



**TERRA FIRMA
INDUSTRIES P/L**

ACN 129 115 484
ABN 22 129 115 484

Terra Firma Industries

Petroleum case study

Situation

Petroleum retailers and distributors across the country need to ensure they install high quality products that improve the safety of their workers and customers. Working in environments with highly flammable materials can be dangerous, and diligence to prevent incidents must always be front of mind. Any pit covers installed must be of a high quality to prevent injuries, water ingress, sparking, and gas leakage.

A leading environmental engineering company specialising in pollution, waste and remediation was brought in to consultant for a specific project for a prominent petroleum retailer in Sandringham, Victoria. The scope of works included an installation of a remedial multi-phase vacuum extraction system for the removal of soil and ground water with five inspection pits located in the services station forecourt. For the project, the consultant was required to select appropriate access covers that were not only lightweight, strong and easy to open, but were water and gas tight.

Problem

Petroleum forecourts encounter many challenges when it comes to their manhole covers, and therefore the material used must be able to combat the following issues.

Firstly, many covers installed are bolted down with locator pins which bend, rust and drastically increase the time it takes to open a cover to access a pit. Speed of access is critical from a safety perspective, as it reduces the time workers are in busy, chaotic forecourts. It is also an inconvenience for customers and employees of the service station as the number of available petrol pumps diminishes. It is difficult or near impossible to replace bolted down lids securely which is a major issue when a seal is required.

Working with highly flammable chemicals is very dangerous, and products installed in and around petrol stations must be electrically non-conductive. Stray voltage and electrical sparking are big safety issues, and pit covers that are combustible must be avoided around petrol stations as the risk of fire is far greater than other environments.

Also, the slip resistance of pit lids in petroleum stations is vital – imagine the danger of slippery lids in an environment where the risk of petrol spills is high!

Unwanted and potentially dangerous elements must be kept out of pits within petrol station forecourts and pit lids that are not sealed can have a damaging effect. Consider if water ingress leaked into a pit – water can carry any spill to a far greater area increasing the danger, and the clean-up. Sand and other particles carried in the wind that get into pits can speed up corrosion with damaging effects to the safety of the petrol station.

Containment is a major issue for petrol forecourts. Consider how easily sparking can set off leaked gas which has been building up? Petrol stations need pit lids that contain gas leaks and minimise the risk of sparking.

As pit lids on forecourts are situated in areas with high traffic volumes and large trucks, pit lids need to be able to withstand significant forces. Consider the weight of a loaded fuel tank, and the strength required to bear that load.



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Constant breaking of pit lids made from metal or concrete that don't meet load bearing requirements runs into an expensive exercise considering not only the cost of the lid, but the labour costs to replace and install new ones.

Solution

The environmental engineering consultants identified Terra Firma E-400 composite fibreglass pit lids as the ideal solution to tackle the above mentioned problems.

Ease of access

Terra Firma pit lids are extremely lightweight – they are only 25% of the weight of concrete, 33% of steel or iron, and 50% of aluminium. Lightweight lids drastically reduce the risk of injury to workers who are installing pit covers, and are servicing the pits.

Terra Firma pit lids are not bolted down when installed, instead they are precision moulded and sealed which allows for easy replacement during maintenance. This removes the problem of worn and disfigured bolts heavily reducing the time it takes to access a pit. Another benefit of fibreglass composite lids is that they won't react to heat – removing the problem of fretting, or wear which is commonly seen with metal and aluminium lids.

Electrically non-conductive

Terra Firma's pit lids are electrically non-conductive and have been tested to withstand 80,000 volts, making them ideal for areas where electrical shock and stray voltage has to be negated or avoided. A petrol station is a prime example of this type of environment!

Sealing

Terra Firma E-400 pit lids are designed with a special sealing method to create a water, sand and airtight barrier.

Non-corrosive

Corrosion can have a destructible effect within petrol station forecourts, which is why Terra Firma's E-400 composite fibreglass pit lids will not corrode when subjected to elements such as wind borne sand, salt, water and all chemicals met in road environments. Terra Firma lids are also petroleum resistant, non-flammable and don't conduct heat.

Load bearing

Terra Firma's E-400 pit lids can bear loads of 400kN or 40 tonnes, placing them in the E-Class category as per AS3996. These lids far outperform their concrete and aluminium alternatives and are ideally suited for areas that require heavy duty lids such as forecourts. In fact, Terra Firma's pit lids are so strong they come with a 15 year guarantee.





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Slip resistance

Terra Firma's composite fibreglass lids have a better slip resistance than metal when wet, dry or worn. A Terra Firma E-400 cover has been tested to R11 and W classifications under AS4586-2004. This is the highest rating for pedestrian covers.

Benefit

How has the installation of Terra Firma's D-400 composite fibreglass pit lids benefited the busy petrol station? The lightweight lids have dramatically reduced the time required to open, access and inspect pits. On a busy Friday afternoon, the contractor who installed the lids, commented, *"Don't worry, with the Terra Firma D400 pit lids, we can open the lid, inspect the pit and have it closed before the customer has finished paying for their petrol."* To see how fast Terra Firma lids can open, click the on the image below to see a video of an inspection of the lids after they were installed for this particular case study.



But most importantly, the benefits are felt by the workers as creating safe environments reduces the risk of injury to workers and the public utilising petroleum forecourts. Manual handling injuries carry not only economic costs but expensive personal costs. Improve the environment for your workers and reduce their risk of injury by taking advantage of the benefits from innovation.

Ready to reap the benefits of innovative technologies in your forecourts?

Contact Terra Firma on (03) 9464 6169, info@terrafirmapitlids.com, or visit our website at www.terrafirmapitlids.com for more information.

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