



spelstormwater

Fibreglass tank

Installation Guide



spel.com.au

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General overview

SPEL Products is a quality assured company to BS EN ISO 9001:2008.

We have been manufacturing glass reinforced plastic tanks since the mid 1960s and began making underground tanks in 1975.

These years of experience and our company's diversified operations have allowed us to design, engineer and manufacture the range of quality GRP tanks available today.

Our modern plant, equipment and quality assurance procedures ensure both quality and competitive pricing.

SPEL underground tanks are filament wound by the technically advanced chop hoop filament winding process (patented) which was chosen after careful investigation proved it produced the most desirable GRP underground tanks.

This process produces not only circumferential strength as found in helical wound tanks, but also longitudinal strength. The interlaminar shear strength permits tanks to be cut for manholes and pipework without any undue loss in strength.

The manufacturing process is carefully monitored with a digital read out system. Chopping glass, winding glass, the resin-rich inner layer and main laminate resins are kept within specification parameters thus minimising human error.

Each tank has a smooth moulded resin-rich corrosion barrier inner layer and an external resin-rich water penetration barrier.

These layers can incorporate special resins to meet specific applications where the contents are highly corrosive or a potable water approved resin system is required or where surrounding soil is heavily contaminated.

Quality control procedures require each tank to be carefully inspected and tested. Ultrasonic thickness readings, material content weights, etc are checked and recorded against the tank's unique serial number. Additional periodic laminate testing is carried out by independent testing facilities including stress and strain analysis and also physical property tests to meet specific design criteria.

Being manufactured in glass reinforced plastics, SPEL underground tanks are light, easy to handle and easy to install. They are not susceptible to rust, exhibit excellent corrosion resistant properties and have a life expectancy in excess of 50 years. The smooth internal moulded finish provides good flow characteristics and enables easy desludging and cleaning operations.

The SPEL underground tank shell carries a 25 year warranty.



Introduction to installation

All SPEL underground tanks must be installed according to these instructions.

The local authority and the local region of the Environment Agency should also be consulted as to whether any particular code applies to installation. Failure to follow these installation instructions will make void our warranty and may result in tank failure.

Site access and conditions

It is the responsibility of the contractor to ensure suitable access to good hard ground that is safe and suitable for off-loading.

Wide & long loads

Where the tank is of such size that a police or private escort is required, delivery times given are estimates only. In the event of delays outside our control eg. police re-routing or escort delays, the extra charges that result will be forwarded to the contractor.

Off-loading/handling

The contractor is responsible for off-loading. Tank handling during off loading must be carried out with care to prevent rolling off the vehicle. Care must also be exercised to prevent accidental damage from impact or contact with sharp objects.

Tanks should be lifted using slings, not chains or wire ropes. Do not drag tanks along the ground for any distance and avoid jarring or bumps. Do not lift with water in the tank.

Storage

Set tank on smooth ground free of bricks and sharp objects. Chock/tie down to prevent movement in high winds.

Tank dimensions

Dimensions given on drawings and literature shall be subject to manufacturing tolerances and should be checked physically prior to installation.

Installation procedures

The alternative methods of installation depend on the ground conditions, water table, the tank's location and whether the tank is fitted with feet or not.

Installation should be carried out by a competent contractor in accordance with the above procedures, Health & Safety at Work legislation and good building practice.

It is not possible to cover every condition in these instructions, therefore if in doubt contact us.

Tank specification

Check that you have received the correct specification tank.

SPEL underground tanks are available in specifications to suit invert depths, concrete or pea gravel surround and ground water conditions; standard, heavy, extra heavy and special.

For most applications the standard or heavy specifications are adequate. If the tank invert depth and/or water table depth is outside the range we shall be pleased to advise accordingly.

Safety Precautions

1. Ensure installer is aware of 'Confined Spaces' guidelines.
2. Make sure that there is sufficient oxygen and that there are no poisonous gases present.
3. Check the explosion risk before welding or using electric hand tools.
4. Do not ignore health hazards. Observe strict cleanliness.
5. Ensure that the lifting equipment (where required) is in good condition.
6. All personnel who are to work with sewerage systems should be vaccinated against diseases that can occur.
7. Keep a first aid kit handy.

Health and safety

Installation should be carried out by a competent contractor in accordance with the above procedures, Health & safety at Work legislation and good building practice.

A warning notice should be visible at the top of each access shaft – 'danger, harmful fumes' and 'respirators must be worn in this tank'. Before entering persons must be qualified in accordance with 'confined space' requirements.



Information contained in this data sheet is approximate and for general guidance only. In accordance with the company's policy of constant improvement and development SPEL Products reserves the right to change the specification without prior notice.

Important notice

When the tank is sitting in the excavation and before back fill commences, please take note of the following points.

Although the attached drawings show the SPEL “Anchoring System”, they are optional extras and not always required – Please refer to the engineering department for further information.

- Whether you are using the SPEL “Anchor” system or not it is mandatory to put some water into all the tank chambers of equal levels, to a maximum of 300mm deep.
- This is to help the tank stay in place and stop the tank from “Riding Up” while the gravel is being put under and around the tank.
- Ensure the backfill flows under the “Belly” of the tank and all voids are filled.
- Once the backfill has fully supported and cradles the tank up to the tank centre line, additional water **can** be added up to the pipe invert level.
- Prior to installation on site please consider the site levels to see if your installation required inspection shaft risers. NOTE that these may take up to 2 weeks for production if not standard.
- The excavation should be kept dry until the backfill and installation is complete. If in doubt please contact your nearest SPEL supplier.
- Use only backfill material as specified in this document. Backfill to be layered in 150mm layers. Refer to installation details.

NOTE: SPEL Tanks are designed specifically for each project, the designed burial depth is stated in the quotation and on the shop drawings. If this installation is deeper or different than the designed installation criteria and you are unsure or in doubt please contact your nearest SPEL supplier — see back page of this guide booklet.

Prior to installation

Before installing the SPEL system, check the depth of the inlet pipe as this will determine the tank depth. (See tank inlet specification).

- CAUTION:
- Installation should be carried out by experienced and qualified tradesmen.
 - Before digging, call any relevant local authorities to locate any underground lines or cables.
 - The installation of a SPEL system requires the prior approval of local authorities. Questions relating to this should be directed to a responsible officer of local council and/or other relevant authority.

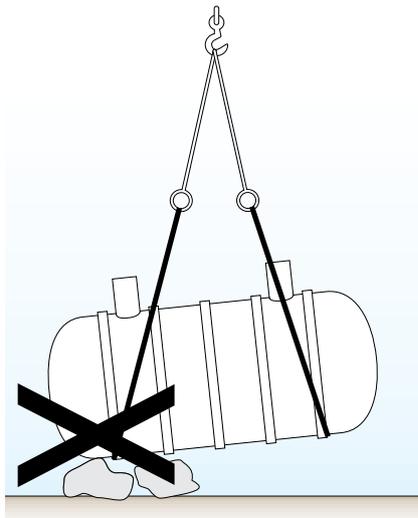
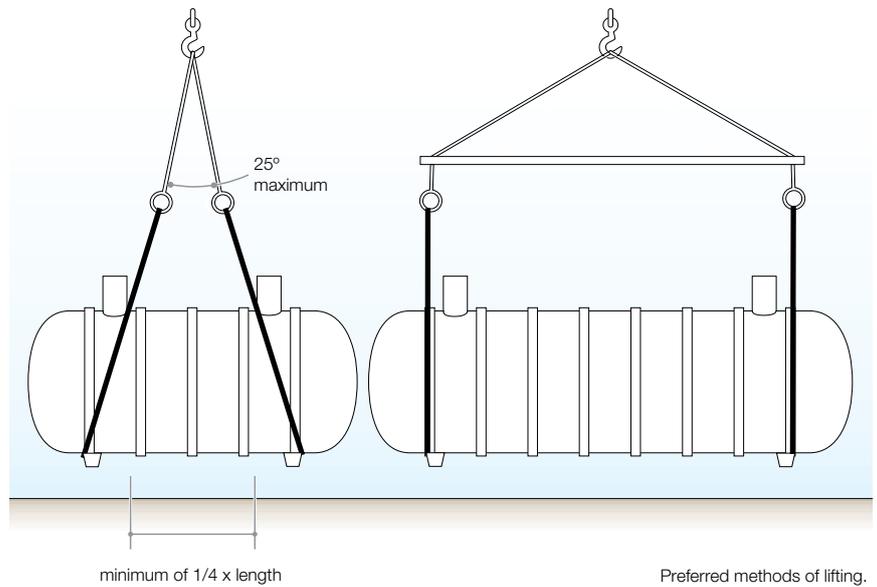
The following information must be regarded as a guide only and is to be read in conjunction with the site specific design details as provided by the relevant engineers.

1. a. Determine the best location for your tank, and control panel (if applicable).
b. Correct appraisal of site conditions is essential before installation of stormwater tanks. Installers must recognize that these tanks when empty will float on approximately 50mm of water. The upward thrust at the base of the tank fully immersed in water could exceed 69 MPA. Close attention to site conditions is therefore necessary.
c. Consider:
 - Drainage, particularly at the tank base.
 - The rise in water due to:
 - i. Tidal conditions
 - ii. Saturation of the ground during heavy rain
 - iii. Likelihood of flooding or run-off water from any source.
 - iv. The quality of available backfill
 - d. Where tanks are installed under adverse site conditions, the utmost care is required to prevent any chance of the vessel being forced out of the ground by upward pressure of the water. This can occur if the base is not properly drained.
 - e. For installations where the water table is above the bottom of the tank it is recommended to check whether a SPEL anchoring system should be used. Please contact your local SPEL representative for further details and calculations.
2. The alert probe control panel, when applicable and where the alarm light can be easily seen. Should be installed by a qualified electrician that is familiar with the electrical codes, mounted in an easy to see position. Refer to shop drawings.
 3. Make sure you have all the necessary equipment and supplies before starting your installation.
 4. Finish ground level in relation to tank lid, as tank lid risers are not normally recommended. Also lids must not be buried at any time.

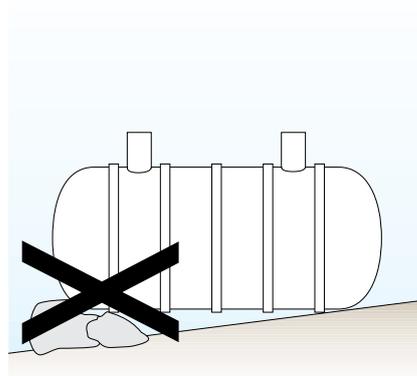
Lifting, handling & storage

Lifting and handling – preferable methods

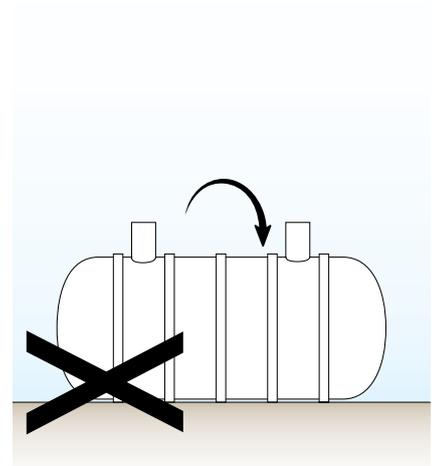
- Do not roll or drop tanks. Only move tanks by lifting. Rolling tanks could damage fittings.
- Tanks can be lifted using slings/webbing straps as illustrated.
- Where necessary a spreader bar should be used.
- Guide the tank with guide lines.
- Never use chains or steel cables around tank shell.
- Do not drag tanks along ground for any distance.
- Avoid jarring or bumps.
- Do not lift with liquid in the tank.
- Set tanks on smooth ground, free of sharp objects.



Never drag along the ground or lift unevenly.



Place tanks on smooth, level ground.

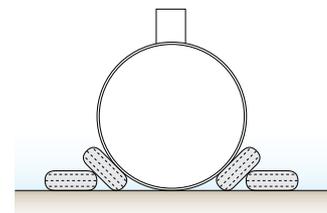


Do not roll or drop tank.

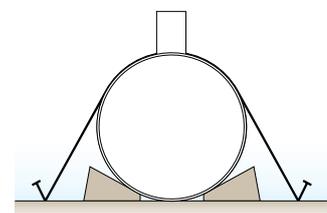
Storage – preferable methods

If tanks have to be stored temporarily prior to installation, they should be located:

- In an area where the chance of accidental damage or vandalism will be minimised.
- On a flat surface free from sharp objects.
- With efficient temporary anchorage to prevent high winds causing damage.



Prevent any movement.



Tie down against high winds.

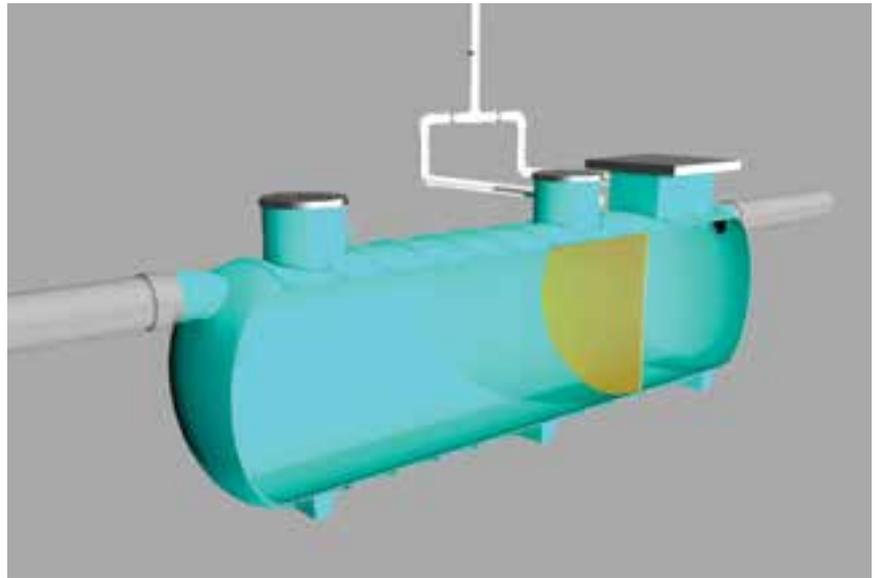
Venting

Venting should be as per the Australian Standards and complying with governing regulation to match the specific site requirements. Refer to engineering drawings for vent system layout (client drawings).

Each chamber will incorporate a single vent point, these should extend above ground and as a minimum above flood level and as per site requirements and regulations.

The ventlines from the SPEL tank are primarily for pressure venting and equalisation; if installed where hydrocarbon vapour may be present, ensure the appropriate vent material is utilised.

Clean chambers not to be manifolded with other chambers to prevent cross contamination.



Each chamber should have its own venting.

Refer to engineering drawings in the first instance for sizes and layout.

Vents can be finished in multiple configurations, these are determined through site and client requirements.

The material and size of the vent lines are specific to the site application; these details can be found on the SPEL Tank drawing/client drawings.



Inspection Shaft Riser Installation

SPEL tanks are designed to achieve total inspection and maintenance from surface level with no confined space entry. This is the reason for extension of the following items.

Flanged Inspection Shaft Installation

The following steps are to be performed in the order shown after backfilled is complete to the top of the barrel:

- Ensure the flanges on both Inspection Shaft and the tank are clean and dry
- Apply Sikaflex-PRO sealant or equivalent to the entire Inspection Shaft riser flanges
- Align and secure, using Stainless steel fasteners, the Inspection Shaft riser with the corresponding opening on tank
- Backfill around the Inspection Shafts to surface level as per chosen installation procedure



Sleeved Inspection Shaft Installation

These steps are to be performed in this order after the tank is backfilled to the top of the barrel:

- Ensure the sleeved surfaces on both Inspection Shaft and the tank are clean and dry
- Apply Sikaflex-PRO sealant or equivalent to the Inspection Shaft riser sleeved surface
- Align the Inspection Shaft riser with the corresponding opening on tank
- When joining, twist the riser to ensure a complete seal
- Backfill around the Inspection Shaft to surface level as per chosen installation procedure
- When backfilling, ensure the inspection shaft is kept straight



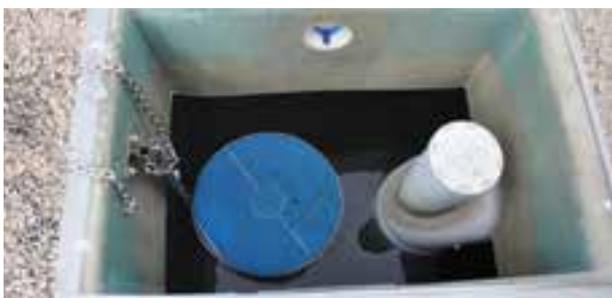
Internal Component Extensions

After extending the Inspection shafts to surface level, the following items also need to be extended to within approx. 200mm from the finished ground level:



Alert probe protection Tube

NOTE: Junction box is to be mounted as high as possible within the inspection shaft (200mm from surface level)

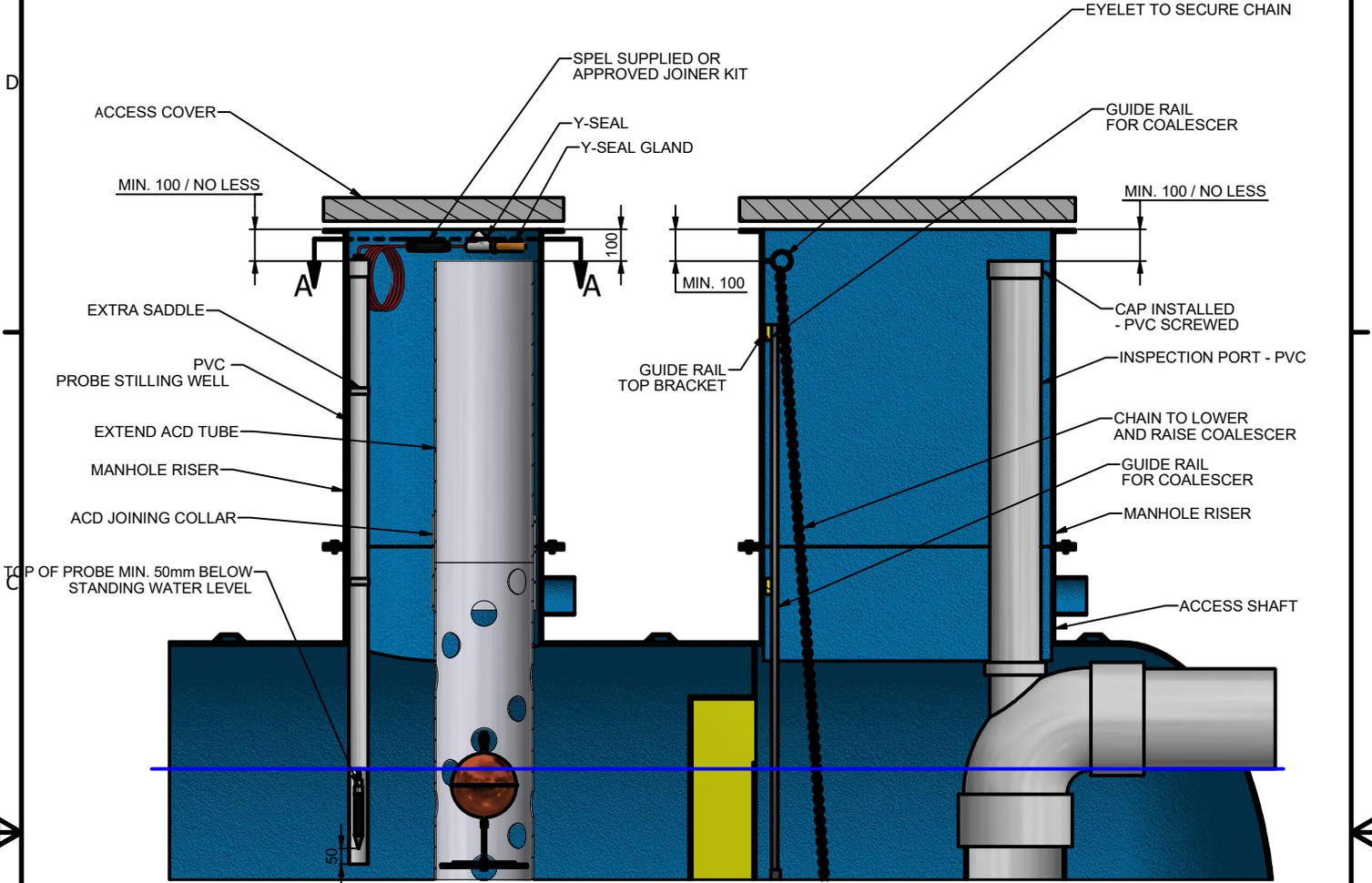


Discharge inspection (Sample point) portal

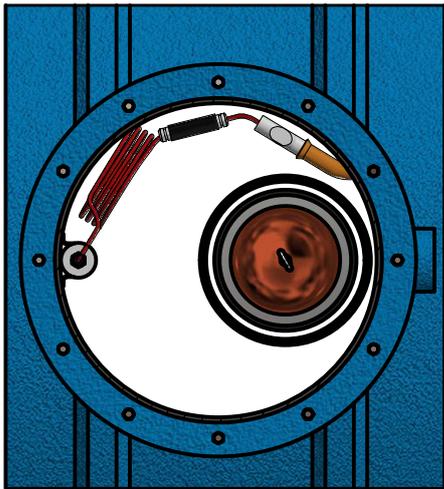


Coalescer Guiderail & Lifting Chain

| REVISION HISTORY | | | | |
|------------------|-----------------|----------|---------------|---------|
| REV | DESCRIPTION | DESIGNER | CREATION DATE | CHECKED |
| 1 | INITIAL RELEASE | P.Z. | 08-08-19 | |



SECTIONAL VIEW



SECTION A-A

NOTE: All SPEL tanks installations must be finished off with a concrete cover slab that is the length and width of the tank, even for non-trafficable installation.

TOLERANCE: ALL DIMENSIONS 10mm UNLESS OTHERWISE STATED.

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| Approved | Date |
| Request No. | |



| | | | |
|--|-------|------------------------|----|
| PROJECT : PURACEPTOR PRE-COMMISSIONING CHECKLIST DIA | | | |
| TITLE SPEL PURACEPTOR GENERAL ARRANGEMENT | | | |
| SCALE | N.T.S | SIZE | A3 |
| SHEET | 1 | R | |
| CUSTOMER CODE : | | DWG No. SP19-PC17190-P | |

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Pipe Connections

FRP Collar Connections

This style of connections is suitable for:

- RCP
- FRC
- Blackmax
- Riblock
- Stormpro

All of the above pipes are to be bonded into the fibreglass collar with either concrete grout, mastic or suitable epoxy sealant.

All pipes must be centrally located within the collar of the tank.



FRP Flanged Connections

This style of connections is suitable for:

- Ductile Iron
- NUPI
- HDPE
- PVC
- FRP
- Stainless Steel

All of the above pipes should be connected to the flange with a gasket and stainless steel hardware.



PVC Connections

The inlet and outlet of the tank will be fitted with PVC connections; these are suitable for glue jointing.



Rubber Boot Connection

Rubber boots can be used on most pipe connections. If reducing or enlarging the pipe diameter.

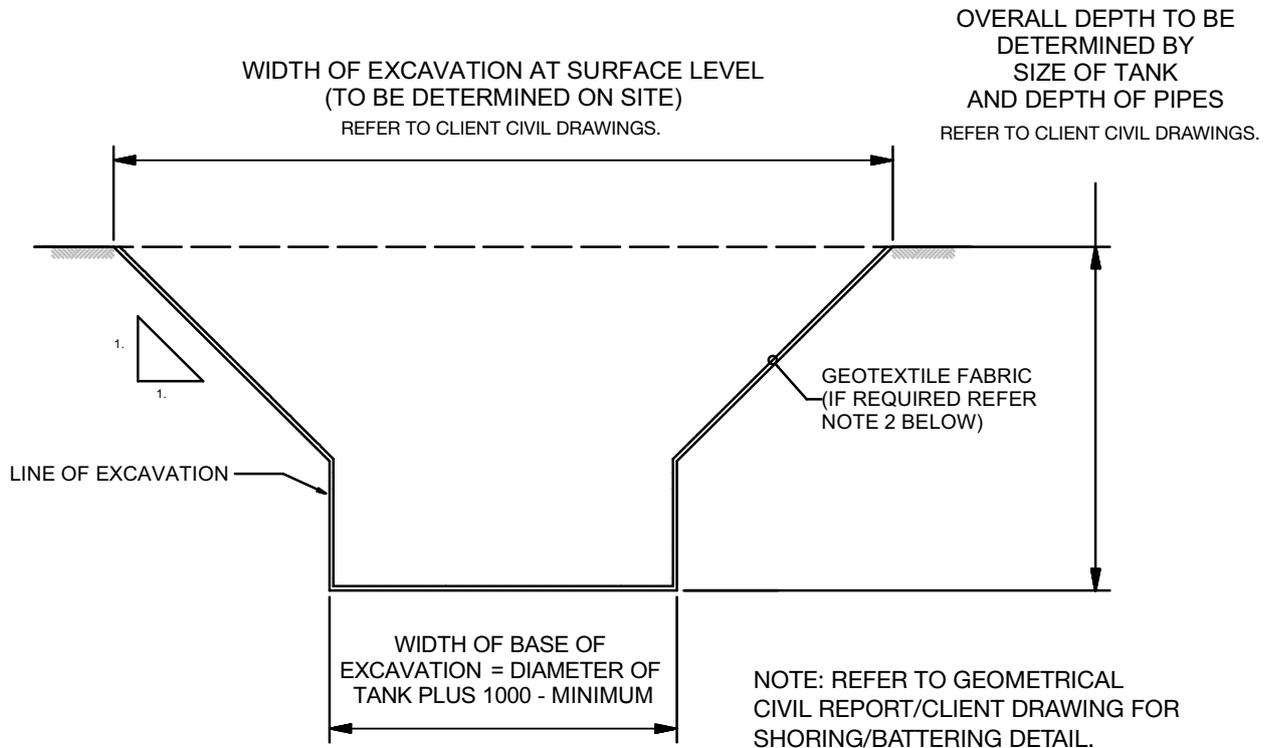


Option 1

Installation Drawings

**Method: Battered or Benched
Excavation**

Application: Non-Trafficable



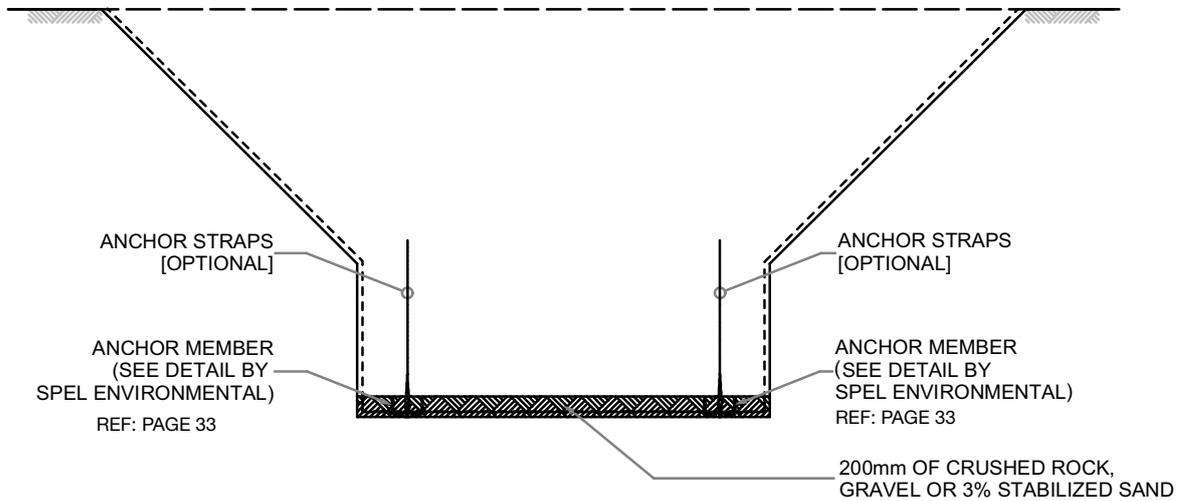
Stage 1

A: EXCAVATE TO PROFILE SHOWN

Typical Installation Procedure

- NOTE:**
1. ACCESS PERMITTED TO EXCAVATION DURING CONSTRUCTION.
 2. DEPENDING ON EXISTING SOIL CONDITIONS, SUPPLY AND LAY GEOTEXTILE FABRIC TO PERIMETER OF EXCAVATION. FIX GEOTEXTILE FABRIC INTO POSITION ON SIDES OF VERTICAL EXCAVATION.

| | | | | |
|--|---|--|--|---------------|
| Page-Green & Associates Pty Ltd CONSULTING ENGINEERS 5 Villamanta St, Geelong West Phone: (03) 5222 1899 Fax: (03) 5229 8382 Email: pga@pipeline.com.au | SPEL UNDERGROUND TANK Typical Installation Details : Option A Non- Trafficable |  PH: 1300 773 500 E: sales@spel.com.au www.spel.com.au | Design d.c.g. | Drawn a.h. |
| | <small>© SPEL Environmental - This drawing is the property of SPEL Environmental ABN: 83 151 832 629 and is subject to return on demand. It is submitted for the use only in connection with the proposal and contracts of SPEL Environmental with the expressed conditions that it is not to be reproduced or copied in any form. This data must only be used in accordance with our standard terms and conditions. © Copyright</small> | | Date April 09 | Scale 1:50 |
| Project | <small>SPEL Environmental accepts no responsibility for any loss or damage resulting from any person acting on this information. The details and dimensions contained in this document may change, please check with SPEL Environmental for confirmation of current specifications.</small> | | AutoCad Filename 13402-Details | |
| Location | | | Ref No 13402-DA1 | |



Stage 2

B : SUPPLY AND POSITION ANCHOR MEMBERS COMPLETE WITH ANCHOR STRAPS

C : SUPPLY, LAY AND COMPACTED TO 98% STANDARD COMPACTION 200mm OF CRUSHED ROCK/GRAVEL OR 200mm OF 3% CEMENT STABILIZED SAND TO BASE OF EXCAVATION. STABILIZED SAND TO CURE PRIOR TO PROCEEDING TO STAGE 3.

Backfill Material

ALL BACKFILL (UNLESS OTHERWISE NOTED ON THESE DRAWINGS) SHALL BE : -

A. GRAVEL :

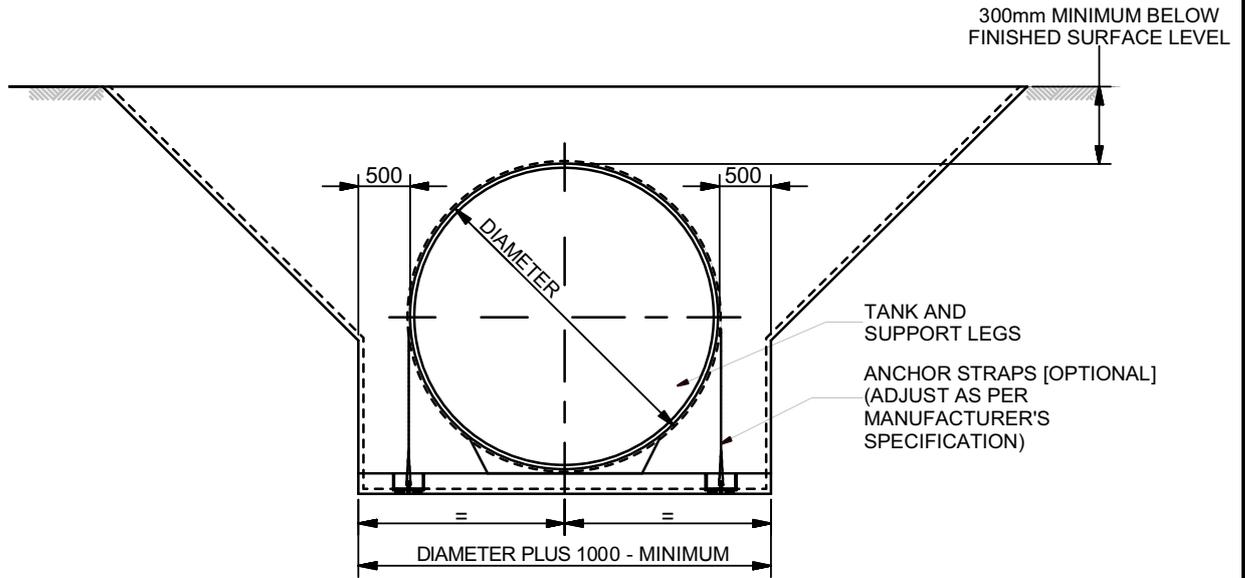
CLEAN NATURALLY ROUNDED AGGREGATE OF A NOMINAL SIZE OF 4.75mm TO 19mm

B. CRUSHED ROCK OR CRUSHED GRAVEL :

ALL CRUSHED AGGREGATE SHALL BE WASHED WITH A NOMINAL SIZE OF 4.75mm TO 19mm (LESS THAN 3% PASSING A No. 8 SIEVE) IN ACCORDANCE WITH AS2758.1 : 1998

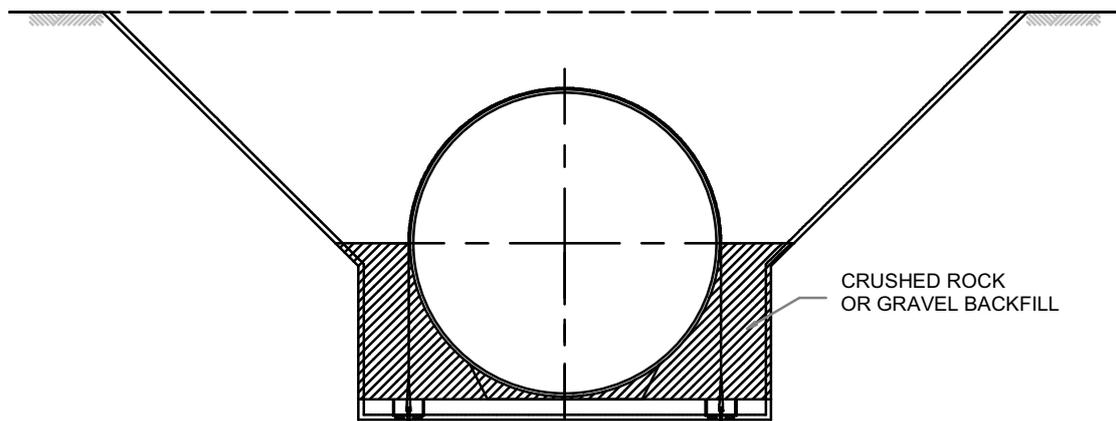
REFERENCE APPENDIX
AT BACK FOR APPROVAL
BACKFILL SPEC PAGE 31.

| | | | | |
|--|---|---|---------------------|---------------|
| Page-Green & Associates Pty Ltd CONSULTING ENGINEERS 5 Villamanta St, Geelong West Phone: (03) 5222 1899 Fax: (03) 5229 8382 Email: pga@pipeline.com.au | SPEL UNDERGROUND TANK Typical Installation Details : Option A Non- Trafficable |  spelstormwater joy in water PH: 1300 773 500 E: sales@spel.com.au www.spel.com.au | Design d.c.g. | Drawn a.h. |
| | Project | | Date April 09 | Scale 1:50 |
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Stage 3

D : FIT TANK INTO EXCAVATION AND FIX INTO POSITION WITH ANCHOR STRAPS



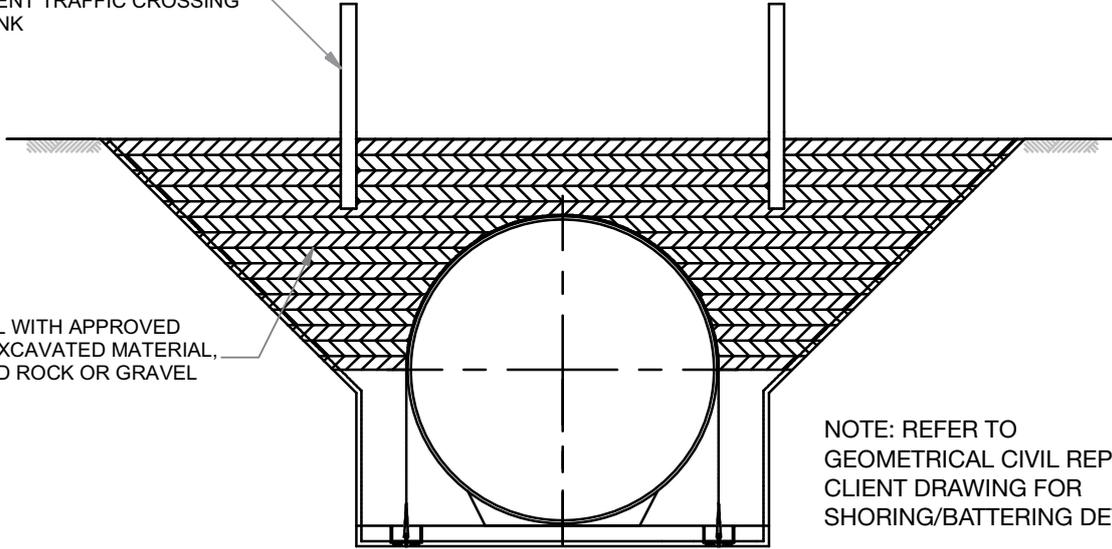
Stage 4

E : BACKFILL WITH CRUSHED ROCK OR GRAVEL PUSH AND COMPACT UNDER TANK FULLY COMPACT IN 150mm LAYERS DRY RODDED DENSITY SHALL BE NOT LESS THAN 1500Kg/M³

REFERENCE APPENDIX AT BACK FOR APPROVAL BACKFILL SPEC PAGE 31.

| | | | | |
|--|---|---|--|---------------|
| Page-Green & Associates Pty Ltd CONSULTING ENGINEERS 5 Villamanta St, Geelong West Phone: (03) 5222 1899 Fax: (03) 5229 8382 Email: pga@pipeline.com.au | SPEL UNDERGROUND TANK Typical Installation Details : Option A Non- Trafficable | spelstormwater joy in water PH: 1300 773 500 E: sales@spel.com.au www.spel.com.au | Design d.c.g. | Drawn a.h. |
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| Location | | | Ref No 13402-DA3 | |

PROVIDE BOLLARDS AS SHOWN TO PREVENT TRAFFIC CROSSING OVER TANK



BACKFILL WITH APPROVED CLEAN EXCAVATED MATERIAL, CRUSHED ROCK OR GRAVEL

NOTE: REFER TO GEOMETRICAL CIVIL REPORT/ CLIENT DRAWING FOR SHORING/BATTERING DETAIL.

REFERENCE APPENDIX AT BACK FOR APPROVAL BACKFILL SPEC PAGE 31.

Stage 5

F : BACKFILL AROUND AND OVER THE TANK WITH APPROVED EXCAVATED MATERIAL, CRUSHED ROCK OR GRAVEL FULLY COMPACTED IN 150mm LAYERS

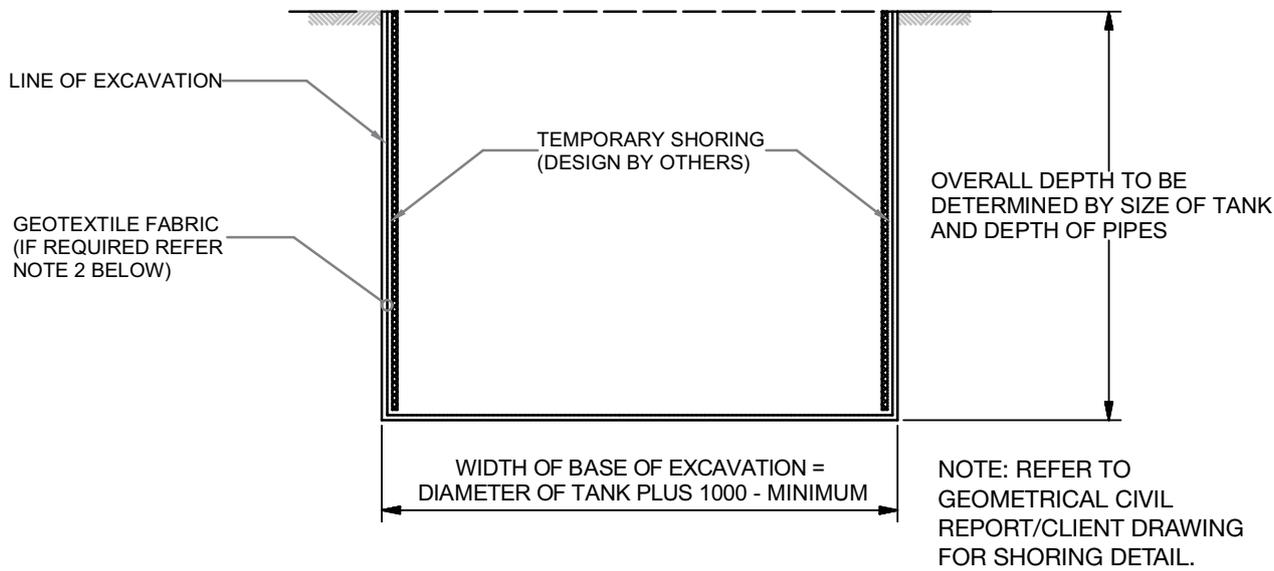
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| Page-Green & Associates Pty Ltd <u>CONSULTING ENGINEERS</u> 5 Villamanta St, Geelong West Phone: (03) 5222 1899 Fax: (03) 5229 8382 Email: pga@pipeline.com.au | SPEL UNDERGROUND TANK Typical Installation Details : Option A Non- Trafficable |  spelstormwater joy in water PH: 1300 773 500 E: sales@spel.com.au www.spel.com.au | Design d.c.g. | Drawn a.h. |
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| Project | | | AutoCad Filename 13402-Details | |
| Location | | | Ref No. 13402-DA4 | |

Option 2

Installation Drawings

**Method: Shored or Vertical
Excavation**

Application: Non-Trafficable



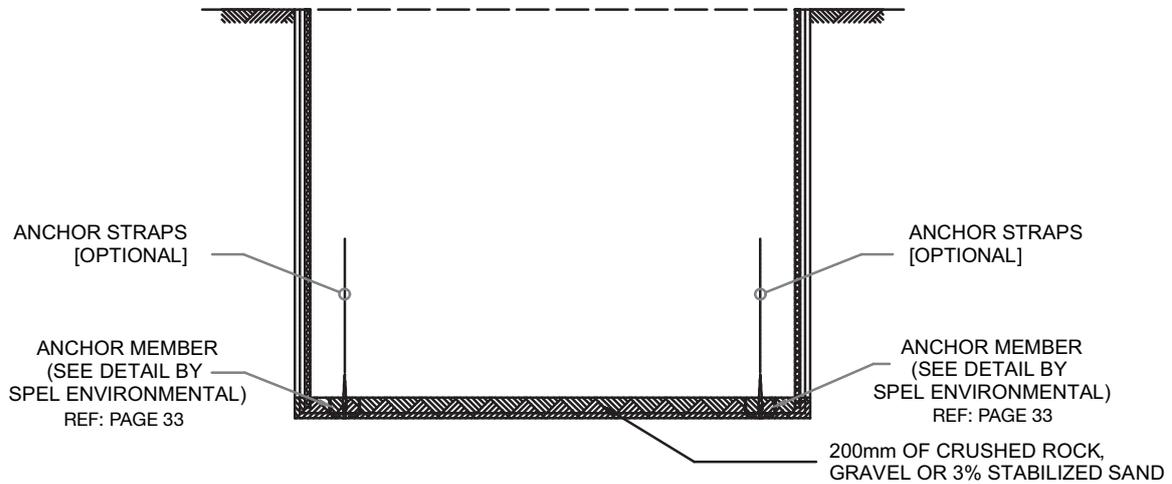
Stage 1

A : EXCAVATE TO PROFILE SHOWN

Typical Installation Procedure

- NOTE:**
1. FIT TEMPORARY SHORING TO VERTICAL SIDES OF EXCAVATION. (DESIGN OF SHORING AND RECOVERY SYSTEM BY OTHERS)
 2. ACCESS PERMITTED TO EXCAVATION DURING CONSTRUCTION AFTER INSTALLATION OF SHORING.
 3. DEPENDING ON EXISTING SOIL CONDITIONS, SUPPLY AND LAY GEOTEXTILE FABRIC TO PERIMETER OF EXCAVATION. PIN GEOTEXTILE FABRIC INTO POSITION ON SIDES OF VERTICAL EXCAVATION

| | | | | |
|--|--|---|-----------------------------------|---------------|
| Page-Green & Associates Pty Ltd CONSULTING ENGINEERS 5 Villamanta St, Geelong West Phone: (03) 5222 1899 Fax: (03) 5229 8382 Email: pga@pipeline.com.au | SPEL UNDERGROUND TANK Typical Installation Details : Option B Non- Trafficable : Excavation Shored |  spelstormwater joy in water PH: 1300 773 500 E: sales@spel.com.au www.spel.com.au | Design d.c.g. | Drawn a.h. |
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| Location | | | Ref No 13402-DB1 | |



Stage 2

B: SUPPLY AND POSITION ANCHOR MEMBERS COMPLETE WITH ANCHOR STRAPS

C: SUPPLY, LAY AND COMPACTED TO 98% STANDARD COMPACTION 200mm OF CRUSHED ROCK/GRAVEL OR 200mm OF 3% CEMENT STABILIZED SAND TO BASE OF EXCAVATION. STABILIZED SAND TO CURE PRIOR TO PROCEEDING TO STAGE 3.

Backfill Material

ALL BACKFILL (UNLESS OTHERWISE NOTED ON THESE DRAWINGS) SHALL BE : -

A. GRAVEL :

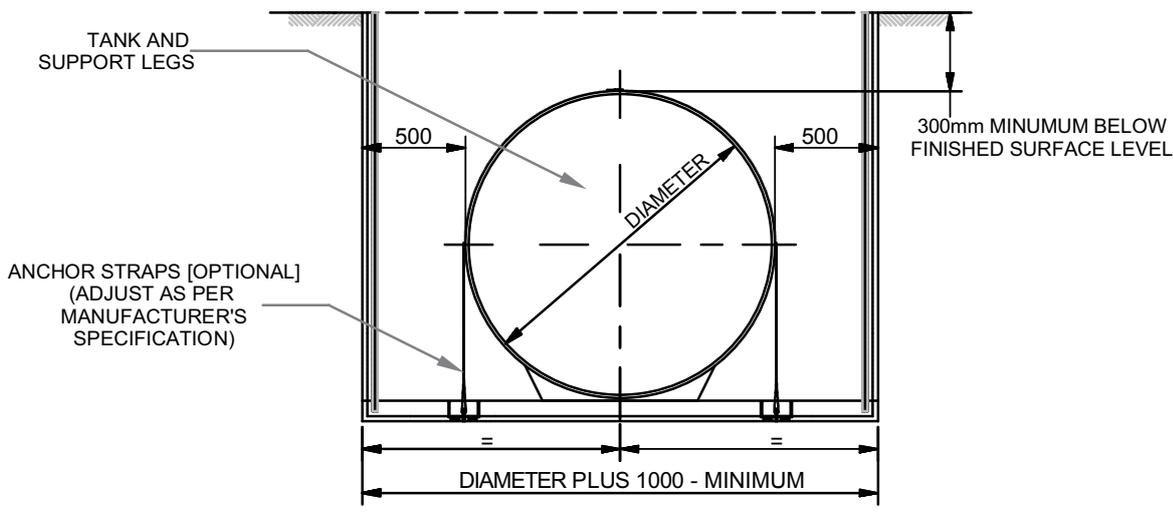
CLEAN NATURALLY ROUNDED AGGREGATE OF A NOMINAL SIZE OF 4.75mm TO 19mm

B. CRUSHED ROCK OR CRUSHED GRAVEL :

ALL CRUSHED AGGREGATE SHALL BE WASHED WITH A NOMINAL SIZE OF 4.75mm TO 19mm (LESS THAN 3% PASSING A No. 8 SIEVE) IN ACCORDANCE WITH AS2758.1 : 1998

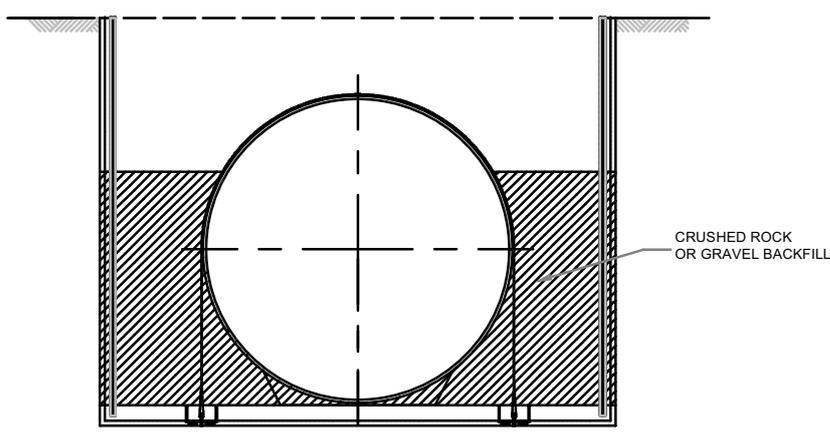
REFERENCE APPENDIX AT BACK FOR APPROVAL BACKFILL SPEC PAGE 31.

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| Project | <small>AutoCad Filename</small> 13402-Details | <small>Ref No</small> 13402-DB2 | | |
| Location | | | | |



Stage 3

D: FIT TANK INTO EXCAVATION AND FIX INTO POSITION WITH ANCHOR STRAPS



Stage 4

E: BACKFILL WITH CRUSHED ROCK OR GRAVEL PUSH AND COMPACT UNDER TANK FULLY COMPACT IN 150mm LAYERS DRY RODDED DENSITY SHALL BE NOT LESS THAN 1500Kg/M³

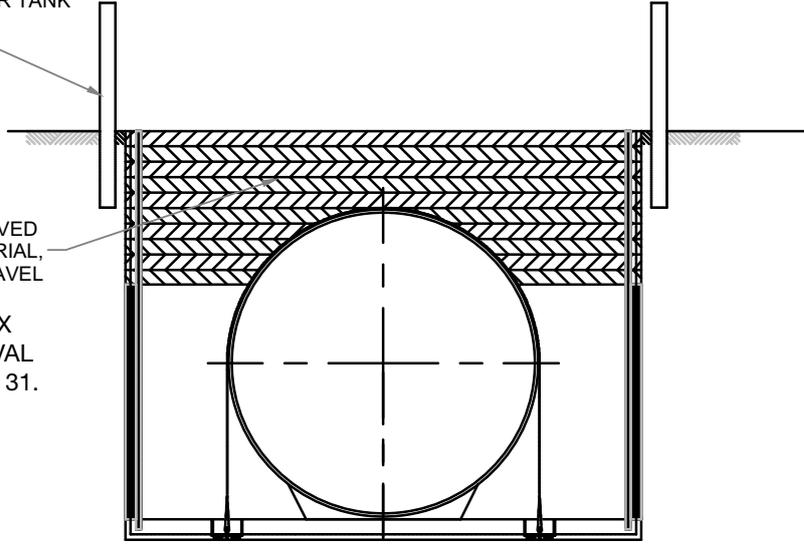
REFERENCE APPENDIX AT BACK FOR APPROVAL BACKFILL SPEC PAGE 31.

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| | | | Date April 09 | Scale 1:50 |
| Project | AutoCad Filename 13402-Details | | | |
| Location | Ref No 13402-DB3 | | | |

PROVIDE BOLLARDS AS SHOWN
TO PREVENT TRAFFIC
CROSSING OVER TANK

BACKFILL WITH APPROVED
CLEAN EXCAVATED MATERIAL,
CRUSHED ROCK OR GRAVEL

REFERENCE APPENDIX
AT BACK FOR APPROVAL
BACKFILL SPEC PAGE 31.



Stage 5

F: BACKFILL AROUND AND OVER THE TANK WITH APPROVED
EXCAVATED MATERIAL, CRUSHED ROCK OR GRAVEL
FULLY COMPACTED IN 150mm LAYERS

Page-Green & Associates Pty Ltd

CONSULTING ENGINEERS

5 Villamanta St, Geelong West
Phone: (03) 5222 1899 Fax: (03) 5229 8382
Email: pga@pipeline.com.au

Project

Location

SPEL UNDERGROUND TANK
Typical Installation Details : Option B
Non- Trafficable : Excavation Shored

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joy in water

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Design
d.c.g.

Drawn
a.h.

Date
April 09

Scale
1:50

AutoCad Filename

13402-Details

Ref No

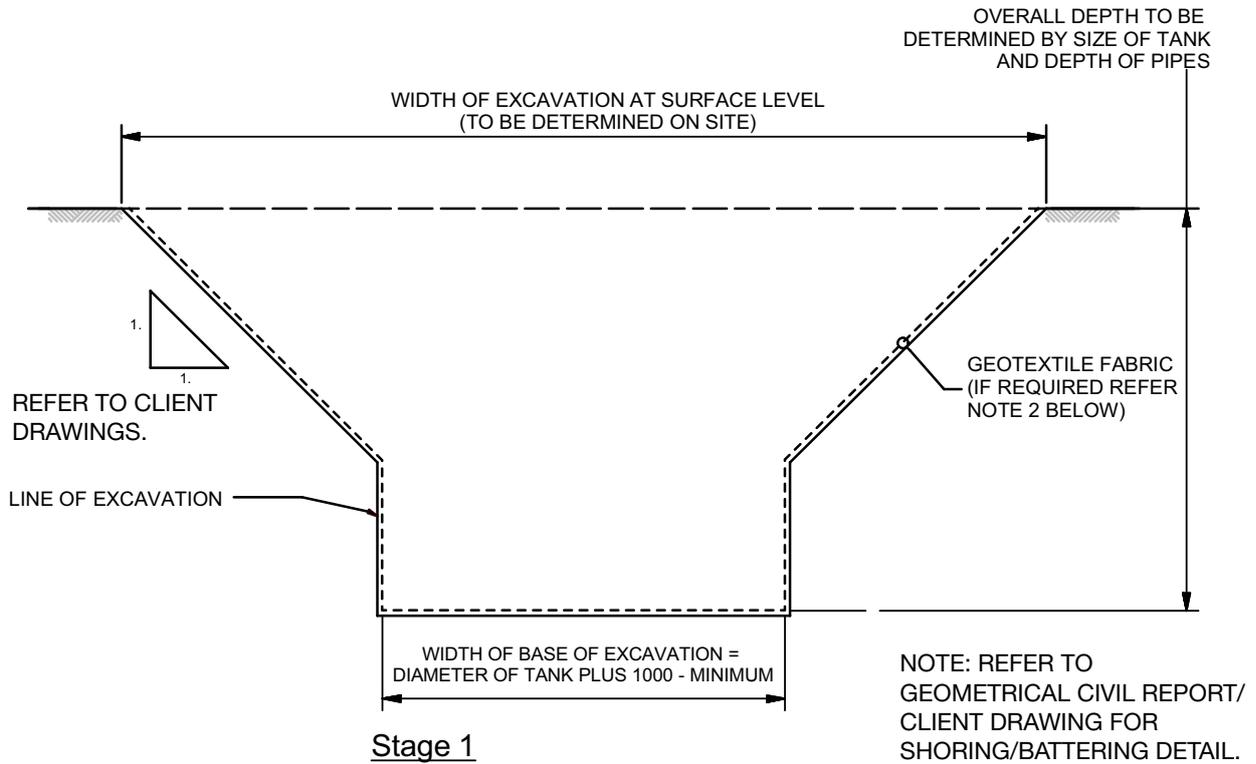
13402-DB4

Option 3

Installation Drawings

**Method: Battered or Benched
Excavation**

Application: Trafficable



Stage 1

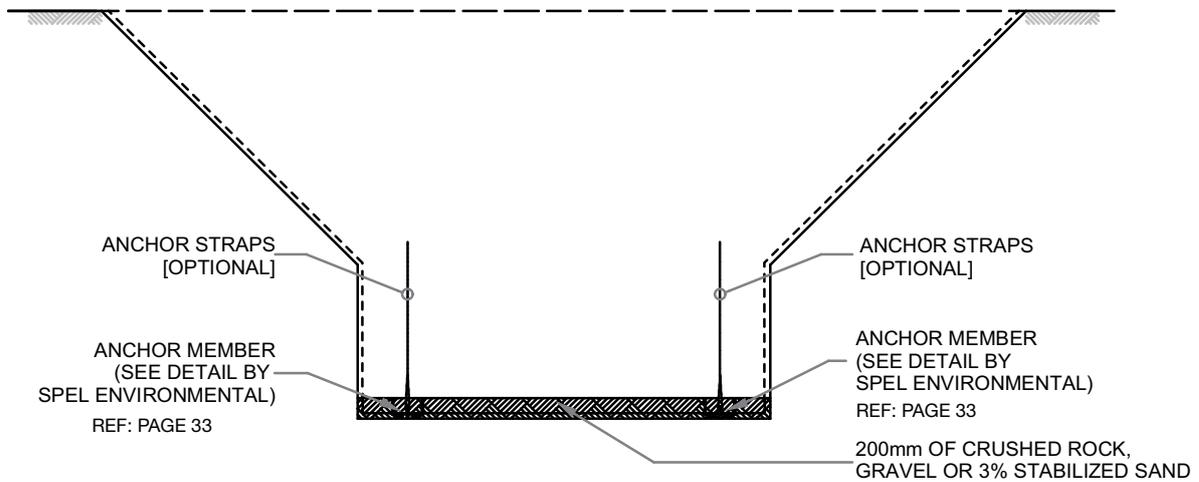
A: EXCAVATE TO PROFILE SHOWN

Typical Installation Procedure

- NOTE: 1. ACCESS PERMITTED TO EXCAVATION DURING CONSTRUCTION.
 2. DEPENDING ON EXISTING SOIL CONDITIONS, SUPPLY AND LAY GEOTEXTILE FABRIC TO PERIMETER OF EXCAVATION. FIX GEOTEXTILE FABRIC INTO POSITION ON SIDES OF VERTICAL EXCAVATION.

REFER TO CLIENT ENGINEERING DRAWINGS TO SEE IF THIS IS SPECIFIED.

| | | | |
|--|---|--|---------------|
| Page-Green & Associates Pty Ltd CONSULTING ENGINEERS 5 Villamanta St, Geelong West Phone: (03) 5222 1899 Fax: (03) 5229 8382 Email: pga@pipeline.com.au | SPEL UNDERGROUND TANK Typical Installation Details : Option A Trafficable | Design d.c.g. | Drawn a.h. |
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| Location |  spelstormwater joy in water PH: 1300 773 500 E: sales@spel.com.au www.spel.com.au | Ref No 13402-DC1 | |



Stage 2

B: SUPPLY AND POSITION ANCHOR MEMBERS COMPLETE WITH ANCHOR STRAPS

C: SUPPLY, LAY AND COMPACTED TO 98% STANDARD COMPACTION 200mm OF CRUSHED ROCK/GRAVEL OR 200mm OF 3% CEMENT STABILIZED SAND TO BASE OF EXCAVATION. STABILIZED SAND TO CURE PRIOR TO PROCEEDING TO STAGE 3.

Backfill Material

ALL BACKFILL (UNLESS OTHERWISE NOTED ON THESE DRAWINGS) SHALL BE :-

A. GRAVEL :

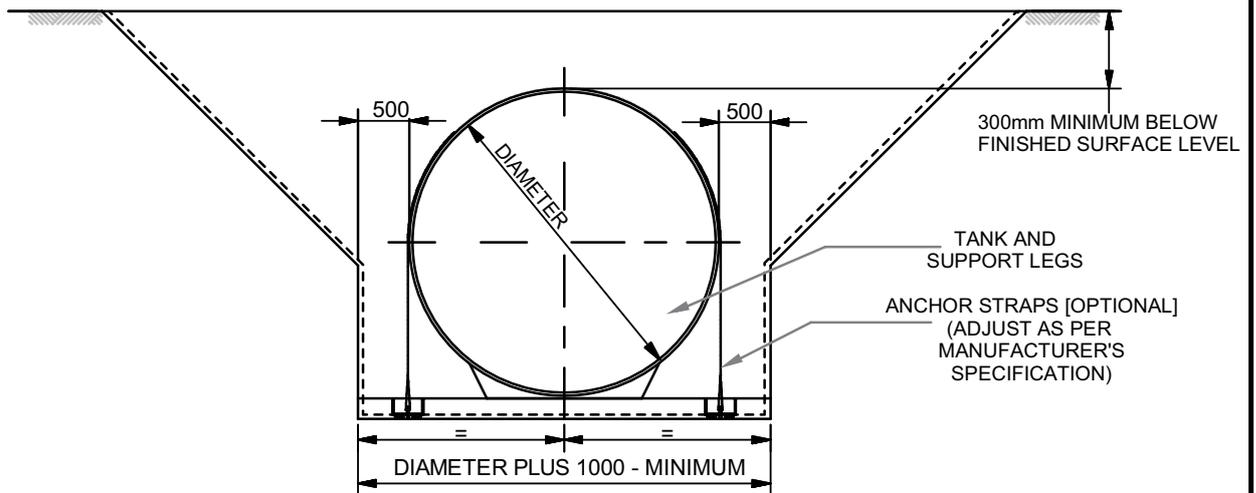
CLEAN NATURALLY ROUNDED AGGREGATE OF A NOMINAL SIZE OF 4.75mm TO 19mm

B. CRUSHED ROCK OR CRUSHED GRAVEL :

ALL CRUSHED AGGREGATE SHALL BE WASHED WITH A NOMINAL SIZE OF 4.75mm TO 19mm (LESS THAN 3% PASSING A No. 8 SIEVE) IN ACCORDANCE WITH AS2758.1 : 1998

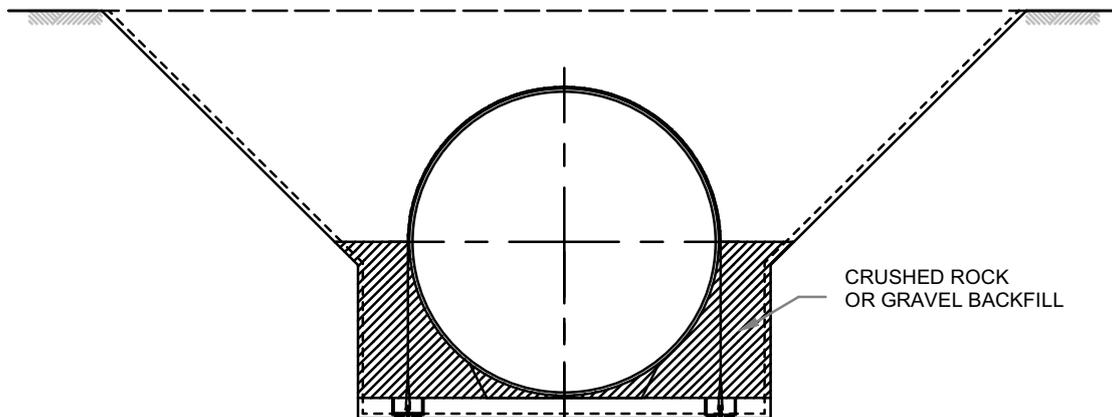
REFERENCE APPENDIX AT BACK FOR APPROVAL BACKFILL SPEC PAGE 31.

| | | | | |
|--|--|---|-----------------------------------|---------------|
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| Location | | | Ref No 13402-DC2 | |



Stage 3

D: FIT TANK INTO EXCAVATION AND FIX INTO POSITION WITH ANCHOR STRAPS



Stage 4

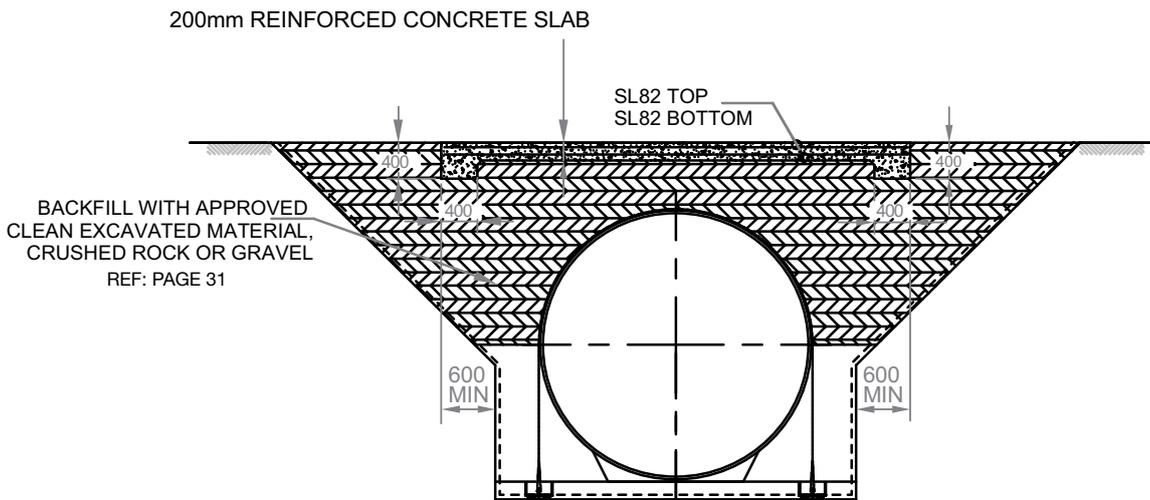
E: BACKFILL WITH CRUSHED ROCK OR GRAVEL PUSH AND COMPACT UNDER TANK FULLY COMPACT IN 150mm LAYERS DRY RODDED DENSITY SHALL BE NOT LESS THAN 1500Kg/M³

REFERENCE APPENDIX AT BACK FOR APPROVAL BACKFILL SPEC PAGE 31.

| | | | | |
|--|--|---|--|---------------|
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| Project | | | AutoCad Filename 13402-Details | |
| Location | | | Ref No 13402-DC3 | |

LOAD RATING: CLASS "D" – AS3996 – 210KN.
HIGHER LOAD RATING AVAILABLE.

REFER TO CLIENT CIVIL DRAWINGS FOR PAVEMENT DETAILS.



Stage 5

F: BACKFILL AROUND AND OVER THE TANK WITH APPROVED EXCAVATED MATERIAL, CRUSHED ROCK OR GRAVEL FULLY COMPACTED IN 150mm LAYERS

G: REINFORCE AND POUR CONCRETE SLAB : CONCRETE SHALL BE GRADE 32

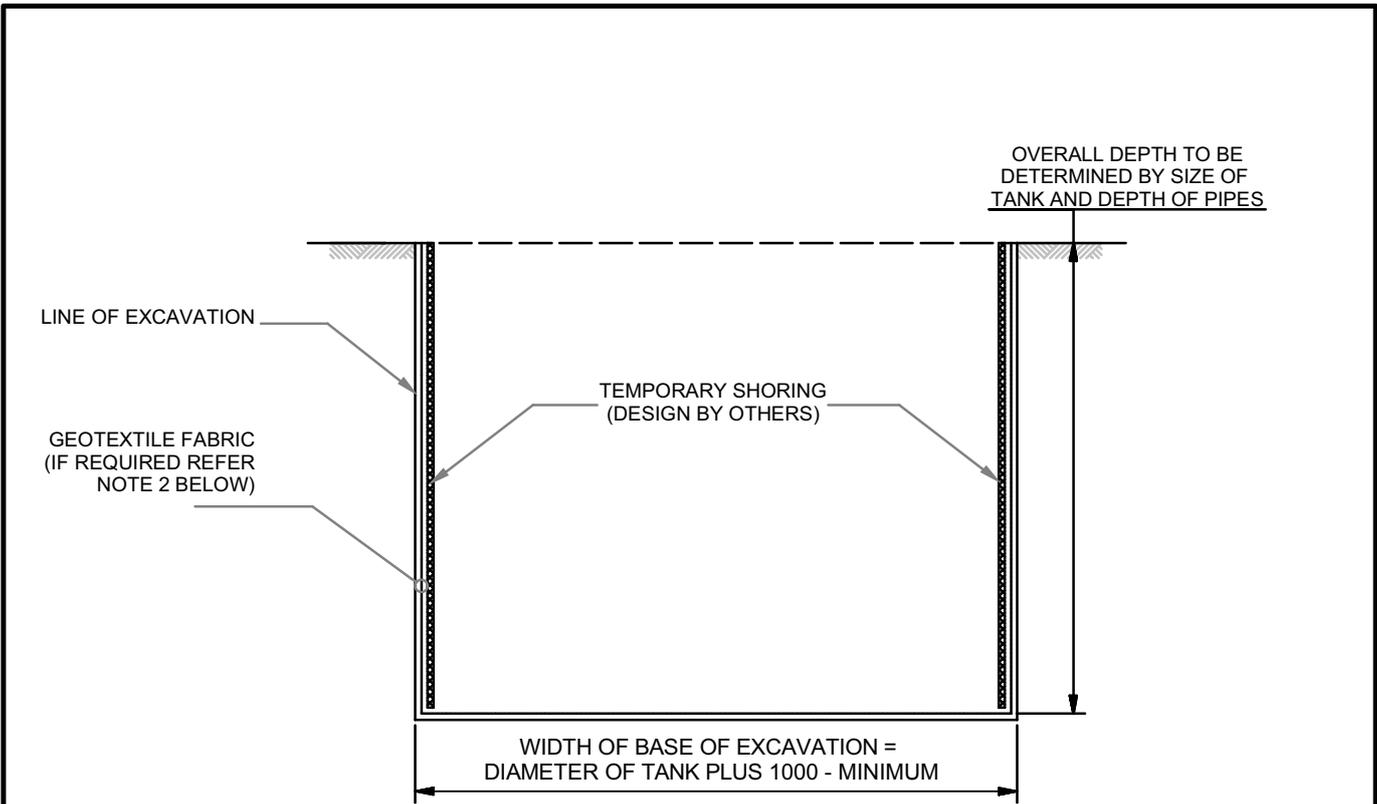
| | | | | |
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| Page-Green & Associates Pty Ltd CONSULTING ENGINEERS 5 Villamanta St, Geelong West Phone: (03) 5222 1899 Fax: (03) 5229 8382 Email: pga@pipeline.com.au | SPEL UNDERGROUND TANK Typical Installation Details : Option A Trafficable |  spelstormwater joy in water Ph: 1300 773 500 E: sales@spel.com.au www.spel.com.au | Design d.c.g. | Drawn a.h. |
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Option 4

Installation Drawings

**Method: Shored or Vertical
Excavation**

Application: Trafficable



NOTE: REFER TO GEOMETRICAL CIVIL REPORT/ CLIENT DRAWING FOR SHORING/BATTERING DETAIL.

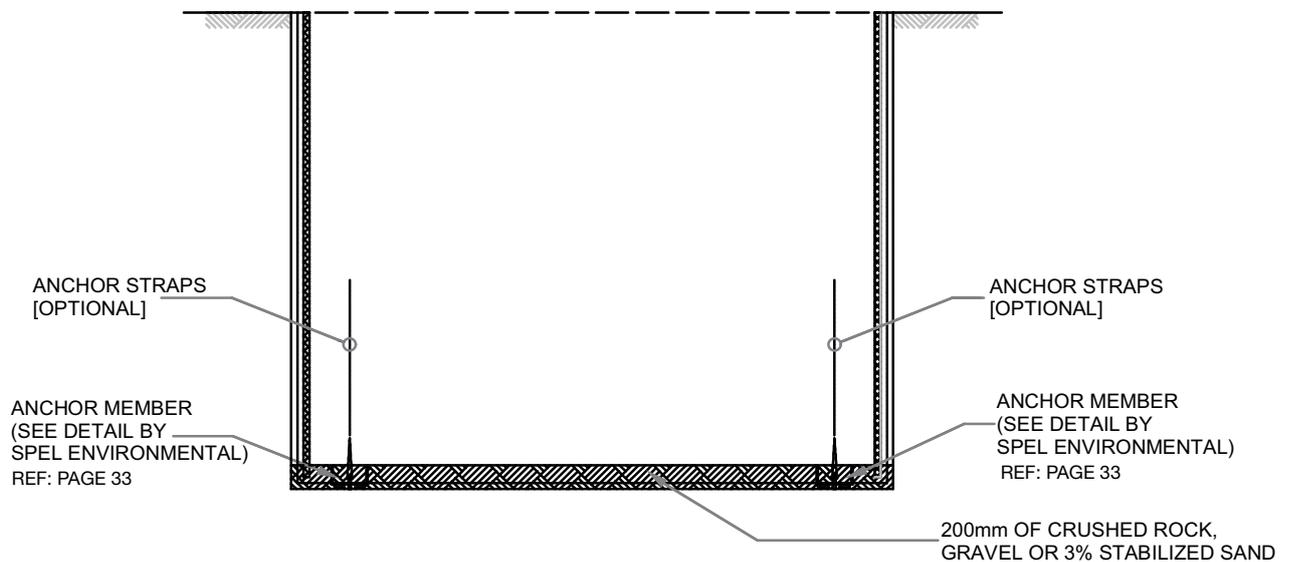
Stage 1

A : EXCAVATE TO PROFILE SHOWN

Typical Installation Procedure

- NOTE: 1. FIT TEMPORARY SHORING TO VERTICAL SIDES OF EXCAVATION. (DESIGN OF SHORING AND RECOVERY SYSTEM BY OTHERS)
2. ACCESS PERMITTED TO EXCAVATION DURING CONSTRUCTION AFTER INSTALLATION OF SHORING.
3. DEPENDING ON EXISTING SOIL CONDITIONS, SUPPLY AND LAY GEOTEXTILE FABRIC TO PERIMETER OF EXCAVATION. PIN GEOTEXTILE FABRIC INTO POSITION ON SIDES OF VERTICAL EXCAVATION

| | | | | |
|--|--|---|-----------------------------------|---------------|
| Page-Green & Associates Pty Ltd CONSULTING ENGINEERS 5 Villamanta St, Geelong West Phone: (03) 5222 1899 Fax: (03) 5229 8382 Email: pga@pipeline.com.au | SPEL UNDERGROUND TANK Typical Installation Details : Option B Trafficable | spelstormwater joy in water Ph: 1300 773 500 E: sales@spel.com.au www.spel.com.au | Design d.c.g. | Drawn a.h. |
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| Project | | | AutoCad Filename 13402-Details | |
| Location | | | Ref No 13402-DD1 | |



Stage 2

B: SUPPLY AND POSITION ANCHOR MEMBERS COMPLETE WITH ANCHOR STRAPS

C: SUPPLY, LAY AND COMPACTED TO 98% STANDARD COMPACTION 200mm OF CRUSHED ROCK/GRAVEL OR 200mm OF 3% CEMENT STABILIZED SAND TO BASE OF EXCAVATION. STABILIZED SAND TO CURE PRIOR TO PROCEEDING TO STAGE 3.

Backfill Material

ALL BACKFILL (UNLESS OTHERWISE NOTED ON THESE DRAWINGS) SHALL BE :-

A. GRAVEL :

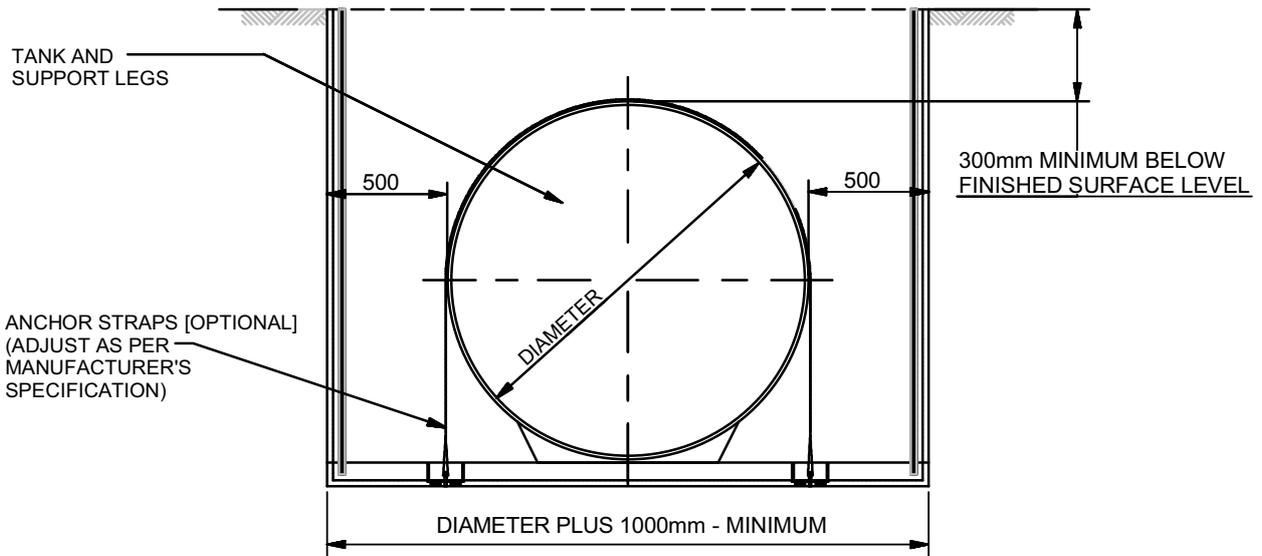
CLEAN NATURALLY ROUNDED AGGREGATE OF A NOMINAL SIZE OF 4.75mm TO 19mm

B. CRUSHED ROCK OR CRUSHED GRAVEL :

ALL CRUSHED AGGREGATE SHALL BE WASHED WITH A NOMINAL SIZE OF 4.75mm TO 19mm (LESS THAN 3% PASSING A No. 8 SIEVE) IN ACCORDANCE WITH AS2758.1 : 1998

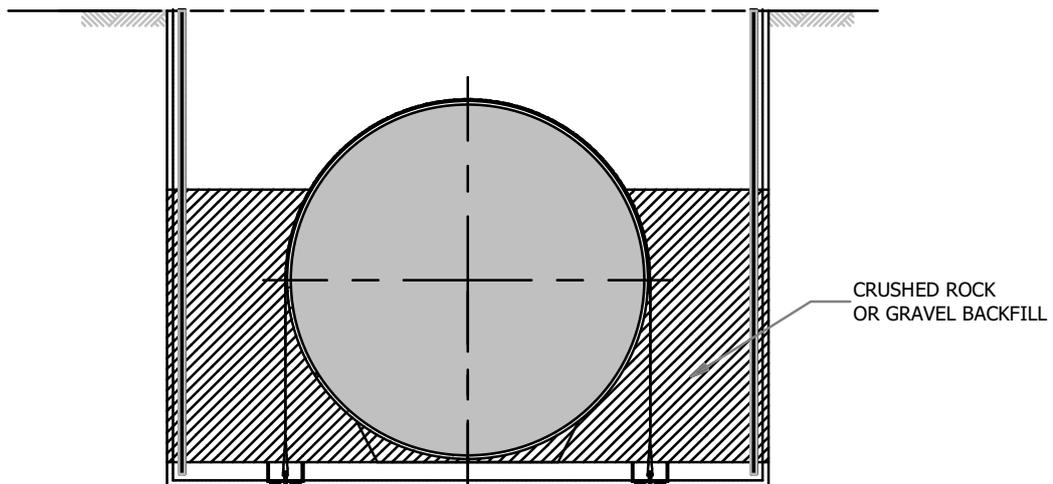
REFERENCE APPENDIX AT BACK FOR APPROVAL BACKFILL SPEC PAGE 31.

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Stage 3

D: FIT TANK INTO EXCAVATION AND FIX INTO POSITION WITH ANCHOR STRAPS



Stage 4

E: BACKFILL WITH CRUSHED ROCK OR GRAVEL PUSH AND COMPACT UNDER STORMCEPTOR/PURACEPTOR FULLY COMPACT IN 150mm LAYERS DRY RODDED DENSITY SHALL BE NOT LESS THAN 1500Kg/M³

REFERENCE APPENDIX
AT BACK FOR APPROVAL
BACKFILL SPEC PAGE 31.

Page-Green & Associates Pty Ltd

CONSULTING ENGINEERS

5 Villamanta St, Geelong West
Phone: (03) 5222 1899 Fax: (03) 5229 8382
Email: pga@pipeline.com.au

Project

Location

SPEL UNDERGROUND TANK
Typical Installation Details : Option B
Trafficable

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Design
d.c.g.

Drawn
a.h.

Date
April 09

Scale
1:50

AutoCad Filename

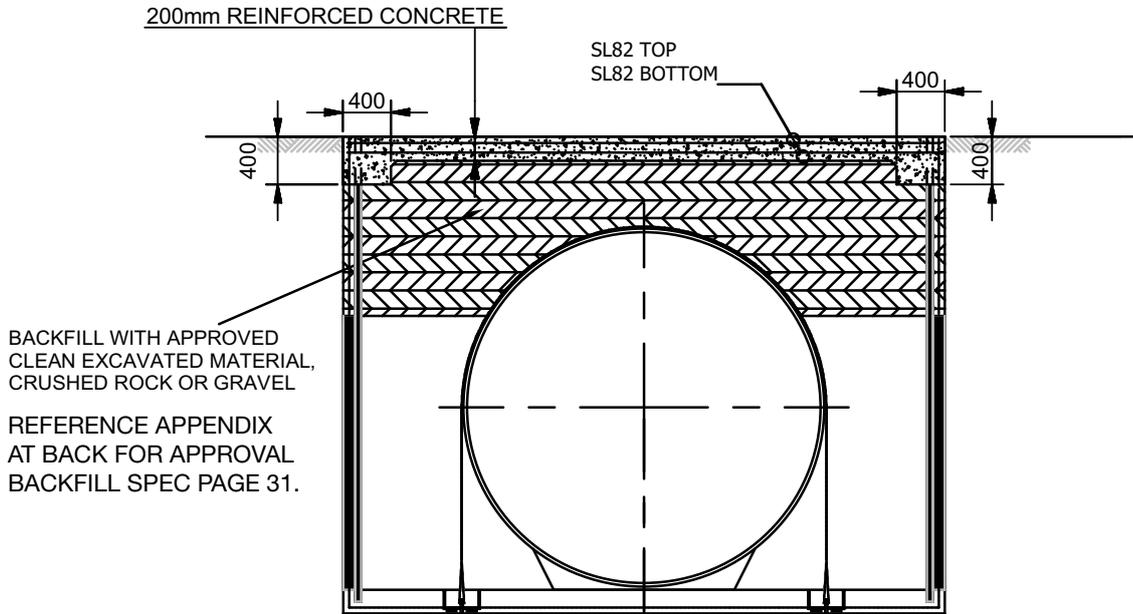
13402-Details

Ref No

13402-DD3

LOAD RATING: CLASS "D" – AS3996 – 210KN.
HIGHER LOAD RATING AVAILABLE.

REFER TO CLIENT CIVIL/STRUCTURAL DRAWINGS FOR PAVEMENT DETAILS.



Stage 5

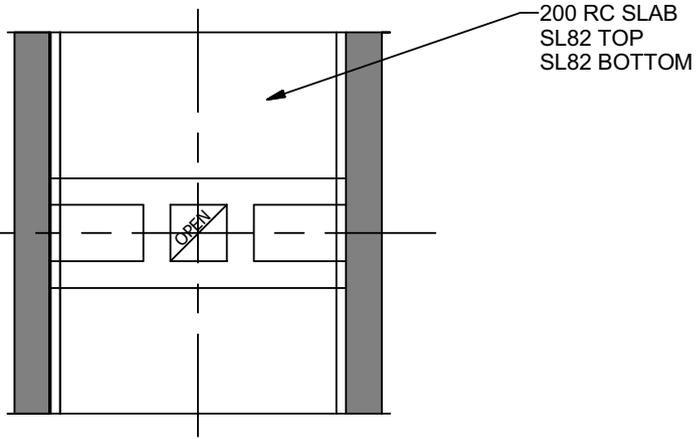
F: BACKFILL AROUND AND OVER THE STORMCEPTOR/PURCEPTOR WITH APPROVED EXCAVATED MATERIAL, CRUSHED ROCK OR GRAVEL FULLY COMPACTED IN 150mm LAYERS

G: REINFORCE AND POUR CONCRETE SLAB : CONCRETE SHALL BE GRADE 32

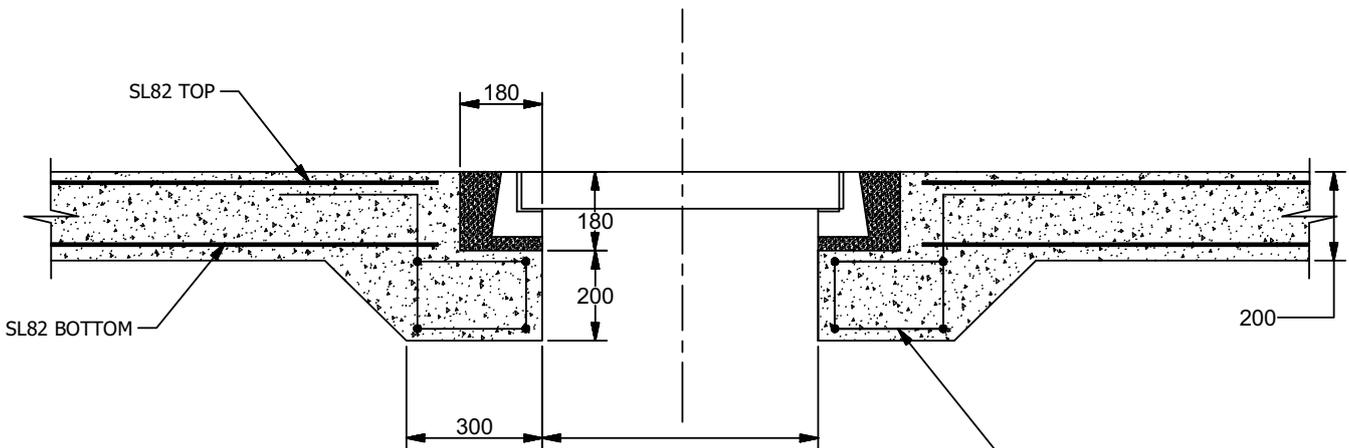
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| | Project | | Date April 09 | Scale 1:50 |
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TYPICAL LID AND CONCRETE SLAB DETAILS
 LOAD RATING: CLASS "D" – AS3996 – 210KN.
 HIGHER LOAD RATING AVAILABLE.

OPTION: REFER TO CLIENT DRAWINGS FOR RAISED LID SECTION FOR WATER TO DRAIN AWAY.



PART PLAN LAYOUT



TYPICAL SECTION AT ACCESS MANHOLE

2 N12 BARS
 TOP AND BOTTOM
 R10 LUGS AT 250 CTS

- APPLICABLE FOR ALL LID TYPES AND SIZE – CIRCULAR / RECTANGULAR
- REFER TO CLIENT DRAWINGS
- FITTED TO MANUFACTURERS DETAIL

| | | | | |
|--|--|---|-----------------------------|----------------|
| Page-Green & Associates Pty Ltd CONSULTING ENGINEERS 5 Villamanta St, Geelong West Phone: (03) 5222 1899 Fax: (03) 5229 8382 Email: pga@pipeline.com.au | Typical Section at Access Manhole |  spelstormwater joy in water PH: 1300 773 500 E: sales@spel.com.au www.spel.com.au | Design d.c.g. | Drawn a.h. |
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| Project | | | AutoCad Filename 11500-7 | |
| Location | | | Ref No 11500-7 | |

Approved Backfill Specifications

SPEL Approved Backfill Specifications

NOTES

The granular backfill is for the tank excavation, terminating level with the top of the barrel of the tank, and the remaining backfill from top of tank barrel to ground level/underside of concrete slab may be the approved backfill, excavated material or selected clean backfill material.

It may be necessary to line the excavation with Geofab (Filter Fabric) class A24 to separate the approved backfill from any unstable latent soil conditions – If unsure check with the Client Drawings.

The correct backfill medium is one of the critical factors in the successful installation of an in ground fiberglass SPEL Environmental tank.

We insist on backfill compliance prior to starting any installation works. Confirm with your supplier in advance that your backfill will meet or exceed the following. Ask to provide appropriate certification.

SPECIFICATIONS

Backfill shall be either gravel, crushed stone, crushed gravel, recycled material or sand, all sourced from a reputable quarry or recycling facility and should meet with a size grading as follows:

Gravel: A clean naturally rounded aggregate of a nominal size range of **19mm to 5mm** minimum.

Crushed Stone or Crushed Gravel: Washed crushed stone or gravel of a nominal size range of 14mm to 5mm minimum.

Sand: Free draining, single washed sand, compacted with no more than a hand held compaction device.

NOTE: All aggregate should conform to **AS2758.1:1986**. The dry rodded density shall not be less than **1500 kg/cu m**. The backfill should not have more than 3% passing a No:8 sieve (2.36mm).

Backfill material

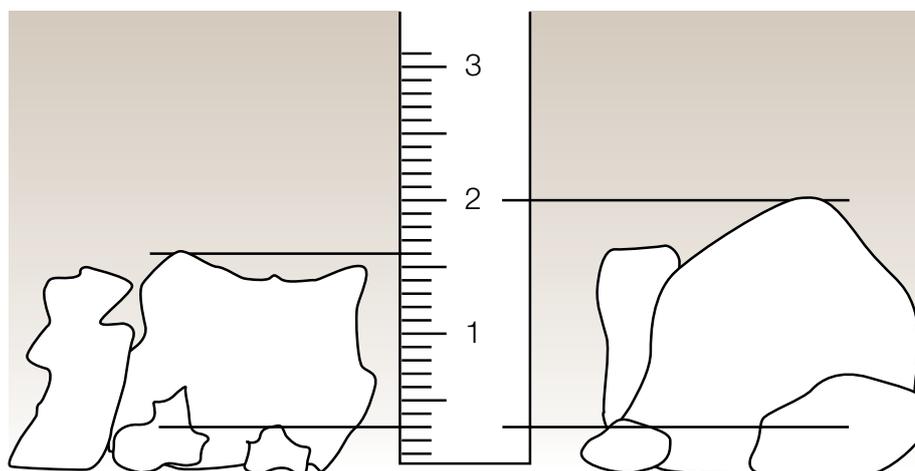
Pea gravel or crushed rock is preferred as backfill material.

Clean and washed sand may be used. Sand must be compacted in 300mm lifts to above the tank top.

Requirements for backfill material are:

- Clean and washed
- Non-cohesive, inert material
- Pea gravel or crushed rock
- Particles from 4.75mm but not larger than 19mm
- Material free from rocks, ice, snow, or organic material.

Approved backfill material for tanks and pipes



Crushed rock 4.75mm-14mm

Pea gravel 4.75mm-19mm

SPEL Anchor System

| REVISION HISTORY | | | | |
|------------------|-----------------|-----|------------|---------|
| REV | DESCRIPTION | BY | DATE | APPROVE |
| 1 | INITIAL RELEASE | M.M | 24/07/2013 | J.L. |

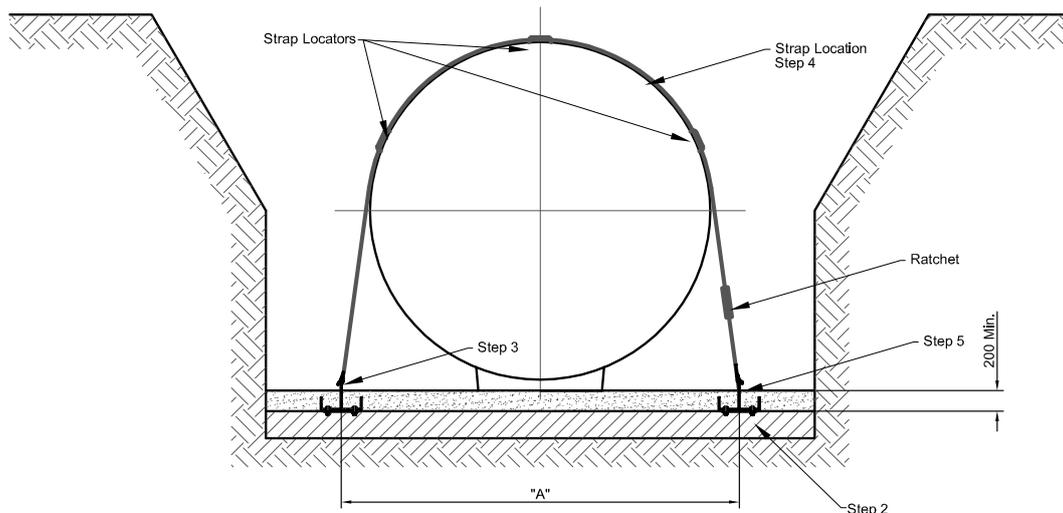


Figure 1

Installation procedure for SPEL Anchors

- Step 1** Check contents of SA. 1500-1-SS kit contents list
 2 off Anchors Base @ 1500mm long
 1 off 5 tonne Ratchet Strap Assembly
 3 off Strap Locators
 2 Rolls 'DENSON' Tap or equivalent
- Step 2** Place Anchors on prepared level base parallel to tanks as shown in Figure 1 and Table 1 Anchor bases should be evenly spaced from center out.
- Step 3** Attached the "long" length of the webbing and hook to the Anchor base, then throw the remaining length of webbing over the tank and make sure it is not twisted.
- Step 4** Side the strap locators on to the 'long' length of webbing and position the locators as shown in Figure 1 and 3.
- Step 5** Anchor the ratchet and short length of webbing with hook to other anchor base.
- Step 6** Taking the end of the 'long' length of webbing, thread it through the slot of the ratchet and tighten uniformly to snug tension, but cause no deflection. Deflection can be checked by measuring diameter (Table 1) before and after tensioning webbing.
- Anchor's bases should be held in position by covering with 200mm of gravel.
- Step 7** On completion, the ratchet tensioner and both hooks should be well wrapped in 'DENSO' or similar tape for long term protection.

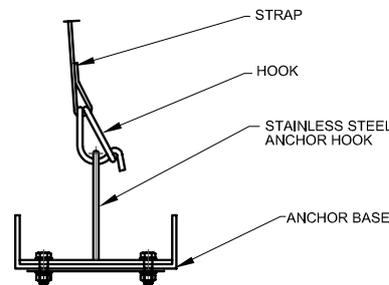


Figure 2

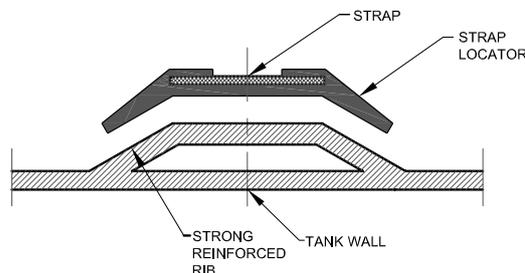


Figure 3

WARNING NOTICE:
 INSTALLATION PROCEDURE MUST BE IN ACCORDANCE WITH INSTRUCTION & GUIDANCE MANUAL SUPPLIED WITH THE EQUIPMENT. FOR DETAILED INFORMATION REFER TO ENGINEERS DEPARTMENT.

WARNING
 OBSERVE ALL OH&S and CONFINED SPACES REQUIREMENTS PRIOR TO ENTERING THE EXCAVATION

| Tank Diameter | Dimension "A" |
|---------------|---------------|
| Ø900 | 1200 |
| Ø1200 | 1500 |
| Ø1500 | 1900 |
| Ø1850 | 2200 |
| Ø2500 | 2900 |
| Ø3000 | 3400 |
| Ø3500 | 3900 |

Table 1

| | |
|------------------|--------------------|
| Drawn M.M. | Date 24/07/2013 |
| Designed J.L. | Date 24/07/2013 |
| Verified | Date |
| Approved | Date |
| Dig. Add. | |



PH: 1300 773 500 | E: sales@spel.com.au
 www.spel.com.au

TITLE
 Installation Procedure for SPEL AS-1500-1-SS Anchor Kit

| | | | |
|---------------|--------------------------|------------|----------|
| CODE | SIZE A4 | SHEET 1 | REV 1 |
| SCALE 1:30 | DWG No. SP13-IM1100-S | | |

SPEL Anchor Strap Assemble

MODEL: TD 75

5000kg Lashing capacity



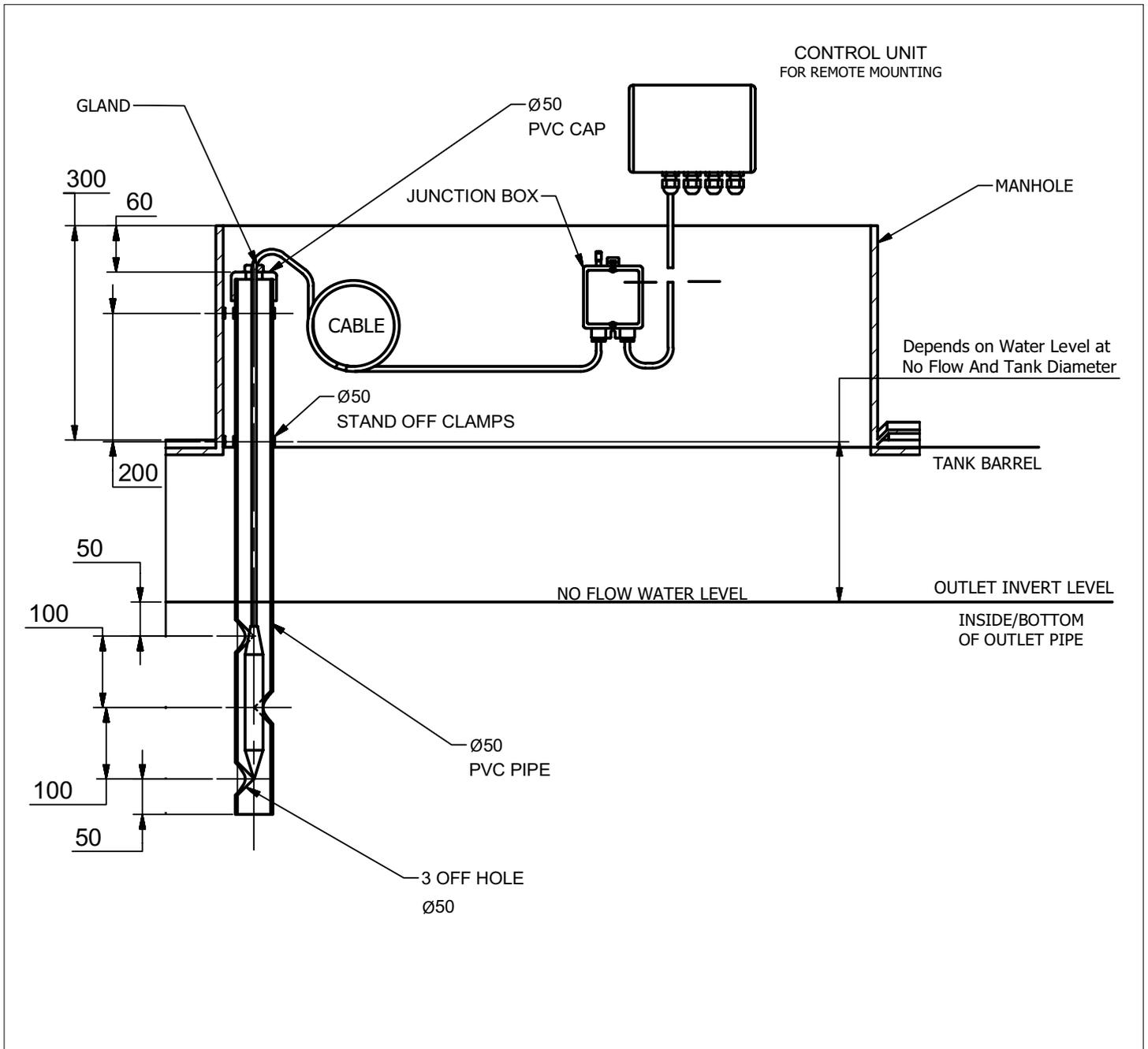
SPEL anchor straps are a high quality tie down system produced by 'SECURE-A-LOAD' and are suitable for medium duty commercial applications.

The construction of the system complies and is tested to "**AS/NZS 4380-2001**" with the 75 mm x 10 Mtr strapping manufactured from 100% polyester having a "Breaking" strength of 11 100 kgs.

The ratchet buckle is type 45 steel with 2mm side plates, the metal hook and keeper are "20 MN²" steel and they are all zinc plated, gold chromate, these components are further protected, when buried, by being wrapped in "Denso" waterproofing tape, prior to back fill.

Details may change without notice.

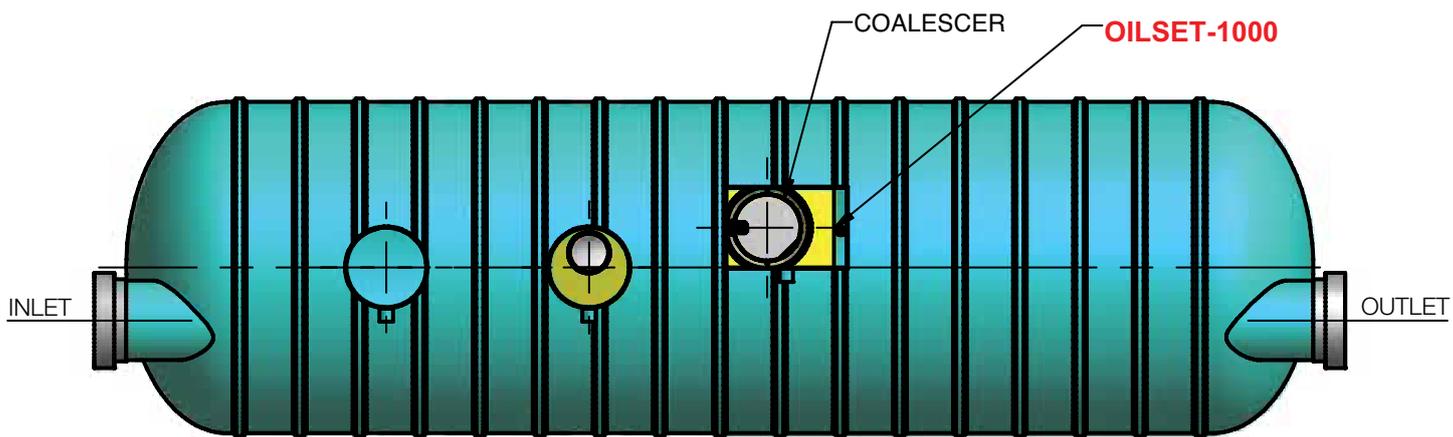
Alert Probe Settings



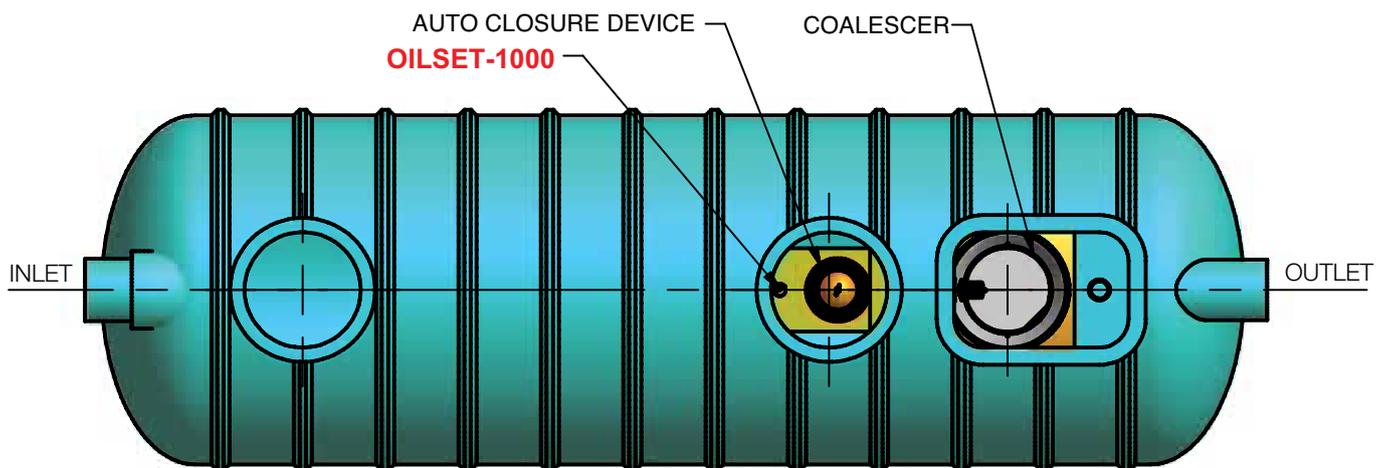
SPEL OilSET 1000 Probe Settings.

Positioning of OilSET-1000

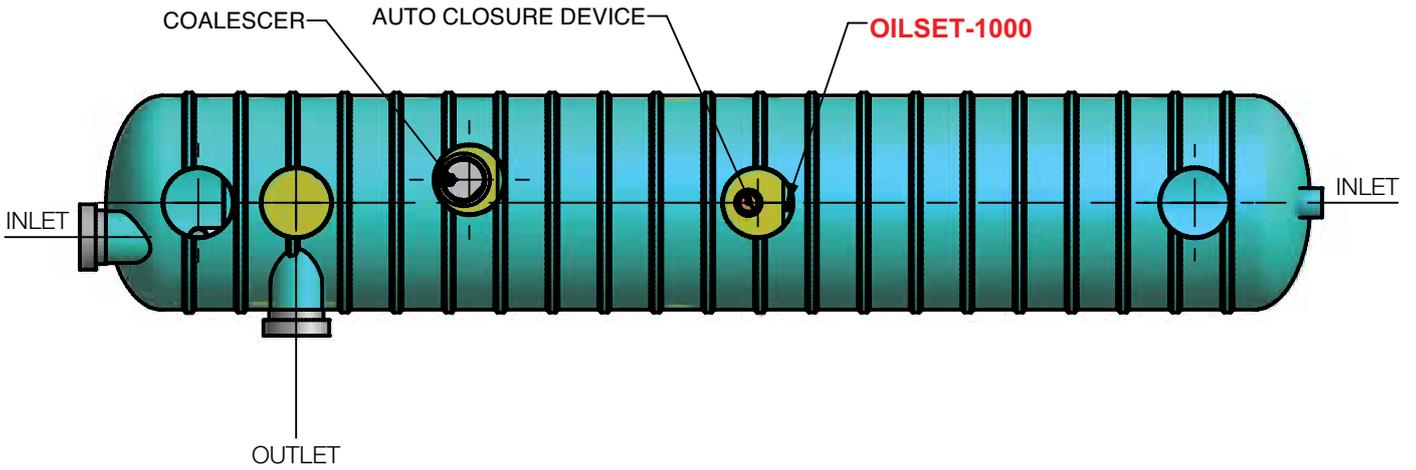
Stormceptor



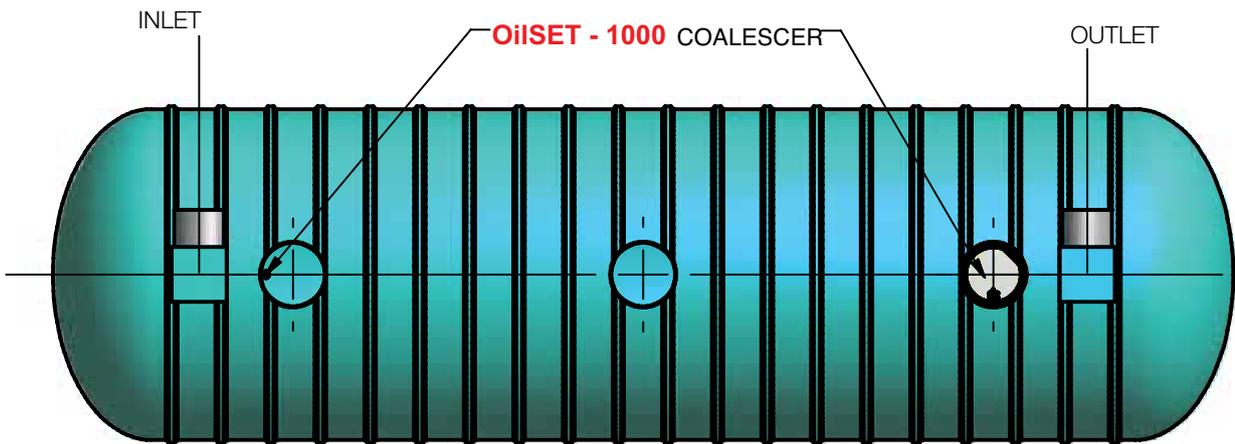
Puraceptor



Triceptor



Off-line Stormceptor





spelstormwater
joy in water

DELIVERY, INSPECTION & CHECK SHEET.

| | | | |
|-----------|--|---------------|--|
| Docket No | | Delivery Date | |
| Job No | | Order No | |

SITE DETAILS

| Company Name | | | | | |
|------------------|--------------------------------|-------|---------|------|--|
| Delivery Address | | | | | |
| Site Contact | | Phone | | | |
| Line | Description | QTY | Factory | Site | |
| 1 | Tank Serial Number: | CHECK | | | |
| 2 | Tank Type: | CHECK | | | |
| 3 | Model: | CHECK | | | |
| 4 | Installation Manual | | | | |
| 5 | Operation & Maintenance Manual | | | | |
| 6 | Installation & Drawing Manual | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |

| | | | | |
|--------------------|------|--|-------|--|
| Factory Checked By | Sign | | Print | |
| Comments | | | Date | |
| Site Checked By | Sign | | Print | |
| Comments | | | Date | |

Note: Please check equipment for damage or missing items before signing this docket.

Please keep a copy of this docket for your records and reference.

Should you have any questions or difficulties, please contact our office ASAP.

SPEL Environmental - Sydney

100 Silverwater Rd Silverwater NSW 2128. PH: +61 2 8705 0255

SPEL Stormceptor Class 1™ – Commissioning Checklist

SITE DETAILS

| | |
|-----------|-----------|
| Client: | Date: |
| Contact: | Order No: |
| Location: | |
| Address: | |

PRODUCT DETAILS

| |
|------------------------|
| Stormceptor Model: |
| Stormceptor Serial No: |
| OilSET Model: |

CHECKLIST

STATUS

COMMENTS

| CHECKLIST | STATUS | COMMENTS |
|--|--------|----------|
| Stormceptor tank installed level | | |
| Orientation of Stormceptor correct — Pipe Configuration Type | | |
| Inlet/Outlet connections installed correctly | | |
| Vent Connections installed (Individual vent for each chamber) | | |
| Access risers installed and sealed correctly | | |
| Ensure all portals, rails and risers extend to surface level | | |
| Lids and covers installed correctly | | |
| Tank chambers free from debris | | |
| Oil alert probe installed, wired to controller and set below water level | | |
| Test function of OilSET System (run through full cycle as per manual) | | |
| Check coalescer is correctly installed | | |
| Ensure coalescer is clean and free from debris | | |
| Fill chambers with clean water (minimum— coalescer to be covered) | | |
| Check water level in all chambers is even | | |

GENERAL

| | | |
|---|--|--|
| Inspect catchment area for contamination | | |
| Brief client on Maintenance requirements | | |
| Ensure adequate signage is mounted at the control panel | | |
| Ensure operation manual is mounted at the control panel | | |
| Ensure client has received operation manual | | |

NOTES

SIGN OFF

| | |
|----------------------------------|-------|
| Checklist Completed By: | Date: |
| Signature: | Date: |
| Client Representative Name: | Date: |
| Client Representative Signature: | Date: |

SPEL Puraceptor Class 1™ – Commissioning Checklist

SITE DETAILS

| | |
|-----------|-----------|
| Client: | Date: |
| Contact: | Order No: |
| Location: | |
| Address: | |

PRODUCT DETAILS

| |
|-----------------------|
| Puraceptor Model: |
| Puraceptor Serial No: |
| OilSET Model: |

| CHECKLIST | STATUS | COMMENTS |
|--|--------|----------|
| Puraceptor tank installed level | | |
| Orientation of Puraceptor correct — Pipe Configuration Type | | |
| Inlet/Outlet connections installed correctly | | |
| Vent Connections installed (Individual vent for each chamber) | | |
| Access risers installed and sealed correctly | | |
| Ensure all portals, rails and risers extend to surface level | | |
| Lids and covers installed correctly | | |
| Tank chambers free from debris | | |
| Oil alert probe installed, wired to controller and set below water level | | |
| Test function of OilSET System (run through full cycle as per manual) | | |
| Check coalescer is correctly installed | | |
| Ensure coalescer is clean and free from debris | | |
| Fill chambers with clean water (minimum — coalescer to be covered) | | |
| Before installing Auto closure device ensure sealing surfaces are clean | | |
| Install Auto Closure Device (ACD) and ensure the ACD is buoyant | | |
| Check water level in all chambers is even | | |

GENERAL

| | | |
|---|--|--|
| Inspect catchment area for contamination | | |
| Brief client on Maintenance requirements | | |
| Ensure adequate signage is mounted at the control panel | | |
| Ensure operation manual is mounted at the control panel | | |
| Ensure client has received operation manual | | |

NOTES

SIGN OFF

| | |
|----------------------------------|-------|
| Checklist Completed By: | Date: |
| Signature: | Date: |
| Client Representative Name: | Date: |
| Client Representative Signature: | Date: |

Warranty

SPEL Underground Tank Shells

We warrant that our Separator and storage underground tank shells, if installed strictly in accordance with the company's relevant installation procedure - having in mind particularly:- ground conditions, invert depth, water table depth in winter, external loading, type and quality of backfill material, will

1. meet our published specifications and will be free from material defects in materials and workmanship for a period of one year following date of original delivery.
2. not fail for a period of twenty-five years from date of original purchase due to external corrosion; and
3. not fail for a period of twenty-five years from date of original purchase due to internal corrosion provided the tank is solely used for:-

Rainwater storage
Potable water at ambient temperatures
Fuel/oil contaminated surface rainwater
Domestic sewage.

For other applications the life expectancy will be determined by the contents, the operating conditions and the resin system/reinforcement specification used.

Our liability under this warranty shall be limited to, at our option,

- (1) repair of the defective tank
- (2) delivery of a replacement tank to the original site or
- (3) refund of the original purchase price.

We shall not be liable for any labour or other installation costs, indirect or consequential loss, damage or other damages in connection with such tanks.

Accessory warranties do not extend beyond the warranty period by our suppliers. This applies to such items as access covers and frames, monitoring equipment, connections for emptying, pumping equipment or any accessories as defined in the company's official order acknowledgement/invoice.

The foregoing constitutes our exclusive obligation and we make no express or implied warranties, or any warranty of merchantability or fitness for any particular purpose whatsoever, except as stated above.



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joy in water

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