



WESTERN AUSTRALIA
DEVELOPMENT DESIGN
SPECIFICATION

D6

SITE REGRADING

Amendment Record for this Specification Part

This Specification is Council's edition of the AUS-SPEC generic specification part and includes Council's primary amendments.

Details are provided below outlining the clauses amended from the Council edition of this AUS-SPEC Specification Part. The clause numbering and context of each clause are preserved. New clauses are added towards the rear of the specification part as special requirements clauses. Project specific additional script is shown in the specification as italic font.

The amendment code indicated below is 'A' for additional script 'M' for modification to script and 'O' for omission of script. An additional code 'P' is included when the amendment is project specific.

Amendment Sequence No.	Key Topic addressed in amendment	Clause No.	Amendment Code	Author Initials	Amendment Date
1	<i>Site Regrading Concept</i>	<i>D6.04(1)</i>	A	<i>ykw</i>	<i>October 2009</i>
2	<i>Flooding</i>	<i>D6.05(1)</i>	M	<i>ykw</i>	<i>October 2009</i>
3	<i>Topsoil</i>	<i>D6.11(2)</i>	A	<i>ykw</i>	<i>October 2009</i>

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DEVELOPMENT DESIGN SPECIFICATION D6 - SITE REGRADING

GENERAL

D6.01 SCOPE

1. This Design Specification sets out requirements for the site regrading involved in land development and subdivision. Conceptual requirements are presented as necessary considerations when preparing designs for site regrading.

2. The scope of this Specification 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 needs to make reference to the associated design specifications related to stormwater drainage design, geometric road design and erosion control and stormwater management.

***Familiarity
with other
Specifications
Required***

D6.02 OBJECTIVES

1. This Specification aims to assist the Designer in achieving:

Efficient

- 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 development
- equality of building conditions for residential development
- a minimal impact on adjoining properties and developments.

Environmentally Sound

Safe for Construction

Impact on Adjoining Properties

D6.03 REFERENCE AND SOURCE DOCUMENTS

(a) Council Specifications

Construction Specifications

- C211 - Control of Erosion and Sedimentation
- C212 - Clearing and Grubbing
- C213 - Earthworks

Design Specifications

- D1 - Geometric Road Design
- D5 - Stormwater Drainage Design
- D7 - Erosion Control and Stormwater Management

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(b) Australian Standards

- AS 3798 - Guidelines on earthworks for commercial and residential developments
- AS 2870.1 - Residential slabs and footings - Construction.

D6.04 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 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) Regrade excessively steep slopes that would preclude economical construction of dwelling foundations
- (e) Allow effective recreational use or give reasonable access

The Consultant shall review the natural surface contours and where necessary shall design finished surface levels that ensure the land is suitably prepared. The expected minimum site classification according to AS 2780 for prepared sites shall be Class S for urban subdivision and Class M for rural subdivision (over the building envelope only for rural subdivision).

2. 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.

Drainage

3. The Consultant shall consider the implications of site regrading in relation to the existing natural environment. Generally site regrading shall be minimised in heavily treed areas.

Natural Environment

4. 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.

Overland Flow

5. 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 development and minimising haulage of imported fill or spoil to and from the development site. Bulk haulage should always be considered an adverse effect on adjacent development, and infrastructure.

Minimal Road Haulage

D6.05 SPECIAL TREATMENT OF PARTICULAR AREAS

1. Areas abutting the 1% AEP Flood levels shall be site regraded to a minimum level of 0.5 metres above the 1% AEP Flood levels or as directed by the Department of Water. In doing so, the Designer shall ensure that other areas are then not affected by flooding. The site shall be identified on the Drawings with appropriate notation of site specific requirements.

Flooding

2. 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 development and advise the Developer in the preliminary design report on all data obtained in the investigation and recommend appropriate contour adjustments.

Inundation Areas

The report should normally be accompanied by sketch plans to clarify recommendations.

3. Site constraints either natural or otherwise may be required to be identified as a burden on developed property. 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 covenant placed on title to the land advising prospective purchasers of any restrictions affecting the land.

***Restrictions
on Land Use***

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

***Piped Gullies
or
Depressions***

5. The location of such features shall be clearly defined on the site regrading plans and defined by distance to corner boundaries, monuments, etc for purposes of relocation at the geotechnical testing stage for work as executed plans. A geotechnical report specifying the site specific preparation and compaction requirements will be required to be incorporated with the site regrading plan. A description of the minimum acceptable quality of the fill shall also be specified on the plans, supported by geotechnical recommendations. All documentation necessary from various authorities to support the filling of dams and watercourses shall be supplied with the design plans.

***Dams and
Water Courses***

6. The finished level of any building area shall be designed to ensure a desirable surface grading of 1.5% (1% minimum) oriented in the direction of the drainage system designed to cater for its catchment.

Flat Ground

7. Building areas containing natural ground slopes of an excessively steep nature, ie greater than 15% shall be brought to the attention of a Geotechnical Engineer for investigation of compatibility with dwelling types proposed. Specific requirements shall be noted on the design plans.

Steep Slopes

8. In known salt affected areas, or areas found to be salt affected by the geotechnical investigations, the Designer shall evaluate the existing conditions as they relate to the proposed development. The Designer shall also take advise from the relevant land and water resource authority and advise the Developer, in the preliminary design report, of areas requiring action to prevent salinity development. Appropriate regrading strategies aimed at lowering the groundwater table should also be included in the preliminary design report together with primary measures to prevent extension of salinity problems.

***Salinity
Prevention***

D6.06 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's Representative is necessary. Such requirements shall be shown on the design plan.

Clearing

2. 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. Such requirements shall be shown on the design plan.

Disposal

3. In areas to be filled over butts of trees, allowance is to be made for clearing of all trees and replanting with a minimum of six (6) advanced suitable species to each lot; planting to be clear of probable future building location, and not to be commenced until filling has been completed and graded, with provision for watering and maintenance for duration of the contract. These specific requirements shall be shown on the design plans.

***Overfilling
Area of Trees***

4. 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

***Preservation
of Trees***

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zone. The Council's Representative shall be consulted for advice and all specific requirements noted on the design plans.

D6.07 STANDARD OF FILL FOR LOTS

1. The following notations are to be incorporated in the design plans. "Filling is to be of sound clean material, reasonable standard and free from large rock, stumps, organic matter and other debris." "Placing of filling on the prepared areas shall not commence until the authority to do so has been obtained from the Council".

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

Fill Quality

3. 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.

Restricted Fill

4. It is essential that prior advice be given of 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.

Prior Approval

5. 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 for LANDSCAPING

Top Dressing

D6.08 TEMPORARY DIVERSION DRAINS

1. Where temporary drains are required to divert surface flows away from the site regrading area, the location and silt/erosion control treatment shall be clearly identified on the engineering plans. The scale of such works shall reflect the volume of water to be diverted.

Erosion

The objective will be to ensure minimal soil disturbances and material loss off the site.

Control measures will include, but not be limited to:

- (a) Provision of trench stops every 30m along a trench, with provision for overtopping to be directed to the kerb.
- (b) Placement of "blue metal" bags along kerb at maximum 30m spacings.
- (c) Placement of "blue metal" bags around downstream drainage pits.

The requirements identified in Council's Specification D7 should be addressed for any additional requirements.

D6.09 CONCURRENCE WITH THE DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP)

1. The Consultant is recommended to refer to the DEP with regard to any items requiring specific consideration when preparing a site regrading plan. Such plans may need to incorporate sediment/siltation/erosion/salinity control devices with specific reference to the stage at which these are to be provided. The responsibility shall rest with the consultant/ developer to make enquiries with DEP and subsequently obtain Council approval to proposed measures.

DEP

D6.10 WORK AS EXECUTED PLANS

1. The Consultant shall annotate on the site regrading plan, the site specific detail to be shown on the Work-as-Executed plans. Such detail shall include geotechnical report certifying the works to be suitable for the intended purpose and any other certifications, testing and survey data, as required in this specification.

D6.11 CARTAGE OF SOIL

1. The Consultant shall refer to Council for acceptable haul roads with applicable load limits. This detail shall be required to be shown on the site regrading plan. The payment of a Bond may be required by the developer/contractor where Council has some concern about the ability of a haul road to sustain the loads without undue damage or maintenance requirements.

Possible Bond Requirement

2. Unless specific application is made to Council and approval obtained, the plans will be annotated as follows:

Topsoil

"All topsoil shall be retained on the development site and utilised effectively to encourage appropriate revegetation. No topsoil shall be respread on lots except on verges and public open space."

D6.12 EFFECT ON ADJOINING PROPERTIES

1. 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 Specification for STORMWATER DRAINAGE DESIGN

Stormwater Easement

2. A written agreement shall also be sought to carry out construction work on adjoining properties and all such agreements are to be submitted to Council.

Construction Agreement

SPECIAL REQUIREMENTS

D6.13 RESERVED

D6.14 RESERVED

D6.15 RESERVED