Appendix 15

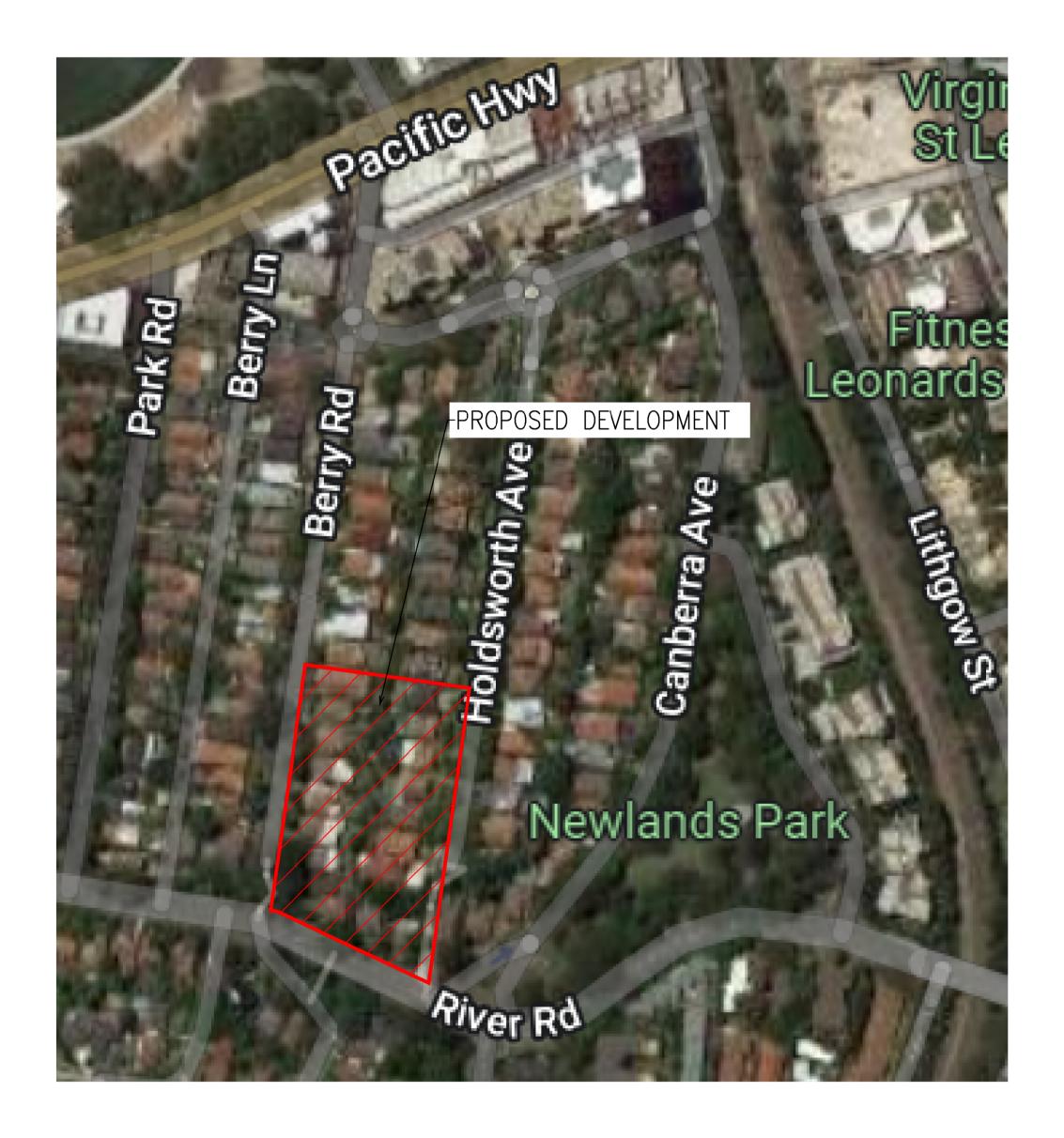
Civil Plans

Robert Birds

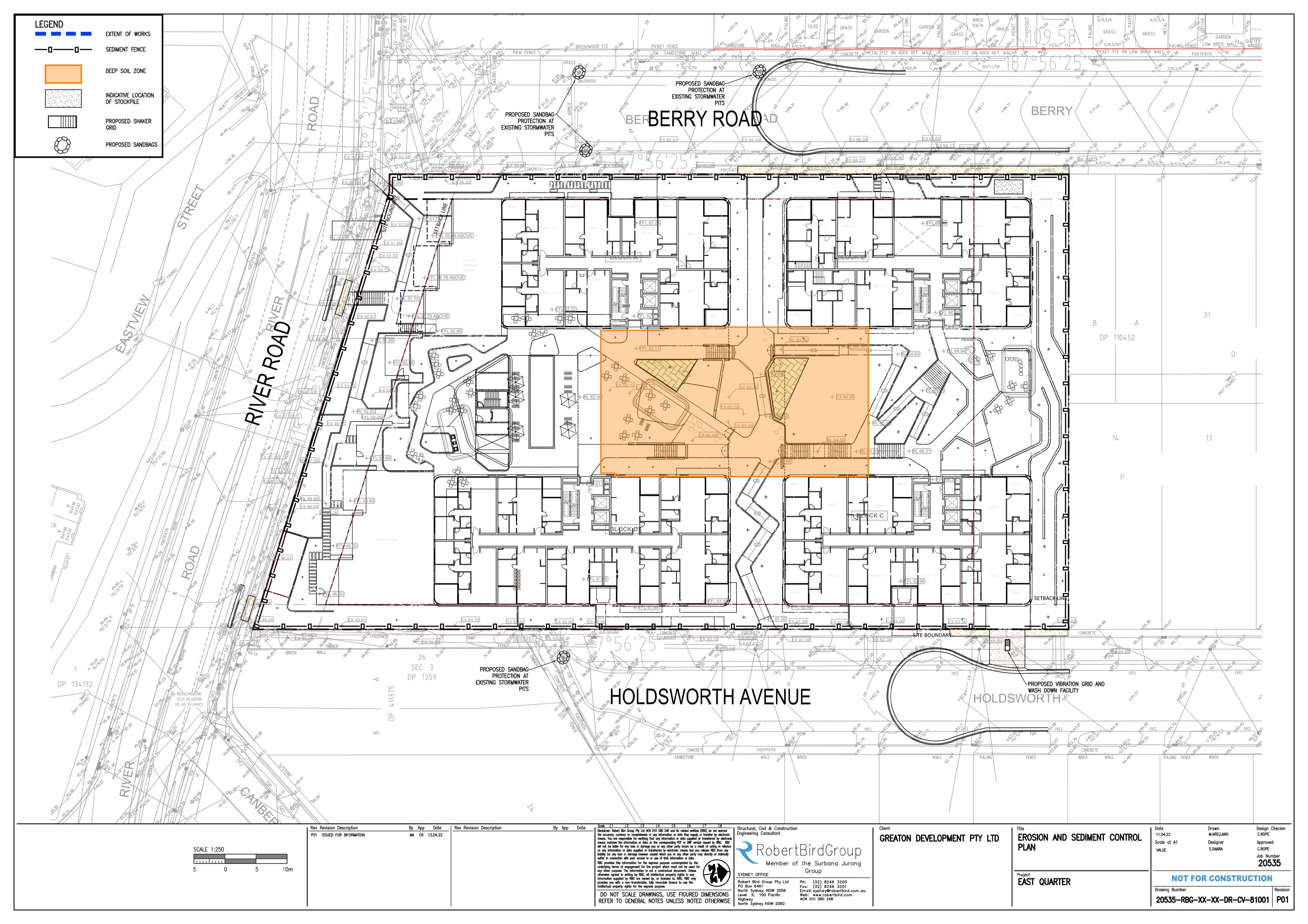
ST. LEONARDS SOUTH LOT 18,19 AND 20 EAST QUARTER

DA ISSUE CIVIL ENGINEERING DRAWINGS

Sheet List Table								
Sheet Number	Sheet Title							
20535-RBG-XX-XX-DR-CV-80000	COVER SHEET							
20535-RBG-XX-XX-DR-CV-81001	EROSION AND SEDIMENT CONTROL PLAN							
20535-RBG-XX-XX-DR-CV-81101	EROSION AND SEDIMENT CONTROL NOTES AND DETAILS							
20535-RBG-XX-XX-DR-CV-83101	CIVIL DETAILS							
20535-RBG-XX-XX-DR-CV-87001	STORMWATER MANAGEMENT PLAN							
20535-RBG-XX-XX-DR-CV-87101	STORMWATER DETAILS							
20535-RBG-XX-XX-DR-CV-87201	ON-SITE DETECTION TANK PLAN AND DETAILS							
20535-RBG-XX-XX-DR-CV-87401	STORMWATER CATCHMENT PLAN							



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GENERAL NOTES:

- A1. THIS SOIL AND WATER MANAGEMENT PLAN IS TO BE READ IN CONJUNCTION WITH OTHER ENGINEERING PLANS RELATING TO THIS DEVELOPMENT.
- A2. CONTRACTORS WILL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE UNDERTAKEN AS INSTRUCTED IN THIS SPECIFICATION AND CONSTRUCTED FOLLOWING THE CITY OF SYDNEY COUNCIL REQUIREMENTS AND TO LANDCOM MANAGING URBAN STORMWATER: SOIL AND CONSTRUCTION, 4th EDITION, MAR 2004.
- A3. REFER GEOTECHNICAL REPORT FOR EARTHWORKS AND PARAMETERS.
- A10. ALL CONSTRUCTION VEHICLES SHALL ENTER AND EXIT THE SITE VIA THE APPROVED CONSTRUCTION ENTRY/EXIT ROUTE.
- A11. ALL VEHICLES LEAVING THE SITE SHALL BE CLEANED AND INSPECTED BEFORE
- A12. MAINTAIN ALL STORMWATER PIPES AND PITS CLEAR OF DEBRIS AND SEDIMENT. INSPECT STORMWATER SYSTEM AND CLEAN OUT AFTER EACH STORM EVENT.
- STORMWATER SYSTEM AND CLEAN OUT AFTER EACH STORM EVENT.

 A13. CLEAN OUT ALL EROSION AND SEDIMENT CONTROL DEVICES AFTER EACH STORM EVENT.
- A14. ALL DISTURBED AREAS SHALL BE REVEGETATED AS SOON AS THE RELEVANT WORKS HAVE BEEN COMPLETED.
- A15. KERB INLET SOCKS TO BE PROVIDED ON DOWNSTREAM PITS.

SITE MAINTENANCE NOTES:

- SM1. THE CONTRACTOR WILL INSPECT THE SITE AT LEAST WEEKLY AND AT THE CONCLUSION OF EVERY STORM EVENT TO:
- A) ENSURE THAT DRAINS OPERATE PROPERLY AND TO EFFECT AND NECESSARY REPAIRS.
- B) REMOVED SPILLED SAND OR OTHER MATERIALS FROM HAZARD AREAS, INCLUDING LANDS CLOSER THAN 5 METRES FROM AREAS OF LIKELY CONCENTRATED OR HIGH VELOCITY FLOWS ESPECIALLY WATERWAYS AND PAVED AREAS.
- C) REMOVED TRAPPED SEDIMENT WHENEVER THE DESIGN CAPACITY OF THAT STRUCTURES HAS BEEN EXCEEDED.
- D) ENSURE REHABILITATION LANDS HAVE EFFECTIVELY REDUCED THE EROSION HAZARD TO INITIATE UPGRADING OR REPAIR AS NECESSARY.
- E) CONSTRUCT ADDITIONAL EROSION AND OR SEDIMENT CONTROL WORKS AS MIGHT BECOME NECESSARY TO ENSURE THE DESIRED PROTECTION IS GIVEN TO DOWNSLOPE LANDS AND WATERWAYS. MAKE ONGOING CHANGES TO THE PLAN WHERE IT PROVES INADEQUATE IN PRACTICE OR IS SUBJECT TO CHANGES IN CONDITIONS ON THE WORK-SITE OR ELSEWHERE IN THE CATCHMENT.
- F) MAINTAIN EROSION AND SEDIMENT CONTROL STRUCTURES IN A FULLY FUNCTIONING CONDITION UNTIL ALL EARTHWORK ACTIVITIES ARE COMPLETED AND THE SITE IS DEHABILITATED.
- G) FILL IN AND COMPACT ALL TRENCHES IMMEDIATELY AFTER SERVICES HAVE BEEN LAID.
- SM2. THE CONTRACTOR WILL KEEP A LOGBOOK MAKING ENTRIES AT LEAST WEEKLY, IMMEDIATELY BEFORE FORECAST RAIN AND AFTER RAINFALL. ENTRIES WILL INCLUDE:
 - A) THE VOLUME AND INTENSITY OF ANY RAINFALL EVENTS.
 - B) THE CONDITION OF ANY SOIL AND WATER MANAGEMENT WORKS.
- C) THE CONDITION OF VEGETATION AND ANY NEED TO IRRIGATE.
- D) THE NEED FOR DUST PREVENTION STRATEGIES

 THE LOGBOOK WILL BE KEPT ON-SITE AND MADE AVAILABLE TO ANY AUTHORISED PERSON
 UPON REQUEST. IT WILL BE GIVEN TO THE PROJECT MANAGER AT THE CONCLUSION OF
 THE WORKS.

SEDIMENT CONTROL NOTES:

- SC1. SEDIMENT FENCES WILL BE INSTALLED AS SHOWN ON THE PLAN AND ELSEWHERE AT THE
- DISCRETION OF THE SITE CONTRACTOR TO CONTAIN SOIL AS NEAR AS POSSIBLE TO THEIR SOURCE. SC2. SEDIMENT FENCES WILL NOT HAVE CATCHMENT AREAS EXCEEDING 900 SQUARE METRES AND HAVE A STORAGE DEPTH OF AT LEAST 0.6 METRES.
- SC3. SEDIMENT FENCES SHOULD LAST FOR UP TO SIX MONTHS BUT REQUIRE REGULAR MAINTENANCE AND WEEKLY CHECKS. IT MUST REMAIN VERTICAL AND KEYED INTO THE SOIL. DAMAGED FENCES MUST BE REPAIRED PROMPTLY.
- SC4. SEDIMENT FENCES NEED TO BE TRENCHED IN AT LEAST 150mm AND BURIED SO THE WATER FLOWS THROUGH AND NOT UNDERNEATH.
- SC5. SEDIMENT REMOVED FROM ANY TRAPPING DEVICES WILL BE RELOCATED WHERE FURTHER POLLUTION TO DOWNSLOPE LANDS AND WATERWAYS CANNOT OCCUR.
- SC6. STOCKPILES ARE NOT TO BE LOCATED WITHIN 5 METERS OF HAZARD AREAS INCLUDING AREAS OF HIGH VELOCITY FLOWS SUCH AS WATERWAYS. PAVED AREAS AND DRIVEWAYS.
- SC7. WATER WILL BE PREVENTED FROM DIRECTLY ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS THE CATCHMENT AREA HAS BEEN PERMANENTLY LANDSCAPED AND/OR WATER HAS BEEN TREATED BY AN APPROVED DEVICE.
- SC8. TEMPORARY SEDIMENT TRAPS WILL REMAIN IN PLACE UNTIL AFTER THE LANDS THEY ARE PROTECTING ARE COMPLETELY REHABILITATED.
- SC9. ACCESS TO SITES SHOULD BE STABILIZED TO REDUCE THE LIKELIHOOD OF VEHICLES TRACKING SOIL MATERIALS ONTO PUBLIC ROADS AND ENSURE ALL—WEATHER ENTRY/EXIT.

SEDIMENT BASIN CONSTRUCTION NOTES:

- SB1. REMOVE ALL VEGETATION AND TOPSOIL FROM UNDER THE DAM WALL AND FROM WITHIN THE STORAGE AREA.
- SB2. CONSTRUCT A CUT OF 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
- SB3. MAINTAIN THE TRENCH FREE OF WATER AND RECOMPACT THE MATERIALS WITH EQUIPMENT AS SPECIFIED IN THE SWMP TO 98 PER CENT STANDARD PROCTOR DENSITY.
- SB4. SELECT FILL FOLLOWING THE SWMP THAT IS FREE OF ROOTS, WOOD, ROCK, LARGE STONE OR FOREIGN MATERIAL.
- SB5. PREPARE THE SITE UNDER THE EMBANKMENT BY RIPPING TO AT LEAST 100mm TO HELP BOND COMPACTED FILL TO THE EXISTING SUBSTRATE.
- SB6. SPREAD THE FILL IN 100mm TO 150mm LAYERS AND COMPACT IT AT OPTIMUM MOISTURE CONTENT FOLLOWING THE SWMP.
- SB7. CONSTRUCT THE EMERGENCY SPILLWAY.
- SB8. REHABILITATE THE STRUCTURE FOLLOWING THE SWMP.

SEDIMENT BASIN MAINTENANCE NOTES:

- SBM1. KEEP ALL SEDIMENT DETENTION SYSTEMS IN GOOD, WORKING CONDITION, ENSURE:
- (i) RECENT WORKS HAVE NOT RESULTED IN THE DIVERSION OF SEDIMENT -
- LADEN WATER AWAY FROM THEM;
- (ii) DEGRADABLE PRODUCTS (E.G. STRAW BALES) ARE REPLACED AS REQUIRED;
 (iii) SEDIMENT IS REMOVED IF THE DESIGN CAPACITY OR LESS REMAINS IN THE SETTLING ZONE;
- (iv) WATER IN RETENTION BASINS ON TYPE D SOILS IS TREATED WITH A FLOCCULATING AGENT FOLLOWING THE REQUIREMENTS OF SECTION 6.3 AND APPENDIX E OF THE LANDCOM BLUE BOOK IF THE SOILS AT THE SEDIMENT SOURCE CONTAIN MORE THAN 10 PERCENT DISPERSIBLE MATERIALS [1]. WHERE BASINS REQUIRE PUMPING OUT, THE NECESSARY DOSING SHOULD OCCUR WITHIN 24 HOURS OF THE CONCLUSION OF EACH STORM EVENT AND THE BASIN SHOULD BE DRAINED ONCE SUSPENDED SOLIDS LEVEL ARE LESS THAN 50 MILLIGRAMS PER LITRE, USUALLY 36 TO 48 HOURS IF GYPSUM IS USED. LONGER OR SHORTER TREATMENT AND DEWATERING PERIODS MAY APPLY IF RAINFALL EVENTS OF DURATION OTHER THAN 5 DAYS HAS BEEN ADOPTED IN THE DESIGN OF THE BASING [2]; AND
- (v) POLLUTANTS, SEDIMENT AND / OR WASTE REMOVED FROM SEDIMENT BASINS, GRASS POLLUTANT TRAPS AND TRASH RACKS ARE DISPOSED IN STABILISED DUMPS WHERE SOIL AND WATER MEASURES HAVE BEEN IMPLEMENTED TO STOP OFFSITE MOVEMENT OF POLLUTANTS.
- SBM2. TO DETERMINE THE EFFECTIVENESS OF ANY SEDIMENT RETENTION BASINS, THE CONSENT AUTHORITY MIGHT REQUIRE THE SITE MANAGER TO UNDERTAKE SAMPLING AND SUBSEQUENT ANALYSIS OF NON FILTERABLE RESIDUE (NFR) CONCENTRATIONS OF WASTE WATER. SUCH SAMPLING AND ANALYSIS IS LIKELY TO BE REQUIRED PERIODICALLY OR FOR A NOMINATED PERIOD, USUALLY THE FIRST THREE MONTHS AFTER COMMISSIONING THE BASINS.
- SBM3. DISPOSE ANY POLLUTANTS REMOVED FROM SEDIMENT BASINS IN AREAS WHERE FURTHER POLLUTION TO DOWNSLOPE LANDS AND WATERWAYS SHOULD NOT OCCUR.
- SBM4. CONSTRUCT ADDITIONAL
- [1] WHERE NECESSARY, A SUITABLY SIZED STOCKPILE OF FLOCCULATING AGENT SHOULD BE KEPT ONSITE FOR THE TREATMENT OF WASTEWATER IMPOUNDING IN SEDIMENT RETENTION SYSTEMS.
- [2] PLACE A MARKER PEG WITHIN EACH SEDIMENT RETENTION BASIN TO INDICATE THE DESIGN CAPACITY OF THE SEDIMENTATION ZONE AND LEVEL ABOVE WHICH CAPACITY IS AVAILABLE IN THE SETTLING ZONE FOR CONTAINMENT OF RUNOFF.

LAND DISTURBANCE NOTES:

- LD1. ACCESS AREAS ARE TO BE LIMITED TO A MAXIMUM WIDTH OF 10 METERS THE SITE MANAGER WILL DETERMINE AND MARK THE LOCATION OF THESE ZONES ON—SITE. ALL SITE WORKERS WILL CLEARLY RECOGNIZE THOSE BOUNDARIES THAT, WHERE APPROPRIATE, ARE IDENTIFIED WITH A BARRIER FENCING (UPSLOPE) AND SEDIMENT FENCING (DOWNSLOPE) OR SIMILAR MATERIALS.
- LD2. ENTRY TO LANDS NOT REQUIRED FOR CONSTRUCTION OR ACCESS IS PROHIBITED EXCEPT FOR ESSENTIAL THINNING OF PLANT GROWTH.
- LD3. WORKS ARE TO PROCEED IN THE FOLLOWING SEQUENCE:
 - A) INSTALL ALL BARRIER AND SEDIMENT FENCING WHERE SHOWN ON THE PLAN.
 - B) CONSTRUCT THE STABILISED SITE ACCESS.
 - C) CONSTRUCT DIVERSION DRAINS AS REQUIRED.
- D) INSTALL MESH AND GRAVEL INLETS FOR ANY ADJACENT KERB INLETS.
- E) INSTALL GEOTEXTILE INLET FILTERS AROUND ANY ON-SITE DROP INLET PITS.
- F) CLEAR SITE AND STRIP AND STOCKPILE TOPSOIL IN LOCATIONS SHOWN ON THE PLAN.
- G) UNDERTAKE ALL ESSENTIAL CONSTRUCTION WORKS ENSURING THAT ROOF AND/OR PAVED AREA STORMWATER SYSTEMS ARE CONNECTED TO PERMANENT DRAINAGE AS SOON AS
- H) GRADE LOT AREAS TO FINAL GRADES AND APPLY PERMANENT STABILISATION (LANDSCAPING) WITHIN 20 DAYS OF COMPLETION OF CONSTRUCTION WORKS.
- I) REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER THE PERMANENT LANDSCAPING HAS BEEN COMPLETED.
- LD4. ENSURE THAT SLOPE LENGTHS DO NOT EXCEED 80 METRES WHERE PRACTICABLE. SLOPE LENGTHS ARE DETERMINED BY SILTATION FENCING AND CATCH DRAIN SPACING.

SOIL EROSION CONTROL NOTES:

- SE1. EARTH BATTERS WILL BE CONSTRUCTED WITH AS LOW A GRADIENT AS PRACTICABLE BUT NO
- STEEPER, UNLESS OTHERWISE NOTES, THAN THAT RECOMMENDED BY GEOTECHNICAL REPORT.

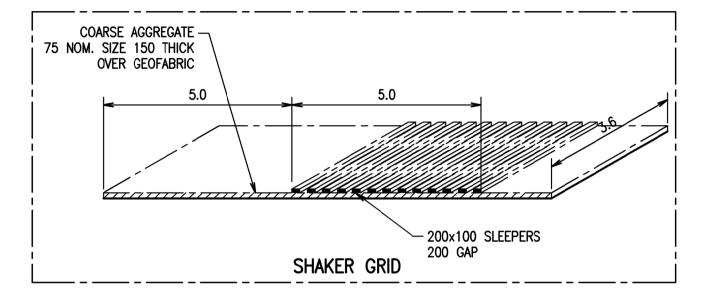
 SE2. ALL WATERWAYS, DRAINS, SPILLWAYS AND THEIR OUTLETS WILL BE CONSTRUCTED TO BE STABLE
 IN AT LEAST THE 1:20 YEAR ARI, TIME OF CONCENTRATION STORM EVENT.
- SE3. WATERWAYS AND OTHER AREAS SUBJECT TO CONCENTRATED FLOWS AFTER CONSTRUCTION ARE TO HAVE A MAXIMUM GROUNDCOVER C—FACTOR OF 0.05

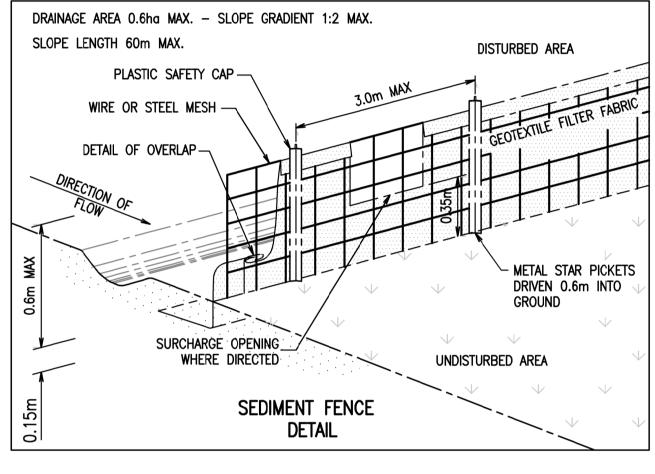
 (70% GROUND COVER) WITHIN 10 WORKING DAYS FROM COMPLETION OF FORMATION. FOOT AND VEHICULAR TRAFFIC WILL BE PROHIBITED IN THESE AREAS.
- SE4. STOCKPILES AFTER CONSTRUCTION ARE TO HAVE A MAXIMUM GROUND—COVER C—FACTOR OF 0.1% (60% GROUND—COVER) WITHIN 10 WORKING DAYS FROM COMPLETION OF FORMATION.
- SE5. ALL LANDS, INCLUDING WATERWAYS AND STOCKPILES DURING CONSTRUCTION ARE TO HAVE A MAXIMUM GROUND COVER C-FACTOR OF 0.15 (50% GROUND COVER) WITHIN 20 WORKING DAYS FROM INACTIVITY EVEN THOUGH WORKS MAY CONTINUE LATER.
- SE6. PERMANENT REHABILITATION OF LANDS AFTER CONSTRUCTION WILL ACHIEVE A GROUND-COVER C-FACTOR OF LESS THAN 0.1 AND LESS THAN 0.05 WITHIN 60 DAYS. NEWLY PLANTED LANDS WILL BE WATERED REGULARLY UNTIL AN EFFECTIVE COVER IS ESTABLISHED AND PLANTS ARE GROWING VIGOROUSLY. FOLLOW-UP SEED AND FERTILISER WILL BE APPLIED AS NECESSARY.

WASTE CONTROL NOTES:

- WC1. ACCEPTABLE BINS WILL BE PROVIDED FOR ANY CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHING, LIGHTWEIGHT WASTE MATERIALS AND LITTER. CLEARANCE SERVICES WILL BE PROVIDED AT LEAST WEEKLY. DISPOSAL OF WASTE WILL BE IN A MANNER APPROVED BY THE SITE CONTRACTOR.
- WC2. ALL POSSIBLE POLLUTANT MATERIALS ARE TO BE STORED WELL CLEAR OF ANY POORLY DRAINED AREAS, FLOW PRONE AREAS, STREAMBANKS, CHANNELS AND STORMWATER DRAINAGE AREAS. STORE SUCH MATERIALS IN A DESIGNATED AREA UNDER COVER WHERE POSSIBLE AND WITHIN CONTAINMENT BUNDS.
- WC3. ALL SITE STAFF AD SUBCONTRACTORS ARE TO BE INFORMED OF THEIR OBLIGATION TO USE WASTE CONTROL FACILITIES PROVIDED.
- WC4. ANY DE-WATERING ACTIVITIES ARE TO BE CLOSELY MONITORED TO ENSURE THAT WATER IS

 NOT POLLUTED BY SEDIMENT, TOXIC MATERIALS OR PETROLEUM PRODUCTS.
- WC5. PROVIDE DESIGNATED VEHICULAR WASHDOWN AND MAINTENANCE AREAS WHICH ARE TO HAVE CONTAINMENT BUNDS.



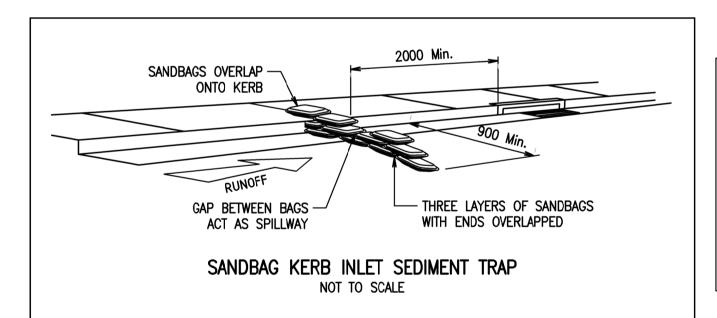


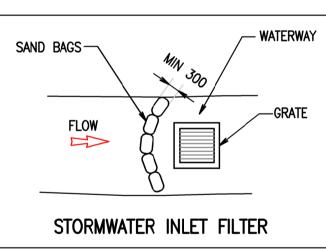
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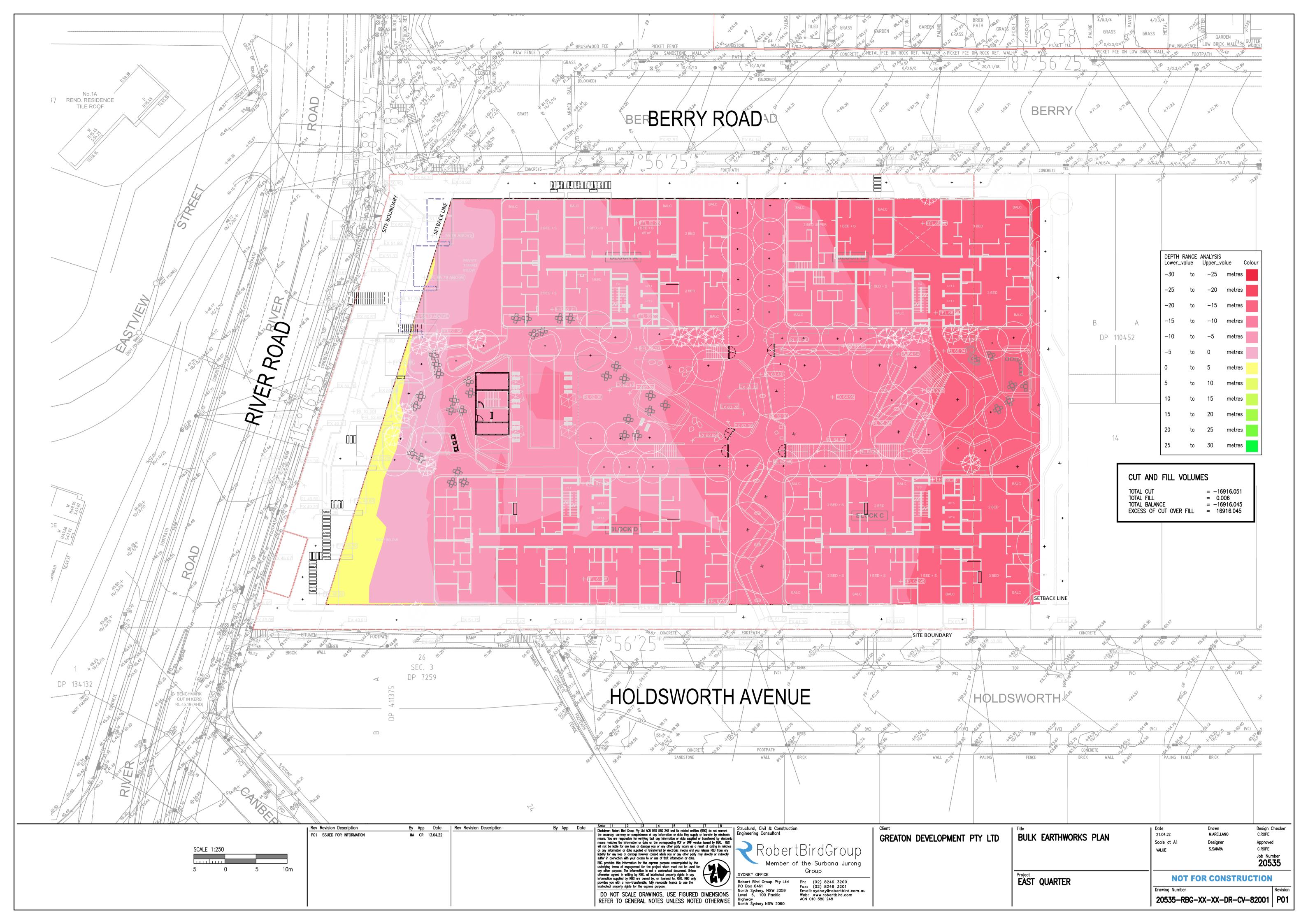
- EXCAVATE A TRENCH AT LEAST 150mm DEEP.
 DRIVE POSTS 500-600mm INTO GROUND AT A MAXIMUM SPACING OF 3.0m CENTRES.
- PLACE AND FIX SUPPORT MESH (F52) TO POST.
 LAY BIDIM GEOFABRIC (SF 2000) AGAINST THE SUPPORT MESH AND FIX BY TIE WIRE, STAPLES OR
- 5. PLACE BIDIM IN TRENCH AND BACKFILL WITH SOIL.
 6. SOIL ON BOTH SIDES OF THE FENCE MUST BE
- COMPACTED TO AVOID SEEPAGE UNDER THE BARRIER.

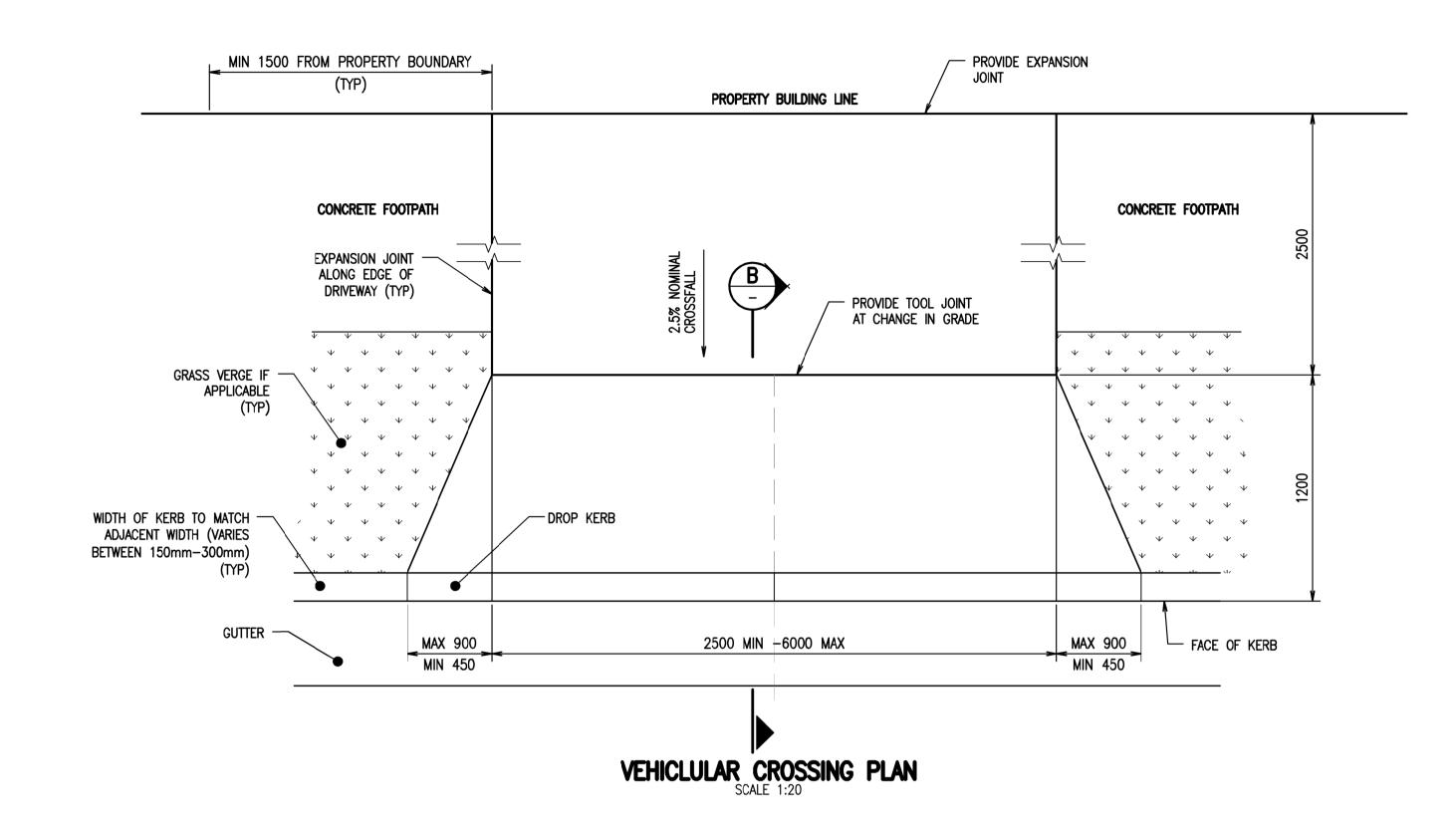
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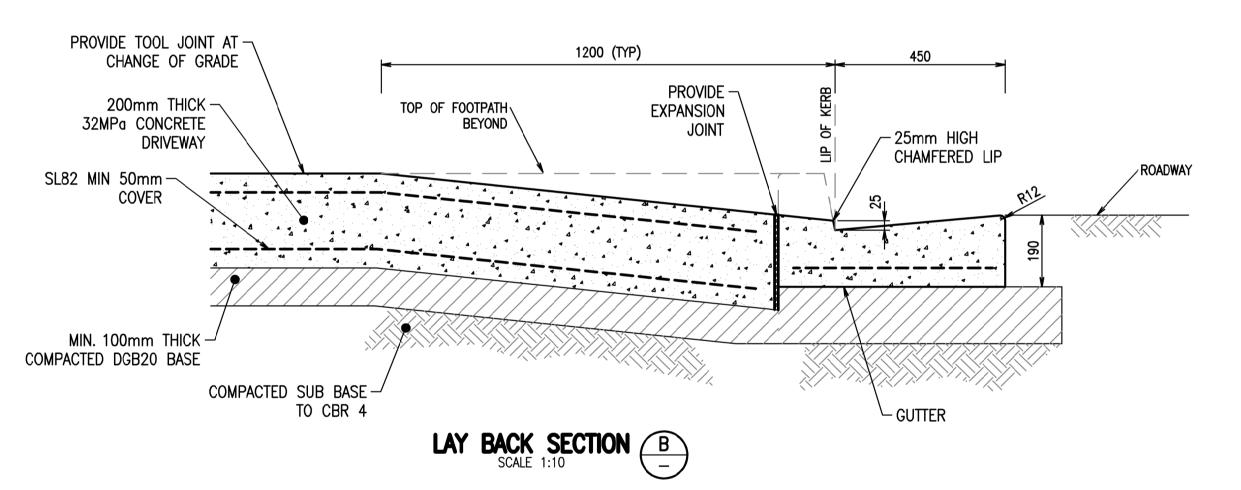
POSITION OF SEDIMENT FENCE AS DIRECTED BY MANAGING CONTRACTOR. FENCE TO REMAIN IN PLACE UNTIL EXCAVATION IS BELOW FOOTPATH LEVEL. PROVIDE 2mx2m TURFED AREA ON DOWNSTREAM SIDE OF FENCE AT SURCHARGE OPENINGS.









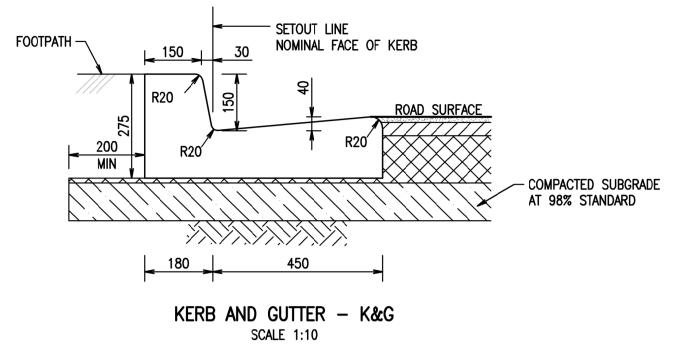


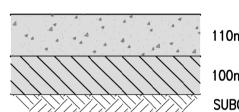
NOTES:

- DRIVEWAY TO BE GENERALLY PERENDICULAR TO KERB
 LINE LINESS NOTED OTHERWISE
- LINE, UNLESS NOTED OTHERWISE.

 2. FOR DRIVEWAYS WIDER THAN 6.0m A TOOL JOINT SHALL
- BE PROVIDED ALONG THE CENTRE OF THE DRIVEWAY.

 3. DRIVEWAY CONCRETE SHALL BE WOOD FLOAT FINISHED.





32MPa CONCRETE 110mm REINFORCED WITH SL72 MESH 40 COVER

100mm DGB20 BASE COURSE TO 98% STANDARD COMPACTION

SUBGRADE COMPACTED TO 95% STD. COMPACTION

CONCRETE FOOTPATH PAVEMENT
TYPICAL DETAIL
SCALE 1:10

