

Appendix H – Sanitary Sewer Computations

PROJECTED FLOW RATES

OPTION #1:

Per the NYS DEC "Design Standards for Wastewater Treatment Works", 1998 Manual:

Type of Facility	Flow Rate per Person (gal/day)	Flow Rate per Unit (gal/day)	Allowable Decrease for Water Saving Devices	Resulting Flow Rate per Unit (gal/day)
Condominiums				
2-Bedroom Units		300	20.00%	240
Townhomes				
3-Bedroom Units		400	20.00%	320
Apartments				
1-Bedroom Units		150	20.00%	120
2-Bedroom Units		300	20.00%	240

Site Flows:

Building I.D.	Number of Buildings	Number of Units	Daily Flow Rate (gpd/unit)	Sub-Total Flows (gpd)
Area A:				
No Buildings				
Area B:				
Apartments				
1-Bedroom Apartment Units		25	120	3,000.00
2-Bedroom Apartment Units		25	240	6,000.00
Townhomes				
3-Bedroom Units		36	320	11,520.00
Area C:				
Townhomes				
3-Bedroom Units		42	320	13,440.00
Area D:				
Condominiums				
2-Bedroom Units		88	240	21,120.00

Total Site Flows = 55,080.00 gpd

PROJECTED FLOW RATES

OPTION #2:

Per the "Recommended Standards for Wastewater Facilities" (a.k.a. the "Ten State Standards"); 2004 Edition:

Type of Facility	Flow Rate per Capita (gal/day)	Projected Capita per Unit	Resulting Flow Rate per Unit (gal/day)
Condominiums			
2-Bedroom Units	100	2	200
Townhomes			
3-Bedroom Units	100	3.6	360
Apartments			
1-Bedroom Units	100	1	100
2-Bedroom Units	100	2	200

Site Flows:

Building I.D.	Number of Buildings	Number of Units	Daily Flow Rate (gpd/unit)	Sub-Total Flows (gpd)
Area A:				
No Buildings				
Area B:				
<u>Apartments</u>				
1-Bedroom Apartment Units		25	100	2,500.00
2-Bedroom Apartment Units		25	200	5,000.00
<u>Townhomes</u>				
3-Beroom Units		36	360	12,960.00
Area C:				
<u>Townhomes</u>				
3-Bedroom Units		42	360	15,120.00
Area D:				
<u>Condominiums</u>				
2-Bedroom Units		88	200	17,600.00

Total Site Flows = 53,180.00 gpd

PROJECTED FLOW RATES

OPTION #3:

Per the NYS Department Of Health's Appendix 75-A:

Type of Facility	Flow Rate per Person (gal/day)	Flow Rate per Unit (gal/day)		
<u>Condominiums</u>				
2-Bedroom Units		220		
<u>Townhomes</u>				
3-Bedroom Units		330		
<u>Apartments</u>				
1-Bedroom Units		110		
2-Bedroom Units		220		

Site Flows:

Building I.D.	Number of Buildings	Number of Units	Daily Flow Rate (gpd/unit)	Sub-Total Flows (gpd)
<u>Area A:</u>				
No Buildings				
<u>Area B:</u>				
<u>Apartments</u>				
1-Bedroom Apartment Units		25	110	2,750.00
2-Bedroom Apartment Units		25	220	5,500.00
<u>Townhomes</u>				
3-Bedroom Units		36	330	11,880.00
<u>Area C:</u>				
<u>Townhomes</u>				
3-Bedroom Units		42	330	13,860.00
<u>Area D:</u>				
<u>Condominiums</u>				
2-Bedroom Units		88	220	19,360.00

Total Site Flows = 53,350.00 gpd

PROJECTED FLOW RATES

Projected Daily Flows when applying the NYS DEC "Design Standards for Wastewater Treatment Works" Flow Rates = 55,080.00 gpd

Projected Daily Flows when applying the "Recommended Standards for Wastewater Facilities" (a.k.a. the "Ten State Standards") Flow Rates = 53,180.00 gpd

Projected Daily Flows when applying the NYS Department Of Health's "Individual Residential Wastewater Treatment Systems Design Handbook (a.k.a. Appendix 75-A)" Flow Rates = 53,350.00 gpd

PROJECTED SANITARY SEWER FLOW RATES:

Average Daily Flow Rate = **55,080.00** gpd

Max. Daily Flow Rate (using a Peaking Factor of 2.5) = **137,700.00** gpd

PROJECTED POTABLE WATER FLOW RATES:

Average Daily Flow Rate = 55,080.00 gpd

Irrigation Demand (+ 10%) = 5,508.00 gpd

Total Average Daily Demand = **60,588.00** gpd

Max. Daily Flow Rate (using a Peaking Factor of 2.5) = **151,470.00** gpd

Peak Hourly Demand (using a Peaking Factor of 4)* = **224.40** gpm*

* This value is based on an 18 hrs/day assumption



ingalls & associates, I.L.P

JOB NAME: DUNCAN MEADOWS - Sanitary Sewer

SHEET: 1 OF X 2 (1-21-09)

CALCULATED BY: SDP DATE: 4-4-08

CHECKED BY: _____ DATE: _____

SCALE: W.T.S.

Portion of Project connecting to McChesney Ave. :

Flows from site = 15,840 gpd = 2,117.5 cf/day = 88 cf/hr = 1.47 cf/min = 0.02 cf/sec

Ex Flows to Pump station + Highland's Flows = 104,000 gpd = 13,894.27 cf/day = 578.93 cf/hr = 9.65 cf/min = 0.16 cf/sec

TOTAL = 0.18 cfs

Most Restrictive section of Sewer (to connection w/ McChesney Ave Ext.)

= 8" PVC main @ slope = 0.43%

Per Manning's Formula; $Q_{full} = 1.03$ cfs.

SINCE 0.18 cfs < 1.03 cfs \Rightarrow OK.

~~REV'D 1-21-09 - SEE SH 2~~

Portion of Project connecting to McChesney Ave Ext. :

Flows from site = 27,810 gpd = 3,717.66 cf/day = 154.90 cf/hr = 2.58 cf/min = 0.04 cf/sec.

Ex Flows + Flows from Highland = 104,000 gpd = 13,894.27 cf/day = 578.93 cf/hr = 9.65 cf/min = 0.16 cf/sec.

AT PUMP STATION

TOTAL flows = 0.20 cf/sec.

Most Restrictive section of Sewer (to connection w/ Flows from

= 8" PVC main @ slope = 3.64%

Per Manning's Formula; $Q_{full} = 3.0$ cfs.

SINCE 0.2 cf/sec < 3.0 cfs \Rightarrow O.K.

~~REV'D 1-21-09 - SEE SH 2~~

Portion of Project connecting to McChesney Ave Ext AFTER Brunswick Assoc (Sagehill Apt's):

AND PRIOR TO JOINING McChesney Ave's Flows:

Flows from site = 27,810 gpd = 0.04 cf/sec.

Ex Flows + Flows from Highland = 104,000 gpd = 0.16 cf/sec

AT PUMP STATION

TOTAL = 0.20 cf/sec.

Most Restrictive section of Sewer = 10" PVC @ slope = 0.72%

Per Manning's formula; $Q_{full} = 2.42$ cfs

SINCE 0.2 cf/sec < 2.42 cfs \Rightarrow O.K.

~~REV'D 1-21-09 - SEE SH 2~~



ingalls & associates, LLP

JOB NAME: DUNLAN MEADOWS - SANITARY SEWER

SHEET: 2 OF 2

CALCULATED BY: SDP DATE: 1-21-09

CHECKED BY: _____ DATE: _____

SCALE: N.T.S.

Revise calculations for Sanitary Sewer Along McChesney Ave. Ext. due to existing infiltration and inflow issues AND REVISED flow rates?

Portion of Project connecting to McChesney Ave. Ext. prior to Brunswick Assoc.'s connection AND joining McChesney Ave's flows:

$$\begin{aligned}
 \text{Flows from site} &= 33,960 \text{ gpd} = 4,537.01 \text{ cf/day} = 0.05 \text{ cf/sec} \\
 \text{Ex flows to Pump Station} &= 50,000 \text{ gpd} = 6,679.94 \text{ cf/day} = 0.08 \text{ cf/sec} \\
 \text{Ex. I \& I issues} &= 50 \text{ gpm} = 6.68 \text{ cf/min} = 0.11 \text{ cf/sec} \\
 \text{Flows from Highland Creek (use pump rate)} &= 180 \text{ gpm} = 24.05 \text{ cf/min} = 0.40 \text{ cf/sec} \\
 \text{TOTAL} &= 0.64 \text{ cf/sec}
 \end{aligned}$$

SINCE 0.64 cf/sec < 3.0 cfs \rightarrow OK.

Portion of Project connecting to McChesney Ave. Ext. After Brunswick Assoc. AND prior to joining McChesney Ave's flows:

$$\begin{aligned}
 \text{Flows from site} &= 33,960 \text{ gpd} = 0.05 \text{ cf/sec} \\
 \text{Ex flows to Pump Station} &= 50,000 \text{ gpd} = 0.08 \text{ cf/sec} \\
 \text{Ex. I \& I issues} &= 50 \text{ gpm} = 6.68 \text{ cf/min} = 0.11 \text{ cf/sec} \\
 \text{Flows from Highland Creek (use pump rate)} &= 180 \text{ gpm} = 0.40 \text{ cf/sec} \\
 \text{TOTAL} &= 0.64 \text{ cf/sec}
 \end{aligned}$$

SINCE 0.64 cf/sec < 2.42 cfs \rightarrow OK.

Revise calculations for Sanitary Sewer Along McChesney Ave. due to REV'D flow rates:

$$\begin{aligned}
 \text{Flows from site} &= 21,120 \text{ gpd} = 2,821 \text{ gal cf/day} = 117.57 \text{ cf/hr} = 1.96 \text{ cf/min} = 0.03 \text{ cf/sec} \\
 \text{Ex. flows to pump station} &= 50,000 \text{ gpd} = 0.08 \text{ cf/sec} \\
 \text{Flows from Highland Creek (use pump rate)} &= 180 \text{ gpm} = 0.40 \text{ cf/sec} \\
 \text{TOTAL} &= 0.51 \text{ cf/sec}
 \end{aligned}$$

SINCE 0.51 cf/sec < 1.03 cf/sec \rightarrow OK.