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CADS Piled Wall Suite Version 5.31 Design of embedded retaining walls and cofferdams	Project 2023-2352 File Name dovehouse close 3.pws
PROPOSED NEW 3.5M CONTIGUOUS PILED RETAINING WALL LAND ADJ 11 DOVEHOUSE CLOSE M45 7PE - NEW PLATEAU	Engineer JPR Date 19/07/2023

Pile geometry

Pile top Level 0 m
 Pile Length 7 m
 Pile toe level -7 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 -20

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	SAND	18.00	19.00	24000	0			33 33	.50 .50	.26 5.83	

Construction sequence

Stage Ref	Stage Type	Level or Angle m/deg.	Load kN/(m)	Offset m	Width m	Length m
1	Active surcharge	0.00	10.0	.0		
2 A	Passive side excavation	-3.50				

Code of practice

Code of practice or reference document	BS8002 - Moderately conservative parameters
Application of pressures for stability	Not applicable for FOS=1 on moments
FOS on moments (stability check)	1.00
ULS factor on Tan(Phi) values	1.20
ULS fFactor on drained cohesion values	1.20
ULS factor on undrained cohesion values	1.50
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

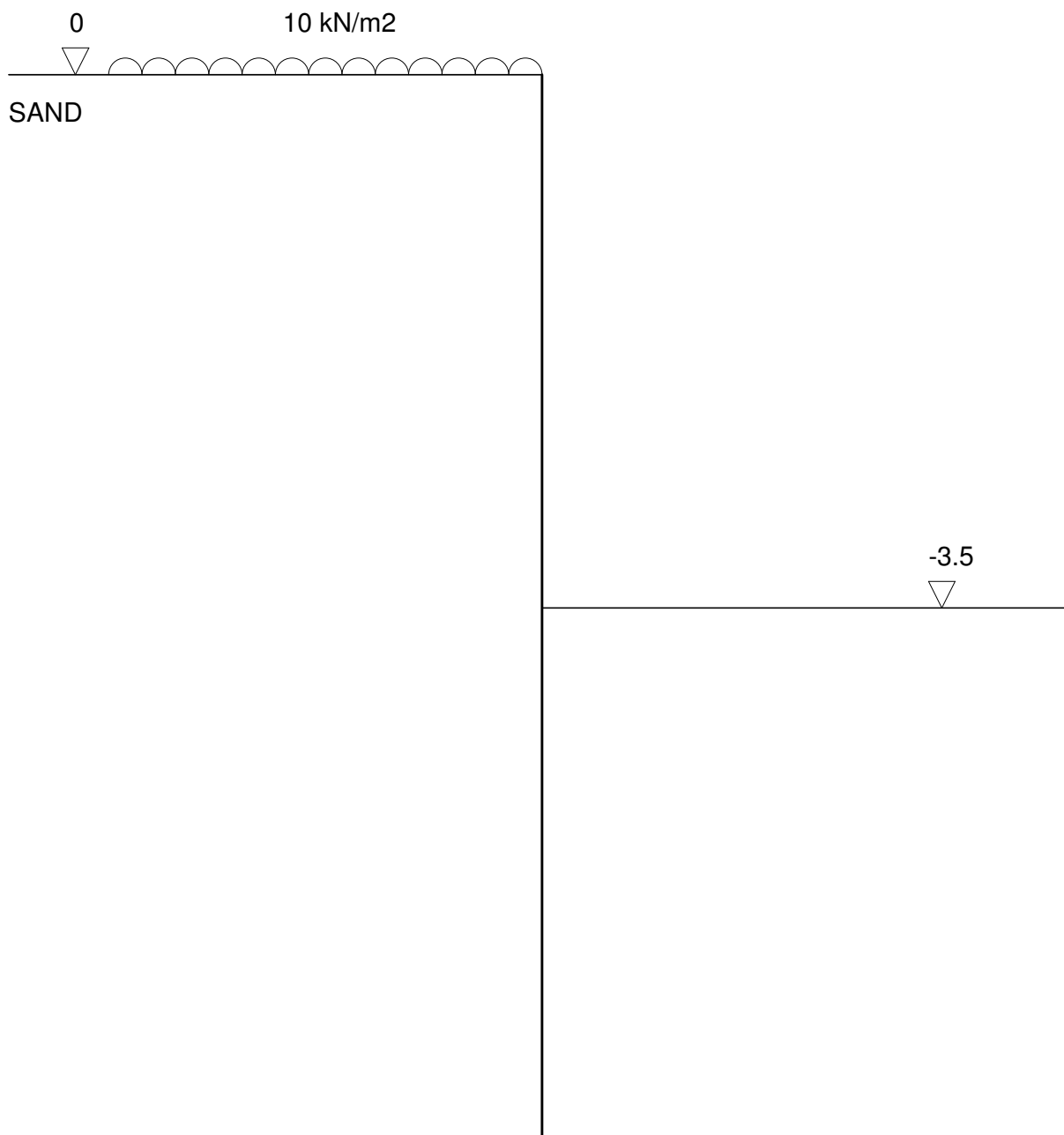
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Deflection parameters

Wall moment of inertia 147324 cm⁴/m
Wall Youngs modulus 27000000 kN/m²

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Stage ref. 2
Stage type Passive side excavation

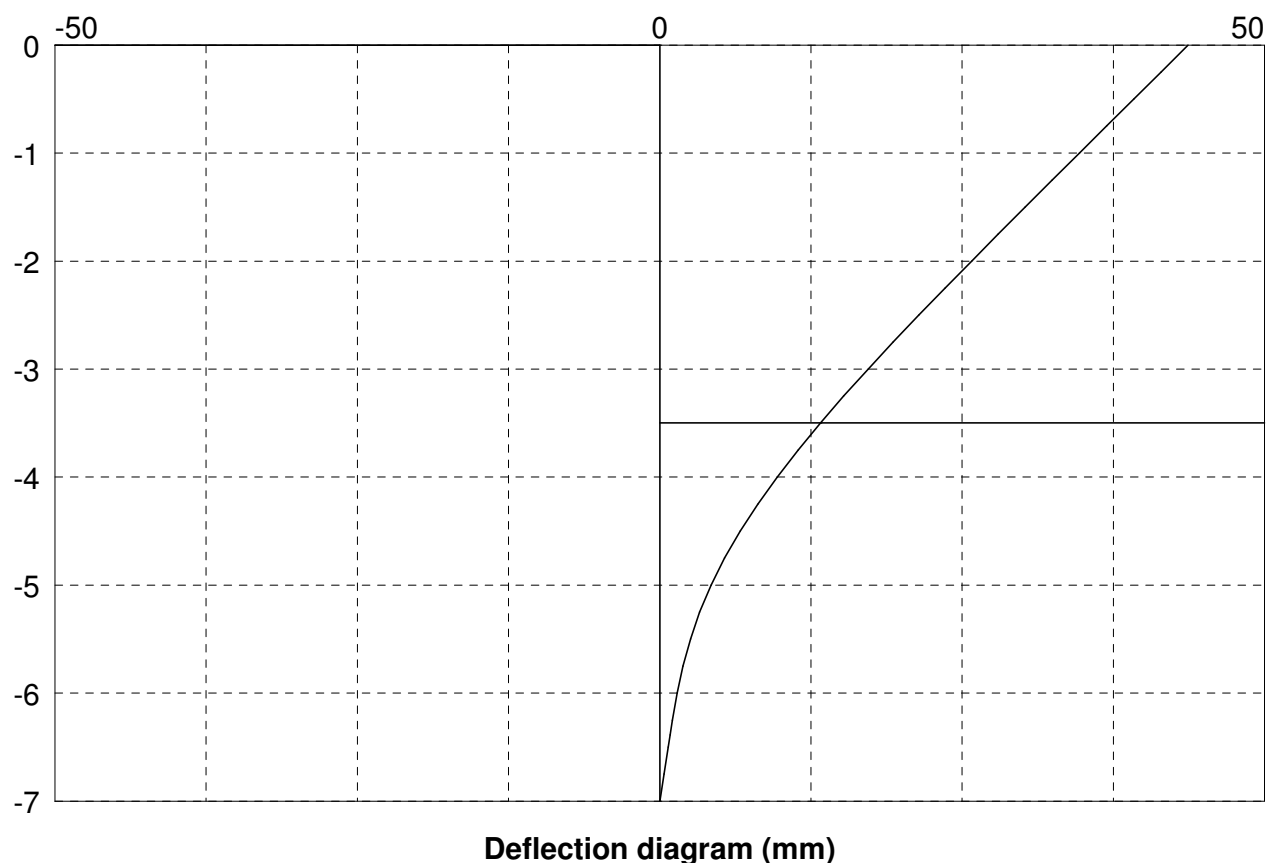
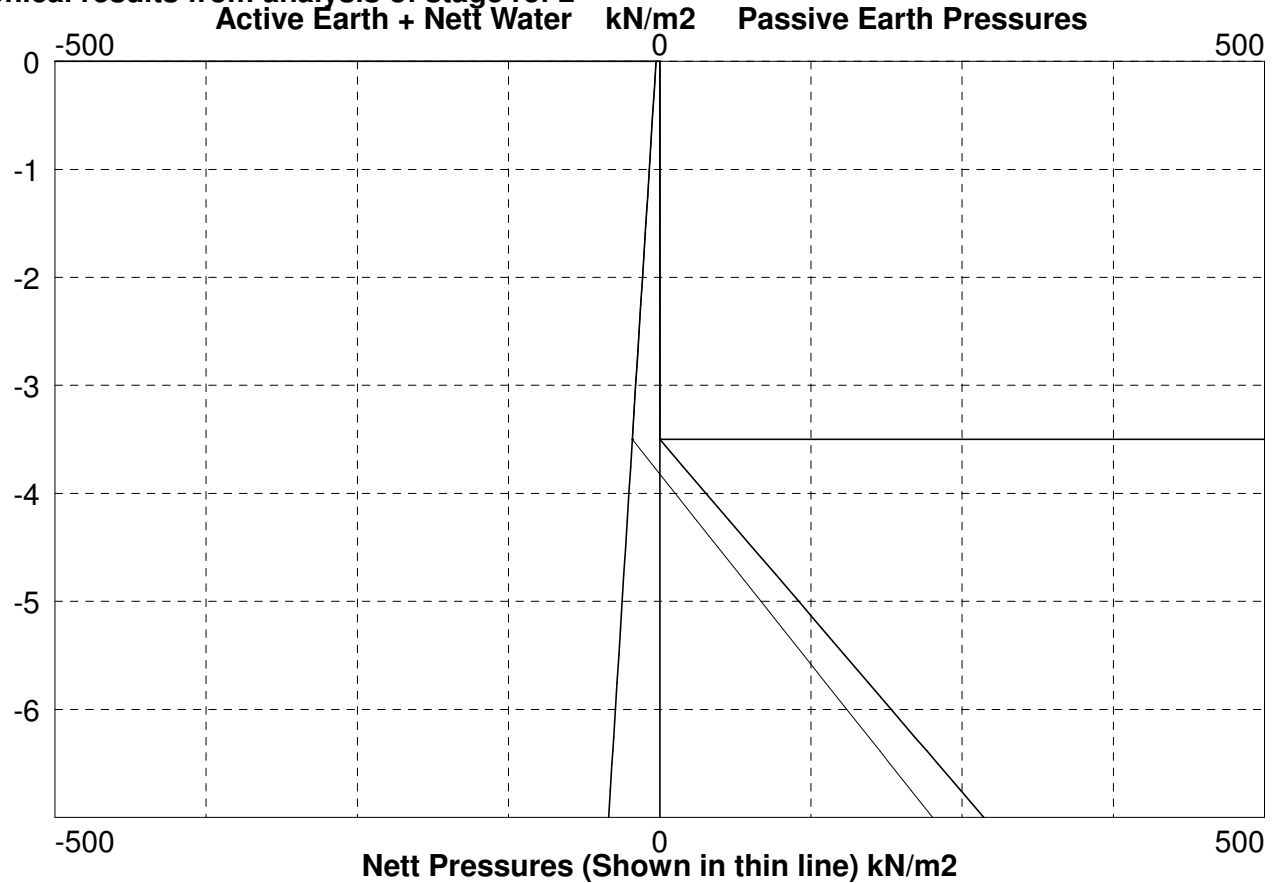


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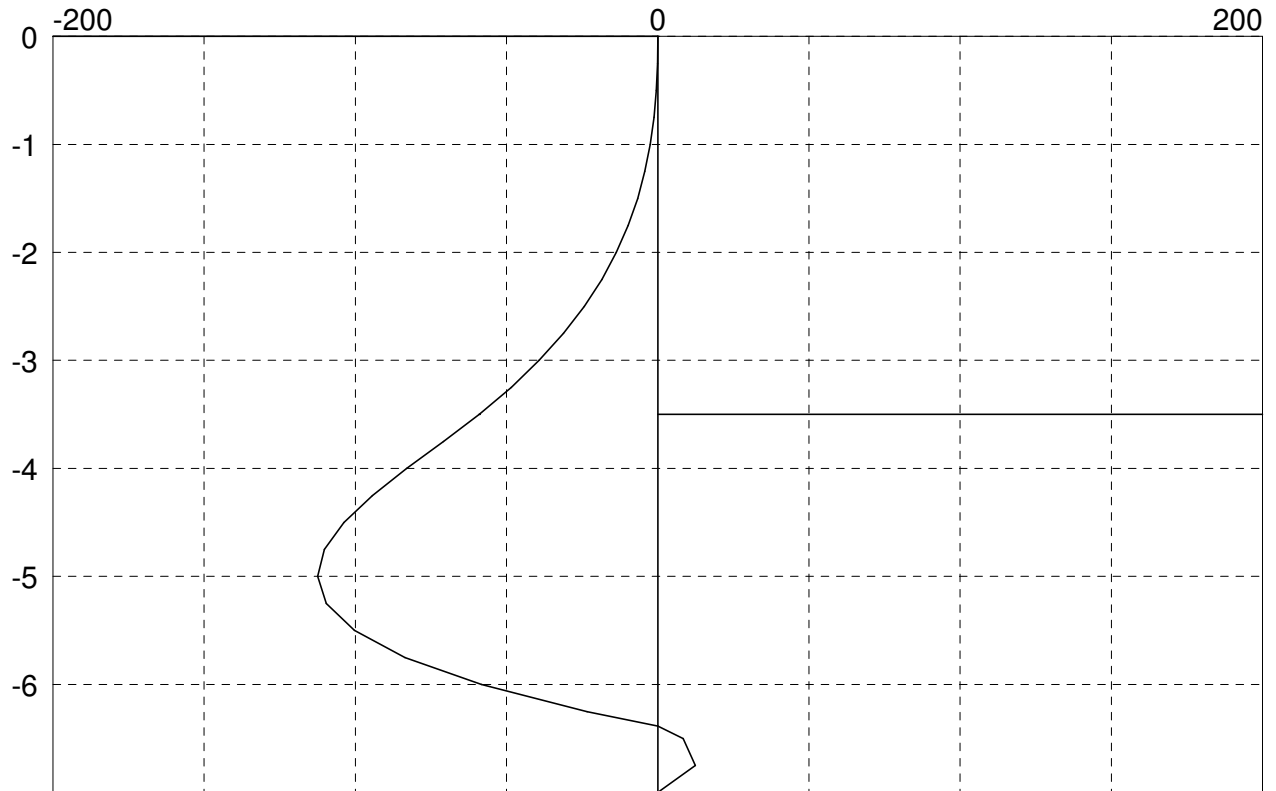
Tabular results from analysis of stage ref 2

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
.00	10.0	3.1	.0	.0	.0	.0	3.1	0	0	43.7		.00
-1.00	28.0	8.7	.0	.0	.0	.0	8.7	2.5	-5.9	34.7		.00
-2.00	46.0	14.3	.0	.0	.0	.0	14.3	13.7	-17.4	25.8		.00
-3.00	64.0	19.9	.0	.0	.0	.0	19.9	39.2	-34.5	17.2		.00
-3.50	73.0	22.7	.0	.0	.0	.0	22.7	59.0	-45.1	13.3		.00
-3.50	73.0	22.7	.0	.0	.0	.0	22.7	59.1	-45.2	13.3		.00
-4.00	82.0	25.5	.0	9.0	38.3	.0	-12.8	83.0	-47.7	9.7		.01
-5.00	100.0	31.1	.0	27.0	114.8	.0	-83.7	112.5	.6	4.2		.18
-6.00	118.0	36.7	.0	45.0	191.4	.0	-154.7	58.3	119.8	1.4		.55
-6.39	124.9	38.9	.0	51.9	220.9	.0	-182.1	0	184.7	.9		.72
-7.00	136.0	42.3	.0	63.0	267.9	.0	-225.6	0	0	0		1.02

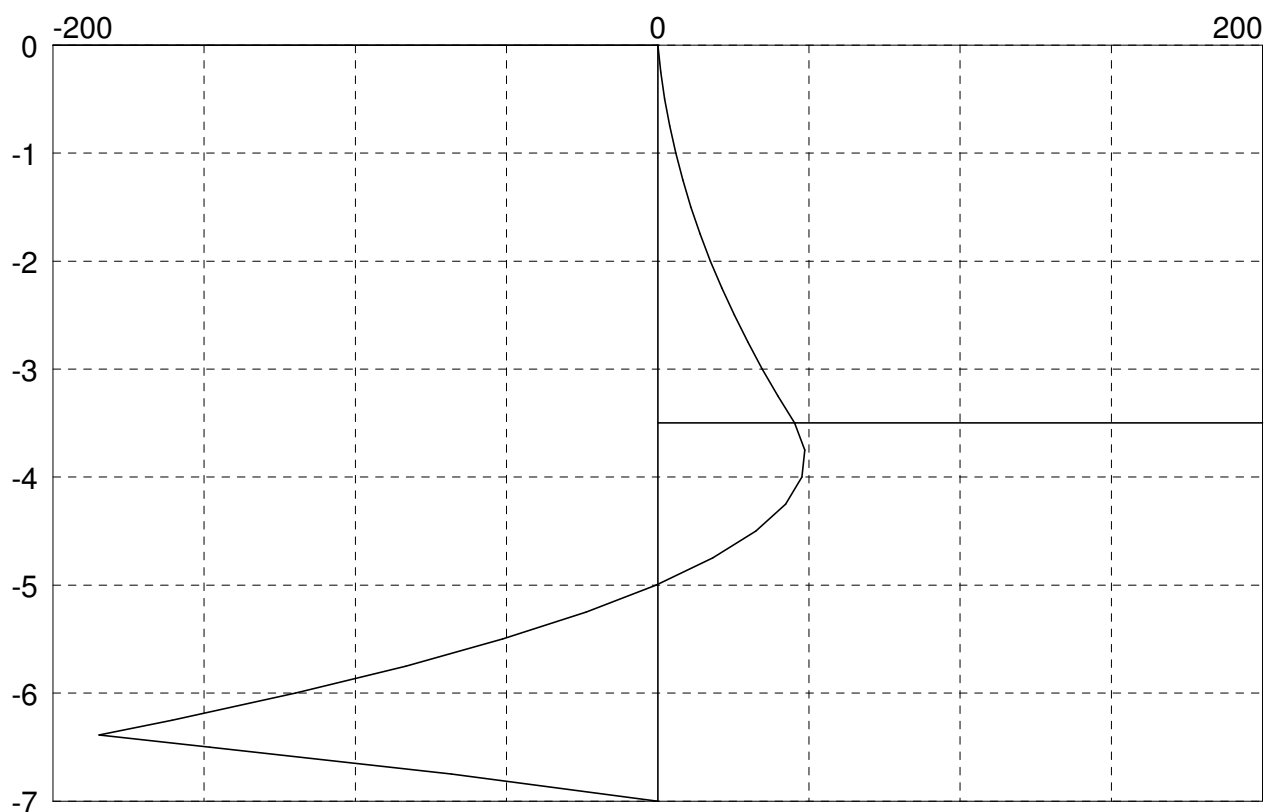
Graphical results from analysis of stage ref 2



Graphical results from analysis of stage ref 2 continued



Bending Moment Diagram (kNm/m)



Shear Force Diagram (kN/m)

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Structural design of wall

Wall section properties

Primary pile diameter	350 mm
Primary pile spacing	500 mm
Infill pile diameter	mm
Main rebar bar diameter	25 mm
Main rebar number of bars	10
Links/Helix bar diameter	12 mm
Links/Helix spacing/pitch	100 mm

Wall material properties

Concrete cube strength	35 N/mm ²
Concrete cover	75 mm
Main rebar steel grade	500 N/mm ²
Link rebar steel grade	500 N/mm ²
Ultimate load factor	1.20

Wall structural design checks

Check description	Required or Limit	Provided or Actual	Units
Max. ultimate moment BS8110, Ultimate resistance	67	114	kNm
Maximum longitudinal steel BS8110, Max 6% by area	5772	4908	mm ²
Minimum longitudinal steel BS8110, Min 0.4% by area	384	4908	mm ²
Maximum ultimate shear BS8110 Ultimate resistance	110	244	kN
Minimum link diameter BS8110, 6mm or 0.25x bar dia	6	12	mm
Max. link spacing/pitch BS8110, 12x main bar dia or 0.75d	152	100	mm
Minimum shear link area BS8110, Clause 3.4.5	332	2261	mm ² /m