



Above-ground pipework using drainage principles

This technical note has been issued to clarify the requirements when installing sanitary plumbing systems using drainage principles. AS/NZS 3500.2:2025, part 2 Sanitary plumbing and drainage, clause 10.11 specifically relates to the installation of above-ground pipework and connection of fixtures using elevated drainage principles (EDP).

Installation

Sanitary plumbing systems using EDP, as the name suggests, uses drainage principles in elevated positions and relies on larger pipe sizes used in drainage design to provide additional air to prevent siphonic action and potential loss of fixture trap water seals.

These principles are found in AS/NZS 3500.2:2025, clause 3.10 and table 3.10.2 for unvented branch drains where the following basic unvented limits apply:

- ▶ Ten metres (10 m) maximum length.
- ▶ Two (2) water closet pans (maximum).
- ▶ Thirty (30) fixture unit maximum loading.

If any of the three (3) points above are exceeded, additional venting is required.

Other requirements in AS/NZS 3500.2:2025, clause 10.11.4(a) prohibit connections into the vertical pipework, unless it is the top floor connection or a vented sanitary stack. This means that all junctions shall be connected into the graded pipework.



Photo 1: Typical EDP pipework

Multi storey buildings

EDP in multi storey buildings may serve a maximum of four floor levels above ground level as well as fixtures on the top floor of a building. EDP branches serving fixtures on the first four floors shall only be connect to the graded sections of pipework.

Only vented stacks are permitted to connect to vertical sections of pipework. The branch on the top floor may either connect as branches to stacks or as EDP discharge pipes.

Restricted zones in EDP

Any vertical pipe extending through more than one floor level is not considered a stack, therefore restricted zones for the connection of branches within the graded sections of the EDP are as follows:

- (A) No connections shall be made in the graded sections of the elevated drainage within 450 mm of the downstream bend as per AS/NZS 3500.2:2025, clause 8.6.2.5(b).
- (B) No connections shall be made in the graded sections of the elevated drainage within 500 mm of the upstream bend as per AS/NZS 3500.2:2025, clause 6.8.1(b).
- (C) If a sanitary stack is connected to a vertical section of the EDP, the connection shall not be within 600 mm of the downstream bend on the vertical section as per AS/NZS 3500.2:2025, clause 6.8.2(a).
- (D) No connections shall be made within 600 mm of the upstream and downstream bends on the vertical section as per AS/NZS 3500.2:2025, clause 8.6.2.3 and clause 8.6.2.4.
- (E) If continued as a stack after the four floor levels of EDP, connections near base of stacks shall apply as per AS/NZS 3500.2:2025, clause 6.8 and figure 6.8.1.

Examples of the above are shown in diagram 1.

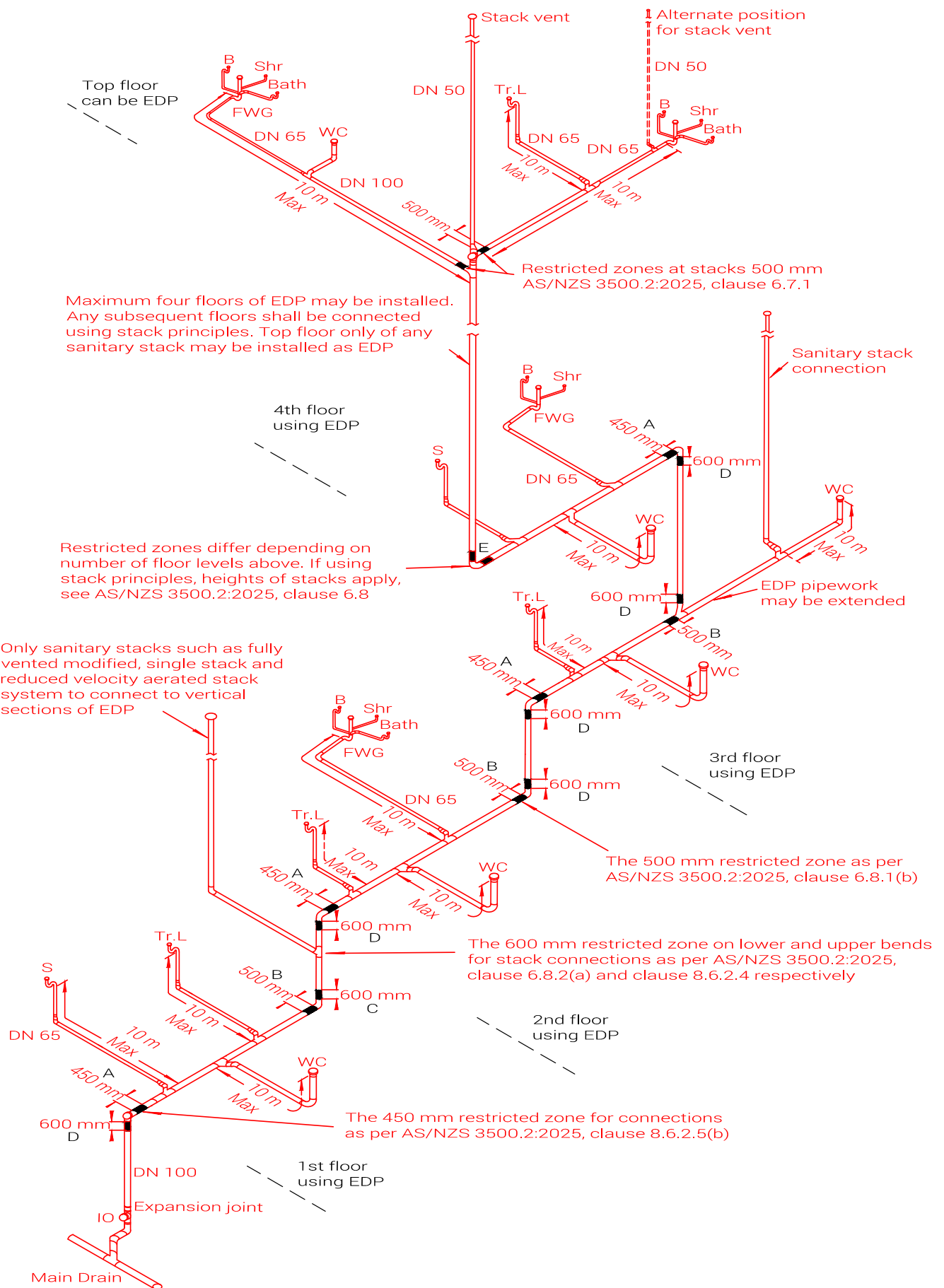


Diagram 1: Maximum four floors as well as the top floor of a sanitary system using elevated drainage principles

Typical double storey Class 1 buildings

When using EDP on a typical double storey Class 1 building (dwelling) branches may connect to the discharge stack on the top floor as shown in AS/NZS 3500.2:2025, figure 10.11.4. This is permitted because there are no other floors and fixtures above that may place adverse air pressures on the trap water seals of the top floor fixtures.

The discharge stack must be vented because it exceeds the vertical unvented limit of 2.5 m in AS/NZS 3500.2:2025, clause 3.10.3.

Venting options for a single branch on the top floor of any system

Where any unvented limits for branches in AS/NZS 3500.2:2025, clause 3.10 are not exceeded, a single vent off the discharge stack is a minimum requirement. The vent may be relocated to the upstream end of the branch either for aesthetics or building design requirements. If the stack is rolled over, a vent must be placed at the upstream end of the branch and the branch must comply with unvented limits, see diagram 3.

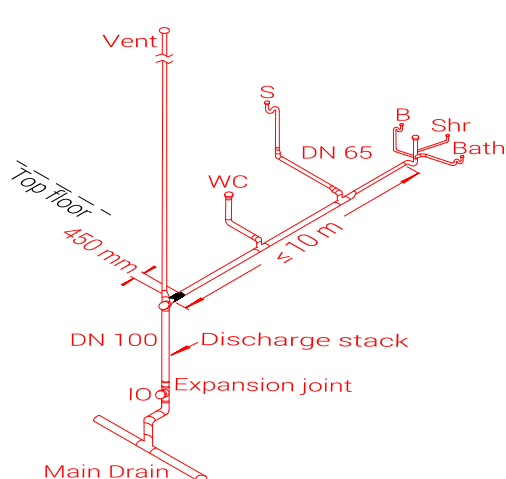


Diagram 2: Vent from the discharge stack only if branch is within branch limits

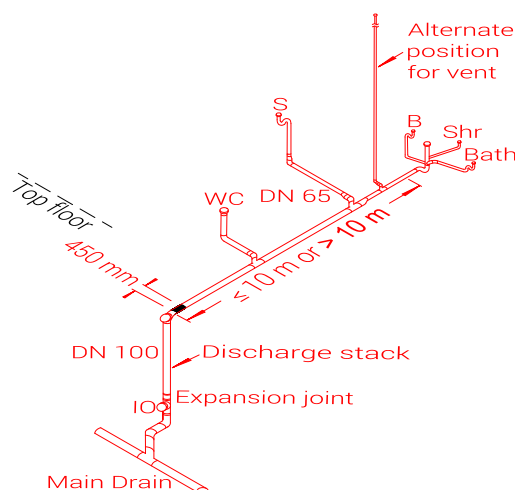


Diagram 3: Alternate vent position, stack rolled over

Venting options for branches connected independently on the top floor of any system

Branches may be connected independently using separate junctions with a vent off the discharge stack, see diagram 4. The vent from the discharge stack may be relocated to the upstream end of the uppermost branch, see diagram 5.

If any branch exceeds unvented limits it must have a vent at the upstream end.

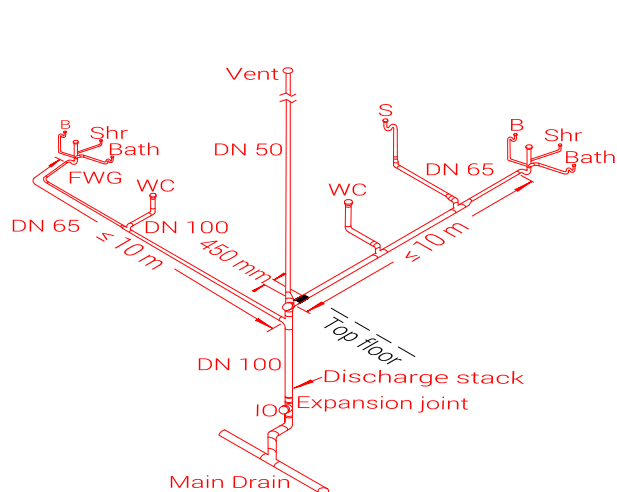


Diagram 4: Vent from the discharge stack with branches within unvented limits

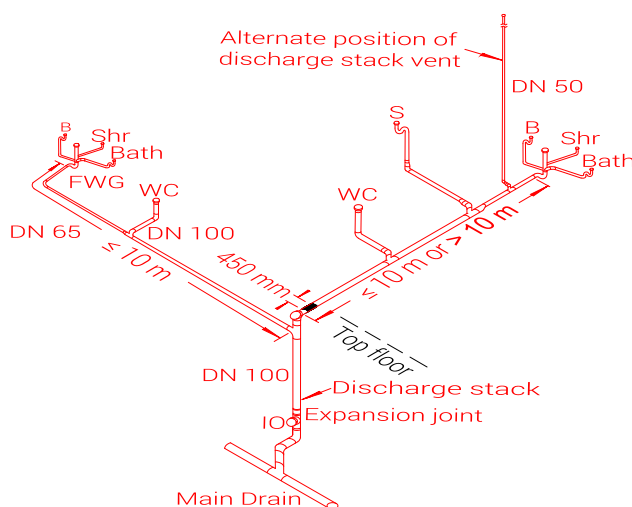


Diagram 5: Alternate vent position, stack rolled over with second branch within unvented limits

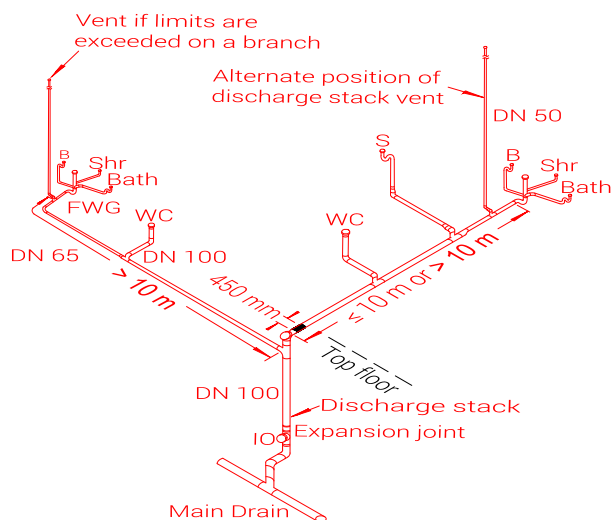


Diagram 6: Alternate vent position, stack rolled over with second branch exceeding unvented limits

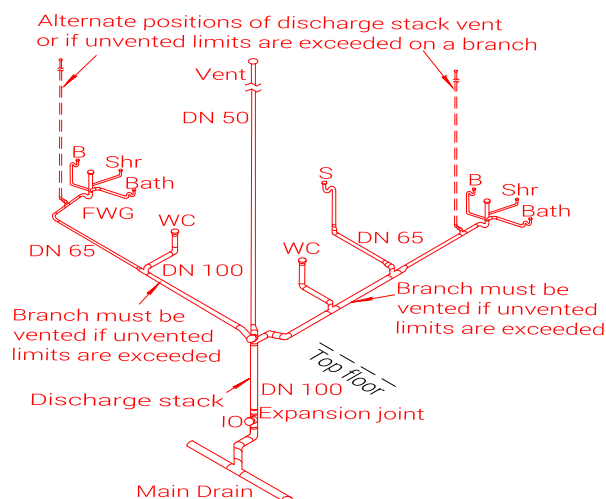


Diagram 7: Double junction used for the connection of two branches

Connection of unequal pipes and DN 100 to DN 100 pipes on grade

The diagrams and photograph below show the correct methods of connecting pipes on grade using either unequal or equal 45° junctions.

If a junction is used to connect one DN 100 branch pipe to another on grade, the entry level of the branch pipe must be elevated at an incline not less than 15° above the horizontal. The 15° incline is not required if there are no WC pans installed upstream of either the inlet or the branch of the DN 100 junction, see diagram 9.

The 15° provision only applies to new installations and not for repairs or extensions to existing plumbing systems or any other pipe sizes.

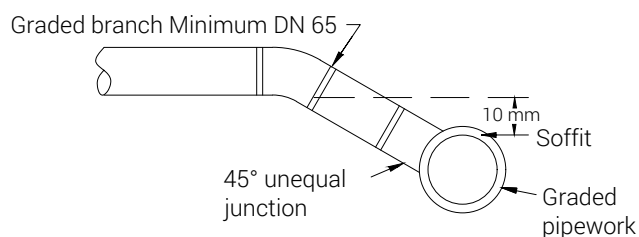


Diagram 8: Connection of a branch using an unequal 45° junction



Photo 2: Connection of branches using unequal 45° junctions

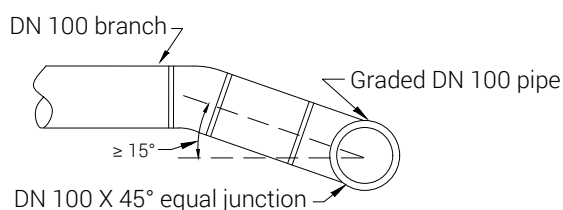


Diagram 9: Connection of DN 100 pipes with a 45° equal junction inclined at 15° with at least one pan upstream of the junction inlet or on the branch

Commencement of EDP

The requirements of EDP apply to the first four floor levels only above either the invert level of the connection point to the boundary trap riser or inspection shaft. However multi-storey buildings may have pipework passing through basements below ground level before the EDP commences. In these circumstances the pipework below ground level is considered drainage plumbing, as per the definition in the Plumbers Licensing and Plumbing Standards Regulations 2000, regulation 4. Sanitary plumbing, in this case EDP, commences where the pipework rises above the ground level as shown below.

If the stack system is a reduced velocity aerator stack system (RVASS), an aerated junction must be used to connect discharge pipes on the top floor, see diagram 11.

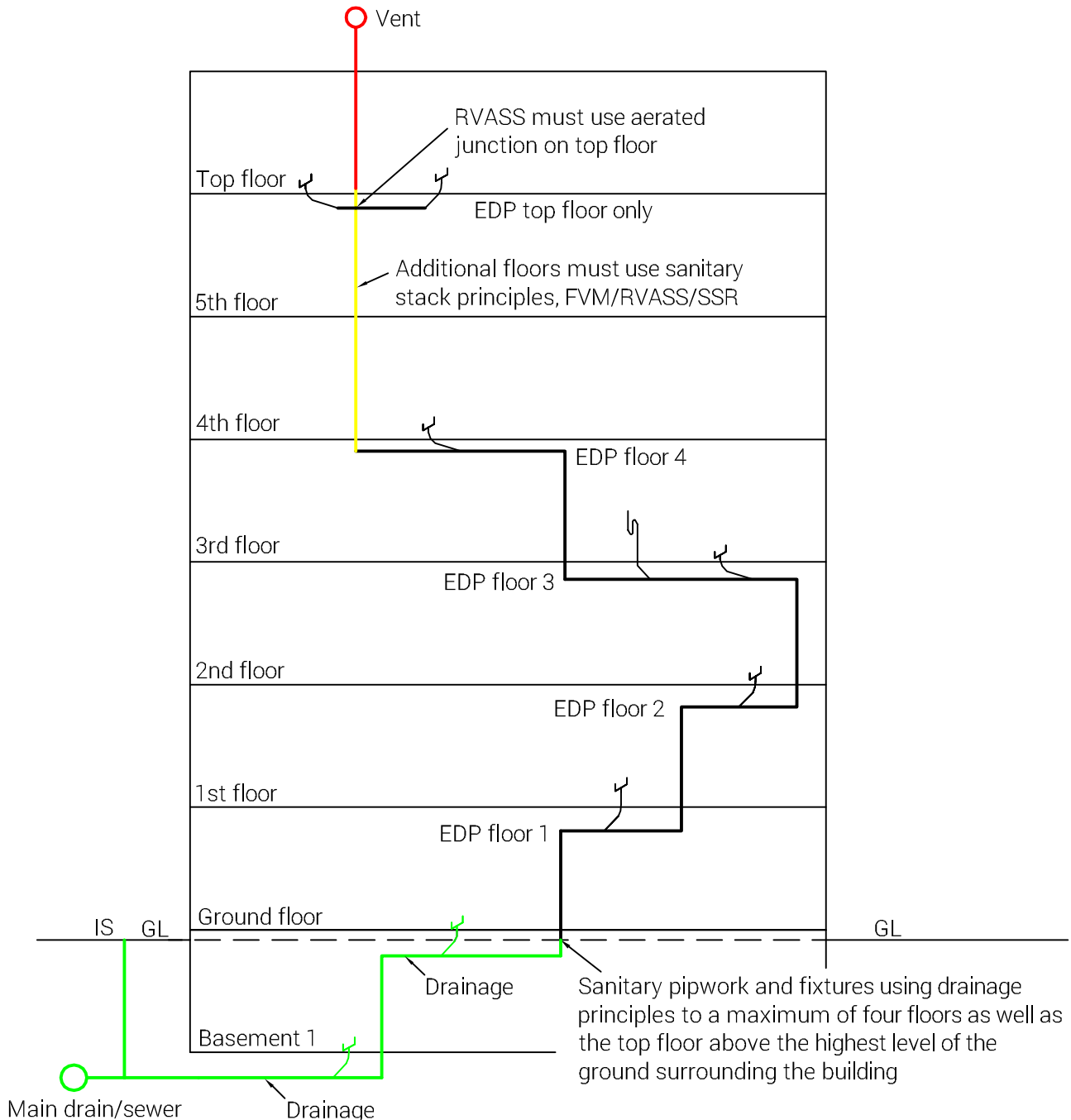


Diagram 10: Shows the point at which EDP commences when buildings have floors below the ground level

NOTES:

1. If a reduced velocity aerated stack system (RVASS) is used to connect fixtures on floors above the first four floor levels, discharge pipes on the top floor must also be connected using an aerator junction fitting, unless the installation is done using a performance solution in accordance the PCA. For further information see Building and Energy technical note on RVASS:
2. 88° junctions are only permitted to connect branches into vertical stacks and risers.
3. The minimum size of drains and drains acting as vents is DN 65. Therefore a DN 65 bend shall always be used. Reduction in the vertical above the DN 65 bend to a DN 50 or DN 40 vent, waste pipe or fixture trap is then permitted.
4. Fixtures may be connected in DN 40 and DN 50 via floor waste gullies with a minimum DN 65 outlet and discharge pipe as specified in AS/NZS 3500.2:2025, clause 4.6.7.

Notes

The technical note series is issued by Building and Energy to assist the plumbing industry to comply with the Plumbers Licensing and Plumbing Standards Regulations 2000 (the Regulations) applicable to plumbing work in Western Australia (WA).

Each technical note is to be read in conjunction with Part 6 of the Regulations that currently adopt the Plumbing Code of Australia (PCA) as the standards that apply to the carrying out of plumbing work in WA. The PCA contains specific deemed to satisfy provisions and applies AS/NZS 3500:2025, parts 1, 2 and 4 to plumbing work. PCA, schedule 11 applies variations to certain matters to suit the state's building approach and other local conditions.

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