

Calculation Report for "Primary 1-12-21 BR"

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Project Information

Project:
System:
Client:
Reference:
Designer:
Date:

System Designed By

MIFAB, Inc
 1321 West 119th Street
 Chicago
 IL
 60643-5109
 USA
 1-800-465-2736
 1-773-341-3049
 hydromax@mifab.com



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Hydraulic Calculation Summary

Current
 Out of Balance 1.38 ft
 Minimum Pressure -22.499 ft
 Maximum Pressure 12.184 ft
 Minimum Velocity 5.859 ft/sec
 Minimum Vertical Velocity 7.855 ft/sec
 Maximum Velocity 26.777 ft/sec
 Discharge Velocity 15.55 ft/sec
 Fill time 52 seconds
 Pass/Fail? **PASS**

| Tail Pressures | |
|----------------|-----------|
| 1 | -1.857 ft |
| 2 | -1.957 ft |
| 3 | -0.942 ft |
| 4 | -2.322 ft |

Material Parameters

| Material | Actual Diameter | Nominal Diameter | K/Roughness |
|------------------|-----------------|------------------|-------------|
| PVC sch 40 solid | 2" | 2" | 0.15 |
| PVC sch 40 solid | 4" | 4" | 0.15 |
| PVC sch 40 solid | 3" | 3" | 0.15 |

Overall Parameters

| No. | Type | Diameter | Length | Height | Direction | Flowrate | Velocity | Headloss | Pressure | Loading |
|-----|-----------------|----------|--------|--------|-----------|----------|--------------|----------|-----------|-----------|
| 0 | Discharge | 4" | | 0 | | 617 gpm | 15.55 ft/sec | 3' 9" | 0 ft | 0 lb/ft |
| 1 | Pipe | 4" | 5' | 0 | +X | 617 gpm | 15.55 ft/sec | 1' 3" | 1.243 ft | 7.3 lb/ft |
| 2 | 90° radius bend | 4" | | 0 | | 617 gpm | 15.55 ft/sec | 1' 1½" | 2.37 ft | 7.3 lb/ft |
| 3 | Pipe | 4" | 10' | 10' | +Z | 617 gpm | 15.55 ft/sec | 2' 6" | -5.143 ft | 7.3 lb/ft |
| 4 | Pipe | 4" | 3' | 3' | +Z | 617 gpm | 15.55 ft/sec | 9" | -7.398 ft | 7.3 lb/ft |
| 5 | 90° radius bend | 4" | | 0 | | 617 gpm | 15.55 ft/sec | 1' 1½" | -6.271 ft | 7.3 lb/ft |
| 6 | Pipe | 4" | 14' 4" | 0 | +X | 617 gpm | 15.55 ft/sec | 3' 7" | -2.707 ft | 7.3 lb/ft |
| 7 | 45° elbow | 4" | | 0 | | 617 gpm | 15.55 ft/sec | 1' ½" | -1.655 ft | 7.3 lb/ft |
| 8 | Pipe | 4" | 26' 6" | 0 | +X +Y | 617 gpm | 15.55 ft/sec | 6' 7" | 4.934 ft | 7.3 lb/ft |
| 9 | 45° elbow | 4" | | 0 | | 617 gpm | 15.55 ft/sec | 1' ½" | 5.986 ft | 7.3 lb/ft |
| 10 | Pipe | 4" | 9' 4" | 0 | +X | 617 gpm | 15.55 ft/sec | 2' 4" | 8.306 ft | 7.3 lb/ft |
| 11 | 45° elbow | 4" | | 0 | | 617 gpm | 15.55 ft/sec | 1' ½" | 9.358 ft | 7.3 lb/ft |

| No. | Type | Diameter | Length | Height | Direction | Flowrate | Velocity | Headloss | Pressure | Loading |
|-----|----------------------------|----------|---------|--------|-----------|----------|--------------|----------|------------|-----------|
| 12 | Pipe | 4" | 6' 10" | 0 | +X +Y | 617 gpm | 15.55 ft/sec | 1' 8½" | 11.057 ft | 7.3 lb/ft |
| 13 | 90° radius bend | 4" | | 0 | | 617 gpm | 15.55 ft/sec | 1' 1½" | 12.184 ft | 7.3 lb/ft |
| 14 | Expansion | 3" | | 0 | | 617 gpm | 26.78 ft/sec | 1' 11½" | 6.76 ft | 4.4 lb/ft |
| 15 | Pipe | 3" | 81' | 81' | +Z | 617 gpm | 26.78 ft/sec | 83' 2" | 8.908 ft | 4.4 lb/ft |
| 16 | Reducer | 3" | | 0 | | 617 gpm | 26.78 ft/sec | 2' 2" | 11.067 ft | 4.4 lb/ft |
| 17 | Pipe | 4" | 54' 6" | 54' 6" | +Z | 617 gpm | 15.55 ft/sec | 13' 6½" | -22.499 ft | 7.3 lb/ft |
| 18 | 90° radius bend | 4" | | 0 | | 617 gpm | 15.55 ft/sec | 1' 1½" | -21.372 ft | 7.3 lb/ft |
| 19 | Pipe | 4" | 5' | 0 | -Y | 617 gpm | 15.55 ft/sec | 1' 3" | -20.129 ft | 7.3 lb/ft |
| 20 | Junction | 4" | | 0 | | 151 gpm | 3.81 ft/sec | 6" | -16.088 ft | 7.3 lb/ft |
| 21 | Expansion | 3" | | 0 | | 151 gpm | 6.55 ft/sec | 1½" | -16.413 ft | 4.4 lb/ft |
| 22 | 90° radius bend | 3" | | 0 | | 151 gpm | 6.55 ft/sec | 2½" | -16.212 ft | 4.4 lb/ft |
| 23 | Expansion | 2" | | 0 | | 151 gpm | 14.44 ft/sec | 11½" | -17.818 ft | 2 lb/ft |
| 24 | Pipe | 2" | 2' | 0 | -X | 151 gpm | 14.44 ft/sec | 1' | -16.818 ft | 2 lb/ft |
| 25 | Pipe | 2" | 9' | 0 | -X | 151 gpm | 14.44 ft/sec | 4' 6" | -12.32 ft | 2 lb/ft |
| 26 | 90° radius bend | 2" | | 0 | | 151 gpm | 14.44 ft/sec | 11½" | -11.348 ft | 2 lb/ft |
| 27 | Pipe | 2" | 10' 6" | 0 | -Y | 151 gpm | 14.44 ft/sec | 5' 3" | -6.1 ft | 2 lb/ft |
| 28 | 90° radius bend | 2" | | 0 | | 151 gpm | 14.44 ft/sec | 11½" | -5.129 ft | 2 lb/ft |
| 29 | Pipe | 2" | 6" | 6" | +Z | 151 gpm | 14.44 ft/sec | 3" | -5.379 ft | 2 lb/ft |
| 30 | Pipe | 2" | 9" | 9" | +Z | 151 gpm | 14.44 ft/sec | 4½" | -5.749 ft | 2 lb/ft |
| 31 | Flexible joint (reducer) | 2" | | 0 | | 151 gpm | 14.44 ft/sec | 9½" | -4.951 ft | 0 lb/ft |
| 32 | MH-300 (23 to 415 GPM) | 3" | | 0 | | 151 gpm | 7.04 ft/sec | 1" | -1.857 ft | 0 lb/ft |
| 33 | Branch | 4" | | 0 | | 466 gpm | 11.74 ft/sec | 1' 4" | -17.18 ft | 7.3 lb/ft |
| 34 | 45° elbow | 4" | | 0 | | 466 gpm | 11.74 ft/sec | 7" | -16.58 ft | 7.3 lb/ft |
| 35 | Pipe | 4" | 13' 10" | 0 | +X | 466 gpm | 11.74 ft/sec | 1' 11½" | -14.602 ft | 7.3 lb/ft |
| 36 | 90° radius bend | 4" | | 0 | | 466 gpm | 11.74 ft/sec | 7½" | -13.959 ft | 7.3 lb/ft |
| 37 | Pipe | 4" | 8' 2" | 0 | +Y | 466 gpm | 11.74 ft/sec | 1' 2" | -12.79 ft | 7.3 lb/ft |
| 38 | Junction | 4" | | 0 | | 331 gpm | 8.34 ft/sec | 7½" | -11.104 ft | 7.3 lb/ft |
| 39 | Pipe | 4" | 25' | 0 | +Y | 331 gpm | 8.34 ft/sec | 1' 10" | -9.275 ft | 7.3 lb/ft |
| 40 | Expansion | 3" | | 0 | | 331 gpm | 14.37 ft/sec | 7" | -10.836 ft | 4.4 lb/ft |
| 41 | Pipe | 3" | 1' 4" | 0 | +Y | 331 gpm | 14.37 ft/sec | 5" | -10.437 ft | 4.4 lb/ft |
| 42 | Junction | 3" | | 0 | | 150 gpm | 6.51 ft/sec | 1' 2½" | -6.694 ft | 4.4 lb/ft |
| 43 | 90° radius bend | 3" | | 0 | | 150 gpm | 6.51 ft/sec | 2½" | -6.496 ft | 4.4 lb/ft |
| 44 | Pipe | 3" | 24' 10" | 0 | -X | 150 gpm | 6.51 ft/sec | 1' 7" | -4.919 ft | 4.4 lb/ft |
| 45 | 90° radius bend | 3" | | 0 | | 150 gpm | 6.51 ft/sec | 2½" | -4.721 ft | 4.4 lb/ft |
| 46 | Pipe | 3" | 3' | 0 | +Y | 150 gpm | 6.51 ft/sec | 2½" | -4.53 ft | 4.4 lb/ft |
| 47 | Pipe | 3" | 11' 10" | 0 | +Y | 150 gpm | 6.51 ft/sec | 9" | -3.779 ft | 4.4 lb/ft |
| 48 | 90° radius bend | 3" | | 0 | | 150 gpm | 6.51 ft/sec | 2½" | -3.581 ft | 4.4 lb/ft |
| 49 | Expansion | 2" | | 0 | | 150 gpm | 14.34 ft/sec | 11½" | -5.165 ft | 2 lb/ft |
| 50 | Pipe | 2" | 6" | 6" | +Z | 150 gpm | 14.34 ft/sec | 3" | -5.419 ft | 2 lb/ft |
| 51 | Pipe | 2" | 9" | 9" | +Z | 150 gpm | 14.34 ft/sec | 4½" | -5.794 ft | 2 lb/ft |
| 52 | Flexible joint (reducer) | 2" | | 0 | | 150 gpm | 14.34 ft/sec | 9½" | -5.006 ft | 0 lb/ft |
| 53 | MH-300 (23 to 415 GPM) | 3" | | 0 | | 150 gpm | 6.99 ft/sec | 1" | -1.957 ft | 0 lb/ft |
| 54 | Branch | 3" | | 0 | | 181 gpm | 7.86 ft/sec | 10" | -7.367 ft | 4.4 lb/ft |
| 55 | 45° elbow | 3" | | 0 | | 181 gpm | 7.86 ft/sec | 3½" | -7.062 ft | 4.4 lb/ft |
| 56 | Pipe | 3" | 48' 4" | 0 | +X | 181 gpm | 7.86 ft/sec | 4' 5" | -2.634 ft | 4.4 lb/ft |
| 57 | 90° radius bend | 3" | | 0 | | 181 gpm | 7.86 ft/sec | 3½" | -2.346 ft | 4.4 lb/ft |
| 58 | Pipe | 3" | 15' | 0 | +Y | 181 gpm | 7.86 ft/sec | 1' 4½" | -0.972 ft | 4.4 lb/ft |
| 59 | 90° radius bend | 3" | | 0 | | 181 gpm | 7.86 ft/sec | 3½" | -0.685 ft | 4.4 lb/ft |
| 60 | Pipe | 3" | 6" | 6" | +Z | 181 gpm | 7.86 ft/sec | ½" | -1.139 ft | 4.4 lb/ft |
| 61 | Pipe | 3" | 9" | 9" | +Z | 181 gpm | 7.86 ft/sec | 1" | -1.812 ft | 4.4 lb/ft |
| 62 | Flexible joint (expansion) | 3" | | 0 | | 181 gpm | 8.44 ft/sec | 0 | -1.954 ft | 0 lb/ft |
| 63 | MH-300 (23 to 415 GPM) | 3" | | 0 | | 181 gpm | 8.44 ft/sec | 1½" | -0.942 ft | 0 lb/ft |
| 64 | Branch | 3" | | 0 | | 135 gpm | 5.86 ft/sec | ½" | -11.132 ft | 4.4 lb/ft |
| 65 | 45° elbow | 3" | | 0 | | 135 gpm | 5.86 ft/sec | 2" | -10.944 ft | 4.4 lb/ft |
| 66 | Pipe | 3" | 48' 10" | 0 | +X | 135 gpm | 5.86 ft/sec | 2' 6½" | -8.416 ft | 4.4 lb/ft |
| 67 | 90° radius bend | 3" | | 0 | | 135 gpm | 5.86 ft/sec | 2" | -8.256 ft | 4.4 lb/ft |
| 68 | Pipe | 3" | 10' | 0 | -Y | 135 gpm | 5.86 ft/sec | 6" | -7.739 ft | 4.4 lb/ft |
| 69 | Expansion | 2" | | 0 | | 135 gpm | 12.91 ft/sec | 9½" | -9.022 ft | 2 lb/ft |
| 70 | Pipe | 2" | 9' | 0 | -Y | 135 gpm | 12.91 ft/sec | 3' 7½" | -5.414 ft | 2 lb/ft |
| 71 | 90° radius bend | 2" | | 0 | | 135 gpm | 12.91 ft/sec | 9½" | -4.637 ft | 2 lb/ft |
| 72 | Pipe | 2" | 6" | 6" | +Z | 135 gpm | 12.91 ft/sec | 2½" | -4.937 ft | 2 lb/ft |
| 73 | Pipe | 2" | 9" | 9" | +Z | 135 gpm | 12.91 ft/sec | 3½" | -5.381 ft | 2 lb/ft |
| 74 | Flexible joint (reducer) | 2" | | 0 | | 135 gpm | 12.91 ft/sec | 7½" | -4.743 ft | 0 lb/ft |
| 75 | MH-300 (23 to 415 GPM) | 3" | | 0 | | 135 gpm | 6.29 ft/sec | 1" | -2.322 ft | 0 lb/ft |

Report for "Primary 1-12-21 BR"

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