



**AGENDA ITEM:**

**SUMMARY**

<b>Report for:</b>	<b>Cabinet</b>
<b>Date of meeting:</b>	<b>20<sup>th</sup> April 2021</b>
<b>Part:</b>	<b>Part II</b>
<b>If Part II, reason:</b>	The Part II report contains information relating to the financial or business affairs of the Council.  <b>(Local Government Act 1972, Schedule 12A, Part 1, Paragraph 3).</b>

<b>Title of report:</b>	Highbarns Collapse Feature Remediation Phase
<b>Contact:</b>	Cllr Andrew Williams, Leader of the Council and Portfolio Holder for Corporate and Contracted Services  Author/Responsible Officers:  <ul style="list-style-type: none"> <li>• Ben Hosier, Group Manager Procurement &amp; Contracted Services</li> </ul>
<b>Purpose of report:</b>	<ul style="list-style-type: none"> <li>a) To provide Cabinet with an update on the Highbarns collapse feature, and</li> <li>b) To request financial support for the remediation phase, and</li> <li>c) To highlight the potential financial exposure for the Council.</li> <li>d) To request delegated authority to award a contract for the remediation work.</li> <li>e) To recommend that the Council formally highlights with Central Government and Hertfordshire County Council the potential scale of the risk facing the Council</li> </ul>

<p>Recommendations:</p>	<ol style="list-style-type: none"> <li>1. That Cabinet note the collapse feature that has appeared in the vicinity of historical chalk mines in Highbarns, Hemel Hempstead and the works that have been carried out to date.</li> <li>2. That Cabinet recommend Council note the expenditure incurred under the urgency provision of the Financial Regulations (see paragraph 8.6), and agree to the use of the Dacorum Development Reserve to fund the remediation works.</li> <li>3. That Cabinet highlight to Council the risk of further emergency expenditure and, under the provisions of the Financial Regulations, delegate authority to the Leader of the Council in consultation with the Corporate Director, Finance and Operations, and the Chief Executive to approve additional expenditure if costs escalate during the remediation process.</li> <li>4. That Cabinet agree to delegate authority to award a contract for the remediation work to the Assistant Director Corporate &amp; Contracted Services in consultation with the Leader of the Council and the Corporate Director, Finance and Operations.</li> <li>5. That Cabinet agree for the Council to formally write to the relevant authorities requesting financial assistance towards the remediation works.</li> </ol>
<p>Corporate Objectives:</p>	<p>Clean, Safe and Enjoyable Environment – The remediation of the land around the collapse feature will stabilise the land and mitigate the risk of further spontaneous collapse.</p> <p>This will ensure that the land will continue to meet the needs of current and future residents as public open space.</p>
<p>Implications:</p>	<p><u>Financial</u></p> <p>An outline of the financial implications of both phase 1 the exploration costs and phase 2* the remediation costs are set out in the report.</p> <p>*Indicative costs for the remediation works are expected to be £250k, however, the exact costs are</p>

	<p>based upon the volume of infill required which will not be known until the pumped compaction work is carried out.</p> <p>This report seeks approval to use the Dacorum Development Reserve to fund the initial £400k costs of the remediation works.</p> <p><u>Operational</u></p> <p>The Council would need to bring in a specialist contractor to undertake the remediation work. This work will be carried out under contract that will include overseeing the operational implications.</p> <p>BAM Ritchie's (the contractor that undertook the previous remediation work) have been approached to carry out the remediation works.</p> <p><u>Value for Money</u></p> <p>The consultant (Arcadis) deal with remediation works on a regular basis, they have indicated that the indicative remediation costs are what they would expect for a project of this size.</p>
<p>Risk Implications:</p>	<p>If the void is not filled, it will remain unsafe for local residents and may result in a further collapse, which could damage to adjoining land or person.</p> <p>There remains the risk that the costs incurred filling the void will go beyond those projected and this will continue to be monitored once the works commence.</p>
<p>Community Impact:</p>	<p>A Community Impact Assessment has been carried out and is attached to the report.</p>
<p>Health And Safety Implications:</p>	<p>There do not appear to be any other options other than remediation.</p> <p>Fencing off the site has been a temporary solution to ensure no one falls in the void but this does not prevent the wider issue of a further collapse if the void is not filled.</p>
<p>Monitoring Officer/S.151 Officer Comments:</p>	<p><b>Monitoring Officer:</b></p> <p>The Monitoring Officer's comments are included in the report at paragraph 9.</p>

	<p><b>S.151 Officer:</b></p> <p>The Section 151 Officer's comments are incorporated in the report at paragraph 8.</p>
Consultees:	Portfolio Holder Corporate Officer's Group
Background papers:	None
Glossary of acronyms and any other abbreviations used in this report:	

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## 1. Executive Summary

- 1.1 Members are asked to note the remediation work that is required to a collapsed feature that has been identified in the region of the historic Highbarns chalk mines (see plan below for details of the location) and approve the funding to procure a contractor to commence the required remediation works.
- 1.2 The void appears to be isolated and is relatively small (150m<sup>3</sup> material), when compared to the treatment works that have been carried out in this area over the last few years (9,000m<sup>3</sup> material). However, Members should be aware that there have been a number of voids/collapses over the last decade or so and further collapses/voids cannot be ruled out.
- 1.3 The identified void lies beneath DBC owned land in between two footpaths and is considered a risk that should be mitigated, as there is a high risk of a spontaneous collapse.
- 1.4 The cost for the remediation work is estimated to be around £325k and the costs to date of exploratory work are £66k. Total exposure is currently forecast to be a minimum of £391k. Officers have made contact with Homes England to enquire whether there is any support from Government, similar to the financial support that the Council received from Homes and Communities Agency (HCA) during the remediation work carried out previously.
- 1.5 Officers are waiting a formal response, but the HCA previously advised in relation to the former voids that there would be no further funding streams available to support land stabilisation.
- 1.6 It is suggested that this matter is raised with MHCLG, and the local MP to request financial support from central government.

## 2. Background

2.1 A hole appeared in mid-October in an area of public open space adjacent to 4 properties, No.'s 28, 29 & 30 East Green and No. 30 Highbarns. The properties are in private ownership, apart from 30 East Green, which is owned by the Council. The land where the hole is located is Council owned so arrangements for geotechnical engineers to visit the site were made. The collapse has revealed a brick shaft approximately 1.2m in diameter that appears to be a former well (see Figure 1 below)



Figure 1 Site layout plan

## 3. Findings

3.1 Land close to this area had stabilisation works carried out to it over the past decade. Remediated galleries forming part of the historic Highbarns Chalk Mine are located short distances to the northeast and north-west of the feature (see Figure 2 below – shown hatched purple).

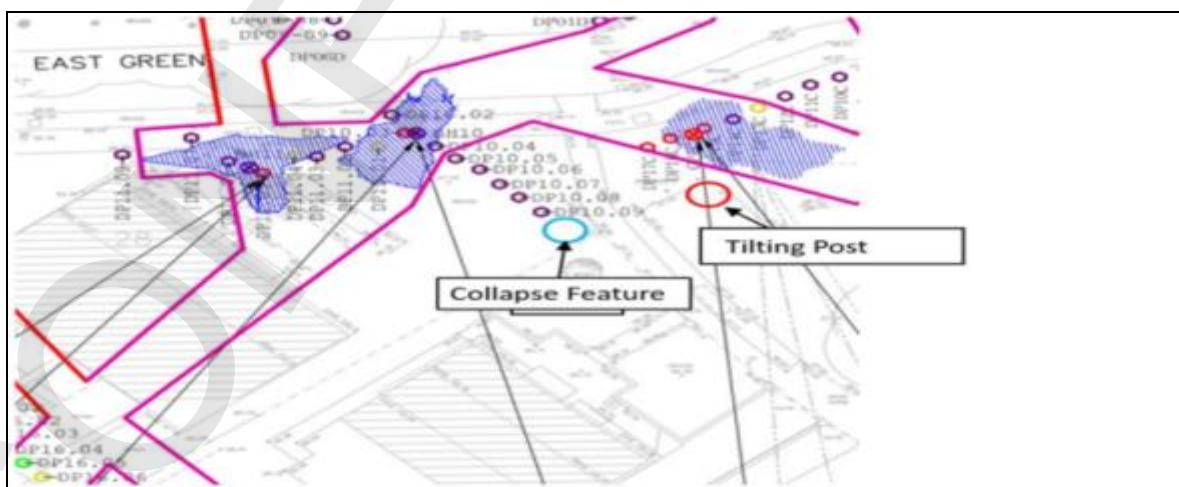


Figure 2 Plan of the extent of the known remediated mine workings (and previous exploratory holes)



#### 4. Ground Investigation

4.1 Intrusive ground investigation work was carried out around the collapse feature to ascertain the extent of the sub-surface and loosened ground to enable the design of remedial works. Exploratory holes were drilled around the tilting cable post to determine whether the tilt is related to the subsidence. The Council has kept residents in the properties directly adjacent to this area informed of the situation.



Figure 3 Proposed Ground Investigation Works

4.2 Initial results of the dynamic probing has identified a void running from the edge of the collapsed feature towards No. 30 East Green, and the lateral and vertical extent of any voided/loosened ground of this void has been identified as being approximately 13.5 m x 4 m.



Figure 4 Scope of the identified void

## 6. Costs

Phase 1 exploration costs included the following:

Condition Surveys	£9k
Ground Investigation	<u>£57k</u>
Total	<u>£66k</u>

Consultant fees for supporting the Council with phase 2 the remediation:

Prepare works specification & treatment works	£22k
Mobilisation & engineering supervision	£35k
Demobilisation & validation reporting	<u>£18k</u>
Total	<u>£75k</u>

Remediation works (subject to contract and tendering est) £250K

Total £391K

## 6. Remediation Phase

6.1 The void is estimated to need 150m<sup>3</sup> of material and is likely to cost in the region of £250k to remediate. For comparison, the chalk mine voids remediated between 2007 and 2015 required 9,000m<sup>3</sup> of material and cost £6.5M to remediate.

The chalk mine remediation work previously undertaken in this area was part-funded by the land stabilisation programme that was administered by the Homes and Communities Agency on behalf of DCLG. This has since closed and there is currently no support from central Government for this type of project. Officers have contacted the MHCLG to enquire if any other funding options exist and have been informed to contact Homes England, who have responded by saying that land stabilisation funding is not within their departments responsibility. Officers have made further contact with MHCLG and Members will be updated if other responses are received.

## 7. Works required

7.1 Proposed scope of remedial works around the collapse feature comprises:

- vertical compaction grout holes around the collapse to depths of 20m, two inclined grout holes beneath the north-eastern corner of the front garden of No. 30 East Green and a single vertical compaction grout hole located in the centre of the collapse feature to infill the shaft;
- construction of a concrete cap over the shaft/collapse feature.



- 7.2 The recommended remediation method is compaction grouting and bulk infilling both within the shaft and in the vicinity.

BAM Ritchie's (the contractor that undertook the previous remediation work) has been approached to identify their availability for the remediation works.

Indicative costs for the remediation works are expected to be £250k, however, the exact costs are based upon the volume of infill required which will not be known until the pumped compaction work is carried out.

It is expected that the remediation work can be concluded over a period of 6-weeks including mobilisation, site works and demobilisation.

## **8. S151 Officer Comments**

- 8.1 Between 2007 and 2015, the total cost of filling chalk mine voids within the Highbarns area was £7.4m. Although the Council was able to secure a £5m funding contribution from Central Government and a further £650k from HCC, this still left DBC having to meet £1.7m of the cost from its own funds.
- 8.2 Significantly, the above works were originally forecast to cost much less than the actual £7.4m – the rapid escalation of scale and costs only began after the infilling process was underway. Since the actual size of a void cannot be known with absolute certainty before the works begin, there is a risk that a similar escalation could happen in this case. This risk is compounded by the fact that the Central Government funding pot from which the £5m contribution was awarded is no longer in place. In summary, the Council could be left with sole liability for a very significant cost with no identifiable means of financial support.
- 8.3 Based on recent exploratory data and improved knowledge of the mine network gleaned from previous infill works, the Council's contractors have advised that in their opinion the risk of the void being significantly bigger than currently anticipated is low. However, even a 1% risk is significant if the consequences of it crystallising could result in a multi-million pound cost to the Council. Whilst the Council may have a legal obligation to complete the works, before embarking on the project it should consider how it could best mitigate the financial impact in the event that the escalation risk comes to fruition.
- 8.4 It is recommended that the Council mobilise political and senior officer resource to formally highlight to Central Government and HCC the scale of the risk facing the Council. This should include lobbying for financial support for both the currently projected bill of £400k, which in itself is significant, as well as for the potential increase in cost if the project

escalates. While it is unlikely that either party will agree to contribute to the project in advance, the Council will be in a stronger position further down the line if it has already raised the financial pressure and the need for assistance.

- 8.5 The Council's capital balances are fully committed to delivering the approved Capital Programme, and in addition, it faces significant medium-term financial pressure stemming from uncertainty around future funding and the unknown impact of Covid. A repeat of previous £1.7m costs to be funded from reserves would materially harm the Council's future ambitions and resilience, and the Council should take all steps to mitigate this threat in advance.
- 8.6 In the interim, the Council can fund the initial £400k remediation costs from the Dacorum Development Reserve. Whilst ordinarily subject to approval from Full Council in advance, the Financial Regulations (Section A.12 g) allow for the S151 Officer to approve urgent in-year expenditure where there a danger to life or property is imminent. Following consultation with the Chief Executive, the Assistant Director (Corporate and Contracted Services) and the Leader of the Council, I am satisfied that this condition has been met. In accordance with the Financial Regulations this expenditure will now be reported to Cabinet and Full Council at the earliest opportunity.
- 8.7 Members will be kept advised on the potential need to incur further expenditure, and the urgency of that requirement, as the works progress.

**9. Legal position:**

- 9.1 The Council obtained Counsel's opinion in 2009 regarding its potential liability relating to the first voids identified and whilst there was no clear requirement on DBC to fill the voids, liability arises if the surrounding land collapses which causes damage to adjoining property or person.
- 9.2 The void identified in the current case is all on DBC land and therefore if the void was not filled the Council would likely be liable if either an accident occurred on our land, e.g. a fall relating to the void itself, or if the void collapsed further which extended onto adjoining land such as the adjacent public footpath and caused damage to property or person. As this is a now a known risk, the Council should take steps to remediate the land to mitigate this risk.
- 9.3 There do not appear to be any other options other than remediation. Fencing off the site has been a temporary solution to ensure no one falls in the void but this does not prevent the wider issue of a further collapse if the void is not filled.

## **10. Conclusions**

- 10.1 The Council has already incurred costs of approximately £66k on phase 1 of this project and phase 2 costs are likely to be in the region of £325k.
- 10.2 Compared to the costs associated with the chalk mine remediation back in 2013, the costs to remediate this identified void are significantly lower, but following the closure of the HCA land stabilisation programme the Council would need to fund 100% of the remediation works itself.
- 10.3 The Council has first-hand experience that costs can increase significantly when remediating these types of collapses and it would be prudent to raise the potential financial exposure of the Council through the appropriate channels with the Secretary of State and request assistance with funding the remediation works.
- 10.4 The identified void lies beneath public land in between two footpaths and is seen as a risk that should be mitigated. The area was historically used for mining chalk and although there has been a significant programme of land stabilisation carried out, it is not known whether other collapses will occur in the future.
- 10.5 The following appendices show the area in more detail.
1. Appendix 1 Consultant Questions
  2. Appendix 2 Treatment Areas
  3. Appendix 3 Interpreted Mine Layout, and the voids that were identified in 2008 and 2012
  4. Appendix 4 Treatment carried out in vicinity of current collapse feature
- 10.6 Members are requested to consider and approve the recommendations in the report in order for the contract to be formally procured for the remediation works.

Appendix 1 Questions subsequently asked of the Consultant:

**a. Is it imperative that the remediation work is carried out, how likely is a collapse?**

*The recent collapse in October 2020 and the disturbed/voided/weak chalk identified around the collapse by the recent dynamic probing including open voids and void migration indicated by dynamic probes DP2, DP13 and DP14 indicating incipient collapse suggests a high risk of a spontaneous collapse.*

**b. How far down does the shaft reach before it opens up into the void heading towards 30 East Green?**

*The depth of the brick shaft is unknown. Dynamic probes DP13 and DP25 recorded low blow counts to depths of >18m bgl and 19m bgl respectively indicating that disturbed/voided/weak chalk extends to these depths.*

**c. Is it feasible to somehow cap off the shaft (or only remediate the top section) without needing to remediate the entire shaft and void?**

*To prevent further collapse and to secure the land for its use as public open space including the footpath it will be necessary to remediate the shaft and the adjacent ground by compaction grouting and bulk infilling to depths of 20m bgl followed by the construction of a concrete cap over the shaft.*

**d. How confident are you that the current identified scope of the shaft/void will not significantly increase in size upon commencement of the remediation work?**

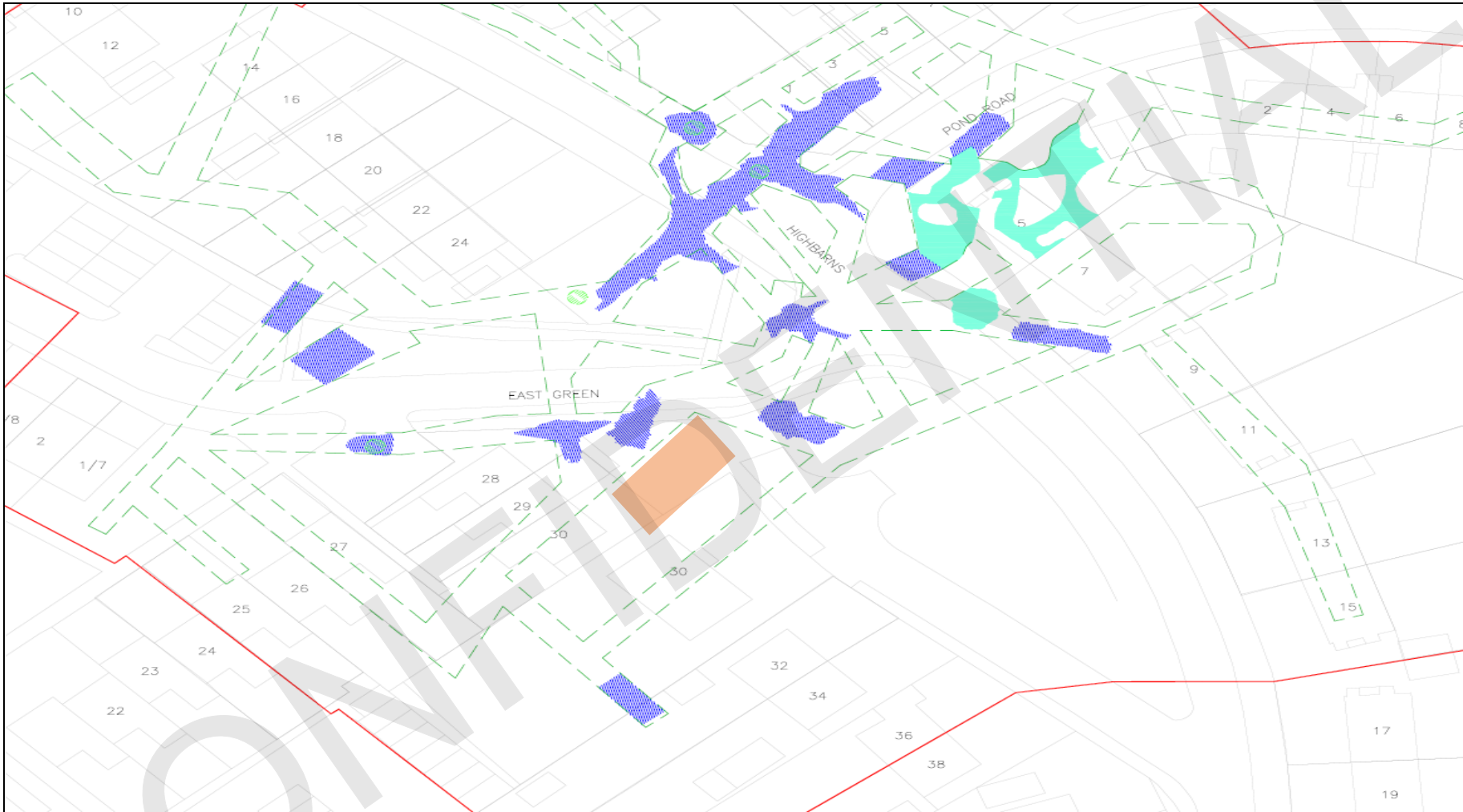
*Our review of the previous exploratory holes, grout holes and validation probes sunk in the area surrounding the collapse feature together with the findings of the recent dynamic probing provides us with confidence that the proposed scope of treatment works comprising 15 No. grout holes should be sufficient to treat the shaft and the adjacent ground.*

**e. Were the volumes of material stated used to treat the voids or the interpreted mine layout?**

*The total volume of grout of over 9,000m<sup>3</sup> was used to treat the interpreted mine layout shown on the drawing in appendix 3 including the large open voids identified by boreholes and laser surveys.*



Appendix 3 Interpreted Mine Layout, and the voids that were identified in 2008 and 2012



Not for Publication



Appendix 4 Treatment carried out in vicinity of current collapse feature

Property	Location	Type of Hole	Number of Holes	Range of Grout Volumes <sup>1</sup> (m <sup>3</sup> )	Total Grout Volume <sup>1</sup> (m <sup>3</sup> )
<b>No. 28 East Green</b> (Total Grout Holes = 10, Total Grout Volume = 56.2m <sup>3</sup> )	Beneath the property	Inclined compaction grout holes	7	1.01 (CGI281) to 6.02 (CGI241)	20.59
	Back garden	Vertical compaction grout holes	3	3.43 (CGV408) to 23.38 (CGV406)	35.63
	Front garden	Vertical compaction grout holes	5	2.19 (CGV350) to 18.253 (CGV351)	38.83
<b>No. 29 East Green</b> (Total Grout Holes = 17, Total Grout Volume = 144.6m <sup>3</sup> )	Beneath the property	Inclined compaction grout holes	8	1.735 (CGI239) to 30.904 (CGI238)	92.21
	Back garden	Vertical compaction grout holes	4	1.89 (CVG405) to 5.69 (CGV403)	13.59
	Front garden	Vertical compaction grout holes	3	2.92 (CGV346) to 9.50 (CGV348)	12.44
<b>No. 30 East Green</b> (Total Grout Holes = 16, Total Grout Volume = 158.6m <sup>3</sup> )	Beneath the property	Inclined compaction grout holes	4	3.06 (CGI251) to 20.10 (CGI253)	39.96
	Back garden	Vertical compaction grout holes	9	0.77 (CVG398) to 43.44 (CGV401)	106.22

**Notes:**  
The above extract is based on data from BAM Ritchies' Sectional Validation Report for Nos. 28, 29 & 30 East Green. (BAM Ritchies, 2015). The factual report should be referenced for further details of treatment works including the volumes of grout injected and injection pressures per grout hole.

Property	Location	Type of Hole	Number of Holes	Range of Grout volumes <sup>1</sup> (m <sup>3</sup> )	Total Grout volume <sup>1</sup> (m <sup>3</sup> )
<b>No. 30 Highbarns</b> (Total Grout Holes = 30, Total Grout Volume = 742.40m <sup>3</sup> )	Beneath the property	Inclined compaction grout holes	6	5.6 (CGI660) to 69.71 (CGI629)	189.91
	Rear garden	Vertical compaction grout holes	22	1.93 (CGV385) to 124.06 (CGV659)	529.38
Notes:					
The above extract is based on data from BAM Ritchies' Sectional Validation Report for Nos 30 and 32 Highbarns (BAM, 2015). The factual report should be referenced for further details of treatment works including the volumes of grout injected and injection pressures per grout hole.					