

FLOOD RISK ASSESSMENT

FOR

PROPOSED HOLIDAY LODGE DEVELOPMENT

AT

MALTON GRANGE COUNTRY PARK,
AMOTHERBY LANE,
AMOTHERBY, YO17 6TG

ON BEHALF OF

EDWARDSON

ASSOCIATES

Project ref: 29628/FRA/DJC
Date First Issued: 12th December 2022
Issue: 01
Revision Date: 12th December 2022
Prepared by: D. Cook
Project Engineer
Checked by: J. Collins
BSc. (Hons), MCIWEM.

GGP Consult
2 Hallam Road
Priory Park East
Hull
HU4 7DY
United Kingdom

Tel: +44 (0) 1482 627963
Fax: +44 (0) 1482 641736
Email: danielcook@ggpconsult.co.uk
Website: www.ggpconsult.co.uk

Contents

1. Introduction
2. Description of Proposed Development
3. Flood Risk Vulnerability of the Proposed Development
4. Sequential Test
 - 4.1 Exception Test
5. Flood Risk
 - 5.1 Pluvial Flooding
 - 5.2 Fluvial Flooding
 - 5.3 Historic Flooding
 - 5.4 Groundwater Flooding
 - 5.5 Reservoir Flooding
 - 5.6 Sewer Flooding
6. Summary & Recommendations

Appendices

- I Site Location Plan
- II Site Layout

Report contains Environment Agency information © Environment Agency and database right Report contains material based upon records provided by British Geological Survey (NERC) Report contains images from google earth ©Google

Document Revision Box			
Revision	Date	Description	Author
01	12 th Dec' '22	Draft Issue	DJC

1.0 Introduction

GGP Consult has been commissioned by Edwardson Associates to prepare a flood risk assessment for the proposed holiday lodge development at Malton Grange Country Park, Amotherby Lane, Amotherby, YO17 6TG.

The purpose of this assessment is to demonstrate compliance with local planning policy as outlined within the Ryedale District Council Strategic Flood Risk Assessment (SFRA) and the National Planning Policy Framework (NPPF).

This assessment will highlight flood risk to the site and detail appropriate measures to mitigate the risk.

2.0 Description of Proposed Development

The existing site is currently entirely greenfield, with an area of approximately 0.4ha.

The site grid reference is SE 74838 74903.

Refer to Appendix I for the site location plan.

The development is located south of an established holiday park. It is proposed to develop 8 additional holiday lodges which will be operationally linked to the existing holiday park.

The Redbridge Sewer watercourse is located along the southern and eastern boundary which flows east into the River Rye.

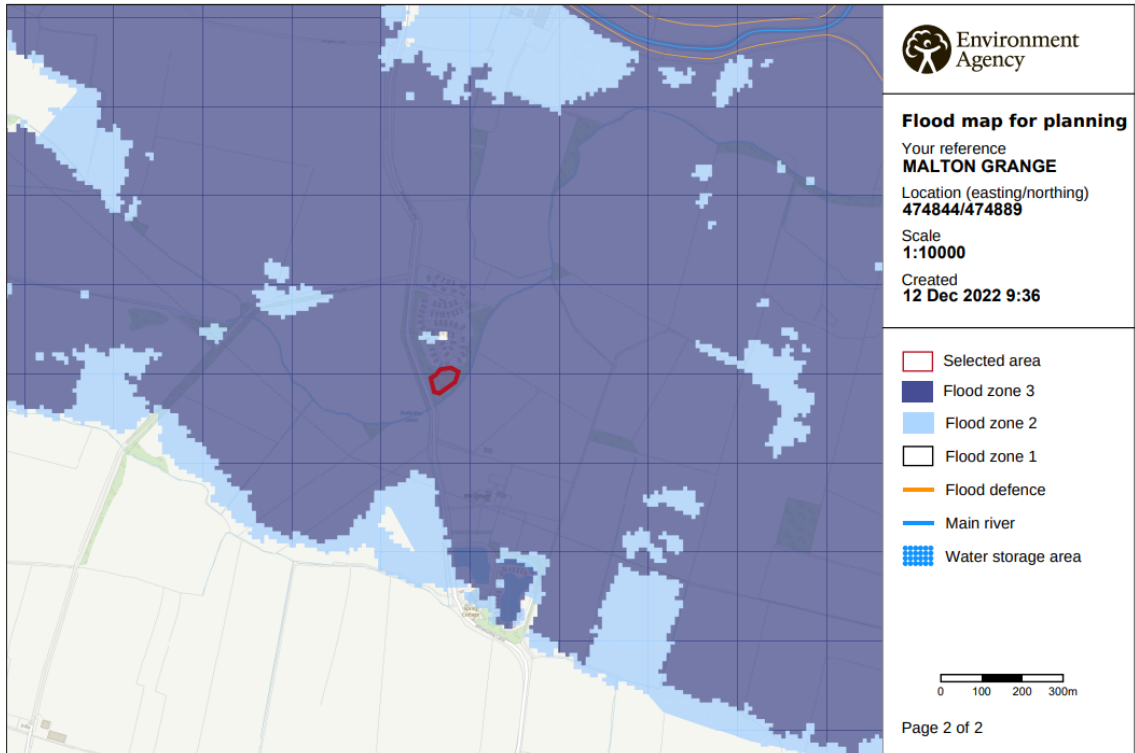
The LLFA is North Yorkshire Council.

LIDAR data for the site indicates an approximate level of 22.5mAOD.

Refer to Appendix II for the proposed site plan.

3.0 **Flood Risk Vulnerability of the Proposed Development**

The development is located within Flood Zone 3 as shown with the below Environment Agency map.



Environment Agency Flood Risk Map for Planning

This means the site is at greater probability of flooding, with 1% or greater annual probability of river flooding, or over 0.5% or greater annual probability of sea flooding in any year.

In accordance with Table 2 of the National Planning Policy Framework technical guidance, the proposed development of a holiday lodge classifies as 'More Vulnerable'.

With reference to Table 3 of the technical guidance, developments with 'More Vulnerable' classifications within flood zone 3 are acceptable with an accompanying exception test.

Table 3: Flood risk vulnerability and flood zone ‘compatibility’

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	✗	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	✗	✗	✗

Key: ✓ Development is appropriate.
 ✗ Development should not be permitted.

Therefore, the proposal is acceptable on the basis of an accompanying exception test.

4.0 **Sequential Test**

The purpose of the sequential test is to steer development towards areas of low flood risk, this would normally require development in Flood Zone 1 where possible.

The proposal is to expand the existing holiday park and to maintain functional operation between the existing and proposed development. No undeveloped land within the holiday park is located within a reduced flood zone.

With the incorporation of appropriate mitigation measures, the proposal is acceptable. Through this, it can be demonstrated that the development and occupants are not at risk from a flooding event.

Therefore, the development has adequately passed the sequential test on the provision of appropriate mitigation.

4.1 **Exception Test**

NPPF Technical Guidance states that, on provision that the sequential test is past, more vulnerable developments within flood zone 3a require an exemption test.

This exception test will detail how flood risk will be managed and show how the sustainable benefits of the development to the community outweigh the flood risk.

The proposed development will increase income for the park and ensure the financial viability of the Malton Grange Lodges throughout the future. This will also ensure that park employment is secure and provides the possibility of employment growth.

Additionally, increased tourism will provide a much needed benefit to the local economy.

The flood risk to the proposal will be mitigated, preventing flood risk to life and property. Detail of proposed mitigation is noted within section 5.0. Additionally, the development will not increase flood risk.

Therefore, the exception test is deemed satisfied.

5.0 **Flood Risk**

The following section will highlight flooding risk from the following areas;

1. Pluvial (Surface Water)
2. Fluvial (Rivers)
3. Historic
4. Groundwater
5. Reservoir
6. Sewer

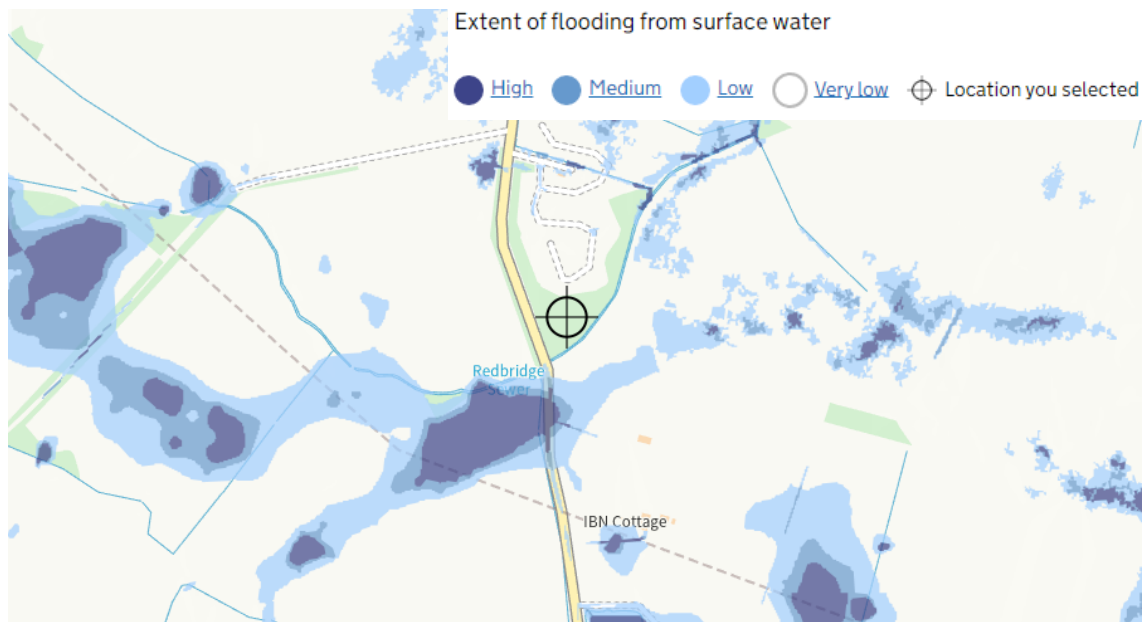
The following section will follow the structure of the headings above.

5.1 **Pluvial Flooding**

Surface water flood risk has been assessed on a national level by The Environment Agency. Maps were released in December 2013, which are some of the most comprehensive surface water flood risk maps in the world.

'The Surface Water mapping involves cutting edge technology, with flood experts using models to observe how rainwater flows and ponds. Then producing maps that take local topography, weather patterns and historical data into account.'

The extract below identifies surface water flooding risk to the site.



Environment Agency Surface Water Flood Risk Map

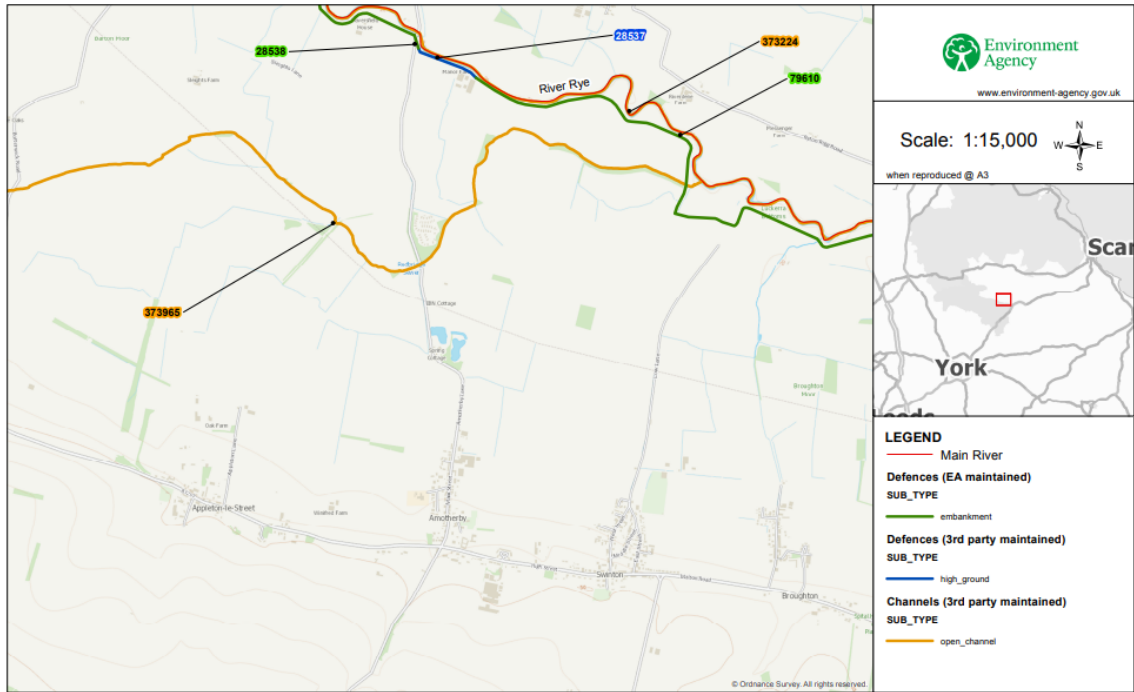
As shown above, the site is at 'very low' risk of surface water flooding. This means the site has less than a 0.1% chance of surface water flooding each year.

Therefore, the risk posed by surface water flooding is considered negligible.

5.2 Fluvial Flooding

Potential sources of fluvial flooding include the Redbridge Sewer located along the southern boundary of the development and the River Rye located approximately 0.95km to the northeast.

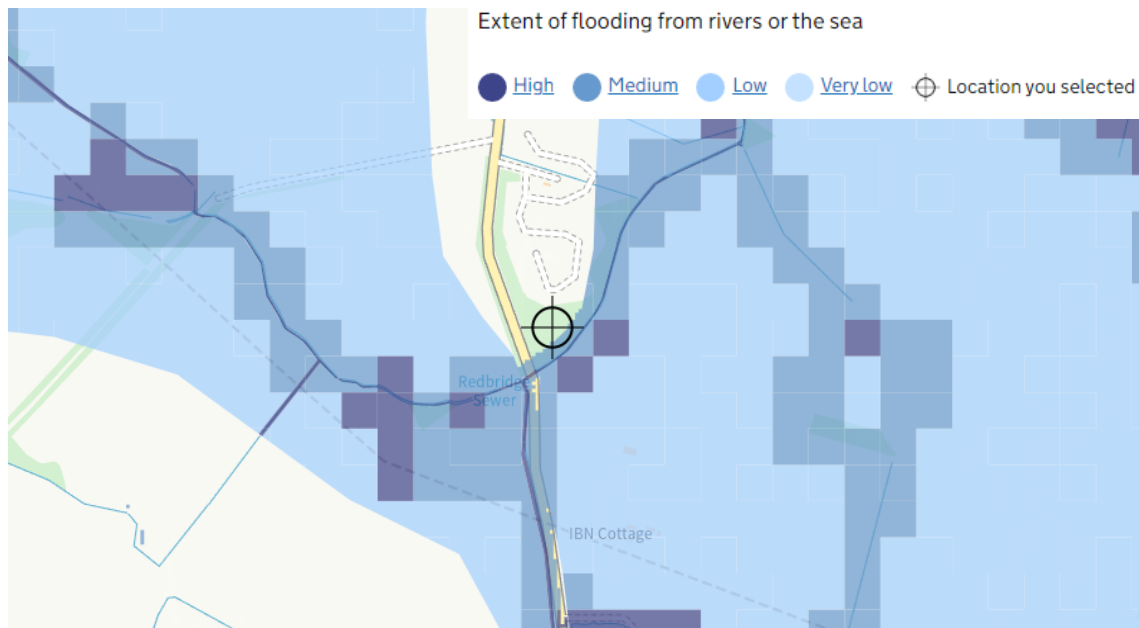
The Environment Agency asset map identifies the Redbridge Sewer and River Rye as being an open channel under 3rd party maintenance. An Environment Agency embankment is located along the south of the River Rye. An extract of the asset map is shown below.



Environment Agency Asset Map

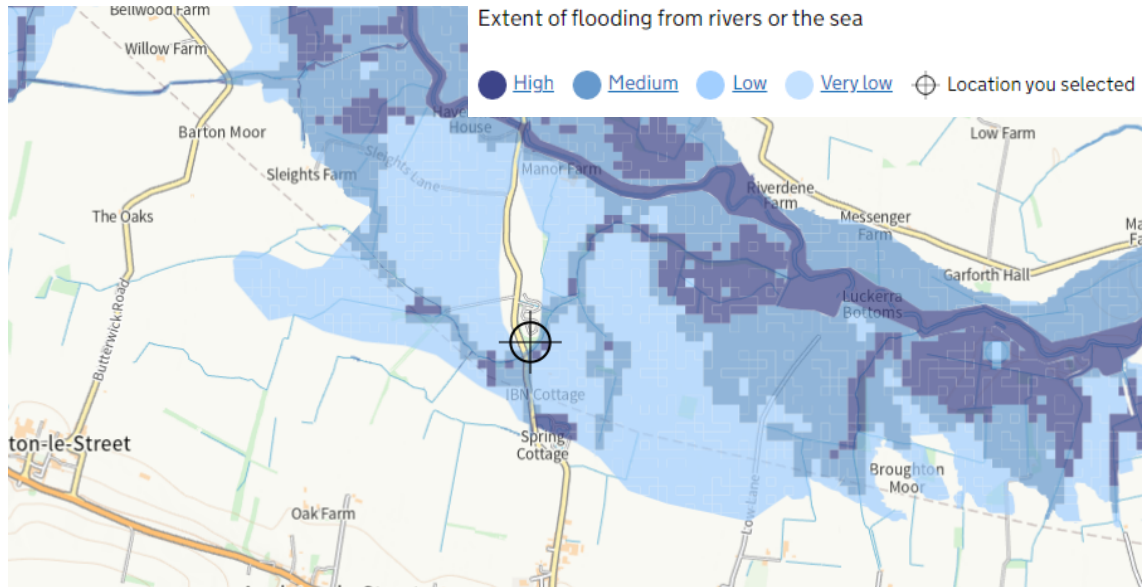
The lowest crest level along the Environment Agency embankment is identified as being 23.45mAOD. Therefore, as our proposed development has an approximate level of 22.5mAOD, the development is at theoretical risk of flooding from the overtopping of the embankment.

As shown within the Environment Agency river and sea flood risk map below, the proposed development is at 'very low' risk of flooding, resulting in a chance of flooding of less than 0.1% each year. This takes into account the effect of local flood defences.



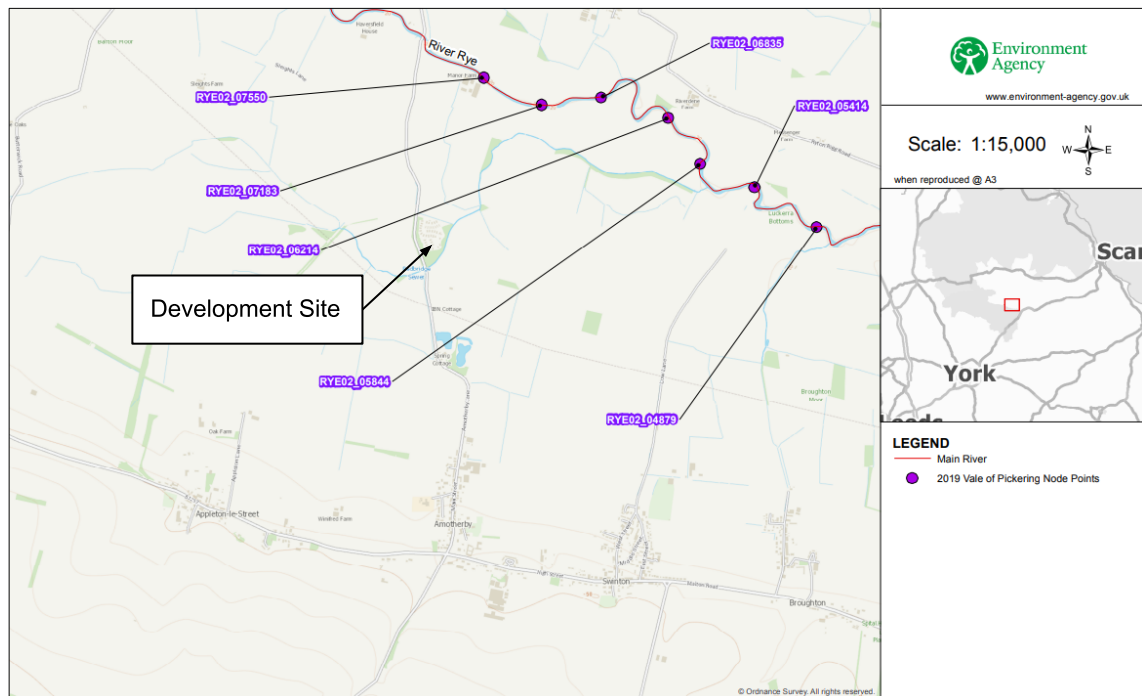
Environment Agency River & Sea Flood Risk Map

The river and sea flood risk map shows the development site and areas to the north are located within a local highspot. This is clearly shown within the below map extract.



Environment Agency River & Sea Flood Risk Map

Fluvial flooding models of the River Rye have been undertaken with accompanying modelled levels for a range of return periods being produced. The modelled nodes are shown below.



Environment Agency River Rye Node Map

The closest node is RYE02_07183, which will be used to assess flood risk. The embankment located to the south of the River Rye has a lower crest level of 23.45mAOD. The highest modelled water level for a 1:1,000 year event is 23.405mAOD which will be contained by the embankment.

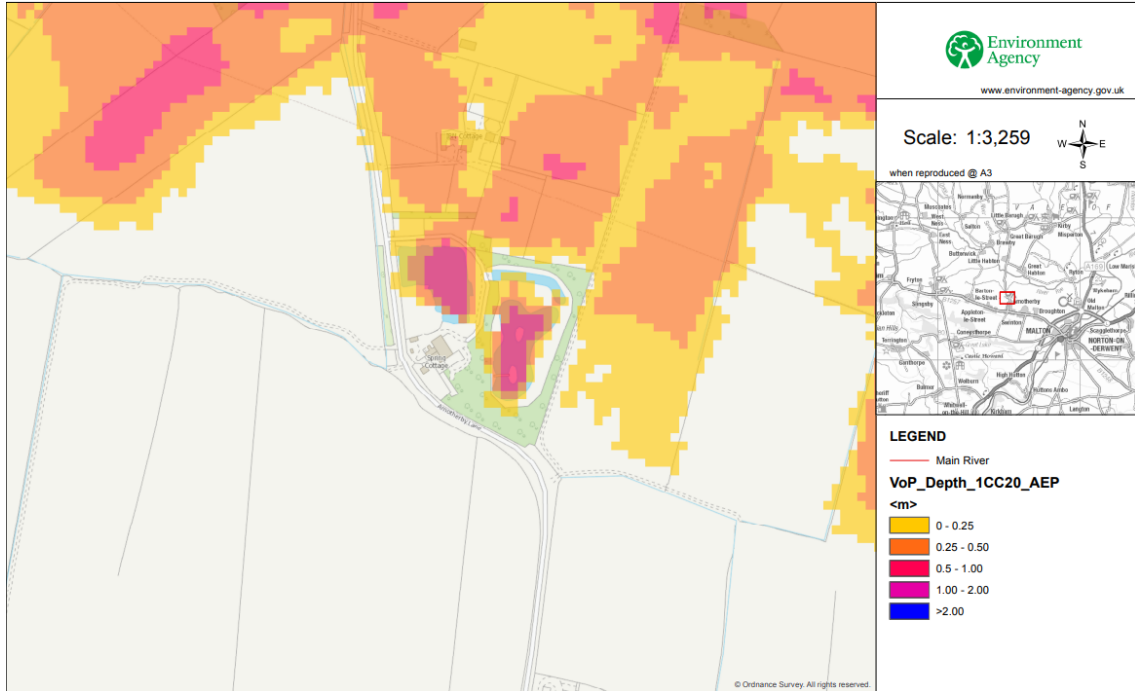
The development is not at risk from fluvial flooding up to and including the 1:1,000 year flood event.

Therefore, due to the development being located on elevated land and the Environment Agency flood defence, flood risk from fluvial sources is deemed unlikely.

Environment Agency Product 4 data map has been requested and the report will be updated once received.

Environment Agency Product 4 data supplied for a development approximately 560m to the south indicates varying flood depths for the 1:100 year event +20%CC.

An extract of this map is shown below. This development is lower than the proposed development site.



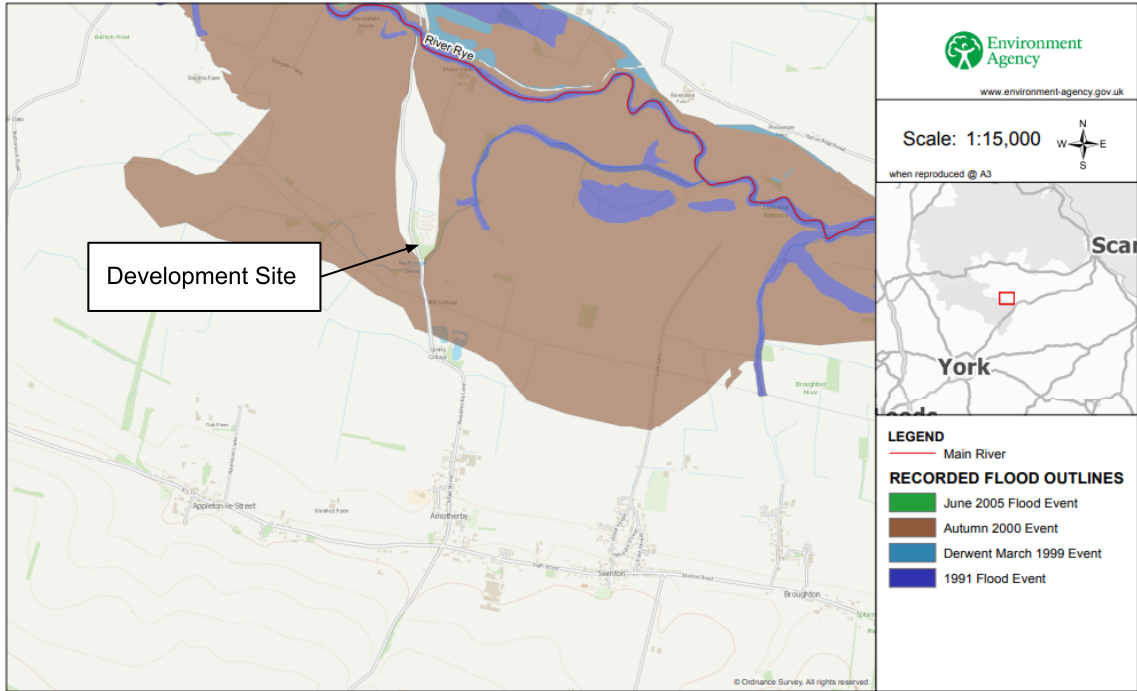
Environment Agency 1% +20%CC Flood Risk Map

Flood risk is shown to be between 0.25 - 0.5mAOD, with local low spots being at between 1.00-2.00mAOD. As our proposed development is located above the areas shown to be at risk, it has been conservatively assumed that the development will be at theoretical risk of up to 0.5mAOD of flooding with the consideration of climate change.

As the proposed holiday lodges will be raised 600mm above ground level, above the theoretical flood risk level, providing sufficient mitigation.

5.3 Historic Flooding

The Environment Agency historic flood map is shown below. As shown the development site has no previous history of flooding, even within severe storm events where defences were overtopped.



Environment Agency Historic Flooding Map

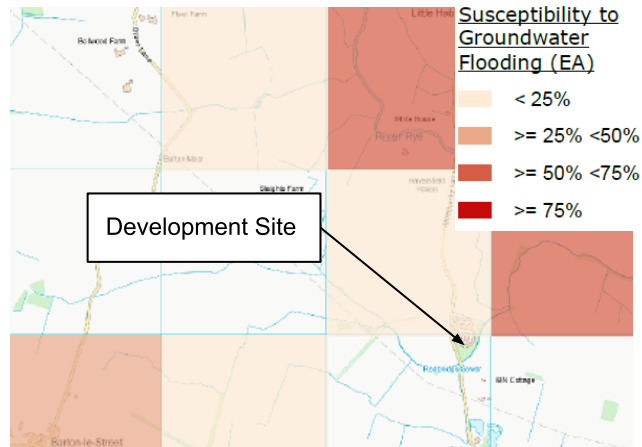
Name	Start Date	End Date	Flood Source	Flood Cause	Source of data
June 2005 Flood Event	19/06/2005	20/06/2005	main river	channel capacity exceeded (no raised defences)	Survey
Autumn 2000 Event	30/10/2000	15/11/2000	unknown	overtopping of defences	Survey
Derwent March 1999 Event	02/03/1999	16/03/1999	unknown	overtopping of defences	Survey
1991 Flood Event	21/02/1991	27/02/1991	unknown	overtopping of defences	Survey

Environment Agency Historic Flooding Event Data

This demonstrates that the development is at very low risk from fluvial and pluvial sources of flooding.

5.4 Groundwater Flooding

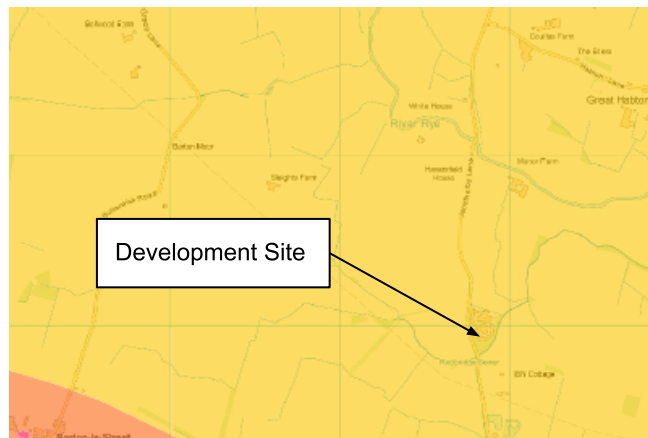
The Level 1 Strategic Risk Assessment details areas susceptible to groundwater flooding, an extract from this map can be found below.



Level 1 SFRA Groundwater Flooding Susceptibility Map

The site falls outside of all groundwater vulnerability classifications.

The groundwater levels risk mapping is shown below.

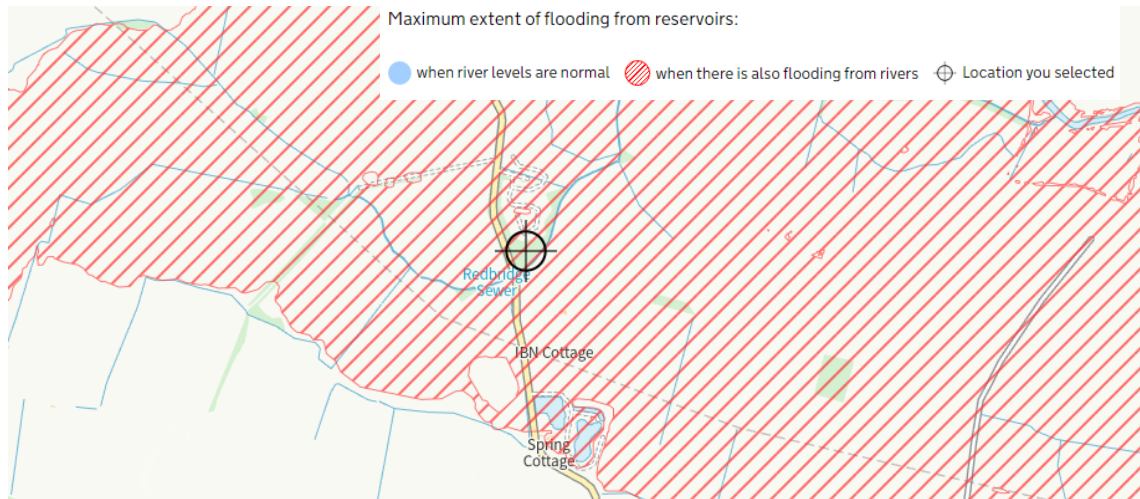


Level 1 SFRA Groundwater Levels Risk Map

Therefore, the risk of groundwater flooding is considered negligible.

5.5 **Reservoir Flooding**

The Environment Agency reservoir flood risk map identifies that the development site is at risk of flooding from a reservoir during river flooding.



Environment Agency Reservoir Flooding Map

As the holiday lodges will be raised a minimum of 600mm above ground level, mitigation is provided.

5.6 **Sewer Flooding**

No manhole chambers or other drainage features are located within the development site. For the development, it is proposed to install a positive drainage system which will be designed to attenuate and restrict flows from the site.

Therefore, the risk of sewer flooding is considered negligible.

6.0 **Summary and Recommendation**

The FRA demonstrates that the flood risk to the site from various sources is low, considering local flood defences and the elevated site levels.

The site is at risk of flooding from fluvial flooding when this occurs in conjunction with fluvial flooding.

The sequential and exception test has demonstrated the development is acceptable and offers sustainable benefits over the potential flood risk.

The proposed holiday lodges will be raised by 600mm above ground level, providing sufficient mitigation.

The proposed development will not increase flood risk to neighbouring properties.

It is recommended that the land owner sign up to the Environment Agency flood warning system;
<https://www.gov.uk/sign-up-for-flood-warnings>

In addition the owners should prepare a site flood plan and be included within each lodge welcome pack.
The template can be found below;
<https://www.gov.uk/government/publications/personal-flood-plan>

Report Written by:-

D. Cook

Project Engineer

Report Checked by:-

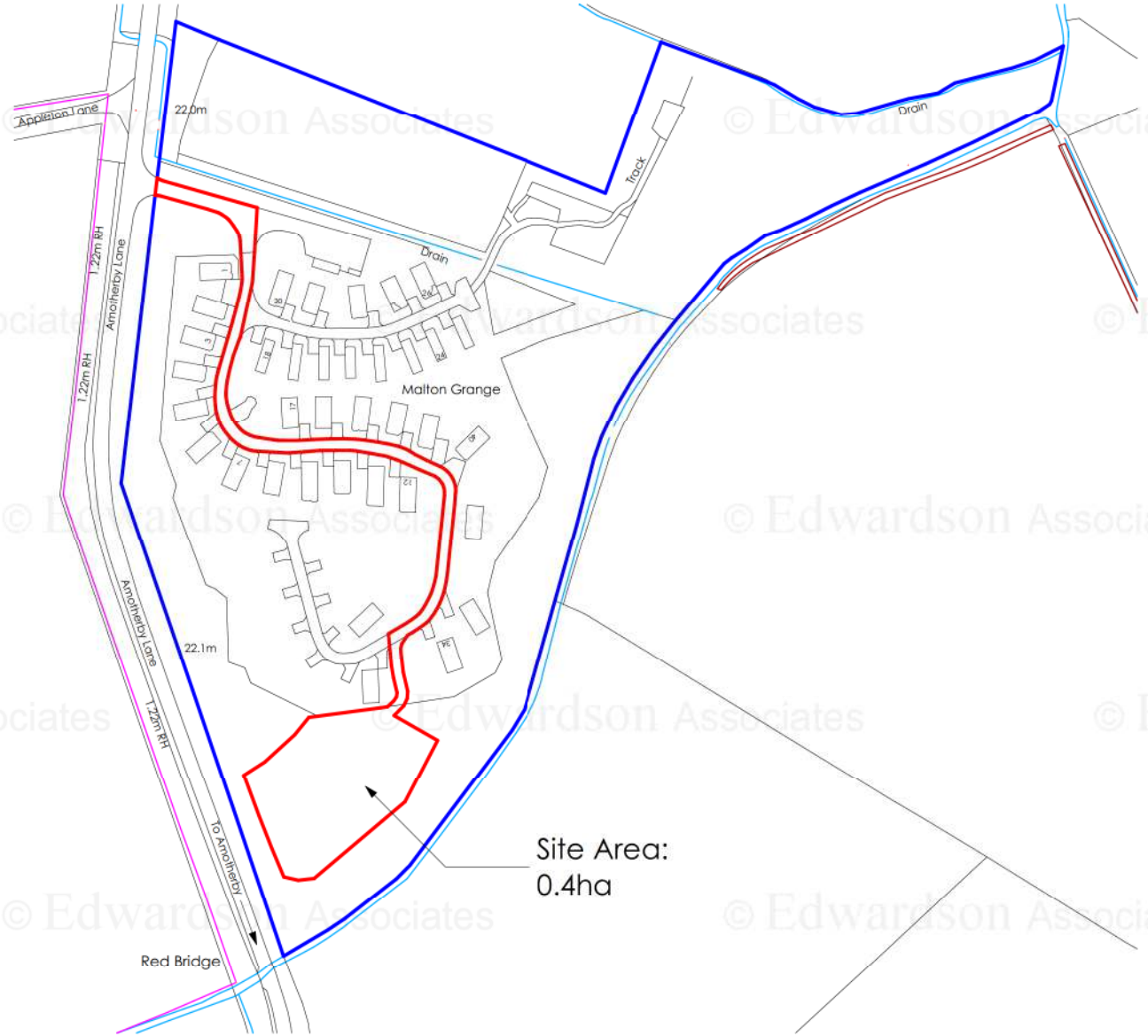
J. H. Collins BSc. (Hons), MCIWEM

Senior Civil Engineer
Drainage & Infrastructure

APPENDIX I
Site Location Plan



NOTES
 Do not scale from this Drawing.
 It is the Contractor's responsibility to check all governing dimensions with the Engineer and client and verify all dimensions on site before commencing any work or making any other drawings.
 This drawing to be read in conjunction with structural, mechanical and electrical drawings prepared by others and other relevant information and any discrepancies are to be reported to the Architect/Project Manager.
 Work and materials to be in accordance with the Building Regulations where appropriate and to comply with relevant British Standards. Materials to agree with Planning Conditions.
 This drawing is the copyright of Edwardson Associates Ltd and should not be reproduced in whole or in part without their written permission.



Location Plan 1:2500

© May 2019

EDWARDSON ASSOCIATES

Paddock House, 10 Middle Street South
 Driffield, East Yorkshire, YO25 6PT
 Tel: 01377 249720 fax: 01377 259052
 info@edwardsonassociates.com

www.edwardsonassociates.com

Reproduced from the Ordnance Survey Map with permission of the Controller Of Her Majesty's Stationary Office - O.S. Licence No: AL 100037761

project:	Change of use of land to permit the siting of 8 timber clad cabin-style caravans at Malton Grange, Amotherby Lane, Amotherby, YO17 6TG	rev:	notes:	date:	by:
client:	Malton Grange Country Park	scale @ A4:	1:2500	date:	May 2019
drawing title:	Location Plan	drawn:	DW	checked:	
		job no:	KNO.L 2019.01	drawing no:	001
		issue status:	Planning	revision:	

APPENDIX II

Site Plan

Landscaping
General
 Any existing trees and hedging to be retained.
 Proposed planting will take place at the next available planting season following commencement.

Pre-Planting Treatment (if specified in the planting work schedule)
 Ripping: If ripping is specified it should be undertaken to a depth sufficient to break up any soil/clay pan. Rip lines should be spaced at the specified planting spacing and follow the proposed planting lines. Ripping should be confined to those areas to be planted and not proposed rides, paths and open areas. Ripping should only take place in suitable dry weather and should be stopped if rubble or other material is brought to the surface.
 Grass Cutting: To cut the whole area of the site to provide a sward height of approximately 2.5cm in height.

Tree/Shrub Planting
 Spot spraying: Each proposed planting station is to be treated to give a 1m diameter weed free area.
 Band spraying: At the correct spacing to create a 1m wide weed free strip along the proposed planting line.
 Treatment of noxious weeds: The area and weed species to be treated will be specified in the planting schedule.

Hedges - Site Preparation

- Tall grasses and weeds are to be cut down to 75mm and removed from the site.
- The planting line is to be treated with a suitable contact herbicide in a strip 600mm wide.
- Fully cultivate planting strip to a depth of 300mm.
- The ground is to be well firmed but not consolidated around the roots to leave the plant upright.
- To suppress weed growth around the hedge bark chip mulch or other suitable should be used.

Planting
 All plants to be notched planted where the notch will provide a sill of sufficient size to take the roots untrimmed without unnecessary force being applied. If this is not possible then the plants are to be pit planted with the planting pits of adequate size to take the roots untrimmed and are to be backed filled with soil from the pit with any turf placed upside down at the base of the pit. Where sites have been ripped prior to planting then the trees must not be planted in the rip line but at least 20-25cm to one side. All plants to be planted so that the top of the nursery mark is level with the final soil level. The plants to be firmed in so that a gentle tug will not remove the plants from the soil.
 Any surface vegetation within 10cm (4in) minimum of the planted tree/shrub to be removed. The appropriate shelter/protection is to be erected immediately after planting.

New Tree and Shrub Planting - General
 Trees and shrubs are to be planted between November and March, but not when the soil is waterlogged or frozen.
 Holes are to be large enough to accommodate the roots, the bottom of the hole to be forked over and the tree positioned on a mound of topsoil placed in the hole, so that the tree is planted at its original soil depth. The hole is to be backfilled with top soil, firmed layer by layer and the ground finished off with a 50mm layer of mulch.
 The trees are to be protected with spiral guards, tubes or box shaped plastic tree shelters.

Tree/Shrub Maintenance (5 growing seasons)
 Water trees immediately after planting and during periods of drought including regular spraying of the crown with water in the growing period (when the sun is off their leaves in the evening).
 Perennial and annual weeds to be removed using hand or chemical means in April and June.
 Topping up mulch as necessary.
 Where required shrubs to be cut back in accordance with good horticultural practice to promote flowering and growth and the removal of damaged, diseased, crowded, weak or dead shoots and removal of suckers.
 Woodland to be managed as recommended by good arboreal practice. All felled trees to be replaced the following planting season.
 Guards and rabbit fencing to be removed when no longer needed.

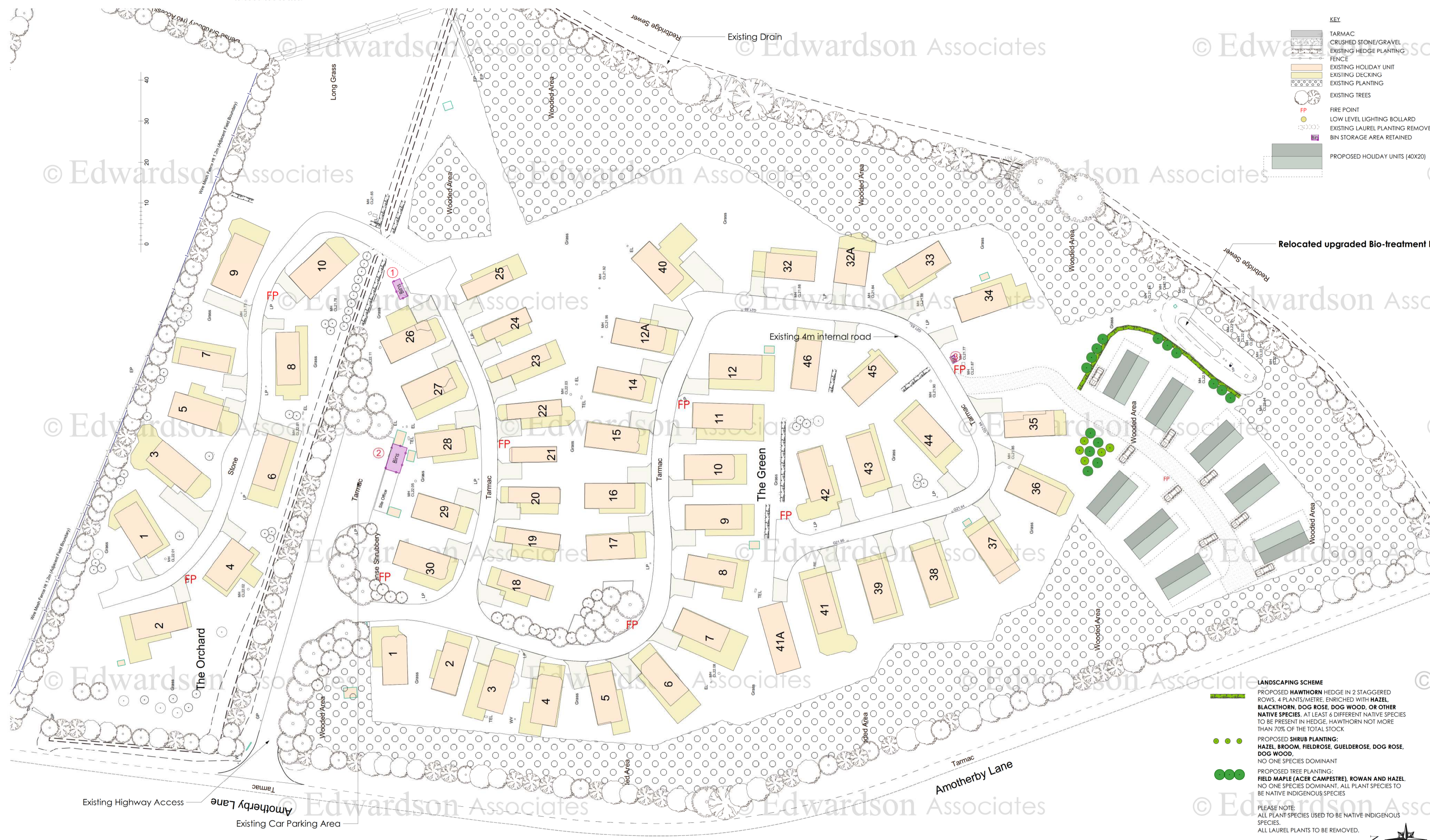
Hedge Maintenance

- (5 Growing Seasons)
- Water plants immediately after planting and during periods of drought
- Any weed growth at the hedge to be treated with a suitable contact herbicide in April and June.
- Tubing and mulching are to be maintained to ensure weed growth is minimised.
- Any weeds can be spot treated.
- All failed plants to be replaced the following planting season.
- Guards and rabbit fencing to be removed when no longer needed.
- Trim hedges in regular intervals (3 years). Mark young hedge trees and ensure they are kept and not cut during trimming.

NOTES
 Not scale from this Drawing.
 It is the Contractor's responsibility to check all governing dimensions with the Engineer and client and verify all dimensions on site before commencing any work or making any other drawings.
 This drawing to be read in conjunction with structural, mechanical and electrical drawings prepared by others and other relevant information and any discrepancies are to be reported to the Architect/Project Manager.
 Work and materials to be in accordance with the Building Regulations where appropriate and to comply with relevant British Standards, wherever applicable with Planning Conditions.
 This drawing is the copyright of Edwardson Associates Ltd and should not be reproduced in whole or in part without their written permission.

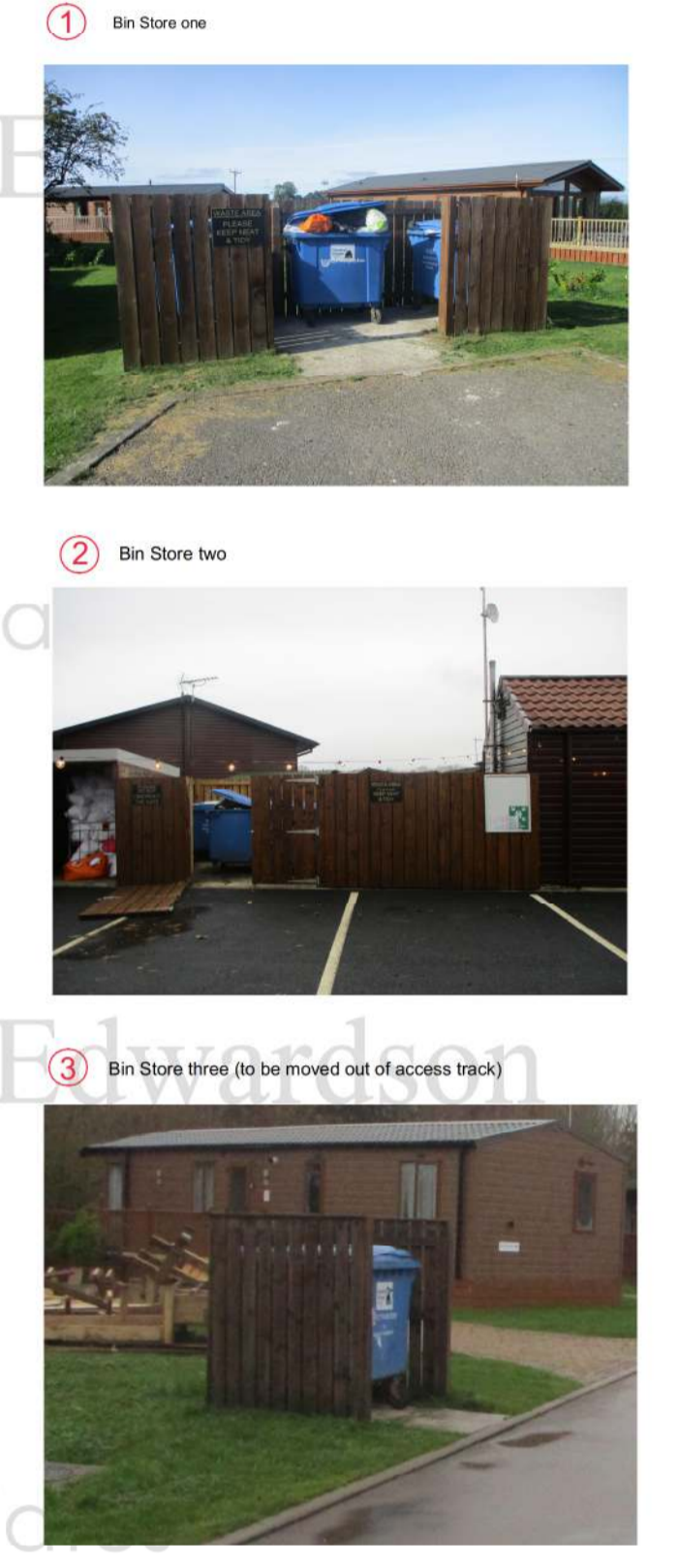
NOTES

- Additional static caravans to be sited and laid out in accordance with the Ryedale District Council Site License Conditions for Static Caravans.
- All the units are capable of meeting the definition of a caravan as described within "The Caravan Sites & Control of Development Act 1960" and the "Caravan Sites Act 1968".
- All units to be sited outside the 100 year flood risk area.
- Surface water to be disposed of to ground and then to ditches via existing field drainage system - no change.
- Foul to connect to proposed Bio-treatment plant and then to discharge to Redbridge Sewer.
- Existing approved highway access point to the main park to be utilised.
- Minimal site disturbance necessary with no tree removal or threat to trees.
- Proposed area for static caravans generally well screened by existing trees and shrubs together with new planting in indigenous species.



KEY

- TARMAC
- CRUSHED STONE/GRAVEL
- EXISTING HEDGE PLANTING
- FENCE
- EXISTING HOLIDAY UNIT
- EXISTING DECKING
- EXISTING PLANTING
- EXISTING TREES
- FIRE POINT
- LOW LEVEL LIGHTING BOLLARD
- EXISTING LAUREL PLANTING REMOVED
- BIN STORAGE AREA RETAINED
- PROPOSED HOLIDAY UNITS (40X20)



LANDSCAPING SCHEME
 PROPOSED HAWTHORN HEDGE IN 2 STAGGERED ROWS, 4 PLANTS/METRE. ENRICHED WITH HAZEL, BLACKBURN, DOG ROSE, DOG WOOD, OR OTHER NATIVE SPECIES. AT LEAST 4 DIFFERENT NATIVE SPECIES TO BE PRESENT IN HEDGE, HAWTHORN NOT MORE THAN 70% OF THE TOTAL STOCK.
 PROPOSED SHRUB PLANTING:
 HAZEL, BROOM, FIELDROSE, GUELDEROSE, DOG ROSE, DOG WOOD.
 NO ONE SPECIES DOMINANT
 PROPOSED TREE PLANTING:
 FIELD MARLE (ACER CAMPESTRE), ROWAN AND HAZEL.
 NO ONE SPECIES DOMINANT. ALL PLANT SPECIES TO BE NATIVE INDIGENOUS SPECIES.
 PLEASE NOTE:
 ALL PLANT SPECIES USED TO BE NATIVE INDIGENOUS SPECIES.
 ALL LAUREL PLANTS TO BE REMOVED.

Plan Revision B - Elderberry removed from planting list 08/11/2022 ABR
 Plan Revision A - New Klargester Location. 01/09/2022 ABR
 rev: notes: date: by:

© September 2022
EDWARDSON ASSOCIATES

project: Change of use of land to permit the siting of 8 timber clad cabin-style caravans at Malton Grange, Amotherby Lane, Amotherby, YO17 6TG

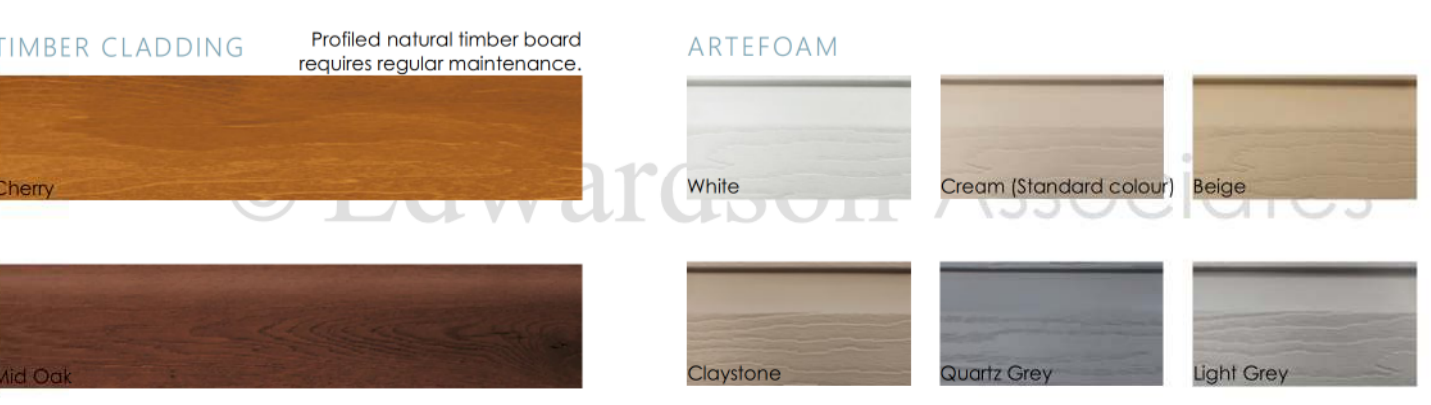
client: Malton Grange County Park
 drawing title: Site Plan - As Proposed

scale @ A1: 1:500 date: September 2022
 drawn: ABR checked:

job no: KNO1 2019 01 drawing no: 101
 issue status: Planning revision: B

Paddock House, 10 Middle Street South
 Driffield, East Yorkshire, YO25 6PT
 tel: 01377 249720 fax: 01377 259052
 info@edwardsonassociates.com
 www.edwardsonassociates.com

External Materials
 (Caravan Cladding and Veranda Materials/Colours)
 Units/Verandas to be boarded with high quality boarding materials or a combination of high quality boarding material and plaster (see example pictures)
 Colours to be chosen from attached colour ranges and colours show in the example pictures (especially the timber boarding)



As Existing/As Proposed Decking

