IRRIGATION

irrigation F/X

GETTING STARTED GUIDE

Preface

Irrigation design is an exceedingly complex science that demands precision. In developing Irrigation F/X, our irrigation design software plugin for AutoCAD, we set out to provide a powerful design tool that marries unprecedented functionality with intuitive features and full customization.

This guide will show you the available tools and techniques for creating an intelligent irrigation system design using our software, including:
- Selecting and placing a water source
- Specifying pipe classes and types for your region and the needs of your site
- Creating an equipment inventory from a gigantic database of manufacturers
- Configuring and placing your equipment
- Sizing your pipes and checking for errors at the click of a button
- Performing automatic calculations to determine the necessary pressure and flow for each portion of your system design
- Building a variety of irrigation schedules and reports
- Customizing everything from text and callout styles to layer colors and equipment symbols

We don't just simplify the principles of irrigation. We take care of the calculations and other heavy lifting, allowing you to get back to designing.

Jeremiah Farmer
CEO, Land F/X

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Appendix

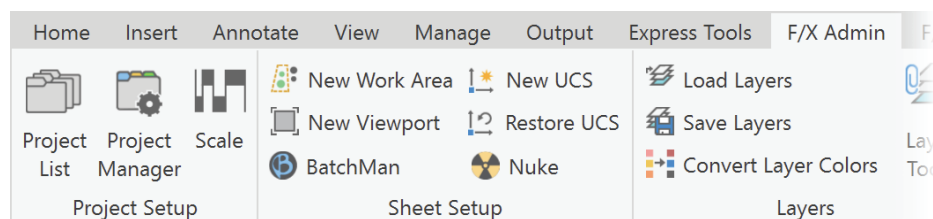Print your Support ID here for reference:

The Irrigation F/X Ribbons

■ *Use this spread as a reference for locating tools described in this guide. Most tools you'll need for planting are located on the F/X Irrigation ribbon. A few are on the F/X Admin ribbon.*
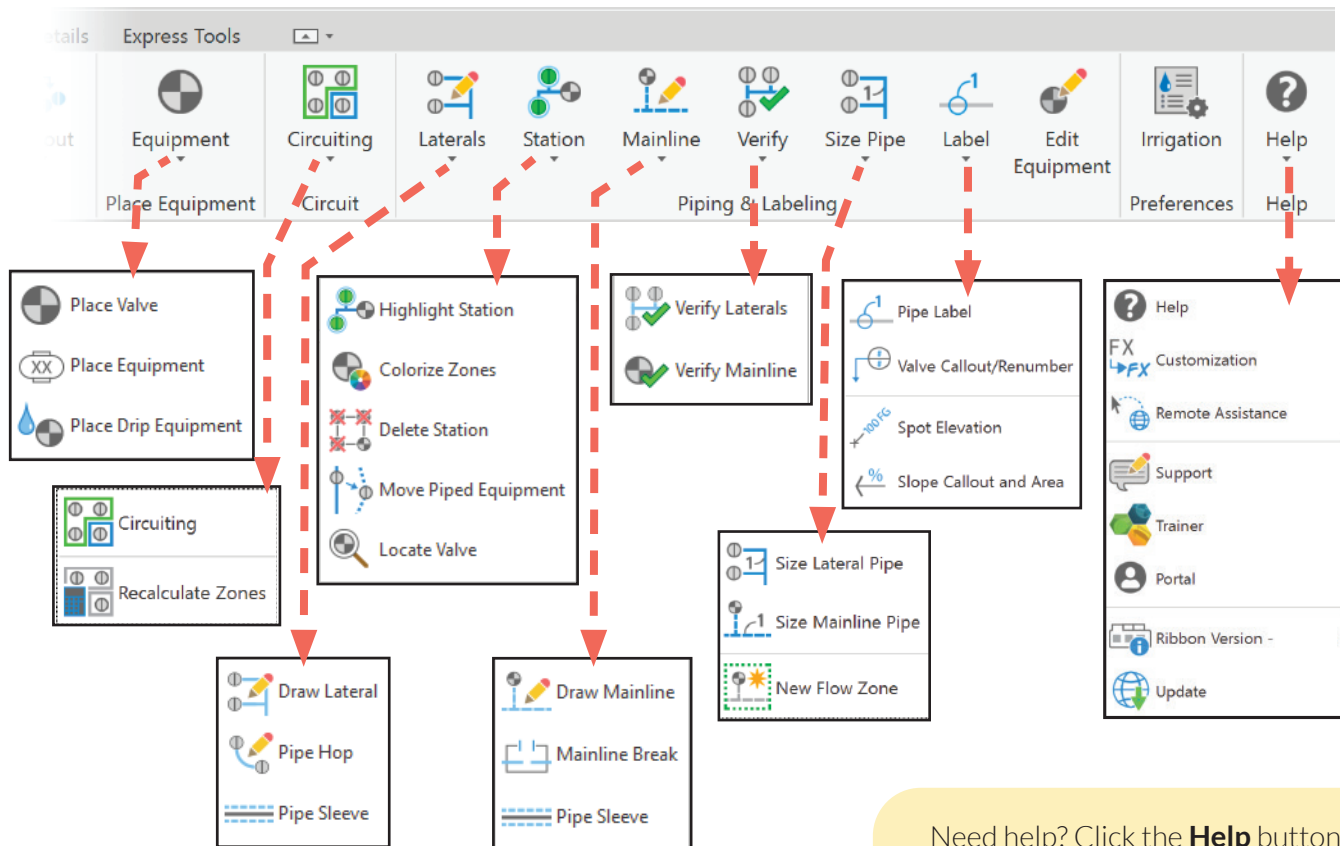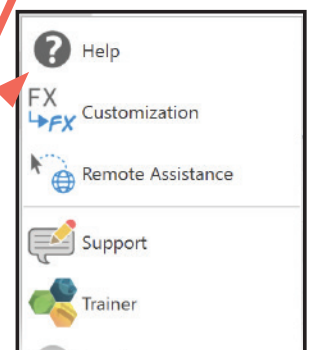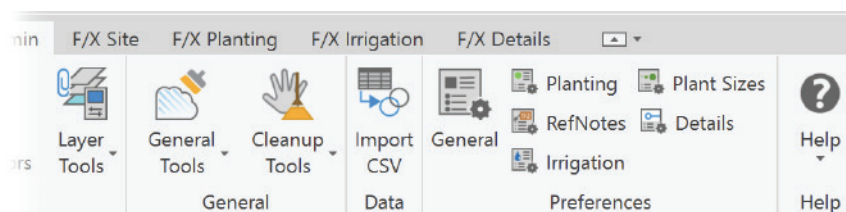
F/X Irrigation Ribbon
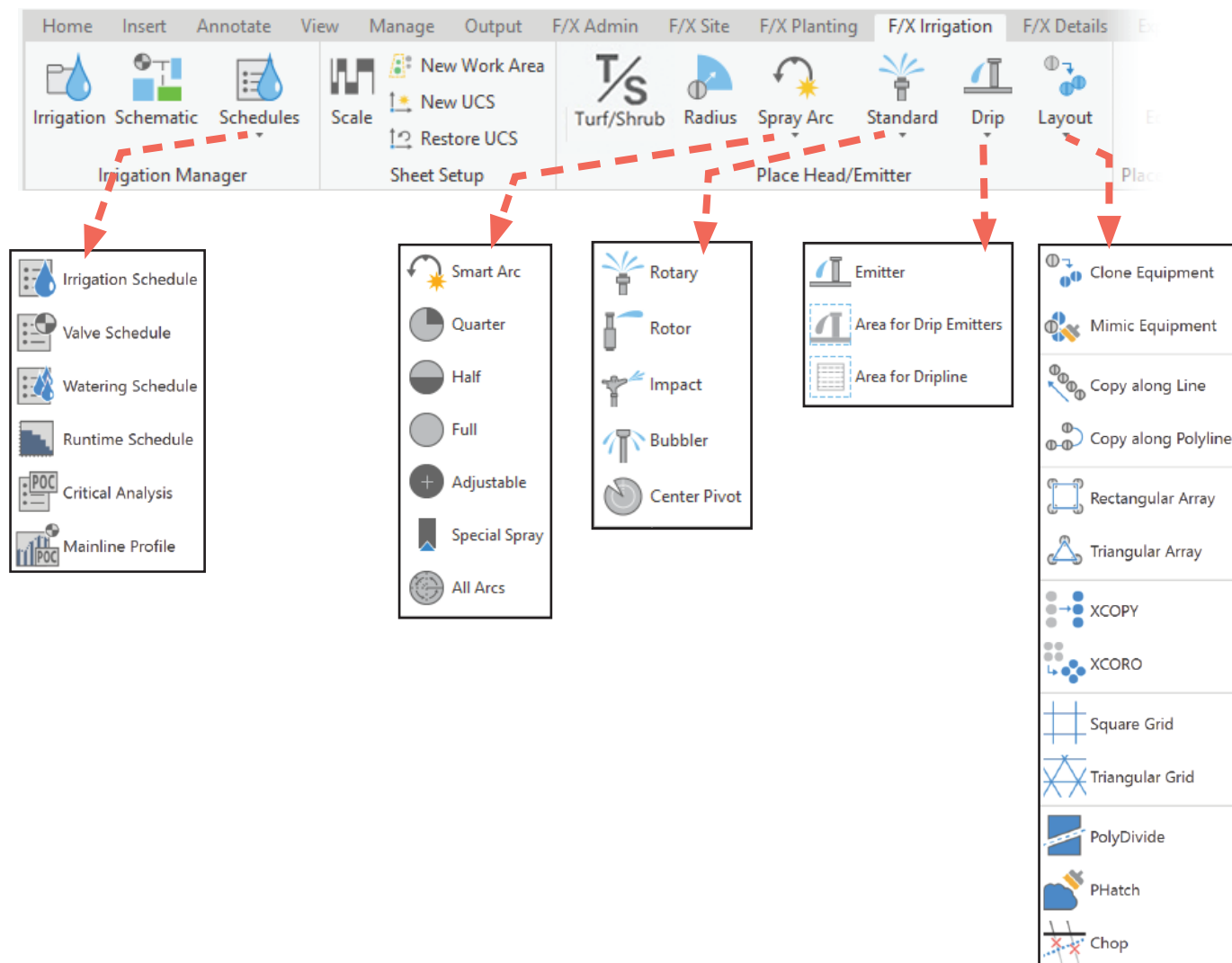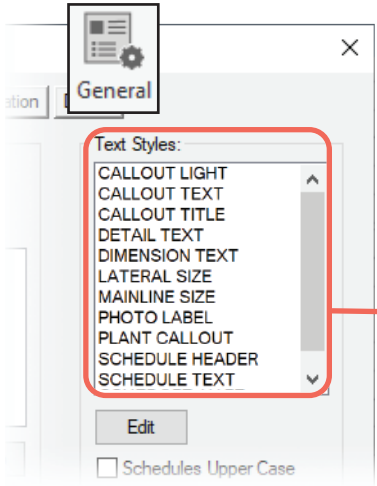

F/X Admin Ribbon

The Irrigation F/X Ribbons

Place Equipment
- Place Valve
- Place Equipment
- Place Drip Equipment

Circuit
- Circuiting
- Recalculate Zones

Laterals
- Highlight Station
- Colorize Zones
- Delete Station
- Move Piped Equipment
- Locate Valve

Draw Lateral
- Draw Lateral
- Pipe Hop
- Pipe Sleeve

Draw Mainline
- Draw Mainline
- Mainline Break
- Pipe Sleeve

Verify
- Verify Laterals
- Verify Mainline

Size Pipe
- Size Lateral Pipe
- Size Mainline Pipe
- New Flow Zone

Label
- Pipe Label
- Valve Callout/Renumber
- Spot Elevation
- Slope Callout and Area

Help
- Help
- Customization
- Remote Assistance
- Support
- Trainer
- Portal
- Ribbon Version -
- Update

Need help? Click the **Help** button on any Irrigation F/X ribbon, or visit **www.LandFX.com/help**.

Help
- Help
- Customization
- Remote Assistance
- Support
- Trainer

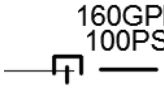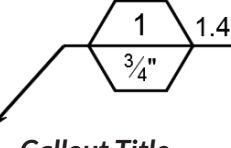■ *Use the General Preferences to customize your text styles and layers.*

F/X Admin >

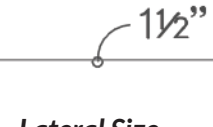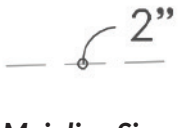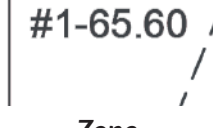### Irrigation-Related Text Styles

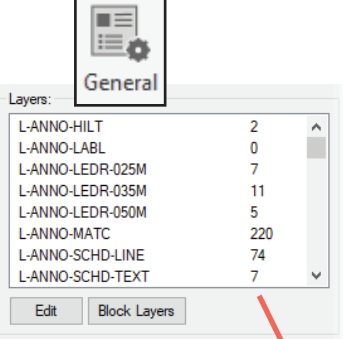*Callout Light*

Callout Text

Callout Title

Lateral Size

Mainline Size

Zone

IRRIGATION SCHEDULE

SYMBOL | MANUFACTURER/MODEL/DESCRIPTION

① ② ③ | K-RAIN RN ADJUSTABLE PROS-06 SHRUB ROTATOR, 6.0" POP-UP WITH ADJUSTABLE ROTARY NOZZLE. NOZZLE ADJUSTS FROM 80 TO 360. AVAILABLE WITH SIDE AND BOTTOM INLETS. RUGGED HEAVY DUTY CONSTRUCTION.

Schedule Title, Schedule Header, & Schedule Text
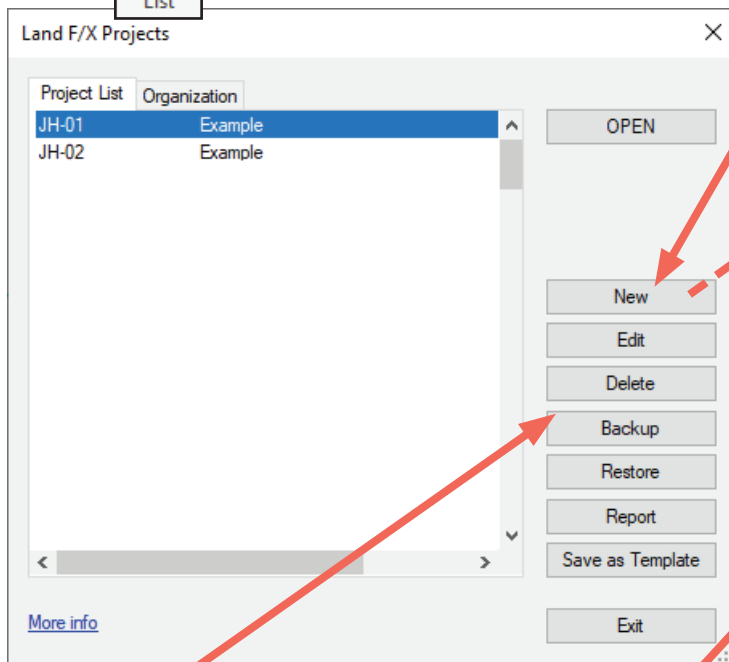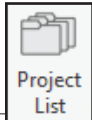
F/X Admin >

Layer Settings

You can also configure your layer settings, including layer colors, from the General Preferences. See page 24, as well as our *Customization Getting Started Guide*, for instructions.

Irrigation-related objects, such as equipment and callouts, are all placed on specific layers whose names begin with **LI-**. Each layer has its own specific purpose, and everything is placed on the correct layer automatically. As a result, you have a level of fine control that ensures that all your equipment is in the correct location and layer.

■ *First, you'll need to start a project, which will enable a connection between AutoCAD and the Irrigation F/X database. Starting a project allows you to associate manufacturer data with an object in the drawing.*
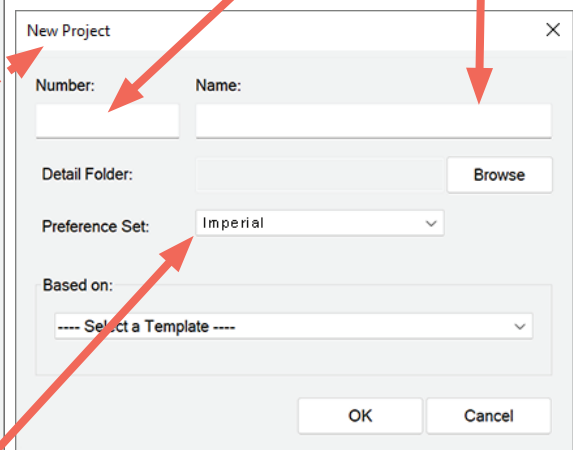
Important: *Create a new Irrigation F/X project for each new job.* **Do not** *reuse projects for new jobs.*

F/X Admin >

Project List

Land F/X Projects ✕

Project List	Organization	
JH-01	Example	
JH-02	Example	

OPEN

New
Edit
Delete
Backup
Restore
Report
Save as Template
Exit

More info

Click **New** to start a new project.

Give your project a **Number** and a **Name**.

New Project ✕

Number: Name:

Detail Folder: Browse

Preference Set: Imperial

Based on:

---- Select a Template ----

OK   Cancel

Any time a project has to follow a different set of standards, you'll need a different set of preferences, known as a Preference Set. (See page 4.)

The **Project Number** has to be a unique number in relation to all other projects in the office. It can include up to 12 characters, and may be any combination of letters, numbers, or symbols (other than an apostrophe).

The **Project Name** is simply your office name for the project, and does not necessarily need to be unique from one project to another. (For example, you can have several "Smith Residence" projects.)

POWER TIPS
Don't risk losing your customized content! Click the **Backup** on in the **Projects** dialog box to back up your projects and Preference Sets.

■ *Scale is critical in your initial sheet setup. It determines how information and symbols display, how they will appear in the final product, and, in the end, how they will plot.*
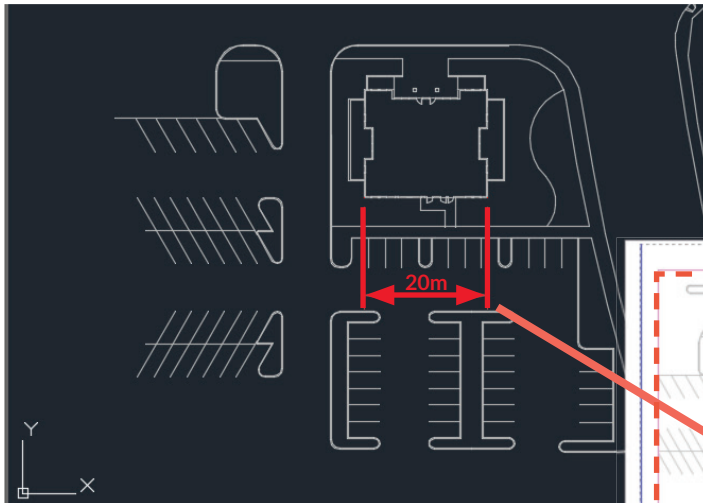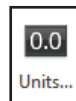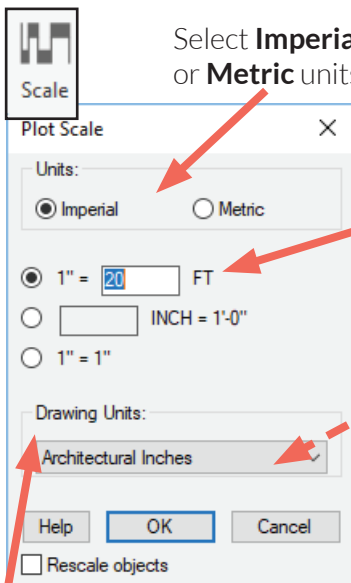
Design at the actual size of your site in Model Space (1:1), then view your design through a viewport that fits your desired paper size.

20m

100mm

SOUTH PLANTING PLAN 1:200
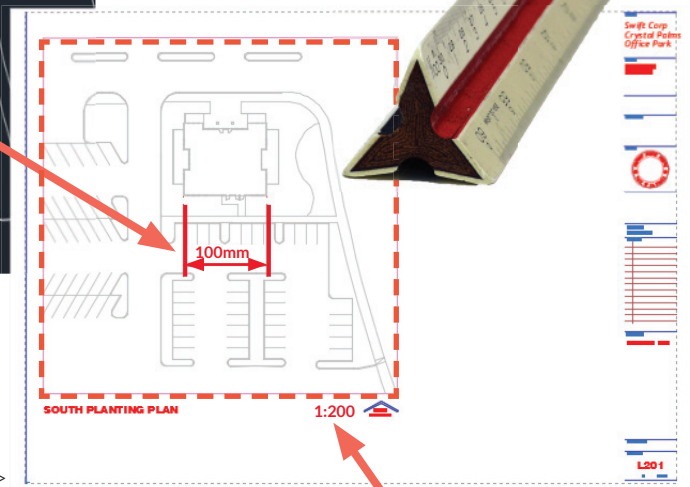
Set your scale and units once, and forget it. All Irrigation F/X information and symbols will automatically be scaled correctly.

Manage >

Viewport scale

F/X Admin >

Scale

Select **Imperial** or **Metric** units.

ACAD **Manage** ribbon

0.0 Units...

Plot Scale

Units:
◉ Imperial   ○ Metric

Set your scale.

◉ 1" = 20 FT
○ ___ INCH = 1'-0"
○ 1" = 1"

Drawing Units:
Architectural Inches

Help   OK   Cancel
☐ Rescale objects

Select your **Drawing Units**.

Drawing Units

Length
Type:
Decimal
Precision:
0.0000

Angle
Type:
Decimal Degrees
Precision:
0
☐ Clockwise

Insertion scale
Units to scale inserted content:
Feet

Sample Output
1.5000,2.0039,0.0000
3.0000<45,0.0000

Lighting
Units for specifying the intensity of lighting:
International

OK   Cancel   Direction...   Help

Need more guidance on scale and units?
Just click **Help**.

9 "units"

Verify your units by drawing a 9-unit line and checking it against an object with a known size – like a vehicle.

In the example above, we can assume that the units are in feet based on the lengths of the line and the car.

■ *Set your Irrigation Preferences, then place your equipment. Changing your Preferences will not affect any equipment that is already placed in your drawing.*
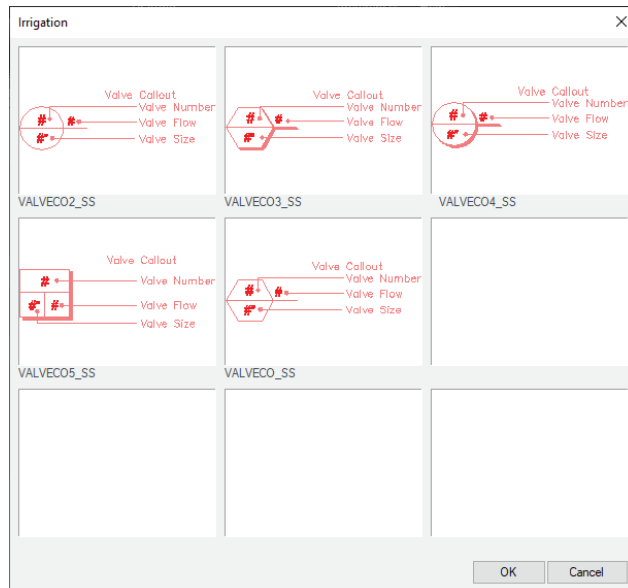
F/X Irrigation >
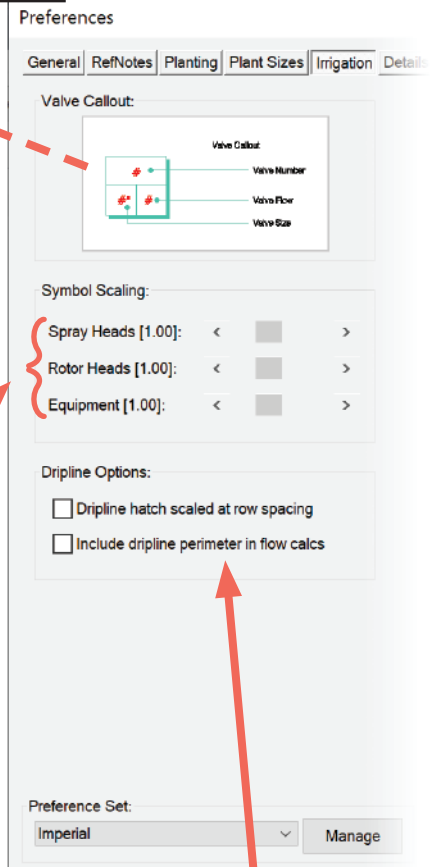
Click to select a **Valve Callout** style.

Make global changes to the graphic size of your spray heads, rotor heads, or other equipment (such as valves).

Options to scale dripline areas to show their exact row spacing and include dripline perimeters in flow calculations.

POWER TIPS

To get information on block customization and the Irrigation Preferences, and to see our Irrigation Spray Family Symbols, download our *Irrigation Getting Started Guide* at www.landfx.com/docs/irrigation.

Color-coded pipe sizes create an easy reference in your drawing ...

1"   3/4"   1/2"
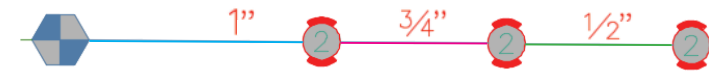
... but plot in black and white.

1"   3/4"   1/2"

Pipe Callout Lasso Option:

3/4"

3/4"

Irrigation | Details

Pipe Size Options:
☑ Color-code sized pipe
☑ Pipe callout lasso
☑ Pipe callout layer per class

Pipe Classes:
US Imperial

Flow and Pressure Units:
○ m3/h   ○ bars
○ l/min   ○ kPa
○ l/s   ● PSI
● GPM

Schematic Irrigation
Pipe Data Defaults
Schedule Defaults

Help   OK   Cancel
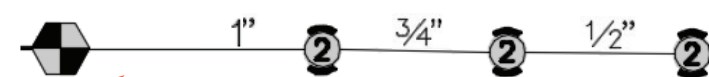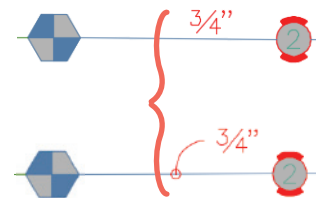
Select this option to separate your pipe callouts by layer per pipe class.

Pipe Classes:

US Imperial
US Imperial
Australia/New Zealand
British Imperial
Chinese Metric
US Metric
European Metric
British Metric
Southeast Asia
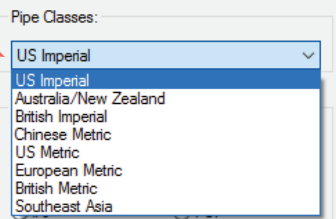
Choose the settings that work best for your region:

• **Pipe Classes**

• **Flow and Pressure Units (Imperial or Metric)**

Plan your irrigation areas intelligently with **Schematic Irrigation** Zones. (See page 8.)

Set all data for your lateral pipe, mainline pipe, and pipe sleeves, then set it as the default for the current Preference Set.

Configure an Irrigation Schedule format and style, and set it as the default style for the current Preference Set. See page 19 for more information about Irrigation Schedules.

A **Point of Connection** can be a fixed size or have a Custom flow.

A **Master Valve** isolates an entire system at the source.

Mainline Pipe is constantly charged with pressure.

Irrigation F/X will automatically detect a looped mainline and adjust accordingly.

A **Cap** can stand in for any demand, whether future, existing, or just planning purposes.

POC

MV

45GPM
55PSI

A **Water Meter** will have additional loss through the Service Line. It will typically include a **Backflow Device** to prevent contamination of municipal water.

M

BF 1¼"

A **Shutoff Valve** can be used to isolate part of a system. When using **Valve-in Head Rotors**, you can use a shutoff valve to transition to **Lateral Line Pipe**.

A **Remote Control Valve**, **Drip Control Valve**, or **Manual Control Valve** transitions between the **Mainline Pipe** and **Lateral Line Pipe**, pressurizing the lateral pipes as directed by the **Controller.**

When you size the lateral pipes, the callouts will populate with the valve's demands.

After you size the lateral pipes, you can size the mainline as well.

A-01 7.32
1"

6.30 B-01
1"

¾"

Use a **Schematic Area** at a conceptual level to determine the necessary source.

7.32

#1-6.30

10 10 10

10 10 10

10 10 10

Zoning a system is not necessary in order to pipe to the heads.

Irrigation F/X will calculate the actual precipitation rate, depending on how the heads are laid out.

■ *Adding equipment from the Irrigation F/X database requires an Internet connection. The information is pulled from our server and stored locally. When you add equipment to your project, the Irrigation Preferences will be applied to it.*

F/X Irrigation >

Add equipment to your project.

POWER TIPS After adding all your equipment to the Irrigation Manager, create a schedule with the **Entire Palette** option checked. You can then use the schedule as an inventory of all equipment you've added.
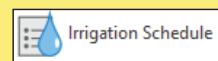
■ *Our Schematic Irrigation tool helps you calculate the size of your water source, form an initial idea of what your flow totals might be, determine a watering window, and produce quick trade-off studies. It's a great way to estimate your system design's potential needs before placing your heads.*

F/X Irrigation >

Schematic Irrigation now shares a docked palette with our **Circuiting** tool. The palette will open to the **Schematic** tab automatically when you open the tool, and you can easily switch back and forth. Note that the Schematic Mnager will be blank when you open it.

Create and configure a water source for your system while creating your Schematic plan.
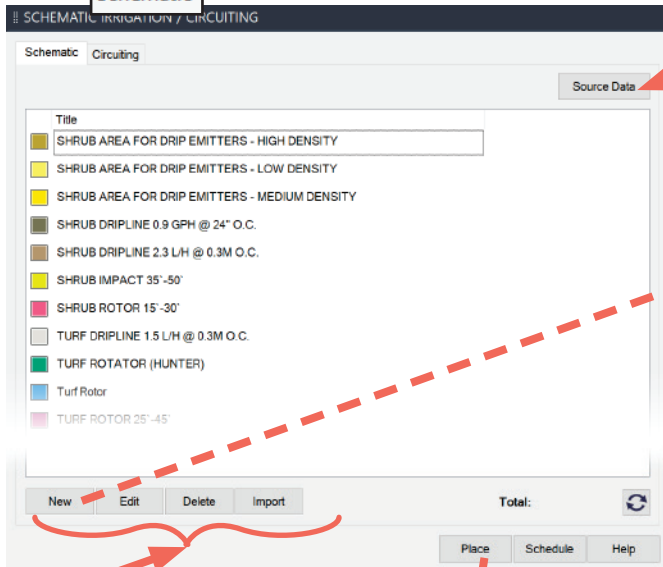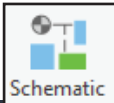
Create Schematic types based on the types of irrigation heads you anticipate using in your design.

You can also **Edit** the data associated with your types, **Delete** types you don't need, and even **Import** types from other projects.

Select a type and click **Place** to place a Schematic area based on that head type.
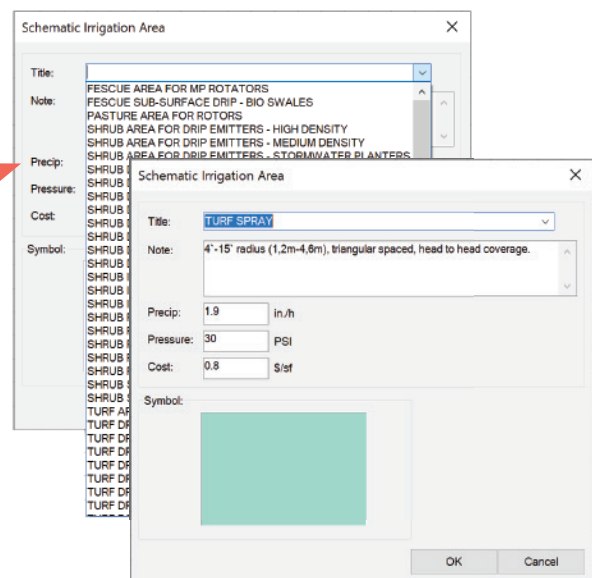
Schematic types are now tied to your projects. Choose from our list of default types or create your own. You can still manage a list of default types, which will be tied to your active Preference Set.
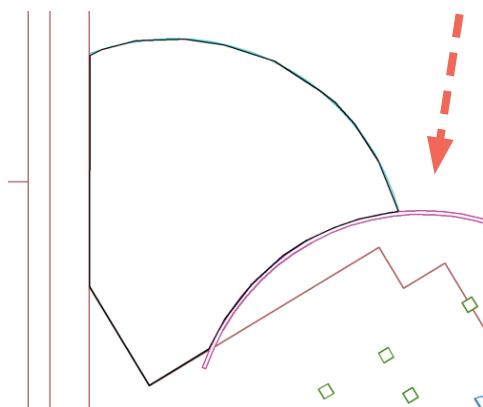
Draw a closed polyline, or select an existing one.
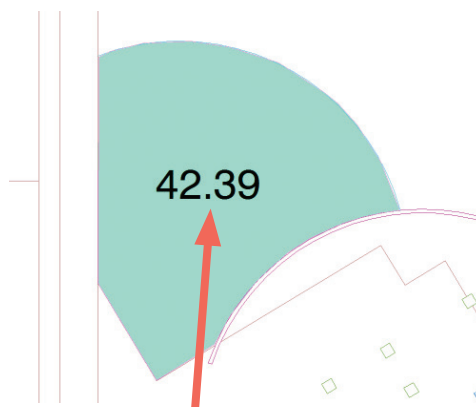
The closed polyline will become a Schematic area, and you'll see the area's estimated flow total.

42.39

Continue to place Schmenatic areas to sketch out your design. You'll have reasonable estimates of your flow totals and other important information before you even place your heads!

■ *Once you've specified your equipment inventory and determined the necessary flow rates for your design, you're ready to start building your irrigation system. You can place equipment directly from the Irrigation Manager.*

F/X Irrigation >

Irrigation

Select the type of equipment you want to place.

Select a component.

To place exactly what you want, check the option to **Show Components**.

IRRIGATION MANAGER

Irrigation Equipment:

◉ Heads   ◯ Valves   ◯ Auxiliary Equipment   ◯ Drip   Source Data   Pipe Data

All ▾   ☐ Show Components

Equipment	Detail
GPH Irrigation GPCB	
K-RAIN PROS-04-CV-PR-TB	
Hunter MP Corner PROS-00-PRS40	
Hunter MP Strip PROS-00-PRS40	
Hunter MP1000 PROS-00-PRS40	

New	Edit	Delete	Import	Replace	Highlight	View Data	Detail
			Place	Schedule	Circuit	Help	

Then click **Place** to begin placing the selected equipment.

M

M

Click to place the component in your drawing. The example above shows a valve being placed on a mainline, where it's automatically connected.

F/X Irrigation >

Equipment

POWER TIPS Place valves, auxiliary equipment, and drip equipment using the **Equipment** menu, available from the **F/X Irrigation** ribbon.

⊕ Place Valve
XX Place Equipment
Place Drip Equipment

Place Head/Emitter
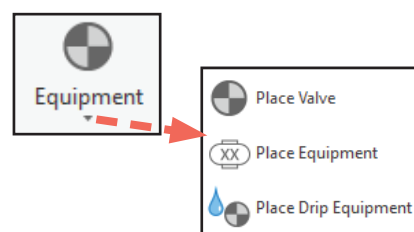
Ribbon tabs: Output | F/X Admin | F/X Site | F/X Planting | **F/X Irrigation** | F/X Details

Tools: Turf/Shrub | Radius | Spray Arc | Standard | Drip | Layout

Place Drip Emitters

- Emitter
- Area for Drip Emitters
- Area for Dripline

Place Other Emitter Types

- Rotary
- Rotor
- Impact
- Bubbler
- Center Pivot

Place Spray Heads

Select Head Type

- Turf Spray - <Add New>
- Shrub Spray - Irritrol I-PRO600
- Shrub Spray 2 - K-Rain 78006
- Shrub Spray 3 - Toro 570S
- Shrub Spray 4 - Weathermatic MAX6
- Shrub Spray - <Add New>

OK | Cancel

Select Radius

4
5
6
8
10
12
15
17

Cancel

① Click **Turf/Shrub** and choose a spray head to place.

② Select a radius size.

- Smart Arc
- Quarter
- Half
- Full
- Adjustable
- Special Spray

③ Select an arc pattern.

Layout Tools

Layout

- Clone Equipment
- Mimic Equipment
- Copy along Line
- Copy along Polyline
- Rectangular Array
- Triangular Array
- XCOPY
- Square Grid
- Triangular Grid

POWER TIPS

We highly recommend using our **Schematic Irrigation** tool to create a preliminary analysis of your design (see previous page). You can then place your actual equipment knowing that you've set up a viable model of your system's flow requirements.

More Layout Tools: Clone Equipment & Mimic Equipment

F/X Irrigation >

Layout

Clone Equipment
Mimic Equipment
Copy along Line
Copy along Polyline
Rectangular Array
Triangular Array
XCOPY
XCORO
Square Grid
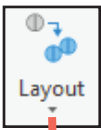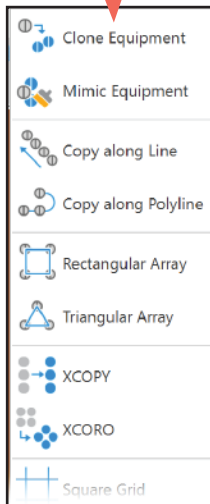
Clone Equipment
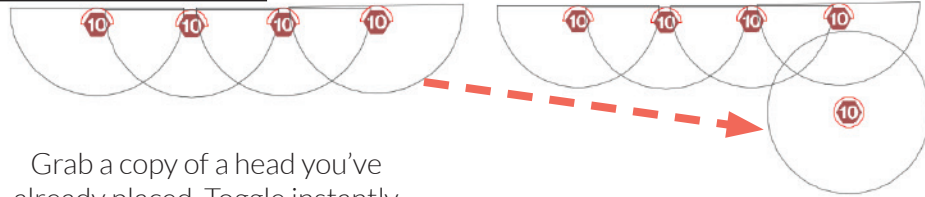
Grab a copy of a head you've already placed. Toggle instantly to the radius, nozzle, and spray arc of your choice using keyboard commands (see below).

Then place a duplicate head with the settings you selected (like in the example above, where we've placed a duplicate head with a full arc). Repeat. It's so fast!

Mimic Equipment

Change one head into another by grabbing a "source" head and applying its properties to a "destination" head.

Keyboard Commands

To speed up your workflow, use our keyboard commands for placing equipment. To see the dialog box showing all the keyboard commands (pictured to the right), press the **K** key on your keyboard while placing heads.
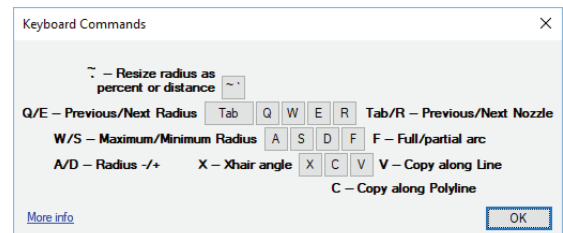
Toggle When Placing Heads

Use the following keys to toggle between different options when placing heads:

- **~ / `:** Resize the coverage radius of a head as a percentage or distance.
- **Q/E:** Toggle to the previous/next coverage radius. (Example: 5'➔8'➔ 10', etc.)
- **Tab/R:** Toggle to the previous/next available nozzle. (Example: Q ➔ H ➔ T ➔ F, etc.)
- **W/S:** Toggle to the minimum/maximum available coverage radius. (Example: 75% ➔ 100%, etc.)
- **D/A:** Toggle up/down in coverage radius size. (Example: 75% ➔ 80% ➔ 85% ➔ 90%, etc.). You'll toggle between distances or percentages, depending on what you've set with the **~** and ` keys.
- **F:** Toggle to a full/partial arc.
- **C/V:** Copy equipment along a polyline / line.

Snap Equipment to a Specific Angle in Your Drawing

Use **X** key to fire our **Xhair Angle** tool. The cursor crosshairs will "snap" to an angle in your drawing.
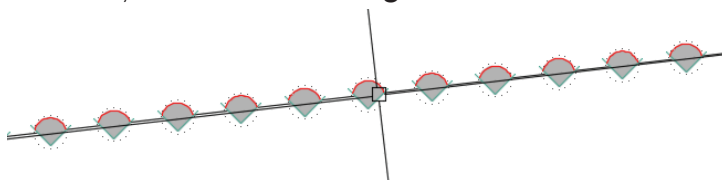
Click a polyline to snap to its angle, or type your desired angle in the Command line. Then place your equipment.

■ *Group your heads into stations, or zones, using our Circuit tool. You can group similar head types, plant materials, exposures, rotor types, arc types ... it's all up to you.*

Circuiting now shares a docked palette with our **Schematic Irrigation** tool. The palette will open to the **Circuiting** tab automatically when you open the tool, and you can easily switch back and forth.

F/X Irrigation >

Create and configure a water source for your system while circuiting.

Quickly **Merge** two or more existing zones into one.
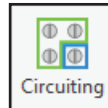
Click **New**, then draw your zone that encompasses all heads you want to include. It couldn't be simpler!

Start with the **Flow Total** to add up the flow of everything in the drawing.

Recalculate the flow total of your zones after making changes.

Use the **Head Tally** to select heads one at a time and calculate their total flow.

Edit the data assigned to a zone. You can even select a different head type and the zone will recognize it automatically.

ZONE SCHEDULE

ZONE	HEAD TYPE	GPM
1	Shrub Rotary	6.80
2	Shrub Rotary	4.61
3	Turf Spray	18.22
4	Turf Spray	29.94

POWER TIPS

No need to select a head type before creating or drawing a zone. You can select your head type(s) after drawing a zone. The zone will ignore other types of heads.

Use the **Uniformity** tool to create a color-coded analysis of the head coverage in your design.

■ *Our pipe drawing tools make piping incredibly simple. Just select whether you want to draw lateral or mainline pipe. Then connect the dots – the pipe is a polyline that grabs onto equipment.*

F/X Irrigation >

Select **Draw Lateral** or **Draw Mainline**, then click a piece of equipment to begin piping. A yellow circle indicates a successful connection. Keep clicking to keep piping.
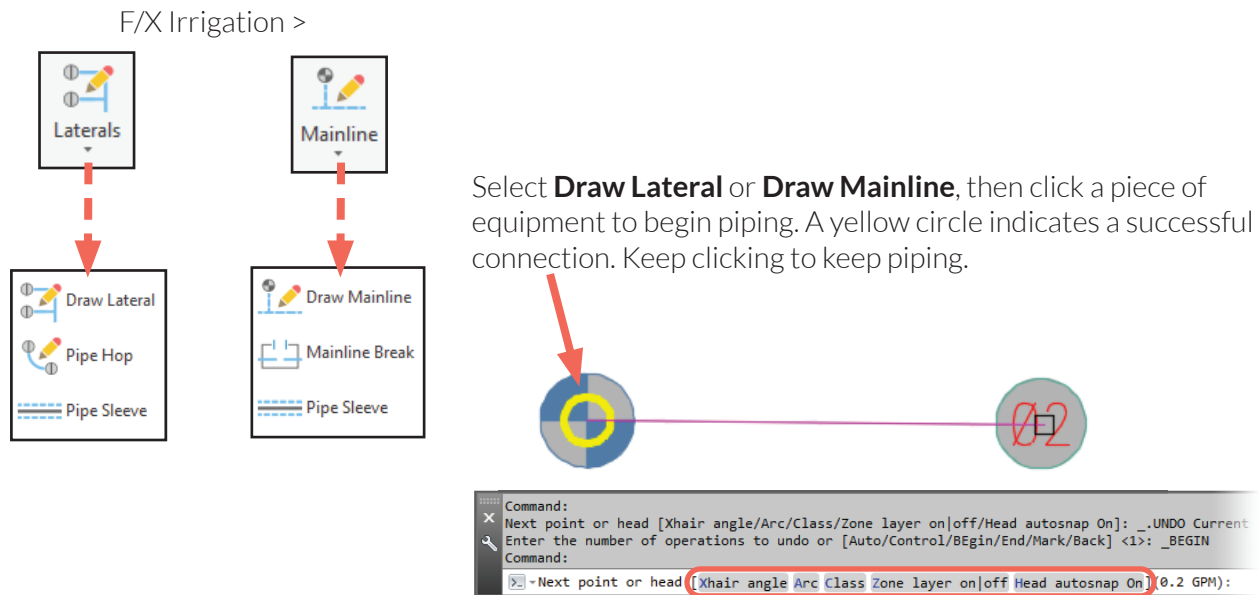
Keyboard Commands

While you're drawing pipe, you'll see a list of keyboard commands in the Command line. Press any of the following keys on your keyboard for even quicker piping:

● [**X**hair angle]: Type **x** to fire our **Xhair Angle** tool, which allows you to "snap" the cursor crosshairs to an angle in your drawing. Select an existing polyline to snap to its angle, or type your desired angle in degrees.

● [**A**rc]: Type **A** to draw an arc of pipe.

● [**C**lass]: Type **C** to toggle between the pipe classes you've added to your project. Different pipe classes will be assigned different linetypes, and the length of each class you use will be recorded separately. See page 5 of this Guide for details on setting pipe classes. You can also use the number keys (**1** through **9**) to toggle to the corresponding pipe class.

● [**Z**one layer on | off]: Type **z** to toggle Zone (Circuit) layers on and off. See page 12 of this guide for details on our **Circuiting** tool.

● [**H**ead autosnap]: Type **H** to toggle our **Head AutoSnap** tool on and off. When **Head AutoSnap** is enabled, your pipe will connect to heads automatically as you pass over them – no need to click. It's a great way to speed up the piping process in projects large and small.

● [**T**oggle layers]: When drawing mainline, type **T** to toggle all non-mainline layers on and off.

● [**U**ndo]: Type **U** to undo a pipe, unhooking it from a component or fitting you've clicked.

■ *Checking an irrigation plan for errors was once a long, tedious process. No more! With our error-checking tools, you can scan your entire drawing instantly with the click of a button.*

Our **Verify Laterals** tool scans your drawing for several common lateral piping errors.

F/X Irrigation >

Verify

Verify Laterals
Verify Mainline

Verify Laterals

Verify Laterals   ✕

Pipe Fittings/Callouts
✔ Any errant pipe fittings or callouts have been deleted.

Circular Pipe Errors
✖ 2 locations have circular piping.
[Highlight in Cyan]

Unpiped Heads
✖ 2 emitters are not connected to valves.
[Highlight in Green]

Zero Flow Emitter Areas
✖ 1 drip emitter areas have zero flow.

Apparent Pipe Intersections
✖ 1 locations of overlapping pipe require hops.
[Place Pipe Hops] [Highlight in Yellow]

More info   [OK]

Before sizing the mainline, use our updated **Verify Mainline** tool to ensure that your system design is error free.

Verify Mainline

Verify Mainline   ✕

Pipe Fittings/Callouts
✔ Any errant pipe fittings or callouts have been deleted.

Valid Valve Callouts
✖ 1 valve callouts are not pointing to valid valves.
[Highlight in Green]

Controller Placed
✖ A controller has not placed in the drawing.

Lateral Pipes Sized
✖ 1 valves have not had their lateral pipe sized.
[Highlight in Magenta]

Valves Piped
✖ 1 valves are not connected to a water source.
[Highlight in Yellow]

Valves Called Out
✖ 2 valves have not been called out.
[Highlight in Cyan]

More info   [OK]

■ *Our instant pipe-sizing tools automatically apply the Hazen-Williams formula to your pipes based on the performance data of your equipment. Size your laterals with a click.*

F/X Irrigation >
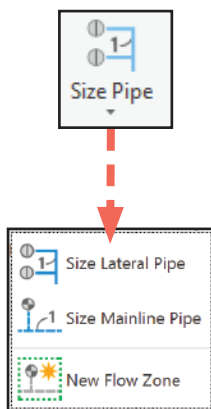
Select a valve to size only the laterals connected to that valve ...

... or right-click to size all valves at a time.

When sizing one valve at a time, use the slides to fine-tune the **Design Pressure** and **Friction Loss** for that valve.

When sizing all valves, dial in the **Maximum Velocity**, **Pressure Variation**, and **Fittings Factor** for your entire system.

F/X Irrigation >
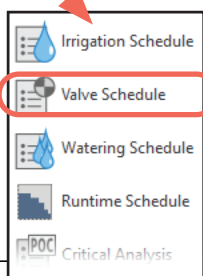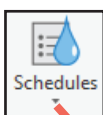
Lateral pipe size callouts will appear automatically.

Once you've sized your laterals, place a Valve Schedule. Here, you'll see important information about all valve stations in your design, including the types of heads connected to them, their size, flow, pressure required at the valve and at the POC, and the precipitation rates of the heads on that valve.

VALVE SCHEDULE

NUMBER	MODEL	SIZE	TYPE	GPM	HEADS	PIPE	WIRE	DESIGN PSI	FRICTION LOSS	VALVE LOSS	PSI	PSI @ POC	PRECIP
1	HUNTER ICV-G	1-1/2"	TURF ROTOR	44.40	4	178.4		50	3.97	1.92	55.89	70.71	0.48 in/h
2	HUNTER ICV-G	1-1/2"	TURF ROTOR	44.40	4	178.3		50	3.96	1.92	55.89	70.94	0.48 in/h
3	HUNTER ICV-G	1-1/2"	TURF ROTOR	44.40	4	178.3		50	3.96	1.92	55.89	71.18	0.48 in/h
4	HUNTER ICV-G	1-1/2"	TURF ROTOR	44.40	4	178.3		50	3.96	1.92	55.88	71.41	0.48 in/h
5	HUNTER ICV-G	1-1/2"	TURF ROTOR	55.50	5	195.6		50	2.81	2.64	55.45	74.01	0.82 in/h
6	HUNTER ICV-G	2"	SHRUB SPRAY	29.10	30	662.7		30	5.29	0.80	36.09	53.09	2.07 in/h
7	HUNTER ICV-G	1-1/2"	TURF ROTOR	44.40	4	178.3		50	3.96	1.92	55.88	71.65	0.48 in/h
8	HUNTER ICV-G	1-1/2"	TURF ROTOR	44.40	4	178.4		50	3.97	1.92	55.89	71.89	0.48 in/h
9	HUNTER ICV-G	1-1/2"	TURF ROTOR	44.40	4	885.5		50	7.44	1.92	59.87	76.03	1.68 in/h
10	HUNTER ICV-G	1-1/2"	TURF ROTOR	55.50	5	269.8		50	6.22	2.64	58.86	78.40	0.82 in/h
11	HUNTER ICV-G	1-1/2"	TURF ROTOR	55.50	5	216.4		50	4.68	2.64	57.21	76.03	0.85 in/h
12	HUNTER ICV-G	1-1/2"	SHRUB ROTOR	47.50	18	561.9		45	8.48	2.08	55.56	70.57	0.57 in/h
13	HUNTER ICV-G	1-1/2"	SHRUB ROTOR	21.50	11	311.9		45	4.23	1.50	50.73	68.02	0.57 in/h
14	HUNTER ICV-G	1-1/2"	SHRUB ROTOR	7.50	8	172.8		45	1.19	1.50	47.64	58.74	0.22 in/h
15	HUNTER ICV-G	1-1/2"	SHRUB ROTARY	21.47	29	490.8		40	1.80	1.50	43.30	57.54	0.44 in/h
16	HUNTER ICV-G	1-1/2"	TURF ROTOR	55.50	5	251.2		50	5.12	2.64	57.76	75.73	0.95 in/h
17	HUNTER ICV-G	1-1/2"	SHRUB SPRAY	29.57	32	354.4		30	1.64	1.50	33.14	46.38	1.59 in/h
18	HUNTER ICV-G	1-1/2"	TURF SPRAY	39.22	26	317.8		30	2.17	1.68	33.85	47.87	1.71 in/h
19	HUNTER ICV-G	1-1/2"	TURF SPRAY	56.95	17	282.3		30	1.32	1.64	32.96	46.58	1.75 in/h
20	HUNTER ICV-G	2"	SHRUB ROTARY	14.68	15	288.1		40	1.17	1.50	42.66	55.74	0.39 in/h
Unknown	HUNTER ICV-G	1-1/2"	TURF SPRAY	43.56	20	259.3		50	3.04	1.88	54.92	44.95	1.71 in/h
Unknown	HUNTER ICV-G	1"		0.00	1								Unknown

■ *Sizing your mainline pipe is just as quick as sizing your laterals. Click a button, select the number of valves that will operate at a time, and your mainline is sized.*

F/X Irrigation >
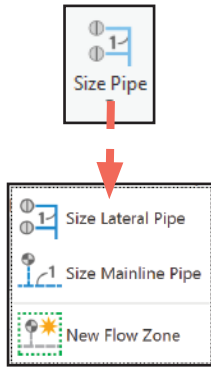
Mainline sizing options are very simple: Will one valve be running at a time, or will you size all pipe for a maximum flow?

With mainline, it's all about **Velocity**.

Create **Flow Zones** if you need to limit areas to a flow lower than the maximum – like a small green of a golf course.

Looped mainline calculations are all automatic!

When you size the mainline, you'll automatically generate a Critical Analysis of your system design. This report includes some extremely important data about your system, including available pressure and flow.

The Critical Analysis is a report that provides the flow and pressure statistics of your system design.

The most important item in the Critical Analysis is the **Residual Pressure Available**, the last number in the analysis. If your system has insufficient residual pressure, this item will appear as a negative number. The maximum flow should have been controlled with the Circuiting process (see page 12), and should not have been exceeded if this process were completed correctly.

F/X Irrigation >
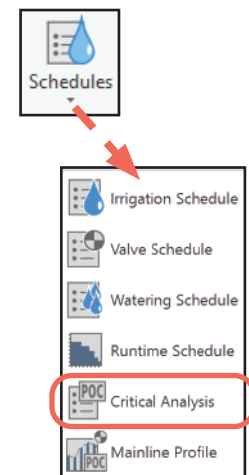
You can also place a Critical Analysis in your drawing manually.

■ *Once you've piped your equipment, you'll inevitably need to make edits, delete components, and move equipment around. Use our editing tools to make the necessary changes without losing your connections.*

F/X Irrigation >

Station

↓

Highlight Station
Colorize Zones
Delete Station
Move Piped Equipment
Locate Valve
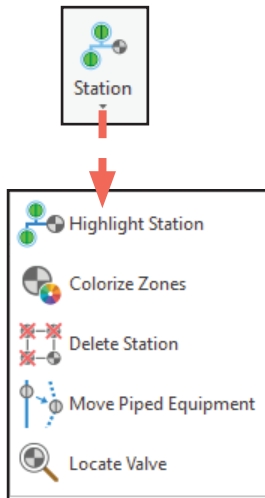
Highlight Station

Open our **Highlight Station** tool, then select a valve, head, or length of pipe. Everything that's connected to the pipe or component you selected will be highlighted, allowing you to verify connections.

¾"
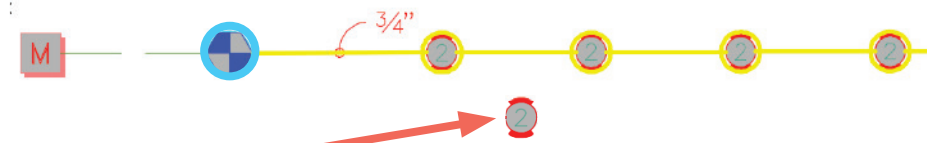
If a piece of equipment isn't connected to the station you selected, it won't be highlighted.
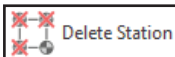
Delete Station

Delete an entire station – or specific items from a station, such as callouts, all pipe, or pipe plus heads (pictured below).

Delete Station ✕

Delete:
○ Callouts only
○ Pipe only
● Pipe and heads
○ Everything, including valve

More info   OK   Cancel

¾"

Move Piped Equipment
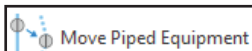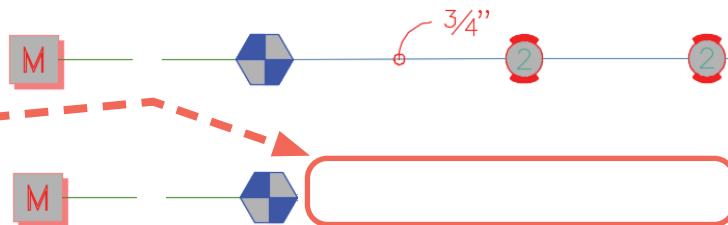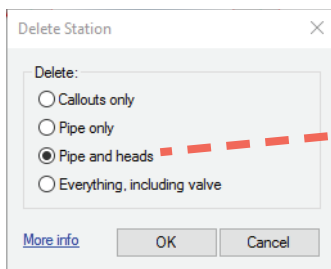
What if you need to move equipment you've already piped to? Easy! Use this tool, and maintain all your connections. In the example below, we've moved a piped head. Note that the pipes stay connected to the head, and the pipe label remains attached to the pipe.

¾"

¾"

POWER TIPS
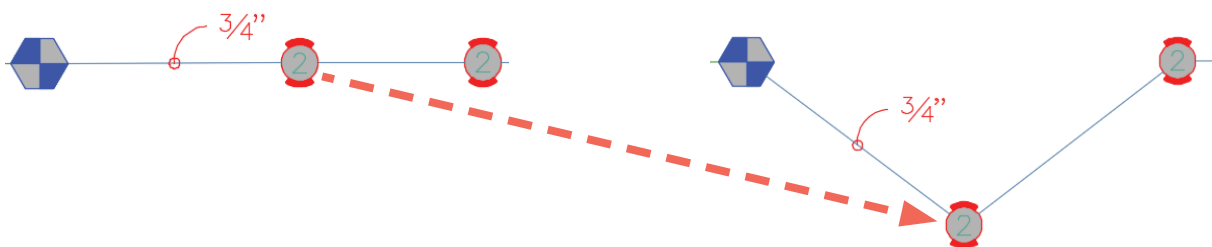
After making your edits, resize your laterals and then your mainline. You'll see a new Critical Analysis, which will provide the pressure and flow stats you need. And remember: You have our **Verify Laterals** and **Verify Mainline** tools to help you along the way.

F/X Irrigation >
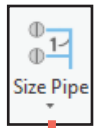
Size Pipe

Pipe labels are placed automatically when you size your pipes.

Need more labels? Use our **Pipe Label** tool.

Pipe Label

Pipe Label
Valve Callout/Renumber
Spot Elevation
Slope Callout and Area
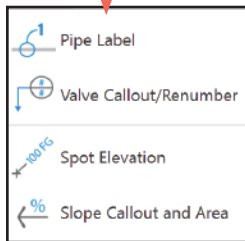
You can also use the **Pipe Label** tool to move and delete pipe labels.

2"   3/4"

M
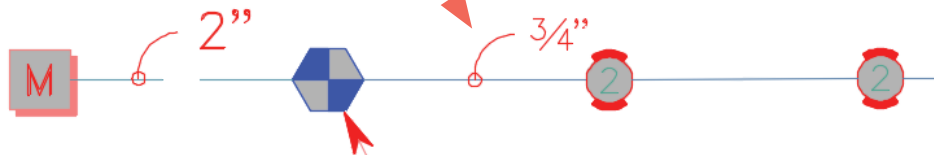
POWER TIPS Choose whether you want your pipe labels to include a lasso (as in the pipe labels pictured on this page). Use the **Pipe callout lasso** option in the Irrigation Preferences. (See page 5.)

Valve Callout/Renumber

1   8.30
1"
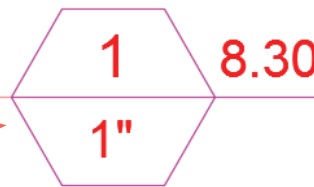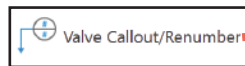
Select your Valve Callout style from the Irrigation Preferences. (See page 4.)

Valve Callout   ✕

Controller: [▾] [...]

Number: [1   ] [>>]

1 is available

Number Conflict:
☐ By Work Area
☐ Duplicate this number
☐ Increment other valves

[OK]   [Cancel]

If you've placed one or more **Controllers**, they'll be selectable here.

When you call out a valve, you'll enter a **Number** for that valve.

If the number you entered is already in use for another valve, you'll have three options:
- **Work Area:** This option will be grayed out if no Work Areas are detected in your drawing, but will be selectable if Work Areas are present. (See Power Tip below.)
- **Duplicate this number:** Use the same number for both valves.
- **Increment other valves:** Assign this number to the valve you're calling out, and assign a new number to all valves with an equal or higher number.

POWER TIPS A Work Area functions like a "drawing within a drawing," allowing you to perform functions such as limiting your schedules to a particular area, setting unique scales, and error checking by region.

F/X Irrigation >

New Work Area
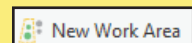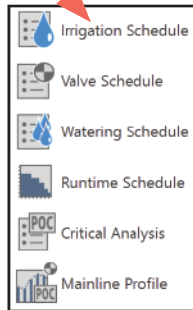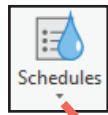
F/X Irrigation >

Catalog all equipment used in your project by running an Irrigation Schedule.

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL	QTY	PSI	DETAIL
(10 10 10 10) Q T H F	Rain Bird 1804-SAM-PRS 10 Series MPR	2	30	
(12 12 12 12) Q T H TQ	Rain Bird 1804-SAM-PRS 12 Series MPR	12	30	
(15 15 15 15) Q T H TQ	Rain Bird 1804-SAM-PRS 15 Series MPR	15	30	
(12) 12 HE-VAN-V 12 HE-VAN-F	Rain Bird 1804-SAM-PRS 12 Series HE-VAN	16	30	
(15) 15 HE-VAN-V 15 HE-VAN-F	Rain Bird 1804-SAM-PRS 15 Series HE-VAN	19	30	
EST LCS RCS CST SST	Rain Bird 1812-SAM-PRS 15 Strip Series	62	30	
(8 8 8) Q T H F	Rain Bird 1812-SAM-PRS 8 Series MPR	11	30	
(10 10 10 10) Q T H F	Rain Bird 1812-SAM-PRS 10 Series MPR	9	30	
(12 12 12 12 12) Q T H TQ F	Rain Bird 1812-SAM-PRS 12 Series MPR	38	30	
(15 15 15 15 15) Q T H TQ F	Rain Bird 1812-SAM-PRS 15 Series MPR	7	30	
(4 6 8 10 18) 4 6 8 10 18	Rain Bird 1812-SAM-PRS ADJ	14	30	
(12) 12 HE-VAN-V 12 HE-VAN-F	Rain Bird 1812-SAM-PRS 12 Series HE-VAN	16	30	
(15) 15 HE-VAN-V 15 HE-VAN-F	Rain Bird 1812-SAM-PRS 15 Series HE-VAN	4	30	
M L O	Hunter MP1000 PROS-12-CV	7	40	
K G R	Hunter MP2000 PROS-12-CV	22	40	

SYMBOL	MANUFACTURER/MODEL	QTY	PSI	GPM	RADIUS	DETAIL
(13)	Hunter I-40-06-SS	48	50	11.1	15.2 m	
		3	40	3	9.4 m	
		20	40	4	10.4 m	
		14	40	5	11.3 m	

		QTY		DETAIL
		3		
		1,038 m²		
		121.5 m²		

		QTY		DETAIL
		2		
		21		
		11		
		1		
		1		
		1		
5 3/4"	1,142 m			
5 1"	601.2 m			

Irrigation Schedule dialog

Destination:
- ⦿ Table
  - ☑ Gridlines non-plot
- ○ Spreadsheet
- ○ [_____]
  - ☑ Entire Palette
  - ☐ Include Xrefs

Sprays / Rotaries / Bubblers:
☑ | ⦿ Group ○ By Nozzle | ☑ Description | ☐ Quantity | ☐ Arc | ☑ PSI | ☐ GPM | ☐ Radius | ☐ Detail

Rotors / Impacts:
☑ | ☑ Description | ☐ Quantity | ☑ PSI | ☑ GPM | ☑ Radius | ☐ Detail

Drip:
☑ | ⦿ Group ○ By Nozzle | ☑ Description | ☐ Quantity ... | ☐ PSI | ☐ Detail

Valves / Equipment / Pipe:
☑ | ☑ Description | ☐ Quantity ... | ☐ Detail

Schematic Areas:
☑ | ☐ Description | ☐ Quantity | ☐ Precip | ☐ PSI | ☐ GPM | ☐ Cost

[OK] [Help] [Cancel]

POWER TIPS

We recommend placing an Irrigation Schedule with the **Entire Palette** option checked after you've added all your equipment to your project but before you've placed any equipment in your drawing. You can then use this initial schedule as an inventory of your equipment for your reference throughout the life of the project.

F/X Irrigation >

Schedules

- Irrigation Schedule
- Valve Schedule
- Watering Schedule
- Runtime Schedule
- POC Critical Analysis
- Mainline Profile
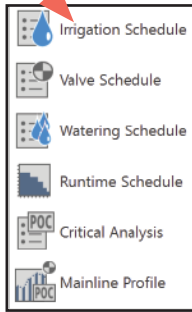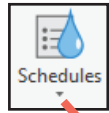
The Watering Schedule displays the time required to apply a certain amount of water on a weekly basis. It's a valuable resource for systems with one valve running at a time.
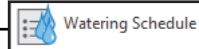
Watering Schedule

WATERING SCHEDULE

NUMBER	MODEL	TYPE	PRECIP	mm/WEEK	MIN./WEEK	L/WEEK	L/DAY
1	Rain Bird PEB	Shrub Spray	43.2 mm/h	25.4	36	5,810	1,937
2	Rain Bird PEB	Shrub Spray	37.6 mm/h	25.4	41	5,634	1,878
3	Rain Bird PEB	Shrub Spray	42.2 mm/h	25.4	37	4,331	1,444
4	Rain Bird PEB	Shrub Spray	35.6 mm/h	25.4	43	6,382	2,127
5	Rain Bird PEB	Shrub Spray	51.1 mm/h	25.4	30	3,305	1,102
6	Rain Bird PEB	Turf Spray	43.2 mm/h	38.1	53	7,147	2,382
7	Rain Bird PEB	Turf Spray	43.2 mm/h	38.1	53	7,790	2,597
8	Rain Bird PEB	Turf Spray	42.7 mm/h	38.1	54	8,678	2,893
9	Rain Bird PEB	Shrub Rotary	10.4 mm/h	25.4	147	11,798	3,933
10	Rain Bird PEB	Shrub Rotor	10.9 mm/h	25.4	140	15,369	5,123
11	Rain Bird PEB	Shrub Rotor	28.4 mm/h	25.4	54	9,607	3,202
12	Rain Bird PEB	Shrub Rotor	28.7 mm/h	25.4	54	16,966	5,655
13	Rain Bird PEB	Turf Rotor	24.9 mm/h	38.1	92	19,328	6,443
14	Rain Bird PEB	Turf Rotor	23.9 mm/h	38.1	96	20,169	6,723
15	Rain Bird PEB	Turf Rotor	11.9 mm/h	38.1	192	32,270	10,757
16	Rain Bird PEB	Turf Rotor	12.2 mm/h	38.1	188	31,598	10,533
17	Rain Bird PEB	Turf Rotor	12.2 mm/h	38.1	188	31,598	10,533
18	Rain Bird PEB	Turf Rotor	24.4 mm/h	38.1	94	19,748	6,583
19	Rain Bird PEB	Turf Rotor	12.2 mm/h	38.1	188	31,598	10,533
20	Rain Bird PEB	Turf Rotor	12.2 mm/h	38.1	188	31,598	10,533
21	Rain Bird PEB	Turf Rotor	47.5 mm/h	38.1	49	8,236	2,745
22	Rain Bird PEB	Turf Rotor	24.6 mm/h	38.1	93	19,538	6,513
23	Rain Bird XCZ-100-PRF	Area for Dripline	19.3 mm/h				
24	Rain Bird XCZ-100-PRF	Area for Dripline	19.3 mm/h				
25	Rain Bird XCZ-100-PRF	Area for Dripline	25.7 mm/h				
26	Rain Bird PEB	Turf Rotor	12.2 mm/h	38.1	188	31,598	10,533
		TOTALS:			2,298	380,094	126,698

Runtime Schedule

RUNTIME SUMMARY

GPM (vertical axis) vs Time (horizontal axis)

Program: (1) tuesday thursday
Total Time: 05:30
Total Water Use: 45,763 gallons
Max Allowed GPM: 180
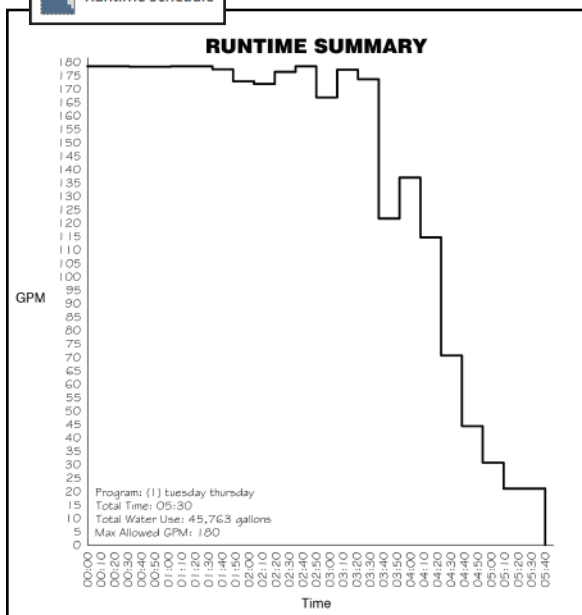
If your system will run multiple valves at a time, we recommend generating a Runtime Schedule, which mimics what a "smart" irrigation controller will do.

The Runtime Schedule calculates and records precipitation per day of watering. It also groups valves together (if you want) and determines the most efficient runtime representing the capability of the mainline in your system.

POWER TIPS

Remember: You can get a preliminary estimate of your system's required flow and precip rates using our **Schematic Irrigation** tool before you even place a head or lay a pipe! (See page 8.)

▪ Do not copy valves or heads after piping.

When you copy piped equipment, you're also copying the reference to the linked pipe. As a result, the copy will think it's also connected to the original pipe! Instead, use our **XCOPY**, **XCORO**, or **Match Properties** tools.

▪ Use Schematic Irrigation.

It's an amazing tool to calculate the size of the water source required for your system, determine your watering window, and quickly produce trade-off studies.

▪ Highlight Station is your best friend.

This tool doesn't just highlight all connected pipe and heads. Try it on a segment of mainline, or on any unpiped equipment. It will highlight all similar instances in the drawing. If you can't locate a certain head, are trying to troubleshoot a mainline connection, or want to query the flow of what you have just piped, leave it to **Highlight Station**.

▪ Velocity is everything.

The amount of water flowing is the given – that is, the amount that each sprinkler and emission device will consume at the desired pressure. Therefore, the only variable is the velocity: Delivering that given amount of water at a high velocity will allow you to use smaller pipe but will also generate an incredible amount of pressure loss due to **Friction Loss** (water is really heavy!). Likewise, reducing the velocity will require larger pipes to move the same amount of water but will use less pressure – and be gentler on all your equipment.

▪ Irrigation tools can accomplish multiple tasks.

The **Valve Schedule** can colorize all circuits. **Verify Laterals** can also check for overlapping pipe. **Verify Mainline** deletes errant pipe fittings and callouts, reminds you to place a controller, and ensures that valves are connected, have their lateral pipes sized, and are called out. **Pipe Label** not only places labels but can also move labels, slide them along pipe, delete labels, or move equipment along with its connected pipe. **Delete Station** can delete lateral or mainline pipe, and it also has options to delete only pipe callouts, only the pipe, everything but the valve, or everything completely.

Appendix

■ *Use the Appendix to help you configure Irrigation F/X to match your layer color & plotting standards. All symbols are shown at their plot scale for your review and customization.*

Visit **www.landfx.com/customize** for information on customizing irrigation settings and adding your own symbols.
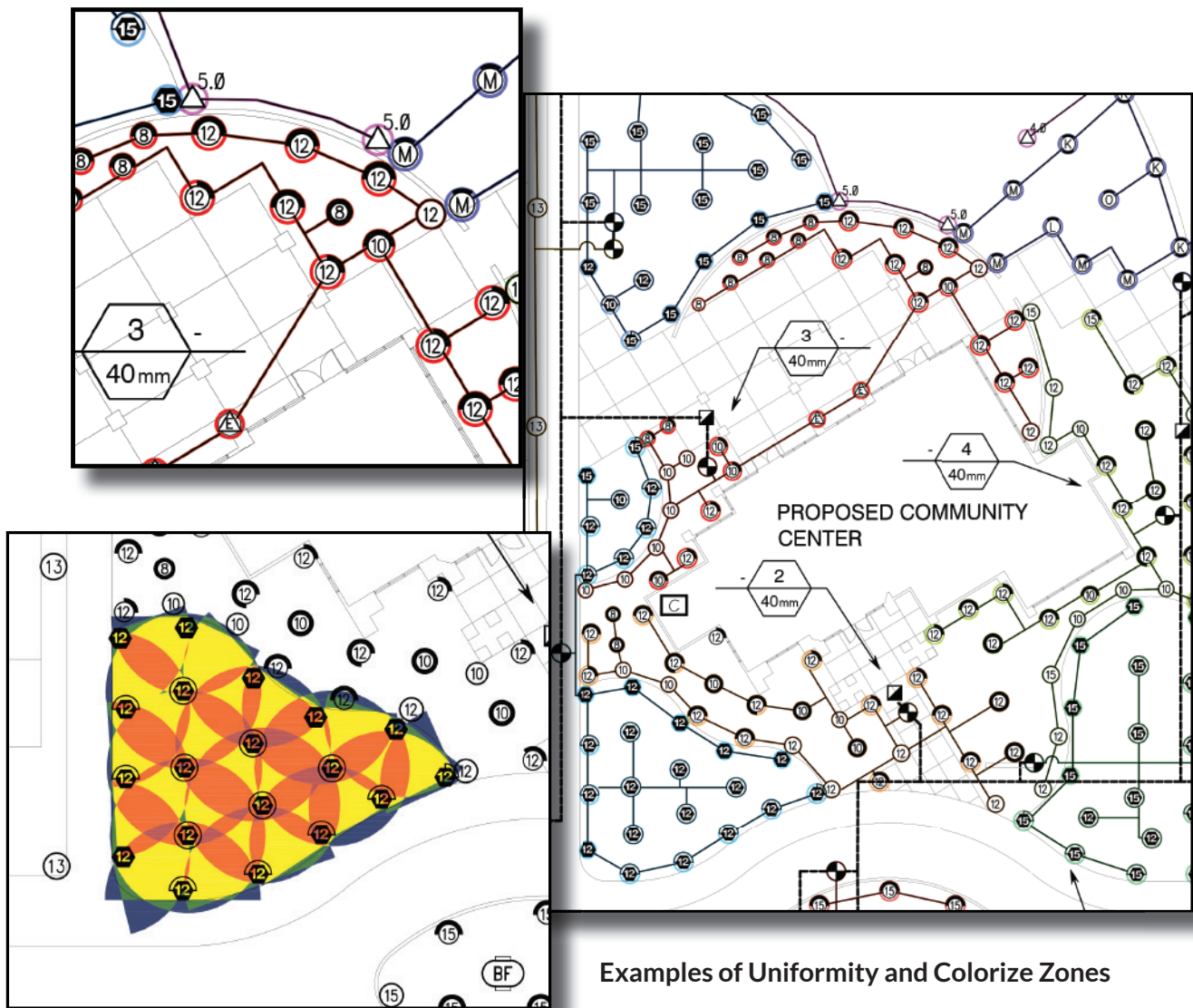
Examples of Uniformity and Colorize Zones

DOC NO: LandFX/Admin/LFX Pens   LFX.ctb

SOLID LINE COLORS

Color	Description	Line Sample	Dot & Box Sample

013M - Extra Fine (0.13mm)

8	Gray
13	Lt. Brown
150	Lt. Blue
191	Lt. Lavender

025M - Fine (0.25mm)

1	Red
4	Cyan
7	White (Black)
15	Brown

035M - Medium (0.35mm)

6	Magneta
11	Lt. Red
32	Brown
123	Teal

050M - Broad (0.50mm)

3	Green
5	Blue
52	Olive Green

070M - Extra Broad (0.70mm)

| 30 | Orange |
| 74 | Dull Green |

100M - Wide (1.00mm)

| 40 | Dk. Yellow |

IRRIGATION LINE COLORS

Lateral Pipe - (0.35mm)

193	Min.
153	
160	
113	
110	
71	
21	
240	
241	

Mainline Pipe - (0.70mm)

143	Min.
170	
122	
100	
53	
23	
242	
203	Max.

SCREENED LINE COLORS

SMXX - Medium (0.35mm)

255	0%
254	10%
253	20%
252	30%
251	40%
250	50%
249	60%
133	0%

SBXX - Broad (0.50mm)

141	20%
140	30%
142	40%
152	50%
154	60%

SWXX - Wide (1.00mm)

| 202 | 40% |
| 220 | 50% |

SCREENED SOLID FILL HATCH

0% 255	10% 254	20% 253
30% 252	40% 251	50% 250
60% 249	0% 133	

SCREENED NON-PLOT COLOR
Screening set to 0%

| 111 | Lt. Teal |
| 211 | Lt. Pink |

■ **Click the Block Colors button to change the Irrigation F/X colors to match your office standard.**

First select the Irrigation F/X Layer Colors to be Changed. See page 23 of this Getting Started Guide for a list of the layer colors used by Land F/X. Review this list, and check whether any color used by our software conflicts with your office standard. You won't need to review every color Land F/X uses – just review the colors used by both Land F/X and your office.

F/X Admin >
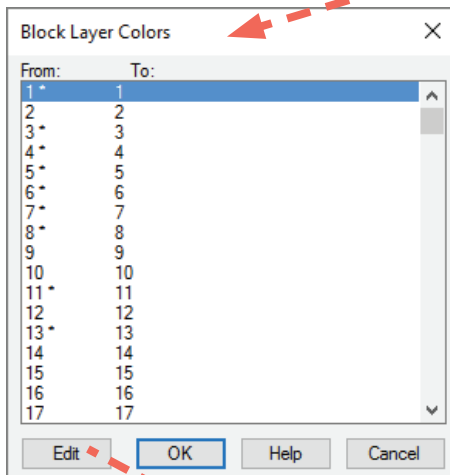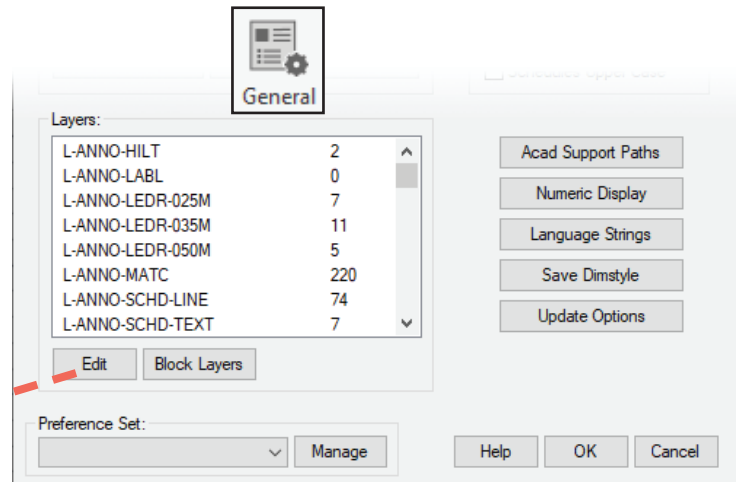
The **Block Layer Colors** dialog box lists the 255 colors used by AutoCAD as index colors for plotting. Each color used by Land F/X is followed by an asterisk (*).

Go to each color used by Land F/X that conflicts with your office standards. Click **Edit** to change it to meet your standards. You can ignore any colors your company doesn't use.

The ***Edit Block Layer*** dialog box:
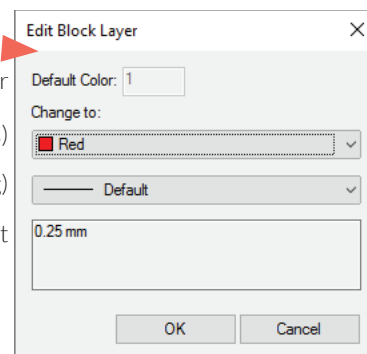
Land F/X default layer color

Color in your CTB that plots to the selected lineweight (thickness)

Optional lineweight (STB printing)

Block layer description/lineweight

Create the Plot File: Edit your CTB file to account for some additional colors, or just edit the **LFX.ctb** file. Visit **www.LandFX.com/docs** for instructions on saving your plot style.

LandF/X Irrigation Symbols - Spray Heads

The Head symbols are scaled as they would appear in the drawing
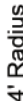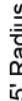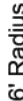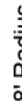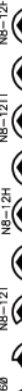
FAMILY 1 (Symbols rotate)

FAMILY 2 (Symbols rotate)

FAMILY 3 (Symbols do not rotate)

FAMILY 4 (Symbols do not rotate)

Row labels:
- 2' Radius
- 4' Radius
- 5' Radius
- 6' Radius
- 8' Radius
- 10' Radius
- 12' Radius
- 15' Radius
- 17' Radius
- Adj Arc
- 2' Strip
- 4',5',6' Strip
- 4',5',6' Strip
- 9' Strip
- 8' Flat
- Stream

LandF/X Irrigation Symbols - Spray Heads

The Head symbols are scaled as they would appear in the drawing

FAMILY 5 (Symbols do not rotate)
FAMILY 6 (Symbols do not rotate)
FAMILY 7 (Symbols do not rotate)
FAMILY 8 (Symbols do not rotate)

Row labels (left column):

- 2' Radius
- 4' Radius
- 5' Radius
- 6' Radius
- 8' Radius
- 10' Radius
- 12' Radius
- 15' Radius
- 17' Radius
- Adj Arc
- 2' Strip
- 4',5',6' Strip
- 4',5',6' Strip
- 9' Strip
- 8' Flat
- Stream

LandF/X Irrigation Symbols - Spray Heads

The Head symbols are scaled as they would appear in the drawing

FAMILY 9 (Symbols do not rotate)

FAMILY 10 (Symbols do not rotate)

Row labels (left side):
- 2' Radius
- 4' Radius
- 5' Radius
- 6' Radius
- 8' Radius
- 10' Radius
- 12' Radius
- 15' Radius
- 17' Radius
- Adj Arc
- 2' Strip
- 4',5',6' Strip
- 4',5',6' Strip
- 9' Strip
- 8' Flat
- Stream

LandF/X Irrigation Symbols - Spray Heads

The Head symbols are scaled as they would appear in the drawing

Customizable Spray Family

Blank symbols with the nozzle type text on the layer LK-IRRG-NPLT. These symbols will rotate when placed.
Open the symbols you wish to use and modify with your symbol and save. Symbols are saved to the location
LandFX/Blocks/Irrigation/spray/... The Schedule Blocks are saved to the file location
LandFX/Blocks/Irrigation/schedule_symbols/...

FAMILY X (Symbols rotate)

2' Radius
Q H F
X-02Q X-02H X-02F

4' Radius
Q T H TT TQ F
X-04Q X-04T X-04H X-04TT X-04TQ X-04F

5' Radius
60 Q T 150 H 210 TT TQ F
X-05-60 X-05Q X-05T X-05-150 X-05H X-05-210 X-05TT X-05TQ X-05F

6' Radius
Q T H TT TQ F
X-06Q X-06T X-06H X-06TT X-06TQ X-06F

8' Radius
60 Q T 150 H 210 TT TQ F
X-08-60 X-08Q X-08T X-08-150 X-08H X-08-210 X-08TT X-08TQ X-08F

10' Radius
60 Q T 150 H 210 TT TQ F
X-10-60 X-10Q X-10T X-10-150 X-10H X-10-210 X-10TT X-10TQ X-10F

12' Radius
60 Q T 150 H 210 TT TQ F
X-12-60 X-12Q X-12T X-12-150 X-12H X-12-210 X-12TT X-12TQ X-12F

15' Radius
60 Q T 150 H 210 TT TQ F
X-15-60 X-15Q X-15T X-15-150 X-15H X-15-210 X-15TT X-15TQ X-15F

17' Radius
Q T H TT TQ F
X-17Q X-17T X-17H X-17TT X-17TQ X-17F

Adj Arc
4 6 8 10 12 15 17 18
X-04A X-06A X-08A X-10A X-12A X-15A X-17A X-18A

2' Strip

4',5',6' Strip
EST EST2 SST
X-02-EST X-02-EST2 X-02-SST

EST CST SST LST RST
X-04EST X-04CST X-04SST X-04LST X-04RST

4',5',6' Strip
EST CST SST LST RST
X-04EST2 X-04CST2 X-04SST2 X-04LST2 X-04RST2

9' Strip

8' Flat
9EST 9CST 9SST 9LST 9RST
X-09EST X-09CST X-09SST

Q H F
X-8Q-FLT X-8H-FLT X-8F-FLT

Stream
10Q 10H 10F 35Q 35H 35F
X-10SSQ X-10SSH X-10SSF X-35SSQ X-35SSH X-35SSF

Rotor- No Rotation

The head symbols are scaled as they will appear in the drawing. Symbol will place with no rotation.

Rotor Single Attribute Nozzles

Single Attribute Nozzles indicate the nozzle number only, either within or next to the head symbol. These symbols are the library that would be available when adding a Rotor Head that only needs one attribute, or the nozzle number, indicated.

Rotor Double Attribute Nozzles

Double Attribute Nozzles indicate the nozzle number and an attribute, such as the angle or further description such as LA for Low Angle. These symbols are the library that would be available when adding a Rotor Head that needs two attributes.

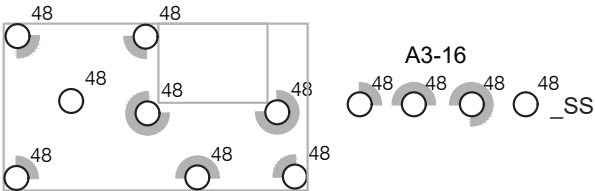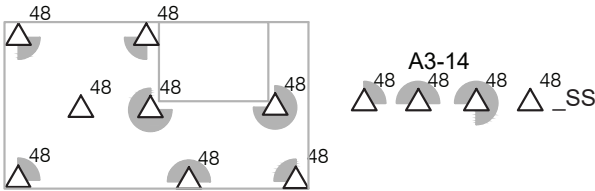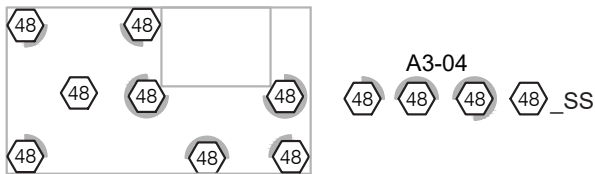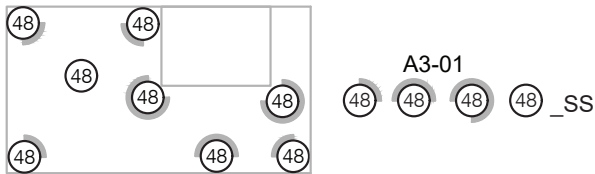| SINGLE ATTRIBUTE	NO ATTRIBUTE	DOUBLE ATTRIBUTE	NO ATTRIBUTE
A1-01	A1-21	A1-51	A1-71
A1-02	A1-22	A1-52	A1-72
A1-04	A1-24	A1-54	A1-74
A1-05	A1-25	A1-55	A1-75
A1-07	A1-27	A1-57	A1-77
A1-08	A1-28	A1-58	A1-78
A1-10	A1-30	A1-60	A1-80
A1-11	A1-31	A1-61	A1-81
A1-12	A1-32	A1-62	A1-82
A1-14	A1-34	A1-64	A1-84
A1-15	A1-35	A1-65	A1-85
A1-16		A1-66	
A1-17	A1-37	A1-67	A1-87
A1-18		A1-68	
A1-19	A1-39	A1-69	A1-89

Rotor- Arc Rotates

The head symbols are scaled as they will appear in the drawing. Symbol will not rotate, but an arc indicator block will rotate based on the position of spray. Each symbol style shares a collective set of Arc blocks: Q,H,TQ,F.
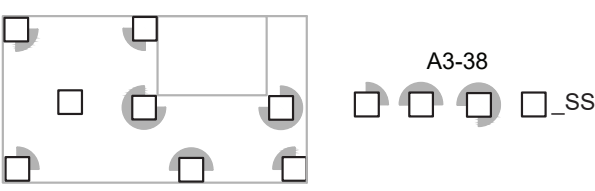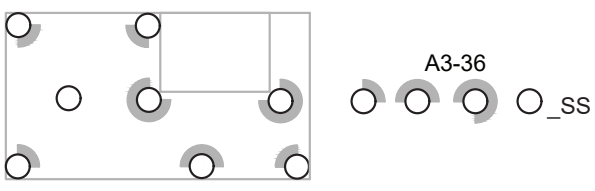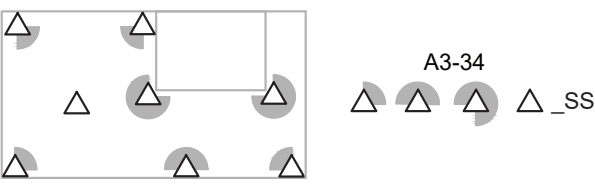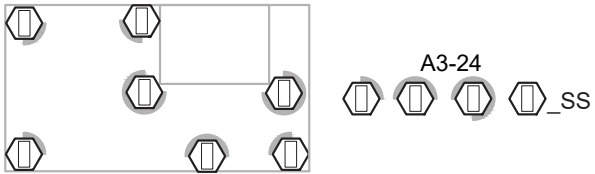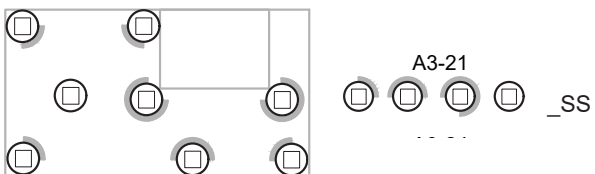
Rotor Single Attribute Nozzles

Single Attribute Nozzles indicate the nozzle number only, either within or next to the head symbol. These symbols are the library that would be available when adding a Rotor Head that only needs one attribute, or the nozzle number, indicated.

SINGLE ATTRIBUTE

NO ATTRIBUTE

A3-01

A3-21

A3-04

A3-24

A3-14

A3-34

A3-16

A3-36

A3-18

A3-38
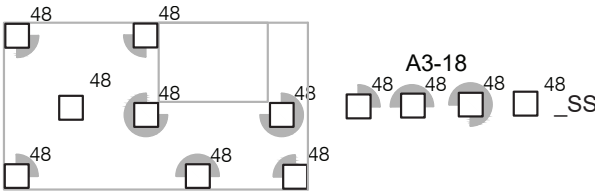
Rotor- Symbol Rotates

The head symbols are scaled as they will appear in the drawing. Entire symbol will rotate to direction of spray. Each symbol style has (4) corresponding blocks: Q,H,TQ,F
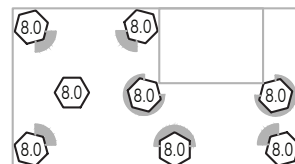
Rotor Single Attribute Nozzles

Single Attribute Nozzles indicate the nozzle number only, either within or next to the head symbol. These symbols are the library that would be available when adding a Rotor Head that only needs one attribute, or the nozzle number, indicated.
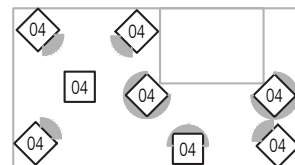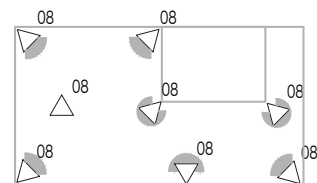
SINGLE ATTRIBUTE
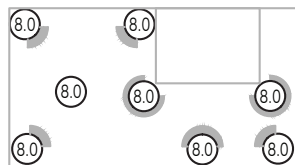
A5-01
_SS
-Q -H -TQ -F

A5-04
_SS
-Q -H -TQ -F

A5-07
_SS
-Q -H -TQ -F

A5-14
_SS
-Q -H -TQ -F

A5-16
_SS
-Q -H -TQ -F

A5-18
_SS
-Q -H -TQ -F

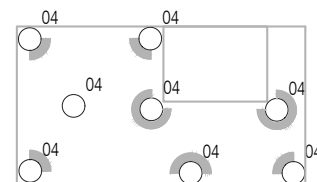NO ATTRIBUTE

A5-21
_SS
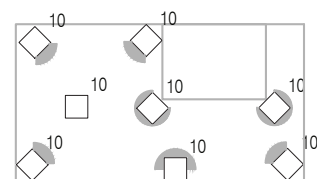-Q -H -TQ -F

A5-24
_SS
-Q -H -TQ -F
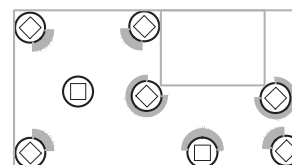
A5-27
_SS
-Q -H -TQ -F
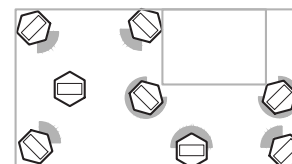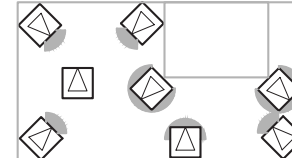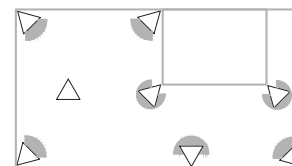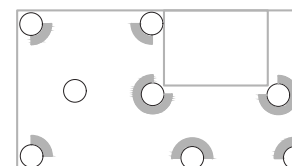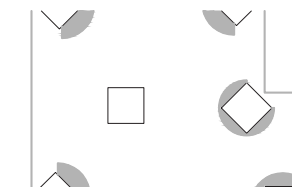
A5-34
_SS
-Q -H -TQ -F

A5-36
_SS
-Q -H -TQ -F

A5-38
_SS
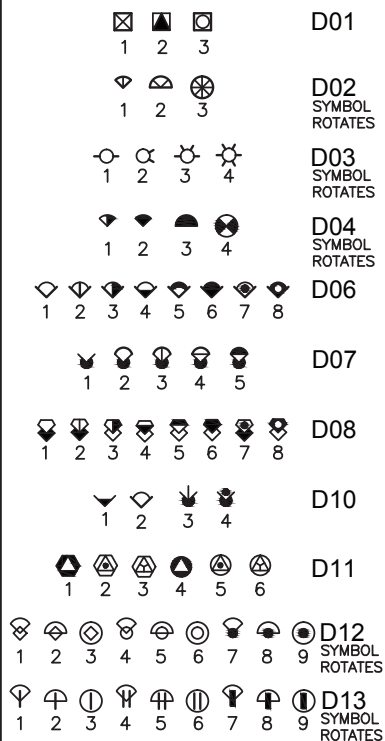-Q -H -TQ -F

LandF/X Point Source Symbols
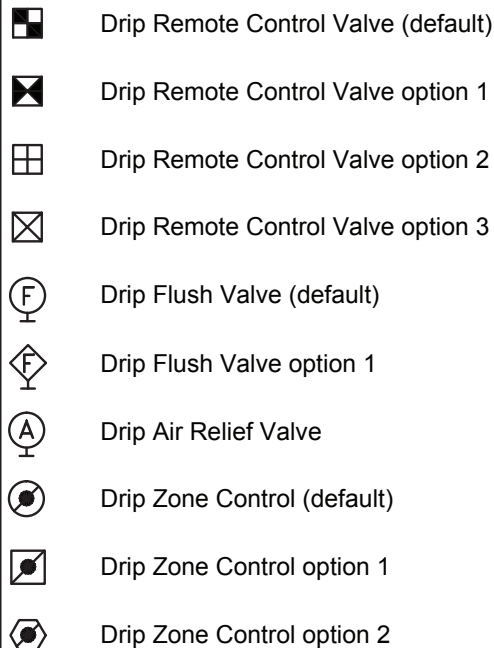Drip and Bubbler symbols are scaled as they will appear in the drawing.
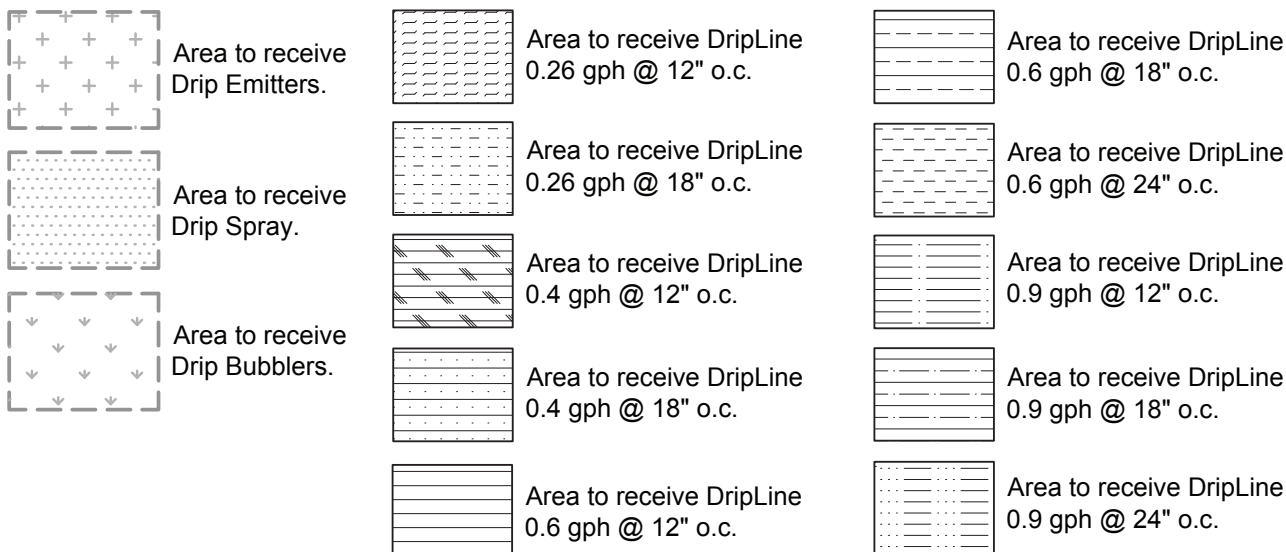
FLOOD AND STREAM BUBBLERS

ST Q H F	B01	1 2 3 4 5	B04	1 2 3 4 5 6 7	B07
ST ST2 Q H F	B02	1 2 3 4 5 6	B05	1 2 3 4 5 6	B08
1 2 3 4 F	B03	1 2 3 4 5 6	B06	2−180 4−180 Q H F	B10

DRIP SPRAY AND BUBBLER HEADS

1 2 3	D01
1 2 3	D02 SYMBOL ROTATES
1 2 3 4	D03 SYMBOL ROTATES
1 2 3 4	D04 SYMBOL ROTATES
1 2 3 4 5 6 7 8	D06
1 2 3 4 5	D07
1 2 3 4 5 6 7 8	D08
1 2 3 4	D10
1 2 3 4 5 6	D11
1 2 3 4 5 6 7 8 9	D12 SYMBOL ROTATES
1 2 3 4 5 6 7 8 9	D13 SYMBOL ROTATES

DRIP EQUIPMENT

	Drip Remote Control Valve (default)
	Drip Remote Control Valve option 1
	Drip Remote Control Valve option 2
	Drip Remote Control Valve option 3
(F)	Drip Flush Valve (default)
(F)	Drip Flush Valve option 1
(A)	Drip Air Relief Valve
	Drip Zone Control (default)
	Drip Zone Control option 1
	Drip Zone Control option 2

DRIP EMITTERS

	FAMILY 1
	FAMILY 2
	FAMILY 3
	FAMILY 4
	FAMILY 5
	FAMILY 6
	FAMILY 7
	FAMILY 8
	FAMILY 9
	FAMILY 10

DRIP AREA SYMBOLS

|	
	Area to receive Drip Emitters.
	Area to receive Drip Spray.
	Area to receive Drip Bubblers.
	Area to receive DripLine 0.26 gph @ 12" o.c.
	Area to receive DripLine 0.26 gph @ 18" o.c.
	Area to receive DripLine 0.4 gph @ 12" o.c.
	Area to receive DripLine 0.4 gph @ 18" o.c.
	Area to receive DripLine 0.6 gph @ 12" o.c.
	Area to receive DripLine 0.6 gph @ 18" o.c.
	Area to receive DripLine 0.6 gph @ 24" o.c.
	Area to receive DripLine 0.9 gph @ 12" o.c.
	Area to receive DripLine 0.9 gph @ 18" o.c.
	Area to receive DripLine 0.9 gph @ 24" o.c.

LandF/X Irrigation Equipment Symbols

The equipment symbols are scaled as they will appear in the drawing.

VALVES

Symbol	Description
	Remote Control Valve (default)
	Remote Control Valve option 1
	Remote Control Valve option 2
	Remote Control Valve option 3
	Remote Control Valve option 4
	Shut Off Valve (default)
	Shut Off Valve option 1
	Shut Off Valve option 2
	Shut Off Valve option 3
M	Master Valve
	Quick Coupler (default)
	Quick Coupler option 1
	Quick Coupler option 2
HB	Hose Bibb (default)
HB	Hose Bibb option 1
HB	Hose Bibb option 2
	Check valve swing type
	Check valve spring type
A	Air Relief valve
	Manual Control Valve

AUXILIARY EQUIPMENT

| Symbol	Description
C	Controller (numbered up to 9)
R	Rain Switch
BF	Backflow Device (numbered up to 99)
P	Booster Pump (numbered up to 9)
WP	Well Pump (numbered up to 9)
WS	Weather Station
F2	Flow Meter
MS	Moisture Sensor
M0	Water Meter (numbered up to 99)
F	Flush Valve
	Thrust Block
CW P#/C#	Wire Bundle
XX	Miscellaneous 1
XX	Miscellaneous 2
XX	Miscellaneous 3
XX	Miscellaneous 4
XX	Miscellaneous 5
XX	Miscellaneous 6
XX	Miscellaneous 7
XX	Miscellaneous 8

LandF/X Irrigation Equipment Symbols
The equipment symbols are scaled as they will appear in the drawing.

## AUXILIARY EQUIPMENT

Controller Accessory Symbols

⊗ Controller Accessory 1

⬦ Controller Accessory 2

⊗ Controller Accessory 3

△ Controller Accessory 4

☒ Controller Accessory 5

⬡ Controller Accessory 6

◇ Controller Accessory 7

⊗ Controller Accessory 8

△ Controller Accessory 9

☒ Controller Accessory 10

Enclosure Symbols

E0 Enclosure 1

E0 Enclosure 2

E0 Enclosure 3

E0 Enclosure 4

E0 Enclosure 5

E0 Enclosure 6

E0 Enclosure 7

E0 Enclosure 8

2-WIRE DECODER SYMBOLS

D Decoder 1A

D Decoder 1B

D2 Decoder 2A

D2 Decoder 2B

D4 Decoder 4A

D4 Decoder 4B

D6 Decoder 6A

D6 Decoder 6B

LandF/X Irrigation Equipment Symbols
The equipment symbols are scaled as they will appear in the drawing.

PIPE & PIPE SLEEVE TYPES

Lateral Pipe

————————————————— LI–PIPE–LTRL

——— —— – – — ——— LI–PIPE–LTRL–TYP2

— —— — · — —— · — LI–PIPE–LTRL–TYP3

—— · ——— · —— LI–PIPE–LTRL–TYP4

— · — · — · — · — LI–PIPE–LTRL–TYP5

— · · — — · · — LI–PIPE–LTRL–TYP6

——— | ——— | ——— LI–PIPE–LTRL–TYP7

——— ‖ ——— ‖ ——— LI–PIPE–LTRL–TYP8

——— ⫫ ——— ⫫ ——— LI–PIPE–LTRL–TYP9

Mainline Pipe

▬ ▬ ▬ ▬ ▬ ▬ ▬ LI–PIPE–MAIN

▬▬▬▬ ▬ ▬▬▬ LI–PIPE–MAIN–TYP2

▬▬▬ ▬ ▬ ▬▬▬ LI–PIPE–MAIN–TYP3

▬▬ ~ ▬▬ ~ ▬▬ LI–PIPE–MAIN–TYP4

▬▬ ~~ ▬▬ ~~ ▬▬ LI–PIPE–MAIN–TYP5

▬▬ ~~~ ▬▬ ~~~ ▬▬ LI–PIPE–MAIN–TYP6

▬ ▬ ▬ ▬ ▬ ▬

LI–PIPE–SLVE

▬ ▬ ▬ ▬ ▬ ▬

Sleeve Pipe

LI–PIPE–SLVE–TYP2
LI–PIPE–SLVE–TYP2–FILL
LI–PIPE–SLVE–TYP2

LI–PIPE–SLVE–TYP3

LI–PIPE–SLVE–TYP4