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60% Design Technical Memorandum

To:	Bruce Thomas, P.E. – Town of Hooksett	File: **2447.08**
From:	David J. Mercier, P.E., Senior Project Manager	
Cc:	Ed Rushbrook, Robert Saunders, Liz Philpott, Keith Pratt	
Date:	April 13, 2021	
Subject:	60% Design – Route 3A Utilities Expansion – Contract 1	

BACKGROUND

On January 22, 2020, Underwood Engineers submitted the final version of the Route 3A Utilities Expansion Project Planning Stage Technical Memorandum to the Town. That Memorandum recommended water and sewer utilities expansion in the Route 3A area of Hooksett under four major projects as follows:

Contract 1 – consisting of sewering the Phase 1 and Phase 2 areas, immediately surrounding the Route 93/ Exit 10 exchange. In addition to ~14,250 feet of gravity sewer, this contract includes construction of a new pump station serving the Kimball Drive area, a twin force main under the Merrimack River to transmit flows to the existing Martins Ferry Pump Station, and an upgrade of the existing Martins Ferry Pump Station.

Contract 2 – consisting of the Phase 3 construction of the Tri-Town Ice Arena Wastewater Pumping Station and gravity sewer main and water main through the Bayview Terrace Road and Meadowcrest Road neighborhoods to West River Road (3A) (~4,000 feet).

Contract 3 – consisting of the Phase 4 proposed gravity sewer main north of the Tri-Town Ice Arena Pumping Station to Hackett Hill Road (~4,800 feet).

Contract 4 – consisting of the Phase 5 gravity sewer main from the intersection of West River Road (3A) and Meadowcrest Road south to the Dunkin Donuts property (~5,700 feet), including a water main interconnection between the Hooksett Village Water Precinct and the Manchester Water Works (~3,650 feet). **Refer to the Workplan Drawings 1-3 for a graphical depiction of Contracts 1-4 (Phases 1-5) contained in Appendix A.**

The Town is committed to the expansion of utilities along the Route 3A corridor and to initiate that process, has authorized preliminary and final design to be performed on all four contracts. However, given the magnitude of these four contracts (~$21M) and limited funding currently available, a decision was made to give priority to the preliminary and final design of Contract 1 at this time. Preliminary and final design of Contract 1 is currently scheduled to be completed by June 2021, while the preliminary and final design of the other three contracts is currently anticipated for completion by the end of 2021.

The purpose of this Memorandum is to provide a description of the concepts being evaluated in the final design process. **The issuance of this 60% Design Technical Memorandum focuses on Contract 1. It will be amended over time to provide details on the other three contracts as the overall project progresses.**

CONTRACT 1 SUMMARY

The goal of Contract 1 is to establish municipal sewer service to the existing businesses that are within the Route 93/Exit 10 exchange area. Several of these existing businesses are known to have problematic private subsurface systems and several business owners have expressed a desire for municipal sewer service in the area. Given the limited Town funding available from the Tax Incremental Finance (TIF) zone that has been established, this project will focus on constructing sewers from the low point on Kimball Drive to the north and south sides of the Rte 93/Exit 10 exchange, ending at Rte 3A within a reasonable distance of the large businesses in order to make it affordable for them to construct additional sewer and sewer services to their individual businesses. In order for this concept to be successful, financial participation by Walmart, Bass Pro Shops, Market Basket, Dunkin Donuts and Subway will be required.

The proposed municipal sewer infrastructure to be constructed by the Town under Contract 1 includes a new wastewater pumping station located on a 0.5 acre easement between Quality Drive and Kimball Drive at the low point, new gravity sewer extending both north and south from the new Kimball Drive Pumping Station up to Rte 3A, a new double-barrel force main directionally drilled under the Merrimack River, and upgrades to the existing Martins Ferry Pumping Station on the east side.

The design flows being assumed in these evaluations are the projected 20-year flows for both the Kimball Drive Pump Station and Martins Ferry Pump Station.

GRAVITY SEWERS

Approximately 14,250 feet of gravity sewers are being designed under this contract (refer to ***Appendix A***). It is assumed that ~9,250 feet will be constructed by the Town and ~5,000 feet by local businesses wishing to connect.

A further breakdown would be ~4,250 feet by the Town and ~3,800 feet by local businesses in Zone 1, and ~4,100 feet by the Town and ~1,200 feet by local businesses in Zone 2. An additional ~900 feet along Rte 3A in Zone 2 would be constructed by the Town to serve residential homes, but that piece is recommended to be postponed to a later date when the need arises. All sewer pipe is proposed to be either 8" or 10" SDR-35 PVC sewer.

Workplan 1 in ***Appendix A*** shows the proposed Town constructed sewers in solid purple and green; the private business constructed sewers are shown in solid pink. The 60% design drawings for all of the new gravity sewers (except Technology Drive) consists of 17 sheets and is contained in ***Appendix B (Dwg No.'s C4-C20)***.

KIMBALL DRIVE PUMPING STATION

The Town of Hooksett is in the process of obtaining a 0.5 acre permanent easement on Lot 29-64-3 for construction of the new pumping station. The site is adequate in size to site a new submersible pumping station with room for growth and is accessible from both Kimball Drive and Quality Drive, with the main access being from Quality Drive.

Given the projected magnitude of wastewater flows, the pump station is proposed as a submersible pump station with the entire station fully enclosed within a small building footprint to provide ease of maintenance as well as protection from harsh winter weather conditions. The building consists of three sections including a) a fully-enclosed wetwell area which will house a grinder for the raw wastewater and two wetwells, each with a submersible pump; b) a drywell area which will consist of electrical and control components on the first floor level and a valve pit and flow meter on the below-grade level; and c) an enclosed building space to house a backup generator for the facility at ground level rather than in a stand-alone exterior enclosure.

The building structure will consist of concrete masonry unit block on the interior and split face architectural block on the exterior, with a flat, sloped concrete plank roof with membrane roofing. The overall dimensions of the proposed building are approximately 14' wide x 36' long with an 11' first floor ceiling height. The building layout can be seen on the 60% design floor plan included in ***Appendix B, Dwg No. P1***. The ground floor of the station will be constructed at elevation 188.0', 2-feet above the 100-year flood elevation for flood protection.

Essential to the design of the station is the estimated 20-year design wastewater flow and the eventual full buildout flow projection. Projected flows at this station are based on available data given that the majority of the properties in Zone 1 and Zone 2 are occupied and currently served by municipal water from the Manchester Water Works (MWW). Utilizing a combination of existing water meter data from years 2016 to 2018, and assuming reasonable allocations for development on undeveloped lots based on the Hooksett Sewer Commission's sewer use ordinance and NHDES commercial flow contributions guidelines, Underwood calculated the 20-year design and buildout flows which can be seen in ***Table 1*** below.

TABLE 1 –KIMBALL DRIVE PUMP STATION BASIS OF DESIGN FLOWS

Zone	20-year Flow Avg Day (GPD)	20-year Flow Peak Hour (GPD)	Build-out Flow Avg Day (GPD)	Build-out Flow Peak Hour (GPD)
Zone 1	56,000	168,000	141,000	423,000
Zone 2	16,000	48,000	28,000	84,000
KDPS Design Q	72,000	216,000	169,000	507,000

Note: A peaking factor of 3 was utilized as all flow is from commercial businesses assumed to be generated during the 8-hr work day.

From ***Table 1***, the average day and peak hour 20-year design flows for the Kimball Drive Pumping Station serving Zone 1 and Zone 2 are 0.072 MGD and 0.216 MGD.

Fortunately, both the projected 20-year and build-out design flows are reasonable for a single 10.1 pump to handle operating with a variable frequency drive motor. Two (2) pumps will be provided in duty/standby fashion, with one pump being capable of handling peak flows all the way to build-out. The pump can be operated from 352 gpm down to 175 gpm.

KIMBALL DRIVE PUMPING STATION FORCE MAIN

It will be necessary to convey flows from the Kimball Drive Pump Station to the east side of the river into the existing sewer. This will be provided by constructing a 1,000 linear foot long twin force main from the Kimball Drive Pumping Station to the Martins Ferry Pumping Station directionally drilled under the Merrimack River. The key constraints that exist for a directional drill are the need to maintain a minimum of 30 feet below the bottom of the riverbed at all points to minimize the potential for a "frac out", with a maximum pipe slope of 20%. In order to make cleaning/servicing of the directional drilled force main pipes easier, an access vault with valving will be constructed on both sides of the river.

Given the effort required to perform a directional drill of this magnitude, Underwood recommends that two independent force mains be installed side-by-side under the river (a double-barrel force main) to provide backup capacity should either of the force mains become compromised in the future. Evaluations of the cost of a single versus a twin force main indicates that the difference in cost is relatively small since a majority of the cost is in the drilling process and not the pipe materials. The valve vaults on both sides of the river will allow an operator to choose which of the force mains to have online at any given time.

It is recommended that the directionally drilled force mains be constructed of 6" high-density polyethene (HDPE) pipe, which will result in a velocity of 4.0 feet per second at the projected buildout peak hour flow of 0.507 MGD or 352 gpm. In order to provide a minimum desired flushing velocity of 2.0 feet per second, the minimum pump flow rate provided should be at least 175 gpm. (Refer to ***Appendix B, Dwg No. C3*** to view the 60% design configuration of the proposed double-barrel force main between the Kimball Drive Pumping Station and the Martin's Ferry Pumping Station.)

It is important to note that the Kimball Drive Pump Station will pump right to the existing Martins Ferry Pump Station. The existing Martins Ferry Pumping Station cast iron force main is only 8" in diameter, is 50+ years old, and will be difficult and costly to replace given it is located within the PanAm Railroad right-of-way. At some point in the near future, the economic hydraulic capacity of the 8" CI force main will be exceeded and replacement is advisable.

Two options that have been evaluated to deal with this issue are a) design new pumps for the Martins Ferry Pump Station sized to force the required flows through the existing 8" force main (results in the need for 167 HP pumps pumping at 273 feet of TDH), or b) design new pumps for the Martins Ferry Pump Station that are large enough to handle the next 5 to 10 years of flow utilizing the existing force main, and also sized appropriately to handle the 20-yr design flows through a new larger and shorter force main directionally drilled under the adjacent wetlands and onto and across land owned by Manchester Sand and Gravel to a new gravity sewer to the WWTF. Given the location, age, and condition of the existing force main, and the fact that the larger pumps that would be needed to continue to use it long term are large, costly, and operating at the very edge of their capability, we recommend that option b) be pursued and the 60% design information below reflects that. It should also be noted that the Hooksett Sewer Commission is in full agreement with this approach and is committed to replacing the force main in the near future.

MARTINS FERRY PUMPING STATION UPGRADES

The Martins Ferry Pumping Station was originally constructed in 1968 and underwent one major upgrade in 1985. New pumps and controls were later installed in 2006. The station is a wetpit/drypit station. The wet wells on the wetpit side of the station are extremely small by standard practices. The station houses an influent channel with a mechanical grinder which then discharges to the two wet wells, each with a capacity of only 1,300 gallons.

On the dry side, electrical and controls and the backup generator exist on the ground-floor level. Two centrifugal pump motors are also located at the ground level with drive shafts extending to the pumps at the basement level. A mezzanine level walkway/stairwell exists as well. The rated design capacity of the pumps, based on the 2006 upgrade, is indicated as 738 gpm at 130 feet TDH. Due to age of the equipment and/or the condition of the force main, pump tests performed by Underwood show the pumps currently max out at a flow of 650 gpm, or 88% of the initially rated capacity.

Current average flows to the Martins Ferry Pumping Station based on 5 years of data collected from 2015-2019 are 0.293 MGD. Because the chart recorder data is questionable in terms of calibration, the actual peak hourly flow is unknown. For the purpose of these evaluations, Underwood has assumed that the peak hour flow is equal to 650 gpm (0.936 MGD) because a second pump has not been called in the last year. This equates to a peak hour peaking factor of of 3.2.

Below in ***Table 2*** are the suggested 20-year design flows for the Martins Ferry Pumping Station, assuming 10% growth and the addition of the Kimball Drive Pumping Station flows.

TABLE 2 – MARTINS FERRY PUMPING STATION BASIS OF DESIGN FLOWS

	Current Flow Avg Day (GPD)	Current Flow Peak Hour (GPD)	20-year Flow Avg Day (GPD)	20-year Flow Peak Hour (GPD)
MFPS Basin	293,000	936,000	322,000	1,030,000
KDPS Basin	0	0	72,000	216,000
MFPS Design Q	293,000	936,000	394,000	1,246,000

Note: 20-year design flows include 10% growth within MFPS sewer shed plus Kimball Drive Pumping Station Flows

From ***Table 2***, the average day and peak hour 20-year design flows for the Martins Ferry Pumping Station are 0.394 MGD and 1.25 MGD. The existing lead/lag pumps are each 50 HP and the backup generator is a 60 KW unit. To accommodate the future 20-year design flows

using the existing force main, the pumps would have to be upsized to 150 HP and the backup generator would need to be significantly increased in size as well. Instead, we have designed the new 70 HP pumps to be able to handle short term peak flows up to 760 gpm (1.1 MGD) through the existing force main, and up to 1,078 gpm (1.55 MGD) through a new larger and shorter force main to the Manchester Sand and Gravel property.

In addition, Underwood recommends that the wet well capacity at the station be increased to prevent short cycling of the pumps during low flow periods overnight, and to accommodate new flows from the Kimball Drive Pumping Station. As a rule of thumb, the wet wells should be sized based on a filling time of 30 minutes or less at design average day flows. This would translate to 8,208 gallons at 0.394 MGD. The most cost-efficient way to accomplish this would be to provide additional wet well capacity (8,208-2,600=5,608gal) in the form of new exterior storage provided via a precast concrete tank installed immediately adjacent to the existing pumping station wet wells on the west side of the station.

For the 60% design, it has been assumed that a 10,000-gallon precast concrete storage tank would be provided as shown in the 60% preliminary drawings attached in ***Appendix B (Dwg No.'s C2, P4 &P5)***. Note: For the new tanks, not all 10,000 gallons is usable given the available pump operating band.

MARTINS FERRY PUMPING STATION FORCE MAIN EVALUATIONS

During 60% design development, Underwood investigated the condition of the existing 8" CI force main via pump flow rate and discharge pressure tests at the station. The existing pumps were designed in 2006 for 738 gpm, but in early 2020 were only able to pass 525 gpm. This suggested the force main might be constricted due to heavy scale buildup. However, after a series of investigations/corrections supervised by Underwood, including testing with temporary flow meters, replacing an inoperable air relief valve on the force main, and clearing the pump discharge lines and check valves at the station, it was determined that the existing pumps can pass 650 gpm through the existing 8" CI force main.

As noted previously, the force main will require replacement in the near future to economically pass future buildout flows.

COST OPINIONS

For Contract 1, Underwood has updated the conceptual cost opinion based on the 60% design documents. The 60% design engineer's opinion of probable project cost, including the design of Contracts 2-4, but not including business constructed sewers, is $9.27M. A breakdown is as follows:

Gravity Sewer south along Kimball Drive to Rte 3A serving Zone 1:	$2.73M
Gravity Sewer north along Kimball Drive and cross-country in Zone 2:	$1.54M
Kimball Drive Pumping Station:	$2.0M
Kimball Drive Pumping Station Force Main and Vaults:	$0.75M
Martins Ferry Pumping Station Upgrades:	$1.5M
Contribution to Pinnacle Hill Water Main Extension:	$0.0M
Final Design of Contracts 2-4:	$0.75M
TOTAL=	**$9.27M**

Business constructed sewers along Rte 3A and Technology Drive: $3.24M

For a more detailed breakdown of Contract 1 costs, refer to the cost opinions contained in ***Appendix C***.

FUNDING

The Town has the following available and proposed funding to put towards the Route 3A Utilities Expansion Project:

Available:	
Existing Remaining Funding from HSC	$1.2M
Existing Funding from 2019 Warrant Article	$2.5M
Existing Funding from TIF ($450K per year, 2018-2019)	$0.9M
Existing Funding from TIF ($150K per year, 2020-2022)	$0.45M
Subtotal	$5.05M
Proposed:	
Proposed Funding from 2022 Warrant Article	$2.45M
Subtotal	$2.45M
TOTAL	**$7.50M**

Notes:

1. Existing 2019 Warrant Article TD Bank Loan payment is ~$300K for 10 years (2020-2029).

2. Proposed 2022 Warrant Article assumes 20-yr bank loan at 2% or $143K/yr (2023-2042).
3. If the non-engineering portion of the 2019 Warrant Article loan ($1.25M) can be refinanced to a 20-yr bank loan at 2%, then an additional $1.2M can be borrowed with annual TIF income.

APPENDIX A

WORKPLAN DRAWINGS 1-3

ZONE 1

ZONE 2

ZONE 3

PHASE 1

PHASE 2

UPGRADE MARTIN'S FERRY PUMP STATION

FIGURE 1.

LEGEND:

- PROPOSED PRIVATE FUNDED SEWER
- PROPOSED GRAVITY MAIN PHASE 1
- PROPOSED GRAVITY MAIN PHASE 2
- FUTURE GRAVITY MAIN
- FM PROPOSED FORCE MAIN
- PRIVATE (PROPOSED)
- PRIVATE (EXISTING)
- PROPOSED PUMP STATION
- PROPOSED SEWER MANHOLE
- TIF ZONES
- TIF PARCEL
- NON-TIF PARCEL

SCALE: 1 INCH = 300 FT.

ISSUE FOR

	Date	By
APPROVAL		
CONSTRUCTION		
RECORD DRAWING		

NO.	REVISIONS	APP'D

Drawn/Chk. DBP
Designed
Checked
Approved
Date 7/17/2020
Book No.
Project No.
Dwg. ID
Scale

UNDERWOOD engineers
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RTE 3A SEWER

ZONE 1 & ZONE 2 OPTIMIZED

HOOKSETT, NH

DWG NO 1

SHEET 1 OF 3

FIGURE 2.

LEGEND:

- PROPOSED WATER MAIN
- PROPOSED PRIVATE FUNDED SEWER
- PROPOSED PRIVATE FUNDED WATER
- PROPOSED GRAVITY MAIN
- FUTURE GRAVITY MAIN
- FM EXISTING FORCE MAIN
- PROPOSED (PRIVATE)
- PROPOSED PUMP STATION
- PROPOSED SEWER MANHOLE
- TIF ZONES
- TIF PARCEL
- NON-TIF PARCEL

WATER AND SEWER DESIGN BY OTHERS

PHASE 1 (WATER ONLY)

PHASE 3

PHASE 4

PS

FM

SCALE: 1 INCH = 300 FT.

ISSUE FOR
APPPROVAL Date – By –
CONSTRUCTION Date – By –
RECORD DRAWING Date – By –

NO.	REVISIONS	APP'D

Drawn/Chk. DBP
Designed –
Checked –
Approved –
Date 4/27/2020
Book No. –
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Scale –

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RTE 3A SEWER
ZONE 3 NORTH OPTIMIZED
HOOKSETT, NH

DWG NO 2
SHEET 2 OF 3

PHASE 5

PROPOSED WATER INTERCONNECT BETWEEN HVWP AND MWW ≈ 3,650 FT

FIGURE 3.

LEGEND:

- PROPOSED WATER MAIN
- PROPOSED GRAVITY MAIN
- FM PROPOSED FORCE MAIN
- PROPOSED PUMP STATION
- PROPOSED SEWER MANHOLE
- TIF ZONES
- TIF PARCEL
- NON-TIF PARCEL

SCALE: 1 INCH = 300 FT.

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (

NO.	REVISIONS	APP'D

ISSUE FOR
APPROVAL Date _ By _
CONSTRUCTION Date _ By _
RECORD DRAWING Date _ By _

Drawn/Chk. DBP
Designed _ _
Checked _ _
Approved _ _
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Scale _ _

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RTE 3A SEWER

ZONE 3 SOUTH OPTIMIZED

HOOKSETT, NH

DWG NO 3

SHEET 3 OF 3

APPENDIX C

COST OPINIONS

4/13/2021

Opinion of Probable Construction Cost: Hooksett Zone 1

		Parcels Served	Linear Feet of Sewer					Number of:		Cost
		Total (TIF)	*Cross Country*	*Town Road*	*Comments*	*Along Route 3A*	*Crossing Route 3A*	*Manholes*	*Parcel Easements*	*Segment*
Publicly Constructed	**PS-3A via Kimball**	17(8)		5000			50	28	1	***$ 2,730,000.00***
Privately Constructed	***To Bass Pro/ Walmart***	6(6)				1335		6		$ 957,750.00
	To Regal	4(4)	1367			750		13	1	$ 1,170,950.00
	To NH Oncology	1(1)		300				1		$ 150,000.00

Opinion of Probable Construction Cost: Hooksett Zone 2

		Parcels Served	Linear Feet of Sewer					Number of:		Cost
		Total (TIF)	*Cross Country*	*Town Road*	*Comments*	*Along Route 3A*	*Crossing Route 3A*	*Manholes*	*Parcel Easements*	*Segment*
Publicly Constructed	**PS to 3A Quality**	31(14)	1925	1200			40	18	2	***$ 1,543,750.00***
Privately Constructed	***To Irving***	5(5)				1300		7	1	$ 960,000.00
Future	***To Gosselin Ave***	7(0)					1175	5		$ 1,250,000.00

Privately Constructed Total $ 3,238,700.00

Hooksett Rte 3A Sewer Construction Costs		
Item	**Unit**	**Costs**
Cross Country Sewer	LF	$350.00
Town Road Sewer	LF	$450.00
Town Road Deep Sewer (>12ft)	LF	$550.00
US Route 3A Sewer	LF	$650.00
Sewer Crossing Route 3A	LF	$1,000.00
Manhole	each	$15,000.00
Bridge Crossing	each	$200,000.00
Parcel Easements	each	$10,000.00
Sewer Under the River	LS	$750,000.00

Hooksett Water Main Construction Costs		
Item	**Unit**	**Costs**
Cross Country	LF	$250.00
Town Road	LF	$350.00
Route 3A	LF	$550.00
Hydrants	each	$5,000.00
Bridge Crossings	each	$200,000.00
Parcel Easements	each	$10,000.00

*Note: Water costs assume construction is concurrent with sewer. If constructed separately, costs will be higher.

HOOKSETT, NH
KIMBALL DRIVE PUMP STATION
60% DESIGN OPINION OF PROBABLE PROJECT COST

4/9/2021

ITEM	QUANTITY	UNIT	UNIT PRICE	PROBABLE COST
General Requirements (12%)	1	LS	$ 101,971.26	$102,000
SITE				
Site Work Allowance	1	LS	$25,000.00	$25,000
Excavation and Backfill	365	CY	$15.00	$5,475
Sheeting and Dewatering Allowance	1	LS	$200,000.00	$200,000
Parking Lot Subbase - Bank Run gravel, 12", compacted	185	CY	$25.00	$4,625
Parking Lot Subbase - Crushed gravel, 6", compacted	93	CY	$30.00	$2,775
Paved Parking Lot - 4" Bituminous Pavement	115	Ton	$120.00	$13,800
Fence and Gates	320	LF	$105.00	$33,600
Plantings Allowance	1	LS	$10,000.00	$10,000
Misc Concrete Pads	1	LS	$6,000.00	$6,000
Concrete and Geotechnical Testing Allowance	1	LS	$10,000.00	$10,000
Restoration allowance	1	LS	$5,000.00	$5,000
Precast Concrete Vault	2	EA	$20,000.00	$40,000
BUILDING				
CMU Walls	1406	SF	$ 29.00	$40,774
Split Face block exterior	1116	SF	$ 35.00	$39,060
Concrete Plank Roof	645	SF	$ 25.00	$16,125
Roofing Insulation	645	SF	$ 29.00	$18,705
Slabs	20	CY	$ 750.00	$15,000
Footings	18.70	CY	$ 750.00	$14,025
Foundations Walls	27.00	CY	$ 1,000.00	$27,000
Wetwell separation wall 12'x7.5'x0.67' and Inlet box	4.2	CY	$ 750.00	$3,150
Fill Concrete in Wetwell	6	CY	$ 750.00	$4,500
Painting Allowance	1	LS	$ 75,000.00	$75,000
Trim	1	LS	$ 5,000.00	$5,000
Mandoors/Doors	5	EA	$ 2,500.00	$12,500
Handrails, Beams, Miscellaneous Metals Allowanc	1	LS	$ 25,000.00	$25,000
Metal Stairs	1	LS	$ 8,500.00	$8,500
Diamond plate	152	SF	$ 75.00	$11,400
EQUIPMENT				
Grinder	1	EA	$ 40,000.00	$40,000
Sluice Gates	3	EA	$ 8,000.00	$24,000
New Submersible Pumps	2	EA	$ 11,500.00	$23,000
Aluminum floor hatches	2	EA	$ 7,500.00	$15,000
Valve Pit Sump Pump	1	EA	$ 1,500.00	$1,500
Sink and Dehumidifie	1	EA	$ 1,000.00	$1,000
FE, Lockout/lagout kit, Knoxbox	1	LS	$ 500.00	$500
Equipment Installation Allowance (35%	1	LS	$ 36,750.00	$36,750
PROCESS PIPING				
Inside PS				
6" DI Pipe	100	LF	$ 75.00	$7,500
6" 90 Degree Elbows	6	EA	$ 500.00	$3,000
6" Plug Valves	4	EA	$ 1,000.00	$4,000
6" Check Valves	3	EA	$ 1,500.00	$4,500
6" Wyes	1	EA	$ 750.00	$750
6" 45 degree elbows	1	EA	$ 500.00	$500
Presure gauge assemblies	2	EA	$ 500.00	$1,000
6" Bauer Fittings	2	EA	$ 500.00	$1,000
Plumbing Allowance	1	LS	$ 2,500.00	$2,500
Inside Vault 1				
6" Pipe	12	LF	$ 75.00	$900
6" 45 degree elbows	1	EA	$ 500.00	$500
6' 90 degree elbows	2	EA	$ 500.00	$1,000
6" Plug Valves	7	EA	$ 1,500.00	$10,500
6" Wyes	3	EA	$ 750.00	$2,250
6" Blind flange	2	EA	$ 250.00	$500
6" Tees	1	EA	$ 750.00	$750
Air/Vac Relief valve	1	EA	$ 7,500.00	$7,500
Inside Vault 2				
6" Pipe	6	LF	$ 75.00	$450
6" 45 degree elbows	4	EA	$ 500.00	$2,000
6" Plug Valves	6	EA	$ 1,500.00	$9,000
6" Wyes	4	EA	$ 750.00	$3,000
6" Blind flange	3	EA	$ 250.00	$750
Process Piping Installation Allowance (35%	1	LS	$ 22,347.50	$22,348
YARD PIPING				
PS to Vault 1				
6" DI Pipe	10	LF	$ 150.00	$1,500
6" 45 deg bends	2	EA	$ 500.00	$1,000
Vault 2 to SMH 1041				
8" SDR 35 PVC	20	LF	$ 300.00	$6,000
8" SDR 35 45 deg PVC bends	3	EA	$ 500.00	$1,500
Core existing SMH	1	LS	$ 2,500.00	$2,500
HVAC				
Gas Unit Heaters	3	EA	$ 7,500.00	$22,500
Ventilation Allowance	1	LS	$ 40,000.00	$40,000
ELECTRICAL				
Allowance	1	LS	$ 250,000.00	$250,000
SUBTOTAL				*$1,327,000*
Contractor OH&P - 15%				$199,000
Contingency - 10%				$133,000
TOTAL PROBABLE CONSTRUCTION COST				*$1,659,000*
Admin, Engineering and Construction Services				$331,800
TOTAL PROJECT COSTS YEAR 2021				***$1,991,000***

Notes:

HOOKSETT, NH
MARTINS FERRY PUMP STATION UPGRADE
60% DESIGN OPINION OF PROBABLE PROJECT COST

4/9/2021

ITEM	QUANTITY	UNIT	UNIT PRICE	PROBABLE COST
General Requirements (12%)	1	LS	$ 91,493.25	$91,000
SITE				
Demolish Propane Tank, Gas Piping and Pads	1	LS	$5,000.00	$5,000
Pump and Process Piping Demolition Allowance	1	LS	$10,000.00	$10,000
Site Work Allowance	1	LS	$5,000.00	$5,000
Excavation and Backfill of Wet Well	186	CY	$15.00	$2,790
Sheeting and Dewatering Allowance	1	LS	$200,000.00	$200,000
Wet Well Subbase - Crushed gravel, 12", compacted	20	CY	$ 30.00	$600
Parking Lot Repairs - 4" Bituminous Pavement	46	Ton	$ 120.00	$5,520
Remove and Replace Fence	1	LS	$ 5,000.00	$5,000
Concrete and Geotechnical Testing Allowance	1	LS	$ 2,500.00	$2,500
Restoration allowance	1	LS	$ 5,000.00	$5,000
Precast Concrete Vault for Wet Well	1	EA	$ 25,000.00	$25,000
Manhole risers and covers	3	EA	$ 750.00	$2,250
Fill Concrete in Wetwell	6	CY	$ 770.00	$4,620
Precast Concrete Bypass Pump Manhole	1	EA	$ 15,000.00	$15,000
Bypass Pumping	2	MO	$ 30,000.00	$60,000
BUILDING				
Structural Demolition	1	LS	$ 10,000.00	$10,000
CMU Wall Repair	1	LS	$ 10,000.00	$10,000
Painting Allowance	1	LS	$ 3,000.00	$3,000
Trim	1	LS	$ 5,000.00	$5,000
New Double Door	1	EA	$ 10,000.00	$10,000
Beams, Miscellaneous Metals Allowance	1	LS	$ 20,000.00	$20,000
EQUIPMENT				
Sluice Gates	2	EA	$ 8,000.00	$16,000
New Submersible Pumps	2	EA	$ 37,000.00	$74,000
Equipment Installation Allowance (35%)	1	LS	$ 31,500.00	$31,500
PROCESS PIPING				
Inside PS				
8" DI Pipe	17	LF	$ 100.00	$1,700
8" 90 Degree Elbows/Flared Ends	4	EA	$ 750.00	$3,000
8" Plug Valves	5	EA	$ 1,500.00	$7,500
8" 45 Degree Elbows	2	EA	$ 750.00	$1,500
8" Tees/Coupling	2	EA	$ 1,000.00	$2,000
8" DI Cross	1	EA	$ 1,500.00	$1,500
8"x6" Reducer	2	EA	$ 750.00	$1,500
6" DI Pipe	8	LF	$ 75.00	$600
6"x4" Increaser	2	EA	$ 500.00	$1,000
6" 90 Degree Elbows	4	EA	$ 500.00	$2,000
6" Plug Valves	2	EA	$ 1,000.00	$2,000
6" Check Valves	2	EA	$ 1,500.00	$3,000
6" Wyes	0	EA	$ 750.00	$0
6" 45 degree elbows	0	EA	$ 500.00	$0
Presure gauge assemblies	4	EA	$ 500.00	$2,000
Inside Bypass Manhole				
8" DI Pipe	3	LF	$ 75.00	$225
8"x6" Wye	1	EA	$ 1,000.00	$1,000
8" Plug Valves	1	EA	$ 1,500.00	$1,500
6" 45 degree elbows	1	EA	$ 500.00	$500
6" Plug Valves	1	EA	$ 1,000.00	$1,000
6" Bauer Fitting	1	EA	$ 500.00	$500
Process Piping Installation Allowance (35%)	1	LS	$ 11,908.75	$11,909
YARD PIPING				
PS to Wet Well				
8" DI Pipe	24	LF	$ 300.00	$7,200
8" Solid Sleeve Couplings	2	EA	$ 1,000.00	$2,000
Core existing Wet Well	4	LS	$ 2,500.00	$10,000
At Bypass Pump Manhole				
8" DI Piping	35	LF	$ 300.00	$10,500
8" Solid Sleeve Couplings	4	EA	$ 1,500.00	$6,000
ELECTRICAL				
Allowance	1	LS	$ 290,000.00	$290,000
SUBTOTAL				*$990,000*
Contractor OH&P - 15%				$149,000
Contingency - 10%				$99,000
TOTAL PROBABLE CONSTRUCTION COST				*$1,238,000*
Admin, Engineering and Construction Services				$247,600
TOTAL PROJECT COSTS YEAR 2021				***$1,486,000***

Notes: