Attachment to item number 5.1 -

Onsite - Wastewater Assessment

ONSITE-WASTEWATER ASSESSMENT

223 Carlton River Road

Carlton

February 2025

GEO-ENVIRONMENTAL

SOLUTIONS

Investigation Details

Client:	Stargar PTY LTD
Site Address:	223 Carlton River Road, Carlton
Date of Inspection:	18/12/2024
Proposed Works:	Wastewater system
Investigation Method:	Hand Auger
Inspected by:	JP Cumming

Site Details

Certificate of Title (CT):	126930/1
Title Area:	Approx. 3.311 ha
Applicable Planning Overlays:	Flood-prone Areas, Airport obstacle limitation area
Slope & Aspect:	2° SW facing slope
Vegetation:	Mixed Flora
Ground Surface:	Disturbed

Background Information

Geology Map:	MRT 1:250000
Geological Unit:	Quaternary Sediments
Climate:	Annual rainfall 500mm
Water Connection:	Tank
Sewer Connection:	Unserviced-On-site required
Testing and Classification:	*AS2870:2011, AS1726:2017 & AS1547:2012*

Investigation

A number of bore holes were completed to identify the distribution and variation of the soil materials at the site, bore hole locations are indicated on the site plan. See soil profile conditions presented below. Tests were conducted across the site to obtain bearing capacities of the material at the time of this investigation.

Wastewater Soil Profile Summary

Hole 1 Depth (m)	Horizon	Description
0.00 – 0.20	A1	Grey **SAND (SP),** single grain structure, slightly moist loose consistency, variable boundary to
0.20 – 1.30+	A2	Pale Grey **SAND (SP),** single grain structure, slightly moist, loose, no refusal.

Site Notes

Soils on these aeolian deposits are characterised by moderately deep sandy profiles. The anticipated subsoil permeability under saturated conditions from samples across the site is expected to be in the order of >3m/day.

Wastewater Classification & Recommendations

According to AS1547-2012 (on-site waste-water management) the natural soil is classified as **Sand (category 1).** It is proposed to install a dual-purpose septic tank with on-site absorption. A Design Loading Rate (DLR) of 20L/m^2/day has been assigned for primary treated effluent.

The existing three-bedroom dwelling has a calculated maximum wastewater output of 600L/day. This is based on a tank water supply and a maximum occupancy of 5 people (120L/day/person). The existing septic system does not appear to be functioning therefore it is proposed that it be disconnected and decommissioned.

Using the DLR of 20L/m^2/day, an absorption area of at least 30m^2 will be required to accommodate the expected flows. This can be accommodated by one 15m x 2m x 0.6m terraced absorption trench connected to a dual-purpose septic tank (min 3000L). For all calculations please refer to the Trench summary reports. A cut-off drain will be required upslope of the absorption area and the area excluded from traffic or any future building works. A 100% reserve area should be set aside for future wastewater requirements.

To comply with the Southern Beaches On-site Waste Water and Stormwater Management Specific Area Plan of the Sorell Local Provisions Schedule:

SOR-S2.7.1 On-site waste water

Acceptable Solutions	**Comment**
A1 Development must: (a) not cover more than 20% of the site; (b) not be located on land shown on an overlay map, as within: (i) a flood-prone hazard area; (ii) a landslip hazard area; (iii) a coastal erosion hazard area; (iv) a waterway and coastal protection area; or (v) a coastal inundation hazard area; (c) be located on a site with a soil depth of at least 1.5m; (d) be located on a site where the average gradient of the land does not exceed 10%; and (e) in the case of a dwelling, provide 65m^2 of land for wastewater land application area per bedroom which is located at least 1.5m from an upslope or side slope boundary and 5m from a downslope boundary.	Non-compliance with A1 (e) See P1

Performance Criteria	**Comment**
P1 The site must provide sufficient area for management of on-site waste water, having regard to: (a)the topography of the site; (b) the capacity of the site to absorb wastewater; (c) the size and shape of the site; (d) the existing buildings and any constraints imposed by existing development; (e) the area of the site to be covered by the proposed development; (f) the provision for landscaping, vehicle parking, driveways and private open space; (g) any adverse impacts on the quality of ground, surface and coastal waters; (h) any adverse environmental impact on surrounding properties and the locality; and (i) any written advice from a suitably qualified person (onsite waste water management) about the adequacy of the on-site waste water management system.	Complies

Design provisions have been made to address site constraints and manage risk including the use of subsurface application, assigning a conservative DLR and the designation of a 100% reserve area.. It is therefore concluded that there is a low and acceptable risk of environmental impact and impact on human health from wastewater management on the site for the current proposal.

The following setback distances are required to comply with the Building Act 2016:

Upslope or level buildings:	3m
Downslope buildings:	6m
Upslope or level boundaries:	1.5m
Downslope boundaries:	4m
Downslope surface water:	100m

Compliance with Building Act 2016 Guidelines for On-site Wastewater Management Systems is outlined in the attached table.

During construction GES will need to be notified of any variation to the soil conditions or wastewater loading as outlined in this report.

Dr John Paul Cumming B.Agr.Sc (hons) PhD CPSS GAICD

Director

GES P/L

Land suitability and system sizing for on-site wastewater management

Trench 3.0 (Australian Institute of Environmental Health)

Assessment Report

Site assessment for on-site waste water disposal

Assessment for	Stargar PTY LTD	Assess. Date	20-Feb-25
		Ref. No.	
Assessed site(s)	223 Carlton River Road, Carlton	Site(s) inspected	30-Jun-23
Local authority	Sorell	Assessed by	John Paul Cumming

This report summarises wastewater volumes, climatic inputs for the site, soil characteristics and sustem sizing and design issues. Site Capability and Environmental sensitivity issues are reported separately, where 'Alert' columns flag factors with high (A) or very high (AA) limitations which probably require special consideration for system design(s). Blank spaces on this page indicate data have not been entered into TRENCH.

Wastewater Characteristics

Wastewater volume (L/day) used for this assessment = 600 (using the 'No. of bedrooms in a dwelling' method)
Septic tank wastewater volume (L/day) = 200
Sullage volume (L/day) = 400
Total nitrogen (kg/year) generated by wastewater = 5.4
Total phosphorus (kg/year) generated by wastewater = 2.3

Climatic assumptions for site (Evapotranspiration calculated using the crop factor method)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean rainfall (mm)	39	32	45	35	42	53	33	49	46	44	43	43
Adopted rainfall (R, mm)	39	32	45	35	42	53	33	49	46	44	43	43
Retained rain (Rr, mm)	35	29	41	31	38	48	30	44	42	39	39	39
Max. daily temp. (deg. C)												
Evapotrans (ET, mm)	130	110	91	63	42	29	32	42	63	84	105	126
Evapotr. less rain (mm)	**95**	**81**	**50**	**32**	**4**	**-18**	**2**	**-2**	**21**	**45**	**66**	**87**

Annual evapotranspiration less retained rain (mm) = 463

Soil characterisitics

Texture = Sand Category = 1 Thick. (m) = 2
Adopted permeability (m/day) = 3 Adopted LTAR (L/sq m/day) = 20 Min depth (m) to water = 3

Proposed disposal and treatment methods

Proportion of wastewater to be retained on site:	All wastewater will be disposed of on the site
The preferred method of on-site primary treatment:	In dual purpose septic tank(s)
The preferred method of on-site secondary treatment:	In-ground
The preferred type of in-ground secondary treatment:	Trench(es)
The preferred type of above-ground secondary treatment:	None
Site modifications or specific designs:	Not needed

Suggested dimensions for on-site secondary treatment system

Total length (m) =	15
Width (m) =	2
Depth (m) =	0.6
Total disposal area (sq m) required =	30
comprising a Primary Area (sq m) of:	30
and a Secondary (backup) Area (sq m) of:	

Sufficient area is available on site

Comments

The assigned LTAR for the Category 1 soil present is 40L/m^2/day with an absorption area of 30m^2 required for a typical three-bedroom dwelling with a mains water supply.

GES P/L

Land suitability and system sizing for on-site wastewater management

Trench 3.0 (Australian Institute of Environmental Health)

Site Capability Report

Site assessment for on-site waste water disposal

Assessment for	Stargar PTY LTD	Assess. Date	20-Feb-25
		Ref. No.	
Assessed site(s)	223 Carlton River Road, Carlton	Site(s) inspected	30-Jun-23
Local authority	Sorell	Assessed by	John Paul Cumming

This report summarises data relating to the physical capability of the assessed site(s) to accept wastewater. Environmental sensitivity and system design issues are reported separately. The 'Alert' column flags factors with high (A) or very high (AA) site limitations which probably require special consideration in site acceptability or for system design(s). Blank spaces indicate data have not been entered into TRENCH.

Alert	Factor	Units	Value	Confid level	Limitation Trench	Limitation Amended	Remarks
A	Expected design area	sq m	400	V. high	High		
	Density of disposal systems	/sq km	20	Mod.	Moderate		
	Slope angle	degrees	2	High	Very low		
	Slope form	Convex spreading		High	Very low		
	Surface drainage	Good		High	Very low		
	Flood potential	Site floods 1 in 75-100 yrs		High	Low		
	Heavy rain events	Infrequent		High	Moderate		
	Aspect (Southern hemi.)	Faces NE or NW		V. high	Low		
	Frequency of strong winds	Common		High	Low		
	Wastewater volume	L/day	600	High	Moderate		
	SAR of septic tank effluent		1.4	High	Low		
	SAR of sullage		2.5	High	Moderate		
	Soil thickness	m	2.0	V. high	Very low		
	Depth to bedrock	m	3.0	V. high	Very low		
	Surface rock outcrop	%	0	V. high	Very low		
	Cobbles in soil	%	0	V. high	Very low		
	Soil pH		6.5	High	Very low		
	Soil bulk density	gm/cub. cm	1.5	High	Low		
	Soil dispersion	Emerson No.	8	V. high	Very low		
AA	Adopted permeability	m/day	3	Mod.	Very high		
	Long Term Accept. Rate	L/day/sq m	20	High	Low		

Comments

The soils on site have good capacity to accept wastewater provided that secondary treatment of effluent is applied.

GES P/L

Land suitability and system sizing for on-site wastewater management

Trench 3.0 (Australian Institute of Environmental Health)

Environmental Sensitivity Report

Site assessment for on-site waste water disposal

Assessment for	Stargar PTY LTD	Assess. Date	20-Feb-25
		Ref. No.	
Assessed site(s)	223 Carlton River Road, Carlton	Site(s) inspected	30-Jun-23
Local authority	Sorell	Assessed by	John Paul Cumming

This report summarises data relating to the environmental sensitivity of the assessed site(s) in relation to applied wastewater. Physical capability and system design issues are reported separately. The 'Alert' column flags factors with high (A) or very high (AA) limitations which probably require special consideration in site acceptability or for system design(s). Blank spaces indicate data have not been entered into TRENCH.

Alert	Factor	Units	Value	Confid level	Limitation Trench	Limitation Amended	Remarks
A	Cation exchange capacity	mmol/100g	30	High	High		
A	Phos. adsorp. capacity	kg/cub m	0.3	High	High		
	Annual rainfall excess	mm	-463	High	Very low		
	Min. depth to water table	m	3	High	Very low		
	Annual nutrient load	kg	7.7	High	Low		
	G'water environ. value	Agric sensit/dom irrig		V. high	Moderate		
	Min. separation dist. required	m	3	High	Very low		
	Risk to adjacent bores						Factor not assessed
	Surf. water env. value	Agric sensit/dom drink		V. high	Moderate		
	Dist. to nearest surface water	m	300	V. high	Low		
AA	Dist. to nearest other feature	m	4	V. high	Very high		
	Risk of slope instability		Very low	V. high	Very low		
	Distance to landslip	m	1000	V. high	Very low		

Comments

There is low risk of environmental degredation associated with the disposal of wastewater on this site.

Demonstration of wastewater system compliance to *Building Act 2016 Guidelines for On-site Wastewater*

Acceptable Solutions	**Performance Criteria**	**Compliance**
A1 Horizontal separation distance from a building to a land application area must comply with one of the following: a) be no less than 6m; or b) be no less than: (i) 3m from an upslope building or level building; (ii) If primary treated effluent to be no less than 4m plus 1m for every degree of average gradient from a downslope building; (iii) If secondary treated effluent and subsurface application, no less than 2m plus 0.25m for every degree of average gradient from a downslope building.	P1 a) The land application area is located so that (i) the risk of wastewater reducing the bearing capacity of a building's foundations is acceptably low.; and (ii) is setback a sufficient distance from a downslope excavation around or under a building to prevent inadequately treated wastewater seeping out of that excavation	Complies with A1 (b) (i) Land application area will be located with a minimum separation distance of 3m from an upslope or level building. Complies with A1 (b) (ii) Land application area will be located with a minimum separation distance of 6m from a downslope building.
A2 Horizontal separation distance from downslope surface water to a land application area must comply with (a) or (b) (a) be no less than 100m; or (b) be no less than the following: (i) if primary treated effluent 15m plus 7m for every degree of average gradient to downslope surface water; or (ii) if secondary treated effluent and subsurface application, 15m plus 2m for every degree of average gradient to down slope surface water.	P2 Horizontal separation distance from downslope surface water to a land application area must comply with all of the following: a) Setbacks must be consistent with AS/NZS 1547 Appendix R; b) A risk assessment in accordance with Appendix A of AS/NZS 1547 has been completed that demonstrates that the risk is acceptable.	Complies with A2 (a) Land application area located > 100m from downslope surface water

A3 Horizontal separation distance from a property boundary to a land application area must comply with either of the following: (a) be no less than 40m from a property boundary; or (b) be no less than: (i) 1.5m from an upslope or level property boundary; and (ii) If primary treated effluent 2m for every degree of average gradient from a downslope property boundary; or (iii) If secondary treated effluent and subsurface application, 1.5m plus 1m for every degree of average gradient from a downslope property boundary.	P3 Horizontal separation distance from a property boundary to a land application area must comply with all of the following: (a) Setback must be consistent with AS/NZS 1547 Appendix R; and (b) A risk assessment in accordance with Appendix A of AS/NZS 1547 has been completed that demonstrates that the risk is acceptable.	Complies with A3 (b) (i) Land application area will be located with a minimum separation distance of 1.5m from an upslope or level property boundary Complies with A3 (b) (ii) Land application area will be located with a minimum separation distance of 4m from a downslope property boundary.
A4 Horizontal separation distance from a downslope bore, well or similar water supply to a land application area must be no less than 50m and not be within the zone of influence of the bore whether up or down gradient.	P4 Horizontal separation distance from a downslope bore, well or similar water supply to a land application area must comply with all of the following: (a) Setback must be consistent with AS/NZS 1547 Appendix R; and (b) A risk assessment completed in accordance with Appendix A of AS/NZS 1547 demonstrates that the risk is acceptable	Complies with A4 No bore or well identified within 50m

A5 Vertical separation distance between groundwater and a land application area must be no less than: (a) 1.5m if primary treated effluent; or (b) 0.6m if secondary treated effluent	P5 Vertical separation distance between groundwater and a land application area must comply with the following: (a) Setback must be consistent with AS/NZS 1547 Appendix R; and (b) A risk assessment completed in accordance with Appendix A of AS/NZS 1547 that demonstrates that the risk is acceptable	Complies with A5 (a) No groundwater encountered
A6 Vertical separation distance between a limiting layer and a land application area must be no less than: (a) 1.5m if primary treated effluent; or (b) 0.5m if secondary treated effluent	P6 Vertical setback must be consistent with AS/NZS1547 Appendix R.	Complies with A6 (a)
A7 nil	P7 A wastewater treatment unit must be located a sufficient distance from buildings or neighbouring properties so that emissions (odour, noise or aerosols) from the unit do not create an environmental nuisance to the residents of those properties	Complies

AS1547:2012 – Loading Certificate – Septic System Design

This loading certificate sets out the design criteria and the limitations associated with use of the system.

Site Address: 223 Carlton River Road, Carlton

System Capacity: 5 people @ 120L/person/day

Summary of Design Criteria

DLR: 20L/m^2/day.

Absorption area: 30m^2

Reserve area location /use: Assigned

Water saving features fitted: Standard fixtures

Allowable variation from design flows: 1 event @ 200% daily loading per quarter

Typical loading change consequences: Expected to be minimal due to capacity of system and site area (provided loading changes within 25% of design)

Overloading consequences: Continued overloading may cause hydraulic failure of the absorption area and require upgrading/extension of the area. Risk considered acceptable due to visible signs of overloading and owner monitoring.

Underloading consequences: Lower than expected flows will have minimal consequences on system operation unless the house has long periods of non occupation. Under such circumstances additional maintenance of the system may be required. Risk considered acceptable.

Lack of maintenance / monitoring consequences: Issues of underloading/overloading and condition of the absorption area require monitoring and maintenance, if not completed system failure may result in unacceptable health and environmental risks. Septic tank de-sludging must also be monitored to prevent excessive sludge and scum accumulation. Monitoring and regulation by the property owner required to ensure compliance.

Other operational considerations: Owners/occupiers must be aware of the operational requirements and limitations of the system, including the following; the absorption area must not be subject to traffic by vehicles or heavy stock and should be fenced if required. The absorption area must be kept with adequate grass cover to assist in evapotranspiration of treated effluent in the absorption trenches. The septic tank must be desludged at least every 3 years, and any other infrastructure such as septic tank outlet filters must also be cleaned regularly (approx. every 6 months depending upon usage). Foreign materials such as rubbish and solid waste must be kept out of the system.

CERTIFICATE OF THE RESPONSIBLE DESIGNER

Section 94
Section 106
Section 129
Section 155

Form **35**

To: Stargar PTY LTD *Owner name*
223 Carlton River Road *Address*
Carlton 7173 *Suburb/postcode*

Designer details:

Name: John-Paul Cumming
Category: Bld. Srvcs. Dsgnr. - Hydraulic
Business name: Geo-Environmental Solutions
Phone No: 03 6223 1839
Business address: 29 Kirksway Place
Battery Point 7004
Fax No: N/A
Licence No: CC774A
Email address: office@geosolutions.net.au

Details of the proposed work:

Owner/Applicant Stargar PTY LTD
Designer's project reference No. J8849
Address: 223 Carlton River Road
Lot No: 126930/1
Carlton 7173

Type of work: Building work ☐ Plumbing work ☒ *(X all applicable)*

Description of work:
On-site wastewater management system - design

(new building / alteration / addition / repair / removal / re-erection water / sewerage / stormwater / on-site wastewater management system / backflow prevention / other)

Description of the Design Work (Scope, limitations or exclusions): *(X all applicable certificates)*

Certificate Type:	Certificate	Responsible Practitioner
	☐ Building design	Architect or Building Designer
	☐ Structural design	Engineer or Civil Designer
	☐ Fire Safety design	Fire Engineer
	☐ Civil design	Civil Engineer or Civil Designer
	☒ Hydraulic design	Building Services Designer
	☐ Fire service design	Building Services Designer
	☐ Electrical design	Building Services Designer
	☐ Mechanical design	Building Service Designer
	☐ Plumbing design	Plumber-Certifier; Architect, Building Designer or Engineer
	☐ Other (specify)	

Deemed-to-Satisfy: ☒ Performance Solution: ☐ *(X the appropriate box)*

Other details:

Septic tank and absorption trench

Design documents provided:

The following documents are provided with this Certificate –

Document description:

Drawing numbers:	Prepared by: Geo-Environmental Solutions	Date: Feb-25
Schedules:	Prepared by:	Date:
Specifications:	Prepared by: Geo-Environmental Solutions	Date: Feb-25
Computations:	Prepared by:	Date:
Performance solution proposals:	Prepared by:	Date:
Test reports:	Prepared by: Geo-Environmental Solutions	Date: Feb-25

Standards, codes or guidelines relied on in design process:

AS1547:2012 On-site domestic wastewater management.

AS3500 (Parts 0-5)-2013 Plumbing and drainage set.

Any other relevant documentation:

Onsite Wastewater Assessment - 223 Carlton River Road, Carlton - Feb-25

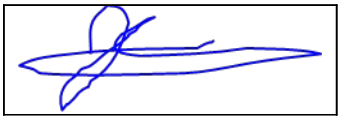
Onsite Wastewater Assessment - 223 Carlton River Road, Carlton - Feb-25

Attribution as designer:

I John-Paul Cumming, am responsible for the design of that part of the work as described in this certificate;

The documentation relating to the design includes sufficient information for the assessment of the work in accordance with the *Building Act 2016* and sufficient detail for the builder or plumber to carry out the work in accordance with the documents and the Act;

This certificate confirms compliance and is evidence of suitability of this design with the requirements of the National Construction Code.

	Name: (print)	*Signed*	*Date*
Designer:	John-Paul Cumming		20/02/2025
Licence No:	CC774A		

Assessment of Certifiable Works: (TasWater)

Note: single residential dwellings and outbuildings on a lot with an existing sewer connection are not considered to increase demand and are not certifiable.

If you cannot check ALL of these boxes, LEAVE THIS SECTION BLANK.

TasWater must then be contacted to determine if the proposed works are Certifiable Works.

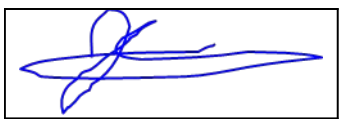
I confirm that the proposed works are not Certifiable Works, in accordance with the Guidelines for TasWater CCW Assessments, by virtue that all of the following are satisfied:

- [x] The works will not increase the demand for water supplied by TasWater
- [x] The works will not increase or decrease the amount of sewage or toxins that is to be removed by, or discharged into, TasWater's sewerage infrastructure
- [x] The works will not require a new connection, or a modification to an existing connection, to be made to TasWater's infrastructure
- [x] The works will not damage or interfere with TasWater's works
- [x] The works will not adversely affect TasWater's operations
- [x] The work are not within 2m of TasWater's infrastructure and are outside any TasWater easement
- [x] I have checked the LISTMap to confirm the location of TasWater infrastructure
- [x] If the property is connected to TasWater's water system, a water meter is in place, or has been applied for to TasWater.

Certification:

I ..... John-Paul Cumming..... being responsible for the proposed work, am satisfied that the works described above are not Certifiable Works, as defined within the *Water and Sewerage Industry Act 2008,* that I have answered the above questions with all due diligence and have read and understood the Guidelines for TasWater CCW Assessments.

Note: the Guidelines for TasWater Certification of Certifiable Works Assessments are available at: www.taswater.com.au

	Name: (print)	*Signed*	*Date*
Designer:	John-Paul Cumming		20/02/2025

Wastewater system:

Dual-purpose septic tank (min 3000L)

Cut-off drain

Absorption Trenches
1 x 15m x 2m x 0.6m

Min 3m from upslope buildings
Min 6m from downslope buildings
Min 1.5m from upslope or level boundaries
Min 4m from downslope boundary
Min 100m from downslope surface water

Refer to GES report

GES
GEO-ENVIRONMENTAL SOLUTIONS
29 Kirkaway Place Battery Point
T| 62231839 E| office@geosolutions.net.au

Dr. John Paul Cumming
Building Services Designer-Hydraulic
CCC774A

20/02/2025

Do not scale from these drawings. Dimensions to take precedence over scale.	Stargar PTY LTD Lot 1 223 Carlton River Road	C.T.: 126929/1 PID: 5914397	Date: 20/02/2025	On-Site Wastewater Management Plan	Drawing Number:	Sheet 1 of 1 Drawn by: LR

Design notes:

1.Absorption trench dimensions of up to 20m long by 0.45m deep by 2m wide
– total storage volume calculated at average 35% porosity.
2.Base of trenches to be excavated level and smearing and compaction avoided.
3.350-410mm Arch should be placed in the centre of trench
4.Geotextile or filter cloth to be placed over the distribution arch to prevent clogging
5.Construction on slopes up to 20% to allow trench depth range 720mm upslope edge to 450mm on down slope edge
6.Dispersive soils gypsum to be incorporated into the base of the trench at a rate of 1kg/m^2
7.All works on site to comply with AS3500 and Tasmanian Plumbing code.

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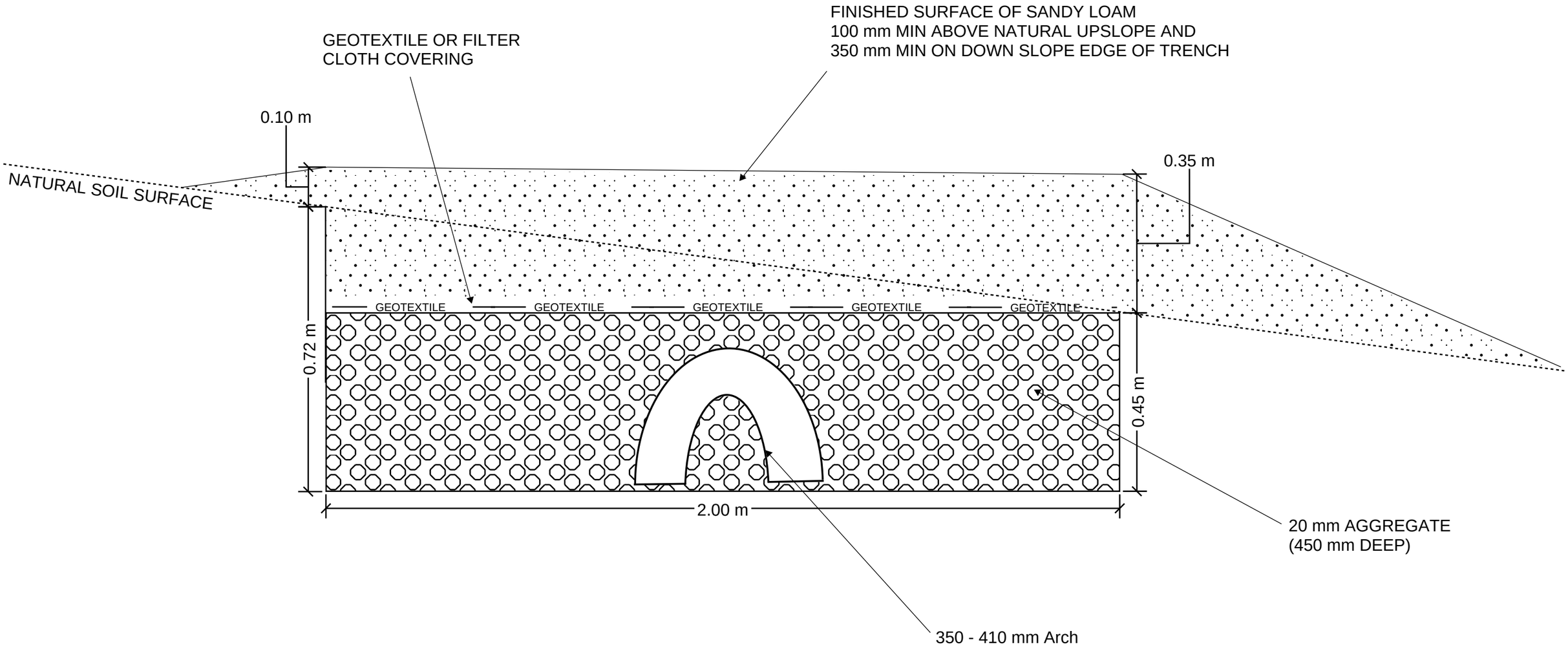

Do not scale from these drawings. Dimensions to take precedence over scale.	Geo-Environmental Solutions			Terraced Absorption Trench Detail	Sheet 1 of 1

GES
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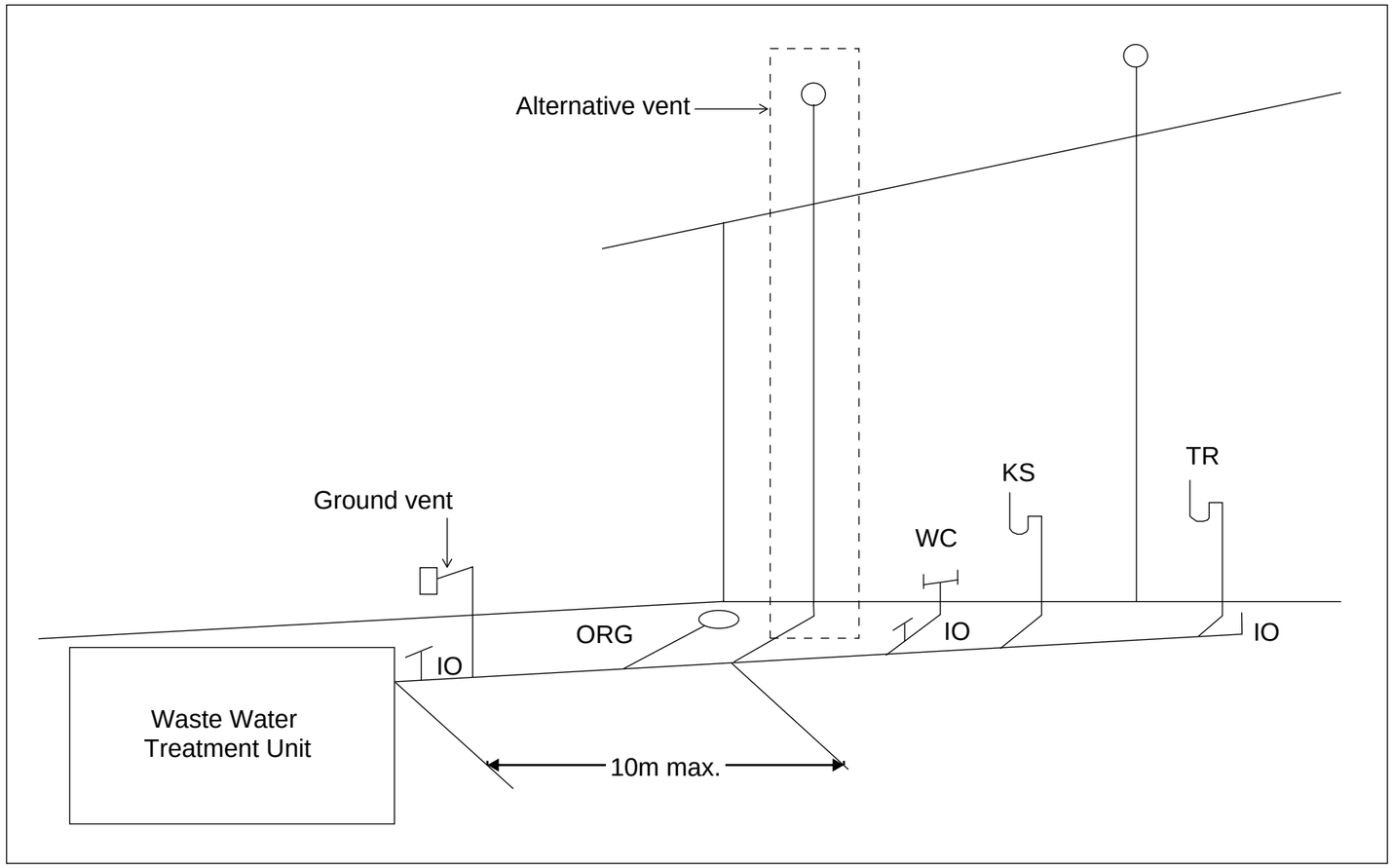

Tas Figure C2D6 Alternative Venting Arrangements

Vents must terminate in accordance with AS/NZS 3500.2

Alternative venting to be used by extending a vent to terminate as if an upstream vent, with the vent connection between the last sanitary fixture or sanitary appliance and the on-site wastewater management system. Use of a ground vent in not recommended

Inspection openings must be located at the inlet to an on-site wastewater management system treatment unit and the point of connection to the land application system and must terminate as close as practicable to the underside of an approved inspection opening cover installed at the finished surface level

Access openings providing access for desludging or maintenance of on-site wastewater management system treatment unites must terminate at or above finished surface level

Do not scale from these drawings. Dimensions to take precedence over scale.				Tas Figure C2D6 Alternative Venting Arrangements		Sheet 1 of 1