

Table 5 Guide to rock durability (after CIRIA/CUR 1991)

Test	Excellent	Good	Marginal	Poor	Comments
Rock density (oven dry) (t/m <sup>3</sup> )	> 2.9	2.6-2.9	2.3-2.6	< 2.3	Physical property affecting hydraulic stability. Good indicator of durability except dense but weathered basic rocks.
Water absorption (by mass) (%)	< 0.5	0.5-2.0	2.0-6.0	> 6.0	Most important indicator for weathering. Can be misleading for porous limestone with free-draining pores.
Magnesium sulphate soundness BS12/BS 6349 (%)	< 2	2-12	12-30	> 30	Resistance to weathering. Important for porous sedimentary rocks in hot dry climate. Good correlation with water absorption.
Freeze/Thaw FT (%)	< 0.1	0.1-0.5	0.5-2.0	> 2.0	Important test for freezing winter climates. Good correlation with water absorption.
Methylene blue absorption (g/100 g)	< 0.4	0.4-0.7	0.7-1.0	> 1.0	Indicate presence of deleterious clay minerals
Fracture toughness (Mpa <sup>1/2</sup> )	> 2.2	1.4-2.2	0.8-1.4	< 0.8	Indicates resistance to type 2 breakage. Good correlation with abrasion resistance. Can mislead for impact resistance of large blocks.
Point load index (MPa)	> 8.0	4.0-8.0	1.5-4.0	< 1.5	Indicates resistance to type 2 breakage. Quick, but high variability. Can mislead for impact resistance of large blocks.
Wet dynamic crushing value (%)	< 12	12-20	20-30	> 30	Indicates resistance to type 2 breakage. Quick test
Mill abrasion Resistance (loss/1000 revs)	< 0.002	0.002-0.004	0.004-0.015	> 0.015	Indicates resistance to abrasion by mutual grinding of saturated rock surface.
Block integrity drop test Id(%)	< 2	2-5	5-15	> 15	Indicates resistance to type 1 breakage of large blocks.


(VALUES TO BE AT LEAST BETTER THAN MARGINAL)

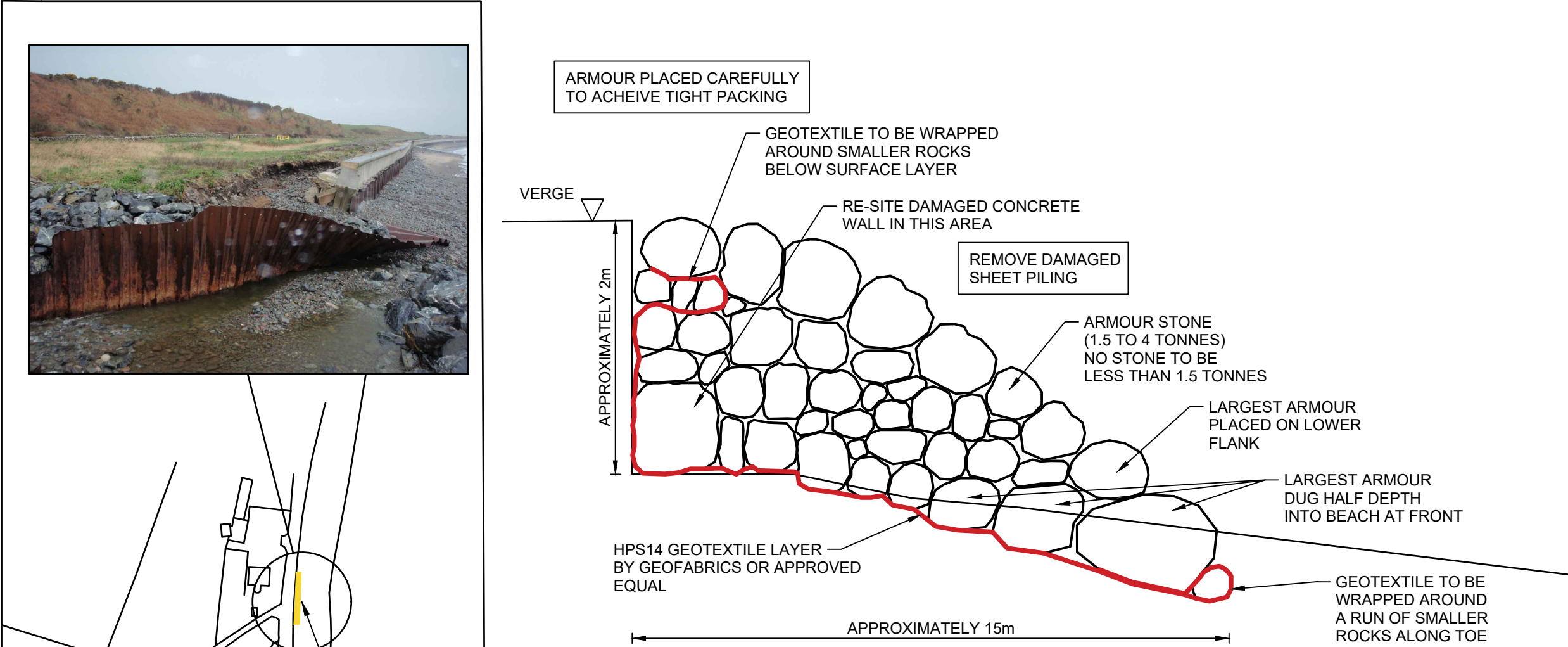
KEY

- DENOTES INDICATIVE LOCATION WHERE ROCK ARMOUR TO BE PLACED ON TOP OF EXISTING CONCRETE REVETMENT AS PER DETAIL ABOVE
- DENOTES INDICATIVE LOCATION OF WHERE EXISTING CONCRETE REVETMENT IS DILAPIDATED/MISSING AND TO BE REPLACED BY ROCK ARMOUR PROTECTION AS PER DETAIL ABOVE
- DENOTES INDICATIVE LOCATION AT KILSTAY BURN OUTFALL WHERE EXISTING VERGE/REVTMENT IS DILAPIDATED/MISSING AND TO BE REPLACED BY ROCK ARMOUR PROTECTION AS PER DETAIL ABOVE
- DENOTES INDICATIVE LOCATION OF WHERE EXISTING VERGE SLOPE IS DILAPIDATED/MISSING AND TO BE REPLACED BY STONE PITCHING BEDDED INTO GEN 3 CONCRETE AS PER DETAIL BELOW

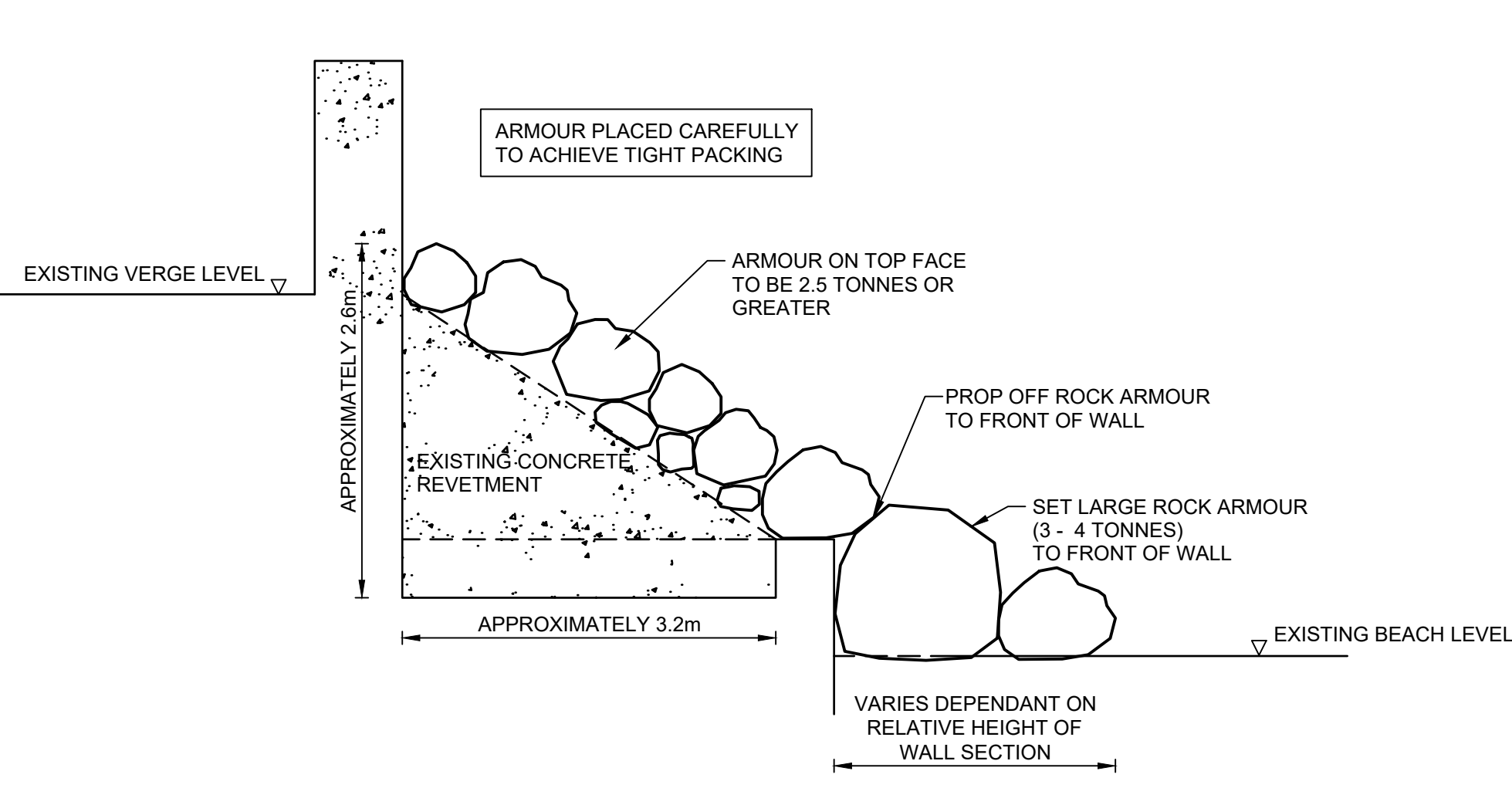
NOTES

- ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED.
- DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS, DETAILS AND SPECIFICATIONS.
- 50% OF THE ARMOUR STONE TO BE A MINIMUM OF 4.5 TONNE  
30% OF THE ARMOUR STONE TO BE A MINIMUM OF 2.5 TONNE.  
20% OF THE ARMOUR STONE TO BE NOT LESS THAN 1 TONNE.
- ROCKS TO BE INDIVIDUALLY PLACED WITH GOOD ORIENTATION CONTROL ABOVE WATER. PLACEMENT BY A GRAB MOUNTED ON A HYDRAULIC EXCAVATOR.
- ROCK DURABILITY TO BE 'GOOD' OR ABOVE IN ACCORDANCE WITH TABLE 5 SHOWN ABOVE.

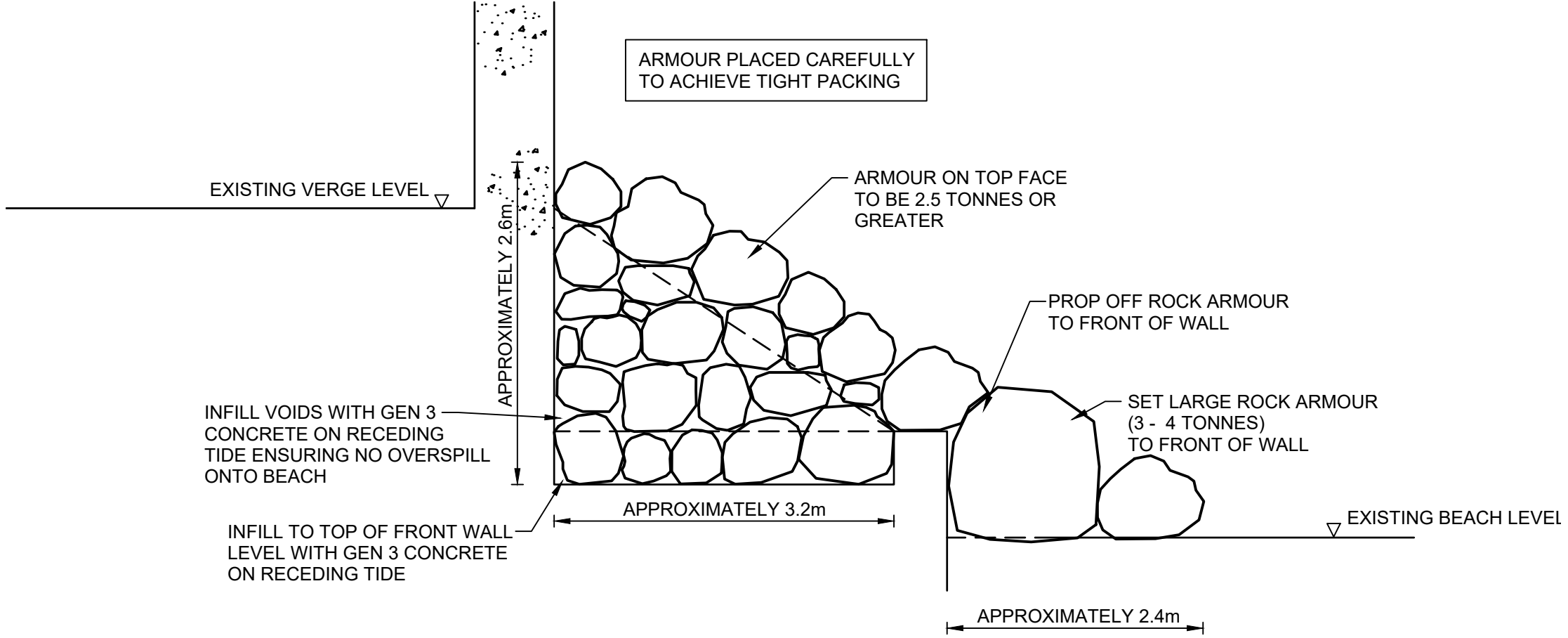
Ref.	Date	Revisions	Initials
Amendments			
Duncan McDonald, C.Eng., MICE Engineering Design Manager Cargen Tower Garroch Business Park Cargenbridge DG2 8PN		 <b>Dumfries &amp; Galloway</b>	
<b>Engineering Design</b>			
A716 KILSTAY SEA WALL ROCK ARMOUR PROTECTION TO SEA WALL			
GENERAL ARRANGEMENT (PHASE 6)			
PRELIMINARY	TENDER	<input checked="" type="checkbox"/> CONTRACT	RECORD
Drawn By	AC	Checked By	WAP
Approved By	DMcD	Date	FEB 2022
SCALE : AS SHOWN		DRG. No. PE264524/10	



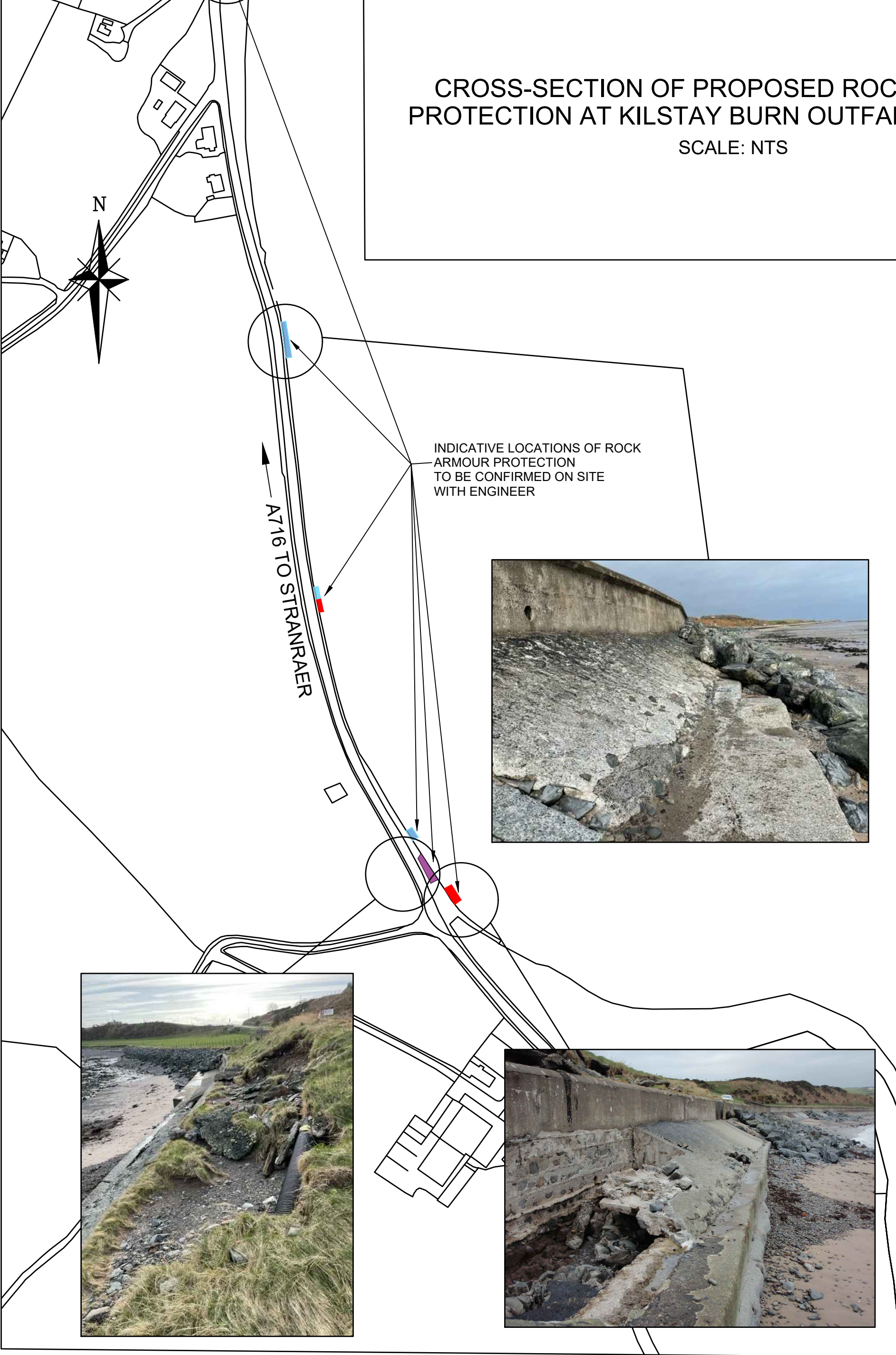
CROSS-SECTION OF PROPOSED ROCK ARMOUR PROTECTION AT KILSTAY BURN OUTFALL (YELLOW SECTION)  
SCALE: NTS



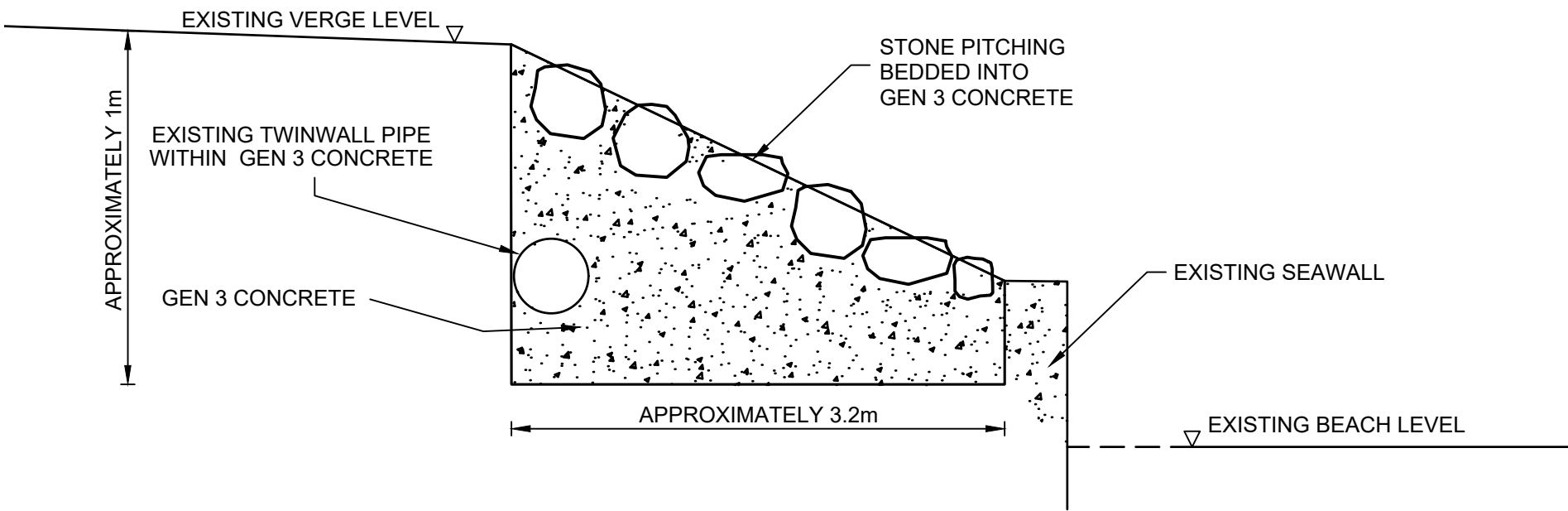
CROSS-SECTION OF PROPOSED ROCK ARMOUR PROTECTION AGAINST EXISTING WALL (25m BLUE SECTION)  
SCALE: 1:50



CROSS-SECTION OF PROPOSED ROCK ARMOUR PROTECTION AGAINST EXISTING WALL (10m RED SECTIONS)  
SCALE: 1:50



PLAN ON EXTENT OF ROCK ARMOUR PROTECTION  
SCALE: 1:2500



CROSS-SECTION OF PROPOSED PROTECTION ON EXISTING VERGE SLOPE (PURPLE SECTION)  
SCALE: 1:50

DESIGNER IDENTIFIED HAZARDS



- WORKING ADJACENT TO A716 PRINCIPAL ROAD
- WORKING CLOSE TO TIDAL WATERS
- ACCESS/EGRESS TO/FROM SITE
- PUBLIC SAFETY
- PLACEMENT OF LARGE ROCK ARMOUR STONE

REFER TO PRE-CONSTRUCTION INFORMATION FOR PROPOSED ACTION.

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