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Goodman International Ltd

Oakdale Central (East)

Estate Works and DHL Project Application No. 1

Soil and Water Management Plan

September 2010

INFRASTRUCTURE | MINING & INDUSTRY | DEFENCE | PROPERTY & BUILDINGS | ENVIRONMENT

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Appendices

A Erosion and Sediment Control Plans

1. Introduction

The Soil and Water Management Plan (SWMP) outlines how soil and water issues are to be identified, planned, managed and monitored during the construction period. The SWMP addresses erosion, sedimentation, water pollution, fuel and chemical storage management and outlines measures to minimise adverse impact on the riparian environment.

This Soil and Water Management Plan relates to the staged construction of the bulk earthworks associated with the Oakdale Central (East) Precinct Estate Works including Pads 1A and 2A (DHL).

This Soil and Water Management Plan shall be read in conjunction with the Erosion and Sediment Control Plan (ESCP) included in Appendix A.

The plan should be updated by the Contractor and incorporated into the Contractor's Environmental Management Plan (CEMP).

2. Purpose and Objectives

The primary purpose of the SWMP is to integrate management processes in order to minimise erosion, control movement of sediments and other contaminants and limit the impact of construction activities on the aquatic and riparian environments adjacent to and downstream of the works.

The key objectives of the plan are:

- Identification of activities that may contribute to erosion, sedimentation and water quality impacts;
- Minimisation of adverse water quality and sedimentation impacts by the construction operations on the riparian environment adjacent to and downstream of the works through the implementation of industry best management practices; and
- Provision of organised, integrated and systematic processes that effectively manage erosion, sedimentation and water quality during the term of the project.

3. Reference Documents

The following documents shall be referred to and complied with during the bulk earthworks associated with the Central (East) Precinct Estate Works including Pads 1A and 2A (DHL):

- NSW Department of Housing: Managing Urban Stormwater: Soils and Construction (2004) (Blue Book)
- NSW Department of Conservation and Land Management: Urban Erosion and Sediment Control (1992) Hunt, J.S. (ed.)
- Fairfield City Council Works Specification
- ANZECC (2000): Water Quality Guidelines
- EPA Bunding and Spill Management Guidelines
- AS/NZS5667-1998: Water Quality Sampling Guidelines
- AS1940-2004: The Storage and Handling of Flammable and Combustible Liquids.
- AS2430-2004: Classification of Hazardous Areas
- AS3773-1990: Bulk Solids Containers
- AS3780-1994: The Storage and Handling of Corrosive Substances
- AS4084-1993: Steel Storage Racking
- AS4332-2004: The Storage and Handling of Gases In Cylinders
- AS4452-1997: The Storage and Handling of Toxic Substances

4. Project Issues

4.1 Sources of Pollution

The activities and aspects of the works that have potential to lead to erosion, sediment transport, siltation and contamination of natural waters include:

- Earthworks undertaken immediately prior to rainfall periods;
- Work areas that have not been stabilised;
- Extraction of construction water from waterways during low rainfall periods;
- Clearing of vegetation and the methods adopted, particularly in advance of construction works;
- Stripping of topsoil, particularly in advance of construction works;
- Bulk earthworks and construction of pavements;
- Works within drainage paths, including depressions and waterways;
- Stockpiling of excavated materials;
- Storage and transfer of oils, fuels, fertilisers and chemicals;
- Maintenance of plant and equipment;
- Ineffective implementation of erosion and sediment control measures;
- Inadequate maintenance of environmental control measures; and
- Time taken for the rehabilitation/ revegetation of disturbed areas.

4.2 Potential Impacts

The major potential impacts on the riparian environment relate to erosion of disturbed areas or stockpiles and sediment transportation. Potential adverse impacts from erosion and sediment transportation can include:

- Loss of topsoil;
- Increased water turbidity;
- Decreased levels of dissolved oxygen;
- Changed salinity levels;
- Changed pH levels;
- Smothering of stream beds and aquatic vegetation;
- Reduction in aquatic habitat diversity;
- Increased maintenance costs; and
- Decrease in waterway capacity leading to increased flood levels and durations.

Furthermore there is potential for contamination from the storage, transfer and use of oils, fuels, fertilisers and chemicals with impacts that can include:

- Discharge of toxic substances to waterways leading to death of flora and fauna; and
- Increased nutrient levels leading to algal growth.

Infiltration from spillage of oils, fuels and chemicals can lead to groundwater pollution.

The extraction of construction water from waterways during periods of low rainfall can lead to reductions in environmental flow.

5. General Erosion and Sedimentation Control Strategy

The clearing of vegetation leaves the land surface susceptible to increased erosion. The eroded particles can be transported off site and into natural waterways causing siltation, loss of hydraulic capacity and environmental stress. The ESCP aims to minimise the extent of erosion of the site, restrict movement of soil particles and mitigate the impacts of the works on the riparian environment.

Before bulk earthwork operations commence the appropriate soil and water management measures are to be implemented as detailed in the ESCP. New sediment basins, an existing sediment basin and other erosion control measures as detailed on the ESCP make up the sediment and erosion control measures required for the management of the soil and water associated with the Oakdale Central East precinct. The construction of the bulk earthworks are to be staged, therefore so are the implementation of the soil and water management measure as detailed on the ESCP.

Stage 1 of the proposed strategy for soil and water management associated with the Oakdale Central (East) Precinct Estate Works including Pads 1A and 2A utilises the existing sediment basin within the Central Precinct. This basin currently treats stormwater discharge from the existing Austral Brickworks located on the eastern side of Old Wallgrove Road. This sediment basin will be modified and then utilised to capture sediment associated with the proposed earthworks required for Pad 1A and Pad 3 (part there of).

A new sedimentation basin will be utilised to capture sediment from Pad 2A and Pad 4 (part there of) will also be constructed as detailed on the ESCP.

Ultimately the stormwater run-off from the Austral Brickworks will need to be considered in the Central Precinct stormwater management strategy. In the interim, during earthworks operations, the stormwater run-off from the Austral Brickworks will drain to a new sedimentation basin (refer ESCP). This interim arrangement will need to be maintained until the permanent stormwater management strategy is in place.

Stage 2 of the proposed strategy for soil and water management associated with the Oakdale Central (East) precinct will utilise the embankment formation works of the proposed bio-retention basin as a sediment basin for the bulk earthwork associated with Pad 3 (part there of), Pad 4 (part there of) and Pad 5, as detailed on the ESCP. This stage of the works will also include the decommissioning of sediment basins utilised in Stage 1.

Completed batters, pipeline excavation extents and access road verges will be topsoiled and seeded as soon as the earthworks operations have been completed in accordance with the ESCP.

6. Construction Methodology

The following construction methodology will be followed to minimise the risk of erosion and sediment export from the site:

- Install silt fencing;
- Install straw bale sediment traps across existing drainage paths;
- Construct sediment basins;
- Install all other erosion and sediment controls as indicated on the ESCP;
- Strip and stockpile topsoil;
- Carry out bulk earthworks;
- Decommission sediment basins and divert flows;
- Topsoil and rehabilitate bulk earthworks areas immediately on completion of works; and
- Remove silt fence and straw bales only when disturbed areas have been fully stabilised.

7. Site Inspection and Maintenance

7.1 Site Inspection and Maintenance Requirements

The ESCP outlines the erosion and sediment control measures that are required to be in place for the bulk earthworks associated with Oakdale Central (East) Precinct Estate works and Pads 1A and 2A. As such, the inspection and maintenance requirements outlined in this section will need to be carried out as long as either earthworks or quarrying is being conducted and all areas re-established.

The Contractor's site Superintendent will inspect the site after every rainfall event and at least weekly, and will:

- Inspect and assess the effectiveness of the ESCP and identify any inadequacies that may arise during normal work activities or from a revised construction methodology. Construct additional erosion and sediment control works as necessary to ensure the desired protection is given to downstream lands and waterways;
- Ensure that drains operate properly and to effect any repairs;
- Remove spilled sand or other materials from hazard areas, including lands closer than 5 metres from areas of likely concentrated or high velocity flows especially waterways and paved areas;
- Remove trapped sediment whenever less than design capacity remains within the structure;
- Ensure rehabilitated lands have effectively reduced the erosion hazard and to initiate upgrading or repair as appropriate;
- Maintain erosion and sediment control measures in a fully functioning condition until all construction activity is completed and the site has been rehabilitated; and
- Remove temporary soil conservation structures as the last activity in the rehabilitation program.

7.2 Inspection and Auditing

The CEMP shall detail the ESCP inspection and auditing procedures to be implemented on the project.

To ensure effective implementation of the soil and water controls and management procedures, the CEMP shall include an Inspection and Test Plan for management of the soil and water controls.

8. Environmental Control

The Contractor shall implement the following in order to minimise the impact of the works on the riparian ecosystems in the vicinity of the project.

- Measures that minimise the impacts of the clearing of vegetation;
- Measures to minimise the area of disturbed ground that is exposed to erosion and that retain vegetation until earthworks operations require its removal;
- Measures that ensure that topsoil is correctly stored and reused;
- Measures to ensure that erosion minimisation and sediment controls works are installed prior to commencement of construction and that these controls are adequate for the continued protection of the waterways;
- Measures to ensure that diversion drains are routinely installed so as to minimise erosion, sedimentation and water quality impacts;
- Measures to encourage prompt topsoiling and revegetation of completed works areas; and
- Measures to locate compounds, access tracks, stockpile sites, temporary work areas and stage work so as to minimise erosion, sedimentation and water quality impacts.

9. Protection of Vegetation

Native vegetation shall be protected during the course of the project through the implementation of Best Management Practices, which shall include but shall not be limited to:

- Educating project staff in the importance of environmentally sensitive work practices;
- Clearly defining the limit of permitted clearing on the work site through the use of distinctive markings, flagging tape and iridescent webbing;
- Avoiding disturbance of vegetated areas until immediately prior to commencement of that phase or element of the works;
- Locating site facilities, compounds and material storage areas away from sensitive areas;
- Restricting vehicular movements to specific access points and routes;
- Routine maintenance of vegetation protection measures; and
- Prompt rehabilitation and revegetation of disturbed areas following completion of work elements or phases.

10. Topsoil Management

Topsoil shall be protected, stockpiled and reused through the implementation of Best Management Practices, which shall include but shall not be limited to:

- Deferring topsoil stripping until work areas are required and conditions are suitable;
- Identifying weed-infested topsoil prior to stripping and stockpiling separately;
- Stripping and respreading topsoil at an ideal moisture content;
- Preventing the mixing of topsoil and subsoil;
- Using low stockpile mounds to minimise organic stress and decay;
- Locating stockpiles away from drainage paths and flood-prone areas
- Using stormwater diversion drains and temporary vegetation to protect stockpiles from water and wind erosion;
- Minimising or preventing traffic loads on stockpiled materials;
- Routinely maintaining erosion minimisation works;
- Progressive respreading of topsoil to minimise storage time; and
- Prompt revegetation of topsoil.

11. Materials Handling, Transfer and Storage

The CEMP shall include method statements and procedures for all activities that involve the handling, transfer and storage of materials including operational by-products, plant wash-down, fine particulates/dust and waste.

Materials storage areas shall not be located within 50 metres of any drainage path, waterway or flood-prone land.

Materials storage procedures shall comply with any EPA and Workcover requirements and relevant Australian Standards, including the current issues of:

- AS1940 The Storage and Handling of Flammable and Combustible Liquids.
- AS2430 Classification of Hazardous Areas
- AS3773 Bulk Solids Containers
- AS3780 The Storage and Handling of Corrosive Substances
- AS4084 Steel Storage Racking
- AS4332 The Storage and Handling of Gases In Cylinders
- AS4452 The Storage and Handling of Toxic Substances

Materials Safety Data Sheets for all chemicals stored on-site shall be kept at the site office, made available to the staff who manage the storage of materials and be readily available to site personnel.

The CEMP shall contain procedures for the management of curing compounds and bitumen tacking to ensure that runoff containing these products is prevented from entering any drainage path or waterway. It shall also contain precautions to be taken during paving operations to minimise wash-off from bitumen following rain.

Storage areas for fuels, oils and other liquid chemicals shall be surrounded by impervious bund walls. The retained volume shall be no less than 120% of the volume of the largest container within the bunded area. There shall be no pipes and valves in the bund. The storage area shall slope to one corner to allow for clean up.

Chemical drums shall not be left open either inside or outside of bunded areas.

A copy of the EPA Bunding and Spill Management Guidelines shall be kept at the project site office, made available to the staff that manage the storage of materials and routinely implemented.

Old drums used as temporary works markers shall not contain chemical or hydrocarbon residues.

11.1 Transfer, Refuelling and Maintenance

The transfer, the refuelling/maintenance of equipment, the mixing of cutting oil with bitumen or any other activity that may result in a spillage of any fuel, oil or chemical shall not be permitted within 20 metres of

any drainage path or waterway.

A responsible person shall remain present to observe all transfer, refuelling and maintenance operations.

In the event that equipment, plant or vehicles require refuelling or maintenance and cannot be moved away from a drainage path or waterway, a temporary bund or spillage trays shall be used to contain all potential contaminants.

All equipment, plant and vehicles shall be routinely maintained to prevent leakage from tanks, hoses and sumps.

11.2 Emergency Action Plan

The Contractor shall develop an Emergency Action Plan to deal with uncontrolled spillage or discharge of fuels, oils and chemicals. The plan shall include response procedures aimed at protecting the soils and water, that:

- Contain and control environmental emergency incidents;
- Safeguard people on-site and off-site;
- Protect drainage paths and waterways;
- Minimise damage to the environment and property;
- Identify appropriate disposal techniques for contaminated soils and water; and
- Facilitate remediation of the environment.

Contingency plans shall be prepared for implementation in the event of a major spill or discharge.

Adequate quantities of suitable containment and clean-up materials shall be maintained within easy and quick access. Containment and clean-up materials storage areas shall be clearly sign-posted and shall include materials usage instructions. Used materials shall be promptly replaced.

12. Rehabilitation and Revegetation

All disturbed areas and batters shall be restored and revegetated as quickly as possible to reduce protect against erosion, to minimise sediment transportation and to limit ongoing impacts on water quality.

All disturbed areas shall be rehabilitated and revegetated in accordance with the drawings and the Specification.

Rehabilitation and revegetation shall be undertaken immediately the disturbed work areas are no longer required for construction purposes. Temporary vegetation shall be used where areas will remain open but inactive for any prolonged period.

13. Site Management, Responsibility and Resources

13.1 Site Management Plan

A project specific Site Management Plan shall be developed by the Contractor, which shall allocate responsibilities and the resources necessary to implement the environmental controls and procedures. It shall include a flow chart that clearly presents the chain of responsibility for implementing the erosion, sedimentation and pollution controls.

13.2 Allocation of Responsibilities

Responsibility for the implementation of the various controls should be covered in the CEMP and its referenced documents.

13.3 Allocation of Resources

Resources and materials shall be allocated to enable the timely implementation of the ESCP, reduce impacts and protect the environment. Resources and materials shall also be allocated for the routine and emergency maintenance of environmental protection works.

13.4 Induction and Environmental Awareness Training

13.4.1 Site Induction

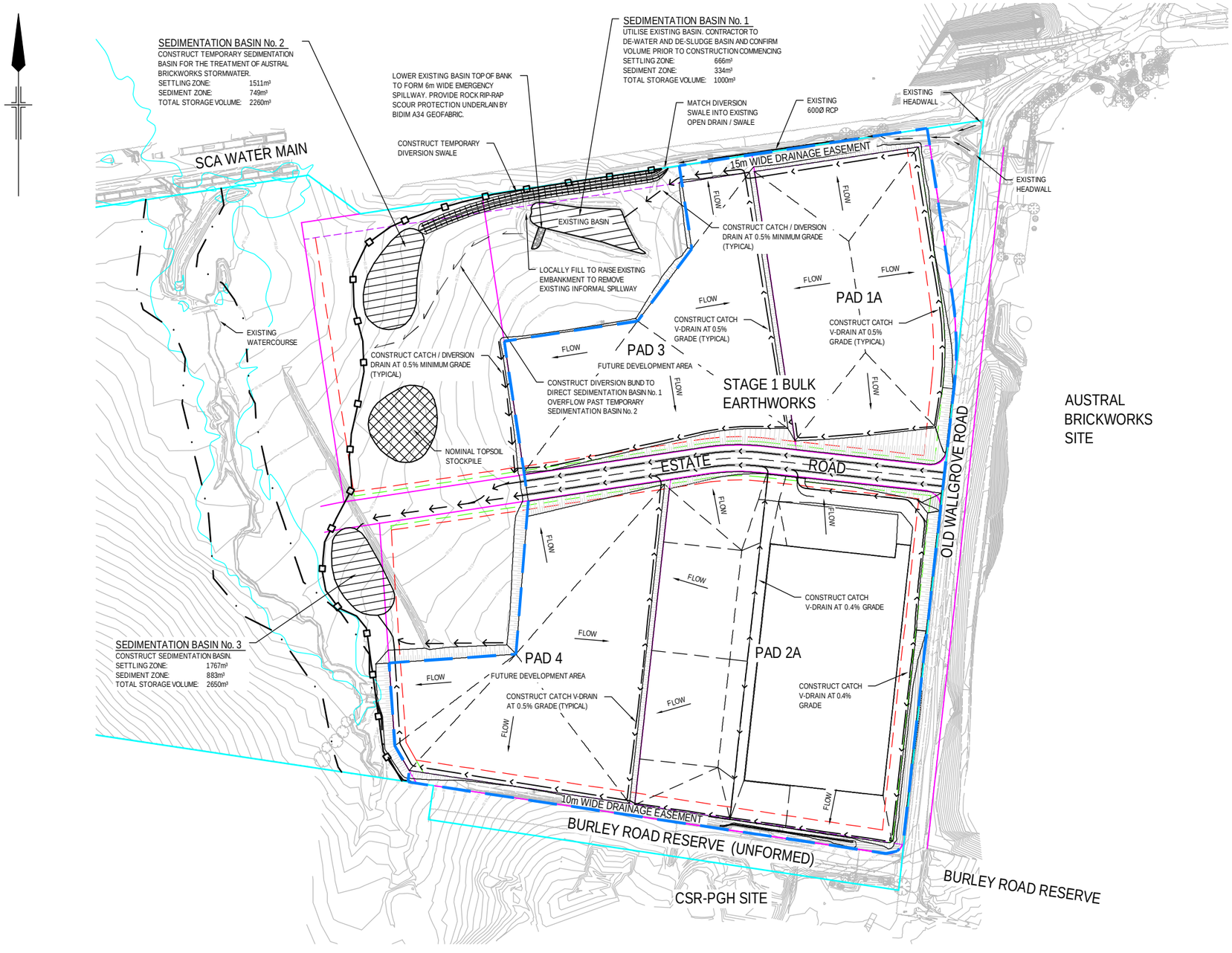
Environmental matters shall be highlighted in the site induction for all personnel including subcontractors. The site induction shall include issues relating to erosion minimisation, sediment control and water quality. Staff shall be made aware of their responsibilities under relevant environmental legislation.

13.4.2 Toolbox Meetings

Informal training on erosion, sedimentation and water quality issues shall be undertaken during toolbox meetings with site personnel.

Appendix A

Erosion and Sediment Control Plans



EROSION & SEDIMENTATION CONTROL NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE SOIL AND WATER MANAGEMENT PLAN.
2. ALL EROSION AND SEDIMENT CONTROL MEASURES TO BE IN ACCORDANCE WITH THE DEPARTMENT OF HOUSING MANAGING URBAN STORMWATER EDITION 2004 AND FAIRFIELD CITY COUNCIL SPECIFICATIONS. WHERE DISCREPANCY OCCURS BETWEEN THESE TWO, COUNCIL DCP12 WILL TAKE PRECEDENCE.
3. WORKS SHALL BE UNDERTAKEN IN THE FOLLOWING SEQUENCE:
   1 INSTALL ALL SILT FENCING.
   2 CONSTRUCT BASIN.
   3 CONSTRUCT CATCH DRAINS, DIVERSION DRAINS AND STRAW BALES.
   4 INSTALL OTHER EROSION AND SEDIMENT CONTROLS.
   5 STRIP AND STOCKPILE TOPSOIL AND CARRY OUT BULK EARTHWORKS
   6 TOPSOIL AND REHABILITATE BULK EARTHWORK AREAS IMMEDIATELY UPON COMPLETION.
   7 UNDERTAKE REMAINING SITE WORKS IN ACCORDANCE WITH THE ENGINEERING PLANS.
   8 REHABILITATE THE REMAINING SITE.
   9 REMOVE SOIL AND WATER MANAGEMENT WORKS ONCE UPSTREAM SURFACES ARE STABILISED TO THE SATISFACTION OF THE SUPERINTENDENT AND COUNCIL.
4. THIS ORDER MAY BE CHANGED SUBJECT TO FIELD CONDITIONS BUT ANY SUCH CHANGE MUST ACHIEVE ALL ENVIRONMENTAL AND CONSTRUCTION GOALS.
5. CONTROLS AFFECTED BY WORKS ARE TO BE RE-ESTABLISHED PRIOR TO THE COMPLETION OF EACH DAYS WORK.
6. THE CONTRACTOR SHhes ALL PROVIDE SHAKER GRIDS AT ALL SITE ACCESS / EGRESS POINTS.
7. STRIP TOPSOIL OVER THE SITE TO AN AVERAGE DEPTH OF 150mm UNLESS OTHERWISE APPROVED BY THE SUPERINTENDENT. TOP SOIL STOCKPILES SHALL NOT EXCEED 2m IN HEIGHT AND BATTER SLOPES TO BE 3H:1V MAXIMUM.
8. THE CONTRACTOR IS TO STABILISE TOPSOIL STOCKPILES AND ALL DISTURBED AREAS AS SOON AS THEY REACH FINAL LEVELS. STABILISATION TO BE BY HYDROSEEDING OR OTHER METHOD APPROVED BY SUPERINTENDENT AND COUNCIL ENGINEER. ALL SEEDED AREAS TO BE WATERED TWICE WEEKLY UNTIL GRASS IS ESTABLISHED OR COVERED WITH BITUMEN HAY MULCH.
   A RECOMMENDED LIST OF PLANT SPECIES FOR TEMPORARY COVER IS:
   - JAPANESE MILLET 25kg/ha (SPRING)
   - OATS (RYECORN) 25kg/ha (SUMMER)
   - JAPANESE MILLET 10kg/ha (AUTUMN)
   - OATS (RYECORN) 30kg/ha (WINTER)
   GYPSUM AND MULTIGROW/ ENRICH FERTILISER AT RATES TO BE DETERMINED BY SUBSOIL AND TOPSOIL TESTING.
   PERMANENT GRASSING TO BE IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS.
9. WHERE SURFACE SLOPES ARE STEEPER THAN 6H:1V BITUMEN STRAW MULCH SHALL BE APPLIED AFTER SEEDING AT THE FOLLOWING RATES, OR AS DIRECTED.
   - MULCH 0.5kg/m²
   - BITUMEN EMULSION 0.25 l/m² (50% WATER, 50% SLOW BREAKING ANIONIC EMULSION MIX).
10. TOPSOIL SHALL BE RE SPREAD AND STABILISED AS SOON AS POSSIBLE. DISTURBED AREAS SHALL BE LEFT WITH A SCARIFIED SURFACE TO ENCOURAGE WATER INFILTRATION AND ASSIST KEYING IN TOPSOIL.
11. DUST CONTROL MEASURES SHALL BE IMPLEMENTED CONTINUOUSLY DURING CONSTRUCTION WORKS TO THE SATISFACTION OF THE SUPERINTENDENT AND COUNCIL.
12. THE CONTRACTOR SHALL TEMPORARILY REHABILITATE ANY DISTURBED AREAS WITHIN 20 DAYS. WHERE FINAL SHAPING HAS OCCURRED THE CONTRACTOR SHALL PROVIDE FINAL REHABILITATION WITHIN 10 DAYS.
13. DURING EARTHWORKS, TEMPORARY DIVERSION BANKS SHOULD BE CONSTRUCTED TO LIMIT SLOPE LENGTH, WHERE POSSIBLE, IN ACCORDANCE WITH THE FOLLOWING:

    RECOMMENDED MAXIMUM SPACING BETWEEN CROSS BANKS ON ALL ROADS.

SLOPE	MAXIMUM SPACING (m)
0 TO 1%	150
1 TO 3%	100
3 TO 5%	70
5 TO 10%	50
10 TO 17%	16

14. ALL STORMWATER PITS TO BE COVERED OR DROP INLET SEDIMENT TRAPS SHALL BE PROVIDED. KERB INLET TRAPS ARE TO BE INSTALLED AFTER COMPLETION OF PAVING.
15. TEMPORARY KERB INLET SEDIMENT TRAPS TO BE PROVIDED TO ALL EXISTING KERB INLETS IN THE VICINITY OF THE WORKS DURING CONSTRUCTION.
16. SEDIMENT TRAPS AND BASINS ARE TO BE MAINTAINED SUCH THAT:
    (A) SEDIMENT IS REMOVED SUCH THAT NO LESS THAN 70% OF THE DESIGN CAPACITY REMAINS AT ANY ONE TIME.
    (B) MATERIALS ARE REPLACED OR REPAIRED AS REQUIRED TO ENSURE SERVICEABILITY OF BOTH THE ELEMENT AND THE TRAP OR BASIN.
17. PERMANENT DRAINAGE STRUCTURES INCLUDING: PIPES, PITS ARE TO BE HANDED OVER IN A CLEAN CONDITION AT THE COMPLETION OF THE CONTRACT MAINTENANCE PERIOD.
18. FOLLOWING COMPLETION AND RESTORATION OF SITE: REMOVE ALL MATERIALS AND FILL DIVERSION DRAINS, WATERWAYS, SEDIMENT TRAPS, AND SEDIMENT BASINS AND COMPACT IN ACCORDANCE WITH THE SPECIFICATION TO MATCH FINAL LEVELS OF THE WORKS. PROVIDE 100mm TOPSOIL AND HYDROSEED.
19. ACCESS POINT TO ALLOW MACHINE ENTRY / EXIT ARE TO INCLUDE A ROUNDED DIVERSION BANK 0.3m HIGH WITH 10H:1V BATTERS TO DIVERT RUNOFF TO SEDIMENT FENCES EITHER SIDE OF ENTRY.
20. WHERE FLOCCULATION OF BASINS IS REQUIRED UNLESS OTHERWISE SPECIFIED THE RECOMMENDED INITIAL DOSING IS 0.32KG OF GYPSUM PER CUBIC METRES OF BASIN VOLUME. THE CONTRACTOR MAY VARY THIS RATE SUBJECT TO TESTING OF PREVIOUS WATER SAMPLES AND THE ACHIEVEMENTS OF THE REQUIRED WATER QUALITY STANDARDS. FLOCCULATION TO TAKE PLACE WITHIN 48 HOURS OF AN EVENT.
21. THE CONTRACTOR SHALL MAINTAIN A LOG BOOK DETAILING
    - RECORDS OF ALL RAINFALL
    - CONDITION OF SOIL AND WATER MANAGEMENT STRUCTURES
    - ANY APPLICATION OF FLOCCULATING AGENTS TO SEDIMENT BASIN
    - VOLUMES OF ALL WATER DISCHARGED FROM SEDIMENT BASINS - ANY ADDITIONAL REMEDIAL WORKS REQUIRED
    THE LOG BOOK SHALL BE MAINTAINED ON A WEEKLY BASIS AND BE MADE AVAILABLE TO ANY AUTHORISED PERSON UPON REQUEST. THE ORIGINAL LOG BOOK SHALL BE ISSUED TO THE PROJECT MANAGER AT THE COMPLETION OF THE WORKS.
22. THE CONTRACTOR SHALL AT ALL TIMES RESTRICT CONSTRUCTION EQUIPMENT MOVEMENT TO THE ESSENTIAL CONSTRUCTION AREAS. THE CONTRACTOR SHALL NOT EXTEND LAND DISTURBANCE BEYOND 2m FROM THE EDGE OF ANY ESSENTIAL CONSTRUCTION ACTIVITY.

LEGEND

- PROPOSED SEDIMENT "SILT" FENCE
- EARTH CATCH / DIVERSION DRAIN
- EARTH CATCH V-DRAIN
- EARTH DIVERSION BUND
- EARTH DIVERSION SWALE
- AUSTRAL BRICKWORKS STORMWATER FLOW
- LIMIT OF BULK EARTHWORKS - STAGE 1
- SEDIMENTATION BASIN
- NOMINAL TOPSOIL STOCKPILE
- PROPOSED LOT BOUNDARY
- PROPOSED LANDSCAPE SETBACK LINE
- PROPOSED BUILDING SETBACK LINE
- PROPOSED EASEMENT
- CORE RIPARIAN ZONE

PLAN
SCALE 1:2000

APPROVAL

No	Revision	Drawn	Checked	Approved	Date
B	RE-ISSUED FOR APPROVAL	SA			02.09.10
A	ISSUED FOR APPROVAL	MP			28.05.10

Note: * indicates signatures on original issue of drawing or last revision of drawing

0 20 40 60 80 100m
SCALE 1:2000 AT ORIGINAL SIZE

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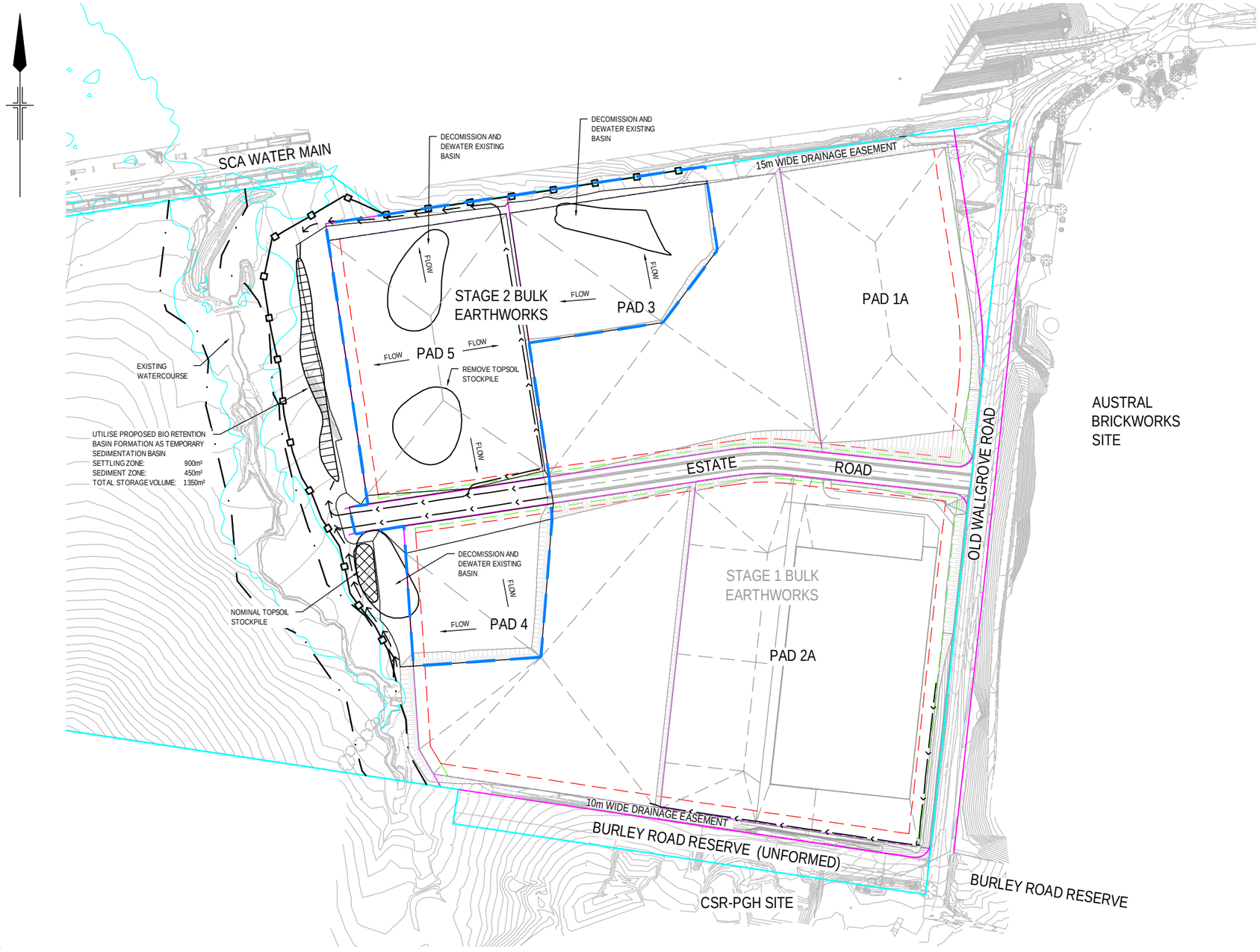
Drawn	M. PELLOW	Designed	S. ATKINS
Drafting Check		Design Check	
Approved			
Date			
Scale	AS SHOWN	This Drawing must not be used for Construction unless signed as Approved	

Client GOODMAN INTERNATIONAL
Project OAKDALE CENTRAL PRECINCT EAST - STAGE 1
Title BULK EARTHWORKS - SEDIMENTATION AND EROSION CONTROL PLAN - STAGE 1

Original Size A1
Drawing No: 21-19628-SK001
Rev: B

Plot Date: 2 September 2010 - 5:33 PM Plotted by: Jee M Soo/Sydney/GHD/AU Cad File No: G:\21\19628\CADD\Drawings\21-19628-SK001.dwg



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10. TOPSOIL SHALL BE RE SPREAD AND STABILISED AS SOON AS POSSIBLE. DISTURBED AREAS SHALL BE LEFT WITH A SCARIFIED SURFACE TO ENCOURAGE WATER INFILTRATION AND ASSIST KEYING IN TOPSOIL.
11. DUST CONTROL MEASURES SHALL BE IMPLEMENTED CONTINUOUSLY DURING CONSTRUCTION WORKS TO THE SATISFACTION OF THE SUPERINTENDENT AND COUNCIL.
12. THE CONTRACTOR SHALL TEMPORARILY REHABILITATE ANY DISTURBED AREAS WITHIN 20 DAYS. WHERE FINAL SHAPING HAS OCCURRED THE CONTRACTOR SHALL PROVIDE FINAL REHABILITATION WITHIN 10 DAYS.
13. DURING EARTHWORKS, TEMPORARY DIVERSION BANKS SHOULD BE CONSTRUCTED TO LIMIT SLOPE LENGTH, WHERE POSSIBLE, IN ACCORDANCE WITH THE FOLLOWING:

    RECOMMENDED MAXIMUM SPACING BETWEEN CROSS BANKS ON ALL ROADS.

SLOPE	MAXIMUM SPACING (m)
0 TO 1%	150
1 TO 3%	100
3 TO 5%	70
5 TO 10%	50
10 TO 17%	16

14. ALL STORMWATER PITS TO BE COVERED OR DROP INLET SEDIMENT TRAPS SHALL BE PROVIDED. KERB INLET TRAPS ARE TO BE INSTALLED AFTER COMPLETION OF PAVING.
15. TEMPORARY KERB INLET SEDIMENT TRAPS TO BE PROVIDED TO ALL EXISTING KERB INLETS IN THE VICINITY OF THE WORKS DURING CONSTRUCTION.
16. SEDIMENT TRAPS AND BASINS ARE TO BE MAINTAINED SUCH THAT:
    (A) SEDIMENT IS REMOVED SUCH THAT NO LESS THAN 70% OF THE DESIGN CAPACITY REMAINS AT ANY ONE TIME.
    (B) MATERIALS ARE REPLACED OR REPAIRED AS REQUIRED TO ENSURE SERVICEABILITY OF BOTH THE ELEMENT AND THE TRAP OR BASIN.
17. PERMANENT DRAINAGE STRUCTURES INCLUDING: PIPES, PITS ARE TO BE HANDED OVER IN A CLEAN CONDITION AT THE COMPLETION OF THE CONTRACT MAINTENANCE PERIOD.
18. FOLLOWING COMPLETION AND RESTORATION OF SITE: REMOVE ALL MATERIALS AND FILL DIVERSION DRAINS, WATERWAYS, SEDIMENT TRAPS, AND SEDIMENT BASINS AND COMPACT IN ACCORDANCE WITH THE SPECIFICATION TO MATCH FINAL LEVELS OF THE WORKS. PROVIDE 100mm TOPSOIL AND HYDROSEED.
19. ACCESS POINT TO ALLOW MACHINE ENTRY / EXIT ARE TO INCLUDE A ROUNDED DIVERSION BANK 0.3m HIGH WITH 10H:1V BATTERS TO DIVERT RUNOFF TO SEDIMENT FENCES EITHER SIDE OF ENTRY.
20. WHERE FLOCCULATION OF BASINS IS REQUIRED UNLESS OTHERWISE SPECIFIED THE RECOMMENDED INITIAL DOSING IS 0.32KG OF GYPSUM PER CUBIC METRES OF BASIN VOLUME. THE CONTRACTOR MAY VARY THIS RATE SUBJECT TO TESTING OF PREVIOUS WATER SAMPLES AND THE ACHIEVEMENTS OF THE REQUIRED WATER QUALITY STANDARDS. FLOCCULATION TO TAKE PLACE WITHIN 48 HOURS OF AN EVENT.
21. THE CONTRACTOR SHALL MAINTAIN A LOG BOOK DETAILING
    - RECORDS OF ALL RAINFALL
    - CONDITION OF SOIL AND WATER MANAGEMENT STRUCTURES
    - ANY APPLICATION OF FLOCCULATING AGENTS TO SEDIMENT BASIN
    - VOLUMES OF ALL WATER DISCHARGED FROM SEDIMENT BASINS - ANY ADDITIONAL REMEDIAL WORKS REQUIRED
    THE LOG BOOK SHALL BE MAINTAINED ON A WEEKLY BASIS AND BE MADE AVAILABLE TO ANY AUTHORISED PERSON UPON REQUEST. THE ORIGINAL LOG BOOK SHALL BE ISSUED TO THE PROJECT MANAGER AT THE COMPLETION OF THE WORKS.
22. THE CONTRACTOR SHALL AT ALL TIMES RESTRICT CONSTRUCTION EQUIPMENT MOVEMENT TO THE ESSENTIAL CONSTRUCTION AREAS. THE CONTRACTOR SHALL NOT EXTEND LAND DISTURBANCE BEYOND 2m FROM THE EDGE OF ANY ESSENTIAL CONSTRUCTION ACTIVITY.

LEGEND

- PROPOSED SEDIMENT "SILT" FENCE
- EARTH CATCH / DIVERSION DRAIN
- EARTH CATCH V-DRAIN
- EARTH DIVERSION BUND
- EARTH DIVERSION SWALE
- AUSTRAL BRICKWORKS STORMWATER FLOW
- LIMIT OF BULK EARTHWORKS - STAGE 2
- SEDIMENTATION BASIN
- NOMINAL TOPSOIL STOCKPILE
- PROPOSED LOT BOUNDARY
- PROPOSED LANDSCAPE SETBACK LINE
- PROPOSED BUILDING SETBACK LINE
- PROPOSED EASEMENT
- CORE RIPARIAN ZONE

PLAN
SCALE 1:2000

APPROVAL

No	Revision	Drawn	Checked	Approved	Date
B	RE-ISSUED FOR APPROVAL	SA			02.09.10
A	ISSUED FOR APPROVAL	MP			28.05.10

Note: * indicates signatures on original issue of drawing or last revision of drawing

0 20 40 60 80 100m
SCALE 1:2000 AT ORIGINAL SIZE

Goodman

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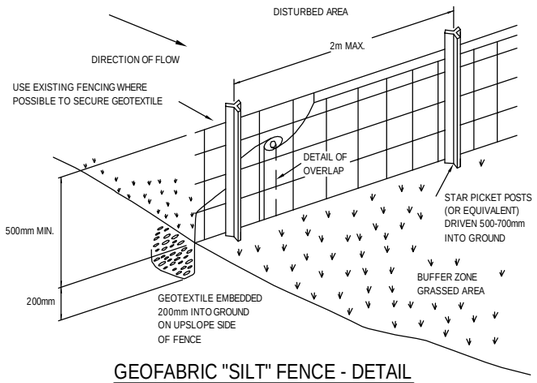
Drafting Check		Design Check	
Approved			
Date			
Scale	AS SHOWN	This Drawing must not be used for Construction unless signed as Approved	

Client: GOODMAN INTERNATIONAL
Project: OAKDALE CENTRAL PRECINCT EAST - STAGE 2
Title: BULK EARTHWORKS - SEDIMENTATION AND EROSION CONTROL PLAN - STAGE 2

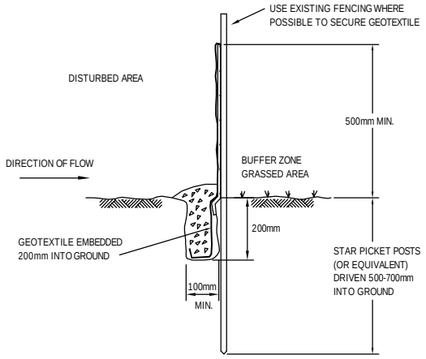
Original Size A1
Drawing No: 21-19628-SK002
Rev: B

Plot Date: 2 September 2010 - 5:40 PM Plotted by: Jee M Soo/Sydney/GHD/AU Cad File No: G:\21\19628\CADD\Drawings\21-19628-SK002.dwg



GEOFABRIC "SILT" FENCE - DETAIL

NOT TO SCALE



GEOFABRIC "SILT" FENCE - TYPICAL SECTION

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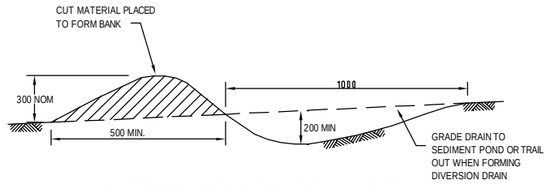
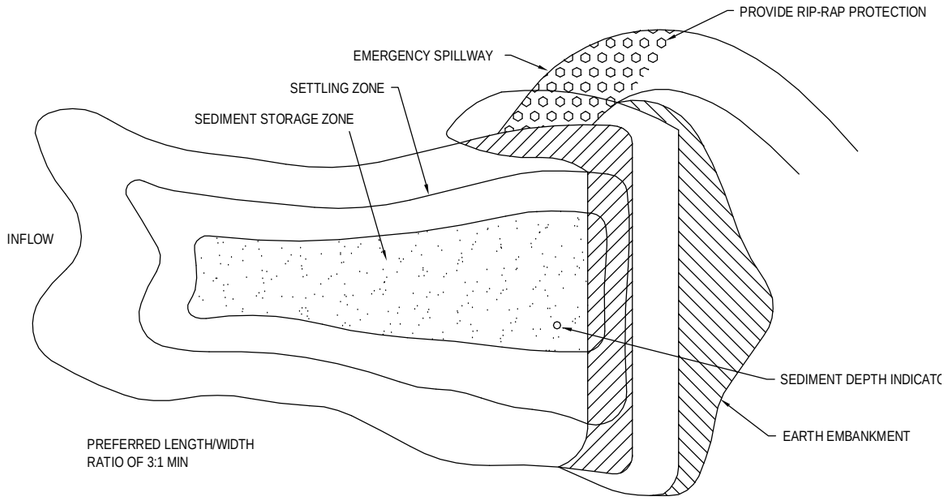


DIVERSION OR CATCH DRAIN - DETAIL

NOT TO SCALE

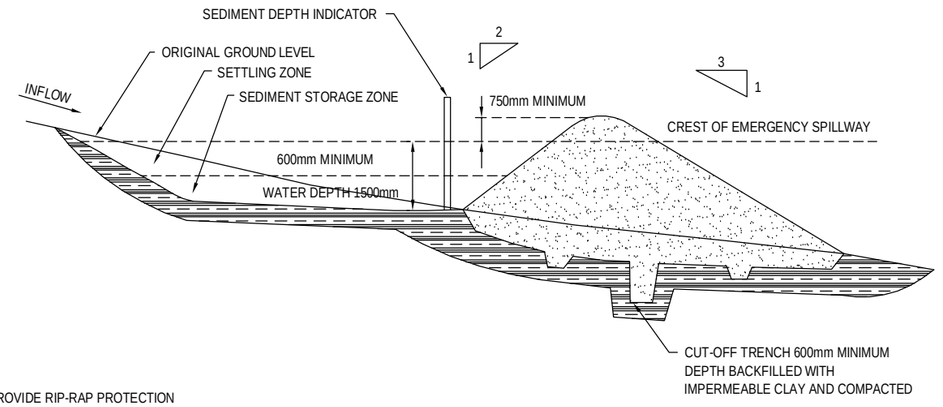


TYPICAL TEMPORARY EARTH BASIN (PLAN)

NTS

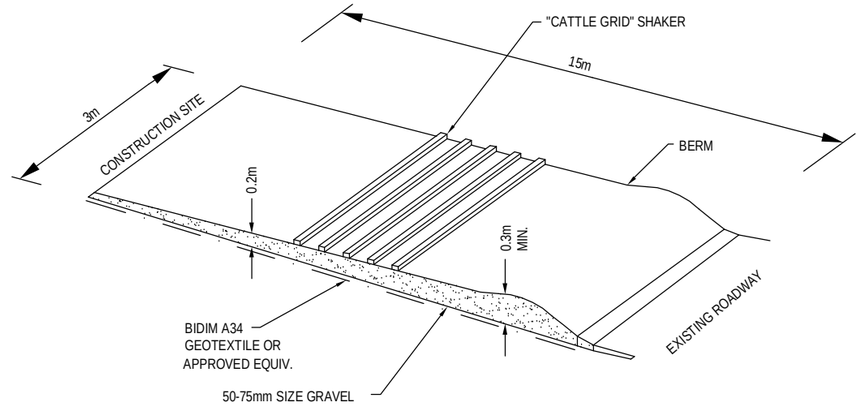
OPERATIONAL POLICY FOR BASIN

1. SETTLING ZONE SHOULD BE PUMPED OUT WITHIN 5 DAYS FOLLOWING RAINFALL EVENT.
2. PUMPING OF SETTLED WATER SHOULD BE:
   (a) FIRSTLY RE-USE FOR PROCESS WATER IF DEMAND EXISTS
   (b) SECONDLY RE-USE FOR ONSITE DUST SUPPRESSION
   (c) LASTLY DISPOSE TO STORMWATER IF WATER QUALITY APPROPRIATE
3. FLOCCULATION SHOULD BE USED WHERE EXTENDED SETTLING IS LIKELY TO FAIL.
4. FOR CONSTRUCTION NOTES REFER TO THE DEPARTMENT OF HOUSING MANAGING URBAN STORMWATER HANDBOOK EDITION 2004 DETAIL SD6-4.



TYPICAL TEMPORARY EARTH BASIN (SECTION)

NTS



STABILISED SITE ACCESS

NTS

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date
A	ISSUED FRO APPROVAL		MP			28.05.10

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Client GOODMAN INTERNATIONAL
Project OAKDALE CENTRAL PRECINCT EAST - STAGE 1
Title BULK EARTHWORKS
EROSION AND SEDIMENT CONTROL DETAILS

Original Size A1 Drawing No: 21-19628-SK003 Rev: A

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Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
Rev 1	F. Carrozza	F. Carrozza	* On File	C McDougall	* On File	28/5/10
Rev 2	F. Carrozza	F. Carrozza	* On File	C McDougall	* On File	02/09/10
Rev 3	F. Carrozza	F. Carrozza	* On File	C McDougall	* On File	10/09/10