The following is offered as showing how to use features available in AutoSPRINK and should not be construed as design guidance or used in lieu of code &/or local recommendations or requirements:

When determining pressure reducing hose or floor control valve requirements, you will need to know:

- a.) Demand flow gpm, (to pick the appropriate valve curve for the size needed)
- b.) Expected maximum residual inlet psi (at the Demand flow gpm)
- c.) Desired residual outlet psi range (Static psi and Residual psi at the Demand flow gpm)
- d.) Expected maximum static inlet psi
- e.) Valve elevation.

- Using these values, and the Manufacturer’s data charts, the valve that best suits the purpose can be determined. Code &/or local regulations will dictate the maximum psi allowable (c).

Verify that the calculator is set for a standard demand driven calculation (‘Satisfy minimum…’) on the

'Settings \Hydraulic Calculations \Calculator' tab:

The general standpipe calculation is done with only the hose element(s) at the top of the standpipe(s) set to a 'Fixed Flow' of 500gpm @ 65.0psi – 100.0psi (as required by code &/or local requirements) for the most remote standpipe and a 'Fixed Flow' of 250gpm @ 0.0psi for each additional standpipes. To obtain the standpipe results: 'Calculate with manually flowing devices'.

To determine the expected maximum static inlet psi for each valve: Place a gauge at each hose outlet on the standpipe and additional gauges attached to each floor control valve. The 'Check Point Gauge Data' report will then show the 'Inlet Static Pressure' (and 'Elevation') at each gauge.
For each Hose Valve:

Select all of the Hose Valves and set them to:

![Flow State During Hydraulic Calculations](image)

Select them all again and set them to "Not Flowing". Select the one (1) Hose Valve that you want to calculate and reset it to a "Fixed Flow". Click on the 'System Optimizer' button 🔄, calculate with manually flowing devices and note the "Pressure Overage" psi.

In this example: calculating for the Hose Valve adjacent to "Hose 2-26" gauge, the overage is

![System Information](image)

102.013 psi.

Add this to the "Minimum Pressure" set for the valve (100psi), which equals 202.013psi and use this value on the form for the "Inlet Residual (psi)" and show: "at Flow of GPM" = 250(gpm).

<table>
<thead>
<tr>
<th>Location</th>
<th>Inlet</th>
<th>Flow</th>
<th>Outlet desired</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tag</td>
<td>Style</td>
<td>Size (in.)</td>
<td>Elev.</td>
<td>Static (psi)</td>
</tr>
<tr>
<td>Hose 2-26</td>
<td>4663</td>
<td>2 1/2&quot;</td>
<td>272.75</td>
<td>222.588</td>
</tr>
</tbody>
</table>

Normally: The "Outlet desired": "Static (psi)" and "Residual (psi)" would be a pressure range with the "Static (psi)" being a maximum of 100 (psi). The factory determines the “Actual” information.

Repeat for each Hose Valve.
Floor Control Valves:

On the Standpipe drawing, set all of the Floor Control PRVs to:

Double-check that all Hose Valves are set to "Not Flowing".

In each Floor System drawing:

X-Ref the Standpipe drawing, connecting to the appropriate floor connection.

Add one Hose (Rack) to the appropriate hose standpipe outlet for the floor, snapping it to the x-ref (turn on 'Snap into Symbol'). The Hose should default to:

100gpm is normal for a hose allowance on a Light Hazard occupancy. Adjust the 'Flow' (gpm) if needed but leave the 'Minimum Pressure' at 0.0psi.

Select the desired remote area and review the results using 'Hydraulics \Analysis Reports':
On the 'Node Analysis' tab, verify that the hose is included:
On the 'Remote Area Data' tab:

Scroll down the list of gauges (within the 'Supply Information' section) and select the proper System gauge for the floor that is being calculated. Note the system requirements on the graph. Add this required psi to the 'Pressure Overage' psi.

In this example: System 27 shows a system requirement (demand) of 270.78gpm @ 72.167psi. The overage shown is 113.251psi. Thus the maximum residual (Inlet) pressure is 185.418psi at a flow of 270.78gpm.

Show these values on the form for System 27:

<table>
<thead>
<tr>
<th>Location</th>
<th>Inlet</th>
<th>Static (psi)</th>
<th>Residual (psi)</th>
<th>Flow at Flow</th>
<th>Outflow desired</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>System 27</td>
<td>2 1/2&quot;</td>
<td>275.75</td>
<td>221 204</td>
<td>185 418</td>
<td>270.78</td>
<td>160 160</td>
</tr>
</tbody>
</table>

Normally: The "Outlet desired...Static (psi)" and "...Residual (psi)" would be a pressure range with the "Static (psi)" being the maximum desired system pressure. The factory determines the "Actual" information.

Repeat for each Floor Control PRV, where necessary.

If the "Inlet...Static (psi)" is equal to, or less than, the maximum desired system pressure, there is generally be no need for a PRV.
Determining the appropriate pressure reducing valves:

- Make sure that the residual outlet pressure available from each Hose PRV, at its required flow, is less than the desired (or maximum) allowable pressure, but still above the minimum allowable pressure (40 - 65psi, for example).
- Make sure that the residual outlet pressure available from each Floor Control PRV, at its required flow, exceeds the desired (or minimum calculated) required pressure and is less than the maximum allowable pressure (160psi, for example).

It is normally recommended &/or required that a small relief valve (175psi, for example) be installed on the discharge side of the floor control PRV to avoid excessive static pressure buildup.

The same approximate results can be obtained for the residual inlet pressure of the hose valves by calculating the highest hose on a standpipe and then subtracting the friction loss and elevation for the hose valve at each lower floor. Individual hose valves generally need to reflect the hydraulic conditions (friction loss) flowing 250gpm.

For preliminary purposes, floor system requirements can be simulated in the Standpipe drawing by inserting a ‘Floating Node’ (found under ‘Hydraulics’ on the menu) at each intended point of connection for the floor systems. Set the floating node to a 'Pressure Dependent Flow', using the required flow and pressure that is anticipated for the floor system.
In either of these latter “shortcut” methods, remember to change the default (and normal) setting for the Calculation Method from "Satisfy minimum demand..." to "Pressure at supply..." using a 0.0psi margin (on the 'Settings \Hydraulic Calculations \Calculator' tab); and, remember to change it back to the default when you are done.

If multiple Floating Nodes are used, instead of moving a single FN from point to point, set them all to 'No demand on current system' with the exception of the one that you are calculating. These must be calculated one at a time. Delete all FNs when you are done.

**Notes:** Floating Nodes can be used to create a demand at any point of future connection within the Standpipe drawing. To have the program place nodes tags at all necessary points on the standpipe (highly recommended), place a gauge at all desired points (such as valves), place a floating node at each connection point for a floor/future floor (using the default flow options, gpm and psi), open all hose valves (set to ‘Fixed Flow’ with any gpm and psi) and then click on ‘Update Node Tags’.

If desired, additional nodes can be added (using ‘Hydraulics \Node Tags \Single’). All node numbers can be changed manually, if desired, but ‘Update Node Tags’ must then be used to correct any possible duplication of numbers on the drawing. (The calculator will not use duplicate numbers so the drawing must be updated to match the calculations. This is normally accomplished automatically when the hydraulic calculations are previewed &/or printed.)

Once all necessary and desired node tags are in place, the floating nodes should all be deleted and the hose valves closed (set to ‘Not Flowing’). The standpipe drawing can then be used as an X-Ref to supply the Floor system drawings.

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