

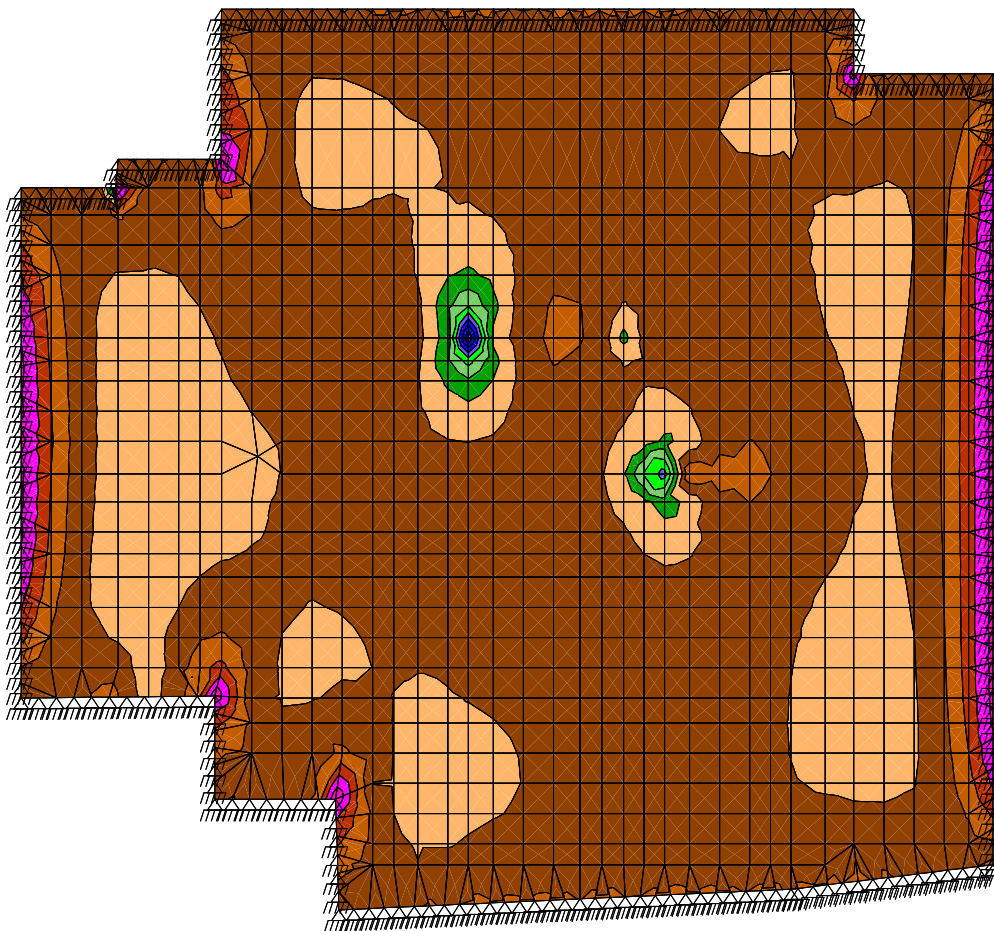
Job No	Description	Page:	35
8082	29 New End, London, NW3	Date:	March 2012
		By:	I. Tozluoglu
		Checked:	U. Mizrahi

11. FOUNDATION RAFT IN TEMPORARY CONDITION

11.1. Stress Values

Values shown below is for X Direction under ULS Combination

Stress Values : -6.78N/mm² to 3.71N/mm²

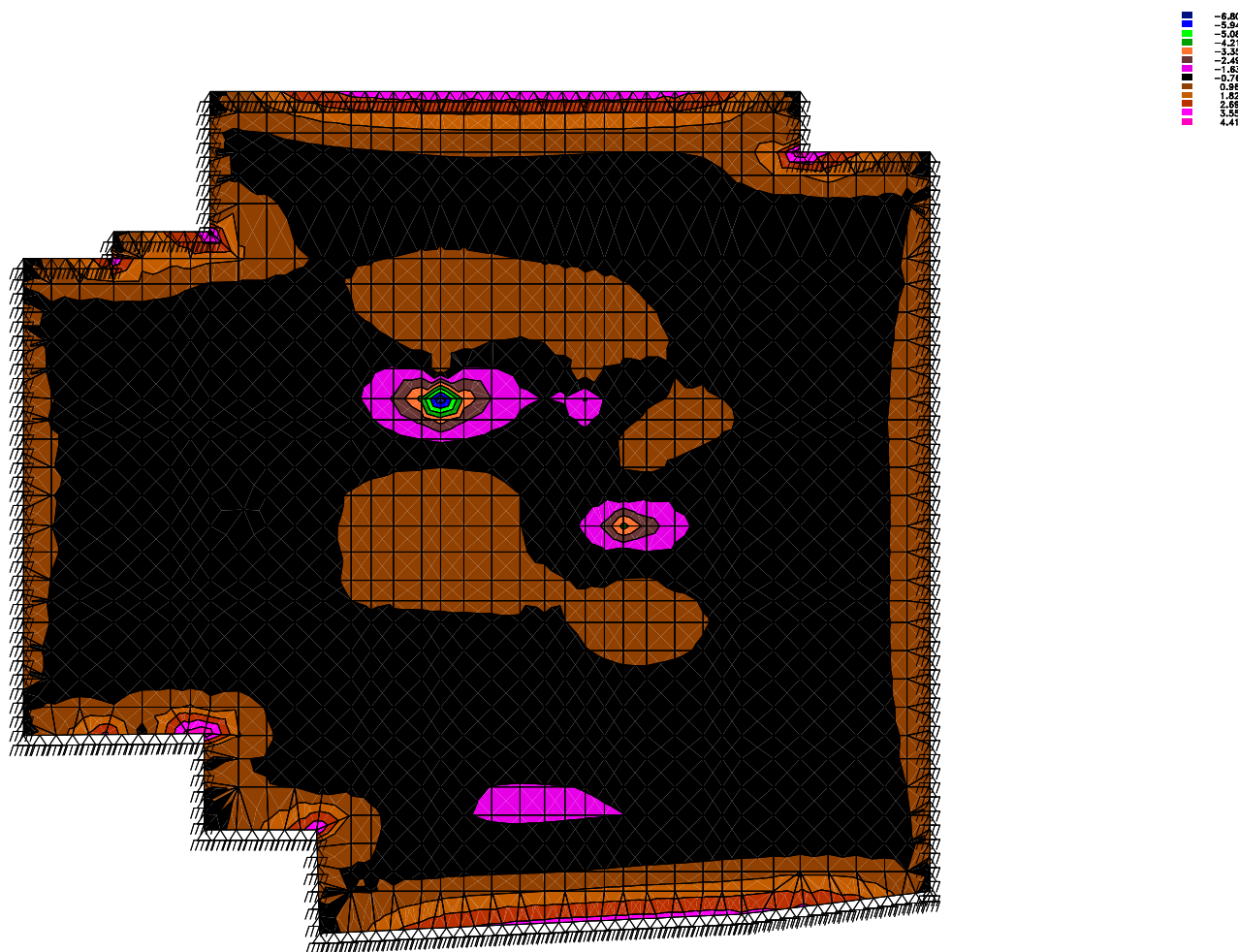


LINE	VALUE
1	-6.78
2	-5.97
3	-5.17
4	-4.36
5	-3.55
6	-2.75
7	-1.94
8	-1.13
9	0.48
10	1.28
11	2.10
12	2.90
13	3.71

Values shown here is for Y Direction under ULS Combination

Job No	Description	Page:	36
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		By:	I. Tozluoglu
		Checked:	U. Mizrahi

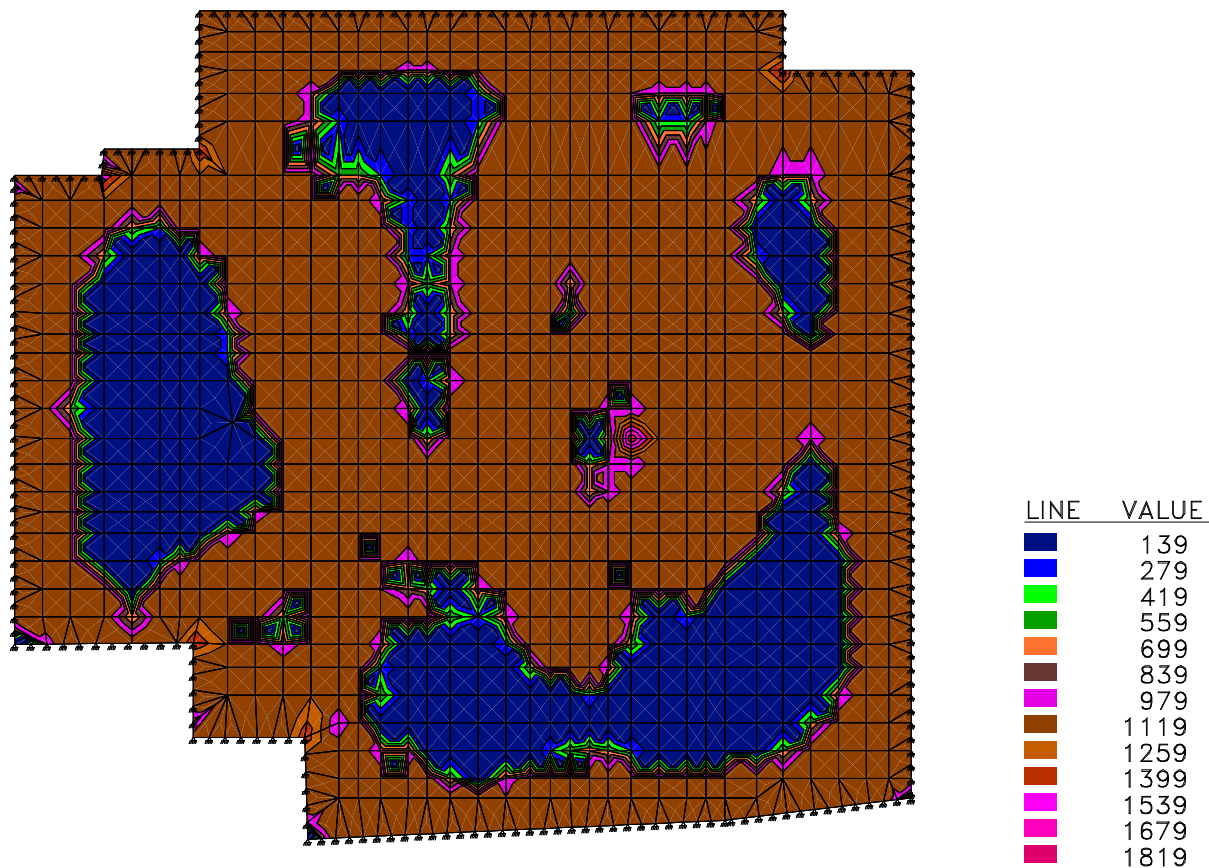
Stress values: - 6.80N/mm² to 4.41N/mm²



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8082	29 New End, London, NW3	Date:	March 2012
		By:	I. Tozluoglu
		Checked:	U. Mizrahi

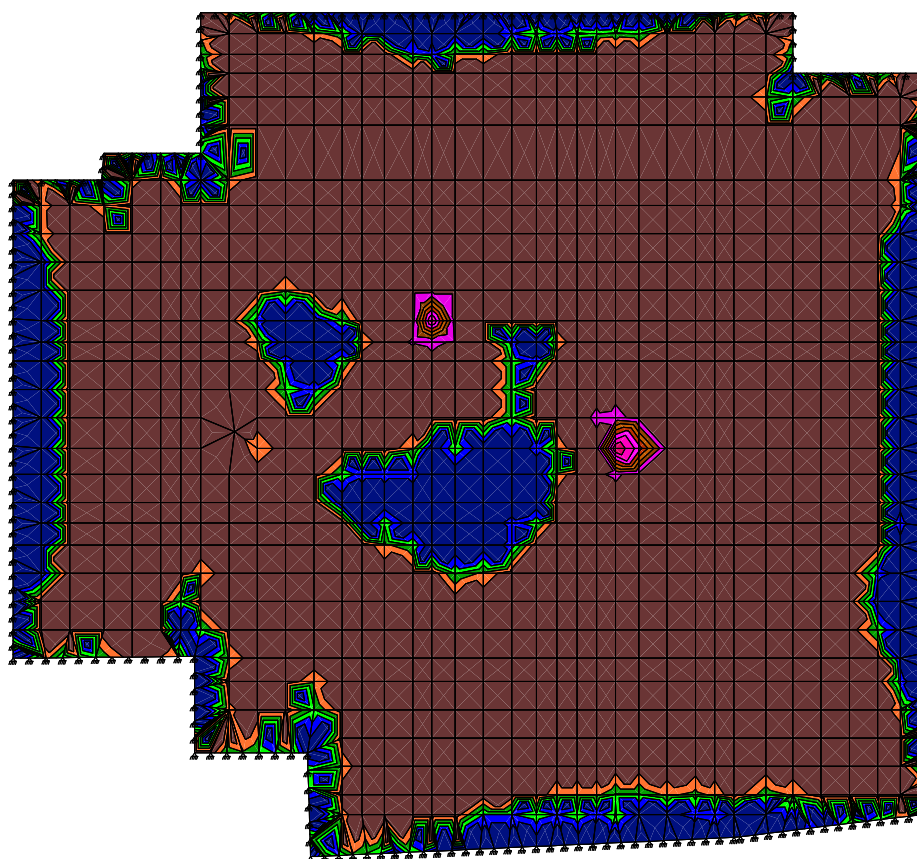
11.2. Check of Reinforcement Amounts for Buildability

X Direction Top Reinforcement



Job No	Description	Page:	38
8082	29 New End, London, NW3	Date:	March 2012
		By:	I. Tozluoglu
		Checked:	U. Mizrahi

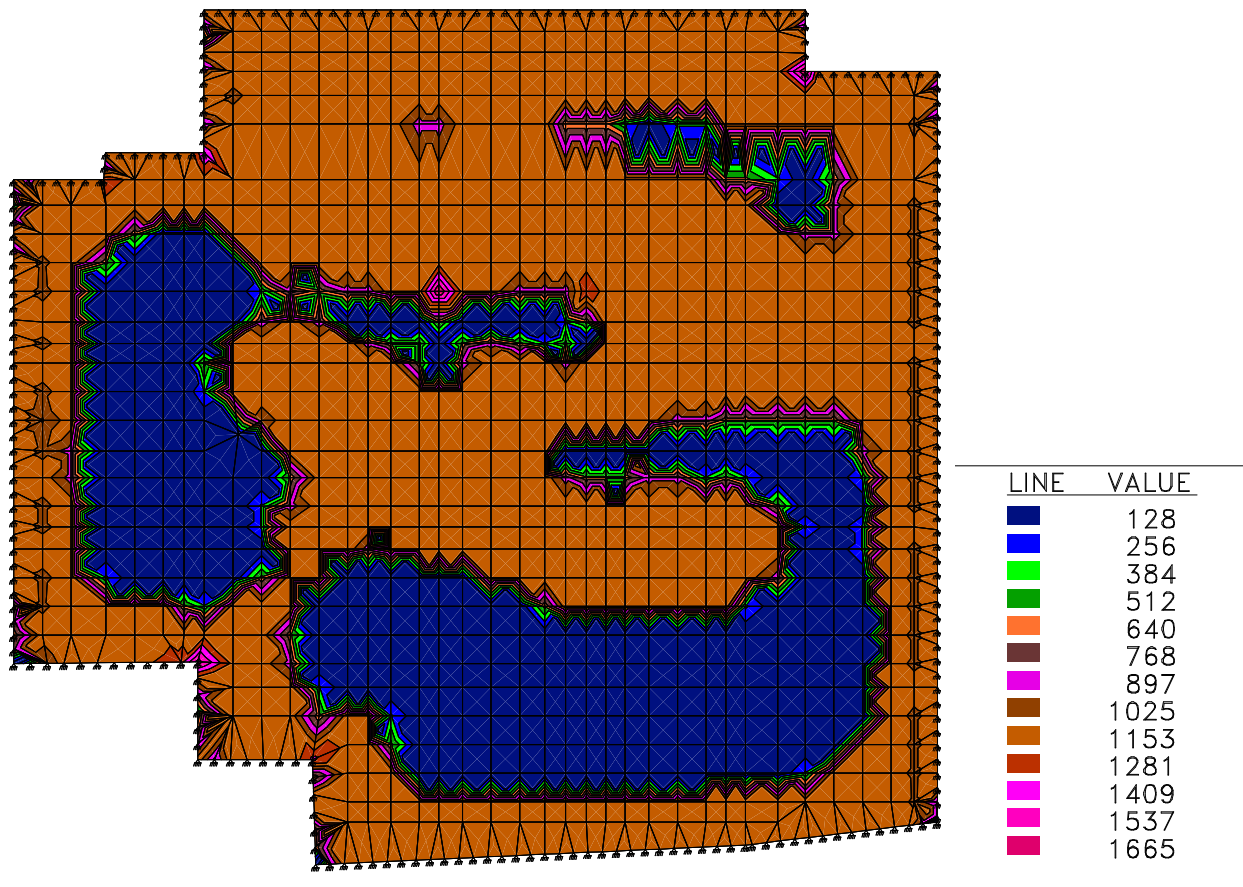
X Direction Bottom Reinforcement



LINE	VALUE
193	193
387	387
581	581
774	774
968	968
1162	1162
1356	1356
1549	1549
1743	1743
1937	1937
2130	2130
2324	2324
2518	2518

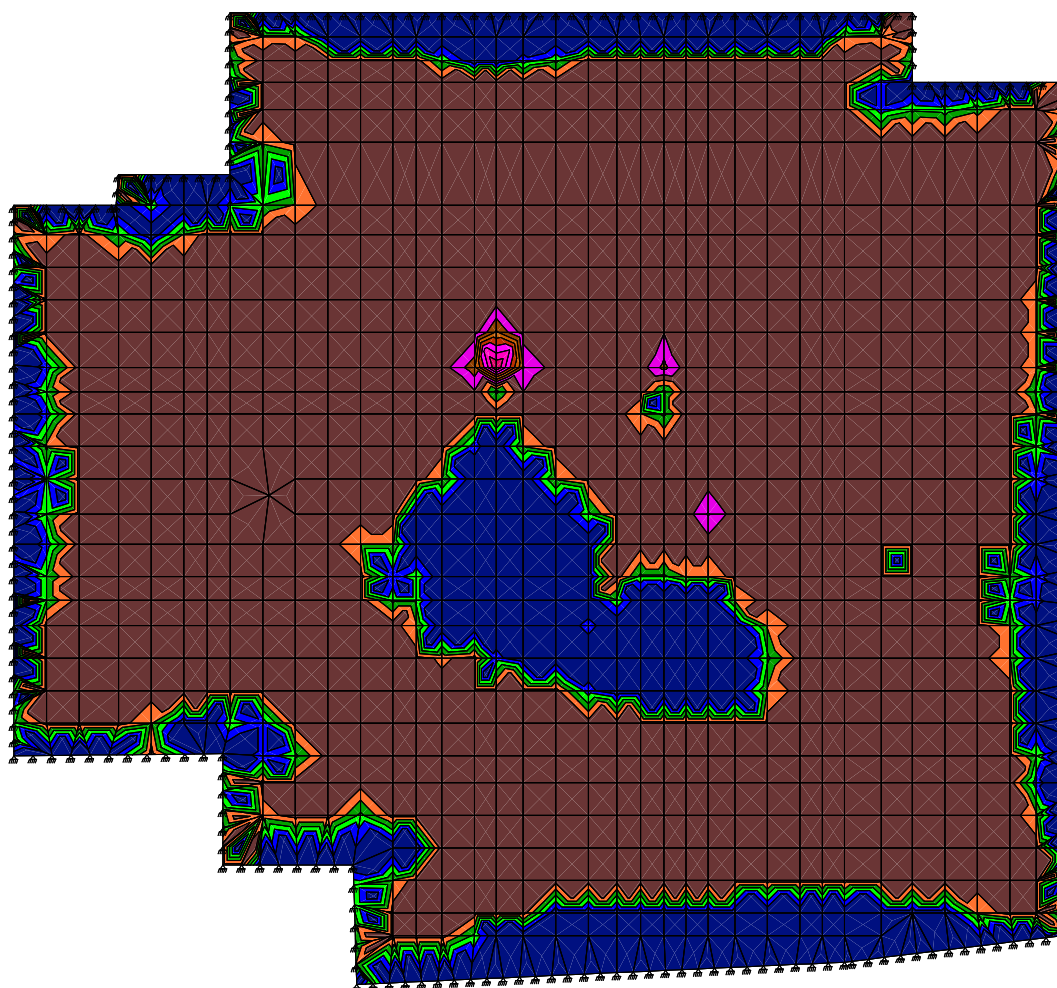
Job No	Description	Page:	39
8082	29 New End, London, NW3	Date:	March 2012
		By:	I. Tozluoglu
		Checked:	U. Mizrahi

Y Direction Top Reinforcement



Job No	Description	Page:	40
8082	29 New End, London, NW3	Date:	March 2012
		By:	I. Tozluoglu
		Checked:	U. Mizrahi

Y Direction Bottom Reinforcement



LINE	VALUE
202	202
405	405
607	607
810	810
1013	1013
1215	1215
1418	1418
1621	1621
1823	1823
2026	2026
2229	2229
2431	2431
2634	2634

Job No	Description	Page:	41
8082	29 New End, London, NW3	Date:	March 2012
		By:	I. Tozluoglu
		Checked:	U. Mizrahi



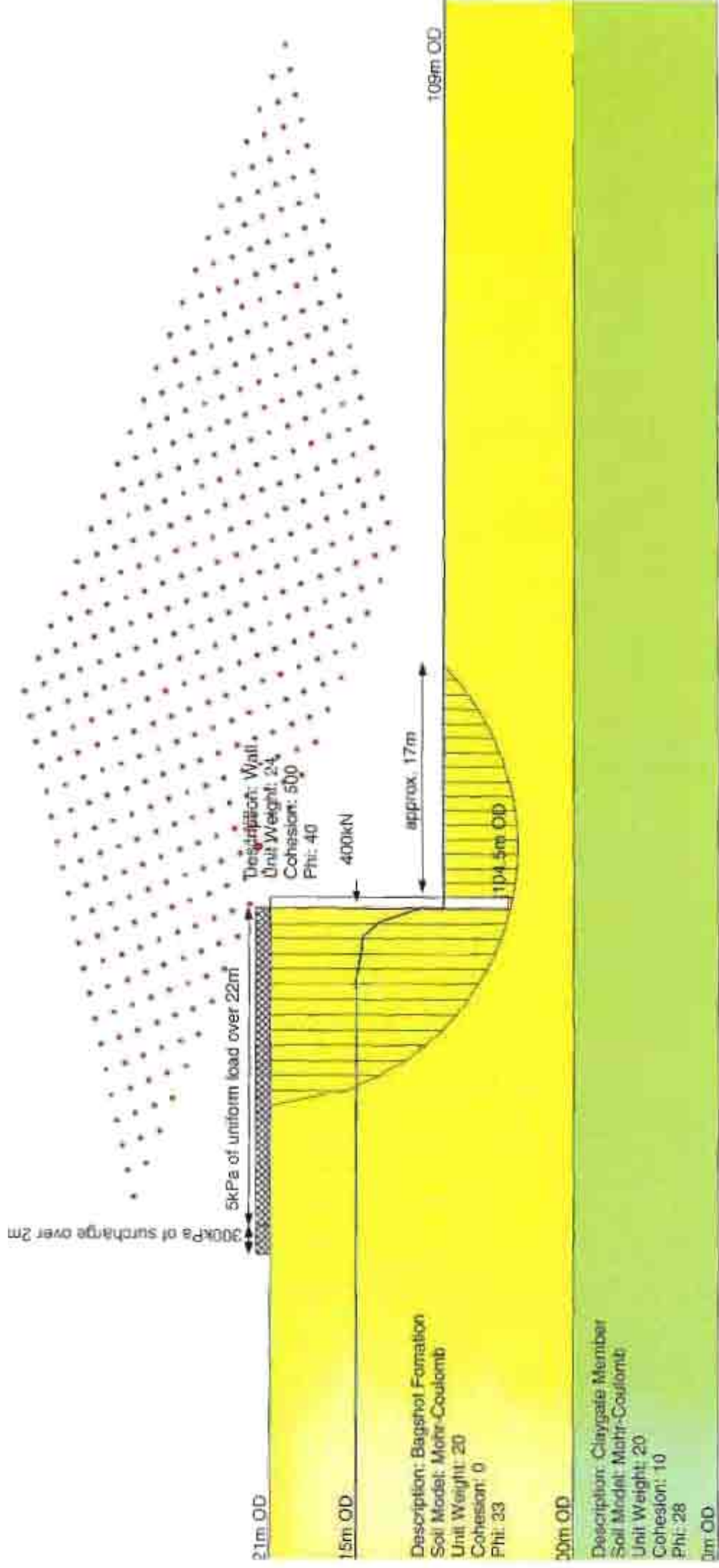
12. ANALYSIS RESULTS from the RETAINING WALL MODEL

PRELIMINARY RETAINING WALL ANALYSES AND SLOPE STABILITY CHECK

The attached calculations summarise the retaining wall analyses carried out by Dr Peter Bourne Webb and the stability check.

The stability check has been carried out using the program SLOPEW. The parameters, geometry and levels are summarised in the attached figure.

The retaining wall analyses carried out using the same conservative soil strength parameters and a K_0 value of 0.5 in the Bagshot Beds. The ground stiffnesses have been based on a lower bound N value of $N=15 + 1Z$ (where Z is the depth below the ground surface) and $E = 1.3N \text{ MN/m}^2$. The stiffness of the concrete in the wall was assumed to be 0.8 of the full E value reducing to 0.5 of the full value in the long term. This is in accordance with the recommendations in CIRIA C580.



SUMMARY OF PRELIMINARY RETAINING WALL ANALYSIS

The attached documents describe the analyses carried out using the program WALLAP to model the behaviour of the retaining wall at four sections designated as:

New End: The front of the site where external ground level is +113 mOD. In this analysis it has been assumed that the wall acts as a cantilever.

Lawn House: This section is taken through Lawn House with the weight of the house taken as a surcharge. The existing ground level is assumed to be +118.2mOD.

Lawn House Front Garden: This section is taken through the garden between the House and the Theatre. The initial ground level is at +118.2 mOD

Tennis Court: This section is taken through the rear wall of the site.

The figures at the rear of this attachment show the construction sequence assumed in the analyses.

The estimate wall deflections for the different sections are shown in the following figures. The deflected profiles are given for each stage of construction.

The input parameters and the assumed sequences are summarised in the output sheets to WALLAP which follow the profiles.

The maximum displacements and the structural loads are summarised below:

New End – summary of wall analyses

	Wall displ., mm		Wall forces		TP loads, kN/m			Slab loads, kN/m		
	$\delta_{H,113}$	$\delta_{H,118}$	M, kNm/m	V, kN/m	+118.5	+116.0	+112.5	+110.0	+113.5	+117.0
Lawn House	6	16	265	190	130	-	365	310	-	180
Tennis Ct	-	15	235	200	115	-	365	315	15	135
Garden	8	22	345	160	-	290	-	15	135	205
New End	-	10	70	65	-	-	60	115	20	-
	-	20	210	80	-	-	-	25	25	-

Wall deflection: m

-0.010 0.000 0.010 0.020 0.030 0.040 0.050

Elevation: m OD

118

117

116

115

114

113

112

111

110

109

108

107

106

105

104

Section thru New End boundary

- Stage 3 Excav. to elev. 112.00 on PASSIVE side
- Stage 4 Excav. to elev. 109.00 on PASSIVE side
- Stage 10 Long-term conditions

TAYLOR WHALLEY SPYRA
 Program: WALLAP Version 5.04 Revision A34.B48.R39
 Run ID. New End Bdry
 29 New End
 Section thru bdry with New End

Sheet No.
 Job No.
 Made by : PJBW
 Date:25-07-2011
 Checked :

Units: kN,m

INPUT DATA

SOIL PROFILE

Stratum no.	Elevation of top of stratum	Active side	Soil types	Passive side
1	113.50	1 Bagshot Beds		1 Bagshot Beds

SOIL PROPERTIES

No.	Soil type	Bulk density kN/m3	Young's Modulus Eh, kN/m2 (dEh/dy)	At rest coeff. Ko (dKo/dy)	Consol. state. NC/OC (Nu)	Active limit Ka (Kac)	Passive limit Kp (Kpc)	Cohesion kN/m2 (dc/dy)
1	Bagshot B.. (113.50)	20.00	20000 (1330)	0.500	OC (0.200)	0.248 (1.158)	5.773 (7.350)	0.0d

Additional soil parameters associated with Ka and Kp

No.	Soil type	parameters for Ka			parameters for Kp		
		Soil friction angle	Wall adhesion coeff.	Back-fill angle	Soil friction angle	Wall adhesion coeff.	Back-fill angle
1	Bagshot Beds	33.00	0.670	0.00	33.00	0.670	0.00

GROUND WATER CONDITIONS

Density of water = 10.00 kN/m3

	Active side	Passive side
Initial water table elevation	109.00	109.00

Automatic water pressure balancing at toe of wall : No

Water profile no.	Point no.	Active side			Passive side			
		Elev. m	Piezo elev. m	Water press. kN/m2	Point no.	Elev. m	Piezo elev. m	Water press. kN/m2
1	1	109.00	109.00	0.0	1	109.00	109.00	0.0
	2	113.00	113.00	0.0	1	109.00	109.00	0.0
2	1	109.00	109.00	0.0	2	109.00	113.00	40.0
	2	109.00	113.00	40.0				

WALL PROPERTIES

Elevation of toe of wall = 102.00
 Maximum finite element length = 0.60
 Youngs modulus of wall E = 2.4000E+07 kN/m2
 Moment of inertia of wall I = 8.4800E-03 m4/m run
 E.I = 203520 kN.m2/m run
 Yield Moment of wall = Not defined

STRUTS and ANCHORS

Strut/ anchor no.	Elev.	Strut spacing m	X-section area of strut sq.m	Youngs modulus kN/m2	Free length m	Inclin -ation (degs)	Pre-stress /strut kN	Tension allowed
1	112.50	1.00	0.060000	2.100E+08	20.00	0.00	0	No
2	109.85	1.00	0.400000	3.000E+07	20.00	0.00	0	No
3	113.25	1.00	0.400000	3.000E+07	20.00	0.00	0	No

SURCHARGE LOADS

Surcharge no.	Elev.	Distance from wall	Length parallel to wall	Width perpendicular to wall	Surcharge kN/m2		Equiv. soil type
					Near edge	Far edge	
1	113.50	0.00(A)	1000.00	1000.00	10.00	=	N/A
2	109.00	-0.00(P)	1000.00	20.00	22.00	=	N/A
3	109.00	-0.00(P)	1000.00	20.00	40.00	=	N/A

Note: A = Active side, P = Passive side

CONSTRUCTION STAGES

Construction stage no.	Stage description
1	Apply surcharge no.1 at elevation 113.50 No analysis at this stage
2	Change EI of wall to 203600 kN.m2/m run Yield moment not defined Reset wall displacements to zero at this stage
3	Excavate to elevation 112.00 on PASSIVE side Toe of berm at elevation 109.00 Width of top of berm = 1.00 Width of toe of berm = 7.00
4	Excavate to elevation 109.00 on PASSIVE side
5	Apply surcharge no.2 at elevation 109.00 No analysis at this stage
6	Install strut or anchor no.2 at elevation 109.85
7	Install strut or anchor no.3 at elevation 113.25
8	Change EI of wall to 145425 kN.m2/m run Yield moment not defined Allow wall to relax with new modulus value
9	Apply surcharge no.3 at elevation 109.00 No analysis at this stage
10	Apply water pressure profile no.2

FACTORS OF SAFETY and ANALYSIS OPTIONS

Type of structure - Retaining wall

Stability analysis:

Method of analysis - Strength Factor method

Factor on soil strength for calculating wall depth = 1.20

Factor on soil strength for calculating tie force = 1.00

Parameters for undrained strata:

Minimum equivalent fluid density = 5.00 kN/m3

Maximum depth of water filled tension crack = 0.00 m

Bending moment and displacement calculation:

Method - Subgrade reaction model using Influence Coefficients

Open Tension Crack analysis? - No

Non-linear Modulus Parameter (L) = 0 m

Boundary conditions:

Length of wall (normal to plane of analysis) = 1000.00 m

Width of excavation on active side of wall = 20.00 m

Width of excavation on passive side of wall = 20.00 m

Distance to rigid boundary on active side = 20.00 m

Distance to rigid boundary on passive side = 20.00 m

OUTPUT OPTIONS

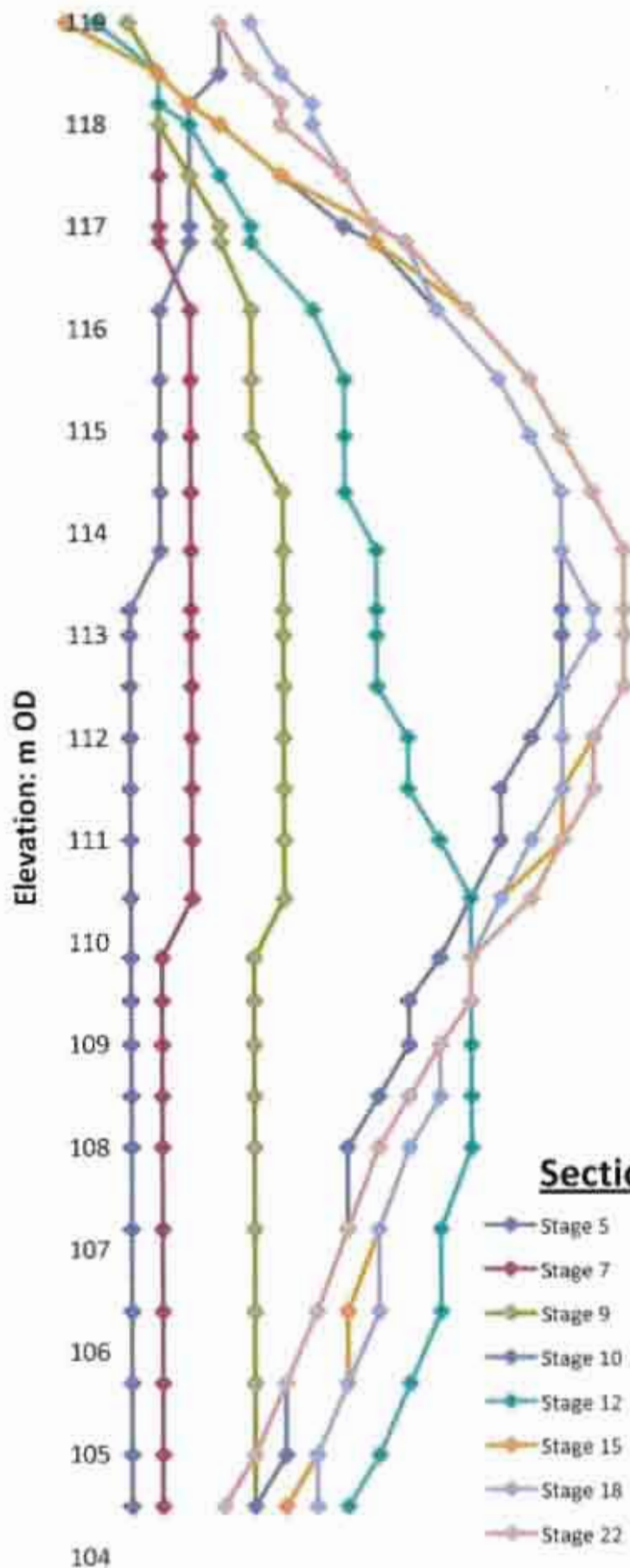
Results to be stored on disk? - Yes

Results to be output on the printer? - No

Stage no.	Stage description	Displacement Bending mom. Shear force	Active, Passive pressures	Graph. output
1	Apply surcharge no.1 at elev. 113.50	No	No	No
2	Change EI of wall to 203600kN.m2/m run	Yes	Yes	Yes
3	Excav. to elev. 112.00 on PASSIVE side	Yes	Yes	Yes
4	Excav. to elev. 109.00 on PASSIVE side	Yes	Yes	Yes
5	Apply surcharge no.2 at elev. 109.00	No	No	No
6	Install strut no.2 at elev. 109.85	Yes	Yes	Yes
7	Install strut no.3 at elev. 113.25	Yes	Yes	Yes
8	Change EI of wall to 145425kN.m2/m run	Yes	Yes	Yes
9	Apply surcharge no.3 at elev. 109.00	No	No	No
10	Apply water pressure profile no.2	No	No	No
*	Summary output	Yes	-	Yes

Wall deflection: m

-0.005 0.000 0.005 0.010 0.015 0.020



TAYLOR WHALLEY SPYRA
 Program: WALLAP Version 5.04 Revision A34.B48.R39
 Run ID: LawnHse01d
 29 New End
 Section thru Lawn House

Sheet No.
 Job No.
 Made by : PJBW
 Date: 25-07-2011
 Checked :

Units: kN,m

INPUT DATA

SOIL PROFILE

Stratum no.	Elevation of top of stratum	Active side	Soil types	Passive side
1	119.00	1 Bagshot Beds		1 Bagshot Beds

SOIL PROPERTIES

-- Soil type --	Bulk density	Young's Modulus	At rest coeff.	Consol state.	Active limit	Passive limit	Cohesion
No. Description (Datum elev.)	kN/m3	Eh, kN/m2 (dEh/dy)	Ko (dKo/dy)	NC/OC (Nu)	Ka (Kac)	Kp (Kpc)	kN/m2 (dc/dy)
1 Bagshot B.. (119.80)	20.00	20000 (1330)	0.500	OC (0.200)	0.248 (1.158)	5.773 (7.350)	0.0d

Additional soil parameters associated with Ka and Kp

No. Description	--- parameters for Ka ---			--- parameters for Kp ---		
	Soil friction angle	Wall adhesion coeff.	Back-fill angle	Soil friction angle	Wall adhesion coeff.	Back-fill angle
1 Bagshot Beds	33.00	0.670	0.00	33.00	0.670	0.00

GROUND WATER CONDITIONS

Density of water = 10.00 kN/m3

	Active side	Passive side
Initial water table elevation	113.00	113.00

Automatic water pressure balancing at toe of wall : No

Water profile no.	Active side				Passive side			
	Point no.	Elev. m	Piezo elev. m	Water press. kN/m2	Point no.	Elev. m	Piezo elev. m	Water press. kN/m2
1	1	111.00	111.00	0.0	1	109.00	109.00	0.0
2	1	113.00	113.00	0.0	1	109.00	109.00	0.0
					2	109.00	113.00	40.0

WALL PROPERTIES

Elevation of toe of wall = 104.50
 Maximum finite element length = 0.80
 Youngs modulus of wall E = 2.4000E+07 kN/m2
 Moment of inertia of wall I = 8.4800E-03 m4/m run
 E.I = 203520 kN.m2/m run
 Yield Moment of wall = Not defined

STRUTS and ANCHORS

Strut/ anchor no.	Elev.	Strut spacing m	X-section area of strut sq.m	Youngs modulus kN/m2	Free length m	Inclin -ation (degs)	Pre-stress /strut kN	Tension allowed
1	118.50	1.00	0.060000	2.100E+08	20.00	0.00	30.00	No
2	116.00	1.00	0.060000	2.100E+08	20.00	0.00	100.0	No
3	112.50	1.00	0.060000	2.100E+08	20.00	0.00	200.0	No
4	109.85	1.00	0.400000	3.000E+07	20.00	0.00	0	No
5	113.25	1.00	0.400000	3.000E+07	20.00	0.00	0	No
6	116.85	1.00	0.400000	3.000E+07	20.00	0.00	0	No
7	120.35	1.00	0.400000	3.000E+07	20.00	0.00	0	No

SURCHARGE LOADS

Surcharge no.	Elev.	Distance	Length	Width	Surcharge		Equiv. soil type
		from wall	parallel to wall	perpend. to wall	----- Near edge	----- Far edge	
1	118.20	1.00(A)	1000.00	1000.00	10.00	=	N/A
2	118.20	0.00(A)	1000.00	1.00	150.00	=	N/A
3	109.00	-0.00(P)	1000.00	20.00	22.00	=	N/A
4	109.00	-0.00(P)	1000.00	20.00	40.00	=	N/A

Note: A = Active side, P = Passive side

CONSTRUCTION STAGES

Construction stage no.	Stage description
1	Excavate to elevation 118.20 on ACTIVE side
2	Apply surcharge no.1 at elevation 118.20 No analysis at this stage
3	Apply surcharge no.2 at elevation 118.20
4	Change EI of wall to 203600 kN.m2/m run Yield moment not defined Reset wall displacements to zero at this stage
5	Excavate to elevation 118.00 on PASSIVE side
6	Install strut or anchor no.1 at elevation 118.50
7	Excavate to elevation 117.00 on PASSIVE side
8	Apply water pressure profile no.1 No analysis at this stage
9	Excavate to elevation 115.50 on PASSIVE side Toe of berm at elevation 109.00 Width of top of berm = 2.00 Width of toe of berm = 12.00
10	Excavate to elevation 112.00 on PASSIVE side Toe of berm at elevation 109.00 Width of top of berm = 7.50 Width of toe of berm = 12.00
11	Install strut or anchor no.3 at elevation 112.50
12	Excavate to elevation 109.00 on PASSIVE side
13	Apply surcharge no.3 at elevation 109.00 No analysis at this stage
14	Install strut or anchor no.4 at elevation 109.85
15	Remove strut or anchor no.3 at elevation 112.50
16	Install strut or anchor no.5 at elevation 113.25
17	Install strut or anchor no.6 at elevation 116.85
18	Remove strut or anchor no.1 at elevation 118.50
19	Install strut or anchor no.7 at elevation 120.35
20	Change EI of wall to 145425 kN.m2/m run Yield moment not defined Allow wall to relax with new modulus value
21	Apply surcharge no.4 at elevation 109.00 No analysis at this stage
22	Apply water pressure profile no.2

FACTORS OF SAFETY and ANALYSIS OPTIONS

Type of structure - Retaining wall

Stability analysis:

Method of analysis - Strength Factor method

Factor on soil strength for calculating wall depth = 1.20

Factor on soil strength for calculating tie force = 1.00

Parameters for undrained strata:

Minimum equivalent fluid density = 5.00 kN/m3

Maximum depth of water filled tension crack = 0.00 m

Bending moment and displacement calculation:

Method - Subgrade reaction model using Influence Coefficients

Open Tension Crack analysis? - No

Non-linear Modulus Parameter (L) = 0 m

Boundary conditions:

Length of wall (normal to plane of analysis) = 1000.00 m

Width of excavation on active side of wall = 20.00 m

Width of excavation on passive side of wall = 20.00 m

Distance to rigid boundary on active side = 20.00 m
Distance to rigid boundary on passive side = 20.00 m

OUTPUT OPTIONS

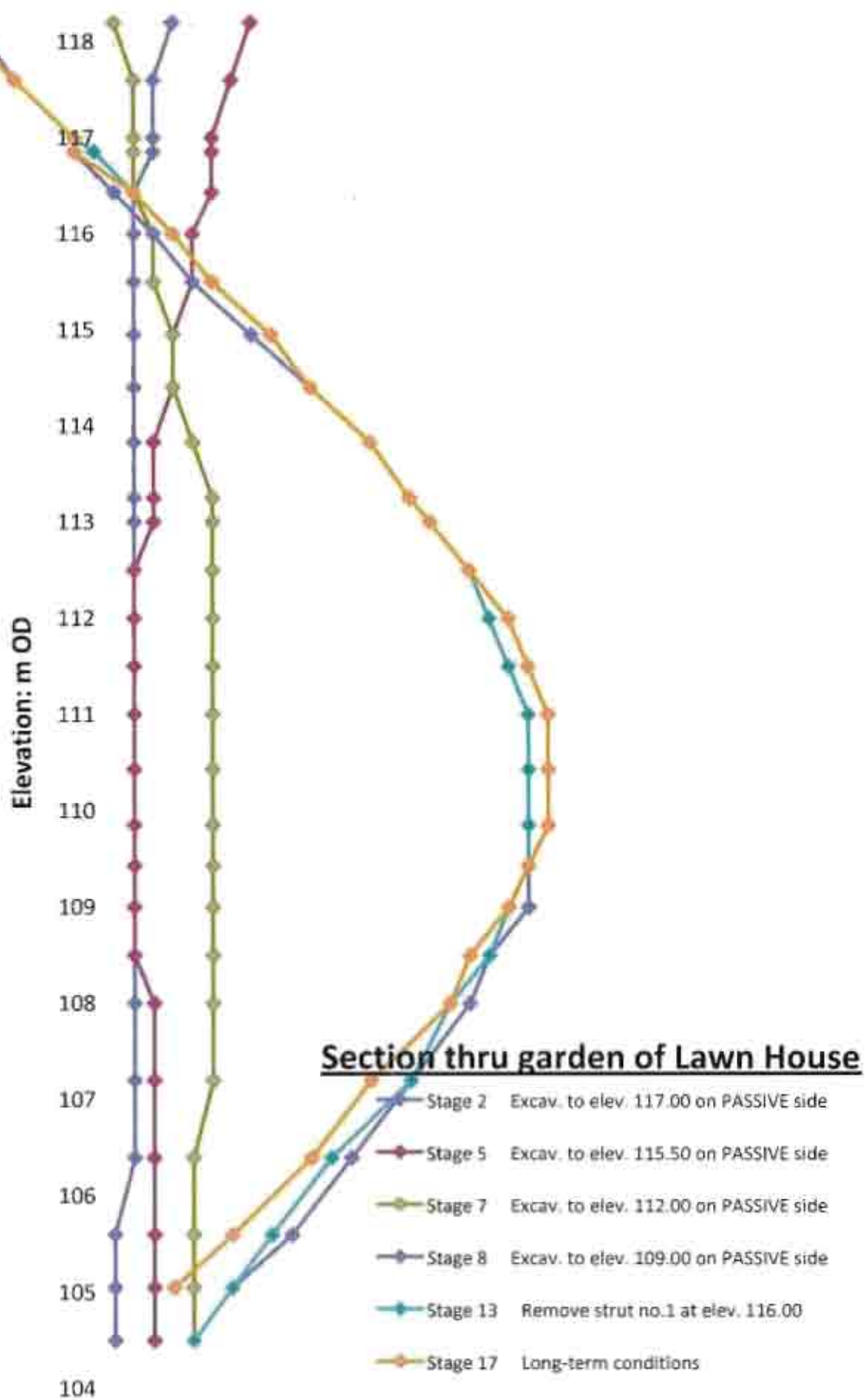
Results to be stored on disk? - Yes
Results to be output on the printer? - No

Stage no.	Stage description	Displacement Bending mom. Shear force	Active, Passive pressures	Graph. output
1	Excav. to elev. 118.20 on ACTIVE side	No	No	No
2	Apply surcharge no.1 at elev. 118.20	No	No	No
3	Apply surcharge no.2 at elev. 118.20	No	No	No
4	Change EI of wall to 203600kN.m2/m run	No	No	No
5	Excav. to elev. 118.00 on PASSIVE side	Yes	Yes	Yes
6	Install strut no.1 at elev. 118.50	No	No	No
7	Excav. to elev. 117.00 on PASSIVE side	Yes	Yes	Yes
8	Apply water pressure profile no.1	No	No	No
9	Excav. to elev. 115.50 on PASSIVE side	Yes	Yes	Yes
10	Excav. to elev. 112.00 on PASSIVE side	Yes	Yes	Yes
11	Install strut no.3 at elev. 112.50	No	No	No
12	Excav. to elev. 109.00 on PASSIVE side	Yes	Yes	Yes
13	Apply surcharge no.3 at elev. 109.00	No	No	No
14	Install strut no.4 at elev. 109.85	Yes	Yes	Yes
15	Remove strut no.3 at elev. 112.50	Yes	Yes	Yes
16	Install strut no.5 at elev. 113.25	Yes	Yes	Yes
17	Install strut no.6 at elev. 116.85	Yes	Yes	Yes
18	Remove strut no.1 at elev. 118.50	Yes	Yes	Yes
19	Install strut no.7 at elev. 120.35	Yes	Yes	Yes
20	Change EI of wall to 145425kN.m2/m run	Yes	Yes	Yes
21	Apply surcharge no.4 at elev. 109.00	No	No	No
22	Apply water pressure profile no.2	No	No	No
*	Summary output	Yes	-	Yes

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69 Rodenhurst Road, London SW4, UK. Tel: +44 20 8674 7251

Wall deflection: m

-0.010 -0.005 0.000 0.005 0.010 0.015 0.020 0.025



TAYLOR WHALLEY SPYRA
 Program: WALLAP Version 5.04 Revision A34.B48.R39
 Run ID: LawnHse_gardn01d
 29 New End
 Section thru front garden of Lawn Hse

Sheet No.
 Job No.
 Made by : PJBW
 Date: 25-07-2011
 Checked :

Units: kN,m

INPUT DATA

SOIL PROFILE

Stratum no.	Elevation of top of stratum	Active side	Soil types	Passive side
1	118.20	1 Bagshot Beds		1 Bagshot Beds

SOIL PROPERTIES

-- Soil type --	Bulk density	Young's Modulus	At rest coeff.	Consol state.	Active limit	Passive limit	Cohesion
No. Description (Datum elev.)	kN/m3	Eh, kN/m2 (dEh/dy)	Ko (dKo/dy)	NC/OC (Nu)	Ka (Kac)	Kp (Kpc)	kN/m2 (dc/dy)
1 Bagshot B.. (119.80)	20.00	20000 (1330)	0.500	OC (0.200)	0.248 (1.158)	5.773 (7.350)	0.0d

Additional soil parameters associated with Ka and Kp

Soil type		parameters for Ka			parameters for Kp		
No. Description	friction angle	Soil friction	Wall adhesion coeff.	Back-fill angle	Soil friction angle	Wall adhesion coeff.	Back-fill angle
1 Bagshot Beds	33.00		0.670	0.00	33.00	0.670	0.00

GROUND WATER CONDITIONS

Density of water = 10.00 kN/m3

	Active side	Passive side
Initial water table elevation	113.00	113.00

Automatic water pressure balancing at toe of wall : No

Active side					Passive side			
Water profile no.	Point no.	Elev. m	Piezo elev. m	Water press. kN/m2	Point no.	Elev. m	Piezo elev. m	Water press. kN/m2
	1	111.00	111.00	0.0	1	109.00	109.00	0.0
	2	113.00	113.00	0.0	1	109.00	109.00	0.0
					2	109.00	113.00	40.0

WALL PROPERTIES

Elevation of toe of wall = 104.50
 Maximum finite element length = 0.80
 Youngs modulus of wall E = 2.4000E+07 kN/m2
 Moment of inertia of wall I = 8.4800E-03 m4/m run
 E.I = 203520 kN.m2/m run
 Yield Moment of wall = Not defined

STRUTS and ANCHORS

Strut/ anchor no.	Elev.	Strut spacing m	X-section area of strut sq.m	Youngs modulus kN/m2	Free length m	Inclin -ation (degs)	Pre-stress /strut kN	Tension allowed
1	116.00	1.00	0.060000	2.100E+08	20.00	0.00	75.00	No
2	114.50	1.00	0.060000	2.100E+08	20.00	0.00	100.0	No
3	112.50	1.00	0.060000	2.100E+08	20.00	0.00	200.0	No
4	109.85	1.00	0.400000	3.000E+07	20.00	0.00	0	No
5	113.25	1.00	0.400000	3.000E+07	20.00	0.00	0	No
6	116.85	1.00	0.400000	3.000E+07	20.00	0.00	0	No
7	120.35	1.00	0.400000	3.000E+07	20.00	0.00	0	No

SURCHARGE LOADS

Surcharge no.	Elev.	Distance	Length	Width	Surcharge		Equiv. soil type
		from wall	parallel to wall	perpend. to wall	----- Near edge	----- Far edge	
1	118.20	0.00(A)	1000.00	1000.00	10.00	=	N/A
2	118.20	0.00(A)	1000.00	1.00	150.00	=	N/A
3	109.00	-0.00(P)	1000.00	20.00	22.00	=	N/A
4	109.00	-0.00(P)	1000.00	20.00	40.00	=	N/A

Note: A = Active side, P = Passive side

CONSTRUCTION STAGES

Construction stage no.	Stage description
1	Apply surcharge no.1 at elevation 118.20 No analysis at this stage
2	Excavate to elevation 117.00 on PASSIVE side
3	Change EI of wall to 203600 kN.m2/m run Yield moment not defined Reset wall displacements to zero at this stage
4	Apply water pressure profile no.1
5	Excavate to elevation 115.50 on PASSIVE side Toe of berm at elevation 109.00 Width of top of berm = 2.00 Width of toe of berm = 12.00
6	Install strut or anchor no.1 at elevation 116.00
7	Excavate to elevation 112.00 on PASSIVE side Toe of berm at elevation 109.00 Width of top of berm = 7.50 Width of toe of berm = 12.00
8	Excavate to elevation 109.00 on PASSIVE side
9	Apply surcharge no.3 at elevation 109.00 No analysis at this stage
10	Install strut or anchor no.4 at elevation 109.85
11	Install strut or anchor no.5 at elevation 113.25
12	Install strut or anchor no.6 at elevation 116.85
13	Remove strut or anchor no.1 at elevation 116.00
14	Install strut or anchor no.7 at elevation 120.35
15	Change EI of wall to 145425 kN.m2/m run Yield moment not defined Allow wall to relax with new modulus value
16	Apply surcharge no.4 at elevation 109.00 No analysis at this stage
17	Apply water pressure profile no.2

FACTORS OF SAFETY and ANALYSIS OPTIONS

Type of structure - Retaining wall

Stability analysis:

Method of analysis - Strength Factor method

Factor on soil strength for calculating wall depth = 1.20

Factor on soil strength for calculating tie force = 1.00

Parameters for undrained strata:

Minimum equivalent fluid density = 5.00 kN/m3

Maximum depth of water filled tension crack = 0.00 m

Bending moment and displacement calculation:

Method - Subgrade reaction model using Influence Coefficients

Open Tension Crack analysis? - No

Non-linear Modulus Parameter (L) = 0 m

Boundary conditions:

Length of wall (normal to plane of analysis) = 1000.00 m

Width of excavation on active side of wall = 20.00 m

Width of excavation on passive side of wall = 20.00 m

Distance to rigid boundary on active side = 20.00 m

Distance to rigid boundary on passive side = 20.00 m

OUTPUT OPTIONS

Results to be stored on disk? - Yes

Results to be output on the printer? - No

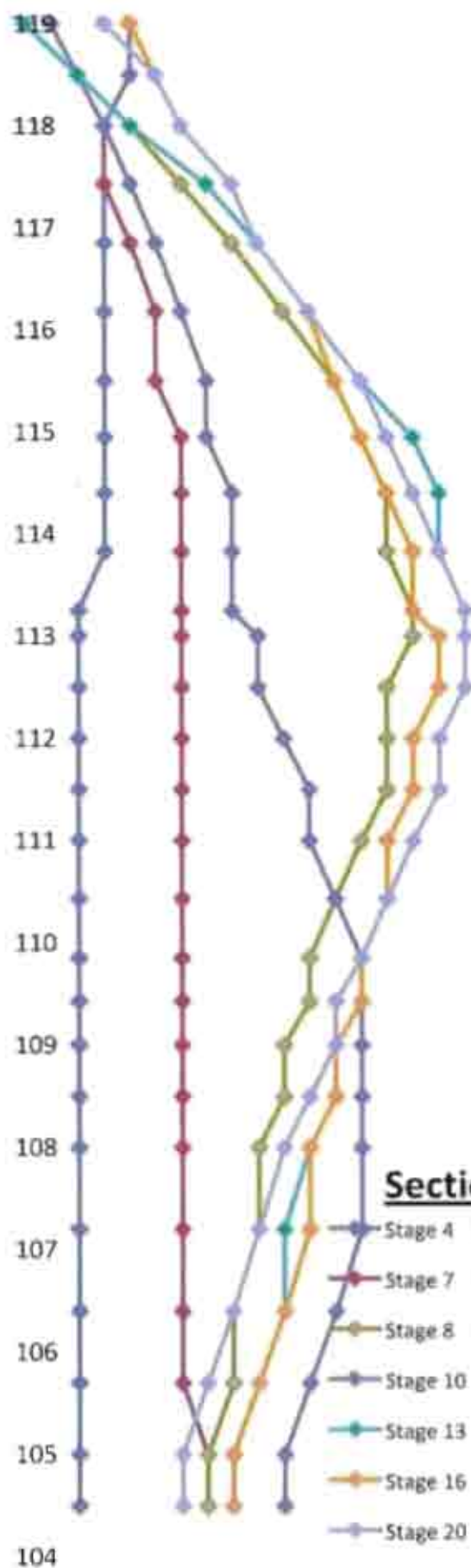
Stage no.	Stage description	Displacement Bending mom. Shear force	Active, Passive pressures	Graph. output
1	Apply surcharge no.1 at elev. 118.20	No	No	No
2	Excav. to elev. 117.00 on PASSIVE side	Yes	Yes	Yes
3	Change EI of wall to 203600kN.m2/m run	Yes	Yes	Yes
4	Apply water pressure profile no.1	Yes	Yes	Yes
5	Excav. to elev. 115.50 on PASSIVE side	Yes	Yes	Yes
6	Install strut no.1 at elev. 116.00	Yes	Yes	Yes
7	Excav. to elev. 112.00 on PASSIVE side	Yes	Yes	Yes
8	Excav. to elev. 109.00 on PASSIVE side	Yes	Yes	Yes
9	Apply surcharge no.3 at elev. 109.00	No	No	No
10	Install strut no.4 at elev. 109.85	Yes	Yes	Yes
11	Install strut no.5 at elev. 113.25	Yes	Yes	Yes
12	Install strut no.6 at elev. 116.85	Yes	Yes	Yes
13	Remove strut no.1 at elev. 116.00	Yes	Yes	Yes
14	Install strut no.7 at elev. 120.35	Yes	Yes	Yes
15	Change EI of wall to 145425kN.m2/m run	Yes	Yes	Yes
16	Apply surcharge no.4 at elev. 109.00	No	No	No
17	Apply water pressure profile no.2	No	No	No
*	Summary output	Yes	-	Yes

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Wall deflection: m

-0.010 -0.005 0.000 0.005 0.010 0.015 0.020

Elevation: m OD



Section thru Tennis Court

- Stage 4 Excav. to elev. 118.00 on PASSIVE side
- Stage 7 Excav. to elev. 115.50 on PASSIVE side
- Stage 8 Excav. to elev. 112.00 on PASSIVE side
- Stage 10 Excav. to elev. 109.00 on PASSIVE side
- Stage 13 Remove strut no.3 at elev. 112.50
- Stage 16 Remove strut no.1 at elev. 118.50
- Stage 20 Long-term conditions

TAYLOR WHALLEY SPYRA
 Program: WALLAP Version 5.04 Revision A34.B48.R39
 Run ID: TennisCt02
 29 New End
 Section thru Tennis Court

Sheet No.
 Job No.
 Made by : PJBW
 Date:25-07-2011
 Checked :

Units: kN,m

INPUT DATA

SOIL PROFILE

Stratum no.	Elevation of top of stratum	Active side	Soil types	Passive side
1	119.00	1 Bagshot Beds		1 Bagshot Beds

SOIL PROPERTIES

-- Soil type --	Bulk density	Young's Modulus	At rest coeff.	Consol state.	Active limit	Passive limit	Cohesion
No. Description (Datum elev.)	kN/m3	Eh, kN/m2 (dEh/dy)	Ko (dKo/dy)	NC/OC (Nu)	Ka (Kac)	Kp (Kpc)	kN/m2 (dc/dy)
1 Bagshot B.. (119.80)	20.00	20000 (1330)	0.500	OC (0.200)	0.248 (1.158)	5.773 (7.350)	0.0d

Additional soil parameters associated with Ka and Kp

--- parameters for Ka ---				--- parameters for Kp ---		
Soil	Wall	Back-	Soil	Wall	Back-	
friction	adhesion	fill	friction	adhesion	fill	
angle	coeff.	angle	angle	coeff.	angle	
1 Bagshot Beds	33.00	0.670	0.00	33.00	0.670	0.00

GROUND WATER CONDITIONS

Density of water = 10.00 kN/m3

	Active side	Passive side
Initial water table elevation	113.00	113.00

Automatic water pressure balancing at toe of wall : No

Active side					Passive side			
Water press.	Point no.	Elev. m	Piezo elev. m	Water press. kN/m2	Point no.	Elev. m	Piezo elev. m	Water press. kN/m2
1	1	111.00	111.00	0.0	1	109.00	109.00	0.0
2	1	113.00	113.00	0.0	1	109.00	109.00	0.0
					2	109.00	113.00	40.0

WALL PROPERTIES

Elevation of toe of wall = 104.50
 Maximum finite element length = 0.80
 Youngs modulus of wall E = 2.4000E+07 kN/m2
 Moment of inertia of wall I = 8.4800E-03 m4/m run
 E.I = 203520 kN.m2/m run
 Yield Moment of wall = Not defined

STRUTS and ANCHORS

Strut/ anchor no.	Elev.	Strut spacing m	X-section area of strut sq.m	Youngs modulus kN/m2	Free length m	Inclin -ation (degs)	Pre-stress /strut kN	Tension allowed
1	118.50	1.00	0.060000	2.100E+08	20.00	0.00	30.00	No
2	116.00	1.00	0.060000	2.100E+08	20.00	0.00	100.0	No
3	112.50	1.00	0.060000	2.100E+08	20.00	0.00	200.0	No
4	109.85	1.00	0.400000	3.000E+07	20.00	0.00	0	No
5	113.25	1.00	0.400000	3.000E+07	20.00	0.00	0	No
6	116.85	1.00	0.400000	3.000E+07	20.00	0.00	0	No
7	120.35	1.00	0.400000	3.000E+07	20.00	0.00	0	No

SURCHARGE LOADS

Surcharge no.	Elev.	Distance	Length	Width	Surcharge		Equiv. soil type
		from wall	parallel to wall	perpend. to wall	----- Near edge	----- Far edge	
1	119.00	1.50(A)	1000.00	1000.00	40.00	=	N/A
2	119.00	0.00(A)	1000.00	1.50	15.00	=	N/A
3	109.00	-0.00(P)	1000.00	20.00	22.00	=	N/A
4	109.00	-0.00(P)	1000.00	20.00	40.00	=	N/A

Note: A = Active side, P = Passive side

CONSTRUCTION STAGES

Construction stage no.	Stage description
1	Apply surcharge no.1 at elevation 119.00 No analysis at this stage
2	Apply surcharge no.2 at elevation 119.00
3	Change EI of wall to 203600 kN.m2/m run Yield moment not defined Reset wall displacements to zero at this stage
4	Excavate to elevation 118.00 on PASSIVE side
5	Install strut or anchor no.1 at elevation 118.50
6	Apply water pressure profile no.1 No analysis at this stage
7	Excavate to elevation 115.50 on PASSIVE side Toe of berm at elevation 109.00 Width of top of berm = 2.00 Width of toe of berm = 12.00
8	Excavate to elevation 112.00 on PASSIVE side Toe of berm at elevation 109.00 Width of top of berm = 7.50 Width of toe of berm = 12.00
9	Install strut or anchor no.3 at elevation 112.50
10	Excavate to elevation 109.00 on PASSIVE side
11	Apply surcharge no.3 at elevation 109.00 No analysis at this stage
12	Install strut or anchor no.4 at elevation 109.85
13	Remove strut or anchor no.3 at elevation 112.50
14	Install strut or anchor no.5 at elevation 113.25
15	Install strut or anchor no.6 at elevation 116.85
16	Remove strut or anchor no.1 at elevation 118.50
17	Install strut or anchor no.7 at elevation 120.35
18	Change EI of wall to 145425 kN.m2/m run Yield moment not defined Allow wall to relax with new modulus value
19	Apply surcharge no.4 at elevation 109.00 No analysis at this stage
20	Apply water pressure profile no.2

FACTORS OF SAFETY and ANALYSIS OPTIONS

Type of structure - Retaining wall

Stability analysis:

Method of analysis - Strength Factor method

Factor on soil strength for calculating wall depth = 1.20

Factor on soil strength for calculating tie force = 1.00

Parameters for undrained strata:

Minimum equivalent fluid density = 5.00 kN/m3

Maximum depth of water filled tension crack = 0.00 m

Bending moment and displacement calculation:

Method - Subgrade reaction model using Influence Coefficients

Open Tension Crack analysis? - No

Non-linear Modulus Parameter (L) = 0 m

Boundary conditions:

Length of wall (normal to plane of analysis) = 1000.00 m

Width of excavation on active side of wall = 20.00 m

Width of excavation on passive side of wall = 20.00 m

Distance to rigid boundary on active side = 20.00 m

Distance to rigid boundary on passive side = 20.00 m

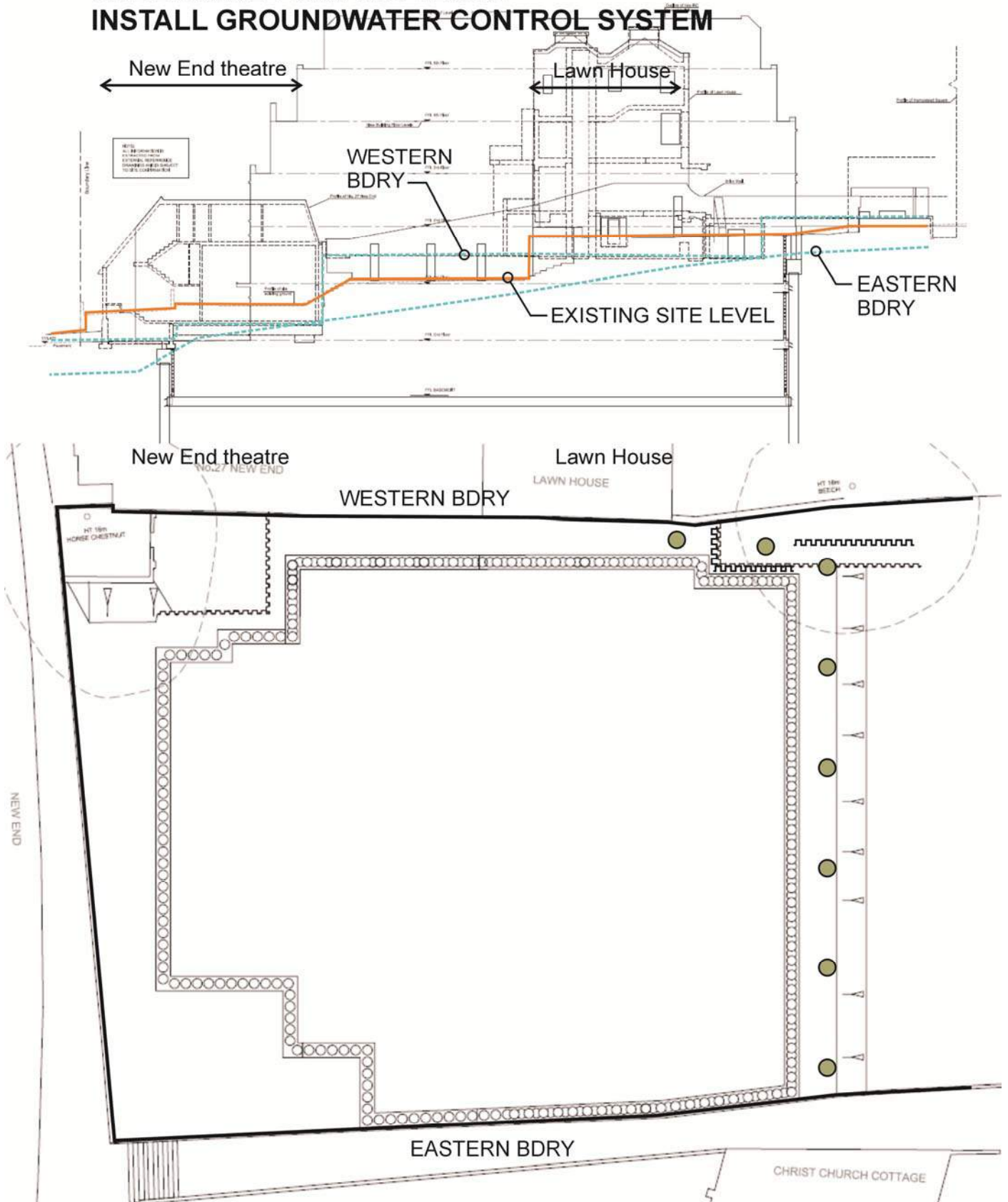
OUTPUT OPTIONS

Results to be stored on disk? - Yes
Results to be output on the printer? - No

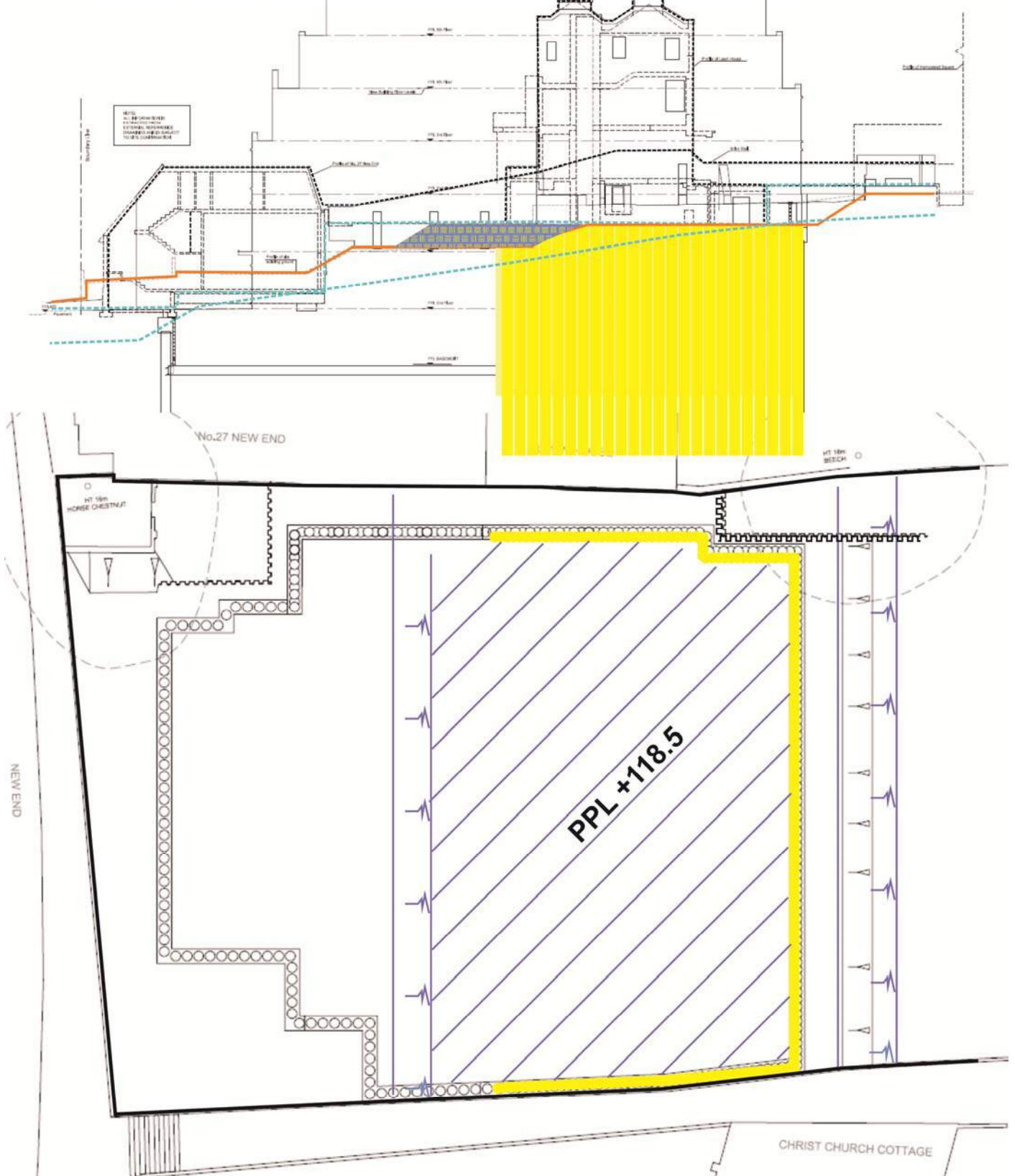
Stage no.	Stage description	Displacement Bending mom. Shear force	Output options Active, Passive pressures	Graph. output
1	Apply surcharge no.1 at elev. 119.00	No	No	No
2	Apply surcharge no.2 at elev. 119.00	No	No	No
3	Change EI of wall to 203600kN.m2/m run	No	No	No
4	Excav. to elev. 118.00 on PASSIVE side	Yes	Yes	Yes
5	Install strut no.1 at elev. 118.50	No	No	No
6	Apply water pressure profile no.1	No	No	No
7	Excav. to elev. 115.50 on PASSIVE side	Yes	Yes	Yes
8	Excav. to elev. 112.00 on PASSIVE side	Yes	Yes	Yes
9	Install strut no.3 at elev. 112.50	Yes	Yes	Yes
10	Excav. to elev. 109.00 on PASSIVE side	Yes	Yes	Yes
11	Apply surcharge no.3 at elev. 109.00	No	No	No
12	Install strut no.4 at elev. 109.85	Yes	Yes	Yes
13	Remove strut no.3 at elev. 112.50	Yes	Yes	Yes
14	Install strut no.5 at elev. 113.25	Yes	Yes	Yes
15	Install strut no.6 at elev. 116.85	Yes	Yes	Yes
16	Remove strut no.1 at elev. 118.50	Yes	Yes	Yes
17	Install strut no.7 at elev. 120.35	Yes	Yes	Yes
18	Change EI of wall to 145425kN.m2/m run	Yes	Yes	Yes
19	Apply surcharge no.4 at elev. 109.00	No	No	No
20	Apply water pressure profile no.2	No	No	No
*	Summary output	Yes	-	Yes

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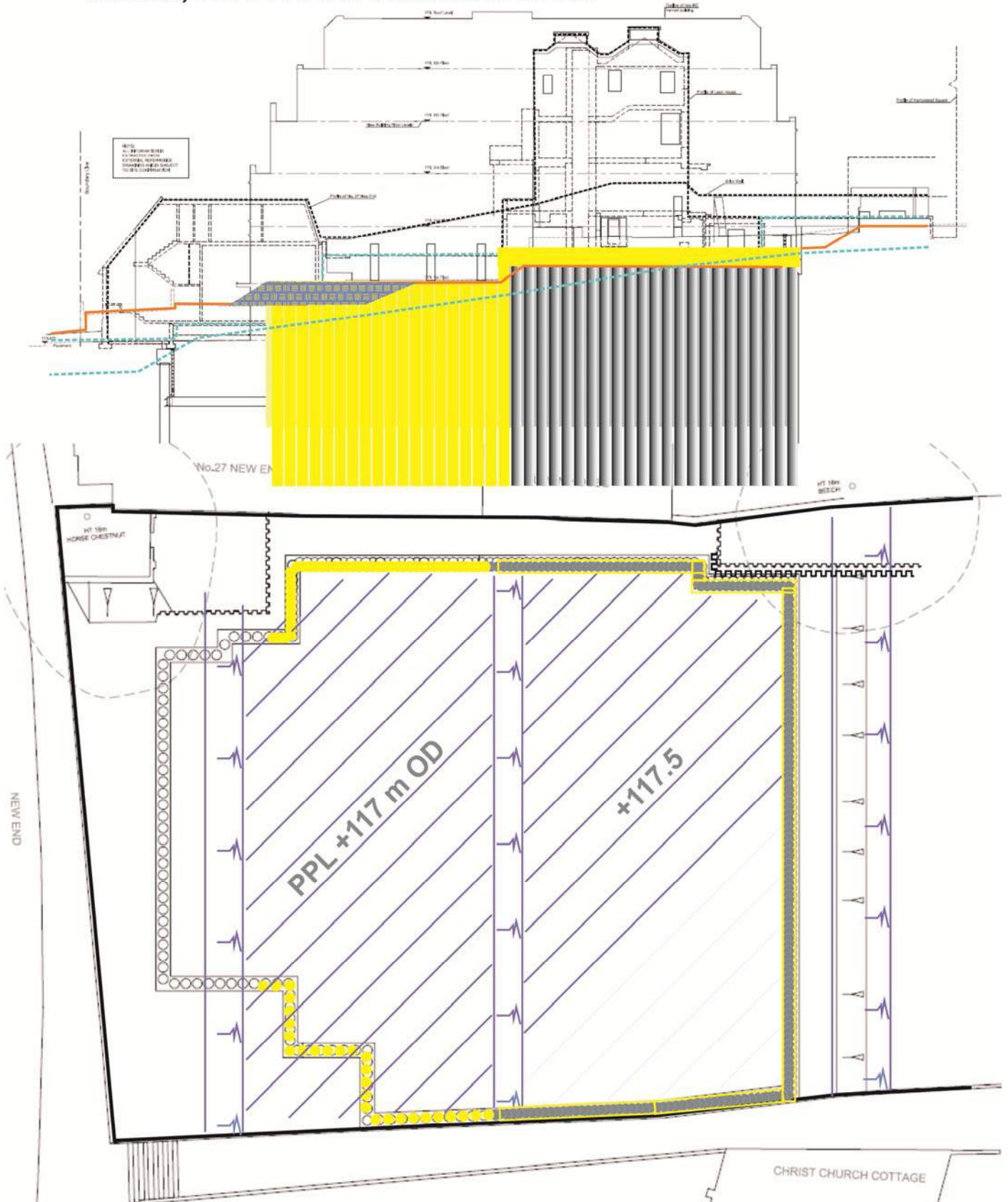
0. EXISTING GROUND LEVELS
INSTALL MONITORING SYSTEM
UNDERTAKE PUMPING TESTS
INSTALL GROUNDWATER CONTROL SYSTEM



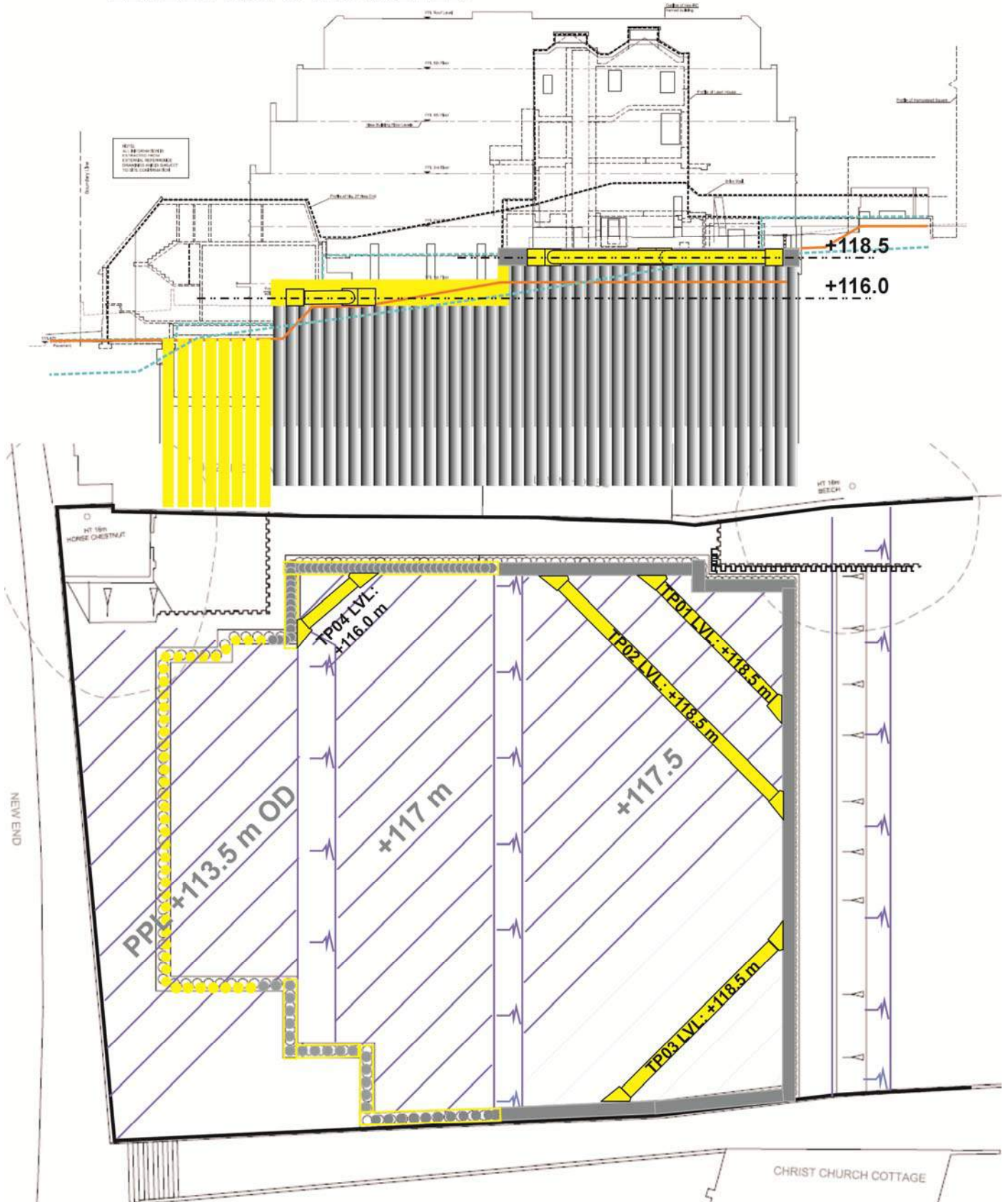
1. "HIGH LEVEL" PILING (PPL +118.5 m OD)
INSTALL PILES TO REAR OF SITE & MONITOR GROUND
MOVEMENTS; CONTINUE PILING PAST LAWN HOUSE
NOTE FILL FOR RIG ACCESS ALONG LAWN HOUSE



**2. "MID LEVEL" PILING (PPL +117.0 m OD)
REDUCED GL IN FRONT "HIGH" CAPPING BEAM (+118 m)
AGAIN, NOTE FILL FOR RIG ACCESS**

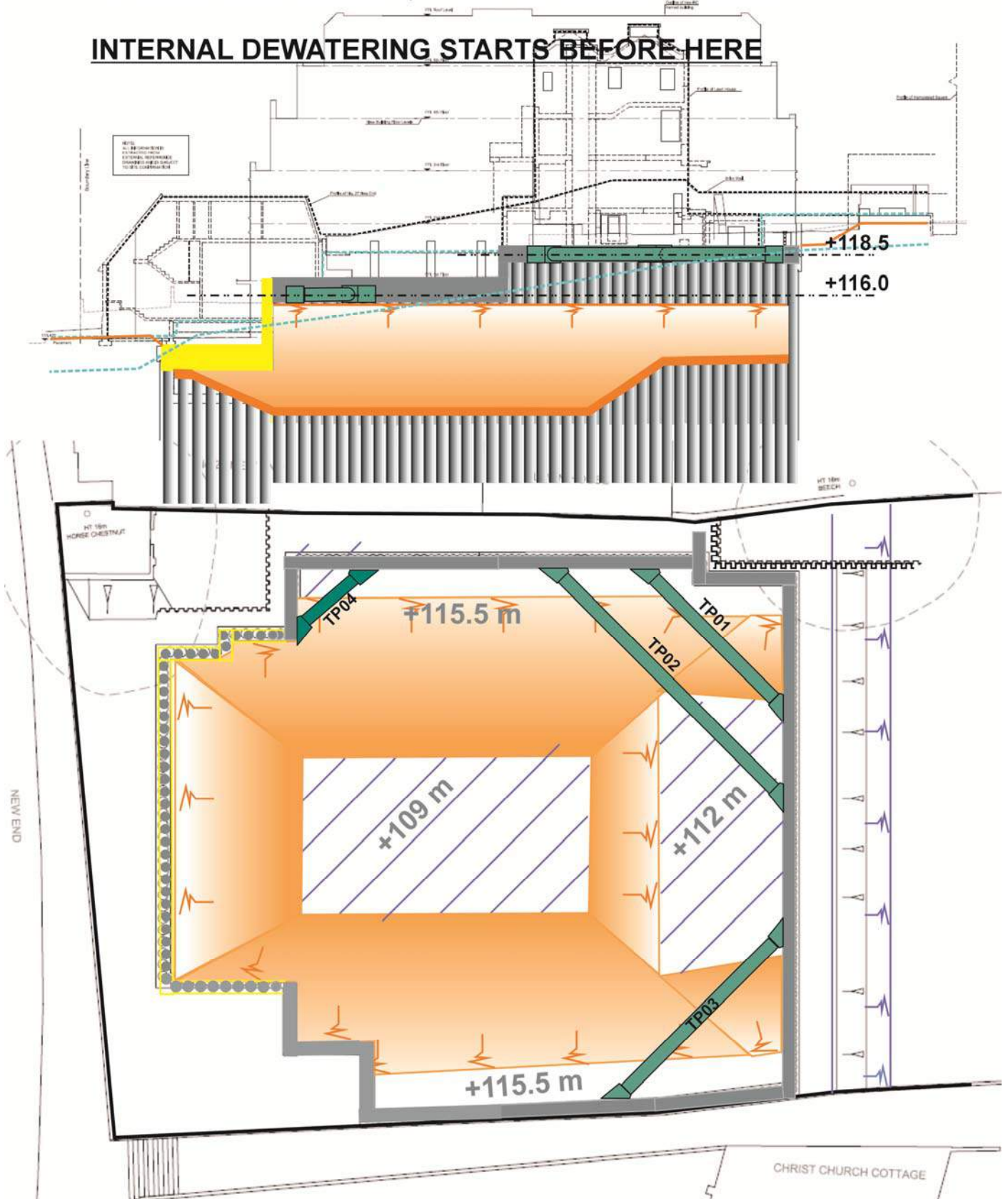


**3. "LOW LEVEL" PILING (PPL +113.5 m OD)
"HIGH" (TP01, TP02 & TP03) & "MID" (TP04)
LEVEL PROPS INSTALLED**



**4. REDUCE CENTRE TO FINAL LEVEL (+109 mOD)
BERMS TO PERIMETER WALL;
+115.5 m EAST & WEST, +112.0 m NORTH & SOUTH**

INTERNAL DEWATERING STARTS BEFORE HERE



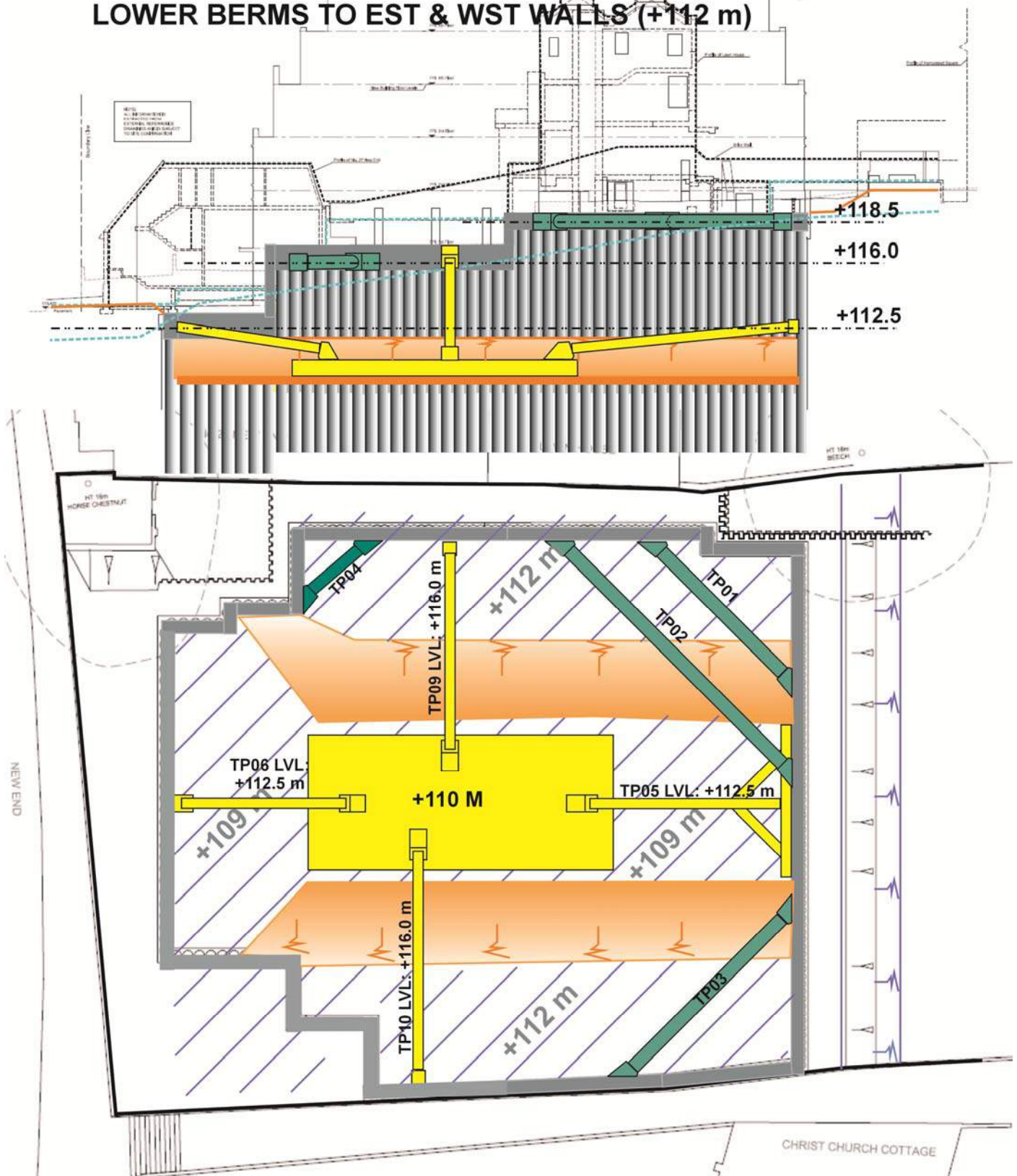
5. CAST BASE SLAB IN CENTRE OF SITE

INSTALL RAKERS (TP05 to TP08) TO NTH & STH WALLS

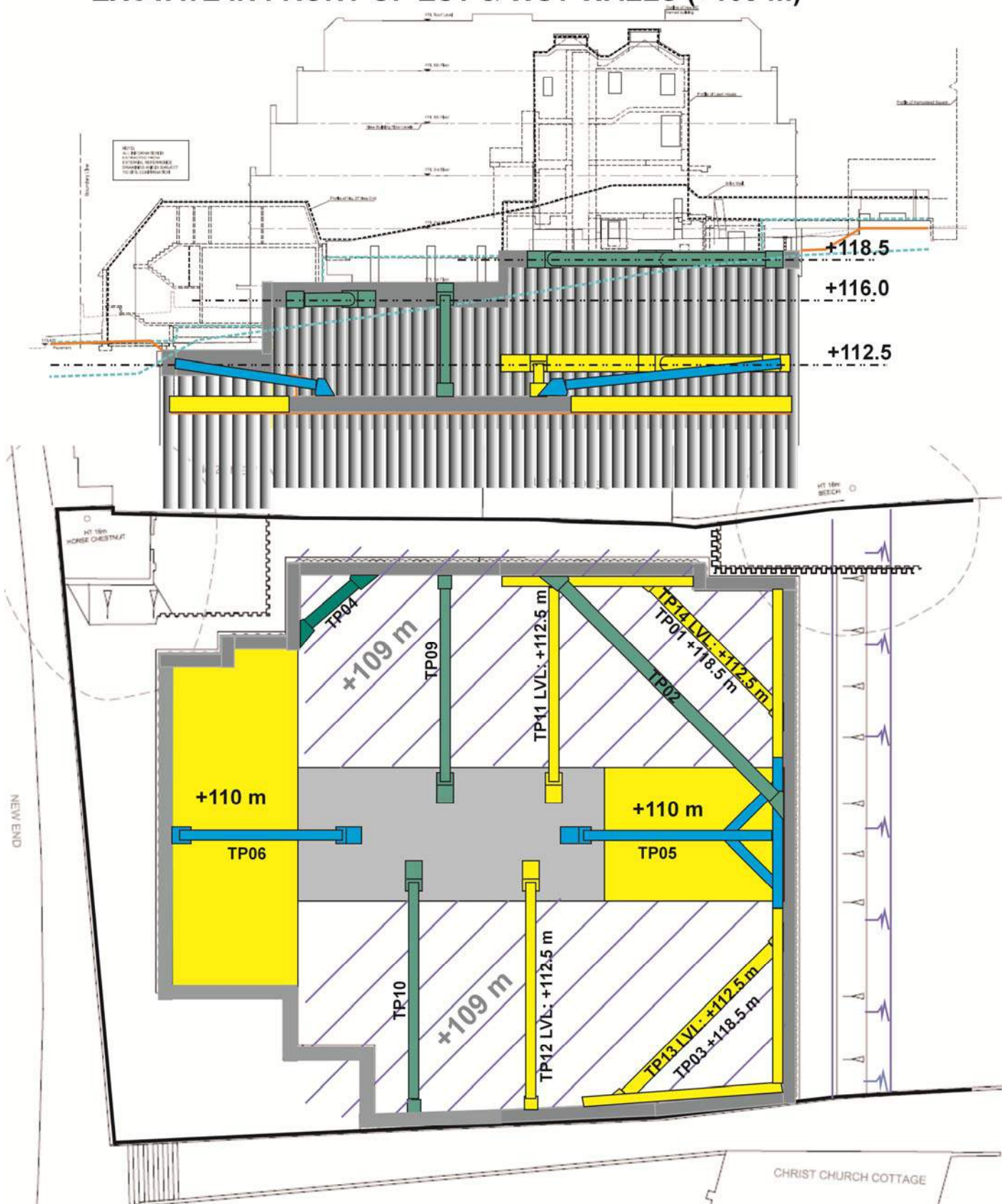
INSTALL RAKERS (TP09 & TP10) TO EST & WST WALLS

EXCAVATE IN FRONT OF NTH & STH WALLS (+109 m)

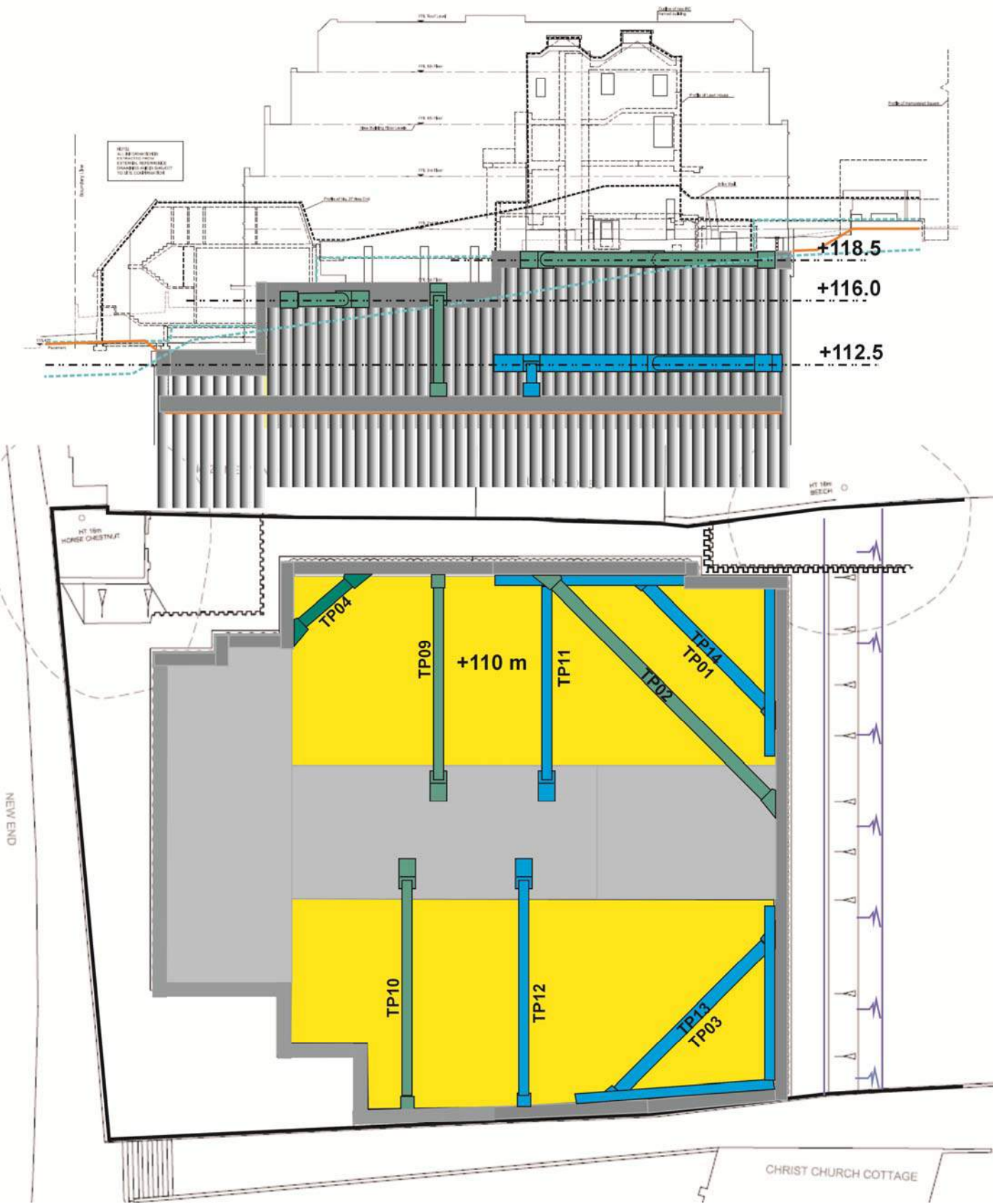
LOWER BERMS TO EST & WST WALLS (+112 m)



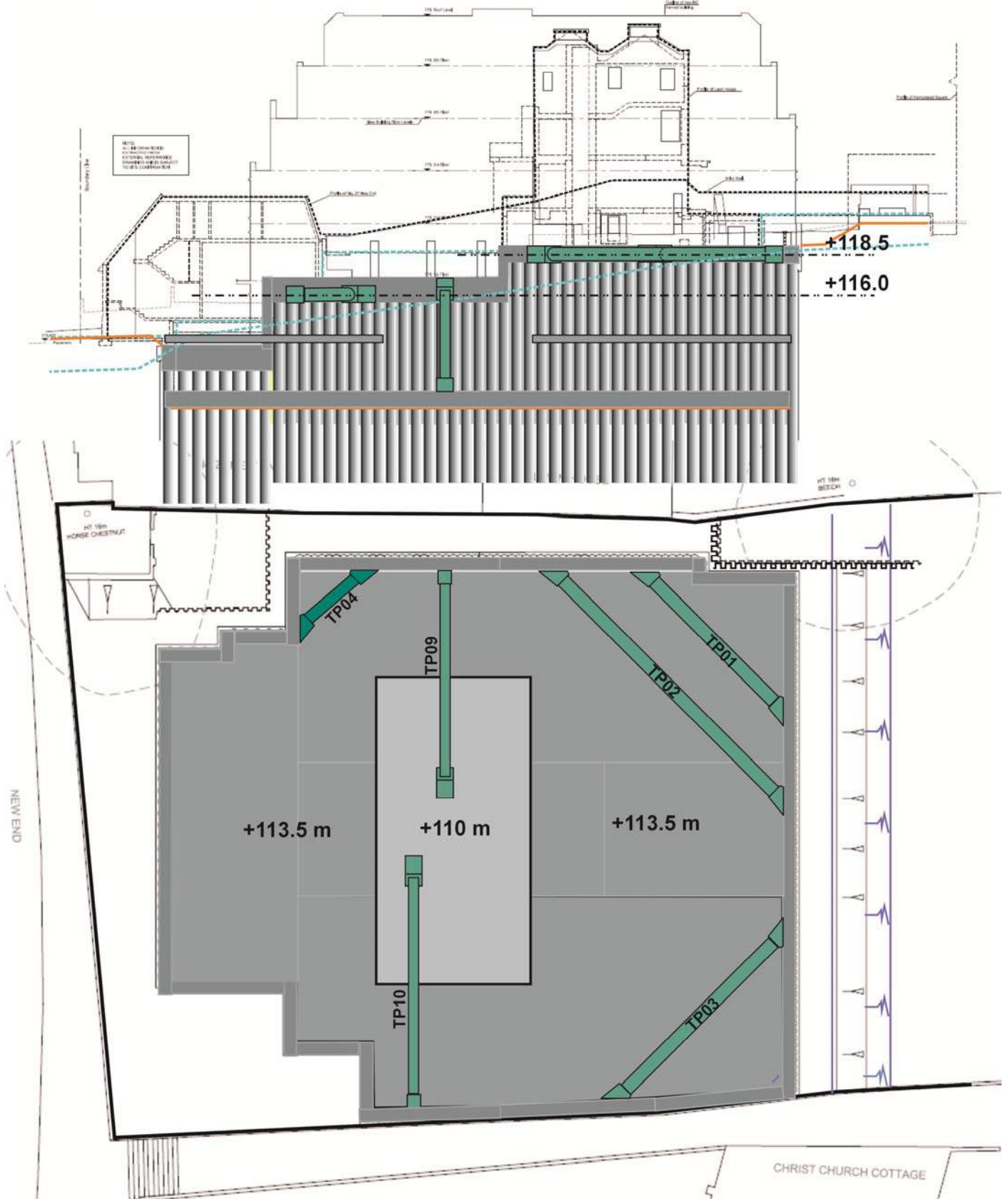
**6. EXTEND BASE SLAB TO NORTH & SOUTH WALLS
INSTALL RAKERS & CORNER STRUTS (TP11 to TP14)
EXCVATE IN FRONT OF EST & WST WALLS (+109 m)**



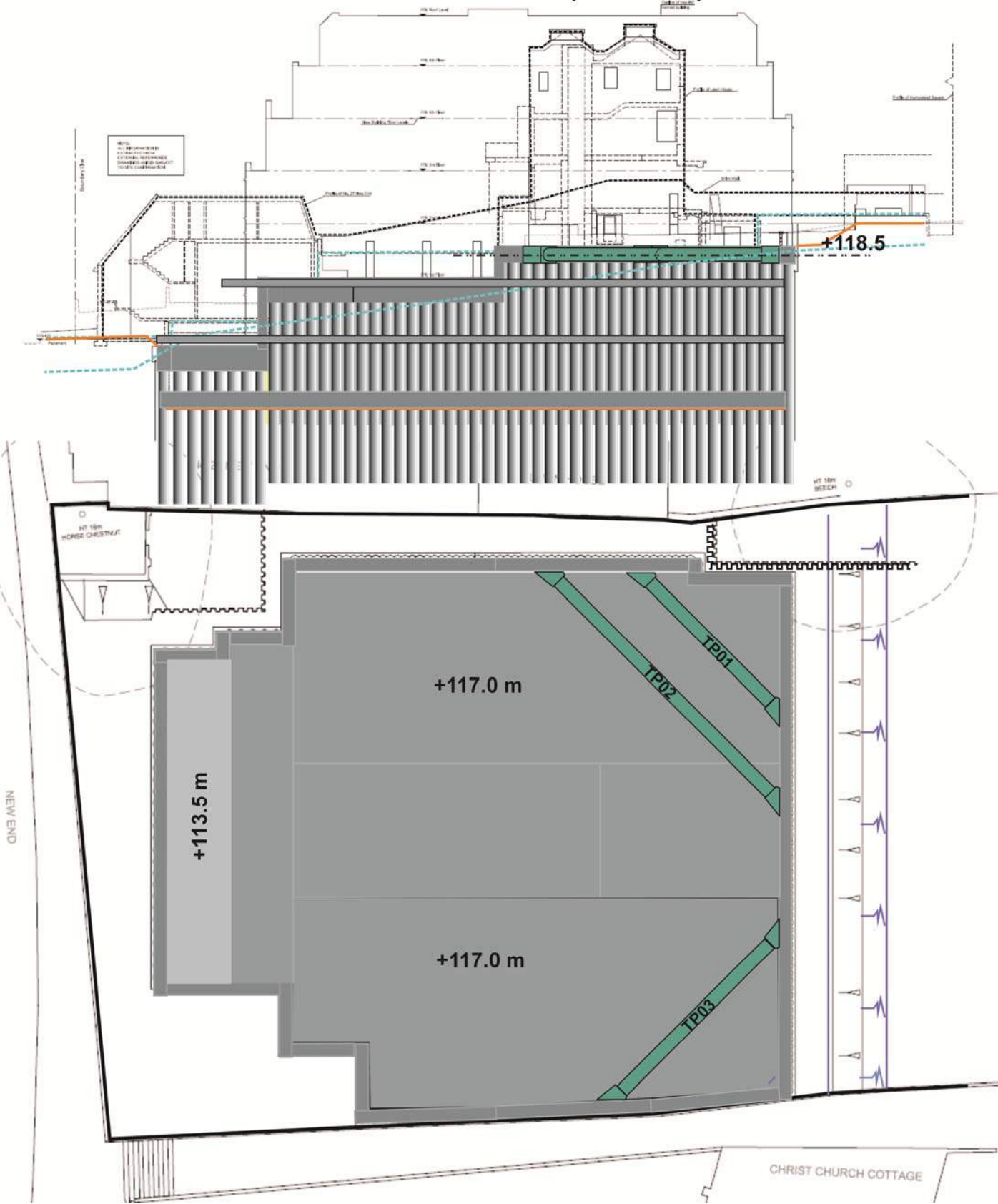
7. CAST REMAINDER OF BASE SLAB
REMOVE LOW LEVEL RAKERS (TP05 to TP08)



**8. REMOVE LOW LEVEL RAKERS (TP11 to Tp14)
CONSTRUCT GROUND FLOOR LEVEL (+113.5 m)
NOTE HOLE IN SLAB FOR “MID LEVEL” PROPS**



**9. REMOVE “MID LEVEL” PROPS & RAKERS (TP04, TP09 & TP10)
CLOSE HOLE IN GF SLAB
CONSTRUCT FIRST FLOOR LEVEL (+117.0 m)**



10. REMOVE “HIGH LEVEL” PROPS & RAKERS (TP01 to TP03)

CONSTRUCT 2ND FLOOR LEVEL (+120.5 m)

