TECHAPPR

# THE DIAMOND WOOD PARTNERSHIP

CONSULTING ENGINEERS

## STRUCTURAL SURVEY

**69 Newbold Road**
**Barlestone**
**NUNEATON**

***for***

**Mr P Holden**

**Prepared by:**


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# 1. INTRODUCTION

1.1 Instructions were received from Mr P Holden to carry out a structural survey of: **69 Newbold Road, Barlestone, Nuneaton.**

1.2 Our brief was to inspect and report upon the condition of the structure. We were to advise on the nature of any structural defects which might be found. We were also to advise on any works which might be required in order to secure both the stability and the serviceable life of the structure.

## 2. SCOPE OF SURVEY

2.1 Our survey comprised a visual inspection of the superstructure. We have not inspected woodwork or other parts of the structure which are covered, unexposed or inaccessible and we are therefore unable to report that any such parts of the property are free from defect.

2.2 In addition to our inspection of the superstructure, we also commissioned a CCTV Survey of the drains which serve the property.

## 3. DESCRIPTION OF PROPERTY

3.1 **69 Newbold Road** is a detached two-storey Victorian period dwelling which clearly once comprised a pair of semi-detached cottages which are now interlinked at ground floor level but are still independent at first floor level; the upper floors are accessed via the separate stairs which once served each of the semi-detached cottages.

There are two extended two-storey rear wings, one to each of the former cottages.

3.2 The main roof is pitched and is clad with slate. The roofs to the two rear wing extensions are flat and are assumed to be clad with felt. The external walls of the main building are of solid brickwork construction and the front and gable walls have a cement render finish. The external walls of the rear wings are also of solid brickwork construction but have no render finish.

The upper floors are of timber construction and the ground floors are of solid ground bearing construction.

# 4. SURVEY FINDINGS AND DISCUSSION

4.1 The pitched roof profiles, as viewed from the ground, have variable undulations. Access to the roof space was restricted and we were unable to closely inspect any of the supporting rafters or purlins. Some of the movement which has given rise to the uneven roof profiles can probably be attributed to historic warping of the supporting timbers but, we also found evidence to indicate that spreading of the front rafters had occurred at wall plate level. That movement at the foot of the rafters was evidenced by high level internal cracking in one gable wall, and by horizontal cracking on the internal wall face at wall plate level.

Provision should now be made to strip and re-slate the roof and to add supplementary timbers to strengthen the existing supports. We also recommend that improved access hatches be formed in the first floor ceilings for future maintenance purposes.

4.2 The cast iron rainwater gutters and downpipes are in poor condition and they should be replaced.

4.3 We did not inspect either of the flat roofs but can report that there was no evidence of leaking through them. It should however be noted that flat roofs do have a limited serviceable life expectancy and provision should be allowed for periodic maintenance of the roof on, say, a 10 – 12 year cycle.

4.4 The render finish to the front and gable walls is in a very poor condition. The render is cracked and in large areas have separated from the underlying masonry. All of the render will have to be hacked off and replaced.

4.5 None of the window and external door openings in either the rear main wall or in the walls of the two extended wings have been constructed with the benefit of lintels. These openings rely upon the timber window and door frames to lend support to the overhead brickwork. Most of those frames are now rotten and will have to be replaced and proprietary steel or concrete lintels will also have to be introduced above the openings.

The openings in the front and gable walls are formed under self supporting arched brickwork and will not require additional lintels. Given the condition of the joinery in the rear windows and doors, it would be prudent to also allow for replacing the frames in those front and gable openings.

4.6 We found evidence that one of the rear wings had settled and rotated on its foundations. That movement was evident in diagonal cracking at first floor level where the outer flank wall of the extension joins the gable of the main house. We did not inspect the foundations of the rear wing. The later drain survey found a defective drain which might have caused or contributed to the movement. Further investigations to identify what did cause the movement will be required. In the worst case the foundations to both rear extensions may have to be underpinned.

4.7 The front wall of the main house has been provided with an injected damp proof course. We could find no damp proof course in any of the other external walls. We recommend that all of the external and internal ground floor walls be treated to provide suitable barriers against rising damp. Further advise on appropriate treatment should be sought from a specialist contractor.

4.8 We found no significant structural defects in the ground floor accommodation. We have described elsewhere, **4.1** and **4.6,** of various cracks which were found at first floor level. In addition to these cracks, we also noted that some internal lintels over door openings had deflected. These lintels are most probably of timber construction and provision should be allowed to replace all internal lintels with proprietary steel or concrete sections.

4.9 Given the age of the property, advice should be sought from a specialist contractor on the condition of all construction timbers which are built into the solid brickwork externals walls.

4.10 As noted previously, the property comprises two former cottages, each having extending rear wings. The floor levels between the rear wings and the cottages and between the cottages themselves vary. These variations in level are presently accommodated by shallow steps up into the two rear extensions, and by a ramp where the two cottages have been interlinked by the partial removal of the ground floor party wall. If the former cottages are to be fully interlinked at each level, substantial rebuilding of the ground and first floors will be required.

4.11 A copy of Servo-Rod's report on the CCTV survey of the drains is attached in the Appendix. Given the very poor state of repair of some drains, we recommend that all existing drains be abandoned and that new drains be constructed preferably using runs which do not pass under the footprint of the building.

## 5. SUMMARY OF SURVEY FINDINGS AND RECOMMENDATIONS

5.1 We found the building to be in a variable and sometimes poor structural condition. The following works will be required in order to secure the stability and long term serviceable life of the property:

i) Re-slate the main roof and allow for providing supplementary or new rafters and purlins.

ii) Subject to inspection, allow for some works to the coverings of the flat roofs to the rear wings.

iii) Replace all rainwater goods.

iv) Take off and replace all render finishes to the front and gable walls.

v) Replace all window and external door frames. Install proprietary lintels over the external openings in all rear walls and over all internal doors.

vi) Provide injected damp proof courses to all external and all internal walls.

vii) Obtain a condition report for all timbers which are supported or built into the solid brickwork external walls and implement any remedial measures identified in that report.

viii) Make provision for reconstructing both the first floor and ground floors to provide level access throughout the building.

ix) Subject to further investigations, allow for underpinning the foundations of the extended rear wings.

x) Construct new storm and foul drains to serve the property and seal off the existing defective and collapsed drains.



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**THE DIAMOND WOOD PARTNERSHIP**

## APPENDIX

- Servo-Rod CCTV Survey Report

# DEFINITIONS

The following definitions are given to clarify sewer classifications

## STRUCTURAL CONDITION

| | |
|---|---|
| **CRACKED** | Crack lines visible on the pipe wall, pieces all still in place. |
| **FRACTURED** | Cracks visibly open on the pipe wall, pieces all still in place. |
| **BROKEN** | Pipes cracked with pieces of pipe visibly displaced, some pieces could be missing. |

*CRACKED, FRACTURED and BROKEN can all be further described as:*

| | |
|---|---|
| **LONGITUDINAL** | Defect runs approximately along the axis of the pipe/sewer. |
| **CIRCUMFERENTIAL** | Defect runs approximately at right angles to the axis of the pipe/sewer. |
| **MULTIPLE** | Combination of both longitudinal and circumferential defects. |

| | |
|---|---|
| **DEFORMED** | Original cross-section of pipe/sewer altered, pipe possibly broken. |
| **COLLAPSED** | Complete loss of structural integrity. Most of cross-sectional area lost. |
| **DISPLACED JOINT** | Adjacent pipes are not concentric. Classified as; medium and large |
| **OPEN JOINT** | Adjacent pipes are not butted together. Classified as; medium and large |

## CONSTRUCTION FEATURES - PIPE/SEWERS

| | |
|---|---|
| **JUNCTION** | A purpose made or preformed junction built in to the pipe/sewer during construction. |
| **CONNECTION** | A lateral pipe which has been added to the pipe/sewer. Includes saddle connections. |
| **MANHOLE** | May be direct or side entry . May be 'buried', i.e. covered over at some time since construction. |
| **DEFECTIVE JUNCTION** | The junction or the adjacent sewer have been damaged during or after construction or the the connection is incorrectly positioned or of poor workmanship. |
| **DEFECTIVE CONNECTION** | The connection intrudes into the pipe/sewer. |

## SERVICE CONDITION

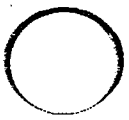
| | |
|---|---|
| **ROOTS** | The ingress of roots through defects and joints in the pipe/sewer or manhole. Described as; fine, mass or tap roots - depending on severity. 'Tap' meaning an individual root over 10mm thick. Mass meaning the roots have formed a congealed density of root. |
| **INFILTRATION** | The ingress of groundwater into the sewer/pipe through defects, joints and manholes. Described as; Seeper, dripper, runner or gusher - depending on severity. |
| **ENCRUSTATION** | Deposits left by partial evaporation of infiltrated ground water containing mineral salts. Classified into; light medium or heavy by percentage loss of diameter. |
| **SCALE** | Hard deposits which cannot be identified as encrustation, e.g. deposits resulting from corrosion of iron pipes or hardened grout. |
| **DEBRIS** | Grease organic or silty materials deposited in a pipe/sewer, which cause flow turbulence and a reduction in hydraulic efficiency. E.g. road grit, rubble, fatty deposits, soil etc |
| **OBSTRUCTION** | Solid material in a sewer which impedes the inspection and/or causes a reduction in hydraulic efficiency. E.g. bricks, rods or displaced sealing rings. |
| **WATER LEVEL** | The level of water at the observed point in the pipe/sewer. |
| **LINE** | A visible change in the direction of the pipe/sewer. May be; left right up or down. |

**CLOCK REFERENCES** Given in a clockwise direction, irrelevant of the position of the camera.


3 to 9 o'clock


9 to 3 o'clock


11 to 1 o'clock


8 to 4 o'clock


3 to 10 o'clock

| | | | |
|---|---|---|---|
| Survey From: | F1, BRANCH A | Survey To: | RWP |
| Direction: | UPSTREAM | Type: | COMBINED WATER |
| Pipe Size: | 100MM | Pipe Material: | SALT GLAZED CLAY |
| Depth: | 0.28M | Mh Mat/Cond: | BRICK/GOOD |

| Metres | Report | Defect Grade |
|---|---|---|
| 0.0 | START OF SURVEY | 1 |
| | WATER LEVEL - 0% - from here to end | 1 |
| 0.5 | LINE BENDS - up | 1 |
| | RWP REACHED | 1 |
| | END OF SURVEY | 1 |

**NOTES**

This run appears to be in adequate structural condition.

| | | | |
|---|---|---|---|
| Survey From: | F1 | Survey To: | SVP |
| Direction: | UPSTREAM | Type: | COMBINED WATER |
| Pipe Size: | 100MM | Pipe Material: | VITRIFIED CLAY |
| Depth: | 0.28M | | |

| Metres | Report | Defect Grade |
|---|---|---|
| 0.0 | START OF SURVEY | 1 |
| | WATER LEVEL - 0% - from here to end | 1 |
| | *DEBRIS/SILT* - 20% loss of diameter | 2 |
| 0.7 | LINE BENDS - up | 1 |
| 1.0 | SVP REACHED | 1 |
| | END OF SURVEY | 1 |

**NOTES**

This run has had a half pipe laid on top of the channel, probably to make the chamber smaller. Otherwise this run appears to be in adequate structural condition.

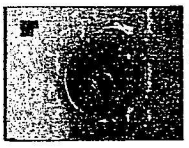
| | | | |
|---|---|---|---|
| Survey From: | F1, BRANCH B | Survey To: | |
| Direction: | UPSTREAM | Type: | COMBINED WATER |
| Pipe Size: | 100MM | Pipe Material: | SALT GLAZED CLAY |
| Depth: | 0.28M | | |

| Metres | Report | Defect Grade |
|---|---|---|
| 0.0 | START OF SURVEY | 1 |
| | WATER LEVEL - 0% - from here to end | 1 |
| | *DEBRIS/SILT* - 10% loss of diameter | 2 |
| 0.1 | ***CIRCUMFERENTIAL CRACK*** - from to o'clock - in pipe section  | 3 |
| 2.1 | LINE BENDS - left | 1 |
| 2.6 | GULLY REACHED | 1 |
| | END OF SURVEY | 1 |

**NOTES**

This run has a cracked pipe but otherwise this run appears to be in adequate structural condition.

| | | | |
|---|---|---|---|
| Survey From: | F1, BRANCH C | Survey To: | |
| Direction: | UPSTREAM | Type: | COMBINED WATER |
| Pipe Size: | 100MM | Pipe Material: | SALT GLAZED CLAY |
| Depth: | 0.28M | | |

| Metres | Report | Defect Grade |
|---|---|---|
| 0.0 | START OF SURVEY | 1 |
| | WATER LEVEL - 0% - from here to end | 1 |
| 1.3 | ***CIRCUMFERENTIAL FRACTURE*** - from 12 to 12 o'clock - in pipe section  | 3 |
| | *DEBRIS/SILT* - 30% loss of diameter | 2 |
| | *MEDIUM SCALE* - from 12 to 12 o'clock - 15% loss of diameter - grout from joint | 2 |
| | SURVEY ABANDONED - due to access | 2 |

**NOTES**

The survey of this run was abandoned because of access, the silt and grout protruding from the joint prevented further access.
The section surveyed has a fractured pipe.

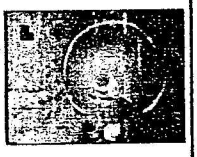
| | | | |
|---|---|---|---|
| Survey From: | F1, BRANCH D | Survey To: | |
| Direction: | UPSTREAM | Type: | COMBINED WATER |
| Pipe Size: | 100MM | Pipe Material: | PVC |
| Depth: | 0.28M | | |

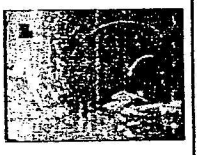
| Metres | Report | Defect Grade |
|---|---|---|
| 0.0 | START OF SURVEY | 1 |
| | WATER LEVEL - 0% - from here to end | 1 |
| | *DEBRIS/SILT* - 10% loss of diameter | 2 |
| 0.5 | LINE BENDS - right | 1 |
| 0.7 | GULLY REACHED | 1 |
| | END OF SURVEY | 1 |

**NOTES**
This run appears to be in good structural condition.

| | | | |
|---|---|---|---|
| Survey From: | F1 | Survey To: | F3 |
| Direction: | DOWNSTREAM | Type: | COMBINED WATER |
| Pipe Size: | 100MM | Pipe Material: | SALT GLAZED CLAY |
| Depth: | 0.28M | | |

| Metres | Report | Defect Grade |
|---|---|---|
| 0.0 | START OF SURVEY | 1 |
| | WATER LEVEL - 10% - from here to end | 1 |
| 0.5 | LINE DEVIATES - left | 1 |
| 3.5 | ***CIRCUMFERENTIAL CRACK*** - from 9 to 3 o'clock - at joint | 3 |
| 4.3 | CHAMBER F2 REACHED | 1 |
| 4.9 | EXIT CHAMBER F2 | 1 |
| | ***CIRCUMFERENTIAL CRACK*** - from 12 to 12 o'clock - in bend section | 2 |
| | LINE DEVIATES - right | 1 |
| 6.4 | ***CIRCUMFERENTIAL CRACK*** - from 12 to 12 o'clock - in pipe section - fine | 3 |
| 7.0 | CHAMBER F3 REACHED | 1 |
| | END OF SURVEY | 1 |





**NOTES**
This run has three cracks.

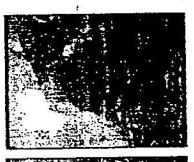
| | | | |
|---|---|---|---|
| Survey From: | F2, BRANCH A | Survey To: | |
| Direction: | UPSTREAM | Type: | COMBINED WATER |
| Pipe Size: | 100MM | Pipe Material: | SALT GLAZED CLAY |
| Depth: | 0.35M | Mh Mat/Cond: | BRICK/GOOD |

| Metres | Report | Defect Grade |
|---|---|---|
| 0.0 | START OF SURVEY | 1 |
| | WATER LEVEL - 0% - from here to end | 1 |
| 0.5 | LINE BENDS - up | 1 |
| 1.0 | SVP REACHED | 1 |
| | END OF SURVEY | 1 |

**NOTES**
This run appears to be in adequate structural condition.

| | | | |
|---|---|---|---|
| Survey From: | F3 | Survey To: | |
| Direction: | UPSTREAM | Type: | COMBINED WATER |
| Pipe Size: | 100MM | Pipe Material: | SALT GLAZED CLAY |
| Depth: | 0.45M | Mh Mat/Cond: | BRICK/GOOD |

| Metres | Report | Defect Grade |
|---|---|---|
| 0.0 | START OF SURVEY | 1 |
| | WATER LEVEL - 0% - from here to end | 1 |
| 0.2 | LINE DEVIATES - left | 1 |
| 1.8 | *DEBRIS* - 20% loss of diameter - pushed forward by camera | 2 |
| 2.5 | JUNCTION 100MM at 9 o'clock | 1 |
| | *DEBRIS/SILT* - 15% loss of diameter | 2 |
| 3.3 | ***BROKEN PIPE*** - from 9 to 12 o'clock - HOLE | 4 |
| | ***CIRCUMFERENTIAL FRACTURE*** - from 12 to 9 o'clock - in pipe section | 3 |
| 4.3 | ***JOINT DISPLACED*** - LARGE - with flow | 3 |
| | ***BROKEN PIPE*** - from 11 to 12 o'clock - HOLE | 4 |
| 4.6 | SURVEY ABANDONED - due to access | 1 |





**NOTES**

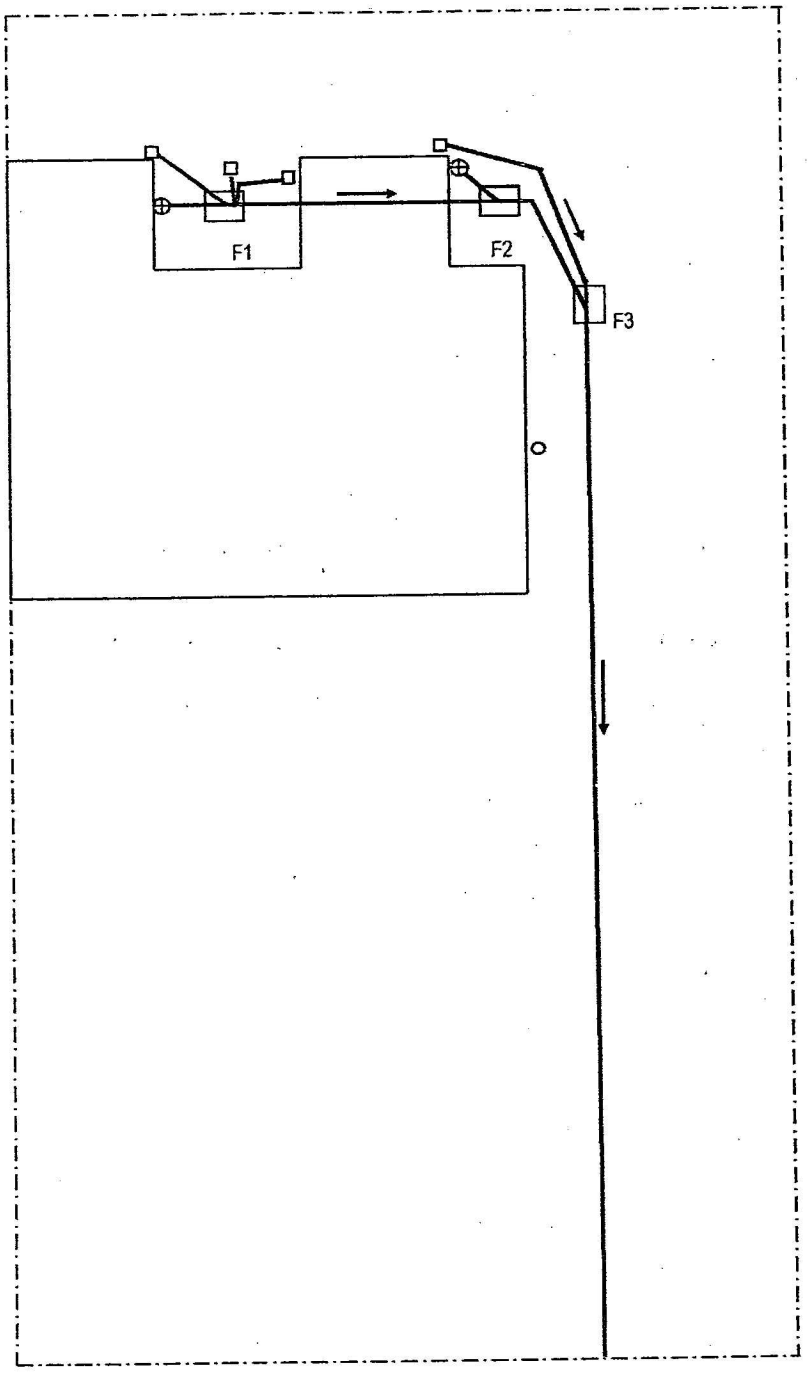
The survey of this run was abandoned at a large displaced joint which prevented further access.
The section surveyed has two broken sections, both with holes in the pipe wall.

| | | | |
|---|---|---|---|
| Survey From: | F3 | Survey To: | |
| Direction: | DOWNSTREAM | Type: | COMBINED WATER |
| Pipe Size: | 100MM | Pipe Material: | SALT GLAZED CLAY |
| Depth: | 0.45M | | |

| Metres | Report | Defect Grade |
|---|---|---|
| 0.0 | START OF SURVEY | 1 |
| | WATER LEVEL - 0% - from here to end | 1 |
| 1.2 | WATER LEVEL - % - from here to end | 1 |
| 2.1 | *DEBRIS/SILT* - 15% loss of diameter - pushed forward by camera | 2 |
| | GENERAL REMARK - vision obscured by silt | 2 |
| 13.0 | WATER LEVEL - 30% - from here to end | 2 |
| 13.7 | ***ROOTS - MASS*** - from to o'clock - at joint | 3 |
| 14.5 | SURVEY ABANDONED - due to access | 1 |
| | GENERAL REMARK - Recording continues while withdrawing the camera | 1 |
| 12.1 | ***ROOTS - MASS*** - from to o'clock - at joint | 3 |
| 0.0 | CHAMBER F1 REACHED | 1 |
| | END OF SURVEY | 1 |

<u>NOTES</u>
The survey of this run was abandoned at a large root mass, these roots have caused silt etc to build up which ultimately obscured vision. There are at least two joints with large root ingress.

KEY - INTERCEPTOR ⋈ SVP RWP WC ROAD GULLY WASTE L. A. SEWER GULLY BOUNDARY F W S W




| | |
|---|---|
| TITLE | DRAINAGE PLAN |
| SCALE | NOT TO SCALE |
| SITE | 69 NEWBOLD ROAD<br>BARLESTONE<br>LEICS |
| DATE | 19. NOVEMBER 2010 |

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