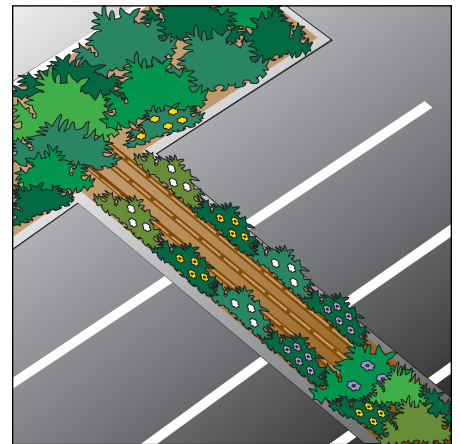
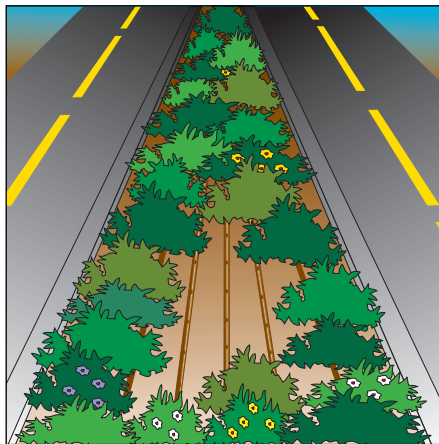


# DURA-FLO™ PC DRIPPERLINE

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## LANDSCAPE DESIGN GUIDE

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## Introduction

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For most applications, a grid layout of the DURA-FLO™ PC dripperline is recommended. Essentially this balances the system hydraulically and allows improved emission uniformity. In addition, in case of a break in the line, water would exit from both sides of the break, preventing dirt from entering the system.

DURA-FLO™ PC dripperline is the ideal product for watering plants, trees, shrubs and groundcovers. It can be used for both commercial and residential landscaping.

This product is more efficient and effective than sprinklers in hard-to-irrigate areas, including slopes, and locations where overspray from sprinklers could cause damage or just be a safety hazard.

With its precise watering capability, ease of installation, and its ability to be concealed, there is little wonder why architects, designers and contractors are promoting inline PC dripperline.

The drip emitter is the key component of the dripperline. The DURA-FLO™ PC emitter is self-cleaning and has unique built-in filtration slits to minimize the risk of clogging.

Furthermore, the drip emitter also has dual outlet ports positioned 180° apart. This ensures that only one port ever has direct contact with the ground and virtually eliminates the chance of back siphoning dirt into the dripperline.

DURA-FLO™ PC uses the industry standard tubing size, 0.600" (ID) x 0.700" (OD), making it compatible with all the readily available fittings used throughout the country.

This manual attempts to provide some of the basic design parameters for using DURA-FLO™ PC dripperline. However each application is unique and designers should be creative while still adhering to the fundamental principles offered in this manual.

If you have any questions, comments or ideas, please feel free to contact us.

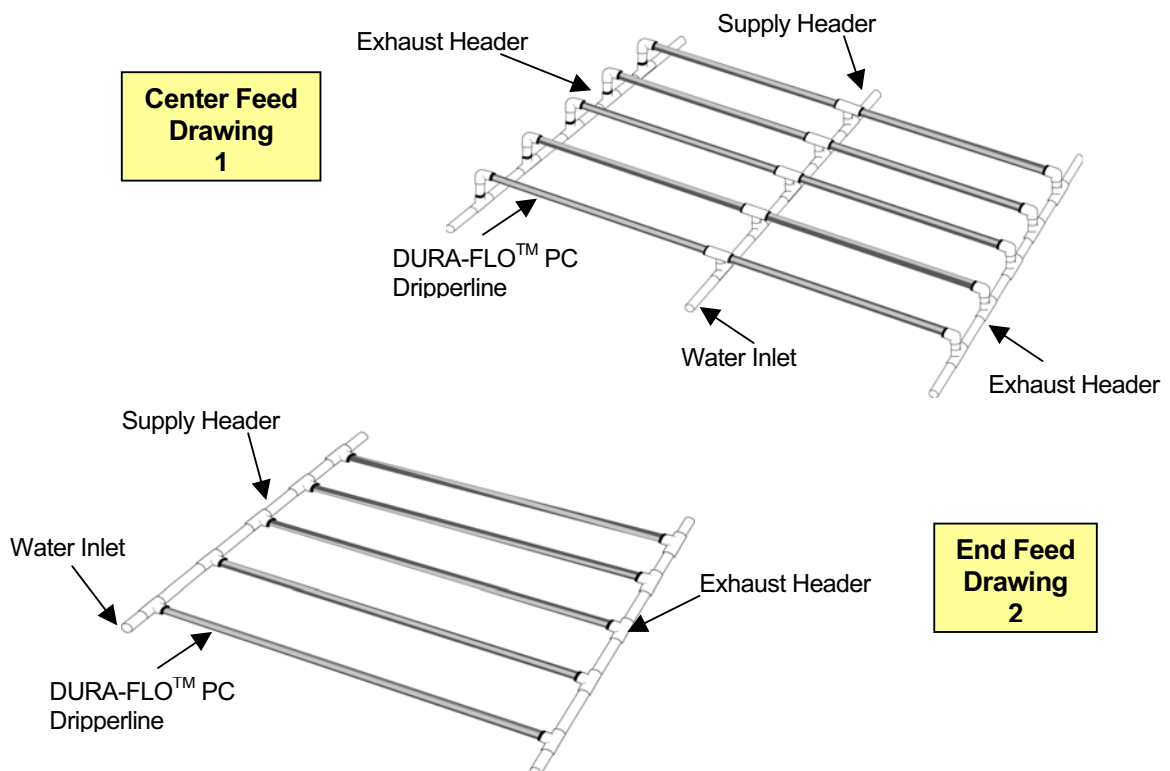
We look forward to hearing from you.

## Basic Layout

For most applications, a grid layout of the DURA-FLO™ PC dripperline is recommended. Essentially this balances the system hydraulically and allows improved emission uniformity. In addition, in case of a break in the line, water would exit from both sides of the break, preventing dirt from entering the system.

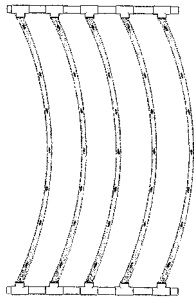
The grid system comprises a supply header and an exhaust header. These headers (or manifolds) are normally rigid PVC pipe with PVC tees and compression adapters. The DURA-FLO™ PC dripperline is then inserted into the compression adapter for a watertight seal. Depending on the maximum length of runs required the grid system might be end or center fed.

In certain cases, (smaller systems or freezing conditions), these headers can be assembled using polyethylene tubing and compression tees.

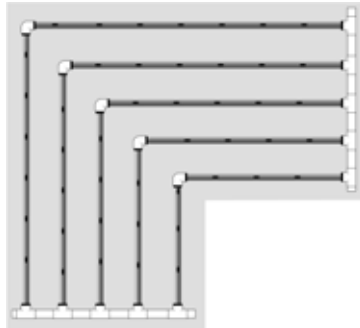


## Additional Layout Options

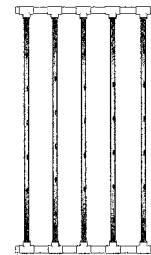
There are endless layouts that can be used, but it is recommended that the basic grid system design always be used. Various dripperline grid designs follow:



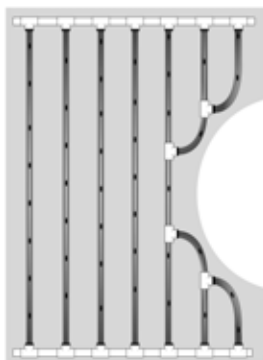
**Curved-Shaped**



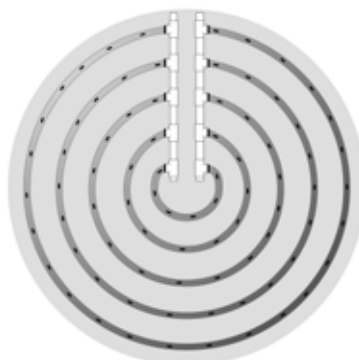
**Ell-Shaped**



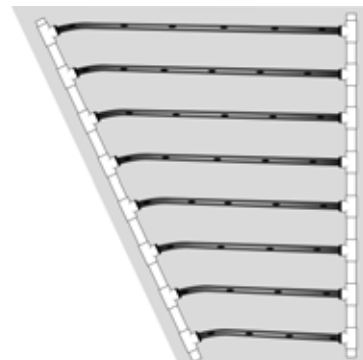
**Rectangular-Shaped**



**Odd-Shaped**



**Round-Shaped**



**Triangle-Shaped**

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## Soil – Water Relationship

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When designing an efficient drip irrigation system, it is essential to understand the relationship between water and soil.

Most soils are mixtures of sand, silt and clay. The ideal soil is loam, which contains equal proportions of sand, silt and clay. Sandy soils also contain sand, silt and clay, but predominantly comprise sand. Likewise, clay soils are also a mixture of these three elements but clay is the largest component.

Hence, the watering requirements are different for the various soil types. It is important to design the irrigation system so that the optimum emitter discharge rate and appropriate spacing are selected.

When applied slowly from a drip emitter, water moves through the soil in two directions.

- (a) Gravitational forces which draws the water downwards
- (b) Capillary forces which draws the water upwards and outwards.

In clay soils, the capillary forces will be more dominant than in sandy soils. In sandy soils, the opposite is true. Hence, the soil type will have a major impact on the way water moves through the soil.

Typically, the wetting pattern in a sandy soil will be fairly narrow but deep, while in a clay soil, the water will spread laterally but shallower.

As we are trying to create overlapping wetting patterns below the surface at the root zones, the water emission points must be closer for sandy soils and further apart for clay soils.

Another important factor to consider when designing the system is the soil infiltration rate. This is the rate that the soil can accept the water and is a function of the soil type. Any water application rate in excess of the infiltration rate may result in puddling, run-off and erosion.

## Product Selection Guide

The soil type will be the main factor in determining the emitter flow rate, spacing between emitters and the nominal spacing between the rows of DURA-FLO™ PC dripperline.

Design using the following chart::

Chart 1			
Dripperline Selection Chart			
Soil Type	Clay	Loam	Sandy
Emitter Flow Rate	½ gph	1 gph	2 gph
Emitter Spacing	24"	18"	12"
Nominal Dripperline Spacing	20"	16"	14"
Application Rate	.24"/hr	.80"/hr	2.74"/hr
Time to apply 1/4" of water	62 minutes	19 minutes	6 minutes
Time to apply 1/10" of water	25 minutes	8 minutes	2½ minutes

The above chart is intended as a guide only. There may be unique conditions where spacing may be different. (Examples: steep slopes and large trees, etc.).

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## Spacing Between Dripperlines

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The previous section defined the recommended **nominal** spacing between the DURA-FLO™ PC dripperlines. To calculate the **exact** spacing you need to consider the actual area to be irrigated.

Keep in mind that DURA-FLO™ PC dripperline should be placed approximately 3" from the edge of the area to be watered.

The following example will explain the calculation.

**Example:**

*Width of area to be irrigated is 10'. Soil type is loam.*

**Question:**

*What is the correct actual spacing between dripper lines?*

**Solution:**

1. Recommended nominal spacing between dripperlines (see Chart 1, page 5) = 16"
2. Total width from first dripperline to last dripperline = 120" (10 feet) minus the 3" at each edge which is equal to 114" (120" – 6")
3. The number of spaces between dripperlines is therefore 114" divided by the recommended spacing between dripperlines of 16" which calculates out at 7.13. It is necessary to round up this number to 8.
4. Therefore, the actual spacing between dripperlines would be 114" divided by 8 which is equal to 14.3" (instead of the original 16").
5. Space dripperlines 14.3" apart.

## Length of Dripperlines

In order to have a balanced system with good emission uniformity between all drip emitters, the maximum recommended length of a DURA-FLO™ PC dripperline must not be exceeded.

The following chart indicates the maximum recommended length, based on no elevation changes, and will also help in deciding on the optimum operating pressure of the system.

**Chart 2**

Maximum Length of Run (in feet)									
Initial Pressure	12" Spacing			18" Spacing			24" Spacing		
	1/2 gph	1 gph	2 gph	1/2 gph	1 gph	2 gph	1/2 gph	1 gph	2 gph
15 psi	210'	155'	100'	300'	220'	145'	380'	280'	180'
20 psi	260'	195'	125'	375'	275'	180'	475'	350'	225'
25 psi	315'	230'	150'	450'	330'	215'	570'	420'	270'
30 psi	345'	255'	165'	495'	360'	235'	625'	460'	295'
35 psi	380'	280'	180'	540'	395'	255'	685'	505'	320'
40 psi	405'	300'	190'	575'	420'	275'	730'	535'	340'
45 psi	430'	315'	200'	610'	450'	290'	775'	570'	360'

**Example:**

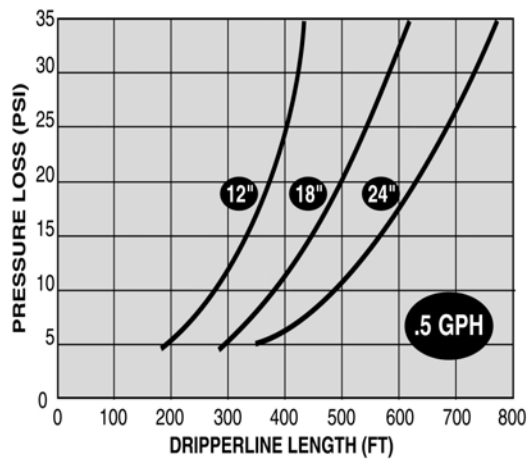
1. If you have 18" spacing, 1 gph flow rate and an available pressure of 45 psi, the maximum length of run would be 450'.
2. If you have 18" spacing, 1 gph flow rate, but only have 25 psi available pressure the maximum length of run would be 330'

3. If you have 24" spacing, ½ gph flow rate and needed to run 500', the maximum pressure required would be about 22 psi.

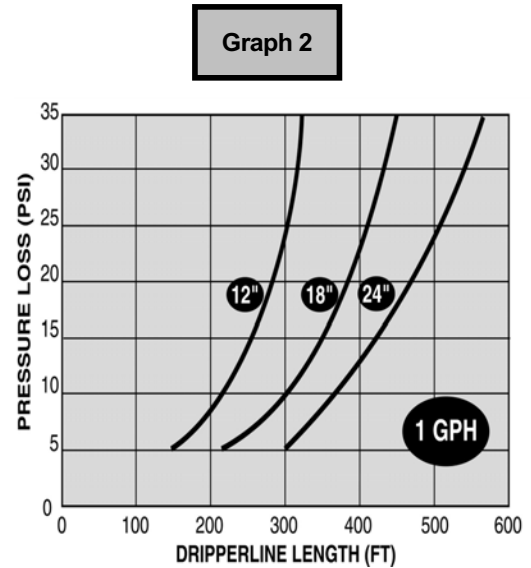
All the above calculations are based on end feeding the DURA-FLO™ PC dripperline. If necessary, the maximum allowable length can be increased by center feeding the zone. Hence, the length shown in the chart can be used in each direction effectively doubling the maximum length.

The following series of curves gives the actual friction losses for the various discharge rates and spacings

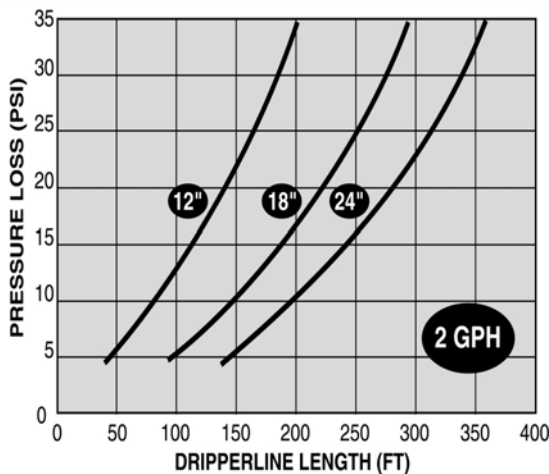
These curves can be used in calculating actual friction losses within the system for various lengths.



Graph 1



Graph 2



Graph 3

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## Other Components

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### 1. Filter

The purpose of the filter is to remove any impurities in the water supply before they enter the drip system. The filter is generally positioned directly downstream of the remote control valve. A Y-strainer or disc filter could be used and should be designed based on the flow requirements of the system and the minimum mesh size required by the DURA-FLO™ PC Drip Emitters, (see Chart 9, page 21).

### 2. Automatic Flush Valve

This valve will be open at system start-up and shutdown, and automatically closes when the system is operating. Hence, sediment is flushed out twice during the irrigation cycle. Typically, the automatic flush valve is located at the furthest point from the water source.

### 3. Air/Vacuum Relief Valve

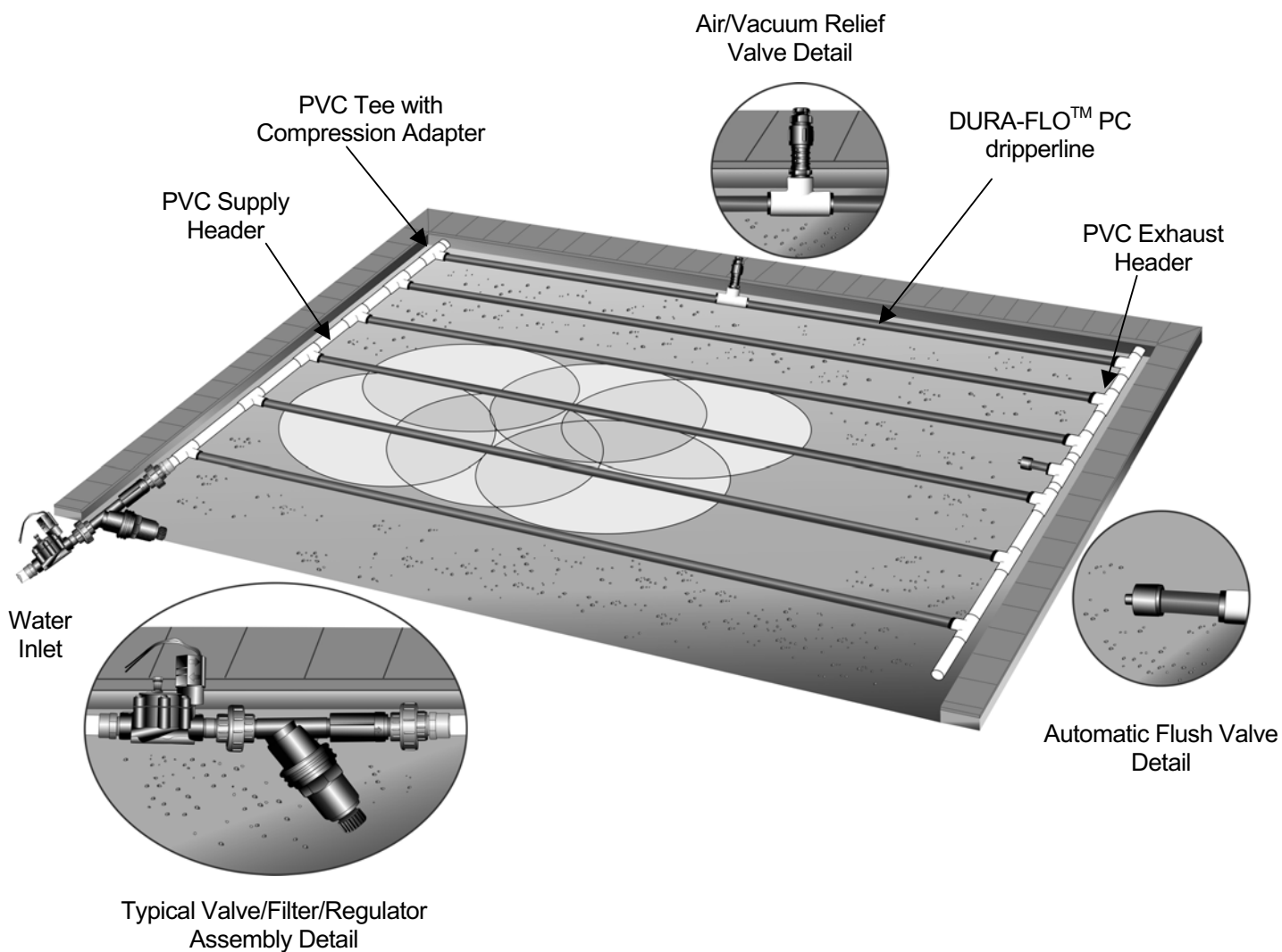
This device automatically controls air into and out of the system. On start-up air escapes through this valve to prevent air pockets. On shutdown if a vacuum starts to form, air is drawn into the system. By preventing a vacuum being formed in the system, debris will not be sucked into the drip emitter.

The air/vacuum relief valve should be installed at all the high points of the system.

If air pockets or vacuum formation are considered an issue, position the air/vacuum relief valve on a line interconnecting the DURA-FLO™ PC dripperline. This could be a header or on an additional piece of plain tubing interconnecting the dripperlines.

### 4. Pressure Regulator

Where there is excessive pressure, (more pressure than is required per Chart 2, page 7), a pressure regulator should be installed directly downstream of the filter. The filter maintains a pre-determined constant pressure in the system regardless of changes in the supply pressure. Select a pressure regulator according to the desired preset pressure and the flow requirements of the system.



### Typical DURA-FLO™ PC Dripperline Layout

Note the use of the grid system. Dripperlines are placed about 3" from the edge.

## Slopes

Slopes need to be treated a little differently from flat areas because of the way the water moves through the soil and also because water in the DURA-FLO™ PC dripperline, supply and exhaust headers and piping could drain through the lowest emitter of the DURA-FLO™ PC dripperline when the system is shut off.

To minimize these problems the following is suggested:

1. Run the DURA-FLO™ PC dripperline across, not down, the slope.
2. Use smaller zones, (separate grids), when there are slopes. As a general rule of thumb, design the zones to limit the elevation change to 10' ( $\pm 4$  psi).
3. In steep slopes, the use of inline check valves should be considered.
4. When the DURA-FLO™ PC dripperline is running across the slope and the elevation drop from the top dripperline to the bottom dripperline in the same zone exceeds 3 feet, it is recommended to increase the spacing between dripperlines progressively as they move down the slope. See Chart 3.

**Chart 3**

<b>Dripperline Spacings on Slopes</b>	
Total Elevation Change	Aggregate Increase in Drillerline Spacing
3'	5%
5'	10%
7'	15%
10'	25%

To use this chart, calculate the total elevation change from the top dripperline to the bottom dripperline within the zone and then look up the appropriate recommended total increase in dripperline spacing. Remember this number represents the total change from the first spacing to the last spacing. The spacing increases progressively from top to bottom.

The following example explains this calculation.

**Example:**

*Elevation change is 10' downhill, recommended DURA-FLO™ PC dripperline nominal spacing for flat ground is 24", with 11 rows of dripperline.*

**Question:**

*What is the actual spacing between dripperline to allow for the slope?*

**Solution:**

*From Chart 3, page 11, spacing should be progressively increased by a total of 25%. (Final spacing is 25% more than initial spacing).*

Between Dripperline Number	Spacing Increase	Theoretical Spacing	Actual Spacing
1 and 2	2.5%	24.6"	24.5"
2 and 3	5.0%	25.2"	25"
3 and 4	7.5%	25.8"	26"
4 and 5	10.0%	26.4"	26.5"
5 and 6	12.5%	27.0"	27"
6 and 7	15.0%	27.6"	27.5"
7 and 8	17.5%	28.2"	28"
8 and 9	20.0%	28.8"	29"
9 and 10	22.5%	29.4"	29.5"

**Note:** *Dripperline 1 is at the top of the slope, dripperline 11 is at the bottom of the slope.*

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## Simplified Design Flow Chart

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- Step 1.** Evaluate area to be irrigated including plant material, soil type, topography, slope and water source. Water source information includes water pressure, quantity available and water quality.
- Step 2.** Based on soil type, select the optimum DURA-FLO™ PC dripperline from Chart 1 on page 5.
- Step 3.** Prepare a basic layout design based on the options shown on pages 2 and 3.
- Step 4.** Check the maximum recommended length of run and system operating pressure requirements from Chart 2 on page 7.
- Step 5.** Determine width of area to be irrigated and then calculate actual spacings between dripperlines as in Section 6 on page 6. Also refer to Section 9 on pages 11 and 12 for steep slopes if necessary.
- Step 6.** Calculate system or zone flow rates as per Section 14 on pages 18 and 19.
- Step 7.** Size headers and pipes based on system or zone flow rates (do not exceed 5 feet/second velocity in headers).
- Step 8.** Position automatic flush valves and air vacuum relief valves based on criteria given in Section 8 on pages 9 and 10.
- Step 9.** Select appropriate filter based on system or zone flow rate and emitter minimum filtration requirement. See Chart 8 on page 21.
- Step 10.** Select correct pressure regulator based on system or zone flow rates and optimum system pressure requirement.

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## Sub-Surface Systems

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DURA-FLO™ PC dripperline can be used above grade (exposed or covered with a layer of mulch) or buried.

When used above grade, wire or plastic stabilizer stakes are recommended to prevent the DURA-FLO™ PC dripperline from wandering. Depending on the soil type, the stakes should be positioned 4' to 6' apart. The looser the soil, the closer the stakes should be placed.

If the DURA-FLO™ PC dripperline is to be buried the following section should be studied carefully so that the risks of burying the DURA-FLO™ PC dripperline can be clearly understood.

If buried, the DURA-FLO™ PC dripperline should be at a uniform, constant depth of up to 6". Buried or sub-surface drip irrigation (SSDI) has some advantages, but there are some additional risks involved. Proper design and management of the system is essential. The risks are the following:

1. A break in the system, if above grade, would be immediately visible and easily repaired. A sub-surface system could take longer to detect, could plug emitters and would be more labor intense to repair.
2. Root intrusion into the actual drip emitters could partially or totally plug the system. To prevent this from happening, especially where there is very active root system such as turfgrass, proper irrigation scheduling is critical. It is imperative to irrigate on a **regular** basis so that the area around the drip emitter does not dry out. If this were to dry out, the root could follow the water source, actually penetrate the drip emitter, and cause plugging.

Another pro-active solution to prevent root intrusion is to inject herbicide, (Trifluralin), into the drip system a few times each season.

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## **System Monitoring**

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Each system should be monitored so that if a problem were to occur, it could be detected early without allowing the plants to stress.

The following may be helpful in monitoring the system.

1. Install a pressure gauge in the system as far away as possible from the water source. The pressure should then be tracked on a regular basis when the system is operating. Any significant reduction in pressure could indicate a problem and should be addressed. Line breaks, dirty filters, reduced water source pressures are possible causes.
2. For more sophisticated monitoring where one could track the system flow through the DURA-FLO™ PC dripperline, a flow meter could be installed. Compare the actual flow to the theoretical flow for the entire system or just a particular zone. A change in flow rate would indicate a problem.

Section  
**13**

## Application Rates

The following formula should be used to calculate application rates.

$$\text{Application Rate (inches per hour)} = \frac{231 \times \text{Emitter Flow Rate (gph)}}{\text{Spacing Between Dripperline (inches)} \times \text{Spacing Between Emitters (inches)}}$$

**Example:**

*Emitter Flow Rate = 1 gph*

*Spacing Between Drip Emitters = 18"*

*Spacing Between Dripperlines = 16"*

**Question:**

*What is the application rate?*

**Solution:**

$$\text{Application Rate} = \frac{231 \times 1}{18 \times 16} = .80"/\text{hr}$$

**Chart 4**

Application Rates (inches/hour)											
Based on Nominal Flow Rates											
½ gph											
Emitter Spacing	Spacing Between Dripperlines										
	12"	13"	14"	15"	16"	17"	18"	19"	20"	22"	24"
12"	.80	.74	.69	.64	.60	.57	.53	.51	.48	.44	.40
18"	.53	.49	.46	.43	.40	.38	.36	.34	.32	.29	.27
24"	.40	.37	.34	.32	.30	.28	.26	.25	.24	.22	.20

**Chart 5**

Application Rates (inches/hour)											
Based on Nominal Flow Rates											
1 gph											
Emitter Spacing	Spacing Between Dripperlines										
	12"	13"	14"	15"	16"	17"	18"	19"	20"	22"	24"
12"	1.60	1.48	1.38	1.28	1.20	1.14	1.06	1.02	.96	.88	.80
18"	1.07	.99	.92	.86	.80	.75	.71	.68	.64	.58	.53
24"	.80	.74	.69	.64	.60	.57	.53	.51	.48	.44	.40

**Chart 6**

Application Rates (inches/hour)											
Based on Nominal Flow Rates											
2 gph											
Emitter Spacing	Spacing Between Dripperlines										
	12"	13"	14"	15"	16"	17"	18"	19"	20"	22"	24"
12"	3.20	2.96	2.75	2.56	2.40	2.28	2.12	2.04	1.92	1.76	1.60
18"	2.14	1.98	1.84	1.72	1.60	1.50	1.42	1.36	1.28	1.16	1.06
24"	1.60	1.48	1.38	1.28	1.20	1.14	1.06	1.02	.96	.88	.80

## System Flow Rates

The following formula should be used to calculate the total system flow rate.

$$\text{System Flow Rate (gpm)} = \frac{2.4 \times \text{Irrigated Area (feet}^2\text{)} \times \text{Emitter Flow Rate (gph)}}{\text{Emitter Spacing (inches)} \times \text{Dripperline Spacing (inches)}}$$

**Example:**

*Irrigated Area = 7500 feet*

*Emitter Flow Rate = 1 gph*

*Spacing Between Drip Emitters = 18"*

*Spacing Between Dripperlines = 16"*

**Question:**

*What is the system flow rate?*

**Solution:**

$$\text{System Flow Rate} = \frac{2.4 \times 7500 \times 1}{18 \times 16} = 62.5 \text{ gpm}$$

The following formula may also be used.

$$\text{System Flow Rate (gpm)} = \frac{0.2 \times \text{Total Length of Dripperline (feet)} \times \text{Emitter Flow Rate (gph)}}{\text{Emitter Spacing (inches)}}$$

**Example:**

*Total Length of Dripperline Used = 600 feet*

*Emitter Flow Rate = 2 gph*

*Spacing Between Drip Emitters = 12"*

**Question:**

*What is the system flow rate?*

**Solution:**

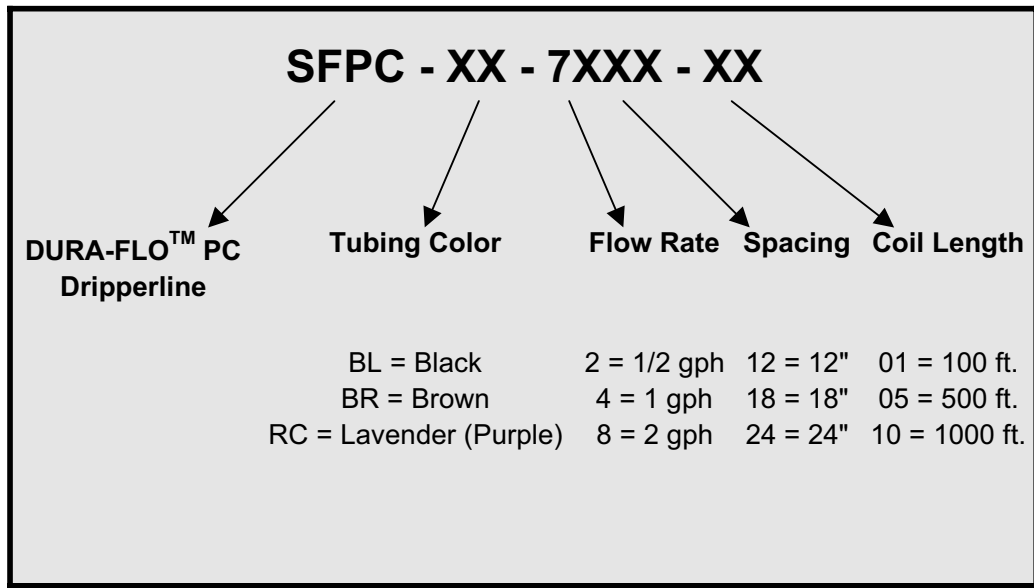
$$\text{System Flow Rate} = \frac{0.2 \times 600 \times 2}{12} = 20 \text{ gpm}$$

Chart 7 offers a simpler method of calculating total flows. Calculate the total footage of DURA – FLO™ PC dripperline used, divide that by 100 and then multiply that number by the appropriate number in the chart.

**Chart 7**

Nominal Flow Per 100 Feet			
Dripper Spacing	½ gph	1 gph	2 gph
12"	50 gph (.83 gpm)	100 gph (1.67 gpm)	200 gph (3.33 gpm)
18"	33 gph (.55 gpm)	67 gph (1.12 gpm)	133 gph (2.22 gpm)
24"	25 gph (.42 gpm)	50 gph (.83 gpm)	100 gph (1.67 gpm)

## How to Specify



**Colors:** DURA-FLO™ PC dripperline is available in brown, black or lavender (purple)

**Flow Rates:** 3 nominal flow rates are available (1/2, 1 or 2 gph)

**Spacing:** 3 standard spacings are offered (12", 18" or 24"). However, other customized spacings are available on request.

**Coil Length:** Coil lengths of 100', 500' or 1000' are standard.

## Technical Data

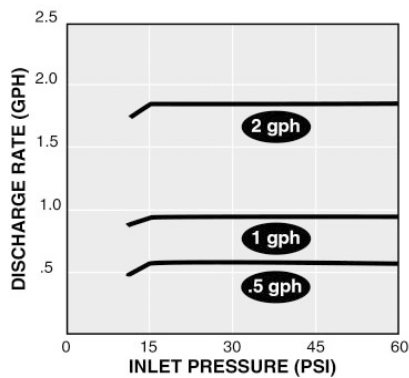
**Chart 8**

Tubing Characteristics	
Inside Diameter	0.600" ID
Outside Diameter	0.700" OD
Wall Thickness	.050"
Bending Radius	7"

**Note:** When placed above grade and exposed to the sunlight and other weather conditions, the life expectancy of the brown and purple DURA-FLO™ PC dripperline is expected to be approximately half of the life expectancy of the black DURA-FLO™ PC dripperline

**Chart 9**

Emitter Characteristics				
Flow Rate	Color Code	X-Section of Flow Path	Length of Flow Path	Minimum Filtration
1/2 gph	Red	.037"	1"	140 mesh
1 gph	Yellow	.045"	1"	120 mesh
2 gph	Purple	.062"	1"	80 mesh


**Pressure – Discharge Curve  
Graph 4**

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## Performance Specifications

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### **DURA-FLO™ PC Dripperline**

#### **SELF-CLEANING, PRESSURE COMPENSATING DRIPPERLINE**

##### **Description**

DURA-FLO™ PC Dripperline is a low volume dripperline with internally bonded and evenly spaced pressure compensating emitters at specified intervals in three discharge rates (1/2, 1 and 2 gallons per hour). DURA-FLO™ PC Dripperline is available in 100', 500', and 1,000' coils. Compatible plain tubing is available in 100', 500', and 1,000' coils.

##### **Construction**

DURA-FLO™ PC Dripperline shall consist of nominal sized one-half inch (1/2") linear low-density polyethylene tubing with pressure compensating, continuously self-cleaning, internally bonded emitters at a specified spacing, (12", 18" or 24" centers) or plain tubing without emitters. The tubing shall be brown, black or lavender in color and have an outside diameter (O.D.) of 0.700 inches and an inside diameter (I.D.) of 0.600 inches. Individual pressure compensating emitters shall be permanently bonded to the inside wall of the tubing. These emitters shall be constructed of polyethylene with a silicone diaphragm. The emitters shall also have dual outlet ports, ensuring that only one port has direct contact with the ground when the polyethylene tubing is on the surface.

##### **Operation**

The emitters shall have the ability to independently control discharge rates, with an inlet pressure of ten to sixty (10-60) pounds per square inch (PSI), at a constant flow and with a manufacturer's coefficient of variability (Cv) not exceeding 0.05. Recommended operating

(Continuation of Operation on next page)

pressure shall be between 15-45 PSI. The emitter discharge rate shall be ½, 1, or 2 gallons per hour (GPH). The emitters shall include a turbulent path to create a pressure differential across a flexible diaphragm. The diaphragm will flex towards the outlet hole according to the pressure changes and restricts the out flow path thereby limiting variations in the flow rate. The dripperline shall be available in 12", 18" and 24" spacing between emitters unless otherwise specified. Maximum system pressure shall be 45 PSI. Filtration shall be 140 mesh for ½ GPH, 120 mesh for 1 GPH, and 80 mesh for 2 GPH emitters.

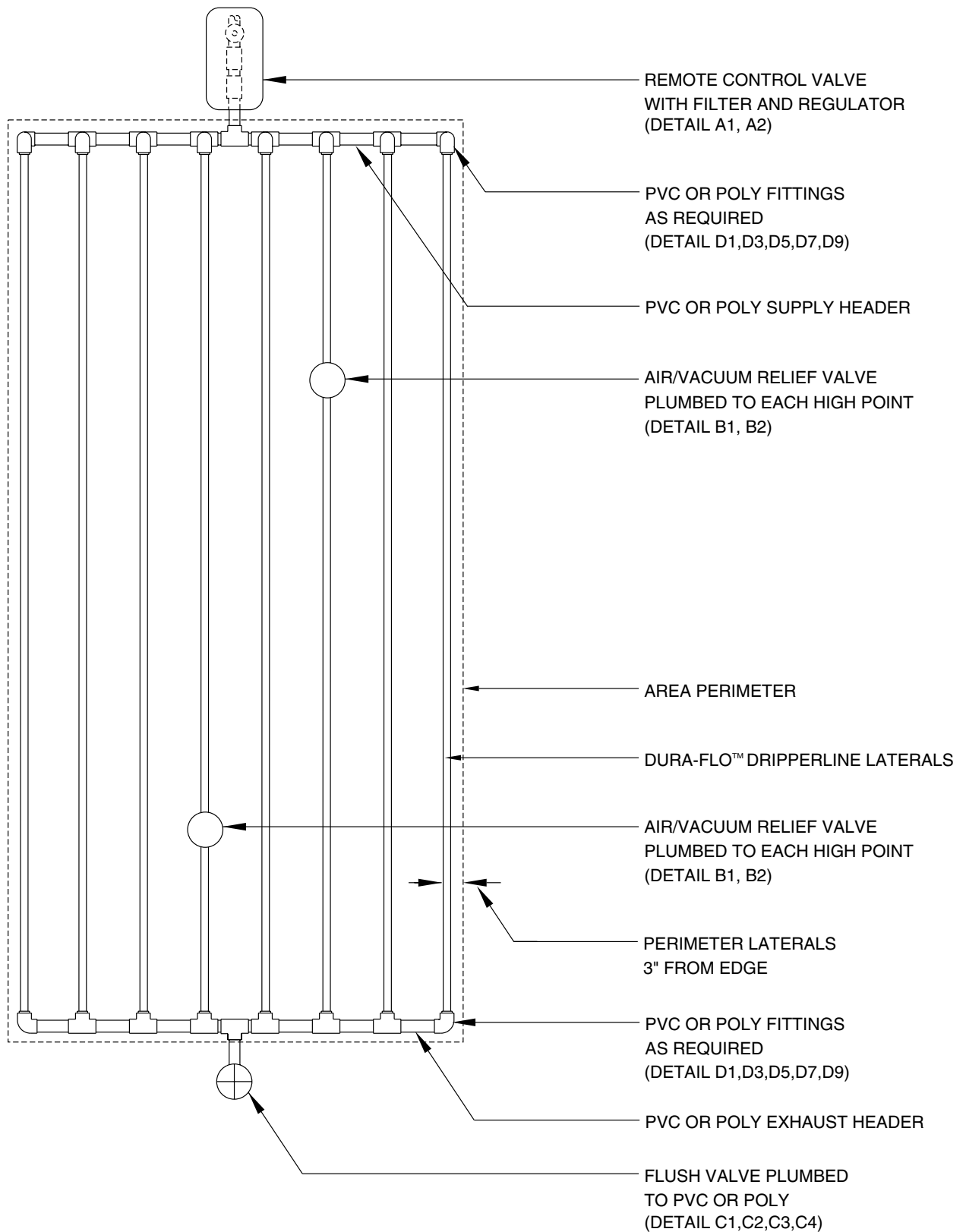
DURA-FLO™ PC Dripperline shall be manufactured by Agrifim.  
Model Number SFPC-\_\_\_\_\_-\_\_\_\_\_-\_\_\_\_\_  
The plain tubing shall be Agrifim Model Number A700\_\_\_\_\_-\_\_\_\_\_

Section  
**18**

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## Installation Details

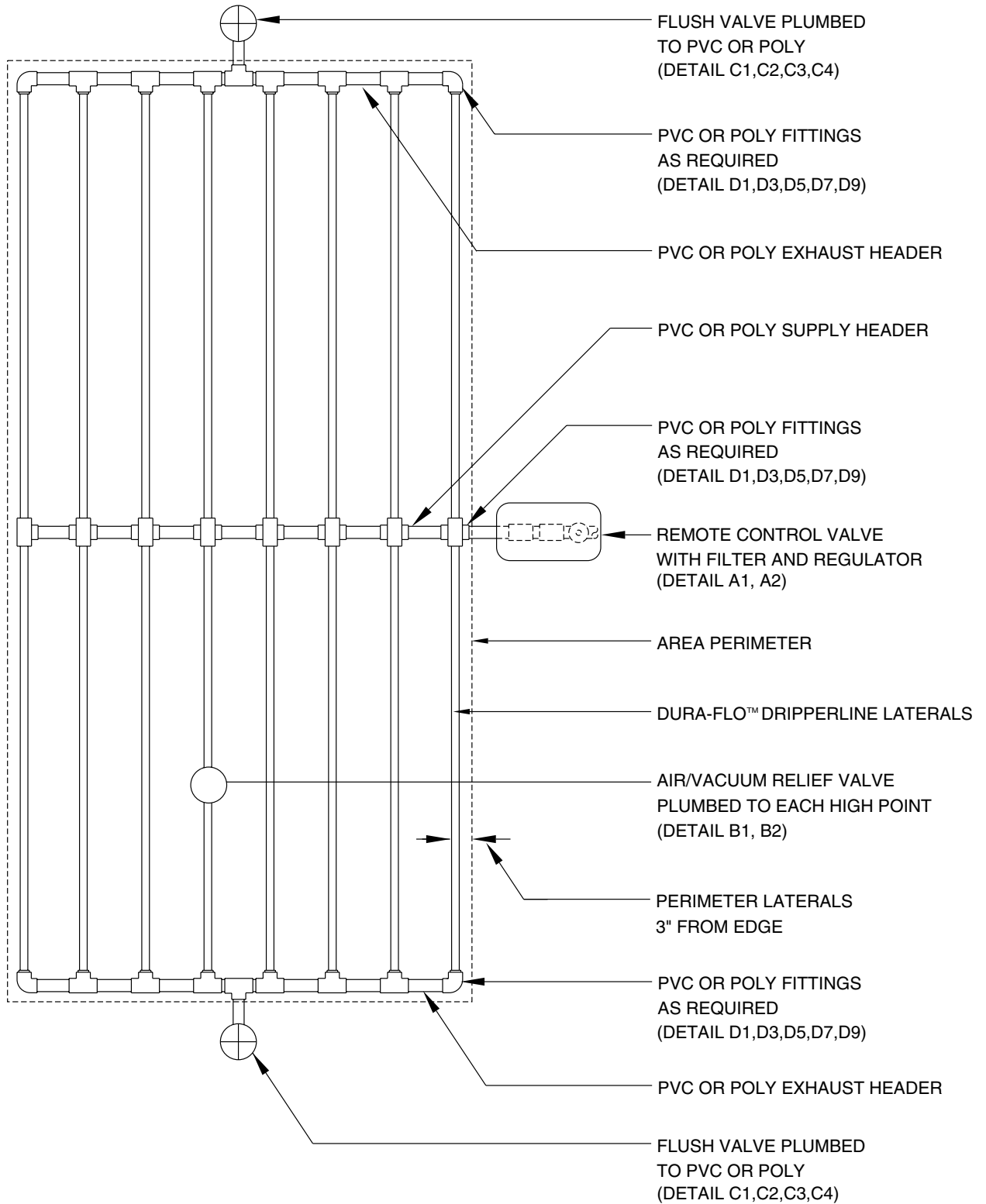
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1

## END FEED LAYOUT

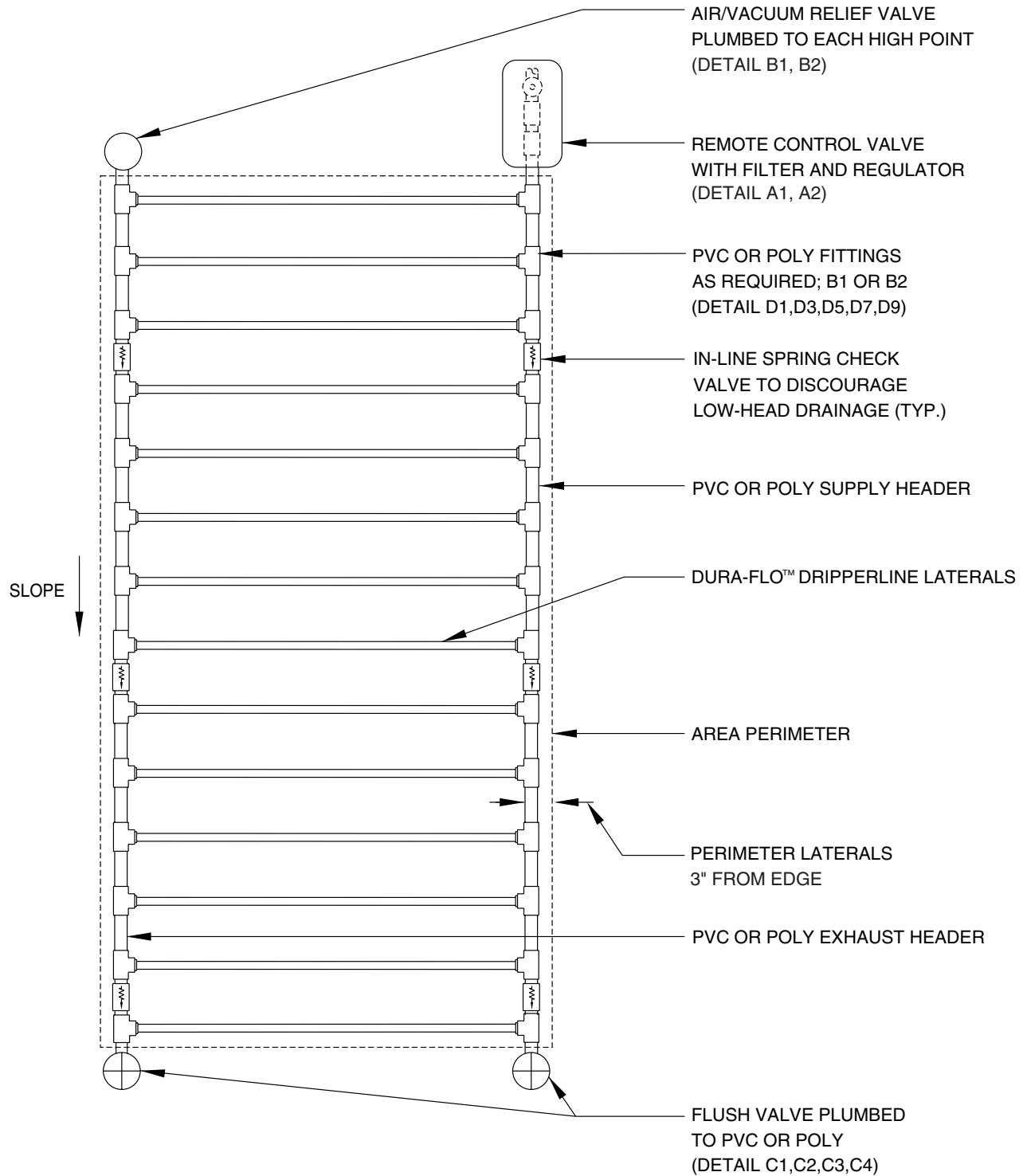
NOT TO SCALE



2

## CENTER FEED LAYOUT

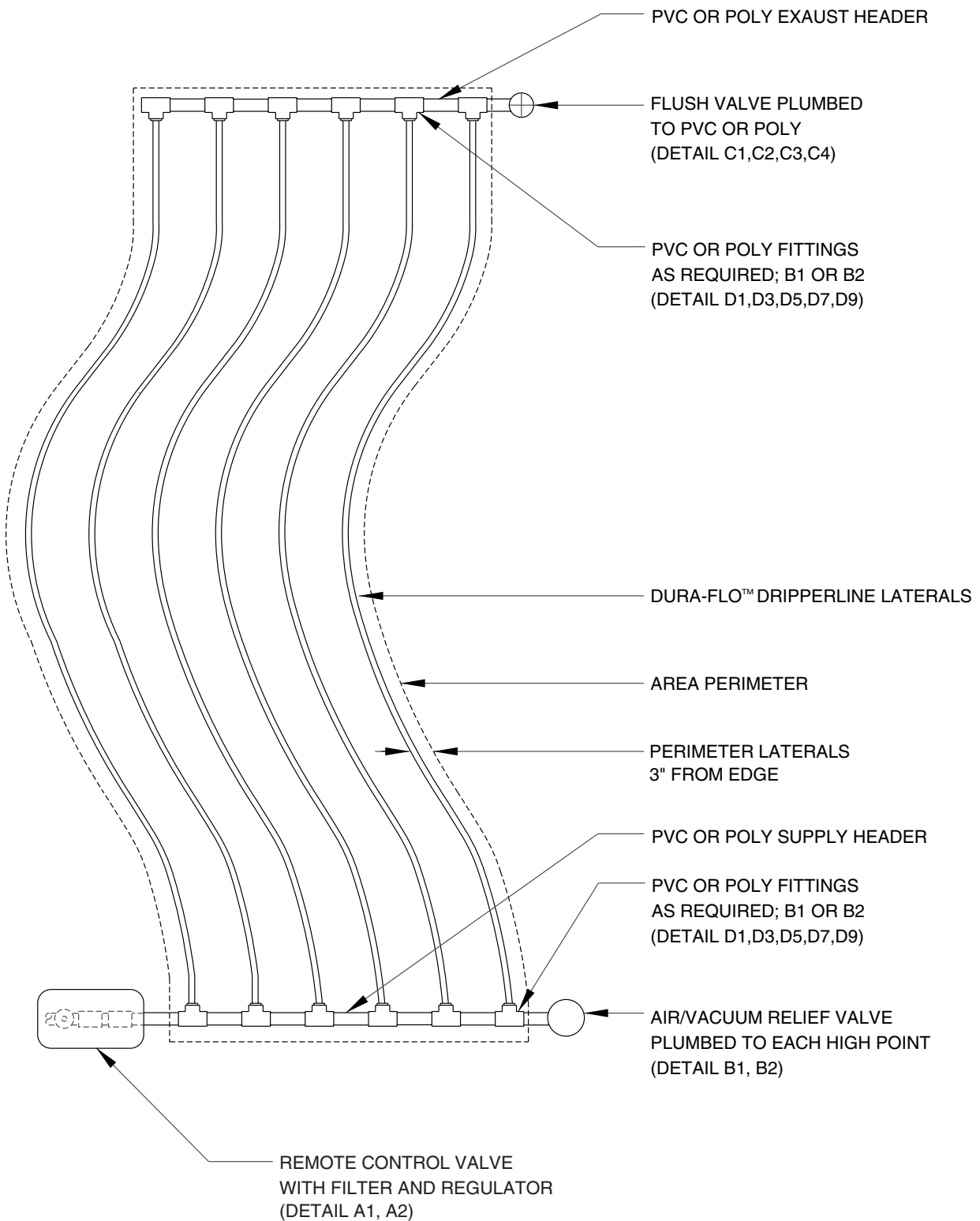
NOT TO SCALE



3

## END FEED LAYOUT ON SLOPE

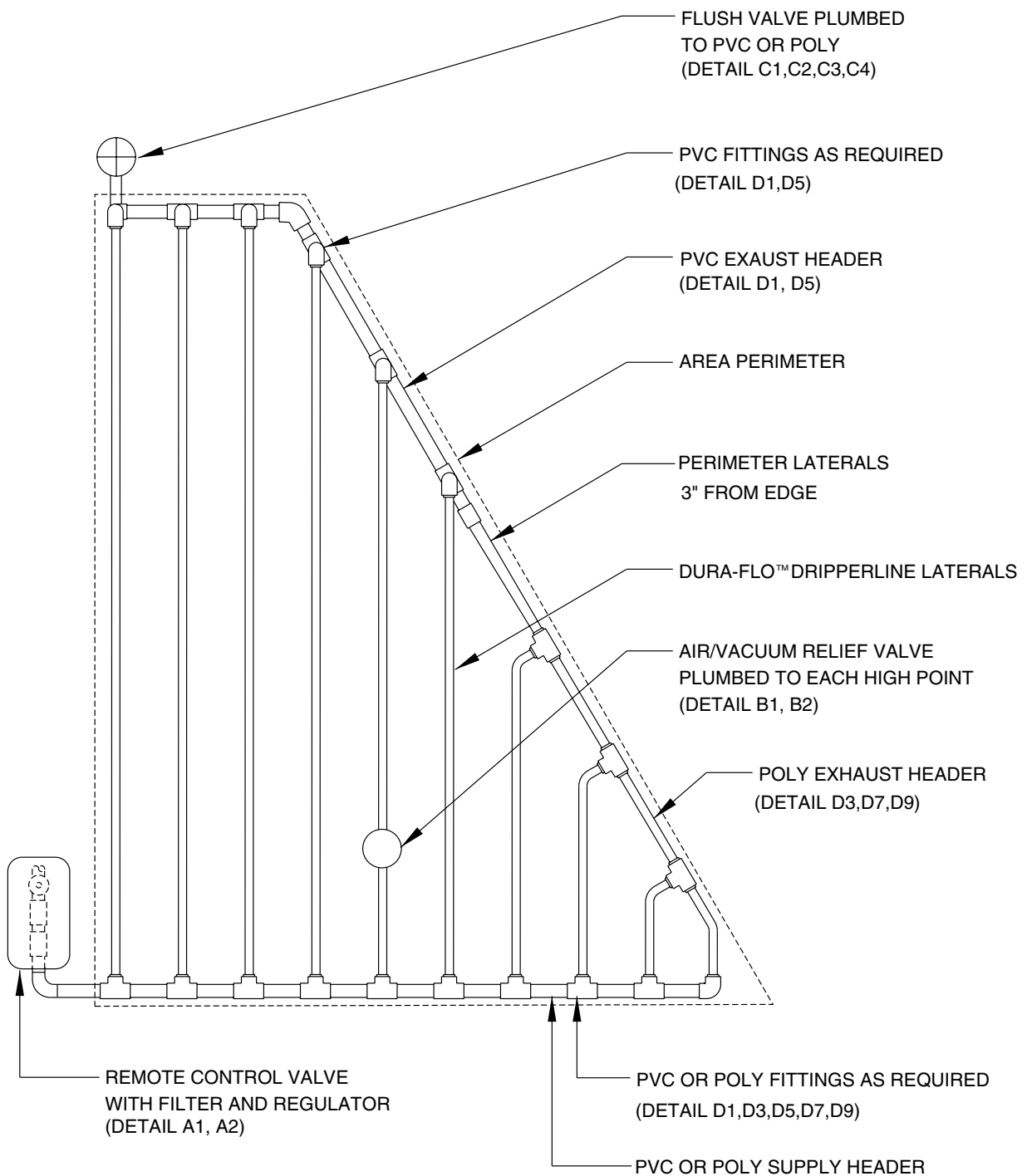
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4

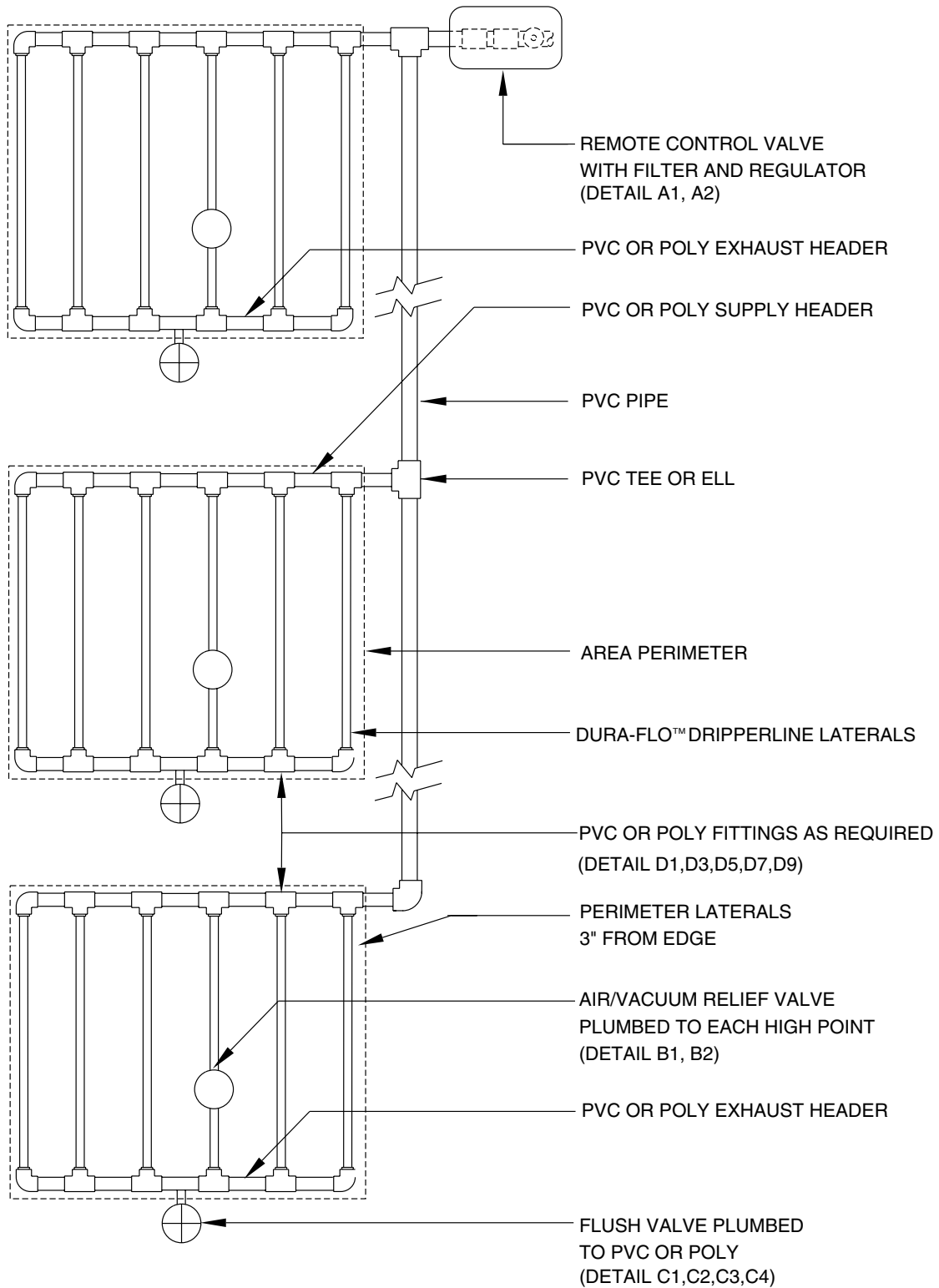
## END FEED LAYOUT CURVED AREAS

NOT TO SCALE



## 5 END FEED LAYOUT TRIANGULAR AREAS

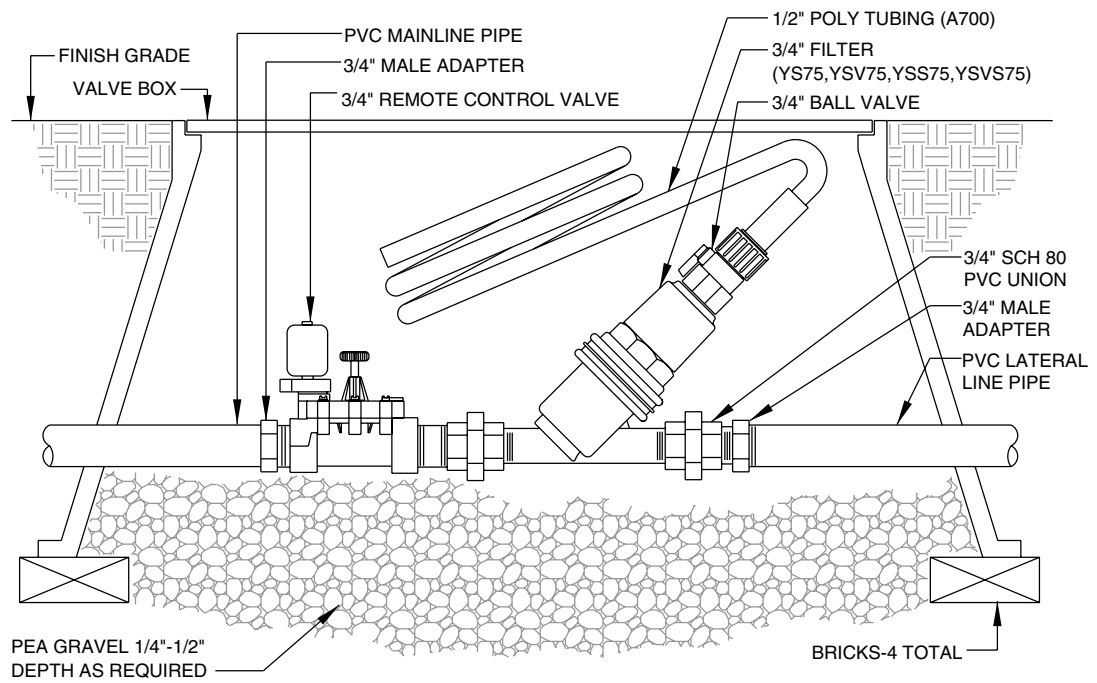
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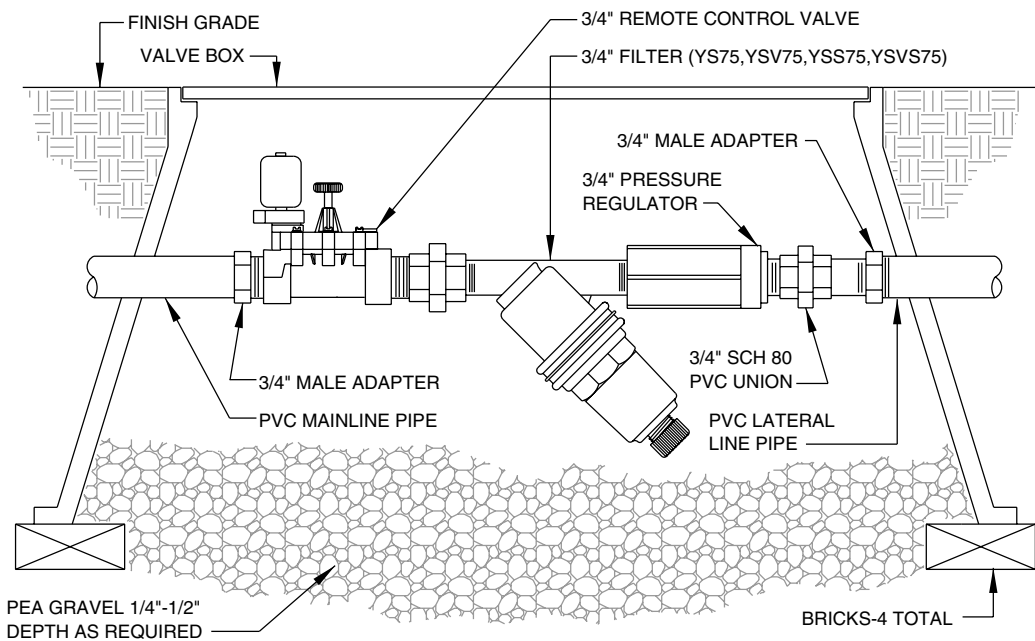
6

## MULTIPLE ISLAND LAYOUT

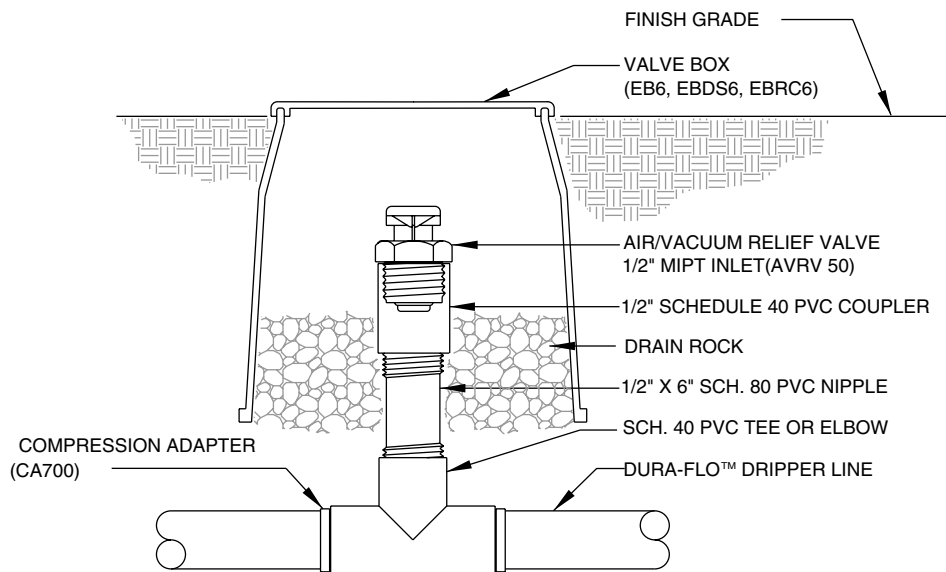
NOT TO SCALE



**A1** **VALVE WITH FILTER DETAIL**  
NOT TO SCALE



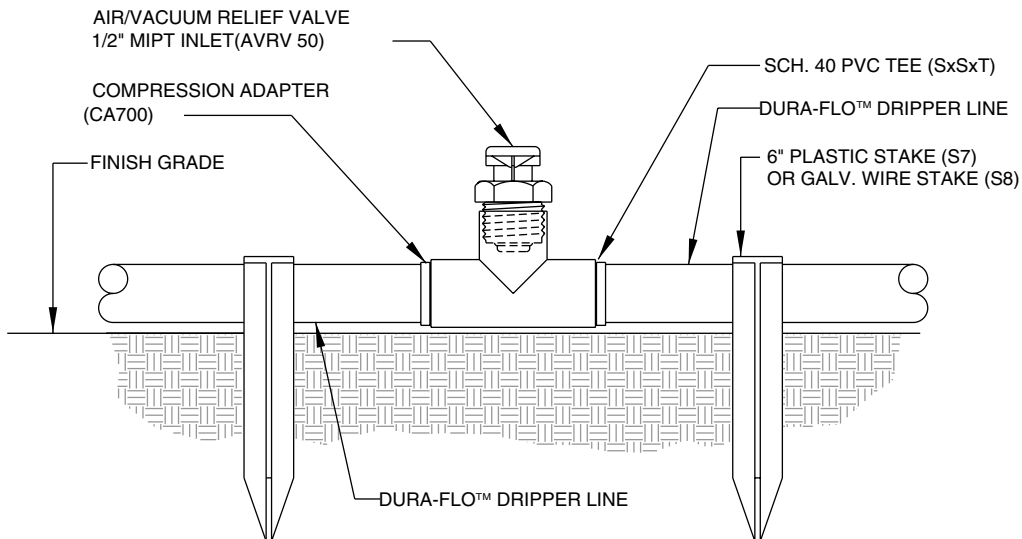
**A2** **VALVE, FILTER & REGULATOR DETAIL**  
NOT TO SCALE



## AIR/VACUUM RELIEF VALVE BELOW GRADE INSTALLATION

B1

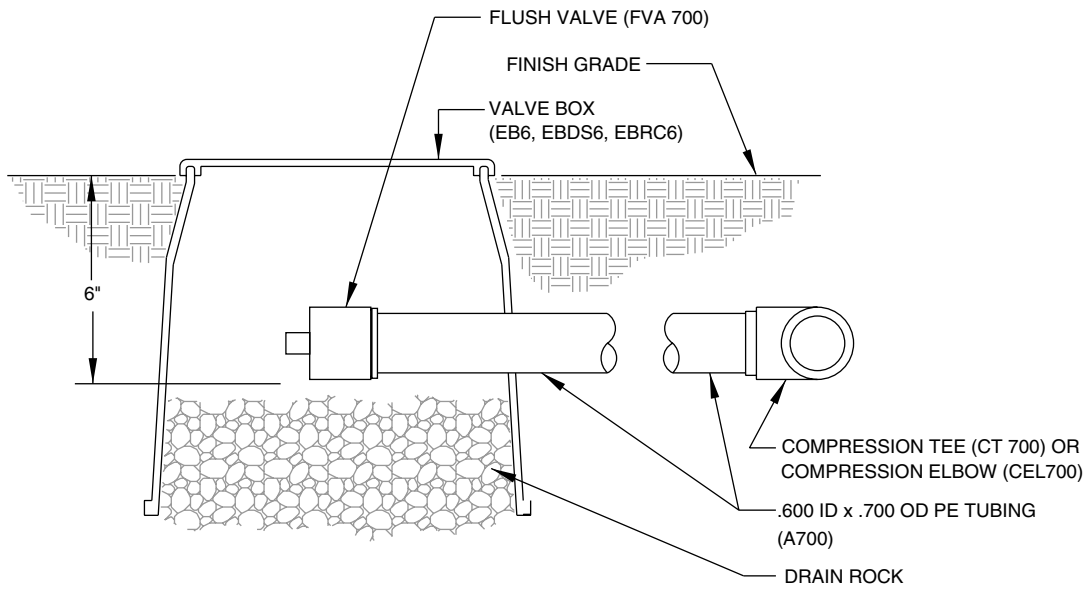
NOT TO SCALE



## AIR/VACUUM RELIEF VALVE ABOVE GRADE INSTALLATION

B2

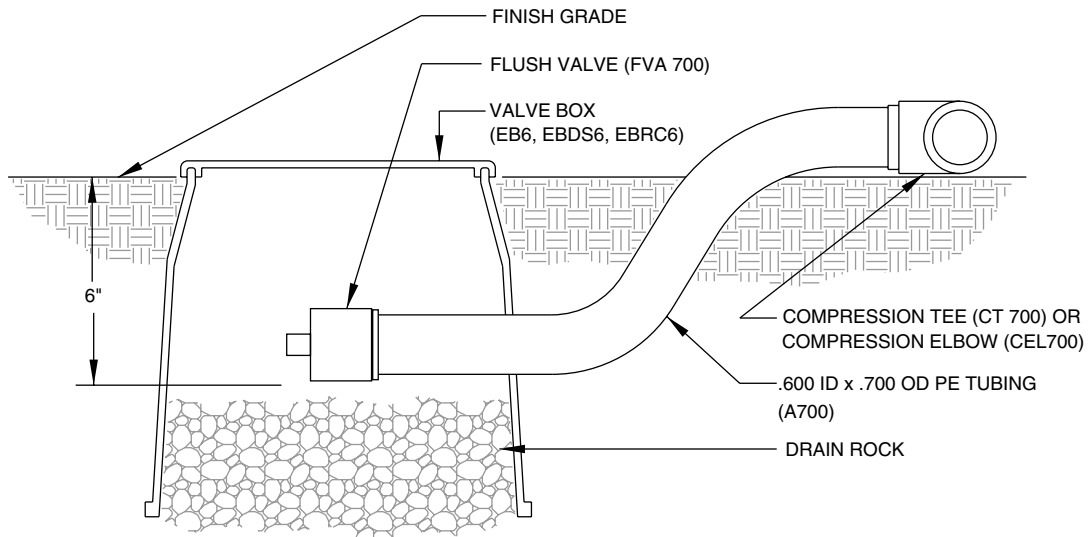
NOT TO SCALE



## FLUSH VALVE FOR PE HEADER BELOW GRADE INSTALLATION

C1

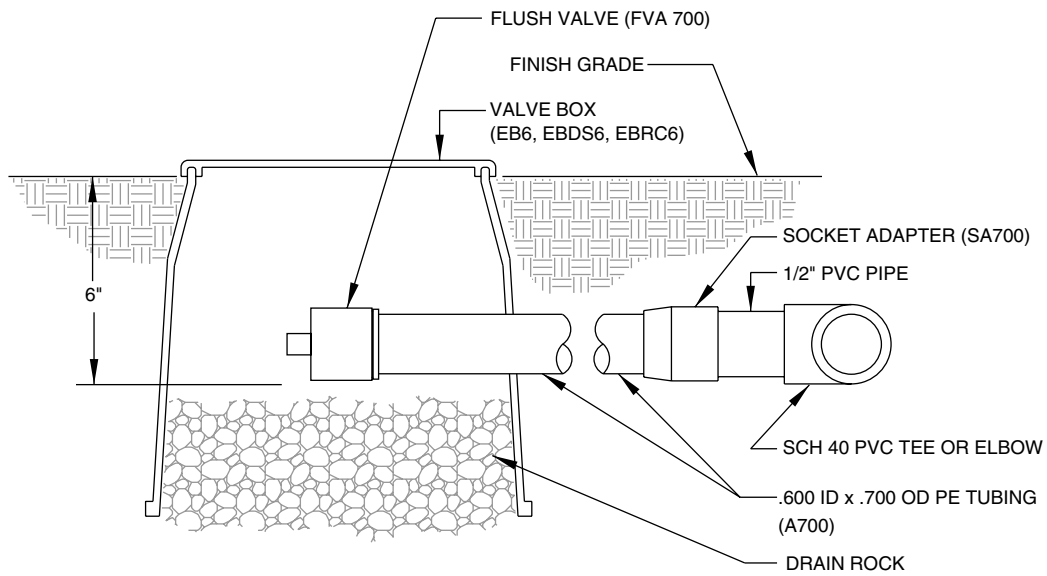
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## FLUSH VALVE FOR PE HEADER ABOVE GRADE INSTALLATION

C2

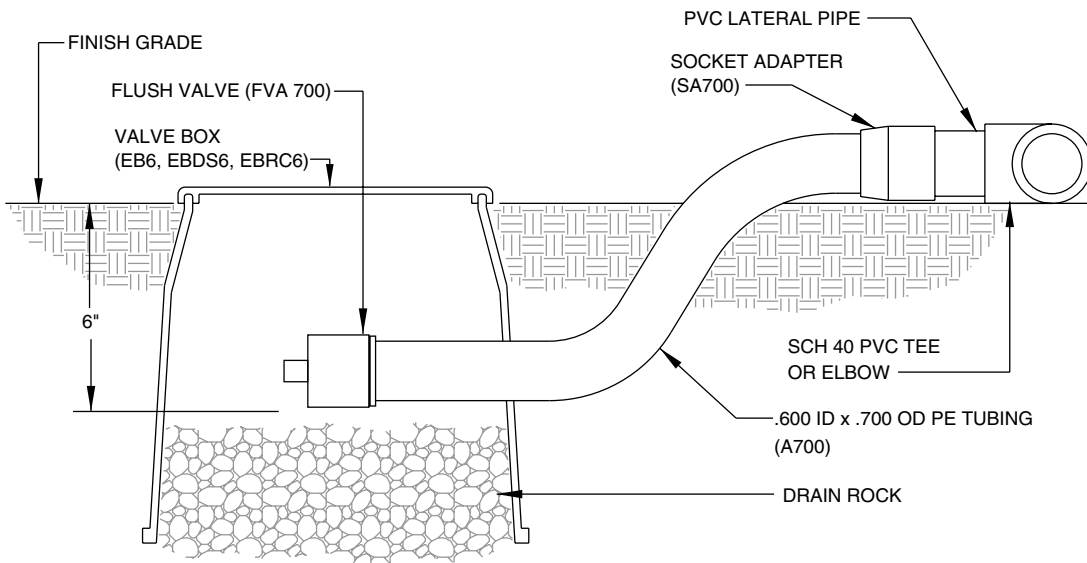
NOT TO SCALE



### FLUSH VALVE FOR PVC HEADER BELOW GRADE INSTALLATION

C3

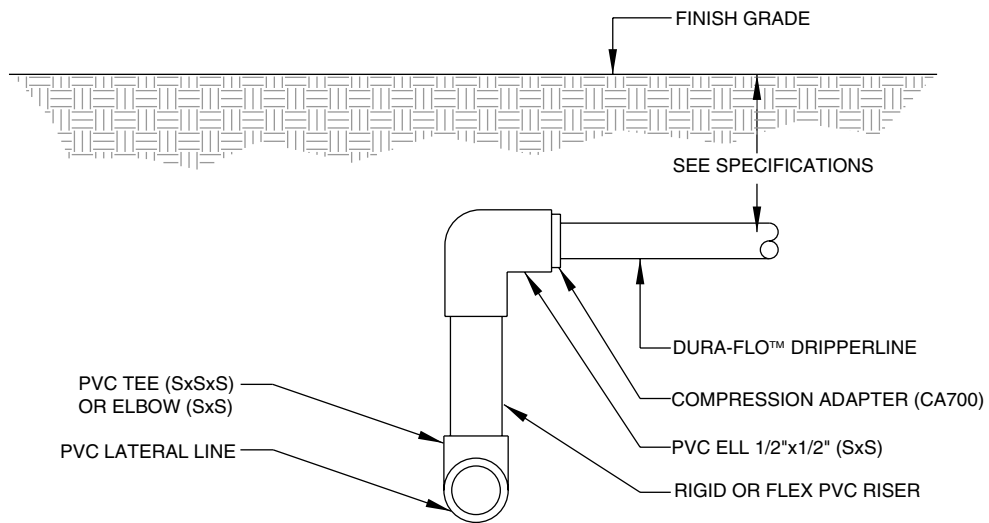
NOT TO SCALE



### FLUSH VALVE FOR PVC HEADER ABOVE GRADE INSTALLATION

C4

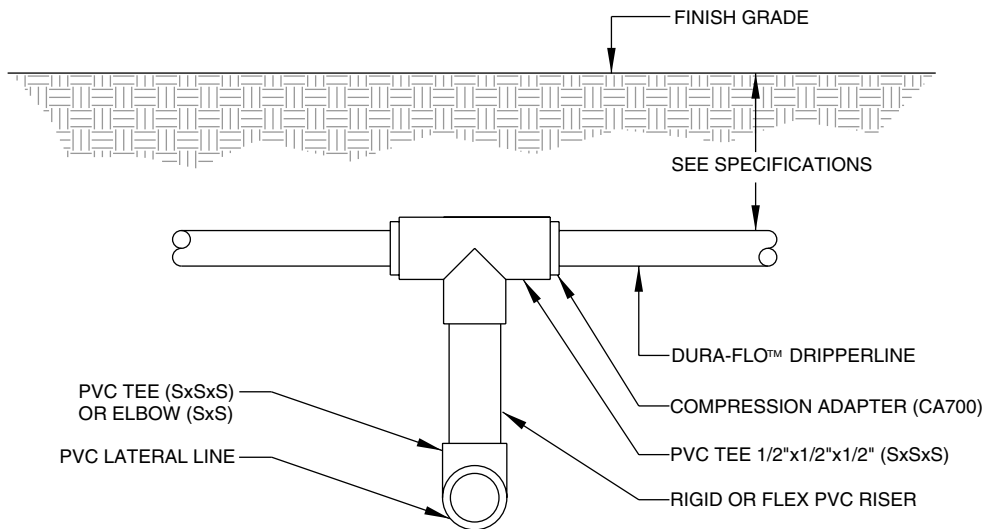
NOT TO SCALE



### PVC SUPPLY OR EXHAUST HEADER END FEED DETAIL BELOW GRADE INSTALLATION

D1

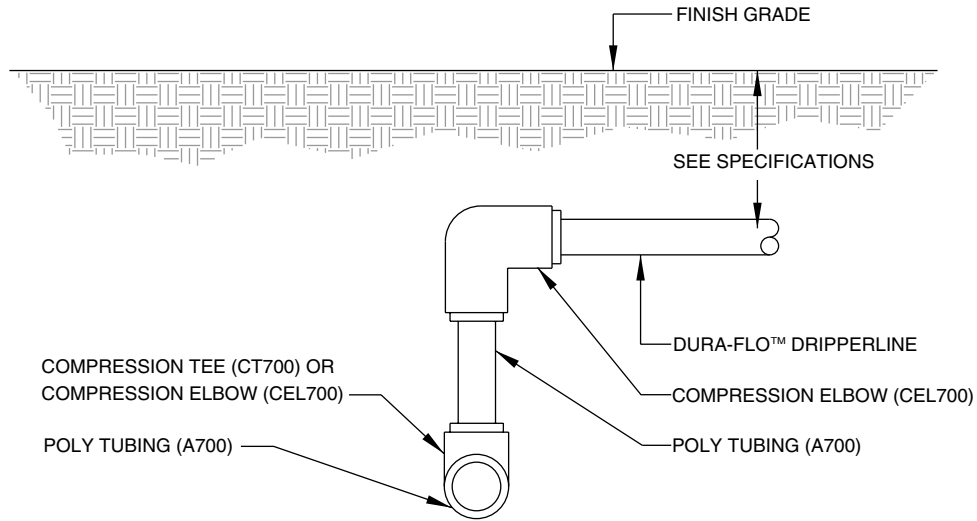
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### PVC SUPPLY HEADER CENTER FEED DETAIL BELOW GRADE INSTALLATION

D2

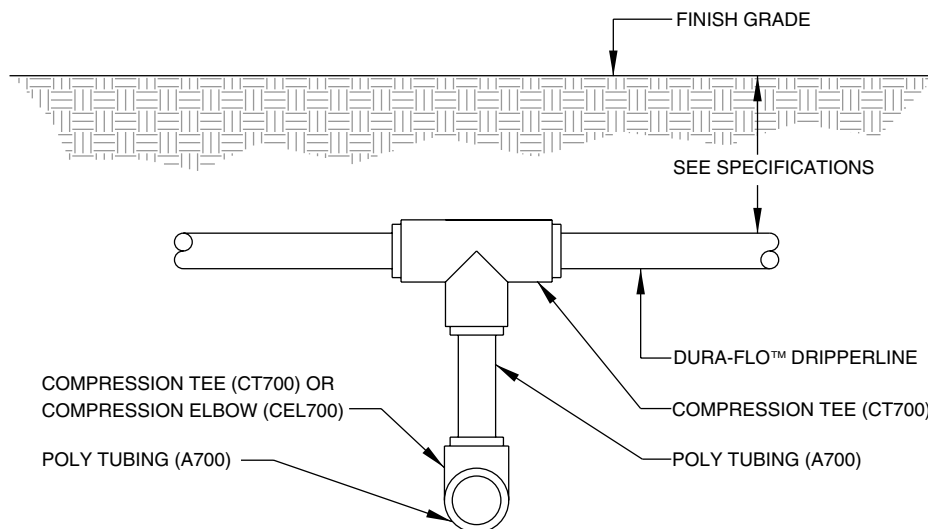
NOT TO SCALE



### POLY SUPPLY OR EXHAUST HEADER END FEED DETAIL

D3

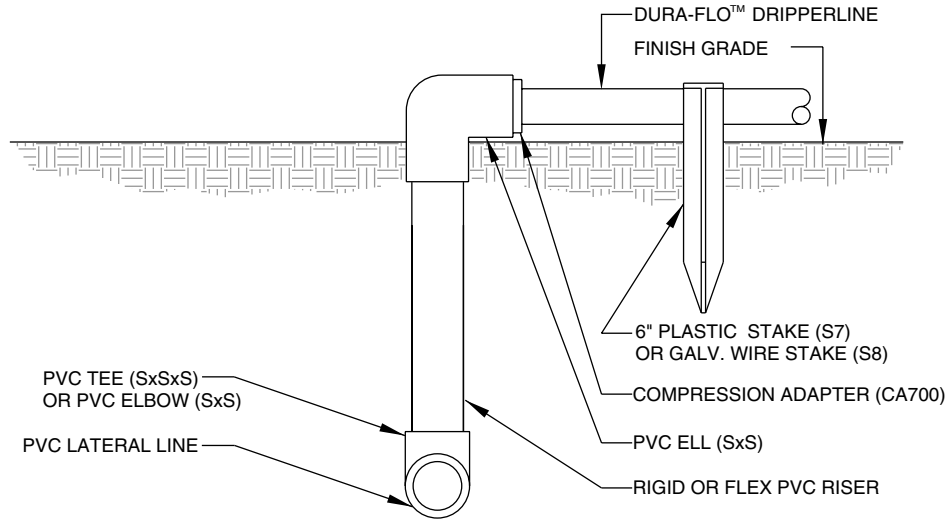
NOT TO SCALE



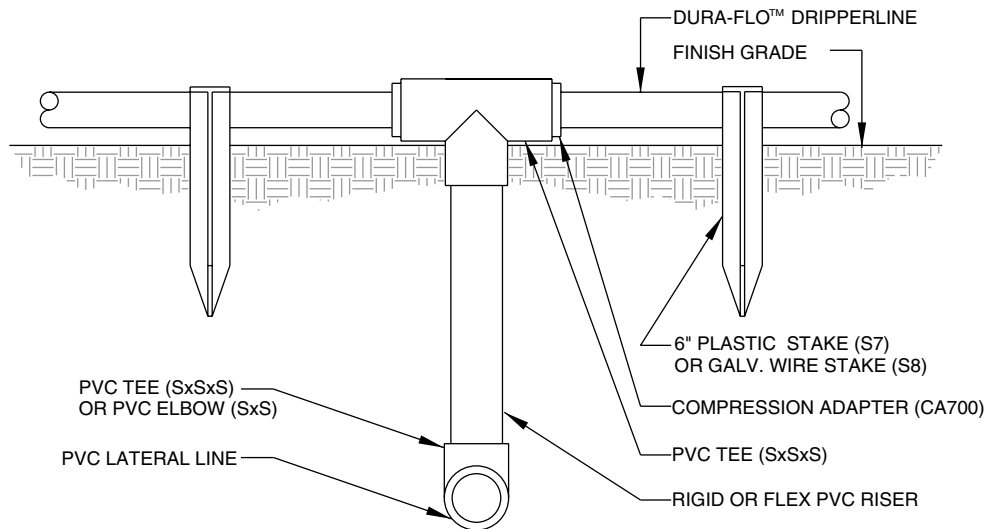
### POLY SUPPLY HEADER CENTER FEED DETAIL

D4

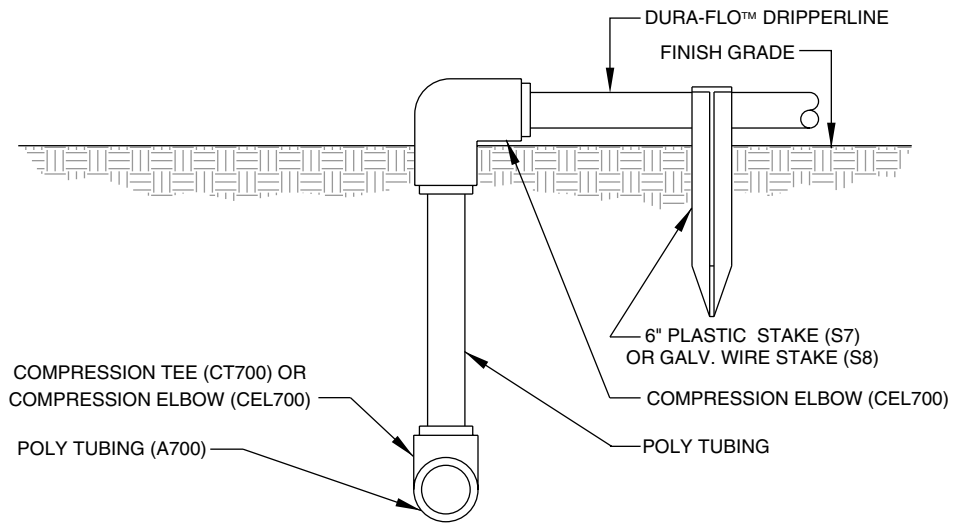
NOT TO SCALE



**PVC SUPPLY OR EXHAUST HEADER END FEED DETAIL**  
**D5** PARTIALLY ABOVE GRADE INSTALLATION  
 NOT TO SCALE



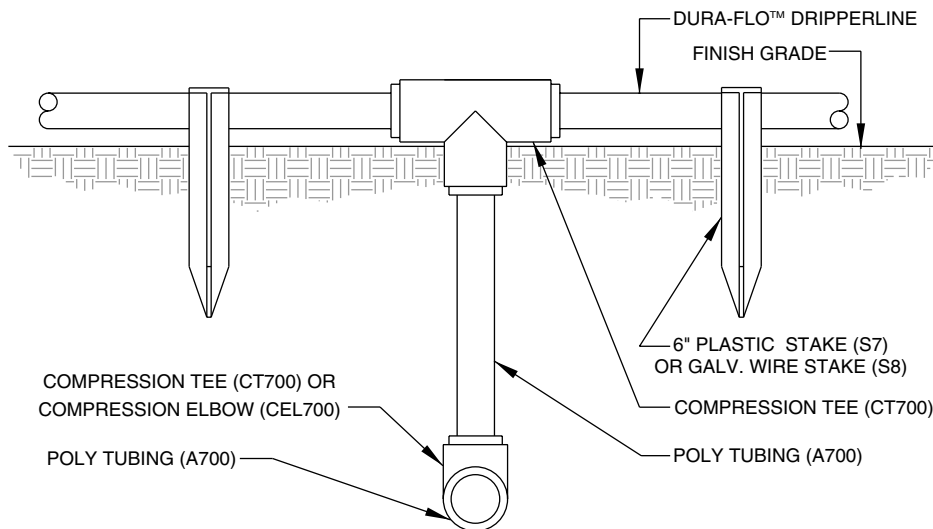
**PVC SUPPLY HEADER CENTER FEED DETAIL**  
**D6** PARTIALLY ABOVE GRADE INSTALLATION  
 NOT TO SCALE



### POLY SUPPLY OR EXHAUST HEADER END FEED DETAIL PARTIALLY ABOVE GRADE INSTALLATION

D7

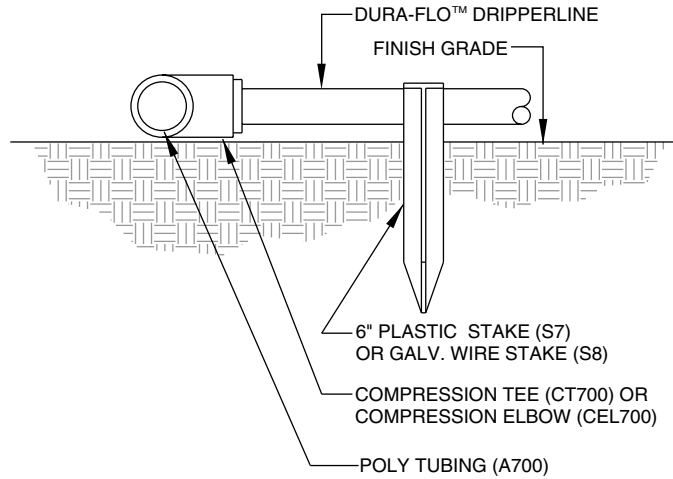
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### POLY SUPPLY HEADER CENTER FEED DETAIL PARTIALLY ABOVE GRADE INSTALLATION

D8

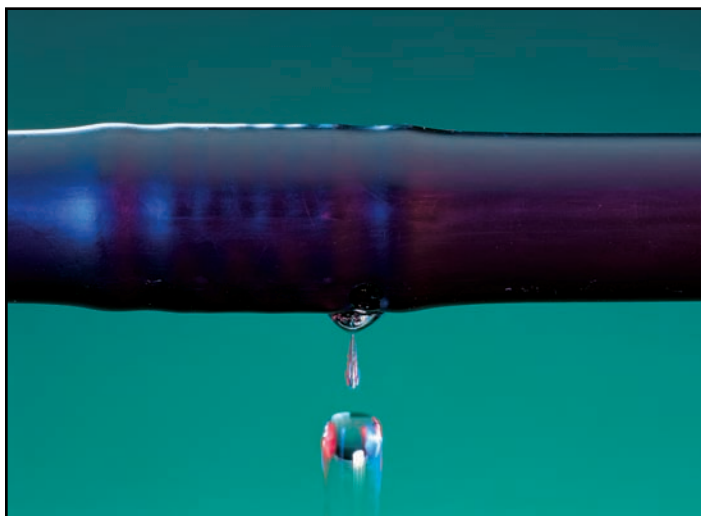
NOT TO SCALE



# **POLY SUPPLY OR EXHAUST HEADER END FEED DETAIL ABOVE GRADE INSTALLATION**

D9

NOT TO SCALE



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