

4 Turkey Hill Road
Newtown, CT 06470
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Fred Hurley,
Director

TOWN OF NEWTOWN
WATER AND SEWER AUTHORITY

Marianne Brown,
Chairman
Richard Zang
Louis Carbone
George Hill
Alan Shepard
Eugene Vetrano
Carl Zencey

THESE MINUTES ARE SUBJECT TO APPROVAL BY THE WATER AND SEWER AUTHORITY

The Water and Sewer Authority a regular meeting on June 8, 2017 at the Wasterwater Treatment Plant, 24 Commerce Road, Newtown, CT. Dick Zang called the meeting to order at 7:00pm.

Present: Lou Carbone, George Hill, Dick Zang, Alan Shepard, Carl Zencey

Absent: Gene Vetrano, Marianne Brown

Also Present: Director of Public Work Fred Hurley and Julio Segarra of Suez Water Environmental Services

Public Participation – NONE

Approval of the Minutes – George Hill moved to approved the minutes of the May 11, 2017.

Corrections: 3 members of the public and 1 member of the press were present, motion for 12 Church Hill is resynced, the information used was for 12 Queen Street. Minutes unanimously approved with corrections.

UNFINISHED BUSINESS

Hawleyville Sewer Extension – Fred Hurley reported that there is no improvement with Centerplan. They are essentially out of the project. The final punch list will be completed by Public Works and Suez. When the water line goes in for the multi housing project, WSA will share the cost of paving. The WSA has been advised by the Town Attorney not to pay the vendors from the retainage. Vendors will be referred to the bonding company for payment.

NEW BUSINESS

Set Sewer Benefit Assessment for 12 Church Hill Road – a request for the benefit assessment has been made.

Sandy Hook Pump Station and Available System Capacity – They went over the preliminary analyses from Fuss and O’Neil (Attachment A). The piping is ok but will be cleaned out. The capacity of the pipes is fine but the capacity of the pumps needs to be addressed.

Fred Hurley provided a Preliminary Analysis of Available Sewer Capacity (Attachment B). In that analysis he is trying to anticipate projects that are coming in. The WSA does not have the projects before them for The Boulevard or 79 Church Hill Road. They were told that their projects need to go through P&Z and have an approved project. Alan Shepard suggested a joint meeting with P&Z to make sure both boards are aware of the process. For projects that there is a sewer extension, P&Z would have to request an opinion of the WSA before approval of any application by P&Z.

Committee Reports – I&I; An aggressive I&I program should be able to return 10%-15% of the system capacity. Julio Segarra discussed several procedures to clear lines using crushed ice and improved air relief values. **Well development**; Three months ago well 3 was shut down but is now back in operation. **SCADA**; There were two problems. One was two imbedded databases that was discovered programmed into the RTU. Removal of one solved the problem. Second was several communication problems solved by antennae redirection.

Report by Suez Water Environmental Services – Monthly report (Attachment C).

Report by Public Director – Fred Hurley reported that he spoke with Mike Burton regarding development on Washington Avenue. They have gotten good news from the bank and it looks like they are going to move forward.

Having no further business, the meeting was adjourned at 8:20pm.

Arlene Miles, Clerk

MEMORANDUM

TO: Mr. Fred Hurley
Newtown DPW Director

FROM: Fereshteh Doost, P.E., Kurt A. Mailman, P.E.

DATE: April 25, 2017

RE: Cursory Sandy Hook Pump Station Capacity Study

The Newtown Water and Sewer Authority (WSA) solicited the services of Fuss & O'Neill to cursorily evaluate the Sandy Hook Pump Station for increased wastewater flows due to two proposed developments and a sewer extension within the sewershed. As part of this evaluation, the following tasks have been performed:

- Average and peak hour flows have been calculated for the proposed developments and sewer extension
- Existing pump data for the past two years has been reviewed
- System hydraulics with potential increased flows have been calculated
- Impacts of potential increased flows on existing Sandy Hook (Glen Road) Pump Station (pumps, electrical, generator, etc.) have been evaluated
- Impacts of potential increased flows on the existing force main downstream of the pump station have been evaluated

It is noted that this cursory evaluation was limited to a desktop study of the pump station records and potential wastewater flow increases, and did not include a physical evaluation of the pump station or collection system.

Flow Calculations:

For the purposes of projecting flows from the proposed developments (179 Church Hill Rd., River Walk) and sewer extension to an existing commercial building that would connect to the Sandy Hook Pump Station, average and peak hourly wastewater flows were calculated based on the Newtown Water and Sewer Authority Sewer Use Regulations dated October 29, 2015. Details regarding the expected flows from each source are provided below:

- The flow for the proposed 225 units at 79 Church Hill Road was estimated based on multifamily housing units (148 gpd/unit, including I/I).
- The flow for the proposed 65 units at River Walk Road was estimated based on multifamily housing units (148 gpd/unit, including I/I).
- A design flow of 10,000 gallon per day (gpd) was assumed for the proposed fabric fire hose commercial building (based on meeting with DPW).

Sandy Hook Pump Station Capacity- Ms. Marianne Brown

April 25, 2017

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According to TR-16 (Guides for the Design of Wastewater Treatment Works 2011 edition, as revised in 2016) by the New England Interstate Water Pollution Control Commission, sanitary sewers should be designed on a peak hourly design flow basis. The ratio of extreme peak hourly flow to average daily flow is typically 4.0-5.6 times the average daily flow for wastewater generation, pursuant to Table 2-1 of TR-16 (**Exhibit 1**). To obtain a peak hour, a representative peaking factor of 4.5 was multiplied by the average daily wastewater flows.

The existing pump data for the past two years has been reviewed (See **Exhibit 2**). The 2016 data was used for the hydraulic calculations. See **Table -1** below for existing and proposed wastewater flows to the pump station.

Table 1 – Existing and Proposed Wastewater Flow

	Average Daily Flow		Peak Hourly Flow
	GPD	GPM	GPM
Existing Flow (2016)	58,705	41	185
79 Church Hill Road	33,300	23	104
River Walk	9,620	7	30
Commercial Building	10,000	6.9	31
Total	111,625	78	350

The original flow (calculated in 1994) for the Sandy Hook Pump Station was 98 gallons per minute (gpm) and pump design capacity was 200 gpm. One of the existing pumps is currently pumping below its original rated capacity and is not meeting cleansing velocity requirement for the force main. The capacities of Pump #1 and Pump #2 are 215 gpm and 180 gpm, respectively (as presented by the SUEZ Plant Manager). Adding the calculated flows for 79 Church Hill Road, River Walk Apartments, and a new fabric fire hose commercial building to the existing peak flow of 185 gpm (in 2016) would increase the design flow to 350 gpm., which cannot be supported by the existing pumps (See **Exhibit 3** for existing pump curve and **Table-2 of Exhibit 4** for pump station capacity). The combined capacities of the existing pumps are less than 240 gpm. (Pump station is not designed for pumps to operate in parallel under normal operations).

Hydraulic Calculations:

The Hazen-Williams equation is used to determine the head loss through pressurized force mains. Hazen-Williams coefficients of 120 were used for old ductile iron (DI) pipes. The total dynamic head

Sandy Hook Pump Station Capacity- Ms. Marianne Brown

April 25, 2017

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(TDH) for the existing plus proposed flows (350 gpm) was calculated to be 200 feet and is presented in **Table -3 of Exhibit 4**.

Cursory Pump Station Evaluation:

Data indicates that the Sandy Hook Pump Station is currently at its design capacity and existing pumps cannot handle greater flow, particularly due to the reduced pumping capacity of Pump #2. The pump station is currently reportedly over-cycling (exceeding the recommended number of pump starts per hour) and would not be capable of pumping the proposed additional flows without surcharging. In March 2017 repairs reportedly occurred to fix a clogged lateral at the High School, upstream of the Sandy Hook Pump Station. Once the repairs were complete, the flow rushed into the pump station. Even with both pumps running in parallel, the pumps could not handle the flow of +/- 250 gpm as estimated by the SUEZ Plant Manager.

Force Main Evaluation:

Flows from the pump station are pumped through a 6-inch force main (3,120 ft.) into a termination manhole (SMH #51) which is located near the I-84 interstate at Church Hill Road. With an existing pumping rate of 180 gpm from Pump #2, the force main line velocity is 2.04 feet per second (ft./s). The existing velocity does not provide the minimum 3.0 ft./s cleansing velocity required for the force main, pursuant to TR-16. However, the collection system downstream of the Sandy Hook Pump Station is capable of transporting the proposed design flows. The new pumps will be sized for the proposed pumping rate to ensure velocities in the force main are greater than 3.0 ft./s in order to provide enough scour to keep the force main clean. Utilizing the proposed design flow of 350 gpm, the force main line velocity would be 3.97 ft./s, which is above the minimum cleansing velocity of 3.0 ft./s (**Table 3 of Exhibit 4**).

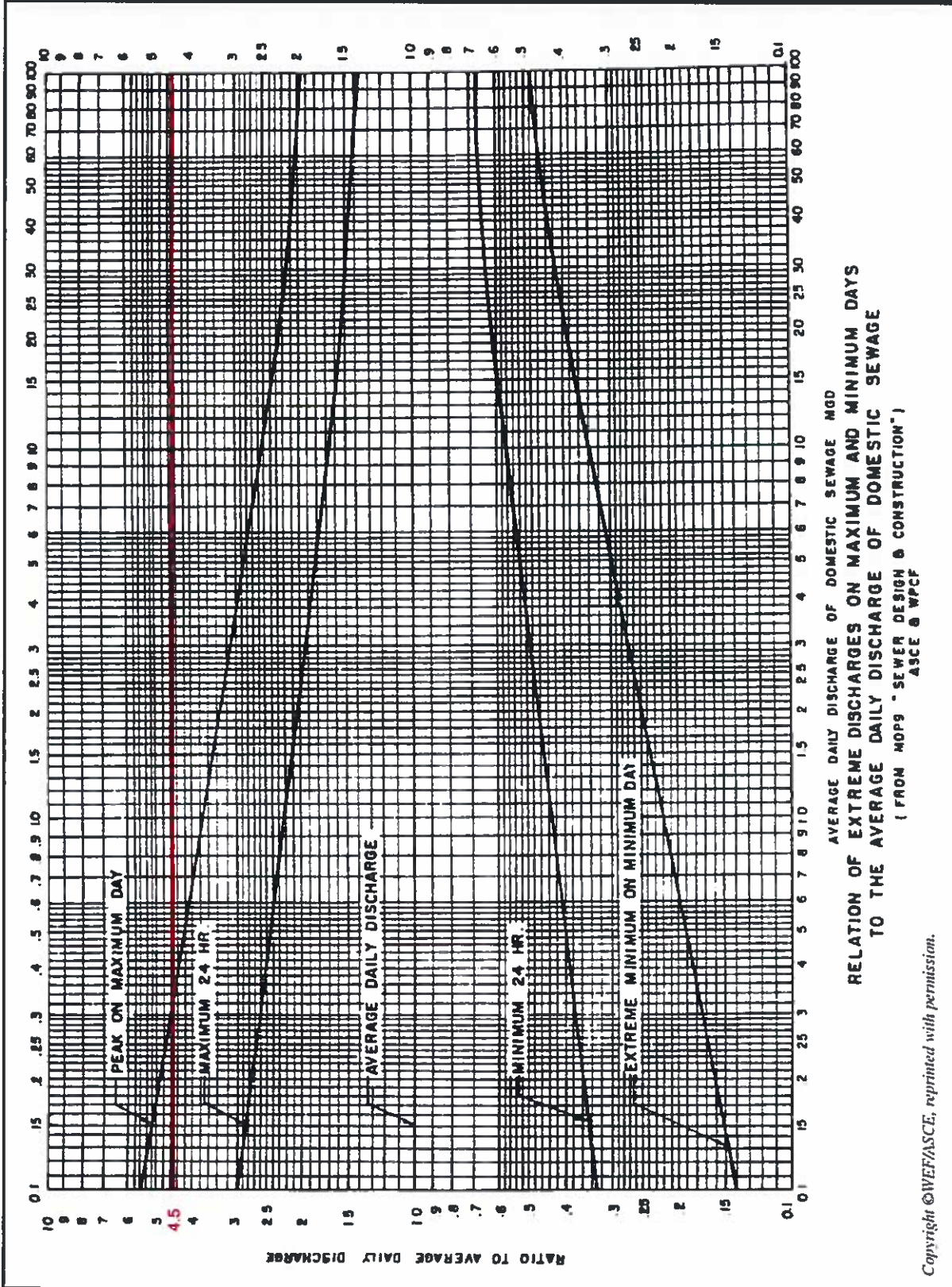
Minimum Recommended Pump Station Improvements to Accommodate Proposed Additional Flow:

At a minimum, the two existing 25 HP submersible pumps would need to be replaced with larger 50 HP pumps. **Exhibit 5** presents the proposed pump. In addition, the current start-stop controls should be upgraded to variable frequency drives (VFDs) or soft starts-stops to reduce the increased inrush current associated with the larger pump horsepower and reduce electrical costs. Additional improvements would likely be required due to the age and condition of the existing pump station including replacement of the existing check valves, electrical panel, electrical service, and standby exterior mounted generator with sound attenuation. Cleaning the force main to remove any sediment, debris (perhaps via ice slurry) and cleaning/exercising the air relief/vacuum valve is also recommended.

In order to determine the full extent of improvements and costs required to upgrade the pump station to accommodate the proposed additional wastewater flows additional design, including a complete pump station evaluation, would be required.

Sandy Hook Pump Station Capacity Study
Exhibit 1

Figure 2-1 Ratio of Extreme Flow to Average Daily Flow



AVERAGE DAILY DISCHARGE OF DOMESTIC SEWAGE MGD
 RELATION OF EXTREME DISCHARGES ON MAXIMUM AND MINIMUM DAYS
 TO THE AVERAGE DAILY DISCHARGE OF DOMESTIC SEWAGE

Sandy Hook Pump Station Capacity Study

Exhibit 2



2015

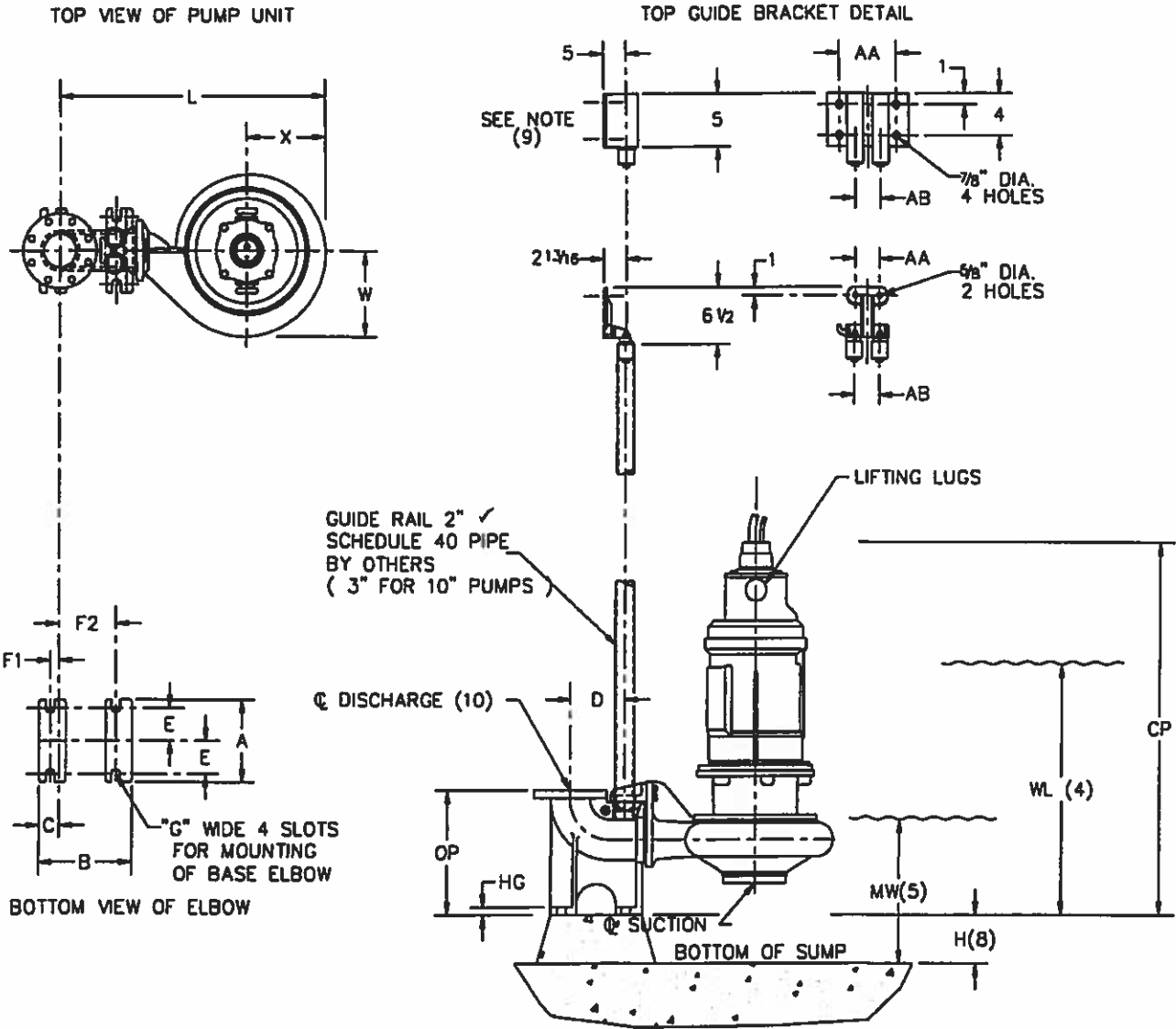
2016

CT NEWTOWN WWTP (NEWTOWN, CT)

Sandy Hook PS Flow				Sandy Hook PS Flow					
Date	Total	Average	Maximum Day	Minimum Day	Date	Total	Average	Maximum Day	Minimum Day
Jan '15	1,687,088	54,422	61,631	50,247	Jan '16	1,631,717	52,636	61,081/16	56,375
Feb '15	1,496,773	53,456	62,271/15	51,662	Feb '16	1,605,347	55,557	62,261/16	63,428
Mar '15	1,854,989	59,838	69,984	54,446	Mar '16	1,821,653	58,763	63,281/16	81,272
Apr '15	1,804,089	60,136	67,523	49,193	Apr '16	1,629,917	54,331	64,081/16	57,068
May '15	1,928,273	62,202	81,341	54,173	May '16	1,800,627	58,085	65,311/16	105,430
Jun '15	1,722,131	57,404	83,533	39,934	Jun '16	1,801,566	60,052	66,011/16	105,430
Jul '15	1,495,997	48,258	55,752	39,934	Jul '16	1,738,151	56,069	67,191/16	63,918
Aug '15	1,467,234	47,330	51,467	44,851	Aug '16	2,234,772	72,089	68,301/16	266,270
Sep '15	1,552,311	51,744	55,396	47,368	Sep '16	2,012,213	67,074	69,011/16	266,270
Oct '15	1,638,887	52,867	59,960	48,201	Oct '16	1,812,391	58,464	62,51/16	62,493
Nov '15	1,486,089	49,536	54,576	42,445	Nov '16	1,754,460	58,482	64,061/16	64,061
Dec '15	1,562,967	50,418	53,499	45,951	Dec '16	1,644,940	53,063	64,061/16	58,445
Total	19,696,825				Total	21,487,753			
Average	1,641,402	53,968			Average	1,790,646	58,705		
Maximum	1,928,273		83,533		Maximum	2,234,772		266,270	
Minimum	1,467,234			39,934	Minimum	1,605,347			45,600

*Pump Go ON 5 Times/WR
 DURING PEAK FLOW. 7 AM - 11 PM
 6.9 TIMES PER DAY TOTAL
 TOTAL RUNTIME AVG
 5.4 Hrs/DAY*

Sandy Hook Pump Station Capacity Study - Exhibit 3



PUMP	MOTOR FRAME	DISCH.	A	B	C	D	E	F1	F2	G	H	L	W	X	AA	AB	CP	HG	MW	OP	WL
4" D5435MV	250T	4	10	11 5/8	2 3/8	6 3/4	4	1	7	1 1/8	3	33 7/8	10 7/8	9 5/8	3	3 3/8	46 5/8	7/8	15 1/4	15	38 1/2

NOTES:

- (1) DISCHARGE FLANGE IS 125# ANSI DRILLING UNLESS NOTED.
- (2) ALL DIMENSIONS ARE IN INCHES UNLESS NOTED.
- (3) 5400'S AND 5400K'S ARE DIMENSIONALLY IDENTICAL.
- (4) RECOMMENDED LOW WATER LEVEL FOR CONTINUOUS OPERATION. *LOW: 74*
~~PERSONAL CONTINUOUS IN AIR MODIFICATION - AVAILABLE.~~
- (5) WATER LEVEL MAY BE DRAWN DOWN TO THIS LEVEL FOR SHORT TIME DUTY IN AIR MOTOR RATINGS. DRAW DOWN CAN OCCUR OVER A PERIOD OF ONE HOUR FOR 210 FRAMES AND 15 MINUTES FOR ALL OTHER FRAMES.
- (6) BASES ARE DESIGNED TO HAVE FULL CONTACT WITH GROUT OR A SOLE PLATE GROUTED IN PLACE.
- (7) NOT FOR CONSTRUCTION, INSTALLATION, OR APPLICATION PURPOSES UNLESS CERTIFIED. DIMENSIONS SHOWN MAY VARY DUE TO NORMAL MANUFACTURING TOLERANCES.
- (8) DISTANCE REQUIRED FOR PROPER SUCTION CLEARANCE.
- (9) NOTED GUIDE BRACKET USED ONLY ON 10" PUMPS.
- (10) IF RISER PIPE IS NOT SAME SIZE AS THE DISCHARGE ELBOW, AN ECCENTRIC INCREASER MUST BE USED LIMITED TO TWO SIZES LARGER MAXIMUM.

UL LISTED

CUSTOMER PACE INDUSTRIES INC.				P.O. NO. 97-108			
JOB NAME <i>Don</i> CITY OF NEWTOWN, NEWTOWN, CT.				TAG NAME SANDY HOOK P. S.			
PUMP SIZE AND MODEL 4" D5435MV /		GPM 200 /	TDH 165 FT. /	RPM 1766 /		ROTATION CW	
MOTOR FAIRBANKS	HP 25 /	FRAME 250T	PHASE 3 /	HERTZ 60	VOLTS 208	ENCLOSURE SUB	BASIC PUMP D5435MV PULL-UP SUBMERSIBLE FAIRBANKS MORSE MTR
CERTIFIED FOR K4G1-078230			CERTIFIED BY J HUTCHINS		DATE FEBRUARY 6 1997	DWG NO. 543MS013	

THIS CURVE IS BASED ON ACTUAL TEST PERFORMANCE OF A SIMILAR PUMP. ONLY THE INDICATED POINT(S) IS GUARANTEED.

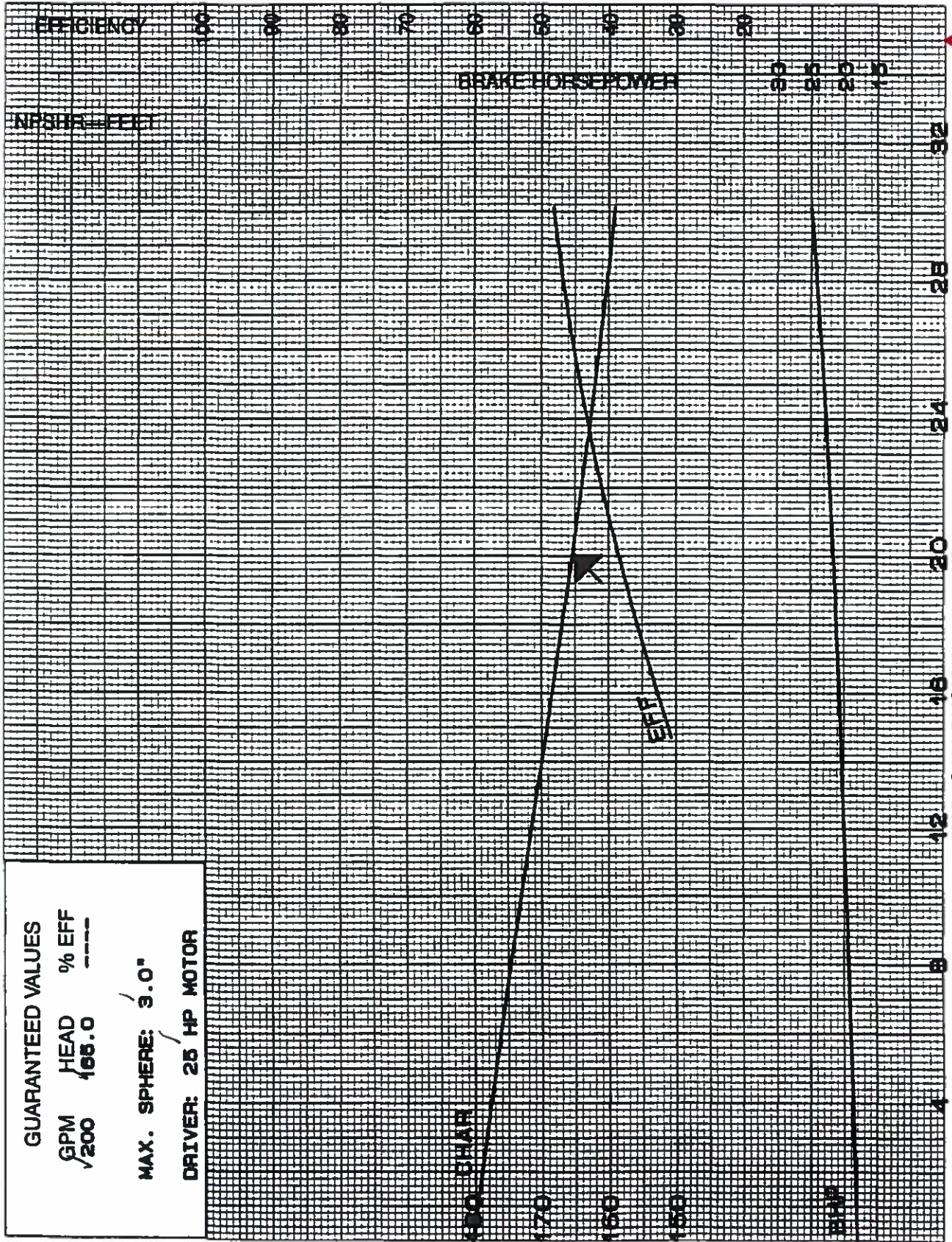
NO. STAGES ONE
REFERENCE 74935
PLOTTED BY JCM
DATE 2/4/97

SIZE-MODEL 4-D5495MV
IMPELLER DES. T4E1E
IMPELLER DIA. 12.50"
RPM(S) 1766

Sandy Hook Pump Station Capacity Study - Exhibit 3

PUMP PERFORMANCE CURVE

CURVE NO. CK4G1-07B230



GUARANTEED VALUES
 GPM HEAD % EFF
 ✓ 200 165.0 ----
 MAX. SPHERE: 3.0"
 DRIVER: 25 HP MOTOR

U.S. GALLONS PER MINUTE X 10

Note: Proposed flow (350 gpm) is outside the existing pump curve.

Sandy Hook Pump Station Capacity Exhibit 4



Table 2 - Newtown Flow Calculations

Flow Node E (E3, E4)	Average Flow ⁽¹⁾ (gpd)	Average (gpm)	Peak Factor ⁽²⁾ (gpd)	Infiltration & Inflow (l/l)	Total Peak Hour Flow Plus I/I (gpd)	Pump #1 Capacity ⁽⁴⁾ (gpm)	Pump #2 Capacity ⁽⁴⁾ (gpm)
Initial (Table 9-2 PDR)	29,970	21	120,180	21,318	141,498	215	180
79 Church Hill Rd. (225 units)	33,300	23	149,850	(b)	149,850		
River Walk (65 units)	9,620	7	43,290	(c)	43,290		
Commercial Bldg. (Fabric fire hose)	10,000	7	45,000	(d)	45,000		
Total	82,890	58	358,320	21,318	379,638	Not OK	Not OK
Based on Actual in 2016	58,705	41	266,270		266,270	215	180
79 Church Hill Rd. (225 units)	33,300	23	149,850	(b)	149,850		
River Walk (65 units)	9,620	7	43,290	(b)	43,290		
Commercial Bldg. (Fabric fire hose)	10,000	7	45,000	(b)	45,000		
Total	111,625	78	504,410		504,410	Not OK	Not OK
79 Church Hill Rd. (225 units)	33,300	23	149,850	(b)	149,850	215	180
River Walk (65 units)	9,620	7	43,290	(b)	43,290		
Commercial Bldg. (Fabric fire hose)	10,000	7	45,000	(b)	45,000		
Ultimate (Table 9-3 PDR)-Includes Following Developments	341,880	237	1,111,110	596,636	1,707,746	Not OK	Not OK

Notes:

- 1- Flow Assumptions:
Initial and Final Flow
79 Church Hill Rd (225 units) - Table 9-2 and 9-3 PDR dated 04/20/94 by F&O
River Walk (65 units) 148 gpd/unit - Town of Newtown Sewer Use Regulations dated October 29, 2015
Commercial Bldg. (Fabric fire hose) 148 gpd/unit - Town of Newtown Sewer Use Regulations dated October 29, 2015
10,000 - Assumed
- 2- Following peaking factors have been used :
Initial Flow 4.01 - Table 9-2 PDR dated 04/20/94 by F&O
79 Church Hill Rd (225 units) 4.5 -Table 2-1 of TR-16, 2011 Edition
River Walk (65 units) 4.5 -Table 2-1 of TR-16, 2011 Edition
Commercial Bldg. (Fabric fire hose) 4.5 -Table 2-1 of TR-16, 2011 Edition
Ultimate Flow 3.25 - Table 9-3 PDR dated 04/20/94 by F&O
- 3- Infiltration & Inflow (I/I) included in calculated flow
- 4- Existing pumps can not handle the 165 gpm additional flow from the proposed developments

**Sandy Hook Pump Station Capacity
Exhibit 4**



Table 3 - Force Main Hydraulic Calculations - Actual Flow

Description	Value	Units
Pump Rate	350	gpm
C Factor	120	Old D.I.
Force Main Length (6")	3,120	feet
Pump Discharge (LL Alarm, H)	210.2	feet
Force Main Highest Elevation	357.0	feet
Force Main Discharge Elev. at P.S.	226.5	
Force Main Length (4")	40	
Pump Rate		gpm
Static Head	147	feet

	Avg. Flow (gpd)	Peak Hour (gpm)
Church Hill Rd L = 2,524 ft		185
Under Poolatuck River = 396	33300	23
To Div Pit = 200	9620	7
Total = 3,120	10000	31
Existing and Future Flow		37
Sandy Hook Max Day Flow (Sep. 2016)		185
79 Church Hill Rd. (225 units)*		104
River Walk (65 units)		30
Commercial Bldg. (Fabric fire hose)		31
Proposed Total		350

Mechanical Friction Head

Type of Fitting	Quantity	K Factor	# x (K + 2g) P.S. (4")	# x (K + 2g) Force Main (6")
Entrance	1	0.50	0.0078	
90 Degree Bend (Standard Radius)	3	0.90	0.0420	
90 Degree Bend (Long Radius)	5	0.60		0.0486
45 Degree Bend	4	0.42		0.0281
11.5 Degree Bend	6	0.20		0.0186
Wye Increaser	1	0.90	0.0140	
Cross	1	0.30	0.0047	
Branch	0	0.90		
Swing Check Valve	1	2.30	0.0357	
Gate Valve (Total of 6, one for 4" & 5 for 6")	6	0.19	0.0030	0.0148
Increaser	1	0.30		0.0047
Air Release/Vacuum Valve	1	0.80		0.0124
Cleanout	0	0.90		
Flow Meter	1	0.10	0.0016	
Exit	1	1.00		0.0155
Mechanical Friction Head = 0.1086 x (v^2)		Subtotal	0.1086	0.1388

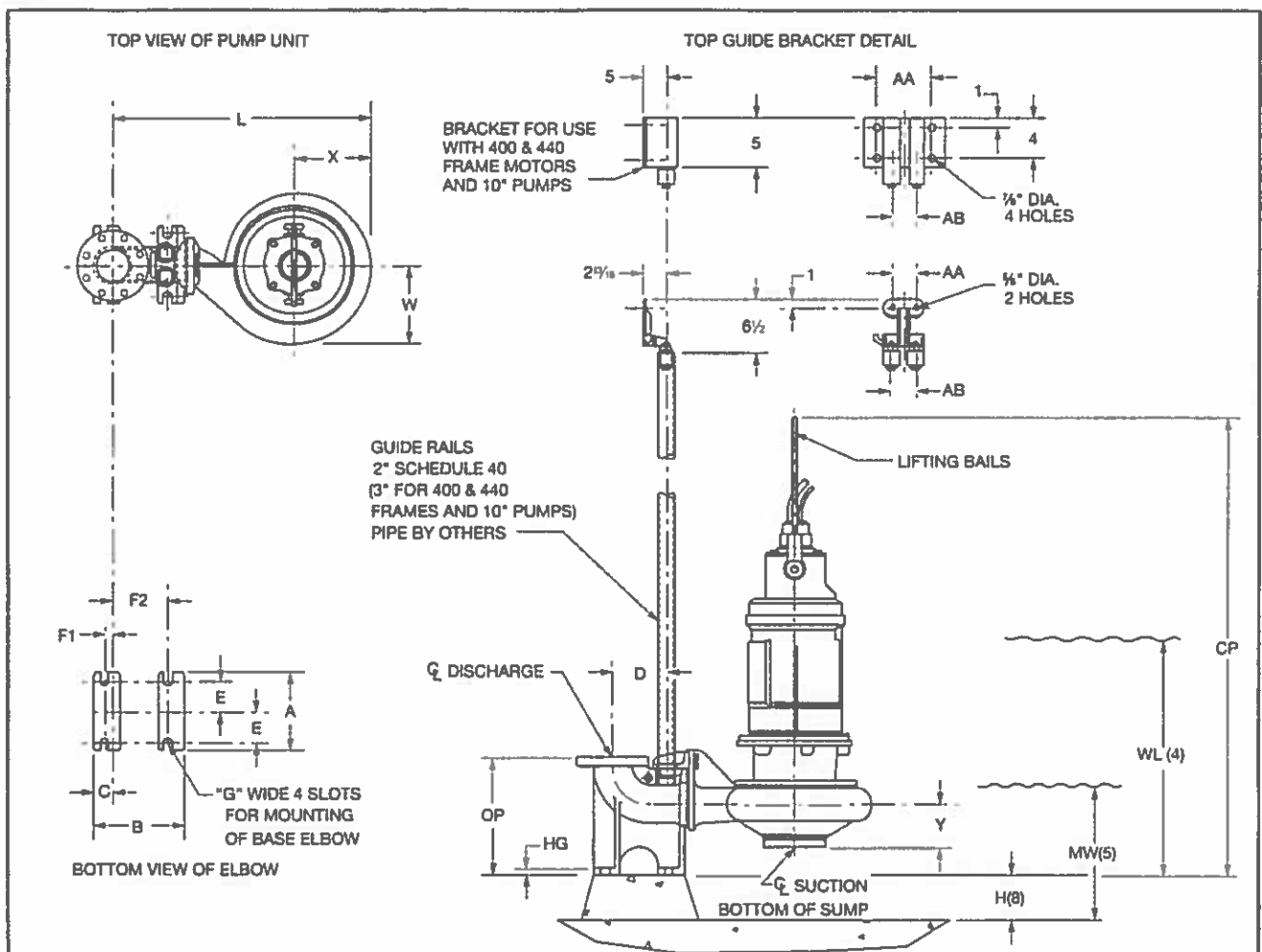
Assumptions
148 "Each Units EDUs (Including If) - "Town of Newtown Sewer Use Regulations", October 29, 2015
4.5 Peaking Factor

Total Dynamic Head

Pipe Diameter inches	Flow gpm	Velocity fps	Friction Head (feet)	Static Head feet	Total Dynamic Head feet	Maximum Pressure psi
4	350	8.94	3.6	16	29	12 P.S.
6	350	3.97	38.8	131	172	74 FM
Total			42.4	147	200	87

(Using Hazen-Williams Equation)

The Hazen-Williams equation with discharge coefficient of C = 120 was used for head loss in Old D.I. Pipe.



PUMP	MOTOR FRAME	DISCH.	A	B	C	D	E	F1	F2	G	H	L	W	X	Y	AA	AB	CP	HG	MW	OP	WL
4"D5435MV	210T	4(9)	10	11 1/4	2 1/2	6 1/4	4	1	7	1 1/4	3	33 1/4	10 1/2	9 1/2	7 1/2	3	3 1/2	55 1/2	1 1/2	15 1/4	15	33 1/4
4"D5435MV	250T	4(9)	10	11 1/4	2 1/2	6 1/4	4	1	7	1 1/4	3	33 1/4	10 1/2	9 1/2	7 1/2	3	3 1/2	58 1/2	1 1/2	15 1/4	15	38 1/2
4"D5435MV	320T	4(9)	10	11 1/4	2 1/2	6 1/4	4	1	7	1 1/4	3	33 1/4	10 1/2	9 1/2	7 1/2	3	3 1/2	68 1/2	1 1/2	15 1/4	15	44 1/2
8"D5435MV	320T	8(11)	16	17 1/2	4 1/2	9 1/4	7	2 1/2	10 1/2	1 1/4	9 1/4	61 1/2	21	19 1/2	12 1/2	3	3 1/2	70	1 1/2	24 1/2	19	45 1/2
8"D5435MV	360T	8(11)	18	17 1/2	4 1/2	9 1/4	7	2 1/2	10 1/2	1 1/4	9 1/4	61 1/2	21	19 1/2	12 1/2	3	3 1/2	70 1/2	1 1/2	24 1/2	19	47 1/2
8"D5435MV	365T	8(11)	16	17 1/2	4 1/2	9 1/4	7	2 1/2	10 1/2	1 1/4	9 1/4	61 1/2	21	19 1/2	12 1/2	3	3 1/2	72 1/2	1 1/2	24 1/2	19	49 1/2
8"D5435MV	400T	8(9)	30 1/2	34 1/4	6 1/2	12 1/2	14	4	25	1 1/4	3 1/2	69	21	19 1/2	12 1/2	11	8	RTF	1 1/2	24 1/2	27 1/2	RTF
8"D5435MV	440T	8(9)	30 1/2	34 1/4	6 1/2	12 1/2	14	4	25	1 1/4	3 1/2	69	21	19 1/2	12 1/2	11	8	112	1 1/2	24 1/2	27 1/2	71
10"D5435MV	360T	10(9)	30 1/2	34 1/4	8 1/2	13 1/2	14	4	25	1 1/4	5 1/2	74 1/2	21 1/2	20 1/2	13 1/2	11	8	85 1/2	1 1/2	27	33	62 1/2
10"D5435MV	400T	10(9)	30 1/2	34 1/4	8 1/2	13 1/2	14	4	25	1 1/4	5 1/2	74 1/2	21 1/2	20 1/2	13 1/2	11	8	115	1 1/2	27	33	74

NOTES:

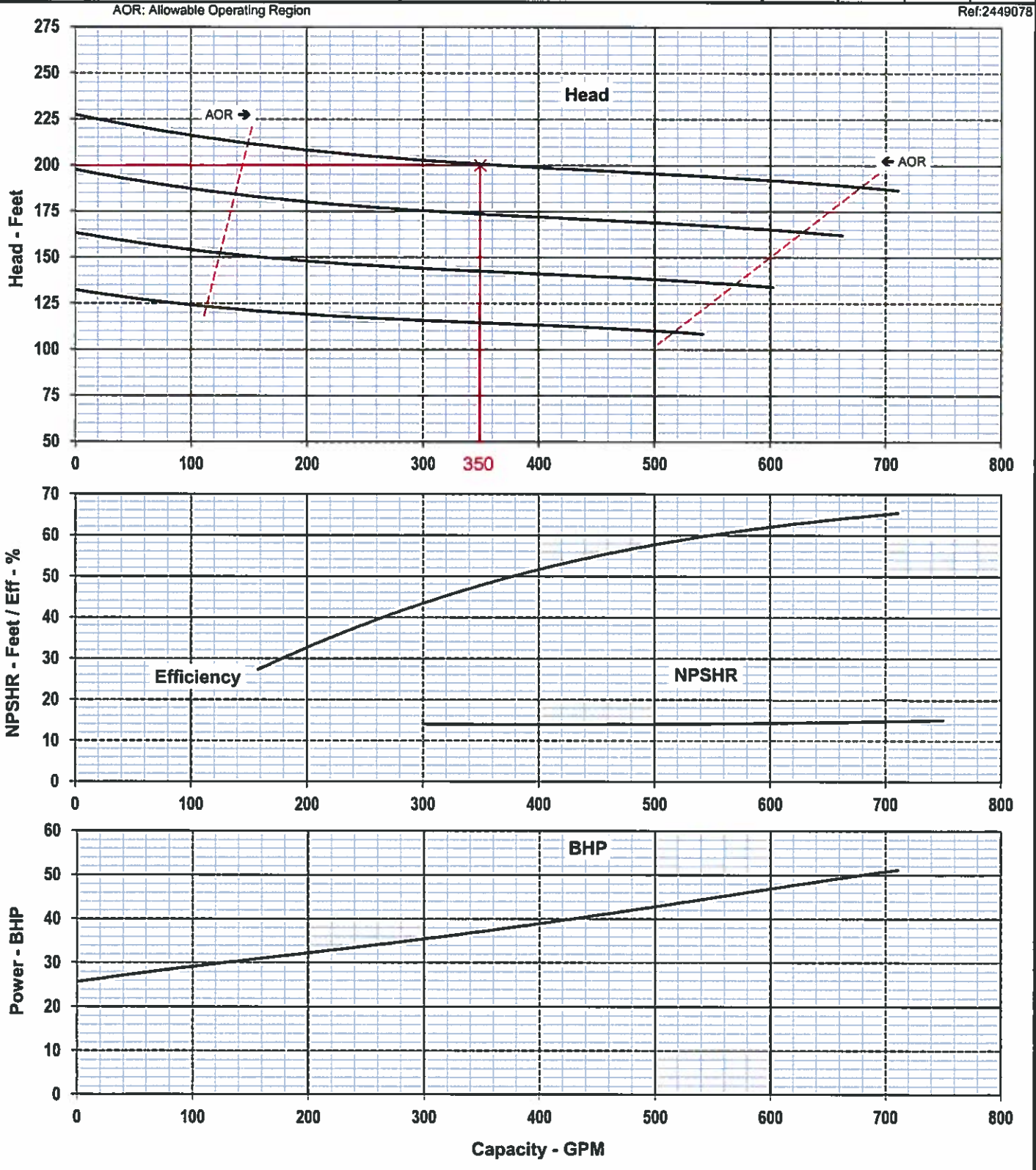
- (1) DISCHARGE FLANGE IS 125# ANSI DRILLING UNLESS NOTED.
- (2) ALL DIMENSIONS ARE IN INCHES UNLESS NOTED.
- (3) 5400'S AND 5400K'S ARE DIMENSIONALLY IDENTICAL.
- (4) RECOMMENDED LOW WATER LEVEL FOR CONTINUOUS OPERATION. 210 FRAME AND WATER JACKETED 250 THRU 440 FRAME UNITS CAN OPERATE CONTINUOUSLY AT "MW" WATER LEVEL.
- (5) WATER LEVEL MAY BE DRAWN DOWN TO THIS LEVEL FOR SHORT TIME DUTY IN AIR MOTOR RATINGS. DRAW DOWN CAN OCCUR OVER A PERIOD OF 15 MINUTES.
- (6) BASES ARE DESIGNED TO HAVE FULL CONTACT WITH GROUT OR A SOLE PLATE GROUTED IN PLACE.
- (7) NOT FOR CONSTRUCTION, INSTALLATION, OR APPLICATION PURPOSES UNLESS CERTIFIED. DIMENSIONS SHOWN MAY VARY DUE TO NORMAL MANUFACTURING TOLERANCES.
- (8) DISTANCE REQUIRED FOR PROPER SUCTION CLEARANCE.
- (9) IF RISER PIPE IS NOT SAME SIZE AS THE DISCHARGE ELBOW, AN ECCENTRIC INCREASER MUST BE USED LIMITED TO TWO SIZES LARGER MAXIMUM.
- (10) IF FUTURE CONSIDERATIONS REQUIRE CHANGING TO A 400 OR 440 FRAME MOTOR, THE 400 OR 440 FRAME DIMENSIONS SHOULD BE USED.
- (11) IF RISER PIPE IS NOT SAME SIZE AS THE DISCHARGE ELBOW, AN ECCENTRIC INCREASER MUST BE USED LIMITED TO ONE SIZE LARGER MAXIMUM.

UL LISTED
ISO-9001 CERTIFIED
CSA CERTIFIED (THRU 365 FRAME)

CUSTOMER					P.O. NO.		Fairbanks Morse Pump
JOB NAME					TAG NAME		
PUMP SIZE AND MODEL			QPM	TDH	RPM	ROTATION	BASIC PUMP D5435MV PULL-UP SUBMERSIBLE FAIRBANKS MORSE MTR
MOTOR	HP	FRAME	PHASE	HERTZ	VOLTS	ENCLOSURE	
CERTIFIED FOR			CERTIFIED BY		DATE		
DWG NO. 543MS013							REV NO. 5

Sandy Hook Pump Station Capacity Study - Exhibit 5

FAIRBANKS NIJHUIS				4" D5435MV SUBMITTAL CURVE							
				SPEED 1770	IMPELLER T4E1E	DIAMETER AS REQ'D"	STAGE ONE	GUARANTEED VALUES			
CURVE NO.:	N-170297 A	REV.:	0	SPHERE 3"	DRIVER 50 HP	DATE 4/13/2017	BY JCM	FLOW 350	HEAD 200	% EFF	BHP
THIS CURVE IS BASED ON THE ACTUAL TEST PERFORMANCE OF A SIMILAR PUMP. ONLY THE INDICATED POINT(S) IS GUARANTEED.											



Attachment B

Analysis of Available Sewer Capacity –Preliminary 6/8/17

	Current Sewer Plan	Changes	Adjusted Results
Metered Flow*	267,000	+5,000	272,000
Allocated**	31,630	- 9,100	22,530
Reserve	9,960		9,960
Unallocated***	23,410	+4,100	27,510

There is no change in allocation for any pickup from projected corrections from improvements in reducing I&I.

- *This is the average metered flow since 11/14.
- ** Sandy Hook School, Lexington Gardens and The Boulevard are removed from this line.
- *** This line is adjusted for the changes above.

At the current time we have the following potential projects for which capacity may be required:

The Boulevard: 75 units of assisted living – 5,400 gpd.

Fabric Fire Hose: 2,000 gpd.

79 Church Hill: 225 units – 28,125 gpd.

Total potential request of 35,525 gpd.

Attachment C

WSA Monthly Report
CT NEWTOWN WWTF
5/1/2017 to 5/31/2017

06/05/2017 02:05:40 PM

Date	Inf Q Total MGD	Inf BOD mg/L	Inf BOD lbs/day	Inf TSS mg/L	Inf TSS lbs/day	Inf TN Lbs	Inf Alk mg/L	Eff BOD mg/L	Eff TSS mg/L	Eff TN mg/L	Eff TN lbs/day	Eff Alk mg/L	BOD % Rem	TSS % Rem	TN % Rem
05/01/17	0.471														
05/02/17	0.450	139	521	133	500	129	150	1.3	0.6	3.0	11.8	70	99.1	99.5	91.3
05/03/17	0.462														
05/04/17	0.439														
05/05/17	0.678														
05/06/17	0.678														
05/07/17	0.678														
05/08/17	0.658														
05/09/17	0.617	141	726	167	859	161		1.0	0.5	2.5	13.8		99.3	99.7	92.0
05/10/17	0.561														
05/11/17	0.512														
05/12/17	0.579														
05/13/17	0.579														
05/14/17	0.579														
05/15/17	0.546														
05/16/17	0.505	143	602	168	707	132		1.2	0.9	3.4	15.6		99.2	99.5	89.2
05/17/17	0.442														
05/18/17	0.468														
05/19/17	0.507														
05/20/17	0.507														
05/21/17	0.507														
05/22/17	0.515														
05/23/17	0.486														
05/24/17	0.501	147	614	175	731	144		1.2	0.7	4.1	16.8		99.2	99.6	88.1
05/25/17	0.527														
05/26/17	0.465														
05/27/17	0.465														
05/28/17	0.465														
05/29/17	0.465														
05/30/17	0.406	142	481	158	535	98		1.1	0.7	2.9	11.1		99.2	99.6	90.0
05/31/17	0.426														
Average	0.521	142	589	160	666.400	132.800	150	1.2	0.7	3.2	13.8	70	99.2	99.6	90.1
Total	16.145	712	2,943	801	3,332.666	664.064	150	5.8	3.4	15.9	69.1	70	495.9	497.9	450.5
Minimum	0.406	139	481	133	499.659	98.134	150	1.0	0.5	2.5	11.1	70	99.1	99.5	88.1
Maximum	0.678	147	726	175	859.412	160.818	150	1.3	0.9	4.1	16.8	70	99.3	99.7	92.0

Newtown Water and Sewer
Monthly Flow Summary

May 2017	Sandy Hook PS	Taunton Lake PS	Baldwin PS	Hawleyville PS	Hanover PS
	Flow Total (Gal)	Flow Total (Gal)	Flow Total (Gal)	Flow Total (Gal)	Flow Total (Gal)
1	72,957	17,189	3,708	28,030	4,754
2	76,614	17,432	2,870	29,179	5,013
3	75,611	16,397	2,997	30,201	5,303
4	72,071	15,597	2,986	28,980	5,246
5	81,588	19,242	4,283	32,638	5,602
6	78,527	26,249	4,214	28,202	6,397
7	73,649	26,430	4,209	28,831	6,049
8	77,499	22,026	3,463	30,451	4,965
9	72,675	20,664	3,798	30,651	5,166
10	73,859	19,564	3,284	31,561	4,762
11	76,867	19,671	3,220	29,895	4,601
12	72,946	19,035	3,532	30,669	4,625
13	71,737	21,089	3,941	32,524	6,035
14	73,310	28,922	4,723	28,281	6,262
15	76,144	22,748	3,249	31,939	5,287
16	76,986	21,485	3,378	31,703	4,469
17	74,381	20,473	3,025	30,257	5,321
18	71,363	18,697	1,615	30,669	6,129
19	66,820	18,929	3,093	30,002	8,916
20	61,935	21,223	2,790	29,905	9,745
21	59,934	18,904	3,476	31,732	10,168
22	68,037	17,921	3,493	33,730	9,791
23	66,330	18,707	2,794	31,371	9,791
24	64,754	19,240	3,002	34,483	9,082
25	67,536	18,951	3,015	31,336	10,247
26	73,846	22,110	4,274	32,507	10,064
27	66,128	20,629	3,713	31,947	11,514
28	59,396	19,750	3,576	29,894	10,645
29	58,843	21,255	3,938	32,714	10,645
30	66,368	19,003	3,351	28,436	8,288
31	66,668	18,893	3,001	30,161	10,169
Min	58,843	15,597	1,615	28,030	4,469
Max	81,588	28,922	4,723	34,483	11,514
Ave	70,819	20,272	3,420	30,738	7,260
Total	2,195,380	628,429	106,012	952,880	225,050

Newtown Water and Sewer
Monthly Flow Summary

May 2017	Pump Stations		Fairfield Hills		Combined Remote		WWTP Influent		Gravity Flow		Rain Fall (inch)	
	Flow Total (Gal)		Flow Total (Gal)		Flow Total (Gal)		Flow Total (Gal)		Flow Total (Gal)		Annual	Daily
1	126,639		176,675		303,314		479,961		126,639		0.00	0.00
2	131,108		171,159		302,266		447,695		131,108		0.00	0.00
3	130,511		168,125		298,636		459,343		130,511		0.00	0.00
4	124,880		162,720		287,600		442,286		124,880		0.00	0.00
5	143,353		219,196		362,549		593,665		143,353		0.00	0.00
6	143,589		251,515		395,105		657,183		143,589		0.00	0.00
7	139,169		281,332		420,501		703,917		139,169		0.00	0.00
8	138,403		231,797		370,199		661,995		138,403		0.00	0.00
9	132,953		198,797		331,749		632,432		132,953		0.00	0.00
10	133,030		198,128		331,158		563,736		133,030		0.00	0.00
11	134,254		189,443		323,696		528,200		134,254		0.00	0.00
12	130,808		189,383		320,191		522,330		130,808		0.00	0.00
13	135,326		204,055		339,381		567,974		135,326		0.00	0.00
14	141,499		226,808		368,307		620,543		141,499		0.00	0.00
15	139,368		208,404		347,773		560,661		139,368		0.00	0.00
16	138,021		198,658		336,679		507,868		138,021		0.00	0.00
17	133,456		187,920		321,377		462,208		133,456		0.00	0.00
18	128,473		176,653		305,126		454,188		128,473		0.00	0.00
19	127,760		178,759		306,519		498,053		127,760		0.00	0.00
20	125,598		169,183		294,780		501,283		125,598		0.00	0.00
21	124,213		185,659		309,873		498,275		124,213		0.00	0.00
22	132,973		202,869		335,843		539,834		132,973		0.09	0.09
23	128,993		173,895		302,888		475,318		128,993		0.09	0.00
24	130,561		170,307		300,868		472,948		130,561		0.10	0.01
25	131,085		179,517		310,603		493,482		131,085		0.41	0.31
26	142,801		224,984		367,785		540,885		142,801		1.02	0.61
27	133,931		184,727		318,658		464,563		133,931		1.02	0.00
28	123,261		182,443		305,704		434,552		123,261		1.02	0.00
29	127,395		173,429		300,825		453,668		127,395		1.07	0.05
30	125,446		179,388		304,834		449,472		125,446		1.07	0.00
31	128,892		173,783		302,675		400,313		128,892		1.15	0.08
Min	123,261		162,720		287,600		400,313		123,261			0.00
Max	143,589		281,332		420,501		703,917		143,589			0.61
Ave	132,508		194,184		326,692		518,994		132,508			0.04
Total	4,107,751		6,019,711		10,127,462		16,088,829		4,107,751			1.15

Newtown Water and Sewer
Monthly Flow Summary

May 2017	Well House #3	Well House #7	Booster Pumps
	Flow Total (Gal)	Flow Total (Gal)	Flow Total (Gal)
1	0	136,811	138,036
2	95	128,559	129,687
3	0	142,183	143,410
4	0	134,825	136,061
5	0	131,024	132,214
6	0	138,826	143,250
7	0	208,863	207,533
8	0	159,797	161,627
9	0	135,295	136,475
10	0	133,537	134,779
11	0	124,988	126,233
12	0	137,067	140,558
13	0	121,236	120,678
14	0	132,864	134,223
15	0	128,824	132,908
16	0	137,477	135,767
17	0	145,637	146,987
18	0	126,018	127,106
19	0	141,924	143,302
20	0	124,477	125,808
21	0	152,450	153,837
22	0	159,889	161,116
23	0	139,270	140,770
24	0	139,025	140,136
25	0	140,268	141,816
26	0	141,661	142,916
27	0	133,553	134,630
28	0	131,781	133,046
29	0	136,809	138,501
30	0	135,113	136,405
31	0	210,630	211,084
Min	0	121,236	120,678
Max	95	210,630	211,084
Ave	3	141,635	142,932
Total	95	4,390,681	4,430,899