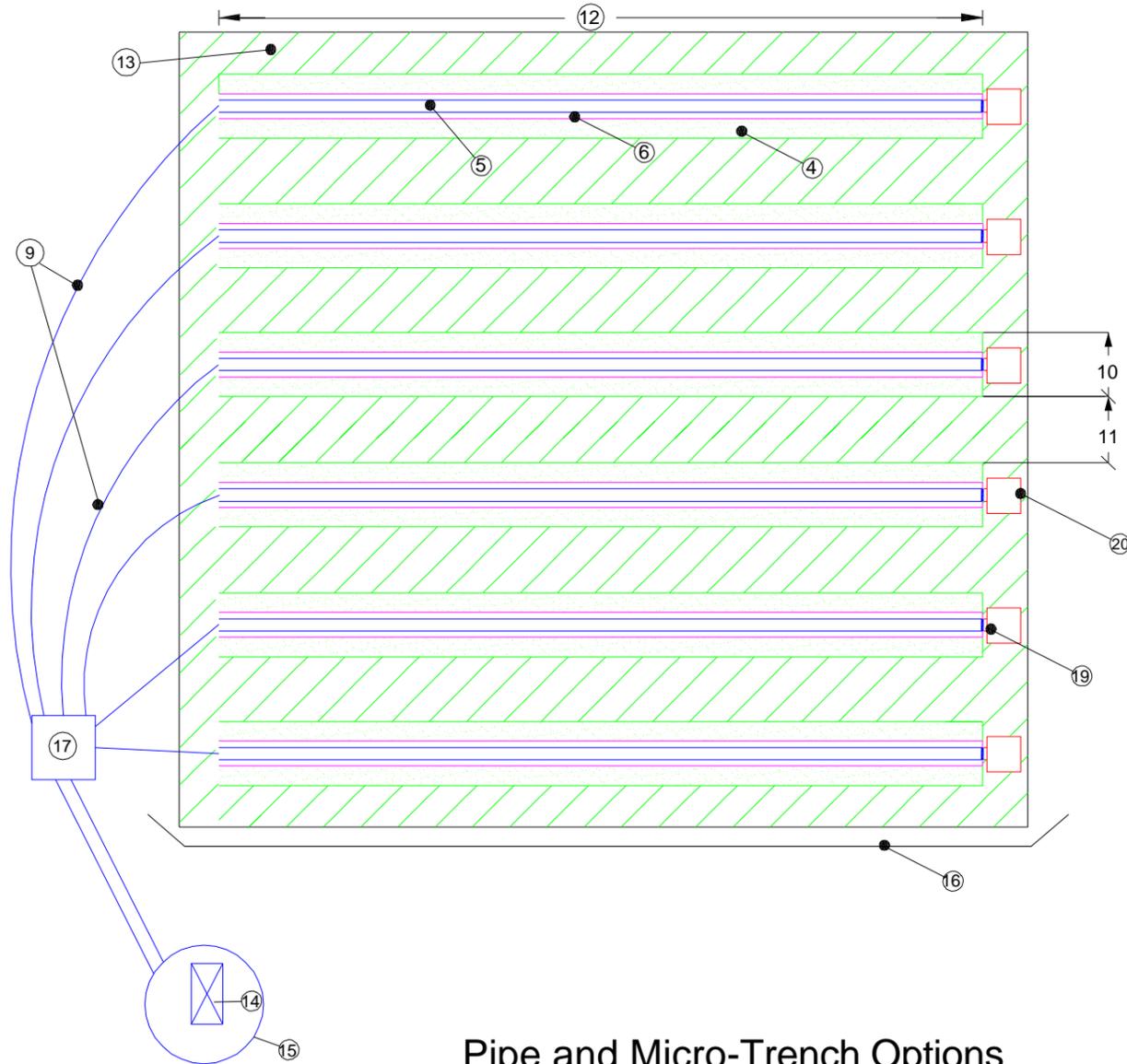
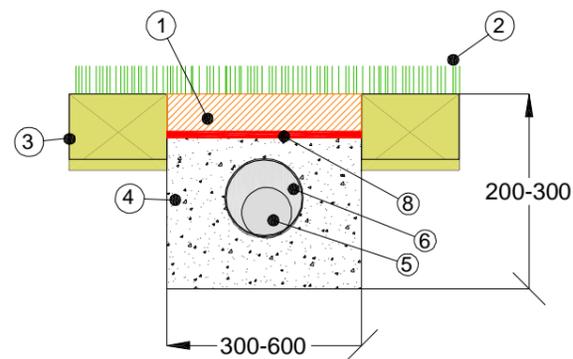


# PLAN VIEW - Example of Low pressure Irrigation in Micro-trenches

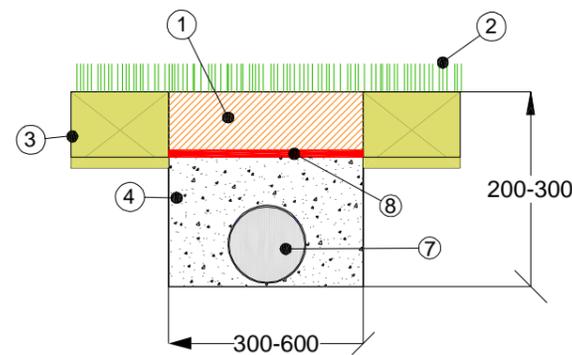


## Pipe and Micro-Trench Options END VIEW

B. LOW-PRESSURISED PIPE IN AGRICULTURAL PIPE MICRO TRENCH



B. UNPRESSURISED PIPE IN AGGREGATE MICRO-TRENCH



### Micro-Trench Distribution Options - Minimum Components and Design Requirements

1. Imported clean fill or local soil.
2. Grass or other suitable vegetation cover.
3. Existing soil.
4. 20 mm distribution aggregate.
5. 20 - 50 mm sewer-grade PVC pipe. See Note a. below for further detail of low-pressure dosing design.
6. 100-150 mm diameter agricultural drainage pipe.
7. 100 mm diameter sewer-grade slotted or frequently top-drilled PVC pipe laid in aggregate to enable even flow. Refer Sheet 4 for preferred distribution methods for non-pressurised systems. Alternatively for high-risk or very difficult sites, can use 25 mm pressure-compensated dripline for pressurised distribution within trench.
8. Geotextile filter cloth to prevent overlying soils clogging aggregate.
9. Individual lines from k-rain valve (or similar) to each trench.
10. Trench width - 300 to 600 mm.
11. Spacing between trenches - B. The distance between trenches will vary depending upon trench dimensions and absorption field area requirements (m<sup>2</sup>). Spacing between trenches should be at least 1000 mm.
12. Trench length - C. No longer than 25 m for pressurised distribution or 10 m each side of distribution box for non-pressurised trenches.
13. Trench dispersal area (m<sup>2</sup>). If greater than 1 m between trenches, calculate dispersal area as trench basal area plus 300 mm each side.
14. Dosing siphon, sized and installed to reliably charge distribution pipes for 2-5 minutes per dosing cycle. Siphon required unless pump-pressurised distribution system to be used.
15. Dosing pump-well. Minimum capacity as specified in NSW Health's "Septic Tank and Collection Well Accreditation Guideline" April, 1998.
16. Upslope run-on diversion and/or drain if required (see inset B of Sheet 4). Diversion required on all sloped sites. Downslope containment may also be required on sensitive or high-risk sites.
17. 6 way k-rain valve located on highest point of disposal area or distribution box for unpressurised systems.
18. Inspection port at end of each trench, typically capped P.V.C. pipe. This allows access to screw cap on end of pressure distribution line for flushing.
19. Flush valves (generally screw caps) to allow flushing for pressurised distribution systems. Screwed or glued end caps for non-pressurised systems.
20. Flushing trench.
21. Glued 45°Y-bend in 50 mm PVC pipe, only suitable for low-pressure distribution.

### Notes

- a. Irrigation design requires specialist knowledge, and should only be undertaken by people with adequate understanding and experience. Micro-trenches may need to be used to provide adequate distribution of effluent on heavy clay soils, on very steep slopes or in plantation situations, and can be used in conjunction with fully pressurised (pumped), siphon-dosed low-pressure or siphon-dosed non-pressurised distribution systems.
- b. For low-pressure dosing applications, lateral pipes must be drilled along the top of the pipe, with the diameter and spacing of the holes to be calculated by a suitably qualified person to account for hydraulic loads, head differences, appropriate hydraulic loading rates and configuration of pipes. Distribution laterals to be firmly anchored to main line, incorporating non-return valves where necessary to prevent backflow. Flushing trenches at the end of each trenches and suitable valves must be installed and kept accessible to enable regular flushing.
- c. For non-pressurised dosing in micro-trenches, effluent must be dosed through a siphon and fed to each trench on an alternating basis through an indexing valve or similar. Trenches and pipes must follow contour and be laser-levelled to ensure even distribution. Distribution laterals to be firmly anchored to main line, incorporating non-return valves where necessary to prevent backflow. 300 mm wide trenches required to provide additional treatment and storage.
- d. Refer to Sheets 7 and 8 for further detail on fully pressurised irrigation designs.
- e. Sub-surface pipes as per manufactures specifications, all pipe work and fitting should comply with the Australian Standard 2698 "Plastic Pipes and Fittings for Irrigation and Rural Application". Effluent grade pipe work should be used.
- f. In clay soils each trench should be scoured to a depth of 5-10 mm to reduce base and sidewall sealing.
- g. In acid soils, addition of lime at 0.5 kg/m<sup>2</sup> is recommended at the base of the disposal trench.
- h. In heavy clay soils, addition of gypsum at 0.5 kg/m<sup>2</sup> is recommended at the base of the disposal trench.
- i. No clay spoil should be placed over the constructed effluent disposal field, but field should be covered with 50-100 mm topsoil.
- j. Application field to be covered with grass or other suitable cover.
- k. On blocks where it is necessary to use slopes >15 %, trenches may need to be terraced. Maximum slope over the micro-trench should be < 5 %.
- l. On completion of work a plan indicating the works as executed shall be provided to Council detailing any changes to the original design.

### Maintenance and Management

- a. The system operator should maintain the irrigation area regularly, to ensure adequate cover of the pipe work, elimination of weeds maintenance and harvesting of plants and shrubs.
- b. Micro trenches and irrigation systems should be inspected as part of the regular service and maintenance program, and flushed every three months where pressurised distribution used. Refer Council requirements and Sheet 7 for further maintenance requirements.

Final Draft

CLIENT/ PROJECT

North Coast Councils

All measurements in mm unless otherwise specified.

TITLE

Example Design for  
Low- Pressure Dosing  
and Micro-Trenches

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PROJECT REFERENCE / DRAWING NUMBER:  
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VERTICAL RATIO:

na

SHEET

5

OF 10

SHEETS

PAPER SIZE:

A3

REV.

1.0

2.0

3.0

DESCRIPTION

Design guide for subsurface irrigation systems.

Amended subsurface irrigation designs.

Final subsurface irrigation designs.

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