



Parkhouse Farm, Harbottle, Morpeth, Northumberland, NE65 7BD
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BACKGROUND STATEMENT

**Land to East of Durhams Road
Wiles Farm, Dawsmere
Spalding, Lincolnshire**

**Proposed
Irrigation Reservoir**

Ref No. FP/007/BS October 2016

**Loveden Estates Ltd
Wiles Farm
Durhams Road
Dawsmere
Spalding
Lincolnshire
PE12 9NJ**

1. BACKGROUND

Wiles Farm extends to some 385 hectares, farming the normal South Lincolnshire crops including 65 hectares of potatoes and some brassicas and lettuces beside the normal arable crops.

In the light of recent concerns over availability of supply due to changes in weather patterns Loveden Estates wish to future proof their farming operations by constructing a winter storage reservoir at Wiles Farm.

2. RESERVOIR DESIGN CRITERIA

The reservoir has been designed with reference to the following:-

Small Embankment Reservoirs; Report 161; CIRIA (Construction Industry Research and Information Association)
Floods and Reservoir Safety: an Engineering Guide; The Institution of Civil Engineers. (*F&RS*)

Freeboard Height

Design Freeboard when full is 0.75m

Fetch	0.2 km	
Average Hourly annual max wind speed	18 - 20 m/s	<i>Fig 3 F&RS</i>
Once in Ten Yearly maximum wind speed	24 - 26 m/s	<i>Fig 4 F&RS</i>
Design Wind Speed assumed	25 m/s	

Using *Fig 9. F&FS* Relationship between effective fetch, wind speed and significant wave height by interpolation

Significant Wave Height 0.3 m

Design Wave Height

Using *Table 2 F & FS* Design Wave Heights

Dam Type	Earth Fill
Crest	Road
Downstream slope	Random grass
Design wave height factor	1.2
Design wave height	= 0.3 m x 1.2
	= 0.36 m
	= 0.4 m

Wave Run Up

Using *Fig 10 F&FS* Ratio of run-up height to design wave height

Dam Slope	1 : 3
Slope characteristic	Smooth
By interpolation Run-up Ratio	1.7

Minimum Freeboard Allowance	=	0.4 m x 1.7
	=	0.68 m
	=	0.7 m

3. ARCHAEOLOGY

There are no known evidences of archaeology on the site which has been intensively cultivated over the years.

Should on stripping the site any evidence be found then Lincolnshire County Councils Historic Environment Team will be advised.

4. PLANNING LEGALISATION

Lincolnshire County highways have confirmed the Durham Road is not a classified road and that therefore the proposed development can be dealt with under the Prior Notification Procedure for the following reasons:-

The reservoir is reasonable necessary for the purposes of agriculture
The development is being carried out on an area of land of greater than 5 ha
The area of the proposed operations exceeds 0.5 ha
No part of the development is within 25 metres of a metalled part of a trunk or classified road
No excavated material will be removed from the unit. (The spoil from the excavation will be used to construct the walls of the reservoir with any surplus top soil spread adjacent to the reservoir - see appendix i)

5. CONCLUSION

Prior Approval should be granted for the proposed reservoir which is reasonably necessary for agriculture and will enable Loveden Estates to store excess winter rainfall for irrigation during the summer months thereby helping to future proofing the business from the affects of climate change.

Simon Kenny B.Sc., I.Eng., M.I.Agr.E.
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Harbottle, Morpeth, Northumberland, NE65 7BD

PLANS

FP/007/125 Site Plan

FP/007/01 Plan and typical Section of reservoir

Appendix i

Volume Calculations based on Rectangular Reservoir with
Area of Bottom = 12,500 sq m

10m Gall Reservoir
 Client Loveden Estates Ltd
 Site Land East of Durham Road

04/10/2016

CALCULATION OF RESERVOIR QUANTITIES

10,158,720 Galls
 46,176 cu m

Volume above Ground Level

6,039,450 Galls
 27,452 cu m

Description

Qty Unit

Bottom Width of Reservoir	100.00	m
Bottom Lenght of Reservoir	125.00	m
Ratio of Side Slopes (Wet)	4.00	
Ratio of Side Slopes (Dry)	2.50	
Depth of Water	3.00	m
Freeboard	0.75	m
Depth of Excavation below existing G.L.	1.40	m
Depth of Top Soil	0.45	m
Bulk Factor for Top Soil	1.00	
Width of Bank Top	4.00	m

Height of Bank above Ground Level	2.35	m
Width at Mid Depth of Water	112.00	m
Lenght at Mid Depth of Water	137.00	m
Width at Top Water Level	124.00	m
Lenght at Top Water Level	149.00	m
Width at Top of Bank	130.00	m
Lenght at Top of Bank	155.00	m
Area of Bottom	12,500.00	sq m
Area at Mid Depth	15,344.00	sq m
Area at Top Water Level	18,476.00	sq m
Width of Liner	134.92	m
Lenght of Liner	159.92	m
Area of Liner	21,577.38	sq m
Surface Area of Excavation @ Sub-Soil level	14,267.76	sq m
Area at Mid Depth of Excavation of Sub Soil	13,369.44	sq m
Overall Width of Reservoir Top of Bank	138.00	m
Overall Lenght of Reservoir Top of Bank	163.00	m
Overall Width of Reservoir @ Sub-Soil level	152.00	m
Overall Lenght of Reservoir @ Sub-Soil level	177.00	m
Overall Area of Reservoir @ Sub-Soil level	26,904.00	

VOLUMES

Volume of Water Storage in Gallons	10,158,720	galls
Volume above Ground Level	6,039,450	galls
Volume of Sub Soil Excavated	12,706	cu m
Volume of Top Soil Strip	12,107	cu m
Total Volume of Excavation	24,812	cu m
Volume of Bank	21,115	cu m