



ENGINEERING DESIGN GUIDELINES

SITE REGRADING

Planning Scheme Policy No. 15.06

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1 Scope and general

1.1 Scope

This Design Guidelines sets out requirements for the site regarding involved in Council works and land development and subdivision to be approved by Council.

The scope of this Guideline assumes that the Designer is familiar with requirements cited in the various construction specifications, specifically those related to earthworks, clearing and grubbing, erosion and sedimentation.

Additionally, the Designer will need to make reference to the associated design Guidelines related to stormwater drainage design, geometric road design and erosion control and stormwater management.

1.2 Objective

This Guideline aims to assist the Designer in achieving:

- Efficient and economical design
- Enhancement of the environmental character of the site whilst maintaining the natural features of the site
- Provision of safe conditions for construction commensurate with the proposed purpose of the works
- A minimal impact on adjoining properties and other works.

1.3 Reference and Source Documents

(a) Council Guidelines & Specifications

Design Specifications

D1	Geometric Road Design
D5	Stormwater Drainage Design
D7	Erosion Control and Stormwater Management
D20	Drawings and Documentation
Standard Drawings (various)	

Construction Specifications

C211	Control of Erosion and Sedimentation
C212	Clearing and grubbing
C213	Earthworks
C273	Landscaping

(b) Australian Standards

AS 3798	Guidelines on earthworks for commercial and residential developments
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(c) QLD State Authorities

State Planning Policy 1/03	Mitigating the adverse impact of Flood, Bushfire and Landslide
State Planning Policy 2/02	Planning and Managing Development involving Acid Sulfate Soils

1.4 Site Regrading Concept

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 to:

- a. Alleviate flooding of low-lying ground
- b. Fill gullies or create emergency flowpaths after underground stormwater piping has been installed
- c. Allow improved runoff from flat ground
- d. Allow effective recreational use or give reasonable access.

Where natural surface levels are above the 100yr ARI flood level or the designated storm surge level excavation to lower levels will not be permitted.

Filling of land below the 100yr ARI flood level or the designaed storm surge level will only be permitted where justification is provided to Council that:

- The filling will not have a detrimental effect on other land; or
- That the proposed filling is in the public interest to an extent that outweighs any detrimental effects on other lands.

The Designer shall review the natural surface contours and where necessary shall design finished surface levels that ensure the land is suitably prepared.

Where practical, areas should be regraded to minimise the necessity for interallotment drainage systems and allow overland water to flow naturally to roads or drainage reserves without excessive concentration.

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.

Care shall be taken to provide depressions for overland flow from low points and over major drainage lines, to direct stormwater for storms up to a 100 year average recurrence interval (ARI).

The designer shall ensure that design for the regrading does not result in the diversion and ponding of stormwater from the development onto adjoining land, or that stormwater is not diverted from one adjoining land onto another.

The design of site regrading areas, in conjunction with the design of roadworks, shall be considered with the objective of balancing cut to fill and achieving both an economical works and to minimise the haulage of imported fill or spoil to and from the works site.

1.5 Special Treatment of Particular Areas

In the event that an area is known to be affected by or inundated by local stormwater flows, the designer shall investigate the existing conditions as they relate to the proposed Works and advise Council in a preliminary report on all data obtained in the investigation and recommend appropriate contour adjustments. The report shall be accompanied by sketch plans to clarify recommendations.

Constraints either natural or otherwise are to be identified as a burden on the developed site. It is recommended that the Designer take this into account when preparing the design. The property may ultimately be affected by a “*restriction as to user*”, which may be controlled by a legal instrument placed on title to the land advising prospective purchasers of any restrictions affecting the land.

The proposed finished surface or filled area shall be designed to levels allowing an adequate minimum cover depth over the pipeline (if piped) and permitting surface stormwater flow to be guided to field inlet pits if depressions are retained in the finished surface contouring.

A geotechnical report is required to be provided with the site regrading plan specifying:

- the site specific preparation and compaction requirements;
- the suitability of the site for the proposed earthworks & any constraints that the earthworks would create for further development; and
- the resulting effects of the proposed earthworks.

A description of the minimum acceptable quality of the fill shall also be specified on the plans, supported by geotechnical recommendations.

The finished surface of any allotment shall be designed to comply with Council's standard drawing.

Development in areas containing natural ground slopes of an excessively steep nature, ie greater than 15%, shall conform to the requirements of State Planning Policy 1/03.

1.6 General Standard of Site Preparation

Generally, clearing shall be kept to a minimum; however, the site is to be cleared of 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.

Trees and vegetation of significance shall be identified prior to design in order that the amount of disturbance may be minimised through appropriate design.

In areas with significant trees or vegetation, the extent of clearing shall generally be limited to:

- a. Clearing roadways to the limit of approved earthworks plus a sufficient lateral clearance to ensure that the trees or vegetation do not interfere with the works.
- b. Allotment clearing 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 that the trees or vegetation do not interfere with the works.

All timber and other materials cleared from the site shall be removed and legally disposed of. All roots, loose timber, etc which may contribute to future drain blockage shall be removed.

No incineration of cleared vegetation is permitted.

In areas to be filled over the butts of trees, allowance is to be made for clearing of all trees and replanting with advanced species, the number and type of which shall be approved by Council.

All replanting to be clear of probably future building location, and not to be commenced until filling have been completed and graded, with provision for watering and maintenance for duration of the contract. These specific requirements shall be shown on the Drawings.

Trees on existing roads shall not be damaged or removed without the approval of Council.

No trees that are located on land to be dedicated under the control of Council shall be removed or damaged without written approval. Such requirements shall be shown on the Drawings.

Selected trees shall be preserved by approved means to prevent destruction normally caused by placement of conventional filling or other action within the tree drip zone. The details of the protection or relocation of selected trees shall be shown on the Drawings.

In rural developments, the recommendations of the Queensland Fire and Rescue Authority (Rural Fire Division) are to be sought and considered by the designer.

Where surplus or unsuitable material is to be disposed of outside the site the designer shall note on the drawings a requirement that the Contractor shall obtain an Operational Works Permit from Council prior to placing the material at the disposal site.

Where surplus or unsuitable material is proposed to be disposed of on parkland or road reserves, the designer shall submit details and seek separate approval prior to the lodgement of an Operational Works Application.

Where the surplus material is generated from works from within existing declared road reserves, Council may nominate that the spoil be placed on Council controlled land within 5 km of the project site.

The extraction of material from within existing road reserves requires the approval of DPI – Forestry, who may levee a royalty to be paid by the contractor.

2 Design Detail

2.1 Fill Embankments

The designer shall take into account the requirements of AS 3798 "Guidelines on Earthworks for Commercial and Residential Developments" and State Planning Policy 2/02 in the design of any filling.

All materials proposed for use in fill embankments, regardless of location, shall be suitable for the purpose.

Fill comprising natural sands or industrial wastes or by-products may only be used after the material type and location for its use is approved by Council and will be subject to specific requirements determined by prevailing conditions.

All fill areas shall be subject to a geotechnical assessment to ensure their stability.

Where the volume of fill material to be imported to the site exceeds 2,500 m³ (loose), the designer/contractor shall submit details of the following information and seek separate approval.

- Proposed source
- Volume of material required
- Proposed transport route – the route must take particular care to minimise any adverse impacts upon residents and businesses
- Proposed time of cartage – start and finish times and days per week.

In considering the most appropriate haul route, the designer shall refer to Council for acceptable haul roads and details of any applicable load limits timing.

Council may require contributions toward the cost of any accelerated pavement degradation along the haul route and will additionally request a bond to cover the cost of any pavement repairs to the approved route.

Where embankments require maintenance by conventional machinery, then the maximum transverse slope shall be 1:5, with the absolute maximum being 1:4 over short sections.

The grading of allotments shall be in accordance with the requirements detailed in Council's standard drawing. Generally, the following principles are to apply:

- a. Allotments should preferably drain to the street, where practicable
- b. Where significant allotment areas drain to the rear, or other adjoining allotment, then interallotment drainage shall be provided
- c. The following minimum allotment grades are to apply
 - Residential 1:200
 - Commercial/Industrial 1:300

2.2 Batter Treatments

The designer shall ensure that no cut or fill batters extend into an existing or proposed road, parkland or allotment, without specific prior approval.

Where Council approval to fill adjoining lands has been given, the designer shall ensure that the filling complies with the following criteria:

- a. Provision of a 1m minimum wide strip of land inside the adjoining allotment, having a slope between 1:20 and 1:200 and
- b. The batter slope shall be a maximum of 1:5. The designer must provide the written approval of the adjoining property owner to Council.

Where Council approval to fill adjoining lands has been given, the designer shall ensure that the filling complies with the following criteria:

- Cut 1:2.5
- Fill 1:2.5

2.3 Levels

The final level of any filling on an allotment shall be in accordance with the requirements of Council's Planning Scheme. The development level makes allowance for:

- Storm Surge where the 'Minimum Level' shall be the 1 in 100 year frequency tidal surge plus an allowance factor for safety, stormwater drainage freeboard and minor wave run-up with this level being assessed as:
 - Mackay Urban Area ("Existing Areas") RL 5.4 m AHD
 - Ball Bay/ Haliday Bay/ Seaforth RL 5.3 m AHD
 - Midge Point RL 5.0 m AHD

The minimum finished ground level for such lots shall be at or above the DFE or not less than 400mm below the defined "Minimum Level" for the location.

Note, the 'Minimum Level' is raised by 600mm when the site is located within 100m of the foreshore.

- River, stream & local flooding where the Defined Flood Event is the 1 in 100 year ARI flood event which shall cause the highest flood level at the allotment in question.

2.4 Access

The designer shall ensure that the footpath crossfall and batter grades comply with the following requirements, to enable appropriate vehicle access to each allotment to be achieved:

- a. The first 3 m from kerb and channel to be 2%
- b. Balance of verge

Max 1:6 (17%)
Min 1:50 (2%)
- c. Within allotment

Residential	Desirable	1:6 (17%)
	Absolute	1:4 (for a minimum distance of 6 m from front boundary)
Rural	Desirable	1:6 (17%)
	Absolute	1:5 (20%)
Industrial	Desirable	1:10 (10%)
	Absolute	1:16 (17%)

- d. Accesses to 'hatchet' allotments are to be connected to the kerb and channel for the full length of the access 'handle' with 3 m (minimum) wide paved driveway.
- e. Any concrete inverts are to be built in accordance with Council's standard drawings.

Unless specifically excluded in the development approval, the designer shall ensure that an access is provided to all rural allotments. The access shall be built in accordance with Council's standard drawings.

Accesses to rural allotments that are at a slope greater than 1:10 (10%) shall be paved and sealed or concreted.

The designer may be required to demonstrate to Council's satisfaction that practical access can be provided to all allotments and also to a building envelope within the allotment boundary.

2.5 Standard of Fill for Sites

Where fill is required, the designer shall ensure that the following notations, and the items addressed in paragraphs 2 to 5 below, are incorporated in the *Special Requirements Clauses in the Construction Specification C213 – Earthworks*.

"Fill is to be sound clean material, of reasonable standard and free from large rock, stumps, organic matter and other debris."

"Placing of fill on the prepared areas shall not commence until the authority to do so has been obtained from the Superintendent".

Fill comprising natural sands or industrial wastes or by-products may only be used after the material type and location for its use is approved by Council and will be subject to specific requirements determined by prevailing conditions.

It is essential that the designer give prior advice to Council of any intended use of such materials. It should be noted that failure to obtain Council's approval may lead to an order for removal of any material considered by Council or other relevant authorities as unsuitable or in any way unfit for filling.

All work shall be in accordance with AS 3798. Fill is to be placed in layers not exceeding 150 mm compacted thickness. All fills are to be compacted to 95% standard maximum dry density. Maximum particle size shall be 2/3 of the layer thickness.

The area under paved areas, footpaths, batters and areas of fill shall be stripped of topsoil and any other organic materials.

2.6 Topsoiling and Grassing

All areas where filling has been placed are to be dressed with clean arable topsoil, fertilised and sown with suitable grasses. This work shall be carried out in accordance with the Construction Specification C273 – Landscaping.

Topsoil shall be spread to a depth of 75 mm.

Topsoil is defined as surface soils that are high in organic matter and contaminated by residual grass seeds and grass roots.

The Drawings shall be annotated as follows:

"All topsoil shall be retained on the site and utilised effectively to encourage appropriate revegetation."

All areas are to be seeded/turfed, watered and fertilised to obtain a minimum of 80% grass coverage within 6 months of the work being accepted "on maintenance" by Council.

Designers are to ensure that the full width of the verge is to be seeded / turfed.

2.7 Retaining Walls & Rock Protected Slopes

A suitably qualified and experienced professional structural engineer (RPEQ) shall design all retaining walls and rock protected slopes and also provide appropriate certification to design.

Any building restrictions within the lot which occurs as a result of the design or construction of the retaining wall is to be identified on the Drawings. This may also result in Council requiring a covenant being placed on the lot title, or requiring a building envelope being placed on the lot.

The only exceptions are walls that have no surcharge loading and are less than 1 m high.

Retaining walls are to be located in general on the allotment which contains the earthworks which gives rise to the need for the retaining wall. Where a retaining wall is required on the boundary between a lot and a road reserve if the earthworks are part of the works required for the creation of the lot, then the retaining wall must be located within the lot.

All walls retaining road or parkland fill are to be located within the road or parkland reserve.

The designer shall ensure that permanent fencing (of a type approved by Council) having a minimum height of 1.2 m shall be provided on retaining walls located on future public land.

2.8 Effect on Adjoining Properties

Where it is proposed to divert or direct piped stormwater into adjoining properties, drainage easement rights are to be created over the adjoining lots in accordance with the Guideline D5 – Stormwater Drainage Design.

3 Special Requirements

3.1 Temporary Diversion Drains

Where temporary drains are required to divert surface flows away from the site regarding area, the location and silt/erosion control treatment shall ensure minimal soil disturbances and material loss off the site.

The designer shall include any requirements identified in the Engineering Design Guideline D7 – Soil and Water Quality Management for any additional requirements.