

ADDENDUM No. 1 to CITY OF BUSSELTON ENGINEERING TECHNICAL STANDARDS AND SPECIFICATIONS.

The following standards shall apply to all residential subdivisional and property developments within the City of Busselton and is in addition to the specifications and requirements of the existing City of Busselton Engineering Technical Standards and Specifications. Where the requirements in this Addendum overlap, the requirements as described in the Addendum shall have precedence.

This addendum outlines updated groundwater separation requirements for subdivisional and property developments within the City of Busselton. It reinforces the City's commitment to sustainable, maintainable infrastructure by defining minimum standards for groundwater control, infiltration drainage, and subsoil systems. The document also clarifies the City's position on maintenance responsibilities and the need for developers to provide detailed risk and cost assessments when proposing variations from standard specifications. These standards are designed to ensure long-term viability, minimise public maintenance burden, and support consistent stormwater outcomes across the City.

ADDENDUM No. 1**Preface**

It is essential to recognise that the engineering design process must include a thorough assessment of the maintenance obligations a design imposes. This ensures that proposed infrastructure is not only technically sound but also sustainable, maintainable, and appropriate for long-term use. A design that cannot be maintained — for any reason — is inherently flawed and cannot be considered a viable engineering solution.

Across Australia, it is increasingly common for local governments to require developers to submit detailed Asset Management Plans for infrastructure intended for public handover. These plans help local governments understand the long-term financial and operational implications of accepting new assets.

The City of Busselton acknowledges that requiring a full Maintenance Asset Plan for infrastructure that is materially consistent with previously approved and documented assets — particularly those in comparable subdivisions — may result in unnecessary duplication of work. To streamline this process while safeguarding the City's financial sustainability, the City has adopted minimum standards that define and limit its maintenance obligations. These standards are calibrated to ensure that anticipated maintenance costs can be reasonably covered by the rates revenue generated from the serviced lots.

Where proposals seek to vary from these accepted standards — particularly through the introduction of non-standard or higher-maintenance infrastructure, or lower permeability soils — the City must undertake a detailed analysis of the long-term maintenance implications. This includes assessing whether the rate base can sustainably support the proposed variation. In the absence of sufficient information and consideration of these obligations, the City cannot support or accept deviations from its established standards.

Developers seeking to vary from these standards must submit a comprehensive risk and cost assessment, including:

- Long-term maintenance projections
- Contingency planning
- Evidence of sustainability over the 100-year planning horizon

Design Groundwater Level (DGL)

In some guidance documents, reference is made to the Controlled Groundwater Level (CGL), and design separations are often stated relative to this level. This has led to confusion, as the phrasing suggests that the CGL represents the actual groundwater level achieved through control measures. In practice, the CGL refers to the invert level of the groundwater control system (e.g., subsoil drains), and the actual groundwater level can differ significantly due to factors such as mounding between controls.

To provide clarity, and in addition to specifying separations to the CGL, the City will require that separations from relevant infrastructure be defined relative to the Design Groundwater Level (DGL). The design groundwater level is defined as follows depending on the proposed development:

DGL for Non-engineered Groundwater Control Areas

In areas of shallow groundwater, where an engineering controlled system is not proposed, a site-specific drainage (and fill, where required) strategy shall be designed with consideration of the pre- and post-development site water balance. The water balance assessment shall include consideration of:-

- Reduced evapotranspiration, due to site clearing for development;
- Increased stormwater infiltration, due to lot and development scale drainage systems;
- Anticipated rise in groundwater due to placement of fill if required;
- Groundwater abstraction change, due to land use change; and
- Changing rainfall quantity, intensity, frequency & duration due to the changing climate.
- Anticipated rise in groundwater due to Sea Level Rise (SLR) over a 100 year planning timeframe

The DGL for non-engineered groundwater control areas will typically then be the anticipated post development Maximum Groundwater Level (MGL) taking into consideration the above. However, locations proven not to be sensitive (i.e. where the function of the stormwater drainage system is not highly dependent on infiltration maintaining stormwater drainage capacity between events and where sea level rise will not impact ground water levels) the DGL if agreed by the City can be the Annual Average Maximum Groundwater Level (AAMGL) taking into consideration the above. Determination of this level will need to be made in consultation with the City and DWER.

DGL for Engineered Groundwater Control Areas

Where an engineering controlled system is proposed the DGL is calculated as per the guidance in the IPWEA Specification Separation distances for groundwater controlled urban development for different critical elements of built form and infrastructure. Reporting will need to provide justification for model selection as discussed in Section 3.2 of the IPWEA Specifications and all other modelling inputs as described in Section 3.3 to 3.5 of the IPWEA Specifications.

Any assessment of an engineered groundwater control system must also demonstrate that the outfall will be free flowing throughout the 100-year planning timeframe. This is also to consider the influence of Sea Level Rise (SLR) on groundwater levels and baseflows within the receiving environment and watercourses.

Groundwater Separation Requirements

Non-engineered Groundwater Control Areas

For groundwater separation requirements in areas where there is no engineering controlled system the following slight modification to the requirements as outlined in the City of Busselton Technical Standards and Specifications are to be adhered to.

- Finished Lot Levels (FLLs) must be at least 1200mm above DGL (refer section above: DGL for Non-engineered Groundwater Control Areas).
- Base of underground infiltration drainage shall be a minimum of 300mm above DGL
- Invert level of Drainage Basins shall be a minimum of 300mm above DGL

Engineered Groundwater Control Systems

Groundwater shall be controlled to levels not higher than:

- The groundwater separations to the DGL for the critical elements of built form and infrastructure as outlined in the IPWEA 2016 Draft Specification for separation distances for groundwater-controlled urban development with the following clarifications:-
 - The interpretation of “Private spaces” is areas within the lot that have no other potential critical elements of built form and infrastructure that would result in a greater groundwater separation requirement. For example, underground infiltration drainage can and is installed within front and rear private spaces, so the separation distances for this element would supersede the separation requirements for private spaces if the underground infiltration drainage is deeper than the private spaces separation specification;
- DGL shall be 500mm below lowest sub-grade for roads or access ways to ensure protection of road base; and
- 300mm below invert of drainage basins;
- A minimum of 1200mm separation will be required from the DGL to the FLL in areas where underground infiltration drainage devices (soakwells) are to be located to accommodate a typical 900mm deep soakwell liner with the necessary base and cover; and
- A minimum depth below finished surface level of 1200mm clean soil with a minimum saturated hydraulic conductivity of 5m/day (compacted at 95% MMDD) is required across all lots. Note: Where it is proposed to retain one or more significant trees within a lot, this expectation may be modified or waived in consultation with the City of Busselton to achieve an agreed outcome.
- Controlled Groundwater Levels (CGLs) must not lower AAMGLs, unless environmental, DWER and City approvals are obtained.

- The subsoil groundwater control systems must be free draining.

Subsoil Systems

For areas with engineered groundwater control systems, the City will only accept management of subsoil drainage that is located within road and drainage reserves. The City will not accept management of subsoil drainage within private property or responsibility for managing groundwater levels within private property.

If subsoils are also proposed within lots then the subsoil systems shall be solely contained within individual lots and shall not cross into adjoining lot boundaries. The subsoil drainage will also be fully the lot owners' responsibility for ongoing maintenance. To ensure lot owners responsibility and City maintenance liability is defined the following will need to be provided where private subsoil drainage is proposed:

Subsoil drainage within the road reserve serves the road infrastructure only, and any subsoil drainage design for private lots must operate independently of the road subsoil system.

- All subsoil drainage, including private subsoil drainage, is to be installed as part of subdivision works, this is to include: -
 - Min. diameter 150mm uPVC to AS/ANZ 1260. Min. class SN8;
 - Min. diameter 225mm uPVC to AS/ANZ 1260. Min. class SN8 for City Managed Assets;
 - Pipes to be slotted except when under roads, parking, paths;
 - Subsoil pipe gradients shall be a desirable minimum of 1:200, and an absolute minimum of 1:250, unless explicitly approved otherwise for sound reasons;
 - Flushing points are required at the beginning of the line and at all changes in direction (except for connection to an outlet pit where the bend angle is 45 degrees or less and pipe distance is 2.5m or less);
 - Flushing point spacing to be a maximum of 80m;
 - Subsoil pits to be spaced a maximum of 160m;
 - No less than 10mm drop shall be provided through any subsoil pit;
 - One subsoil property connection pit with 600mm silt trap (concrete, min. 900mm diameter for residential lots or min. 1050mm diameter for industrial lots to allow ready maintenance access and is to serve two lots were possible and an easement is required to ensure both lot owners and the City have access to the connection pit for maintenance purposes;
 - Subsoil connection pit should be provided within the lot at the boundary with the road reserve;
 - No less than a 300mm drop shall be provided from the subsoil property connection pit outlet pipe outlet invert level to the City drainage pit outlet pipe invert level.
 - Adequate protection against sand ingress into the aggregate surround where the geofabric wrap meets the outside of the drainage pit liner is required. A suitable detail is required with 1.0m minimum/2.0m maximum of solid PVC pipe at each subsoil start and end termination into manholes with the geofabric wrap brought directly against the outside perimeter of that section of solid PVC pipe and tightly secured by a suitable heavy duty stainless steel tie strap around the pipe circumference within 0.5m of the pit edge.
 - Private subsoil pipe connections are only permitted into the City stormwater network via the property connection pit, this excludes connection into City subsoil. Private lot subsoil

- drainage connections shall be via a pit on the City system. The limit of City maintenance responsibility is the pipe into the lot and excludes the connection pit within the lot;
- Overflows from onsite soakage systems to connect to the City stormwater network is not permitted and never via internal lot subsoil systems.
 - The City will not accept unnecessary road crossings from private subsoil drainage systems to connect into the City drainage network. Pipe crossings defined as a City asset which connect a private lot subsoil pit to a City drainage pit on the same or opposite side of the road are to be min. 300mm diameter rubber ring jointed reinforced concrete with the appropriate class for the design cover.
 - Duplication of subsoil lines on both sides of roads is not permitted within the road reserve.
 - General Principles:
 - Minimise to total number of flushing points required at surface level in verges;
 - Minimise the number of subsoil junction pits required in verges;
 - Minimise the number of horizontal bends required on subsoil lines;
 - Minimise subsoil encroachments over other utilities' service corridors.
 - Notifications on title and mechanisms to the satisfaction of the City are required to inform lot owners of the subsoil drainage and their maintenance responsibilities.
 - No connection of private stormwater drainage is to be made to the City stormwater system.

Verification of lot permeability

- For larger developments (total area larger than 1500m²): Laboratory saturated permeability testing will be required for a minimum of 1 sample per 2500m² of lot area to be taken at random from lots at varying depth between surface and full depth of fill material.
- For smaller developments (total area less than 1500m²): A minimum of 2 tests shall be required.
- In addition 2 samples shall be taken from the proposed source of fill and tested prior to import and commencement of works.
- If topsoil blending is proposed then additional tests shall be undertaken to demonstrate prior to placement of the fill that required permeabilities will be achieved.
- Laboratory saturated permeability testing shall test all samples at 95% Maximum Modified Dry Density (MMDD) and must confirm not be less than 5m/day saturated permeability has been obtained post construction.

Mandating Location of Underground Infiltration Drainage

Where the location of on lot infiltration devices (soakwells etc.) must be controlled to ensure satisfactory operation of the proposed groundwater control systems then the City will consider accepting applications to allow the location of underground infiltration drainage to be mandated. This will need to be controlled using an appropriate planning mechanism that aligns with the intent of this addendum and addresses any concerns and risks to the satisfaction of the City. To consider mandating of underground infiltration drainage the following will need to be demonstrated:

- The mechanism to be used will need to be agreed to by the City planning and building departments.

- There is sufficient horizontal and vertical space in the proposed location for mandated underground infiltration drainage. This will also need to consider separation to groundwater as well as other services and infrastructure that may be located in the mandated location.
- Modelling will be required to demonstrate the implications of 25% of drainage being non-compliant with mandated underground infiltration drainage locations.

It is considered that specifying the location of underground infiltration drainage at the front of lots – through a modification to the City of Busselton Local Planning Policy No. 6.1 Stormwater Management – would assist in achieving broad-scale compliance across new developments.

This approach is viewed as beneficial across all areas of the City, and accordingly, the City is aiming to undertake an update to the planning policy to define the horizontal and vertical envelope within which underground infiltration drainage may be installed within a lot.

However, it is acknowledged that this policy mechanism alone may not capture all scenarios where underground infiltration drainage is required. Therefore, agreement will still need to be sought from the City's Planning and Building teams to establish a suitable mechanism for controlling the location of these systems on a case-by-case basis.

This dual approach – policy guidance supported by internal coordination – aims to ensure consistent, practical, and sustainable stormwater outcomes across the City.

Industrial/Commercial Subdivisions

- Roads and drainage pipe systems shall be designed for 10% AEP and overland flow paths for 1% AEP events.
- Finished lots surface shall be a minimum of 1.5m of free draining soil above DGL.
- DGL shall be at or above predevelopment AAMGL and not lowered.
- All subsoil systems necessary to achieve DGL shall be installed in roads and lots by developers.
- Base of onsite infiltration drainage systems shall be a minimum of 300mm above DGL.

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