



Design ground water level was assumed to be at the ground level.

To manage settlements the following measures are proposed:

- a geogrid/geocell mattress will be constructed at the base of the embankment
- staged embankment construction with hold periods
- piles/CMC columns will be utilised in the vicinity of the bridge abutment structures
- Instrumentation including road & plate settlement gauges, settlement pins and pneumatic piezometers

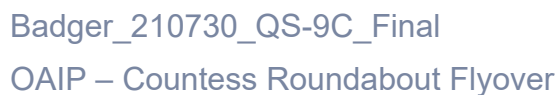
Project risks associated with this approach and measures to reduce and/or mitigate risk are covered in the following table:

Risk	Risk Reduction – GI & Monitoring	Mitigation
<ul style="list-style-type: none"><li>• Ground conditions worse than anticipated resulting in greater total and/or differential settlements.</li></ul>	In advance of detail design: <ul style="list-style-type: none"><li>• CPT &amp; boreholes testing to validate stiffness/consolidation parameters.</li></ul>	<ul style="list-style-type: none"><li>• If necessary, CMCs utilised along a greater length of the approach embankments and potentially to greater depths.</li></ul>
<ul style="list-style-type: none"><li>• Permeability lower than anticipated resulting in settlement taking longer.</li></ul>	In advance of detail design: <ul style="list-style-type: none"><li>• Permeability testing within the Structureless Chalk required to validate the assumed hold period durations.</li></ul> During construction: <ul style="list-style-type: none"><li>• Piezometers, settlement plates &amp; structure pins (or similar) will be utilised to monitor the settlement against trigger points.</li></ul>	<ul style="list-style-type: none"><li>• If necessary, CMCs utilised along a greater length of the approach embankments and potentially to greater depths.</li><li>• Hold periods managed through monitoring with trigger points.</li><li>• Allowance in program for lengthening hold periods.</li></ul>
<ul style="list-style-type: none"><li>• Construction programme/sequence required for the bridge structures results in additional settlements being induced once the deck is in place and resulting in total/differential settlement tolerances being exceeded.</li></ul>		<ul style="list-style-type: none"><li>• If necessary, a temporary bridge could be utilised during construction instead of the permanent bridge.</li><li>• If necessary, integral connections locked at a later stage in construction following further settlement (confirmed by trigger points).</li></ul>



## Appendix C – CDM designer’s risk register for the Countess flyovers

Potential hazards and risk have been defined and will be detailed in further stages, early stage and risks will continue to be considered as the design develops. A detailed risk register will be developed during detailed design.



## DESIGN HAZARD ELIMINATION AND REDUCTION REGISTER

[illegible]

Phase	
C	Construction
M	Maintain/Clean
D	Demolish/Adapt

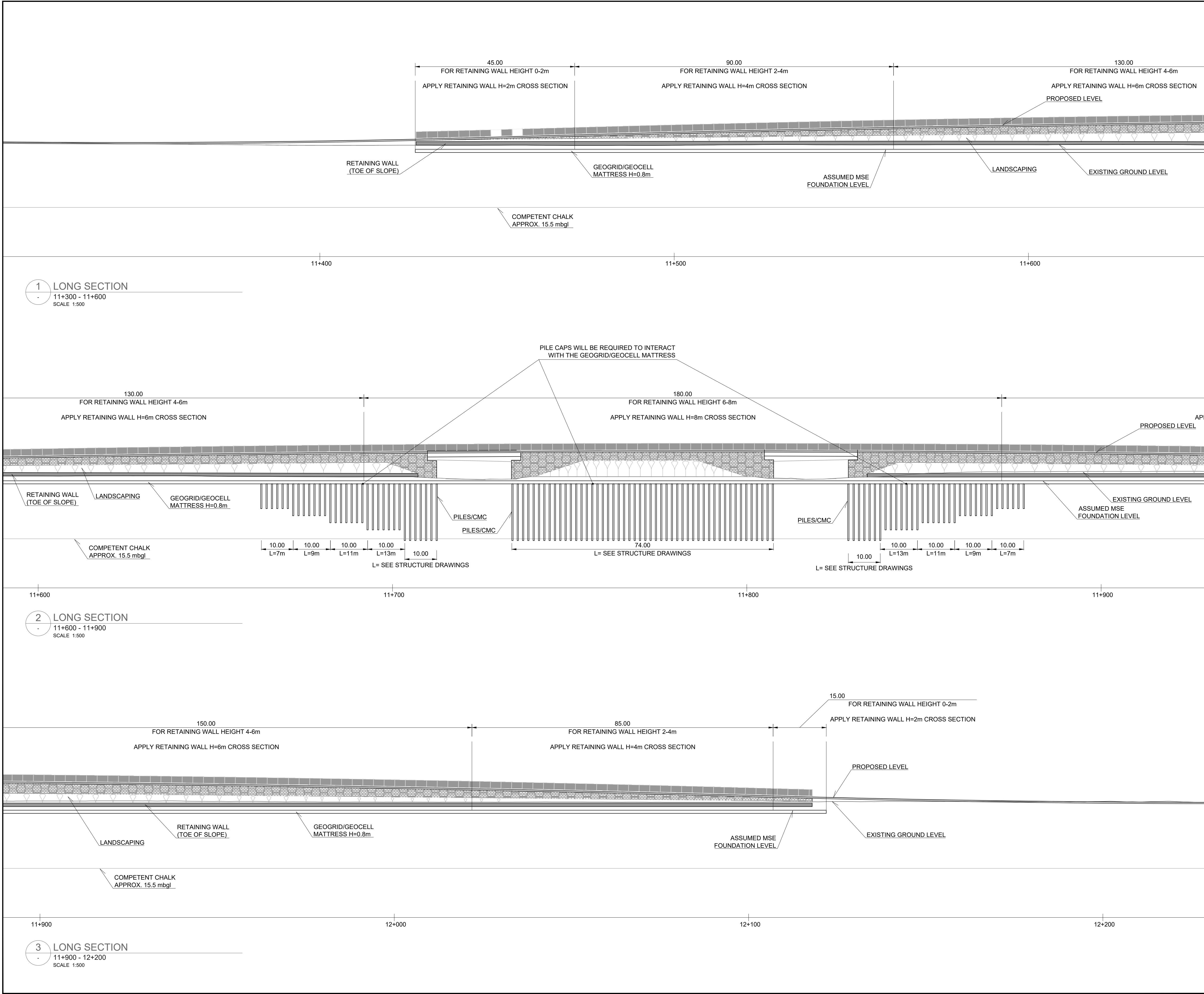
### Hierarchy of Mitigation

1. Eliminate hazard - design out
2. Reduce risk at source - amend design
3. Provide risk information - add to design

[illegible]

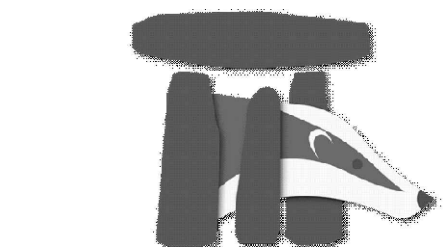


## Appendix D – Embankment drawings



- NOTES:**
1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. FOR FURTHER DETAILS OF THE PROPOSED GROUND IMPROVEMENT [PILES/CMC AND GEOGRID/GEOCELL MATTRESS], REFER TO THE GEOTECHNICAL TENDER REPORT.
  3. INDICATIVE SPACING OF 1.5M WITH A 360MM DIAMETER OF PILES/CMC.
  4. TO BE READ IN CONJUNCTION WITH THE GEOTECHNICAL TENDER REPORT, GEOLOGICAL LONG SECTIONS, EARTHWORK PLANS AND STANDARD EARTHWORK DETAILS.
  5. FOR DETAILS OF THE BRIDGE STRUCTURES REFER TO THE STRUCTURE REPORT AND DRAWINGS.
  6. THE LENGTH, LAYOUT AND DIMENSIONS OF PILES/CMCS ARE INDICATIVE.
  7. PILES/CMCS ARE LIKELY TO REQUIRE REINFORCEMENT PARTICULARLY THOSE ADJACENT TO THE BRIDGE STRUCTURES AND IN THE UPPER LENGTH OF THE PILES/CMCS.

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Rev	Rev. Date	Purpose of revision	Drawn	Checked	Rev'd	Appr'd	



Client

Project

A303  
Amesbury to Berwick Down

Drawing title

COUNTLESS JUNCTION  
STRUCTURES  
LONG SECTION

Drawing status

S0 - INITIAL STATUS

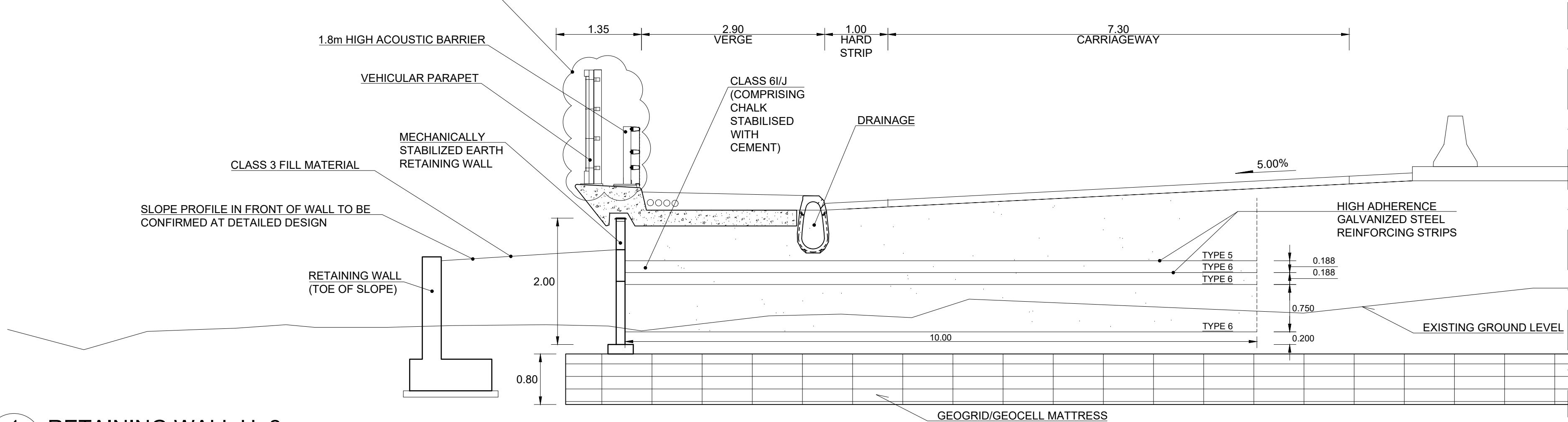
State Code	Preliminary
Project Stage	PCF Stage 5
Scale	AS SHOWN
Jacobs No.	HE551506
Client no.	HE551506

Drawing number	PIN	Originator	Volume
Location	Type	Role	Number

DO NOT SCALE

Rev P01

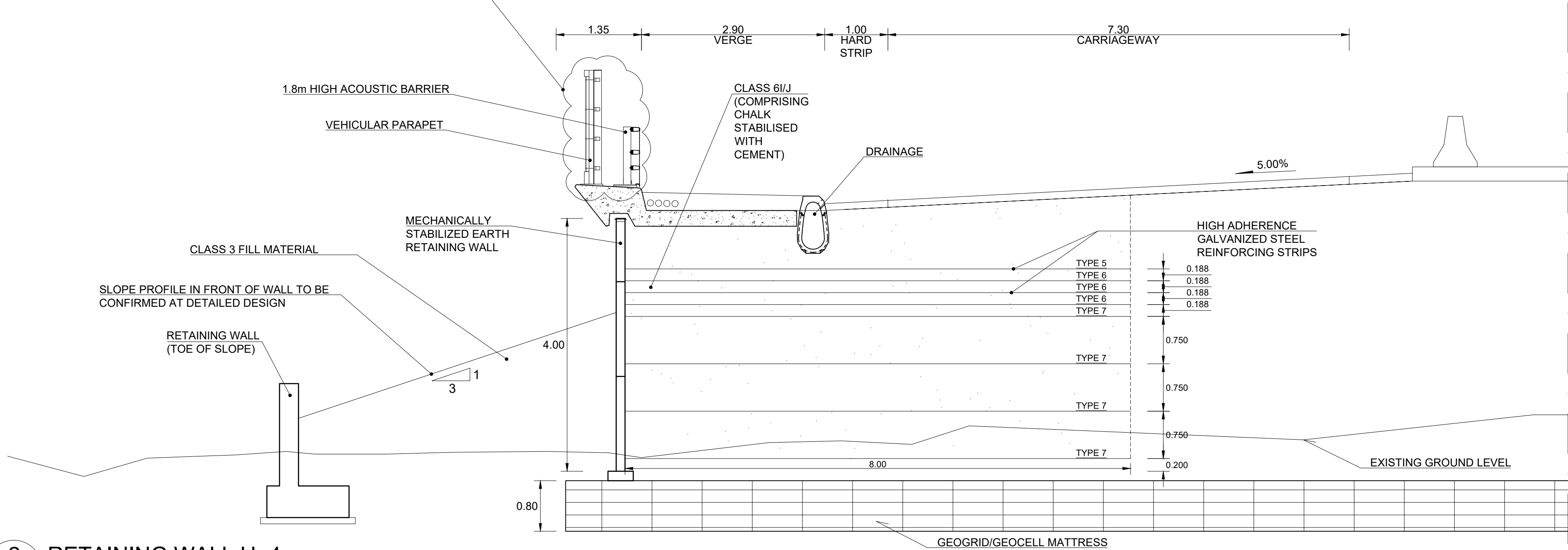
THE VEHICULAR PARAPET, ACOUSTIC BARRIER AND DRAINAGE ARRANGEMENT ON THIS DRAWING ARE INDICATIVE AND FOR DETAILS REFER TO THE STRUCTURE DRAWINGS.



**1** RETAINING WALL H=2m  
(MECHANICALLY STABILIZED EARTH RETAINING WALL )  
SCALE 1:50

RETAINING WALL H=2m						
REINFORCEMENT NUMBER	REINFORCEMENT TYPE	SPACING (M)	ABOVE FOUNDATION LEVEL	NUMBER OF STRIPS PER ROW, PER 1.5M WIDTH PANEL	RUPTURE STRENGTH AT THE END OF THE DESIGN LIFE TCR (kN)	LENGTH OF ELEMENT OF REINFORCEMENT L (m)
4	TYPE 5	0.188	1.326	3	24.0	10.0
3	TYPE 6	0.188	1.138	2	24.0	10.0
2	TYPE 6	0.750	0.950	2	24.0	10.0
1	TYPE 6	0.200	0.200	2	24.0	10.0

THE VEHICULAR PARAPET, ACOUSTIC BARRIER AND DRAINAGE ARRANGEMENT ON THIS DRAWING ARE INDICATIVE AND FOR DETAILS REFER TO THE STRUCTURE DRAWINGS.



**2** RETAINING WALL H=4m  
(MECHANICALLY STABILIZED EARTH RETAINING WALL )  
SCALE 1:50

RETAINING WALL H=4m						
REINFORCEMENT NUMBER	REINFORCEMENT TYPE	SPACING (M)	ABOVE FOUNDATION LEVEL	NUMBER OF STRIPS PER ROW, PER 1.5M WIDTH PANEL	RUPTURE STRENGTH AT THE END OF THE DESIGN LIFE TCR (kN)	LENGTH OF ELEMENT OF REINFORCEMENT L (m)
8	TYPE 5	0.188	3.202	3	24.0	10.0
7	TYPE 6	0.188	3.014	2	24.0	10.0
6	TYPE 6	0.188	2.826	2	24.0	10.0
5	TYPE 6	0.188	2.638	2	24.0	10.0
4	TYPE 7	0.750	2.450	2	42.0	10.0
3	TYPE 7	0.750	1.700	2	42.0	10.0
2	TYPE 7	0.750	0.950	2	42.0	10.0
1	TYPE 7	0.200	0.200	2	42.0	10.0

- NOTES:**
- ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
  - FOR FURTHER DETAILS OF THE PROPOSED GROUND IMPROVEMENT (PILES/CMC AND GEOGRID/GEOCELL MATTRESS), REFER TO THE GEOTECHNICAL TENDER REPORT.
  - TO BE READ IN CONJUNCTION WITH THE GEOTECHNICAL TENDER REPORT, GEOLOGICAL LONG SECTIONS, EARTHWORK PLANS AND STANDARD EARTHWORK DETAILS.
  - REINFORCEMENT TYPE BASED ON RUPTURE STRENGTH AND NUMBER OF STRIPS PER ROW.

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Client

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Drawing status

S0 - INITIAL STATUS

State Code

Preliminary

Project Stage

PCF Stage 5

Scale

AS SHOWN

Jacobs No.

HE551506

Client no.

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Drawing number

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Originator

Volume

Location

Type

Role

Number

DO NOT SCALE

Rev

P01



THE VEHICULAR PARAPET, ACOUSTIC BARRIER AND DRAINAGE ARRANGEMENT ON THIS DRAWING ARE INDICATIVE AND FOR DETAILS REFER TO THE STRUCTURE DRAWINGS.

1.35 2.90 VERGE 1.00 HARD STRIP 7.30 CARRIAGEWAY

1.8m HIGH ACOUSTIC BARRIER

VEHICULAR PARAPET

DRAINAGE

5.00%

MECHANICALLY STABILIZED EARTH RETAINING WALL

CLASS 6/IJ (COMPRISING CHALK STABILISED WITH CEMENT)

CLASS 3 FILL MATERIAL

SLOPE PROFILE IN FRONT OF WALL TO BE CONFIRMED AT DETAILED DESIGN

RETAINING WALL (TOE OF SLOPE)

6.00

11.00

0.80

TYPE 1 0.188

TYPE 2 0.188

TYPE 2 0.188

TYPE 2 0.188

TYPE 3 0.750

TYPE 3 0.750

TYPE 3 0.750

TYPE 3 0.750

TYPE 3 0.750

TYPE 3 0.750

TYPE 3 0.200

HIGH ADHERENCE GALVANIZED STEEL REINFORCING STRIPS

EXISTING GROUND LEVEL

GEOGRID/GEOCELL MATTRESS

3 RETAINING WALL H=6m  
(MECHANICALLY STABILIZED EARTH RETAINING WALL )  
SCALE 1:50

RETAINING WALL H=6m						
REINFORCEMENT NUMBER	REINFORCEMENT TYPE	SPACING [M]	ABOVE FOUNDATION LEVEL	NUMBER OF STRIPS PER ROW, PER 1.5M WIDTH	RUPTURE STRENGTH AT THE END OF DESIGN LIFE TCR [kN]	LENGTH OF ELEMENT OUT OF REINFORCEMENT [m]
11	TYPE 1	0.188	5.452	3	24.0	11.0
10	TYPE 2	0.188	5.264	2	24.0	11.0
9	TYPE 2	0.188	5.076	2	24.0	11.0
8	TYPE 2	0.188	4.888	2	24.0	11.0
7	TYPE 2	0.750	4.700	2	24.0	11.0
6	TYPE 3	0.750	3.950	2	42.0	11.0
5	TYPE 3	0.750	3.200	2	42.0	11.0
4	TYPE 3	0.750	2.450	2	42.0	11.0
3	TYPE 3	0.750	1.700	2	42.0	11.0
2	TYPE 3	0.750	0.950	2	42.0	11.0
1	TYPE 3	0.200	0.200	2	42.0	11.0

**NOTES:**

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3. TO BE READ IN CONJUNCTION WITH THE GEOTECHNICAL TENDER REPORT, GEOLOGICAL LONG SECTIONS, EARTHWORK PLANS AND STANDARD EARTHWORK DETAILS.
4. REINFORCEMENT TYPE BASED ON RUPTURE STRENGTH AND NUMBER OF STRIPS PER ROW

THE VEHICULAR PARAPET, ACOUSTIC BARRIER AND DRAINAGE ARRANGEMENT ON THIS DRAWING ARE INDICATIVE AND FOR DETAILS REFER TO THE STRUCTURE DRAWINGS.

1.35 2.90 1.00 7.30  
VERGE HARD STRIP CARRIAGEWAY

1.8m HIGH ACOUSTIC BARRIER  
VEHICULAR PARAPET  
DRAINAGE

5.00%

MECHANICALLY STABILIZED EARTH RETAINING WALL

CLASS 6I/J (COMPRISING CHALK STABILISED WITH CEMENT)

CLASS 3 FILL MATERIAL

SLOPE PROFILE IN FRONT OF WALL TO BE CONFIRMED AT DETAILED DESIGN

RETAINING WALL (TOE OF SLOPE)

1  
3

8.00

11.00

0.80

0.188  
TYPE 1  
TYPE 2  
TYPE 2  
TYPE 2  
TYPE 2  
TYPE 2  
TYPE 2  
TYPE 2  
TYPE 3  
TYPE 3  
0.750  
TYPE 3  
0.750  
TYPE 3  
0.750  
TYPE 4  
0.750  
TYPE 4  
0.750  
TYPE 4  
0.750  
TYPE 3  
0.200

HIGH ADHERENCE GALVANIZED STEEL REINFORCING STRIPS

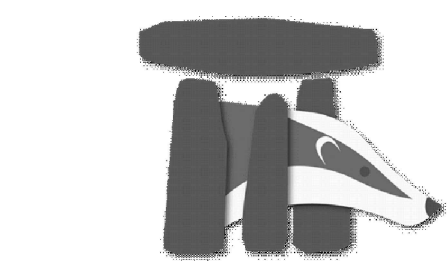
EXISTING GROUND LEVEL

GEOGRID/GEOCELL MATTRESS

4 RETAINING WALL H=8m  
(MECHANICALLY STABILIZED EARTH RETAINING WALL )  
SCALE 1:50

RETAINING WALL H=8m						
REINFORCEMENT NUMBER	REINFORCEMENT TYPE	SPACING [M]	ABOVE FOUNDATION LEVEL	NUMBER OF STRIPS PER ROW, PER 1.5M WIDTH PANEL	RUPTURE STRENGTH AT THE END OF THE DESIGN LIFE TCR [kN]	LENGTH OF ELEMENT OF REINFORCEMENT [m]
17	TYPE 1	0.188	7.142	3	24.0	11.0
16	TYPE 1	0.188	6.954	3	24.0	11.0
15	TYPE 2	0.188	6.766	2	24.0	11.0
14	TYPE 2	0.188	6.578	2	24.0	11.0
13	TYPE 2	0.188	6.390	2	24.0	11.0
12	TYPE 2	0.188	6.202	2	24.0	11.0
11	TYPE 2	0.188	6.014	2	24.0	11.0
10	TYPE 2	0.188	5.826	2	24.0	11.0
9	TYPE 3	0.188	5.638	2	42.0	11.0
8	TYPE 3	0.750	5.450	2	42.0	11.0
7	TYPE 3	0.750	4.700	2	42.0	11.0
6	TYPE 3	0.750	3.950	2	42.0	11.0
5	TYPE 3	0.750	3.200	2	42.0	11.0
4	TYPE 4	0.750	2.450	3	42.0	11.0
3	TYPE 4	0.750	1.700	3	42.0	11.0
2	TYPE 4	0.750	0.950	3	42.0	11.0
1	TYPE 3	0.200	0.200	2	42.0	11.0

P01	30/03/21	FINAL ISSUE	MP	MP	JC	JC
Rev	Rev. Date	Purpose of revision	Drawn	Checked	Rev'd	Apprv'd



Client

 highways  
england

Project	A303 Amesbury to Berwick Down
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Drawing title

COUNTESS JUNCTION  
STRUCTURES  
CROSS SECTION

Drawing status

S0 - INITIAL STATUS

State Code	Preliminary					
Project Stage	PCF Show 5					
Scale	AS SHOWN			DO NOT SCALE		
Jacobs No.	HE551506			Rev	P01	
Client no.	HE551506					
Drawing number PIN		Originator		Volume		
	-		-			
Location				Type   Role   Number		