BACKGROUND AND CALCULATIONS

RUSLE: A = SOIL LOSS (tonnes/ha/yr) = R.K.LS.P.C.

THE AVERAGE ANNUAL SOIL LOSS CALCULATIONS WERE UNDERTAKEN USING THE "BLUE BOOK" - MANAGING URBAN STORMWATER (LANDCOM, 2004)

R-FACTOR	2,500 (MANAGING URBAN STORMWATER, LANDCOM, 2004)
K-FACTOR	0.06 SOILS ARE TYPE D (DISPERSIBLE)
LS-FACTOR	WASTE ROCK EMPLACEMENT AREA = 9.90ha (MAX. SLOPE = 15%, MAX. SLOPE LENGTH = 200m) HAUL ROAD CONSTRUCTION WORKS = 5.06ha (MAX. SLOPE = 15%, MAX SLOPE LENGTH = 80m)
P-FACTOR	1.3 – DEFAULT ASSUMED
C-FACTOR	1 – DEFAULT ASSUMED
CATCHMENT AREA	WASTE ROCK EMPLACEMENT AREA = 7.86ha (TOTAL DISTURBED) HAUL ROAD CONSTRUCTION WORKS = 0.4ha (TOTAL DISTURBED)
ESTIMATED SOIL LOSS	WASTE ROCK EMPLACEMENT AREA = 1931 t/ha/yr = 15178 tonnes/yr (SOIL LOSS CLASS 7) HAUL ROAD CONSTRUCTION WORKS = 987 t/ha/yr = 394.8 tonnes/yr (SOIL LOSS CLASS 6)

THE "BLUE BOOK" REQUIRES THE INSTALLATION OF A SEDIMENT BASIN ON THE SITE IF THE SOIL LOSS > 200 tonnes/yr.
THE SOIL LOSS FOR THIS SITE IS > 200 tonnes/yr, THEREFORE SEDIMENT BASIN/S ARE REQUIRED.

ADOPTED VALUES FOR SEDIMENT BASIN AND DRAINAGE CALCULATIONS:

- 2yr, 6hr ARI event = 10.5mm/hr
- 5-day, 85th%'ile rainfall depth = 42.4mm (Temporary sediment basins for haul road construction)
- 10-day, 95th%'ile rainfall depth = 110.4 (Operation sediment basin for waste rock emplacement area)
- Cv = 0.9
- Cw (for disturbed/construction areas) = 0.9
- Cw (for grassed upslope/clean water areas) = 0.55

TABLE 3
STORMWATER DISCHARGE/RELEASE LIMITS

CHARACTERISTIC	LIMIT
pH	6.5-8.5
Total suspended solids (mg/L)	40* (Maximum)
Turbidity (NTU)	An approved correlated NTU value which corresponds to <40mg/L TSS
Hydrocarbons	Nil

* TSS has been reduced from the Blue Book standard of 50mg/L to account for the inherent sensitivity of the receiving environment.

TABLE 1 MAXIMUM ACCEPTABLE C-FACTORS AT NOMINATED TIMES

LANDS	MAXIMUM C-FACTOR	REMARKS
Waterways and other areas subjected to concentrated flows (e.g. table drains), post construction and during operation	0.05	Applies after ten working days from completion of formation and before they are allowed to carry any concentrated flows. Flows will be limited to those shown in Table 5.2 of Landcom (2004). Foot and vehicular traffic will be prohibited in these areas. Maximum C-factor of 0.05 equals 70% ground cover
Stockpiles and batters, post construction	0.10	Applies after ten working days from completion of formation. Maximum C-factor of 0.10 equals 60% ground cover
All lands, including waterways and stockpiles during construction and operation	0.15	Applies after 20 working days of inactivity, even though works might continue later. Maximum C-factor of 0.15 equals 50% ground cover
All lands post construction	0.05	Applies after 60 working days of completion of works. Maximum C-factor of 0.05 equals 70% ground cover

TABLE 2 LIMITATIONS TO ACCESS DURING CONSTRUCTION

LAND USE	LIMITATION	REMARKS
Construction areas	Limited to 5 (preferably 2) metres from the edge of any essential construction activity as shown on the engineering plans	All site workers should clearly recognise these areas that, where appropriate, are identified with barrier fencing (upslope) and sediment fencing (downslope) or similar materials.
Access corridors	Limited to a maximum width of 5 metres	The site manager will determine and mark the location of these zones on site. They can vary in position so as to best conserve existing vegetation and protect downstream areas while being considerate of the needs of efficient works activities. All site workers will clearly recognise these boundaries
Remaining lands, including revegetation areas	Entry prohibited except for essential management works	Thinning of growth might be necessary, for example, for fire reduction or weed removal

TABLE 4 - SEDIMENT BASIN AND BASIN SPILLWAY SIZING DETAILS

Basin	Sediment Storage Volume (m^3)	Settling Volume (m^3)	Total Basin Volume (m^3)	Basin Spillway				
				Depth (m)	Side Slope (H:V)	Base Width (m)	Top Width (m)	Lining
WRESB1	1946	8207	10153	1	3:1	8	12	To engineering specifications
WRESB2	32	95	127	0.5	3:1	1.5	3.5	Rock (d50 = 100) with geotextile underlay (bidim A34 min.).
WRESB3	32	95	127	0.5	3:1	1.5	3.5	

- WRESB1 sediment basin is to be constructed in accordance with engineering and geotechnical specifications to be structurally sound and geotechnically stable.
- WRESB2 and WRESB3 sediment basins are to be installed in accordance with Blue Book Standard Drawing SD 6-4.
- WRESB1 sediment basin spillway is to be constructed in accordance with engineering and geotechnical specifications to be structurally sound and geotechnically stable.
- WRESB2 and WRESB3 sediment basin spillways are to be installed in accordance with Blue Book Standard Drawing SD 6-4.
- Gypsum is to be shallow ripped into the basin walls at a rate of 5 tonnes/ha during basin construction.
- Gypsum is to be shallow ripped into the spillway walls at a rate of 10 tonnes/ha during basin construction.
- Ensure the total basin volumes are provided within the available basin capacity below the spillway level.
- Ensure suitable access is provided into the sediment basins to enable treatment, sediment removal and maintenance.
- A sediment marker is to be installed within each basin (well away from the inlets and outlets) to indicate the sediment storage volume level (measured from the bottom surface of the basin).
- Dissipaters are to be provied at the outlet of sediment basin spillways and are to extend to a watercourse or 100% vegetated lands.

TABLE 5 - DIVERSION DRAIN SIZING AND LINING DETAILS

DRAIN SIZING DETAILS

Refer to 'Detail 1' below and Blue Book Standard Drawings SD 5-5 and SD 5-6

Structure Name	CD1	CD2	CD3	CD4	CD5	DD1-A	DD1-B	DD1-C	DD2-A	DD2-B	DD2-C	DD3	DD4	DD5	DD6	DD7	DD8	DD9	DD10	D8
Type (CHANNEL/BUND)	CHANNEL	CHANNEL	CHANNEL	CHANNEL	CHANNEL	CHANNEL	CHANNEL	CHANNEL	CHANNEL	CHANNEL	CHANNEL	CHANNEL	CHANNEL	CHANNEL	CHANNEL	CHANNEL	CHANNEL	CHANNEL	CHANNEL	BUND
Channel/bund depth, D (m)	0.3	0.4	0.3	0.3	0.3	0.5	0.4	0.3	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.3	0.3	0.6
Channel base width, B (m)	0.5	0.5	0.5	0.5	0.5	1.4	1.2	0.5	1.4	1.2	0.5	1	1	1	1	1.2	1.2	0.5	0.5	N/A
Channel/bund side slope (H:V)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2
Channel top width, T (m)	2.3	2.9	2.3	2.3	2.3	4.4	3.6	2.3	4.4	4.2	2.9	3.4	3.4	3.4	3.4	4.2	4.2	2.3	2.3	N/A
Lining Type	TYPE 1	TYPE 1	TYPE 1	TYPE 1	TYPE 1	TYPE 2	TYPE 2	TYPE 1	TYPE 2	TYPE 2	TYPE 1	TYPE 1	TYPE 1	TYPE 1	TYPE 1	TYPE 1	TYPE 1	TYPE 1	TYPE 1	TYPE 1
Drain slope (%)	Drains to fall in the direction shown. Drain slopes to be relative to the site topography. However, the minimum drain slope to be 1%.																			

DRAIN/BUND STABILISATION AND LINING

TYPE 1

Soil preperation (prior to lining drains):
- Refer to Blue Book Standard Drawing SD 5-7.
- Gypsum is to be shallow ripped into the subgrade surface at a rate of 10 tonnes/ha prior to placing topsoil.
- Place treated topsoil over entire drain surface to a minimum depth of 75mm.

Drain lining:
- Coir mesh + Vital Stonewall (or bitumen spray) + seeding (or equivalent).
- Vital stonewall to be applied at a maximum dilution of 1:10 (Vital:Water)
- Seeding: Use rye grass for winter months / Japanese Millet for summer months and a combination with a suitable perrennial (long term) local native grass mix for long term drains.

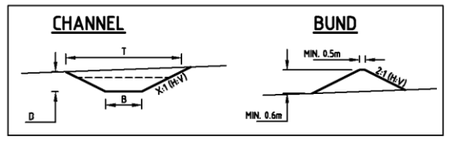
Watering:
- Regular watering required where rainfall is insufficient.
- Ensure water is applied gently (not with a pressure spray).

TYPE 2

Soil preperation (prior to lining drains):
- Gypsum is to be shallow ripped into the subgrade surface at a rate of 10 tonnes/ha prior to placing topsoil.
- The ground surface is to be left rough and uneven prior to lining the drain.

Drain lining:
- Geotextile underlay (bidim A34 min. or equivalent). The geotextile is to be placed loosely over the underlying bank - do not stretch or pull the cloth.
- Rock rip-rap (d50 = 200mm DIA)

DETAIL 1 - DIVERSION DRAIN/CHUTE



REV	DATE	DES.	DRN.	APP.	REVISION DETAILS
01	19/05/15	A.J.B.	A.J.B.	M.P.	REVISED SEDIMENT BASIN DESIGN
00	21/01/15	A.J.B.	A.J.B.	M.P.	ISSUE FOR USE
A	19/11/14	A.J.B.	A.J.B.	M.P.	DRAFT ISSUE FOR CONSULTATION

DRAWING STATUS: FINAL
DESIGN BY: A.J.B.
DRAWN BY: A.J.B.
FINAL APPROVAL: M.P.
SCALE: (on A3 Original)
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PROJECT TITLE: DARGUES GOLD PROJECT – EASTERN WASTE ROCK EMPLACEMENT

DRAWING TITLE: EROSION & SEDIMENT CONTROL PLAN CALCULATIONS & TABLES

PROJECT NO.	SUB-PR NO.	DRAWING NO.	REV
13000046	P03	ESCP03	01

Plot Date: Tuesday, 19 May 2015 8:49:55 AM CAD File Name: K:\13000046 Unity Mining – Dargues Reef Gold Project\Drawings\13000046_P03_ESCP_REV 01.dwg

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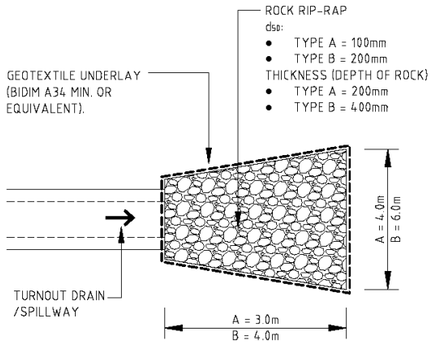
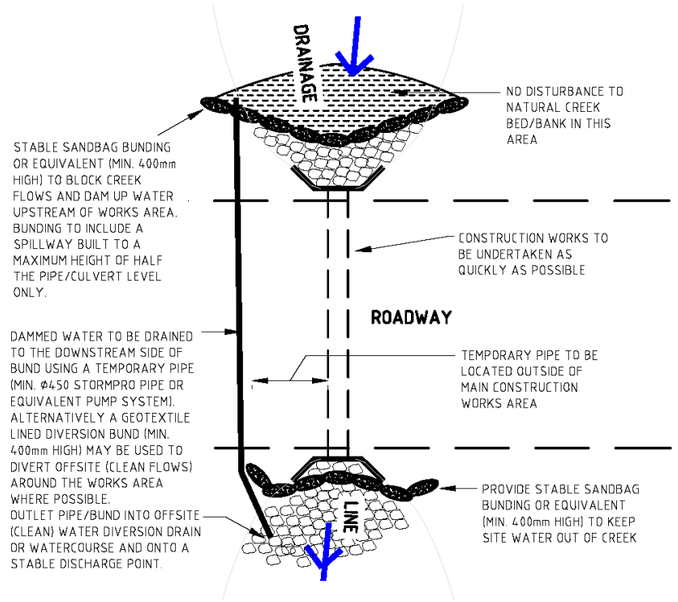
DETAIL 2 – ROCK DISSIPATER



- ROCK DISSIPATERS TO BE INSTALLED IN ACCORDANCE WITH BLUE BOOK STANDARD DRAWING (SD 5-8).
- GYPSUM IS TO BE SHALLOW RIPPED INTO THE SUBGRADE SURFACE (AT A RATE OF 10 tonnes/ha) PRIOR TO PLACING THE GEOTEXTILE AND ROCK.
- BASIN SPILLWAY DISSIPATERS ARE TO BE CONSTRUCTED WITH GEOTEXTILE, ROCK AND AN OUTLET WIDTH OF EQUIVALENT SIZE/SPECIFICATIONS TO THE SPILLWAY REQUIREMENTS.
- BASIN SPILLWAY DISSIPATERS TO EXTEND TO A WATERCOURSE OR 100% VEGETATED LANDS.

DETAIL 3 – TYIPCAL WATER MANAGEMENT FOR PIPE INSTALLATION WORKS



EROSION AND SEDIMENT CONTROL REQUIREMENTS FOR CULVERT/PIPE WORKS

GENERAL

- ALL WORKS ARE TO BE SCHEDULED FOR THE MONTHS FROM APRIL TO MAY INCLUSIVE OR JULY TO SEPTEMBER INCLUSIVE (THE LOWEST RAINFALL EROSIVITY AND AVERAGE RAINFALL MONTHS BASED ON DATA SOURCED FROM THE BLUE BOOK (2004) AND THE BUREAU OF METEROLOGY WEBSITE (APRIL 2014)).
- PRIOR TO UNDERTAKING ANY CONSTRUCTION OR EARTHWORKS ENSURE TEMPORARY GROUNDCOVER MATERIALS (E.G. GEOFABRIC OR BLACK PLASTIC) ARE TO BE LOCATED ON SITE FOR STABILISATION OF EXPOSED SURFACES.
- EARTHWORKS OR SOIL DISTURBANCE OF ANY KIND MUST NOT COMMENCE WITHIN THE DRAINAGE LINE UNTIL A CLEAN DIVERSION (PUMP, PIPE OR LINED DRAIN) IS IN PLACE TO TAKE UPSTREAM FLOWS AROUND THE WORK AREA.
- AT ALL TIMES DURING WORKS, ENSURE THAT NATURAL UPSTREAM FLOWS ARE PIPED, PUMPED OR DIVERTED AROUND THE WORK SITE WITHOUT COMING INTO CONTACT WITH EXPOSED SOIL OR DIRTY CONSTRUCTION WATER.
- TEMPORARY CLEAN WATER DIVERSIONS (PUMPS/PIPES/DRAINS) HAVE THE CAPACITY TO TAKE LOW FLOWS ONLY. HIGHER DRAINAGE LINE FLOWS DURING LARGER STORM EVENTS MAY OVERTOP THE CLEAN DIVERSION AND THEREFORE ALL EXPOSED SOILS WITHIN THE WATERWAY MUST BE COVERED OR LINED PRIOR TO RAINFALL TO MINIMISE THE RISK OF EROSION.
- DURING ALL WORKS STAGES ALL EXPOSED SOILS WITHIN THE DRAINAGE LINE EXTENT ARE TO BE STABILISED WITH A TEMPORARY GROUNDCOVER (E.G. GEOFABRIC OR BLACK PLASTIC) PRIOR TO RAINFALL. THE TOP SURFACE OF THE EARTHWORKS FILL PLATFORM MAY BE STABILISED WITH VITAL STONEWALL PRIOR TO RAINFALL (IN PLACE OF GEOTEXTILE) ONCE THE SUBJECT LEVEL IS AT LEAST 500mm ABOVE THE PIPE OVERFLOW LEVEL.
- EXPOSED BATTERS WITHIN THE DRAINAGE LINE EXTENT WHERE WORKS ARE NOT ACTIVELY OCCURRING ARE TO BE TEMPORARILY COVERED WITH GEOTEXTILE OR EQUIVALENT.
- DISTURBANCE WITHIN IN-STREAM LOCATIONS IS TO BE MINIMISED AS MUCH AS POSSIBLE.
- FINAL STABILISATION OF SURFACES IS TO OCCUR PROGRESSIVELY AS EACH SECTION OF WORKS ARE COMPLETE.
- DIRTY (ON-SITE) WATER ACCUMULATING WITHIN THE WORKS AREA IS TO BE PUMPED TO A SEDIMENT BASIN FOR TREATMENT OR TREATED IN-SITU PRIOR TO DISCHARGING.
- ALTERNATIVELY ONSITE WATER CAN BE USED FOR DUST SUPPRESSION ON THE ROADWORK AREAS OUTSIDE OF THE WATERWAY EXTENT (I.E. AREAS THAT DRAIN BACK INTO A SEDIMENT BASIN).

REV	DATE	DES.	DRN.	APP.	REVISION DETAILS
01	19/05/15	A.J.B.	A.J.B.	M.P.	REVISED SEDIMENT BASIN DESIGN
00	21/01/15	A.J.B.	A.J.B.	M.P.	ISSUE FOR USE
A	19/11/14	A.J.B.	A.J.B.	M.P.	DRAFT ISSUE FOR CONSULTATION

DRAWING STATUS	
DESIGN BY	A.J.B.
DRAWN BY	A.J.B.
FINAL APPROVAL	M.P.

SCALE: (on A3 Original)

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PROJECT TITLE: DARGUES GOLD PROJECT – EASTERN WASTE ROCK EMPLACEMENT

DRAWING TITLE: EROSION & SEDIMENT CONTROL PLAN DETAILS

PROJECT NO.	SUB-PR NO.	DRAWING NO.	REV
13000046	P03	ESCP04	01

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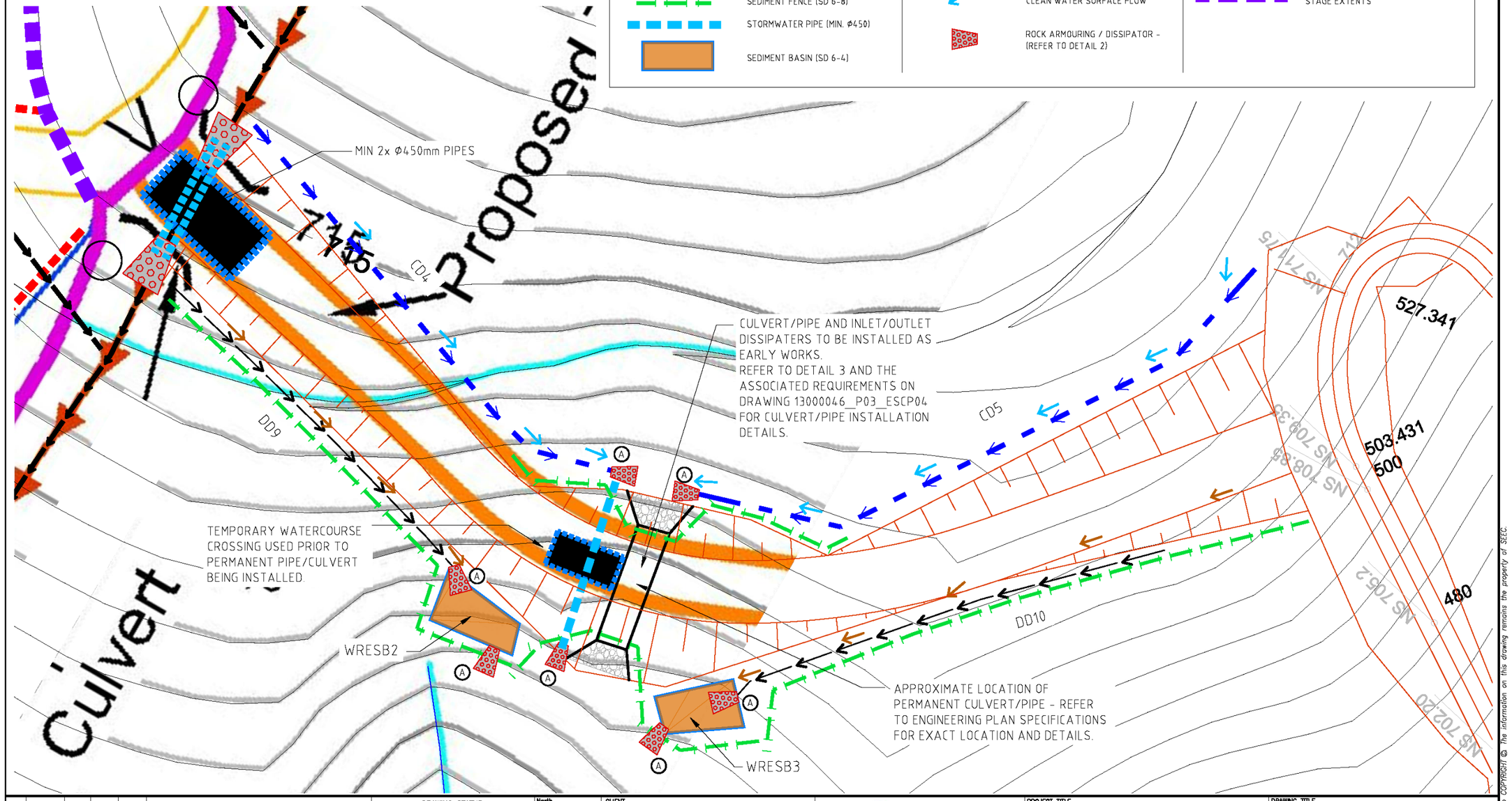
EROSION AND SEDIMENT CONTROL REQUIREMENTS
REFER TO DRAWINGS 13000046_P03_ESCP01 -03 FOR EROSION AND SEDIMENT CONTROL STAGING DETAILS, GENERAL REQUIREMENTS AND SEDIMENT BASIN, DIVERSION DRAIN AND DISSIPATER CONSTRUCTION SPECIFICATIONS.

WATER QUALITY DISCHARGE REQUIREMENTS
ENSURE ALL SITE WATER COMPLIES WITH THE WATER QUALITY REQUIREMENTS PRIOR TO DISCHARGING FROM SITE OR INTO A WATERCOURSE:
- TSS < 40mg/L
- pH: 6.5 – 8.5
- NO VISIBLE SIGN OF OIL/GREASE

REFER TO THE DIRTY WATER TREATMENT AND DISCHARGE REQUIREMENTS ON DRAWING 13000046_P03_ESCP01 FOR ADDITIONAL DETAILS.

LEGEND

- LINED DIRTY WATER DIVERSION DRAIN (REFER TO TABLE 5 FOR DETAILS)
- LINED CLEAN WATER DIVERSION DRAIN (REFER TO TABLE 5 FOR DETAILS)
- SEDIMENT FENCE (SD 6-8)
- STORMWATER PIPE (MIN. Ø450)
- SEDIMENT BASIN (SD 6-4)
- NOMINATED STOCKPILE AREAS (SD 4-1)
- TEMPORARY WATERWAY CROSSING (SD 5-1)
- DIRTY WATER SURFACE FLOW
- CLEAN WATER SURFACE FLOW
- ROCK ARMOURING / DISSIPATOR - (REFER TO DETAIL 2)
- STABILISED DIVERSION BUND/BERM ALONG TOP EDGE OF BATTER (DB - REFER TO TABLE 5 FOR DETAILS)
- APPROXIMATE ROAD LOCATION AND CUT FILL EXTENT (REFER TO ENGINEERING DESIGN FOR DETAILS)
- STAGE EXTENTS



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00	21/01/15	A.J.B.	A.J.B.	M.P.	ISSUE FOR USE
A	19/11/14	A.J.B.	A.J.B.	M.P.	DRAFT ISSUE FOR CONSULTATION

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DESIGN BY A.J.B.
DRAWN BY A.J.B.
FINAL APPROVAL M.P.
SCALE: (on A3 Original) 1:500
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PROJECT TITLE: DARGUES GOLD PROJECT – EASTERN WASTE ROCK EMPLACEMENT

DRAWING TITLE: EROSION & SEDIMENT CONTROL PLAN HAUL ROAD CONSTRUCTION

PROJECT NO.	SUB-PR NO.	DRAWING NO.	REV
13000046	P03	ESCP05	01

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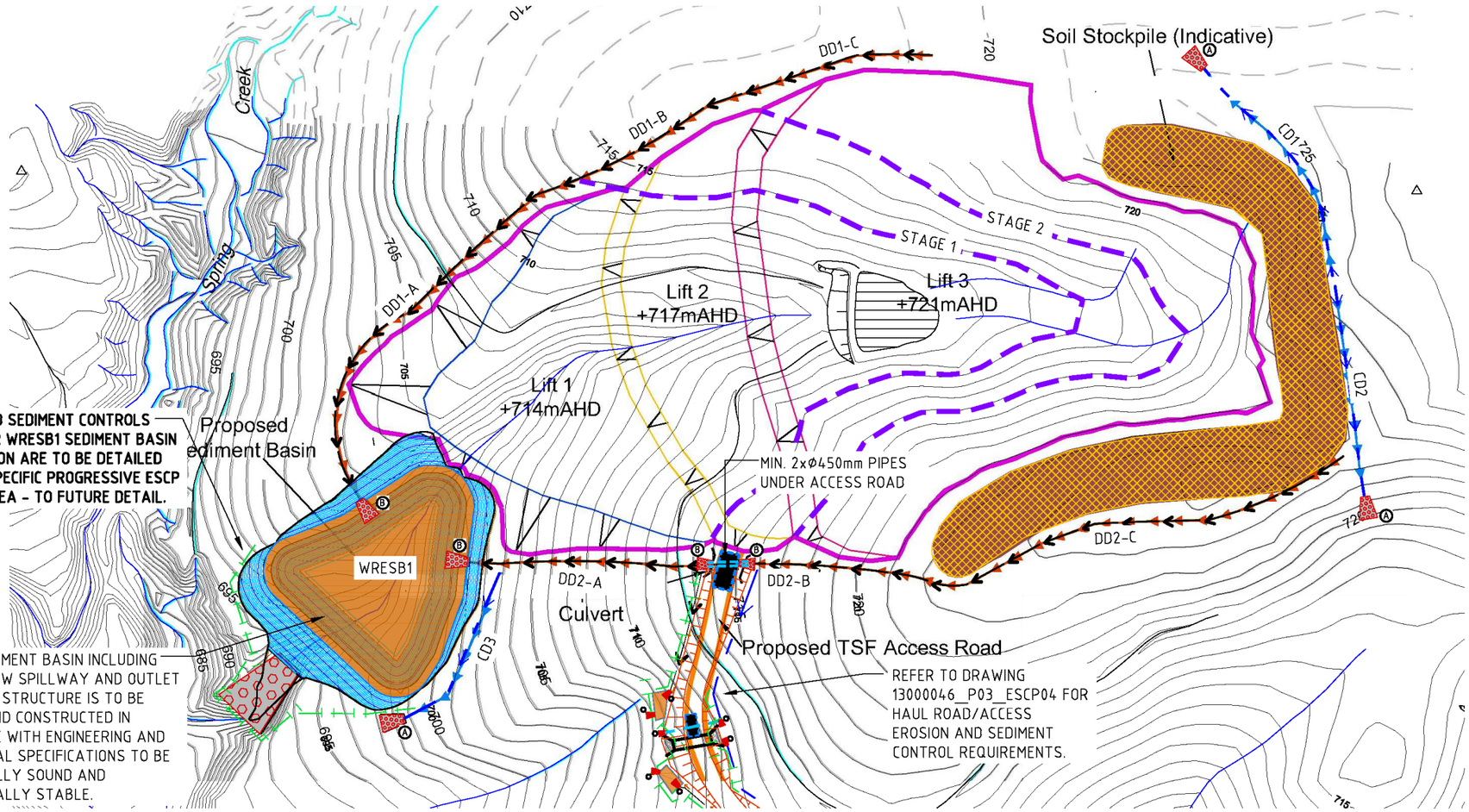
EROSION AND SEDIMENT CONTROL REQUIREMENTS
REFER TO DRAWINGS 13000046_P03_ESCP01 -03 FOR EROSION AND SEDIMENT CONTROL STAGING DETAILS, GENERAL REQUIREMENTS AND SEDIMENT BASIN, DIVERSION DRAIN AND DISSIPATER CONSTRUCTION SPECIFICATIONS.

WATER QUALITY DISCHARGE REQUIREMENTS
ENSURE ALL SITE WATER COMPLIES WITH THE WATER QUALITY REQUIREMENTS PRIOR TO DISCHARGING FROM SITE OR INTO A WATERCOURSE:
- TSS < 40mg/L
- pH: 6.5 – 8.5
- NO VISIBLE SIGN OF OIL/GREASE

REFER TO THE DIRTY WATER TREATMENT AND DISCHARGE REQUIREMENTS ON DRAWING 13000046_P03_ESCP01 FOR ADDITIONAL DETAILS.

LEGEND

- LINED DIRTY WATER DIVERSION DRAIN (REFER TO TABLE 5 FOR DETAILS)
- LINED CLEAN WATER DIVERSION DRAIN (REFER TO TABLE 5 FOR DETAILS)
- SEDIMENT FENCE (SD 6-8)
- STORMWATER PIPE (MIN. Ø450)
- SEDIMENT BASIN (SD 6-4)
- NOMINATED STOCKPILE AREAS (SD 4-1)
- TEMPORARY WATERWAY CROSSING (SD 5-1)
- DIRTY WATER SURFACE FLOW
- CLEAN WATER SURFACE FLOW
- ROCK ARMOURING / DISSIPATOR – (REFER TO DETAIL 2)
- STABILISED DIVERSION BUND/BERM ALONG TOP EDGE OF BATTER (DB – REFER TO TABLE 5 FOR DETAILS)
- APPROXIMATE ROAD LOCATION AND CUT FILL EXTENT (REFER TO ENGINEERING DESIGN FOR DETAILS)
- STAGE EXTENTS



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00	21/01/15	A.J.B.	A.J.B.	M.P.	ISSUE FOR USE
A	19/11/14	A.J.B.	A.J.B.	M.P.	DRAFT ISSUE FOR CONSULTATION

DRAWING STATUS
DESIGN BY A.J.B.
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FINAL APPROVAL M.P.
SCALE: (on A3 Original) 1:2000
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PROJECT TITLE: DARGUES GOLD PROJECT – EASTERN WASTE ROCK EMPLACEMENT

DRAWING TITLE: EROSION & SEDIMENT CONTROL PLAN – ROCK EMPLAEMENT AREA SITE PREPARATION

PROJECT NO.	SUB-PR NO.	DRAWING NO.	REV
13000046	P03	ESCP06	01

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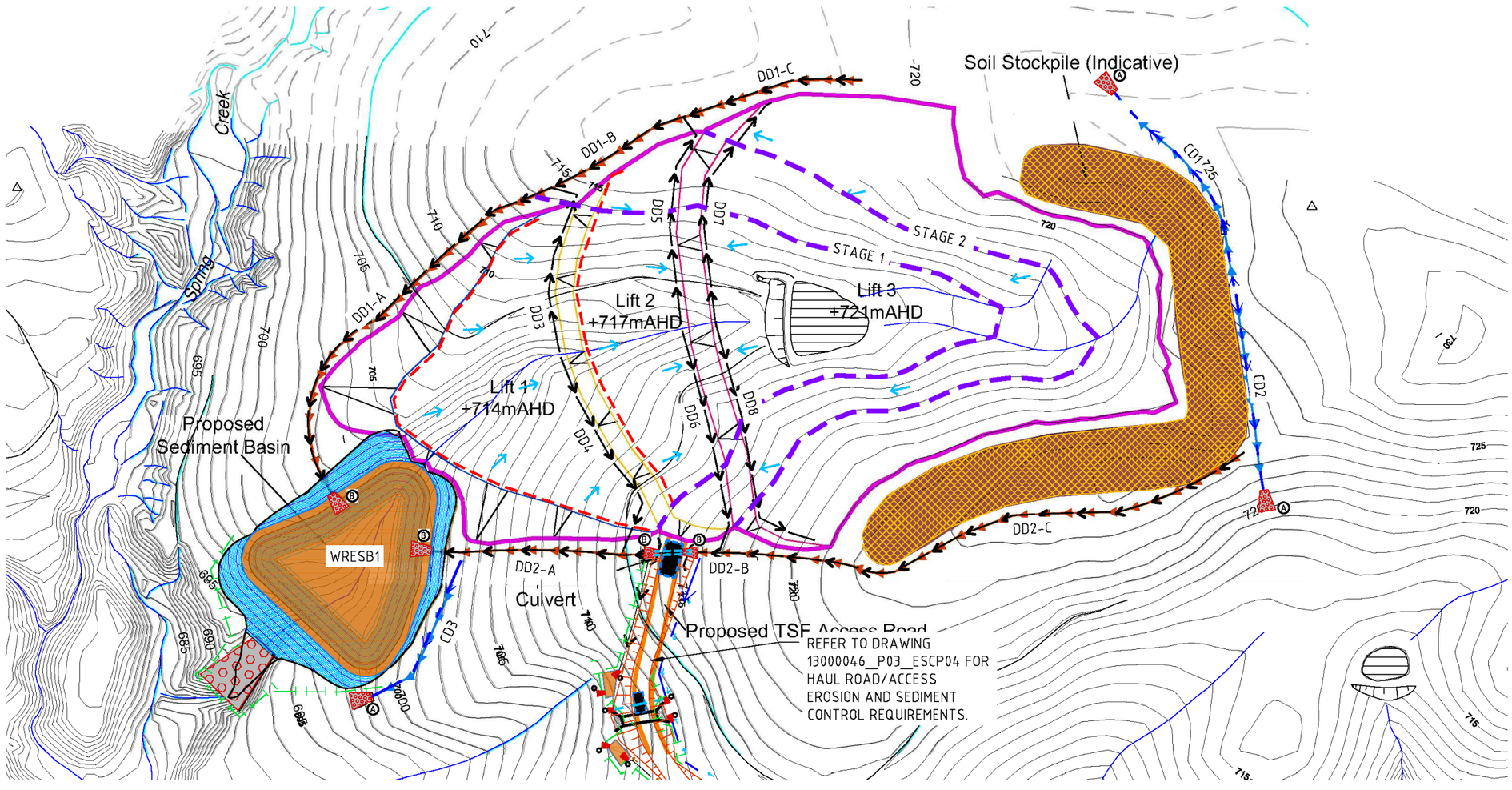
EROSION AND SEDIMENT CONTROL REQUIREMENTS
REFER TO DRAWINGS 13000046_P03_ESCP01 -03 FOR EROSION AND SEDIMENT CONTROL STAGING DETAILS, GENERAL REQUIREMENTS AND SEDIMENT BASIN, DIVERSION DRAIN AND DISSIPATER CONSTRUCTION SPECIFICATIONS.

WATER QUALITY DISCHARGE REQUIREMENTS
ENSURE ALL SITE WATER COMPLIES WITH THE WATER QUALITY REQUIREMENTS PRIOR TO DISCHARGING FROM SITE OR INTO A WATERCOURSE:
- TSS < 40mg/L
- pH: 6.5 – 8.5
- NO VISIBLE SIGN OF OIL/GREASE

REFER TO THE DIRTY WATER TREATMENT AND DISCHARGE REQUIREMENTS ON DRAWING 13000046_P03_ESCP01 FOR ADDITIONAL DETAILS.

LEGEND

- LINED DIRTY WATER DIVERSION DRAIN (REFER TO TABLE 5 FOR DETAILS)
- LINED CLEAN WATER DIVERSION DRAIN (REFER TO TABLE 5 FOR DETAILS)
- SEDIMENT FENCE (SD 6-8)
- STORMWATER PIPE (MIN. Ø450)
- SEDIMENT BASIN (SD 6-4)
- NOMINATED STOCKPILE AREAS (SD 4-1)
- TEMPORARY WATERWAY CROSSING (SD 5-1)
- DIRTY WATER SURFACE FLOW
- CLEAN WATER SURFACE FLOW
- ROCK ARMOURING / DISSIPATOR – (REFER TO DETAIL 2)
- STABILISED DIVERSION BUND/BERM ALONG TOP EDGE OF BATTER (DB – REFER TO TABLE 5 FOR DETAILS)
- APPROXIMATE ROAD LOCATION AND CUT FILL EXTENT (REFER TO ENGINEERING DESIGN FOR DETAILS)
- STAGE EXTENTS



REV	DATE	DES.	DRN.	APP.	REVISION DETAILS
01	19/05/15	A.J.B.	A.J.B.	M.P.	REVISED SEDIMENT BASIN DESIGN
00	21/01/15	A.J.B.	A.J.B.	M.P.	ISSUE FOR USE
A	19/11/14	A.J.B.	A.J.B.	M.P.	DRAFT ISSUE FOR CONSULTATION

DRAWING STATUS
DESIGN BY A.J.B.
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FINAL APPROVAL M.P.
SCALE: (on A3 Original) 1:2000
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PROJECT TITLE: DARGUES GOLD PROJECT – EASTERN WASTE ROCK EMPLACEMENT

DRAWING TITLE: EROSION & SEDIMENT CONTROL PLAN WASTE ROCK PLACEMENT

PROJECT NO.	SUB-PR NO.	DRAWING NO.	REV
13000046	P03	ESCP07	01

Plot Date: Tuesday, 19 May 2015 8:50:16 AM CAD File Name: K:\13000046 Unity Mining – Dargues Reef Gold Project\Drawings\13000046_P03_ESCP_REV 01.dwg

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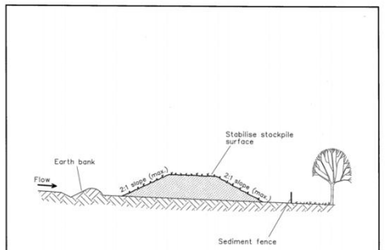
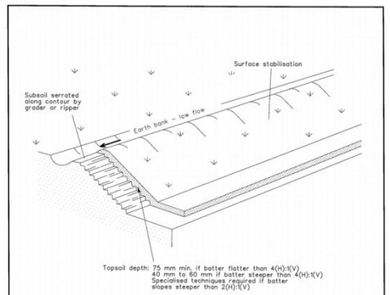


Construction Notes

1. Place stockpiles more than 2 (preferably 5) metres 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 2 metres 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 2 metres downslope.

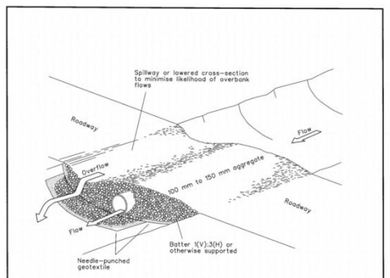
STOCKPILES **SD 4-1**



Construction Notes

1. Scarify the ground surface along the line of the contour to a depth of 50 mm to 100 mm to break up any hardsetting surfaces and to provide a good bond between the respread material and subsoil.
2. Add soil ameliorants as required by the ESCP or SWMP.
3. Rip to a depth of 300 mm if compacted layers occur.
4. Where possible, replace topsoil to a depth of 40 to 60 mm on lands where the slope exceeds 4(H):1(V) and to at least 75 mm on lower gradients.

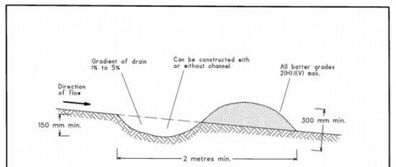
REPLACING TOPSOIL **SD 4-2**



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 100 mm to 150 mm size class over the fabric to a minimum depth of 200 mm.
4. Provide a 3-metre 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**

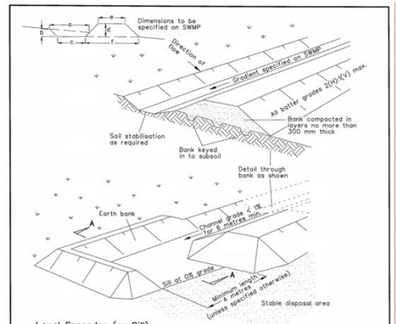


NOTE: Only to be used as temporary bank where maximum upslope length is 80 metres.

Construction Notes

1. Build with gradients between 1 percent 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.

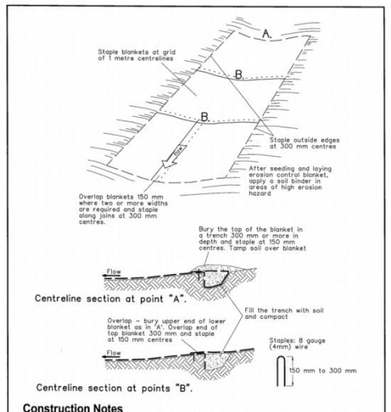
EARTH BANK (LOW FLOW) **SD 5-5**



Construction Notes

1. Construct at the gradient specified on the ESCP or SWMP, normally 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, at the dimensions shown on the SWMP.
5. Ensure the banks are properly compacted to prevent failure.
6. Complete permanent or temporary stabilisation within 10 days of construction following Table 5.2 in Landcom (2004).
7. Where discharging to erodible lands, ensure they outlet through a properly constructed level spreader.
8. Construct the level spreader at the gradient specified on the ESCP or SWMP, normally less than 1 percent or level.
9. Where possible, ensure they discharge waters onto either stabilised or undisturbed disposal sites within the same subcatchment area from which the water originated. Approval might be required to discharge into other subcatchments.

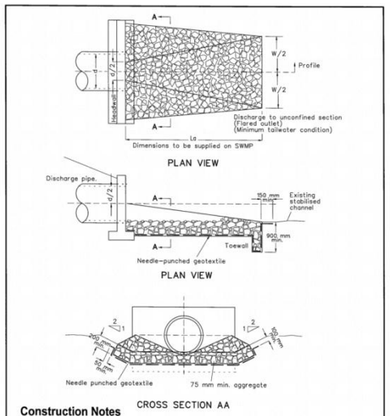
EARTH BANK (HIGH FLOWS) **SD 5-6**



Construction Notes

1. Remove any rocks, clods, sticks or grass from the surface before laying matting
2. Ensure that topsoil is at least 75 mm deep.
3. Complete fertilising and seeding before laying the matting.
4. Ensure fabric will be continuously in contact with the soil by grading the surface carefully first.
5. Lay the fabric in "shingle-fashion", with the end of each upstream roll overlapping those downstream. Ensure each roll is anchored properly at its upslope end (Standard Drawing 5-7b).
6. Ensure that the full width of flow in the channel is covered by the matting up to the design storm event, usually in the 10-year ARI time of concentration storm event.
7. Divert water from the structure until vegetation is stabilised properly.

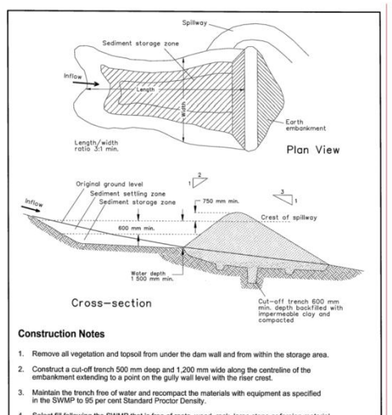
RECP : CONCENTRATED FLOW **SD 5-7**



Construction Notes

1. Compact the subgrade fill to the density of the surrounding undisturbed material.
2. Prepare a smooth, even foundation for the structure that will ensure that the needle-punched geotextile does not sustain serious damage when covered with rock.
3. Should any minor damage to the geotextile occur, repair it before spreading any aggregate. For repairs, patch one piece of fabric over the damage, making sure that all joints and patches overlap more than 300 mm.
4. Lay rock following the drawing, according to Table 5.2 of Landcom (2004) and with a minimum diameter of 75 mm.
5. Ensure that any concrete or riprap used for the energy dissipater or the outlet protection conforms to the grading limits specified on the SWMP.

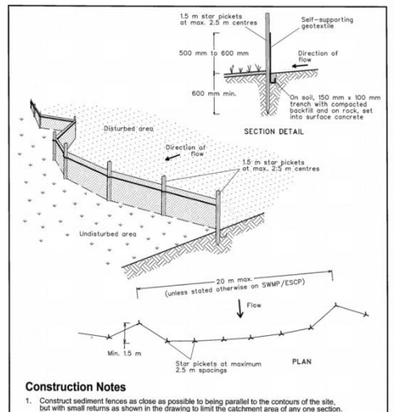
ENERGY DISSIPATER **SD 5-8**



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 500 mm deep and 1,200 mm 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 100 mm to help bond compacted fill to the existing substrate.
6. Spread the fill in 100 mm to 150 mm layers and compact it at optimum moisture content following the SWMP.
7. Construct the emergency spillway.
8. Rehabilitate the structure following the SWMP.

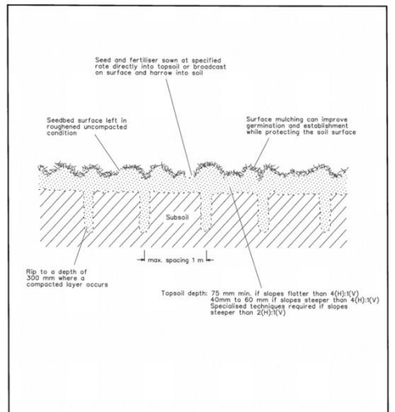
EARTH BASIN - WET
(APPLIES TO 'TYPE D' AND 'TYPE F' SOILS ONLY) **SD 6-4**



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 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 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 150-mm 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. Loosen compacted soil before sowing any seed. If necessary, rip the soil to a depth of 300 mm. Avoid rotary hoe cultivation.
2. Work the ground only as much as necessary to achieve the desired tilth and prepare a good seedbed.
3. Avoid cultivation in very wet or very dry conditions.
4. Cultivate on or close to the contour where possible, not up and down the slope.

SEEDBED PREPARATION **SD 7-1**

REV	DATE	DES.	DRN.	APP.	REVISION DETAILS
01	19/05/15	A.J.B.	A.J.B.	M.P.	REVISED SEDIMENT BASIN DESIGN
00	21/01/15	A.J.B.	A.J.B.	M.P.	ISSUE FOR USE
A	19/11/14	A.J.B.	A.J.B.	M.P.	DRAFT ISSUE FOR CONSULTATION

DRAWING STATUS	
DESIGN BY	A.J.B.
DRAWN BY	A.J.B.
FINAL APPROVAL	M.P.
SCALE: (on A3 Original)	

FINAL

North

CLIENT: UNITY Mining Limited

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PROJECT TITLE: DARGUES GOLD PROJECT – EASTERN WASTE ROCK EMPLACEMENT

DRAWING TITLE: EROSION & SEDIMENT CONTROL PLAN STANDARD DRAWINGS

PROJECT NO.	SUB-PR NO.	DRAWING NO.	REV
13000046	P03	ESCP08	01

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