Environmental Protection

Water Resource Protection

CSO – West High #019 - Mussey Street

This 2013 capital improvement item is for the funding of the separation at the top of the drainage area that affects the West High CSO #019. This inital phase of separation in the West High drainage area will eliminate 8 catch basins (CB's) at the top of Mussey Street. This work will connect on Clemons Street and involve Sprague, Mussey and Sixth streets in the area. These CB's are the last of the combined basins in the drainage area for the West High CSO. We recently installed a standby generator at the West High pump station that will reliably provide power generation to the pump station. We haven't seen a CSO overflow from #019 for better than a year. By removing the last of the inflow issues here, we're getting much closer to eliminating the CSO. A follow up Sewer System Evaluation Study being conducted over the next year will investigate any additional potential I/I that may need to be addressed in the West High collection system.

The funding is coming from two sources for a total project cost estimation of $200,000. A previously approved CSO Undesignated CIP account with a balance of $137,422 will be used with this request for the balance.

Project Cost:	$200,000	
Funding Source:	$ 62, 578	TIF Funds
	$137,422	Prior Year's CIP – CSO Undesignated
Source of Cost Estimate:	Wright-Pierce Engineers	
Projected Useful Life:	65 years	

COMBINED SEWER OVERFLOW FACILITIES PLAN UPDATE for the CITY OF SOUTH PORTLAND, MAINE

September 2008
(Revised October 2011)

WRIGHT-PIERCE
Engineering a Better Environment

1.2.3.5 Front Street CSO #018

The annual number of CSO events at Front Street has ranged from 0 to 6 per year between January 2002 and June 2008 with a total of 14 events and a total volume of approximately 6.0 million gallons. The following alternatives are targeted for further evaluation to address CSO events at the Front Street CSO #018:

- Stand-Alone Alternatives:
  - Alternative 1 - Infiltration/Inflow Removal
  - Alternative 2 - Collection System Capacity Increase
  - Alternative 4 - Off-Line Storage of CSO Flow
  - Alternative 5 - Satellite Treatment of CSO Flow (Swirl Concentrator)
- Combination Alternatives:
  - Alternative 7 - Combination of the following alternatives:
    - Alternative 2 - Collection System Capacity Increase
    - Alternative 4 - Off-Line Storage of CSO Flow
  - Alternative 8 - Combination of the following alternatives:
    - Alternative 2 - Collection System Capacity Increase
    - Alternative 5 - Satellite Treatment of CSO Flows (Swirl Concentrator)

1.2.3.6 West High Street CSO #019

The annual number of CSO events at West High Street has ranged from 1 to 6 per year between January 2002 and June 2008 with a total of 20 events and a total volume of approximately 5.0 million gallons.

In September 2008, the City discovered cross-connections between MH-4A-65 and MH-4A-70 and between MH-4A-64 and 4A-65A in District 4A, which may have been allowing wastewater that should flow to the main interceptor that runs along the Bike Path to flow to the West High Street Pump Station drainage area. The City plugged these cross-connections on September 3, 2008. On September 6, 2008, the City experienced a 5.5 inch rain event over a 12-hour period (100-year, 12-hour storm). CSO #019 experienced a 260,000 gallon overflow during this event.

Before the cross-connections were eliminated, this CSO could be expected to discharge approximately 300,000 gallons during a 1-year, 24-hour storm event or less. This CSO will continue to be monitored to determine the impact of eliminating these two cross-connections. It may be discovered that eliminating these cross-connections will eliminate CSO #019 up to a 2-year, 24-hour storm.

The following alternatives are targeted for further evaluation to address CSO events at the West High Street CSO #019:

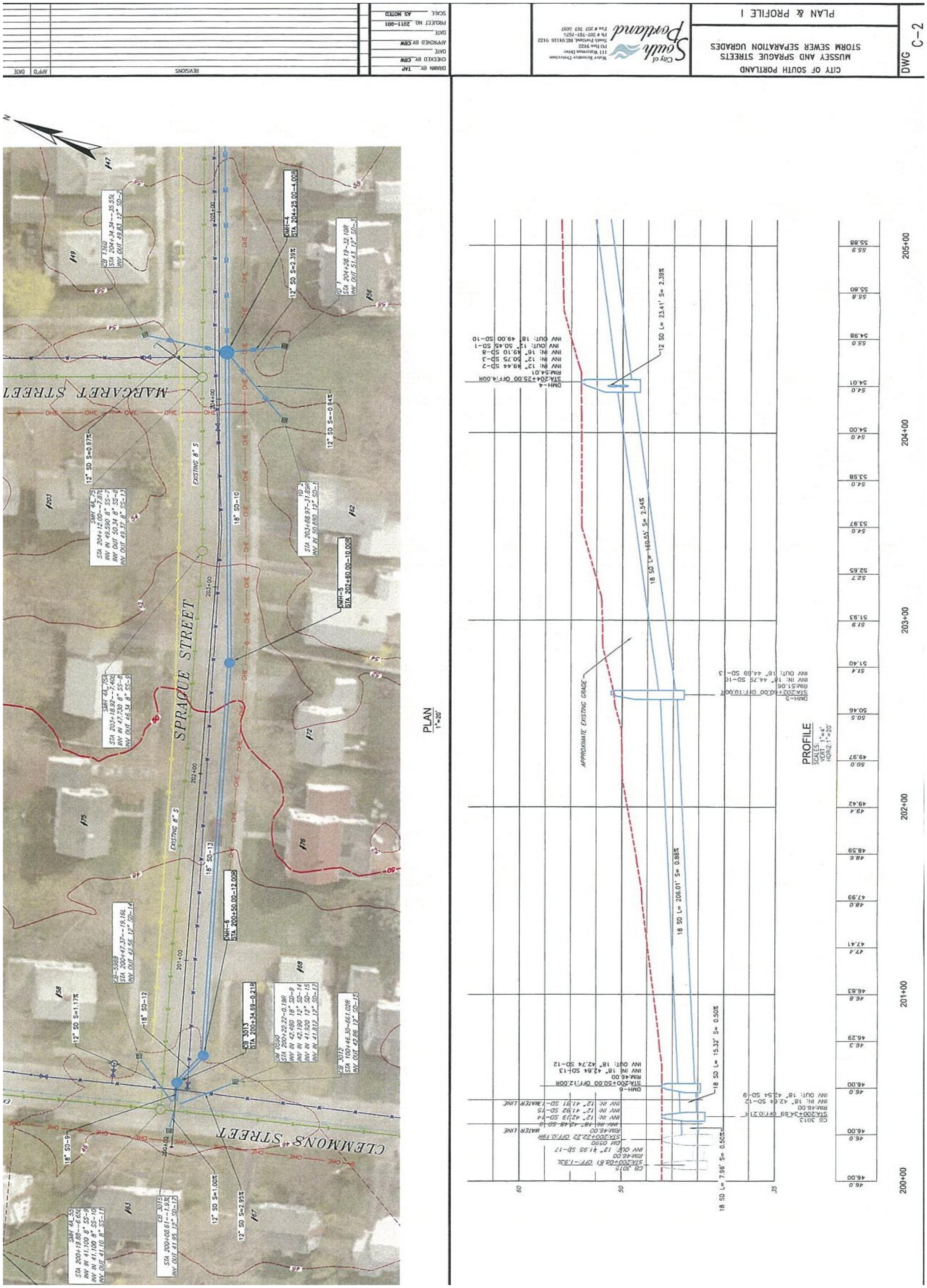
- Stand-Alone Alternatives:
    - Alternative 1 - Infiltration/Inflow Removal
    - Alternative 2 - Collection System Capacity Increase
    - Alternative 4 - Off-Line Storage of CSO Flow
    - Alternative 5 - Satellite Treatment of CSO Flow (Swirl Concentrator)
- Combination Alternatives:
    - Alternative 7 - Combination of the following alternatives:
        - Alternative 2 - Collection System Capacity Increase
        - Alternative 4 - Off-Line Storage of CSO Flow
    - Alternative 8 - Combination of the following alternatives:
        - Alternative 2 - Collection System Capacity Increase
        - Alternative 5 - Satellite Treatment of CSO Flows (Swirl Concentrator)

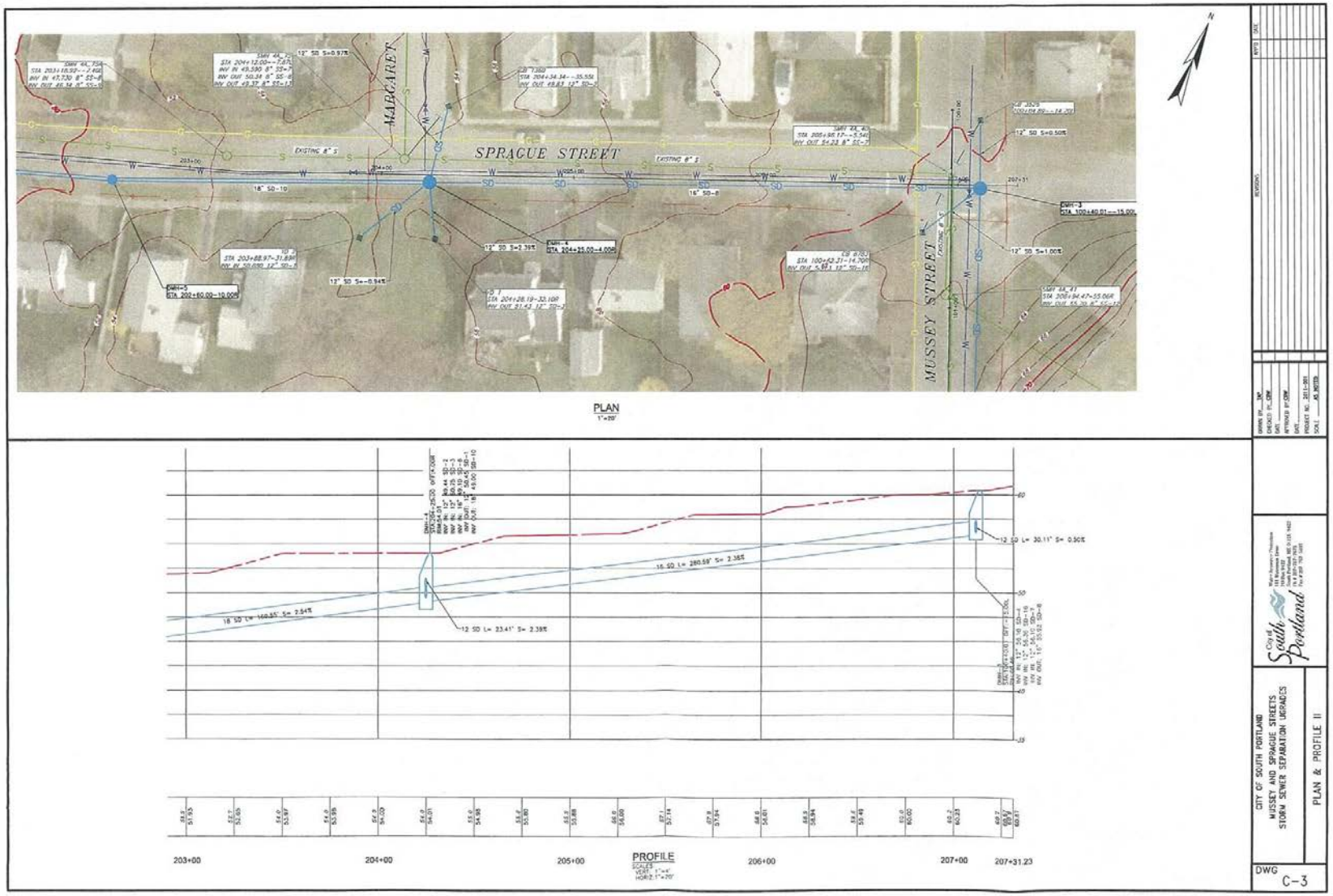
In addition, a large-scale sewer separation in downtown South Portland (Knightville), which will improve the possibility of CSO mitigation/reduction at West High CSO #19, Front Street CSO #018, and Elm Street CSO #024, has been recommended and is included in the 12-year implementation plan.

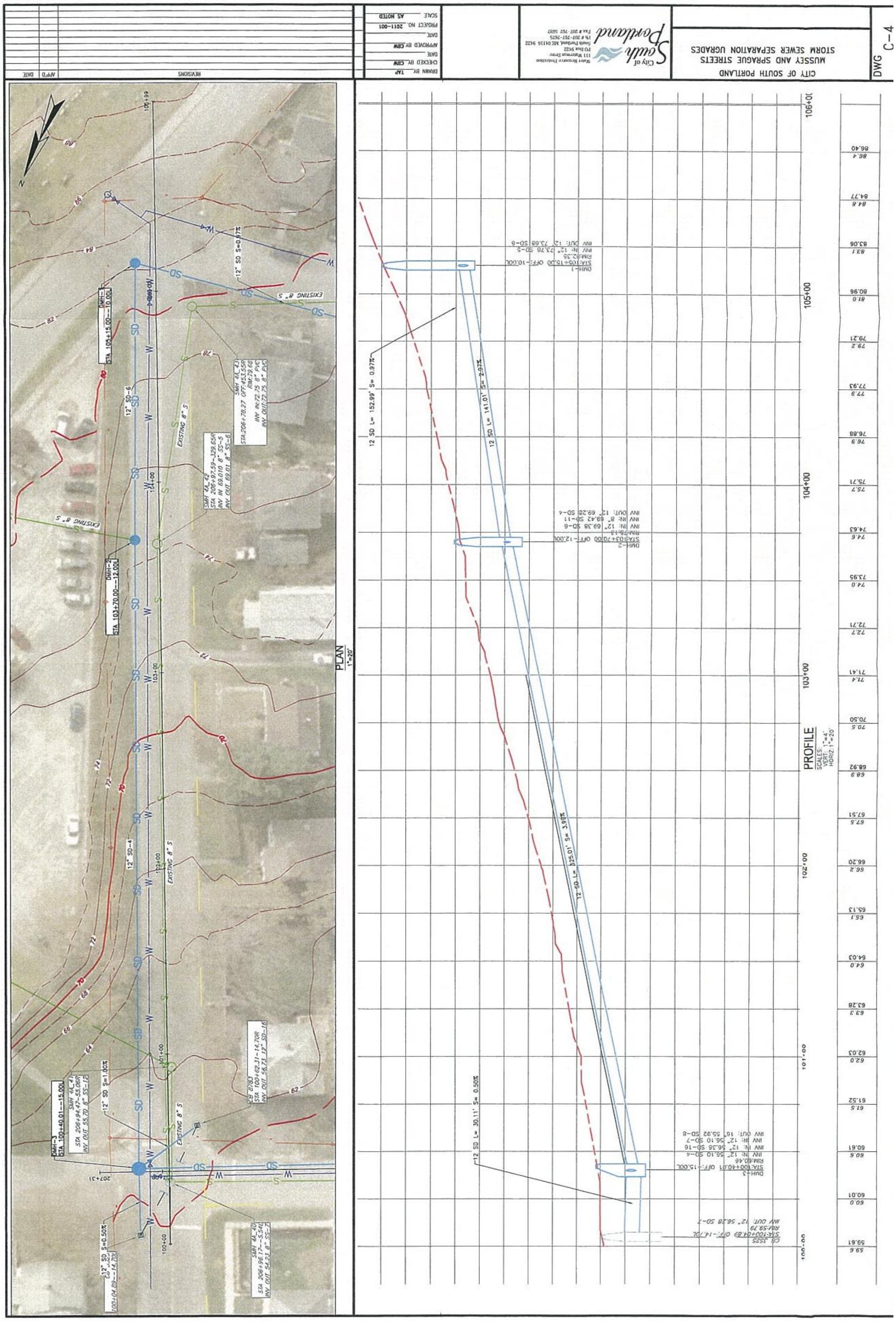
TABLE 10-1
PRELIMINARY 12-YEAR CSO ABATEMENT/ELIMINATION PLAN

CSO Location/Recommendation	Preliminary Cost Estimate	Target Completion Date
Phase 2		
• *Wastewater Screening*: Install a mechanical screen and wash press within a new addition to the Front Street Pump Station to eliminate blinding of the existing manual bar rack.	$1,500,000	2020
• *Collection System Capacity Upgrade*: Increase size of pipe between Front Street diversion structure from 18" to 36" to maximize flow to the pump station.		
Phase 3		
• *Flow Monitoring*: Monitor flow at CSO #018 to determine impact of collection system capacity and screenings upgrades	Included in existing operating budget	2021
• Conduct collection system flow monitoring, update SWMM modeling and reevaluate CSO Facilities Plan Update.	Included under Long Creek Phase 2	
West High Street CSO #019		
Phase 1		
• *SSES Investigation:* Conduct sewer system evaluation survey within the West High drainage area to determine the impact of cross-connection elimination and potential projects to completely eliminate West High Street CSO #019	$100,000	2012
• *Complete Mussey Street Separation*	$200,000	2012
• *Complete Knightville Sewer Separation Project Phase 1*	$256,000	2011
Phase 2		
• *Infiltration/Inflow Removal:* Depending upon the findings of the SSES investigation, conduct removal project(s) to reduce peak flows to the West High Street Pump Station.	Up to $500,000	2014
• *Complete Knightville Sewer Separation Project Phase 2*	$837,000	2012
Phase 3		
• *Collection System Capacity Upgrade*: Replace 21" interceptor between force main terminus manhole on Margaret Street to interceptor near Clemons Street with 27" pipe.	Included under Front Street CSO #018 Phase 1 cost	2018
• Lower operating levels at the Main Pump Station to reduce "stacking" issue along the main interceptor.		
• Bolt down manhole covers at manholes along Bike Path interceptor to eliminate flooding to grade.		
Phase 4		
• Conduct collection system flow monitoring, update SWMM modeling and reevaluate CSO Facilities Plan Update.	Included under Long Creek Phase 2	2021
TOTAL COST (2008 dollars, ENR 8361, August 2008)	**$13.44 million** [1]	

Notes: 1. Refer to Table 10-3 for the escalated cost over the 12-year implementation schedule, assuming a 3% annual inflation rate.
2. The improvements at the treatment plant, which are summarized in Section 10.3, have not been included in the implementation schedule.


CITY OF SOUTH PORTLAND
MUSSEY AND SPRAGUE STREETS
STORM SEWER SEPARATION UPGRADES
PLAN & PROFILE I
DWG C-2
SPRAGUE STREET
MARGARET STREET
CLEMMONS STREET
PLAN
1"=20'
PROFILE
APPROXIMATE EXISTING GRADE


MARGARET
SPRAGUE STREET
MUSSEY STREET
EXISTING 8" S
PLAN
1"=20'
PROFILE
SCALES
VERT. 1"=4'
HORIZ. 1"=20'
203+00
204+00
205+00
206+00
207+00
207+31.23
18" SD L= 160.85' S= 2.54%
15" SD L= 280.58' S= 2.38%
12" SD L= 30.11' S= 0.50%
12" SD L= 23.41' S= 2.39%
CITY OF SOUTH PORTLAND
MUSSEY AND SPRAGUE STREETS
STORM SEWER SEPARATION UPGRADES
PLAN & PROFILE II
DWG
C-3


CITY OF SOUTH PORTLAND
MUSSEY AND SPRAGUE STREETS
STORM SEWER SEPARATION UPGRADES
DWG C-4
PLAN
PROFILE

Environmental Protection

Water Resource Protection

Grit Truck – Body Only

This 2013 Capital Improvement Program request is for the purchase of a dumpster body to be installed on the Department's 1999 container vehicle.

The equipment is used to remove 7-yard dumpsters located at several of the City's wastewater pumping stations and treatment facility on a weekly basis. The dumpsters are used to hold sand and grit material removed through the wastewater treatment process until it is transported to a secure landfill site. The existing dumpster body is deteriorated with rust due to the leakage of dumpster contents and therefore needs to be replaced. However, the 1999 International chassis is in excellent condition with very low hours and mileage and should provide several more years of service. The replacement of only the body will save the department money while ensuring that this weekly task continues to be completed in a safe, timely, and cost effective manner. The project cost of $37,000 was obtained from a local equipment sales company.

Project Cost:	$37,000
Funding Source:	Sewer User Fund Reserve
Source of Cost Estimate:	Messer Truck Co., Inc.
Projected Useful Life:	10-12 years

MESSER TRUCK EQUIPMENT
170 WARREN AVE.
WESTBROOK, ME 04092
(207) 854-9751
Fax (207) 854-8042
www.messertruckequipment.com

Quote

Date	Quote #
12/5/2011	4384

Name / Address
CITY OF SO PORTLAND WATER RESOURCE PROTECTION P O BOX 9422 SO PORTLAND, ME 04116-9422

Attention	Terms	Sales Representative	Acct. Rep	P.O. No.
DAVE	Net 30	BOB TARDIFF	225	

Description	Qty	U/M	Total
CONVERTO HOIST SYSTEM (BUDGETARY PRICE) MODEL #78-H-20 with cross shaft PRICE INCLUDES Installation on 1999 INTERNATIONAL 7500 cab chassis with proper CA and automatic transmission Inside cab air controls 7" Cylinders , 3878 series chains and hooks LED lights (except back up lights) Painted dark blue 4' Jack leg cylinders , 3" contact cylinders , 7" lift cylinders NEW PTO AND PUMP	1	EA	37,000.00

We propose to furnish material and labor, in accordance with the above specifications. All material is guaranteed to be as specified. All work is to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the quotation. All agreements contingent upon strikes, accidents, or delays beyond our control. Owner to carry fire, tornado, and other necessary insurance. Our workers are fully covered by worker's compensation insurance. Any applicable Federal Excise Tax is not included in the above quotation. Quote valid for 30 days from date of issue.

Sales Tax (5.0%)	$0.00
Total	$37,000.00

Acceptance of Proposal - Sign and Return _____

Converto Mfg. Co., Inc.
Cambridge City, IN 47327

Convertainer Specification Sheet

Model No. 78-H-20

1. **Description** – The Convertainer is a truck mounted, hydraulically operated hoisting mechanism designed to handle detachable containers in a variety of types and sizes. It consists of (2) boom assemblies pivoted at the rear of a flatbed surface. Jackleg stabilizers are to provide support during the loading and unloading process. The J-hook/Contact cylinder permits containers to be handled and dumped with stability and control.

2. **Subframe** – All welded steel construction consisting of two (2) 10-inch 15.3# channel longitudinal members, box section front and rear crossmembers, 1/4" steel deck, 1/4" inner and 1/4" outer steel side panels, with heavy duty bosses for cylinder and arm pivots.

3. **Boom** – The boom consists of two (2) all welded, box section lift arms constructed of 1/4" steel and connected at the base with a 3" diameter load shaft. The arms pivot in heavy duty bronze bushings in the subframe. The arms are held in place by 6 capscrews, no shear pins. At the top of each arm are two (2) 1/2" lift chains suspended from a 2 1/2" diameter cross shaft which ties both arm assemblies together. Each arm assembly is operated by a double acting hydraulic cylinder.

4. **Hydraulic System** – All hydraulic cylinders are self bleeding type. The reservoir is 26 gallon capacity mounted at the front of the unit. The hydraulic tank has a vented filler cap and a sump type oil filter. A three spool 4-way directional valve is mounted under the front center floor decking accessed through a door in the floor. The hydraulic pump is gear-type, driven by a transmission mounted power take off, with a driveline between it and the P.T.O. or the use of an optional P.T.O./Pump combination. All hoses and fittings are high pressure type with a burst pressure rating at least four times the operating pressure.

5. **Jacklegs** – The hydraulic operated jacklegs are ground seeking, mounted in outrigger extensions of the subframe side plates at the rear of the hoist, one on each side. These are to be operated vertically during the working stroke. The full swing jacklegs are designed to prevent damage if the truck is driven off with them in the down position.

6. **Individual Components Minimum Specifications**

Pump:	30 GPM at 1200 RPM, 2500 P.S.I. rating
Normal working pressure:	1850 P.S.I.
Direction valve:	To have 3 spools, each spool 4-way with internal Relief and flow control built in
Cylinder Packing:	To be "V" type with wiper seals
Jackleg cylinder:	4" bore x 13 1/4" stroke x 3" rod
Contact cylinder:	3" bore x 5" stroke x 2 1/2" rod
Lift cylinder:	7" bore x 39" stroke x 3" rod
Hoist Model No. Identification:	78 means boom length in inches H – stands for hoist With lifting capacity of 20,000 lbs.

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Environmental Protection

Water Resource Protection

Knightville Separation

This 2013 capital improvement item is for the second phase of the separation of the Knightville area streets. This second phase of the project is for the Ocean Street, Cottage Road, and E Street separation portion of the work as well as the road, sidewalk, and street light reconstruction for the section of Ocean Street from the City Hall parking area to Waterman Drive at Thomas Knight Park. There is also the same work on Cottage Road from Hinckley Drive to the Round-a-bout. This is being proposed as the second phase of the separation and road work that was completed this fall as Phase I.

The work will include the Area's outlined on the attached project map. Area 2 - Ocean Street, Area 4 - Ocean Street/E Street, Area 5 - Cottage Road/F Street, and Area 6 – E Street. The project is much more complicated given that other utility companies will be replacing all their utilities while the City has the streets open. The Portland Water District will be replacing all its water lines within the Ocean Street and Cottage Road construction areas as well as the gas lines by Unitil. For the City's part, the project will be eliminating 33 catch basins from the sewer and providing stormwater hookups to the businesses down Ocean Street as long as they agree to hook up to the line provided at their cost. This will eliminate a significant amount of stormwater from the sewer lines in the area and provide some drainage service to the businesses. The sidewalk replacements are going to widen the sidewalk for the city to provide sidewalk plowing in the winter and the street lights will be replaced with upgraded LED systems for cost efficiency placed at strategic locations to keep enough adequate light and enhance appearance.

Ocean Street and Cottage are also considered State Aid Highways which gave the City the opportunity to apply for a grant to do the street reconstruction improvements. The City was awarded a $500,000 grant to do the work as long as the grant amount was matched by the City through the MDOT Municipal Partnership Initiative.

The project is slated to start April 15, 2012 and last through to November 15th

Project Cost:	$1,700,000
Funding Source:	TIF Funds
Source of Cost Estimate:	Sebago Technics Engineering
Projected Useful Life:	65 years

KNIGHTVILLE SEWER SEPARATION AND STREET IMPROVEMENTS PHASE II

PROGRESS PRINT

CITY OF SOUTH PORTLAND, MAINE

SCALE: 1" = 1'

LOCATION MAP N.T.S.

OWNER:

CITY OF SOUTH PORTLAND
P.O. BOX 9422
SOUTH PORTLAND, ME 04116

ENGINEER / SURVEYOR:

Sebago Technics
Engineering Tomorrow You Can Build On

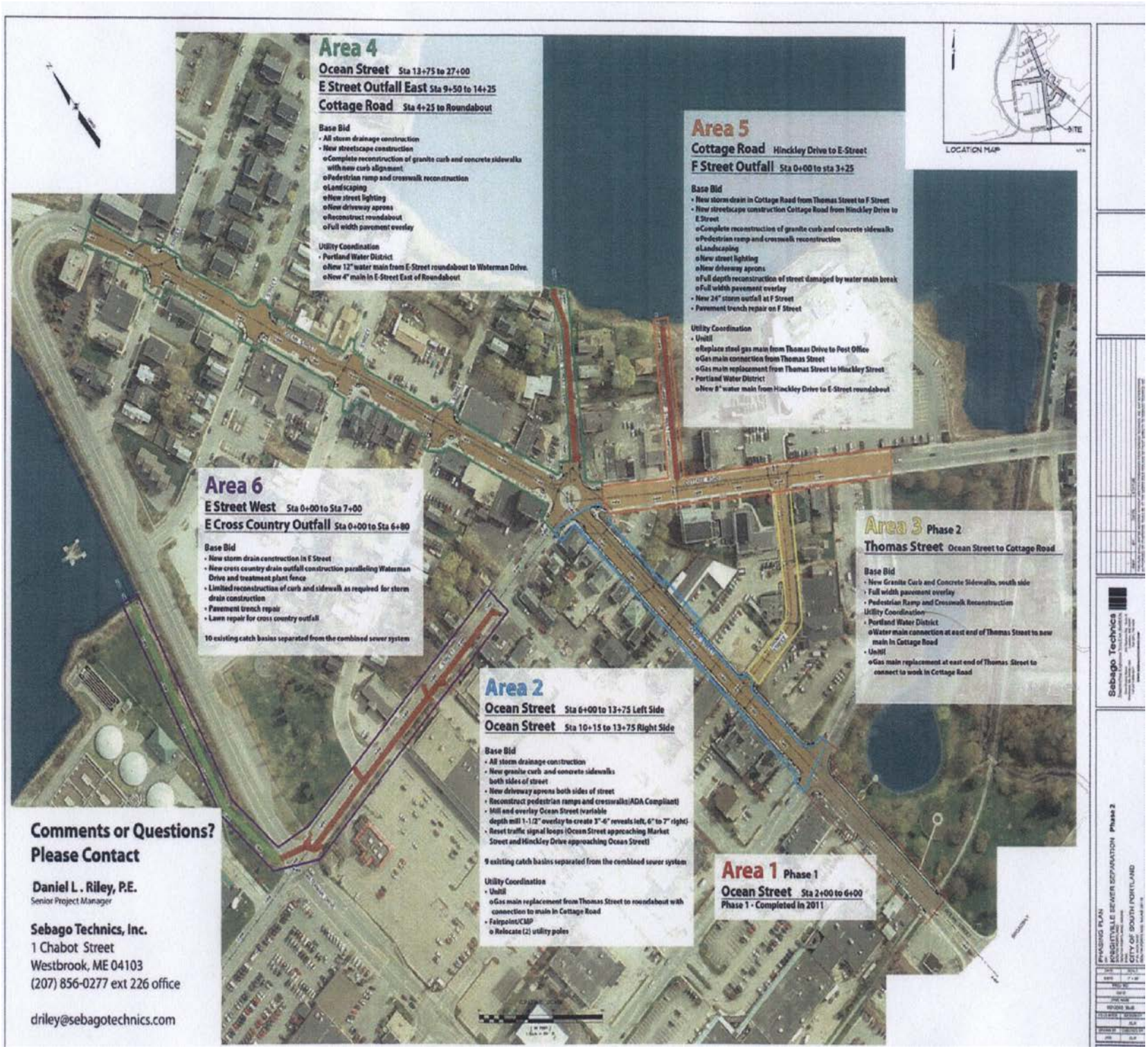
One Chabot Street, Westbrook, ME 04098-1339, Tel (207) 856-0277
200 Goddard Rd - Suite B, Lewiston, ME 04243, Tel (207) 783-6868
WWW.SEBAGOTECHNICS.COM

SHEET INDEX:

SHEET	DESCRIPTION
1	COVER
2	PLAN & PROFILE: OCEAN STREET STA. 0+00 TO STA. 10+00
3	PLAN & PROFILE: OCEAN STREET STA. 10+00 TO STA. 15+00
4	PLAN & PROFILE: OCEAN STREET STA. 15+00 TO STA. 20+00
5	PLAN & PROFILE: OCEAN STREET STA. 20+00 TO STA. 25+00
6	PLAN & PROFILE: OCEAN STREET STA. 25+00 TO STA. 27+45.57
7	PLAN & PROFILE: E STREET STA. 10+00 TO STA. 6+00
8	PLAN & PROFILE: E STREET STA. 6+00 TO STA. 0+00
9	PLAN & PROFILE: E STREET STA. 0+00 TO STA. 10+00
10	PLAN & PROFILE: COTTAGE ROAD STA. 0+00 TO STA. 3+15.83
11	PLAN & PROFILE: F STREET STA. 0+00 TO STA. 3+00
12	PLAN & PROFILE: CROSS COUNTRY STA. 0+00 TO STA. 4+00
13	PLAN & PROFILE: CROSS COUNTRY STA. 4+00 TO STA. 7+00
14	PIPE CROSSINGS
15	PIPE CROSSINGS
16	PIPE CROSSINGS

SCALE REDUCED

REV.	BY	DATE	STATUS
A	DLR	12-09-11	PROGRESS PRINT


Area 4
Ocean Street Sta 13+75 to 27+00
E Street Outfall East Sta 9+50 to 14+25
Cottage Road Sta 4+25 to Roundabout
Base Bid
• All storm drainage construction
• New streetscape construction
oComplete reconstruction of granite curb and concrete sidewalks with new curb alignment
oPedestrian ramp and crosswalk reconstruction
oLandscaping
oNew street lighting
oNew driveway aprons
oReconstruct roundabout
oFull width pavement overlay
Utility Coordination
• Portland Water District
oNew 12" water main from E-Street roundabout to Waterman Drive.
oNew 4" main in E-Street East of Roundabout
Area 5
Cottage Road Hinckley Drive to E-Street
F Street Outfall Sta 0+00 to sta 3+25
Base Bid
• New storm drain in Cottage Road from Thomas Street to F Street
• New streetscape construction Cottage Road from Hinckley Drive to E Street
oComplete reconstruction of granite curb and concrete sidewalks
oPedestrian ramp and crosswalk reconstruction
oLandscaping
oNew street lighting
oNew driveway aprons
oFull depth reconstruction of street damaged by water main break
oFull width pavement overlay
• New 24" storm outfall at F Street
• Pavement trench repair on F Street
Utility Coordination
• Unitil
oReplace steel gas main from Thomas Drive to Post Office
oGas main connection from Thomas Street
oGas main replacement from Thomas Street to Hinckley Street
• Portland Water District
oNew 8" water main from Hinckley Drive to E-Street roundabout
LOCATION MAP
SITE
Area 6
E Street West Sta 0+00 to Sta 7+00
E Cross Country Outfall Sta 0+00 to Sta 6+80
Base Bid
• New storm drain construction in E Street
• New cross country drain outfall construction paralleling Waterman Drive and treatment plant fence
• Limited reconstruction of curb and sidewalk as required for storm drain construction
• Pavement trench repair
• Lawn repair for cross country outfall
10 existing catch basins separated from the combined sewer system
Area 3 Phase 2
Thomas Street Ocean Street to Cottage Road
Base Bid
• New Granite Curb and Concrete Sidewalks, south side
• Full width pavement overlay
• Pedestrian Ramp and Crosswalk Reconstruction
Utility Coordination
• Portland Water District
oWater main connection at east end of Thomas Street to new main in Cottage Road
• Unitil
oGas main replacement at east end of Thomas Street to connect to work in Cottage Road
Area 2
Ocean Street Sta 6+00 to 13+75 Left Side
Ocean Street Sta 10+15 to 13+75 Right Side
Base Bid
• All storm drainage construction
• New granite curb and concrete sidewalks both sides of street
• New driveway aprons both sides of street
• Reconstruct pedestrian ramps and crosswalks(ADA Compliant)
• Mill and overlay Ocean Street (variable depth mill 1-1/2" overlay to create 3"-6" reveals left, 6" to 7" right)
• Reset traffic signal loops (Ocean Street approaching Market Street and Hinckley Drive approaching Ocean Street)
9 existing catch basins separated from the combined sewer system
Utility Coordination
• Unitil
oGas main replacement from Thomas Street to roundabout with connection to main in Cottage Road
• Fairpoint/CMP
o Relocate (2) utility poles
Area 1 Phase 1
Ocean Street Sta 2+00 to 6+00
Phase 1 - Completed in 2011
Comments or Questions?
Please Contact
Daniel L. Riley, P.E.
Senior Project Manager
Sebago Technics, Inc.
1 Chabot Street
Westbrook, ME 04103
(207) 856-0277 ext 226 office
driley@sebagotechnics.com
Sebago Technics
PHASING PLAN
RESISTIVILLE SEWER SEPARATION Phase 2
CITY OF SOUTH PORTLAND

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Environmental Protection

Water Resource Protection

Pump Station Radio Telemetry
Appletree, Checkerberry, Snowberry and Western Ave. 2 PS's

This CIP project will connect the alarms from four of the City's pump stations that were left out of the original projects (Pump Station Telemetry Projects for CIP 10/11) due to budget limitations. Currently, the pump station alarms from one of these stations (Western Ave 2) are transmitted to the treatment plant via a phone line. The Western Ave pump station is directly downstream of the semiconductors. The remaining three stations only have alarm indicator lights at the stations. Phase 1 of this system was proposed and approved in the 2010 CIP; Phase 2 and 3 were approved in the 2011 CIP. All three phases were designed and bid together in June 2011. However, these additional pump stations were not included in the original bid package except as bid alternates. The City opted not to exercise the bid alternates due to funding limits at that time.

This project will provide a state of the art control system at the pump stations with remote communications utilizing a radio telemetry system. Radios will transmit critical information to the treatment plant's SCADA system. The SCADA system itself will be upgraded to accept and display the pump station information. This will allow the City to respond quickly and efficiently to problems at the stations, helping to reduce or eliminate residential sewer backups or overflows associated with malfunctioning stations. Also, information supplied to the upgraded SCADA system will allow operators and maintenance personnel to efficiently monitor pump stations operation.

In summary, the radio system will expand coverage to these stations, expand the amount of information obtained from the stations, and increase the system's reliability. This project is also an investment in avoiding the cost of adding staff with the ever increasing demand of maintenance to older pump stations.

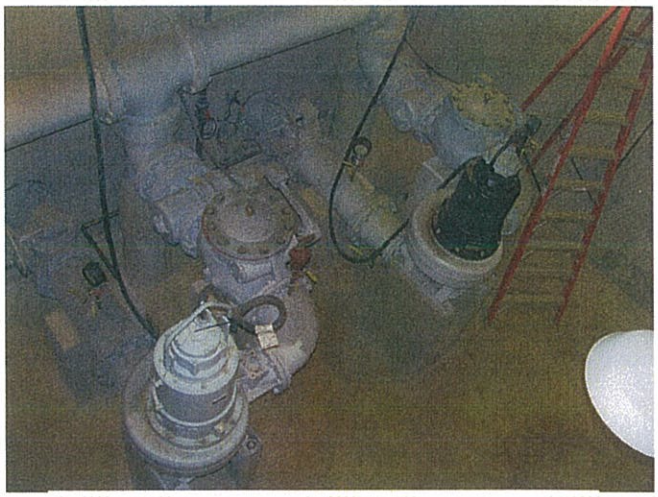
Project Cost:	$171,000
Funding Source:	Sewer User Fund Reserves
Source of Cost Estimate:	Wright-Pierce Engineers and Electrical Contractor
Projected Useful Life:	20 years

WESTERN AVENUE NO. 2

Western Avenue No. 2 Existing Conditions

General

- The pump station was originally installed in 1997.
- The station consists of two Flygt 35HP 2500GPM dry pit submersible pumps.
- The pump station building is split into two sides, a dry side and a wet side. The dry side houses all the electrical and controls equipment. The wet side allows access to the wetwell, influent channel, and a manual bar rack.



Western Ave. 2 - Pump Room

Controls Information

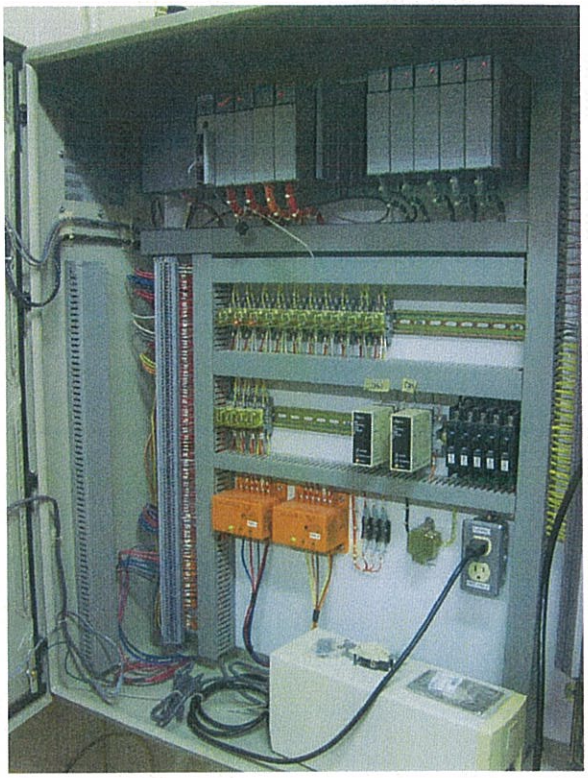
- The station's control panel is wall mounted in the dry side of the pump station.
- A PLC-based control panel was built by AEC Engineering as part of the original project in 1997.
- The control panel includes the following:
  - NEMA 12 painted steel enclosure, wall-mount
  - Allen Bradley SLC 5/03 with 16K of RAM
  - Allen Bradley PanelView 550
  - Flygt Motor Protection devices (MiniCAS)
  - Intrinsically Safe Relays for four floats
  - Control Relays
  - Circuit Breakers
  - Field Termination Strips
  - Analog Leased Line Modem
  - Uninterruptible Power Supply,

Western Ave. 2 - Central Panel

- A Hydroranger 1 provides backup control. A user must manually select the Hydroranger by using the selector switch on the panel.
- The 4-20mA level signal from the Hydroranger is used as the Process Variable (PV) to control the pumps.
- The PLC starts and stops the pumps at the following setpoints:
  - Lead pump - On 7.0' / Off 5.8'
  - Lag Pump - On 7.3' / Off 6.0'
- The PLC proportionally controls the Pump's VFD speed in relation to wetwell level:

- Lead Pump Max Speed - 60Hz at 7.2' / Min Speed 29.5Hz at 6.0'
- Lag Pump Max Speed - 60Hz at 7.3' / Min Speed 29.5Hz at 6.5'

- Three floats in each wetwell provide backup float control through the PLC and a high level alarm at the following elevations:
  - Wetwell #1
    - Backup Float Mode On - High High Level Alarm - 10.2
    - Pump Start - 8.2'
    - Pump Stop - 4.8'
  - Wetwell #2
    - Backup Float Mode On - High High Level Alarm - 10.3
    - Pump Start - 8.1'
    - Pump Stop - 5.1'
- When the backup float mode is activated, an operator must reset it at the OIT.
- The pumps can only be started manually at the OIT or at the VFD keypads.



Western Ave. 2 - Central Panel Interior

Electrical Information

- 200 amp 480VAC, three-phase electrical service.
- All electrical equipment is wall mounted in the station.
- A 135KW diesel generator with automatic transfer switch is used for backup power.
- Pump 1 is driven by a VFD:
  - Pump 1 - VFD 1: Toshiba G3
  - Pump 2 - VFD 2: Toshiba G3

Western Ave. 2 - Grinder Panel and Pump VFDs

Documentation

- Panel drawings are available.

Telemetry Information

- This pump station is connected to the plant over an analog leased line. The station is polled by a Master PLC5 at the plant over a RS232 DF1 connection. The following alarms are monitored over the WIN911 system:
    - Communication Alarm
    - Dry Well Alarm
    - High Level
    - Power Fail

Western Avenue No. 2 Discussion & Scope of Work

Controls Discussion & Scope of Work

- The City would like to bring this station up to their current control panel standard, similar to West High Street. To do this, the following work is required:
    - Install 12 Optifloats, 6 in each wetwell. The floats will provide hardwired backup control through the hardwired relay logic, including one spare. The backup float system will start when the High Level Float is activated. The system will require an operator to reset the backup float mode at the control panel:
        - LSLL - Low Low Level Float - for Low Level Alarming through PLC
        - LSL - Low Level Float - for shutting down all pumps
        - LS - Lead Pump Start float
        - LSH - High Level Float - places station in backup float mode and starts Lag Pump
        - LSHH - High High Level Float - For High High Level alarm through PLC
    - Install two submersible transducers and intrinsically safe barriers to measure each wetwell level.
    - The following lights and indications will be added to the front of the PLC control panel:
        - On Float Control System amber light
        - Start Float Control System pushbutton
        - Wetwell 1 / 2 Backup Float selector switch
        - Float Control Reset pushbutton
        - Low Low Float Pumps Locked Out red light
        - Pump 1 Run green light
        - Pump 1 H/O/A
        - Pump 2 Run green light
        - Pump 2 H/O/A
        - General Alarm red light
    - The PLC panel will be modified similarly to the modifications done at West High.
    - The PLC will be reprogrammed using a standard PLC program.
    - The PanelView 550 will be replaced with a PanelView Plus 1000 color touchscreen OIT. New graphics will be developed for this screen.
    - The leased line modem will be replaced with a radio telemetry system.
    - New hazardous gas detection will be added to the wet side.

Electrical Discussion & Scope of Work

- The following electrical work will be required as par of this project:
    - Install all required signal, control, and power wiring for new instrumentation.
    - Install new relay control panel for the hazardous gas analyzer system.
    - Install hazardous gas horn inside wet side of the station.
    - Install hazardous gas alarm lights above all entrances to the wet side of the station.
    - Install required telemetry equipment per the Wireless Communication Propagation Study.

INSTRUMENTATION - EQUIPMENT & INSTALLATION
WESTERN NO. 2 CONTROL PANEL UPGRADE

EQUIP. NAME	TAG	QUAN.	UNIT	DESIGN BASIS	Unit Cost	Installation Cost	O/H&P	SubTotal	Source (Do not print for Client)	Date of Budget Quote
Western No. 2 Control Panel Components						30%	15.0%			
Allen Bradley SLC 5/05 16K Processor		1	ea	1747-L551	$3,252	$976	$488	$4,715	Saginaw	6/11/2010
Allen Bradley Panelview Plus Compact 1000		1	ea	2711PC-T10C4D1	$2,600	$780	$390	$3,770	Website	3/24/2010
Allen Bradley Panelview Power Supply		1	ea	2711P-RSACDIN	$275	$83	$41	$399	Horizon Solutions	8/28/2007
4 port 10/100BaseTX Industrial Ethernet Switch, DIN-Rail		1	ea	N-Tron 304TX	$188	$56	$28	$273	Manufacturer	7/30/2008
Phoenix Contact Intrinsically Safe Barrier (4-20mA Signals)		2	ea	PI/Ex-ME-RPS-I/I	$150	$45	$23	$435	Website	8/29/2008
24VDC Power Supply		1	ea	SOLA	$250	$75	$38	$363	Manufacturer	5/28/2009
Three Position Selector Switches, 22mm, NEMA 4X		3	ea	Schneider Electric XB5AVG5	$46	$14	$7	$199	Grainger Catalog	6/11/2010
Black Pushbutton, 22mm, NEMA 4X		5	ea	Schneider Electric XB5AA25	$34	$10	$5	$247	Grainger Catalog	6/11/2010
Pilot Lights, 22mm, LED, NEMA 4X, Various Colors		5	ea	Schneider Electric XB5AVG5	$45	$14	$7	$328	Grainger Catalog	6/11/2010
VHF Radio Modem		1	ea	Teledesign TS4000-05C15SNR	$1,400	$420	$210	$2,030	Manufacturer	10/28/2009
VHF Unity Gain Omni Antenna		1	ea	ComTelco VHF Omni	$336	$101	$50	$487	Manufacturer	10/28/2009
Universal Mounting Clamps		1	ea	Antennex FM2	$42	$13	$6	$61	Manufacturer	10/28/2009
Antenna Lightning Surge Arrestor		1	ea	Polyphasor IS50NXC1	$82	$25	$12	$119	Manufacturer	10/28/2009
LMR400 Cable Type N Male Connectors		3	ea	EZ-400-NMH-D	$22	$7	$3	$96	Manufacturer	10/28/2009
LMR400 Cable Type N Male Connector Right Angle		1	ea	EZ-400-NMH-RA	$36	$11	$5	$52	Manufacturer	10/28/2009
Grounding Kit for LMR400		1	ea	GK-S400TT	$609	$183	$91	$883	Manufacturer	10/28/2009
Coaxial Antenna Cable (By the Foot)		25	ea	LMR400	$2	$0	$0	$54	Manufacturer	10/28/2009
							SUBTOTAL:	**$14,510**		
Local Control Stations						30%	15.0%			
Three Position Selector Switches, 22mm, NEMA 4X		3	ea	Schneider Electric XB5AVG5	$46	$14	$7	$199	Grainger Catalog	6/11/2010
22mm Emergency Stop Pushbutton		3	ea	Automation Direct E22LPB2B	$14	$4	$2	$60	Automation Direct.cc	6/11/2010
Two Pushbutton NEMA 4X Enclosure 5.75Hx3.25Wx2.75D		3	ea	Saginaw SCE-2PBSSI	$168	$50	$25	$732	Saginaw	6/11/2010
							SUBTOTAL:	**$991**		
Intrinsically Safe Barrier Enclosure						30%	15.0%			
Phoenix Contact Intrinsically Safe Barrier (4-20mA Signals)		2	ea	PI/Ex-ME-RPS-I/I	$150	$45	$23	$435	Website	8/29/2008
24VDC Power Supply		1	ea	Phoenix Contact	$100	$30	$15	$145	Manufacturer	5/28/2009
Enclosure Stainless Steel NEMA 4X 12"Hx12"Wx6"D		1	ea	Saginaw SCE-12EL1206SSLP	$536	$161	$80	$777	Website	6/14/2010
							SUBTOTAL:	**$1,357**		
Instruments						30%	15.0%			
Submersible Pressure Transducer		2	ea	Blue Ribbon BCO1 "Birdcage"	$840	$252	$126	$2,436	Vendor	4/20/2008
Float balls		6	ea	Opti-Float by Cox Research	$115	$35	$17	$1,001	Vendor	4/20/2008
Float ball Modules		3	ea	Opti-Float by Cox Research	$230	$69	$35	$1,001	Vendor	4/20/2008
Stainless Steel Float Rack		1	ea		$200	$60	$30	$290	Estimate	5/14/2009
							SUBTOTAL:	**$4,727**		

INSTRUMENTATION - EQUIPMENT & INSTALLATION
WESTERN NO. 2 CONTROL PANEL UPGRADE

EQUIP. NAME	TAG	QUAN.	UNIT	DESIGN BASIS	Unit Cost	Installation Cost	OH&P	SubTotal	Source (Do not print for Client)	Date of Budget Quote
Hazardous Gas Analyzer System						30%	15.0%			
MSA LEL		1	ea	A-TriGard A-E-1-0-31-5-0-0-0-0-0-0-2-T-C	$2,095	$629	$314	$3,038	Website	6/15/2010
MSA O2		1	ea	A-TriGard A-E-1-0-14-5-0-0-0-0-0-0-2-T-C	$2,095	$629	$314	$3,038	Website	6/15/2010
MSA H2S		1	ea	A-TriGard A-E-1-0-16-5-0-0-0-0-0-0-2-T-C	$2,095	$629	$314	$3,038	Website	6/15/2010
Round 90 mm Beacon, Surface Mount, Standard, 120V AC Full Voltage, Flashing Halogen, Red		1	ea	Allen Bradley 855BS-S10FH4	$161	$48	$24	$233	Website	6/15/2010
Light Rough Wall Mounting Plate		1	ea	Allen Bradley 855BS-AWP	$12	$4	$2	$17	Website	6/15/2010
Vertical Bracket		1	ea	Allen Bradley 855BS-AVM	$20	$6	$3	$29	Website	6/15/2010
Three Position Selector Switches, 22mm, NEMA 4X		1	ea	Schneider Electric XB5AVG5	$46	$14	$7	$66	Grainger Catalog	6/11/2010
Black Pushbutton, 22mm, NEMA 4X		1	ea	Schneider Electric XB5AA25	$34	$10	$5	$49	Grainger Catalog	6/11/2010
Relays		2	ea	Allen Bradley 700-HK36A1-4	$19	$6	$3	$55	Website	5/28/2009
Relay Socketes (10 pack)		1	ea	Allen Bradley 700-HN121	$11	$3	$2	$15	Website	5/28/2009
Wall Mount NEMA 4/12 Painted Steel Enclosure, 16Hx16Wx8D		1	ea	Saginaw SCE-16EL1608LP	$235	$70	$35	$341	Website	6/15/2010
Enclosure Subpanel 13H X 13W X 0.88D		1	ea	Saginaw SCE-42P36	$25	$7	$4	$36	Website	6/15/2010
Class 1, Div 1 Explosion Proof Vibrating Horn		1	ea	Federal Signal 31X-120-3	$556	$167	$83	$806	Website	6/15/2010
							SUBTOTAL:	**$10,762**		
							TOTAL:	**$32,348**		