



Flow Monitoring Report

March 2022

Prepared For:

WinnDevelopment

Services Performed In:

Swampscott, MA

Prepared by:

EST Associates Inc.

124 Crescent Road, Needham, MA 02494 Tel: (781) 455-0003

ESTAssociates.com

Meter 1 - Swampscott, MA



Outside View



Downhole View



Downstream View



US1 View



US2 View

SITE INVESTIGATION FORM

Client: WinnDevelopment

Meter ID: Swampscott Meter 1

Location: Swampscott, MA

Address: Burrill St & Maple Ave

INSTALL DATA

Date: 3/10/2022

Time: 7:45 AM

GPS Coordinates: 42.4750499, -70.9217225

Sensor Location: US2

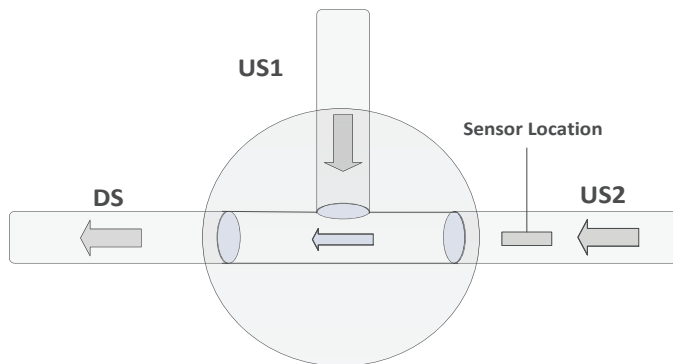
Installed By: MK BK



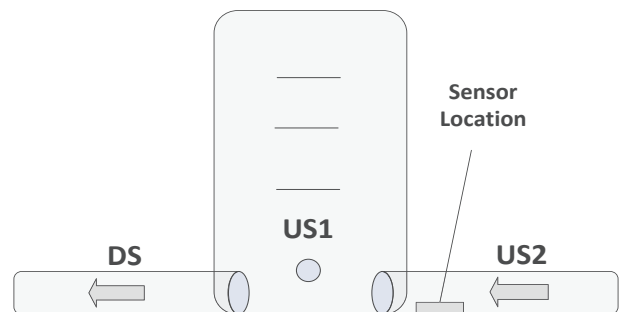
LINE DESCRIPTIONS

	Size (in)	Pipe Material	Debris (in)	Shape	Depth (ft, in)
DS	8"	VCP	0	Circle	7'3"
US1	8"	VCP	0	Circle	7'1"
US2	8"	VCP	0	Circle	6'11"

PLAN VIEW



PROFILE VIEW



Meter 1

Swampscott, MA





Swampscott Meter 1, Swampscott, MA
Daily Flow Rate Table

Date/Time (m/d/yyyy)	Average Flow Rate (gpm)	Minimum Flow Rate (gpm)	Time of Minimum Flow Rate (h:mm)	Maximum Flow Rate (gpm)	Time of Maximum Flow Rate (h:mm)	Total Flow (gal)
3/10/2022	104.4	68.4	11:15 PM	166.2	11:00 AM	150,310.0
3/11/2022	89.2	55.9	5:15 AM	156.6	10:45 AM	128,495.0
3/12/2022	92.2	50.1	2:30 AM	172.4	1:15 PM	132,806.0
3/13/2022	86.1	45.0	3:45 AM	152.2	7:15 PM	123,966.0
3/14/2022	76.2	42.2	11:30 PM	155.5	6:30 AM	109,720.0
3/15/2022	57.6	30.7	11:00 PM	110.4	1:30 PM	82,993.1
3/16/2022	58.8	28.6	4:15 AM	115.8	6:30 PM	84,687.5
3/17/2022	58.1	32.1	1:15 AM	121.5	8:00 AM	83,674.2
3/18/2022	54.6	27.6	5:45 AM	109.6	6:30 PM	78,676.8
3/19/2022	52.3	20.4	11:45 PM	125.5	11:00 AM	75,299.7
3/20/2022	46.5	19.9	5:45 AM	129.4	12:45 PM	66,914.0
3/21/2022	39.8	21.8	11:30 PM	88.5	3:45 PM	57,311.4
3/22/2022	39.8	15.5	5:15 AM	118.5	1:15 PM	57,353.5
3/23/2022	39.2	17.1	3:00 AM	93.8	10:30 AM	56,398.0
3/24/2022	40.0	19.7	3:00 AM	107.1	7:15 AM	57,606.2
Flow Total (gal)	Average Flow Rate Total (gpm)	Minimum Flow Rate (gpm)	Time of Minimum Flow Rate (m/d/yyyy h:mm)	Maximum Flow Rate (gpm)	Time of Maximum Flow Rate (m/d/yyyy h:mm)	Average Total Flow (gal)
1,346,211	62.3	15.5	3/22/2022 5:15	172.4	3/12/2022 13:15	89,747.4

CALIBRATION & DATA COLLECTIONClient: WinD Meter ID: Swampscott Meter 1Address: Burrill + Maple Ave Swampscott**SERVICES PERFORMED**Date: 3-10-22 Technicians: MK/BKTime: 0745 Meter Serial Number: EST 230☐ Sensor Cleaning☐ Calibration Check☐ Data Download☒ Other: Meter Install

Data Downloaded:

☒ Yes☐ No☐ By Modem on: _____☒ To LaptopSerial Number: #MK

Battery Replacement:

☐ Yes☒ NoExisting voltage: 11.7 New voltage: _____

Dessicant Status:

GoodReplaced: ☐ Yes ☒ No**METER READINGS**Levels: Meter: 2.196 (in.) Actual: 2.6 (in.)Recalibrated: ☐ Yes ☒ No

Sensor Type:

☒ Area Velocity ☐ Ultrasonic ☐ LaserVelocity: Meter: 2.898 (ft/s) Actual: 3.0 (ft/s)**NOTES**

Notes: _____

CALIBRATION & DATA COLLECTIONClient: Wian Development Meter ID: Swampscott Meter 1Address: Burrill + Maple Ave Swampscott**SERVICES PERFORMED**Date: 3-17-22Technicians: MK/TATime: 0732Meter Serial Number: EST 230

Sensor Cleaning



Calibration Check



Data Download



Other: _____

Data Downloaded:



Yes



No



By Modem on: _____



To Laptop

Serial Number: #mk

Battery Replacement:



Yes



No

Existing voltage: 11.4

New voltage: _____

Dessicant Status:

Good

Replaced:



Yes



No

METER READINGS

Levels:

Meter:

2.026

(in.)

Actual:

2.0

(in.)

Recalibrated:



Yes



No

Sensor Type:



Area Velocity



Ultrasonic



Laser

Velocity:

Meter:

1.395

(ft/s)

Actual:

2.4

(ft/s)

NOTES

Notes:

Heavy ragging on sensor. Velocity increased after removal

CALIBRATION & DATA COLLECTION

Client: Winn Development Meter ID: Swampscott Meter 1

Address: _____

SERVICES PERFORMED

Date: 3/24/22 Technicians: TA MK

Time: 09 Meter Serial Number: EST

☒ Sensor Cleaning ☐ Calibration Check
☒ Data Download ☒ Other: Meter Removal

Data Downloaded: ☒ Yes ☐ No
☐ By Modem on: _____
☒ To Laptop Serial Number: # MK

Battery Replacement: ☐ Yes ☒ No
Existing voltage: 11.18 New voltage: _____

Dessicant Status: Good
Replaced: ☐ Yes ☒ No

METER READINGS

Levels: Meter: 2.48 (in.) Actual: 2.5 (in.)
Recalibrated: ☐ Yes ☒ No
Sensor Type: ☒ Area Velocity ☐ Ultrasonic ☐ Laser
Velocity: Meter: 2.54 (ft/s) Actual: 2.5 (ft/s)

NOTES

Notes: _____

Meter 2 - Swampscott, MA



Outside View



Downhole View



Downstream View



US1 View

SITE INVESTIGATION FORM

Client: WinnDevelopment

Meter ID: Swampscott Meter 2

Location: Swampscott, MA

Address: 203 Burrill St

INSTALL DATA

Date: 3/10/2022

Time: 7:30 AM

GPS Coordinates: 42.473744, -70.921715

Sensor Location: US2

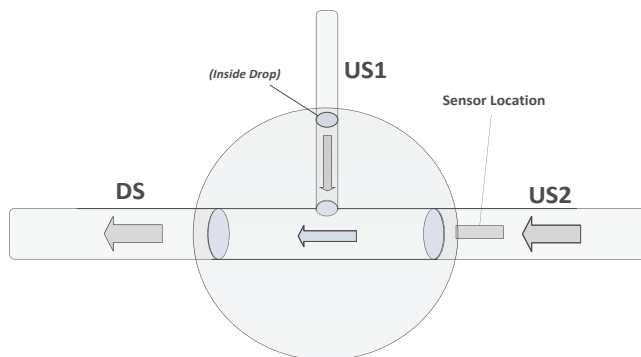
Installed By: MK BK



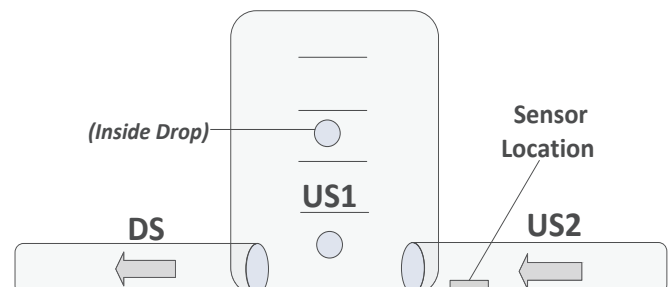
LINE DESCRIPTIONS

	Size (in)	Pipe Material	Debris (in)	Shape	Depth (ft, in)
DS	12"	VCP	0	Circle	12'8"
US1	8"	VCP	0	Circle	7'9"
US2	12"	VCP	0	Circle	12'7"

PLAN VIEW



PROFILE VIEW



Meter 2 Swampscott, MA





Swampscott Meter 2, Swampscott, MA
Daily Flow Rate Table

Date/Time (m/d/yyyy)	Average Flow Rate (gpm)	Minimum Flow Rate (gpm)	Time of Minimum Flow Rate (m/d/yyyy h:mm)	Maximum Flow Rate (gpm)	Time of Maximum Flow Rate (m/d/yyyy h:mm)	Total Flow (gal)
3/10/2022	244.5	174.7	11:45 PM	300.9	8:00 AM	352,060.0
3/11/2022	214.7	157.4	2:15 AM	297.5	7:45 AM	309,097.0
3/12/2022	221.1	147.3	2:30 AM	303.8	12:00 PM	318,315.0
3/13/2022	218.5	145.2	5:15 AM	298.1	12:15 PM	314,641.0
3/14/2022	206.9	142.8	11:15 PM	274.9	6:15 AM	297,950.0
3/15/2022	195.9	137.1	10:45 PM	278.6	6:15 PM	282,076.0
3/16/2022	178.6	116.3	11:30 PM	248.6	7:45 AM	257,224.0
3/17/2022	160.2	102.5	2:45 AM	235.7	7:45 AM	230,726.0
3/18/2022	158.7	104.6	3:00 AM	231.6	8:15 AM	228,549.0
3/19/2022	154.7	97.2	5:45 AM	225.3	9:45 AM	222,711.0
3/20/2022	160.9	101.0	3:15 AM	243.4	10:15 AM	231,694.0
3/21/2022	143.2	94.5	3:30 AM	222.3	7:15 PM	206,272.0
3/22/2022	136.5	83.3	2:30 AM	215.5	8:30 PM	196,554.0
3/23/2022	125.2	83.2	3:00 AM	206.1	8:15 AM	180,244.0
3/24/2022	116.6	78.3	3:45 AM	204.4	7:00 AM	167,940.0
Flow Total (gal)	Average Flow Rate Total (gpm)	Minimum Flow Rate (gpm)	Time of Minimum Flow Rate (m/d/yyyy h:mm)	Maximum Flow Rate (gpm)	Time of Maximum Flow Rate (m/d/yyyy h:mm)	Average Total Flow (gal)
3,796,053	175.7	78.3	3/24/2022 3:45	303.8	3/12/2022 12:00	253,070.2

CALIBRATION & DATA COLLECTIONClient: Winn Meter ID: Swampscott Meter 2Address: 203 Burrill St Swampscott**SERVICES PERFORMED**Date: 3-10-22 Technicians: MK / BKTime: 0730 Meter Serial Number: EST 152☐ Sensor Cleaning☐ Calibration Check☐ Data Download☒ Other: Meter InstallData Downloaded: ☐ Yes ☐ No
☐ By Modem on: _____
☒ To Laptop Serial Number: # MKBattery Replacement: ☐ Yes ☒ NoExisting voltage: 11.1 New voltage: _____Dessicant Status: GoodReplaced: ☐ Yes ☒ No**METER READINGS**Levels: Meter: 6.194 (in.) Actual: 6.25 (in.)Recalibrated: ☐ Yes ☐ NoSensor Type: ☒ Area Velocity ☐ Ultrasonic ☐ LaserVelocity: Meter: 1.589 (ft/s) Actual: 1.6 (ft/s)**NOTES**Notes: _____

CALIBRATION & DATA COLLECTION

Client: Winn Development Meter ID: Swampscott Meter 2

Address: 203 Burrill St

SERVICES PERFORMED

Date: 3-17-22 Technicians: MK/TA

Time: 0713 Meter Serial Number: EST 152

☒ Sensor Cleaning ☒ Calibration Check
☒ Data Download ☐ Other: _____

Data Downloaded: ☒ Yes ☐ No
☐ By Modem on: _____
☒ To Laptop Serial Number: #MK

Battery Replacement: ☒ Yes ☐ No
Existing voltage: 10.1 New voltage: 12.5

Dessicant Status: Good
Replaced: ☐ Yes ☒ No

METER READINGS

Levels: Meter: 5.433 (in.) Actual: 5.25 (in.)

Recalibrated: ☐ Yes ☐ No

Sensor Type: ☒ Area Velocity ☐ Ultrasonic ☐ Laser

Velocity: Meter: 1.0 (ft/s) Actual: 1.452 (ft/s)

NOTES

Notes: Heavy ragging on sensor. Velocity returned after it was removed

CALIBRATION & DATA COLLECTION

Client: Winn Development Meter ID: Swampscott Meter 2

Address: _____

SERVICES PERFORMED

Date: 3/24/22 Technicians: TA MK

Time: 0858 Meter Serial Number: EST 152

☒ Sensor Cleaning

☐ Calibration Check

☒ Data Download

☒ Other: Meter Removal

Data Downloaded: ☒ Yes

☐ No

☐ By Modem on: _____

☒ To Laptop

Serial Number: # M/L

Battery Replacement: ☐ Yes

☒ No

Existing voltage: 12.24

New voltage: _____

Dessicant Status: Good

Replaced: ☐ Yes

☒ No

METER READINGS

Levels: Meter: 4.96 (in.) Actual: 4.9 (in.)

Recalibrated: ☐ Yes

☒ No

Sensor Type: ☒ Area Velocity

☐ Ultrasonic

☐ Laser

Velocity: Meter: 1.275 (ft/s)

Actual: 1.25 (ft/s)

NOTES

Notes: Tagging on sensor

RAIN GAUGE INSTALLATION FORM

Client: WinnDevelopment

Gauge ID: Rain Gauge

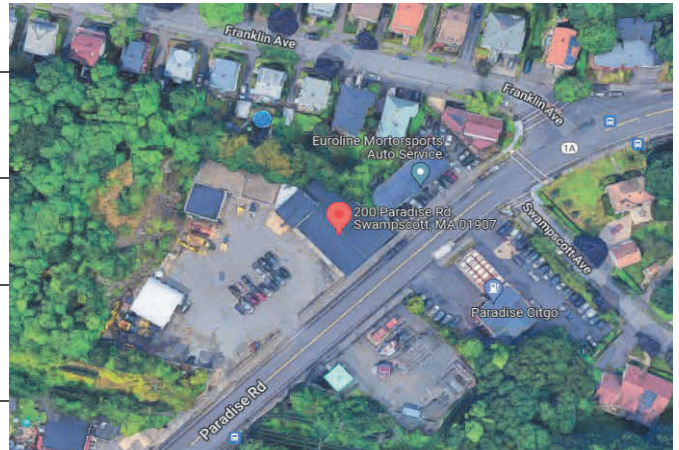
INSTALLATION DATA

Street Address: 200 Paradise Rd, Swampscott, MA

GPS Coordinates: 42.4756629, -70.9144893

Install Date/Time: 0800 3/10/2022

Monitored By: EST

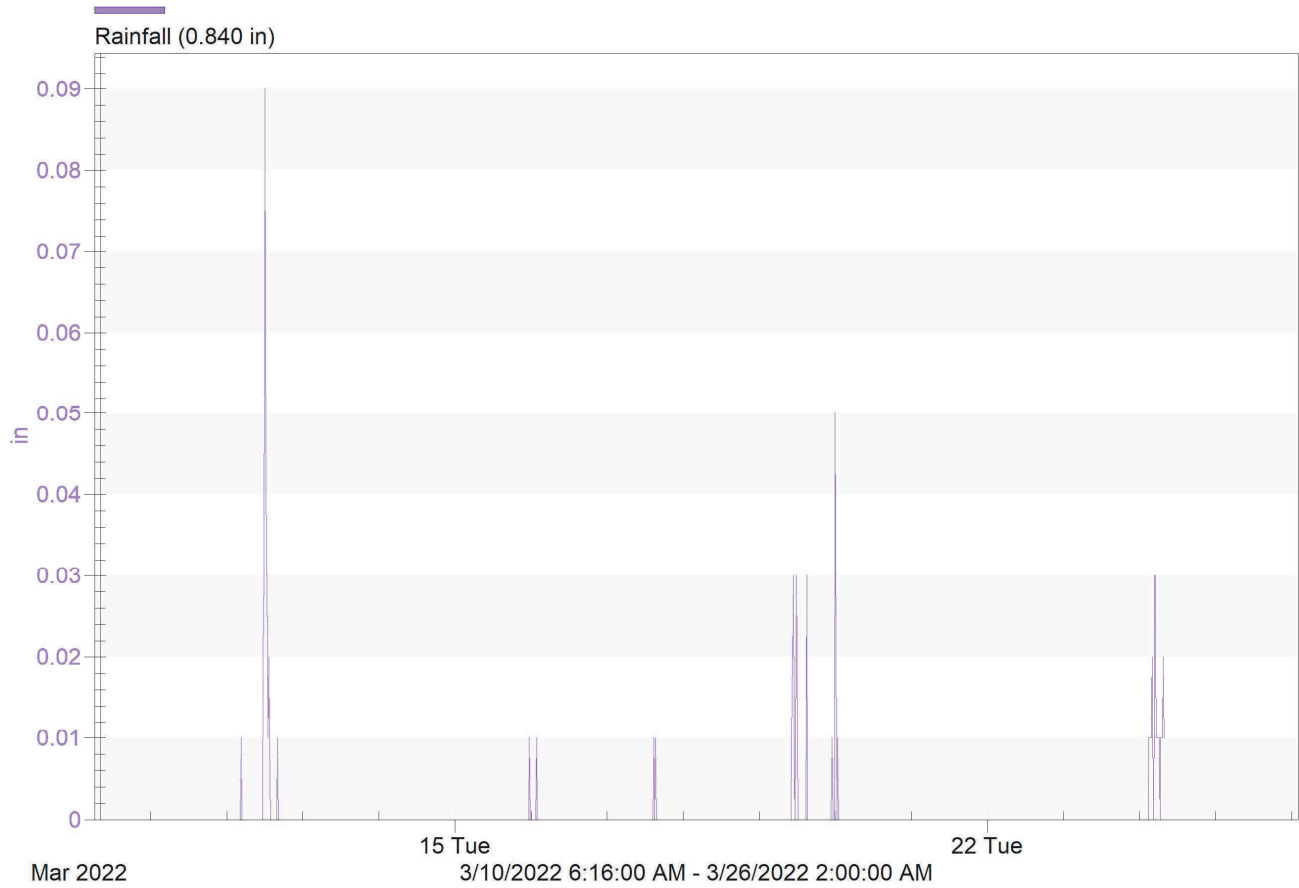


AREA PHOTO



Rain Gauge

Swampscott, MA





Swampscott RG - Swampscott, MA

Daily Rainfall Table

Date	Average Rainfall (in)	Minimum Rainfall (in)	Time of Minimum Rainfall hh:mm	Maximum Rainfall (in)	Time of Maximum Rainfall hh:mm	Total Rainfall (in)
3/10/2022	0.000	0.000	8:15 AM	0.000	8:15 AM	0.000
3/11/2022	0.000	0.000	12:00 AM	0.000	12:00 AM	0.000
3/12/2022	0.003	0.000	12:00 AM	0.090	12:00 PM	0.320
3/13/2022	0.000	0.000	12:00 AM	0.000	12:00 AM	0.000
3/14/2022	0.000	0.000	12:00 AM	0.000	12:00 AM	0.000
3/15/2022	0.000	0.000	12:00 AM	0.010	11:30 PM	0.010
3/16/2022	0.000	0.000	12:00 AM	0.010	1:45 AM	0.010
3/17/2022	0.000	0.000	12:00 AM	0.010	2:45 PM	0.020
3/18/2022	0.000	0.000	12:00 AM	0.000	12:00 AM	0.000
3/19/2022	0.002	0.000	12:00 AM	0.030	10:45 AM	0.160
3/20/2022	0.001	0.000	12:30 AM	0.050	12:00 AM	0.080
3/21/2022	0.000	0.000	12:00 AM	0.000	12:00 AM	0.000
3/22/2022	0.000	0.000	12:00 AM	0.000	12:00 AM	0.000
3/23/2022	0.000	0.000	12:00 AM	0.000	12:00 AM	0.000
3/24/2022	0.008	0.000	12:00 AM	0.030	4:45 AM	0.240
Rainfall Total (in)	Average Rainfall (in)	Minimum Rainfall (in)	Time of Minimum Rainfall (m/d/yyyy h:mm)	Maximum Rainfall (in)	Time of Maximum Rainfall (m/d/yyyy h:mm)	Average Total Rainfall (in)
0.840	0.001	0.000	3/10/22 8:15 AM	0.090	3/12/22 12:00 PM	0.056