
FLOOD RISK ASSESSMENT REPORT

AUG 2022

PLANNING APPLICATION FOR
DEVELOPMENT CONSISTING OF

- 1) Alterations to Existing Vehicular Entrance
- 2) Provisions of 2No. New Office/Welfare Cabins
- 3) Relocation of an existing Storage Container
- 4) Extension of Existing Vehicular Storage Yard.
- 5) Recladding of an Existing Steel Frame Storage Shed
- 6) Installation of a new 2 bay lorry wash facility.
- 7) Revised/Alterations to boundary treatments.
- 8) All associated Site Development Works including drainage & lighting.

At Southery Mill, Sedge, Fen Road,
Southery, Norfolk.

FLOOD RISK ASSESSMENT COMPLIANCE REPORT

Project	<p>PLANNING APPLICATION FOR DEVELOPMENT CONSISTING OF</p> <ol style="list-style-type: none">1) Alterations to Existing Vehicular Entrance2) Previsions of 2No. New Office/Welfare Cabins3) Relocation of an existing Storage Container4) Extension of Existing Vehicular Storage Yard.5) Recladding of an Existing Steel Frame Storage Shed6) Installation of a new 2 bay lorry wash facility.7) Revised/Alterations to boundary treatments.8) All associated Site Development Works including drainage & lighting. <p>At Southery Mill, Sedge, Fen Road, Southery, Norfolk.</p>
Client	Brian Easey.

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SECTION A

Introduction

1 Scope of Report

This report is submitted with drawings and other documentation in support of providing a Flood Risk Assessment for **“PLANNING APPLICATION FOR DEVELOPMENT CONSISTING OF 1) Alterations to Existing Vehicular Entrance, 2) Provisions of 2No. New Office/Welfare Cabins, 3) Relocation of an existing Storage Container, 4) Extension of Existing Vehicular Storage Yard, 5) Recladding of an Existing Steel Frame Storage Shed, 6) Installation of a new 2 bay lorry wash facility, 7) Revised/Alterations to boundary treatments, 8) All associated Site Development Works including drainage & lighting at Southery Mill, Sedge, Fen Road, Southery, Norfolk”** for Brian Easey.

In this report, it is demonstrated that the proposed works, if constructed in accordance with the drawings and design details submitted with the application, together with performance requirements prescribed in this Report, will comply as far as possible with The Planning Policy Statement 25, Development & Flood Risk and the Environment Agency.

The subject of the Flood Risk Assessment is limited to the proposed development site and adjoining lands as identified on the accompanying drawings.

2 Philosophy and Approach

The underlying philosophy and approach adopted by the designers is to review the subject development site and adjoining lands and ensure the development as proposed is not and does not present a flood risk as proposed and to make recommendations to ensure this. To support this commitment, Joseph Cotter Engineer & Surveyor, procedures require preparation of the FLOOD RISK ASSESSMENT REPORT Checklists throughout all stages of the planning and development process:

- Prior to sign-off of Definitive Project Brief
- At the sketch stage
- At the tender stage
- At the placing of the contract
- At the construction stage

3 Format of Report

The report will be subdivided using the following subheadings:

- *Development Description & Site Location*
- *Initial Flood Risk Assessment*
- *Screening Assessment*
- *Scoping Assessment*
- *Exception Test*
- *Flood Risk- Mitigation Measures, Suds Flood Resilient Construction Measures.*

4 Key Project Details

Brian Easey has appointed Joseph Cotter Engineer & Surveyor to prepare and a Flood Risk Assessment for **“PLANNING APPLICATION FOR DEVELOPMENT CONSISTING OF 1) Alterations to Existing Vehicular Entrance, 2) Previsions of 2No. New Office/Welfare Cabins, 3) Relocation of an existing Storage Container, 4) Extension of Existing Vehicular Storage Yard, 5) Recladding of an Existing Steel Frame Storage Shed, 6) Installation of a new 2 bay lorry wash facility, 7) Revised/Alterations to boundary treatments, 8) All associated Site Development Works including drainage & lighting at Southery Mill, Sedge, Fen Road, Southery, Norfolk”**, Joseph Cotter Engineer & Surveyor have carried out the Flood Risk Assessment Report for the proposed development and makes recommendation for compliance with the Environment Agency in relation to The Planning System and Flood Risk Management Guidelines for Planning Authorities.

SECTION B

Flood Risk Assessment

5 Development Description & Site Location

Brian Easey intends to apply for permission for development consisting of "PLANNING APPLICATION FOR DEVELOPMENT CONSISTING OF 1) Alterations to Existing Vehicular Entrance, 2) Provisions of 2 No. New Office/Welfare Cabins, 3) Relocation of an existing Storage Container, 4) Extension of Existing Vehicular Storage Yard, 5) Recladding of an Existing Steel Frame Storage Shed, 6) Installation of a new 2 bay lorry wash facility, 7) Revised/Alterations to boundary treatments, 8) All associated Site Development Works including drainage & lighting at Southery Mill, Sedge, Fen Road, Southery, Norfolk"

Site Location:

The proposed development site is centred at Ordnance Survey Grid Reference TL 61893 92940 as shown on the following Ordnance Survey and aerial photograph extract.

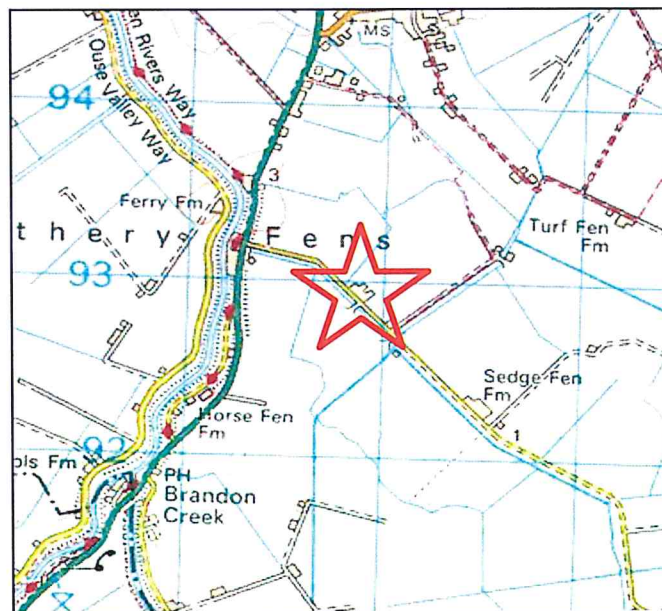


Figure 1 – OS Mapping location plan

Imagery © 2022 Digital Globe, Get mapping plc, Intorfera Ltd & Bluesky.

The proposed development site comprises of a collection of buildings and hard surfaces and is located to the east of the River Great Ouse, to the south of the village of Southery and to the east of Sedge Fen Road. The site was surrounded by arable farmland and a network of ditches. For the purpose of this report the buildings have been numbered 1 – 5 as shown on figure 5 below. Buildings 3-5 and the dwelling to the south of the site, are not to be impacted on by the proposed works.

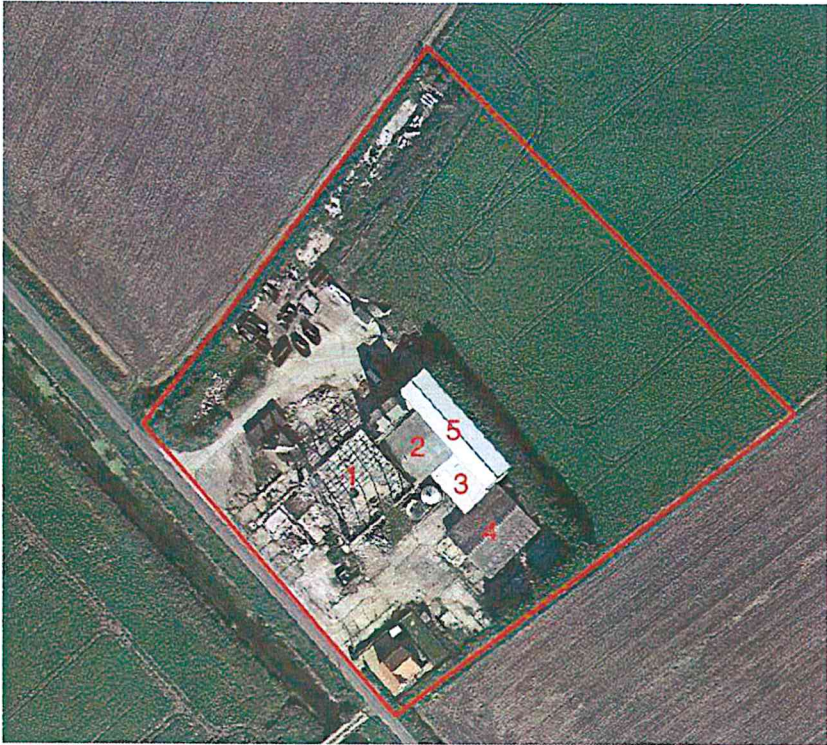
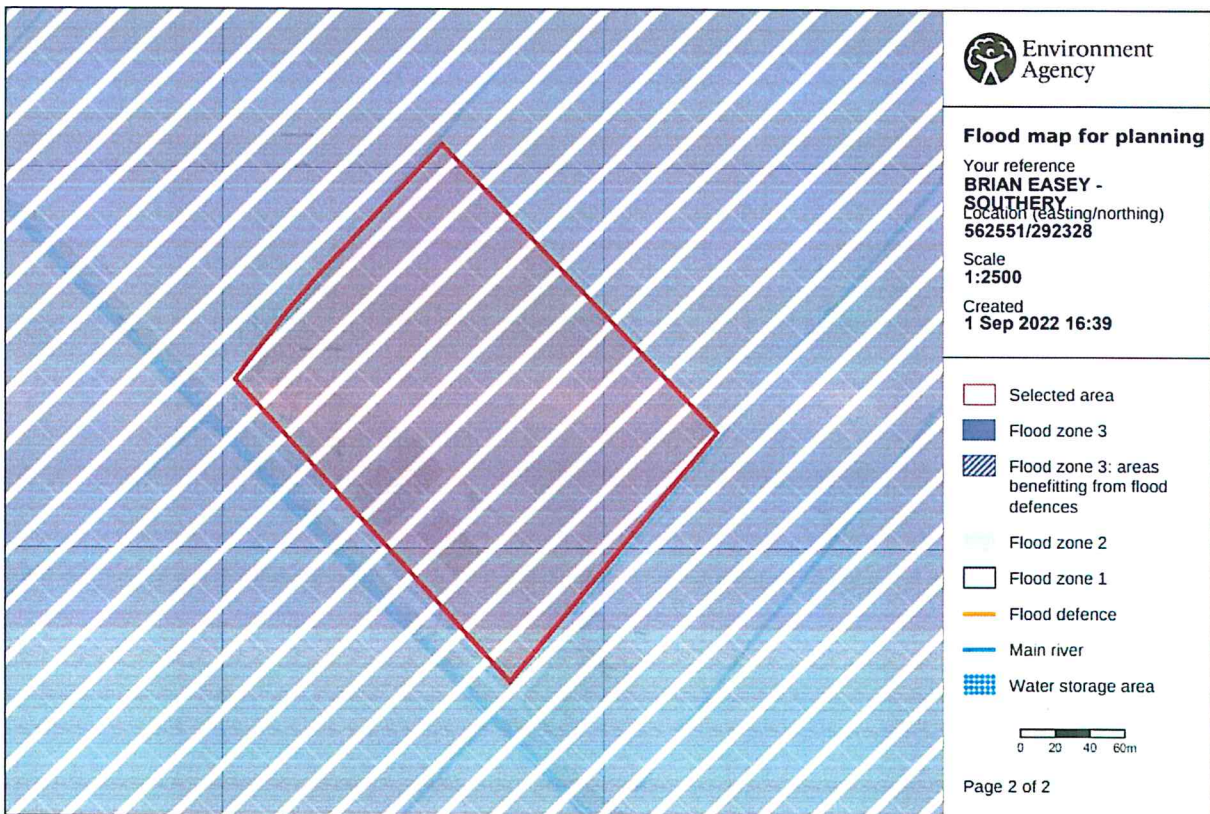


Figure 2 – Building numbers

6 Flood Risk Assessment

A Flood Risk Assessment is required to accompany the planning application in order to meet the requirements and general principles contained in Paragraph 9 of the Technical Guidance to the National Planning and Policy Framework (NPPF) and for approval by the Environment Agency.

The site is located in a defended Flood Zone 3 of the River Ely Ouse and within the catchment area of the Southery & District IDB. The site is also shown in fluvial Flood Zone Category 3 and a Hazard Zone of the Kings Lynn & West Norfolk Borough Council Strategic Flood Risk Assessment Maps.



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These Flood Zones are summarized below.

Zone 3 High Probability.

Land assessed as having a 1 in 100 or greater annual probability (i.e. 1% AEP) of river flooding, or a 1 in 200 or greater annual probability (i.e. 0.5% AEP) of tidal flooding, in any year.

Zone 3b The Functional Floodplain.

Areas of the region susceptible to fluvial flooding within which "water has to flow or be stored in times of flood" (PPS25).

Zone 3a High Probability.

Land assessed as having a 1 in 100 or greater annual probability (i.e. 1% AEP) of river flooding, or a 1 in 200 or greater annual probability (i.e. 0.5% AEP) of tidal flooding, in any year.

Zone 2 Medium Probability.

Land assessed as having between a 1 in 100 (i.e. 1% AEP) fluvial or 1 in 200 (i.e. 0.5 % AEP) tidal, and 1 in 1000 (i.e. 0.1% AEP) annual probability of flooding (from fluvial and/or tidal flooding) in any year.

Zone 1 Low Probability.

Land assessed as having a less than 1 in 1000 annual probability of flooding in any year (i.e. 0.1% AEP).

Table D.1: of The Planning Policy Statement 25, Development & Flood Risk describes **Zone 3 – an area with High Probability that benefits from flood defences** as follow:

Zone 3a High Probability

Definition

This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

Appropriate uses

The water-compatible and less vulnerable uses of land in Table D.2 are appropriate in this zone.

The highly vulnerable uses in Table D.2 should not be permitted in this zone.

The more vulnerable and essential infrastructure uses in Table D.2 should only be permitted in this zone if the Exception Test (see para. D.9) is passed. Essential infrastructure permitted in this zone should be designed and constructed to remain operational and safe for users in times of flood.

FRA requirements

All development proposals in this zone should be accompanied by a FRA. See Annex E for minimum requirements.

Policy aims

In this zone, developers and local authorities should seek opportunities to:

- i. reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage techniques;
- ii. relocate existing development to land in zones with a lower probability of flooding; and
- iii. create space for flooding to occur by restoring functional floodplain and flood flow pathways and by identifying, allocating and safeguarding open space for flood storage.

Table D.2: of The Planning Policy Statement 25, Development & Flood Risk outlines the Flood Risk Vulnerability Classification:

Less Vulnerable Classification is described as follows:

Table D.2:

Less Vulnerable	<ul style="list-style-type: none"> • Police, ambulance and fire stations which are <i>not</i> required to be operational during flooding. • Buildings used for: shops; financial, professional and other services; restaurants and cafes; hot food takeaways; offices; general industry; storage and distribution; non-residential institutions not included in 'more vulnerable'; and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do not need to remain operational during times of flood. • Sewage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place).
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The site fall under this classification.

Table D.3²³: of The Planning Policy Statement 25, Development & Flood Risk outlines the appropriate development through the Flood Vulnerability and Flood Zone 'Compatibility' which is as follows:

Table D.3²³: Flood Risk Vulnerability and Flood Zone 'Compatibility'

Flood Risk Vulnerability classification (see Table D2)		Essential Infrastructure	Water compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone (see Table D.1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	x	Exception Test required	✓
	Zone 3b 'Functional Flood plain'	Exception Test required	✓	x	x	x

Key:

✓ Development is appropriate

x Development should not be permitted

7 Site Specific Assessment

- The site is within a defended floodplain, as defined in Appendix 1 of the Environment Agency's 'Policy and Practice for the Protection of Floodplains' and is considered to be passive until such time as a flood greater than that for which the defences were designed occurs. The likelihood of flooding due to overtopping or failure of a flood defence embankment is considered to be small.
- The site is located within the catchment area of the Southery & District IDB. Road level of Sedge Fen Road is at minus 0.65m aOD.
- The existing standard of drainage for the Southery & District IDB is assessed at 1 in 50 years return period, compatible with the Department of the Environment, Food and Rural Affairs target level of service for rural drainage and flood defence works. Freeboard of 900mm is provided to the lowest land levels.
- The site and surrounding land drains by gravity to the Board's Southery Pumping Station to discharge into the River Ely Ouse.
- The River Ely Ouse is an embanked main river, the responsibility of the Environment Agency, with operating water levels controlled by the sluices and weirs of the Denver Complex, some 9.00kms downstream of the development site.
- The Environment Agency has commissioned in recent years the Ely Ouse Flood Defences Strategy; carried out by its Consulting Engineers. This Strategy included a hydraulic model of the Ely Ouse System extending from Bottisham Lock on the River Cam to the Wash downstream of Kings Lynn.
- As a result of this study, the Ely Ouse flood defences have a minimum protection of 1 in 100 years return period against a fluvial event. There is a long-term strategy for the maintenance of the defences which is reviewed and updated every 5 years. The main element of the strategy is the development of a programme for protecting the river banks from erosion.
- The study also took into account the consequences of a combined tidal and fluvial event occurring at the Denver Complex. The probability of such extreme events occurring at the same time is negligible and would not affect the Ely Ouse defences.
- Likewise the study analysed the impacts of climate change which the hydraulic model identified as a 250mm increase in sea level on fluvial flooding. This was found to have little effect on the 1 in 100 year fluvial flood event and well within the freeboard allowances of the Ely Ouse defences.
- Current maintenance standards of the Southery & District IDB and the Environment Agency's flood embankments are generally good. During the operation and maintenance of its pumping stations, associated structures and channel systems, particularly those that could affect property, the Board seeks to maintain a general standard capable of providing flood protection to its district. A routine maintenance programme is in place to ensure that the Board's assets are commensurate with the standard of protection that is sought. However, bank slips, blocked culverts etc. may occur from time to time and these matters are usually dealt with promptly.

8 Potential Sources of Flooding

- Four potential sources of flooding have been identified as a result of this assessment:
 - A. local blockages to IDB main drain system
 - B. storm return period of 1 in 50 years being exceeded
 - C. failure of Southery Pumping Station
 - D. overtopping and breaching of the Ely Ouse flood defences

- The probability of flooding from a) is low due to the maintenance standards already achieved and managed by the IDB.

- The probability of flooding from b) is also low due to the Southery & District IDB main drain design standard incorporating a minimum 900mm freeboard to the lowest land level which provides adequate storage in events greater than 1 in 50 years.

- Failure of Southery Pumping Station may occur due to long term mechanical breakdown or power supply being disrupted. However, in these circumstances, if conditions were such to put properties and land at risk of flooding, the Internal Drainage Board would take emergency action to maintain the drainage level of service by utilising temporary pumping equipment. The probability of such an occurrence is also considered to be low.

- Overtopping and breaching of the Ely Ouse flood defences is also considered to be a low risk as a result of the Ely Ouse Flood Defences Strategy which identified a minimum protection of 1 in 100 years allowing for climate change and the effect of a tidal event combining with a fluvial event. Existing defence level alongside the River Ely Ouse is 4.23m aOD.

- Design flood levels for the 1 in 100 year return period event inclusive of climate change demonstrate that sufficient freeboard is available to existing defence levels that no overtopping would occur.

- For a breach to occur, this is normally associated with water initially overtopping the defences and as can be seen from the previous paragraph and also the Agency's Ely Ouse Flood Defences Standard of Protection Study, this is highly unlikely.

- The developer should ensure that the eventual occupiers of the dwellings are sufficiently aware of the risk of flooding, and the standard of the existing defences. The Environment Agency provides a Flood Warning Service which includes Flood Warning Codes and uses direct warning methods where the risks and impacts of flooding are high. Indirect warnings are provided to all flood risk areas, even those at low risk of flooding. The main method is media broadcasts via local radio and also by television. In addition to direct and indirect flood warnings, the Environment Agency operates a 24 hour a day Floodline Service providing advice and information on flooding contacting 0845 988 1188 and the occupiers should register with the Floodline Direct Warnings Service to receive any future flood warnings.

- The standard of protection provided by the proposed soakaway surface water drainage gives a low risk of flooding due to high groundwater, overland flow and any surcharging of systems due to prolonged or intense rainfall.

9 Extent of Known Flooding

- During the preparation of this assessment, no evidence was discovered of the site being flooded.

10 Probabilities and Trends of Flooding

- The probability of this development flooding from localised drainage systems is very low. It is also intended to construct floor levels of the new dwellings at a minimum level of Sedge Fen Road carriageway level.
- The probability of the site flooding with water from any Environment Agency system is less than 1% because of the standards of the existing flood defence systems, storage within existing drainage channels and proposed floor levels at the site.
- If under very extreme events, levels of floodwater from the Ely Ouse and the Southery & District IDB rose to such an extent that the site was affected, the situation would not be sudden. It is very probable that sufficient time would be available to take precautionary actions to limit the extent and potential impact of flooding.
- The water levels in the drainage channels will tend to rise as a result of the impacts of climate change. However the existing systems and defences together with the raising of floor levels above ground level will be appropriate for the design life of the development (i.e. 100 years). No adverse effect will be suffered at this site.

11 Impacts of Flooding

- No significant impacts of flooding are anticipated due to the existing standards of drainage and the proposals for soakaway surface water drainage.
- Floor levels of the development will be above existing land level and compatible with Sedge Fen Road carriageway level.
- The general location of the site within the catchment is such that if flooding occurred from the Ely Ouse and the Southery & District IDB main drain systems, then probably sufficient warning time would be available.
- Displacement of water from the site will not affect any adjoining properties and agricultural land due to the surface water drainage being designed to meet with BRE365 requirements and Building Regulations approval.

12 Residual Risk – Extreme Events.

- The residual risk from extreme events is very low on this site, because of its location within the catchment and the level of protection offered by the Ely Ouse and the Burnt Fen IDB defences and proposed floor levels compared to surrounding land and road level.
- In the extreme event of a serious blockage or pumping station failure occurring to the arterial drainage system, protection will be afforded by the proposed raising of floor levels above existing land level

13 Exception Test

The proposed development is to be used solely for a vehicle storage yard in connection with the applicant's existing establish use on-site.

The proposed work comprises of 1) Alterations to Existing Vehicular Entrance, 2) Provisions of 2No. New Office/Welfare Cabins, 3) Relocation of an existing Storage Container, 4) Extension of Existing Vehicular Storage Yard, 5) Recladding of an Existing Steel Frame Storage Shed, 6) Installation of a new 2 bay lorry wash facility, 7) Revised/Alterations to boundary treatments, 8) All associated Site Development Works including drainage & lighting.

The proposed development is low risk and does not entail the following:

- The Applicant's have owned and operated the lands for many years and the existing shed locations have not known to be threatened by flood waters.
- The development type is Low risk.
- Does not involve the construction of any new significant buildings in the area.
- Does not obstruct an important flow path.
- Does not entail the storage of hazardous material.
- Does not impede access to a watercourse, floodplain or flood protection and management facilities.
- Proposes mitigation measurements to counter-act any risk to flood by the development.

It is our conclusion of the Exception Test that the development is permissible under the guidelines and passes the test.

14 Mitigating Flood Risk

It is necessary to protect and minimize the impact flooding may have on the development and the surrounding area.

The following measures are to be taken to ensure as far as reasonable possible the proposed development and surrounding areas are protected from flooding:

- 1) Apply Sustainable Drainage Systems (SuDS) design to the site.
- 2) Apply Flood Resilient Construction Measures.
- 3) Implement Water Harvesting

- **The measures to be implemented from the SuDS Design work:**

Constructed soak pits/water attenuation tanks and divert the rain water to the soak pits/water attenuation tanks in accordance with BRE365 Soakaway Design.

In our professional opinion the proposed storm water solutions are the most desirable solution to runoff management as they control the rate of runoff from the site and reduce the amount of Surface/Overland Flow runoff from the development site and reduce the impact the proposed development will have on the surrounding areas.

- **Flood Resilient Construction Measures**

Flood Resilience construction measures are works carried out to the structure and services of the proposed building to ensure the building is more robust and easier to clean/dry out and repair in the event of flood water entering the building.

The following Resilience Construction measures will be carried out:

1. All Electric sockets/cabling to be constructed above Freeboard flood risk level.
2. Cabins to be of steel construction laid on robust dpm to resist floodwater and rising groundwater.
3. Reduce the use of timber in any of the construction.

- **Implement Water Harvesting**

Rain water from the roofs of buildings 1 & 2 is to be collected and utilised in the 2 bay lorry wash facility.

Rain water from the roof of the office/welfare cabins is to be utilised in the sanitary facilities and feed the cisterns of the toilets.

SECTION C

15 Conclusion

Based on the examination of the development site, and of its location and all development works relating to the application as proposed we have taken account and applied 'The Planning Policy Statement 25, Development & Flood Risk' in this proposed Flood Risk Assessment of the development site, the following conclusions have been reached:-

The proposed development is not in a Functional Floodplain. It is located in the Passive floodplain of the Ely Ouse and protected to a minimum of the 1 in 100 years return period event.

Although the site is located within an Internal Drainage Board catchment with a minimum standard of drainage of 1 in 50 years, this accords with Defra guidelines for rural development. Freeboard to design water level of 900mm to lowest land level is available for events greater than 1 in 50 years providing further storage within the drainage channels.

Floor levels will be raised above existing land level by 500mm.

Surface water drainage from the development will be achieved by soakaway drainage to BRE365 requirements and Building Regulations approval.

The results for the Exception Test show the proposed development with the measures outlined in section 10 of the report will not represent a flood risk.

We feel this application as proposed should be granted planning permission as it put into place measures to minimize any potential risk to people, the property and the environment, and it is located within an area where LOW RISK development is permitted under "The Planning Policy Statement 25, Development & Flood Risk"

In our professional opinion the granting of the proposed works in this location will have no impact on flooding or of flood Risk to the development site or the surrounding area and will allow the applicant to extend his business in a sustainable way.

16 Declaration

We have endeavoured in my report and in my opinion to have covered all relevant issues concerning the matters stated, which I have been asked to address, and the opinions expressed represent my true and complete professional opinion.

I have endeavoured to include in my report those matters of which I have knowledge and of which I have been made aware which might adversely affect the validity of my opinion.

I have indicated the sources of all the information that I have used.

I have where possible formed an independent view on matters. Where I have relied upon information from others I have so disclosed in my report.

I will notify those instructing me immediately and confirm in writing if, for any reason, my existing report or opinion requires any correction or qualification.

Signed:  _____

Joseph Cotter – BEng (Hons) Civil Engineering, M.I.E.I
For and on behalf of Dowdall Architects

Dated: 25th August 2022

Appendix A

- **Environment Agency – Flood Map for Planning**

Flood map for planning

Your reference
**BRIAN EASEY -
SOUTHERY**

Location (easting/northing)
562471/292322

Created
1 Sep 2022 14:50

Your selected location is in flood zone 3 – an area with a high probability of flooding that benefits from flood defences.

This means:

- you may need to complete a flood risk assessment for development in this area
- you should ask the Environment Agency about the level of flood protection at your location and request a Flood Defence Breach Hazard Map (You can email the Environment Agency at: enquiries@environment-agency.gov.uk)
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (find out more at www.gov.uk/guidance/flood-risk-assessment-standing-advice)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>









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Flood map for planning

Your reference
BRIAN EASEY -
SOUTHRY
Location (easting/northing)
562471/292322

Scale
1:2500
Created
1 Sep 2022 14:50

-  Selected point
-  Flood zone 3
-  Flood zone 3: areas benefiting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area

