

PERFORMANCE SOLUTION

Onsite-Sewage Treatment Plant Land Application Area

Spray Movable Sprinklers

Introduction

In the Gympie Region, the use of movable sprinklers for distribution of effluent within the wastewater facility disposal area is approved by Council. The movable sprinkler is a cost effective method used by designers to dispose effluent within a designated land application area.

Council has the responsibility to ensure the assessment of work is in accordance with code requirements. Australian Standard 1547:2012 (the standard) is the adopted standard for onsite wastewater management. The standard does not provide a **Deemed to Satisfy** (DTS) solution for the design of movable sprinklers.

The standard does not have a method of ensuring even distribution of effluent within the designated area for a movable sprinkler. The calculation guideline attached determines the size of the spray area, and the safe practice for the relocation of the sprinkler within the area.

Code Requirement

The design and method of effluent distribution must be demonstrated in a performance solution, in conjunction with a report and design when movable sprinklers are the chosen method of distributing the effluent to ground.

The performance solution must demonstrate the requirements set out in the Plumbing Code of Australia (PCA) section 2.2 **Performance Solution**, and supporting documents as per section 6 of the *Plumbing and Drainage Regulation 2019*.

The performance solution may have DTS terms to demonstrate the design and performance requirements for movable sprinklers as a part of the performance solution as per the criteria demonstrated in PCA section A2.4 A 'Combination of Solutions'.

Demonstration of performance solution requirement:

1. The standard Appendix M 'Land Application Methods – Irrigation Systems', demonstrates the DTS requirement for the distribution of effluent to ground for an irrigation system.
2. The standard section M 6.2 demonstrates the requirement for daily irrigation rate (DIR) calculation for sizing the Application Area.
3. Gympie Regional Council Land Application area guideline design for movable sprinklers (the guideline) demonstrates an acceptable method for calculating the size of the land application area.
4. Hose design to meet the requirements of Gympie Regional Council Moveable Sprinkler Guideline Design for a Land Application Area.
5. The standard section M9.4.3 (e): the spray is not to exceed greater than 500mm in height from the finished surface level, and must not exceed 2000mm in diameter.
6. Hose design to meet the requirements of Gympie Regional Council Moveable Sprinkler Guideline Design for a Land Application Area.
Note: movable sprinkler guideline demonstrates a minimum requirement that may be accepted as a part of a performance solution for movable sprinklers.
7. The spray droplet is to be of a size that does not mist, aerosol or leave the designated land application area at any stage.
8. Demonstrate a method for the pipe work to be equal to, or a required performance with section M10.2.
9. Buried pipes must comply with section M13.
10. Demonstrate a method of isolating the effluent from the sprinkler when maintenance is required to be undertaken.
11. The method of isolation cannot cause harm to the treatment plant operations such as pump motor burn out or electrical fault.
12. Isolation cannot create an issue with the treatment of effluent.
13. Manufacturer of the treatment plant is to approve the method of isolation.
14. Sprinklers are not to operate when persons are required to enter the land application area.
15. Maintenance and procedures are to be presented for the maintenance of even distribution for the movable sprinkler(s).

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Designer requirements

The **competent person** who designs and prepares the on-site domestic waste water management (ODWM) performance solution report must demonstrate one of the following:

1. Queensland Building Construction Commission (QBCC) Hydraulic design licence with ODWM or limited to ODWM; or
2. QBCC Site Classifier licence with ODWM; or
3. Registered Professional Engineer Queensland (RPEQ) report for the performance solution and licensed ODWM person; or
4. A person who holds a licence under the [Queensland Building and Construction Commission Act 1991](#) under which the person is qualified to develop the solution.

Conclusion

When a moveable sprinkler is the preferred method for disposal of effluent for an on-site wastewater facility installation, a performance solution must be lodged with the plumbing and drainage application.

The plumbing and drainage application requires all associated documents in accordance with schedule 6 of the *Plumbing and Drainage Regulation 2019*.

The application will be assessed under part 5 of the *Plumbing and Drainage Regulation 2019*, and if movable sprinkler are the chosen method for distributing effluent to ground, the performance solution is to be lodged with the application.

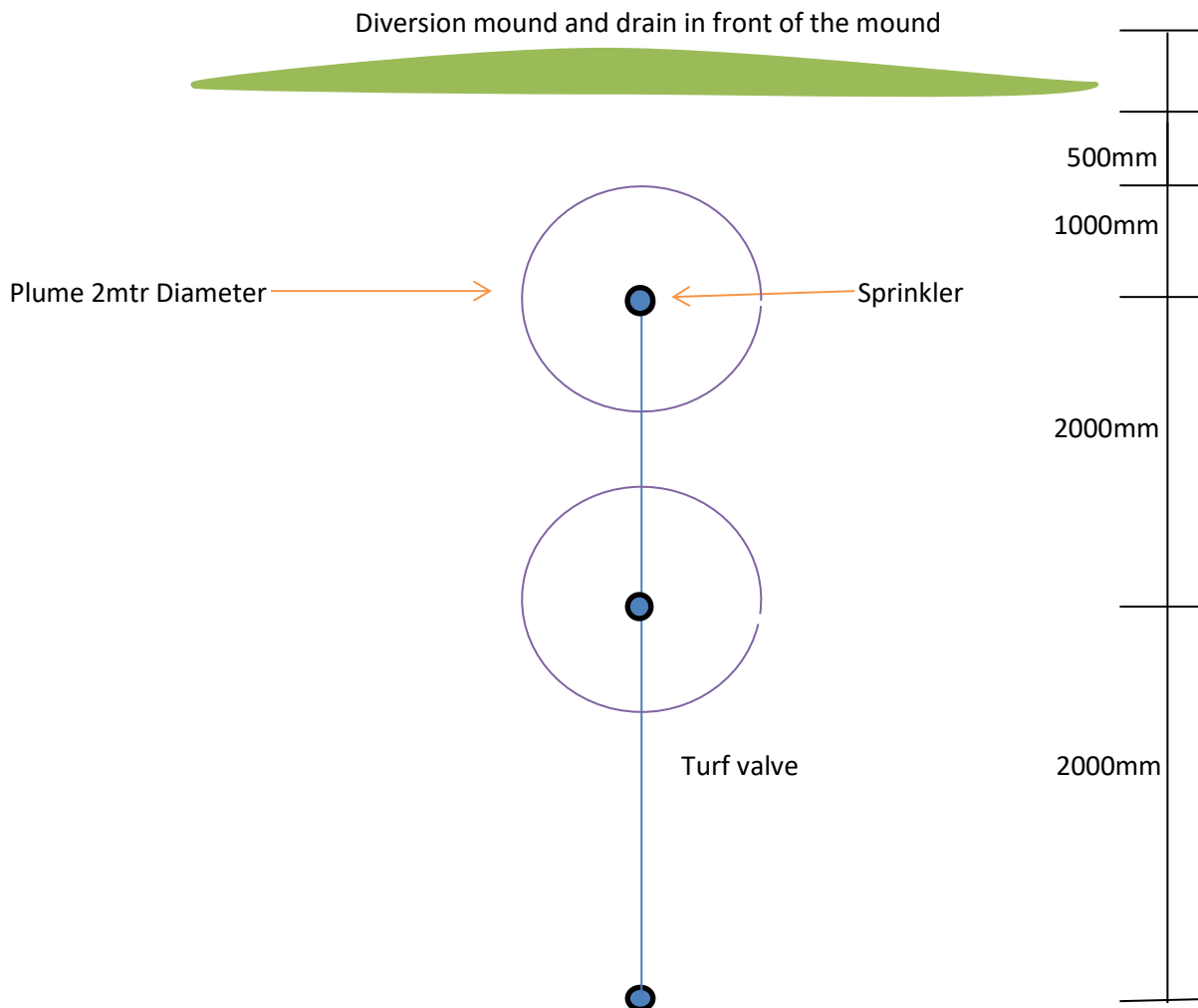
The performance solution and additional conditions if required will be attached to the information notice for the permit.

The plumbing and drainage application and assessment process is to ensure plumbing and drainage is installed in a manner to prevent health and environmental harm within our region.

Gympie Regional Council

Land Application Area Guideline Design for Moveable Sprinklers

The selected location for the land application area (LAA) requires the first 0.3 layer of top soil to be category (Cat) 4 on underlying cat 5&6 soils. The cat 4 provides assistance with distributing the wastewater in the designated area when periods of moving sprinklers are not achieved. Most sites in the region the soil can be reclaimed from the house footprint during the cut.



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Gympie Regional Council requires heavy droplet wobbler type sprinkler or the like. The minimum length of hose is 4 metres with two sprinklers and maximum 7 metres with three sprinklers. The minimum distance between sprinklers is 2metres.

The land application area is formulated by the length of the hose, plus 1 metre for an area of a circle:

IRRIGATION AREA OF CIRCLE TO BE CALCULATED AS

$r = \text{LENGTH OF HOSE} + 1\text{m PLUME} + 0.5\text{m}$

$r = 4\text{m} + 1\text{m} + 0.5\text{m}$

$\text{AREA} = \pi r^2$

$\text{AREA} = 3.14 \times 5.5^2$

$\text{AREA} = 95\text{m}^2$ (ROUNDED)

The construction requirement for the mound is at a height of approximately 150mm and 1000mm wide, track rolled for compaction, and the diversion drain is to fall to a depth of 150mm below surface level 500mm wide in front of the mound and entire of length.

Diversion drain and mound are not required when the LAA is located on level land, as the drain or mound could create ponding. Two additional signs can be added to achieve delineation of the area, or a raised LAA from imported soil would be another acceptable method.

A design with imported soil will have to consider method of retaining the wastewater within the area under normal conditions. Retention mound can be used as a method of retaining the wastewater within the LAA, in a method to ensure ponding will not occur.

Retention mound should not be used for the primary role of preventing nutrient run off to a watercourse. The positioning of the LAA should prevent any harm to the environment and human and animal's health. The means of planting trees and shrubs for nutrient removal is considered as secondary solution due the fact the vegetation could be removed.

The slope of the land shall not exceed 15%, the LAA turf is to be in a condition for mowing by a domestic lawn mower. Trees and shrubs are to be absent within the LAA for the ease of moving the sprinklers on a regular basis. If the conditions cannot be maintained, fixed sprinklers will be required as a part of the design for surface irrigation in a wastewater report.

The **Queensland Plumbing and Wastewater Code** references the standard AS1547-2012 in Part A3 'Documents adopted by reference', the design of the facility is required to meet the performance requirements of the PCA and **Queensland Plumbing and Wastewater Code**. The ODWM report will require a performance solution for the installation of movable sprinkler(s).