### △ HOCHTIEF MURPHY Joint Venture

### C310 THAMES TUNNEL REPORT

EMPLOYER | CROSSRAIL | eB NO |

C310-HTM-C-RGN-CR148-50025

Rev 1.0

TITLE

Monitoring Close-Out Reports for Thames Water assets relating to Tunnelling Works North Embankment River Thames - North Woolwich Portal (excl. Store Rd)

ORIGINATOR COMPANY NAME | Hochtief Murphy JV

CMDL: C09.006

REVISION	DOCU	MENT APPROVA	L / REVISION RECOR	RD DETAILS	DATE			
1.0	Issued for CRL Ad	Issued for CRL Acceptance						
This docum integration,	ent has been review and acceptance as	ved byi a safe system of	? Yes: x <del>No</del> in the capacity of work, output, controposition to the wo	for cool, sequence. Ti				
Review by S	Stakeholder (if requi	T. Carro		0	L			
organizatio	n Job Title	Name	Signature	Date	Acceptance			

Crossrail	1.5	Crossrail Review and Acceptance Decal all is to be used for submitted documents requiring acceptance by Crossrail.		
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	Code 4.	Received for information only. Receipt is confirmed		
Reviewed/Accepted by:(signature)	10			
Print Name				
Position:		Date:		

PREPARED BY: HMJV Sur Print:	rveying and Monitoring Engineer	REVIEWED BY: HMJV Technical and Ri	sk Manager
Sign:	Date: 11-02-2015	Sign:	Date : 11-02-2015
REVIEWED BY: HMJV Mor	nitoring Manager	APPROVED BY: HMJV Project Director Print:	
Sign:	Date : 11-02-2015	Sign:	Date : 11-02-2015

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A HOCHTIEF  Joint V			C310 THAMES TUNNEL REPORT		
EMPLOYER	CROSSRAIL	eB NO	C310-HTM-C-RGN-CR148-50025	Rev	1.0
TITLE			orts for Thames Water assets relating to T River Thames - North Woolwich Portal (e)		

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### 1.0 INTRODUCTION

The purpose of this report is to compile the individual Thames Water Close-out reports which summarise the monitoring data from the instrumentation within a monitoring area or of an asset and relates it to the construction activities which have produced any observed movement changes.

The data that is presented within the body the individual Close-out report is summarised in a cover sheet. This forms the basis for which the associated monitoring instrumentation is to be decommissioned. The values, comments and conclusions presented in the cover sheet of the individual Close-out report are derived from the monitoring data attached to the individual close-out report.

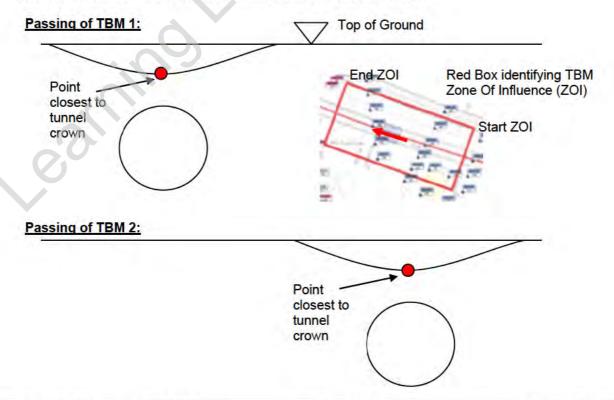
The content of the Close-out reports complies with what is required as per C122 – M&W Specification KX10 – Instrumentation & Monitoring C122-OVE-Z4-RSP-CR001-00007 Rev.7.0.

Each individual Close-out report contains

- -a cover summary sheet
- -monitoring point location plan
- -Settlement-time plot and/or monitoring data spreadsheets

The Cover summary sheet entails:

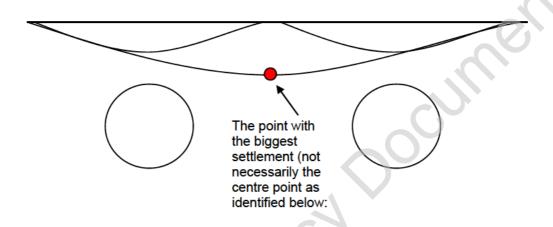
- Information on location of Monitoring area and/or asset
- Reference C310 I&M drawing
- Relevant chainage
- Sensor type
- Trigger value
- Selected critical monitoring points following the logic illustrated below:



A HOCHTIEF  Joint Ve				C310 THAMES TUNNEL REPORT		
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- Start and end date of relevant construction activity (other than TBM-Drive), where applicable.
- Long-term: The monitoring point with the greatest confirmed value of vertical movement of the corresponding monitoring asset.

### After Passage of TBM 1 and TBM 2



- Note on possible residual risks
- Supporting comments and conclusions that also focus on Thames Water specific requirements:
  - Deflection ratio for surface monitoring (e.g. ground studs) to be presented if settlements are more than 10mm.
  - Movements at shallow datum to be checked with the similar movement trend as the monitoring on the surface.
  - Rate of change in monitoring data to be less than 2mm per annum (suggesting simple settlement-time curves to demonstrate that the settlement is of no further concern).
  - · Reasons or explanations to be provided for no requirement to continue monitoring.

All close-out reports identified in the appendices form part of this report.

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### 2.0 REFERENCE DOCUMENTS

MPCGM C310-HTM-Z-STP-CR148-50058 Rev.14.0 MPCGM NWP C310-HTM-Z-STP-CR146-50002 Rev. 4.0

HMJV I&M Drawings:

C310-HTM-C-DWG-CR146\_ST004-70003 Rev. 12.0

M&W Specification KX10 - Instrumentation & Monitoring / C122-OVE-Z4-RSP-CR001-00007 Rev. 7.0

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### APPENDIX 00 Overall Register / Close out report

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APPENDIX 76
CS Pier Road



### **C310 Thames Tunnel**

**Close Out Report** 

Rev. 1.0

monitoring asset				Services underneath Pier Road				
referen	ce monitorin	g drawing:		C310-H	TM-C-DWG-CR146-ST004-70003			
name o	f monitorin	g section:		CS Pier Road				
	sensor type	2;			manual levelling studs			
chainage		89260		point no.:	3004 1501 - 3004 1510			
1	trigger value [mm]	es:	green:	+16 -16	amber 20 red: +25			
refe	rence docu	ment for trig	ger values:	Managen	ment Plan for Control of Ground Move	ment		
			EB-no.:		C310-HTM-Z-STP-CR148-50058			
Appendix:					AAA			
			m	onitoring o	data			
	date max. value		point no.	comments				
baseline	01/	10/13	0.00					
твм 1	start ZOI	10/12/13	0.41	3004 1507				
	end ZOI	17/12/13	-8.41	3004 1507	breached not any trigger value			
твм 2	start ZOI	14/04/14	-1.70	3004 1503				
	end ZOI	21/04/14	-15.54	3004 1503	breached not any trigger value			
longterm		21/11/14	-19.83	3004 1504	breached green trigger value			
Evalua	tion of any	potential	7	No residual ri since the Wor	isk rks have been completed by HMJV			
residual risks				Yes, residual risk (see comment below)				

### summary / comments

The maximum deflection ratio is 1:8530 (3004 1506 - 3004 1507 - 3004 1508) - no TW trigger breached (TW alert value 1:1000).

Under consideration of temperature differences, the surrounding ground condition and the achievable accuracy of the measurement, HMJV has no concern to cease the monitoring.

The rate of change in the monitoring data is less than the required standards as per the specifications and drawings.

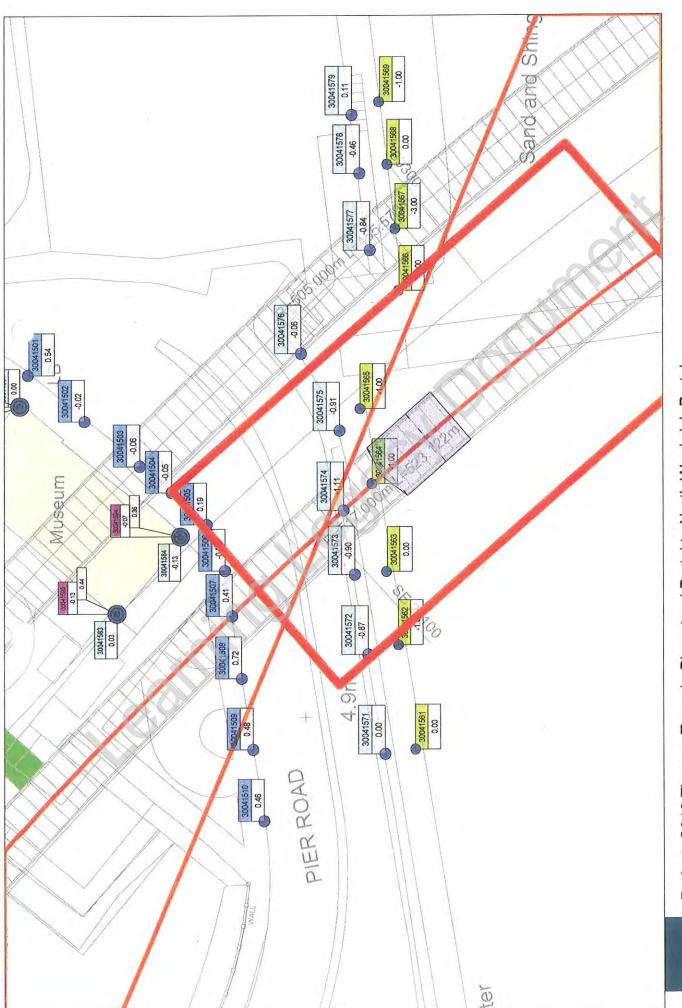
date / signature:

01/02/2015

print name:

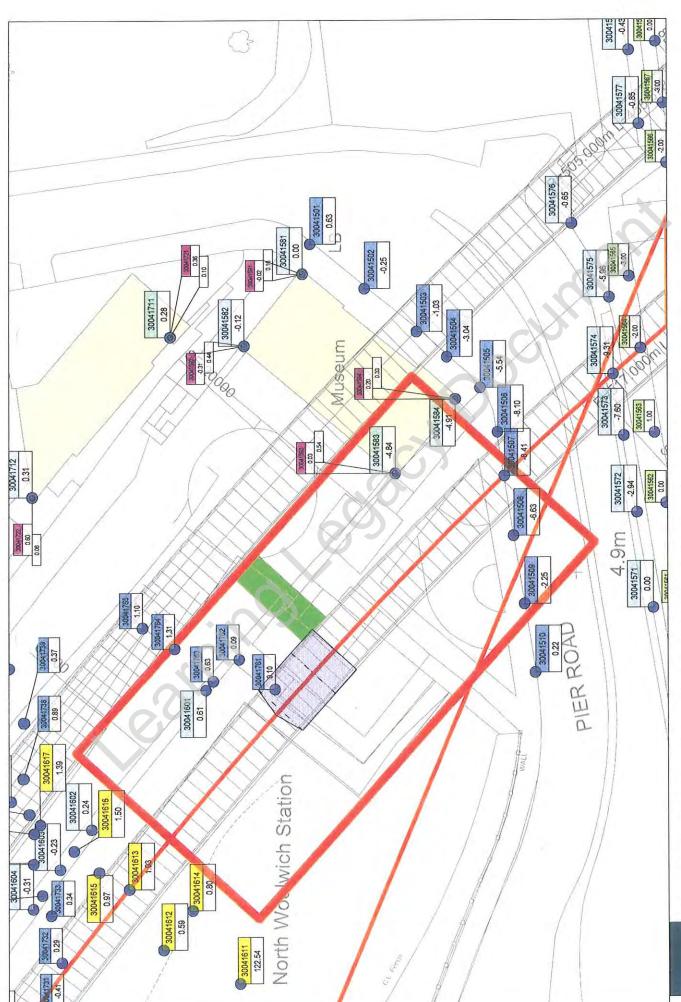
HMJV project role:

Monitoring & Survey engineer



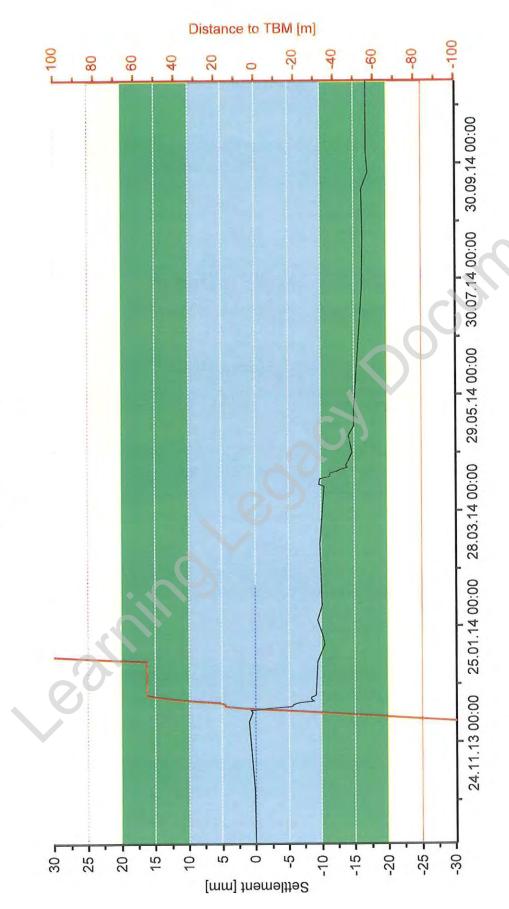
Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB current values: 10.12.2013 17:49





working activities: portal excavation, construction base slab and capping beam current values: 17.12.2013 09:00 Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal

Qe ec

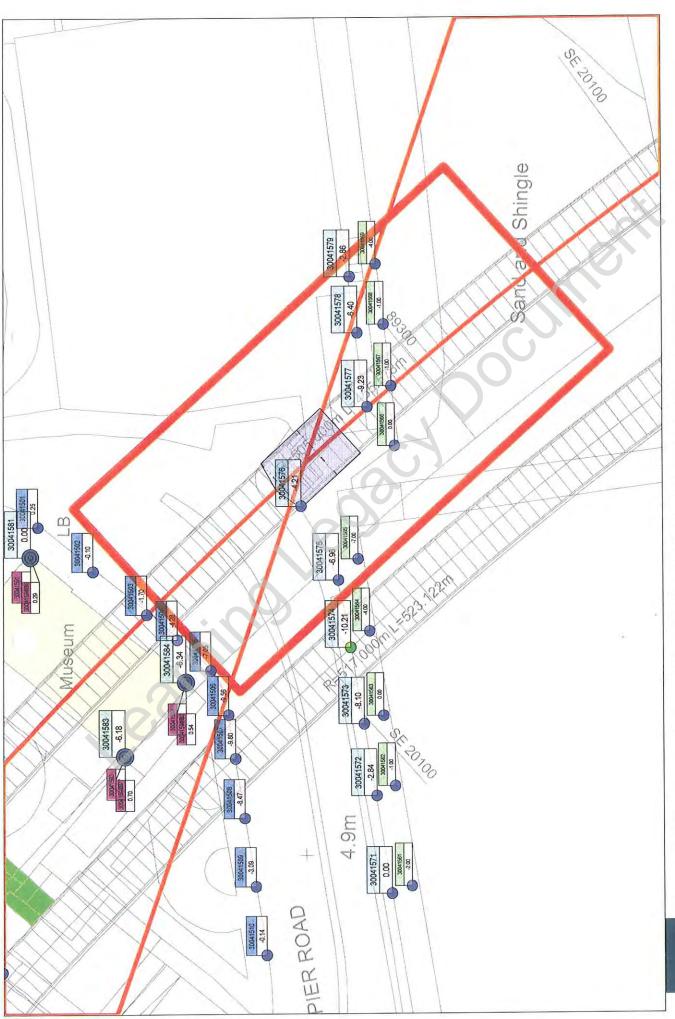


Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: WB Tunnel - CS Pier Road - 01.10.2013 - 13.11.2014 Date: 18.11.2014 10:45 Current Values: 18.11.2014 10:29

---- Distance TBM ----- Zero Distance

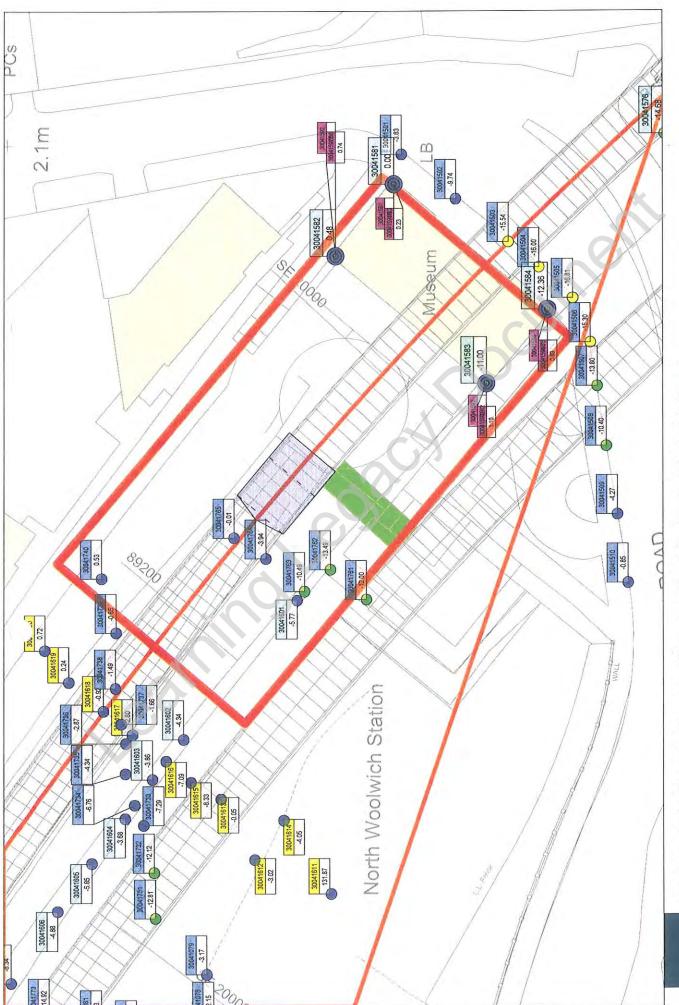
30041507





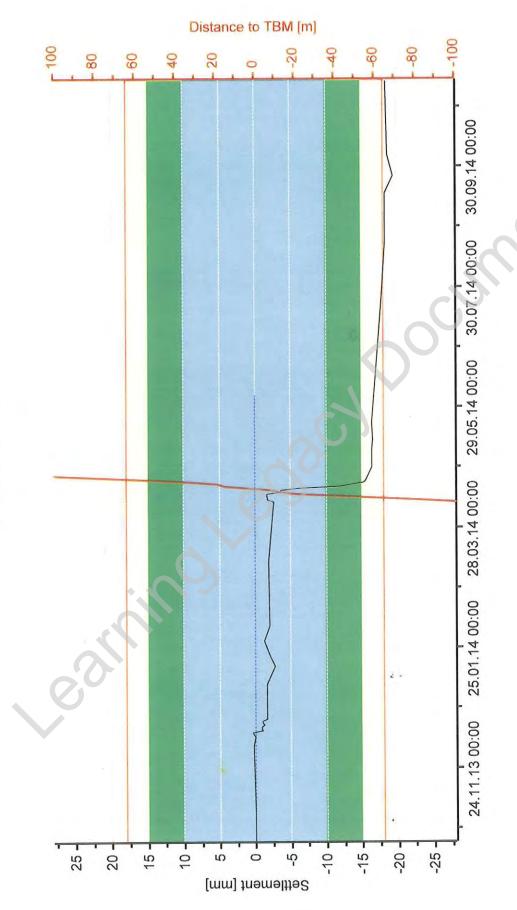
working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal





Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab current values: 21.04.2014 09:00





Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: EB Tunnel - CS Pier Road - 01.10.2013 - 13.11.2014 date: 17.11.2014 11:42 current values: 17.11.2014 11:21

---- Distance TBM ------ Zero Distance

-30041503





### Joint Venture

1	_	П	En						100					7
	Ō		deviation from last/baseline	0	٦	7	ကု	4	φ	φ	ကု	7	0	
	6. following	13/12/2013	deviat last/b	7	7	7	ch.	တု	4	4	ကု	çì	7	
	6.	13	elevation	103.924	104.157	104.389	104.502	104.618	104.691	104.778	104.854	104.799	104.829	
			from	-	0	0	7	¢,	ო	42	0	-	-	
	5. following	12/12/2013	deviation from last/baseline	0	0	0	7	7	ဗု	ကု	7	0	-	
	5. f	12	elevation	103.925	104.158	104.390	104.504	104.620	104.694	104.781	104.857	104.801	104.830	
			deviation from last/baseline	-	0	0	0	0	0	+	-	-	0	
	4. following	11/12/2013	deviation from last/baseline	0	0	0	0	0	1	0	0	0	0	
	4.	11	elevation	103.925	104.158	104.390	104,505	104.622	104.698	104.784	104.858	104,801	104.829	
			from	-	0	0	0	0	0	0	11	0	0	
	3. following	10/12/2013	deviation from last/baseline	0	0	0	0	3	7	0	τ	0	7	
	3. fc	10/	elevation	103.925	104.158	104.390	104.505	104.622	104.697	104.784	104.858	104.800	104.830	
			n from seline	F	0	0	0	+	-	1	1	1	1	
Pier road	2. following	05/12/2013	deviation from last/baseline	-	0	0		-	-	-	+	1	4	
	ci T	05,	elevation	103.925	104.158	104.390	104,505	104.623	104.698	104.784	104.859	104.801	104.830	
Cross section			on from seline	0	0	0	0	0	0	0	0	0	0	
	1. following	30/10/2013	deviation from last/baseline	0	0	0	0	0	0	0	0	0	0	
structure:		30	elevation	103.924	104.158	104.390	104.505	104.622	104.697	104.783	104.858	104.800	104.829	
	baseline	1/10/13	elevation	103,924	104.158	104.390	104.505	104.622	104.697	104.783	104.857	104.800	104.829	
	No. of reading	date	, o	30041501	30041502	30041503	30041504	30041505	30041506	30041507	30041508	30041509	30041510	



### Joint Venture

nune	
Thames Tu	
C310 Tha	
2	
project	

	owing	2013	deviation from last/baseline	0 0	<del>-</del>	-1 -2	-1 -4	-1	6-	6-	-1 -7	<del>ب</del> ښ	0 0	
	12. following	19/12/2013	elevation la	103.924	104.157	104.388	104.501	104.616	104.688	104.774	104.850	104.797	104.829	
	-	П		1	0	7	ကု	φ	φ	φ	-7	-5	0	
	11. following	18/12/2013	deviation from last/baseline	0	0	0	0	0	0	0	0	0	0	
	11.	16	elevation	103.925	104.158	104.389	104.502	104.616	104,689	104.775	104.851	104.798	104.829	
	D		n from seline	,-	0	7	ကု	φ	φ	φ	-7	-5	0	
	10. following	17/12/2013	deviation from last/baseline	0	0	0	0	0	0	0	0	0	0	
	10.	17	elevation	103.925	104,158	104.389	104,502	104.616	104.689	104.775	104.851	104.798	104.829	
			n from seline	0	0	7	လု	φ	89	6-	-7	-2	0	
	9. following	16/12/2013	deviation from last/baseline	0	0	0	7	T	-1	-2	67-	7	7	
	o,	16	elevation	103.924	104.158	104.388	104.502	104.616	104.689	104.775	104.851	104.797	104,829	
				0	0	1	Ç	ဟု	-7	1-	4	7	0	
er road	8. following	15/12/2013	deviation from last/baseline	0	0	0	0	0	7	7	7	0	0	
Cross section Pier road	8.1	16	elevation	103.924	104.158	104.389	104.502	104.617	104,690	104.777	104.853	104.799	104.829	
Cross s			n from seline	0	7	T	4	ιģ	φ	φ	ကု	7	0	
	7. following	14/12/2013	deviation from last/ baseline	0	0	0	0	0	0	0	0	0	0	
structure:	7.1	14	elevation	103.924	104.158	104.389	104.502	104.617	104.691	104.778	104.854	104.799	104.829	
	baseline	1/10/13	elevation	103.924	104.158	104.390	104,505	104,622	104.697	104.783	104.857	104.800	104.829	
	No. of reading	date	o N	30041501	30041502	30041503	30041504	30041505	30041506	30041507	30041508	30041509	30041510	



### Joint Venture

	F.		n from seline	0	0	-5	4	1-	-10	-10	φ	ကု	0	
	18. following	10/03/2014	deviation from last/baseline	0	-	0	0	0	0	0	0	0	-	
	18.	10	elevation	103.924	104.158	104.388	104.501	104.615	104.687	104.774	104.849	104.796	104.829	
	D		deviation from last/baseline	,	7	7	4	7-	-10	-10	ф	4	T	
	17. following	05/02/2014	deviation from last/baseline	0	т	٦	7	7	7	7	7	7	7	
	17.	Ö	elevation	103.925	104.157	104.388	104.500	104.615	104,687	104.773	104.849	104.796	104,828	
	D		n from seline	-	0	7	ကု	φ	တု	တု	φ	ကု	0	
	16. following	28/01/2014	deviation from last/baseline	0	,	-	-	-	,	-	-	-	-	
	16.	28	elevation	103.925	104.158	104.389	104.501	104.616	104,688	104.774	104.850	104.797	104.829	
	CD.		n from seline	0	T	Ċ,	ç,	-7	-10	-10	φ	4	٦	
	15. following	20/01/2014	deviation from last/baseline	,-	-	-	0	0	-	0	<b>)</b> -	0	-	
	15.	20	elevation	103.924	104.157	104.388	104.500	104.615	104.687	104.773	104.849	104.796	104.828	
	CD.		n from seline	Ŧ	-2	ဗု	ς,	φ	-10	-10	တု	4	ç,	
on Pier road	14. following	15/01/2014	deviation from last/baseline	7	T	7	Ť	T	7	7	7	7	2	
section Pie	14.	11	elevation	103.923	104.156	104.387	104.500	104.614	104.687	104.773	104.848	104.796	104.827	
Cross section			on from aseline	-	7	ņ	4	φ	တု	တု	φ	ကု	0	
Ä	13, following	06/01/2014	deviation from last/ baseline	0	0	0	0	0	0	0	0	0	0	
structure:	13,	90	elevation	103.925	104.157	104.388	104.501	104.615	104.688	104.774	104.850	104.797	104.829	
	baseline	1/10/13	elevation	103.924	104,158	104.390	104.505	104.622	104.697	104.783	104.857	104.800	104.829	
	No. of reading	date	No.	30041501	30041502	30041503	30041504	30041505	30041506	30041507	30041508	30041509	30041510	



### Joint Venture

			from	0	ကု	φ	တု	-11	-12	-11	တု	4	0	
	24. following	17/04/2014	deviation from last/baseline	0	ç	4	-5	42	7	0	0	0	0	
	24.	17	elevation	103.924	104.155	104.384	104.496	104.611	104.685	104.772	104.848	104.796	104.829	
	D		deviation from last/baseline	0	7	4	φ	တု	7	Ę	-10	4	7	
	23, following	16/04/2014	deviatio last/ba	0	0	0	77	0	0	0	0	0	-	
	83	9	elevation	103.924	104.157	104.386	104.499	104.613	104.686	104.772	104.848	104.795	104.828	
	D		leviation from last/baseline	7	7	4	φ	<b>о</b> -	-11	-1	-10	ς,	-5	
	22. following	15/04/2014	deviation from last/baseline	7	7	7	7	ç	7	7	7	-2	-5	
	23	# .	elevation	103.923	104.157	104.386	104.499	104.613	104,686	104.772	104.848	104.795	104.827	
	D		leviation from last/baseline	0	0	Ņ	4	-7	-10	-10	-8	-3	0	
	21, following	14/04/2014	deviation from last/baseline	0	0	0	0	0	0	0	0	0	0	
	21.	17	elevation	103.924	104.158	104.388	104.500	104.615	104.687	104.774	104.849	104.797	104.829	
	D		leviation from last/baseline	0	0	42	4	-7	တု	-10	φ	ကု	0	
Pier road	20. following	11/04/2014	deviation from last/baseline	0	÷	-	-	1	1	-	1	ē	+-	
-	20.	1	elevation	103.924	104.158	104.388	104.501	104.615	104.688	104.774	104.849	104.797	104.829	
Cross section			aseline	0	7	ကု	ιģ	φ	-10	E	တု	4	7	
	19. following	10/04/2014	deviation from last/ baseline	0	0	77	7	0	7	7	Ţ	7	7	
structure:	9.	01	elevation	103.924	104.158	104.387	104.500	104.614	104.687	104.773	104.848	104.796	104.828	
	baseline	1/10/13	elevation	103.924	104.158	104.390	104.505	104.622	104.697	104.783	104.857	104.800	104.829	
	No. of reading	date	o.	30041501	30041502	30041503	30041504	30041505	30041506	30041507	30041508	30041509	30041510	



### Joint Venture

llowing 28. following 30. following 30. following	4/2014 28/04/2014 07/05/2014	deviation from elevation from last/baseline last/baseline	-1 -4 103.920 0 -4 103.920 -1 -5 103.920 0 -4	-2 -10 104,148 0 -10 104,148 -1 -10 104,148 0 -10	-2 -15 104,374 0 -16 104,373 -1 -16 104,373 0 -16	-2 -16 104,489 0 -16 104,488 -1 -17 104,488 0 -17	-2 -17 104.605 0 -17 104.604 -1 -18 104.605 1 -17	-1 -15 104.682 0 -15 104.681 -1 -16 104.681 0 -16	-1 -14 104,770 0 -14 104,769 -1 -15 104,769 1 -14	0 -11 104.847 0 -10 104.846 -1 -11 104.846 0	-5 104,796 1 -4 104,794 -1 -6 104,795 1 -5	0 -1 104 828 0 1-1 104 827 1-1 0-104 828 0 1-1 0	
ving 27. following	14 20/04/2014	deviation from elevation last/baseline	-3 103.920 -1	-8 104.148 -2	-14 104.374 -2	-14 104.489 -2	-16 104.605 -2	-15 104.682 -1	-13 104.769 -1	-10 104.846 0	-5 104.795 0	-1 104.828 0	
26. following	19/04/2014	elevation	103.921 -1	7 104.150 -1	2 104.376 -2	3 104.490 -1	5 104.606 -1	4 104.682 -1	1- 04.770 -1	0 104.847 -1	104.795 0	104.828 -1	
25. following	18/04/2014	elevation from last/ baseline	103.922 -2 -3	7- 4 -7	104.378 -6 -12	104.492 -4 -13	104.607 -4 -15	104.683 -2 -14	104.771 -1 -12	104.848 -1 -10	104.796 0 -4	104.828 0 -1	
No. of reading baseline	date 1/10/13	No. elevation	30041501 103.924	30041502 104.158	30041503 104,390	30041504 104,505	30041505 104.622	30041506 104,697	30041507 104.783	30041508 104,857	30041509 104.800	30041510 104.829	

project: C310 Thames Tunnel



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### Joint Venture

No. of reading baseline date 1/10/13	De																		
		31. fc	31, following	7	32.	32. following		33.	33. following	<i>C</i>	34.	34. following	O)	35.	35. following		36.	36. following	
	13	12/0	12/05/2014		21,	21/05/2014	П	17	17/06/2014		22	24/07/2014		23	22/08/2014		16	16/09/2014	П
		elevation	deviation from last/ baseline		elevation	deviation from last/baseline	from	elevation	deviation from last/baseline	n from seline	elevation	deviation from last/baseline	deviation from last/baseline	elevation	deviation from last/baseline	n from seline	elevation	deviation from last/baseline	r from seline
30041501 103.924		103.920	0	ιŅ	103.920	0	τÒ	103.919	0	ဟု	103.918	7	φ	103.919	0	φ	103.918	0	9
30041502 104,158		104.147	0	÷	104.147	0	=	104.148	0	-10	104.147	7	-12	104.146	7	-12	104.146	0	12
30041503 104,390		104.373	0	-16	104.373	0	-16	104.373	0	-16	104.372	7	-18	104.371	7	-18	104.371	0	19
30041504 104.505		104.488	0	-17	104.488	0	-17	104.488	0	-17	104.486	42	-18	104,485	7	-19	104.485	0	-19
30041505 104,622		104.604	7	18	104.604	0	-18	104.604	,	-17	104.603	-5	-19	104.602	7	-20	104.602	0	-20
30041506 104.697		104.680	0	-17	104,680	0	-17	104.681	7	-16	104.680	ç	-17	104.679	7	-18	104.679	0	-18
30041507 104.783		104.768	7	-15	104.768	0	-15	104.769	-	-14	104.767	ņ	-16	104.767	0	-16	104.767	0	-16
30041508 104.857		104.846	7	-12	104.846	0	-11	104.846	0	-11	104.845	7	-12	104.844	7	5	104.844	0	5
30041509 104,800		104.794	-	ιŅ	104.794	0	ς,	104.795	0	φ	104.793	42	-7	104.793	0	-7	104.793	0	2-
30041510 104,829		104.827	0	42	104.827	0	ņ	104.828	0	Ŧ	104.826	-5	ကု	104.821	ιģ	ထု	104.826	വ	ကု
			ij																



### Joint Venture

			deviation from last/baseline											
			elevation											
			deviation from last/baseline											
			elevation											
			deviation from last/baseline											
			elevation											
	. 79		n from seline	φ	-13	-18	-20	-19	-18	-17	-13	φ	4	
	39. following	21/11/2014	deviation from last/baseline	0	0	0	0	0	7	0	2	0	0	
	39.	21	elevation	103.919	104.146	104.371	104.485	104.602	104.679	104.766	104.844	104.792	104.825	
	6		deviation from last/baseline	φ	-12	-19	-20	-19	-19	-17	-13	1-	ကု	
er road	38. following	06/10/2014	deviatio last/ba	-	+	-	-	,-	-	0	0	0	0	
Cross section Pier road	38.	90	elevation last/baseline	103.919	104.146	104.371	104.485	104.602	104.679	104.766	104.844	104.793	104.826	
Cross s				φ	-13	-19	-50	-20	-19	-17	-14	. 2-	4	
Š	37. following	25/09/2014	deviation from last/ baseline	7	7	7	7	٦	7	$\tau$	7	0	7	
structure:	37.	25	elevation	103.918	104.145	104.370	104.485	104.601	104.678	104.766	104.844	104.792	104.825	
	baseline	1/10/13	elevation	103.924	104.158	104.390	104,505	104.622	104,697	104.783	104.857	104.800	104.829	
	No. of reading	date	ON	30041501	30041502	30041503	30041504	30041505	30041506	30041507	30041508	30041509	30041510	

△ HOCHTIEF Joint V			C310 THAMES TUNNEL REPORT		
EMPLOYER	CROSSRAIL	eB NO	C310-HTM-C-RGN-CR148-50025	Rev	1.0
TITLE			orts for Thames Water assets relating to T River Thames - North Woolwich Portal (ex		

APPENDICES 83



### **C310 Thames Tunnel**

Close Out Report

Rev. 1.0

monitori	ing asset		TV	V Twin Rising IV	lain			
reference moni	toring drawing:		C310-HT	M-C-DWG-CR146-STO	004-70003			
name of moni	toring section:			CS Twin Rising Main	n			
sensor	type:			manual levelling stud	ls			
chainage:	89190		point no.:	3004 173	31 - 3004 1740			
trigger [m		green:	+16 -16	amber: +20 70	red: +25 -25			
reference o	document for trigg	ger values:	Managem	ent Plan for Contro	l of Ground Movement			
		EB-no.:						
Appendix:								

### monitoring data

	d	ate	max. value	point no.	comments
baseline	14/	11/13	0.00		
TBM 1	start ZOI	06/01/14	-0.05	30041732	9,
	end ZOI	10/01/14	-12.92	3004 1732	breached not any trigger value
твм 2	start ZOI	21/04/14	-1,49	3004 1738	
	end ZOI	25/04/14	-10.51	3004 1738	breached not any trigger value
longterm		21/11/14	-16.11	3004 1734	breached green trigger value
Evaluati	tion of any	potential	~	No residual i	risk orks have been completed by HMJV
	residual ris	ks		Yes, residual	

### summary / comments

The maximum deflection ratio is 1:3350 (3004 1732 - 3004 1733 - 3004 1734) - no trigger breached (TW alert value 1:1000).

Under consideration of temperature differences, the surrounding ground condition and the achievable accuracy of the measurement, HMJV has no concern to cease the monitoring.

The rate of change in the monitoring data is less than the required standards as per the specifications and drawings.

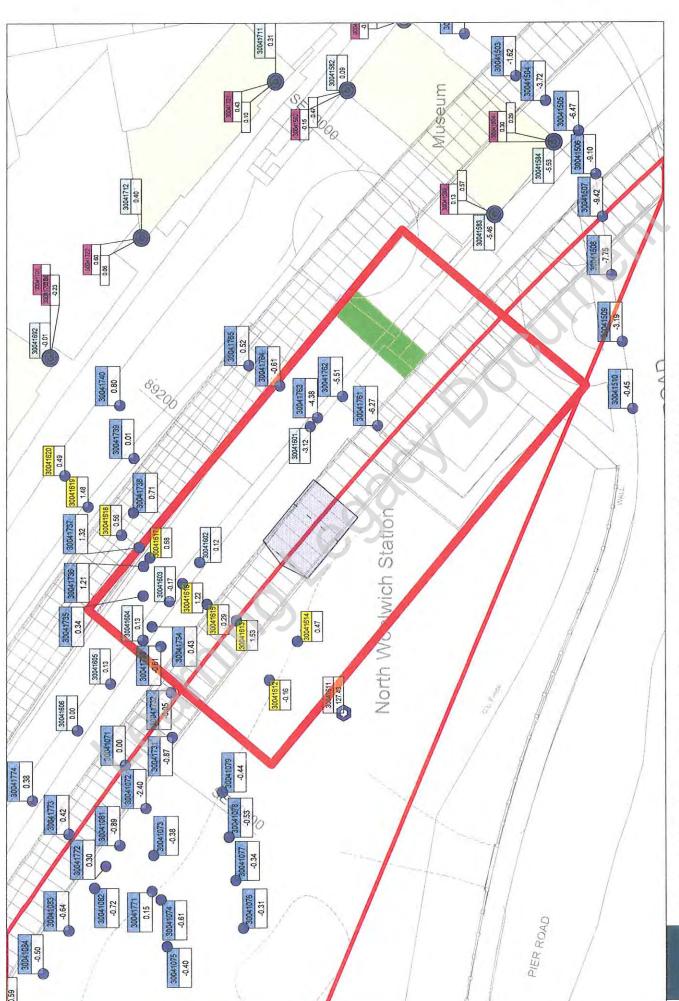
date / signature:

19/01/2015

print name:

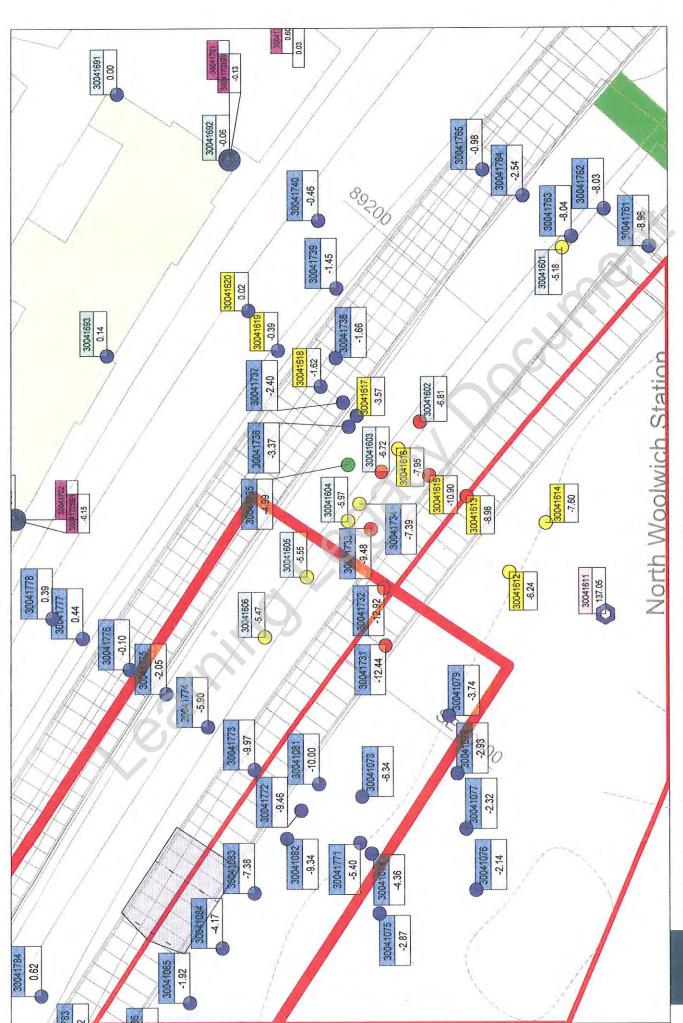
HMJV project role:

Monitoring & Survey engineer



Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB current values: 06.01.2014 15:00

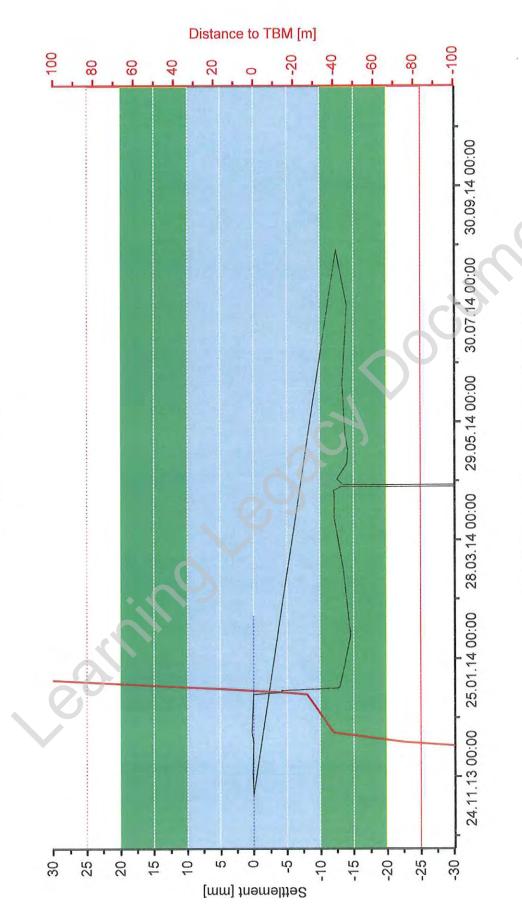




Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB



current values: 10.01.2014 09:23



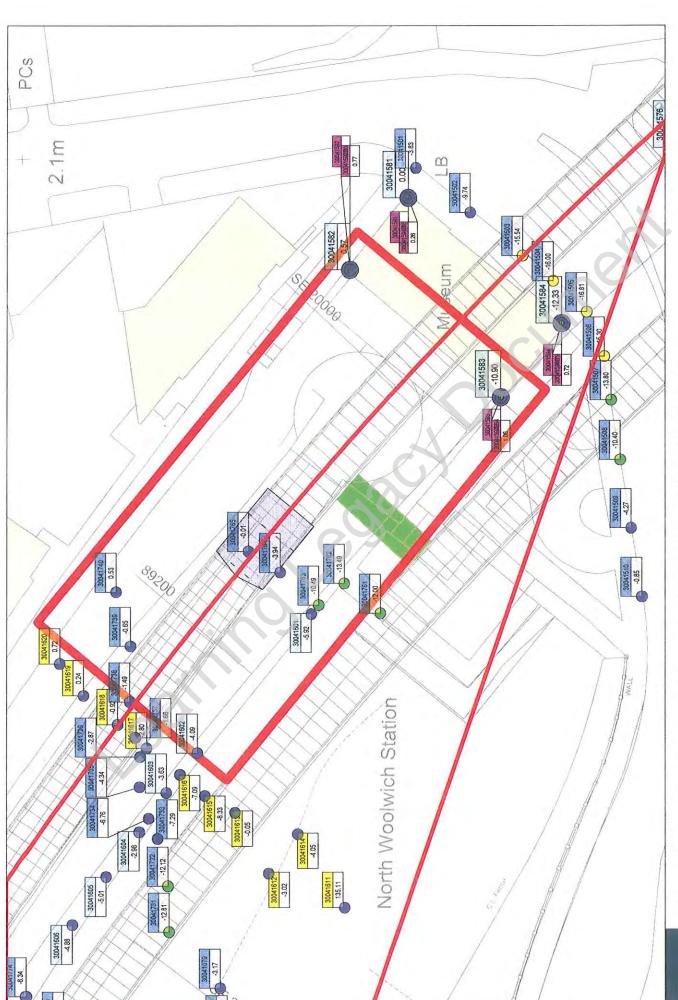
Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: WB Tunnel - CS TRM - 17.10.2013 - 21.11.2014

Date: 20.01.2015 09:46 Current Values: 20.01.2015 09:23

---- Distance TBM ----- Zero Distance

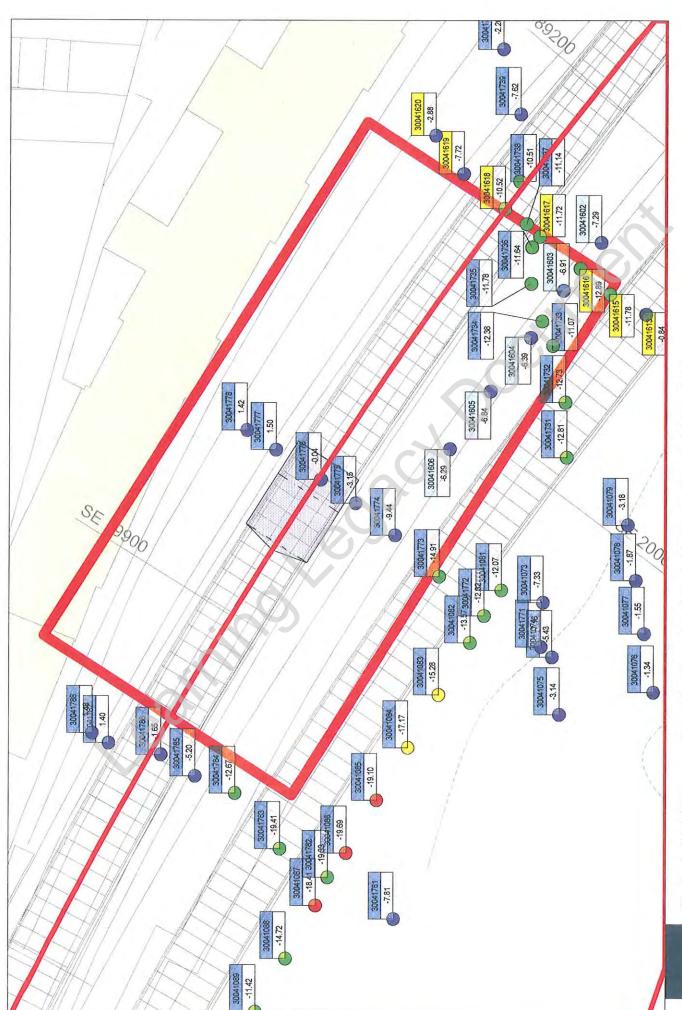
-30041732





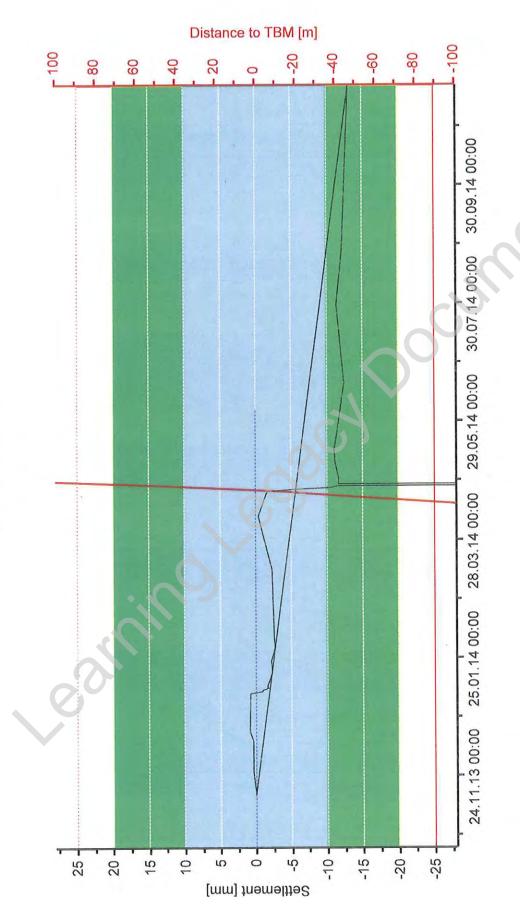
working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal current values: 21.04.2014 17:50





working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal current values: 25.04.2014 06:44



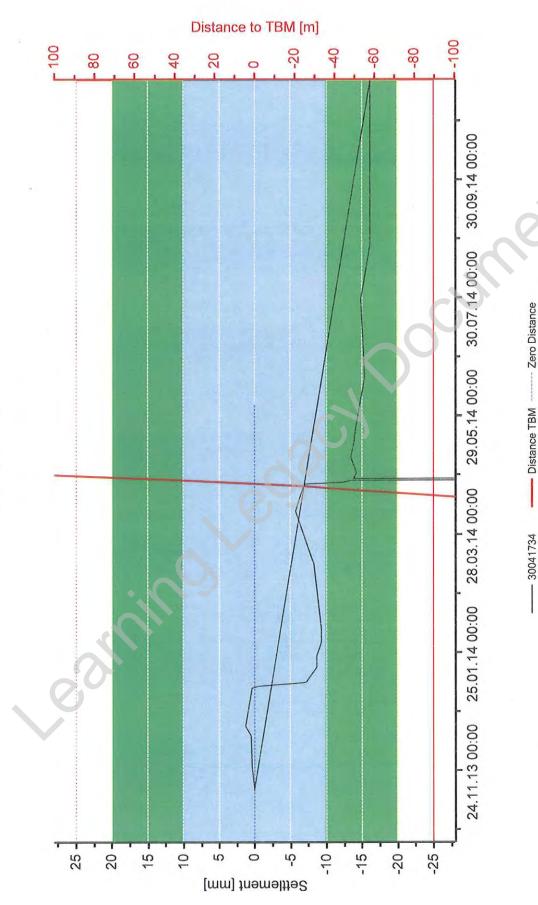


Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: EB Tunnel - CSTRM - 17.10.2013 - 21.11.2014 date: 20.01.2015 10:09 current values: 20.01.2015 09:39

---- Distance TBM ----- Zero Distance

30041738





Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: EB Tunnel - CSTRM - 17.10.2013 - 21.11.2014 date: 20.01.2015 10:14 current values: 20.01.2015 09:39





### Joint Venture

Tunnel
Thames
C310
project:

1			n from seline	ကု	4	ťγ	4	ကု	Ņ	7	7	7	0	
	6. following	08/01/2014	deviation from last/baseline	ç	4	ιŞ	ကု	-5	ņ	7	0	0	0	
	6.	80	elevation	102.582	102.542	102.590	103.772	103.781	103.871	102.759	102.757	102.767	103.867	
			n from seline	77		0	7	7	0	0	7	7	7	
	5, following	07/01/2014	deviation from last/baseline	0	flooded	-	7	7	ç	ç	ç	7	7	
	č,	70	elevation	102.584	#	102.595	103,775	103.783	103.872	102.760	102.757	102.767	103.867	
		П	n from seline	-	0	-	0	0	+	-	-	0	-	
	4, following	06/01/2014	deviation from last/baseline	0	0	7	Ţ	7	0	0	0	0	0	
	4, 1	90	elevation	102.584	102.546	102.594	103.776	103.784	103.874	102.762	102.759	102.768	103.868	3
1				0	0	0	-	7			-	0	-	
	3. following	17/12/2013	deviation from last/baseline	0	0	0		0	0	1	0	a	0	
_	69	17	elevation	102.584	102.546	102.595	103.777	103.785	103.874	102.762	102.759	102.768	103.868	
section		П	n from seline	7	0	0	-	-	-	+	0	0	÷	
structure: Twin Raising Mains Cross section	2. following	12/12/2013	deviation from last/baseline	0	0	0	0	0	-	0	0	0	0	
		12	elevation	102.584	102.546	102.594	103.776	103.784	103.874	102.762	102.759	102.768	103.868	
			n from seline	0	0	0	0	0	0	ş	0	0	0	
	1. following	26/11/2013	deviation from last/baseline	0	0	0	0	0	0	-	0	0	0	
	Ţ	22	elevation	102.584	102.546	102.595	103.776	103.784	103.873	102.762	102.759	102.768	103.868	
	baseline	14/11/13	elevation	102.585	102.546	102.595	103.776	103.784	103.873	102.761	102.758	102.768	103.867	
	No. of reading	date	ON	30041731	30041732	30041733	30041734	30041735	30041736	30041737	30041738	30041739	30041740	



### Joint Venture

Tunnel
Thames
C310
project:

		structure:		Twin Ra	win Raising Mains Cross section	ins Cros	ss secti	on											
No. of reading	baseline	7.	7. following		8,	8, following		ஏ	9. following	ET)	10.	10, following	0	11.	11. following	CD.	12.	12. following	-
date	14/11/13	30	08/01/2014		ő	09/01/2014		30	09/01/2014		10	10/01/2014		17	17/01/2014		18	18/01/2014	
Š	elevation	elevation	deviation last/ bas	deviation from last/ baseline	elevation	deviation from last/baseline	on from seline	elevation	deviation last/be	deviation from last/baseline	elevation	deviation from last/baseline	on from sseline	elevation	deviation from last/baseline	in from seline	elevation	deviation from last/baseline	n from seline
30041731	102.585	102.581	7	4	102.575	φ	-10	102,573	-2	Ę	102.572	7	-12	102.571	7	-13	102.572	0	-13
30041732	102.546	102.540	17	9	102.535	ιģ	Ŧ	102.533	-2	-13	102.533	0	-13				102.532	Ţ	4-
30041733	102,595				102.586	တု	œρ	102,586	7	o,	102.585	0	6	102.585	7	-10	102.584	0	-10
30041734	103.776	103.770	7	ι'n	103.769	c <sup>2</sup>	-7	103.768	0	1-	103.768	0	-7	103.767	7	တု			
30041735	103.784	103.780	$\tau$	4	103.779	7	τ'n	103.779	0	ıç,	103.779	0	τÒ	103.778	π	9			
30041736	103.873	103.870	77	ဗု	103.869	7	ကု	103.869	0	65-	103.869	0	ကု	103.868	5	4			
30041737	102.761	102.759	7	-2	102.758	0	ç	102.759	0	-2	102.758	0	42	102.758	7	ဗု			
30041738	102.758	102.757	0	7	102.757	0	Ņ	102.757	0	2	102.757	0	4	102.756	7	Ċ			
30041739	102.768	102.767	0	7	102.766	0	2	102.766	0	-2	102.767	0	7	102.766	7	-2			
30041740	103.867	103.867	0	0	103.866	7	7	103.866	0	7	103.867	0	0	103.866	7	7			
											3		K						



Joint Venture

project: C310 Thames Tunnel

	18. follo	21/04/	9 a	destro				_	-				-	
	+2		elevation		102.534	102.587	103.769	103.779	103.870	102.759	102.757	102.767	103.868	
	- 0		an from		-12	1-	φ	ကု	Ŋ	7	0	0	-	
	17, following	09/04/2014	deviation from last/baseline	destroyed	-	2	m	2	Q	2	2	2	2	
	17.	30	elevation	de	102.534	102.588	103.770	103.780	103.871	102.760	102.758	102.768	103.868	
	0		n from seline	-13	-14	ο̈́	φ	φ	4	ကု	4	ņ	0	
	16. following	12/03/2014	deviation from last/baseline	-	-	Ø	-	-	÷	÷	0	-	-	
	16	12	elevation	102.572	102.533	102.586	103.767	103.778	103.869	102.758	102.756	102.766	103.867	
	TD.		n from seline	-14	-15	11.	6-	9	-5	6.	6	42	7	
	15. following	06/02/2014	deviation from last/baseline	7	۲	0	0	0	0	0	0	0	0	
nc	15.	90	elevation	102.571	102.531	102.584	103.766	103.777	103.868	102.757	102.756	102.766	103.866	
s section		30/01/2014	deviation from last/baseline	14		-10	တု	-7	ιŅ	ကု	ကု	ç	42	
ns Cros	14. following			0		0	7	7	7	0	0	0	7	
Twin Raising Mains Cross section	14.	30	elevation	102,571		102.584	103.766	103.777	103,868	102.757	102.756	102.766	103.865	
Twin Ra			an from sseline	-13	-14	-10	o,	9	4	ကု	ņ	Ċ	7	
	3. following	23/01/2014	deviation from last/ baseline	0	0	0	0	0	0	0	0	0	0	
structure:	13,	23,	elevation	102.572	102.532	102.584	103.767	103.778	103.869	102.758	102.756	102.766	103.866	
	baseline	14/11/13	elevation	102.585	102.546	102.595	103.776	103.784	103.873	102.761	102.758	102.768	103.867	
	No. of reading	date	O	30041731	30041732	30041733	30041734	30041735	30041736	30041737	30041738	30041739	30041740	

deviation from last/baseline

18. following

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destroyed

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7 7 7 7



Joint Venture

C310 Thames Tunnel

project:

		structure:	Twin	n Raisii	ng Mair	n Raising Mains Cross section	s section	uc											
No. of reading	baseline	19	19. following		20. 1	20. following		21.	21. following	m	22.	22, following		23.	23. following		24.	24. following	70
date	14/11/13	2	22/04/2014	_	23/	23/04/2014		24	24/04/2014		63	25/04/2014	П	26	26/04/2014		29	29/04/2014	
Ŏ.	elevation	elevation	deviation from last/ baseline		elevation	deviation from last/baseline	r from	elevation	deviation from last/baseline	on from seline	elevation	deviation from last/baseline		elevation	deviation from last/baseline	from seline	elevation	deviation from last/baseline	n from seline
30041731	102.585	O	destroyed		de	destroyed		S. C.	destroyed		Ö	destroyed		de	destroyed		de	destroyed	
30041732	102.546	102.534	0	-12 10	102.534	0	-12	102.533	7	-13	102.533	0	-13	102.533	0	-13	102.533	-	-13
30041733	102.595	102.588	0 -7		102.587	7	ထု	102.584	ကု	7	102.583	7	-12	102.583	0	-12	102.583	0	-12
30041734	103.776	103.769	2- 0		103.769	0	-7	103.763	5	-12	103.762	7	-14	103.762	0	-14	103.761	0	41-
30041735	103.784	103.779	0		103.779	0	4	103.772	-7	-12	103.771	7	73	103.770	7	-14	103.770	0	-14
30041736	103.873	103.870	0		103.870	0	ကု	103.861	0	-12	103.860	7	-13	103.860	7	-13	103.859	0	-13
30041737	102.761	102.759	0		102.756	ကု	ιģ	102.750	9	-11	102.749	7	-12	102.748	7	-13	102.748	0	-12
30041738	102.758	102.757	0		102,753	4-	ιģ	102.748	-5	7	102.747	7	-12	102.747	0	-12	102.747	0	-12
30041739	102.768	102.767	0		102.764	ကု	4	102.760	4	φ	102.760	7	φ	102.759	0	6	102.759	0	o,
30041740	103.867	103.868	0	10	103.866	-5	7	103.865	7	2	103.865	0	ကု	103.864	0	ကု	103.864	0	ကု
													<						



Joint Venture

C310 Thames Tunnel

project:

	_			-		_	,		_	_	,			_
D		on from asseline		-5										
followin	7/08/2014	deviation last/ba		estroyed	N	-	7	7	77	7	7	π	7	
30.	27	elevation		de	102.534	102.580	103.759	103.769	103.858	102.747	102.746	102.759	103.863	
-		n from seline			-14	-15	-15	-14	77	-12	7	1-	က္	
following	/07/2014	deviatio last/ba		stroyed	7	çı	0	-	-		-	N	0	
29.	29	elevation		de	102.532	102.579	103,761	103.770	103,859	102.748	102.747	102.761	103.864	
D		n from seline			-13	-13	-15	-15	41-	-14	-12	o,	ņ	
following	3/06/2014	deviatio last/ba		estroyed	0	0	7	7	7	Ť	٣	7	7	
28,	18	elevation		ŏ	102.533	102.581	103.760	103.769	103.859	102.747	102.746	102.759	103.864	
-		n from seline			-14	-13	-14	-13	-13	-13	-12	φ	-5	
following	2/05/2014	deviatio last/ba		stroyed	0	0	0	0	0	77	0	7	0	
27.	22/	elevation		de	102.532	102.581	103.761	103.770	103,860	102.748	102.747	102.760	103.865	
D		in from seline			-14	7	-14	-13	-13	-12	÷	1-	Ċ	
following	1/05/2014	deviatio		lestroyed	0	0	0	0	0	0	0	0	0	
26.	12	elevation		de	102.532	102.581	103.762	103.771	103.860	102.749	102.747	102,760	103.865	
		aseline			-14	-13	-13	-13	<del>ا</del>	-12	Ę	ထု	-5	
following	7/05/2014	deviatio		estroyed	7	7	,	-		-	-		-	
25.	0.0	elevation		de	102.532	102.582	103.762	103.771	103.860	102.749	102.747	102.760	103.865	
baseline	14/11/13	elevation		102,585	102.546	102.595	103.776	103.784	103.873	102.761	102.758	102.768	103.867	
No. of reading	date	No.		30041731	30041732	30041733	30041734	30041735	30041736	30041737	30041738	30041739	30041740	
		baseline         25. following         26. following         27. following         28. following         29. following           14/11/13         07/05/2014         14/05/2014         22/05/2014         22/05/2014         29/07/2014	baseline 25. following 26. following 27. following 28. following 29. fol	baseline 25. following 26. following 27. following 28. following 39. following 30. 14/11/13 07/05/2014 14/05/2014 22/05/2014 18/06/2014 29/07/2014 27/05/2	baseline         25. following         26. following         27. following         27. following         28. following         29. following         30.           14/11/13         07/05/2014         14/05/2014         22/05/2014         18/05/2014         29. following         30.           elevation from elevation flow elevation flow action from elevation flow deviation from last/baseline actioned         elevation flow elevation flow elevation flow flow flow flow flow flow flow flow	baseline         25. following         26. following         27. following         27. following         28. following         29. following         30.           14/11/13         O7/05/2014         14/05/2014         27. following         27. following         28. following         30.           elevation         deviation from lesvation         deviation from last/baseline         elevation last/baseline         elevation last/baseline         last/baseline         last/baseline         elevation last/baseline         last/baseline <td>baseline levation         25. following         26. following levation         27. following         27. following         28. following         29. following         30.           14/11/13         25. following         26. following         26. following         27. following         28. following         30. following         30.           elevation         deviation from leavation         deviation from last/baseline         elevation last/baseline         elevation last/baseline         elevation last/baseline         elevation last/baseline         last/baseline         last/baseline         elevation last/baseline         last/baseline         elevation last/baseline         last/baseline</td> <td>baseline levation         25. following levation         26. following levation         26. following levation         27. following levation         28. following levation         28. following levation         29. following levation         29. following levation         30.           elevation         levation from levation         deviation from last/baseline levation         deviation from last/baseline levation         deviation from last/baseline levation         deviation from last/baseline levation         last/baseline levation         deviation from last/baseline levation         last/b</td> <td>baseline levation         25 following levation         26 following levation         27 following levation         27 following levation         27 following levation         27 following levation         28 following levation         29 following levation         29 following levation         30.           elevation from levation         deviation from leavation         deviation from last/baseline levation         elevation from last/baseline levation         elevation from last/baseline levation         elevation from last/baseline last</td> <td>  Passeline   25. following   26. following   27. following   28. following   28. following   29. following   29. following   29. following   29. following   29. following   30. following   29. following   29. following   30. following   29. following   30. following  </td> <td>  Description   Pasceline   Pa</td> <td>  1411/13   102.585   102.585   1   102.758</td> <td>  1411/13   1411/14   1411</td> <td>  Passeline                                      </td>	baseline levation         25. following         26. following levation         27. following         27. following         28. following         29. following         30.           14/11/13         25. following         26. following         26. following         27. following         28. following         30. following         30.           elevation         deviation from leavation         deviation from last/baseline         elevation last/baseline         elevation last/baseline         elevation last/baseline         elevation last/baseline         last/baseline         last/baseline         elevation last/baseline         last/baseline         elevation last/baseline         last/baseline	baseline levation         25. following levation         26. following levation         26. following levation         27. following levation         28. following levation         28. following levation         29. following levation         29. following levation         30.           elevation         levation from levation         deviation from last/baseline levation         deviation from last/baseline levation         deviation from last/baseline levation         deviation from last/baseline levation         last/baseline levation         deviation from last/baseline levation         last/b	baseline levation         25 following levation         26 following levation         27 following levation         27 following levation         27 following levation         27 following levation         28 following levation         29 following levation         29 following levation         30.           elevation from levation         deviation from leavation         deviation from last/baseline levation         elevation from last/baseline levation         elevation from last/baseline levation         elevation from last/baseline last	Passeline   25. following   26. following   27. following   28. following   28. following   29. following   29. following   29. following   29. following   29. following   30. following   29. following   29. following   30. following   29. following   30. following	Description   Pasceline   Pa	1411/13   102.585   102.585   1   102.758	1411/13   1411/14   1411	Passeline

C310 Thames Tunnel

project:

MURPHY SELLINGS AG

		structure:		win Ra	ising Ma	Twin Raising Mains Cross section	ion							
No. of reading	baseline	31,	31, following											
date	14/11/13	2	21/11/2014											
No.	elevation	elevation	deviation from last/ baseline		elevation	deviation from last/baseline	elevation	deviation from last/baseline						
30041731	102,585	Ď	destroyed											
30041732	102.546	ō	destroyed											
30041733	102.595	ō	destroyed											
30041734	103.776	103.759	0	-16				Ç						
30041735	103.784	103.769	0	-15				3						
30041736	103.873	103.859	-	-14										
30041737	102.761	O	obstructed											
30041738	102.758	102.745	+	-13										
30041739	102.768	102.759	0	o-										
30041740	103.867	103.862	0	ကု					)					

△ HOCHTIEF Joint V			C310 THAMES TUNNEL REPORT		
EMPLOYER	CROSSRAIL	eB NO	C310-HTM-C-RGN-CR148-50025	Rev	1.0
TITLE			orts for Thames Water assets relating to T River Thames - North Woolwich Portal (e)		

APPENDIX 84
TRM Car park



#### **C310 Thames Tunnel**

**Close Out Report** 

Rev. 1.0

monitor	ing asset		TV	V Twin Rising N	/lain
reference mon	itoring drawing:		C310-HT	M-C-DWG-CR146-ST	004-70003
name of moni	toring section:		Twin f	Rising Main - Carpa	rk HMJV
senso	r type:			manual levelling stu	ds
chainage:	89190-89050		point no.:	3004 10	71 - 3004 1100
	values: m]	green:	+16 -16	andw1 *20.	red: +25
reference	document for trigg	ger values:	Managem	ent Plan for Contro	ol of Ground Movement
		EB-no.:		C310-HTM-Z-STP-	CR148-50058
		Appendix:		AAA	

#### monitoring data

	d	late	max. value	point no.	comments
baseline	25/	11/13	0.00		
TBM 1	start ZOI	07/01/14 14/01/14	-1.33 -1.93	3004 1081 3004 1097	0,
	end ZOI	11/01/14 16/01/14	-12.59 -6.36	3004 1081 3004 1097	breached not any trigger value
твм 2	start ZOI	23/04/14 28/04/14	-12.13 -9.08	3004 1081 3004 1097	
	end ZOI	26/04/14 30/04/14	-13.03 -9.91	3004 1081 3004 1097	breached not any trigger value
longterm		21/11/14	-21.99	3004 1085	breached amber trigger value
Evalua	tion of any	potential	<b>V</b>	No residual i	risk orks have been completed by HMJV
	residual ris	ks		Yes, residual	

#### summary / comments

The maximum deflection ratio is 1:3960 (3004 1087 - 3004 1086 - 3004 1085) - no trigger breached (TW alert value 1:1000).

Under consideration of temperature differences, the surrounding ground condition and the achievable accuracy of the measurement, HMJV has no concern to cease the monitoring.

The rate of change in the monitoring data is less than the required standards as per the specifications and drawings.

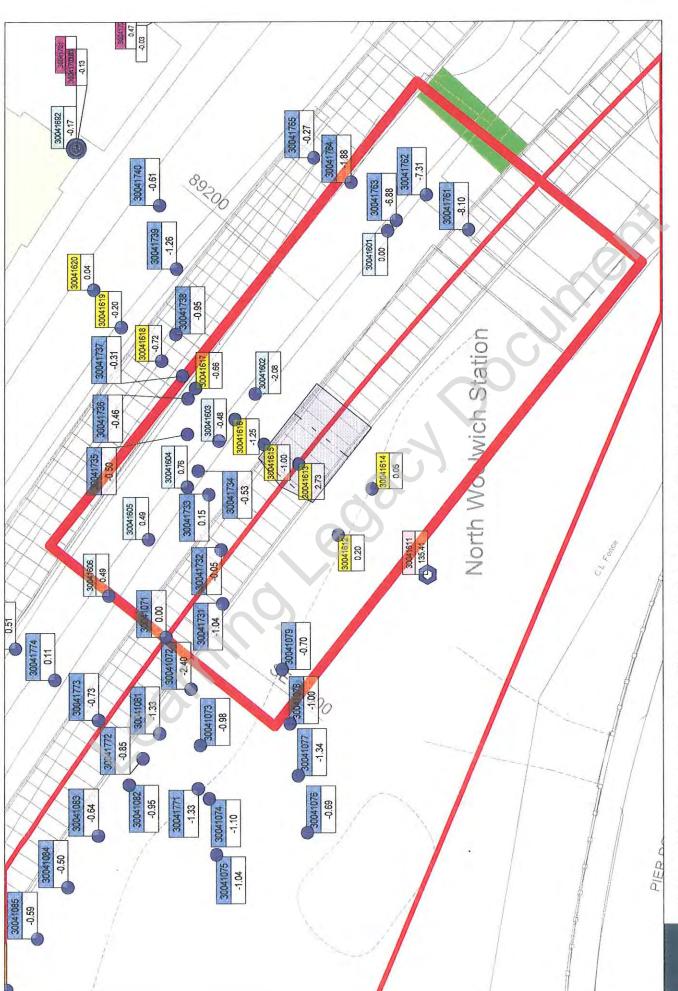
date / signature:

19/01/2015

print name:

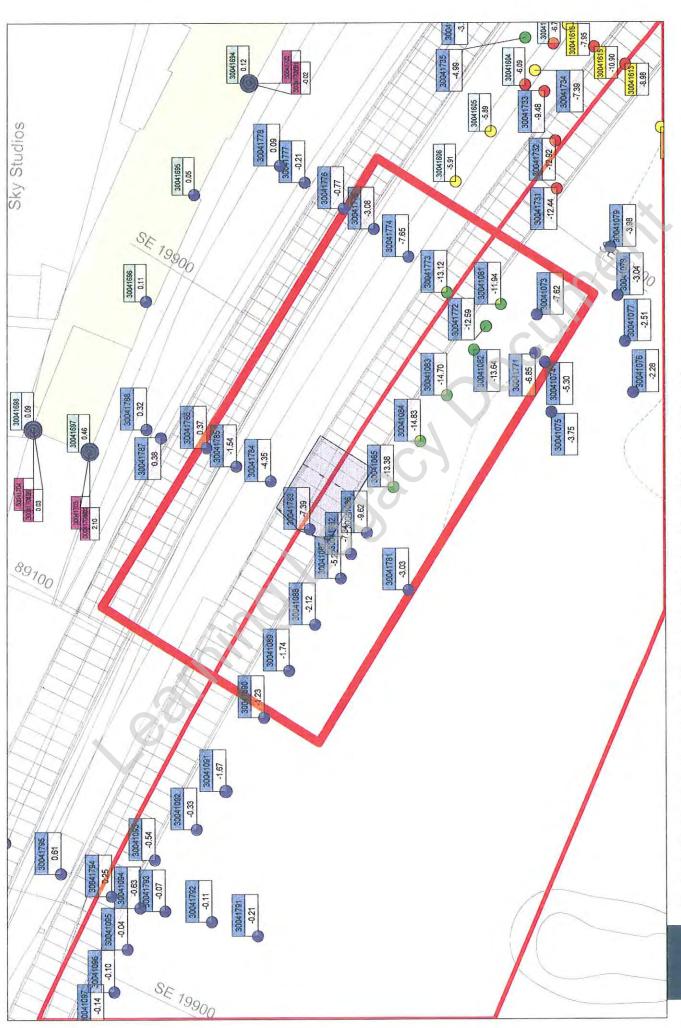
HMJV project role:

Monitoring & Survey engineer



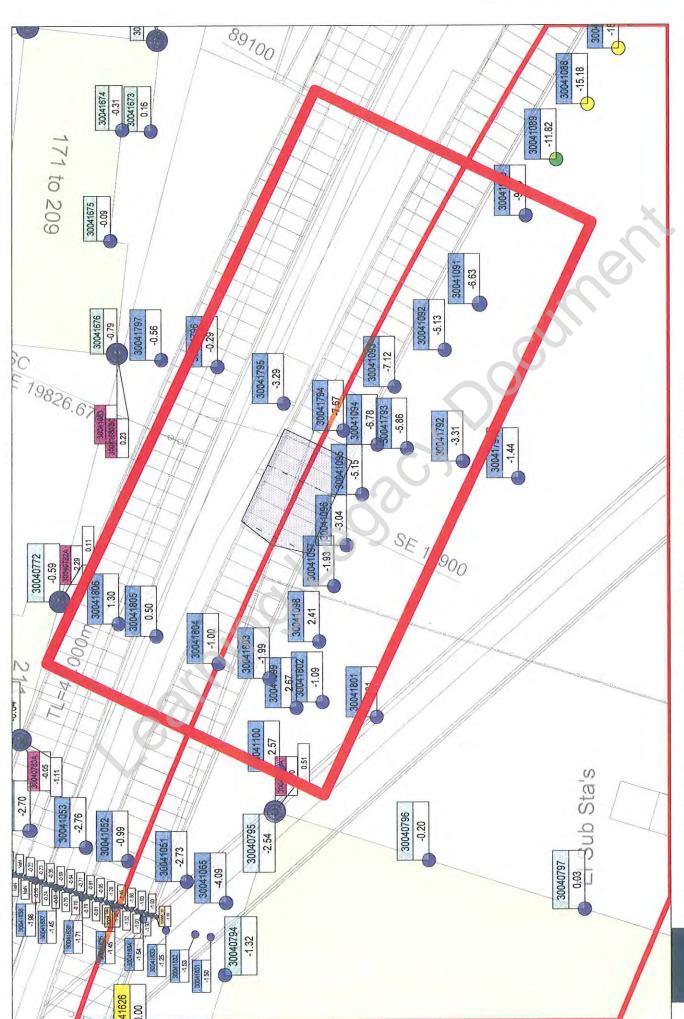
Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB current values: 07.01.2014 17:24





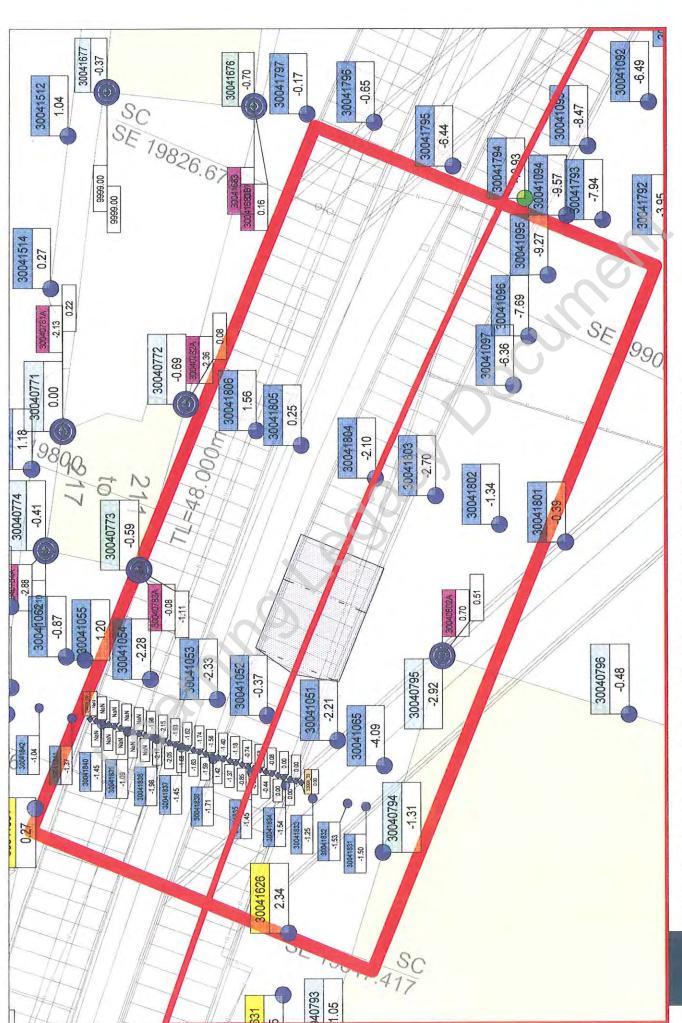
Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB current values: 11.01.2014 09:00

Ge ec



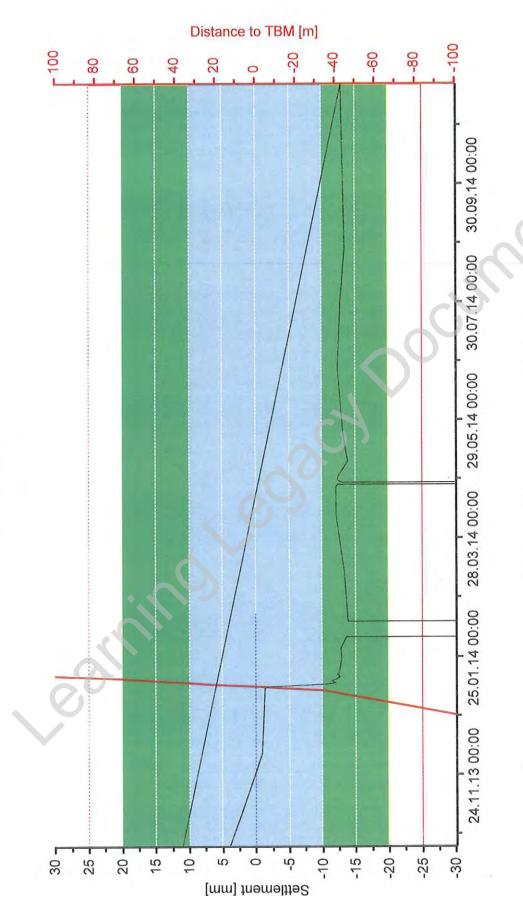
Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB current values: 14.01.2014 16:00





Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB current values: 16.01.2014 08:59



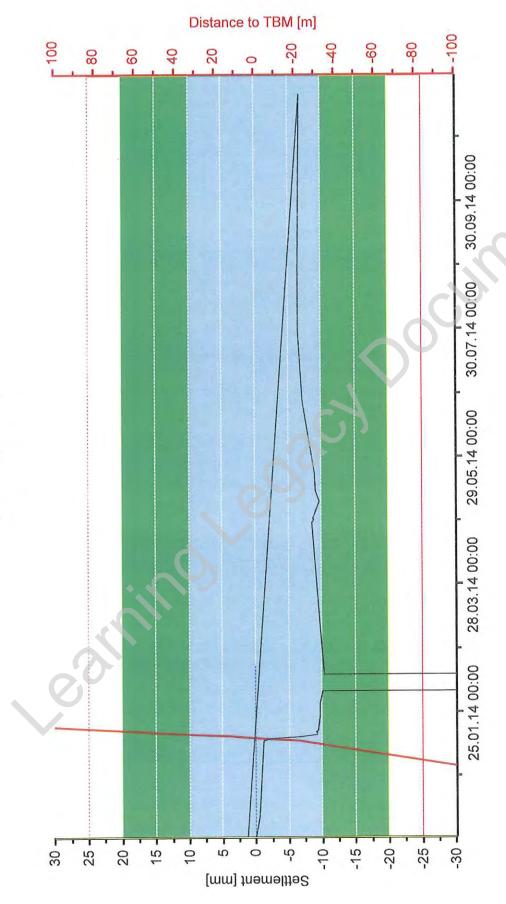


Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: WB Tunnel - TRM Carpark - 17.10.2013 - 21.11.2014 Date: 20.01.2015 12:08 Current Values: 20.01.2015 11:53

---- Distance TBM ----- Zero Distance

30041081





Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: WB Tunnel - TRM Carpark - 17.10.2013 - 21.11.2014 Date: 20.01.2015 12:11 Current Values: 20.01.2015 11:53

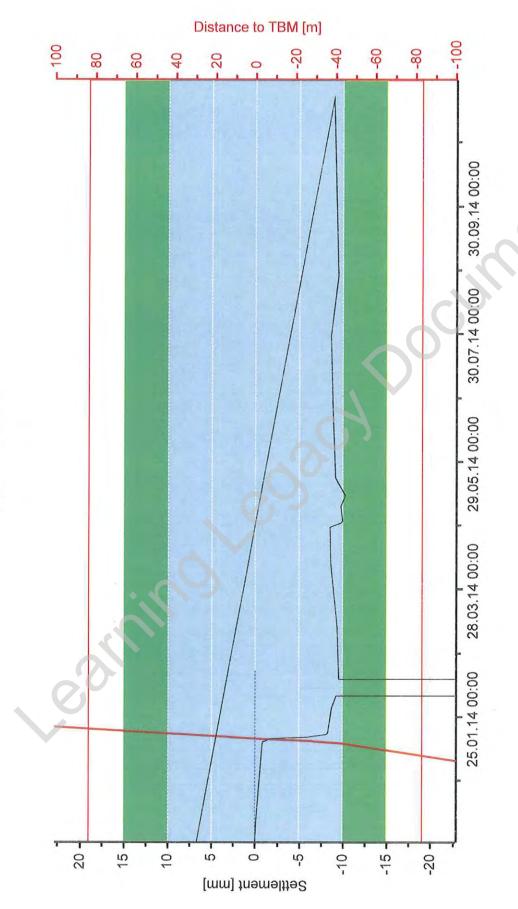
- Zero Distance

Distance TBM

cur. Values

-30041090





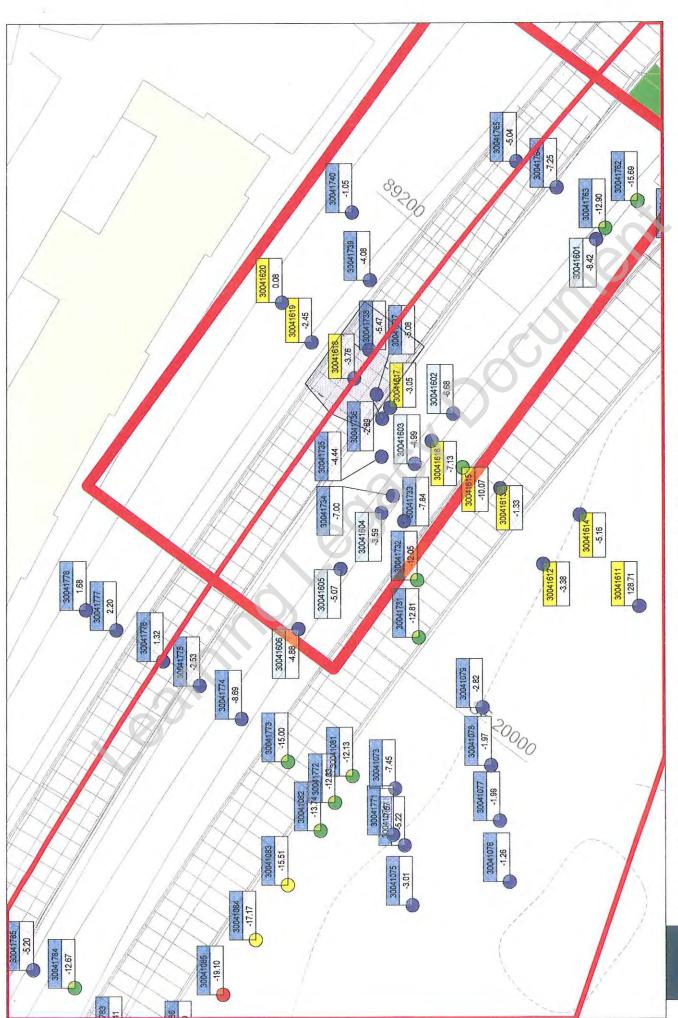
Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: WB Tunnel - TRM Carpark - 17.10.2013 - 21.11.2014

Date: 20.01.2015 12:14 Current Values: 20.01.2015 12:06

---- Distance TBM ----- Zero Distance

30041097





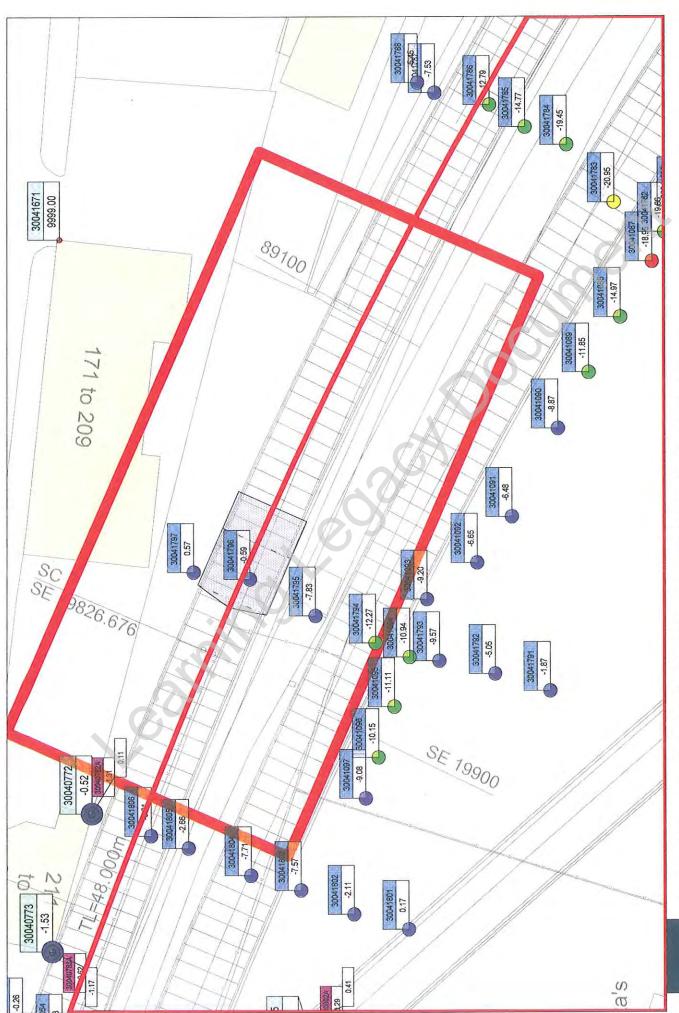
working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal current values: 23.04.2014 12:00





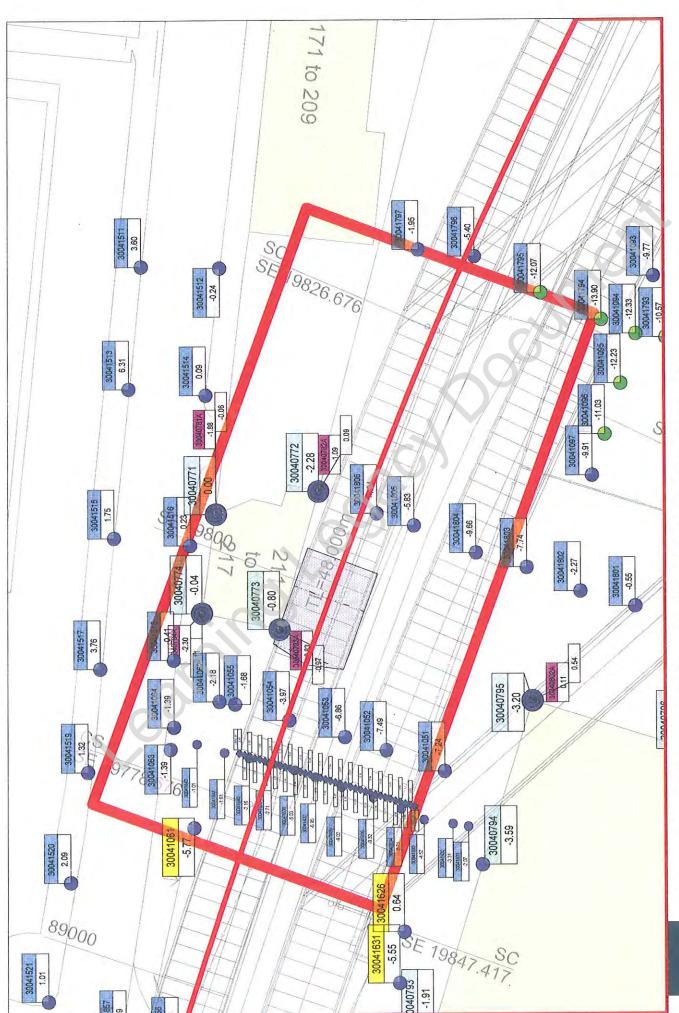
working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal current values: 26.04.2014 09:01





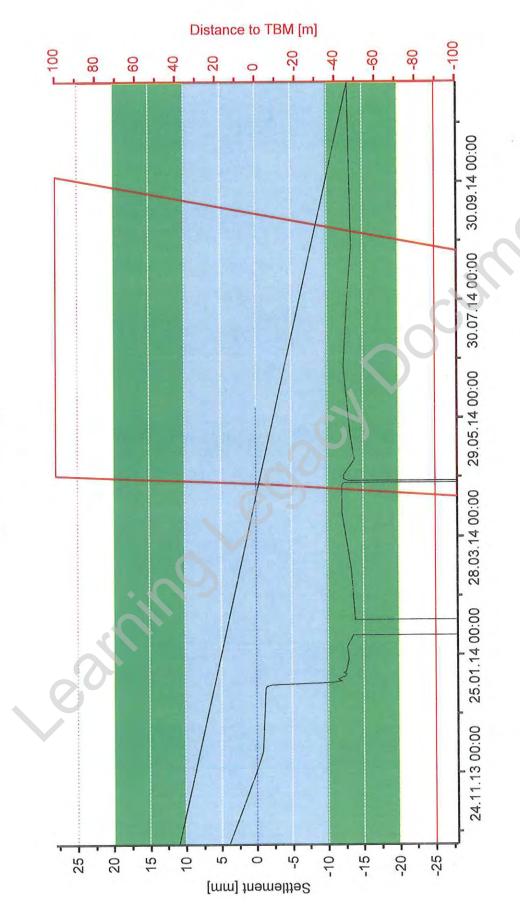
working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab current values: 28.04.2014 13:52 Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal





working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal current values: 30.04.2014 09:00

Gelec

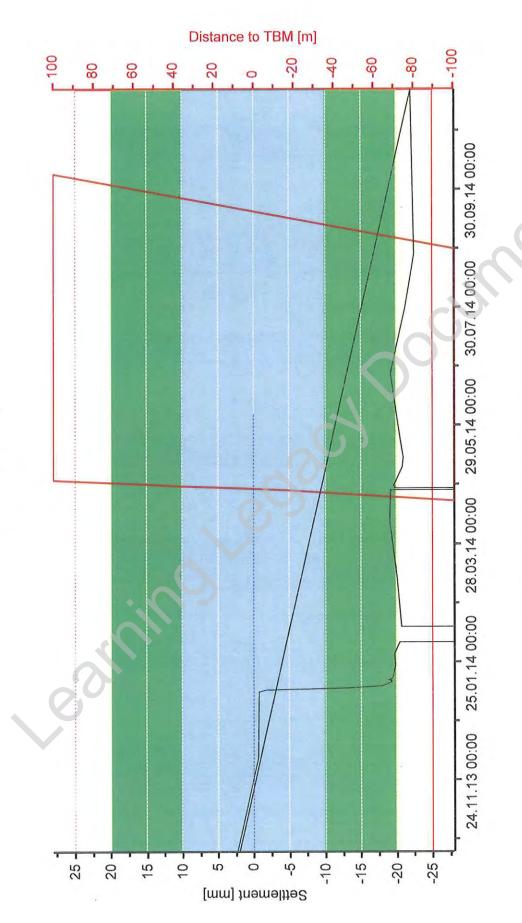


Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: EB Tunnel - TRM Carpark - 17.10.2013 - 21.11.2014 date: 20.01.2015 10:21 current values: 20.01.2015 09:39

---- Distance TBM ----- Zero Distance

-- 30041081



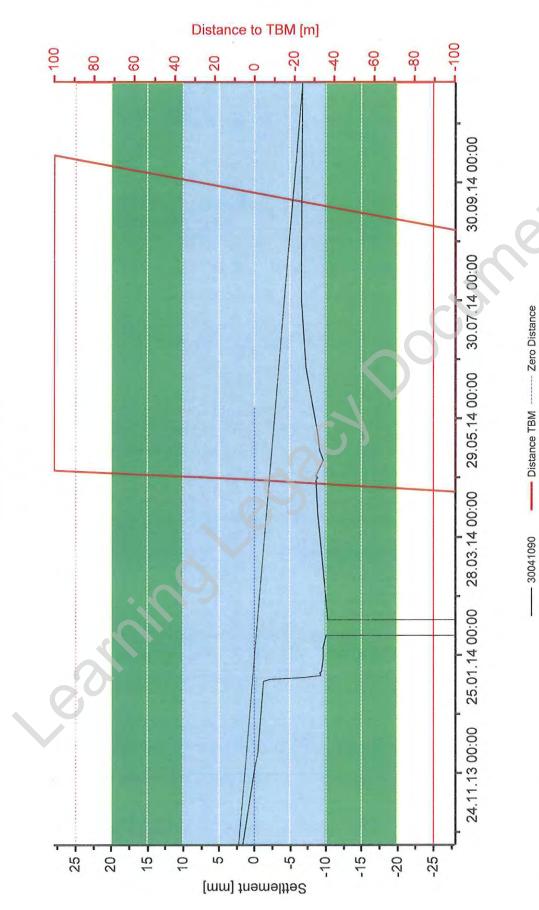


Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: EB Tunnel - TRM Carpark - 17.10.2013 - 21.11.2014 date: 20.01.2015 10:24 current values: 20.01.2015 09:39

---- Distance TBM ----- Zero Distance

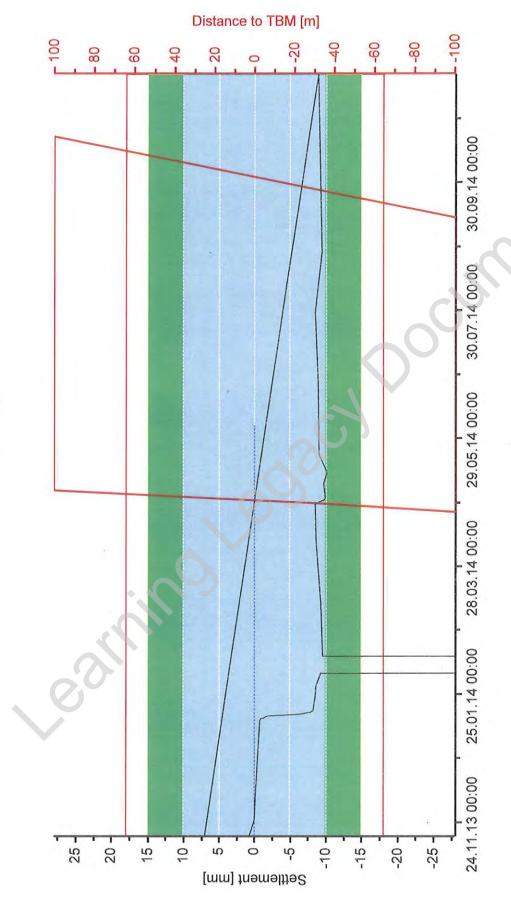
- 30041085





Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: EB Tunnel - TRM Carpark - 17.10.2013 - 21.11.2014 date: 20.01.2015 10:26 current values: 20.01.2015 09:39





Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: EB Tunnel - TRM Carpark - 17.10.2013 - 21.11.2014 date: 20.01.2015 10:32 current values: 20.01.2015 09:39

---- Distance TBM ----- Zero Distance

-30041097



C310 Thames Tunnel

project:

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No. of reading	baseline	÷	1. following		oi.	2. following		69	3. following		4	4. following		ល	5. following		6	6. following	
date	25/11/13	Ö	05/12/2013	T	00	07/01/2014		ŏ	08/01/2014	П	ŏ	08/01/2014	П	ő	09/01/2014	П	10	401/2014	
NO NO	elevation	elevation	deviation from last/baseline		elevation	deviation from last/baseline	n from seline	elevation	deviatio	deviation from last/baseline	elevation	deviation from last/baseline	an from seline	elevation	deviation from last/baseline	n from seline	elevation	deviation from last/baseline	n from seline
30041071	destroyed	t	Tooler State of		7	Postonion		ī	payoutos		T	Hactroyed		t	peybytach		÷	destroyed	
30041072	destroyed	d	destroyed		5	estroyed		3	desiloyed		3	nakonsa		3	makanga		i	no ko no	
30041073	103.187	103.187	0	0	103.186	7	T	103.187	0	-1	103.186	0	77	103.186	0	5	103.181	κ'n	φ
30041074	103,180	103,180	77	7	103.179	0	7	103.179	0	7	103,179	0	7	103.179	0	Ţ	103.176	ကု	4
30041075	103.160	103,160	0	0	103.159	7	7				103,159	0	7	103.159	0	77	103,157	ç	ကု
30041076	103.243	103.243	0	0	103.242	0	7				103.241	7	-2	103.241	0	7	103.241	7	-2
30041077	103.269	103.268	0	0	103.267	7	7				103.267	0	-5	103.267	0	-5	103.266	7	-5
30041078	103,285	103,285	7	V	103.284	0	7				103.284	7	-2	103,283	0	4	103.282	7	ú
30041079	103.312	103,312	0	0	103.311	0	7				103.311	7	7	103,310	7	-2	103,308	7	4
30041080	destroyed	O	destroyed		ō	destroyed		to	destroyed		D	estroyed		O	destroyed		ŭ	destroyed	
30041081	103,157	103,156	7	Ţ	103.156	0	7	103,156	0	7	103.156	0	2	103.155	7	?	103.147	ф	-10
30041082	103.102	103.102	7	77	103.101	0	7				103.101	0	17	103,101	0	7	103.093	φ	6
30041083	103.042	103.041	7	Ψ										103.041	0	7	103.034	-7	1-
30041084	102.994	102.993	7	7									4	102.993	0	7	102,989	4	4
30041085	102.941	102.940	7	7										102.940	0	7	102.939	7	ç
30041086	102,887	102.887	0	0													102,886	7	7
30041087	102.834	102.833	0	0													102.833	7	7
30041088	102.749	102.748	7	7															
30041089	102,671	102.671	7	Ţ															
30041090	102.589	102,588	7	7															
30041091	102.512	102.511	-	7															
30041092	102,420	102.419	0	0															
30041093	102.490	102.489	7	٦															
30041094	102.903	102.902	7	7															
30041095	102.887	102,887	0	0															
30041096	102.852	102,852	0	0															
30041097	102.845	102.844	0	0															
30041098	destroyed																		
30041099	destroyed	D	destroyed		D	destroyed		D	destroyed		d	destroyed		0	destroyed		D	destroyed	
30041100	destroyed																		



		structure:		Twin Ra	Twin Raising Mains CarPark	ins Carl	Park												١
No. of reading	baseline	7.	7. following		00	8. following		6	9. following		10.	10. following	8	Ť.	11. following		12	12. following	Đ,
date	25/11/13	=	10/01/2014	T	1	11/01/2014		12	12/01/2014	T	13	13/01/2014	П	1	13/01/2014	П		14/01/2014	
o Z	elevation	elevation	deviation from last/ baseline		elevation	deviation from last/baseline	on from seline	elevation	deviation from last/baseline		elevation	deviation from last/baseline		elevation	deviation from last/baseline	n from seline	elevation	deviation fron last/baseline	on fro aselin
30041071	destroyed	ō	destroyed		ŭ	destroyed		ä	destroyed		쁑	destroyed		ð	destroyed		0	destroyed	73
30041072	destroyed	001001	,		00+00+	,	o	100 100	C	1	001 001	c	a	001 001	c	a	102 170	c	a
30041073	103.107	103.150	7 0	- u	103.160	, 0	ò ri	103.175	0 0	- u	103.175	0 0	p u	103.175	0 0	b rů	103 175	0 0	2 4
30041075	103.160	103.157	0	o e	103.156	7	4	103.157	, -	ņ	103.157	0	ņ	103,157	0	4	103.156	0	4
30041076	103.243	103.241	0	2.	103.241	0	?	103.241	0	C)	103,241	0	2	103.241	0	2	103.241	0	-2
30041077	103.269	103.266	0	ċ'n	103.266	0	ņ	103.267	0	-2	103.267	0	ņ	103,266	0	ç	103,266	0	-2
30041078	103.285	103.282	0	ņ	103.282	0	ń	103.282	0	eγ	103.282	0	ņ	103,282	0	e,	103.282	F	6,
30041079	103,312	103,308	0	4	103.308	0	4	103.306	2	ę	103,308	2	4	103,308	0	4	103.308	0	4-
30041080	destroyed	Ō	destroyed		ō	destroyed		Ď	destroyed		Cle	destroyed		to	destroyed		D	destroyed	73
30041081	103,157	103.146	7	-11	103,145	T	-12	103.145	-	-11	103.145		-12	103,145	0	-12	103.144	0	-13
30041082	103.102	103.090	ကု	-12	103.089	ç	14	103.089	0	-13	103.088	T	-14	103.088	0	-14	103,088	0	-15
30041083	103.042	103.030	4	H	103.027	6,	-15	103.026	0	-15	103,026	0	-15	103.026	0	-16	103.025	0	-16
30041084	102,994	102,985	4-	6	102.979	9-	-15	102.977	2	-17	102.976	7	-17	102.976	0	-17	102.976	0	-18
30041085	102.941	102.936	ep.	ċ	102,927	œρ	-13	102.923	Ġ.	-18	102.922	7	-19	102.922	0	-19	102,922	0	-19
30041086	102.887	102,885	۲	-2	102.877	-7	-10	102,869	<u>ق</u>	-18	102,868	τ	-19	102.867	0	-19	102,867	0	-50
30041087	102.834	102.833	0	7	102.828	4	τÓ	102.819	-10	-15	102.816	ņ	-18	102.815	0	-18	102.815	0	-19
30041088	102.749	102.748	0	7	102.747	77	?	102.739	-7	-10	102.734	ΐν	-15	102.734	0	-15	102.733	7	-16
30041089	102.671				102.670	T	-5	102.667	တု	ιģ	102.661	φ	÷	102.660	0	-11	102,660	7	-12
30041090	102.589				102.587	-1	7	102,586	7	2	102,581	ιγ	-7	102,581	7	φ	102,579	ç	ο̈́
30041091	102.512				102.510	Ŧ	-2	102.511	0	7	102.509	57	က္	102.509	٥	က္	102.505	ဗု	-7
30041092	102,420							102,419	0	7	102.419	0	7	102,418	τ	57	102,415	ကု	τÒ
30041093	102,490							102.489	0	-	102.489	0	77	102,489	٦	7	102,484	-ĈI	Ģ
30041094	102.903							102.901	7	7	102.902	0	-1	102.901	0	7	102.898	4	5
30041095	102,887							102.886	7	7	102.886	0	77	102.886	0	T	102.884	ch	8
30041096	102,852							102.851	٦	7	102,851	0	T	102.851	0	7	102.850	5	5
30041097	102,845							102.844	Ţ	7	102.844	0	7	102.843	0	ফ	102.843	0	
30041098	destroyed																		
30041099	destroyed		destroyed		O	destroyed	-	D	destroyed		ō	destroyed		O	destroyed			destroyed	0
30041100	destroyed																		-

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25/11/13 25/11/13 elevation elevation destroyed destroyed 103.187 103.187 103.243 103.243 103.285 103.285 103.285	13. fo			IWIII RAISIIIG MAIIIS CAILAIN	-												
elevation elevation elevation destroyed destroyed 103.187 103.243 103.285 103.285 103.312 103.312 103.312 103.312	14/0.	13. following		14. fi	14. following		15.	15. following		16.	16. following	D	17.	17. following		18. following	guiv
destroyed destroyed destroyed 103.187 103.269 103.269 103.285		14/01/2014	H	15/1	15/01/2014		44	15/01/2014		16	16/01/2014	П	î	16/01/2014	H	17/01/201	114
destroyed destroyed 103.187 103.269 103.269 103.285 103.205 10	elevation d	deviation from last/ baseline		elevation	deviation from last/baseline		elevation	deviation from last/baseline		elevation	deviation from last/baseline	deviation from last/baseline	elevation	deviation from last/baseline	n elevation		deviation from last/baseline
destroyed destroyed 103.187 103.269 103.285 10																	
destroyed 103.187 103.180 103.243 103.285 103.285 103.285 103.312 103.312	dest	destroved		des	destroved		de	destroyed		90	destroyed		Ó	destroyed		destroyed	ed
103.187 103.180 103.243 103.285 103.285 103.312 103.312		200															
103.180 103.243 103.285 103.285 103.312 103.312	103.180	0	8	103.179	0	ထု	103,180	0	φ	103.180	0	æ					
103.160 103.283 103.285 103.285 103.312 103.312	103.175	0	9	103,175	0	φ	103,175	0	rὑ	103.175	0	ι'n					
103.243 103.269 103.285 103.312 103.157	103,156	0	4 10	103,157	0	4	103.157	0	ņ	103.157	0	ņ					
103.285 103.285 103.312 destroyed 103.157	103.241	0	-2 10	103.241	0	ç	103.241	0	C)Ł	103.241	0	ç					
103.285 103.312 destroyed 103,157	103.266	0	-2 10	103.266	0	Ċ	103.267	0	-2	103.266	0	42					
103.312 destroyed 103,157	103,282	0	-3 10	103.282	0	ņ	103.283	1	ņ	103,282	0	ကု					
destroyed 103,157	103.308	0	4 10	103.308	0	4	103,308	0	4	103.308	0	4					
103,157	desi	destroyed		de	destroyed		Ö	destroyed		D	destroyed		O	destroyed		destroyed	pe
	103.144	0	-13 10	103,144	0	- 13	103.145	0	-12	103.144	0	-13					
30041082 103.102 103	103.088	0	-14 10	103.088	0	-14	103,088	0	-14	103.088	0	-14					
30041083 103.042 103	103.026	0	-16 10	103.026	0	-16	103.026	0	-16	103.026	0	-16					
30041084 102.994 102	102.976	0	-18 10	102.976	0	19	102.976	0	-17	102.976	0	-17					
30041085 102.941 102	102.921	0	-19 10	102.922	0	-19	102,922	0	-19	102,921	7	-19					
30041086 102.887 102	102.867	0	-20 10	102.867	0	-20	102.867	0	-50	102.867	0	-20					
30041087 102.834 102	102.815	0	-18 10	102.815	0	-19	102.815	0	-18	102.815	0	-19					
30041088 102.749 102	102.734	0	-15 10	102.733	0	-15	102.734	0	-15	102.733	0	-15					
30041089 102.671 102	102,660	0	-12 10	102.660	0	-12	102,660	0	-12	102,659	0	-12					
30041090 102.589 102	102.579	0	-9	102.579	0	op.	102.579	0	o,	102.579	0	တု					-
30041091 102.512 102	102.505	0	-7 10	102,505	0	-7	102.505	0	-7	102,505	0	1-					4
30041092 102,420 102	102,415	0	5	102.414	7	φ	102.413	7	φ	102.414	-	φ					
30041093 102.490 102	102.483	-	-7 10	102.481	-2	o,	102,481	0	œρ	102.481	7	ο'n					K
30041094 102.903 102	102.896	-5	-7 10	102.893	6	-10	102.893	0	-10	102.892	7	-10	102.892	0 -10	0		
30041095 102.887 102	102.882	ç	-5-	102.878	ç	-10	102.878	0	o-	102.877	7	-10	102.877	0 -10	7102.877	77 0	-10
30041096 102,852 102	102.849	-	9	102.845	5	œρ	102.844	0	ф	102.843	7	6	102.843	6.	102.843	43	
30041097 102,845 102	102.843	0	-2	102,839	4	φ	102,838	0	φ	102.837	7	ထု	102.837	φ 0	102.836	36 0	φ
30041098 destroyed															_		
destroye	sap	destroyed	-	de	destroyed		0	destroyed		0	destroyed	-	0	destroyed		destroyed	pe/
30041100 destroyed															-	1	-

C310 Thames Tunnel

project:

△ HOCHTIEF MURPHY

	Ĩ	structure:	Τ	vin Ra	Twin Raising Mains CarPark	ns CarF	ark						1						
No. of reading	baseline	19	9. following		20,	20, following		21.	21. following		22	22. following		23.	23. following	m.	24	24. following	gr.
date	25/11/13	17	17/01/2014	Ħ	23	23/01/2014		29	29/01/2014	Ħ	04	04/02/2014	T	12	12/02/2014		1	10/03/201	
, O	elevation	elevation	deviation from last/ baseline		elevation	deviation from last/baseline	r from seline	elevation	deviation from last/baseline		elevation	deviation from last/baseline		elevation	deviation from last/baseline	n from seline	elevation	deviat last/b	deviation from last/baseline
				T						T			Г						
30041071	destroyed	07	doctrovari		2	Hactrowar		C	destroyad		- F	destroyed		90	destroyed		t	pevortsep	t
30041072	destroyed	5	pakanaa		Ť	Do Annie		5	pakana		5			j	200		3	1	,
30041073	103.187				103.179	π	œρ	103.179	0	6-	103.178	7	6	103.178	0	-10	103.179	÷	φ
30041074	103.180				103.174	+	φ	103.174	0	9	103.173	5	-7	103.173	0	-7	103.174	-	φ
30041075	103,160				103,156	0	4	103.156	0	4	103.156	7	٠,	103,156	0	4-	103.156	+	4
30041076	103.243				103,241	0	Ċ	103,241	0	-2	103,240	Ţ	က္	103.240	0	6,	103.241	-	2
30041077	103.269				103.266	0	ώ	103,266	0	6	103,265	7	4	103.265	0	4	103.266	+	ကု
30041078	103.285				103.282	0	က္	103.281	0	4	103.281	7	4	103,281	0	4	103.282	+	ကို
30041079	103.312				103,308	0	-5	103,308	0	ιŲ	103,307	1	φ	103.307	0	ιģ	103.308	1	κ'n
30041080	destroyed	de	destroyed		de	destroyed		de	destroyed		de	destroyed		de	destroyed		O	destroyed	t)
30041081	103,157				103.144	0	13	103.144	0	-13	103.143	-1	-14	103.143	0	-14	103.144	+	-13
30041082	103,102				103.087	7	-15	103.088	0	-15	103.087	7	-15	103.087	0	-16	103.087	0	-15
30041083	103.042				103.025	0	-16	103.025	0	-16	103.024	7	-17	103.024	0	-17	103.025	+	-17
30041084	102.994				102.975	٦	-18	102.976	0	-18	102.975	-17	-19	102.974	Ŧ	-19	102.975	-	<u>1</u>
30041085	102.941				102.921	0	-20	102.921	0	-20	102.920	70	-20	102.920	0	-21	102.921	-	-50
30041086	102,887				102.867	0	-20	102,867	0	-20	102.866	7	-21	102,866	0	-21	102.866	-	-21
30041087	102.834				102.815	0	-19	102.815	0	91-	102.814	7	-20	102.814	0	-20	102.814	-	-19
30041088	102.749				102.733	0	-16	102,733	0	-16	102.733	Ŧ	-16	102.732	0	-17	102.733	+	-16
30041089	102.671				102.659	0	-12	102.659	0	-12	102.659	7	-13	102.658	0	-13	102,659	+	-12
30041090	102,589				102,579	0	-10	102.579	0	-10	102.578	0	-10	102.578	0	-10	102.579	-	-10
30041091	102,512				102.504	0	ф	102.504	0	-7	102.504	0	φ	102.504	0	æρ	102.504	-	-7
30041092	102.420				102.412	-5	-7	102,413	1	1-	102,413	0	1-	102,412	7	ф	102.413	-	-7
30041093	102,490				102.480	0	o <sub>i</sub>	102,481	0	o,	102,480	0	-10	102.480	0	-10	102.480	-	o,
30041094	102.903	102.892	0	-11	102.892	0	Ţ	102.892	0	-11	102.891	0	-11	102.891	0	-12	102.892	7	Ē
30041095	102.887	102.877	0	-11	102.877	0	Ŧ,	102.876	0	-11	102.876	7	-12	102.876	0	-12	102.876	0	F
30041096	102.852	102.843	0	ο̈́	102.843	0	-10	102.842	0	-10	102,842	7	-10	102,842	0	-10	102.842	0	-10
30041097	102,845	102.836	0	ф	102.836	0	o,	102.836	0	o,	102.835	7	on T	102,835	0	-10	102.835	0	o,
30041098	destroyed																		
30041099	destroyed	D	destroyed		ð	destroyed		ō	destroyed		ō	destroyed		O	destroyed		U	destroyed	O
30041100	destroyed																		
																			L

C310 Thames Tunnel

project:

A HOCHTIEF MURPHY

		structure:		Twin Ra	Twin Raising Mains CarPark	ins Carl	Park												
No. of reading	baseline	25.	25. following	70	26.	26. following	75	27.	27. following		28.	28. following		65	29. following		30,	30, following	O
date	25/11/13	ŏ	09/04/2014		2	21/04/2014		22	22/04/2014	П	25	23/04/2014	T	24	24/04/2014	П	22	25/04/2014	
No.	elevation	elevation	deviation from last/ baseline	-	elevation	deviation from last/baseline		elevation	deviation from last/baseline		elevation	deviation from last/baseline	-	elevation	deviation from last/baseline	n from seline	elevation	deviation last/ba	deviation from last/baseline
																		Ú	
30041071	destroyed	7	doctround		1	The state of the		1	To to		1	Postonia		1	Portorio		7	- Constant	
30041072	destroyed		delinada		3	nakalisa ani chen		5	nakonsan		5	nesiloyen		3	nesiroken		5	nesnoven	
30041073	103,187	103.180	-	1-	103.180	0	φ	103.179	0	φ	103.180	-	1-	103,180	0	1-	103.180	0	φ
30041074	103.180	103.175	+	လှ	103.175	0	φ	103.175	0	φ	103.175	-	κ'n	103,175	0	ι'n	103.175	0	φ
30041075	103,160	103.157	-	eγ	103.157	0	ကု	103.156	0	4	103.157	-	ņ	103,157	0	ņ	103.157	0	ကု
30041076	103.243	103.241	0	-5	103.241	0	-5	103.241	0	-2	103.242	0	দ	103.242	0	7	103.241	0	-5
30041077	103.269	103.267		42	103.267	0	-5	103.266	0	-5	103.267	0	-5	103.267	0	42	103.267	7	-,5
30041078	103,285	103.283	-	-2	103.283	0	-2	103.283	0	5	103.283	0	2	103.283	0	-5	103,283	0	42
30041079	103,312	103.309	-	ņ	103,309	0	ကု	103.309	0	ņ	103,309	0	ကု	103,309	0	ņ	103.309	0	eņ
30041080	destroyed	ō	destroyed		ਹੋ	destroyed		de	destroyed		de	destroyed		d	destroyed		ō	destroyed	
30041081	103.157	103.145	,-	-12										103.145	0	-12	103.144	0	12
30041082	103,102	103.089	1	-14										103.089	0	-14	103.089	0	-14
30041083	103.042	103.026	-	-16								I		103.026	0	-15	103.026	77	-16
30041084	102.994	102.976	1	-17													102.976	0	-17
30041085	102,941	102,922	1	-19													102.922	0	-19
30041086	102,887	102.867	-	-20													102.867	0	-20
30041087	102.834	102.815	1	-18															
30041088	102.749	102.734	-	-15															
30041089	102.671	102.660	1	-11						1									
30041090	102.589	102.580	-	6															
30041091	102.512	102,505	-	-7															
30041092	102.420	102.413	+	1-															
30041093	102,490	102.481	0	o <sub>j</sub>															
30041094	102,903	102.892	0	-11															
30041095	102.887	102.877	-	+															1
30041096	102.852	102.842	0	-10															
30041097	102.845	102.836	-	o,															I
30041098	destroyed																		
30041099	destroyed	Ö	destroyed		ð	destroyed		ਹ	destroyed		ō	destroyed		ð	destroyed		Ö	destroyed	
30041100	destroyed																		

△ HOCHTIEF MURPHY

		structure:		Twin R	Twin Raising Mains CarPark	ins CarP	ark												
No. of reading	baseline	31	31. following	Ō	32.	32, following		33.	33, following		34,	34, following		35.	35, following		36.	36. following	
date	25/11/13	6	26/04/2014		2	27/04/2014		27	27/04/2014	П	28	104/2014	H	29	29/04/2014	П	20	07/05/2014	
No.	elevation	elevation	deviati	deviation from last/baseline	elevation	deviation from last/baseline	from	elevation	deviation from last/baseline	n from seline	elevation	deviation from last/baseline	-	elevation	deviation from last/baseline		elevation	deviation from last/baseline	n from seline
30041071	destroyed	t	daetrovari		ť	destroyed		T	dactroved		-	destroyed		- E	destroyed		t	destroyed	
30041072	destroyed		no do mon		1				The state of the s					í	no formation and				
30041073	103.187	103.179	0	φ													103.179	0	6
30041074	103,180	103.174	0	9-													103.174	0	φ
30041075	103.160	103.156	0	4											- 1		103.156	0	4
30041076	103,243	103.241	0	42													103.241	0	ņ
30041077	103.269	103.267	0	-2							?						103.266	0	က္
30041078	103,285	103.283	0	-,5													103.282	0	ကု
30041079	103,312	103.309	0	ę													103,308	77	4
30041080	destroyed	0	destroyed	7	D	destroyed		O	destroyed		de	destroyed		de	destroyed		de	destroyed	
30041081	103,157	103.144	7	-13	103.145	-	-12							103.145	0	-12	103.143	Ġ	-14
30041082	103.102	103.088	7	-15	103.088	0	-14					}		103.088	0	-14	103.087	7	-15
30041083	103.042	103.025	0	-16	103.025	0	-16							103.025	0	-16	103.025	7	-17
30041084	102.994	102.976	7	-18	102.976	0	-18							102.976	0	-18	102.974	7	-19
30041085	102,941	102.921	7	-20	102.921	O	-20	102.921	0	-20	102.921	0	-20	102,921	0	-20	102.920	π	-21
30041086	102,887	102.867	0	-20	102,866	Τ	-21	102,867	0	-20	102.867	0	-20	102,867	0	-20	102,865	7	-21
30041087	102.834				102.815	0	-19	102.815	0	-18	102.815	7	-19	102.815	-	-18	102.814	7	-20
30041088	102.749				102.734	0	-15				102.734	0	-15	102.734	0	-15	102.733	$\pi$	-16
30041089	102,671				102,660	0	5				102,660	7	-12	102,660	-	-11	102,659	7	-13
30041090	102.589				102,580	0	o,				102.580	0	6-	102.580	0	6,	102.579	7	-10
30041091	102.512				102.506	è	φ				102.505	7	φ	102.505	0	-1	102.505	77	1-
30041092	102.420				102.414	-	9				102.413	7	-7	102.413	0	1-	102,413	7	1-
30041093	102.490				102,481	0	οņ				102.480	0	6	102,480	7	-10	102.480	0	-10
30041094	102.903				102.892	0	-11				102.892	0	÷	102.891	7	-12	102.891	0	-12
30041095	102.887				102.877	0	-11				102.876	0	-11-	102.876	0	-12	102.875	0	-12
30041096	102.852				102.843	0	-10				102.842	7	-10	102.842	0	-10	102.842	0	-11
30041097	102.845				102.836	0	ō.				102.835	7	6-	102.835	7	-10	102,835	0	-10
30041098	destroyed																		
30041099	destroyed		destroyed	T	D	destroyed		O	destroyed		ð	destroyed		ō	destroyed		ō	destroyed	
30041100	destroyed																		

C310 Thames Tunnel

project:



No. of reading date	_																		
date	paseline	37.	37. following		38.	38. following	-	39.	39, following	5	40.	40. following	-	41.	41. following	C	45.	42. following	m
	25/11/13	112	12/05/2014		21	21/05/2014		28	28/05/2014	T	25	25/06/2014		26	29/07/2014		27	27/08/2014	
ò	elevation	elevation	deviation from last/ baseline		elevation	deviation from last/baseline	n from seline	elevation	deviation from last/baseline		elevation	deviation from last/baseline		elevation	deviation from last/baseline	on from seline	elevation	deviation from last/baseline	deviation from last/baseline
										1									
30041071	destroyed							1			7								
30041072	destroyed	Ö	destroyed		ő	destroyed		ğ	desiroyed		ă	destroyed		Ü	destroyed		ŏ	destroyed	
30041073	103.187	103.179	0	φ	103.179	0	ф				103.179	0	φ	103.179	0	œρ	103.179	7	o,
30041074	103,180	103.174	0	φ	103.174	0	φ				103,175	0	φ	103.175	0	φ	103,174	0	φ
30041075	103,160	103,156	0	4	103,156	0	4				103.156	0	4	103.156	0	4	103.156	0	4
30041076	103,243	103.241	+	Ş	103.241	0	-,5			V	103,241	0	-,5	103,241	0	5	103.240	7	ကု
30041077	103.269	103.266	0	4	103.266	0	42				103.266	0	ņ	103.266	0	ကု	103.266	0	ကု
30041078	103,285	103,282	0	ņ	103.282	0	φ				103.282	0	ကု	103.282	0	ကု	103.281	7	4
30041079	103.312	103.308	0	4	103,308	0	4				103.308	0	4	103,308	$\tau$	τĊ	103,307	0	ι'n
30041080	destroyed	ğ	destroyed		Q.	destroyed		de	destroyed		de	destroyed		D	estroyed		à	destroyed	
30041081	103,157	103.143	0	-14	103.144	0	-13	103.144	+	-13	103.145	0	-12	103.144	0	-13	103.143	7	-13
30041082	103.102	103.087	0	-15	103.088	0	15	103,088	-	-14	103,089	-	-14	103,089	0	-14	103.088	7	-14
30041083	103.042	103.024	0	-17	103.025		-17	103.026	-	-16	103.026	0	-16	103.025	7	-17	103.024	٣	-18
30041084	102.994	102.975	0	-19	102.975	0	-19	102.976	1	-18	102.976	0	-18	102.974	2	-20	102.972	Ç	-21
30041085	102.941	102.920	0	-21	102,920	0	-21	102.921	+	-20	102.922	0	-19	102.920	-2	-21	102,918	7	-23
30041086	102.887	102,866	0	-21	102.866	,-	-21	102.867	-	-20	102,868	-	-19	102.867	-1	-20	102.866	7	-21
30041087	102.834	102.814	0	-20	102.815	0	-19	102.816	-	-18	102.816	0	-18	102.817	0	-17	102.816	7	-18
30041088	102,749	102.733	0	-16	102.734	0	-15	102.734	÷	-14	102.735	+	-14	102.736		-13	102.735	77	-14
30041089	102.671	102.660	÷	-12	102.660	0	-12	102.661	-	F	102.661	0	-10	102.662	+	-10	102.662	0	-10
30041090	102,589	102.579	0	o,	102.580	0	op -	102.581	Ţ.	-7	102.581	0	-7	102.582	+	-7	102,582	0	-7
30041091	102.512	102.505	0	-7	102,505		φ	102.506	+	9	102.506	0	ċ	102,508	1	4	102,508	0	4
30041092	102.420	102.413	0	1-	102.413	-	1-	0	Sovered		0	Covered		U	Covered			overed	
30041093	102.490	102.479	0	-10	102.480	0	-10	102,481	-	ō,	102.480	77	-10	102.481	-	ထု	102,482	0	φ
30041094	102.903	102.891	0	-12	102.891	0	-12	102.892	-	-11	102.892	0	-11	102.893	1	-10	102.892	1	+11
30041095	102.887	102.875	0	-12	102.876	-	-12	102.877	-	÷	102.876	0	41	102.877	0	17	102.876	0	-11
30041096	102,852	102.841	0	Ę	102.842	0	-10	102.842	-	-10	102.842	0	-10	102,843		ō,	102.842	7	-10
30041097	102.845	102,834	7	-10	102,835	-	o,	102.836	0	6-	102.836	0	o,	102.836	0	ō,	102.835	7	6-
30041098	destroyed																		
30041099	destroyed	Ö	destroyed		ð	destroyed		d	destroyed		Ď.	destroyed		Ö	destroyed		Ū	destroyed	
30041100	destroyed																		

C310 Thames Tunnel

project:

MURPHY MURPHY

		structure:		Twin-R	aising Mai	Twin Raising Mains CarPark								
lo. of reading	baseline	.63	43. following	D	3									
date	25/11/13	2.	21/11/2014											
Š	elevation	elevation	deviation last/bc	deviation from last/baseline	elevation	deviation from last/baseline	elevation	deviation from last/baseline	elevation	deviation from last/baseline	elevation	deviation from last/baseline	elevation	deviation from last/baseline
30041071	destroyed	4	1											
30041072	destroyed	ō.	destroyed											
30041073	103.187	103.180	-	φ										
30041074	103,180	103.175	0	φ										
30041075	103,160	103,157	-	ကု										
30041076	103.243	103.241	-	-2										
30041077	103.269	103.267	-	Ŋ										
30041078	103,285	103,282	-	ņ						Ī				
30041079	103.312	103,309	-	ဗု										
30041080	destroyed	Ö	destroyed											
30041081	103,157	103,144	-	-13										
30041082	103,102	103.089	-	-13										
30041083	103.042	103.025	-	-17										
30041084	102.994	102.972	0	-21										
30041085	102.941	102.919	-	-22										
30041086	102.887	102.865	7	-22										
30041087	102.834	102.817		-16										
30041088	102.749	102.736	-	-13										
30041089	102.671	102.663	-	<u>٥</u> -										
30041090	102.589	102.582	0	-7										
30041091	102.512	102.508	-	6										
30041092	102.420	0	Covered										j	
30041093	102.490	102.482	-	-7										
30041094	102.903	102.893	1	-10										
30041095	102.887	102.877	-	-10										
30041096	102.852	102.843	1	6										
30041097	102.845	102.836	-	o,										
30041098	destroyed													
30041099	destroyed	Ö	destroyed	20										
30041100	destroyed													

△ HOCHTIEF MURPHY  Joint Venture		C310 THAMES TUNNEL REPORT				
<b>EMPLOYER</b>	CROSSRAIL	eB NO	C310-HTM-C-RGN-CR148-50025	Rev	1.0	
TITLE	Monitoring Close-Out Reports for Thames Water assets relating to Tunnelling Works North Embankment River Thames - North Woolwich Portal (excl. Store Rd)					

APPENDIX 93
TW Pumping Station - HLC



#### **C310 Thames Tunnel**

**Close Out Report** 

Rev. 1.0

mo	nitoring	asset		TV	V Pumping Stat	ion		
reference monitoring drawing:		C310-HTM-C-DWG-CR146-ST004-70003						
name of	f monitorin	g section:			TW Pumping Station	n		
	sensor type	e:		hydrostatic levelling cell (hlc)				
chainage	1	89040		point no.:	3004 079	1 - 3004 0799		
trigger values: [mm]			green:	+12 -12	umber: 15	red: +18		
refe	rence docur	ment for trig		Managem		of Ground Movement		
			EB-no.:					
			Appendix:		AAA			
			m	onitoring d	ata			
	date		max. value	point no.	comments			
baseline	08/6	03/13	0.00					
гвм 1	start ZOI	14/01/14	-2.54	3004 0795	) ,			
	end ZOI	19/01/14	-2.82	3005 0795	breached no	t any trigger value		
гвм 2	start ZOI	29/04/14	-3.14	3006 0795				
	end ZOI	02/05/14	-2.80	3007 0795	breached not	t any trigger value		
longterm 18/11/14		-1.91	3008 0795					
Evaluation of any potential		V	No residual risk since the Works have been completed by HMJV					
residual risks				Yes, residual risk (see comment below)				
ummary	/ comment	e						
annia y	Comment	3						

no concern to cease the monitoring.

The rate of change in the monitoring data is less than the required standards as per the specifications and drawings.

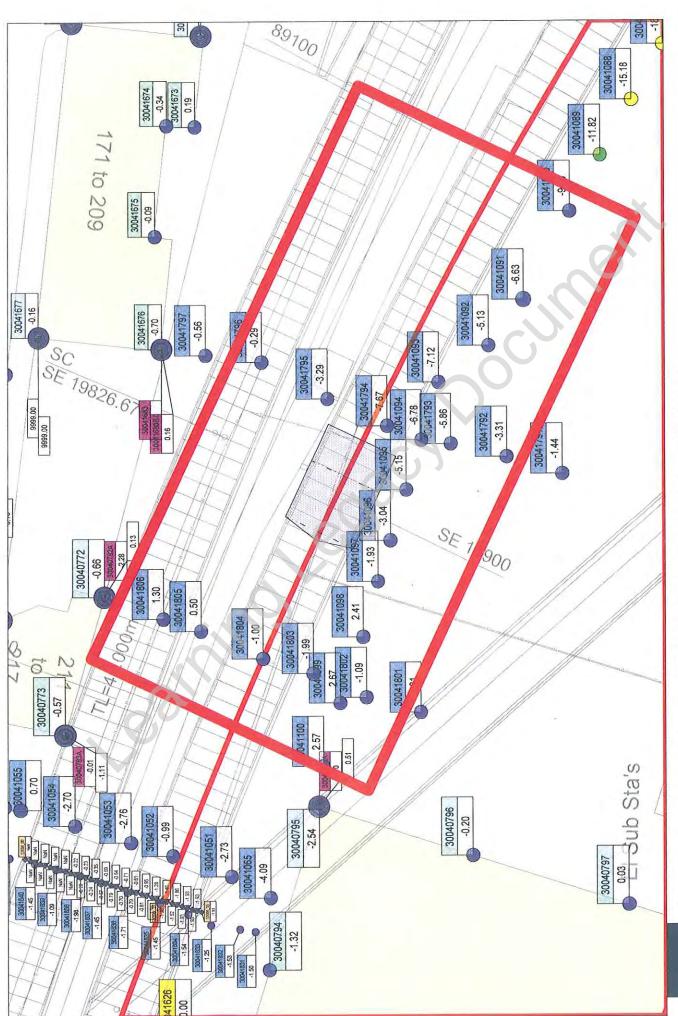
date / signature:

19/01/2015

print name:

HMJV project role:

Monitoring & Survey Engineer



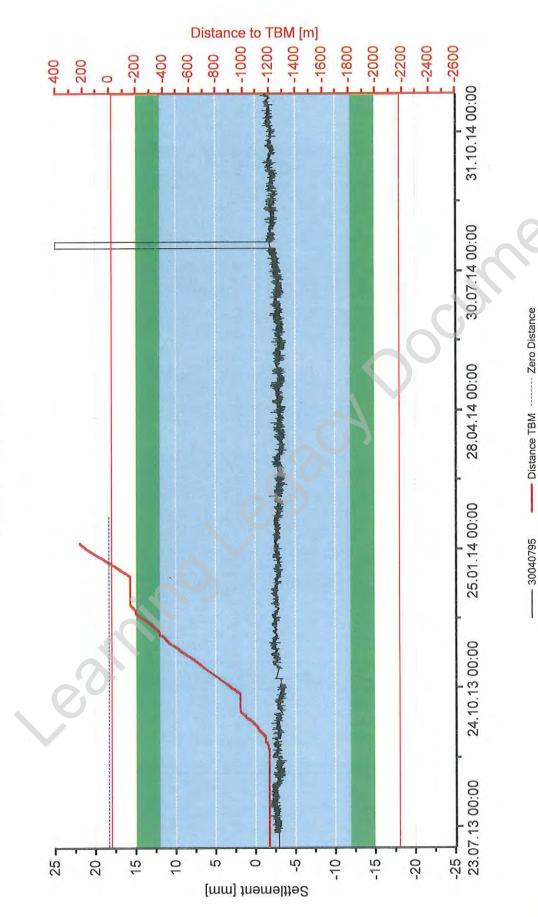
8

Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB current values: 14.01.2014 17:37



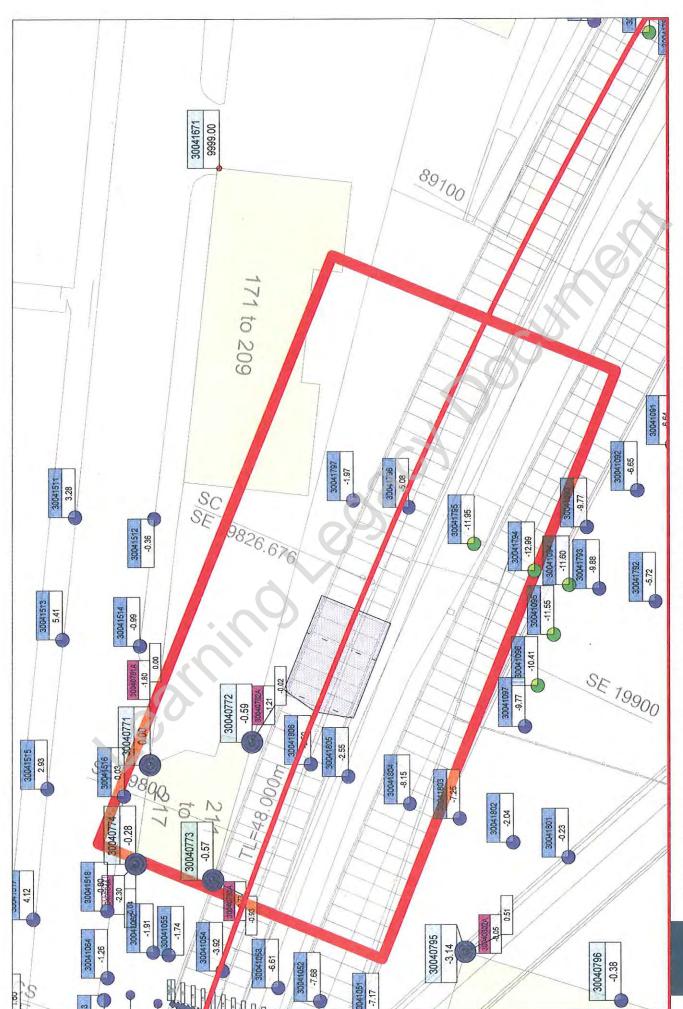
Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB current values: 19.01.2014 18:06





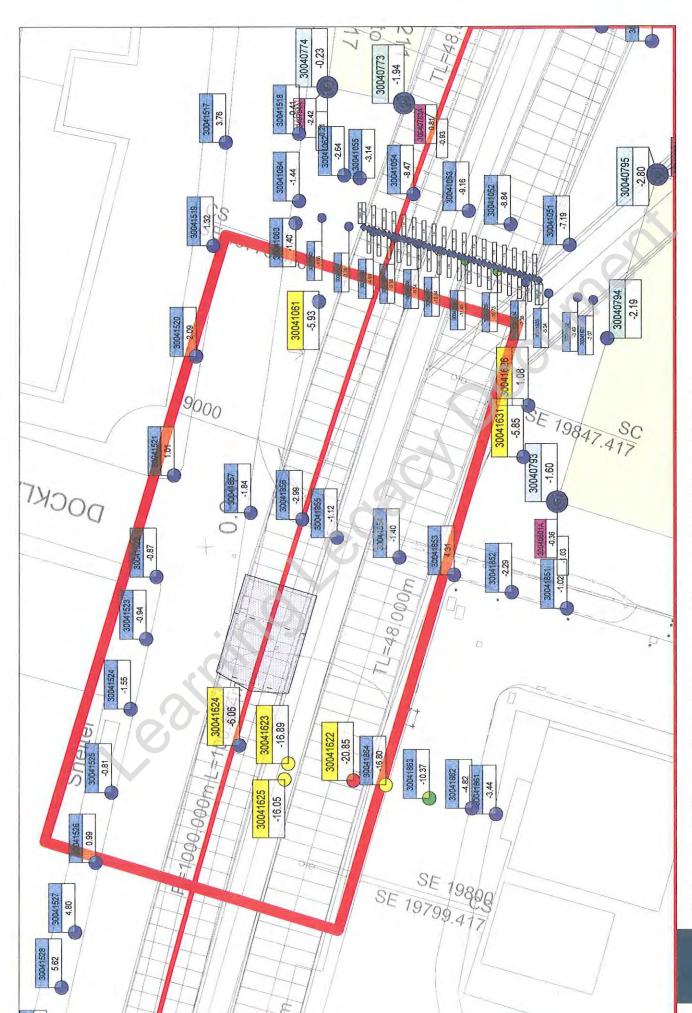
Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: WB Tunnel- TW Pumping station - 17.10.2013 - 21.11.2014 Date: 22.01.2015 10:06 Current Values: 22.01.2015 09:52





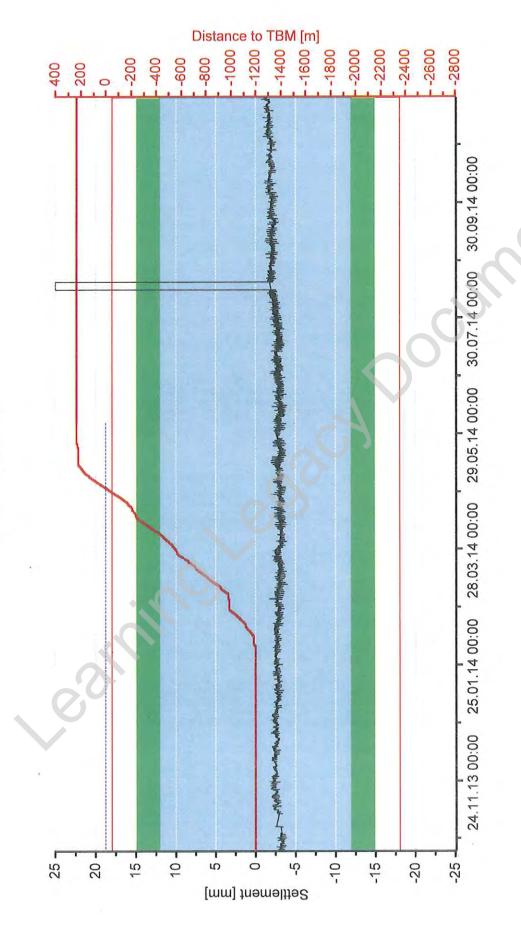
working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal current values: 29.04.2014 09:57

Gelec



working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal current values: 02.05.2014 17:41





Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: EB Tunnel - TW Pumping station - 17.10.2013 - 21.11.2014 date: 22.01.2015 09:57 current values: 22.01.2015 09:39

---- Distance TBM ----- Zero Distance

-30040795



△ HOCHTIEF MURPHY  Joint Venture		C310 THAMES TUNNEL REPORT				
EMPLOYER	CROSSRAIL	eB NO	C310-HTM-C-RGN-CR148-50025	Rev	1.0	
TITLE	Monitoring Close-Out Reports for Thames Water assets relating to Tunnelling Works North Embankment River Thames - North Woolwich Portal (excl. Store Rd)					

APPENDIX 94
TW Pumping Station - TM



#### **C310 Thames Tunnel**

**Close Out Report** 

Rev. 1.0

monitoring asset			TW Pumping Station					
referenc	ce monitoring	g drawing:		C310-H7	rm-c-dwg-cr146-sto	004-70003		
name o	name of monitoring section:			TW Pumping Station				
	sensor type	e:			tiltmeter			
chainage		89040		point no.: 3004 0801 - 3004 0802				
t	trigger value [mm]	es:	green:	+12 -12	amber -19	red: +18		
refe	rence docur	ment for trig		Managen		ol of Ground Movement		
			EB-no.:		C310-HTM-Z-STP-C	CR148-50058		
			Appendix:		AAA			
			m	onitoring d	lata			
	d	late	max. value	point no.	cc	omments		
baseline	08/	03/13	0.00					
твм 1	start ZOI	14/01/14	0.90	3004 0802A	,			
	end ZOI	19/01/14	0.77	3005 0802A	breached no	ot any trigger value		
твм 2	start ZOI	29/04/14	-0.05	3006 0802A				
	end ZOI	02/05/14	0.15	3007 0802A	breached no	ot any trigger value		
longterm		18/11/14	0.64	3008 0802A				
Evalua	Evaluation of any potential		7	No residual risk since the Works have been completed by HMJV				
residual risks			Yes, residual risk (see comment below)					
summary	/ comment	is.						
concern to	o cease the of change in	monitoring.				of the system, HMJV has raise per the specifications		

date / signature:

19/01/615

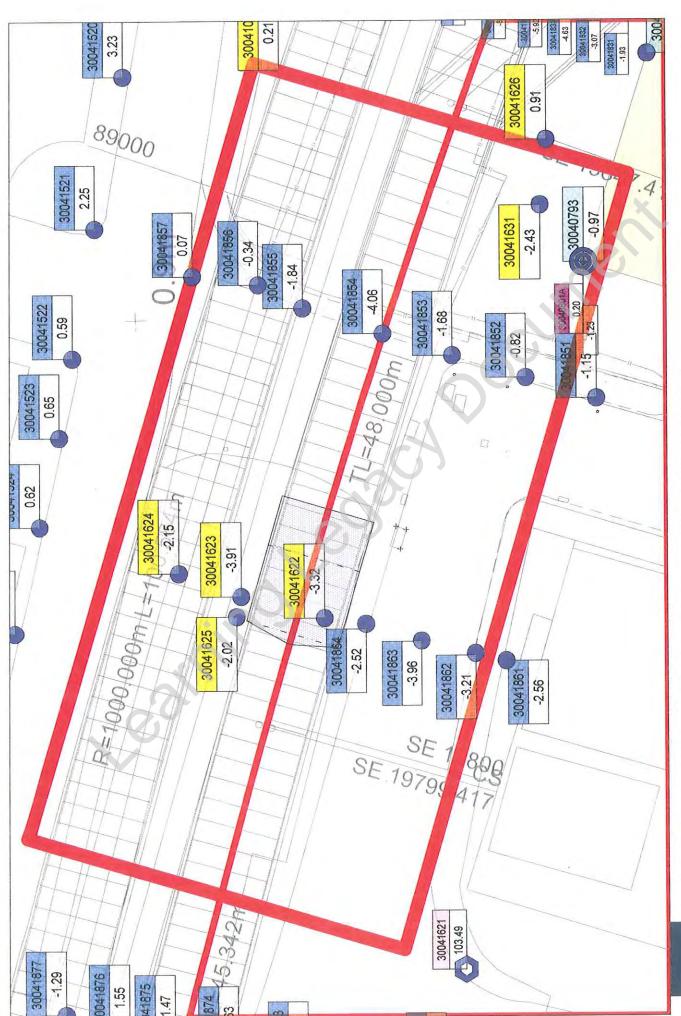
print name:

HMJV project role:

Monitoring & Survey Engineer

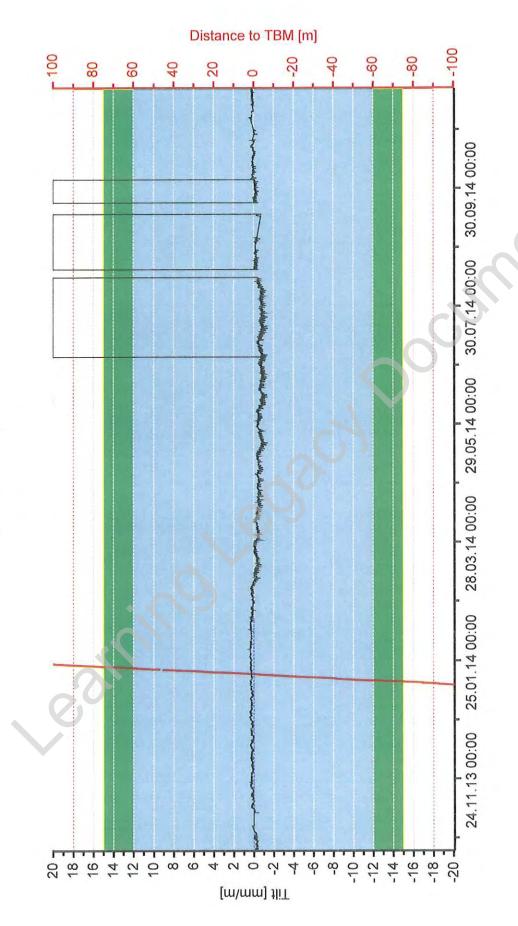
Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB current values: 14.01.2014 17:37





Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB current values: 19.01.2014 18:06



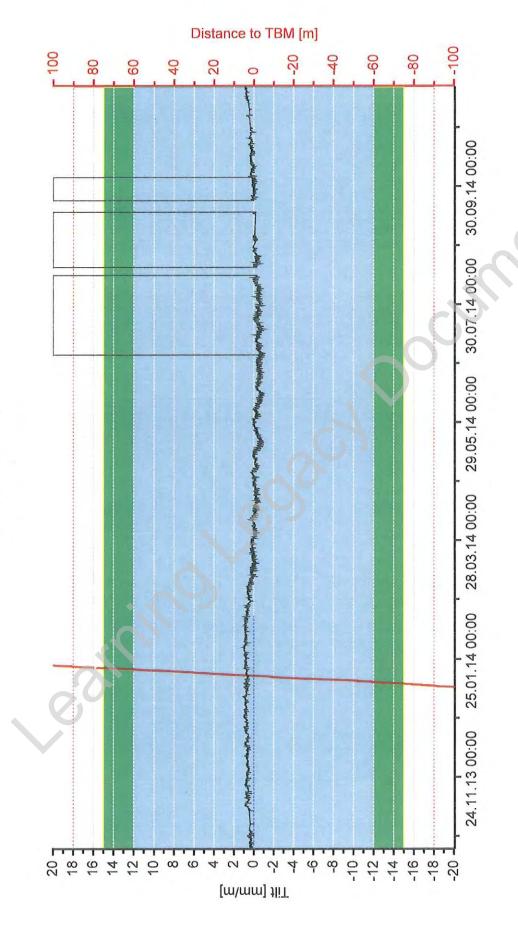


Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: WB Tunnel - TW Pumping station - 17.10.2013 - 21.11.2014 Date: 20.01.2015 14:23 Current Values: 20.01.2015 13:28

---- Distance TBM ----- Zero Distance

- 30040801A





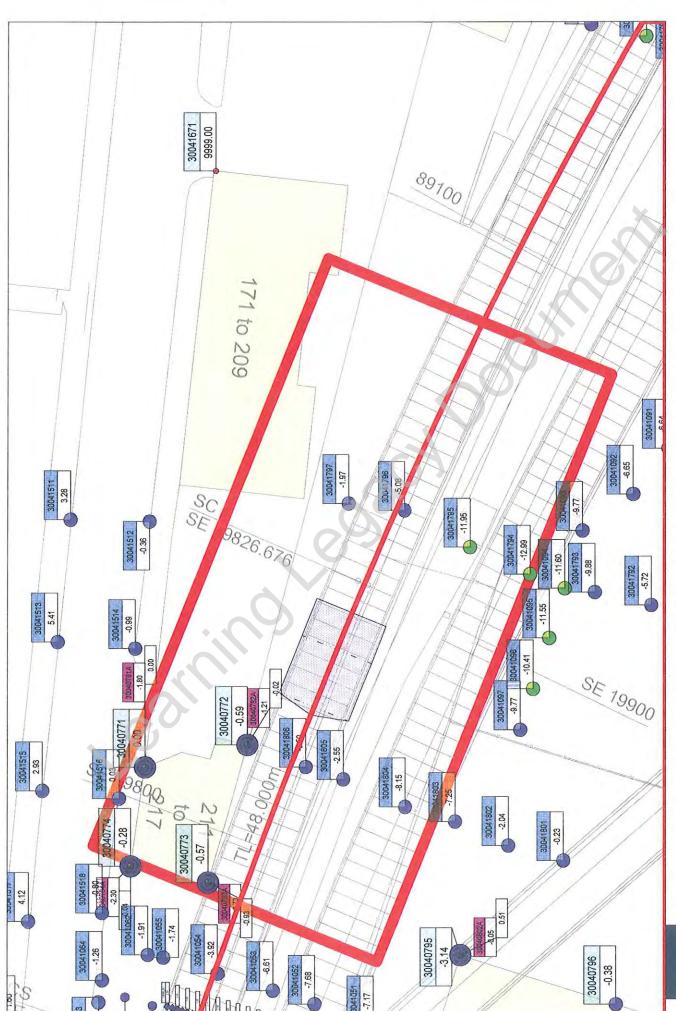
Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: WB Tunnel - TW Pumping station - 17.10.2013 - 21.11.2014 Date: 20.01.2015 14:21 Current Values: 20.01.2015 13:28

--- Zero Distance

---- Distance TBM ----

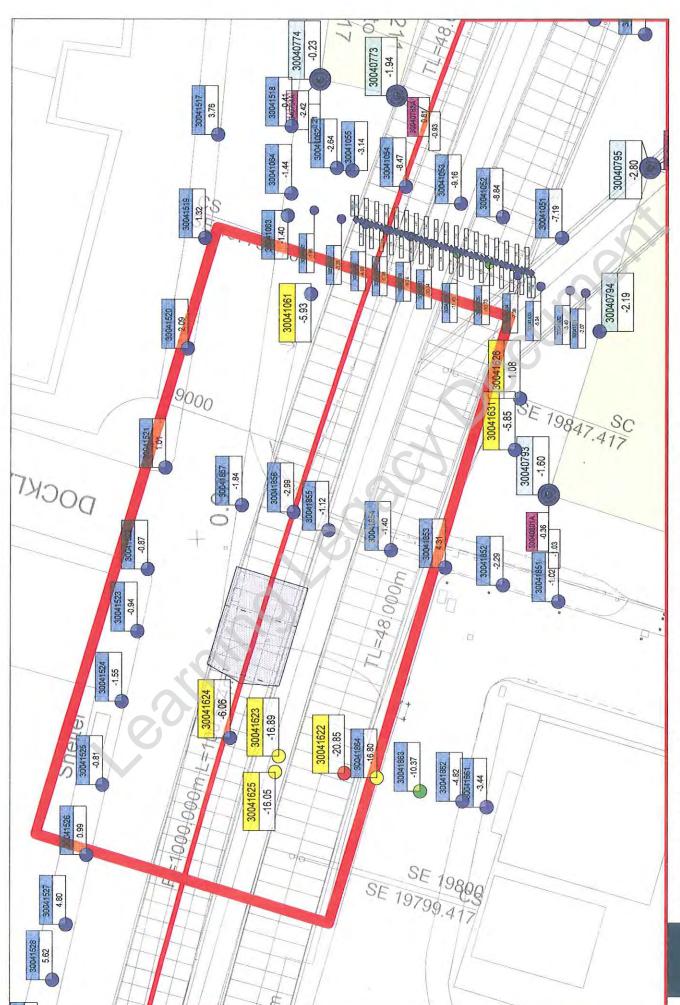
30040802A





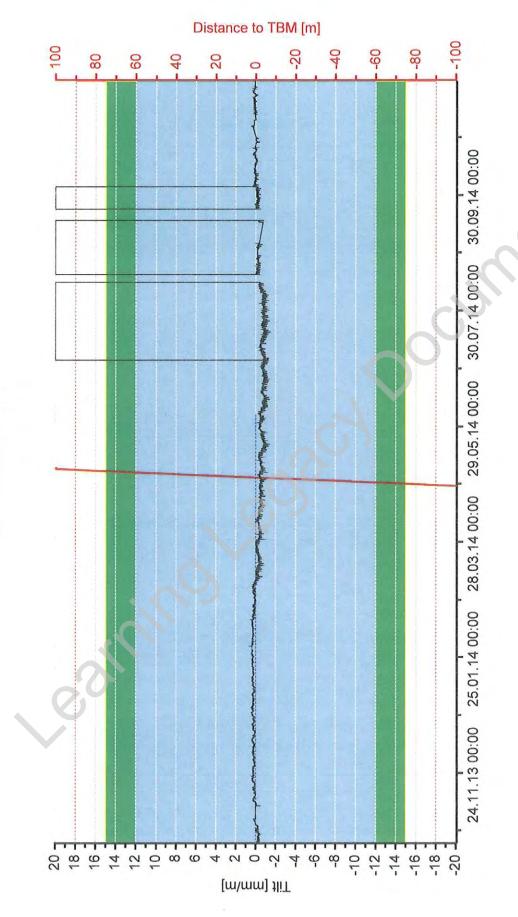
working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal current values: 29.04.2014 09:57





working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab current values: 02.05.2014 17:41 Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal



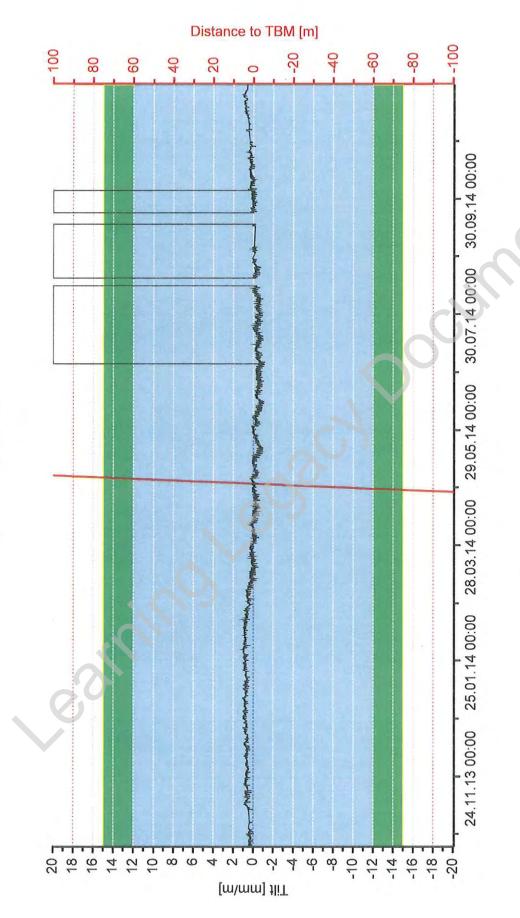


Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: EB Tunnel - TW Pumping station - 17.10.2013 - 21.11.2014 date: 20.01.2015 16:17 current values: 20.01.2015 13:28

--- Distance TBM ----- Zero Distance

- 30040801A





----- 30040802A ----- Distance TBM ------ Zero Distance

Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: EB Tunnel - TW Pumping station - 17.10.2013 - 21.11.2014 date: 20.01.2015 16:19 current values: 20.01.2015 13:28



△ HOCHTIEF Joint V			C310 THAMES TUNNEL REPORT		
EMPLOYER	CROSSRAIL	eB NO	C310-HTM-C-RGN-CR148-50025	Rev	1.0
TITLE			orts for Thames Water assets relating to T River Thames - North Woolwich Portal (ex		

APPENDIX 98
CS 28 – Pumping Station – CH 89055



#### C310 Thames Tunnel

**Close Out Report** 

Rev. 1.0

monitori	ng asset		TV	V Pumping Stat	tion
reference monit	toring drawing:		C310-HT	M-C-DWG-CR146-ST	004-70003
name of monit	oring section:		(	CS 28 Pumping Stati	on
sensor	type:			manual levelling stud	ds
chainage:	89055		point no.:	3004 18	01 - 3004 1806
trigger ( [mi		green:	+12 -12	amber 415	red: +18
reference d	locument for trigg	ger values:	Managem	ent Plan for Contro	of Ground Movement
		EB-no.:		C310-HTM-Z-STP-C	CR148-50058
		Appendix:		AAA	

#### monitoring data

	d	ate	max. value	point no.	comments
baseline	14/	11/13	0.00		
TBM 1	start ZOI	14/01/14	-1.00	3004 1804	
	end ZOI	17/01/14	-7.65	3005 1804	breached not any trigger value
ТВМ 2	start ZOI	28/04/14	-0.01	3006 1806	
	end ZOI	01/05/14	-5.70	3007 1806	breached not any trigger value
longterm		21/11/14	-5.50	3008 1804	
Evalua	tion of any	potential	7	No residual since the Wo	risk orks have been completed by HMJV
	residual ris	iks		Yes, residua (see comme	

#### summary / comments

Under consideration of temperature differences, the surrounding ground condition and the achievable accuracy of the measurement, HMJV has no concern to cease the monitoring.

The rate of change in the monitoring data is less than the required standards as per the specifications and drawings.

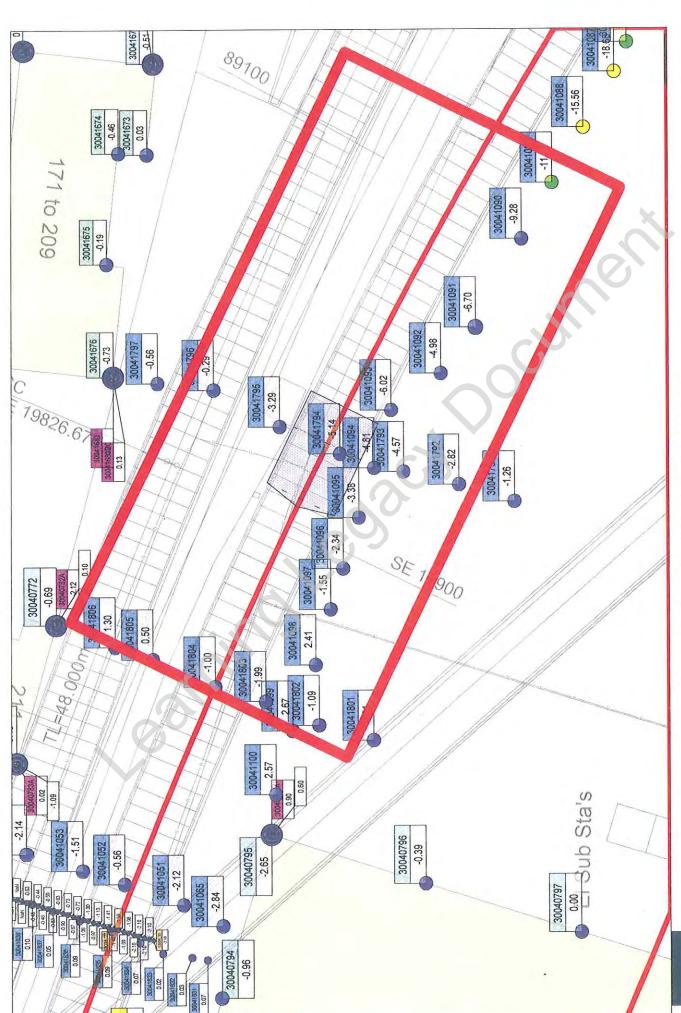
date / signature:

19/01/2015

print name:

HMJV project role:

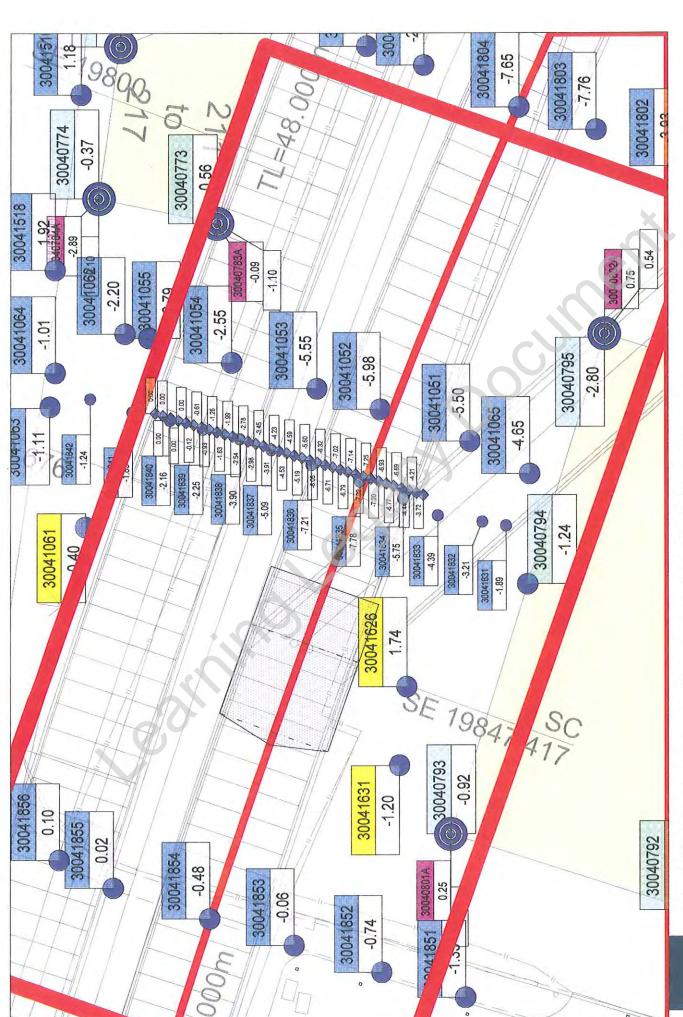
Monitoring & Survey engineer



Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB

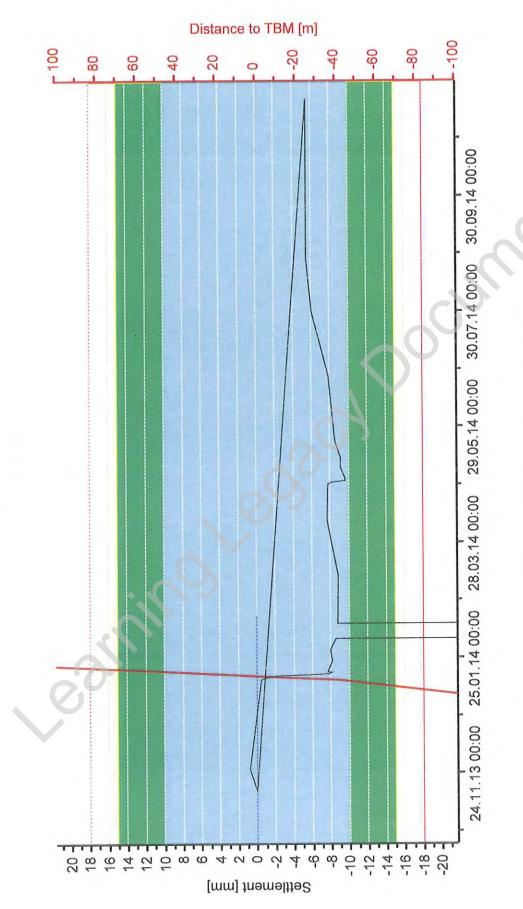


current values: 14.01.2014 09:00



Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB current values: 17.01.2014 17.26



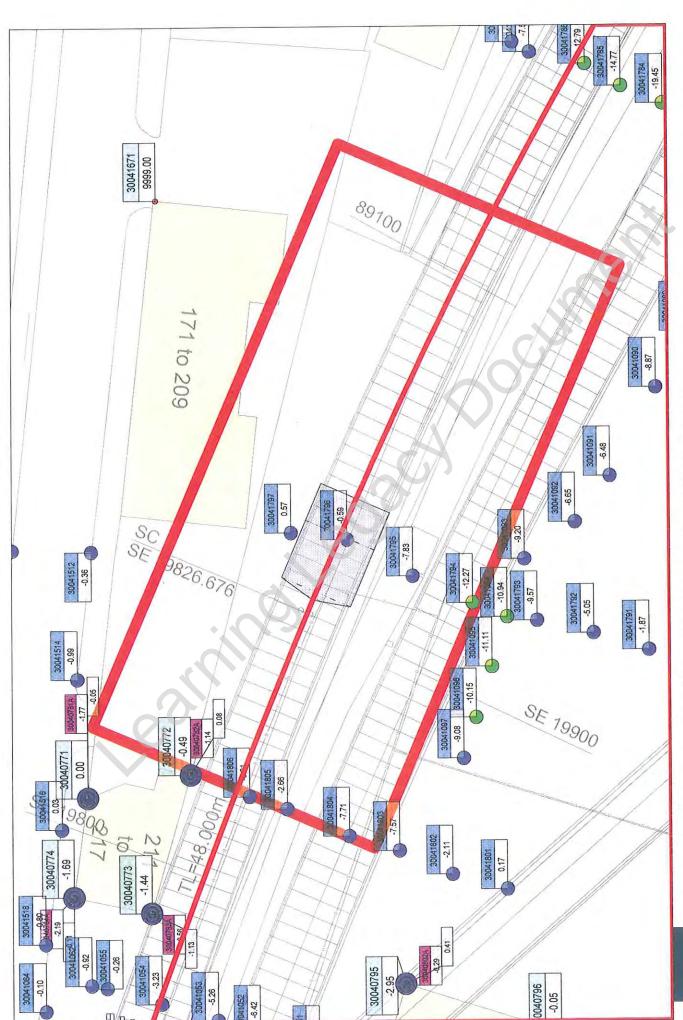


Close Out Report: WB Tunnel - CS28 Pumping station - 17.10.2013 - 21.11.2014 Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Date: 20.01.2015 12:42 Current Values: 20.01.2015 12:22

---- Distance TBM ----- Zero Distance

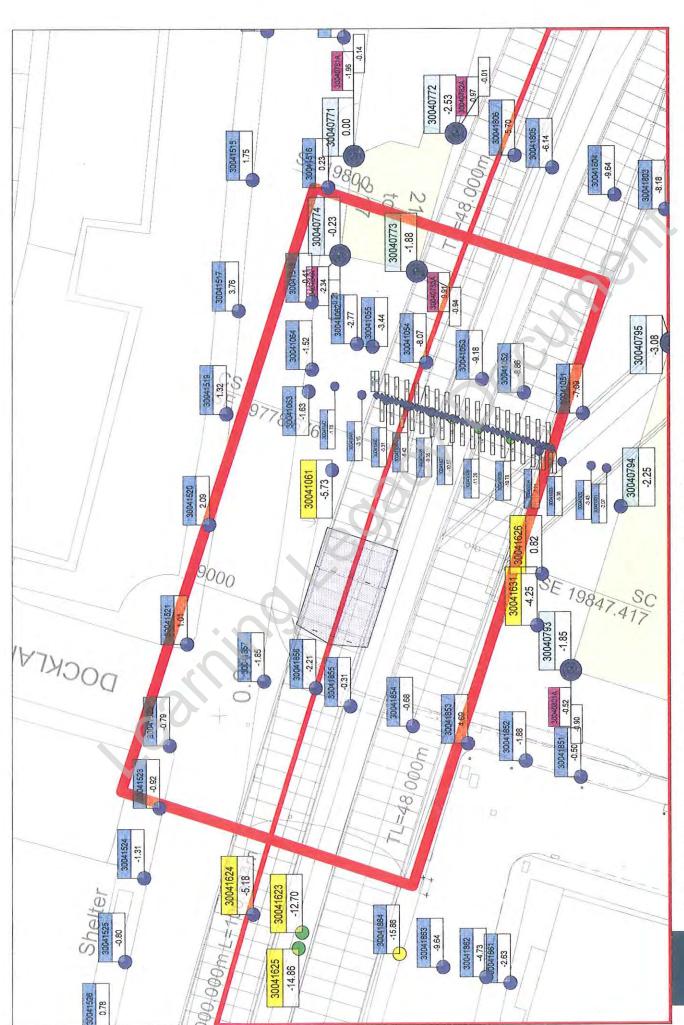
- 30041804





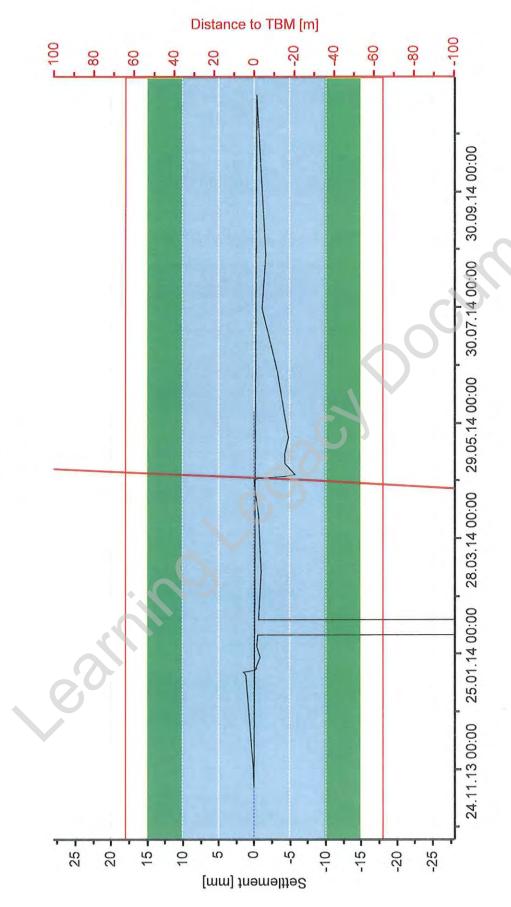
working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal current values: 28.04.2014 17:52





working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab current values: 01.05.2014 18:32 Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal





Close Out Report: EB Tunnel - CS 28 Pumping station - 17.10.2013 - 21.11.2014 Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal date: 20.01.2015 11:47 current values: 20.01.2015 11:21

---- Distance TBM ----- Zero Distance

30041806





#### Joint Venture

-	1000	5
	NO STORES	. 11
	ביביםוסיבי	2000

Teaching passing   Teaching   T			CONTRACTOR INC.																	
Herenting   Here	No. of reading	baseline	+	following	-	2.	following		e,	following	-	4	following	m	ເດ	following		Ö	followin	D.
Control   Cont	date	14/11/13	2	16/11/2013		51	3/01/2014	T	14	1/01/2014			15/01/2014			6/01/2014			6/01/201	4
101.388   101.388   0   0   101.888   0   0   101.889   0   0   101.887   1   1   101.387   0   1		elevation		-	on from		deviation last/base		elevation	deviatic last/ba	on from sseline	elevation		on from aseline	elevation	deviation last/ba	n from seline	elevation		tion from paseline
101.386         101.386         0         0         101.386         0         0         101.386         0         0         101.387         0         0         101.387         0         0         101.387         0         0         101.387         0         0         101.387         0         0         101.387         0         0         101.387         0         0         101.387         0         0         101.387         0         0         101.387         0         0         101.387         0         0         101.387         0         0         101.389         0         0         101.389         0         0         101.389         0         0         101.389         0         0         101.389         0         0         101.389         0         0         101.389         0         0         101.389         0         0         101.389         0         0         101.389         0         0         101.389         0         0         101.389         0         0         101.389         0         0         101.389         0         0         101.389         0         0         101.389         0         0         101.389         0         0	T																			
101.383         101.382         0         0         0         101.382         0         0         0         101.382         0         0         0         101.382         0         0         0         101.382         0	41801	101.388	101.388	0	0	101.388	0	0	101.387	0	7	101,388		0	101.387	7	7	101,387	0	7
101.566         101.567         101.567         -1         -1         101.564         -1         -2         101.564         -1         -3         101.569         -4         -7         101.569         -9         -7         101.569         -1         -101.569         -1         -101.569         -1         -101.569         -1         -101.549         -1         -2         101.544         -5         -7         101.549         -7         -1	41802	101.383	101.383	0	0	101.382	0	0	101.382	7	7	101.382	0	7	101.380	-5	ကု	101.379	0	4
101,352   10,1352   1   101,351   1   101,352   1   1   101,352   1   1   1   101,352   1   1   1   1   1   1   1   1   1	41803	101,566	101.566	0	0	101,565	7	7	101.564	Ŷ	5	101.564	1	-3	101.560	4-	-7	101,559	0	-7
101,722   101,723   0 0 0   101,723   1 1 1 101,672   0 1 1   101,723   0 0 0   101,720   3 3   101,720   0 0   101,720   3 3   101,720   0 0   101,616   0 0 0   101,616   0 0 0   101,616   0 0 0   101,616   0 0 0   101,616   0 0 0   101,616   0 0 0   101,616   0 0 0   101,616   0 0   101,616   0 0 0   101,616   0	41804	101.951	101.952	-	-	101,951	7	7	101,950	0	7	101.949		-,5	101.944	ιņ	1-	101.943	7	φ
101-616 0 0 0 101-617 1 1 101-617 0 1 1 101-618 0 2 101-618 0 2 0 101-618 0 0 0 101-618 0 0 0 101-618 0 0 0 101-618 0 0 0 101-618 0 0 0 101-618 0 0 0 101-618 0 0 0 101-618 0 0 0 101-618 0 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 101-618 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 0 101-618 0 101-618 0 0 101-618 0 0 101-618 0 101-61	41805	101.722	101.723	0	0	101.723	-	-	101.723	0	7	101.723		0	101.720	ကု	ကု	101.720	0	ģ
	41806	101,616	101.616	0	0	101.617	-	1	101,617	0	P	101,618		2	101,616	Ņ	0	101,616	0	0
												0,	-1		Co					
																			<	

A HOCHTIEF MURPHY

#### Joint Venture

	D		deviation from last/baseline	ကု	4-	89	o,	4	7	8
	12. following	12/02/2014	deviation last/ba	0	0	0	0	0	0	
	12	12	elevation	101,385	101.379	101.558	101.942	101.718	101,615	
	m		n from seline	6,	-4	89	o <sub>r</sub>	က္	7	
	11. following	04/02/2014	deviation from last/baseline	0	0	7	7	0	0	
	11	Ŏ	elevation	101.386	101.379	101,558	101.943	101.719	101,615	
	D		deviation from last/baseline	5	4	8-	φ	က္	0	
	10. following	29/01/2014	deviation last/ba	7	0	0	0	0	-	
	10.	25	elevation	101.386	101,379	101.559	101.943	101.719	101,616	A
			deviation from last/baseline	-5	4	8	φ	-4	1	
	9. following	23/01/2014	deviation last/ba	0	0	0	0		٦	
	6	23	elevation	101.386	101.379	101,559	101.943	101.719	101.615	
			deviation from last/baseline	-2	-4	æ	œρ	6	0	
station	8. following	17/01/2014	deviation last/ba	0	0	0	0	0	0	
SS28 Pumping Station	89	1	elevation	101.387	101.379	101,559	101.943	101.720	101,616	
CS28 F			deviation from last/ baseline	2	4	æ	æ	ကု	0	
	7. following	17/01/2014	deviation last/ bas	7	7	0	0	0	0	
structure:	7.	4	elevation	101.386	101.379	101.559	101.943	101.719	101.616	
	baseline	14/11/13	elevation	101.388	101.383	101.566	101,951	101.722	101.616	
	No. of reading baseline	date	O	30041801	30041802	30041803	30041804	30041805	30041806	



Joint Venture

C310 Thames Tunnel

project:

wing 014 iation fi	elevation 101.388 101.381 101.381 101.941	from sline	30/64/2014  30/64/2014  deviation from last/baseline		w .	16. following 29/04/2014 deviation from a last/baseline as 0 0 31 0 -2 59 0 -7 43 0 -8 20 0 -3	+ /6		28/04/2014 28/04/2014 deviation from last/baseline 31 0 -2 39 0 -8 39 0 -8 39 0 -8 39 0 -8	7. 88		oo da see	14. following 09/04/2014 deviation lass/bass 1 1 88 1 1 59 1 1 1 59 1 1 1 1 1 1 1 1 1 1 1 1	OS28 Pumping Station  14. followit  on from elevation last/foll  -2 101,388 1  -3 101,381 1  -9 101,381 1  -9 101,382 1  -3 101,383 1  -9 101,383 1  -9 101,383 1	OS28 P on from seeline -2 -2 -8 -9 -9 -9	wing 7 bits	13. 10. 10.387 101.388 101.388 101.388	baseline 14/1/13 elevation elevation 101.383 101.566 101.722
	101.610	4	4	101.612		0	101.615		9	919	101	7	0	101.615	7	0	101.615	
φ	101,610	4	4	101.612	·-	0	101.615	-0.01	-	101.616	101	7	0	101.615	7	0	101.615	9
	101.716	9-	ဗု	101.717		0	101.720	e,	7	1.720	101	ņ	F	101.720	ကု	0	101,719	101.722
	101,941	-10	ç	101.941	φ	0	101.943		0	.943	101	တ္	-	101.943	o <sub>i</sub>	0	101.942	11.951
	101.558	φ	0	101.559		0	101.559		211	1.559	101	1-	-	101.559	8	0	101.558	995.10
	101.381	-2	0	101.381		O	101.381		0	1.381	101	-2	-	101.381	6	-	101.380	01.383
	101.388	7	0	101.388		0	101.388		-	388	101	Ŧ	٠	101,388	-2	-	101.387	01.388
				7							Ġ					1 15		
deviation from last/baseline	elevation		deviation last/bas			deviation last/base			leviation fr last/baseli			ion from	deviat last/b	elevation	aseline	deviatio	elevation	
1/05/2014	01	П	04/2014	30//	H	04/2014	29/0	T	4/2014	28/0	Ц		9/04/2014	0		/03/2014	10	14/11/13
following	18.		ollowing	17.1		ollowing	16. fc		guiwolli	15. fo		Đ.	followii	14	5	following	13.	aseline
					Ì			1					Station	umping §	CS28 F		structure:	



Joint Venture

C310 Thames Tunnel project:

		structure:		CS28 F	CS28 Pumping Station	Station													
No, of reading	baseline	19.	19. following		20.	20. following	-	21.	21, following		22.	22, following		23.1	23. following		24.	24. following	
date	14/11/13	0	07/05/2014		11	12/05/2014		2	21/05/2014		38	28/05/2014		25	25/06/2014	Ħ	58	29/07/2014	П
No.	elevation	elevation	deviation last/ ba	deviation from last/ baseline	elevation	deviation from last/baseline	n from seline	elevation	deviation from last/baseline	n from seline	elevation	deviation from last/baseline		elevation	deviation from last/baseline		elevation	deviation from last/baseline	n from
																			Γ
30041801	101,388	101.389		-	101.389	0		101.390	-	2	101.390	0	2	101.392	2	4	101.394	Ø	9
30041802	101.383	101.381	-	ņ	101,381	0	42	101.381	0	ç	101.381	0	ç	101.382	0	7	101.383	-	0
30041803	101.566	101.559	-	φ	101.559	0	æρ	101.560	-	-7	101.560	0	φ	101,560	0	-7	101,561	-	ιģ
30041804	101.951	101.942	0	oʻ.	101.942	0	ο̈́	101.943	1	6	101.944		φ	101,943	0	φ	101.945	2	φ
30041805	101.722	101.716	0	φ	101.716	0	φ	101.717	F	-5	101.718	-	÷	101.718	0	4-	101.720	2	-5
30041806	101.616	101.612	-	4	101.612	0	-4	101,611	7	-5	101.613	2	ကု	101,613	0	ကု	101,615	2	7
										C									

A HOCHTIEF MURPHY

Joint Venture

		27. following
C310 Thames Tunnel	CS28 Pumping Station	26. following
	CS28 P	25. following
project:	structure:	25. fe
		baseline
		D

No. of reading baseline         25. following         26. following         27. following <t< th=""><th></th><th></th><th>Sil delaie.</th><th>0000</th><th>to running station</th><th>Olation</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>			Sil delaie.	0000	to running station	Olation							
14/11/13   27/08/2014   29/09/2014   21/11	No. of reading		25.	following .	S)	6. following	27.	following					
Comparison   Comparison from   Comparison from	date	14/11/13	2	7/08/2014		29/09/2014	2.	/11/2014					
101.388   101.393   0   5   destroyed   termitalementworks   101.383   101.383   0   1   destroyed   termitalementworks   101.366   101.561   0   -5   destroyed   termitalementworks   101.946   1   -5     101.722   101.720   0   -2     101.616   1     101.720   0	N.	elevation		deviation fre last/baselir				deviation from last/baseline	 deviation from last/baseline	elevation	deviation from last/baseline	elevation	deviation from last/baseline
101.388   101.383   0   5   destroyed   destroyed   destroyed   destroyed   destroyed   destroyed   destroyed   destroyed   101.566   101.561   0   -5   destroyed   destroyed   destroyed   101.946   1   -5   destroyed   101.722   101.720   0   -2   101.722   101.724   -1   -2   101.616   1   101.616   1													
101.383 101.383 0 1 destroyed contactementwents. 101.566 101.561 0 -5 destroyed contactementwents. 101.951 101.946 1 -5 destroyed contactementwents. 101.722 101.720 0 -2 101.720 0 101.720 0 101.720 0 101.616 101.616 101.616	30041801	101.388	101,393										
101.566         101.561         0         -5         destroyed centual termal stems of the constitution of	30041802	101.383	101.383	0	destroyed								
101.951     101.946     1     -5     101.946     0       101.722     101.720     0     -2     101.720     0       101.616     101.614     -1     -2     101.616     1	30041803	101.566	101.561				Y						
101.722         101.720         0         -2         101.720         0           101.616         101.614         -1         -2         101.616         1	30041804	101.951	101.946	7	10		101.946						
101.616 101.614 -1 -2	30041805	101.722	101.720		O.		101.720						
	30041806	101.616			CI.		101.616	1 0					

A HOCHTIEF Joint V			C310 THAMES TUNNEL REPORT		
EMPLOYER	CROSSRAIL	eB NO	C310-HTM-C-RGN-CR148-50025	Rev	1.0
TITLE			orts for Thames Water assets relating to T River Thames - North Woolwich Portal (e)		

APPENDIX 106
CS 31 – Store Road Sewer West – CH 89000



#### **C310 Thames Tunnel**

**Close Out Report** 

Rev. 1.0

mo	nitoring a	asset		TV	V Store Road Sewe	er		
referen	ce monitoring	g drawing:		C310-H	TM-C-DWG-CR146-ST004-	70003		
name o	f monitorin	g section:		CS :	31 Store Road Sewer We	est		
	sensor type	9;			manual levelling studs			
chainage	1	89000		point no.:	3004 1851 -	3004 1857		
1	trigger value [mm]	es:	green:	+12 -12	amher: (15	red: +18 -18		
refe	rence docur	ment for trig	ger values:	Manager	nent Plan for Control of			
			EB-no.:		C310-HTM-Z-STP-CR14	18-50058		
			Appendix:		AAA			
			m	onitoring o	lata			
			,	, ,				
	d	ate	max. value	point no.	comm	ents		
baseline	16/	12/13	0.00					
твм 1	start ZOI	17/01/14	-0.48	3004 1854				
	end ZOI	20/01/14	-4.35	3004 1854	breached not ar	ny trigger value		
твм 2	start ZOI	30/04/14	-2.92	3004 1856				
	end ZOI	03/05/14	4.16	3004 1856	breached not any trigger value			
longterm	(a)	21/11/14	-2.87	3004 1856				
Evalua	tion of any	potential	~	No residual ri since the Wor	sk ks have been completed b	у НМЈV		
	residual ris			Yes, residual				

Under consideration of temperature differences, the surrounding ground condition and the achievable accuracy of the measurement, HMJV has no concern to cease the monitoring.

The rate of change in the monitoring data is less than the required standards as per the specifications and drawings.

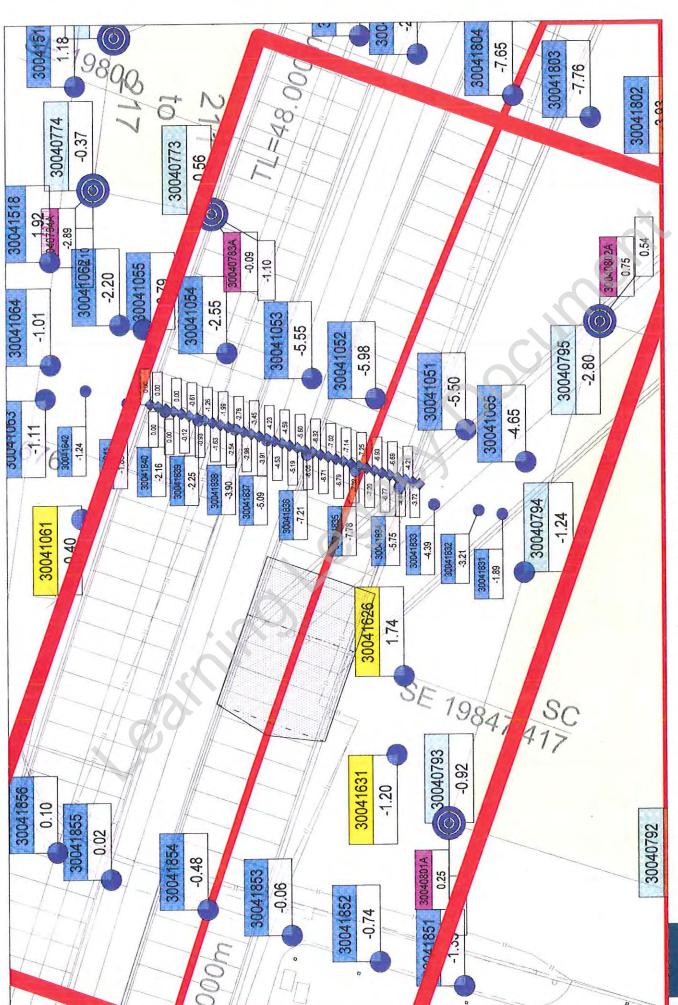
date / signature:

02/02/2015

print name:

HMJV project role:

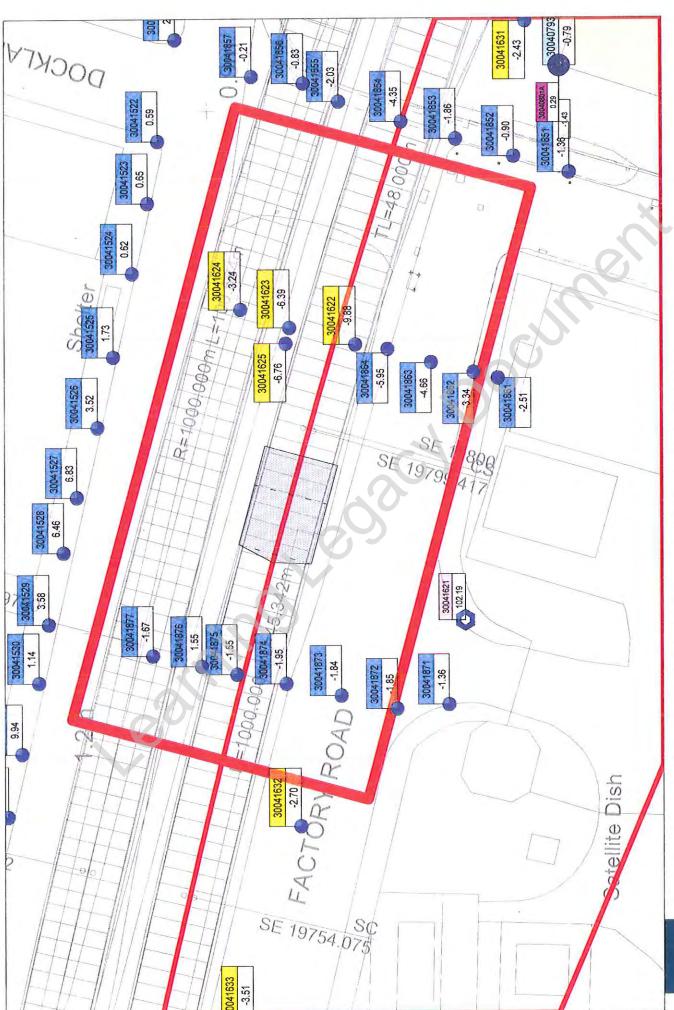
Monitoring & Survey engineer



Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB



current values: 17.01.2014 17:26



Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB current values: 20.01.2014 17:43



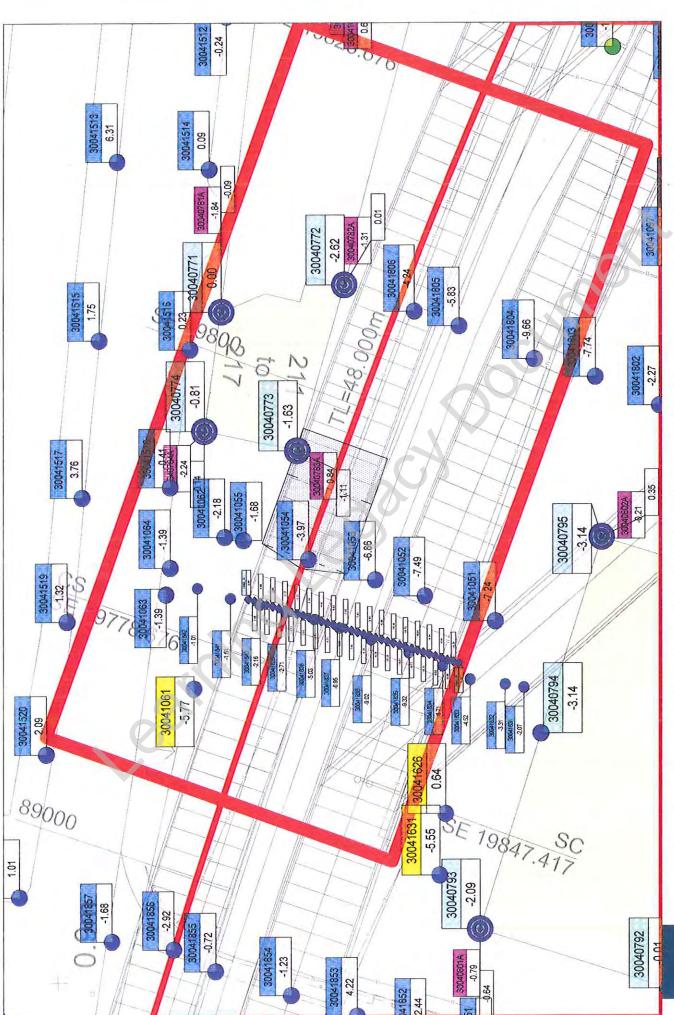


Close Out Report: WB Tunnel - CS 31 Store Road sewer West - 17.10.2013 - 21.11.2014 Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Date: 20.01.2015 13:57 Current Values: 20.01.2015 13:28

--- Distance TBM ----- Zero Distance

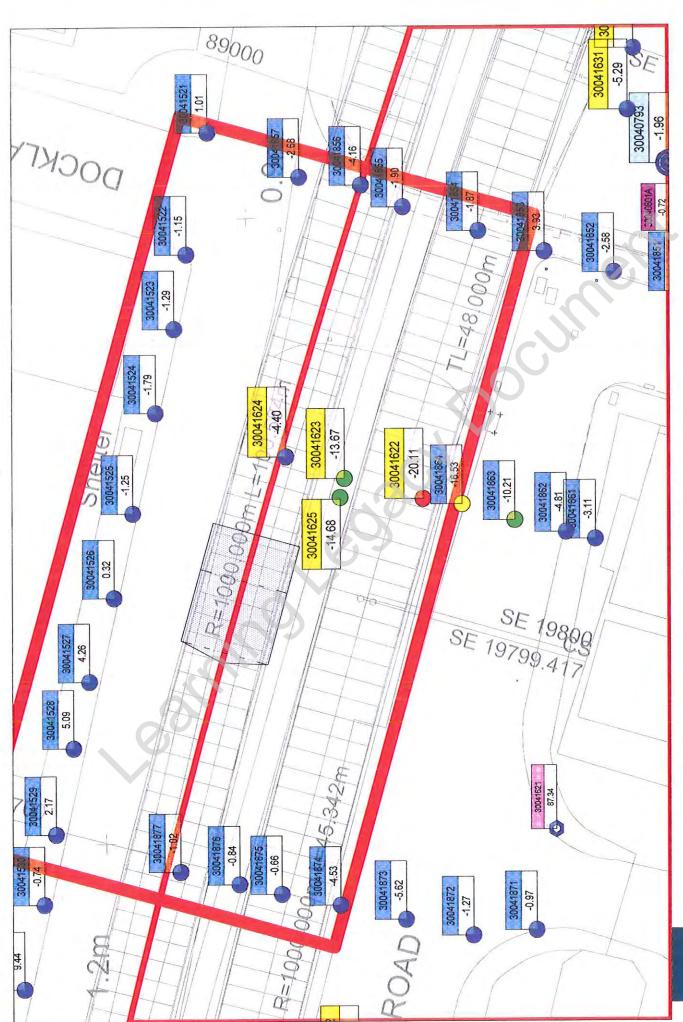
--30041854





working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab current values: 30.04.2014 17:43 Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal





working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal current values: 03.05.2014 19:00

Ge ec



Close Out Report: EB Tunnel - CS 31 Store road Sewer West - 17.10.2013 - 21.11.2014 Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal date: 20.01.2015 11:52 current values: 20.01.2015 11:21

---- Distance TBM ----- Zero Distance

-30041856





#### Joint Venture

-				1		-						
	g .		on from seline	7	7	0	7	0	0	0		
	6. following	18/01/2014	deviation from last/baseline	0	0	0	0	0	0	0		
	6.	18	elevation	101.068	101.165	101.176	101.129	101.104	101.092	100.938		
			n from seline	7	7	0	0	0	0	0		
	5. following	17/01/2014	deviation from last/baseline	0	0	0	0	0	0	0		
	70	17,	elevation	101.068	101.165	101.177	101.129	101.104	101.092	100.938		
			n from seline	٣	7	0	0	0	0	0		
	4. following	17/01/2014	deviation from last/baseline	0	0	0	0	0	0	0		
	4. f	17	elevation	101.068	101,165	101.177	101.130	101.104	101.092	100.938	<	
CS 31 Store Road	3. following	16/01/2014	n from seline	7	7	0	0	0	0	0		
			deviation from last/baseline	0	0	0	0	0	0	0		
	3.	16	elevation	101.068	101.165	101,176	101.130	101.104	101,091	100.938		
	2. following	14/01/2014	n from seline	F	7	0	0	0	0	0		
			deviation from last/baseline	7	7	0	0	0	0	0		
		14	elevation	101.068	101.165	101.176	101,130	101.104	101.092	100.938		
	1. following		n from seline	0	0	0	0	0	0	0		
		17/12/2013	deviation from last/baseline	0	0	0	0	0	0	0		
structure:		17	elevation	101.070	101.166	101.177	101.130	101.104	101.092	100.938		
	baseline	16/12/13	elevation elevation	101.069	101.166	101.177	101.130	101.104	101.092	100.938		
	No. of reading	date	Ö	30041851	30041852	30041853	30041854	30041855	30041856	30041857		



### Sources do Joint Venture

-				-	-	-	-	-	-		-	-	-
	O)		in from seline	ကု	7	ç	4	ç	0	0			
	12. following	10/02/2014	deviation from last/baseline	ç	7	7	τ	7	7	7			
	12.	10	elevation	101.067	101,165	101.175	101.126	101.102	101.091	100.938			
	70		n from seline	7	7	7	ဗှ	7	0	,-			
	11. following	03/02/2014	deviation from last/baseline	-	-	,-	-	+	-	-			
	1,	60	elevation	101.069	101.166	101,175	101.127	101.103	101.092	100.939			
			n from seline	42	7	7	4	-2	7	0			
	10, following	28/01/2014	deviation from last/baseline	0	0	0	0	0	0	0			
	10.	28	elevation	101.068	101.165	101.174	101.126	101.102	101.091	100.938			
CS 31 Store Road	9. following	21/01/2014	n from seline	ç	7	ç	4	Ġ	0	0			
			deviation from last/baseline	0	0	0	0	0		0			
			elevation	101.068	101,165	101,175	101.126	101.102	101.091	100.938			
	8. following		n from seline	F	7	5	4	Ġ	7	0			
		20/01/2014	deviation from last/baseline	0	0	0	0	0	0	0			
	8. f	20	elevation	101.068	101.165	101.175	101.126	101.102	101.091	100.938			
	7. following		in from sseline	7	٦	ņ	4	2	0	0			
		19/01/2014	deviation from last/ baseline	0	0	7	ကု	d	0	0			
structure:	7.1	19	elevation	101.068	101.165	101,175	101.126	101.102	101,091	100.938			
	baseline	16/12/13	elevation elevation	101.069	101.166	101.177	101.130	101.104	101.092	100.938			
	No. of reading	date	Ö	30041851	30041852	30041853	30041854	30041855	30041856	30041857			



#### Joint Venture

18. following	01/05/2014		tion deviation from last/baseline		~										
		om elevation		-	-1 101.029										
17. following	30/04/2014	deviation from last/baseline			7										
17.1	30/	elevation	-		101.029	101.029	101.029	101.029	101.029 101.164 101.181 101.129	101.029 101.164 101.181 101.129 101.022	101.029 101.164 101.181 101.022 101.089 100.937	101.029 101.164 101.181 101.022 101.089 100.937	101.029 101.164 101.129 101.022 101.089 100.937		
16. following	29/04/2014	deviation from last/baseline			0				v Base	0 0 -2 -2 -4 -4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 -2 7 5 5 4 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 -2 4 4 0 0 4ew Baseline 0 -2 -1 -2 -1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
16. fo	29/0	elevation			101.029	101.029	101.029	101,029 101,165 101,182 101,130							
15. following	07/04/2014	deviation from last/baseline			New Baseline										
τΩ.		elevation			101.030										
14. following	11/03/2014	deviation from last/baseline			-16										
14.	11	elevation			101.051	101.051	101.051	101.051	101.051	101.051	101.051	101.051	101.051		
13. following	18/02/2014	deviation from last/ baseline			φ										
13. fc	18/0	elevation	elevation		elevation		101.067	101.067	101.067	101.067 101.166 101.175	101.067 101.166 101.175 101.126	101.067 101.166 101.175 101.102 101.102	101.067 101.166 101.175 101.102 101.091	101.067 101.166 101.175 101.102 101.091	101.067 101.166 101.175 101.102 101.091 100.939
baseline	16/12/13	elevation			101.069	101.069	101.069	101.069 101.166 101.177 101.130	101,069 101,166 101,177 101,130	101.069 101.166 101.177 101.130 101.104	101.069 101.166 101.177 101.130 101.092 100.938	101.069 101.166 101.177 101.130 101.092 100.938	101.069 101.166 101.177 101.130 101.092 100.938		
No. of reading baseline	date	o N			30041851	30041851	30041851 30041852 30041853	30041851 30041852 30041853 30041854	30041851 30041852 30041853 30041854 30041855	30041851 30041852 30041853 30041854 30041855	30041851 30041852 30041853 30041854 30041855 30041856	30041851 30041852 30041853 30041854 30041855 30041856	30041851 30041852 30041853 30041854 30041855 30041856		



#### Joint Venture

Tunne
C310 Thames
C310
project.

		structure.		CS 31 (	CS 31 Store Road	7													
No. of reading	baseline	19.	19. following	6	20.	20. following		21.	21. following	E	22.	22. following		23.1	23. following		24.	24. following	
date	16/12/13	0	02/05/2014		03	03/05/2014	П	04	04/05/2014		70	07/05/2014		13,	13/05/2014	T	20	20/05/2014	
o N	elevation	elevation		deviation from last/ baseline	elevation last/baseline	deviation from last/baseline		elevation	deviation from last/baseline	n from seline	elevation	deviation from last/baseline		elevation	deviation from last/baseline		elevation	deviation from last/baseline	r from eline
30041851	101.069	101.028	7	ç	101.028	0	T	101.028	0	7	101.028	0	7	101.029	0	7	101.026	5	φ
30041852	101,166	101.164	0	ņ	101.164	0	ფ	101.164	0	ņ	101.164	0	ç	101.164	0	ç	101.164	0	ņ
30041853	101,177	101,181	0	4	101.181	0	4	101.180	0	4	101.180	0	4	101.181	-	4	101.181	0	4
30041854	101,130	101.129	7	7	101.128	0	ςŅ	101.128	0	ç	101.128	0	ņ	101.128	-	Ċ	101.128	0	Ņ
30041855	101.104	101.021	7	7	101.021	7	Ņ	101.020	7	ę	101.020	-	ç	101.021	0	ç	101.021	0	Ċì
30041856	101.092	101.089	7	φ	101.088	7	4	101.087	0	ιņ	101.087	0	က္	101.088	-	4	101.088	0	4
30041857	100.938	100.936	0	ņ	100.936	7	ကု	100.935	0	ကု	100.936	٥	ကု	100.936	0	ကု	100.936	0	Ċ
									)										
									P										



### Joint Venture

			deviation from last/baseline											
			elevation											
			n from seline		-28	7	ιņ			ကု	ကု	aged	orries	
	29. following	21/11/2014	deviation from last/baseline		7	-	-	destroyed	destroyed	-	0	51 - dam	from site plant/ lorries	
	83	21	elevation		101,002	101.165	101.182	de	ap	101.089	100.935	3004 1851 - damaged	from site	
	<i>L</i> 0		n from seline		-27	Ŋ	4	ကု	4	4	ကု	aged	orries	
	28, following	27/08/2014	deviation from last/baseline		7	7	0	7	4	0	7	3004 1851 - damaged	from site plant/ lorries	
	28.	27	elevation		101.003	101.164	101.181	101.127	101.019	101.088	100.935	3004 18	from site	
	D	31/07/2014	deviation from last/baseline		-26	7	w	ç	7	ကု	ŋ	naged	orries	
	27. following		deviatio last/ba	Y	4	-	-	0	-	-	1	3004 1851 - damaged	from site plant/ lorries	
		က	elevation		101.004	101.165	101.181	101.128	101.021	101.088	100.936	3004 18	from sit	
	26. following	25/06/2014	on from seline	Ĭ	-22	ç	4	42	7	4	ကု	naged	orries	
Q			deviation from last/baseline		-20	0	T	0	7	7	٦	3004 1851 - damaged	from site plant/ lorries	
CS 31 Store Road		32	elevation		101.007	101.165	101.180	101.128	101.020	101.087	100.935	3004 18	from sit	
CS 31	D		deviation from last/ baseline		-2	7	2	4	7	4	ကု			
	25. following	27/05/2014	deviation last/ba			-	1	0	0	0	0			
structure.	25.	2	elevation		101.027	101.165	101,181	101.128	101.021	101.088	100.936			
	baseline	16/12/13	elevation elevation		101.069	101.166	101.177	101.130	101.104	101.092	100.938		141	
	No. of reading	date	Ö		30041851	30041852	30041853	30041854	30041855	30041856	30041857			

△ HOCHTIEF Joint V			C310 THAMES TUNNEL REPORT		
EMPLOYER	CROSSRAIL	eB NO	C310-HTM-C-RGN-CR148-50025	Rev	1.0
TITLE			orts for Thames Water assets relating to T River Thames - North Woolwich Portal (ex		

#### APPENDIX 108 Factory Road Extensometer / SD



#### **C310 Thames Tunnel**

**Close Out Report** 

Rev. 1.0

mo	nitoring	asset			TW	Royal Dock Sewer	
referen	ce monitorin	g drawing:			C310-HTM	-C-DWG-CR146-ST004-70003	
name o	f monitorin	g section:			Facto	ory Road Extensometer	
	trigger value [mm] reference docur  da seline 14/1  M 1 start ZOI end ZOI  end ZOI end ZOI end ZOI	e:				extensometer	
chainage		89000-8885	0	point no.:	7	3004 1631 - 3004 163	4
	trigger valu	es;	green	+12	-1010	red	+18 -18
refe		ment for tris	ger values:		Manageme	nt Plan for Control of Ground N	Vovement'
1010	Terree docu	memerator trig	EB-no.:			310-HTM-Z-STP-CR148-50058	
			Appendix:	-		AAA, ZZ	
				monit	oring da	ta	
	d	ate	max. value	max. value toe of Royal Dock sewer	point no.	comment	s
baseline	14/	11/13	0.00	0.00			
TBM 1	start ZOI	16/01/14 20/01/14 20/01/14 24/01/14	-1.34 -2.70 -3.51 -1.32	+2.85 -2.86 -4.40 -2.46	3004 1631 3004 1632 30041633 30041634	0	
	20/01/14		-2.43 -0.71. -4.82 -0.72	-2.31 -1.74 -5.08 -2.32	3004 1631 3004 1632 30041633 30041634	breached not any tr	igger value
TBM 2	start ZOI	30/04/14 03/05/14 04/05/14 07/05/14	-5.55 -0.78 -7.35 -0.72	-2.54 -1.81 -4.72 -2.32	3004 1631 3004 1632 30041633 30041634	values for 30041634 are from the las possible on 05/02 due to disassembly of TBM 1 this senso (see also comme	2/2014 or was permanently covered
	end ZOI	03/05/14 07/05/14 07/05/14 22/05/14	-5.29 -0.80 -11.24 -9.20	-2.10 -3.22 -8.08 -4.47	3004 1631 3004 1632 30041633 30041634	breached not any tr	igger value
longterm		21/11/14	-5.62 -3.45 -7.21 -9.11	-7.65 -6.09 -7.24 -7.27	3004 1631 3004 1632 30041633 30041634		
Evalua	tion of any	potential	v	No residual since the Wo		en completed by HMJV	
2.40.00	residual ris			Yes, residua (see comme	l risk	***************************************	

summary / comments

Due to different site activities some of the points were damaged/destroyed/permanently covered (TBM disassembly). See datatable for more details.

The "max. value on surface" shows the movement of each sensor at the surface which was potentially caused by site activities and "heavy" traffic on Factory Road e.g. during TBM disassembly.

The "max. value toe of Royal Dock Sewer" shows the movement in a depth of approx. 18m, which is the level of the Royal Dock Sewer invert / toe. The maximum deflection ratio in the relevant elevation (bottom of Royal Dock Sewer) is 1:11855 (3004 1632 - 3004 1633 - 3004 1634) - no TW trigger breached (TW alert value for Royal Dock Sewer is 1:11600).

Under consideration of temperature differences, the surrounding ground condition and the achievable accuracy of the measurement, HMJV has no concern to cease the monitoring.

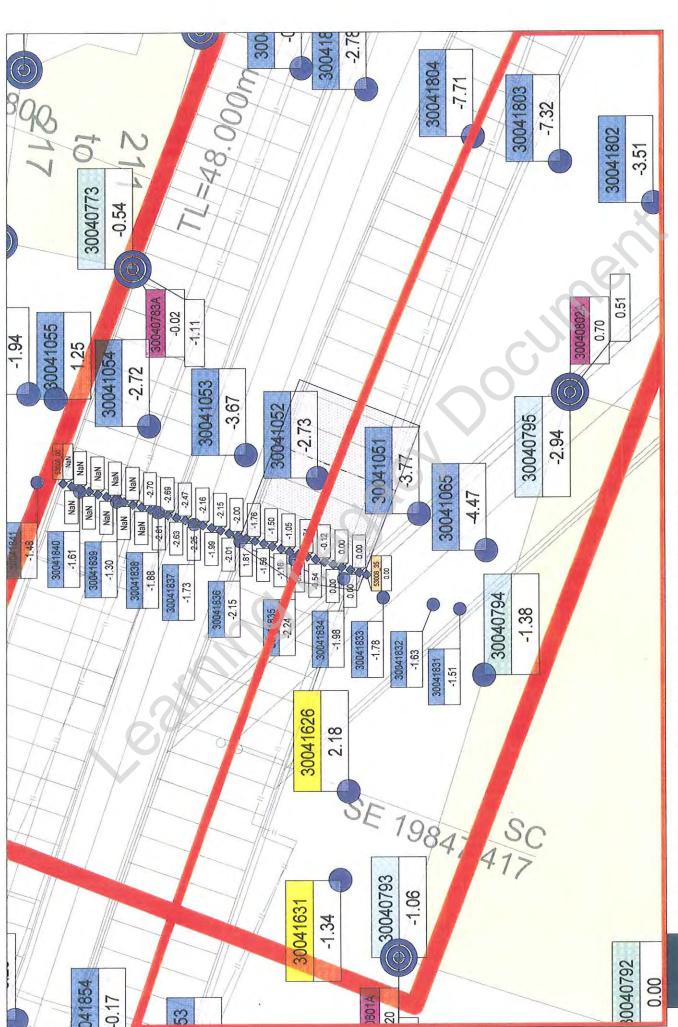
The rate of change in the monitoring data is less than the required standards as per the specifications and drawings.

date / signature: 10/02/

print name;

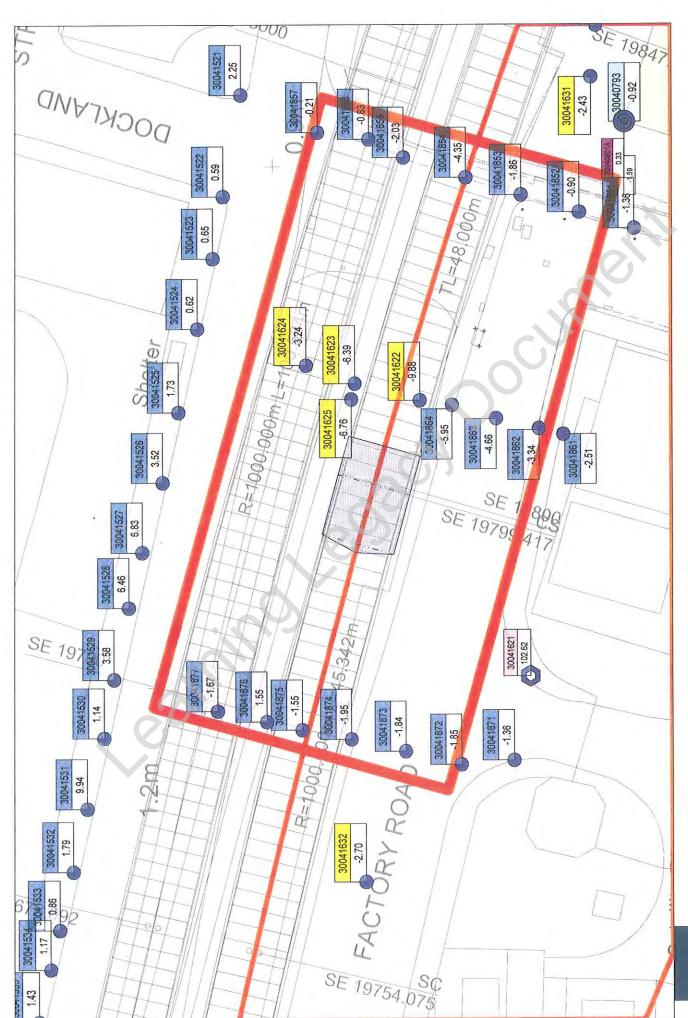
HMJV project role:

Monitoring & Survey engineer



Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB

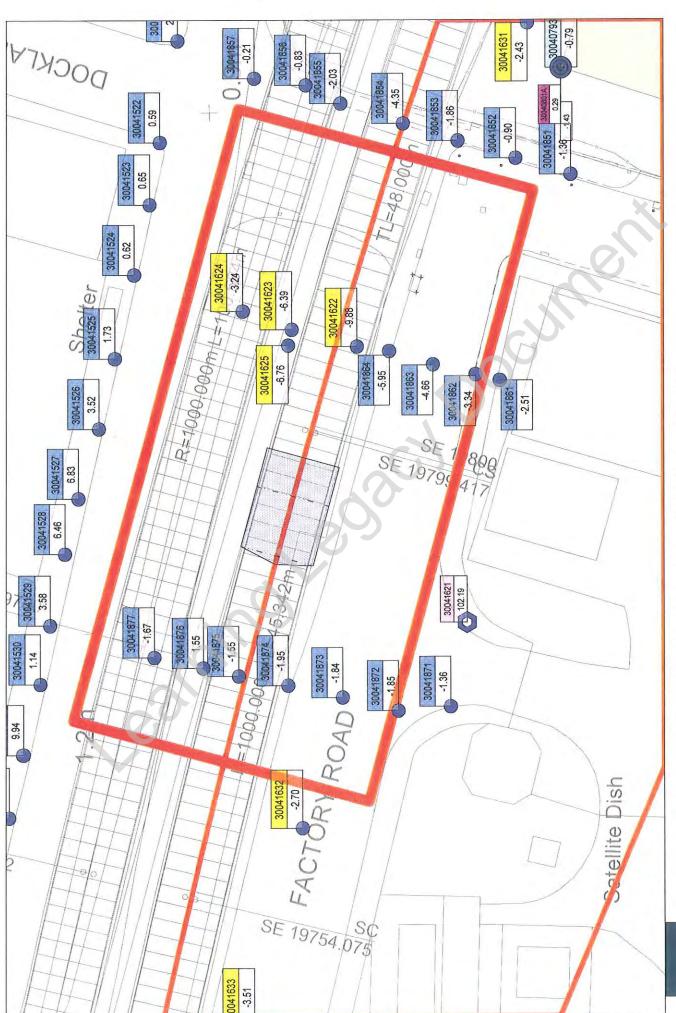




Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB

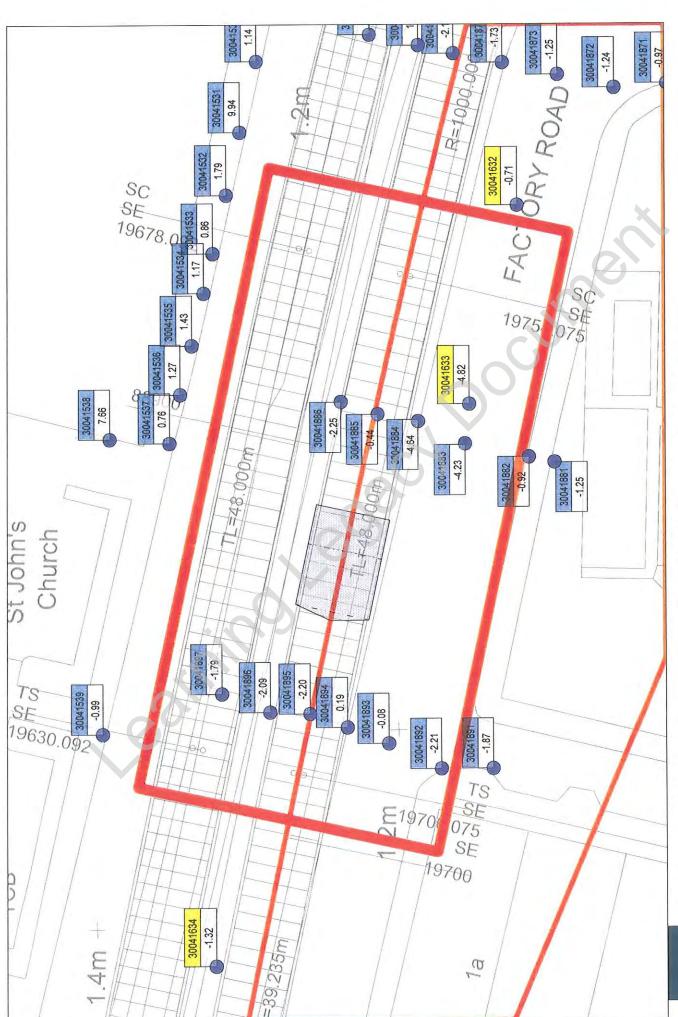


current values: 20.01.2014 09:00



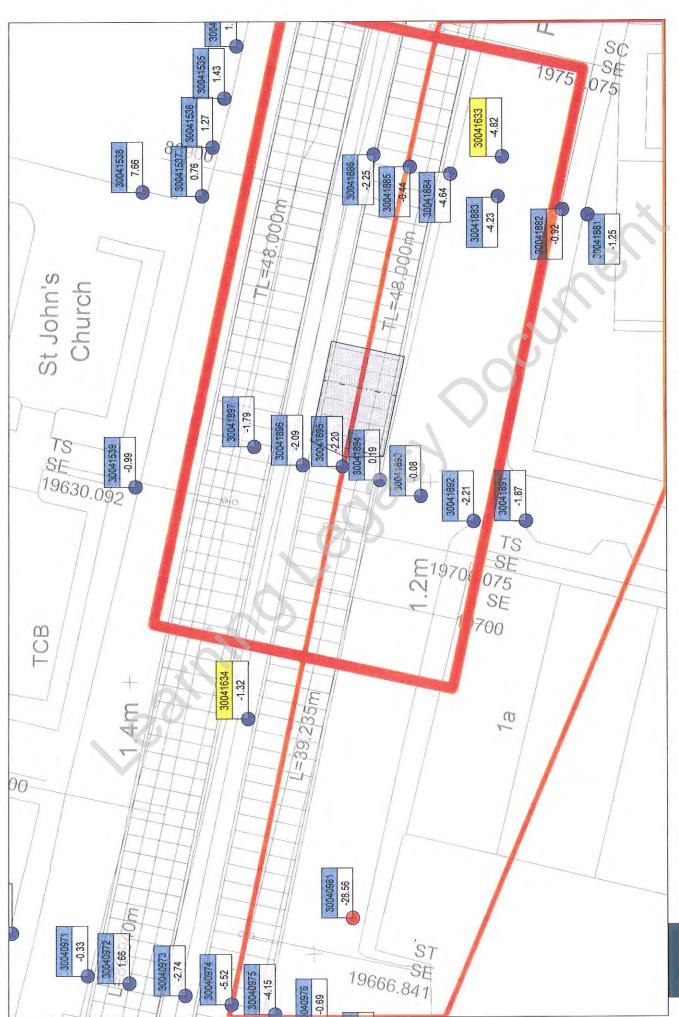
Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB current values: 20.01.2014 17:43





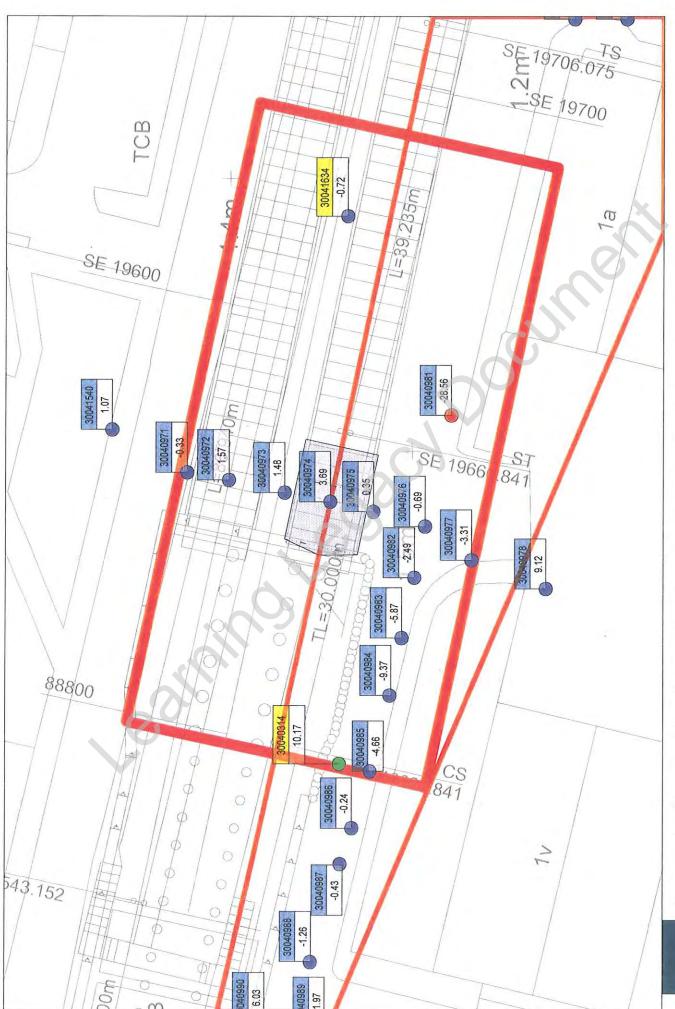
Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB current values: 24.01.2014 09:00





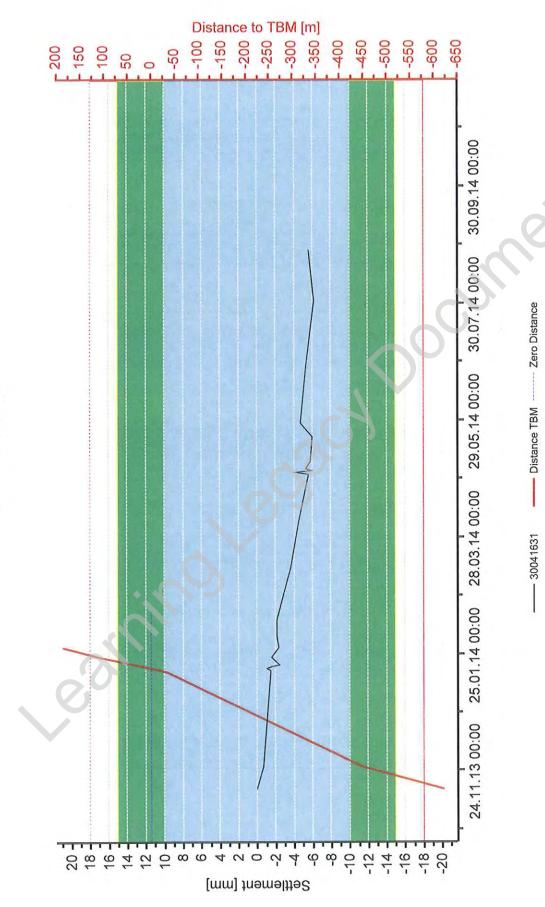
Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB current values: 24.01.2014 19:18





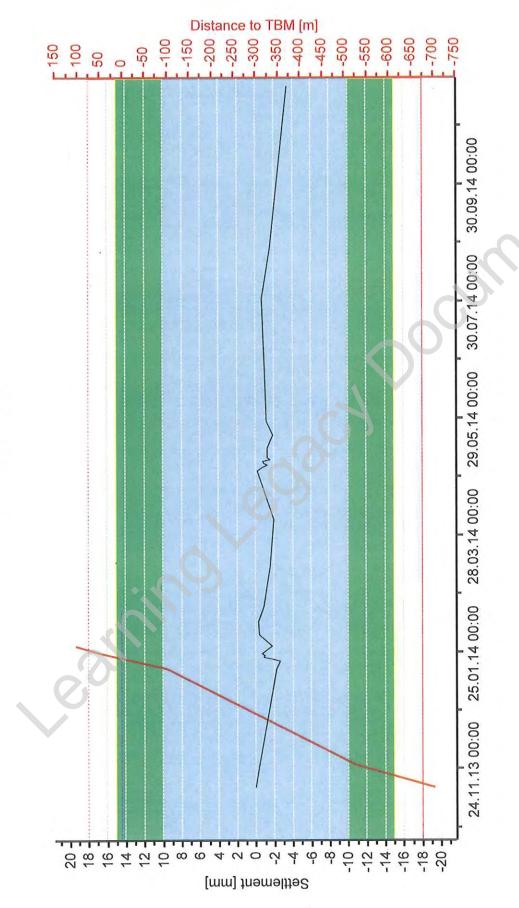
Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB current values: 05.02.2014 10:11





Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: WB Tunnel - SD Factory Road - 17.10.2013 - 21.11.2014 Date: 21.01.2015 10:14 Current Values: 21.01.2015 10:06





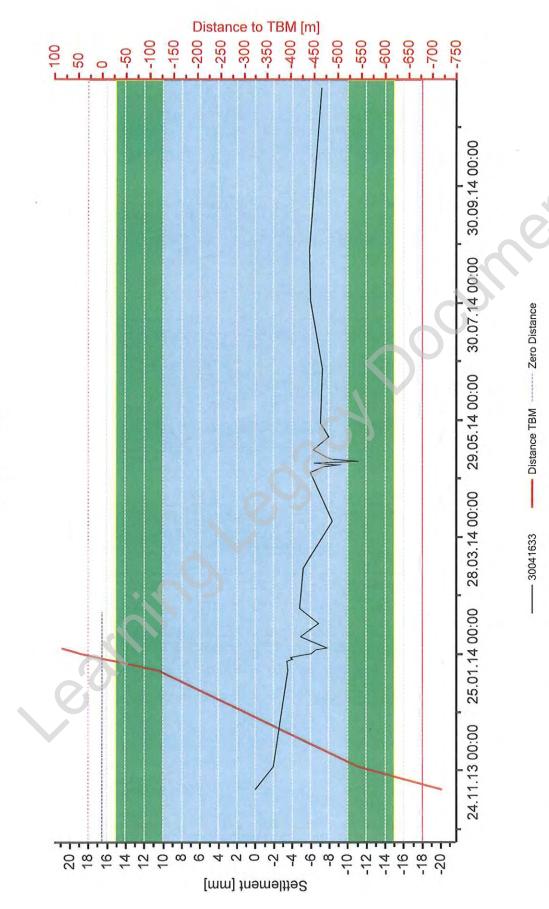
Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: WB Tunnel - SD Factory Road - 17.10.2013 - 21.11.2014 Date: 21.01.2015 10:13 Current Values: 21.01.2015 10:06

Distance TBM ----- Zero Distance

--30041632



Point: 30041633







Point: 30041634

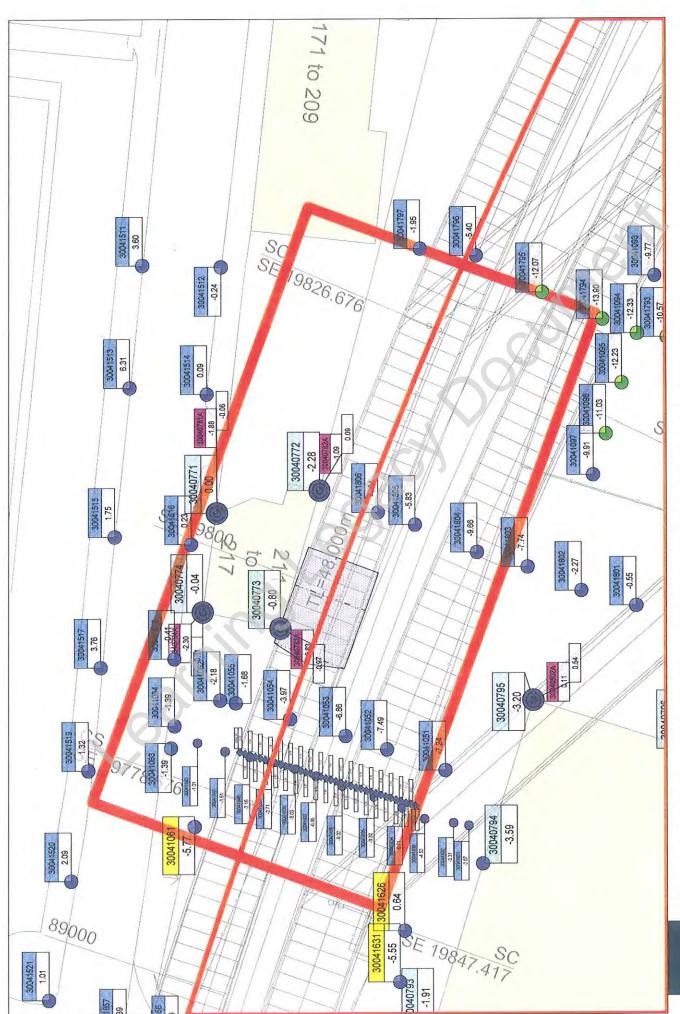


Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: WB Tunnel - SD Factory Road - 17.10.2013 - 21.11.2014 Date: 21.01.2015 10:09 Current Values: 21.01.2015 09:51

---- Distance TBM ----- Zero Distance

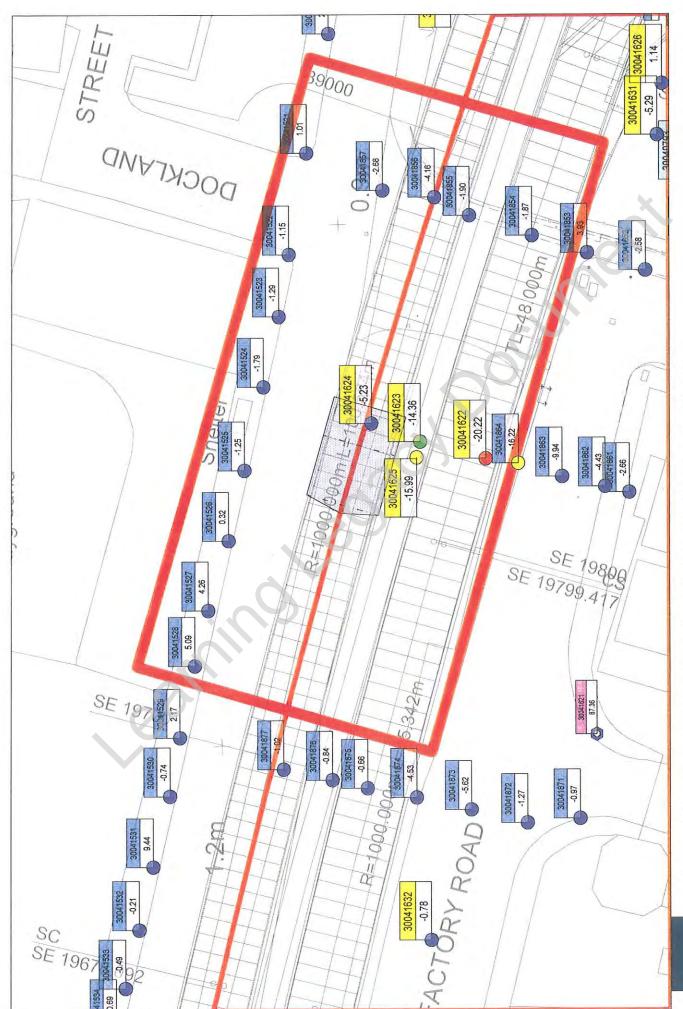
30041634





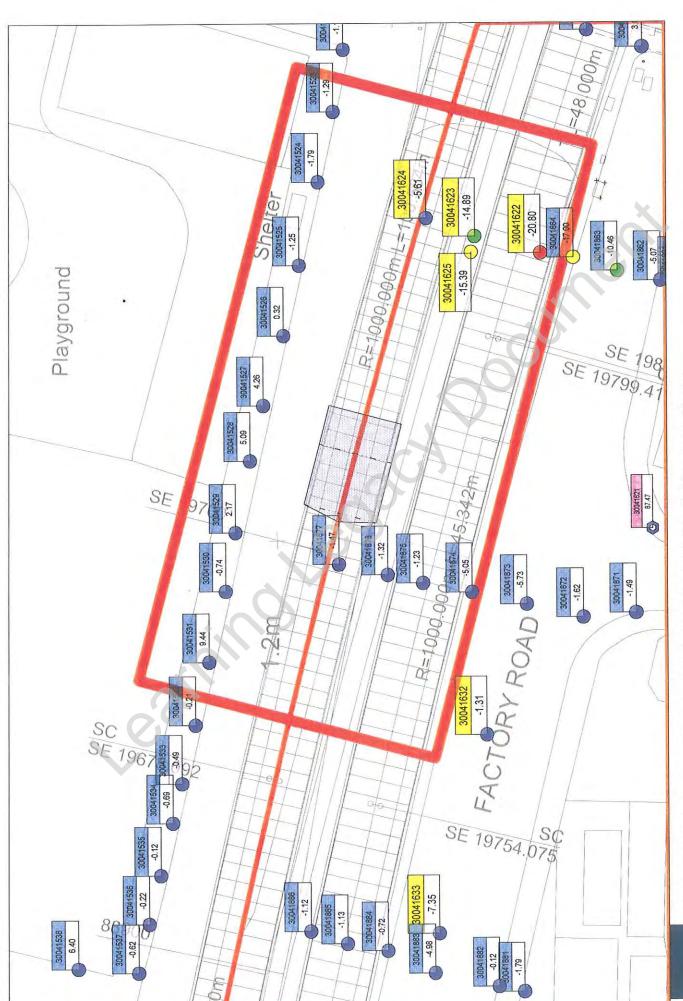
working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal current values: 30.04.2014 09:00





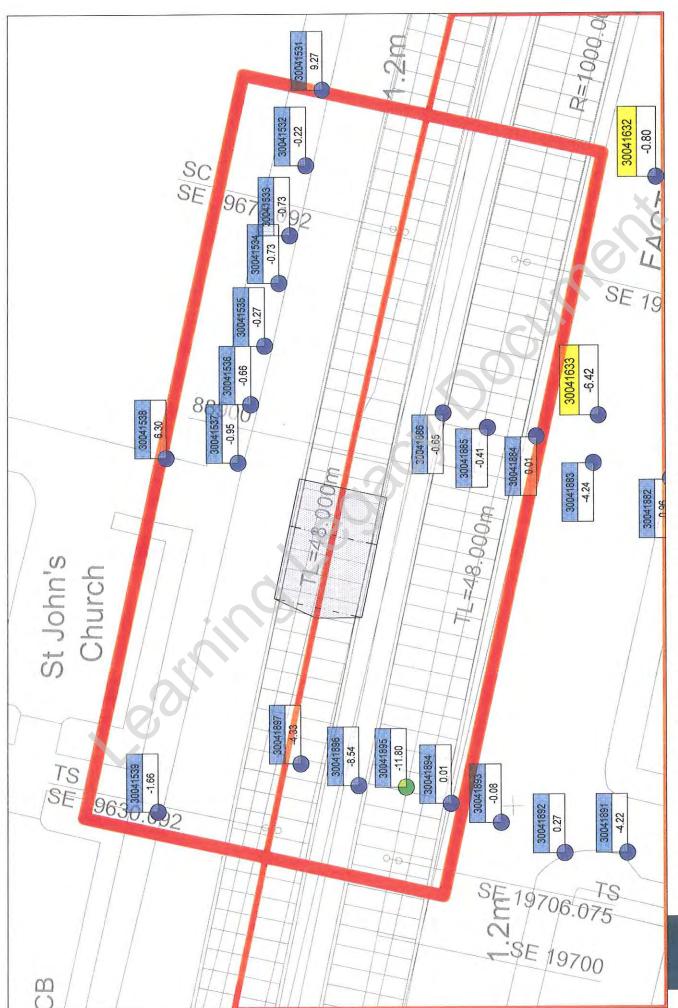
working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal current values: 03.05.2014 09:00





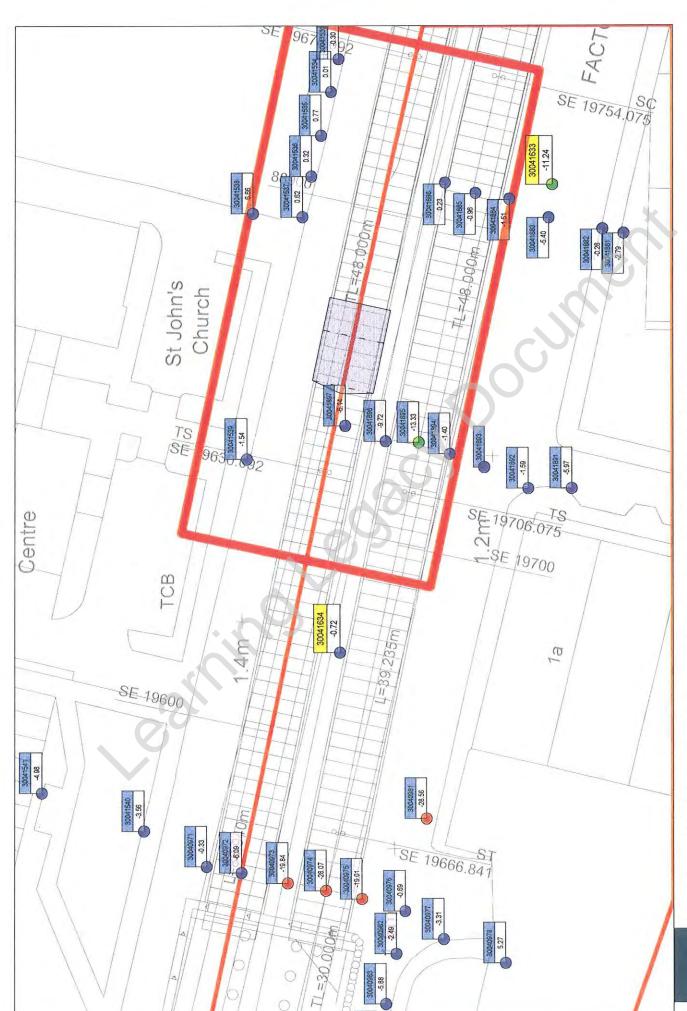
working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal current values: 04.05.2014 09:00





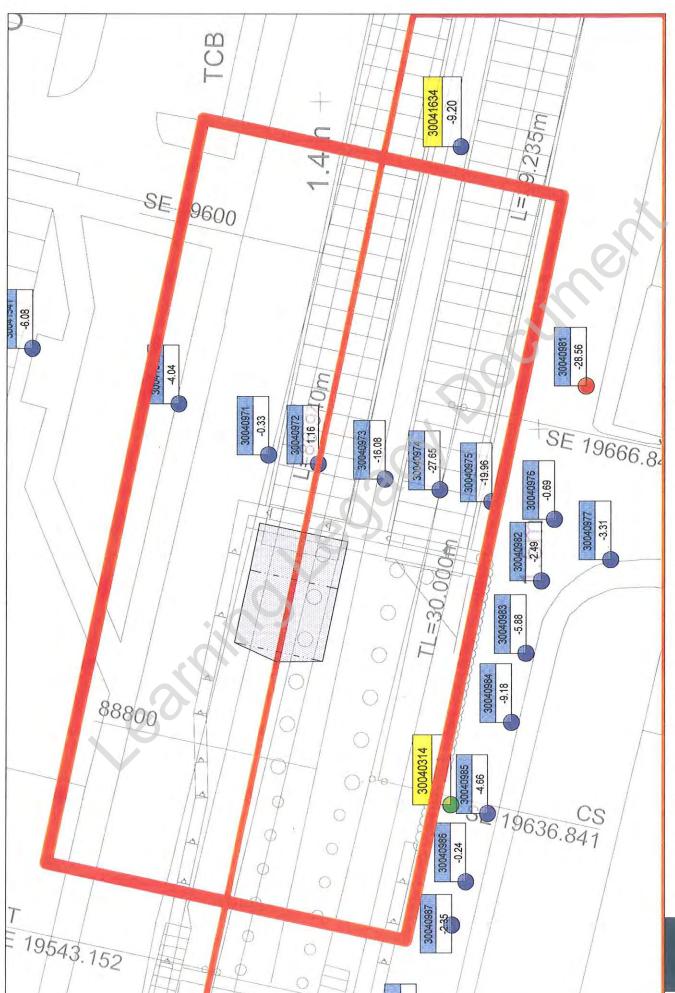
working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab current values: 07.05.2014 09:00 Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal





working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal current values: 07.05.2014 17:35

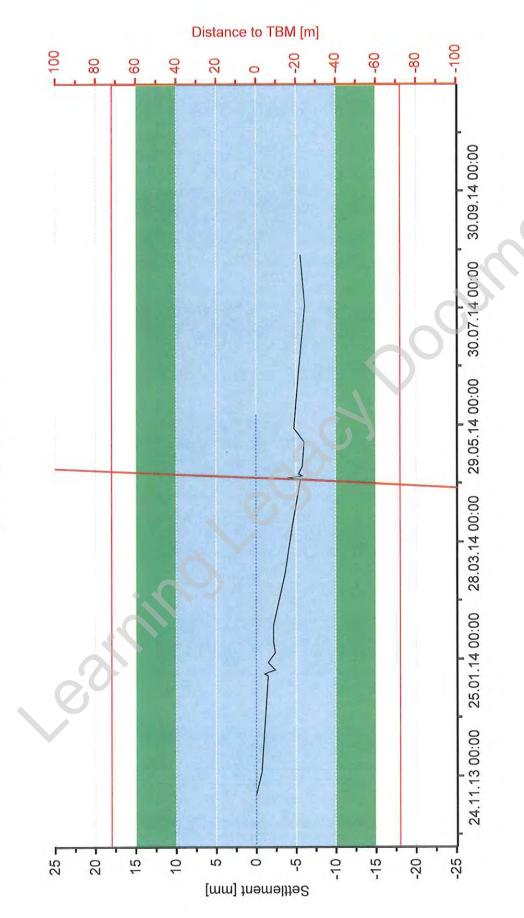




working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab current values: 22.05.2014 17:49 Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal



Point: 30041631

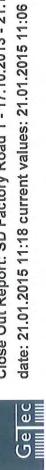


Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: SD Factory Road 1 - 17.10.2013 - 21.11.2014

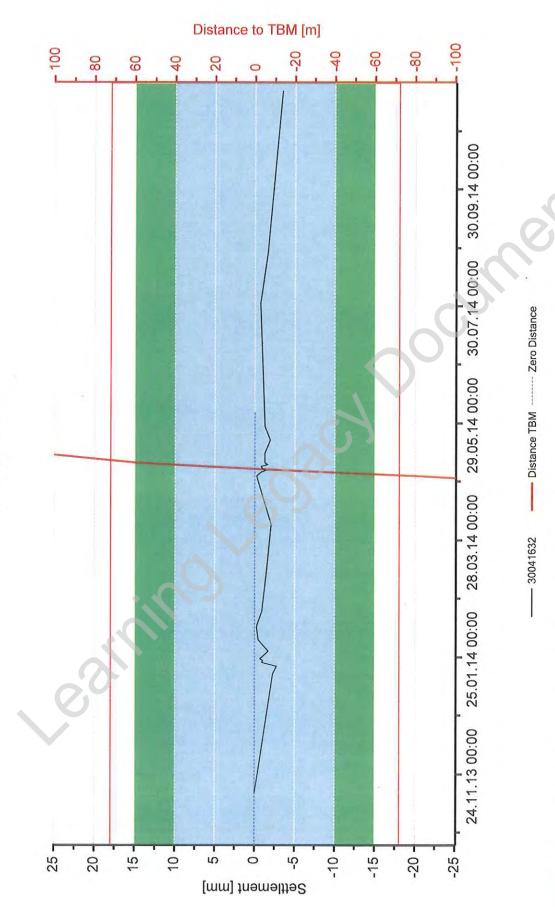
---- Zero Distance

Distance TBM —

- 30041631

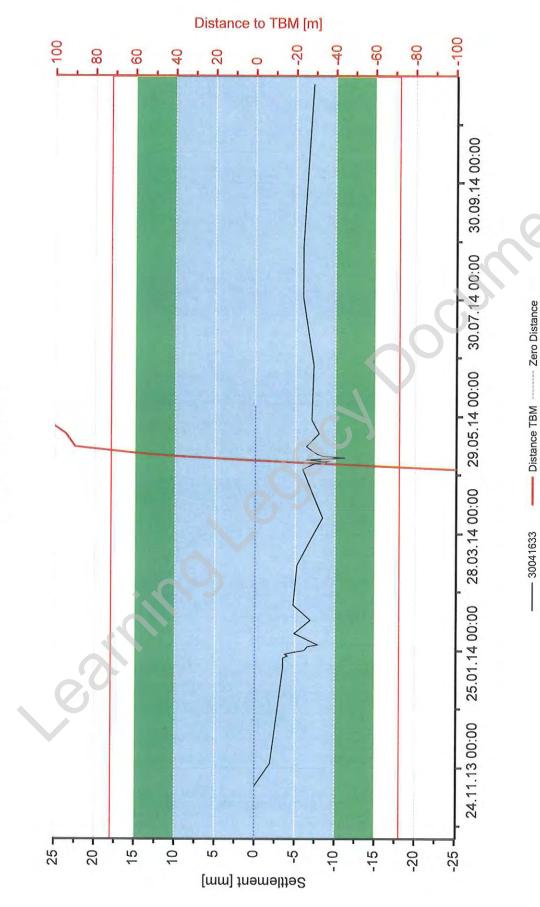


Point: 30041632



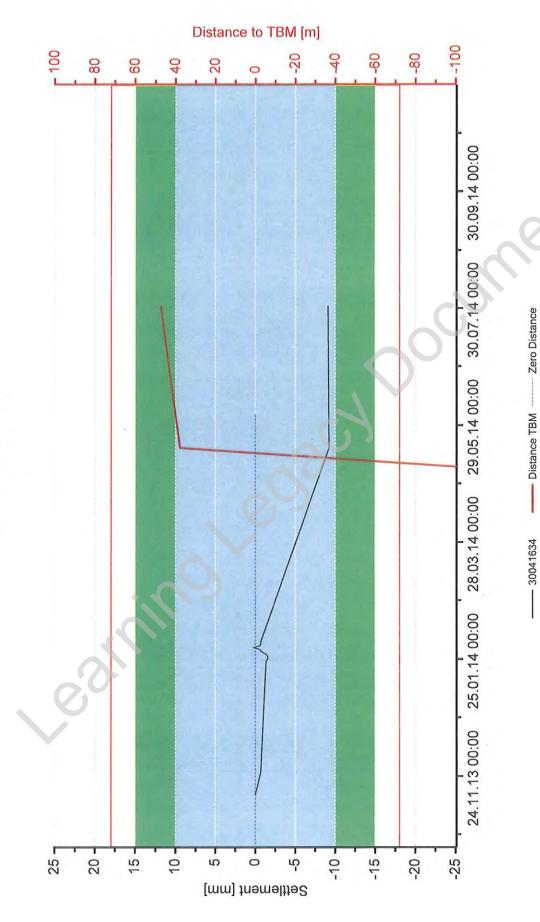
Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: SD Factory Road - 17.10.2013 - 21.11.2014 date: 21.01.2015 11:20 current values: 21.01.2015 11:06





Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: SD Factory Road - 17.10.2013 - 21.11.2014 date: 21.01.2015 11:21 current values: 21.01.2015 11:06





Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: SD Factory Road - 17.10.2013 - 21.11.2014





Tunnel	
hames	
C310 T	
project:	

No. of reading baseline   1.1   Tollowing   1.2   Tollowing   1.3   Tollowing   1.			structure:		Shallow Datur	Datums, I	ns, Factory Road	Road							-				1
14711/13   14711/13	o. of reading	baseline	÷	following		5	following		က်	following		4	following		5. follo	wing	9	following	
Hervation   Geviation from   Geviation	date	14/11/13	23	5/11/2013		15	5/01/2014		16	3/01/2014		1	5/01/2014		17/01/	2014		7/01/2014	
101.156         101.168         -1         -1         101.167         -1         101.167         0         -2         101.167         0         -1         101.168         0         -1         101.167         0         -2         101.167         0         -1         101.168         0         -1         101.167         0         -1         101.168         0         -1         101.167         0         -1         101.167         0         -1         101.167         0         -1         101.168         0         -1         101.168         0         -1         101.167         0         -1         101.168         0         -1         101.167         0         -2         101.167         0         -2         101.167         0         -2         101.167         0         -1         101.167         0         -2         101.167         0         -1         101.167         0         -1         101.167         0         -1         101.167         0         -1         101.167         0         -1         101.167         0         -1         101.167         0         -1         101.167         0         -1         101.167         0         -1         101.167         0	O	elevation	elevation	deviatic last/ba	on from seeline	elevation	deviatio	n from seline	elevation	deviatio last/ba	n from seline	elevation	deviation fro last/baselin			viation from st/baseline		deviatio last/ba	n from seline
101.168         1         101.167         1         101.167         0         2         101.167         0         1         101.167         0         1         101.168         0         1         101.167         0         1         101.167         0         1         101.168         0         1         101.167         0         1         101.168         0         1         101.167         0         1         101.168         0         1         101.167         0         1							5												
101.257         101.256         0         0         101.254         -2         -2         -4         -8	30041631	101.169	101.168	7	7	101.167	7	1-	101,167	0	-5	101.167					101,167	0	7
101.120         101.128         -2         -2         101.116         -2         -4	30041632	101.257	101.256	0	0				101,254	-5	4								
101.549         101.548         -1         -1         96.084         -1         -1         96.084         -1         -1         96.084         -1         -1         96.084         -1         -1         96.084         -1         -1         96.084         -1         -2         96.084         -1         -2         96.084         -1         -2         96.084         -1         -2         96.084         -1         -2         96.084         -1         -2         96.084         -1         -2         96.084         -1         -2         96.084         -1         -2         96.087         4         3         83.087         0         -3         96.085         0         -3         96.087         4         3         83.087         0         -3         96.087         0         -3         96.087         0         -3         96.087         0         -3         96.087         0         -3         96.087         0         -3         96.087         0         -3         96.087         0         -3         96.087         0         -3         96.087         0         -3         96.087         0         -3         96.087         0         -3         96.087         0	30041633	101.120	101.118	ç	Ċ				101,116	-5	4								
96.087         96.086         -1         -1         96.085         -1         -1         96.085         -1         -1         96.085         -1         -1         96.085         -1         -2         95.083         -1         -2         95.083         -1         -2         95.083         -2         -3         91.083         0         -3         91.083         0         -3         91.083         0         -3         91.083         0         -3         91.083         0         -3         83.087         4         3         83.087         0         0         -3         91.083         0         -3         93.087         0         -3         93.087         0         -3         93.087         0         -3         83.087         -3	30041634	101.549	101.548	7	7				101.547		-1								
91,086         91,086         -1         -1         91,083         -2         -2         91,083         0         -3         91,083         0           83,084         83,084         -1         -1         83,082         -1         -2         83,087         4         3         91,083         0           96,163         91,169         91,169         0         0         0         91,166         -3         -3         -3         0         0           96,034         -2         -2         -2         -2         -2         -3         -3         -3         -2         -3         -3         -3         -2         -2         -3         -3         -3         -3         -2         -3	30041631(1)	96.087	96.086	7	-1	96.085	2	π	96.084	17	-5	96.085							
83.084         83.085         -1         -2         83.087         4         3         83.087         0           96.163         96.163         0         0         0         96.166         -3         -3         -3         0         0           83.180         91.169         0         0         0         83.177         -2         -3         -3         0         0         0           96.036         96.034         -2         -2         -2         -2         -3         -5         -3         -5         -2         -2         -3         -5         -2         -3         -5         -2         -3         -5         -2         -3         -5         -4         -5         -4         -5         -4         -5         -4         -5         -4	30041631(2)	91,086	91.085	7	7	91.083	4	-5	91.083	0	-3	91.083		m					
96.163         96.163         0         0         96.160         -3           91.169         91.169         0         0         91.166         -3           83.180         0         0         83.177         -2           96.036         96.034         -2         -2         96.031         -3           91.034         91.032         -2         -2         91.030         -2           83.039         83.038         -2         -2         83.035         -3           96.464         96.463         -1         -1         96.460         -2           91.467         -1         -1         91.465         -2           83.465         83.464         -1         -1         91.465         -2	30041631(3)	83.084	83.083	7	7	83.082	7	-5	83.087	4	3	83.087							
91.169         91.169         0         0         91.166         -3           83.180         83.180         0         0         83.177         -2           96.036         96.034         -2         -2         96.031         -3           91.034         91.032         -2         91.030         -2           83.039         83.038         -2         -2         83.035         -3           96.464         96.463         -1         -1         96.460         -2           91.468         91.467         -1         -1         91.465         -2           83.465         83.464         -1         -1         -1         83.462         -2	30041632(1)	96,163	96.163	0	0				96.160	ဗု	-3								
83.180         83.180         0         0         83.177         -2           96.036         96.034         -2         -2         96.031         -3           91.034         91.032         -2         -2         91.030         -2           83.039         83.038         -2         -2         83.035         -3           96.464         96.463         -1         -1         96.460         -2           91.468         91.467         -1         -1         91.465         -2           83.465         83.464         -1         -1         883.462         -2	30041632(2)	91.169	91.169	0	0				91.166	۴-	-3								
96.036       96.034       -2       -2       96.031       -3         91.034       91.032       -2       -2       91.030       -2         83.039       83.038       -2       -2       83.035       -3         96.464       96.463       -1       -1       96.460       -2         91.465       91.467       -1       -1       91.465       -2         83.465       83.464       -1       -1       83.462       -2	30041632(3)	83,180	83.180	0	0				83.177	-2	6								
91.034     91.032     -2     -2     91.030     -2       83.039     83.038     -2     -2     83.035     -3       96.464     96.463     -1     -1     96.460     -2       91.468     91.467     -1     -1     91.465     -2       83.465     83.464     -1     -1     -1     83.462     -2	30041633(1)	96.036	96.034	Ņ	ç				96.031	ဗု	-5								
83.039     83.038     -2     -2     83.035     -3       96.464     96.463     -1     -1     96.460     -2       91.468     91.467     -1     -1     91.465     -2       83.465     83.464     -1     -1     83.462     -2	30041633(2)	91.034	91.032	42	ç				91,030	-2	4								
96.464     96.463     -1     -1     96.460     -2       91.468     91.467     -1     -1     91.465     -2       83.465     83.464     -1     -1     83.462     -2	30041633(3)	83.039	83.038	ņ	ç				83.035	ကု	5								
91.468     91.467     -1     -1     -1     91.465     -2       83.465     83.464     -1     -1     83.462     -2	30041634(1)	96.464	96.463	7	7				96.460	-5	ဗု								
83.465 83.464 -1 -1 83.462 -2	30041634(2)	91.468	91.467	7	7				91.465	-5	ကု								
	30041634(3)	83.465	83.464	77	7				83.462	-2	ကု								



#### Joint Venture

# project: C310 Thames Tunnel

No. of reading   Easeline   Fraction   Fra			structure.		Shallow	Shallow Datums, Factory Road	Factory	Road												
14711/13   Accordance   1801/2014   Accordan	No. of reading	baseline	7.	following		8. f	ollowing		0	following	<i>F</i> 5	10.	following		Ę	ollowing		12	following	-
Felevation   Levation from   Levation   Le	date	14/11/13	11	3/01/2014		19	1/01/2014	П	20	3/01/2014		61	1/01/2014	П	22	701/2014	П	- 23	/01/2014	
101.169   101.167   0   2   101.166   -1   2   2   2   2   2   2   2   2   2	NO,	elevation	elevation	deviatio	n from seline	elevation	deviation last/bas	n from seline	elevation	deviatio last/ba	on from sseline	elevation	deviatior last/bas		elevation	deviation last/base		elevation	deviatio last/ba	n from seline
101.166   101.167   1																				
101.257         101.256         1         101.256         1         2         101.256         1         2         101.256         1         2         101.256         1         2         101.256         1         2         101.156         1         4         101.156         0         2         101.116         1         4         101.116         0         3         101.116         1         4         101.116         0         3         101.116         1         4         101.116         0         3         101.116         1         4         101.116         0         3         101.116         1         4         101.116         0         3         101.116         1         4         101.116         0         3         101.116         0         3         101.116         0         3         101.116         0         3         101.116         0         3         101.116         1         4         101.116         0         3         101.116         0         3         101.116         0         3         101.116         0         3         101.116         0         3         101.116         0         3         101.116         0         3         1	30041631	101.169	101.167	0	2		7	-2										101.167	-	5
101.126   10.1	30041632	101.257							101.254	0	ကု	101.255	-	ý	101,256	1	7	101.256	0	Τ
101.549         Columnate of the columnation of the colum	30041633	101.120										101.116	0	ကု	101.116	Ţ	4	101,116	0	4
96.085         0         2         96.085         -1         -3         -4         <	30041634	101,549																		
91.086         91.083         0         -3         91.082         -1         -4	30041631(1)	96.087	96.085	0	ç	96.084	7	ကု										96.085	-	ç
83.084         83.083         4         -1         83.081         -2         -2         -2         -4         96.160         1         -3         96.161         1         -2         96.160         1         -3         96.161         1         -2         96.160         1         -2         96.161         1         -2         96.160         1         -2         96.161         1         -2         96.160         1         -2         96.160         1         -2         96.160         1         -2         96.160         1         -2         96.160         1         -2         96.160         1         -2         96.160         1         -2         96.160         1         -2         96.160         1         -2         96.160         1         -2         96.160         1         -2         96.176         1         -2         96.176         1         -2         96.176         1         -2         96.176         1         -2         96.176         1         -2         96.176         1         -2         96.176         1         -2         96.176         1         -2         96.031         1         -1         -2         96.031         1         -1 <td>30041631(2)</td> <td>91.086</td> <td>91.083</td> <td>0</td> <td>ကု</td> <td>91.082</td> <td>τ</td> <td>4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>91.084</td> <td>1</td> <td>-5</td>	30041631(2)	91.086	91.083	0	ကု	91.082	τ	4										91.084	1	-5
96.163         -1         -4         96.160         1         -2         96.161         1         -2         96.161         1         -2         96.166         0           91.169         91.169         -1         4         96.160         1         -2         91.168         1         -1         91.167         -1 <td< td=""><td>30041631(3)</td><td>83.084</td><td>83.083</td><td>4</td><td>7</td><td>83.081</td><td>5</td><td>q</td><td></td><td></td><td>1</td><td>+</td><td></td><td></td><td></td><td></td><td></td><td>83.083</td><td>-</td><td>7</td></td<>	30041631(3)	83.084	83.083	4	7	83.081	5	q			1	+						83.083	-	7
91.169         91.169         -3         91.167         1         -2         91.168         1         -1         91.167         -1         91.167         -1         91.167         -1         91.167         -1         91.167         -1         91.167         -1         91.167         -1         91.178         -1         -2         91.179         1         -1         91.178         -1         -2         91.179         1         -1         91.178         -1         -1         91.178         -1         -1         91.178         -1         -1         91.178         -1         -1         91.178         -1         -1         91.178         -1         -1         91.178         -1         -1         91.178         -1         -1         91.178         -1         -1         -1         91.178         -1         -1         -1         91.178         -1<	30041632(1)	96.163							96.159	Ŧ	4	96.160	-	ကု	96.161	+	-5	96.160	0	ဗု
83.180       83.177       0       -3       83.178       1       -2       83.179       1       -1       83.178       -1       -1       83.178       -1	30041632(2)	91.169							91.166	0	ကု	91.167	+	2	91.168	1	Ť	91.167	7	Ç
96.036         4         96.037         -1         -5         96.031         1           91.034         91.034         -1         -4         91.030         -1         -4         91.030         1           83.035         96.464         83.035         0         -4         83.034         -1         -5         83.035         0           91.468         91.468         9         -4         83.034         -1         -5         83.035         0           83.465         9         -4         83.034         -1         -5         83.035         0	30041632(3)	83.180							83.177	0	ကု	83.178	-	42	83.179	1	7	83.178	Ţ	-5
91.034         91.034         91.030         9 .4         91.030         -1         -4         91.030         1         -4         91.030         1         -4         91.030         1         -4         91.030         1         -4         91.030         1         -4         91.030         1         -4         91.030         1         -4         91.030         1         -4         91.030         -1         -5         83.035         0         -4         83.034         -1         -5         83.035         0         -4         91.030         1         -4         91.030         -1         -4         91.030         -1         -4         83.034         -1         -5         83.035         0         -1         -4         91.030         -1         -4         91.030         -1         -4         91.030         -1         -4         91.030         -1         -4         91.030         -1         -4         91.030         -1         -4         91.030         -1         -4         91.030         -1         -4         91.030         -1         -4         91.030         -1         -4         91.030         -1         -4         91.030         -1         -4         9	30041633(1)	96.036										96.032	0	4	96.031	7	-Ş	96.031	1	\$
83.039       83.039       96.464       1       -5       83.035       0       -4       83.034       -1       -5       83.035       0         91.468       91.	30041633(2)	91.034										91.030	0	4	91.030	7	4	91.030	-	4
	30041633(3)	83.039										83.035	0	4	83.034	7	φ	83.035	0	ς
	30041634(1)	96.464																		
	30041634(2)	91.468																		
	30041634(3)	83.465												N						



Tunnel
C310 Thames
C310
project:

Table   Tabl			structure:		Shallow	Shallow Datums, Factory Road	Factory	, Road												
1471/115	No, of reading	baseline	13.	. following	D	14.	following	E	15,	following	O)	16,	followin	Ď.	17.	following		18.	following	
101.166   101.167   131/ Daseline   16vation from   161/ Daseline   161/ Das	date	14/11/13	2	4/01/2014		25	3/01/2014		2	7/01/2014		Ñ	3/01/2014		Ċ.	3/01/2014		53	9/01/2014	
101.169	ON	elevation	elevation		on from aseline	elevation	deviatio last/ba	in from seline	elevation	deviatic last/ba	on from seeline	elevation		on from aseline	elevation	deviation last/bas	r from seline	elevation	deviation last/bas	n from seline
1011.65																				
101.257   101.266   0   -1   -1   -6   101.114   -1   -6   101.113   -1   -7   101.124   0   -1   -8   -1   -2   101.114   -1   -6   101.113   -1   -7   101.114   -1   -8   -7   -7   -7   -7   -7   -7   -7	30041631	101.169													101.166	7	ç			
101.120         101.134         -1         -5         101.134         -1         -6         101.134         -1         -7         101.142         -1         -8         -0         -1         -8         -0         -1         -0         -1         -0         -1         -0         -1 <t< td=""><td>30041632</td><td>101.257</td><td>101,256</td><td>0</td><td>7</td><td></td><td></td><td></td><td>C</td><td></td><td></td><td>101,255</td><td>7</td><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	30041632	101.257	101,256	0	7				C			101,255	7	7						
101549         101547         0         -1         101548         0         -1         101548         0         -1         101548         0         -1         101549         0         -1         101549         0         -1         101549         0         -1         101549         0         -1         101549         0         -1         101549         0         -1         101549         0         -1         101549         0         -1         101549         0         -1         101549         0         -1         101549         0         -1         101549         0         -1         96.084         -1         96.084         -1         -2         -1         -2         -1         -2         -1         -2         -1         -2         -1         -2         -1         -2         -1         -2         -1         -2         -1         -2         -1         -1         -2         -1         -2         -1         -2         -1         -2         -1         -2         -1         -2         -1         -2         -1         -2         -1         -2         -1         -2         -1         -2         -1         -2         -1         -2<	30041633	101.120	101.115	7	ιγ	101.114	7	φ	101.113	٦	-7	101,112	7	φ						
96.087         4 <td>30041634</td> <td>101.549</td> <td>101.547</td> <td>0</td> <td>٦</td> <td>101.547</td> <td>0</td> <td>ç</td> <td>101,547</td> <td>0</td> <td>-1</td> <td>101.548</td> <td>0</td> <td>7</td> <td></td> <td></td> <td></td> <td>101.548</td> <td>0</td> <td>7</td>	30041634	101.549	101.547	0	٦	101.547	0	ç	101,547	0	-1	101.548	0	7				101.548	0	7
91,086         A         A         A         A         A         A         A         A         A         A         A         B1,086         A <th< td=""><td>30041631(1)</td><td>96.087</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>96.084</td><td>7</td><td>ကု</td><td></td><td></td><td></td></th<>	30041631(1)	96.087													96.084	7	ကု			
83.084         Factorial Serior	30041631(2)	91.086													91.083	7	ကု			
96.163         91.169         91.169         91.166<	30041631(3)	83.084								U					83.082	Ť	-2			
91.169         91.167         0         -2         -2         -4         91.166         -1         -3         -8         -1         -3         -3	30041632(1)	96.163	96.160	0	ကု							96.159	7	4						
83.180         83.178         0         -2         -4         96.028         -2         -8         96.027         -1         -3         -9         -9         -9         -9         -1         -3         -9	30041632(2)	91.169	91.167	0	4							91.166	7	ကု						
96.036         96.031         -1         -6         96.031         0         -5         96.028         -2         -8         96.027         -1         -9 </td <td>30041632(3)</td> <td>83.180</td> <td>83.178</td> <td>0</td> <td>-2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>83.177</td> <td>7</td> <td>ကု</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	30041632(3)	83.180	83.178	0	-2							83.177	7	ကု						
91,034         91,036         0         -4         91,028         -2         -6         91,027         -1         -7         -8         -7         -8         -1         -7         -8	30041633(1)	96.036	96.031	7	φ	96.031	0	ιģ	96.028	ņ	φ	96.027	٦	6						
83.039         83.034         0         -5         83.033         -2         -7         83.031         -1         -8	30041633(2)	91.034	91.030	0	4	91.030	0	4	91.028	7	φ	91.027	F	7-						
96.464         96.461         0         -3         96.460         -2         96.460         -2         -4         96.460         0         -4         96.460         1         96	30041633(3)	83.039	83.034	0	φ	83.034	0	ç	83.033	-5	-7	83.031	-1	8-						
91.468         91.466         0         -2         91.465         -2         -3         91.464         0         -3         91.465         1           83.465         1         -2         83.463         1         -2         83.463         -2         -3         83.462         0         -3         83.463         1	30041634(1)	96.464	96.461	0	φ	96.462	1	ç	96,460	-2	4	96.460	0	-4				96.460	1	ကု
83.465         83.463         1         -2         83.462         -2         -3         83.462         0         -3         83.463         1	30041634(2)	91.468	91,466	0	Ņ	91.467	-	7	91,465	-5	ŋ	91,464	0	တို				91,465	1	ကု
	30041634(3)	83.465	83.463	,	5	83.463	-	4	83.462	5	ကု	83,462	0	-3				83,463	-	-2

### North Woolwich levelling

# monitoring table



Structure   Stru			project:		3310	C310 Thames Tunnel	es Tur	nnel											
Passeline   Table			structure:		shallow	Datums,	Factory	Road											
1411/113   1411/114	No. of reading		9,	following		20.	following		21.	following	0	22.	following		23. follov	ying	24.	following	77)
Participation   Lay Daseline   Lay	date	14/11/13	30	5/01/2014		31,	/01/2014		01	/02/2014	П	20	1/02/2014	$\parallel$	03/05/20	14	1	3/02/2014	
101.169   101.257   101.246   1   1   1   1   1   1   1   1   1	, ON	elevation	elevation	deviation last/bas		elevation	deviation last/basi		elevation	deviatic last/ba	on from seline	elevation	deviation fro last/baseline			ation from 'baseline		deviatio last/ba	in from seline
101.169   101.169   101.164   101.649   10   101.549   10   101.266   101.2666   101.2666   101.2666   101.2666   101.2666   101.2666   101.2666   101.2666   101.26666   101.2666   101																L			
101.257   101.546   1   1   1   1   1   1   1   1   1	30041631	101.169												101.16		42			
101.13c   101.13c   101.54c   1   1   1   1   1   1   1   1   1	30041632	101.257							(					101.25		0	101.256	0	0
101.549   101.546   0   -1   101.549   1   0   101.548   -1   -1   101.548   0   -1   101.548   0   -1   101.548   0   -1   101.548   0   -1   101.548   0   -1   101.548   0   -2     101.548   0   -2	30041633	101.120							2					101.11		ιγ	101,113	-5	1-
96.087         1         4 <td>30041634</td> <td>101.549</td> <td>101.548</td> <td>0</td> <td></td> <td>101.549</td> <td>1</td> <td>0</td> <td>101.548</td> <td>7</td> <td>Ţ</td> <td>101.548</td> <td></td> <td></td> <td></td> <td>7</td> <td></td> <td>covered</td> <td></td>	30041634	101.549	101.548	0		101.549	1	0	101.548	7	Ţ	101.548				7		covered	
91,086         91,086         91,086         91,086         91,086         91,086         91,086         91,086         91,086         91,086         91,086         91,086         91,083         91,083         91,083         91,189<	30041631(1)	96.087												96.08		4			
83.084         9         1         4 <td>30041631(2)</td> <td>91.086</td> <td></td> <td>91.08</td> <td></td> <td>4</td> <td></td> <td></td> <td></td>	30041631(2)	91.086												91.08		4			
96.163         Characterist	30041631(3)	83.084									1			83.08		٦			
91.169         1         1         1         2         91.168         1         2         91.168         1         2         91.168         1         2         91.168         1         2         91.168         1         2         91.168         1         2         91.168         1         2         91.168         1         2         91.168         1         2         96.030         3         6         96.028         2         96.028         2         9         96.030         3         6         96.028         2         9	30041632(1)	96.163												96.15		4	96.160	0	ကု
83.180         Mathematical Section         Mathematical Section <td>30041632(2)</td> <td>91.169</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>J</td> <td></td> <td></td> <td></td> <td>91.16</td> <td></td> <td>Ņ</td> <td>91.168</td> <td>0</td> <td>ch.</td>	30041632(2)	91.169								J				91.16		Ņ	91.168	0	ch.
96,036         A         A         A         A         A         A         A         A         B6,036         3         -6         96,036         -2         96,036         -2         96,036         -3         -6         96,028         -2         -8         -2         -8         -2         -8         -2         -8         -3         -6         -6         -3         -6         -6         -3         -3         -4         -3	30041632(3)	83.180												83,175		٦	83.179	0	7
91.034         1         2         1         3         4         91.030         3         -4         91.028         -2           83.039         4         -3         96.461         -1         -3         96.461         -1         -3         96.461         0         -3         96.461	30041633(1)	96.036												96.03		9-	96.028	-5	φ
83,039         4         -3         96,461         -1         -3         96,460         -1         -3         96,461         -1         -3         96,460         -1         -3         96,461         0         -3         96,	30041633(2)	91,034												91.03(		4	91.028	-5	မှ
96.464         96.461         0         -2         96.461         -1         -3         96.460         0         -3         96.461         0           91.468         91.464         -1         -3         91.465         1         -2         91.465         -1         -3         91.465         0         -3         91.465         0           83.465         83.465         0         -3         83.463         1         -2         83.463         -1         -2         83.463         0         -2         83.463         0	30041633(3)	83.039												83.03		4	83.034	-5	9
91,468         91,464         -1         -3         91,465         1         -2         91,465         -1         -3         91,465         0         -3         91,465         0         -3         91,465         0         -3         91,465         0         -3         91,465         0         -3         91,465         0         -3         91,465         0         -3         91,465         0         -3         91,465         0         -3         83,463         0         -3         83,463         0         -2         83,463         0         -2         83,463         0         -3         83,463         0         -3         83,463         0         -2         83,463         0         -3         83,463         0         -3         83,463         0         -3         83,463         0         -3         83,463         0         -3         83,463         0         -3         83,463         0         -3         83,463         0         -3         83,463         0         -3         83,463         0         -3         83,463         0         -3         83,463         0         -3         83,463         0         -3         83,463         0         -	30041634(1)	96.464	96.461	0	ကု	96.461	0	-5	96.461	7	ဗှ	96,460				ဗှ			
83.465     83.463     0     -3     83.463     1     -2     83.463     -1     -2     83.463     0     -2     83.463     0	30041634(2)	91.468	91.464	۲	ო	91.466	1	ņ	91.465	7	ကု	91,465				ო			
	30041634(3)	83.465	83.463	0	ကု	83.463	1	-2	83.463	7	-2	83.463		7		-2			

North Woolwich levelling

# MURPHY SOUTHWAY

#### Joint Venture

# project: C310 Thames Tunnel

monitoring table

No. of reacting baseline   1411113   111112   111112   111113			structure:		Shallow	Shallow Datums, Factory Road	Factory	Road												
14711/13   14711/13	No. of reading	baseline	25.	following		26.	following	-	27.	following	D	. 28.	following		29.	following		30.	following	<b>T</b>
101.159   101.166   0   2   3   4   4   4   101.164   101.165	date	14/11/13	112	2/02/2014		18	/02/2014	П	1	1/03/2014		0	7/04/2014		36	/04/2014	Ħ	0	/05/2014	
101.166   101.166   0   2   101.165   -1   -1   101.265   -1   -2   101.164   -1   -5   101.165   -1   -5   101.164   -1   -5   101.165   -1   -5   101.165   -1   -5   101.165   -1   -5   101.165   -1   -5   101.165   -1   -5   101.165   -1   -5   101.165   -1   -5   101.165   -1   -5   101.165   -1   -5   101.165   -1   -5   101.165   -1   -5   101.115   -2   -2   101.115   -2   -	ŏ	elevation		deviation last/bas			deviatio last/ba	n from seline	elevation	deviatic last/ba	on from seline	elevation	deviation last/bas		elevation	deviation last/bas		elevation	deviatio last/ba	n from seline
1011.65   1011.66   0   2   2   2   2   2   2   2   2   2																				
101.257   101.256   1   101.256   1   101.255   1   101.255   1   101.255   1   101.255   1   101.255   1   101.255   1   101.255   1   101.114   2   2   101.114   2   2   101.114   2   2   101.114   2   2   101.114   2   2   101.114   2   2   2   101.114   2   2   2   2   2   2   2   2   2	30041631	101,169	101.166	0	ch				101.165	7	4	101.164	$\hat{\tau}$	τ'n	101.163	7	φ	101.164	-	4
101.120   101.130   101.115   2   5   101.115   0   5   101.111   3   5   5   101.111   3   5   5   101.111   3   5   5   5   101.111   3   5   5   5   5   101.111   3   5   5   5   5   5   5   5   5   5	30041632	101.257				101.256	7	7	101.255	T	q	101.255	0	ch.				101,256	2	0
101549   According to Converted   Conven	30041633	101.120				101,115	2	ιγ	101.115	0	ιγ	101,111	ကု	φ				101.114	7	9
96.087         96.088         1         -2         -4         96.084         -1         -3         96.083         -1         -4         96.083         -1         -4         96.083         -1         -4         96.084         -1         -3         91.082         -1         -3         91.082         -1         -3         91.082         -1         -3         91.082         -1         -3         91.082         -1         -3         91.082         -1         -3         91.081         -1         -3         91.081         -1         -3         91.081         -1         -3         91.082         -1         -3         91.081         -1         -3         91.082         -1         -2         91.082         -1         -2         91.082         -1         -2         91.082         -1         -2         91.082         -1         -3         91.082         -1         -3         91.082         -1         -3         91.082         -1         -3         91.082         -1         -3         91.082         -1         -3         91.082         -1         -3         91.082         -1         -3         91.082         -1         -3         91.082         -1         -3	30041634	101.549	U	covered		O	palend			parang		7	perevo		D	overed		0	palevo	
91.086         91.083         0         -2         91.083         0         -1         -3         91.083         0         -1         -3         91.083         0         -1         -3         91.083         0         -1         83.082         -1         -2         91.083         0         -1         83.082         -1         -2         91.081         -1         -2         91.081         -1         -2         91.082         -1         -2         91.083         -1         -2         91.162         -1         -2         91.163         -2         91.165         7         2         91.167         -8         -3         -1         -3         -2         91.167         -8         -3         -2         91.167         -8         -3	30041631(1)	96.087	96.085	1	42				96.084	Ŧ	ကု	96.083	7	4-	96.083	0	4	96.084	1	6-
83.084         83.083         0         -1         83.082         -1         -2         83.082         -1         -2         83.082         -1         -2         83.082         -1         -2         83.082         -1         -2         83.082         -1         -3         -3         -4         83.032         -1         -3         -3         -4         83.032         -1         -3         -4         -3         -4         -3 </td <td>30041631(2)</td> <td>91.086</td> <td>91.083</td> <td>0</td> <td>4</td> <td></td> <td></td> <td></td> <td>91.083</td> <td>0</td> <td>5</td> <td>91.082</td> <td>7</td> <td>က္</td> <td>91.081</td> <td>7</td> <td>4</td> <td>91.083</td> <td>2</td> <td>ဗှ</td>	30041631(2)	91.086	91.083	0	4				91.083	0	5	91.082	7	က္	91.081	7	4	91.083	2	ဗှ
96.163         -1         -4         96.165         7         2         96.155         -10           91.169         -1         -4         96.165         7         5         91.167         -8           91.169         0         -2         91.175         7         5         91.167         -8           96.036         0         -1         83.176         -3         -4         83.177         1           91.034         0         -1         83.176         -6         96.039         8         3         96.026         -13           83.039         2         -4         91.038         8         4         91.028         -10           96.464         91.468         8         4         91.028         -10         -1           83.465         9         83.465         9         -2         83.038         2         -2         83.038         1           83.465         9<	30041631(3)	83.084	83.083	0	77				83.083	0	1-1	83.082	7	-2	83.081	-	-3	83.082	-	ç
91.169       0       -2       91.175       7       5       91.167       -8         83.180       83.179       0       -1       83.176       -3       4       83.177       1         96.036       96.031       2       -6       96.039       8       3       96.026       -13         91.034       91.030       2       -4       91.038       8       4       91.028       -10         96.464       91.468       8       33.038       2       -2       83.038       -2       83.033       -4         91.468       93.465       9	30041632(1)	96.163					T	4	96.165	7	2	96.155	-10	φ						
83.180       83.179       0       -1       83.176       -3       -4       83.177       1         96.036       96.036       2       -6       96.039       8       3       96.026       -13         91.034       91.034       2       -4       91.038       8       4       91.028       -10         83.039       2       -3       83.038       2       -2       83.038       4         96.464       1       1       1       1       1       1       1         83.465       1       1       1       1       1       1       1       1	30041632(2)	91.169				91.168	0	ç	91.175		2	91.167	φ	ကု						
96.036         96.036         2         -6         96.039         8         3         96.026         -13           91.034         91.030         2         -4         91.038         8         4         91.026         -10           83.039         8         3         83.038         2         -2         83.038         4         -10           96.464         91.468         9         1         1         1         1         1         1         1           83.465         9         1	30041632(3)	83.180				83.179	0	7	83.176	ကု	4	83.177	1	67						
91.034       91.036       2       -4       91.038       8       4       91.028       -10         83.039       83.036       2       -3       83.038       2       -2       83.033       -4         96.464       91.468       <	30041633(1)	96.036				96.031	7	9	96.039	ω	ო	96.026	-13	-10						
83.039       83.036       2       -3       83.038       2       -2       83.033       44         96.464       7	30041633(2)	91.034				91.030	N	4	91.038	ω	4	91.028	-10	9						
	30041633(3)	83,039				83.036	N	ကု	83.038	N	Ç	83.033	4	φ						
	30041634(1)	96.464																		
	30041634(2)	91.468																		
	30041634(3)	83.465																		

project: C310 Thames Tunnel



	D		deviation from last/baseline	φ	ç	17		4	4	ဇှ	oʻ.	4	ကု	+	-10	φ				
	36. following	07/05/2014		0	Ţ	-Ç	covered	42	7	7	7	7	7	4	ς	4				
	36.	0	elevation	101.163	101,255	101.109	9	96.083	91,081	83.081	96.154	91.165	83.177	96.025	91,025	83.031				
П			n from seline		7	φ					φ	ကု	ကု	2-	φ	4				
	35, following	06/05/2014	deviation from last/baseline		0	ო	covered				0	0	7	2	ო	က				
	35.	90	elevation		101.256	101.113	0				96.155	91.167	83.177	96.029	91.029	83.035				
			_		77	o <sub>i</sub>					φ	ကု	-2	တု	1-	φ				
	34. following	05/05/2014	deviation from last/baseline		0	-2	covered				0	0	-	42	-2	-2				
	34.	05	elevation		101.256	101.111	Ö				96.155	91,167	83.178	96.027	91.027	83.033				
					Ÿ	-7					φ	ņ	ფ	1-	ιŲ	ιŅ				
	33, following	04/05/2014	deviation from last/baseline		7	7	povered				7	7	7	ო	-					
	33,	04	elevation		101.255	101,113	0				96.155	91.166	83.177	96.029	91,029	83,035				
Road				ιģ	7			?	4	-5	1-	ņ	7							
Factory	32. following	03/05/2014	deviation from last/baseline	+	7		pereveo	ო	-		0	-	-							
Datums, Factory Road	32.	03	elevation	101.163	101,256		6	96.085	91.082	83.082	96.156	91.167	83.178							
Shallow D			n from sseline	φ				4	4	ကု										
	31. following	02/05/2014	deviation from last/ baseline	ç			covered	?	-5	7										
structure:	37.	05	elevation	101.163			5	96.082	91.081	83.081										
	baseline	14/11/13	elevation	101.169	101.257	101.120	101.549	96.087	91,086	83.084	96.163	91.169	83.180	96.036	91.034	83.039	96.464	91.468	83.465	
	No. of reading	date	Ö	30041631	30041632	30041633	30041634	30041631(1)	30041631(2)	30041631(3)	30041632(1)	30041632(2)	30041632(3)	30041633(1)	30041633(2)	30041633(3)	30041634(1)	30041634(2)	30041634(3)	



Joint Venture

# project: C310 Thames Tunnel

No. of Freeding   Description   Descriptio			structure:	1	Shallow Date	v Datums,	ıms, Factory Road	/ Road												
14/11/13   Autoritical letwation   deviation from   dev	No. of reading	baseline	37.	following	D	38.	, following	m	36.	followin	Ō	40.	following		41.	following		45.	following	D
101.169   Sevation from   Se	date	14/11/13	ō	8/05/2014		0	19/05/2014		-	3/05/2014			7/05/2014	$\parallel$	200	/05/2014		2	7/05/2014	
101.169	N.	elevation	elevation		on from aseline			on from seline	elevation		on from aseline	elevation				deviatior last/bas	r from seline	elevation	deviatio last/ba	on from seline
101.169   101.169   1   1   1   1   1   1   1   1   1																				
101.257   101.255   0   -1   0   0   0   0   0   0   0   0   0	30041631	101.169							101.163	0	φ				101.163	0	φ	101.164	-	φ
101.126   101.111   3   3   4   101.112   1   3   4   101.114   1   6   4   4   4   4   4   4   4   4   4	30041632	101.257	101.255	0	7				101.255	0	7				101,255	7	ç	101.255	-	7
101.549         CONVENENT         PROVENENT         101.540	30041633	101.120	101.111	ო	φ	101.112		φ	101.114		φ				101,112	-5	φ	101.113	-	-7
96.087         4 <td>30041634</td> <td>101,549</td> <td></td> <td>parevoc</td> <td></td> <td></td> <td>payered</td> <td></td> <td></td> <td>povered</td> <td></td> <td>101.540</td> <td>φ</td> <td>တု</td> <td>ŭ</td> <td>pered</td> <td></td> <td>Q</td> <td>perevo</td> <td></td>	30041634	101,549		parevoc			payered			povered		101.540	φ	တု	ŭ	pered		Q	perevo	
91,086         4         4         4         4         4         4         91,081         0         4         91,081         0         4         91,081         0         4         91,081         0         4         91,081         0         4         91,081         0         4         91,081         0         4         91,081         0         4         91,081         0         4         7         96,153         1         2         83,080         2         4         7         96,153         1         4         91,164         1         4         91,164         1         4         91,164         1         4         91,164         1         4         91,164         1         4         91,164         1         4         91,165         1         4         91,165         1         4         91,165         1         4         91,165         1         4         91,165         1         4         91,164         1         4         91,164         1         4         91,164         1         4         91,165         1         4         91,165         1         4         91,165         1         4         91,164         1         4	30041631(1)	96.087							96.083	0	4				96.082	0	ιģ	96.083	+	4
83.084         4         83.084         9         -3         -3         -4         -5         83.089         1         -2         83.080         -2         83.080         -2         83.080         -2         83.080         -2         83.080         -2         83.080         -2         83.080         -2         83.080         -2         83.080         -2         83.080         -1	30041631(2)	91.086							91.081	0	4				91.081	0	4	91.081	0	4
96.163         96.154         0         -9         9         -9         <	30041631(3)	83.084							83.081	0	-3				83.082	1	-5	83.080	-5	4-
91.166         1         -4         91.166         0         -4         4         91.165         -1         -4         91.164         -1         -4         91.166         -1         -4         91.165         -1         -4         91.164         -1         -1         -1         -1         -1         -1         -1         -1         -1         -1         -1         -1         -1         -1         -1         -1 <t< td=""><td>30041632(1)</td><td>96.163</td><td>96.154</td><td>0</td><td>o<sub>i</sub></td><td></td><td></td><td></td><td>96.154</td><td>0</td><td>6-</td><td></td><td></td><td></td><td>96.153</td><td>7</td><td>-10</td><td>96.154</td><td>+</td><td>ဝှ</td></t<>	30041632(1)	96.163	96.154	0	o <sub>i</sub>				96.154	0	6-				96.153	7	-10	96.154	+	ဝှ
83.176         0         -3         4         83.177         0         -3         4         83.176         -1         -4         83.176         -1         -4         83.176         -1         -4         83.176         -1         -4         83.176         -1         -4         83.176         -1         -4         83.176         -1         -4         83.176         -1         -4         83.176         -1         -4         83.176         -1         -4         83.176         -1         -4         83.176         -1         -4         83.176         -1         -4         83.176         -1         -4         83.176         -1         -4         83.034         -1         -4         83.034         -1         -5         -4	30041632(2)	91.169	91.166	-	4				91.166	0	4				91.165	7	4	91.164	7	ςγ
96.036         96.028         3         -8         96.036         2         -6         -8         96.028         -2         -8         96.028         -2         -8         96.028         -2         -8         96.028         0         -8         96.030         2         -6         -8         96.038         -1         -8         96.028         -7         91.027         -2         -7         91.027         -7         -7         91.026         -1         -8         96.028         0         -8         96.028         1         -8         83.033         1         -8         83.034         -1         -8         83.034         -1         -8         83.034         -1         -8         83.034         -1         -8         83.034         -1         -8         83.034         -1         -8         83.034         -1         -8         83.034         -1         -8         83.451         -8	30041632(3)	83.180	83.177	0	6				83.177	0	67				83.176	7	4	83.176	7	4-
91.034         91.027         3         -7         91.028         1         -5         -6         91.029         1         -5         -7         91.027         -2         -7         91.026         -1         91.026         -1         91.026         -1         91.026         -1         91.026         -1         91.026         -1         91.026         -1         91.026         -1         91.026         -1         91.026         -1         91.027         -1         -5         83.033         -1         91.026         -1         96.459         -2         -5	30041633(1)	96.036	96.028	ო	φ	96.028	0	φ	96.030	2	9				96.028	-2	φ	96.028	0	æρ
83,039         83,033         2         -6         83,034         1         -6         83,035         1         -4         -         63,034         -1         -5         83,033         -1           96,464         -2         -5         -5         -5         -5         -5         -5         -7	30041633(2)	91.034	91.027	ო	2-	91,028	-	9	91.029	-	τÒ				91.027	-2	-7	91.026	7	φ
96.464       96.459       -2         91.468       91.461       -4         83.465       83.461       -2	30041633(3)	83.039	83,033	2	φ	83.034	-	φ	83.035	-	4				83.034	7	ကု	83.033	٦	-7
91.468     91.461     -4       83.465     83.461     -2	30041634(1)	96.464										96.459	-2	رې						
83.465 83.461 -2	30041634(2)	91.468										91,461	4	1-						
	30041634(3)	83.465										83.461	-2	4						

project: C310 Thames Tunnel



	structure:	Shallow Date	v Datums,	ums, Factory Road	Road												
	43.	43. following	44.	44. following		45.	45. following	D	46	46, following	Ð	47	47. following	D	48.	48. following	D
Ш	(Z)	28/05/2014	13	25/06/2014		26	26/06/2014		e	31/07/2014		23	27/08/2014		2	21/11/2014	
<u>a</u>	elevation	deviation from last/ baseline	elevation	deviation from last/baseline		elevation	deviation from last/baseline	on from seline	elevation	deviation last/ba	deviation from last/baseline	elevation		deviation from last/baseline	elevation	deviation from last/baseline	n from seline
		-															
			covered	covered (see 26/08/14)	3/14)	101.163	7	τÒ	101.162	7	φ	101.163	,-	φ	D	destroyed	
			101.256	0	T	ees)	(see 25/06/14)	4)	101,256	0	7	101,255	7	ch.	101.253	ç	ကု
			101.113	0	-7	eas)	See 25/06/14)	4)	101.114	-	φ	101,114	0	φ	101.113	7	-7
	0	covered	0	covered		0	covered		101.540	0	တု		payered		Ü	covered	
						96.083	0	4	96.080	ကု	1-	96.080	0	-7			
						91.081	0	ф	91.077	4	φ	91.077	0	φ			
						83.080	0	4	83.076	ကု	1-	83.076	0	φ			
			96.154	0	တု				96.154	0	တု	96.153	7	-10	96.153	7	-10
			91.164	Ţ	φ				91,164	0	φ	91.163	0	φ	91.163	7	2-
			83.175	7	5				83.175	0	ιģ	83.174	0	φ	83.174	0	φ
			96.028	7	တု				96.030	ო	φ	96.030	0	မှ	96.031	-	φ
			91.025	T	တု				91.027	2	-7	91.027	0	-7	91.028		φ
			83.031	7	φ				83.031	0	o,	83.031	0	φ	83.032	-	-7
									96.455	ဇု	φ						
									91.456	4	44						
									83.458	ဗှ	7-						
ı.																	

△ HOCHTIEF Joint V			C310 THAMES TUNNEL REPORT		
EMPLOYER	CROSSRAIL	eB NO	C310-HTM-C-RGN-CR148-50025	Rev	1.0
TITLE			orts for Thames Water assets relating to T River Thames - North Woolwich Portal (ex		

APPENDIX 112
CS 35 – Factory Road 4 – CH 88870



#### **C310 Thames Tunnel**

**Close Out Report** 

Rev. 1.0

mo	onitoring a	asset		Area Facto	ory Road / TW H	enley Road
referen	ce monitoring	g drawing:		C310-H	TM-C-DWG-CR146-ST0	04-70003
name o	of monitorin	g section:		CS 3	5 Factory Road 4 - Ch	188870
	sensor type				manual levelling stud	
chainage		88870		point no.:	3004 189	91 - 3004 1897
1	trigger value [mm]	es:	green:	-14	oweer 45	red: +18 -18
refe	erence docur	ment for tris		Manager		of Ground Movement
			EB-no.:		C310-HTM-Z-STP-CI	R148-50058
			Appendix:		AAA	
			me	onitoring o	lata	
	d	late	max. value	point no.	cor	mments
baseline	16/	12/13	0.00			
TBM 1	start ZOI	23/01/14	-1.98	3004 1895		
	end ZOI	27/01/14	-7.44	3004 1895	breached no	t any trigger value
твм 2	start ZOI	06/05/14	-4.33	3004 1897		
	end ZOI	11/05/14	-2.83	3004 1897	breached no	t any trigger value
longterm		21/11/14	-13.82	3004 1895	breached gr	reen trigger value
Evalua	ition of any	potential	v	No residual ris	sk ks have been complete	ed by HMJV
	residual ris	ks	П	Yes, residual i		

#### summary / comments

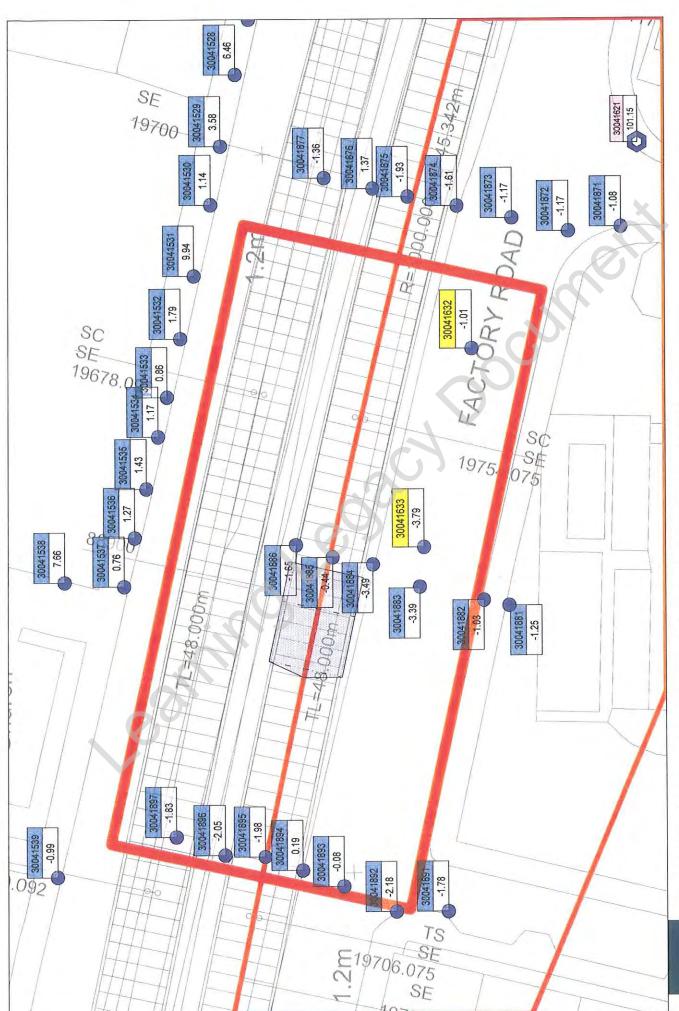
Due to different site activities some of the points were damaged/destroyed and also reinstalled. See datatable for more details. It wasn't possible to reinstall point 3004 1894.

The maximum deflection ratio is 1:1372. (3004 1894 - 3004 1895 - 3004 1896) - no TW trigger breached (TW alert value 1:1000).

Under consideration of temperature differences, the surrounding ground condition and the achievable accuracy of the measurement, HMJV has no concern to cease the monitoring.

The rate of change in the monitoring data is less than the required standards as per the specifications and drawings.

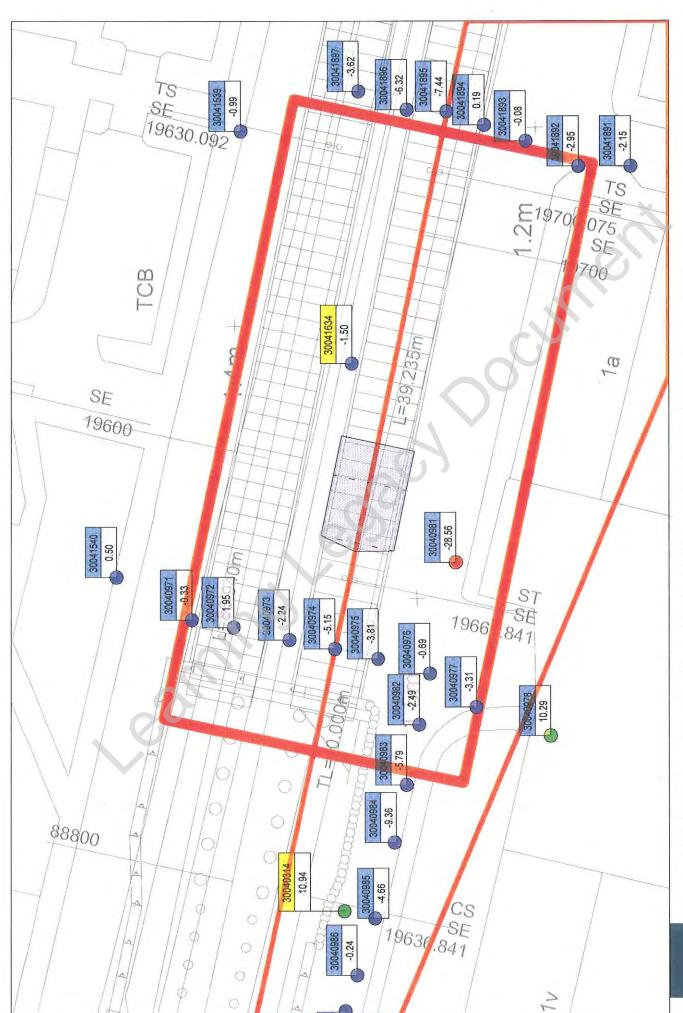
date / signature:	
print name:	
HMJV project role:	Monitoring & Survey engineer



Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB



current values: 23.01.2014 19:26



Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal working activities: TBM drive WB current values: 27.01.2014 15:00



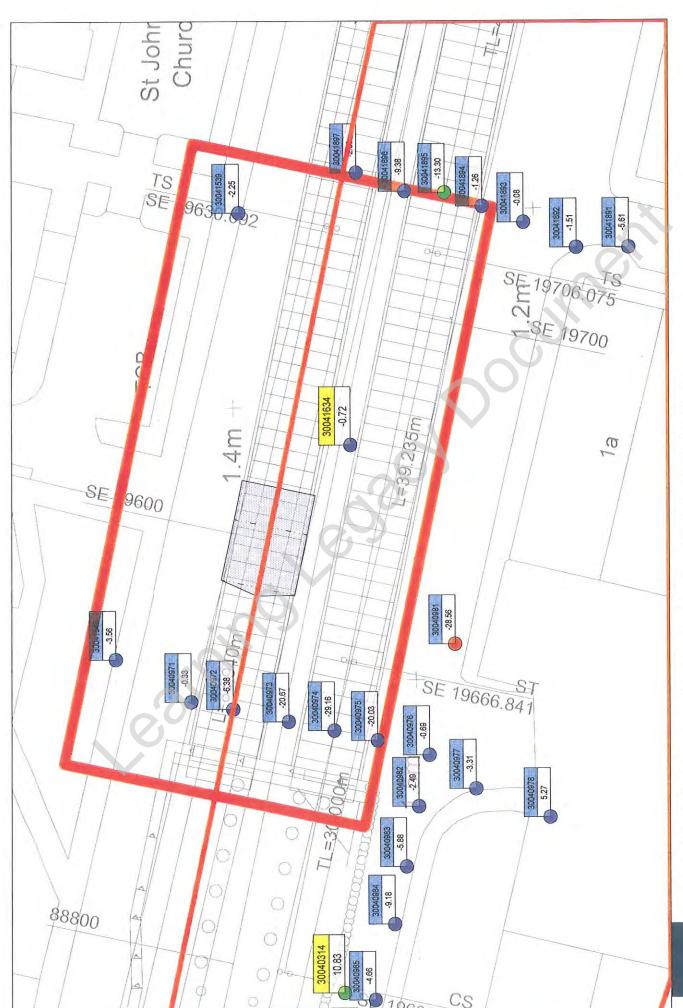


Close Out Report: WB Tunnel - CS 35 Factory Road 4 - 17.10.2013 - 21.11.2014 Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Date: 21.01.2015 10:05 Current Values: 21.01.2015 09:51



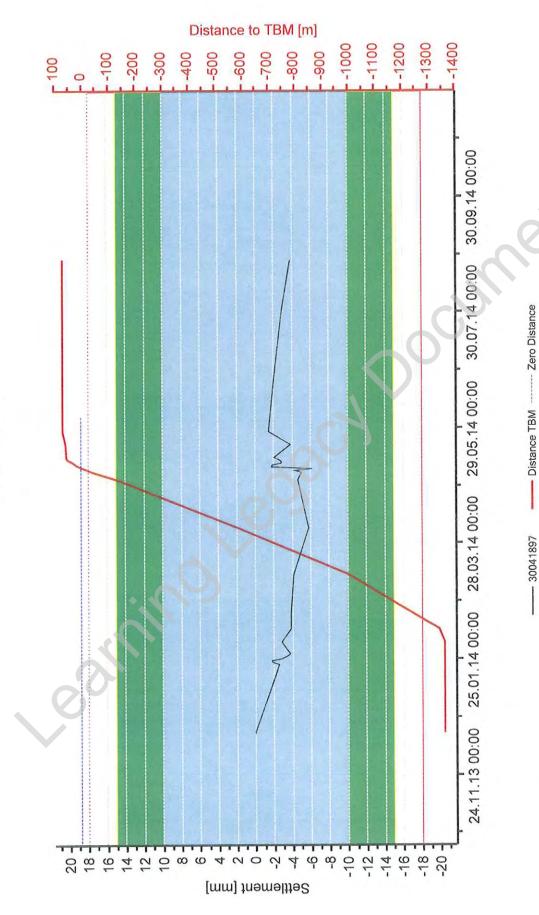
working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal current values: 06.05.2014 17:20





working activities: C310 EB tunnel drive; NWP: portal excavation, construction base slab current values: 11.05.2014 08:55 Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal

Ge ec



Project: C310 Thames Tunnel - Plumstead Portal to North Woolwich Portal Close Out Report: EB-Tunnel - CS 35 Factory Road 4 - 17.10.2013 - 21.11.2014 date: 21.01.2015 10:50 current values: 21.01.2015 10:21







Innne	
C310 Thames	
C310 1	
project:	
pro	

		structure:		CS 35 F	CS 35 Factory Road 4	ad 4													
No. of reading	baseline	÷	1. following	0	23	2. fallowing		က်	3. following		4.	4. following		5. f	5. following		9	6. following	
date	16/12/13		17/12/2013		16	16/01/2014	П	123	22/01/2014		25	23/01/2014	П	24	24/01/2014		N.	25/01/2014	
ŏN	elevation	elevation		deviation from last/baseline	elevation	deviation from last/baseline	n from seline	elevation	deviation from last/baseline	nn from seline	elevation	deviation from last/baseline		elevation	deviation from last/baseline		elevation	deviation from last/baseline	n from seline
						5													
30041891	101.154	101.155	0	0	101.152	-2	-5	101.152	0	4	101.153	-	ņ	101,153	0	-2	101.152	0	7
30041892	101.159	101.159	0	0	101.157	42	Ŋ	101.156	7	တု	101.157	+	42	101,157	0	42	101,157	7	ကု
30041893	101.203	101,203	0	0	8	destroyed			destroyed		2	beyonset		D	destrayed		D.	destroyed	
30041894	101.237	101.237	0	0	3.2	destroyed			destroyed		O	destroyed		15	destroyed		9	destroyed	
30041895	101.940	101.940	0	0	101.938	ņ	?	101.937	0	ကု	101.938	+	ç	101.938	0	-5	101.932	ιģ	φ
30041896	101.855	101.855	0	0	101.853	ņ	4	101.853	1	ကု	101.853	٠	-5	101.853	0	42	101.850	4	φ
30041897	101.837	101.836	0	0	101.834	ņ	4	101.834	0	ကု	101.835	+	ç	101.835	0	-5	101.834	٦	ကု
30041898																			
30041899																			
												OCALUS .			a enti				



		project:		C310 T	Tham	Thames Tunnel	innel								noc	r ve	Joint Venture		
		structure:	K	S 35 F	CS 35 Factory Road 4	ad 4										П			
No. of reading	baseline	7.	7. following		œ,	8. following	-	ത്	9. following	6	10.	10. following	-	Ę	11. following		12.	12. following	
date	16/12/13	2	27/01/2014		28	28/01/2014		Ki	29/01/2014		õ	03/02/2014	П	10	10/02/2014	П	18	18/02/2014	
Ö	elevation	elevation	deviation from last/ baseline		elevation	deviation from last/baseline	on from sseline	elevation	9	deviation from last/baseline	elevation	deviation from last/baseline		elevation	deviation from last/baseline		elevation	deviation from last/baseline	from eline
				Γ												Γ			
30041891	101.154	101.152	0	ņ	101.152	0	ç	101.152	0	ņ	101.153	-	7	101.152	Ť	φ	101.152	-	Ņ
30041892	101,159	101,156	0	φ	101.156	0	ဇု	101.156	0	ကု	101.157	-	ç	101.155	7	4	101.156	0	4
30041893	101,203		destroyed		Ď	destroyed			Jestroyed		O	destroyed		D	destroyed		PD.	destroyed	
30041894	101.237		destroyed		5	pekonsep			bestroyed		E .	destroyed		a	destroyed		ið	destrayed	
30041895	101.940	101.933	0	2-	101.932	0	φ	101.933	0	-7	101.933	0	-7	101.932	7	φ	101.931	0	o <sub>i</sub>
30041896	101,855	101.849	7	φ	101.849	0	φ	101.849	0	φ	101.850	-	ιģ	101.849	7	φ	101.849	0	-7
30041897	101.837	101.833	7	4	101.833	0	4	101.833	0	-3	101.834	-	ကု	101.833	7	4	101.833	0	4
30041898																			
30041899																			



### Solumons ag

Tunnel
Thames
C310
project:

		structure;		CS 35 F	CS 35 Factory Road 4	oad 4													
No. of reading	baseline	13.	13. following	(D)	14.	14. following		15.	15. following	-	16.	16, following		17.	17, following	-	18.	18. following	
date	16/12/13	,	11/03/2014		Ö	07/04/2014		0	01/05/2014		ŏ	05/05/2014	П	90	06/05/2014		07	07/05/2014	
N <sub>O</sub>	elevation	elevation	deviation from last/ baseline	on from aseline	elevation	deviation from last/baseline		elevation	deviation from last/baseline		elevation	deviation from last/baseline		elevation	deviation from last/baseline		elevation	deviation from last/baseline	n from seline
30041891	101.154	101.152	7	ကု	101.149	-2	ιģ	101.150	-	4	101.150	7	ιŲ	101.150	0	4	101.148	ņ	φ
30041892	101,159		destroyed		-	destroyed		101,151	New Baseline	aseline	101.151	0	0	101.152	-	0	101.150	42	ņ
30041893	101.203		destroyed		-	destroyed			pewortsep		ā	destroyed		D	destrayed		t	destroyed	
30041894	101.237		pestroyed		a	destrayed		101,570	New Baseline	aseline	101.570	0	0	101.570	0	0	101.568	7	7
30041895	101.940	101,930	7	-10	101.928	ņ	-12	101.928	0	-12	101.928	0	-12	101.928	0	-12	101.927	-5	13
30041896	101,855	101.848	7	1-	101.846	7	တု	101.847	-	φ	101.847	0	တု	101.847	0	တု	101.846	7	-10
30041897	101.837	101.832	0	4	101.831	Ċ	φ	101.832	1	ď	101.832	0	ιŲ	101.832	1	4	101.830	42	φ
30041898																			
30041899										Ţ									



### Joint Venture

# project: C310 Thames Tunnel structure: CS 35 Factory Road 4

100   100	structure:	structure;		(1)	88.83	CS 35 Factory Road 4	pad 4							T						I
aseline elevation from elevation from last/baseline leavation from last/baseline leavation from last/baseline last	No. of reading baseline 19. following 20. following	(	(	(	20. followir	followir	D		21.	following	-	22.	following		23.	following		24.	following	77
elevation from last/baseline         deviation from last/baseline         deviation from last/baseline         elevation from last/baseline <th< th=""><th>16/12/13 08/05/2014 09/05/2014</th><th></th><th></th><th>09/05/2014</th><th>09/05/2014</th><th>3/05/2014</th><th></th><th>П</th><th>=</th><th>0/05/2014</th><th></th><th>11</th><th>/05/2014</th><th>П</th><th>12</th><th>/05/2014</th><th>П</th><th>÷</th><th>3/05/2014</th><th></th></th<>	16/12/13 08/05/2014 09/05/2014			09/05/2014	09/05/2014	3/05/2014		П	=	0/05/2014		11	/05/2014	П	12	/05/2014	П	÷	3/05/2014	
101.149	elevation elevation deviation from elevation deviation last/baseline	elevation deviation from elevation last/ baseline	elevation	elevation	ation	deviation last/ba	LS(	from	elevation	deviatio last/ba	n from seline	elevation	deviatior last/bas		elevation	deviatior last/bas		elevation	deviatio last/ba	n from seline
-5 101.149 -1 -6 101.150 0 -6 101.150 0 -1 101.150 1 1 101.150 -1 -2 101.150 0 -1 101.150 0 -1 101.150 0 -1 101.150 0 -1 101.150 0 -1 101.150 0 -1 101.150 0 -1 101.150 0 -1 101.150 0 -1 101.150 0 -1 101.150 0 -1 101.150 1 101.																				m
101,150   -1   -2   101,150   0   -2   101,150   0   -1   101,151   0	101.154 101.149 0 -6 101.149 1	φ 0	φ		101.149 1	F		τĊ	101.149	٦	φ	101.149	0	φ	101.149	0	ιģ	101.150	-	ιŅ
101.568	101.159 101.150 0 -2 101.150 1	0 -2 10	-2 10	10	101.150 1	=		7	101.150	7	ςŅ	101,150	0	ç,	101.150	0	7	101.151	0	7
101.568     -1     101.569     0     -1     101.569     1       101.927     -1     101.927     0     -13     101.927     0     -13     101.928     1       101.846     -1     -9     101.846     0     -9     101.846     0     -9     101.837     1       101.834     -1     -3     101.834     0     -2.83     101.834     0     -3     101.834     1	101.203 destroyed destroyed			destroyed	destroyed	estroyed			d	perionser		ā	estroyed		Ü	sstrayed		b	pakouse	
101.927     -1     101.927     -1     101.927     0     -13     101.928     1       101.846     -1     -9     101.846     0     -9     101.847     1       101.834     -1     -3     101.834     0     -9     101.837     1	101.237 101.568 0 -1 101.569 1	101 1- 0	-1 101	101		,		0	101.568	T	T	101,568	0	Τ	101.569	0	7	101,569	-	0
101.846     -1     -9     101.846     0     -9     101.847     1       101.834     -1     -3     101.834     0     -2.83     101.834     0     -3     101.834     1	101.940 101.927 0 -13 101.928 1	0 -13 101	-13 101	101		1		-12	101.927	7	-13	101.927	0	-13	101.927	0	-13	101.928	-	-12
101.834 -1 -3 101.834 0 -2.83 101.834 0 -3 101.834 1	101.855 101.847 1 -9 101.847 0	1 -9 101.847	101.847	101.847	.847	0		တု	101.846	7	တု	101.846	0	o,	101.846	0	တု	101.847	-	တု
	101.837         101.835         4.         -2         101.835         0	42 101.835	-2 101,835	101.835	.835	0		Ņ	101.834	1	ဗှ	101.834	0	-2.83	101.834	0	ကု	101.834	-	Ņ
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project: C310 Thames Tunnel

		structure:		CS 35	Factory R	oad 4													
No. of reading	baseline	25.	followin	ng	26.	, followir	ng	27.	. followir	ng	28	. followir	ng	29	, followir	ng	3	D. follov	ving
date	16/12/13	20	0/05/2014		2	7/05/2014		2	5/06/2014		3	1/07/2014		2	7/08/2014			21/11/20	14
No.	elevation	elevation	1 July 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	on from aseline	elevation		on from aseline	elevation	Little Control	on from aseline	elevation		ion from aseline	elevation	100000000000000000000000000000000000000	on from aseline	elevation		ation fron /baseline
30041891	101.154	101.148	-1	-6	101.151	3	-3	101.150	-1	-5	101.149	-1	-5	101.149	0	-5	101.150	1	-4
30041892	101.159	101.150	-1	-2		destroyed		101.151	1	0	101.150	-1	-2		covered			destroye	d
30041893	101.203	C	estroyed			destroyed		7	destroyed			destroyed		-0	destroyed			destroye	d
30041894	101.237	101.568	-1	-2	101.570	3	1	101.569	-2	1-1	101.567	-1	-2	101.566	-1	-3		destroye	ect
30041895	101.940	101.926	-1	-14	101.929	2	-11	101.928	0	-12	101.927	-1	-13	101.926	-2	-14	101.926	0	-14
30041896	101.855	101.846	-1	-10	101.848	3	-7	101.849	0	-7	101.848	-1	-8	101.846	-1	-9	101.846	0	-9
30041897	101.837	101.833	-2	-4	101.835	2	-1	101.834	-1	-2	101.834	-1	-3	101.833	-1	-4		destroye	d
30041898																			
30041899																			