

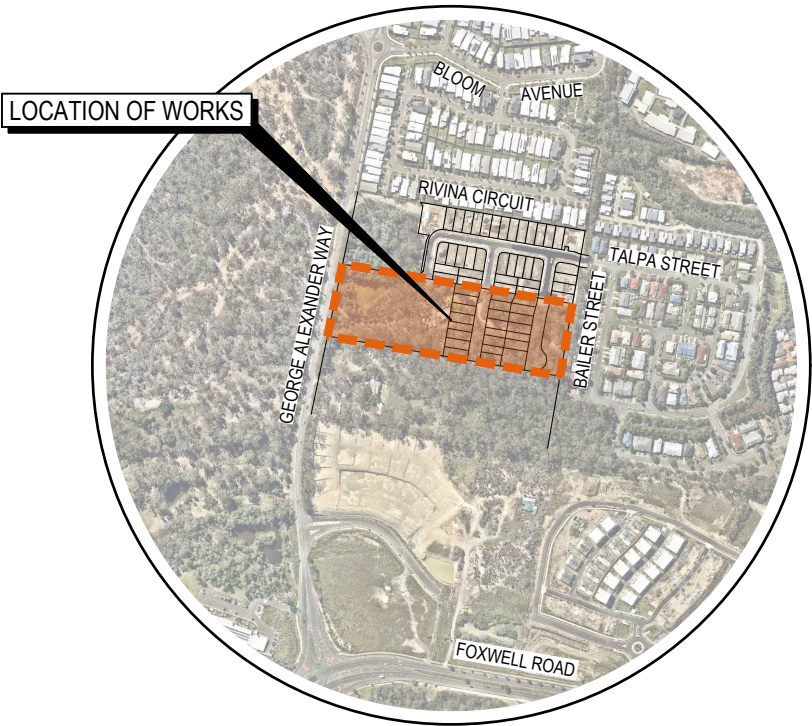
54 GEORGE ALEXANDER WAY, COOMERA

OPERATIONAL WORKS - BULK EARTHWORKS

CITY OF GOLD COAST

DRAWING SCHEDULE

DWG. No.	DESCRIPTION
GENERAL	
0001	COVER SHEET, LOCALITY PLAN & DRAWING SCHEDULE
0011	EXISTING FEATURES SURVEY PLAN
EARTHWORKS	
0101	BULK EARTHWORKS CUT AND FILL LAYOUT PLAN
0105	TYPICAL RETAINING WALL DETAILS
0111	BULK EARTHWORKS SECTIONS
0121	EROSION AND SEDIMENT CONTROL PLAN
0131	EROSION AND SEDIMENT CONTROL DETAILS SHEET 1
0132	EROSION AND SEDIMENT CONTROL DETAILS SHEET 2
0133	EROSION AND SEDIMENT CONTROL DETAILS SHEET 3
ROADWORKS	
0201	CONTROL LINE SETOUT PLAN
0202	CONTROL LINE SETOUT TABLE & TYPICAL ROAD CROSS SECTION
0221	PIONEER STREET AND MERCY STREET LONGITUDINAL SECTIONS
MISCELLANEOUS	
0601	HAZARD REGISTER



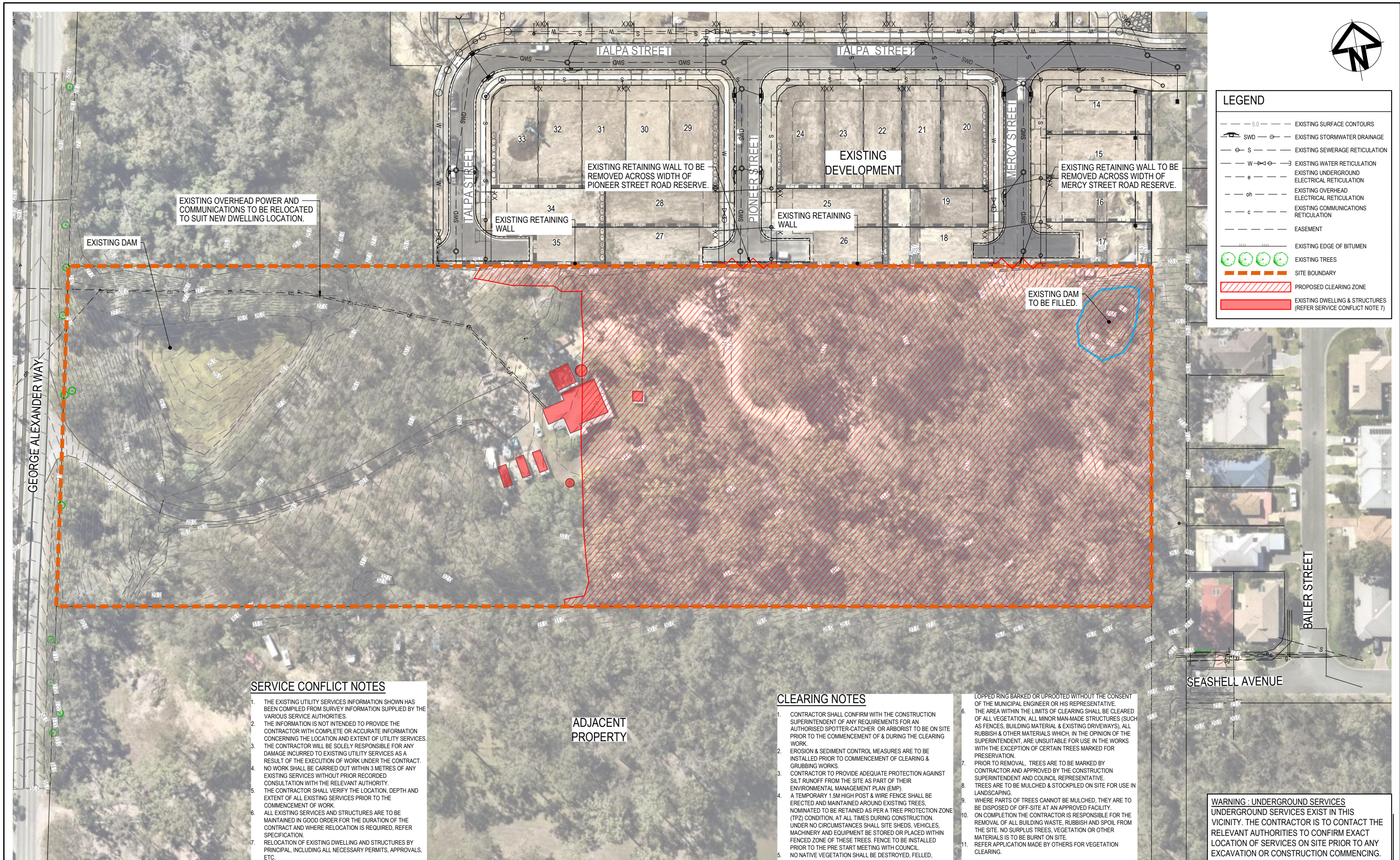
LEVELS & GRID
ORIGIN PM139395 RL 26.512
LEVEL TO AHD
(AUSTRALIAN HEIGHT DATUM)
GRID MGA (ZONE 56)

LOCALITY PLAN
1 : 5000

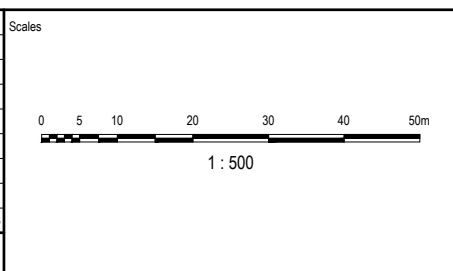
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						 1 : 5000				Coomera GA Pty Ltd ATF The Coomera GA Unit Trust Pty Ltd		FOR APPROVAL CONSTRUCTION SUBJECT TO APPROVAL © Copyright reserved		54 GEORGE ALEXANDER WAY, COOMERA		Arcadis Australia Pacific Pty Limited Level 7, Seabank Building, 12-14 Marine Parade SOUTHPORT QLD 4215 ABN 76 104 485 289 Tel No: +61 7 5503 4800 www.arcadis.com/au	
												Original Issue Signatures		Title		Project Number	
01 ORIGINAL ISSUE						DK AS RM 19.12.2023						Drawn D. KEARNEY Original Size A1		COVER SHEET, LOCALITY PLAN & DRAWING SCHEDULE		30157884	
Issue Description						DR CH VE Date						Designed G. GESMUNDO Height Datum AHD				Issue	
												Project Manager A. SHEPHERD Grid MGA (ZONE 56)				GAW-AAP-BE-00-DRG-CV-0001 01	
												Verified R. MULLIGAN R.P.E.Q. No: 7850 Date 31.01.2024					



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Issue	Description	DR	CH	VE	Date



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Verified	R. MULLIGAN	R.P.E.Q. No. 7850 Date 31.01.2024		

Project

54 GEORGE ALEXANDER WAY,
COOMERA

Title

EXISTING FEATURES
SURVEY PLAN

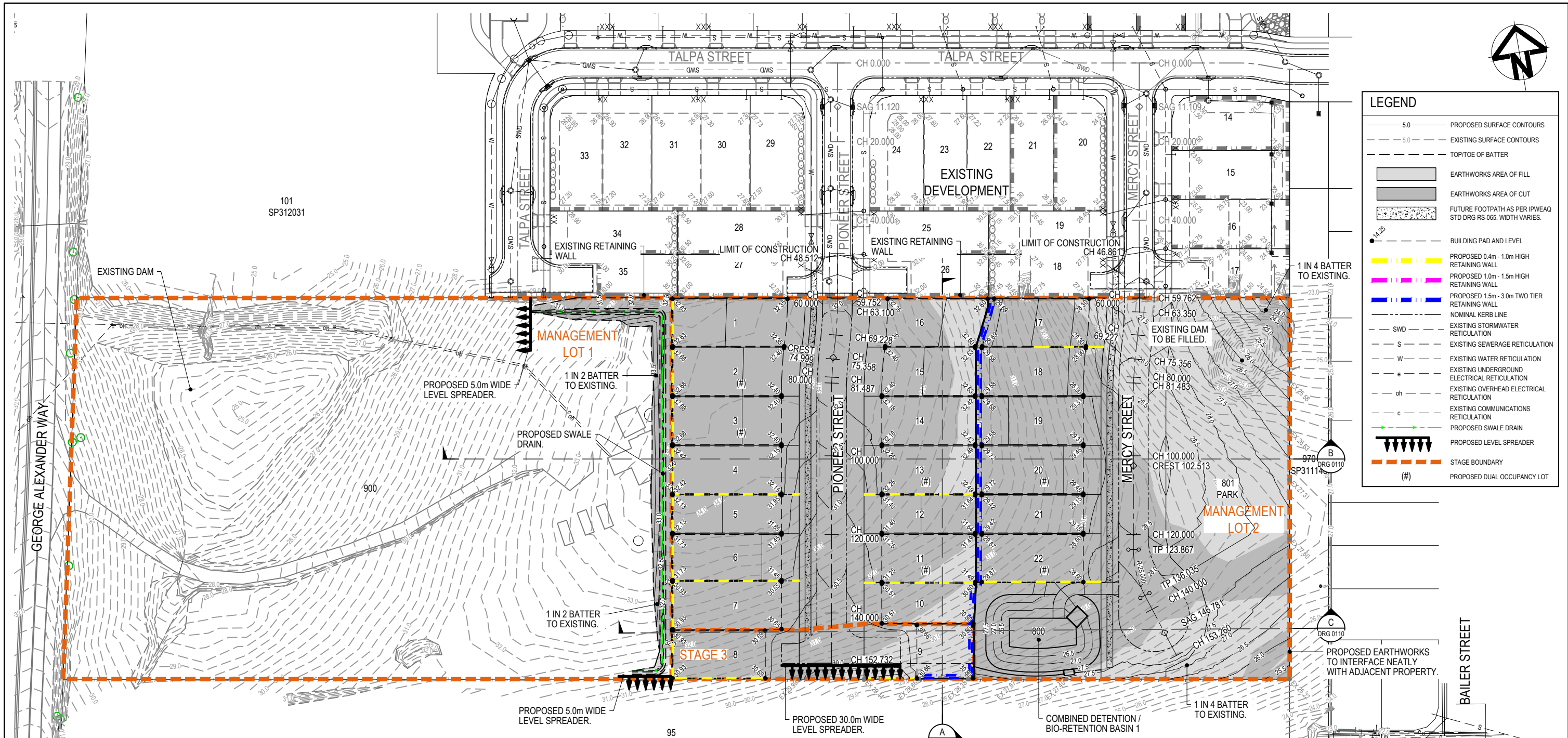
ARCADIS

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Project Number 30157884

Drawing No. GAW-AAP-BE-00-DRG-CV-0011

Issue 01



NOTES

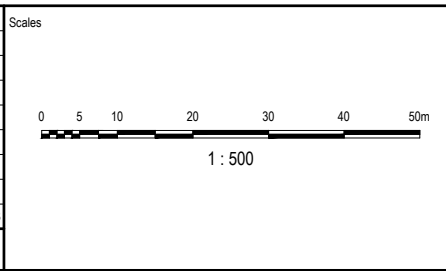
- THE CONTRACTOR IS TO FENCE LIMIT OF WORKS PRIOR TO PRE START MEETING WITH COUNCIL.
- SEDIMENT & EROSION CONTROL MEASURES ARE TO BE INSTALLED PRIOR TO COMMENCEMENT OF CLEARING & GRUBBING WORKS.
- AN AUTHORISED SPOTTER-CATCHER IS TO BE ON SITE PRIOR TO THE COMMENCEMENT OF & DURING THE CLEARING WORK.
- ANY CLEARING REQUIRED TO BE UNDERTAKEN BY THE CONTRACTOR IS TO BE STRICTLY IN ACCORDANCE WITH THE COUNCIL APPROVED VEGETATION MANAGEMENT PLAN.
- THE AREA WITHIN THE LIMITS OF CLEARING SHALL BE CLEARED OF ALL VEGETATION, ALL MINOR MAN-MADE STRUCTURES (SUCH AS FENCES, BUILDING MATERIAL & EXISTING DRIVEWAYS), ALL RUBBISH & OTHER MATERIALS WHICH, IN THE OPINION OF THE SUPERINTENDENT, ARE UNSUITABLE FOR USE IN THE WORKS WITH THE EXCEPTION OF CERTAIN TREES MARKED FOR PRESERVATION.
- TREES ARE TO BE MULCHED & STOCKPILED ON SITE FOR USE IN LANDSCAPING. EXCESS TO BE REMOVED FROM SITE AT CONTRACTORS EXPENSE.
- WHERE PARTS OF TREES CANNOT BE MULCHED, THEY ARE TO BE DISPOSED OF OFF-SITE AT AN APPROVED FACILITY.
- ALL TOPSOIL FROM EARTHWORKS AREA SHALL BE STRIPPED & STOCKPILED PRIOR TO THE COMMENCEMENT OF ANY EARTHWORKS OPERATIONS.
- NOTWITHSTANDING THE LIMITS OF CUTTING & FILLING SHOWN ON THE DRAWINGS, THE ACTUAL LIMITS SHALL BE DETERMINED ON SITE BY THE ENGINEER DURING CONSTRUCTION. FINISHED SURFACE CONTOURS MAY BE ADJUSTED BY WRITTEN DIRECTION OF THE ENGINEER DURING CONSTRUCTION.
- FILL AREAS SHALL BE CONSTRUCTED IN LAYERS NOT EXCEEDING 300mm LOOSE DEPTH. THE FILL MATERIAL SHALL BE COMPACTED TO 95% (MINIMUM) OF THE MAXIMUM DRY DENSITY. TESTING SHALL BE IN ACCORDANCE WITH A.S.1289 (MODIFIED COMPACTION). THE CONTRACTOR SHALL SUPPLY TO THE ENGINEER CERTIFICATION OF THE COMPACTION ACHIEVED.
- ALL EARTHWORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH AS3798 UNDER LEVEL 1 SUPERVISION AND HAVE A FREQUENCY FIELD DENSITY TESTING RECORD IN ACCORDANCE WITH TABLE 8.1 OF AS3798.
- ALL FILL PLACED ON THE SITE IS TO COMPRISE OF ONLY NATURAL EARTH & ROCK & IS TO BE FREE OF ALL CONTAMINANTS (REFER TO THE ENVIRONMENTAL PROTECTION ACT 1994 SECTION 11). NO DEMOLITION MATERIAL IS TO BE USED.
- UNLESS DIRECTED OTHERWISE BY THE SUPERINTENDENT ALL FILL SHALL BE PLACED AT BETWEEN +2% & -2% OF OPTIMUM MOISTURE CONTENT.
- PROPOSED SURFACE CONTOURS ARE DESIGNED FINISHED SURFACE LEVELS. SPOT LEVELS ARE DESIGN FINISHED SURFACE LEVELS.
- ALL NEW WORKS TO MATCH NEATLY WITH EXISTING. THE CONTRACTOR SHALL CONFIRM LOCATION OF ALL EXISTING SERVICES & PROTECT THESE SERVICES DURING CONSTRUCTION. DAMAGED SERVICES SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE.
- ALL OF THE SITE SHALL BE KEPT FREE DRAINING DURING ALL PHASES OF THE PROJECT.
- REFER TO ROAD CROSS SECTIONS FOR BATTER GRADES. WHERE GRADES ARE NOT SPECIFIED:-
FILL - 1 IN 4 CUT - 1 IN 4
- ALL ALLOTMENTS TO BE GRASS SEEDING WITH MINIMUM 80% COVERAGE. SEEDING TO OCCUR WITHIN 7 DAYS OF COMPLETION OF EARTHWORKS.
- FOR TYPICAL RETAINING WALL DETAILS REFER DRG 0105.

ADJACENT
PROPERTY

LEGEND	
	PROPOSED SURFACE CONTOURS
	EXISTING SURFACE CONTOURS
	TOP/TOE OF BATTER
	EARTHWORKS AREA OF FILL
	EARTHWORKS AREA OF CUT
	FUTURE FOOTPATH AS PER IPWEAQ STD DRG RS-065. WIDTH VARIES.
	BUILDING PAD AND LEVEL
	PROPOSED 0.4m - 1.0m HIGH RETAINING WALL
	PROPOSED 1.0m - 1.5m HIGH RETAINING WALL
	PROPOSED 1.5m - 3.0m TWO TIER RETAINING WALL
	NOMINAL KERB LINE
	EXISTING STORMWATER RETICULATION
	EXISTING SEWERAGE RETICULATION
	EXISTING WATER RETICULATION
	EXISTING UNDERGROUND ELECTRICAL RETICULATION
	EXISTING OVERHEAD ELECTRICAL RETICULATION
	EXISTING COMMUNICATIONS RETICULATION
	PROPOSED SWALE DRAIN
	PROPOSED LEVEL SPREADER
	STAGE BOUNDARY
	PROPOSED DUAL OCCUPANCY LOT

CUT / FILL VOLUMES	
CUT	-14,294.744m³
FILL	2,302.670m³
BALANCE (EXPORT)	-11,992.074m³
NOTE: NO TOPSOIL STRIP OF EXISTING AND TOPSOIL RE-SPREAD HAS BEEN APPLIED TO VOLUMES. NO COMPACTION OR BULKING FACTORS HAVE BEEN APPLIED.	

Issue	Description	DR	CH	VE	Date
01	ORIGINAL ISSUE	DK	AS	RM	19.12.2023



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Project Manager	A. SHEPHERD	Grid	MGA (ZONE 56)
Verified	R. MULLIGAN	R.P.E.Q. No: 7850 Date: 31.01.2024	

Project
54 GEORGE ALEXANDER WAY,
COOMERA

Title
BULK EARTHWORKS CUT & FILL
LAYOUT PLAN

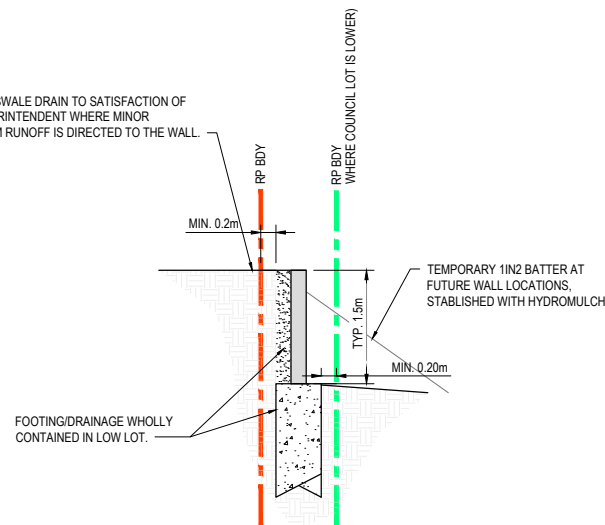
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Project Number
30157884

Issue
01

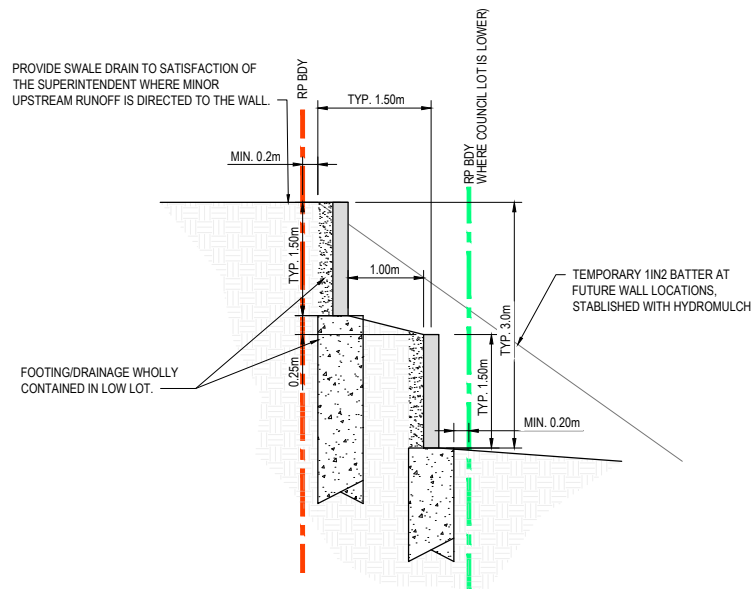
GAW-AAP-BE-00-DRG-CV-0101

PROVIDE SWALE DRAIN TO SATISFACTION OF THE SUPERINTENDENT WHERE MINOR UPSTREAM RUNOFF IS DIRECTED TO THE WALL.

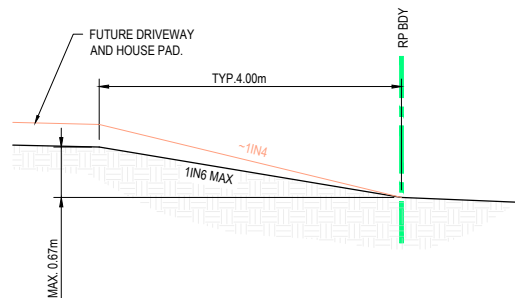


SINGLE TIER RETAINING WALL
CONCRETE SLEEPER
SCALE 1:50

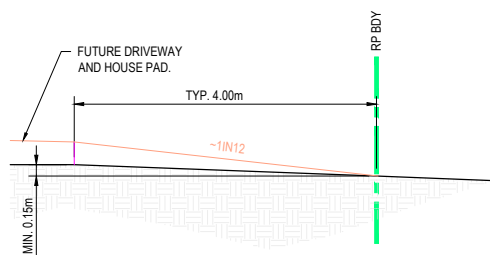
PROVIDE SWALE DRAIN TO SATISFACTION OF THE SUPERINTENDENT WHERE MINOR UPSTREAM RUNOFF IS DIRECTED TO THE WALL.



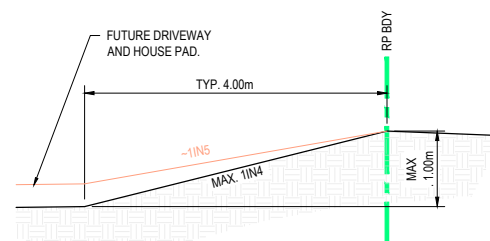
DOUBLE TIER RETAINING WALL (NO REAR SERVICE)
CONCRETE SLEEPER
SCALE 1:50



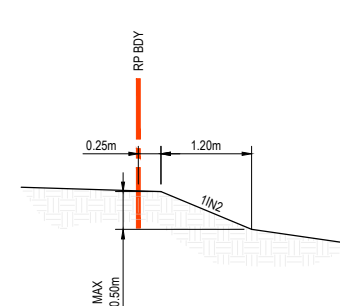
TYPICAL LOT SETBACK
HIGHER THAN VERGE TYPE 2
AT INDICATIVE DRIVEWAY LOCATION
SCALE 1:50



TYPICAL LOT SETBACK
HIGHER THAN VERGE TYPE 1
AT INDICATIVE DRIVEWAY LOCATION
SCALE 1:50



TYPICAL LOT SETBACK
LOWER THAN VERGE
AT INDICATIVE DRIVEWAY LOCATION
SCALE 1:50

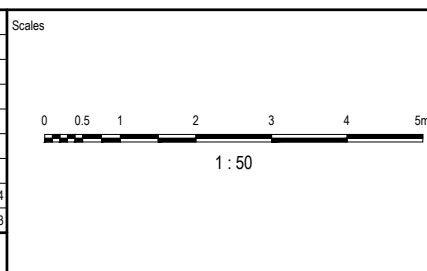


SIDE BOUNDARY BATTER
SCALE 1:50

TYPICAL SLEEPER RETAINING WALL NOTES

- DETAILS SHOWN ARE TYPICAL ONLY AND NOT FOR CONSTRUCTION. CONTRACTOR SHALL PROVIDE DESIGN DRAWINGS AND RPEQ RELEVANT CERTIFICATIONS TO THE SUPERINTENDED 10 WORKING DAYS PRIOR TO THE COUNCIL PRE-START MEETING (CONDITION 15.83). POST CONSTRUCTION CERTIFICATIONS MUST BE PROVIDED WITHIN 5 WORKING DAYS UPON COMPLETION OF THE WALL.
- WALLS SHALL BE DESIGNED IN ACCORDANCE WITH AS4678 AND THE DEVELOPMENT APPROVAL CONDITIONS 'EARTHWORKS - RETAINING STRUCTURES'.
- CONCRETE STANDARD IS AS3600 STANDARD DESIGN EXPOSURE CLASSIFICATION SLEEPERS AND POSTS - B1 AND FOOTINGS - A2.
- A MINIMUM SURCHARGE LOAD OF 10kPa SHALL BE USED WHERE THE RETAINING WALL IS BELOW AND ADJACENT TO ROAD RESERVE AND 5kPa ELSEWHERE. THE DESIGN MUST ALSO CONSIDER ANY CONSTRUCTION LOADING DURING BUILDING CONSTRUCTION.
- WALL SHALL BE DESIGNED TO BRIDGE ANY UNDERGROUND SERVICES, SO AS NOT TO IMPOSE ANY ADDITIONAL LOADINGS.
- ALL WALLS ADJACENT TO PROPERTY BOUNDARIES SHALL BE DESIGNED TO ALLOW FOR AND INSTALLED WITH FENCE BRACKETS. MINIMUM FENCE HEIGHT IS 1.8m EXCEPT WHERE VARIED BY THE CONDITIONS OF APPROVAL.
- SUBSOIL DRAINAGE BEHIND ALL WALLS TO INCLUDE DISCHARGE PIPE INTO THE NEAREST STORMWATER STRUCTURE (OR DEDICATED KERB ADAPTOR) AND BE FREE DRAINING. ALL WALL DRAINAGE LINES DISCHARGING THROUGH LOTS OR ROAD VERGE TO BE SOLID uPVC (NO SLOTS) AND MUST BE FREE DRAINING.
- TEMPORARY SAFETY BARRIER MESH FENCING SHALL BE PROVIDED AND MAINTAINED TO ALL WALLS 1.0m AND GREATER IN HEIGHT.
- RP BDY LINE LOCATIONS APPLY UNLESS NOTED OTHERWISE ON PLAN.
- ALL SLEEPER WALLS TO HAVE DARK GRAY FINISH (PLAIN CONCRETE COLOUR NOT ACCEPTABLE).

02	OPW IR RESPONSE	DK	AS	RM	31.01.2024
01	ORIGINAL ISSUE	DK	AS	RM	19.12.2023
Issue	Description	DR	CH	VE	Date



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Project Manager	A. SHEPHERD	Grid	MGA (ZONE 56)	
Verified	R. MULLIGAN	R.P.E.Q. No: 7850 Date: 31.01.2024		

Project

54 GEORGE ALEXANDER WAY,
COOMERA

Title

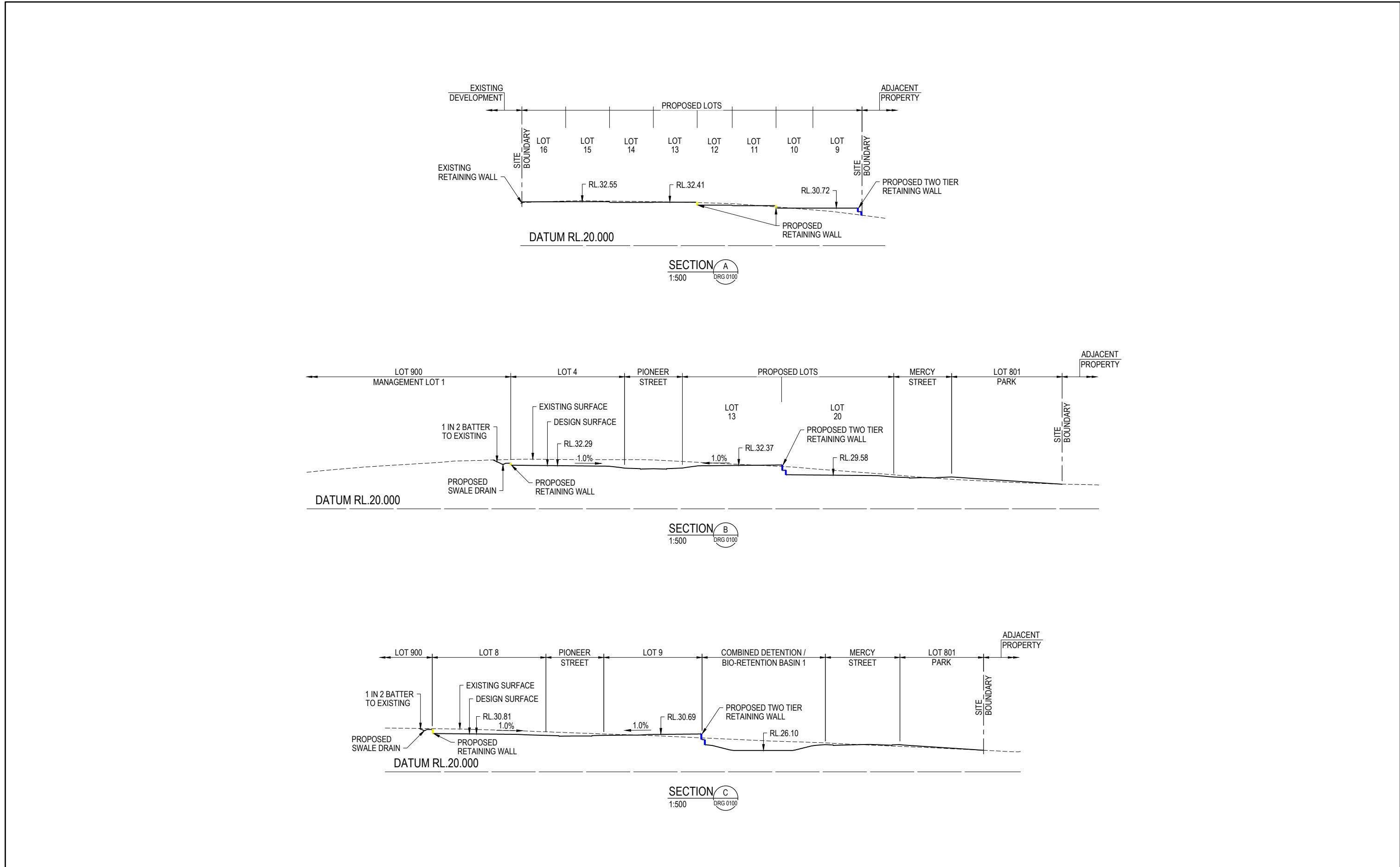
TYPICAL RETAINING
WALL DETAILS

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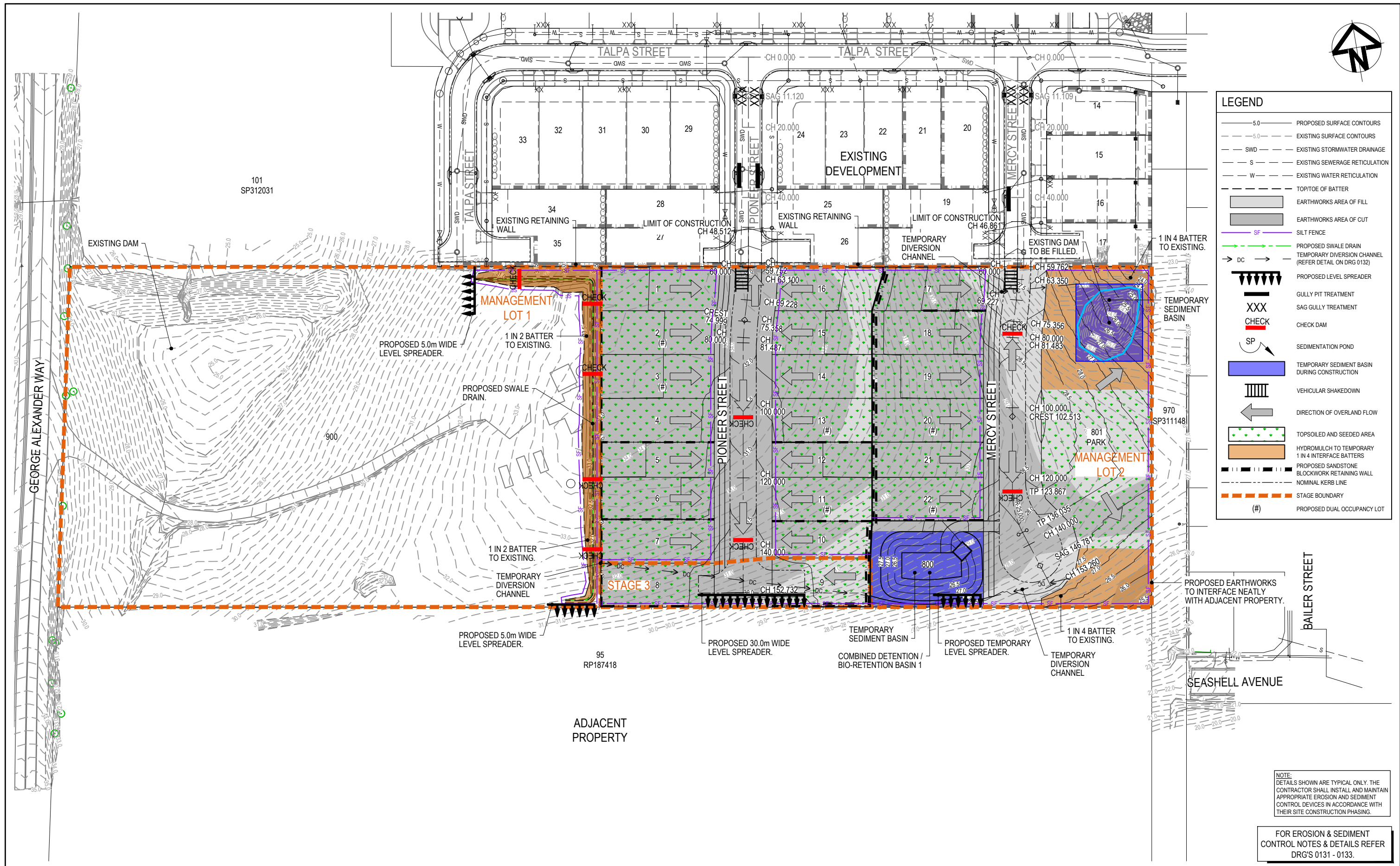
Project Number	30157884
Issue	01

Drawing No.

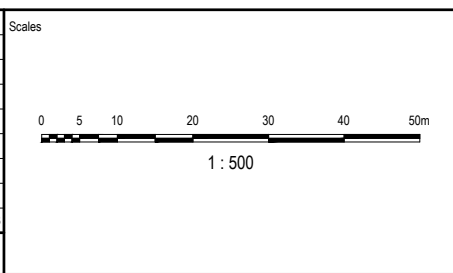
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						Scales 0 5 10 20 30 40 50m 1 : 500		Surveyor SH saunders havill group		Client Coomera GA Pty Ltd ATF The Coomera GA Unit Trust Pty Ltd		Status FOR APPROVAL CONSTRUCTION SUBJECT TO APPROVAL © Copyright reserved Original Issue Signatures Drawn D. KEARNEY Original Size A1 Designed G. GESMUNDO Height Datum AHD Project Manager A. SHEPHERD Grid MGA (ZONE 56) Verified R. MULLIGAN R.P.E.Q. No: 7850 Date 31.01.2024 				Project 54 GEORGE ALEXANDER WAY, COOMERA		ARCADIS Arcadis Australia Pacific Pty Limited Level 7, Seabank Building, 12-14 Marine Parade SOUTHPORT QLD 4215 ABN 76 104 485 289 Tel No: +61 7 5503 4800 www.arcadis.com/au Project Number 30157884 Issue 01 Drawing No. GAW-AAP-BE-00-DRG-CV-0111			
												Title BULK EARTHWORKS SECTIONS									
01 ORIGINAL ISSUE DK AS RM 19.12.2023																					
Issue		Description				DR	CH	VE	Date												



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Project

54 GEORGE ALEXANDER WAY,
COOMERA

Title

EROSION AND SEDIMENT
CONTROL PLAN

Arcadis Australia Pacific Pty Limited
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Project Number

30157884

Issue

01

GAW-AAP-BE-00-DRG-CV-0121

NOTE:
DETAILS SHOWN ARE TYPICAL ONLY. THE
CONTRACTOR SHALL INSTALL AND MAINTAIN
APPROPRIATE EROSION AND SEDIMENT
CONTROL DEVICES IN ACCORDANCE WITH
THEIR SITE CONSTRUCTION PHASING.

FOR EROSION & SEDIMENT
CONTROL NOTES & DETAILS REFER
DRG'S 0131 - 0133.

1. WHEREVER REASONABLE AND PRACTICABLE, STORMWATER RUNOFF ENTERING THE SITE FROM EXTERNAL AREAS, AND NON-SEDIMENT LADEN (CLEAN) STORMWATER RUNOFF ENTERING A WORK AREA OR AREA OF SOIL DISTURBANCE, MUST BE DIVERTED AROUND OR THROUGH THAT AREA IN A MANNER THAT MINIMISES SOIL EROSION AND THE CONTAMINATION OF THAT WATER FOR ALL DISCHARGES UP TO THE SPECIFIED DESIGN STORM DISCHARGE.
2. DURING THE CONSTRUCTION PERIOD, ALL REASONABLE AND PRACTICABLE MEASURES MUST BE IMPLEMENTED TO CONTROL FLOW VELOCITIES IN SUCH A MANNER THAT PREVENTS SOIL EROSION ALONG DRAINAGE PATHS AND AT THE ENTRANCE AND EXIT OF ALL DRAINS AND DRAINAGE PIPES DURING ALL STORMS UP TO THE RELEVANT DESIGN STORM DISCHARGE.
3. TO THE MAXIMUM DEGREE REASONABLE AND PRACTICABLE, ALL WATERS DISCHARGED DURING THE CONSTRUCTION PHASE MUST DISCHARGE ONTO STABLE LAND, IN A NON-EROSIVE MANNER, AND AT A LEGAL POINT OF DISCHARGE.
4. DURING THE CONSTRUCTION PERIOD, ROOF WATER MUST BE MANAGED IN A MANNER THAT MINIMISES SOIL EROSION THROUGHOUT THE SITE, AND SITE WITNESS WITHIN ACTIVE WORK AREAS.

1. CLEAR THE LOCATION FOR THE CHANNEL, CLEARING ONLY WHAT IS NEEDED TO PROVIDE ACCESS FOR PERSONNEL AND CONSTRUCTION EQUIPMENT.
2. REMOVE ROOTS, STUMPS, AND OTHER DEBRIS AND DISPOSE OF THEM PROPERLY. DO NOT USE DEBRIS TO BUILD ANY ASSOCIATED EMBANKMENTS.
3. EXCAVATE THE CHANNEL TO THE SPECIFIED SHAPE, ELEVATION AND GRADIENT (1% MIN). THE SIDES OF THE CHANNEL SHOULD BE NO STEEPER THAN A 2:1 (H:V) IF CONSTRUCTED IN EARTH, UNLESS SPECIFICALLY DIRECTED WITHIN THE APPROVED PLANS.
4. STABILISE THE CHANNEL AND BANKS IMMEDIATELY UNLESS IT WILL OPERATE FOR LESS THAN 30 DAYS. IN EITHER CASE, TEMPORARY EROSION PROTECTION (MATTING, ROCK, TURF, ETC.) WILL BE REQUIRED AS SPECIFIED WITHIN THE APPROVED PLANS OR AS DIRECTED.
5. IF THE CHANNEL IS CUT INTO A DISPERSIVE (SODIC) SOIL, THE EXPOSED DISPERSIVE SOIL MUST BE COVERED AND MAINTAINED WITH A MINIMUM 200mm THICK LAYER OF NON-DISPERSIVE SOIL PRIOR TO PLACEMENT OF EROSION PROTECTION MEASURES.
6. ENSURE THE CHANNEL DISCHARGES TO A STABLE AREA SUCH THAT SOIL EROSION WILL BE PREVENTED. SPECIFICALLY, ENSURE THE DRAIN DOES NOT DISCHARGE TO AN UNSTABLE FILL SLOPE.

1. THE APPLICATION OF LIQUID-BASED SOIL SUPPRESSION MEASURES MUST ENSURE THAT SEDIMENT-LADEN RUNOFF RESULTING FROM SUCH MEASURES DOES NOT CREATE A TRAFFIC OR ENVIRONMENTAL HAZARD.
2. ALL TEMPORARY EARTH BANKS, FLOW DIVERSION SYSTEMS, AND EMBANKMENTS ASSOCIATED WITH CONSTRUCTED SEDIMENT BASINS MUST BE MACHINE-COMPACTED, SEEDED AND MULCHED FOR THE PURPOSE OF ESTABLISHING A TEMPORARY VEGETATIVE COVER WITHIN 10 DAYS AFTER GRADING.
3. UNPROTECTED SLOPE LENGTHS MUST NOT EXCEED 80M, OR AN EQUIVALENT VERTICAL FALL OF 3M.
4. THE CONSTRUCTION AND STABILISATION OF EARTH BATTERS STEEPER THAN 6:1 (H:V) MUST BE STAGED SUCH THAT NO MORE THAN 3 VERTICAL-METRES OF ANY BATTER IS EXPOSED TO RAINFALL AT ANY INSTANT.
5. SYNTHETIC REINFORCED EROSION CONTROL MATS AND BLANKETS MUST NOT BE PLACED WITHIN, OR ADJACENT TO, RIPARIAN ZONES AND WATERCOURSES IF SUCH MATERIALS ARE LIKELY TO CAUSE ENVIRONMENTAL HARM TO WILDLIFE OR WILDLIFE HABITATS.
6. A MINIMUM 60% GROUND COVER MUST BE ACHIEVED ON ALL NON-COMPLETED EARTHWORKS EXPOSED TO ACCELERATED SOIL EROSION IF FURTHER CONSTRUCTION ACTIVITIES OR SOIL DISTURBANCES ARE LIKELY TO BE SUSPENDED FOR MORE THAN 30 DAYS DURING THOSE MONTHS WHEN THE EXPECTED RAINFALL IS LESS THAN 30mm; MINIMUM 70% COVER WITHIN 30 DAYS IF BETWEEN 30 AND 45mm; MINIMUM 70% COVER WITHIN 20 DAYS IF BETWEEN 45 AND 100mm; MINIMUM 75% COVER WITHIN 10 DAYS IF BETWEEN 100 AND 225mm; AND MINIMUM 80% COVER WITHIN 5 DAYS IF GREATER THAN 225mm. (ALTERNATIVE TO ABOVE)

1. EROSION CONTROL MATS MUST BE STORED AWAY FROM DIRECT SUNLIGHT OR COVERED WITH ULTRAVIOLET PROTECTIVE SHEETING UNTIL THE SITE IS READY FOR THEIR INSTALLATION.
2. VEHICLES AND CONSTRUCTION EQUIPMENT MUST NOT BE PERMITTED TO MANEUVER OVER THE MATTING UNLESS IT HAS BEEN COVERED WITH A LAYER OF SOIL OR GRAVEL AT LEAST 150mm THICK.
3. IF THE CHANNEL IS TO BE GRASSED, PREPARE A SMOOTH SEED BED OF APPROXIMATELY 75mm OF TOPSOIL, SEED, FERTILISE, WATER AND RAKE TO REMOVE ANY REMAINING SURFACE IRREGULARITIES.
4. EXCAVATE A 300mm DEEP BY 150mm WIDE ANCHOR TRENCH ALONG THE FULL WIDTH OF THE UPSTREAM END OF THE AREA TO BE TREATED.
5. AT LEAST 300mm OF THE MAT MUST BE ANCHORED INTO THE TRENCH WITH THE ROLL OF MATTING RESTING ON THE GROUND UP-SLOPE OF THE TRENCH.
6. WHEN SPREADING THE MATS, AVOID STRETCHING THE FABRIC. THE MATS SHOULD REMAIN IN GOOD CONTACT WITH THE SOIL.
7. THE INSTALLATION PROCEDURE MUST ENSURE THAT THE MAT ACHIEVES AND RETAINS GOOD CONTACT WITH THE SOIL.
8. DAMAGED MATTING MUST BE REPAIRED OR REPLACED.

1. TURF SHOULD BE USED WITHIN 12 HOURS OF DELIVERY, OTHERWISE ENSURE THE TURF IS STORED IN CONDITIONS APPROPRIATE FOR THE WEATHER CONDITIONS (e.g. A SHADED AREA).
2. MOISTENING THE TURF AFTER IT IS UNROLLED WILL HELP MAINTAIN ITS VIABILITY.
3. TURF SHOULD BE LAID ON A MINIMUM 75mm BED OF ADEQUATELY FERTILISED TOPSOIL. RAKE THE SOIL SURFACE TO BREAK THE CRUST JUST BEFORE LAYING THE TURF.
4. DURING THE WARMER MONTHS, LIGHTLY IRRIGATE THE SOIL IMMEDIATELY BEFORE LAYING THE TURF.
5. ENSURE THE TURF IS NOT LAID ON GRAVEL, HEAVILY COMPACTED SOILS, OR SOILS THAT HAVE BEEN RECENTLY TREATED WITH HERBICIDES.
6. ENSURE THE TURF EXTENDS UP THE SIDES OF THE DRAIN AT LEAST 100mm ABOVE THE ELEVATION OF THE CHANNEL INVERT, OR AT LEAST TO A SUFFICIENT ELEVATION TO FULLY CONTAIN EXPECTED CHANNEL FLOW.
7. ON CHANNEL GRADIENTS OF 3:1(H:V) OR STEEPER, OR IN SITUATIONS WHERE HIGH FLOW VELOCITIES (i.e. VELOCITY >1.5m/s) ARE LIKELY WITHIN THE FIRST TWO WEEK FOLLOWING PLACEMENT, SECURE THE INDIVIDUAL TURF STRIPS WITH WOODEN OR PLASTIC PEGS.
8. ENSURE THAT INTIMATE CONTACT IS ACHIEVED AND MAINTAINED BETWEEN THE TURF AND THE SOIL SUCH THAT SEEPAGE FLOW BENEATH THE TURF IS AVOIDED.
9. WATER UNTIL THE SOIL IS WET 100mm BELOW THE TURF. THEREAFTER, WATERING SHOULD BE SUFFICIENT TO MAINTAIN AND PROMOTE HEALTHY GROWTH.

1. ALL ROCK MUST BE HARD, WEATHER RESISTANT, AND DURABLE AGAINST DISINTEGRATION UNDER CONDITIONS TO BE MET IN HANDLING, PLACEMENT AND OPERATION.
2. ALL ROCK MUST HAVE ITS GREATEST DIMENSION NOT GREATER THAN 3 TIMES ITS LEAST DIMENSIONS.
3. THE ROCK USED IN FORMATION OF THE DRAIN MUST BE EVENLY GRADED WITH 50% BY WEIGHT LARGER THAN THE SPECIFIED NOMINAL ROCK SIZE AND HAVE SUFFICIENT SMALL ROCK TO FILL THE VOIDS BETWEEN THE LARGER ROCK, DIRT, FINES, AND SMALLER ROCK MUST NOT EXCEED 5% BY WEIGHT.
4. THE DIAMETER OF THE LARGEST ROCK SIZE SHOULD BE NO LARGER THAN 1.5 TIMES THE NOMINAL ROCK SIZE. SPECIFIC GRAVITY TO BE AT LEAST 2.5.
5. FILTER CLOTH GEOTEXTILE FABRIC: HEAVY-DUTY, NEEDLE-PUNCHED, NON-WOVEN FILTER CLOTH, MINIMUM 'BIDIM A24 OR EQUIVALENT.
6. PRIOR TO PLACEMENT, ALL ROCKS MUST BE VISUALLY CHECKED FOR SIZE, ELONGATION, CRACKS, DETEIORATION AND OTHER VISIBLE DEFECTS. THE DEGREE AND THOROUGHNESS OF SUCH CHECKING MUST BE APPROPRIATE FOR THE POTENTIAL CONSEQUENCES ASSOCIATED WITH FAILURE OF THE STRUCTURE OR PURPOSE FOR WHICH THE MATERIAL WILL BE USED.
7. IF A FILTER CLOTH UNDERLAY IS SPECIFIED, PLACE THE FILTER FABRIC DIRECTLY ON THE PREPARED FOUNDATION. IF MORE THAN ONE SHEET OF FILTER CLOTH IS REQUIRED OVER THE AREA, OVERLAP THE EDGE OF EACH SHEET AT LEAST 300mm, AND SECURE ANCHOR PINS AT MINIMUM 1M SPACING ALONG THE OVERLAP.
8. ENSURE THE FILTER CLOTH IS PROTECTED FROM PUNCHING OR TEARING DURING INSTALLATION OF THE FABRIC AND THE ROCK. REPAIR ANY DAMAGE BY REMOVING THE ROCK AND REPLACING WITH ANOTHER PIECE OF FILTER CLOTH OVER THE DAMAGED AREA OVERLAPPING THE EXISTING FABRIC A MINIMUM OF 300mm.
9. PLACEMENT OF ROCK SHOULD FOLLOW IMMEDIATELY AFTER PLACEMENT OF THE FILTER LAYER. PLACE ROCK SO THAT IT FORMS A DENSE, WELL-GRADED MASS OF ROCK WITH A MINIMUM OF VOIDS.
10. PLACE ROCK LINING TO THE EXTENT AND DEPTH INDICATED WITHIN THE APPROVED PLANS.
11. ENSURE THE ROCK IS PLACED IN AN APPROPRIATE MANNER TO AVOID DISPLACING UNDERLYING MATERIALS OR PLACING UNDUE IMPACT FORCE ON THE BEDDING MATERIALS.
12. ENSURE THE ROCK IS PLACED WITH A MINIMUM THICKNESS OF 1.5 TIMES THE NOMINAL ROCK SIZE (D50).
13. ENSURE MATERIALS THAT ARE 50 AND LARGER ARE POSITIONED FLUSH WITH THE TOP SURFACE WITH FACES AND SHAPES MATCHED TO MINIMISE VOIDS.
14. ENSURE PROJECTIONS ABOVE OR DEPRESSIONS UNDER THE SPECIFIED TOP SURFACE ARE LESS THAN 20% OF THE ROCK LAYER THICKNESS. THE AVERAGE SURFACE PLANE OF THE FINISHED ROCK IS DEFINED AS THE PLANE WHERE 50% OF THE TOPS OF ROCKS WOULD CONTACT.
15. ENSURE THE COMPLETED CHANNEL HAS SUFFICIENT DEPTH (AS SPECIFIED FOR THE TYPE OF CHANNEL) MEASURED FROM THE CHANNEL INVERT (AVERAGE SURFACE PLANE ALONG CHANNEL INVERT) TO THE TOP OF THE EMBANKMENT. THE AVERAGE SURFACE PLANE OF THE FINISHED ROCK IS DEFINED AS THE PLANE WHERE 50% OF THE TOPS OF ROCKS WOULD CONTACT.
16. TO THE MAXIMUM DEGREE PRACTICABLE, THE MATERIAL BETWEEN LARGER ROCK MUST NOT BE LOOSE OR EASILY DISPLACED BY THE EXPECTED FLOW.
17. AFTER PLACEMENT OF THE ROCK LINING, ENSURE THE DRAIN HAS A CONSTANT FALL IN THE DESIRED DIRECTION FREE OF OBSTRUCTIONS.

1. **ROCK:** 150 TO 300mm EQUIVALENT DIAMETER HARD EROSION RESISTANT ROCK.
2. **RECYCLED CONCRETE:** 150 TO 300mm EQUIVALENT DIAMETER FREE FROM FINES AND CEMENT DUST.
3. **SANDBAGS:** GEOTEXTILE BAGS (WOVEN SYNTHETIC, OR NON-WOVEN BIODEGRADABLE) FILLED WITH CLEAN COARSE SAND, CLEAN AGGREGATE, OR COMPOST.

1. PRIOR TO PLACEMENT OF THE SEDIMENT TRAP, ENSURE THE DRAINAGE CHANNEL IS DEEP ENOUGH TO PREVENT WATER BEING UNSAFELY DIVERTED OUT OF THE DRAIN ONCE THE CHECK DAMS ARE INSTALLED.
2. LOCATE EACH CHECK DAM SEDIMENT TRAP AS DIRECTED WITHIN THE APPROVED PLANS, OR OTHERWISE AT SUCH A SPACING TO ACHIEVE THE REQUIRED SEDIMENT TRAPPING OUTCOMES. REFER DETAIL.
3. PLACE EACH CHECK DAM SEDIMENT TRAP TO THE LINES AND PROFILE SHOWN IN THE APPROVED PLAN OR AS DIRECTED BY THE SITE SUPERVISOR.

1. THE OUTLET SILL OF THE SPREADER SHOULD BE PROTECTED WITH EROSION CONTROL MATTING TO PREVENT EROSION DURING THE ESTABLISHMENT OF VEGETATION. THE MATTING SHOULD BE A MINIMUM OF 1200mm WIDE EXTENDING AT LEAST 300mm UPSTREAM OF THE EDGE OF THE OUTLET CREST AND BURIED AT LEAST 150mm IN A VERTICAL TRENCH. THE DOWNSTREAM EDGE SHOULD BE SECURELY HELD IN PLACE WITH CLOSELY SPACED HEAVY-DUTY WIRE STAPLES AT LEAST 150mm LONG.
2. ENSURE THAT THE OUTLET SILL (CREST) IS LEVEL FOR THE SPECIFIED LENGTH.
3. IMMEDIATELY AFTER CONSTRUCTION, TURF, OR SEED AND MULCH WHERE APPROPRIATE, THE LEVEL SPREADER.

1. OPTIMUM BENEFIT MUST BE MADE OF EVERY OPPORTUNITY TO TRAP SEDIMENT WITHIN THE WORK SITE, AND AS CLOSE AS PRACTICABLE TO ITS SOURCE.
2. SEDIMENT TRAPS MUST BE INSTALLED AND OPERATED TO BOTH COLLECT AND RETAIN SEDIMENT.
3. THE POTENTIAL SAFETY RISK OF A PROPOSED SEDIMENT TRAP TO SITE WORKERS AND THE PUBLIC MUST BE GIVEN APPROPRIATE CONSIDERATION, ESPECIALLY THOSE DEVICES LOCATED WITHIN PUBLICLY ACCESSIBLE AREAS.
4. ALL REASONABLE AND PRACTICABLE MEASURES MUST BE TAKEN TO PREVENT, OR AT LEAST MINIMISE, THE RELEASE OF SEDIMENT FROM THE SITE.
5. SUITABLE ALL-WEATHER MAINTENANCE ACCESS MUST BE PROVIDED TO ALL SEDIMENT CONTROL DEVICES.

1. SEDIMENT FENCE TO BE INSTALLED ALONG A LINE OF CONSTANT GROUND ELEVATION WHEREVER PRACTICAL.
2. BOTH ENDS 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 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 DEPENDING ON SLOPE.
5. MINIMUM 4 STAPLES OR TIE WIRES PER STAKE.

1. 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%).

2. FABRIC REINFORCEMENTS: WIRE OR STEEL MESH MINIMUM 14-GAUGE WITH A MAXIMUM MESH SPACING OF 200mm.
3. SUPPORT POSTS/STAKES: 1500mm² (MIN.) HARDWOOD, 2500mm² (MIN.) SOFTWOOD, OR 1.5kg/m (MIN) STEEL STAR PICKETS WITH SAFETY CAPS SUITABLE FOR ATTACHING FABRIC.

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 ABOVE 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.

1. ENSURE THAT THE INSTALLATION OF THE SEDIMENT TRAP WILL NOT CAUSE UNDESIRABLE SAFETY OR FLOODING ISSUES.
2. WHERE POSSIBLE, EXCAVATE A 200x200mm TRENCH AROUND THE INLET STRUCTURE.
3. SPACE STAKES EVENLY AROUND THE PERIMETER OF THE STORMWATER INLET AT A MAXIMUM 1m SPACING AND SECURELY DRIVE THEM INTO THE GROUND.
4. WHERE NECESSARY, INSTALL A HORIZONTAL SPILL-THROUGH WEIR TO LIMIT THE MAXIMUM HEIGHT WATER PONDING AROUND THE STRUCTURE.
5. ENSURE THE MAXIMUM POND HEIGHT WILL NOT CAUSE A SAFETY HAZARD, INCLUDING UNDESIRABLE FLOODING OF AN ADJACENT PROPERTY OR ROADWAY. WHEREVER PRACTICAL, THE SPILL-THROUGH WEIR SHOULD BE AT LEAST 300mm ABOVE GROUND LEVEL.
6. IF A SPILL THROUGH WEIR IS NOT INSTALLED, THEN FRAME THE TOP OF THE STAKES WITH HORIZONTAL CROSS MEMBERS.
7. CUT FABRIC FROM A CONTINUOUS ROLL TO ELIMINATE JOINTS.
8. PLACE THE BOTTOM 300mm OF FABRIC IN THE EXCAVATED TRENCH
9. SECURELY FASTEN THE FABRIC TO THE STAKES AND CROSS MEMBERS AT THE FABRIC JOINT, OVERLAP THE FABRIC TO THE NEXT STAKE.
10. BACKFILL THE TRENCH WITH AT LEAST 200mm OF AGGREGATE OR COMPACTED SOIL. IF A TRENCH CANNOT BE EXCAVATED, LAY THE BOTTOM 300mm OF FABRIC EVENLY ON THE GROUND SURFACE AND COVER WITH A 300mm LAYER OF AGGREGATE, NOT EARTH OR SOIL.
11. WHERE REQUIRED, INSTALL A FLOW CONTROL BUND TO MAINTAIN THE SPECIFIED POOL DEPTH AND CONTROL THE MOVEMENT OF WATER.
12. TAKE ALL NECESSARY MEASURES TO MINIMISE THE SAFETY RISK CAUSED BY THE STRUCTURE AND TO PREVENT UNSAFE ENTRY INTO THE STORMWATER INLET.

1. REMOVE ALL VEGETATION AND TOPSOIL FROM UNDER THE DAM WALL AND FROM WITHIN THE STORAGE AREA.
2. PREPARE THE SITE UNDER THE EMBANKMENT BY RIPPING AT LEAST 100mm TO HELP BOND COMPACTED FILL TO THE EXISTING SUBSTRATE.
3. FOR EARTH EMBANKMENT MATERIAL TYPE AND COMPACTION REFER TO DTMR SPECIFICATION MRTS04 SECTION 14.2.6 - WATER RETAINING EMBANKMENTS.
4. CONSTRUCT EMERGENCY SPILLWAY.
5. INSTALL MARKER POST SHOWING MAXIMUM STORAGE AND SETTLING ZONE VOLUMES.
6. AS-CONSTRUCTED PLANS MUST BE PREPARED FOR ALL CONSTRUCTED SEDIMENT BASINS AND ASSOCIATED EMERGENCY SPILLWAYS. SUCH PLANS MUST APPROPRIATELY VERIFY THE BASIN'S DIMENSIONS, LEVELS AND VOLUMES, AND MUST BE SUBMITTED TO THE RELEVANT REGULATORY AUTHORITY WITHIN 14 CALENDAR DAYS OF THE CONSTRUCTION OF EACH BASIN.
7. BASINS SHOULD BE APPROPRIATELY FENCED AND MARKED BY WARNING SIGNS IF UNSUPERVISED PUBLIC ACCESS IS LIKELY AND PUBLIC SAFETY IS AT RISK.

1. ALL DRAINAGE, EROSION AND SEDIMENT CONTROL MEASURES MUST BE INSPECTED:
 - (i) AT LEAST DAILY (WHEN WORK IS OCCURRING ON-SITE);
 - (ii) AT LEAST WEEKLY (WHEN WORK IS NOT OCCURRING ON-SITE);
 - (iii) WITHIN 24 HOURS OF EXPECTED RAINFALL; AND

- (iv) WITHIN 18 HOURS OF A RAINFALL EVENT OF SUFFICIENT INTENSITY AND DURATION TO CAUSE RUNOFF ON-SITE).
- WHERE MORE THAN 2,500m² OF LAND ARE DISTURBED, A SELF AUDITING PROGRAM MUST BE DEVELOPED FOR THE SITE. A SITE INSPECTION SELF AUDIT AND MONITORING PROGRAM MUST BE UNDERTAKEN BY THE LAND DEVELOPER OR AS DELEGATED IN ADDITION TO THE ABOVE FOR THE FOLLOWING:

- IMMEDIATELY BEFORE SITE CLOSURE\
- IMMEDIATELY FOLLOWING RAINFALL EVENTS THAT CAUSE RUN-OFF.

2. INSPECTION SHALL BE CONDUCTED IN LINE WITH THE FOLLOWING AS A MINIMUM:
 - i) RECORD TYPE OF DEVICE/CONTROL MEASURE BEING INSPECTED AND ITS LOCATION;
 - ii) RECORD THE CONDITION OF EACH DEVICE/CONTROL MEASURE BEING INSPECTED;
 - iii) RECORD MAINTENANCE REQUIREMENTS FOR DEVICE/CONTROL MEASURE BEING INSPECTED;
 - iv) RECORD SEDIMENT VOLUMES REMOVED FROM DEVICE/CONTROL MEASURE BEING INSPECTED;
 - v) RECORD DETAILS OF SEDIMENT BASIN TREATMENT, FLOCCULANT DOSAGE AND CLEANOUTS;
 - vi) RECORD SEDIMENT DISPOSAL PROCEDURES AND LOCATION;
3. ALL DRAINAGE, EROSION AND SEDIMENT CONTROL MEASURES MUST BE MAINTAINED IN PROPER WORKING ORDER AT ALL TIMES DURING THEIR OPERATIONAL LIVES.
4. SEDIMENT CONTROL DEVICES MUST BE DE-SILTED AND MADE FULLY OPERATIONAL AS SOON AS REASONABLE AND PRACTICABLE AFTER A SEDIMENT-PRODUCING EVENT, WHETHER NATURAL OR ARTIFICIAL. IF THE DEVICE'S SEDIMENT RETENTION CAPACITY FALLS BELOW 75% OF ITS DESIGN RETENTION CAPACITY, DE-SILT SEDIMENT TRAP IF THE SEDIMENT LEVEL EXCEEDS 1/3 OF THE CREST HEIGHT.
5. MATERIALS, WHETHER LIQUID OR SOLID, REMOVED FROM SEDIMENT CONTROL DEVICES DURING MAINTENANCE OR DECOMMISSIONING, MUST BE DISPOSED OF IN A MANNER THAT DOES NOT CAUSE ONGOING SOIL EROSION OR ENVIRONMENTAL HARM.
6. ALL WATER QUALITY DATA, INCLUDING DATES OF RAINFALL, DATES OF TESTING, TESTING RESULTS AND DATES OF WATER RELEASE, MUST BE KEPT IN AN ON-SITE REGISTER. THE REGISTER IS TO BE MAINTAINED UP TO DATE FOR THE DURATION OF THE APPROVED WORKS AND BE AVAILABLE ON-SITE FOR INSPECTION BY THE RELEVANT REGULATORY AUTHORITY ON REQUEST.
7. AT NOMINATED INSTREAM WATER MONITORING SITES, A MINIMUM OF 3 WATER SAMPLES MUST BE TAKEN AND ANALYSED, AND THE AVERAGE RESULT USED TO DETERMINE QUALITY.
8. ALL ENVIRONMENTALLY RELEVANT INCIDENTS MUST BE RECORDED IN A FIELD LOG THAT MUST REMAIN ACCESSIBLE TO ALL RELEVANT REGULATORY AUTHORITIES.
9. WASHING/FLUSHING OF SEALED ROADWAYS MUST ONLY OCCUR WHERE SWEEPING HAS FAILED TO REMOVE SUFFICIENT SEDIMENT AND THERE IS A COMPELLING NEED TO REMOVE THE REMAINING SEDIMENT (E.G. FOR SAFETY REASONS). IN SUCH CIRCUMSTANCES, ALL REASONABLE AND PRACTICABLE SEDIMENT CONTROL MEASURES MUST BE USED TO PREVENT, OR AT LEAST MINIMISE, THE RELEASE OF SEDIMENT INTO RECEIVING WATERS. ONLY THOSE MEASURES THAT WILL NOT CAUSE SAFETY AND PROPERTY FLOODING ISSUES SHALL BE EMPLOYED. SEDIMENT REMOVED FROM ROADWAYS MUST BE DISPOSED OF IN A LAWFUL MANNER THAT DOES NOT CAUSE ONGOING SOIL EROSION OR ENVIRONMENTAL HARM.
10. ALL SEEDING, HYDROSEEDING AND TURFING REQUIRES REGULAR WATERING UNTIL EFFECTIVE COVER IS ESTABLISHED AND PLANTS ARE GROWING VIGOROUSLY. WATERING SHOULD DEPEND ON WEATHER AND SOIL CONDITIONS. WATERING SHOULD START IMMEDIATELY AFTER PLANTING AND SHOULD COMPLY WITH THE FOLLOWING AS A MINIMUM:
 - a) WEEK 1 3 WATERINGS PER WEEK
 - ii) WEEK 2-6 2 WATERINGS PER WEEK
 - iii) WEEK 7-12 1 WATERING PER WEEK
11. MAINTENANCE MOWING OF ALL ROAD SHOULDERS, TABLE DRAINS, BATTERS AND OTHER SURFACES LIKELY TO EXPERIENCE ACCELERATED SOIL EROSION MUST AIM TO LEAVE THE GRASS LENGTH NO SHORTER THAN 50mm WHERE REASONABLE AND PRACTICABLE.
12. MAINTENANCE MOWING MUST BE DONE IN A MANNER THAT WILL NOT DAMAGE THE PROFILE OF FORMED, SLOP EDGES, SUCH AS THE CREST OF EARTH EMBANKMENTS.

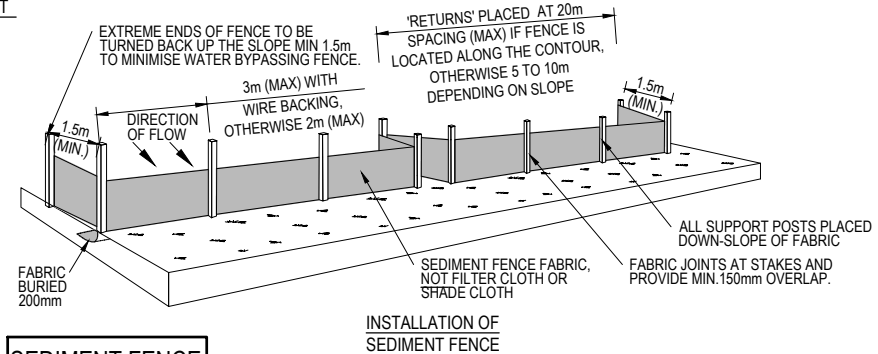
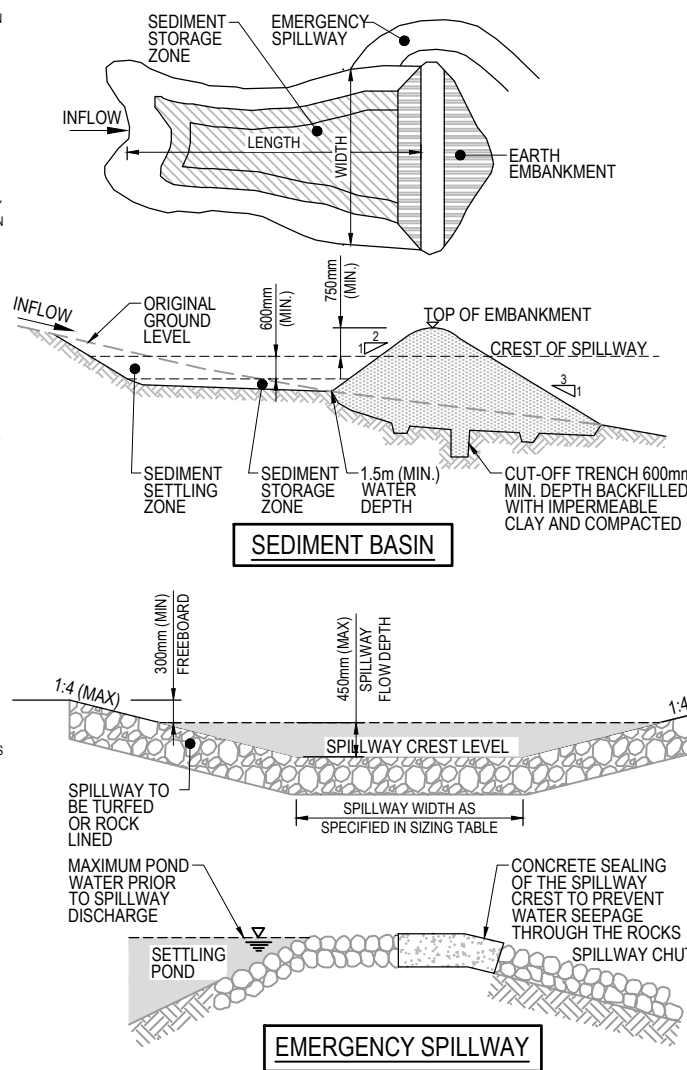
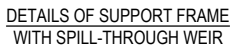
2. CONSTRUCTED SEDIMENT BASINS MUST BE MAINTAINED AND FULLY OPERATIONAL THROUGHOUT THE CONSTRUCTION PERIOD AND UNTIL EACH BASIN'S CATCHMENT AREA ACHIEVES 80% GROUND COVER ON ALL SOIL SURFACES.
3. SETTLED SEDIMENT MUST BE REMOVED FROM SEDIMENT BASINS WHEN THE VOLUME OF THE SEDIMENT EXCEEDS THE DESIGNATED SEDIMENT STORAGE VOLUME, OR THE DESIGN MAXIMUM SEDIMENT STORAGE ELEVATION.
4. SEDIMENT BASIN WATER QUALITY SAMPLES MUST BE TAKEN AT A DEPTH NO GREATER THAN 200mm ABOVE THE LEVEL OF SETTLED SEDIMENT BY A SUITABLY QUALIFIED PERSON. WATER TESTING TO BE UNDERTAKEN USING EITHER A HANDHELD PH/TURBIDITY METER OR SAMPLES COLLECTED FOR LABORATORY TESTING PRIOR TO BASIN DewaterING. ALL LABORATORY TESTING TO BE UNDERTAKEN BY A NATA ACCREDITED LABORATORY.
5. ALL WATER PUMPED FROM THE SEDIMENT BASIN SHALL BE TESTED FOR ENVIRONMENTAL COMPLIANCE AGAINST THE RELEASE CRITERIA IN THE TABLE BELOW (AS A MINIMUM), UNLESS ALTERNATIVE (MORE STRINGENT) STANDARDS ARE SPECIFIED BY THE LOCAL AUTHORITY PRIOR TO RELEASE.

PARAMETER	RELEASE CRITERIA
SUSPENDED SOLIDS	50mg/l MAX
pH	WITHIN RANGE 6.5-8.5
TURBIDITY	60NTU MAX

6. THE SEDIMENT BASIN SHALL BE TREATED BY FLOCCULATION AFTER ALL RAINFALL EVENTS (> 5mm) USING GYPSUM OR ALUM. MANUAL DOSEAGE OF BASIN SHALL BE UNDERTAKEN USING A MINIMUM RATE OF 32kg/100m³ FOR GYPSUM AND 1.5-8kg/100m³ FOR ALUM. HIGHER DOSEAGE MAY BE REQUIRED DEPENDING ON SOIL TYPE AND APPLICATION TECHNIQUE. ALUM SHALL NOT BE USED WHERE THE CATCHMENT DISCHARGES DIRECTLY TO A WATERWAY.
7. THE CHOSEN FLOCCULANT SHALL BE SPREAD EVENLY OVER THE BASIN SURFACE AREA. THE BASIN WILL REQUIRE A PUMP SYSTEM TO SPRAY SLURRY OF FLOCCULANTS OVER SURFACE AT AN ANGLE OF 10°-20°.
8. THE TREATED BASIN SHALL BE DEWATERED WITH A PUMP SYSTEM WITH A FLOATING INLET TO ENSURE SETTLED SEDIMENT IS NOT ENTRAINED AND DISCHARGED. BASIN DEWATERING SHALL OCCUR WITHIN 5 DAYS FROM CONCLUSION OF RAINFALL EVENT.

1. ALL DISTURBED AREAS IDENTIFIED AS VERY LOW, LOW, MEDIUM, HIGH OR EXTREME EROSION RISK MUST BE SUITABLY STABILISED WITHIN 60, 30, 20, 10 OR 5 DAYS RESPECTIVELY, OR PRIOR TO ANTICIPATED RAINFALL, WHICHEVER IS THE GREATER, FROM THE DAY THAT SOIL DISTURBANCES ON THE AREA HAVE BEEN FINALISED.
2. THE TYPE OF GRASS COVER APPLIED TO COMPLETED EARTHWORKS SHOULD BE COMPATIBLE WITH THE ANTICIPATED LONG-TERM LAND USE, ENVIRONMENTAL RISK, AND SITE REHABILITATION MEASURES.
3. UNLESS OTHERWISE DIRECTED BY SUPERINTENDENT OR WHERE DIRECTED BY THE APPROVED REVEGETATION PLAN, TOPSOIL MUST BE PLACED AT A MINIMUM DEPTH OF 75mm ON SLOPES 4:1 (H:V) OR

- THE PH LEVEL (SOIL:WATER 1:5) OF TOPSOIL MUST BE ADEQUATE TO ENABLE ESTABLISHMENT AND GROWTH OF THE SPECIFIED VEGETATION.
5. SOIL AMELIORANTS MUST BE ADDED TO THE SOIL IN ACCORDANCE WITH THE APPROVED LANDSCAPE/REVEGETATION PLANS AND/OR SOIL ANALYSIS.
6. SOIL DENSITY/COMPACTION MUST BE ADJUSTED PRIOR TO SEEDING/PLANTING IN ACCORDANCE WITH THE RELEVANT SPECIFICATIONS, SOIL REPORT AND/OR APPROPRIATE REFERENCE PLANS.
7. ALL UNSTABLE OR DISTURBED SOIL SURFACES MUST BE ADEQUATELY STABILISED AGAINST EROSION TO ACHIEVE A C-FACTOR OF 0.15 OR LESS AS DEFINED BY "MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION" LANDCOM 4TH EDITION, 2004 APPENDIX M. THIS EQUATES TO MINIMUM 50% GRASS COVER IF SOIL HAS BEEN RECENTLY DISTURBED ON ALL LANDS, STOCKPILES AND OTHER EXPOSED MATERIALS SCHEDULED TO REMAIN UNATTENDED FOR A DURATION OF MORE THAN 20 DAYS.
8. ALL TEMPORARY DRAINAGE, EROSION AND SEDIMENT CONTROL MEASURES MUST BE REMOVED AFTER ACHIEVING A SATISFACTORY "OFF-MAINTENANCE INSPECTION" BY THE RELEVANT REGULATORY AUTHORITY.
9. DISPOSE OF ANY COLLECTED SEDIMENT OR FILL IN A LAWFUL MANNER THAT DOES NOT CAUSE ONGOING SOIL EROSION OR ENVIRONMENTAL HARM.
10. IMMEDIATELY PRIOR TO THE CONSTRUCTION OF THE PERMANENT STORMWATER TREATMENT DEVICE, APPROPRIATE FLOW BYPASS CONDITIONS MUST BE ESTABLISHED TO PREVENT SEDIMENT-LADEN WATER ENTERING THE DEVICE.
11. IMMEDIATELY FOLLOWING THE CONSTRUCTION OF THE FILTER MEDIA OF THE PERMANENT STORMWATER TREATMENT DEVICE, THE FILTER MEDIA MUST BE COVERED BY HEAVY-DUTY FILTER CLOTH (MINIMUM BIDIM A44 OR EQUIVALENT) AND A MINIMUM 200mm LAYER OF EARTH OR SACRIFICIAL FILTER MEDIA. SUCH EARTH AND FILTER CLOTH MUST NOT BE REMOVED FROM THE DEVICE UNTIL SUITABLE SURFACE CONDITIONS BEING ACHIEVED WITHIN THE BASIN'S CATCHMENT AREA.
12. IMMEDIATELY FOLLOWING THE CONSTRUCTION OF THE PERMANENT STORMWATER TREATMENT DEVICE AN APPROPRIATE TYPE 2 SEDIMENT TRAP MUST BE INSTALLED IN A MANNER TO PREVENT SEDIMENT INTRUSION INTO THE DEVICE.
13. THE MINIMUM SEDIMENT CONTROL STANDARD FOR THE PROTECTION OF THE PERMANENT STORMWATER TREATMENT DEVICE DURING THE CONSTRUCTION AND MAINTENANCE PHASES IS A TYPE 2 SEDIMENT TRAP. (ALTERNATIVE TO ABOVE)
14. PLANT ESTABLISHMENT WITHIN THE PERMANENT STORMWATER TREATMENT DEVICE MUST BE DELAYED UNTIL SEDIMENT INTRUSION INTO THE DEVICE IS SUITABLY UNDER CONTROL.
15. UPON SUITABLE CONDITIONS BEING ACHIEVED WITHIN THE BASIN'S CATCHMENT AREA, THE OPERATIONAL FEATURES OF THE PERMANENT STORMWATER TREATMENT SYSTEM MUST BE MADE FULLY OPERATIONAL (I.E. MAINTENANCE AND/OR RECONSTRUCTION AS REQUIRED).
16. THE PERMANENT STORMWATER TREATMENT FEATURES OF THE REHABILITATED BASIN MUST NOT BE MADE OPERATIONAL UNTIL ALL UP-SLOPE SITE STABILISATION MEASURES HAVE BEEN IMPLEMENTED AND ARE APPROPRIATELY WORKING TO CONTROL SOIL EROSION AND SEDIMENT RUNOFF IN ACCORDANCE WITH THE SPECIFIED ESC STANDARD. (ALTERNATIVE TO ABOVE).



01	ORIGINAL ISSUE	DK	AS	RM	19.12.2023
Issue	Description	DR	CH	VE	Date

Surveyor

 **saunders
havill
group**

Client

Coomera GA Pty Ltd
ATF The Coomera
GA Unit Trust
Pty Ltd

Status	FOR APPROVAL CONSTRUCTION SUBJECT TO APPROVAL		
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Original Issue Signatures			
Drawn	D. KEARNEY	Original Size	A1
Designed	G. GESMUNDO	Height Datum	AHD
Project Manager	A. SHEPHERD	Grid	MGA (ZONE 56)
Verified	R. MULLIGAN	R.P.E.Q. No: 7850 Date 31.01.2024	

Project	54 GEORGE ALEXANDER WAY, COOMERA
Title	EROSION AND SEDIMENT CONTROL DETAILS SHEET 3

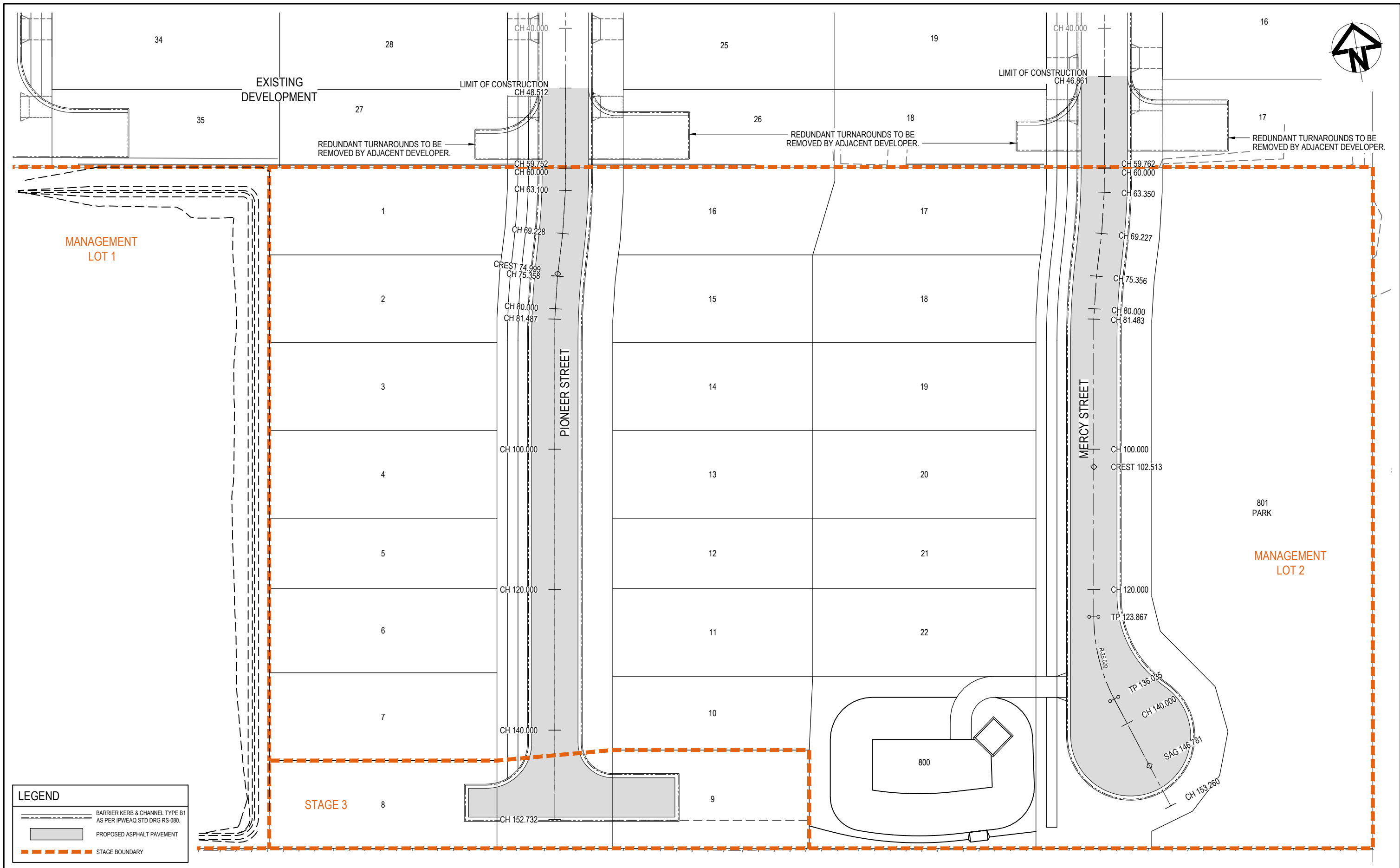


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Project Number	30157884
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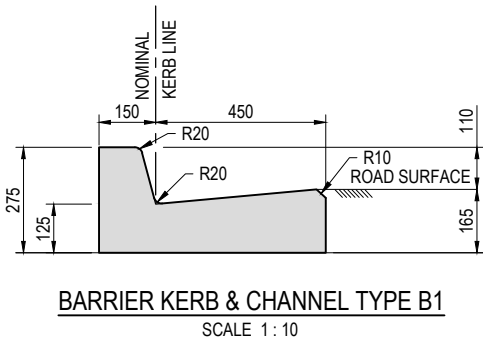
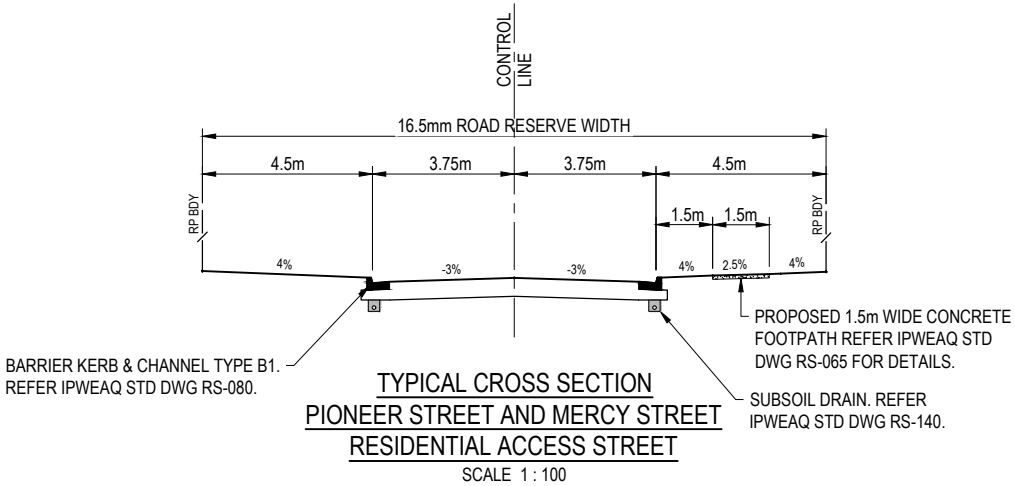
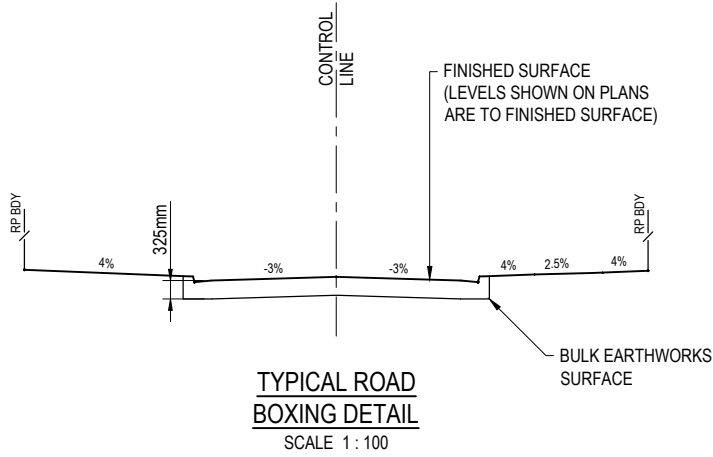
Drawing No.	GAW-AAP-BE-00-DRG-CV-0133	Issue	01
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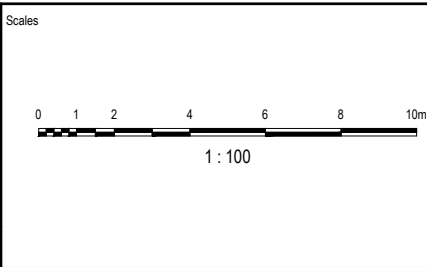
LEGEND BARRIER KERB & CHANNEL TYPE B1 AS PER IPWEAQ STD DRG RS-080. PROPOSED ASPHALT PAVEMENT STAGE BOUNDARY		Scale 0 5 10 15 20 25m 1 : 250		Surveyor 		Client Coomera GA Pty Ltd ATF The Coomera GA Unit Trust Pty Ltd		Status FOR APPROVAL CONSTRUCTION SUBJECT TO APPROVAL © Copyright reserved Original Issue Signatures Drawn: D. KEARNEY, Original Size: A1 Designed: G. GESMUNDO, Height Datum: AHD Project Manager: A. SHEPHERD, Grid: MGA (ZONE 56) Verified: R. MULLIGAN, R.P.E.Q. No: 7850, Date: 31.01.2024				Project 54 GEORGE ALEXANDER WAY, COOMERA CONTROL LINE SETOUT PLAN		 Arcadis Australia Pacific Pty Limited Level 7, Seabank Building, 12-14 Marine Parade SOUTHPORT QLD 4215 ABN 76 104 485 289 Tel No: +61 7 5503 4800 www.arcadis.com/au Project Number: 30157884 Issue: 01 Drawing No: GAW-AAP-BE-00-DRG-CV-0201	
01 ORIGINAL ISSUE Issue Description DR CH VE Date		DK AS RM 19.12.2023													

CONTROL LINE SETOUT - PIONEER STREET					
PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING
IP 1	0.000	1841.724	9681.360	27.024	189°46'49.48"
IP 2	59.752	1831.574	9622.476	31.916	
IP 3	63.100	1831.005	9619.177	32.067	
IP 4	69.228	1829.596	9613.213	32.248	
IP 5	75.358	1827.824	9607.345	32.303	
IP 6	81.487	1826.415	9601.380	32.233	
IP 7	152.732	1814.313	9531.170	30.036	189°46'47.70"

CONTROL LINE SETOUT - MERCY STREET								
PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	1917.408	9668.313	22.552	189°46'50.43"			
IP 2	59.762	1907.256	9609.420	27.261				
IP 3	63.350	1906.631	9605.886	27.441				
IP 4	69.227	1905.280	9600.167	27.735				
IP 5	75.356	1903.508	9594.299	28.041				
IP 6	81.483	1902.100	9588.337	28.347				
TC	123.867	1894.900	9546.568	28.338	189°46'47.70"			
IP 7	129.951	1893.846	9540.452	28.106		R = -25.000	12.167	27°53'07.38"
CT	136.035	1895.775	9534.553	27.945	161°53'40.32"			
IP 8	153.260	1901.128	9518.180	27.873	161°53'40.32"			



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Verified	R. MULLIGAN	R.P.E.Q. No: 7850 Date 31.01.2024	

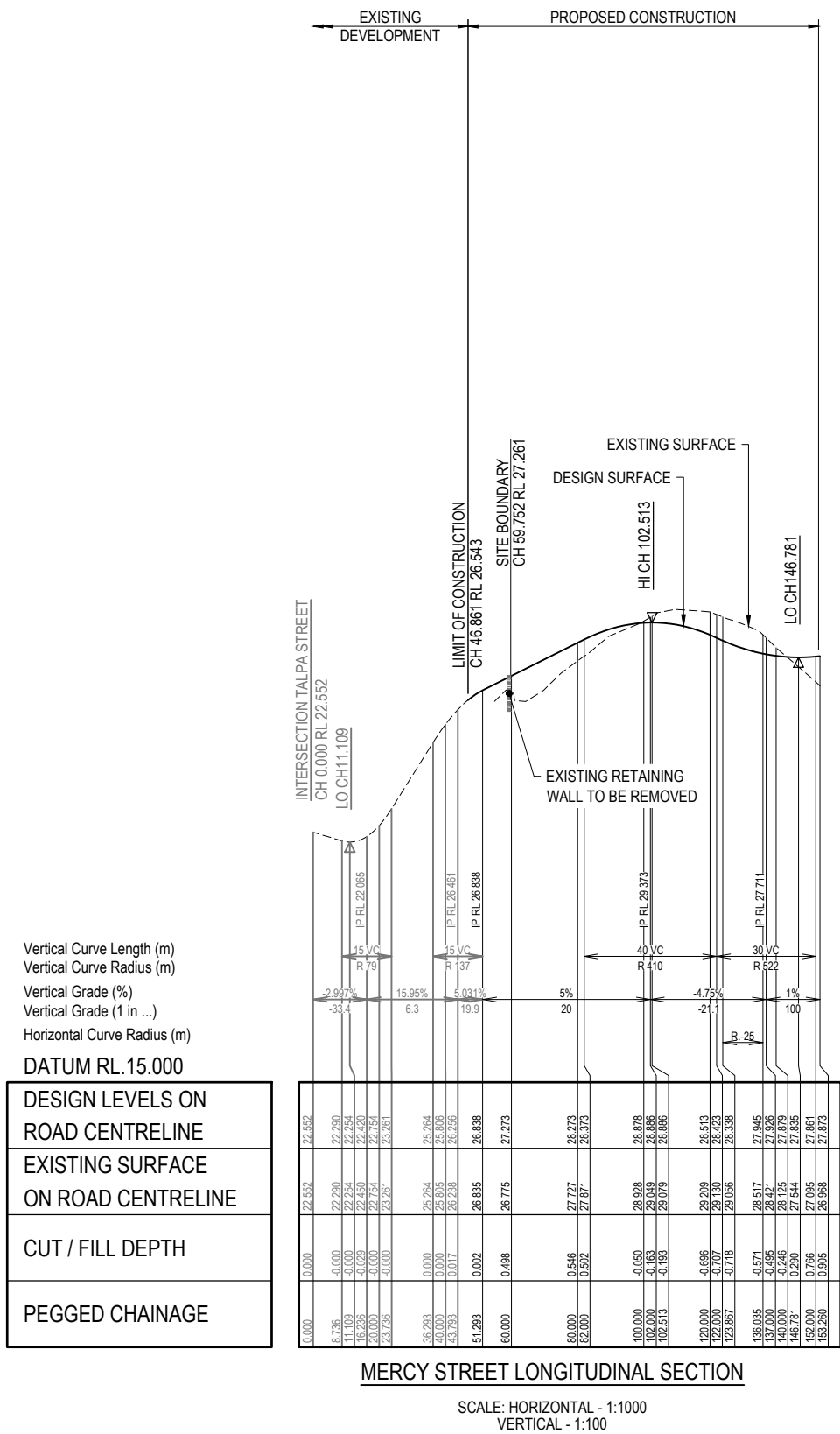
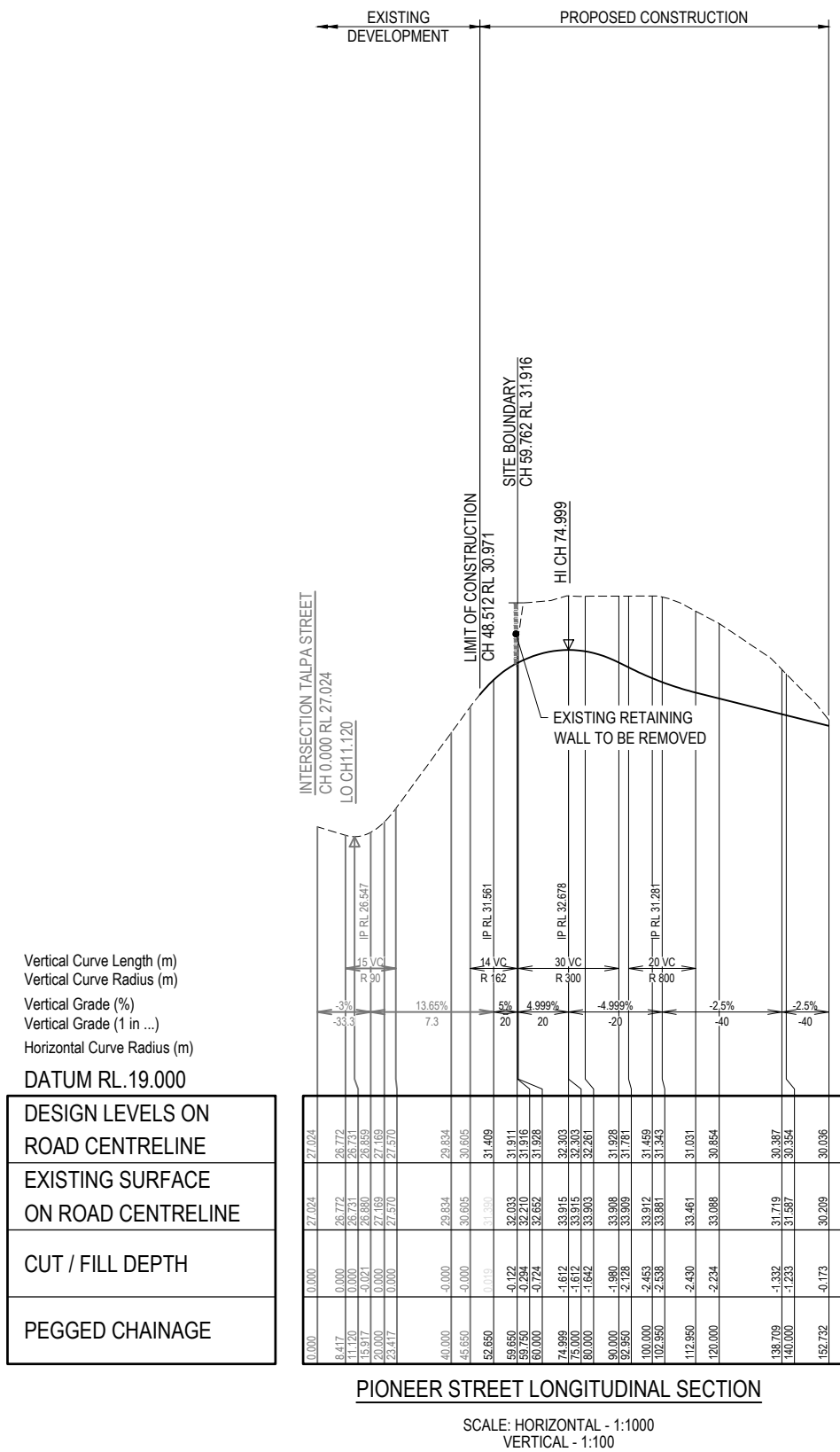
Project	
54 GEORGE ALEXANDER WAY, COOMERA	
Title	
CONTROL LINE SETOUT TABLE & TYPICAL ROAD CROSS SECTION	



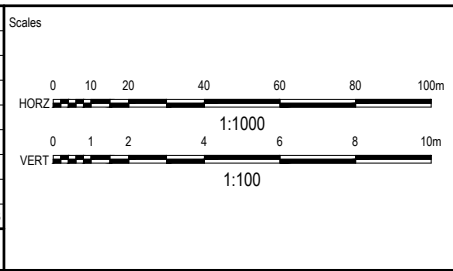
Arcadis Australia Pacific Pty Limited
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Project Number	30157884
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GAW-AAP-BE-00-DRG-CV-0202



01	ORIGINAL ISSUE	DK	AS	RM	19.12.2023
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Verified	R. MULLIGAN	R.P.E.Q. No: 7850 Date: 31.01.2024	

Project

54 GEORGE ALEXANDER WAY,
COOMERA

Title

PIONEER STREET AND
MERCY STREET
LONGITUDINAL SECTIONS

Arcadis Australia Pacific Pty Limited
Level 7, Seabank Building, 12-14 Marine Parade
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Project Number	30157884
Issue	01

Drawing No. GAW-AAP-BE-00-DRG-CV-0221



A HAZARD is something with the potential to cause harm.
RISK is a combination of the likelihood of the harm occurring and the severity of the harm should it occur.
CONTROLS are measures to eliminate or reduce risk to an acceptable level.
ABNORMAL RISKS are aspects of our project, structure or materials as identified by our design which may present significant hazards that are unusual, not obvious or may be difficult to manage

Risk ID No	Project Phase	Hazard / Risk Description	Risk Manager	Consequence / Likely Ham	Likelihood	Severity	Initial Risk Rating = L x S	Treatment Option Plan for Avoidance Mitigation Action Controls to be Provided	Consequence / Likely Harm	Likelihood	Severity	Residual Risk Rating = L x S	- Adopted Treatment - Reason - By Whom	Comment
1	Design & Construction	Works adjacent to existing services (electricity, optic fibre, water etc) / Damage to services, electrocution	Principal Contractor	Existing service is struck / property damage, private property without services, physical injury or death (i.e. electrocution).	2	5	10	- Design considers clearances to mains as required by asset holders and has been approved by asset holders. -The Principal Contractor shall locate all existing services and ensure they are marked and protected appropriately onsite in accordance with the requirements of the respective asset holder and ensure safe work method statements are undertaken and approved by any asset holders as required.	Service is not struck / no harm	1	5	5	- Treatment Adopted - Cost effective - Principal Contractor	
2	Design & Construction & Maintenance	Stormwater Runoff in overland flow path	Principal Contractor / CoGC	Drowning / Death	3	5	15	Risk mitigation measures such as screen on outlet and inlets, walkable batters, fencing, warning signs are proposed to be implemented and maintained.	Drowning / Death	2	5	10	- Treatment Adopted - Cost effective - Principal Contractor / CoGC	
3	Design & Construction	Batter and adjacent retaining wall Stability / Batters Collapse	Principal Contractor	Batter or retaining wall fails / death	3	5	15	Design has been undertaken in accordance with Council requirements. The contractor shall implement a safe work method statement, design, undertake works with the required level of supervision from a geotechnical engineer and provide certifications as required.	No failure	1	5	5	- Treatment Adopted - Required - Principal Contractor	
4	Construction	Stormwater Runoff / Sediment and Erosion of earthworks areas	Principal Contractor	Sedimentation of stormwater infrastructure and creeks as well as erosion of batters / environmental harm, conveyance of stormwater infrastructure compromised	4	3	12	Principal Contractor shall implement and maintain erosion and sediment control in accordance with current guidelines prior to, during and after construction.	Erosion and sedimentation is controlled on-site using devices	4	1	4	- Treatment Adopted - Cost effective - Principal Contractor	
5	Construction & Maintenance	Traffic and Pedestrians / Collision with traffic or pedestrian during works.	Principal Contractor	Collision / Injury, death, property damage	3	5	15	Principal Contractor shall implement and maintain a safe work method statement and ensure personal awareness. Appropriate traffic control is to be implemented by the Contractor.	Collision / Injury, death, property damage	2	5	10	- Treatment Adopted - Cost effective - Principal Contractor	
6	Construction	Open trench during night / Portions of the services may be constructed using open trench. Private site operators or others may fall into trenches	Civil Contractor	Falling from heights / Major injury	3	4	12	Trench is backfilled each day before contractor leaves site	Trench is filled and therefore cannot be fallen into	1	4	4	- Treatment may be adopted - Cost prohibitive but highly effected at reducing likelihood - Civil Contractor	Contractor to provide preferred management measure in safe work method statement
7	Construction							Contractor provides man-proof fencing around open trench areas with adequate warning of deep excavation as well as covering open trench with boards.	Adequate warning and protection provided to prevent non-intentional entry.	1	4	4	- Treatment may be adopted - Cost and likelihood reduction effective - Civil Contractor	

LIKELIHOOD	SCORE
OCCURRENCE VIRTUALLY INEVITABLE, MAY OCCUR MANY TIMES	5
OCCURRENCE NOT SURPRISING, MAY OCCUR MORE THAN ONCE	4
LIKELY TO OCCUR SOMETIMES	3
UNLIKELY TO OCCUR, THOUGH CONCEIVABLE	2
SO UNLIKELY THAT PROBABILITY IS CLOSE TO ZERO	1

SEVERITY	SCORE
FATALITY	5
MAJOR INJURY	4
SIGNIFICANT INJURY	3
FIRST AID INJURY	2
MINOR INJURY	1



RISK RATING					
5	5	10	15	20	25
4	4	8	12	16	20
3	3	6	9	12	15
2	2	4	6	8	10
1	1	2	3	4	5
	1	2	3	4	5

RISK RATING RESULTS		
15-25	VERY HIGH	THIS ACTIVITY MUST NOT BE UNDERTAKEN, OR SHOULD BE STOPPED, UNTIL ADDITIONAL MEASURES HAVE BEEN PUT IN PLACE TO REDUCE THE RISK
8-12	HIGH	ALL REASONABLY PRACTICABLE CONTROL MEASURES MUST BE PUT IN PLACE BEFORE THIS TASK MAY PROCEED
3-6	MEDIUM	CONTROL MEASURES MUST BE PUT IN PLACE TO REDUCE THIS RISK UNLESS IT WOULD INVOLVE EXCESSIVE COST FOR LITTLE BENEFIT
1-2	LOW	NO FURTHER ACTION REQUIRED UNLESS BENEFICIAL ACTION CAN BE EASILY UNDERTAKEN

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Scales
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Verified	R. MULLIGAN	R.P.E.Q. No: 7850 Date: 31.01.2024 	

Project	54 GEORGE ALEXANDER WAY, COOMERA
Title	HAZARD REGISTER

