Flow per grinder pump = 11 gpm (0.0245 ft^3/s)

Area = $[\pi(D)^2]/4$

Area ~ 1.25” pipe = 0.0085 ft^2
Area ~ 1.5” pipe = 0.0123 ft^2
Area ~ 2” pipe = 0.0218 ft^2
Area ~ 3” pipe = 0.0491 ft^2

Check velocity > 2 ft/s

(# of pumps x 0.0245 ft^3/s) divided by area of pipe size = velocity

TDH = h_f + elev diff.

(Hazen Williams) $h_f = 10.44(L)[Q^{1.85}/(C^{1.85}*d^{4.87})]$

L=ft, Q=gpm, d=in, C=140 (assume new pipe… for older pipe C can decrease evaluate case by case) and h_f=ft

Find h_f for each zone flow and length of pipe change.

Reverse calculate 185 minus elevation loss. Assume pipe size. Determine flow. Use table to determine approximate number of pumps.