**Section 906.APPENDIX A Illustrations and Exhibits**

**Section 906.ILLUSTRATION A Plan View of a Mound Utilizing Two Trenches as the Absorption Area**



**Section 906.APPENDIX A Illustrations and Exhibits**

**Section 906.ILLUSTRATION B Cross-Section of a Mound Using Trenches for the Absorption Area**



**Section 906.APPENDIX A Illustrations and Exhibits**

**Section 906.ILLUSTRATION C Plan View of a Mound Utilizing a Bed as the Absorption Area**



**Section 906.APPENDIX A Illustrations and Exhibits**

**Section 906.ILLUSTRATION D Cross-Section of a Mound Using a Bed for the Absorption Area**



**Section 906.APPENDIX A Illustrations and Exhibits**

**Section 906.ILLUSTRATION E Mound Distribution System**



Mound Distribution System (continued)



**Section 906.APPENDIX A Illustrations and Exhibits**

**Section 906.ILLUSTRATION F Typical Pumping Chamber**



**Section 906.APPENDIX A Illustrations and Exhibits**

**Section 906.ILLUSTRATION G Tee-To-Tee Lateral/Manifold Construction**



**Section 906.APPENDIX A Illustrations and Exhibits**

**Section 906.ILLUSTRATION H Dosing Frequencies for Various Soil Textures**

|  |  |
| --- | --- |
| Soil Texture | Dosing Frequency |
|  |  |
| Sand | 4 doses/day |
| Sandy loam | 1 dose/day |
| Loam | Frequency not critical\* |
| Silt loam; silty clay loam | 1 dose/day\* |
| Clay | Frequency not critical\* |

\*Long-term resting provided by alternating fields may be desirable.

**Section 906.APPENDIX A Illustrations and Exhibits**

**Section 906.ILLUSTRATION I Maximum Manifold Length (ft) for Various Manifold Diameters Given the Lateral Discharge Rate and Lateral Spacing**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| LateralDischarge Rate |  | ManifoldDiameter – 1¼" |  | ManifoldDiameter – 1½ " |  | ManifoldDiameter – 2" |
|  |  |
|  |
| EndManifold | CentralManifold |  | LateralSpacing (ft) |  | Lateral Spacing (ft) |  | LateralSpacing (ft) |
|  |  |
|  |  |  | 2 | 4 | 6 | 8 | 10 |  | 2 | 4 | 6 | 8 | 10 |  | 2 | 4 | 6 | 8 | 10 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 10 | 5 |  | 4 | 8 | 6 | 11 | 10 |  | 10 | 5 | 6 | 8 | 10 |  | 12 | 16 | 24 | 24 | 30 |
| 20 | 10 |  | 4 | 4 | 6 |  |  |  | 4 | 4 | 6 | 8 | 10 |  | 4 | 8 | 12 | 16 | 20 |
| 30 | 15 |  | 2 |  |  |  |  |  | 2 | 4 | 6 |  |  |  | 6 | 8 | 6 | 8 | 10 |
| 40 | 20 |  |  |  |  |  |  |  |  |  |  |  |  |  | 4 | 4 | 6 | 8 | 10 |
| 50 | 25 |  |  |  |  |  |  |  |  |  |  |  |  |  | 2 | 4 | 6 | 8 |  |
| 60 | 30 |  |  |  |  |  |  |  |  |  |  |  |  |  | 2 | 4 |  |  |  |
| 70 | 35 |  |  |  |  |  |  |  |  |  |  |  |  |  | 2 | 4 |  |  |  |
| 80 | 40 |  |  |  |  |  |  |  |  |  |  |  |  |  | 2 |  |  |  |  |
| 90 | 45 |  |  |  |  |  |  |  |  |  |  |  |  |  | 2 |  |  |  |  |
| 100 | 50 |  |  |  |  |  |  |  |  |  |  |  |  |  | 2 |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| LateralDischarge Rate |  | ManifoldDiameter – 3" |  | ManifoldDiameter – 4 " |  | ManifoldDiameter – 6" |
|  |  |
|  |
| EndManifold | CentralManifold |  | LateralSpacing (ft) |  | Lateral Spacing (ft) |  | LateralSpacing (ft) |
|  |  |
|  |  |  | 2 | 4 | 6 | 8 | 10 |  | 2 | 4 | 6 | 8 | 10 |  | 2 | 4 | 6 | 8 | 10 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 10 | 5 |  | 24 | 40 | 48 | 56 | 70 |  | 42 | 64 | 84 | 96 | 110 |  | 84 | 136 | 174 | 206 | 240 |
| 20 | 10 |  | 16 | 24 | 30 | 32 | 40 |  | 26 | 40 | 54 | 64 | 70 |  | 54 | 84 | 108 | 128 | 150 |
| 30 | 15 |  | 12 | 16 | 24 | 24 | 30 |  | 20 | 28 | 36 | 48 | 50 |  | 42 | 64 | 84 | 96 | 110 |
| 40 | 20 |  | 10 | 12 | 18 | 16 | 20 |  | 16 | 24 | 30 | 32 | 40 |  | 34 | 52 | 66 | 80 | 90 |
| 50 | 25 |  | 8 | 12 | 12 | 16 | 20 |  | 14 | 20 | 24 | 32 | 40 |  | 30 | 44 | 60 | 72 | 80 |
| 60 | 30 |  | 6 | 8 | 12 | 16 | 20 |  | 12 | 16 | 24 | 24 | 30 |  | 26 | 40 | 48 | 64 | 70 |
| 70 | 35 |  | 6 | 8 | 12 | 8 | 10 |  | 10 | 16 | 18 | 24 | 30 |  | 24 | 36 | 48 | 56 | 60 |
| 80 | 40 |  | 6 | 8 | 6 | 8 | 10 |  | 10 | 12 | 18 | 16 | 20 |  | 22 | 32 | 42 | 48 | 60 |
| 90 | 45 |  | 4 | 8 | 6 | 8 | 10 |  | 8 | 12 | 18 | 16 | 20 |  | 20 | 28 | 42 | 48 | 50 |
| 100 | 50 |  | 4 | 4 | 6 | 8 | 10 |  | 8 | 12 | 12 | 16 | 20 |  | 18 | 28 | 36 | 40 | 50 |
| 110 | 55 |  | 4 | 4 | 6 | 8 | 10 |  | 8 | 12 | 12 | 16 | 20 |  | 16 | 24 | 36 | 40 | 40 |
| 120 | 60 |  | 4 | 4 | 6 | 8 | 10 |  | 6 | 8 | 12 | 16 | 10 |  | 16 | 24 | 30 | 32 | 40 |
| 130 | 65 |  | 4 | 4 | 6 | 8 | 10 |  | 6 | 8 | 12 | 16 | 10 |  | 14 | 24 | 30 | 32 | 40 |
| 140 | 70 |  | 2 | 4 | 6 | 8 |  |  | 6 | 8 | 12 | 8 | 10 |  | 14 | 20 | 24 | 32 | 40 |
| 150 | 75 |  | 2 | 4 | 6 |  |  |  | 6 | 8 | 12 | 8 | 10 |  | 14 | 20 | 24 | 32 | 30 |
| 160 | 80 |  | 2 | 4 | 6 |  |  |  | 6 | 8 | 6 | 8 | 10 |  | 12 | 20 | 24 | 32 | 30 |
| 170 | 85 |  | 2 | 4 | 6 |  |  |  | 4 | 8 | 6 | 8 | 10 |  | 12 | 20 | 24 | 24 | 30 |
| 180 | 90 |  | 2 | 4 |  |  |  |  | 4 | 8 | 6 | 8 | 10 |  | 12 | 16 | 24 | 24 | 30 |
| 190 | 95 |  | 2 | 4 |  |  |  |  | 4 | 8 | 6 | 8 | 10 |  | 12 | 16 | 18 | 24 | 30 |
| 200 | 100 |  | 2 | 4 |  |  |  |  | 4 | 4 | 6 | 8 | 10 |  | 10 | 16 | 18 | 24 | 30 |

**Section 906.APPENDIX A Illustrations and Exhibits**

**Section 906.EXHIBIT A Soil and Site Factors that Restrict Mound Systems**

|  |  |
| --- | --- |
|  | Soil Group |
|  | Slowly Permeable Soils | Permeable Soils With Pervious Bedrock | Permeable Soils With High Water Tables |
| Percolation rate a | 180-360 min. | 18-180 min. | 18-180 min. |
| Depth to pervious rock | 24 in. | 24 in. | 24 in. |
| Depth of high water tables | 24 in. | 24 in. | 24 in. |
| Minimum depth to impermeable soil layer or rock strata | 60 in. | 60 in. | 60 in. |
| Depth to 50% by volume rock fragments | 24 in. | 24 in.  | 24 in.  |
| Slope | 6% | 12b | 12% b |

a Percolation test depth at 24 in., 12 in., and 24 in., for slowly permeable, shallow soils and high water table soils, respectively, unless there is a more restrictive horizon above. If perched water is at 24 in., test depth should be held to 16 in.

b For percolation rate of 18-90 minutes max. slope is 12% and for 18-360 minutes, max. slope is 6%.

**Section 906.APPENDIX A Illustrations and Exhibits**

**Section 906.EXHIBIT B Fine Aggregate Gradations**

|  |
| --- |
| Sieve Size |
| Percent Passing |
| Grad. |  | No. | No. | No. | No. | No. | No. | No. | No. | No. |
| No. | 3/8 | 4 | 8 | 10 | 16 | 40 | 50 | 80 | 100 | 200 |
| FA 1 | 100 | 97±3 |  |  | 65±20 |  | 16±13 |  | 5±5 |  |
| FA 2 | 100 | 97±3 |  |  | 65±20 |  | 20±10 |  | 5±5 |  |
| FA 3 | 100 | 97±3 |  | 80±15 |  | 50±20 |  | 25±15 |  | 3±3 |
| FA 4 | 100 |  |  |  | 5±5 |  |  |  |  |  |
| FA 5 | 100 | 92±8 |  |  |  |  |  |  | 20±20 | 15±15 |
| FA 6 |  | 92±8 |  |  |  |  |  |  | 20±20 | 5±5 |
| FA 7 |  | 100 |  | 97±3 |  | 75±15 |  | 35±10 |  | 3±3 |
| FA 8 |  |  | 100 |  |  | 60±20 |  |  | 3±3 | 2±2 |
| FA 9 |  |  | 100 |  |  |  | 20±15 |  | 5±5 |  |
| FA 10 |  |  |  | 100 |  | 90±10 |  | 60±30 |  | 7±7 |

Horizontal Grade No. indicates the sieve sizes used to test the material sample. FA numbers indicate the Illinois Department of Transportation fine aggregate sizes.

Numbers throughout the table such as 97 ± 3 mean that 97% of the sample, plus or minus 3% of the sample passed through the screen.

**Section 906.APPENDIX A Illustrations and Exhibits**

**Section 906.EXHIBIT C Downslope and Upslope Width Corrections for Mounds on Sloping Sites**

|  |  |  |
| --- | --- | --- |
| Slope % | Downslope (I) Correction Factor | Upslope (J) Correction Factor |
|  |  |  |
| 0 | 1.00 | 1.00 |
|  |  |  |
| 2 | 1.06 |  .94 |
|  |  |  |
| 4 | 1.14 |  .89 |
|  |  |  |
| 6 | 1.22 |  .86 |
|  |  |  |
| 8 | 1.32 |  .80 |
|  |  |  |
| 10 | 1.44 |  .77 |
|  |  |  |
| 12 | 1.57 |  .73 |

**Section 906.APPENDIX A Illustrations and Exhibits**

**Section 906.EXHIBIT D Allowable Lateral Lengths (Feet) for Three Pipe Diameters, Three Perforation Sizes, and Two Perforations Spacings 906.60 if system is to treat flow from more than 4 bedrooms)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Perforation Spacing (in) | Perforation Diameter (in) | (1 in) | (1¼ in) | (1½ in) |
| 30 | 3/16 | 34 | 52 | 70 |
|  | 7/32 | 30 | 45 | 57 |
|  | 1/4 | 25 | 38 | 50 |
| 36 | 3/16 | 36 | 60 | 75 |
|  | 7/32 | 33 | 51 | 63 |
|  | 1/4 | 27 | 42 | 54 |

**Section 906.APPENDIX A Illustrations and Exhibits**

**Section 906.EXHIBIT E Dosing Quantity for Various Sized Homes**

|  |  |  |
| --- | --- | --- |
| Home SizeNo. Bedrooms | GallonsDay | Dosing Quantity\*Gal/Dose |
| 1 | 200 | 50 |
| 2 | 400 | 100 |
| 3 | 600 | 150 |
| 4 | 800 | 200 |

\* Each system must be checked to determine if this quantity is at least 10 times the lateral void volume.

**Section 906.APPENDIX A Illustrations and Exhibits**

**Section 906.EXHIBIT F Void Volume for Various Diameter Pipes**

|  |  |
| --- | --- |
| Diameterinch | Volumegal/ft/length |
| 1 | .041 |
| 1¼ | .064 |
| 1½ | .092 |
| 2 | .164 |
| 3 | .368 |
| 4 | .655 |
| 6 | 1.470 |

**Section 906.APPENDIX A Illustrations and Exhibits**

**Section 906.EXHIBIT G Pumping Chamber Sizes for Various Sized Homes**

|  |  |
| --- | --- |
| Home SizeNo. Bedrooms | Minimum Pumping Chamber SizeGallons |
| 1 | 250-500 |
| 2 | 250-500 |
| 3 | 500-750 |
| 4 | 500-750 |

**Section 906.APPENDIX A Illustrations and Exhibits**

**Section 906.EXHIBIT H Perforation Discharge Rates in Gallons per Minute Versus Perforation Diameter and In-Line Pressure**

|  |  |  |
| --- | --- | --- |
| In-Line Pressure(ft) | Perforation Diameter (in) |  |
|  |  |  |  |  |  |  |
| 1/4 | 5/16 | 3/8 | 7/16 | 1/2 | 9/16 | 5/8 |
| 1.0 | 0.74 | 1.15 | 1.66 | 2.26 | 2.95 | 3.73 | 4.60 |
| 1.5 | 0.90 | 1.41 | 2.03 | 2.76 | 3.61 | 4.57 | 5.64 |
| 2.0 | 1.17 | 1.82 | 2.62 | 3.57 | 4.66 | 5.90 | 7.28 |
| 3.0 | 1.28 | 1.99 | 2.87 | 3.91 | 5.10 | 6.46 | 7.97 |
| 3.5 | 1.38 | 2.15 | 3.10 | 4.22 | 5.51 | 6.98 | 8.61 |
| 4.0 | 1.47 | 2.30 | 3.31 | 4.51 | 5.89 | 7.46 | 9.21 |
| 4.5 | 1.56 | 2.44 | 3.52 | 4.79 | 6.25 | 7.91 | 9.77 |
| 5.0 | 1.65 | 2.57 | 3.71 | 5.04 | 6.59 | 8.34 | 10.29 |

**Section 906.APPENDIX A Illustrations and Exhibits**

**Section 906.EXHIBIT I Friction Loss in Schedule 40 Plastic Pipe**

FRICTION LOSS IN SCHEDULE 40 PLASTIC PIPE, C = 150

(ft/100 ft)

Pipe Diameter (in.)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Flow | 1 | 1¼ | 1½ | 2 | 3 | 4 | 6 | 8 | 10 |
| gpm |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| 1 | 0.07 |  |  |  |  |  |  |  |  |
| 2 | 0.28 | 0.07 |  |  |  |  |  |  |  |
| 3 | 0.60 | 0.16 | 0.07 |  |  |  |  |  |  |
| 4 | 1.01 | 0.25 | 0.12 |  |  |  |  |  |  |
| 5 | 1.52 | 0.39 | 0.18 |  |  |  |  |  |  |
| 6 | 2.14 | 0.55 | 0.25 | 0.07 |  |  |  |  |  |
| 7 | 2.89 | 0.76 | 0.36 | 0.10 |  |  |  |  |  |
| 8 | 3.63 | 0.97 | 0.46 | 0.14 |  |  |  |  |  |
| 9 | 4.57 | 1.21 | 0.58 | 0.17 |  |  |  |  |  |
| 10 | 5.50 | 1.46 | 0.70 | 0.21 |  |  |  |  |  |
| 11 |  | 1.77 | 0.84 | 0.25 |  |  |  |  |  |
| 12 |  | 2.09 | 1.01 | 0.30 |  |  |  |  |  |
| 13 |  | 2.42 | 1.17 | 0.35 |  |  |  |  |  |
| 14 |  | 2.74 | 1.33 | 0.39 |  |  |  |  |  |
| 15 |  | 3.06 | 1.45 | 0.44 | 0.07 |  |  |  |  |
| 16 |  | 3.49 | 1.65 | 0.50 | 0.08 |  |  |  |  |
| 17 |  | 3.93 | 1.86 | 0.56 | 0.09 |  |  |  |  |
| 18 |  | 4.37 | 2.07 | 0.62 | 0.10 |  |  |  |  |
| 19 |  | 4.81 | 2.28 | 0.68 | 0.11 |  |  |  |  |
| 20 |  | 5.23 | 2.46 | 0.74 | 0.12 |  |  |  |  |
| 25 |  |  | 3.75 | 1.10 | 0.16 |  |  |  |  |
| 30 |  |  | 5.22 | 1.54 | 0.23 |  |  |  |  |
| 35 |  |  |  | 2.05 | 0.30 | 0.07 |  |  |  |
| 40 |  |  |  | 2.62 | 0.39 | 0.09 |  |  |  |
| 45 |  |  |  | 3.27 | 0.48 | 0.12 |  |  |  |
| 50 |  |  |  | 3.98 | 0.58 | 0.16 |  |  |  |
| 60 |  |  |  |  | 0.81 | 0.21 |  |  |  |
| 70 |  |  |  |  | 1.08 | 0.28 |  |  |  |
| 80 |  |  |  |  | 1.38 | 0.37 |  |  |  |
| 90 |  |  |  |  | 1.73 | 0.46 |  |  |  |
| 100 |  |  |  |  | 2.09 | 0.55 | 0.07 |  |  |
| 150 |  |  |  |  |  | 1.17 | 0.16 |  |  |
| 200 |  |  |  |  |  |  | 0.28 | 0.07 |  |
| 250 |  |  |  |  |  |  | 0.41 | 0.11 |  |
| 300 |  |  |  |  |  |  | 0.58 | 0.16 |  |
| 350 |  |  |  |  |  |  | 0.78 | 0.20 | 0.07 |
| 400 |  |  |  |  |  |  | 0.99 | 0.26 | 0.09 |
| 450 |  |  |  |  |  |  | 1.22 | 0.32 | 0.11 |
| 500 |  |  |  |  |  |  |  | 0.38 | 0.14 |
| 600 |  |  |  |  |  |  |  | 0.54 | 0.18 |
| 700 |  |  |  |  |  |  |  | 0.72 | 0.24 |
| 800 |  |  |  |  |  |  |  |  | 0.32 |
| 900 |  |  |  |  |  |  |  |  | 0.38 |
| 1000 |  |  |  |  |  |  |  |  | 0.46 |