



FNQROC DEVELOPMENT MANUAL

DESIGN MANUAL

D2

SITE REGRADING

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GENERAL

D2.01 SCOPE

1. This section sets out the minimum standards specifically developed for site regrading involved in land development and subdivision.
2. The designer needs to make reference to the associated design manual related to, D1 Road Geometry, D4 Stormwater Drainage and D5 Stormwater Quality Management.

D2.02 OBJECTIVES

1. This Manual aims to assist the Designer in achieving:
 - Efficient and economical design
 - Enhancement of the environmental character and maintenance of natural features of the site.
 - Minimal impact on adjoining properties and developments.

D2.03 REFERENCE DOCUMENTS

Note: Where Acts or reference documents are updated, reference should be made to the current version.

Australian Standards

- AS 3798 "Guidelines on Earthworks for Commercial and Residential Development".
- AS 4373 "Pruning of Amenity trees
- AS 4970 "Protection of trees on development sites"
- AS 4678 "Earth Retaining Structures"

D2.04 SITE REGRADING CONCEPT

1. Areas of a site proposed for building or recreational purposes may not be suitable in their natural state for their intended function without improvement works, the designer shall review the natural surface contours and where necessary shall design finished surface levels that ensure the land is suitably prepared.
2. Excessive site regrading should be avoided, wherever possible site layouts should be developed to position roads and drainage networks to take advantage of natural surface grades. Site layouts that minimise the disturbance of the land will require less erosion and sediment control measures during construction phase and reduce the risk of environmental harm.
3. The designer shall consider the implications of site regrading in relation to the existing natural environment. Generally site regrading shall be minimised in heavily treed areas.
4. The design of site regrading areas preferably should aim to achieve a balanced cut to fill to minimising haulage of imported fill or spoil to and from the development site.

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5. Where practical, areas should be regraded to minimise the necessity for underground drainage systems with surface inlet pits, and allow surface water to flow naturally to roads or drainage reserves without excessive concentration.

D2.05 CLEARING ^{CRC}

1. Unless otherwise approved by Council any pruning and/or protection of trees shall be carried out in accordance with AS4970 "Protection of trees on development sites" and AS4373 "Pruning of Amenity trees"
2. Clearing must be kept to a minimum. Trees and vegetation of significance shall be identified prior to design in order that the amount of disturbance may be minimised through appropriate design.
3. Reference should be made to the Vegetation Management Act and any relevant Local Laws and Policies prior to any tree clearing.
4. Generally, in areas with significant trees and vegetation:
 - a. Roadways clearing shall be limited to the limits of approved earthworks plus a sufficient lateral clearance to ensure that the works are not interfered by the trees or vegetation.
 - b. Allotment clearing shall be limited to the minimum areas required to safely construct services such as sewers and catchment drains, and the limits of approved earthworks to allotments plus a sufficient lateral clearance to ensure the works are not interfered by the trees or vegetation.
5. No trees shall be damaged or removed from areas to be dedicated under the control of Council without prior written approval of Council.
6. Trees on existing roads shall not be damaged or removed without the approval of Council. All trees on existing roads affected by the works shall be shown and details given of proposed protection or relocation methods.
7. Prior to any clearing, all existing and future parkland shall be delineated to ensure its protection from unauthorised clearing.

D2.06 GENERAL STANDARD OF LOT PREPARATION

1. Special requirements will apply where necessary but generally lots are to be cleared of low scrub, fallen timber, debris, stumps, large rocks and any trees which in the opinion of Council are approaching the end of their functional life or are dangerous or will be hazardous to normal use of the development. Prior consultation with Council is necessary. Such requirements shall be shown on the design plan.
2. Class 1, 2 and 3 Pest Plants are to be removed and disposed of in accordance with Land, pest and Stock Route Management Act and Regulation.
3. All timber and other materials cleared from lots shall be removed from the site. All roots, loose timber, etc which may contribute to drain blockage shall be removed.
4. All trees nominated by Council in its conditions of approval shall be preserved by approved means to prevent destruction normally caused by placement of conventional filling or other action within the tree drip zone. Details of the proposed protection measures shall be detailed on the design plans.

D2.07 FILLING

1. If any land is to be filled all practices must ensure compliance with AS 3798, "Guidelines on Earthworks for Commercial and Residential Developments".
2. Fill comprising industrial wastes or by-products is not permitted.
3. No person shall be permitted to fill any land where, in the opinion of Council, such filling will detrimentally affect the area available in any natural or artificial watercourse for either present or estimated future flood flows, or will detrimentally reduce the volume within a flood plain available for the storage of flood waters.
4. No person shall be permitted to fill any land if such filling may detrimentally affect natural drainage of any of the surrounding land.
5. All new allotments are to be flood free. Immunity levels shall be in accordance with relevant Council Policies and Planning Scheme requirements.
6. Every allotment shall be filled and drained to achieve Council's performance criteria, such that an area is available above the adopted flood line, or stipulated flood level, in accordance with the following documents:
 - a. Queensland Urban Drainage Manual (QUDM)
 - b. Council's Local Laws & Policies
 - c. Council's Flooding and Drainage Policies

D2.08 COMPACTION

1. Compaction of earthworks shall be in accordance with AS 3798 - Guidelines on Earthworks for Commercial and Residential Developments.

D2.09 CARTAGE OF SOIL

1. The designer shall nominate in their design submission whether excess spoil is generated by the proposed earthworks and in these cases shall nominate the proposed spoil dump site and external haul route which shall be subject to the written approval of the Council.
2. In cases where the spoil is generated from works within existing declared roads, Council may nominate that the spoil be placed on Council controlled land within 5 km of the project site.
3. Where rock is disposed of on site, the position of the rock is to be approved by Council and shown on the 'as constructed' drawings
4. Unless otherwise approved by Council all topsoil shall be retained on the development site and utilised effectively to encourage appropriate revegetation.

D2.10 ALLOTMENT EARTHWORKS

1. Allotments shall be provided with a minimum finished surface gradient of 0.5%, including catch drains, to facilitate drainage.

D2.11 BATTER TREATMENTS

1. Cut and fill batters shall not straddle allotment boundaries unless otherwise approved by the Council.

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2. Cut batters shall not extend into existing or proposed parks or bushland reserves unless specifically approved by Council. Fill batters may extend into proposed parks or bushland reserves with a maximum slope of 1 in 10 unless otherwise approved by Council.
3. In general cut and fill batters shall be limited to a maximum slope of 1 in 4 (1 in 10 in parks), such that stabilisation is achieved by topsoiling and grassing which can be maintained by conventional tractor slasher.
4. All embankments and cuttings must be outside the road reserve. The toe of any cut batter is to be 300mm inside the property boundary; the top of any fill batter is to be 300mm inside the property boundary.
5. In environmentally sensitive areas or steep terrain, consideration may be given to relaxation of clause 4 subject to council approval
6. Where subdivision roads are constructed in fill and the batter slope exceeds 1 in 2, Council may require an easement over the batter and to a nominated distance past the toe of the batter.
7. Batters in road reserves but outside the verge steeper than 1 in 4 may be retained by a retaining structure subject to approval by the Council.
8. On private land, batters should preferably be 1 in 4 or flatter for batters fronting the road reserve and 1 in 2 elsewhere. Batters steeper than 1 in 2 may be approved subject to the submission of an acceptable landscape treatment.
9. All batters steeper than 1 in 2 and higher than 1.5m shall require certification as to stability by a Geotechnical Engineer.

D2.12 ALLOTMENT ACCESSES

1. The slope of the natural surface can result in difficulty in providing vehicular access to allotments fronting the road. Driveway grades within the property should be limited for safety and amenity. Refer Table 2.1 for Maximum Driveway Grades

Table D2.1 Maximum Driveway Grades

Location	Desirable	Maximum
Residential	16.6% (1 in 6)	20% (1 in 5) for 6m in every 12m
Industrial	10% (1 in 10)	16.6% (1 in 6)
Maximum change in driveway Grades - All areas ¹	8%	10%

Note:

1. Change of grade is expressed algebraically as the change in gradient between the two roadway grades.

2. Steep allotment access and drainage shall be designed and constructed to include the following (unless otherwise approved by council:
 - a. The driveway shall be a minimum of 3 metre wide concrete slab, with barrier kerb and channel provided on one side for vehicular safety and drainage purposes;
 - b. The driveway shall be constructed in such a manner as to ensure that the crossfall of the driveway be one-way and directed into the hill, for vehicle safety and drainage purposes
 - c. A turn around shall be provided adjacent to each of the proposed dwellings sufficient to allow turning movements for an emergency services vehicle;

- d. The driveway shall be located to minimise the visual impact, and minimise the amount of earthworks required; and
- e. Both sides of the areas adjacent to the driveway shall be re-vegetated to minimise visual impact. This information is to be included in the application for engineering approval.

D2.13 RETAINING WALLS

1. All retaining walls must comply with AS4678.
2. Council will allow retaining walls to be constructed up to a maximum height of 1.0m without structural certification provided they constructed fully in accordance with the technical literature provided by the manufacturer (ie. concrete block, Keystone or similar).
3. All retaining walls greater than 1.0m high must be designed, detailed and certified by a structural engineer. Structural certification and geotechnical assessment if required shall be submitted to Council with design submission.
4. Retaining walls shall be designed so as to consider the location of any adjacent services (e.g. sewer). The minimum horizontal clearance between any adjacent services and the outermost edge of the retaining wall structure shall 800mm and outside the zone of influence whichever is the greater. Retaining walls must be designed to ensure that no imposed loads are applied directly to service infrastructure. Retaining walls adjacent to services shall be subject to Council approval.

D2.14 EARTHWORKS ON HILLSLOPES

1. Where earthworks are proposed in any development where the slope of the land exceeds 15% (unless otherwise agreed), Council requires a report from a qualified Geotechnical Engineer addressing slope stability and construction issues.
2. The designer shall incorporate the specific measures and recommendation contained within the geotechnical report to control soil and rock movements into the design of roads and house bench pads.
3. Where batters are 2.0 metres or higher a risk assessment is to be undertaken by the Engineer to determine if fencing is required to be undertaken in accordance with the relevant Australian Standard.

D2.15 EARTHWORKS TO PARKS

1. All earthworks within proposed or existing parkland shall:
 - a. Be adequately drained.
 - b. Have no batters exceeding 1 in 10.
 - c. Have acceptable landscaping in accordance with Council's minimum standards.

D2.16 FOOTPATHS / VERGE CROSSFALL

1. All Footpaths / Verges shall fall from the frontage property boundary to the adjacent kerb and channel with acceptable crossfalls of between 3% - 5%. In the case where the allotment falls away from the road reserve (ie. the allotment is lower than the level of the road), the footpath / verge shall have a minimum fall from the frontage property boundary to the adjacent kerb of 3%.

D2.17 TOPSOILING AND GRASSING

1. Topsoil is defined as surface soils high in organic matter and contaminated by residual grass seeds and grass roots.
2. The area under paved areas, footpaths, batters and areas of fill shall be stripped of topsoil and any other organic matter.
3. On the completion of the works, topsoil shall be re-spread to allotments, batters and footpaths and fill areas to a depth of 75mm with an absolute minimum of 40mm.
4. The footpath areas, batters and all disturbed areas including allotments are to be trimmed and drill seeded with an approved grass species.
5. All cut and fill batters shall be hydromulched or approved equivalent.

D2.18 INSPECTION REQUIREMENTS

1. Inspections and testing requirements for all allotments and roads shall be to Level 2 in accordance with AS 3798 - Guidelines on Earthworks for Commercial and Residential Developments.
2. A higher level of inspection and testing may be required for more significant works as determined by Council.
3. Council may approve a lower level of inspection and testing for minor works and drainage works.