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1.0 BATTERS AND EARTH RETAINING STRUCTURES

1.1 GENERAL REQUIREMENTS

General

Batters and earth retaining structures should conform to the requirements set out in Schedule 5 of the *Standard Building Regulation 1993*. For example, fill batters steeper than 1V:4H and retaining walls greater than 1 m in height will require the lodgement of building applications. Batters and earth retaining structures (including footings) should be wholly contained within the allotments (subdivision) or development site.

The locations of batters and earth retaining structures should be shown on plans certified by a Licensed Surveyor prior to the development being accepted On Maintenance or prior to the issuance of a Certificate of Classification. Note that On Maintenance applies mainly to subdivisions and developments with significant portions of donated assets.

Treatment abutting public space

Earthwork batters as opposed to retaining walls are preferred adjacent to existing or future public space (eg road reserves, parks, etc). Where the slope of the batter is steeper than 1V:6H, the toe of fill batter or the top of cut batter abutting existing or future public space (eg road reserves, parks, etc) should be provided with a minimum setback distance of 0.3 m from the property boundary. Where a retaining structure cannot be avoided, the preferred design solution is a retaining wall that does not exceed 1.0 m in height. Where the change of level exceeds 1.0 m, terraced retaining walls generally in accordance with Figure B3.5 are acceptable.

1.2 TYPES OF TREATMENT

1.2.1 *Batters*

It is desirable that fill batters no steeper than 1V:4H be provided adjacent to residential properties, although steeper landscaped embankments up to 1V:2H will be considered. If any proposed fill or cut is likely to have a damaging effect on the visual amenity of the adjoining property, or 1V:4H batters are impracticable, consideration should be given to providing a low retaining wall and associated landscaping of the reduced embankment.

The minimum treatment required for batters is topsoiling and grassing where the slope is no steeper than 1V:4H. Irrespective of the treatment, a cross section showing the interface between the proposed development and the existing properties should be shown on the engineering drawings. The effects on the drainage of adjoining properties of any cut or fill operation should be considered and details shown on the engineering drawings. No ponding or nuisance from stormwater runoff will be accepted. Typical acceptable treatment alternatives are illustrated in **Figures B3.1 to B3.4**.

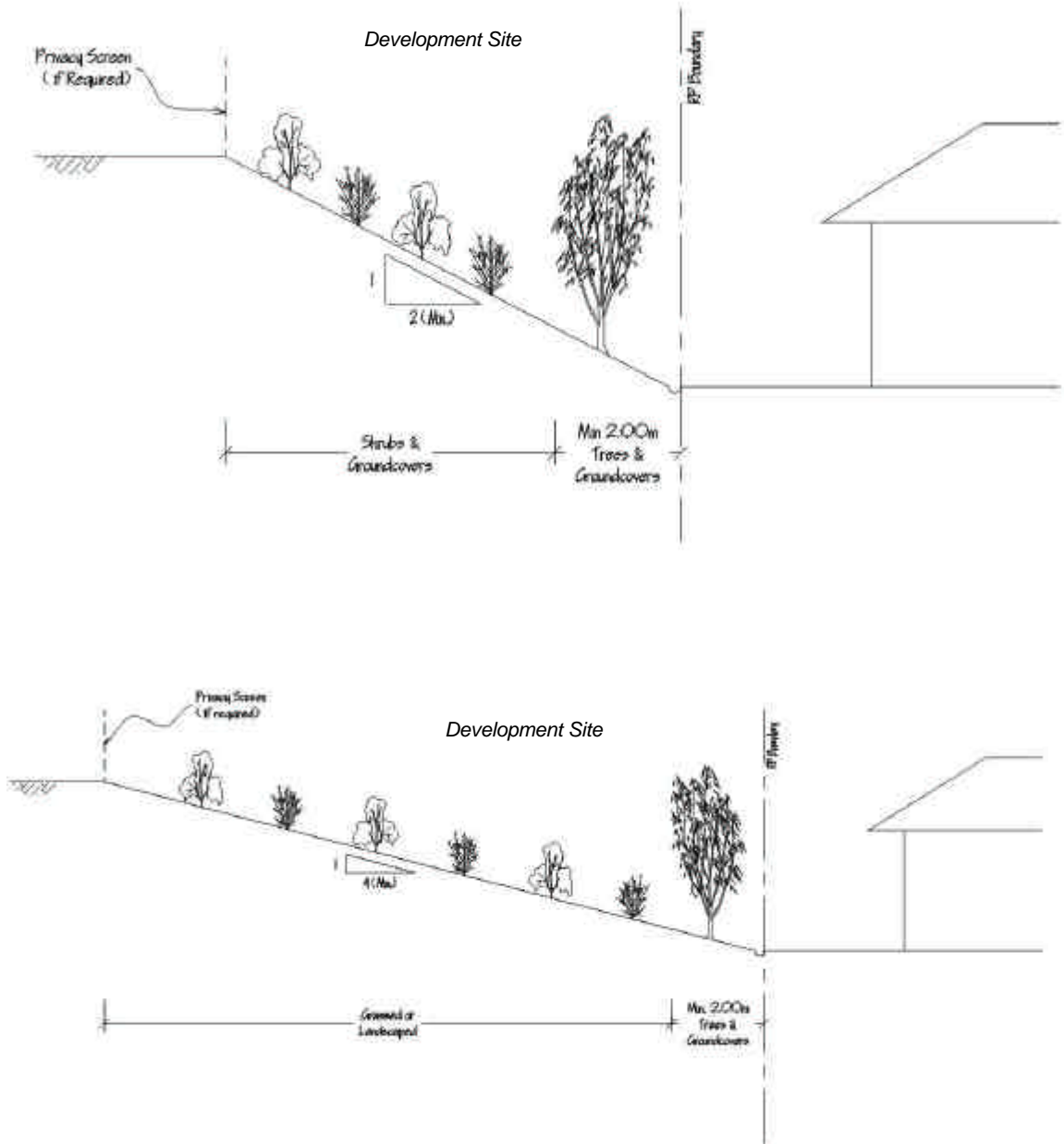


FIGURE B3.1
 FILL EMBANKMENT - LANDSCAPED BATTER

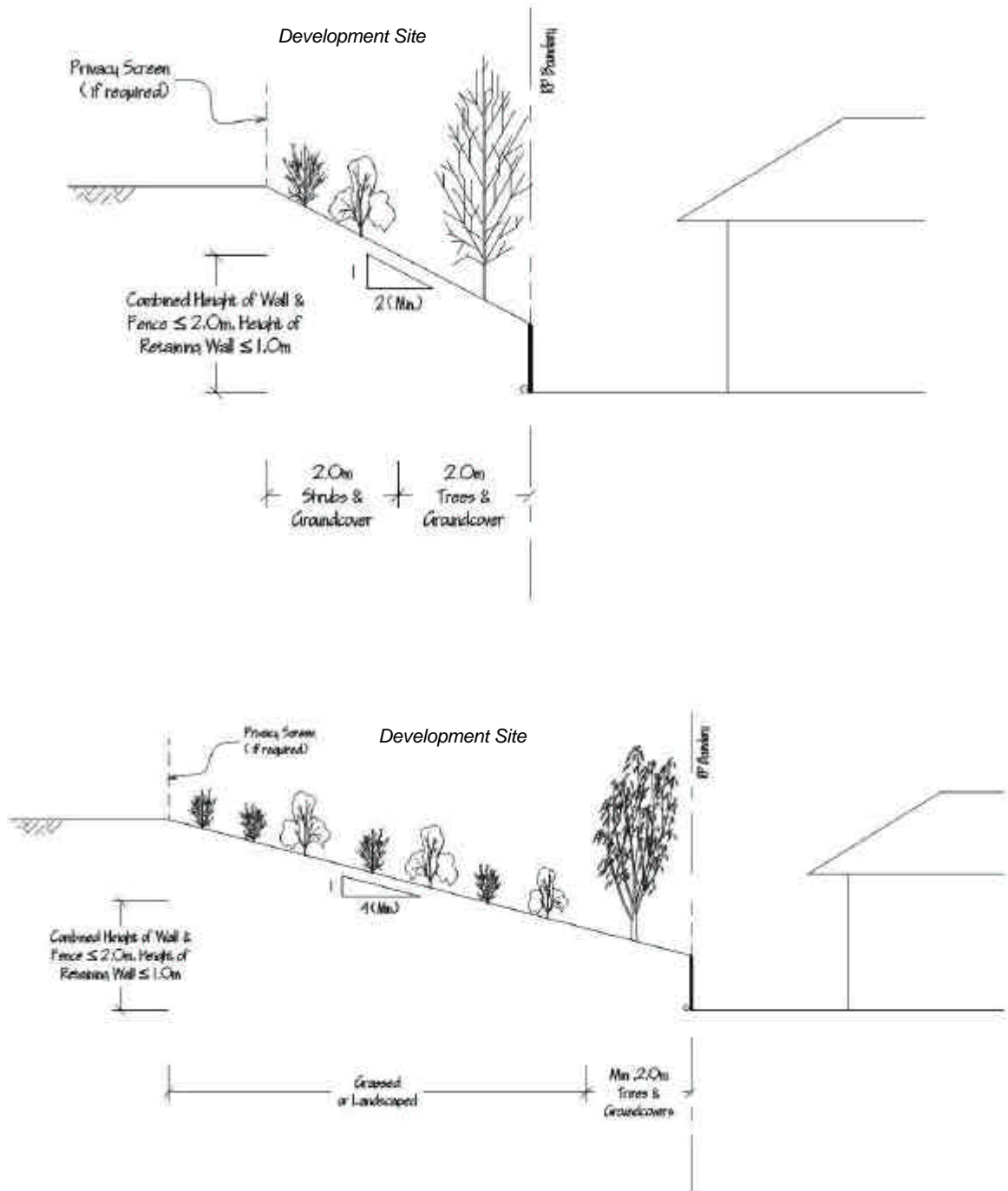


FIGURE B3.2
 FILL EMBANKMENT - COMBINED BATTER/RETAINING WALL

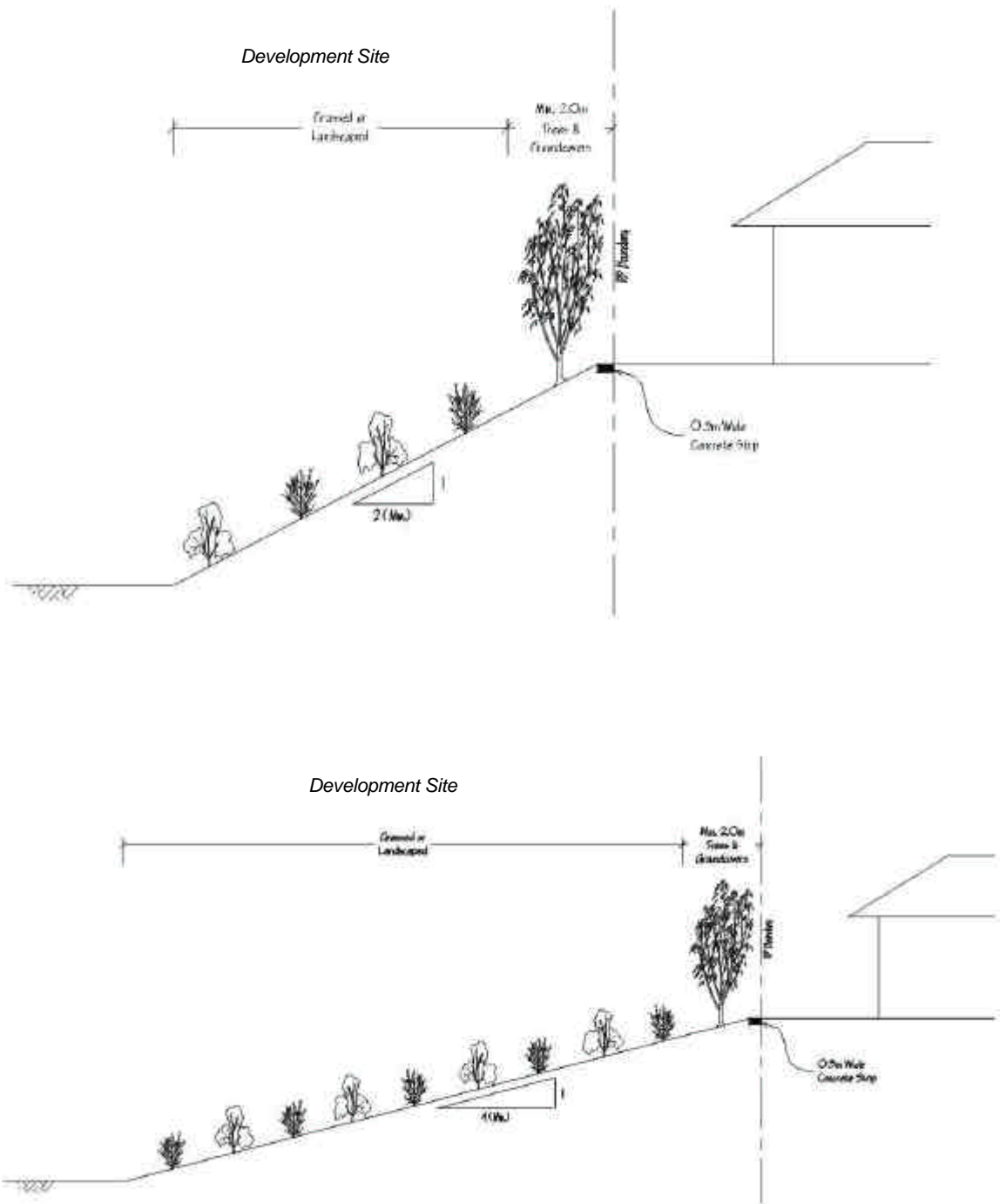


FIGURE B3.3
 EXCAVATION - LANDSCAPED BATTER

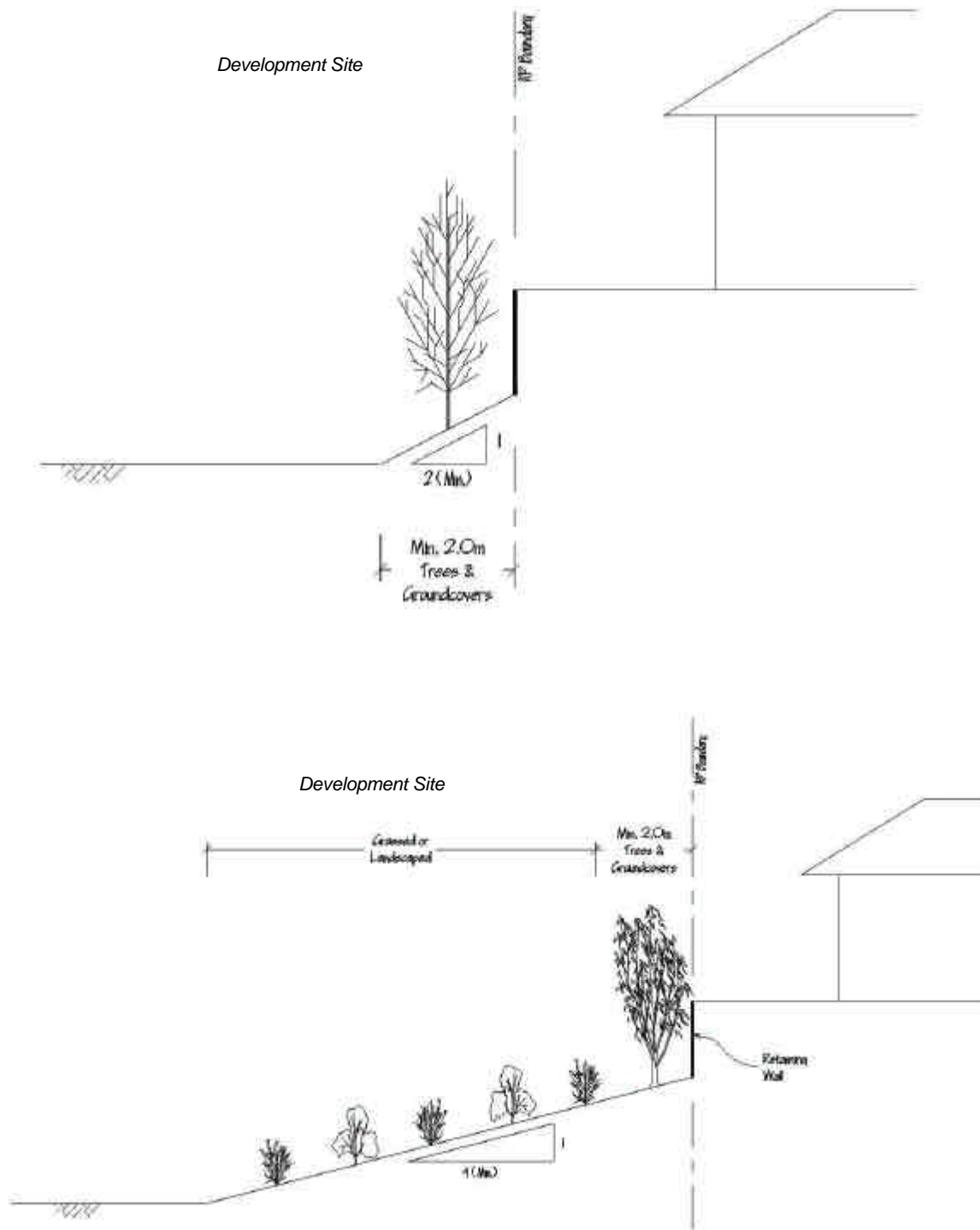


FIGURE B3.4
 EXCAVATION - COMBINED BATTER/RETAINING WALL



1.2.2 Retaining Walls

An earth retaining structure is built to protect land, buildings, and structures in the vicinity of proposed excavation or filling. Retaining walls are broadly classified into three categories A-C as defined below.

- **Category A: Council built, Council ownership.** Council builds the retaining wall structure and the maintenance responsibility lies with Council. (Section 1122(3) of the Local Government Act 1993 states “If a local government, in exercise of the jurisdiction of local government, constructs a roadway or other structure or performs any works on someone else’s land, the materials in the roadway, structure or works are the local government’s property.”) The wall is usually characterised by the use of a consistent construction material over a lengthy stretch across several properties. The wall may be located on Council land or private property. The private property may be subject to an easement (in favour of Council) to provide unimpeded maintenance access. This category is most commonly associated with transport infrastructure upgrade projects.
- **Category B: Developer built, Council ownership.** The developer builds the retaining wall structure, which becomes a contributed/donated asset from a development following expiry of the defects liability period. The maintenance responsibility lies with Council. The wall is located in Council land such as the road reserve. This application may arise from construction works by a developer in the reconfiguration of lots (subdivision). This category is rare and should only be considered where extreme topographical and spatial constraints cannot be negotiated.
- **Category C: Privately built, private ownership.** The developer or property owner builds the retaining wall structure. The ownership and maintenance responsibilities remain private. This category is usually characterised by the use of different construction material or discontinuity in retaining wall structure past the subject property boundaries. The application is most commonly associated with development applications pertaining to a material change of use and/or operational work for filling and excavation exceeding one vertical metre in relation to the natural ground.

All retaining structures should be shown and detailed on engineering plans for approval by Council. Timber (limited life span) and bush rocks (stability and vermin problems) are not permitted on land adjoining public space. Construction materials acceptable to Council include grouted rock, reinforced concrete, and masonry (bricks and blocks).

Timber retaining walls (permitted at proposed lot boundaries of a subdivision) should be preservative treated to hazard class 5 in accordance with AS 1604 for protection against decay, insect or marine borer attack.

Generally all walls should be:

- Aesthetically pleasing to adjoining property, ie the retaining wall finishes are of a high quality appearance and compatible with the surrounding development.
- Contained wholly within the property (refer Section 1.1).
- Terraced and landscaped to mitigate any adverse visual impacts. Plant species should be appropriately selected to preserve the structural integrity of the wall. A minimum 1 m wide continuous landscape strip is required for shrubs and groundcovers whereas a minimum 2 m wide continuous landscape strip is required for tree planting. Where planting is not practical in the area between the retaining wall and boundary fence (being too narrow and less than 0.5 m wide), this area should be paved with concrete or other approved materials to avoid future maintenance problems.



- Designed with catch drains along the toe of the wall should any overland flow overtop the wall.
- Designed with subsoil drainage.

Walls exceeding 1 m in height will require building application and structural certification. When the combined height of a retaining wall and fence exceeds 2 m, the aforementioned requirements plus the written authorisation from the low side neighbour will need to be provided with the engineering drawings. Typical acceptable treatment alternatives are illustrated in [Figure B3.5](#) and [Figure B3.6](#).

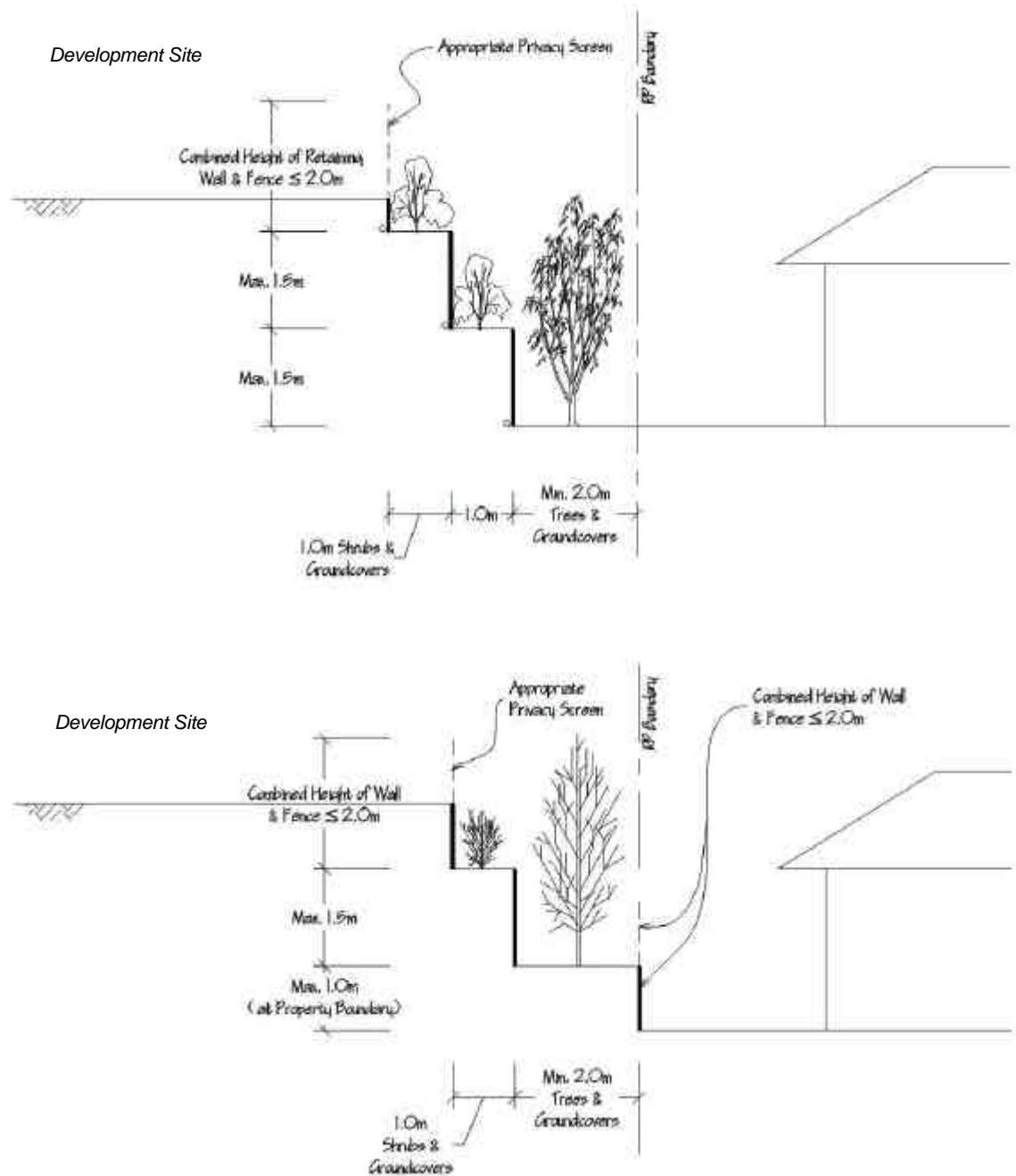


FIGURE B3.5
FILL EMBANKMENT - TERRACED RETAINING WALLS

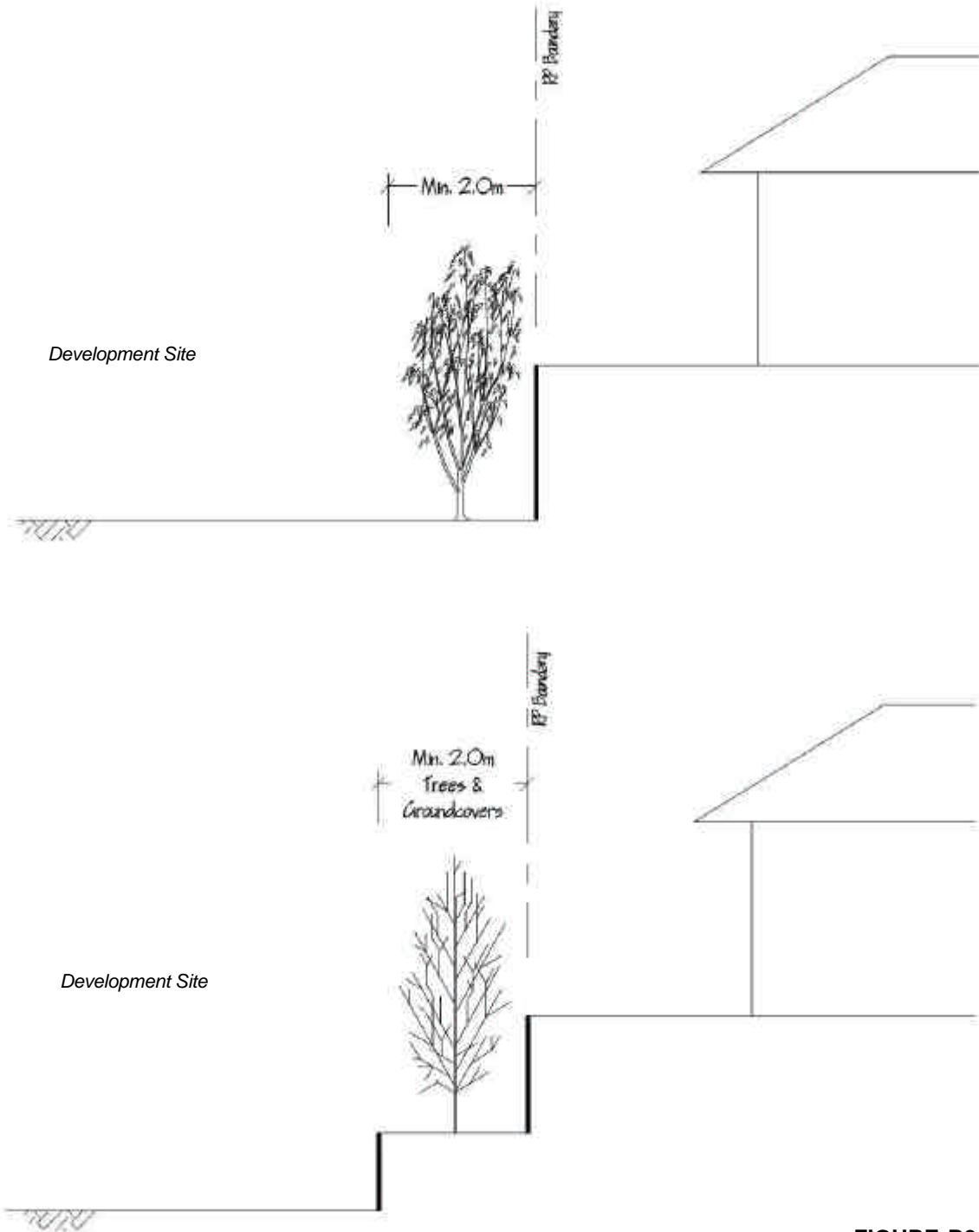


FIGURE B3.6
EXCAVATION - RETAINING WALLS



1.2.3 Ground Anchors

A ground anchor is a tie back to the soil behind the face requiring support. Ground anchors are generally used to stabilise the excavated face of railway or road cuttings, basements of buildings, and to provide local support in underground excavations and mines. The ground anchor transfers forces into the ground by means of a steel tendon inserted into a borehole and grouted to the surrounding material. The anchor spacings, sizes, and angles of inclination depend on the type of soil, the loads to be resisted and the physical limitations used to install the anchors.

Council approval is required for ground anchor systems (permanent or temporary) proposed within 2.0 m of Council infrastructure such as sewer pipes, water mains, stormwater lines or associated structures. The application will form part of the filling and excavation/ bulk earthworks plans submitted at the operational works stage.

The ground anchoring system should be designed and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ). Anchors should not be located closer than 1.2 m vertically above or 1.0 m below or 1.0 m horizontally from the existing Council infrastructure. The following information should accompany the operational works application.

- Payable fees.
- Site plan (layout, elevation, and sections) depicting details of the anchoring system (position, length, inclination angle, lock-off load) and surveyed locations of Council infrastructure and other services such as telecommunications, electricity, and gas.
- Approval from Department of Natural Resources and Mines if the anchoring system extends into the road reserve.
- Approval from the providers of affected services, for example, telecommunications, electricity and gas.
- Pre and post construction closed circuit television camera (CCTV) inspections of the pipe. CCTV surveys should be carried out in colour using a camera with the capacity to pan and tilt. The applicant should submit both the hardcopy report and a video display of the CCTV inspection. The CCTV inspection of stormwater pipes should conform to Brisbane City Council's standard inspection and reporting protocols, achieved by using the WinCan CCTV data capture and asset management software customised to Council standard format. The CCTV inspection of sewer pipes should be carried by accredited Australian Water Association (AWA) operators, in accordance with the guidelines of the Australian National Manual for Conduit Condition Evaluation (ANMCCE) and the Sewrat data capture software.

1.3 SURFACE WATER

Plans submitted for approval need to indicate effects on surface water created by filling. No ponding or nuisance from stormwater is to occur. In redeveloped areas, shallow concrete spoon drains may need to be constructed along the toe of the embankment to permit the drainage of adjoining property. In low areas subsoil drainage may also be required along the toe of the fill batters as the compaction of fill may affect subsoil drainage of the area. Drainage may also be required where seepage is likely from irrigated lawns and gardens.



2.0 FENCES

2.1 GENERAL REQUIREMENTS

Unless all survey pegs are obvious, the Developer should submit a certification by a Licensed Surveyor that the fences are contained entirely within the development prior to the acceptance of works Off Maintenance. Under the *Standard Building Regulation 1993*, fences higher than 2 m above the natural ground surface would require a building application.

The following requirements will apply to fencing:

- The minimum standard of pedestrian safety fence is the galvanised tubular handrail as shown on Standard Drawing UMS 241. However powder coated galvanised steel or aluminium pool fencing to AS 1926 of minimum 1.2 m height is the preferred barrier installation at traffic islands, signalised crossing, and refuge islands.
- A galvanised tubular handrail with chainwire (Standard Drawing UMS 241) or a galvanised weld mesh fencing (Standard Drawing UMS 242) should be provided where there is a danger of children gaining access to high risk areas or where the drop height exceeds 1 m. Where the drop height exceeds 1.5 m, a powder coated steel fence (hunter rod top or approved equivalent) capable of resisting a minimum static load of 0.75 kN/m (in accordance with Clause 4.7.1 of AS 1170.1) should be installed.
- Where required, a log barrier fence including a lock rail for access should be provided in accordance with Standard Drawing UMS 244. Refer Chapter 8 of Part B of this document for fencing requirements along park frontages.
- The construction standards of typical 2 m high timber acoustic fence are shown on Standard Drawings UMS 245 and UMS 246. These drawings do not represent suitable noise attenuation solutions for all developments. On the contrary, site specific attenuation solution for each development should be determined in accordance with the attenuation criteria and methodologies set out in the Noise Impact Assessment Planning Scheme Policy.
- The fencing should not hinder general maintenance, otherwise the fencing should incorporate vehicular access gates or the fencing panels are designed for easy removal. Pedestrian gates should be provided along road frontages.
- A concrete (extruded or cast in situ) mowing strip should be provided under all fences (including acoustic barriers) which interface with lawn and landscaped areas. A minimum 140 mm wide x 100 mm deep strip, flush with the surrounding ground, will need to be installed under timber fences/walls or galvanised steel fences. Mowing strips are generally not required under masonry or concrete fences/walls as the footings are usually sufficient for this purpose.



2.2 COST SHARING

Under the *Dividing Fences Act 1953*, Council is required to share the cost of dividing fence where it **has freehold ownership of the adjoining property**. Council is not liable for costs where the land it controls is crown land held in trust (eg parkland or roads) nor is Council responsible for sharing fencing costs at easements that are granted in favour of Council inside private properties.

Council approvals are required where:

- Council contributes towards the cost of fencing.
- Fencing is proposed inside any drainage easement or overland flow path or flood regulation line or waterway corridor.

2.3 HYDRAULIC CONSTRAINTS

It is desirable that fencing is not erected inside any drainage easement or overland flow path or flood regulation line or waterway corridor. Council recommends against the construction of debris retaining or solid fences, as these structures will inhibit the conveyance of floodwaters. However in instances where the overland flow between private allotments is shallow, generally less than 200 mm deep, solid fences can be constructed provided that openings are installed at ground level to accommodate overland flows.

Council approval is required where fencing is proposed inside any drainage easement or overland flow path or flood regulation line or waterway corridor. Some suggested fencing styles include:

- Open post and rail, where no panels of fencing are incorporated between the post and rail structure to provide minimum resistance to flood flows. Examples include log barrier fencing and galvanised tubular handrail.
- Collapsible fencing, where sections of the fence are designed to collapse under flood loading so as not to increase flood levels, but are also anchored to avoid being washed away. Low strength ties may be used to hold the fence in place during non-flood times.
- Swing fencing, where sections of the fence are designed to yield under the pressure of flood flows so as not to increase flood levels, but are also anchored to avoid being washed away. Usually fence panels are fitted with hinges or pivot points to allow opening during floods. Low strength ties may be used to hold the fence in place during non-flood times.
- Lifting fencing, where sections of the fence may be temporarily raised to not obstruct flood flows.