

OFFICE OF THE TOWN ADMINISTRATOR



MEMORANDUM

DATE: March 14, 2019
TO: Town Council
FROM: Jeffrey D. Nutting, Town Administrator
Jamie Hellen, Deputy Town Administrator
RE: Fund for Study of Beaver Street Sewer Interceptor

We have received a quote of \$156,700 to do a general review of the interceptor which will provide options and proposed cost for dealing with the Interceptor. The study will take approximately 12 months and a final report will be provided to the Council.

Please see attached the summary of the proposal.

CC: Robert Cantoreggi, Public Works Director
Laurie Ruzala, Water and Sewer Superintendent



Sponsor: Administration

TOWN OF FRANKLIN

RESOLUTION NO.: 19-29
APPROPRIATION: Sewer Enterprise Fund Beaver St. Interceptor
TOTAL REQUESTED: \$ 156,700

PURPOSE: To appropriate funds from Sewer Enterprise Fund Retained Earnings for an engineering study of the Beaver St. Interceptor in the amount of \$156,700.

MOTION

Be It Moved and Voted by the Town Council that the sum of One Hundred Fifty-Six Thousand Seven Hundred Dollars (\$156,700) be appropriated/transferred from the Sewer Enterprise Fund Retained Earnings for an engineering study of the Beaver St. Interceptor.

DATED: _____, 2019

VOTED:
UNANIMOUS _____
YES _____ NO _____
ABSTAIN _____
ABSENT _____
RECUSED _____

A True Record Attest:

Teresa M. Burr
Town Clerk

Glenn Jones, Clerk
Franklin Town Council

Mr. Robert Cantoreggi, Director
Ms. Laurie Ruzala, Water and Sewer Superintendent
Department of Public Works
Town of Franklin
257 Fisher Street
Franklin, MA 02038

WATER DIVISION

Re: **Beaver Street Interceptor Renewal/Replacement
Alternatives Analysis**
Letter Proposal for Engineering Services

Date:
February 26, 2019

Mr. Cantoreggi and Ms. Ruzala

ARCADIS is pleased to submit this letter proposal to assist the Town of Franklin with its continuing efforts to monitor and maintain the Town's sanitary sewer system. The overall goal of this project is to evaluate the Beaver Street Interceptor, determine its physical and operational condition and consider alternatives for renewing or replacing the interceptor, either in its current location or in an alternative location.

Contact:
Scott Haynes

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781.213.4905

Email:
scott.haynes@arcadis.com

Background

The Beaver Street Interceptor (BSI) was originally constructed in 1914 and discharged to the former Franklin Wastewater Treatment Plant on Pond Street (a.k.a, the sewer beds). The BSI conveys over 70% of the Town's sewage and, on average, approximately 1.5 million gallons per day (mgd) of sewage flow through the pipeline. The interceptor includes 59 manholes and 2.3 miles (12,137 LF) of pipe, extending from the intersection of Cottage Street and Union Street to the easement behind Pond Street, near the Interstate 495/Route 140 interchange, where it discharges to the Mine Brook Interceptor. Due to its age and the percentage of the Town's sewer flows conveyed by the interceptor, the BSI is considered Franklin's most critical sewer asset.

Our ref:
04496057.0000

Since 2003, the Town has contracted for cleaning, internal investigation and condition assessment of the interceptor on a recurring 5-year basis. In addition, the Town has been monitoring flows in the BSI continuously since 2005. These studies, culminating with the July 2018, "*Collection System Master Plan – Phase 1*" Report recommended that the Town perform a Beaver Street Interceptor Renewal/Replacement Evaluation, including a full condition assessment of the BSI; a build-out analysis of all tributary areas; development and application of a hydraulic model; and a renewal/replacement alternatives analysis, including consideration of

Imagine the result

permitting and environmental impacts, accessibility and maintenance issues, and short-term and life-cycles cost analyses.

Scope of Work

This proposal consists of the following tasks as they pertain the Beaver Street Interceptor:

- 1) Current conditions assessment
- 2) Tributary area buildout analysis
- 3) Hydraulic model and capacity assessment
- 4) Renewal/replacement alternatives analysis
- 5) Findings and Recommendations Report

The specific work to be done under each of these tasks is discussed below.

Tasks 1 – Current Conditions Assessment

Under this Task, Arcadis will review and evaluate the current physical and operating condition of the Beaver Street Interceptor. We will describe the physical parameters of the BSI, including its size(s), materials of construction, location and routing, and previously identified defects, and its operating condition, including average and peak daily flows, availability capacity and O&M history.

Utilizing past inspections of the Beaver Street Interceptor pipeline and manholes, particularly the most recent (2014) cleaning and CCTV project, Arcadis will provide an updated and summarized evaluation of the physical condition of the BSI. We will also provide narrative on the recommendations from past investigations and update the condition assessments and recommendations, as warranted, based on the time which has elapsed since the last study.

Current flow data will also be summarized and used to evaluate the available capacity of the BSI (see Task 3, Hydraulic Model). We will utilize flow data from the 2018-2019 on-going flow monitoring of the BSI itself, as well as the extensive, Town-wide flow data collected utilizing 18 meters in 2017.

The physical condition assessment and flow data will be used in context of the Alternatives Analysis and Recommendations Report to be completed under Tasks 4 and 5.

Task 2 – Tributary Area Buildout Analysis

Using available information, including planning studies and growth projection information, Arcadis will evaluate the potential future population growth within the BSI tributary area. These projections will be used to estimate commercial, industrial and

domestic wastewater flows, and these flows will be applied to the BSI hydraulic model (Task 3).

The buildout analysis will consist of analysis of buildout potential for currently undeveloped parcels within the BSI tributary area. Due to the uncertainty of how currently developed lots might be redeveloped or repurposed, Arcadis will provide a general assessment of potential impacts as they pertain to increased flows within the sanitary sewer system and BSI. Going forward, the hydraulic model to be developed under Task 3 can be utilized to evaluate capacity impacts of unanticipated, future, new development or redevelopment.

Task 3 – Hydraulic Model and Capacity Assessment

Task 3 includes the development of system-wide hydraulic model. A system-wide hydraulic model is a valuable tool for future master planning, capacity assessments, build-out and development analyses and wet weather overflow abatement evaluations.

The hydraulic model will be used to evaluate the current and future available capacity of the BSI in support of the renewal/replacement alternatives analysis (Task 4). In the long term, the model will support evaluation of the sewer system as the community grows and changes over the next several decades, and it can be used to identify current and future collection system needs.

The model will focus in detail on areas of known capacity concerns, particularly the BSI, and span town-wide for all gravity sewers 12" in diameter or larger. The hydraulic model will be developed based on 2017 flow metering data, population and water use records, the Town's GIS and existing Record Drawing information.

Where required to complete the hydraulic model and capacity assessment, this task will include up to 2-days of field survey to collect elevations of manhole rims and/or inverts. This will be utilized in locations where GIS or record drawing information is not available and where topographic information not available or reliable.

Tasks to be completed for the collection system hydraulic model for focus areas will include:

- Selection of modeling software
- Development of baseline hydraulic model (gravity sewers, pump stations, force mains)
- Collection and incorporation of population and water use records or sewer flow data (2017 flow monitoring)
- Delineation of model sub-basins and flow load points to model network

Application of the hydraulic model will include development of calibration guidelines, estimation of base flow parameters and calibration and validation of the model. The

model will be calibrated using dry and wet weather flows and will incorporate future Town growth projections (Task 2).

Task 4 – Renewal/Replacement Alternatives Analysis

Baseline information from Tasks 1 – 3 will be used to conduct an alternatives analysis for renewal or replacement of the Beaver Street Interceptor. The alternatives analysis will include determination of the need and timing for renewal or replacement of the BSI, with consideration of factors including:

- Physical condition of the BSI pipes and manholes (from Task 1)
- Current flows and current and future capacity needs (from Task 1)
- Estimate of build-out potential and associated additional flows (from Task 2)
- Capacity needs (from Task 3)
- Alternative options for meeting the identified needs

Arcadis will evaluate the following alternatives to renew (rehabilitate in place) or replace the BSI:

- Rehabilitation of the BSI in place by cured-in-place pipe lining (CIPPL) or other dig or no-dig alternatives
- Replacement of the BSI along its current alignment
- Replacement of the BSI along two (2), technically feasible alternative routes. The alternative routes to be assessed will be determined in conjunction with the Town during the early stages of the project. One alternative route will be along Route 140 (East and West Central Street).

Factors to be considered and weighed in the Alternatives Analysis will include:

- Capacity needs
- Accessibility for operation, maintenance and future repairs
- Constructability
- Life-cycle costs, including short-term capital costs and long-term O&M costs
- Environmental impacts, risks and permitting
- Disruption to the public

Task 5 – Findings and Recommendations Report

This task consists of the development of Draft and Final Reports detailing all data and information collected and developed during Tasks 1 – 4. The Report(s) will also include recommendations, cost estimates and a proposed implementation schedule. DPW comments on the Draft Report will be addressed and incorporated into the Final Report.

Arcadis will meet with the Town throughout the project to provide updates and solicit input at all critical stages of the project. We also conduct or attend meetings to:

- Determine the alternative routes to be evaluated
- Discuss findings and recommendations from the alternatives analysis as the project progresses
- Deliver and discuss the draft and final reports
- Present the findings and recommendations to the Town Council, as requested

Engineering Fee

We propose to complete the work described above for a lump sum fee of **\$156,700**, as shown in the following table.

Task	Task Description	Fee
1	Current Conditions Assessment	\$8,800
2	Tributary Area Buildout Analysis	\$15,400
3	Hydraulic Model and Capacity Assessment*	\$54,200
4	Renewal/Replacement Alternatives Analysis	\$59,700
5	Findings and Recommendations Report**	\$18,600
Total:		\$156,700

*Includes field survey

**Includes meetings and workshops with DPW and presentation to Town Council

Schedule

We propose to begin work on this project upon receipt of a signed contract. Barring unforeseen delays, we anticipate completion of all tasks and deliverables within twelve (12) months of starting work.

We appreciate the opportunity to submit this proposal and look forward to continuing to assist the Town of Franklin DPW with your on-going efforts to investigate, operate, maintain and rehabilitate your sanitary sewer system.

Sincerely,
ARCADIS U.S., Inc.



Scott Haynes, PE, BCEE
Principal Engineer/Project Manager

Cc: Deacon Perrotta, Franklin DPW
Amy Anderson, Arcadis