



Decorative Pond Information



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Greetings,

I would like to take this opportunity to introduce you to our company.

Lange Containment Systems, Inc. (LCSI) is a premier fabricator of custom geosynthetic membrane products. We specialize in large panels, custom shapes and a full line of accessories. We utilize the highest quality materials including PVC, Hypalon, XR-5, Polypropylene, Urethanes and a variety of coated fabrics.

Our management team has over 50 years experience in all facets of the business and in all corners of the globe. We have had extensive experience with secondary containment of fuels and chemicals. Our applications range from temporary liners below a skid-mounted diesel tank to complex tank farms. At your direction we can provide all the components to do a containment kit and also offer the field installation services of a technician or complete crew to install the system.

LCSI is committed to providing the highest quality products, with the service and flexibility that sets the standard for our industry. This means that each bid, job, and person will get the quality individual attention of our team that is deserved. Our service will not be compromised.

With that said, please take your time reviewing our brochure and work. We welcome your calls and questions, and look forward to doing business with you in the future.

Sincerely,



Stuart Lange, President
Lange Containment Systems, Inc.



About LCSI

Centrally located in Denver Colorado, Lange Containment Systems Inc (LSCI) is a fabricator and installer of geomembranes and other geosynthetics. LSCI was founded in 1994 and has since fabricated and installed in excess of 100,000,000 F² of liner systems all over the world, including Antarctica.

LCSI received an [Industrial Fabrics Association International](#) (IFAI) award of Excellence for the Salt Lake City International Airport deicing fluid storage and recycling ponds.

Health & Safety Policy:

At Lange Containment Safety is our number one priority for our staff, our clients and the people with whom we interact. Our approach is based on individual behavior and we apply this behaviour-based safety approach to all aspects of our work.

Environmental Policy:

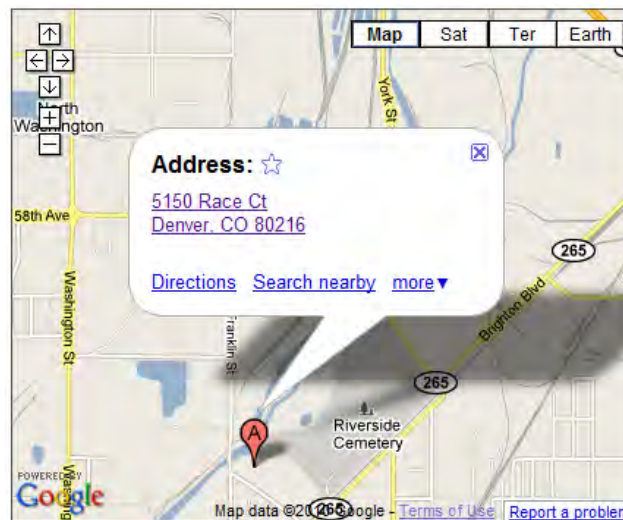
Lange Containment is committed to improving the environment through our own internal initiatives. Our key environmental objectives include:

- Conduct our business in an environmentally responsible manner;
- Minimise environmental risks by employing safe operating procedures; and
- Limiting our impact on the environment by reducing office waste and waste generated by our operations.



Locate LCSI

We are conveniently located the heart of Denver's Industrial center. Click on Map for further details.





Project Profile

Dip Creek Ranch at Sun Valley, Idaho

The task of transforming a 20 acre sheep pasture into an exclusive million dollar residential development is the type of challenging project Doug McCoy Construction of Twin Falls, Idaho aggressively pursues. However, when the design called for an aquaculture system of membrane lined lakes and stream beds capable of growing trophy trout, the company knew it would need a quality sub-contractor to supply and install the 30 mil PVC liner. After a thorough investigation of a number of lining companies, Lange Containment Systems was chosen for the project.

Lange Containment Systems began the project by creating a panel layout that minimized field seaming and waste materials. Next, the 30 mil PVC product was fabricated into large panels in the LCS factory using state of the art Radio Frequency (dielectric) welding equipment. Once the product was delivered to the site, LCS personnel quickly followed on a coordinated schedule with the contractor. This allowed the installation crew to arrive on site and begin installation as soon as the substrate had been prepared. The installation crew's high productivity maximized the on-site time and provided for an efficient and worry free installation.

After the liner was installed, the crew from Doug McCoy Construction placed the required cover materials on the liner. After filling the lakes and landscaping the shores, the development is ready for home construction. Regardless of whether you need industrial containment or water features for trophy fish, Lange Containment Systems can meet your geomembrane liner needs.



Before



During Construction



After



Installation



Back-filling





PVC Geomembrane – Mechanical Properties PGI 1104 Specifications¹

Certified Properties ²	ASTM	PVC 20	PVC 30	PVC 40	PVC 50	PVC 60
Thickness	D-5199	20 ±1 mil	30 ± 1.5 mil	40 ± 2 mil	50 ± 2.5 mil	60 ± 3 mil
Tensile Properties ³						
Strength at Break	D-8824 Min	48 lbs/in	73 lbs/in	97 lbs/in	116 lbs/in	137 lbs/in
Elongation	D-8824 Min	360%	380%	430%	430%	450%
Modulus at 100%	D-8824 Min	21 lbs/in	32 lbs/in	40 lbs/in	50 lbs/in	60 lbs/in
Tear Strength	D-1004 ⁴ Min	6 lbs	8 lbs	10 lbs	13 lbs	15 lbs
Dimensional Stability	D-1204 ⁴ Max Chg	4%	3%	3%	3%	3%
Low Temperature Impact	D-1790 ⁴ Pass	-15°F	-20°F	-20°F	-20°F	-20°F
Index Properties ⁵	ASTM	PVC 20	PVC 30	PVC 40	PVC 50	PVC 60
Specific Gravity	D-792 Typical	1.2 g/cc	1.2 g/cc	1.2 g/cc	1.2 g/cc	1.2 g/cc
Water Extraction Percent Loss (max)	D-1239 ⁴ Max Loss	0.15%	0.15%	0.20%	0.20%	0.20%
Average Plasticizer Molecular Weight	D-2124 ^{4,5}	400	400	400	400	400
Volatile Loss Percent Loss (max)	D-12034 Max Loss	0.9%	0.7%	0.5%	0.5%	0.5%
Soil Burial	G1604 Max Chg					
Break Strength		5%	5%	5%	5%	5%
Elongation		20%	20%	20%	20%	20%
Modulus at 100%		20%	20%	20%	20%	20%
Hydrostatic Resistance	D-7514 Min	68 psi	100 psi	120 psi	150 psi	180 psi
Seam Strengths	ASTM	PVC 20	PVC 30	PVC 40	PVC 50	PVC 60
Shear Strength ³	D-882 ⁴ Min	38.4 lbs/in	58.4 lbs/in	77.6 lbs/in	96 lbs/in	116 lbs/in
Peel Strength ³	D-882 ⁴ Min	12.5 lbs/in	15 lbs/in	15 lbs/in	15 lbs/in	15 lbs/in

- Notes:
1. PGI 1104 replaces PGI 1103 Specification effective 1/1/04.
 2. Certified properties are tested by lot as specified in PGI 1104 Appendix A.
 3. Metric values are converted from US values and are rounded to the available significant digits.
 4. Modifications or further details of test are described in PGI 1104 Appendix B.
 5. Index properties are tested once per formulation as specified in PGI 1104 Appendix A.

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Polypropylene Geomembrane – Mechanical Properties

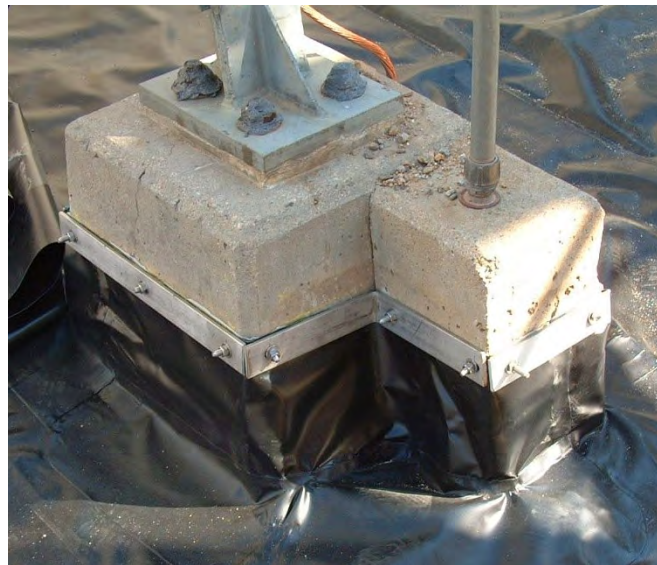
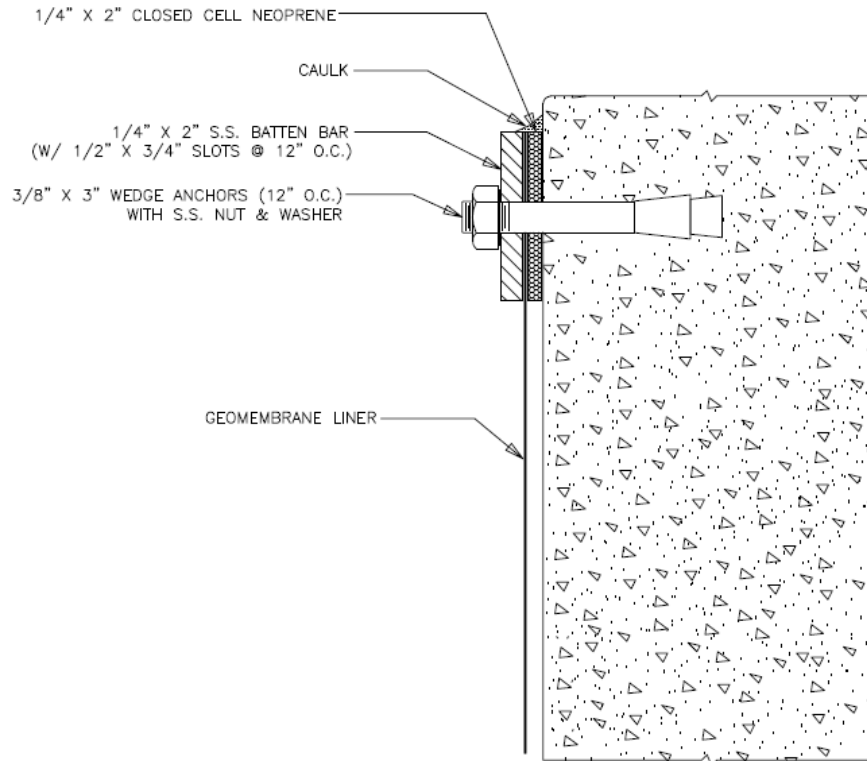


Property	Test Method	Units	Specification		
			Certified Value	Certified Value	Certified Value
Thickness (±10%)	-	mil	0.036	0.045	0.060
Breaking Strength-fabric (min.)	ASTM D-751 Method A	lbf	275	300	300
Low Temp. Flex	ASTM D2136 1/8-in mandrel, 4 hr. pass	°F	-40	-40	-40
Puncture Resistance (min.)	FTMS 101C Method 2031	lbs.	300	300	300
Tear Strength (min.)	ASTM D-5884	lbf	70	70	70
Dim. Stability (max.)	ASTM D-1204 180°F (82°C) 1 hr.	% chg	1	1	1
Hydrostatic resist. (min.)	ASTM D-751 Method A, Procedure 1	psi	350	350	350
Ply Adhesion (min.)	ASTM D-413 machine Method Modified	lbs/2 in	40	40	40
Stress Crack Resistance (black)	ASTM D-1693, 3000 hrs	hrs w/o failure	3,000	3,000	3,000
UV Resistance	ASTM G26 Xenon Arc 176°F (80°C) / 4000 hrs	hrs	35,000	35,000	35,000
Ozone Resistance (100 pphm / 14 days)	D1149	-	No Cracks	No Cracks	No Cracks
Typical Fabricated Seam Properties					
Bonded Seam Strength (min.)	ASTM D-751, modified	lbf	200	200	200
Peel Adhesion (min.)	ASTM D-413, modified	lbs/in	20	20	20

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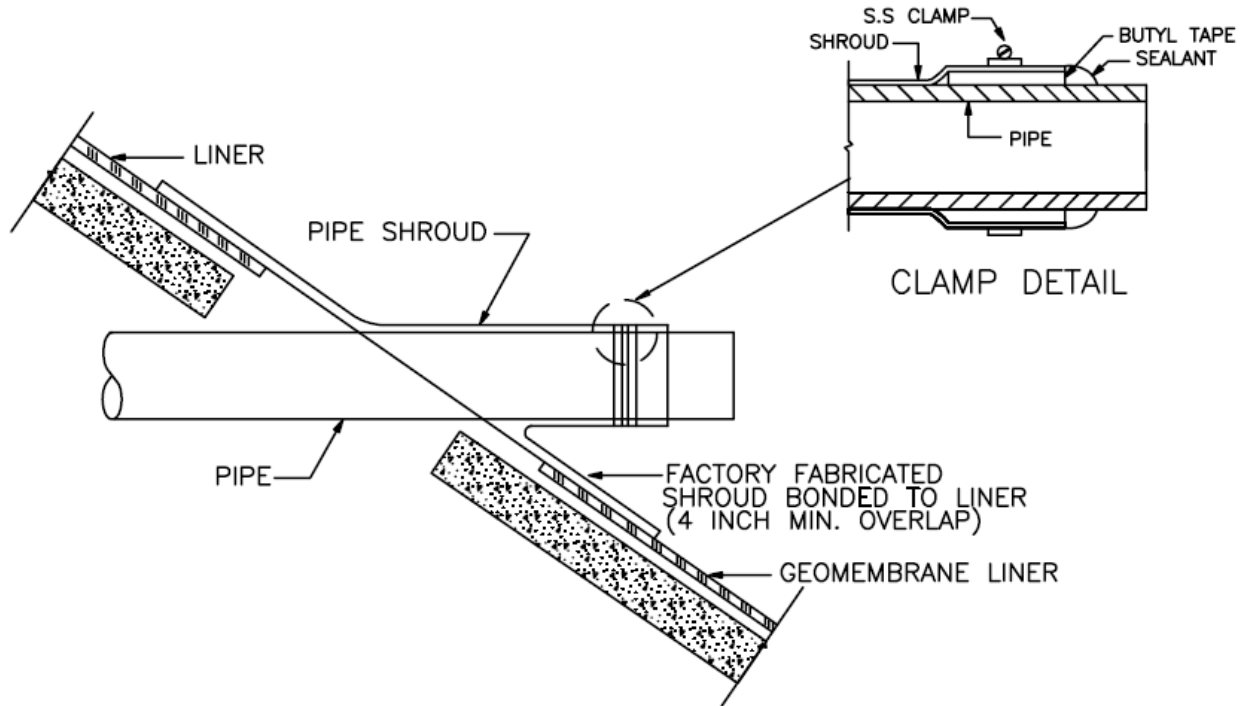
Typical Mechanical Attachment Detail



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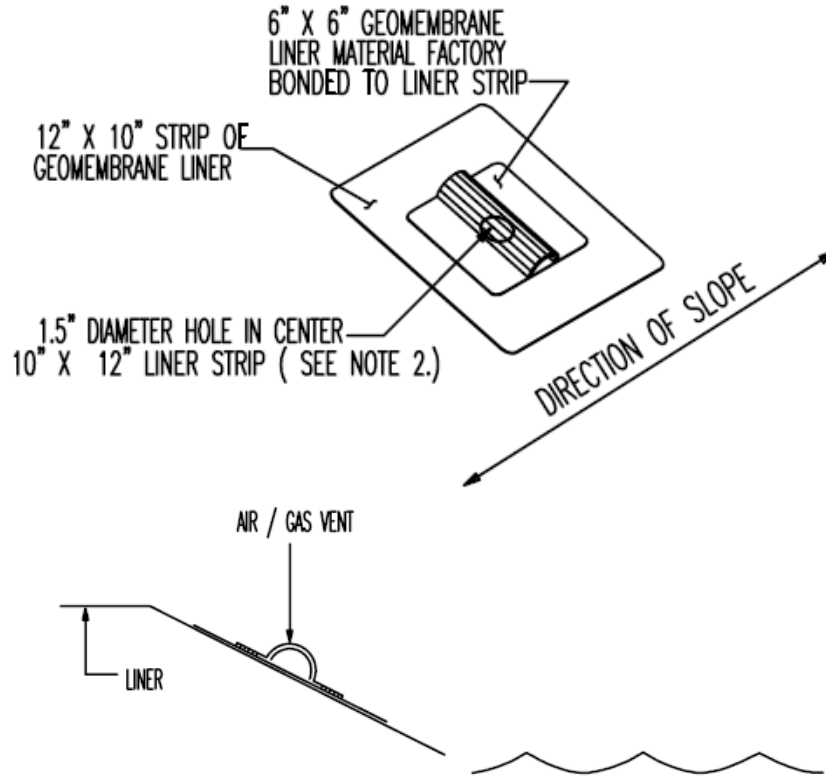
Typical Pipe Boot Detail



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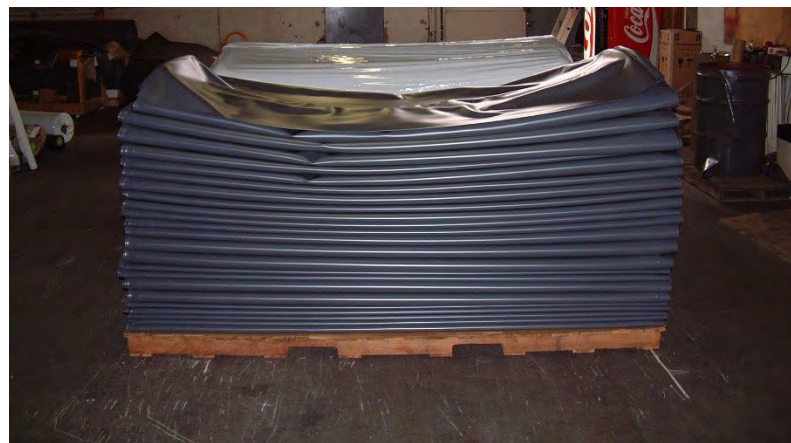
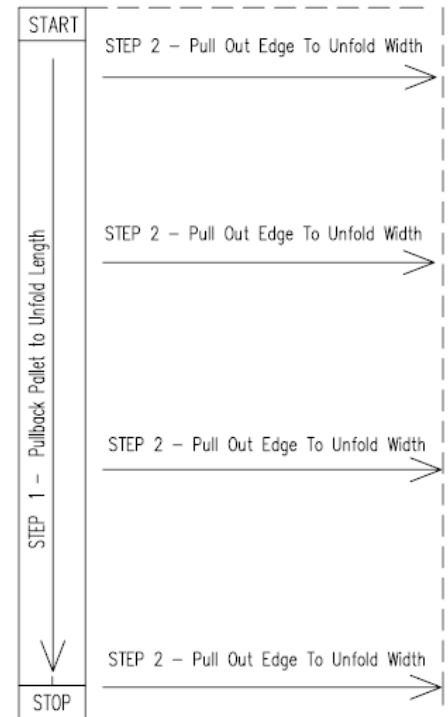
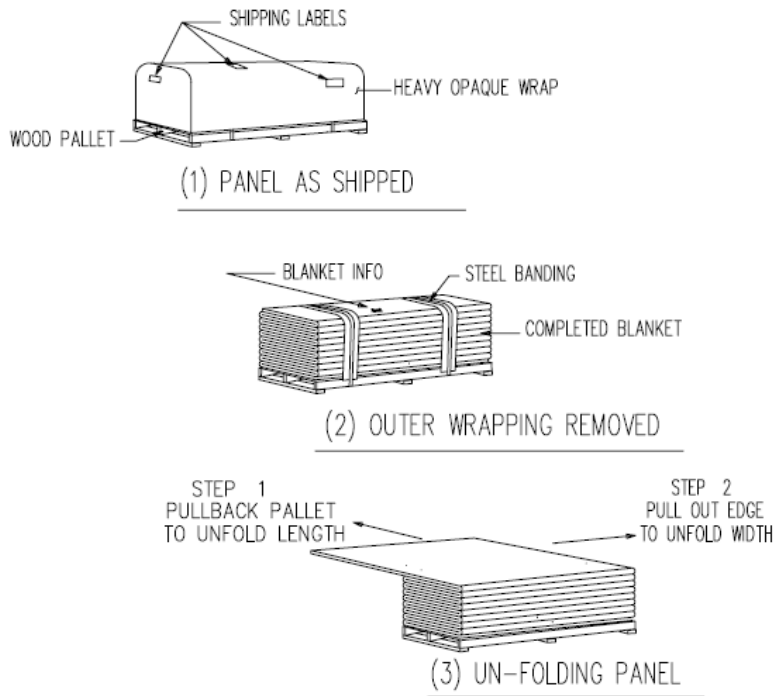
Typical Air / Gas Vent Detail



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Typical Palletizing & Unfolding Detail



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brochure and work.

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