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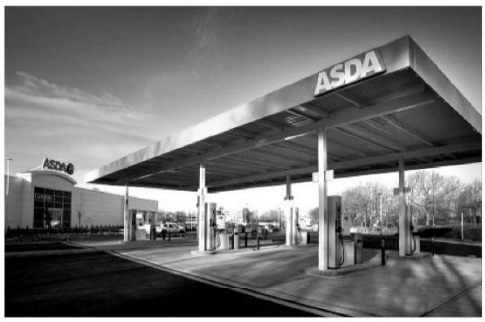

STRUCTURAL REPORT
17 POPLAR CLOSE, LEEDS, LS13 4UQ

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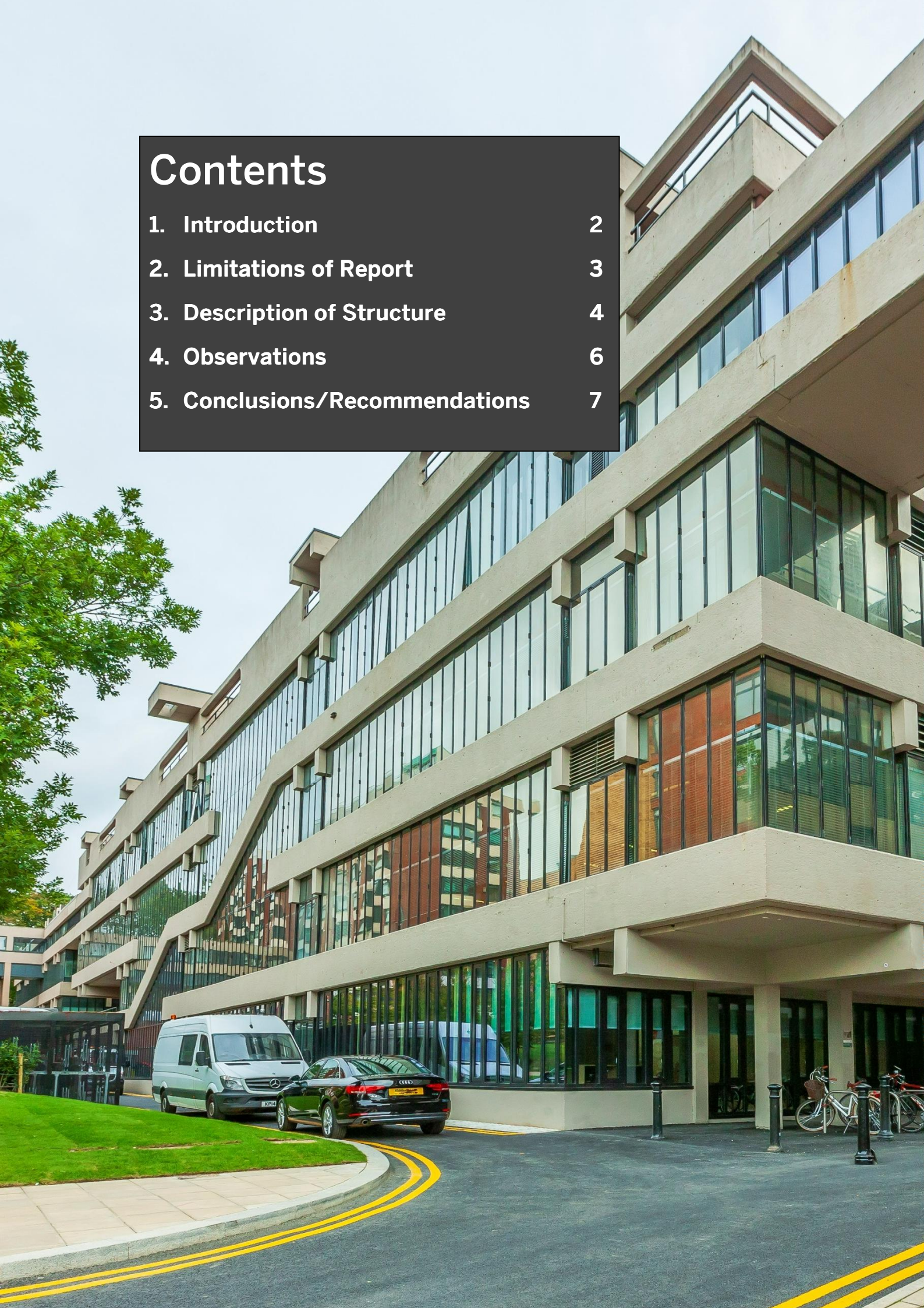

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Client:	Leeds Federated Housing Association
Project Name:	17 Poplar Close
Report Title:	Retaining Wall Survey
Report Author:	TH
Document ref:	00.21166-ACE-ZZ-ZZ-RP-S-0001
Date:	16/07/2021

Revision	Suitability	Date	Author	Checked	Approved	Description
P1	S2	July'21	TH	PG	EE	Initial Issue
P2	S2	March'22	TH	PG	EE	Further information following site visit

1. Introduction

1.1. Adept Consulting Engineers Limited were instructed by Leeds Federated Housing Association to undertake a site inspection to investigate reported movement of a retaining wall. The retaining wall runs the entire length of The Poplars estate in Bramley, Leeds.

1.2. The section of wall being investigated as part of this report runs along the boundary between the garden of 17 Poplar Close and St Mary's Hospital. The dwelling does not appear on historical maps of the area (prior to 1990). It is unclear how old the wall is however, the brick façade has the same appearance as the dwelling. Further down the wall (along Poplar Gate) the concrete backing of the stem appears to be older.

1.3. The original inspection as carried out on 07th July 2021.

1.4. The weather was dry and overcast.

1.5. Photographs of the retaining wall are given in Appendix A.

1.6. Sketches with recorded dimensions are given in Appendix B.

1.7. A further inspection was carried out on 20th January 2022.

1.8. The weather for the second inspection was dry and overcast.

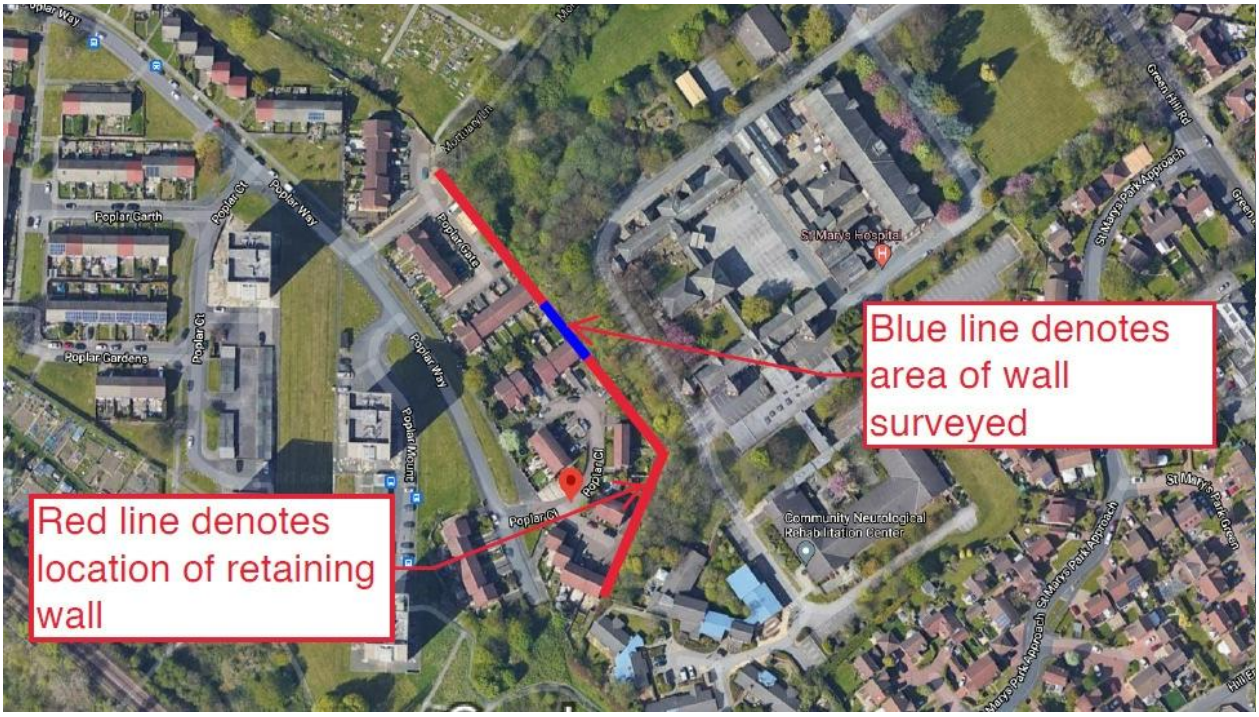
2. Limitations of Report

2.1. The limitations of our structural inspection report is included in the text at the end of this report.

3. Description of Structure

3.1. The length of wall that was surveyed was 17.85m from the front of the house at 17 Poplar Close to the end of the garden. It is unknown when the original wall was built but the façade bricks are the same as the houses, so it is assumed that the wall and houses were constructed at the same time.

3.2. Location Plan for the retaining wall



3.3. The wall was of a cantilever type structure which appeared to be constructed with a concrete stem and base but fronted with a brickwork façade. The top of the wall had a coping cap. There were weep holes through the stem at approximately 2m horizontal centres.

3.4. The stem appeared to be a total thickness of approximately 510mm wide including the bricks and concrete. The stem appeared to consist of 102.5mm brick façade with 20mm cavity between the concrete and brick faces. The assumed thickness of reinforced concrete stem was c380mm. The top of the concrete stem is thought to end at a point below the retained ground level approx. 1500mm above the lower ground level at the section (in the section between 12.05 and 14.95m), with the remaining construction up to the top of the stem appears to be brickwork.

3.5. The retained ground is sloped up towards St Mary's hospital. There was dense vegetation on the bank leading up to the road including trees, shrubs and bushes.

3.6. Historical mapping show that the buildings at St Mary's Hospital were originally built in 1871 and was used as a workhouse before being converted maternity unit in the 1920s then a mental health hospital in the 1970's. The Poplars have had houses built in the early 1960's but knocked down in the 1990's and the properties currently in place have been built since.

3.7. The retained heights, sketches and recorded dimensions of the wall are shown in the site sketches in Appendix B.

Site Visit (20/01/2022):

3.8. The masonry façade was removed to the level of the top of the concrete stem at ch 9.45m (see photo 8). The bricks were removed from the top of the wall to the top of the concrete stem (recorded at approx 1.525m above ground level).

3.9. In addition to the exposure of the stem, 2No. trial pits were dug at CH 9.45 and Ch 12.05 to investigate the extent and stability of the foundations.

4. Observations

4.1. Wall heights, widths and out of vertical tolerance measurements were taken at maximum 4.0m centres to assess the walls stability. Tabular results of these measurements are shown below.

Chainage (m)	Retained Height (m)	Assumed thickness of wall (m)	Distance from face of wall to secondary wall behind (m)	Out of Plumb distance (mm)
0	2.8	0.51	0.12	14
4	3.15	0.51	0.12	14
7.8	3.18	0.51	0.12	13
9.45	3.25	0.51	0.125	82
12.05	2.8	0.47	0.125	82
14.95	1.9	0.455	0.125	55
17.85	2	0.455	0.13	14

4.2. There appeared to be no movement at the base of the walls during inspection so it can be assumed that the movement is not down to overturning, sliding or bearing pressure failures.

4.3. The table shows that the section of the wall between CH 9.45 and CH 14.95 has displayed significant movement in the stem. The vertical alignment for the rest of the wall observed was within an acceptable limit.

4.4. From the results above it is apparent that the retaining wall is deflecting at an unacceptable level and that further investigation, and remedial works are required.

Site Visit (20/01/2022):

4.5. The exposed concrete stem behind the brick façade appeared to be in the original position from when it was constructed. The brick façade only had been observed to have bowed away from the retaining structure, moving independently from the stem.

4.6. The trial pits revealed the foundations at the front of the retaining structure (the foundations at the back were inaccessible due to the dense vegetation on the steep slope of the retained side).

4.7. The foundations were in good condition when observed. The concrete footing was found to extend approx 620mm from the edge of the brick leaf.

5. Conclusions/Recommendations

5.1. It is recommended that the brick outer leaf is removed for the area of wall that has shown movement to the stem ch 9.45m to 14.95m. The actual reinforced concrete stem can then be surveyed to establish the extent of damage and the possible causes of the failure. The backfill behind the wall would need to be removed prior to the removal of the brickwork to ensure the wall is not under load during the works.

5.2. Trial pits should be undertaken on the retained side to investigate the side of the wall that was not able to be observed during the inspection.

5.3. Trial pits will also need to be undertaken within the garden area of the property on the lower side to uncover the extent of the foundations of the wall.

Site Visit (20/01/2022):

5.4. It is recommended that the brick leaf between CH 9.45 and 14.95 be taken down and rebuilt. Refer to appendix B for sketch detail. Provide a 150mm thick concrete stem from the top of the existing concrete stem, reinforced with 1No. layer A393 mesh.

5.5. The proposed concrete stem is to be dowelled into the existing concrete stem with B10 bars at 200mm centres. The embedment (in both existing and proposed concrete) should be min. 200mm.

5.6. The brick face is to be taken down (to ground level) and rebuilt to the top of the wall. Tie back to concrete stem using Ancon 36/8 wall extension system or similar.

Report prepared by
Tom Hogan
For and on behalf of Adept Consulting Engineers Limited.
9th July 2021

Limitations of Report

a) Adept Consulting Engineers Ltd have prepared this report for the sole use and benefit of the client and/or his appointed agent only and no liability is accepted to any third party who may seek to rely on the whole or any part of this report. Should the client not act upon specific reasonable advice contained in the report, no responsibility is accepted for the consequences.

b) Comments are restricted to those elements of the structure which are loadbearing and/or provide stability to the buildings, and to the external envelope. Non-structural items of interior or exterior fabric are excluded, except where deterioration or damage to such items may have caused or may in the future cause, damage to or loss of integrity of the structure.

c) Comments are restricted to those elements of the structure which were readily available for visual inspection and exclude all items or elements which were covered in any way by, for example, fittings, fixtures, carpets, floor coverings, furniture, stored goods or plaster/finishes etc. or any items which are buried. No "opening up" of the structure or exposure of foundations took place and none of the above items were moved or disturbed.

d) The external inspection of the roof, chimneys and rainwater goods, was made from ground floor level. It should be noted that the efficiency of rainwater goods, which may appear in good condition, can only be assessed if there is heavy rain falling during the inspection.

e) Roof voids are only inspected from the access hatch, unless there are fully boarded walkways and adequate light available. Should it be felt necessary to make a more detailed inspection and walkways or light are not available, suitable access arrangements may need to be made, the costs of which would be the responsibility of the client.

f) Similarly basements or under floor voids will only be inspected if adequate light and safe access are available.

g) It is not practical to itemise every defect and minor defects which are obvious to the layman are not generally noted unless they are symptomatic of a more serious underlying structural fault.

h) The inspection does not include any services in or to the building and the services of appropriate experts should be sought if deemed necessary.

i) The detection and eradication of timber infestation and rising damp are specialist matters and as such are outside the scope of this report. We would, nevertheless, recommend that a firm of appropriate experts should be employed to carry out an independent survey and prepare a report.

j) Although mention may be made in this report, we have not carried out an exhaustive survey as to whether hazardous or deleterious materials such as asbestos is used in the construction of the buildings, neither have we carried out any tests or other investigation to determine the presence or otherwise of methane gases or other noxious substances of any kind whatsoever on the site. Appropriate experts should be consulted if deemed necessary.

k) It should be noted that further deterioration of existing defects, or the presence of any defects undetectable at the time of the inspection, cannot be ruled out.

Appendix A
Photographs (07/07/2021)

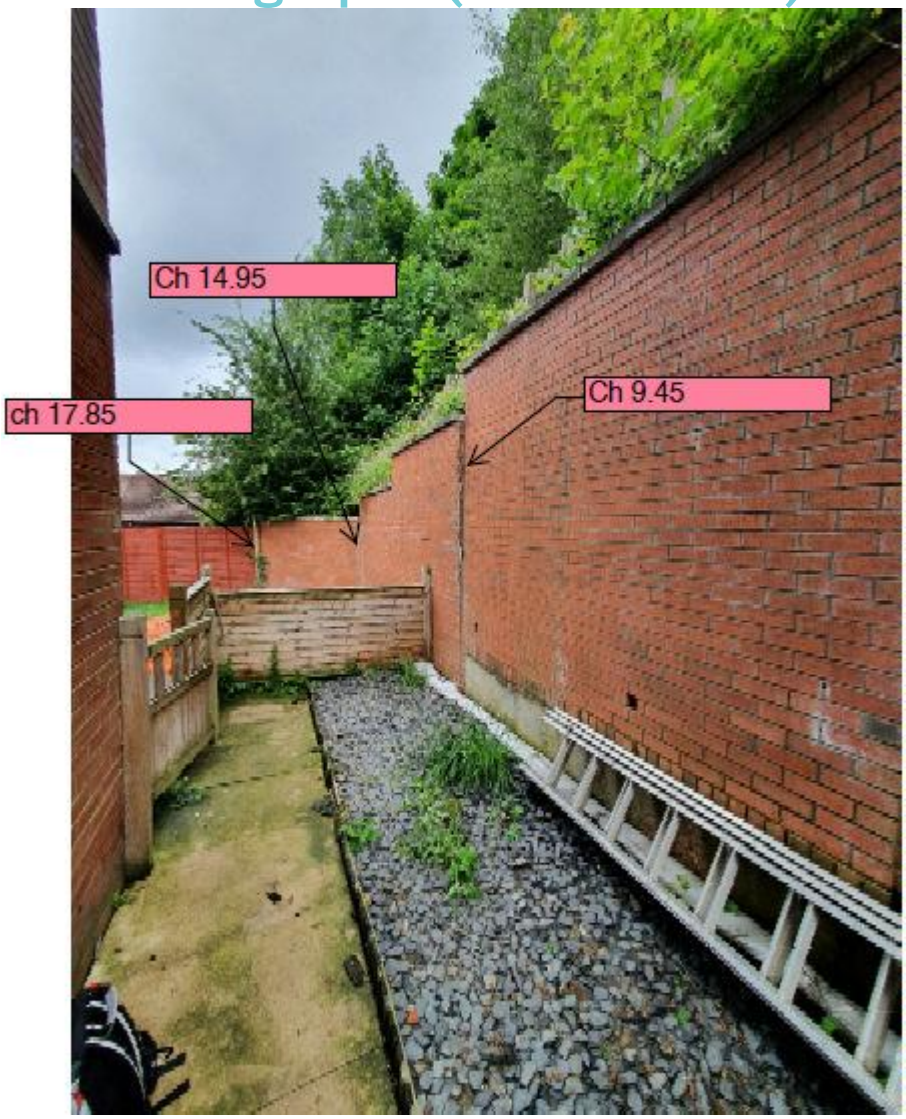


Photo 1 – CH 4m – CH 17.85m

Photo 2 – Section wall showing movement

Photo 3 – extent of movement

Photo 4 – Elevation of section under movement

Photo 5 – CH 12.05m to CH 4m

Photo 6 – CH 0

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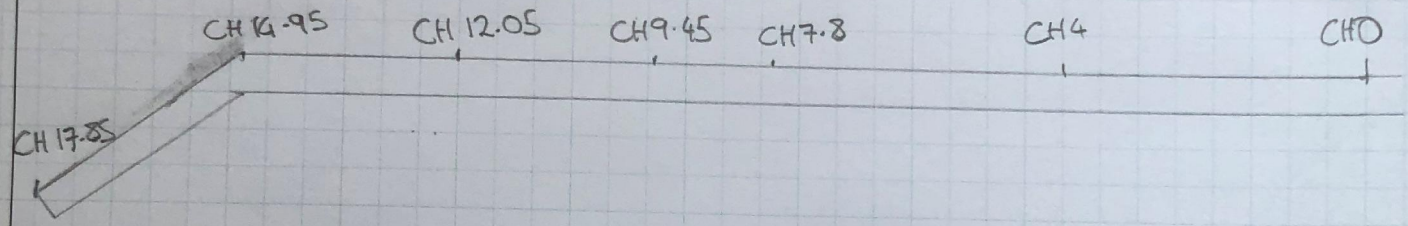
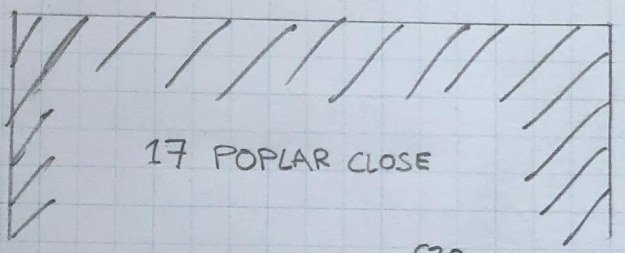
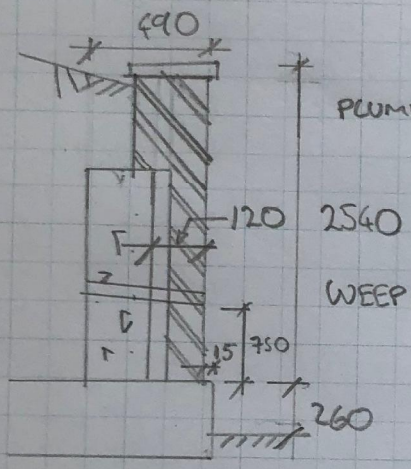
PROJECT
POPLAR CLOSE
RETAINING WALL SURVEY

PROJECT No. 00.21165
SHEET No.
BY TH DATE
CHKD PG DATE

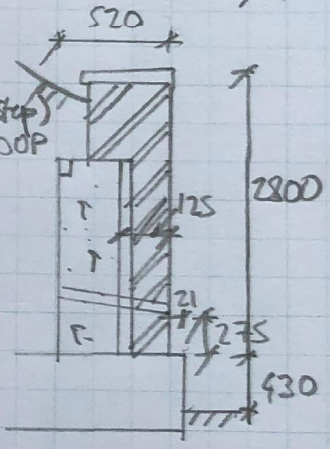




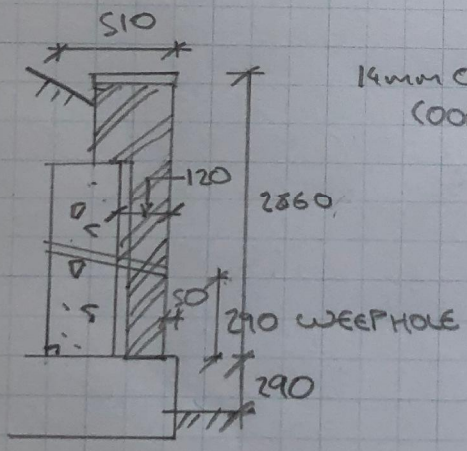
CH 0



CH 9.45
(Higher level of step)
14mm OOP

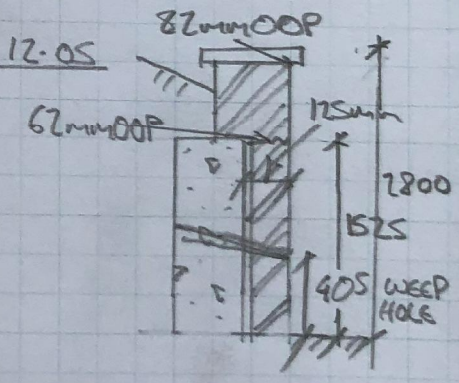


CH 4

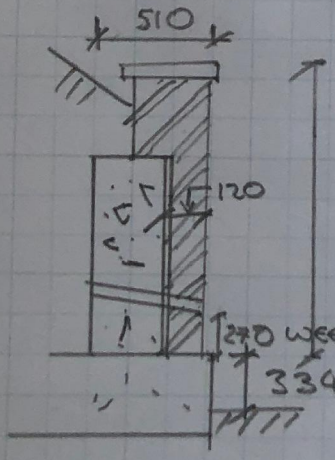


14mm OUT OF PLUMB (OOP)

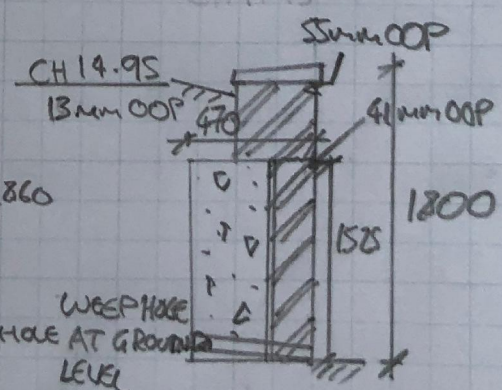
CH 12.05



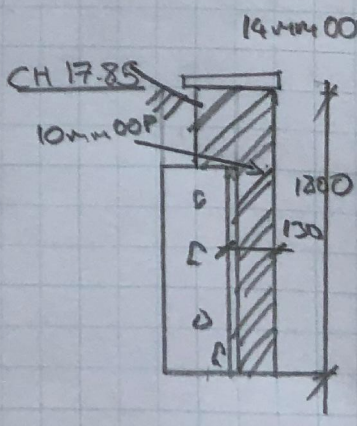
CH 7.8



CH 14.95
13mm OOP



CH 17.85
10mm OOP
14mm OOP



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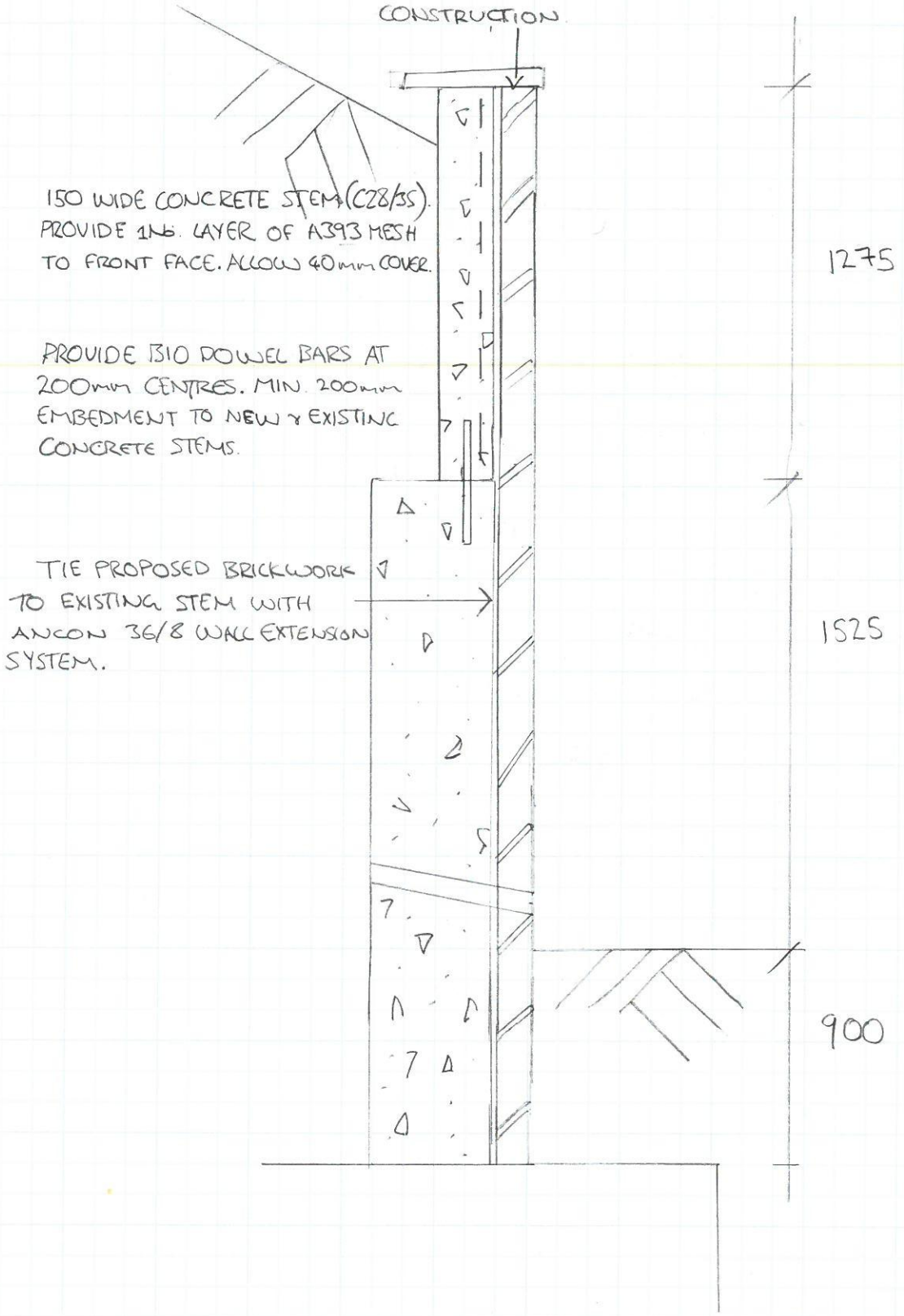
PROJECT
17 POPLAR CLOSE

RETAINING WALL REPAIR DETAIL

PROJECT No. 00.21166	
SHEET No.	
BY	DATE
CHKD	DATE



Appendix C
Photographs (20/01/2022)

Photo 8 – Level of the top of concrete stem

Photo 9 – Close up of exposed concrete stem

Photo 10 – Trial Hole at CH 9.45

Photo 11 – Trial Hole at CH 12.05