

TEMPORARY WORKS DESIGN

DESIGN COVER SHEET



Design Ref	45240	Status	FOR APPROVAL	MGF Design Category	2B
Area / Rep	SW1	Kevin Martin		CRM Project Ref	144730
Customer	Forkers Ltd				
Contact	Chris Goldsmith	07765022416		chrisgoldsmith@forkers.com	
Site	Albany Street, Newport				
Title	Manhole SW1				
Issue	Rev	Date	Designer (TWD) Checker (TWDC)	Comments	
1	A1	18.01.2017	Duncan Knights Richard Lawrenson	For Approval	
2	A2	07.02.2017	Duncan Knights Richard Lawrenson	For Approval Customer has requested that over dig be considered	
3	A3	19.06.2018	Patrick Marshall Richard Lawrenson	For Approval  Customer to confirm anticipated deflection are acceptable Existing Sheet Pile Wall – See design note 7b & 7d	



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TEMPORARY WORKS DESIGN

DESIGN SUMMARY

EXCAVATION DETAILS

EXCAVATION TYPE	3	Sided Excavation / Cofferdam
DEPTH (m)	4.30	(4.60m with over-dig)
OVER-DIG CONSIDERED	Yes	– 0.30m
GROUND REDUCTION	No	
PLAN DIMENSIONS (m)	5.50	x 5.10 sheet-to-sheet
EXISTING GROUND LEVEL (m AOD)	7.95	
CLEARANCE (m)	1.35	to underside of lowest frame after removal of F3 following casting of concrete base.
DURATION OF WORKS	< 6 weeks	

GROUND CONDITIONS

SI REF.	Crindau – Sainsburys Geotechnical Interpretative Report 108234/MS/161108 Rev 2 CC Ground Investigations Ltd 2014 Factual Report (Report No. C4176)
BOREHOLE LOG REF.	WS01, WS02, WS03
TOP OF BOREHOLE (m AOD)	Not Provided
GROUNDWATER (m BGL)	1.24 (WS01)

SURCHARGE / EXTERNAL LOADING

PLANT / CONSTRUCTION LOAD	Up to 30 tonne	10	kN/m ²
OTHER(S)	None Considered		

TEMPORARY WORKS DESIGN

DESIGN SUMMARY

DESIGN SOLUTION SUMMARY

GROUND SUPPORT SYSTEM			Sheet & Brace		
METHOD OF INSTALL			Dig & Push Lowering Frames		
SHEET DETAILS			5.00	m Long	KKD 600/60 m toe-in
MAX. SHEET DEFLECTION (mm)			<20		
FRAME(S)	1	0.50m BGL	MGF 200 Series Manhole Brace 4900-6000 DA (D Legs)		
	2	2.65m BGL	MGF 254UC Brace		
	3	3.75m BGL	MGF 254UC Brace		
MAX. FRAME DEFLECTION (mm)			<30 as per MGF technical file section 3.1.14 (Issue 4)		
FRAME SUPPORT			Standard Restraining Chains		
2 STAGE CONSTRUCTION			Yes	Frame 3 can be removed after construction of 150mm concrete slab	

TEMPORARY WORKS DESIGN

DESIGN NOTES

1. The customer has provided MGF a full SI. A design bore hole has been derived from the supplied borehole logs WS01, WS02 and WS03. WS03A & WS03B have been disregarded due to their shallow nature. The top of the bore hole is assumed to be at Commencing Level. The CDM Regulations 2015 place legal obligations on all parties to provide all relevant information to enable them to perform their function. The Customer should be aware of the increase in their level of risk when only limited soil information is available.
2. Passive softening has been considered in this design for cohesive soils for which the trench sheets rotational stability relies upon the passive resistance of the soil.
3. The excavation is anticipated to be open for a period less than three months; therefore a total stress analysis has been undertaken for cohesive soils.
4. Groundwater has been taken at 1.24m below the top of the borehole / commencing level as per borehole WS01.
5. The presence of low strength soils and the residual risk of encountering very poor soils at formation level provides potential for structural base heave. The customer should monitor the base of the excavation, and if heave begins to occur then the customer should immediately backfill the excavation with 1.00m of fill and seek further advice.



6. If ground / groundwater conditions differ from those analysed in this design the customer must contact MGF immediately for a re-design.
7. The following Live Load Surcharges have been considered within this design:-

General

- a. A Construction Plant live load surcharge of 10kN/m² has been adopted to consider a construction live load (in accordance with CIRIA Special Publication 95 cl. 4.2.1 recommendation for adjacent plant laden wt. up to 30 Tonnes). Although this design considers a plant live load surcharge it is recommended that the Customer maintains a 1m exclusion zone from the edge of the excavation in order to reduce risk of ground consolidation (directly adjacent to the wall) and any consequential deflections / movement of the ground.

Buildings / Structures / Underground Structures / Highways / Cranes



- b. The customer has informed MGF there is an existing permanent sheet pile wall adjoining the proposed cofferdam. As a result the proposed cofferdam will be 3 sided. The customer must ensure the permanent sheet piles wall is capable of withstanding the loads imposed upon it by the TW's. The structural integrity of the permanent sheet pile wall is the customers responsibility.
 - c. This design assumes that all other buildings / structures / underground structures / highways are 5.00m away from the edge of the TW's. Therefore, they are deemed to be outside the zone-of-influence of the TWs and as such will impart no additional loads onto the excavation.
 - d. It is recommended that the Customer continuously monitors the excavation for signs of movements and any existing buildings / structures for signs of distress. Should excessive movement of the excavation occur the Customer should seek advice from MGF DSL.
8. This TWs design adopts the 'Dig & Push / Lowering Frames' method of installation. Please refer to the MGF drawing associated with this design for installation and excavation requirements / guidance.
 9. The concrete base must achieve a minimum strength of 5N/mm² prior to removal of F3.
 10. Customer to provide suitable edge protection and provision for safe access and egress, as defined by Work at Height Regulation 2005 (+AMD 2007).
 11. Existing services should be adequately supported and protected for the duration of the excavation.
 12. This design has made an allowance for unplanned excavation (accidental over-dig) to a maximum of 300mm.
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13. The customer should confirm the anticipated deflections are acceptable in the surrounding environment.
 14. MGF recommend a high level of site supervision should be maintained for the duration of the works by a person with the appropriate skills, knowledge, experience and training.
 15. This design is offered based on information within the TWs Design Brief (Design Request Form). Prior to construction it is the Customer's responsibility to check that the Design Request Form is complete and accurate and that the installation proposed can be safely constructed. If the proposed works deviate from this design and / or site conditions vary, please seek a re-design. If in doubt, please contact MGF DSL (01942 402704).
 16. Refer to the MGF Technical File and MGF Installation Guidelines for more detailed technical information.

TEMPORARY WORKS DESIGN

DESIGN NOTES

17. References:-

- a. CIRIA Special Publication 95: - The Design and Construction of Sheet Piled Cofferdams
- b. CIRIA Report 97 Second Edition 2001 Revision: - Trenching Practice
- c. BS EN 14653 (2005) Parts 1 & 2 Manually Operated Hydraulic Shoring Systems for Groundwork Support
- d. BS 5975 (2008) Code of Practice for Temporary Works Procedures and the Permissible Stress Design of Falsework

TEMPORARY WORKS DESIGN

SAFETY PRODUCTS

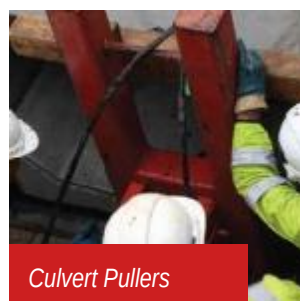
A number of safety products to ensure safe access and egress into the excavation are available to complement the equipment in this design:



We also have a comprehensive range of emergency escape breathing apparatus, gas detectors, fall arrest and rescue equipment and harnesses available. Please contact your local depot for more details.

For more information on our safety products, download our [ancillaries booklet](#).

ADDITIONAL PRODUCTS



Temporary Works Design

DESIGN CALCULATIONS

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Pile geometry

Pile top Level .3 m
 Pile Length 4.5 m
 Pile toe level -4.2 m
 Active ground slope 0 Degrees (To horizontal)

Soils and ground water initial data (Soils data given for active and passive sides)

Initial Ground Water level -1.24

Top Level m	Description	Bulk Dens kN/m3	Sat' Dens kN/m3	Young Mod kN/m2	Young Inc. kN/m3	Cu C' kN/m2	C Inc. kN/m3	Phi Deg	Wall Shear Ratio	Ka Kp	Kac Kpc
.00	MG Granular	18.00	20.00	16000	0			28 28	.50 .50	.32 4.15	
-2.10	MG Cohesive	18.00	18.00	9000	0	13 13			.50 .50	1.00 1.00	2.45 2.45

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Construction sequence

Stage Ref	Stage Type	Level or Angle m/deg.	Load kN/(m)	Offset m	Width m	Length m
1 A	Active surcharge	0.00	10.0	.0		
2 A	Insert prop	-0.50				
3	Insert prop	-1.05				
4 A	Pile toe level	-1.80				
5	Passive side excavation	-1.80				
6 A	Passive water level	-1.80				
7	Insert prop	-1.65				
8 A	Remove prop	-1.05				
9	Insert prop	-1.35				
10 A	Remove prop	-1.65				
11	Pile toe level	-2.40				
12	Passive side excavation	-2.40				
13 A	Passive water level	-2.40				
14	Insert prop	-2.25				
15 A	Remove prop	-1.35				
16	Insert prop	-1.95				
17 A	Remove prop	-2.25				
18	Pile toe level	-3.10				
19	Passive side excavation	-3.10				
20 A	Passive water level	-3.10				
21	Insert prop	-2.95				
22 A	Remove prop	-1.95				
23	Insert prop	-2.65				
24 A	Remove prop	-2.95				
25	Pile toe level	-3.90				
26	Passive side excavation	-3.90				
27 A	Passive water level	-3.90				
28	Insert prop	-3.75				
29	Pile toe level	-4.60				
30	Passive side excavation	-4.60				
31 A	Passive water level	-4.60				
32	Insert prop	-4.45				
33 A	Remove prop	-3.75				

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Code of practice

Code of practice or reference document	CIRIA R104 Burland and Potts Permanent Works
Application of pressures for stability	FOS on available passive
FOS on moments (stability check)	2.00
ULS factor on Tan(Phi) values	1.00
ULS fFactor on drained cohesion values	1.00
ULS factor on undrained cohesion values	1.00
ULS factor on active soil pressures	1.00
ULS factor on passive soil pressures	1.00
ULS factor on active water pressures	1.00
ULS factor on passive water pressures	1.00
ULS factor on loads applied to the soil	1.00
ULS factor on loads applied to the wall	1.00
FOS on embedment (stability check)	1.00
Correction factor on cantilever embedment	1.20

Wall analysis detail options

Nominal Phi for load distribution	30.0 Degrees
Depth of water filled tension cracks	.0 m
Density of water	10.0 kN/m3
Minimum equivalent fluid density	5.0 kN/m3
Depth of passive softened soil	1.0 m
Continuity model for wall analysis	Pins at second and lower props

Deflection parameters

Wall moment of inertia	698 cm4/m
Wall Youngs modulus	210000000 kN/m2
Properties for prop at -0.5	
Prop/Tie cross sectional area	200 cm2 each
Prop/Tie Youngs modulus	210000000 kN/m2
Prop/Tie length	10.0 m
Prop/Tie spacing	6.0 m
Waling moment of inertia	Waling deflection not included
Waling Youngs modulus	Waling deflection not included
Prop/Tie preload	0 kN
Initial lack of fit	0.0 mm
Properties for prop at -1.05	
Prop/Tie cross sectional area	200 cm2 each
Prop/Tie Youngs modulus	210000000 kN/m2
Prop/Tie length	10.0 m
Prop/Tie spacing	6.0 m
Waling moment of inertia	Waling deflection not included
Waling Youngs modulus	Waling deflection not included
Prop/Tie preload	0 kN
Initial lack of fit	0.0 mm

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Deflection parameters - continued

Properties for prop at -1.65

Prop/Tie cross sectional area	200 cm2 each
Prop/Tie Youngs modulus	210000000 kN/m2
Prop/Tie length	10.0 m
Prop/Tie spacing	6.0 m
Waling moment of inertia	Waling deflection not included
Waling Youngs modulus	Waling deflection not included
Prop/Tie preload	0 kN
Initial lack of fit	0.0 mm

Properties for prop at -1.35

Prop/Tie cross sectional area	200 cm2 each
Prop/Tie Youngs modulus	210000000 kN/m2
Prop/Tie length	10.0 m
Prop/Tie spacing	6.0 m
Waling moment of inertia	Waling deflection not included
Waling Youngs modulus	Waling deflection not included
Prop/Tie preload	0 kN
Initial lack of fit	0.0 mm

Properties for prop at -2.25

Prop/Tie cross sectional area	200 cm2 each
Prop/Tie Youngs modulus	210000000 kN/m2
Prop/Tie length	10.0 m
Prop/Tie spacing	6.0 m
Waling moment of inertia	Waling deflection not included
Waling Youngs modulus	Waling deflection not included
Prop/Tie preload	0 kN
Initial lack of fit	0.0 mm

Properties for prop at -1.95

Prop/Tie cross sectional area	200 cm2 each
Prop/Tie Youngs modulus	210000000 kN/m2
Prop/Tie length	10.0 m
Prop/Tie spacing	6.0 m
Waling moment of inertia	Waling deflection not included
Waling Youngs modulus	Waling deflection not included
Prop/Tie preload	0 kN
Initial lack of fit	0.0 mm

Properties for prop at -2.95

Prop/Tie cross sectional area	200 cm2 each
Prop/Tie Youngs modulus	210000000 kN/m2
Prop/Tie length	10.0 m
Prop/Tie spacing	6.0 m
Waling moment of inertia	Waling deflection not included
Waling Youngs modulus	Waling deflection not included
Prop/Tie preload	0 kN
Initial lack of fit	0.0 mm

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Deflection parameters - continued

Properties for prop at -2.65

Prop/Tie cross sectional area	200 cm2 each
Prop/Tie Youngs modulus	210000000 kN/m2
Prop/Tie length	10.0 m
Prop/Tie spacing	6.0 m
Waling moment of inertia	Waling deflection not included
Waling Youngs modulus	Waling deflection not included
Prop/Tie preload	0 kN
Initial lack of fit	0.0 mm

Properties for prop at -3.75

Prop/Tie cross sectional area	200 cm2 each
Prop/Tie Youngs modulus	210000000 kN/m2
Prop/Tie length	10.0 m
Prop/Tie spacing	6.0 m
Waling moment of inertia	Waling deflection not included
Waling Youngs modulus	Waling deflection not included
Prop/Tie preload	0 kN
Initial lack of fit	0.0 mm

Properties for prop at -4.45

Prop/Tie cross sectional area	200 cm2 each
Prop/Tie Youngs modulus	210000000 kN/m2
Prop/Tie length	10.0 m
Prop/Tie spacing	6.0 m
Waling moment of inertia	Waling deflection not included
Waling Youngs modulus	Waling deflection not included
Prop/Tie preload	0 kN
Initial lack of fit	0.0 mm

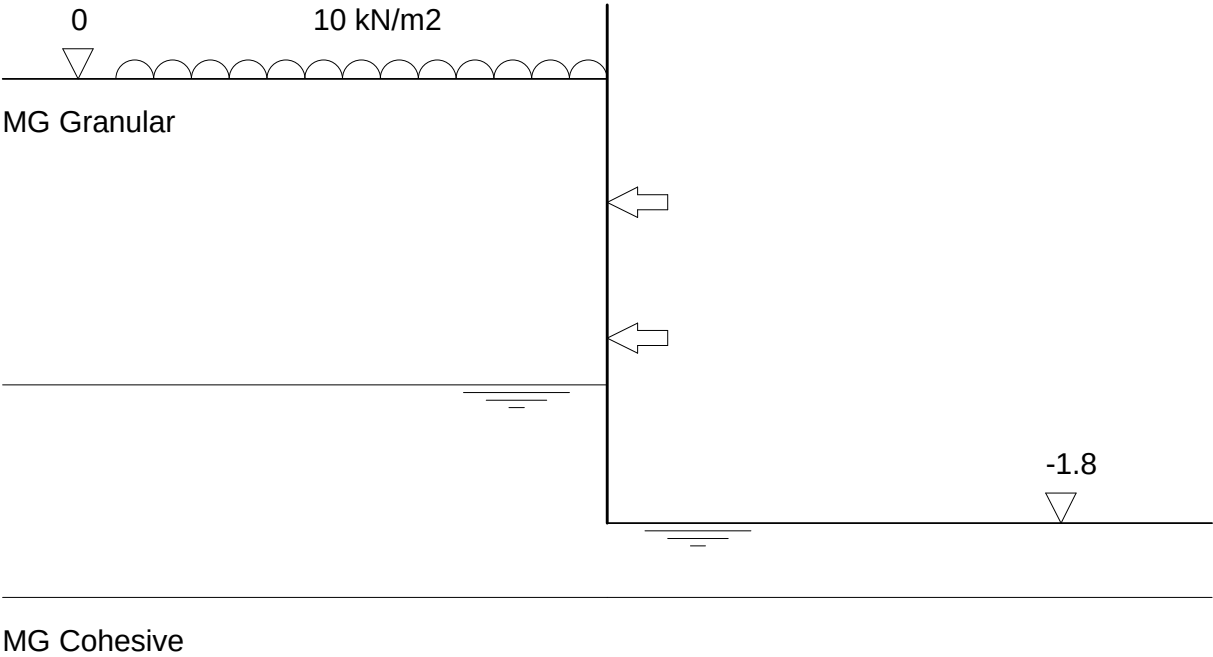
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Stage ref.

6

Stage type

Passive water level



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Tabular results from analysis of stage ref 6

Calc Level m	Active Vert kN/m2	Active Earth kN/m2	Active Water kN/m2	Pas' Vert kN/m2	Pas' Earth kN/m2	Pas' Water kN/m2	Total Nett kN/m2	Bend. Moment kNm/m	Shear Force kN/m	Defl't mm	Prop Force kN/m	FOS
.30	.0	.0	.0	.0	.0	.0	0	0	0	0		.00
.00	.0	.0	.0	.0	.0	.0	0	0	0	0		.00
.00	10.0	3.2	.0	.0	.0	.0	3.2	0	0	0		.00
-.14	12.5	4.0	.0	.0	.0	.0	4.0	0	-.5	0		.00
-.50	19.0	6.0	.0	.0	.0	.0	6.0	.5	-2.3	0	-2.2	.00
-.50	19.0	6.0	.0	.0	.0	.0	6.0	.5	-4.5	0		.00
-1.00	28.0	8.9	.0	.0	.0	.0	8.9	3.6	-8.2	.2		.00
-1.05	28.9	9.2	.0	.0	.0	.0	9.2	4.0	-8.6	.3	18.3	.00
-1.05	28.9	9.2	.0	.0	.0	.0	9.2	4.0	9.6	.3		.00
-1.24	32.3	10.2	.0	.0	.0	.0	10.2	2.4	7.8	.4		.00
-1.35	33.4	10.6	1.1	.0	.0	.0	11.7	1.6	6.6	.4	.0	.00
-1.35	33.4	10.6	1.1	.0	.0	.0	11.7	1.6	6.6	.4		.00
-1.65	36.4	11.5	4.1	.0	.0	.0	15.6	.2	2.5	.7	.0	.00
-1.65	36.4	11.5	4.1	.0	.0	.0	15.6	.2	2.5	.7		.00
-1.80	37.9	12.0	5.6	.0	.0	.0	17.6	0	0	0		.00
-1.80	37.9	12.0	5.6	.0	.0	.0	17.6	0	0	0		.00

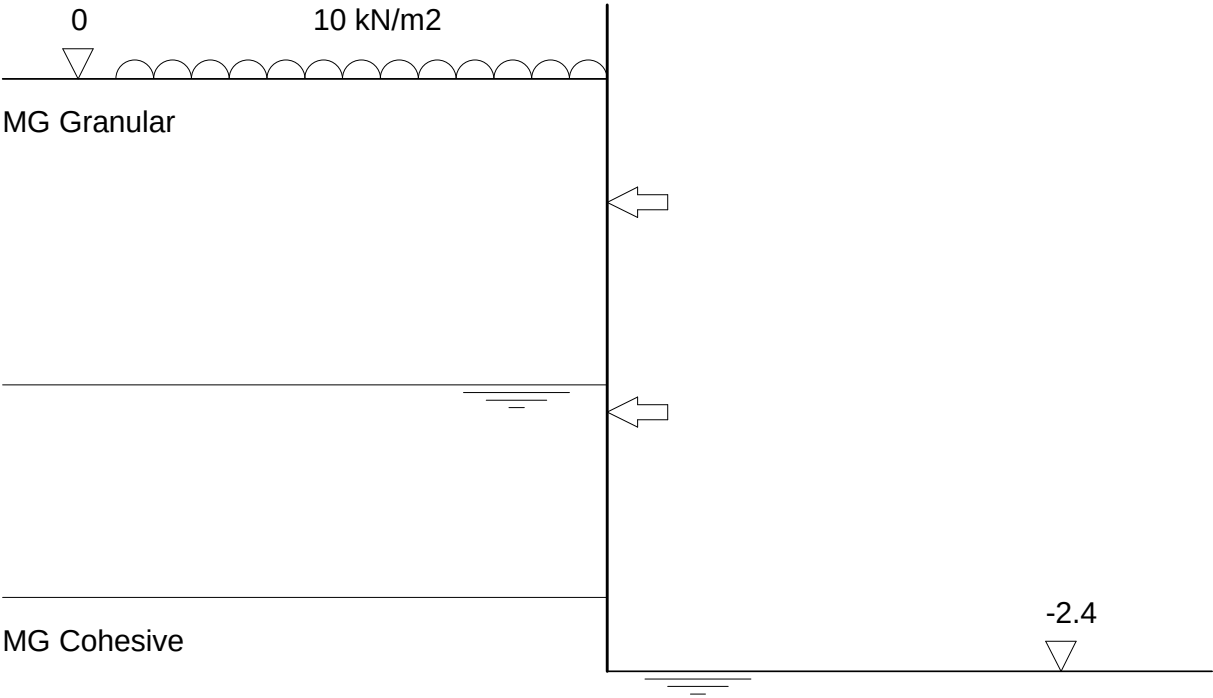
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Stage ref.

13

Stage type

Passive water level



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Tabular results from analysis of stage ref 13

Calc Level m	Active Vert kN/m2	Active Earth kN/m2	Active Water kN/m2	Pas' Vert kN/m2	Pas' Earth kN/m2	Pas' Water kN/m2	Total Nett kN/m2	Bend. Moment kNm/m	Shear Force kN/m	Defl't mm	Prop Force kN/m	FOS
.30	.0	.0	.0	.0	.0	.0	0	0	0	.2		.00
.00	.0	.0	.0	.0	.0	.0	0	0	0	.1		.00
.00	10.0	3.2	.0	.0	.0	.0	3.2	0	0	.1		.00
-.14	12.5	4.0	.0	.0	.0	.0	4.0	0	-.5	.1		.00
-.50	19.0	6.0	.0	.0	.0	.0	6.0	.5	-2.3	.1	-6.4	.00
-.50	19.0	6.0	.0	.0	.0	.0	6.0	.5	-8.7	.1		.00
-1.00	28.0	8.9	.0	.0	.0	.0	8.9	5.7	-12.4	.4		.00
-1.05	28.9	9.2	.0	.0	.0	.0	9.2	6.4	-12.9	.5	.0	.00
-1.05	28.9	9.2	.0	.0	.0	.0	9.2	6.4	-12.9	.5		.00
-1.24	32.3	10.2	.0	.0	.0	.0	10.2	9.0	-14.7	.9		.00
-1.35	33.4	10.6	1.1	.0	.0	.0	11.7	10.7	-15.9	1.2	34.5	.00
-1.35	33.4	10.6	1.1	.0	.0	.0	11.7	10.7	18.6	1.2		.00
-1.65	36.4	11.5	4.1	.0	.0	.0	15.6	5.7	14.5	1.7	.0	.00
-1.65	36.4	11.5	4.1	.0	.0	.0	15.6	5.7	14.5	1.7		.00
-1.80	37.9	12.0	5.6	.0	.0	.0	17.6	3.7	12.0	2.1		.00
-1.80	37.9	12.0	5.6	.0	.0	.0	17.6	3.7	12.0	2.1		.00
-1.95	39.4	12.5	7.1	.0	.0	.0	19.6	2.1	9.2	2.6	.0	.00
-1.95	39.4	12.5	7.1	.0	.0	.0	19.6	2.1	9.2	2.6		.00
-2.00	39.9	12.6	7.6	.0	.0	.0	20.2	1.7	8.2	2.8		.00
-2.10	40.9	13.0	8.6	.0	.0	.0	21.6	1.0	6.1	3.1		.00
-2.10	40.9	9.1	8.6	.0	.0	.0	17.7	1.0	6.1	3.1		.00
-2.25	42.1	10.3	10.1	.0	.0	.0	20.4	.2	3.3	3.6	.0	.00
-2.25	42.1	10.3	10.1	.0	.0	.0	20.4	.2	3.3	3.6		.00
-2.40	43.3	11.5	11.6	.0	.0	.0	23.0	0	0	0		.00
-2.40	43.3	11.5	11.6	.0	.0	.0	23.1	0	0	0		.00

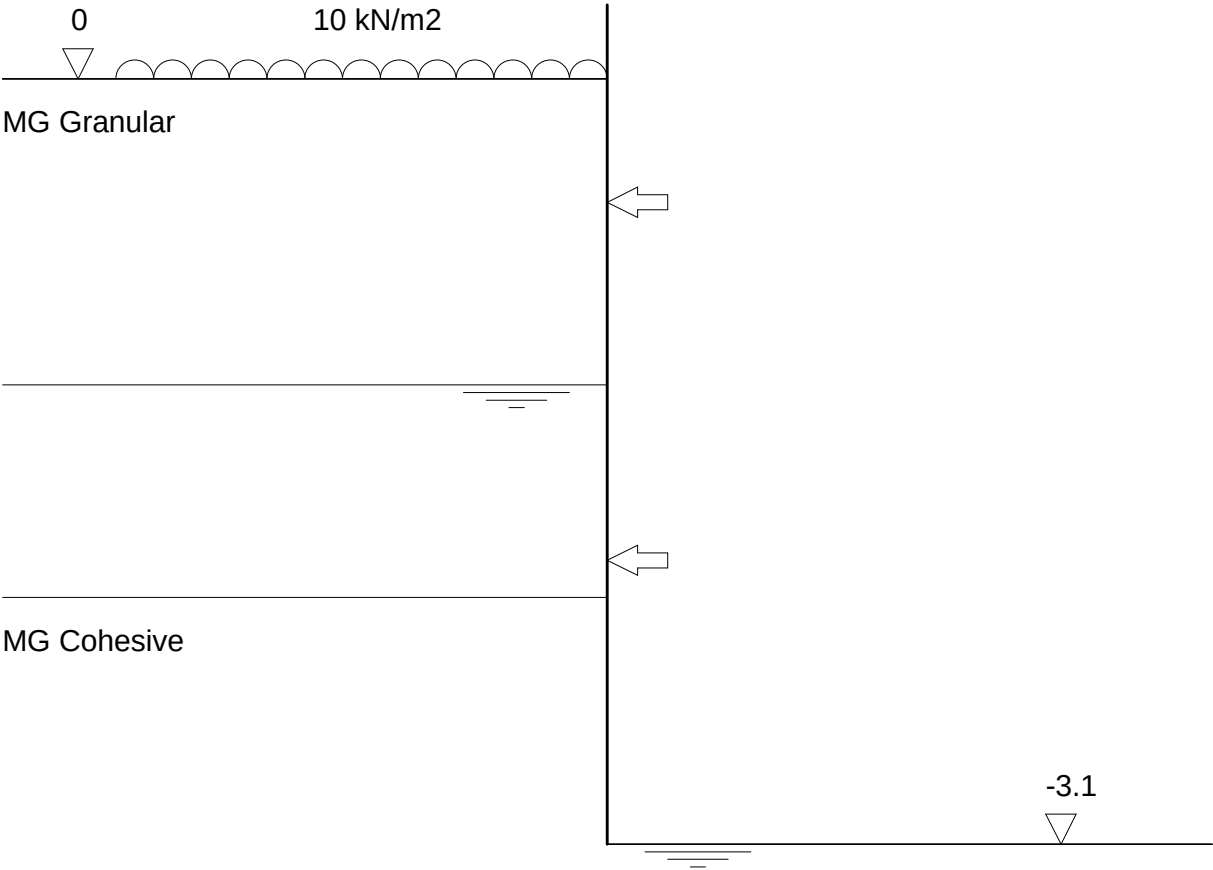
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Stage ref.

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Stage type

Passive water level



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Tabular results from analysis of stage ref 20

Calc Level m	Active Vert kN/m2	Active Earth kN/m2	Active Water kN/m2	Pas' Vert kN/m2	Pas' Earth kN/m2	Pas' Water kN/m2	Total Nett kN/m2	Bend. Moment kNm/m	Shear Force kN/m	Defl't mm	Prop Force kN/m	FOS
.30	.0	.0	.0	.0	.0	.0	0	0	0	.2		.00
.00	.0	.0	.0	.0	.0	.0	0	0	0	.2		.00
.00	10.0	3.2	.0	.0	.0	.0	3.2	0	0	.2		.00
-.14	12.5	4.0	.0	.0	.0	.0	4.0	0	-.5	.2		.00
-.50	19.0	6.0	.0	.0	.0	.0	6.0	.5	-2.3	.2	-3.8	.00
-.50	19.0	6.0	.0	.0	.0	.0	6.0	.5	-6.1	.2		.00
-1.00	28.0	8.9	.0	.0	.0	.0	8.9	4.5	-9.9	.6		.00
-1.05	28.9	9.2	.0	.0	.0	.0	9.2	5.0	-10.3	.7	.0	.00
-1.05	28.9	9.2	.0	.0	.0	.0	9.2	5.0	-10.3	.7		.00
-1.24	32.3	10.2	.0	.0	.0	.0	10.2	7.1	-12.1	1.1		.00
-1.35	33.4	10.6	1.1	.0	.0	.0	11.7	8.5	-13.4	1.3	.0	.00
-1.35	33.4	10.6	1.1	.0	.0	.0	11.7	8.5	-13.4	1.3		.00
-1.65	36.4	11.5	4.1	.0	.0	.0	15.6	13.1	-17.4	2.5	.0	.00
-1.65	36.4	11.5	4.1	.0	.0	.0	15.6	13.1	-17.5	2.5		.00
-1.80	37.9	12.0	5.6	.0	.0	.0	17.6	15.8	-19.9	3.4		.00
-1.80	37.9	12.0	5.6	.0	.0	.0	17.6	15.9	-19.9	3.4		.00
-1.95	39.4	12.5	7.1	.0	.0	.0	19.6	19.1	-22.7	4.5	52.5	.00
-1.95	39.4	12.5	7.1	.0	.0	.0	19.6	19.1	29.8	4.5		.00
-2.00	39.9	12.6	7.6	.0	.0	.0	20.2	17.6	28.8	4.6		.00
-2.10	40.9	13.0	8.6	.0	.0	.0	21.6	14.8	26.7	4.8		.00
-2.10	40.9	9.1	8.6	.0	.0	.0	17.7	14.8	26.7	4.8		.00
-2.25	42.1	10.3	10.1	.0	.0	.0	20.4	11.1	23.8	5.4	.0	.00
-2.25	42.1	10.3	10.1	.0	.0	.0	20.4	11.0	23.8	5.4		.00
-2.40	43.3	11.5	11.6	.0	.0	.0	23.0	7.8	20.6	6.2		.00
-2.40	43.3	11.5	11.6	.0	.0	.0	23.1	7.7	20.6	6.2		.00
-2.65	45.3	13.5	14.1	.0	.0	.0	27.6	3.3	14.2	7.7	.0	.00
-2.65	45.3	13.5	14.1	.0	.0	.0	27.6	3.3	14.2	7.7		.00
-2.95	47.7	15.9	17.1	.0	.0	.0	33.0	.4	5.2	9.7	.0	.00
-2.95	47.7	15.9	17.1	.0	.0	.0	33.0	.4	5.1	9.7		.00
-3.00	48.1	16.3	17.6	.0	.0	.0	33.9	.2	3.5	10.0		.00
-3.10	48.9	17.1	18.6	.0	.0	.0	35.6	0	.1	.2		.00
-3.10	48.9	17.1	18.6	.0	.0	.0	35.7	0	0	0		.00

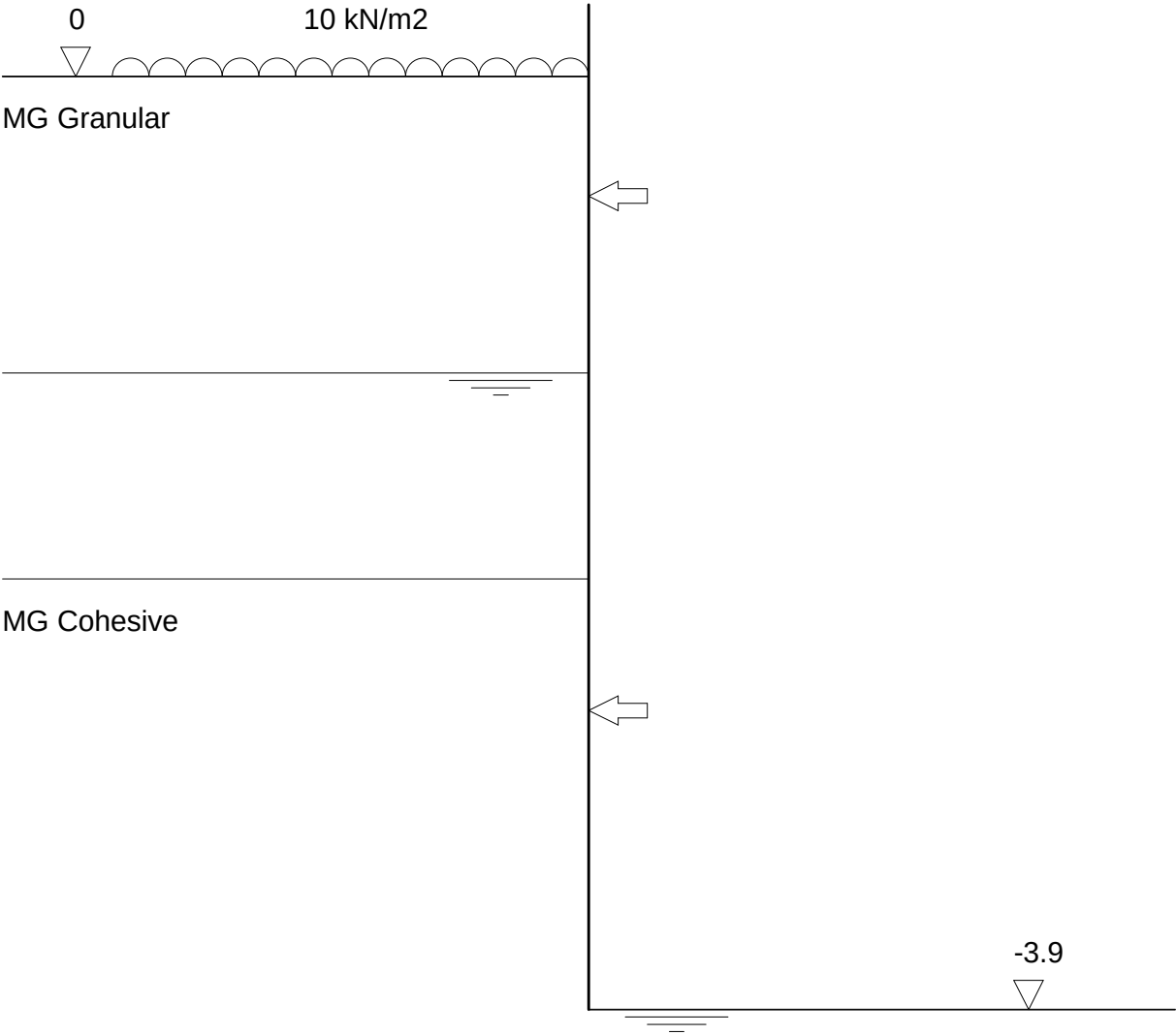
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CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name 45240-3.pws"
	Engineer Date 19/06/2018

Stage ref.

27

Stage type

Passive water level



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Tabular results from analysis of stage ref 27

Calc Level m	Active Vert kN/m2	Active Earth kN/m2	Active Water kN/m2	Pas' Vert kN/m2	Pas' Earth kN/m2	Pas' Water kN/m2	Total Nett kN/m2	Bend. Moment kNm/m	Shear Force kN/m	Defl't mm	Prop Force kN/m	FOS
.30	.0	.0	.0	.0	.0	.0	0	0	0	.3		.00
.00	.0	.0	.0	.0	.0	.0	0	0	0	.3		.00
.00	10.0	3.2	.0	.0	.0	.0	3.2	0	0	.3		.00
-.14	12.5	4.0	.0	.0	.0	.0	4.0	0	-.5	.3		.00
-.50	19.0	6.0	.0	.0	.0	.0	6.0	.5	-2.3	.3	-.7	.00
-.50	19.0	6.0	.0	.0	.0	.0	6.0	.5	-3.0	.3		.00
-1.00	28.0	8.9	.0	.0	.0	.0	8.9	2.9	-6.7	.9		.00
-1.05	28.9	9.2	.0	.0	.0	.0	9.2	3.2	-7.1	1.0	.0	.00
-1.05	28.9	9.2	.0	.0	.0	.0	9.2	3.2	-7.1	1.0		.00
-1.24	32.3	10.2	.0	.0	.0	.0	10.2	4.7	-9.0	1.4		.00
-1.35	33.4	10.6	1.1	.0	.0	.0	11.7	5.8	-10.2	1.6	.0	.00
-1.35	33.4	10.6	1.1	.0	.0	.0	11.7	5.8	-10.2	1.6		.00
-1.65	36.4	11.5	4.1	.0	.0	.0	15.6	9.4	-14.3	2.6	.0	.00
-1.65	36.4	11.5	4.1	.0	.0	.0	15.6	9.4	-14.3	2.6		.00
-1.80	37.9	12.0	5.6	.0	.0	.0	17.6	11.7	-16.7	3.3		.00
-1.80	37.9	12.0	5.6	.0	.0	.0	17.6	11.7	-16.8	3.3		.00
-1.95	39.4	12.5	7.1	.0	.0	.0	19.6	14.5	-19.6	4.2	.0	.00
-1.95	39.4	12.5	7.1	.0	.0	.0	19.6	14.5	-19.6	4.2		.00
-2.00	39.9	12.6	7.6	.0	.0	.0	20.2	15.5	-20.5	4.5		.00
-2.10	40.9	13.0	8.6	.0	.0	.0	21.6	17.6	-22.6	5.3		.00
-2.10	40.9	9.1	8.6	.0	.0	.0	17.7	17.7	-22.6	5.3		.00
-2.25	42.1	10.3	10.1	.0	.0	.0	20.4	21.2	-25.5	6.7	.0	.00
-2.25	42.1	10.3	10.1	.0	.0	.0	20.4	21.2	-25.5	6.7		.00
-2.40	43.3	11.5	11.6	.0	.0	.0	23.0	25.2	-28.7	8.3		.00
-2.40	43.3	11.5	11.6	.0	.0	.0	23.1	25.3	-28.8	8.4		.00
-2.65	45.3	13.5	14.1	.0	.0	.0	27.6	33.3	-35.1	12.1	83.6	.00
-2.65	45.3	13.5	14.1	.0	.0	.0	27.6	33.3	48.5	12.1		.00
-2.95	47.7	15.9	17.1	.0	.0	.0	33.0	20.0	39.5	13.7	.0	.00
-2.95	47.7	15.9	17.1	.0	.0	.0	33.0	20.0	39.4	13.7		.00
-3.00	48.1	16.3	17.6	.0	.0	.0	33.9	18.1	37.8	14.1		.00
-3.10	48.9	17.1	18.6	.0	.0	.0	35.6	14.6	34.4	14.9		.00
-3.10	48.9	17.1	18.6	.0	.0	.0	35.7	14.5	34.3	15.0		.00
-3.75	54.1	22.3	25.1	.0	.0	.0	47.4	.6	7.3	22.3	.0	.00
-3.75	54.1	22.3	25.1	.0	.0	.0	47.4	.6	7.3	22.3		.00
-3.90	55.3	23.5	26.6	.0	.0	.0	50.0	0	.1	.3		.00
-3.90	55.3	23.5	26.6	.0	.0	.0	50.1	0	0	0		.00

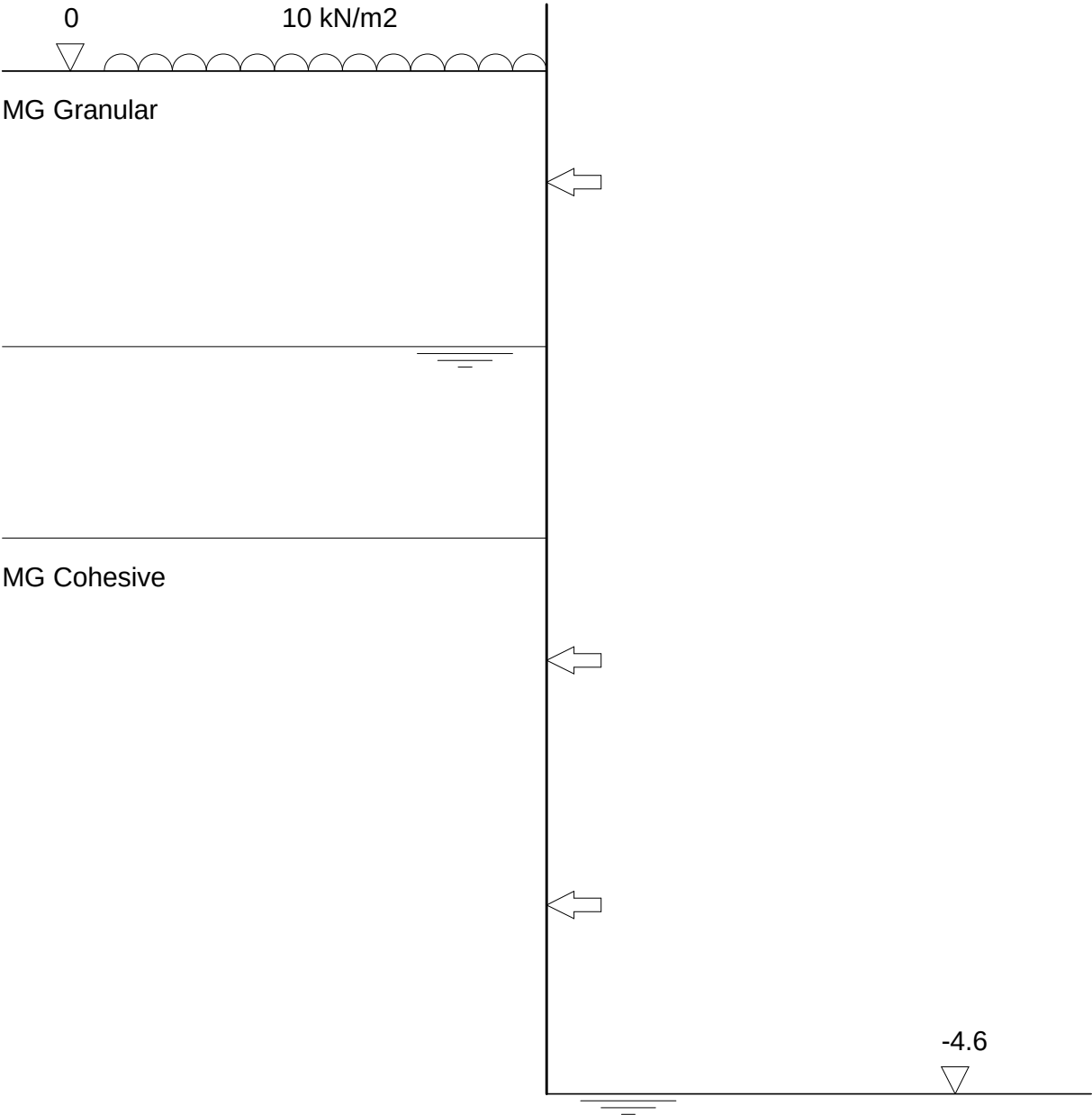
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	Engineer Date 19/06/2018

Stage ref.

31

Stage type

Passive water level



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Tabular results from analysis of stage ref 31

Calc Level m	Active Vert kN/m2	Active Earth kN/m2	Active Water kN/m2	Pas' Vert kN/m2	Pas' Earth kN/m2	Pas' Water kN/m2	Total Nett kN/m2	Bend. Moment kNm/m	Shear Force kN/m	Defl't mm	Prop Force kN/m	FOS
.30	.0	.0	.0	.0	.0	.0	0	0	0	-3.1		.00
.00	.0	.0	.0	.0	.0	.0	0	0	0	-1.9		.00
.00	10.0	3.2	.0	.0	.0	.0	3.2	0	0	-1.9		.00
-.14	12.5	4.0	.0	.0	.0	.0	4.0	0	-.5	-1.5		.00
-.50	19.0	6.0	.0	.0	.0	.0	6.0	.5	-2.3	.3	14.8	.00
-.50	19.0	6.0	.0	.0	.0	.0	6.0	.5	12.5	.3		.00
-1.00	28.0	8.9	.0	.0	.0	.0	8.9	-4.9	8.8	4.8		.00
-1.05	28.9	9.2	.0	.0	.0	.0	9.2	-5.3	8.3	5.2	.0	.00
-1.05	28.9	9.2	.0	.0	.0	.0	9.2	-5.3	8.3	5.2		.00
-1.24	32.3	10.2	.0	.0	.0	.0	10.2	-6.7	6.5	6.7		.00
-1.35	33.4	10.6	1.1	.0	.0	.0	11.7	-7.4	5.3	7.4	.0	.00
-1.35	33.4	10.6	1.1	.0	.0	.0	11.7	-7.4	5.3	7.5		.00
-1.65	36.4	11.5	4.1	.0	.0	.0	15.6	-8.4	1.2	9.3	.0	.00
-1.65	36.4	11.5	4.1	.0	.0	.0	15.6	-8.4	1.2	9.3		.00
-1.80	37.9	12.0	5.6	.0	.0	.0	17.6	-8.4	-1.3	10.0		.00
-1.80	37.9	12.0	5.6	.0	.0	.0	17.6	-8.4	-1.3	10.0		.00
-1.95	39.4	12.5	7.1	.0	.0	.0	19.6	-8.0	-4.1	10.6	.0	.00
-1.95	39.4	12.5	7.1	.0	.0	.0	19.6	-8.0	-4.1	10.6		.00
-2.00	39.9	12.6	7.6	.0	.0	.0	20.2	-7.7	-5.1	10.8		.00
-2.10	40.9	13.0	8.6	.0	.0	.0	21.6	-7.1	-7.2	11.1		.00
-2.10	40.9	9.1	8.6	.0	.0	.0	17.7	-7.1	-7.2	11.1		.00
-2.25	42.1	10.3	10.1	.0	.0	.0	20.4	-5.8	-10.0	11.5	.0	.00
-2.25	42.1	10.3	10.1	.0	.0	.0	20.4	-5.8	-10.0	11.5		.00
-2.40	43.3	11.5	11.6	.0	.0	.0	23.0	-4.1	-13.2	11.7		.00
-2.40	43.3	11.5	11.6	.0	.0	.0	23.1	-4.1	-13.3	11.7		.00
-2.65	45.3	13.5	14.1	.0	.0	.0	27.6	0	-19.6	12.1	19.5	.00
-2.65	45.3	13.5	14.1	.0	.0	.0	27.6	0	-.1	12.1		.00
-2.95	47.7	15.9	17.1	.0	.0	.0	33.0	1.3	-9.2	14.9	.0	.00
-2.95	47.7	15.9	17.1	.0	.0	.0	33.0	1.4	-9.2	14.9		.00
-3.00	48.1	16.3	17.6	.0	.0	.0	33.9	1.9	-10.8	15.3		.00
-3.10	48.9	17.1	18.6	.0	.0	.0	35.6	3.1	-14.3	16.3		.00
-3.10	48.9	17.1	18.6	.0	.0	.0	35.7	3.1	-14.3	16.3		.00
-3.75	54.1	22.3	25.1	.0	.0	.0	47.4	20.8	-41.3	23.6	88.1	.00
-3.75	54.1	22.3	25.1	.0	.0	.0	47.4	20.8	46.8	23.6		.00
-3.90	55.3	23.5	26.6	.0	.0	.0	50.0	14.4	39.6	20.2		.00
-3.90	55.3	23.5	26.6	.0	.0	.0	50.1	14.3	39.5	20.1		.00
-4.00	56.1	24.3	27.6	.0	.0	.0	51.9	10.6	34.4	18.0		.00
-4.20	57.7	25.9	29.6	.0	.0	.0	55.5	4.8	23.6	13.8		.00
-4.45	59.7	27.9	32.1	.0	.0	.0	60.0	.7	9.2	8.8	.0	.00
-4.45	59.7	27.9	32.1	.0	.0	.0	60.0	.7	9.2	8.7		.00
-4.60	60.9	29.1	33.6	.0	.0	.0	62.6	0	.1	.2		.00
-4.60	60.9	29.1	33.6	.0	.0	.0	62.7	0	0	0		.00

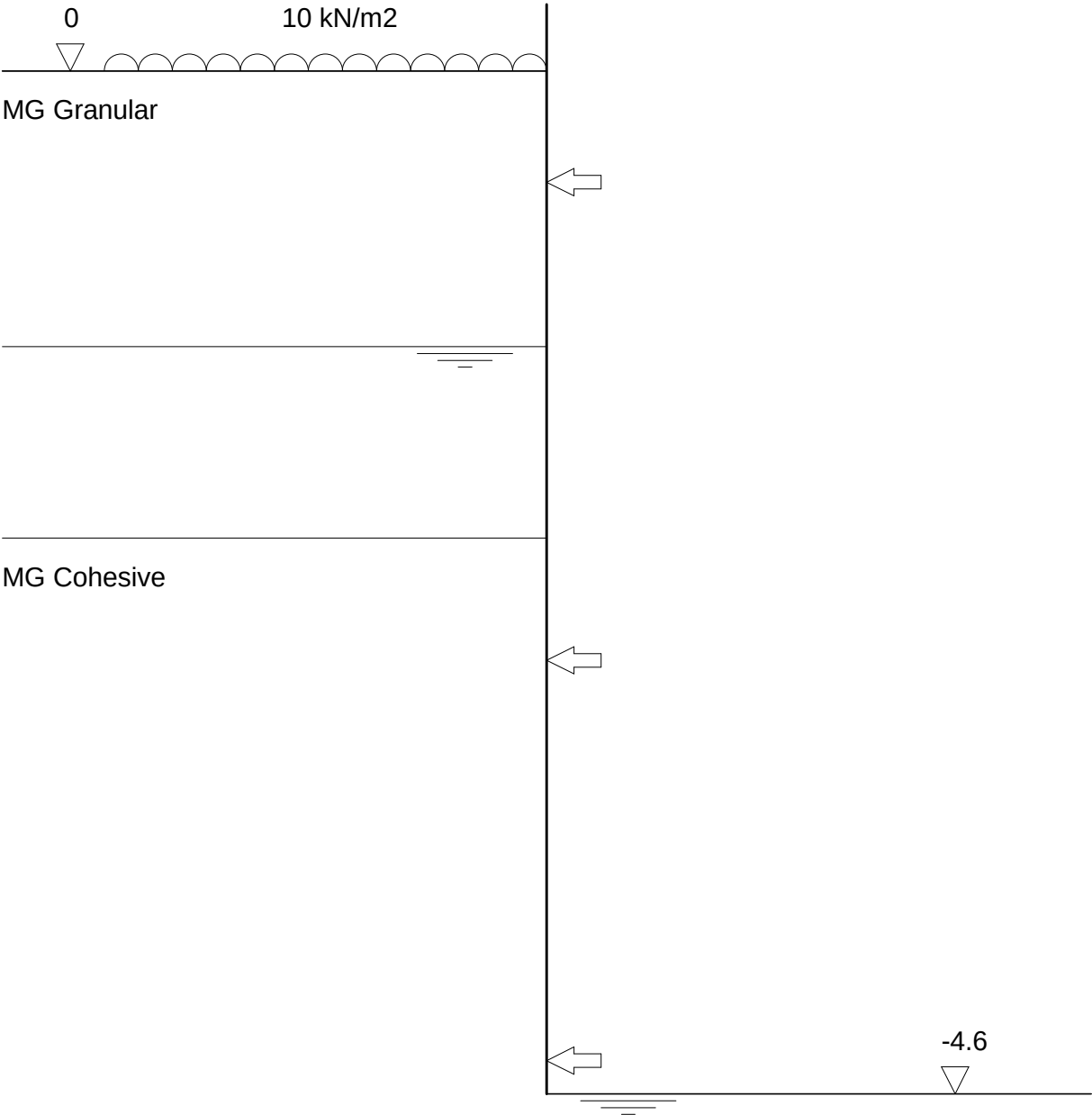
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Stage ref.

33

Stage type

Remove prop



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	Engineer Date 19/06/2018

Tabular results from analysis of stage ref 33

Calc Level m	Active Vert kN/m2	Active Earth kN/m2	Active Water kN/m2	Pas' Vert kN/m2	Pas' Earth kN/m2	Pas' Water kN/m2	Total Nett kN/m2	Bend. Moment kNm/m	Shear Force kN/m	Defl't mm	Prop Force kN/m	FOS
.30	.0	.0	.0	.0	.0	.0	0	0	0	-3.1		.00
.00	.0	.0	.0	.0	.0	.0	0	0	0	-1.9		.00
.00	10.0	3.2	.0	.0	.0	.0	3.2	0	0	-1.9		.00
-.14	12.5	4.0	.0	.0	.0	.0	4.0	0	-.5	-1.5		.00
-.50	19.0	6.0	.0	.0	.0	.0	6.0	.5	-2.3	.3	14.8	.00
-.50	19.0	6.0	.0	.0	.0	.0	6.0	.5	12.5	.3		.00
-1.00	28.0	8.9	.0	.0	.0	.0	8.9	-4.9	8.8	4.8		.00
-1.05	28.9	9.2	.0	.0	.0	.0	9.2	-5.3	8.3	5.2	.0	.00
-1.05	28.9	9.2	.0	.0	.0	.0	9.2	-5.3	8.3	5.2		.00
-1.24	32.3	10.2	.0	.0	.0	.0	10.2	-6.7	6.5	6.7		.00
-1.35	33.4	10.6	1.1	.0	.0	.0	11.7	-7.4	5.3	7.4	.0	.00
-1.35	33.4	10.6	1.1	.0	.0	.0	11.7	-7.4	5.3	7.5		.00
-1.65	36.4	11.5	4.1	.0	.0	.0	15.6	-8.4	1.2	9.3	.0	.00
-1.65	36.4	11.5	4.1	.0	.0	.0	15.6	-8.4	1.2	9.3		.00
-1.80	37.9	12.0	5.6	.0	.0	.0	17.6	-8.4	-1.3	10.0		.00
-1.80	37.9	12.0	5.6	.0	.0	.0	17.6	-8.4	-1.3	10.0		.00
-1.95	39.4	12.5	7.1	.0	.0	.0	19.6	-8.0	-4.1	10.6	.0	.00
-1.95	39.4	12.5	7.1	.0	.0	.0	19.6	-8.0	-4.1	10.6		.00
-2.00	39.9	12.6	7.6	.0	.0	.0	20.2	-7.7	-5.1	10.8		.00
-2.10	40.9	13.0	8.6	.0	.0	.0	21.6	-7.1	-7.2	11.1		.00
-2.10	40.9	9.1	8.6	.0	.0	.0	17.7	-7.1	-7.2	11.1		.00
-2.25	42.1	10.3	10.1	.0	.0	.0	20.4	-5.8	-10.0	11.5	.0	.00
-2.25	42.1	10.3	10.1	.0	.0	.0	20.4	-5.8	-10.0	11.5		.00
-2.40	43.3	11.5	11.6	.0	.0	.0	23.0	-4.1	-13.2	11.7		.00
-2.40	43.3	11.5	11.6	.0	.0	.0	23.1	-4.1	-13.3	11.7		.00
-2.65	45.3	13.5	14.1	.0	.0	.0	27.6	0	-19.6	12.1	53.8	.00
-2.65	45.3	13.5	14.1	.0	.0	.0	27.6	0	34.2	12.1		.00
-2.95	47.7	15.9	17.1	.0	.0	.0	33.0	-8.9	25.1	13.6	.0	.00
-2.95	47.7	15.9	17.1	.0	.0	.0	33.0	-8.9	25.1	13.7		.00
-3.00	48.1	16.3	17.6	.0	.0	.0	33.9	-10.1	23.4	13.9		.00
-3.10	48.9	17.1	18.6	.0	.0	.0	35.6	-12.3	20.0	14.3		.00
-3.10	48.9	17.1	18.6	.0	.0	.0	35.7	-12.3	19.9	14.3		.00
-3.75	54.1	22.3	25.1	.0	.0	.0	47.4	-16.9	-7.1	14.3	.0	.00
-3.75	54.1	22.3	25.1	.0	.0	.0	47.4	-16.9	-7.1	14.3		.00
-3.90	55.3	23.5	26.6	.0	.0	.0	50.0	-15.3	-14.3	13.6		.00
-3.90	55.3	23.5	26.6	.0	.0	.0	50.1	-15.3	-14.4	13.6		.00
-4.00	56.1	24.3	27.6	.0	.0	.0	51.9	-13.6	-19.5	13.0		.00
-4.20	57.7	25.9	29.6	.0	.0	.0	55.5	-8.6	-30.2	11.6		.00
-4.45	59.7	27.9	32.1	.0	.0	.0	60.0	.7	-44.6	4.8	53.8	.00
-4.45	59.7	27.9	32.1	.0	.0	.0	60.0	.7	9.2	4.8		.00
-4.60	60.9	29.1	33.6	.0	.0	.0	62.6	0	.1	.1		.00
-4.60	60.9	29.1	33.6	.0	.0	.0	62.7	0	0	0		.00

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Table of envelope for wall forces

Calc Level m	Bending Minimum kNm/m	Bending Maximum kNm/m	Shear Minimum kN/m	Shear Maximum kN/m	Prop Force kN/m
.30	.0	.0	.0	.0	
.00	.0	.0	.0	.0	
.00	.0	.0	.0	.0	
-.14	.0	.0	-.5	.2	
-.50	.0	.5	-2.3	.0	17.6
-.50	.0	.5	-8.7	15.3	
-1.00	-6.3	5.7	-12.4	11.6	
-1.05	-6.8	6.4	-12.9	11.1	18.3
-1.05	-6.8	6.4	-12.9	11.1	
-1.24	-8.8	9.0	-14.7	9.3	
-1.35	-9.7	10.7	-15.9	8.1	34.5
-1.35	-9.7	10.7	-13.4	18.6	
-1.65	-11.6	13.1	-17.4	14.5	8.7
-1.65	-11.6	13.1	-17.5	14.5	
-1.80	-12.0	15.8	-19.9	12.0	
-1.80	-12.0	15.9	-19.9	12.0	
-1.95	-12.0	19.1	-22.7	9.2	52.5
-1.95	-12.0	19.1	-19.6	29.8	
-2.00	-11.9	17.6	-20.5	28.8	
-2.10	-11.6	17.6	-22.6	26.7	
-2.10	-11.6	17.7	-22.6	26.7	
-2.25	-10.7	21.2	-25.5	23.8	16.8
-2.25	-10.7	21.2	-25.5	23.8	
-2.40	-9.4	25.2	-28.7	20.6	
-2.40	-9.4	25.3	-28.8	20.6	
-2.65	-6.0	33.3	-35.1	14.2	83.6
-2.65	-6.0	33.3	-16.8	48.5	
-2.95	-8.9	20.0	-25.9	39.5	31.1
-2.95	-8.9	20.0	-9.2	39.4	
-3.00	-10.1	18.1	-10.8	37.8	
-3.10	-12.3	14.6	-14.3	34.4	
-3.10	-12.3	14.5	-14.3	34.3	
-3.75	-16.9	20.8	-41.3	7.3	88.1
-3.75	-16.9	20.8	-7.1	46.8	
-3.90	-15.3	14.4	-14.3	39.6	
-3.90	-15.3	14.3	-14.4	39.5	
-4.00	-13.6	10.6	-19.5	34.4	
-4.20	-8.6	4.8	-30.2	23.6	
-4.45	.0	.7	-44.6	9.2	53.8
-4.45	.0	.7	.0	9.2	
-4.60	.0	.0	.0	.1	
-4.60	.0	.0	.0	.0	

	Page No 20 Analysis
CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name 45240-3.pws"
	Engineer Date 19/06/2018

Structural design of wall

Wall section properties

Sheet pile section ref MGF KKD 600/6

Wall material properties

Yield stress of steel	275 N/mm2
Bending Stress Ratio	1.30
Allowable bending stress	211 N/mm2
Allowable shear stress	126 N/mm2

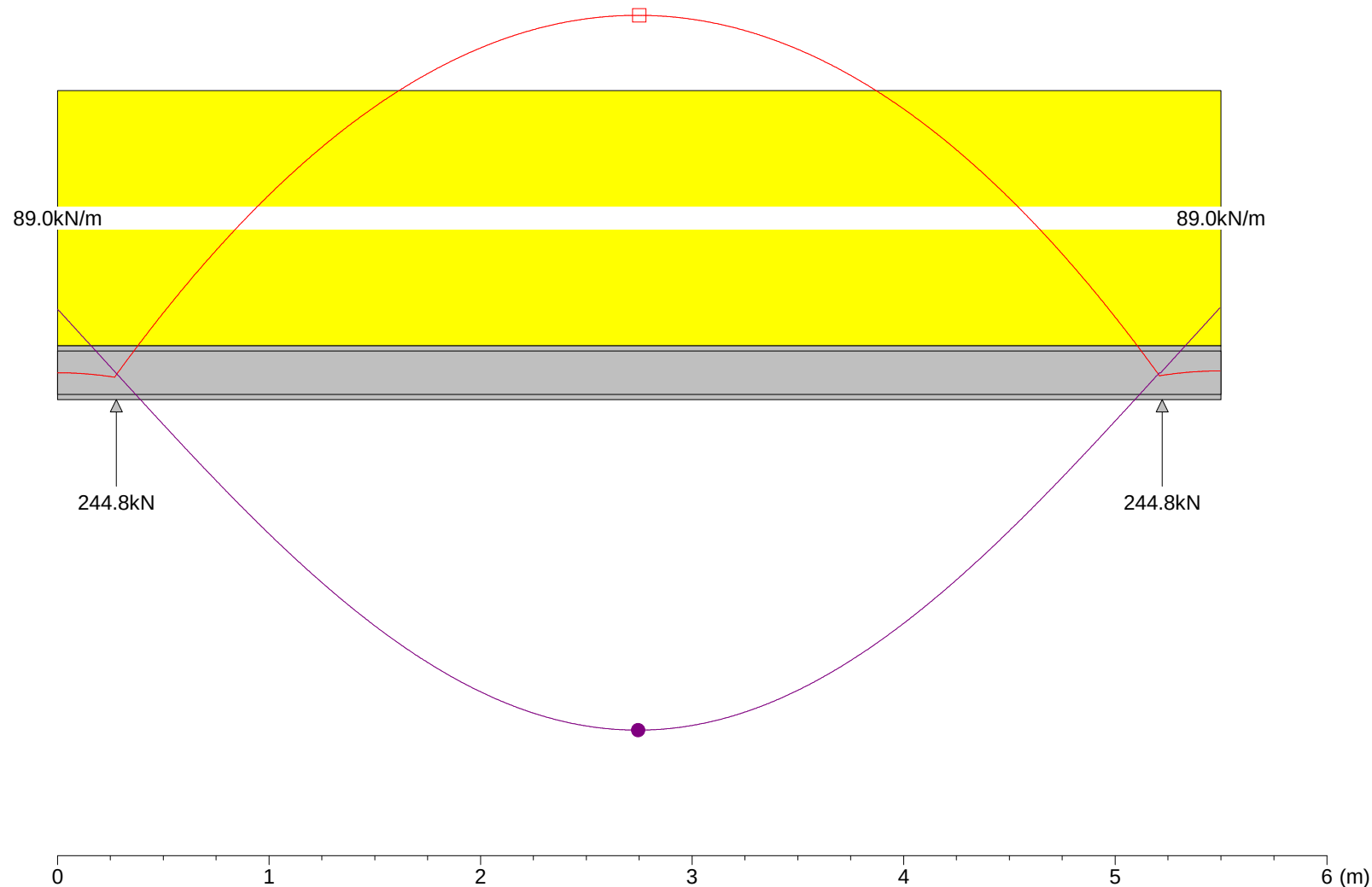
Wall structural design checks

Check description	Required or Limit	Provided or Actual	Units
Max. bending moment Design stress check	33	37	kNm/m
Min. section modulus Design stress check	157	179	cm3/m
Maximum shear force Design stress check	48	196	kN/m

Page: 1
 Date: 19.6.18
 Beam: MGF 254UC Brace
 L = 5.500 m
 I = 17500.0 cm⁴
 E = 2.1E+08 kN/m²
 EI = 36750.0 kNm²

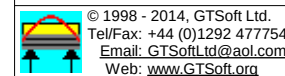
Maximum	x (m)
□ 268.55 kNm	2.750
● 18.496 mm	2.744
R 244.8 kN	0.278

F3



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SPAN, v2.51



Input Data

Beam

Name	L (m)	b (mm)	h (mm)	E (kN/m ²)	I _{xx} (cm ⁴)	EI (kNm ²)	f (N/mm ²)
MGF 254UC Brace	5.500	267.000	258.000	2.1E+08	17500.0	36750.0	307.0

Distributed Loads



x (m)	w (m)	L ₁ (kN/m)	L ₂ (kN/m)
0.000	5.500	89.0	89.0

Solution

Supports

x (m)	R (kN)	M (kNm)
0.278	244.8	-2.2
5.222	244.8	-2.2

Maxima

	Maximum	x (m)
Reaction	244.8 kN	0.278
Shear Force	219.8 kN	0.278
Sagging Moment	268.55 kNm	2.734
Hogging Moment	-3.37 kNm	0.264
Sagging Deflection	18.496 mm	2.734
Hogging Deflection	-3.363 mm	5.489



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Temporary Works Design

Appendix 1: Borehole Log Extracts WS01, WS02, WS03 (Report No. C4176)



WINDOW SAMPLE LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: info@ccground.co.uk

Project Name: Crindau	Project No: C4176	Co-ords: E N	Hole Type WS
Location: Newport	Level: mAD	Scale 1 : 50.00	
Client: Morgan Sindall	Dates: Start: 13/06/2014 End: 13/06/2014	Logged By PF	

(m)	Water Levels	Samples & In Situ Testing			Sample	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result						
		B	0.20				MADE GROUND: Concrete.	0.11		
		ES					MADE GROUND: Grey mottled light brown sandy GRAVEL. Gravel is angular to sub-angular fine to coarse igneous material and limestone.	0.30		
		B	0.50				MADE GROUND: Grey mottled light brown sandy GRAVEL. Gravel is angular to sub-angular fine to coarse glass fragments, clinker, ash, igneous material and limestone.			
1		B	1.00				1.20-2.10m: Very loose.	(1.80)		
		ES	1.20 - 2.00	S 2						
		B	1.20 - 1.65							
		SPT	1.60							
2		SPT	2.00 - 2.45	S<1			MADE GROUND: Very soft dark grey slightly sandy gravelly CLAY with occasional rootlets and a slight organic odour. Gravel is angular to sub-angular fine to medium glass fragments, ash and sandstone.	2.10		
		ES	2.60					(0.65)		
		H	2.70	H 23						
		D	2.80	H 24						
3		H	2.90	S<1			Very soft light brown mottled brownish grey CLAY with occasional rootlets and partially decomposed organic material <10mm.	2.75		
		SPT	3.00 - 3.45							
		H	3.50	H 13						
		ES	3.60							
		H	3.75	H 13						
4		D	3.80	H 15						
		H	3.85	S<1						
		SPT	4.00 - 4.45				4.30-7.00m: Grey mottled greyish brown.			
		ES	4.60	H 21						
		H	4.70	H 17						
		H	4.80	H 13						
5		D	5.00 - 5.45	S<1				(4.25)		
		H								
		SPT								
		D	5.70	H 8						
		H	5.80	H 12						
		H	5.90	H 11						
6		H	6.00 - 6.45	S<1			5.80-7.00m: Silty clay.			
		SPT					6.00-7.00m: Grey mottled dark grey.			
		H	6.65	H 12						
		D	6.70	H 14						
7		ES	6.80	H 16			Borehole completed at 7.00m	7.00		
		H	6.90							
8										

REMARKS:

EQUIPMENT: Hand digging tools, Terrier 2002 track mounted rig.
 METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous disturbed sampling using a 101mm diam sample barrel: 1.20-7.00m.
 CASING: 113mm to 6.00m.
 GROUNDWATER: Water struck at 1.36m rose to 1.24m after 20 minutes.
 INSTALLATION: 50mm ID HDPE slotted pipe with washed gravel response zone: 0.90-7.00m, plain pipe with bentonite pellet seal: 0.20-0.90m, flush 150mm steel cover set in concrete 0.00-0.20m. Gas valve fitted.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
13/06/14	1.36	Nil	1.24

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
13/06/2014	7.00	6.00	5.97



WINDOW SAMPLE LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: info@ccground.co.uk

Project Name: Crindau	Project No: C4176	Co-ords: E N	Hole Type WS
Location: Newport	Level: mAD	Scale 1 : 50.00	
Client: Morgan Sindall	Dates: Start: 12/06/2014 End: 12/06/2014	Logged By PF	

(m)	Water Levels	Samples & In Situ Testing			Sample	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result						
1		B	0.20				MADE GROUND: Light brown sandy GRAVEL with medium cobble content. Gravel is angular to sub-angular fine to coarse brick fragments, concrete, limestone, sandstone and igneous material. Cobbles are sub-angular brick fragments, limestone and igneous material.	(0.70)		
		B ES	0.50					0.70		
		B ES	1.00				MADE GROUND: Dark brown slightly clayey GRAVEL. Gravel is angular to sub-angular fine to coarse brick fragments, clinker, ash, sandstone, limestone and igneous material.	(1.00)		
		SPT	1.20 - 1.65	S<1			1.20-1.70m: Very loose.			
		D	1.70				MADE GROUND: Very loose dark grey sandy GRAVEL with a strong chemical odour. Gravel is angular to sub-angular brick fragments and limestone.	1.70		
2		B SPT	2.00 - 3.00	S 1				(1.40)		
			2.00 - 2.45							
		ES	2.60							
3		SPT	3.00 - 3.45	S<1			MADE GROUND: Very soft brown mottled greenish brown slightly sandy slightly gravelly CLAY. Gravel is angular to sub-angular fine to coarse brick fragments, clinker, metal fragments <60mm and ceramic fragments <60mm.	3.10		
		ES	3.60							
4		D SPT	3.90	S<1						
			4.00 - 4.45							
		ES	4.60							
5		SPT	5.00 - 5.45	S<1			4.70-4.90m: Slightly clayey sandy gravel. Gravel is angular to sub-angular fine to coarse brick fragments, coal fragments, ash and limestone.	(2.90)		
		ES	5.50							
6		D SPT	5.80	S<1			5.90-6.00m: Slightly clayey sandy gravel with occasional rootlets. Gravel is angular to sub-angular fine to coarse brick fragments, coal fragments, ash and limestone.	6.00		
			6.00 - 6.45				Borehole completed at 6.00m			
7										
8										

REMARKS:

EQUIPMENT: Hand digging tools, Terrier 2002 track mounted rig.
 METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous disturbed sampling using a 101mm diam sample barrel: 1.20-6.00m.
 CASING: 113mm to 6.00m.
 GROUNDWATER: Water struck at 2.03m and rose to 1.52m after 20 minutes.
 INSTALLATION: 50mm ID HDPE slotted pipe with washed gravel response zone: 3.40-6.00m, plain pipe with bentonite pellet seal: 0.20-3.40m, flush 150mm steel cover set in concrete 0.00-0.20m. Gas valve fitted.
 REMARKS: SPT hammer fell under it's own weight: 1.20-1.65m, 3.00-3.45m, 4.00-4.45m, 5.00-5.45m, 6.00-6.45m.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
12/06/14	2.03	2.00	1.52

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
12/06/2014	6.00	6.00	3.47

INSPECTION PIT LOG



Pit No

WS03

Sheet 1 of 1

Telephone: 01452 739165 , Fax: 01452 739220 , Email: info@ccground.co.uk

Project Name: Crindau	Project No: C4176	Co-ords: E N Level: mAD	Date 12/06/2014
Location: Newport	Dimensions: m Depth 0.60m E		Scale 1 : 9.375
Client: Morgan Sindall			Logged By PF

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1					MADE GROUND: Dark brown mottled greyish brown and orangish brown sandy GRAVEL. Gravel is angular to sub-rounded fine to coarse sandstone, limestone and brick fragments.			
		B	0.20		0.20-0.40m: Slightly clayey.	(0.40)		
					MADE GROUND: Dark brown mottled greyish brown slightly clayey gravelly SAND. Gravel is angular to sub-rounded fine to coarse sandstone, limestone brick fragments, clinker and ash.	0.40		
					0.60m: Concrete.	(0.20)		
					Inspection pit completed at 0.60m	0.60		

REMARKS:

EQUIPMENT: Hand digging tools.

METHOD: Hand dug inspection pit: 0.00-0.60m.

GROUNDWATER: None encountered.

BACKFILL: On completion hole back filled with compacted arisings.

REMARKS: Hand excavation refused on concrete at 0.60m. Location moved.

Temporary Works Design

Appendix 2: Borehole Location Plan



KEY:

- Window Sample position
- Inspection Pit position

Notes:

Locations indicative only.

Reproduced from site plan supplied by client.



Site Layout Plan

Crindau

Newport

Appendix A

Contract No: C4176

Drawn by

JD

Scale

NTS