2.2.3 The Method of 72 to Determine Effective Soil Depths to Porous Layers and Ground Water

Often times effective soil depths as required by IDAPA 58.01.03.008.02.c are not achievable due to various site conditions. In response to this issue section 2.2.1 provides guidance for reducing separation distances to limiting layers based upon soil design subgroups. In some situations this guidance does not go far enough to address these site limitations, nor does it provide guidance on how to approach separation distances to limiting layers when the soil profile is variable and does not meet the minimum effective soil depths as described in IDAPA 58.01.03.008.02 or table 2-6, or when the In-trench Sand Filter system design is utilized. To provide further guidance in these situations the Technical Guidance Committee has developed the Method of 72.

The Method of 72 is based upon assigning treatment units to soil design subgroups. Treatment units assigned to soil design subgroups are extrapolated from the effective soil depths required by IDAPA 58.01.03.008.02.c. Based on this rule it can be determined that 72 treatment units are necessary from the drainfield-soil interface to the porous layer/ground water to ensure adequate treatment of effluent by the soil. Table 2-7 provides the treatment units assigned to each soil design subgroup.

Table 2-7. Treatment units assigned to each soil design subgroup per foot and per inch. (*Medium sand receives an additional 6 treatment units for the sand-native soil interface)

<table>
<thead>
<tr>
<th>Soil Design Subgroup</th>
<th>A-1 / Medium Sand*</th>
<th>A-2</th>
<th>B-1</th>
<th>B-2</th>
<th>C-1</th>
<th>C-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment Units Per 12 Inches of Soil</td>
<td>12</td>
<td>14.4</td>
<td>18</td>
<td>24</td>
<td>24</td>
<td>28.8</td>
</tr>
<tr>
<td>Treatment Units Per Inch of Soil</td>
<td>1</td>
<td>1.2</td>
<td>1.5</td>
<td>2</td>
<td>2</td>
<td>2.4</td>
</tr>
</tbody>
</table>

2.2.3.1 Native Soil Profiles and the Method of 72

When the soil profile contains multiple suitable layers, but no layer is thick enough to meet the separation guidance provided in IDAPA 58.01.03.008.02.c or table 2-6, an individual may utilize the Method of 72 to determine the suitable separation distance for the proposed drainfield site. The following example is based off of the soil profile identified in figure 2-3.
Example 1:

Based upon the soil profile in figure 2-3 and the treatment units from table 2-7 the following treatment unit equivalent would be ascribed:

\[ \text{Treatment Units} = 24 + 36 + 21.6 = 81.6 \]

Since this is the treatment unit equivalent from grade to the porous layer or normal high ground water level the installation depth must still be determined. In this particular instance the soil profile has 9.6 treatment units more than the minimum necessary to be considered suitable for a standard alternative drainfield. To determine installation depth utilize the upper layer of the soil profile where the system will be installed and determine the treatment units per inch of soil. Once the treatment units per inch are known the depth of allowable installation can be determined.

\[ \frac{24 \text{ treatment units}}{12 \text{ inches of B-2 soil}} = 2 \text{ treatment units per inch} \]

\[ \text{Installation depth} = \frac{9.6 \text{ excess treatment units}}{2 \text{ treatment units per inch}} \]
\[ \text{Installation depth} = 4.8 \text{ inches} \]

In this example a standard basic alternative system can be permitted. The system design would be a capping fill trench with a maximum installation depth of 4.5 inches below grade.

2.2.3.2 In-Trench Sand Filters and the Method of 72

The Method of 72 may also be used in determining the necessary depth of medium sand required for installation between a drainfield and the native soils overlying a porous limiting layer or normal high ground water. In this application an additional 6 treatment units are allotted for the medium sand and native soil interface. Medium sand is classified under the A-1 soil design subgroup providing 12 treatment units per foot of medium sand. Treatment units for native soils are provided in table 2-7. The following example is based off of the soil profile identified in figure 2-4.
Example 2:

In this example the site soils must be excavated down to 54 inches to access suitable soils. This leaves 36 inches of A-2b soils, providing 43.2 treatment units. An additional 6 treatment units is then added for the medium sand – native soil interface, for a total of 49.2 treatment units. The amount of medium sand required to be backfilled prior to system installation would be determined as follows:

\[
\text{Remaining treatment units} = 72 - 49.2 = 22.8
\]

\[
\text{Depth of medium sand required} = \frac{22.8 \text{ treatment units remaining}}{1 \text{ treatment unit per inch}} = 23 \text{ inches}
\]

Thus the medium sand would be backfilled to a depth of 31 inches below grade. The drainfield would then be installed on top of the leveled medium sand.

*Note: Regardless of soil profile and treatment units necessary, drainfields must be installed no deeper than 48 inches below grade per IDAPA 58.01.03.008.04.*