

April 9, 2026

Giselle Hipolito, E.I.  
CITY OF HOLLYWOOD  
Department of Public Utilities  
Engineering and Construction Services Division Post  
Office Box 229045  
Hollywood, Florida 33022

City of Hollywood  
Phase 2 Infiltration and Inflow  
Reduction Program Assistance  
City Project No. 23-6021

Dear Ms. Hipolito:

Hazen and Sawyer, P.C. (Hazen) is pleased to offer engineering services for continued assistance to the Infiltration and Inflow (I&I) Reduction Program for the City of Hollywood's wastewater collection system. Support of this Phase 2 of the I&I Program will incorporate related requirements in the City's Consent Order 21-0392 with the Florida Department of Environmental Protection (FDEP).

**BACKGROUND**

The City of Hollywood (City) wastewater collection system includes approximately 85 sewer lift stations, 66 miles of force main, 240 miles of sewer gravity mains, and 4,399 sewer manholes. In April of 2022, the Department of Public Utilities (Department) issued a Request for Qualifications seeking Engineering Consulting Services for assistance in the development and implementation of a system-wide I&I reduction program. The City defined a two-phase program as described below.

- **Phase 1 – I&I Analysis.** Wastewater flow monitoring, rainfall measurement, and groundwater gauging for both dry and wet weather, along with tidal gauging where applicable. Data analysis and prioritization of basins recommended for I&I source investigation.
- **Phase 2 – Field Investigation and Repairs.** Detailed field investigations including video inspection, manhole inspection, smoke testing, and other methods as needed to identify specific sources of I&I in those basins identified as priorities during Phase 1. Phase 2 will also include repair and rehabilitation of identified defects.

The City's program also includes training for City staff so that longer-term management of the I&I reduction program is done using in-house resources.

At this time, the Phase 1 I&I Analysis has been completed. The goals of the I&I analysis were to understand the magnitude of I&I system-wide, and to prioritize pump station collection areas (basins) based on I&I severity so that follow-up inspection and rehabilitation work can be focused on those areas where the greatest I&I reduction potential exists. The I&I analysis included the following primary tasks:

- Compare system-wide water usage and wastewater flow records for the most recent available 12-month period.
- Characterize the overall system based on I&I severity and the approximate proportions of infiltration, inflow, and wastewater.
- Develop a wastewater flow database for individual pump stations, using a combination of third-party flow data from temporary meters, and SCADA-based wet well fill rates.
- Analyze wastewater flow data considering selected wet weather events and periods of high groundwater and/or tidal influence, as well as the so-called “night flow” time period between 1:00 AM and 5:00 AM when actual wastewater flow is minimal and the majority of flow is infiltration.
- Prioritize basins by I&I severity to help plan subsequent field investigation and optimize effectiveness of the City’s I&I reduction program.

The next step is to use the findings of the Phase 1 I&I Analysis to initiate Phase 2 of the I&I Reduction Program. The City had previously defined Phase 2 of the I&I Program as inclusive of field investigation and repair/rehabilitation, and the City is arranging to have multiple contracts in place that will allow investigation and repair/rehabilitation activities to be initiated without additional procurement-related delays. Key activities for investigation and repair/rehabilitation are summarized below.

## **Investigation**

- Smoke testing
- Manhole inspection
- Night flow isolation
- Video inspection – mainlines
- Video inspection – laterals

## **Rehabilitation**

- Excavated repairs – mains and laterals
- Manhole repairs
- Cured-in-place lining – mains
- Cured-in-place lining - laterals

The City is currently reviewing the findings of the Phase 1 I&I Analysis and assigning internal and contracted resources to implement the recommended work activities. This Scope of Services addresses engineering services to assist the City in initiating and implementing Phase 2 of the program.

On November 8, 2025, the City submitted a plan and schedule to reduce infiltration and inflow into the collection system (I&I Plan) to the FDEP as required under the Consent Order.

**Attachment A** contains the implementation schedule submitted to the FDEP as part of the I&I Plan. The Consent Order stipulates that I&I Plan implementation shall be completed within a five-year period.

This scope of services is intended to support the City's previously initiated I&I Reduction Program as well as newer I&I-related requirements under the Consent Order. In keeping with the City's stated intention that longer-term management of the I&I reduction program be done using in-house resources, Hazen's services as outlined herein are projected for the first year of the program, after which a transition to primary responsibility by City personnel will take effect. Should the City build up its in-house capabilities more slowly, Hazen will submit a future proposal for continuation of services.

## SCOPE OF SERVICES

Hazen will provide engineering services to assist the City with investigation and rehabilitation activities as required for I&I program implementation. It is anticipated that the work will be conducted using a collaborative approach that includes the performance of some subtasks by City personnel and the joint performance of other subtasks.

### **Task 1 – Project Meetings**

Hazen will conduct meetings at key points throughout the project:

- Project initiation for overall planning, coordination, and discussion of schedule.
- Pre-construction meetings for review and coordination concerning contractor assignments.
- Periodic intervals throughout the project for review of program status, priorities, and issues requiring coordination and resolution.

Hazen will prepare an agenda and minutes for each meeting.

### **Task 2 – Investigation Activities**

Hazen will perform investigation tasks to support the City's implementation of the I&I reduction program. It is anticipated that the following tasks will be required at various times throughout the program:

#### **Collect and Analyze Wastewater Flow Data**

- Confirm monitoring method (third-party meter, SCADA, or data logger) through consultation with City Operations personnel and field visits.
- Procure/install data loggers and subcontracted third-party meters.
- Download/analyze data at monitoring endpoint. Data analysis will focus on I&I metrics pursuant to the Consent Order.

## **Collect and Analyze Wastewater Salinity Data**

- For selected coastal basins, collect wastewater samples and submit to a subcontracted laboratory for chloride analysis via EPA Method 300. Review salinity results and characterize the extent of tidal influence suggested by the data.

## **Conduct Smoke Testing**

Coordinate, schedule, and manage smoke testing by a qualified subcontractor for identification of sources of inflow including the following program activities:

- Provide a specification for the smoke product to be used. Coordinate with the City concerning communications to residents. Provide adequate notification to the fire department and police department of the anticipated smoke testing schedule. Place door hangers in advance of the smoke testing to advise residents, in English and Spanish, of the tests. Ensure that operators who participate in the smoke testing are trained and briefed in the handling of residents and business owners who discover smoke in their buildings or in their yards.
- Smoke test gravity sewer mains using a high volume blower, along with smoke canisters or liquid smoke to generate the smoke. Smoke will be non-toxic, odorless, and non-staining. Document each case of smoke coming out of the ground, catch basins, pipes and other sources during the test and record: date and personnel; address and GPS coordinates of the smoke source; area and type of surface drained by the leak; designation as to whether defect is located on public (utility) property or private (customer) property; description of the defect; and, a digital photograph to show the maximum amount of smoke from the leak, the exact source of smoke, and the location of the smoke with reference to some recognizable topographic feature such as a building.
- Provide a report including the field inspection data as outlined above, a location map showing the location of each smoke source with respect to streets and avenues to establish the approximate location of the smoke source, and a photograph showing the exact location of the smoke source to facilitate follow-up location and repair.

## **Conduct Manhole Inspection**

- Inspect each manhole and record: cover defects enabling inflow into the system; susceptibility to ponding (submergence of the cover during wet weather); construction materials and conditions of cover, frame, chimney, corbel, wall, steps, bench and channel; special problems and conditions, such as surcharges; type and quantity of debris in the manhole; and, incoming and outgoing sewer lines connected to the manhole. Photograph the manhole physical conditions.
- Provide a report to document the physical condition of manholes, and present information obtained during the physical survey to estimate rehabilitation costs and select rehabilitation methods.

## **Analyze Smoke Testing Data and Develop Repair Recommendations**

- Process, evaluate, and electronically store the results of the smoke testing. Confirm preliminary repair recommendations. Record recommendations and a repair cost estimate for use in rehabilitation planning.

## **Analyze Manhole Inspection Data and Develop Repair Recommendations**

- Process, evaluate, and electronically store the results of the manhole inspections. Confirm preliminary repair recommendations. Record recommendations and a repair cost estimate for use in rehabilitation planning.

## **Perform Night Flow Isolation and Provide Video Inspection Recommendations**

- Analyze the system and select locations for night flow isolation. Access the manholes during the night flow period and document observations regarding sources and estimated rates of flow. Provide a brief summary report upon completion with findings and recommendations for follow-up video inspection and/or repair actions as warranted.

## **Review Mainline Inspection Video and Develop Repair Recommendations**

- Analyze inspection video and reports provided by a specialty sewer inspection contractor or by City forces. Record and document the nature and location of pipe conditions that may require intervention and/or correction, including offset or separated joints, protruding or damaged service connections, roots or solids accumulations, cracked or broken pipe, and other defects that may permit groundwater infiltration or compromise structural or operational integrity.
- Develop infiltration estimates, repair recommendations, and estimated costs as warranted. Develop a list of assets to be repaired based on review of videotapes and reports.
- Identify “suspect” laterals to be inspected at a later time using specialized equipment. (During inspection of the mains the camera will stop and pan the laterals to look for steady, clear flow indicative of infiltration. Actual television inspection internal to the laterals is not normally performed during mainline inspection. Based on the results of this inspection of the mains, a more informed decision can be made concerning the need for a focused lateral inspection program.)

## **Review Lateral Inspection Video and Develop Repair Recommendations**

- Analyze inspection video and reports provided by a specialty sewer inspection contractor or by City forces. Record and document the nature and location of pipe conditions that may require intervention and/or correction, including offset or separated joints, roots or solids accumulations, cracked or broken pipe, and other defects that may permit groundwater infiltration or compromise structural or operational integrity.
- Develop infiltration estimates, repair recommendations, and estimated costs as warranted. Develop a list of assets to be repaired based on review of videotapes and reports.

## **Task 3 – Rehabilitation Activities**

Hazen will perform rehabilitation tasks to support the City’s implementation of the I&I reduction program. It is anticipated that the following tasks will be required at various times throughout the program:

### **Office Engineering Services for Rehabilitation**

- Assist in procurement activities as needed for gravity sewer investigation and rehabilitation through “piggyback” contracting and/or development of bid documents and technical specifications.

- Coordinate project specifics, including project field issues, with City and Contractor throughout the project. Coordinate and document regular project meetings to address issues requiring discussion/resolution and/or actions by the City, Contractor, or others.
- Review pre-repair video documentation and make recommendations as to repair methodologies as defined by the unit price schedules in the City's existing contracts. Verify proper NASSCO Pipeline Assessment and Certification Program (PACP) coding and reporting by inspection Contractor. Develop a list of priority assets to be repaired and identify specific corrective actions as well as any special conditions and estimated costs.
- Organize the sewer rehabilitation activities into Work Orders for assignment to the Contractor. Provide detailed sanitary sewer maps that indicate the locations of all assigned repairs. Visit the site when needed to supplement information concerning the repairs and, if required, take photographs and measurements to support rehabilitation planning. Maps, and supplemental information as required, will be furnished with the Work Orders. Review the recommended rehabilitation activities and estimated cost for each Work Order with the City, for the City to indicate preferences concerning implementation and scheduling. In cases where repairs to the sewer system may affect City streets and/or storm water drainage facilities, work will be coordinated with City personnel responsible for the affected infrastructure.
- Issue Work Orders, as described above, to the Contractor. Review Work Order with Contractor and issue clarifications as required. Each Work Order will be scheduled and monitored for status and payment.
- Review post-repair video documentation for quality control and provide approval or remediation plan.
- Review the Contractor's applications for payment and accompanying data, determine the amount owed the Contractor, and recommend in writing payments due the Contractor. Coordinate with City procurement staff as required concerning use of any existing checklists or payment application procedures. In the course of Contractor pay request reviews, recommend specific repairs for warranty follow-up and provide a schedule of warranty expiration dates for use by the City.
- Review and process shop drawings and any other data which the Contractor is required to submit as noted in the construction contract documents. Determine the acceptability of materials and equipment proposed by the Contractor. Issue necessary technical interpretations and clarifications of the construction contract documents.
- Upon acceptance of completed work for payment, update a Program Database to show that the associated repairs were completed, record the date and actual cost of the repair, and designate specific repairs for warranty follow-up inspection.
- Provide a monthly report documenting repairs and issues requiring resolution. Conduct monthly meetings with the City's Project Manager to review progress and discuss issues requiring resolution.

## **Resident Project Representation**

- Provide part-time field representation, in accordance with the City's direction and assigned budget, over the course of the contract while sewer rehabilitation efforts are underway. Consult with and advise City and act as its representative. Schedule and coordinate field activities

between City and the contractors. Assist in obtaining from City additional details or information when required at the job site.

- Conduct observations of the work in progress to assist in determining if the work is proceeding in accordance with the construction contract documents and that completed work will conform to the construction contract documents. Report to the City and Contractor whenever Resident Project Representative (RPR) believes that any work is unsatisfactory, faulty or defective, does not conform to the construction contract documents, does not meet the requirements of any inspections, tests or approval required to be made, or has been damaged prior to final payment. Advise the Contractor and City when RPR believes work should be corrected or rejected. Advise the Contractor immediately of the commencement of any work requiring a shop drawing or sample submission if the submission has not been accepted. Visually inspect and review suitability and method of storage of materials, equipment and supplies delivered to construction site. Document the foregoing observations and opinions in construction field reports.
- Maintain orderly files for correspondence, reports of job conferences, shop drawings and sample submission, construction contract document addenda, change orders, field orders, additional drawings issued subsequent to the execution of the contract, clarifications and interpretations of the construction contract documents, progress reports, and other project related documents. Keep a daily diary or log to record daily activities, decisions, observations in general, and daily quantities of unit items installed or repaired. Advise City in advance of scheduled major tests, inspections, or the start of important phases of the work. Report to the City immediately when known by the RPR upon the occurrence of any accident.
- Before issuance of a determination of substantial completion, prepare a list of observed items requiring completion or correction.

#### **Task 4 – City-Directed Services**

This task is intended to provide for additional services, not currently defined, that may be requested and authorized by the City during the course of the project. Use of the associated budget is subject to specific authorization by the City.

#### **KEY ASSUMPTIONS**

The following assumptions apply to the overall scope of work described above.

1. This effort envisions significant interdependence among Hazen and City staff and will require timely action and clear communication with respect to information requests, joint or pre-requisite tasks, work product reviews, and other aspects of the project.
2. The work effort detailed herein assumes the City will assist with various information and work needs, including but possibly not limited to the following:
  - a. Management and coordination of City personnel and Contractors through office and field meetings to address issues requiring City input in the gravity sewer investigation and rehabilitation program.
  - b. Plans, specifications, and as-built drawings for existing facilities and infrastructure.
  - c. Identification of any private pump stations.

- d. Pump curves and motor and impeller data.
- e. Fixed and variable field data to be defined as part of the project.
- f. Data relative to the age and maintenance history of infrastructure and equipment.
- g. Access throughout the project to engineering and operations staff for field visit accompaniment and/or assistance if required and interviews to help supplement existing data and document existing conditions.
- h. Reports or other written material, including regulatory reports and/or correspondence.
- i. Identification of planned future improvements to be included in the system representation for buildout conditions.

## COMPENSATION

In accordance with Article 3.1 of RFQ-4717-22-OT, Phase 2 is expected to continue for four years with the fee to be submitted each year after completion of Phase 1. Hourly rates proposed for Phase 2 are as outlined in our 2023 General Consulting Agreement.

The engineering services for this project will be performed for the not-to-exceed amount of \$492,239. This amount consists of \$442,239 in labor (including a \$30,000 allowance for City-directed services) and an estimated \$50,000 in as-needed expenses. A fee breakdown is attached (**Attachment B**).

## SCHEDULE

It is anticipated that engineering services will be generally completed within 12 months from Notice-to-Proceed, after which primary responsibility for Consent Order I&I Plan compliance will be assumed by City forces or Hazen will submit a proposal for continued engineering services in support of the Phase 2 I&I Reduction Program.

Engineering services for the project will be performed as part of our Professional Services Agreement for Engineering Consulting Services for Infiltration and Inflow Program (Agreement) dated May 2022. Services provided by Hazen and Sawyer, P.C. shall be limited to those services specifically identified in this work order.

We look forward to your reply. In the meantime, should you have any questions, please contact us.

Very truly yours,  
HAZEN AND SAWYER, P.C.  
J. Philip Cooke, P.E.



Vice President

c: File No. 4321-016/1.0

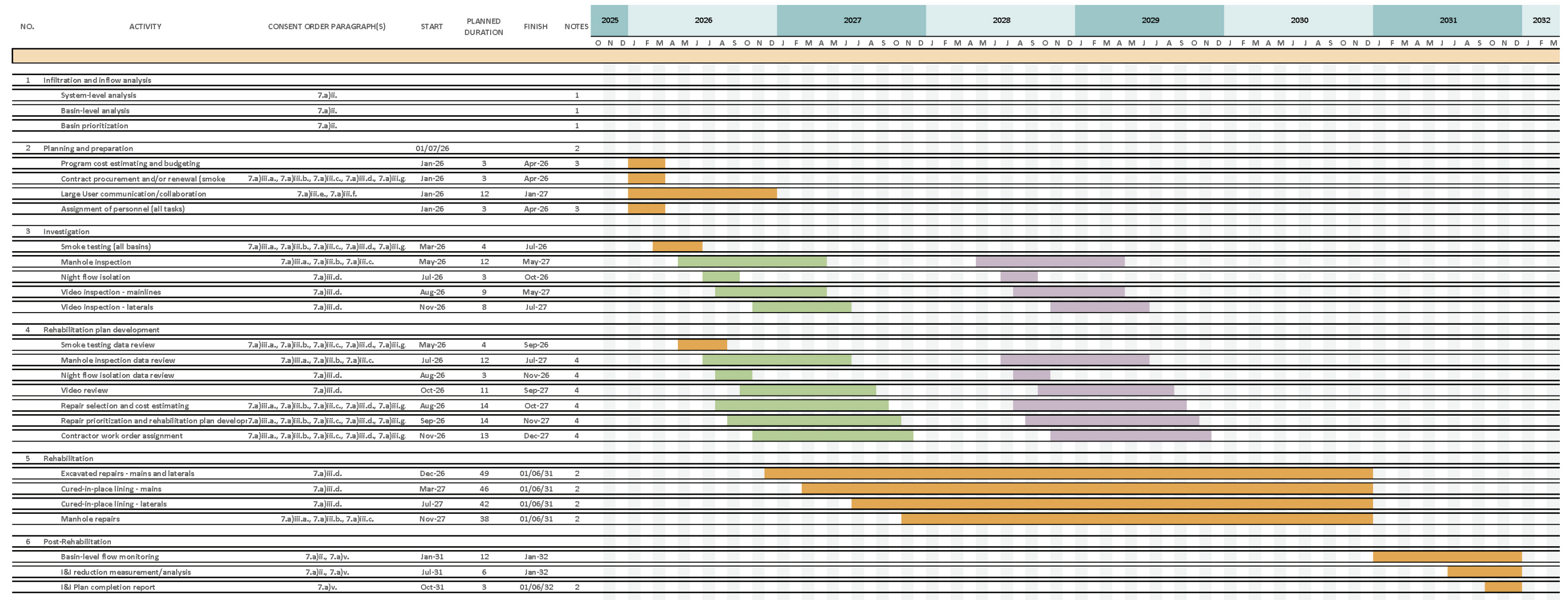
Attachments

## Attachment A

City of Hollywood  
Consent Order for OGC Case #21-0392  
Plan and Schedule to Reduce Infiltration and Inflow into the Collection System (I&I Plan)  
TECHNICAL REPORT

November 7, 2025

**Figure 5-1: Implementation Schedule for I&I Plan Implementation**



**Notes/Legend:**

1. Completed task.
2. Consent Order deadline.
3. Supports overall Consent Order program.
4. Start and Finish dates shown for Priority 1 basins.

 = Primary focus on Priority 1 basins.

 = Primary focus on Priority 2 basins.

 = System-wide or data-dependent focus.

**Attachment B**  
**City of Hollywood Wastewater Collection System**  
**Engineering Services Proposal for Phase 2 Infiltration and Inflow Reduction Program (Year 1)**

|                               |                |                  |                    |                    |                    |                                 |                          |
|-------------------------------|----------------|------------------|--------------------|--------------------|--------------------|---------------------------------|--------------------------|
| <b>Labor category:</b>        | Vice President | Senior Associate | Principal Engineer | Assistant Engineer | Principal Designer | Project Field Representative II | Administrative Assistant |
| <b>Rate for fee estimate:</b> | \$367.20       | \$332.07         | \$194.77           | \$118.14           | \$185.19           | \$159.65                        | \$89.40                  |

| No.                                     | Cost Item                                                                     | Hours     | Hours      | Hours      | Hours      | Hours     | Hours      | Hours     | Hours            | Total (\$)       |
|-----------------------------------------|-------------------------------------------------------------------------------|-----------|------------|------------|------------|-----------|------------|-----------|------------------|------------------|
| <b><u>Labor</u></b>                     |                                                                               |           |            |            |            |           |            |           |                  |                  |
| 1                                       | Project Meetings                                                              | 3         | 31         | 36         | 12         | 0         | 24         | 0         | <b>105.72</b>    | <b>\$23,564</b>  |
| 2                                       | Investigation Activities                                                      | 33        | 223        | 432        | 144        | 22        | 192        | 39        | <b>1084.68</b>   | <b>\$225,401</b> |
| 3                                       | Rehabilitation Activities                                                     | 24        | 131        | 252        | 84         | 26        | 264        | 57        | <b>837.6</b>     | <b>\$163,274</b> |
| 4                                       | Client-directed Services as needed                                            |           |            |            |            |           |            |           |                  | <b>\$30,000</b>  |
|                                         | <b>Total labor</b>                                                            | <b>60</b> | <b>384</b> | <b>720</b> | <b>240</b> | <b>48</b> | <b>480</b> | <b>96</b> | <b>2028</b>      | <b>\$442,239</b> |
| <b><u>Other direct costs (ODCs)</u></b> |                                                                               |           |            |            |            |           |            |           |                  |                  |
|                                         | Miscellaneous field expenses - wastewater flow monitoring, lab analysis, etc. |           |            |            |            |           |            |           |                  | \$50,000         |
|                                         | <b>Total ODCs</b>                                                             |           |            |            |            |           |            |           |                  | <b>\$50,000</b>  |
|                                         |                                                                               |           |            |            |            |           |            |           | <b>Total Fee</b> | <b>\$492,239</b> |