



ECOPROTECTOR FRP STORMWATER TREATMENT SYSTEM INSTALLATION MANUAL

PROTECTOR

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1. INTRODUCTION

Protector is a company excelling in the design, manufacture and production of fibreglass tanks to be utilised in stormwater treatment technologies. The newest development designed by Protector is the ECOPROTECTOR, a filtration device to be implemented into stormwater systems to remove large sediments, gross pollutants, hydrocarbons and oil from stormwater runoff. Once treated this water is then returned into the water system, efficiently keeping our water clean.



The EcoProtector is a hydrodynamic, full capture, high-capacity trash and debris removal GPT (Gross Pollutant a Trap) with superior litter and organic debris capture. The EcoProtector has been designed to remove particles greater than 5mm using physical processes to trap solid waste such as litter and coarse sediment under low velocity conditions. This system is best suited for low risk applications.

EcoProtector are commonly used as the primary treatment for the removal of large, non-biodegradable pollutants in areas with a high fraction of impervious surfaces such as residential subdivisions, roads, carparks, industrial applications and any area that

may require Stormwater treatment. Primary treatments include, physical screening, rapid sedimentation and separation processes. The typical retained contaminants include gross pollutants and coarse sediments. Gross pollutant traps are most often used as part of a treatment process with other Stormwater treatment measures as they are not entirely effective in removing nutrient.

Since gross pollutant traps tend not to be effective in removing nutrient, they are most often used as part of a treatment train with other stormwater treatment measures such as wetlands or bio-retention systems. There are many different types of gross pollutant traps. All of them perform a similar function: trapping litter and sediment above 5 millimetres in size so that they can be removed from the water system. By removing large pollutants, downstream treatment of stormwater can occur more effectively. Protector has a wide range of products that would be highly suitable for downstream filtration as one entire system. Don't hesitate to contact us to enquire about any advice for your systems.

ECOPROTECTOR products, manufactured by the Australian-based manufacturer, PROTECTOR, provide high quality solutions for fast and efficient installation, needed for today's fast track building methods. Built to the highest specifications, the ECOPROTECTOR product is designed and built to BS4994-1987 and ASME RPT1. Popular with councils, municipal, water authorities, civil and construction customers and incorporating state-of-the-art technology, our stormwater treatment solutions provide simple solutions to some of the most complex problems in the water and waste water industry.

ECOPROTECTOR products are designed to reduce operating costs and optimise operating efficiency. Above and below ground options can be used in a multitude of applications, in both domestic and commercial environments, from small, single pump units to dual pump systems, with capacities of up to 250,000 litres per unit. The entire range is easy to install, easy to handle, light and robust.

PROTECTOR's dynamic enterprise has roots in the industry that go back to over 40 years of engineering, design experience and product knowledge passed from generation to generation to where it is today. PROTECTOR products, known as the leading edge of composite manufacture here in Australia are renowned for their quality with painstaking attention to detail that has become the product and basis for the company's operation formed by years of experience and knowledge in the fibreglass and water industry. Today PROTECTOR plant, based in Sydney, comprises of modern 'state of the art' filament winding and computerised robots to ensure fast operations and precision from concept to completion. The basis for the company's operation, with continuous success, both yours and ours!

Fibreglass Reinforced Polymer are composite materials made of a polymer matrix reinforced with fibres and are high strength, long life materials that are commonly used in aerospace, automotive and water industries. Our FRP products are coated with a final internal and external layer of C'veil and CSM to provide a higher resistance to corrosion which makes them ideal to be implemented in tank applications such as our stormwater treatment systems. They can be exposed to the water for years without being corrupted. Light weight,

resistant to high temperature, strong in compression with our guarantee of easy on-site installation are some of the desirable features that FRP indicates. Furthermore, FRP plates have higher mechanical strength which enables them to carry higher loads compared to plastics. PROTECTOR has designed and manufactured stormwater treatment system utilizing FRP to provide a quality product. ENVIROPROTECTOR stormwater treatment system have a better durability, and highly resistant to any impact and corrosion whilst providing the best stormwater treatment available.

This document provides an in-depth and detailed collation of the technical information on the ECOPROTECTOR product including its installation practices, suitable usage, advantages and limitations. Information is also provided on the filtration system, its design and its maintenance.

2. SCOPE OF PRODUCT

This system is design as an underground stormwater treatment system, mainly in the uses of gross pollutant trap, sedimentation and oil capture processes. It is recommended as the first line of treatment in a stormwater treatment system, as either standing along or in a large system with TSS, chemical and nutrient removal systems. The Ecoprotector gross pollutant trap is best suited for low risk applications. The EcoProtector is designed to be used as a gross pollutant trap suitable to many applications. It can easily be retrofitted or included in tandem with a large range of other PROTECTOR products. With its large range of inlet configurations and tank sizes it can handle any needs.

2.1. Applications

The most common applications, but not restricted to, of the ECOPROTECTOR are listed below.

- Residential Subdivisions
- Commercial and Industrial Developments
- Main Stormwater Drainage systems
- Retrofitting to existing Stormwater drainage systems
- Stormwater harvesting systems
- Combined sewer overflows
- Any other applications where the target pollutants are primarily gross pollutants and oils and sediments.

3. ECOPROTECTOR STORMWATER TREATMENT SYSTEM SPECIFICATIONS

3.1. Design and Construction Standards

- AS1546 - Underground tank design
- AS1170 - Loading code

3.2. Design Methodology

The underground tank Design Methodology is based on the use of the above standards as described, where applicable:

- AS1546 is used to formulae the design load of soil/groundwater and use for the testing methods applied.
- AS1170 is used to formulae the design loads from active loads that the stations are subject to, including the required roof slab design. This standard is also used to formulae the ballast requirements for ant floatation.

3.3. Materials of construction

3.3.1. Corrosion

- Internal
 - Internal Corrosion Barrier, moulded with a resin rich C'veil and CSM layers
 - Resin rich Corrosion barrier constructed from Hetron 922 Vinyl Ester Resin
 - C'veil will be Regina 80gsm Surface Tissue
 - The Internal Corrosion Barrier is manufactured in accordance with AS2634
- External
 - External layer will a resin rich CSM layer and C-Glass veil finished with ISO/NPG Flow coat layer for external finish to required colour

3.3.2. Reinforcement

- Manufactured using Chop / Hoop Construction, on a computer-controlled Filament Winding machine.
- Shell Thickness are in accordance to the design requirements set out in the methodology. o Structural layers are constructed from Polyplex Isophthalic Resin with CSM & Hoop in accordance with Ratio's as specified by the design.
- Fiberglass 'E' glass is used for both chopped and continuous strands.

3.3.3. Tank

- The Stormwater treatment system Battered base is circumferentially benched to WSA04—2005
- FRP Flanged fittings are made in accordance with AS2634, and flanges are installed as per AS2634. Both the internal and external FRP attachment laminates are in accordance with AS2634

4. SAFETY

These instructions should not be interpreted in any way to put one's health at risk, or to harm property and/or the environment. The following definitions will serve as a guide when reading this manual:

4.1. Warning

Indicates a potentially hazardous situation, which if not avoided could result in death or serious injury.

4.2. Caution

Indicates a potentially hazardous situation, which if not avoided may result in minor or moderate injury. A caution without the safety alert symbol indicates a potentially hazardous situation, which if not avoided may result in property damage.

4.3. Important Information

Proper installation of each ECOPROTECTOR is essential:

- To ensure the safety of all the individuals involved in the installation.
- To prevent ECOPROTECTOR damage and/or failure, which could lead to product loss and environmental contamination.
- To validate the ECOPROTECTOR warranty.

4.4. General Information

WARNING ECOPROTECTORS are a confined space per OHS guidelines. Follow proper confined space safety procedures.

PROTECTOR fibreglass ECOPROTECTORS are designed for installation with concrete top pad and bottom slabs. The following instructions reflect the approved methods for installing ECOPROTECTORS. Follow all OHS, Federal, State or Local, safety and environmental codes and regulations

4.5. Before you Begin

- Read, understand and follow these instructions.
- Barricade the work area.
- Review and prepare to complete the installation checklist as the installation progresses. If you have questions on other ECOPROTECTOR installation details, call Technical Support at 02 8006 4229

5. PRIOR TO INSTALLATION

Our Products are Suitable for almost all locations, from an industrial Car Park to Residential Catchment areas, from mining areas to Airports, our large range of products will provide the solution you need. Our FRP designs will strive to keep our streams, waterways and our environment clean.

5.1. Design Considerations

Important considerations must be taken when deciding on which Protector product is suitable for your needs. With the assistance of our team of experienced staff we can offer endless assistance and advice in this matter. The most important aspects we consider helping solve your needs are:

- Physical Locale and rainfall conditions
- Catchment Size
- Contaminant types
- Flow Rate
- Risk Analysis

All our products ensure clean, treated water to flow back into the environment.

5.2. Location

Location is vital for design considerations for PROTECTOR to provide the best possible ECOPROTECTOR FRP tank for you site demands. Information shall need to be supplied to our team depicting all information necessary for us to select the perfect ECOPROTECTOR tank for you. Rainfall data, flow rates, storm conditions and other aspects of the surrounding area are recommended to be provided or detailed.

For optimal installation and transport of the ECOPROTECTOR FRP tanks, clear and safe access to the stormwater treatment system, stormwater treatment system installation site and control panels must be considered to facilitate ease of installation, maintenance and servicing. The access manways built into our ECOPROTECTOR tanks must be accessible at all times and well-sealed to prevent foreign contaminants from entering the stormwater treatment system. Access roads must be available for delivery of the tanks, with no intrusion or obstacles that may cause damage to the FRP tank upon delivery and installation.

6. PROCEDURE FOR INSTALLATION

6.1. General

The construction method used in the manufacture of FRP ECOPROTECTOR stormwater treatment system utilises high strength Composite Laminar of Resin and Glass. These materials are extremely strong as well as corrosion resistant. But, like all engineered products, care must be taken during installation to ensure that long, trouble free operation can be expected.

6.2. Pre-Installation Checks

1. After unloading inspect the tank skin for any damage during transportation and crane slinging. Should any minor surface damage be evident, this must be reported to your supplier and inspected before proceeding with the installation.
2. Check walls, floor and roof for any surface damage. If minor repairs are required, report as outlined in above.
3. Check all pipe penetrations through wall, ensure that no damage has occurred and that the surfaces are clean for later joining to incoming and outgoing pipes and vents.

4. Check hold down bolts on pedestals and tighten if necessary.

6.3. Handling and Preparation

WARNING Do not stand on or under ECOPROTECTOR while it is being lifted. This could result in personal injury or death.

- Do not drop or impact the ECOPROTECTOR.
- ECOPROTECTORS should be stored horizontally and chocked, using only appropriate materials such as sandbags, tires, or other soft or pliable materials.
- Upon ECOPROTECTOR delivery and when lifting ECOPROTECTOR, visually inspect entire exterior surface of the ECOPROTECTOR for shipping or handling damage.
- If the ECOPROTECTOR must be moved by rolling, ensure that ground to be traversed is smooth and free of rocks, debris, or other hard objects.
- Do not roll or set the ECOPROTECTOR on any pipe stub out, accessory or appurtenance installed on the ECOPROTECTOR.
- The contractor is responsible for rigging, unloading and securing the ECOPROTECTOR.
- When lifting the ECOPROTECTOR in the horizontal position, use two slings with a spreader bar.
- Use a minimum of two lift lugs when pivoting the ECOPROTECTOR from horizontal to vertical.
- Utilize all lift lugs provided at the ECOPROTECTOR top for vertical lifting.
- Only a pliable strap or rope should contact the ECOPROTECTOR, do not use chains, steel cables or hard metallic slings.

Lifting and Tank Handling from Truck

Once the truck arrives:

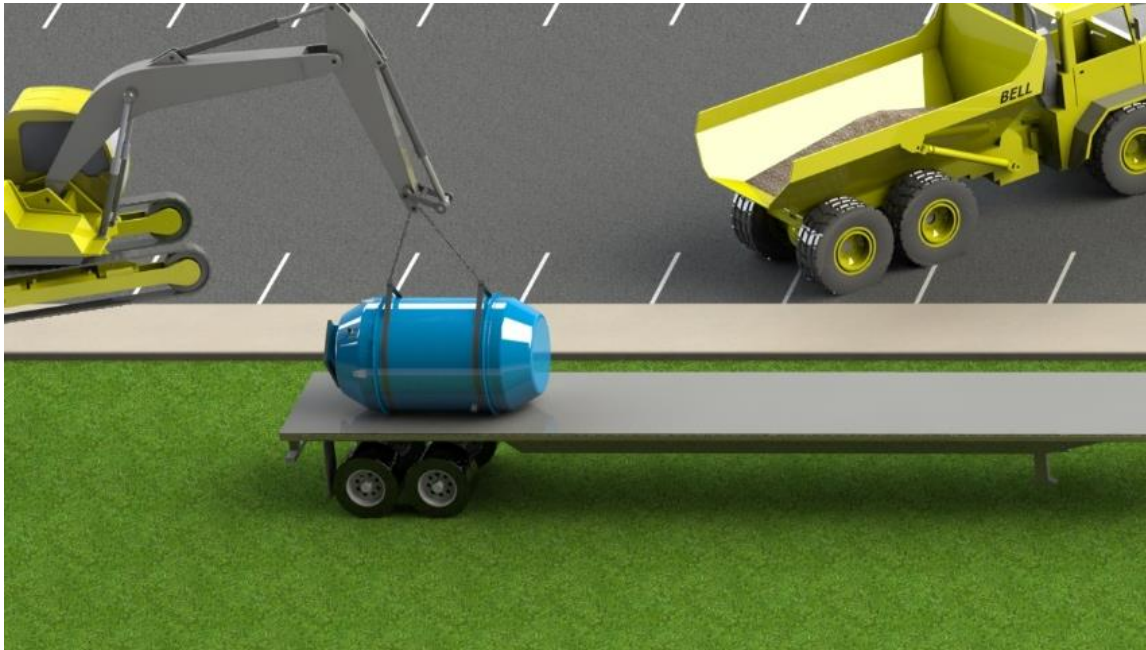
1. check condition of tank to ensure no damage has incurred in Transport. All issues must be photographed and sent to PROTECTOR for verification.

Lifting procedure:

1. Place Soft Slings around the body of the station



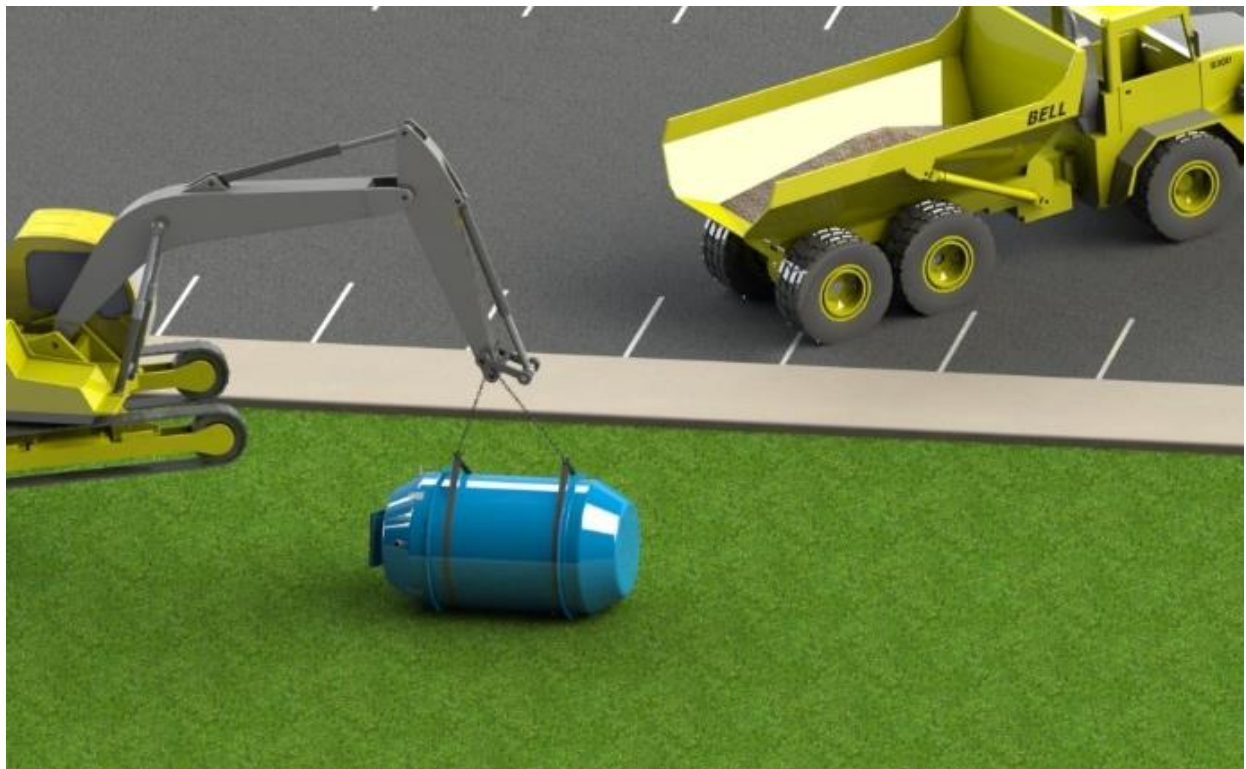
2. Slings to be $\frac{1}{4}$ from each end
3. Connect two leg chains to slings



4. Lift and Place on Ground
5. Place tank on ground as the same Position of the truck
6. Ensure that the tank is resting on supports. Ensure that the flanges do not come in to contact with the ground.

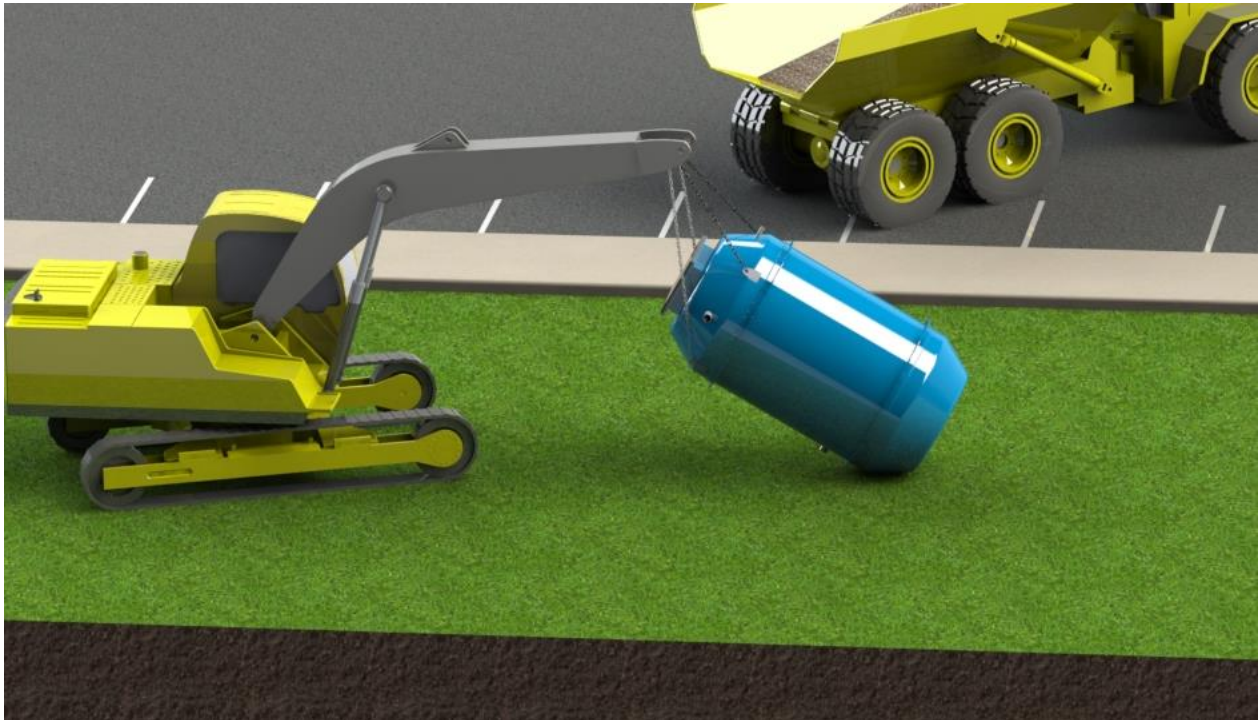


7. Ensure that the base of the tank is on soft ground (I.E. grass)
8. Place a Short Soft Sling through each Lifting Lug Eyes Provided
9. With a toe Chain set or (1 redundant) ensure that the ties are the same length.
10. Try to make the chains if possible to reduce angle
11. Take up tension on the 2 Lugs beside the Valve Pit.



Below: Image to show 50% of the way to Vertical, showing that only 2 chains will be tight at this point.

12. Once the tank is vertical with all chains tight, the tank is ready to be moved to the excavation for installation.



6.4. Site Preparation

Dimensions of the excavation should be wide enough to provide sufficient working room around the ECOPROTECTOR. Minimum anti floatation ring and ballast dimensions are specified in (Table 1, page 7)

Anti-floatation ring and ballast designs in (Table 1, page 7) meet Australian Standard Code S3600A.

(Dead load resisting floatation have a factor of safety of 0.9 applied.)

6.5. Anti-Floatation Ballasts for FRP ECOPROTECTOR Tanks

The tank walls are designed to resist the crushing effects of underground pressures to the full depth of the wall without the need to be surrounded by concrete. However, in conditions of high water table, external ballast will be required to resist upward buoyancy forces. It is important to note that, as ECOPROTECTOR tanks do not require outer concrete walls for strength, the ballast concrete may be placed in the most economical position, which is at the base of the excavation normally to the base locking ring. Concrete must be poured in accordance with 'best practice' as set out by the industry Standard. Please refer to the Concrete Manufacturers' Association Handbook. The calculation of the volume of concrete ballast is not covered in this document. This calculation should be carried out by a certified civil engineer.



WARNING Collapsing excavation walls can cause injury or death. Do not enter the ECOPROTECTOR excavation unless necessary and in compliance with OHS regulations. Follow OHS guidelines for excavations.

ECOPROTECTORS • Lower ECOPROTECTOR onto Compacted Base then place Wet concrete around the Unit, until it covers the lock-in Rib plus meets the Ballast Quantity in (Table 1 and figure 1, page 7.)

Cold concrete joints are not allowed. Fibreglass solid bottom ECOPROTECTORS with external reinforcing ribs must be installed in a continuous and monolithic concrete pour. Concrete must extend 100mm above the lock-in rib from the ECOPROTECTOR bottom, and around the entire circumference of the ECOPROTECTOR. (Refer to figure 1, page 7) • Concrete slab must fill all gaps and voids in and around the external tank lock-in ribs. • It may be necessary to add ballast (water) inside the ECOPROTECTOR to counteract buoyancy until the concrete is cured.

ANTI FLOATATION RING CONCRETE SLAB Use minimum 20 MPa concrete for anti-floatation and ballast Final concrete depth, size, thickness and reinforcements shall meet the minimum requirements in these instructions and applicable tables. Anti-floatation ring should extend a minimum of (refer to table 1, page 7) in all directions from the ECOPROTECTOR outer diameter.

CAUTION Voids in the concrete slab around external structural anchors will result in product damage and environmental contamination.
Below are the details for the Ballast installation for the ECOPROTECTOR range.

Model	Ballast Thickness (mm)	Ballast Depth (mm)	Total Depth (mm)	Ballast Length
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ECP.1200	300	1500	2400	440
ECP.1500	350	1800	2700	540
ECP.1850	400	2200	3200	675
ECP.2200	400	2500	3400	775
ECP.2500	500	3500	4700	840

6.6. Bed and Backfill

Proper backfill selection and compaction are required for a proper installation. The allowed backfills are shown in Table D-1 along with the degree of compaction required.

Bed and Backfill Compaction	
Soil type-pipe bedding material (Unified Soil Classification System See Table D-2)	Minimum Degree of Compaction Required*
Fine - grained soils (Liquid Limit < 50) with medium to no plasticity with less than 25% coarse grained particles. CL, ML, ML - CL,	High
Fine grained soils (Liquid Limit < 50) with medium to no plasticity with more than 25% coarse grained particles. CL, ML, ML - CL	Moderate
Coarse grained soils containing more than 12% fines. GM, GC, SM, SC	Moderate
Coarse grained soils with less than 12% fines. GW, GP, SW, SP	Slight
Coarse grained soils with less than 12% fines. GW, GP, SW, SP	Dumped

* Degree of compaction:

- Dumped - No compaction effort.
- Slight - Some compactive effort. In-place density <85% standard compaction. Or < 40% modified compaction.
- Moderate - Intermediate level of compactive effort, In-place density $\geq 85\%$ and < 95% standard compaction, or $\geq 40\%$ and <70% modified compaction.
- High - Considerable compactive effort. In-place density $\geq 95\%$ standard compaction, or $\geq 70\%$ modified compaction
- The difference in the “dumped” and “slight” degree of compaction values is significant and are based on the method of construction, not the measured densities. “Dumped” means that there is absolutely no compaction of the embedment soil. “Slight” means there was something done that increased the soil density, even if minor, such as water settling, jetting, flooding, equipment travel, and in some cases, foot traffic.
- For stable soils (cohesion ≥ 36 kpa and / or a bearing capacity ≥ 170 kpa a minimum 300mm of backfill must be placed around the ECOPROTECTOR.
- For unstable soils (cohesion ≤ 36 kpa and ultimate bearing capacity ≤ 170 kpa). - ECOPROTECTORS 1200mm diameter or smaller require a minimum 600mm of backfill around the entire circumference of the ECOPROTECTOR. - ECOPROTECTORS larger than 1200mm diameter require a minimum backfill of $\frac{1}{2}$ the ECOPROTECTOR diameter around the entire circumference of the ECOPROTECTOR.

- If muck, bog or peat are present, consult with a Geotechnical Engineer for backfill and excavation requirements.
- For permafrost conditions, consult with a Geotechnical Engineer for backfill and excavation requirements. Keep backfill dry and free of ice in freezing conditions. Ensure that no foreign objects such as large stones, concrete clumps, tree roots/limbs, or debris is in the backfill surrounding the ECOPROTECTOR.



Prevent large surges of backfill from displacing the ECOPROTECTOR.

Table D-2

Letter and Definition	Second Letter and Definition
G = Gravel	P = Poorly Graded (uniform particle sizes)
S = Sand	W = Well Graded (diversified particle sizes)
M = Silt	H = High Plasticity
C = Clay	L = Low Plasticity
O = Organic	

6.7. ECOPROTECTOR Installation with a Fibreglass Underground Tank

CAUTION Not using approved backfill material may result in tank failure and environmental contamination.

If the ECOPROTECTOR is installed in the same excavation as an underground fibreglass tank, the backfill around the ECOPROTECTOR must also meet the tank backfill requirements to not compromise the tank installation. Tank backfill requirements are more restricted and strict conformance to the tank backfill requirements in MAN 600 must be met for both the ECOPROTECTOR and tank.

6.8. Piping Penetrations/Fittings

CAUTION Always wear safety glasses and protective clothing when cutting on the ECOPROTECTOR, failure to do so can result in personal injury.

- Pipe penetration cut-outs should be round holes and should be no larger than the pipe diameter plus 25mm. - Make cuts using a saw with a masonry or diamond grit blade. - Do not use an axe or other impact type tools.
- Accessories must be installed and used in strict accordance with the manufacturer's instructions.
- All piping must have a flexible connector installed directly on the fitting or accessory to allow for a minimum 15mm differential settlement between the ECOPROTECTOR and the pipe. If more than 15mm differential settlement is expected, choose a flexible connector designed for the expected settlement. Do not backfill around the ECOPROTECTOR until the concrete slab has hardened. Add backfill in maximum 900mm lifts evenly around the ECOPROTECTOR to avoid uneven backfill loads.
- A flexible joint on each connecting pipe is required to relieve stresses from differential backfill movement or soil consolidation. Backfill should be added to the invert elevation of each connecting pipe, the connection made and sealed, before continuing to backfill.



WARNING To prevent fire or explosion hazard, PROTECTOR recommends air driven tools whenever possible. DO NOT use power tools where flammable vapours or liquids exist. Also, when electric hand tools are used, be aware of potential shock hazards. Wear protective clothing and eye protection. ECOPROTECTORS may be a confined space. Follow proper safety procedures.

6.9. Invert

Invert specified by Certified Engineer. The invert may be at any angle and may project up the ECOPROTECTOR any distance.

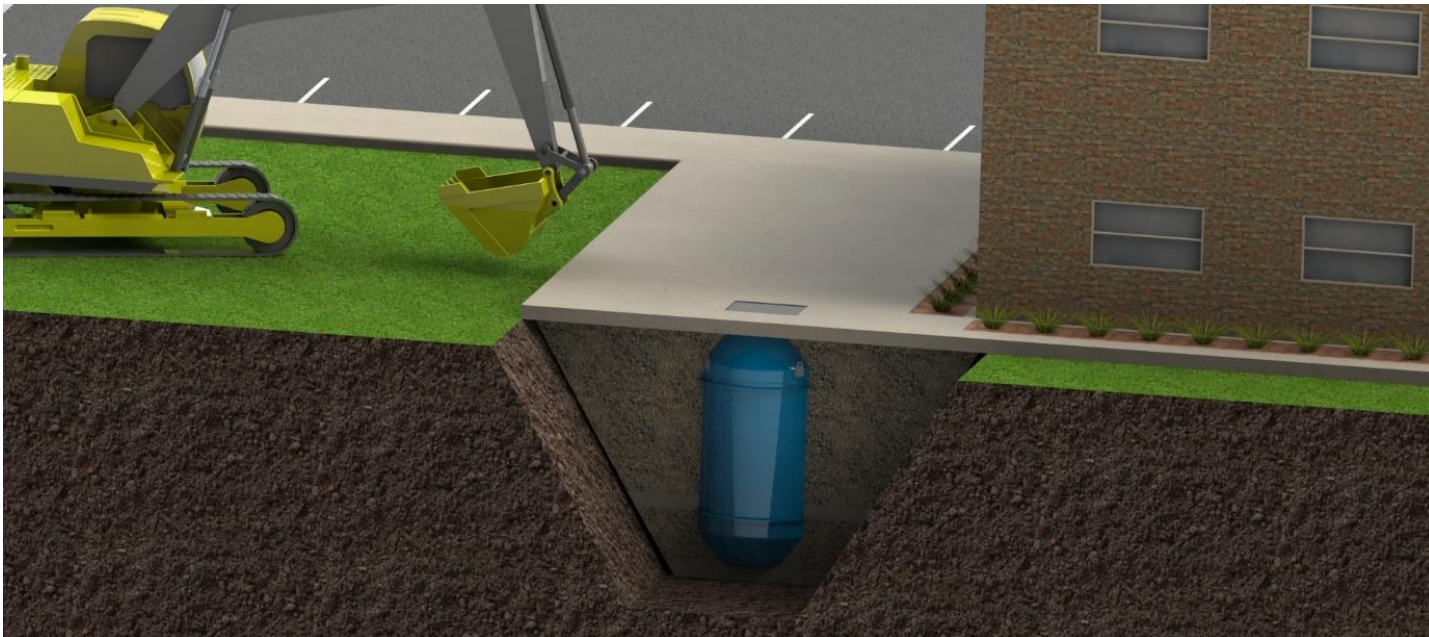
6.10. Top Pad

The ECOPROTECTOR is designed to support the dead weight of an 200mm thick square pad 600mm larger than the diameter of the ECOPROTECTOR (centred on the ECOPROTECTOR) along with a dynamic T-44 traffic load as long as the pad is designed to distribute the loads on the ECOPROTECTOR perimeter and not on the interior of the lid.

If the static load will exceed the 200mm pad weight or the traffic load will exceed T-44, the pad must be 1200mm larger than the ECOPROTECTOR diameter (centred on the ECOPROTECTOR) and all of the pad and / or traffic loads must be supported by the soil around the ECOPROTECTOR and not by the ECOPROTECTOR itself.

Fibreglass flat tops 1000mm through 2500mm diameter are designed to support 200mm concrete pads without internal supports while the concrete cures.

The concrete pad must be designed to be self-supporting after cured.
The pad shall be specified by the Certified Engineer.



FIBREGLASS FLAT TOPS WITHOUT TRAFFIC LOAD

- The pad must be larger than the ECOPROTECTOR a minimum of 300mm in all directions.
- Maximum 200mm concrete pad thickness.

FIBREGLASS FLAT TOPS WITH TRAFFIC LOAD

- The pad must be larger than the ECOPROTECTOR a minimum of 600mm in all directions.
- The Certified Engineer shall specify the pad strength and reinforcement so that the static weight of an 200mm thick square pad (no more than 600mm larger than the diameter of the ECOPROTECTOR centred on the ECOPROTECTOR) along with a dynamic T-44 traffic load must be distributed on the ECOPROTECTOR perimeter and not on the interior of the lid.

- If either the static pad load or the dynamic traffic load is exceeded, all of the pad and / or traffic loads must be supported by the soil around the ECOPROTECTOR and not by the ECOPROTECTOR itself.

6.11. Wet Hole Installation

CAUTION: Never allow an empty tank to remain in a wet hole, or a dry hole that may become wet unless anchoring and backfilling have been completed. Failure to anchor and backfill may damage the tank or surrounding property.

Firstly, make site preparation as per section B.

Pump the water from the hole to maintain minimum water level. Add a minimum of 300mm of well-placed backfill material (Must Be Crushed Gravel) to the hole, and level the bed to assure uniform bottom support for the tank. Position the tank in the hole.

Partially ballast tank using water until it settles firmly on the prepared bed. Ballast level in a tank must never exceed water level in hole during installation. Use only enough ballast to sink the tank. One tank is level and ballasted, carefully place concrete ballast as per section C. then processed to sections D, E (if applicable), F, G and H.

Fibreglass ECOPROTECTORS With External Anti Floatation Rib:

The ECOPROTECTOR bottom is designed to BS4994 to any resist buckling of the ECOPROTECTOR bottom from external water pressure and internal pressure, in the installed condition with a compacted base to Figure C.1, and the perimeter of the ECOPROTECTOR including the anti-floatation lock-in Rib embedded in concrete. This table must be followed for the concrete slab design for all ECOPROTECTORS with fibreglass external ribs. These slabs are designed to AS3600. In some cases, the slab and/or reinforcing design is controlled by temperature requirements cases by flexure. Use minimum 20Mpa concrete. Since some of the slab designs are controlled by temperature, the slab thickness should not be without the approval of a Design Engineer

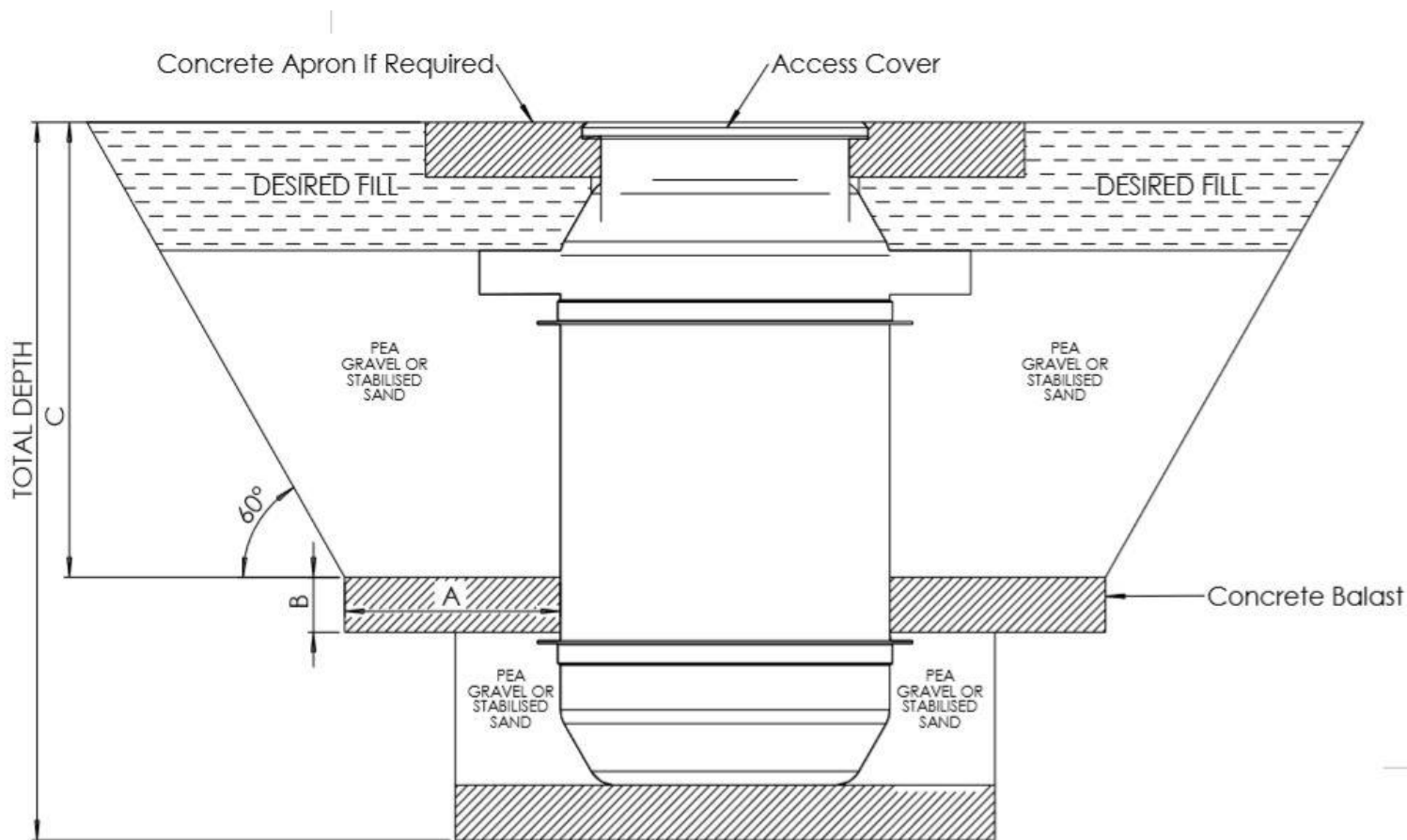


FIGURE 1

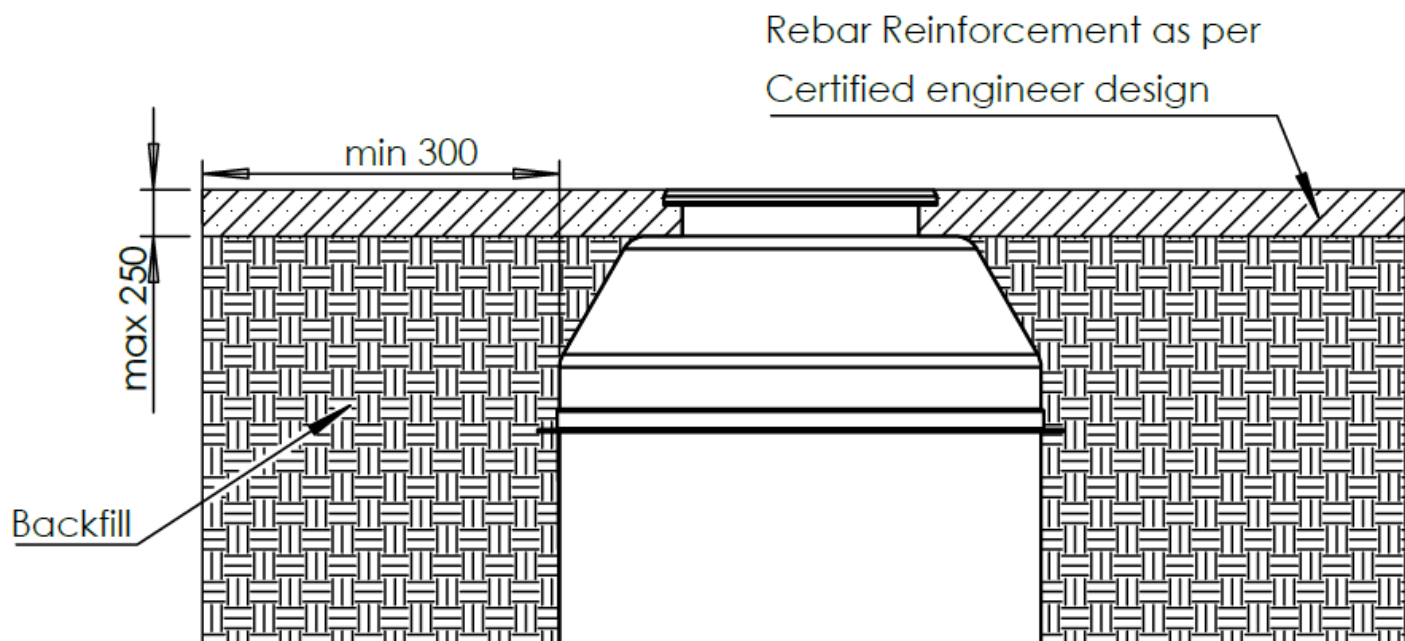
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Model	Ballast Thickness (mm)	Balast Depth (mm)	Total Depth (mm)	Ballast Length
ECP.1200	300	1500	2400	440
ECP.1500	350	1800	2700	540
ECP.1850	400	2200	3200	675
ECP.2200	400	2500	3400	775
ECP.2500	500	3500	4700	840

7. TRAFFIC AND NON-TRAFFIC LOAD COVERS

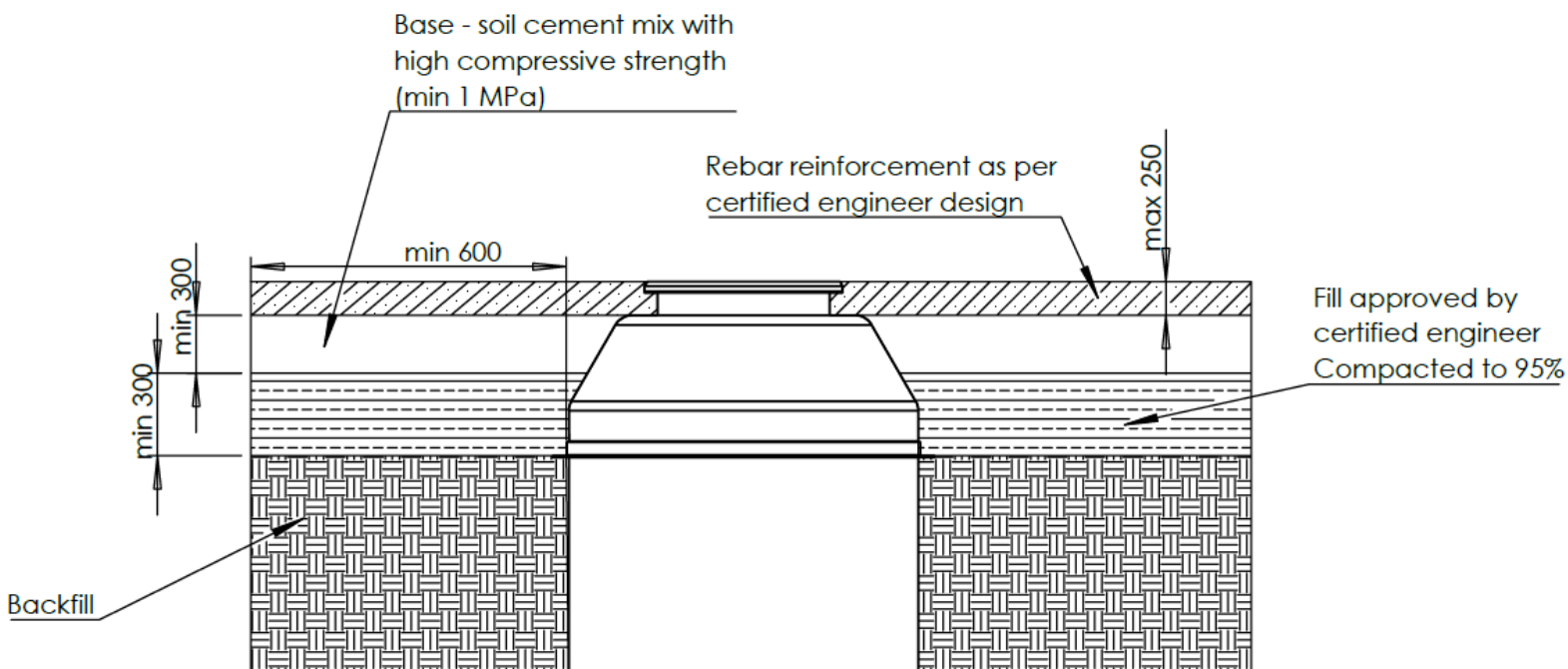
7.1. Fibreglass Flat Tops Without Traffic Loads

- The pad must be larger than the ECOPROTECTOR a minimum of 300mm in all directions.
- Maximum 200mm concrete pad thickness.



7.2. Fibreglass Flat Tops with Traffic Load

- The pad must be larger than the ECOPROTECTOR a minimum of 600mm in all directions.
- The Certified Engineer shall specify the pad strength and reinforcement so that the static weight of an 200mm thick square pad (no more than 600mm larger than the diameter of the ECOPROTECTOR centred on the ECOPROTECTOR) along with a dynamic T-44 traffic load must be distributed on the ECOPROTECTOR perimeter and not on the interior of the lid.
- If either the static pad load or the dynamic traffic load is exceeded, all of the pad and / or traffic loads must be supported by the soil around the ECOPROTECTOR and not by the ECOPROTECTOR itself.



8. AFTER INSTALLATION

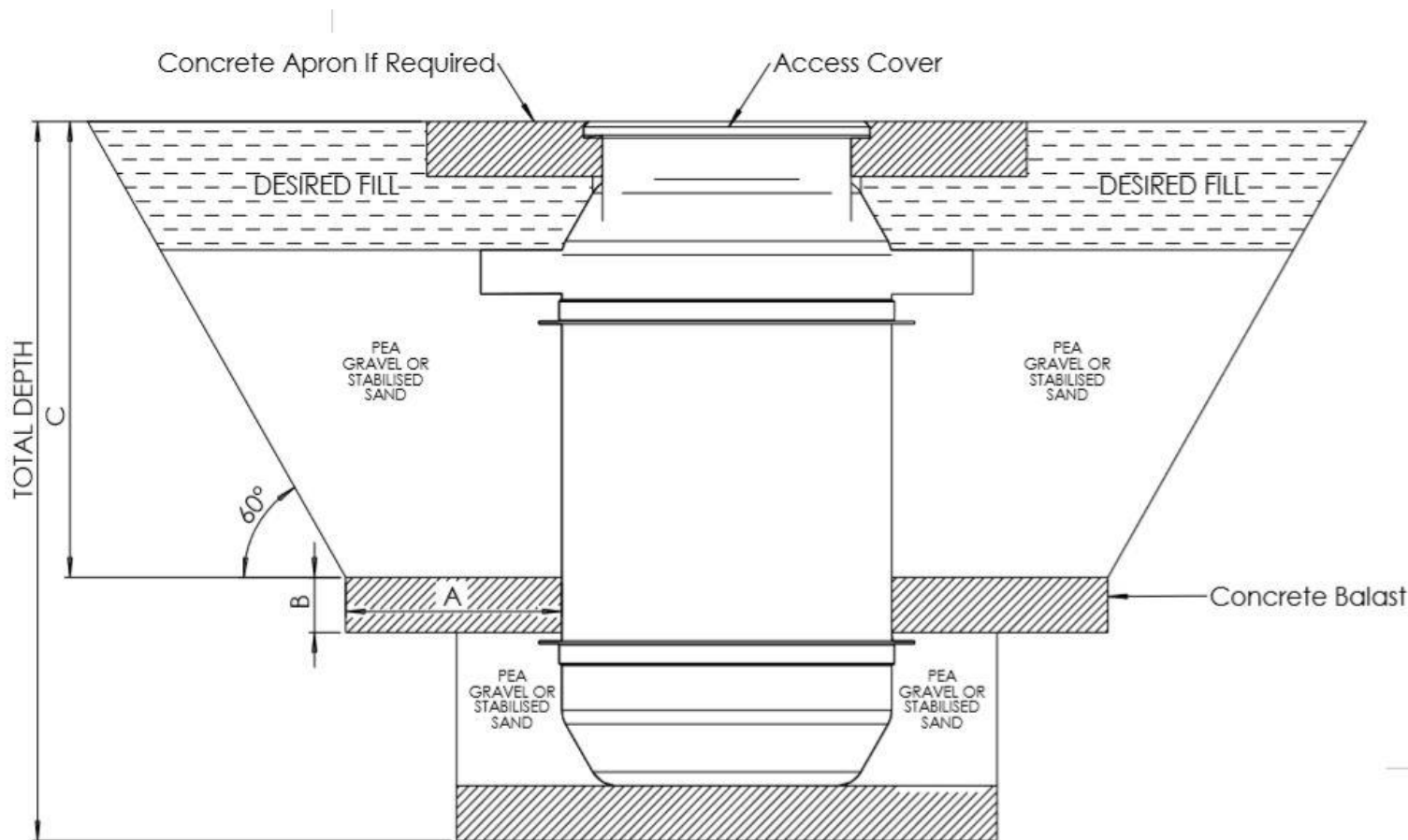
After the installation procedure has been followed and the ECOPROTECTOR system is secured in place, a few final steps must be adhered to, to maximise the lifespan of the FRP Underground tank.

It must be ensured that the tank will have no contact from outside environmental conditions and protection from contact with moving factors. These include motor vehicles, farm equipment, construction and any animal interference. If not installed completely underground, fencing must be included on site to ensure no contact by environmental conditions from high wind, and existing fauna interactions. The lids must be designed to be able to take the impact of any contact from motor vehicles or animals, and alternatively must not cause damage to any vehicles or animals that walk or drive upon the lid. Hence the surroundings must be carefully cordoned off and the lid designed for the sites demands.

8.1. Live Surface Loads

Light duty Fibreglass or aluminium access covers are not suitable for vehicular traffic. If a package stormwater treatment system is to be positioned in a location subject to vehicular traffic, then a certified cast iron cover must be used. Either Class B or Class D covers may be selected to suit the appropriate wheel loading. Special design consideration must be given to the surface slab, which must provide a full re-enforced bridge support to transmit slab loads to virgin ground. In this case, the services of a qualified civil engineer should be engaged to provide adequate slab designs.

9. TYPICAL INSTALLATION DRAWING



10. MAINTENANCE

A necessary requirement of the use of the EcoProtector is the need for regular inspection, maintenance and cleaning. This regularity is defined by the catchment area that it is located in and the features and properties of the surroundings. Regardless of the catchment area features, it is recommended by PROTECTOR that there is a mandatory inspection after 1 month of use after installation to determine the amount of capture of gross pollutants and sediments and determination of regularity of maintenance can be taken from this.

As previously stated, any form of weather conditions outside the norm of which the specific ECOPROTECTOR is design fall, be it high rainfall or heavy storm conditions, an immediate inspection is recommended.

NB: when maintenance is conducted on the ECOPROTECTOR system, ensure that all Workplace health and Safety precautions and directions are adhered to and the Confined space Regulations are carefully followed when required.

The cleaning and maintenance procedure is simple, requiring removal of the access cover and inserting a suction hose into the chamber, recommended use of a vacuum loader truck. Remove all forms of refuse and debris before entering the chamber. Always ensure cleaning is begun from the inlet side of the chamber and ensure carefully resealing of the access cover when completed.

Specific maintenance procedures of each aspect of the stormwater treatment system is outlined below. All maintenance must be carried out by some authorised personnel and all OH and S regulations and confined space regulations must be strictly followed.

10.1. ECOPROTECTOR Chamber Maintenance

1. Remove access manway carefully and safely.
2. Using a vacuum or hose truck, insert a suction hose into the chamber. Remove all forms of refuse, silt and debris before entering the chamber. Always ensure cleaning is begun from the inlet side of the chamber and ensure carefully resealing of the access cover when completed.

10.2. Interior Maintenance

1. Gross Collector - Remove all sediment, gross pollutants and anything other trash that can restrict water flow.
2. Trash screen – ensure that all clogging is removed, and that water can flow without obstacle through the trash screen
3. Bypass channel – clean out all sediment that may have entered the bypass.
4. Dropper pipe and Riser Tube – ensure clogging has not occurred and that free flow is possible.
5. Silt Chamber – Use that vacuum truck and hose to remove all sedimentation at the bottom of the ECOPROTECTOR.

11. WARRANTY AND EXPECTED LIFESPAN

The quality assurance of our FRP products ensures that the ECOPROTECTOR range of FRP underground packaged tanks has an expected lifespan of 50 years. There is also a guarantee of our ECOPROTECTOR products to be free of defects in material and workmanship for one (1) year from the date of shipment from our manufacturing factory. The obligation of this warranty, statutory or otherwise, is limited to replacement or repair at factory or at a point designated by PROTECTOR, of such part as shall appear to us, upon inspection at such point, to have been defective in material or workmanship. This warranty does not obligate PROTECTOR to bear the cost of labour or transportation charges in connection with replacement or repair of defective part; nor shall it apply to a pump upon which repairs or alterations have been made unless authorised by PROTECTOR in writing. No Warranty is made in respect to electrical control panels, pumps, motors or trade accessories, such being subject to warranties of their respective manufacturers. No express, limited or statutory warranty, other than herein set forth is made or authorised to be made by PROTECTOR. In no event shall PROTECTOR be liable for consequential damages or contingent liabilities arising out of failure of any Packaged Stormwater treatment system or parts thereof to operate properly. Packaged Stormwater treatment system must be installed by licensed tradesmen. Failure to do so voids all Warranty.

This image shows a full page of a handwriting practice worksheet. It consists of numerous horizontal rows, each defined by two parallel dotted lines. The rows are evenly spaced and extend across the entire width of the page, providing a guide for letter height and placement. There is no text or other markings on the page.

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.