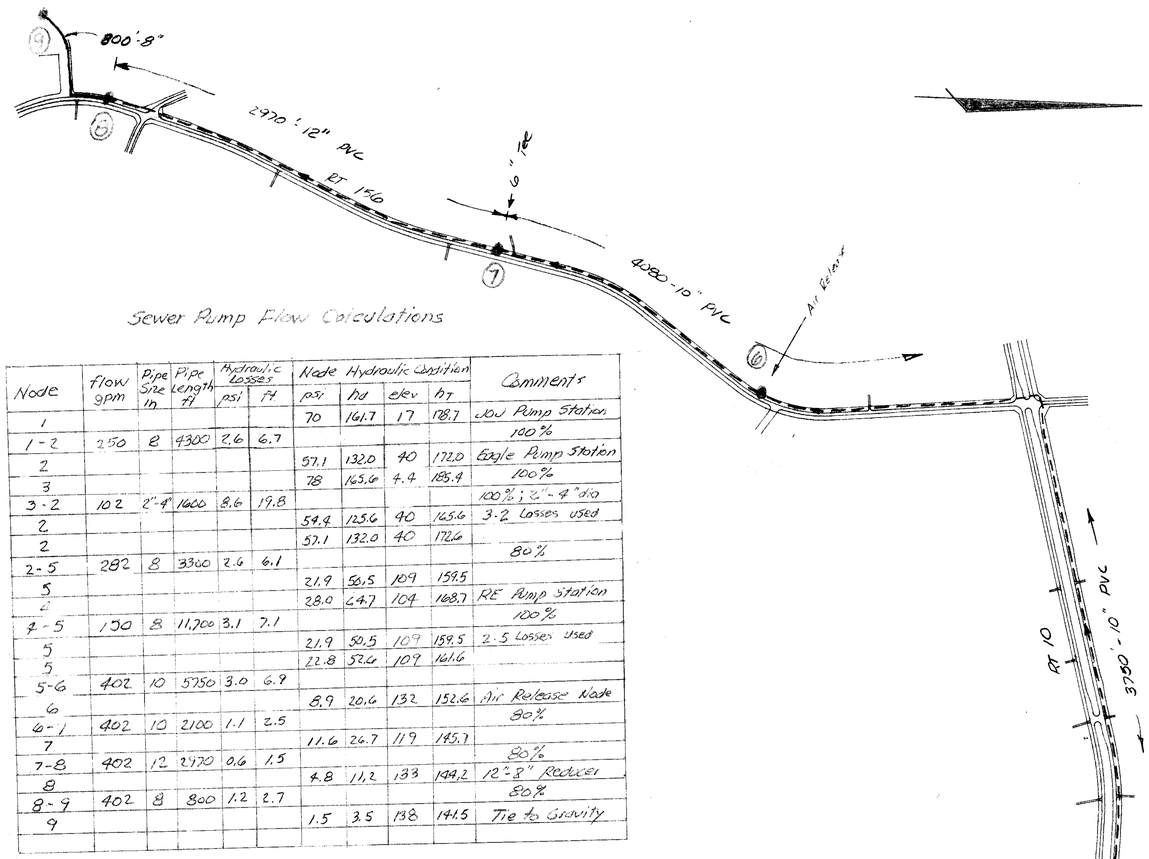
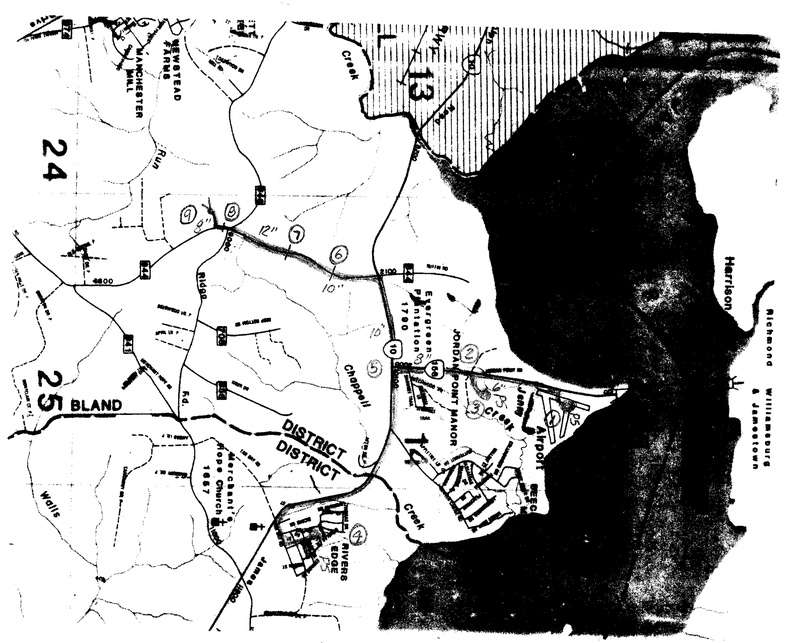
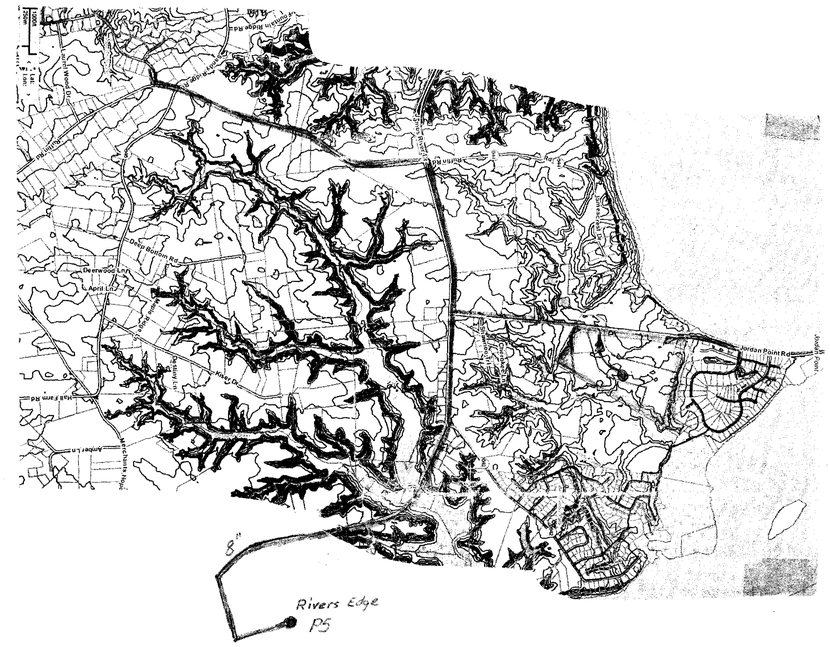


Sewer Pump Flow Calculations

Node	flow gpm	Pipe Size in	Pipe Length ft	Hydraulic Losses psi	Hydraulic Losses ft	Node Hydraulic Condition psi	hd	elev	h_T	Comments
1						70	161.7	17	178.7	JOJ Pump Station
1-2	250	8	4300	2.6	6.7					100%
2						57.1	132.0	40	172.0	Eagle Pump Station
3						78	165.6	4.4	185.9	100%
3-2	102	2"-4"	1600	8.6	19.8					100%; 2"-4" dia
2						54.4	125.6	40	165.6	3-2 Losses used
2						57.1	132.0	40	172.6	80%
2-5	282	8	3300	2.6	6.1					
5						21.9	50.5	109	159.5	
4						28.0	64.7	104	168.7	RE Pump Station
4-5	150	8	11,700	3.1	7.1					100%
5						21.9	50.5	109	159.5	2-5 Losses used
5						22.8	52.6	109	161.6	
5-6	402	10	5750	3.0	6.9					
6						8.9	20.6	132	152.6	Air Release Node
6-7	402	10	2100	1.1	2.5					80%
7						11.6	26.7	119	145.7	
7-8	402	12	2970	0.6	1.5					80%
8						4.8	11.2	133	144.2	12"-8" Reducer
8-9	402	8	800	1.2	2.7					80%
9						1.5	3.5	138	141.5	Tie to Gravity





Notes

1. 80% factor accounts for non simultaneous pump operation
   - JOJ: 250 gpm @ 70 psi
   - Eagle: 102 gpm @ 78 psi
   - Rivers Edge: 150 gpm @ 28 psi
   - Total = 520 gpm
2. hd = Dynamic head (ft)
   ht = Total Head (ft.)
   ehc = Equivalent house connection
3. Capacity of 80% Pump Operation (Peak hour)

$$ehc = \frac{\text{flow rate} \times 24\text{hrs} \times 60\text{min}}{2.36} \div 250 \text{ gal/day/house}$$

$$ehc = \frac{(416)(24)(60)}{2.36} \div 250 = 1015 \text{ homes}$$

4. c factor = 120

REVISIONS	BY
10-7-13	
12-4-13	
2-3-14	
4-24-14	

Architectural Graphics
6676 LAKESHORE DRIVE
QUINTON, VIRGINIA 23141
804-551-6944

FORCE MAIN CALCILATIONS
EAGLE PRESERVE
AT JORDAN ON THR JAMES

SEAL: COMMONWEALTH OF VIRGINIA — WALTER M. ALTMAN III — No. 11039 — 4/24/14 — PROFESSIONAL ENGINEER

DRAWN: PBM	CHECKED: WMA
DATE: 8-19-13	
SCALE: AS NOTED	
JOB NO.:	
SHEET C3	
OF 35 SHEETS	