NORTHERN RIVERS
STRUCterre
consulting engineers

PROJECT

ROCK RETAINING WALL
#17 WARRINGA DRIVE
BILAMBIL HEIGHTS NSW 2486

for

BORDER ROCK WALLS

STRUCTURAL ENGINEERING
DRAWING INDEX

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BR0013 - ST1A COVER SHEET
17.10.2026

GENERAL

G1. THE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE ARCHITECT'S DRAWINGS AND THE SPECIFICATION. ANY DISCREPANCY TO BE REFERRED TO THE ENGINEER IN WRITING.

G2. ALL DIMENSIONS ARE TO BE CHECKED ON THE SITE BEFORE WORK COMMENCES.

G3. DIMENSIONS SHALL NOT BE OBTAINED BY SCALING THE STRUCTURAL DRAWINGS.

G4. DURING THE CONSTRUCTION THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION AND NO PART SHALL BE OVERSTRESSED.

G5. ALL WORKMANSHIP AND MATERIALS TO BE IN ACCORDANCE WITH THE CURRENT SAA CODES AND THE BY-LAWS AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITY.

G6. TERMITE CONTROL BARRIER TO AS 3660.1 - REFER ARCHITECT'S DETAILS

G7. TEMPORARY DOWN PIPES MUST BE INSTALLED & MAINTAINED DURING CONSTRUCTION TO DRAIN ROOF WATER TO STORMWATER AND WELL CLEAR OF BUILDING.

G8. GROUND SURFACE DRAINAGE SHALL BE INSTALLED TO DRAIN GROUND WATER WELL CLEAR OF BUILDING FOUNDATIONS WITH NO PONDING AND MAINTAINED FOR THE LIFE OF THE BUILDING.

FOUNDATIONS

F1. REQUIRED MINIMUM SAFE BEARING CAPACITY OF FOUNDATION IS 100 kPa.

F2. THE BUILDER SHALL OBTAIN APPROVAL OF THE FOUNDATION MATERIAL FROM ENGINEER BEFORE PLACING CONCRETE.

F3. FOR SLABS ON GROUND, ALL TOPSOIL AND UPPER STRATA CONTAINING ORGANIC MATERIAL IS TO BE REMOVED AND REPLACED BY AN APPROVED FILLING MATERIAL IN LAYERS NOT EXCEEDING 200mm AND COMPACTED TO ENSURE SETTLEMENT OF SUBSEQUENTLY PLACED SLABS DOES NOT OCCUR.

F4. BASE OF ALL FOOTINGS SHALL BE IN FIRM DEVELOPED GROUND.

F5. ENSURE BASE OF PIER HOLES IS CLEAR OF ANY LOOSE MATERIAL.

F6. IF FOUNDATION CONDITIONS VARY OR ANY UNUSUAL CONDITIONS ARE NOTICED DURING EXCAVATION PLEASE NOTIFY ENGINEER.

REPAIR OF FIELD WELDS IN HOT DIP GALVANISING

W1. POWER TOOL CLEAN TO AUSTRALIAN STANDARD 1627:2 CLASS 3 TO REMOVE ALL WELDING SCALE, SLAG AND CORROSION PRODUCTS.

W2. DEGREASE AND REMOVE ALL SURFACE OIL, GREASE OR SOIL. (THIS STEP CAN BE OMITTED ON NEW WELDS WHERE NO ORGANIC CONTAMINATION OF THE EXPOSED STEEL HAS OCCURRED.)

W3. APPLY TWO COATS OF JOTUNS BARRIER TWO PACK EPOXY ZINC SYSTEM TO A MINIMUM DRY FILM THICKNESS OF 45 MICRONS EACH COAT.

W4. OBSERVE GOOD PAINTING PRACTICE WITH RESPECT TO WEATHER CONDITION AND APPLICATION CONDITIONS. ENSURE THAT THE STEEL SURFACE IS ABOVE DEW POINT PRIOR TO APPLICATION. IF BELOW THE DEW POINT, WARM AREA TO ENSURE SURFACE DRYNESS.

W5 ADHERE TO COATING MANUFACTURERS PRODUCT DATA SHEETS FOR SAFETY, MIXING, POT LIFE, APPLICATION, OVERCOATING AND CURING INFORMATION.

W6. IF A CLOSE COLOUR MATCH IS ESSENTIAL, APPLY A LIGHT COAT OF ALUMINIUM PAINT OVER REPAIR AREA AFTER DRYING. RUB OVER ALUMINIUM PAINT WITH A SOFT RAG BEFORE DRYING TO BLEND THE REPAIR INTO THE SURROUNDING GALVANIZED COATING APPEARANCE.
NOTE: THE ALUMINIUM PAINT IS NOT AN ANTI- CORROSIVE COATING AND DOES NOT CONTRIBUTE TO THE PERFORMANCE OF THE REPAIR.

CONCRETE

IF IN DOUBT - ASK

C.1 ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH A.S. 3600.

C2. THE EXPOSURE CLASSIFICATION IN ACCORDANCE WITH AS. 3600 IS AS FOLLOWS:
INTERIOR - EXPOSURE CLASSIFICATION A1
EXTERIOR - EXPOSURE CLASSIFICATION B1

C3. CONCRETE QUALITY AND COVER:
i) U.N.O CONCRETE SLUMP SHALL NOT EXCEED 80mm.
ii) U.N.O MAXIMUM AGGREGATE SIZE SHALL BE 20mm.
ii) CONCRETE GRADE AND COVER SHALL BE AS FOLLOWS:

CONCRETE COVER REQUIREMENTS IN ACCORDANCE WITH AS 3600

ELEMENT	EXPOSURE CLASS.	CONC STRENGTH mPa	CURING PERIOD (Min.)	REQUIRED COVER (mm)	NOTES
FOOTINGS RAFT	A1	20	3 DAYS	30	PROTECTED BY DAMP PROOF MEMBRANE
FOOTINGS STRIP	A1	20	3 DAYS	40	NON AGGRESSIVE SOILS
INTERNAL SLABS ON GROUND	A1	20	3 DAYS	20	TOP COVER
EXTERNAL SLABS ON GROUND	B1	25	7 DAYS	40	TOP COVER
INTERNAL SUSPENDED SLABS	A1	32	3 DAYS	20	BACK PROP 28 DAYS
EXTERNAL SUSPENDED SLABS	B2	40	7 DAYS	45	BACK PROP 28 DAYS

C4. ALL CONCRETE IS TO BE VIBRATED, ESPECIALLY AT BEAMS.

C5. 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.

C6. ALL CONCRETE SLABS SHALL BE SPRAYED WITH AN APPROVED CURING AGENT IMMEDIATELY AFTER FINISHING.

C7. MESH SHALL BE SUPPORTED IN PLACE 850 MAX CTS.

STEELWORK

ST1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS. 4100 AND AS.1554 EXCEPT WHERE VARIED BY CONTRACT DOCUMENTS.

ST2. PROTECTIVE SURFACE TREATMENT TO STRUCTURAL STEELWORK SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE:

A) STEELWORK FULLY ENCLOSED AND CONCEALED FROM VIEW:
(SYSTEM 'IZS2' AS/NZ 2312)
PREPARATION: ABRASIVE BLAST CLEAN TO CLASS 2½ (A.S. 1627.4)
FINAL COAT: INORGANIC ZINC SILICATE TO 75 MICRON DFT

B) ALL EXPOSED STEELWORK SHALL BE HOT DIP GALVANISED IN ACCORDANCE WITH AS/NZS 4680:2006

ST3. UNLESS NOTED OTHERWISE ALL CAST-IN STEELWORK, INCLUDING HOLDING DOWN BOLTS SHALL BE GALVANIZED.

ST4 ALL STRUCTURAL STEEL BOLTS SHALL COMPLY WITH AS 4100 AND ALL HIGH STRENGTH STRUCTURAL STEEL BOLTS SHALL COMPLY WITH AS 1252

TIMBER

T1. ALL TIMBER DESIGN, CONSTRUCTION AND MATERIAL TO A.S.1720 AND A.S. 1720.2 U.N.O.

T2. ALL WORK TO BE IN ACCORDANCE WITH A.S. 1684 (CURRENT EDITION)

T3. DURABILITY REQUIREMENTS FOR TIMBER SHALL BE IN ACCORDANCE WITH A.S. 1684.2 (APPENDIX B) AND A.S.1604. EXCEPTING THAT ALL EXTERNAL TIMBER SHALL BE DURABILITY CLASS 1. ALL SAWN ENDS SHALL BE TREATED TO PREVENT INGRESS OF MOISTURE

T4. ALL BOLTS IN TIMBER CONSTRUCTION TO BE MINIMUM M16 U.N.O. (H.D.G.). BOLT HOLES TO BE DRILLED EXACT SIZE. WASHERS UNDER HEADS AND NUTS TO BE AT LEAST 2.5 TIMES BOLT DIAMETER.

T5. ALL TIMBER JOINTS AND NOTCHES ARE TO BE 100mm MINIMUM AWAY FROM LOOSE KNOTS, SEVERE SLOPING GRAIN, GUM VEINS OR OTHER MINOR DEFECTS.

T6. ALL EXTERNAL TIMBER SEALED IN ACCORDANCE WITH HYNE TECHNICAL DATA SHEET No.8 OR EQUIVALENT.

T7. WHEN HYNE T3 GREEN IS USED, THE BUILDING CONTRACTOR SHALL OBTAIN THE 25 YEAR WRITTEN GUARANTEE FROM HYNE AND PASS ON TO OWNER.

CONCRETE BLOCKWORK MASONRY

B1. CONCRETE BLOCK MASONRY WORK SHALL BE EXECUTED IN ACCORDANCE WITH THE CURRENT EDITION OF:-
AS 3700 - SAA MASONRY CODE
AS 2733 - CONCRETE MASONRY UNITS
AS 4773 - PARTS 1 & 2 - MASONRY IN SMALL BUILDINGS
AS 2701 - METHODS OF SAMPLING AND TESTING MORTAR FOR MASONRY CONSTRUCTION
AS 3600 - SAA CONCRETE STRUCTURES CODE

B2. ALL MORTAR DROPPINGS TO BE REMOVED FROM BOTTOM OF THE CAVITY BEFORE CONCRETING BY THE USE OF CLEAN-OUT BLOCKS OR AS APPROVED BY THE ENGINEER.

B3. COVER TO REINFORCEMENT SHALL BE 30mm MINIMUM FROM INSIDE FACE OF BLOCK UNLESS NOTED OTHERWISE.

B4. CONCRETE MIXED USED TO FILL CAVITY TO BE GRADE F'c = 20 MpA , MAXIMUM AGGREGATE SIZE 10mm AND A MINIMUM CEMENT CONTENT OF 300 kg/m³ U.N.O. ALL CAVITY FILLING TO BE VIBRATED BY HAND RODDING WITH 12mm ROD.

B5. SLABS SUPPORTED ON LOAD BEARING BLOCKWORK TO HAVE TWO LAYERS OF BITUMEN COATED ALUMINIUM DAMP-PROOF COURSE MATERIAL LAID ON A FLAT SURFACE SEPARATING SLAB FROM BLOCKS EXCEPT WHERE REINFORCED.

B7. MORTAR TO BE MIXED IN PROPORTION OF ;-
1 PART TYPE GP CEMENT
4 PARTS SAND + METHYL CELLULOSE WATER THICKENER.

DURABILITY REQUIREMENTS IN ACCORDANCE WITH TABLE 5.1 AS 3700

MASONRY UNITS SALT ATTACK RESISTANCE GRADE	MORTAR	BUILT IN COMPONENTS	MINIMUM COVER
EXPOSURE	M4	R4	30

ENGINEER'S DESIGN CERTIFICATION

I, GERVASE PURICH, HERE BY CERTIFY THAT THE ENGINEERING DESIGNS SHOWN ON THESE PLANS ARE IN ACCORDANCE WITH THE BUILDING CODE OF AUSTRALIA AND THE AUSTRALIAN STANDARDS REFERENCED THERE IN.

I FURTHER CERTIFY THAT THE BUILDING, BUILT IN ACCORDANCE WITH THESE PLANS WILL BE ABLE WITHSTAND THE LOADS IMPOSED UPON IT.

GERVASE PURICH
Civil & Structural Engineer
BE (Civil) F.I.E. (Aust)
NER(212716). RPEQ(11656).

DATE 17.10.26

Project:
ROCK RETAINING WALL
#17 WARRINGA DRIVE
BILAMBIL HEIGHTS NSW 2486

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Client: BORDER ROCK WALLS

Title: **GENERAL NOTES**

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Rev.	Date	Description	Des	Drw	Appd
A	17.10.26	FOR CONSTRUCTION	TNL	TNL	

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IF IN DOUBT - ASK

FOOTING LEGEND

RW1 BOULDER ROCK RETAINING WALL, REFER DETAIL ON 'S4'

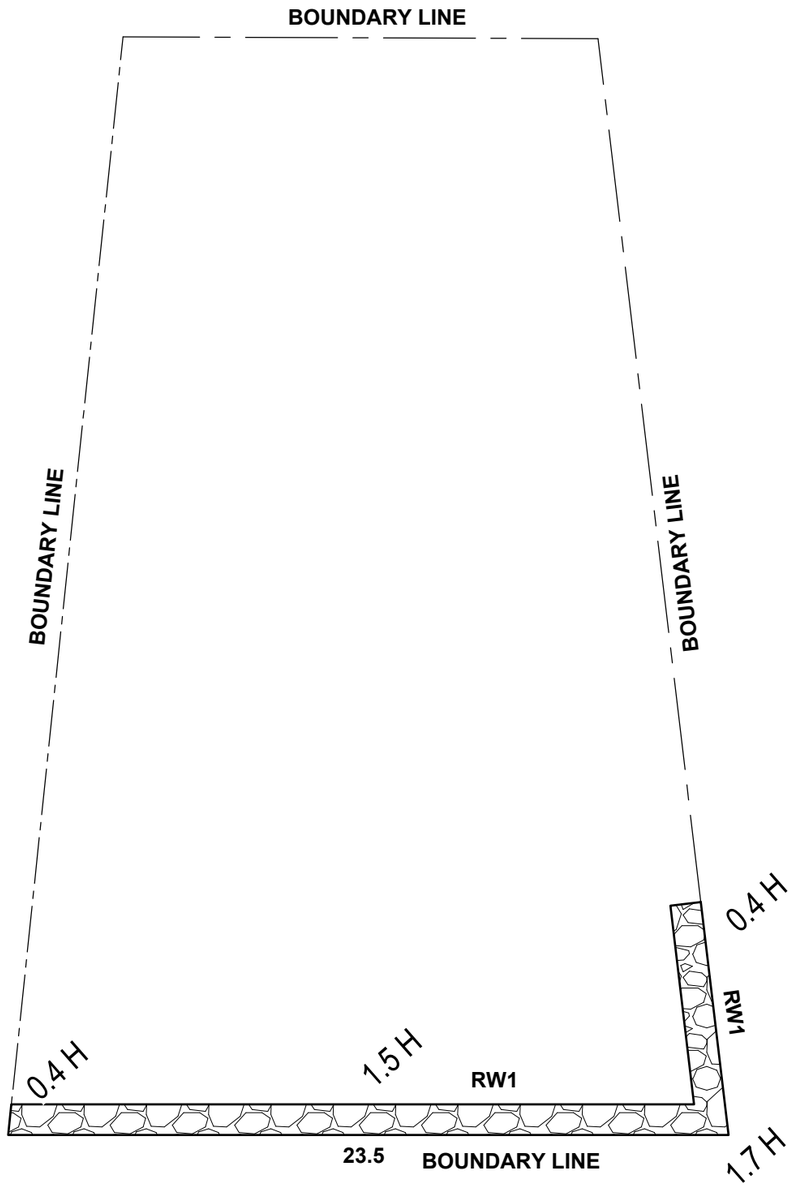
DRAINAGE:

DRAINAGE MEASURES MUST BE INSTALLED IMMEDIATELY UP SLOPE & BEHIND ALL CUT BATTERS INCLUDING THOSE RETAINED TO CAPTURE BOTH SURFACE & SUBSURFACE WATER MOVEMENTS & DIVERT WATERS TO A SUITABLE, CONTROLLED OUTFLOW BELOW & CLEAR OF THE BUILDING ENVELOPE .

ALL DRAINS MUST BE MAINTAINED FOR THE LIFE OF THE STRUCTURE

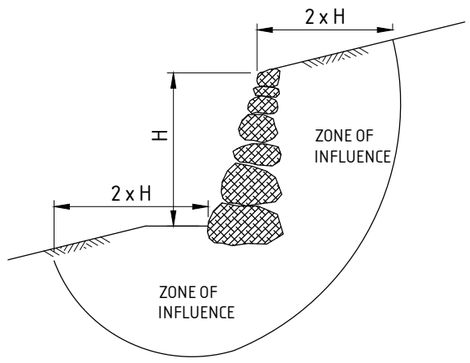
EXCAVATION & TEMPORARY WORKS NOTES:

1. THE BUILDER SHALL PROVIDE SUITABLE FENCING AND BARRICADING AROUND ALL EXCAVATIONS IN ACCORDANCE WITH WORK HEALTH AND SAFETY REQUIREMENTS.
2. THE BUILDER SHALL SUPPORT, SHORE, OR PROP ANY EXISTING STRUCTURES (INCLUDING BUT NOT LIMITED TO SWIMMING POOLS, RETAINING WALLS, FOOTINGS, AND SERVICES) LOCATED WITHIN THE ZONE OF INFLUENCE OF ALL EXCAVATIONS.
3. THE BUILDER IS RESPONSIBLE FOR MAINTAINING STABILITY OF ALL ADJACENT STRUCTURES AND GROUND THROUGHOUT THE CONSTRUCTION PROCESS
4. THE BUILDER SHALL MONITOR ADJACENT STRUCTURES FOR SIGNS OF MOVEMENT OR DISTRESS DURING EXCAVATION AND SHALL NOTIFY THE ENGINEER IMMEDIATELY IF ANY MOVEMENT IS OBSERVED.
5. ALL ASPECTS DETAILED IN THE STRUCTURAL DOCUMENTS ARE THOSE REQUIRED FOR THE COMPLETED STRUCTURE ONLY. THE BUILDER IS RESPONSIBLE FOR PROVIDING ANY NECESSARY TEMPORARY CONNECTIONS, SUPPORTS, AND BRACING TO MAINTAIN THE STABILITY AND SAFETY OF THE STRUCTURE AND ALL ADJACENT STRUCTURES THROUGHOUT THE CONSTRUCTION PERIOD.
6. THE BUILDER SHALL CONSULT THE GEOTECHNICAL ENGINEER IF IN ANY DOUBT REGARDING EXCAVATION STABILITY OR SHORING REQUIREMENTS.



NOTES:

1. IF COUNCIL SERVICES, MAIN STRUCTURES OR EXISTING RETAINING WALLS ARE LOCATED WITHIN THE ZONE OF INFLUENCE OF THE PROPOSED WALL THE ENGINEER SHOULD BE CONTACTED FOR FURTHER ADVICE.



Project:

ROCK RETAINING WALL
#17 WARRINGA DRIVE
BILAMBIL HEIGHTS NSW 2486

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Client: BORDER ROCK WALLS

Title: **RETAINING WALL PLAN**

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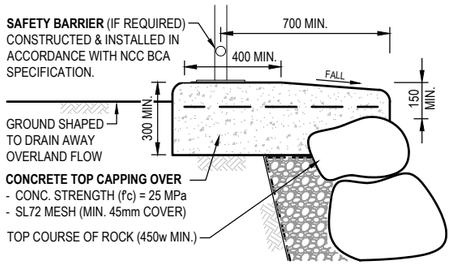
CONSTRUCTION NOTES:

1. ROCKS USED FOR WALL CONSTRUCTION SHALL BE SOUND AND DURABLE, AND NOT LESS THAN 450mm WIDE, EXCEPT ROCKS USED FOR PACKING AROUND LARGER ROCKS.
2. THE LONGEST ROCK DIMENSION SHALL NOT EXCEED 3 x THE SHORTEST ROCK DIMENSION.
3. ROCK SHALL BE PLACED IN SUCH A MANNER THAT THEY ARE STABLE AND INTERLOCKING AND LAID ROUGHLY COURSED AND BEDDED ON THEIR BROADEST BASE WITH LONGEST DIMENSION PERPENDICULAR TO FACE OF WALL.
4. STRUCTURAL ROCKS SHALL BEAR ON AT LEAST 2 x ROCKS BELOW. THERE SHALL BE NO CONTINUOUS JOINT IN EITHER VERTICAL OR HORIZONTAL PLANES.
5. THE LEVEL OF FILLING BEHIND THE WALL SHALL BE BROUGHT UP AT THE SAME TIME AS THE WALL.
6. THE BASE OF THE ROCK WALL SHALL BE SLOPED BACK TO ENSURE ROCKS ARE NOT LIKELY TO FALL OUT OF PLACE.
7. NO OTHER EXCAVATION WORKS SHALL OCCUR WITHIN 1500mm OF BASE OF ROCK WALL.

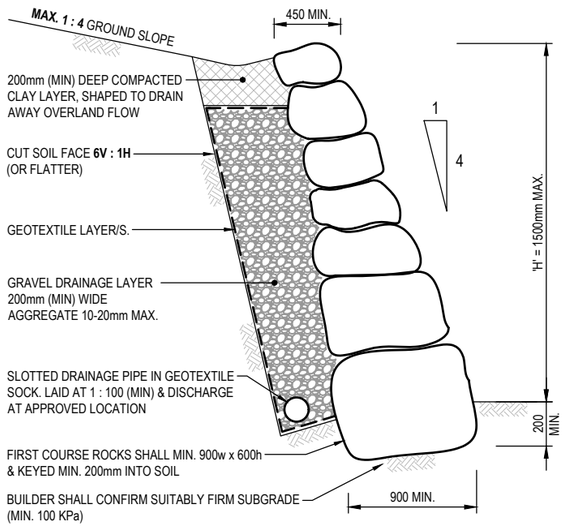
RETAINED MATERIAL SPECIFICATIONS:

1. THIS RETAINING WALL HAS BEEN DESIGNED FOR A **SURCHARGE LOADING OF 5kPa**.
2. WIND ACTIONS FOR STRUCTURES AT TOP OF ROCK WALLS HAVE **NOT** BEEN ALLOWED FOR (ie. IMPERMEABLE FENCES, ETC).
5. PERMANENT LOADS FROM FUTURE ADJACENT BUILDINGS SHALL **NOT** BE TRANSFERRED ONTO ROCK WALL
6. RETAINED MATERIAL:
   - 6.1. STIFF SILTY CLAY OR CONTROLLED FILL IN ACCORDANCE AS4678
   - 6.2. $\Phi = 26°$
   - 6.3. $K_a = 0.39$

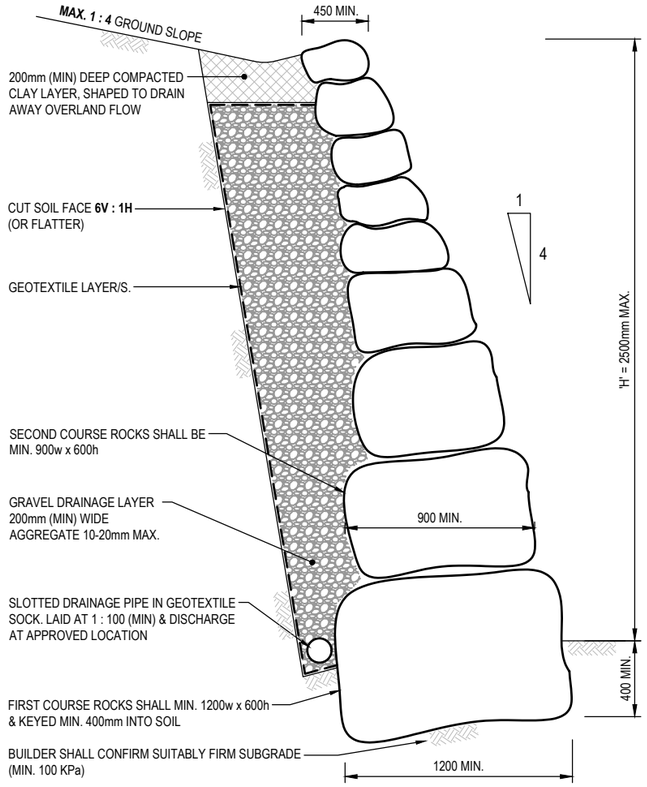
IF IN DOUBT - ASK



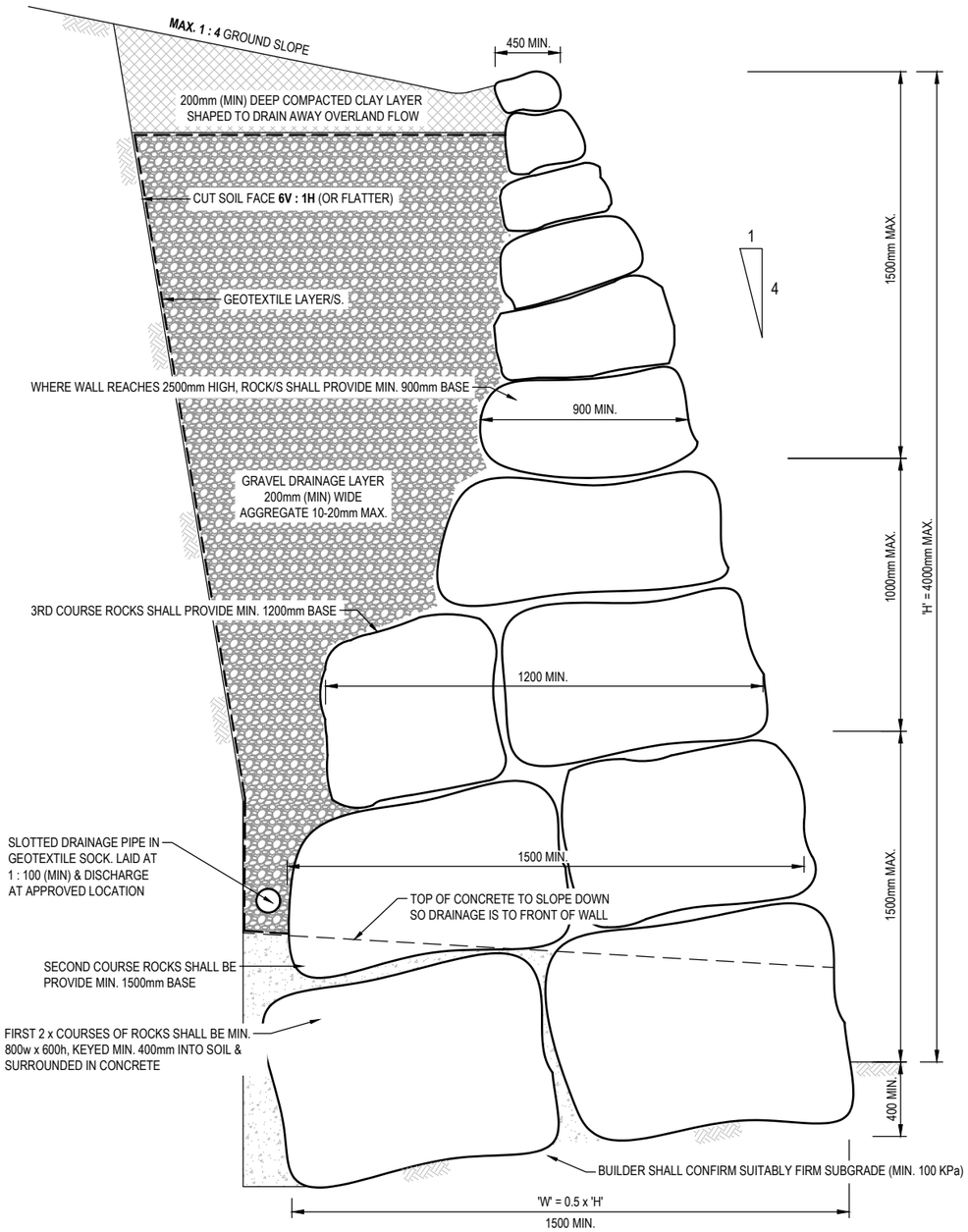
TOP CAP & BARRIER DETAIL
IF REQUIRED



BOULDER ROCK RETAINING WALL DETAIL
1500mm MAX HEIGHT



BOULDER ROCK RETAINING WALL DETAIL
2500mm MAX HEIGHT



BOULDER ROCK RETAINING WALL DETAIL
4000mm MAX HEIGHT

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