

PROPOSED RETAINING WALL

LOT 1 MAGPIE HOLLOW ROAD, SOUTH BOWENFELS NSW 2790

RETAINING WALLS

RW1. WALLS ARE TO HAVE 100mm OF CRUSHER DUST COMPACTED TO 98% STD UNDER THE WALL FOOTING.

RW2. ARTICULATION JOINTS ARE REQUIRED IN BLOCKWORK WALLS AT 8000mm CENTRES UNLESS NOTED OTHERWISE. JOINT IS TO BE SEALED WITH SUITABLE SEALANT OR WATERSTOP.

RW3. NO MACHINE COMPACTION IS PERMITTED WITHIN 2m OF THE BACK OF THE WALL WITHOUT LATERAL SUPPORT BEING PROVIDED TO THE TOP OF THE WALL.

RW4. WALL IS TO BE BACKFILLED WITH CLEAN 20-40mm FREE DRAINING AGGREGATE. A SEPARATION LAYER OF GEOTEXTILE CLOTH IS TO BE PROVIDED BETWEEN GRANULAR BACKFILL AND IN-SITU SOIL. ALTERNATIVELY GEOTEXTILE DRAIN SHEET PRODUCTS MAY BE USED. IT IS RECOMMENDED EVERY 4TH PERPEND BE USED AS A WEEPHOLE FOR DRAINAGE ON EXTERNAL BLOCKWORK RETAINING WALLS.

RW5. WALL IS TO HAVE AG DRAIN INSTALLED IN GRANULAR FILL WITH A MINIMUM GRADIENT OF 1:100 AND CONNECTED INTO SUITABLE STORMWATER DISCHARGE LINE.

RW6. WALL IS NOT TO BE BUILT WITHIN 3m OF ANY EXISTING STRUCTURES OR SERVICES WITHOUT REVIEW BY ENGINEER TO ENSURE STABILITY OF ADJACENT STRUCTURES AND NO ADVERSE IMPACTS ON SERVICES.

RW7. STRUCTURAL WORK HAS BEEN DESIGNED FOR FOLLOWING LOADS: SUPERIMPOSED DEAD / LIVE LOADS TO AS/NZS1170.1 AND AS4678:

DESIGN PARAMETERS FOR CLAY	DEAD LOAD	LIVE LOAD
SOIL DENSITY	18 kN/m	
SOIL FRICTION FACTOR	22°	
SOIL COHESION	Cu= 10 kPa	
LONG TERM LIVE LOAD	REFER TO TABLE	

NOTE: THE ABOVE PARAMETERS APPLY ONLY TO STIFF OR MEDIUM CLAYS AND IT HAS BEEN ASSUMED THE FOUNDING MATERIAL FOR FOUNDATIONS IS THE SAME AS THE RETAINED MATERIAL.

GENERAL DESIGN PARAMETERS:
MATERIAL STRENGTH UNCERTAINTY FACTOR $\phi_{u0} = 0.85$ AND $\phi_{uc} = 0.7$ (IN SITU MATERIAL)
STRUCTURE IMPORTANCE LEVEL 2
RETAINING WALL CATEGORY B
DESIGN LIFE 60 YEARS IN ACCORDANCE WITH AS4678 TABLE 3.1
SOIL TYPE TO BE CONFIRMED BY ENGINEER PRIOR TO DRILLING OF PIER HOLES.

DESIGN LIVE LOAD AND STRUCTURE CLASSIFICATION			
WALL HEIGHT	LEVEL BACKFILL	1:4 INCLINED BACKFILL	STRUCTURE CLASSIFICATION
< 1.5m	2.5 kPa	1.25 kPa	A
> 1.5m	5.0 kPa	2.5 kPa	B

CONCRETE MASONRY

CM1. ALL CONCRETE MASONRY UNITS SHALL CONFORM TO THE REQUIREMENTS OF AS1500.

CM2. ALL BLOCKWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE RELEVANT SAA CODE.

CM3. THE DESIGN STRENGTH OF BLOCKWORK SHALL BE 15 MPa WITH M3 MORTAR MIX IN THE RATIO OF 1:1:6 (CEMENT:LIME:SAND). LIME CANNOT BE SUBSTITUTED BY CHEMICAL PLASTICISERS.

CM4. CONCRETE FOR FILLING CORES WHERE REQUIRED SHALL HAVE A DESIGN STRENGTH AT 28 DAYS OF $f_{ct}=20$ MPa AND A SLUMP OF 125mm WHEN BEING PLACED WITH 10mm MAXIMUM SIZE OF AGGREGATE.

CM5. CLEANOUT OPENINGS SHALL BE PROVIDED AT THE BASE OF ALL REFINED CORES TO ENABLE CLEANING OF CORES.

CM6. APPROVED JOINT REINFORCEMENT SHALL BE LAID IN HORIZONTAL JOINTS AT A MAXIMUM OF 600mm CENTRES WITH ADDITIONAL LAYERS DIRECTLY ABOVE AND BELOW WINDOW AND DOOR OPENINGS.

CM7. WALL TIES FOR BRICKWORK AND BLOCKWORK CAVITY WALLS SHALL COMPLY WITH AS/NZS 2699.1 TIES ARE TO BE MEDIUM DUTY MINIMUM AND SPACED AT MAXIMUM 600mm CENTRES BOTH HORIZONTALLY AND VERTICALLY.

CM8. WHERE BLOCKWORK SUPPORTS CONCRETE SLABS THE TOP COURSE SHALL BE COVERED WITH TWO LAYERS OF ALCOR OR EQUIVALENT.

CM9. WHEN LAYING BLOCKS, FACE SHELLS AND PERPENDS SHOULD BE FULLY BEDDED IN THE MORTAR.

CM10. REINFORCEMENT MUST BE POSITIONED ACCURATELY AND TIED SECURELY BEFORE PLACING CONCRETE OR GROUT.

CM11. VERTICAL REINFORCING BARS, INCLUDING STARTER BARS, SHOULD BE AS CLOSE AS POSSIBLE TO THE CENTRE OF THE WALL UNLESS NOTED OTHERWISE, CONSISTENT WITH COVER REQUIREMENTS.

CM12. MORTAR FINS PROTRUDING INTO CORES SHOULD BE REMOVED BEFORE GROUTING.

CM13. CLEANOUT OPENINGS SHOULD BE PROVIDED IN THE BOTTOM COURSE, IN ALL REINFORCED CORES, TO PERMIT REMOVAL OF MORTAR FINS AND OTHER DEBRIS, AND TO ALLOW POSITIONING AND TYING OF VERTICAL REINFORCEMENT. THESE OPENINGS MUST BE CLOSED BEFORE GROUTING.

CM14. IT IS RECOMMENDED THAT READY-MIXED GROUT SHALL BE USED.

CM15. ALL CORES SHOULD BE FILLED WITH GROUT IF REINFORCED AND RODDED TO ENSURE THERE ARE NO VOIDS IN ANY CAVITY OR CORES OF THE WALL.

CM16. EXPANSION JOINTS AND CONTROL JOINTS ARE TO BE CONSTRUCTED AT 6000mm CENTRES U.N.O.

CM17. THE GROUT SHALL BE COMPACTION THOROUGHLY SO THAT VOIDS ARE NOT LEFT. COMPACTION SHALL BE BY RODDING WITH A PLAIN ROUND BAR (DO NOT USE MAIN VERTICAL REINFORCING BARS OR OTHER DEFORMED BARS) OR WITH A HIGH FREQUENCY PENCIL VIBRATOR USED CAREFULLY.

CM18. THE HEIGHT OF ANY SINGLE LIFT OF GROUTING SHOULD NOT EXCEED 30 TIMES THE MINIMUM CORE DIMENSIONS OR 3.0m TOTAL WALL HEIGHT, WHICHEVER IS LESS IN A 72 HOUR PERIOD. LIFTS SHOULD BE COMPLETED IN 1500mm INCREMENTS WITH 60 MINUTES BETWEEN THE PROCEEDING LIFT.

CM19. WALLS SHALL NOT BE CONSTRUCTED OVER ANY SUSPENDED CONCRETE UNTIL THE SUPPORTING CONCRETE HAS CURED.

CM20. IF ANY SHRINKAGE OF THE CORES IS TO OCCUR, THE TOP COURSE SHALL BE FILLED WITH SELF LEVELING-HIGH STRENGTH GROUT TO ENSURE ADEQUATE BEARING TO THE TOP SIDE OF THE WALL.

CM21. ALL BLOCKS SHALL BE CONSTRUCTED WITH THE APPROPRIATE BLOCK TYPE, INCLUDING KNOCK-OUTS, CHANNEL, LINTEL, CONTROL JOINT WHERE REQUIRED FOR THE RELEVANT BLOCK CODINGS. BLOCK CODING MAY BE OBTAINED FROM CONCRETE MASONRY ASSOCIATION AUSTRALIA (CMAA) FOR THE APPLICABLE BLOCK SERIES.

CM22. ALL REINFORCEMENT SHALL BE INSPECTED BY A SUITABLY QUALIFIED ENGINEER PRIOR TO CORE FILLING.

CM23. LAP LENGTHS IN BAR REINFORCEMENT SHALL BE MADE IN ACCORDANCE WITH THE FOLLOWING TABLE:

BAR DIAMETER	LAP (mm)
N12	800
N16	1000
N20	1300

CONCRETE:

C1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS3600 CURRENT EDITION WITH AMENDMENTS, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.

C2.

CONCRETE SPECIFICATION					
ELEMENT	SLUMP (mm)	MAX. AGGREGATE SIZE (mm)	CEMENT TYPE	f_{ct} 28 DAY STRENGTH	ADMIXTURE
PAD FOOTINGS AND PIERS	80	20		N25	-
				N20	-
				N15	-
BLINDING	-	-			

UNDER NO CIRCUMSTANCES IS ADDITIONAL WATER TO BE ADDED TO THE CONCRETE ON SITE TO IMPROVE WORKABILITY. THE ADDITION OF WATER SIGNIFICANTLY REDUCES THE FINAL CONCRETE STRENGTH.

C3. MINIMUM CLEAR CONCRETE COVER TO REINFORCEMENT INCLUDING TIES AND STIRRUPS SHALL BE AS FOLLOWS UNLESS OTHERWISE SHOWN.

ELEMENT	COVER (mm)
FOOTINGS	75
WALL REINFORCEMENT	30 FROM INSIDE FACE OF BLOCK

C4. COVER TO REINFORCEMENT SHALL BE OBTAINED BY THE USE OF APPROVED BAR CHAIRS. BAR CHAIR SPACING SHALL ENSURE THAT REINFORCEMENT REMAINS IN PLACE THROUGHOUT THE POUR AND SHALL BE AT MIN. C/C SPACING AS FOLLOWS:

MESH 800mm
BAR REINFORCEMENT 1000mm

C5. ALL CONCRETE SHALL BE COMPACTION WITH MECHANICAL VIBRATORS. VIBRATORS SHALL NOT BE USED TO SPREAD CONCRETE.

C6. SIZES OF CONCRETE ELEMENTS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.

C7. BEAM DEPTHS ARE WRITTEN FIRST AND INCLUDE SLAB THICKNESS.

C8. TOLERANCES FOR THE SIZE AND SHAPE OF REINFORCEMENT AND FOR STRUCTURES AND MEMBERS SHALL BE IN ACCORDANCE WITH AS4671

C9. FORMWORK SHALL BE DESIGNED AND CERTIFIED BY A CHARTERED ENGINEER AND BUILT IN ACCORDANCE WITH AS3610.

C10. NO HOLES OR CHASES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT THE PRIOR APPROVAL OF THE ENGINEER.

C11. CONSTRUCTION JOINTS WHERE NOT SHOWN SHALL BE LOCATED TO THE APPROVAL OF THE ENGINEER. ALL CONSTRUCTION JOINTS SHALL BE SCABBLED OVER THE WHOLE FACE AND ANY UNSOUND MATERIAL REMOVED.

C12. SAW CUT SHRINKAGE JOINTS SHALL BE MADE AS SOON AS POSSIBLE AFTER THE POUR. THIS TIME IS CONCRETE AND TEMPERATURE DEPENDENT BUT IS TO BE COMPLETED WITHIN THE FOLLOWING TIME LIMITS:
- IF TEMPERATURE EXCEEDS 25° THEN SAWCUTS MUST BE COMPLETED WITHIN 12 HOURS OF FINISHING
- ALL OTHER TEMPERATURES, SAWCUTS MUST BE COMPLETED WITHIN 16 HOURS

C13. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY. IT IS NOT NECESSARILY SHOWN IN TRUE PROJECTION. HOOKS, COGS, LAPS, ETC, SHALL COMPLY WITH SECTION 13 OF AS3600 (U.N.O.).

C14. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITIONS SHOWN UNLESS THE APPROVAL OF THE ENGINEER IS OBTAINED FOR ANY OTHER SPLICE.

C15. WELDING OF REINFORCEMENT WILL NOT BE PERMITTED UNLESS SHOWN ON THE STRUCTURAL DRAWINGS. PIPES OR CONDUITS SHALL NOT BE PLACED WITHIN THE CONCRETE COVER TO REINFORCEMENT WITHOUT THE APPROVAL OF THE ENGINEER.

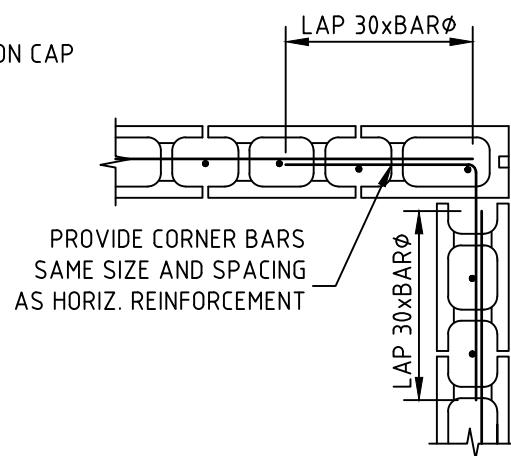
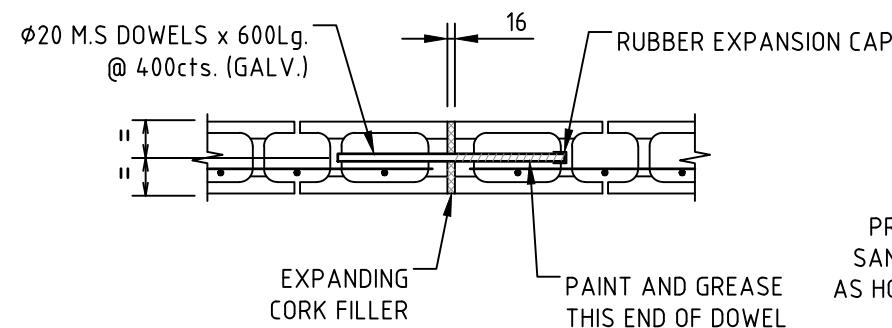
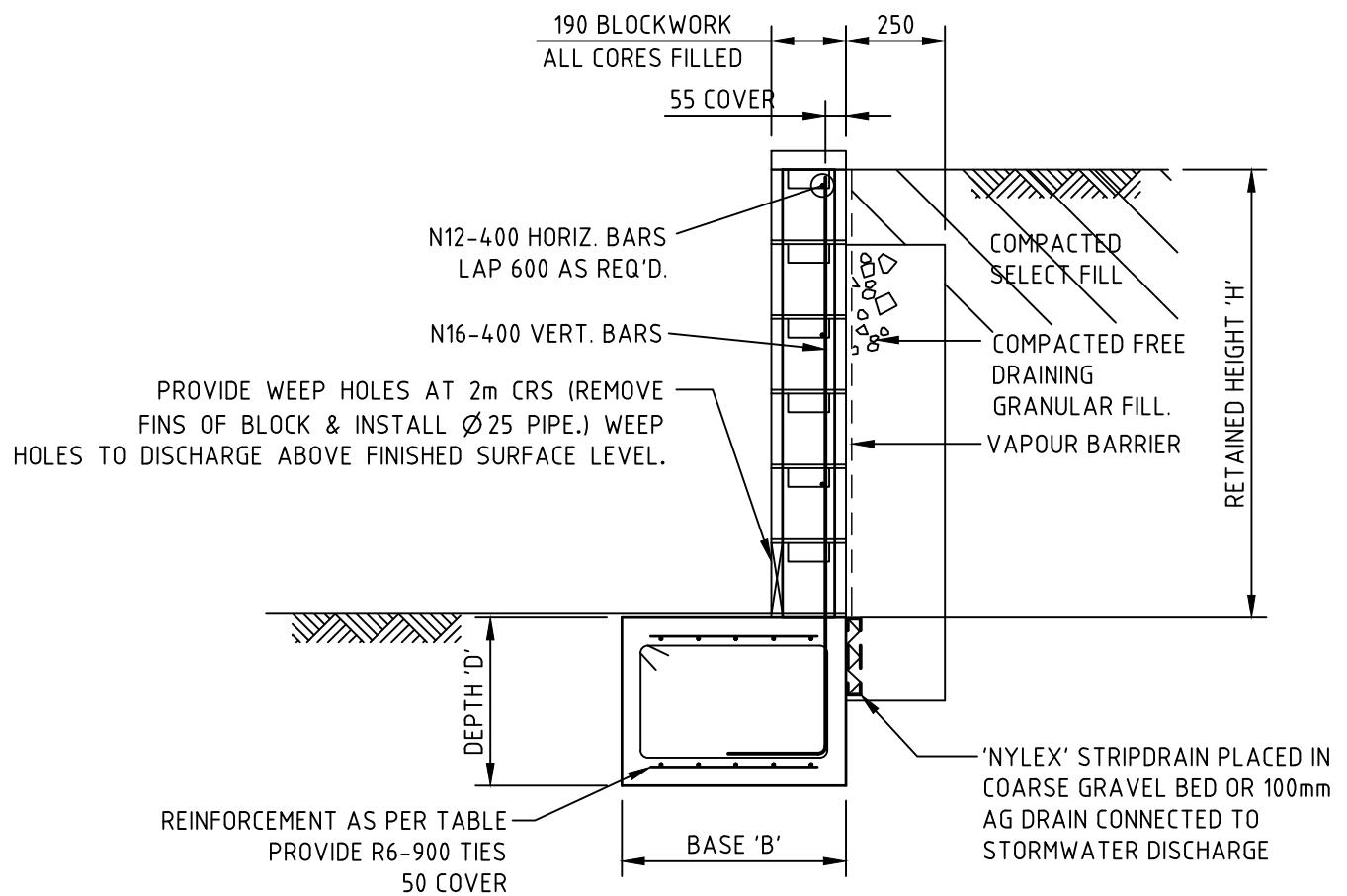
C16. LAP LENGTHS IN BAR REINFORCEMENT SHALL BE MADE IN ACCORDANCE WITH THE FOLLOWING TABLE:

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Drawn: S.D. Q Plan No: Designed: S.P.J.
Scale: AS SHOWN Q Chk Sign: Approve sign:
CAD Ref: 220234-RW1

CALARE CIVIL CONSULTING ENGINEERS
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Job No. 22.0234
DWG. No. Amdt. RW1 A
No. in set 2



TYPICAL CONTROL JOINT DETAILS

(8000 MAX. CENTRES U.N.O)

BLOCKWORK RETAINING WALL 0 -1400 HIGH (MAX.)

SCALE 1:20

WALL HEIGHT 'H'	BASE WIDTH 'B'	BASE DEPTH 'D'	REINFORCEMENT DETAILS
600	300	450	3-L11TM TOP & BTM.
800	450	450	4-L11TM TOP & BTM.
1000	600	450	5-L11TM TOP & BTM.
1200	800	500	6-L11TM TOP & BTM.
1400	900	600	6-L11TM TOP & BTM.

NOTE: TRENCH MESH MAY BE SUBSTITUTED FOR AN EQUIVALENT NUMBER OF N12 BARS (i.e. 5-L11TM FOR 5-N12 BARS)

APPROVED PRACTISING STRUCTURAL ENGINEER
SEAN JOHNSON (S.P.J.)
BE. MIEAUST
ENGINEERS AUSTRALIA MEMBERSHIP NUMBER 4531351

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PROPOSED RETAINING WALL LOT 1 MAGPIE HOLLOW ROAD SOUTH BOWENFELS NSW 2790			
Drawn: S.D.	Q Plan No:	Designed: S.P.J.	Job No.
Scale: 1: 20	Q Chk Sign:	Approve sign:	22.0234
CAD Ref: 220234-RW			DWG. No. Amdt. RW2 A
A 16/09/24 ORIGINAL ISSUE	Description	STRUCTURAL SECTIONS AND DETAILS	No. in set 2
Amendment Date			