

16th May 2023

Jason Russel
Reef Group
51 Welbeck Street
London
W1G 9HL

Your ref:
Our ref: CGL/09751A

Please reply to:
antonella@cgl-uk.com;
josephb@cgl-uk.com

Dear Jason,

Tribeca Plot B & C, Camden – Technical Note on Ground Movement Analysis & Sewer Impact Assessment Relating to Demolition Stage Only

CGL has been instructed by Reef Group (The Client) to assess the impact of the proposed demolition to ground level of the existing Plot B and Plot C buildings, on the adjacent Thames Water Assets at the Tribeca site in 2-6A St Pancras Way, NW1 0QG, London. CGL's Technical addendum below is supplementary to the main detailed Ground Movement Analysis and Sewer Impact Assessment (SIA) report ref. CGL09571A_TribecaCamden-PlotC_GMA&SIA_December2022 which was issued on 22/12/2022.¹

It should be noted that the existing buildings are founded on traditional pile foundations and there isn't any existing basement levels.

On behalf of Reef Group (the Client), it is intended that this technical note be submitted to Thames Water Utilities Ltd (TW), and that TW may rely on it for the purpose of accepting that the risk to their pipe assets, as predicted from this impact assessment for the demolition stage, is within acceptable limits.

Critical Thames Water Assets

The same geotechnical Parameters, PLAXIS 3D FEM model, geometry and stages of analysis used within the CGL SIA report¹ issued in December 2022, has been adopted to derive the potential ground movements at the demolition stage only, on the critical Thames Water Assets presented in the table below.

Table 1. Assets Details for Assessment

Asset Name	Boundary	Closer distance to the site ^c (m)	material	Lining Thickness (m)	Nominal internal vertical [horizontal] diameter (m)	Nominal external vertical [horizontal] diameter (m)	External Crown [invert] Level (mOD) ^b
Fleet Sewer	St. Pancras Way	6.5	Brick	0.200 ^a	1.093 [0.762]	1.493 [1.162]	+17.1 [15.61]
4-6" CI water main	St. Pancras Way	8.5	Cast iron	0.01 ^a	0.1 to 0.15	0.12 – 0.17	1mbg ^d +20.7
150mm Sewer	Granary Street	2.75	Vitrified Clay ^d	0.01 ^a	0.152	0.172	4mbg ^e +17.7
5" Water main	Granary Street	6.3	Cast Iron ^d	0.01 ^a	0.15	0.17	1mbg ^d +20.7

¹ CGL, Ground Movement Analysis and Sewer Impact Assessment, Ref. CGL09571A, issue 22/12/2022

Table Notes:

- a. Assumed thickness based on similar diameter/material TW assets.
- b. mOD = metres above the Ordnance Datum.
- c. Based on surveys and GDP drawings presented in Appendix A
- d. Assumed.
- e. Based on the anticipated worst case on the trunk sewer in St Pancras way.

Demolition Stage Ground Movements

The predicted movements and corresponding stains induced on the Brick Fleet Sewer along St. Pancras Way due to demolition of the existing Plot B and C buildings have been presented within the original GMA&SIA¹.

The predicted maximum vertical and horizontal movements and corresponding strain at the crown level at demolition stage are summarised in Table 2 below, and detailed plots are presented in the appended Figure 1 to Figure 11 for the fleet sewer.

Table 2. Impact Assessment Output Summary

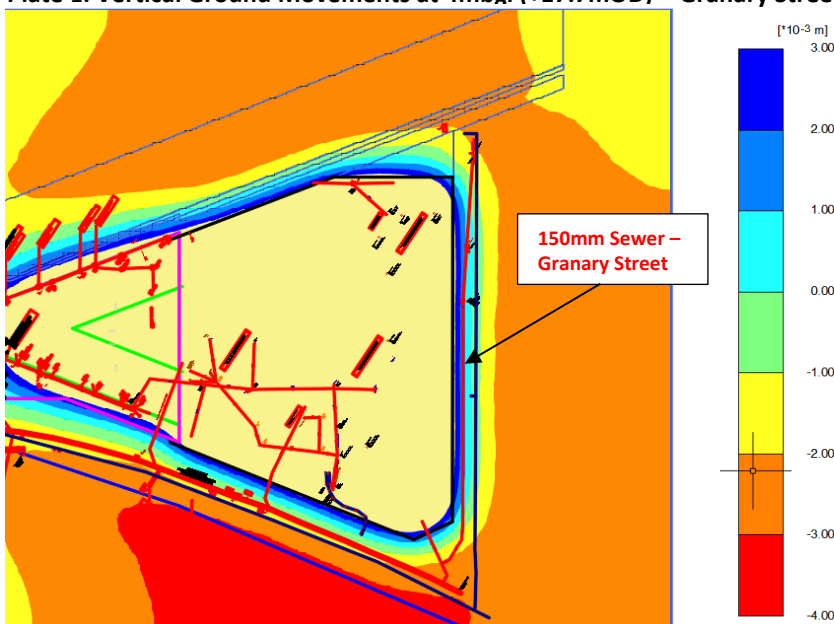
Asset	Maximum perpendicular horizontal displacement (mm)	Maximum parallel/axial horizontal displacement (mm)	Maximum vertical displacement (mm)	Maximum combined strain – Tension (µε)	Maximum combined strain – Compression (µε)
Fleet Sewer	+6.0	+4.0	-4.0	+70	-110

By comparison of the above results with the allowable values specified by Thames Water², the calculated tensile and compressive strains, are within the allowable limits.

It should be noted that, where there are changes in direction along each sub-section of the linearly modelled fleet sewer asset, exceedances are predicted. However, these are considered to be due to the way in which the assets have been modelled and are not representative of the actual asset behaviour. These zones have been labelled ‘corner effects’ in the plots and have not been considered further in the impact assessment above.

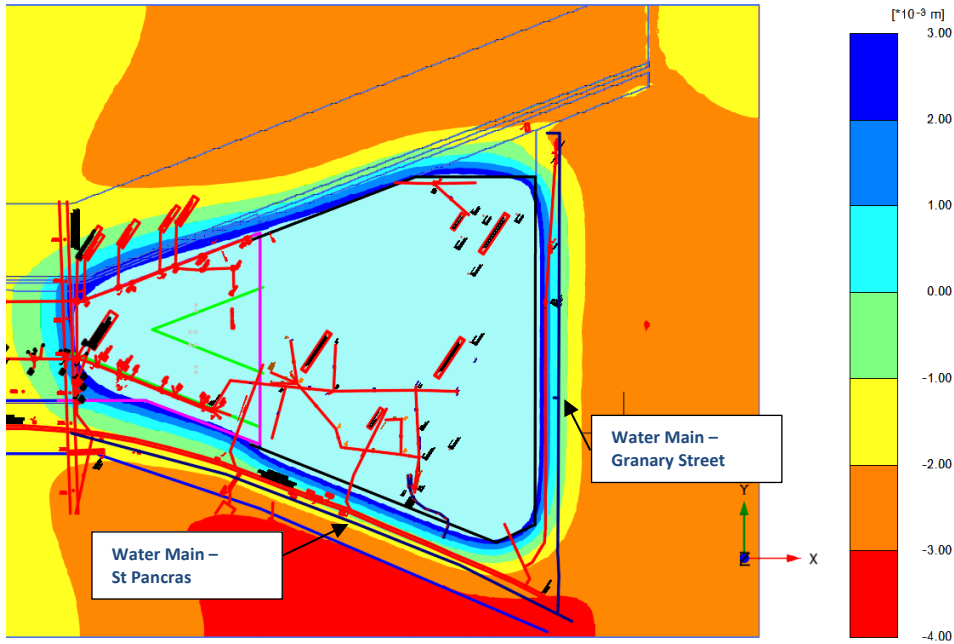
Plate 1 below present the vertical displacements contour plot at the conservatively assumed crown level of +17.1mOD (4mbgl), of the 150mm Sewer along Granary Street. Plate 2 present the movement at 1m below ground level (bgl), at +20.7mOD, which is the conservative level assumed to the water mains along both Granary Street and St Pancras Way.

Plate 1. Vertical Ground Movements at 4mbgl (+17.7mOD) – Granary Street 150mmSewer



² Thames Water.co.uk/developer services ‘Guidance for working near our assets’.

Plate 2. Vertical Ground Movements at 1mbgl (+20.7mOD) – Water Mains



The Plots above shows that the predicted movements of the Sewer at Granary Street, and water mains, fall within the <1mm contours of movement and therefore are negligible.

As Table 2 and Plate1 and Plate2 illustrate, the predicted movements at the critical Thames Water Assets due to the demolition of the existing Plot B and Plot C buildings as Tribeca Site, are considered to be very low.

Therefore, the risk to the Thames Water sewers/mains from the proposed demolition works is considered to very low and within acceptable limits.

Yours sincerely,

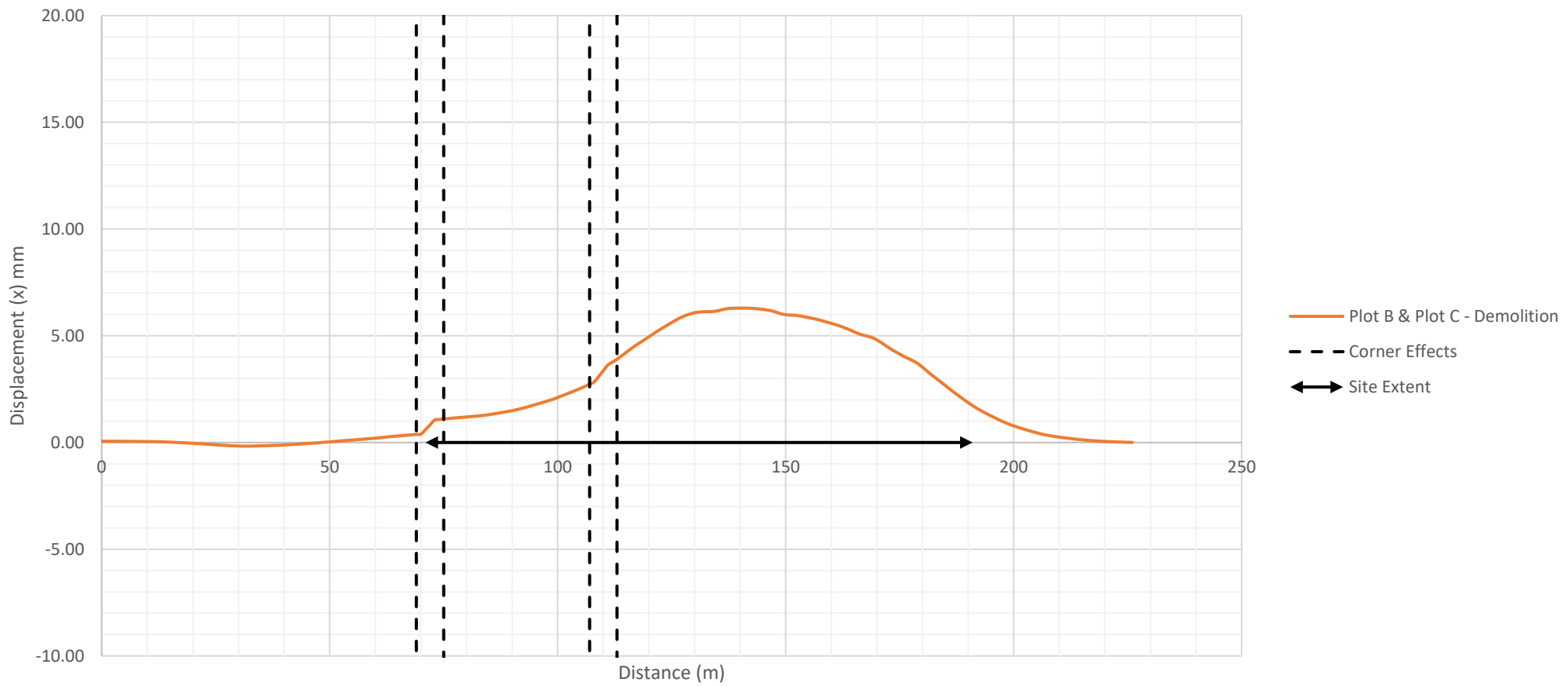



Antonella Galliani, Principal Numerical Analyst
MSc BSc (Hons) GMICE

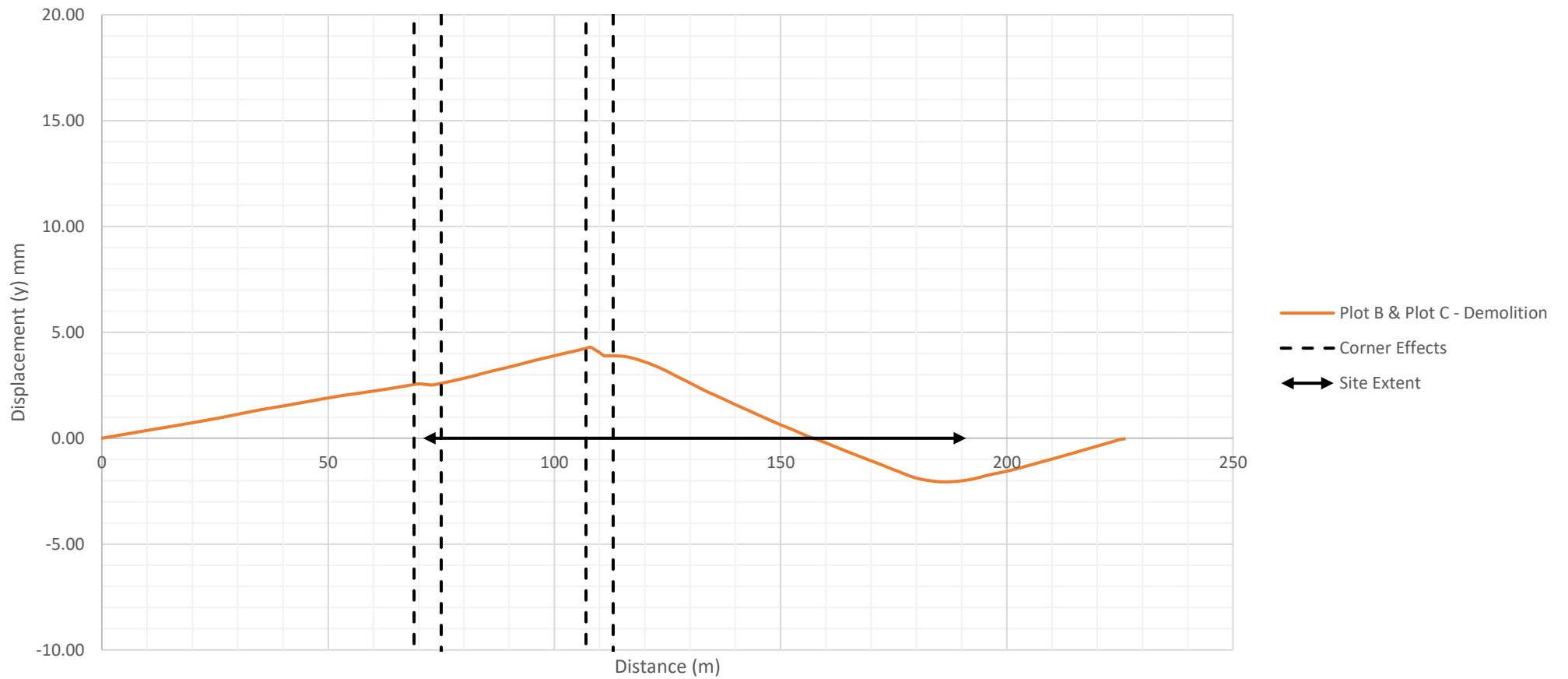
Enclosed:


Figures 1 to 11 – Fleet Sewer Plots
Appendix A – Survey and Structural Information

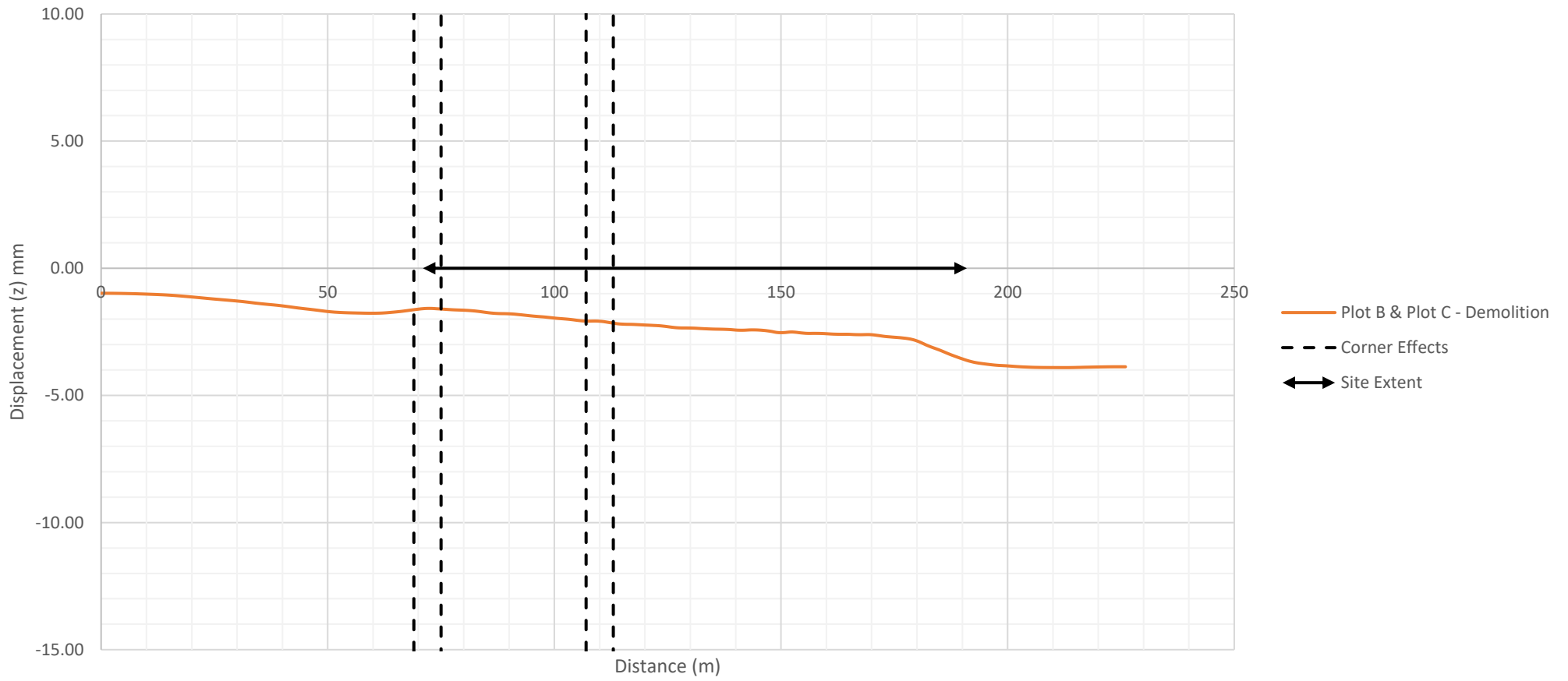
FIGURES




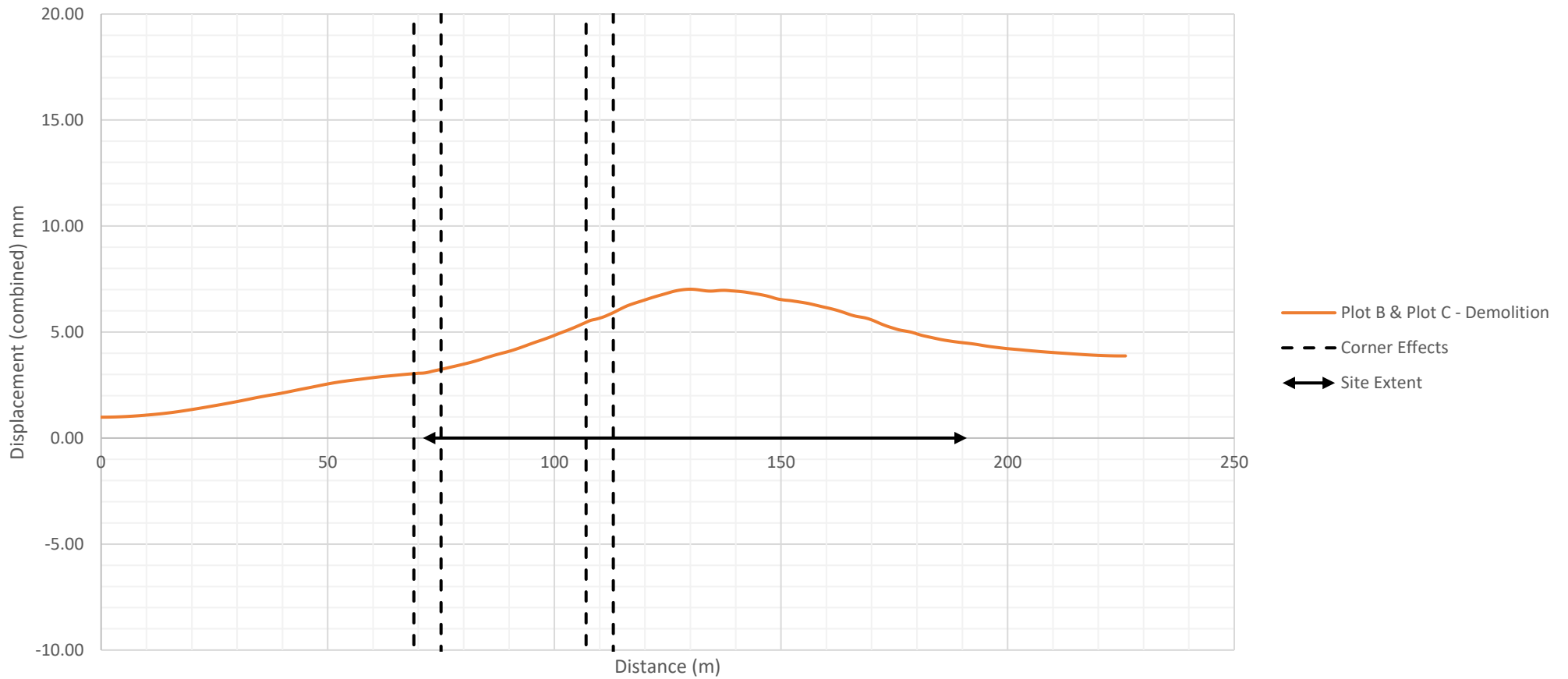
<p>Client</p> <p>Reef Group</p>	<p>Project</p> <p>Tribeca, Camden Ugly Brown Building - Plot B & C</p>	<p>Job No.</p> <p>CGL/09751A</p>
	<p>Title</p> <p>Fleet Brick Sewer Crown - Displacement (Perpendicular to Asset axis) (mm)</p>	<p>Figure 1</p>




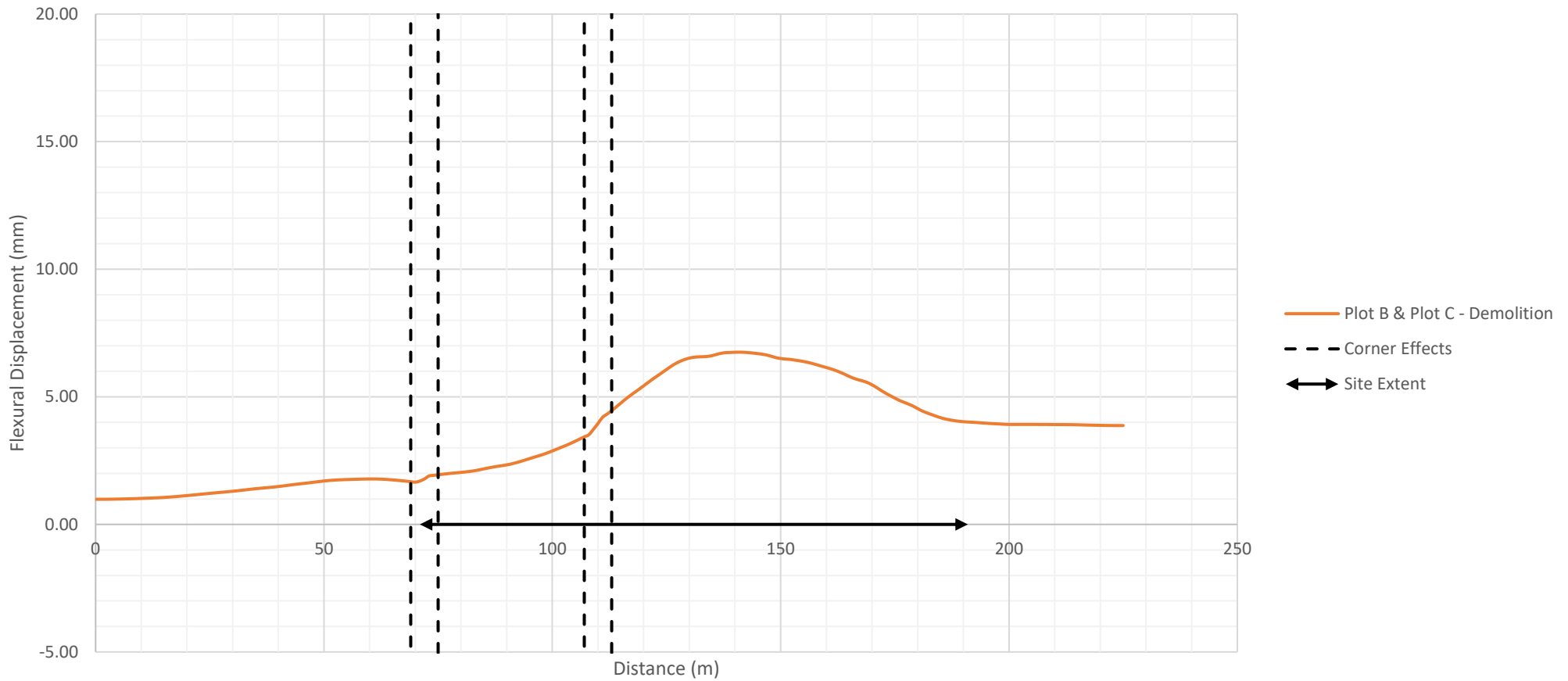
<p>Client</p> <p>Reef Group</p>	<p>Project</p> <p>Tribeca, Camden Ugly Brown Building - Plot B & C</p>	<p>Job No.</p> <p>CGL/09751A</p>
	<p>Title</p> <p>Fleet Brick Sewer Crown - Displacement (Parallel to Asset axis) (mm)</p>	<p>Figure 2</p>




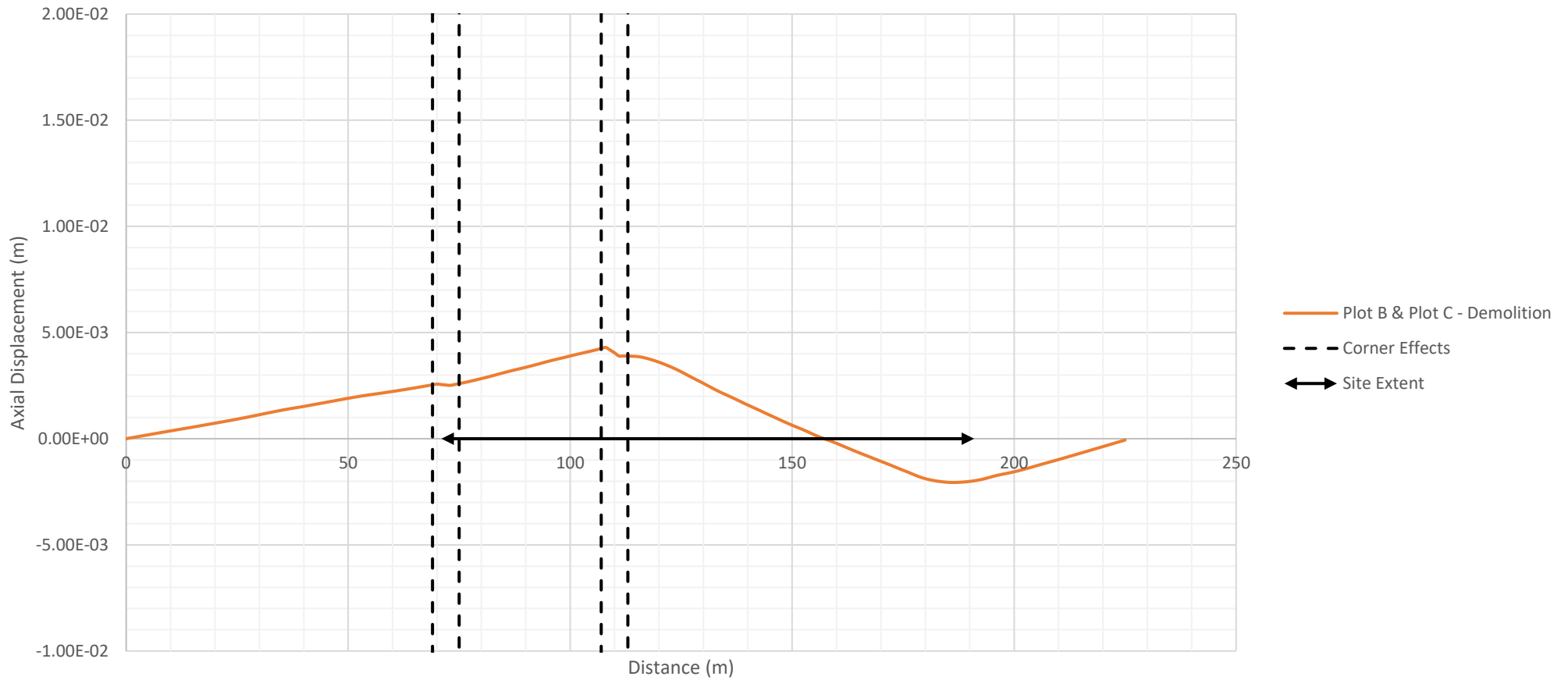
<p>Client</p> <p>Reef Group</p>	<p>Project</p> <p>Tribeca, Camden Ugly Brown Building - Plot B & C</p>	<p>Job No.</p> <p>CGL/09751A</p>
	<p>Title</p> <p>Fleet Brick Sewer Crown - Displacement (z axis)</p>	<p>Figure 3</p>




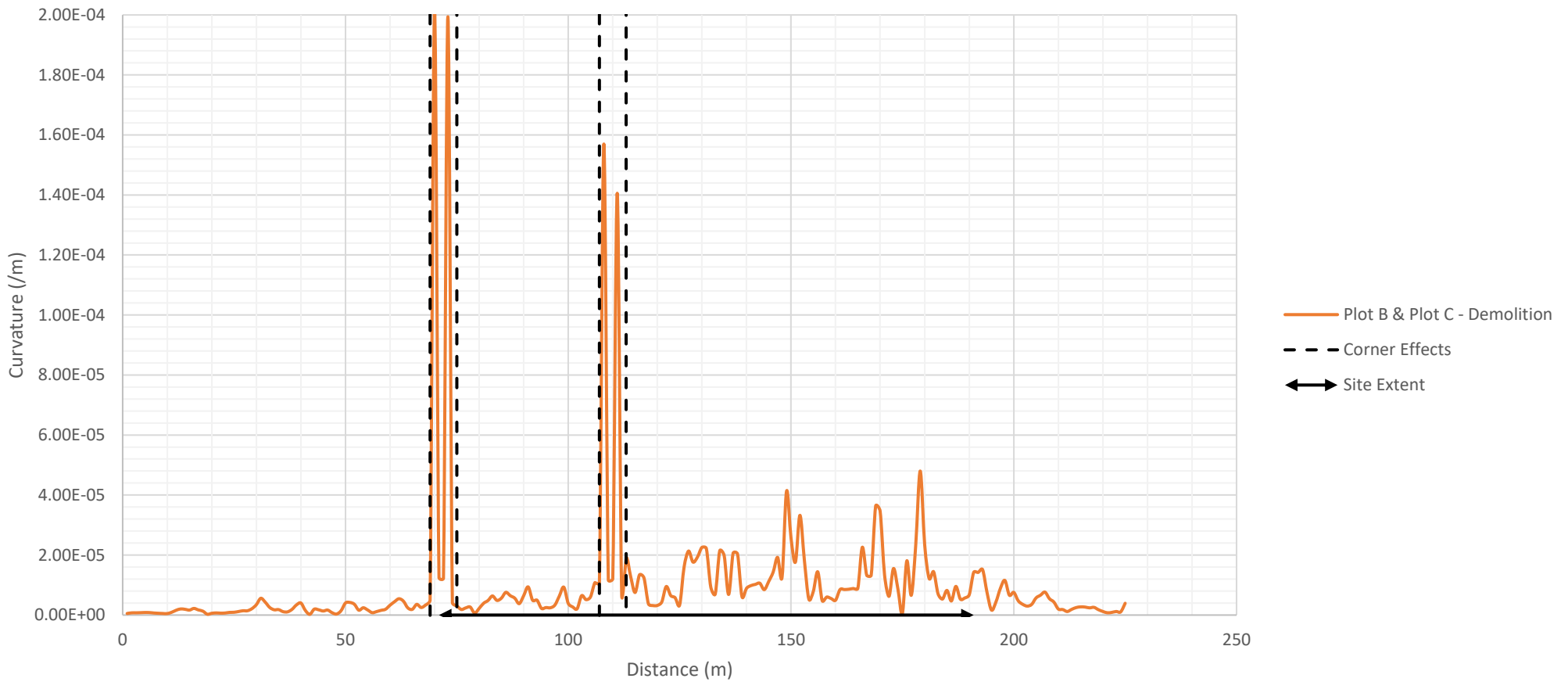
<p>Client</p> <p>Reef Group</p>	<p>Project</p> <p>Tribeca, Camden Ugly Brown Building - Plot B & C</p>	<p>Job No.</p> <p>CGL/09751A</p>
	<p>Title</p> <p>Fleet Brick Sewer Crown - Combined Displacement</p>	<p>Figure 4</p>




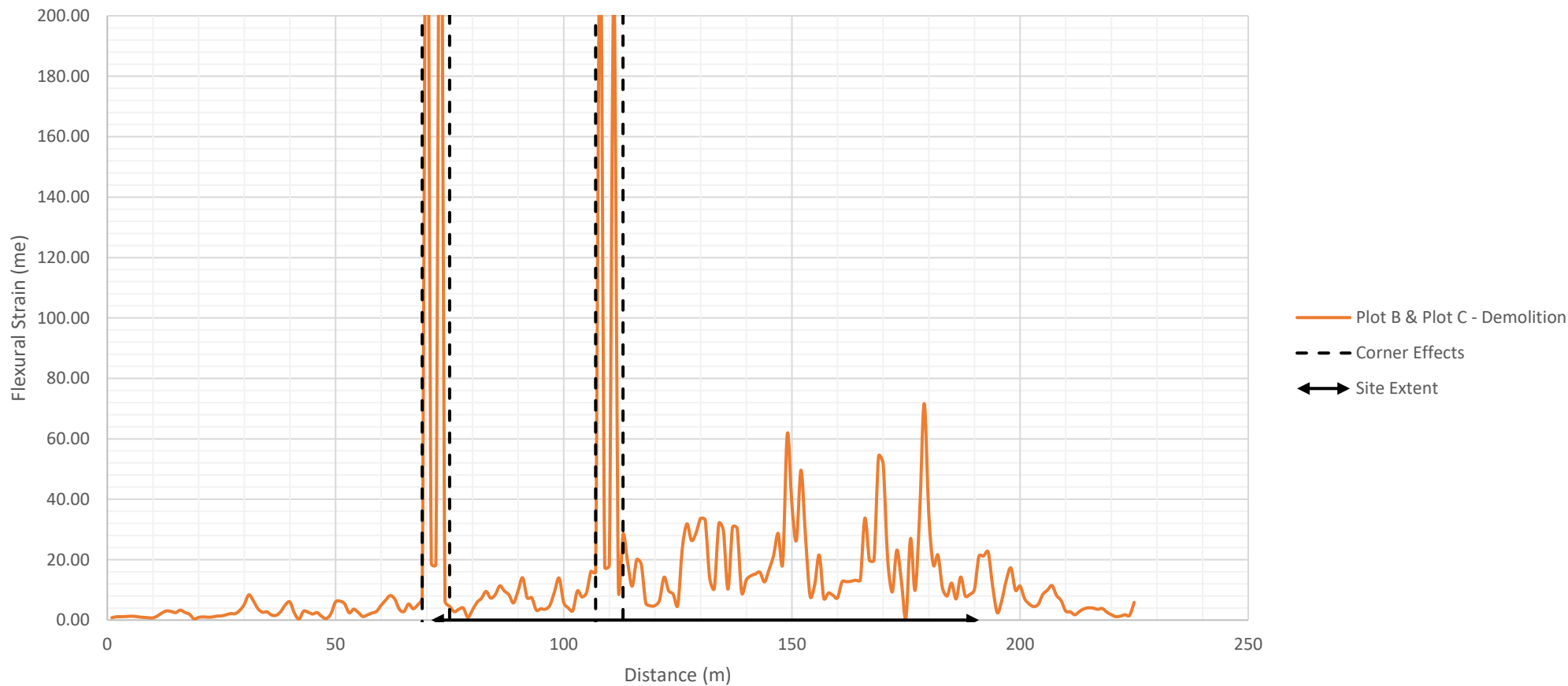
<p>Client</p> <p>Reef Group</p>	<p>Project</p> <p>Tribeca, Camden Ugly Brown Building - Plot B & C</p>	<p>Job No.</p> <p>CGL/09751A</p>
	<p>Title</p> <p>Fleet Brick Sewer Crown - Flexural Displacement (m)</p>	<p>Figure 5</p>




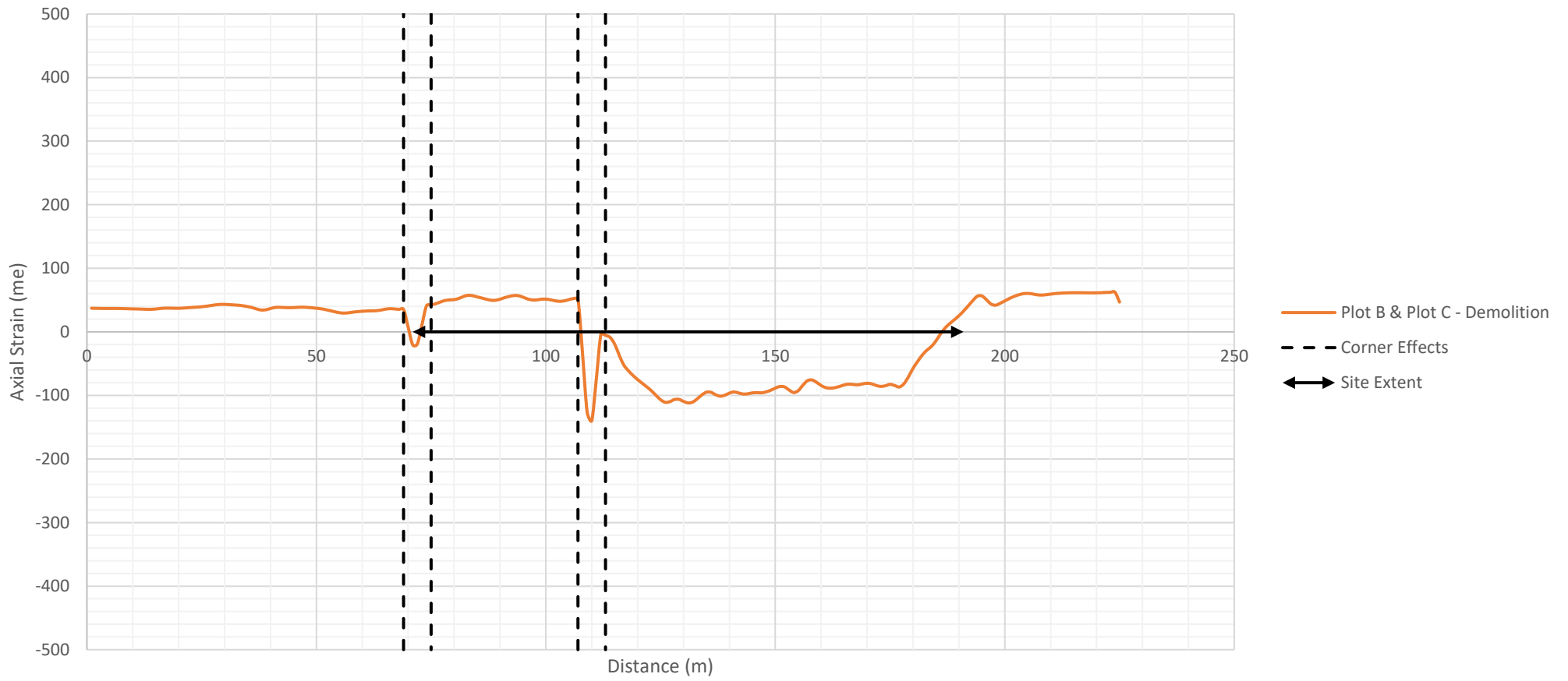
Client Reef Group	Project Tribeca, Camden Ugly Brown Building - Plot B & C	Job No. CGL/09751A
	Title Fleet Brick Sewer Crown - Axial Displacement (m)	Figure 6




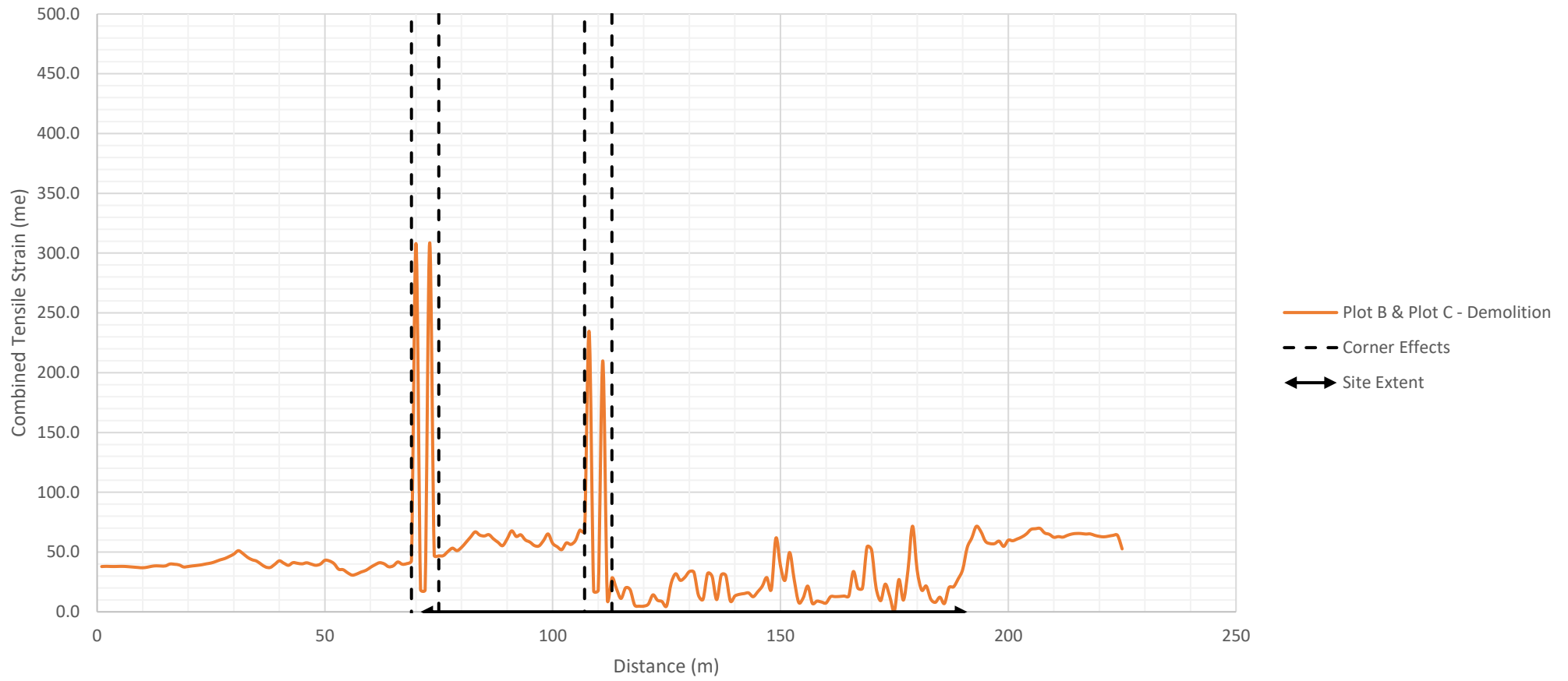
Client <p style="text-align: center;">Reef Group</p>	Project <p style="text-align: center;">Tribeca, Camden Ugly Brown Building - Plot B & C</p>	Job No. <p style="text-align: center;">CGL/09751A</p>
	Title <p style="text-align: center;">Fleet Brick Sewer Crown - Curvature</p>	<p style="text-align: center;">Figure 7</p>




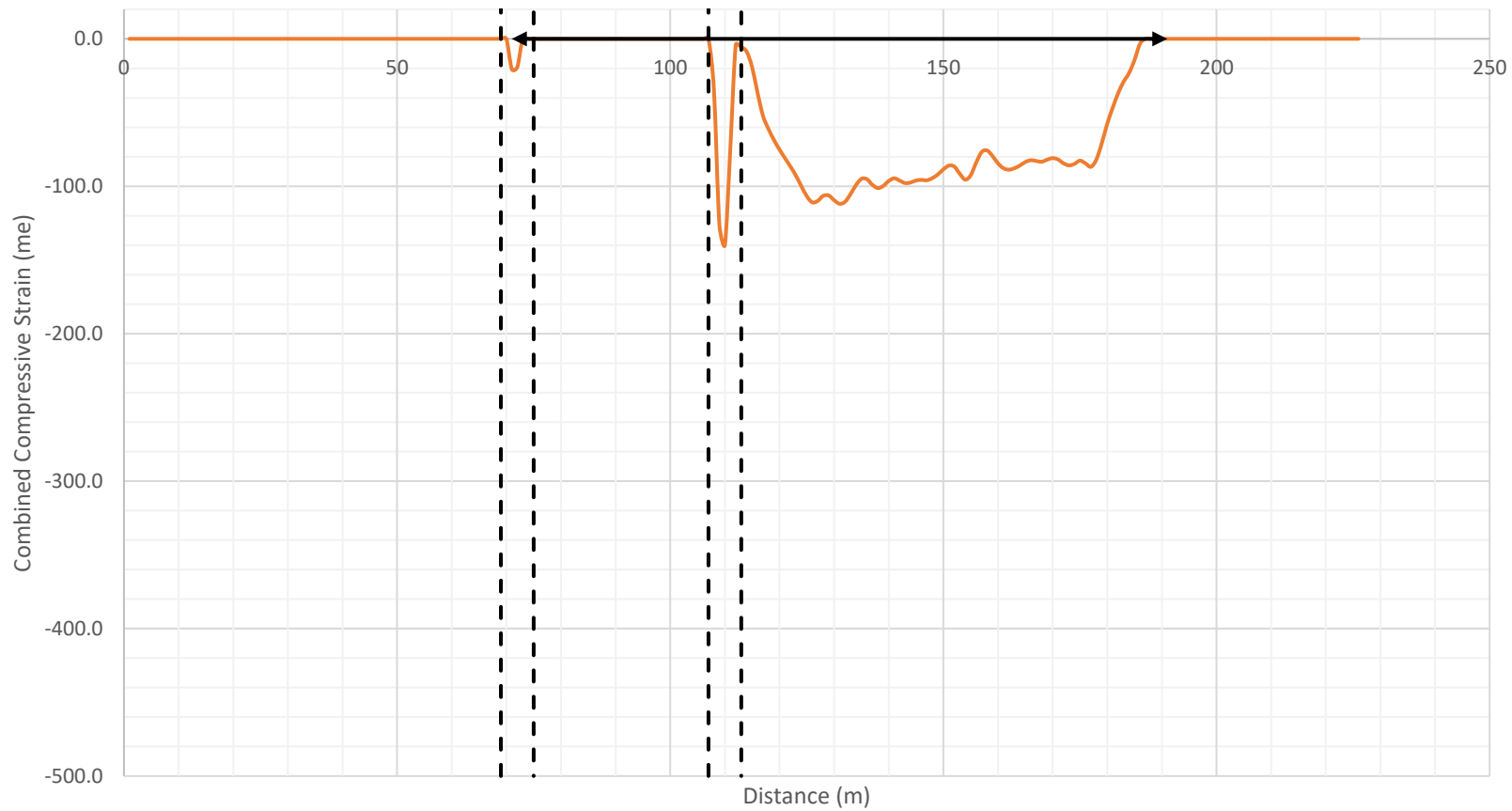
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	<p>Title</p> <p>Fleet Brick Sewer Crown - Flexural Strain</p>	<p>Figure 8</p>



Client Reef Group	Project Tribeca, Camden Ugly Brown Building - Plot B & C	Job No. CGL/09751A
	Title Fleet Brick Sewer Crown - Axial Strain	Figure 9



Client <p style="text-align: center;">Reef Group</p>	Project <p style="text-align: center;">Tribeca, Camden Ugly Brown Building - Plot B & C</p>	Job No. <p style="text-align: center;">CGL/09751A</p>
	Title <p style="text-align: center;">Fleet Brick Sewer Crown - Combined Tensile Strain</p>	<p style="text-align: center;">Figure 10</p>

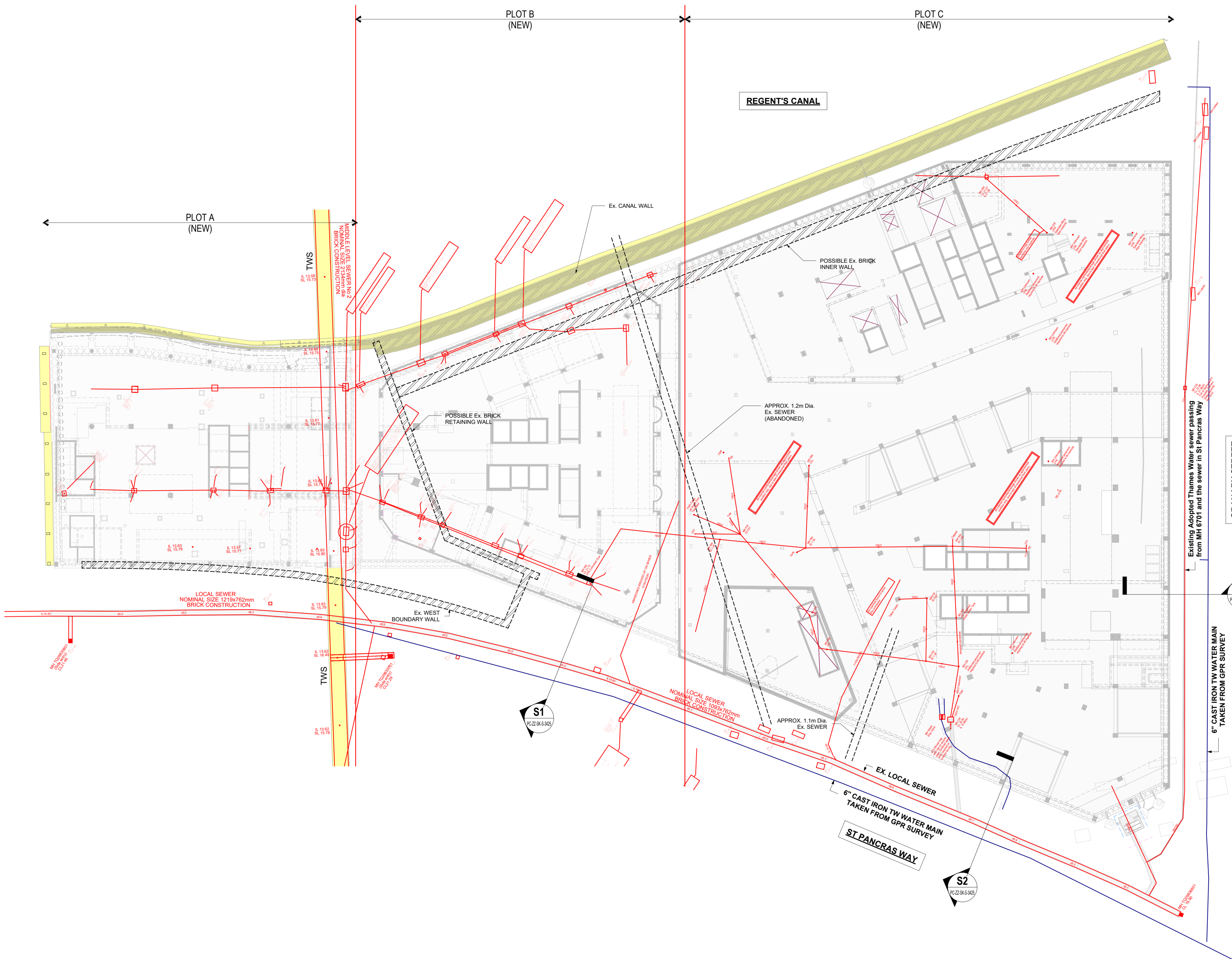


- Plot B & Plot C - Demolition
- - - Corner Effects
- ↔ Site Extent

Client <p style="text-align: center;">Reef Group</p>	Project <p style="text-align: center;">Tribeca, Camden Ugly Brown Building - Plot B & C</p>	Job No. <p style="text-align: center;">CGL/09751A</p>
	Title <p style="text-align: center;">Fleet Brick Sewer Crown - Combined Compressive Strain</p>	<p style="text-align: center;">Figure 11</p>

APPENDIX A

Survey & Structural Information



NOTES

Rev	Date	By / Chk'd	Revision Notes
P01	11.05.23	MM / RD	ISSUED FOR INFORMATION

Client:

RG Reef Group

GD Partnership Ltd. GDP
Consulting Engineers

The Cart Lodge, Lullingstone Lane, Eynsford, Kent, DA40HZ
Tel: 01322 868629 Fax: 01322 861050
Email: contact@gdteam.co.uk

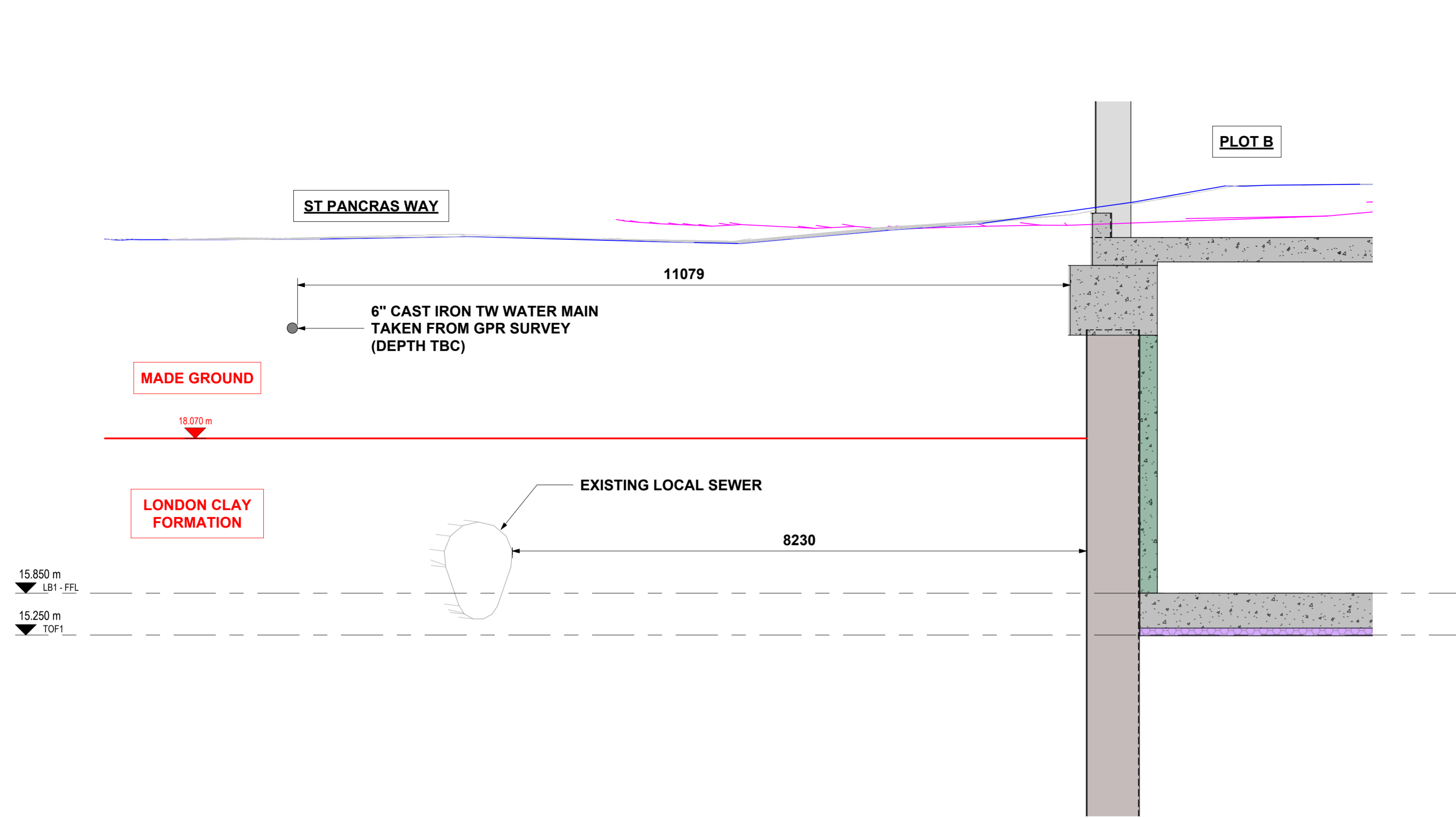
Project:

Tribeca - Plot C

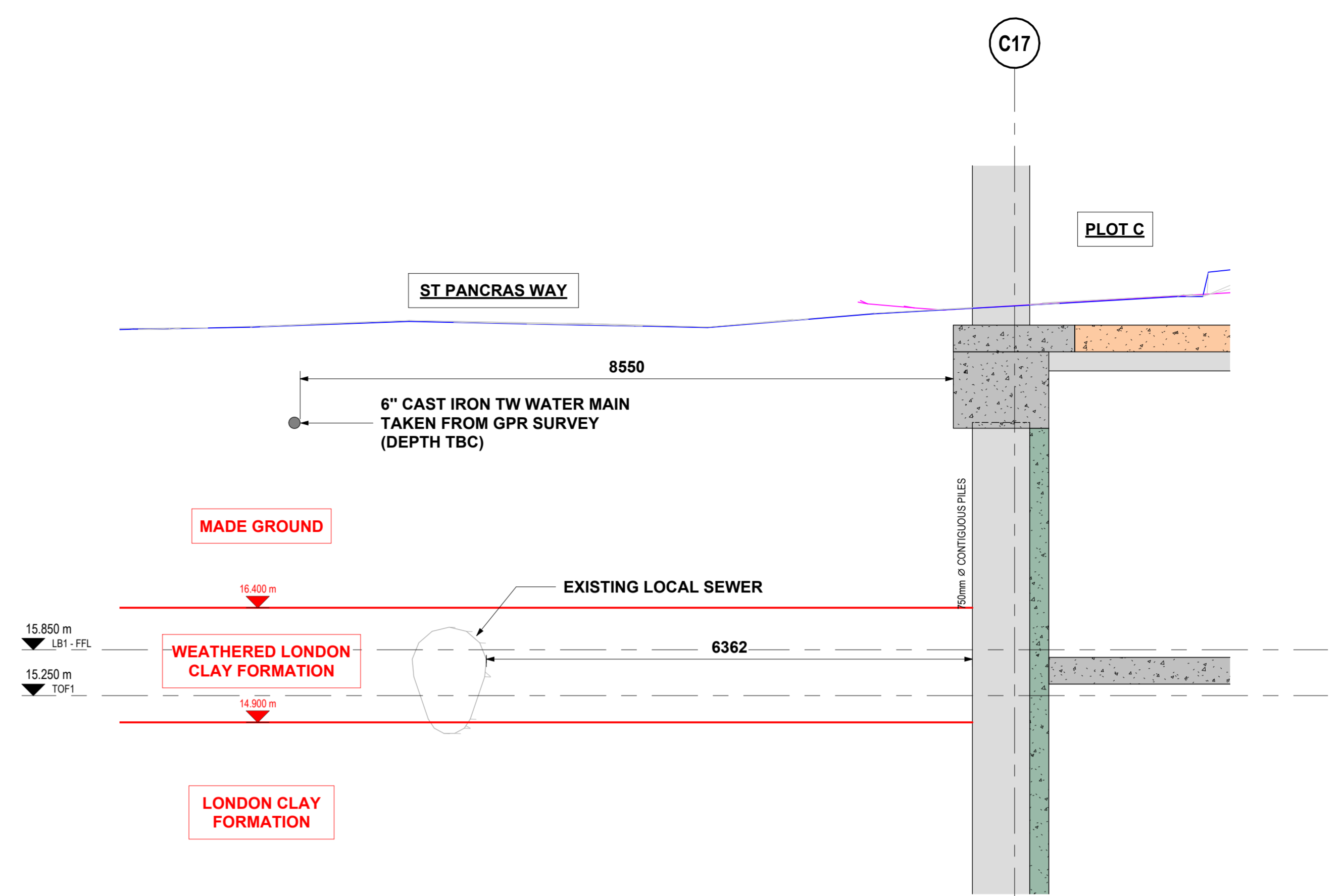
Drawing:

Proposed Structure with Existing TW Sewer - Plan

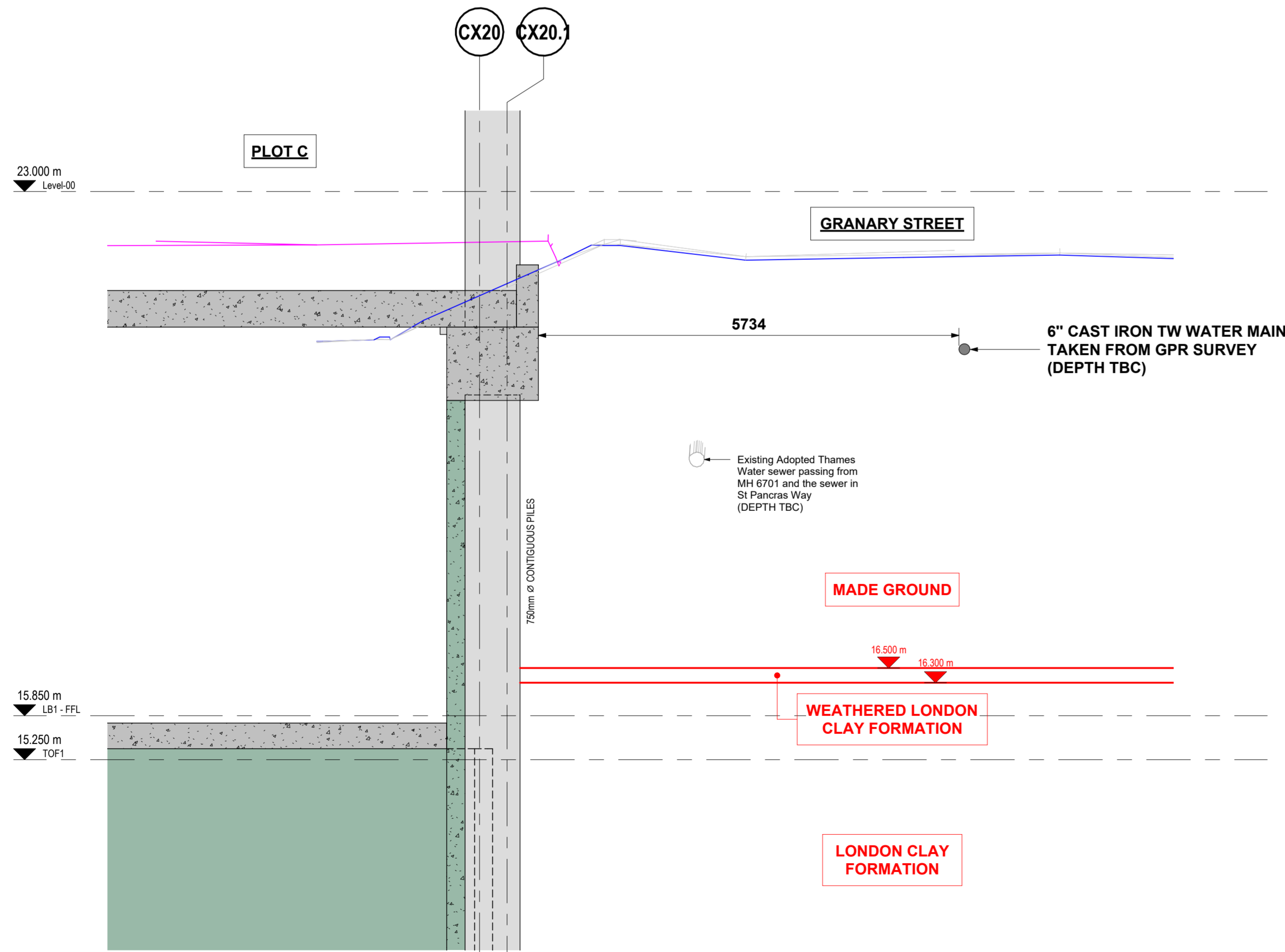
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Drawn: MM	Checked: YG/RD	Date: Apr. 2023
Drawing Status: PRELIMINARY	CDE Status Code: S2	Revision: P01
SHEET NUMBER: TRI - GDP - PC - ZZ - SK - S - 3420		
<small>Project Originator Zone Level Type Role Number</small>		



S1 Section 1 (St Pancras Way - Plot B)
1 : 50



S2 Section 2 (St Pancras Way - Plot C)
1 : 50



S3 Section 3 (Granary Street - Plot C)
1 : 50

KEY

—	PROPOSED LEVELS (FROM CAMLINS)
—	EXISTING LEVELS (FROM TOPO SURVEY)

Rev	Date	By / Chk'd	Revision Notes
P01	11.05.23	MM / RD	ISSUED FOR INFORMATION

Client:

GD Partnership Ltd. GDP
Consulting Engineers
The Cart Lodge, Lullingstone Lane, Eynsford, Kent, DA40HZ
Tel: 01322 868622 Fax: 01322 861050
Email: contact@gdteam.co.uk

Project:
Tribeca - Plot C

Drawing:
Proposed Structure with Existing TW Sewer - Sections

Scale: 1 : 50	at A1	GDP Ref: 21-131
Drawn: MM	Checked: YG/RD	Date: Apr. 2023
Drawing Status: PRELIMINARY	CDE Status Code: S2	Revision: P01
SHEET NUMBER: TRI - GDP - PC - ZZ - SK - S - 3425		
Project Originator Zone Level Type Role Number		

