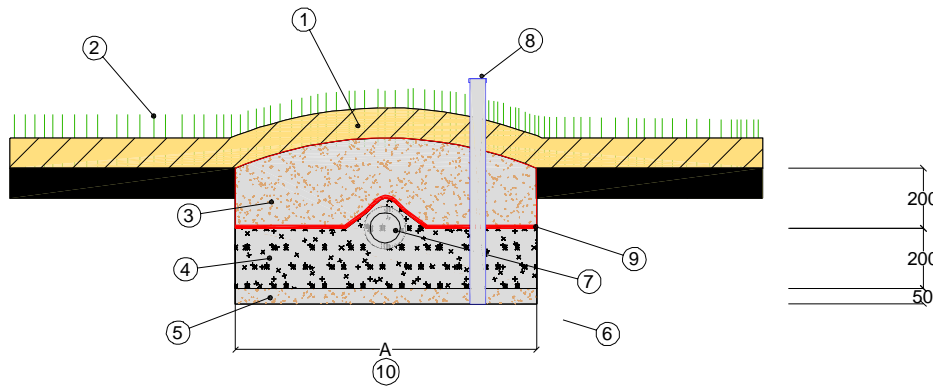
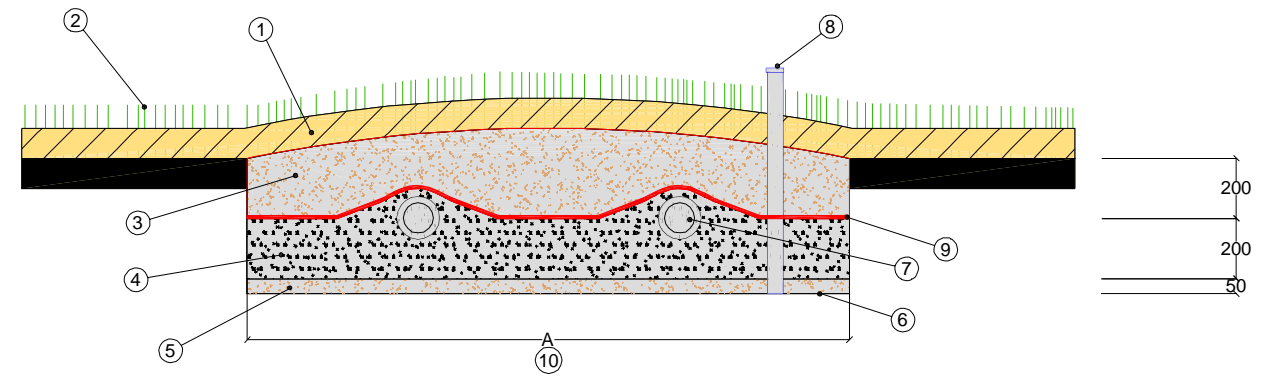


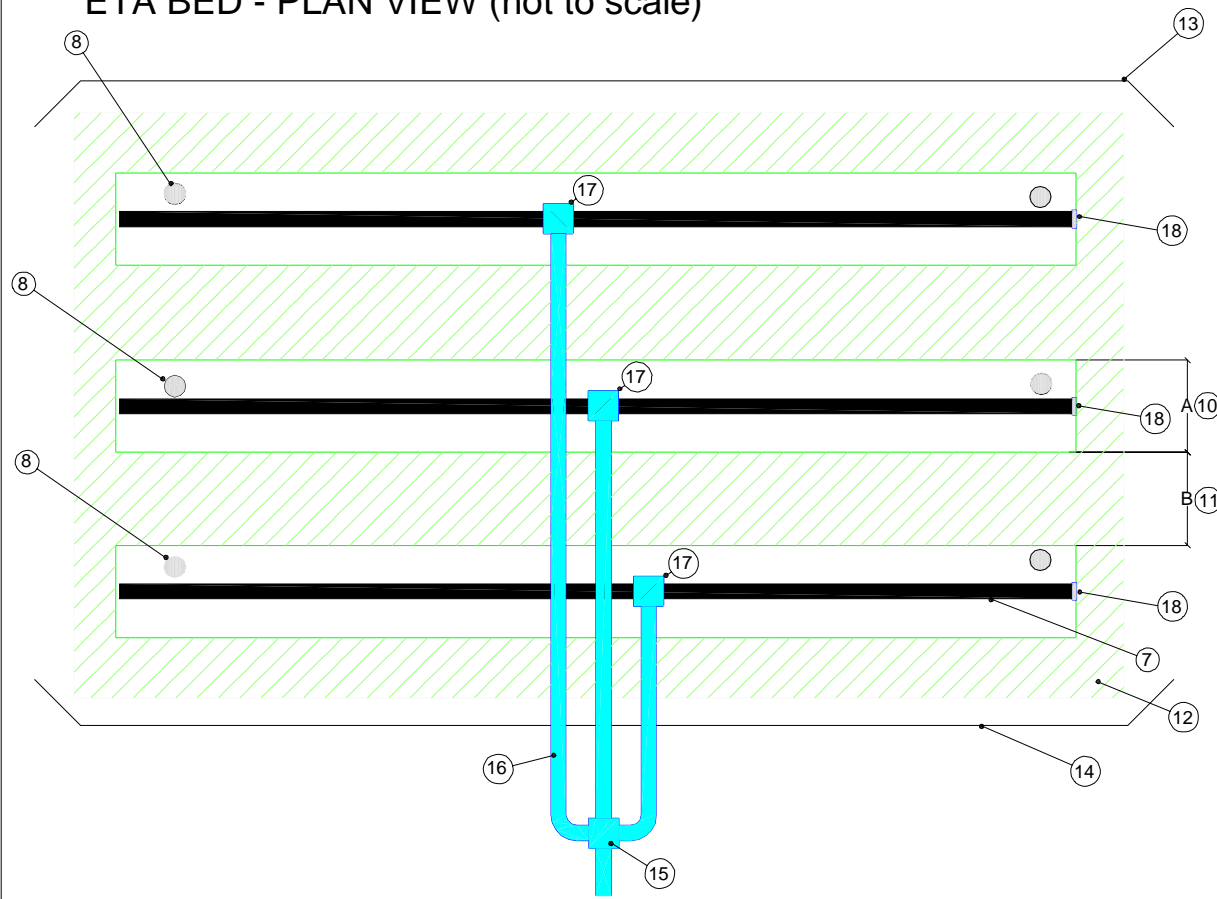
ETA Trench (Central distribution pipe) - SECTION VIEW



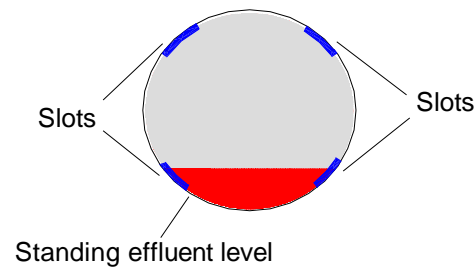
ETA Trench (Two distribution pipes) - SECTION VIEW



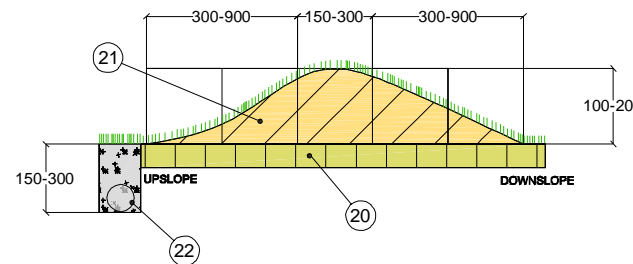
ETA BED - PLAN VIEW (not to scale)



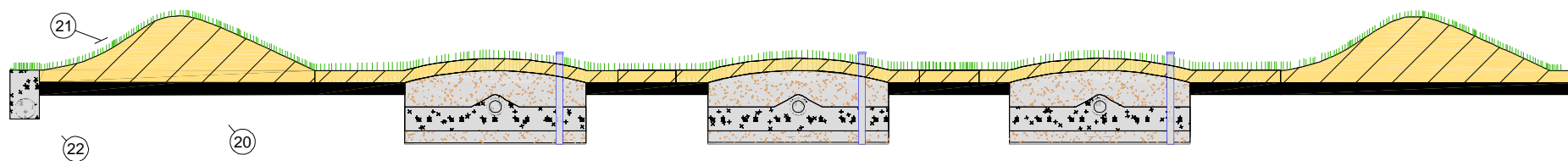
Component 7. 100 mm PVC pre-slotted pipe oriented and levelled to ensure even distribution of effluent



Component 13. Profile of downslope diversion diversion swale and drain.



SECTION VIEW (not to scale)



ETA Beds - Minimum Components and Design Requirements

1. 100 mm of topsoil or backfilled local soils, mounded to reduce surface water infiltration.
 2. Grass or other suitable cover (refer Council guidelines).
 3. 100-200 mm of coarse packed sand.
 4. 100-200 mm thick layer of 10-20 mm aggregate.
 5. 50 mm thick sand cushion. Interface by raking existing soils prior to placing sand.
 6. Flat base ETA bed to ensure equal distribution of effluent.
 7. 90 - 100 mm pre-slotted sewer-grade PVC pipe. Additional distribution pipes are recommended with each metre in width, e.g. 2 m wide trenches require 2 pipes for even effluent distribution.
 8. Inspection port to be placed on downhill side of each trench. Typically a 50 mm PVC piezometer perforated in gravel and sand zone. Inspection ports must be kept visible, accessible and suitably protected to prevent damage by mower or other maintenance.
 9. Geotextile filter cloth.
 10. ETA trench width – A (width ranges from 1000 – 4000 mm).
 11. Spacing between ETA trenches - B. Spacing between trenches should be at least 1000 mm.
 12. Trench dispersal area (m²). If greater than 1 m between trenches, calculate dispersal area as trench basal area plus 500 mm each side.
 13. Downslope surface runoff collection drain. May be required if close to sensitive feature downstream
 14. Upslope run-on diversion and/or drain, required on all sloped sites.
 15. Manifold distribution box, to be built from moulded PVC or pre-cast concrete, housed within 600mm x 600 mm stormwater pit with solid lid. Distribution box must be placed and levelled on 1000mm x 1000mm pre-cast slab or bedded in concrete.
 16. Feeder pipe, typically 100 mm PVC pipe. Effluent should be intermittently dosed, either by gravity through dosing siphon or by pumped application.
 17. Splitter box, to be built from moulded PVC or pre-cast concrete. Box must be placed and levelled on 600mm x 600mm pre-cast slab or bedded in concrete.
 18. End caps.
 20. Existing soil.
 21. Imported clean fill or local soil.
 22. Agricultural distribution pipe in 100-150 mm wide diversion drain, filled with 10 - 20 mm gravel.
- Notes**
- a. Maximum trench length 30 m for centrally-fed trenches, or 15 m for end-fed trenches.
 - b. Applied effluent must be filtered to 1-2 mm through effluent outlet filter or disk filter, and will ideally have been treated through secondary treatment device (e.g. reed-bed or sandfilter).
 - c. Effluent must be applied in discrete doses, either by gravity through dosing siphon or by pumped application.
 - d. 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 must be used.
 - e. For soils with high permeability, clay lining is required to prevent rapid loss to groundwater. Clay lining should be a minimum 20 mm thick, compacted while moist.
 - f. In clay soils each trench should be scoured to a depth of 5-10 mm to reduce base and sidewall sealing.
 - g. In heavy clay soils, addition of gypsum at 0.5 kg/m² is recommended at the base of the disposal trench.
 - h. In acid soils, addition of lime at 0.5 kg/m² is recommended at the base of the disposal trench.
 - i. For dispersive soils addition of gypsum at 1 kg/m² is recommended at the base of the bed/trench.
 - j. Mounded beds to be covered by 50-100 mm topsoil (not heavy clays), maintaining all access points.
 - k. On sloping blocks, effluent application fields may be terraced. Maximum slope along and across trench must be <0.5 %.
 - l. Plumbing and drainage works must be performed by licensed trades persons in accordance with council requirements.
 - m. All materials should be durable with non-corrosive components with an expected operating life of at least 15 years.
 - n. Effluent should be evenly distributed throughout the absorption trench to prevent 'short-circuiting' and ensure optimum operating conditions are maintained over the total available area. Before filling, the base of the trenches should be filled with water to identify low areas. Low areas should be levelled with compacted soil before ETA bed constructed.
 - o. The commissioning of the piped dispersal system should include a test run/check for leaks and poorly distributed areas.
 - p. Shrubs to be planted no closer than 1 m from the sidewall of the ETA bed/trench. Small trees should be no closer than 5 m and large trees should be at least 20 m from the ETA system.
 - q. The base of the trench must be at least 500 mm from highest seasonal groundwater table.

Maintenance and Management

- i. If effluent ponds on the surface or soils become soggy, seek advice from Council or a plumber immediately
- ii. The absorption systems must be maintained in such a manner as to prevent any run-off of effluent of the mound system to adjoining allotments, public places and natural waterways.
- iii. The system operator should maintain the absorption field regularly, to ensure adequate cover of the pipe work, elimination of weeds maintenance and harvesting of plants and shrubs.
- iv. Trenches should be inspected as part of the regular on-site wastewater system service and maintenance program.

Final Draft

CLIENT/ PROJECT
North Coast Councils

TITLE
Example Design for
Evapo-Transpiration Beds

DESIGNED: DM
DRAWN: DM
REVIEWED: DL

DATUM: na
HORIZONTAL RATIO: na
VERTICAL RATIO: na

SHEET 6 OF 10 SHEETS
PAPER SIZE: A3

REV.	DESCRIPTION	DATE	ISSUED
1.0	ETA system unit design guide	12/11/2003	DM
2.0	Amended ETA system unit design guide	29/01/2004	DM
3.0	Final ETA system unit design guide	25/03/2004	DM

All measurements in mm unless otherwise specified.

PROJECT MANAGER:
PROJECT REFERENCE / DRAWING NUMBER:
2003G812JD5.2