



STRUCTURAL CALCULATIONS
For

PROPOSED RESIDENTIAL DEVELOPMENT

REAR OFF 12 MARKET PLACE
DONINGTON

DRAINAGE STRATEGY

FRAMEWORK

REVISION A

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PROJECT No: 6550

DATE : 11 SEP 2020



Prepared : RW

Checked :

Approved :

Reference:

Job ref : 6550

Sheet : 2 –

Rev No: A

Date : 11 Sep 2020

INTRODUCTION

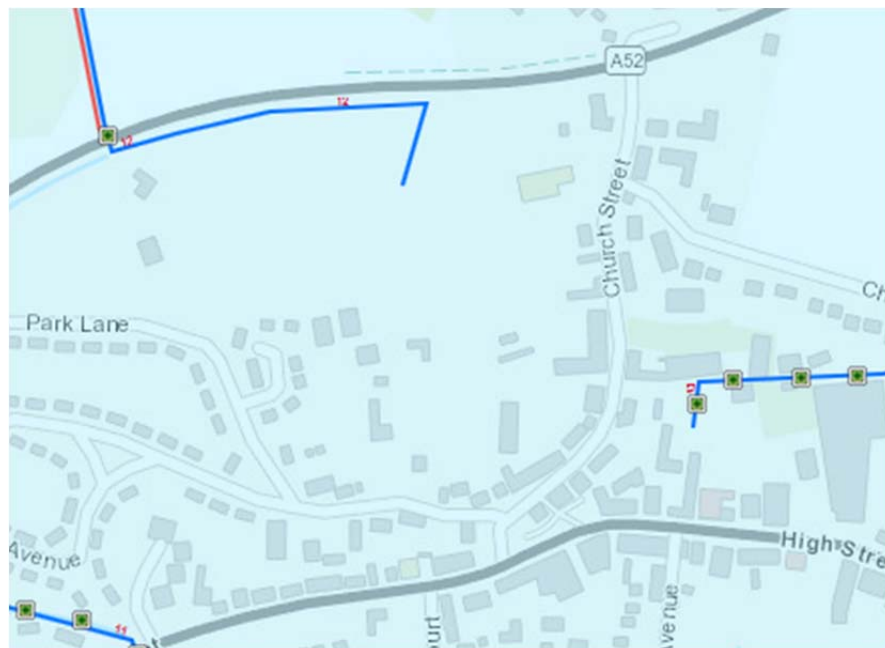
The project involves the residential development on a green field site to rear of 12 Market Place in Donington. The total site area is approximately 5730m² (0.57ha) of which approximately 4830m² is greenfield, 820m² is impermeable hardstanding and outbuildings without positive drainage and the remaining 80m² comprises a single dwelling with a combined foul and surface water drainage connection into the existing Anglian Water sewer in the Market Place. A pre-application for the connection into the Anglian Water sewer has been completed and it is anticipated that a response for the application will perhaps be received at the start of October 2020.

The Environment Agency map record indicates the following information for the site:

- It is located in Flood Zone 1 area, therefore low probability of flooding from rivers and sea
- It is in an area of very low risk of surface water flooding
- It lies over an Unproductive Strata (bedrock). These are geological strata with low permeability that have negligible significance for water supply or river base flow.
- It lies over Unproductive Strata (superficial drift). These are geological strata with low permeability that have negligible significance for water supply or river base flow.

At this point, there is no site investigation available, but the British Geological Survey (BGS) map indicates that the bedrock formation is of Oxford Clay formation (mudstone) with Tidal Flat superficial deposits (clay and silt) over. Local experience would suggest a very low infiltration rate below 1.00×10^{-7} m/s and probable high groundwater levels. Subject to confirmation by ground investigation, it is unlikely that infiltration will be a suitable method of surface water disposal.

The nearest IDB drain indicated on the Black Sluice Internal Drainage Board district map is Drain No.12 of Catchment 2 – the branch south from Wykes Drain to Donington Church, which terminates half way across the field to the rear of the site:



Prepared : **RW**

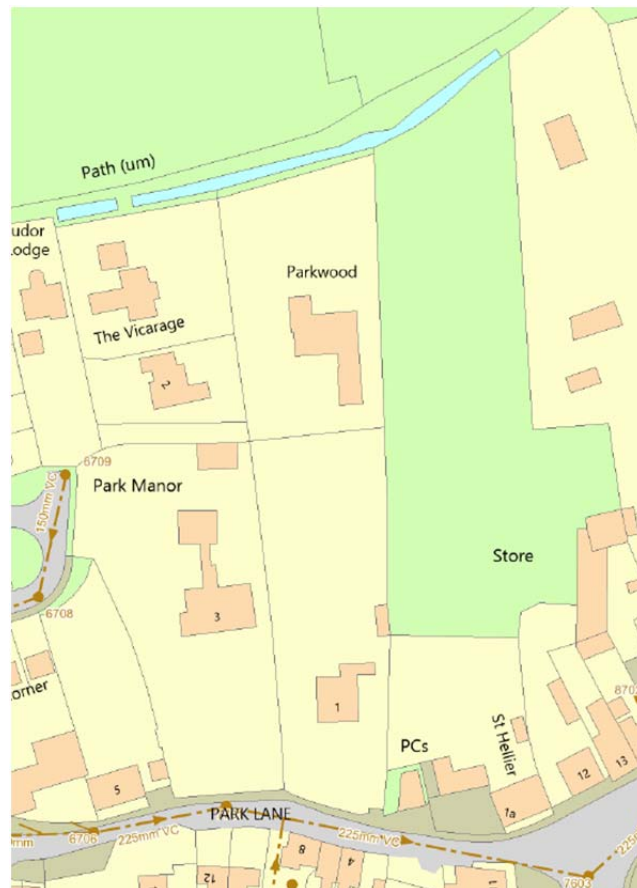
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The site topography falls to an unnamed body of water indicated on the north boundary (refer below) of the site and shown on the Ordnance Survey. The site has been confirmed to lie within the catchment of the Black Sluice IDB and currently attracts a drainage charge, so it must be assumed that this body of water connects into the IDB drain in some manner, to be further investigated.



The existing run-off area into the stream is assumed to be approximately 2425m² (refer sheet 2 and 3) and it is proposed to limit the surface water discharge to a practical minimum of 5 litres/sec using flow control device and attenuation designed to retain for:

- 1:10 yr. event
- No surface flooding will occur in the 1:30 yr. event + 30% Climate Change Allowance
- No off-site flooding will occur in the 1:100 yr. event + 30% Climate Change Allowance

The following calculations are prepared in accordance with the appropriate British Standards as listed below. All dimensions used in the calculations are taken from the Architect's drawings and must be confirmed on site before ordering materials or the like. No changes or modifications must be made to the calculations without prior and written permission from York Sills Ltd. Any such action will invalidate the designs.

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BRITISH STANDARDS AND OTHER REFERENCES

- a) Building Regulation 2010 – Approved Document H – Drainage and Waste Disposal
- b) Anglian Water's Wastewater Plan – Reference – 437371-1
- c) Proprietary manufacturer's technical literature.

ATTENUATION DESIGN

Assumed areas as follows (refer sketch on sheet 4):

- 6 No. dwellings and garages = 1005 m²
- Road, footpath and driveway = 1420 m²

2731 / P02 rev C

ROAD + FOOTPATH: 1420 m²
(INC. DRIVEWAY)

DWELLINGS + GARAGE: 1005 m²

INDICATIVE LAYOUT FOR upto
6no RESIDENTIAL DWELLINGS

Site Block Plan

1 : 500

SHEET: 04
JOB REF: 6550



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Attenuation Design: 1:10 yr event

Site Specific Properties:

Impermeable Area: = 2425 m²
 Additional in-line Storage available = 0 m³
 Country = England or Scotland

Design Storm Properties:

Specified Return Period = 10 years
 Specified Duration = ALL mins
 M5-60 Rainfall = 20 mm
 Rainfall Ratio = 0.40
 Total M10-60 Rainfall = 19.9 mm

Design Parameters:

Inflow Routing Coefficient = 1
 Run-off Coefficient = 0.83
 Constant Outflow Rate = 5.0 l/s

Stormwater Storage Design:

Critical Storm Duration = 60 mins
 Total Inflow = 48.3 m³
 Total Outflow = 18 m³
 Volume of Storage Required = 30.3 cu.m

Storage Configuration = 7.5m long x 7.5m wide x 0.8m deep

Storage Volume Provided = 45 + 0 = 45 m³ PASS
 Time taken to half empty = 0 hrs and 50 mins PASS

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Attenuation Design: 1:30 yr event + 30% CCA

Site Specific Properties:

Impermeable Area: = 2425 m²
 Additional in-line Storage available = 0 m³
 Country = England or Scotland

Design Storm Properties:

Specified Return Period = 30 years
 Specified Duration = ALL mins
 M5-60 Rainfall = 20 mm
 Rainfall Ratio = 0.40
 Total M30-60 Rainfall = 25.6 mm

Design Parameters:

Inflow Routing Coefficient = 1
 Run-off Coefficient = 0.83
 Constant Outflow Rate = 5.0 l/s

Stormwater Storage Design:

Critical Storm Duration = 60 mins
 Total Inflow = 62 m³ + 30% CCA = 81.84m³
 Total Outflow = 18 m³
 Volume of Storage Required = 63.84 cu.m
 Storage Configuration = 9m long x 9m wide x 0.8m deep
 Storage Volume Provided = 64.8 + 0 = 64.8 m³
 Time taken to half empty = 1 hrs and 13 mins

PASS

PASS

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Attenuation Design: 1:100 yr event + 30% CCA

Site Specific Properties:

Impermeable Area: = 2425 m2
 Additional in-line Storage available = 0 m3
 Country = England or Scotland

Design Storm Properties:

Specified Return Period = 100 years
 Specified Duration = 360 mins
 M5-60 Rainfall = 20 mm
 Rainfall Ratio = 0.40
 Total M100-360 Rainfall = 51.9 mm

Design Parameters:

Inflow Routing Coefficient = 1
 Run-off Coefficient = 0.83
 Constant Outflow Rate = 5.0 l/s

Stormwater Storage Design:

Critical Storm Duration = 360 mins
 Total Inflow = 125.8 m3 + 30% CCA = 163.54m3
 Total Outflow = 108 m3
 Volume of Storage Required = 55.54 cu.m

Storage Configuration = 9m long x 9m wide x 0.8m deep

Storage Volume Provided = 64.8 + 0 = 64.8 m3 PASS
 Time taken to half empty = 0 hrs and 29 mins PASS

- **Provide attenuation pond/storage to collect 65m³ of surface water**