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WATERCOURSE ASSESSMENT



Client:	**Mr N Rylance**
Site Address:	**53 Far Bank** **Shelley** **HD8 8HS**
Project Number:	**16126**
Report Reference (Revision):	**REP02 (A)**
Date:	**November 2017**

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Revision	Date	Author	Checked by;	Comments
A	09/11/16	Kieran Breheney	Andrew Walker	

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1.0 Introduction

1.1 This report provides an assessment of the onsite watercourse located on the land of 53 Far Bank, Shelley, HD8 8HS. This report has been produced to determine the suitability of a surface water connection for the proposed residential development in response to a request by Kirklees District Council to support the planning application for the development.

1.2 The watercourse assessment was undertaken on Wednesday the 08th November 2017. The weather at the time of the inspection was wet after heavy rain the previous night.

2.0 References & Standards

2.1 This Watercourse Assessment has been carried out generally in accordance with:

- Environment Agency's - Fluvial Design Guide - 7.4.2 'Equations for open-channel flow'

3.0 The Site

3.1 The site is currently undeveloped, mostly open greenfield with a small single storey garage building to the west which will be demolished. The site is located off Far Bank in Shelley. The approximate grid reference of the site is SE202110.

3.2 It is proposed that the site will be developed with a single two storey residential plot, hardstanding and double garage. The remaining site will be landscaped.

3.3 The site is bounded by residential properties to the north, west and south and agricultural fields to the east. The topography of the site shows that the area falls from northwest to southeast by 8.0m over 63m (1 in 8 gradient).

3.4 The undisclosed watercourse runs along the east boundary of the site. The watercourse flows in a southerly direction.

3.5 An inspection of the watercourse took place by walking over the length of the watercourse, starting at the North-East corner of the site then recording at 5m intervals the width and depth. From the information recorded it was then possible to carry out a manning's equation calculation to determine the capacity of the receiving watercourse. For reference to the watercourse in context, refer to appendix B.

4.0 Watercourse Information

4.1 The catchment for the watercourse is the adjacent farmer's field and the gardens to the north. The water percolates through the permeable ground and resurfaces when the clay outcrops in the watercourse.

4.2 The depth of the watercourse to determine capacity was taken from bank to bank at the midpoint.

4.3 The Width of the watercourse was taken from top of bank.

Chainage	Watercourse Dimensions		Water	Notes
	Depth (m)	Width (m)		
0	0.3	0.9	No visible water, muddy ground	3m 1in2 bank, overgrown, long reeds/grass.
5	0.3	1.0	Visible water 20mm	Overgrown, consistent visible bank and water.
10	0.4	0.5	Visible water 10mm	
15	0.5	2.0	Visible water, very muddy	Potential Existing Outfall
20	0.4	1.2	No visible water, muddy ground	
23	0.4	1.3	No Visible Groundwater, mulchy soil	Proposed Outfall
25	0.4	1.3	Waterbed is dry	
30	0.2	1.3	Waterbed is dry	Watercourse has permeated underground

Drawing 16126-SK-01(A) contained in Appendix A shows the location of each Chainage.

4.4 It is assumed that the watercourse continues in a southerly direction until it following the path of the valley and it is apparent that the watercourse doesn't resurface. It is reasonable to assume the watercourse joins the Shepley Dike that is located approx. 310m to the southwest of the site.

5.0 Capacity Assessment

5.1 The Capacity Assessment has been based on Manning's equation to define the mean channel velocity.

$$V = (1/n)R^{2/3}S^{1/2}$$

V = Velocity (m/s)
R = Hydraulic Radius (m) (Area/Perimeter)
S = Slope (m/m)
n = Manning coefficient of roughness (very weedy reaches = 0.075)

5.2 The Capacity Assessment has used Manning's equation to define the maximum and existing velocity of the channel then by reducing the maximum by the existing we can determine that the channel has sufficient capacity to support the additional inflow from the proposed development.

5.3 The results show that the outfall has a maximum Cannel Capacity of 1.320m³/s.

5.4 At the time of the assessment the weather was wet from the heavy rain on the previous night an existing channel utilisation of 0.184m³/s.

5.5 At the proposed point of connection the existing watercourse has the capacity for and additional 1136l/s. Therefore it is reasonable to assume that the watercourse will be able to cope with the additional flow of 3l/s as requested by the Lead Local Flood Authority.

5.6 The capacity calculations are contained in Appendix B.

6.0 Conclusion

6.1 This report provides an assessment of the onsite watercourse located at 53 Far Bank, Shelley, HD8 8HS.

6.2 The existing watercourse capacity has been assessed using Manning's Equation the proposed watercourse has a maximum capacity of 1.320m³/s and the existing channel utilises 0.184m³/s.

6.3 The existing watercourse has the capacity for an additional 1136l/s. Therefore, the watercourse will be able to cope with the additional flow of 3l/s as requested by the Lead Local Flood Authority.

7.0 Appendices

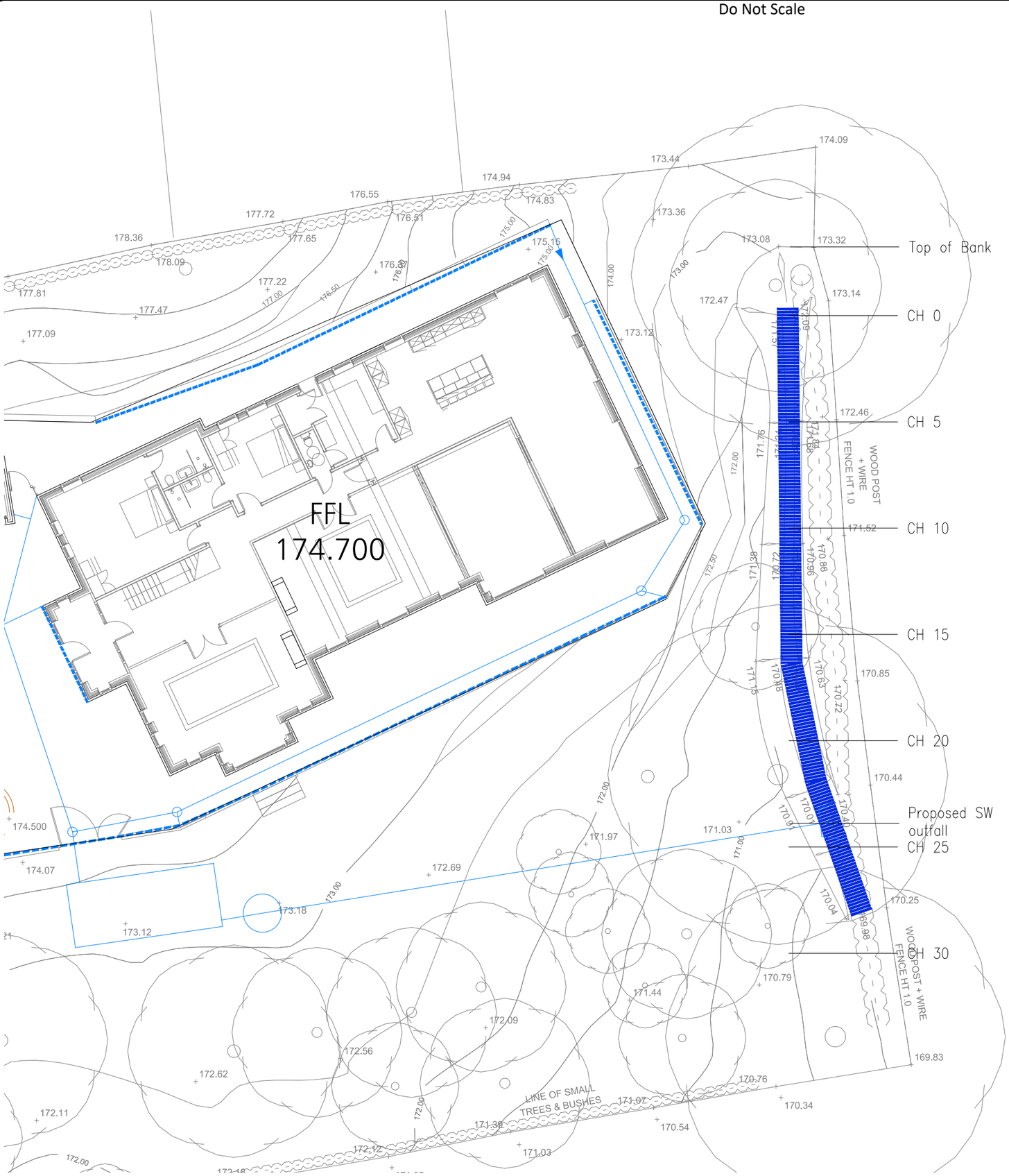
Appendix A: Watercourse Chainage Plan

Appendix B: Photos and Notes

Appendix C: Capacity Calculations

Appendix A: Watercourse Chainage Plan

Do Not Scale



N

DESIGNERS HAZARD IDENTIFICATION

IT IS ASSUMED THAT ALL WORKS WILL BE UNDERTAKEN BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT, IN ADDITION TO THE HAZARDS TYPICALLY ASSOCIATED WITH THE TYPES OF CONSTRUCTION DETAILED ON THIS DRAWING, ANY KNOWN ABNORMAL HAZARDS SPECIFIC TO THIS DRAWING HAVE BEEN IDENTIFIED.

ABNORMAL HAZARD REFERENCE

Notes

1. THIS DRAWING IS BASED ON KPP ARCHITECTS PLANNING LAYOUT DRG: 2042 2050 P2 AND ELLAM LAND SURVEYS LTD TOPOGRAPHICAL SURVEY DRAWING NO. 7270/1.

Date	Revision	By	Chkd	Ref
14.06.17	PRELIMINARY ISSUE	KB	AW	P1

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A1 v.1.1

Project
53 FAR BANK,
SHELLY,
HUDDERSFIELD HD8 8HS

Title
EXISTING WATERCOURSE CHANAINAGE PLAN

Scale	1:200	Drawn	KLB	Checked	AMW
Date	JUNE'17	Status	PRELIMINARY		
Drg. No.	16126/SK/01			Rev.	A


SITE
Assumed Underground Watercourse Route.
Shepley Dike
© 2017 DigitalGlobe ©CNES (2017) Distribution Airbus DS © 2017 Microsoft Corporation
bing

Appendix B: Photos and Notes

- **CH0**

This area was highly overgrown with long grass but when cleared out water is visible.











- **CH5**

Overgrown with an inconsistent bank. Visible water to a depth of 20mm.









- **CH10**

Overgrown with a consistent bank, lots of long reeds/grass. When cleared there was visible water to a depth of 10mm.








04
03
02
01

- **CH15**

Chainage 15 is less overgrown with a clear bank, the watercourse is still overgrown but the width from bank to bank is 2m. In addition there is an existing potential outfall that constrained a crushed plastic pipe with two smaller pipes inside.


15
5
15
10






E-U
E-U
1933





- **CH20**

Chainage 20 is overgrown but with less reeds and more ivy and other weeds.


5
20
5
20






0·6
0·5
0·4
0·3

- **CH25**

Chainage 25 the watercourse is not overgrown just 1.3m wide ditch, the waterbed was dry.


5
25
5









- **CH30**

Chainage 30 the waterbed is dry and it is assumed that the existing watercourse has permeated underground following the impermeable clay strata.


38







Outfall/downstream

Walking south from site it is evident that the valley follows the path of the watercourse and it is apparent that the watercourse doesn't resurface. It is reasonable to assume the watercourse joins the Shepley Dike that is located approx. 310m to the southwest of the site.









Appendix B: Capacity Calculations

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PROJECT

53 Far Bank

PROJECT No. 16126
SHEET No. 1 of 2
BY Kieran Breheney
DATE 09.11.2017

Watercourse Capacity Assessment

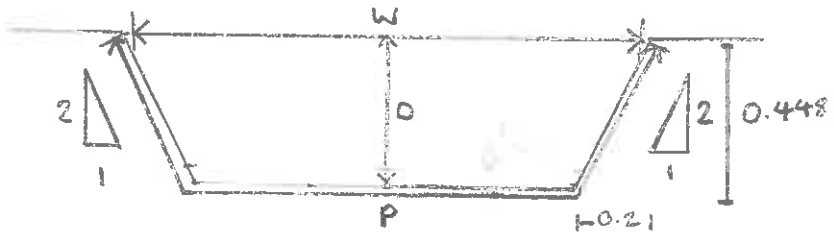
using Mannings steady uniform flow equation:

$$V = \left(\frac{1}{n}\right) \times R^{2/3} \times S^{1/2}$$

V = Velocity (m/s)
R = Hydraulic Radius (m) (AREA/PERIM)
S = Slope (m/m)
n = Mannings Coefficient of roughness = 0.075 (Very Weedy reaches)
A = Area of Water
P = Wetted Perimeter

Section A-A (Proposed Outfall location)

Max Channel Capacity



Width W = 1.3m
Depth D = 0.4m
P = 1.8m
A = 0.45m²
S = 1in16 (0.0625)

$R = A/P$

$R = 0.45/1.8$

$R = 0.25m$

$$Q_{max} = \left(\frac{1}{0.075}\right) \times 0.25^{2/3} \times 0.0625^{1/2}$$

$Q_{max} = 1.32\ m^3/s = \underline{1320\ l/s}$

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PROJECT
53, Far Bank

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SHEET No. 2 of 2
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Actual Channel Capacity

W = 1.3m
D = 0.01m
P = 1.0m
A = 0.013m²
S = 1in 16 (0.0625)

$R = A/P$

$R = 0.013$

$$Q_{(actual)} = \left(\frac{1}{0.075}\right) \times 0.013^{2/3} \times 0.0625^{1/2}$$

$$Q_{(actual)} = 0.184\ m^3/s = 184\ l/s$$

Conclusion

The Mannings Calculation surguests that there is enough Capacity in the Watercourse to drain the additional flow from the proposed development

$V = Q_{max} - Q_{min}$

$V = 1320 - 184\ l/s$

$V = \underline{1136}\ l/s$