-27
1169	ALT-SUFF-146-1620	SUFF-146 - Review & Approve Submittals	15	0%	75	17-May-27	07-Jun-27	01-Sep-27	22-Sep-27
1170	**CONSTRUCTION**		125		75	08-Jun-27	02-Dec-27	23-Sep-27	21-Mar-28
1171	ALT-SUFF-146-1630	SUFF-146 - Construction Mobilization	5	0%	75	08-Jun-27	14-Jun-27	23-Sep-27	29-Sep-27
1172	ALT-SUFF-146-1640	SUFF-146 - Work Package Construction	120	0%	75	15-Jun-27	02-Dec-27	30-Sep-27	21-Mar-28
1173	**POST CONSTRUCTION**		145		75	10-Dec-27 A	06-Jul-28	22-Mar-28	20-Oct-28
1174	ALT-SUFF-146-1650	SUFF-146 - Post Construction Flow Monitoring	105	46%	75	10-Dec-27 A	02-May-28	22-Mar-28	17-Aug-28
1175	ALT-SUFF-146-1660	SUFF-146 - I/I Reduction Effectiveness Analysis	40	0%	75	03-May-28	28-Jun-28	18-Aug-28	13-Oct-28
1176	ALT-SUFF-146-1670	SUFF-146 - Host Workshop on I/I Reduction Effectiveness	5	0%	75	29-Jun-28	06-Jul-28	16-Oct-28	20-Oct-28
1177	**ALTERNATE 2 PROJECT CONTINGENCY**		60		75	07-Jul-28	29-Sep-28	23-Oct-28	18-Jan-29
1178	ALT-SUFF-146-1680	SUFF-146 - Weather Contingency	60	0%	75	07-Jul-28	29-Sep-28	23-Oct-28	18-Jan-29
1179	**PORT-02/04**		659		80	15-Sep-25	18-Apr-28	09-Jan-26	10-Aug-28
1180	**DESIGN**		160		85	15-Sep-25	30-Apr-26	09-Jan-26	31-Aug-26
1181	PORT-02/04-1000	PORT-02/04 - Finalize PER & Submit to HRSD For Review	20	0%	80	15-Sep-25	10-Oct-25	09-Jan-26	05-Feb-26
1182	PORT-02/04-1010	PORT-02/04 - Meet with HRSD to Review PER	1	0%	80	24-Oct-25	24-Oct-25	19-Feb-26	19-Feb-26
1183	PORT-02/04-1020	PORT-02/04 - Prepare Design Scope for HRSD Commission Meeting Approval	17	0%	80	27-Oct-25	18-Nov-25	20-Feb-26	16-Mar-26
1184	PORT-02/04-1030	PORT-02/04 - Furnish & Submit 50% Plans, Specs, & OPCC to HRSD for Review	69	0%	80	19-Nov-25	27-Feb-26	17-Mar-26	22-Jun-26
1185	PORT-02/04-1050	PORT-02/04 - Furnish & Submit 100% Plans (IFC), Specs, & OPCC to HRSD for Approval	34	0%	85	16-Mar-26	30-Apr-26	15-Jul-26	31-Aug-26
1186	**PROCUREMENT/SUBCONTRACTING**		93		80	02-Mar-26	10-Jul-26	23-Jun-26	02-Nov-26
1187	PORT-02/04-1040	PORT-02/04 - Prepare Final Design Documents & Solicit Subcontractor Pricing	10	0%	80	02-Mar-26	13-Mar-26	23-Jun-26	07-Jul-26
1188	PORT-02/04-1060	PORT-02/04 - Pre-Negotiation of Subcontractor Unit Pricing	13	0%	80	16-Mar-26	01-Apr-26	08-Jul-26	24-Jul-26



Primary Baseline
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HRSD
Sustainable, Innovative Wastewater Treatment

HRSD - HIGH PRIORITY I/I REDUCTION PDB PROGRAM

BURNS McDONNELL

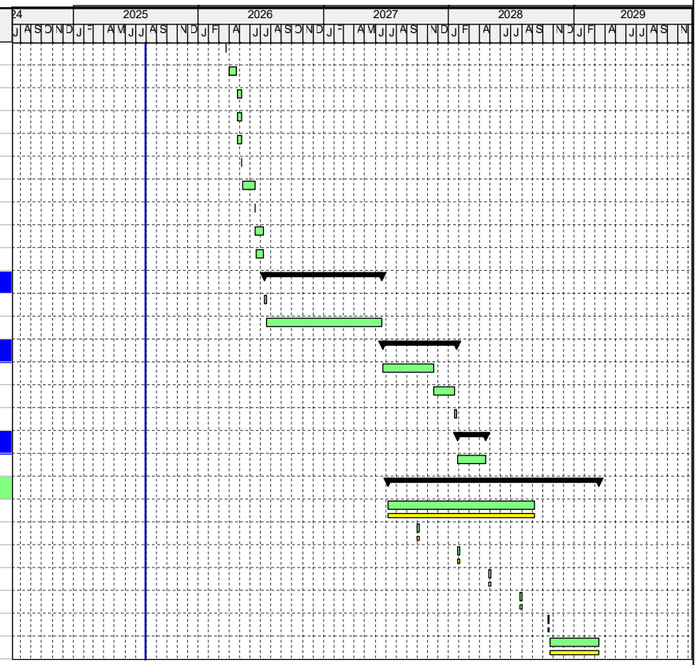
Date	Revision	Checked	Approved
27-May-25	MASTER SCHEDULE APR 2025 UPDATE	BPJ/JKC	
26-Jun-25	MASTER SCHEDULE MAY 2025 UPDATE	BPJ/JKC	
17-Jul-25	MASTER SCHEDULE JUN 2025 UPDATE	BPJ/JKC	
20-Aug-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	
16-Sep-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	

Project Name : HRSD - High Priority I/I Reduction PDB Program
BMcD Project Number: 175247

HRSD - PROGRAM MASTER SCHEDULE JULY 2025

Print Date: 16-Sep-25
Data Date: 31-Jul-25

#	Activity ID	Activity Name	Original Duration	Physical % Complete	Total Float	Start	Finish	Late Start	Late Finish
1189	PORT-02/04-1070	PORT-02/04 - Pre-Proposal Subcontractor Meetings	1	0%	87	23-Mar-26	23-Mar-26	24-Jul-26	24-Jul-26
1190	PORT-02/04-1080	PORT-02/04 - Confirm Final Construction Pricing	15	0%	80	02-Apr-26	22-Apr-26	27-Jul-26	14-Aug-26
1191	PORT-02/04-1090	PORT-02/04 - Formal Risk Review Associated with Construction Pricing (BMcD)	10	0%	80	24-Apr-26	07-May-26	18-Aug-26	31-Aug-26
1192	PORT-02/04-1100	PORT-02/04 - Technical & Commerical Evaluation (BMcD)	10	0%	80	24-Apr-26	07-May-26	18-Aug-26	31-Aug-26
1193	PORT-02/04-1110	PORT-02/04 - Executive Pricing Review (BMcD)	10	0%	80	24-Apr-26	07-May-26	18-Aug-26	31-Aug-26
1194	PORT-02/04-1120	PORT-02/04 - Host Workshop for HRSD Approval of GMP	1	0%	80	08-May-26	08-May-26	01-Sep-26	01-Sep-26
1195	PORT-02/04-1130	PORT-02/04 - Award & NTP to Subcontractors	25	0%	80	11-May-26	15-Jun-26	02-Sep-26	07-Oct-26
1196	PORT-02/04-1140	PORT-02/04 - Pre-Construction Meeting	1	0%	80	16-Jun-26	16-Jun-26	08-Oct-26	08-Oct-26
1197	PORT-02/04-1150	PORT-02/04 - Subcontractors Prepare & Submit Submittals for Approval	15	0%	80	17-Jun-26	08-Jul-26	09-Oct-26	29-Oct-26
1198	PORT-02/04-1160	PORT-02/04 - Review & Approve Submittals	15	0%	80	19-Jun-26	10-Jul-26	13-Oct-26	02-Nov-26
1199	CONSTRUCTION		240		80	13-Jul-26	21-Jun-27	03-Nov-26	13-Oct-27
1200	PORT-02/04-1170	PORT-02/04 - Construction Mobilization	5	0%	80	13-Jul-26	17-Jul-26	03-Nov-26	09-Nov-26
1201	PORT-02/04-1180	PORT-02/04 - Work Package Construction	235	0%	80	20-Jul-26	21-Jun-27	10-Nov-26	13-Oct-27
1202	POST CONSTRUCTION		150		80	22-Jun-27	25-Jan-28	14-Oct-27	16-May-28
1203	PORT-02/04-1190	PORT-02/04 - Post Construction Flow Monitoring	105	0%	80	22-Jun-27	17-Nov-27	14-Oct-27	14-Mar-28
1204	PORT-02/04-1200	PORT-02/04 - I/I Reduction Effectiveness Analysis	40	0%	80	18-Nov-27	18-Jan-28	15-Mar-28	09-May-28
1205	PORT-02/04-1210	PORT-02/04 - Host Workshop on I/I Reduction Effectiveness	5	0%	80	19-Jan-28	25-Jan-28	10-May-28	16-May-28
1206	PORT-02/04 - PROJECT CONTINGENCY		60		80	26-Jan-28	18-Apr-28	17-May-28	10-Aug-28
1207	PORT-02/04-1220	PORT-02/04 - Weather Contingency	60	0%	80	26-Jan-28	18-Apr-28	17-May-28	10-Aug-28
1208	ADAPTIVE MANAGEMENT PLAN		430		200	07-Jul-27	15-Mar-29	19-Apr-28	28-Dec-29
1209	AMP-GEN-1000	Develop Draft Adaptive Management Plan	300	0%	200	07-Jul-27	08-Sep-28	19-Apr-28	22-Jun-29
1210	AMP-GEN-1010	Adaptive Management Plan Workshop #1	5	0%	200	30-Sep-27	06-Oct-27	14-Jul-28	20-Jul-28
1211	AMP-GEN-1020	Adaptive Management Plan Workshop #2	5	0%	200	26-Jan-28	01-Feb-28	06-Nov-28	10-Nov-28
1212	AMP-GEN-1030	Adaptive Management Plan Workshop #3	5	0%	200	26-Apr-28	02-May-28	09-Feb-29	15-Feb-29
1213	AMP-GEN-1040	Adaptive Management Plan Workshop #4	5	0%	200	28-Jul-28	03-Aug-28	11-May-29	17-May-29
1214	AMP-GEN-1050	Adaptive Management Plan Workshop #5	5	0%	200	16-Oct-28	20-Oct-28	31-Jul-29	06-Aug-29
1215	AMP-GEN-1060	Final Adaptive Management Plan	100	0%	200	23-Oct-28	15-Mar-29	07-Aug-29	28-Dec-29



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BURNS McDONNELL

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16-Sep-25	MASTER SCHEDULE JUL 2025 UPDATE	BPJ/JKC	

Appendix C: Cost Metadata

Appendix C: Cost Metadata

- 2025 Conceptual Pricing Basis
  - Pricing References
    - HRSD Sewer On-Call Rehab
    - HPIIRP Subcontractor Quotes
    - South Norfolk Gravity Sewer
    - Wilroy PRS and Storage Tank
    - Tabb PRS and Storage Tank
    - ENR CCI 20 City Average
    - Other Area Research
- RHM Capacity Improvement Cost Reference
  - Capacity Project Reference Tables
  - Capacity Project Detail Table
- Additional I/I Cost Details
  - Assumption Reference
  - CHES-016
  - JCSA-LSA3-1
  - JCSA-LSA3-6
  - JCSA-LSA3-8
  - JCSA-LSA5-4
  - PORT-10
  - SUFF-146
  - YORK-003
  - YORK-006
- Additional Program Costs
  - Program Management
  - HPIIRP Post-Construction Assessment
  - RHM Update and Adaptive Management Plan Support

2025 Conceptual Pricing Basis

General planning level cost assumptions were reviewed and adjusted based on a combination of the following:

HRSD sewer on-call rehabilitation 2025

HPIIRP subcontractor quotes 2025

Comparisons to available cost information and/or bid data from:

- HRSD (e.g. Wilroy PRS and Tank 2025, Tabb PRS and Tank 2024, South Norfolk Area Gravity Sewer 2024)
- Projects from Hampton Roads Localities 2023-2024
- Projects in VA and neighboring states 2022-2025

RS Means construction data, 2024 baseline plus factors to consider location and 2025 escalation

ENR Construction Cost Index (CCI), 20 City Average as of June 2025

Pricing References

HRSD 2025 On Call Sewer Rehabilitation

Line Item with Variable Pricing from Vortex Services LLC by Service Area

				Vortex Services LLC												SAK	
				Service Area 1 Chesapeake Norfolk Portsmouth Suffolk Virginia Beach		Service Area 2 Hampton James City County Newport News Poquoson Williamsburg York County		Service Area 3 Gloucester King William King and Queen Matthews Middlesex New Kent		Service Area 4 Isle of Wight Surry		Service Area 5 Nassawadox Onancock		Vortex Services LLC Average (All Areas)		SAK All Areas	
Item No.	Description	Unit	Quantity (Not Guaranteed)	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price
1.1	6" CIPP Lining (Water or Steam Cured), 4.5 mm	LF	500	$ 70.00	$ 35,000.00	$ 70.00	$ 35,000.00	$ 70.00	$ 35,000.00	$ 70.00	$ 35,000.00	$ 70.00	$ 35,000.00	**$ 70.00**	**$ 35,000.00**	**$ 100.00**	**$ 50,000.00**
1.2	8" CIPP Lining (Water or Steam Cured), 6.0 mm	LF	5,000	$ 50.00	$ 250,000.00	$ 50.00	$ 250,000.00	$ 50.00	$ 250,000.00	$ 50.00	$ 250,000.00	$ 50.00	$ 250,000.00	**$ 50.00**	**$ 250,000.00**	**$ 70.00**	**$ 350,000.00**
1.3	10" CIPP Lining (Water or Steam Cured), 6.0 mm	LF	4,000	$ 55.00	$ 220,000.00	$ 55.00	$ 220,000.00	$ 55.00	$ 220,000.00	$ 55.00	$ 220,000.00	$ 55.00	$ 220,000.00	**$ 55.00**	**$ 220,000.00**	**$ 75.00**	**$ 300,000.00**
1.4	12" CIPP Lining (Water or Steam Cured), 6.0 mm	LF	4,000	$ 60.00	$ 240,000.00	$ 60.00	$ 240,000.00	$ 60.00	$ 240,000.00	$ 60.00	$ 240,000.00	$ 60.00	$ 240,000.00	**$ 60.00**	**$ 240,000.00**	**$ 80.00**	**$ 320,000.00**
1.5	15" CIPP Lining (Water or Steam Cured), 7.5 mm	LF	1,000	$ 80.00	$ 80,000.00	$ 80.00	$ 80,000.00	$ 80.00	$ 80,000.00	$ 80.00	$ 80,000.00	$ 80.00	$ 80,000.00	**$ 80.00**	**$ 80,000.00**	**$ 122.00**	**$ 122,000.00**
1.6	6" CIPP Lining (UV Cured), 3.0 mm	LF	500	$ 100.00	$ 50,000.00	$ 100.00	$ 50,000.00	$ 100.00	$ 50,000.00	$ 100.00	$ 50,000.00	$ 100.00	$ 50,000.00	**$ 100.00**	**$ 50,000.00**	**$ 110.00**	**$ 55,000.00**
1.7	8" CIPP Lining (UV Cured), 4.5 mm	LF	5,000	$ 82.00	$ 410,000.00	$ 82.00	$ 410,000.00	$ 82.00	$ 410,000.00	$ 82.00	$ 410,000.00	$ 82.00	$ 410,000.00	**$ 82.00**	**$ 410,000.00**	**$ 85.00**	**$ 425,000.00**
1.8	10" CIPP Lining (UV Cured), 4.5 mm	LF	4,000	$ 90.00	$ 360,000.00	$ 90.00	$ 360,000.00	$ 90.00	$ 360,000.00	$ 90.00	$ 360,000.00	$ 90.00	$ 360,000.00	**$ 90.00**	**$ 360,000.00**	**$ 91.00**	**$ 364,000.00**
1.9	12" CIPP Lining (UV Cured), 4.5 mm	LF	4,000	$ 100.00	$ 400,000.00	$ 100.00	$ 400,000.00	$ 100.00	$ 400,000.00	$ 100.00	$ 400,000.00	$ 100.00	$ 400,000.00	**$ 100.00**	**$ 400,000.00**	**$ 100.00**	**$ 400,000.00**
1.10	15" CIPP Lining (UV Cured), 6.0 mm	LF	1,000	$ 110.00	$ 110,000.00	$ 110.00	$ 110,000.00	$ 110.00	$ 110,000.00	$ 110.00	$ 110,000.00	$ 110.00	$ 110,000.00	**$ 110.00**	**$ 110,000.00**	**$ 132.00**	**$ 132,000.00**
1.11	Removing of Intruding Service Lateral Connections (Ferrous)	EA	200	$ 250.00	$ 50,000.00	$ 250.00	$ 50,000.00	$ 250.00	$ 50,000.00	$ 250.00	$ 50,000.00	$ 250.00	$ 50,000.00	**$ 250.00**	**$ 50,000.00**	**$ 825.00**	**$ 165,000.00**
1.12	Removing of Intruding Service Lateral Connections (Non-ferrous)	EA	200	$ 250.00	$ 50,000.00	$ 250.00	$ 50,000.00	$ 250.00	$ 50,000.00	$ 250.00	$ 50,000.00	$ 250.00	$ 50,000.00	**$ 250.00**	**$ 50,000.00**	**$ 597.00**	**$ 119,400.00**
1.13	Internal Reinstatement of Lateral Connections	EA	500	$ 200.00	$ 100,000.00	$ 200.00	$ 100,000.00	$ 200.00	$ 100,000.00	$ 200.00	$ 100,000.00	$ 200.00	$ 100,000.00	**$ 200.00**	**$ 100,000.00**	**$ 300.00**	**$ 150,000.00**
2.1	Testing of Lateral Connections Mainline Sewers	EA	500	$ 325.00	$ 162,500.00	$ 325.00	$ 162,500.00	$ 325.00	$ 162,500.00	$ 325.00	$ 162,500.00	$ 325.00	$ 162,500.00	**$ 325.00**	**$ 162,500.00**	**$ 965.00**	**$ 482,500.00**
2.2	Testing of Pipe Joints in Mainline Sewers	EA	250	$ 150.00	$ 37,500.00	$ 150.00	$ 37,500.00	$ 150.00	$ 37,500.00	$ 150.00	$ 37,500.00	$ 150.00	$ 37,500.00	**$ 150.00**	**$ 37,500.00**	**$ 69.00**	**$ 17,250.00**
2.3	Testing of Lateral Connections to Manholes	EA	250	$ 75.00	$ 18,750.00	$ 75.00	$ 18,750.00	$ 75.00	$ 18,750.00	$ 75.00	$ 18,750.00	$ 75.00	$ 18,750.00	**$ 75.00**	**$ 18,750.00**	**$ 910.00**	**$ 227,500.00**
3.1	Chemical Grouting, Packer Injection Grouting of Pipe Joints in Mainline Sewers	EA	150	$ 250.00	$ 37,500.00	$ 250.00	$ 37,500.00	$ 250.00	$ 37,500.00	$ 250.00	$ 37,500.00	$ 250.00	$ 37,500.00	**$ 250.00**	**$ 37,500.00**	**$ 57.00**	**$ 8,550.00**
3.2	Chemical Grouting, Packer Injection Grouting of Lateral Connections in Mainline Sewers	EA	250	$ 500.00	$ 125,000.00	$ 500.00	$ 125,000.00	$ 500.00	$ 125,000.00	$ 500.00	$ 125,000.00	$ 500.00	$ 125,000.00	**$ 500.00**	**$ 125,000.00**	**$ 228.00**	**$ 57,000.00**
3.3	Chemical Grouting, Chemical Grouting of Lateral Connections to Manholes	EA	150	$ 100.00	$ 15,000.00	$ 100.00	$ 15,000.00	$ 100.00	$ 15,000.00	$ 100.00	$ 15,000.00	$ 100.00	$ 15,000.00	**$ 100.00**	**$ 15,000.00**	**$ 228.00**	**$ 34,200.00**
3.4	Chemical Grouting, Chemical Grout	GAL	5,000	$ 15.00	$ 75,000.00	$ 15.00	$ 75,000.00	$ 15.00	$ 75,000.00	$ 15.00	$ 75,000.00	$ 15.00	$ 75,000.00	**$ 15.00**	**$ 75,000.00**	**$ 17.00**	**$ 85,000.00**
3.5	Chemical Grouting, Post Construction CCTV Inspection, 6" Diameter	LF	1,000	$ 10.00	$ 10,000.00	$ 10.00	$ 10,000.00	$ 10.00	$ 10,000.00	$ 10.00	$ 10,000.00	$ 10.00	$ 10,000.00	**$ 10.00**	**$ 10,000.00**	**$ 3.50**	**$ 3,500.00**
3.6	Chemical Grouting, Post Construction CCTV Inspection, 8" - 12" Diameter	LF	3,000	$ 10.00	$ 30,000.00	$ 10.00	$ 30,000.00	$ 10.00	$ 30,000.00	$ 10.00	$ 30,000.00	$ 10.00	$ 30,000.00	**$ 10.00**	**$ 30,000.00**	**$ 4.50**	**$ 13,500.00**
3.7	Chemical Grouting, Post Construction CCTV Inspection, 15" Diameter	LF	1,000	$ 10.00	$ 10,000.00	$ 10.00	$ 10,000.00	$ 10.00	$ 10,000.00	$ 10.00	$ 10,000.00	$ 10.00	$ 10,000.00	**$ 10.00**	**$ 10,000.00**	**$ 5.75**	**$ 5,750.00**
3.8	Chemical Grouting, Post Lateral Connection Residual Grout Cleaning, 4" Diameter Lateral	EA	100	$ 150.00	$ 15,000.00	$ 150.00	$ 15,000.00	$ 150.00	$ 15,000.00	$ 150.00	$ 15,000.00	$ 150.00	$ 15,000.00	**$ 150.00**	**$ 15,000.00**	**$ 57.00**	**$ 5,700.00**
3.9	Chemical Grouting, Post Lateral Connection Residual Grout Cleaning, 6" Diameter Lateral	EA	100	$ 150.00	$ 15,000.00	$ 150.00	$ 15,000.00	$ 150.00	$ 15,000.00	$ 150.00	$ 15,000.00	$ 150.00	$ 15,000.00	**$ 150.00**	**$ 15,000.00**	**$ 57.00**	**$ 5,700.00**
3.10	Chemical Grouting, Warranty Testing Mainline Joints or Lateral Pipe Connections	EA	550	$ 350.00	$ 192,500.00	$ 350.00	$ 192,500.00	$ 350.00	$ 192,500.00	$ 350.00	$ 192,500.00	$ 350.00	$ 192,500.00	**$ 350.00**	**$ 192,500.00**	**$ 228.00**	**$ 125,400.00**

HRSD 2025 On Call Sewer Rehabilitation

Line Item with Variable Pricing from Vortex Services LLC by Service Area

				Vortex Services LLC												SAK	
				Service Area 1 Chesapeake Norfolk Portsmouth Suffolk Virginia Beach		Service Area 2 Hampton James City County Newport News Poquoson Williamsburg York County		Service Area 3 Gloucester King William King and Queen Matthews Middlesex New Kent		Service Area 4 Isle of Wight Surry		Service Area 5 Nassawadox Onancock		Vortex Services LLC Average (All Areas)		SAK All Areas	
Item No.	Description	Unit	Quantity (Not Guaranteed)	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price
4.1	Insitu Structural Point Repair, 6" Diameter	LF	100	$ 1,148.00	$ 114,800.00	$ 1,148.00	$ 114,800.00	$ 1,148.00	$ 114,800.00	$ 1,148.00	$ 114,800.00	$ 1,148.00	$ 114,800.00	**$ 1,148.00**	**$ 114,800.00**	**$ 800.00**	**$ 80,000.00**
4.2	Insitu Structural Point Repair, 8" Diameter	LF	100	$ 1,300.00	$ 130,000.00	$ 1,300.00	$ 130,000.00	$ 1,300.00	$ 130,000.00	$ 1,300.00	$ 130,000.00	$ 1,300.00	$ 130,000.00	**$ 1,300.00**	**$ 130,000.00**	**$ 835.00**	**$ 83,500.00**
4.3	Insitu Structural Point Repair, 10" Diameter	LF	100	$ 1,454.00	$ 145,400.00	$ 1,454.00	$ 145,400.00	$ 1,454.00	$ 145,400.00	$ 1,454.00	$ 145,400.00	$ 1,454.00	$ 145,400.00	**$ 1,454.00**	**$ 145,400.00**	**$ 950.00**	**$ 95,000.00**
4.4	Insitu Structural Point Repair, 12" Diameter	LF	100	$ 1,607.00	$ 160,700.00	$ 1,607.00	$ 160,700.00	$ 1,607.00	$ 160,700.00	$ 1,607.00	$ 160,700.00	$ 1,607.00	$ 160,700.00	**$ 1,607.00**	**$ 160,700.00**	**$ 1,050.00**	**$ 105,000.00**
4.5	Insitu Structural Point Repair, 15" Diameter	LF	100	$ 1,913.00	$ 191,300.00	$ 1,913.00	$ 191,300.00	$ 1,913.00	$ 191,300.00	$ 1,913.00	$ 191,300.00	$ 1,913.00	$ 191,300.00	**$ 1,913.00**	**$ 191,300.00**	**$ 1,250.00**	**$ 125,000.00**
4.6	Insitu Point Repair by Sectional Lining, 6" Diameter	LF	100	$ 883.00	$ 88,300.00	$ 883.00	$ 88,300.00	$ 883.00	$ 88,300.00	$ 883.00	$ 88,300.00	$ 883.00	$ 88,300.00	**$ 883.00**	**$ 88,300.00**	**$ 1,075.00**	**$ 107,500.00**
4.7	Insitu Point Repair by Sectional Lining, 8" Diameter	LF	100	$ 1,000.00	$ 100,000.00	$ 1,000.00	$ 100,000.00	$ 1,000.00	$ 100,000.00	$ 1,000.00	$ 100,000.00	$ 1,000.00	$ 100,000.00	**$ 1,000.00**	**$ 100,000.00**	**$ 1,235.00**	**$ 123,500.00**
4.8	Insitu Point Repair by Sectional Lining, 10" Diameter	LF	100	$ 1,118.00	$ 111,800.00	$ 1,118.00	$ 111,800.00	$ 1,118.00	$ 111,800.00	$ 1,118.00	$ 111,800.00	$ 1,118.00	$ 111,800.00	**$ 1,118.00**	**$ 111,800.00**	**$ 1,350.00**	**$ 135,000.00**
4.9	Insitu Point Repair by Sectional Lining, 12" Diameter	LF	100	$ 1,236.00	$ 123,600.00	$ 1,236.00	$ 123,600.00	$ 1,236.00	$ 123,600.00	$ 1,236.00	$ 123,600.00	$ 1,236.00	$ 123,600.00	**$ 1,236.00**	**$ 123,600.00**	**$ 1,475.00**	**$ 147,500.00**
4.10	Insitu Point Repair by Sectional Lining, 15" Diameter	LF	100	$ 1,471.00	$ 147,100.00	$ 1,471.00	$ 147,100.00	$ 1,471.00	$ 147,100.00	$ 1,471.00	$ 147,100.00	$ 1,471.00	$ 147,100.00	**$ 1,471.00**	**$ 147,100.00**	**$ 1,775.00**	**$ 177,500.00**
5.1	Sewer Lateral Rehabilitation – One Piece Main and Lateral Liner (Including the First 3 Feet of Lateral), 4" Diameter Lateral, BLD Type	EA	200	$ 4,313.00	$ 862,600.00	$ 4,313.00	$ 862,600.00	$ 4,313.00	$ 862,600.00	$ 4,313.00	$ 862,600.00	$ 4,313.00	$ 862,600.00	**$ 4,313.00**	**$ 862,600.00**	**$ 3,925.00**	**$ 785,000.00**
5.2	Sewer Lateral Rehabilitation – One Piece Main and Lateral Liner (Including the First 3 Feet of Lateral), 4" Diameter Lateral, LMK Type	EA	200	$ 4,671.00	$ 934,200.00	$ 4,671.00	$ 934,200.00	$ 4,671.00	$ 934,200.00	$ 4,671.00	$ 934,200.00	$ 4,671.00	$ 934,200.00	**$ 4,671.00**	**$ 934,200.00**	**$ 5,100.00**	**$ 1,020,000.00**
5.3	Sewer Lateral Rehabilitation – One Piece Main and Lateral Liner (Including the First 3 Feet of Lateral), 6" Diameter Lateral, BLD Type	EA	100	$ 4,563.00	$ 456,300.00	$ 4,563.00	$ 456,300.00	$ 4,563.00	$ 456,300.00	$ 4,563.00	$ 456,300.00	$ 4,563.00	$ 456,300.00	**$ 4,563.00**	**$ 456,300.00**	**$ 4,150.00**	**$ 415,000.00**
5.4	Sewer Lateral Rehabilitation – One Piece Main and Lateral Liner (Including the First 3 Feet of Lateral), 6" Diameter Lateral, LMK Type	EA	100	$ 4,630.00	$ 463,000.00	$ 4,630.00	$ 463,000.00	$ 4,630.00	$ 463,000.00	$ 4,630.00	$ 463,000.00	$ 4,630.00	$ 463,000.00	**$ 4,630.00**	**$ 463,000.00**	**$ 5,395.00**	**$ 539,500.00**
5.5	Sewer Lateral Rehabilitation – One Piece Main and Lateral Liner (Additional Feet of Lateral), 4" Diameter Lateral, BLD Type	LF	1,000	$ 79.00	$ 79,000.00	$ 79.00	$ 79,000.00	$ 79.00	$ 79,000.00	$ 79.00	$ 79,000.00	$ 79.00	$ 79,000.00	**$ 79.00**	**$ 79,000.00**	**$ 85.50**	**$ 85,500.00**
5.6	Sewer Lateral Rehabilitation – One Piece Main and Lateral Liner (Additional Feet of Lateral), 4" Diameter Lateral, LMK Type	LF	1,000	$ 69.00	$ 69,000.00	$ 69.00	$ 69,000.00	$ 69.00	$ 69,000.00	$ 69.00	$ 69,000.00	$ 69.00	$ 69,000.00	**$ 69.00**	**$ 69,000.00**	**$ 110.00**	**$ 110,000.00**
5.7	Sewer Lateral Rehabilitation – One Piece Main and Lateral Liner (Additional Feet of Lateral), 6" Diameter Lateral, BLD Type	LF	500	$ 100.00	$ 50,000.00	$ 100.00	$ 50,000.00	$ 100.00	$ 50,000.00	$ 100.00	$ 50,000.00	$ 100.00	$ 50,000.00	**$ 100.00**	**$ 50,000.00**	**$ 108.00**	**$ 54,000.00**
5.8	Sewer Lateral Rehabilitation – One Piece Main and Lateral Liner (Additional Feet of Lateral), 6" Diameter Lateral, LMK Type	LF	500	$ 69.00	$ 34,500.00	$ 69.00	$ 34,500.00	$ 69.00	$ 34,500.00	$ 69.00	$ 34,500.00	$ 69.00	$ 34,500.00	**$ 69.00**	**$ 34,500.00**	**$ 140.00**	**$ 70,000.00**
5.9	Sewer Lateral Rehabilitation – Standard Lateral Liner, 4" Diameter Lateral, BLD Type	LF	500	$ 295.00	$ 147,500.00	$ 295.00	$ 147,500.00	$ 295.00	$ 147,500.00	$ 295.00	$ 147,500.00	$ 295.00	$ 147,500.00	**$ 295.00**	**$ 147,500.00**	**$ 285.00**	**$ 142,500.00**
5.10	Sewer Lateral Rehabilitation – Standard Lateral Liner, 4" Diameter Lateral, LMK Type	LF	500	$ 177.00	$ 88,500.00	$ 177.00	$ 88,500.00	$ 177.00	$ 88,500.00	$ 177.00	$ 88,500.00	$ 177.00	$ 88,500.00	**$ 177.00**	**$ 88,500.00**	**$ 370.00**	**$ 185,000.00**
5.11	Sewer Lateral Rehabilitation – Standard Lateral Liner, 6" Diameter Lateral, BLD Type	LF	500	$ 324.00	$ 162,000.00	$ 324.00	$ 162,000.00	$ 324.00	$ 162,000.00	$ 324.00	$ 162,000.00	$ 324.00	$ 162,000.00	**$ 324.00**	**$ 162,000.00**	**$ 313.00**	**$ 156,500.00**
5.12	Sewer Lateral Rehabilitation – Standard Lateral Liner, 6" Diameter Lateral, LMK Type	LF	500	$ 177.00	$ 88,500.00	$ 177.00	$ 88,500.00	$ 177.00	$ 88,500.00	$ 177.00	$ 88,500.00	$ 177.00	$ 88,500.00	**$ 177.00**	**$ 88,500.00**	**$ 407.00**	**$ 203,500.00**
5.13	LACP Compliant “Lateral Launch” CCTV Pipeline Inspection	EA	500	$ 375.00	$ 187,500.00	$ 375.00	$ 187,500.00	$ 375.00	$ 187,500.00	$ 375.00	$ 187,500.00	$ 375.00	$ 187,500.00	**$ 375.00**	**$ 187,500.00**	**$ 370.00**	**$ 185,000.00**
5.14	“Lateral Launch” Lateral Locating for Cleanout Installation	EA	500	$ 400.00	$ 200,000.00	$ 400.00	$ 200,000.00	$ 400.00	$ 200,000.00	$ 400.00	$ 200,000.00	$ 400.00	$ 200,000.00	**$ 400.00**	**$ 200,000.00**	**$ 484.00**	**$ 242,000.00**
5.15	Install Cleanout on Existing Lateral, 0'-6' Depth, Within Pavement/Sidewalk	EA	50	$ 4,118.00	$ 205,900.00	$ 4,118.00	$ 205,900.00	$ 4,353.00	$ 217,650.00	$ 4,353.00	$ 217,650.00	$ 4,353.00	$ 217,650.00	**$ 4,259.00**	**$ 212,950.00**	**$ 4,775.00**	**$ 238,750.00**
5.16	Install Cleanout on Existing Lateral, 0'-6' Depth, Outside of Pavement/Sidewalk	EA	150	$ 2,941.00	$ 441,150.00	$ 2,942.00	$ 441,300.00	$ 3,177.00	$ 476,550.00	$ 3,177.00	$ 476,550.00	$ 3,177.00	$ 476,550.00	**$ 3,082.80**	**$ 462,420.00**	**$ 4,200.00**	**$ 630,000.00**

HRSD 2025 On Call Sewer Rehabilitation

Line Item with Variable Pricing from Vortex Services LLC by Service Area

				Vortex Services LLC												SAK	
				Service Area 1 Chesapeake Norfolk Portsmouth Suffolk Virginia Beach		Service Area 2 Hampton James City County Newport News Poquoson Williamsburg York County		Service Area 3 Gloucester King William King and Queen Matthews Middlesex New Kent		Service Area 4 Isle of Wight Surry		Service Area 5 Nassawadox Onancock		Vortex Services LLC Average (All Areas)		SAK All Areas	
Item No.	Description	Unit	Quantity (Not Guaranteed)	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price
5.17	Install Cleanout on Existing Lateral, 6'-12' Depth, Within Pavement/Sidewalk	EA	100	$ 4,706.00	$ 470,600.00	$ 4,706.00	$ 470,600.00	$ 4,942.00	$ 494,200.00	$ 4,942.00	$ 494,200.00	$ 4,942.00	$ 494,200.00	**$ 4,847.60**	**$ 484,760.00**	**$ 5,900.00**	**$ 590,000.00**
5.18	Install Cleanout on Existing Lateral, 6'-12' Depth, Outside of Pavement/Sidewalk	EA	150	$ 5,294.00	$ 794,100.00	$ 5,295.00	$ 794,250.00	$ 5,530.00	$ 829,500.00	$ 5,530.00	$ 829,500.00	$ 5,530.00	$ 829,500.00	**$ 5,435.80**	**$ 815,370.00**	**$ 5,340.00**	**$ 801,000.00**
6.1	Sewer Point Repair by Excavation, 6" Diameter, 0'-6' Depth, Beneath Pavement/Sidewalk	LF	100	$ 1,412.00	$ 141,200.00	$ 1,589.00	$ 158,900.00	$ 1,765.00	$ 176,500.00	$ 1,765.00	$ 176,500.00	$ 1,883.00	$ 188,300.00	**$ 1,682.80**	**$ 168,280.00**	**$ 2,100.00**	**$ 210,000.00**
6.2	Sewer Point Repair by Excavation, 8" Diameter, 0'-6' Depth, Beneath Pavement/Sidewalk	LF	100	$ 1,441.00	$ 144,100.00	$ 1,618.00	$ 161,800.00	$ 1,795.00	$ 179,500.00	$ 1,795.00	$ 179,500.00	$ 1,912.00	$ 191,200.00	**$ 1,712.20**	**$ 171,220.00**	**$ 2,145.00**	**$ 214,500.00**
6.3	Sewer Point Repair by Excavation, 10" Diameter, 0'-6' Depth, Beneath Pavement/Sidewalk	LF	100	$ 1,471.00	$ 147,100.00	$ 1,648.00	$ 164,800.00	$ 1,824.00	$ 182,400.00	$ 1,824.00	$ 182,400.00	$ 1,942.00	$ 194,200.00	**$ 1,741.80**	**$ 174,180.00**	**$ 2,170.00**	**$ 217,000.00**
6.4	Sewer Point Repair by Excavation, 12" Diameter, 0'-6' Depth, Beneath Pavement/Sidewalk	LF	100	$ 1,500.00	$ 150,000.00	$ 1,677.00	$ 167,700.00	$ 1,853.00	$ 185,300.00	$ 1,853.00	$ 185,300.00	$ 1,971.00	$ 197,100.00	**$ 1,770.80**	**$ 177,080.00**	**$ 2,200.00**	**$ 220,000.00**
6.5	Sewer Point Repair by Excavation, 15" Diameter, 0'-6' Depth, Beneath Pavement/Sidewalk	LF	100	$ 1,559.00	$ 155,900.00	$ 1,736.00	$ 173,600.00	$ 1,912.00	$ 191,200.00	$ 1,912.00	$ 191,200.00	$ 2,030.00	$ 203,000.00	**$ 1,829.80**	**$ 182,980.00**	**$ 2,300.00**	**$ 230,000.00**
6.6	Sewer Point Repair by Excavation, 6" Diameter, 0'-6' Depth, Outside of Pavement/Sidewalk	LF	100	$ 1,294.00	$ 129,400.00	$ 1,471.00	$ 147,100.00	$ 1,648.00	$ 164,800.00	$ 1,648.00	$ 164,800.00	$ 1,765.00	$ 176,500.00	**$ 1,565.20**	**$ 156,520.00**	**$ 1,990.00**	**$ 199,000.00**
6.7	Sewer Point Repair by Excavation, 8" Diameter, 0'-6' Depth, Outside of Pavement/Sidewalk	LF	100	$ 1,324.00	$ 132,400.00	$ 1,500.00	$ 150,000.00	$ 1,677.00	$ 167,700.00	$ 1,677.00	$ 167,700.00	$ 1,795.00	$ 179,500.00	**$ 1,594.60**	**$ 159,460.00**	**$ 2,030.00**	**$ 203,000.00**
6.8	Sewer Point Repair by Excavation, 10" Diameter, 0'-6' Depth, Outside of Pavement/Sidewalk	LF	100	$ 1,353.00	$ 135,300.00	$ 1,530.00	$ 153,000.00	$ 1,706.00	$ 170,600.00	$ 1,706.00	$ 170,600.00	$ 1,824.00	$ 182,400.00	**$ 1,623.80**	**$ 162,380.00**	**$ 2,060.00**	**$ 206,000.00**
6.9	Sewer Point Repair by Excavation, 12" Diameter, 0'-6' Depth, Outside of Pavement/Sidewalk	LF	100	$ 1,382.00	$ 138,200.00	$ 1,559.00	$ 155,900.00	$ 1,736.00	$ 173,600.00	$ 1,736.00	$ 173,600.00	$ 1,853.00	$ 185,300.00	**$ 1,653.20**	**$ 165,320.00**	**$ 2,090.00**	**$ 209,000.00**
6.10	Sewer Point Repair by Excavation, 15" Diameter, 0'-6' Depth, Outside of Pavement/Sidewalk	LF	100	$ 1,441.00	$ 144,100.00	$ 1,618.00	$ 161,800.00	$ 1,795.00	$ 179,500.00	$ 1,795.00	$ 179,500.00	$ 1,912.00	$ 191,200.00	**$ 1,712.20**	**$ 171,220.00**	**$ 2,190.00**	**$ 219,000.00**
6.11	Sewer Point Repair by Excavation, 6" Diameter, 6'-12' Depth, Beneath Pavement/Sidewalk	LF	100	$ 2,176.00	$ 217,600.00	$ 2,353.00	$ 235,300.00	$ 2,530.00	$ 253,000.00	$ 2,530.00	$ 253,000.00	$ 2,648.00	$ 264,800.00	**$ 2,447.40**	**$ 244,740.00**	**$ 2,815.00**	**$ 281,500.00**
6.12	Sewer Point Repair by Excavation, 8" Diameter, 6'-12' Depth, Beneath Pavement/Sidewalk	LF	100	$ 2,235.00	$ 223,500.00	$ 2,412.00	$ 241,200.00	$ 2,589.00	$ 258,900.00	$ 2,589.00	$ 258,900.00	$ 2,706.00	$ 270,600.00	**$ 2,506.20**	**$ 250,620.00**	**$ 2,970.00**	**$ 297,000.00**
6.13	Sewer Point Repair by Excavation, 10" Diameter, 6'-12' Depth, Beneath Pavement/Sidewalk	LF	100	$ 2,294.00	$ 229,400.00	$ 2,471.00	$ 247,100.00	$ 2,648.00	$ 264,800.00	$ 2,648.00	$ 264,800.00	$ 2,765.00	$ 276,500.00	**$ 2,565.20**	**$ 256,520.00**	**$ 3,025.00**	**$ 302,500.00**
6.14	Sewer Point Repair by Excavation, 12" Diameter, 6'-12' Depth, Beneath Pavement/Sidewalk	LF	100	$ 2,353.00	$ 235,300.00	$ 2,530.00	$ 253,000.00	$ 2,706.00	$ 270,600.00	$ 2,706.00	$ 270,600.00	$ 2,824.00	$ 282,400.00	**$ 2,623.80**	**$ 262,380.00**	**$ 3,085.00**	**$ 308,500.00**
6.15	Sewer Point Repair by Excavation, 15" Diameter, 6'-12' Depth, Beneath Pavement/Sidewalk	LF	100	$ 2,588.00	$ 258,800.00	$ 2,765.00	$ 276,500.00	$ 2,942.00	$ 294,200.00	$ 2,942.00	$ 294,200.00	$ 3,059.00	$ 305,900.00	**$ 2,859.20**	**$ 285,920.00**	**$ 3,125.00**	**$ 312,500.00**
6.16	Sewer Point Repair by Excavation, 6" Diameter, 6'-12' Depth, Outside of Pavement/Sidewalk	LF	100	$ 2,000.00	$ 200,000.00	$ 2,177.00	$ 217,700.00	$ 2,353.00	$ 235,300.00	$ 2,353.00	$ 235,300.00	$ 2,471.00	$ 247,100.00	**$ 2,270.80**	**$ 227,080.00**	**$ 2,640.00**	**$ 264,000.00**
6.17	Sewer Point Repair by Excavation, 8" Diameter, 6'-12' Depth, Outside of Pavement/Sidewalk	LF	100	$ 2,059.00	$ 205,900.00	$ 2,236.00	$ 223,600.00	$ 2,412.00	$ 241,200.00	$ 2,412.00	$ 241,200.00	$ 2,530.00	$ 253,000.00	**$ 2,329.80**	**$ 232,980.00**	**$ 2,800.00**	**$ 280,000.00**
6.18	Sewer Point Repair by Excavation, 10" Diameter, 6'-12' Depth, Outside of Pavement/Sidewalk	LF	100	$ 2,118.00	$ 211,800.00	$ 2,295.00	$ 229,500.00	$ 2,471.00	$ 247,100.00	$ 2,471.00	$ 247,100.00	$ 2,589.00	$ 258,900.00	**$ 2,388.80**	**$ 238,880.00**	**$ 2,855.00**	**$ 285,500.00**
6.19	Sewer Point Repair by Excavation, 12" Diameter, 6'-12' Depth, Outside of Pavement/Sidewalk	LF	100	$ 2,176.00	$ 217,600.00	$ 2,353.00	$ 235,300.00	$ 2,530.00	$ 253,000.00	$ 2,530.00	$ 253,000.00	$ 2,648.00	$ 264,800.00	**$ 2,447.40**	**$ 244,740.00**	**$ 2,915.00**	**$ 291,500.00**
6.20	Sewer Point Repair by Excavation, 15" Diameter, 6'-12' Depth, Outside of Pavement/Sidewalk	LF	100	$ 2,412.00	$ 241,200.00	$ 2,589.00	$ 258,900.00	$ 2,765.00	$ 276,500.00	$ 2,765.00	$ 276,500.00	$ 2,883.00	$ 288,300.00	**$ 2,682.80**	**$ 268,280.00**	**$ 2,955.00**	**$ 295,500.00**
7.1	MACP Compliant Manhole Inspections, Level 1, Within Right of Way	EA	200	$ 175.00	$ 35,000.00	$ 175.00	$ 35,000.00	$ 175.00	$ 35,000.00	$ 175.00	$ 35,000.00	$ 175.00	$ 35,000.00	**$ 175.00**	**$ 35,000.00**	**$ 227.00**	**$ 45,400.00**
7.2	MACP Compliant Manhole Inspections, Level 2, Within Right of Way	EA	200	$ 300.00	$ 60,000.00	$ 300.00	$ 60,000.00	$ 300.00	$ 60,000.00	$ 300.00	$ 60,000.00	$ 300.00	$ 60,000.00	**$ 300.00**	**$ 60,000.00**	**$ 455.00**	**$ 91,000.00**
7.3	MACP Compliant Manhole Inspections, Level 1, Outside of Right of Way	EA	200	$ 200.00	$ 40,000.00	$ 200.00	$ 40,000.00	$ 200.00	$ 40,000.00	$ 200.00	$ 40,000.00	$ 200.00	$ 40,000.00	**$ 200.00**	**$ 40,000.00**	**$ 228.00**	**$ 45,600.00**
7.4	MACP Compliant Manhole Inspections, Level 2, Outside of Right of Way	EA	200	$ 325.00	$ 65,000.00	$ 325.00	$ 65,000.00	$ 325.00	$ 65,000.00	$ 325.00	$ 65,000.00	$ 325.00	$ 65,000.00	**$ 325.00**	**$ 65,000.00**	**$ 569.00**	**$ 113,800.00**

HRSD 2025 On Call Sewer Rehabilitation

Line Item with Variable Pricing from Vortex Services LLC by Service Area

				Vortex Services LLC												SAK	
				Service Area 1 Chesapeake Norfolk Portsmouth Suffolk Virginia Beach		**Service Area 2** Hampton James City County Newport News Poquoson Williamsburg York County		**Service Area 3** Gloucester King William King and Queen Matthews Middlesex New Kent		**Service Area 4** Isle of Wight Surry		**Service Area 5** Nassawadox Onancock		Vortex Services LLC Average (All Areas)		SAK All Areas	
Item No.	Description	Unit	Quantity (Not Guaranteed)	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price
7.5	Manhole Structure and/or Bench and Invert Reconstruction	SF	200	$ 73.00	$ 14,600.00	$ 73.00	$ 14,600.00	$ 73.00	$ 14,600.00	$ 73.00	$ 14,600.00	$ 73.00	$ 14,600.00	**$ 73.00**	**$ 14,600.00**	**$ 171.00**	**$ 34,200.00**
7.6	Lining of Existing Manholes, Standard Cementitious Liner, 4' Diameter Manhole	VF	250	$ 500.00	$ 125,000.00	$ 500.00	$ 125,000.00	$ 500.00	$ 125,000.00	$ 500.00	$ 125,000.00	$ 500.00	$ 125,000.00	**$ 500.00**	**$ 125,000.00**	**$ 273.00**	**$ 68,250.00**
7.7	Lining of Existing Manholes, Standard Cementitious Liner, 5' Diameter Manhole	VF	250	$ 511.00	$ 127,750.00	$ 511.00	$ 127,750.00	$ 511.00	$ 127,750.00	$ 511.00	$ 127,750.00	$ 511.00	$ 127,750.00	**$ 511.00**	**$ 127,750.00**	**$ 342.00**	**$ 85,500.00**
7.8	Lining of Existing Manholes, Enhanced Cementitious Liner, 4' Diameter Manhole	VF	1,000	$ 509.00	$ 509,000.00	$ 509.00	$ 509,000.00	$ 509.00	$ 509,000.00	$ 509.00	$ 509,000.00	$ 509.00	$ 509,000.00	**$ 509.00**	**$ 509,000.00**	**$ 295.00**	**$ 295,000.00**
7.9	Lining of Existing Manholes, Enhanced Cementitious Liner, 5' Diameter Manhole	VF	250	$ 518.00	$ 129,500.00	$ 518.00	$ 129,500.00	$ 518.00	$ 129,500.00	$ 518.00	$ 129,500.00	$ 518.00	$ 129,500.00	**$ 518.00**	**$ 129,500.00**	**$ 410.00**	**$ 102,500.00**
7.10	Lining of Existing Manholes, 100% Solids Epoxy, 4' Diameter Manhole	VF	1,000	$ 572.00	$ 572,000.00	$ 572.00	$ 572,000.00	$ 572.00	$ 572,000.00	$ 572.00	$ 572,000.00	$ 572.00	$ 572,000.00	**$ 572.00**	**$ 572,000.00**	**$ 540.00**	**$ 540,000.00**
7.11	Lining of Existing Manholes, 100% Solids Epoxy, 5' Diameter Manhole	VF	250	$ 578.00	$ 144,500.00	$ 578.00	$ 144,500.00	$ 578.00	$ 144,500.00	$ 578.00	$ 144,500.00	$ 578.00	$ 144,500.00	**$ 578.00**	**$ 144,500.00**	**$ 683.00**	**$ 170,750.00**
7.12	Manhole Frame and Cover Replacement, Watertight, Within Pavement/Sidewalk	EA	500	$ 2,750.00	$ 1,375,000.00	$ 2,750.00	$ 1,375,000.00	$ 2,750.00	$ 1,375,000.00	$ 2,750.00	$ 1,375,000.00	$ 2,750.00	$ 1,375,000.00	**$ 2,750.00**	**$ 1,375,000.00**	**$ 8,245.00**	**$ 4,122,500.00**
7.13	Manhole Frame and Cover Replacement, Non-watertight, Within Pavement/Sidewalk	EA	250	$ 2,500.00	$ 625,000.00	$ 2,500.00	$ 625,000.00	$ 2,500.00	$ 625,000.00	$ 2,500.00	$ 625,000.00	$ 2,500.00	$ 625,000.00	**$ 2,500.00**	**$ 625,000.00**	**$ 7,900.00**	**$ 1,975,000.00**
7.14	Manhole Frame and Cover Replacement, Watertight, Outside of Pavement/Sidewalk	EA	500	$ 2,300.00	$ 1,150,000.00	$ 2,300.00	$ 1,150,000.00	$ 2,300.00	$ 1,150,000.00	$ 2,300.00	$ 1,150,000.00	$ 2,300.00	$ 1,150,000.00	**$ 2,300.00**	**$ 1,150,000.00**	**$ 7,674.00**	**$ 3,837,000.00**
7.15	Manhole Frame and Cover Replacement, Non-watertight, Outside of Pavement/Sidewalk	EA	250	$ 2,000.00	$ 500,000.00	$ 2,000.00	$ 500,000.00	$ 2,000.00	$ 500,000.00	$ 2,000.00	$ 500,000.00	$ 2,000.00	$ 500,000.00	**$ 2,000.00**	**$ 500,000.00**	**$ 7,335.00**	**$ 1,833,750.00**
7.16	Manhole Frame/Chimney Seals (Internal)	EA	25	$ 800.00	$ 20,000.00	$ 800.00	$ 20,000.00	$ 800.00	$ 20,000.00	$ 800.00	$ 20,000.00	$ 800.00	$ 20,000.00	**$ 800.00**	**$ 20,000.00**	**$ 625.00**	**$ 15,625.00**
7.17	Manhole Frame/Chimney Sealant (Internal)	EA	25	$ 719.00	$ 17,975.00	$ 719.00	$ 17,975.00	$ 719.00	$ 17,975.00	$ 719.00	$ 17,975.00	$ 719.00	$ 17,975.00	**$ 719.00**	**$ 17,975.00**	**$ 625.00**	**$ 15,625.00**
8.1	Temporary Bypass Pumping, Flows greater than 0.5 MGD up to 2.0 MGD	EA/DAY	100	$ 3,000.00	$ 300,000.00	$ 3,000.00	$ 300,000.00	$ 3,000.00	$ 300,000.00	$ 3,000.00	$ 300,000.00	$ 3,000.00	$ 300,000.00	**$ 3,000.00**	**$ 300,000.00**	**$ 2,845.00**	**$ 284,500.00**
9.1	Light Sewer Cleaning, 6" Diameter	LF	500	$ 5.00	$ 2,500.00	$ 5.00	$ 2,500.00	$ 5.00	$ 2,500.00	$ 5.00	$ 2,500.00	$ 5.00	$ 2,500.00	**$ 5.00**	**$ 2,500.00**	**$ 5.00**	**$ 2,500.00**
9.2	Light Sewer Cleaning, 8" - 12" Diameter	LF	3,000	$ 5.00	$ 15,000.00	$ 5.00	$ 15,000.00	$ 5.00	$ 15,000.00	$ 5.00	$ 15,000.00	$ 5.00	$ 15,000.00	**$ 5.00**	**$ 15,000.00**	**$ 5.50**	**$ 16,500.00**
9.3	Light Sewer Cleaning, 15" Diameter	LF	500	$ 5.00	$ 2,500.00	$ 5.00	$ 2,500.00	$ 5.00	$ 2,500.00	$ 5.00	$ 2,500.00	$ 5.00	$ 2,500.00	**$ 5.00**	**$ 2,500.00**	**$ 7.00**	**$ 3,500.00**
9.4	Heavy Sewer Cleaning	HR	500	$ 350.00	$ 175,000.00	$ 350.00	$ 175,000.00	$ 350.00	$ 175,000.00	$ 350.00	$ 175,000.00	$ 350.00	$ 175,000.00	**$ 350.00**	**$ 175,000.00**	**$ 710.00**	**$ 355,000.00**
9.5	PACP Compliant CCTV Pipeline Inspection, 6" Diameter	LF	500	$ 5.00	$ 2,500.00	$ 5.00	$ 2,500.00	$ 5.00	$ 2,500.00	$ 5.00	$ 2,500.00	$ 5.00	$ 2,500.00	**$ 5.00**	**$ 2,500.00**	**$ 3.00**	**$ 1,500.00**
9.6	PACP Compliant CCTV Pipeline Inspection, 8" - 12" Diameter	LF	3,000	$ 5.00	$ 15,000.00	$ 5.00	$ 15,000.00	$ 5.00	$ 15,000.00	$ 5.00	$ 15,000.00	$ 5.00	$ 15,000.00	**$ 5.00**	**$ 15,000.00**	**$ 4.00**	**$ 12,000.00**
9.7	PACP Compliant CCTV Pipeline Inspection, 15" Diameter	LF	500	$ 5.00	$ 2,500.00	$ 5.00	$ 2,500.00	$ 5.00	$ 2,500.00	$ 5.00	$ 2,500.00	$ 5.00	$ 2,500.00	**$ 5.00**	**$ 2,500.00**	**$ 6.00**	**$ 3,000.00**
10.1	Abandonment with Flowable Fill (Pipes and Structures)	CY	500	$ 471.00	$ 235,500.00	$ 471.00	$ 235,500.00	$ 471.00	$ 235,500.00	$ 589.00	$ 294,500.00	$ 706.00	$ 353,000.00	**$ 541.60**	**$ 270,800.00**	**$ 680.00**	**$ 340,000.00**
11.1	Traffic Control Plans and Permitting	EA	100	$ 750.00	$ 75,000.00	$ 750.00	$ 75,000.00	$ 750.00	$ 75,000.00	$ 750.00	$ 75,000.00	$ 750.00	$ 75,000.00	**$ 750.00**	**$ 75,000.00**	**$ 250.00**	**$ 25,000.00**
11.2	Flagger Service (Certified)	HR	1,000	$ 120.00	$ 120,000.00	$ 120.00	$ 120,000.00	$ 120.00	$ 120,000.00	$ 120.00	$ 120,000.00	$ 120.00	$ 120,000.00	**$ 120.00**	**$ 120,000.00**	**$ 432.00**	**$ 432,000.00**
11.3	Flagger Service (Police-assisted))	HR	1,000	$ 150.00	$ 150,000.00	$ 150.00	$ 150,000.00	$ 150.00	$ 150,000.00	$ 150.00	$ 150,000.00	$ 150.00	$ 150,000.00	**$ 150.00**	**$ 150,000.00**	**$ 564.00**	**$ 564,000.00**
11.4	Truck Mounted Attenuator (TMA)	EA/DAY	500	$ 750.00	$ 375,000.00	$ 750.00	$ 375,000.00	$ 750.00	$ 375,000.00	$ 750.00	$ 375,000.00	$ 750.00	$ 375,000.00	**$ 750.00**	**$ 375,000.00**	**$ 569.00**	**$ 284,500.00**

HRSD 2025 On Call Sewer Rehabilitation

Line Item with Variable Pricing from Vortex Services LLC by Service Area

				Vortex Services LLC												SAK	
				Service Area 1 Chesapeake Norfolk Portsmouth Suffolk Virginia Beach		**Service Area 2** Hampton James City County Newport News Poquoson Williamsburg York County		**Service Area 3** Gloucester King William King and Queen Matthews Middlesex New Kent		**Service Area 4** Isle of Wight Surry		**Service Area 5** Nassawadox Onancock		Vortex Services LLC Average (All Areas)		SAK All Areas	
Item No.	**Description**	**Unit**	**Quantity** **(Not Guaranteed)**	**Unit Price**	**Extended Price**	**Unit Price**	**Extended Price**	**Unit Price**	**Extended Price**	**Unit Price**	**Extended Price**	**Unit Price**	**Extended Price**	**Unit Price**	**Extended Price**	**Unit Price**	**Extended Price**
11.5	Portable Changeable Message Sign (PCMS)	EA/DAY	1,000	$ 45.00	$ 45,000.00	$ 45.00	$ 45,000.00	$ 45.00	$ 45,000.00	$ 45.00	$ 45,000.00	$ 45.00	$ 45,000.00	**$ 45.00**	**$ 45,000.00**	**$ 228.00**	**$ 228,000.00**
11.6	Electronic Arrow	EA/DAY	500	$ 150.00	$ 75,000.00	$ 150.00	$ 75,000.00	$ 150.00	$ 75,000.00	$ 150.00	$ 75,000.00	$ 150.00	$ 75,000.00	**$ 150.00**	**$ 75,000.00**	**$ 86.00**	**$ 43,000.00**
11.7	Group 1 Channelizing Devices	EA/DAY	10,000	$ 20.00	$ 200,000.00	$ 20.00	$ 200,000.00	$ 20.00	$ 200,000.00	$ 20.00	$ 200,000.00	$ 20.00	$ 200,000.00	**$ 20.00**	**$ 200,000.00**	**$ 0.60**	**$ 6,000.00**
11.8	Group 2 Channelizing Devices	EA/DAY	10,000	$ 20.00	$ 200,000.00	$ 20.00	$ 200,000.00	$ 20.00	$ 200,000.00	$ 20.00	$ 200,000.00	$ 20.00	$ 200,000.00	**$ 20.00**	**$ 200,000.00**	**$ 0.60**	**$ 6,000.00**
11.9	Type III Barricades	EA/DAY	1,000	$ 10.00	$ 10,000.00	$ 10.00	$ 10,000.00	$ 10.00	$ 10,000.00	$ 10.00	$ 10,000.00	$ 10.00	$ 10,000.00	**$ 10.00**	**$ 10,000.00**	**$ 9.00**	**$ 9,000.00**
11.10	Traffic Barrier Service, Standard	LF/DAY	3,000	$ 3.00	$ 9,000.00	$ 3.00	$ 9,000.00	$ 3.00	$ 9,000.00	$ 3.00	$ 9,000.00	$ 3.00	$ 9,000.00	**$ 3.00**	**$ 9,000.00**	**$ 57.00**	**$ 171,000.00**
11.11	Construction Signs	EA/DAY	3,000	$ 20.00	$ 60,000.00	$ 20.00	$ 60,000.00	$ 20.00	$ 60,000.00	$ 20.00	$ 60,000.00	$ 20.00	$ 60,000.00	**$ 20.00**	**$ 60,000.00**	**$ 8.00**	**$ 24,000.00**
12.1	Select Material	CY	1,500	$ 177.00	$ 265,500.00	$ 177.00	$ 265,500.00	$ 206.00	$ 309,000.00	$ 206.00	$ 309,000.00	$ 206.00	$ 309,000.00	**$ 194.40**	**$ 291,600.00**	**$ 199.00**	**$ 298,500.00**
12.2	Undercut Excavation	CY	500	$ 118.00	$ 59,000.00	$ 118.00	$ 59,000.00	$ 118.00	$ 59,000.00	$ 118.00	$ 59,000.00	$ 118.00	$ 59,000.00	**$ 118.00**	**$ 59,000.00**	**$ 137.00**	**$ 68,500.00**
12.3	Backfill of Undercut Excavation	CY	500	$ 118.00	$ 59,000.00	$ 118.00	$ 59,000.00	$ 118.00	$ 59,000.00	$ 118.00	$ 59,000.00	$ 118.00	$ 59,000.00	**$ 118.00**	**$ 59,000.00**	**$ 137.00**	**$ 68,500.00**
Total of all Extended Prices for Unit Price Work					$ 21,768,225.00		$ 22,122,425.00		$ 22,624,775.00		$ 22,683,775.00		$ 22,977,575.00		**$ 22,435,355.00**		**$ 33,340,700.00**

NOTE: *Quantities shall be determined by an authorized Work Order and are in no way a guarantee of work associated with this Contract.*

HPRRIP 2025 Subcontractor Quotes

Item Description	UOM	Average UP	Tri State	SAK	Azuria	ART
Sanitary Sewer Pipe Construction and Rehabilitation						
8-Inch Diameter Pipe - Open Cut or Pipe Burst - Paved	L.F.	$ 2,250	$ 2,250			
8-Inch Diameter Pipe - Open Cut or Pipe Burst - Unpaved	L.F.	$ 1,900	$ 1,900			
10-Inch Diameter Pipe - Open Cut or Pipe Burst - Paved	L.F.	$ 2,250	$ 2,250			
10-Inch Diameter Pipe - Open Cut or Pipe Burst - Unpaved	L.F.	$ 1,900	$ 1,900			
12-Inch Diameter Pipe - Open Cut or Pipe Burst - Unpaved	L.F.	$ 2,150	$ 2,150			
12-Inch Diameter Pipe - Open Cut or Pipe Burst - Paved	L.F.	$ 2,500	$ 2,500			
15-inch Diameter Pipe - Open Cut or Pipe Burst - Unpaved	L.F.	$ 2,300	$ 2,300			
15-inch Diameter Pipe - Open Cut or Pipe Burst - Paved	L.F.	$ 2,650	$ 2,650			
18-inch Diameter Pipe - Open Cut or Pipe Burst - Unpaved	L.F.	$ 2,300	$ 2,300			
18-inch Diameter Pipe - Open Cut or Pipe Burst - Paved	L.F.	$ 2,650	$ 2,650			
Point Repairs						
8-Inch Diameter Pipe - 5ft or less (Paved)	Each	$ 22,500	$ 22,500			
8-Inch Diameter Pipe - 5ft or less (Unpaved)	Each	$ 19,000	$ 19,000			
10-Inch Diameter Pipe - 5ft or less (Paved)	Each	$ 22,500	$ 22,500			
10-Inch Diameter Pipe - 5ft or less (Unpaved)	Each	$ 19,000	$ 19,000			
12-Inch Diameter Pipe - 5ft or less (Paved)	Each	$ 25,000	$ 25,000			
12-Inch Diameter Pipe - 5ft or less (Unpaved)	Each	$ 21,500	$ 21,500			
15-Inch Diameter Pipe - 5ft or less (Paved)	Each	$ 26,500	$ 26,500			
15-Inch Diameter Pipe - 5ft or less (Unpaved)	Each	$ 23,000	$ 23,000			
18-Inch Diameter Pipe - 5ft or less (Paved)	Each	$ 26,500	$ 26,500			
18-Inch Diameter Pipe - 5ft or less (Unpaved)	Each	$ 23,000	$ 23,000			
Additional linear foot point repair - 8-Inch Diameter Pipe (Paved)	L.F.	$ 2,250	$ 2,250			
Additional linear foot point repair - 8-Inch Diameter Pipe (Unpaved)	L.F.	$ 1,900	$ 1,900			
Additional linear foot point repair - 10-Inch Diameter Pipe (Paved)	L.F.	$ 2,250	$ 2,250			
Additional linear foot point repair - 10-Inch Diameter Pipe (Unpaved)	L.F.	$ 1,900	$ 1,900			
Additional linear foot point repair - 12-Inch Diameter Pipe (Paved)	L.F.	$ 2,500	$ 2,500			
Additional linear foot point repair - 12-Inch Diameter Pipe (Unpaved)	L.F.	$ 2,150	$ 2,150			
Additional linear foot point repair - 15-Inch Diameter Pipe (Paved)	L.F.	$ 2,650	$ 2,650			
Additional linear foot point repair - 15-Inch Diameter Pipe (Unpaved)	L.F.	$ 2,300	$ 2,300			
Additional linear foot point repair - 18-Inch Diameter Pipe (Paved)	L.F.	$ 2,650	$ 2,650			
Additional linear foot point repair - 18-Inch Diameter Pipe (Unpaved)	L.F.	$ 2,300	$ 2,300			
CIPP						
8-Inch Cured-In-Place Pipe Lining	L.F.	$ 60	$ 60	$ 56.07	$ 64.00	
10-Inch Cured-In-Place Pipe Lining	L.F.	$ 65	$ 65	$ 58.86	$ 71.00	
12-Inch Cured-In-Place Pipe Lining	L.F.	$ 81	$ 75	$ 75.64	$ 93.00	
15-Inch Cured-In-Place Pipe Lining	L.F.	$ 109	$ 105	$ 107.14	$ 116.00	
18-Inch Cured-In-Place Pipe Lining	L.F.	$ 132	$ 120	$ 120.36	$ 155.00	
CIPP Spot Repair						
8-Inch Main Sewer CIPP Point Repair - 5ft or less	Each	$ 4,883	$ 6,600	$ 3,166.67		
10-Inch Main Sewer CIPP Point Repair - 5ft or less	Each	$ 5,233	$ 7,000	$ 3,466.67		
12-Inch Main Sewer CIPP Point Repair - 5ft or less	Each	$ 5,900	$ 7,500	$ 4,300.00		
15-Inch Main Sewer CIPP Point Repair - 5ft or less	Each	$ 6,500	$ 8,000	$ 5,000.00		
18-Inch Main Sewer CIPP Point Repair - 5ft or less	Each	$ 7,400	$ 8,500	$ 6,300.00		
8-Inch Additional linear foot Main Sewer CIPP Point Repair	L.F.	$ 663	$ 825	$ 500.00		
10-Inch Additional linear foot Main Sewer CIPP Point Repair	L.F.	$ 738	$ 875	$ 600.00		
12-Inch Additional linear foot Main Sewer CIPP Point Repair	L.F.	$ 919	$ 938	$ 900.00		
15-Inch Additional linear foot Main Sewer CIPP Point Repair	L.F.	$ 1,000	$ 1,000	$ 1,000.00		
18-Inch Additional linear foot Main Sewer CIPP Point Repair	L.F.	$ 1,131	$ 1,063	$ 1,200.00		
Service Lateral Pipe Construction and Rehabilitation						
Open Cut Replace Service Lateral Connection (Paved - Includes 5-feet)	Each	$ 10,600	$ 10,600			
Open Cut Replace Service Lateral Connection (Unpaved - Includes 5-feet)	Each	$ 9,000	$ 9,000			
Open Cut Lateral Replacement (Paved - Beyond 5-feet)	L.F.	$ 2,120	$ 2,120			
Open Cut Lateral Replacement (Unpaved - Beyond 5-feet)	L.F.	$ 902	$ 1,800	$3.00		
Lateral Connection Full Wrap CIPP Liner (Short Length Typ 18" - 24")	Each	$ 3,783	$ 4,000	$3,566.67		
Lateral Connection Full-Wrap CIPP Long Liner (Initial 5-feet)	Each	$ 5,347	$ 5,500	$5,193.33		
Lateral CIPP Long Liner (Beyond 5-feet)	L.F.	$ 88	$ 100	$ 75.00		
Intruding Lateral Removal	Each	$ 800	$ 1,250	$ 350.00		
Lateral Grouting (including 3 gallons of grout)	Each	$ 1,156		$1,156.25		
Mainline Joint Grouting (including 3 gallons of grout)	Each	$ 394		$393.75		
Additional Grout	Gal	$ 6,025		$6,025.00		

HPRRIP 2025 Subcontractor Quotes

Item Description	UOM	Average UP	Tri State	SAK	Azuria	ART
Manhole Rehabilitation						
Install Internal Manhole Chimney Seal	Each	$ 925	$ 850			1000
Replace Manhole Frame & Cover and Chimney (Paved)	Each	$ 3,750	$ 3,500			4000
Replace Manhole Frame & Cover and Chimney (Unpaved)	Each	$ 3,250	$ 3,000			3500
Replace WATERTIGHT Manhole Frame & Cover and Chimney (Paved)	Each					5000
Replace WATERTIGHT Manhole Frame & Cover and Chimney (Unpaved)	Each					4500
Replace Cone	Each	$ 12,500	$ 12,500			
Replace Chimney (Paved)	Each	$ 12,500	$ 12,500			
Replace Chimney (Unpaved)	Each	$ 12,000	$ 12,000			
Cementitious Liner (48-inch)	V.F.	$ 330	$ 375	$ 285.00		
Cementitious Liner (60-inch)	V.F.	$ 432	$ 490	$ 373.75		
Line Manhole - Epoxy (48-inch)	V.F.	$ 359	$ 325	$ 392.50		
Line Manhole - Epoxy (60-Inch)	V.F.	$ 469	$ 425	$ 512.50		
Reconstruct Bench and Trough	Each	$ 1,210	$ 1,850	$ 570.00		
Remove and Replace Manhole - Paved	Each	$ 12,859	$ 25,000	$ 718.75		
Remove and Replace Manhole - Unpaved	Each	$ 10,138	$ 20,200	$ 75.00		
Remove and Replace Manhole Beyond 8-Feet in Depth	V.F.	$ 2,000	$ 2,000			
Miscellaneous						
Preliminary Cleaning and CCTV	L.F.	$ 5	$ 3.75	$5.55		
Mechanical Cleaning/Cutting	L.F.	$ 5		$5.00		
Heavy Cleaning	L.F.	$ 4		$3.60		
Cleaning Day Rate	D.Y.	$ 5,250		$5,250.00		

SOUTH NORFOLK AREA GRAVITY SEWER IMPROVEMENTS, PHASE 2

11/22/24

				Tidewater Utility Constn Inc.		Bridgeman Civil, Inc.		Contractor
Bid Item	Description	Quantity	Unit	Unit Price	Total Price	Unit Price	Total Price	Average Total
1	Mobilization	1	LS	$650,000.00	$650,000.00	$880,000.00	$880,000.00	$765,000
2	48” Pre-Cast Sewer Manhole	14	EA	$45,000.00	$630,000.00	$70,000.00	$980,000.00	$805,000
3	26” Manhole Frame and Cover	19	EA	$3,500.00	$66,500.00	$3,000.00	$57,000.00	$61,750
4	32” Manhole Frame and Cover	2	EA	$4,500.00	$9,000.00	$3,500.00	$7,000.00	$8,000
5	8” PVC Pipe Installation	1,027	LF	$1,150.00	$1,181,050.00	$1,000.00	$1,027,000.00	$1,104,025
6	10” PVC Pipe Installation	537	LF	$1,200.00	$644,400.00	$1,200.00	$644,400.00	$644,400
7	12” PVC Pipe Installation	488	LF	$1,500.00	$732,000.00	$1,600.00	$780,800.00	$756,400
8	8” Cured-in-Place Pipe Lining	831	LF	$250.00	$207,750.00	$200.00	$166,200.00	$186,975
9	10” Cured-in-Place Pipe Lining	2,290	LF	$275.00	$629,750.00	$275.00	$629,750.00	$629,750
10	18” Cured-in-Place Pipe Lining	1,728	LF	$375.00	$648,000.00	$360.00	$622,080.00	$635,040
11	Bypass Pumping: Bainbridge Blvd	1	LS	$300,000.00	$300,000.00	$560,000.00	$560,000.00	$430,000
12	Bypass: Berkley Trunk North	1	LS	$300,000.00	$300,000.00	$600,000.00	$600,000.00	$450,000
13	Bypass: Berkley Trunk South	1	LS	$300,000.00	$300,000.00	$600,000.00	$600,000.00	$450,000
14	Bypass: Steamboat Creek North	1	LS	$1,200,000.00	$1,200,000.00	$1,400,000.00	$1,400,000.00	$1,300,000
15	Bypass: Steamboat Crk S/Ford Dr	1	LS	$300,000.00	$300,000.00	$1,400,000.00	$1,400,000.00	$850,000
16	Bypass Pumping: Quail Avenue	1	LS	$3,000,000.00	$3,000,000.00	$1,000,000.00	$1,000,000.00	$2,000,000
17	Traffic Control	1	LS	$450,000.00	$450,000.00	$1,600,000.00	$1,600,000.00	$1,025,000
18	Aggregate Base Material: 21-A	1,300	SY	$150.00	$195,000.00	$100.00	$130,000.00	$162,500
19	Asphalt Base Course: BM-25	1,300	SY	$225.00	$292,500.00	$160.00	$208,000.00	$250,250
20	Mill and Overlay: SM-9.5A	2,770	SY	$125.00	$346,250.00	$40.00	$110,800.00	$228,525
21	MH Rehab: 45 to 52" Barrel Diam	540	VF	$2,250.00	$1,215,000.00	$1,800.00	$972,000.00	$1,093,500
22	MH Rehab: 58 to 60" Barrel Diam	37	VF	$2,800.00	$103,600.00	$2,400.00	$88,800.00	$96,200
23	MH Rhb: FLWCTRL-SG-096-3202	9	VF	$6,500.00	$58,500.00	$2,800.00	$25,200.00	$41,850
24	Chemical Grout Injection	500	GAL	$427.00	$213,500.00	$350.00	$175,000.00	$194,250
25	Sewer Point Repair	8	EA	$65,000.00	$520,000.00	$100,000.00	$800,000.00	$660,000
26	On-Site Police Support	500	HR	$85.00	$42,500.00	$100.00	$50,000.00	$46,250
27	Select Backfill	3,100	CF	$25.00	$77,500.00	$80.00	$248,000.00	$162,750
28	Geotextile Fabric	3,100	SF	$20.00	$62,000.00	$10.00	$31,000.00	$46,500
29	Sewer Pipe Deposit Cut	2,240	LF	$10.00	$22,400.00	$40.00	$89,600.00	$56,000
FOR ALL UNIT PRICES					$14,397,200.00		$15,793,030.00	

WILROY PRPS & OLSF
50% DESIGN
CONSTRUCTION COST ESTIMATE
CROWDER PROJECT ~ 40437
REVISION: 0; Initial Issue
DATE: 12/7/2023

CROWDER CONSTRUCTION COMPANY
CIVIL & ENVIRONMENTAL DIVISION

ITEM	COST CATEGORY			50% ESTIMATE BUDGET	COMMENTS
DIRECT CONSTRUCTION COSTS:					
1	MATERIAL BID PACKAGES		$	1,320,000.00	
2	CONSTRUCTION SUPPORT BID PACKAGES		$	305,000.00	
3	MAJOR CONTRACTOR BID PACKAGES		$	33,980,968.22	
4	SOLE-SOURCE BID PACKAGES		$	1,008,000.00	
5	CM PACKAGES		$	-	
	SUBTOTAL WORK PACKAGES		***$***	***36,613,968.22***	
6	UNKNOWN DESIGN CONTINGENCY	10%	$	3,661,396.82	50% Design Completion
7	CMAR CONTINGENCY	2%	$	732,279.36	Preliminary per original price proposal
	SUBTOTAL DIRECT CONSTRUCTION COST		***$***	***41,007,644.41***	
INDIRECT CONSTRUCTION COSTS:					
8	GENERAL CONDITIONS COSTS		$	1,974,000.00	Preliminary per original price proposal
	SUBTOTAL DIRECT AND INDIRECT CONSTRUCTION COST		***$***	***42,981,644.41***	
9	OVERHEAD COST (PROJECT AND HOME OFFICE)	7.0%	$	3,008,715.11	
10	PERMIT & UTILITY FEES, ROW & STORMWATER BONDS, & BUS. LICENSE COST		$	100,000.00	Allowance
11	INSURANCE & BOND COST	2.10%	$	608,622.33	Preliminary per original price proposal
	SUBTOTAL DIRECT & INDIRECT CONSTRUCTION COSTS, OHP, INSURANCE, BONDS		***$***	***46,698,981.84***	
12	PROFIT (AS A PERCENTAGE OF SUBTOTAL ABOVE)	3.5%	$	1,634,464.36	
	TOTAL ESTIMATED COST		***$***	***48,333,446.20***	
ALTERNATES SUMMARIES					
	ALT NO. 1 ~		$	-	As Needed
	ALT NO. 2 ~		$	-	As Needed
	ALT NO. 3 ~		$	-	As Needed
	ALT NO. 4 ~		$	-	As Needed
	TOTAL w/ ALTERNATES		***$***	***48,333,446.20***	

Note: The above does not include costs for Pre-Construction Services

WILROY PRPS & OLSF
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CROWDER CONSTRUCTION COMPANY
CIVIL & ENVIRONMENTAL DIVISION
APEX, NC

PCKG NO.	PACKAGE DESCRIPTION		50% ESTIMATE BUDGET	SELECTED MANUF.	COMMENTS
11A	Pumping Equipment: Sump	$	-		In Package 40437-002
11B	Pumping Equipment: Grinder Pump	$	-		In Package 40437-002
11C	Pump Equip: Submersible Centrifugal, Dry-Pit	$	500,000.00	Hidrostal	
11D	Odor Control Equipment: FRP Tank, Grease Filter, Centrifugal Fan, Media	$	495,000.00	Daniels	
16A	Harmonic Equip, Safety Switches, Dry-Type Transformers, & Panelboards	$	-		In Package 40437-004
16B	Variable Frequency Drives: Low Voltage	$	-		In Package 40437-005
16C	Transfer Switches		In Below		
16D	Generator	$	325,000.00	CAT	Includes plugs to cover exclusions.
	MATERIAL BID PACKAGE TOTAL	***$***	***1,320,000.00***		

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CROWDER CONSTRUCTION COMPANY
CIVIL & ENVIRONMENTAL DIVISION
APEX, NC

PCKG NO.	PACKAGE DESCRIPTION		50% ESTIMATE BUDGET	SELECTED BIDDER	COMMENTS
01A	General Labor	$	30,000.00	N/A	Unit Price Item, Allowance
01B	Construction Photographs	$	25,000.00	N/A	Allowance
01C	Mobilization & Demobilization Services	$	250,000.00	N/A	Reimbursable Allowance
	CONSTRUCTION SUPPORT BID PACKAGE TOTAL	***$***	***305,000.00***		

WILROY PRPS & OLSF
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CROWDER CONSTRUCTION COMPANY
CIVIL & ENVIRONMENTAL DIVISION
APEX, NC

PCKG NO.	PACKAGE DESCRIPTION		50% ESTIMATE BUDGET	SELECTED BIDDER	COMMENTS
40437-001	Line Work Package	$	6,810,754.84	N/A	See C3 Breakdown
40437-002	PRPS General Construction Package	$	16,446,517.93	N/A	See C3 Breakdown
40437-003	OLSF General Construction Package	$	7,279,794.67	N/A	See C3 Breakdown
40437-004	Electrical Construction Package	$	2,982,570.78	N/A	See C3 Breakdown
40437-005	Instrumentation & Controls Subcontractor Package	$	461,330.00	N/A	See C3 Breakdown
	MAJOR BID PACKAGE TOTAL	***$***	***33,980,968.22***		

WILROY PRPS & OLSF
50% DESIGN
CONSTRUCTION COST ESTIMATE
CROWDER PROJECT ~ 40437
REVISION: 0; Initial Issue
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CROWDER CONSTRUCTION COMPANY
CIVIL & ENVIRONMENTAL DIVISION
APEX, NC

PCKG NO.	PACKAGE DESCRIPTION		50% ESTIMATE BUDGET	SOLE SOURCE SUPPLIER	COMMENTS
40437-006	PRPS PCP & Programing	$	640,000.00	Emerson	Allowance based on LS pricing from Tabb Project
40437-007	Dynamic Pump Optimizer	$	30,000.00	Specific Energy	Allowance based on unit pricing from Tabb Project
40437-008	Tank Cleaning System	$	338,000.00	WSG Solutions	
	SOLE-SOURCE BID PACKAGE TOTAL	***$***	***1,008,000.00***		

Division	UnitCost	Description	Qty	Units	ManHours	Labor	Material	SubContr	Equipment	XtdCost
		PKG 01 - LINE WORK								
02	$ 1,331,109.74	Road Work - Demo, Paving, Curb, Traffic Control	1	LS	1,268.40	$ 53,653.32	$ 108,797.64	$ 1,074,374.40	$ 94,284.38	$ 1,331,109.74
02	$ 1,200.80	...Concrete Demo Roadway	1	CY	4	$ 169.20	$ -	$ 320.00	$ 711.60	$ 1,200.80
02	$ 38.91	...Demo Asphalt Roadway	2,500.00	SY	200.00	$ 8,460.00	$ -	$ 83,500.00	$ 5,324.00	$ 97,284.00
02	$ 4.21	...Sidewalk Demo Roadway	1,000.00	SF	24	$ 1,015.20	$ -	$ 2,480.00	$ 711.60	$ 4,206.80
02	$ 10.62	...Curb Demo Roadway	640	LF	72	$ 3,045.60	$ -	$ 2,330.00	$ 1,423.20	$ 6,798.80
02	$ 3,565.20	...Selective Demolition- Curb Ramps	1	DAY	40	$ 1,692.00	$ 500.00	$ 1,020.00	$ 353.20	$ 3,565.20
02	$ 49,500.00	...Roadway Tie In / Milling Work	1	LS	0	$ -	$ -	$ 49,500.00	$ -	$ 49,500.00
02	$ 188.69	...Asphalt Paving Offsite Roadway	3,300.00	SY	818.4	$ 34,618.32	$ 100,124.64	$ 445,734.40	$ 42,209.58	$ 622,686.94
02	$ 69.65	...Concrete Curb & Gutter Roadway	800	LF	14	$ 592.20	$ 2,673.00	$ 48,990.00	$ 3,465.20	$ 55,720.40
02	$ 10.00	...Pavement Marking Roadway	4,000.00	LF	0	$ -	$ -	$ 40,000.00	$ -	$ 40,000.00
02	$ 400,000.00	...Traffic Control	1	LS	0.00	$ -	$ -	$ 400,000.00	$ -	$ 400,000.00
02	$ 751.00	...Road Sweeper (Sunblet)	52	WK	0	$ -	$ -	$ -	$ 39,052.00	$ 39,052.00
02	$ 11,094.80	...Traffic Barriers for Line Work at Entranceway for Above Ground Work	1	LS	96.00	$ 4,060.80	$ 5,500.00	$ 500.00	$ 1,034.00	$ 11,094.80
02	$ 370,483.80	Dewatering for Mechanical Pipe Work	1.00	LS	3,176.00	$ 134,344.80	$ 121,256.00	$ 27,280.00	$ 87,603.00	$ 370,483.80
02	$ 32,117.65	...Dewatering for 24 in FM in Road	8	MO	2,144.00	$ 90,691.20	$ 87,000.00	$ 13,520.00	$ 65,730.00	$ 256,941.20
02	$ 15,393.90	...Dewatering for 24 in FM Line Stop Work - 2 ea	2	WK	276	$ 11,674.80	$ 8,128.00	$ 4,880.00	$ 6,105.00	$ 30,787.80
02	$ 21,487.50	...Dewatering for 30 in FM Line Stop Work - 2 ea	2	WK	480	$ 20,304.00	$ 8,128.00	$ 4,880.00	$ 9,663.00	$ 42,975.00
02	$ 19,889.90	...Dewatering for 30 in FM to PRS - 2 ea	2.00	WK	276	$ 11,674.80	$ 18,000.00	$ 4,000.00	$ 6,105.00	$ 39,779.80
03	$ 583.28	LINE STOP - 30" Concrete Block	8	CY	57	$ 2,411.03	$ 2,087.20	$ 168.00	$ -	$ 4,666.23
03	$ 291.70	...Place Foundation Mats (48" plus)	8	CY	24	$ 1,015.21	$ 1,318.40	$ -	$ -	$ 2,333.61
03	$ 2,760.00	...Reinforcing	0.2	TN	0	$ -	$ 384.00	$ 168.00	$ -	$ 552.00
03	$ 13.58	...Form Foundation Mat	120	SF	30	$ 1,269.00	$ 360.00	$ -	$ -	$ 1,629.00
03	$ 0.33	...Slab Finish (Float)	184	SF	1.23	$ 51.89	$ 9.20	$ -	$ -	$ 61.09
03	$ 0.40	...Screed Poles & Chairs	64	SF	0.46	$ 19.34	$ 6.40	$ -	$ -	$ 25.74
03	$ 0.35	...Cure & Protect Walls & Slabs	184	SF	1.31	$ 55.59	$ 9.20	$ -	$ -	$ 64.79
03	$ 679.11	LINE STOP - 24" Concrete Block	7	CY	61.66	$ 2,608.40	$ 1,977.40	$ 168.00	$ -	$ 4,753.80
03	$ 309.84	...Place Foundation Mats (48" plus)	7	CY	24	$ 1,015.26	$ 1,153.60	$ -	$ -	$ 2,168.86
03	$ 2,760.00	...Reinforcing	0.2	TN	0	$ -	$ 384.00	$ 168.00	$ -	$ 552.00
03	$ 13.58	...Form Foundation Mat	138	SF	34.5	$ 1,459.35	$ 414.00	$ -	$ -	$ 1,873.35
03	$ 0.33	...Slab Finish (Float)	198	SF	1.32	$ 55.84	$ 9.90	$ -	$ -	$ 65.74
03	$ 0.40	...Screed Poles & Chairs	60	SF	0.43	$ 18.13	$ 6.00	$ -	$ -	$ 24.13
03	$ 0.35	...Cure & Protect Walls & Slabs	198	SF	1.41	$ 59.82	$ 9.90	$ -	$ -	$ 69.72
07	$ 8.50	Waterproofing Force main meter vaults (2 ea) [C-101 & C-601]	721	SF	0	$ -	$ -	$ 6,128.50	$ -	$ 6,128.50
15	$ 723,629.38	...DIP - Adjustment - Linework Package	1	LS	0	$ -	$ 723,629.38	$ -	$ -	$ 723,629.38
15	$ 51,951.60	****** SITEWORK GENERAL COST - Testing / Disinfection / Dewatering / Hauli	1	LS	431.13	$ 20,060.70	$ 30,850.90	$ 1,040.00	$ -	$ 51,951.60
15	$ 4,634.34	...Dewatering - Neusiance	4	LS	130.48	$ 6,071.45	$ 11,425.90	$ 1,040.00	$ -	$ 18,537.35
15	$ 19,167.20	...Pipe Testing	1	LS	240	$ 11,167.20	$ 8,000.00	$ -	$ -	$ 19,167.20
15	$ 1,122.24	...Disinfection piping	2	EA	16	$ 744.48	$ 1,500.00	$ -	$ -	$ 2,244.48
15	$ 152.33	...Valve Tags	8	EA	0.4	$ 18.61	$ 1,200.00	$ -	$ -	$ 1,218.61
15	$ 0.57	...Detectable Tracer Wire for Buried Pipe	1,900.00	LF	9.5	$ 442.04	$ 646.00	$ -	$ -	$ 1,088.04
15	$ 0.83	...Poly Tubing for buried DIP 3"-8"	100	LF	1	$ 46.53	$ 36.00	$ -	$ -	$ 82.53
15	$ 1.24	...Poly Tubing for buried DIP 10"-16"	100	LF	1.25	$ 58.16	$ 66.00	$ -	$ -	$ 124.16
15	$ 1.74	...Poly Tubing for buried DIP 18"-24"	1,200.00	LF	20	$ 930.60	$ 1,152.00	$ -	$ -	$ 2,082.60
15	$ 2.81	...Poly Tubing for buried DIP 30"-36"	500	LF	12.5	$ 581.63	$ 825.00	$ -	$ -	$ 1,406.63
15	$ 500.00	...Polywrap Tape	12	EA	0	$ -	$ 6,000.00	$ -	$ -	$ 6,000.00

Division	UnitCost	Description	Qty	Units	ManHours	Labor	Material	SubContr	Equipment	XtdCost
15	$ 215,951.44	Bypass #1 - Windsor Force main (Ryan Construction Entrance) [C-503]	1	LS	466.04	$ 21,684.84	$ 67,153.20	$ 113,163.00	$ 13,950.40	$ 215,951.44
15	$ 3,111.20	...Protect Existing Piping	1	LS	40	$ 1,861.20	$ 1,250.00	$ -	$ -	$ 3,111.20
15	$ 1,244.48	...Pipe Prep & Coating - per Line Stop Note 3 sht C-600	1	EA	16	$ 744.48	$ 500.00	$ -	$ -	$ 1,244.48
15	$ 1,528.72	...Pot Holing to find existing DIP joints	1	EA	24	$ 1,116.72	$ -	$ -	$ 412.00	$ 1,528.72
15	$ 2.83	...Saw cut asphalt 2"-6" deep @ Driveway	50	LF	2.5	$ 116.33	$ -	$ 25.00	$ -	$ 141.33
15	$ -	...Thrust Blocks - BY DIV 03	0	CY	0	$ -	$ -	$ -	$ -	$ -
15	$ 78.78	...Stone #57 in place - Pipe Trench - Taxable under pipe per note 3.2 sht G03	120	TN	48	$ 2,233.44	$ 4,831.20	$ 858.00	$ 1,530.40	$ 9,453.04
15	$ 6,717.96	...Excavation / Backfill for Bypass Thrust Blocks - 2 locations	2	LS	64	$ 2,977.92	$ 2,390.00	$ 180.00	$ 7,888.00	$ 13,435.92
15	$ 68,234.99	...HDPE Bypass Piping	1	EA	221.04	$ 10,284.99	$ 55,890.00	$ -	$ 2,060.00	$ 68,234.99
15	$ 23,100.00	...HOT TAP - 24" DIP w/ 20" Valve	2	EA	0	$ -	$ -	$ 46,200.00	$ -	$ 46,200.00
15	$ 3,308.33	... Temporary - Tap, Saddle, Valve DIP 42" x 8" per note 3.3 sht G03	1	EA	2.5	$ 116.33	$ 2,292.00	$ 900.00	$ -	$ 3,308.33
15	$ 69,293.44	...Double Line Stop 24"	1	EA	48	$ 2,233.44	$ -	$ 65,000.00	$ 2,060.00	$ 69,293.44
15	$ 395,798.72	Bypass #2 - Wilroy Road Force Main Replacement [C-503]	1	LS	869.51	$ 40,458.25	$ 128,440.60	$ 201,422.34	$ 25,477.53	$ 395,798.72
15	$ 3,111.20	...Protect Existing Piping	1	LS	40	$ 1,861.20	$ 1,250.00	$ -	$ -	$ 3,111.20
15	$ 1,244.48	...Pipe Prep & Coating - per Line Stop Note 3 sht C-600	1	EA	16	$ 744.48	$ 500.00	$ -	$ -	$ 1,244.48
15	$ 1,528.72	...Pot Holing to find existing DIP joints	1	EA	24	$ 1,116.72	$ -	$ -	$ 412.00	$ 1,528.72
15	$ 2.83	...Saw cut asphalt 2"-6" deep @ Driveways	400	LF	20	$ 930.60	$ -	$ 200.00	$ -	$ 1,130.60
15	$ -	...Thrust Blocks - BY DIV 03	0	CY	0	$ -	$ -	$ -	$ -	$ -
15	$ 42.28	...TRENCH: 4' Depth at driveways	200	LF	93.03	$ 4,328.63	$ 265.00	$ 1,584.34	$ 2,277.50	$ 8,455.48
15	$ 5,997.00	...Equipment Adjustment for Valve, Fittings and Precast - 1.4 Exc	0.08	WK	0	$ -	$ 42.40	$ -	$ 437.36	$ 479.76
15	$ 78.78	...Stone #57 in place - Pipe Trench - Taxable under pipe per note 3.2 sht G03	120	TN	48	$ 2,233.44	$ 4,831.20	$ 858.00	$ 1,530.40	$ 9,453.04
15	$ 8,307.96	...Excavation / Backfill for Bypass Connections - 2 locations	2	LS	64	$ 2,977.92	$ 5,570.00	$ 180.00	$ 7,888.00	$ 16,615.92
15	$ 148,477.76	...HDPE Bypass Piping	1	EA	513.98	$ 23,915.49	$ 113,690.00	$ -	$ 10,872.27	$ 148,477.76
15	$ 23,100.00	...HOT TAP - 30" DIP x 24" NTP w/ 24" Valve	2	EA	0	$ -	$ -	$ 46,200.00	$ -	$ 46,200.00
15	$ 3,308.33	...Temporary - Tap, Saddle, Valve DIP 30" x 8"	1	EA	2.5	$ 116.33	$ 2,292.00	$ 900.00	$ -	$ 3,308.33
15	$ 155,793.44	...Double Line Stop 30"	1	EA	48	$ 2,233.44	$ -	$ 151,500.00	$ 2,060.00	$ 155,793.44
15	$ 429,960.07	24" DIP - Windsor force main extension [C-501, C502]	1	LS	2,249.53	$ 104,670.74	$ 179,268.09	$ 80,238.07	$ 65,783.16	$ 429,960.07
15	$ 8,616.72	...Protect Existing Utilties	1	LS	24	$ 1,116.72	$ 7,500.00	$ -	$ -	$ 8,616.72
15	$ 5,816.72	...Tie Ins / Drain forcemain	2	EA	48	$ 2,233.44	$ 4,000.00	$ 5,400.00	$ -	$ 11,633.44
15	$ 8.33	...Saw cut asphalt 6" deep	2,000.00	LF	100	$ 4,653.00	$ -	$ 12,000.00	$ -	$ 16,653.00
15	$ 104.80	...TRENCH: 5.5' Depth - 6' per Crew HR - 4 man Crew - 1.4 Exc	117	LF	95.62	$ 4,449.39	$ 1,707.34	$ 3,733.17	$ 2,371.50	$ 12,261.39
15	$ 142.56	...TRENCH: 7' Depth - 4' per Crew HR - 4 man Crew - 1.4 Exc	475	LF	562.38	$ 26,167.53	$ 7,455.04	$ 19,668.44	$ 14,426.68	$ 67,717.68
15	$ 149.93	...TRENCH: 8' Depth - 4' per Crew HR - 4 man Crew - 1.4 Exc	494	LF	595.85	$ 27,725.02	$ 7,753.40	$ 23,583.87	$ 15,005.20	$ 74,067.48
15	$ 157.35	...TRENCH: 9' Depth - 4' per Crew HR - 4 man Crew - 1.4 Exc	62	LF	76.16	$ 3,543.79	$ 973.37	$ 3,352.60	$ 1,885.90	$ 9,755.66
15	$ 5,358.60	...Equipment Adjustment for Valve, Fittings and Precast - 1.4 Exc	6.22	WK	0	$ -	$ 3,296.60	$ -	$ 30,033.89	$ 33,330.49
15	$ 103.78	...DI RJ Pipe 24" 200 psi	1,116.00	LF	435.94	$ 20,284.17	$ 95,529.60	$ -	$ -	$ 115,813.77
15	$ 1,146.63	...DI MJ 90 Bend 24"	2	EA	25	$ 1,163.25	$ 1,130.00	$ -	$ -	$ 2,293.25
15	$ 986.63	...DI MJ 45 Bend 24"	4	EA	50	$ 2,326.50	$ 1,620.00	$ -	$ -	$ 3,946.50
15	$ 993.63	...DI MJ 22.5 Bend 24"	3	EA	37.5	$ 1,744.88	$ 1,236.00	$ -	$ -	$ 2,980.88
15	$ 896.63	...DI MJ 11.25 Bend 24"	6	EA	75	$ 3,489.75	$ 1,890.00	$ -	$ -	$ 5,379.75
15	$ 1,550.89	...DI MJ Tee 24"	1	EA	17.86	$ 830.89	$ 720.00	$ -	$ -	$ 1,550.89
15	$ 541.86	...Meg-a-Lug Accessory Set 24"	13	EA	13	$ 604.89	$ 6,439.29	$ -	$ -	$ 7,044.18
15	$ 22,684.87	...Gate Valve MJ 24" w/Gear & 2" Nut	1	EA	26.32	$ 1,224.67	$ 21,460.20	$ -	$ -	$ 22,684.87
15	$ 5,046.02	...Manual Air Release Assembly [Detail 22 / C-603]	5	EA	66.9	$ 3,112.85	$ 7,557.25	$ 12,500.00	$ 2,060.00	$ 25,230.10
15	$ 750.00	...Roadway Plates (NTS) 10' x 20' - 3 ea for 4 months	12	MO	0	$ -	$ 9,000.00	$ -	$ -	$ 9,000.00
15	$ 317,392.62	30" DIP - Wilroy Road force main replacement [C-505]	1	LS	699.61	$ 32,552.93	$ 235,877.06	$ 30,850.32	$ 18,112.31	$ 317,392.62
15	$ 12,116.72	...Tie Ins / Drain forcemain	2	EA	48	$ 2,233.44	$ 4,000.00	$ 18,000.00	$ -	$ 24,233.44
15	$ 8.23	...Saw cut asphalt 6" deep	250	LF	12	$ 558.36	$ -	$ 1,500.00	$ -	$ 2,058.36
15	$ 48.24	...Buried PCCP Pipe Demolition	210	LF	42	$ 1,954.26	$ 750.00	$ 3,600.00	$ 3,826.00	$ 10,130.26
15	$ 104.96	...TRENCH: 6' Depth - 8' per Crew HR - 4 man Crew - 1.4 Exc	250	LF	204.62	$ 9,520.81	$ 3,904.64	$ 7,750.32	$ 5,063.69	$ 26,239.45
15	$ 5,358.60	...Equipment Adjustment for Valve, Fittings and Precast - 1.4 Exc - 4 Man Crew	1.91	WK	0	$ -	$ 1,012.30	$ -	$ 9,222.63	$ 10,234.93
15	$ 170.07	...DI RJ Pipe 36" 150 psi	252	LF	113	$ 5,258.10	$ 37,598.40	$ -	$ -	$ 42,856.50

Division	UnitCost	Description	Qty	Units	ManHours	Labor	Material	SubContr	Equipment	XtdCost
15	$ 2,153.89	...DI MJ Tee 30"	2	EA	35.71	$ 1,661.79	$ 2,646.00	$ -	$ -	$ 4,307.79
15	$ 763.77	...DI MJ Cap 30"	2	EA	18	$ 837.54	$ 690.00	$ -	$ -	$ 1,527.54
15	$ 1,200.60	...DI MJ Solid Sleeve 30"	2	EA	24.1	$ 1,121.20	$ 1,280.00	$ -	$ -	$ 2,401.20
15	$ 13,244.48	...PCCP Adapter/Casting 30"	2	EA	32	$ 1,488.96	$ 25,000.00	$ -	$ -	$ 26,488.96
15	$ 1,622.24	...PCCP Diapers 30"	2	EA	16	$ 744.48	$ 2,500.00	$ -	$ -	$ 3,244.48
15	$ 1,257.22	...Meg-a-Lug Accessory Set 30"	12	EA	24	$ 1,116.72	$ 13,969.92	$ -	$ -	$ 15,086.64
15	$ 70,116.46	...Plug Valve MJ 30"	2	EA	58.18	$ 2,707.12	$ 137,525.80	$ -	$ -	$ 140,232.92
15	$ 8,350.16	...Adandond Plug Valve MJ 30"	1	EA	72	$ 3,350.16	$ 5,000.00	$ -	$ -	$ 8,350.16
15	**$ 172,779.89**	**30" DIP - PRS Influent line [C-101, C-504]**	**1**	**LS**	**386.36**	**$ 17,977.39**	**$ 139,293.76**	**$ 4,318.26**	**$ 11,190.48**	**$ 172,779.89**
15	$ 81.53	...Grout Pipe Penetration	2	BAG	2	$ 93.06	$ 70.00	$ -	$ -	$ 163.06
15	$ 79.43	...TRENCH: 6' Depth - 8' per Crew HR - 4 man Crew - 1.4 Exc	104	LF	65.33	$ 3,039.99	$ 1,566.86	$ 2,173.42	$ 1,480.38	$ 8,260.64
15	$ 166.87	...TRENCH: 10.5' Depth - 4' per Crew HR - 4 man Crew - 1.4 Exc	35	LF	43.97	$ 2,046.02	$ 585.42	$ 2,144.85	$ 1,064.12	$ 5,840.41
15	$ 5,387.29	...Equipment Adjustment for Valve, Fittings and Precast - 1.4 Exc	1.78	WK	0	$ -	$ 943.40	$ -	$ 8,645.98	$ 9,589.38
15	$ 125.66	...DI RJ Pipe 30" 150 psi	144	LF	43.19	$ 2,009.69	$ 16,084.80	$ -	$ -	$ 18,094.49
15	$ 65.25	...DI MJ Cap 6"	1	EA	1.08	$ 50.25	$ 15.00	$ -	$ -	$ 65.25
15	$ 501.02	...DI MJ Cap 24"	1	EA	7.2	$ 335.02	$ 166.00	$ -	$ -	$ 501.02
15	$ 1,511.63	...DI MJ 90 Bend 30"	1	EA	12.5	$ 581.63	$ 930.00	$ -	$ -	$ 1,511.63
15	$ 1,246.63	...DI MJ 22.5 Bend 30"	1	EA	12.5	$ 581.63	$ 665.00	$ -	$ -	$ 1,246.63
15	$ 2,153.89	...DI MJ Tee 30" x 6"	1	EA	17.86	$ 830.89	$ 1,323.00	$ -	$ -	$ 2,153.89
15	$ 2,153.89	...DI MJ Tee 30" x 24"	1	EA	17.86	$ 830.89	$ 1,323.00	$ -	$ -	$ 2,153.89
15	$ 418.77	...DEMO - DI MJ Cap 30"	1	EA	9	$ 418.77	$ -	$ -	$ -	$ 418.77
15	$ 709.92	...Bolt & Gasket Set 30" - Carbon Steel	2	EA	15.38	$ 715.85	$ 704.00	$ -	$ -	$ 1,419.85
15	$ 64.66	...Meg-a-Lug Accessory Set 6"	1	EA	0.25	$ 11.63	$ 53.03	$ -	$ -	$ 64.66
15	$ 541.86	...Meg-a-Lug Accessory Set 24"	1	EA	1	$ 46.53	$ 495.33	$ -	$ -	$ 541.86
15	$ 1,257.22	...Meg-a-Lug Accessory Set 30"	8	EA	16	$ 744.48	$ 9,313.28	$ -	$ -	$ 10,057.76
15	$ 93.06	...DEMO - Meg-a-Lug Accessory Set 30"	1	EA	2	$ 93.06	$ -	$ -	$ -	$ 93.06
15	$ 5,166.92	...EBAA Mega Flange 30"	2	EA	24.1	$ 1,121.20	$ 9,212.64	$ -	$ -	$ 10,333.84
15	$ 2,956.68	...Precast Vault 7' x 7'-6"	9.2	VF	42.8	$ 1,991.43	$ 25,210.00	$ -	$ -	$ 27,201.43
15	$ 2,162.34	...Adjusteable Saddle Support- 30" Pipe; 3'-3" from floor to CL of pipe	1	EA	7.25	$ 337.34	$ 1,825.00	$ -	$ -	$ 2,162.34
15	$ 70,161.56	...Plug Valve MJ 30"	1	EA	29.09	$ 1,353.56	$ 68,808.00	$ -	$ -	$ 70,161.56
15	$ 744.48	...In Line Meter 30"	1	EA	16	$ 744.48	$ -	$ -	$ -	$ 744.48
15	**$ 162,270.44**	**30" DIP - PRS Effluent line [C-101, C-504]**	**1**	**LS**	**333.12**	**$ 15,499.94**	**$ 131,261.76**	**$ 4,318.26**	**$ 11,190.48**	**$ 162,270.44**
15	$ 81.53	...Grout Pipe Penetration	2	BAG	2	$ 93.06	$ 70.00	$ -	$ -	$ 163.06
15	$ 79.43	...TRENCH: 6' Depth - 8' per Crew HR - 4 man Crew - 1.4 Exc	104	LF	65.33	$ 3,039.99	$ 1,566.86	$ 2,173.42	$ 1,480.38	$ 8,260.64
15	$ 166.87	...TRENCH: 10.5' Depth - 4' per Crew HR - 4 man Crew - 1.4 Exc	35	LF	43.97	$ 2,046.02	$ 585.42	$ 2,144.85	$ 1,064.12	$ 5,840.41
15	$ 5,387.29	...Equipment Adjustment for Valve, Fittings and Precast - 1.4 Exc	1.78	WK	0	$ -	$ 943.40	$ -	$ 8,645.98	$ 9,589.38
15	$ 125.66	...DI RJ Pipe 30" 150 psi	144	LF	43.19	$ 2,009.69	$ 16,084.80	$ -	$ -	$ 18,094.49
15	$ 1,511.63	...DI MJ 90 Bend 30"	1	EA	12.5	$ 581.63	$ 930.00	$ -	$ -	$ 1,511.63
15	$ 1,246.63	...DI MJ 22.5 Bend 30"	1	EA	12.5	$ 581.63	$ 665.00	$ -	$ -	$ 1,246.63
15	$ 418.77	...DEMO DI MJ Cap 30"	1	EA	9	$ 418.77	$ -	$ -	$ -	$ 418.77
15	$ 709.92	...Bolt & Gasket Set 30" - Carbon Steel	2	EA	15.38	$ 715.85	$ 704.00	$ -	$ -	$ 1,419.85
15	$ 1,257.22	...Meg-a-Lug Accessory Set 30"	4	EA	8	$ 372.24	$ 4,656.64	$ -	$ -	$ 5,028.88
15	$ 93.06	...DEMO Meg-a-Lug Accessory Set 30"	1	EA	2	$ 93.06	$ -	$ -	$ -	$ 93.06
15	$ 5,166.92	...EBAA Mega Flange 30"	2	EA	24.1	$ 1,121.20	$ 9,212.64	$ -	$ -	$ 10,333.84
15	$ 2,956.68	...Precast Vault 7' x 7'-6"	9.2	VF	42.8	$ 1,991.43	$ 25,210.00	$ -	$ -	$ 27,201.43
15	$ 2,162.34	...Adjusteable Saddle Support- 30" Pipe; 3'-3" from floor to CL of pipe	1	EA	7.25	$ 337.34	$ 1,825.00	$ -	$ -	$ 2,162.34
15	$ 70,161.56	...Plug Valve MJ 30"	1	EA	29.09	$ 1,353.56	$ 68,808.00	$ -	$ -	$ 70,161.56
15	$ 744.48	...In Line Meter 30"	1	EA	16	$ 744.48	$ -	$ -	$ -	$ 744.48
15	**$ 10,250.75**	**3" PVC - PRS Sump pump drain [C-101, C-505]**	**1**	**LS**	**109.28**	**$ 5,084.72**	**$ 1,453.52**	**$ 978.76**	**$ 2,733.75**	**$ 10,250.75**
15	$ 52.91	...TRENCH: 6' Depth - 8' per Crew HR - 4 man Crew - 1.0 Exc	155	LF	92.07	$ 4,284.06	$ 973.93	$ 978.76	$ 1,964.25	$ 8,200.99
15	$ 4,050.00	...Equipment Adjustment for Valve, Fittings and Precast - 1.0 Exc - 3 Man Crew	0.19	WK	0	$ -	$ -	$ -	$ 769.50	$ 769.50
15	$ 5.56	...PVC Pipe Sch40 3" - Underground	160	LF	13.87	$ 645.21	$ 245.04	$ -	$ -	$ 890.25

Division	UnitCost	Description	Qty	Units	ManHours	Labor	Material	SubContr	Equipment	XtdCost
15	$ 25.68	...PVC Pipe Sch40 6" - Underground	10	LF	1.78	$ 82.89	$ 173.90	$ -	$ -	$ 256.78
15	$ 18.20	...PVC Sch 40 90 Bend 3"	1	EA	0.33	$ 15.51	$ 2.69	$ -	$ -	$ 18.20
15	$ 26.10	...PVC Sch 40 Wye 3" x 1.25"	1	EA	0.48	$ 22.16	$ 3.95	$ -	$ -	$ 26.10
15	$ 24.27	...PVC Sch 40 Reducer 6" x 3"	1	EA	0.5	$ 23.27	$ 1.00	$ -	$ -	$ 24.27
15	$ 64.66	...Meg-a-Lug Accessory Set 6"	1	EA	0.25	$ 11.63	$ 53.03	$ -	$ -	$ 64.66
15	**$ 4,723.67**	**2" PVC Influent Meter Vault Drain to PRS Sump [C-601]**	**1**	**LS**	**52.49**	**$ 2,442.15**	**$ 286.52**	**$ 269.70**	**$ 1,725.30**	**$ 4,723.67**
15	$ 42.39	...TRENCH: 6' Depth - 8' per Crew HR - 4 man Crew - 1.0 Exc	85	LF	43.99	$ 2,046.65	$ 209.43	$ 269.70	$ 1,077.30	$ 3,603.08
15	$ 4,050.00	...Equipment Adjustment for Valve, Fittings and Precast - 1.0 Exc - 3 Man Crew	0.16	WK	0	$ -	$ -	$ -	$ 648.00	$ 648.00
15	$ 4.05	...PVC Pipe Sch40 2" - Underground	100	LF	7.14	$ 332.05	$ 72.68	$ -	$ -	$ 404.73
15	$ 11.31	...PVC Sch 40 90 Bend 2"	6	EA	1.36	$ 63.45	$ 4.41	$ -	$ -	$ 67.86
15	**$ 3,168.13**	**2" PVC Effluent Meter Vault Drain to PRS Sump [C-601]**	**1**	**LS**	**34.11**	**$ 1,586.99**	**$ 183.53**	**$ 174.51**	**$ 1,223.10**	**$ 3,168.13**
15	$ 42.38	...TRENCH: 6' Depth - 8' per Crew HR - 4 man Crew - 1.0 Exc	55	LF	28.46	$ 1,324.31	$ 135.51	$ 174.51	$ 696.60	$ 2,330.93
15	$ 4,050.00	...Equipment Adjustment for Valve, Fittings and Precast - 1.0 Exc - 3 Man Crew	0.13	WK	0	$ -	$ -	$ -	$ 526.50	$ 526.50
15	$ 4.05	...PVC Pipe Sch40 2" - Underground	60	LF	4.28	$ 199.23	$ 43.61	$ -	$ -	$ 242.84
15	$ 11.31	...PVC Sch 40 90 Bend 2"	6	EA	1.36	$ 63.45	$ 4.41	$ -	$ -	$ 67.86
15	**$ 69,693.54**	**12" DIP - Watermain tie-in to 4" Reducer [C-505]**	**1**	**LS**	**389.85**	**$ 18,139.51**	**$ 39,220.80**	**$ 2,896.74**	**$ 9,436.50**	**$ 69,693.54**
15	$ 4,361.20	...Protect Existing Utilties	2	LS	80	$ 3,722.40	$ 5,000.00	$ -	$ -	$ 8,722.40
15	$ 236.12	...Tie Ins	1	EA	4	$ 186.12	$ 50.00	$ -	$ -	$ 236.12
15	$ 64.37	...TRENCH: 6' Depth - 8' per Crew HR - 4 man Crew - 1.0 Exc	160	LF	93.24	$ 4,338.68	$ 1,038.85	$ 2,896.74	$ 2,025.00	$ 10,299.26
15	$ 4,580.00	...Equipment Adjustment for Valve, Fittings and Precast - 1.0 Exc - 4 Man Crew	1.83	WK	0	$ -	$ 969.90	$ -	$ 7,411.50	$ 8,381.40
15	$ 21.59	...DI B&S Pipe 6" 350 psi	100	LF	10.5	$ 488.56	$ 1,670.00	$ -	$ -	$ 2,158.56
15	$ 43.15	...DI B&S Pipe 12" 350 psi	100	LF	14.5	$ 674.74	$ 3,640.00	$ -	$ -	$ 4,314.74
15	$ 364.93	...DI Flg Pipe 6" x 4'-0" F x PE	2	EA	10.24	$ 476.25	$ 253.60	$ -	$ -	$ 729.85
15	$ 59.25	...DI MJ Cap 4"	1	EA	1.08	$ 50.25	$ 9.00	$ -	$ -	$ 59.25
15	$ 173.87	...DI MJ 90 Bend 6"	1	EA	2.9	$ 134.87	$ 39.00	$ -	$ -	$ 173.87
15	$ 264.65	...DI MJ Tee 6"	1	EA	4.48	$ 208.65	$ 56.00	$ -	$ -	$ 264.65
15	$ 163.73	...DI MJ Reducer 6" x 4"	1	EA	3	$ 139.73	$ 24.00	$ -	$ -	$ 163.73
15	$ 575.45	...DI MJ Tee 12" x 6"	1	EA	8.93	$ 415.45	$ 160.00	$ -	$ -	$ 575.45
15	$ 150.21	...DI MJ Cap 12" w/ 2" NPT Tap	1	EA	2.33	$ 108.21	$ 42.00	$ -	$ -	$ 150.21
15	$ 105.16	...Bolt & Gasket Set 6" - Carbon Steel	4	EA	5	$ 232.65	$ 188.00	$ -	$ -	$ 420.65
15	$ 53.69	...Meg-a-Lug Accessory Set 4"	1	EA	0.25	$ 11.63	$ 42.06	$ -	$ -	$ 53.69
15	$ 64.66	...Meg-a-Lug Accessory Set 6"	7	EA	1.75	$ 81.43	$ 371.21	$ -	$ -	$ 452.64
15	$ 149.19	...Meg-a-Lug Accessory Set 12"	4	EA	1.33	$ 62.04	$ 534.72	$ -	$ -	$ 596.76
15	$ 1,713.40	...Gate Valve MJ 6" w/2" Nut	3	EA	30.42	$ 1,415.44	$ 3,724.76	$ -	$ -	$ 5,140.20
15	$ 2,571.45	...Hydrant, Fire, 6"	1	EA	14.51	$ 675.20	$ 1,896.25	$ -	$ -	$ 2,571.45
15	$ 1,261.78	...Manual Blow-off Assembly [Detail 21 / C-603]	1	EA	5.38	$ 250.33	$ 1,011.45	$ -	$ -	$ 1,261.78
15	$ 22,966.88	...Meter Assy w/vault 6"	1	ea	96	$ 4,466.88	$ 18,500.00	$ -	$ -	$ 22,966.88

Division	UnitCost	Description	Qty	Units	ManHours	Labor	Material	SubContr	Equipment	XtdCost
									LINE WORK (PKG 01) ESTIMATE TOTALS	
									Direct Costs	
									Labor	$ 473,175.71
									Material	$ 1,911,037.36
									Subcontract	$ 1,547,788.86
									Equipment	$ 342,710.39
										$ 4,274,712.32
								Indirect Costs		
								Sales Tax		$ 32,344.38
								Fuel		$ 95,065.28
							General Conditions		14.3%	$ 796,199.47
								Contingeny	6.2%	$ 345,335.56
								Business License	0.2%	$ 10,897.21
								P&P Bonds	0.5%	$ 30,264.79
							Contractor Markup		22.0%	$ 1,225,935.83
									TOTAL	**$ 6,810,754.84**

Division	UnitCost	Description	Qty	Units	ManHours	Labor	Material	SubContr	Equipment	XtdCost
		PKG 02 - PRESSURE REDUCING STATION & SITE								
02	$ 127,599.80	Erosion Control Work	1	LS	675	$ 28,552.50	$ 26,901.80	$ 43,362.50	$ 28,783.00	$ 127,599.80
02	$ 5.05	...Silt Fencing w/10% Replace	2,000.00	LF	60	$ 2,538.00	$ -	$ 7,060.00	$ 495.00	$ 10,093.00
02	$ 639.65	...Silt Fence Outlet	2.00	EA	6	$ 253.80	$ 643.50	$ 283.00	$ 99.00	$ 1,279.30
02	$ 1,176.40	...Rip Rap - Stone Check Dams Install/Remove	5	EA	20	$ 846.00	$ 3,427.00	$ 1,510.00	$ 99.00	$ 5,882.00
02	$ 62.26	...Rip Rap - Outlet Dissipator	300	SF	6	$ 253.80	$ 2,624.00	$ 440.00	$ 15,360.00	$ 18,677.80
02	$ 0.06	...Temporary Seeding	135,000.00	SF	0	$ -	$ -	$ 8,100.00	$ -	$ 8,100.00
02	$ 375.05	...Inlet Protection Install/Remove	4	EA	12	$ 507.60	$ 805.60	$ 88.00	$ 99.00	$ 1,500.20
02	$ 5.00	...Tree Protection	1,400.00	LF	0	$ -	$ -	$ 7,000.00	$ -	$ 7,000.00
02	$ 25.70	...Coir Fiber Sediment Tubes Install/Remove [Qty]	40	LF	3	$ 126.90	$ 632.00	$ 170.00	$ 99.00	$ 1,027.90
02	$ 21,047.80	...Temporary Sediment Basin Install/Remove	1	EA	96	$ 4,060.80	$ 3,712.50	$ 8,381.50	$ 4,893.00	$ 21,047.80
02	$ 521.73	...Erosion Control Maintenance (16/YR)	24	EA	192	$ 8,121.60	$ -	$ 4,400.00	$ -	$ 12,521.60
02	$ 11.78	...Construction Entrance Install/Remove [Qty]	1,000.00	SF	48	$ 2,030.40	$ 6,752.00	$ 2,800.00	$ 198.00	$ 11,780.40
02	$ 21,627.00	...Bio-Retention Basin	1	EA	200	$ 8,460.00	$ 6,308.00	$ 440.00	$ 6,419.00	$ 21,627.00
02	$ 7,062.80	...Concrete Washout- Install / Remove	1	EA	32	$ 1,353.60	$ 1,997.20	$ 2,690.00	$ 1,022.00	$ 7,062.80
02	$ 21,419.35	Clearing & Grubbing	3.1	AC	0	$ -	$ -	$ 66,400.00	$ -	$ 66,400.00
02	$ 205,824.80	Earthwork PRS Site	1	LS	992	$ 41,961.60	$ 26,402.30	$ 93,516.00	$ 43,944.90	$ 205,824.80
02	$ 19.40	...Topsoil Strip to Waste Offsite	2,000.00	CY	200	$ 8,460.00	$ -	$ 24,864.00	$ 5,477.00	$ 38,801.00
02	$ 29.07	...Site Import to Fill	2,967.00	CY	240	$ 10,152.00	$ -	$ 63,333.00	$ 12,778.00	$ 86,263.00
02	$ 29.25	...Earthwork Swale	600	LF	160	$ 6,768.00	$ 3,600.00	$ -	$ 7,180.00	$ 17,548.00
02	$ 10,488.90	...Outlet Structure for Basin	1	LS	16	$ 676.80	$ 9,162.80	$ 44.00	$ 605.30	$ 10,488.90
02	$ 39.01	...Temporary Gravel for Ramp / Access Road Site	700	SY	96	$ 4,060.80	$ 11,448.00	$ 4,780.00	$ 7,019.80	$ 27,308.60
02	$ 1.23	...Fine Grade Site	15,000.00	SY	240	$ 10,152.00	$ -	$ -	$ 8,274.00	$ 18,426.00
02	$ 1,787.20	...Excavate for 24 Bollards	1	LS	24	$ 1,015.20	$ -	$ -	$ 772.00	$ 1,787.20
02	$ 5,202.10	...Gravel Under Sidewalks & Site Pads	1	LS	16	$ 676.80	$ 2,191.50	$ 495.00	$ 1,838.80	$ 5,202.10
02	$ 391,171.20	Dewatering	1	LS	104	$ 4,399.20	$ 11,462.00	$ 372,340.00	$ 2,970.00	$ 391,171.20
02	$ 375,000.00	...Dewatering Site- PRS & Tank	1	LS	0	$ -	$ 5,000.00	$ 370,000.00	$ -	$ 375,000.00
02	$ 10,827.00	...Nuisance Dewatering Pipe Work Onsite	1	LS	80	$ 3,384.00	$ 4,528.00	$ 440.00	$ 2,475.00	$ 10,827.00
02	$ 5,344.20	...Dewatering / Basin Work	1	LS	24	$ 1,015.20	$ 1,934.00	$ 1,900.00	$ 495.00	$ 5,344.20
02	$ 792,876.60	Earthwork PRS Building	1	LS	2,362.00	$ 99,912.60	$ 191,894.00	$ 423,310.00	$ 77,760.00	$ 792,876.60
02	$ 24.03	...Structure Excavate to Waste Offsite (Low)	12,500.00	CY	1,050.00	$ 44,415.00	$ -	$ 224,000.00	$ 31,944.00	$ 300,359.00
02	$ 0.28	...Excavation Slope Protection	40,000.00	SF	40	$ 1,692.00	$ 9,600.00	$ -	$ -	$ 11,292.00
02	$ 28.65	...Site Import to Backfill	7,100.00	CY	640	$ 27,072.00	$ -	$ 150,800.00	$ 25,556.00	$ 203,428.00
02	$ 118,289.00	...Structure #57 Stone Backfill Under Slab	1	LS	160	$ 6,768.00	$ 83,028.00	$ 22,440.00	$ 6,053.00	$ 118,289.00
02	$ 0.19	...Fine Grade Earth Around New Construction	9,000.00	SF	24	$ 1,015.20	$ -	$ -	$ 737.00	$ 1,752.20
02	$ 0.38	...Fabric Under Building	10,000.00	SF	32	$ 1,353.60	$ 2,400.00	$ -	$ -	$ 3,753.60
02	$ 31.07	...6" CPP perforated w/stone and fabric around BLDG	0	LF	0	$ -	$ -	$ -	$ -	$ -
02	$ 129,408.00	...Structure #57 Stone Backfill Sides	1	LS	320	$ 13,536.00	$ 81,400.00	$ 22,000.00	$ 12,472.00	$ 129,408.00
02	$ 66.47	...Stone Fill for PRS Loading Dock Slab	370	TN	96	$ 4,060.80	$ 15,466.00	$ 4,070.00	$ 998.00	$ 24,594.80
02	$ 298,316.50	Earthwork Tank - Mass Excavation & Backfill	1	LS	1,045.00	$ 44,203.50	$ -	$ 213,650.00	$ 40,463.00	$ 298,316.50
02	$ 24.67	...Structure Excavate to Waste Offsite (Low)	6,700.00	CY	600	$ 25,380.00	$ -	$ 118,600.00	$ 21,296.00	$ 165,276.00
02	$ 29.90	...Site Import to Fill	4,450.00	CY	445	$ 18,823.50	$ -	$ 95,050.00	$ 19,167.00	$ 133,040.50
02	$ 146,400.00	Final Access Road Around Tank	1	LS	660	$ 27,918.00	$ 62,451.00	$ 43,780.00	$ 12,251.00	$ 146,400.00
02	$ 25.06	...Stone Base (6") for Tank Contractor Access - Install / Remove	1,420.00	SY	224	$ 9,475.20	$ 14,256.00	$ 5,280.00	$ 6,581.00	$ 35,592.20
02	$ 75.06	...Mod Pave 85 - Grass PArking Area	1,000.00	SY	436	$ 18,442.80	$ 48,195.00	$ 2,750.00	$ 5,670.00	$ 75,057.80
02	$ 1.75	...Sod for Mod Pave 85 - Grass PArking Area	9,000.00	SF	0	$ -	$ -	$ 15,750.00	$ -	$ 15,750.00
02	$ 200.00	...60/40 Mix for Mod Pave 85 - Grass PArking Area	100	CY	0	$ -	$ -	$ 20,000.00	$ -	$ 20,000.00
02	$ 117.81	Asphalt Paving - PRS Site	1,550.00	LS	480	$ 20,304.00	$ 36,745.20	$ 101,401.00	$ 24,150.00	$ 182,600.20
02	$ 57.98	...No. 21A Stone Base for Pavement	1,550.00	SY	480	$ 20,304.00	$ 33,145.20	$ 12,276.00	$ 24,150.00	$ 89,875.20
02	$ 59.82	...Asphalt Paving Onsite	1,550.00	SY	0	$ -	$ 3,600.00	$ 89,125.00	$ -	$ 92,725.00
02	$ 126,000.00	Fence Work	1	LS	0	$ -	$ -	$ 126,000.00	$ -	$ 126,000.00

Division	UnitCost	Description	Qty	Units	ManHours	Labor	Material	SubContr	Equipment	XtdCost
02	$ 70.00	...Chain Link Fence & Gates	1,400.00	LF	0	$ -	$ -	$ 98,000.00	$ -	$ 98,000.00
02	$ 20.00	...Temporary Construction Fence	1,400.00	LF	0	$ -	$ -	$ 28,000.00	$ -	$ 28,000.00
02	**$ 80,000.00**	**Landscape Work**	**1**	**LS**	**0**	**$ -**	**$ -**	**$ 80,000.00**	**$ -**	**$ 80,000.00**
02	$ 30,000.00	...Irrigation Systems	1	LS	0	$ -	$ -	$ 30,000.00	$ -	$ 30,000.00
02	$ 50,000.00	...Landscaping	1	LS	0	$ -	$ -	$ 50,000.00	$ -	$ 50,000.00
02	**$ 0.07**	**Permanent Seeding & Mulching**	**136,000.00**	**SF**	**0**	**$ -**	**$ -**	**$ 9,520.00**	**$ -**	**$ 9,520.00**
03	**$ 740.26**	**SITE - Transformer Pad**	**4**	**CY**	**34.7**	**$ 1,467.86**	**$ 1,283.20**	**$ 210.00**	**$ -**	**$ 2,961.06**
03	$ 291.71	...Place S.O.G. (7" to 12")	4	CY	12	$ 507.65	$ 659.20	$ -	$ -	$ 1,166.85
03	$ 2,760.00	...Reinforcing	0.25	TN	0	$ -	$ 480.00	$ 210.00	$ -	$ 690.00
03	$ 24.15	...Form SOG Edge	41	SF	20.5	$ 867.15	$ 123.00	$ -	$ -	$ 990.15
03	$ 0.33	...Slab Finish (Float)	105	SF	0.7	$ 29.61	$ 5.25	$ -	$ -	$ 34.86
03	$ 0.40	...Screed Poles & Chairs	105	SF	0.75	$ 31.73	$ 10.50	$ -	$ -	$ 42.23
03	$ 0.35	...Cure & Protect Walls & Slabs	105	SF	0.75	$ 31.73	$ 5.25	$ -	$ -	$ 36.98
03	**$ 805.75**	**SITE - Concrete Driveway Aprons**	**14**	**CY**	**110.96**	**$ 4,693.53**	**$ 5,411.00**	**$ 1,176.00**	**$ -**	**$ 11,280.53**
03	$ 227.02	...Placing Pavement	14	CY	24	$ 1,015.26	$ 2,163.00	$ -	$ -	$ 3,178.26
03	$ 2,760.00	...Reinforcing	1.4	TN	0	$ -	$ 2,688.00	$ 1,176.00	$ -	$ 3,864.00
03	$ 24.15	...Form Pavement Edge	140	SF	70	$ 2,961.00	$ 420.00	$ -	$ -	$ 3,381.00
03	$ 0.52	...Slab Finish Broom for Pavement	370	SF	4.11	$ 173.90	$ 18.50	$ -	$ -	$ 192.40
03	$ 0.35	...Cure & Protect Walls & Slabs	370	SF	2.64	$ 111.79	$ 18.50	$ -	$ -	$ 130.29
03	$ 0.40	...Screed Poles & Chairs	370	SF	2.64	$ 111.79	$ 37.00	$ -	$ -	$ 148.79
03	$ 24.15	...Form Bulkhead Pavement	12	SF	6	$ 253.80	$ 36.00	$ -	$ -	$ 289.80
03	$ 3.12	...Expansion Joint (Fiber)	12	SF	0.6	$ 25.38	$ 12.00	$ -	$ -	$ 37.38
03	$ 2.69	...Sawcut Concrete Joints	12	LF	0.48	$ 20.30	$ 12.00	$ -	$ -	$ 32.30
03	$ 2.19	...Seal/Caulk Concrete Joints	12	LF	0.48	$ 20.30	$ 6.00	$ -	$ -	$ 26.30
03	**$ 566.67**	**SITE - Sidewalk**	**48**	**CY**	**372.78**	**$ 15,768.55**	**$ 11,431.49**	**$ -**	**$ -**	**$ 27,200.04**
03	$ 196.80	...Place Sidewalk	48	CY	48	$ 2,030.40	$ 7,416.00	$ -	$ -	$ 9,446.40
03	$ 19.92	...Form Sidewalk	548	SF	219.2	$ 9,272.16	$ 1,644.00	$ -	$ -	$ 10,916.16
03	$ 1.56	...Tooled Control Joints	297	LF	7.43	$ 314.08	$ 148.50	$ -	$ -	$ 462.58
03	$ 0.52	...Slab Finish (Broom)	3,855.00	SF	42.83	$ 1,811.85	$ 192.75	$ -	$ -	$ 2,004.60
03	$ 0.77	...WWF 6x6-W8.1xW8.1	3,855.00	SF	26.99	$ 1,141.47	$ 1,821.49	$ -	$ -	$ 2,962.95
03	$ 3.12	...Expansion Joint (Fiber)	16	SF	0.8	$ 33.84	$ 16.00	$ -	$ -	$ 49.84
03	$ 0.35	...Cure & Protect Walls & Slabs	3,855.00	SF	27.54	$ 1,164.76	$ 192.75	$ -	$ -	$ 1,357.51
03	**$ 537.85**	**PRS - Foundation Slabs EL.5.00 & EL. 12.67**	**632**	**CY**	**936.45**	**$ 39,611.68**	**$ 256,107.84**	**$ 46,728.00**	**$ -**	**$ 342,447.52**
03	$ 182.23	...Place Foundation Mats (24" to 48")	632	CY	260.38	$ 11,014.24	$ 104,153.60	$ -	$ -	$ 115,167.84
03	$ 12.00	...Concrete Pumping	632	CY	0	$ -	$ -	$ 7,584.00	$ -	$ 7,584.00
03	$ 2,760.00	...Reinforcing	46.6	TN	0	$ -	$ 89,472.00	$ 39,144.00	$ -	$ 128,616.00
03	$ 13.58	...Form Foundation Mat	1,092.00	SF	273	$ 11,547.90	$ 3,276.00	$ -	$ -	$ 14,823.90
03	$ 24.15	...Form Bulkheads - SOG	346	SF	173	$ 7,317.90	$ 1,038.00	$ -	$ -	$ 8,355.90
03	$ 0.33	...Slab Finish (Float)	8,549.00	SF	56.99	$ 2,410.82	$ 427.45	$ -	$ -	$ 2,838.27
03	$ 0.40	...Screed Poles & Chairs	8,549.00	SF	61.06	$ 2,583.02	$ 854.90	$ -	$ -	$ 3,437.92
03	$ 0.35	...Cure & Protect Walls & Slabs	8,549.00	SF	61.06	$ 2,583.02	$ 427.45	$ -	$ -	$ 3,010.47
03	$ 0.48	...Vapor Barrier (USOG)	8,549.00	SF	32.64	$ 1,380.74	$ 2,692.94	$ -	$ -	$ 4,073.68
03	$ 0.85	...Keyway (2" X 4")	173	LF	1.44	$ 60.98	$ 86.50	$ -	$ -	$ 147.48
03	$ 6.02	...Waterstop (6" PVC)	173	LF	12.36	$ 522.71	$ 519.00	$ -	$ -	$ 1,041.71
03	$ 14.58	...Form Boxouts for SOG	18	SF	4.5	$ 190.35	$ 72.00	$ -	$ -	$ 262.35
03	$ 84.00	...Admixture - Crystalline Waterproofing	632	CY	0	$ -	$ 53,088.00	$ -	$ -	$ 50,560.00
03	**$ 687.94**	**PRS - Pump Pedestals [4 EA]**	**34**	**CY**	**315.06**	**$ 13,326.97**	**$ 9,895.12**	**$ 168.00**	**$ -**	**$ 23,390.09**
03	$ 224.52	...Place Curbs, Pipe & Equipment Bases	34	CY	48	$ 2,030.35	$ 5,603.20	$ -	$ -	$ 7,633.55
03	$ 2,760.00	...Reinforcing	0.2	TN	0	$ -	$ 384.00	$ 168.00	$ -	$ 552.00
03	$ 14.58	...Form Pipe Cradles	720	SF	180	$ 7,614.00	$ 2,880.00	$ -	$ -	$ 10,494.00
03	$ 0.38	...Chamfer Strip 3/4"	224	LF	1.6	$ 67.68	$ 17.92	$ -	$ -	$ 85.60

Division	UnitCost	Description	Qty	Units	ManHours	Labor	Material	SubContr	Equipment	XtdCost
03	$ 18.08	...Drill & Grout Dowels	80	EA	20	$ 846.00	$ 600.00	$ -	$ -	$ 1,446.00
03	$ 0.92	...Patch & Grout Concrete	720	SF	12.32	$ 521.00	$ 144.00	$ -	$ -	$ 665.00
03	$ 2.42	...Rub Finish Concrete	720	SF	36	$ 1,522.80	$ 216.00	$ -	$ -	$ 1,738.80
03	$ 4.43	...Roughen Concrete Surfaces	100	SF	10	$ 423.00	$ 20.00	$ -	$ -	$ 443.00
03	$ 3.32	...Bonding Agent	100	SF	7.14	$ 302.14	$ 30.00	$ -	$ -	$ 332.14
03	**$ 837.82**	**PRS - Walls**	**498**	**CY**	**3,175.93**	**$ 134,341.82**	**$ 245,522.75**	**$ 39,360.00**	**$ -**	**$ 419,224.57**
03	$ 198.78	...Place Walls	498	CY	400	$ 16,920.00	$ 82,070.40	$ -	$ -	$ 98,990.40
03	$ 7.50	...Admixture - HRWR (Type F)	498	CY	0	$ -	$ 3,735.00	$ -	$ -	$ 3,735.00
03	$ 20.00	...Concrete Pumping	498	CY	0	$ -	$ -	$ 9,960.00	$ -	$ 9,960.00
03	$ 2,760.00	...Reinforcing	35	TN	0	$ -	$ 67,200.00	$ 29,400.00	$ -	$ 96,600.00
03	$ 12.46	...Form Straight Walls (12'+) Med	10,089.00	SF	2,017.80	$ 85,352.94	$ 40,356.00	$ -	$ -	$ 125,708.94
03	$ 21.60	...Form Wall Bulkheads	389	SF	129.67	$ 5,484.90	$ 2,917.50	$ -	$ -	$ 8,402.40
03	$ 14.58	...Form Boxouts for Walls	14	SF	3.5	$ 148.05	$ 56.00	$ -	$ -	$ 204.05
03	$ 0.35	...Cure & Protect Walls & Slabs	10,089.00	SF	72.06	$ 3,048.32	$ 504.45	$ -	$ -	$ 3,552.77
03	$ 0.92	...Patch & Grout Concrete	10,089.00	SF	172.59	$ 7,300.46	$ 2,017.80	$ -	$ -	$ 9,318.26
03	$ 2.42	...Rub Finish Concrete	5,367.00	SF	268.35	$ 11,351.21	$ 1,610.10	$ -	$ -	$ 12,961.31
03	$ 0.38	...Chamfer Strip 3/4" (Sub)	750	LF	5.36	$ 226.61	$ 60.00	$ -	$ -	$ 286.61
03	$ 0.85	...Keyway (2" X 4") (Sub)	141	LF	1.18	$ 49.70	$ 70.50	$ -	$ -	$ 120.20
03	$ 6.02	...Waterstop (6" PVC) (Sub)	586	LF	41.86	$ 1,770.56	$ 1,758.00	$ -	$ -	$ 3,528.56
03	$ 9.04	...Form Raised Key	445	LF	63.57	$ 2,689.07	$ 1,335.00	$ -	$ -	$ 4,024.07
03	$ 84.00	...Admixture - Crystalline Waterproofing	498	CY	0	$ -	$ 41,832.00	$ -	$ -	$ 41,832.00
03	**$ 1,288.07**	**PRS - Strip Footings EL.19.00**	**18**	**CY**	**233.29**	**$ 9,868.11**	**$ 10,053.10**	**$ 3,336.00**	**$ -**	**$ 23,257.21**
03	$ 221.20	...Place S.O.G. (7" to 12")	18	CY	24	$ 1,015.20	$ 2,966.40	$ -	$ -	$ 3,981.60
03	$ 85.00	...Concrete Pumping	18	CY	0	$ -	$ -	$ 1,530.00	$ -	$ 1,530.00
03	$ 2,760.00	...Reinforcing	2.15	TN	0	$ -	$ 4,128.00	$ 1,806.00	$ -	$ 5,934.00
03	$ 24.15	...Form SOG Edge	389	SF	194.5	$ 8,227.35	$ 1,167.00	$ -	$ -	$ 9,394.35
03	$ 24.15	...Form Bulkheads - SOG	5	SF	2.5	$ 105.75	$ 15.00	$ -	$ -	$ 120.75
03	$ 0.33	...Slab Finish (Float)	480	SF	3.2	$ 135.36	$ 24.00	$ -	$ -	$ 159.36
03	$ 0.40	...Screed Poles & Chairs	480	SF	3.43	$ 145.03	$ 48.00	$ -	$ -	$ 193.03
03	$ 0.35	...Cure & Protect Walls & Slabs	480	SF	3.43	$ 145.03	$ 24.00	$ -	$ -	$ 169.03
03	$ 0.48	...Vapor Barrier (USOG)	480	SF	1.83	$ 77.52	$ 151.20	$ -	$ -	$ 228.72
03	$ 0.85	...Keyway (2" X 4")	5	LF	0.04	$ 1.76	$ 2.50	$ -	$ -	$ 4.26
03	$ 6.02	...Waterstop (6" PVC)	5	LF	0.36	$ 15.11	$ 15.00	$ -	$ -	$ 30.11
03	$ 84.00	...Admixture - Crystalline Waterproofing	18	CY	0	$ -	$ 1,512.00	$ -	$ -	$ 1,512.00
03	**$ 1,170.93**	**PRS - Slabs on Grade EL.21.00**	**28**	**CY**	**222.9**	**$ 9,428.66**	**$ 16,987.25**	**$ 6,566.00**	**$ -**	**$ 32,981.91**
03	$ 213.14	...Place S.O.G. (7" to 12")	28	CY	32	$ 1,353.52	$ 4,614.40	$ -	$ -	$ 5,967.92
03	$ 80.00	...Concrete Pumping	28	CY	0	$ -	$ -	$ 2,240.00	$ -	$ 2,240.00
03	$ 2,760.00	...Reinforcing	5.15	TN	0	$ -	$ 9,888.00	$ 4,326.00	$ -	$ 14,214.00
03	$ 24.15	...Form SOG Edge	205	SF	102.5	$ 4,335.75	$ 615.00	$ -	$ -	$ 4,950.75
03	$ 24.15	...Form Bulkheads - SOG	29	SF	14.5	$ 613.35	$ 87.00	$ -	$ -	$ 700.35
03	$ 14.58	...Form Boxouts for SOG	134	SF	33.5	$ 1,417.05	$ 536.00	$ -	$ -	$ 1,953.05
03	$ 0.52	...Slab Finish (Trowel)	1,290.00	SF	12.9	$ 545.67	$ 129.00	$ -	$ -	$ 674.67
03	$ 0.40	...Screed Poles & Chairs	1,290.00	SF	9.21	$ 389.76	$ 129.00	$ -	$ -	$ 518.76
03	$ 0.35	...Cure & Protect Walls & Slabs	1,290.00	SF	9.21	$ 389.76	$ 64.50	$ -	$ -	$ 454.26
03	$ 0.48	...Vapor Barrier (USOG)	1,290.00	SF	4.93	$ 208.35	$ 406.35	$ -	$ -	$ 614.70
03	$ 0.85	...Keyway (2" X 4")	52	LF	0.43	$ 18.33	$ 26.00	$ -	$ -	$ 44.33
03	$ 6.02	...Waterstop (6" PVC)	52	LF	3.71	$ 157.11	$ 156.00	$ -	$ -	$ 313.11
03	$ 84.00	...Admixture - Crystalline Waterproofing	4	CY	0	$ -	$ 336.00	$ -	$ -	$ 140.00
03	**$ 14.58**	**PRS - Temporary Shoring Bracing**	**408**	**SF**	**102**	**$ 4,314.60**	**$ 1,632.00**	**$ -**	**$ -**	**$ 5,946.60**
03	$ 7.50	...Reshore Suspended Slab	408	SF	102	$ 4,314.60	$ -	$ -	$ -	$ 4,314.60
03	$ 4.00	...Reshore Suspended Slab	408	SF	0	$ -	$ 1,632.00	$ -	$ -	$ 1,632.00
03	**$ 1,491.23**	**PRS - Loading Dock Slab**	**9**	**CY**	**69.45**	**$ 2,937.86**	**$ 7,879.20**	**$ 2,604.00**	**$ -**	**$ 13,421.06**

Division	UnitCost	Description	Qty	Units	ManHours	Labor	Material	SubContr	Equipment	XtdCost
03	$ 277.59	...Place S.O.G. (7" to 12")	9	CY	24	$ 1,015.07	$ 1,483.20	$ -	$ -	$ 2,498.27
03	$ 2,760.00	...Reinforcing	3.1	TN	0	$ -	$ 5,952.00	$ 2,604.00	$ -	$ 8,556.00
03	$ 33.08	...Form SOG Edge	45	SF	32	$ 1,353.55	$ 135.00	$ -	$ -	$ 1,488.55
03	$ 0.52	...Slab Finish (Trowel)	480	SF	4.8	$ 203.04	$ 48.00	$ -	$ -	$ 251.04
03	$ 0.40	...Screed Poles & Chairs	480	SF	3.43	$ 145.03	$ 48.00	$ -	$ -	$ 193.03
03	$ 0.35	...Cure & Protect Walls & Slabs	480	SF	3.43	$ 145.03	$ 24.00	$ -	$ -	$ 169.03
03	$ 4.91	...Expansion Joint (Cork)	54	SF	1.8	$ 76.14	$ 189.00	$ -	$ -	$ 265.14
03	**$ 919.35**	**PRS - Generator Slab**	**5**	**CY**	**56.52**	**$ 2,390.92**	**$ 1,911.81**	**$ 294.00**	**$ -**	**$ 4,596.73**
03	$ 300.19	...Place S.O.G. (7" to 12")	5	CY	16	$ 676.96	$ 824.00	$ -	$ -	$ 1,500.96
03	$ 2,760.00	...Reinforcing	0.35	TN	0	$ -	$ 672.00	$ 294.00	$ -	$ 966.00
03	$ 24.15	...Form SOG Edge	51	SF	25.5	$ 1,078.65	$ 153.00	$ -	$ -	$ 1,231.65
03	$ 0.33	...Slab Finish (Float)	134	SF	0.89	$ 37.79	$ 6.70	$ -	$ -	$ 44.49
03	$ 0.40	...Screed Poles & Chairs	134	SF	0.96	$ 40.49	$ 13.40	$ -	$ -	$ 53.89
03	$ 0.35	...Cure & Protect Walls & Slabs	134	SF	0.96	$ 40.49	$ 6.70	$ -	$ -	$ 47.19
03	$ 0.48	...Vapor Barrier (USOG)	134	SF	0.51	$ 21.64	$ 42.21	$ -	$ -	$ 63.85
03	$ 4.91	...Expansion Joint (Cork)	51	SF	1.7	$ 71.91	$ 178.50	$ -	$ -	$ 250.41
03	$ 8.59	...Rub Finish Concrete	51	SF	10	$ 423.00	$ 15.30	$ -	$ -	$ 438.30
03	**$ 1,831.18**	**PRS - Pipe Supports [20 EA]**	**12**	**CY**	**366.02**	**$ 15,482.67**	**$ 6,281.54**	**$ 210.00**	**$ -**	**$ 21,974.21**
03	$ 376.30	...Place Curbs, Pipe & Equipment Bases	12	CY	60	$ 2,538.00	$ 1,977.60	$ -	$ -	$ 4,515.60
03	$ 2,760.00	...Reinforcing	0.25	TN	0	$ -	$ 480.00	$ 210.00	$ -	$ 690.00
03	$ 18.10	...Form Pipe Cradles	534	SF	178	$ 7,529.40	$ 2,136.00	$ -	$ -	$ 9,665.40
03	$ 0.38	...Chamfer Strip 3/4"	418	LF	2.99	$ 126.30	$ 33.44	$ -	$ -	$ 159.74
03	$ 18.08	...Drill & Grout Dowels	178	EA	44.5	$ 1,882.35	$ 1,335.00	$ -	$ -	$ 3,217.35
03	$ 0.92	...Patch & Grout Concrete	534	SF	9.13	$ 386.41	$ 106.80	$ -	$ -	$ 493.21
03	$ 4.53	...Rub Finish Concrete	534	SF	53.4	$ 2,258.82	$ 160.20	$ -	$ -	$ 2,419.02
03	$ 4.43	...Roughen Concrete Surfaces	105	SF	10.5	$ 444.15	$ 21.00	$ -	$ -	$ 465.15
03	$ 3.32	...Bonding Agent	105	SF	7.5	$ 317.25	$ 31.50	$ -	$ -	$ 348.75
03	**$ 105.58**	**PRS - 6" Trench Drain EL.12.50**	**57**	**LF**	**14.25**	**$ 602.78**	**$ 5,415.00**	**$ -**	**$ -**	**$ 6,017.78**
03	$ 7.50	...Precast Trench Drain	57	LF	14.25	$ 602.78	$ -	$ -	$ -	$ 602.78
03	$ 95.00	...Precast Trench Drain	57	LF	0	$ -	$ 5,415.00	$ -	$ -	$ 5,415.00
03	**$ 3,660.54**	**PRS - Electrical Pads [4 EA]/ Heat Pump [1 EA]**	**2**	**CY**	**115.47**	**$ 4,884.34**	**$ 2,142.74**	**$ 294.00**	**$ -**	**$ 7,321.08**
03	$ 587.80	...Place Curbs, Pipe & Equipment Bases	2	CY	20	$ 846.00	$ 329.60	$ -	$ -	$ 1,175.60
03	$ 30.03	...Form Pipe & Equipment Bases	39	SF	24	$ 1,015.20	$ 156.00	$ -	$ -	$ 1,171.20
03	$ 0.38	...Chamfer Strip 3/4"	123	LF	0.88	$ 37.16	$ 9.84	$ -	$ -	$ 47.00
03	$ 18.08	...Drill & Grout Dowels	116	EA	29	$ 1,226.70	$ 870.00	$ -	$ -	$ 2,096.70
03	$ 0.52	...Slab Finish (Broom)	156	SF	1.73	$ 73.32	$ 7.80	$ -	$ -	$ 81.12
03	$ 13.32	...Rub Finish Concrete	39	SF	12	$ 507.60	$ 11.70	$ -	$ -	$ 519.30
03	$ 0.35	...Cure & Protect Walls & Slabs	156	SF	1.11	$ 47.13	$ 7.80	$ -	$ -	$ 54.93
03	$ 4.43	...Roughen Concrete Surfaces	156	SF	15.6	$ 659.88	$ 31.20	$ -	$ -	$ 691.08
03	$ 3.32	...Bonding Agent	156	SF	11.14	$ 471.34	$ 46.80	$ -	$ -	$ 518.14
03	$ 2,760.00	...Reinforcing	0.35	TN	0	$ -	$ 672.00	$ 294.00	$ -	$ 966.00
03	**$ 1,438.96**	**PRS - HVAC Pad/ MTS Pad**	**2**	**CY**	**47.09**	**$ 1,991.93**	**$ 760.00**	**$ 126.00**	**$ -**	**$ 2,877.93**
03	$ 672.42	...Place S.O.G. (7" to 12")	2	CY	24	$ 1,015.24	$ 329.60	$ -	$ -	$ 1,344.84
03	$ 2,760.00	...Reinforcing	0.15	TN	0	$ -	$ 288.00	$ 126.00	$ -	$ 414.00
03	$ 24.15	...Form SOG Edge	44	SF	22	$ 930.60	$ 132.00	$ -	$ -	$ 1,062.60
03	$ 0.33	...Slab Finish (Float)	52	SF	0.35	$ 14.66	$ 2.60	$ -	$ -	$ 17.26
03	$ 0.40	...Screed Poles & Chairs	52	SF	0.37	$ 15.71	$ 5.20	$ -	$ -	$ 20.91
03	$ 0.35	...Cure & Protect Walls & Slabs	52	SF	0.37	$ 15.71	$ 2.60	$ -	$ -	$ 18.31
03	**$ 613.50**	**ODOR CONTROL - Slab on Grade**	**10**	**CY**	**61.15**	**$ 2,586.77**	**$ 3,044.20**	**$ 504.00**	**$ -**	**$ 6,134.97**
03	$ 232.47	...Place S.O.G. (7" to 12")	10	CY	16	$ 676.75	$ 1,648.00	$ -	$ -	$ 2,324.75
03	$ 2,760.00	...Reinforcing	0.6	TN	0	$ -	$ 1,152.00	$ 504.00	$ -	$ 1,656.00
03	$ 29.03	...Form SOG Edge	65	SF	40	$ 1,692.00	$ 195.00	$ -	$ -	$ 1,887.00

Division	UnitCost	Description	Qty	Units	ManHours	Labor	Material	SubContr	Equipment	XtdCost
03	$ 0.33	...Slab Finish (Float)	246	SF	1.64	$ 69.37	$ 12.30	$ -	$ -	$ 81.67
03	$ 0.40	...Screed Poles & Chairs	246	SF	1.76	$ 74.33	$ 24.60	$ -	$ -	$ 98.93
03	$ 0.35	...Cure & Protect Walls & Slabs	246	SF	1.76	$ 74.33	$ 12.30	$ -	$ -	$ 86.63
03	$ 20,120.00	Concrete Escalation	1	LS	0	$ -	$ 20,120.00	$ -	$ -	$ 20,120.00
03	$ 15.00	...Concrete Material Escalation (2025)	1,240.00	CY	0	$ -	$ 18,600.00	$ -	$ -	$ 18,600.00
03	$ 20.00	...Concrete Material Escalation (2026)	76	CY	0	$ -	$ 1,520.00	$ -	$ -	$ 1,520.00
04	$ 487,123.00	Masonry CMU - Pressure Reducing Station	1	LS	40	$ 1,692.00	$ 35,920.00	$ 449,511.00	$ -	$ 487,123.00
05	$ 619.20	6" Pipe Bollards [Not Shown]	24	EA	96	$ 4,060.80	$ 10,800.00	$ -	$ -	$ 14,860.80
05	$ 9,543.28	Bridge Crane Runway Beams & Support Columns [S-103 & S-104]	15.71	TN	680	$ 28,764.00	$ 114,594.00	$ -	$ 6,567.00	$ 149,925.00
05	$ 22,193.53	Entrance Canopy Str. Steel Overhang Framing [S-103 & S-104]	0.34	TN	80	$ 3,384.00	$ 3,032.00	$ -	$ 1,129.80	$ 7,545.80
05	$ 135.27	Galvanized Steel Trench Grating w/Frames [S-101]	51	SF	32	$ 1,353.60	$ 5,545.40	$ -	$ -	$ 6,899.00
05	$ 188,289.00	Top Level Access Platform (EL 21.0) [S-103 & H-102]	1	EA	832	$ 35,193.60	$ 150,892.20	$ -	$ 2,203.20	$ 188,289.00
05	$ 934.58	Pump Room Steel Stair 1, Grate Tread 36", Rail [S-102 & H-101]	13	Riser	56	$ 2,368.80	$ 9,780.80	$ -	$ -	$ 12,149.60
05	$ 934.58	Pump Room Steel Stair 2, Grate Tread 36", Rail [S-102 & H-101]	13	Riser	56	$ 2,368.80	$ 9,780.80	$ -	$ -	$ 12,149.60
05	$ 71,585.20	Pump Access Platforms [S-102 & H-101]	1	EA	368	$ 15,566.40	$ 55,712.80	$ -	$ 306.00	$ 71,585.20
05	$ 26,980.00	Pipe Crossover Access Platform #1 [S-102 & H-101]	1	EA	176	$ 7,444.80	$ 19,229.20	$ -	$ 306.00	$ 26,980.00
05	$ 26,980.00	Pipe Crossover Access Platform #2 [S-102 & H-102]	1	EA	176	$ 7,444.80	$ 19,229.20	$ -	$ 306.00	$ 26,980.00
05	$ 1,708.30	Loading Dock Steel Stair 1, Grate Tread 36", Rail [S-102 & H-102]	28	Riser	173	$ 7,317.90	$ 40,025.00	$ -	$ 489.60	$ 47,832.50
05	$ 25,349.20	Pump Room South Wall Access Platform [S-101 & H-101]	1	EA	184	$ 7,783.20	$ 17,076.40	$ -	$ 489.60	$ 25,349.20
05	$ 14.30	High Rise Metal Truss & Metal Decking Roof [S-105 & A-110]	8,524.00	SF	40	$ 1,692.00	$ -	$ 120,188.40	$ -	$ 121,880.40
05	$ 32.09	Concrete Corner Guards - Overhead Door Sills [S-103]	31	LF	8	$ 338.40	$ 656.25	$ -	$ -	$ 994.65
05	$ 4.20	Masonry Overhead Door Lintel [S-104]	1,617.00	LB	12	$ 507.60	$ 6,225.45	$ -	$ 61.20	$ 6,794.25
05	$ 2,612.40	Pump Room Steel Ship's Ladder [S-101 & H-101]	1	EA	28	$ 1,184.40	$ 1,428.00	$ -	$ -	$ 2,612.40
05	$ 81.47	Aluminum Rail - Surface Mount [S-101, S-102, H-101, & H-102]	46	LF	34	$ 1,438.20	$ 2,309.20	$ -	$ -	$ 3,747.40
05	$ 92.60	Aluminum Rail - Removable [H-102]	6	LF	8	$ 338.40	$ 217.20	$ -	$ -	$ 555.60
07	$ 1.95	WP Fluid, Cold Applied, Foundation - Sub [S-101 & 1/S-303]	5,206.00	SF	0	$ -	$ -	$ 10,151.70	$ -	$ 10,151.70
07	$ 2.38	2" Rigid Styrofoam Below Grade & Under Slab [S-103]	1,521.00	SF	48	$ 2,030.40	$ 1,597.05	$ -	$ -	$ 3,627.45
07	$ 1.92	2" Rigid Polystyrene Siding Wall Insulation [3/A-301]	5,856.00	SF	120	$ 5,076.00	$ 5,856.00	$ -	$ 306.00	$ 11,238.00
07	$ 20.00	Hardie Siding Package [A-201 & A-202]	5,856.00	SF	0	$ -	$ -	$ 117,120.00	$ -	$ 117,120.00
07	$ 393,719.00	Metal Roofing Package - Pressure Reducing Station	1	LS	40	$ 1,692.00	$ -	$ 392,027.00	$ -	$ 393,719.00
07	$ 46.15	Concrete Splash Blocks [A-201]	8	EA	4	$ 169.20	$ 200.00	$ -	$ -	$ 369.20
08	$ 60,267.80	Door & Hardware Package - Pressure Reducing Station	1	LS	186	$ 7,867.80	$ 51,600.00	$ 800.00	$ -	$ 60,267.80
08	$ 46,021.00	16' x 16'-5" OH Coiling Door, HD, w/ Operator [A-101]	1	EA	0	$ -	$ -	$ 46,021.00	$ -	$ 46,021.00
08	$ 135,000.00	Alum. Window Package - Pressure Reducing Station	1	LS	0	$ -	$ -	$ 135,000.00	$ -	$ 135,000.00
09	$ 6,000.00	Painting Package - Site Work	1	LS	0	$ -	$ -	$ 6,000.00	$ -	$ 6,000.00
09	$ 38,460.00	Caulking Package - Pressure Reducing Station	1	LS	0	$ -	$ -	$ 38,460.00	$ -	$ 38,460.00
09	$ 3,667.00	Acoustical Ceiling - Pressure Reducing Station	1	LS	0	$ -	$ -	$ 3,667.00	$ -	$ 3,667.00
09	$ 235,515.00	Epoxy Flooring - Pressure Reducing Station	1	LS	0	$ -	$ -	$ 235,515.00	$ -	$ 235,515.00
09	$ 486,281.00	Painting Package - Pressure Reducing Station	1	LS	0	$ -	$ -	$ 486,281.00	$ -	$ 486,281.00
09	$ 976.80	Painting for Dissimular Materails - Entry Columns in Masonry	1	LS	16	$ 676.80	$ 300.00	$ -	$ -	$ 976.80
09	$ 2,892.00	Painting Package - Offline Storage Tank	1	LS	0	$ -	$ -	$ 2,892.00	$ -	$ 2,892.00
10	$ 1,338.40	Signage - Pressure Reducing Station [Spec 10 14 00]	1	LS	8	$ 338.40	$ 1,000.00	$ -	$ -	$ 1,338.40
10	$ 471.60	Fire Extinguisher, Dry Chemical, 10lb. [Spec 10 44 00]	9	EA	28	$ 1,184.40	$ 1,485.00	$ 1,575.00	$ -	$ 4,244.40
10	$ 756.90	Fire Extinguisher, Carbon Dioxide, 10 lb. [Spec 10 44 00]	1	EA	3	$ 126.90	$ 455.00	$ 175.00	$ -	$ 756.90
10	$ 178.34	SS Toilet & Bath Accessories [Spec 10 28 00]	7	EA	8	$ 338.40	$ 910.00	$ -	$ -	$ 1,248.40

Division	UnitCost	Description	Qty	Units	ManHours	Labor	Material	SubContr	Equipment	XtdCost
11	$ 5,494.55	PRS - Submersible Pumps	4	EA	306	$ 14,238.18	$ 1,490.00	$ 6,250.00	$ -	$ 21,978.18
11	$ 8,405.21	Odor Control System	1	LS	157	$ 7,305.21	$ 1,100.00	$ -	$ -	$ 8,405.21
11	$ 3,141.09	Tank Vacuum Flushing System	1	LS	53	$ 2,466.09	$ 675.00	$ -	$ -	$ 3,141.09
14	$ 173,500.00	Bridge Crane - 3 ton [S-104 & Spec 41 22 13.13]	1	EA	0	$ -	$ -	$ 173,500.00	$ -	$ 173,500.00
15	$ 919,457.50	****** HVAC / PLUMBING / HEAT TRACE & INSULATION / TEST & BALLANCE *	1	LS	0	$ -	$ 12,500.00	$ 906,957.50	$ -	$ 919,457.50
15	$ 461,250.00	...HVAC & PLUMBING	1	LS	0	$ -	$ -	$ 461,250.00	$ -	$ 461,250.00
15	$ -	...PLUMBING	1	LS	0	$ -	$ -	$ -	$ -	$ -
15	$ 30,000.00	...HEAT TRACE AND INSULATION SUBCONTRACTOR	1	EA	0	$ -	$ -	$ 30,000.00	$ -	$ 30,000.00
15	$ 4,500.00	...TEST AND BALLANCE SUBCONTRACTOR	1	EA	0	$ -	$ -	$ 4,500.00	$ -	$ 4,500.00
15	$ 398,707.50	...FUEL TANK SUBCONTACTOR	1	LS	0	$ -	$ 12,500.00	$ 386,207.50	$ -	$ 398,707.50
15	$ 25,000.00	...Piping and Pipe Support PE Inspections	1	EA	0	$ -	$ -	$ 25,000.00	$ -	$ 25,000.00
15	$ 1,657,650.16	****** ADJUSTMENTS - PURCHASES ******	1	LS	0	$ -	$ 934,020.78	$ -	$ -	$ 934,020.78
15	$ 927,520.78	...DIP - Adjustment - PRS Package	1	LS	0	$ -	$ 927,520.78	$ -	$ -	$ 927,520.78
15	$ 6,500.00	...PVC - Adjustment - PRS Package	1	LS	0	$ -	$ 6,500.00	$ -	$ -	$ 6,500.00
15		**----- PRS PACKAGE - YARD PIPE -----**								
15	$ 53,536.08	30" DIP - OLST Fill [C-101, C-504]	1	LS	244.69	$ 11,385.33	$ 30,063.54	$ 4,728.10	$ 7,359.10	$ 53,536.08
15	$ 66.30	...TRENCH: 3' Depth - 8' per Crew HR - 4 man Crew - 1.4 Exc	64	LF	37.48	$ 1,744.01	$ 578.22	$ 1,009.97	$ 911.00	$ 4,243.20
15	$ 229.70	...TRENCH: 15' Depth - 3' per Crew HR - 4 man Crew - 1.8 Exc	40	LF	68.22	$ 3,174.11	$ 713.42	$ 3,718.13	$ 1,582.47	$ 9,188.14
15	$ 5,997.00	...Equipment Adjustment for Valve, Fittings and Precast - 1.4 Exc	0.89	WK	0	$ -	$ 471.70	$ -	$ 4,865.63	$ 5,337.33
15	$ 125.66	...DI RJ Pipe 30" 150 psi	108	LF	32.39	$ 1,507.27	$ 12,063.60	$ -	$ -	$ 13,570.87
15	$ 1,511.63	...DI MJ 90 Bend 30"	1	EA	12.5	$ 581.63	$ 930.00	$ -	$ -	$ 1,511.63
15	$ 1,361.63	...DI MJ 45 Bend 30"	2	EA	25	$ 1,163.25	$ 1,560.00	$ -	$ -	$ 2,723.25
15	$ 1,246.63	...DI MJ 22.5 Bend 30"	1	EA	12.5	$ 581.63	$ 665.00	$ -	$ -	$ 1,246.63
15	$ 1,181.63	...DI MJ 11.25 Bend 30"	1	EA	12.5	$ 581.63	$ 600.00	$ -	$ -	$ 1,181.63
15	$ 1,257.22	...Meg-a-Lug Accessory Set 30"	10	EA	20	$ 930.60	$ 11,641.60	$ -	$ -	$ 12,572.20
15	$ 980.60	...Sleeve Couplings Dresser Style 38 30"	2	EA	24.1	$ 1,121.20	$ 840.00	$ -	$ -	$ 1,961.20
15	$ 10,796.86	12" DIP - OLST Tank Drain [C-101, C-505]	1	LS	74.46	$ 3,464.53	$ 3,887.22	$ 1,156.47	$ 2,288.64	$ 10,796.86
15	$ 76.99	...TRENCH: 6' Depth - 8' per Crew HR - 4 man Crew - 1.4 Exc	45	LF	27.46	$ 1,277.63	$ 345.30	$ 1,156.47	$ 685.12	$ 3,464.52
15	$ 5,541.00	...Equipment Adjustment for Valve, Fittings and Precast - 1.4 Exc	0.32	WK	0	$ -	$ 169.60	$ -	$ 1,603.52	$ 1,773.12
15	$ 45.01	...DI RJ Pipe 12" 350 psi	54	LF	9.99	$ 464.78	$ 1,965.60	$ -	$ -	$ 2,430.38
15	$ 384.27	...DI MJ 45 Bend 12"	2	EA	12.82	$ 596.54	$ 172.00	$ -	$ -	$ 768.54
15	$ 149.19	...Meg-a-Lug Accessory Set 12"	4	EA	1.33	$ 62.04	$ 534.72	$ -	$ -	$ 596.76
15	$ 440.89	...Sleeve Couplings Dresser Style 38 12"	4	EA	22.86	$ 1,063.54	$ 700.00	$ -	$ -	$ 1,763.54
15	$ 36,664.25	1", 2", 4" Watermain [C-505]	1	LS	310.53	$ 14,448.95	$ 9,806.97	$ 2,331.94	$ 10,076.40	$ 36,664.25
15	$ 31.23	...TRENCH: 4' Depth - 10' per Crew HR - 3 man Crew - 1.0 Exc	735	LF	244.23	$ 11,364.09	$ 1,810.80	$ 2,331.94	$ 7,443.90	$ 22,950.72
15	$ 4,050.00	...Equipment Adjustment for Valve, Fittings and Precast - 1.0 Exc - 3 Man Crew	0.65	WK	0	$ -	$ -	$ -	$ 2,632.50	$ 2,632.50
15	$ 15.59	...DI B&S Pipe 4" 350 psi	40	LF	3.6	$ 167.49	$ 456.00	$ -	$ -	$ 623.49
15	$ 3.04	...PVC Pipe Sch80 1" - Underground	110	LF	3.68	$ 171.33	$ 163.20	$ -	$ -	$ 334.53
15	$ 4.69	...PVC Pipe Sch80 2" - Underground	610	LF	22.18	$ 1,032.12	$ 1,826.83	$ -	$ -	$ 2,858.95
15	$ 59.25	...DI MJ Cap 4" - Tapped w/ 2" NTP	1	EA	1.08	$ 50.25	$ 9.00	$ -	$ -	$ 59.25
15	$ 9.80	...PVC Sch 80 90 Bend 1"	2	EA	0.34	$ 15.77	$ 3.82	$ -	$ -	$ 19.59
15	$ 13.90	...PVC Sch 80 22.5 Bend 2"	2	EA	0.45	$ 21.15	$ 6.64	$ -	$ -	$ 27.79
15	$ 27.32	...PVC Sch 80 Tee 2" x 1"	1	EA	0.33	$ 15.51	$ 11.81	$ -	$ -	$ 27.32
15	$ 27.32	...PVC Sch 80 Tee 2"	1	EA	0.33	$ 15.51	$ 11.81	$ -	$ -	$ 27.32
15	$ 53.69	...Meg-a-Lug Accessory Set 4"	1	EA	0.25	$ 11.63	$ 42.06	$ -	$ -	$ 53.69
15	$ 1,762.27	...Hydrant, Yard, Freezeproof Post - Eclipse No. 2 by Kupferle 2"	4	EA	34.04	$ 1,584.09	$ 5,465.00	$ -	$ -	$ 7,049.09
15	$ 1,192.16	2" PVC Water Line to Odor Control	1	LS	6.79	$ 315.99	$ 215.30	$ 25.65	$ 635.22	$ 1,192.16
15	$ 46.67	...TRENCH: 3' Depth - 12' per Crew HR - 3 man Crew - MiniExc	20	LF	5.56	$ 258.88	$ 144.41	$ 25.65	$ 504.54	$ 933.49

Division	UnitCost	Description	Qty	Units	ManHours	Labor	Material	SubContr	Equipment	XtdCost
15	$ 3,267.00	...Equipment Adjustment for Valve, Fittings and Precast - MiniExc	0.04	WK	0	$ -	$ -	$ -	$ 130.68	$ 130.68
15	$ 4.64	...PVC Pipe Sch80 2" - Underground	20	LF	0.73	$ 33.84	$ 58.93	$ -	$ -	$ 92.77
15	$ 35.23	...PVC Sch 80 Adapter 2" (MPT x Socket)	1	EA	0.5	$ 23.27	$ 11.96	$ -	$ -	$ 35.23
15	**$ 8,890.34**	**3" HPDE / PVC Biofilter Condensate Drain**	**1**	**LS**	**37.52**	**$ 1,745.84**	**$ 5,221.70**	**$ 123.57**	**$ 1,799.23**	**$ 8,890.34**
15	$ 78.34	...TRENCH: 9' Depth - 5' per Crew HR - 3 man Crew - 1.4 Exc	45	LF	33.56	$ 1,561.66	$ 815.02	$ 123.57	$ 1,024.88	$ 3,525.13
15	$ 5,085.00	...Equipment Adjustment for Valve, Fittings and Precast - 1.4 Exc	0.17	WK	0	$ -	$ 90.10	$ -	$ 774.35	$ 864.45
15	$ 7.51	...PVC Pipe Sch80 3" - Underground	35	LF	1.46	$ 67.86	$ 194.94	$ -	$ -	$ 262.80
15	$ 4,000.00	...HDPE, - WELDER RENTAL	1	LS	0	$ -	$ 4,000.00	$ -	$ -	$ 4,000.00
15	$ 5.34	...HDPE, SDR17, 3"	10	LF	0.7	$ 32.57	$ 20.80	$ -	$ -	$ 53.37
15	$ 77.21	...HDPE, SDR11, 3" 90	1	EA	1.3	$ 60.49	$ 16.72	$ -	$ -	$ 77.21
15	$ 53.69	...Meg-a-Lug Accessory Set 3"	2	EA	0.5	$ 23.27	$ 84.12	$ -	$ -	$ 107.39
15	**$ 824.59**	**Hose Rack-Strahman HR100 (loop)**	**2**	**EA**	**6**	**$ 279.18**	**$ 1,370.00**	**$ -**	**$ -**	**$ 1,649.18**
15	**$ 14,856.03**	******* INTERIOR MECHANICAL - GENERAL COST ***********	**1**	**LS**	**214.4**	**$ 9,976.03**	**$ 4,880.00**	**$ -**	**$ -**	**$ 14,856.03**
15	$ 472.24	...Pipe Testing	24	EA	192	$ 8,933.76	$ 2,400.00	$ -	$ -	$ 11,333.76
15	$ 622.24	...Disinfection piping - BY PLUMBER	0	EA	0	$ -	$ -	$ -	$ -	$ -
15	$ 7.33	...Pipe ID 2" & Under	24	EA	1.2	$ 55.84	$ 120.00	$ -	$ -	$ 175.84
15	$ 14.65	...Pipe ID 3" & Over	200	EA	20	$ 930.60	$ 2,000.00	$ -	$ -	$ 2,930.60
15	$ 17.33	...Valve Tags	24	EA	1.2	$ 55.84	$ 360.00	$ -	$ -	$ 415.84
15		**----- PRESSURE REDUCING STATION -----**								
15	**$ 129,482.15**	**12", 18", 30" Interceptor Header [M-201, M-302]**	**1**	**LS**	**693.42**	**$ 32,264.63**	**$ 97,217.52**	**$ -**	**$ -**	**$ 129,482.15**
15	$ 121.70	...DI B&S Pipe 30" 150 psi	18	LF	3.87	$ 180.04	$ 2,010.60	$ -	$ -	$ 2,190.64
15	$ 930.96	...DI Flg Pipe 12" x 5'-0" F x F	1	EA	11.3	$ 525.76	$ 405.20	$ -	$ -	$ 930.96
15	$ 1,036.59	...DI Flg Pipe 12" x 7'-0" F x F	1	EA	11.45	$ 532.99	$ 503.60	$ -	$ -	$ 1,036.59
15	$ 1,114.46	...DI Flg Pipe 18" x 4'-0" F x F	1	EA	13.37	$ 622.06	$ 492.40	$ -	$ -	$ 1,114.46
15	$ 1,286.66	...DI Flg Pipe 18" x 4-6" F x F	1	EA	13.61	$ 633.06	$ 653.60	$ -	$ -	$ 1,286.66
15	$ 2,589.82	...DI Flg Pipe 30" x 6'-6" F x F	1	EA	18.8	$ 874.62	$ 1,715.20	$ -	$ -	$ 2,589.82
15	$ 2,920.53	...DI Flg Pipe 30" x 9'-6" F x F	2	EA	38.54	$ 1,793.06	$ 4,048.00	$ -	$ -	$ 5,841.06
15	$ 763.77	...DI MJ Cap 30"	2	EA	18	$ 837.54	$ 690.00	$ -	$ -	$ 1,527.54
15	$ 1,045.77	...DI Flg 90 Bend 18"	1	EA	12.8	$ 595.77	$ 450.00	$ -	$ -	$ 1,045.77
15	$ 1,045.77	...DI Flg 90 Reducing Base Bend 18" x 12"	1	EA	12.8	$ 595.77	$ 450.00	$ -	$ -	$ 1,045.77
15	$ 841.94	...DI Flg Ecc Reducer 18 x 12"	1	EA	10.79	$ 501.94	$ 340.00	$ -	$ -	$ 841.94
15	$ 3,229.58	...DI Flg Tee 30" x 6"	2	EA	46.4	$ 2,159.16	$ 4,300.00	$ -	$ -	$ 6,459.16
15	$ 3,229.58	...DI Flg Tee 30"	2	EA	46.4	$ 2,159.16	$ 4,300.00	$ -	$ -	$ 6,459.16
15	$ 1,915.73	...DI Flg Ecc Reducer 30" x 18"	2	EA	40.65	$ 1,891.46	$ 1,940.00	$ -	$ -	$ 3,831.46
15	$ 1,691.66	...DI Wall Casting 30" x 5'-3" FLG x WC x PE	2	EA	44	$ 2,047.32	$ 1,336.00	$ -	$ -	$ 3,383.32
15	$ 105.16	...Bolt & Gasket Set 6" - Carbon Steel	6	EA	7.5	$ 348.98	$ 282.00	$ -	$ -	$ 630.98
15	$ 158.55	...Bolt & Gasket Set 12" - Carbon Steel	5	EA	8.33	$ 387.75	$ 405.00	$ -	$ -	$ 792.75
15	$ 442.65	...Bolt & Gasket Set 18" - Carbon Steel	9	EA	45	$ 2,093.85	$ 1,890.00	$ -	$ -	$ 3,983.85
15	$ 709.92	...Bolt & Gasket Set 30" - Carbon Steel	11	EA	84.62	$ 3,937.15	$ 3,872.00	$ -	$ -	$ 7,809.15
15	$ 1,257.22	...Meg-a-Lug Accessory Set 30"	2	EA	4	$ 186.12	$ 2,328.32	$ -	$ -	$ 2,514.44
15	$ 980.60	...Sleeve Couplings Dresser Style 38 30"	4	EA	48.19	$ 2,242.41	$ 1,680.00	$ -	$ -	$ 3,922.41
15	$ 2,576.51	...Dismantling Joint 18" - Smith Blair #975	2	EA	24.78	$ 1,153.01	$ 4,000.00	$ -	$ -	$ 5,153.01
15	$ 542.75	...Adjustable Saddle, 12"Pipe - 3'-6" CL of pipe to Floor	2	EA	8.5	$ 395.51	$ 690.00	$ -	$ -	$ 1,085.51
15	$ 1,389.59	...Conc Pipe Cradle Supports 30" (2.25' from floor to CL of Pipe) - BY DIV 03	3	EA	9	$ 418.77	$ 3,750.00	$ -	$ -	$ 4,168.77
15	$ 346.53	...Conc Pipe Pier Support 18" at Base 90 bend (2'x2'x2') - BY DIV 03	1	EA	1	$ 46.53	$ 300.00	$ -	$ -	$ 346.53
15	$ 21,071.72	...Plug Valve Flg 18"	2	EA	34.34	$ 1,597.84	$ 40,545.60	$ -	$ -	$ 42,143.44
15	$ 913.14	...OS&Y Gate Valve Flange 6" (PIT 0100 & 0255)	2	EA	12.6	$ 586.28	$ 1,240.00	$ -	$ -	$ 1,826.28
15	$ 13,194.19	...Check Valve 12" - Lever & Weight	1	EA	12.77	$ 594.19	$ 12,600.00	$ -	$ -	$ 13,194.19
15	$ 33.00	...Labor Adder - working in "pit" (10%)	50	EA	50	$ 2,326.50	$ -	$ -	$ -	$ 2,326.50
15	**$ 251,924.04**	**12", 16", 24", 30" Pump Suction Header [M-201]**	**1**	**LS**	**614.32**	**$ 28,584.36**	**$ 223,339.68**	**$ -**	**$ -**	**$ 251,924.04**

Division	UnitCost	Description	Qty	Units	ManHours	Labor	Material	SubContr	Equipment	XtdCost
15	$ 43.15	...DI B&S Pipe 12" 350 psi	18	LF	2.61	$ 121.45	$ 655.20	$ -	$ -	$ 776.65
15	$ 825.53	...DI Flg Pipe 12" x 3'-6" F x F	1	EA	11.15	$ 518.73	$ 306.80	$ -	$ -	$ 825.53
15	$ 1,035.41	...DI Flg Pipe 16" x 2'-6" F x F	1	EA	12.79	$ 595.01	$ 440.40	$ -	$ -	$ 1,035.41
15	$ 1,263.55	...DI Flg Pipe 24" x 1'-6" F x F	1	EA	15.36	$ 714.75	$ 548.80	$ -	$ -	$ 1,263.55
15	$ 1,442.21	...DI Flg Pipe 30" x 1'-0" F x F	1	EA	17.36	$ 807.81	$ 634.40	$ -	$ -	$ 1,442.21
15	$ 2,589.82	...DI Flg Pipe 30" x 7'-0" F x F	1	EA	18.8	$ 874.62	$ 1,715.20	$ -	$ -	$ 2,589.82
15	$ 150.21	...DI MJ Cap 12"	1	EA	2.33	$ 108.21	$ 42.00	$ -	$ -	$ 150.21
15	$ 1,203.78	...DI Flg Tee 16"	1	EA	13.51	$ 628.78	$ 575.00	$ -	$ -	$ 1,203.78
15	$ 718.14	...DI Flg Ecc Reducer 16" x 12"	1	EA	9.42	$ 438.14	$ 280.00	$ -	$ -	$ 718.14
15	$ 2,314.34	...DI Flg Tee 24" x 16"	1	EA	20.08	$ 934.34	$ 1,380.00	$ -	$ -	$ 2,314.34
15	$ 1,359.04	...DI Flg Ecc Reducer 24" x 16"	1	EA	16.42	$ 764.04	$ 595.00	$ -	$ -	$ 1,359.04
15	$ 3,229.58	...DI Flg Tee 30" x 24"	1	EA	23.2	$ 1,079.58	$ 2,150.00	$ -	$ -	$ 3,229.58
15	$ 3,229.58	...DI Flg Tee 30" x 16"	2	EA	46.4	$ 2,159.16	$ 4,300.00	$ -	$ -	$ 6,459.16
15	$ 1,915.73	...DI Flg Ecc Reducer 30" x 24"	1	EA	20.33	$ 945.73	$ 970.00	$ -	$ -	$ 1,915.73
15	$ 504.40	...DI Wall Casting 12" x 5'-3" FLG x WC x PE	1	EA	6.8	$ 316.40	$ 188.00	$ -	$ -	$ 504.40
15	$ 158.55	...Bolt & Gasket Set 12" - Carbon Steel	2	EA	3.33	$ 155.10	$ 162.00	$ -	$ -	$ 317.10
15	$ 392.65	...Bolt & Gasket Set 16" - Carbon Steel	12	EA	60	$ 2,791.80	$ 1,920.00	$ -	$ -	$ 4,711.80
15	$ 568.81	...Bolt & Gasket Set 24" - Carbon Steel	5	EA	31.25	$ 1,454.06	$ 1,390.00	$ -	$ -	$ 2,844.06
15	$ 709.92	...Bolt & Gasket Set 30" - Carbon Steel	6	EA	46.15	$ 2,147.54	$ 2,112.00	$ -	$ -	$ 4,259.54
15	$ 149.19	...Meg-a-Lug Accessory Set 12"	1	EA	0.33	$ 15.51	$ 133.68	$ -	$ -	$ 149.19
15	$ 440.89	...Sleeve Couplings Dresser Style 38 12"	2	EA	11.43	$ 531.77	$ 350.00	$ -	$ -	$ 881.77
15	$ 2,076.51	...Dismantling Joint 16" - Smith Blair #975	2	EA	24.78	$ 1,153.01	$ 3,000.00	$ -	$ -	$ 4,153.01
15	$ 3,441.26	...Dismantling Joint 24" - Smith Blair #975	1	EA	18.08	$ 841.26	$ 2,600.00	$ -	$ -	$ 3,441.26
15	$ 5,841.26	...Dismantling Joint 30" - Smith Blair #975	1	EA	18.08	$ 841.26	$ 5,000.00	$ -	$ -	$ 5,841.26
15	$ 343.06	...Conc Pipe Supports 12" (3.5' from floor to CL of pipe) - BY DIV 03	1	EA	2	$ 93.06	$ 250.00	$ -	$ -	$ 343.06
15	$ 493.06	...Conc Pipe Supports 16" (3.0' from floor to CL of pipe) - BY DIV 03	1	EA	2	$ 93.06	$ 400.00	$ -	$ -	$ 493.06
15	$ 889.59	...Conc Pipe Supports 24" (2.75' from floor to CL of pipe) - BY DIV 03	1	EA	3	$ 139.59	$ 750.00	$ -	$ -	$ 889.59
15	$ 1,089.59	...Conc Pipe Supports 30" (2.47' from florr to CL of pipe) - BY DIV 03	1	EA	3	$ 139.59	$ 950.00	$ -	$ -	$ 1,089.59
15	$ 27,798.11	...Plug Valve Flg 16" (MOV-0203)	1	EA	23.11	$ 1,075.31	$ 26,722.80	$ -	$ -	$ 27,798.11
15	$ 27,798.11	...Plug Valve Flg 16" (MOV-0401)	1	EA	23.11	$ 1,075.31	$ 26,722.80	$ -	$ -	$ 27,798.11
15	$ 56,214.30	...Plug Valve Flg 24" (MOV-0202)	1	EA	30.98	$ 1,441.50	$ 54,772.80	$ -	$ -	$ 56,214.30
15	$ 82,910.87	...Plug Valve Flg 30" (MOV-0201)	1	EA	34.13	$ 1,588.07	$ 81,322.80	$ -	$ -	$ 82,910.87
15	$ 33.00	...Labor Adder - working in "pit" (10%)	43	EA	43	$ 2,000.79	$ -	$ -	$ -	$ 2,000.79
15	**$ 205,787.05**	**24" / 30" OLST Fill [M-201]**	**1**	**LS**	**220.72**	**$ 10,269.89**	**$ 195,517.16**	**$ -**	**$ -**	**$ 205,787.05**
15	$ 121.70	...DI B&S Pipe 30" 150 psi	18	LF	3.87	$ 180.04	$ 2,010.60	$ -	$ -	$ 2,190.64
15	$ 1,753.27	...DI Flg Pipe 24" x 5'-0" F x F	1	EA	16.05	$ 746.87	$ 1,006.40	$ -	$ -	$ 1,753.27
15	$ 1,753.27	...DI Flg Pipe 24" x 6'-0" F x F	1	EA	16.05	$ 746.87	$ 1,006.40	$ -	$ -	$ 1,753.27
15	$ 1,928.49	...DI Flg Pipe 30" x 3'-6" F x F	1	EA	17.86	$ 830.89	$ 1,097.60	$ -	$ -	$ 1,928.49
15	$ 763.77	...DI MJ Cap 30"	1	EA	9	$ 418.77	$ 345.00	$ -	$ -	$ 763.77
15	$ 1,915.73	...DI Flg Ecc Reducer 30" x 24"	1	EA	20.33	$ 945.73	$ 970.00	$ -	$ -	$ 1,915.73
15	$ 1,691.66	...DI Wall Casting 30" x 5'-3" FLG x WC x PE	1	EA	22	$ 1,023.66	$ 668.00	$ -	$ -	$ 1,691.66
15	$ 568.81	...Bolt & Gasket Set 24" - Carbon Steel	4	EA	25	$ 1,163.25	$ 1,112.00	$ -	$ -	$ 2,275.25
15	$ 709.92	...Bolt & Gasket Set 30" - Carbon Steel	2	EA	15.38	$ 715.85	$ 704.00	$ -	$ -	$ 1,419.85
15	$ 1,257.22	...Meg-a-Lug Accessory Set 30"	1	EA	2	$ 93.06	$ 1,164.16	$ -	$ -	$ 1,257.22
15	$ 980.60	...Sleeve Couplings Dresser Style 38 30"	2	EA	24.1	$ 1,121.20	$ 840.00	$ -	$ -	$ 1,961.20
15	$ 3,441.26	...Dismantling Joint 24" - Smith Blair #975	1	EA	18.08	$ 841.26	$ 2,600.00	$ -	$ -	$ 3,441.26
15	$ 889.59	...Conc Pipe Supports 24" (2.75' from floor to CL of pipe) - BY DIV 03	1	EA	3	$ 139.59	$ 750.00	$ -	$ -	$ 889.59
15	$ 181,801.36	...Ball Control Valve, 24" Flgd (FCV-0255)	1	EA	12	$ 558.36	$ 181,243.00	$ -	$ -	$ 181,801.36
15	$ 33.00	...Labor Adder - working in "pit" (10%)	16	EA	16	$ 744.48	$ -	$ -	$ -	$ 744.48
15	**$ 27,651.38**	**16" Pump Suction [M-201 , M302] Qty=4**	**4**	**LS**	**448.25**	**$ 20,856.95**	**$ 89,748.56**	**$ -**	**$ -**	**$ 110,605.51**
15	$ 1,035.41	...DI Flg Pipe 16" x 2'-6" F x F	4	EA	51.15	$ 2,380.05	$ 1,761.60	$ -	$ -	$ 4,141.65
15	$ 1,635.99	...DI Flg Pipe 16" x 12'-0" F x F w/ 2 - 1" NPT Taps	4	EA	54.57	$ 2,539.15	$ 4,004.80	$ -	$ -	$ 6,543.95

Division	UnitCost	Description	Qty	Units	ManHours	Labor	Material	SubContr	Equipment	XtdCost
15	$ 887.00	...DI Flg 90 Reducing Baser Bend 16" x 10"	4	EA	44.44	$ 2,068.00	$ 1,480.00	$ -	$ -	$ 3,548.00
15	$ 155.55	...Bolt & Gasket Set 10" - Carbon Steel	4	EA	6.67	$ 310.20	$ 312.00	$ -	$ -	$ 622.20
15	$ 392.65	...Bolt & Gasket Set 16" - Carbon Steel	16	EA	80	$ 3,722.40	$ 2,560.00	$ -	$ -	$ 6,282.40
15	$ 2,076.51	...Dismantling Joint 16" - Smith Blair #975	4	EA	49.56	$ 2,306.03	$ 6,000.00	$ -	$ -	$ 8,306.03
15	$ 4,076.51	...Equipment Connection Fitting (ECF) 16" - Romac ECF	4	EA	49.56	$ 2,306.03	$ 14,000.00	$ -	$ -	$ 16,306.03
15	$ 493.06	...Conc Pipe Supports 16" (3.0' from floor to CL of pipe) - BY DIV 03	4	EA	8	$ 372.24	$ 1,600.00	$ -	$ -	$ 1,972.24
15	$ 15,065.87	...Plug Valve Flg 16"	4	EA	60.44	$ 2,812.27	$ 57,451.20	$ -	$ -	$ 60,263.47
15	$ 170.40	...1" Air Release (Detail D3200 / Sht M-502)	4	EA	8.43	$ 392.14	$ 289.48	$ -	$ -	$ 681.62
15	$ 170.40	...1" Drain Release (Detail D3200 / Sht M-502)	4	EA	8.43	$ 392.14	$ 289.48	$ -	$ -	$ 681.62
15	$ 33.00	...Labor Adder - working in "pit" (10%)	27	EA	27	$ 1,256.31	$ -	$ -	$ -	$ 1,256.31
15	**$ 27,402.74**	**10" Pump Discharge [M-201, M-302] Qty =4**	**4**	**LS**	**371.83**	**$ 17,301.18**	**$ 92,309.78**	**$ -**	**$ -**	**$ 109,610.96**
15	$ 407.00	...DI Flg Pipe 10" x 1'-0" F x F	4	EA	25.43	$ 1,183.22	$ 444.80	$ -	$ -	$ 1,628.02
15	$ 549.25	...DI Flg Pipe 10" x 3'-6" F x F	4	EA	27.55	$ 1,281.82	$ 915.20	$ -	$ -	$ 2,197.02
15	$ 652.38	...DI Flg Pipe 10" x 5'-6" F x F	4	EA	29.67	$ 1,380.71	$ 1,228.80	$ -	$ -	$ 2,609.51
15	$ 155.55	...Bolt & Gasket Set 10" - Carbon Steel	28	EA	46.67	$ 2,171.40	$ 2,184.00	$ -	$ -	$ 4,355.40
15	$ 1,198.76	...Dismantling Joint 10" - Smith Blair #975	8	EA	68.56	$ 3,190.10	$ 6,400.00	$ -	$ -	$ 9,590.10
15	$ 2,898.76	...Equipment Connection Fitting (ECF) 10" - Romac ECF	4	EA	34.28	$ 1,595.05	$ 10,000.00	$ -	$ -	$ 11,595.05
15	$ 493.06	...Conc Pipe Supports 10" (2.8' from floor to CL of pipe) - BY DIV 03	4	EA	8	$ 372.24	$ 1,600.00	$ -	$ -	$ 1,972.24
15	$ 7,748.10	...Plug Valve Flg 10"	4	EA	40	$ 1,861.20	$ 29,131.20	$ -	$ -	$ 30,992.40
15	$ 10,491.37	...Check Valve 10" - Lever & Weight	4	EA	45.68	$ 2,125.49	$ 39,840.00	$ -	$ -	$ 41,965.49
15	$ 373.99	...3/4" Pump Vent	4	EA	19.99	$ 930.18	$ 565.78	$ -	$ -	$ 1,495.96
15	$ 33.00	...Labor Adder - working in "pit" (10%)	26	EA	26	$ 1,209.78	$ -	$ -	$ -	$ 1,209.78
15	**$ 108,217.88**	**10", 24" Pump Discharge Header [M-201]**	**1**	**LS**	**268.59**	**$ 12,497.51**	**$ 95,720.37**	**$ -**	**$ -**	**$ 108,217.88**
15	$ 755.47	...DI Flg Pipe 10" x 7'-0" F x F	1	EA	7.95	$ 369.87	$ 385.60	$ -	$ -	$ 755.47
15	$ 825.53	...DI Flg Pipe 12" x 2'-6" F x F	2	EA	22.3	$ 1,037.46	$ 613.60	$ -	$ -	$ 1,651.06
15	$ 1,509.20	...DI Flg Pipe 24" x 3'-6" F x F	1	EA	15.72	$ 731.60	$ 777.60	$ -	$ -	$ 1,509.20
15	$ 1,997.99	...DI Flg Pipe 24" x 7'-6" F x F	1	EA	16.39	$ 762.79	$ 1,235.20	$ -	$ -	$ 1,997.99
15	$ 649.22	...DI Flg Tee 10"	1	EA	8.15	$ 379.22	$ 270.00	$ -	$ -	$ 649.22
15	$ 173.99	...DI Flg Blind 10" w/ 1" NPT	1	EA	2.45	$ 113.99	$ 60.00	$ -	$ -	$ 173.99
15	$ 810.71	...DI Flg Tee 12" x 10"	1	EA	9.15	$ 425.71	$ 385.00	$ -	$ -	$ 810.71
15	$ 482.49	...DI Flg Ecc Reducer 12" x 10"	1	EA	6.72	$ 312.49	$ 170.00	$ -	$ -	$ 482.49
15	$ 2,314.34	...DI Flg Tee 24" x 10"	2	EA	40.16	$ 1,868.67	$ 2,760.00	$ -	$ -	$ 4,628.67
15	$ 1,359.04	...DI Flg Ecc Reducer 24" x 12"	1	EA	16.42	$ 764.04	$ 595.00	$ -	$ -	$ 1,359.04
15	$ 1,915.73	...DI Flg Ecc Reducer 30" x 24"	1	EA	20.33	$ 945.73	$ 970.00	$ -	$ -	$ 1,915.73
15	$ 155.55	...Bolt & Gasket Set 10" - Carbon Steel	7	EA	11.67	$ 542.85	$ 546.00	$ -	$ -	$ 1,088.85
15	$ 158.55	...Bolt & Gasket Set 12" - Carbon Steel	5	EA	8.33	$ 387.75	$ 405.00	$ -	$ -	$ 792.75
15	$ 568.81	...Bolt & Gasket Set 24" - Carbon Steel	7	EA	43.75	$ 2,035.69	$ 1,946.00	$ -	$ -	$ 3,981.69
15	$ 493.06	...Conc Pipe Supports 10" (3.8' from floor to CL of pipe) - BY DIV 03	1	EA	2	$ 93.06	$ 400.00	$ -	$ -	$ 493.06
15	$ 343.06	...Conc Pipe Supports 12" (3.0' from floor to CL of pipe) - BY DIV 03	1	EA	2	$ 93.06	$ 250.00	$ -	$ -	$ 343.06
15	$ 889.59	...Conc Pipe Supports 24" (2.8' from floor to CL of pipe) - BY DIV 03	1	EA	3	$ 139.59	$ 750.00	$ -	$ -	$ 889.59
15	$ 83,687.36	...Ball Valve, 12" Flanged (FCV-252)	1	EA	12	$ 558.36	$ 83,129.00	$ -	$ -	$ 83,687.36
15	$ 170.40	...1" Drain Release (Detail D3200 / Sht M-502)	1	EA	2.11	$ 98.03	$ 72.37	$ -	$ -	$ 170.40
15	$ 33.00	...Labor Adder - working in "pit" (10%)	18	EA	18	$ 837.54	$ -	$ -	$ -	$ 837.54
15	**$ 16,908.80**	**3" PVC - PRS Sump pump drain [M-101, M-320]**	**1**	**LS**	**59.73**	**$ 2,779.34**	**$ 14,129.46**	**$ -**	**$ -**	**$ 16,908.80**
15	$ 16.19	...PVC Pipe Sch40 3"	80	LF	17.6	$ 818.92	$ 476.40	$ -	$ -	$ 1,295.32
15	$ 18.20	...PVC Sch 40 90 Bend 3"	6	EA	2	$ 93.06	$ 16.11	$ -	$ -	$ 109.17
15	$ 26.10	...PVC Sch 40 Tee 3"	1	EA	0.48	$ 22.16	$ 3.95	$ -	$ -	$ 26.10
15	$ 37.49	...PVC Sch 40 Van Stone Flange 3"	2	EA	1.16	$ 54.10	$ 20.88	$ -	$ -	$ 74.98
15	$ 64.27	...Bolt & Gasket Set 3" - 304 Stainless Steel	2	EA	1	$ 46.53	$ 82.00	$ -	$ -	$ 128.53
15	$ 243.59	...PVC Ball Valve-TU-3"	2	EA	0.67	$ 31.02	$ 456.16	$ -	$ -	$ 487.18
15	$ 297.49	...PVC Check Valve-TU-3"	2	EA	0.67	$ 31.02	$ 563.96	$ -	$ -	$ 594.98
15	$ 6,744.48	...Duplex 3/4hp sump pumps w/controls	2	EA	32	$ 1,488.96	$ 12,000.00	$ -	$ -	$ 13,488.96

Division	UnitCost	Description	Qty	Units	ManHours	Labor	Material	SubContr	Equipment	XtdCost
15	$ 703.56	...6" Wall Sleeve x 3' w/wtr stop for 3" Pipe	1	EA	4.16	$ 193.56	$ 510.00	$ -	$ -	$ 703.56
15	**$ 30,175.69**	**Electrical work wall / floor sleeves**	**1**	**LS**	**304.94**	**$ 14,188.73**	**$ 15,986.96**	**$ -**	**$ -**	**$ 30,175.69**
15	$ 257.76	...2.5" Wall Sleeve w/wtr stop for 1" and Smaller Pipe	60	EA	168.75	$ 7,851.94	$ 7,613.40	$ -	$ -	$ 15,465.34
15	$ 319.83	...3.5" Wall Sleeve w/wtr stop for 2" Pipe	10	EA	33	$ 1,535.49	$ 1,662.80	$ -	$ -	$ 3,198.29
15	$ 402.45	...5" Wall Sleeve w/wtr stop for 3" Pipe	6	EA	21.91	$ 1,019.34	$ 1,395.36	$ -	$ -	$ 2,414.70
15	$ 454.87	...6" Wall Sleeve w/wtr stop for 4" Pipe	20	EA	81.28	$ 3,781.96	$ 5,315.40	$ -	$ -	$ 9,097.36
15		**----- OFFLINE STORAGE TANK -----**								
15	**$ 11,325.99**	**30" RS - Tank Fill [M-204]**	**1**	**LS**	**65.12**	**$ 3,030.03**	**$ 8,295.96**	**$ -**	**$ -**	**$ 11,325.99**
15	$ 3,250.55	...DI Flg Pipe 30" x 12'-0" F x WC x PE	1	EA	19.72	$ 917.75	$ 2,332.80	$ -	$ -	$ 3,250.55
15	$ 763.77	...DI MJ Cap 30"	1	EA	9	$ 418.77	$ 345.00	$ -	$ -	$ 763.77
15	$ 2,314.60	...DI Flg 90 Bend 30"	1	EA	19.01	$ 884.60	$ 1,430.00	$ -	$ -	$ 2,314.60
15	$ 1,869.92	...Bolt & Gasket Set 30" - 316 Stainless Steel	2	EA	15.38	$ 715.85	$ 3,024.00	$ -	$ -	$ 3,739.85
15	$ 1,257.22	...Meg-a-Lug Accessory Set 30"	1	EA	2	$ 93.06	$ 1,164.16	$ -	$ -	$ 1,257.22
15	$ -	...Conc Pipe Thrust Block 30" - BY DIV 03	1	EA	0	$ -	$ -	$ -	$ -	$ -
15	**$ 803.80**	**12" RS - Tank Drain [M-204]**	**1**	**LS**	**9.46**	**$ 440.12**	**$ 363.68**	**$ -**	**$ -**	**$ 803.80**
15	$ 504.40	...DI Wall Casting 12" x 8'-0" PE x WC x PE	1	EA	6.8	$ 316.40	$ 188.00	$ -	$ -	$ 504.40
15	$ 150.21	...DI MJ Cap 12"	1	EA	2.33	$ 108.21	$ 42.00	$ -	$ -	$ 150.21
15	$ 149.19	...Meg-a-Lug Accessory Set 12"	1	EA	0.33	$ 15.51	$ 133.68	$ -	$ -	$ 149.19
15		**----- ODOR CONTROL -----**								
15	**$ 199,631.49**	**14", 20", 24", 28" FRP Duct work**	**1**	**LS**	**292.57**	**$ 13,613.49**	**$ 157,500.00**	**$ 26,450.00**	**$ 2,068.00**	**$ 199,631.49**
15	$ 1,800.00	...FRP Joints 14"	2	EA	0	$ -	$ -	$ 3,600.00	$ -	$ 3,600.00
15	$ 2,975.00	...FRP Joints 20" to 28"	6	EA	0	$ -	$ -	$ 17,850.00	$ -	$ 17,850.00
15	$ 1,386.12	...Control Dampers 14"	4	EA	16	$ 744.48	$ 4,800.00	$ -	$ -	$ 5,544.48
15	$ 366.88	...FRP Pipe 14"	60	LF	54	$ 2,512.62	$ 19,500.00	$ -	$ -	$ 22,012.62
15	$ 405.84	...FRP Pipe 20"	35	LF	42	$ 1,954.26	$ 12,250.00	$ -	$ -	$ 14,204.26
15	$ 455.84	...FRP Pipe 24"	38	LF	45.6	$ 2,121.77	$ 15,200.00	$ -	$ -	$ 17,321.77
15	$ 519.80	...FRP Pipe 28"	60	LF	90	$ 4,187.70	$ 27,000.00	$ -	$ -	$ 31,187.70
15	$ 531.55	...Bolt & Gasket Set 14" - 316 Stainless Steel	4	EA	6.67	$ 310.20	$ 1,816.00	$ -	$ -	$ 2,126.20
15	$ 1,869.92	...Bolt & Gasket Set 30" - 316 Stainless Steel	3	EA	23.08	$ 1,073.77	$ 4,536.00	$ -	$ -	$ 5,609.77
15	$ 96,708.69	...Butterfly Valve - FRP - AIR Service - 28" HW Operator	1	EA	15.23	$ 708.69	$ 96,000.00	$ -	$ -	$ 96,708.69

Division	UnitCost	Description	Qty	Units	ManHours	Labor	Material	SubContr	Equipment	XtdCost
15	$ 3,435.00	...110 Ton Crawler Crane (Crowder Owned) - COVERED IN DIV 01	0	WK	0	$ -	$ -	$ -	$ -	$ -
15	$ 1,034.00	...Manlift- JLG600A (United) - FOR JOINT WRAPPING SUB	2	WK	0	$ -	$ -	$ -	$ 2,068.00	$ 2,068.00
15	$ 5,000.00	...Manufacturer Start-up	1	LS	0	$ -	$ -	$ 5,000.00	$ -	$ 5,000.00
15	$ (23,602.00)	...FRP Material Adjustment	1	EA	0	$ -	$ (23,602.00)	$ -	$ -	$ (23,602.00)
15	**$ 1,586.74**	**H2S Sampling Pipe - SST Tubing**	**1**	**LS**	**10.46**	**$ 486.74**	**$ 1,100.00**	**$ -**	**$ -**	**$ 1,586.74**
15	$ 184.44	...Ball Valve, Stainless Steel, .5"	4	EA	2.96	$ 137.76	$ 600.00	$ -	$ -	$ 737.76
15	$ 16.98	...SS 316 , .065 Tubing, .5"	50	LF	7.5	$ 348.98	$ 500.00	$ -	$ -	$ 848.98
15	**$ 1,633.27**	**Diffirental Pressure Gauges - SST Tubing**	**1**	**LS**	**11.46**	**$ 533.27**	**$ 1,100.00**	**$ -**	**$ -**	**$ 1,633.27**
15	$ 23.27	...Press Sensor <2"	2	EA	1	$ 46.53	$ -	$ -	$ -	$ 46.53
15	$ 184.44	...Ball Valve, Stainless Steel, .5"	4	EA	2.96	$ 137.76	$ 600.00	$ -	$ -	$ 737.76
15	$ 16.98	...SS 316 , .065 Tubing, .5"	50	LF	7.5	$ 348.98	$ 500.00	$ -	$ -	$ 848.98
15	**$ 1,246.52**	**2" PVC Potable Water to Water Panel**	**1**	**LS**	**8.69**	**$ 404.55**	**$ 178.77**	**$ -**	**$ 663.20**	**$ 1,246.52**
15	$ 18.56	...TRENCH: 2' Depth - 12' per Crew HR - 3 man Crew - MiniExc	25	LF	6.25	$ 290.92	$ -	$ -	$ 173.15	$ 464.07
15	$ 3,267.00	...Equipment Adjustment for Valve, Fittings and Precast - MiniExc	0.15	WK	0	$ -	$ -	$ -	$ 490.05	$ 490.05
15	$ 5.80	...PVC Pipe Sch80 2" - Underground	30	LF	1.2	$ 56.05	$ 117.86	$ -	$ -	$ 173.91
15	$ 13.90	...PVC Sch 80 90 Bend 2"	1	EA	0.23	$ 10.58	$ 3.32	$ -	$ -	$ 13.90
15	$ 31.33	...PVC Sch 80 Van Stone Flange 2"	1	EA	0.51	$ 23.74	$ 7.59	$ -	$ -	$ 31.33
15	$ 73.27	...Bolt & Gasket Set 2" - 316 Stainless Steel	1	EA	0.5	$ 23.27	$ 50.00	$ -	$ -	$ 73.27

PRESSURE REDUCING STATION (PKG 02) ESTIMATE TOTALS

Direct Costs	
Labor	$ 903,568.57
Material	$ 3,525,329.90
Subcontract	$ 4,841,762.83
Equipment	$ 267,376.09
	$ 9,538,037.39
Indirect Costs	
Sales Tax	$ 28,871.35
Fuel	$ 151,846.57
General Conditions 22.3%	$ 3,011,916.04
Contingeny 4.9%	$ 661,264.34
Business License 0.2%	$ 26,314.43
P&P Bonds 0.5%	$ 67,894.63
Contractor Markup 22.0%	$ 2,960,373.18
TOTAL	**$ 16,446,517.93**

Division	UnitCost	Description	Qty	Units	ManHours	Labor	Material	SubContr	Equipment	XtdCost
		PKG 03 - STORAGE TANK								
13	$ 7,235,800.00	Prestressed Concrete Tank Contractor	1	LS	0	$ -	$ -	$ 7,235,800.00	$ -	$ 7,235,800.00
										STORAGE TANK (PKG 03) ESTIMATE TOTALS
									Direct Costs	
									Labor	$ -
									Material	$ -
									Subcontract	$ 7,235,800.00
									Equipment	$ -
										$ 7,235,800.00
								Indirect Costs		
								Sales Tax		$ 0.00
								Fuel		$ -
								General Conditions	0.4%	$ 32,347.00
								Contingeny	0.0%	$ 0.00
								Business License	0.2%	$ 11,647.67
								P&P Bonds	0.0%	$ -
								Contractor Markup	0.0%	$ -
									TOTAL	**$ 7,279,794.67**

Division	UnitCost	Description	Qty	Units	ManHours	Labor	Material	SubContr	Equipment	XtdCost
		PKG 04 - ELECTRICAL								
		GEAR	1	LS	-	$ -	$ 245,000.00	$ -	$ -	$ 245,000.00
		FIXTURES	1	LS	-	$ -	$ 53,000.00	$ -	$ -	$ 53,000.00
		(Est) labor & material takeoff	1	LS	9,000.00	$ 494,910.00	$ 418,000.00	$ -	$ -	$ 912,910.00
		MISC MAT.	1	LS	-	$ -	$ 21,000.00	$ -	$ -	$ 21,000.00
		Temp Power	1	LS	240.00	$ 13,197.60	$ 5,000.00	$ -	$ -	$ 18,197.60
		3rd Party Testing	1	LS	-	$ -	$ -	$ 30,000.00	$ -	$ 30,000.00
		LP Systems	1	LS	-	$ -	$ -	$ 30,000.00	$ -	$ 30,000.00
		FA System	1	LS	-	$ -	$ -	$ 62,000.00	$ -	$ 62,000.00
		Cameras/Intrusion/Access (Pavion)	1	LS	-	$ -	$ -	$ 51,000.00	$ -	$ 51,000.00
		Fuel	250	GA	-	$ -	$ -	$ 1,250.00	$ -	$ 1,250.00
		Crane/move gen into building	1	LS	-	$ -	$ -	$ 10,000.00	$ -	$ 10,000.00
		Mini Excavator (S)	8	WK	-	$ -	$ -	$ -	$ 6,176.00	$ 6,176.00
		Rammax Vibratory Roller (H)	8	WK	-	$ -	$ -	$ -	$ 5,832.00	$ 5,832.00
		6000 LB Forklift (H)	4	WK	-	$ -	$ -	$ -	$ 2,820.00	$ 2,820.00
									ELECTRICAL (PKG 04) ESTIMATE TOTALS	
									Direct Costs	
									Labor	$ 508,107.60
									Material	$ 742,000.00
									Subcontract	$ 184,250.00
									Equipment	$ 14,828.00
										$ 1,449,185.60
								Indirect Costs		
								Sales Tax		$ 2,359.74
								Fuel		$ 24,035.00
							General Conditions		30.4%	$ 726,019.55
								Contingeny	6.9%	$ 164,512.13
								Business License	0.2%	$ 4,772.11
								P&P Bonds	0.6%	$ 15,172.49
							Contractor Markup		25.0%	$ 596,514.16
									TOTAL	**$ 2,982,570.78**

Wilroy PRS Tank - Package 5 Pricing Estimate
I&C and VFD

Tag Function Abb.	Tag Area Code	Tag Loop Identifier	Tag Suffix	Instrument ID	Device Function	Size or Connection	Unit Price
PIT	01	00		PIT0100	INFLUENT PRESSURE	1/2"	$5,000.00
PIT	01	01		PIT0101	INFLUENT PRESSURE	1/2"	$5,000.00
LSH	01	02		LSH0102	VAULT FLOOD ALARM	N/A	$250.00
FE/FIT	01	02		FE/FIT0102	INFLUENT FLOW	30"	$30,000.00
LSH	04	14		LSH0414	PUMP ROOM FLOOD ALARM	N/A	$250.00
PIT	02	55		PIT0255	DISCHARGE PRESSURE	1/2"	$5,000.00
PIT	02	56		PIT0256	DISCHARGE PRESSURE	1/2"	$5,000.00
LSH	02	57		LSH0257	VAULT FLOOD ALARM	N/A	$250.00
FE/FIT	02	57		FE/FIT0257	DISCHARGE FLOW	30"	$30,000.00
LSLL	03	13		LSLL0313	TANK LOW LOW LEVEL	N/A	$250.00
LSHH	03	13		LSHH0313	TANK HIGH HIGH LEVEL	N/A	$250.00
LIT	03	12		LIT0312	TANK LEVEL	N/A	$4,000.00
LSH	03	30		LSH0330	CELL FULL	N/A	$250.00
LSH	03	40		LSH0340	CELL FULL	N/A	$250.00
FSL	06	21		FSL0621	ODOR CONTROL LOW FLOW	N/A	$150.00
FSL	8	31		FSL831	EXHAUST FAN 1 LOW FLOW	N/A	$150.00
FSL	8	32		FSL832	EXHAUST FAN 2 LOW FLOW	N/A	$150.00
					VFD-0211	90 HP	$40,000.00
					VFD-0221	90 HP	$40,000.00
					VFD-0231	90 HP	$40,000.00
					VFD-0241	90 HP	$40,000.00
					VFD-0631	20 HP	$20,000.00
					ISP-0102	N/A	$4,000.00
					ISP-0257	N/A	$4,000.00
					ISP @ tank	N/A	$4,000.00
					PIT valve tree	N/A	$2,500.00
					PIT valve tree	N/A	$2,500.00
					IRP panel	N/A	$10,000.00

SUBTOTAL material only		**$293,200.00**
S&H	2%	$5,864.00
loop drawings	(2wks*40hr*$250)	$20,000.00
submittals	(2wks*40hr*$250)	$20,000.00
training	(1wks*40hr*$250)	$10,000.00
start-up/commissioning	(2wks*40hr*$250)	$20,000.00

SUBTOTAL		**$369,064.00**
I&C OH&P	25%	$92,266.00

TOTAL		**$461,330.00**

Basis of Price Proposal

Description	Quantity	Unit	Unit Price	Extended Total
Project Management & Supervision				
SR. PROJECT MANAGER	4774	Hours	$117.00	$559,000.00
QUALITY MANAGER	477	Hours	$87.00	$42,000.00
ADMINISTRATIVE ASSISTANT	477	Hours	$35.00	$17,000.00
GENERAL SUPERINTENDENT	239	Hours	$129.00	$31,000.00
SUPERINTENDENT	4774	Hours	$107.00	$511,000.00
SAFETY MANAGER	477	Hours	$65.00	$32,000.00
PROJECT ENGINEER	4774	Hours	$65.00	$311,000.00
Miscellaneous Costs				
EQUIPMENT ESCALATION	1	LS	$10,000.00	$10,000.00
JOB SIGN	1	LS	$3,000.00	$3,000.00
INSTALL UTILITIES	1	LS	$15,000.00	$15,000.00
OFFICE TRAILER	1	LS	$49,614.24	$50,000.00
OFFICE TRAILER MOBILIZATION	1	LS	$10,000.00	$10,000.00
OFFICE TRAILER UTILITIES	1	LS	$16,538.08	$17,000.00
COPY MACHINE	1	LS	$1,000.00	$1,000.00
JANITORIAL SERVICE	1	LS	$11,934.98	$12,000.00
OFFICE FURNITURE	1	LS	$5,400.00	$6,000.00
FIELD OFFICE SUPPLIES	1	LS	$2,756.35	$3,000.00
PRINTING	1	LS	$4,800.00	$5,000.00
MAIL	1	LS	$2,756.35	$3,000.00
SMALL TOOLS	1	LS	$15,000.00	$15,000.00
INTERNET SERVICE	1	LS	$5,512.69	$6,000.00
WATER, ICE, CUPS	1	LS	$4,134.52	$5,000.00
TEMP TOILETS	1	LS	$17,902.47	$18,000.00
TEMP SEWAGE HOLDING TANKS	1	LS	$17,902.47	$18,000.00
LABOR ESCALATION	1	LS	$273,689.42	$274,000.00
Total				**$1,974,000**

Schedule of Values

Act ID	Activity Name	Cost % Comp	Budgeted Cost	Earned to Date	Remaining Cost	Earned This Period
Total		69.78%	$34,366,128.00	$23,980,062.00	$10,386,066.00	$2,057,750.00
	Tabb PRS and Off-line Storage Facility	69.78%	$34,366,128.00	$23,980,062.00	$10,386,066.00	$2,057,750.00
	Permits, Bond	100%	$292,910.00	$292,910.00	$0.00	$0.00
	Change Orders	100%	$609,128.00	$609,128.00	$0.00	$110,025.00
	Long Lead Equipment	64.67%	$4,879,844.00	$3,155,930.00	$1,723,914.00	$1,353,400.00
	Systems East DCS	82.1%	$593,844.00	$487,530.00	$106,314.00	$60,000.00
	Instrumentation & Controls	100%	$135,000.00	$135,000.00	$0.00	$0.00
	VFDs	5.98%	$251,000.00	$15,000.00	$236,000.00	$0.00
	Valves	100%	$620,000.00	$620,000.00	$0.00	$0.00
	Generator & Loadbank	100%	$555,000.00	$555,000.00	$0.00	$0.00
	MTS	0%	$65,000.00	$0.00	$65,000.00	$0.00
	MCC	3.85%	$260,000.00	$10,000.00	$250,000.00	$0.00
	MDS	3.53%	$425,000.00	$15,000.00	$410,000.00	$0.00
	Pumps	100%	$970,000.00	$970,000.00	$0.00	$970,000.00
	Odor Control Unit	33%	$980,000.00	$323,400.00	$656,600.00	$323,400.00
	Storage Tank Design & Materials	100%	$25,000.00	$25,000.00	$0.00	$0.00
	Procurement	50%	$140,000.00	$70,000.00	$70,000.00	$0.00
	Initial Sitework & Waterline	100%	$3,096,494.00	$3,096,494.00	$0.00	$0.00
	Pressure Reducing Station	77.83%	$12,344,000.00	$9,607,350.00	$2,736,650.00	$378,650.00
	Pile Installation & Shell Construction	95.3%	$8,747,000.00	$8,335,500.00	$411,500.00	$113,500.00
	Stairwells A and B	27.95%	$415,000.00	$116,000.00	$299,000.00	$0.00
	Pump Room Buildout	53.21%	$2,024,000.00	$1,076,900.00	$947,100.00	$241,200.00
	Electrical Room Buildout	6.22%	$687,000.00	$42,700.00	$644,300.00	$15,200.00
	Generator Room Buildout	9.27%	$337,000.00	$31,250.00	$305,750.00	$8,750.00
	Restroom & Vestibules Buildout	0%	$57,000.00	$0.00	$57,000.00	$0.00

Schedule of Values

Act ID	Activity Name	Cost % Comp	Budgeted Cost	Earned to Date	Remaining Cost	Earned This Period
	Loading Dock & Corridor	6.49%	$77,000.00	$5,000.00	$72,000.00	$0.00
	Off-line Storage Tank	79.51%	$7,102,000.00	$5,646,800.00	$1,455,200.00	$48,000.00
	Bypass, Yard Piping & Final Sitework	12.31%	$4,552,500.00	$560,200.00	$3,992,300.00	$116,800.00
	Testing & Facility Startup	0%	$146,252.00	$0.00	$146,252.00	$0.00
	Trail Construction	78.24%	$1,203,000.00	$941,250.00	$261,750.00	$50,875.00

ENR Construction Cost Index

Year	Mo	20 Cities Average	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle
2016	Jan	10,133	6,260	7,080	7,046	13,187	14,789	8,780	11,898	5,566	7,084	11,009	10,979	11,138	11,994	5,866	16,513	12,190	8,856	11,690	11,357	10,490
2016	Feb	10,182	6,267	6,933	7,054	13,192	14,785	8,790	11,907	5,579	7,092	11,063	10,988	11,147	11,998	5,873	16,265	12,200	9,025	11,732	11,175	10,575
2016	Mar	10,242	6,269	7,236	7,056	13,180	14,795	8,779	11,908	5,576	7,094	11,064	10,989	11,158	12,000	5,869	16,763	12,193	9,041	11,734	11,558	10,581
2016	Apr	10,280	6,269	7,314	7,057	13,177	14,796	8,939	12,060	5,581	7,097	11,118	11,280	11,159	11,999	5,871	16,754	12,195	9,050	11,751	11,559	10,582
2016	May	10,315	6,253	7,306	7,033	13,159	14,788	8,929	12,051	5,577	7,088	11,109	11,271	11,150	11,990	5,881	16,745	12,184	9867.60r	11803.91r	11,550	10,573
2016	Jun	10,337	6,244	7,301	7,031	13,159	14,791	9,406	12,035	5,575	7,093	11,113	11,259	11,148	11,985	5,876	16,748	12,182	9886.02r	11789.39r	11,548	10,571
2016	Jul	10,379	6,251	7,310	7,048	13,172	15,232	9,418	12,047	5,595	7,112	11,125	11,372	11,155	11,998	5,882	16,755	12,202	9907.45r	11,863	11,555	10,586
2016	Aug	10,386	6,257	7,343	7,047	13,196	15,239	9,431	12,046	5,599	7,112	11,126	11,372	11,155	12,010	5,891	16,764	12,206	9906.95r	11,863	11,555	10,596
2016	Sep	10,403	6,257	7,226	7,053	13,498	15,239	9,406	12,032	5,629	7,136	11,080	11,262	11,178	12,076	5,892	16,765	12,525	9880.63r	11,741	11,576	10,616
2016	Oct	10,435	6,302	7,228	7,038	13,514	15,233	9,408	12,051	5,631	7,138	11,135	11,289	11,526	12,118	5,888	16,771	12,527	9895.20r	11,798	11,578	10,622
2016	Nov	10,530	6,322	7,229	7,039	13,525	15,235	9,451	12,052	5,633	7,162	11,196	11,288	11,527	12,119	5,887	16,772	12,551	9884.45r	11,778	11,579	10,623
2016	Dec	10,338	6,386	7,228	7,221	13,533	15,233	9,450	12,240	5,704	7,366	11,274	11,286	11,555	12,352	5,886	17,162	12,549	9,883	12,070	11,609	10,623
2017	Jan	10,532	6,394	7,396	7,221	13,533	15,242	9,450	12,268	5,702	7,362	11,274	11,282	11,555	12,352	5,886	17,172	12,558	9,883	12,070	11,609	10,623
2017	Feb	10,282	6,061	7,406	6,615	13,710	15,247	9,450	10,494	5,604	7,094	10,303	10,620	11,555	11,693	5,686	18,413	12,547	9,888	11,083	11,609	10,561
2017	Mar	10,278	6,061	7,406	6,604	13,710	15,238	9,458	10,494	5,592	7,083	10,293	10,581	11,555	11,693	5,678	18,402	12,547	9,900	11,083	11,609	10,564
2017	Apr	10,678	6,492	7,457	7,292	13,761	15,292	9,539	12,319	5,768	7,403	11,197	11,354	11,642	12,443	5,934	18,453	12,596	9,984	12,241	11,696	10,699
2017	May	10,692	6,500	7,460	7,296	13,787	15,309	9,542	12,322	5,771	7,411	11,351	11,357	11,636	12,456	5,945	18,461	12,599	9,997	12,250	11,691	10,703
2017	June	10,703	6,503	7,592	7,305	13,787	15,310	9,549	12,331	5,785	7,411	11,366	11,389	11,636	12,478	5,954	18,464	12,597	10,009	12,250	11,722	10,718
2017	July	10,789	6,503	8,273	7,322	13,787	15,333	9,754	12,337	5,785	7,388	11,408	11,390	11,636	12,628	5,958	18,490	12,951	10,146	12,248	11,726	10,721
2017	Aug	10,842	6,516	8,245	7,326	13,797	15,337	10,163	12,341	5,801	7,395	11,412	11,375	11,962	12,603	5,961	18,494	12,964	10,126	12,251	12,037	10,725
2017	Sept	10,823	6,514	8,250	7,326	13,795	15,354	9,855	12,339	5,799	7,397	11,427	11,373	11,960	12,522	5,962	18,494	12,962	10,116	12,249	12,037	10,727
2017	Oct	10,817	6,550	8,234	7,240	13,818	15,410	10,082	12,258	5,851	7,379	11,323	11,153	11,936	12,789	5,907	18,509	12,974	10,131	12,064	12,015	10,720
2017	Nov	10,870	6,550	8,268	7,255	13,818	15,415	10,082	12,277	5,851	7,412	11,323	11,153	11,936	12,984	5,908	18,509	12,974	10,165	12,064	12,015	11,443
2017	Dec	10,870	6,555	8,288	7,253	13,830	15,415	10,082	12,287	5,857	7,412	11,330	11,153	11,936	12,984	5,908	18,516	12,976	10,168	12,064	12,015	11,443
2018	Jan	10,878	6,555	8,321	7,257	13,830	15,419	10,088	12,299	5,857	7,413	11,345	11,153	11,936	13,002	5,912	18,514	12,979	10,158	12,064	12,015	11,444
2018	Feb	10,889	6,563	8,556	7,258	13,838	15,420	10,088	12,287	5,857	7,412	11,335	11,153	11,936	12,984	5,912	18,512	12,979	10,168	12,064	12,015	11,447
2018	Mar	10,959	6,563	8,556	7,257	14,328	15,842	10,088	12,287	5,857	7,412	11,335	11,153	11,936	12,984	5,909	18,992	12,984	10,168	12,064	12,015	11,447
2018	Apr	10,972	6,572	8,619	7,257	14,335	15,842	10,088	12,331	5,860	7,413	11,353	11,153	11,936	13,024	5,909	18,990	12,982	10,220	12,064	12,015	11,475
2018	May	11,013	6,555	8,619	7,264	14,329	15,844	10,108	12,325	5,833	7,475	11,575	11,153	11,936	13,451	5,909	18,991	13,002	10,220	12,180	12,015	11,472
2018	June	11,069	6,555	8,619	7,274	14,340	15,844	10,218	12,336	5,857	7,475	12,336	11,158	11,940	13,382	5,930	19,055	13,021	10,320	12,189	12,015	11,479
2018	July	11,116	6,555	8,774	7,279	14,372	15,849	10,283	12,392	5,857	7,447	12,494	11,158	11,986	13,708	5,930	19,055	13,029	10,433	12,189	12,051	11,480
2018	Aug	11,124	6,603	8,838	7,405	14,397	15,832	10,152	12,529	5,884	7,485	12,267	11,413	12,000	13,032	6,054	19,091	13,046	10,463	12,410	12,075	11,515
2018	Sept	11,170	6,638	8,838	7,412	14,691	15,848	10,154	12,531	5,900	7,487	12,222	11,416	12,003	13,034	6,211	19,486	13,050	10,438	12,410	12,104	11,525
2018	Oct	11,183	6,649	8,862	7,415	14,709	15,858	10,150	12,535	5,906	7,499	12,220	11,419	12,010	12,978	6,215	19,503	13,325	10,441	12,406	12,107	11,187
2018	Nov	11,184	6,651	8,860	7,418	14,718	15,861	10,147	12,532	5,913	7,499	12,217	11,417	12,006	12,975	6,218	19,499	13,322	10,438	12,345	12,110	11,532
2018	Dec	11,186	6,656	8,866	7,417	14,726	15,867	10,152	12,537	5,910	7,514	12,222	11,422	12,012	12,981	6,226	19,488	13,324	10,443	12,293	12,115	11,538
2019	Jan	11,206	6,659	8,865	7,418	14,725	15,873	10,152	12,537	5,909	7,506	12,166	11,422	12,011	12,980	6,216	19,487	13,329	10,443	12,293	12,115	12,008
2019	Feb	11,213	6,676	8,885	7,418	14,725	15,873	10,152	12,537	5,926	7,520	12,157	11,445	12,028	13,003	6,232	19,508	13,345	10,447	12,325	12,131	12,026
2019	Mar	11,228	6,669	8,808	7,311	14,735	15,905	10,113	12,395	5,906	7,485	12,325	11,203	11,944	13,892	6,141	19,475	13,320	10,817	12,080	12,048	11,989
2019	Apr	11,228	6,663	8,651	7,430	14,730	15,879	10,148	12,391	5,902	7,509	12,120	11,446	12,119	13,004	6,236	19,492	13,329	10,860	12,314	12,322	12,015
2019	May	11,230	6,670	8,662	7,441	14,740	15,891	10,095	12,380	5,912	7,529	12,113	11,458	12,131	12,959	6,248	19,505	13,340	10,872	12,294	12,333	12,027
2019	June	11,268	6,671	8,997	7,437	14,740	16,342	10,082	12,396	5,913	7,542	12,084	11,464	12,113	12,937	6,243	19,505	13,348	10,831	12,340	12,354	12,029
2019	July	11,293	6,678	9,007	7,447	14,740	16,873	10,087	12,385	5,899	7,518	12,084	11,464	12,113	12,937	6,262	19,514	13,324	10,811	12,340	12,354	11,999
2019	Aug	11,311	6,692	8,970	7,461	14,747	16,881	10,137	12,413	5,916	7,533	12,131	11,478	12,037	12,999	6,280	19,528	13,340	10,864	12,354	12,368	12,093
2019	Sept	11,311	6,691	8,967	7,460	14,745	16,881	10,183	12,410	5,921	7,535	12,138	11,475	12,021	13,005	6,291	19,523	13,341	10,831	12,349	12,366	12,090
2019	Oct	11,326	6,700	8,929	7,464	14,756	16,890	10,195	12,417	5,930	7,544	12,149	11,490	12,027	13,026	6,301	19,534	13,345	10,846	12,360	12,525	12,095
2019	Nov	11,381	6,699	8,947	7,463	14,755	16,888	10,217	12,432	5,932	7,542	12,177	11,488	12,026	13,012	6,314	20,359	13,345	10,845	12,358	12,723	12,094
2019	Dec	11,381	6,710	8,932	7,459	14,755	16,883	10,206	12,426	5,918	7,536	12,170	11,481	12,034	13,040	6,307	20,352	13,354	10,838	12,352	12,765	12,112
2020	Jan	11,496	6,721	8,969	7,470	14,762	16,894	10,137	12,436	5,931	7,551	12,108	11,501	12,144	13,042	6,318	20,363	13,372	10,838	12,362	12,806	12,122
2020	Feb	11,396	6,726	9,044	7,471	14,760	16,898	10,218	12,438	5,933	7,553	12,103	11,503	12,043	13,043	6,307	20,362	13,379	10,850	12,364	12,808	12,117
2020	Mar	11,397	6,739	9,109	7,483	14,763	16,901	10,226	12,454	5,945	7,564	12,105	11,512	12,043	13,010	6,314	20,365	13,389	10,849	12,367	12,811	11,991
2020	Apr	11,413	6,741	9,115	7,489	14,773	16,907	10,160	12,464	5,958	7,573	12,128	11,524	12,054	13,065	6,330	20,373	13,395	10,873	12,373	12,817	12,142
2020	May	11,418	6,744	9,117	7,493	14,775	16,914	10,153	12,466	5,961	7,575	12,097	11,574	12,056	13,068	6,332	20,378	13,399	10,874	12,421	12,819	12,146
2020	June	11,436	6,746	9,069	7,490	14,771	16,909	10,121	12,439	5,961	7,573	12,084	11,601	12,056	13,055	6,327	20,373	13,714	10,849	12,424	13,023	12,142
2020	July	11,439	6,744	9,113	7,482	14,769	16,923	10,142	12,458	5,959	7,580	12,104	11,635	12,056	13,052	6,324	20,387	13,715	10,845	12,445	12,908	12,140
2020	Aug	11,455	6,741	9,092	7,480	14,767	16,918	10,126	12,432	5,958	7,576	12,094	11,730	12,052	13,052	6,335	20,383	13,704	10,860	12,455	12,921	12,431
2020	Sept	11,499	6,747	9,138	7,485	14,773	16,926	10,178	12,470	5,998	7,580	12,134	11,770	12,062	13,095	6,361	20,392	13,710	10,901	12,478	13,006	12,772
2020	Oct	11,539	6,752	9,237	7,500	14,837	16,929	10,211	12,523	6,031	7,584	12,170	11,812	12,067	13,151	6,417	20,413	13,732	10,948	12,521	13,168	12,776
2020	Nov	11,579	6,774	9,348	7,526	14,875	16,978	10,259	12,570	6,065	7,605	12,217	11,859	12,071	13,215	6,465	20,439	13,760	11,007	12,578	13,172	12,797
2020	Dec	11,626	6,824	9,466	7,524	14,942	17,003	10,307	12,614	6,063	7,603	12,269	11,911	12,068	13,262	6,531	20,561	13,927	11,060	12,575	13,169	12,840

ENR Construction Cost Index

Year	Mo	20 Cities Average	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle
2021	Jan	11,628	6,879	9,397	7,535	14,956	17,013	10,317	12,619	6,144	7,637	12,268	11,866	12,079	13,226	6,516	20,590	13,925	11,069	12,581	13,098	12,845
2021	Feb	11,699	6,891	9,413	7,603	15,775	17,076	10,525	12,595	6,156	7,655	12,326	11,885	12,091	13,245	6,577	20,580	13,921	11,108	12,618	13,110	12,826
2021	Mar	11,750	6,960	9,545	7,654	15,831	17,103	10,600	12,662	6,207	7,682	12,395	11,932	12,119	13,294	6,632	20,577	13,951	11,174	12,675	13,137	12,865
2021	Apr	11,849	7,039	9,708	7,674	15,924	17,124	10,928	12,754	6,259	7,719	12,492	12,029	12,140	13,389	6,652	20,599	13,972	11,719	12,763	13,157	12,945
2021	May	11,990	7,174	9,851	7,732	15,973	17,207	11,031	12,864	6,390	7,777	12,609	12,149	12,995	13,513	6,766	20,648	13,989	11,831	12,877	13,425	12,994
2021	June	12,112	7,364	10,079	7,861	16,133	17,351	11,162	12,991	6,424	7,934	12,735	12,266	13,029	13,581	6,957	20,751	14,065	11,926	13,006	13,459	13,165
2021	July	12,238	7,523	10,327	7,983	16,267	17,434	11,313	13,137	6,573	7,944	12,889	12,409	13,018	13,731	7,088	20,783	14,097	12,074	13,156	13,762	13,248
2021	Aug	12,463	7,645	10,438	8,189	16,511	17,644	11,463	13,266	6,809	8,139	13,041	12,667	13,404	13,880	7,349	21,180	14,830	12,214	13,308	13,818	13,467
2021	Sept	12,465	7,752	10,487	8,218	16,607	17,719	11,399	13,187	6,985	8,180	12,973	12,619	13,212	13,931	7,341	21,194	14,864	12,250	13,264	13,584	13,526
2021	Oct	12,465	7,855	10,084	8,252	16,652	17,767	11,341	13,141	7,035	8,228	12,905	12,551	12,704	13,763	7,389	21,250	14,904	12,292	13,163	14,452	13,574
2021	Nov	12,647	7,897	9,941	8,293	16,715	17,809	11,392	13,191	7,140	8,270	12,851	12,487	12,848	13,702	7,453	21,291	14,897	12,033	13,119	14,421	13,596
2021	Dec	12,482	8,000	9,892	8,330	16,889	17,908	11,279	13,096	7,177	8,346	12,843	12,498	12,912	13,712	7,490	21,280	14,940	12,006	13,129	14,228	13,683
2022	Jan	12,556	8,067	9,965	8,363	16,962	17,977	11,341	13,250	7,176	8,419	12,910	12,623	12,996	13,811	7,546	21,335	15,013	12,105	13,228	14,301	13,723
2022	Feb	12,684	8,047	10,146	8,409	17,383	17,978	11,444	13,296	7,225	8,431	13,025	12,752	13,187	13,945	7,591	21,354	15,039	12,243	13,365	14,396	14,425
2022	Mar	12,791	8,056	10,309	8,459	17,396	17,987	11,540	13,444	7,364	8,512	13,121	12,844	13,341	14,049	7,601	21,370	15,048	12,345	13,465	15,127	14,451
2022	Apr	12,899	8,148	10,554	8,502	17,471	18,035	11,664	13,585	7,463	8,554	13,256	12,964	13,698	14,161	7,755	21,446	15,091	12,459	13,576	15,104	14,493
2022	May	13,004	8,184	10,783	8,639	17,507	18,155	11,798	13,723	7,559	8,590	13,395	13,108	13,671	14,296	7,791	21,481	15,136	12,603	13,722	15,327	14,624
2022	June	13,111	8,405	11,039	8,677	17,544	18,260	11,951	13,876	7,588	8,627	13,638	13,276	13,489	14,342	8,002	21,631	15,228	12,735	13,882	15,356	14,661
2022	July	13,168	8,500	11,119	8,712	17,740	18,296	11,946	13,910	7,727	8,679	13,673	13,280	13,575	14,320	8,037	21,635	15,264	12,716	13,850	15,640	14,739
2022	Aug	13,171	8,560	11,184	8,834	17,924	18,357	12,012	13,840	7,798	8,719	13,602	13,216	13,401	14,269	8,098	21,680	15,559	12,644	13,800	15,051	14,873
2022	Sept	13,173	8,584	11,221	8,834	17,964	18,346	11,891	13,783	7,764	8,677	13,539	13,164	13,120	14,229	8,138	21,951	15,575	12,622	13,779	15,083	15,202
2022	Oct	13,175	8,556	11,247	8,859	17,910	18,365	12,058	13,732	7,755	8,661	13,464	13,152	13,278	14,194	8,157	21,902	15,533	12,577	13,757	15,141	15,198
2022	Nov	13,175	8,622	11,246	8,804	17,915	18,310	12,059	13,660	7,702	8,680	13,421	13,293	13,413	14,131	8,006	21,884	15,519	12,521	13,997	15,114	15,203
2022	Dec	13,175	8,612	11,226	8,826	17,812	18,235	12,040	13,684	7,620	8,611	13,717	13,276	13,665	14,064	7,937	21,870	15,496	12,448	13,974	14,978	15,115
2023	Jan	13,175	8,427	11,250	8,710	17,756	18,220	11,605	13,551	7,574	8,617	13,745	13,590	13,990	14,301	7,930	21,999	15,568	12,408	13,630	15,499	15,132
2023	Feb	13,176	8,408	10,596	8,781	17,797	18,312	11,860	13,619	7,743	8,680	13,787	13,586	13,908	14,357	7,920	21,930	15,569	12,468	13,691	15,420	15,088
2023	Mar	13,176	8,314	10,610	8,751	17,834	18,346	11,847	13,632	7,680	8,668	13,801	13,588	13,870	14,363	7,889	22,187	15,534	12,460	13,684	15,362	15,107
2023	Apr	13,230	8,408	10,631	8,726	17,719	19,819	11,939	13,682	7,682	8,707	13,822	13,570	13,729	14,388	7,877	21,863	15,506	12,476	13,697	15,320	15,031
2023	May	13,288	8,378	10,297	8,651	17,682	19,732	11,936	13,772	7,532	8,719	13,878	13,548	15,110	14,432	7,828	21,930	15,534	12,510	13,671	15,595	15,031
2023	June	13,345	8,157	10,263	8,663	17,707	19,899	12,244	13,887	7,479	8,914	13,846	13,906	15,112	14,414	7,748	22,256	15,536	12,473	13,786	15,367	15,242
2023	July	13,425	8,063	10,331	8,600	17,709	19,896	12,471	14,342	7,492	9,333	13,849	13,908	15,147	14,416	7,771	22,507	15,955	12,476	13,688	15,370	15,174
2023	Aug	13,473	8,068	10,344	8,619	17,712	19,894	12,630	14,491	7,505	9,368	13,727	14,140	15,179	14,419	7,702	22,545	15,992	12,852	13,691	15,405	15,172
2023	Sept	13,486	8,171	10,360	8,681	17,724	19,899	12,632	14,493	7,617	9,351	13,447	14,176	15,158	14,355	7,723	22,557	15,994	12,852	13,701	15,490	15,333
2023	Oct	13,498	8,205	10,362	8,686	17,732	19,957	12,630	14,488	7,637	9,348	13,594	13,916	15,299	14,358	7,748	22,526	15,969	12,854	13,841	15,473	15,335
2023	Nov	13,511	8,215	10,489	8,651	17,734	19,978	12,627	14,483	7,709	9,283	13,614	13,904	15,301	14,365	7,725	22,528	15,972	12,924	13,844	15,526	15,338
2023	Dec	13,515	8,217	10,491	8,654	17,737	20,105	12,630	14,481	7,758	9,286	13,674	13,901	15,258	14,368	7,730	22,480	15,967	12,922	13,949	15,515	15,174
2024	Jan	13,515	8,255	10,545	8,669	17,643	20,123	12,388	14,184	7,779	9,170	13,737	14,034	15,300	14,605	7,737	22,436	15,952	12,935	13,971	15,525	15,312
2024	Feb	13,518	8,214	10,548	8,671	17,641	20,125	12,391	14,182	7,824	9,167	13,672	14,083	15,214	14,610	7,735	22,439	15,944	12,932	13,969	15,528	15,475
2024	Mar	13,532	8,216	10,360	8,674	17,643	20,128	12,464	14,467	7,872	9,170	14,014	13,812	15,220	14,613	7,850	22,374	15,914	12,941	13,971	15,459	15,478
2024	Apr	13,532	8,229	10,378	8,691	17,929	19,871	12,282	14,285	7,846	9,422	13,981	13,835	15,245	14,540	8,091	22,384	15,929	12,951	13,772	15,489	15,493
2024	May	13,532	8,234	10,383	8,694	17,818	20,047	12,287	14,290	7,871	9,445	13,983	13,829	15,250	14,665	8,030	22,379	15,783	12,969	13,781	15,418	15,495
2024	June	13,547	8,231	10,527	8,691	17,816	20,159	12,332	14,340	7,868	9,442	13,767	13,808	15,293	14,727	8,100	22,376	15,780	12,976	13,843	15,367	15,493
2024	July	13,556	8,229	10,535	8,689	17,669	20,343	12,291	14,299	7,858	9,458	13,655	13,976	15,315	14,773	8,097	22,374	15,778	12,980	13,837	15,335	15,632
2024	Aug	13,594	8,311	10,594	8,580	17,769	20,423	12,303	14,286	7,948	9,543	13,519	14,141	15,380	14,811	8,167	22,506	15,679	12,985	13,845	15,367	15,714
2024	Sept	13,632	8,653	10,591	8,858	17,742	20,406	12,803	14,284	8,036	9,541	13,645	13,745	15,374	14,809	8,237	22,298	15,677	13,015	13,843	15,375	15,712
2024	Oct	13,632	8,706	10,683	8,766	17,755	20,635	12,816	14,294	7,473	9,289	13,657	13,776	15,432	14,921	8,250	22,310	15,694	13,135	13,855	15,385	15,813
2024	Nov	13,632	8,728	10,632	8,904	17,777	20,426	12,833	14,311	7,478	9,295	13,813	13,737	15,580	14,803	8,272	22,333	15,717	12,991	13,877	15,401	15,738
2024	Dec	13,632	8,738	10,642	8,914	17,942	20,534	12,843	14,324	7,491	9,268	13,614	13,756	15,587	14,755	8,285	22,042	15,727	13,004	13,912	15,413	15,856
2025	Jan	13,732	8,741	10,640	8,911	17,851	20,486	12,559	14,040	7,558	9,266	13,611	13,753	15,592	17,171	8,282	22,056	15,739	13,001	14,137	15,478	15,758
2025	Feb	13,766	8,738	10,637	8,909	17,828	20,722	12,507	14,461	7,431	9,251	13,611	13,750	15,601	17,169	8,280	22,054	16,309	12,999	14,135	15,405	15,529
2025	Mar	13,783	8,741	10,757	8,906	18,509	20,611	12,509	14,463	7,428	9,224	13,621	13,748	15,778	16,551	7,703	22,058	16,311	13,016	14,943	15,239	15,532
2025	Apr	13,798	8,738	10,760	8,907	18,512	20,686	12,507	14,466	7,497	9,258	13,630	13,766	15,980	16,548	7,955	22,508	16,370	12,505	14,872	15,264	15,238
2025	May	13,839	8,740	10,762	8,904	18,407	20,809	12,719	14,783	7,494	9,261	13,639	13,787	15,977	16,694	7,965	22,540	16,404	12,503	14,870	15,276	15,238
2025	June	13,871	8,740	10,761	8,904	18,687	20,909	12,703	14,794	7,517	9,228	13,732	13,784	15,977	16,697	7,990	22,626	16,479	12,505	14,870	15,282	15,239
2025	July																					
2025	Aug																					
2025	Sept																					
2025	Oct																					
2025	Nov																					
2025	Dec																					

Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Pipe	CIPP	8-inch Pipe Rehab by Cured-in-Place Pipe Lining Method	LF	$ 35.50	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Pipe	CIPP	10-inch Pipe Rehab by Cured-in-Place Pipe Lining Method	LF	$ 37.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Lateral	CIPP	6-inch Lateral Rehab by Cured-in-Place Pipe Lining Method	LF	$ 140.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Manhole	Lining	Manhole Rehabilitation using Epoxy Lining (including removing steps and repair of cone, walls, bench, and channels)	VF	$ 245.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Manhole	Frame / Cover	Internal Manhole Frame Sealant	EA	$ 400.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Misc.	Mob/Demob	Mobilization (approx. 3% of total bid)	LS	$ 10,000.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Misc.	Traffic Control	Maintenance of Traffic (approx. 5%)	LS	$ 25,000.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Pipe	CIPP	8-inch Pipe Rehab by Cured-in-Place Pipe Lining Method	LF	$ 36.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Pipe	CIPP	10-inch Pipe Rehab by Cured-in-Place Pipe Lining Method	LF	$ 43.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Lateral	CIPP	6-inch Lateral Rehab by Cured-in-Place Pipe Lining Method	LF	$ 136.50	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Manhole	Lining	Manhole Rehabilitation using Epoxy Lining (including removing steps and repair of cone, walls, bench, and channels)	VF	$ 420.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Manhole	Frame / Cover	Internal Manhole Frame Sealant	EA	$ 253.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Misc.	Mob/Demob	Mobilization (approx. 3% of total bid)	LS	$ 20,000.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Misc.	Traffic Control	Maintenance of Traffic (approx. 5%)	LS	$ 72,000.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Pipe	CIPP	8-inch Pipe Rehab by Cured-in-Place Pipe Lining Method	LF	$ 43.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Pipe	CIPP	10-inch Pipe Rehab by Cured-in-Place Pipe Lining Method	LF	$ 51.50	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Lateral	CIPP	6-inch Lateral Rehab by Cured-in-Place Pipe Lining Method	LF	$ 290.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Manhole	Lining	Manhole Rehabilitation using Epoxy Lining (including removing steps and repair of cone, walls, bench, and channels)	VF	$ 415.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Manhole	Frame / Cover	Internal Manhole Frame Sealant	EA	$ 410.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Misc.	Mob/Demob	Mobilization (approx. 3% of total bid)	LS	$ 9,200.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Misc.	Traffic Control	Maintenance of Traffic (approx. 5%)	LS	$ 44,500.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Pipe	CIPP	8-inch Pipe Rehab by Cured-in-Place Pipe Lining Method	LF	$ 41.12	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Pipe	CIPP	10-inch Pipe Rehab by Cured-in-Place Pipe Lining Method	LF	$ 46.07	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Lateral	CIPP	6-inch Lateral Rehab by Cured-in-Place Pipe Lining Method	LF	$ 150.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Manhole	Lining	Manhole Rehabilitation using Epoxy Lining (including removing steps and repair of cone, walls, bench, and channels)	VF	$ 525.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Manhole	Frame / Cover	Internal Manhole Frame Sealant	EA	$ 715.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Misc.	Mob/Demob	Mobilization (approx. 3% of total bid)	LS	$ 15,000.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Misc.	Traffic Control	Maintenance of Traffic (approx. 5%)	LS	$ 58,850.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Pipe	CIPP	8-inch Pipe Rehab by Cured-in-Place Pipe Lining Method	LF	$ 43.85	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Pipe	CIPP	10-inch Pipe Rehab by Cured-in-Place Pipe Lining Method	LF	$ 57.37	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Lateral	CIPP	6-inch Lateral Rehab by Cured-in-Place Pipe Lining Method	LF	$ 230.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	

*Not all list items were utilitzed for comparisons

Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Manhole	Lining	Manhole Rehabilitation using Epoxy Lining (including removing steps and repair of cone, walls, bench, and channels)	VF	$ 618.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Manhole	Frame / Cover	Internal Manhole Frame Sealant	EA	$ 500.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Misc.	Mob/Demob	Mobilization (approx. 3% of total bid)	LS	$ 15,000.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Misc.	Traffic Control	Maintenance of Traffic (approx. 5%)	LS	$ 7,800.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Pipe	CIPP	8-inch Pipe Rehab by Cured-in-Place Pipe Lining Method	LF	$ 58.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Pipe	CIPP	10-inch Pipe Rehab by Cured-in-Place Pipe Lining Method	LF	$ 61.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Lateral	CIPP	6-inch Lateral Rehab by Cured-in-Place Pipe Lining Method	LF	$ 495.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Manhole	Lining	Manhole Rehabilitation using Epoxy Lining (including removing steps and repair of cone, walls, bench, and channels)	VF	$ 625.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Manhole	Frame / Cover	Internal Manhole Frame Sealant	EA	$ 930.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Misc.	Mob/Demob	Mobilization (approx. 3% of total bid)	LS	$ 18,000.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Misc.	Traffic Control	Maintenance of Traffic (approx. 5%)	LS	$ 90,000.00	7/26/2022	Midlothian-Providence Fairview Sewer Rehabilitation	ADMN22000496	Central VA - Ches Midlo	
Pipe	Abandon	Abandon Pipe w/out Flowable Fill (10" Diameter)	LF	$ 4.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Bedding	Additional Pipe Bedding (6-Inch Lift VDOT #57 Stone, As Authorized By Owner)	LF	$ 6.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Bedding	Additional Pipe Bedding (6-Inch Lift VDOT #57 Stone, As Authorized By Owner)	LF	$ 7.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Bedding	Additional Pipe Bedding (6-Inch Lift VDOT #57 Stone, As Authorized By Owner)	LF	$ 7.75	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Pipe	Abandon	Abandon Pipe w/out Flowable Fill (10" Diameter)	LF	$ 11.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Pipe	Abandon	Abandon Pipe with Flowable Fill (10" Diameter)	LF	$ 12.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Pipe	Abandon	Abandon Pipe w/out Flowable Fill (10" Diameter)	LF	$ 15.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Pipe	Abandon	Abandon Pipe with Flowable Fill (10" Diameter)	LF	$ 15.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Misc. Site Work	Hydraulic Concrete Sidewalk Removal and Replacement (4" Thickness)	SY	$ 20.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Pipe	Abandon	Abandon Pipe w/out Flowable Fill (10" Diameter)	LF	$ 22.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Pipe	Abandon	Abandon Pipe with Flowable Fill (10" Diameter)	LF	$ 27.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Other	Select Material (Min. CBR 15)	CY	$ 30.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Other	Select Material (Min. CBR 15)	CY	$ 35.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Other	Composite Detectable Warning Panels	SF	$ 35.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Other	Composite Detectable Warning Panels	SF	$ 35.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Pipe	Abandon	Abandon Pipe with Flowable Fill (10" Diameter)	LF	$ 38.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Misc. Site Work	Combination Concrete Curb and Gutter Removal and Replacement (Match Existing)	LF	$ 40.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Pipe	Abandon	Abandon Pipe with Flowable Fill (10" Diameter)	LF	$ 40.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Pipe	Abandon	Abandon Pipe w/out Flowable Fill (10" Diameter)	LF	$ 40.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Site Restoration	Pavement Patch	LF	$ 50.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Misc. Site Work	Combination Concrete Curb and Gutter Removal and Replacement (Match Existing)	LF	$ 50.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	

*Not all list items were utilitzed for comparisons

Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Misc.	Other	Select Material (Min. CBR 15)	CY	$ 50.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Bedding	Additional Pipe Bedding (6-Inch Lift VDOT #57 Stone, As Authorized By Owner)	LF	$ 55.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Other	Select Material (Min. CBR 15)	CY	$ 60.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Misc. Site Work	Hydraulic Concrete Sidewalk Removal and Replacement (4" Thickness)	SY	$ 60.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Misc. Site Work	Hydraulic Concrete Sidewalk Removal and Replacement (4" Thickness)	SY	$ 62.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Misc. Site Work	Combination Concrete Curb and Gutter Removal and Replacement (Match Existing)	LF	$ 65.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Other	Select Material (Min. CBR 15)	CY	$ 65.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Misc. Site Work	Combination Concrete Curb and Gutter Removal and Replacement (Match Existing)	LF	$ 67.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Site Restoration	Pavement Patch	LF	$ 75.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Misc. Site Work	Combination Concrete Curb and Gutter Removal and Replacement (Match Existing)	LF	$ 75.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Site Restoration	Pavement Patch	LF	$ 82.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Other	Select Material (Min. CBR 15)	CY	$ 83.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Misc. Site Work	Hydraulic Concrete Sidewalk Removal and Replacement (4" Thickness)	SY	$ 90.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Pipe	Abandon	Abandon Pipe w/out Flowable Fill (10" Diameter)	LF	$ 100.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Site Restoration	Pavement Patch	LF	$ 100.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Site Restoration	Pavement Patch	LF	$ 100.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Misc. Site Work	Curb-Cut Ramp Removal and Replacement	SY	$ 120.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Site Restoration	Pavement Patch	LF	$ 125.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Misc. Site Work	Hydraulic Concrete Sidewalk Removal and Replacement (4" Thickness)	SY	$ 125.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Misc. Site Work	Curb-Cut Ramp Removal and Replacement	SY	$ 145.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Misc. Site Work	Combination Concrete Curb and Gutter Removal and Replacement (Match Existing)	LF	$ 145.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Misc. Site Work	Curb-Cut Ramp Removal and Replacement	SY	$ 150.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Other	Composite Detectable Warning Panels	SF	$ 155.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Misc. Site Work	Curb-Cut Ramp Removal and Replacement	SY	$ 165.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Other	Composite Detectable Warning Panels	SF	$ 165.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Other	Composite Detectable Warning Panels	SF	$ 200.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Force Main	New Install	10-Inch DIP CL 52 Force Main W/Protecto 401 Lining	LF	$ 245.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Pipe	New Install	10-inch PVC SDR-26 Gravity Sewer (Depth 8'-10')	LF	$ 250.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Misc. Site Work	Curb-Cut Ramp Removal and Replacement	SY	$ 250.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Force Main	New Install	10-Inch DIP CL 52 Force Main W/Protecto 401 Lining	LF	$ 300.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Force Main	New Install	10-Inch DIP CL 52 Force Main W/Protecto 401 Lining	LF	$ 310.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Force Main	New Install	10-Inch DIP CL 52 Force Main W/Protecto 401 Lining	LF	$ 325.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Pipe	New Install	10-inch PVC SDR-26 Gravity Sewer (Depth 8'-10')	LF	$ 325.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	

*Not all list items were utilitzed for comparisons

Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Pipe	New Install	10-inch PVC SDR-26 Gravity Sewer (Depth 8'-10')	LF	$ 350.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Misc. Site Work	Hydraulic Concrete Sidewalk Removal and Replacement (4" Thickness)	SY	$ 350.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Force Main	New Install	10-Inch DIP CL 52 Force Main W/Protecto 401 Lining	LF	$ 388.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Pipe	New Install	10-inch PVC SDR-26 Gravity Sewer (Depth 8'-10')	LF	$ 400.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Other	Composite Detectable Warning Panels	SF	$ 500.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Pipe	Abandon	Abandon Pipe with Flowable Fill (10" Diameter)	LF	$ 500.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Force Main	New Install	10-Inch DIP CL 52 Force Main W/Protecto 401 Lining	LF	$ 525.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Misc. Site Work	Curb-Cut Ramp Removal and Replacement	SY	$ 550.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Pipe	New Install	10-inch PVC SDR-26 Gravity Sewer (Depth 8'-10')	LF	$ 750.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Pipe	New Install	10-inch PVC SDR-26 Gravity Sewer (Depth 8'-10')	LF	$ 750.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Other	Manual Air Vent Assembly	EA	$ 2,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Other	Manual Air Vent Assembly	EA	$ 3,500.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Valve	10-Inch Gate Valve	EA	$ 3,750.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Valve	10-Inch Gate Valve	EA	$ 4,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Connection	Connection to Existing Sanitary Sewer Manhole	EA	$ 4,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Valve	10-Inch Gate Valve	EA	$ 4,200.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Other	Manual Air Vent Assembly	EA	$ 4,500.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Other	Manual Air Vent Assembly	EA	$ 4,500.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Valve	10-Inch Gate Valve	EA	$ 4,700.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Connection	Connection to Existing 10-inch DIP Force Main	EA	$ 5,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Other	Manual Air Vent Assembly	EA	$ 5,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Connection	Connection to Existing Sanitary Sewer Manhole	EA	$ 6,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Other	Manual Air Vent Assembly	EA	$ 6,500.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Valve	10-Inch Gate Valve	EA	$ 7,500.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Connection	Connection to Existing Sanitary Sewer Manhole	EA	$ 7,500.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Valve	10-Inch Gate Valve	EA	$ 8,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Valve	18-Inch Gate Valve	EA	$ 10,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Erosion & Sediment Control	Erosion and Sediment Control	LS	$ 10,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Connection	Connection to Existing Sanitary Sewer Manhole	EA	$ 12,500.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Force Main	New Install	18-Inch DIP CL 52 Force Main W/Protecto 401 Lining	LS	$ 15,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Erosion & Sediment Control	Erosion and Sediment Control	LS	$ 15,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Erosion & Sediment Control	Erosion and Sediment Control	LS	$ 15,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Erosion & Sediment Control	Erosion and Sediment Control	LS	$ 15,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	

*Not all list items were utilitzed for comparisons

Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Misc.	Connection	Connection to Existing Sanitary Sewer Manhole	EA	$ 15,800.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Valve	18-Inch x 10-Inch Tapping Sleeve & Valve	EA	$ 20,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Valve	18-Inch Gate Valve	EA	$ 20,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Valve	18-Inch Gate Valve	EA	$ 21,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Traffic Control	Maintenance of Traffic	LS	$ 25,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Connection	Connection to Existing 10-inch DIP Force Main	EA	$ 28,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Valve	18-Inch x 10-Inch Tapping Sleeve & Valve	EA	$ 30,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Valve	18-Inch Gate Valve	EA	$ 30,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Connection	Connection to Existing Sanitary Sewer Manhole	EA	$ 30,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Valve	18-Inch Gate Valve	EA	$ 35,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Force Main	Connection	Connection to Existing 10-inch DIP Force Main	EA	$ 35,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Erosion & Sediment Control	Erosion and Sediment Control	LS	$ 35,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Erosion & Sediment Control	Erosion and Sediment Control	LS	$ 39,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Force Main	Connection	Connection to Existing 10-inch DIP Force Main	EA	$ 40,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Connection	Connection to Existing 10-inch DIP Force Main	EA	$ 47,500.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Valve	18-Inch x 10-Inch Tapping Sleeve & Valve	EA	$ 48,323.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Traffic Control	Maintenance of Traffic	LS	$ 50,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Traffic Control	Maintenance of Traffic	LS	$ 50,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Valve	18-Inch x 10-Inch Tapping Sleeve & Valve	EA	$ 59,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Valve	18-Inch Gate Valve	EA	$ 63,500.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Force Main	Connection	Connection to Existing 10-inch DIP Force Main	EA	$ 65,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Traffic Control	Maintenance of Traffic	LS	$ 65,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Mob/Demob	Mobilization/Demobilization (2 Payments)	LS	$ 70,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Mob/Demob	Mobilization/Demobilization (2 Payments)	LS	$ 75,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Mob/Demob	Mobilization/Demobilization (2 Payments)	LS	$ 75,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Valve	18-Inch x 10-Inch Tapping Sleeve & Valve	EA	$ 80,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Force Main	New Install	18-Inch DIP CL 52 Force Main W/Protecto 401 Lining	LS	$ 82,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	New Install	18-Inch DIP CL 52 Force Main W/Protecto 401 Lining	LS	$ 100,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Traffic Control	Maintenance of Traffic	LS	$ 100,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Mob/Demob	Mobilization/Demobilization (2 Payments)	LS	$ 100,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Valve	18-Inch x 10-Inch Tapping Sleeve & Valve	EA	$ 125,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Force Main	New Install	18-Inch DIP CL 52 Force Main W/Protecto 401 Lining	LS	$ 125,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Force Main	New Install	18-Inch DIP CL 52 Force Main W/Protecto 401 Lining	LS	$ 150,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	

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Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Force Main	New Install	18-Inch DIP CL 52 Force Main W/Protecto 401 Lining	LS	$ 195,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Mob/Demob	Mobilization/Demobilization (2 Payments)	LS	$ 200,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Mob/Demob	Mobilization/Demobilization (2 Payments)	LS	$ 200,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Misc.	Traffic Control	Maintenance of Traffic	LS	$ 235,000.00	4/14/2022	GREEN GARDEN PUMP STATION #547 FORCE MAIN REPLACEMENT	CIP NUMBER: 100519 BID NUMBER: PUCN-22-0006	Central VA	
Pipe	Cleaning	CLEAN EXISTING PIPE ANY SIZE	LF	$ 3.35	3/14/2024		AA9105177	Maryland	Maryland DOT
Pipe	Cleaning	CLEAN EXISTING PIPE ANY SIZE	LF	$ 3.52	1/4/2024		PG8505177	Maryland	Maryland DOT
Pipe	Cleaning	CLEAN EXISTING PIPE ANY SIZE	LF	$ 4.00	1/4/2024		HA5015187	Maryland	Maryland DOT
Pipe	Cleaning	CLEAN EXISTING PIPE ANY SIZE	LF	$ 15.00	8/1/2024		MO1595977	Maryland	Maryland DOT
Pipe	Cleaning	CLEAN EXISTING PIPE ANY SIZE	LF	$ 19.00	2/15/2024		XB2355H74	Maryland	Maryland DOT
Pipe	Cleaning	CLEAN EXISTING PIPE ANY SIZE	LF	$ 25.25	1/4/2024		DO3885176	Maryland	Maryland DOT
Pipe	Remove & Replace	REMOVAL OF EXISTING PIPE	LF	$ 38.00	1/4/2024		HA5015187	Maryland	Maryland DOT
Pipe	Cleaning	CLEAN EXISTING PIPE ANY SIZE	LF	$ 40.00	1/25/2024		GA1865177	Maryland	Maryland DOT
Pipe	Remove & Replace	REMOVAL OF EXISTING PIPE	LF	$ 40.00	8/1/2024		CO1115176	Maryland	Maryland DOT
Pipe	Cleaning	CLEAN EXISTING PIPE ANY SIZE	LF	$ 42.00	8/22/2024		SO1945388	Maryland	Maryland DOT
Pipe	Cleaning	CLEAN EXISTING PIPE ANY SIZE	LF	$ 50.00	5/23/2024		WA4795176	Maryland	Maryland DOT
Pipe	Cleaning	CLEAN EXISTING PIPE ANY SIZE	LF	$ 50.00	5/30/2024		XB1825574	Maryland	Maryland DOT
Misc.	Backfill	SELECTED BACKFILL USING CRUSHER RUN AGGREGATE CR-6	CY	$ 70.00	1/18/2024		WO1965180	Maryland	Maryland DOT
Pipe	Remove & Replace	REMOVAL OF EXISTING PIPE	LF	$ 76.76	9/19/2024		GA4225180	Maryland	Maryland DOT
Pipe	Cleaning	CLEAN EXISTING PIPE ANY SIZE	LF	$ 85.00	1/18/2024		WO1965180	Maryland	Maryland DOT
Manhole	New Install	48 INCH DIAMETER MANHOLE - VERTICAL DEPTH	VF	$ 86.50	10/24/2024		CE2475179	Maryland	Maryland DOT
Pipe	Remove & Replace	REMOVAL OF EXISTING PIPE	LF	$ 100.00	5/23/2024		WA4795176	Maryland	Maryland DOT
Pipe	Remove & Replace	REMOVAL OF EXISTING PIPE	LF	$ 175.00	5/30/2024		XB1825574	Maryland	Maryland DOT
Manhole	New Install	48 INCH DIAMETER MANHOLE - VERTICAL DEPTH	VF	$ 176.00	6/20/2024		FR6865181	Maryland	Maryland DOT
Manhole	New Install	48 INCH DIAMETER MANHOLE - VERTICAL DEPTH	VF	$ 200.00	5/30/2024		XB1825574	Maryland	Maryland DOT
Manhole	New Install	60 INCH DIAMETER MANHOLE - VERTICAL DEPTH	VF	$ 233.50	5/23/2024		WA4795176	Maryland	Maryland DOT
Manhole	New Install	48 INCH DIAMETER MANHOLE - VERTICAL DEPTH	VF	$ 400.00	2/15/2024		WA4435180	Maryland	Maryland DOT
Manhole	New Install	60 INCH DIAMETER MANHOLE - VERTICAL DEPTH	VF	$ 425.00	5/30/2024		XB1825574	Maryland	Maryland DOT
Pipe	Backfill	FLOWABLE BACKFILL FOR PIPE ABANDONMENT	CY	$ 475.00	5/30/2024		XB1825574	Maryland	Maryland DOT
Pipe	Backfill	FLOWABLE BACKFILL FOR PIPE ABANDONMENT	CY	$ 500.00	2/15/2024		WA4435180	Maryland	Maryland DOT
Manhole	New Install	48 INCH DIAMETER DROP MANHOLE - VERTICAL DEPTH	VF	$ 600.00	2/15/2024		WA4435180	Maryland	Maryland DOT

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Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Pipe	Backfill	FLOWABLE BACKFILL FOR PIPE ABANDONMENT	CY	$ 920.50	2/15/2024		XB2355H74	Maryland	Maryland DOT
Manhole	New Install	48 INCH DIAMETER MANHOLE - VERTICAL DEPTH	VF	$ 1,000.00	1/25/2024		GA1865177	Maryland	Maryland DOT
Pipe	Backfill	FLOWABLE BACKFILL FOR PIPE ABANDONMENT	CY	$ 1,000.00	5/23/2024		WA4795176	Maryland	Maryland DOT
Manhole	Other	ADJUST EXISTING MANHOLE	MH	$ 1,025.00	9/26/2024		XQ3265177	Maryland	Maryland DOT
Pipe	Backfill	FLOWABLE BACKFILL FOR PIPE ABANDONMENT	CY	$ 1,400.00	1/4/2024		WI2225180	Maryland	Maryland DOT
Manhole	New Install	48 INCH DIAMETER MANHOLE FOR 12 INCH TO 24 INCH PIPES - MINIMUM DEPTH	EA	$ 3,300.00	5/30/2024		XB1825574	Maryland	Maryland DOT
Manhole	New Install	48 INCH DIAMETER MANHOLE FOR 12 INCH TO 24 INCH PIPES - MINIMUM DEPTH	EA	$ 3,800.00	6/20/2024		FR6865181	Maryland	Maryland DOT
Manhole	New Install	48 INCH DIAMETER MANHOLE FOR 12 INCH TO 24 INCH PIPES - MINIMUM DEPTH	EA	$ 4,400.00	1/25/2024		GA1865177	Maryland	Maryland DOT
Manhole	New Install	48 INCH DIAMETER MANHOLE FOR 12 INCH TO 24 INCH PIPES - MINIMUM DEPTH	EA	$ 4,665.00	8/22/2024		SO1945388	Maryland	Maryland DOT
Manhole	New Install	60 INCH DIAMETER MANHOLE FOR 27 INCH TO 36 INCH PIPES - MINIMUM DEPTH	EA	$ 5,826.00	5/23/2024		WA4795176	Maryland	Maryland DOT
Manhole	New Install	48 INCH DIAMETER MANHOLE FOR 12 INCH TO 24 INCH PIPES - MINIMUM DEPTH	EA	$ 6,000.00	1/4/2024		HA5015187	Maryland	Maryland DOT
Manhole	New Install	48 INCH DIAMETER MANHOLE FOR 12 INCH TO 24 INCH PIPES - MINIMUM DEPTH	EA	$ 6,110.00	1/4/2024		WI2225180	Maryland	Maryland DOT
Manhole	New Install	60 INCH DIAMETER MANHOLE FOR 27 INCH TO 36 INCH PIPES - MINIMUM DEPTH	EA	$ 7,000.00	5/30/2024		XB1825574	Maryland	Maryland DOT
Manhole	New Install	48 INCH DIAMETER MANHOLE FOR 12 INCH TO 24 INCH PIPES - MINIMUM DEPTH	EA	$ 7,825.00	10/24/2024		CE2475179	Maryland	Maryland DOT
Manhole	New Install	60 INCH DIAMETER MANHOLE FOR 27 INCH TO 36 INCH PIPES - MINIMUM DEPTH	EA	$ 8,350.00	1/4/2024		WI2225180	Maryland	Maryland DOT
Manhole	New Install	48 INCH DIAMETER MANHOLE FOR 12 INCH TO 24 INCH PIPES - MINIMUM DEPTH	EA	$ 8,600.00	2/15/2024		WA4435180	Maryland	Maryland DOT
Manhole	New Install	48 INCH DIAMETER DROP MANHOLE - MINIMUM DEPTH	EA	$ 8,600.00	2/15/2024		WA4435180	Maryland	Maryland DOT
Manhole	New Install	96 INCH DIAMETER MANHOLE FOR 72 INCH PIPE - MINIMUM DEPTH	EA	$ 20,000.00	5/30/2024		XB1825574	Maryland	Maryland DOT
Misc.	Other	Select Material	TN	$ 60.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Rock Removal	CY	$ 500.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Undercut Excavation	CY	$ 70.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Geotextile for Soil Stabilization	SY	$ 8.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Foundation Conditioning Material, Minor Structures	TN	$ 75.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Foundation Conditioning Geotextile	SY	$ 10.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Culvert	15" R.C. Pipe Culverts, Class IV	LF	$ 145.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Culvert	24" R.C. Pipe Culverts, Class III	LF	$ 205.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Culvert	24" R.C. Pipe Culverts, Class IV	LF	$ 210.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Culvert	30" R.C. Pipe Culverts, Class III	LF	$ 240.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Culvert	48" R.C. Pipe Culverts, Class IV		$ 415.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Other	15" R.C. Flared End Section (CLDS 20.22)	EA	$ 2,000.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte

*Not all list items were utilitzed for comparisons

Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Pipe	Other	24" R.C. Flared End Section (CLDS 20.22)	EA	$ 2,900.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Other	36" R.C. Flared End Section (CLDS 20.22)	EA	$ 4,700.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Backfill	Aggregate Base Course	TN	$ 75.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Site Restoration	Milling Asphalt Pavement, 0.0" to 3.0"	SY	$ 30.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Site Restoration	Asphalt Concrete Base Course, Type B 25.0C	TN	$ 220.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Site Restoration	Asphalt Concrete Intermediate Course, Type I 19.0C	TN	$ 280.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Site Restoration	Asphalt Concrete Surface Course, Type S 9.5C	TN	$ 220.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Site Restoration	Asphalt Binder for Plant Mix	TN	$ 900.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Site Restoration	Asphalt Plant Mix, Pavement Repair	TN	$ 335.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Drainage	Masonry Drainage Structures	EA	$ 5,350.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Drainage	Masonry Drainage Structures	LF	$ 1,000.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Drainage	Frame with Grate (all types)	EA	$ 1,800.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Manhole	Frame / Cover	Manhole Frame and Cover, NCDOT Std 840.54	EA	$ 800.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	6"x18" Concrete Curb	LF	$ 45.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	2' 6" Concrete Curb and Gutter	LF	$ 45.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Site Restoration	4 " Concrete Sidewalk or pad	SY	$ 80.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	6" Concrete SUP	SY	$ 100.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	6" Concrete Greenway (fiber reinforced)	SY	$ 110.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	6" Concrete Driveways	SY	$ 110.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Pedestrian Refuge Island (Pass-Thru)	SY	$ 150.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	6" Concrete Wheelchair Ramps	SY	$ 280.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	5" Monolithic Concrete Islands	SY	$ 150.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Drainage	Geotextile for Drainage	SY	$ 5.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Drainage	Riprap (Class A, Class B, Class I & Class II)	TN	$ 85.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Wall, Precast Modular Block Retaining	SF	$ 200.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Safety Rail, Metal CLDS 50.04	LF	$ 150.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Contractor Furnished, Type E Sign	SF	$ 50.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Supports, 3-lb (4.5 kg) Steel U-Channel	LF	$ 40.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Sign Erection, Type E	EA	$ 175.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Thermoplastic Pavement Marking Lines, 4", 90 mils or 120 mils	LF	$ 3.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte

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Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Misc.	Misc. Site Work	Thermoplastic Pavement Marking Lines, 8", 90 mils or 120 mils	LF	$ 7.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Thermoplastic Pavement Marking Lines, 24", 90 mils or 120 mils	LF	$ 30.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Unpaved Trenching (2-2" SCH80)	LF	$ 50.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Junction Box (13"x24"x12" PC, TRAFFIC SIGNAL logo)	EA	$ 2,500.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Concrete Foundation for 10 foot Metal Base/Pole/Pedestrian Signal	EA	$ 3,500.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Concrete base for controller cabinet	EA	$ 3,000.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Fire Hydrant	Fire Hydrant	EA	$ 10,000.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Fire Hydrant	Relocate Fire Hydrant	EA	$ 9,000.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Foundation Conditioning Material for Utilities	TN	$ 88.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Backfill	Select Backfill Material for Utilities	TN	$ 68.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Valve	4" Gate Valve and Valve Box	EA	$ 2,500.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Valve	12" Gate Valve and Valve Box	EA	$ 6,500.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Water	1" Copper Water Tubing, Type K	LF	$ 70.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Water	2" Copper Water Tubing, Type K	LF	$ 100.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	New Install	8" DI Sewer Pipe, PC 350	LF	$ 550.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Manhole	New Install	4' Dia Precast Conc Manhole, 0-6' Depth	EA	$ 7,700.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Other	Select Material	TN	$ 45.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Rock Removal	CY	$ 200.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Undercut Excavation	CY	$ 40.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Geotextile for Soil Stabilization	SY	$ 5.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Foundation Conditioning Material, Minor Structures	TN	$ 70.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Foundation Conditioning Geotextile	SY	$ 5.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Culvert	15" R.C. Pipe Culverts, Class III	LF	$ 120.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Culvert	15" R.C. Pipe Culverts, Class IV	LF	$ 125.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Culvert	18" R.C. Pipe Culverts, Class III	LF	$ 135.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Culvert	18" R.C. Pipe Culverts, Class IV	LF	$ 140.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Culvert	24" R.C. Pipe Culverts, Class III	LF	$ 160.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Culvert	24" R.C. Pipe Culverts, Class IV	LF	$ 190.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Culvert	36" R.C. Pipe Culverts, Class III	LF	$ 250.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Culvert	36" R.C. Pipe Culverts, Class IV	LF	$ 300.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte

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Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Misc.	Backfill	Aggregate Base Course	TN	$ 60.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Site Restoration	Milling Asphalt Pavement, 0.0" to 3.0"	SY	$ 17.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Site Restoration	Asphalt Concrete Base Course, Type B 25.0C	TN	$ 115.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Site Restoration	Asphalt Concrete Intermediate Course, Type I 19.0C	TN	$ 115.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Site Restoration	Asphalt Concrete Surface Course, Type S 9.5C	TN	$ 115.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Site Restoration	Asphalt Binder for Plant Mix	TN	$ 900.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Site Restoration	Asphalt Plant Mix, Pavement Repair	TN	$ 250.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Drainage	Masonry Drainage Structures	EA	$ 4,750.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Drainage	Masonry Drainage Structures	LF	$ 870.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Drainage	Frame with Grate (all types)	EA	$ 1,400.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Manhole	Frame / Cover	Manhole Frame and Cover, NCDOT Std 840.54	EA	$ 800.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	6"x18" Concrete Curb	LF	$ 38.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	2' 6" Concrete Curb and Gutter	LF	$ 38.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Site Restoration	4 " Concrete Sidewalk or pad	SY	$ 65.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	6" Concrete SUP	SY	$ 85.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	6" Concrete Driveways	SY	$ 105.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	6" Concrete Wheelchair Ramps	SY	$ 250.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	5" Monolithic Concrete Islands	SY	$ 130.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Drainage	Geotextile for Drainage	SY	$ 5.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Drainage	Riprap (Class A, Class B, Class I & Class II)	TN	$ 80.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Wall, Precast Modular Block Retaining	SF	$ 55.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Safety Rail, Metal CLDS 50.04	LF	$ 90.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Contractor Furnished, Type E Sign	SF	$ 25.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Supports, 3-lb (4.5 kg) Steel U-Channel	LF	$ 10.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Sign Erection, Type E	EA	$ 140.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Thermoplastic Pavement Marking Lines, 6", 90 mils or 120 mils	LF	$ 2.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Thermoplastic Pavement Marking Lines, 8", 90 mils or 120 mils	LF	$ 3.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Thermoplastic Pavement Marking Lines, 12", 90 mils or 120 mils	LF	$ 6.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Thermoplastic Pavement Marking Lines, 24", 90 mils or 120 mils	LF	$ 13.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Thermoplastic Pavement Marking Symbols, Left-Turn Arrow	EA	$ 100.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte

*Not all list items were utilitzed for comparisons

Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Misc.	Misc. Site Work	Thermoplastic Pavement Marking Symbols, (Bicycle) 120 mils	EA	$ 950.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Thermoplastic Pavement Marking Symbols, (Bicycle Arrow), 120 mils	EA	$ 400.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Green Thermoplastic	SF	$ 20.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Unpaved Trenching (2-2" SCH80)	LF	$ 30.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Junction Box (13"x24"x12" PC, TRAFFIC SIGNAL logo)	EA	$ 1,000.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Concrete Foundation for 10 foot Metal Base/Pole/Pedestrian Signal	EA	$ 2,500.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Water	4" DIP Restrained Joint Water Pipe, PC 350	LF	$ 300.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Water	12" DIP Restrained Joint Water Pipe, PC 350	LF	$ 400.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Pipe	Water	DI Restrained Joint Water Pipe Fittings	LB	$ 15.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Misc. Site Work	Foundation Conditioning Material for Utilities	TN	$ 80.00	2/1/2024	City of Charlotte Memorandum: Construction Costs	City of Charlotte Memorandum: Construction Costs	NC	City of Charlotte
Misc.	Mob/Demob	MOBILIZATION	LS	$ 500,115.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Traffic Control	MAINTENANCE OF TRAFFIC	LS	$ 150,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Traffic Control	TRAFFIC OFFICER	HR	$ 121.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Traffic Control	FLAGGER, NEW CASTLE COUNTY, STATE	HR	$ 99.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	CONTAMINATED MATERIALS MANAGEMENT	CY	$ 400.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	DISPOSAL OF EXCAVATED MATERIALS	CY	$ 32.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	OIL WATER SEPARATOR	MO	$ 12,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	CARBON FILTRATION SYSTEM	MO	$ 13,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	BAG FILTER SYSTEM	MO	$ 14,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	ALUMINA FILTER SYSTEM	MO	$ 15,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	PORTABLE SEDIMENT TANK	EA	$ 14,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	SELECTIVE CLEARING	LS	$ 10,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	CONTINGENT TEST PITS	EA	$ 1,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	CONTINGENT PIPE TRENCH, UTILITY TRENCH AND STRUCTURE BACKFILL	CY	$ 26.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Stone	DELAWARE NO. 57 STONE (PER DELDOT SECTION 302)	TONS	$ 60.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	STABILIZED CONSTRUCTION ENTRANCES	TONS	$ 56.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	INLET PROTECTION TYPE 2	EA	$ 175.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	INLET PROTECTION TYPE 3	EA	$ 195.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Geotech	GEOTEXTILE DEWATERING BAG (PER DELDOT SECTION 906)	EA	$ 700.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Geotech	GEOTEXTILE STABILIZATION FABRIC (PER DELDOT SECTION 1060)	SY	$ 3.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON

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Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Misc.	Stone	GRADED AGGREGATE BASE COURSE, DELDOT TYPE B	CY	$ 95.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Excavation	CONTINGENT UNDERCUT EXCAVATION	CY	$ 105.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	TEMPORARY CHAINLINK FENCING (PER DELDOT SECTION 727)	LF	$ 13.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	CHAINLINK FENCE GATE (PER DELDOT SECTION 727)	EA	$ 2,135.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	COMPOST FILTER LOG (PER DELDOT SECTION 907.2.C)	LF	$ 20.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Geotech	SOIL STABILIZATION MATTING (PER DELDOT SECTION 908.2.D)	SY	$ 10.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	CONTINGENT ASPHALT PAVEMENT	TONS	$ 155.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	PERMANENT PAVEMENT MARKINGS, EPOXY RESIN PAINT, 5-INCH (WHITE OR YELLOW)	LF	$ 2.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	CONTINGENT 4-INCH CONCRETE SIDEWALK	SF	$ 12.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PCC CURB TYPE 1-6	LF	$ 41.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	GRANITE CURB	LF	$ 110.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PEDESTRIAN CONNECTION, TYPE 1 (PER DELDOT SECTION 705)	SF	$ 24.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PEDESTRIAN CONNECTION, TYPE 2,3 AND/OR 4 (PER DELDOT SECTION 705)	SF	$ 24.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	DETECTABLE WARNING SURFACE (PER DELDOT SECTION 705)	SF	$ 45.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PAVEMENT PATCHING (PER DELDOT SECTION 402)	SYIN	$ 4.50	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PCC PAVEMENT, 8" (PER DELDOT SECTION 501)	SY	$ 225.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PCC PAVEMENT, 10" (PER DELDOT SECTION 501)	SY	$ 260.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	EXISTING P.C.C. REMOVAL (PER DELDOT SECTION 211)	SY	$ 150.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	SAWCUTTING (PER DELDOT SECTION 762)	LF	$ 6.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	TOPSOIL, 6" DEPTH (PER DELDOT SECTION 908)	SY	$ 50.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	PERMANENT GRASS SEEDING, SUBDIVISION (PER DELDOT SECTION 908)	SY	$ 25.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	PAVEMENT MILLING, BITUMINOUS CONCRETE PAVEMENT (PER DELDOT SECTION 760)	SYIN	$ 4.50	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	SUPERPAVE, TYPE C, PG 76-22 (PER DELDOT SECTION 401)	TON	$ 180.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	2-INCH ASPHALT MILL AND OVERLAY	SY	$ 23.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 12-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 215.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 15-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 255.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 18-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 225.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 24-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 300.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 27-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 309.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 45-INCH X 29 INCH RC ELLIPTICAL STORM DRAIN PIPING, CLASS IV	LF	$ 385.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON

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Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Pipe	Storm	INSTALL 12-INCH DUCTILE IRON STORM DRAIN PIPING	LF	$ 259.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 14-INCH DUCTILE IRON STORM DRAIN PIPING	LF	$ 280.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 16-INCH DUCTILE IRON STORM DRAIN PIPING	LF	$ 300.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 36-INCH DUCTILE IRON STORM DRAIN PIPING	LF	$ 780.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 48-INCH STANDARD STORMWATER MANHOLE	EA	$ 9,200.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 48-INCH SHALLOW STORMWATER MANHOLE	EA	$ 8,900.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 60-INCH STANDARD STORMWATER MANHOLE	EA	$ 11,200.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 72-INCH STANDARD STORMWATER MANHOLE	EA	$ 13,200.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 72-INCH SHALLOW STORMWATER MANHOLE	EA	$ 13,200.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 72-INCH SHALLOW STORMWATER MANHOLE - CITY TO PROVIDE STRUCTURE	EA	$ 7,600.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	INSTALL NEW DRAINAGE INLET 34"X18" TYPE A & C	EA	$ 4,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	INSTALL NEW DRAINAGE INLET 34"X24" TYPE A & C	EA	$ 4,400.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	INSTALL NEW DRAINAGE INLET 34"X24" TYPE A & C - CITY TO PROVIDE STRUCTURE	EA	$ 2,100.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL DELDOT BOX MANHOLE 48"X66"	EA	$ 13,100.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Remove	REMOVE STORM DRAIN PIPING	LF	$ 27.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Abandon	ABANDON DRAINAGE INLET	EA	$ 1,770.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Remove & Replace	REMOVE & REPLACE DRAINAGE INLET 34"X24" TYPE A & C	EA	$ 4,700.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Remove & Replace	REMOVE & REPLACE DRAINAGE INLET 34"X24" TYPE A & C - CITY TO PROVIDE STRUCTURE	EA	$ 2,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Remove & Replace	REMOVE & REPLACE DRAINAGE INLET 30"X48" TYPE C	EA	$ 5,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Remove & Replace	REMOVE & REPLACE DRAINAGE INLET 32"X48" TYPE A & C - CITY TO PROVIDE STRUCTURE	EA	$ 2,900.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Remove & Replace	TEMPORARY SEWER BYPASS PUMPING - EXCLUDES FILTERING AND DEWATERING	WKS	$ 5,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Abandon	FLOWABLE FILL FOR ABANDONMENT OF PIPE	CY	$ 350.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Traffic Control	MAINTENANCE OF TRAFFIC - C STREET	LS	$ 190,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Traffic Control	TRAFFIC OFFICER	HR	$ 121.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Traffic Control	FLAGGER, NEW CASTLE COUNTY, STATE	HR	$ 99.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	CONTAMINATED MATERIALS MANAGEMENT	CY	$ 400.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	DISPOSAL OF EXCAVATED MATERIALS	CY	$ 32.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	OIL WATER SEPARATOR	MO	$ 12,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	CARBON FILTRATION SYSTEM	MO	$ 13,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	BAG FILTER SYSTEM	MO	$ 14,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON

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Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Misc.	Filtering	ALUMINA FILTER SYSTEM	MO	$ 15,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	PORTABLE SEDIMENT TANK	EA	$ 14,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	SELECTIVE CLEARING	LS	$ 2,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	CONTINGENT TEST PITS	EA	$ 1,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	CONTINGENT PIPE TRENCH, UTILITY TRENCH AND STRUCTURE BACKFILL	CY	$ 26.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Stone	DELAWARE NO. 57 STONE (PER DELDOT SECTION 302)	TON	$ 60.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	STABILIZED CONSTRUCTION ENTRANCES	TON	$ 56.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	INLET PROTECTION TYPE 1	EA	$ 200.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	INLET PROTECTION TYPE 2	EA	$ 175.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	INLET PROTECTION TYPE 3	EA	$ 195.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Geotech	GEOTEXTILE DEWATERING BAG (PER DELDOT SECTION 906)	EA	$ 700.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Geotech	GEOTEXTILE STABILIZATION FABRIC (PER DELDOT SECTION 1060)	SY	$ 3.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Stone	GRADED AGGREGATE BASE COURSE, DELDOT TYPE B	CY	$ 95.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Excavation	CONTINGENT UNDERCUT EXCAVATION	CY	$ 105.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	CONTINGENT ASPHALT PAVEMENT	TONS	$ 155.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	PERMANENT PAVEMENT MARKINGS, EPOXY RESIN PAINT, 5-INCH (WHITE OR YELLOW)	LF	$ 2.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	CONTINGENT 4-INCH CONCRETE SIDEWALK	SF	$ 12.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PCC CURB TYPE 1-2 (701010)	LF	$ 31.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PCC CURB TYPE 1-4 (701011)	LF	$ 36.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PCC CURB TYPE 1-6 (701012)	LF	$ 41.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PEDESTRIAN CONNECTION, TYPE 1 (PER DELDOT SECTION 705)	SF	$ 24.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PEDESTRIAN CONNECTION, TYPE 2,3 AND/OR 4 (PER DELDOT SECTION 705)	SF	$ 24.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	DETECTABLE WARNING SURFACE (PER DELDOT SECTION 705)	SF	$ 45.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	PAVEMENT PATCHING (PER DELDOT SECTION 402)	SYIN	$ 4.50	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PCC PAVEMENT, 8" (PER DELDOT SECTION 501)	SY	$ 225.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PCC PAVEMENT, 10" (PER DELDOT SECTION 501)	SY	$ 260.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Remove	EXISTING P.C.C. REMOVAL (PER DELDOT SECTION 211)	SY	$ 150.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	SAWCUTTING (PER DELDOT SECTION 762)	LF	$ 6.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	TOPSOIL, 6" DEPTH (PER DELDOT SECTION 908)	SY	$ 50.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	PERMANENT GRASS SEEDING, SUBDIVISION (PER DELDOT SECTION 908)	SY	$ 25.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON

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Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Misc.	Site Restoration	PAVEMENT MILLING, BITUMINOUS CONCRETE PAVEMENT (PER DELDOT SECTION 760)	SYIN	$ 4.50	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	SUPERPAVE, TYPE C, PG 76-22 (PER DELDOT SECTION 401)	TON	$ 180.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	2-INCH ASPHALT MILL AND OVERLAY	SY	$ 23.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	COLLAPSIBLE BOLLARDS	EA	$ 1,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	New Install	INSTALL 16-INCH DUCTILE IRON SANITARY SEWER PIPING	LF	$ 300.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	New Install	INSTALL 10-INCH DUCTILE IRON SANITARY SEWER PIPING	LF	$ 292.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 12-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 214.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 15-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 255.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 18-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 270.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 24-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 280.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 30-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 380.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 23-INCH X 14-INCH RC ELLIPTICAL STORM DRAIN PIPING, CLASS IV	LF	$ 315.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 45-INCH X 29-INCH RC ELLIPTICAL STORM DRAIN PIPING, CLASS IV	LF	$ 550.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 53-INCH X 34-INCH RC ELLIPTICAL STORM DRAIN PIPING, CLASS IV	LF	$ 490.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 16-INCH DUCTILE IRON STORM DRAIN PIPING	LF	$ 300.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 18-INCH DUCTILE IRON STORM DRAIN PIPING	LF	$ 320.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 48-INCH STANDARD STORMWATER MANHOLE	EA	$ 8,700.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 48-INCH SHALLOW STORMWATER MANHOLE	EA	$ 8,300.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 60-INCH STANDARD STORMWATER MANHOLE	EA	$ 10,700.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 60-INCH SHALLOW STORMWATER MANHOLE	EA	$ 10,700.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 72-INCH STANDARD STORMWATER MANHOLE	EA	$ 12,600.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 72-INCH SHALLOW STORMWATER MANHOLE	EA	$ 7,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	INSTALL NEW DRAINAGE INLET 34"X18" TYPE C	EA	$ 4,200.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	INSTALL NEW DRAINAGE INLET 34"X24" TYPE C	EA	$ 4,430.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	INSTALL NEW DRAINAGE INLET 42"X30" TYPE C	EA	$ 5,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	INSTALL NEW DRAINAGE INLET 48"X30" TYPE C	EA	$ 4,800.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL DELDOT BOX MANHOLE 48"X48"	EA	$ 9,800.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL DELDOT BOX MANHOLE 66"X66"	EA	$ 9,300.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Remove	REMOVE STORM DRAIN PIPING	LF	$ 27.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	ABANDON DRAINAGE INLET	EA	$ 1,770.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON

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Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Misc.	Storm	REMOVE & REPLACE DRAINAGE INLET 34"X18" TYPE C	EA	$ 4,700.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	REMOVE & REPLACE DRAINAGE INLET 34"X24" TYPE C	EA	$ 5,200.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	REMOVE & REPLACE DRAINAGE INLET 42"X30" TYPE C	EA	$ 4,700.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Bypass	TEMPORARY SEWER BYPASS PUMPING - EXCLUDES FILTERING AND DEWATERING	WKS	$ 5,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Abandon	FLOWABLE FILL FOR ABANDONEMENT OF PIPE	CY	$ 350.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Utilities	PRECAST UTILITY CONFLICT VAULT	LS	$ 60,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Mob/Demob	MOBILIZATION	LS	$ 540,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Traffic Control	MAINTENANCE OF TRAFFIC	LS	$ 100,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Traffic Control	TRAFFIC OFFICER	HR	$ 100.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Traffic Control	FLAGGER, NEW CASTLE COUNTY, STATE	HR	$ 85.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Traffic Control	FLAGGER, NEW CASTLE COUNTY, OVERTIME	HR	$ 126.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	CONTAMINATED MATERIALS MANAGEMENT	CY	$ 140.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	DISPOSAL OF EXCAVATED MATERIALS	CY	$ 23.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	OIL WATER SEPARATOR	MO	$ 17,600.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	CARBON FILTRATION SYSTEM	MO	$ 17,600.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	BAG FILTER SYSTEM	MO	$ 17,600.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	ALUMINA FILTER SYSTEM	MO	$ 17,600.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	PORTABLE SEDIMENT TANK	EA	$ 18,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	SELECTIVE CLEARING	LS	$ 100,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	CONTINGENT TEST PITS	EA	$ 1,400.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	CONTINGENT PIPE TRENCH, UTILITY TRENCH AND STRUCTURE BACKFILL	CY	$ 50.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Stone	DELAWARE NO. 57 STONE (PER DELDOT SECTION 302)	TONS	$ 32.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	STABILIZED CONSTRUCTION ENTRANCES	TONS	$ 125.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	INLET PROTECTION TYPE 2	EA	$ 160.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	INLET PROTECTION TYPE 3	EA	$ 500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Geotech	GEOTEXTILE DEWATERING BAG (PER DELDOT SECTION 906)	EA	$ 180.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Stone	GRADED AGGREGATE BASE COURSE, DELDOT TYPE B	CY	$ 45.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Excavation	CONTINGENT UNDERCUT EXCAVATION	CY	$ 75.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	TEMPORARY CHAINLINK FENCING (PER DELDOT SECTION 727)	LF	$ 22.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	FABRIC SCREENING (PER DELDOT SECTION 727)	SF	$ 1.50	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON

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Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Misc.	Misc. Site Work	CHAINLINK FENCE GATE (PER DELDOT SECTION 727)	EA	$ 4,600.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	COMPOST FILTER LOG (PER DELDOT SECTION 907.2.C)	LF	$ 25.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Geotech	SOIL STABILIZATION MATTING (PER DELDOT SECTION 908.2.D)	SY	$ 4.50	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	CONTINGENT ASPHALT PAVEMENT	TONS	$ 207.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	PERMANENT PAVEMENT MARKINGS, EPOXY RESIN PAINT, 5-INCH (WHITE OR YELLOW)	LF	$ 1.85	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	CONTINGENT 4-INCH CONCRETE SIDEWALK	SF	$ 9.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PCC CURB TYPE 1-6	LF	$ 38.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	GRANITE CURB	LF	$ 125.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PEDESTRIAN CONNECTION, TYPE 1 (PER DELDOT SECTION 705)	SF	$ 26.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PEDESTRIAN CONNECTION, TYPE 2,3 AND/OR 4 (PER DELDOT SECTION 705)	SF	$ 26.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	DETECTABLE WARNING SURFACE (PER DELDOT SECTION 705)	SF	$ 32.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PAVEMENT PATCHING (PER DELDOT SECTION 402)	SYIN	$ 17.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PCC PAVEMENT, 8" (PER DELDOT SECTION 501)	SY	$ 280.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PCC PAVEMENT, 10" (PER DELDOT SECTION 501)	SY	$ 492.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	EXISTING P.C.C. REMOVAL (PER DELDOT SECTION 211)	SY	$ 43.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	SAWCUTTING (PER DELDOT SECTION 762)	LF	$ 2.60	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	TOPSOIL, 6" DEPTH (PER DELDOT SECTION 908)	SY	$ 50.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	PERMANENT GRASS SEEDING, SUBDIVISION (PER DELDOT SECTION 908)	SY	$ 50.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	PAVEMENT MILLING, BITUMINOUS CONCRETE PAVEMENT (PER DELDOT SECTION 760)	SYIN	$ 5.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	SUPERPAVE, TYPE C, PG 76-22 (PER DELDOT SECTION 401)	TON	$ 220.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	2-INCH ASPHALT MILL AND OVERLAY	SY	$ 24.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 12-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 173.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 15-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 200.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 18-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 300.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 24-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 380.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 27-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 260.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 45-INCH X 29 INCH RC ELLIPTICAL STORM DRAIN PIPING, CLASS IV	LF	$ 350.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 12-INCH DUCTILE IRON STORM DRAIN PIPING	LF	$ 275.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 14-INCH DUCTILE IRON STORM DRAIN PIPING	LF	$ 395.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 16-INCH DUCTILE IRON STORM DRAIN PIPING	LF	$ 392.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON

*Not all list items were utilitzed for comparisons

Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Pipe	Storm	INSTALL 36-INCH DUCTILE IRON STORM DRAIN PIPING	LF	$ 796.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 48-INCH STANDARD STORMWATER MANHOLE	EA	$ 13,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 48-INCH SHALLOW STORMWATER MANHOLE	EA	$ 11,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 60-INCH STANDARD STORMWATER MANHOLE	EA	$ 15,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 72-INCH STANDARD STORMWATER MANHOLE	EA	$ 14,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 72-INCH SHALLOW STORMWATER MANHOLE	EA	$ 15,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 72-INCH SHALLOW STORMWATER MANHOLE - CITY TO PROVIDE STRUCTURE	EA	$ 9,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	INSTALL NEW DRAINAGE INLET 34"X18" TYPE A & C	EA	$ 7,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	INSTALL NEW DRAINAGE INLET 34"X24" TYPE A & C	EA	$ 7,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	INSTALL NEW DRAINAGE INLET 34"X24" TYPE A & C - CITY TO PROVIDE STRUCTURE	EA	$ 5,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL DELDOT BOX MANHOLE 48"X66"	EA	$ 17,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Remove	REMOVE STORM DRAIN PIPING	LF	$ 165.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Abandon	ABANDON DRAINAGE INLET	EA	$ 2,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Remove & Replace	REMOVE & REPLACE DRAINAGE INLET 34"X24" TYPE A & C	EA	$ 8,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Remove & Replace	REMOVE & REPLACE DRAINAGE INLET 34"X24" TYPE A & C - CITY TO PROVIDE STRUCTURE	EA	$ 6,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Remove & Replace	REMOVE & REPLACE DRAINAGE INLET 30"X48" TYPE C	EA	$ 8,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Remove & Replace	REMOVE & REPLACE DRAINAGE INLET 32"X48" TYPE A & C - CITY TO PROVIDE STRUCTURE	EA	$ 6,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Abandon	FLOWABLE FILL FOR ABANDONMENT OF PIPE	CY	$ 600.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Traffic Control	MAINTENANCE OF TRAFFIC - C STREET	LS	$ 200,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Traffic Control	TRAFFIC OFFICER	HR	$ 100.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Traffic Control	FLAGGER, NEW CASTLE COUNTY, STATE	HR	$ 85.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Traffic Control	FLAGGER, NEW CASTLE COUNTY, OVERTIME	HR	$ 126.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	CONTAMINATED MATERIALS MANAGEMENT	CY	$ 140.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	DISPOSAL OF EXCAVATED MATERIALS	CY	$ 23.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	OIL WATER SEPARATOR	MO	$ 17,600.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	CARBON FILTRATION SYSTEM	MO	$ 17,600.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	BAG FILTER SYSTEM	MO	$ 17,600.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	ALUMINA FILTER SYSTEM	MO	$ 17,600.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Filtering	PORTABLE SEDIMENT TANK	EA	$ 18,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	SELECTIVE CLEARING	LS	$ 115,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON

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Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Misc.	Misc. Site Work	CONTINGENT TEST PITS	EA	$ 1,400.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	CONTINGENT PIPE TRENCH, UTILITY TRENCH AND STRUCTURE BACKFILL	CY	$ 50.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Stone	DELAWARE NO. 57 STONE (PER DELDOT SECTION 302)	TON	$ 32.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	STABILIZED CONSTRUCTION ENTRANCES	TON	$ 125.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	INLET PROTECTION TYPE 1	EA	$ 175.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	INLET PROTECTION TYPE 2	EA	$ 160.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	INLET PROTECTION TYPE 3	EA	$ 500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Geotech	GEOTEXTILE DEWATERING BAG (PER DELDOT SECTION 906)	EA	$ 180.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Stone	GRADED AGGREGATE BASE COURSE, DELDOT TYPE B	CY	$ 45.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Excavation	CONTINGENT UNDERCUT EXCAVATION	CY	$ 73.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	CONTINGENT ASPHALT PAVEMENT	TONS	$ 207.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	PERMANENT PAVEMENT MARKINGS, EPOXY RESIN PAINT, 5-INCH (WHITE OR YELLOW)	LF	$ 1.85	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	CONTINGENT 4-INCH CONCRETE SIDEWALK	SF	$ 9.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PCC CURB TYPE 1-2 (701010)	LF	$ 38.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PCC CURB TYPE 1-4 (701011)	LF	$ 38.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PCC CURB TYPE 1-6 (701012)	LF	$ 38.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PEDESTRIAN CONNECTION, TYPE 1 (PER DELDOT SECTION 705)	SF	$ 26.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PEDESTRIAN CONNECTION, TYPE 2,3 AND/OR 4 (PER DELDOT SECTION 705)	SF	$ 26.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	DETECTABLE WARNING SURFACE (PER DELDOT SECTION 705)	SF	$ 32.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	PAVEMENT PATCHING (PER DELDOT SECTION 402)	SYIN	$ 22.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PCC PAVEMENT, 8" (PER DELDOT SECTION 501)	SY	$ 225.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	PCC PAVEMENT, 10" (PER DELDOT SECTION 501)	SY	$ 430.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Remove	EXISTING P.C.C. REMOVAL (PER DELDOT SECTION 211)	SY	$ 42.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	SAWCUTTING (PER DELDOT SECTION 762)	LF	$ 2.50	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	TOPSOIL, 6" DEPTH (PER DELDOT SECTION 908)	SY	$ 40.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	PERMANENT GRASS SEEDING, SUBDIVISION (PER DELDOT SECTION 908)	SY	$ 40.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	PAVEMENT MILLING, BITUMINOUS CONCRETE PAVEMENT (PER DELDOT SECTION 760)	SYIN	$ 5.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	SUPERPAVE, TYPE C, PG 76-22 (PER DELDOT SECTION 401)	TON	$ 213.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Site Restoration	2-INCH ASPHALT MILL AND OVERLAY	SY	$ 23.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Misc. Site Work	COLLAPSIBLE BOLLARDS	EA	$ 1,800.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON

*Not all list items were utilitzed for comparisons

Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Pipe	New Install	INSTALL 16-INCH DUCTILE IRON SANITARY SEWER PIPING	LF	$ 1,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	New Install	INSTALL 10-INCH DUCTILE IRON SANITARY SEWER PIPING	LF	$ 650.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 12-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 195.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 15-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 195.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 18-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 200.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 24-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 210.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 30-INCH RCP STORM DRAIN PIPING, CLASS IV	LF	$ 260.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 23-INCH X 14-INCH RC ELLIPTICAL STORM DRAIN PIPING, CLASS IV	LF	$ 225.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 45-INCH X 29-INCH RC ELLIPTICAL STORM DRAIN PIPING, CLASS IV	LF	$ 340.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 53-INCH X 34-INCH RC ELLIPTICAL STORM DRAIN PIPING, CLASS IV	LF	$ 1,310.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 16-INCH DUCTILE IRON STORM DRAIN PIPING	LF	$ 360.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Storm	INSTALL 18-INCH DUCTILE IRON STORM DRAIN PIPING	LF	$ 395.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 48-INCH STANDARD STORMWATER MANHOLE	EA	$ 12,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 48-INCH SHALLOW STORMWATER MANHOLE	EA	$ 11,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 60-INCH STANDARD STORMWATER MANHOLE	EA	$ 14,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 60-INCH SHALLOW STORMWATER MANHOLE	EA	$ 13,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 72-INCH STANDARD STORMWATER MANHOLE	EA	$ 15,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL 72-INCH SHALLOW STORMWATER MANHOLE	EA	$ 14,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	INSTALL NEW DRAINAGE INLET 34"X18" TYPE C	EA	$ 7,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	INSTALL NEW DRAINAGE INLET 34"X24" TYPE C	EA	$ 7,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	INSTALL NEW DRAINAGE INLET 42"X30" TYPE C	EA	$ 8,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	INSTALL NEW DRAINAGE INLET 48"X30" TYPE C	EA	$ 8,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL DELDOT BOX MANHOLE 48"X48"	EA	$ 16,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Manhole	Storm	INSTALL DELDOT BOX MANHOLE 66"X66"	EA	$ 16,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Remove	REMOVE STORM DRAIN PIPING	LF	$ 215.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	ABANDON DRAINAGE INLET	EA	$ 2,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	REMOVE & REPLACE DRAINAGE INLET 34"X18" TYPE C	EA	$ 7,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	REMOVE & REPLACE DRAINAGE INLET 34"X24" TYPE C	EA	$ 7,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Misc.	Storm	REMOVE & REPLACE DRAINAGE INLET 42"X30" TYPE C	EA	$ 7,500.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pipe	Abandon	FLOWABLE FILL FOR ABANDONEMENT OF PIPE	CY	$ 600.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON

*Not all list items were utilitzed for comparisons

Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Misc.	Utilities	PRECAST UTILITY CONFLICT VAULT	LS	$ 150,000.00	UNKNOWN	NAME: SOUTH WILMINGTON SEWER SEPARATION PROJECT - B & C STREETS	24025PW	South Wilmington	CITY OF WILMINGTON
Pump Station		New West Lakeshore Drive Pump Station	LS	$ 825,000.00	4/26/2024	West Lakeshore Drive Pump Station	Contract No. 3	Colchester, Vermont	Town of Colchester, Vermont
Pump Station		New West Lakeshore Drive Pump Station	LS	$ 667,500.00	4/26/2024	West Lakeshore Drive Pump Station	Contract No. 3	Colchester, Vermont	Town of Colchester, Vermont
Pump Station		New West Lakeshore Drive Pump Station	LS	$ 802,500.00	4/26/2024	West Lakeshore Drive Pump Station	Contract No. 3	Colchester, Vermont	Town of Colchester, Vermont
Pump Station		New West Lakeshore Drive Pump Station	LS	$ 919,470.00	4/26/2024	West Lakeshore Drive Pump Station	Contract No. 3	Colchester, Vermont	Town of Colchester, Vermont
Pump Station		Blakely Road Pump Station	LS	$ 550,000.00	4/2/2024	Blakely Road Forcemain and Pump Station	Contract No. 2	Colchester, Vermont	Town of Colchester, Vermont
Pump Station		Blakely Road Pump Station	LS	$ 707,000.00	4/2/2024	Blakely Road Forcemain and Pump Station	Contract No. 2	Colchester, Vermont	Town of Colchester, Vermont
Pump Station		Blakely Road Pump Station	LS	$ 625,000.00	4/2/2024	Blakely Road Forcemain and Pump Station	Contract No. 2	Colchester, Vermont	Town of Colchester, Vermont
Pump Station		Blakely Road Pump Station	LS	$ 960,000.00	4/2/2024	Blakely Road Forcemain and Pump Station	Contract No. 2	Colchester, Vermont	Town of Colchester, Vermont
Pump Station		Retreat Pump Station Replacement	LS	$ 807,300.00	5/1/2023	Retreat Pump Station Replacement	Contract No. 1	Brattleboro, Vermont	Town of Brattleboro, Vermont
Pump Station		Retreat Pump Station Replacement	LS	$ 836,000.00	5/1/2023	Retreat Pump Station Replacement	Contract No. 1	Brattleboro, Vermont	Town of Brattleboro, Vermont
Pump Station		Retreat Pump Station Replacement	LS	$ 950,000.00	5/1/2023	Retreat Pump Station Replacement	Contract No. 1	Brattleboro, Vermont	Town of Brattleboro, Vermont
Pump Station		Retreat Pump Station Replacement	LS	$ 992,277.00	5/1/2023	Retreat Pump Station Replacement	Contract No. 1	Brattleboro, Vermont	Town of Brattleboro, Vermont
Pump Station		Line Item "1" Suction Lift Pump StationBypass Connection, Electrical Building, Generator Connection, Stormwater Utilities, Pump Station Access Road, Drainage Ditch and Guardrail, Clearing and Grubbing	LS	$ 3,903,415.00	12/3/2021	Payne Branch Basin Sewer Improvements	RFB (486)	Greenville, SC	ReWa
Pump Station		Line Item "1" Suction Lift Pump StationBypass Connection, Electrical Building, Generator Connection, Stormwater Utilities, Pump Station Access Road, Drainage Ditch and Guardrail, Clearing and Grubbing	LS	$ 4,770,000.00	12/3/2021	Payne Branch Basin Sewer Improvements	RFB (486)	Greenville, SC	ReWa
Lateral	Cleanout	Fiberglass/Composite Box	EA	$ 2,500.00	1/1/2024	CLEBURN AVE COMPREHENSIVE REHABILITATION	CONTRACT NO. 2024 AMP08		Jefferson County Environmental Services Department
Lateral	Cleanout	Adder for Concrete Box	EA	$ 300.00	1/1/2024	CLEBURN AVE COMPREHENSIVE REHABILITATION	CONTRACT NO. 2024 AMP08		Jefferson County Environmental Services Department
Lateral	Cleanout	Fiberglass/Composite Box	EA	$ 2,570.30	1/1/2024	CLEBURN AVE COMPREHENSIVE REHABILITATION	CONTRACT NO. 2024 AMP08		Jefferson County Environmental Services Department
Lateral	Cleanout	Adder for Concrete Box	EA	$ 300.00	1/1/2024	CLEBURN AVE COMPREHENSIVE REHABILITATION	CONTRACT NO. 2024 AMP08		Jefferson County Environmental Services Department
Lateral	Cleanout	Fiberglass/Composite Box	EA	$ 4,100.00	1/1/2024	CLEBURN AVE COMPREHENSIVE REHABILITATION	CONTRACT NO. 2024 AMP08		Jefferson County Environmental Services Department
Lateral	Cleanout	Adder for Concrete Box	EA	$ 2,900.00	1/1/2024	CLEBURN AVE COMPREHENSIVE REHABILITATION	CONTRACT NO. 2024 AMP08		Jefferson County Environmental Services Department
Pump Station	Valve	• Three (3) 24" Extended Service Knife Gate Valves valves, • Three (3) 20" Rubber Flapper Swing Check Valves • Three (3) 20" Full Port Eccentric Plug Valves	LS	$ 103,749.00	9/18/2024	Construction Turkey Creek PS Upgrade (Valve Procurement) CIP# 2451000		Charleston, SC	North Charleston Sewer District
Pump Station	Valve	• Three (3) 24" Extended Service Knife Gate Valves valves, • Three (3) 20" Rubber Flapper Swing Check Valves • Three (3) 20" Full Port Eccentric Plug Valves	LS	$ 115,048.41	9/18/2024	Construction Turkey Creek PS Upgrade (Valve Procurement) CIP# 2451000		Charleston, SC	North Charleston Sewer District
Pump Station	Valve	• Three (3) 24" Extended Service Knife Gate Valves valves, • Three (3) 20" Rubber Flapper Swing Check Valves • Three (3) 20" Full Port Eccentric Plug Valves	LS	$ 116,539.53	9/18/2024	Construction Turkey Creek PS Upgrade (Valve Procurement) CIP# 2451000		Charleston, SC	North Charleston Sewer District
Pump Station	Valve	• Three (3) 24" Extended Service Knife Gate Valves valves, • Three (3) 20" Rubber Flapper Swing Check Valves • Three (3) 20" Full Port Eccentric Plug Valves	LS	$ 118,374.02	9/18/2024	Construction Turkey Creek PS Upgrade (Valve Procurement) CIP# 2451000		Charleston, SC	North Charleston Sewer District
Pump Station	Valve	• Three (3) 24" Extended Service Knife Gate Valves valves, • Three (3) 20" Rubber Flapper Swing Check Valves • Three (3) 20" Full Port Eccentric Plug Valves	LS	$ 142,101.41	9/18/2024	Construction Turkey Creek PS Upgrade (Valve Procurement) CIP# 2451000		Charleston, SC	North Charleston Sewer District

*Not all list items were utilitzed for comparisons

Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Pump Station	Valve	• Four (4) 16” Rubber Flapper Swing Check Valves • Eight (8) 16” Full Port Eccentric Plug Valves • Two (2) 6” Full Port Eccentric Plug Valves	LS	$ 99,717.56	9/3/2024	Construction Popperdam PS Upgrade (Valve Procurement) #2450000		Charleston, SC	North Charleston Sewer District
Pump Station	Valve	• Four (4) 16” Rubber Flapper Swing Check Valves • Eight (8) 16” Full Port Eccentric Plug Valves • Two (2) 6” Full Port Eccentric Plug Valves	LS	$ 107,840.24	9/3/2024	Construction Popperdam PS Upgrade (Valve Procurement) #2450000		Charleston, SC	North Charleston Sewer District
Pump Station	Valve	• Four (4) 16” Rubber Flapper Swing Check Valves • Eight (8) 16” Full Port Eccentric Plug Valves • Two (2) 6” Full Port Eccentric Plug Valves	LS	$ 115,278.40	9/3/2024	Construction Popperdam PS Upgrade (Valve Procurement) #2450000		Charleston, SC	North Charleston Sewer District
Pump Station		New Lift Station, piping, controls, 859 lf of 4” force main, 2 new manholes, 504 lf of 6” directional drill, 118 lf of 8” gravity sewer, and remove 430 lf of 8” D.I. sewer pipe.	LS	$ 500,000.00		Hwy. 34 Sewer Pump Station		Darlington, SC	City of Darlington
Misc.	Mob/Demob	Mobilaztion / Demobilization	LS	$ 99,125.00	2/9/2023	Brigadoon Waff Pump Station #455 Replacement	CIP #100327; ITB #COVB-23-100981/PUCN-23-0004	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		Sewer Pump Station and Miscellaneous Site and ROW Work	LS	$ 2,285,870.00	2/9/2023	Brigadoon Waff Pump Station #455 Replacement	CIP #100327; ITB #COVB-23-100981/PUCN-23-0004	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Misc.	Mob/Demob	Mobilaztion / Demobilization	LS	$ 118,000.00	2/9/2023	Brigadoon Waff Pump Station #455 Replacement	CIP #100327; ITB #COVB-23-100981/PUCN-23-0004	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		Sewer Pump Station and Miscellaneous Site and ROW Work	LS	$ 2,267,000.00	2/9/2023	Brigadoon Waff Pump Station #455 Replacement	CIP #100327; ITB #COVB-23-100981/PUCN-23-0004	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Misc.	Mob/Demob	Mobilaztion / Demobilization	LS	$ 66,000.00	2/9/2023	Brigadoon Waff Pump Station #455 Replacement	CIP #100327; ITB #COVB-23-100981/PUCN-23-0004	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		Sewer Pump Station and Miscellaneous Site and ROW Work	LS	$ 3,212,000.00	2/9/2023	Brigadoon Waff Pump Station #455 Replacement	CIP #100327; ITB #COVB-23-100981/PUCN-23-0004	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Misc.	Mob/Demob	Mobilaztion / Demobilization	LS	$ 175,000.00	2/9/2023	Brigadoon Waff Pump Station #455 Replacement	CIP #100327; ITB #COVB-23-100981/PUCN-23-0004	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		Sewer Pump Station and Miscellaneous Site and ROW Work	LS	$ 3,614,000.00	2/9/2023	Brigadoon Waff Pump Station #455 Replacement	CIP #100327; ITB #COVB-23-100981/PUCN-23-0004	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		New Pump Station 525, Complete	LS	$ 4,500,000.00	6/25/2024	CONSTRUCTION OF PLAZA BOW CREEK PUMP STATION 525 REPLACEMENT	CIP NUMBER: 100327, 100361, 100519 BID NUMBER: PUCN-24-0009	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		New Pump Station 525, Complete	LS	$ 2,380,000.00	6/25/2024	CONSTRUCTION OF PLAZA BOW CREEK PUMP STATION 525 REPLACEMENT	CIP NUMBER: 100327, 100361, 100519 BID NUMBER: PUCN-24-0009	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		New Pump Station 525, Complete	LS	$ 2,950,000.00	6/25/2024	CONSTRUCTION OF PLAZA BOW CREEK PUMP STATION 525 REPLACEMENT	CIP NUMBER: 100327, 100361, 100519 BID NUMBER: PUCN-24-0009	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		PUMP STATION COMPLETE IN PLACE	LS	$ 1,926,000.00	8/24/2023	CONSTRUCTION OF PUMP STATION NO. 532 LAKECREST REPLACEMENT	BID NO. PUCN-23-0012	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		PUMP STATION COMPLETE IN PLACE	LS	$ 2,082,191.47	8/24/2023	CONSTRUCTION OF PUMP STATION NO. 532 LAKECREST REPLACEMENT	BID NO. PUCN-23-0012	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		PUMP STATION COMPLETE IN PLACE	LS	$ 2,791,800.00	8/24/2023	CONSTRUCTION OF PUMP STATION NO. 532 LAKECREST REPLACEMENT	BID NO. PUCN-23-0012	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station	Demo	EXISTING PUMP STATION DEMOLITION	LS	$ 72,000.00	8/24/2023	CONSTRUCTION OF PUMP STATION NO. 532 LAKECREST REPLACEMENT	BID NO. PUCN-23-0012	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station	Demo	EXISTING PUMP STATION DEMOLITION	LS	$ 42,000.00	8/24/2023	CONSTRUCTION OF PUMP STATION NO. 532 LAKECREST REPLACEMENT	BID NO. PUCN-23-0012	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station	Demo	EXISTING PUMP STATION DEMOLITION	LS	$ 35,000.00	8/24/2023	CONSTRUCTION OF PUMP STATION NO. 532 LAKECREST REPLACEMENT	BID NO. PUCN-23-0012	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		Sewer Pump Station Replacement and Miscellaneous Site Work	LS	$ 1,784,499.00	3/22/2023	48 th Street Pump Station 103 Replacement	CIP #100327; ITB #COVB-23-100915/PUCN-23-0010	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		Sewer Pump Station Replacement and Miscellaneous Site Work	LS	$ 2,138,100.00	3/22/2023	48 th Street Pump Station 103 Replacement	CIP #100327; ITB #COVB-23-100915/PUCN-23-0010	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		Sewer Pump Station Replacement and Miscellaneous Site Work	LS	$ 2,229,360.00	3/22/2023	48 th Street Pump Station 103 Replacement	CIP #100327; ITB #COVB-23-100915/PUCN-23-0010	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		Sewer Pump Station Replacement and Miscellaneous Site Work	LS	$ 4,432,547.63	3/22/2023	48 th Street Pump Station 103 Replacement	CIP #100327; ITB #COVB-23-100915/PUCN-23-0010	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		Sewer Pump Station Replacement and Miscellaneous Site Work	LS	$ 5,195,000.00	3/22/2023	48 th Street Pump Station 103 Replacement	CIP #100327; ITB #COVB-23-100915/PUCN-23-0010	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		New Pump Station 414, Complete	LS	$ 1,667,832.00	4/12/2023	Woods of Avalon Pump Station #414 Replacement	CIP #100327; ITB #COVB-23-101053/PUCN-23-0001	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		New Pump Station 414, Complete	LS	$ 1,788,000.00	4/12/2023	Woods of Avalon Pump Station #414 Replacement	CIP #100327; ITB #COVB-23-101053/PUCN-23-0001	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		New Pump Station 414, Complete	LS	$ 2,013,620.00	4/12/2023	Woods of Avalon Pump Station #414 Replacement	CIP #100327; ITB #COVB-23-101053/PUCN-23-0001	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		New Pump Station 414, Complete	LS	$ 2,678,000.00	4/12/2023	Woods of Avalon Pump Station #414 Replacement	CIP #100327; ITB #COVB-23-101053/PUCN-23-0001	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities

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Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Pump Station		New Pump Station 414, Complete	LS	$ 3,500,000.00	4/12/2023	Woods of Avalon Pump Station #414 Replacement	CIP #100327; ITB #COVB-23-101053/PUCN-23-0001	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station	Water	Lynnhaven Water Pump Station Upgrades	LS	$ 3,231,000.00	6/11/2024	Lynnhaven Water Pump Station Upgrades	Solicitation #: COVB-24-101368 Project Number: CIP: 100479 Bid Number: PUCN-24-0017	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station	Water	Lynnhaven Water Pump Station Upgrades	LS	$ 3,375,000.00	6/11/2024	Lynnhaven Water Pump Station Upgrades	Solicitation #: COVB-24-101368 Project Number: CIP: 100479 Bid Number: PUCN-24-0017	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		Pump Station and Force Main (included but not limited to the construction of a cast in place submersible sanitary sewer pump station with brick equiptment room, all assoiated site improvements including new enterances, pavement and approximately 130 LF of force main.)	LS	$ 1,880,000.00	5/10/2024	Fox Run Pump Station No. 436 Replacement Project	COVB-24-101352	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		Pump Station and Force Main (included but not limited to the construction of a cast in place submersible sanitary sewer pump station with brick equiptment room, all assoiated site improvements including new enterances, pavement and approximately 130 LF of force main.)	LS	$ 2,435,000.00	5/10/2024	Fox Run Pump Station No. 436 Replacement Project	COVB-24-101352	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		Pump Station and Force Main (included but not limited to the construction of a cast in place submersible sanitary sewer pump station with brick equiptment room, all assoiated site improvements including new enterances, pavement and approximately 130 LF of force main.)	LS	$ 2,277,000.00	5/10/2024	Fox Run Pump Station No. 436 Replacement Project	COVB-24-101352	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		Pump Station and Force Main (included but not limited to the construction of a cast in place submersible sanitary sewer pump station with brick equiptment room, all assoiated site improvements including new enterances, pavement and approximately 130 LF of force main.)	LS	$ 4,700,000.00	5/10/2024	Fox Run Pump Station No. 436 Replacement Project	COVB-24-101352	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station	Demo	Demolition of Existing Pump Station (Including but not limited to the removal of the existing building and wet/dry pit top slabs, partial removal of wet pit/dry pit walls as defined in the plans, filling of the pits, abandonment of the existing gravity sewer and force main on the existing pump station site as denoted in the plans and all associated restoration.)	LS	$ 125,000.00	5/10/2024	Fox Run Pump Station No. 436 Replacement Project	COVB-24-101352	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station	Demo	Demolition of Existing Pump Station (Including but not limited to the removal of the existing building and wet/dry pit top slabs, partial removal of wet pit/dry pit walls as defined in the plans, filling of the pits, abandonment of the existing gravity sewer and force main on the existing pump station site as denoted in the plans and all associated restoration.)	LS	$ 75,000.00	5/10/2024	Fox Run Pump Station No. 436 Replacement Project	COVB-24-101352	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station	Demo	Demolition of Existing Pump Station (Including but not limited to the removal of the existing building and wet/dry pit top slabs, partial removal of wet pit/dry pit walls as defined in the plans, filling of the pits, abandonment of the existing gravity sewer and force main on the existing pump station site as denoted in the plans and all associated restoration.)	LS	$ 60,000.00	5/10/2024	Fox Run Pump Station No. 436 Replacement Project	COVB-24-101352	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities

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Addtional Research References

Asset Type	Other Key Word	Bid Asset Title	Unit	Unit Price ($)	Bid / Estimate Date	Project	Contract / Relevant #	Location	Entity
Pump Station	Demo	Demolition of Existing Pump Station (Including but not limited to the removal of the existing building and wet/dry pit top slabs, partial removal of wet pit/dry pit walls as defined in the plans, filling of the pits, abandonment of the existing gravity sewer and force main on the existing pump station site as denoted in the plans and all associated restoration.)	LS	$ 486,720.00	5/10/2024	Fox Run Pump Station No. 436 Replacement Project	COVB-24-101352	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		Pump Station 550, Complete-in-Place	LS	$ 2,153,000.00	10/9/2023	Cardinal Estates Pump Station No. 550 Replacement	CIP# 100327, 100361, 100470; Bid No. PUCN-23-0025	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		Pump Station 550, Complete-in-Place	LS	$ 2,281,900.00	10/9/2023	Cardinal Estates Pump Station No. 550 Replacement	CIP# 100327, 100361, 100470; Bid No. PUCN-23-0025	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		Pump Station 550, Complete-in-Place	LS	$ 2,450,000.00	10/9/2023	Cardinal Estates Pump Station No. 550 Replacement	CIP# 100327, 100361, 100470; Bid No. PUCN-23-0025	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station		Pump Station 550, Complete-in-Place	LS	$ 3,703,868.00	10/9/2023	Cardinal Estates Pump Station No. 550 Replacement	CIP# 100327, 100361, 100470; Bid No. PUCN-23-0025	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station	Demo	Existing Pump Station 550 Demolition, Complete-in-Place	LS	$ 64,000.00	10/9/2023	Cardinal Estates Pump Station No. 550 Replacement	CIP# 100327, 100361, 100470; Bid No. PUCN-23-0025	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station	Demo	Existing Pump Station 550 Demolition, Complete-in-Place	LS	$ 52,000.00	10/9/2023	Cardinal Estates Pump Station No. 550 Replacement	CIP# 100327, 100361, 100470; Bid No. PUCN-23-0025	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station	Demo	Existing Pump Station 550 Demolition, Complete-in-Place	LS	$ 55,000.00	10/9/2023	Cardinal Estates Pump Station No. 550 Replacement	CIP# 100327, 100361, 100470; Bid No. PUCN-23-0025	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities
Pump Station	Demo	Existing Pump Station 550 Demolition, Complete-in-Place	LS	$ 98,000.00	10/9/2023	Cardinal Estates Pump Station No. 550 Replacement	CIP# 100327, 100361, 100470; Bid No. PUCN-23-0025	Virginia Beach, VA	City of Virginia Beach, Dept. of Public Utilities

*Not all list items were utilitzed for comparisons

RHM Capacity Improvements Cost Reference

RHM Conveyance Capacity Improvements
Cost Template Reference Tables

Project Output	Material Cost	Labor Cost	Equipment Cost	Sub Cost	Unit Cost	Relationship / Formula	Assumptions
Construction Management and Inspection	-	-	-	9%	% of Construction	9% of total construction costs	
Contingency	-	-	-	25%	% of Construction	25% of total construction costs	
Appurtenances	-	-	-	10%	% of pipe installation costs	10% of pipe installation costs to account for Pipe Fittings, Appurt, and Joint Restraints	
Cathodic Protection				5%	% of pipe installation costs	additional $ to account for cathodic protection	
Mobilization				varies	% of Construction	% of construction costs w/o mobilization costs or contingency	Percentage varies based on project cost range
Surveying and Layout	-	-	-	$ 1,400	DAY	Low complexity project: 1 field crew for 4 days; Higher complexity project: rate of 1500 ft of pipeline per day for field crew (+3days start/close)	8 hour workday; 3 man crew at $175 / hr
Traffic Control	-	-	-	$ 1,500	DAY	Based on estimated construction duration and assuming 20 working days in a month	Assuming that traffic control is needed for active construction time; completely excludes parts of timeframe during startup/closeout
Traffic Control Premium	-	-	-	$ 800	DAY	For busy project areas traffic control premium on top of traffic control charge (additional $/day)	only applied when traffic control flag switched to 'High Traffic'
Dewatering	-	-	-	$ 20,400	MO	roundup(Months of active Construction) * subcontractor cost per month	Excludes timeframe during startup/closeout
Bypassing	-	-	-	$ 1,500	DAY	(Base Cost $1500 + additional $400 per day per additional MGD)* construction duration	2 MGD for pipe OD sizes <24-in and 4 MGD for OD >=24-in. If the flow exceeds either of these charge an additional $400 per additional MGD per day
Erosion and Sediment Control [construction costs >$200K]	-	-	-	1%	% of Construction	1% of Construction costs w/o Contingency, Mobilization, and Construction Management	E&SC costs include Landscaping and SWPPP; Include on every project. Applies to projects whose construction costs w/o contingency, mobilization, or E&SC costs > $200k
Erosion and Sediment Control [construction costs <$200K]	-	-	-	2%	% of Construction	2% of Construction costs w/o Contingency, Mobilization, and Construction Management	E&SC costs include Landscaping and SWPPP; Include on every project. Applies to projects whose construction costs w/o contingency, mobilization, or E&SC costs < $200k use
Line Stops	-	-	-	varies	EA	Direct input of line stops	assumed price includes ancillary items (ie concrete work, megalugs, etc) When # of linestops >0 on template, bypassing is calculated at a daily rate
Demolition (sawcutting)	0.25	2.52	1.86	0.00	LF	(# Lanes being demoed x 2) x linear feet of road being demoed	6 in of Asphalt
Demolition (paving) [asphalt]	0.00	5.46	3.39	0.00	SY	(# Lanes being demoed x standard width) x linear feet of road being demoed	Assume 4 to 6 inches thick

RHM Conveyance Capacity Improvements
Cost Template Reference Tables

Project Output	Material Cost	Labor Cost	Equipment Cost	Sub Cost	Unit Cost	Relationship / Formula	Assumptions
Demolition (paving) [concrete]	0.00	8.93	5.56	0.00	SY	(# Lanes being demoed x standard width) x linear feet of road being demoed	Assume up to 6" thick
Demolition (paving) [weighted 85% asphalt, 15% concrete]	0.00	6.03	3.75	0.00	SY	LF of road being demoed x (trench width)	Width being demoed is trench width and pavement length; Use largest OD of pipe being replaced Assume system is 15% concrete and 85% bituminous asphalt
Demolition (pipe)				varies	LF	Demolition of pipe (LF)	Varies by pipe size range; Uses largest pipe diameter being replaced; no excavation costs included
Demolition (manholes)	0	4689.82	1051.43	0	EA	Cost per manhole times number of manholes	Precast or Brick over 8' deep Cost excludes excavation Assume average HRSD MH is 10 feet deep
Demolition (disposal)	0.00	4.40	7.86	0.00	LCY	SF of Pavement demoed * depth of 6 inch + (Soil of Excavation - volume of pipe walls (assume 1 inch thickness)) LCY = Loose Cubic Yard = Cubic Yards	Uses largest pipe OD being replaced Assume 100% of soil excavated will be hauled Hauling distance of 30 miles and truck speed of 50 MPH
Excavation				varies	BCY	(Length * Width * Depth of trench) - Volume of Largest pipe being replaced BCY Units = Bank Cubic Yards = same as cubic yards	Trench Width = OD of largest pipe being replaced + E dimension Trench Depth = depth of largest OD + 1' Trench Length = total length of all pipes being replaced Common earth with no sheeting or dewatering included; using most expensive option
Binder Course	10.47	0.87	0.59	0.00	SY	Trench width * Pavement Length	Binder course 2-1/2" deep Only a layer if pavement is being used
Base Course	8.10	0.51	0.90	0.00	SY	Trench width * Pavement Length	Crushed 3/4 Stone base; compacted; 6" deep Only a layer if pavement is being used
Select Fill	41.19	8.77	1.98	0.00	LCY	Excavation Volume - Type II Bedding Volume - 1/2 Volume of Pipe - Binder Course LCY = Loose Cubic Yard = Cubic Yards	Uses Largest OD being Replaced Crushed Stone 3/4" to 1/2"; does not include compaction; assume this is transported to site during trips back from disposal of soil
Type II Bedding	55.10	8.77	1.98	0.00	LCY	(0.5 feet for undercut + 0.5 feet of depth under pipe + 1/2 diameter of pipe) * width of trench * length of trench) - (1/2 volume of pipe) (convert to cubic yards) LCY = Loose Cubic Yard = Cubic Yards	Assume one half feet deep + height of centerline of pipe Use largest pipe OD for replacement Crushed or screened bank run gravel; does not include compaction
Compaction	0.00	0.57	0.63	0.00	ECY	(Select Fill CY + Type II Bedding CY) * unit cost (in embankment cubic yards- assumes a depth of 6') (assumed same as cubic yards)	Uses Largest OD being Replaced Sheepsfoot or wobbly wheel roller, 8" lifts Compacting the Select Fill and Type II Bedding layers only
Pipe Installation, [FM, All sizes]	-	-	-	varies	LF	Diameter Cost * LF Diameter cost = aggregrate cost of cement lined ductile iron + interior corrosion resistant coating + exterior polyethylene wrap	Costs of putting the pipe in the ground only values may be adjusted from the source info listed when local and recent bid tab information is available

RHM Conveyance Capacity Improvements
Cost Template Reference Tables

Project Output	Material Cost	Labor Cost	Equipment Cost	Sub Cost	Unit Cost	Relationship / Formula	Assumptions
FM Connections	-	-	-	$ 45,000	EA	-	
Pipe Installation, GM	-	-	-	varies	LF	Diameter Cost * LF	Does not include excavation or backfill costs For Replacement Only Pipes less than or equal to 24in are PVC Pipes OD > 24" are Ductile Iron
Manholes Replaced	-	-	-	$ 24,000	EA	Subcontractor Unit cost * # of MHs to be replaced	
Public Lateral Replacement	-	-	-	$ 7,100	EA	Subcontractor Unit cost * # of laterals to be replaced	For unknown number of laterals, spacing is assumed at 75ft
Control Setups (<42")				$ 60,000	ea		
Control Setups (>=42")				$ 85,000	ea		
Bore and Jack				varies	LF	LF of Bore and Jack needed *unit cost	Varies by pipe OD range" Casing only, 100' minimum, not incl. jacking pits or dewatering; Roadwork, 1/2" thick wall
Milling Pavement	0.00	1.91	3.32	0.00	SY	# of Lanes to be demoed* LF of Pavement to be demoed * Standard Lane Width (12 ft) *conversion to SY (.11)	Assume entire road (all lanes recorded in project) will be resurfaced once disturbed Reclamation, pulverizing and blending with existing base
Paving [wearing course]	4.16	0.52	0.36	0.00	SY	# of Lanes to be demoed* LF of Pavement to be demoed * Standard Lane Width (12 ft) *conversion to SY (.11)	Refers only to the wearing course (binder course included in Excavation, Backfill, and Compaction line item Wearing course will be the same dimensions as resurfacing; assume entire road will be repaved once disturbed 1" thick
Curb and Gutter				$ 65	LF	length of pavement disturbed * Unit Cost	assuming that one side of curb and gutter along the road will require replacement for the full length of disturbed pavement
General Site Restoration				$ 14	LF	Length of pipe replacement * Unit Cost	assumes a 25ft width of restoration (seeding, trees, etc)

RHM Conveyance Capacity Improvements
Cost Template Reference Tables

Pipe Demolition

Min Dia (in)	Max Dia (in)	Adj Material Cost	Adj Labor Cost	Adj Equipment Cost	Adj Sub Cost	Cost Unit	Category Label
2	12	$0	$7.54	$1.69	$0	LF	Demolition (pipe) [12" and less]
14	18	$0	$9.20	$11.98	$0	LF	Demolition (pipe) [14" to 18"]
21	24	$0	$11.45	$15.03	$0	LF	Demolition (pipe) [21" to 24"]
27	36	$0	$15.30	$20.01	$0	LF	Demolition (pipe) [27" to 36"]

Uses largest pipe diameter being replaced; no excavation costs included

Excavation

Min Depth (ft)	Max Depth (ft)	Adj Material Cost	Adj Labor Cost	Adj Equipment Cost	Adj Sub Cost	Cost Unit	Category Label
1	4	$0	$6.31	$1.98	$0	BCY	Excavation [1' to 4']
4	6	$0	$5.17	$5.78	$0	BCY	Excavation[4' to 6']
6	10	$0	$4.59	$5.29	$0	BCY	Excavation [6' to 10']
10	14	$0	$5.17	$5.94	$0	BCY	Excavation [10' to 14']
14	20	$0	$3.23	$3.97	$0	BCY	Excavation [14' to 20']
20	24	$0	$3.58	$4.42	$0	BCY	Excavation [20' to 24']

(Length * Width * Depth of trench) - Volume of Largest pipe being replaced

Bore and Jack

Min Dia (in)	Max Dia (in)	Adj Material Cost	Adj Labor Cost	Adj Equipment Cost	Adj Sub Cost	Cost Unit	Category Label
2	12	$176.00	$184.00	$154.00	$0	LF	Bore and Jack 24" casing [Pipe OD <=12"]
14	24	$272.00	$230.00	$193.00	$0	LF	Bore and Jack 36" casing [Pipe OD >12" & <= 24"]
30	36	$378.00	$245.00	$206.00	$0	LF	Bore and Jack 48" casing [Pipe OD >=30"]

LF of Bore and Jack needed *unit cost

Casing only, 100' minimum, not incl. jacking pits or dewatering; Roadwork, 1/2" thick wall

Jack Pits

Min Dia (in)	Max Dia (in)	Adj Material Cost	Adj Labor Cost	Adj Equipment Cost	Adj Sub Cost	Cost Unit	Category Label
2	12	$0	$0	$0	$8,600	EA	Bore and Jack 24" casing [Pipe OD <=12"] Jack Pits
14	24	$0	$0	$0	$19,400	EA	Bore and Jack 36" casing [Pipe OD >12" & <= 24"] Jack Pits
30	36	$0	$0	$0	$21,600	EA	Bore and Jack 48" casing [Pipe OD >= 30"] Jack Pits

2 pits per stretch of bore and jack; Number of pits required times subcontractor unit price

RHM Conveyance Capacity Improvements
Cost Template Reference Tables

Duration by Project Type, Months

Type	Complexity	Study	Permitting and Design	Construction	Total
Force Main-Low	Low	6	12	varies	varies
Force Main-High	High	8	15	varies	varies
Gravity Main-Low	Low	6	12	varies	varies
Gravity Main-High	High	8	15	varies	varies
PS-Large	High	10	16	20	46
PS-Small	Low	6	12	12	30
Storage	N/A	7	14	18	39

For variable construction durations, project complexity and production assumptions are applied

Mobilization Cost as a Percentage of Construction Cost

Construct Min, $	Construct Max, $	Mobilization %	Category Label
$0	$50,000	50%	[construction cost <$50K]
$50,001	$100,000	20%	[construction cost >$50K to <$100K]
$100,001	$200,000	8%	[construction cost >$100K to $200K]
$200,001	$1,000,000	7%	[construction cost >$200K to <$1M]
$1,000,001	-	5%	[construction cost >$1M]

smaller projects anticipated to be at a higher percentage than larger bid projects

Conveyance Construction Production Rates

Activity Type	Complexity	Production Rate, LF/Day	Monthly Production Rate w/ Delay, LF/mo	Minimum Production Activity Length (months)	Construction Startup (months)	Construction closeout (months)	Total Startup and Closeout
FM/GM	High	60	1,140	2	4	3	7
FM/GM	Low	100	1,900	2	2	2	4

Working Days/Month	20	days
Weather Delay	5%	(1 day in 20)

Trench Width Reference

Min Ref Value	Pipe Size Range (in)	Trench Width (in)
2	0 to 24	8
27	27 to 36	12
42	42 to 72	15

Trench Width (in) (minus the OD) x 2

Spacing Assumptions

MH Spacing (LF)	300	Threshold for High Complexity	5,000	linear feet
Valve Spacing (LF)	2,500	Procurement	3	months
Line Stop Spacing (LF)	2,500	New Property Acquisition	4	months
Lateral (LF)	75	PreConstruction Activites	15%	costs for each are divided proprotionally based on phase duration

Capacity Project Solution Details

Solution Set Reference **8/30/17 - 9/19/17** Optimized RWWMP Solution Set - Regional Hydraulic Model

Dates: **6/8/17 - 9/8/17** Locality Hydraulic Models

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Element ID	STP	Locality Code	Asset Ownership	Source	Element Name	Element Description	Asset Type	TDH (ft)	Qmax (gpm)	HP	Pipe Length (ft)	No. of Existing Pipe Segments	Old Pipe Size (in)	New Pipe Size (in)	Volume (MG)	Passing Rate (MGD)	Shaving Rate (MGD)	Drain Rate (MGD)	Drain Time (Days)	Max Discharge HGL at PRS (ft NAVD88)	Drain Pump TDH (ft)	Drain Start Elevation (ft)	Tank Invert Elevation (ft)	Drain Pump Q (mgd)	Land Acquisition Included in Cost (Y/N)	RWWMP Project ID	RWWMP Project Name
AT-FM-CHES-1	AT	CHES	Locality	RHM	CHES-PS-067 FM	Install 1,930 lf of 10" Discharge force main downstream of Chesapeake pump station 067 (114 Mann Dr.)	FM				1,930			10											N	AT-RWWMP-01	Chesapeake High-Priority Project 1
AT-FM-R101-1	AT	HRSD	HRSD	RHM	Birdneck - General Booth Blvd. FM - I	Parallel a new 42" with existing 42" (54" Equivalent) - Install 5,310 LF along General Booth Blvd. from easement connection North of Berknor Drive to Dam Neck Road	FM				5,310			54											N	AT-RWWMP-06	Birdneck-General Booth Blvd. Force Main Improvements
AT-FM-R101-2	AT	HRSD	HRSD	RHM	Birdneck - General Booth Blvd. FM - II	Parallel a new 42" with existing 42" (54" Equivalent) - Install 11,500 lf new FM along Birdneck Road from Owl Creek Golf Course to General Booth Blvd.	FM				11,500			54											N	AT-RWWMP-06	Birdneck-General Booth Blvd. Force Main Improvements
AT-FM-R101-3	AT	HRSD	HRSD	RHM	Birdneck - General Booth Blvd. FM - III	Parallel a new 42" with existing 42" (54" Equivalent) - 3,000 LF Along Birdneck Road from Southern Blvd to Owl Creek Golf Course	FM				3,000			54											N	AT-RWWMP-06	Birdneck-General Booth Blvd. Force Main Improvements
AT-PS-CHES-PS072	AT	CHES	Locality	RHM	CHES-PS-072	CHES Pump Station 072; 100 Tilden Ave	PS	100	110	8															N	AT-RWWMP-01	Chesapeake High-Priority Project 1
BH-GM-R101-1	BH	HRSD	HRSD	RHM	Mercury Blvd and Newmarket GM Improvement - I	Install 3,090 LF of 30" GM; Gravity main u/s of Newmarket Creek PS	GM				3,090	11		30											N	BH-RWWMP-08	Mercury Blvd and Newmarket Gravity Main Improvements
BH-GM-R101-2	BH	HRSD	HRSD	RHM	Mercury Blvd and Newmarket GM Improvement - II	Install 3,780 LF of 36" GM	GM				3,780	18		36											N	BH-RWWMP-08	Mercury Blvd and Newmarket Gravity Main Improvements
BH-GM-R102-1	BH	HRSD	HRSD	RHM	Claremont Ave GM Improvement - I	Upgrade 6,490 LF to 42" GM	GM				6,490	21		42											N	BH-RWWMP-01	Claremont PS Upgrade, Chesapeake Ave. Pipe Improvements and 14th St Storage Tank
BH-GM-R102-2	BH	HRSD	HRSD	RHM	Claremont Ave GM Improvement - II	Upgrade 2,180 LF of 24" GM to 36" GM	GM				2,180	8	24	36												BH-RWWMP-01	Claremont PS Upgrade, Chesapeake Ave. Pipe Improvements and 14th St Storage Tank
BH-PS-R100	BH	HRSD	HRSD	RHM	Claremont PS	NS-PS-208	PS	95	12,500	700															N	BH-RWWMP-01	Claremont PS Upgrade, Chesapeake Ave. Pipe Improvements and 14th St Storage Tank
BH-PS-R102	BH	HRSD	HRSD	RHM	Newmarket Creek PS	NS-PS-219	PS	85	7,800	390															N	BH-RWWMP-07	Newmarket Creek PS Upgrade
BH-SPH-R101-1	BH	HRSD	HRSD	RHM	Claremont Siphon - Chesapeake Ave and Robinson Rd	Upgrade 70 lf of 42" inverted siphon along Chesapeake Avenue upstream of NS-PS-208	Siphon				70	3		42											N	BH-RWWMP-01	Claremont PS Upgrade, Chesapeake Ave. Pipe Improvements and 14th St Storage Tank
BH-SPH-R101-2	BH	HRSD	HRSD	RHM	Claremont Siphon - Indian River	Upgrade 70 lf of 42" inverted siphon along Chesapeake Avenue upstream of NS-PS-208	Siphon				70	3		42											N	BH-RWWMP-01	Claremont PS Upgrade, Chesapeake Ave. Pipe Improvements and 14th St Storage Tank
BH-ST-R100	BH	HRSD	HRSD	RHM	14th St Storage	Install new 4.3 MG storage tank	Storage			180					4.3	23.0	16.0	2.0	1.5	N/A	40	4.7	4	16.0	Y	BH-RWWMP-01	Claremont PS Upgrade, Chesapeake Ave. Pipe Improvements and 14th St Storage Tank
BH-ST-R101	BH	HRSD	HRSD	RHM	58th St Storage	Install new 2.5 MG storage tank	Storage			110					2.5	6.4	9.0	1.1	2.1	N/A	40	10.2	8	9.0	Y	BH-RWWMP-04	58th St Storage Tank
JR-PRS-R100	JR	HRSD	HRSD	RHM	Lucas Creek PRS	Upgrade PRS to 65 ft. of assistance - Existing Location	PRS	65	22,800	600															N	JR-RWWMP-04	Lucas Creek PRS Upgrade
JR-PRS-R101	JR	HRSD	HRSD	RHM	Tabb PRS	Install new PRS with 80 ft. of assistance - New Location	PRS	80	2,420	80															Y	JR-RWWMP-02	Tabb PRS and Storage Tank
JR-ST-R101	JR	HRSD	HRSD	RHM	Tabb Storage	Install new 1 MG storage tank	Storage			20					1.0	3.5	5.8	1.5	1.6	71	36	68.0	35	1.5	Y	JR-RWWMP-02	Tabb PRS and Storage Tank
NA-FM-R100	NA	HRSD	HRSD	RHM	Jumper FM CHES-PS-041	150 LF of 16" Jumper FM; d/s of CHES-PS-41; along Canal Drive to S. Military Hwy	FM				150			16											N	NA-RWWMP-01	Chesapeake High-Priority Project 2
NA-GM-R101	NA	HRSD	HRSD	RHM	Cedar Lane PS GM Improvement	Upgrade 910 LF from 18" to 24" GM upstream of Cedar Lane PS	GM				910	3	18	24											N	NA-RWWMP-12	Cedar Lane Gravity Main Improvement
NA-PRS-R102	NA	HRSD	HRSD	RHM	Western Branch PRS	Install new PRS with 80 ft of assistance - New Location	PRS	80	2,500	90															Y	NA-RWWMP-16	Western Branch PRS
NA-PRS-R103	NA	HRSD	HRSD	RHM	Wilroy PRS	Install new PRS with 80 ft of assistance - New Location	PRS	80	8,250	270															Y	NA-RWWMP-03	Wilroy PRS and Storage Tank
NA-PS-CHES-PS046	NA	CHES	Locality	RHM	CHES-PS-046	CHES Pump Station 046; 3733 Cannon Point Dr	PS	140	620	60															N	NA-RWWMP-19	Chesapeake City System Improvements E
NA-PS-CHES-PS069	NA	CHES	Locality	RHM	CHES-PS-069	CHES Pump Station 069; 4224 Meadowood Dr	PS	120	1,340	100															N	NA-RWWMP-19	Chesapeake City System Improvements E
NA-PS-R100	NA	HRSD	HRSD	RHM	Cedar Lane PS	SS-PS-104	PS	130	10,160	780															N	NA-RWWMP-14	Cedar Lane PS Upgrade and Portsmouth PS 47 Force Main Jumper

Capacity Project Solution Details

Solution Set Reference **8/30/17 - 9/19/17** Optimized RWWMP Solution Set - Regional Hydraulic Model

Dates: **6/8/17 - 9/8/17** Locality Hydraulic Models

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Element ID	STP	Locality Code	Asset Ownership	Source	Element Name	Element Description	Asset Type	TDH (ft)	Qmax (gpm)	HP	Pipe Length (ft)	No. of Existing Pipe Segments	Old Pipe Size (in)	New Pipe Size (in)	Volume (MG)	Passing Rate (MGD)	Shaving Rate (MGD)	Drain Rate (MGD)	Drain Time (Days)	Max Discharge HGL at PRS (ft NAVD88)	Drain Pump TDH (ft)	Drain Start Elevation (ft)	Tank Invert Elevation (ft)	Drain Pump Q (mgd)	Land Acquisition Included in Cost (Y/N)	RWWMP Project ID	RWWMP Project Name
NA-ST-R101	NA	HRSD	HRSD	RHM	Wilroy Storage	Install new 2.9 MG storage tank	Storage			40					2.9	11.9	13.4	1.4	1.6	104	87	114.0	16.7	1.4	Y	NA-RWWMP-03	Wilroy PRS and Storage Tank
VIP-FM-NORF-4	VIP	NORF	Locality	RHM	Victoria Ave FM	Install 1,100 LF of 12" FM Immediately d/s from NORF PS-149, along Victoria Ave and Norchester Ave to I-264.	FM				1,100		8	12											N	VIP-RWWMP-14	Norfolk City System Improvements A
VIP-GM-PORT-1	VIP	PORT	Locality	RHM	Camden Ave. GM Improvement - I	Upgrade 1,670 LF of 12" GM to 15" GM	GM				1,670	8	12	15											N	VIP-RWWMP-04	Portsmouth High-Priority Project 1
VIP-GM-PORT-2	VIP	PORT	Locality	RHM	Camden Ave. GM Improvement - II	Upgrade 2,170 LF of 17" GM to 21" GM and 370 LF of 15" GM to 18" GM	GM				2,540	10	17	21											N	VIP-RWWMP-04	Portsmouth High-Priority Project 1
VIP-PRS-R100	VIP	HRSD	HRSD	RHM	State St PRS	Install new PRS with 35ft of assistance - New Location	PRS	35	7,900	120															Y	VIP-RWWMP-05	State Street PRS and Storage Tank
VIP-PS-NORF-PS149	VIP	NORF	Locality	RHM	NORF-PS-149	NORF Pump Station 149	PS	145	2,020	180															N	VIP-RWWMP-14	Norfolk City System Improvements A
VIP-PS-PORT-PS002	VIP	PORT	Locality	RHM	PORT-PS-002	PORT Pump Station 002; Glasgow Street PS	PS	130	3,020	230															N	VIP-RWWMP-04	Portsmouth High-Priority Project 1
VIP-PS-PORT-PS008	VIP	PORT	Locality	RHM	PORT-PS-008	PORT Pump Station 008; Clifford Street PS	PS	135	4,910	390															N	VIP-RWWMP-04	Portsmouth High-Priority Project 1
VIP-PS-R102	VIP	HRSD	HRSD	RHM	City Park PS	SS-PS-106	PS	85	760	40															N	VIP-RWWMP-03	Chesapeake Blvd PS, Ashland Circle PS and City Park PS Upgrades
VIP-PS-R107	VIP	HRSD	HRSD	RHM	Willoughby Ave PS	SS-PS-132	PS	115	1,430	100															N	VIP-RWWMP-13	Willoughby Ave PS Upgrade
VIP-PS-R110	VIP	HRSD	HRSD	RHM	Camden Ave. PS	SS-PS-146	PS	165	12,870	1,250															N	VIP-RWWMP-04	Portsmouth High-Priority Project 1
VIP-ST-R101	VIP	HRSD	HRSD	RHM	State Street Storage	Install new 2.3 MG storage tank	Storage			20					2.3	11.4	12.9	1.1	1.4	35.6	35	34.7	0.2	1.1	Y	VIP-RWWMP-05	State Street PRS and Storage Tank
VIP-ST-R102	VIP	HRSD	HRSD	RHM	May Ave Storage	Install new 1.9 MG storage tank	Storage			20					1.9	10.1	10.9	1.0	1.4	44.5	43	42.2	1.9	1.0	Y	VIP-RWWMP-12	May Ave. Storage Tank
WB-FM-R100	WB	HRSD	HRSD	RHM	Williamsburg Crossing FM	Install 2,090 LF of 24" FM; Routing Jamestown Rd flow to co-located Tank/PRS (Williamsburg Crossing)	FM				2,090			24											N	WB-RWWMP-02	Williamsburg Crossing PRS, Force Main and Storage Tank
WB-PRS-R102	WB	HRSD	HRSD	RHM	Williamsburg Crossing PRS	Install new PRS with 80 ft of assistance - New Location	PRS	80	12,375	410															Y	WB-RWWMP-02	Williamsburg Crossing PRS, Force Main and Storage Tank
WB-ST-R102	WB	HRSD	HRSD	RHM	Lodge Rd Extended WW	extended wet well storage at Lodge Rd PS	Storage								0.14	4.4	1.8	N/A	0.5	N/A	0	N/A	N/A	1.8	N	WB-RWWMP-19	Lodge Rd. PS Extended Wet Well
WB-ST-R103	WB	HRSD	HRSD	RHM	Williamsburg Crossing Storage	Install 1.8 MG Storage Tank	Storage			20					1.8	17.8	15.7	0.9	0.4	146	49	143.0	97.3	0.9	Y	WB-RWWMP-02	Williamsburg Crossing PRS, Force Main and Storage Tank
AT-GM-CHES-067-1	AT	CHES	Locality	LHM	CHES-067 GM Improvement - I	Install 280 LF of 12" GM	GM				280	2		12												AT-RWWMP-01	Chesapeake High-Priority Project 1
AT-GM-CHES-067-2	AT	CHES	Locality	LHM	CHES-067 GM Improvement - II	Install 2,760 LF of 16" GM	GM				2760	10		16												AT-RWWMP-01	Chesapeake High-Priority Project 1
JR-GM-NEWP-013	JR	NEWP	Locality	LHM	NEWP-013 GM Improvement	Install 910 LF of 12" GM	GM				910	4		12												JR-RWWMP-11	Newport News I/I Reduction Project C
NA-GM-CHES-016	NA	CHES	Locality	LHM	CHES-016 GM Improvement	Install 320 LF of 12" GM	GM				320	1		12												NA-RWWMP-01	Chesapeake High-Priority Project 2
WB-GM-YORK-006	WB	YORK	Locality	LHM	YORK-006 GM improvement	Upgrade Influent pipe to wet well; YORK-PS-006	GM				70	1		10												WB-RWWMP-07	York County I/I Reduction Project A

Additional I/I Reduction Cost Details

Planning Level I/I Reduction Plan

Unit Cost Assumptions

Category	Cost	Unit
Private SF Lateral Pre-Rehab Investigation	32	per foot
Private Single Family Lateral Replacement	4,800	EA
Private Single Family Lateral Rehabilitation	180	per foot
Private Single Family Lateral Replacement	240	per Foot
Manhole Rehab (up to 10 ft depth)	15,900	EA
Manhole Replace (up to 10 ft depth)	24,000	EA
Public Lateral Replacement	7,100	EA
Asphalt Pavement Restoration	225,000	Lane-Mile

25%	Public GM Replacement % Assumption
75%	Public GM Rehabilitation % Assumption

Gravity Pipe Rehabilitation/Replacement Unit Prices					<10ft	10-15ft	>15ft
Pipe Diameter	Pipe Rehabilitation	Pipe Replacement (<10' depth)	Pipe Replacement (10' to 15' depth)	Pipe Replacement (>15' depth)	Ratio R/R Compiled costs	Ratio R/R Compiled costs	Ratio R/R Compiled costs
8	$76	$448	$565	$664			
10	$95	$448	$565	$664	$183	$213	$237
12	$114	$518	$651	$764	$215	$248	$277
15	$143	$623	$780	$913	$263	$302	$336
16	$166	$658	$824	$963	$289	$331	$365
18	$187	$728	$912	$1,063	$322	$368	$406
20	$208	$798	$1,000	$1,162	$356	$406	$447
21	$218	$833	$1,044	$1,212	$372	$425	$467
24	$250	$938	$1,176	$1,362	$422	$482	$528
27	$300	$1,043	$1,308	$1,512	$486	$552	$603
30	$333	$1,148	$1,440	$1,662	$537	$610	$665
36	$400	$1,358	$1,704	$1,962	$640	$726	$791
42	$466	$1,568	$1,968	$2,262	$742	$842	$915
48	$533	$1,778	$2,232	$2,562	$844	$958	$1,040
54	$599	$1,988	$2,496	$2,862	$946	$1,073	$1,165
60	$666	$2,198	$2,760	$3,162	$1,049	$1,190	$1,290

Cost associated with greater depth were assumed based on pipe diameter

Additional Assumptions

Category	Replace	Rehab
Public GM	25%	75%
Public MH	25%	75%
Public Lateral	40%	60%
Private SF Lateral	NA	NA
NSF GM	50%	50%
NSF MH	50%	50%
MSF Lateral	50%	50%

	Priv SF	Priv NSF
Participation Rate	70%	70%
Failure Rate	25%	70%

Private NSF R/R Ratio Unit Cost

$262 LF GM unit costs for 8" main <10ft depth at assumed rehab/replace ratios

$150 LF priv Lateral unit costs applied at assumed rehab/replace ratios

$19,950 MH unit costs applied at assumed NSF rehab/replace ratios; <10ft depth

CHES-016 I/I Reduction Plan
Additional Cost Detail

CHES-016, R/R Scope, Basis of Cost Estimate			
Asset Type	Total Quantity in Catchment	Quantity in R/R Scope	Unit Cost, Assumes Replacement and Rehabilitation Ratios
Public Sewer R/R Costs			
25% Replacement and 75% Rehabilitation			
Length of Pipe up to 10-inch diameter	30,358	30,358	$183 per foot
Length of Pipe 12-inch diameter	-	-	$215 per foot
Length of Pipe 15-inch diameter	-	-	$302 per foot
Length of Pipe 16-inch diameter	-	-	$331 per foot
Length of Pipe 18-inch diameter	-	-	$368 per foot
Length of Pipe 20-inch diameter	-	-	$447 per foot
Length of Pipe 21-inch diameter	-	-	$467 per foot
Length of Pipe 24-inch diameter	-	-	$528 per foot
Length of Pipe 27-inch diameter	-	-	$603 per foot
Length of Pipe 30-inch diameter	-	-	$665 per foot
Length of Pipe 33-inch diameter	-	-	$791 per foot
Length of Pipe 36-inch diameter	-	-	$915 per foot
Public Manhole/MCO R/R Costs	153	153	$17,925 each
25% Replacement and75% Rehabilitation			
Public Lateral R/R, assumes 25/ft per lateral	12,975	12,975	$222 per foot
40% Replacement and 60% Rehabilitation			
Private SF Lateral R/R, feet	14,711	-	- per foot
Private SF not included in current scope assumptions			
NSF Sewer R/R Costs			
50% Replacement and 50% Rehabilitation; 70% Participation Rate; 70% Failure Rate			
Private NSF > 1 Acre, Pipe Length	14,196	6,956	$262 per foot
Private NSF > 1 acre, Lateral Length	14,040	6,880	$150 per foot
Private NSF > 1 Acre, Manhole Count	90	44	$19,950 each

CHES-016, Estimated Predesign Investigation, Design and Construction Costs		
Category	Quantity in R/R Scope	Estimated Cost, $
NSF Private Assets		
Pre-Design SSES, Feet[1]	19,765	$483,900
Private NSF Sewer R/R, Feet	6,956	$1,822,500
Private NSF Lateral R/R, Feet	6,880	$1,031,900
Private NSF Manhole R/R, count	44	$877,800
Pavement Restoration[2], Lane-Miles	0.67	$148,200
Engineering and Contingency		$2,531,400
Total NSF R/R		**$6,895,700**
Private SF Lateral R/R, feet		
Footage of SF Lateral in R/R Scope	NA	$0
Pre-Rehab Investigation, Feet[3]	NA	$0
Private SF Lateral Replacement, Feet[4]	NA	$0
Engineering and Contingency	NA	$0
Total SF Lateral R/R	NA	**$0**
Public Sewer System Assets		
Pre-Design SSES, Feet	NA	$0
Public Sewer R/R, Feet	30,358	$5,563,100
Public Lateral R/R, Feet	12,975	$2,875,300
Manhole R/R, count	153	$2,742,500
Pavement Restoration[2], Lane-Miles	3	$675,000
Public Sewer System R/R Cost Subtotal		$11,855,900
Engineering and Contingency		$5,809,400
Total Public Asset R/R		**$17,665,300**
Total I/I Reduction Plan		**$24,561,000**

[1] Includes Flow Monitoring and Inspection

[2] Applied only to portion of pipe assumed for replacement

[3] Assumes 70% participation based on total length of laterals in R/R scope

[4] Assumes 25% failure rate for tested laterals

JCSA-LSA3-1 I/I Reduction Plan
Additional Cost Detail

JCSA-LSA3-1, R/R Scope, Basis of Cost Estimate				
Asset Type	Total Quantity in Catchment	Quantity in R/R Scope	Unit Cost, Assumes Replacement and Rehabilitation Ratios	
Public Sewer R/R Costs				
25% Replacement and 75% Rehabilitation				
Length of Pipe up to 10-inch diameter	57,495	57,495	$183	per foot
Length of Pipe 12-inch diameter	3,782	3,782	$215	per foot
Length of Pipe 15-inch diameter	915	915	$302	per foot
Length of Pipe 16-inch diameter	-	-	$331	per foot
Length of Pipe 18-inch diameter	12	12	$368	per foot
Length of Pipe 20-inch diameter	-	-	$447	per foot
Length of Pipe 21-inch diameter	-	-	$467	per foot
Length of Pipe 24-inch diameter	-	-	$528	per foot
Length of Pipe 27-inch diameter	-	-	$603	per foot
Length of Pipe 30-inch diameter	-	-	$665	per foot
Length of Pipe 33-inch diameter	-	-	$791	per foot
Length of Pipe 36-inch diameter	-	-	$915	per foot
Public Manhole/MCO R/R Costs	367	367	$17,925	each
25% Replacement and75% Rehabilitation				
Public Lateral R/R, assumes 25/ft per lateral	17,275	17,275	$222	per foot
40% Replacement and 60% Rehabilitation				
Private SF Lateral R/R, feet	28,377	-	-	per foot
Private SF not included in current scope assumptions				
NSF Sewer R/R Costs				
50% Replacement and 50% Rehabilitation; 70% Participation Rate; 70% Failure Rate				
Private NSF > 1 Acre, Pipe Length	18,536	9,083	$262	per foot
Private NSF > 1 acre, Lateral Length	6,560	3,214	$150	per foot
Private NSF > 1 Acre, Manhole Count	125	61	$19,950	each

JCSA-LSA3-1, Estimated Predesign Investigation, Design and Construction Costs		
Category	Quantity in R/R Scope	Estimated Cost, $
NSF Private Assets		
Pre-Design SSES, Feet[1]	17,567	$412,400
Private NSF Sewer R/R, Feet	9,083	$2,379,700
Private NSF Lateral R/R, Feet	3,214	$482,200
Private NSF Manhole R/R, count	61	$1,217,000
Pavement Restoration[2], Lane-Miles	0.86	$193,500
Engineering and Contingency		$2,726,900
Total NSF R/R		**$7,411,700**
Private SF Lateral R/R, feet		
Footage of SF Lateral in R/R Scope	NA	$0
Pre-Rehab Investigation, Feet[3]	NA	$0
Private SF Lateral Replacement, Feet[4]	NA	$0
Engineering and Contingency	NA	$0
Total SF Lateral R/R	NA	**$0**
Public Sewer System Assets		
Pre-Design SSES, Feet	NA	$0
Public Sewer R/R, Feet	62,204	$11,630,000
Public Lateral R/R, Feet	17,275	$3,828,100
Manhole R/R, count	367	$6,578,500
Pavement Restoration[2], Lane-Miles	6	$1,350,000
Public Sewer System R/R Cost Subtotal		$23,386,600
Engineering and Contingency		$11,459,500
Total Public Asset R/R		**$34,846,100**
Total I/I Reduction Plan		**$42,257,800**

[1] Includes Flow Monitoring and Inspection

[2] Applied only to portion of pipe assumed for replacement

[3] Assumes 70% participation based on total length of laterals in R/R scope

[4] Assumes 25% failure rate for tested laterals

JCSA-LSA3-6 I/I Reduction Plan
Additional Cost Detail

JCSA-LSA3-6, R/R Scope, Basis of Cost Estimate				
Asset Type	Total Quantity in Catchment	Quantity in R/R Scope	Unit Cost, Assumes Replacement and Rehabilitation Ratios	
Public Sewer R/R Costs				
25% Replacement and 75% Rehabilitation				
Length of Pipe up to 10-inch diameter	22,847	7,511	$183	per foot
Length of Pipe 12-inch diameter	1,499	945	$215	per foot
Length of Pipe 15-inch diameter	-	-	$302	per foot
Length of Pipe 16-inch diameter	-	-	$331	per foot
Length of Pipe 18-inch diameter	-	-	$368	per foot
Length of Pipe 20-inch diameter	-	-	$447	per foot
Length of Pipe 21-inch diameter	-	-	$467	per foot
Length of Pipe 24-inch diameter	-	-	$528	per foot
Length of Pipe 27-inch diameter	-	-	$603	per foot
Length of Pipe 30-inch diameter	-	-	$665	per foot
Length of Pipe 33-inch diameter	-	-	$791	per foot
Length of Pipe 36-inch diameter	-	-	$915	per foot
Public Manhole/MCO R/R Costs	124	59	$17,925	each
25% Replacement and75% Rehabilitation				
Public Lateral R/R, assumes 25/ft per lateral	9,025	2,375	$222	per foot
40% Replacement and 60% Rehabilitation				
Private SF Lateral R/R, feet	19,048	-	-	per foot
Private SF not included in current scope assumptions				
NSF Sewer R/R Costs				
50% Replacement and 50% Rehabilitation; 70% Participation Rate; 70% Failure Rate				
Private NSF > 1 Acre, Pipe Length	949	-	$262	per foot
Private NSF > 1 acre, Lateral Length	80	-	$150	per foot
Private NSF > 1 Acre, Manhole Count	6	-	$19,950	each

JCSA-LSA3-6, Estimated Predesign Investigation, Design and Construction Costs		
Category	Quantity in R/R Scope	Estimated Cost, $
NSF Private Assets		
Pre-Design SSES, Feet[1]	NA	$0
Private NSF Sewer R/R, Feet	NA	$0
Private NSF Lateral R/R, Feet	NA	$0
Private NSF Manhole R/R, count	NA	$0
Pavement Restoration[2], Lane-Miles	NA	$0
Engineering and Contingency		$0
Total NSF R/R		**$0**
Private SF Lateral R/R, feet		
Footage of SF Lateral in R/R Scope	NA	$0
Pre-Rehab Investigation, Feet[3]	NA	$0
Private SF Lateral Replacement, Feet[4]	NA	$0
Engineering and Contingency	NA	$0
Total SF Lateral R/R	NA	**$0**
Public Sewer System Assets		
Pre-Design SSES, Feet	NA	$0
Public Sewer R/R, Feet	8,456	$1,579,600
Public Lateral R/R, Feet	2,375	$526,300
Manhole R/R, count	59	$1,057,600
Pavement Restoration[2], Lane-Miles	0.5	$112,500
Public Sewer System R/R Cost Subtotal		$3,276,000
Engineering and Contingency		$1,605,200
Total Public Asset R/R		**$4,881,200**
Total I/I Reduction Plan		**$4,881,200**

[1] Includes Flow Monitoring and Inspection

[2] Applied only to portion of pipe assumed for replacement

[3] Assumes 70% participation based on total length of laterals in R/R scope

[4] Assumes 25% failure rate for tested laterals

JCSA-LSA3-8 I/I Reduction Plan
Additional Cost Detail

JCSA-LSA3-8, R/R Scope, Basis of Cost Estimate			
Asset Type	Total Quantity in Catchment	Quantity in R/R Scope	Unit Cost, Assumes Replacement and Rehabilitation Ratios
Public Sewer R/R Costs			
25% Replacement and 75% Rehabilitation			
Length of Pipe up to 10-inch diameter	51,924	51,924	$183 per foot
Length of Pipe 12-inch diameter	3,114	3,114	$215 per foot
Length of Pipe 15-inch diameter	-	-	$302 per foot
Length of Pipe 16-inch diameter	-	-	$331 per foot
Length of Pipe 18-inch diameter	-	-	$368 per foot
Length of Pipe 20-inch diameter	-	-	$447 per foot
Length of Pipe 21-inch diameter	-	-	$467 per foot
Length of Pipe 24-inch diameter	-	-	$528 per foot
Length of Pipe 27-inch diameter	-	-	$603 per foot
Length of Pipe 30-inch diameter	-	-	$665 per foot
Length of Pipe 33-inch diameter	-	-	$791 per foot
Length of Pipe 36-inch diameter	-	-	$915 per foot
Public Manhole/MCO R/R Costs	307	307	$17,925 each
25% Replacement and75% Rehabilitation			
Public Lateral R/R, assumes 25/ft per lateral	14,900	14,900	$222 per foot
40% Replacement and 60% Rehabilitation			
Private SF Lateral R/R, feet	29,995	-	- per foot
Private SF not included in current scope assumptions			
NSF Sewer R/R Costs			
50% Replacement and 50% Rehabilitation; 70% Participation Rate; 70% Failure Rate			
Private NSF > 1 Acre, Pipe Length	6,879	-	$262 per foot
Private NSF > 1 acre, Lateral Length	960	-	$150 per foot
Private NSF > 1 Acre, Manhole Count	41	-	$19,950 each

JCSA-LSA3-8, Estimated Predesign Investigation, Design and Construction Costs		
Category	Quantity in R/R Scope	Estimated Cost, $
NSF Private Assets		
Pre-Design SSES, Feet[1]	NA	$0
Private NSF Sewer R/R, Feet	NA	$0
Private NSF Lateral R/R, Feet	NA	$0
Private NSF Manhole R/R, count	NA	$0
Pavement Restoration[2], Lane-Miles	NA	$0
Engineering and Contingency		$0
Total NSF R/R		**$0**
Private SF Lateral R/R, feet		
Footage of SF Lateral in R/R Scope	NA	$0
Pre-Rehab Investigation, Feet[3]	NA	$0
Private SF Lateral Replacement, Feet[4]	NA	$0
Engineering and Contingency	NA	$0
Total SF Lateral R/R	NA	**$0**
Public Sewer System Assets		
Pre-Design SSES, Feet	NA	$0
Public Sewer R/R, Feet	55,038	$10,184,500
Public Lateral R/R, Feet	14,900	$3,301,800
Manhole R/R, count	307	$5,503,000
Pavement Restoration[2], Lane-Miles	5.3	$1,192,500
Public Sewer System R/R Cost Subtotal		$20,181,800
Engineering and Contingency		$9,889,100
Total Public Asset R/R		**$30,070,900**
Total I/I Reduction Plan		**$30,070,900**

[1] Includes Flow Monitoring and Inspection

[2] Applied only to portion of pipe assumed for replacement

[3] Assumes 70% participation based on total length of laterals in R/R scope

[4] Assumes 25% failure rate for tested laterals

JCSA-LSA5-4 I/I Reduction Plan
Additional Cost Detail

JCSA-LSA5-4, R/R Scope, Basis of Cost Estimate			
Asset Type	Total Quantity in Catchment	Quantity in R/R Scope	Unit Cost, Assumes Replacement and Rehabilitation Ratios
Public Sewer R/R Costs			
25% Replacement and 75% Rehabilitation			
Length of Pipe up to 10-inch diameter	35,622	35,622	$183 per foot
Length of Pipe 12-inch diameter	-	-	$215 per foot
Length of Pipe 15-inch diameter	-	-	$302 per foot
Length of Pipe 16-inch diameter	-	-	$331 per foot
Length of Pipe 18-inch diameter	-	-	$368 per foot
Length of Pipe 20-inch diameter	-	-	$447 per foot
Length of Pipe 21-inch diameter	-	-	$467 per foot
Length of Pipe 24-inch diameter	-	-	$528 per foot
Length of Pipe 27-inch diameter	-	-	$603 per foot
Length of Pipe 30-inch diameter	-	-	$665 per foot
Length of Pipe 33-inch diameter	-	-	$791 per foot
Length of Pipe 36-inch diameter	-	-	$915 per foot
Public Manhole/MCO R/R Costs	143	143	$17,925 each
25% Replacement and75% Rehabilitation			
Public Lateral R/R, assumes 25/ft per lateral	4,150	4,150	$222 per foot
40% Replacement and 60% Rehabilitation			
Private SF Lateral R/R, feet	4,742	-	- per foot
Private SF not included in current scope assumptions			
NSF Sewer R/R Costs			
50% Replacement and 50% Rehabilitation; 70% Participation Rate; 70% Failure Rate			
Private NSF > 1 Acre, Pipe Length	5,788	-	$262 per foot
Private NSF > 1 acre, Lateral Length	1,840	-	$150 per foot
Private NSF > 1 Acre, Manhole Count	37	-	$19,950 each

JCSA-LSA5-4, Estimated Predesign Investigation, Design and Construction Costs		
Category	Quantity in R/R Scope	Estimated Cost, $
NSF Private Assets		
Pre-Design SSES, Feet[1]	NA	$0
Private NSF Sewer R/R, Feet	NA	$0
Private NSF Lateral R/R, Feet	NA	$0
Private NSF Manhole R/R, count	NA	$0
Pavement Restoration[2], Lane-Miles	NA	$0
Engineering and Contingency		$0
Total NSF R/R		**$0**
Private SF Lateral R/R, feet		
Footage of SF Lateral in R/R Scope	NA	$0
Pre-Rehab Investigation, Feet[3]	NA	$0
Private SF Lateral Replacement, Feet[4]	NA	$0
Engineering and Contingency	NA	$0
Total SF Lateral R/R	NA	**$0**
Public Sewer System Assets		
Pre-Design SSES, Feet	NA	$0
Public Sewer R/R, Feet	35,622	$6,527,800
Public Lateral R/R, Feet	4,150	$919,600
Manhole R/R, count	143	$2,563,300
Pavement Restoration[2], Lane-Miles	3.5	$787,500
Public Sewer System R/R Cost Subtotal		$10,798,200
Engineering and Contingency		$5,291,100
Total Public Asset R/R		**$16,089,300**
Total I/I Reduction Plan		**$16,089,300**

[1] Includes Flow Monitoring and Inspection

[2] Applied only to portion of pipe assumed for replacement

[3] Assumes 70% participation based on total length of laterals in R/R scope

[4] Assumes 25% failure rate for tested laterals

PORT-10 I/I Reduction Plan
Additional Cost Detail

PORT-10, R/R Scope, Basis of Cost Estimate			
Asset Type	Total Quantity in Catchment	Quantity in R/R Scope	Unit Cost, Assumes Replacement and Rehabilitation Ratios
Public Sewer R/R Costs			
25% Replacement and 75% Rehabilitation			
Length of Pipe up to 10-inch diameter	63,467	19,361	$183 per foot
Length of Pipe 12-inch diameter	5,038	2,366	$215 per foot
Length of Pipe 15-inch diameter	1,232	457	$302 per foot
Length of Pipe 16-inch diameter	-	-	$331 per foot
Length of Pipe 18-inch diameter	2,021	1,248	$368 per foot
Length of Pipe 20-inch diameter	-	-	$447 per foot
Length of Pipe 21-inch diameter	-	-	$467 per foot
Length of Pipe 24-inch diameter	-	-	$528 per foot
Length of Pipe 27-inch diameter	-	-	$603 per foot
Length of Pipe 30-inch diameter	-	-	$665 per foot
Length of Pipe 33-inch diameter	-	-	$791 per foot
Length of Pipe 36-inch diameter	-	-	$915 per foot
Public Manhole/MCO R/R Costs	300	133	$17,925 each
25% Replacement and75% Rehabilitation			
Public Lateral R/R, assumes 25/ft per lateral	36,625	13,425	$222 per foot
40% Replacement and 60% Rehabilitation			
Private SF Lateral R/R, feet	37,366	-	- per foot
Private SF not included in current scope assumptions			
NSF Sewer R/R Costs			
50% Replacement and 50% Rehabilitation; 70% Participation Rate; 70% Failure Rate			
Private NSF > 1 Acre, Pipe Length	4,507	2,208	$262 per foot
Private NSF > 1 acre, Lateral Length	760	372	$150 per foot
Private NSF > 1 Acre, Manhole Count	25	12	$19,950 each

PORT-10, Estimated Predesign Investigation, Design and Construction Costs		
Category	Quantity in R/R Scope	Estimated Cost, $
NSF Private Assets		
Pre-Design SSES, Feet[1]	3,687	$103,300
Private NSF Sewer R/R, Feet	2,208	$578,600
Private NSF Lateral R/R, Feet	372	$55,900
Private NSF Manhole R/R, count	12	$239,400
Pavement Restoration[2], Lane-Miles	0.21	$47,100
Engineering and Contingency		$595,000
Total NSF R/R		**$1,619,300**
Private SF Lateral R/R, feet		
Footage of SF Lateral in R/R Scope	NA	$0
Pre-Rehab Investigation, Feet[3]	NA	$0
Private SF Lateral Replacement, Feet[4]	NA	$0
Engineering and Contingency	NA	$0
Total SF Lateral R/R	NA	**$0**
Public Sewer System Assets		
Pre-Design SSES, Feet	NA	$0
Public Sewer R/R, Feet	23,432	$4,654,300
Public Lateral R/R, Feet	13,425	$2,975,000
Manhole R/R, count	133	$2,384,000
Pavement Restoration[2], Lane-Miles	2	$450,000
Public Sewer System R/R Cost Subtotal		$10,463,300
Engineering and Contingency		$5,127,000
Total Public Asset R/R		**$15,590,300**
Total I/I Reduction Plan		**$17,209,600**

[1] Includes Flow Monitoring and Inspection

[2] Applied only to portion of pipe assumed for replacement

[3] Assumes 70% participation based on total length of laterals in R/R scope

[4] Assumes 25% failure rate for tested laterals

SUFF-146 I/I Reduction Plan
Additional Cost Detail

SUFF-146, R/R Scope, Basis of Cost Estimate			
Asset Type	Total Quantity in Catchment	Quantity in R/R Scope	Unit Cost, Assumes Replacement and Rehabilitation Ratios
Public Sewer R/R Costs			
25% Replacement and 75% Rehabilitation			
Length of Pipe up to 10-inch diameter	11,608	11,608	$183 per foot
Length of Pipe 12-inch diameter	2,043	2,043	$215 per foot
Length of Pipe 15-inch diameter	644	644	$302 per foot
Length of Pipe 16-inch diameter	-	-	$331 per foot
Length of Pipe 18-inch diameter	-	-	$368 per foot
Length of Pipe 20-inch diameter	-	-	$447 per foot
Length of Pipe 21-inch diameter	-	-	$467 per foot
Length of Pipe 24-inch diameter	-	-	$528 per foot
Length of Pipe 27-inch diameter	-	-	$603 per foot
Length of Pipe 30-inch diameter	-	-	$665 per foot
Length of Pipe 33-inch diameter	-	-	$791 per foot
Length of Pipe 36-inch diameter	-	-	$915 per foot
Public Manhole/MCO R/R Costs	77	77	$17,925 each
25% Replacement and75% Rehabilitation			
Public Lateral R/R, assumes 25/ft per lateral	4,325	4,325	$222 per foot
40% Replacement and 60% Rehabilitation			
Private SF Lateral R/R, feet	4,971	-	- per foot
Private SF not included in current scope assumptions			
NSF Sewer R/R Costs			
50% Replacement and 50% Rehabilitation; 70% Participation Rate; 70% Failure Rate			
Private NSF > 1 Acre, Pipe Length	3,171	1,554	$262 per foot
Private NSF > 1 acre, Lateral Length	200	98	$150 per foot
Private NSF > 1 Acre, Manhole Count	21	10	$19,950 each

SUFF-146, Estimated Predesign Investigation, Design and Construction Costs		
Category	Quantity in R/R Scope	Estimated Cost, $
NSF Private Assets		
Pre-Design SSES, Feet[1]	2,360	$77,500
Private NSF Sewer R/R, Feet	1,554	$407,100
Private NSF Lateral R/R, Feet	98	$14,700
Private NSF Manhole R/R, count	10	$199,500
Pavement Restoration[2], Lane-Miles	0.15	$33,100
Engineering and Contingency		$424,800
Total NSF R/R		**$1,156,700**
Private SF Lateral R/R, feet		
Footage of SF Lateral in R/R Scope	NA	$0
Pre-Rehab Investigation, Feet[3]	NA	$0
Private SF Lateral Replacement, Feet[4]	NA	$0
Engineering and Contingency	NA	$0
Total SF Lateral R/R	NA	**$0**
Public Sewer System Assets		
Pre-Design SSES, Feet	NA	$0
Public Sewer R/R, Feet	14,295	$2,761,000
Public Lateral R/R, Feet	4,325	$958,400
Manhole R/R, count	77	$1,380,200
Pavement Restoration[2], Lane-Miles	1.4	$315,000
Public Sewer System R/R Cost Subtotal		$5,414,600
Engineering and Contingency		$2,653,200
Total Public Asset R/R		**$8,067,800**
Total I/I Reduction Plan		**$9,224,500**

[1] Includes Flow Monitoring and Inspection

[2] Applied only to portion of pipe assumed for replacement

[3] Assumes 70% participation based on total length of laterals in R/R scope

[4] Assumes 25% failure rate for tested laterals

YORK-003 I/I Reduction Plan
Additional Cost Detail

YORK-003, R/R Scope, Basis of Cost Estimate			
Asset Type	Total Quantity in Catchment	Quantity in R/R Scope	Unit Cost, Assumes Replacement and Rehabilitation Ratios
Public Sewer R/R Costs			
25% Replacement and 75% Rehabilitation			
Length of Pipe up to 10-inch diameter	31,512	10,750	$183 per foot
Length of Pipe 12-inch diameter	-	-	$215 per foot
Length of Pipe 15-inch diameter	-	-	$302 per foot
Length of Pipe 16-inch diameter	-	-	$331 per foot
Length of Pipe 18-inch diameter	-	-	$368 per foot
Length of Pipe 20-inch diameter	-	-	$447 per foot
Length of Pipe 21-inch diameter	-	-	$467 per foot
Length of Pipe 24-inch diameter	-	-	$528 per foot
Length of Pipe 27-inch diameter	-	-	$603 per foot
Length of Pipe 30-inch diameter	-	-	$665 per foot
Length of Pipe 33-inch diameter	-	-	$791 per foot
Length of Pipe 36-inch diameter	-	-	$915 per foot
Public Manhole/MCO R/R Costs	136	119	$17,925 each
25% Replacement and75% Rehabilitation			
Public Lateral R/R, assumes 25/ft per lateral	9,575	5,375	$222 per foot
40% Replacement and 60% Rehabilitation			
Private SF Lateral R/R, feet	15,354	-	- per foot
Private SF not included in current scope assumptions			
NSF Sewer R/R Costs			
50% Replacement and 50% Rehabilitation; 70% Participation Rate; 70% Failure Rate			
Private NSF > 1 Acre, Pipe Length	5,951	-	$262 per foot
Private NSF > 1 acre, Lateral Length	640	-	$150 per foot
Private NSF > 1 Acre, Manhole Count	37	-	$19,950 each

YORK-003, Estimated Predesign Investigation, Design and Construction Costs		
Category	Quantity in R/R Scope	Estimated Cost, $
NSF Private Assets		
Pre-Design SSES, Feet[1]	NA	$0
Private NSF Sewer R/R, Feet	NA	$0
Private NSF Lateral R/R, Feet	NA	$0
Private NSF Manhole R/R, count	NA	$0
Pavement Restoration[2], Lane-Miles	NA	$0
Engineering and Contingency		$0
Total NSF R/R		**$0**
Private SF Lateral R/R, feet		
Footage of SF Lateral in R/R Scope	NA	$0
Pre-Rehab Investigation, Feet[3]	NA	$0
Private SF Lateral Replacement, Feet[4]	NA	$0
Engineering and Contingency	NA	$0
Total SF Lateral R/R	NA	**$0**
Public Sewer System Assets		
Pre-Design SSES, Feet	NA	$0
Public Sewer R/R, Feet	10,750	$1,969,800
Public Lateral R/R, Feet	5,375	$1,191,100
Manhole R/R, count	119	$2,133,100
Pavement Restoration[2], Lane-Miles	1	$225,000
Public Sewer System R/R Cost Subtotal		$5,519,000
Engineering and Contingency		$2,704,300
Total Public Asset R/R		**$8,223,300**
Total I/I Reduction Plan		**$8,223,300**

[1] Includes Flow Monitoring and Inspection

[2] Applied only to portion of pipe assumed for replacement

[3] Assumes 70% participation based on total length of laterals in R/R scope

[4] Assumes 25% failure rate for tested laterals

YORK-006 I/I Reduction Plan
Additional Cost Detail

YORK-006, R/R Scope, Basis of Cost Estimate			
Asset Type	Total Quantity in Catchment	Quantity in R/R Scope	Unit Cost, Assumes Replacement and Rehabilitation Ratios
Public Sewer R/R Costs			
25% Replacement and 75% Rehabilitation			
Length of Pipe up to 10-inch diameter	38,620	38,620	$183 per foot
Length of Pipe 12-inch diameter	-	-	$215 per foot
Length of Pipe 15-inch diameter	-	-	$302 per foot
Length of Pipe 16-inch diameter	-	-	$331 per foot
Length of Pipe 18-inch diameter	-	-	$368 per foot
Length of Pipe 20-inch diameter	-	-	$447 per foot
Length of Pipe 21-inch diameter	-	-	$467 per foot
Length of Pipe 24-inch diameter	-	-	$528 per foot
Length of Pipe 27-inch diameter	-	-	$603 per foot
Length of Pipe 30-inch diameter	-	-	$665 per foot
Length of Pipe 33-inch diameter	-	-	$791 per foot
Length of Pipe 36-inch diameter	-	-	$915 per foot
Public Manhole/MCO R/R Costs	211	211	$17,925 each
25% Replacement and75% Rehabilitation			
Public Lateral R/R, assumes 25/ft per lateral	17,175	17,175	$222 per foot
40% Replacement and 60% Rehabilitation			
Private SF Lateral R/R, feet	25,241	-	- per foot
Private SF not included in current scope assumptions			
NSF Sewer R/R Costs			
50% Replacement and 50% Rehabilitation; 70% Participation Rate; 70% Failure Rate			
Private NSF > 1 Acre, Pipe Length	-	-	$262 per foot
Private NSF > 1 acre, Lateral Length	-	-	$150 per foot
Private NSF > 1 Acre, Manhole Count	-	-	$19,950 each

YORK-006, Estimated Predesign Investigation, Design and Construction Costs		
Category	Quantity in R/R Scope	Estimated Cost, $
NSF Private Assets		
Pre-Design SSES, Feet[1]	NA	$0
Private NSF Sewer R/R, Feet	NA	$0
Private NSF Lateral R/R, Feet	NA	$0
Private NSF Manhole R/R, count	NA	$0
Pavement Restoration[2], Lane-Miles	NA	$0
Engineering and Contingency		$0
Total NSF R/R		**$0**
Private SF Lateral R/R, feet		
Footage of SF Lateral in R/R Scope	NA	$0
Pre-Rehab Investigation, Feet[3]	NA	$0
Private SF Lateral Replacement, Feet[4]	NA	$0
Engineering and Contingency	NA	$0
Total SF Lateral R/R	NA	**$0**
Public Sewer System Assets		
Pre-Design SSES, Feet	NA	$0
Public Sewer R/R, Feet	38,620	$7,077,100
Public Lateral R/R, Feet	17,175	$3,806,000
Manhole R/R, count	211	$3,782,200
Pavement Restoration[2], Lane-Miles	3.8	$855,000
Public Sewer System R/R Cost Subtotal		$15,520,300
Engineering and Contingency		$7,604,900
Total Public Asset R/R		**$23,125,200**
Total I/I Reduction Plan		**$23,125,200**

[1] Includes Flow Monitoring and Inspection

[2] Applied only to portion of pipe assumed for replacement

[3] Assumes 70% participation based on total length of laterals in R/R scope

[4] Assumes 25% failure rate for tested laterals

Additional Program Costs

A. PROGRAM MANAGEMENT SERVICES

The costs for program management services shown below are based on the proposed Scope of Services for Year 1 and Engineering Fee Summary that has been submitted to HRSD. Year 2 and Year 3 costs shown below are based on a continuation of select programmatic activities needed to support programmatic implementation of all projects during construction and HRSD system planning efforts.

Year #1 Under Comprehensive Agreement: 9/8/25 – 9/7/26
Year #2 Under Comprehensive Agreement: 9/8/26 – 9/7/27
Year #3 Under Comprehensive Agreement: 9/8/27 – 9/7/28

Task Series	Task Description	Year #1 Costs	Year #2 Costs	Year #3 Costs
100	Programmatic Activities - management and administration, PEP updates, program controls, and stakeholder engagement	$4,231,835	$4,220,110	$4,431,115
200	Existing Data Review and Field Investigations – flow monitoring, DTS, SSES invest., and GIS data management	$4,099,584	$156,618	$164,449
300	Time Series Data Analysis and modeling – Flow and RTK analyses, and mini-model development	$2,063,235	$208,172	$218,580
400	Preliminary I/I Reduction Program Plans- 9 project basins	$2,133,692	$0	$0
500	Private I/I Reduction – NSF SSES invest.	$1,057,152	$0	$0
600	Project Delivery – design and preconstruction processes and procedure.	$232,502	$0	$0
Subtotal		**$13,818,000**	**$4,584,900**	**$4,814,144**
TOTAL				**$23,217,044**

B. POST-CONSTRUCTION FLOW MONITORING AND HYDRAULIC MODELING TO ASSESS PEAK FLOW I/I REDUCTION AND SSO VOLUME REDUCTION

Will use mini-models prepared by BMcD Team to predict I/I reduction and SSO reduction achieved in each project basin

Number of basins:	9	Time to complete task	
Number of Models:	5	12	months
Number of Meters:	90	50	work weeks
Revised Pump Stations:	20		

Major Work Elements	Level of Effort (hours)	Value of Work Performed ($)
Update Flows to input into mini-models	712	$137,400
Update networks and conduct pump station drawdown tests	325	$64,100
Run model scenarios – Post I/I Rehab alone and with HPP capacity projects	150	$31,400
SSO and I/I reduction comparisons; Pre- vs Post- Peak flows and I/I densities	675	$121,500
TM and PPT for HRSD - Regulatory compliance	314	$64,000
Modeling Function Group management	400	$96,000
Subtotal	2,577	514,400
Contingency – 15%	386	$77,200
Subtotal – Modeling (BC)	2963	591,600
Pre-/Post-RDII Assessment, for 90 flow monitor sites, includes Site-Event RDII Characterization and Regression with Control meter.	900	$162,000
HazenQ Data Review; Includes monthly maintenance. Data QC, balance review, and field work coordination	2,256	$352,800
Flow data analysis reports and contingency -20%	458	$103,000
Subtotal Flow Analysis (Hazen)	3,614	$617,800
2027 -2029 Post-Construction Flow Monitoring for 12-Month Period(RJN)	90 Flow Meters 1,080 Flow Meter-Months 12 Rain Gauges	$3,310,500

	144 Rain Guage-Months 5 Meter Install/Repl./Month	
Project Management, Prepare I/I Reduction and SSO Reduction Reports, Presentations and Contingency (BMCD)	25%	$1,130,000
TOTAL BUDGET AMOUNT		**$5,649,900**

C. SUPPORT OF HRSD'S SYSTEM-WIDE RHM UPDATE AND DEVELOPMENT OF ADAPTIVE MANAGEMENT PLAN

Start Q4 2026 - 10/1/2026; Stop Q1 2030 - 3/31/2030
Number of basins: 1,600 in Southshore + 1,100 in Northshore = 2,700 Total
Number of Models:2
Number of Calibration Sites: 450 consisting of 250 new sites and 200 existing sites
Number of Key Pump Stations: 600
Number of Gravity Flow Meters: 500

Major Work Elements	Level of Effort (hours)	Value of Work Performed ($)
Function Group Collaboration with HRSD HAMs	700	$168,000
RHM Upkeep and Troubleshooting (Locality and HRSD updates)	2,000	$440,000
Full RHM Update - Hydrology	805	$147,700
Full RHM Update - Hydraulics	160 hrs/ Model = 320	$48,000
Pump Station Drawdown Tests	1200	$264,000
Setup Calibration Events(x3)	240	$36,000
Hydraulic Calibration to Evaluate Peaks, Volume, Pressure, and Assess new Hydraulic Changes	6,853	$1,325,400
TM and PPT Presentations for HRSD - Regulatory Compliance	960	$144,000
HRSD Model Review Workshops and Regulatory Review Comments	752	$200,000
Subtotal	13,830	$2,773,100
Contingency- 30%	4,288	$831, 900
Total Modeling (BC)	18,118	$3,605,000
General Flow Data Quality Monitoring for Non-HRSD Sites	2,228	$274,800
Hydrology (DW and WW flow parameters		
Dry Weather Flow Characterization	1,300	$195,000
Wet Weather Flow Characterization	7,800	$1,716,000
Support of Model Refinements and Hydrology Quality Control	4,355	1,098,500
Subtotal	15,683	$3,284,300

GIS PDS hosting, TM and PPT for HRSD, and contingency -15%	2,240	$492,600
Total Flow Data Analysis (Hazen)	17,923	$3,776,900
Systemwide Flow Monitoring for 12-month period (RJN)	500 flow monitors 6,000 meter-months 5 Meter Install/Repl./Month 75 Pressure Gauges/months	$14,929,300
Assist Developing Adaptive Management Plan (BMcD Team)	5 FTEs for 15 months = 12,750	$3,251,300
Project Management and Prepare I/I Reduction and SSO Reduction Reports, Presentations and Contingency (BMCD) - 25%		$6,390,600
TOTAL BUDGET AMOUNT		**$31,953,100**

Project Package #___
Hampton Roads Sanitation District
High Priority Inflow and Infiltration Reduction Program

This Project Package is approved and executed between Hampton Roads Sanitation District ("HRSD" or "Owner") and Burns & McDonnell Engineering Co., Inc., a Missouri corporation ("Private Entity" or "Design-Builder"), and is governed by the Comprehensive Agreement dated September XX, 2025 ("Agreement") and the General Conditions attached thereto, which is incorporated herein by reference. Owner and Private Entity are referred to individually as a "Party" and collectively as the "Parties." Unless otherwise defined in this Project Package, all capitalized terms shall have the meanings as defined by the General Conditions.

I. Work to be performed:

A. The Work to be performed for this Project Package is described in Exhibit A – Scope of Work.

II. Contract Price for the Project Package Price:

A. The Contract Price for the Work to be performed within this Project Package is _____ Dollars ($XX,XXX,XXX.XX). This value is established as a <Stipulated Price> <Cost Reimbursement Plus Fee Not-to-Exceed Amount> or <Contract Cost Limit> and is subject to adjustments made in accordance with the Agreement.

1. If used, the Contract Cost Limit for the Project Package is comprised of the Cost of the Work plus the Private Entity's Fee as further described below:

   a. The Cost of the Work for this Project Package is _____ Dollars ($XX,XXX,XXX.XX). The Cost of the Work includes the costs outlined in Paragraph 12.01.B of the General Conditions, as well as the Private Entity's Contingency and Cash Allowances as further described below:

      i. For the items defined under Paragraph 12.01.B of the General Conditions, the sum is _____ Dollars ($XX,XXX,XXX.XX).

      ii. The Private Entity's contingency in the amount of _____ Dollars ($X,XXX,XXX.XX). The contingency is for the Private Entity's exclusive use as further described in Paragraph 2.03.A.2 of the Agreement.

      iii. Cash Allowances in the amount of _____ Dollars ($X,XXX,XXX.XX). The Allowance Items and Values are further described in Exhibit C.

   b. The Private Entity's Fee in the amount of _____ Dollars ($X,XXX,XXX.XX) based on:

i. A _____ (#) percent markup on all professional engineering services performed by Construction Subcontractors; and

ii. A _____ (#) percent markup on all Construction performed by Construction Subcontractors.

2. If used, a Cost Reimbursement Plus Fee Not-to-Exceed Amount for the Project Package is comprised of the Cost of the Work plus the Private Entity's Fee plus an Owner-controlled contingency as further described below:

a. The Cost of the Work for this Project Package is _____ Dollars ($XX,XXX,XXX.XX). The Cost of the Work includes the costs outlined in Paragraph 12.01.B of the General Conditions, as well as the Private Entity's Cash Allowances and an Owner-controlled contingency as further described below:

i. For the items defined under Paragraph 12.01.B of the General Conditions, the sum is _____ Dollars ($XX,XXX,XXX.XX).

ii. Cash Allowances in the amount of _____ Dollars ($X,XXX,XXX.XX). The Allowance Items and Values are further described in Exhibit C.

b. The Private Entity's Fee in the amount of _____ Dollars ($X,XXX,XXX.XX) based on:

i. A _____ (#) percent markup on all professional engineering services performed by Construction Subcontractors; and

ii. A _____ (#) percent markup on all Construction performed by Construction Subcontractors.

c. An Owner-controlled contingency in the amount of _____ Dollars (($X,XXX,XXX.XX) is included for Additional Services, if authorized by Owner.

III. Contract Times for the Project Package:

A. Substantial Completion of the entire Work to be provided under this Project Package shall be achieved no later than [XX calendar days after the Effective Date of the Contract OR INSERT DATE OR REFERENCE TO EXHIBIT].

B. Final Completion of the entire Work to be completed under this Project Package shall be achieved no later than [XX calendar days after Substantial Completion OR INSERT DATE OR REFERENCE TO EXHIBIT].

C. Liquidated Damages: [INSERT IF APPLICABLE]

IV. Additional Insureds: The following persons shall be included as additional insureds on Private Entity's applicable policies of insurance:

A. [INSERT Operators< Locality names>]

B. [INSERT Landowners of the Site with an existing private sewer system or a portion of a private sewer system that Private Entity will <evaluate the condition of> or <repair structure defects as authorized by Owner>] List of landowners identified by name and address will be added as Exhibit I to this Project Package by amendment.
C. [INSERT Owner's Consultant(s)]

V. Other:

A. [INSERT Locality-specific Items]
B. [INSERT …]

VI. Exhibits: The following Exhibits are incorporated herein by reference, as applicable:

A. Exhibit "A" – Scope of Work
B. Exhibit "B" – Engineering Fee Summary and Billing Rate Schedules
C. Exhibit "C" - Assumptions, Clarifications & Exclusions
D. Exhibit "D" – Cash Allowances
E. Exhibit "E" – Permit and Easement Matrix
F. Exhibit "F" – Preliminary Project Schedule
G. Exhibit "G" – Prevailing Wage and Davis Bacon Wage Rates
H. Exhibit "H" – Design Documents
I. Exhibit "I" – List of Landowners
J. Other

IN WITNESS WHEREOF, the Parties have executed this Project Package as of the Effective Date of the Contract. The Project Package and all subsequent changes to the Project Package will be approved and executed using Owner's Enterprise Project Management (Unifier) system. Physical signatures (on the Project Package and future Change Orders) will not be required if accepted by Private Entity through the online system.

OWNER:	**PRIVATE ENTITY:**
Hampton Roads Sanitation District	Burns & McDonnell Engineering Company, Inc.
_____	_____
(Signature)	*(Signature)*
_____	_____
(Printed Name)	*(Printed Name)*
_____	_____
(Title)	*(Title)*
Date: _____	Date: _____

Project Package #1
Hampton Roads Sanitation District
High Priority Inflow and Infiltration Reduction Program

This Project Package is approved and executed between Hampton Roads Sanitation District ("HRSD" or "Owner") and Burns & McDonnell Engineering Co., Inc., a Missouri corporation ("Private Entity" or "Design-Builder"), and is governed by the Comprehensive Agreement dated September XX, 2025 ("Agreement") and the General Conditions attached thereto, which is incorporated herein by reference. Owner and Private Entity are referred to individually as a "Party" and collectively as the "Parties." Unless otherwise defined in this Project Package, all capitalized terms shall have the meanings as defined by the General Conditions.

I. Work to be performed:

A. The Work to be performed for this Project Package is described in Exhibit A – Scope of Work.

II. Contract Price for the Project Package Price:

A. The Contract Price for the Work to be performed within this Project Package is Fourteen Million, Three Hundred Eighteen Thousand Dollars ($14,318,000.00). This value is established as a Cost Reimbursement Plus Fee Not-to-Exceed Amount and is subject to adjustments made in accordance with the Agreement.

1. The Cost Reimbursement Plus Fee Not-to-Exceed Amount for the Project Package is comprised of the Cost of the Work plus the Private Entity's Fee plus an Owner-controlled contingency as further described below:

   a. The Cost of the Work for this Project Package is Thirteen Million Seven Hundred Eight Thousand Two Hundred Forty-Seven Dollars ($13,708,247.00). The Cost of the Work includes the costs outlined in Paragraph 12.01.B of the General Conditions, as well as an Owner-controlled contingency as further described below:

      i. For the items defined under Paragraph 12.01.B of the General Conditions, the sum is Thirteen Million Two Hundred Eight Thousand Two Hundred Forty-Seven Dollars ($13,208,247.00).

      ii. Reimbursement of travel expenses will be in accordance with Owner's Guideline in Exhibit C.

   b. The Private Entity's Fee in the amount of Six Hundred Nine Thousand Seven Hundred Fifty-Three Dollars ($609,753.00) based on:

      i. A seven (7) percent markup on all professional engineering services performed by Design Professional Subcontractors.

c. An Owner-controlled contingency in the amount of Five Hundred Thousand Dollars ($500,000.00) is included for Additional Services, if authorized by Owner.

III. Contract Times for the Project Package:

A. Substantial Completion of the entire Work to be provided under this Project Package shall be achieved no later than 365 calendar days after the Effective Date of the Contract.

B. Final Completion of the entire Work to be completed under this Project Package shall be achieved no later than 90 calendar days after Substantial Completion.

IV. Additional Insureds: The following persons shall be included as additional insureds on Private Entity's applicable policies of insurance:

A. Operators: City of Chesapeake, VA; City of Suffolk, VA; City of Portsmouth, VA; York County, VA; City of Williamsburg, VA; James City Service Authority; and City of Norfolk, VA.

B. Landowners of the Site with an existing private sewer system or a portion of a private sewer system that Private Entity will evaluate the condition of. A list of landowners identified by name and address will be added as Exhibit D to this Project Package by amendment.

V. Exhibits: The following Exhibits are incorporated herein by reference, as applicable:

A. Exhibit "A" – Scope of Work

B. Exhibit "B" – Engineering Fee Summary and Billing Rate Schedules

C. Exhibit "C" – HRSD Guideline for Reimbursable Charges Related to Professional and Non-Professional Services Dated January 2025

IN WITNESS WHEREOF, the Parties have executed this Project Package as of the Effective Date of the Contract. The Project Package and all subsequent changes to the Project Package will be approved and executed using Owner's Enterprise Project Management (Unifier) system. Physical signatures (on the Project Package and future Change Orders) will not be required if accepted by Private Entity through the online system.

OWNER:	**PRIVATE ENTITY:**
Hampton Roads Sanitation District	Burns & McDonnell Engineering Company, Inc.
_____	_____
(Signature)	*(Signature)*
_____	_____
(Printed Name)	*(Printed Name)*
_____	_____
(Title)	*(Title)*
Date: _____	Date: _____

EXHIBIT A

SCOPE OF SERVICES – CONTRACT NO. 1

Private Entity: Burns & McDonnell Engineering Company, Inc.

Owner: Hampton Roads Sanitation District

Project: High-Priority Inflow and Infiltration Reduction Program Implementation (CIP NO. GN 020310)

I. GENERAL

The Hampton Roads Sanitation District (HRSD) is implementing a High Priority Inflow and Infiltration Reduction Program (Program) in accordance with a Federal Consent Decree and has selected Private Entity to design and construct high-priority inflow and infiltration reduction projects under the Public-Private Education Facilities and Infrastructure Act of 2002 (PPEA). The Scope of Services defined herein will be performed under a Comprehensive Agreement pursuant to Virginia Code § 56-575.9:1.

A. The Program includes program management, professional engineering, construction, post-construction, and support services necessary to design and construct multiple sanitary sewer rehabilitation and replacement projects within gravity sanitary sewer systems, utilizing a design/build delivery method governed by an Interim Agreement and this Comprehensive Agreement. The program also includes post-construction flow monitoring and hydraulic modeling to determine the effectiveness of I/I and SSO reduction achieved and assisting HRSD with developing an Adaptive Management Plan.

B. The goal of this Program is to support the reduction of capacity-related sanitary sewer overflows (SSOs) within Locality catchments based on the results of flow monitoring and cost-effective analyses of inflow and infiltration (I/I) reduction by Private Entity. Work may be located on Locality-owned assets, HRSD-owned assets, and/or private assets/property, and may include but not be limited to manhole rehabilitation, cured-in-place pipe, lateral lining/replacement, spot fixes or the upsizing of gravity pipelines. HRSD's Regional Wet Weather Management Plan (RWWMP) identified nineteen high-priority projects where I&I reduction could be performed to cost-effectively reduce model-simulated sanitary sewer overflows (SSOs), and are included in Appendix 3 of the Sixth Amendment to the HRSD Consent Decree filed January 19, 2024. Substantial Completion of all sewer rehabilitation within these nineteen basins is required by December 31, 2028.

Based on work performed by the Private Entity during the Interim Agreement phase of the Program from October 1, 2024 to May 31, 2025, only three of these nineteen high priority projects remain in the list of priority projects proposed by Private Entity. Under the Interim Agreement, a Comprehensive I/I Reduction Plan was developed to assist in the selection of alternative project basins. Nine priority projects are proposed by Private Entity for further cost-effective analysis and subsequent sewer rehabilitation upon HRSD approval, and are located in York County, James City County, and the Cities of Portsmouth, Chesapeake, and Suffolk. Private Entity will continue to evaluate other potential alternate basins for future addition to this High Priority I/I Reduction Program or for inclusion in HRSD's future Adaptive Management Plan which is required to be submitted by HRSD to the regulatory agencies by March 31, 2030. HRSD will coordinate the identification and reduction of SSOs with its Locality partners.

C. This Program is part of HRSD's Consent Decree with the United States Environmental Protection Agency (EPA) for Sanitary Sewer Overflows and associated RWWMP. The overall goal of the RWWMP is to reduce the model-predicted SSO volume in the 5-year peak flow event by 69 percent through a combination of I/I reduction projects and capacity improvements by December 31, 2040.

D. Based on past flow monitoring and hydrologic modeling, the sanitary sewer systems in Hampton Roads are typically inflow-dominated and exhibit very rapid responses to rainfall. Capacity-related SSOs are typically also short-duration, predominantly occurring during or shortly after the peak rainfall.

E. The primary work to be performed under this Contract No. 1 will include the continuation of programmatic activities, including program administration, collection system flow monitoring and data analyses, sewer system evaluation survey (SSES) data collection and analyses, and hydraulic modeling, I/I reduction cost-effective analyses and development of Preliminary I/I Reduction Program Plans for the priority project basins identified in the Comprehensive I/I Reduction Program Plan developed by Private Entity and approved by HRSD. Work will also include the evaluation of historical SSO data to identify additional alternate project basin basins, and the characterization and evaluation of private sewer systems on non-single family (NSF) private properties for NSFs within each priority project basin.

F. Future Contracts will be executed under the Comprehensive Agreement to authorize Private Entity to perform design and construction work for each priority project basin after the cost-effective evaluation is completed under this Contract No. 1. Additional contracts will also be issued to provide continuation of program management services on an annual basis.

G. Private Entity's program approach will combine SSES data previously collected by others with basin-specific data collected by Private Entity to evaluate multiple repair technologies and develop informed and cost-effective basin rehabilitation strategies. These strategies will be adapted with data-driven feedback from design and construction work packages during program implementation.

II. BASIC SCOPE OF SERVICES

The Basic Scope of Services to be provided by the Private Entity under this Contract No. 1 is described below and organized under the following Task Series:

TASK SERIES 100 – PROGRAMMATIC ACTIVITIES

TASK SERIES 200 – EXISTING DATA REVIEW AND FIELD INVESTIGATIONS

TASK SERIES 300 – TIME SERIES DATA ANALYSIS AND MODELING

TASK SERIES 400 –PRELIMINARY I/I REDUCTION PLANS

TASK SERIES 500 – PRIVATE I/I REDUCTION PROGRAM

TASK SERIES 600 – PROJECT DELIVERY

DESCRIPTION OF BASIC SCOPE OF SERVICES

The following is a description of the Work to be performed under this Contract No. 1 Scope of Services to assist HRSD in implementing its High Priority Inflow and Infiltration Reduction Program. These services will be performed throughout the lifecycle of the Comprehensive Agreement.

TASK SERIES 100 - PROGRAMMATIC ACTIVITIES

Task 101 Program Management and Mobilization

a. Private Entity will provide a Program Manager responsible for oversight of all services performed by its team and be the primary liaison with HRSD management staff. Program Manager will provide strategic planning and manage day-to-day activities through a Deputy Program Manager, a Planning Coordinator, a Project Planning Lead, a SSES and GIS Data Manager, a Design Manager, and a Construction Manager.

b. Prepare and execute subcontract agreements for work contracted to subconsultants and subcontractors agreements, and monitor the performance of subcontracted work. Flow down contract terms and conditions from Comprehensive Agreement with HRSD to Private Entity's Subcontractor Agreements as required or deemed appropriate.

c. Lead and monitor Private Entity's program management services to achieve timely completion of activities and deliverables, including planning, engineering and preconstruction activities; project controls, tracking and trend analyses and dashboard reporting; quality control and quality assurance; and modeling projections of inflow and infiltration reduction to be achieved and presumed progress towards reducing baseline modeled SSOs by volume for the 5-year peak flow recurrence event.

d. Identification and implementation of accounting structure and cost reporting, invoicing and program status reporting requirements for design and construction services utilizing HRSD's Unifier system, , in accordance with the requirements of the latest version of the applicable HRSD Design and Construction Standards. Prepare and submit monthly

invoices, and project status reports. Review and process monthly invoices received from subcontractors.

e. Conduct monthly Program Progress meetings with HRSD staff and weekly leadership coordination meetings with HRSD project managers.

f. Participate in quarterly HRSD SSO Reduction Team Meetings to discuss program status, performance and direction, and collaborate with Hazen and Sawyer, and Brown and Caldwell to leverage synergies and gain efficiencies from sharing I/I Reduction project approaches and outcomes.

g. Maintain document management system for projects and the overall program. Work collaboratively with HRSD to deposit project record documents via Unifier throughout the project and program lifecycle. Maintain and provide standardized templates for program memos, letters, contract documents, change management documents, and signatory authority.

h. Prepare a project contract for each project basin to proceed with detailed design following HRSD's approval of the Preliminary I/I Reduction Program Plan for each project basin. Prepare a project contract to support preconstruction activities in advance of constructing sewer rehabilitation work in the Port-02-04 basin that is designed by others. Amend design professional subcontracts to incorporate detailed design services for each assigned project basin.

Task 102 Program Execution Plan (PEP)

a. Update the Program Execution Plan to incorporate design and construction processes and procedures and periodically thereafter as needed or approximately every 6 months to document changes in program policies, practices and procedures for which the Scope of Services to be performed under the Comprehensive Agreement will be implemented, monitored and closed out.

b. Develop methodologies, technology tools, and techniques that will be used during program execution, and project management lifecycle process with HRSD decision points for each phase, including project planning and development, engineering, procurement, construction, commissioning and transfer to locality, and closeout, to execute projects in a consistent, standardized fashion.

c. Develop and implement a quality assurance and quality control processes to be used during the design and construction phases of each proposed project.

Task 103 Program and Project Controls

a. Provide program and project-level controls to develop, implement, monitor and manage the scope of work, costs, and schedule for program implementation.

b. Provide and deploy a Procore software platform to track and monitor programmatic, design, and construction costs and the processing of subcontractor payment applications. Monitor and track scope of work, budget and schedule for individual projects and report status to HRSD program dashboard.

c. Implement and maintain a program dashboard shared by HRSD and Private Entity to report the status of the scope of work, costs, and schedule for the overall program and each project contract once they are defined at the conclusion of preliminary design, during detailed design and construction of each project. Report on the status of sewer rehabilitation work planned in each Locality and the associated budget and cost of completed work.

Task 104 Stakeholder Engagement and Public Outreach

a. Utilize the HRSD-approved 'Public Outreach Plan for engagement and notification of individual Localities and the public for project-level public outreach and program-level communications.

b. Support HRSD as requested with the maintenance of the Program website and associated content.

c. Assist HRSD as requested with implementing and maintaining an ongoing public information strategy to promote public support for the Program.

d. Prepare and distribute informational materials and notifications to stakeholders and Localities as requested by HRSD.

e. Participate in stakeholder meetings, and support HRSD's overall coordination of public involvement activities as requested. The timing of these meetings and support services will be mutually agreed upon.

f. Provide an annual 12-month subscription to Social Pinpoint software platform to support public engagement as requested by HRSD.

g. Assist HRSD with conducting up to five 1-on-1 meetings with each Locality to discuss their involvement during the design and construction phases of each project in their basin.

Task 105 HRSD Consent Decree Program Review

a. Complete the review of the minimum required scope of all Consent Decree (CD) projects

b. Complete the review of actual work completed and cost for each CD project, including Interim System Improvements and Rehabilitation Action Plan project.

c. Complete review of other non-regulatory capacity-related HRSD projects that could have an impact on SSO volume.

d. Summarize findings from subtasks a., b. and c. above and identify completed work that goes beyond Consent Decree requirements and impacts SSO volume reduction.

e. Review HRSD Consent Decree and referenced RWWMP and supplement to the RWWMP to identify key elements related to modeling, SSO reductions, projects and other commitments and provide input into potential strategies for HRSD's continued regulatory compliance.

f. Provide technical memorandum with findings from analysis of reported capacity-related wet weather SSOs in the Hampton Roads region from 2008 to 2025.

g. Provide technical support of HRSD's regulatory strategies as described in HRSD's Integrated Management Plan 2.0.

TASK SERIES 200 - EXISTING DATA REVIEW AND FIELD INVESTIGATIONS

Task 201 Review Existing Data & Develop Data Collection Plans

a. Evaluate historical SSO data reported by HRSD and the Localities to support the identification of additional alternate project basins for HRSD's consideration.

b. Assess additional alternate project basins for I/I reduction that have potential for cost-effective I/I reduction using HRSD's existing RHMs and available flow data. Determine if there is a need for additional flow metering in these potential alternate basins. Flow monitoring to assess additional alternate basins will be performed as Additional Services.

c. Review existing available data provided by HRSD for each additional alternate I/I reduction project basin and assess the quality and completeness of data to determine sewer system asset condition and system response to wet weather events. This may include:

    - Asset data from GIS
    - Model files
    - Flow data and flow parameters
    - SSES data (CCTV, smoke testing, manhole inspections)
    - SSO Records
    - Work done since RWWMP
    - Pump Station Data
    - Stormwater, flooding and drainage information, including public complaints
    - Best available Lidar data/DEM
    - Groundwater Monitoring
    - Salinity Data contributing to SSOs

d. Develop basin-specific data collection plan for each additional alternate project basin by identifying locations where additional flow, rainfall or SSES asset condition data is needed prior to defining the scope of I/I reduction work. Submit each basin-specific data collection plan to HRSD for review and approval.

e. Determine locality permitting requirements, including, but not limited to, traffic control, water usage, waste disposal, and Locality notifications.

Task 202 Collection System Flow Monitoring

a. Continue to maintain and monitor flow data from currently installed flow meters. For budgetary purposes the following quantities are assumed for flow monitoring:

   i. Operation, analysis and maintenance of 85 meters through 12/31/25 and 60 meters through 8/31/26 @ $1,800/ meter month.
   ii. Flow meter replacement installations/month for O&M – 5 meters/month @ $1,850/unit for installation and @ $875/unit for removal
   iii. RJN Clarity data platform hosting at $5,000/month
   iv. Additional Level-only meter installation – 6 total in each of 7 basins (42 total) @ $800/unit
   v. Level-only meter operation, analysis and maintenance (54 total) at $600/ unit / month
   vi. Level-only meter removal – 24 meters at $500/unit
   vii. Rain gauge maintenance – 12 total at $875/unit/ month
   viii. Rain gauge installation – 4units @ $875/unit
   ix. Rain gauge removal @ $875/unit

   The installation of flow meters in additional alternate basins will be performed as Additional Services.

b. Develop a post-construction flow monitoring plan for each proposed project basin prior to performing any sewer rehabilitation work to evaluate I/I reduction resulting from planned work.

Task 203 Distributed Temperature Sensing (DTS)

a. Conduct DTS monitoring for a period of up to two months in the areas tributary to the following project basin flow monitors:

   - JCSA-LSA3-8-001: 5,300 LF of fiber cable
   - YORK-003-002: 10,000 LF of fiber cable
   - JCSA-LSA3-6-003: 8,400 LF of fiber cable
   - YORK-006-002A: 5,500LF of fiber cable

b. Perform DTS data analysis where applicable to identify sources of significant I/I and compare to previously collected SSES data in each area.

c. Based on flow monitoring data for sufficiently large wet weather events (1-inch or more rainfall), determine the range of peak flow corresponding to each location of interest.

d. Develop a Technical Memorandum covering the data collection, analysis, and findings for each monitored area. The TM is to include recommendations for possible staging of system rehabilitation and follow-up DTS monitoring to confirm I/I reduction achieved.

e. Conduct up to four 1-hour workshops with HRSD to review DTS investigation findings for each project basin flow monitor identified above.

Task 204 SSES Data Collection and Processing

a. Monitor field activities performed by Private Entity's subcontractors, including SSES work (CCTV, manhole inspections, smoke testing, DTS monitoring, flow monitoring and other related field activities). Provide one vehicle leased by Private Entity to conduct field monitoring activities.

b. The following remaining quantities of SSES investigative work is budgeted to be performed under this Comprehensive Agreement in Port-10 and JCSA-LSA 5-4 combined:

   - CCTV Sewer Inspection: 27,400 LF at $3.25/LF
   - Manhole Inspections: 105 manholes at $170 each
   - Mainline Lamphole Inspections:10 lampholes at $225 each
   - Smoke Testing: 220,000 LF at $0.97/LF

c. Code structural defects identified from CCTV and manhole inspections following PACP and MACP procedures and process the data through the SewerAI platform and quality control processes for the follow quantities of sewer SSES data:

   - CCTV Sewer Inspection PACP defect coding: 150,000LF at $0.05/LF
   - Manhole Inspections MACP defect coding: 200 manholes at $45 each

Task 205 GIS Data Updates and Management of System GIS Files

a. Utilizing condition assessment data collected by Private Entity, update GIS system connectivity and append attribute tables.

b. The GIS system connectivity will be updated to reflect GPS coordinates of located manholes, newly found manholes, manholes that do not exist and other misc. pipe connections that are not reflected in the existing GIS files.

c. Asset attribute data that is collected via manhole inspections and CCTV inspections will be appended to the existing attribute tables.

d. Compile SSES CCTV, manhole inspection, and smoke testing data collected by Private Entity within each Locality project area along with flow monitoring data and GIS update data and provide database files to HRSD for transmittal to each Locality as requested.

e. Host and maintain geographic information system site (Project Delivery Subscription) with version control for GIS files used during planning, design and construction in each project area.

TASK SERIES 300 - TIME SERIES DATA ANALYSIS AND MODELING

Task 301 Regional Hydraulic Model Strategy Document and Workshop

a. Continue collaboration with HRSD to support the maintenance of HRSD's current 2025 RHMs and project-specific mini-models to support their use for this program, including:
    - Any additional model updates that may be necessary within each project basin selected by HRSD necessary to support the use of RHMs for cost-effective and post-construction analysis.
    - Discuss hydrologic parameter modifications based on new data and share updated post-construction parameters when available for integration in the RHMs.
    - Continue collaboration on updating of HRSD's RHMs with HRSD modeling staff.
b. Finalize a Model Strategy and Protocol Document that outlines the existing status of models, coordination protocols, data management, version control, baseline SSO volume and locations, current SSO volume and locations, and the proposed overall modeling approach for this project. The strategy document will be finalized after completion of all cost-effective evaluations to incorporate what is learned about the RHMs and project mini-models into the strategy.
c. Conduct a Workshop with HRSD staff to review the Model Strategy and Protocol Document and gain consensus on approach and modeling responsibilities between the BMcD team and HRSD.

Task 302 Time Series Analysis and RTK Development

a. Import all time-series data gathered as part of the program into flow analysis software, HazenQ, which is provided by Private Entity's subcontractor, Hazen and Sawyer.
b. Review early data in HazenQ to identify and address any quality issues and perform ongoing data reviews if sufficient usable data is collected.
c. As sufficient data are gathered, conduct detailed flow decomposition for the full-time series, including, but not limited to:
    - Base sanitary flow
    - GWI – This will be calculated seasonally or after significant changes in the overall GWI
    - Rainfall analysis, including return periods for all events
    - Total RDII and R-values for each event
    - Ongoing development of RTK model parameters to match extended periods and will likely include multiple sets depending on season and antecedent conditions. Initial abstractions will be included, as necessary. It is assumed that the

Groundwater Infiltration Module will not be utilized. This can be included if desired, but cannot be used in Mike+ for large hydraulic analyses.

- For level-only flow monitor sites, use HazenQ to develop diurnal patterns and plot against level data to identify locations of high I/I, including rapid response. This data may be used to add additional sensors upstream to further isolate the I/I contribution.

d. Conduct ongoing reviews of R-values and RTKs to identify potential additional upstream locations or other field activities to identify sources and inform alternative analysis.

e. Determine if any adjustments may be needed or desired to the inputs for the RHM and LHMs based on the data analysis.

f. Work with HRSD to select the RTKs to use for the development of basin mini-models, LHMs, and RHMs.

Task 303 Locality Hydraulic Model and Mini-Model Assessments

a. Review LHM model parameters and compare them to available flow data analysis results to determine if mini-model refinements are needed.

b. Update mini-models with new information collected during the program.

c. Utilize the mini-models as necessary to support the overall goals of the program and the analyses of any sewer upsizing needed for alternative costing.

Task 304 Support Update of Regional Hydraulic Models

a. Assist HRSD staff with updates necessary to use the RHM for the cost-effectiveness analysis per Task Series 300 and ongoing HRSD use. These updates may include:

- Updating dry weather flow forecasts for future planning horizons using updated HRSD-provided populations growth information
- Adding projects completed but not added to the model yet
- Adding projects under construction
- Revising PS operations if there are known changes
- Revising hydrologic parameters where necessary

b. Complete the preparation of flow monitoring plan to support a system-wide hydraulic model update with prioritization of flow monitoring needs to be addressed over a multi-year period. Flow monitor installation and maintenance for system-wide model updates will be provided as an Additional Service.

c. Complete the development of a white paper outlining the vision, structure, and capabilities of a “Great Model” (GM) working collaboratively with HRSD staff. The GM discussed in white paper will focus on the characteristics of the hydraulic and hydrologic components of the models that would support the following primary HRSD objectives:

- Evaluate and optimize system hydraulics across diverse hydrologic and operational conditions.
- Serve as a tool for integrated planning and design of capital improvement projects.

- Support Consent Decree compliance and the associated RWWMP.
- Support Capacity Assurance Planning.
- Include more of the locality infrastructure where appropriate.
- Simplify the current modeling architecture while preserving accuracy.
- Incorporate critical drivers like seasonal variation and tidal influence.
- Support faster runtimes and/or "sub-models" to eliminate the need to run the entire RHM.
- Streamline the ongoing model updates and refinements.
- Provide a foundation for digital twin applications and real-time system management.

d. Assist HRSD with developing a system-wide model update plan based on the completed GM white paper for a comprehensive update and recalibration of HRSD's models. This future update would be implemented after completion of all program I/I reduction projects are completed and support the development of an Adaptive Management Plan which is required to be submitted to the regulatory agencies in 2030.

TASK SERIES 400 - PRELIMINARY I/I REDUCTION PROGRAM PLANS

Task 401 Sewer Rehabilitation Cost-Effective Analysis Guidance Document

a. Complete the development of a Cost-Effective Analysis Guidance Document that defines Private Entity's methodology used for cost-effective analysis of JCSA-LSA-3-8, for use on all other project cost-effective analyses, including sewer rehabilitation and repair technologies for defects that are considered potential contributors to I/I and assessment of I/I reduction for alternate sewer rehabilitation strategies.

b. Host a workshop with HRSD to present the Private Entity's Cost-Effective Analysis Guidance Document and asset management software tool, including associated rehabilitation technologies and rehabilitation costs. Solicit feedback from HRSD staff and update the Cost-Effective Analysis Guidance Document to incorporate feedback.

Task 402 Condition Data Review and Rehabilitation Categorization

a. Evaluate asset condition data and develop recommended methods for rehabilitation of sewer mains, manholes, private laterals, and stormwater disconnections for each proposed project basin. For budgeting purposes, this task is limited to condition data being collected for the nine currently proposed project basins.

Task 403 I/I Reduction Strategy Alternatives Development

a. Develop a suite of applicable alternative I/I reduction strategies for the nine proposed project basins.

b. Each alternative will be developed utilizing a mini-model developed by Private Entity to identify any additional local improvements needed to convey the peak flows and to develop a predicted post-construction hydrograph.

c. Develop rehabilitation costs and local conveyance improvements costs for each alternative. The following describes alternatives that will be evaluated. All alternatives will consider the inclusion of non-single family private sewer systems and inflow sources pending the outcome of Task Series 500.

   Level 1 – Inflow Only - Removal of inflow defects identified from SSES activities as well as other analyses such as interflow inflow. This work could include activities on private properties of interest (coordinated with Task Series 500).

   Level 2 – Data Driven Level 1 plus addressing the pipes and manholes with defects that may allow infiltration to enter the collection system. For this approach to work, any pipe with a qualifying defect will be completely lined or replaced along with lining or replacement of the public portion of the lateral. Upstream and downstream manholes will also be sealed at the chimney, the pipe penetrations, observed defects, and joints that are not clearly watertight.

   Level 3 – Comprehensive - Level 1 plus Level 2 for all pipes, manholes, and laterals (public) in a particular basin subcatchment.

Task 404 Cost-Effective Evaluation

a. Develop equivalent storage costs to account for the additional flow reduction required to meet the target flow rates established in the original basin I/I Reduction Plans (from the RWWMP).

b. Select the most cost-effective I/I reduction strategy alternative by summing the costs for I/I reduction, equivalent storage volume, and local capacity improvements for each alternative and select the lowest total cost alternative as the “Preliminary Preferred I/I Reduction Plan”.

c. Confirm the predicted success of the preliminary preferred solution using the RHM.
   - Run the RHM with all planned future HPP capacity improvements and the revised flow parameters from the “Preliminary Preferred I/I Reduction Strategy” within each HPP basin to calculate their combined impact on the targeted SSO volume reduction within each Treatment Plant Service Area (TPSA).
   - Calculate the cost to eliminate any remaining SSO volume required to meet the TPSA SSO reduction target established by the RWWMP. This will be accomplished by using the cost of the RWWMP HPPs divided by the total SSO volume removed to determine a $/(SSO gallon removed) in each TPSA.
   - Compare the total cost to eliminate any remaining SSO volume to the total cost of the equivalent storage volume.

- If these total costs do not fall within a reasonable range of each other, then we will adjust the total cost of the equivalent storage and rerun our cost-effective analysis.
- Make necessary adjustments to generate the Preliminary I/I Reduction Program Plan for each Project.

Task 405 Preliminary I/I Reduction Program Plans

a. Host up to nine workshops to present results of each project cost-effective evaluation and the most cost-effective alternative for inclusion into a Preliminary I/I Reduction Program Plan, and solicit feedback from HRSD staff.

b. Develop a Preliminary I/I Reduction Program Plan to describe the proposed implementation of the alternative I/I reduction strategy selected by HRSD for each proposed project basin, including the proposed phased implementation schedule with interim milestones for the completion of detailed design, construction, and post-construction flow monitoring.

c. Develop a preliminary design level total opinion of probable construction cost for each proposed project basins in accordance with Association for the Advancement of Cost Engineering (AACE) International Recommended Practice NO. 18R-97. The total opinion of probable construction cost shall be a Class 4 estimate consistent with AACE standards for inclusion in the Preliminary I/I Reduction Program Plan.

d. Submit a draft Preliminary I/I Reduction Program Plan to HRSD for review and comment. Incorporate their review comments and submit a final plan for each project basin. Follow HRSD standard table of contents for PERs to the extent practicable.

TASK SERIES 500 - PRIVATE I/I REDUCTION PROGRAM

Previous planning activities completed under the Interim Agreement identified private properties of interest for further SSES and potential I/I rehabilitation. These properties were identified with a combination of public system SSES investigations, including DTS. The properties of interest include Non-Single Family (NSF) properties. This task will advance the Interim Agreement efforts by performing SSES on private sewer systems and private laterals on NSF properties of interest.

Task 501 Planning SSES on Private Sewer Systems

Plan SSES activities to investigate NSF private property I/I sources, including assisting HRSD with obtaining landowner signatures on HRSD Right-of-Entry agreements, conducting initial site visits and private system characterization investigations, and reporting initial findings.

Characterize the connectivity and condition of private sewer system assets on each NSF property, except those located within buildings.

a. Assist HRSD in presenting its Right-of-Entry Agreement to landowners for them to sign prior to commencing system characterization work on their property.

b. Contact NSF landowner(s) about proposed SSES investigations of private sewer systems connected to each Locality's sanitary sewer system by Private Entity and execution of Right-of-Entry Agreement by HRSD and landowner(s). Discuss the approximate limits of work with each landowner to confirm their willingness to grant HRSD a no-cost ROE agreement to enable completion of the work.

Task 502 Assessment of NSF Sewer Systems

a. Perform SSES CCTV of private main and laterals, manhole inspections, dye water testing and smoke testing on each NSF property to assess the condition of private sewer system assets. For budgeting purposes, the following quantities are assumed:

   CCTV: 83,000 LF at $3.35/LF with Sewer AI PACP coded defects

   MH Inspections: 370 Total at $215 each with Sewer AI MACP coded defects

   Dye Water Testing: 40 Tests at $2,500 each

   Smoke Testing: 83,000 LF at $0.97/LF

b. Confirm the connectivity of private sewer system assets on each NSF property, except those located within buildings. For budgeting purposes, SSES subcontractors will characterize private sewer system on up to 350 NSF properties.

c. Prepare report documenting findings from SSES data collection and analysis of the defect types identified on each NSF private property within each project basin.

d. Perform cost-effective analysis of private sewer system defect repairs on each NSF as appropriate based on SSES investigation finding to identify the scope of rehabilitation work to be proposed for HRSD's consideration and approval. The development of preliminary I/I reduction design plans for NSFs properties within each priority project basin will be provided as Additional Services. For budgeting purposes, a 70 percent participation rate (based on previous experience with the HRSD pilot programs) is assumed for included NSF parcels, with a failure rate of 70 percent of participating assets. Consideration will be given to the cost-effectiveness of these sewer repairs based on presumed flow reduction from eliminated I/I sources.

TASK SERIES 600 - PROJECT DELIVERY

Task 601 Design and Preconstruction Processes and Procedures

a. Develop programmatic document controls and administrative procedures for work that will be performed during the detailed design phase of each Locality project, including:

- Preparation of design process workflows that include HRSD decision points to obtain approval of the sewer rehabilitation work proposed
- Development of construction contract documents
- Confirmation of all Locality, HRPDC and HRSD design and construction standards applicable to the project(s) within each Locality
- Documentation of design correspondence with and submittals to HRSD and Locality representatives.
- Subcontractor constructability reviews
- Development of construction cost estimates
- Obtaining construction price proposals
- Developing the Cost of the Work for each Locality Project, and
- Role and responsibilities of HRSD and Locality representatives during design phase of each project

b. Incorporate these design phase processes and procedures into the Program Execution Plan per Task 102.
c. Determine permitting and temporary construction easement acquisition requirements to perform construction within the public right-of-way of each locality and applicable environmental permitting requirements.
d. Develop programmatic document controls and administrative procedures for construction management work to be performed during the construction phase of each Locality project, including:
    - Processing of subcontractor payment applications
    - Processing of shop drawings and data submittals
    - Development of preliminary project construction schedules
    - Maintenance of project construction records
    - Documentation of communications and correspondence between Private Entity and HRSD and Locality representatives
    - Daily construction field reports during active construction
    - Roles and responsibilities of resident project representative
    - Monthly construction progress meetings
    - Project closeout requirements
    - Development and submittal of construction record drawings
    - Role and responsibilities of HRSD and Locality representatives during the construction phase of each project.
e. Incorporate these construction administration processes and procedures into the Program Execution Plan per Task 102.
f. Establish protocols for testing and inspection of completed construction work for acceptance and commissioning prior to transfer to locality for operation and maintenance.
g. Provide cost estimating and subcontractor procurement support services in advance of HRSD authorizing a project package for construction of sewer rehabilitation and replacement work in the Port-02-04 basin.
h. Prepare plan for a field office in the Northshore area equipped with office equipment and accessories for construction staff to operate from in support of sewer rehabilitation work in Northshore project basins. Actual costs for office space lease and equipment will be included with the first construction contract.

III. ADDITIONAL SERVICES

HRSD may request the Private Entity to provide a wide range of staff resources to supplement and support HRSD Staff with implementation of its High Priority I/I Reduction Program. Any work requested by HRSD that is not stated in the Basic Scope of Services described above will be classified as Additional Services. Private Entity's contract maximum upper limit for compensation includes a total allowance amount of $500,000 for Additional Services not yet authorized by HRSD that may be required throughout the course of the work. This allowance amount shall not be utilized by Private Entity unless specifically authorized in writing by HRSD to perform Additional Services. Additional Services will not be performed, nor is the Private Entity approved to utilize any of the allowance amount, unless HRSD provides written authorization to Private Entity that includes the scope of work and for each Additional Service to be performed and a maximum billing limit for compensation that has been mutually agreed upon. Additional Services may include, but are not limited to:

a. Development of RTK values for locality pump station service basins that are not located in the priority project basins included in Comprehensive I/I Reduction Program Plan.
b. Updating of Locality GIS System of Record files to correct sanitary sewer connectivity and/or location errors and discrepancies.
c. Flow monitoring and data analysis for additional alternate basins or to support the update and recalibration of HRSD's system-wide hydraulic model.
d. SSES investigation of additional alternate basins
e. Support to acquire temporary and permanent easements
f. Performance of Environmental Impact Assessments
g. The development of preliminary design plans for NSFs within each priority project basin.
h. Detailed design of sewer rehabilitation and replacement work for project basins held in reserve.

IV. OWNER RESPONSIBILITIES

Owner will furnish, or request from the Localities, the following items as required by the Basic Scope of Services, and not at the expense of the Private Entity:

A. The most recent available HRSD or Locality data associated with additional alternate project basins identified below:

Data:

- Collection system improvements (including rehabilitation) completed, 2011 to present
- Sanitary sewer evaluation survey (SSES) data, 2011 to present
- Stormwater / drainage GIS data
- Historical SSO data reported by HRSD and Localities from 2008 to 2025
- Collection system flow/level/velocity data, 2019 to present
- Pump station operational data, 2019 to present

- Flow, level, or pressure data (for pressure data, please provide elevation of gauge relative to pumps)
- Pump run times or status
- Bypass pump information, 2019 to present
  - Temporarily or permanently installed
  - Time periods in active
  - Pump size/model and number installed

B. Hydraulic models for the alternate basins from each Locality, including collection system sensor network data to be used by Private Entity to support locality hydraulic model updates and refinements, as available

C. Coordination of Private Entity's work with each Locality, may include but not limited to:

- The commitments described in the Memorandum of Agreement between each Locality and Owner.
- Identification of additional work requested by Locality and paid for by Owner to be added to sewer rehabilitation work to be designed by Private Entity.
- Owner approval of Locality-funded infrastructure improvements as part of each project and Owner compensation directly to Private Entity for locality funded work, as agreed to by Owner and Locality in cost-share agreement, or similar.
- Communication of work planned within each proposed project basin to Locality representatives and confirmation of Locality-specific preferences, policies or guidelines for design and construction requirements and construction permitting requirements for work on public and private system sewers
- Locality consideration of substitute or "or equal" products used to rehabilitate sewers.
- Coordination of Locality involvement, including identification of all notifications of Locality that are required, during design and construction phase activities performed by Private Entity in each project basin.
- Public outreach and engagement of locality utility customers with support from Private Entity.
- Private Entity's work with other third-party contractors contracted directly with Locality and performing work within or immediately adjacent to HPIIRP project basins.
- Public infrastructure improvements recently completed or to be completed by Locality that could impact the sequencing, schedule, or cost of work performed by Private Entity.
- Submission of and timely completion of shop drawing and data review by each locality prior to commencement of related construction work
- Obtain access agreements, or similar, from Locality to enable Private Entity to perform work within locality utility easements within each HPIIRP project basin.
- Negotiate Right of Entry Agreement and temporary construction easements, as necessary, to perform work on NSF private property within each HPIIRP project basin.
- Resolution of pre-existing unforeseen subsurface conditions

- Locality operation and maintenance of all existing collection system assets including sewers, equipment, valves, lift stations and other locality system assets necessary to maintain reliable sanitary sewer service and for functional or performance testing required by Private Entity.
- Locality performance of CCTV condition assessments of rehabilitated sewers during the correction period of each HPIIRP to identify defects to be corrected by Contractor.
- Transmittal of documents and information prepared by Private Entity, including Preliminary I/I Reduction Program Plan, updated GIS files, construction documents, shop drawings and data, record drawings, etc.

D. Execution of cost-share agreement between each Locality and HRSD regarding the sewer rehabilitation work to be performed by Private Entity

E. The services of a Project Manager who obtains permission to enter and have knowledge of existing locality facilities

F. Maintenance and administration HRSD project management system (Unifier) and workflow planning, development and implementation of any new Unifier functionality, and training system users on the use of new functionality to meet program needs.

G. Review and approval of Private Entity submittals at Owner decision points established throughout the planning, engineering, and construction phases of each HPIIRP.

H. Acceptance and disposal of sanitary sewer debris at Owner's wastewater treatment facilities that is removed by Private Entity from underground facilities as part of the Work. All such sanitary sewer debris must be of a type and nature treatable at Owner's facility in the normal course of the facility's operation.

(End of Scope of Services)

EXHIBIT B

HRSD High Priority I/I Reduction Program

Contract #1 Programmatic Activities Under Comprehensive Agreement
Burns & McDonnell Engineering Fee Summary for 12-Month Period Ending 9/7/2026

9/15/2025

Task Number	Task Description	Total Hours	BMcD Total Labor Billings	Brown & Caldwell	Hazen	RJN Group	The Miles Agency	WRA	Dukes Root Control	Crotty Consulting	*Subconsultant Markup (7%)*	Total Subconsultants	Total Direct Expenses	Total
100 -Programmatic Activities														
101	Program Management and Mobilization	5,734	$1,669,680	$203,334	$339,230	$144,000	$0	$28,384	$0	$18,000	*$51,306*	**$784,255**	$9,069	**$2,463,004**
102	Program Execution Plan (PEP)	408	$117,028	$4,928	$0	$0	$0	$10,192	$0	$0	*$1,058*	**$16,178**	$0	**$133,206**
103	Program and Project Controls	4,376	$911,896	$11,488	$0	$0	$0	$22,525	$0	$0	*$2,381*	**$36,394**	$3,840	**$952,130**
104	Stakeholder Engagement and Public Outreach	1,574	$355,046	$14,400	$0	$6,000	$50,000	$31,713	$0	$0	*$7,148*	**$109,261**	$7,440	**$471,747**
105	HRSD Consent Decree Program Review	156	$52,416	$12,320	$135,750	$0	$0	$838	$0	$0	*$10,424*	**$159,331**	$0	**$211,747**
	100 Subtotal	**12,248**	**$3,106,066**	**$246,470**	**$474,980**	**$150,000**	**$50,000**	**$93,652**	**$0**	**$18,000**	***$72,317***	**$1,105,420**	**$20,349**	**$4,231,835**
200 -EXISTING DATA REVIEW AND FIELD INVESTIGATIONS														
201	Review Existing Data & Develop Data Collection Plans	96	$30,184	$0	$81,550	$0	$0	$14,362	$0	$0	*$6,714*	**$102,625**	$0	**$132,809**
202	Collection System Flow Monitoring	121	$36,330	$0	$98,810	$2,234,150	$0	$0	$0	$0	*$163,307*	**$2,496,267**	$0	**$2,532,597**
203	Distributed Temperature Sensing (DTS)	92	$24,840	$316,545	$0	$168,000	$0	$0	$0	$0	*$33,918*	**$518,463**	$0	**$543,303**
204	SSES Data Collection and Processing	34	$10,336	$0	$0	$325,650	$0	$9,534	$109,200	$0	*$31,107*	**$475,490**	$27,600	**$513,426**
205	GIS Data Updates and Management of System GIS Files	168	$42,084	$0	$251,630	$36,000	$0	$0	$0	$0	*$20,134*	**$307,764**	$27,600	**$377,448**
	200 Subtotal	**511**	**$143,774**	**$316,545**	**$431,990**	**$2,763,800**	**$0**	**$23,895**	**$109,200**	**$0**	***$255,180***	**$3,900,610**	**$55,200**	**$4,099,584**
300 -TIME SERIES DATA ANALYSIS AND MODELING														
301	Regional Hydraulic Model Strategy Document and Workshop	160	$52,920	$86,448	$47,850	$0	$0	$0	$0	$0	*$9,401*	**$143,699**	$1,640	**$198,259**
302	Time Series Analysis and RTK Development	56	$18,504	$63,200	$924,770	$0	$0	$0	$0	$0	*$69,158*	**$1,057,128**	$0	**$1,075,632**
303	Local Hydraulic Model and Mini-Model Assessments	64	$21,144	$234,280	$147,860	$0	$0	$0	$0	$0	*$26,750*	**$408,890**	$0	**$430,034**
304	Support Update of Regional Hydraulic Model	276	$91,224	$116,888	$133,660	$0	$0	$0	$0	$0	*$17,538*	**$268,086**	$0	**$359,310**
	300 Subtotal	**556**	**$183,792**	**$500,816**	**$1,254,140**	**$0**	**$0**	**$0**	**$0**	**$0**	***$122,847***	**$1,877,803**	**$1,640**	**$2,063,235**
400 -PRELIMINARY I/I REDUCTION PROGRAM PLANS														
401	Sewer Rehabilitation Cost-Effective Analysis Guidance Document	116	$31,756	$7,264	$10,410	$0	$0	$18,697	$0	$0	*$2,546*	**$38,917**	$1,640	**$72,313**
402	Condition Data Review and Rehabilitation Categorization	572	$133,108	$101,104	$77,240	$0	$0	$32,136	$0	$0	*$14,734*	**$225,213**	$0	**$358,321**
403	I/I Reduction Strategy Alternatives Development	542	$142,930	$213,896	$224,760	$0	$0	$33,600	$0	$0	*$33,058*	**$505,314**	$0	**$648,244**
404	Cost-Effective Evaluation	604	$166,836	$150,264	$224,760	$0	$0	$25,276	$0	$0	*$28,021*	**$428,321**	$0	**$595,157**
405	Preliminary I/I Reduction Program Plans	888	$237,850	$84,710	$82,000	$0	$0	$40,586	$0	$0	*$14,511*	**$221,807**	$0	**$459,657**
	400 Subtotal	**2,722**	**$712,480**	**$557,238**	**$619,170**	**$0**	**$0**	**$150,295**	**$0**	**$0**	***$92,869***	**$1,419,572**	**$1,640**	**$2,133,692**
500 -PRIVATE I/I REDUCTION PROGRAM														
501	Planning SSES on Private Sewer Systems	56	$13,256	$81,280	$0	$0	$0	$0	$0	$0	*$5,690*	**$86,970**	$0	**$100,226**
502	Assessment of NSF Sewer Systems	381	$95,626	$210,944	$0	$261,310	$0	$0	$332,700	$0	*$56,347*	**$861,301**	$0	**$956,927**
	500 Subtotal	**437**	**$108,882**	**$292,224**	**$0**	**$261,310**	**$0**	**$0**	**$332,700**	**$0**	***$62,036***	**$948,270**	**$0**	**$1,057,152**
600 -PROJECT DELIVERY														
601	Design and Preconstruction Processes and Procedures	536	$158,388	$9,382	$34,080	$0	$0	$20,869	$0	$0	*$4,503*	**$68,834**	$5,280	**$232,502**
	600 Subtotal	**536**	**$158,388**	**$9,382**	**$34,080**	**$0**	**$0**	**$20,869**	**$0**	**$0**	***$4,503***	**$68,834**	**$5,280**	**$232,502**
	Subtotal Task Series 100 - 600	**17,010**	**$4,413,382**	**$1,922,675**	**$2,814,360**	**$3,175,110**	**$50,000**	**$288,711**	**$441,900**	**$18,000**	***$609,753***	**$9,320,509**	**$84,109**	**$13,818,000**
	Additional Services - Owner's Contingency													**$500,000**
	Program Total													**$14,318,000**

Burns & McDonnell

Schedule of Hourly Rates and Expenses

Position Classification	Hourly Billing Rate
Technician 6*	$103.00
Assistant 7*	$124.00
Project Specialist*	$126.00
Project Controls Support*	$151.00
Assistant 8*	$166.00
Project Administrator*	$168.00
Senior Project Specialist*	$173.00
Public Outreach Specialist*	$195.00
Assistant 9*	$197.00
Staff 10*	$222.00
Staff 11*	$243.00
Project Finance	$267.00
Senior 12	$273.00
Senior 13	$294.00
Associate 14	$304.00
Associate 15	$321.00
Associate 16	$330.00
Associate 17	$336.00

NOTES:

1. Position classifications listed above refer to the firm's internal classification system for employee compensation. For example, "Associate", "Senior", etc., refer to such positions as "Associate Engineer", "Senior Architect", etc.

2. For any nonexempt personnel in positions marked with an asterisk (*), overtime will be billed at 1.5 times the hourly labor billing rates shown.

3. Monthly invoices will be submitted for payment covering services and expenses during the preceding month. Invoices are due upon receipt. A late payment charge of 1.5% per month will be added to all amounts not paid within 30 days after receipt of the invoice.

4. The services of contract/agency and/or any personnel of a Burns & McDonnell subsidiary, such as Burns & McDonnell India (BMI), or affiliate shall be billed to Owner according to the rate sheet as if such personnel is a direct employee of Burns & McDonnell.

5. The rates shown above are effective for services through October 1, 2026, and are subject to revision thereafter.

6. Reimbursement of direct expenses associated with the performance of Professional and Non-Professional Services will be based on the actual costs incurred for airfare, rental car, lodging, meals, reproduction of deliverables, taxi service, special equipment and supplies, partnering facilitator services, mobilization of staff to the project area, and daily Per Diem established for construction field staff assigned full-time to the project. Consideration will be given to the maximum allowable amount for each type of direct expense as indicated in the latest version of the Owner's annual published guideline for reimbursable expenses.

301 Bendix Road, Suite 400
Virginia Beach, VA 23452-1385

T: 757.518.2400

September 8, 2025

John Pruss
Burns & McDonnell
Via email

Subject: Rates for HRSD PPEA I/I Comprehensive Agreement

Please find the hourly rates for Brown and Caldwell staff categories for the HRSD PPEA I/I Comprehensive Agreement Year 1 (Sept 2025 – Sept 2026). These rates have been escalated in line with the Consumer Price Index (CPI) of 2.7% and we would expect subsequent annual increases corresponding to the CPI.

Category	Rate
Vice President	$338.00
Managing Engineer	$308.00
Sr Principal	$256.00
Principal	$246.00
Sr Associate	$236.00
Supervisor	$195.00
Associate	$174.00
Sr Analyst	$143.00
Sr Staff	$154.00
Staff	$143.00
Project Analyst	$102.00
Admin	$92.00

Respectfully,

Christopher Wilson
Local Leader
Brown and Caldwell

HRSD High Priority Inflow & Infiltration Reduction Program

Hazen and Sawyer Categorical Rates (through September 7, 2026)

Job Title	Level	Hourly Rate
Vice President	17	$347
Associate Vice President	16	$336
Senior Associate	15	$305
Associate	14	$284
Sr. Principal Engineer	13	$242
Principal Engineer	12	$179
Principal GIS Analyst/Scientist	11	$179
Assistant Engineer II	10	$168
Sr. Principal Designer	9	$168
Assistant Engineer I	8	$147
Principal Designer	7	$126
Office Support	6	$91

Exhibit 2

The Miles Agency 2025 Billing Rate Schedule

Job Title	Rate/Hr
Sr Community Engagement Specialist	$ 300
Community Engagement Specialist	$ 150
Jr Community Engagement Specialist	$ 120

RJN Group, Inc.
2026 Compensation Schedule

Position Classification	Level	2025 Rate (1)	2026 Rate (2)
Project Directror	17	$ 340.00	$ 357.00
Sr. Project Manager	16	$ 300.00	$ 315.00
Technology Specialist	15	$ 275.00	$ 289.00
Technical Advisor	14	$ 225.00	$ 237.00
Practice Leader	13	$ 200.00	$ 210.00
Project Manager	13	$ 185.00	$ 195.00
Senior Project Engineer	12	$ 165.00	$ 174.00
Field Manager	11	$ 145.00	$ 153.00
Project Engineer	11	$ 145.00	$ 153.00
Sr. Apps Engineer	11	$ 145.00	$ 153.00
Staff Engineer	10	$ 140.00	$ 147.00
GIS Technician	9	$ 130.00	$ 137.00
Construction Manager	9	$ 130.00	$ 137.00
Software Aps Engineer	8	$ 120.00	$ 126.00
Engineering Technician	8	$ 120.00	$ 126.00
Senior GIS Analyst	8	$ 120.00	$ 126.00
Senior Designer	8	$ 120.00	$ 126.00
Graduate Engineer	8	$ 120.00	$ 126.00
Administrative Manager	7	$ 105.00	$ 111.00
Senior Resident Project Rep.	7	$ 105.00	$ 111.00
Senior Field Manager	7	$ 105.00	$ 111.00
Info System Analyst	7	$ 105.00	$ 111.00
Lead Info Sys Specialist	7	$ 105.00	$ 111.00
Lead GIS Analyst	6	$ 95.00	$ 100.00
Field Technician	6	$ 95.00	$ 100.00
Senior Data Analyst	6	$ 95.00	$ 100.00
Info. System Spcialist	6	$ 95.00	$ 100.00
Sr. Project Accountant	6	$ 95.00	$ 100.00

(1) 2025 Rates are effective 9/1/2024 - 8/31/2025
(2) 2026 Rates are effective 9/1/2025 - 8/31/2026

WRA ENGINEERING
TECHNICAL WAGE RANGES BY CLASSIFICATION
Effective July 27, 2025

Position		Rates
Senior Vice President	$	267.75
Vice President	$	245.41
Associate-Vice President	$	229.60
Associate	$	209.48
Senior Project Engineer II	$	192.86
Senior Project Engineer I	$	181.36
Senior Project Construction Engineer	$	185.51
Senior Project Architect II	$	191.51
Senior Project Architect I	$	162.64
Senior Project Landscape Architect	$	147.90
Senior Project Interior Designer	$	202.73
Senior Project Designer II	$	185.97
Senior Project Designer I	$	191.00
Senior Project Planner II	$	172.46
Senior Project Environmental Planner/Scientist II	$	163.20
Senior Project Environmental Planner/Scientist I	$	166.54
Senior Construction Manager II	$	177.86
Senior Construction Manager I	$	167.66
Project Engineer	$	150.40
Project Architect	$	138.21
Project Designer II	$	177.56
Project Designer I	$	157.77
Project GIS Specialist	$	171.36
Project Planner	$	152.69
Project Environmental Planner/Scientist	$	131.07
Project Geologist	$	142.49
Construction Manager II	$	145.58
Construction Manager I	$	124.95
Design Engineer	$	137.14
Construction Engineer	$	120.82
Senior Environmental Scientist/Planner	$	124.95
Senior GIS Specialist	$	152.36
Engineer	$	111.00
Architect	$	101.06
Data Analyst	$	98.18
Interior Designer	$	108.38
Landscape Architect	$	98.81
Environmental Planner/Scientist	$	92.74
Geologist	$	91.80
Safety Specialist	$	127.50
Real Estate Specialist	$	136.68
Planner	$	109.42
Senior Designer	$	138.82
Designer	$	108.22
CADD Technicians	$	97.16
Drafter / Draftsperson	$	110.29
Resident Engineer I	$	115.67
Inspector	$	93.05
Party Chief	$	124.01
Survey Technician II	$	96.59
Survey Technician I	$	70.89
Technical Specialist I	$	228.66
Security Analyst/Specialist	$	189.72

HRSD GUIDELINE

Reimbursable Charges Related to Professional and Non-Professional Services Guideline

Adopted: January 2013	Revised: January 2025	Page 1 of 3

EXHIBIT 3

1.0 Purpose and Need

These guidelines are established to provide staff with benchmarks for certain reimbursable costs that are typically negotiated as part of Professional and Non-Professional Services. HRSD typically negotiates Lump Sum Contracts for services associated with Capital Improvement Program projects and other similar work requiring assistance from consulting firms. These projects typically include some level of reimbursable costs that once negotiated are billed by the consultants as deliverables are completed for the project. For other less quantifiable projects a not-to-exceed budget is established. Using this contract format, the consultant provides monthly billing based on actual costs for both labor and other direct expenses. It is important that HRSD has a benchmark or internal guidance document for certain direct expenses that limits allowable reimbursable charges to HRSD and also fairly compensates consultants for their costs as part of their work.

2.0 Definitions

None specified.

3.0 Guiding Principles

Table 1 establishes guidelines for allowable direct expenses associated with Professional and Non-Professional Services. The limits shown in Table 1 are for general guidance only. The actual costs for the items listed will vary and could be significantly different.

4.0 Procedures

Consultants should invoice for the actual cost incurred but, if an actual cost exceeds the amount listed in Table 1, the consultant should provide documentation with the invoice on why the actual cost exceeded the recommended limit. Good judgment must always be used by HRSD staff and the consultants working for our organization when considering project-related costs. Table 1 includes only those items that are typically negotiated for Professional and Non-Professional Services. Other items not included in Table 1 should be negotiated as needed on a case-by-case basis. The costs listed are based on typical costs in the Hampton Roads Area. Reimbursable costs that occur outside this region will likely be different.

5.0 Responsibility and Authority

The Engineering Division will review this document annually for necessary changes to the guidelines or the limits shown in Table 1.

Table 1
Limits for Certain Reimbursable Items - Related to Professional and Non-Professional Services

Item	Unit	Max. Allowable Cost*	Comments	Metric used to set cost
Airfare	Roundtrip	**$700**	- Coach seating - Compared same flight itineraries using multiple airlines	Sunday – Friday travel to Chicago O'Hare Delta $346-$592 United $375-$603 American Airlines $349-$632 Southwest* $560-$707 Sunday-Friday travel to Charlotte, NC (non-stop) $615-$845 *Includes 2 checked bags
Airport Parking	Per Day	**$12**	- Long Term or Economy Lots	Norfolk $12 Newport News $10
Car Rental	Per Day	**$80**	- Standard Class Vehicle - Compared same trip information using multiple rental agencies - Sunday-Friday Airport pickup and drop-off.	Hertz $53 Enterprise $66 Budget $80
Hotel	Per night	**$210**	- Standard room - Based on the season	Fairfield Inn $102-$191 Comfort Inn $81-$160 Hampton Inn & Suites $102-$189 GSA $110-210
Mileage Rate	Per mile	**$0.70**	- IRS Guidance	IRS Rate currently $0.70 per mile
Meals	Per Day Per Meal	**$68** **$28**	- Meals & Incidentals	GSA: Breakfast $16 Lunch $19 Dinner $28 Incidentals $ 5 Total: $68
Taxi Service	$6.00 initial cost + $2.10 per mile + $0.30 per minute (waiting fee)	**$51**	21.2 miles from Norfolk International Airport to the Atlantic Plant	Taxigator Rates in Virginia Beach

*Note: If actual costs exceed limit, the consultant and/or HRSD Project Manager must document reason for overage.