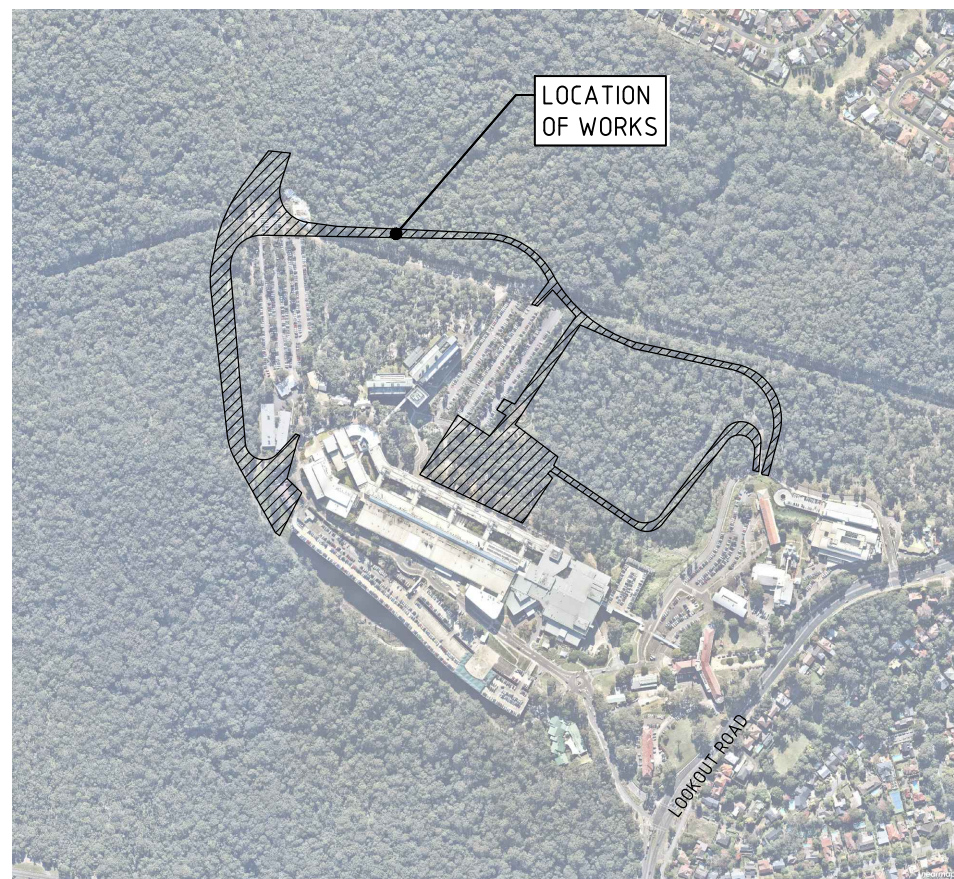



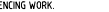


LOOKOUT ROAD, NEW LAMBTON HEIGHTS CIVIL SSDA PACKAGE

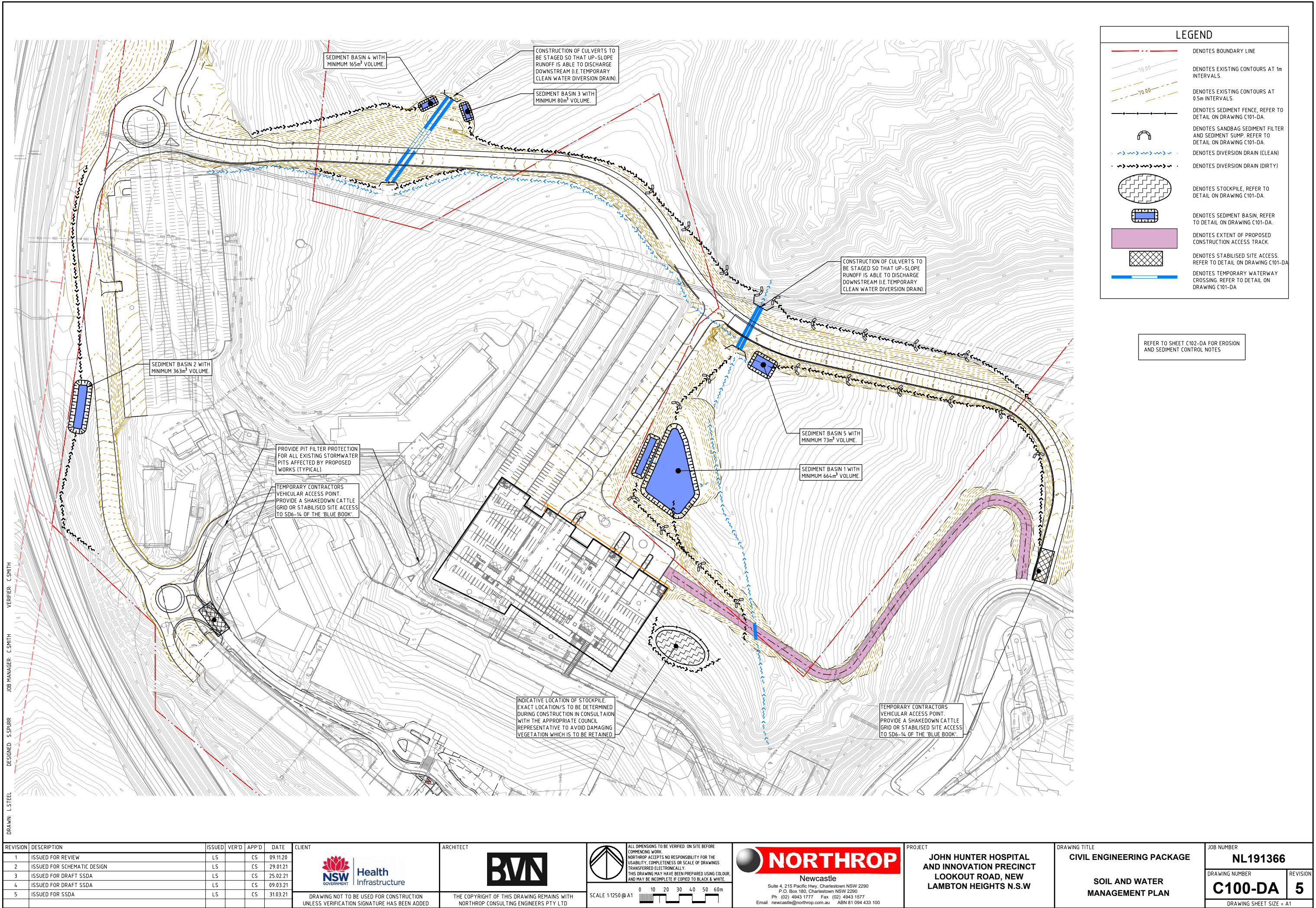


LOCALITY PLAN

DRAWING SCHEDULE

DRG No.	DRAWING TITLE
C001-DA	COVER SHEET, LOCALITY PLAN AND DRAWING SCHEDULE
C100-DA	SOIL AND WATER MANAGEMENT PLAN
C101-DA	SOIL AND WATER MANAGEMENT DETAILS
C102-DA	SOIL AND WATER MANAGEMENT NOTES
C200-DA	BULK EARTHWORKS PLAN
C300-DA	CIVIL WORKS ARRANGEMENT PLAN
C400-DA	ROAD SETOUT PLAN
C401-DA	ROAD TYPICAL SECTIONS
C501-DA	ROAD LONG SECTIONS - SHEET 1
C502-DA	ROAD LONG SECTIONS - SHEET 2
C503-DA	ROAD LONG SECTIONS - SHEET 3

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE	CLIENT	ARCHITECT		ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WORK. NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY. THIS DRAWING MAY HAVE BEEN PREPARED USING COLOUR, AND MAY BE INCOMPLETE IF COPIED TO BLACK & WHITE.	 Newcastle Suite 4, 215 Pacific Hwy, Charlestown NSW 2290 P.O. Box 180, Charlestown NSW 2290 Ph (02) 4943 1777 Fax (02) 4943 1577 Email newcastle@northrop.com.au ABN 81 094 433 100	PROJECT JOHN HUNTER HOSPITAL AND INNOVATION PRECINCT LOOKOUT ROAD, NEW LAMBTON HEIGHTS N.S.W	DRAWING TITLE CIVIL ENGINEERING PACKAGE COVER SHEET, LOCALITY PLAN AND DRAWING SCHEDULE	JOB NUMBER NL191366
1	ISSUED FOR DRAFT REVIEW	LS		CS	30.09.20	 							
2	ISSUED FOR REVIEW	LS		CS	09.11.20								
3	ISSUED FOR SCHEMATIC DESIGN	LS		CS	29.01.21								
4	ISSUED FOR DRAFT SSDA	LS		CS	25.02.21								
5	ISSUED FOR DRAFT SSDA	LS		CS	09.03.21								
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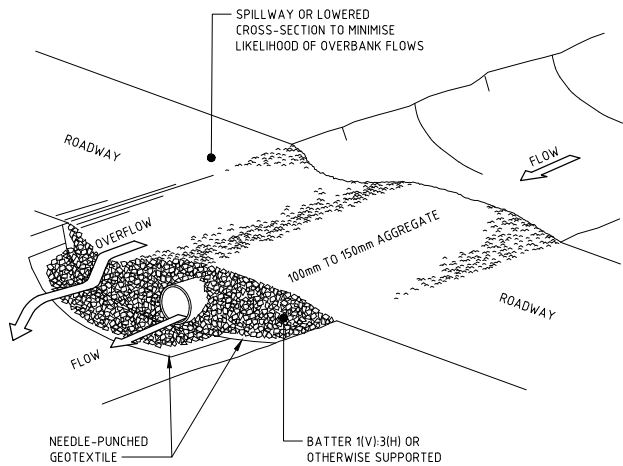

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PROJECT
JOHN HUNTER HOSPITAL AND INNOVATION PRECINCT
LOOKOUT ROAD, NEW LAMBTON HEIGHTS N.S.W

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
SOIL AND WATER MANAGEMENT PLAN

JOB NUMBER
NL191366
DRAWING NUMBER
C100-DA
REVISION
5
DRAWING SHEET SIZE = A1

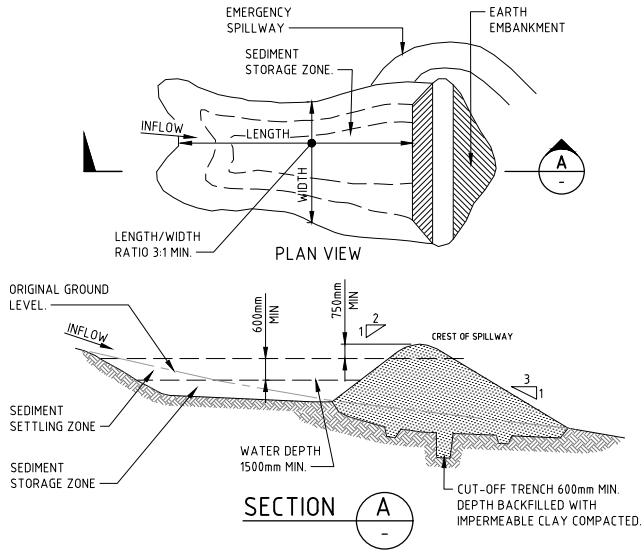
VERIFIER: C SMITH
JOB MANAGER: C SMITH
DESIGNED: S SPURR
DRAWN: L STEEL



CONSTRUCTION NOTES

1. PROHIBIT ALL TRAFFIC UNTIL THE ACCESS WAY IS CONSTRUCTED.
2. STRIP ANY TOPSOIL AND PLACE A NEEDLE-PUNCHED TEXTILE OVER THE BASE OF THE CROSSING.
3. PLACE CLEAN, RIGID, NON POLLUTING AGGREGATE OR GRAVEL IN THE 100mm to 150mm SIZE CLASS OVER THE FABRIC TO A MINIMUM DEPTH OF 200mm.
4. PROVIDE A 3m WIDE CARRIAGEWAY WITH SUFFICIENT LENGTH OF CULVERT PIPE TO ALLOW LESS THAN A 3(H): 1 (V) SLOPE ON SIDE BATTERS.
5. INSTALL A LOWER SECTION TO ACT AS AN EMERGENCY SPILLWAY IN GREATER THAN DESIGN STORM EVENTS.
6. ENSURE THAT CULVERT OUTLETS EXTEND BEYOND THE TOE OF FILL EMBANKMENTS.

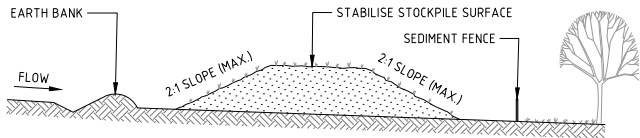
TEMPORARY WATERWAY CROSSING (SD 5-1)



CONSTRUCTION NOTES

1. REMOVE ALL VEGETATION AND TOPSOIL FROM UNDER THE DAM WALL AND FROM WITHIN THE STORAGE AREA.
2. CONSTRUCT A CUT-OFF TRENCH 500mm DEEP AND 1200mm WIDE ALONG THE CENTRELINE OF THE EMBANKMENT EXTENDING TO A POINT ON THE GULLY WALL LEVEL WITH THE RISER CREST.
3. MAINTAIN THE TRENCH FREE OF WATER AND RECOMPACT THE MATERIALS WITH EQUIPMENT AS SPECIFIED IN THE SWMP TO 95 PER CENT STANDARD PROCTOR DENSITY.
4. SELECT FILL FOLLOWING THE SWMP THAT IS FREE OF ROOTS, WOOD, ROCK, LARGE STONE OR FOREIGN MATERIAL.
5. PREPARE THE SITE UNDER THE EMBANKMENT BY RIPPING TO AT LEAST 100mm TO HELP BOND COMPACTED FILL TO THE EXISTING SUBSTRATE.
6. SPREAD THE FILL IN 100mm TO 150mm LAYERS AND COMPACT IT AT OPTIMUM MOISTURE CONTENT FOLLOWING THE SWMP.
7. CONSTRUCT THE EMERGENCY SPILLWAY.
8. REHABILITATE THE STRUCTURE FOLLOWING THE SWMP.

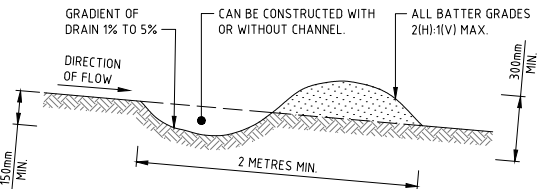
(APPLIES TO 'TYPE D' AND 'TYPE F' SOILS ONLY)
EARTH BASIN - WET (SD 6-4)



CONSTRUCTION NOTES

1. PLACE STOCKPILES MORE THAN 2m (PREFERABLY 5m) FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2m IN HEIGHT.
4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS (STANDARD DRAWING 5-5) ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES (STANDARD DRAWING 6-8) 1 TO 2m DOWNSLOPE.

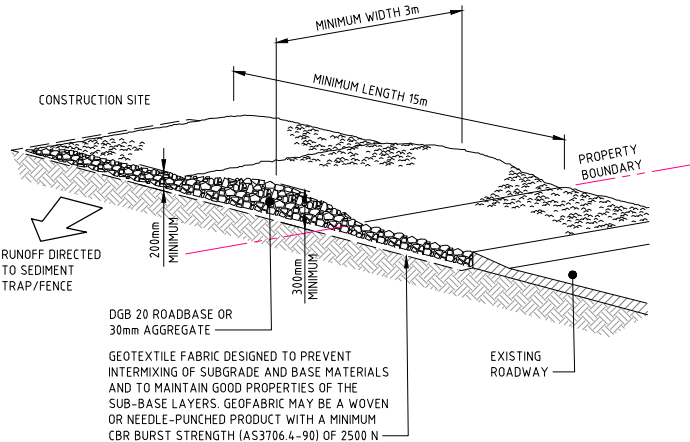
STOCKPILES (SD 4-1)



CONSTRUCTION NOTES

1. BUILD WITH GRADIENTS BETWEEN 1 AND 5 PERCENT.
2. AVOID REMOVING TREES AND SHRUBS IF POSSIBLE - WORK AROUND THEM.
3. ENSURE THE STRUCTURES ARE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT COULD IMPEDE WATER FLOW.
4. BUILD THE DRAINS WITH CIRCULAR, PARABOLIC OR TRAPEZOIDAL CROSS SECTIONS, NOT V SHAPED.
5. ENSURE THE BANKS ARE PROPERLY COMPACTED TO PREVENT FAILURE.
6. COMPLETE PERMANENT OR TEMPORARY STABILISATION WITHIN 10 DAYS OF CONSTRUCTION.

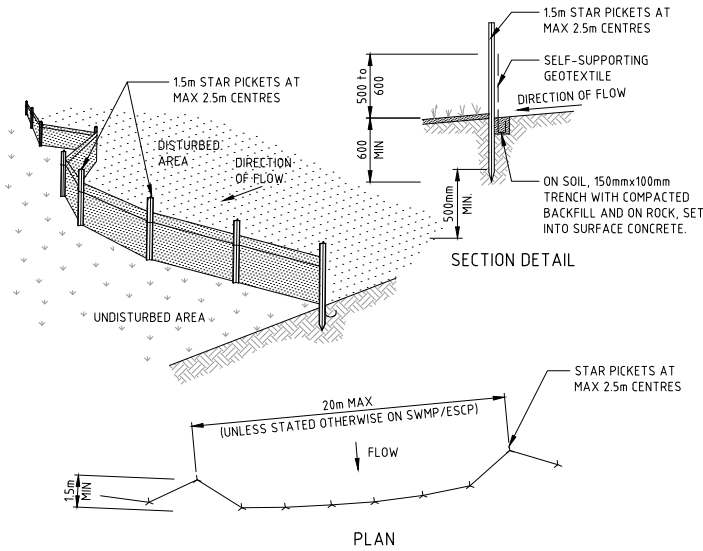
NOTE: ONLY TO BE USED AS TEMPORARY BANK
WHERE MAXIMUM UPSLOPE LENGTH IS 80 METRES.
EARTH BANK - LOW FLOW (SD 5-5)



CONSTRUCTION NOTES

1. STRIP THE TOPSOIL, LEVEL THE SITE AND COMPACT THE SUBGRADE.
2. COVER THE AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
3. CONSTRUCT A 200mm THICK PAD OVER THE GEOTEXTILE USING ROAD BASE OR 30mm AGGREGATE.
4. ENSURE THE STRUCTURE IS AT LEAST 15 METRES LONG OR TO BUILDING ALIGNMENT AND AT LEAST 3 METRES WIDE.
5. WHERE A SEDIMENT FENCE JOINS ONTO THE STABILISED ACCESS, CONSTRUCT A HUMP IN THE STABILISED ACCESS TO DIVERT WATER TO THE SEDIMENT FENCE.

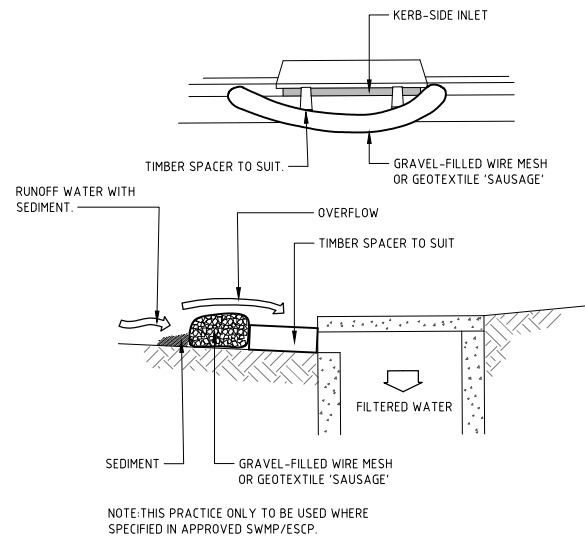
STABILISED SITE ACCESS (SD 6-14)



CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 15 METRE LONG STAR PICKETS INTO GROUND AT 2.5 METRE INTERVALS (MAX) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

SEDIMENT FENCE (SD 6-8)




CONSTRUCTION NOTES


1. INSTALL FILTERS TO KERB INLETS ONLY AT SAG POINTS.
2. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
3. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
4. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
5. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
6. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY FIRMLY ABUT EACH OTHER AND SEDIMENT-LADEN WATERS CANNOT PASS BETWEEN.

MESH AND GRAVEL INLET FILTER (SD 6-11)

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PROJECT
JOHN HUNTER HOSPITAL AND INNOVATION PRECINCT LOOKOUT ROAD, NEW LAMBTON HEIGHTS N.S.W

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
SOIL AND WATER MANAGEMENT DETAILS

JOB NUMBER
NL191366
DRAWING NUMBER
C101-DA
REVISION
5
DRAWING SHEET SIZE = A1

THE ESCP/SWMP AND ITS ASSOCIATED EROSION AND SEDIMENT CONTROL MEASURES MUST BE CONSTANTLY MONITORED, REVIEWED, AND MODIFIED AS REQUIRED TO CORRECT DEFICIENCIES. COUNCIL HAS THE RIGHT TO REQUEST CHANGES IF, IN ITS OPINION, THE MEASURES THAT ARE PROPOSED OR HAVE BEEN INSTALLED ARE INADEQUATE TO PREVENT POLLUTION.

PRIOR TO ANY ACTIVITIES ONSITE, THE RESPONSIBLE PERSON(S) IS TO BE NOMINATED. THE RESPONSIBLE PERSON(S) MUST BE RESPONSIBLE FOR THE EROSION AND SEDIMENT CONTROL (ESC) MEASURES ONSITE.

THE APPROVED SWMP MUST BE AVAILABLE ON-SITE FOR INSPECTION BY COUNCIL OFFICERS WHILE WORKING ACTIVITIES ARE OCCURRING.

ALL EROSION AND SEDIMENT CONTROL MEASURES MUST BE APPROPRIATE FOR THE SEDIMENT TYPE(S) OF THE SOILS ONSITE, IN ACCORDANCE WITH THE BLUE BOOK (MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION, LANDCOM, 2004), OR OTHER CURRENTLY RECOGNISED INDUSTRY STANDARD FOR EROSION AND SEDIMENT CONTROL FOR AUSTRALIAN CONDITIONS. THIS INCLUDES SEDIMENT TRAPS, TREATMENT OF CAPTURED WATER, AND LINING OF CHANNELS.

NO LAND-DISTURBING ACTIVITIES ON THE SITE SHALL OCCUR UNTIL ALL PERIMETER ESC MEASURES, SEDIMENT BASINS, AND ASSOCIATED TEMPORARY DRAINAGE CONTROLS, HAVE BEEN CONSTRUCTED AND ARE FULLY OPERATIONAL, IN ACCORDANCE WITH CURRENT BEST PRACTICE ESC. THIS IS UNLESS SUCH CLEARING IS REQUIRED FOR THE PURPOSE OF INSTALLING SUCH MEASURES, IN WHICH CASE ONLY THE MINIMUM CLEARING NECESSARY TO INSTALL SUCH MEASURES SHALL OCCUR.

ADDITIONAL ESC MEASURES MUST BE IMPLEMENTED, AND A REVISED SWMP IS TO BE SUBMITTED FOR APPROVAL TO THE CERTIFIER (WITHIN FIVE (5) BUSINESSDAYS OF ANY SUCH AMENDMENTS) IN THE EVENT THAT:

- (i) THERE IS A HIGH PROBABILITY THAT SERIOUS OR MATERIAL ENVIRONMENTAL HARM MAY OCCUR AS A RESULT OF SEDIMENT LEAVING THE SITE; OR
- (ii) THE IMPLEMENTED WORKS FAIL TO ACHIEVE COUNCIL'S WATER QUALITY OBJECTIVES SPECIFIED IN THESE CONDITIONS; OR
- (iii) SITE CONDITIONS SIGNIFICANTLY CHANGE; OR
- (iv) SITE INSPECTIONS INDICATE THAT THE IMPLEMENTED WORKS ARE FAILING TO ACHIEVE THE "OBJECTIVE" OF THE SWMP;
- (v) A COPY OF ANY AMENDED SWMP MUST BE FORWARDED TO AN APPROPRIATE COUNCIL OFFICER, WITHIN FIVE (5) BUSINESSDAYS OF ANY SUCH AMENDMENTS.

ALL REASONABLE AND PRACTICABLE MEASURES MUST BE TAKEN TO ENSURE STORMWATER RUNOFF FROM ACCESS ROADS AND STABILISED ENTRY/EXIT SYSTEMS, DRAINS TO AN APPROPRIATE SEDIMENT CONTROL DEVICE.

THE APPLICANT MUST ENSURE AN ADEQUATE SUPPLY OF ESC, AND APPROPRIATE POLLUTION CLEAN-UP MATERIALS ARE AVAILABLE ON-SITE AT ALL TIMES. THIS INCLUDES CHEMICALS/AGENTS TO TREAT TURBID WATER IN BASINS.

SEDIMENT DEPOSITED OFF SITE AS A RESULT OF ON-SITE ACTIVITIES MUST BE COLLECTED AND THE AREA CLEARED/REHABILITATED AS SOON AS REASONABLE AND PRACTICABLE.

NEWLY SEALED HARD-STAND AREAS (E.G. ROADS, DRIVEWAYS AND CAR PARKS) MUST BE SWEEPED THOROUGHLY AS SOON AS PRACTICABLE AFTER SEALING/SURFACING TO MINIMISE THE RISK OF COMPONENTS OF THE SURFACING COMPOUND ENTERING STORMWATER DRAINS.

STOCKPILES OF ERODIBLE MATERIAL MUST BE PROVIDED WITH AN APPROPRIATE PROTECTIVE COVER (SYNTHETIC OR ORGANIC) IF THE MATERIALS ARE LIKELY TO BE STOCKPILED FOR MORE THAN 10 DAYS.

STOCKPILES, TEMPORARY OR PERMANENT, SHALL NOT BE LOCATED IN AREAS IDENTIFIED AS NO-GO ZONES (INCLUDING, BUT NOT LIMITED TO, RESTRICTED ACCESS AREAS, BUFFER ZONES, OR AREAS OF NON-DISTURBANCE) ON THE ESCP/SWMP.

PRIORITY MUST BE GIVEN TO THE PREVENTION, OR AT LEAST THE MINIMISATION, OF SOIL EROSION, RATHER THAN THE TRAPPING OF DISPLACED SEDIMENT.

MEASURES USED TO CONTROL WIND EROSION MUST BE APPROPRIATE FOR THE LOCATION AND PREVENT SOIL EROSION AT ALL TIMES, INCLUDING WORKING HOURS, OUT OF HOURS, WEEKENDS, PUBLIC HOLIDAYS, AND DURING ANY OTHER SHUTDOWN PERIODS.

THE APPLICATION OF LIQUID OR CHEMICAL-BASED DUST SUPPRESSION MEASURES MUST ENSURE THAT SEDIMENT-LADEN RUNOFF RESULTING FROM SUCH MEASURES (E.G. RUNOFF OF EXCESS WATER) DOES NOT CREATE A TRAFFIC OR ENVIRONMENTAL HAZARD.

PRIOR TO THE CONTROLLED DISCHARGE (E.G. DE-WATERING ACTIVITIES FROM EXCAVATIONS AND SEDIMENT BASINS) OF ANY WATER FROM THE SITE DURING CONSTRUCTION, THE FOLLOWING WATER QUALITY OBJECTIVES MUST BE ACHIEVED:

- a) TOTAL SUSPENDED SOLIDS (TSS) TO A MAXIMUM 50MG/L;
- b) TURBIDITY (NTU) TO A MAXIMUM OF 60 NTU MEASURED BY A TURBIDITY METER;
- c) WATER PH BETWEEN 6.5 AND 8.5 UNLESS OTHERWISE REQUIRED BY THE COUNCIL; AND
- d) EC LEVELS NO GREATER THAN BACKGROUND LEVELS.

PRIOR TO ANY FORECAST WEATHER EVENT LIKELY TO RESULT IN SEDIMENT LADEN RUNOFF ON THE SITE, ANY EXISTING DETENTION BASINS/TRAPS SHALL BE DEWATERED TO PROVIDE SUFFICIENT CAPACITY TO CAPTURE SEDIMENT LADEN WATER FROM THE SITE PRIOR TO THE WEATHER EVENT.

ANY SEDIMENT-LADEN WATER CAPTURED ONSITE MUST BE TREATED TO ENSURE IT WILL ACHIEVE COUNCIL'S WATER QUALITY OBJECTIVES SPECIFIED IN THESE CONDITIONS, PRIOR TO ITS RELEASE FROM SITE. A SAMPLE OF THE RELEASED TREATED WATER MUST BE KEPT ONSITE IN A CLEAR CONTAINER WITH THE SAMPLE DATE RECORDED ON IT.

THE SITE IS LOCATED WITHIN THE NEWCASTLE SOIL LANDSCAPE, WHICH HAS THE FOLLOWING PROPERTIES (IN ACCORDANCE WITH TABLE C13 OF THE "BLUE BOOK"):

- SEDIMENT TYPE F
- SOIL HYDROLOGY GROUP A
- K-FACTOR OF 0.016 (WORST CASE)

WHERE: R = RAINFALL EROSIONITY FACTOR = 2590
2 YEAR, 6 HOUR STORM INTENSITY = 10.9 mm/hr
LS = SLOPE LENGTH/GRADIENT FACTOR = 0.7
K = SOIL ERODIBILITY FACTOR = 0.016
P = EROSION CONTROL PRACTICE (P-FACTOR) = 13 (TYPICAL)
C = GRASS COVER (C-FACTOR) = 10 (TYPICAL FOR STRIPPED SITE)

THE SETTLING ZONE VOLUME OF THE BASIN WAS CALCULATED FOR A 2 MONTHS SOIL LOSS AS CALCULATED BY THE RUSLE METHOD:

SETTLING ZONE VOLUME = 10 CV RX-DAY, Y-%ILE x CATCHMENT AREA
WHERE RX-DAY, Y-%ILE = 30.5 mm/hr
[5 DAY, 80th PERCENTILE RAINFALL EVENT, NEWCASTLE]

TOTAL BASIN VOLUME					
SITE	C _v	TOTAL CATCHMENT AREA (ha)	SETTLING ZONE VOLUME (m ³)	SEDIMENT STORAGE VOLUME (m ³)	TOTAL BASIN VOLUME (m ³)
SEDIMENT BASIN 1	0.5	3.29	502	162	664
SEDIMENT BASIN 2	0.5	2.3	350	13	363
SEDIMENT BASIN 3	0.5	0.49	74	6	80
SEDIMENT BASIN 4	0.5	0.84	128	37	165
SEDIMENT BASIN 5	0.5	0.47	72	1	73

THE LONG TERM GROUND COVER FACTORS FOR THE CONSTRUCTION WORKS IS NOT TO EXCEED THE FOLLOWING LIMITS:

LAND	MAXIMUM C-FACTOR	REMARKS
WATERWAYS AND OTHER AREAS OF CONCENTRATED FLOWS, POST CONSTRUCTION	0.05	APPLIES AFTER TEN WORKING DAYS OF COMPLETION OF FORMATION AND BEFORE CONCENTRATED FLOWS ARE APPLIED. FOOT AND VEHICULAR TRAFFIC IS PROHIBITED IN THIS AREA AND 70% GROUND COVER IS REQUIRED.
STOCKPILES, POST CONSTRUCTION	0.10	APPLIES AFTER TEN WORKING DAYS FROM COMPLETION OF FORMATION. 60% GROUND COVER IS REQUIRED.
ALL LANDS, INCLUDING WATERWAYS AND STOCKPILES, DURING CONSTRUCTION	0.15	APPLIES AFTER 20 DAYS OF INACTIVITY, EVEN THOUGH WORKS MAY BE INCOMPLETE. 50% GROUND COVER IS REQUIRED.

TEMPORARY SEED MIX

SOWING SEASON	SEED MIX
AUTUMN/WINTER	OATS @40kg/Ha + JAPANESE MILLET @10kg/Ha
SPRING/SUMMER	OATS @10kg/Ha + JAPANESE MILLET @40kg/Ha

THESE PLANT SPECIES ARE FOR TEMPORARY REVEGETATION ONLY. THEY WILL ONLY PROVIDE PROTECTION FROM EROSION FOR SIX MONTHS. WHERE THE LOTS ARE TO BE LEFT UNDEVELOPED FOR A LONGER PERIOD, THE CONTRACTOR SHALL SEEK ADVICE FROM THE SITE SUPERINTENDENT AS TO MORE APPROPRIATE REVEGETATION METHODS.

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