Steps for Designing a Drip Irrigation System

1. Obtain basic information:
    a. Total area to be irrigated
    b. Number of irrigation zones
    c. Vertical distance between water source and emitter at highest elevation
    d. Length of mainline
    e. Crop to be grown
    f. Soil information (texture, layering, depth)
    g. Plant and row spacing
    h. Shaded area of your crop
2. Determine number of emitters required per plant (n)
    a. Determine area per plant or tree
    b. Determine percent wet area
    c. Determine wetted area from one emitter
    d. Estimate number of emitters
3. Select your emitter
4. Determine the total number of emitters per zone and the total system flow rate.
5. Layout your system.
6. Estimate average evapotranspiration for the crop (ET_t)
    a. Determine maximum daily ET rate (can use PRET).
    b. Adjust using the percent shaded area to obtain ET_t.
7. Use irrigation equation to estimate the time required to irrigate. If the time is too great, consider selecting another emitter with a larger flow rate.
8. Design lateral (if applicable)
    a. Select diameter
    b. Determine friction loss. Take into account reduction of friction losses for multiple outlets.
9. Design manifold
    a. Select diameter
    b. Determine friction loss. Take into account reduction of friction losses for multiple outlets.
10. Design Submain (if applicable)
    a. Select diameter
    b. Determine friction loss
11. Design Mainline
    a. Select Diameter
    b. Determine friction loss
12. Determine head loss from elevation difference
    a. Positive if water source is below highest outlet
    b. Negative if the water source is above highest outlet
13. Estimate total head loss for the system.
    a. Friction loss+ elevation loss + required emitter pressure+ minor losses
    b. Minor losses are equal to 10% of all other losses.

14. Select Pump
    a. https://cornell.pump-flo.com/app/storefront.aspx?sid=cornell
15. Check that Net Positive Suction Head (NPSH) available is greater than NPSH required.
    a. NPSH calculator:
    http://irrigation.wsu.edu/Content/Calculators/General/NPSHA.php