

## *WORKING WITH MULTI-VALVE DESIGNS*

Tasks covered in this tutorial:

- Subdividing blocks
- Automatically Connecting Valves
- Running more than one valve
- Managing multi-valves in Design
- Limiting the number of pipes selected
- Multiple valves running together

### GETTING STARTED

1. Complete A Simple Orchard Design if you have not done so already.
2. We wish to break this block up into multiple zones because the flow of the entire block exceeds the capacity of the water supply.
3. To automatically break the block into 3 even parts we can use the subdivide tool. Go to *Tools/Selection Filter* and set the "Type" to **Area** and check the "Filter" check box. Make sure that all the other fields in this dialog say **[ALL]**. Click **[OK]**. This ensures that only Irrigation Area items can be selected to make selecting the correct item easy. Go to *Tools/Select Object* first and then click on the cyan Area boundary and then select *Tools/Sub-Divide Block*. In the "Slices" section, select "Number" and type in **3**. In the "Cuts" section, select "None". See Figure SM9.

**Subdivision** [Close]

Area no. 1

Irrigated Area:	1.39 acres	Total Flow:	98.26 US gpm
Number of Rows:	31	Longest Lateral:	150.0 ft

Auto

Auto

Maximum Lateral Length:  ft

Equal Flow  US gpm  
 Equal Area  acres  
 Number of sub-blocks

Slices

None  
 Distance   ft  
 Number    
 Rows    Use Multiple Values

Cuts

None  
 Distance   ft  
 Number    
 Use Multiple Values  
 Cut Direction:

Figure SM 1

- Click **[OK]**. A dialog will appear and a preview of the subdivision specified will be shown in the design view. Click the **[Accept/View Changes]** button to accept the subdivision. See Figure SM10.

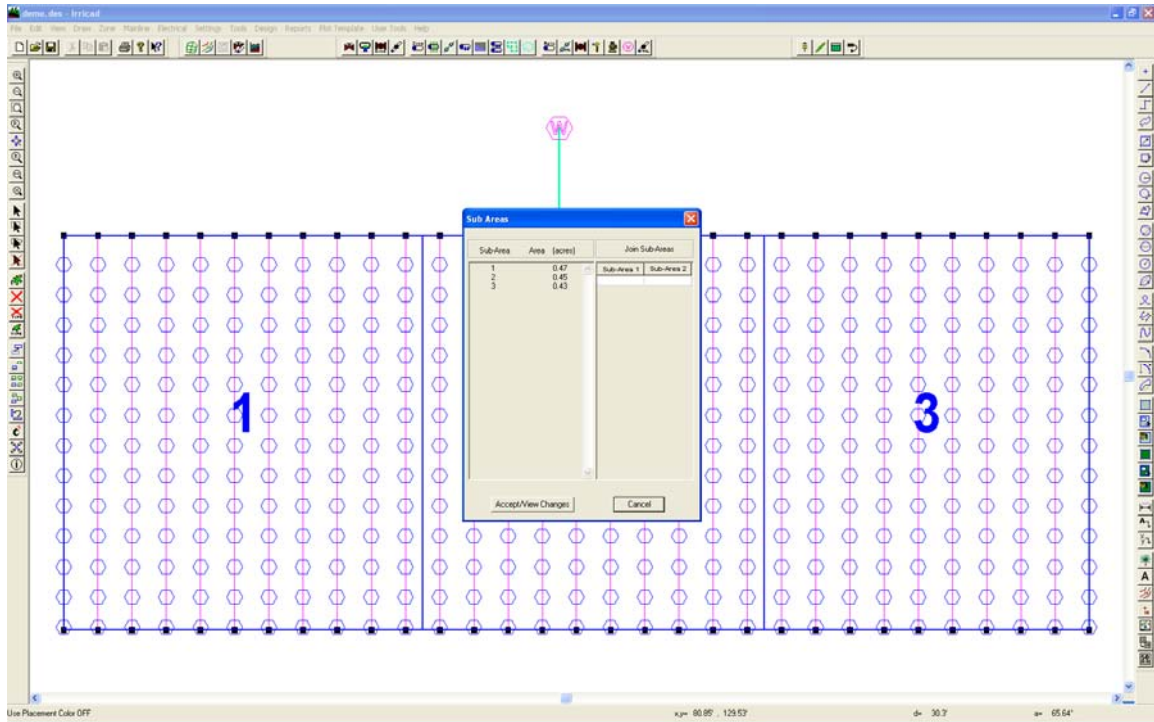


Figure SM 2

5. IRRICAD will automatically subdivide the block and connect submains and control valves to each new sub-block, thereby creating three new zones.
6. Now go back to *Tools/Selection Filter* and uncheck the “Filter” check box.
7. Now select *Tools/Connect Valves* for IRRICAD to automatically connect mainline pipe to the new valves. See Figure SM 11.

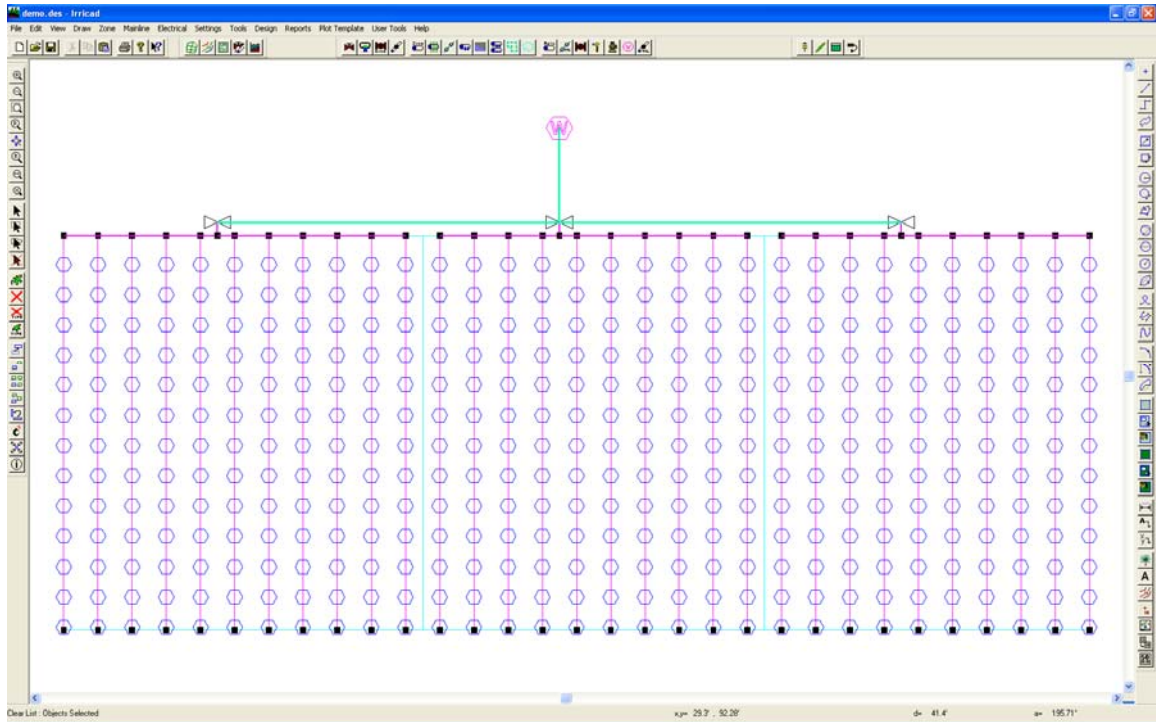


Figure SM 3

8. Now we will specify how the zones will be operated. As we want each zone to run by itself select *Design\Assign Each Zone to a Unique System Flow*. The dialog will automatically assign system flows to our zones. Note also that each zone has been given a new name based on the original block area name. See Figure SM 12. Click [OK].

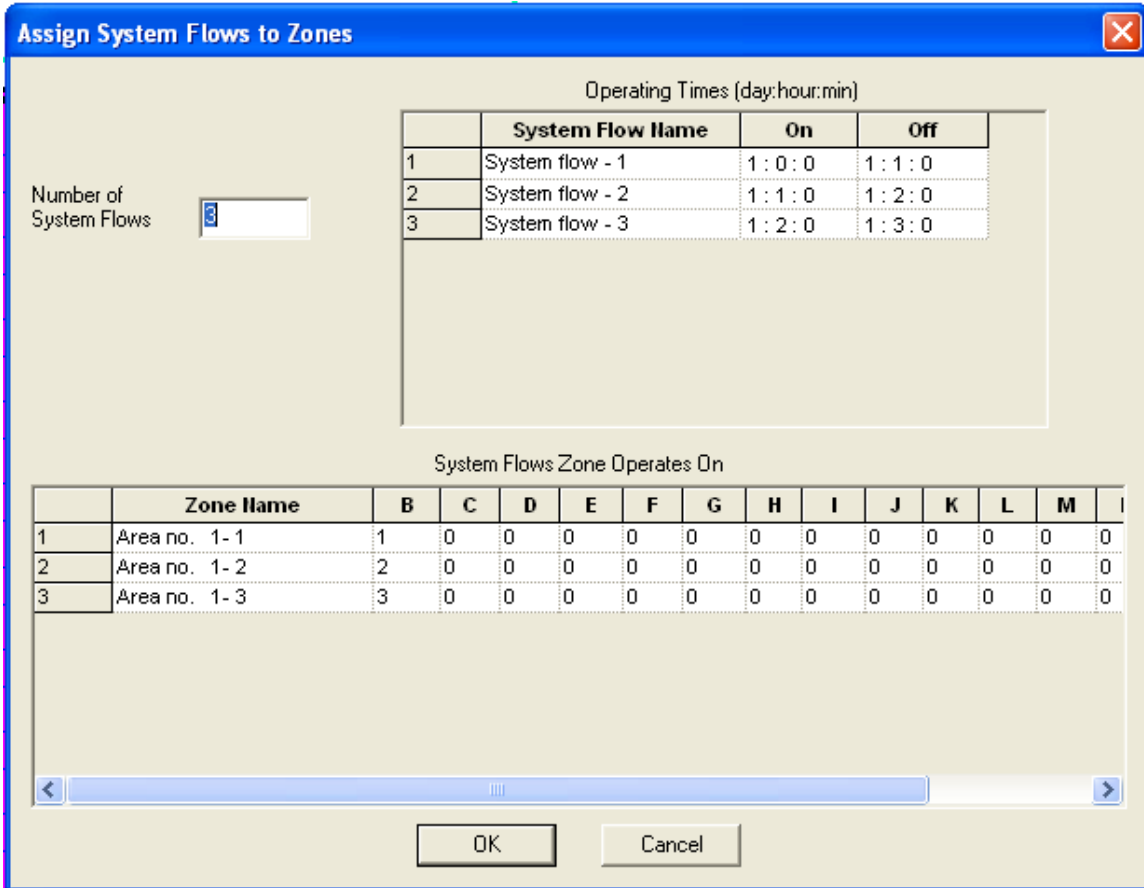


Figure SM 4

9. Select *Design|Zone Design|LP Design*. Once again you will notice that multiple submain sizes have been selected. Go to *Design|Zone Design Configuration* and change the "Number of Submain Sizes" to 3 for all zones, rerun *Design|Zone Design|LP Design*. Run *Design|Valve Analysis* and then *Design|Mainline Design|LP Design*. View the System Duty report when complete (*Reports|Mainline Design Reports|System Duty*), your results should look similar to Figure SM13.

Water Supply : <b>Supply no. 1</b>				
Duty Number	On time	Off time	Pressure (psi)	Flow US gpm
1	1 : 0 : 0	1 : 1 : 0	21.08	32.38
2	1 : 1 : 0	1 : 2 : 0	21.25	29.43
3	1 : 2 : 0	1 : 3 : 0	21.35	29.43

Figure SM 5

## VALVES OPERATING TOGETHER

10. Throughout the above the tutorials we have usually specified that all valves operate independently regardless of the number of valves in the system. We will now look at different scenarios where more than one valve is operating at the same time.

11. Select *Design/Assign Zones to System Flows*. Increase the total “Number of System Flows” to 4. Click [OK] to refresh the screen and create a field for the new system flow. Leave the “Operating Times” as the default (the actual running time is unimportant in this case), click [OK] again. Now you can visually select which zones will operate on which system flow. Click on Area no. 1-1, then *Right-click/Assign to Sys Flow*. Leave the check box for “Replace existing system flows in Zones” checked and click [OK]. See Figure SM 14. Now click on Area no. 1-2, then *Right-click/Assign to Sys Flow*. Make sure the “System Flow Number” has changed to 2. Leave the check box for “Replace existing system flows in Zones” checked and click [OK]. Now click on Area no. 1-3, then *Right-click/Assign to Sys Flow*. Make sure the “System Flow Number” has changed to 3. Leave the check box for “Replace existing system flows in Zones” checked and click [OK]. Now click on all three areas – 1-1, 1-2 and 1-3 one after the other with the mouse.

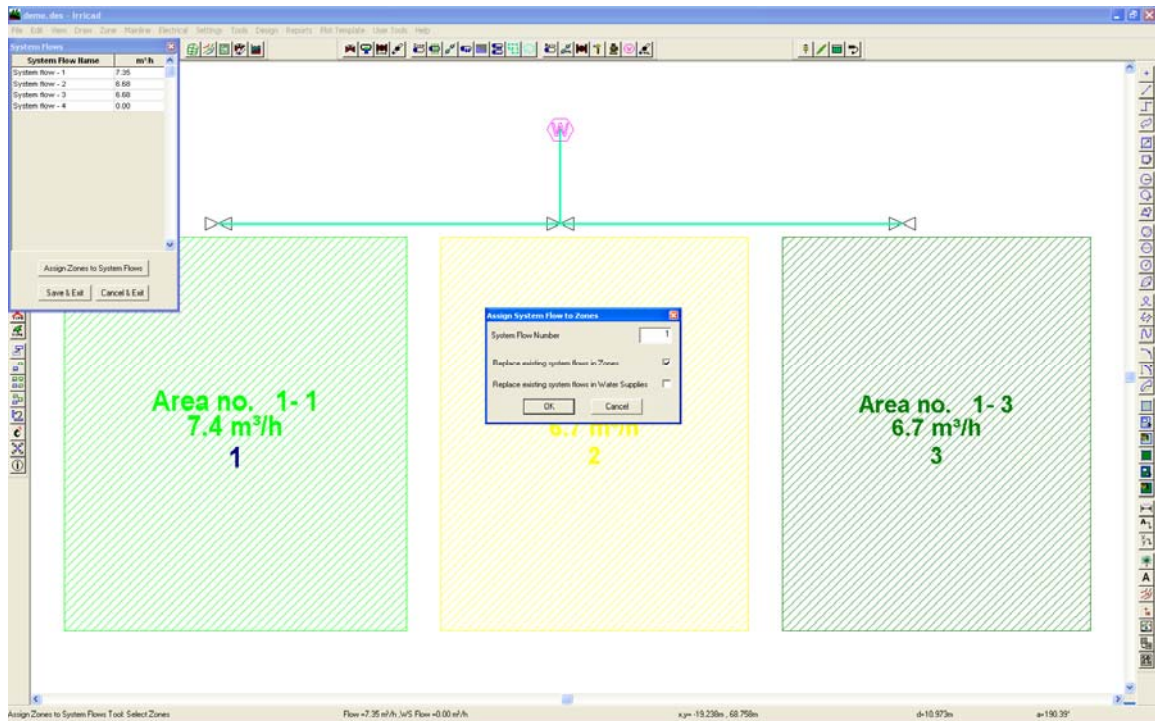


Figure SM 6

12. Once again *Right-click/Assign to Sys Flow* but uncheck the “Replace existing system flows in Zones”. In this way we have specified that we want to allow for these three zones operating independently AND also at the same time. Click [OK]. The “System Flows” dialog box should now show all three individual flows and also the combined flow of all three zones in System Flow 4. In addition, the symbols for the zones will display the system flows that they are assigned to. For example Area no. 1-1 is assigned to system flows 1 and 4. See Figure SM 15.

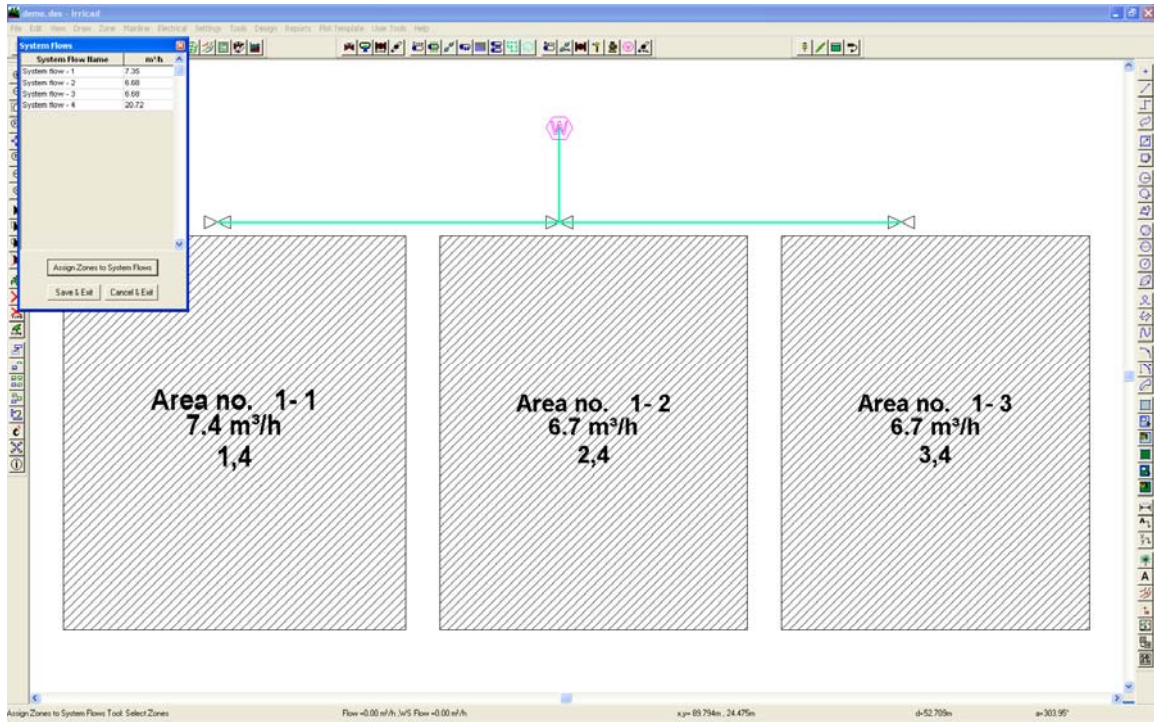


Figure SM 7

13. Re-run Mainline Design. Note that you do not need to re-run Zone design or analysis since nothing has changed in the zones. However, you will need to run LP Design for Mainline Design because the required pipe sizes may well change with the different flow regime. Now open the System Duty report (*Reports|Mainline Design Reports|System Duty*). Your results should look like Figure SM 16.

Water Supply : <b>Supply no. 1</b>				
Duty Number	On time	Off time	Pressure (psi)	Flow US gpm
1	1 : 0 : 0	1 : 1 : 0	20.54	32.38
2	1 : 1 : 0	1 : 2 : 0	20.43	29.43
3	1 : 2 : 0	1 : 3 : 0	20.58	29.43
4	1 : 3 : 0	1 : 4 : 0	20.79	91.24

Figure SM 8

14. Note this tutorial could be repeated using the *Zone|Tape Irrigation Block* tool for Drip tape blocks.