
To:	Nathan Poore Town of Falmouth	From:	Mark Debowski Stantec
File:	195350480	Date:	December 6, 2017

Reference: Route 100 Sewer Study

EXECUTIVE SUMMARY

The Homestead Acres project sewer design will have no negative impact on the Route 100 project. The Homestead Acres project will add wastewater load to the Mill Road and Leighton Road pump stations via existing Town sewer mains, but these flows can be handled in the short term with current capacity and in the long term with future, low-cost upgrades to the Mill Road pump station.

The plan to send Homestead Acres wastewater flow to the Mill Road and Leighton Road pump stations using existing sewer mains presents opportunities to redesign the sewer in the Route 100 project, saving the Town money. Several alternatives were explored, and the recommended option is to utilize Alternatives 1A, 2B, 3B (Combination 3) for a total cost of \$1.2 million.

HISTORY

The Route 100 Vision Plan (May 2015) and the West Falmouth Sewer Master Plan (June 2017) propose sewer in the Route 100 area that utilizes a proposed pump station along Route 100 near Bell Antiques and Rich Exterior Solutions and sends the wastewater to the Leighton Road pump station. Both plans envisioned wastewater from future development on the approximately 80 acres of land bounded by I-95 to the west, Mountain Road to the north, Route 100 to the east, and Marston Street to the south utilizing this route. The Route 100 roadway reconstruction project followed the vision plan and sewer master plan.

During the final stages of the Route 100 roadway reconstruction design process, the proposed Homestead Acres project was initiated. As shown in the Sebago Technics Homestead Acres Conceptual Sewer Plan dated November 21, 2017, wastewater flows for the development are proposed to flow to the Leighton Road and Mill Road pump stations via existing sewer in the Route 100 right-of-way. The Town asked Stantec to evaluate whether the Mill Road Pump Station has capacity for this proposed flow. It is understood that the Leighton Road Pump Station has adequate capacity. At the same time, the Town also asked Stantec to evaluate additional sanitary sewer options along Route 100 that differ from the recommendations in the Route 100 Vision Plan of May 2015 because the estimated cost of sewer increased from conceptual design to final design. Thus, this report evaluates the capacity of the Mill Road pump station to accommodate flows from Homestead Acres and other future development while also exploring options to lower the cost of proposed sewer in the Route 100 area.

MILL ROAD PUMP STATION

Two questions emerge regarding the current sewer plan for the Homestead Acres development:

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- 1) Does the Mill Road Pump Station have capacity to handle the Homestead Acres flows of the development after it is fully built out?
- 2) Does the Mill Road Pump Station have future capacity to handle future flows envisioned in the West Falmouth Sewer Master Plan in addition to the Homestead Acres development?

Stantec performed calculations of the future wastewater flow to the Mill Road Pump Station. Stantec utilized information from the West Falmouth Sewer Master Plan, information gained in correspondence with Christopher Dwinall of Wright-Pierce, the co-author of the plan, and from correspondence with Robert McSorley of Sebago Technics, the wastewater engineer for Homestead Acres.

The findings are as follows, corresponding to the two questions above:

- 1) The Mill Road Pump Station currently has the necessary capacity to handle wastewater flows from the entire Homestead Acres development.
- 2) The Mill Road Pump Station has capacity for additional wastewater flows resulting from development, but not for the entire projected growth delineated in the West Falmouth Sewer Master Plan. Stantec found that upgrading the existing sewer pumps and their electrical services at a cost of approximately \$50,000 (in year 2018) will handle all the growth projected in the West Falmouth Sewer Master Plan, the Homestead Acres development, and additional property able to be developed along Route 100 north of Leighton Road and south of Mountain Road. No upgrades to the sewer force main leaving the pump station are needed. Upgrades to the Falmouth Road Pump Station, downstream of the Mill Road Pump Station, are currently planned by the Town and are outside the scope of this study.

ROUTE 100 SEWER COMPONENT ALTERNATIVES

This section of the memo corresponds with the concept plans attached in the appendix. A complete system consists of combinations of the alternative segments described below.

1. **Existing Conditions** – This plan details the sewer as it currently exists in West Falmouth. The properties currently served by sewer are shaded green.
2. **Full Route 100 Sewer Design** – This is the sewer design as it currently stands in the Route 100 reconstruction project. Properties shaded yellow are those that will be served by the additional sewer proposed in the Route 100 project. The most expensive portion of this design is the pump station located on Parcel U43-003, about one third of the entire proposed sewer cost. As described below in Alternatives 3A, 3B, and 3C, eliminating or reducing the cost of this pump station achieves cost savings.
3. **Alternative 1A – \$350,000.** This alternative shows the proposed sewer design in the Route 100 reconstruction project between Leighton Road and the existing sewer stub at Route 100 near the credit union. This alternative provides sewer service to the properties colored yellow and provides the opportunity for future sewer service to properties on Marston Street

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hatched orange if the sewer were to be extended there. The intent of breaking out this portion of the sewer design is to illustrate the relatively high cost of providing sewer to 6 properties with a combined area of approximately 5 acres. This cost of this portion of sewer is relatively high because of the deep sewer construction needed to avoid proposed drainage culverts.

4. **Alternative 1B - \$150,000.** This alternative provides a sewer extension that terminates at Marston Street. This extension does not serve any additional properties immediately but provides for future connection to Marston Street.
5. **Alternative 2A - \$200,000.** This alternative shows the proposed sewer in the current Route 100 construction plan between the high point near the Music and Arts store and the existing sewer stub south of the credit union. This section of sewer is available to receive wastewater flow from the southern end of the proposed Homestead Acres development with the addition of a sewer connection in the Route 100 right-of-way. The northern portion of the Homestead Acres development can send wastewater flow to the existing sewer along Route 100 with the addition of a sewer connection in the Route 100 right-of-way. This alternative is compatible with Alternatives 3A and 3C.
6. **Alternative 2B - \$550,000.** By deepening the sewer pipe, the gravity sewer can be extended past the crest of the hill near Music and Arts, thereby serving four additional parcels: U43-007/008 and U43-004 and two smaller parcels, U43-009 and U43-010-A . It is possible to receive wastewater flows from the Homestead Acres development as described in Alternative 2A. The cost of Alternative 2B is significantly higher than Alternative 2A because of the higher costs associated with placing deeper sewer. This alternative is compatible with Alternative 3B.
7. **Alternative 3A - \$1,050,000.** This alternative shows the proposed sewer in the current Route 100 construction plan between the high point near the Music and Arts store and Parcels U43-011 and U43-002 with one major exception: The pump station located near Bell's Antiques and Rich Exterior Solutions is smaller than what is currently proposed in the Route 100 construction project. This alternative is compatible with Alternative 2A and not 2B.
8. **Alternative 3B - \$300,000.** In conjunction with Alternative 2B, this portion of sewer serves the remaining properties not served by 2B. The force main shown in this alternative is a low-pressure sewer. Low-pressure sewer gives individual property owners the option of connecting to a town-owned small sewer force main in the Route 100 right-of-way by utilizing small, privately-owned grinder pump stations on each of their properties. Purchase and maintenance of the sewer connecting pipe and grinder pump station is the responsibility of each property owner. The Town operates two low pressure sewer systems in West Falmouth, one on Falmouth Road and one on Cleaves Farm Road and Maple Street. There are also private low-pressure systems that discharge into the Town's sewer system. The low-pressure sewer shown in this alternative empties into the existing gravity sewer at Mill Road.
9. **Alternative 3C - \$450,000.** Instead of utilizing a pump station at the low point near Rich Exterior Solutions and Bell's Antiques as seen in Alternative 3A this design includes low-

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pressure sewer going both directions up the hill. The southern end of the low-pressure sewer ties into proposed gravity sewer as seen in Alternative 2A.

COMBINATIONS OF ALTERNATIVES

There are over 30 possible combinations of the alternatives presented above. Stantec selected what we believe are some of the most relevant options.

- 1. The Original Route 100 Design based on Route 100 Vision Plan and West Falmouth Sewer Master Plan.** This combination serves all properties in the Route 100 area, but the proposed pump station is oversized if the Homestead Acres development utilizes the existing sewer lines and divides the flow between the Mill Road and Leighton Road pump stations.
- 2. Alternatives 1A, 2A, 3A - \$1.6 million.** This combination is the original Route 100 sewer design with a reduced size pump station. It is the most expensive combination of alternatives.
- 3. Alternatives 1A, 2B, 3B - \$1.2 million.** This combination serves all the properties served in the original Route 100 design while limiting low-pressure sewer. This option may be advantageous to the Town and future developers of Parcels U43-004 and U43-007 by allowing them to tie into gravity sewer instead of providing private pump stations.
- 4. Alternatives 1A, 2A, 3C - \$1.0 million.** This combination serves all the properties served in the original Route 100 design while making more extensive use of low-pressure sewer.
- 5. Alternatives 1B, 2B, 3B - \$1.0 million.** This combination matches Combination 3 except for not servicing the properties colored yellow in Alternative 1A. Proposed sewer between Leighton Road and Marston Street could be included as a bid alternate with the Route 100 construction project.
- 6. Alternatives 1A, 2B - \$900,000.** This combination serves all the properties in the original Route 100 design except for the properties in yellow in Alternative 3B. Parcel U43-010 could be served by an easement and future sewer gravity connection that brings wastewater into the proposed Homestead Acres development at the back (west side) of Parcel U43-010.
- 7. Alternatives 1B, 2A, 3C - \$800,000.** This combination serves all but the six properties colored yellow on the Alternative 1A plan and provides the option of future sewer extension to Marston Street.
- 8. Alternatives 1B, 2B - \$700,000.** This combination serves all the large properties along Route 100 that are most likely to include future development. Parcel U43-010 could be served by an easement and future sewer gravity connection that brings wastewater into the proposed Homestead Acres development as described in Combination 5 above.

ADDITIONAL CONSIDERATIONS

The costs indicated in this memo are costs when sewer construction is combined with the Route 100 roadway project. Costs to construct portions or all the sewer at a later date would involve cost increases in four ways:

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- A construction price inflation is anticipated over time.
- Construction unit prices are generally lower when combined with a larger construction project as would be expected in an economy of scale.
- Temporary and less expensive road repair can accompany sewer construction when the road will be reconstructed shortly after sewer is placed.
- Maine DOT requirements for road repair to a state-aid road within five years of reconstruction are more extensive and expensive than requirements for road repair at other times.

Stantec recommends constructing any anticipated sewer in the Route 100 vicinity during the road construction project because of the cost savings.

RECOMMENDATION

Stantec makes the following recommends:

- Utilize existing Town sewer for the Homestead Acres wastewater flows and divide flows between the Mill Road Pump Station and the Leighton Road Pump Station as described in the Sebago Technics Conceptual Sewer Plan dated November 21, 2017.
- The Town can plan for relatively inexpensive Mill Road Pump Station upgrades at some time in the future if future development warrants.
- Redesign Route 100 sewer to one of the combination of alternatives described above. Stantec recommends Combination 3 because Stantec believes it best accommodates future development and provides sewer access to all the properties envisioned in Route 100 Vision Plan.

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Attachments: Concept Plans, Homestead Acres Conceptual Sewer Plan

c. Pete Clark, Theo Holtwijk, Town of Falmouth