# SHORT SHARP TRAINING (monthly) issue 1003

**Welcome to this issue of the VectorWorks Short Sharp Training (monthly). This manual is designed to work like a user group meeting. There is a main workshop topic, then extended movies showing tips or techniques and an area for beginners.**

## Workshop Topic
## Irrigation Tools

Vectorworks comes with several irrigation tools. There is a tool for placing irrigation pipework, and there are two tools for placing sprinklers and drip emitters. When the pipework and emitters are placed, you can create a schedule of the parts.

## Extended Podcast 102 - Click here

Editing a property line, it's easier than you think.

## Extended Podcast 103 - Click here

You can import a PDF File and ungroup it, as long as it has vector information.

# Irrigation Tools

## Introduction

Vectorworks has several irrigation tools. There are tools for placing sprinklers, pipes, and drip emitters, and there are worksheets for counting these objects.

The irrigation tools are only available if you have Vectorworks Landmark. But what if you have Vectorworks Fundamentals, Architect, or one of the other Vectorworks packages? You can't use the irrigation tools, but you can build symbols that replicate the sprinklers and drip emitters. They will not be as flexible, but it is a workaround. We will cover these later, after looking at the Landmark tools.

## Irrigation Heads

The irrigation head tool is used to place your sprinklers. This tool creates a 2D object that shows the head and spray pattern. It does not create a 3D version, although with Vectorworks 2010 you can see the spray pattern in 3D, but only if you layer plane.

Because the object is 2D only, you can't use the Send to Surface command to see the irrigation head on your site model, the planar graphics always have the spray pattern on the bottom of the layer.
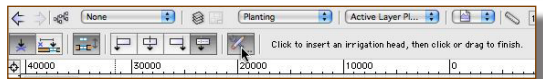
In earlier versions of Vectorworks the spray pattern is 2D only, and you can not change it.

[cadmovie447](cadmovie447)

- Go to the **Site Planning Tool** set.
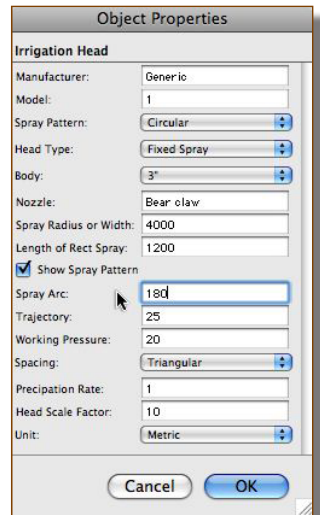- Choose the **Irrigation Head** tool.
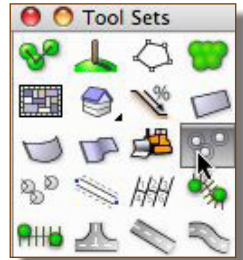
- Go to the **Tool Bar**.
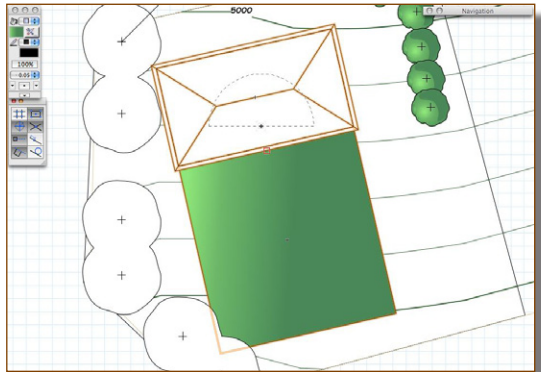- Click on the **Preferences...** button, the last button on the tool bar.

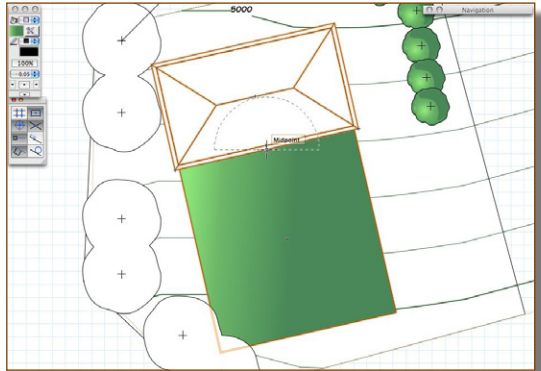This dialog box controls all the settings for the Irrigation Head.
- Fill in the dialog box to suit the Irrigation Head you want to use.
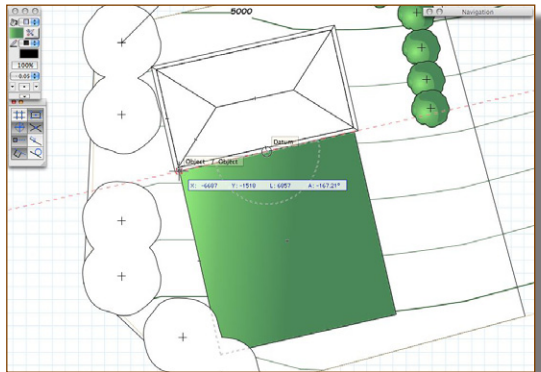- Click on the **OK** button.

- Move your cursor into the drawing area.
  You should notice a ghost image on the cursor. This is your  Irrigation Head.

- Move your cursor to the centre position for your first Irrigation Head (sprinkler).
- Click once.

- The next click controls rotation.
- Move along the edge of the object you want to use.

- Click once.

This has positioned the Irrigation head (sprinkler).
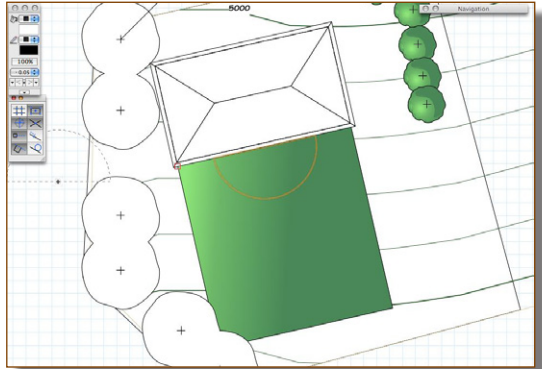
- Move to the next location.
- Click once.
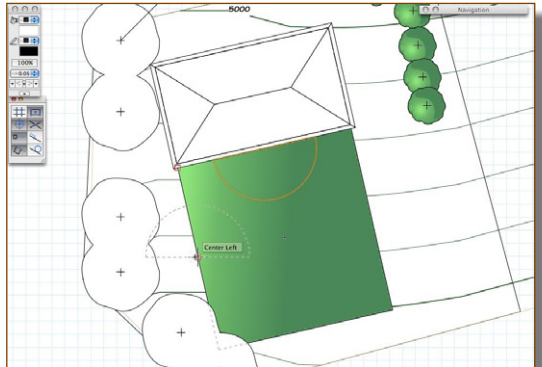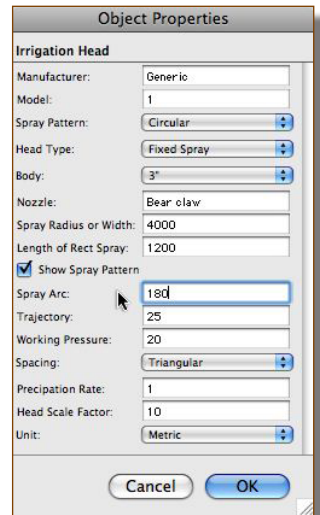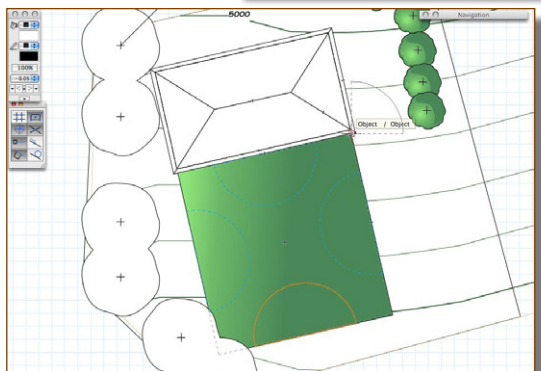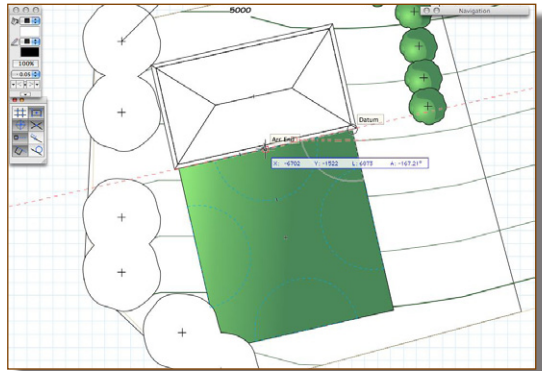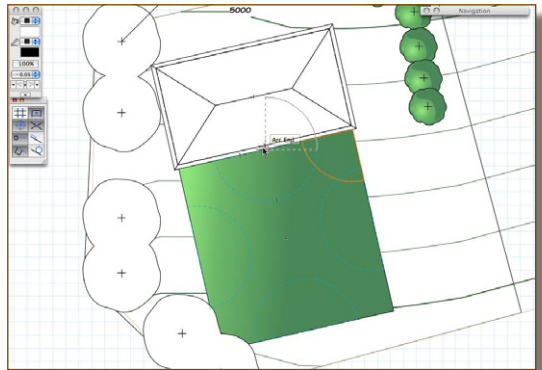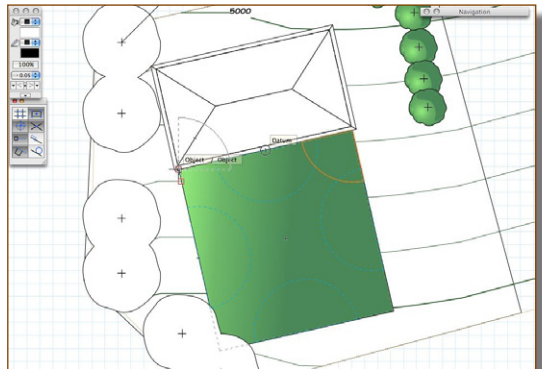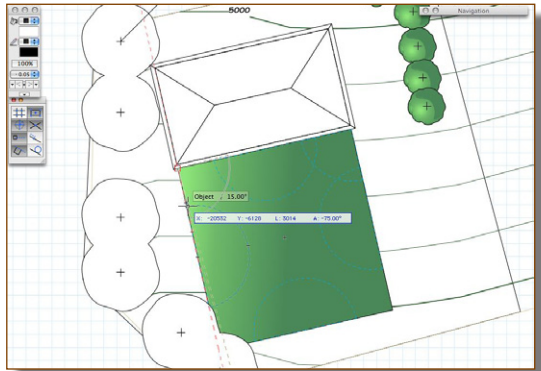
- Move your cursor to set the rotation.
- Click once.
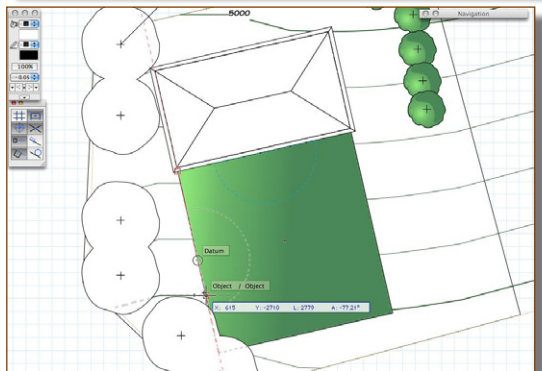
- Place the other sprinklers you want.
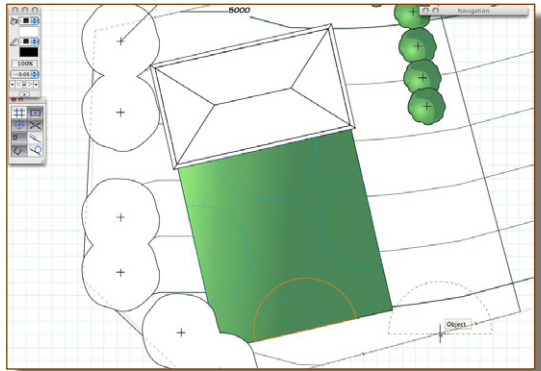
[cadmovie448](cadmovie448)

- Go to the **Tool Bar**.
- Click on the **Preferences...** button, the last button on the tool bar.
- Fill in the dialog box to suit the Irrigation Head you want to use, say 90º.
- Click on the **OK** button.
- Move your cursor into the drawing area.

You should notice a ghost image on the cursor.
- Move your cursor to the corner.
- Click once.
- The next click controls rotation.

- Move along the edge of the object you want to use.
- Click once.

This has positioned the Irrigation head (sprinkler).
- Move to the next location.
- Click once.

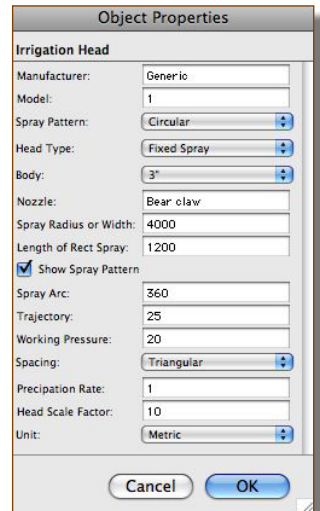- Move your cursor to set the rotation.

- Click once.

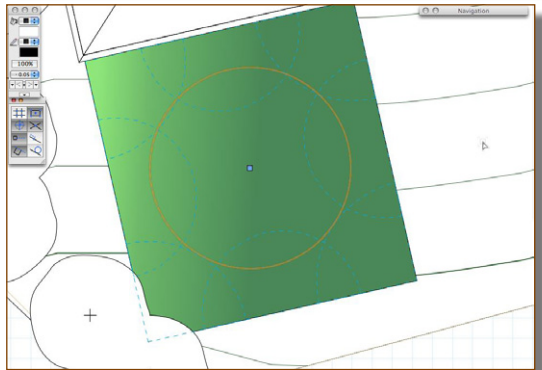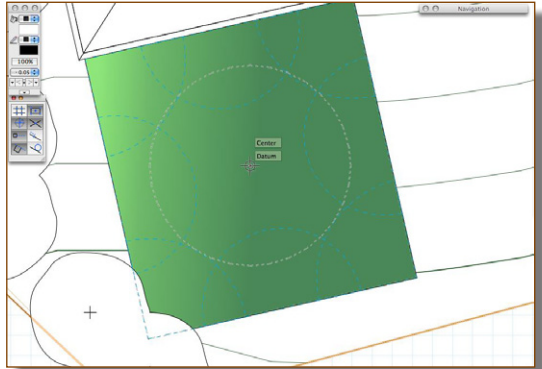- Place the other sprinklers you
  want.
- Go to the **Tool Bar**.
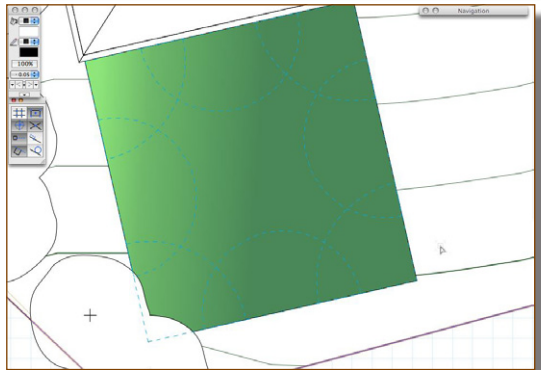
cadmovie449

- Click on the **Preferences...** button, the last
  button on the tool bar.
- Fill in the dialog box to suit the Irrigation
  Head you want to use, say 360°.
- Click on the **OK** button.
- Move your cursor to the correct location.

- Double click to place the sprinkler.

The Irrigation Head doesn't get much more complicated that this. You can choose different fittings, and head types, but that doesn't change the way the tool works.

# Drip Emitter

This tool is to place the small drip emitters on the plan.

cadmovie450

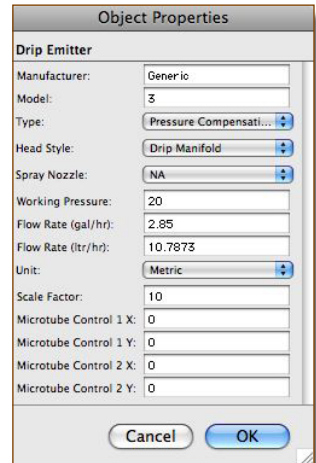- Go to the **Site Planning Tool** set.
- Choose the **Drip Emitter** tool.
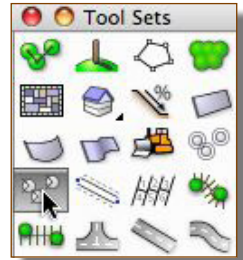
- Go to the **Tool Bar**.
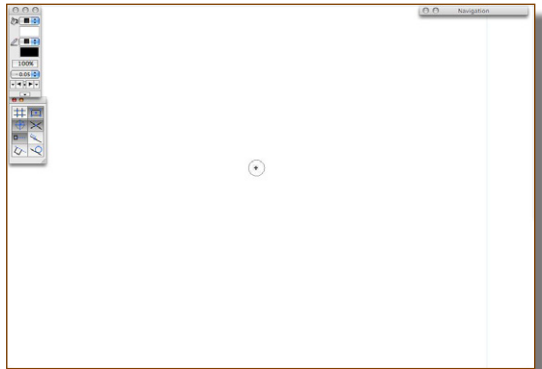- Click on the **Preferences...** button, the last button on the tool bar.
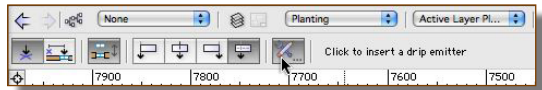
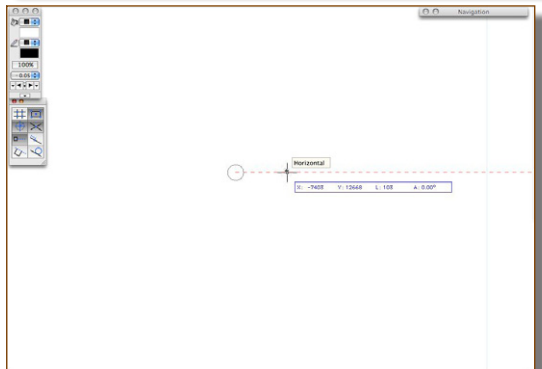This dialog box controls all the settings for the Irrigation Head.
- Fill in the dialog box to suit the Drip Emitter you want to use.
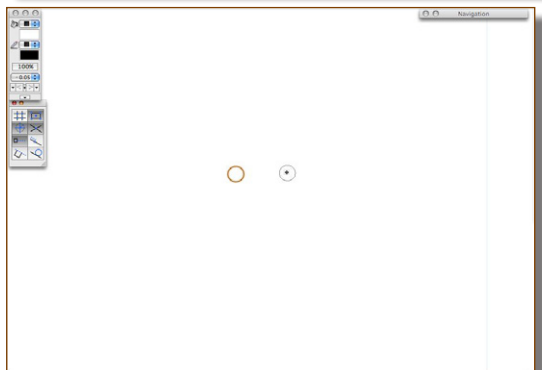- Click on the **OK** button.

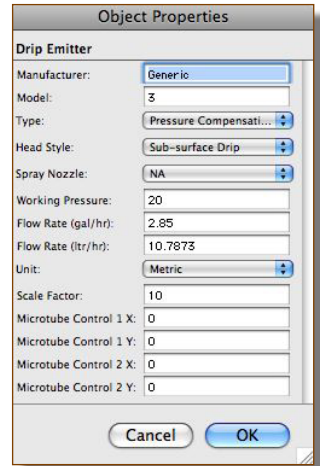- Click once for the centre of the Drip emitter.



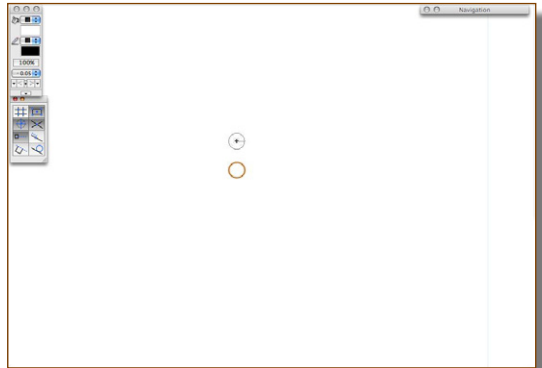- Click once for the rotation of the object.



- Object placed.

- Go to the **Tool Bar**.
- Click on the **Preferences...** button, the last button on the tool bar.
- Choose the Sub-Surface Drip.
- Click on the **OK** button.

**Object Properties**

**Drip Emitter**

| | |
|---|---|
| Manufacturer: | Generic |
| Model: | 3 |
| Type: | Pressure Compensati... |
| Head Style: | Sub-surface Drip |
| Spray Nozzle: | NA |
| Working Pressure: | 20 |
| Flow Rate (gal/hr): | 2.85 |
| Flow Rate (ltr/hr): | 10.7873 |
| Unit: | Metric |
| Scale Factor: | 10 |
| Microtube Control 1 X: | 0 |
| Microtube Control 1 Y: | 0 |
| Microtube Control 2 X: | 0 |
| Microtube Control 2 Y: | 0 |

Cancel    OK

- Move your cursor into the drawing area.
- Click once for the centre of the drip emitter.
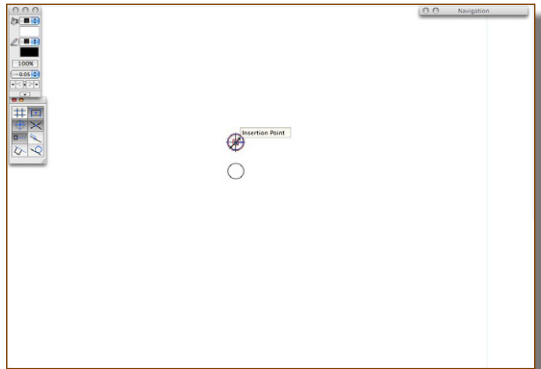
- Move your cursor for the rotation.
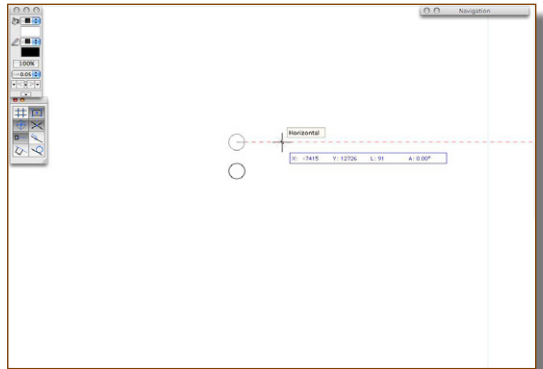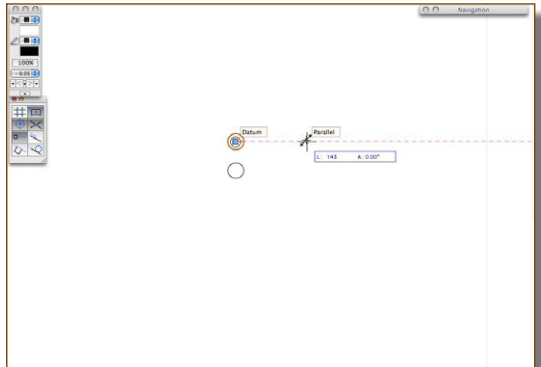
- Click once.
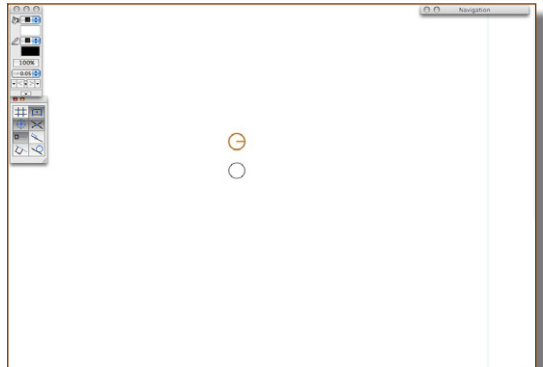
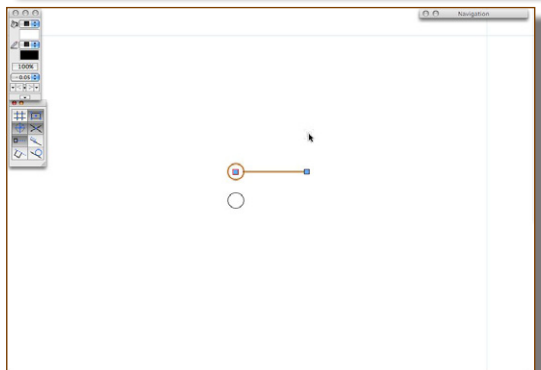- Notice that this drip emitter has a line on it showing the rotation.
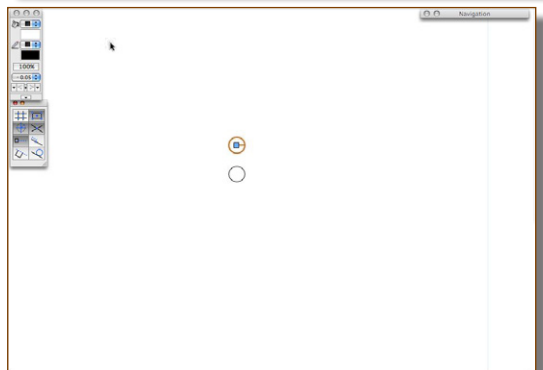
- Go to the Basic toolset.
- Choose the 2D Selection tool.
- Go to the Tool bar.
- Make sure the second mode is active.
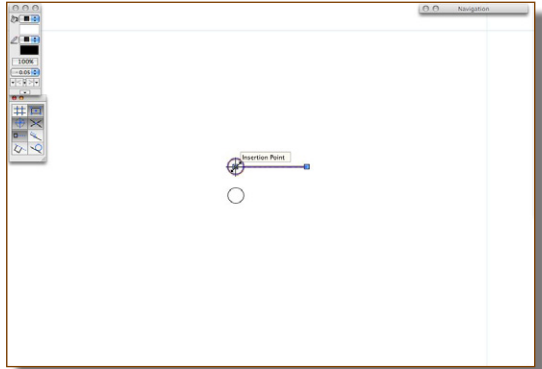- Move to the handle in the middle of the drip emitter.
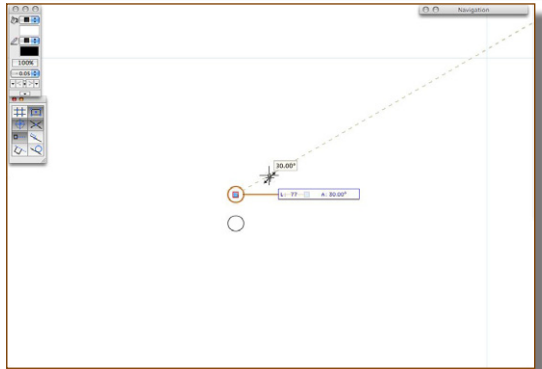- Click once.



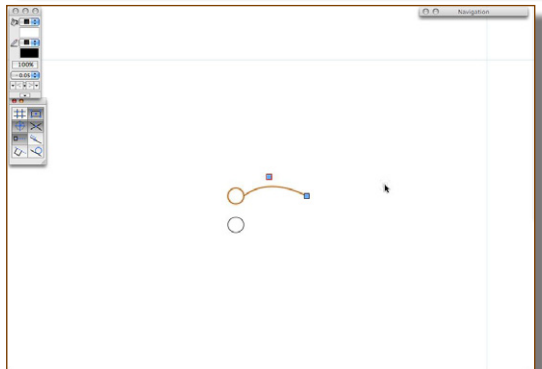- Move across to the right.



- Click once.

- Move back to the blue handle in the middle of the drip emitter.
- Click once.

- Move your cursor across to the right and up.

- Click once.
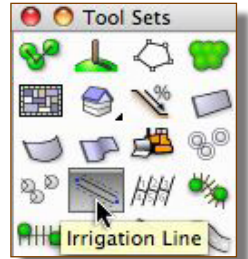- The second handle to used to control the curve on the drip emitter.

# Irrigation Line

The Irrigation line tool is used for drawing the irrigation supply pipes. It only draws straight lines, and it only draws one line each time you use it.

cadmovie451

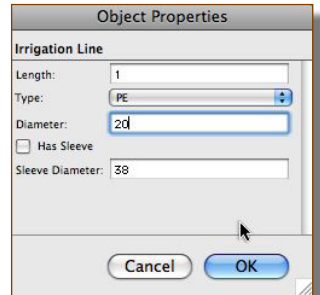- Go to the **Site Planning** toolset
- Select the **Irrigation Line** tool.

- Go to the **Tool Bar**.
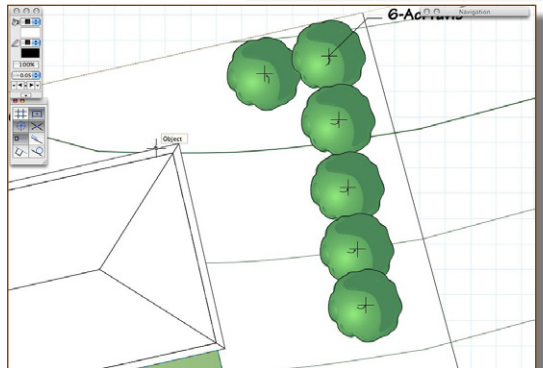- Click on the **Preferences...** button, the last button on the tool bar.
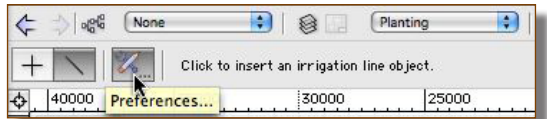
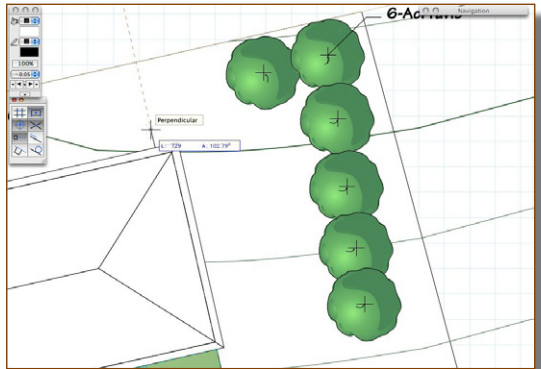This dialog box controls all the settings for the Irrigation Head.
- Fill in the dialog box to suit the Irrigation Line you want to use.
- Click on the **OK** button.
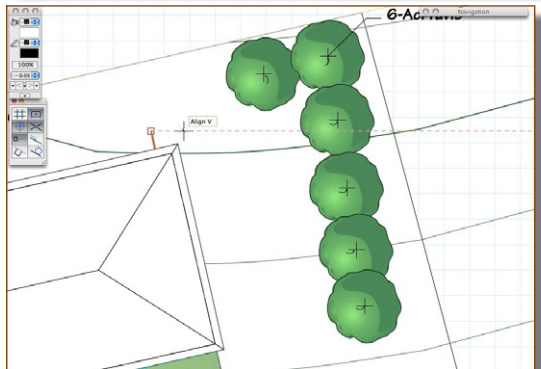
- Click once at the start of the Irrigation Line.

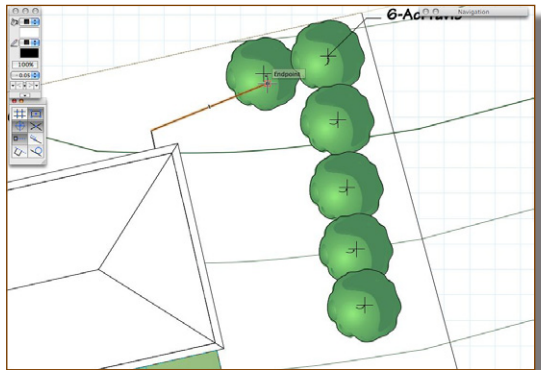- Move your cursor to the first junction.



- Click once.

Remember that this tool creates a single line. So, the second click finishes the first Irrigation Line. To start another Irrigation Line, you have to click again.



- Click to start a new line.
- Click once to finish.

- Draw the rest of your Irrigation Lines. Remember to click once at the start, and once at the end of each Irrigation Line.
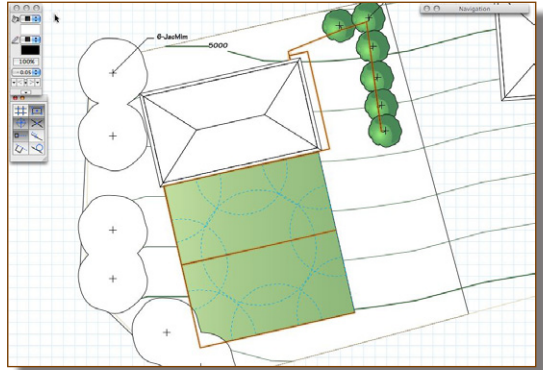


## Scheduling Irrigation Items

Vectorworks has a built-in ability to count and schedule information. So, for irrigation, we could count up all the Irrigation Heads, drip emitters and pipes. Vectorworks has some pre-made worksheets that will count up objects for you.

You can access the worksheets from the Resource Browser, or though a menu command. We'll look at the Resource Browser method first.

cadmovie452

- Go to the **Resource Browser**.
- Click on the arrow next to the **Files**. We can use this to add a favorite file to the Resource Browser. Every time you start Vectorworks, your favorite files are added to the Resource Browser.
- Click on **Add New Favorite Files...**
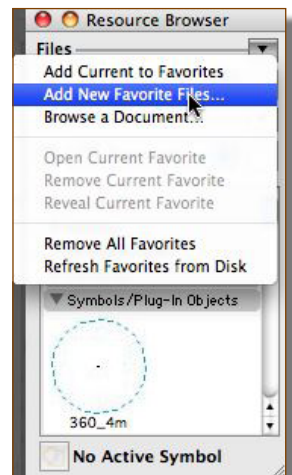
- Navigate to the Vectorworks application folder:
  on a Macintosh
  **Applications:Vectorworks :Libraries:Defaults:Reports~Schedules**
  on a Windows machine
  **Program Files/Vectorworks /Libraries/Defaults/Reports~Schedules**
- Locate the **Irrigation Reports** file in the Landmark Schedules folder.
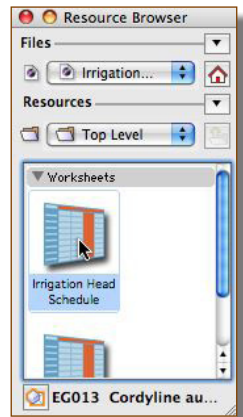- Double click on the file to add it to your Resource Browser.
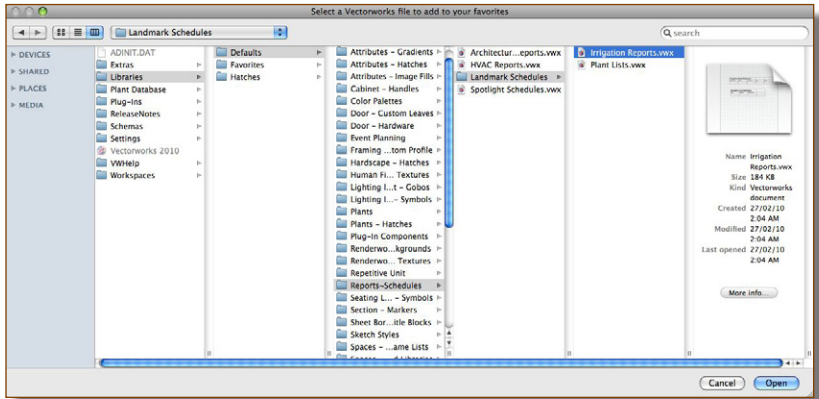


- Go to the **Resource Browser**.
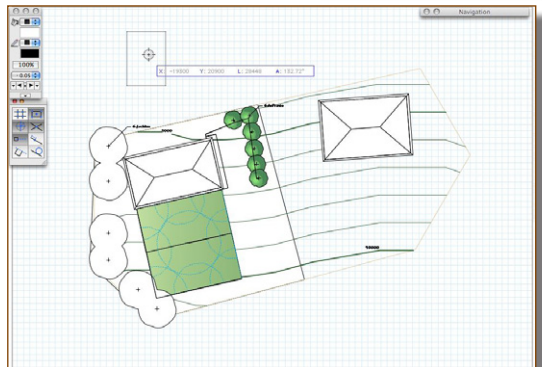- Click on the **Files** pop-up menu.
- Choose **Irrigation Reports**.
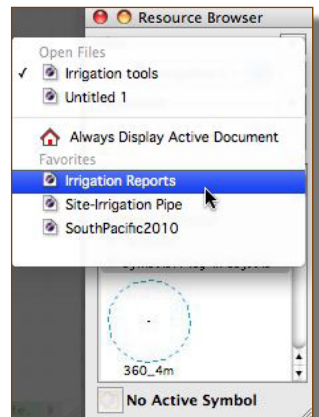
- You should see the **Irrigation Head Schedule** and the **Irrigation Line Schedule** in the Resource Browser.
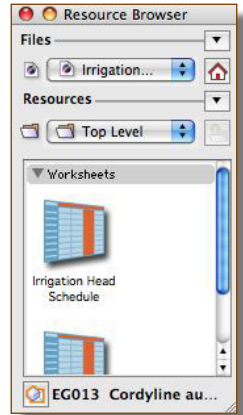


- Click and drag the **Irrigation Head Schedule**.



- Move your cursor into the drawing area.
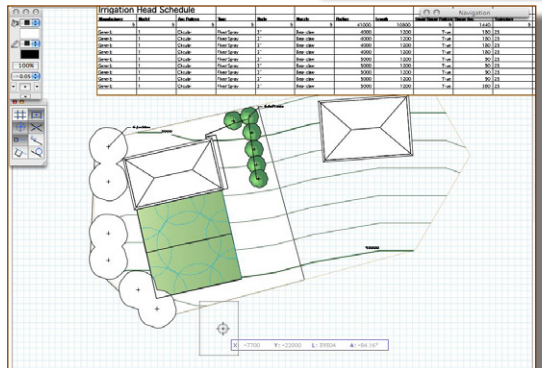- Choose a location away from the plan.

- Release the mouse button.
- The worksheet is placed on the drawing. It becomes like any other drawing object, and you can move with the 2D Selection tool.
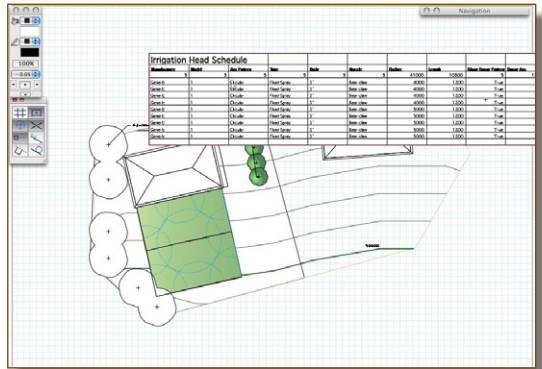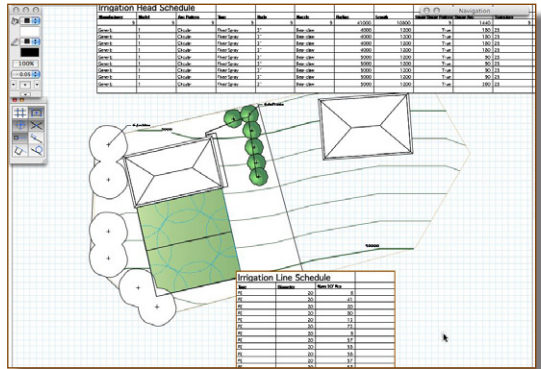
- Go to the **Resource Browser**.
- Click and drag the **Irrigation Line Schedule**.
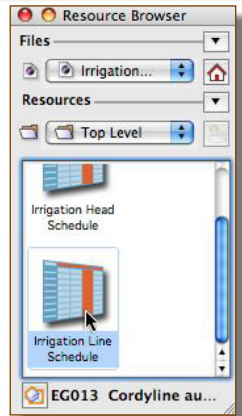
- Move your cursor into the drawing area.
- Choose a location away from the plan.

- Release the mouse button.
- The worksheet is placed on the drawing. It becomes like any other drawing object, and you can move with the 2D Selection tool.



There is a another method which places the worksheets on the drawing, but this only works if you have Vectorworks Designer or Landmark. There is a command to try to automate some of the work, the results are the same.

cadmovie453

- Go to the **Menu Bar**.
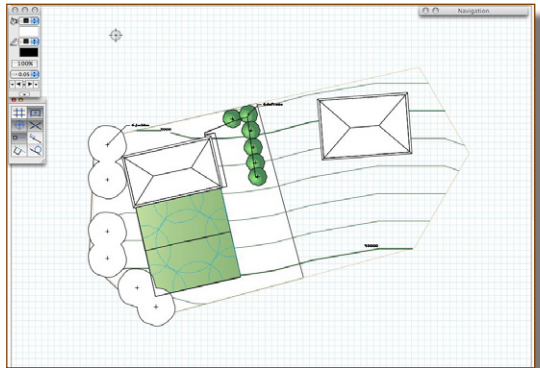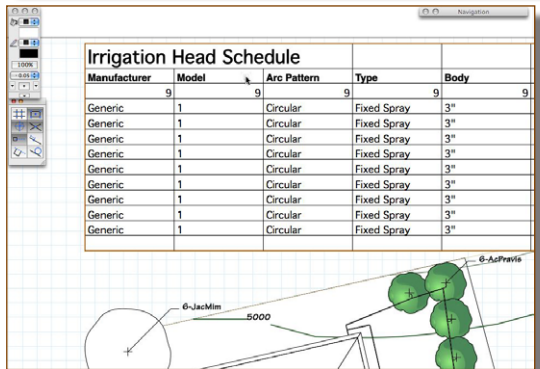- Choose **Tools > Reports > Choose Schedule...**
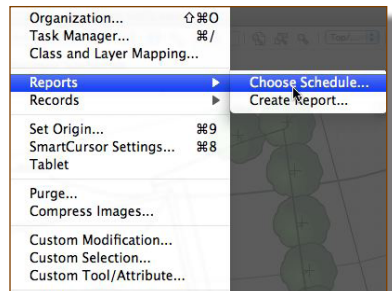


This dialog box lists all the available schedules, so you will see several you do not want. Clicking on more than one schedule doesn't work, Vectorworks will import just the first schedule.

- Click on the schedule you want.
- Click on the **OK** button.
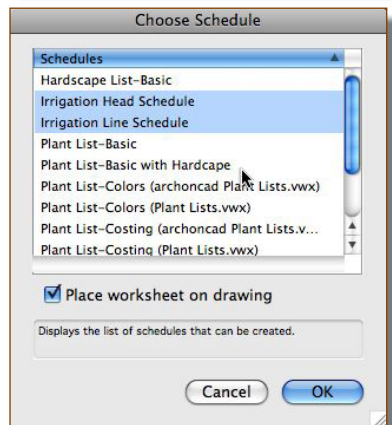
- Move your cursor into the drawing area.
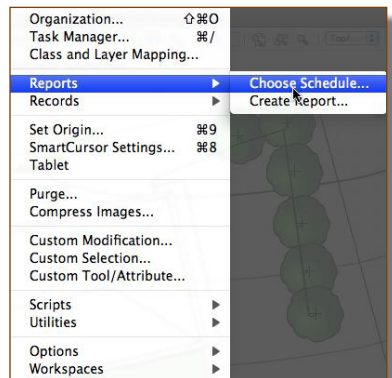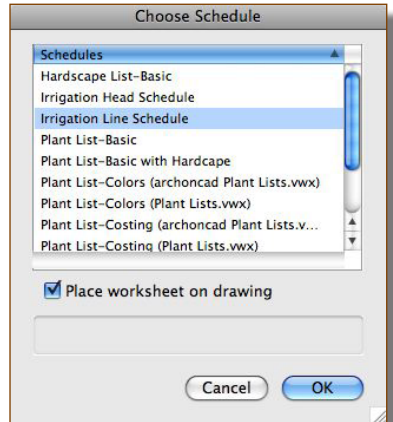- Choose a location away from the plan.



- Click once.

The worksheet is placed on the drawing. It becomes like any other drawing object, and you can move with the 2D Selection tool.
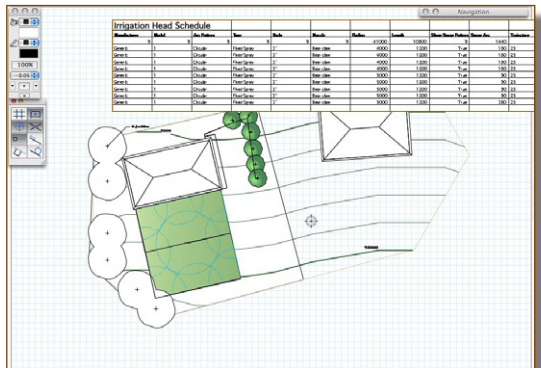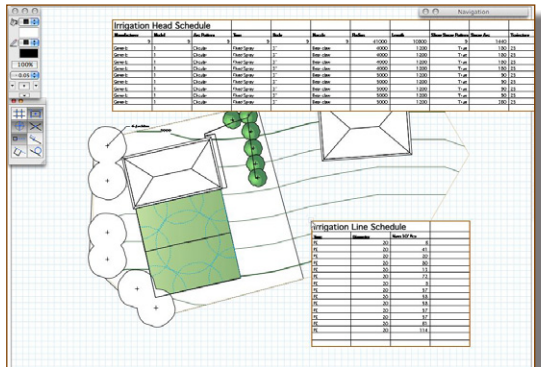


- Go to the **Menu Bar**.
- Choose **Tools > Reports > Choose Schedule...**

- Click on the schedule you want.
- Click on the **OK** button.



- Move your cursor into the drawing area.
- Choose a location away from the plan.



- Click once.

This is the automated way of counting up the sprinklers and pipes. The schedules only count the information that Vectorworks has added to each object. If you want to count other information, you can't with the standard schedules but you can if you put some effort into it.

You might notice that the schedules have not counted the drip emitters. You might also have noticed that there are no risers on the sprinklers, and the irrigation pipes do not have junctions.

Vectorworks has a built -in facility to create a database and schedules. If you create the database to record the information you want, you can create the reports you need.

## Irrigation for non-Landmark Users

The irrigation tools and commands only come with Vectorworks Landmark or Designer. So, if you want to do this kind of work, should you bye Vectorworks Landmark?

Not Necessarily. First of all the Landmark tools and schedules have some problems. Some things do not total (irrigation lines), some things are not counted at all (drip emitters) and some things are just missing (pipe junctions).

So, what is the answer? Well, with a small amount of effort, you can make symbols of the sprinklers, drip emitters and pipe junctions. These object can have the information you want attached and you can create a worksheet that will count all the parts.

If you save the symbols and worksheets in your library, you can use them on project after project, saving you a lot of time and providing a new service to your clients.

If you make a symbol of the sprinkler you can create a 2D part for the plans, and a 3D part for visualization. The 3D part can be sent to the surface of your site model, so they appear at the correct 3D height. This is not currently available with the Landmark irrigation tools.
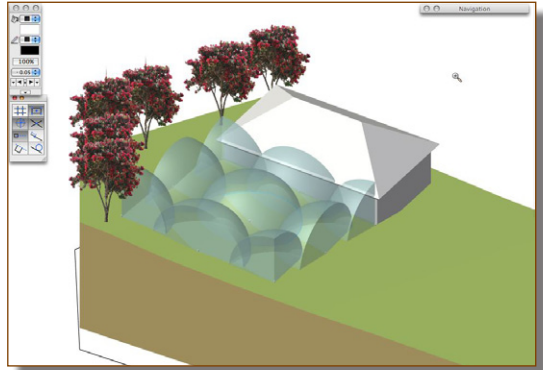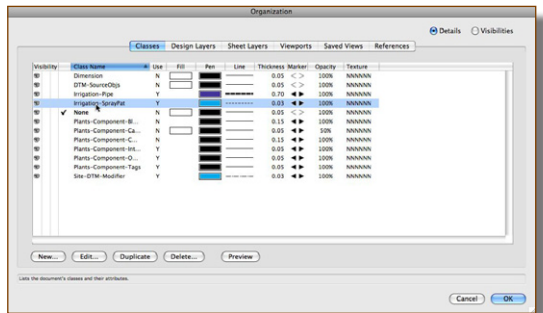


## Making a Symbol

The Vectorworks Irrigation Head uses a class for the Spray Pattern. This allows you to turn the spray pattern on or off, depending on the drawing. We should use this same class name.

cadmovie454

- Go to the **Menu Bar**.
- Choose **Tools > Organization...**
- Click on the **Class** tab.
- Click on the **New...** button to create a new class. Choose the option to **Edit After Creation**.

- Edit the graphic attributes of the class. Set the Fill Style to None and the Pen to a blue dashed line.
- Turn on the option to Use at creation.
- Click on the **OK** button.
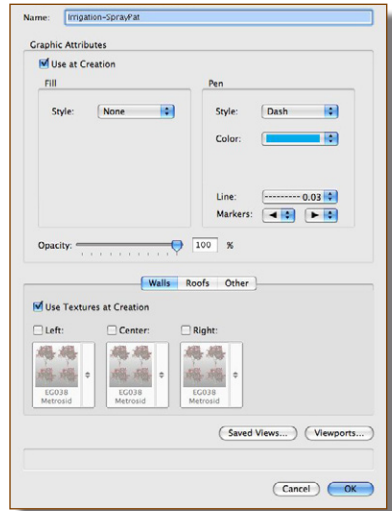


- Draw one circle for the sprinkler head.
- Draw one circle for the spray pattern. This circle should be selected (highlighted).
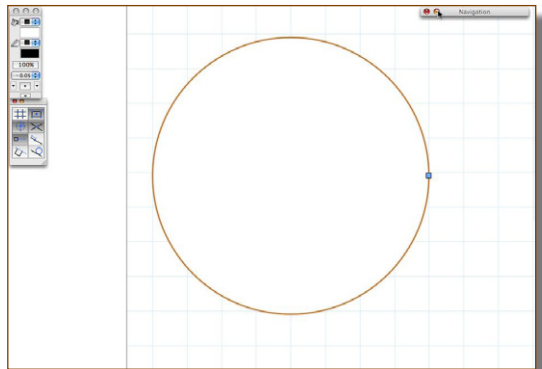


- Go to the **Object Info** palette.
- Click on the **Class** pop-up menu.
- Choose **Irrigation > SprayPat**.
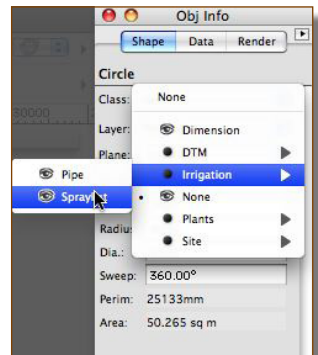
- Notice the change in fill pattern and pen color.
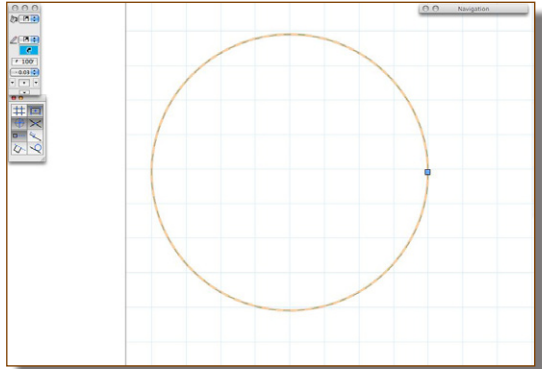


- Duplicate the circle for the spray head, or draw another circle.
- Make sure this circle is selected (highlighted).
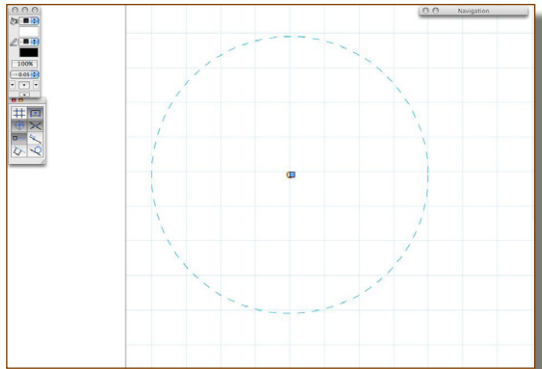


- Go to the Menu Bar.
- Choose **Model > Extrude...**
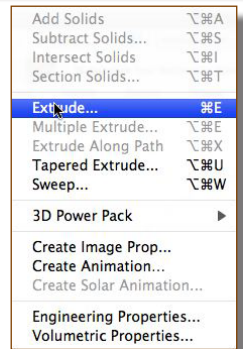


- Do not change the ΔX and the ΔY sizes.
- Type in the height of the sprinkler in the extrusion field.
- Click on the **OK** button.
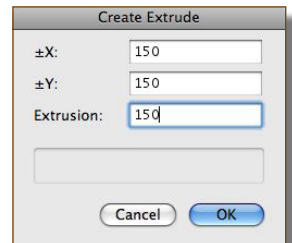
- Go to the 3D Modeling tool set.
- Click on the Hemisphere tool.
- Go to the Tool bar.
- Click in the second mode, Hemisphere By Diameter.



- Move your cursor to the left middle of the circle.
- Click once.
- Move to the right middle of the circle.
- Click once.
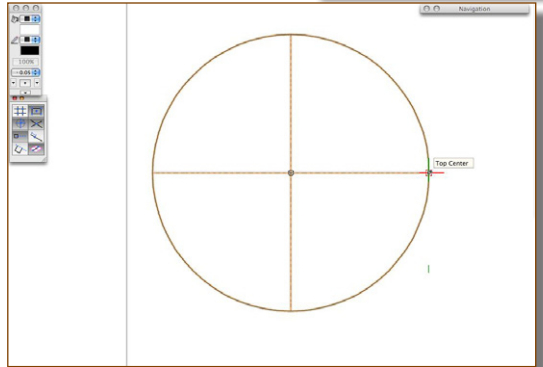


- Select all the 2D and 3D objects.
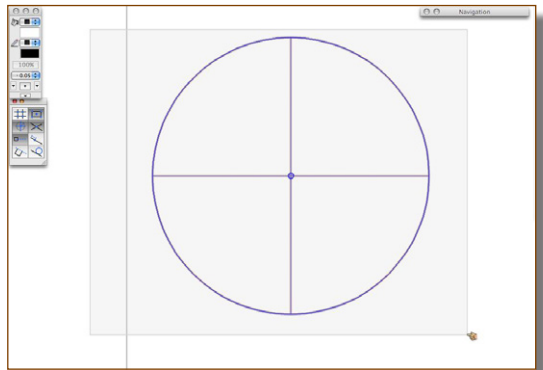


- Check the number of objects on the Object Info palette.
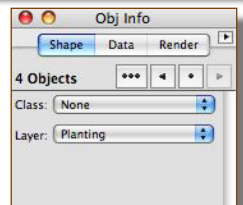
- Go to the Menu Bar.
- Choose **Modify > Create Symbol...**
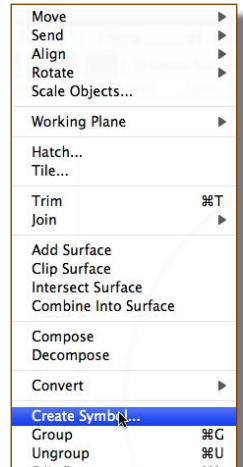
- You might get this message.
- Click on the **Yes** button.
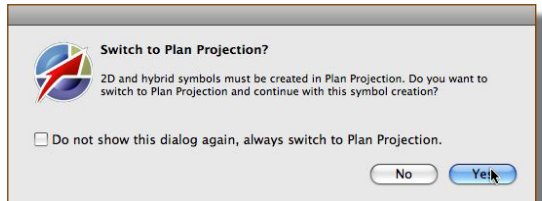
- Name your symbol. I have used the spray radius_angle. That way I can find all the same spray radii together.
- Turn on **Leave Instance in Place**.
- Use **Plan Projection Center** for the Insertion Point.
- Click on the **OK** button.
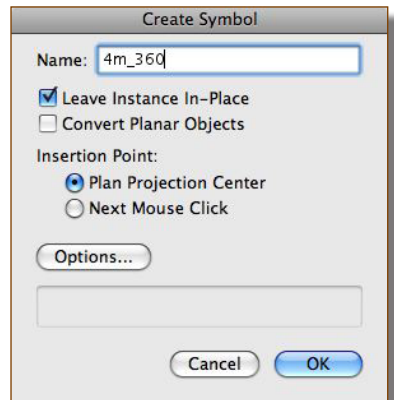
The 4 objects have been made into a symbol. A symbol in Top/Plan view will only show the 2D parts of the symbol. In any other view, Vectorworks will show only the 3D parts of the symbol.
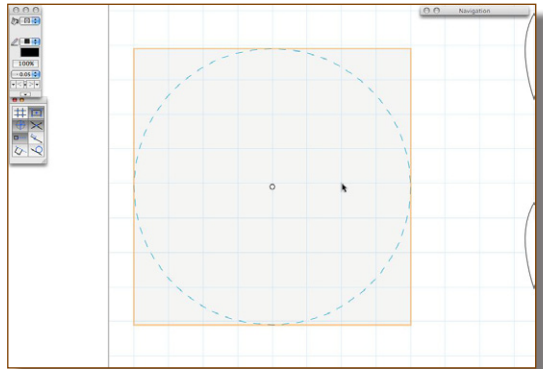


## Making a Database (Record Format)

Vectorworks has a database concept called a record format. This concept allows us to attach information to an object. The information has to be an a structured form to be useful and that is the job of the record format, to structure the information.

You can make the record format to store any kind of information that want. The trick is to figure out what you want to report, and that will tell you want you need to record. Don't worry too much about getting it all sorted at the beginning, you can edit the record format later to fix any mistakes, or to add any new fields you need.

cadmovie455

- Go to the **Resource Browser**.
- Click on the **Resources** Menu, the arrow next to the word Resources.
- Choose **New Resource in file... > Record Format**.
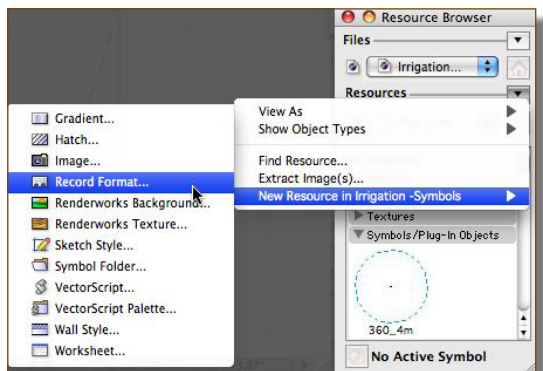
This is the control area for the record format.



• Name your record format. Names in Vectorworks have to be unique, so I often add the name Record, so I don't get any conflicts with other objects.



A record format needs a structure to store the information. Fields are used to structure this information.

• Click on the **New...** button.
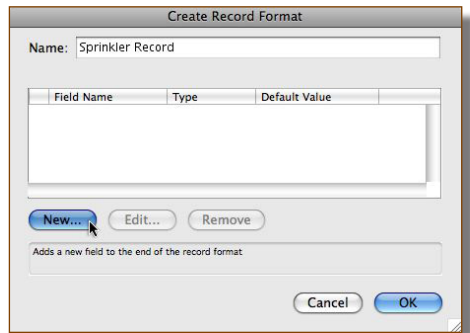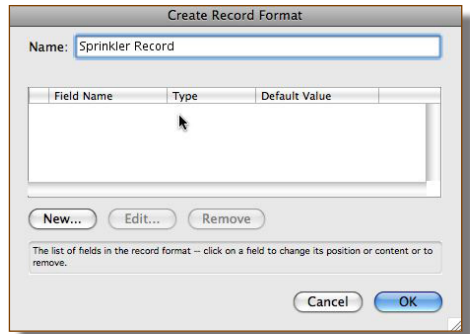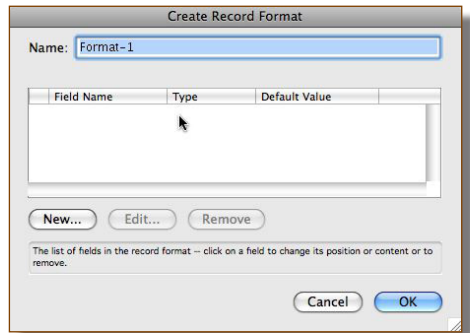
- Name the field. Use a name that makes sense to you. Try to use a name that is self-explanatory.
- Click on the **OK** button.
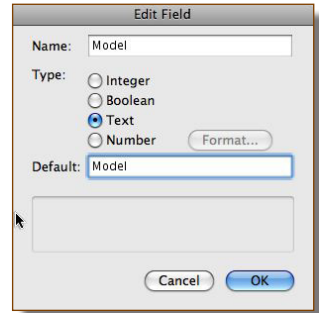
- Click on the **New...** button to create another field.
- Name the field.
- Click on the **OK** button.
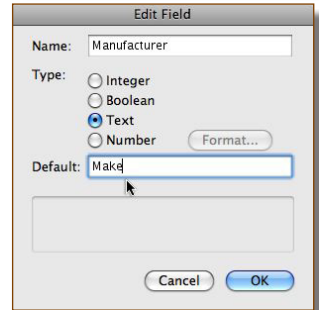
- Click on the **New...** button to create another field.
- Name the field.
- Click on the **OK** button.
- Keep make new fields for all the information you want to store.
- Click on the **OK** button.
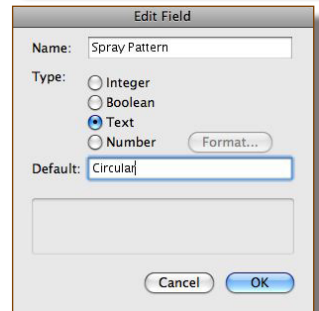
Your record format will be in the Resource Browser.
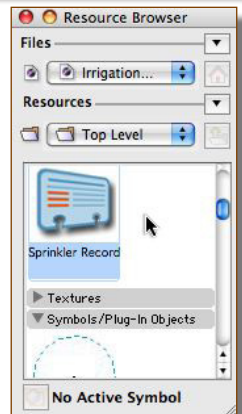
- Locate your record format in the Resource Browser.
- Right mouse click (control+click) on it.
- Choose **Edit...**
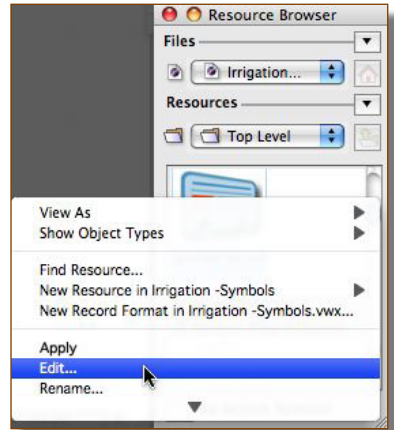
- The Edit Record Format dialog box opens. You can re-order the fields, delete or add files.
- Click on the **New...** button.
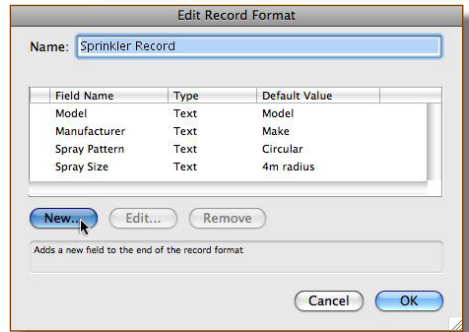
- Name the field.
- Click on the **OK** button to get back to the Edit Record Format dialog box.
- Click on the **OK** button to get back to the drawing.
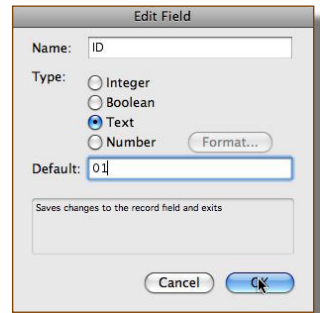
- Locate your sprinkler symbol in the drawing.
- Double click on it.
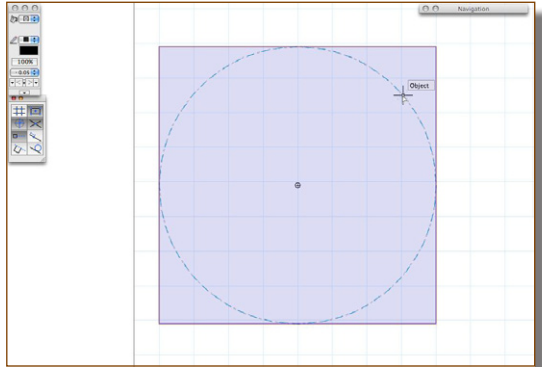


- Normally you will get this dialog box.
- Choose the 2D option.
- Click on the **OK** button.
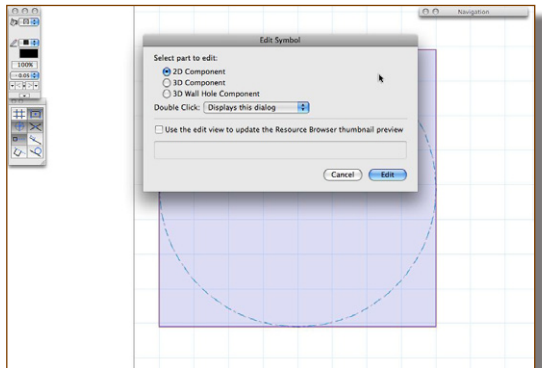


You are now in the symbol editing area. Everything you use to create the symbol is currently selected.

- Click once away from everything to deselect it.
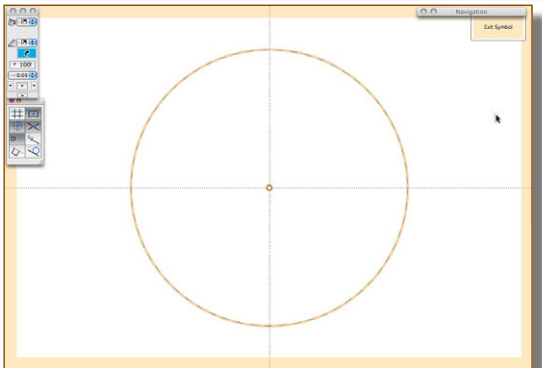
- Select only the spray pattern circle.
- Use the Object Info palette to assign this to the correct class (Irrigation-Spraypat).
- Notice the circle changes line style and color.
- Click away from everything.
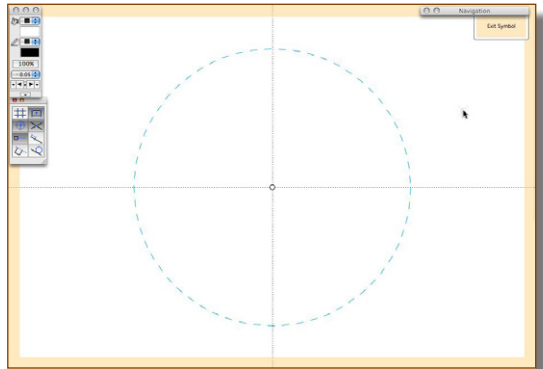


- Go to the **Object Info palette**.
- Click on the **Data** tab.
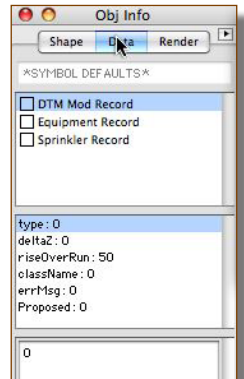


- Click on the tick box.
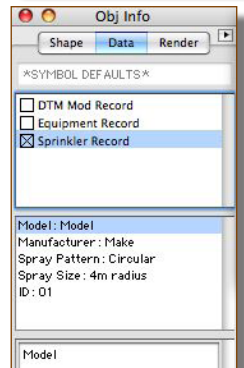
- Create some text for the ID number.
- Leave it selected.
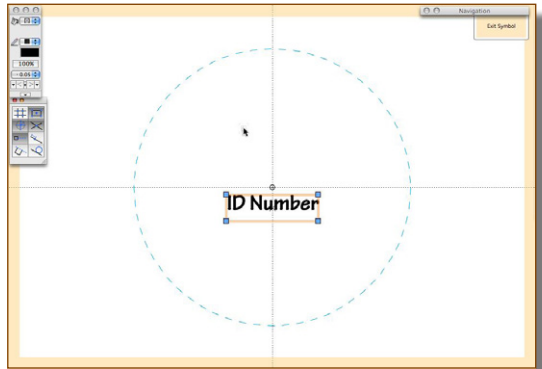


- Go to the **Menu Bar**.
- Choose **Modify > Link Text to Record...**
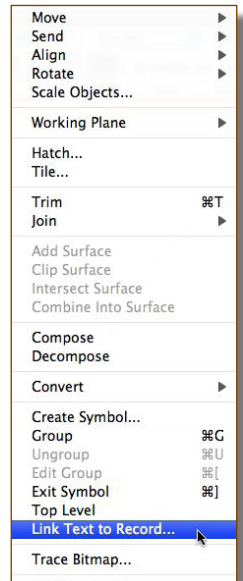
- Select your Record Format at the top part.
- Select the **ID** field.
- Click on the **OK** button.
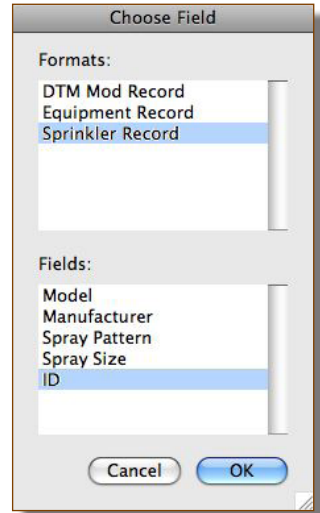


The record format is connected to the text in the symbol. When you edit the data in the field on the Object Info palette, the text on the symbol will change.

- Click on the **Exit Symbol** button on the top right of the screen.
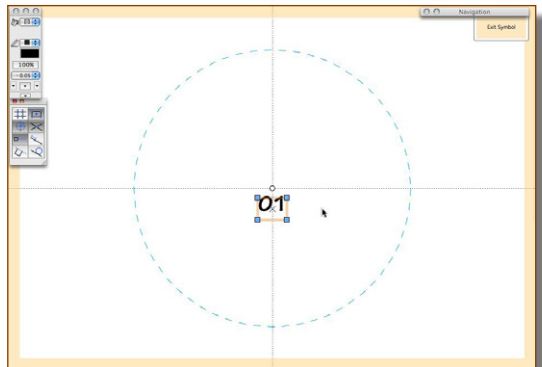


You back to the drawing area. Attach to symbol.

- Delete this instance of the symbol, we want to place the sprinklers on the lawn.
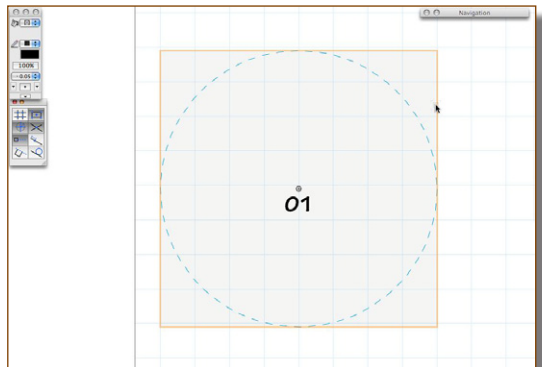
- Go to the **Resource Browser**.
- Locate the sprinkler symbol.
- Double click on the symbol.
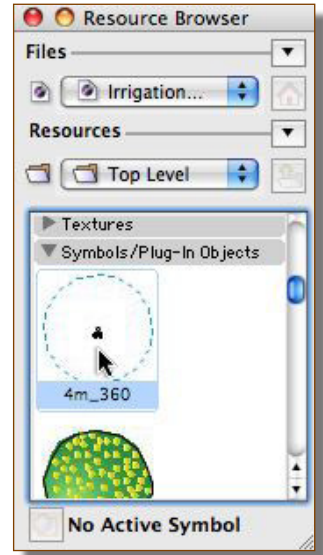


- Move your cursor to the position for your first 360º sprinkler.



- Double click to place the symbol.
- Notice that the ID for the sprinkler is not filled in.

- Go to the **Object Info palette**.
- Click on the **Data** tab.
- Click on the **ID** field.
- Type in the ID number in the bottom area of the Object Info palette.
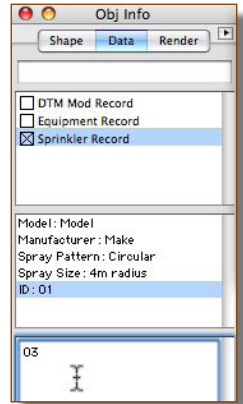
- Hit the **Enter** or Return key.
- The data is added to the symbol.
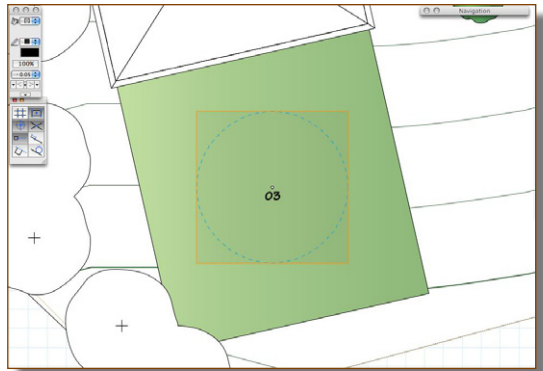
## Creating Duplicate Symbols

cadmovie456

- Go to the **Resource Browser.**
- Locate the first sprinkler symbol.
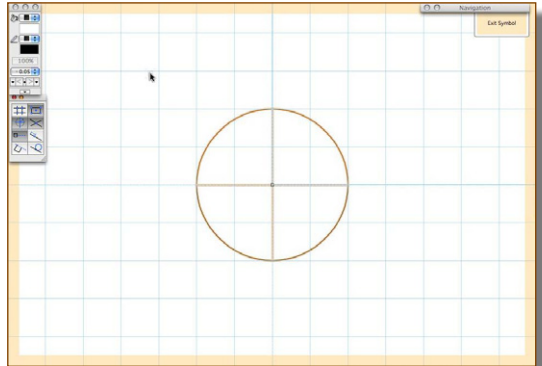- Right mouse click (control+click) on the symbol.
- Choose **Duplicate...**
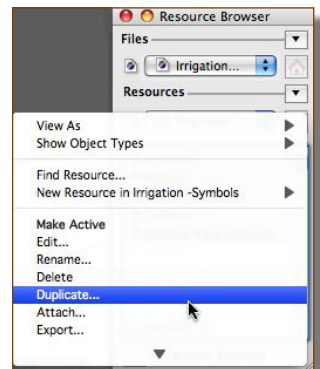
- Name your symbol. I have used the spray radius_angle.
- Click on the **OK** button.

**Assign Name**

New Name:

4m_180

Cancel    OK

- Go to the **Resource Browser.**
- Locate the new symbol.
- Right mouse click (control+click) on the symbol.
- Choose **Edit...**

Resource Browser

Files

Irrigation...

View As
Show Object Types

Find Resource...
New Resource in Irrigation -Symbols

Make Active
Edit...
Rename...
Delete
Duplicate...
Attach...
Export...

Set Thumbnail View
Set Thumbnail Render Mode
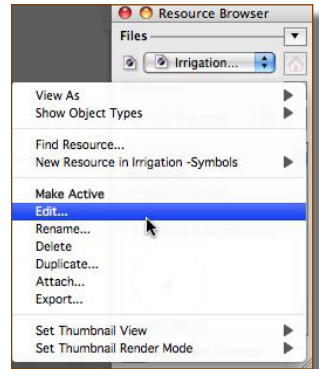
- Choose the **2D Component**.
- Click on the **OK** button.

This takes you into the symbol editing area.

- Click once away from everything to deselect it.

**Edit Symbol**

Select part to edit:
- 2D Component
- 3D Component
- 3D Wall Hole Component
- Insertion Options

☐ Use the edit view to update the Resource Browser thumbnail preview

Cancel    Edit

- Select just the spray pattern.
- Go to the **Basic Tool** set.
- Select the **Split** Tool.

- Go to the **Tool** bar.
- Click on the **third mode**, trim by line.

None    4m_180    Screen Plane

Trim by Line. Draw the cutting line. The third click and the arrow determine which side to keep.

14000   12000   10000   8000   6000   4000   2000   0

- Start outside the circle, lining up with the center.
- Click once.

- Move across the circle, keeping the line straight.
- Click once.
- Move you mouse down.
- Hold the down the option or alt key. This key makes this tool split just the selected object.
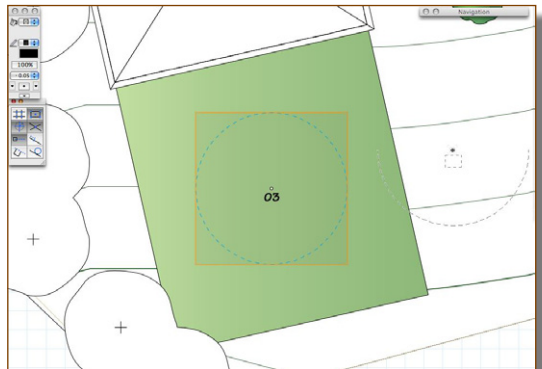
- Click once.
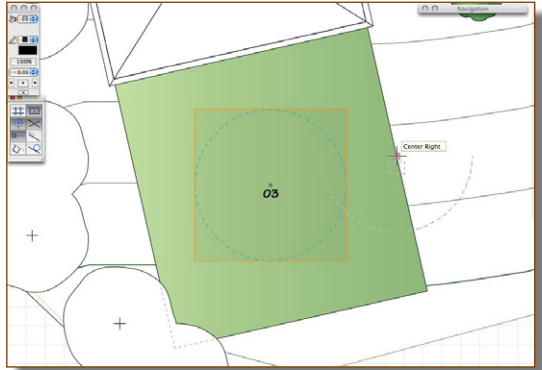- Click on the **Exit Symbol** button on the top right of the screen.

- Go to the **Resource Browser.**
- Locate the new symbol.
- Right mouse click (control+click) on the symbol.
- Choose **Edit...**

- Choose the **3D Component**.
- Click on the **OK** button.

This takes you into the symbol editing area.
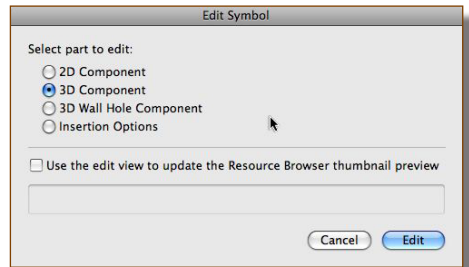
- Click once away from everything to deselect it.
- Select just the spray pattern.
- Go to the **Basic Tool** set.
- Select the **Split** Tool.
- Go to the **Tool** bar.
- Click on the **third mode**, trim by line.

- Start outside the circle, lining up with the center.
- Click once.
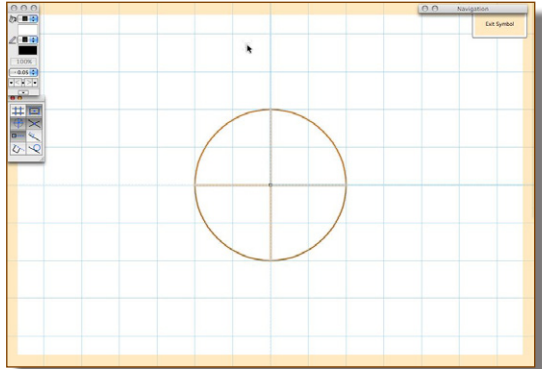
- Move across the circle, keeping the line straight.
- Click once.
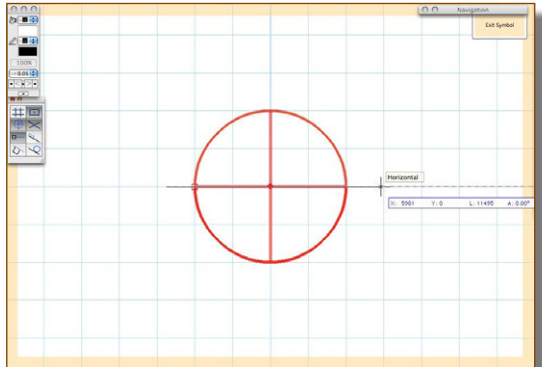
- Move you mouse down.
- Hold the down the option or alt key. This key makes this tool split just the selected object.
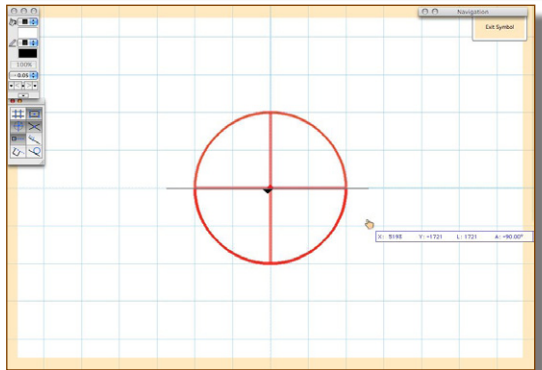
- Click once.
- Click on the **Exit Symbol** button on the top right of the screen.
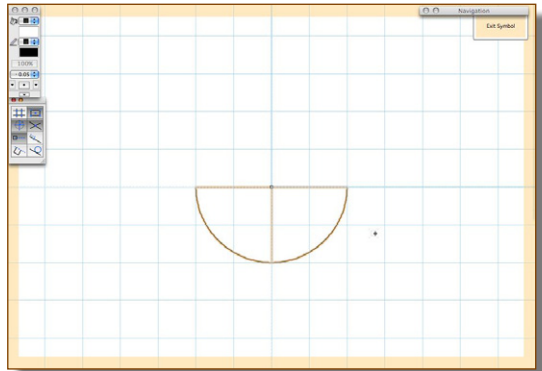


- Go to the **Resource Browser**.
- Locate the sprinkler symbol.
- Double click on the symbol.
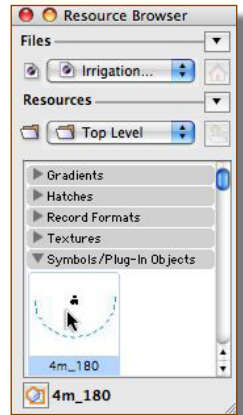


- Move your cursor to the position for your sprinkler.

• Click to place the symbol.

• Move the mouse to define the rotation of the symbol.
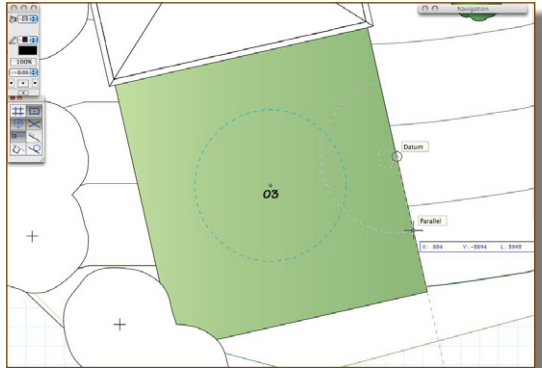
• Click once.

- Place all the symbols you want.



- If you change to a 3D view. You can see the irrigation symbols, but they are not sitting on the site model.
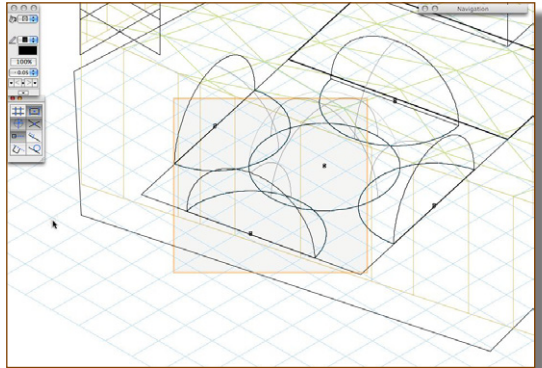


- Select all the irrigation symbols.
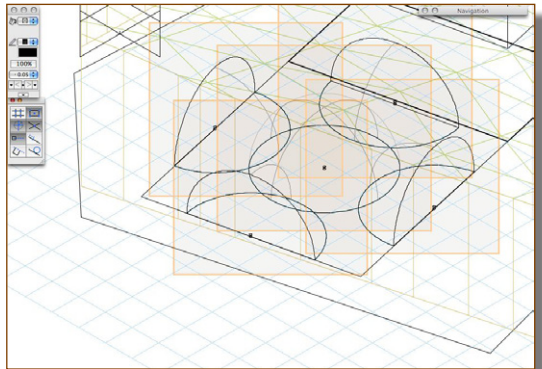
- Go to the Menu Bar.
- Choose **AEC > Terrain > Send to Surface** if you have Vectorworks Architect.
- Choose **Landmark > Send to Surface** if you have Vectorworks Landmark.
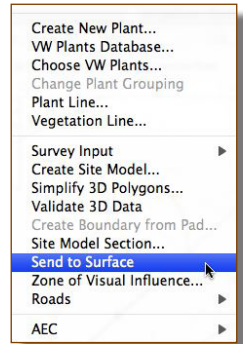


All the symbols are sitting on the site.
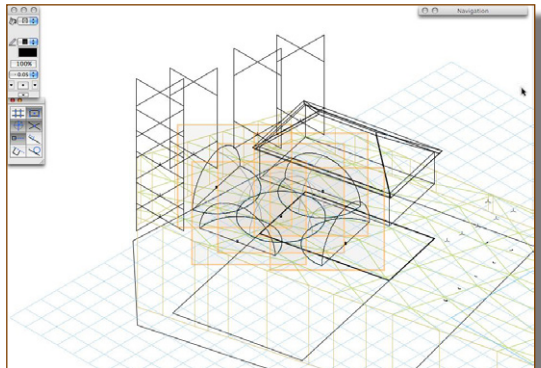


If you render the view, it looks better.

- Change your view to Top/ Plan.
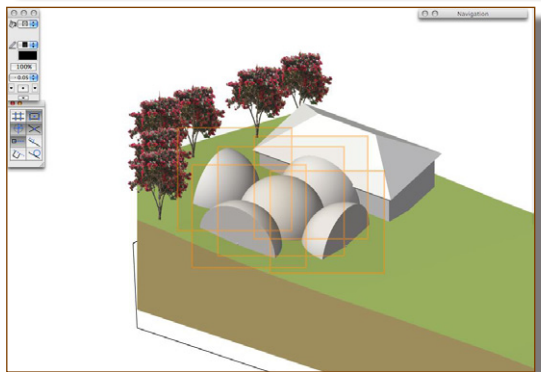
- Go to the **Resource Browser.**
- Locate the last sprinkler symbol.
- Right mouse click (control+click) on the symbol.
- Choose **Duplicate...**
- Name your symbol.
- Click on the **OK** button.
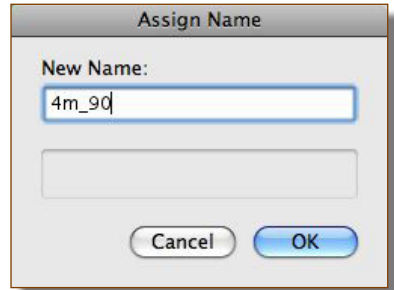
- Go to the **Resource Browser.**
- Right mouse click (control+click) on the symbol, choose **Edit...**
- Edit the **2D Component**.
- Split the Arc to 90°. Go to the **Tool** bar.
- Click on the **Exit Symbol** button .
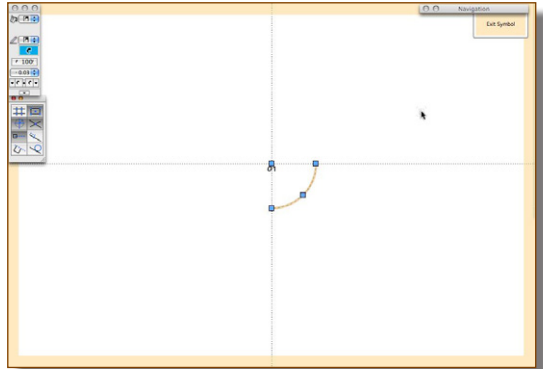
- Edit the **3D Component**
- Use the split tool to cut the 3D shape to 90°.
- Click on the **Exit Symbol** button.
- Go to the **Resource Browser**.
- Double click on the symbol.
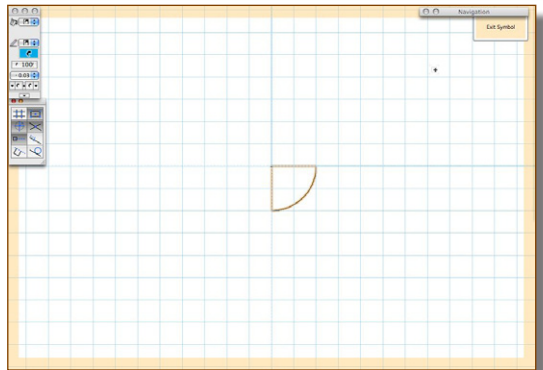
- Place as many symbols as you need.
- Send them to the surface.
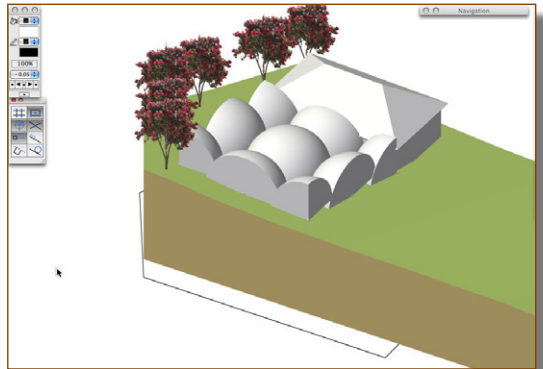


If you have Renderworks, You can edit the symbols to assign a texture to the 3D parts of the spray pattern. I think it looks better that way.
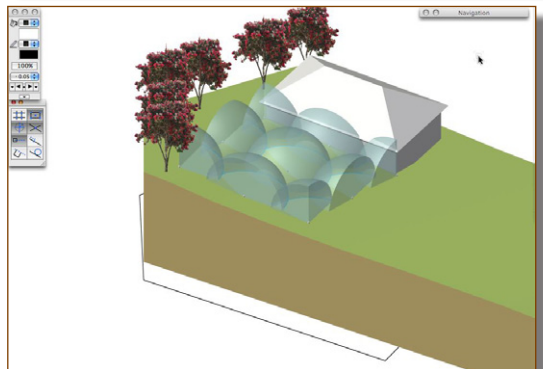


## Symbols for Junctions and Connections

If you wanted to count all the elbow joints, pipe connections and junctions, all you need to do is to create a small symbol with a database, or record format attached. The record format could record the type of connection, the make and model, cost and so on. You can even add the ID like we did for the sprinkler.

The quickest way to make symbols for the connectors is to duplicate a sprinkler symbol and edit it.

• Place the small symbol at each junction.
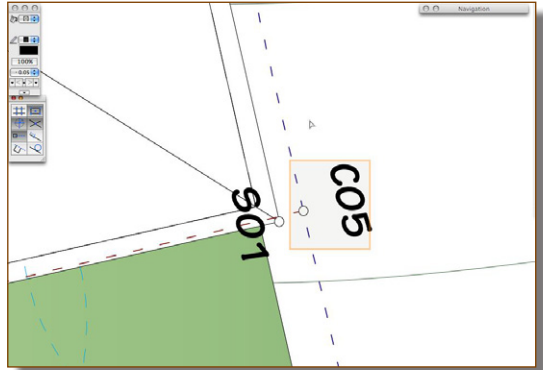


The quickest way to create the record for the connectors is to duplicate the Sprinkler record and edit it

• Go to the Object Info palette, fill in the data and it's ready to count.
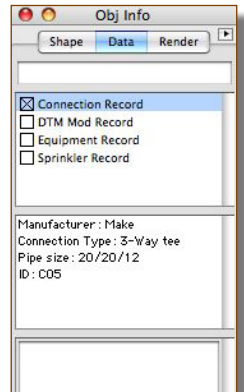


The quickest way to make symbols for the drip emitters is to duplicate a sprinkler symbol and edit it.
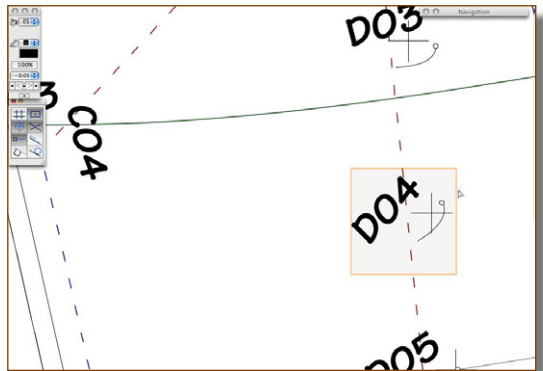
Use the Sprinkler record for the drip emitters, unless you really want to have different information.

• Go to the Object Info palette to fill in the data.
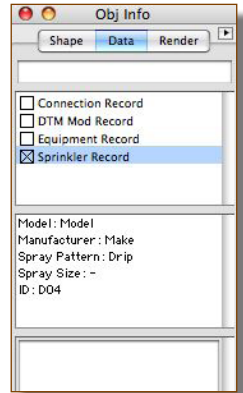
Think about assigning the text in your symbols to a special class. This will allow you to make the text visible for some views or viewports.
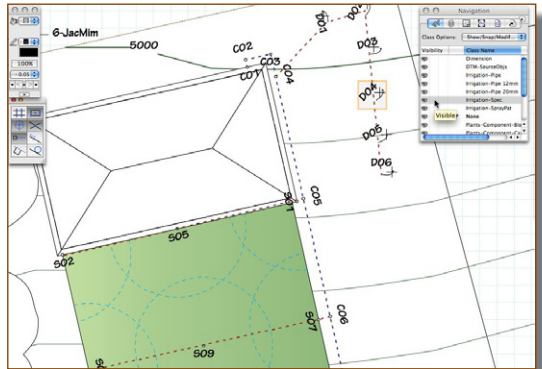
You will also be able to make the text invisible for some views or viewports.
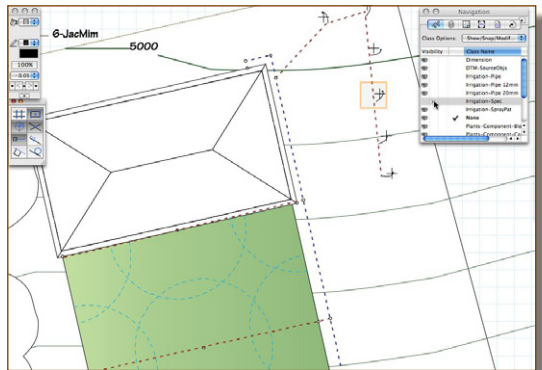
## Irrigation Pipe Work

The Landmark tool set has an Irrigation Line tool, but if you do not have Landmark, what can you do? The answer is to use a polygon, polyline or standard line tool, and assign these to a special class. We can use the class to control the graphic style, and we can also use the class to quantify the lines to give us overall lengths. If you use a class for each pipe size, you can qualify each type of pipe.

[cadmovie457](cadmovie457)

Here are the main pipes. The Line weight and color is controlled by the class settings.
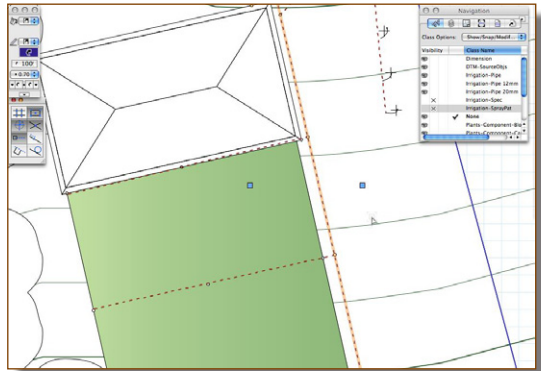


- Use the Object Info palette to assign the objects to the correct class. When we count up the pipes, we want to count up the correct objects, and the class will control this for us.
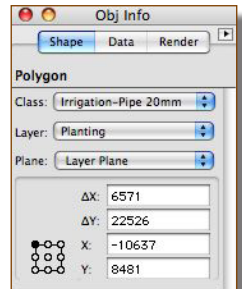
Here are the secondary pipes. The line weight and color are controlled by the class settings.
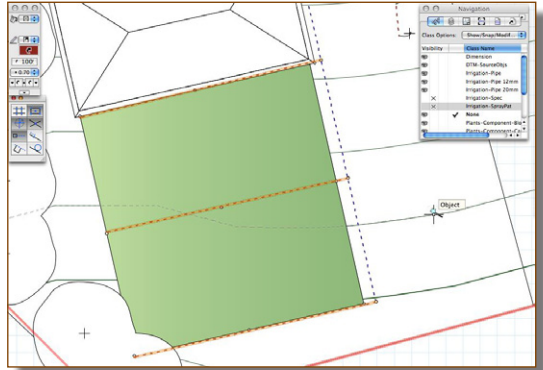
- Use the Object Info palette to assign the objects to the correct class. When we count up the pipes, we want to count up the correct objects, and the class will control this for us.
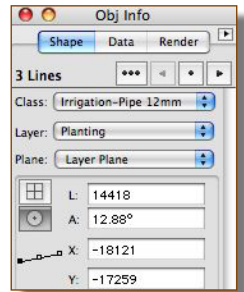
## Building the Worksheet to Count Sprinklers

I mentioned earlier that you can get Vectorworks to count things to suit you, a custom way of counting. In Vectorworks we call this a report, and the results are shown on a worksheet. We can add reports together to collect all the objects we want.

The technique of adding information to objects, then reporting them is useful in several applications, nit just in landscaping. You can use this technique for so many things, it makes Vectorworks one of the most powerful CAD programs around.

cadmovie458

- Go to the Menu Bar.
- Choose **Tools > Reports > Create Report...**
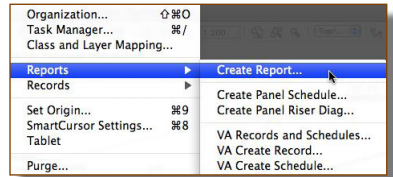


This dialog box allows you to choose how the report will be made.
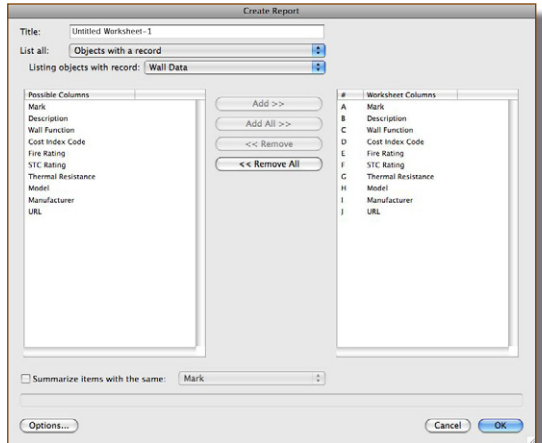


- Name the Report. This will become the name of the worksheet.
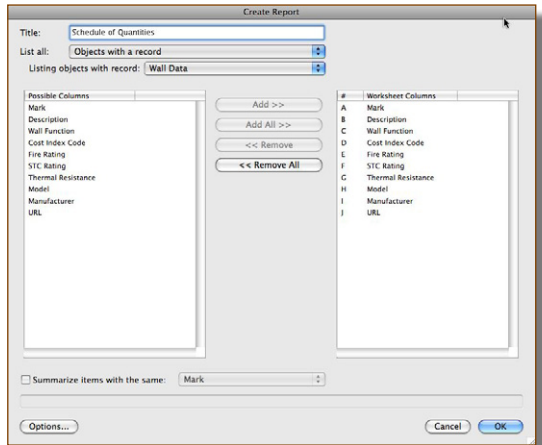
- Click on the Records pop-up menu.
- Choose your sprinkler record.
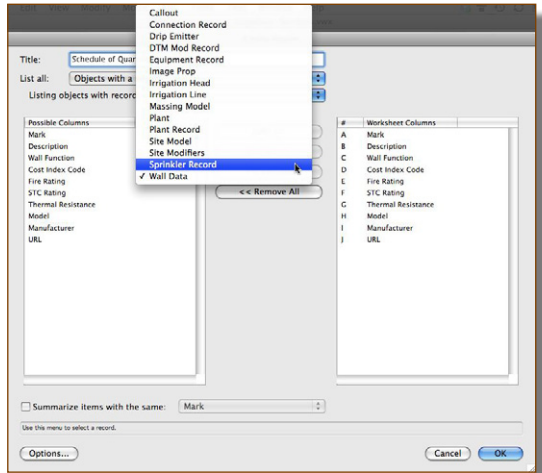
All the fields you created are shown on the right side.

- You can remove fields you do not want to report, by clicking on the field and Click on the Remove button.
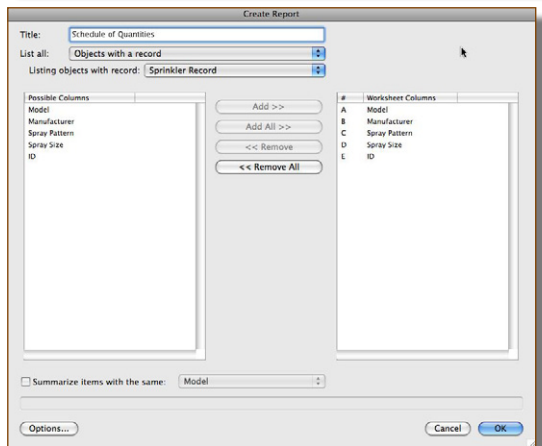
You can re-order the fields.

- Click on the ID field in the number column.
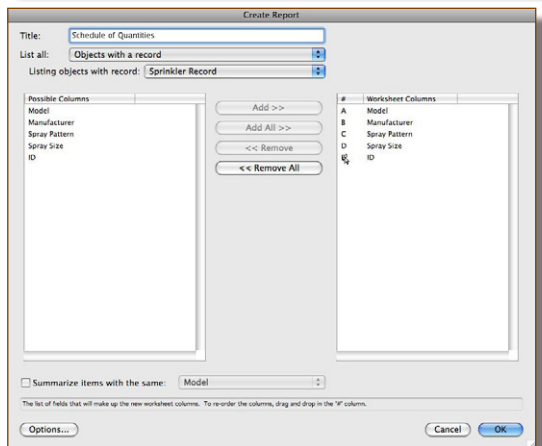
- Drag the field to the top of the list.
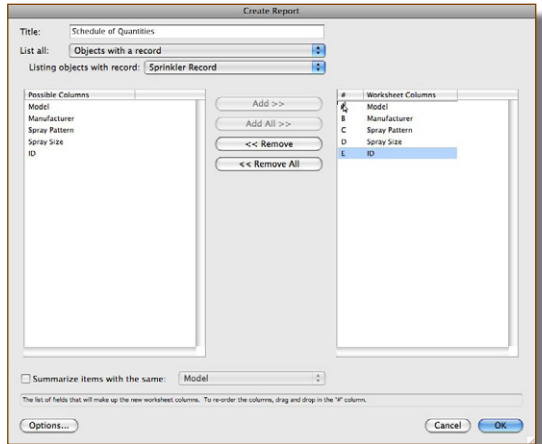


- Release the mouse button. The field is now at the top of the list, and will be the first column in the worksheet.
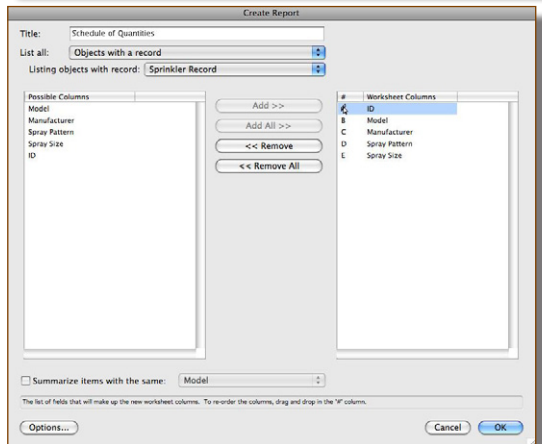


- Click on the **OK** button.
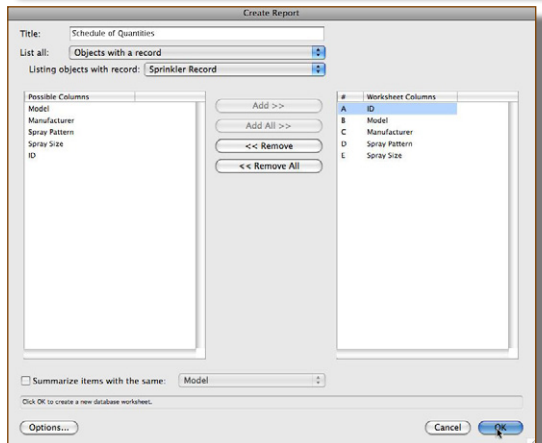
- The worksheet opens. At the moment the worksheet shows all the sprinklers. You can make the worksheet smaller by summing all the same types of sprinkler.

- Click on row 2, the one with the diamond.

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | ID | Model | Manufacturer | Spray Pattern | Spray Size | |
| 2 | 15 | 15 | 15 | 15 | 15 | |
| 2.1 | S09 | Model | Make | Circular | 4m radius | |
| 2.2 | S07 | Model | Make | Circular | 4m radius | |
| 2.3 | S05 | Model | Make | Circular | 4m radius | |
| 2.4 | S06 | Model | Make | Circular | 4m radius | |
| 2.5 | S08 | Model | Make | Circular | 4m radius | |
| 2.6 | S01 | Model | Make | Circular | 4m radius | |
| 2.7 | S04 | Model | Make | Circular | 4m radius | |
| 2.8 | S03 | Model | Make | Circular | 4m radius | |
| 2.9 | S02 | Model | Make | Circular | 4m radius | |
| 2.10 | D01 | Model | Make | Drip | - | |
| 2.11 | D02 | Model | Make | Drip | - | |
| 2.12 | D03 | Model | Make | Drip | - | |
| 2.13 | D04 | Model | Make | Drip | - | |
| 2.14 | D06 | Model | Make | Drip | - | |
| 2.15 | D05 | Model | Make | Drip | - | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |

- You will see three icons above column A.
- Click and drag the **SUM** icon to the column for the spray pattern.
- Release the mouse button. You will notice all the same spray patterns are summed.

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | ID | Model | Manufacturer | Spray Pattern | Spray Size | |
| 2 | 0 | 2 | 2 | 2 | 2 | |
| 2.1 | --- | Model | Make | Circular | 4m radius | |
| 2.2 | --- | Model | Make | Drip | - | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
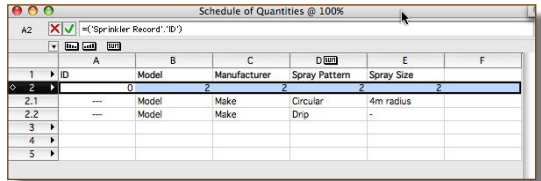
With all the sprinklers summed together, we still want to know how many of each sort there are. We can count these.
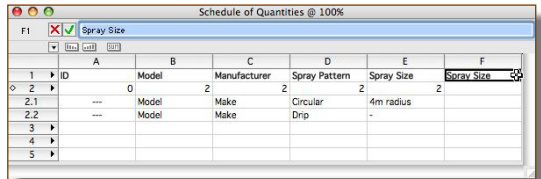
- Copy and paste the text from one cell to the last cell at the top. This keeps all the formatting consistent.

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | ID | Model | Manufacturer | Spray Pattern | Spray Size | Spray Size |
| 2 | 0 | 2 | 2 | 2 | 2 | |
| 2.1 | --- | Model | Make | Circular | 4m radius | |
| 2.2 | --- | Model | Make | Drip | - | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |

- Change the text to **Number**.
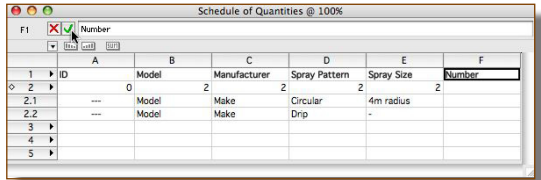
- Click on the green tick.
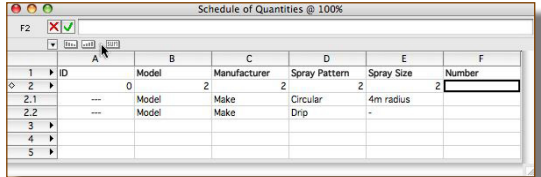
- Click in the next cell down.
- Type in an **=** sign.
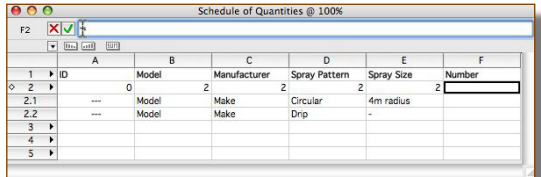
- Click to the Worksheet menu.
- Choose **Paste Function...**
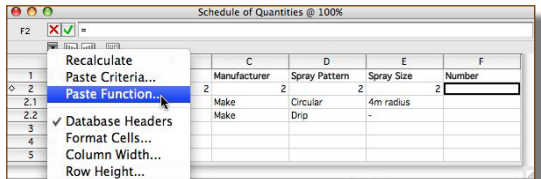
- Choose the **Count** function.
- Click on the OK button.

- Click on the Green tick.

- The worksheet will count your sprinklers.

- Go to the Menu Bar.
- Choose **Tools > Reports > Create Report...**

This dialog box allows you to choose how the report will be made.

- Name the Report. This will become the name of the worksheet.
- Click on the Records pop-up menu.
- Choose your connector or junction record.
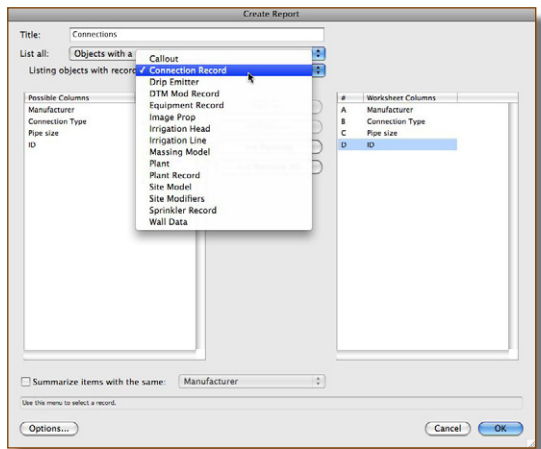
- Remove fields you do not want.
- Drag the ID field to the top of the list.
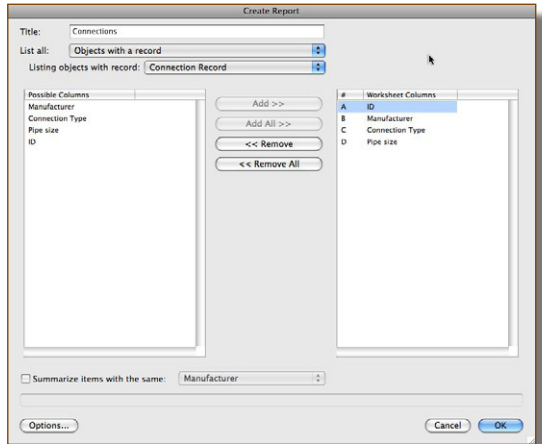
- Click on the Options... button.
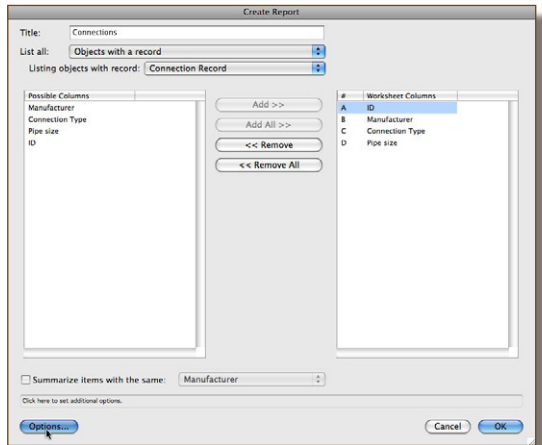
- Click on the option to **Append to Existing** worksheet.
- Click on the pop-up menu to choose your worksheet. In this case I called my worksheet, Schedule of Quantities.
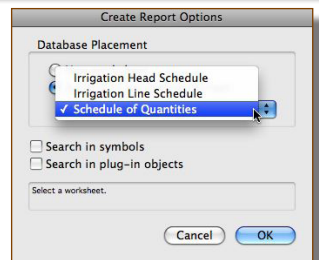
• Click on the **OK** button.
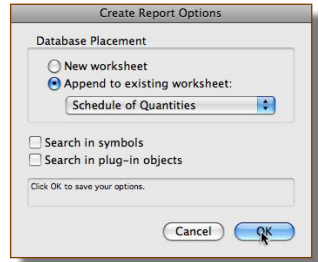
• Click on the **OK** button.
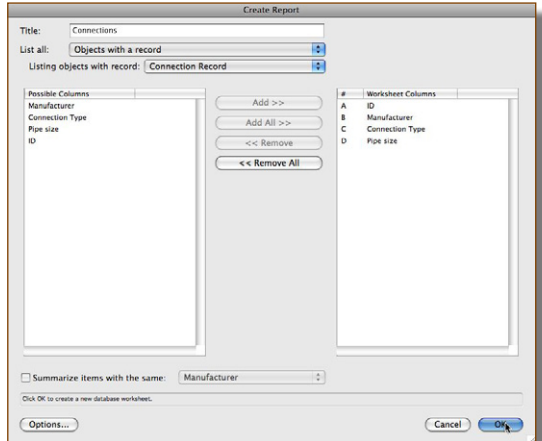
• The report is added to your worksheet.
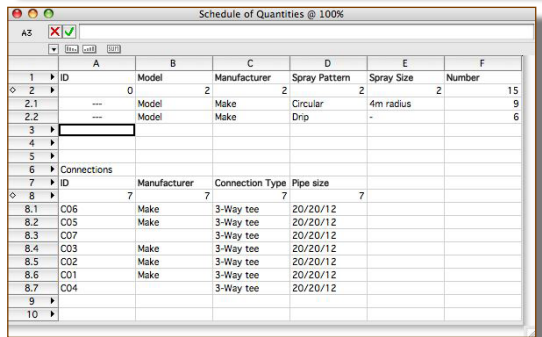
- Click on the Database header.



- Drag the sum icon to the column you want to use.



- The connectors are summed.



- Copy the Number cell from the top of the worksheet.

- Click in the cell for the connectors, where you want to place the title for the counting.

- Go to the **Menu Bar**.
- Choose Click on the OK button. , or use the keyboard shortcut (command+V or control+V).

- Copy the counting formula cell from the top of the worksheet.
- Click in the cell for the connectors, where you want to place the counting formula.

- Go to the **Menu Bar**.
- Choose Click on the OK button. , or use the keyboard shortcut (command+V or control+V).

- Select two rows at the bottom. You can do this by dragging your mouse down the two rows you want to select.
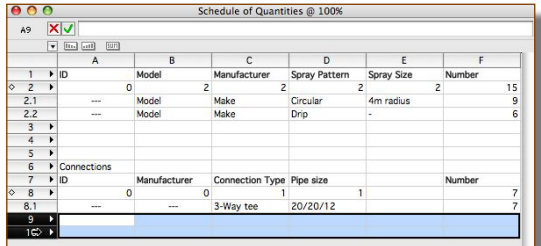


- Click on the worksheet menu (the down turned arrow).
- Choose **Insert > Rows**.
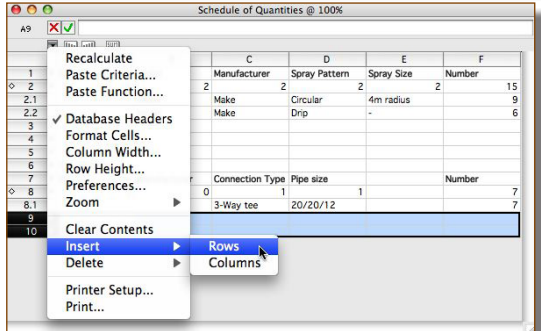


- Type in a title for counting up the irrigation pipes.
- Hit the Return or Enter key.
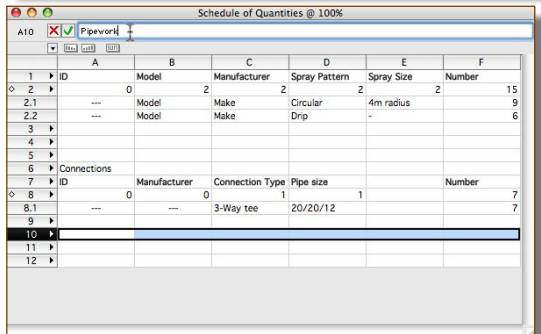


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- Click on the worksheet menu (the down turned arrow).
- Choose **Paste Function...**
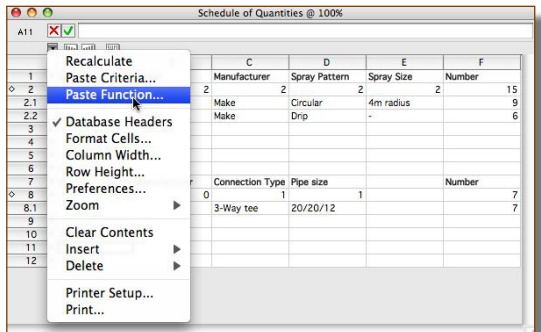
- Choose Length. This will only count up the length of lines or walls. So we will have to make a calculator for polylines and polygons as well.
- Click on the **OK** button.
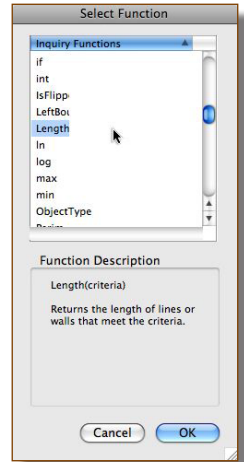
- The function is there, and we need a criteria to look for information.
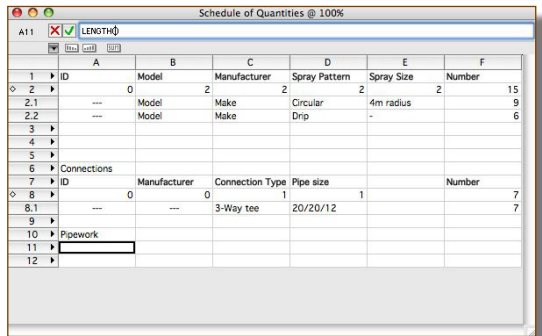
- Click on the worksheet menu (the down turned arrow).
- Choose **Paste Criteria...**
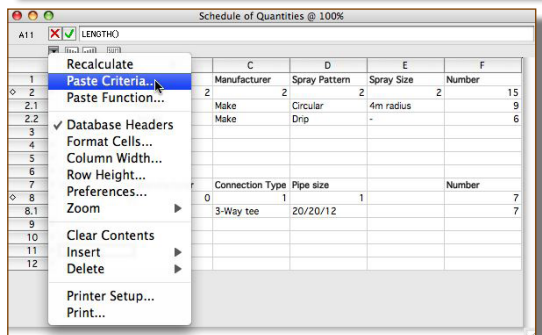
- If you see this dialog box, click on the **Custom...** button.
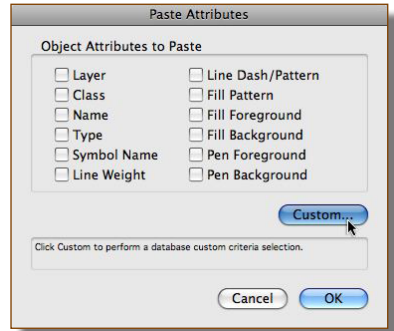
- This is where you choose the filter for the objects.
- The layer is fine.

- Click on the **More Choices** button.
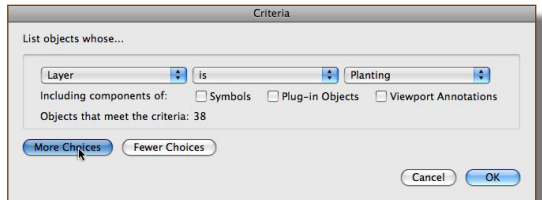
- This new line allows you to refine the filter, or criteria.
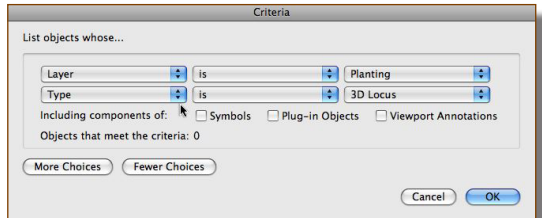
- Click on the last pop-up menu.
- Choose Line from the list of options.
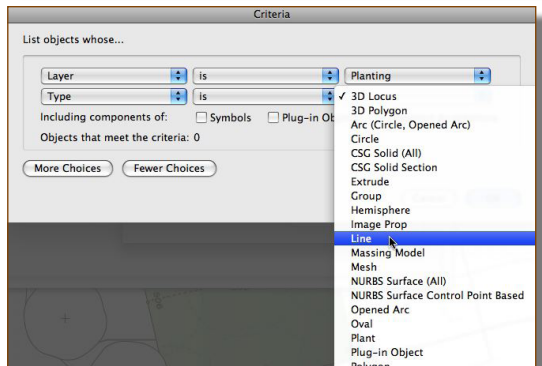
- Click on the **More Choices** button.
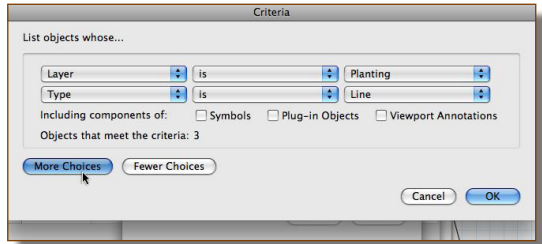


- Click on the first pop-up menu.
- Choose **Class**.
- Click on the last pop-up menu.
- Choose the class for the first irrigation pipe.



-  Click on the **OK** button.
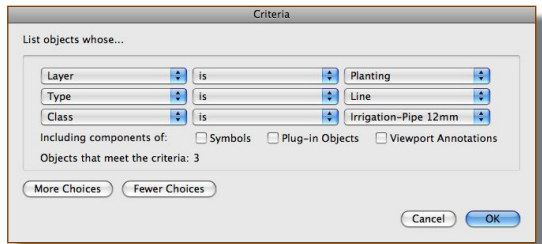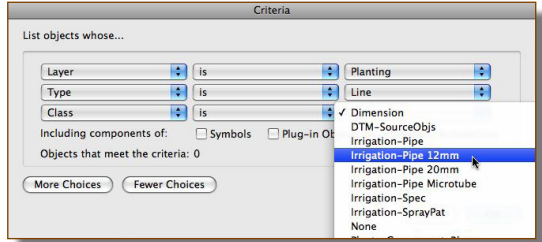


- In this case, my  lengths are reported in mm. You can add a calculation to report the lengths in any format you like.
- Click on the green tick to accept.
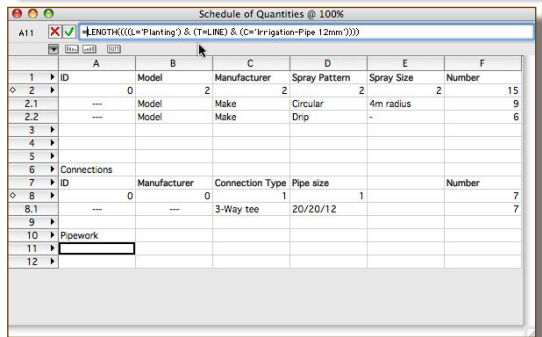
- Move Across to the next field.
- Click on the worksheet menu (the down turned arrow).
- Choose **Paste Function...**
- Choose **Perim**. This will find the length of a polygon or polyline.
- Click on the **OK** button.
- Click on the worksheet menu (the down turned arrow).
- Choose **Paste Criteria...**
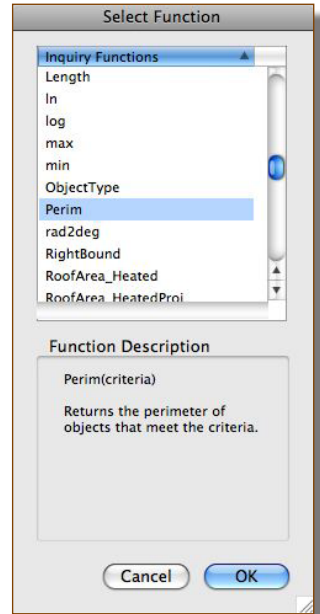


- Ensure the correct layer is selected.
- Click on the **More Choices** button.
- Choose **Type is Polygon**.
- Click on the **More Choices** button.
- Choose **Class is**.
- Click on the last pop-up menu.
- Choose the class for the first irrigation pipe.
- Click on the **OK** button.

- In this case, my lengths are reported in mm. You can add a calculation to report the lengths in any format you like.
- Click on the green tick to accept.



- Make the same function for polylines in the next cell.



- Make a calculation that adds up the lines, polygons and polylines.



- Use the same technique to calculate the lengths of all your pipe work.