SMD Prelay Trenching Systems
Soil Machine Dynamics Ltd (SMD) is the world's leading manufacturer of remote intervention equipment, operating in hazardous environments worldwide.
Headquartered in Beijing, China

Largest rolling stock manufacturer in the world

£42bn Revenue in 2015

Over 175,000 employees
Track Record

Delivering Trenchers since 1981

400+ Equipment & Systems Delivered

Over 90% of all submarine telecoms cables worldwide

50 Customers Worldwide

50% Repeat Customers

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SMD Trenching Capability

Global leader in Trenching systems including;

- Pipeline Ploughs
- Telecom cable ploughs
- Power cable ploughs
- Trenching ROVs
- Hard Ground Trenchers
HD

50Te HD3 3m Power Cable Plough

MD

23Te Telecoms 3m MD3 Plough

15Te Telecoms 1.5m Std Plough
25Te CBT500 with Wheel Cutter

55Te CBT1100 with Chain Cutter

220Te CBT3200 with Chain Cutter and Jetting Cassettes
VAMOS – Submerged Mining System
Prelay Plough Background

- Interconnector and Umbilical Prelay ploughing has traditionally used O&G pipeline ploughs with associated large vessels deploying 120-180Te ploughs, owned by large contractors such as Deepocean, Saipem, Technip etc.

- Lately low cost anchor technology has proven a market need for light weight low cost solutions, as part of the wind energy cost down pressure.

- SMD has developed a patent pending Prelay plough solution using standard plough elements with the benefits of O&G process control in a cost effective compact package.
Route Clearance, Pre-Lay and Post-Lay Backfill Ploughs

- 35Te Boulder Route Clearance and Submerged Boulder Removal. Maximum Tow Force 80Te
- 55Te Boulder Route Clearance, Pre-Lay Trench and Post-Lay Backfill. Maximum Tow Force 150Te 1.7 x 500mm
- 70Te Boulder Route Clearance, Pre-Lay Trench and Post-Lay Backfill. Maximum Tow Force 200Te 1.8 x 600mm

Family of patent pending ploughs.
80Te Tow Boulder Ripper Plough

- 35Te weight boulder clearing plough with ripper capability
- 30deg steering angle for reduced turning circle
- 10-13m corridor width
- 400mm boulder pass trench
- 1.6m deep ripper capability
- Crane launch

Lifts and clears surface and sub-surface boulders up to 80Te Tow Limit
150Te Tow Prelay Plough

- Boulder, Trenching and Backfill Modes with interchangeable front skids and mouldboards
- Crane or A-Frame launch
- 55Te Air Weight
- Full bridle steering for route following
- Variable trench depth to 1.7m
- Multi-pass operation for hard ground
- Thruster landing alignment control
- Full Instrumentation and surveillance
150Te Tow Preelay Plough

Boulder mode
- Clears a 13.0m route
- Cuts a 800 x 500mm first pass
- Clears boulders up to 150Te Tow Load

Trenching mode
- Cuts a ‘Y’ Trench 1700mm deep 500mm base with 45deg friction angle
- Operates in all seabed up to medium strength rock

Backfill mode
- Trench following front skids
- Mouldboard returns spoil heaps inside boulder berm
## 150Te Tow Prelay Plough

### Performance vs Undrained Shear Strength 50 – 600kPa

<table>
<thead>
<tr>
<th>Clay Shear Strength (kPa)</th>
<th>Clay type</th>
<th>Trench Depth Pass#1 (m)</th>
<th>Tow Force Excl. Boulder (Te)</th>
<th>Progress Rate Pass#1 (m/hr)</th>
<th>Trench Depth Pass#2 (m)</th>
<th>Tow Force (Te)</th>
<th>Progress Rate Pass#1 (m/hr)</th>
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</thead>
<tbody>
<tr>
<td>50</td>
<td>Soft</td>
<td>0.8</td>
<td>40+</td>
<td>500</td>
<td>1.7</td>
<td>60</td>
<td>500</td>
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<tr>
<td>100</td>
<td>Firm</td>
<td>0.8</td>
<td>60+</td>
<td>500</td>
<td>1.7</td>
<td>70</td>
<td>500</td>
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<tr>
<td>150</td>
<td>Stiff</td>
<td>0.8</td>
<td>80+</td>
<td>400</td>
<td>1.7</td>
<td>100</td>
<td>400</td>
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<tr>
<td>250</td>
<td>Very stiff to Hard</td>
<td>0.8</td>
<td>90+</td>
<td>400</td>
<td>1.7</td>
<td>120</td>
<td>400</td>
</tr>
<tr>
<td>350</td>
<td>Very Stiff to Hard</td>
<td>0.8</td>
<td>100+</td>
<td>400</td>
<td>1.7</td>
<td>130</td>
<td>300</td>
</tr>
<tr>
<td>400</td>
<td>Very Stiff to Hard</td>
<td>0.8</td>
<td>110+</td>
<td>300</td>
<td>1.7</td>
<td>140</td>
<td>250</td>
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<tr>
<td>500</td>
<td>Very Stiff to Hard</td>
<td>0.8</td>
<td>110+</td>
<td>200</td>
<td>1.7</td>
<td>150</td>
<td>150</td>
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</tbody>
</table>

### Performance vs Sand Density Grades Independently Verified

<table>
<thead>
<tr>
<th>Sand</th>
<th>Trench Depth (m)</th>
<th>Tow Force Excl. Boulder (Te)</th>
<th>Progress Rate m/hr</th>
<th>Trench Depth (m)</th>
<th>Tow Force (Te)</th>
<th>Progress Rate m/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coarse</td>
<td>0.8</td>
<td>60+</td>
<td>500</td>
<td>1.7</td>
<td>60</td>
<td>500</td>
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<tr>
<td>Fine/Dense</td>
<td>0.8</td>
<td>90+</td>
<td>400</td>
<td>1.7</td>
<td>90</td>
<td>400</td>
</tr>
<tr>
<td>Very Dense</td>
<td>0.8</td>
<td>120+</td>
<td>300</td>
<td>1.7</td>
<td>120</td>
<td>300</td>
</tr>
<tr>
<td>Impermeable</td>
<td>0.8</td>
<td>120+</td>
<td>150</td>
<td>1.7</td>
<td>120</td>
<td>150</td>
</tr>
</tbody>
</table>

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Route Clearance, Pre-Lay and Post-Lay Backfill Plough

Ancillary Equipment

- 20ft Control container with;
  - Pilot and Co-pilot control desk
  - Dual 50kW PDU

- Umbilical winch with;
  - 1200m umbilical
  - 75kW HPU

- A-Frame Stabiliser frame with;
  - Lift point interface
  - Roll damping cylinders
  - Pitch damping cylinders
Route Clearance, Pre-Lay and Post-Lay Backfill Plough
600Te Bollard Pull Prelay Plough

- 6m Trenching, Boulder Clearing and Backfill Modes
  Plough with interchangeable front skids and mouldboard extensions

- Air Weight 300Te / Designed for A-Frame launch from 600Te Dual Vessel Tow
Questions?