



Design Guide – Charged Line System Concept Design

This Design Guide summarises general requirements for the design of a charged line system where the system is applicable and suitable for a development. This is a technical document intended to assist developers and engineers at the Development Application stage.

Revision	Summary	Date
A	Design Requirements for Charged Lines Systems	December 2021

Application

For Single dwellings and/or minor alterations that drain to the rear (and/or over adjacent properties), a charged line system may be considered if it can be shown that other stormwater disposal methods have been reviewed and are not possible or practical i.e. a drainage easement over downstream properties is not available or practical.

The use of charged line system will be permitted under the mentioned circumstances provided that:

- The minimum head can be achieved in the system;
- There is a fall from the front boundary to the kerb line;
- The system is designed and sized in accordance with the criteria outlined in this design guide.

If a combination of a charged line and infiltration system is required, please refer to the Infiltration System design guide for further information.

Summary

The following information is required to be provided with the application and must be prepared by a suitably qualified hydraulic/stormwater Engineer satisfying the followings:

- Stormwater plans must be to AHD levels;
 - A roof drainage plan should be provided clearly showing catchment areas;
 - Location and sizes of all downpipes, pipes, pits and discharge point to be included in the plans;
 - Details of the gutter type, capacity and gutter guard system to be included;
 - If the minimum head cannot be achieved, pipeline sizing including hydraulic losses and HGL calculations shall be provided.
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Design Process

This section provides an overview of the key design issues that should be considered when conceptualising and designing a charged line system.

The system should be designed by a competent hydraulic/stormwater engineer. The engineer is to define if the site is suitable for such a system. The design shall include the followings:

- a) The design for the charged system must satisfy a minimum pressure head of 1.6 m and is based on the Rainwater Tank outlet pipe invert level or roof gutter invert level and the discharge outfall invert level at the street gutter. To achieve this, consideration shall be given to raise the rainwater tank on a raised platform like structure or metal frame, if necessary.
- b) A typical screen and gutter protection shall be provided.
- c) Roof gutters, downpipes and pipelines are to be sized for the 1% AEP design storm.
- d) Sealed cleaning eye are to be placed at suitable location at critical bends in the pipeline;
- e) A cleaning eye pit incorporating a pipe with a screw cap on the end and a hole in the cap is to be provided at the lowest point in the charged system.
- f) An isolation pit is to be provided at the boundary.
- g) No surface inlet pit is to be connected to the charged line.
- h) The maximum possible roof area shall be drained through the charged system. Any surface water runoff and lower roof area that cannot be drained to the street gutter shall be appropriately collected using surface collection pits and discharged using a suitable stormwater disposal method and to be included the submitted plans (please refer to the Infiltration System Design Guide for further information).
- i) If the minimum head cannot be achieved, pipeline sizing including hydraulic losses and HGL calculations shall be provided including a longitudinal section of the pipe system showing:
 - i. Gutter levels;
 - ii. Cleaning eye / pit levels;
 - iii. Isolation pit at boundary with invert and surface levels;
 - iv. Location and levels of any services in footpath;
 - v. Discharge point; and
 - vi. Pipe sizes, capacity and design flows in each section.

Figure 1 provides typical details of charged line systems.

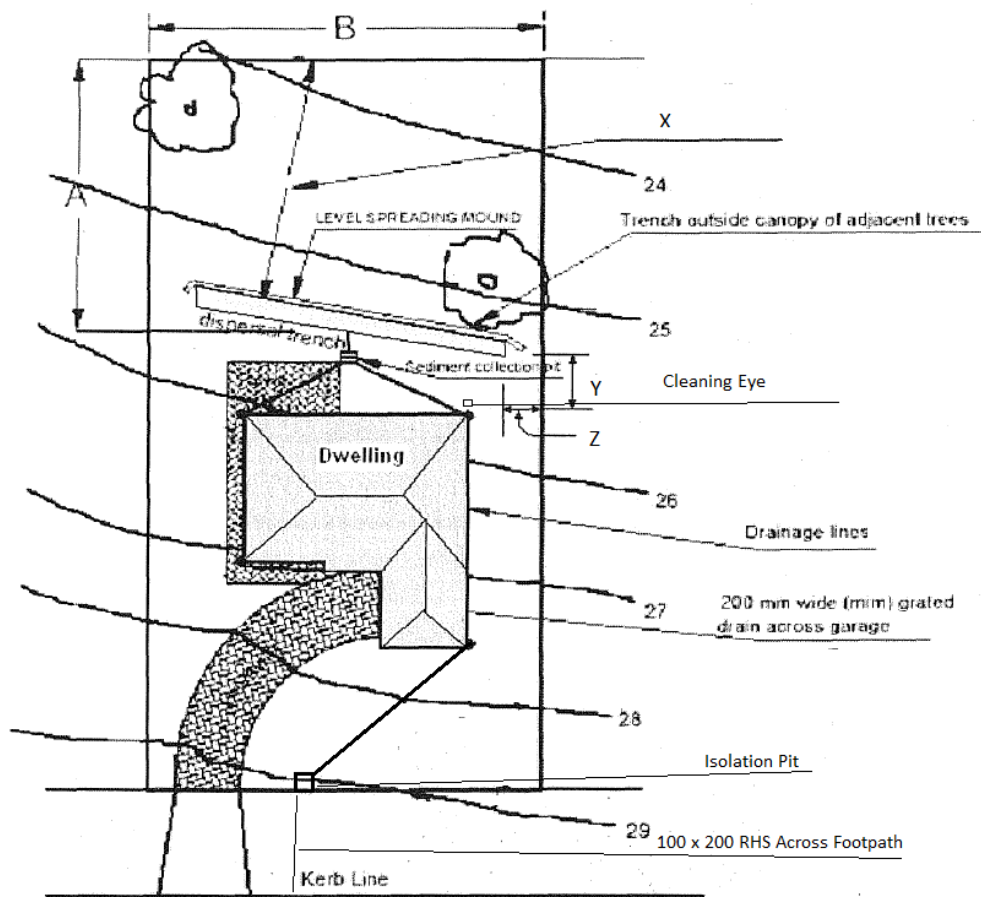


Figure 1 Typical arrangement of charged line and infiltration systems - Refer to the Infiltration System Design Guide for specifying the X, Y and Z values