



Engineering Specifications for **SeaShield Series 160™** Timber Pile Protection System

1.0 Scope

- 1.1 This specification may be used for the materials and application of Denso SeaShield Series 160 System for Timber Pile Protection.
- 1.2 The Engineer shall select appropriate sections of the specification to insure that the specification is comprehensive for specified work.

2.0 General Requirements

- 2.1 Contractor shall comply with all written recommendations of the manufacturer regarding application of the specified system.
- 2.2 The manufacturer of specified materials shall be Denso North America, 9710 Telge Road, Houston, TX 77095, Telephone: 281-821-3355 or 90 Ironside Crescent Unit 12, Toronto, Ontario, Canada M1X1M3 Telephone: 416-291-3435.

E-mail: info@denso.com

3.0 Materials

- 3.1 HDPE Outercover (160 mil)

The HDPE outercover shall be high density polyethylene (HDPE). The HDPE outercover shall be uniform throughout, free from dirt, oil and other foreign matter and free from cracks, creases, wrinkles, bubbles, pin-holes and any other defects that may affect its service. The material shall be produced by extrusion manufacturing to a 16", 18" or 20" diameter split along the longitudinal seam. The outercover shall conform to the following mechanical and physical properties:

Physical Properties	ASTM Method	Typical Values
Flow Rate	D1238	8.5 g/10 min
Density	D792	0.947 g/cm ³
Tensile Strength @ Yield	D638	3,300 psi
Ultimate Elongation	D638	850%
Secant Flexural Modulus @ 2% strain	D3350	125,000 psi
Izod Impact Resistance @ 23°C/73°F	D256	7 ft-lb/in
Hardness, Shore D	D2240	60
ESCR, F ₂₀	D1693	> 5,000 hr

Physical Properties	ASTM Method	Typical Values
Long Term Hydrostatic Strength @ 73°F	D12837	> 1,600 psi
Melting Point	D3417	262°F
Brittleness Temperature	D746	> -180°F
Coefficient of Linear Thermal Exp.	D696	0.8x10 ⁻⁴ in/in/°F

- 3.2 Neoprene Foam

The foam seals shall consist of 0.5" thick by 1.5" wide closed-cell neoprene foam with APS backing conforming to the following physical properties:

Physical Properties	ASTM Method	Typical Values
25% Compression Set (psi)	D1056-67	5-9
Density (PCF)	D1056-67	7 ± 2
Water Absorption Max. Weight %	D1056-67	5
Temperature Range, °F	D1056-67	-70/+225
Tensile Strength (psi)	D1056-67	80
Fuel B Max % Weight Change	D1056-67	250
Elongation, %	D1056-67	175
Durometer Shore 00	D1056-67	45-60
Shrinkage 7 Day @ 158°F Max.	D1056-67	5%

- 3.3 Strapping

The strapping system shall be comprised of either 5052 aluminum alloy or 316 stainless steel. The straps shall be sufficient length to completely encircle the pile over the top and bottom foam seals.

- 3.4 Nails

Nails shall be comprised of either 5052 aluminum alloy or 316 stainless steel. Nails shall be 2½" minimum in length. Ring Shank diameter shall be .135" and Head diameter shall be 3/8". Shall include metal and neoprene washers.

4.0 Installation

4.1 Cleaning and Surface Preparation

Identify piles to be protected with the outercover between elevations indicated in the drawings. Remove marine growth, and foreign matter for the entire length which is to be protected with the SeaShield Series 160 System. All surface projections such as nails, bolts, large splinters, fouling organisms and other surface conditions that would penetrate the outercover shall be removed.

4.2 Neoprene Seals

The neoprene foam seals shall be adhered to the inside of the outercover along the vertical seam. Foam seals shall also be adhered to the inside of the outercover at top and bottom ends as required on contract drawings.

4.3 Nail Holes (Optional)

Holes shall be drilled 3" O.C. along vertical seam as well as top and bottom at a distance of 1" from edge of HDPE cover. Diameter of drill shall be no larger than 0.135".

4.4 HDPE Outercover

Locate the outercover between the elevations indicated in the specifications and drawings. The vertical edges of the outercover shall be snapped around the wood pile with the vertical foam seal overlapping on top of inside layer. A minimum overlap of 4" shall be achieved with tension being applied to form a tight sheath around the pile. The vertical seam shall be secured to the pile with select nails. Nails shall be driven at a minimum of 3" around the circumference of the pile through the outercover and foam seal. Depending on length of outercover, additional strapping may be used. With the outercover fastened in the final position, selected strapping shall be placed directly over the top and bottom seals. The straps shall be drawn tight with a strapping ratchet tool so that the foam seals are compressed.

4.5 Overlapping Outercovers

Where it is necessary to utilize more than one outercover to protect the entire length of a pile, the second outercover shall overlap a minimum of 12" (above and/or below) the inner cover. Rotate the vertical closure seam of the overlapping outercover 90° from the vertical seam of the unit(s) above or below. Install overlapping outercovers as described in Section 4.4.

4.6 Nailing

To ensure a tight enclosure, drive select nails through the outercover every 3" along the closure seam. Drive select nails at top and bottom seals every 3" to ensure a tight seal between the seal and pile.

4.7 Mud Line Seal

Excavate the soil around the base of the piles so that the outercover extends to a minimum of 2 feet below the mud line. After installation of the outercover, back fill all excavated areas to the original mud line.



DENSO NORTH AMERICA

HOUSTON:

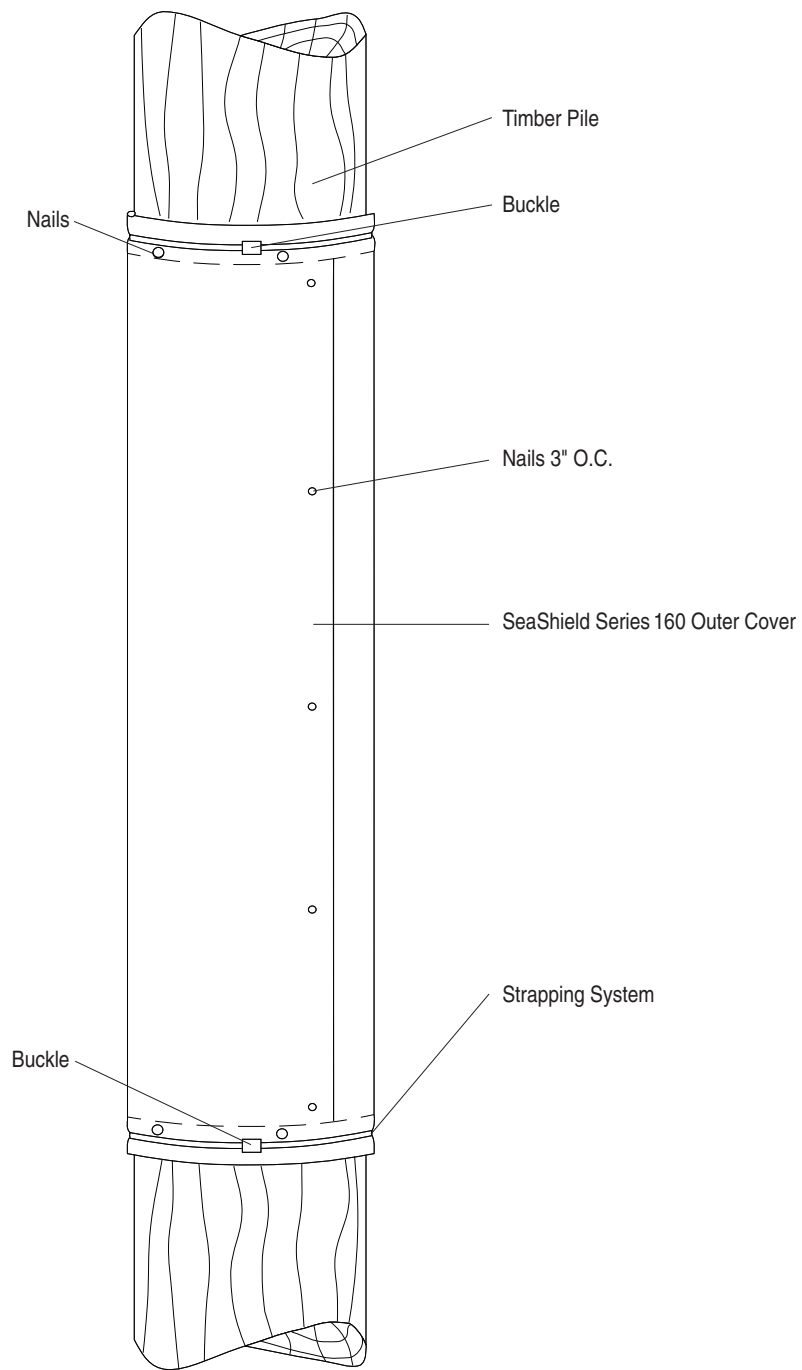
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Installation View

Sheet 1
(Not to Scale)

SeaShield Series 160 Splashzone Protection System

