



DHD STRUCTURES

Chartered Structural & Civil Engineers

Structural Inspection Report



Eastfield House Plough Lane, Marston SN10 5SR

1972-REVB

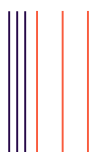
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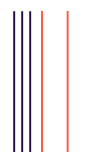
Executive Summary

A visual structural inspection has been undertaken at Eastfield House following identification of cracking within the property. Where visible the cracking has been identified and recorded on the building elevations. The cracking to the rear elevation extension appears to be caused by a combination of insufficient footings and the influence of tree roots. The side wall may have been underpinned previously, the depth of the underpinning is not known. Recommendations have been made extend this underpinning to achieve a total foundation depth of 1.95m to the full extent of the external walls to the rear extension and to provide a Helifix repair to cracking in the rear elevation.



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1.0 Introduction

This report was prepared by DHD Structures following instruction from the Client, Tim Humpage to investigate the following concerns, at the above-titled property:

- Cracking internally at first floor adjacent to chimney breast
- Cracking to the single storey rear extension

The scope of this report is limited to the structural condition of the property only, all other aspects of the building condition are beyond the expertise of the DHD Structures and hence excluded. Where general building defects are noted, it is for the Client to obtain further guidance in that area, please refer to Section 5 for survey limitations.

We undertook the structural inspection during daylight hours on Wednesday 27th February 2025, the weather was dry and sunny. Access was provided internally to the ground and first floors. Externally the elevations were viewed from the surrounding car parking area and gardens. Our comments are based upon visual observations; no intrusive investigations have been undertaken.

The property is located within the Marston residential area of Wiltshire. The front elevation faces north-west onto Plough Lane. All directions in this report are given as if viewing the property from the front. The site is at approximately 55m AOD on the Ordnance Survey (OS) mapping.

No records of construction or alterations have been provided. The property has been extended to the rear several times, none of these extensions appear recent. From review of publicly available mapping the 1840s tithe map, and Ordnance Survey (OS) maps from 1844 & 1888 show the property has been significantly altered over the years.

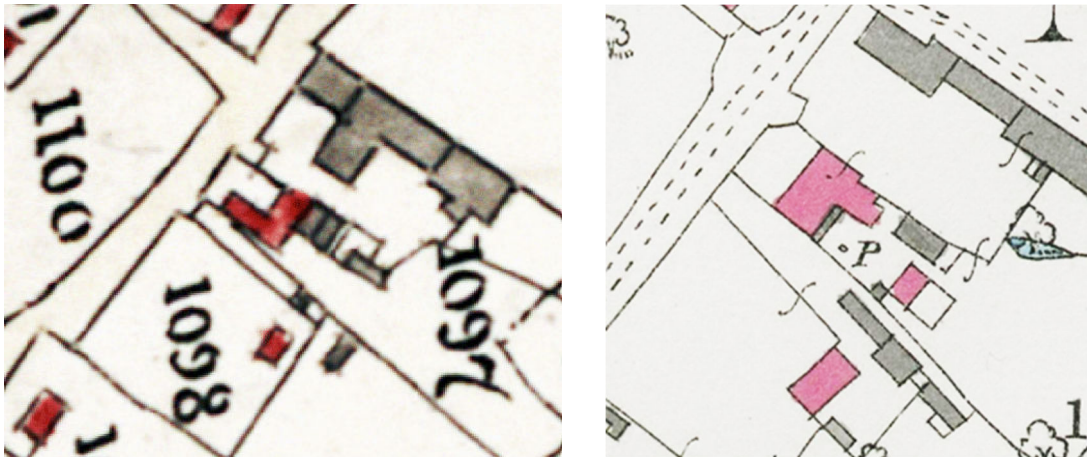
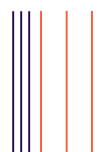


Figure 1 1840s Tithe map vs 1844-1888 OS

Wessex water maps have been checked for below ground drainage, the plans indicate a foul sewer terminating along the front of the property and a water main running along plough lane. Front, side and rear elevations produced for the Estate Agent details are included in figure 2-4 below.





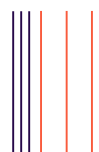
Figures 2 Front elevation



Figure 3 Side elevation



Figure 4 Rear elevation



Approximate floor plans produced for the Estate Agent details are included in figure 5 below. The two main areas of concern have been marked on plan for ease of reference. Our comments and advise will follow in section 3.0 and 4.0.



Figure 5 Floor Plan

2.0 Ground Investigation

The British Geological Survey 1:50,000 geological map identifies surface bedrock geology as Kimmeridge clay formation – mudstone. There are recorded superficial deposits of Clay, Silt, Sand and gravel. There is a publicly available borehole approximately 800m from the site, on the same bedrock geology this records the following strata:

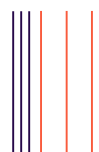
000 - 150feet	Kimmeridge Clay – Clary, dark grey
150 - 300feet	Corallian – Limestone, dark grey
300 - 800feet	Oxford Clay - Clay, pale grey

No ground investigations have been undertaken on site.

3.0 Structural Defects

3.1 Chimney Crack

The crack which ran vertically from wall plate to floor, was measured to be approximately 2.5mm wide at the top. The wall exhibited outward lean measurements of 16mm at 1.0m and 35mm at 2.7m, equating to a 1.30-degree inclination. This remains well within the allowable tolerance. There was no visible cracking to the external. If the appearance of the crack bothers the client, they may choose to have it repaired; however, this would be a cosmetic fix rather than a structural necessity.



To do this we'd recommend removing the plaster, stitching the crack by using horizontal Helifix bars, and re-plastering over.



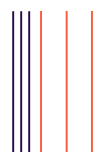
Figure 6 showing position of crack (internally/externally)

3.2 Rear Extension

Cracking in the single storey rear extension appears to be more significant. Diagonal cracks are visible across the entire rear elevation. A large section on the right-hand side of the rear elevation appears to have been rebuilt, with a new lintel installed above the right-side window. The cracking along the rear elevation have been repointed, though some on the left-hand side have reopened once more.

At the time of inspection, two trial pits had been excavated along the rear elevation. The depth of the concrete footings in both pits was measured at approximately 200–250mm. The concrete was flush with the brickwork above, indicating a relatively narrow foundation. Additionally, the top of the concrete was level with the external ground surface.

Along the side elevation, the brickwork was found to be in better condition. The original footings here were observed to be of the same width and depth as those at the rear elevation but may have been underpinned. The theory of previous underpinning is supported with presence of a new damp-proof course (DPC) and low-level brickwork. However, this could not be confirmed as the concrete



extends underneath the nearby flowerbed. The DPC to the top of the concrete was measured at 650mm. The depth could not be determined.



Figure 7 showing cracking externally to rear elevation.



Figure 8 trial pit at rear (no underpinning) and trial pit alongside (underpinning present)

A significant vertical crack was also observed between the main house and the rear extension, measuring 7mm in width at DPC level and widening to 17mm 20 courses above. Additionally, the masonry has moved outward by 25mm from the face of the crack. The absence of diagonal cracking on this elevation suggests rotational movement at the rear corner. Heli-fix corner bars could be installed to improve the connection and tie the two constructions together.

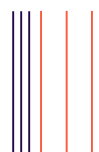




Figure 9 showing corner separation between rear extension and house

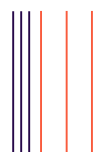
4.0 Interpretation & Recommendations

4.1 Interpretation

The orientation of the cracking along the rear elevations is consistent with subsidence of the underlying clay subgrade. Subsidence in conventional foundations can result from either shrinkage of the clay due to water abstraction from nearby trees or softening caused by leaking drains. We consider the following trees to have the potential to contribute to subsidence:

1. The Weeping Willow 12m from the right-hand corner of the rear extension, which has the highest water demand.
2. The hedgerow approximately 2.5m from the rear elevation.

Foundation depth calculations have been undertaken for high-volume change potential clay subgrades in accordance with NHBC Standards (refer to Appendix 2). These calculations indicate that an engineered foundation depth greater than 1.95m is recommended within 12m of the Willow tree. As the depth of the existing underpinning is unknown, we that the existing foundation/underpinning should be deepened in accordance with NHBC Chapter 4.2 to 1.95m



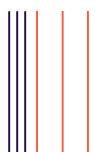
4.2 Recommended Actions:

Foundation Remediation:

1. Underpin the rear elevation to a depth of 1.95m (subject to soil analysis)
2. Deepen the existing underpinning along the side elevation to match the required depth of 1.95m

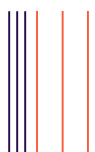
Crack Repairs:

1. Once foundation repairs are complete, the external cracks should be raked out and stitched using helical reinforcement bars, followed by repointing with a lime-based mortar.
2. Similarly, the corner where the single-storey rear extension meets the main house should be stitched with heli-fix corner bars and repointed.
3. Internal Finishes: Carry out internal redecoration upon completion of structural works.
4. Note internal Crack repair detail Helifix CS01 detail in Appendix 3

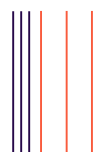


5.0 Survey Limitations

- **Accessibility:** The Structural Engineer (SE) undertook a visual inspection that was limited to the scope set out in 1.0.
- **Services.** The SE has not commented on the existing services to the property, for example the condition of water supply pipes, electrical installations, or drains, unless they relate to a structural issue.
- **Contamination and hazardous materials:** The SE has not commented upon the existence of contamination or hazardous building materials as this can only be established by appropriate specialists.
- **Legal restrictions or Covenants:** It is assumed that the property is not subject to any unusual or especially onerous restrictions or covenants which apply to the structure or affect the reasonable enjoyment of the property. If the purpose of this report is to inform the purchase of the property, the Client is advised to appoint a legal advisor to conduct Local Searches in the usual manner.
- **Property valuation:** This is a Structural Report and has not provided an assessment of the market value of a property or budget costs for intended building works.
- **Restrictions on disclosure:** This report is for the sole use of the named Client and is confidential to the Client and his/her professional advisors. Other parties rely upon the report at their own risk. The report must not be reproduced, in whole or in part, without the prior consent of the SE.



APPENDIX 1 Terms & Conditions of Appointment



Definitions

'Client' is named above.

'Property' is the property to be surveyed by the Structural Engineer (which may or may not be the same as the Client's correspondence address)

'Structural Engineer' (SE) is DHD Structures Ltd.

Programme

We will complete our work in a timely manner with lead in times confirmed upon appointment.

Fees

We will invoice upon issue of the written report to the client.

Payment terms are 7 days from date of invoice.

Late payment will accrue interest at 2% per month.

Documentation

The Structural Engineer's written report will be issued electronically.

Terms

All works will be undertaken with reasonable skill and care. Where repair details are shown or described these are indicative scheme design and do not constitute a Part A Building Regs submission. The Scope and Fee proposal is valid for six months after its date and will be re-issued if not appointed within that time. Once appointed, we will add 5% to the fee for each year that we are involved with the project.

The SE will inform the Client promptly of any issue which could significantly affect the Scope, Fees, or programme.

Access to the Property

The SE will inspect as much of the relevant building structure and surroundings as possible given the access at the time of the inspection. The SE cannot comment on structural elements that were covered, unexposed or inaccessible, or where it is not safe for the SE to access.

It is expected that the SE will be given safe access to inspect the roof space.

Any areas that were not accessible during the inspection will be recorded in the written report. The SE will identify any areas that may require further investigation where access was insufficient at the time of the inspection.

Services

The SE will not inspect or comment on the existing services to the property, for example the condition of water supply pipes, gutters and rainwater pipes, or drains, other than in relation to a structural issue.

Liability

Liability is limited to 10 x fee charged. No liability is accepted relating to asbestos or contamination.

Contamination and hazardous materials

The SE will not comment upon the existence of contamination or hazardous building materials, including asbestos, as this can only be established by appropriate specialists. Where, from local knowledge or the inspection, the SE considers that either might be an issue, the SE may advise as to the importance of obtaining specialist advice.

Site Investigation (SI)

The SE will advise on the requirements for a more comprehensive SI if necessary, which may require the appointment of a ground investigation or soil specialist.

Legal restrictions or Covenants

It is assumed that the Property is not subject to any unusual or especially onerous restrictions or covenants which apply to the structure or affect the reasonable enjoyment of the Property. If the purpose of this report is to inform the purchase of the Property, the Client is advised to appoint a legal advisor to carry out Local Searches in the usual manner.

It is assumed that the Client is either the owner of the Property or has obtained permission from the owner or owner's agent to gain access for the purposes of carrying out the structural survey.

Property valuation

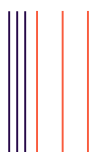
The SE is engaged for the purposes of providing a structural report in relation to the building structure and will not provide an assessment of the market value of a property or budget costs for intended building works.

Restrictions on disclosure

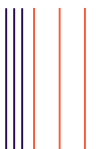
The SE written report is for the sole use of the named Client and is confidential to the Client and his/her professional advisors. Other parties rely upon the report at their own risk. The report must not be reproduced, in whole or in part, without the prior consent of the SE.

Confidentiality

DHD Structures Ltd will not without the Client's prior written consent disclose to any person any private or confidential information concerning the Client or the Property save in the proper course of our business or to our professional advisers or insurers or as required or permitted by UK law.



APPENDIX 2 TEDDS output



Project Eastfield House, Wiltshire				Job no. 1959	
Calcs for Tree Influence				Start page no./Revision 15	
Calcs by HET	Calcs date 03/03/2025	Checked by DH	Checked date 03/03/2025	Approved by	Approved date

FOUNDATIONS NEAR TREES

In accordance with Clause 4.2.12 of NHBC Part 4: Foundations - Chapter 4.2

Tedds calculation version 2.0.03

Site Details

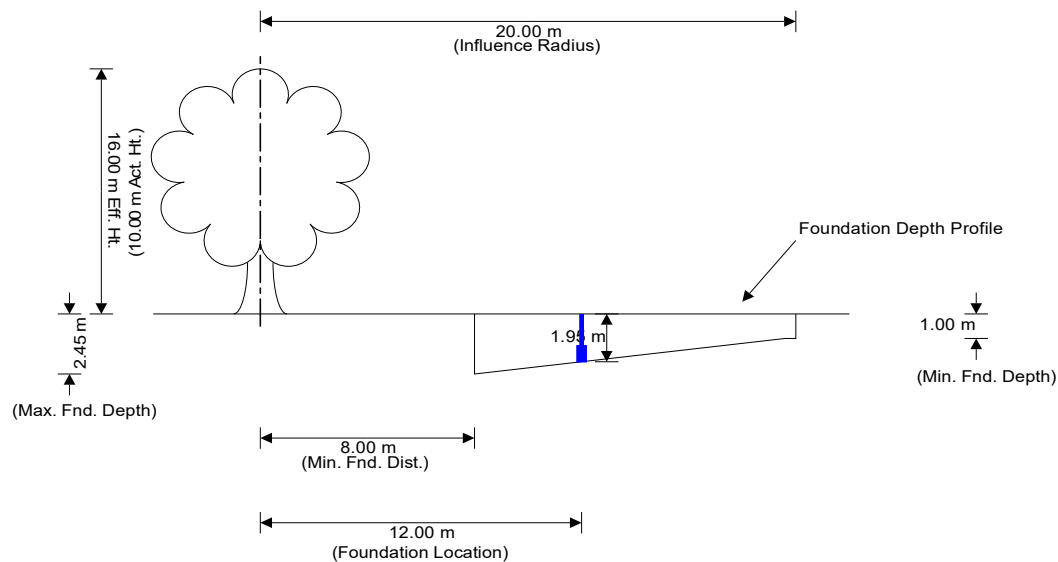
Site location Swindon
Reduction depth due to climate variations - cl.4.2.4 $Z_c = 0.05$ m

Soil Details

Plasticity index from lab tests $I_p = 40$ %
Percentage of particles < 425 μ m $p_{425} = 100$ %
Modified plasticity index - cl. 4.2.4 $I'_p = I_p \times p_{425} / 100$ % = 40 %
Volume change potential - Table 1 High

Details for Tree - 1

Species of tree Broad leaf - Weeping Willow
tree is to remain at the site, with no further planting allowed.
Water demand of tree - Table 3 High
Mature height of tree - Table 3 $H_{m1} = 16.00$ m
Influence radius - Table 3b $r_{inf1} = 1.25 \times H_{m1} = 20.00$ m
Measured height of tree $H_{act1} = 10.00$ m
Distance from centre of tree to face of foundations $D_1 = 12.00$ m
Effective height of tree - Table 3a $H_{eff1} = 16.00$ m



Minimum foundation depth - Table 4B $Z_{min} = 1.00$ m
Look up value for foundation depth - Chart 1 Soils with HIGH volume change potential $Z_{LookUp1} = 2.00$ m
Required foundation depth $Z_{req1} = Z_{LookUp1} - Z_c = 1.95$ m

Project Eastfield House, Wiltshre				Job no. 1959	
Calcs for Tree Influence				Start page no./Revision 16	
Calcs by HET	Calcs date 03/03/2025	Checked by DH	Checked date 03/03/2025	Approved by	Approved date

Summary Table

Tree	Name	Distance (m)	Measured Height (m)	Effective Height (m)	Tree to be removed	Required Foundation Depth (m)
1	Weeping Willow	12.0	10.0	16.0	No	1.95

APPENDIX 3 Helifix Bars

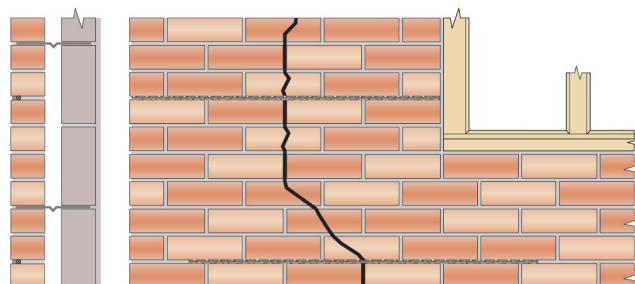


Crack Stitching a Cavity Wall using HeliBars

METHOD STATEMENT

1. Using a twin-bladed, diamond-tipped wall chaser and vacuum attachment, cut slots into the horizontal mortar joints, to the specified depth and at the required vertical spacing. Ensure that NO mortar is left attached to the exposed brick surfaces in order to provide a good masonry/grout bond.
2. Remove ALL dust and mortar from the slots and thoroughly flush with water. Where the substrate is very porous or flushing with water is inappropriate, use HeliPrimer WB. Ensure the slot is damp or primed prior to commencing step 5.
3. Mix HeliBond cementitious grout using a power mixer and load into the Helifix Pointing Gun CS.
4. Fit appropriate mortar nozzle.
5. Inject a bead of HeliBond grout, approx. 15mm deep, into the back of the slot.
6. Push the 6mm HeliBar into the grout to obtain good coverage.
7. Inject a second bead of HeliBond grout over the exposed HeliBar and iron it into the slot using a finger trowel. Inject additional HeliBond as necessary, leaving 10-15mm for new pointing.
8. Point up the remaining slot with a suitable matching mortar and make good the crack using an appropriate Helifix bonding agent depending on the width of the crack.
9. Clean tools with clean, fresh water.

N.B. Pointing may be carried out as soon as is convenient after the HeliBond has started to gel.



RECOMMENDED TOOLING

- For cutting slots up to 40mm deep Twin-bladed cutter with vacuum attachment
- For mixing HeliBond 3-jaw-chuck drill with mixing paddle
- For injection of HeliBond into slots Helifix Pointing Gun CS with mortar nozzle
- For smoothing pointing Standard finger trowel

Specification Notes

The following criteria are to be used unless specified otherwise:

- A. Depth of slot into the masonry to be 25mm to 40mm.
- B. Height of slot to be equal to full mortar joint height, with a minimum of 8mm. For thin mortar joint specifications refer to the Helifix Technical Dept.
- C. HeliBar to be long enough to extend a minimum of 500mm either side of the crack or 500mm beyond the outer cracks if two or more adjacent cracks are being stitched using one rod.
- D. Normal vertical spacing is 450mm (6 brick courses).
- E. Where a crack is less than 500mm from the end of a wall or an opening the HeliBar is to be continued for at least 100mm around the corner and bonded into the adjoining wall or bent back and fixed into the reveal, avoiding any DPC.
- F. In hot conditions ensure the masonry is well wetted or primed to prevent premature drying of the HeliBond due to rapid de-watering. Ideally additional wetting of the slot, or priming with HeliPrimer WB, should be carried out just prior to injecting the HeliBond grout.
- G. Do not use HeliBond when the air temperature is +4°C and falling or apply over ice. In all instances the slot must be thoroughly damp or primed prior to injection of the HeliBond grout.

The above specification notes are for general guidance only and Helifix reserves the right to amend details/notes as necessary.

GENERAL NOTES

If your application differs from this repair detail or you require specific advice on your particular project, call the Helifix Technical Sales Team on **020 8735 5222**. Our Technical Department can provide you with a full support service including:

- Advice, assistance and recommendations on all structural repair matters
- Devising and preparing complete repair proposals for specific situations
- An insurance-backed warranty via our Approved Installers scheme