USE OF AUS-SPEC PUBLICATIONS

1. Greater Taree City Council grants a non-exclusive Licence to the end user for the use of Greater Taree City Council AUS-SPEC Specifications and hereafter referred to as “AUS-SPEC”.

2. AUS-SPEC will only be used for works where Greater Taree City Council is a Consent Authority for, or owner or operator or manager of, assets, or consultant to same.

3. No copying or modification of AUS-SPEC documents is permitted unless authorised by Greater Taree City Council in writing.

4. The end user shall be responsible for the correct application of AUS-SPEC. The end user acknowledges that Standards Australia, IPWEA and Greater Taree City Council have no control over and cannot influence the circumstances in which AUS-SPEC may be used by the end user and, accordingly, the end user agrees to indemnify and hold harmless Standards Australia, IPWEA and Greater Taree City Council against all actions, suits, proceedings, claims, demands, costs or losses whatsoever which may be brought, commenced or made against them, either jointly or separately, or which may be suffered by them or any of them in respect of the use of AUS-SPEC.

5. This License is personal and shall not be assigned, and the end user shall not allow any other person to use or have access to AUS-SPEC.

6. This Agreement shall be governed and construed in accordance with the laws of New South Wales.

7. These Licence conditions are deemed to have been accepted by the end user.

Greater Taree
CITY COUNCIL

DEVELOPMENT DESIGN SPECIFICATION

D7

EROSION CONTROL AND STORMWATER MANAGEMENT

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 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	IPWEA Mid North Coast Working Party Review	D07	A,O,M	HC	Jan 2001
2	Complete revision for GTCC LGA	All	A,O,M	GTCC	Sept 2005

CLAUSE **CONTENTS** **PAGE**

EROSION CONTROL AND STORMWATER MANAGEMENT

GENERAL

D7.01 SCOPE

1. This specification details the information relating to stormwater quality required to accompany development applications and construction certificate applications. Or in the case of Council or Authority works, Part V assessments and detailed engineering plans. ***Specification Details***

2. Works covered by this specification include any land development or use including private, Council or another authority works which may impact on the quality and quantity of runoff discharging from the site or to any natural or artificial waterway or water body. It includes, but, is not limited to construction operation and use of: ***Minimise Sedimentation***

- Subdivisions
- Buildings, structures and surrounds
- Earthworks, dams, lakes, roadworks and drainage works
- Trenches, piplines
- Development site works (access roads, car parks, landscaping, drainage works, pedestrian facilities fencing etc)
- Extract industries
- Mining

D7.02 AIMS

1. To limit the amount of site disturbance. ***Site Disturbance***

2. Isolate the site by diverting clean upstream "run-on" water around or through the development by a controlled drainage system. ***Diversion Works***

3. Control runoff and sediment movement at its point source rather than at one final point using a treatment drain approach. ***Point Source***

4. Stage earthworks and progressively revegetate the site where possible to reduce the area contributing to sediment. ***Progressive Revegetation***

5. Provide an effective major and minor stormwater system that is cost effective and incorporates life cycles costs (LCC) of investigation, design, operation, maintenance and replacement of stormwater infrastructure ***Effective Stormwater Systems***

6. Retain topsoil for effective revegetation works. ***Topsoil***

7. Locate sediment control structures where they are most effective and efficient. ***Sediment Structures***

8. Ensure stormwater runoff meets specified quality objectives during the construction and occupation phase of a development ***Stormwater Quality***

9. To promote scenic, landscape and recreational values for stream corridors through the integration of stormwater treatment techniques into the landscape by incorporating multiple use corridors that maximise the visual and recreational amenity of developments. ***Integration***

D7.03 REFERENCE AND SOURCE DOCUMENTS

(a) Council Specifications

D5	-	Stormwater Drainage Design
C211	-	Control of Erosion and Sedimentation
C273	-	Landscaping
D13	-	Landscaping

(b) NSW State Legislation

Protection of the Environment (operations) Act 1997
Clean Waters Act, 1970
Dams Safety Act, 1978
Soil Conservation Act, 1938
Water Act, 1912
Water Management Act 2000

(c) ACT Government Publications

Design Manual for Urban Erosion and Sediment Control - July 1988
"Protecting the Murrumbidgee from the Effects of Land Development"
"Guidelines for Erosion and Sediment Control on Building Sites"
Implications for Building Construction
Pollution Control on Residential Building Sites (Brochures)
Field Guide - Erosion and Sediment Control
Australian Journal of Soil and Water Conservation - Vol 3, Number 1

(d) State Authorities

Roads and Traffic Authority
- Erosion and Sedimentation Design Considerations.

Soil Conservation Service
- Erosion and Sediment Control - Model Policy and Code of Practice (Discussion Paper).

NSW Department of Land and Water Conservation (DLWC)
- Urban Erosion and Sediment Control.
- Constructed Wetlands

State Environmental Planning Policy No.14 - Coastal Wetlands
No. 71 - Coastal Protection

(e) Other

Greater Taree City Council
- Erosion and Sediment Control Policy and Code of Practice (DCP No 43)

Landcom - Managing Urban Stormwater: Soils and Construction
Greater Taree Urban Stormwater Management Plan

D7.04 PLANNING & CONCEPT DESIGN

Site Characteristics

1. Prior to commencement of design an assessment of the physical characteristics and constraints of soils, landform and drainage of the site shall be carried out. Planning and design of land development shall be based on water quality objectives to ensure there are either no negative stormwater impacts, or there is a beneficial impact, on upstream or downstream, watercourses and receiving waters. Site characteristics should be quantified through the methods outlined in Managing Urban Stormwater: Soils and Construction.

2. A stormwater management concept design shall be submitted with the development application to Council for all developments. This plan shall show location and options for stormwater quality control facilities and techniques. This will assist in assessing the impact of the development on the site. ***Concept Design***

3. A plan for erosion and sediment concurrently with engineering design and in advance of earthworks, ensuring property assessment of site constraints and investigation of the various needs prior to denuding construction area. ***Before Development Commences***

4. Vegetation is not to be removed from the site until the start of construction is imminent.

D7.05 DETAILED DESIGN

1. A separate erosion and sediment control/water management plan shall be submitted to the Principal Certifier as part of the detailed engineering design. This plan must give all details for erosion, sediment and pollution controls. Note: This design shall be site specific and not a generalisation of erosion control philosophy. It should form part of the contract specifications for a contractor to comply with during construction. It shall be referenced on all engineering design plans. ***Site Specific***

2. Detailed designs shall include scaled drawings (no larger than 1:1000) and detailed specifications/diagrams, which can be readily understood and applied on site by supervisory staff. Designs shall adopt the requirements for urban construction sites from Managing Urban Stormwater: Soils and Construction as a minimum.

Items to be included, but not limited to, shall be:

- existing and final contours, each shown in different line types
- the location of all earthworks including roads, areas of cut and fill and re-grading
- location of access haulage tracks and borrow pits
- location and design criteria of erosion and sediment control structures
- location and description of existing vegetation
- proposed vegetated buffer strips and "no access" areas
- location of critical areas (vegetated buffer strips, drainage lines and structures, water bodies, unstable slopes, flood plains and seasonally wet areas)
- type and location of diversion works to direct uncontaminated run-on around areas to be disturbed
- revegetation program
- procedures for maintenance of erosion and sediment control
- details for staging of works
- details of permanent stormwater quality control facilities ie wetlands, GPT, trash racks etc.
- maximum cleared area shall be 2 ha at any particularly point

3. No site works shall commence prior to approval of the detailed engineering design. All works are to be carried out in accordance with the approved management plan. Its implementation must be supervised by personnel with appropriate qualifications and/or experience in soil conservation on construction sites. ***Approval***

4. Notwithstanding the foregoing, Council may require erosion or sediment control works to be carried out additional to or instead of those works specified in the approved plan, should circumstances change during construction. ***Additional Works***

5. Managing Urban Stormwater: Soils and Construction should be consulted during the detailed engineering design phase. Detailed design drawings and notes from Managing Urban Stormwater: Soils and Construction should be read and the principles adapted for your specific site. ***Example Design***

6. An inspection check list shall be prepared as part of the ESCP/SWMP. This inspection checklist shall be used by the site manager/supervisor. Managing Urban Stormwater: Soils and Construction contains sample checklists that may be adapted for your site.

7. Failure to comply with the requirements of this Specification may lead to a delay in approvals, an order to cease work until rectified, the Principal Certifier arranging for the work to be completed at the developer's full cost or prosecution ***Failure to Comply***

EROSION CONTROL

D7.06 BUFFER ZONES

1. Buffer zones are corridors of vegetation adjacent to waterways or disturbed areas. Wetlands, stream and rivers adjacent to construction sites shall be protected by buffer zones. ***Filters***

2. Buffer zone requirements shall be in accordance with the following: ***Requirements***

Slope %	Buffer Width in Metres
2	15
4	20
6	30
8	40
10	50
12	60
14	70

3. Contaminated water in a concentrated form will require treatment both at its source point and final disposal. ***Contaminated Water***

4. A fence shall be used to exclude traffic from buffer zones to prevent damage to the vegetation, particularly during any construction phase. ***Fencing***

D7.07 "NO ACCESS" AREAS

1. It is Council's Policy to conserve as much existing vegetation in new developments as possible. ***Conserve Vegetation***

2. The landscape plan shall incorporate as much existing native vegetation as possible.

3. The "no access" fence locations shall be shown on the detailed design. These locations will be approximate only as machinery type, topography etc will determine actual on site location. ***No Access***

4. Fenced areas shall be clearly signposted "No Access Area".

D7.08 DIVERSION WORKS

1. Diversion works shall be incorporated into the design and construction to divert upstream run-on water around the site. Such flow shall discharge to a: formal drainage point; or a level spreader. ***Diversion Types***

2. Design of the diversion system should suit the following:-

(a) The drain should preferably be dish shaped with batter grades of less than 4:1 for temporary works or 6:1 for permanent works. Fencing will be required for drains with batters steeper than 6:1 where other fencing has not been provided. ***Drain Shape***

(b) If a piped system is selected its design capacity shall be a minimum of the capacity nominated in the design Specification C220 STORMWATER DRAINAGE. ***Pipe Capacity***

3. Channels shall be lined with turf as a minimum. Where velocities are designed in excess of 2 m per second, non erosive linings such as concrete, geotextiles, grouted rock etc or velocity reducers (check dams etc) shall be required. ***Non-Erosive Linings***

4. Diversion of stormwater onto downstream properties will require legal agreement and approval by Council prior to issue of a construction certificate.

D7.09 DROP DOWN DRAINS

1. These are temporary or permanent drains which divert concentrated run-off down slopes such as road batters without causing erosion. ***Lined Drains***

2. Drop down drains shall have sufficient capacity for a minimum 1 in 5 year peak flow without eroding. Energy dissipators and level spreading shall be used to reduce the flow velocity at the outlet of the drop down drain. ***Capacity***

D7.10 STOCKPILES

1. Location of stockpiles shall be indicated on the approved engineering plans. ***Approved Plan***

2. Stockpile sites shall be located: ***Location***

(a) Clear of existing or proposed drainage lines.

(b) Clear of areas likely to be disturbed during construction.

(c) Clear of the drip zone of trees.

(d) Preferably on reasonably flat areas.

3. Stockpiles shall be protected from erosion and sediment loss by: ***Erosion Protection***

   (a) The installation of diversion works; and

   (b) The use of silt fences, straw bales etc or other approved controls on the downstream side; and/or

   (c) Compaction.

4. Site topsoil shall be isolated from subsoil material in separate stockpiles. ***Separate Stockpiles***

5. Stockpiles if intended to be left exposed for longer than 14 days shall be revegetated immediately (see specification C273 Landscaping).

D7.11 SEDIMENT BASINS/TRAPS/DAMS

1. Sediment traps are either permanent or temporary sediment control devices that intercept sediment and run-off of the site. ***Sediment Control***

2. They are formed by excavation and/or by constructing embankments. ***Construction***

3. There are two types, wet and dry basins. ***Types***

4. Sediment traps shall not be located directly upstream of residential areas without careful spillway design in accordance with Safety Committee Guidelines. ***Location***

5. Basin design should be undertaken in accordance with Landcoms publication Managing Urban Stormwater: Soils and Construction. ***Design Criteria***

6. Permanent wet basin designs slightly vary from the above. Refer to the Stormwater Management Section of this Specification. ***Permanent Wet Basins***

D7.12 SEDIMENT TRAPS/ BARRIERS FOR MINOR CATCHMENTS

1. These are silt retention/filtering structures of a temporary nature used in situations where the catchment does not exceed 0.5ha. ***Filtering Structures***

2. Sediment traps/barriers shall be designed and placed in accordance with Managing Urban Stormwater: Soils and Construction as a minimum.

D7.13 LEVEL SPREADERS

1. Level spreaders are outlets or "sills" having a level cross section. They convert erosive channelised flows into non-erosive sheet flow. ***Convert Flows***

2. Level spreaders shall be designed and constructed in accordance with Managing Urban Stormwater: Soils and Construction (SD 5-6) as a minimum.

D7.14 THE LOCATION OF SHAKEDOWN AREAS AND ACCESS STABILISATION

1. Access to construction sites shall be limited to a maximum of two locations. ***Number of Accesses***

2. Access locations and shakedown areas shall require Council approval. ***Location Approval***

4. Cattle grids may be used for shake down areas. They should be so placed as to ensure the vehicles when crossing the grid have sufficient speed to "shake the mud" or other contaminants such as gravel from the vehicle. It must not be placed where the vehicle is slowing to enter a roadway. Cattle grids shall be a minimum length of 7 metres. ***Cattle Grid***

5. Stabilised access shall be in accordance with Managing Urban Stormwater: Soils and Construction (SD 6-14) as a minimum. ***Stabilised Access***

D7.15 WIND EROSION/DUST CONTROL

1. Wind erosion measures shall be undertaken in accordance with the recommendations in Managing Urban Stormwater: Soils and Construction as a minimum. ***Erosion Rate***

D7.16 REQUIREMENTS FOR BUILDING SITES

1. Recommendations from Managing Urban Stormwater: Soils and Construction for urban construction sites shall be undertaken for all building sites as a minimum. These measures shall be shown on the ESCP/SWMP. ***Site Clearing***

D7.17 EXTERNAL SITE REQUIREMENTS

1. Sediment control devices or stabilising works shall be provided outside construction sites where necessary or as directed by the Superintendent. ***Necessary Controls***

2. Where increased stormwater run-off is likely to accelerate erosion of any downstream watercourse, the necessary remedial work shall be provided concurrently with other sediment and erosion requirements. ***Accelerate Erosion***

3. Where sediment is likely to be transported from the site, all immediate downstream drainage inlets shall have appropriate controls installed. ***Downstream Controls***

4. If such works require entry onto private property, written permission shall be obtained prior to the entry and commencement of such works. ***Written Permission***

5. All disturbed areas on private property to be reinstated to original condition and to the satisfaction of the owner. ***Reinstated***

STORMWATER MANAGEMENT

D7.18 GENERAL

Stormwater management shall address temporary and permanent measures for conveyance of stormwater through the site incorporating quantity and quality objectives of Council.

D7.19 QUANTITY

1. To maintain stormwater runoff from a catchment equivalent to the pre-developed or existing flow rate and duration a combination of detention and retention facilities shall be required.

2. Detention facilities shall be designed to attenuate the change in peak flow rate due to a change of landuse within a catchment to a level equal to the pre-developed flow flat. Refer to Auspec Design Specification D5 Stormwater Drainage for details of detention requirements. ***Detention***

3. Retention facilities shall be designed to hold stormwater runoff within the catchment for a period of time to enable water to continue in the hydrological cycle via infiltration and evapotranspiration. ***Retention***

4. If the stormwater runoff flow rate and duration equivalent to the pre-developed conditions cannot be achieved an upgrade of the existing Council stormwater infrastructure downstream of the discharge shall be required. This system shall be subject to approval by Council. ***Downstream Infrastructure***

5. Design details shall be submitted to Council to provide the adequacy of the existing system and/or the proposed upgrade works to handle the increase in flows.

6. Where the discharge point is located at a permanent natural waterway a permanent erosion control design shall be provided to prevent the erosion of the downstream waterway to which the catchment runoff is directed. ***Downstream Waterways***

7. Where in-stream erosion control measurers or upgrade of infrastructure works cannot be carried out by the proponent of the works a contribution (cost figures to be provided by Council) is to be provided for works to be carried out by Council. Erosion control measurers shall be required from the discharge point of the catchment to the receiving waterway or to the next catchment discharge point with the shortest distance being the determinant.

D7.20 QUALITY

1. An assessment of water quality impacts and control measures to mitigate or improve the water quality shall be carried out by the following process:

   (a) determine the Risk Category of the proposal

   (b) identify the Water Quality Objectives (WQO)

   (c) determine the type and condition of the receiving water ecosystem

   (d) determine the pollutant loads generated by the proposed works

   (e) determine the types of treatment measures to be used to mitigate or improve the water quality from the proposed works

Low Risk Developments

2. Low Risk development (eg: single dwelling construction) will not be required to identify relevant water quality objectives for downstream receiving waters but will be required to follow Best Management Practices (BMP) in relation to the control of erosion, sediment and stormwater quality as outlined in this specification and in accordance with the document "Managing Urban Stormwater – Soils and Construction" Chapter 9 – Building Sites (Landcom 2004) and Greater Taree City Council Stormwater Management Plan.

High Risk Developments

3. High Risk developments are classified according to the following criteria. Any development or development proposal:

(a) located in a waterway corridor

(b) located within the catchment of a wetland area

(c) consisting of multiple dwellings or commercial uses with an impermeable surface area (including roof area) in excess of 2500 m^2 and/or

(d) subdivisions greater than 6 lots and/or

(e) industrial activities that are not impact assessable and at least 1000 m^2 in uncovered storage/working space.

(f) uncovered car parks > 100 spaces.

(g) Located within the coastal area identified within SEPP 71.

4. The performance of stormwater quality improvement devices from sites during and after construction shall meet the requirements of the Greater Taree City Council Stormwater Management Plan for the pollution reduction targets.

5. The stormwater pollutant loadings of stormwater runoff from sites during and after construction shall meet the requirements of Australian Run off Quality (ARQ) for the classification of the receiving waters.

6. Temporary and permanent water quality improvement devices and measures shall be incorporated into the design of all proposed developments.

D7.21 WET RETENTION BASINS/PONDS (WETLANDS)

1. Wet retention basis shall be designed to be large enough to incorporate the required settling zone based on the requirements of the soil type as specified within Managing Urban Stormwater: Soild and Construction. A high flow by-pass route incorporating detention requirements shall be placed downstream of the wet detention basin.

2. Other design guides include the following. ***Basin Efficiency***

(a) The basins should have side slopes of 1 in 8 (preferred) or 1 in 6 maximum.

(b) The maximum velocity through the pond based on a 1 in 1 year storm should not exceed 0.3 metres per second.

(c) A minimum freeboard of 0.5 metres should be provided between a restricted discharge outlet for the pond and a storm overflow weir. This discharge outlet should be designed so that the weir overtops on average three times per year.

(d) Inlet and outlet structures should be located at extreme ends of the basin, with short circuiting of flow further minimised by the use of baffles.

(e) Council will require fencing of wet basins by a Council approved fence.

(f) Wet basins in 1.2 metres in a 1:100 year ARI event or with side slopes steeper than 1 in 6 shall be fenced by a child proof fence or other as approved by Council.

(g) Depth indicators and hazard signs shall be located near the basin.

3. Basins should be constructed prior to the commencement of any site clearing or construction works, and should be de-silted when the average water depth is reduced by 25%. A depth indicator shall be placed in the basin for this ***Construction and Maintenance***

4. (a) Urban retention basin shall incorporate an outlet device that enables dewatering of the basin. ***Outlet Design***

(b) An all weather access track shall be provided to the basin for maintenance works a minimum of two (2) metres wide. ***Access Track***

5. It is necessary to incorporate a gross solids trap and trash rack facility on major discharges into the retention basin. ***Trash Racks***

6. Basins shall be surrounded by buffer zones of not less than 20 metres between the nearest development and the basin. ***Buffer Zones***

7. Wet retention basins are regarded as impoundments and normal dam safety requirements shall be met. A dam may be prescribed under the Dams Safety Act, 1978, depending on the recommendations of the NSW Dams Safety Committee. Written evidence shall be provided that the proposed wet retention basin does not require prescription under the Dam Safety Act. ***Basin Classification***

8. If the wet retention basin is a prescribed dam, the Dams Safety Committee will maintain an interest in the dam, will seek information from its owner and will require that reports be prepared on the dam and submitted to the Committee. ***Dam Safety Committee***

9. Wet retention basins shall be designed to incorporate constructed wetland principles as outlined in the DLWC Constructed Wetlands Manual and ARQ.

D7.22 TRASH RACKS, GROSS POLLUTANT TRAPS AND PROPRIETARY POLLUTANT REMOVAL PRODUCTS

1. A trash rack, gross pollutant trap or propriety pollutant removal products shall be installed upstream of all permanent retention/detention basins and elsewhere as required by Council.

2. The structure design shall comply with the following:

   (a) an all weather access track shall be provided for maintenance of the structure a minimum of two (2) metres wide.

   (b) the structure shall remain stable in a 1:20 year ARI event as a minimum or as required by Council.

   (c) flooding analysis shall be undertaken to confirm that there is no flooding of lands during a 1:100 year event due to the structure becoming completely blocked.

   (d) the structure shall drain by gravity to a dry condition.

3. A life cycle cost analysis and comparison with other alternative taking into account installation and maintenance costs for the life of the structure shall be submitted to Council accompanying the design plans.

4. Acceptance of propriety pollutant removal products is at the discretion of Council

D7.23 MAINTENANCE COST

1. An evaluation of costs shall be submitted stating the initial establishment costs, the annual maintenance costs, and anticipated removal/cost replacement.

2. Establishment costs shall include, but not be limited to, the following:

   (a) Total cost of feasibility studies; grant application costs (where applicable) ***Establishment Costs***

   (b) Total conceptual, preliminary and detailed design costs

   (c) Total construction costs including project management and/or contract management costs

3. Annual maintenance costs shall include, but not be limited to, the following

   (a) administration costs

   (b) staff training

   (c) inspections

   (d) waste disposal

   (e) restoration of infrastructure within the maintenance period

   (f) monitoring of pollutant levels

   (g) machinery/equipment

   (h) number of staff required.

Note: Costs shall include any construction difficulty associated with:

- Access requirements
- Service relocations or provision
- Geological conditions
- Shallow bedrock
- Water table level
- Permeability
- Erodibility
- Stability

4. Removal costs shall include, but not be limited, to the following:

   (a) replacement costs;
   (b) testing costs; and
   (c) any other costs associated with future replacement/removal costs

5. Costs shall be based on:

   (a) present worth; and
   (b) future worth for ten (10) year increments up to the design life of the project.

SPECIAL REQUIREMENTS

D7 RESERVED

D7 RESERVED

D7 RESERVED