ASI
AUSTRALIAN SOIL INVESTIGATIONS

···· Site and Soil Evaluation ·····

(On Site Effluent)

Client: A. Stalling

Location
83 Zeller Road
Mount Luke, QLD
(Lot 1 on RP21723)

Report No.: 260071 (A)

Date: 30/03/2026

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ABN: 11147854439

ON-SITE EFFLUENT DISPOSAL REPORT:

Introduction:

Australian Soil Investigations have conducted a Site and Soil Assessment at the above allotment for the purpose of determining the most suitable means of on-site effluent disposal. On-site testing for this assessment was performed in accordance with AS 1547-2012-"On-Site Domestic Wastewater Management , Queensland Plumbing and Wastewater Code and Local Government Requirements.
Field work for this assessment was undertaken on the 06/03/2026.
ASI has been asked to provide a design for a two bedroom dwelling.

Site description:

The allotment is located within the Toowoomba Regional Council and is contained within a rural area.
The slope within the allotment is generally linear divergent.
The slope within the area best suited for effluent disposal is in the order of 2-3%.

On-Site Assessment:

During our site evaluation consideration was given to the following:

- ✓ the available area for the primary siting of absorption areas (Land Application Area) and alternative sightings.
- ✓ the risk of prejudicing adjoining property and underground water supplies, by seepage or run off from the site.
- ✓ permeability, soil type and soil depth.
- ✓ drainage, and envisaged seasonal changes in ground water level.
- ✓ general climate.
- ✓ slope and the effects of seepage and water run-off from surrounding higher ground.

On-Site Testing:

Three test holes were excavated in the positions shown in the attached site sketch. These holes were 100mm diameter x 600 mm deep for the purpose of site soil assessment in accordance with the AS 1547 - 2012. A further 100mm diameter hole was excavated to determine the soil profile. The site was then classified in accordance with AS 1547 – 2012 On-Site Wastewater Management for the purposes of effluent disposal.

Results:

Site Observations

	Yes	*No*
Suitable Area for siting a Land Application Area	√	
Adequate area for a Reserve area	√	
Setback requirements to waterways		
Is there Adequate Soil Depth above rock or the water table	√	
Is the Soil Type Satisfactory	√	
Is the potential of runoff from the proposed area OK	√	
Is there a potential for groundwater seepage		√

Soil Borehole Results

Depth	Soil Description
00-2000	Silty Clay **CH** med clay, red brown Moist, moderate **(Cat 5)**
2000	Borehole Terminated

Constant Head Method permeability results

The following design criteria is applicable for the following disposal methods:

		1	2	3
Fall	(mm)	25	25	25
Time	(mins)	41	53	36
	(secs)	8	19	29
Permeability	(Ksat)	0.0972	0.0750	0.1096
Soil Category		5	5	5
Structure		Moderate	Moderate	Moderate

Indicative Permeability

Test Site:	1	2	3
Soil Category	5	5	5
Structure	Moderate	Moderate	Moderate
Permeability	0.06-0.12	0.06-0.12	0.06-0.12
DIR	3	3	3

Recommendations:

Based upon our Site and Soil Assessments we recommend the following method of On-Site Effluent Disposal should be used.

For the treatment of the Effluent we recommend;

Advanced Secondary WasteWater Treatment System (AWTS)

(NOTE: The system chosen must satisfy both the Queensland Plumbing and Wastewater Code and AS 1547 - 2020 On-Site Domestic Waste Water Code and be approved for use by the Local Shire/Council governing the allotment.)

For the disposal of the treated effluent within the Land Application Area we recommend;

A Pressurised Surface Reticulated Irrigation System

(NOTE: Where Surface irrigation is used the treated effluent shall be disinfected with chlorine prior to dosing of the Land Application Area.)

The size of the Land Application Area is calculated as follows:

Minimum requirement	q	120	litres per person per day	AS 1547 –2012 Appendix H1
Water Supply		Tank Water		
Number of persons =		4		AS 1547 Table J1
Total Volume	Q =	3360	L/week	
Soil Category		5		AS 1547 Table M1
Indicative permeability		0.06-0.12		AS 1547 Table M1
DIR		21	mm/week	AS 1547 Table M1
Disposal Area	A =	160	m^2	

WE RECOMMEND THAT A MINIMUM LAND APPLICATION AREA OF 160m^2 BE PROVIDED.

The Irrigation System should be designed in accordance with AS 1547 – 2012 and comply with all relevant statutory requirements.

Construction Guidelines for Land Application Areas:

Surface Irrigation

Consists of a reticulated pressurised irrigation system that uses a series of surface sprinklers to equally distribute the treated effluent across the Land Application Area. This system allows vegetation within the area to directly benefit from such watering which also assists in disposal of the effluent via evapo-transpiration. Points to consider in the construction of the area include the following:

- To avoid runoff from the area it should be as level as possible. Any steep sloping areas should be terraced or retained and filled.
- Rainwater shall be diverted around the perimeter of the area by use of open catch drains or bunding. Similarly a retention bund should be constructed around the low side of the area to retain any effluent overflow.
- Sprinklers with a throw of not more than one meter shall be used and produce coarse droplets (instead of a fine mist) to minimise the risk of aerosol dispersion and wind drift of effluent. The plume height shall not be more than 500 mm above the finished surface of the irrigation area.
- The treated effluent must not be used for the irrigation of fruit or vegetables.
- Siting of surface irrigation shall be in a location away from regular pedestrian traffic and recreational areas, so there is no risk of direct spray or wind driven spray onto such areas.
- The area should not be within vehicle paths or be near children's play areas. Refer to Queensland Plumbing and Wastewater Code for all required setback distances.
- Treated effluent quality must conform to AS 1547 - 2012 and the Queensland Plumbing and Wastewater Code.

We have attached a site plan showing the proposed position of the Land Application Area and also some details highlighting the construction techniques required for surface irrigation.

Preparation of irrigation area:

When a proposed irrigation area has a low permeability, it is particularly important to ensure that the permeability of the soil in the irrigation area is improved and maintained and that there is an adequate cover of porous and fertile topsoil to act as immediate storage of effluent applied to it, and to support rapid growth of vegetation on the area to maximise evapo-transpiration.

Requirements of irrigation system:

All irrigation pipe work and fittings shall comply with all parts of AS 1477 or AS 2698.2. The distribution irrigation lines should be buried to a minimum depth of 100mm. There shall be no cross connection between any irrigation pipe work and the potable water supply. Any pipe work used for the transport of effluent included treated effluent must be lilac in colour.

Along the boundary of the surface irrigation area there shall be at least two warning signs clearly visible to inform the occupants of the premises that recycled water is used for irrigation. Each sign shall comply with AS 1319 and have:

(a) lettering visible at 3m and
(b) wording: **Recycled Water**
Avoid Contact
DO NOT DRINK

Prior to the use of the system, the warning signs and the landscaping and surface preparation must be completed.

Sighting of the Land Application Area:

The current Code of Practice for On-site Sewerage Facilities (Queensland Plumbing and Wastewater Code) provides minimum horizontal/vertical separation distances for Land Application Areas. They are as follows;

Surface Land Application Areas (ADVANCED SECONDARY)			
Property Boundaries Upslope from the Area	-	2.0m	
Property Boundaries Downslope from the Area	-	4.0m	
Dwellings or buildings	-	10.0m	
In ground swimming Pools	-	6.0m	
In-ground potable Water Tanks	-	6.0m	
Dams, Watercourses or Bores	-	10.0m	
Vertical distance to water table	-	0.6m	
Driveway	-	2.0m	(Upslope);
-	-	4.0m	(Downslope)
Footpath	-	1.0m	(Upslope);
	-	2.0m	(Downslope)

NOTE:- REFER TO QUEENSLAND PLUMBING AND WASTEWATER CODE FOR SITING OF ON SITE SEWERAGE FACILITY FOR LOCATION OF TREATMENT PLANT. TREATMENT PLANT MUST BE 150mm ABOVE Q100 FLOOD LEVEL.

In no instance shall Effluent be used for irrigation of fruit or vegetables.

No Vehicle loading or recreational areas to be applied or constructed within the Land Application Area.

System Maintenance:

The owner of the property shall ensure that all manufacturers maintenance procedures are undertaken in accordance with the local authority and the manufacturers recommendations for what ever system is installed. The system must be inspected/tested on a regular basis in accordance with the manufacturers requirements and all Statutory requirements from relevant local and state government agencies.

NOTE: No Antibacterial products or disinfectant to be used in the system. Refer to manufacturers guidelines on safe products to be used in the system.

System Installation:

Installation of the system must be undertaken by a qualified plumber in accordance with local authority requirements and in accordance with the relevant Australian Standards and Australian Building Code.

NOTE: The system is not to be installed or utilized without Plumbing approval from Council.

The building is not to be occupied without Building and Plumbing approval. Permit Numbers are to be provided to the installer and designer.

Definitions:

Design Loading Rate (DLR)

The long term acceptance rate (LTAR), reduced by a factor of safety, expressed in L/m^2/day or mm/day as applied to the horizontal design area of a land application system.

Design Irrigation Rate (DIR)

The loading rate that applies to the irrigation of a land application area with effluent of a secondary quality. It is expressed in L/m^2/day or mm/week. If a spray irrigation system is used, the secondary effluent is subject to continuous disinfection.

Durable Aggregate

An aggregate with the grading requirements specified in AS 2758.1 for single-size course aggregate for nominal sizes from 20mm - 40mm.

Geotextile

Any permeable durable synthetic textile material used with foundations, soil, rock, earth or other geotechnical engineering related material.

Land Application Area

The designated area of land and reticulation system used for the disposal of the treated effluent.

LTAR

The long term average rate an effluent can be adsorbed into the soil of a disposal system, expressed in litres per square meter per day. LTAR is dependent on effluent quality, permeability and organic loading.

Permeability

The rate clean water is transmitted through a soil, expressed in meters per day.

Steep Slope

Where the L.A.A is in an area where the slope exceeds 15% (approximately 1 in 7) 20% Reduction of the DIR must be applied .

Water Reduction Fixtures

Fixtures include dual flush water closets, shower flow restrictors, aerator taps and water conserving washing machines.

Report Limitations:

The log sections in this report should be representative of the soil conditions over this site, however, soil conditions can change dramatically over short distances. The person responsible for installing the system must observe the soil profile and ensure it matches the soil profiles recorded in this report. If soil conditions differ from those recorded by us, we must be immediately notified so that further investigation can be carried out and the system design modified if necessary. This work may involve additional fees and costs. This company will not accept any responsibility for additional costs to any party as a result of soil variations.

In writing this report, we have also considered all the information supplied to us by our client. Should the client or his agent have omitted to supply us with relevant information, our report may be irrelevant and/or inappropriate. We do not take responsibility for the consequences in such cases and we will make an additional charge if as a result, more testing or rewriting of this report is necessary.

The operation of the disposal system is dependent upon the hydraulic load, the type of the material entering the system and the maintenance of the system. As these factors are beyond the control of this company we do not take any responsibility for the long term adequacy of any disposal system constructed on this site or the consequences of its malfunction.

WADE HOLMES – QBCC 1120066
for and on behalf of:
AUSTRALIAN SOIL INVESTIGATIONS – QBCC 15072110

Revision	Description	Date
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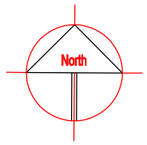

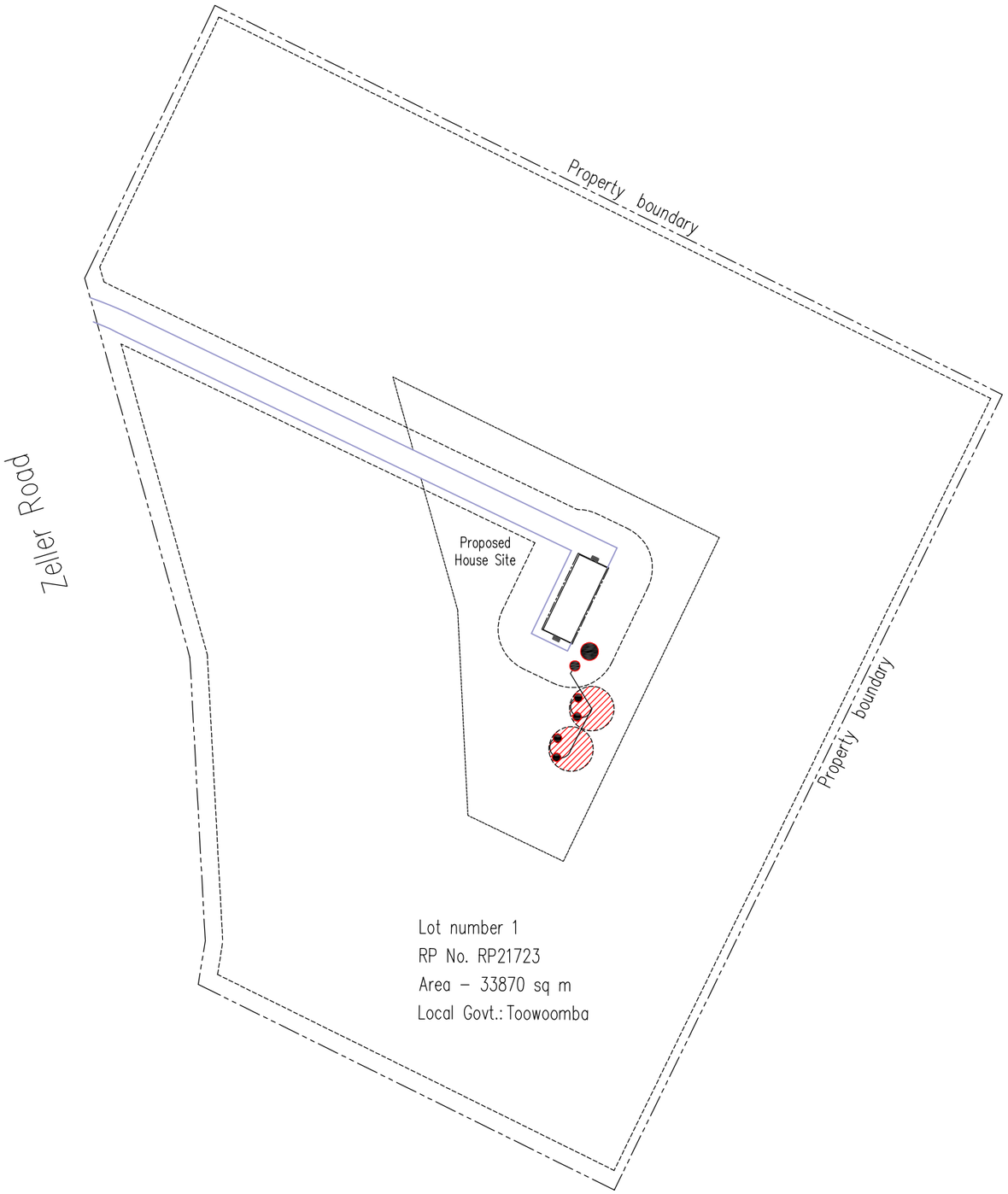

SITE PLAN
Scale 1:1200

Drawn By : W.R.Holmes
QBCC License. No.1120066
Australian Soil Investigations
QBCC License No.15072110

DO NOT DIMENSION OFF THIS DIAGRAM.

ABN11 147 854 439
AUSTRALIAN
SOIL INVESTIGATIONS
174 Railway Road, Cooran
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Title: SITE PLAN - Locality Plan

Project A. Stalling, 83 Zeller Road
Mount Luke

Date: Mar 2026

Drg No.260071-ABS

Rev. .

Revision	Description	Date
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North

Lot number 1
RP No. RP21723
Area – 33870 sq m
Local Govt.: Toowoomba

WATER REDUCTION FIXTURES ARE TO BE INSTALLED IN THE PROPOSED HOUSE.

Designated Land application area is to be installed in compliance with the required setbacks in the Queensland Plumbing and Wastewater Code.

NOTE: – All Treated Effluent Pipework to be Lilac Coloured and Labled Accordingly as per The Australian Standards. Signage to be Installed around Irrigation Area to Australian Standards.

Diversion and Retention mounds are to be installed around the designated Land Application Area to divert stormwater ingress from the surrounding areas.

Zeller Road

Driveway

4.0m Min. offset from Driveways (Downslope) to disposal area.

4m

2m

2.0m Min. offset from Driveways to disposal area.

BH 1

Proposed House Site

10m

106m to Boundary

10.0m Min. offset from house site to disposal area.

Water Tank

Proposed ASWTP

R.L 625m

10m

3%

32mm High density poly (Purple)

Land application Area. 160 sq.m. Surface Irrigation, (Diameter 2 x 10.2m)

BH 2

Hose length not to exceed 4.1m.

53m to Boundary

BH 3

Expected Available Area (EAA) Including 100% Reserve Area

Property boundary

NOTE: – No work is to comence without relevant plumbing approval.

NOTE: ASWTP to be located above the Q100 level.

10m MIN. Setback from all seasonal and existing watercouses and dams to Land Application Areas.

2.0m MIN. Setback from all driveways to Land Application Areas.

2.0m MIN. Setback from all Pathways to Land Application Areas.

6.0m MIN. Setback from Pool to Land Application Areas.

10m MIN. Setback from house to Land Application Areas.

2.0m MIN. Setback from Footings to Land Application Areas.

EFFLUENT SUMMARY

Application system	Advanced Secondary Treatment System
Disposal system	Surface Irrigation
Area Required	160 Sq.m
Soil Category	Cat 5
Water Reduction Fixtures	Yes
Water Supply	On–site Storage Tanks
Maximum Population	4 People

This summary details the parameters for which this system has been designed for. Any variation to the parameters may require a redesign of the system to reduce the risk of failure.

SITE PLAN
Scale 1:1200

Surface Drainage	Good.
Vegetation	Grasses & Scattered Trees

BH 2 Borehole location.

0 – 2 % Slope measured as a percentage gradient from high ground to low ground.

Area to be fenced off from any farm stock and animal movement and grazing.

Do not allow vehicle or animal movement across L.A.A to avoid compaction.

Area Size Calculation
4 Persons @ 120litres per person/ per day = 480 litres x 7 days / 21 (DIR)
= 160m²

DO NOT DIMENSION OFF THIS DIAGRAM.

General Notes :
1. Do not scale from this drawing.
2. The final position of the disposal area is to be determined on–site in accordance with the noted minimum offsets, minimum pipe grades and site constraints.
3. The Plumber is responsible for locating all existing services within and adjacent the allotment prior to commencing the work.
4. This drawing is to be read in conjunction with the attached details and the specifications and requirements of Australian Soil Investigations Absorption Report. No.260071(A). Do not commence construction without first referring to this report.
5. The installation is to be in strict accordance with AS 1547–2012, Local Authority requirements and Australian Soil Investigations Absorption Report. No.260071(A).
6. The work is to be undertaken and completed by a registered plumber.
7. Water reduction fixtures are to be used where nominated in the Effluent Summary below, refer report No. 260071(A) for details.

Drawn By : W.R.Holmes
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Australian Soil Investigations
QBCC License No.15072110

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Title: SITE PLAN - On-Site Effluent Disposal
Project A. Stalling, 83 Zeller Road Mount Luke
Date: Mar 2026
Drg No 260071-ABS
Rev. .

Revision	Description	Date
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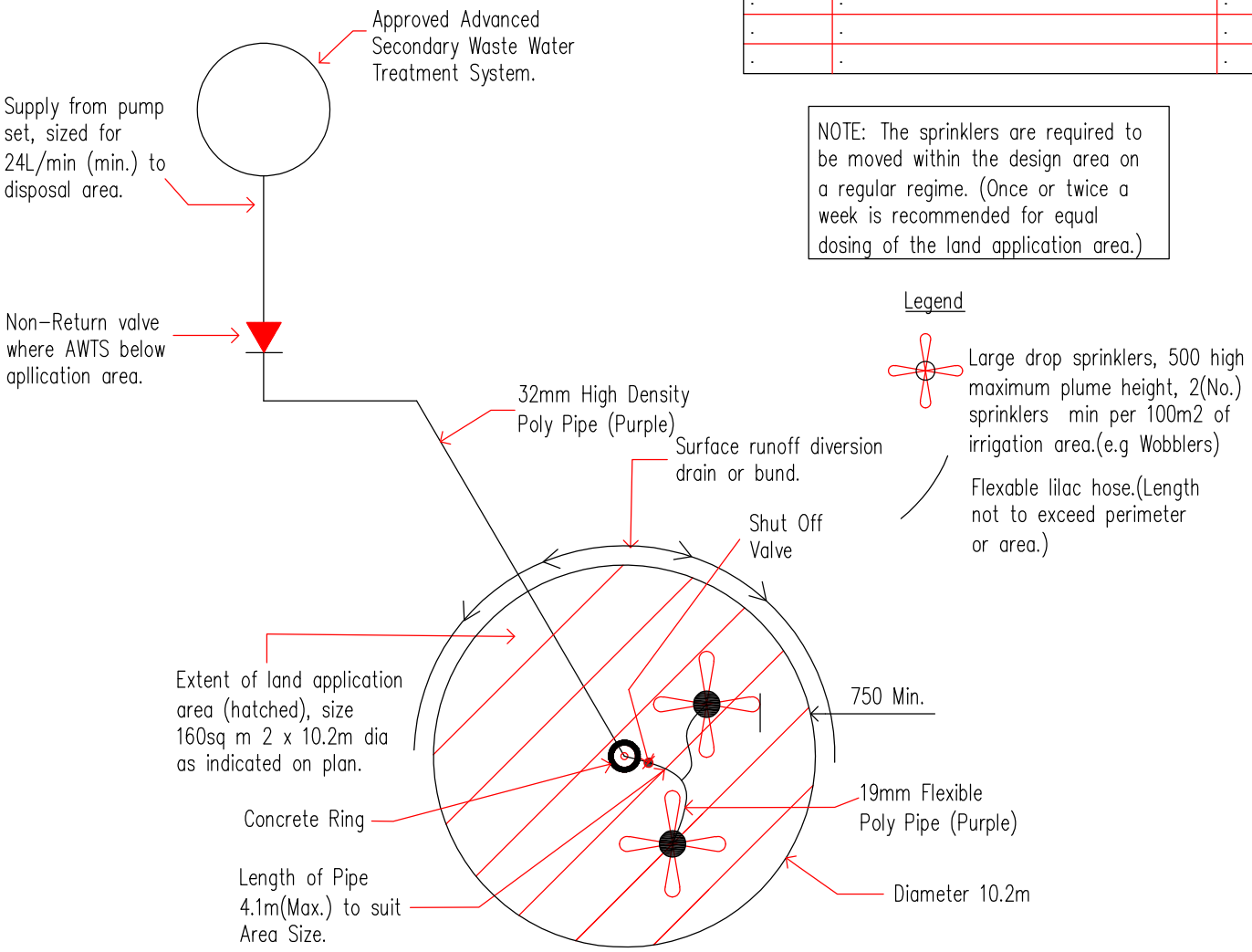
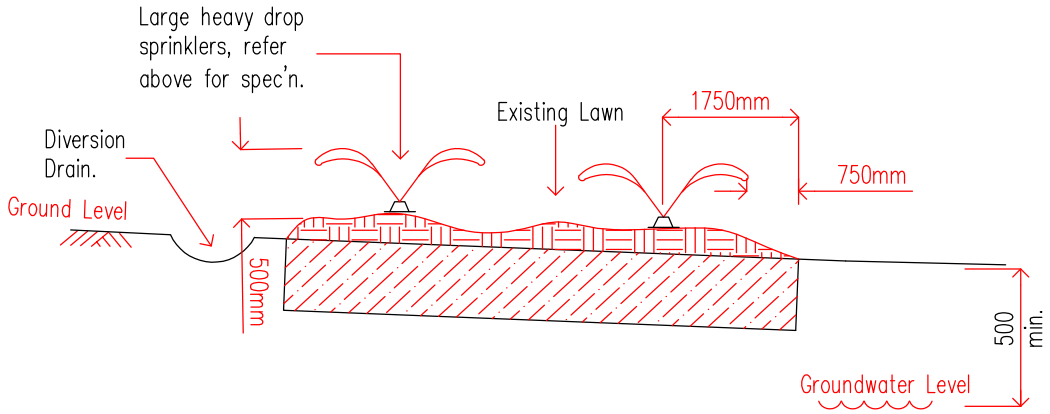


DISPOSAL AREA PLAN (Typ.)–MOVEABLE SPRINKLERS



TYPICAL SECTION ~ SURFACE IRRIGATION DISPOSAL AREA

A.Stalling
83 Zeller Road
Mount Luke

General Notes :

1. The Plumber is responsible for locating all existing services within and adjacent the allotment prior to commencing the work.
2. This drawing is to be read in conjunction with the attached details and the specifications and requirements of ASI Absorption Report.
3. The installation is to be in strict accordance with AS 1547–2012, Local Authority requirements and ASI Absorption Report.
4. The work is to be undertaken and completed by a registered plumber.

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STD DETAIL | Drg No. 260071-Detail