DEVELOPMENT CONSTRUCTION SPECIFICATION

C211

CONTROL OF EROSION AND SEDIMENTATION

SPECIFICATION C211 - CONTROL OF EROSION AND SEDIMENTATION

CONTENTS

SPECIFICATION C211
CONTROL OF EROSION AND SEDIMENTATION

GENERAL

C211.01 SCOPE

1. The work to be executed under this Specification consists of the construction of structures and the implementation of measures to control erosion and sedimentation. These may be temporary or permanent.

2. The Contractor shall plan and carry out the whole of the Works to avoid erosion and sedimentation of the site, surrounding country, watercourses, waterbodies and wetlands.

C211.02 REFERENCE DOCUMENTS

1. Documents referenced in this specification are listed in full below whilst being cited in the text in the abbreviated form or code indicated.

Documents Standards Test Methods

(a) Council Specifications

C212	-	Clearing and Grubbing
C213	-	Earthworks
C273	-	Landscaping

(b) RTA Test Methods

T166	-	Determination of Relative Compaction.

(c) State Legislation

Protection of the Environment (Operations) Act 1997
Soil Conservation Act, 1938
Water Act, 1912

(d) Other

NSW Department of Infrastructure, Planning & Natural Resources (DIPNR) (formerly Dept of Land and Water Conservation (DLWC))
Urban Erosion and Sediment Control

C211.03 EROSION AND SEDIMENTATION CONTROL PLAN

1. For consideration of erosion and sedimentation control measures, the site shall be subdivided into sections based on the catchment area draining to each permanent drainage structure in the works. In addition to the area bounded by the road reserve, the sections shall include:

Site Sections

(a) Access and haulage tracks,

(b) Borrow pits and

(c) Compound areas, such as Contractor's facilities and concrete batching areas.

2. If any construction works are within 40 metres of a watercourse no work is to commence on the site until a part 3A permit and approval of the Erosion Sediment Control Plans have been issued by the Department of Infrastructure, Planning & Natural Resources (DIPNR). ***Integrated Development***

3. The Plan shall consist of scale diagrams indicating: ***Plan Inclusions***

(a) Features of the site including contours and drainage paths,

(b) Relevant construction details of all erosion and sedimentation control structures,

(c) All permanent and temporary erosion and sedimentation control measures, including the control measures to be implemented in advance of, or in conjunction with, clearing and grubbing operations as required under Specification C212 - CLEARING AND GRUBBING,

(d) An order of works based upon construction and stabilisation of all culverts and surface drainage works at the earliest practical stage, and

(e) Proposed time schedules for construction of structures and implementation of measures to control erosion and sedimentation.

4. The following publications provide guidance on typical permanent and temporary erosion and sedimentary control measures which may be required and guidance in the preparation of an Erosion and Sedimentation Control Plan: DLWC publication Urban Erosion and Sediment Control, EPA publication Managing Urban Stormwater and Dept. of Housing publication Managing Urban Stormwater. ***Guidance***

5. Any approval of the Erosion and Sedimentation Control Plan from DIPNR. Or Council shall not relieve the Contractor of the full responsibility to provide whatever measures are required for effective erosion and sedimentation control at all times. ***Contractor's Responsibility***

6. The Contractor shall adhere to the approved Erosion and Sedimentation Control Plan. The Contractor shall submit a revised Erosion and Sedimentation Control Plan for approval by Council fourteen days in advance of any intended variation from the approved plan. ***Adherence to Plan***

C211.04 EROSION AND SEDIMENTATION CONTROL MEASURES

1. Erosion and sedimentation control measures shall include, but shall not be limited to, the following: ***Scope***

(a) The installation of permanent drainage structures before the removal of topsoil and commencement of formation earthworks within the catchment area of each structure.

(b) The prompt completion of all permanent and temporary drainage works to minimise the period of exposure of disturbed areas.

(c) The stabilisation of diversion and catch drains to divert uncontaminated runoff from outside the site, clear of the site. Catch drains shall be installed and lined, as specified or as directed by Council's Development Engineer, before the adjacent ground is disturbed and the excavation is commenced.

(d) The passage of uncontaminated water through or around the site without mixing with contaminated runoff from the site.

(e) The provision of contour and diversion drains across exposed areas before, during and immediately after clearing and the re-establishment and maintenance of these drains during soil removal and earthworks operations.

(f) The provision of sediment filtering or sediment traps, in advance of and in conjunction with earthworks operations, to prevent contaminated water leaving the site.

(g) The restoration of the above drainage and sedimentation control works on a day-to-day basis to ensure that no disturbed area is left without adequate means of containment and treatment of contaminated water.

(h) The limitation of areas of erodible material exposed at any time to those areas being actively worked.

(i) The minimisation of sediment loss during construction of embankments by means such as temporary or reverse superelevations during fill placement, constructing berms along the edge of the formation leading to temporary batter flumes and short term sediment traps.

(j) The progressive vegetation of the site, in accordance with Specification C273 - LANDSCAPING, as work proceeds.

PERMANENT EROSION AND SEDIMENTATION CONTROL

C211.05 EARTHWORKS FOR PERMANENT EROSION AND SEDIMENTATION CONTROL BASINS

Planned Levels

1. Earthworks for permanent erosion and sedimentation control basins shall be to the planned levels and dimensions shown on the Drawings or such levels and dimensions as determined by Council's Development Engineer.

Site Preparation

2. The entire storage and embankment foundation area of permanent erosion and sedimentation control basins shall be cleared in accordance with Specification C212 - CLEARING AND GRUBBING and shall be stripped of topsoil and any unsuitable material under embankments removed in accordance with Specification C213 - EARTHWORKS.

95% Compaction Requirements

3. The embankments shall be constructed in layers not exceeding 200 mm in depth and compacted so that the relative compaction, determined by Test Method T166, shall not be less than 95 per cent for standard compactive effort.

C211.06 INLETS, SPILLWAYS AND LOW FLOW OUTLETS FOR SEDIMENTATION CONTROL BASINS AND SEDIMENT TRAPS

Rock Mattresses

1. Inlets and spillways shall be constructed using rock filled woven galvanised steel mattresses laid on a needle punched, mechanically bonded, non-woven geotextile filter fabric, as shown on the Drawings or as directed by Council's Development Engineer. The rock filled mattresses shall be laid in accordance with the manufacturer's instructions and Specification.

Plastic Pipe Outlet

2. A low flow outlet consisting of a 150 mm diameter plastic pipe shall be installed as shown in the Drawings.

C211.07 DROP INLET SEDIMENT CONTROL

Time of Construction

1. Drop inlet sediment traps and inlet control banks shall be constructed on completion of each gully pit unless otherwise directed by Council's Development Engineer. These drop inlet sediment traps and inlet control banks are additional to the temporary sedimentation control measures that may be required under Clause C211.10 during construction of the gully pits.

Purpose

2. The drop inlet sediment traps are intended to remove sediment from the surface flow before it enters the drainage system. The inlet control banks shall be constructed as required to prevent the surface flows bypassing the gully pits.

Control Banks

3. The drop inlet sediment traps shall be constructed as shown on the Drawings. The associated inlet control banks shall consist of at least two courses of sandbags containing a 10:1 sand/cement mix. The bags shall be keyed at least 25 mm into the surface, dampened sufficiently to ensure hydration of the cement and tamped lightly to provide mechanical interlock between adjacent bags.

C211.08 CLEANING SEDIMENTATION CONTROL STRUCTURES

Contractor's Responsibility

1. The permanent sedimentation control structures shall be cleaned out whenever the accumulated sediment has reduced the capacity of the structure by 50 per cent or more, or whenever the sediment has built up to a point where it is less than 300 mm below the spillway crest. Prior to issue of the Subdivision Certificate, all permanent sedimentation control structures shall be cleaned out

Removal of Sediment

2. Accumulated sediment shall be removed from permanent sedimentation control structures in such a manner as not to damage the structures. The sediment removed shall be disposed of in such locations that the sediment will not be conveyed back into the construction areas or into watercourses. Suitable access to permanent sedimentation control structures to allow cleaning out in all weather conditions shall be provided and maintained.

C211.09 REMOVAL OF SEDIMENTATION CONTROL STRUCTURES

Restoration

1. Prior to the end of the maintenance period, Council's Development Engineer may direct the removal and restoration of any sedimentation control structures or devices. The work shall result in the restoration of the ground surface disturbed by the construction of any sedimentation control structure or device to approximate that previously existing and shall include:

   (a) Removal of the rock mattresses from the spillway and their subsequent burial into the basin area or their use as scour protection or their removal from site,

   (b) Spreading and compaction of the embankment material into the basin area and

   (c) Removal of access roads.

Compaction

2. The disturbed material shall be compacted to at least the relative density of the material existing in the adjacent ground.

Landscaping

3. Landscaping in the restored area shall be carried out in accordance with Specification C273 LANDSCAPING.

TEMPORARY EROSION AND SEDIMENTATION CONTROL

C211.10 GENERAL

1. The Developer shall ensure that effective erosion and sedimentation control measures are installed and maintained at all times during the development of the site. ***Responsibility***

2. Runoff from all areas where the natural surface is disturbed by construction, including access roads, depot and stockpile sites, shall be free of pollutants as defined in the Protection of the Environment (Operations) Act 1997 before it is either dispersed to stable areas or directed to natural watercourses. The Contractor shall be responsible for all temporary erosion and sedimentation control measures required for this purpose, and in this regard shall endeavour to prevent erosion and sediment transport occurring or control it at the source, rather than at the discharge point from the development site. ***Pollutant Free*** ***Source Control***

3. The Developer shall provide and maintain slopes, crowns and drains on all excavations and embankments to ensure satisfactory drainage at all times. Water shall not be allowed to pond on the works unless such ponding is part of an approved Erosion and Sedimentation Control Plan. ***Maintenance***

C211.11 TEMPORARY DRAINS

1. Runoff from areas exposed during the work shall be controlled by construction of temporary contour drains and/or temporary diversion drains. Generally, a temporary contour drain or temporary diversion drain takes the form of a channel constructed across a slope with a ridge on its lower side. These may require progressive implementation and frequent alteration as the work progresses. ***Control of Runoff***

2. Contour drains, which follow points on the natural surface of approximately the same elevation, shall be provided immediately after a construction site is cleared to intercept and divert runoff at non-erosive velocities from the site to nearby stable areas. Contour drains shall be formed with a grade of neither less than 1 per cent nor more than 1.5 per cent and shall be spaced at intervals of neither less than 20 m nor more than 50 m, depending on the erodibility of the exposed soil. Contour drains shall be constructed as shown on the Drawings. ***Contour Drains***

3. Diversion drains shall be provided across haul roads and access tracks when such roads and access tracks are identified as constituting an erosion hazard due to their steepness, soil erodibility or potential for concentrating runoff flow. Diversion drains shall be formed to intercept and divert runoff from the road or track to stable outlets. Spacing of diversion drains shall not be greater than that required to convey runoff at non-erosive velocities. ***Diversion Drains***

C211.12 TEMPORARY SEDIMENT TRAPS

1. Temporary sediment-trapping devices shall be provided during construction to remove sediment from sediment-laden runoff flowing from all disturbed areas before the runoff enters natural watercourses or adjacent land. ***Sediment Traps***

C211.13 BATTER PROTECTION

1. The Developer shall take all necessary action to protect batters from erosion during the development of the site. ***Responsibility***

2. Scour of newly formed fill batters during and after embankment construction shall be minimised by diverting runoff from the formation away from the batter until vegetation is established. ***Scour Control***

C211.14 MAINTENANCE AND INSPECTION

1. The Developer shall inspect all temporary erosion and sedimentation control works after each rain period and during periods of prolonged rainfall. Any defects revealed by such inspections shall be rectified immediately and these works shall be cleaned, repaired and augmented as required, to ensure effective erosion and sedimentation control thereafter. ***Responsibility***

2. The Developer shall provide and maintain access from within the road reserve or from other locations acceptable to Council's Development Engineer, for cleaning out sedimentation control works. ***Access***

3. The Developer shall cause a register to be maintained that lists all sedimentation and erosion control devices installed on the site, records the date of their inspection, such inspection to be no less frequent than weekly, their condition, and any maintenance, cleansing or desilting work conducted thereon. The register shall be made available for inspection to Council's Development Engineer on demand. ***Inspection Register***

C211.15 REMOVAL

1. The Developer with Council's Development Engineer's approval shall remove all temporary erosion and sedimentation control works when revegetation is established on formerly exposed areas. All materials used for the temporary erosion and sedimentation control works shall be removed from the site or otherwise disposed by the Developer to the satisfaction of Council's Development Engineer. ***Responsibility***