



LEGEND

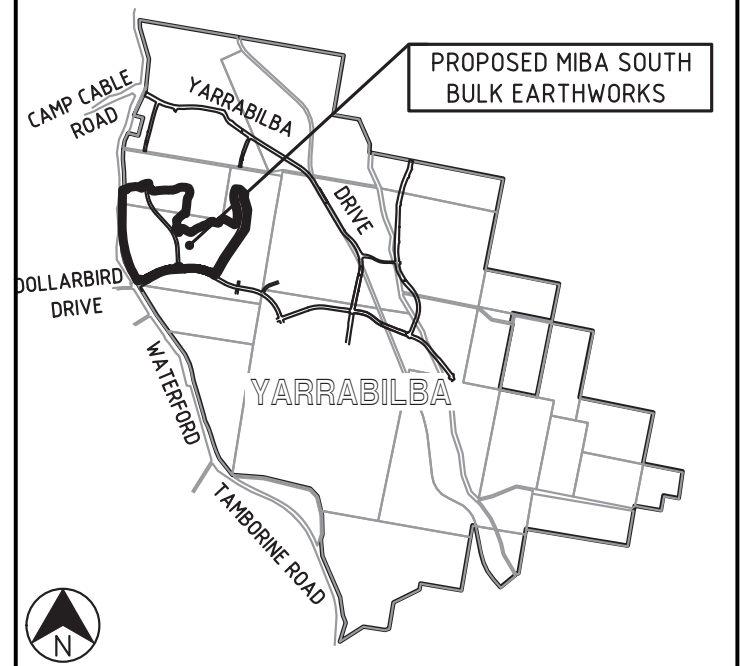
- 37.0 FINISHED SURFACE CONTOURS
- 36.0 NATURAL SURFACE CONTOURS
- BATTER LINE - TOP
- BATTER LINE - BOTTOM
- ESC BASIN
- EXTENT OF CUT
- EXTENT OF FILL
- REFER TO APPROVED PRE CONSTRUCTION APPLICATION
- REFER TO APPROVED PRE CONSTRUCTION APPLICATION
- CONSTRUCTION BOUNDARY
- OPEN SPACE
- FAUNA CORRIDOR
- 10m TREE PROTECTION ZONE
- 15m MINOR WATERWAY BUFFER
- 15m MEDIUM BUSHFIRE HAZARD BUFFER



CATCHMENT PLAN

SCALE 1:500 (IN METERS)

LOCALITY PLAN



LOCALITY PLAN

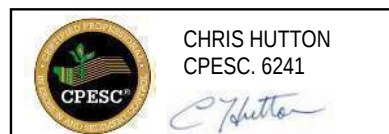
N.T.S.

ESC LEGEND

- CATCHMENT BOUNDARY
- TYPICAL RUNOFF FLOW DIRECTION
- PROPOSED SEDIMENT BASIN LOCATION

ORIGINAL KN GROUP PLANS PROVIDED BY GOLDING PTY LTD

CPESC DESIGNED



PLANS AND DOCUMENTS referred to in the PDA DEVELOPMENT APPROVAL

Approval no: DEV2025/1588
Date: 19 June 2025



89 CASLICK LANE,
BROADWATER, QLD.
PH: (MOB) 0400 643 883

APPROVED DATE 11-05-2025
Chris Hutton
CHRIS HUTTON - CPESC No. 6241

CLIENT GOLDING PTY LTD
PROJECT PRECINCT 5 MIBA SOUTH - BULK EARTHWORKS
LOCATION YARRABILBA, QUEENSLAND
DRAWING TITLE CONCEPTUAL ESC - CATCHMENT PLAN

JOB No. ESC-0499
DRAWING No. / REVISION DR-01 d

ESC DESIGN OBJECTIVES

IN ACCORDANCE WITH THE QLD STATE PLANNING POLICY (2017) ALL EXPOSED AREAS GREATER THAN 2500m2 MUST BE PROVIDED WITH SEDIMENT CONTROLS WHICH ARE DESIGNED, IMPLEMENTED AND MAINTAINED TO A STANDARD WHICH WOULD ACHIEVE AT LEAST 80% OF THE AVERAGE ANNUAL RUNOFF VOLUME OF THE CONTRIBUTING CATCHMENT TREATED TO 50mg/L TOTAL SUSPENDED SOLIDS (TSS) OR LESS, AND pH IN THE RANGE (6.5-8.5).

SOIL LOSS

Soil Loss Estimations									
A = R . K . LS . C . P									
where:									
A=	Annual soil loss due to erosion (t/ha/yr)								
R=	Rainfall erosivity factor								
K=	Soil erodibility factor								
LS=	topographic slope/length factor								
P=	Erosion Control Practice factor								
C=	Cover and management factor								
Construction Area	Exposed Area (ha)	R	K	Equal Area Slope (%)	LS	P	C	A (t/ha/yr)	Soil Loss (t/yr)
Catchment A	19.10	3425	0.05	2.20	0.41	1.3	1	91	1,743
Catchment B	25.70	3425	0.05	4.10	0.91	1.3	1	203	5,207

NOTE: SOIL LOSS BASED ON DISTURBED CATCHMENT AREAS

NOTE:

A CONSERVATIVE K FACTOR OF 0.05 HAS BEEN ADOPTED FOR THE SITE.

P FACTOR VALUE OF 1.3 IS BASED ON AN INDUSTRY DEFAULT "CONSTRUCTION PHASE" IN ACCORDANCE WITH TABLE E11 (IECA 2008)

SITE SPECIFIC R FACTOR OF 3425 IS BASED ON A 6hr /2 yr INSTENSITY OF 12.6mm/hr AND EQUATION R3.2 (IECA 2008)

SEDIMENT CONTROL

SEDIMENT CONTROL IS DETERMINED USING TABLE 4.5.1 (FROM IECA, 2008) THE TABLE INDICATES THAT THE SEDIMENT CONTROL STANDARD IS BASED ON THE CATCHMENT AREA AND SOIL LOSS. THE TABLE BELOW IS ADAPTED FROM TABLE B1 OF APPENDIX B (IN IECA 2018). BASED ON THE CATCHMENT AREAS AND SOIL LOSS, TYPE 1 ESC MEASURES ARE REQUIRED FOR ALL CATCHMENTS

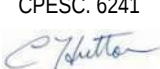
Sediment Control Standard (Table B1 Draft Appendix B IECA 2008)

AREA LIMIT (m²)	SOIL LOSS RATE LIMIT (T/HA/YR)		
	TYPE 1	TYPE 2	TYPE 3
1000	N/A	N/A	All cases
2500	N/A	> 75	75
> 2500	> 150	150	75
> 10000	>75	N/A	75

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CLIENT
GOLDING PTY LTD

PROJECT
PRECINCT 5 MIBA SOUTH - BULK EARTHWORKS

LOCATION
YARRABILBA, QUEENSLAND

DRAWING TITLE
CONCEPTUAL ESC - RISK ASSESSMENT

JOB No.
ESC-0499

DRAWING No. / REVISION
DR-02 d

NOTE: DIRECTION OF DIRTY WATER CONVEYANCE INDICATES FLOW ALONG ROAD BOX DURING BULK EARTHWORKS PHASE.

INSTALL STAKED COIR LOGS OR SAND BAGS AT INTERVALS TO SWALE ONCE PROFILE HAS BEEN ACHIEVED (TYP.)

REFER TO DRAWINGS DR11-14 FOR CULVERT DETAILS

SEDIMENT FENCE OR MULCH BUND TO TOE OF FILL BATTERS (TYP.)

TEMPORARY WATER WAY CROSSING. REFER DETAILS DR-05

CONSTRUCT DIVERSION BUND ON DOWNSLOPE BOUNDARY OF FUTURE PRECINCT TO DIVER RUNOFF TO ROAD BOX

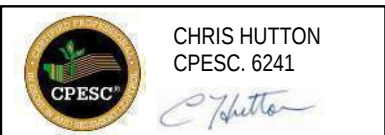
ENSURE EXTERNAL ROADS ARE SWEEPED CLEAN OF SEDIMENT FROM SITE VEHICLES AT ALL TIME

SITE CONSTRUCTION ROCK PAD ACCESS. EXACT LOCATION TO BE DETERMINED BY SITE ENGINEER

- LEGEND
- 37.0 FINISHED SURFACE CONTOURS
 - 36.0 NATURAL SURFACE CONTOURS
 - BATTER LINE - TOP
 - BATTER LINE - BOTTOM
 - ESC BASIN
 - EXTENT OF CUT
 - EXTENT OF FILL
 - REFER TO APPROVED PRE CONSTRUCTION APPLICATION
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 - OPEN SPACE
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 - 10m TREE PROTECTION ZONE
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 - 15m MEDIUM BUSHFIRE HAZARD BUFFER

LAYOUT PLAN

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LOCATION YARRABILBA, QUEENSLAND

DRAWING TITLE CONCEPTUAL ESC - ESC MEASURES SHEET 1

ORIGINAL KN GROUP PLANS PROVIDED BY GOLDING PTY LTD

JOB No. ESC-0499

DRAWING No. / REVISION DR-03 d

ESC LEGEND:

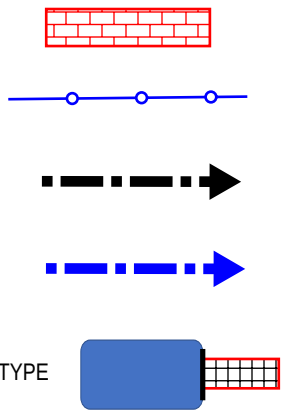
ROCK PAD CONSTRUCTION ENTRANCE TO IECA STD. DRG. EXIT-01

SEDIMENT FENCE TO IECA STD. DR. SF-1 AND SF-02 OR MULCH BUND WHERE MULCH IS AVAILABLE ON SITE

DIRTY WATER CONVEYANCE

CLEAN WATER CONVEYANCE & OR DIVERSION BUND

SPP 2017 COMPLIANT SEDIMENT BASIN AND SPILLWAY CHUTE. REFER DR-04-08 FOR BASIN TYPE OPTIONS AND ASSOCIATED DETAILS (NOTE BASIN SIZES SHOWN INDICATIVELY)



INSTALLATION SEQUENCE PRE-CLEARING AND PRE-BULK EARTHWORKS

- STEP 1
- A. INSTALL ALL WEATHER ENTRANCE / EXIT POINT(S).
 - B. SET UP SITE OFFICE AND WASTE STORAGE AREAS PARKING AREA FOR VEHICLES AND PLANT;
 - C. ERECT BARRIER FENCING FOR "NO GO" AND VEGETATION PROTECTION AREAS AS DIRECTED BY THE SITE SUPERINTENDENT.
 - D. MARK OUT THE LIMITS OF DISTURBANCE WITHIN THE SITES BOUNDARIES.
- STEP 2
- E. CLEAR AREAS FOR SEDIMENT BASIN AND CLEAN/DIRTY WATER DIVERSION DRAINS ONLY.
 - F. CONSTRUCT SEDIMENT BASINS;
 - G. CONSTRUCT SEDIMENT FENCES
 - H. CONSTRUCT "DIRTY WATER & CLEAN WATER" CATCH DRAINS AND LINE IN ACCORDANCE WITH DETAILS ON DWG DR-07.

NOTE: AS CONSTRUCTED SURVEY OF THE SEDIMENT BASIN IS TO BE SENT TO KN GROUP TO CONFIRM THE SEDIMENT BASIN VOLUMES. A HOLD POINT INSPECTION WILL BE HELD BETWEEN KN GROUP AND THE SITE SUPERINTENDENT TO INSPECT INSTALLED ESC MEASURES PRIOR TO THE COMMENCEMENT OF BULK CLEARING.

PHASING NOTES:

PHASE 1 (PRE-CLEARING AND PRE BULK EARTHWORKS) UNDERTAKE ONLY WORKS RELATED TO THE PHASE 1 ESC INSTALLATION SEQUENCE.

INSTALLATION SEQUENCE CLEARING AND BULK EARTHWORKS

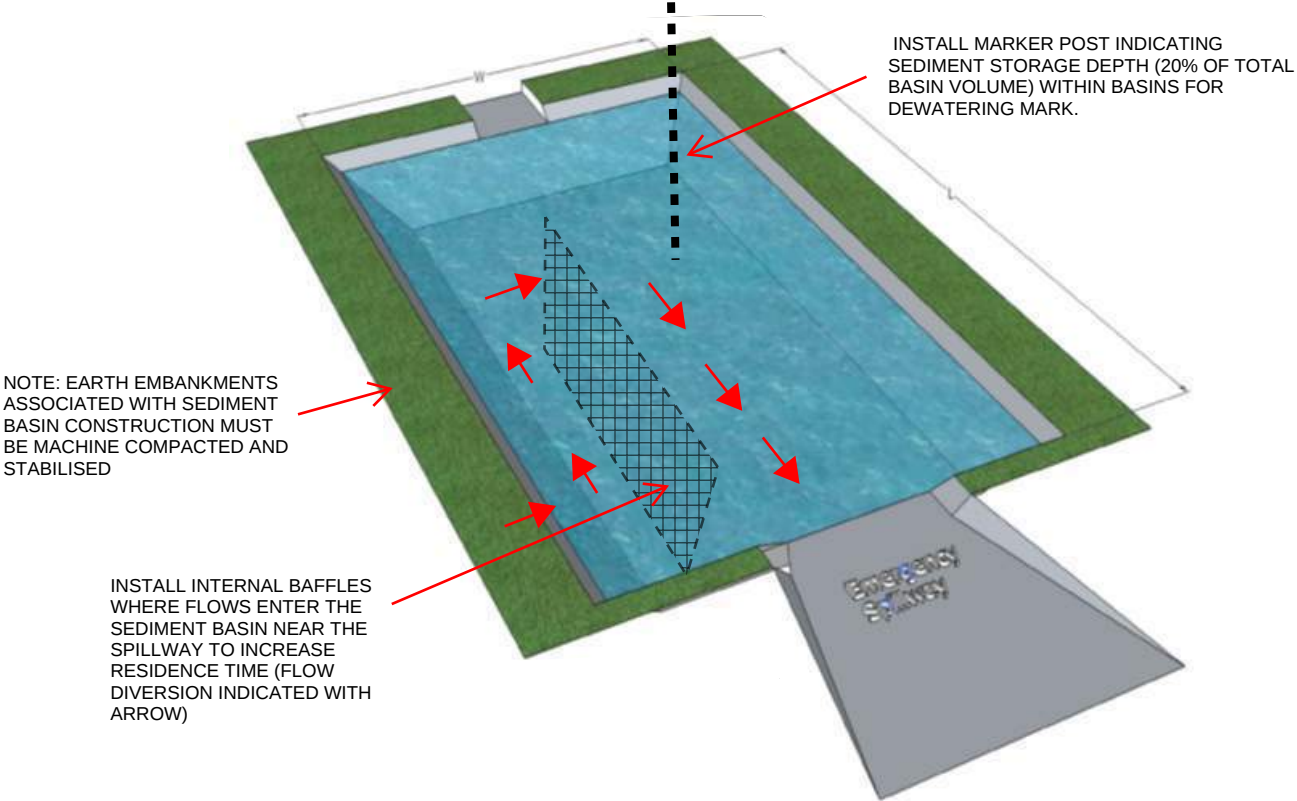
- STEP 1
- ONCE SEDIMENT BASINS, CATCH DRAINS AND SEDIMENT FENCES ARE ESTABLISHED, STRIP TOPSOIL FROM SITE AND STOCKPILE AS DIRECTED BY THE SITE SUPERINTENDANT, ENSURE DOWNSTREAM SEDIMENT FENCES AND UPSTREAM DIVERSION BANKS ARE OPERATIONAL AROUND STOCKPILE AREAS.
- STEP 2
- PERFORM BULK EARTHWORKS ON LEADS CUT TO FILL ON SITE IN ACCORDANCE WITH THE CIVIL BULK EARTHWORKS DRAWINGS.
- STEP 3
- ONCE FINAL CUT AND FILL BATTER LEVELS HAVE BEEN ACHIEVED, REMOVE REQUIRED TOPSOIL FROM STOCKPILED AREAS AND PLACE ON BATTERS AND OTHER DISTURBED AREAS AS DIRECTED BY THE SITE SUPERINTENDENT.
- STEP 4
- AS SOON AS POSSIBLE AFTER TOPSOIL HAS BEEN PLACED ON BATTERS AND OTHER DISTURBED AREAS, THESE AREAS SHOULD BE HYDROMULCHED TO STABILISE. IF A RAINFALL EVENT IS FORECAST WHICH IS LIKELY TO CAUSE RUNOFF PRIOR TO EXPOSED AREAS BEING STABILISED, A COMBINATION OF MULCH AND BIDUM OR APPROPRIATE SOIL BINDER IS TO BE USED TO COVER EXPOSED AREAS.
- STEP 5
- ALL SEDIMENT AND EROSION CONTROL MEASURES ARE TO REMAIN IN PLACE AND BE MONITORED UNTIL CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED. ADDITIONAL EROSION CONTROLS ARE TO BE ERECTED AS REQUIRED BY THE SUPERINTENDENT.

OPTION 1 SPP 2017 COMPLIANT TYPE D SEDIMENT BASIN DETAILS

Total Basin Volume Calculations					
			OUTPUTS		
Description	Catchment Area (ha)	80%Hydrologic Effectiveness / Ha	Settling Zone Volume (m³)	Sediment Storage Volume (m³)	Total Volume at Spillway
Catchment	A	m3	V _{set}	V _{stor}	V _{total}
Catchment A	19.1	1200	22920.0	4584.0	27504.0
Catchment B	25.70	1200	30840.0	6168.0	37008.0

NOTE: BASIN TO BE DEWATERED TO THE SEDIMENT STORAGE DEPTH WITHIN 5 DAYS OF RAINFALL EVENT. INSTALL MARKER POST INDICATING SEDIMENT STORAGE DEPTH (20% OF TOTAL BASIN VOLUME) WITHIN BASINS FOR DEWATERING MARK . PROVIDE "AS CONSTRUCTED" VOLUMES OF ALL NEW BASINS BASIN FLOCKING TO BE BASED ON INSITU JAR TESTING FOR THE SITE. BASIN FLOCKING, TESTING AND DISCHARGE CERTIFICATION TO BE UNDER TAKEN BY A SUITABLY QUALIFIED PERSON.

NOTE: STATE PLANNING POLICY 2017 REQUIRES TYPE D BASINS TO BE DEWATERED TO THE SEDIMENT STORAGE DEPTH WITHIN 5 DAYS OF RAINFALL EVENT.



TYPE D SEDIMENT BASIN AND SPILLWAY DETAIL

CPESC DESIGNED



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PROJECT

PRECINCT 5 MIBA SOUTH - BULK EARTHWORKS

LOCATION

YARRABILBA, QUEENSLAND

DRAWING TITLE

CONCEPTUAL ESC - OPTION 1 SEDIMENT BASIN DETAILS SHEET 1

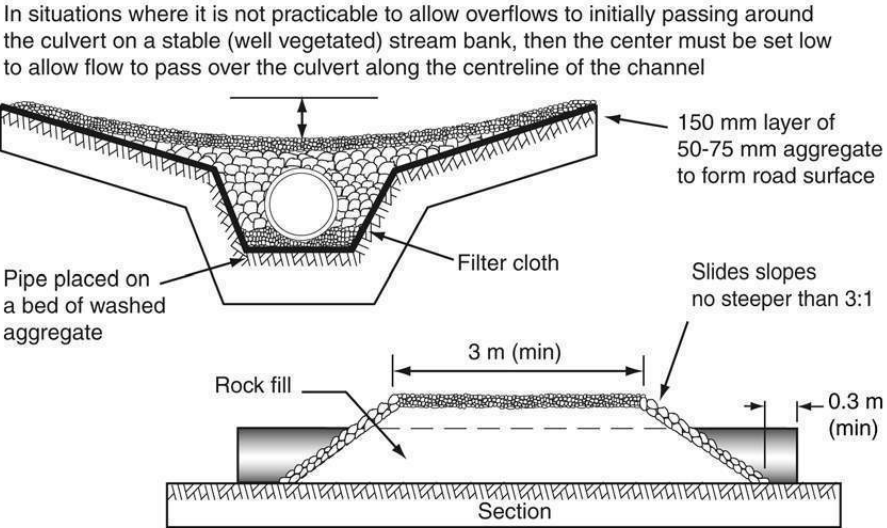
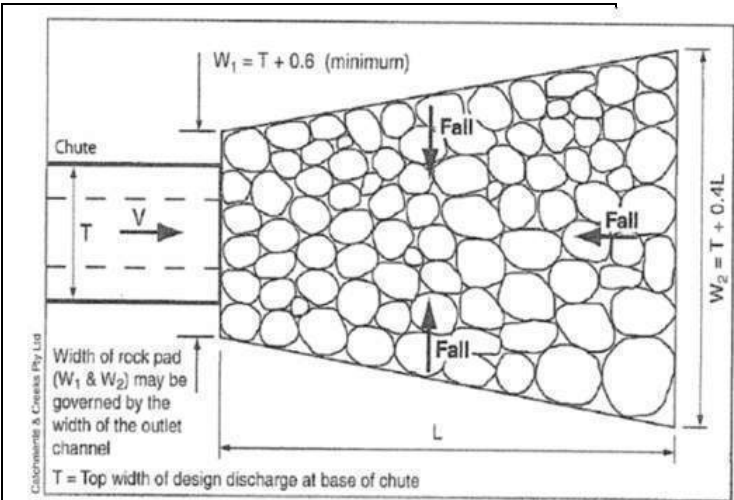
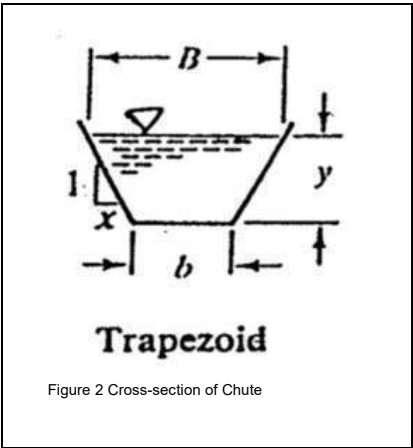
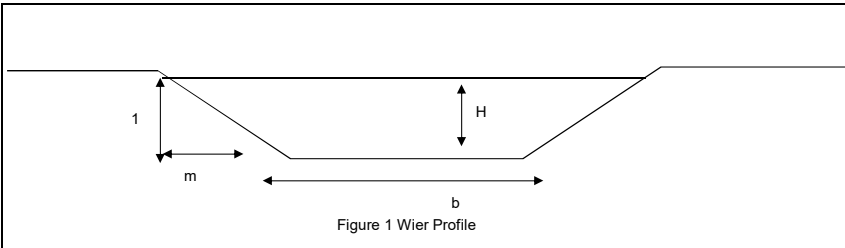
JOB No.

ESC-0499

DRAWING No. / REVISION

DR-04 d

OPTION 1 TYPE D SEDIMENT BASIN SPILLWAY DETAILS



TEMPORARY WATERWAY CULVERT CROSSING

OPTION 1 TYPE D SEDIMENT BASIN SPILLWAY CONSTRUCTION DETAILS

Catchment	Base, B (m)	Weir Depth, D (m)	Chute Depth, D (m)	Weir Width, W (m)	Chute Width, W (m)	Thickness, T (m)	Rock Size, d50 (mm)
Catchment A	10.0	0.8	0.6	13.1	12.3	0.4	200
Catchment B	10.0	0.9	0.6	13.5	12.5	0.4	200

NOTE: SPILLWAY DESIGNED FOR Q20 FLOWS

CPESC DESIGNED



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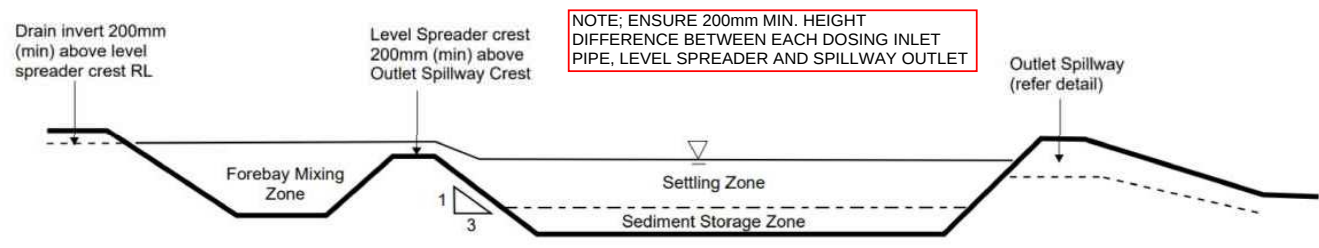


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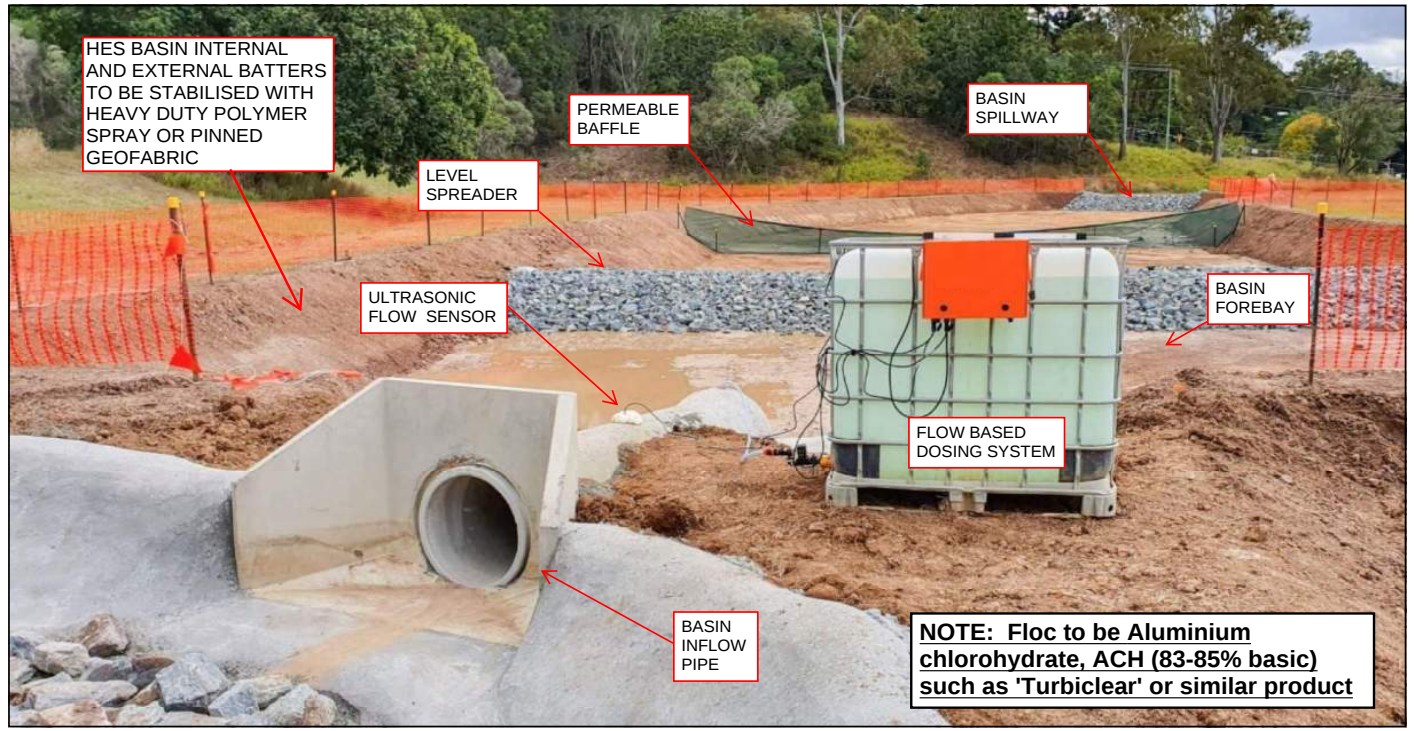
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GOLDING PTY LTD
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PRECINCT 5 MIBA SOUTH - BULK EARTHWORKS
LOCATION
YARRABILBA, QUEENSLAND
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CONCEPTUAL ESC - OPTION 1 SEDIMENT BASIN DETAILS SHEET 2

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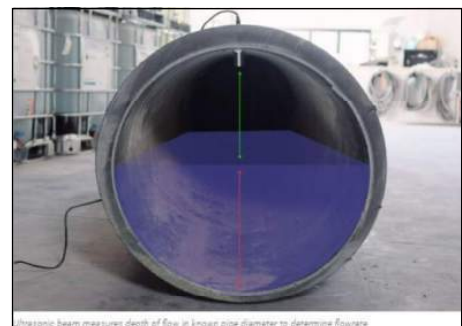


Type B Sediment Basin Long Section (Typical NTS)

RECOMMENDED DISCHARGE STANDARD FOR DEWATERING OPERATIONS.	
SITE CONDITIONS	DISCHARGE WATER QUALITY STANDARD
POST-STORM DEWATERING OF WET SEDIMENT BASINS	90 PERCENTILE TOTAL SUSPENDED SOLIDS (TSS) CONCENTRATION NOT EXCEEDING 50mg/L pH 6.5 TO 8.5



TYPICAL TYPE B HES BASIN LAYOUT FOR FLOW BASED SYSTEM



FLOW DEPTH SENSOR



DEWATER LOW LYING AREAS BY PUMPING TO HES BASIN

OPTION 2 SPP 2017 COMPLIANT TYPE B HES BASIN DETAILS

Basin ID	Settling Zone (incl. sediment storage)				Forebay			
	Volume (m3)	Length (m)	Width (m)	Depth (m)	Volume (m3)	Length (m)	Width (m)	Depth (m)
Basin A	5244.1	85.5	28.5	2.50	609.20	8.6	28.5	2.50
Basin B	7056.2	98.3	32.8	2.50	803.29	9.8	32.8	2.50

NOTE: IT IS RECOMMENDED THAT HES BASINS TREATING LARGE CATCHMENTS (eg. GREATER THAN 10 Ha) HAVE A CONSTRUCTION WATER DAM / REGULATING BASIN CONSTRUCTED UPSTREAM OF THE HES BASIN.

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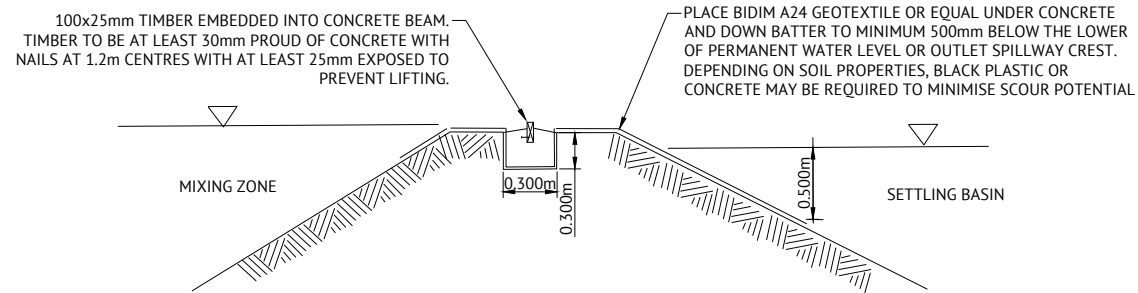
CONCEPTUAL ESC - OPTION 2 SEDIMENT BASIN DETAILS SHEET 1

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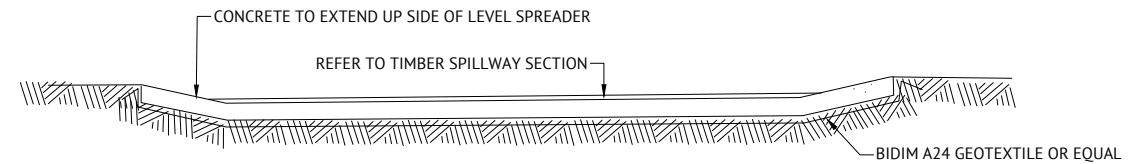
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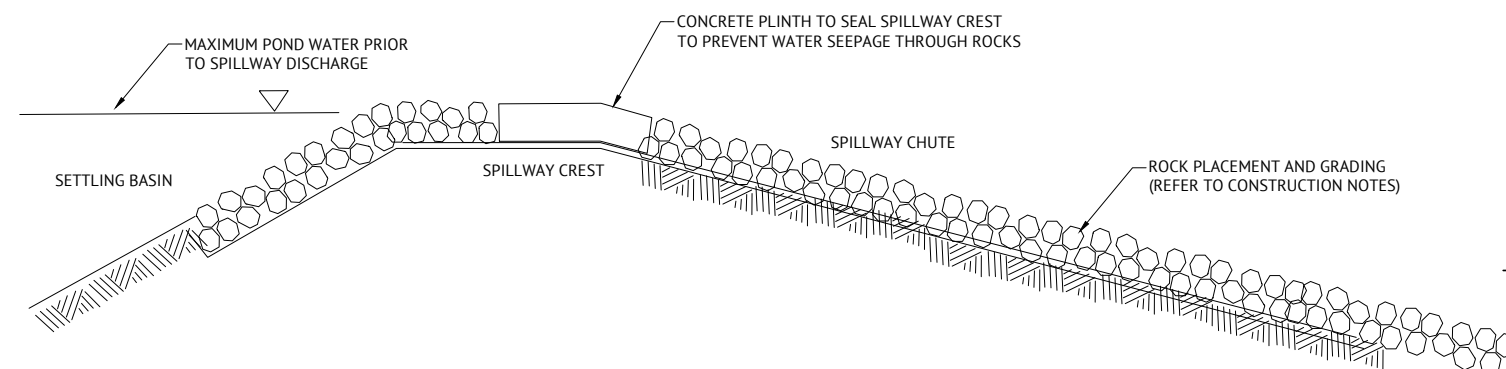
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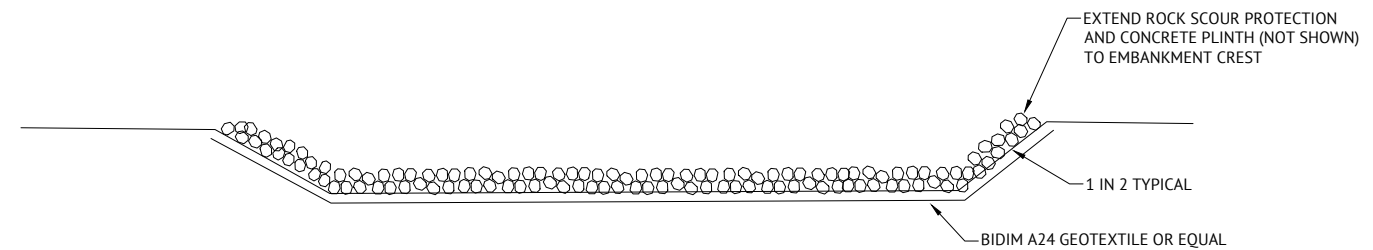
LEVEL SPREADER DETAILS - TYPICAL CROSS SECTION
N.T.S.



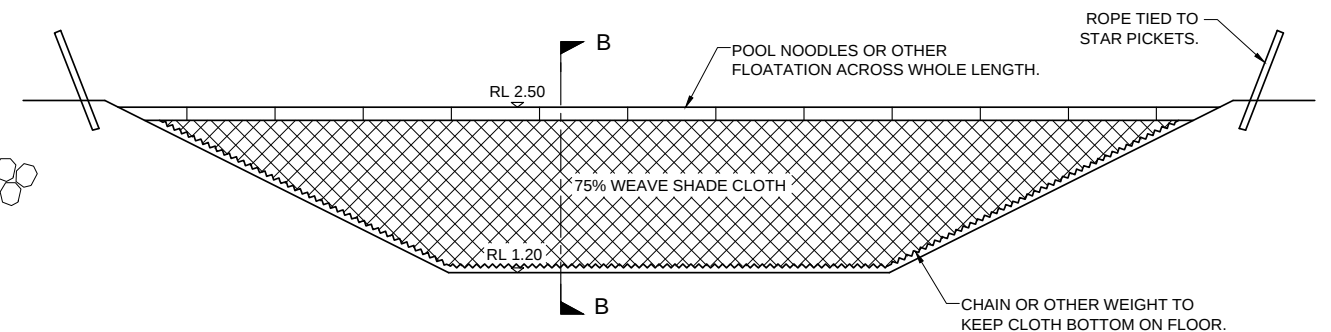
LEVEL SPREADER DETAILS - TYPICAL LONG SECTION
N.T.S.



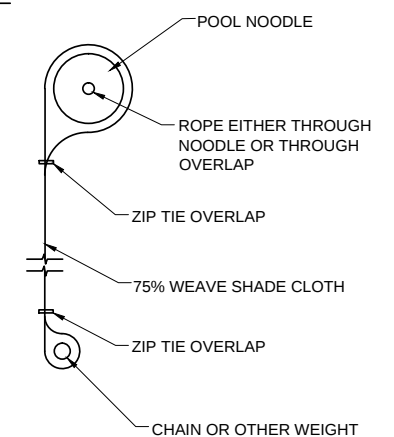
OUTLET SPILLWAY DETAILS - TYPICAL CROSS SECTION
N.T.S.



OUTLET SPILLWAY DETAILS - TYPICAL LONG SECTION
N.T.S.

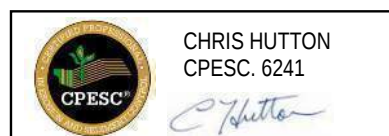


PERMEABLE BAFFLE SECTION



PERMEABLE BAFFLE SECTION B

CPESC DESIGNED



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CONCEPTUAL ESC - OPTION 2 SEDIMENT BASIN DETAILS SHEET 2

JOB No.
ESC-0499
DRAWING No. / REVISION
DR-07 d

NOTES

AUTO DOSER

- 1. PROVIDED AS EITHER FLOC BOX OR iFOD-RAIN TO MANUFACTURES SPECIFICATION.
- 2. DOSER AND SUPPLY OF FLOCCULANT TO BE PROVIDED ON LEVEL PAD 4m x 4m WITHIN 10m OF DOSING POINT.
- 3. ALL-WEATHER ACCESS TRACK TO BE PROVIDED TO DOSER.
- 4. FLOCCULANT PROVIDED AS TURBICLEAR (ahc). IF ALTERNATIVE FLOCCULANT USED THEN THE BASIN SIZE IS TO BE INCREASED ACCORDING TO JAR SETTLEMENT TEST (REFER TO TABLE BELOW).

JAR SETTLEMENT AFTER 15 MINUTES	MULTIPLICATION FACTOR TO SETTLING ZONE
(mm)	VOLUME
50	x3
75	x2
100	x1.5
150	x1

BASIN CONSTRUCTION

MATERIALS

- 1. EARTH FILL: CLEAN SOIL WITH EMERSON CLASS 2(1), 3, 4 OR 5 AND FREE OF ROOTS, WOODY VEGETATION, ROCKS AND OTHER UNSUITABLE MATERIAL. SOIL WITH EMERSON CLASS 4 AND 5 MAY NOT BE SUITABLE DEPENDING ON PARTICLE SIZE DISTRIBUTION AND DEGREE OF DISPERSION.
 - 1.1. CLASS 2(1) SHOULD ONLY BE USED UPON RECOMMENDATION FROM GEOTECHNICAL SPECIALIST.
- 2. SPILLWAY ROCK: HARD, ANGULAR, DURABLE WEATHER RESISTANT AND EVENLY GRADED ROCK WITH 50% BY WEIGHT LARGER THAN THE SPECIFIED NOMINAL (d50) ROCK SIZE. LARGE ROCK SHOULD DOMINATE, WITH SUFFICIENT SMALL ROCK TO FILL THE VOIDS BETWEEN LARGER ROCK. THE DIAMETER OF THE LARGEST ROCK SHOULD BE NO LARGER THAN 1.5 TIMES THE NOMINAL ROCK SIZE. THE SPECIFIED GRAVITY SHOULD BE AT LEAST 2.5.
- 3. GEOTEXTILE FABRIC: HEAVY DUTY, NEEDLE-PUNCHED, NON-WOVEN CLOTH, MINIMUM 'BIDIM' A24 OR EQUIVALENT.

CONSTRUCTION

- 1. NOTWITHSTANDING ANY DESCRIPTION CONTAINED WITH APPROVED PLANS OR SPECIFICATIONS,, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SATISFYING THEMSELVES AS TO THE NATURE AND EXTENT OF THE SPECIFIED WORKS AND THE PHYSICAL AND LEGAL CONDITIONS UNDER WHICH THE WORKS WILL BE CARRIED OUT. THIS SHALL INCLUDE MEANS OF ACCESS, EXTENT OF CLEARING, NATURE OF THE MATERIALS TO BE EXCAVATED, TYPE AND SIZE OF MECHANICAL PLANT REQUIRED, LOCATION AND INSTALLABILITY OF WATER SUPPLY FOR CONSTRUCTION AND TESTING PURPOSES, AND ANY OTHER LIKELY MATTERS AFFECTING THE CONSTRUCTION OF THE WORKS.
- 2. REFER TO APPROVED PLANS FOR LOCATION, DIMENSIONS, AND CONSTRUCTION DETAILS. IF THERE ARE ANY QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.
- 3. BEFORE STARTING ANY CLEARING OR CONSTRUCTION, ENSURE ALL NECESSARY MATERIALS AND COMPONENTS ARE ON THE SITE TO AVOID DELAYS IN COMPLETING THE SEDIMENT BASIN ONCE WORKS BEGIN.
- 4. INSTALL REQUIRES SHORT TERM SEDIMENT RUNOFF DURING CONSTRUCTION OF THE BASIN.

SPILLWAY CONSTRUCTION

- 1. THE SPILLWAY MUST BE EXCAVATED AS SHOWN ON THE PLANS, AND THE EXCAVATED MATERIAL IF CLASSIFIED AS SUITABLE, MUST BE USED IN THE EMBANKMENT, AND IF NOT SUITABLE IT MUST BE DISPOSED OF INTO SPOIL HEAPS.
- 2. ENSURE EXCAVATED DIMENSIONS ALLOW ADEQUATE BOXING-OUT SUCH THAT THE SPECIFIED ELEVATIONS, GRADES, CHUTE WIDTH, AND ENTRANCE AND EXIT SLOPES FOR THE EMERGENCY SPILLWAY WILL BE ACHIEVED AFTER PLACEMENT OF THE ROCK OR OTHER SCOUR PROTECTION MEASURES AS SPECIFIED IN THE PLANS.
- 3. PLACE SPECIFIED SCOUR PROTECTION MEASURES ON THE EMERGENCY SPILLWAY. ENSURE THE FINISHED GRADE BLENDS WITH THE SURROUNDING AREA TO ALLOW A SMOOTH FLOW TRANSITION FROM SPILLWAY TO DOWNSTREAM CHANNEL.
- 4. IF A SYNTHETIC FILTER FABRIC UNDERLAY IS SPECIFIED, PLACE THE FABRIC DIRECTLY ON THE PREPARED FOUNDATION. IF MORE THAN 1 SHEET OF FILTER FABRIC IS REQUIRED, OVERLAP THE EDGES BY AT LEAST 300mm AND PLACE ANCHOR PINS AT MINIMUM 1m SPACING ALONG THE OVERLAP. BURY THE UPSTREAM END OF THE FILTER FABRIC A MINIMUM 300mm BELOW GROUND AND WHERE NECESSARY, BURY THE LOWER END OF THE FABRIC OR OVERLAP A MINIMUM 300mm OVER THE NEXT DOWNSTREAM SECTION AS REQUIRED. ENSURE THE FILTER FABRIC EXTENDS AT LEAST 1m UPSTREAM OF THE SPILLWAY CREST.
- 5. TAKE CARE NOT TO DAMAGE THE FABRIC DURING OR AFTER PLACEMENT. IF DAMAGE OCCURS, REMOVE THE ROCK AND REPAIR THE SHEET BY ADDING ANOTHER LATER OF FABRIC WITH A MINIMUM OVERLAP OF 300mm AROUND THE DAMAGED AREA. IF EXTENSIVE DAMAGE IS SUSPECTED, REMOVE AND REPLACE THE ENTIRE SHEET.
- 6. WHERE LARGE ROCK IS USED, OR MACHINE PLACEMENT IS DIFFICULT, A MINIMUM 100mm LAYER OF FINE GRAVEL, AGGREGATE, OR SAND MAY BE NEEDED TO PROTECT THE FABRIC.
- 7. PLACEMENT OF ROCK SHOULD FOLLOW IMMEDIATELY AFTER PLACEMENT OF THE FILTER FABRIC. PLACE ROCK SO THAT IT FORMS A DENSE, WELL GRADED MASS WITH A MINIMUM OF VOIDS. THE DESIRED DISTRIBUTION OF ROCK THROUGHOUT THE MASS MAYBE OBTAINED BY SELECTIVE LOADING AT THE QUARRY AND CONTROLLED DUMPING DURING FINAL PLACEMENT.
- 8. THE FINISHED SLOPE SHOULD BE FREE OF POCKETS OF SMALL ROCK OR CLUSTERS OF LARGE ROCKS. HAND PLACING MAY BE NECESSARY TO ACHIEVE THE PROPER DISTRIBUTION OF ROCK SIZES TO PRODUCE A RELATIVELY SMOOTH, UNIFORM SURFACE. THE FINISHED GRADE OF THE ROCK SHOULD BLEND WITH THE SURROUNDING AREA. NO OVERFALL OF PROTRUSION OF ROCK SHOULD BE APPARENT.
- 9. ENSURE THAT THE FINAL ARRANGEMENT OF THE SPILLWAY CREST WILL NOT PROMOTE EXCESSIVE FLOW THROUGH THE ROCK SUCH THAT THE WATER CAN BE RETAINED WITHIN THE SETTLING BASIN AT THE ELEVATION NO LESS THAN 50mm ABOVE OR BELOW THE NOMINATED SPILLWAY CREST ELEVATION.

ESTABLISHING THE SETTLING POND

- 1. THE AREA TO BE COVERED BY THE STORED WATER OUTSIDE OF THE LIMITS OF THE BORROW PITS MUST BE CLEARED OF RUBBISH. TREES MUST BE CUT DOWN AND REMOVED FROM THE IMMEDIATE VICINITY OF THE WORK.
- 2. ESTABLISH ALL REQUIRED INFLOW CHUTES AND INLET BAFFLES, IF SPECIFIED, TO ENABLE WATER TO DISCHARGE INTO THE BASIN IN A MANNER THAT WILL NOT CAUSE SOIL EROSION OR THE RE-SUSPENSION OF SETTLED SEDIMENT.
- 3. INSTALL A SEDIMENT STORAGE LEVEL MARKER POST WITH A CROSS MEMBER SET JUST BELOW THE TOP OF THE SEDIMENT STORAGE ZONE (AS SPECIFIED ON THE APPROVED PLANS). USE AT LEAST A 75mm WIDE POST FIRMLY SET INTO THE BASIN FLOOR.
- 4. IF SPECIFIED, INSTALL INTERNAL SETTLING POND BAFFLES. ENSURE THE CREST OF THESE BAFFLES IS SET LEVEL WITH, OR JUST BELOW, THE ELEVATION OF THE EMERGENCY SPILLWAY.
- 5. INSTALL ALL APPROPRIATE MEASURES TO MINIMISE SAFETY RISK TO ON-SITE PERSONNEL AND THE PUBLIC CAUSED BY THE PRESENCE OF THE SETTLING POND. AVOID STEEP, SMOOTH INTERNAL SLOPES. APPROPRIATELY FENCE THE SETTLING POND AND POST WARNING SIGNS IF UNSUPERVISED PUBLIC ACCESS IS LIKELY OR THERE IS CONSIDERED TO BE AN UNACCEPTABLE RISK TO THE PUBLIC.

EROSION & SEDIMENT CONTROL NOTES

- 1. LOCATION & LEVELS OF ALL EXISTING SERVICES TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
- 2. REFER EARTHWORKS DRAWINGS FOR ADDITIONAL NOTES.
- 3. ALL TRENCHES, FOOTPATH EXCAVATIONS & STOCKPILES TO BE PROTECTED BY TEMPORARY SEDIMENT DEVICES UNTIL 80% GRASS COVERAGE IS ACHIEVED TO DISTURBED AREAS
- 4. EVERY PRECAUTION IS TO BE TAKEN TO PREVENT THE TRANSPORT OF SILT INTO THE NEWLY LAID STORMWATER PIPES THAT ARE CONNECTED TO THE DOWNSTREAM PIPE SYSTEMS, AND ANY EXISTING OPEN CHANNELS.
- 5. THESE NOTES SHALL BE READ IN CONJUNCTION WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
- 6. THE EROSION AND SEDIMENT CONTROL WORKS SHALL COMPLY WITH THE REQUIREMENTS OF TMR EROSION AND SEDIMENT CONTROL STANDARDS.
- 7. THE CONTRACTOR SHALL TAKE ALL REASONABLE AND PRACTICABLE MEASURES TO:
 - ALLOW STORMWATER TO PASS THROUGH THE SITE IN A CONTROLLED MANNER AND AT NON EROSIVE FLOW VELOCITIES;
 - MINIMISE SOIL EROSION FROM WATER AND WIND;
 - MINIMISE ADVERSE EFFECTS OF SEDIMENT RUN-OFF;
 - MINIMISE OR PREVENT ENVIRONMENTAL HARM ASSOCIATED WITH DISCHARGES FROM THE SITE (E.G. THE EFFECTS OF SEDIMENTATION ON THE ENVIRONMENTAL VALUES OF RECEIVING WATERS); AND
 - ENSURE THAT THE VALUE AND USE OF RESIDENTIAL PROPERTIES ADJACENT TO THE DEVELOPMENT (SUCH AS DRAINAGE AND ROADS) ARE NOT DIMINISHED AS A RESULT OF THE MIGRATION OF SEDIMENT FROM THE DEVELOPMENT.
- 4. THE CONTRACTOR SHALL APPOINT AN APPROPRIATELY EXPERIENCED PERSON TO BE MADE RESPONSIBLE FOR IMPLEMENTATION OF THE ESC.
- 5. ALL ESC MEASURES SHALL BE INSPECTED:
 - AT LEAST DAILY (WHEN WORK IS OCCURRING ON SITE).
 - AT LEAST WEEKLY (WHEN WORK IS NOT OCCURRING ON SITE).
 - WITHIN 24 HOURS OF EXPECTED RAINFALL.
 - WITHIN 18 HOURS OF RAINFALL OCCURRING.
- 6. MAINTENANCE OF ESC MEASURES SHALL OCCUR TO ENSURE THEY ARE OPERATING EFFICIENTLY AND IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:

ESC MEASURES	MAINTENANCE TRIGGER	TIME FRAME FOR UNDERTAKING MAINTENANCE
SEDIMENT BASINS	WHEN SETTLED SEDIMENT VOLUME EXCEEDS THE VOLUME OF THE SEDIMENT SETTLEMENT ZONE	WITHIN 4 DAYS OF INSPECTION
OTHER ESC MEASURES	WHEN SETTLED SEDIMENT VOLUME EXCEEDS 25% OF THE CAPACITY OF THE ESC MEASURE	BY THE END OF THE DAY

- 7. INSTALL DIVERSION CATCH DRAINS UPSTREAM OF, AND SILT FENCE DOWNSTREAM OF, STOCKPILES.
- 8. STOCKPILES ARE TO BE LOCATED AWAY FROM EROSION HAZARD AREAS SUCH AS DRAINAGE LINES AND STEEP SLOPES.
- 9. STOCKPILES ARE TO BE PROTECTED FROM EROSION BY THE WIND.
- 10. ADEQUATE SUPPLIES OF EMERGENCY MAINTENANCE MATERIALS, INCLUDING (BUT NOT LIMITED TO) TIE WIRE, STAKES, FILTER CLOTH, WIRE MESH AND CLEAN GRAVEL SHOULD BE AVAILABLE ON-SITE.

CPESC DESIGNED



CHRIS HUTTON
CPESC. 6241

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2025/1588

Date: 19 June 2025



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APPROVED

DATE
11-05-2025

CHRIS HUTTON - CPESC No. 6241

CLIENT

GOLDING PTY LTD

PROJECT

PRECINCT 5 MIBA SOUTH - BULK EARTHWORKS

LOCATION

YARRABILBA, QUEENSLAND

DRAWING TITLE

CONCEPTUAL ESC - NOTES SHEET 1

JOB No.

ESC-0499

DRAWING No. / REVISION

DR-08 d

ROLLS AND RESPONSIBILITIES

Role	Responsibility
Project Manager	- Overall responsibility of ESC implementation - Notify the Environmental Manager immediately of any non-compliance with ESCP - Ensure the prompt implementation of measures to mitigate erosion and sediment generation
Site Supervisor/Foremen	- Monitor daily rainfall - Notify Environmental Advisor/Consultant when runoff generating rainfall occurs in the previous 24 hours - Maintain current records of rainfall, storage volumes, water quality, treatment practices, discharge volumes (as appropriate) - Installation and maintenance of ESC
Environmental Manager	- Provide design information as required - Conduct in-situ monitoring (as required) - Collect and submit samples to laboratory (as required) - Collate results and prepare reports (as required) - Conduct site inspections and audits (as required) - Inspect ESC installation and maintenance - Inspect offsite impacts and management - Provide advice regarding ESC site improvement (as required)
All Personnel	Report any damage to ESC devices and any potential or actual environmental harm in line with Duty to Notify under the requirements of the Environmental Protection Act 1994

CORRECTIVE AND PREVENTATIVE ACTION

An environmental incident with respect to the ESCP is defined as any occurrence where sediment is released from the site, whether controlled or uncontrolled, or where storm water is released (controlled) from site which does not meet the water quality requirements.

All incidents and non-conformances are to be reported, investigated and corrected in accordance with the ESCP to ensure effective soil and water quality management practices at all times.

Best practice site management requires all ESC measures to be inspected by the Contractors nominated representative at least daily when rain is occurring, within 24 hours prior to expected rainfall, and within 18 hours of a rainfall event of sufficient intensity and duration to cause onsite runoff (IECA, 2008). Such inspections must check:

- Daily site inspections (during periods of runoff producing rainfall)
 - All drainage, erosion and sediment control measures
 - Occurrences of excessive sediment deposition (whether on-site or off-site)
 - All site discharge points (including dewatering activities as appropriate)
- Weekly site inspections (even if work is not occurring on-site)
 - All drainage, erosion and sediment control measures
 - Occurrences of excessive sediment deposition (whether on-site or off-site)
 - Occurrences of construction materials, litter or sediment placed, deposited, washed or blown from the site, including deposition by vehicular movements
 - Litter and waste receptors
 - Oil, fuel and chemical storage facilities
- Prior to anticipated runoff producing rainfall
 - All drainage, erosion and sediment control measures
 - All temporary flow diversion and drainage works
- Following runoff producing rainfall
 - All drainage, erosion and sediment control measures
 - Occurrences of excessive sediment deposition (whether on-site or off-site)
 - Occurrences of construction materials, litter or sediment placed, deposited, washed or blown from the site, including deposition by vehicular movements

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Environmental Solutions

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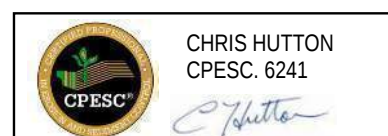
CHRIS HUTTON - CPESC No. 6241

CLIENT	GOLDING PTY LTD	JOB No.	ESC-0499
PROJECT	PRECINCT 5 MIBA SOUTH - BULK EARTHWORKS	DRAWING No. / REVISION	DR-09 d
LOCATION	YARRABILBA, QUEENSLAND		
DRAWING TITLE	CONCEPTUAL ESC - NOTES SHEET 2		

Table 1: Dust Management Program

Purpose	To ensure the impacts of dust on adjacent areas and the community are minimised.		
Performance Objective	No complaints from adjacent premises and/or community.		
Methods/Actions	Action	Timing	Responsibility
	Induction and Training Induction and training for all employees will include information on: - Potential sources of dust; - Development approval conditions relevant to dust management (if applicable); - Site speed limits and designated driving areas; - Awareness of dust; with an obligation to report to management and take action on dust related issues.	Induction	SITE CIVIL CONSTRUCTION CONTRACTOR
	Windy Conditions Monitor wind and weather forecasts (Bureau of Meteorology) and cease non-essential operations during excessively windy conditions.	Ongoing	Site Foreman
	Traffic - Adhere to low speed limits and designated driving areas within the site. - Utilise site entry/exit road shaker pads.	Ongoing	All employees and contractors
	Dust Suppression Supply and operate dedicated water cart to apply water to unsealed operational areas (i.e. traffic areas bulk earthworks area and stockpiles).	Ongoing	Site Foreman
	Stripping and bulk earthworks activities Operations are not to be conducted during excessively windy weather conditions so as to minimize the generation of dust.	Ongoing	Site Foreman
	Material Handling Implement loading and unloading procedures to ensure that dust generation is minimised (i.e. minimise drop heights).	Ongoing	Site Foreman
	Open Areas Minimise open areas exposed to wind erosion as far as practicable to by assessing areas suitable for stabilisation and carry out soil stabilisation works	Prior to areas being stripped.	Site Foreman
Monitoring	Daily inspection of works site to occur, including: - Monitor wind and weather forecasts (Bureau of Meteorology) - visual check for signs of dust emanating from the site and crossing the site boundaries. - visual check of high potential dust areas, such as stockpiles and earthworks areas.	Daily	Site Forman
Reporting	Details of daily meteorological conditions are to be recorded. Any dust complaints are to be recorded in the site complaints register, where a corrective action will be issued and monitoring will be undertaken as per complaints procedure.	Daily	Site Foreman
Incidents	Dust observed leaving the site and or dust complaint is received.		
Corrective Actions	- Investigate cause of excessive dust and take necessary actions to rectify. - Implement controls immediately (e.g. cease works in excessively windy conditions, water trucks or application of polymer soil stabilising sprays)	As soon as possible after complaint received	Site Foreman

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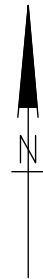


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Chris Hutton
CHRIS HUTTON - CPESC No. 6241

CLIENT **GOLDING PTY LTD**
PROJECT **PRECINCT 5 MIBA SOUTH - BULK EARTHWORKS**
LOCATION **YARRABILBA, QUEENSLAND**
DRAWING TITLE **CONCEPT EROSION AND SEDIMENT CONTROL - DUST MANAGEMENT**

JOB No. **ESC-0499**
DRAWING No. / REVISION
DR-10 d



CULVERT CONSTRUCTION KEY NOTES

- 1. WHERE POSSIBLE, CULVERT WORKS TO BE UNDERTAKEN OFFLINE FROM EXTERNAL FLOWPATHS
- 2. WHERE CULVERT WORKS CANNOT BE UNDERTAKEN OFFLINE WORK WILL:
 - 2.(a) BE PHASED TO OCCUR DURING DRY WEATHER FORECAST
 - 2.(b) BE PHASED TO ENSURE EXISTING CULVERT CAN REMAIN AS CLEAN WATER FLOWPATH IF FLOW DID OCCUR
 - 2.(c) HAVE ACHIEVABLE AND PRACTICAL WET WEATHER ACTIONS
- 3. EROSION AND SEDIMENT CONTROLS ARE TO REMAIN IN PLACE FOR AREAS SURROUNDING WORKS (OR MODIFIED AS REQUIRED IN CONSULTATION WITH ENVIRONMENTAL ADVISER)
- 4. ANY MATERIALS REQUIRED TO IMPLEMENT WET WEATHER ACTIONS ARE TO BE READILY AVAILABLE PRIOR TO AND DURING WORKS.

ENVIRONMENTAL REQUIREMENTS

- 1. PRIOR TO COMMENCING WORKS OR PLANNING ENSURE THE ENVIRONMENTAL ADVISER IS NOTIFIED TO ENSURE ALL RELEVANT APPROVALS ARE IN PLACE (E.G. WATERWAY BARRIER WORKS)
- 2. WHERE EXCAVATION IS EXPECTED TO ENCOUNTER SUBSURFACE GROUNDWATER OR EXISTING POOLING WATER, CONTACT ENVIRONMENTAL ADVISER TO MANAGE DEWATERING REQUIREMENTS

WET WEATHER ACTIONS

- 1. ENSURE PUMP IS ADEQUATELY FUELED AND APPROPRIATE FOR RAINFALL EVENT (IF BEING UTILISED)
- 2. IF OVERFLOW INTO WORKS AREA COULD OCCUR, ENSURE ALL LOOSE MATERIAL OR POTENTIAL CONTAMINANTS ARE REMOVED AND ALL AREAS ARE STABILISED. QUICKLY INSTALL STURDY MATERIAL WHERE HIGH FLOWS ARE LIKELY. WHERE POSSIBLE, CONCRETE BLINDING SHOULD BE USED IN CONSTRUCTION METHODOLOGY WHERE THERE IS A HIGH POTENTIAL FOR OVERTOPS.
- 3. TEMPORARY BUNDS TO BE INSTALLED AROUND ACTIVE WORKS AREAS TO ENSURE FLOW IS DIRECTED THROUGH EXISTING CULVERT IN THE EVENT OF FLOW AND NOT THROUGH WORKS AREA.

(NOTES SOURCED FROM TOPO GROUP PTY LTD.)

BLOCK TEMPORARY PIPE

INSTALL COFFER DAM FOR TRANSITIONAL WORKS ONLY

DIRECT UPSTREAM LOW FLOWS TO TEMPORARY CLEAN WATER CHANNEL

CONSTRUCT NORTHERN CULVERTS

TEMPORARY LOW FLOW CLEAN WATER CHANNEL (EXACT LOCATION DETERMINED ON SITE BY ENGINEER. CLEAN WATER LOW FLOW CHANNEL TO BE STABILISED WITH GEOFABRIC AND ROCK AS REQUIRED FOR STABILITY. WORKS TO BE REVISED WITH SUPERINTENDENT'S REPRESENTATIVE.

WORKS AREA

INSTALL COFFER DAM FOR TRANSITIONAL WORKS ONLY

WORKS METHODOLOGY - CULVERT BLOCKED (OFFLINE)

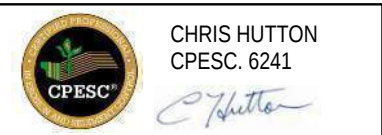
- 1. ENSURE CONTROLS OUTSIDE OF CULVERT ARE INSTALLED AS PER ESCP INCLUDING MULCH BUNDS TO TOES OF ALL DISTURBED BATTERS OUTSIDE OF CREEK FLOW PATHS
- 2. IF EXTERNAL CLEAN WATER FLOWPATH CANNOT BE DIRECTED TO ALTERNATIVE LOCATION AND PONDING MAY OCCUR, ENSURE BLOCKAGE WILL NOT CAUSE FLOODING RISK TO PROPERTIES OR ROAD
- 3. INSTALL BUND ON UPSTREAM SIDE AND PROTECT WITH GEOTEXTILE AND ROCK
- 4. UNDERTAKE WORKS OFF-LINE, FINALISE AND RE-OPEN CULVERT ONCE COMPLETE
- 5. IF RAINFALL EVENT IS FORECAST, IMPLEMENT WET WEATHER ACTIONS AS DETAILED ABOVE.

WORKS METHODOLOGY ALTERNATIVE - CULVERT CANNOT BE BLOCKED (ONLINE)

- 1. ENSURE CONTROLS OUTSIDE OF CULVERT ARE INSTALLED AS PER ESCP INCLUDING MULCH BUNDS TO TOES OF ALL DISTURBED BATTERS OUTSIDE OF CREEK FLOW PATHS
- 2. REMOVE EXISTING HEADWALL AND CULVERTS AND LINE AREA WITH GEOTEXTILE BY END OF SHIFT
- 3. WHERE PRACTICAL, BUND ONE SIDE AND ALLOW (LOW) FLOW THROUGH OTHER SIDE AND KEEP WORK AREA DRY
- 4. INSTALL FOUNDATION TREATMENT WHERE APPLICABLE
- 5. INSTALL BEDDING MATERIAL AND LAY PIPE. ENSURE BEDDING MATERIAL IS INSTALLED ONLY FOR SECTION OF PIPE INSTALLATION TO BE COMPLETED BY END OF EACH DAY. WHERE BOX CULVERTS ARE TO BE INSTALLED, PLACE BINDING OR BASE SLAB TO FORM STABLE FLOWPATH
- 6. FINALISE CULVERT INSTALLATION, INCLUDING HEADWALLS, APRONS AND SCOUR PROTECTION WHERE REQUIRED, ENSURING CULVERTS CAN ACT AS CLEAN WATER FLOWPATH AT END OF EACH DAY AND PRIOR TO FLOW OCCURRING THROUGH THE CULVERTS
- 7. IF RAINFALL EVENT IS FORECAST, IMPLEMENT WET WEATHER ACTIONS AS DETAILED ABOVE.

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CPESC DESIGNED



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APPROVED

DATE
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Chris Hutton

CHRIS HUTTON - CPESC No. 6241

CLIENT

GOLDING PTY LTD

PROJECT

PRECINCT 5 MIBA SOUTH - BULK EARTHWORKS

LOCATION

YARRABILBA, QUEENSLAND

DRAWING TITLE

CONCEPT EROSION AND SEDIMENT CONTROL - CULVERT WORKS PHASE 2

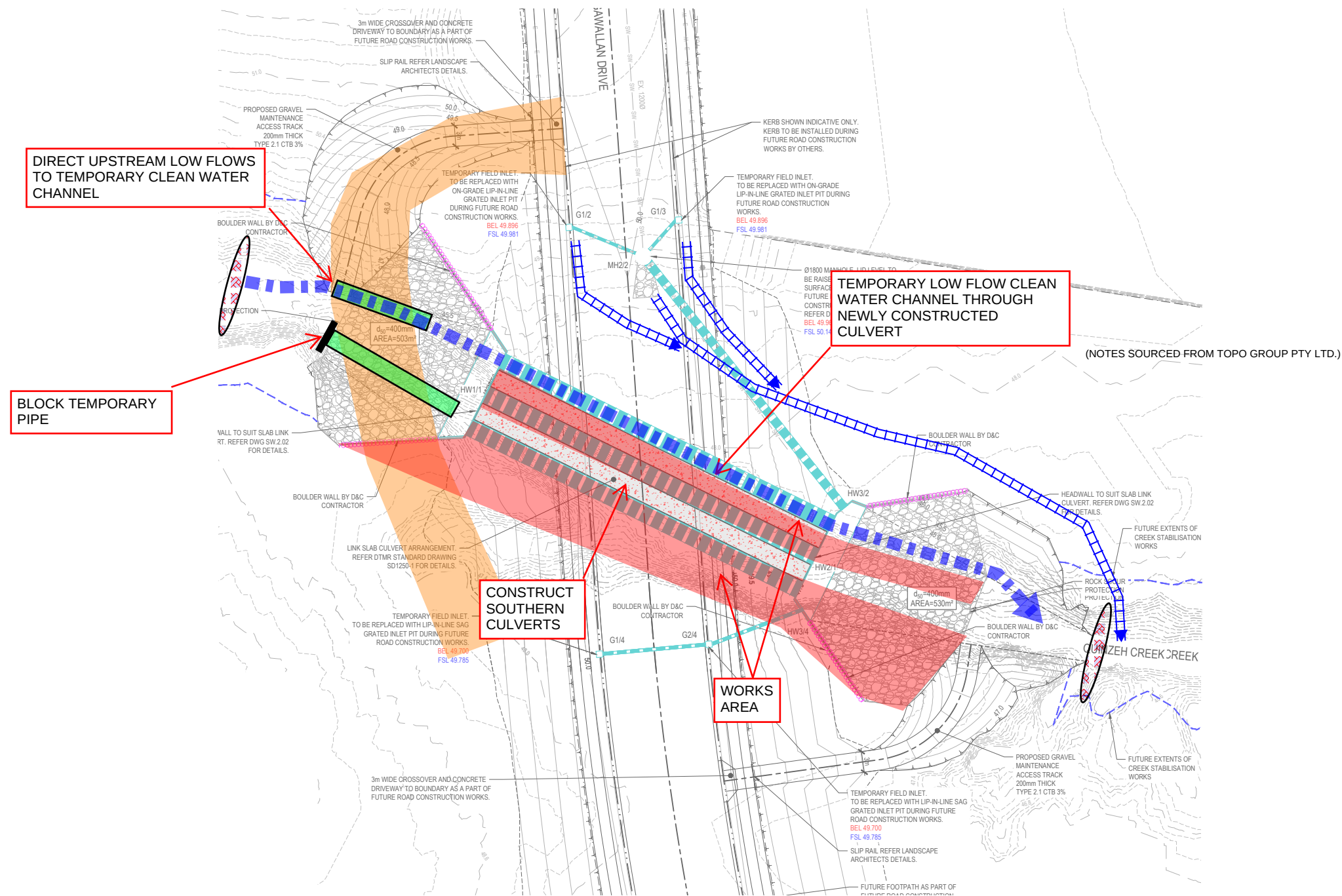
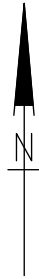
JOB No.

ESC-0499

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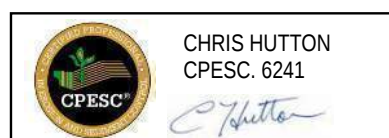
DR-12 d

ORIGINAL MPN CONSULTING PLANS PROVIDED BY GOLDING PTY LTD



(NOTES SOURCED FROM TOPO GROUP PTY LTD.)

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LOCATION

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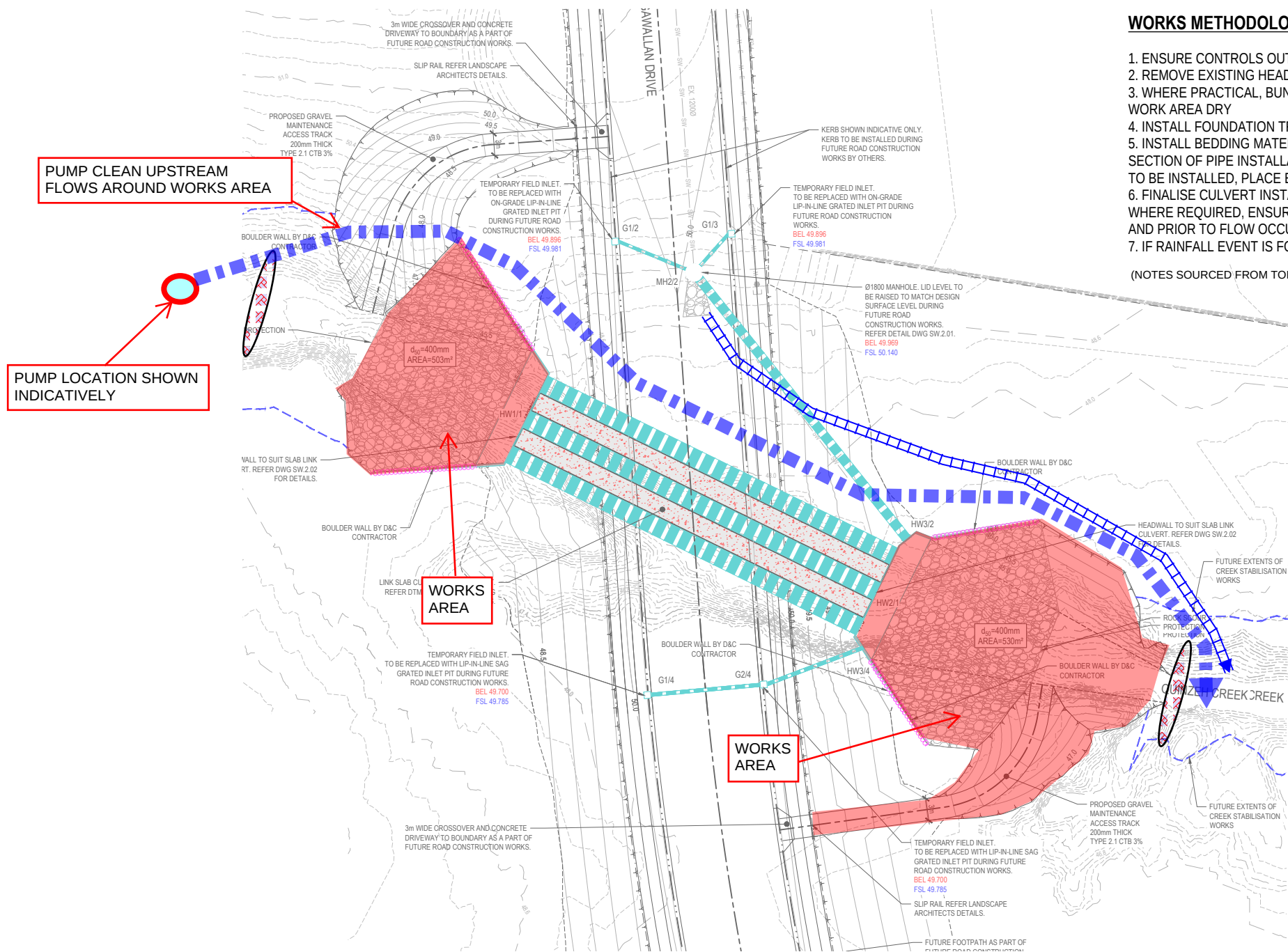
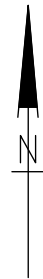
CONCEPT EROSION AND SEDIMENT CONTROL - CULVERT WORKS PHASE 3

JOB No.

ESC-0499

DRAWING No. / REVISION

DR-13 d



WORKS METHODOLOGY - CULVERT BLOCKED (OFFLINE)

1. ENSURE CONTROLS OUTSIDE OF CULVERT ARE INSTALLED AS PER ESCP
2. IF EXTERNAL CLEAN WATER FLOWPATH CANNOT BE DIRECTED TO ALTERNATIVE LOCATION AND PONDING MAY OCCUR, ENSURE BLOCKAGE WILL NOT CAUSE FLOODING RISK TO PROPERTIES OR ROAD
3. INSTALL BUND ON UPSTREAM SIDE AND PROTECT WITH GEOTEXTILE AND ROCK
4. UNDERTAKE WORKS OFF-LINE, FINALISE AND RE-OPEN CULVERT ONCE COMPLETE
5. IF RAINFALL EVENT IS FORECAST, IMPLEMENT WET WEATHER ACTIONS AS DETAILED ON DR-13

WORKS METHODOLOGY ALTERNATIVE - CULVERT CANNOT BE BLOCKED (ONLINE)

1. ENSURE CONTROLS OUTSIDE OF CULVERT ARE INSTALLED AS PER ESCP
2. REMOVE EXISTING HEADWALL AND CULVERTS AND LINE AREA WITH GEOTEXTILE BY END OF SHIFT
3. WHERE PRACTICAL, BUND ONE SIDE AND ALLOW (LOW) FLOW THROUGH OTHER SIDE AND KEEP WORK AREA DRY
4. INSTALL FOUNDATION TREATMENT WHERE APPLICABLE
5. INSTALL BEDDING MATERIAL AND LAY PIPE. ENSURE BEDDING MATERIAL IS INSTALLED ONLY FOR SECTION OF PIPE INSTALLATION TO BE COMPLETED BY END OF EACH DAY. WHERE BOX CULVERTS ARE TO BE INSTALLED, PLACE BINDING OR BASE SLAB TO FORM STABLE FLOWPATH
6. FINALISE CULVERT INSTALLATION, INCLUDING HEADWALLS, APRONS AND SCOUR PROTECTION WHERE REQUIRED, ENSURING CULVERTS CAN ACT AS CLEAN WATER FLOWPATH AT END OF EACH DAY AND PRIOR TO FLOW OCCURRING THROUGH THE CULVERTS
7. IF RAINFALL EVENT IS FORECAST, IMPLEMENT WET WEATHER ACTIONS AS DETAILED ON DR-13

(NOTES SOURCED FROM TOPO GROUP PTY LTD.)

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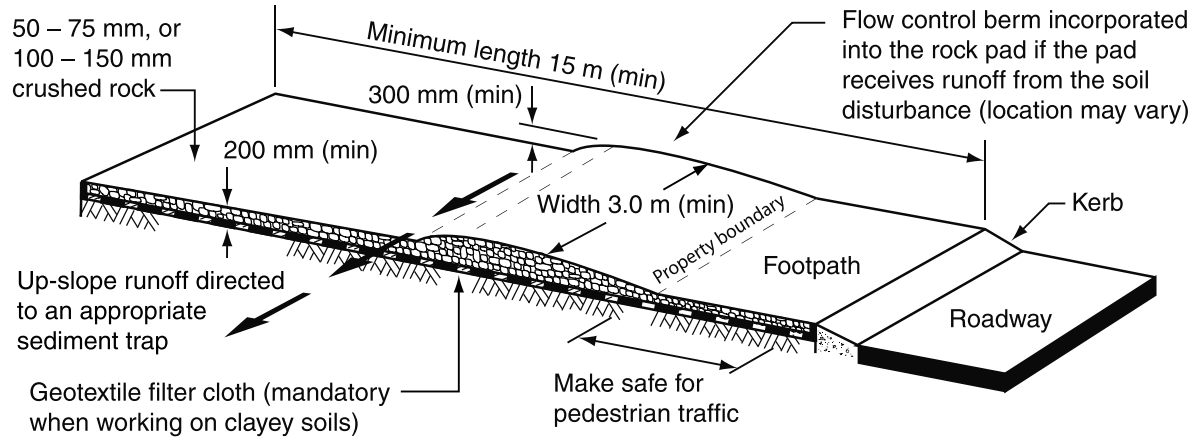
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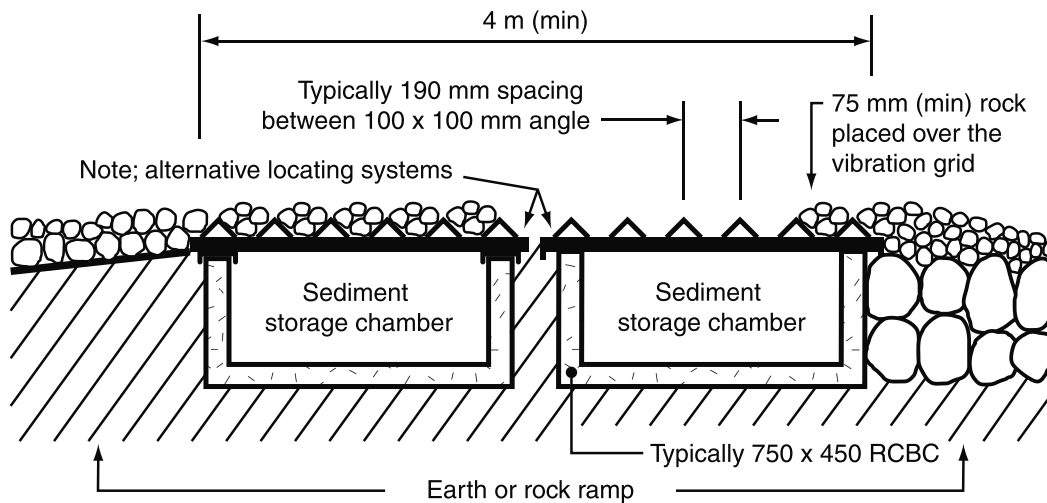
CHRIS HUTTON - CPESC No. 6241

ORIGINAL MPN CONSULTING PLANS PROVIDED BY GOLDING PTY LTD

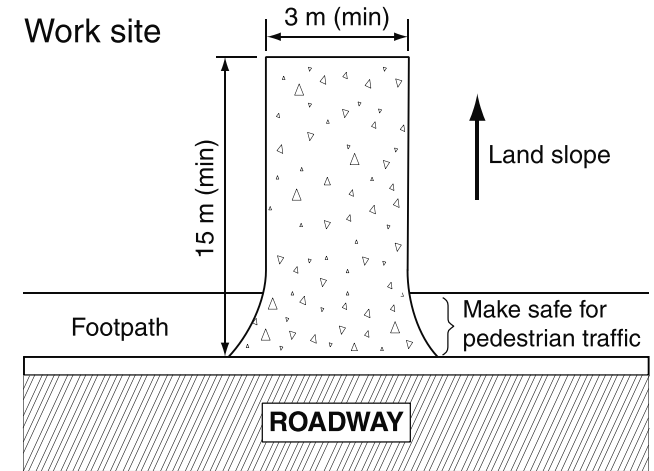
CLIENT	GOLDING PTY LTD	JOB No.	ESC-0499
PROJECT	PRECINCT 5 MIBA SOUTH - BULK EARTHWORKS	DRAWING No. / REVISION	DR-14 d
LOCATION	YARRABILBA, QUEENSLAND		
DRAWING TITLE	CONCEPT EROSION AND SEDIMENT CONTROL - CULVERT WORKS PHASE 4		



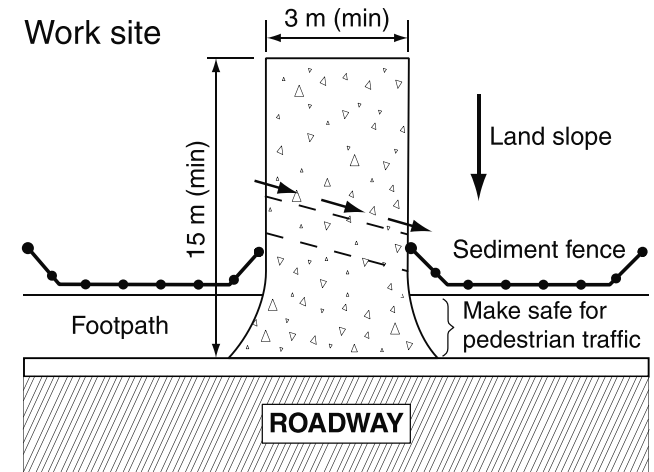
**(a) Rock entry/exit pad for construction sites
(refer to Standard Drawing Exit-03 for building sites)**



**(c) Alternative low maintenance arrangement
(still under development)**

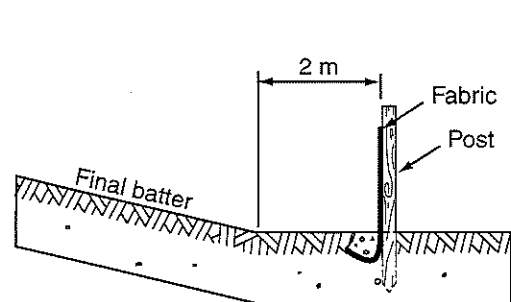


(b) Rock pad sloping away from road

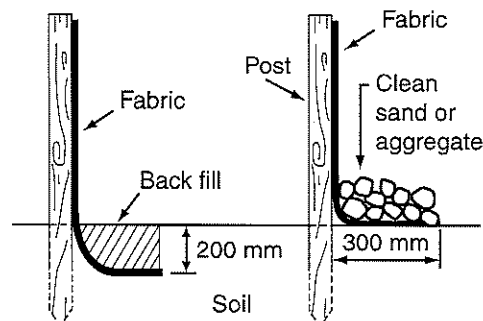


(d) Rock pad sloping towards the road

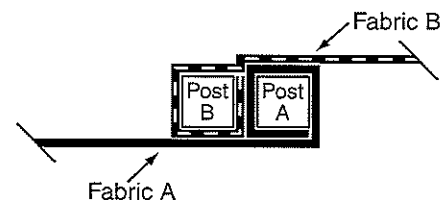
Drawn: GMW	Date: Apr-10	Construction Exit - Rock Pad (construction sites only)	Exit-01
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(a) Location of fence relative to base of slope

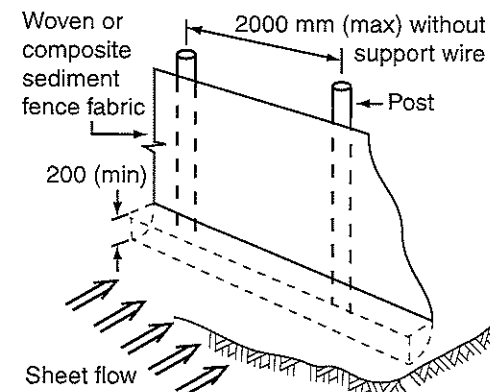


(b) Anchoring base of fabric

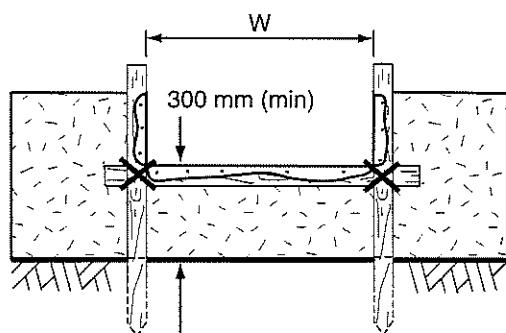


Fabric to fold around each stake one full turn.
Stake B to be drive tightly against Stake A.
The tops of both stakes to be secured with wire.

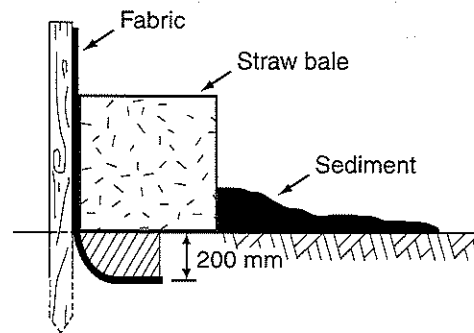
(c) Joining fabric - Method 1



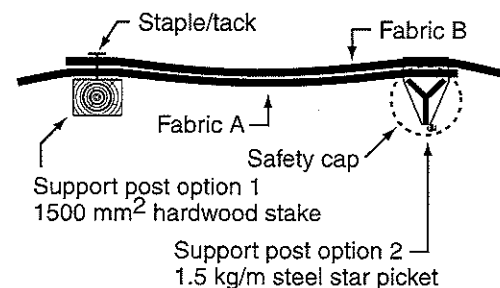
(d) Installation without backing support



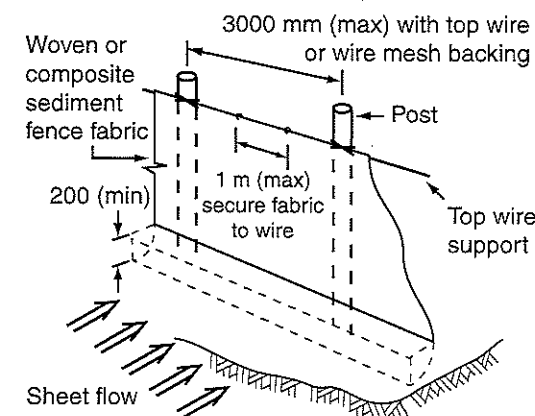
(e) Spill-through weir



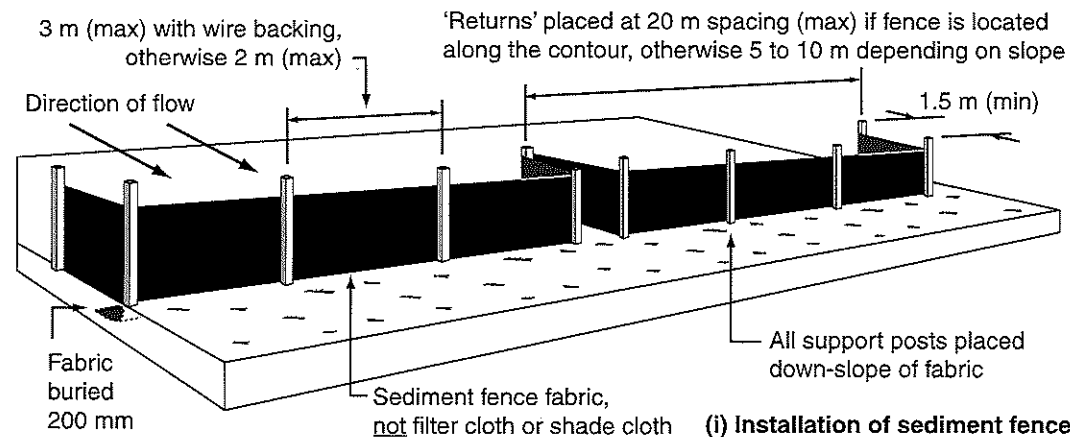
(f) Placement of up-slope straw bale



(g) Joining fabric - Method 2



(h) Installation with top wire support



(i) Installation of sediment fence

Notes:

1. Sediment fence to be installed along a line of constant ground elevation wherever practical.
2. Both end of the sediment fence to extend up the slope at least 1m.
3. Support post to be spaced a maximum 2m unless the fence is supported by a top wire or wire mesh backing, in which case 3m maximum spacing.
4. Fence 'returns' shall be installed at maximum 20m spacing if fence is installed along the contour, otherwise 5 to 10m maximum spacing.
5. Minimum 4 staples or tie wires per stake.

Drawn:	Date:		
GMW	Dec-09	Sediment Fence	SF-01



MATERIALS

FABRIC: POLYPROPYLENE, POLYAMIDE, NYLON, POLYESTER, OR POLYETHYLENE WOVEN OR NON-WOVEN FABRIC, AT LEAST 700mm IN WIDTH AND A MINIMUM UNIT WEIGHT OF 140GSM. ALL FABRICS TO CONTAIN ULTRAVIOLET INHIBITORS AND STABILISERS TO PROVIDE A MINIMUM OF 6 MONTHS OF USEABLE CONSTRUCTION LIFE (ULTRAVIOLET STABILITY EXCEEDING 70%).

FABRIC REINFORCEMENT: WIRE OR STEEL MESH MINIMUM 14-GAUGE WITH A MAXIMUM MESH SPACING OF 200mm.

SUPPORT POSTS/STAKES: 1500mm² (MIN) HARDWOOD, 2500mm² (MIN) SOFTWOOD, OR 1.5kg/m (MIN) STEEL STAR PICKETS SUITABLE FOR ATTACHING FABRIC.

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT, AND REQUIRED TYPE OF FABRIC (IF SPECIFIED). IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, FABRIC TYPE, OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. TO THE MAXIMUM DEGREE PRACTICAL, AND WHERE THE PLANS ALLOW, ENSURE THE FENCE IS LOCATED:

- (i) TOTALLY WITHIN THE PROPERTY BOUNDARIES;
- (ii) ALONG A LINE OF CONSTANT ELEVATION WHEREVER PRACTICAL;
- (iii) AT LEAST 2m FROM THE TOE OF ANY FILLING OPERATIONS THAT MAY RESULT IN SHIFTING SOIL/FILL DAMAGING THE FENCE.

3. INSTALL RETURNS WITHIN THE FENCE AT MAXIMUM 20m INTERVALS IF THE FENCE IS INSTALLED ALONG THE CONTOUR, OR 5 TO 10m MAXIMUM SPACING (DEPENDING ON SLOPE) IF THE FENCE IS INSTALLED AT AN ANGLE TO THE CONTOUR. THE 'RETURNS' SHALL CONSIST OF EITHER:

- (i) V-SHAPED SECTION EXTENDING AT LEAST 1.5m UP THE SLOPE; OR
- (ii) SANDBAG OR ROCK/AGGREGATE CHECK

DAM A MINIMUM 1/3 AND MAXIMUM 1/2 FENCE HEIGHT, AND EXTENDING AT LEAST 1.5m UP THE SLOPE.

4. ENSURE THE EXTREME ENDS OF THE FENCE ARE TURNED UP THE SLOPE AT LEAST 1.5m, OR AS NECESSARY, TO MINIMISE WATER BYPASSING AROUND THE FENCE.

5. ENSURE THE SEDIMENT FENCE IS INSTALLED IN A MANNER THAT AVOIDS THE CONCENTRATION OF FLOW ALONG THE FENCE, AND THE UNDESIRABLE DISCHARGE OF WATER AROUND THE ENDS OF THE FENCE.

6. IF THE SEDIMENT FENCE IS TO BE INSTALLED ALONG THE EDGE OF EXISTING TREES, ENSURE CARE IS TAKEN TO PROTECT THE TREES AND THEIR ROOT SYSTEMS DURING INSTALLATION OF THE FENCE. DO NOT ATTACH THE FABRIC TO THE TREES.

7. UNLESS DIRECTED BY THE SITE SUPERVISOR OR THE APPROVED PLANS, EXCAVATE A 200mm WIDE BY 200mm DEEP TRENCH ALONG THE PROPOSED FENCE LINE, PLACING THE EXCAVATED MATERIAL ON THE UP-SLOPE SIDE OF THE TRENCH.

8. ALONG THE LOWER SIDE OF THE TRENCH, APPROPRIATELY SECURE THE STAKES INTO THE GROUND SPACED NO GREATER THAN 3m IF SUPPORTED BY A TOP SUPPORT WIRE OR WEIR MESH BACKING, OTHERWISE NO GREATER THAN 2m.

9. IF SPECIFIED, SECURELY ATTACH THE SUPPORT WIRE OR MESH TO THE UP-SLOPE SIDE OF THE STAKES WITH THE MESH EXTENDING AT LEAST 200mm INTO THE EXCAVATED TRENCH. ENSURE THE MESH AND FABRIC IS ATTACHED TO THE UP-SLOPE SIDE OF THE STAKES EVEN WHEN DIRECTING A FENCE AROUND A CORNER OR SHARP CHANGE OF DIRECTION.

10. WHEREVER POSSIBLE, CONSTRUCT THE SEDIMENT FENCE FROM A CONTINUOUS ROLL OF FABRIC. TO JOIN FABRIC EITHER:
(i) ATTACH EACH END TO TWO OVERLAPPING STAKES WITH THE FABRIC FOLDING AROUND THE ASSOCIATED STAKE ONE TURN, AND WITH

THE TWO STAKES TIED TOGETHER WITH WIRE; OR
(ii) OVERLAP THE FABRIC TO THE NEXT ADJACENT SUPPORT POST.

11. SECURELY ATTACH THE FABRIC TO THE SUPPORT POSTS USING 25 X 12.5mm STAPLES, OR TIE WIRE AT MAXIMUM 150mm SPACING.

12. SECURELY ATTACH THE FABRIC TO THE SUPPORT WIRE/MESH (IF ANY) AT A MAXIMUM SPACING OF 1m.

13. ENSURE THE COMPLETED SEDIMENT FENCE IS AT LEAST 450mm, BUT NOT MORE THAN 700mm HIGH. IF A SPILL-THROUGH WEIR IS INSTALLED, ENSURE THE CREST OF THE WEIR IS AT LEAST 300mm ABOVE GROUND LEVEL.

14. BACKFILL THE TRENCH AND TAMP THE FILL TO FIRMLY ANCHOR THE BOTTOM OF THE FABRIC AND MESH TO PREVENT WATER FROM FLOWING UNDER THE FENCE.

ADDITIONAL REQUIREMENTS FOR THE INSTALLATION OF A SPILL-THROUGH WEIR

1. LOCATE THE SPILL-THROUGH WEIR SUCH THAT THE WEIR CREST WILL BE LOWER THAN THE GROUND LEVEL AT EACH END OF THE FENCE.

2. ENSURE THE CREST OF THE SPILL-THROUGH WEIR IS AT LEAST 300mm THE GROUND ELEVATION.

3. SECURELY TIE A HORIZONTAL CROSS MEMBER (WEIR) TO THE SUPPORT POSTS/ STAKES EACH SIDE OF THE WEIR. CUT THE FABRIC DOWN THE SIDE OF EACH POST AND FOLD THE FABRIC OVER THE CROSS MEMBER AND APPROPRIATELY SECURE THE FABRIC.

4. INSTALL A SUITABLE SPLASH PAD AND/OR CHUTE IMMEDIATELY DOWN-SLOPE OF THE SPILL-THROUGH WEIR TO CONTROL SOIL EROSION AND APPROPRIATELY DISCHARGE THE CONCENTRATED FLOW PASSING OVER THE WEIR.

MAINTENANCE

1. INSPECT THE SEDIMENT FENCE AT LEAST WEEKLY AND AFTER ANY SIGNIFICANT RAIN. MAKE NECESSARY REPAIRS IMMEDIATELY.

2. REPAIR ANY TORN SECTIONS WITH A CONTINUOUS PIECE OF FABRIC FROM POST TO POST.

3. WHEN MAKING REPAIRS, ALWAYS RESTORE THE SYSTEM TO ITS ORIGINAL CONFIGURATION UNLESS AN AMENDED LAYOUT IS REQUIRED OR SPECIFIED.

4. IF THE FENCE IS SAGGING BETWEEN STAKES, INSTALL ADDITIONAL SUPPORT POSTS.

5. REMOVE ACCUMULATED SEDIMENT IF THE SEDIMENT DEPOSIT EXCEEDS A DEPTH OF 1/3 THE HEIGHT OF THE FENCE.

6. DISPOSE OF SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

7. REPLACE THE FABRIC IF THE SERVICE LIFE OF THE EXISTING FABRIC EXCEEDS 6-MONTHS.

REMOVAL

1. WHEN DISTURBED AREAS UP-SLOPE OF THE SEDIMENT FENCE ARE SUFFICIENTLY STABILISED TO RESTRAIN EROSION, THE FENCE MUST BE REMOVED.

2. REMOVE MATERIALS AND COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

3. REHABILITATE/REVEGETATE THE DISTURBED GROUND AS NECESSARY TO MINIMISE THE EROSION HAZARD.

Drawn:

GMW

Date:

Apr-10

Sediment Fence

SF-02

MATERIALS

- (i) MULCH MUST COMPLY WITH THE REQUIREMENTS OF AS4454.
- (ii) MAXIMUM SOLUBLE SALT CONCENTRATION OF 5dS/m.
- (iii) MOISTURE CONTENT OF 30 TO 50% PRIOR TO APPLICATION.

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION AND EXTENT. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, MATERIAL TYPE, OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. WHEN SELECTING THE LOCATION OF A MULCH FILTER BERM, TO THE MAXIMUM DEGREE PRACTICAL, ENSURE THE BERM IS LOCATED:

- (i) TOTALLY WITHIN THE PROPERTY BOUNDARIES;
- (ii) ALONG A LINE OF CONSTANT ELEVATION (PREFERRED, BUT NOT ALWAYS PRACTICAL);
- (iii) AT LEAST 1m, IDEALLY 3m, FROM THE TOE OF A FILL EMBANKMENT;
- (iv) AWAY FROM AREAS OF CONCENTRATED FLOW.

3. ENSURE THE BERM IS INSTALLED IN A MANNER THAT AVOIDS THE CONCENTRATION OF FLOW ALONG THE BERM, OR THE UNDESIRABLE DISCHARGE OF WATER AROUND THE END OF THE BERM.

4. ENSURE THE BERM HAS BEEN PLACED SUCH THAT PONDING UP-SLOPE OF THE BERM IS MAXIMISED.

5. ENSURE BOTH ENDS OF THE BERM ARE ADEQUATELY TURNED UP THE SLOPE TO PREVENT FLOW BYPASSING PRIOR TO WATER PASSING OVER THE BERM.

6. ENSURE 100% CONTACT WITH THE SOIL SURFACE.

7. WHERE SPECIFIED, TAKE APPROPRIATE STEPS TO VEGETATE THE BERM.

MAINTENANCE

1. DURING THE CONSTRUCTION PERIOD, INSPECT ALL BERMS AT LEAST WEEKLY AND AFTER ANY SIGNIFICANT RAIN. MAKE NECESSARY REPAIRS IMMEDIATELY.

2. REPAIR OR REPLACE ANY DAMAGED SECTIONS.

3. WHEN MAKING REPAIRS, ALWAYS RESTORE THE SYSTEM TO ITS ORIGINAL CONFIGURATION UNLESS AN AMENDED LAYOUT IS REQUIRED OR SPECIFIED.

4. REMOVE ACCUMULATED SEDIMENT IF THE SEDIMENT DEPOSIT EXCEEDS A DEPTH OF 100mm OR 1/3 THE HEIGHT OF THE BERM.

5. DISPOSE OF SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

REMOVAL (IF REQUIRED)

1. WHEN DISTURBED AREAS UP-SLOPE OF THE BERM ARE SUFFICIENTLY STABILISED TO RESTRAIN EROSION, THE BERM MAYBE REMOVED.

2. REMOVE ANY COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

3. REHABILITATE/REVEGETATE THE DISTURBED GROUND AS NECESSARY TO MINIMISE THE EROSION HAZARD.

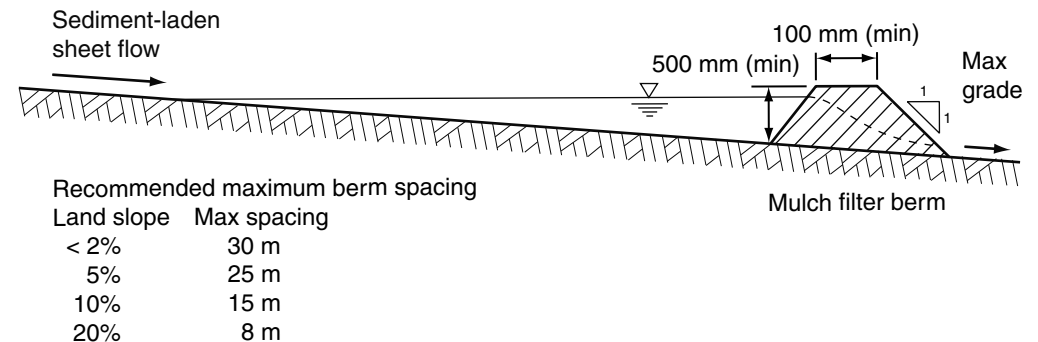


Figure 1 - Typical placement of mulch filter berm

Drawn:	Date:		
GMW	Apr-10	Mulch Filter Berms	MB-01

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT, AND CONSTRUCTION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.
2. CLEAR THE LOCATION FOR THE BANK, CLEARING ONLY THE AREA THAT IS NEEDED TO PROVIDE ACCESS FOR PERSONNEL AND EQUIPMENT.
3. REMOVE ROOTS, STUMPS, AND OTHER DEBRIS AND DISPOSE OF THEM PROPERLY. DO NOT USE DEBRIS TO BUILD THE BANK.
4. FORM THE BANK FROM THE MATERIAL, AND TO THE DIMENSION SPECIFIED IN THE APPROVED PLANS.
5. IF EARTH IS USED, THEN ENSURE THE SIDES OF THE BANK ARE NO STEEPER THAN A 2:1 (H:V) SLOPE, AND THE COMPLETED BANK MUST BE AT LEAST 500mm HIGH.
6. IF FORMED FROM SANDBAGS, THEN ENSURE THE BAGS ARE TIGHTLY PACKED SUCH THAT WATER LEAKAGE THROUGH THE BAGS IS MINIMISED.
7. CHECK THE BANK ALIGNMENT TO ENSURE POSITIVE DRAINAGE IN THE DESIRED DIRECTION.

8. THE BANK SHOULD BE VEGETATED (TURFED, SEEDED AND MULCHED), OR OTHERWISE STABILISED IMMEDIATELY, UNLESS IT WILL OPERATE FOR LESS THAN 30 DAYS OR IF SIGNIFICANT RAINFALL IS NOT EXPECTED DURING THE LIFE OF THE BANK.

9. ENSURE THE EMBANKMENT DRAINS TO A STABLE OUTLET, AND DOES NOT DISCHARGE TO AN UNSTABLE FILL SLOPE.

MAINTENANCE

1. INSPECT FLOW DIVERSION BANKS AT LEAST WEEKLY AND AFTER RUNOFF-PRODUCING RAINFALL.
2. INSPECT THE BANK FOR ANY SLUMPS, WHEEL TRACK DAMAGE OR LOSS OF FREEBOARD. MAKE REPAIRS AS NECESSARY.
3. CHECK THAT FILL MATERIAL OR SEDIMENT HAS NOT PARTIALLY BLOCKED THE DRAINAGE PATH UP-SLOPE OF THE EMBANKMENT. WHERE NECESSARY, REMOVE ANY DEPOSITED MATERIAL TO ALLOW FREE DRAINAGE.
4. DISPOSE OF ANY COLLECTED SEDIMENT OR FILL IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.
5. REPAIR ANY PLACES IN THE BANK THAT ARE WEAKENED OR IN RISK OF FAILURE.

REMOVAL

1. WHEN THE SOIL DISTURBANCE ABOVE THE BANK IS FINISHED AND THE AREA IS STABILISED, THE FLOW DIVERSION BANK SHOULD BE REMOVED, UNLESS IT IS TO REMAIN AS A PERMANENT DRAINAGE FEATURE.
2. DISPOSE OF ANY SEDIMENT OR EARTH IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

3. GRADE THE AREA AND SMOOTH IT OUT IN PREPARATION FOR STABILISATION.
4. STABILISE THE AREA BY GRASSING OR AS SPECIFIED IN THE APPROVED PLAN.

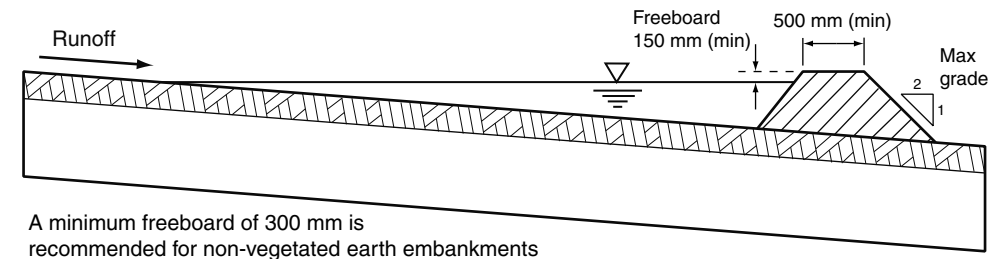


Figure 1 - Typical profile of flow diversion bank formed from earth

Table 1 - Recommended dimensions of flow diversion banks

Parameter	Earth banks	Vegetated banks	Compost berms	Sandbag berms
Height (min)	500 mm	500 mm	300 mm	N/A
Top width (min)	500 mm	500 mm	100 mm	N/A
Base width (min)	2500 mm	2500 mm	600 mm	N/A
Side slope (max)	2:1 (H:V)	2:1 (H:V)	1:1 (H:V)	N/A
Freeboard	300 mm	150 mm	100 mm	50 mm

Drawn:

GMW

Date:

Dec-09

Flow Diversion Banks

DB-01