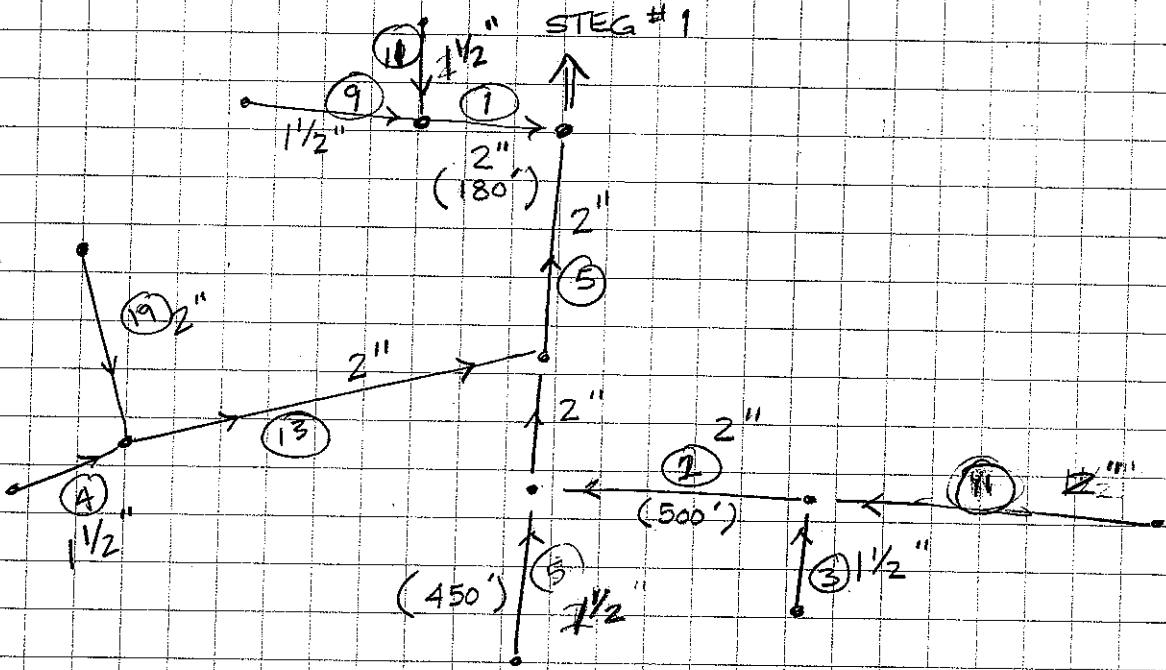


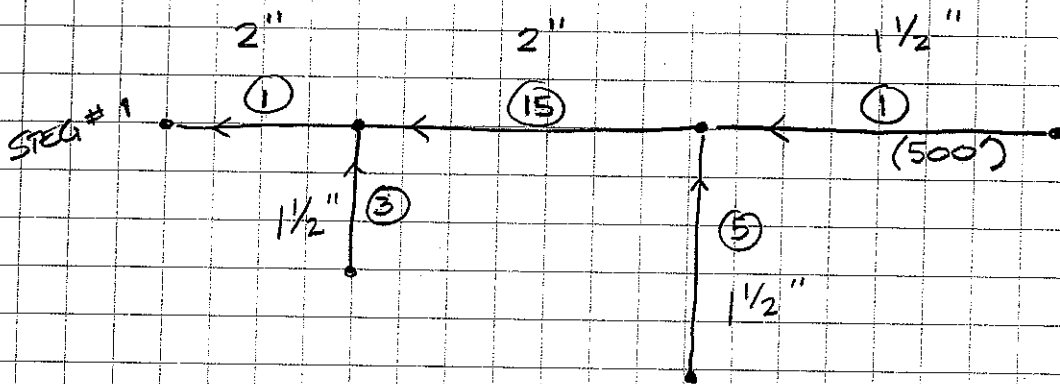
APPENDIX E

Pipe & Pump Station Sizing Calculations (STE System)

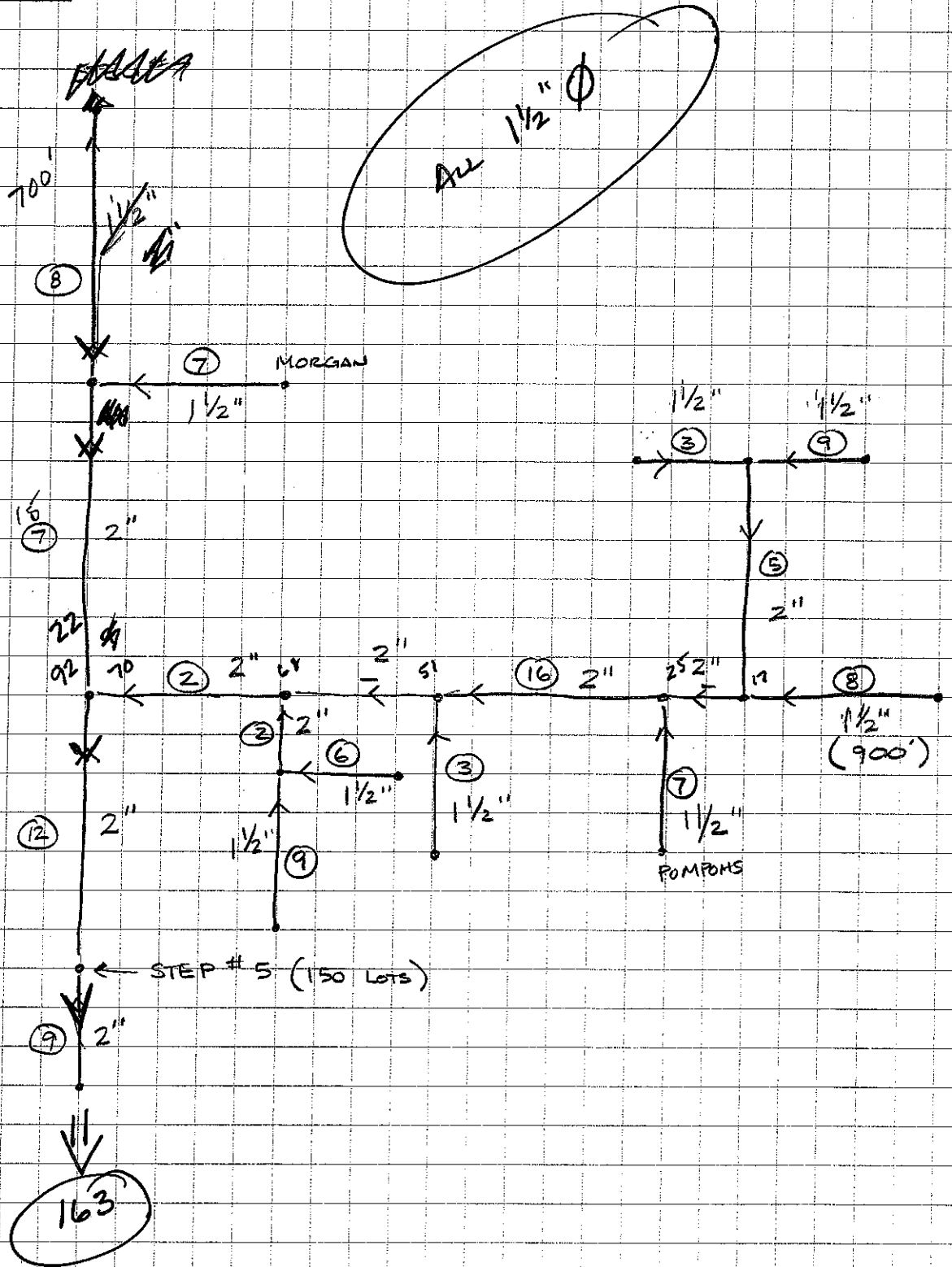
STEP # 1



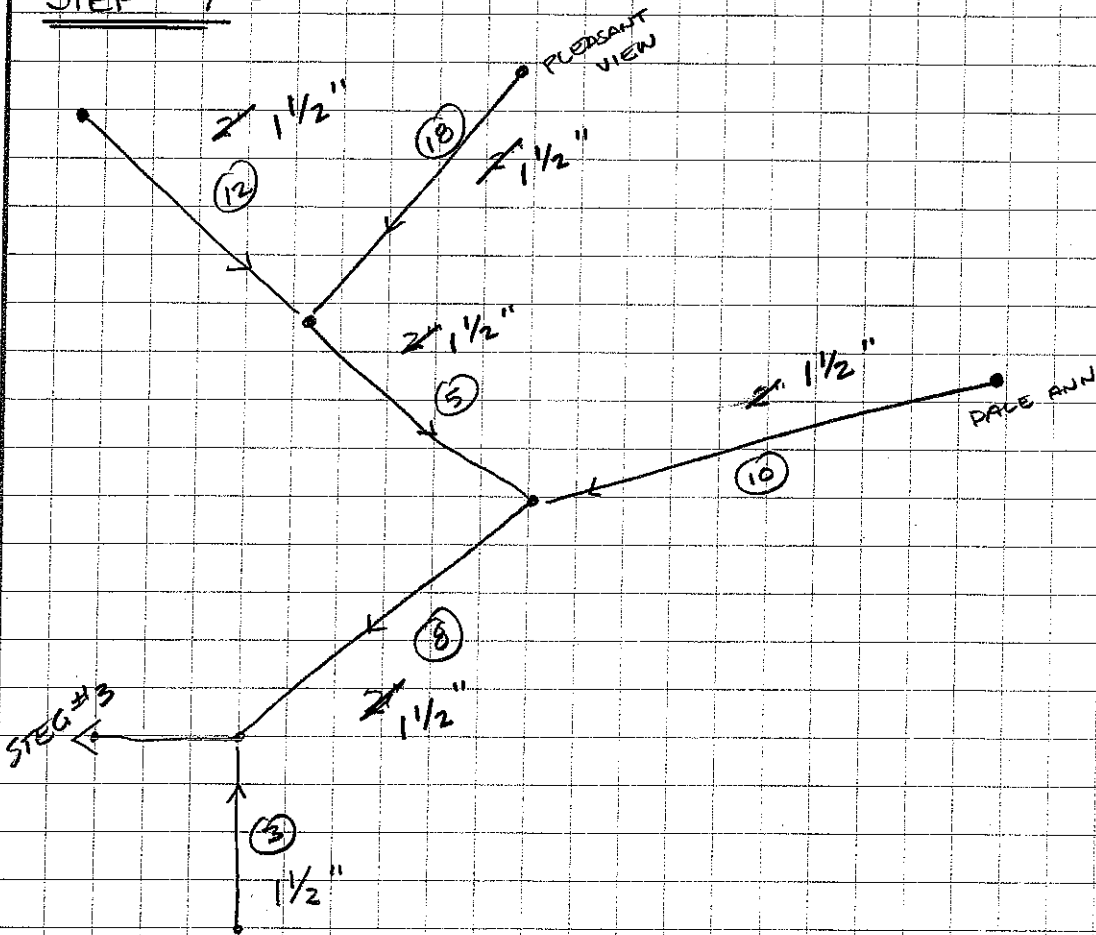
STEP # 2



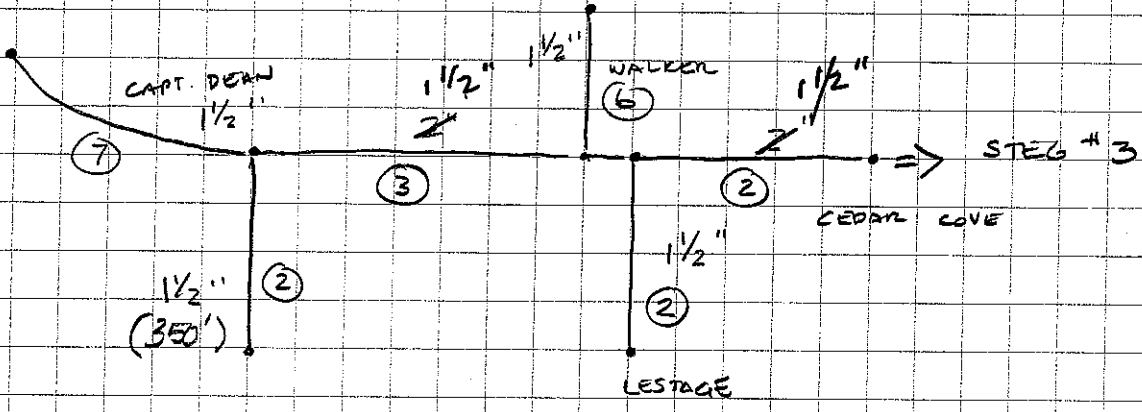
STEP # 6



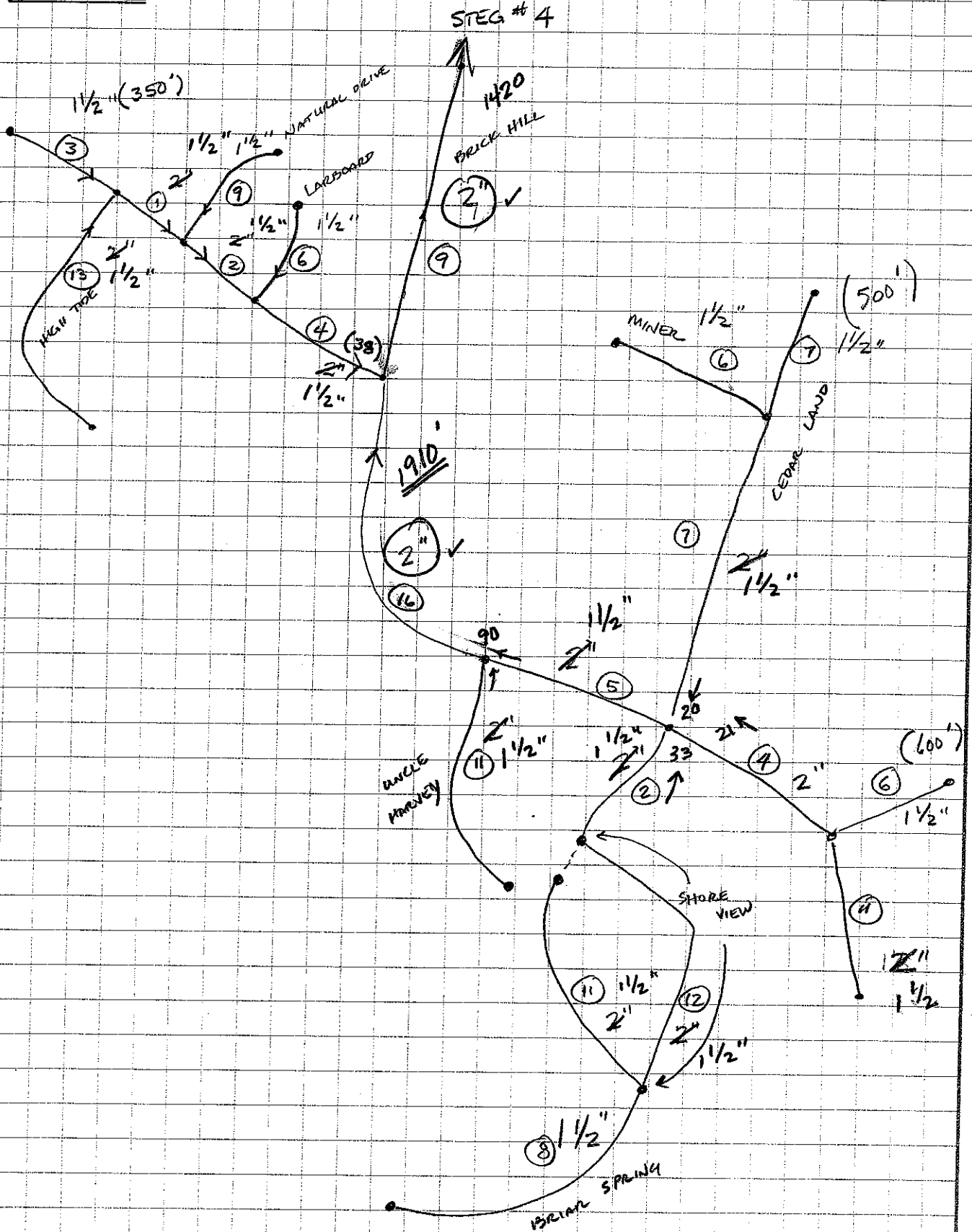
STEP # 7 -



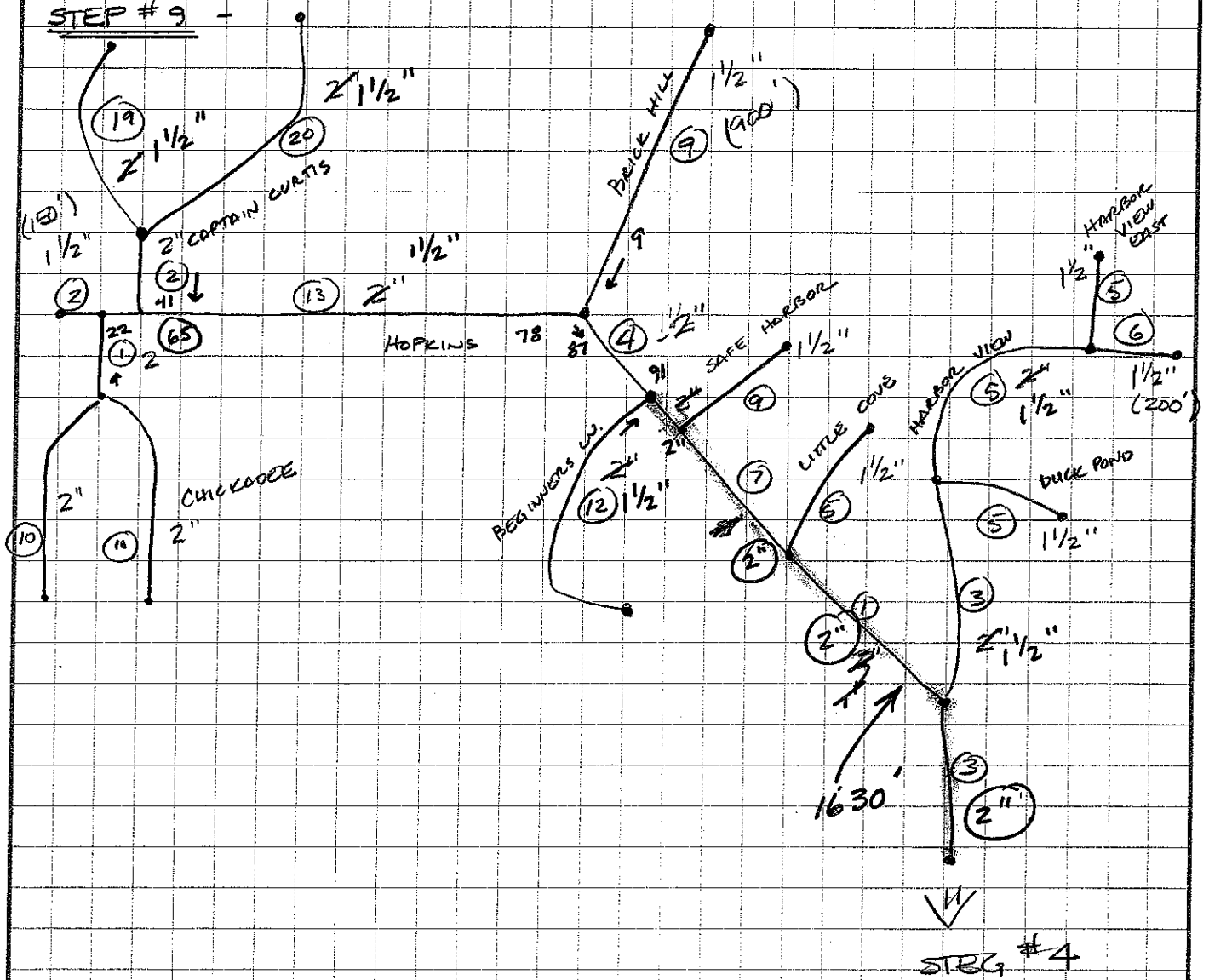
STEP # 3



STEP # 8

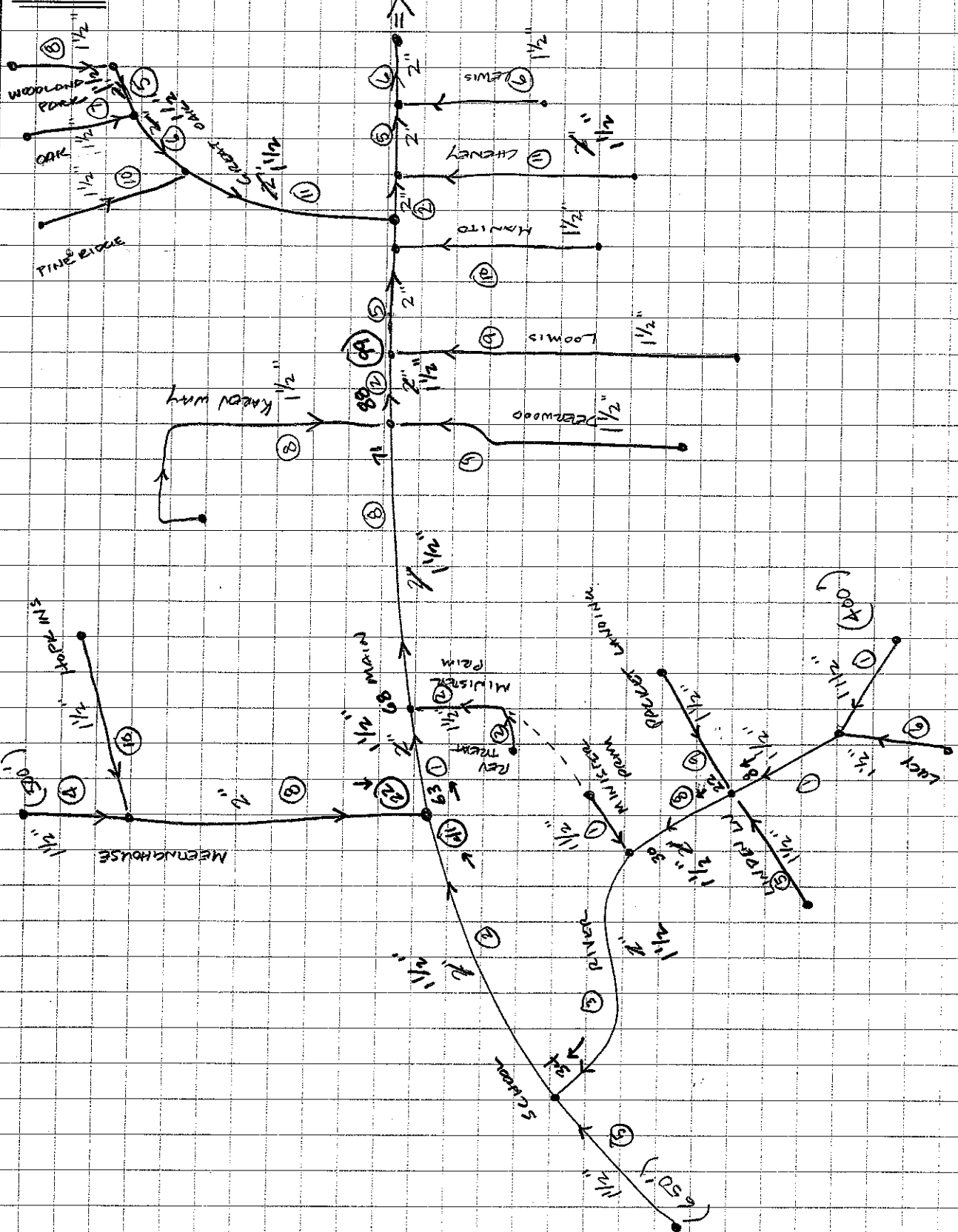


STEP # 9 -



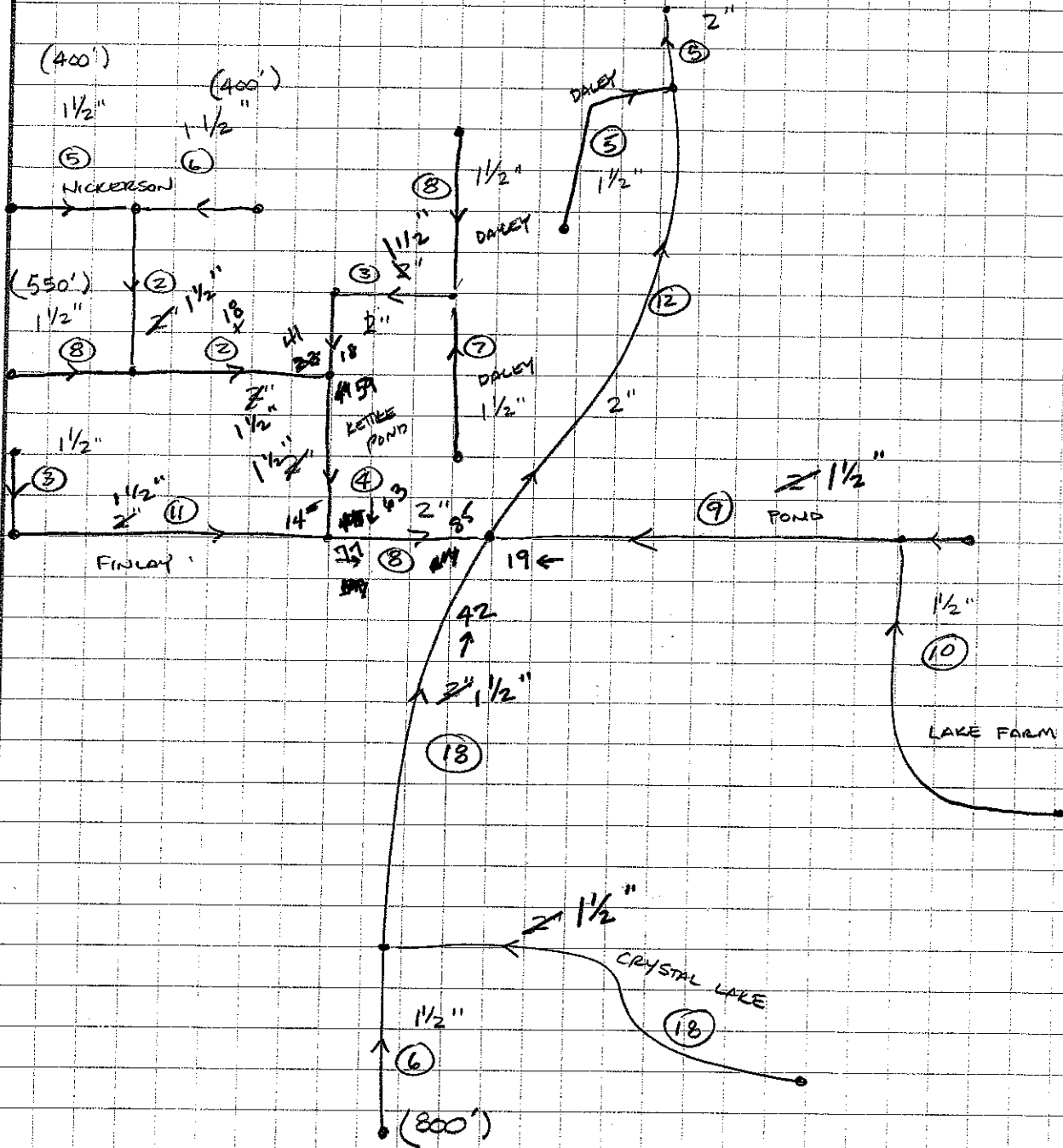
STEP # 10 -

STEP # 5

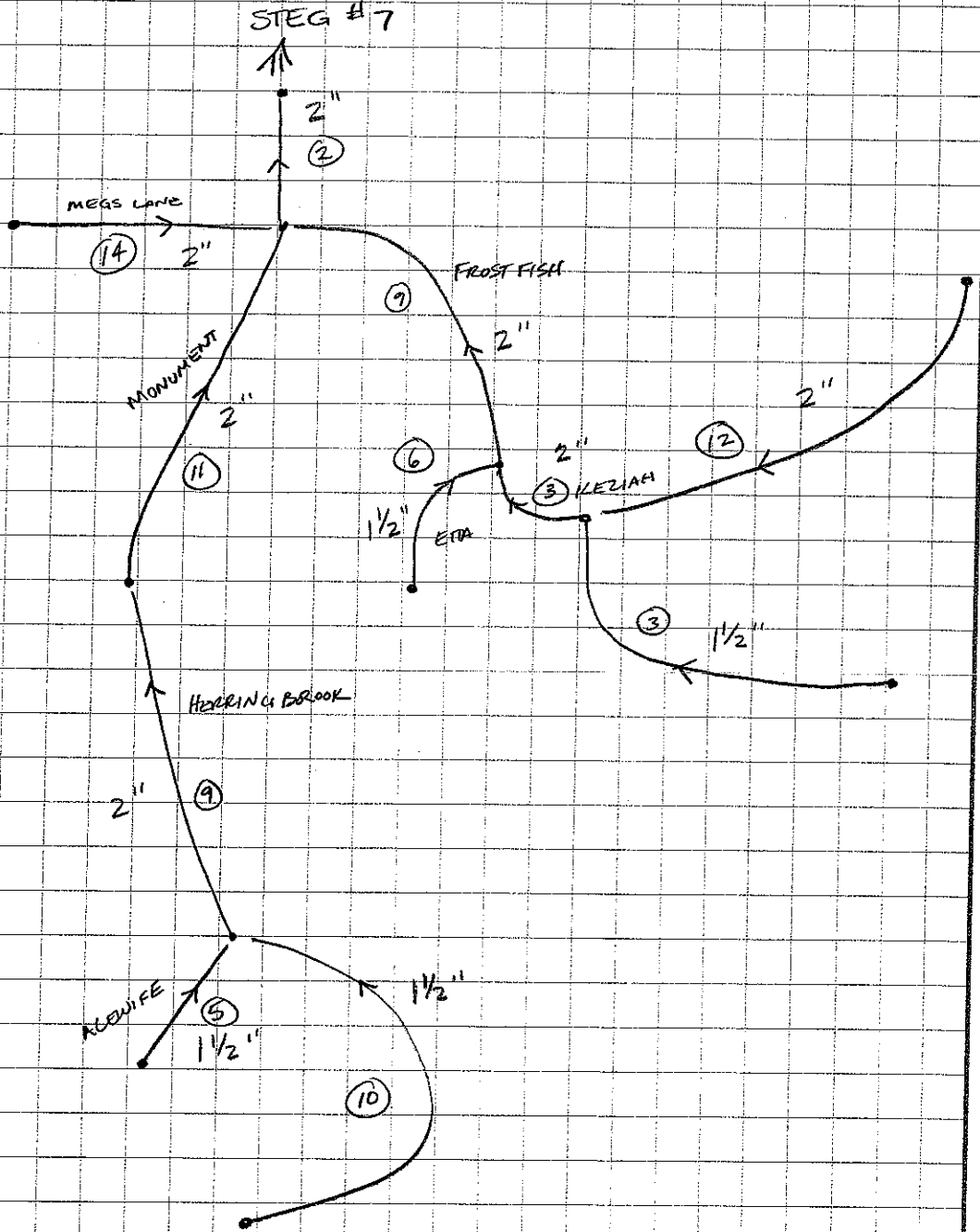


STEP # 13

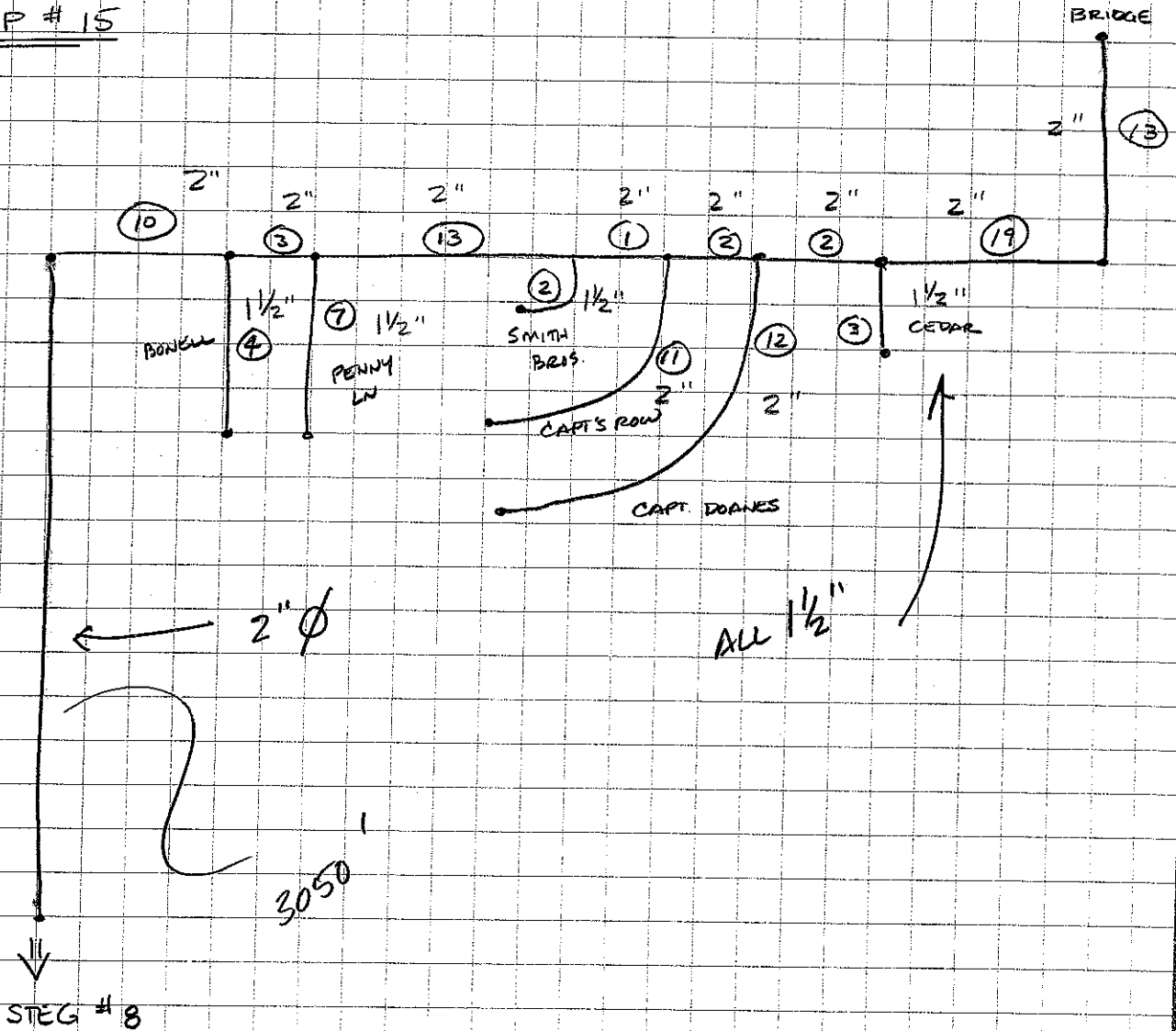
STEP # 7



STEP # 14

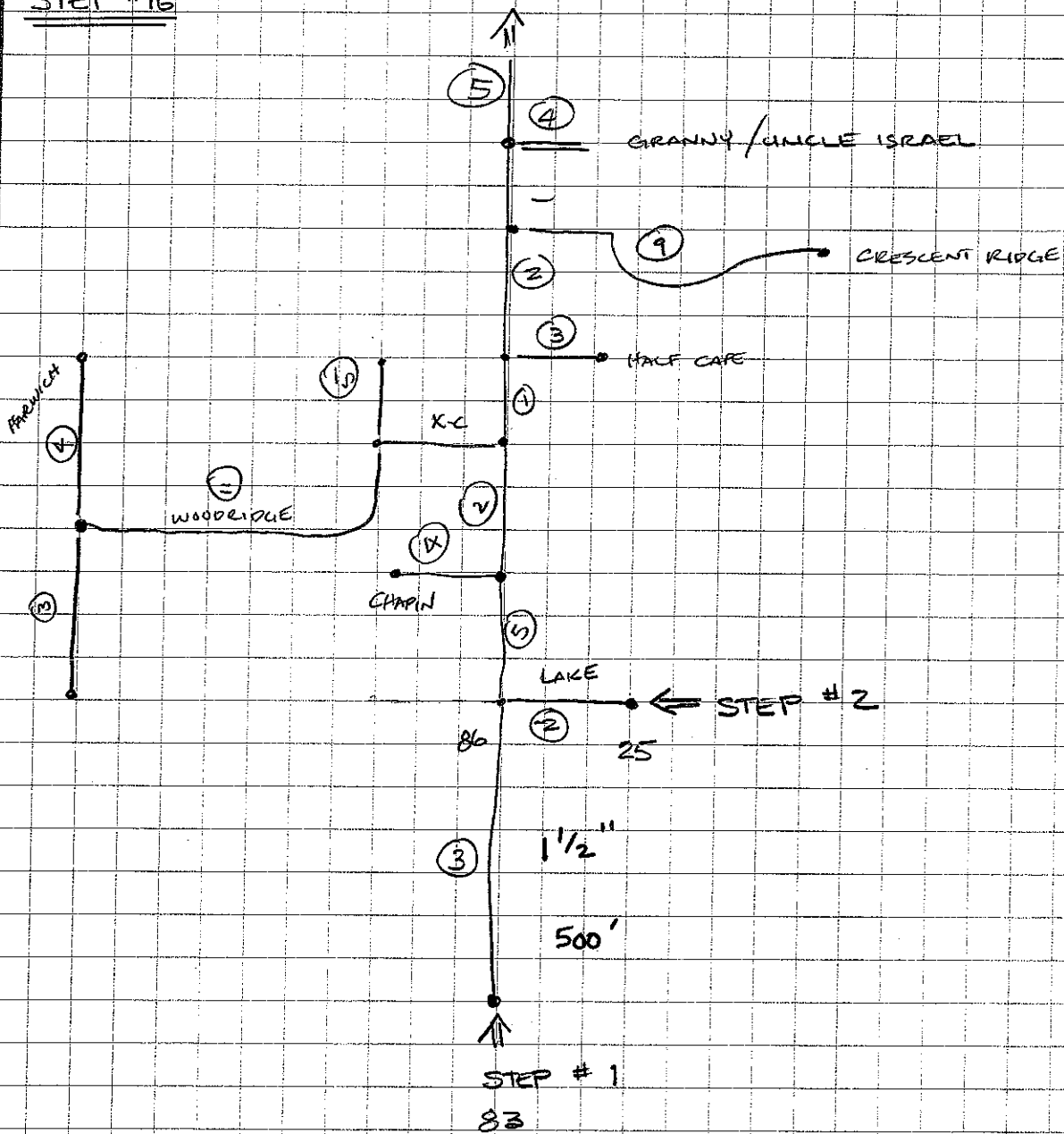


STEP # 15



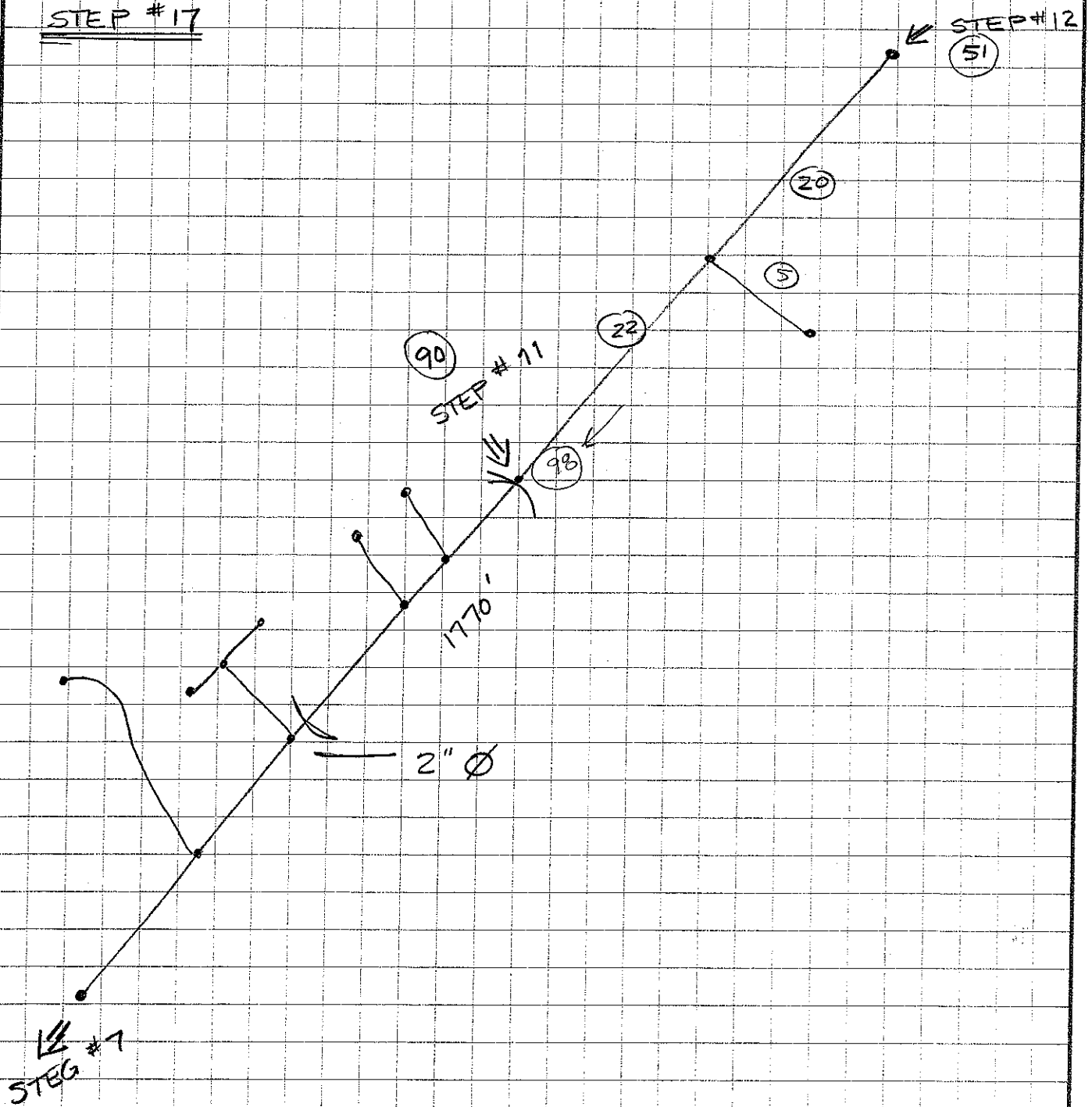
STEP # 16

STEP # 2

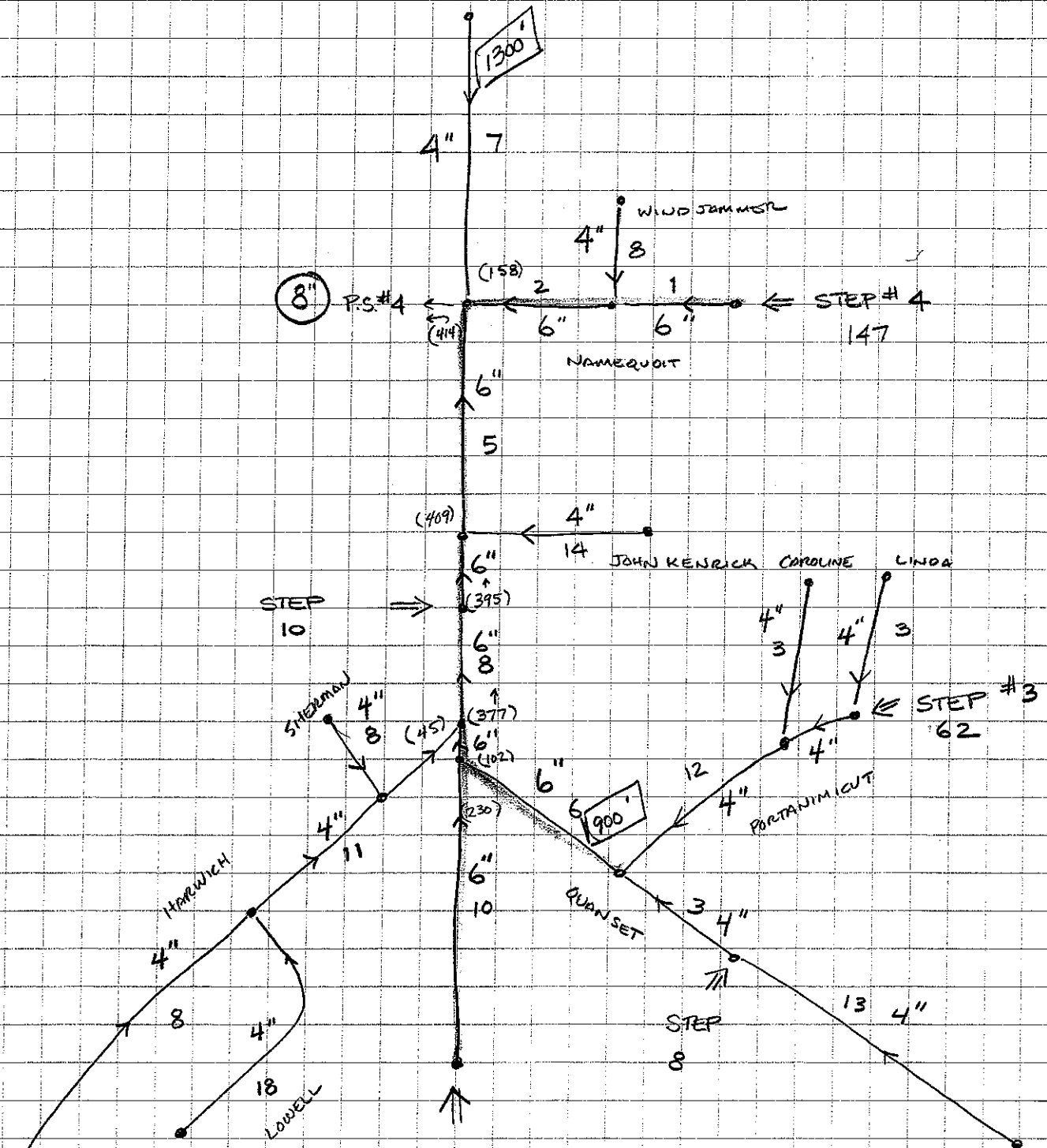


STEP #17

STEP #12

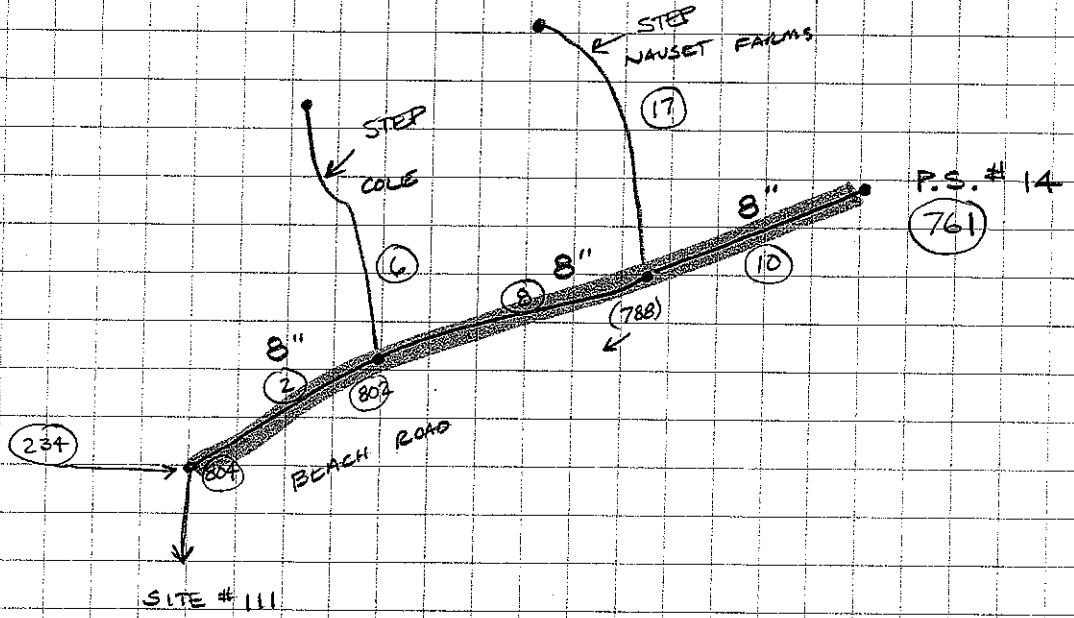


STEP # 2

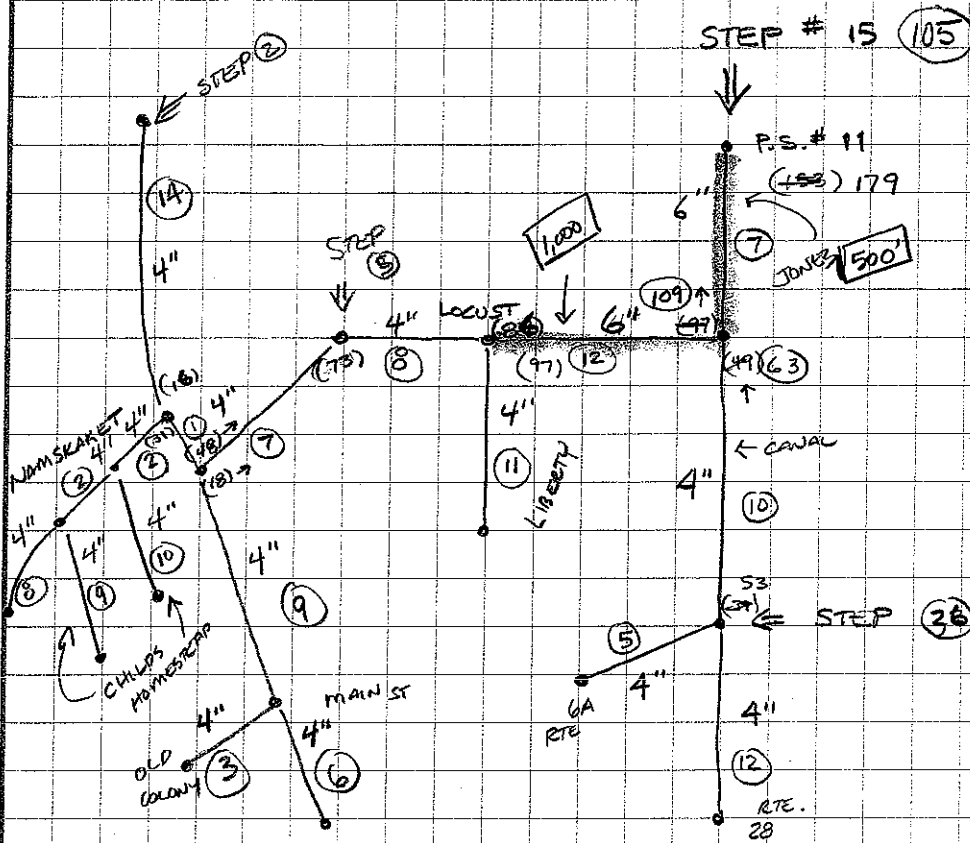


STEP # 1	-	83
STEP # 2	-	25
STEP # 16	-	112
		<u>220</u>

STEP # 5



STEP # 8



2

P.S. # 4 -

* ALL PLEASANT BAY WATERSHED (\therefore 200 GPD/LOT)

$$583 \text{ lots} \times 200 \text{ gpd/lot} = 116,600 \text{ gpd ADF} \quad \therefore \text{P.F.} = 5.4$$

$$116,600 \text{ gpd} \times 5.4 = 629,640 \text{ gpd PEAK}$$

* NO 1/1 ALLOWANCES SINCE PRESSURE SEWER.

$$Q_{\text{PEAK}} = 629,640 \text{ gpd} = 0.974 \text{ cfs} = 437 \text{ gpm PEAK}$$

$$Q = 0.974 \text{ cfs} ; V = 3 \text{ fps (assumed)}$$

$$A = Q/V$$

$$\pi d^2/4 = 0.974/3$$

$$d = 0.64 \text{ ft} = 7.71 \text{ inch}$$

TRY 6" \varnothing FM : $V = Q/A$

$$V = 0.974 / \pi (6/12)^2 / 4 = 4.96 \text{ fps (O.K.)}$$

USE 6" \varnothing FM

$$Q_{\text{PEAK}} = 437 \text{ gpm w/ 6" } \varnothing \text{ FM}$$

P.S. # 13 - * ALL PLEASANT BAY WATERSHED (\therefore 200 GPD/LOT)

$$266 \text{ lots} \times 200 \text{ gpd/lot} = 53,200 \text{ gpd ADF} \quad \therefore \text{P.F.} = 5.6$$

$$53,200 \text{ gpd} \times 5.6 = 297,920 \text{ gpd PEAK} = 0.461 \text{ cfs PEAK}$$

$$= 207 \text{ gpm PEAK}$$

$$Q_{\text{PEAK}} = 0.461 \text{ cfs} ; V = 3 \text{ fps (assumed)}$$

$$A = Q/V$$

$$\pi d^2/4 = 0.461/3$$

$$d = 0.44 \text{ ft} = 5.3 \text{ inch}$$

TRY 4" \varnothing FM : $V = Q/A = 0.461 / \pi (4/12)^2 / 4 = 5.28 \text{ fps (O.K.)}$

USE 4" \varnothing FM

$$Q_{\text{PEAK}} = 207 \text{ gpm w/ 4" } \varnothing \text{ FM}$$

P.S. # 14 - * PLEASANT BAY & NAUSET WATERSHEDS (∴ 200 gpd/lot & 275 gpd/lot)

$$\begin{aligned} & \text{P.S. \# 13 (P.B.)} + \text{STEP \# 8 (P.B.)} + \text{STEP \# 9 (N)} + \text{STEP \# 4 (N)} \\ & (266 \text{ lots} \times 200 \text{ gpd/lot}) + (184 \text{ lots} \times 200 \text{ gpd/lot}) + (168 \text{ lots} \times 275 \text{ gpd/lot}) + (143 \text{ lots} \times 275 \text{ gpd/lot}) \\ & = 53,200 \text{ gpd} + 36,800 \text{ gpd} + 46,200 \text{ gpd} + 39,325 \text{ gpd} \\ & = 175,525 \text{ gpd ADF} \quad \therefore \text{P.F.} = 4.9 \\ & = 175,525 \text{ gpd} \times 4.9 = 860,072.5 \text{ gpd PEAK} = 1.33 \text{ cfs PEAK} \\ & = 597 \text{ gpm PEAK} \end{aligned}$$

$$Q = 1.33 \text{ cfs}; V = 3 \text{ fps (assumed)}$$

$$A = Q/V = \pi d^2/4 = 1.33/3$$

$$d = 0.75 \text{ ft} = 9 \text{ -inch}$$

$$\text{TRY } 8" \text{ } \emptyset \text{ FM: } V = Q/A = 1.33 / \pi (8/12)^2/4 = 3.81 \text{ fps (o.k.)}$$

USE 8" ∅ FM

$$\underline{Q_{\text{PEAK}} = 597 \text{ gpm w/ } 8" \text{ } \emptyset \text{ FM}}$$

P.S. # 11 - * ALL CAPE COD BAY WATERSHED (∴ 600 gpd/lot)

$$\begin{aligned} 296 \text{ lots} \times 600 \text{ gpd/lot} &= 177,600 \text{ gpd ADF} \quad \therefore \text{P.F.} = 4.9 \\ &= 177,600 \text{ gpd} \times 4.9 = 870,240 \text{ gpd PEAK} = 1.35 \text{ cfs PEAK} \\ &= 604 \text{ gpm PEAK} \end{aligned}$$

$$\text{TRY } 8" \text{ } \emptyset \text{ FM: } V = Q/A = 1.35 / \pi (8/12)^2/4 = 3.85 \text{ fps (o.k.)}$$

USE 8" ∅ FM

$$\underline{Q_{\text{PEAK}} = 604 \text{ gpm w/ } 8" \text{ } \emptyset \text{ FM}}$$

P.S. # 10 - * ALL CAPE COD BAY WATERSHED (∴ 600 gpd/lot)

$$\begin{aligned} 84 \text{ lots} \times 600 \text{ gpd/lot} &= 50,400 \text{ gpd ADF} \quad \therefore \text{P.F.} = 5.6 \\ &= 50,400 \text{ gpd} \times 5.6 = 282,240 \text{ gpd PEAK} = 0.437 \text{ cfs PEAK} \\ &= 196 \text{ gpm} \end{aligned}$$

$$\text{TRY } 4" \text{ } \emptyset \text{ FM: } V = Q/A = 0.437 / \pi (4/12)^2/4 = 5.0 \text{ fps (o.k.)}$$

USE 4" ∅ FM

$$\underline{Q_{\text{PEAK}} = 196 \text{ gpm w/ } 4" \text{ } \emptyset \text{ FM}}$$

P.S. # 8 - * ALL 3 WATERSHEDS

$$\begin{aligned}
 & \text{P.S. \# 11 (C.C.)} + \text{STEP \# 11, 12, 13 \& 17 (N)} + \text{STEP \# 7 (N)} + \text{STEP \# 14 (P.B.)} \\
 & 177,600 \text{ gpd} + (387 \text{ lots} \times 275 \text{ gpd/lot}) + (390 \text{ lots} \times 275 \text{ gpd/lot}) + (92 \text{ lots} \times 200 \text{ gpd/lot}) \\
 & 177,600 \text{ gpd} + 106,425 \text{ gpd} + 107,250 \text{ gpd} + 18,400 \text{ gpd} \\
 & = 409,675 \text{ gpd ADF} \therefore \text{P.F.} = 4.4
 \end{aligned}$$

$$\begin{aligned}
 & = 409,675 \text{ gpd} \times 4.4 = 1,802,570 \text{ gpd PEAK} = 2.79 \text{ cfs PEAK} \\
 & = 1,252 \text{ gpm PEAK}
 \end{aligned}$$

$$Q = 2.79 \text{ cfs} ; V = 3 \text{ fps (assumed)}$$

$$\begin{aligned}
 A &= Q/V = 2.79/3 \\
 \pi d^2/4 &= 2.79/3
 \end{aligned}$$

$$d = 1.09 \text{ ft} = 13 \text{ inch}$$

$$\text{TRY } 12" \text{ } \varnothing \text{ FM} : V = Q/A = 2.79 / \pi (12")^2/4 = 3.6 \text{ fps (O.K.)}$$

$$\text{TRY } 10" \text{ } \varnothing \text{ FM} : V = Q/A = 2.79 / \pi (10")^2/4 = 5.1 \text{ fps}$$

USE 12" \varnothing FM

$$\underline{Q_{\text{PEAK}} = 1,252 \text{ gpm w/ } 12" \text{ } \varnothing \text{ FM}}$$