DRIVING

JETTING (All SeaPile Sizes)

- Pressurized water or compressed air pile jetting can be utilized when the sub-grade soil conditions are favorable for this type of installation.

VIBRATORY HAMMERING (All SeaPile Sizes)

- Vibratory Hammering can be utilized when the sub-grade soil conditions are favorable for this type of installation. In this event, SeaPiles are usually purchased a few feet longer, to compensate for any deformation to the pile top grab area.

IMPACT HAMMERING

10” SeaPile

- **Driving Shoe:** Driving shoes are not supplied with 10” SeaPile as a standard item. However, a steel point driving shoe may be provided as an attachment to the SeaPile when required for difficult driving conditions.
- **Hammer:** The minimum recommended hammer size for driving 10” SeaPile is 8,000 ft. lb. However, if readily available or the job calls a sufficiently large number of SeaPiles to drive, a 10,000 ft. lb. hammer may be used for greater efficiency.

13” SeaPile

- **Driving Shoe:** Driving shoes are not supplied with 13” SeaPile as a standard item. However, a steel point driving shoe may be provided as an attachment to the SeaPile when required for difficult driving conditions.
- **Hammer:** The minimum recommended hammer size for driving 13” SeaPile is 10,000 ft. lb. However, if readily available or the job calls for a sufficiently large number of SeaPiles to drive, a 15,000 ft. lb. hammer may be used for greater efficiency.

16” SeaPile

- **Driving Shoe:** Driving shoes are not supplied with 16” SeaPile as a standard item. However, a steel point driving shoe may be provided as an attachment to the SeaPile when required for difficult driving conditions.
- **Hammer:** The minimum recommended hammer size for driving 16” SeaPile is 15,000 ft. lb. However, if readily available or the job calls for a sufficiently large number of SeaPiles to drive, a 25,000 ft. lb. hammer may be used for greater efficiency.

CUTTING

CHAIN SAWS AND CARBIDE TIP BLADES

The following chain saw is recommended to achieve efficient cutting:

- **Make:** Stihl Bar Length: 34”
- **Model:** MS 660 Magnum
- **Size:** 91.6 cc (5.6 cu. in.)
- **Power:** 5.2 kW (7.0 bhp)
- **Bar Length:** 34”
- **Chain:** RAPCO’s Carbide tip, 77 each drive links, part #S
- **Mix Ratio:** 50.1 (2.6 fl. oz. of 2 cycle engine oil/gallon of 93 octane gasoline

The Stihl MS 660 chainsaw will have a standard 3/8 pitch chain bar and a 3/8-8 chain sprocket. The RAPCO chains are a 404 pitch, which will require the purchase of a 404 pitch chain bar and a 4040-7 chain sprocket.

The following company supplies both new chains and reconditions old chain saw blades:

- RAPCO 600 N.E. 88 Street, Suite D-104, Vancouver, WA 98665-0958 (800-959-6130)

CUTTING CONSIDERATIONS

The following considerations are recommended for more efficient cutting and extending the blade life:

- Avoid contact with the ground or other objects that can break or dull the brittle carbide blade tips. The tips are extremely sharp and must be maintained with a diamond tool. Excessive sharpening will reduce the blade life.
- The saw and blade must be kept clean between cuts. Shavings should be blown out in between cuts using a compressed air hose. Check under the top chain cover and remove any plastic build up as required.

LIFE EXPECTANCY OF CARBIDE TIP CHAINS

The following approximate number of cuts are estimated for carbide tipped chains on SeaPile.

Expected Life of Carbide Tipped Chain Used on SeaPile	
10” OD, with 1.00” FRP Rebar	10+ cuts
13” OD, with 1.00” FRP Rebar	10+ cuts
16” OD, with 1.25” FRP Rebar	8+ cuts

DRILLING / COUNTER BORING

POWER DRILL

The following drill specification is recommended for all drilling and countersinking:

- Electric: 3/4" chuck, Milwaukee "Super Holeshooter," 250-350 rpm or equivalent
- Pneumatic: 3/4" chuck, 1.5 to 2 HP, 200-350 rpm

DRILLING AND COUNTER-BORING PLASTIC WITH NO REBAR

Standard high-speed steel twist drills are suitable for drilling holes up to 1-1/2" diameter. These are commonly available but can be sourced from "MSC Industrial Supply Company" (Phone: 1-800-645-7270). If necessary, the tapered shank can easily be machined on a lathe with carbide tooling to allow for use in a standard chuck.

For larger holes, drilling a 1" or 1-1/8" diameter pilot hole is recommended. This is followed by a counter-bore type bit to enlarge the hole to the finished diameter. Counter-bore bits can be fabricated and supplied by Tangent as required. Alternatively, fabrication drawings can be provided by Tangent for customer fabrication. Extended shanks can be added to accommodate specific job needs.

DRILLING AND COUNTER-BORING PLASTIC WITH REBAR

Drilling a 1" or 1-1/8" pilot hole with a standard high-speed steel twist drill is recommended. This is followed by a carbide insert, counter-bore type bit to enlarge the hole to the finished diameter. Fabrication drawings can be provided by Tangent for customer fabrication. Extended shanks can be added to accommodate specific job needs.

When rebar is encountered, increased caution is required by the operator. Application of light pressure to the drill will help reduce the risk of the bit snagging.

Carbide inserts for counter-bores can be procured from Valenite Inc. Call 1-800-544-3336 to locate the nearest distributor. VC29 grade insert part number #SPMW432 and lock screw part number PT-546T are used.

DESIGN CONSIDERATIONS FOR THERMAL EXPANSION AND CONTRACTION

SeaTimbers expand/contract along their length based on temperature swings. This is different than wood timber. The expansion/contraction is less-so when SeaTimbers are reinforced with fiberglass; more-so when not reinforced. It is suggested, especially when connecting to concrete or steel (materials that have significantly lower rates of expansion/contraction) that bolt and counter-bored holes are oversized or slotted to allow for expansion/contraction. For design purposes, the coefficients of thermal expansion for Tangent materials are as follows:

Expected Coefficient of Thermal Expansion for SeaTimber	
Product	**Coefficient (in/in/°F)**
SeaTimber (ST)	0.00002

For more detailed information about expansion/contraction, and for guidance on how to apply the above coefficients to your specific installation, contact your Tangent Representative.

GENERAL CUTTING AND DRILLING

Customers may contact Tangent to answer any questions about working with SeaPile.
Phone: 1-800-721-9037 or 507-372-5558.

RECOMMENDED REPAIR PROCEDURE

REQUIRED TOOLS

- Silicone caulk sealant
- Propane torch
- Shavings of plastic matrix, left over from cutting to length with a chain saw
- Putty knife
- Sandpaper (80-100 grit) and wooden block
- Power sander, ideally battery powered orbital or palm type

FOR DEEP ABRASIONS, CUTS, AND GROOVES:

1. Clean the pertinent area of dust and debris.
2. Apply commercially available, suitably colored silicone caulk sealant.
3. Smooth to achieve an even finish.

FOR SMALL PATCHES:

1. Pre-heat the hole until the surrounding plastic is soft, not runny.
2. Press shavings into the hole and heat until liquefied.
3. Repeat in layers, until the void is flush, or standing slightly proud of the surface.
4. Allow each layer to cool before applying the next.
5. Sand the patch area, blending in until flush with the outer surface.

FOR LARGER PATCHES:

1. Cut a plug from a left-over SeaPile cut off piece to a slightly smaller shape than the depression.
2. Pre-heat the hole until the surrounding plastic is soft, not runny.
3. Press shavings into the hole and heat until liquefied.
4. Pre-heat the plug and press into the depression.
5. Press shavings into the gap around the plug and heat until liquefied.
6. Repeat in layers, until the gap is flush, or standing slightly proud of the surface.
7. Allow each layer to cool before applying the next.
8. Sand the patch area, blending in until flush with the outer surface.

LIFTING & HANDLING

The following considerations are recommended to resist damage when lifting SeaPile:

- Verify the weights and lengths of the material before each lift.
- Smaller and shorter SeaPiles may be handled by forklift utilizing proper forklift operating procedures.
- Use a lifting beam to properly distribute the lifting load and ensure a straight, vertical lift on the SeaPile.
- Use a sling or choker attachment and secure tightly to the SeaPile. Do not use lifting devices that cut or gouge the material. Alternatively, holes may be field drilled to provide lifting points if allowed for in the contract specifications.
- SeaPiles may be lifted at two pick points, provided the points are located at 1/5 of the overall length from each end. Otherwise, support the SeaPile at close intervals along the entire length.
- Stand up SeaPiles for driving by attaching to a single point on the piling that is 1/3 from one end.
- All lifting plans and procedures are the responsibility of the customer. Contact Tangent to review lifting plans as required.

STORAGE

The following considerations are recommended to resist damage when storing:

- Use minimum 4 x 4” plastic or wood lumber dunnage for support.
- Space dunnage at 6’ to 10’ maximum increments with support at each end of the SeaPile, and every 3’ foot when storing SeaTimber.
- Stack SeaPile and SeaTimber no more than 6’ in height. Chock, band, or tie outer rows to resist rolling.

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