

TEMPORARY WORKS DESIGN

DESIGN COVER SHEET



Design Ref	45241	Status	FOR APPROVAL	MGF Design Category	2B
Area / Rep	SW1	Kevin Martin		CRM Project Ref	144731
Customer	Forkers Ltd				
Contact	Chris Goldsmith	chrisgoldsmith@forkers.com		07765022416	
Site	Albany Street, Newport, NP20 5JL				
Scheme	Trench Runs: SW1-SW2, SW2-SW3				

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 Trench Width amended to 2.58m Over dig considered of 300mm within the design.
3	A3	15.06.2018	Patrick Marshall Richard Lawrenson	 Ground/groundwater conditions – See design notes 1, 4, 5 & 6 No crane loads have been considered in this design Existing Structures – See design notes 7c, 7d & 7e



YouTube

Scan to watch our award winning
safe systems of work animations
for this product



TEMPORARY WORKS DESIGN

DESIGN SUMMARY

EXCAVATION DETAILS

EXCAVATION TYPE	2	Sided Excavation / Trench		
DEPTH (m)	4.20			
OVER-DIG CONSIDERED	No			
GROUND REDUCTION	No			
PLAN DIMENSIONS (m)	4.00	x	3.00	sheet-to-sheet (Max)
EXISTING GROUND LEVEL (m AOD)	Varies			
		to underside of lowest frame after F3 removed.		
CLEARANCE (m)	1.10		Please note F3 may only be removed after backfilling with a minimum of 300mm of compacted granular fill.	
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)	Non-Principal Highway	12	kN/m ²

TEMPORARY WORKS DESIGN

DESIGN SUMMARY

DESIGN SOLUTION SUMMARY

GROUND SUPPORT SYSTEM			Sheet & Brace				
METHOD OF INSTALL			Dig & Push Lowering Frames				
SHEET DETAILS			4.50	m Long	KKD 600/8	0	m toe-in
MAX. SHEET DEFLECTION (mm)			<30				
FRAME(S)	1	0.50m BGL	4.00m Medium Duty Steel Waler – 2 No Hydraulic Struts @ 0.58m from each end				
	2	2.70m BGL	203 UC c/w 2No. 250kN 200 Series Hydraulic Struts 0.58m from each end				
	3	3.30m BGL	203 UC c/w 2No. 250kN 200 Series Hydraulic Struts 0.58m from each end				
MAX. FRAME DEFLECTION (mm)			<5				
FRAME SUPPORT			Standard Duty Restraining Chains				

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 is anticipated 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. Customer to monitor excavated material, 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.

Highways

- b. There is an existing highway within the zone of influence of the excavation. The highway has been classified as a Non-Principal Road and therefore a Highway Live Load Surcharge of 12kN/m² (Type HB - 30 units) has been considered. Guidance on highway live load surcharge has been taken from Design Manual for Roads and Bridges (DMRB) Volume 2 Section 1 Part 2 BD42/00 'Design of Embedment retaining Walls and Bridge Abutments' May 2000.

Buildings / Structures / Underground Structures / Cranes



- c. The customer has informed MGF there is an existing concrete post & panel wall 4.50m from the edge of the TW's. The wall is deemed to be outside the zone-of-influence of the TWs and as such will impart no additional loads onto the excavation. The structural integrity of the wall is the customers responsibility.
 - d. The customer has informed MGF the existing factory unit on site will be demolished at the time of the TW's and as such will impart no additional loads onto the excavation.
 - e. This design assumes that all other buildings / structures / underground structures / cranes are 4.50m 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.
 - f. 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. This design has not considered any unplanned excavation (accidental over-dig). The Customer must ensure that excavation works are controlled to ensure unplanned excavation does not occur and excavation levels are not exceeded.
 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 only considers support to a two-sided (trench) excavation. It is the responsibility of the Customer to ensure that a competent person (Suitably Qualified & Experienced Person) carries out a site specific risk assessment on the unsupported faces at either end of the trench to assess its stability and to determine a suitable batter / stepping of the ground prior to commencement on site.
 13. The customer should confirm the anticipated deflections are acceptable in the surrounding environment.

TEMPORARY WORKS DESIGN

DESIGN NOTES

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.
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

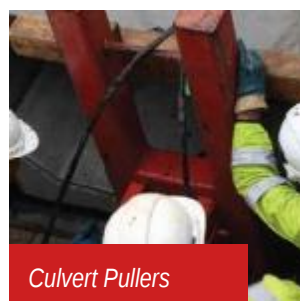
A number of safety products to ensure safe access and egress into the excavation are available to complement the equipment in this design:



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

	Page No 1 Analysis
CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name ...st-case-4.2m pm.pws"
	Engineer Date 18/06/2018

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
	Granular Fill	18.00	20.00	0	5000			35 35		.27 17.50	8.36

	Page No 2 Analysis
CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name ...st-case-4.2m pm.pws"
	Engineer Date 18/06/2018

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	12.0	.0		
2 A	Insert prop	-0.50				
3	Insert prop	-1.10				
4 A	Pile toe level	-1.80				
5	Passive side excavation	-1.80				
6 A	Passive water level	-1.80				
7	Insert prop	-1.70				
8 A	Remove prop	-1.10				
9	Insert prop	-1.50				
10 A	Remove prop	-1.70				
11	Pile toe level	-2.40				
12	Passive side excavation	-2.40				
13 A	Passive water level	-2.40				
14	Insert prop	-2.30				
15 A	Remove prop	-1.50				
16	Insert prop	-2.10				
17 A	Remove prop	-2.30				
18	Pile toe level	-3.00				
19	Passive side excavation	-3.00				
20 A	Passive water level	-3.00				
21	Insert prop	-2.90				
22 A	Remove prop	-2.10				
23	Insert prop	-2.70				
24 A	Remove prop	-2.90				
25	Pile toe level	-3.40				
26	Passive side excavation	-3.40				
27 A	Passive water level	-3.40				
28	Insert prop	-3.30				
29	Pile toe level	-4.20				
30	Passive side excavation	-4.20				
31 A	Passive water level	-4.20				
32 A	Remove prop	-2.70				
33 A	Passive side fill	-3.90				
34 A	Insert prop	-2.70				
35 A	Remove prop	-3.30				

	Page No 3 Analysis
CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name ...st-case-4.2m pm.pws"
	Engineer Date 18/06/2018

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	.5 m
Continuity model for wall analysis	Pins at second and lower props

Deflection parameters

Wall moment of inertia	924 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 -1.1	
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

	Page No 4 Analysis
CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name ...st-case-4.2m pm.pws"
	Engineer Date 18/06/2018

Deflection parameters - continued

Properties for prop at -1.7

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 -1.5

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 -2.3

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 -2.1

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 -2.9

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

	Page No 5 Analysis
CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name ...st-case-4.2m pm.pws"
	Engineer Date 18/06/2018

Deflection parameters - continued

Properties for prop at -2.7

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 -3.3

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 -2.71

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

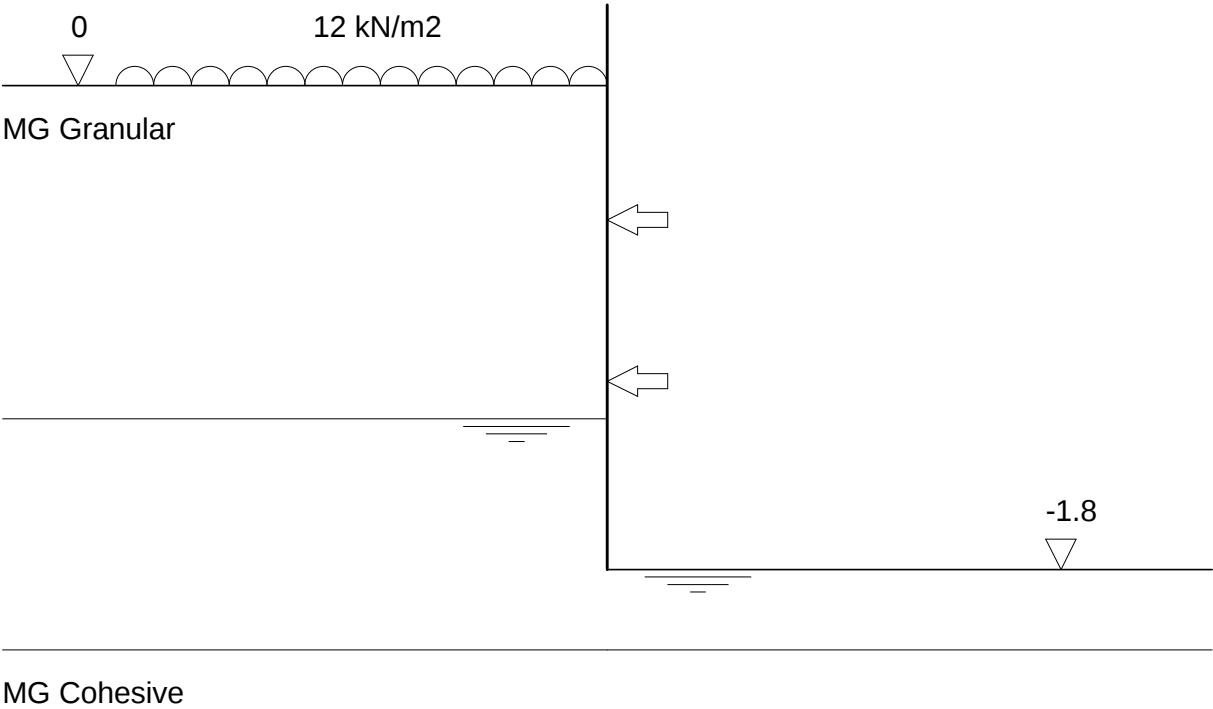
	Page No 6 Analysis
CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name ...st-case-4.2m pm.pws"
	Engineer Date 18/06/2018

Stage ref.

6

Stage type

Passive water level



	Page No 7 Analysis
CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name ...st-case-4.2m pm.pws"
	Engineer Date 18/06/2018

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	12.0	3.8	.0	.0	.0	.0	3.8	0	0	0		.00
-.17	15.0	4.8	.0	.0	.0	.0	4.8	.1	-.7	0		.00
-.50	21.0	6.7	.0	.0	.0	.0	6.7	.6	-2.6	0	-.2	.00
-.50	21.0	6.7	.0	.0	.0	.0	6.7	.6	-2.9	0		.00
-1.00	30.0	9.5	.0	.0	.0	.0	9.5	3.0	-6.9	.2		.00
-1.10	31.8	10.1	.0	.0	.0	.0	10.1	3.7	-7.9	.3	17.5	.00
-1.10	31.8	10.1	.0	.0	.0	.0	10.1	3.7	9.6	.3		.00
-1.24	34.3	10.9	.0	.0	.0	.0	10.9	2.5	8.2	.3		.00
-1.50	36.9	11.7	2.6	.0	.0	.0	14.3	.8	4.9	.4	.0	.00
-1.50	36.9	11.7	2.6	.0	.0	.0	14.3	.8	4.9	.4		.00
-1.70	38.9	12.3	4.6	.0	.0	.0	16.9	.1	1.8	.5	.0	.00
-1.70	38.9	12.3	4.6	.0	.0	.0	16.9	.1	1.8	.5		.00
-1.80	39.9	12.6	5.6	.0	.0	.0	18.2	0	0	0		.00
-1.80	39.9	12.6	5.6	.0	.0	.0	18.2	0	0	0		.00

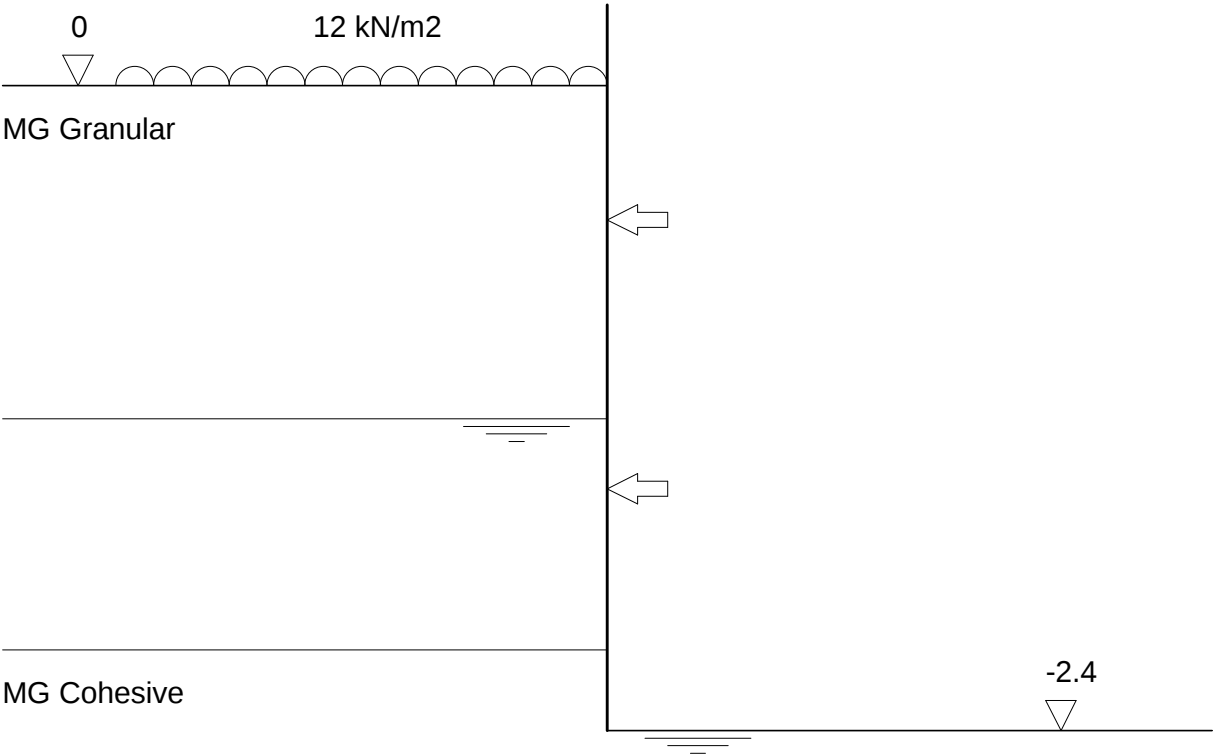
	Page No 8 Analysis
CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name ...st-case-4.2m pm.pws"
	Engineer Date 18/06/2018

Stage ref.

13

Stage type

Passive water level



	Page No 9 Analysis
CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name ...st-case-4.2m pm.pws"
	Engineer Date 18/06/2018

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	.1		.00
.00	.0	.0	.0	.0	.0	.0	0	0	0	.1		.00
.00	12.0	3.8	.0	.0	.0	.0	3.8	0	0	.1		.00
-.17	15.0	4.8	.0	.0	.0	.0	4.8	.1	-.7	.1		.00
-.50	21.0	6.7	.0	.0	.0	.0	6.7	.6	-2.6	.2	-1.1	.00
-.50	21.0	6.7	.0	.0	.0	.0	6.7	.6	-3.7	.2		.00
-1.00	30.0	9.5	.0	.0	.0	.0	9.5	3.4	-7.7	.4		.00
-1.10	31.8	10.1	.0	.0	.0	.0	10.1	4.2	-8.7	.4	.0	.00
-1.10	31.8	10.1	.0	.0	.0	.0	10.1	4.2	-8.7	.4		.00
-1.24	34.3	10.9	.0	.0	.0	.0	10.9	5.5	-10.2	.6		.00
-1.50	36.9	11.7	2.6	.0	.0	.0	14.3	8.6	-13.4	1.0	31.1	.00
-1.50	36.9	11.7	2.6	.0	.0	.0	14.3	8.6	17.7	1.0		.00
-1.70	38.9	12.3	4.6	.0	.0	.0	16.9	5.4	14.5	1.1	.0	.00
-1.70	38.9	12.3	4.6	.0	.0	.0	16.9	5.4	14.5	1.1		.00
-1.80	39.9	12.6	5.6	.0	.0	.0	18.2	4.0	12.8	1.2		.00
-1.80	39.9	12.6	5.6	.0	.0	.0	18.2	4.0	12.8	1.2		.00
-2.00	41.9	13.3	7.6	.0	.0	.0	20.9	1.8	8.9	1.5		.00
-2.10	42.9	13.6	8.6	.0	.0	.0	22.2	1.0	6.7	1.6	.0	.00
-2.10	42.9	11.1	8.6	.0	.0	.0	19.7	1.0	-6.7	1.6		.00
-2.10	42.9	11.1	8.6	.0	.0	.0	19.7	1.0	6.7	1.6		.00
-2.30	44.5	12.7	10.6	.0	.0	.0	23.3	.1	2.4	1.9	.0	.00
-2.30	44.5	12.7	10.6	.0	.0	.0	23.3	.1	2.4	1.9		.00
-2.40	45.3	13.5	11.6	.0	.0	.0	25.0	0	.1	0		.00
-2.40	45.3	13.5	11.6	.0	.0	.0	25.1	0	0	0		.00

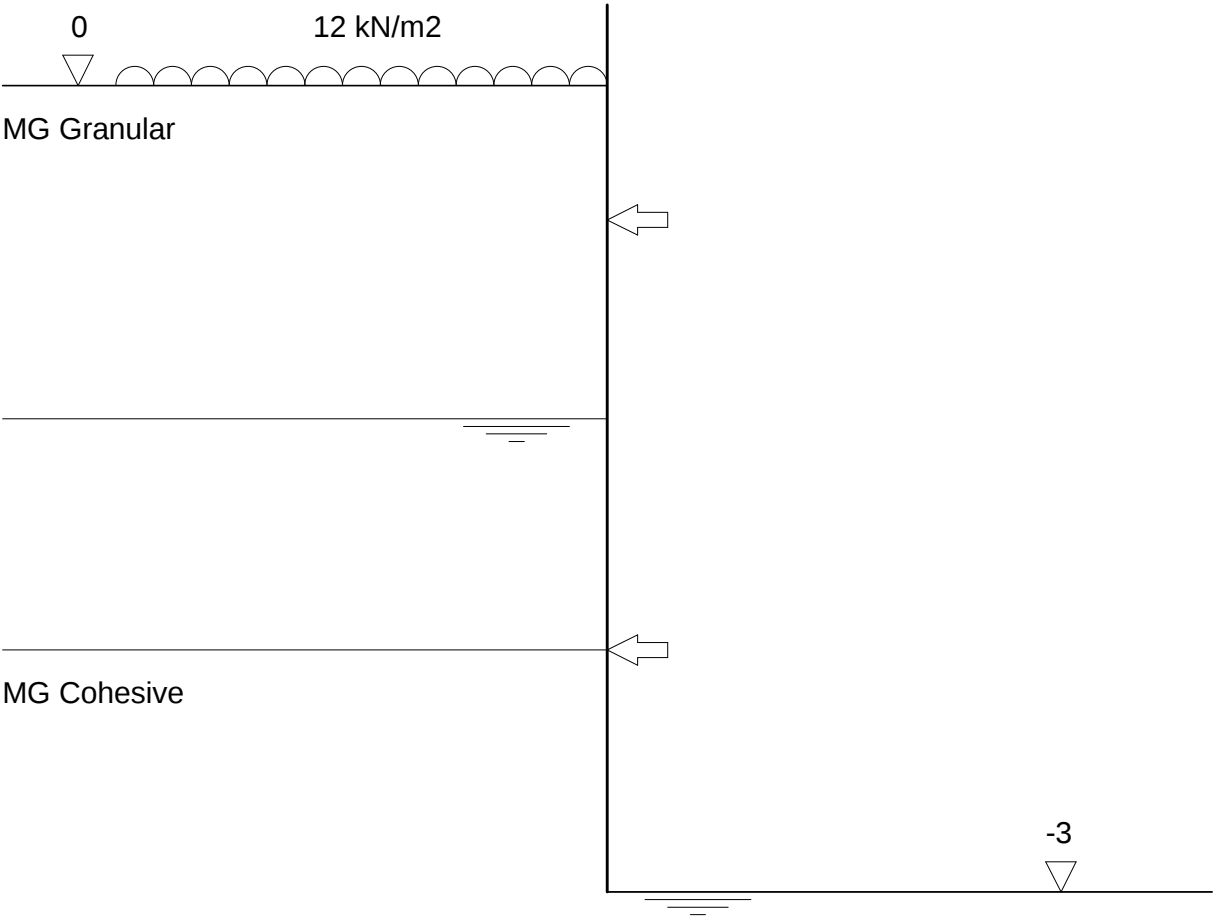
	Page No 10 Analysis
CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name ...st-case-4.2m pm.pws"
	Engineer Date 18/06/2018

Stage ref.

20

Stage type

Passive water level



	Page No 11 Analysis
CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name ...st-case-4.2m pm.pws"
	Engineer Date 18/06/2018

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	-.1		.00
.00	12.0	3.8	.0	.0	.0	.0	3.8	0	0	-.1		.00
-.17	15.0	4.8	.0	.0	.0	.0	4.8	.1	-.7	0		.00
-.50	21.0	6.7	.0	.0	.0	.0	6.7	.6	-2.6	.2	3.6	.00
-.50	21.0	6.7	.0	.0	.0	.0	6.7	.6	.9	.2		.00
-1.00	30.0	9.5	.0	.0	.0	.0	9.5	1.1	-3.1	.7		.00
-1.10	31.8	10.1	.0	.0	.0	.0	10.1	1.4	-4.1	.8	.0	.00
-1.10	31.8	10.1	.0	.0	.0	.0	10.1	1.4	-4.1	.8		.00
-1.24	34.3	10.9	.0	.0	.0	.0	10.9	2.1	-5.5	1.0		.00
-1.50	36.9	11.7	2.6	.0	.0	.0	14.3	4.0	-8.8	1.4	.0	.00
-1.50	36.9	11.7	2.6	.0	.0	.0	14.3	4.0	-8.8	1.4		.00
-1.70	38.9	12.3	4.6	.0	.0	.0	16.9	6.0	-11.9	1.7	.0	.00
-1.70	38.9	12.3	4.6	.0	.0	.0	16.9	6.0	-11.9	1.7		.00
-1.80	39.9	12.6	5.6	.0	.0	.0	18.2	7.3	-13.7	2.0		.00
-1.80	39.9	12.6	5.6	.0	.0	.0	18.2	7.3	-13.7	2.0		.00
-2.00	41.9	13.3	7.6	.0	.0	.0	20.9	10.4	-17.6	2.6		.00
-2.10	42.9	13.6	8.6	.0	.0	.0	22.2	12.3	-19.8	2.9	44.8	.00
-2.10	42.9	11.1	8.6	.0	.0	.0	19.7	12.3	-25.0	2.9		.00
-2.10	42.9	11.1	8.6	.0	.0	.0	19.7	12.3	25.0	2.9		.00
-2.30	44.5	12.7	10.6	.0	.0	.0	23.3	7.8	20.7	2.9	.0	.00
-2.30	44.5	12.7	10.6	.0	.0	.0	23.3	7.8	20.7	2.9		.00
-2.40	45.3	13.5	11.6	.0	.0	.0	25.0	5.8	18.3	2.9		.00
-2.40	45.3	13.5	11.6	.0	.0	.0	25.1	5.8	18.3	2.9		.00
-2.70	47.7	15.9	14.6	.0	.0	.0	30.5	1.5	10.0	3.1	.0	.00
-2.70	47.7	15.9	14.6	.0	.0	.0	30.5	1.5	9.9	3.1		.00
-2.71	47.8	16.0	14.7	.0	.0	.0	30.7	1.4	9.6	3.1	.0	.00
-2.71	47.8	16.0	14.7	.0	.0	.0	30.7	1.4	9.6	3.1		.00
-2.90	49.3	17.5	16.6	.0	.0	.0	34.1	.2	3.5	3.3	.0	.00
-2.90	49.3	17.5	16.6	.0	.0	.0	34.1	.2	3.5	3.3		.00
-3.00	50.1	18.3	17.6	.0	.0	.0	35.8	0	.1	.1		.00
-3.00	50.1	18.3	17.6	.0	.0	.0	35.9	0	0	0		.00

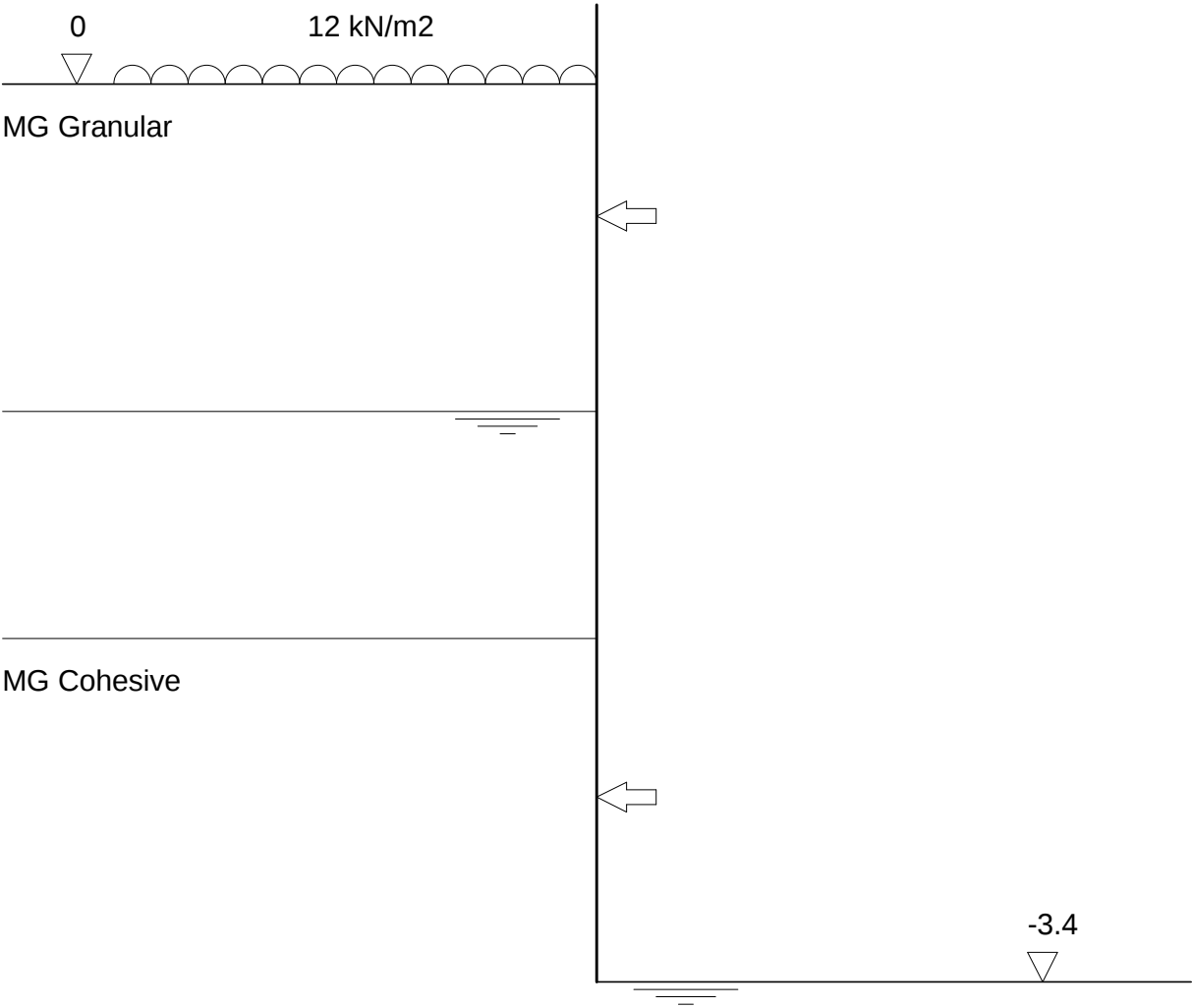
	Page No 12 Analysis
CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name ...st-case-4.2m pm.pws"
	Engineer Date 18/06/2018

Stage ref.

27

Stage type

Passive water level



	Page No 13 Analysis
CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name ...st-case-4.2m pm.pws"
	Engineer Date 18/06/2018

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	-1.1		.00
.00	.0	.0	.0	.0	.0	.0	0	0	0	-.7		.00
.00	12.0	3.8	.0	.0	.0	.0	3.8	0	0	-.7		.00
-.17	15.0	4.8	.0	.0	.0	.0	4.8	.1	-.7	-.4		.00
-.50	21.0	6.7	.0	.0	.0	.0	6.7	.6	-2.6	.3	12.1	.00
-.50	21.0	6.7	.0	.0	.0	.0	6.7	.6	9.5	.3		.00
-1.00	30.0	9.5	.0	.0	.0	.0	9.5	-3.2	5.5	2.1		.00
-1.10	31.8	10.1	.0	.0	.0	.0	10.1	-3.7	4.5	2.4	.0	.00
-1.10	31.8	10.1	.0	.0	.0	.0	10.1	-3.7	4.5	2.4		.00
-1.24	34.3	10.9	.0	.0	.0	.0	10.9	-4.2	3.0	2.8		.00
-1.50	36.9	11.7	2.6	.0	.0	.0	14.3	-4.6	-.3	3.5	.0	.00
-1.50	36.9	11.7	2.6	.0	.0	.0	14.3	-4.6	-.3	3.5		.00
-1.70	38.9	12.3	4.6	.0	.0	.0	16.9	-4.2	-3.4	3.9	.0	.00
-1.70	38.9	12.3	4.6	.0	.0	.0	16.9	-4.2	-3.4	3.9		.00
-1.80	39.9	12.6	5.6	.0	.0	.0	18.2	-3.8	-5.1	4.0		.00
-1.80	39.9	12.6	5.6	.0	.0	.0	18.2	-3.8	-5.1	4.0		.00
-2.00	41.9	13.3	7.6	.0	.0	.0	20.9	-2.4	-9.1	4.3		.00
-2.10	42.9	13.6	8.6	.0	.0	.0	22.2	-1.4	-11.2	4.4	.0	.00
-2.10	42.9	11.1	8.6	.0	.0	.0	19.7	-1.4	11.2	4.4		.00
-2.10	42.9	11.1	8.6	.0	.0	.0	19.7	-1.4	-11.2	4.4		.00
-2.30	44.5	12.7	10.6	.0	.0	.0	23.3	1.3	-15.5	4.6	.0	.00
-2.30	44.5	12.7	10.6	.0	.0	.0	23.3	1.3	-15.5	4.6		.00
-2.40	45.3	13.5	11.6	.0	.0	.0	25.0	2.9	-17.9	4.7		.00
-2.40	45.3	13.5	11.6	.0	.0	.0	25.1	2.9	-17.9	4.7		.00
-2.70	47.7	15.9	14.6	.0	.0	.0	30.5	9.5	-26.2	5.2	52.0	.00
-2.70	47.7	15.9	14.6	.0	.0	.0	30.5	9.5	25.7	5.2		.00
-2.71	47.8	16.0	14.7	.0	.0	.0	30.7	9.3	25.4	5.1	.0	.00
-2.71	47.8	16.0	14.7	.0	.0	.0	30.7	9.3	25.4	5.1		.00
-2.90	49.3	17.5	16.6	.0	.0	.0	34.1	5.0	19.3	3.8	.0	.00
-2.90	49.3	17.5	16.6	.0	.0	.0	34.1	5.0	19.3	3.8		.00
-3.00	50.1	18.3	17.6	.0	.0	.0	35.8	3.3	15.9	3.1		.00
-3.00	50.1	18.3	17.6	.0	.0	.0	35.9	3.3	15.8	3.1		.00
-3.30	52.5	20.7	20.6	.0	.0	.0	41.3	.2	4.2	1.2	.0	.00
-3.30	52.5	20.7	20.6	.0	.0	.0	41.3	.2	4.2	1.2		.00
-3.40	53.3	21.5	21.6	.0	.0	.0	43.0	0	.1	0		.00
-3.40	53.3	21.5	21.6	.0	.0	.0	43.1	0	0	0		.00

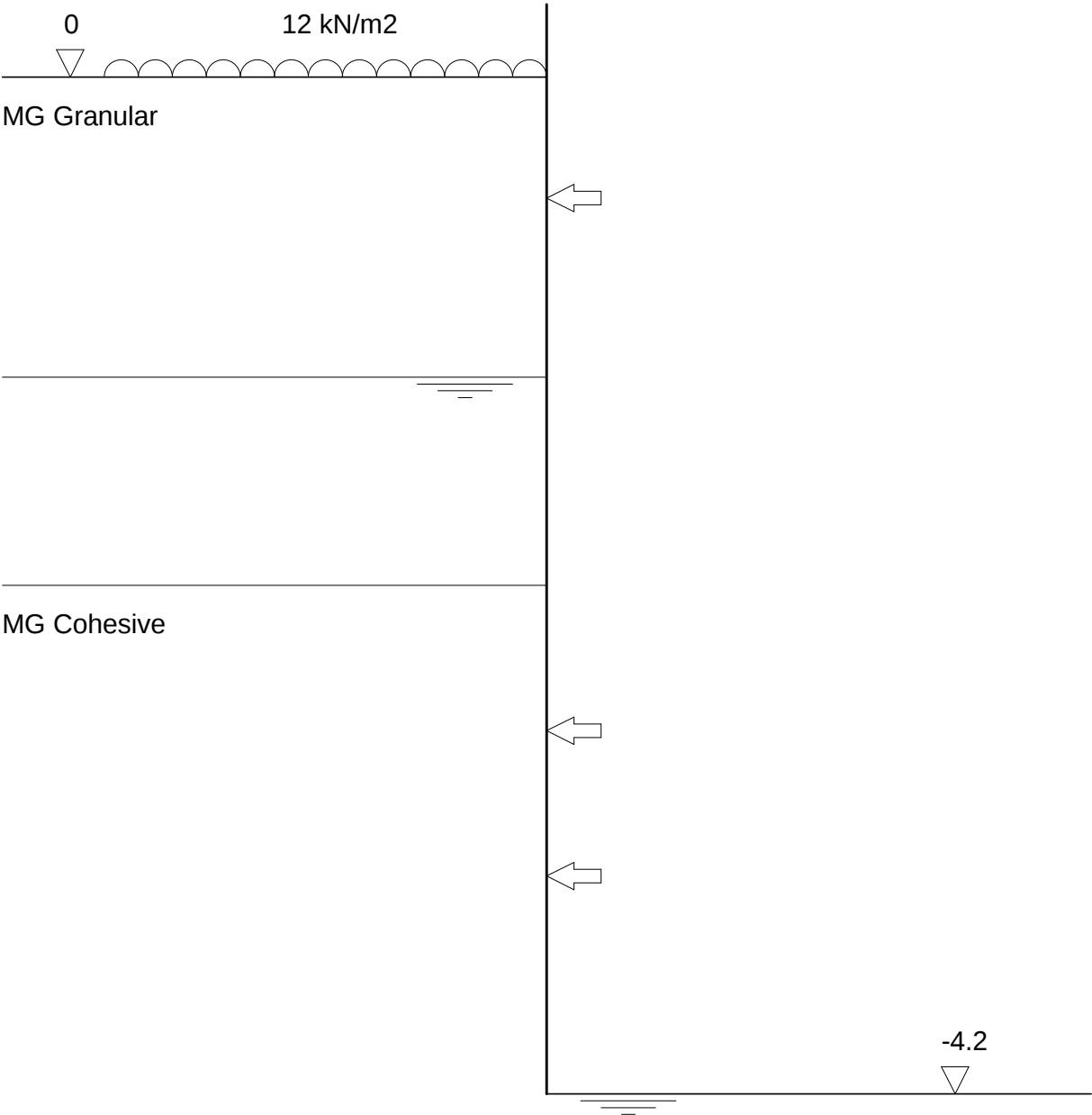
	Page No 14 Analysis
CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name ...st-case-4.2m pm.pws"
	Engineer Date 18/06/2018

Stage ref.

31

Stage type

Passive water level



	Page No 15 Analysis
CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name ...st-case-4.2m pm.pws"
	Engineer Date 18/06/2018

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	-1.8		.00
.00	.0	.0	.0	.0	.0	.0	0	0	0	-1.1		.00
.00	12.0	3.8	.0	.0	.0	.0	3.8	0	0	-1.1		.00
-.17	15.0	4.8	.0	.0	.0	.0	4.8	.1	-.7	-.8		.00
-.50	21.0	6.7	.0	.0	.0	.0	6.7	.6	-2.6	.3	16.4	.00
-.50	21.0	6.7	.0	.0	.0	.0	6.7	.6	13.8	.3		.00
-1.00	30.0	9.5	.0	.0	.0	.0	9.5	-5.4	9.8	2.9		.00
-1.10	31.8	10.1	.0	.0	.0	.0	10.1	-6.3	8.8	3.4	.0	.00
-1.10	31.8	10.1	.0	.0	.0	.0	10.1	-6.3	8.8	3.4		.00
-1.24	34.3	10.9	.0	.0	.0	.0	10.9	-7.4	7.3	4.0		.00
-1.50	36.9	11.7	2.6	.0	.0	.0	14.3	-8.9	4.1	4.9	.0	.00
-1.50	36.9	11.7	2.6	.0	.0	.0	14.3	-8.9	4.1	4.9		.00
-1.70	38.9	12.3	4.6	.0	.0	.0	16.9	-9.4	.9	5.4	.0	.00
-1.70	38.9	12.3	4.6	.0	.0	.0	16.9	-9.4	.9	5.4		.00
-1.80	39.9	12.6	5.6	.0	.0	.0	18.2	-9.4	-.8	5.5		.00
-1.80	39.9	12.6	5.6	.0	.0	.0	18.2	-9.4	-.8	5.5		.00
-2.00	41.9	13.3	7.6	.0	.0	.0	20.9	-8.9	-4.7	5.7		.00
-2.10	42.9	13.6	8.6	.0	.0	.0	22.2	-8.3	-6.9	5.8	.0	.00
-2.10	42.9	11.1	8.6	.0	.0	.0	19.7	-8.3	6.9	5.8		.00
-2.10	42.9	11.1	8.6	.0	.0	.0	19.7	-8.3	-6.9	5.8		.00
-2.30	44.5	12.7	10.6	.0	.0	.0	23.3	-6.5	-11.2	5.7	.0	.00
-2.30	44.5	12.7	10.6	.0	.0	.0	23.3	-6.5	-11.2	5.7		.00
-2.40	45.3	13.5	11.6	.0	.0	.0	25.0	-5.3	-13.5	5.6		.00
-2.40	45.3	13.5	11.6	.0	.0	.0	25.1	-5.3	-13.6	5.6		.00
-2.70	47.7	15.9	14.6	.0	.0	.0	30.5	0	-21.9	5.2	-3.0	.00
-2.70	47.7	15.9	14.6	.0	.0	.0	30.5	0	-24.9	5.2		.00
-2.71	47.8	16.0	14.7	.0	.0	.0	30.7	.2	-25.2	5.1	.0	.00
-2.71	47.8	16.0	14.7	.0	.0	.0	30.7	.3	-25.2	5.1		.00
-2.90	49.3	17.5	16.6	.0	.0	.0	34.1	5.6	-31.4	4.1	.0	.00
-2.90	49.3	17.5	16.6	.0	.0	.0	34.1	5.6	-31.4	4.1		.00
-3.00	50.1	18.3	17.6	.0	.0	.0	35.8	8.8	-34.8	3.6		.00
-3.00	50.1	18.3	17.6	.0	.0	.0	35.9	8.9	-34.9	3.6		.00
-3.30	52.5	20.7	20.6	.0	.0	.0	41.3	21.1	-46.4	2.5	90.9	.00
-3.30	52.5	20.7	20.6	.0	.0	.0	41.3	21.1	44.4	2.5		.00
-3.40	53.3	21.5	21.6	.0	.0	.0	43.0	16.9	40.3	2.4		.00
-3.40	53.3	21.5	21.6	.0	.0	.0	43.1	16.9	40.2	2.4		.00
-3.90	57.3	25.5	26.6	.0	.0	.0	52.0	2.5	16.5	3.3		.00
-3.90	57.3	25.5	26.6	.0	.0	.0	52.1	2.5	16.4	3.3		.00
-4.00	58.1	26.3	27.6	.0	.0	.0	53.9	1.1	11.1	3.5		.00
-4.20	59.7	27.9	29.6	.0	.0	.0	57.4	0	.1	0		.00
-4.20	59.7	27.9	29.6	.0	.0	.0	57.5	0	0	0		.00

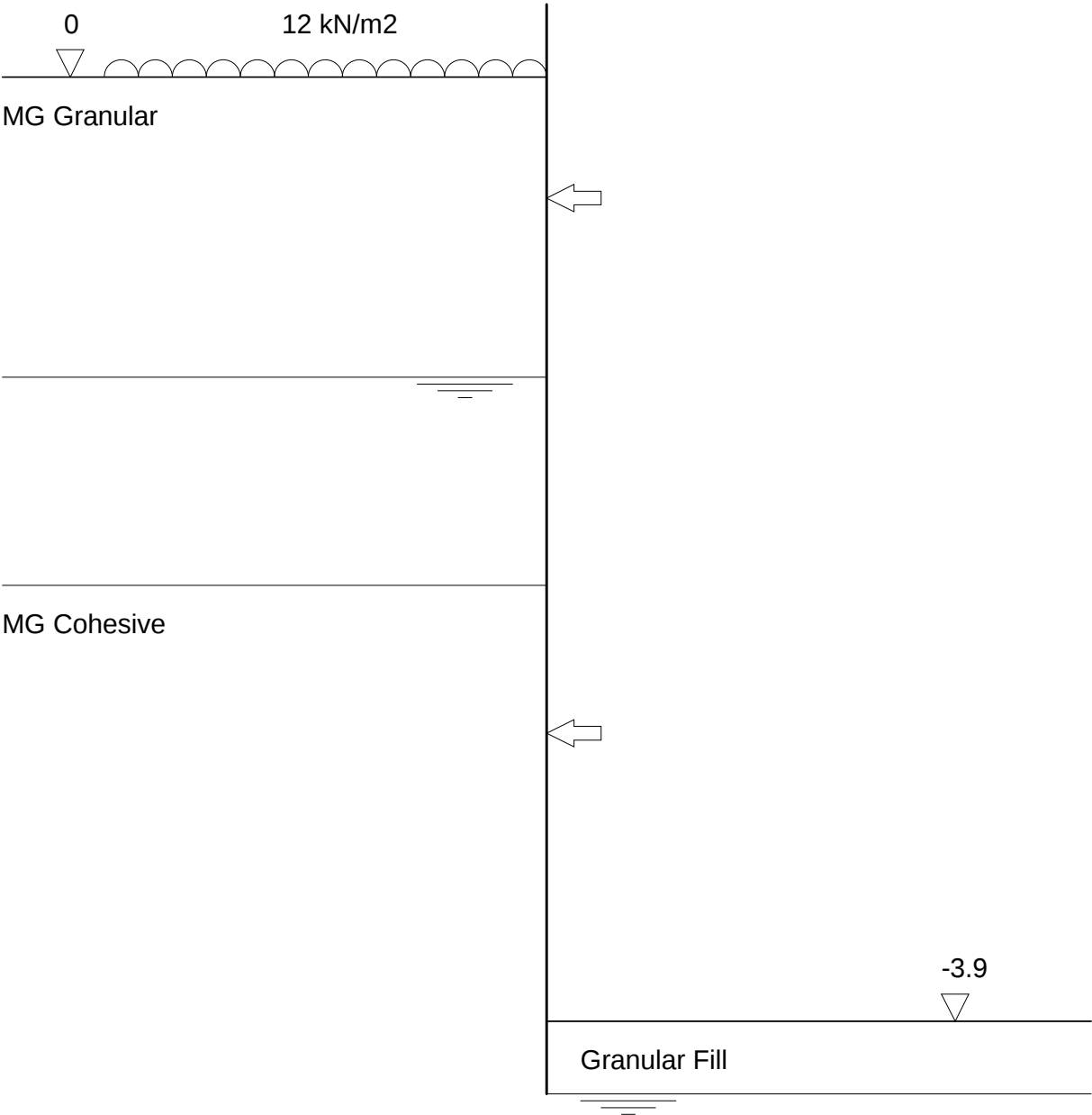
	Page No 16 Analysis
CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name ...st-case-4.2m pm.pws"
	Engineer Date 18/06/2018

Stage ref.

35

Stage type

Remove prop



	Page No 17 Analysis
CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name ...st-case-4.2m pm.pws"
	Engineer Date 18/06/2018

Tabular results from analysis of stage ref 35

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	2.9		.00
.00	.0	.0	.0	.0	.0	.0	0	0	0	1.9		.00
.00	12.0	3.8	.0	.0	.0	.0	3.8	0	0	1.9		.00
-.17	15.0	4.8	.0	.0	.0	.0	4.8	.1	-.7	1.4		.00
-.50	21.0	6.7	.0	.0	.0	.0	6.7	.6	-2.6	.3	-3.6	.00
-.50	21.0	6.7	.0	.0	.0	.0	6.7	.6	-6.2	.3		.00
-1.00	30.0	9.5	.0	.0	.0	.0	9.5	4.6	-10.2	-1.0		.00
-1.10	31.8	10.1	.0	.0	.0	.0	10.1	5.7	-11.2	-1.2	.0	.00
-1.10	31.8	10.1	.0	.0	.0	.0	10.1	5.7	-11.2	-1.2		.00
-1.24	34.3	10.9	.0	.0	.0	.0	10.9	7.4	-12.7	-1.4		.00
-1.50	36.9	11.7	2.6	.0	.0	.0	14.3	11.1	-16.0	-1.7	.0	.00
-1.50	36.9	11.7	2.6	.0	.0	.0	14.3	11.1	-16.0	-1.7		.00
-1.70	38.9	12.3	4.6	.0	.0	.0	16.9	14.6	-19.1	-1.6	.0	.00
-1.70	38.9	12.3	4.6	.0	.0	.0	16.9	14.6	-19.1	-1.6		.00
-1.80	39.9	12.6	5.6	.0	.0	.0	18.2	16.5	-20.8	-1.4		.00
-1.80	39.9	12.6	5.6	.0	.0	.0	18.2	16.6	-20.8	-1.4		.00
-2.00	41.9	13.3	7.6	.0	.0	.0	20.9	21.1	-24.8	-.9		.00
-2.10	42.9	13.6	8.6	.0	.0	.0	22.2	23.7	-26.9	-.4	.0	.00
-2.10	42.9	11.1	8.6	.0	.0	.0	19.7	23.7	26.9	-.4		.00
-2.10	42.9	11.1	8.6	.0	.0	.0	19.7	23.7	-26.9	-.4		.00
-2.30	44.5	12.7	10.6	.0	.0	.0	23.3	29.5	-31.2	.8	.0	.00
-2.30	44.5	12.7	10.6	.0	.0	.0	23.3	29.5	-31.2	.8		.00
-2.40	45.3	13.5	11.6	.0	.0	.0	25.0	32.7	-33.6	1.7		.00
-2.40	45.3	13.5	11.6	.0	.0	.0	25.1	32.8	-33.6	1.7		.00
-2.70	47.7	15.9	14.6	.0	.0	.0	30.5	44.1	-42.0	5.4	.0	.00
-2.70	47.7	15.9	14.6	.0	.0	.0	30.5	44.1	-42.0	5.4		.00
-2.71	47.8	16.0	14.7	.0	.0	.0	30.7	44.5	-42.3	5.5	101.2	.00
-2.71	47.8	16.0	14.7	.0	.0	.0	30.7	44.5	58.9	5.5		.00
-2.90	49.3	17.5	16.6	.0	.0	.0	34.1	33.9	52.8	7.7	.0	.00
-2.90	49.3	17.5	16.6	.0	.0	.0	34.1	33.9	52.7	7.7		.00
-3.00	50.1	18.3	17.6	.0	.0	.0	35.8	28.9	49.3	9.1		.00
-3.00	50.1	18.3	17.6	.0	.0	.0	35.9	28.8	49.3	9.1		.00
-3.30	52.5	20.7	20.6	.0	.0	.0	41.3	15.7	37.7	14.1	.0	.00
-3.30	52.5	20.7	20.6	.0	.0	.0	41.3	15.7	37.7	14.1		.00
-3.40	53.3	21.5	21.6	.0	.0	.0	43.0	12.2	33.6	15.9		.00
-3.40	53.3	21.5	21.6	.0	.0	.0	43.1	12.1	33.5	16.0		.00
-3.90	57.3	25.5	26.6	.0	.0	.0	52.0	1.2	9.8	25.9		.00
-3.90	57.3	25.5	26.6	.0	.0	.0	52.1	1.2	9.7	25.9		.00
-4.00	58.1	26.3	27.6	1.8	15.0	.0	38.8	.4	5.1	28.0		.02
-4.20	59.7	27.9	29.6	5.4	44.8	.0	12.6	0	0	.3		.16
-4.20	59.7	27.9	29.6	5.4	24.5	.0	33.0	0	0	0		.17

	Page No 19 Analysis
CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project File Name ...st-case-4.2m pm.pws"
	Engineer Date 18/06/2018

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	
-.17	.0	.1	-.7	.3	
-.50	.0	.6	-2.6	.0	18.5
-.50	.0	.6	-6.2	15.8	
-1.00	-6.4	4.6	-10.2	11.8	
-1.10	-7.5	5.7	-11.2	10.8	17.5
-1.10	-7.5	5.7	-11.2	10.8	
-1.24	-8.9	7.4	-12.7	9.4	
-1.50	-10.9	11.1	-16.0	6.1	31.1
-1.50	-10.9	11.1	-16.0	17.7	
-1.70	-11.9	14.6	-19.1	14.5	8.7
-1.70	-11.9	14.6	-19.1	14.5	
-1.80	-12.1	16.5	-20.8	12.8	
-1.80	-12.1	16.6	-20.8	12.8	
-2.00	-11.9	21.1	-24.8	8.9	
-2.10	-11.5	23.7	-26.9	6.7	44.8
-2.10	-11.5	23.7	-25.0	26.9	
-2.10	-11.5	23.7	-26.9	25.0	
-2.30	-10.2	29.5	-31.2	20.7	17.3
-2.30	-10.2	29.5	-31.2	20.7	
-2.40	-9.1	32.7	-33.6	18.3	
-2.40	-9.1	32.8	-33.6	18.3	
-2.70	-4.4	44.1	-42.0	10.0	52.0
-2.70	-4.4	44.1	-42.0	25.7	
-2.71	-4.2	44.5	-42.3	25.4	101.2
-2.71	-4.2	44.5	-25.2	58.9	
-2.90	.0	33.9	-31.4	52.8	29.9
-2.90	.0	33.9	-31.4	52.7	
-3.00	.0	28.9	-34.8	49.3	
-3.00	.0	28.8	-34.9	49.3	
-3.30	.0	21.1	-46.4	37.7	90.9
-3.30	.0	21.1	.0	44.4	
-3.40	.0	16.9	.0	40.3	
-3.40	.0	16.9	.0	40.2	
-3.90	.0	2.5	.0	16.5	
-3.90	.0	2.5	.0	16.4	
-4.00	.0	1.1	.0	11.1	
-4.20	.0	.0	.0	.1	
-4.20	.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 ...st-case-4.2m pm.pws"
	Engineer Date 18/06/2018

Structural design of wall

Wall section properties

Sheet pile section ref MGF KKD 600/8

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

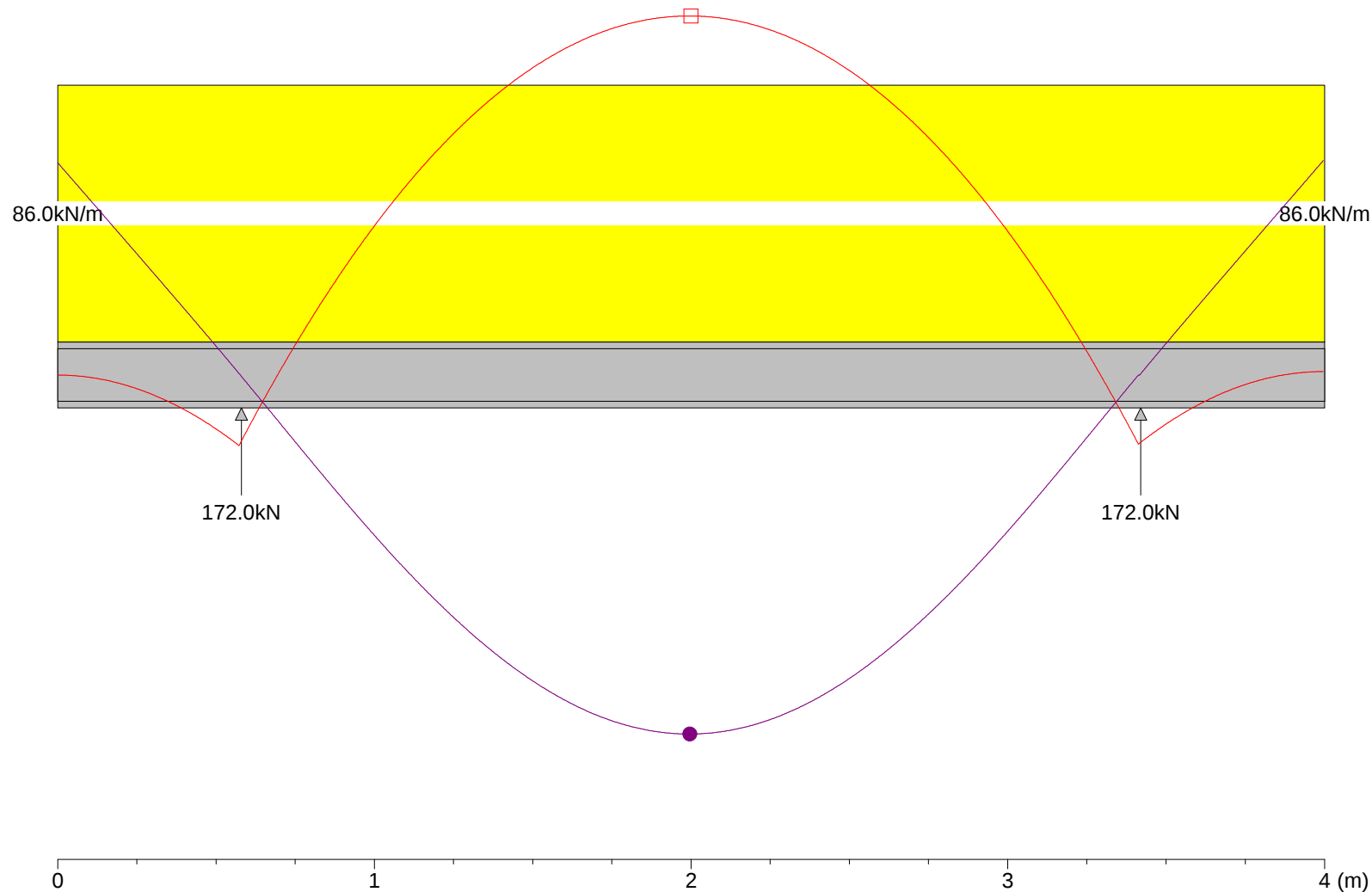
Wall structural design checks

Check description	Required or Limit	Provided or Actual	Units
Max. bending moment Design stress check	44	48	kNm/m
Min. section modulus Design stress check	210	231	cm3/m
Maximum shear force Design stress check	58	268	kN/m

Page: 1
 Date: 14.6.18
 Beam: MGF 203UC Brace
 L = 4.000 m
 I = 9450.0 cm⁴
 E = 2.1E+08 kN/m²
 EI = 19845.0 kNm²

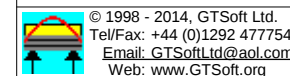
	Maximum	x (m)
□	72.58 kNm	2.000
●	2.947 mm	1.996
R	172.0 kN	0.580

F3



MGF Design Services Ltd.

SPAN, v2.51



© 1998 - 2014, GTSoft Ltd.
 Tel/Fax: +44 (0)1292 477754
 Email: GTSoftLtd@aol.com
 Web: www.GTSoft.org

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 203UC Brace	4.000	222.000	209.000	2.1E+08	9450.0	19845.0	307.0

Distributed Loads



x (m)	w (m)	L ₁ (kN/m)	L ₂ (kN/m)
0.000	4.000	86.0	86.0

Solution

Supports

x (m)	R (kN)	M (kNm)
0.580	172.0	-13.8
3.420	172.0	-13.8

Maxima

	Maximum	x (m)
Reaction	172.0 kN	0.580
Shear Force	122.1 kN	0.580
Sagging Moment	72.58 kNm	1.988
Hogging Moment	-14.27 kNm	0.568
Sagging Deflection	2.947 mm	1.988
Hogging Deflection	-1.761 mm	3.992



MGF Design Services Ltd.

SPAN, v2.51

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	H 23				(0.65)		
		H	2.70							
		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)		
		SPT								
		D	5.70	H 8						
		H	5.80	H 12						
		H	5.90	H 11			5.80-7.00m: Silty clay.			
6		H	6.00 - 6.45	S<1			6.00-7.00m: Grey mottled dark grey.			
		SPT								
		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					1.70		
2		B SPT	2.00 - 3.00	S 1			MADE GROUND: Very loose dark grey sandy GRAVEL with a strong chemical odour. Gravel is angular to sub-angular brick fragments and limestone.	(1.40)		
		ES	2.60							
3		SPT	3.00 - 3.45	S<1				3.10		
		ES	3.60				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.			
4		D SPT	3.90	S<1						
		ES	4.00 - 4.45					(2.90)		
		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.			
		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		
		ES	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

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		B	0.20		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.			
					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