Plastic Piling

planet 14

Landscapes Ltd
Introduction

Planet 14 Landscapes Ltd began supplying and installing plastic piling in 2009. One of our very first projects involved the stabilisation of a bank around a moat for a private client. We are able to supply and install the product very efficiently and under budget compared to metal sheet piles and gabion baskets.

Plastic Piling Solutions

The plastic piling is manufactured solely in the UK and has a number of benefits over traditional steel, timber or concrete piling; mainly cost, durability, ease of handling and environmental.

Benefits of Plastic Piling:
- Does not rot or rust
- Manufactured from recycled plastic
- Has no risk from sparking
- Manufactured in the UK by ourselves, so reduces the environmental impact of the cost of transport
- Maintains its original appearance over time
- Not affected by salt water
- Resistant to the majority of chemicals
- Resistant to rodent and marine borer attack
- Can be easily cut or bored
- Maintenance free
- Lighter than steel, so easier to handle and transport
- Has a clean, consistent appearance
- Available in a number of colours
- Has the ability to create curved walls and a 90° corner pile is available
Installation
Planet 14 will be able to advise you on the type of pile required to suit your project and provide a complete installation service from start to finish.

In many situations, particularly when short lengths of Plastic Piling are being installed, it can be inserted into the ground by hand using a maul and Pile Cap especially in soft ground or pressed in using an excavator. In harder ground conditions the piles are vibrated into the ground using a pile hammer mounted onto an excavator.

Design
The plastic piling is solely manufactured in the UK from 100% PVC material. It is generally produced in a grey colour however it is possible to produce it in a variety of different colours to suit your individual requirements.

Please see technical specifications for the different types of pile available.

For further information please contact:
www.planet14landscapes.co.uk
Or call 01206 272288
Marinas & Sea Defences

Plastic Piling was used along a 160 metre stretch of the River Tawe, as part of the regeneration of the Swansea Waterfront site. Plastic Piling was used to face the filled concrete manhole rings that formed a cornered retaining wall the length of the bank defences. Lengths of recycled PVC sheet pile were bolted on to the rings to create a consistent and protective fascia.

Plastic Piling was chosen over steel or concrete due to the aesthetics of the finished project, its ease of handling, cost effectiveness and durability.

Floodwalls

Plastic Piling provides a comprehensive solution for flood prevention schemes, and is an environmentally friendly and cost effective alternative to steel piling: it doesn’t rot or rust and is maintenance free.
Landscape & River Bank Stabilisation

Plastic piling was used to help create a set of steps and retain the soil around a pool area for a private client. The piles were then clad in timber to disguise the plastic and produce a less industrial and more contemporary look. The piles were capped off using treated wooden sleepers.

Plastic piling was used to stop the bank slipping and eroding around a moat. The private client was concerned that the house might start to slip and so Planet 14 Landscapes was asked to install 25m of 3m long full pan plastic piles. These were tied back into the moat bank using steel bar.
Technical Specifications

Full Pan Pile

Similar appearance to some steel sheet piles, the Full Pan Pile has benefits in terms of ease of installation. It is also stronger than the existing Standard Pile when used in the ‘Z-Ribbed’ format. Its uncluttered design is suitable for installations where appearance is important and the clean look of Plastic Piling can be seen.

<table>
<thead>
<tr>
<th>Material</th>
<th>Weight (Sheet) kg/m</th>
<th>Weight (Wall) kg/m²</th>
<th>Density kg/m³</th>
<th>Initial Tan Modulus kN/mm²</th>
<th>Moment of Inertia cm⁴/m</th>
<th>Maximum Moment kNm/m</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC</td>
<td>3.35</td>
<td>10.50</td>
<td>1450</td>
<td>2.55</td>
<td>688.5</td>
<td>7.38</td>
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</table>

<table>
<thead>
<tr>
<th>Width (sheet) mm</th>
<th>Material Thickness mm</th>
<th>Lugs</th>
<th>Tensile Yield Strength N/mm²</th>
<th>Secant Modulus kN/mm²</th>
<th>Section Modulus cm⁴/m</th>
<th>Allowable Moment kNm/m</th>
</tr>
</thead>
<tbody>
<tr>
<td>310</td>
<td>5</td>
<td>n/a</td>
<td>40</td>
<td>2.15</td>
<td>184.7</td>
<td>2.46</td>
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</tbody>
</table>

Physical Properties

Mechanical Properties

Engineering values represent results of testing when Piling is installed in the format as illustrated above only. Calculations are based on Tensile Strength of material = 40N/mm². Allowable Moment = Tensile Yield Strength x Section Modulus. Factor of Safety = 3.

Trench Pile

The Trench Sheet Pile is designed as a shuttering for temporary or permanent ground works in the utility sector. The unique corrugated design provides additional strength and it is much lighter and easier to handle than steel and therefore cheaper to transport. UPVC also eliminates the risk of sparking.

“The use of Plastic Piling may also provide a low cost alternative to steel piling in many temporary works situations met during the civil engineering construction of bridges, tunnels, drainage system, manholes, etc.”

Source: TRL Report (TRL 533) - Guidance on the structural use of plastic sheet piling in highway applications.

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<th>Moment of Inertia cm⁴/m</th>
<th>Maximum Moment kNm/m</th>
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</thead>
<tbody>
<tr>
<td>PVC</td>
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<td>7.70</td>
<td>1450</td>
<td>2.55</td>
<td>196</td>
<td>1.96</td>
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<table>
<thead>
<tr>
<th>Width (sheet) mm</th>
<th>Material Thickness mm</th>
<th>Lugs</th>
<th>Tensile Yield Strength N/mm²</th>
<th>Secant Modulus kN/mm²</th>
<th>Section Modulus cm⁴/m</th>
<th>Allowable Moment kNm/m</th>
</tr>
</thead>
<tbody>
<tr>
<td>240</td>
<td>5</td>
<td>n/a</td>
<td>40</td>
<td>0.65</td>
<td>49</td>
<td>0.65</td>
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</tbody>
</table>

Physical Properties

Mechanical Properties

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Flat Pile

The Flat Pile can be used on installations where no great strength is required and where a clean straight line of piles is preferred. Examples are the damming of peat bogs, or as a heavy-duty edging or raised bed retaining profile.

<table>
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<tr>
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<th>Density kg/m³</th>
<th>Initial Tan Modulus kN/mm²</th>
<th>Moment of Inertia cm⁴/m</th>
<th>Maximum Moment kNm/m</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC</td>
<td>3.20</td>
<td>11.42</td>
<td>1450</td>
<td>2.55</td>
<td>81</td>
<td>0.92</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Width (sheet) mm</th>
<th>Material Thickness mm</th>
<th>Lugs</th>
<th>Tensile Yield Strength N/mm²</th>
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<th>Section Modulus cm⁴/m</th>
<th>Allowable Moment kNm/m</th>
</tr>
</thead>
<tbody>
<tr>
<td>270</td>
<td>7</td>
<td>n/a</td>
<td>40</td>
<td>2.15</td>
<td>23</td>
<td>0.31</td>
</tr>
</tbody>
</table>

Physical Properties

Mechanical Properties

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**Standard Pile - Z Ribbed Format**

The Standard Pile is a medium strength product which has the versatility to be used in either of 2 formats. The ‘Z’ Ribbed format covers slightly more ground and has a shallower front - on profile.

<table>
<thead>
<tr>
<th>Material PVC</th>
<th>Weight (Sheet) kg/m</th>
<th>Weight (wall) kg/m²</th>
<th>Density kg/m³</th>
<th>Initial Tan Modulus kN/mm²</th>
<th>Moment of Inertia cm⁴/m</th>
<th>Maximum Moment kNm/m</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC</td>
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<td>9.79</td>
<td>1450</td>
<td>2.55</td>
<td>100</td>
<td>4.0</td>
</tr>
</tbody>
</table>

### Physical Properties
- Material Thickness mm: 330o/a
- Tensile Yield Strength N/mm²: 40
- Secant Modulus kN/mm²: 2.15
- Initial Tan Modulus kN/mm²: 2.55

### Mechanical Properties
- Moment of Inertia cm⁴/m: 510
- Section Modulus cm³/m: 100
- Allowable Moment kNm/m: 1.33

**Standard Pile - Box Format**

By inserting every other pile the opposite way around the sheets are configured into ‘box’ format. This configuration creates a much deeper profile with more strength.

<table>
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<tr>
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<th>Initial Tan Modulus kN/mm²</th>
<th>Moment of Inertia cm⁴/m</th>
<th>Maximum Moment kNm/m</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC</td>
<td>3.23</td>
<td>10.77</td>
<td>1450</td>
<td>2.55</td>
<td>2626</td>
<td>14.2</td>
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</tbody>
</table>

### Physical Properties
- Material Thickness mm: 315o/a
- Tensile Yield Strength N/mm²: 40
- Secant Modulus kN/mm²: 2.15
- Initial Tan Modulus kN/mm²: 2.55

### Mechanical Properties
- Moment of Inertia cm⁴/m: 357
- Section Modulus cm³/m: 100
- Allowable Moment kNm/m: 1.33

**Corner Pile**

Connects 2 lines of sheets at 90° and is ideal for creating coffer dams or for bank retention in artificial fish farm pools.

**3-Way Connector Pile**

Allows for another line of sheets to be created behind at 90° to the main wall, removing the need for steel tie bars in many cases.

**2-Way Connector Pile**

The Connector Pile allows 2 parallel runs of sheets to be connected to each other.

**Mini Pile**

A much smaller sheet often used in domestic situations for lawn edging or raised bed retention.

**Pile Cap**

To aid manual installation of Plastic Piling, aluminium pile caps are available.

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The information provided represents average values which are believed to be accurate. No warranty of any kind is made as to the suitability of Piling for any particular application or the results obtained there from.