



Tech Note: Top Mount vs. Base Mount Liner Attachment



With most design details, multiple options exist to accomplish the desired outcome. Engineers' must weigh the different design choices on their merits and choose the solution that best matches the project requirements. When designing a containment system for Oil and Gas facilities, the two most common liner attachment points to be considered are either at the base of the containment wall, a "Base-mount" installation or on the top of the containment wall a "Top-mount" installation.

Contains' installation crews are comfortable installing containment systems employing either design, however Contain Enviro wants to ensure that you understand the points "for" and "against" either system so that you can make your selection based on what is best for your project, rather than what best accommodates the limitations of the containment installer or system.

Many installers promote top-mount liner attachment based solely on the fact that it compensates for limitations inherent to their containment design, in their view; any deficiencies in the system will be protected or hidden by the geomembrane liner. Precast concrete systems are bulky and heavy leaving panels prone to differential settlement, greatly increasing the risk of a gap developing between sections. Any mechanical fasteners driven into the face of the precast concrete allows water to infiltrate the panel, subjecting the metal sub-structure to rust and cracking the concrete during freeze-thaw cycles.

Contain Enviro's corrugated steel panels are overlapped and leak-proof caulking can be placed between the panels to provide a seal. However, with most flat panel steel systems, the thick panels of steel butt up together rather than overlap, preventing the ability to seal this joint effectively. For these systems top-mount liners are promoted as they compensate for short-comings in the containment design.

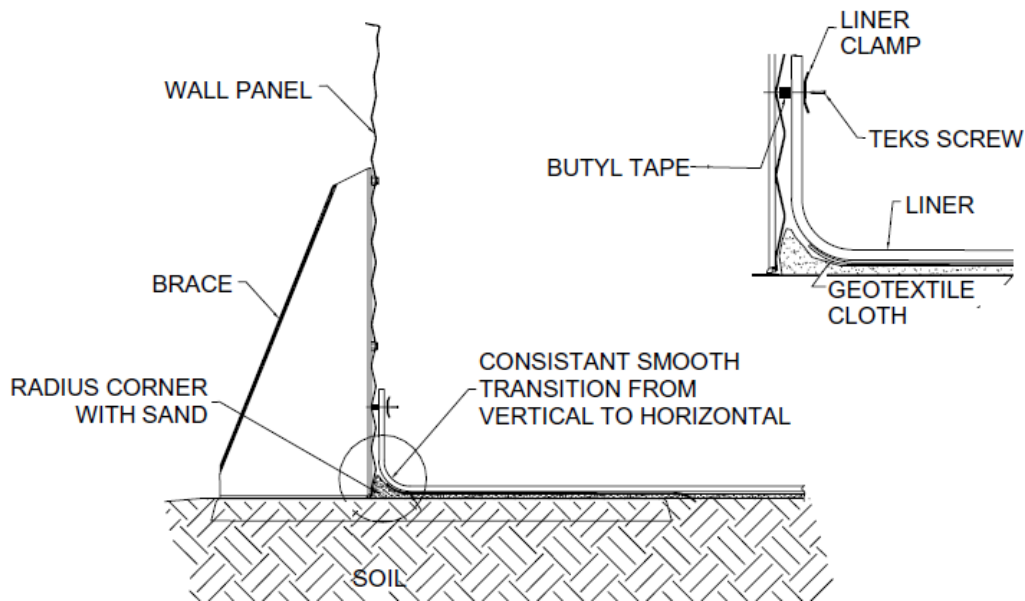
A major design consideration of a top-mount system is that the liner will be left exposed from the base of the containment up to the top of the containment wall. Leaving the liner exposed in this area not only opens it up to UV exposure, it leaves it vulnerable to mechanical damage from a wide variety of potential sources. We encourage a design where the base of the containment is covered by a layer of geotextile, sand and gravel, protecting it from UV light, as well as any foot, vehicle or animal traffic that may move across this area. If the vertical section of the liner is left exposed at the wall, it is open to the risk of damage each and every day as any tear or hole in the liner would compromise the entire installation. By selecting a properly installed base-mount liner attachment, this highly probable failure risk will be avoided.



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There are applications when a top-mount liner attachment is recommended, when providing secondary containment to liquids which would be harmful to the galvanized steel wall such as strong acids or liquid fertilizers, a top-mount system is the correct choice.

A design feature which must be considered when selecting a base-mount liner is that it must be attached to the wall at a point which would be below the liquid level should the containment be called into action. When attaching at this point, both the liner and wall must be penetrated by fasteners, potentially introducing several leak points. To address this, Contain Enviro's trained crews use leak-proof tech screws and other unique hardware and special caulking compounds to construct a base-mount liner attachment ensuring a fully leak-proof installation.



There is no question that a top-mount liner installation can be installed much quicker in the field. The liner is much easier to work with and attach to the containment wall when an installer is standing up rather than squatting down and working at the base of the containment wall. Depending on the unit cost of the geomembrane, these labor savings can be slightly offset by the requirement for a larger geomembrane liner to run up the wall of the containment. However in most installations the labor costs for a top-mount attachment are considerably lower than that of a base-mount system.

There are several design variables which need to be considered when designing a containment system, the attachment point of the liner being only one of them. The intent of this tech note is to better inform you of the risks involved with design details so that you can make an informed decision based on the requirements of the project rather than the limitations of a containment system.

Contain Enviro Services Ltd. is the leader in the supply and installation of corrugated steel primary and secondary containment systems for a wide variety of challenging applications and can provide you with the design support to deal with your most demanding application.

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