TABLE OF CONTENTS

PREFACE – ATL SYSTEM APPLICATIONS INFORMATION 3
I.  INTRODUCTION AND SPECIFICATIONS 4
II.  DEFINITIONS 9
III. DESCRIPTION AND PRINCIPLE OF OPERATION 10
IV.  SOIL AND SITE REQUIREMENTS 10
V.  FILL AND COVER MATERIAL 11
VI.  DESIGN 11
VII. SITE PREPARATION AND CONSTRUCTION 16
VIII. OPERATION, MAINTENANCE AND PERFORMANCE MONITORING 19
IX.  REFERENCES 21
X.  ATL SYSTEM IN-GROUND WORKSHEET 22
XI. EXAMPLE ATL SYSTEM IN-GROUND WORKSHEET 26
XII. PLAN SUBMITTAL AND INSTALLATION INSPECTION 29
XIII. POWTS INSPECTION REPORT 32

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This component manual was produced exclusively for use with ATL products. This manual is originally based upon the “In-Ground Soil Absorption Component Manual for Private Onsite Wastewater Treatment Systems” Ver. 2.0, October 2012, by the State of Wisconsin, Department of Safety and Professional Services, with periodic updates applied.

Infiltrator Water Technologies (Infiltrator) reserves the right to revise this component manual according to changes in regulations or ATL system installation instructions.
Preface

**ATL SYSTEM APPLICATIONS INFORMATION**

<table>
<thead>
<tr>
<th>ATL System Type¹</th>
<th>Infiltrator ATL System Design Document</th>
<th>1-ft Depth Credit Allowed</th>
<th>System Sand Depth (inches)</th>
<th>Effluent Distribution Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subsurface bed</td>
<td>ATL System In-Ground Component Manual</td>
<td>No</td>
<td>6</td>
<td>Gravity</td>
</tr>
<tr>
<td>Subsurface bed</td>
<td>ATL System In-Ground Component Manual</td>
<td>Yes</td>
<td>6</td>
<td>Pressure</td>
</tr>
<tr>
<td>Above-ground bed</td>
<td>ATL System Mound Component Manual</td>
<td>Yes</td>
<td>6</td>
<td>Pressure</td>
</tr>
<tr>
<td>Mound</td>
<td>ATL System Mound Component Manual</td>
<td>Yes</td>
<td>6</td>
<td>Pressure</td>
</tr>
</tbody>
</table>

¹ If any part of the ATL distribution cell is above grade then the ATL System Mound Component Manual shall be used.
I. INTRODUCTION AND SPECIFICATIONS

This Private Onsite Wastewater Treatment System (POWTS) component manual provides design, construction, inspection, operation, and maintenance specifications for an ATL System in-ground soil absorption component. However, these items must accompany a properly prepared and reviewed plan acceptable to the governing unit to help provide a system that can be installed and function properly. Violations of this manual constitute a violation of SPS 383 and 384, Wis. Adm. Code. The ATL System in-ground soil absorption component must receive influent flows and loads less than or equal to those specified in Table 1. When designed, installed, and maintained in accordance with this manual, the ATL System in-ground soil absorption component provides treatment and dispersal of domestic wastewater in conformance with SPS 383 of the Wis. Adm. Code. Final effluent characteristics will comply with SPS 383.41, Wis. Adm. Code when inputs are within the range specified in Tables 1 to 3.

Note: Detailed plans and specifications must be developed and submitted to be reviewed and approved by the governing unit having authority over the plan for the installation. Also, a Sanitary Permit must be obtained from the department or governmental unit having jurisdiction. See Section XII for more details.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>INFLUENT FLOWS AND LOADS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design wastewater flow (DWF)</td>
<td>≤ 5,000 gal/day</td>
</tr>
<tr>
<td>Dosing of Effluent required when DWF</td>
<td>&gt; 1,500 gal/day</td>
</tr>
<tr>
<td>Monthly average value of Fats, Oil and Grease (FOG)</td>
<td>≤ 30 mg/L</td>
</tr>
<tr>
<td>Monthly average value of five-day Biochemical Oxygen Demand (BOD₅)</td>
<td>≤ 220 mg/L</td>
</tr>
<tr>
<td>Monthly average value of Total Suspended Solids (TSS)</td>
<td>≤ 150 mg/L</td>
</tr>
<tr>
<td>Wastewater particle size</td>
<td>≤ 1/8 inch</td>
</tr>
<tr>
<td>Design loading rate of the basal area</td>
<td>= soil application rate of effluent with maximum monthly average values of BOD₅ and TSS of ≤ 30 mg/L as per SPS Table 383.44-1 or Table 383.44-2</td>
</tr>
<tr>
<td>Design wastewater flow (DWF) from one-or two-family dwellings</td>
<td>Based on SPS 383.43 (3), (4), or (5), Wis. Adm. Code</td>
</tr>
<tr>
<td>Design wastewater flow (DWF) from public facilities</td>
<td>≥ 150% of estimated daily wastewater flow in accordance with Table 4 of this manual or SPS 383.43 (6), Wis. Adm. Code</td>
</tr>
<tr>
<td>Volume of single dose when a pressure distribution system is utilized to disperse effluent [Use of pressure distribution is dictated by SPS 383.44(5)]</td>
<td>≥ 5 times the void volume of the distribution conduit(s) and ≤ 20% of the design wastewater flow</td>
</tr>
<tr>
<td>Volume of a single dose to soil absorption component when effluent is delivered to a non-pressure distribution system</td>
<td>≤ 20% of the design wastewater flow</td>
</tr>
<tr>
<td>Distribution cell area per orifice when pressure distribution is used</td>
<td>≤ 12 ft²</td>
</tr>
</tbody>
</table>
### Table 2a
SIZE AND ORIENTATION

| Minimum area of distribution cell | ≥ Design wastewater flow ÷ design loading rate of basal area for the in situ soil or a lower horizon if the lower horizon adversely affects the dispersal of wastewater in accordance with SPS 383.44 (4) (a) and (c), Wis. Adm. Code |
| Distribution cell width (A)\(^a\) | ≥ 3 feet and ≤ 11 feet |
| Distribution cell depth | Product height of 12 inches + system sand of 6 inches = 18 inches |
| Depth of cover over top of distribution cell | ≥ 12 inches and ≤ 4 feet |
| Depth of cover over top of distribution cell measured from in situ soil surface | ≥ 24 inches |

### Table 2b
MINIMUM SYSTEM SAND FOOTPRINT DIMENSIONS AND AREA

<table>
<thead>
<tr>
<th>Minimum Length of Conduit (ft)</th>
<th>3 Conduit Rows</th>
<th>4 Conduit Rows</th>
<th>5 Conduit Rows</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dimensions (A' x B')(^a)</td>
<td>Area (ft²)</td>
<td>Dimensions (A' x B')(^a)</td>
</tr>
<tr>
<td>140</td>
<td>7 x 52</td>
<td>364</td>
<td>9 x 42</td>
</tr>
<tr>
<td>210</td>
<td>7 x 72</td>
<td>504</td>
<td>9 x 62</td>
</tr>
<tr>
<td>280</td>
<td>7 x 102</td>
<td>714</td>
<td>9 x 72</td>
</tr>
<tr>
<td>350</td>
<td>7 x 122</td>
<td>854</td>
<td>9 x 92</td>
</tr>
</tbody>
</table>

### Table 2c
MINIMUM TOTAL LENGTH OF CONDUIT

<table>
<thead>
<tr>
<th>Number of Bedrooms</th>
<th>Minimum Conduit Length Required (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>140</td>
</tr>
<tr>
<td>3</td>
<td>210</td>
</tr>
<tr>
<td>4</td>
<td>280</td>
</tr>
<tr>
<td>5</td>
<td>350</td>
</tr>
<tr>
<td>Each additional</td>
<td>70</td>
</tr>
</tbody>
</table>
NOTES:

a. The conduit rows must be extended to within 12 inches of each end of the bed. The dimensions above include 12 inches of system sand in between each of the conduit rows.
b. Table 2b provides examples of dimensions and area; other configurations are allowed.
c. The conduits are manufactured in 10-foot lengths; all conduit row length calculations in Table 2c are rounded up to the nearest 10 feet.
d. Multiple bed systems: where site conditions or other considerations require multiple beds, the row-specific length dimensions in Table 2b may be modified to account for the number of beds.

Table 3
OTHER SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slope of in situ soil</td>
<td>≤ 25% in area of component</td>
</tr>
<tr>
<td>Vertical separation between distribution cell</td>
<td>≥ 3 ft measured to the bottom of the ATL system sand (gravity distribution)</td>
</tr>
<tr>
<td>Horizontal separation between ATL conduits</td>
<td>≥ 12 inches</td>
</tr>
<tr>
<td>Piping material in the pressure distribution system</td>
<td>Meets requirements of SPS 384.30 (2), Wis. Adm. Code</td>
</tr>
<tr>
<td>Piping material for observation pipes</td>
<td>Meets requirements of SPS 384.30 Table 384.30-1, Wis. Adm. Code</td>
</tr>
<tr>
<td>Bottom of distribution cell</td>
<td>Level</td>
</tr>
<tr>
<td>Slope of gravity flow ATL conduits</td>
<td>≤ 4 inches per 100 feet of conduit</td>
</tr>
<tr>
<td>Location of gravity flow perforated distribution pipe in distribution cell</td>
<td>Centered in the ATL conduit</td>
</tr>
<tr>
<td>Length of distribution pipe for components using gravity flow distribution</td>
<td>= length of ATL conduit</td>
</tr>
<tr>
<td>Distance between distribution pipe end orifice and end of distribution cell</td>
<td>≤ 12 inches</td>
</tr>
<tr>
<td>Length of ATL</td>
<td>Multiply # of ATL conduits x 10 ft</td>
</tr>
<tr>
<td>Number of observation pipes per distribution cell</td>
<td>≥ 2</td>
</tr>
<tr>
<td>Location of observation pipes</td>
<td>At opposite ends of the distribution cell. Observation pipes must be located</td>
</tr>
</tbody>
</table>

Atlanta by Infiltrator
<table>
<thead>
<tr>
<th>Table 3</th>
<th>OTHER SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(continued)</td>
<td>(continued)</td>
</tr>
<tr>
<td>Design and installation of observation pipes</td>
<td>1. Have an open bottom</td>
</tr>
<tr>
<td></td>
<td>2. Have a nominal pipe size of 4</td>
</tr>
<tr>
<td></td>
<td>inches</td>
</tr>
<tr>
<td></td>
<td>3. The lower 6 inches slotted</td>
</tr>
<tr>
<td></td>
<td>4. Slots are ≥ ¼ inch and ≤ ½ inch in</td>
</tr>
<tr>
<td></td>
<td>width and located on opposite sides</td>
</tr>
<tr>
<td></td>
<td>5. Anchored in a manner that will</td>
</tr>
<tr>
<td></td>
<td>prevent the pipe from being pulled out</td>
</tr>
<tr>
<td></td>
<td>6. Extend from the infiltrative surface</td>
</tr>
<tr>
<td></td>
<td>up to or above finish grade</td>
</tr>
<tr>
<td></td>
<td>7. Terminate with removable watertight cap</td>
</tr>
<tr>
<td>Effluent application to ATL system</td>
<td>1. If DWF &lt; 1,500 gpd:</td>
</tr>
<tr>
<td></td>
<td>(a) if a vertical separation credit</td>
</tr>
<tr>
<td></td>
<td>is not being utilized, effluent may</td>
</tr>
<tr>
<td></td>
<td>be applied by gravity flow; or</td>
</tr>
<tr>
<td></td>
<td>dosed to distribution cell or</td>
</tr>
<tr>
<td></td>
<td>distribution box and then applied by</td>
</tr>
<tr>
<td></td>
<td>gravity flow to the distribution cell; or</td>
</tr>
<tr>
<td></td>
<td>(b) pressure distribution is required</td>
</tr>
<tr>
<td></td>
<td>if a vertical separation credit is</td>
</tr>
<tr>
<td></td>
<td>being utilized or pressure</td>
</tr>
<tr>
<td></td>
<td>distribution is required in</td>
</tr>
<tr>
<td></td>
<td>accordance with SPS 383.44 (5)</td>
</tr>
<tr>
<td></td>
<td>(b), Wis. Adm. Code.</td>
</tr>
<tr>
<td></td>
<td>2. If DWF ≥ 1,500 gpd:</td>
</tr>
<tr>
<td></td>
<td>(a) if a vertical separation credit is not being utilized, effluent must be dosed to distribution cell or</td>
</tr>
<tr>
<td></td>
<td>distribution box and then applied by gravity flow to the distribution cell; or</td>
</tr>
<tr>
<td></td>
<td>(b) pressure distribution is required</td>
</tr>
<tr>
<td></td>
<td>if a vertical separation credit is</td>
</tr>
<tr>
<td></td>
<td>required or pressure distribution is</td>
</tr>
<tr>
<td></td>
<td>required in accordance with SPS 383.44 (5) (b), Wis. Adm. Code</td>
</tr>
<tr>
<td>Septic tank effluent pump system</td>
<td>Meets requirements of SPS 384.10, Wis. Adm. Code and this manual</td>
</tr>
</tbody>
</table>
### Table 3
**OTHER SPECIFICATIONS**
(continued)

<table>
<thead>
<tr>
<th>Dose tank or compartment volume employing one pump</th>
<th>≥ Volume of a single dose + reserve capacity(^a) + drain back volume(^b) + (6 inches x average gal/inch of tank)(^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes:</td>
<td>a: Reserve capacity ≥ the estimated daily flow</td>
</tr>
<tr>
<td></td>
<td>b: Drain back volume ≥ volume of wastewater that will drain into the dose tank from the distribution cell.</td>
</tr>
<tr>
<td></td>
<td>c: Four inches of the dimension ≥ vertical distance from pump intake to bottom of tank. Two inches of the dimension ≥ vertical distance between pump on elevation and high water alarm activation elevation.</td>
</tr>
<tr>
<td>Dose tank or compartment volume employing duplex pumps</td>
<td>≥ Volume of a single dose + drain back volume(^a) + (6 inches x average gal/inch of tank)(^b)</td>
</tr>
<tr>
<td>Notes:</td>
<td>a: Drain back volume ≥ volume of wastewater that will drain into the dose tank from the force main.</td>
</tr>
<tr>
<td></td>
<td>b: Four inches of the dimension ≥ vertical distance from pump intake to the bottom of tank. Two inches of the dimension ≥ vertical distance between pump on elevation and high water alarm activation elevation.</td>
</tr>
<tr>
<td>Siphon tank or compartment volume</td>
<td>≥ What is required to accommodate volumes necessary to provide dosing as specified in this manual</td>
</tr>
<tr>
<td>Distribution network for pressurized distribution systems</td>
<td>By use of pressure distribution network conforming with the sizing methods of either Small Scale Waste Management Project publication 9.6, entitled “Design of Pressure Distribution Networks for Septic Tank – Soil Absorption Systems” or Dept. of Safety and Professional Services publications SBD-10573-P or SBD-10706-P, entitled Pressure Distribution Component Manual for Private Onsite Wastewater Treatment Systems”.</td>
</tr>
</tbody>
</table>
II. DEFINITIONS

Definitions not found in this section, are in SPS 381 of the Wisconsin Administrative Code or the terms use the standard dictionary definition.

A. “Basal Area” means the effective in-situ soil surface area available for infiltration of partially treated effluent from the fill material.

B. “Conduit” means Infiltrator ATL System component made up of 4-inch-diameter pipe, large-diameter synthetic aggregate, coarse geotextile, small-diameter synthetic aggregate, fine geotextile.

C. “Fill Material” means sand that meets specifications of ASTM Specification C33 for fine aggregate and is used along the sides of and could be under the distribution cell to provide treatment of effluent.

D. “Limiting Factor” means high groundwater elevation or bedrock.

E. “Product” means one ATL conduit manufactured by Infiltrator.

F. “Sand Extension” means additional system sand which is added to the system sand footprint to meet the minimum basal area requirement.

G. “System Sand” means the sand material that is used along the sides of an under the ATL System Conduits to provide treatment of effluent. Acceptable system sand shall meet ATSM Specification C33.

H. “Vertical Separation” means the total depth of unsaturated soil that exists between the infiltrative surface of a distribution cell and limiting factor (as indicated by redoximorphic features, groundwater, or bedrock).

III. DESCRIPTION AND PRINCIPLE OF OPERATION
The ATL System in-ground soil absorption component operation is a two-stage process involving both wastewater treatment and dispersal. Treatment is accomplished within the ATL System by physical and biochemical processes within the product, the fill material, and the in-situ soil. The fill material and in-situ soil also provide dispersal and separation distance to limiting conditions.

Cover material consisting of material that provides erosion protection, a barrier to excess precipitation infiltration, and allows gas exchange is added. See Figure 1 for a typical in-ground system.

![Diagram of ATL System in-ground soil absorption component](image)

Figure 1. Example cross-section of ATL System in-ground soil absorption component for POWTS

IV. SOIL AND SITE REQUIREMENTS

Every ATL System in-ground soil absorption component design is ultimately matched to the given soil and site.

The design approach presented in this manual is based on criteria that all applied wastewater is successfully transported away from the system, that it will not affect subsequent wastewater additions, and that the effluent is ultimately treated.

A. Minimum Soil Depth Requirements - The minimum soil factors required for successful ATL System in-ground soil absorption component performance are listed in the introduction and specification section of this manual.

Soil evaluations must be in accordance with SPS 385 of the Wis. Adm. Code. In addition, soil application rates must be in accordance with SPS 383 of the Wis. Adm. Code.
B. Other Site Considerations -

1. **ATL System in-ground soil absorption component location** - In open areas, exposure to sun and wind increases the assistance of evaporation and transpiration in the dispersal of the wastewater.

2. **Sites with trees and large boulders** - Generally, sites with large trees, numerous smaller trees or large boulders are less desirable for installing an ATL System in-ground soil absorption component because of difficulty in preparing the surface and the reduced infiltration area beneath the ATL System in-ground soil absorption component. Areas that are occupied with rock fragments, tree roots, stumps and boulders reduce the amount of soil available for proper treatment. If no other site is available, trees in the basal area of the ATL System in-ground soil absorption component must be cut off at ground level. A larger fill area is necessary when any of the above conditions are encountered, to provide sufficient infiltrative area.

3. **Setback distances** - The setbacks specified in SPS 383, Wis. Adm. Code for soil subsurface treatment/dispersal component apply to ATL System in-ground soil absorption components. The distances are measured from the edge of the ATL System in-ground soil absorption component.

V. COVER MATERIAL

A. **Cover material** - The cover material is a soil that will allow air exchange while promoting plant growth. The gas exchange will increase the treatment performance of the system by providing oxygen to the wastewater to help ensure aerobic conditions in the ATL System in-ground soil absorption component. The plant growth will provide frost protection in the winter season. Clays may not be used for cover material, as they will restrict oxygen transfer. Often, excavated soil from the site can be used. Seeding or other means must be done to prevent erosion of the ATL System soil cover material.

VI. DESIGN

A. **Location, Size and Shape** - Placement, sizing and shaping of the ATL System in-ground soil absorption component and the distribution cell within the ATL System in-ground soil absorption component must be in accordance with this manual. The means of pressurizing the distribution network must provide equal distribution of the wastewater. A pressurized distribution network using a method of sizing as described in either Small Scale Waste Management Project publication 9.6, entitled “Design of Pressure Distribution Networks for Septic Tank – Soil Absorption System” or Dept. of Safety and Professional Services publications SBD-10573-P or SBD-10706-P, entitled “Pressure Distribution Component Manual for Private Onsite Wastewater Treatment Systems” is acceptable.

B. **Component Design** - Design of the ATL System in-ground soil absorption component is based upon whether vertical separation credit is being utilized, the design wastewater flow and the soil characteristics. **The distribution system must be pressurized if vertical separation distance is less than three feet from the bottom of the component to a limiting factor.** It must be sized such that it can accept the design wastewater flow without causing surface seepage or groundwater pollution. Consequently, the basal area, which is the in-situ soil area beneath the fill, must be sufficiently large enough to absorb the effluent.
into the underlying soil. The system must also be designed to avoid encroachment of the water table into the required minimum unsaturated zone.

Design of the ATL System in-ground soil absorption component includes the following three steps: (A) calculating design wastewater flow, (B) design of the ATL System distribution cell within the fill, (C) design of the entire ATL System in-ground soil absorption component. This includes calculating total width, total length, system height, distribution lateral location and observation pipes. Each step is discussed. A design example is provided in Section XI, page 26, of this manual.

**Step A. Design Wastewater Flow Calculations**

**One and two-family dwellings.** Distribution cell size for one and two-family dwelling application is determined by calculating the design wastewater flow (DWF). To calculate DWF use, Formulas 1, 2 or 3. Formula 1 is for combined wastewater flows, which consist of blackwater, clearwater and graywater. Formula 2 is for only clearwater and graywater. Formula 3 is blackwater only.

<table>
<thead>
<tr>
<th>Formula 1</th>
<th>Formula 2</th>
<th>Formula 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined wastewater</td>
<td>Clearwater &amp; Graywater</td>
<td>Blackwater</td>
</tr>
<tr>
<td>DWF = 150 gal/day/bedroom</td>
<td>DWF = 90 gal/day/bedroom</td>
<td>DWF = 60 gal/day/bedroom</td>
</tr>
</tbody>
</table>

**Public Facilities.** Distribution cell size for public facilities application is determined by calculating the DWF using Formula 4. Only facilities identified in Table 4 are included in this manual. Estimated daily wastewater flows are determined in accordance with Table 4 or SPS 383.43(6), Wis. Adm. Code. Many commercial facilities have high BODs, TSS and FOG (fats, oils and grease), which must be pretreated in order to bring their values down to an acceptable range before entering into the ATL System in-ground soil absorption component described in this manual.

**Formula 4**

\[
DWF = \text{Sum of each estimated wastewater flow per source per day } \times 1.5
\]

Where 1.5 = Conversion factor to convert estimated wastewater flow to design wastewater flow
<table>
<thead>
<tr>
<th>Source</th>
<th>Unit</th>
<th>Estimated Wastewater Flow (gpd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartment or Condominium</td>
<td>Bedroom</td>
<td>100</td>
</tr>
<tr>
<td>Assembly hall (no kitchen)</td>
<td>Person (10 sq. ft./person)</td>
<td>1.3</td>
</tr>
<tr>
<td>Bar or cocktail lounge <em>(no meals served)</em></td>
<td>Patron (10 sq. ft./patron)</td>
<td>4</td>
</tr>
<tr>
<td>Bar or cocktail lounge <em>(w/meals – all paper service)</em></td>
<td>Patron (10 sq. ft./patron)</td>
<td>8</td>
</tr>
<tr>
<td>Beauty salon</td>
<td>Station</td>
<td>90</td>
</tr>
<tr>
<td>Bowling alley</td>
<td>Bowling lane</td>
<td>80</td>
</tr>
<tr>
<td>Bowling alley <em>(with bar)</em></td>
<td>Bowling lane</td>
<td>150</td>
</tr>
<tr>
<td>Camp, day and night</td>
<td>Person</td>
<td>25</td>
</tr>
<tr>
<td>Camp, day use only (no meals served)</td>
<td>Person</td>
<td>10</td>
</tr>
<tr>
<td>Campground or Camping Resort</td>
<td>Space, with sewer connection and/or service building</td>
<td>30</td>
</tr>
<tr>
<td>Campground sanitary dump station *(a)</td>
<td>Camping unit or RV served</td>
<td>25</td>
</tr>
<tr>
<td>Catch basin</td>
<td>Basin</td>
<td>65</td>
</tr>
<tr>
<td>Church (no kitchen)</td>
<td>Person</td>
<td>2</td>
</tr>
<tr>
<td>Church <em>(b) (with kitchen)</em></td>
<td>Person</td>
<td>5</td>
</tr>
<tr>
<td>Dance hall</td>
<td>Person (10 sq. ft./person)</td>
<td>2</td>
</tr>
<tr>
<td>Day care facility (no meals prepared)</td>
<td>Child</td>
<td>12</td>
</tr>
<tr>
<td>Day care facility <em>(b) (with meal preparation)</em></td>
<td>Child</td>
<td>16</td>
</tr>
<tr>
<td>Dining hall <em>(c) (kitchen waste only without dishwasher and/or food waste grinder)</em></td>
<td>Meal served</td>
<td>2</td>
</tr>
<tr>
<td>Dining hall <em>(c) (toilet and kitchen waste without dishwasher and/or food waste grinder)</em></td>
<td>Meal served</td>
<td>5</td>
</tr>
<tr>
<td>Dining hall <em>(c) (toilet and kitchen waste with dishwasher and/or food waste grinder)</em></td>
<td>Meal served</td>
<td>7</td>
</tr>
<tr>
<td>Drive-in restaurant <em>(a) (all paper service with inside seating)</em></td>
<td>Patron seating space</td>
<td>10</td>
</tr>
<tr>
<td>Drive-in restaurant <em>(a) (all paper service without inside seating)</em></td>
<td>Vehicle space</td>
<td>10</td>
</tr>
<tr>
<td>Drive-in theater</td>
<td>Vehicle space</td>
<td>3</td>
</tr>
<tr>
<td>Employees (total all shifts)</td>
<td>Employee</td>
<td>13</td>
</tr>
<tr>
<td>Floor drain (not discharging to catch basin)</td>
<td>Drain</td>
<td>25</td>
</tr>
<tr>
<td>Gas station / convenience store</td>
<td>Patron</td>
<td>3</td>
</tr>
<tr>
<td>Hospital *(a)</td>
<td>Bed space</td>
<td>135</td>
</tr>
<tr>
<td>Hotel, motel or tourist rooming house</td>
<td>Room</td>
<td>65</td>
</tr>
<tr>
<td>Manufactured home (served by its own POWTS)</td>
<td>Bedroom</td>
<td>100</td>
</tr>
<tr>
<td>Manufactured home community</td>
<td>Manufactured home site</td>
<td>200</td>
</tr>
<tr>
<td>Medical office building</td>
<td>Person</td>
<td>50</td>
</tr>
<tr>
<td>Doctors, nurses, medical staff</td>
<td>Person</td>
<td>13</td>
</tr>
<tr>
<td>Office personnel</td>
<td>Person</td>
<td>6.5</td>
</tr>
<tr>
<td>Patients</td>
<td>Person</td>
<td>50</td>
</tr>
<tr>
<td>Migrant labor camp (central bathhouse)</td>
<td>Employee</td>
<td>20</td>
</tr>
<tr>
<td>Nursing, Rest Home, Community Based Residential Facility *(b)</td>
<td>Bed space</td>
<td>65</td>
</tr>
<tr>
<td>Outdoor sport facility (toilet waste only)</td>
<td>Patron</td>
<td>3.5</td>
</tr>
<tr>
<td>Parks (toilets waste only)</td>
<td>Patron (75 patrons/acre)</td>
<td>3.5</td>
</tr>
<tr>
<td>Parks (toilets and showers)</td>
<td>Patron (75 patrons/acre)</td>
<td>6.5</td>
</tr>
</tbody>
</table>

*(a)* Estimated for space without housing for the population specified
*(b)* Estimated for space with housing for the population specified
Table 4
Public Facility Wastewater Flows
(continued)

<table>
<thead>
<tr>
<th>Source</th>
<th>Unit</th>
<th>Estimated Wastewater Flow (gpd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public shower facility</td>
<td>Shower taken</td>
<td>10</td>
</tr>
<tr>
<td>Restaurant a, 24-hr. (dishwasher and/or food waste grinder only)</td>
<td>Patron seating space</td>
<td>4</td>
</tr>
<tr>
<td>Restaurant a, 24-hr. (kitchen waste only without dishwasher and/or food waste grinder)</td>
<td>Patron seating space</td>
<td>12</td>
</tr>
<tr>
<td>Restaurant, 24-hr. (toilet waste)</td>
<td>Patron seating space</td>
<td>28</td>
</tr>
<tr>
<td>Restaurant a, 24-hr. (toilet and kitchen waste without dishwasher and/or food waste grinder)</td>
<td>Patron seating space</td>
<td>40</td>
</tr>
<tr>
<td>Restaurant a, 24-hr. (toilet and kitchen waste with dishwasher and/or food waste grinder)</td>
<td>Patron seating space</td>
<td>44</td>
</tr>
<tr>
<td>Restaurant a (dishwasher and/or food waste grinder only)</td>
<td>Patron seating space</td>
<td>2</td>
</tr>
<tr>
<td>Restaurant a (kitchen waste only without dishwasher and/or food waste grinder)</td>
<td>Patron seating space</td>
<td>6</td>
</tr>
<tr>
<td>Restaurant (toilet waste)</td>
<td>Patron seating space</td>
<td>14</td>
</tr>
<tr>
<td>Restaurant a (toilet and kitchen waste without dishwasher and/or food waste grinder)</td>
<td>Patron seating space</td>
<td>20</td>
</tr>
<tr>
<td>Restaurant a (toilet and kitchen waste with dishwasher and/or food waste grinder)</td>
<td>Patron seating space</td>
<td>22</td>
</tr>
<tr>
<td>Retail store</td>
<td>Patron (70% of total retail area ÷ 30 sq. ft. per patron)</td>
<td>1</td>
</tr>
<tr>
<td>School a (with meals and showers)</td>
<td>Classroom (25 students/classroom)</td>
<td>500</td>
</tr>
<tr>
<td>School a (with meals or showers)</td>
<td>Classroom (25 students/classroom)</td>
<td>400</td>
</tr>
<tr>
<td>School (without meals or showers)</td>
<td>Classroom (25 students/classroom)</td>
<td>300</td>
</tr>
<tr>
<td>Self-service laundry (toilet waste only)</td>
<td>Clothes washer</td>
<td>33</td>
</tr>
<tr>
<td>Self-service laundry (with only residential clothes washers)</td>
<td>Clothes washer</td>
<td>400</td>
</tr>
<tr>
<td>Swimming pool bathhouse</td>
<td>Patron</td>
<td>6.5</td>
</tr>
</tbody>
</table>

\(^a\) = Expected to be high in biochemical oxygen demand (BOD), total suspended solids (TSS), or fats, oils, and grease (FOG).

\(^b\) = At-risk system (potentially high in BOD, TSS, and FOG).
Step B. Design of the ATL System Distribution Cell - This section determines the required infiltrative surface area of the distribution cell/fill interface, as well as the dimensions of the distribution network within the fill.

a. Design of the ATL System distribution cell is a four-step process:
   1. Determine the minimum total conduit length
   2. Design the system sand configuration
   3. Calculate the minimum basal area required
   4. Make basal area adjustments as necessary

Step 1: Determine the minimum total conduit length

The minimum length of conduit per bedroom is 70 feet. Determine the minimum total length of conduit from Table 5 below, based on the number of bedrooms.

<table>
<thead>
<tr>
<th>Number of Bedrooms</th>
<th>Minimum Conduit Length Required (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>140</td>
</tr>
<tr>
<td>3</td>
<td>210</td>
</tr>
<tr>
<td>4</td>
<td>280</td>
</tr>
<tr>
<td>5</td>
<td>350</td>
</tr>
<tr>
<td>Each additional</td>
<td>70</td>
</tr>
</tbody>
</table>

Step 2: Design the system sand configuration

Use Table 6 below to determine the minimum system sand footprint using the minimum length of conduit (determined using Table 5 above) and the number of rows into which the total length of conduit will be divided. The system should be designed as long and narrow as site conditions allow.

<table>
<thead>
<tr>
<th>Minimum Length of Conduit (ft)</th>
<th>3 Conduit Rows</th>
<th>4 Conduit Rows</th>
<th>5 Conduit Rows</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dimensions (A' x B')</td>
<td>Area (ft²)</td>
<td>Dimensions (A' x B')</td>
</tr>
<tr>
<td>140</td>
<td>7 x 52</td>
<td>364</td>
<td>9 x 42</td>
</tr>
<tr>
<td>210</td>
<td>7 x 72</td>
<td>504</td>
<td>9 x 62</td>
</tr>
<tr>
<td>280</td>
<td>7 x 102</td>
<td>714</td>
<td>9 x 72</td>
</tr>
<tr>
<td>350</td>
<td>7 x 122</td>
<td>854</td>
<td>9 x 92</td>
</tr>
</tbody>
</table>
NOTES:
1. The conduits are manufactured in 10-foot lengths; all conduit row length calculations in Table 5 are rounded up to the nearest 10 feet.
2. The conduit rows must be extended to within 12 inches of each end of the bed. The dimensions above include 12 inches of system sand in between each of the conduit rows.
3. Multiple bed systems: where site conditions or other considerations require multiple beds, the row-specific length dimensions in Table 6 may be modified to account for the number of beds.
4. Table 6 provides examples of dimensions and area; other configurations are allowed.

Step 3: Calculate the minimum basal area required

Investigate the site in accordance with the Wisconsin Administrative Code to determine the design loading rate of the basal area. Calculate the minimum basal area required by dividing the daily design flow by this design loading rate.

Step 4: Make basal area adjustments as necessary

The minimum basal area required in Step 3 cannot be reduced. This area must be maintained to ensure adequate infiltration of treated effluent into the native soil.

Sand extensions are necessary as follows:

- If the minimum basal area determined in Step 3 is smaller than the area of the system sand footprint determined in Step 2, no sand extensions are necessary.
- If the minimum basal area determined in Step 3 is larger than the area of the system sand footprint determined in Step 2, sand extensions must be added to meet the minimum basal area footprint requirements. When adding sand extensions in level system applications, additional width shall be evenly divided on each side of the ATL System;

The length of the bed area may be altered by extending the conduit rows. This method may be preferred over increasing the width of the system under certain site and system design considerations.

VII. SITE PREPARATION AND CONSTRUCTION

Procedures used in the construction of an in-ground ATL system are just as critical as the design of the component. A good design with poor construction results in system failure. It is emphasized that the soil only be worked with it is not frozen and the moisture content is low to avoid compaction and smearing. Consequently, installations are to be made only when the soil is dry enough to prevent compaction and smearing of the infiltrative surface. The construction plan to be followed includes:
A. **Equipment** – Proper equipment is essential. Track type equipment that will not compact the infiltrative surface. Minimize foot traffic and avoid equipment traffic over the infiltrative surface.

B. **Sanitary Permit** – Prior to the construction of the system, a sanitary permit, obtained for the installation must be posted in a clearly visible location on the site. Arrangements for inspection(ss) must also be made with the department or governmental unit issuing the sanitary permit.

C. **Construction Procedures**

   1. Check the moisture content and conditions of the soil. If the soil at the infiltrative surface can be rolled into a ¼ inch wire, the site is too wet, smearing and compaction will result, thus reducing the infiltrative capacity of the soil. If the site is too wet, do not proceed until it dries out. If the soil at or below the infiltrative surface is frozen, do not proceed.

   2. Set up a construction level or similar device and determine all relative elevations in relationship to the bench mark. It is necessary to determine the bottom elevation of the distribution cell, land surface contour lines, and approximate component elevations critical to the installation.

   3. Lay out the absorption area within the designated area. Where possible lay out the absorption area(s) on the site so that the distribution cell runs parallel with the land surface contours. Reference states offset from the corner stakes are recommended in case corner stakes are disturbed during construction.

   4. Excavate the distribution cell(s) to the correct bottom elevation(s) making sure not to smear the infiltrative surface. If the infiltrative surface or sidewalls are smeared, loosen it with the use of a rake or similar device.

   5. Install the system sand over the entire ATL System area as per design. System sand should be leveled and stabilized prior to introduction of the conduits.

   6. Remove plastic wrap from the ATL conduits and place the conduits on the surface of the system sand with the white stripe/seam in the 12 o’clock position, arranged in the configuration shown on the system design. Using approved 4-inch-diameter internal pipe couplings, connect the conduits end-to-end to create rows of the required length.
7. In gravity serial distribution applications, where a vertical separation credit is not required, use of a raised connection at the distal end of each lateral-containing conduit row is recommended. One example of a raised connection is shown below in Figure 2:

![Figure 2]

8. In pressure distribution applications, **where a vertical separation credit is required**, install the ATL conduits and pressure distribution piping per instructions, pressure distribution design and applicable sections of SPS 382, 383, and 384, Wis. Adm. Code. Pressure distribution piping should be sleeved through the 4-inch corrugated pipe located in the ATL conduit. One out of every five orifices in each distribution pipe shall be installed at the 6 o’clock position to allow for thorough drainage of the distribution pipe following each dose. The remaining four orifices shall be installed in the 12 o’clock position. All pipes must drain after dosing.

9. At the distal end of the pressure lateral, place a 90° long sweep with a capped piece of pipe pointing up through the soil surface. Cover the capped pipe with a valve box and lid of an adequate size. The cover of the valve box shall be located above the final grade of the ATL System in-ground soil absorption component (Figure 3).

![Figure 3]

10. Once the ATL conduit is in place on the surface of the system sand and distribution piping is connected to the conduits per design, additional system sand shall be ladled beside and between, and to the top of each of the conduit rows. System sand
shall also be installed on each side and at each end of the backfilled conduit rows, per the design.

11. Install an observation pipe in each row of ATL products with the bottom 6 inches of the observation pipe slotted. It is recommended to wrap geotextile around the slots. Installations of all observation pipes include a suitable means of anchoring (Figures 4 and 5).

12. Be sure to keep the required 12-inch minimum compacted cover over the system.

13. Complete final grading to divert surface water drainage away from the ATL System. Sod or seed and mulch the entire ATL System in-ground soil absorption component.

VIII. OPERATION, MAINTENANCE AND PERFORMANCE MONITORING

A. The ATL system in-ground soil absorption component owner is responsible for the operation and maintenance of the component. The county, department or POWTS service contractor may make periodic inspections of the components, checking for surface discharge, treated effluent levels, etc.

The owner or owner's agent is required to submit necessary maintenance reports to the appropriate jurisdiction and/or the department.

B. Design approval and site inspections before, during, and after the construction are accomplished by the county or other appropriate jurisdictions in accordance to SPS 383 of the Wis. Adm. Code.

C. Routine and preventative maintenance aspects:

1. Treatment and distribution tanks are to be inspected routinely and maintained when necessary in accordance with their approvals.

2. Inspections of the ATL System in-ground soil absorption component performance are required at least once every three years. These inspections include checking the liquid levels in the observation pipes and examination for any seepage around the ATL System in-ground soil absorption component.

3. Winter traffic on the ATL System in-ground soil absorption component is not advised to avoid frost penetration and to minimize compaction.
4. A good water conservation plan within the house or establishment will help assure that the ATL System in-ground soil absorption component will not be overloaded.

D. User's Manual: A user's manual is to accompany the component. The manual is to contain the following as a minimum:

1. Diagrams of all components and their location. This should include the location of the reserve area, if one is provided.

2. Names and phone numbers of local health authority, component manufacturer or POWTS service contractor to be contacted in the event of component failure or malfunction.

3. Information on periodic maintenance of the component, including electrical/mechanical components.

4. Information on limited activities on reserve area if provided.

E. Performance monitoring must be performed on ATL System in-ground soil absorption components installed under this manual.

1. The frequency of monitoring must be:
   a. At least once every three years following installation and,
   b. At time of problem, complaint, or failure.

2. The minimum criteria addressed in performance monitoring of ATL System in-ground soil absorption components are:
   a. Type of use.
   b. Age of system.
   c. Nuisance factors, such as odors or user complaints.
   d. Mechanical malfunction within the system including problems with valves or other mechanical or plumbing components.
   e. Material fatigue or failure, including durability or corrosion as related to construction or structural design.
   f. Neglect or improper use, such as exceeding the design rate, poor maintenance of vegetative cover, inappropriate cover over the ATL in-ground soil absorption component, or inappropriate activity over the ATL in-ground soil absorption component.
   g. Installation problems such as compaction or displacement of soil, improper orientation or location.
   h. Pretreatment component maintenance, including dosing frequency, structural integrity, groundwater intrusion or improper sizing.
   i. Dose chamber maintenance, including improper maintenance, infiltration, structural problems, or improper sizing.
   j. Distribution piping network, including improper maintenance or improper sizing.
   k. Ponding in distribution cell, prior to the pump cycle, is evidence of development of a clogging mat or reduced infiltration rates.
1. Siphon or pump malfunction including dosing volume problems, pressurization problems, breakdown, burnout, or cycling problems.

m. Overflow/seepage problems, as shown by evident or confirmed sewage effluent, including backup if due to clogging.

3. Reports are to be submitted in accordance with SPS 383, Wis. Adm. Code.

IX. REFERENCES


X. ATL SYSTEM IN-GROUND WORKSHEET

A. SITE CONDITIONS

Evaluate the site and soils report for the following:

- Surface water movement.
- Measure elevations and distances on the site so that slope, contours, and available areas can be determined.
- Description of several soil profiles where the component will be located.
- Determine the limiting conditions such as bedrock, high groundwater level, soil permeability, and setbacks.

Slope - ___%
Occancy – One or Two-Family Dwelling - ___(# of bedrooms)
Public Facility - ______ gal/day (Estimated wastewater flow)
Depth to limiting factor - ______ inches
Minimum depth of unsaturated soil required by Table 383.44-3, Wis. Adm. Code - ___ inches
In-situ soil application rate used - ______ gal/ft²/day
FOG value of effluent applied to component - ______ mg/L
BOD₅ value of effluent applied to component - ≤30 mg/L
TSS value of effluent applied to component - ≤30 mg/L
Fecal Coliform monthly geometric mean value of effluent applied to component > 10⁹ CFU/100ml __Yes X No
Product(s) to be installed in one laying length of distribution cell - __________

B. DESIGN WASTEWATER FLOW (DWF)

One or Two-family Dwelling,

Combined wastewater flow:
DWF = 150 gal/day/bedroom x # of bedrooms
    = 150 gal/day/bedroom x ____# of bedrooms
    = ______ gal/day
Clearwater and graywater only:
DWF = 90 gal/day/bedroom x # of bedrooms
    = 90 gal/day/bedroom x _____# of bedrooms
    = ____________ gal/day

Blackwater only:
DWF = 60 gal/day/bedroom x # of bedrooms
    = 60 gal/day/bedroom x _____# of bedrooms
    = ____________ gal/day

Public Facilities.
DWF = Estimated wastewater flow x 1.5
    = ________ gal/day x 1.5
    = ________ gal/day

C. DESIGN OF THE ATL SYSTEM DISTRIBUTION CELL

a. Determine the minimum total conduit length

The minimum length of conduit per bedroom is 70 feet. Determine the minimum total length of conduit from Table 5, based on the number of bedrooms.

<table>
<thead>
<tr>
<th>Number of Bedrooms</th>
<th>Minimum Conduit Length Required (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>140</td>
</tr>
<tr>
<td>3</td>
<td>210</td>
</tr>
<tr>
<td>4</td>
<td>280</td>
</tr>
<tr>
<td>5</td>
<td>350</td>
</tr>
<tr>
<td>Each additional</td>
<td>70</td>
</tr>
</tbody>
</table>
b. Design the system sand configuration

Use Table 6 below to determine the minimum system sand footprint using the minimum length of conduit (determined using Table 5) and the number of rows into which the total length of conduit will be divided. The system should be designed as long and narrow as site conditions allow.

<table>
<thead>
<tr>
<th>Minimum Length of Conduit (ft)</th>
<th>3 Conduit Rows</th>
<th>4 Conduit Rows</th>
<th>5 Conduit Rows</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dimensions (A' x B')</td>
<td>Area (ft²)</td>
<td>Dimensions (A' x B')</td>
</tr>
<tr>
<td>140</td>
<td>7 x 52</td>
<td>364</td>
<td>9 x 42</td>
</tr>
<tr>
<td>210</td>
<td>7 x 72</td>
<td>504</td>
<td>9 x 62</td>
</tr>
<tr>
<td>280</td>
<td>7 x 102</td>
<td>714</td>
<td>9 x 72</td>
</tr>
<tr>
<td>350</td>
<td>7 x 122</td>
<td>854</td>
<td>9 x 92</td>
</tr>
</tbody>
</table>

Table 6
MINIMUM SYSTEM SAND FOOTPRINT DIMENSIONS AND AREA

NOTES:
1. The conduits are manufactured in 10-foot lengths; all conduit row length calculations in Table 6 are rounded up to the nearest 10 feet.
2. The conduit rows must be extended to within 12 inches of each end of the bed. The dimensions above include 12 inches of system sand on each end of the conduit rows.
3. Multiple bed systems: where site conditions or other considerations require multiple beds, the row-specific length dimensions in Table 6 may be modified to account for the number of beds.
4. Table 6 provides examples of dimensions and area; other configurations are allowed.

D. CALCULATE THE MINIMUM BASAL AREA REQUIRED

Calculate the basal area by dividing the daily design wastewater flow (DWF) by the design loading rate (DLR). Verify the 300 ft² minimum basal area is satisfied.

\[
\text{Basal area} = \frac{\text{DWF}}{\text{DLR}}
\]

\[
\text{Basal area} = \frac{\text{_____ gpd}}{\text{_____ gpd/ft}^2}
\]

\[
\text{Basal area} = \text{_____ ft}^2
\]
E. MAKE AREA AND WIDTH ADJUSTMENTS AS NECESSARY

First, verify the minimum ATL conduit length (140 ft) and minimum basal area required (300 ft\(^2\)) have been met.

The minimum areas required in Step C (system sand configuration) and Step D (basal area) cannot be reduced. These areas must be maintained to ensure adequate area for placement of the conduits and infiltration of treated effluent into the native soil.

Sand extensions are necessary as follows:

- If the minimum basal area determined in Step 3 is smaller than the area of the system sand footprint determined in Step 2, no sand extensions are necessary.
- If the minimum basal area determined in Step 3 is larger than the area of the system sand footprint determined in Step 2, sand extensions must be added to meet the minimum basal area footprint requirements. When adding sand extensions in level system applications, additional width shall be evenly divided on each side of the ATL System; and
- In sloped applications, additional width shall be placed entirely on the downslope side of the ATL system. For elevated or mound systems, this manual does not apply. See the Infiltrator ATL System Mound Component Manual.

**Note:** The length of the bed area may be altered, but only by extending the conduit rows. This method may be preferred over increasing the width of the system under certain site and system design considerations.
XI. EXAMPLE ATL SYSTEM IN-GROUND WORKSHEET

A. SITE CONDITIONS

Evaluate the site and soils report for the following:
- Surface water movement.
- Measure elevations and distances on the site so that slope, contours and available areas can be determined.
- Description of several soil profiles where the component will be located.
- Determine the limiting conditions such as bedrock, high groundwater level, soil permeability, and setbacks.

Slope - ___ 0 ___%
Occupancy – One or Two-Family Dwelling - ___4___ (# of bedrooms)
Public Facility - ______ gal/day (Estimated wastewater flow)
Depth to limiting factor - ___60___ inches
Minimum depth of unsaturated soil required by Table 383.44-3, Wis. Adm. Code - ___24___ inches
In-situ soil application rate used - ___0.6___ gal/ft^2/day
FOG value of effluent applied to component - ___≤30___ mg/L
BODs value of effluent applied to component - ___≤30___ mg/L
TSS value of effluent applied to component - ___≤30___ mg/L
Fecal Coliform monthly geometric mean value of effluent applied to component > 10^9 CFU/100ml  ___Yes X No

B. DESIGN WASTEWATER FLOW (DWF)

One or Two-family Dwelling.

Combined wastewater flow:
DWF = 150 gal/day/bedroom x # of bedrooms
    = 150 gal/day/bedroom x ___4___ # of bedrooms
    = 600 gal/day
Clearwater and graywater only:
DWF = 90 gal/day/bedroom x # of bedrooms
    = 90 gal/day/bedroom x ______ # of bedrooms
    = ____________ gal/day
Blackwater only:
DWF = 60 gal/day/bedroom x # of bedrooms
  = 60 gal/day/bedroom x _____# of bedrooms
  = ___________ gal/day

Public Facilities.

DWF = Estimated wastewater flow x 1.5
  = _________ gal/day x 1.5
  = _________ gal/day

C. DESIGN OF THE ATL SYSTEM DISTRIBUTION CELL

a. Determine the minimum total conduit length

The minimum length of conduit per bedroom is 70 feet. Determine the minimum total length of conduit from Table 5, based on the number of bedrooms.

<table>
<thead>
<tr>
<th>Number of Bedrooms</th>
<th>Minimum Conduit Length Required (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>140</td>
</tr>
<tr>
<td>3</td>
<td>210</td>
</tr>
<tr>
<td>4</td>
<td>280</td>
</tr>
<tr>
<td>5</td>
<td>350</td>
</tr>
<tr>
<td>Each additional</td>
<td>70</td>
</tr>
</tbody>
</table>

b. Design the system sand configuration

Use Table 6 below to determine the minimum system sand footprint using the minimum length of conduit (determined using Table 5 above) and the number of rows into which the total length of conduit will be divided. The system should be designed as long and narrow as site conditions allow.
D. CALCULATE THE MINIMUM BASAL AREA REQUIRED

Calculate the basal area by dividing the daily design wastewater flow (DWF) by the design loading rate (DLR). Verify the 300 ft² minimum basal area is satisfied.

\[
\text{Basal area} = \frac{\text{DWF}}{\text{DLR}} \\
\text{Basal area} = \frac{600 \text{ gpd}}{0.6 \text{ gpd/ft}^2} \\
\text{Basal area} = 1,000 \text{ ft}^2
\]

E. MAKE AREA AND WIDTH ADJUSTMENTS AS NECESSARY

The minimum ATL conduit length required (140 ft) is met by the 280 lf of ATL conduit in this system design (Step C a). The minimum basal area required (300 ft²) has been met by the 714 ft² basal area in the system design (Step C b).

As determined in Step C b, the minimum length of the system is 102 feet and the minimum width of the system is 7 feet, creating a system sand footprint of 714 ft². Since the 1,000 ft² minimum basal area (Step D) is larger than the 714 ft² system sand footprint (Step C b), sand extensions must be added.

- **Divide the minimum basal area required by the length of the system sand footprint as designed.**
  \[1,000 \text{ ft}^2 \div 102 \text{ ft} = 9.8 \text{ ft}\]

- **Subtract the design system sand footprint width from the above adjusted system sand footprint width to determine the width of the sand extension required.**
  \[9.8 \text{ ft} - 7 \text{ ft} = 2.8 \text{ ft}\]

- **Divide the total width of the sand extension required as calculated above by 2 to determine the minimum width of the sand extension required on each side of the system.**
  \[2.8 \text{ ft} \div 2 = 1.4 \text{ ft} (1 \text{ ft } 5 \text{ in})\]

**NOTE:** Round up and convert to feet/inches for ease of installation.
• The system sand width must be widened by 2.8 ft. On a level site, this is accomplished by adding a 1-ft 5-in-wide sand extension to the entire length of each side of the system. This results in a total basal area footprint width of 9.8 ft.

\[ 9.8 \text{ ft} \times 102 \text{ ft} = 1,000 \text{ ft}^2 \]

Figure 6. Detailed cross-section of an example in-ground ATL System

Figure 7. Detailed plan-view of an example in-ground ATL System

XII. PLAN SUBMITTAL AND INSTALLATION INSPECTION

A. Plan Submittal

To install a system correctly, it is important to develop plans that will be used to install the system correctly the first time. The following checklist may be used when preparing plans for review. The checklist is intended to be a general guide. Not all needed information may be included in this list. Some of the information may not be required to be submitted due to the design of the system. Conformance to the list is not a guarantee of plan approval. Additional information may be needed or requested to address unusual or unique characteristics of a project. Contact the reviewing agent for specific plan submittal requirements, which the agency may require that are different than the list included in this manual.
General Submittal Information

- Photocopies of soil report forms, plans, and other documents are acceptable. However, an original signature is required on certain documents.
- Submittal of additional information requested during plan review or questions concerning a specific plan must be referenced to the Plan Identification indicator assigned to that plan by the reviewing agency.
- Plans or documents must be permanent copies or originals.

Forms and Fees

- Application form for submittal, provided by reviewing agency along with proper fees set by reviewing agent.

Soils Information

- Complete Soils and Site Evaluation Report (form # SBD-8330) for each soil boring described; signed and dated by a certified soil tester, with license number.
- Separate sheet showing the location of all borings. The location of all borings and backhoe pits must be able to be identified on the plot plan.

Documentation

- Architects, engineers or designers must sign, seal and date each page of the submittal or provide an index page, which is signed, sealed and dated.
- Master Plumbers must sign, date and include their license number on each page of the submittal or provide an index page, which is signed, sealed and dated.
- Three completed sets of plans and specifications (clear, permanent and legible); submittals must be on paper measuring at least 8-1/2 by 11 inches.
- Designs that are based on department approved component manual(s) must include reference to the manual by name, publication number and published date.

Plot Plan

- Dimensioned plans or plans drawn to scale (scale indicated on plans) with parcel size or all property boundaries clearly marked.
- Slope directions and percent in system area.
- Bench mark and north arrow.
- Setbacks indicated as per appropriate code.
- Two-foot contours or other appropriate contour interval within the system area.
- Location information; legal description of parcel must be noted.
- Location of any nearby existing system or well.

Plan View

- Dimensions for distribution cell(s).
- Location of observation pipes.
- Dimensions of ATL System in-ground soil absorption component.
- Pipe lateral layout, which must include the number of laterals, pipe material, diameter and length; and number, location and size of orifices.
• Manifold and force main locations, with materials, length and diameter of each.

**Cross Section of System**
• Include tilling requirement, distribution cell details, percent slope, side slope, and cover material.
• Lateral elevation, position of observation pipes, dimensions of distribution cell, and type of cover material such as geotextile fabric, if applicable.

**System Sizing**
• For one and two-family dwellings, the number of bedrooms must be included.
• For public buildings, the sizing calculations must be included.

**Tank and Pump or Siphon Information**
• All construction details for site-constructed tanks.
• Size and manufacturer information for prefabricated tanks.
• Notation of pump or siphon model, pump performance curve, friction loss for force main and calculation for total dynamic head.
• Notation of high water alarm manufacturer and model number.
• Cross section of dose tank / chamber to include storage volumes; connections for piping, and power; pump “off” setting; dosing cycle and volume, high water alarm setting, and storage volume above the highwater alarm; and location of manhole.
• Cross section of two compartments tanks or tanks installed in a series must include information listed above.

**B. Inspections**

Inspection shall be made in accordance with ch. 145.20, Wis. Stats. and SPS 383.26, Wis. Adm. Code. The inspection form on the following two pages may be used. The inspection of the system installation and/or plans is to verify that the system at least conforms to specifications listed in Tables 1 - 3 of this manual.
XIII. POWTS INSPECTION REPORT
(ATTACH TO PERMIT)

**GENERAL INFORMATION**

<table>
<thead>
<tr>
<th>Permit Holder’s Name</th>
<th>City</th>
<th>Village</th>
<th>Town of</th>
<th>County</th>
<th>Sanitary Permit No.</th>
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<th>Tax Parcel No.</th>
<th>Property Address if Available</th>
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**TREATMENT COMPONENT INFORMATION**

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<th>TYPE</th>
<th>MANUFACTURER AND MODEL NUMBER</th>
<th>CAPACITY</th>
<th>P/L</th>
<th>WELL</th>
<th>WATER LINE</th>
<th>BLDG.</th>
<th>VENT</th>
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**SETBACKS (FT)**

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**PUMP / SIPHON INFORMATION**

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**FORCE MAIN INFORMATION**

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<th>Length</th>
<th>Diameter</th>
<th>Dist. To Well</th>
<th>Component Head</th>
<th>Force Main Losses</th>
<th>Vert. Lift</th>
<th>TDH - As Built</th>
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**SOIL ABSORPTION COMPONENT**

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<th>COVER MATERIAL:</th>
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<td>Cell Width</td>
<td>Cell Length</td>
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<td>UNIT</td>
<td>Manufacturer: ATL L.P.</td>
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<td>SETBACK INFO. (FT)</td>
<td>Property Line</td>
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**DISTRIBUTION COMPONENT**

Elevation data on back of form

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<tr>
<th>Header / Manifold</th>
<th>Distribution Lateral(s)</th>
<th>Orifice size</th>
<th>Orifice Spacing</th>
<th>Obs. Pipes Inst. &amp; No.</th>
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**SOIL COVER**

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<th>Depth over center of cell:</th>
<th>Depth over edge of cell:</th>
<th>Depth of Cover material</th>
<th>Texture</th>
<th>Seeded / Sodded</th>
<th>Mulched</th>
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**DEVIATIONS FROM APPROVED PLAN**

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<th>DATE OF ENFORCEMENT ORDER:</th>
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**COMMENTS** (Persons present, discrepancies, etc.)

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<th>COMPONENTS NOT INSPECTED</th>
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<th>Plan Revision Required</th>
<th>Date:</th>
<th>Signature of Inspector:</th>
<th>Cert. Number</th>
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<td>Yes</td>
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Sketch on other side
### ELEVATION DATA

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<th>Point</th>
<th>Back sight</th>
<th>Height of instrument</th>
<th>Foresight</th>
<th>Elevation</th>
<th>Comments</th>
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### SKETCH OF COMPONENT & ADDITIONAL COMMENTS