

ALL INFORMATION WITHIN THESE EROSION AND SEDIMENT CONTROL NOTES HAVE BEEN SOURCED FROM MANAGING URBAN STORMWATER: SOILS AND CONSTRUCTION (2004) AND THE INTERNATIONAL EROSION CONTROL ASSOCIATION (AUSTRALIA) (IECA) BEST PRACTICE EROSION AND SEDIMENT CONTROL - 2008.

EROSION AND SEDIMENT CONTROL - GENERAL NOTES

WORK AREA

THE DEFINED 'WORK AREA' IS LIMITED TO THE AREA SHOWN WITHIN THE DESIGN DRAWINGS, WITH THE WIDTHS AND ALUMINUMS BEEN DEFINED THROUGH THE INFORMATION PROVIDED BY THE CLIENT. ALL EROSION AND SEDIMENT CONTROLS ARE TO BE CONSTRUCTED, OPERATED AND MAINTAINED WITHIN THE WORK AREA.

KEY MANAGEMENT PRACTICES

PRINCIPLES OF EROSION AND SEDIMENT CONTROL

AVOIDING EROSION & MINIMISING THE POTENTIAL FOR EROSION IN THE FIRST INSTANCE IS CONSIDERED THE MOST EFFECTIVE WAY OF ENSURING ENVIRONMENTAL OBJECTIVES ARE ACHIEVED. CONTROLLING LINE SEDIMENT AS AN END OF LINE TREATMENT IN THE FIRST INSTANCE SHOULD BE AVOIDED. REDUCING OR AVOIDING EROSION CAN BE ACHIEVED THROUGH THE APPLICATION OF MULTIPLE TECHNIQUES, OFTEN WITH ONE TECHNIQUE SUPPLEMENTING ANOTHER. EXAMPLE TECHNIQUES INCLUDE:

- UNDERSTANDING THE REASONS BEHIND SOIL EROSION (I.E. SOIL PROPERTIES, RUNOFF VOLUME, RUNOFF VELOCITY) AND DEVELOPING A TREATMENT STRATEGY ACCORDINGLY.
- SCHEDULING AND STAGING OF CLEARING, EARTHWORKS, ENGINEERING SERVICES, STABILISATION AND REHABILITATION.
- MINIMISING DISTURBANCE AND THE OVERALL CONSTRUCTION FOOTPRINT.
- INCREASE AND OR MAINTAIN TEMPORARY OR PERMANENT GROUND COVER IN HIGH EROSION RISK AREAS.

THE FOLLOWING PRINCIPLES ARE RECOMMENDED WITHIN MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION(2004) AS THE PRINCIPLES OF ESC AND SHOULD BE CONSIDERED WHEN DEVELOPING AND IMPLEMENTING AN EROSION AND SEDIMENT CONTROL PLAN:

1. ASSESS THE SOIL AND WATER IMPLICATIONS OF DEVELOPMENT AT THE SUBDIVISION OR SITE PLANNING STAGE, INCLUDING THOSE RELATING TO EROSION, INVESTIGATE THE SALINITY AND, ON COASTAL LANDS, THE ACID SULPHATE POTENTIALS OF THE SOILS WHERE THEIR DISTURBANCE IS LIKELY TO EXPOSE AND/OR EXAGGERATE THIS PROBLEM.
2. PLAN FOR EROSION AND SEDIMENT CONTROL CONCURRENTLY WITH ENGINEERING DESIGN AND BEFORE EARTHWORKS BEGIN, ENSURING PROPER ASSESSMENT OF SITE CONSTRAINTS AND INTEGRATION OF THE VARIOUS COMPONENTS.
3. MINIMISE THE AREA OF SOIL DISTURBED AND EXPOSED TO EROSION.
4. CONSERVE TOPSOIL FOR LATER SITE REHABILITATION/VEGETATION.
5. CONTROL WATER FLOW FROM THE TOP OF, AND THROUGH THE DEVELOPMENT AREA.
6. REHABILITATE DISTURBED LANDS QUICKLY, AND
7. MAINTAIN SOIL AND WATER MANAGEMENT MEASURES APPROPRIATELY DURING THE CONSTRUCTION PHASE.

RECOMMENDED MANAGEMENT ACTIONS

- IMPLEMENTATION OF THE PRINCIPLES OF ESC MEANS THAT PLANNING FOR SOIL AND WATER MANAGEMENT WILL BE BASED ON ASSESSMENT OF THE PHYSICAL CONSTRAINTS PRESENT AT THE SITE. THESE INCLUDE:
 - A. RAINFALL, EROSION, FLOODING LIABILITY
 - B. TOPOGRAPHY
 - C. TOPOGRAPHY
 - D. SOILS, EROSION, DISPERSIBILITY, SALINITY, SHRINK/SWELL CAPACITY, DRAINAGE CHARACTERISTICS, MASS MOVEMENT POTENTIAL, ETC.
- THE PREPARATION OF SITE DEVELOPMENT PLANS SHOULD:
 - A. OFFER SOLUTIONS THAT ENSURE THAT ANY DEVELOPMENT IS ECOLOGICALLY SUSTAINABLE, BEING CONSIDERATE OF THE IMMEDIATE AND EVENTUAL EFFECT OF DEVELOPMENT ON:
 1. THE QUALITY AND QUANTITY OF BOTH SURFACE WATER AND GROUND WATER
 2. WATERPOTENTIAL/IRRAWARRI ECOSYSTEMS.
 - B. CONSIDER THE CUMULATIVE EFFECT OF EACH PARTICULAR DEVELOPMENT PROGRAM TO OTHER DEVELOPMENT WITHIN THE CATCHMENT AREA.
 - C. ENABLE A CHOICE OF SOIL AND WATER MANAGEMENT STRUCTURES AND STRATEGIES THAT SHOULD CONSIDER ASPECT OTHER THAN JUST CAPITAL OUTLAYS, E.G. ENVIRONMENTAL CONSIDERATIONS, COSTS RELATING TO MAINTENANCE AND REPLACEMENT.
 - D. CONSIDER THE NATURE OF ANY SPECIFIC PLAN FOR CONTROL OF SOIL EROSION, SEDIMENTATION AND POLLUTION.
 - E. BE UNDERTAKEN IN CONCEPT BEFORE AND AT THE DEVELOPMENT APPLICATION STAGE, AND
 - F. BE UNDERTAKEN IN DETAIL AT THE FINAL ENGINEERING PLAN STAGE.
- IT IS NOT SUFFICIENT TO RETROFIT EROSION AND POLLUTION MANAGEMENT STRATEGIES TO DEVELOPMENTS THAT HAVE ESSENTIALLY COMPLETED THE ENGINEERING PLAN STAGE.
- ELEMENTS TO BE INCLUDED IN PLANS FOR SOIL AND WATER MANAGEMENT INCLUDE:
 - A. THE PHASING OF WORKS SO THAT LAND DISTURBANCE IS CONFINED TO MINIMUM AREAS OF WORKABLE SIZE, BUT CONSISTENT WITH THE SCALE AND ECONOMICS OF THE DEVELOPMENT.
 - B. ENSURE CORRECT STOCKPILING OF TOPSOIL.
 - C. GIVE PRIORITY TO THOSE BMPs THAT MITIGATE SOIL EROSION IN THE FIRST PLACE, RATHER THAN TO THOSE THAT CAPTURE SEDIMENT DOWNSLOPE OR AT THE CATCHMENT OUTLET, (I.E. CONCENTRATE ON SOURCE CONTROLS), DIVERTING UPSLOPE WORKS AROUND WORKS IS ESPECIALLY IMPORTANT.
 - D. INSTALL EROSION AND SEDIMENT CONTROL MEASURES AS A FIRST STEP IN THE WORKS PROGRAM AND MAINTAIN THESE IN AN EFFECTIVE CONDITION UNTIL EARTHWORKS ARE COMPLETED AND THE SITE REHABILITATED.
 - E. INTEGRATE SOIL EROSION AND SEDIMENT CONTROL, STORMWATER AND POLLUTION CONTROL WORKS.
 - F. WHERE APPROPRIATE, REDUCE THE EFFECTS OF WIND EROSION.
 - G. REHABILITATE THE SITE TO ENSURE THAT DISTURBED LANDS ARE STABILISED AND INTEGRITY IS MAINTAINED.
 - H. REDUCE MAINTENANCE NEEDS AND OTHER ONGOING COSTS BY INTEGRATING ALL SOIL AND WATER MANAGEMENT WORKS IN THE CONSTRUCTION PHASE.
- ENSURE THAT ALL EROSION AND SEDIMENT CONTROL MEASURES ARE KEPT IN A FUNCTIONING CONDITION UNTIL ALL SITE DISTURBANCE WORKS ARE COMPLETED AND THE SITE IS REHABILITATED.

DRAINAGE CONTROL

WHERE PRACTICAL, UP-SLOPE 'CLEAN' WATER MUST BE DIVERTED AROUND THE DISTURBED OR ACTIVE WORK AREAS. 'CLEAN' WATER FLOW CATCH DRAINS AND DIVERSION BANKS (GENERALLY CONSTRUCTED OF TOPSOIL STRIPPED FROM THE WORK AREA, AND WHERE REQUIRED ARE PROVIDED WITH EFFECTIVE EROSION PROTECTION) ARE TO BE CONSTRUCTED ON THE UP-SLOPE SIDE OF THE WORKS AREA AS NOMINATED ON THE ESC DRAWINGS. WHERE SEPARATION OF 'CLEAN' AND 'DIRTY' WATER IS NOT POSSIBLE, BOTH SOURCES MUST BE COMBINED AND TREATED AS 'DIRTY' WATER. 'DIRTY' WATER DRAINAGE, AS NOMINATED ON THE ESC DRAWINGS IS TO BE CONSTRUCTED TO ENSURE THAT SEDIMENT LADEN RUNOFF FROM DISTURBED OR ACTIVE WORK AREAS IS APPROPRIATELY DIRECTED INTO THE NAMED SEDIMENT CONTROL MECHANISM OR SEDIMENT TRAP.

SOIL MANAGEMENT

DURING THE CONSTRUCTION PHASE, EARTHWORKS SHOULD ONLY BE UNDERTAKEN WHEN THE SOIL MOISTURE CONTENT CAN MAINTAIN THE SOIL PROPERTIES. EARTHWORKS ON DRY SOIL CAN CAUSE EXCESSIVE DUST AND SOIL STRUCTURE DECLINE. SATURATED SOILS ARE MORE LIKELY TO SLUMP AND OR DISPERSE POTENTIALLY CAUSING EXCESSIVE SEDIMENT LOADS AND SOIL STRUCTURE DECLINE. WHERE TOPSOIL IS REQUIRED TO BE STRIPPED AND STOCKPILED PRIOR TO CONSTRUCTION, THE TOPSOIL SHOULD BE MANAGED TO MAINTAIN ITS EXISTING PROPERTIES. EROSION CONTROL AROUND TOPSOIL STOCKPILES MUST ALSO BE MAINTAINED THROUGHOUT THE CONSTRUCTION PHASE.

SOIL TESTING

TESTING OF SOILS PROVIDES ADDITIONAL INFORMATION ON THE CHARACTERISTICS WITHIN THE SOILS OF THE WORK AREA. TESTING RELATED TO EROSION CHARACTERISTICS INCLUDE: SOIL TEXTURE, CATION EXCHANGE CAPACITY (CEC), EXCHANGEABLE SODIUM PERCENTAGE (ESP), EXCHANGEABLE CATIONS, PH AND ELECTRICAL CONDUCTIVITY (EC). FIELD EMERSON TESTING, AND EMERSON DISPERSION SOIL TESTING IS RECOMMENDED TO OBTAIN ADDITIONAL INFORMATION ON THE CHARACTERISTICS OF THE SOILS WITHIN THE WORK AREA TO BE USED IN DETERMINING THE EROSION CONTROL STRATEGY. LIMITED SPECIFIC SOIL INFORMATION AND TESTING REQUIRES CONSERVATIVE ESTIMATES FOR SOIL EROSION TO BE USED. USING CONSERVATIVE VALUES TO ESTIMATE SOIL EROSION POTENTIALLY INCREASES THE LEVEL OF EROSION AND SEDIMENT CONTROL REQUIRED. TESTING AND ANALYSIS OF TOPSOIL TO DEFINE AND OPTIMISE THE PARAMETERS FOR REHABILITATION (I.E. NUTRIENT STATUS) SHOULD BE UNDERTAKEN PRIOR TO REHABILITATION.

SITE CONSTRAINTS AND CHARACTERISTICS

CONSTRAINTS/OPPORTUNITY	VALUE
RAINFALL EROSIONIVITY	LOW (R-FACTOR 1600, FROM MAP 6 IN APPENDIX B IN LANDCOME (2004))
SLOPE GRADIENTS	
POTENTIAL EROSION HAZARD	LOW (FROM FIGURE 4.6 IN LANDCOME(2004))
RAINFALL ZONE	ZONE 6 (FROM FIGURE 4.9 IN LANDCOME(2004))
SOIL ERODIBILITY	LOW (HIGHEST K-FACTOR =0.047, FROM GEOTECHNICAL REPORT)
CALCULATED SOIL LOSS	94.73 M3/HAYR
SOIL LOSS CLASS	2
SOIL TEXTURE GROUP	GROUP B/C (TABLE C8 IN LANDCOME (2004))
PERCENT DISPERSIBLE(SUBSOIL)	INSIGNIFICANT (EMERSON CLASS 3.4 AND 5)
RUNOFF COEFFICIENT	0.5 (ADOPTED)
DISTURBED SITE AREA	

CONSTRUCTION ASSUMPTIONS

A SERIES OF ASSUMPTIONS HAVE BEEN MADE REGARDING THE CONSTRUCTION PHASE WITHIN THE PREPARATION OF THESE NOTES. DURING CONSTRUCTION WORKS, IF THE ASSUMPTIONS ARE IDENTIFIED OR ENVIAGED TO BE INCONSISTENT WITH THE ACTUAL CONSTRUCTION PROCESSES OR SITE CONDITIONS, THE ESC CONTROLS MAY REQUIRE UPDATING TO REFLECT THE ADDITIONAL OR ACTUAL CONDITIONS EXPERIENCED ON SITE. FURTHERMORE, THE CORRESPONDING EROSION AND SEDIMENT CONTROL PLAN MAY REQUIRE IMMEDIATE REVISION.

- EARTHWORKS E.G. CUT OR FILL BATTER SLOPES WILL BE CONSTRUCTED TO ALLOW ALL ESC DEVICES TO REMAIN WITHIN THE DEFINED WORK AREA.
- WORKS WILL BE STAGED TO MINIMISE THE TIME OF EXPOSURE OF SOILS, PARTICULARLY WORKS ASSOCIATED WITH DRAINAGE PATHS AND OR WATERWAYS
- WORKS WILL NOT COMMENCE IN HIGH RISK AREAS IF A FORECAST RAINFALL EVENT THAT IS LIKELY TO PRODUCE MORE THAN APPROXIMATELY 25MM IS FORECAST. UNLESS EROSION AND SEDIMENT CONTROLS CAN BE EFFECTIVELY ESTABLISHED PRIOR TO THE EVENT, AND
- SOIL WITHIN THE WORK AREA WILL BE ASSESSED FOR DISPERSION POTENTIAL, AND TREATED WITH GYPSUM IF REQUIRED.

METHODOLOGY AND INSTALLATION SEQUENCE FOR CONSTRUCTION WORKS

KEY EROSION AND SEDIMENT CONTROL ITEMS TO BE COMPLETED PRIOR TO COMMENCING BROAD SCALE LAND DISTURBANCE. REFER TO THE APPROVED ESC DRAWING FOR THE INDICATIVE LOCATION OF DRAINAGE, EROSION AND SEDIMENT CONTROLS. REFER TO TYPICAL DETAILS AND TECHNICAL NOTES FOR NAMED DRAINAGE, EROSION AND SEDIMENT CONTROLS

KEY CONTROL ITEMS ARE AS FOLLOWS:

1. ESTABLISH STABILISED SITE ACCESS
2. INSTALL PERIMETER SEDIMENT FILTERS AND SEDIMENT FENCES.
3. INSTALL CLEAN WATER DIVERSIONS
 - STRIP AND RELOCATE THE TOPSOIL TO CONSTRUCT A CLEAN WATER FLOW DIVERSION BANK ON THE UP-SLOPE WHERE POSSIBLE AS DETAILED ON THE APPROVED ESC DRAWINGS OR STOCKPILE AND PROVIDE ADEQUATE CONTROLS SUCH AS MULCH BUNDLS OR SEDIMENT FENCE.
 - EXPOSED SECTIONS OF THE 'CLEAN' WATER FLOW DIVERSION BANK THAT WILL EXPERIENCE MEDIUM TO HIGH CONCENTRATIONS AND VELOCITIES OR CLEAN WATER MAY REQUIRE SCOUR PROTECTION. SCOUR PROTECTION MAY INCLUDE:
 - MEDIUM PROTECTION: PLACE A LAYER OF LIQUID POLYMER AT A RATE OF 300ml/m² ON THE UPSLOPE SIDE OF THE 'CLEAN' WATER FLOW DIVERSION BANK. THE LIQUID POLYMER IS TO EXTEND APPROXIMATELY 300mm ON THE UPSLOPE EXISTING GROUND SURFACE.
 - MEDIUM TO HIGH PROTECTION: INSTALL EROSION CONTROL BLANKET (ECB) OR GEOTEXTILE FABRIC (APPROXIMATE ROLL WIDTH 1.2M) TO THE UPSLOPE SURFACE OF THE 'CLEAN' WATER FLOW DIVERSION BANK. THE LINING IS TO EXTEND APPROXIMATELY 300MM UP THE NEWLY CONSTRUCTED FACE OF THE BANK AND REMAINDER OF ROLL TO COVER THE UPSLOPE EXISTING GROUND SURFACE. THE LINING IS TO BE PINNED AS PER THE MANUFACTURERS RECOMMENDATIONS TO MAINTAIN CONTACT WITH THE SOIL.
 - WHERE 'CLEAN' WATER DIVERSION BANKS ARE NOT SUITABLE, CUT OFF DRAINS ARE TO BE CONSTRUCTED AND LINED WITH NON-DISPERSIVE SOIL OR BE TREATED WITH A LAYER OF LIQUID POLYMER AT A RATE OF 600ml/m² TO THE FULL WIDTH OF DISTURBED AREA.
4. CONSTRUCT SEDIMENT BASIN
5. INSTALL DIRTY WATER DIVERSIONS TO BASINS
 - CONSTRUCT CATCH DRAINS OR TOPSOIL DIVERSION BANKS ON THE DOWN-GRADIENT SIDE OF THE WORKS TO RETAIN WATER WITHIN THE DISTURBED LIMITED. MUST USE NON-DISPERSIVE SOIL.
6. COMPLETE ALL OTHER INITIAL ESC WORKS

CLEARING, GRUBBING AND EARTHWORKS ASSOCIATED WITH DRAINAGE PATHS E.G. GULLY CROSSINGS AREA ARE TO BE DELAYED AS LONG AS IS PRACTICABLE AND BE MINIMISED WHERE POSSIBLE.

VEGETATION WHICH HAS BEEN CLEARED IS TO BE MULCHED AND USED AS PART THE EROSION AND SEDIMENT CONTROL PLANS WHERE POSSIBLE.

INSTALL CROSS BANKS AND SEDIMENT TRAPS AS SOON AS PRACTICABLE OR IF RAIN IS FORECAST WITHIN 24 HOURS DURING GROUND SURFACE TREATMENT OPERATIONS.

WHERE SIGNIFICANT QUANTITIES OF SUBSOIL AND CUT FROM THE WORK AREA, THE MATERIAL IS TO BE STOCKPILED IN A DEDICATED AREA WITH APPROPRIATE EROSION AND SEDIMENT CONTROLS.

INSTALL ALL EROSION CONTROL MEASURES (E.G. SOIL BINDER, MULCH, GRAVEL, OR ROCK MULCH) WITHIN THE DISTURBED AREAS AS SOON AS PRACTICABLE, OR IF RAIN IS FORECAST WITHIN 24 HOURS.

CONTROL TRAFFIC ON ALL AREAS WHERE SOIL BINDER HAS BEEN USED FOR EROSION CONTROL TO PREVENT DAMAGE TO THE SURFACE.

WATERWAY CROSSINGS (BED LEVEL CROSSINGS AND OR PIPE CULVERTS) IF ANY ARE TO BE INSTALLED AS REQUIRED FOR ACCESS.

REHABILITATION IS RECOMMENDED TO COMMENCE AS SOON AS PRACTICAL WITH DRAINAGE PATHS E.G. GULLY CROSSING AREAS REHABILITATED AS A PRIORITY.

ONGOING OPERATION, MONITORING AND MAINTENANCE

1. MONITORING OF EROSION AND SEDIMENT CONTROLS SHOULD BE CONDUCTED AT INTERVALS NO GREATER THAN SEVEN (7) DAYS APART.
2. ADDITIONAL MONITORING AND MAINTENANCE SHOULD BE CONDUCTED WITHIN 12 HOURS OF A FORECAST RAINFALL EVENT THAT WOULD PRODUCE RUNOFF AND BEFORE SITE CLOSURE.
3. ONGOING MONITORING AND MAINTENANCE SHOULD BE CONDUCTED DAILY DURING PROLONGED RAINFALL EVENTS.
4. INSPECTIONS WITHIN 18 HOURS AFTER RAINFALL EVENTS PRODUCING RUNOFF ARE REQUIRED TO ASSESS THE ONGOING INTEGRITY AND FUNCTIONALITY OF EROSION AND SEDIMENT CONTROLS AND ADJOINING DRAINAGE. GENERAL INSPECTION CONSIDERATIONS INCLUDE:
 - INLET AND DISCHARGE AREAS FOR DAMAGE OR EXCESSIVE SCOUR
 - CHANNEL BANKS DIRECTING RUNOFF TO THE SEDIMENT TRAP FOR DAMAGE FROM OVERTOPPING FLOWS
 - EXCESSIVE SEDIMENTATION (E.G. MORE THAN 25% OF ORIGINAL SEDIMENT TRAP VOLUME) AND
 - INTEGRITY OF TEMPORARY GROUND COVER
 - DESLTING OF SEDIMENTATION BASINS AND OTHER SEDIMENT CONTROL DEVICES.
 - CORRECTIVE OR RESTORATIVE MAINTENANCE IS TO BE SCHEDULED AND COMPLETED AS NECESSARY (I.E. PRIOR TO RAINFALL EVENTS).
 - REMOVAL AND DISPOSAL OF WATER, SEDIMENT AND OR CORRECTIVE WORK IS TO BE UNDERTAKEN IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

INSPECTIONS AFTER RAINFALL EVENTS PRODUCING RUNOFF ARE REQUIRED TO ASSESS THE ONGOING INTEGRITY AND FUNCTIONALITY OF THE SEDIMENT TRAP AND ADJOINING DRAINAGE. CORRECTIVE OR RESTORATIVE MAINTENANCE IS TO BE SCHEDULED AND COMPLETED AS NECESSARY (I.E. PRIOR TO RAINFALL EVENTS). THE SEDIMENT BASIN MUST BE DETERMINED WHERE POSSIBLE PRIOR TO RAINFALL EVENTS PREVIOUS TO MORE THAN 25MM OF RAINFALL.

SEDIMENT BASIN - GENERAL NOTES

KEY PRINCIPLES

SEDIMENT BASINS ARE GENERALLY USED AS AN END OF LINE SEDIMENT CONTROL MEASURE AT THE END OF TEMPORARY DRAINAGE CHANNELS WITHIN CATCHMENTS GREATER THAN 0.25HA. APPROPRIATELY DESIGNED, CONSTRUCTED AND OPERATED SEDIMENT BASINS ARE CLASSED AS A TYPE 1 SEDIMENT TRAP. SEDIMENT BASINS MAY BE DOWNGRADED TO A TYPE 2 SEDIMENT TRAP IF INAPPROPRIATELY DESIGNED, OPERATED OR MAINTAINED, AND THEREFOR BECOME NON-COMPLIANT.

SEDIMENT COLLECTION IS ACHIEVED THROUGH GRAVITY INDUCED SEDIMENTATION, AUTOMATIC FLOCCULATION IS CONSIDERED TO BE AN ESSENTIAL PART OF THE TYPE 1 HES BASIN. THE HES BASINS CONSIST OF AN INLET CHAMBER, WHERE THE FLOCCULANT/COAGULANT IS APPLIED AND MIXED, FOLLOWED BY A SETTLING ZONE. THE OUTFLOW MECHANISMS OF A HES BASIN CONSIST OF A HIGH FLOW EMERGENCY SPILLWAY AND AN AUTOMATIC DECANTER. A LEVEL SPREADER SEPARATES THE INLET CHAMBER FROM THE SETTLING ZONE. THE LEVEL SPREADER IS TO BE KEPT INTO THE EMBANKMENT AS PER THE DETAIL WITHIN THIS DRAWING SET.

'FIELD' EMERSON TESTING MUST BE UNDERTAKEN TO DETERMINE THE OPTIMUM FLOCCULENT PRODUCT AND DOSAGE, INCLUDING COMPLETION OF FLOC REPORT. THIS PROCESS IS TO BE CONTINUALLY MONITORED THROUGHOUT THE LIFESPAN OF THE BASIN. APPENDIX E OF MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION SPECIFIES THE METHOD FOR TESTING.

SEDIMENT RETENTION BASINS SHOULD BE BUILT TO INCORPORATE:

- A. A PRIMARY OUTLET DESIGNED:
 - TO HAVE A CAPACITY TO PASS THE PEAK FLOW FROM THE DESIGN STORM EVENT
 - WITH AN INVERT LEVEL AT LEAST 300mm BELOW ANY EMERGENCY OUTLET (WHERE IT IS A SEPARATE STRUCTURE);
- B. AN EMERGENCY 'SPILLWAY' DESIGNED TO HAVE A CAPACITY TO PASS THE PEAK FLOW FROM THE APPLICABLE STORM EVENT.
- C. INTERNAL BATTER GRADIENTS FOLLOW UPPER LIMITS.
- WHERE WATER DEPTH IS LESS THAN 150mm WHEN SURCHARGING, 2.5(hv) (1v) TO 4(hv) (1v) ON EARTH STRUCTURES AND VERTICAL ON ROCK OR GABION STRUCTURE
- WHERE WATER DEPTH IS BETWEEN 150mm AND 1,500mm WHEN PROTECTED AND SURCHARGING OR GREATER THAN 1,500mm:
 - 2.5(hv) (1v) to 4(hv) (1v) ON EARTH STRUCTURE
 - 0.5(hv) (1v) ON ROCK GIBION STRUCTURES
 - 1(hv) (4v) ON GABION BASKET STRUCTURES
 - 1(hv) (4v) ON STACKED (ROUGH SQUARED) ROCK STRUCTURES;
 - APPROPRIATE OUTLET PROTECTION TO ENSURE MINIMISATION OF SCOUR

CONSTRUCTION

CONSTRUCT THE SEDIMENT BASIN IN ACCORDANCE WITH THE APPROVED PLANS (I.E. LOCATION, DIMENSIONS AND CONSTRUCTION DETAILS AND SPECIFICATIONS). AN ASSESSMENT OF THE 'AS CONSTRUCTED' SEDIMENT BASIN IS TO BE CONDUCTED BY SUITABLY QUALIFIED PERSONS. CERTIFICATION OF THE CONSTRUCTED SEDIMENT BASIN IS TO BE UNDERTAKEN BY AN APPROPRIATELY QUALIFIED PERSON IN ACCORDANCE WITH THE CERTIFICATE OF SEDIMENT BASIN CONSTRUCTION WITHIN APPENDIX D OF THE IECA GUIDELINES.

MATERIALS

SEDIMENT BASINS ARE TO BE CONSTRUCTED USING SUITABLE MATERIAL, I.E. 'CLEAN' (NON-DISPERSIVE) SOIL. SOIL IS TO BE FREE OF WOODY VEGETATION AND ROOTS, ROCKS OR OTHER UNSUITABLE MATERIAL. SOIL WITH EMERSON CLASS 4 AND 5 MAY NOT BE SUITABLE DEPENDING ON PARTICLE SIZE DISTRIBUTION AND DEGREE OF DISPERSION. SOIL WITH AN EMERSON CLASS 3 SHOULD ONLY BE USED UPON RECOMMENDATION FROM GEOTECHNICAL SPECIALIST WITH THE BASIN TO BE LINED WITH GEOFABRIC AS APPLICABLE. SEEK ADDITIONAL ADVICE REGARDING MATERIALS, SUITABLE IF REQUIRED.

INSTALLATION

1. DELAY CLEARING THE UP-SLOPE POND AREA UNTIL THE SEDIMENT BASIN HAS BEEN CONSTRUCTED AND IS ABLE TO ACT AS A SUITABLE SEDIMENT TRAP.
2. INSTALL EROSION CONTROL IN THE FIRST INSTANCE IN THE UPSTREAM CATCHMENT.
3. INSTALL REQUIRED TEMPORARY SEDIMENT CONTROL MEASURES DOWNSTREAM OF THE PROPOSED EARTHWORKS TO CONTROL SEDIMENT RUNOFF DURING CONSTRUCTION OF THE BASIN.
4. THE 'FOOTPRINT' OF THE EMBANKMENT MUST BE CLEARED OF UNSUITABLE MATERIAL, I.E. TOPSOIL, UNSUITABLE SOIL, VEGETATION MATERIAL, TREES, STUMPS, ROOTS, DEAD TIMBER, WITH LARGE VOIDS TO BE FILLED AND COMPACTED.
5. CLEARING THE MAIN POND AREA IS TO BE DELAYED UNTIL THE EMBANKMENT IS COMPLETED.
6. TOPSOIL IS TO BE APPROPRIATELY STOCKPILED FOR REHABILITATION AS NECESSARY WITH EFFECTIVE EROSION CONTROL AND SEDIMENT CONTROL DOWNSLOPE.
7. EXCAVATE A CUT-OFF TRENCH ALONG THE CENTRE LINE OF THE EARTH EMBANKMENT 600MM DEEP WITH SIDE SLOPES NO STEEPER THAN 1:1(H:V).
8. THE BASE OF CUT-OFF TRENCH IS TO BE SUFFICIENTLY WIDE TO ALLOW ADEQUATE COMPACTION AND BE FREE FROM LOOSE OR UNSUITABLE MATERIAL.
9. BACKFILL AND COMPACT WITH SELECT EARTH/SOIL FILL TO THE REQUIRED COMPACTION AND MOISTURE SPECIFICATION.
10. KEY IN MAIN EMBANKMENT TO PREPARED FOOTPRINT SURFACE USING SCARIFICATION.
11. CONSTRUCT THE MAIN EMBANKMENT WITH SELECT EARTH/SOIL FILL IN CONTINUOUS 150 TO 250MM LAYERS AND COMPACT TO THE REQUIRED COMPACTION AND MOISTURE SPECIFICATION.
12. UNLESS OTHERWISE SPECIFIED ON THE APPROVED PLANS, COMPACT THE SOIL AT APPROXIMATELY 1% TO 2% OF OPTIMUM AND TO 10% STANDARD COMPACTION RECOMMENDING THE OPTIMUM MOISTURE CONTENT.
13. ALL LOOSE UNCOMPACTED EARTH-FILL MATERIAL ON THE UPSTREAM AND DOWNSTREAM BATTER MUST BE REMOVED PRIOR TO SPREADING OF TOPSOIL.
14. STABILISE ASSOCIATED EXPOSED EARTH EMBANKMENTS IMMEDIATELY AFTER CONSTRUCTION THROUGH APPROPRIATE COMPACTION, TOPSOIL VEGETATION AND/OR EROSION CONTROL MATTING.
15. CONSTRUCT THE SPILLWAY SECTION TO THE SPECIFIED FLOW RATES OR DIMENSIONS.
16. WHERE SPECIFIED THE SPILLWAY MUST BE LINED WITH GEOTEXTILE FABRIC (HEAVY-DUTY, NEEDLE-PUNCHED, NON-WOVEN FILTER CLOTH, MINIMUM 900M²/A28 OR EQUIVALENT)
- EXTEND INTO THE UPSTREAM BASE ON POND AND ADEQUATELY SECURE
- OVERLAP SIDE LAPS EDGES A MINIMUM OF 300MM
- FLOW DIRECTION OVERLAPS (IF REQUIRED) TO BE KEPT IN BY BURYING 300MM THE UPSLOPE EDGE AND RECOMPACTING
- PINNED OVERLAPS AT MINIMUM 1M SPACING AND GENERALLY FIVE PINS PER M2
- ENSURE FABRIC IS NOT DAMAGED DURING PLACEMENT OF ROCK. IF REQUIRED REPAIR AS NECESSARY OVERLAPPING 300MM AND SECURELY PINNING.
17. WHERE ROCK IS SPECIFIED:
 - INSTALL WITHOUT DAMAGING GEOTEXTILE LINING. INSTALL PROTECTIVE LAYER OF GRAVEL/AGGREGATE OR SAND (IF REQUIRED).
18. SPECIFIC GRAVITY OF 2.5 (DESIRE).
19. TO BE HARD, ANGULAR, DURABLE, WEATHER RESISTANT AND EVENLY GRADED ROCK WITH 50% BY WEIGHT LARGER THAN THE SPECIFIED NOMINAL (D50) ROCK SIZE.
20. THE LARGEST ROCK SIZE SHOULD BE NO LARGER THAN 1.5 TIMES THE NOMINAL ROCK SIZE.
21. INSTALLED TO ACHIEVE A RELATIVELY CONSISTENT GRADED AND STABILISED SURFACE.
22. SMALL ROCK MUST FILL THE VOIDS BETWEEN THE LARGER ROCK.
23. THE FINAL DISCHARGE AREA MUST BE STABILISED TO ENSURE CONTROLLED DISCHARGE FLOWS AND PREVENT SCOURING.
24. NECESSARY UP-SLOPE DRAINAGE CONTROL MEASURES MUST BE ESTABLISHED TO ENSURE THAT SEDIMENT-LADEN RUNOFF IS APPROPRIATELY DIRECTED INTO THE SEDIMENT TRAP.
25. INSTALL A SEDIMENT STORAGE LEVEL MARKER POST WITHIN SEDIMENT STORAGE ZONE WHICH IS AT MINIMUM THE SAME HEIGHT AS THE TOP OF BUND. ENSURE THE TOP OF SEDIMENT STORAGE ZONE IS CLEARLY MARKED.
26. NOTIFY CONSTRUCTION STAFF OF THE DESIGN PUMP OUT WATER HEIGHT.
27. INSTALL (IF SPECIFIED), INTERNAL SETTLING POND BAPFLES BELOW, THE ELEVATION OF THE EMERGENCY SPILLWAY CREST.
28. INSTALL (AS REQUIRED) ACCESS POINTS FOR OPERATION AND MAINTENANCE EG. DESLTING ACCESS AND STABILISED DOWATERING POINTS.
29. POTENTIAL SAFETY AND OR ENVIRONMENTAL RISKS SHOULD BE ASSESSED FOR THE CONSTRUCTION AND OPERATIONAL STAGES AND MANAGED APPROPRIATELY EG. BARRIER FENCING OR INTERNAL SIDE SLOPE TO ALLOW EGRESS OF WILDLIFE OR FAUNA AS NECESSARY.
30. SEEK CLARIFICATION IF ANY ASPECT OF THE CONSTRUCTION OF THE SEDIMENT TRAP IS IN QUESTION.

OPERATION, MAINTENANCE AND MONITORING

INSPECTIONS AFTER RAINFALL EVENTS PRODUCING RUNOFF ARE REQUIRED TO ASSESS THE ONGOING INTEGRITY AND FUNCTIONALITY OF THE SEDIMENT TRAP AND ADJOINING DRAINAGE. CORRECTIVE OR RESTORATIVE MAINTENANCE IS TO BE SCHEDULED AND COMPLETED AS NECESSARY (I.E. PRIOR TO RAINFALL EVENTS). THE SEDIMENT BASIN MUST BE DETERMINED WHERE POSSIBLE PRIOR TO RAINFALL EVENTS PREVIOUS TO MORE THAN 25MM OF RAINFALL.

WHERE SIGNIFICANT QUANTITIES OF SUBSOIL AND CUT FROM THE WORK AREA, THE MATERIAL IS TO BE STOCKPILED IN A DEDICATED AREA WITH APPROPRIATE EROSION AND SEDIMENT CONTROLS.

INSTALL ALL EROSION CONTROL MEASURES (E.G. SOIL BINDER, MULCH, GRAVEL, OR ROCK MULCH) WITHIN THE DISTURBED AREAS AS SOON AS PRACTICABLE, OR IF RAIN IS FORECAST WITHIN 24 HOURS.

CONTROL TRAFFIC ON ALL AREAS WHERE SOIL BINDER HAS BEEN USED FOR EROSION CONTROL TO PREVENT DAMAGE TO THE SURFACE.

WATERWAY CROSSINGS (BED LEVEL CROSSINGS AND OR PIPE CULVERTS) IF ANY ARE TO BE INSTALLED AS REQUIRED FOR ACCESS.

REHABILITATION IS RECOMMENDED TO COMMENCE AS SOON AS PRACTICAL WITH DRAINAGE PATHS E.G. GULLY CROSSING AREAS REHABILITATED AS A PRIORITY.

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- INLET AND DISCHARGE AREAS FOR DAMAGE OR EXCESSIVE SCOUR
- CHANNEL BANKS DIRECTING RUNOFF TO THE SEDIMENT TRAP FOR DAMAGE FROM OVERTOPPING FLOWS
- EXCESSIVE SEDIMENTATION (E.G. MORE THAN 25% OF ORIGINAL SEDIMENT TRAP VOLUME) AND
- INTEGRITY OF TEMPORARY GROUND COVER
- DESLTING OF SEDIMENTATION BASINS AND OTHER SEDIMENT CONTROL DEVICES.
- CORRECTIVE OR RESTORATIVE MAINTENANCE IS TO BE SCHEDULED AND COMPLETED AS NECESSARY (I.E. PRIOR TO RAINFALL EVENTS).
- REMOVAL AND DISPOSAL OF WATER, SEDIMENT AND OR CORRECTIVE WORK IS TO BE UNDERTAKEN IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

INSPECTIONS AFTER RAINFALL EVENTS PRODUCING RUNOFF ARE REQUIRED TO ASSESS THE ONGOING INTEGRITY AND FUNCTIONALITY OF THE SEDIMENT TRAP AND ADJOINING DRAINAGE. CORRECTIVE OR RESTORATIVE MAINTENANCE IS TO BE SCHEDULED AND COMPLETED AS NECESSARY (I.E. PRIOR TO RAINFALL EVENTS). THE SEDIMENT BASIN MUST BE DETERMINED WHERE POSSIBLE PRIOR TO RAINFALL EVENTS PREVIOUS TO MORE THAN 25MM OF RAINFALL.

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1. ADDITIONAL MONITORING AND MAINTENANCE SHOULD BE CONDUCTED WITHIN 12 HOURS OF A FORECAST RAINFALL EVENT THAT WOULD PRODUCE RUNOFF. REFER IECA GUIDELINES FOR DETAILED INSPECTION REQUIREMENTS.
2. GENERAL INSPECTION CONSIDERATIONS INCLUDE:
 - OUTFLOW OR DOWNSTREAM WATER QUALITY, 'CLARITY'
 - CHECK EMBANKMENTS FOR EXCESSIVE SETTLEMENT, SLUMPING OR PIPING
 - INLET AND DISCHARGE AREAS FOR DAMAGE OR EXCESSIVE SCOUR
- DIVERSION BANKS AND DRAINAGE DIRECTING RUNOFF TO THE SEDIMENT TRAP FOR DAMAGE FROM OVERTOPPING FLOWS
- EXCESSIVE SEDIMENTATION SHALL BE REMOVED APPROPRIATELY (I.E. GREATER THAN THE ORIGINAL SEDIMENT VOLUME
- REMOVAL AND DISPOSAL OF WATER, SEDIMENT AND OR CORRECTIVE WORK IS TO BE UNDERTAKEN IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD

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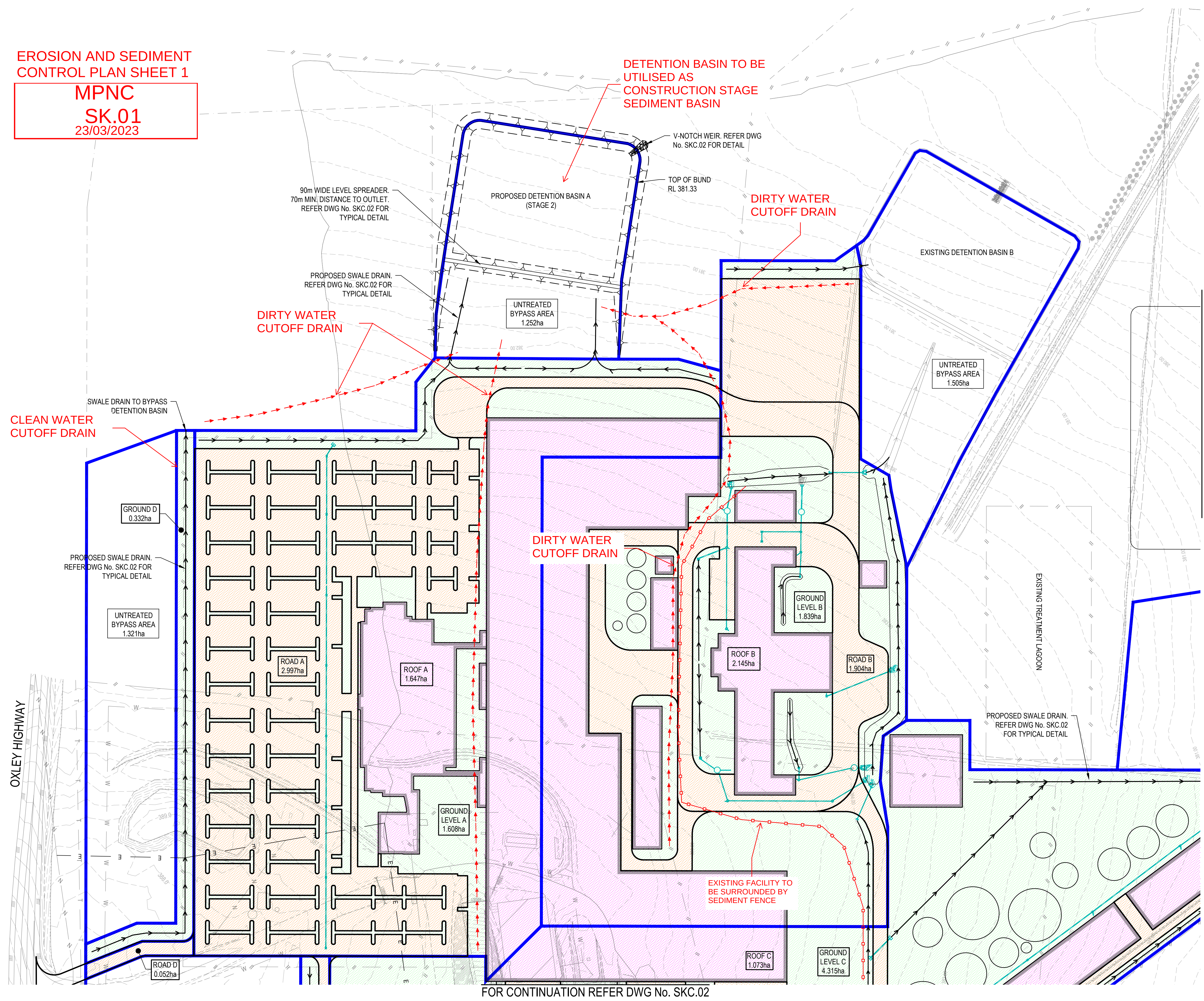
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EROSION AND SEDIMENT
CONTROL PLAN SHEET 1

MPNC
SK.01
23/03/2023



LEGEND

PROPOSED BUILDING

PROPOSED CONCRETE

PROPOSED BARRIER KERB

PROPOSED KERB AND CHANNEL

PROPOSED STORM WATER MAIN

PROPOSED TOP OF BATTER

PROPOSED TOE OF BATTER

PROPOSED CATCHMENT BOUNDARY

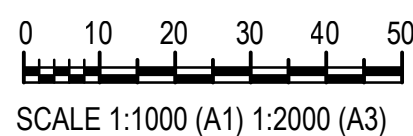
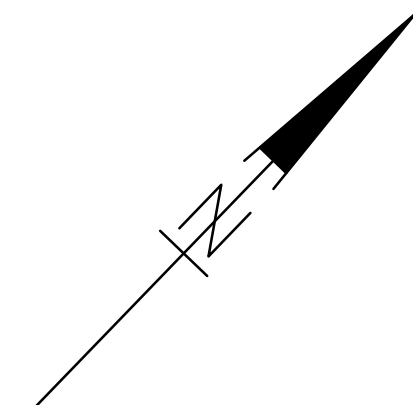
PROPOSED SWALE DRAIN

PROPOSED ROOF AREA

PROPOSED HARDSTAND AREA

PROPOSED GROUND LEVEL AREA

NOTE:
LITTER BASKETS TO BE FITTED
TO FIELD INLETS LOCATED IN
THE CAR PARK AREAS.



D	15.06.20	ISSUE FOR APPROVAL	KC	MH
C	29.04.19	ISSUE FOR APPROVAL	KC	MH
B	22.01.19	ISSUE FOR APPROVAL	KC	MH
A	31.07.18	ISSUE FOR APPROVAL	ND	MH
ISSUE	DATE	AMENDMENT	BY	APP

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E: solutions@mpnc.net.au

CLIENT: PSA CONSULTING AUSTRALIA

OAKBURN PROTEIN RECOVERY PLANT

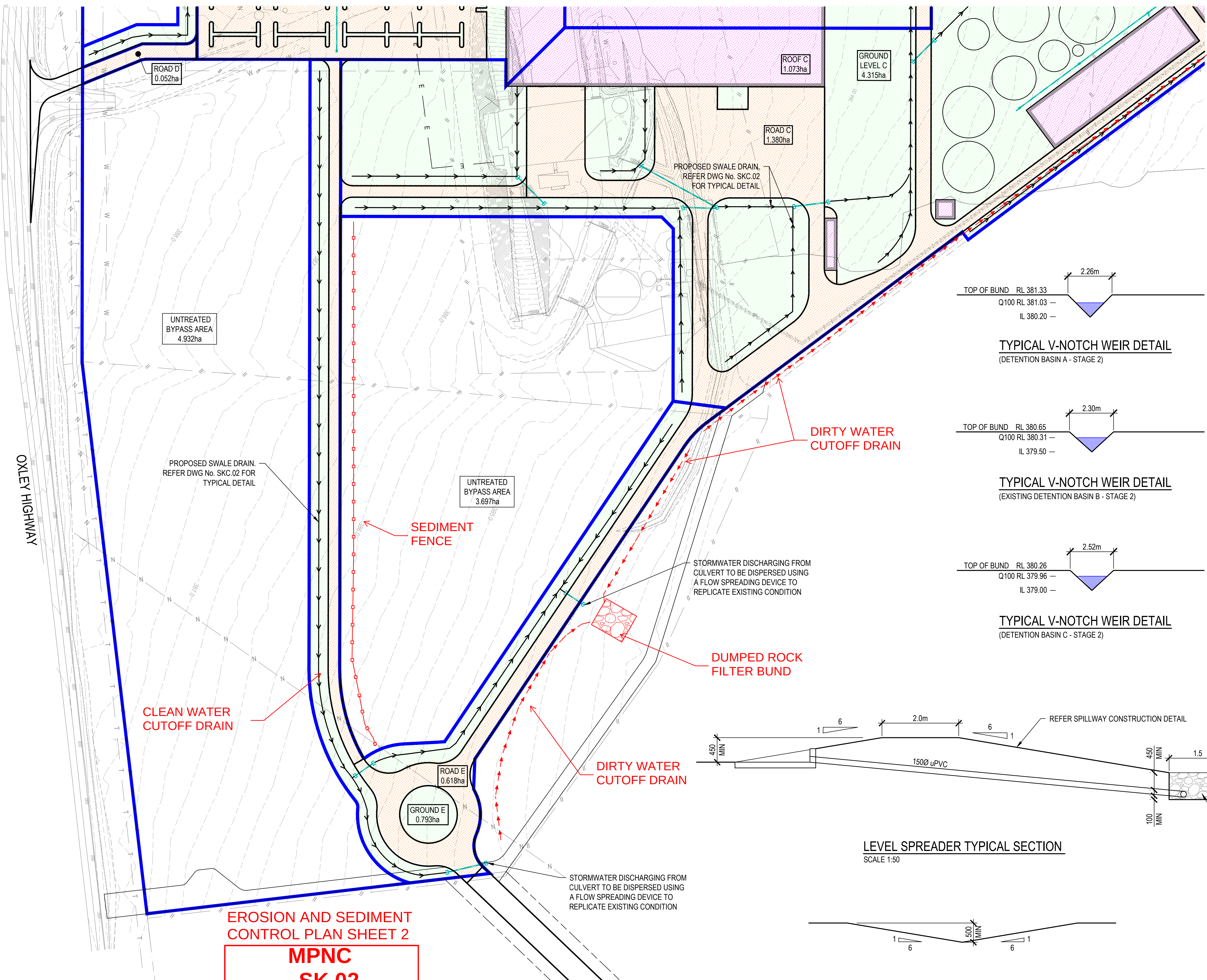
OXLEY HIGHWAY
TAMWORTH, NSW, 2340

STORMWATER CATCHMENT PLAN
STAGE 2 - SHEET 1

DESIGN: ND	DRAWN: ND	SCALES: AS SHOWN
CHKD:	APPRD:	DATE:
mpn JOB	DRAWING No.	REV
7679	SKC.01	D
FOR APPROVAL		

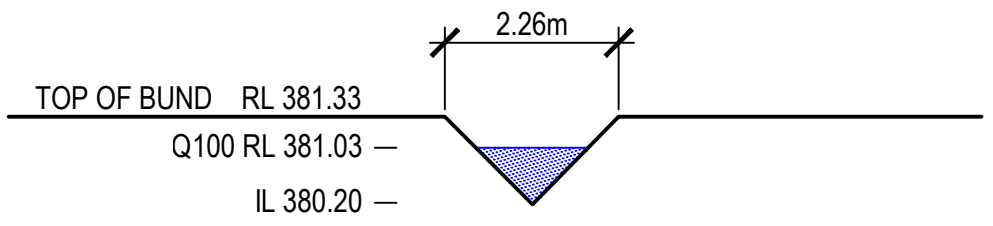
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FOR CONTINUATION REFER DWG No. SKC.01

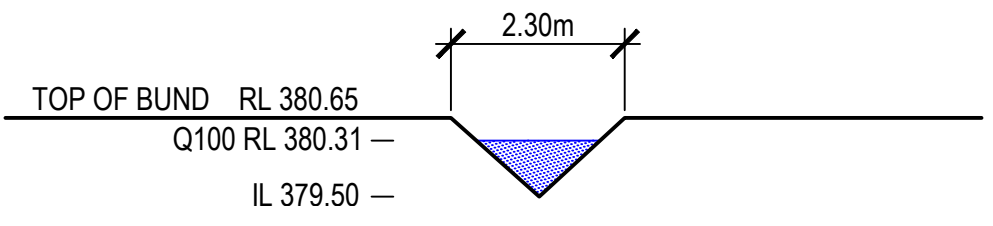


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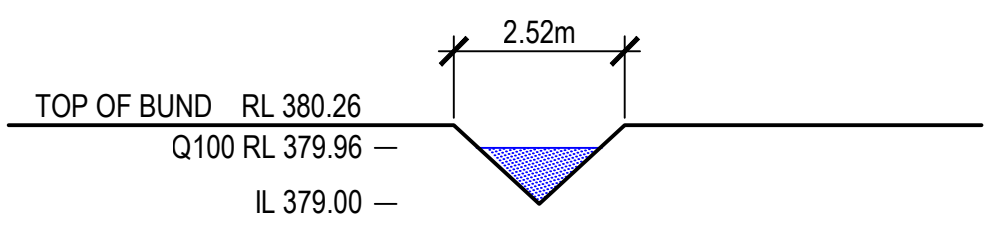
- PROPOSED BUILDING
- PROPOSED CONCRETE
- PROPOSED BARRIER KERB
- PROPOSED KERB AND CHANNEL
- PROPOSED STORM WATER MAIN
- PROPOSED TOP OF BATTER
- PROPOSED TOE OF BATTER
- PROPOSED CATCHMENT BOUNDARY
- PROPOSED SWALE DRAIN
- PROPOSED ROOF AREA
- PROPOSED HARDSTAND AREA
- PROPOSED GROUND LEVEL AREA



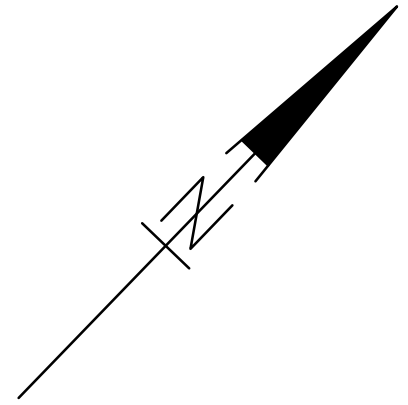
TYPICAL V-NOTCH WEIR DETAIL
(DETENTION BASIN A - STAGE 2)



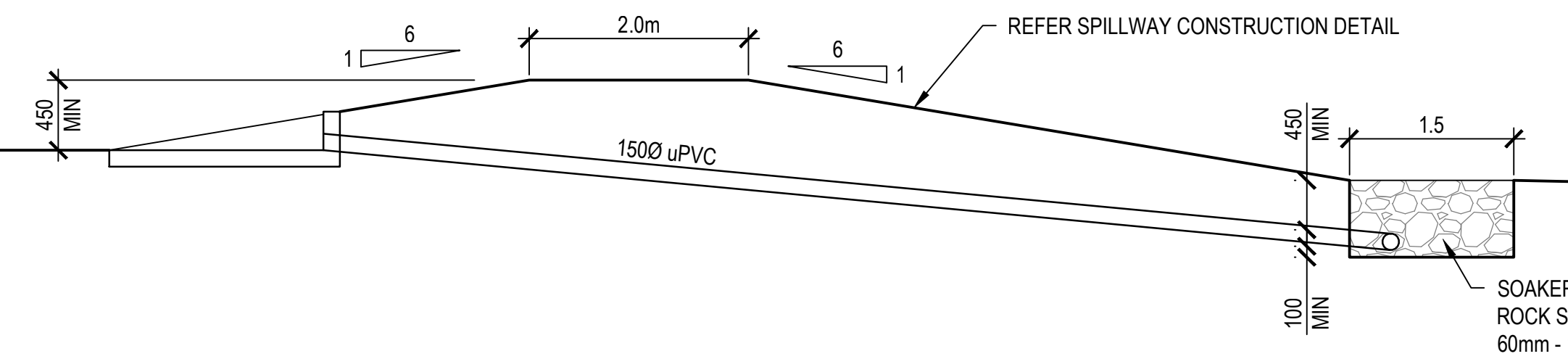
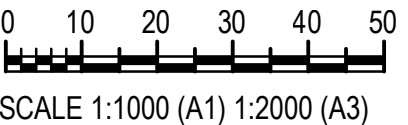
TYPICAL V-NOTCH WEIR DETAIL
(EXISTING DETENTION BASIN B - STAGE 2)



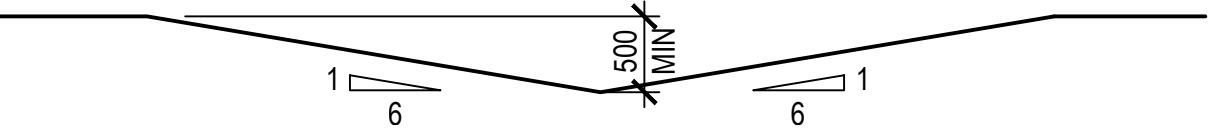
TYPICAL V-NOTCH WEIR DETAIL
(DETENTION BASIN C - STAGE 2)



NOTE:
LITTER BASKETS TO BE FITTED
TO FIELD INLETS LOCATED IN
THE CAR PARK AREAS.



LEVEL SPREADER TYPICAL SECTION
SCALE 1:50



SWALE DRAIN TYPICAL SECTION
SCALE 1:50

ISSUE	DATE	AMENDMENT	BY	APP
D	15.06.20	ISSUE FOR APPROVAL	KC	MH
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E: solutions@mpnc.net.au

CLIENT: **PSA**
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OAKBURN PROTEIN RECOVERY PLANT

OXLEY HIGHWAY
TAMWORTH, NSW, 2340

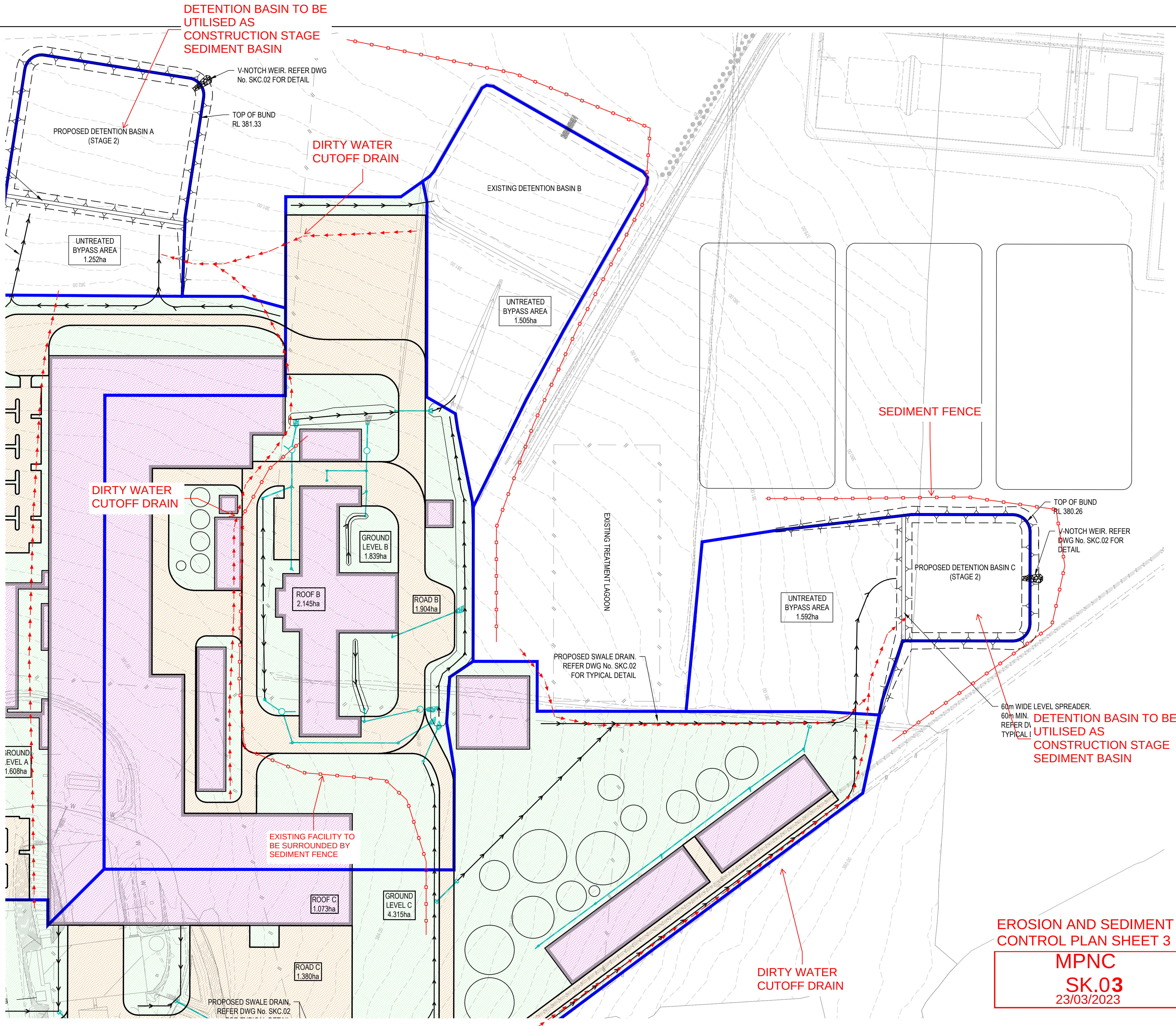
STORMWATER CATCHMENT PLAN
STAGE 2 - SHEET 2

DESIGN: ND	DRAWN: ND	SCALES: AS SHOWN
CHKD:	APPRD:	DATE:
mpn JOB	DRAWING No.	REV
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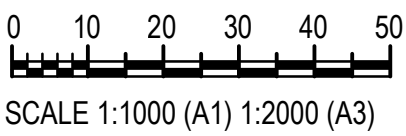
FOR CONTINUATION REFER DWG No. SKC.01



LEGEND

PROPOSED BUILDING	
PROPOSED CONCRETE	
PROPOSED BARRIER KERB	
PROPOSED KERB AND CHANNEL	
PROPOSED STORM WATER MAIN	
PROPOSED TOP OF BATTER	
PROPOSED TOE OF BATTER	
PROPOSED CATCHMENT BOUNDARY	
PROPOSED SWALE DRAIN	
PROPOSED ROOF AREA	
PROPOSED HARDSTAND AREA	
PROPOSED GROUND LEVEL AREA	

NOTE:
LITTER BASKETS TO BE FITTED
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OAKBURN PROTEIN RECOVERY PLANT

OXLEY HIGHWAY
TAMWORTH, NSW, 2340

STORMWATER CATCHMENT PLAN
STAGE 2 - SHEET 3

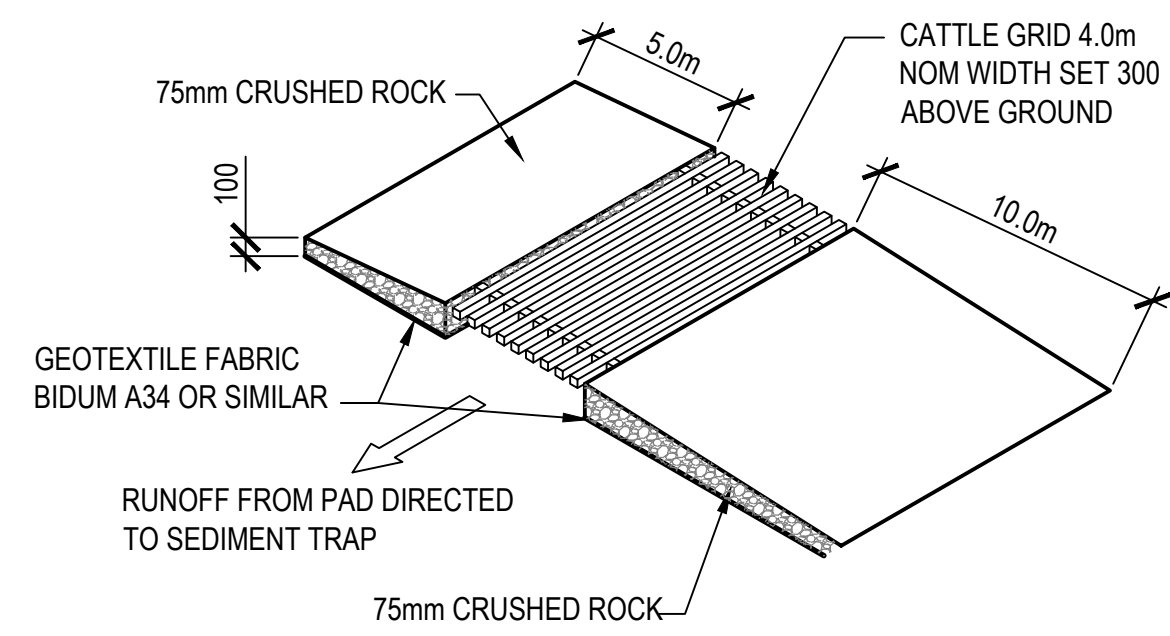
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CHKD:	APPRD:	DATE:
mpn JOB	DRAWING No.	REV
7679	SKC.03	D

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EROSION AND SEDIMENT
CONTROL PLAN SHEET 3

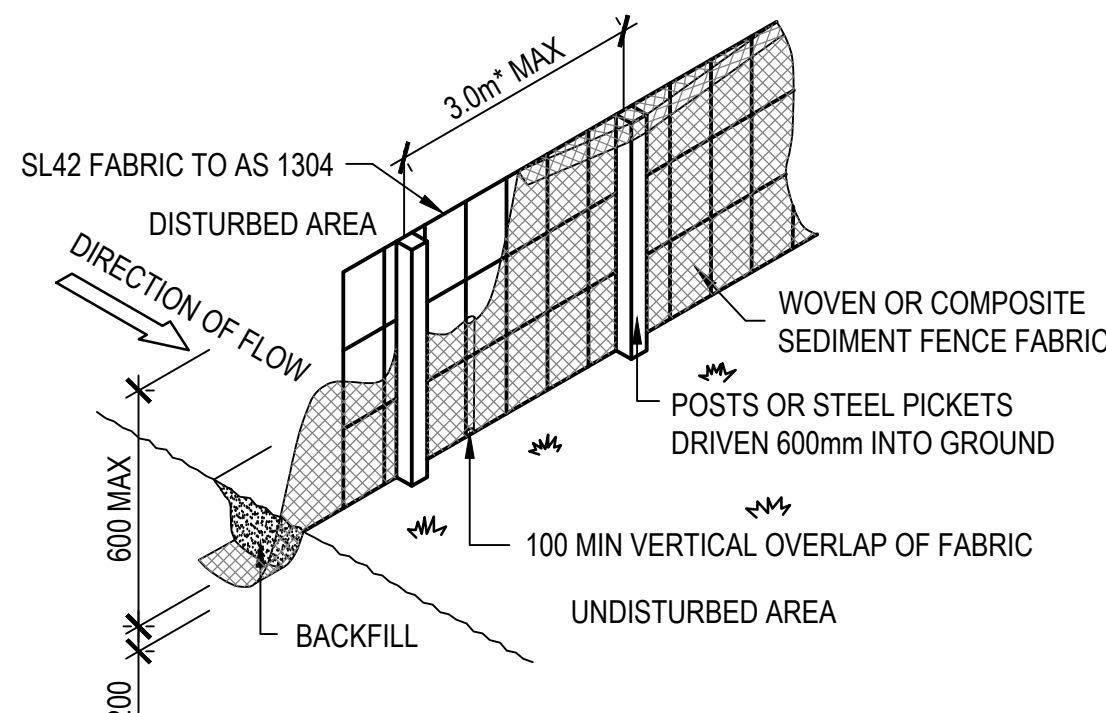
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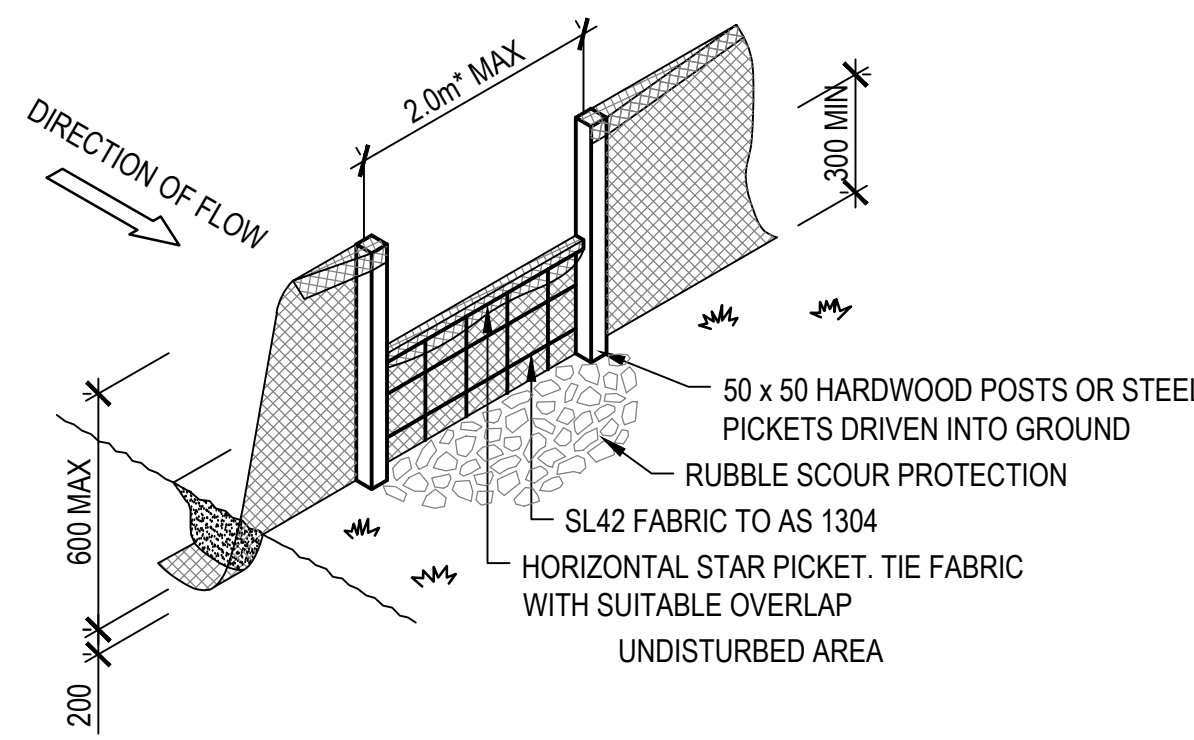
TYPICAL TEMPORARY CONSTRUCTION ENTRY / EXIT DETAIL

N.T.S.



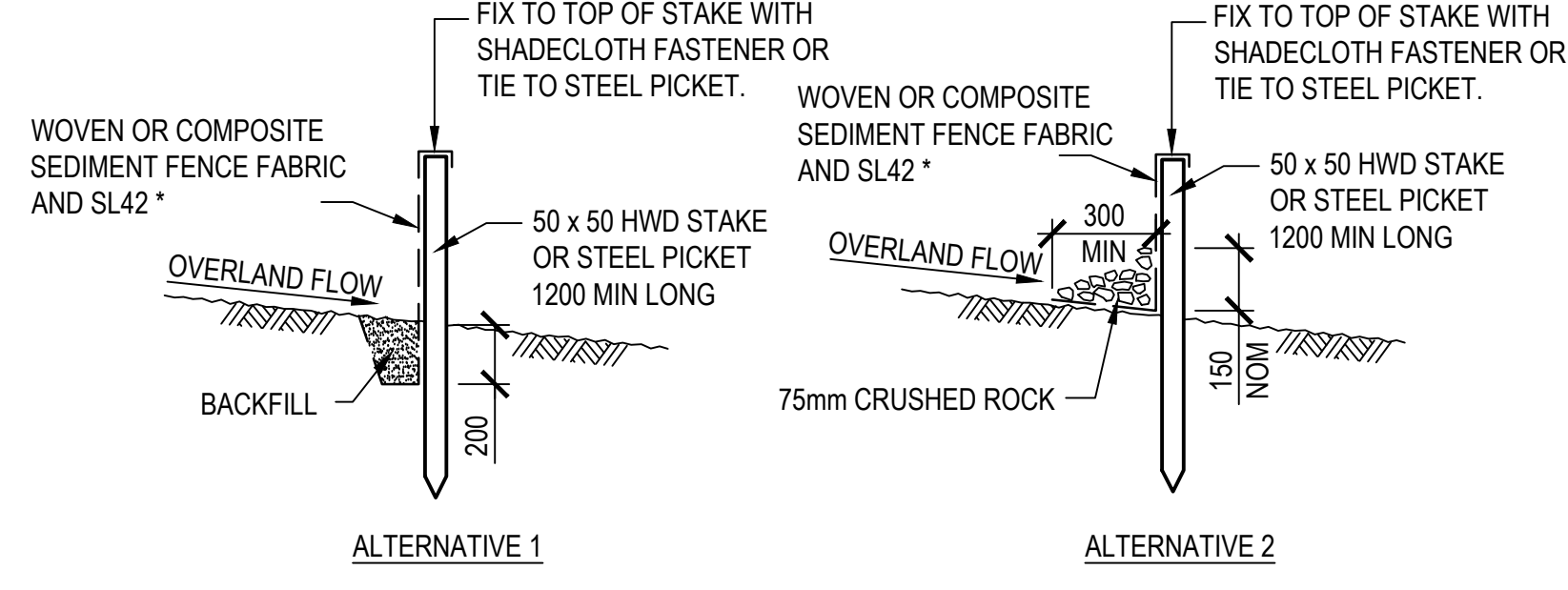
TYPICAL SEDIMENT FENCE ELEVATION

* 2000 MAX WITH OUT SL42 MESH
N.T.S.



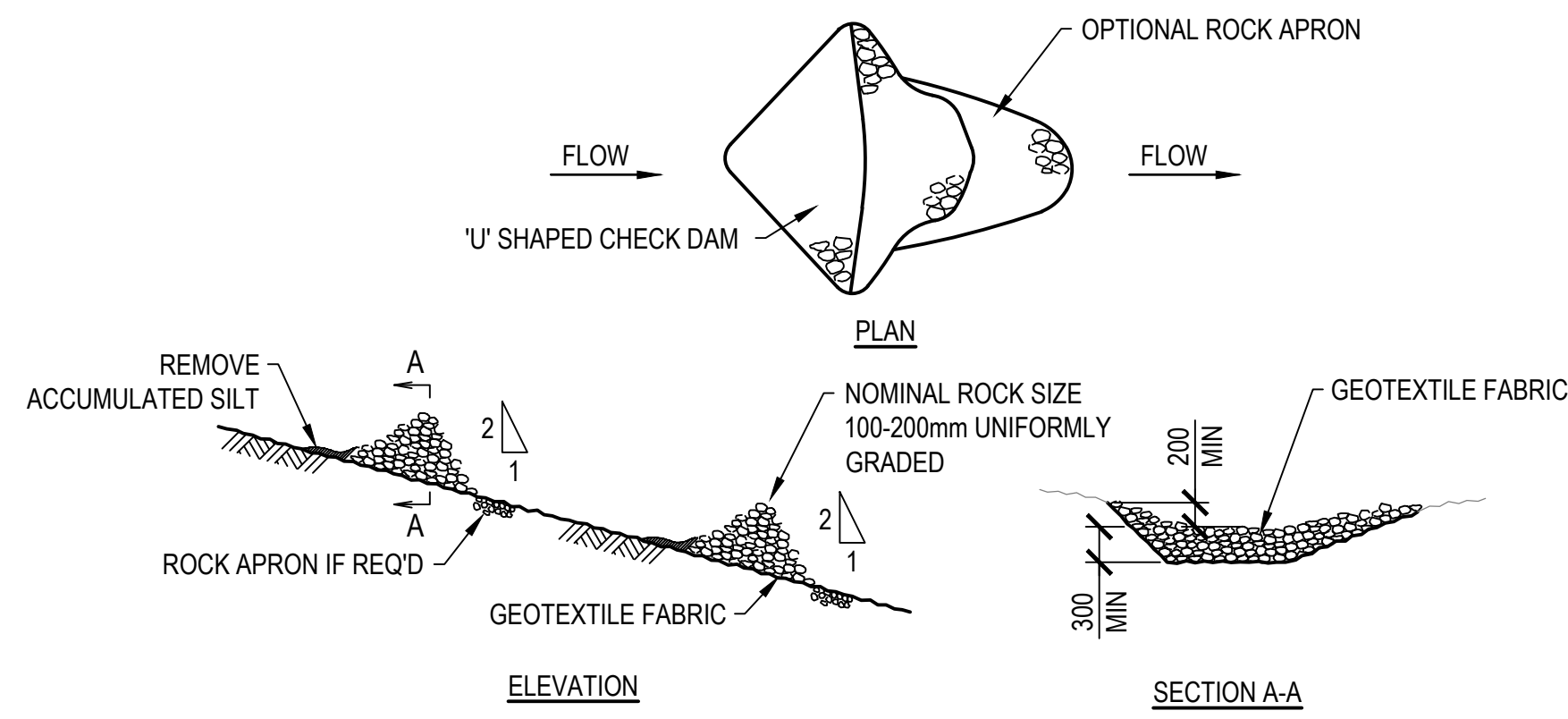
TYPICAL SEDIMENT FENCE SPILL THROUGH

N.T.S.



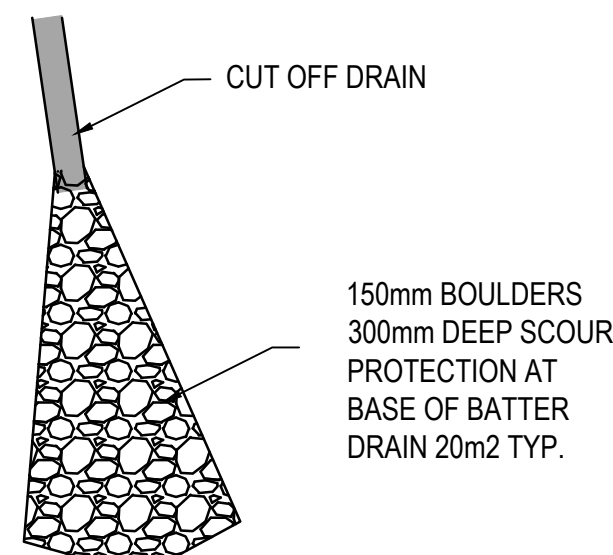
TYPICAL SEDIMENT FENCE SECTIONS

N.T.S.
* MAX SPACING OF POSTS 2.0m WITHOUT SL42
AND 3.0m WITH SL42



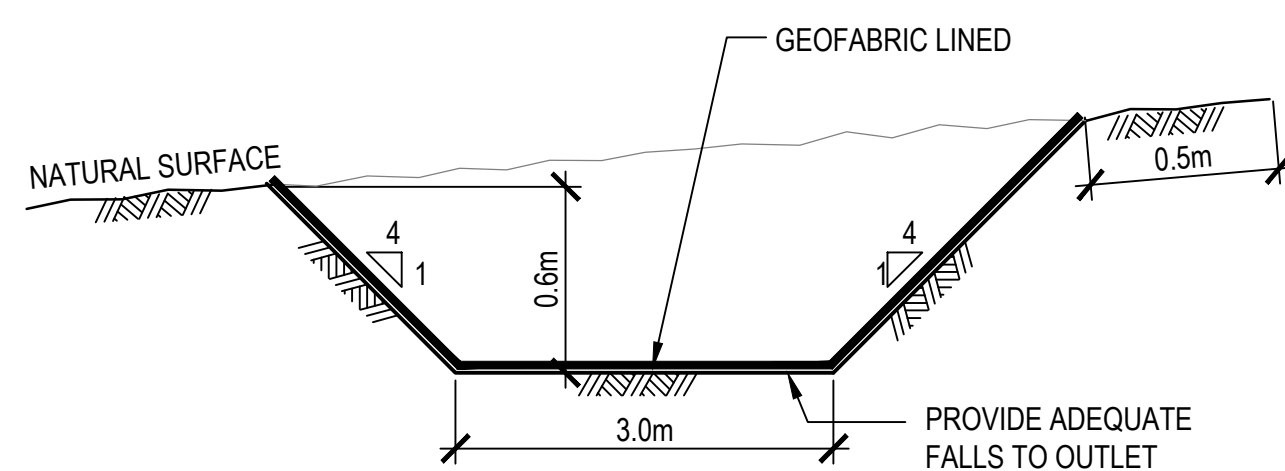
TYPICAL CHECK DAM FLOW CONTROL

N.T.S.



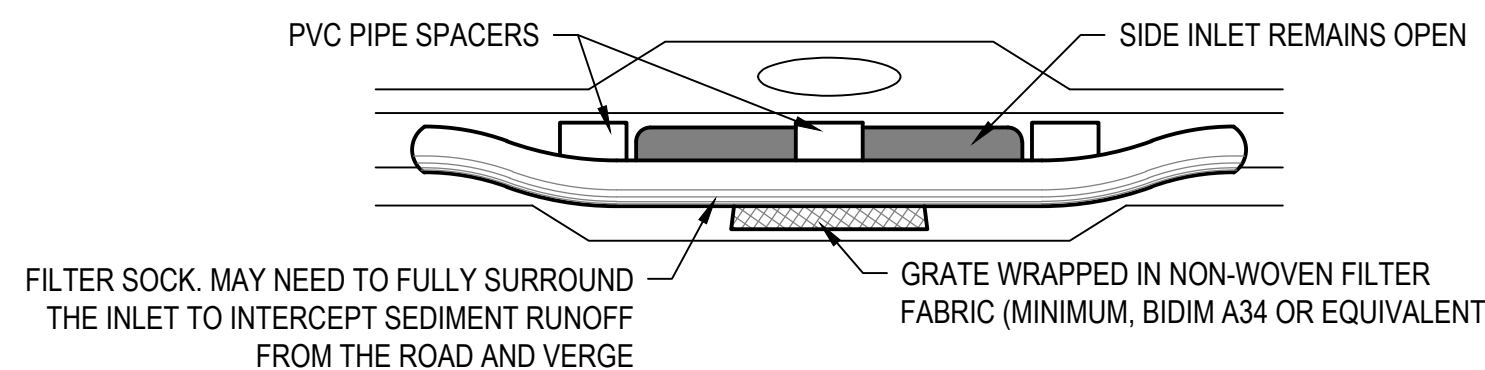
TYPICAL SCOUR PROTECTION
END OF CUT OFF DRAINS

N.T.S.



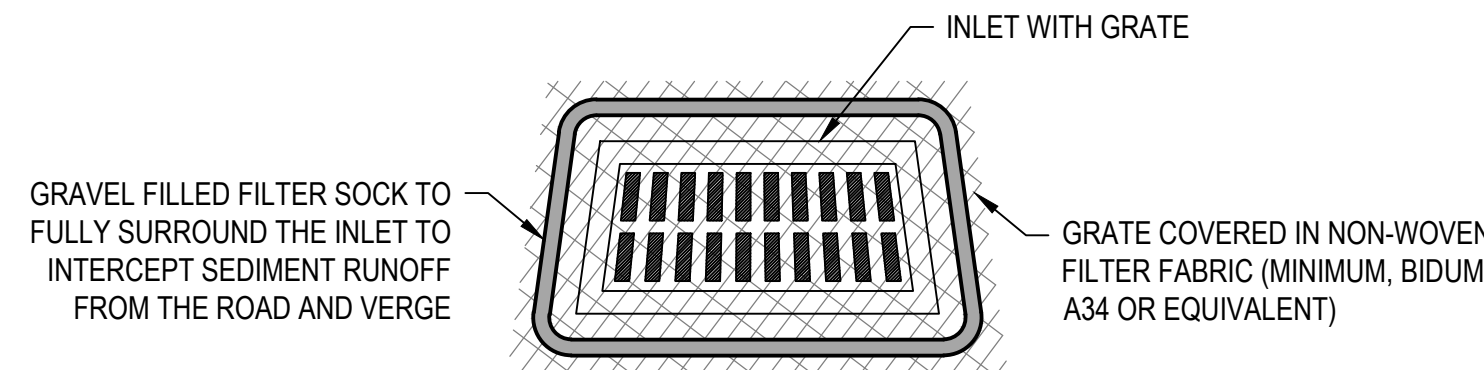
TYPICAL DIRTY WATER CUT OFF DRAIN

N.T.S.



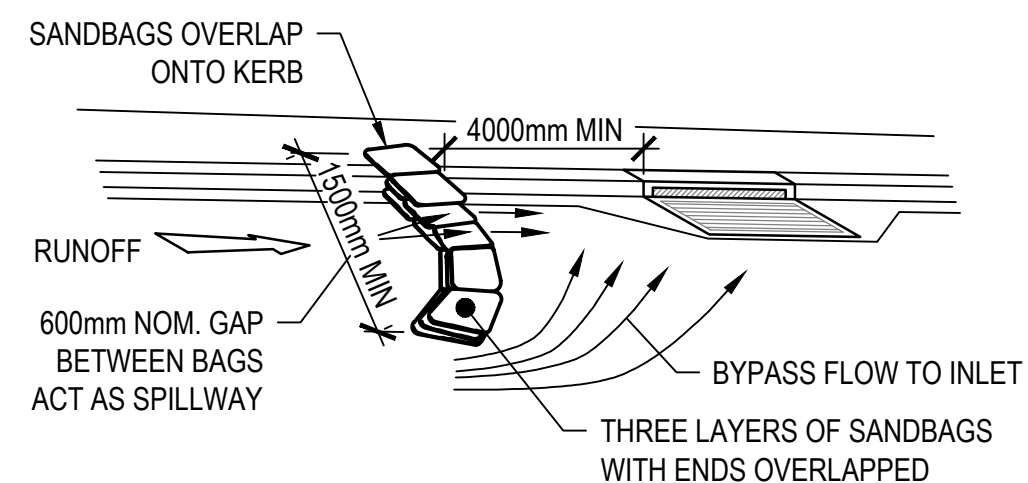
TYPICAL SAG INLET SEDIMENT TRAP.

N.T.S.



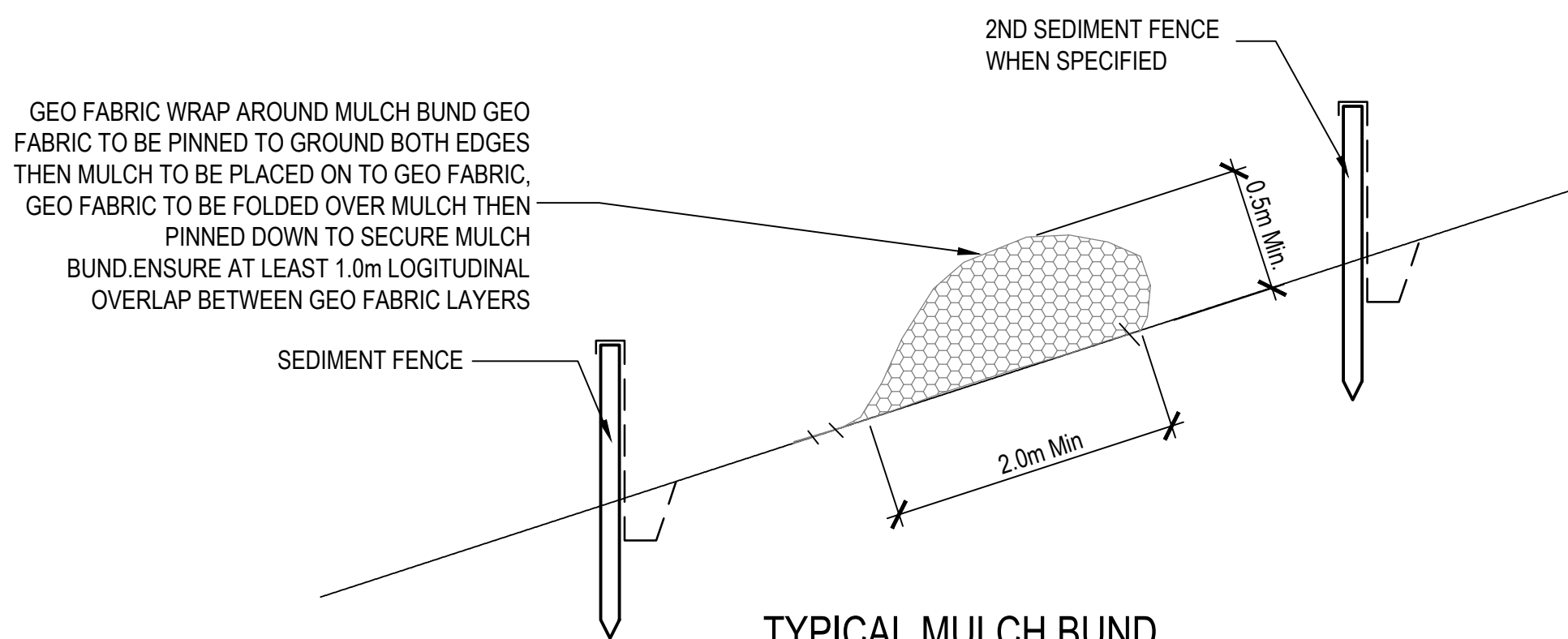
TYPICAL FIELD INLET SEDIMENT TRAP.

N.T.S.



TYPICAL ON GRADE KERB INLET SEDIMENT TRAP

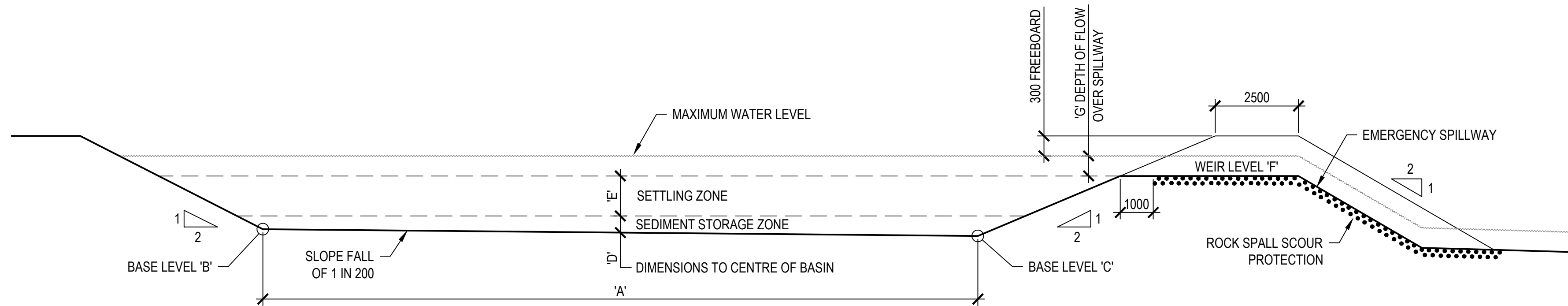
N.T.S.



TYPICAL MULCH BUND

FOR CONSTRUCTION

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	ISSUE	DESCRIPTION	APPD	DATE				DESIGN CHECKED	KC	
	A	FORTENDER	LS	16.09.22				DRAWN	VL	
	B	80% DO ISSUE	LS	22.11.22				DRAWING CHECK	KC	
	C	FOR INFORMATION	LS	24.02.23				APPROVED	LS	
D	FOR APPROVAL	LS	03.03.23	RPEQ.		PROJECT OAKBURN POULTRY PROCESSING FACILITY TAMWORTH, NSW 2340	PROJECT NUMBER A502	DRAWING NUMBER A502-EW-MP-CV-DRG-SW-1201	ISSUE 1	
1	FOR CONSTRUCTION	LS	24.03.23							

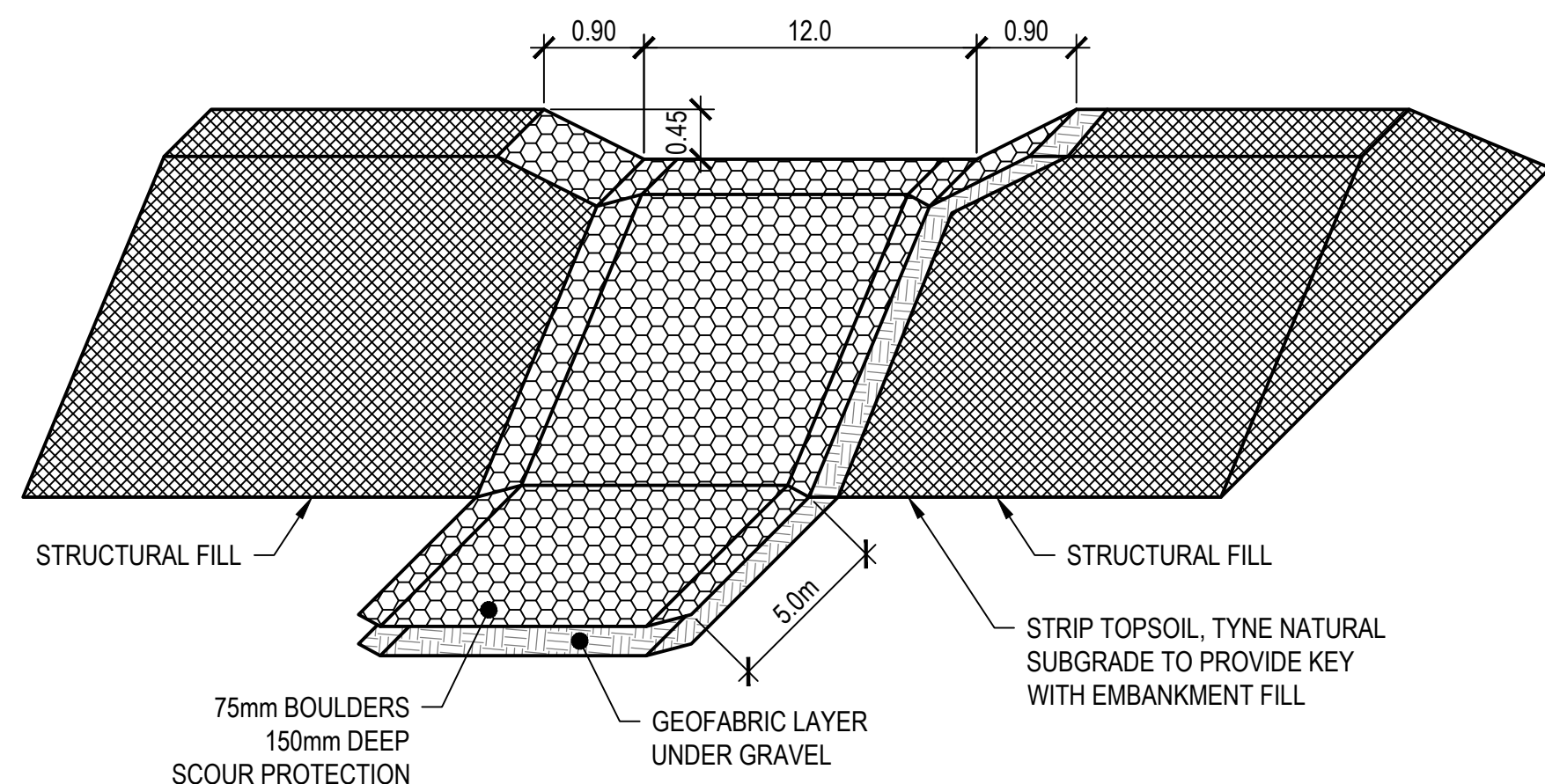


TYPICAL SECTION SEDIMENT BASIN

N.T.S.

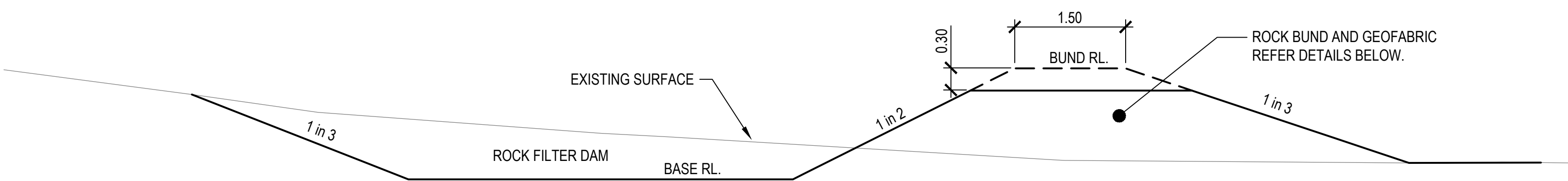
SEDIMENTATION BASIN TABLE

BASIN No.	BASE LENGTH (m) 'A'	BASE WIDTH (m) 'B'	BASE LEVEL 'B'	BASE LEVEL 'C'	STORAGE DEPTH (m) 'D'	SETTLING DEPTH (m) 'E'	WEIR WIDTH (m)	WEIR LEVEL 'F'	WEIR DEPTH (m) 'G'
1	75	15	379.188	378.812	0.30	0.60	12.0	379.90	0.15
2	70	14	379.288	378.912	0.30	0.60	12.0	380.00	0.15



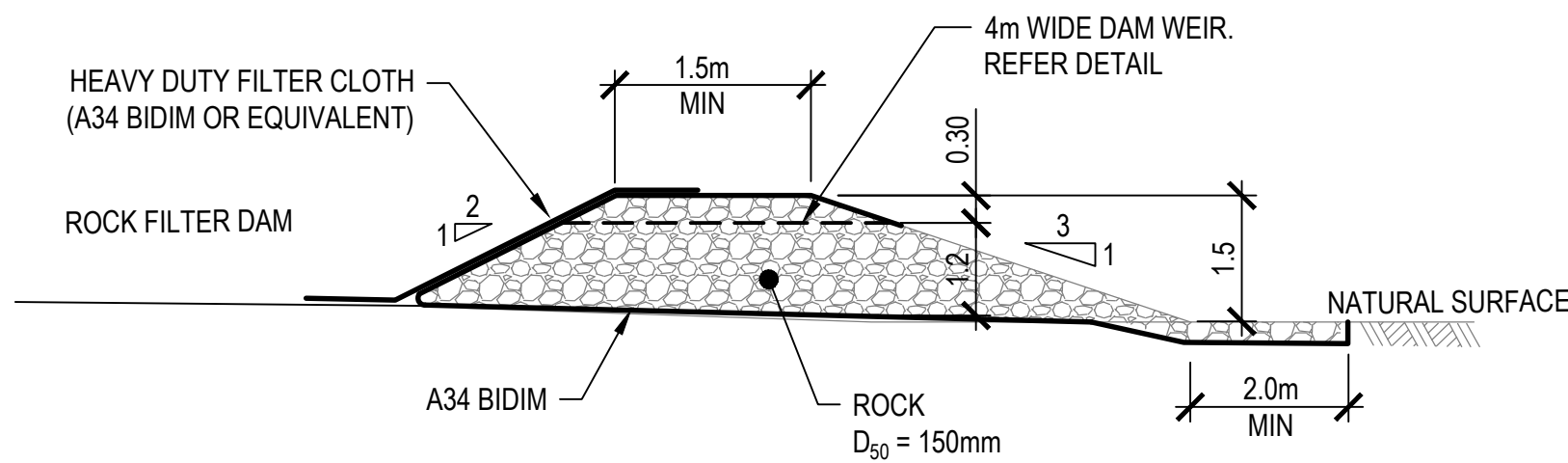
TYPICAL SEDIMENT BASIN EMERGENCY SPILLWAY DETAIL

N.T.S.



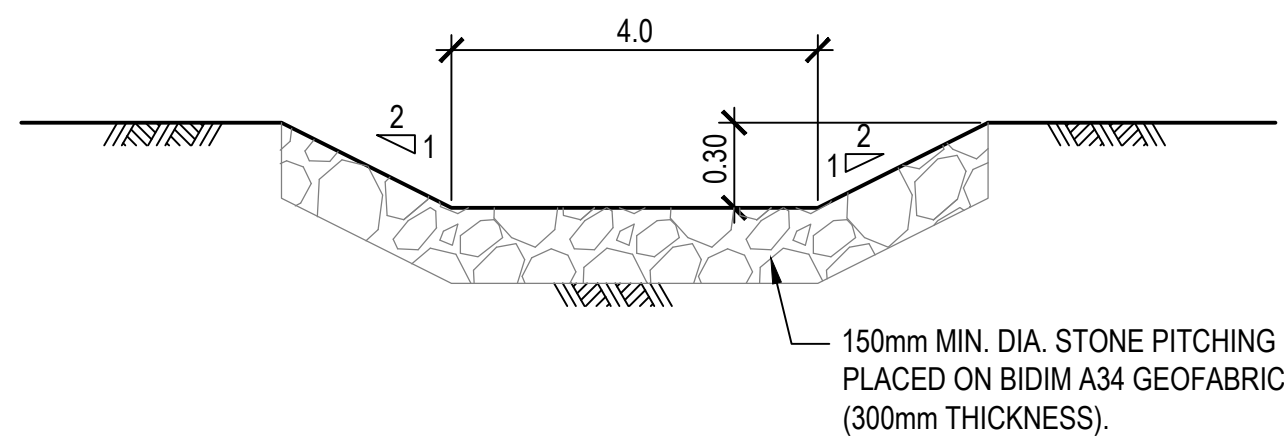
TYPICAL SECTION ROCK DAM THROUGH OVERFLOW WEIR

SCALE 1:50



ROCK BUND AND GEOFABRIC FILTER DETAILS

N.T.S.



TYPICAL SECTION - ROCK DAM WEIR

N.T.S.

FOR CONSTRUCTION

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	ISSUE	DESCRIPTION	APPD	DATE				DESIGN CHECKED	KC	
	A	FOR TENDER	LS	16.09.22				DRAWN	NK	
	B	FOR TENDER	LS	26.09.22				DRAWING CHECK	KC	
	C	80% DD ISSUE	LS	22.11.22						
	1	FOR CONSTRUCTION	LS	24.03.23						
PROJECT OAKBURN POULTRY PROCESSING FACILITY TAMWORTH, NSW 2340										
PROJECT NUMBER A502 DRAWING NUMBER A502-EW-MP-CV-DRG-SW-1202 ISSUE 1										