

## TOWN OF GREENWICH, CT – Representative Town Meeting

ITEM NO: **1**  
DEPARTMENT: Public Works 1408PW02  
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REFERRED TO: **Finance, Health & Human Services & Public Works Committees**  
VOTES: **BET Vote – 8–2–0 on August 4, 2014**

**RESOLVED, that the sum of \$3,100,000 be and the same is hereby appropriated to be added to Capital Account Number J361-59650-14207 known as “Sewer Rehabilitation (Large Diameter)”.**

### **EXPLANATORY COMMENTS:**

The Department of Public Works (DPW) Sewer Division is requesting \$3,100,000 for planned emergency repairs to the Shore Rd. & Horseneck La. large diameter sewers (see attached diagram). The following outlines this project and the critical need to keep it moving as quickly as possible.

DPW’s Sewer Division has a proactive infrastructure assessment program in place, routinely inspecting elements within both the plant and collection system. In late 2013, Town staff and our consultant, CDM Smith, visually inspected critical sewer infrastructure on the north and south side of Horseneck Brook, immediately east of Shore Road. These structures convey nearly all of the Town’s wastewater flow to the Grass Island Wastewater Treatment Plant (WWTP). The WWTP is permitted for 12.5 million gallons per day (mgd), and receives an average 8 to 9 mgd under most conditions. As the visual investigation showed deterioration, we moved quickly to conduct additional assessments as described below.

During the February 2014 BET budget hearings, DPW Sewer Division discussed this project and noted we would be pursuing it using funds already in our budget. We highlighted the potential need for an interim appropriation. At that time, the final condition assessment was not yet complete nor could rehabilitation costs be forecast. Slides from DPW’s presentation to the BET during the budget process are attached for reference. These slides show images of the February 2014 structural inspection that was performed on these structures. This included obtaining concrete core samples for visual and laboratory analysis. When results were obtained in Spring 2014, the deterioration in these structures was determined to be significant and worse than anticipated. As a result of concerns over the integrity of these systems and the consequences of their failure, we moved immediately into the design phase to facilitate repair / replacement.

The Sewer Division began working on several parallel tracks – designing the repair / replacement, planning the necessary bypass pumping, managing the permit process, coordinating with the Shore Rd. Bridge Rehabilitation/Reconstruction project, and working with the bridge contractor to develop a construction approach, costs, and schedule. As these structures carry virtually all the Town’s wastewater to the plant, it is a technically challenging project that must be planned carefully, even while being driven as an emergency.

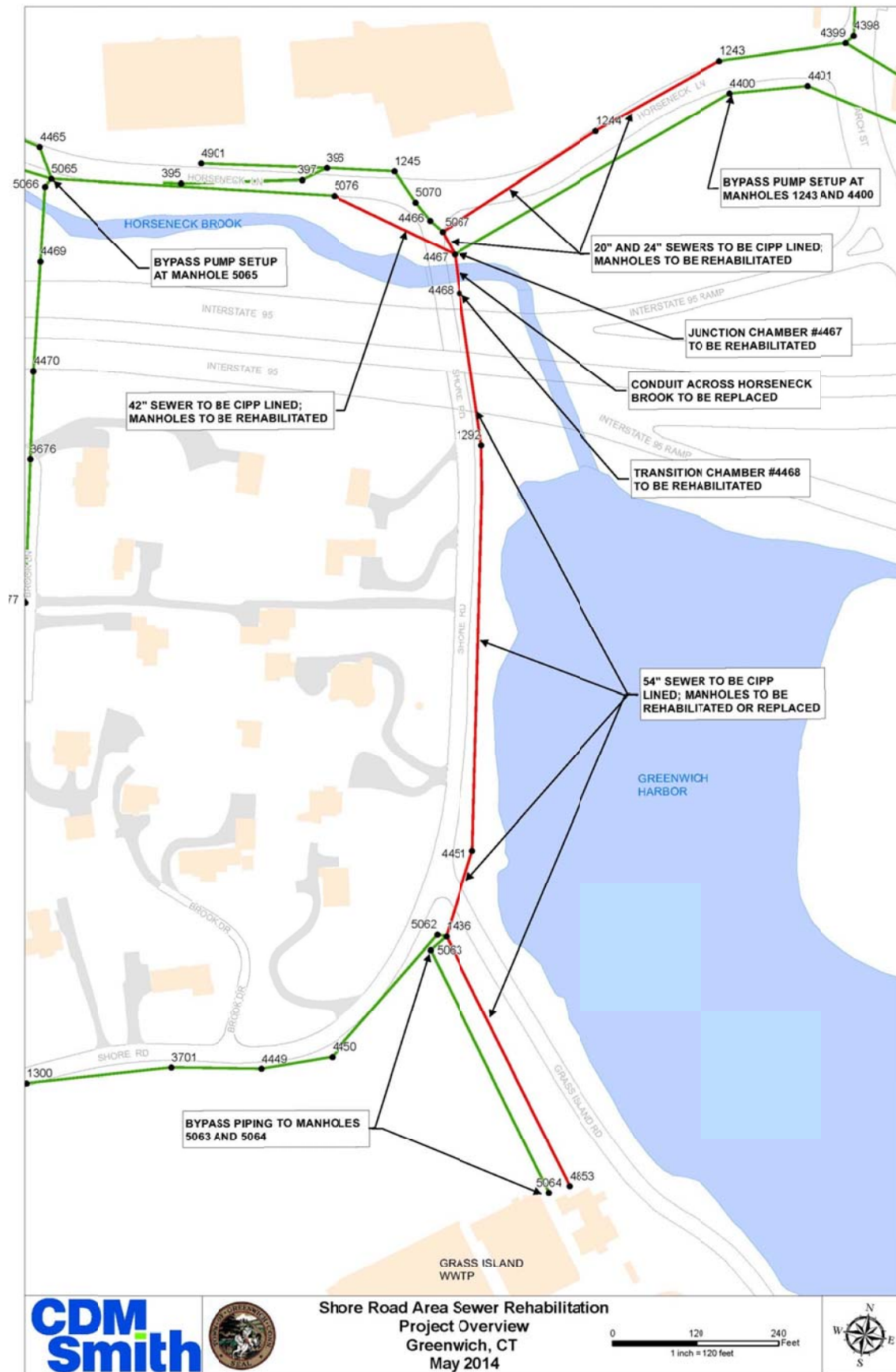
The resulting approach includes a combination of in-situ rehabilitation and replacement. This work will have no direct impact to surrounding adjacent watercourse areas, and takes full advantage of the cofferdam necessary for the bridge project. All permits are in place at this time. The bypass pumping system is fully designed, as is the repair. Only in the last few days of July 2014 did DPW obtain a final schedule of values to finalize the project budget. Upon receiving the budget, DPW found it does not have sufficient funds in its existing large diameter sewer maintenance accounts to cover the project. As a result, we are requesting funds to cover this very urgent project. Our planned schedule is to begin installing the bypass pumping system in August, so that we can begin the necessary construction in September and complete the project by Thanksgiving.

The cost estimates for performing this critical repair to the sewer line are \$ 5,600,000 (a breakdown of these costs is below). We currently have \$3,000,000 available in the "Sewer Rehabilitation (Large Diameter)" account. The request for \$3,100,000 will allow DPW to complete the repair to the sewer as well as continue other critical sewer rehabilitation projects that are currently in progress.

Summary of Key Project Components/Costs:

|                                                         |                   |
|---------------------------------------------------------|-------------------|
| Temporary Bypass Pumping (Installation and Operation)   | \$ 3,000,000      |
| Cured in Place Liner Systems (20"; 24"; 42" & 54" dia.) | \$ 1,100,000      |
| Replacement of Sewer Conduit across Horseneck Brook     | \$ 850,000        |
| Excavation, Road, Walk and Site Restoration and MPT*    | \$ 300,000        |
| Engineering Services during Construction                | <u>\$ 350,000</u> |
| TOTAL                                                   | \$ 5,600,000      |

\* MPT: maintenance and protection of traffic





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## SEWER DIVISION BUDGET REVIEW FEBRUARY 2014



## VALUE / NEED FOR REINVESTMENT IN WASTEWATER INFRASTRUCTURE

- Town's investment in infrastructure (2010 \$s):
  - Grass Island WWTP: estimated value new - \$125-\$150+ Million (without the new FEMA elevation revisions that would be required)
  - 185 miles sewer: estimated value \$300-400 Million (approximately \$300-\$400/linear foot)
  - 28 pump stations: estimated \$40-50+ Million
  - 28 force mains – Old Greenwich Common Force Main alone approx. \$30+ million replacement value
- Equipment runs 24/7, 365 days/yr in a corrosive environment
- Operations are highly regulated –subject to permit violations, fines, etc.

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# DON'T TAKE IT FROM US, HEAR WHAT OTHERS IN THE FIELD ARE SAYING...

## ■ Congressional Budget Office

- Performed a study in 2000 that highlighted projected costs for the nation's wastewater infrastructure
  - Lists \$13-20.9 Billion (in 2001 dollars) needed for wastewater between 2000 - 2019
  - Lists an additional need of \$20.3 - 25.2 Billion in operations and maintenance costs

## ■ American Society of Civil Engineers (ASCE)

- 2013 ASCE Report "Failure to Act - The Impact of Current Infrastructure Investment on America's Economic Future" showed the following:
  - Illustrates funding gaps on investment needs for nation's infrastructure and costs to businesses/households:
    - Estimates by 2020 the economy is expected to lose almost \$1 Trillion in business sales, resulting in a loss of 3.5 million jobs if infrastructure funding is not obtained and improvements made
- The latest ASCE Report Card for 2013 gave the wastewater infrastructure a "D"
  - Estimated \$298 Billion needed in water & wastewater over the next 20 years
  - Estimated \$59 Billion increased costs to households, \$147 Billion increased costs to businesses and \$416 Billion worth of losses to the GDP from water and wastewater infrastructure
  - Estimated \$2.6 Billion need in wastewater infrastructure needs for Connecticut

## United States Environmental Protection Agency (USEPA)

- Estimates nation must invest \$390 Billion over the next 20 years to update or replace existing wastewater systems & build new ones

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# WHAT HAPPENS IF WE DON'T DO IT NOW?

- **When projects put off – risk of failure increases – for critical systems, issues can be permit noncompliance, potential for environmental impact, potential fines/consent orders, increased expense to repair (est. 2-3X to repair on emergency basis vs. planned). Some emergency repairs have cost substantially more**
  - **Example: Old Greenwich Common Force Main** - December 2008 break - emergency repair efforts cost approximately \$260,000 to repair approximately 20-foot section of pipe (\$13,000 per foot) versus an estimated design, bid and construct value of between \$1,250 and \$1,500 per foot - roughly 10x greater than a planned replacement on a per linear foot basis.
- **We use asset management plans with our repair / performance data to adjust priorities and attempt to minimize "emergency" situations**
- **Unexpected/unpredictable circumstances can still arise that are hard to estimate**
- **Equipment and infrastructure continues to age, as it is used 24/7, 365-days a year – postponing typically results in higher costs, as the cost of construction, engineering, etc., typically increases each year**

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# SEWER REHABILITATION

- Currently available funds will be used for Large Diameter Critical Lines program:
  - In last 2-3 months, Sewer Division uncovered a few areas of critical concern including:
    - Two “home plate” structures just upstream of the Grass Island WWTP at the intersection of Horseneck Lane and Shore Road
    - These take just about all of the Town’s sanitary sewer flow
    - Also includes a 39-inch diameter reinforced concrete pipe (RCP) on Bruce Park Avenue
    - Bypass for both areas will be extremely difficult

**Design for both areas is being fast-tracked for 2014 construction!**

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## LARGE DIAMETER SEWER REHABILITATION

- Horseneck and Shore Road



**Images of structural investigation 6-7 February 2014**

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## LARGE DIAMETER SEWER REHABILITATION



### Structure interiors:

- Visible exposed reinforcing steel
- Concrete degradation



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## LARGE DIAMETER SEWER REHABILITATION



**39 inch pipe interior**  
**Visible reinforcement**  
**Concrete degradation**



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## LARGE DIAMETER SEWER REHABILITATION



**Structure interior  
Wall thickness loss**

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## LARGE DIAMETER SEWER REHABILITATION



**Cores taken for structural analysis, 6-7 February 2014**

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## BRUCE PARK AVENUE / DAVIS AVENUE SEWER REHABILITATION



**39 inch pipe flow bypass will involve setting up temporary pumps and bypass piping in this busy intersection of Bruce Park Avenue and Davis Avenue**

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## BRUCE PARK AVENUE / DAVIS AVENUE SEWER REHABILITATION



**Sanitary sewer line runs through resident's property, down driveway, through yards with limited/ difficult access. Line runs parallel with the railroad tracks that are behind the properties on Bruce Park Avenue**



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# LARGE DIAMETER SEWER REHABILITATION

- Bypass Flow for these projects may look similar to this



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# LARGE DIAMETER SEWER REHABILITATION



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# SEWER REHABILITATION FY14/15

- NO additional funds requested in FY 14/15
- At this time, expect to use all we have for these large diameter projects. Cost estimates to be developed during design.
- Potential for interim budget request depending on condition analyses and design needs.
- Delaying annual sewer rehab maintenance project to accommodate this critical sewer project.

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