

PLANNING AUTHORITY'S SUBMISSIONS



Renfrewshire Council

Renfrewshire House Cotton Street Paisley PA1 1JD Tel: 0300 3000 144 Email: dc@renfrewshire.gov.uk

Applications cannot be validated until all the necessary documentation has been submitted and the required fee has been paid.

Thank you for completing this application form:

ONLINE REFERENCE 100603380-002

The online reference is the unique reference for your online form only. The Planning Authority will allocate an Application Number when your form is validated. Please quote this reference if you need to contact the planning Authority about this application.

Applicant or Agent Details

Are you an applicant or an agent? * (An agent is an architect, consultant or someone else acting on behalf of the applicant in connection with this application)

☐ Applicant ☒ Agent

Agent Details

Please enter Agent details

Company/Organisation: ICDP Architects

Ref. Number:

You must enter a Building Name or Number, or both: *

First Name: *

William

Building Name:

Moorpark House

Last Name: *

Findlater

Building Number:

11

Telephone Number: *

Address 1
(Street): *

Orton Place

Extension Number:

Address 2:

Mobile Number:

Town/City: *

Glasgow

Fax Number:

Country: *

Scotland

Postcode: *

G51 2HF

Email Address: *

Is the applicant an individual or an organisation/corporate entity? *

☒ Individual ☐ Organisation/Corporate entity

Applicant Details

Please enter Applicant details

Title:	<input type="text" value="Mrs"/>	You must enter a Building Name or Number, or both: *	
Other Title:	<input type="text"/>	Building Name:	<input type="text" value="East Fulwood Farm House"/>
First Name: *	<input type="text" value="Lyndsey"/>	Building Number:	<input type="text"/>
Last Name: *	<input type="text" value="Martin"/>	Address 1 (Street): *	<input type="text" value="Houston Road"/>
Company/Organisation	<input type="text"/>	Address 2:	<input type="text"/>
Telephone Number: *	<input type="text"/>	Town/City: *	<input type="text" value="Inchinnan"/>
Extension Number:	<input type="text"/>	Country: *	<input type="text" value="Scotland"/>
Mobile Number:	<input type="text" value="REDACTED"/>	Postcode: *	<input type="text" value="PA4 9LX"/>
Fax Number:	<input type="text"/>		
Email Address: *	<input type="text" value="REDACTED"/>		

Site Address Details

Planning Authority:	<input type="text" value="Renfrewshire Council"/>
Full postal address of the site (including postcode where available):	
Address 1:	<input type="text" value="EAST FULWOOD FARM HOUSE"/>
Address 2:	<input type="text" value="HOUSTON ROAD"/>
Address 3:	<input type="text" value="INCHINNAN"/>
Address 4:	<input type="text"/>
Address 5:	<input type="text"/>
Town/City/Settlement:	<input type="text" value="RENFREW"/>
Post Code:	<input type="text" value="PA4 9LX"/>

Please identify/describe the location of the site or sites

Northing	<input type="text" value="667869"/>	Easting	<input type="text" value="245532"/>
----------	-------------------------------------	---------	-------------------------------------

Description of Proposal

Please provide a description of your proposal to which your review relates. The description should be the same as given in the application form, or as amended with the agreement of the planning authority: *
(Max 500 characters)

Erection of two Chalets

Type of Application

What type of application did you submit to the planning authority? *

- ☒ Application for planning permission (including householder application but excluding application to work minerals).
- ☐ Application for planning permission in principle.
- ☐ Further application.
- ☐ Application for approval of matters specified in conditions.

What does your review relate to? *

- ☒ Refusal Notice.
- ☐ Grant of permission with Conditions imposed.
- ☐ No decision reached within the prescribed period (two months after validation date or any agreed extension) – deemed refusal.

Statement of reasons for seeking review

You must state in full, why you are seeking a review of the planning authority's decision (or failure to make a decision). Your statement must set out all matters you consider require to be taken into account in determining your review. If necessary this can be provided as a separate document in the 'Supporting Documents' section: * (Max 500 characters)

Note: you are unlikely to have a further opportunity to add to your statement of appeal at a later date, so it is essential that you produce all of the information you want the decision-maker to take into account.

You should not however raise any new matter which was not before the planning authority at the time it decided your application (or at the time expiry of the period of determination), unless you can demonstrate that the new matter could not have been raised before that time or that it not being raised before that time is a consequence of exceptional circumstances.

The incorporation of measures of mitigation adequately deals with the Policy 22 of NPF4 and Policy 13 of the LDP and the New Development Supplementary Guidance on Delivering the Infrastructure Strategy (Flooding and Drainage) as outlined on the submitted Appeal Statement, Amended Site Layout and Flood Risk Assessment by Messrs Terrenus Land & Water.

Have you raised any matters which were not before the appointed officer at the time the Determination on your application was made? *

☒ Yes ☐ No

If yes, you should explain in the box below, why you are raising the new matter, why it was not raised with the appointed officer before your application was determined and why you consider it should be considered in your review: * (Max 500 characters)

Increasing the Finished Floor level by 150mm to take account of the 300mm freeboard on the 1 in 200-year plus climate change event peak water level and a 350mm freeboard on the 1 in 1000-year event. SEPA had this information but the Officer did not. Additionally incorporating a small raised stilted walkway to an exit point on dry land.

Please provide a list of all supporting documents, materials and evidence which you wish to submit with your notice of review and intend to rely on in support of your review. You can attach these documents electronically later in the process: * (Max 500 characters)

1. Appeal Statement Application 22/0706/PP 2. Revised drawing L(-)01 Rev A indicating extent of raised walkway. 3. Terrenus Land & Water, Flood Risk Assessment

Application Details

Please provide the application reference no. given to you by your planning authority for your previous application.

~~22/0706/PP~~ 22/0706/PP

What date was the application submitted to the planning authority? *

17/08/2022

What date was the decision issued by the planning authority? *

11/07/2023

Review Procedure

The Local Review Body will decide on the procedure to be used to determine your review and may at any time during the review process require that further information or representations be made to enable them to determine the review. Further information may be required by one or a combination of procedures, such as: written submissions; the holding of one or more hearing sessions and/or inspecting the land which is the subject of the review case.

Can this review continue to a conclusion, in your opinion, based on a review of the relevant information provided by yourself and other parties only, without any further procedures? For example, written submission, hearing session, site inspection. *

☒ Yes ☐ No

In the event that the Local Review Body appointed to consider your application decides to inspect the site, in your opinion:

Can the site be clearly seen from a road or public land? *

☒ Yes ☐ No

Is it possible for the site to be accessed safely and without barriers to entry? *

☒ Yes ☐ No

Checklist – Application for Notice of Review

Please complete the following checklist to make sure you have provided all the necessary information in support of your appeal. Failure to submit all this information may result in your appeal being deemed invalid.

Have you provided the name and address of the applicant? *

☒ Yes ☐ No

Have you provided the date and reference number of the application which is the subject of this review? *

☒ Yes ☐ No

If you are the agent, acting on behalf of the applicant, have you provided details of your name and address and indicated whether any notice or correspondence required in connection with the review should be sent to you or the applicant? *

☒ Yes ☐ No ☐ N/A

Have you provided a statement setting out your reasons for requiring a review and by what procedure (or combination of procedures) you wish the review to be conducted? *

☒ Yes ☐ No

Note: You must state, in full, why you are seeking a review on your application. Your statement must set out all matters you consider require to be taken into account in determining your review. You may not have a further opportunity to add to your statement of review at a later date. It is therefore essential that you submit with your notice of review, all necessary information and evidence that you rely on and wish the Local Review Body to consider as part of your review.

Please attach a copy of all documents, material and evidence which you intend to rely on (e.g. plans and Drawings) which are now the subject of this review *

☒ Yes ☐ No

Note: Where the review relates to a further application e.g. renewal of planning permission or modification, variation or removal of a planning condition or where it relates to an application for approval of matters specified in conditions, it is advisable to provide the application reference number, approved plans and decision notice (if any) from the earlier consent.

Declare – Notice of Review

I/We the applicant/agent certify that this is an application for review on the grounds stated.

Declaration Name: Mr William Findlater

Declaration Date: 09/10/2023



ICDP Architects, Moorpark House, 11 Orton Place, Glasgow G51 2HF

APPEAL STATEMENT Application 22/0706/PP

Project: Erection of Two (2) Chalets

Report prepared by: WJF

Address: East Fulwood Farm House, Houston Rd, Inchinnan, Renfrew PA4 9LX

Job No: GW 22 723

Applicant: Ms Lyndsey Martin

Date: 9 October 2023

1.0 INTRODUCTION

1.1 The application reference 22/0706/PP was registered on 5 December 2022 seeking Planning Permission to erect two Chalets at East Fulwood Farm.

1.2 The application was refused under delegated powers on 11 July 2023.

2.0 REASONS FOR REFUSAL

2.1 **Reason 1.** citing the following reason for the decision:

The proposed development is at a location susceptible to flooding. It does not therefore align with the precautionary and avoidance principles advocated by the sustainable flood risk management framework and is contrary to Policy 22 of National Planning Framework 4, Policy 13 of the Adopted Renfrewshire Local Development Plan and the associated New Development Supplementary Guidance on Delivering the Infrastructure Strategy (Flooding and Drainage).

3.0 RESPONSE

3.1 **Policy 22 of NPF 4:** Policy 22 Flood Risk and Water Management is addressed and relevant as the proposed development will be resilient to current and future flood risk. As per Policy 22a) i and iv, the development proposal of two Chalets within a flood risk area can be supported if they are for the redevelopment of an existing site for an equal or less vulnerable use and where proposals demonstrate that the long term safety and resilience can be secured in accordance with relevant SEPA advice (Part a. iii and iv respectively).

3.2 The application site is brownfield in nature and the proposed use of the site is of equal vulnerability as the previous use was residential in nature being conjoined to the Farmhouse for purposes associated with the residence.

3.3 For development proposals that meet criteria Part iv, where flood risk is managed at the site rather than avoided there is also a requirement for the first occupied/utilised floor to be above the flood risk level and have an additional allowance for the freeboard and in the event of a flood to avoid the creation of an island development and that safe access/egress can be achieved.

3.4 The Applicant has commissioned a detailed Flood Risk Assessment by Messrs Terrenus Land & Water (included with this Application) to examine in detail the potential risks associated with this small scale development. For new developments the acceptable risk of flooding must take account of the various factors including risk to human health and the direct and indirect financial losses relating to flooding. Under existing conditions, the risks from flooding at the site are determined as follows:

1. The majority of the site is at **Little or No Risk** of flooding from an isolated extreme costal flooding event. The northwest edge adjacent to the Lin Burn is at **Low to Medium Risk**.
2. The site is at **Little or No Risk** of surface water flooding.
3. The site is at **Little or No Risk** of flooding as a result of a failure in the local drainage network.
4. The site is at **Little or No Risk** of isolated groundwater rise.
5. The site entrance and along the southeast boundary are considered to be **Medium to High Risk** of fluvial flooding. The majority of the site is at **Low to Medium Risk** of fluvial flooding from the Lin Burn.

3.5 While dry pedestrian and vehicular access and egress is compromised by the functional floodplain, the anticipated depths are minimal and will not be sufficient to prevent access to the site. Furthermore, this inundation on the access is limited to only the vicinity of the site, with the remainder of the access road being free from flooding throughout all considered storm events.

3.6 **LDP Policy 13 – Flooding and Drainage:** Policy 13 promotes avoidance as the first principle of sustainable flood risk management. New development requires to avoid areas susceptible to flooding.

3.7 It is accepted that the site is susceptible to flood. The calculated potential flood level however is minimal and the proposed design avoids the risk of flood to residents and structures by lifting the finished floor from +450mmOD to +600mmOD an increase of 150mm.

4.0 PROPOSED DEVELOPMENT AND FLOOD RESILIANCE MEASURES

4.1 The proposed redevelopment has been applied for under the land use classification Most Vulnerable which is the same classification as the existing Farmhouse. To comply with this classification the following flood mitigation and flood resilience measures will be incorporated to ensure there is minimal impact upon the flood storage, conveyance and risk to the proposed re-development and site neighbours.

4.2 The Applicant proposes the following design measures:

1. No land raising within the functional floodplain within the site.
2. A final Ground Floor Level of 6.75mOD which will provide a 300mm freeboard on the 1 in 200-year plus climate change event peak water level and a 350mm freeboard on the 1 in 1000-year event for the development.
3. Use of Flood Resistant construction methods and materials for the new Chalets.
4. Locating electrical equipment outwith estimated peak water surface elevations at a minimum of 6.87mOD, allowing for a 600mm freeboard.
5. Registration with SEPA Floodline for flooding alerts.
6. Installation of a bespoke flood monitoring alarm system to initiate a site flood evacuation plan.
7. Provision of a raised stilted walkway (as submitted Site Plan L(--)-01 Rev A) to permit residents to exit the Chalets keeping their feet dry to the higher ground level at the Farmhouse.

5.0 PHYSICAL WORKS ASSOCIATED WITH THE EXISTING WATERCOURSE

5.1 In relation to flood risk, the Water Environment (Controlled Activities) (Scotland) Regulations 2005 (CAR) may be affected by the development site. The Applicant acknowledges that no earthworks shall be carried out within the banks of the Lin Burn without prior consultation with SEPA and the application of the relevant licensing guidance in relation to CAR regulations.

5.2 Construction works on site will likely require sediment control for surface water runoff to ensure watercourses are not impacted by increased sediment load as a result of construction activities. A pollution prevention plan or surface water management plan will be agreed with SEPA.

6.0 CONCLUSION

6.1 Scottish Planning Policy notes that new developments should be free from significant flood risk from any source and that such developments should not:

1. Materially increase the probability of flooding elsewhere.
2. Add to the area of land which requires protection by flood prevention measures.
3. Affect the ability of the functional flood plain to attenuate the effects of flooding by storing flood water.
4. Interfere detrimentally with the flow of water in the floodplain,
5. Compromise options for future river management.

6.2 It has been established that parts of the site lie within the functional floodplain. Given that the access road to the site allows pedestrian and vehicle access during the design storm event, development of areas within the functional floodplain in line with the measures of mitigation as outlined above, can be considered to be in the spirit of the broad principles of Scottish Planning Policy.

6.3 The Applicant proposed to make a mandatory registration with the SEPA Floodline and will install a flood monitoring/ alarm system in conjunction with a site evacuation plan and operation and maintenance policy highlighting flood risk responsibilities and

mitigation measures. All accommodation is located above the maximum flood level and an elevated walkway to ground outwith the calculated flood level is also incorporated together with construction which is flood resistant.

6.4 As the Application complies with the broad principles of the Development Plan and is supported by relevant material considerations, and with there being no material considerations to indicate otherwise, the appeal should be allowed and the Application approved.

**EAST FULWOOD FARM, INCHINNAN
FLOOD RISK ASSESSMENT REPORT
FOR
LYNDSEY MARTIN**

Report No.	1698-207	Version:	Original
Author:	DA	Issue Date:	5 April 2022

**EAST FULWOOD FARM, INCHINNAN
FLOOD RISK ASSESSMENT REPORT
FOR
LYNDSEY MARTIN**

SITE SUMMARY INFORMATION

Name of Site:	East Fulwood Farm, Inchinnan
Ordnance Survey Grid Reference:	NS 45515 67875
Site Address:	East Fulwood Farm, Houston Road, Inchinnan, PA4 9LX
Local Authority:	Renfrewshire Council
Land Use (Existing):	Vacant Hardstanding
On site buildings:	No
Proposed Site Use:	Holiday Dwelling
Area (m ²);	425m ²
Local Development Plan (LDP);	LDP 2 2021- ENV1 Greenbelt
Type of Investigation:	Level 3 Flood Risk Assessment

**EAST FULWOOD FARM, INCHINNAN
FLOOD RISK ASSESSMENT REPORT
FOR
LYNDSEY MARTIN**

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
1 INTRODUCTION	1
1.1 BACKGROUND	1
1.2 OBJECTIVES OF INVESTIGATION	1
1.3 SCOPE OF STUDY	1
1.4 PROPOSED SITE END-USE	1
1.5 LIMITATIONS OF REPORT	1
2 SITE DETAILS.....	2
2.1 DATA SOURCES	2
2.2 SITE LOCATION & DESCRIPTION.....	2
2.2.1 Ground Truthing	2
2.3 SITE HISTORY	3
2.4 SITE NEIGHBOURS	3
2.5 HYDROLOGY AND DRAINAGE.....	3
2.5.1 SEPA Flood Map	3
2.5.2 Scottish Water Assets	4
2.6 GEOLOGICAL SETTING	4
2.7 FLOOD DEFENCE WORKS	4
3 FLOOD RISK ASSESSMENT	5
3.1 GENERAL.....	5
3.2 COASTAL FLOOD RISK	5
3.2.1 Coastal Flood Boundary Conditions for the UK (2018).....	5
3.2.2 Assessed Risk of Inundation from the Sea	6
3.3 JOINT PROBABILITY	6
3.4 SURFACE WATER.....	7
3.5 LOCAL DRAINAGE.....	7
3.6 GROUNDWATER RISE	8
3.7 FLUVIAL FLOOD RISK.....	8
3.7.1 General.....	8
3.7.2 Model Domain	8
3.7.3 Digital Terrain Development	8

**EAST FULWOOD FARM, INCHINNAN
FLOOD RISK ASSESSMENT REPORT
FOR
LYNDSEY MARTIN**

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
3.7.4 Contributing Catchments	9
3.7.5 Inflow Boundary Condition	9
3.7.6 Climate Change Allowance	10
3.7.7 Downstream Model Boundary	10
3.7.8 Roughness Coefficient	11
3.7.9 Structures	12
3.7.10 Computational Mesh	12
3.7.11 Computational Time Step	13
3.7.12 Mass Balance Errors	13
3.7.13 Equation Set and Default Parameters	13
3.7.14 Projection	13
3.7.15 Sensitivity Analysis	14
3.7.16 Velocity	15
3.7.17 Froude Number	15
3.7.18 Courant Number	15
3.7.19 Model Results under Existing Conditions	16
3.7.20 Blockage Analysis	16
4 DISCUSSION AND RECOMMENDATIONS.....	17
4.1 GENERAL.....	17
4.2 DEVELOPMENT AND POSSIBLE FLOOD RESILIENCE MEASURES	17
4.3 PHYSICAL WORKS ASSOCIATED WITH THE EXISTING WATERCOURSE.....	17
4.4 EFFECTS ON SITE NEIGHBOURS	18
4.5 OVERALL FLOOD RISK ASSESSMENT CONCLUSION	18

**EAST FULWOOD FARM, INCHINNAN
FLOOD RISK ASSESSMENT REPORT
FOR
LYNDSEY MARTIN**

Figures

- Figure 1 – Site Location Plan**
- Figure 2A – Terrenus Spot Heights Survey**
- Figure 2B – Terrenus Spot Heights Survey**
- Figure 3 – Survey Comparison Points**
- Figure 4 – Flow Accumulation Pathways**
- Figure 5 – Catchment Analysis**
- Figure 6 – Lin Burn Fluvial Hydrographs**
- Figure 7 – Black Cart Water Fluvial Hydrographs**
- Figure 8 – River Gryffe Fluvial Hydrographs**
- Figure 9 – Tidal Hydrographs**
- Figure 10 – 1 in 200-Year Fluvial Storm Event Inundation Extent**
- Figure 11 – 1 in 200-Year plus Climate Change Allowance Fluvial Storm Event Inundation Extent**
- Figure 12 – 1 in 500-Year Fluvial Storm Event Inundation Extent**
- Figure 13 – 1 in 1000-Year Fluvial Storm Event Inundation Extent**
- Figure 14 – 1 in 1000-Year plus Climate Change Allowance Fluvial Storm Event Inundation Extent**
- Figure 15 – 1 in 1000-Year Tidal Storm Event Inundation Extent**
- Figure 16 – 1 in 1000-Year plus Climate Change Allowance Tidal Storm Event Inundation Extent**
- Figure 17 – 1 in 1000-Year Fluvial Storm Event Maximum Water Velocity**
- Figure 18 – 1 in 1000-Year Fluvial Storm Event Froude Sensitivity Analysis**
- Figure 19 – 1 in 1000-Year Fluvial Storm Event Courant Sensitivity Analysis**
- Figure 20 – 1 in 200-Year Fluvial Storm Event Inundation Extent – Minor Blockage Analysis**
- Figure 21 – 1 in 200-Year Fluvial Storm Event Inundation Extent – Major Blockage Analysis**

Tables

- Table 1 – Simple Desktop Joint Probability Analysis**
- Table 2 – Peak Flow Methodology Analysis**
- Table 3 – Peak Flow Estimation Summary**

Photographic Plates

Catchment Descriptors

HEC-RAS Computation Reports

SEPA FRA Checklist

**EAST FULWOOD FARM, INCHINNAN
FLOOD RISK ASSESSMENT REPORT
FOR
LYNDSEY MARTIN**

1 INTRODUCTION

1.1 BACKGROUND

The development of a holiday dwelling on the grounds of East Fulwood Farm, Inchinnan is currently under consideration by the Client, Lyndsey Martin.

The Lin Burn flows in close proximity to the northwest boundary and joins the River Gryffe some 430m south-southeast of site. As part of the development process Terrenus Land & Water Ltd was commissioned by Messrs Mabbett & Associates Ltd, on behalf of the Client, to carry out a Level 3 flood risk assessment of the site.

1.2 OBJECTIVES OF INVESTIGATION

The principal aim of the investigation is to define the functional floodplain in the local area and to assess the risk of flooding to the proposed development.

1.3 SCOPE OF STUDY

The following tasks were undertaken during the course of this investigation:

- Site walkover inspection;
- Acquisition of site topographic spot height data;
- Collation of data;
- Assessment of data;
- Joint probability analysis;
- 2D Hydraulic Modelling using HEC-RAS modelling software; and
- Production of an Interpretative Report.

1.4 PROPOSED SITE END-USE

It is understood that the proposed development of the site will involve the construction of a holiday cabin. The site location and extent is shown on Figure 1, which is included in the Appendix.

It is noted that the proposed development increases the SEPA Land Use Vulnerability Classification¹ as per table 1 in the guidance document, holiday dwellings are classified as Most Vulnerable and thus the 1 in 1000-year storm event constitutes the design storm event.

1.5 LIMITATIONS OF REPORT

Terrenus Land & Water Ltd has prepared this report for the sole use of the Client, in accordance with generally accepted consulting practice and for the intended purpose as stated in the related contract agreement. No other warranty, expressed or implied, is made as to the professional advice included in this report. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from Terrenus Land & Water Ltd; a charge may be levied against such approval.

To the best of our knowledge, information contained in this report is accurate at the date of issue. There may be conditions pertaining at the site not disclosed by the study, which might have a bearing on the recommendations provided if such conditions were known. We have, however, used our professional judgement in attempting to limit this during the assessment.

It is important therefore that these implications be clearly recognised when the findings of this study are being interpreted. In addition, this should be borne in mind if this report is used without further confirmatory investigation after a significant delay.

¹ <https://www.sepa.org.uk/media/143416/land-use-vulnerability-guidance.pdf>

2 SITE DETAILS

2.1 DATA SOURCES

The following data sources were consulted during the course of the Flood Risk Assessment:

- Client-supplied data including site location;
- 0.5m Phase 5 DTM LiDAR data set, obtained from the Scottish Remote Sensing Portal;
- Site walkover inspection and additional topographic surveying;
- Flood Estimation Handbook – Web Service (FEH13);
- Publicly available online historic maps; and
- Available additional information.

2.2 SITE LOCATION & DESCRIPTION

The site is located within a rural area of Renfrewshire, near Inchinnan, situated 1km west of Inchinnan Business Park, and is centred on National Grid Reference NS 45515 67875. As shown on Figure 1, which is contained within the Appendix.

The site covers an area of around 425m² and has an approximately rectangular shaped boundary, which lies between the southern bank of the Lin Burn and the existing farm steading of East Fulwood Farm. The boundary is marked by palisade fencing on the northwest and southwest edges and the wall of the farm steading building to the southeast. The northwest boundary is open to the site access road.

An understanding for the local topography was provided by project commissioned topographic spot height survey undertaken by Terrenus Land & Water Ltd during the site walkover inspection on the 7 March 2022. The location of the spot heights acquired by Terrenus are shown on Figures 2A & 2B, contained within the Appendix.

The site is generally flat-lying with a very slight slope southeast to northwest, from a high of 6.0m OD to 5.77m OD. The Lin Burn channel bed lies at around 2.9mOD.

2.2.1 Ground Truthing

The LiDAR dataset was 'truthed' against the spot height survey data at key locations within the site and surrounding area. Table A, below, provides a sample of the spot height survey points against the LiDAR data. The average deviation between the LiDAR and survey data is 17mm, with the greatest differential being 30mm which is reasonable in this instance. The locations of the survey points chosen for comparison are shown on Figure 3. The LiDAR data was found to be a reasonable and accurate representation of the local topography.

Survey Point	Surveyed Levels	LiDAR Data Levels	Deviation
1	6.13	6.12	+0.01
2	6.0	6.01	-0.01
3	6.48	6.48	0
4	6.58	6.61	-0.03
5	5.46	5.49	-0.03
6	4.99	5.01	-0.02
Average Deviation		0.017	
Maximum Deviation		0.03	

Table A: Ground Truthing

The survey comparison found that LiDAR levels within the Lin Burn channel were typically around 600mm higher than actual surveyed levels. This effect is due to the water and vegetation within the channel providing a surface within the LiDAR dataset.

2.3 SITE HISTORY

The site and East Fulwood Farm as a whole is shown on the First Edition Ordnance Survey maps dated 1863. The site and adjacent farm steading are shown to be relatively unchanged since the earliest record. The farm steading is noted to have been changed, likely the historic structure was demolished and replaced with the steading that is now present. The warehouse of the landscaping company to the southeast of site is absent and due to its modern construction, was likely erected in the 2010's.

Little change is recorded in the wider area, with the exception of the relatively recent M8 to the west and the expansion of the industrial estate and Inchinnan to the east.

2.4 SITE NEIGHBOURS

Immediately adjacent to the southeastern site boundary is the farm steading of East Fulwood Farm, with the courtyard beyond. Further southeast is the parking area and warehouse of a local landscaping firm.

Immediately south of the site is the garden of East Fulwood Farm, with small paddocks beyond.

The Lin Burn flows north to south along the northwest and western site boundary, with agricultural fields beyond.

Immediately north of the site is the road bridge over the Lin Burn which connects to the fields north of the site.

2.5 HYDROLOGY AND DRAINAGE

The Lin Burn is the closest watercourse to the site. This watercourse is fed by the fields north of site and has a catchment of 5.03km². The burn is culverted at numerous locations along its course and generally lies within a steep-banked trapezoidal channel. Approximately 440m south-southeast of the site, the Lin Burn comes to confluence with the River Gryffe.

The River Gryffe, which is a tributary of the Black Cart Water and the River Clyde further downstream flows from west to east originating from Loch Thorn and the Gryffe Reservoirs 20km upstream of the site.

During the site walkover, the channel bed of the River Gryffe was noted to be generally flat with gravel and cobbles present. The banks of the watercourse are earthen and well-defined.

The Black Cart Water is fed by the hills of Clyde Muirshiel some 14km southwest of the site. It is additionally fed by runoff from the fields and by tributaries along its course towards the River Clyde.

2.5.1 SEPA Flood Map

The Scottish Environment Protection Agency (SEPA) has produced 'Flood Maps' for the local area. These maps are enhanced and show potential flooding from coastal, rivers (fluvial) and surface water (pluvial) sources. In addition, the maps provide a breakdown of flood likelihood in broad agreement with the Scottish Planning Policy Risk Framework.

A review of the maps indicate that the site is within the Medium to Low Likelihood of fluvial flood risk, with a High Likelihood of fluvial flooding immediately adjacent to the northwestern boundary.

There is no likelihood of surface water flood risk at site, according to the SEPA flood maps.

There is no likelihood of coastal flood risk at site, however, a high likelihood of coastal flood risk is present along the course of the Lin Burn in the immediate vicinity of site, and along the River Gryffe and the Black Cart Water in the wider vicinity. This indicates that there is coastal/tidal influence on the water levels at site.

There is no likelihood of flood risk from any source on the access road or Houston Road as it heads east.

SEPA makes the following statement about the Flood Map:

“The river flood map was developed using a nationally consistent approach to producing flood hazard information, such as depth of water and speed of flow arising from river flooding. It is based on a two-dimensional flood modelling method applied across Scotland to all catchments greater than 3km². The river flood map includes hydraulic structures and defences such as bridges, culverts and flood storage areas where appropriate information was available.

and

The surface water flood map combines information on rainfall and sewer model outputs. It incorporates data from a national surface water study, a regional surface water study with increased resolution in selected areas and a Scottish Water sewer flooding assessment.”

The flood map should be treated with caution and SEPA makes the following general comment:

“The flood maps are designed to provide a community level assessment of flooding and its impacts. They model flooding at a national scale. As with any approach of this scale, there are limitations and assumptions made to enable modelling and a consistent approach to be applied across Scotland. Limitations arise from the data used to create the maps, the modelling techniques applied and the ability to incorporate datasets from local studies into a national approach.”

Additional background details of the SEPA flood map can be found on the SEPA website:
http://www.sepa.org.uk/flooding/flood_maps.aspx

2.5.2 Scottish Water Assets

From a review of Scottish Water asset plans there are no known Scottish Water drainage assets in the vicinity of the site with the nearest assets being along Barnsford Road A726 1km east of site.

A trunk water supply main runs adjacent to the Lin Burn upstream of site and along the access road. A visible washout is located upstream of the bridge adjacent to the site's northern boundary.

An abandoned pipe is present along the northern edge of Houston Road south of site, evidence of which is visible upstream of the Houston Road bridge over the Lin Burn.

The Scottish Water assets plans are included in the Appendix.

2.6 GEOLOGICAL SETTING

The following summary of the solid and superficial geology of the site is based on a review of the British Geological Survey (BGS) Geology of Britain Viewer².

The underlying superficial deposits are recorded to comprise gravel, sand and silt of Devensian age raised tidal flat deposits.

The bedrock at site is recorded to comprise a mix of the Lower Limestone Formation and Limestone Coal Formation.

2.7 FLOOD DEFENCE WORKS

There are no known flood defence works within the vicinity of the site.

² <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

3 FLOOD RISK ASSESSMENT

3.1 GENERAL

Flooding occurs when the amount of water arriving on land exceeds the capacity of the land to discharge that water (by infiltration, overland flow, groundwater rise or a failed drainage system). It can occur on any level or near-level areas of land but the main concern in inland areas is with land adjacent to watercourses (fluvial flooding) and the possibility of overland flow (surface water flooding).

3.2 COASTAL FLOOD RISK

3.2.1 Coastal Flood Boundary Conditions for the UK (2018)

A review of the Coastal Flood Boundary Conditions for the UK: Update 2018 was undertaken, and the September 2020 dataset was utilised following download from data.gov.uk³. The data was downloaded and used under Open Government License V3.0.

The nearest node to the site lies on the River Gryffe, within the Clyde Estuary section of the dataset. The node is situated at the confluence of the Lin Burn and the River Gryffe, some 430m south of the site. The Coastal Design Sea Level – Coastal Flood Boundary (CDSL-CFB) Extreme Sea Level Estuary layer was examined and data for the node at Chainage 1806_51 was adopted. The dataset includes the extreme sea level values for still water sea levels and are based on 2017/18 topographic data for boundary outlines.

Confidence levels provide allowances for uncertainty. The 2.5% and 97.5% confidence levels associated with an extreme sea level estimate are the values such that, in the interval between these values, there is a 95% probability of observing the true extreme sea level. This interval is often referred to as the 95% confidence interval and is commonly used to quantify the uncertainty associated with parameter estimates of a statistical model. The 2.5% and 97.5% confidence levels are provided and referred to as 'C1_' and 'C2_' respectively.

Table B below summarises the dataset entry for the node at Chainage 1806_51:

Is study area within estuary areas?	Adopted Chainage point	Allowance for Uncertainty - c1 (2.5%) Confidence Level (mO.D.)		Coastal Design Sea Levels - Coastal Flood Boundary Extreme Sea Levels Estuary (mO.D.)		Allowance for Uncertainty - c2 (97.5%) Confidence Level (mO.D.)	
Yes	1806_51	c1_T1	3.68	T1	3.73	c2_T1	3.78
		c1_T2	3.85	T2	3.91	c2_T2	3.97
		c1_T5	4.06	T5	4.14	c2_T5	4.23
		c1_T10	4.18	T10	4.29	c2_T10	4.40
		c1_T20	4.30	T20	4.44	c2_T20	4.60
		c1_T25	4.34	T25	4.49	c2_T25	4.67
		c1_T50	4.44	T50	4.63	c2_T50	4.85
		c1_T75	4.49	T75	4.70	c2_T75	4.98
		c1_T100	4.50	T100	4.73	c2_T100	5.03
		c1_T150	4.52	T150	4.77	c2_T150	5.12
		c1_T200	4.54	T200	4.81	c2_T200	5.19
		c1_T250	4.54	T250	4.83	c2_T250	5.24
		c1_T300	4.56	T300	4.86	c2_T300	5.28
		c1_T500	4.58	T500	4.92	c2_T500	5.40
		c1_T1000	4.61	T1000	5.01	c2_T1000	5.59
		c1_T10000	4.68	T10000	5.03	c2_T10000	6.47

Application of Climate Change Allowance - (using Table 3 from SEPA Guidance for Clyde River Basin) (m)

0.85

T1000 plus Climate Change Allowance (mO.D.):

5.86

Table B: Extreme Sea Levels and Climate Change Allowance

³ <https://data.gov.uk/dataset/73834283-7dc4-488a-9583-a94.8320072d9a9d/coastal-design-sea-levels-coastal-flood-boundary-extreme-sea-levels-20184>

As can be seen from Table B, the T1000 Tide extreme sea level within the Clyde Estuary has been predicted at 5.01mOD. A review of the project commissioned spot height data indicates that the majority of the site is at or above 5.66m OD. This puts the site entirely outwith the 1 in 1000-year tidal event floodplain.

Application of the SEPA Climate Change Allowances for Flood Risk Assessment in Land Use Planning⁴ guidance puts the site within the Clyde River Basin Region, with a corresponding sea level rise allowance of 0.85m, up to year 2100. It should be noted that SEPA recommend that an additional allowance of 0.15m per decade after the year 2100 be applied where the design life of a development is known to extend beyond that date. Assuming a design life up to year 2100 the peak extreme sea level estuary level for the site would be 5.86mOD. The inclusion of climate change to the 1 in 1000-year tidal level would impact the northwestern edge of the site, however, depths are less than or equal to 200mm.

3.2.2 Assessed Risk of Inundation from the Sea

The site is situated inland of the Firth of Clyde and is protected by the canalised Black Cart Water and heavily modified River Clyde.

The distance from the estuary mouth with the Firth of Clyde will limit tidal, wave and wind fetch from generating significant waves.

The northwestern edge of the site is considered to be at **Low to Medium Risk** of coastal flooding from an isolated extreme sea level coastal event.

The remainder of the site is at **Little or No Risk** of flooding from coastal sources.

Hydraulic modelling of the Tidal conditions at the site are discussed in full in Section 3.7 below.

3.3 JOINT PROBABILITY

The analysis was undertaken using the DEFRA / Environment Agency (EA) Flood and Coastal Defence R&D Programme Technical Reports FD2308/TR1, FD2308/TR2 and FD2308/TR3. These reports look at Joint Probability: Dependence Mapping and Best Practice, Use of Joint Probability Methods in Flood Management and Joint probability: Dependence between extreme sea surge, river flow and precipitation. Together these technical reports provide a robust methodology and approach to the assessment of Joint Probability and form the current guide to best practice for this assessment.

The first variable was established as the peak flow rate of the River Gryffe for a range of eleven (11) return periods: 1 in 1-year, 1 in 2-year, 1-in 5-year 1 in 10-year, 1 in 20-year, 1 in 50-year, 1 in 75-year, 1 in 100-year, 1 in 200-year, 1 in 500-year and 1 in 1000-year. The peak flow estimations for each return period were carried out using the Revitalised Flood Estimation Handbook, Version 2.3 (ReFH2.3), which calculates the peak flow estimation from the Flood Estimation Handbook Web Service (FEH13) Catchment Descriptors.

The second variable was established as the peak still extreme sea level for the same return periods. The data was taken from the Coastal Design Sea Level – Coastal Flood Boundary Dataset (April 19) and applied to the DEFRA/EA Skew Surge Joint Probability Method. The results of the assessment are shown in Table B in Section 3.2.1 above. As the tidal sequence is applied for the peak sea level assessment, the number of records / years for the joint probability assessment was set at 707.

The Correlation Factor (CF value) for the 1 in 1000-year event used the 1 in 500-year values from Table 3.6 of the DEFRA/EA R&D Technical Report FD2308/TR1 (pg38). This is the most severe storm event considered under the current guidance and extrapolation was not considered a feasible approach. Thus, the correlations will be approximate.

4

<https://sepaweb.maps.arcgis.com/apps/webappviewer/index.html?id=a01f82dbc66145f4a4b558d7b840f51a&extent=-2086266.4068%2C6926044.231%2C1044594.2717%2C9056497.0833%2C102100>

The level of dependence for the relationship between river flow and surge was taken from Figure 2 in the DEFRA/EA R&D Technical Report FD2308/TR2 (pg22). The nearest river station to the site was taken as Station 84011 – Gryffe at Craigend (NGR NS414663). The River Gryffe at Craigend is noted to be Well Correlated in the level of dependence between river flow and surge. This level of dependence has been adopted for the simple desktop joint probability assessment. The CF value for the 1 in 1000-year event was calculated at CF = 182.

The results of the simple desk study joint probability analysis are shown in Table 1, included in the Appendix.

A review of Table 1 shows that the 1 in 1000-year peak flow estimation of the River Gryffe (317.21m³/s) has a joint exceedance return period peak sea level of 0.69mOD, which is less than a peak tide of a 1 in 1-year tidal event. This means that a 1 in 1000-year fluvial storm event (Q1000) is not likely to occur during any tidal storm event. Conversely, a 1 in 1000-year tidal storm event (T1000) is likely to coincide with a 1 in 1-year fluvial event (Q1) of 50m³/s.

Under less severe fluvial storm events such as the Q200 and Q500, the corresponding tidal event remains less than 1 in 1-year and vice versa.

3.4 SURFACE WATER

Topographic maps, LiDAR data and project commissioned spot height survey data were interrogated to determine general overland flow pathways for the site and the surrounding area. The general indicative overland flow pathways are shown on Figure 4, which is included in the Appendix.

Within the site, overland flow pathways stem from the access road and flow west across the site. The local landform will prevent ponding within the site.

Overland flow from the adjacent fields will be prevented from entering site by the raised road and the Lin Burn.

It is therefore considered that the site is at **Little or No Risk** of surface water flooding.

It is understood that any proposed development will comply with Renfrewshire Council requirements for Sustainable Drainage Systems (SuDS), if applicable.

3.5 LOCAL DRAINAGE

No drainage infrastructure currently serves the site. Standard roof drainage was noted to be in place along the southeast boundary, servicing the farm steading. No road drainage at site or along the access road was evidenced during the site walkover inspection.

In the event of the adjacent roof drainage becoming blocked, some nuisance water may wash onto site. The gentle slope of the landform and the lack of ponding-supporting topography will mean that any such water will wash across the site as shallow overland flow and fall into the Lin Burn before being carried away from site.

Standard field drainage is expected to be in place in the neighbouring fields. This drainage will discharge into the Lin Burn and not directly impact the site. Any upwelling from damaged field drains will be prevented from entering site by the raised road deck and the presence of the Lin Burn.

A failure in road drainage along Houston Road leading to upwelling at the gullies may result in shallow overland flow onto the southernmost extent of the farm access road. This flow will wash across the access road due to the lack of kerbing and infiltrate into the soils of the fields.

Due to the site's sloping topography towards the watercourse and the lack of significant drainage infrastructure within the site or surrounding area, the site is assessed to be at **Little or No Risk** of flooding from a failure in drainage systems.

3.6 GROUNDWATER RISE

Given the presence of historic Made Ground and the underlying superficial deposits of alluvium, there is potential for perched groundwater beneath the site.

The groundwater in close proximity to the Lin Burn is likely to be in hydraulic continuity with the watercourses, but the extent will be extremely limited due to the narrow profile of the burn.

Site commissioned survey spot height data records the bed of the Lin Burn to be at around 3.0mOD, with the lowest site level around 5.66mOD. This gives at least 2.66m between the site level and the bed of the burn.

Local superficial groundwater will be impacted by the Lin Burn, however the site is considered to be at **Little or No Risk** of isolated Groundwater rise. Groundwater may be present at shallow depth and encountered during any further excavation.

3.7 FLUVIAL FLOOD RISK

3.7.1 General

Fluvial flood risk in the vicinity of the site arises primarily from the interaction of the Lin Burn and the River Gryffe.

The hydrological analysis uses modified Flood Estimation Handbook Web Service data (FEH13) together with the Hydrologic Engineering Centre's River Analysis System (HEC-RAS), developed by the U.S. Army Corps of Engineers (USACE). HEC-RAS Version 6.1. HEC-RAS provides appropriate 2D hydraulic flood modelling capabilities for the determination of flood routing, overland flow conveyance and flood storage.

Whilst the current HEC-RAS model (6.1) does allow for infiltration, no infiltration losses were applied to this model.

3.7.2 Model Domain

The two-dimensional (2D) flow area for the model covers an area of 3.72km². The model domain was established to be inclusive of all floodplain and potential overland flow pathways that could impact the site and site neighbours from the three watercourses. The extent of the model domain is shown on Figure A.

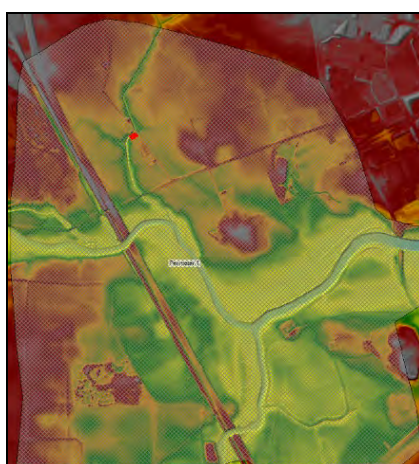


Figure A – Model domain

3.7.3 Digital Terrain Development

A digital terrain was developed in HEC-RAS using the following terrain data:

- Scottish Remote Sensing Portal 0.5m Phase 5 LiDAR DTM data set (NS46 NW & NE tiles);
- TLW GS08 Leica Geosystem Survey Staff and Net Rover Spot Heights – March 2022.

The existing terrain is a composite terrain surface generated from the RAS Mapper functionality within HEC-RAS 6.1. The LiDAR forms the basis of the topographic data and the channel profiles were refined by supplementing the LiDAR data with the project commissioned spot height survey data. This allowed for a more accurate representation of the channels. Figure B shows an extract of the final existing terrain used for the hydraulic modelling.

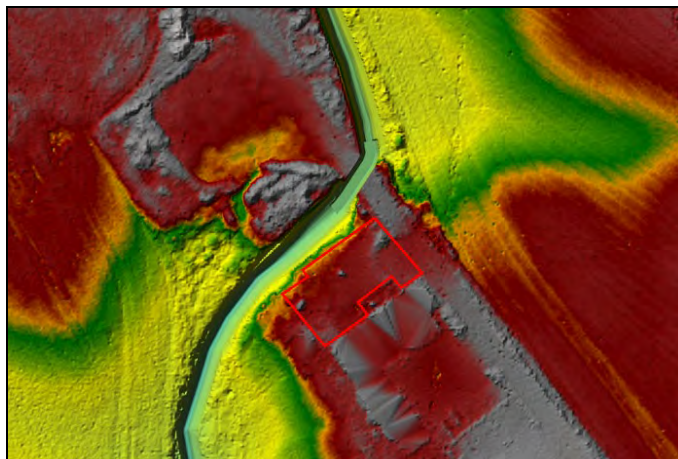


Figure B – Existing Terrain Model

3.7.4 Contributing Catchments

Catchment descriptors for the three watercourses were obtained from the Flood Estimation Handbook Web Service (FEH13).

Catchments for the River Gryffe and Black Cart Water could not be generated in the vicinity of site owing to them being considered tidal catchments at this location under the FEH methodology. Thus, in order to capture suitable fluvial catchments for these watercourses, the closest upstream catchments were extracted and extended to encompass their catchment area up to the vicinity of the site. Due to the areal alterations being greater than 10% of each catchment's area, alterations to other catchment descriptors was necessary. The revised catchment descriptors for the Gryffe and Black Cart are included in the Appendix.

The River Gryffe originates from Loch Thorn and the Gryffe Reservoirs some 20km upstream of the site. The revised River Gryffe catchment is 144.54km² in extent.

The Black Cart Water is initially fed from the hills and moors of Clyde Muirshiel Regional Park as the runoff flows into the Lochwinnoch lochs. The Black Cart is additionally fed by runoff from the fields and burns along its course towards its confluence with the River Clyde. The revised Black Cart Water catchment is 139.97km² in extent.

From review of topographic data, the representation of the Lin Burn catchment was considered accurate and its catchment descriptors were applied without any change. The Lin Burn catchment is 5.04km² in extent.

The revised catchment extents are shown on Figure 5, which is included in the Appendix.

3.7.5 Inflow Boundary Condition

Gauging station data for the Craigend Gauge was reviewed for the River Gryffe. The National River Flow Archive⁵ indicates the gauge to lie some 4.4km west of the site at NGR NS 41476 66362. A review of the gauging station records a maximum observed flow of 142.03m³/s since its earliest records in 1963.

There is also a SEPA gauging station on the Black Cart Water at Milliken Park (NGR NS 41122, 62025), upstream of the site. This station records a maximum observed flow of 110m³/s since its earliest records in 1963.

⁵ <https://nrfa.ceh.ac.uk/>

In each instance, the gauging stations are located significantly upstream of site and the highest recorded flows of each are lower than the estimations calculated using the methodologies described below.

Catchment descriptors from the Flood Estimation Handbook web service (FEH13) were used to calculate the peak flow estimation for the contributing catchments and are included in the Appendix.

The peak flow estimation was calculated using the following methodologies:

- FEH Statistical;
- Revitalised Flood Hydrograph, Version 2.3 (ReFH2.3); and
- FEH Rainfall Runoff.

The results of the flow estimations found that the FEH Rainfall Runoff was the most conservative of the methodologies.

Table 2, in the Appendix provides a summary of the design storm event peak flow estimations under various methodologies. Table 3 provides a suite of peak flow estimations under a variety of storm events using the FEH Rainfall Runoff methodology.

The inflow boundary conditions were applied as hydrographs with energy gradients calculated from the terrain.

3.7.6 Climate Change Allowance

A review of the SEPA Climate Change Allowances for Flood Risk Assessment in Land Use Planning web map⁶ shows that the site lies within the Clyde River Basin Region and in the West Rainfall Uplift Region.

As per the SEPA guidance, the applicable Climate Change Allowance (CCA) for the Lin Burn is an increase of 55% on Peak Rainfall Intensity due to the catchment size being less than 30km².

As per the SEPA guidance, the applicable Climate Change Allowance (CCA) for the River Gryffe and Black Cart Water is an increase of 44% on Peak River Flow due to the catchment sizes being greater than 50km².

Table B, below, lists the corresponding peak flow estimates for the watercourse.

	1 in 1000-year flow	1 in 1000-year plus Climate Change Allowance (CCA)
Lin Burn	14.55	24.78
River Gryffe	317.21	456.78
Black Cart Water	374.55	539.35

Table B – Peak inflow rates

The 1 in 1000-year and 1 in 1000-year plus climate change allowance inflow hydrographs are shown on Figures 6 to 8, which are contained within the Appendix.

3.7.7 Downstream Model Boundary

The downstream model boundary condition is set to a time/stage relationship representing a typical tidal sequence within the Clyde Estuary. The was included in the model as a stage hydrograph to represent the influence of the tide on this point of the watercourses.

⁶<https://sepaweb.maps.arcgis.com/apps/webappviewer/index.html?id=a01f82dbc66145f4a4b558d7b840f51a&extent=-2086266.4068%2C6926044.231%2C1044594.2717%2C9056497.0833%2C102100>

The MIKE21 Tidal Prediction mode, by DHI, was used to generate a typical 3-day tidal sequence as close to the site as possible. The tidal sequence was then modified to provide coincident peaks between the fluvial discharge from the River Gryffe and peak tide. This is a conservative estimation, as the likelihood of coincident peaks is low.

The tidal sequence was then adapted to match the peak water levels from the Coastal Flood Boundary Dataset, with a baseline fluvial scenario peak water level of 3.73m OD, which equates to a 1 in 1-year tidal storm event.

Finally, the tidal sequences were adjusted using the Simplified Harmonic Method for the storm surge profile at the nearest Admiralty Port, Rothesay Dock, Clydebank.

Additional tidal sequence levels corresponding to the 1 in 1-year plus Climate Change Allowance and the 1 in 1000-year extreme sea level with and without Climate Change Allowance, were also assessed.

The downstream boundary was applied at the downstream extent of the modelled domain across the River Gryffe. The modelling software calculates separate water surface elevations per cell face along the boundary condition line.

The downstream boundary condition was applied as a stage hydrograph and these stage hydrographs are shown on Figure 9, included in the Appendix.

3.7.8 Roughness Coefficient

A global Manning's n roughness coefficient value of 0.03n was applied to the whole domain. This value was derived from the mid-range for short-grassed pasture, which makes up the majority of the model domain. Where notable land use changes occur a separate Manning's n map layer was added to the model to reflect changes in land use. The Manning's n map layer overwrites the global Manning's n value and applied a new value corresponding to the terrain as can be seen below on Figure C.



Figure C – Existing Manning's n Layer Extract

The Manning's roughness coefficients n values assigned to the polygons are summarised below in Table C:

Colour	Land Use Classification	Manning's n Value
Cyan	Channel	0.03
Green	Woodland/brush	0.07
Magenta	Road	0.013
Red	Building	0.1

Table C – Existing Manning's n values for hydraulic modelling

All Manning's n values are based on a review of aerial imagery, the site walkover inspection and are aligned to those described in Manning's n for Channels (Chow, 1959).

Manning's n values of $0.07n$ were applied to areas of more dense vegetation and brush coverings, or areas with mature stands of trees with branches outwith the flood zone. Road surfaces were attributed a roughness value of $0.013n$ for asphalt. The channel was set with a roughness value of $0.03n$ for clean, straight channels.

Where the existing buildings are present within the floodplain, a Manning's n roughness value of $0.1n$ was applied to the footprint of the building. This simulates the slowing of flow through vents, doors and other openings into the building. No terrain modifications were made to represent buildings within the model.

3.7.9 Structures

There are two structures present within the model domain, these being the bridge immediately upstream of the site and the Houston Road bridge downstream.

Each of these structures has been included in the model as a 1D (one-dimensional) feature, with a break line assigned perpendicular to flow to represent the overtopping weir. Each structure is set to a weir representing the overtopping level of the road, and an associated culvert barrel. The details of each structure are described below.

The upstream bridge has a 1.7m wide, 1.9m tall arched culvert orifice, with a weir set at the road deck level.

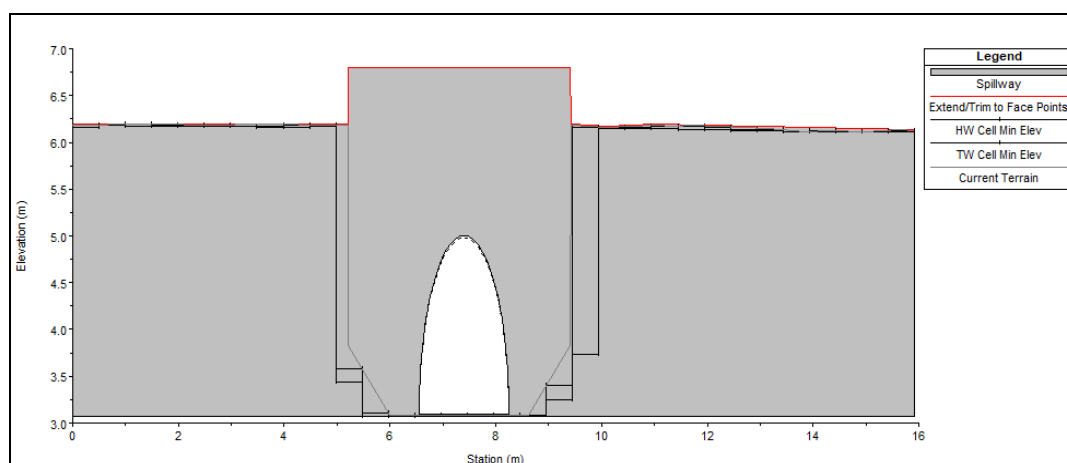


Figure D – 1D HEC-RAS Structure – Upstream Bridge

The downstream bridge has a 1.9m wide, 1.9m tall arched culvert orifice, with a weir set at the road deck level.

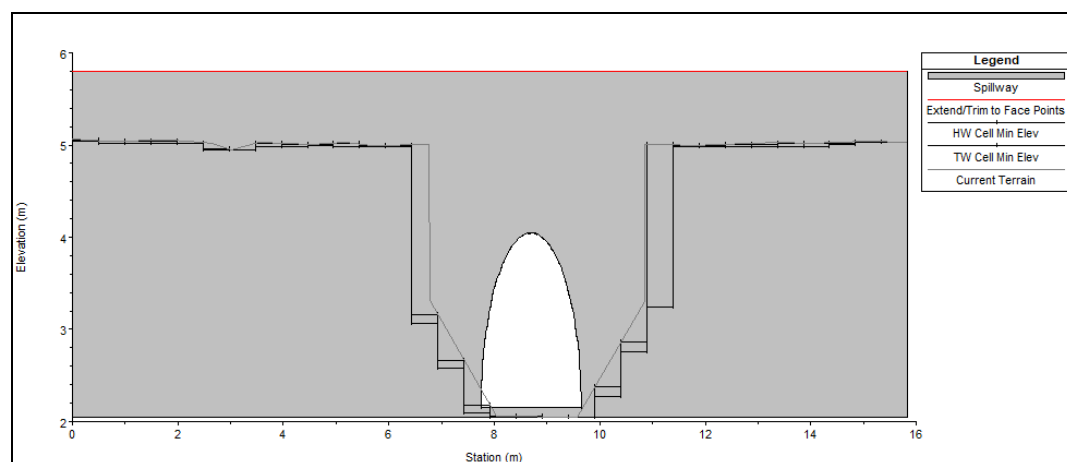


Figure E – 1D HEC-RAS Structure – Downstream Bridge

3.7.10 Computational Mesh

A 5m-by-5m computational mesh was assigned to the whole model domain. The profiles of the Lin Burn, River Gryffe and Black Cart Water were aligned through the use of central break lines and

lateral bank break lines. The break lines served to orientate the grid cells perpendicular to flow and to refine the mesh resolution along the channels.

Each channel is represented by a minimum of eight cells at any cross-sectional location, however this is not necessary for accurate representation of the channels, due to HEC-RAS recognising sub-grid topography/bathymetry and creating more than 1 result per cell.

Figure F below shows an extract of the geometry file including the computational grid around the site.



Figure F – Extract of 2D Geometry with Computational Mesh

3.7.11 Computational Time Step

A fixed 0.5 second time step was applied as the computational time step. The results of the modelled outputs were reviewed for Courant Number violations and velocity spikes which could indicate instability. No instabilities were found within the modelled outputs and the model time step was assessed to be appropriate. The model simulation was set to run for 24 hours of the predicted peak flow estimation hydrographs. The simulation time allows for all the peaks, both fluvial and tidal, to pass and for receding water levels to be observed throughout the domain.

Comparison with a finer timestep of 0.2 seconds found that water levels and other key outputs remained consistent, indicating that the adopted timestep of 0.5 seconds is considered suitable.

3.7.12 Mass Balance Errors

HEC-RAS tracks the cumulative mass balance error throughout the simulation window. Mass balance errors and water surface elevation convergence errors were checked to ensure model stability and that imbalances remained below reasonable thresholds, confirming compliance with Courant Number criteria.

The maximum recorded Mass balance error is 0.0145% for the percentage error, well within tolerances. Computational Reports recording Mass Balance Errors for the modelled scenarios are contained within the Appendix.

3.7.13 Equation Set and Default Parameters

Unsteady plan files were run using the Shallow Water Equations with Eulerian-Lagrangian approach to solving for advection, the SWE-ELM (original/faster) equation set. The SWE-ELM (original/faster) equation set was chosen for the model in order to account for inertial terms resulting from the multidirectional flow paths inherent in the modelled area.

All other parameters were set to default values.

3.7.14 Projection

All geospatial input and output data are projected using the OSGB 1936 British National Grid.

3.7.15 Sensitivity Analysis

To assess the model sensitivity to various parameters, a series of sensitivity analyses was undertaken with respect to the flow, roughness coefficient and downstream boundary conditions.

Analysis of the watercourse was undertaken with a variety of flow rates (1 in 200-year, 1 in 500-year, 1 in 1000-year and 1 in 1000-year plus Climate Change Allowance events). Profile lines were drawn at the locations shown on Figure G and maximum water surface elevations recorded and shown on Table D.

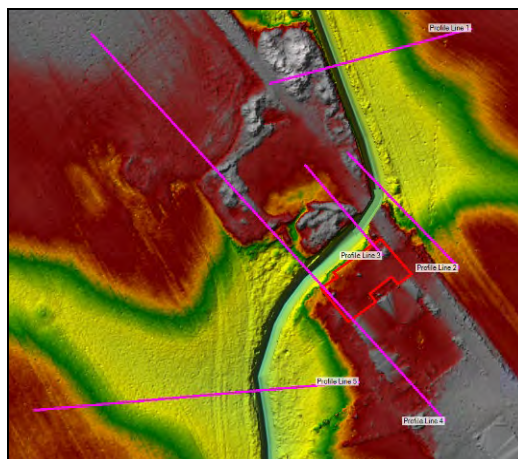


Figure F – Extract of 2D Geometry with Computational Mesh

Profile Line	Water Levels at site during fluvial storm events (m OD)				
	Q200	Q200+CCA	Q500	Q1000	Q1000+CCA
1	6.03	6.34	6.18	6.28	6.43
2	6.03	6.33	6.18	6.28	6.43
3	5.06	6.15	5.87	6.05	6.24
4	4.97	6.18	6.05	6.12	6.30
5	4.92	5.46	5.08	5.32	5.84

Table D – Flow Sensitivity Analysis

The variations in peak water level are in line with expectations. The 1 in 200-year flow is largely contained within the channel banks however, under more severe storm conditions, out of bank flows occur from higher water levels, leading to overland flow and inundation at site. The model is, therefore, not considered to be unduly sensitive to changes in peak flow. Figures 10 through 14 provide the extent of inundation during the considered storm events.

Analysis of the watercourse was undertaken with a +/-20% variation on the Manning's n values. The variation in maximum water surface elevation on the baseline scenario from the sensitivity analysis is up to 50mm at site. Such variation has negligible impact on the inundation extents at site. The model is, therefore, not considered to be unduly sensitive to changes in Manning's n value.

Further analysis of the watercourse was undertaken with variations on the downstream boundary condition. Analysis of the tidal impact was undertaken with a variety of tidal storm events (1 in 200-year with and without Climate Change Allowance, 1 in 500-year, 1 in 1000-year and 1 in 1000-year with and without Climate Change Allowance). Profile lines were drawn at the locations shown on Figure G and maximum water surface elevations recorded and shown on Table E:

Profile Line	Water Levels at site during fluvial storm events (m OD)				
	Q200	Q200+CCA	Q500	Q1000	Q1000+CCA
1	4.90	5.72	5.0	5.08	5.89
2	4.90	5.72	5.0	5.08	5.89
3	4.90	5.74	5.0	5.08	5.93
4	4.90	5.74	5.0	5.08	5.93
5	4.90	5.74	5.0	5.08	5.93

Table E – Tide Sensitivity Analysis

The variations in peak water level are in line with expectations. The tidal storm events are largely contained within the channel banks in the vicinity of site however, under the 1 in 1000-year plus Climate Change Allowance event, out of bank flows occur from higher water levels, leading to inundation at site. The model is, therefore, not considered to be unduly sensitive to changes in peak flow. The results of the tidal analysis in Section 3.2 are corroborated by hydraulic modelling.

Figures 15 and 16 provide the extent of inundation during the 1 in 1000-year tidal storm and the 1 in 1000-year tidal storm plus climate change scenario, respectively.

3.7.16 Velocity

Figure 17, contained within the Appendix records the maximum water velocities recorded throughout the model domain during the 1 in 1000-year fluvial storm event. As can be seen, maximum velocities throughout the domain are typically less than 1m/s. Highs of up to 5.26m/s are recorded in the vicinity of the large Barnsford Road and M8 structures, owing to the increase in velocity from passing through a constriction.

3.7.17 Froude Number

Figure 18, contained within the Appendix records the maximum Froude Number values throughout the model domain. Froude Numbers in excess of 1 are generally indicative of super-critical flow and have erosive potential, Froude Numbers of 1, or less, are generally indicative of sub-critical flow and have low erosive potential.

As can be seen from Figure 18, throughout the model the Froude Numbers are generally less than 1, indicating sub-critical flow and low erosive potential, as well as indicating a stable model. Froude Numbers in excess of 1 typically occur along the banks of the Black Cart water downstream of its confluence with the River Gryffe which may lead to erosion of the banks which is supported by observations made during the site walkover.

3.7.18 Courant Number

The maximum Courant Number values for the model were taken at time 6 hours and 30 minutes into the modelled run time; this is equivalent to the maximum inundation at the site. Courant Numbers are generally at or below 0.4 throughout the site and the immediate surrounding area. Courant Numbers less than 1 indicate stable model performance and sufficient timestep refinement to avoid any Courant Number violations in the hydraulic calculations. Courant numbers at or near 1 are associated with main channel flows, structures and areas of refined computational mesh grid sizes, such as within the channel of the Lin Burn.

A review of the Courant numbers confirms that the model is within acceptable tolerances, with all Courant values less than 3.0 as outlined in the HEC-RAS technical manual. This confirms that the timestep chosen is appropriate.

The maximum Courant Number values are shown on Figure 19, in the Appendix.

3.7.19 Model Results under Existing Conditions

As with all fluvial flood models, uncertainties remain that affect the relationship between flow rate and water level. The analysis must, therefore, be regarded as approximate whilst using the best available data at the time of reporting.

The 1 in 200-Year fluvial storm event constitutes the functional floodplain and should be avoided, whilst the 1 in 1000-year fluvial storm event constitutes the design storm event and influences design criteria.

The bridge immediately upstream of site constrains the peak flow in the channel and causes backing up of water, resulting in overtopping of the road and overland flow onto site through the site entrance. Flow entering site will wash across before falling back into the Lin Burn.

The peak water level during the 1 in 200-year fluvial event is recorded to be 6.03m OD at the site entrance, falling to 5.93m OD near the southern site corner.

The peak water level during the 1 in 1000-year fluvial event is recorded to be 6.27m OD at the site entrance, falling to 5.96m OD along the southwest boundary.

Elements of the site are at **Medium to High Risk** of fluvial flooding and lie within the functional floodplain, however, the expected depths are at or less than 70mm. The majority of the site is at **Low to Medium Risk** of fluvial flooding with depths up to 150mm within the site and up to 290mm at the site entrance.

Figures 10 and 13 show the fluvial inundation at site during the 1 in 200-year and 1 in 1000-year events, respectively.

3.7.20 Blockage Analysis

Under existing conditions, there are no sources that could significantly block the orifices of the two bridges. Thus, 15% and 30% blockages were considered reasonable for the sensitivity analysis if somewhat conservative. This was applied by reducing the span of the culverts, thus imposing a constriction to flow throughout the full hydrograph.

The blockage scenarios were considered for the both the 1 in 200-year and 1 in 1000-year fluvial storm events.

Under the 15% minor blockage scenario, the 1 in 200-year water levels at site rise by 20mm. Under the 30% major blockage scenario, the 1 in 200-year water levels rise by 170mm. The extent of inundation is not significantly increased under the minor blockage scenario. However, under the major blockage scenario, the vast majority of the site is inundated due to the overland flow path from the field to the northeast of site. Figures 20 and 21 provide the extent of inundation during the 1 in 200-year fluvial storm during the minor and major blockage scenarios, respectively.

Under the 15% minor blockage scenario, the 1 in 1000-year water levels at site rise by 50mm. Under the 30% major blockage scenario, the 1 in 1000-year water levels rise marginally by 90mm. The extent of inundation is not significantly increased under either of the scenarios.

4 DISCUSSION AND RECOMMENDATIONS

4.1 GENERAL

For new developments the acceptable risk of flooding should take into account various factors including risk to human health and the direct and indirect financial losses relating to flooding.

Under existing conditions, the risks from flooding at the site are defined as follows:

- The majority of the site is at **Little or No Risk** of flooding from an isolated extreme coastal flooding event. The northwest edge, adjacent to the Lin Burn, is at **Low to Medium Risk**.
- The site is at **Little or No Risk** of surface water flooding.
- The site is at **Little or No Risk** of flooding as a result of a failure in the local drainage network.
- The site is at **Little or No Risk** of isolated groundwater rise.
- The site entrance and along the southeast boundary are considered to be at **Medium to High Risk** of fluvial flooding. The majority of the site is at **Low to Medium Risk** of fluvial flooding from the Lin Burn.

While dry pedestrian and vehicular access and egress is compromised by functional floodplain, the anticipated depths will not be sufficient to prevent access to the site. Furthermore, this inundation on the access is limited to only the vicinity of site, with the remainder of the access road being free from flooding throughout all considered storm events.

4.2 DEVELOPMENT AND POSSIBLE FLOOD RESILIENCE MEASURES

The proposed redevelopment has been applied for under the land use classification 5, Most Vulnerable. To comply with this application, the following flood mitigation and flood resilience measures will be required to ensure there is minimal impact upon the flood storage, conveyance and risk to the proposed re-development and site neighbours.

The following design measures are required:

- No land raising within the functional floodplain within the site;
- A Final Ground Floor Level of 6.57mOD is recommended (providing a 300mm freeboard on the 1 in 200-year plus climate change event peak water level and a 350mm freeboard on the 1 in 1000-year event for the development).
- Use of Flood Resilient construction methods and materials for new building(s);
- Locating electrical equipment outwith estimated peak water surface elevations at a minimum of 6.87m OD, allowing for 600mm freeboard;
- Mandatory registration with SEPA Floodline for flooding alerts;
- Installation of bespoke flood monitoring alarm system to initiate site flood evacuation plan.

4.3 PHYSICAL WORKS ASSOCIATED WITH THE EXISTING WATERCOURSE

In relation to flood risk, the Water Environment (Controlled Activities) (Scotland) Regulations 2005 (CAR) may be affected by the development of the site. No earthworks shall be carried out within the banks of the Lin Burn without prior consultation with SEPA and the application of the relevant licensing guidance in relation to CAR.

Any construction works will likely require sediment control for surface water runoff to ensure watercourses are not impacted by increased sediment load as a result of construction activities. A pollution prevention plan or surface water management plan for construction may also be required. Early consultation with SEPA is recommended in relation to any proposed construction works to ensure compliance.

4.4 EFFECTS ON SITE NEIGHBOURS

The specifics of the proposed development are not known at this time. Due to the presence of existing made ground and impermeable surfaces, the proposed development cannot increase the hardstanding at site and therefore will not increase runoff. Any new buildings may present an obstruction to overland flow routes and this should be accommodated into the design and drainage management so as not to force water onto the adjacent property to the southeast.

The provision of Sustainable Drainage Systems will have a neutral or better impact on runoff from the site, as runoff will be attenuated to greenfield runoff rates which will be equal to or better than the existing conditions.

With a careful and considered approach, the development can achieve an overall neutral impact on the site neighbours.

4.5 OVERALL FLOOD RISK ASSESSMENT CONCLUSION

The Scottish Planning Policy notes that new developments should be free from significant flood risk from any source and that such development should not:

- materially increase the probability of flooding elsewhere;
- add to the area of land which requires protection by flood prevention measures;
- affect the ability of the functional floodplain to attenuate the effects of flooding by storing flood water;
- interfere detrimentally with the flow of water in the floodplain; or
- compromise options for future river management.

It has been established that parts of the site lie within the functional floodplain. Given that the access road to the site allows pedestrian and vehicular access during the design storm event, development of areas outwith the functional floodplain can be considered to be in line with the broad principles of Scottish Planning Policy.

Mandatory registration with the SEPA Floodline will be required as will the installation of a flood monitoring / alarm system in conjunction with a site evacuation plan and operation and maintenance policy highlighting flood risk responsibilities and mitigation actions. Bedrooms should not be located on the ground floor of any proposed residence, whether permanent or holiday, and it is recommended that flood resilient materials be used for the construction.

-oo000oo-

Terrenus Land & Water Ltd wishes to thank the Client Lyndsey Martin and Messrs Mabbett & Associates Ltd for the opportunity to prepare this report and trust that it meets with your requirements. However, should you wish to discuss the contents of the report then please do not hesitate to contact the undersigned.

Signed for and on behalf of

Terrenus Land & Water Ltd

PP  

Douglas Aitken

Director

William Hume

Director

**EAST FULWOOD FARM, INCHINNAN
FLOOD RISK ASSESSMENT REPORT
FOR
LYNDSEY MARTIN**

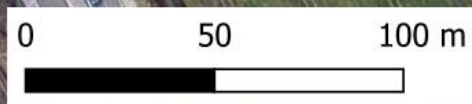
APPENDICES

**EAST FULWOOD FARM, INCHINNAN
FLOOD RISK ASSESSMENT REPORT
FOR
LYNDSEY MARTIN**

FIGURES



- Site Location
- Renfrewshire County Boundary
- Atlas
- Site Boundary
- Google Satellite Hybrid



**terrenus**
land&water

Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

Client:
Lyndsey Martin

Project:
East Fulwood Farm,
Inchinnan

Drawing Title:
Site Location Plan

Drawn: JS	Checked: DA	Approved: DA
Date: 29/03/2022	Figure: 1	



+ Spot Heights
Site Boundary
Google Satellite Hybrid

Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

Client:
Lyndsey Martin

Project:
East Fulwood Farm,
Inchinnan

Drawing Title:
Spot Heights Survey

Drawn: JS	Checked: DA	Approved: DA
Date: 17/03/22	Figure: 2A	



Site Boundary
 Spot Heights
 Google Satellite Hybrid

Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

Client:
 Lyndsey Martin

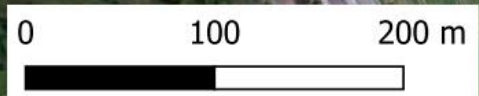
Project:
 East Fulwood Farm,
 Inchinnan

Drawing Title:
 Spot Heights Survey

Drawn: JS	Checked: DA	Approved: DA
Date: 17/03/22	Figure: 2B	



 Site Boundary
 Comparison Points
Google Satellite Hybrid





Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

Client:
Lyndsey Martin

Project:
East Fulwood Farm,
Inchinnan

Drawing Title:
Survey Comparison Points

Drawn: JS	Checked: DA	Approved: DA
Date: 17/03/22	Figure: 3	



 Site Boundary

Flow Accumulation

 HIGH

 LOW

Google Satellite Hybrid



Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

Client:
Lyndsey Martin

Project:
East Fulwood Farm,
Inchinnan

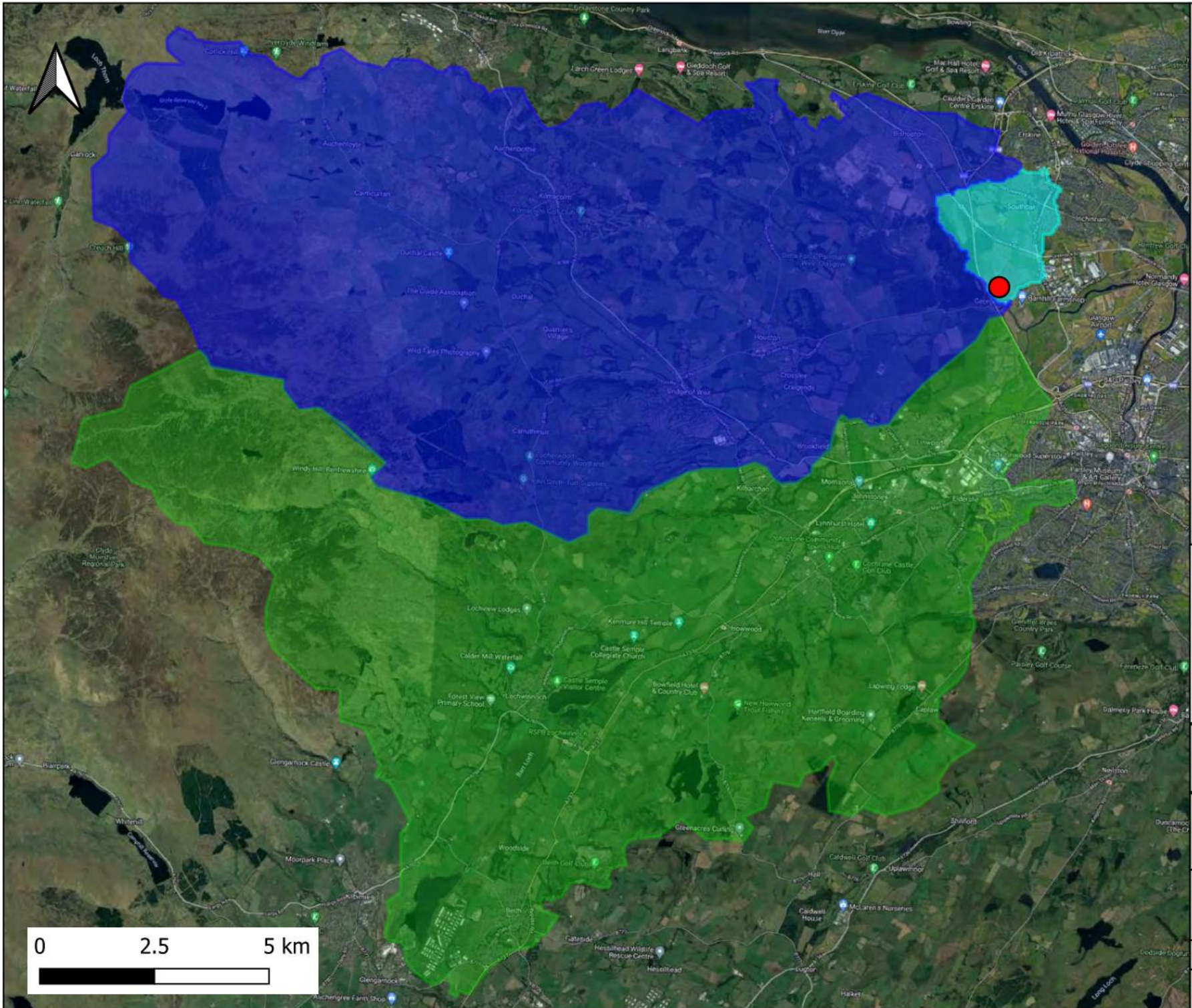
Drawing Title:
Flow Accumulation Pathways

Drawn: JS	Checked: DA	Approved: DA
--------------	----------------	-----------------

Date: 15/03/2022	Figure: 4
---------------------	--------------

0 50 100 m





- Site Location
- Black Cart Catchment
- Gryffe Catchment
- Lin Burn Catchment

Google Satellite Hybrid

Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

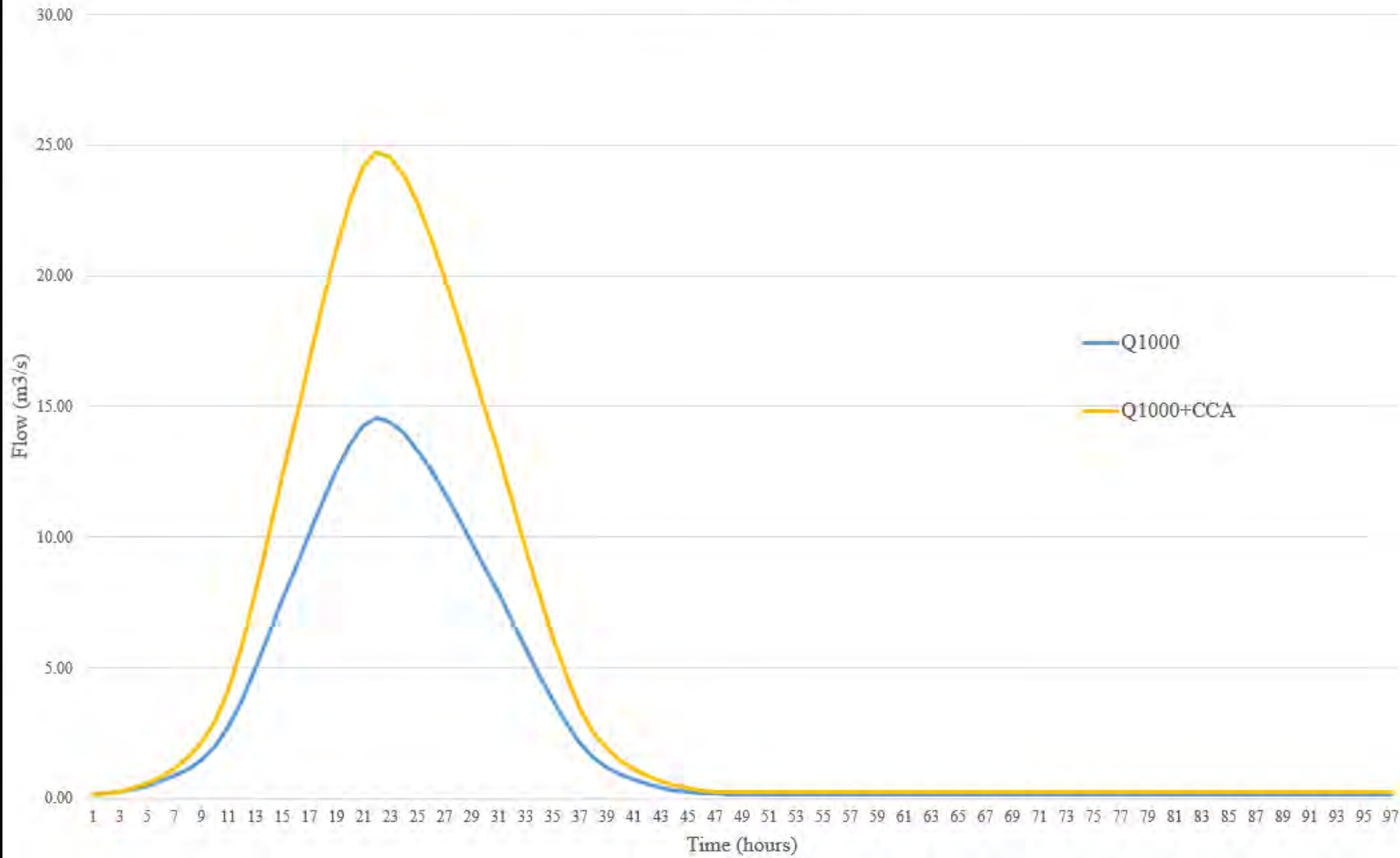
Client:
Lyndsey Martin

Project:
East Fulwood Farm,
Inchinnan

Drawing Title:
Catchment Analysis

Drawn: JS	Checked: DA	Approved: DA
Date: 15/03/2022	Figure: 5	

Lin Burn Hydrographs



Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

Client:
Lyndsey Martin

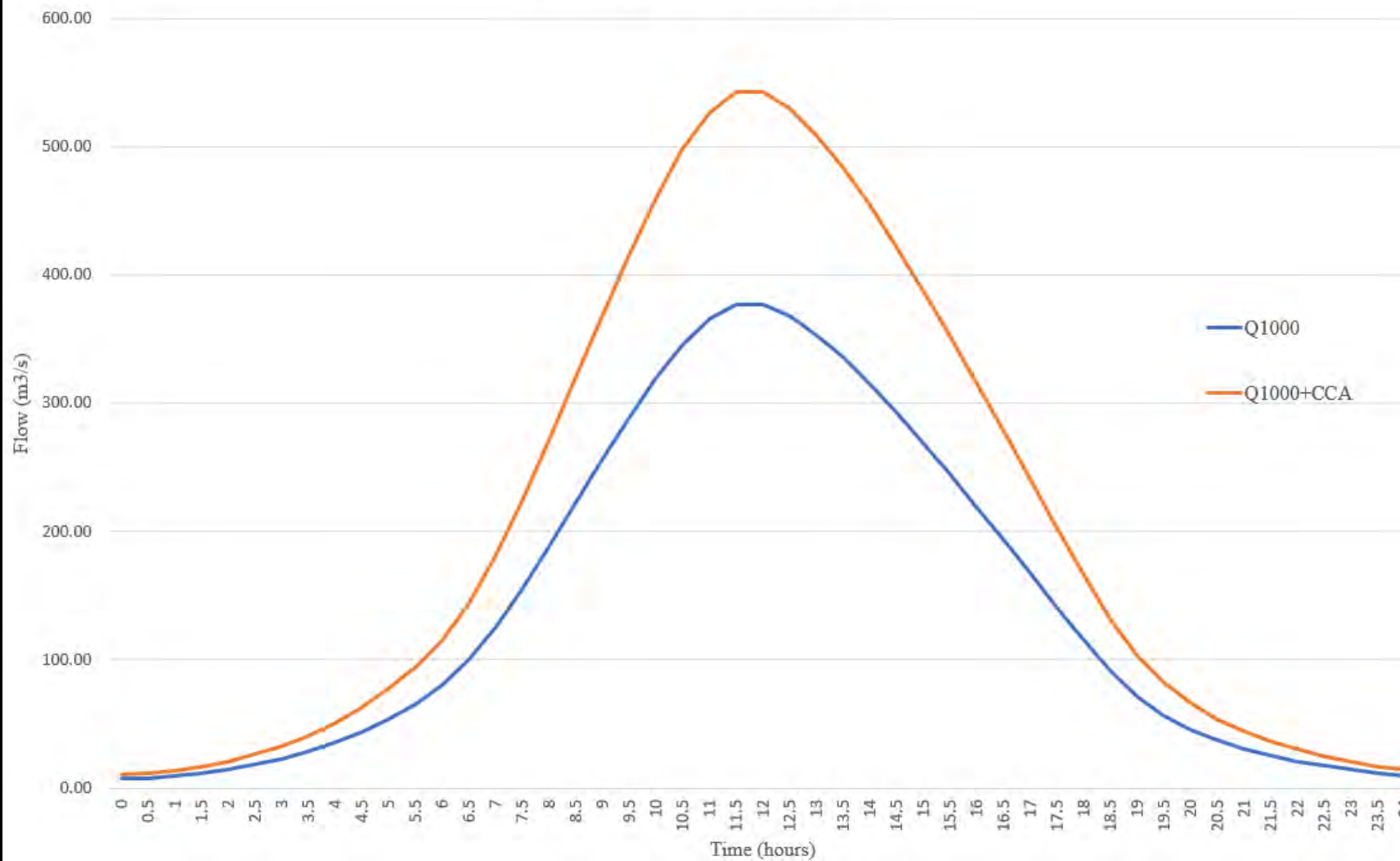
Project:
East Fulwood Farm,
Inchinnan

Drawing Title:
Lin Burn Hydrographs

Drawn: JS	Checked: DA	Approved: DA
--------------	----------------	-----------------

Date: 29/03/2022	Figure: 6
---------------------	--------------

Black Cart Water Hydrographs



Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

Client:
Lyndsey Martin

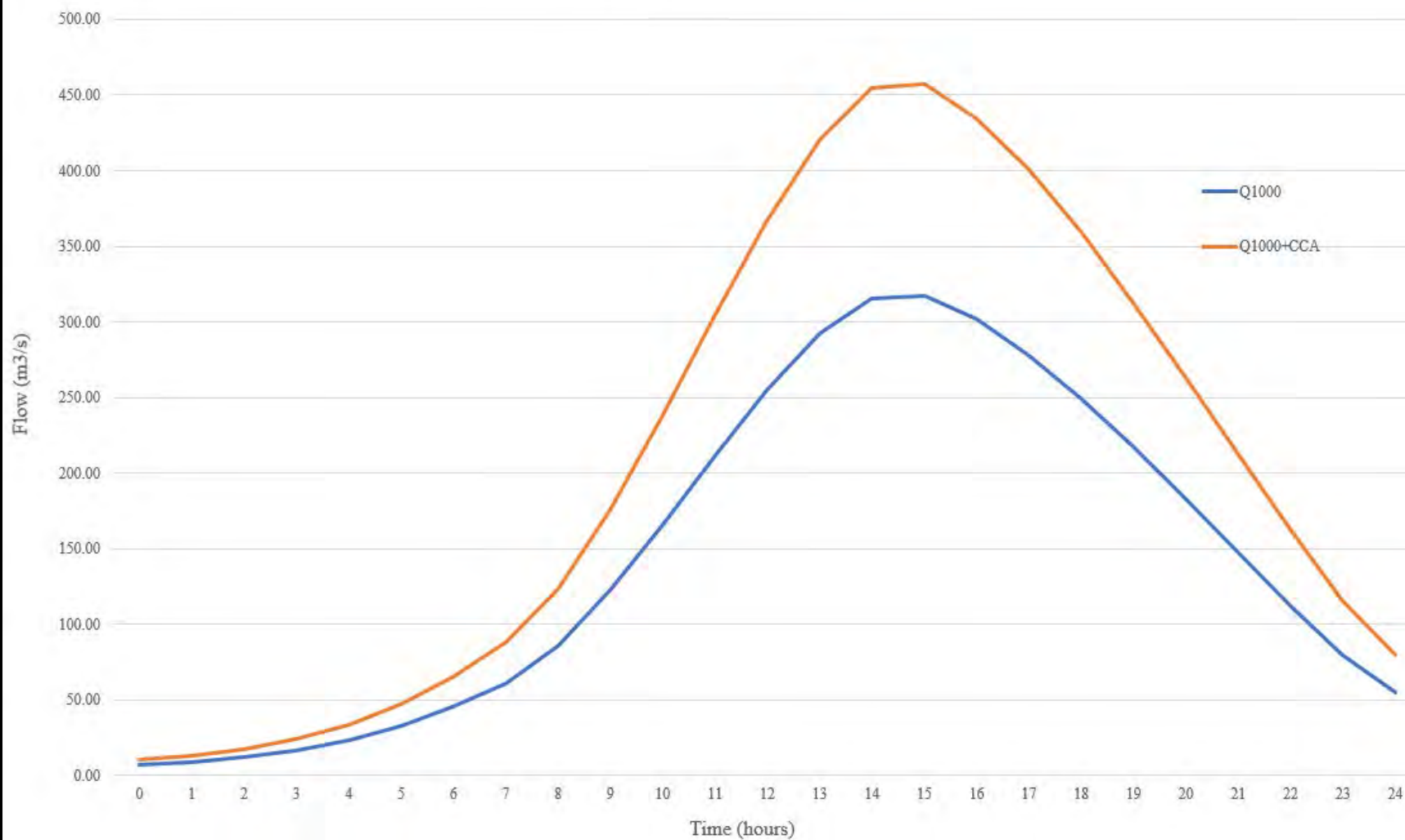
Project:
East Fulwood Farm,
Inchinnan

Drawing Title:
Black Cart Water
Hydrographs

Drawn: JS	Checked: DA	Approved: DA
--------------	----------------	-----------------

Date: 29/03/2022	Figure: 7
---------------------	--------------

River Gryffe Hydrographs



Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

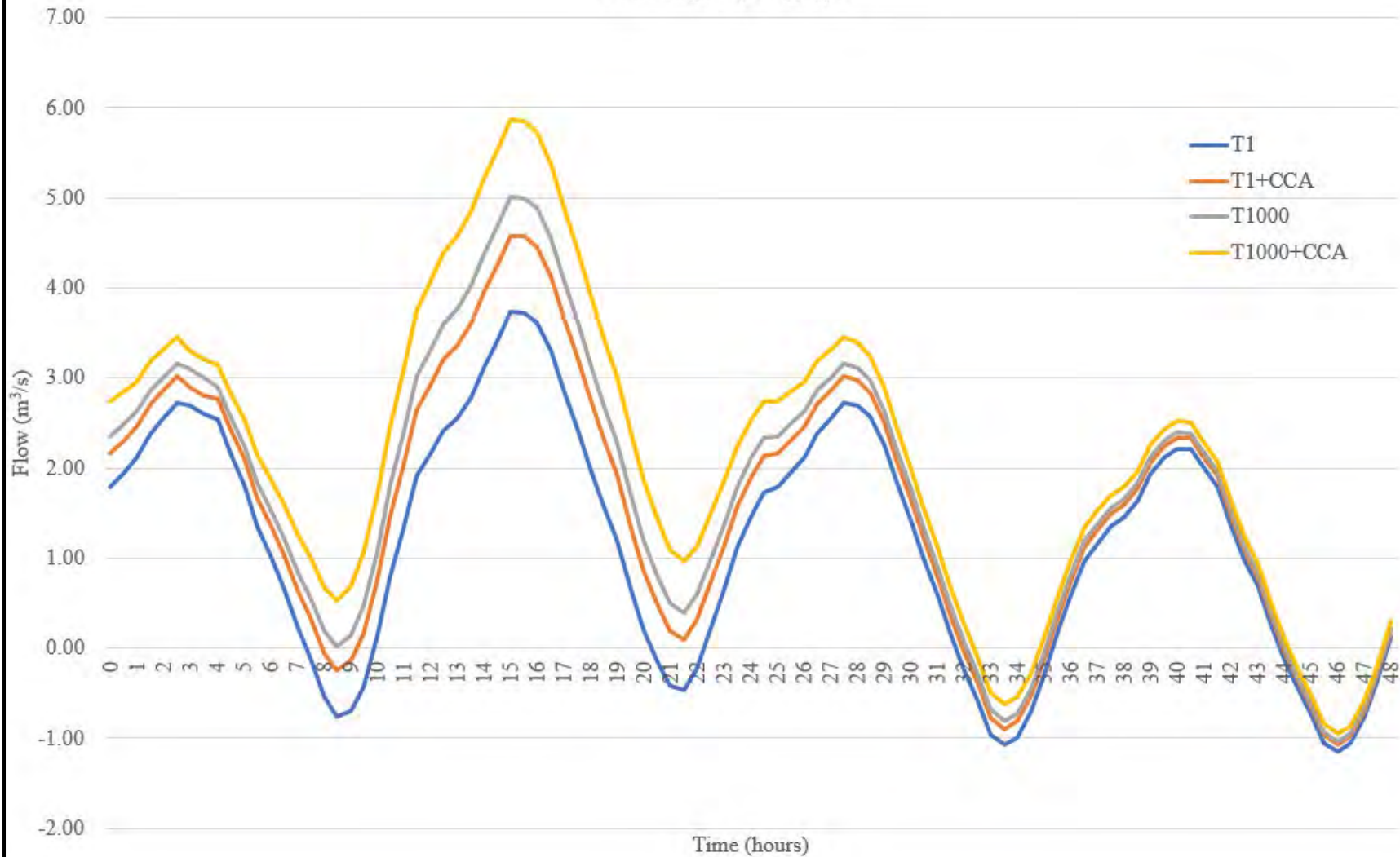
Client:
Lyndsey Martin

Project:
East Fulwood Farm,
Inchinnan

Drawing Title:
River Gryffe Hydrographs

Drawn: JS	Checked: DA	Approved: DA
Date: 29/03/2022	Figure: 8	

Tidal Stage Hydrographs



Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

Client:
Lyndsey Martin

Project:
East Fulwood Farm,
Inchinnan

Drawing Title:
Tidal Stage Hydrographs

Drawn: JS	Checked: DA	Approved: DA
Date: 29/03/2022	Figure: 9	



 Site Boundary

Q200 Depth (Max)



Google Satellite Hybrid



Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

Client:
Lyndsey Martin

Project:
East Fulwood Farm,
Inchinnan

Drawing Title:
1 in 200-Year Fluvial Storm Event
Inundation Extent - Site Specific


Drawn: JS	Checked: DA	Approved: DA
--------------	----------------	-----------------

Date: 29/03/2022	Figure: 10
---------------------	---------------


0 50 100 m





 Site Boundary

Q200 +CCA Depth (Max)

 3.0m
0.02m

Google Satellite Hybrid

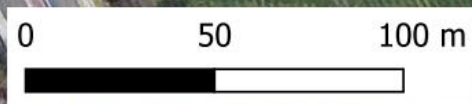
**terrenus**
land & water

Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

Client:
Lyndsey Martin

Project:
East Fulwood Farm,
Inchinnan

Drawing Title: 1 in 200-Year plus Climate Change Allowance Fluvial Storm Event Inundation Extent - Site Specific		
Drawn: JS	Checked: DA	Approved: DA
Date: 29/03/2022	Figure: 11	





 Site Boundary

Q500 Depth (Max)



Google Satellite Hybrid



Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

Client:
Lyndsey Martin

Project:
East Fulwood Farm,
Inchinnan

Drawing Title:
1 in 500-Year Fluvial Storm Event
Inundation Extent - Site Specific

Drawn: JS	Checked: DA	Approved: DA
--------------	----------------	-----------------

Date: 29/03/2022	Figure: 12
---------------------	---------------

0 50 100 m





 Site Boundary

Q1000 T1 Depth (Max)



Google Satellite Hybrid



Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

Client:
Lyndsey Martin

Project:
East Fulwood Farm,
Inchinnan

Drawing Title:
1 in 1000-Year Fluvial Storm Event
Inundation Extent - Site Specific


Drawn: JS	Checked: DA	Approved: DA
--------------	----------------	-----------------

Date: 29/03/2022	Figure: 13
---------------------	---------------


0 50 100 m





 Site Boundary

Q1000 T1 +CCA Depth (Max)

 3.0m
0.02m

Google Satellite Hybrid

 **terrenus**
land & water

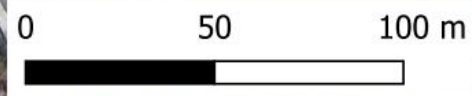
Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

Client:
Lyndsey Martin


Project:
East Fulwood Farm,
Inchinnan

Drawing Title:
1 in 1000-Year plus Climate Change
Allowance Fluvial Storm Event
Inundation Extent - Site Specific

Drawn: JS	Checked: DA	Approved: DA
Date: 29/03/2022	Figure: 14	





 Site Boundary

T200 +CCA Depth (Max)



Google Satellite Hybrid



Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

Client:
Lyndsey Martin


Project:
East Fulwood Farm,
Inchinnan

Drawing Title:
1 in 200-Year plus Climate Change
Allowance Tidal Storm Event
Inundation Extent - Site Specific


Drawn: JS	Checked: DA	Approved: DA
--------------	----------------	-----------------


Date: 29/03/2022	Figure: 15
---------------------	---------------



 Site Boundary

T1000 +CCA Depth (Max)

 3.0m

 0.02m

Google Satellite Hybrid



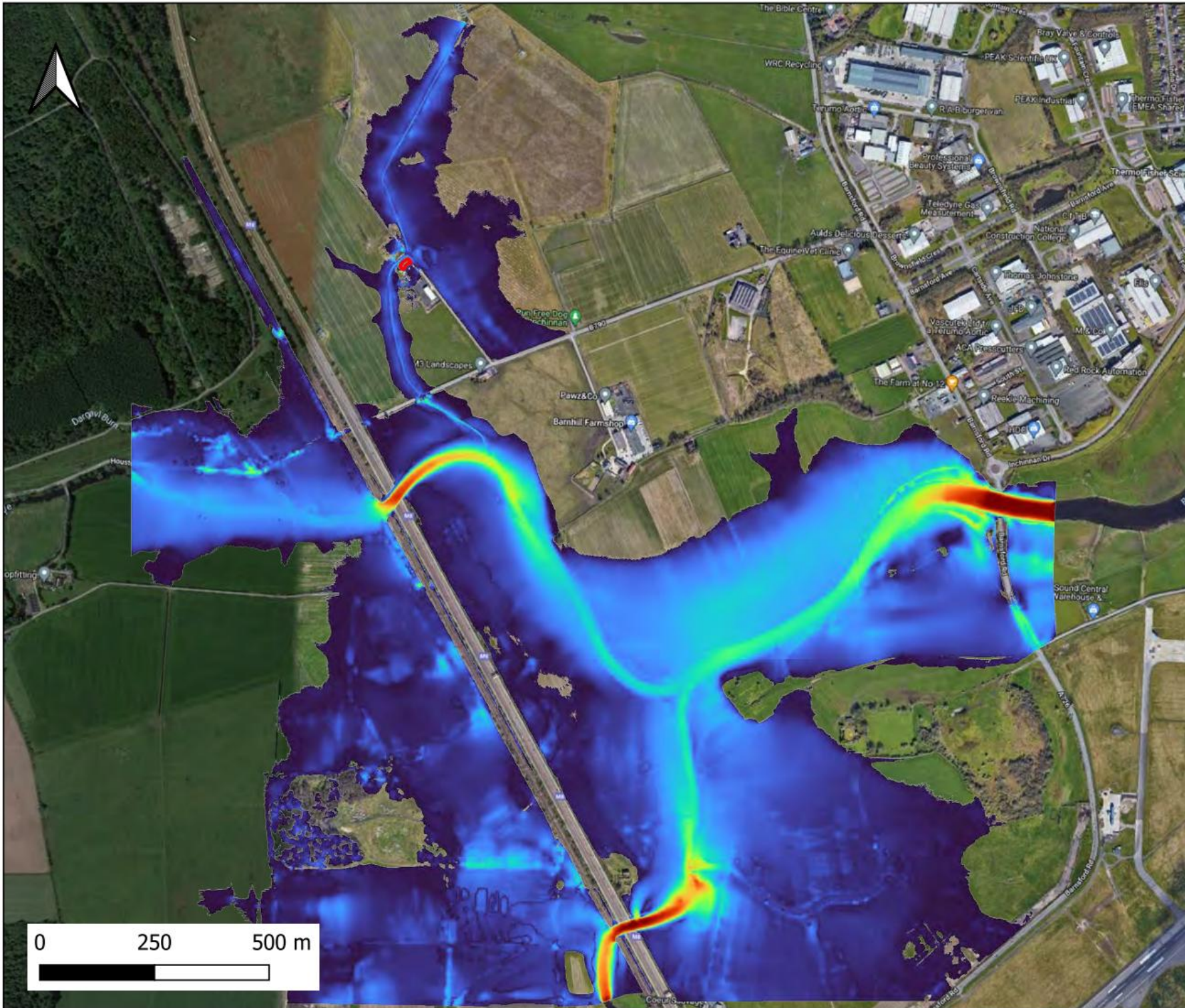
Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

Client:
Lyndsey Martin

Project:
East Fulwood Farm,
Inchinnan

Drawing Title:
1 in 1000-Year plus Climate Change
Allowance Tidal Storm Event
Inundation Extent - Site Specific

Drawn: JS	Checked: DA	Approved: DA
Date: 29/03/2022	Figure: 16	



Site Boundary

Q1000 T1 Velocity (Max)

5.0m/s

0.001m/s

Google Satellite Hybrid

**terrenus**
land&water

Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

Client:
Lyndsey Martin

Project:
East Fulwood Farm,
Inchinnan

Drawing Title:
1 in 1000-Year Fluvial Storm Event
Maximum Water Velocity

Drawn: JS	Checked: DA	Approved: DA
Date: 29/03/2022	Figure: 17	



Site Boundary

Q1000 T1 Froude (Max)

1

0

Google Satellite Hybrid

 **terrenus**
land & water

Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk


Client:
Lyndsey Martin

Project:
East Fulwood Farm,
Inchinnan


Drawing Title:
1 in 1000-Year Fluvial Storm Event
Froude Sensitivity Analysis

Drawn: JS	Checked: DA	Approved: DA
Date: 15/03/2022	Figure: 18	



 Site Boundary

Courant V-L 18 30

 1
0

Google Satellite Hybrid

 **terrenus**
land & water

Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

Client:
Lyndsey Martin

Project:
East Fulwood Farm,
Inchinnan

Drawing Title:
1 in 1000-Year Fluvial Storm Event
Courant Sensitivity Analysis

Drawn: JS	Checked: DA	Approved: DA
Date: 29/03/2022	Figure: 19	



 Site Boundary

Q200 Minor Block Depth (Max)



Google Satellite Hybrid



Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

Client:
Lyndsey Martin

Project:
East Fulwood Farm,
Inchinnan

Drawing Title:
1 in 200-Year Fluvial Storm Event
Inundation Extent - Minor Blockage
Analysis

Drawn: JS	Checked: DA	Approved: DA
--------------	----------------	-----------------

Date: 29/03/2022	Figure: 20
---------------------	---------------

0 50 100 m





 Site Boundary

Q200 Major Block Depth (Max)



Google Satellite Hybrid



Terrenus Land & Water Ltd
Hamilton International Park
G72 0BN
www.terrenus.co.uk

Client:
Lyndsey Martin

Project:
East Fulwood Farm,
Inchinnan

Drawing Title:
1 in 200-Year Fluvial Storm Event
Inundation Extent - Major Blockage
Analysis

Drawn: JS	Checked: DA	Approved: DA
--------------	----------------	-----------------

Date: 29/03/2022	Figure: 21
---------------------	---------------

0 50 100 m





Moorpark House, 11 Orton Place, Glasgow, G51 2HF 0141 445 3974
info@icdparchitects.com www.icdparchitects.com

FILE LOCATION:

PROJECT
Development at East Fulwood Farm

CLIENT
Lyndsey Martin

PLANNING APPLICATION

DATE 09/10/2023	DRAWN CF	SCALE 1:200	PAPER SIZE A3			
NAME:						
SITE PLAN						
PROJECT	ORIGINATOR	ZONE	LEVEL	TYPE	ROLE	NUMBER
GW227- ICDP - 00 - XX - DR - A - L(--)						
23 01 REV A						

REV	DATE	DRW	REVISION	NOTES	CHK	APP	
REVISION HISTORY							
STATUS:			SUITABILITY DESCRIPTION:				
REVISION: A			REVISION DESCRIPTION: RAISED WALKWAY ADDED BETWEEN BUILDINGS TO GARDEN AREA				

My Ref:
Contact: James Weir
Telephone: 07483 370666
Email: dc@renfrewshire.gov.uk
Date: 11 July 2023



William Findlater
ICDP Architects
Moorpark House
11 Orton Place
Glasgow
G51 2HF

Proposal: Erection of two Chalets
Location: East Fulwood Farm House, Houston Road, Inchinnan, Renfrew, PA4 9LX,
Application Type: Planning Permission-Full
Application No: 22/0706/PP

Dear Sir/Madam,

NOTIFICATION OF REFUSAL OF CONSENT

The Council has decided to refuse your application, details of which are given above. I enclose a Decision Notice which provides details of the reasons for refusal. I also enclose a copy of your submitted plans duly endorsed.

You have the right to appeal against this decision to the Local Review Body and notes on how to appeal are attached.

Yours faithfully,



Alasdair Morrison
Head of Economy and Development

REFUSE Consent subject to the reasons

Ref. 22/0706/PP



DECISION NOTICE

Town and Country Planning (Scotland) Act 1997

Planning etc. (Scotland) Act 2006

Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013

TO

Mrs Lyndsey Martin
East Fulwood Farm House
Houston Road
Inchinnan
Renfrew
PA4 9LX

With reference to your application registered on 17 October 2022 for Planning Consent for the following development:-

PROPOSAL

Erection of two Chalets

LOCATION

East Fulwood Farm House, Houston Road, Inchinnan, Renfrew, PA4 9LX

DECISION

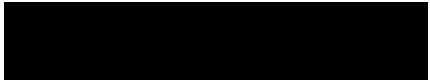
The Council in exercise of their powers under the above Acts and Orders, having considered the above proposal, the plans endorsed as relating to it and the particulars given in the above application hereby:-

REFUSE Consent subject to the reasons listed on the reverse/paper apart.

PLANS AND DRAWINGS

The plans and drawings relative to this refusal are those identified in the Schedule of Plans/Drawings attached as a paper apart and forming part of this Decision Notice.

Dated: 10 July 2023


Signed
Appointed Officer
on behalf of Renfrewshire Council

Ref. 22/0706/PP

REASON FOR REFUSAL

PAPER APART

TERMS AND CONDITIONS

Reason for Decision

1. The proposed development is at a location susceptible to flooding. It does not therefore align with the precautionary and avoidance principles advocated by the sustainable flood risk management framework and is contrary to Policy 22 of National Planning Framework 4, Policy I3 of the Adopted Renfrewshire Local Development Plan and the associated New Development Supplementary Guidance on Delivering the Infrastructure Strategy (Flooding and Drainage).

TOWN AND COUNTRY PLANNING (SCOTLAND) ACT 1997

1. If the applicant is aggrieved by the decision to refuse permission for or approval required by a condition in respect of the proposed development, or to grant permission or approval subject to conditions, the applicant may require the planning authority to review the case under section 43A of the Town and Country Planning Act (Scotland) Act 1997 within three months beginning with the date of this notice. The notice of review should be addressed to Head of Legal and Democratic Services, Renfrewshire House, Cotton Street, Paisley PA1 1PR.

2. If permission to develop land is refused or granted subject to conditions and the owner of the land claims that the land has become incapable of reasonably beneficial use in its existing state and cannot be rendered capable of reasonably beneficial use by the carrying out of any development which has been or would be permitted, the owner of the land may serve on the planning authority a purchase notice requiring the purchase of the owner of the land's interest in the land in accordance with Part 5 of the Town and Country Planning (Scotland) Act 1997.

Appendix 1

RENFREWSHIRE COUNCIL		Application No: 22/0706/PP
CHIEF EXECUTIVE'S SERVICE RECOMMENDATION OF PLANNING APPLICATION		Regd: 5 December 2022
Applicant	Agent	
Mrs Lyndsey Martin East Fulwood Farm House Houston Road Inchinnan Renfrew PA4 9LX	William Findlater ICDP Architects Moorpark House 11 Orton Place Glasgow G51 2HF	
Nature of Proposals Erection of two Chalets		
Site East Fulwood Farm House, Houston Road, Inchinnan, Renfrew, PA4 9LX		
Description This application seeks planning permission for the erection of two chalets at East Fulwood Farm. East Fulwood Farm is located 1km to the west of Inchinnan Business Park, and is accessed via a single-track road which connects with the B790 which is 250m to the south east. The farm comprises of an L shaped single storey farmhouse, with an agricultural barn to the southeast. The proposed chalets will be positioned on a vacant area of ground immediately to the rear (northwest) of the farmhouse. This area is enclosed by a screen fence, with the Linn Burn and associated trees and vegetation to the north and west. The proposed development comprises of a one bedroom (approx. 40 sqm) and a two bedroom (approx. 63 sqm) chalet. They are of matching mono pitched roof design and incorporate access ramps and external seating areas. The exterior will be finished in Cedral lap cladding. There are two parking spaces proposed for each chalet.		
History No previous applications.		
Policy and Material Considerations Legislation requires planning decisions to be made in accordance with the Development Plan unless material considerations indicate otherwise. In this instance, the proposal must be assessed against the following: <u>Development Plan</u> National Planning Framework 4 NPF4: Policy 8 - Green belts NPF4: Policy 22 – Flood Risk and Water Management NPF4: Policy 29 - Rural development		

<p>NPF4: Policy 30 – Tourism</p> <p>Renfrewshire Local Development Plan LDP 2021: Policy ENV1 - Green Belt LDP 2021: Policy ENV4 - The Water Environment LDP 2021: Policy ENV2 - Natural Heritage LDP 2021: Policy I3 - Flooding and Drainage LDP 2021: Policy E4 - Tourism</p> <p><u>Supplementary Guidance</u></p> <p>Delivering the Environment Strategy Delivering the Infrastructure Strategy Delivering the Economic Strategy</p>
<p>Publicity</p> <p>Neighbour notification has been undertaken in accordance with the requirements of the regulations.</p>
<p>Objections/Representation</p> <p>None received.</p>
<p>Consultations</p> <p>Chief Executives Service (Roads Development) – No objection subject to conditions relating to the provision of sight lines at the main access.</p> <p>Communities & Housing Services (Environmental Protection Team) - No comments.</p> <p>Glasgow Airport Safeguarding – No objection.</p> <p>SEPA – Object in principle to the application as the development is expected to put people or property at risk of flooding, which is contrary to National Planning Framework 4.</p> <p>Informative to be added: No</p>
<p>Assessment</p> <p>Policy 8 and ENV1 specify forms of development that are acceptable in the green belt in principle. One of these is tourism related development.</p> <p>Policy 30 and E4 refer to tourism related accommodation as being acceptable provided it contributes to the local economy and is compatible with the surrounding environment. Policy 29 also supports development that contributes to the viability, sustainability and diversification of rural communities.</p> <p>Taking the above into consideration, it is accepted that the erection of two chalets at this location</p>

is acceptable in principle.

However, the site is at risk of flooding from the Lin Burn, specifically a 1 in 200 year event with an allowance for climate change. Policy 22 promotes flood avoidance as a first principle. The erection of the chalets within the flood plain would be contrary to this principle. It is noted that the development does not constitute one of the four development types that are exempt and can be supported within a flood risk area.

SEPA have issued an objection in principle to the development on the basis that it does not comply with Policy 22 and the requirement to avoid floodplains within the 1 in 200 year event. SEPA have advised that the FRA submitted with the application is based on appropriate methodologies and represents an accurate estimation of flooding at the site. The FRA indicates that the site would be inundated during the 1 in 200 year event, and is therefore contrary in principle to Policy 22.

Policy I3 also promotes avoidance as the first principle of sustainable flood risk management. New development requires to avoid areas susceptible to flooding. The development is contrary to policy I3.

In view of the above assessment, the development is found to be contrary to policies 22 and I3 with respect to flood risk. SEPA have also objected in principle to the development. It is therefore considered that the application should be refused.

A site visit has been undertaken on 23rd August 2021, and photographs relevant to the application have been archived.

RECOMMENDATION

Refuse

Reason for Decision

1. The proposed development is at a location susceptible to flooding. It does not therefore align with the precautionary and avoidance principles advocated by the sustainable flood risk management framework and is contrary to Policy 22 of National Planning Framework 4, Policy I3 of the Adopted Renfrewshire Local Development Plan and the associated New Development Supplementary Guidance on Delivering the Infrastructure Strategy (Flooding and Drainage).



Alasdair Morrison
Head of Economy and Development

Applicant: Mrs Lyndsey Martin	Ref. No: 22/0706/PP
Site: East Fulwood Farm House Houston Road Inchinnan Renfrew PA4 9LX	Officer: James Weir

Documents

Document	Document Attached (Admin) ✓	Document Attached and Signed ✓
Decision Letter	✓	✓
Decision Notice	✓	✓
Appendix 1 – Report of Handling	✓	✓

Plans to be stamped

Drawing Number	Drawing Title	Checked Paper/DMS (Officer) ✓	Stamped DMS (BS) ✓
L(--)03	Elevations – One Bedroom Chalet	✓	✓
L(--)02	Elevations – Two Bedroom Chalet	✓	✓
/	Location Plan	✓	✓
L(--)04	Site Elevations & Pictures	✓	✓
L(--)01	Site Plan	✓	✓
L(--)06	Existing Road Splay Photos	✓	✓
L(--)05	Junction Splay	✓	✓

Officers Initials: JW

Business Support Initials: ____DM____

<p align="center">RENFREWSHIRE COUNCIL</p> <p align="center"><u>Town and Country Planning (Scotland)</u></p> <p align="center"><u>Act 1997</u></p>	
<p>Application No.</p>	
<p>REFUSED</p> <p>on</p>	
<p>Signed by </p>	
<p>On behalf of Renfrewshire Council</p>	

CLADDING SYSTEM



Cedral Lap

Installed in a traditional shiplap style, giving your facade beautiful, deep shadow lines.

Length 3600 mm
Width 190 mm
Thickness 10 mm
Weight per plank 11,2 kg

The Ocean range



RENFREWSHIRE COUNCIL

Town and Country Planning (Scotland)

Act 1997

Application No. 22/0706/PP

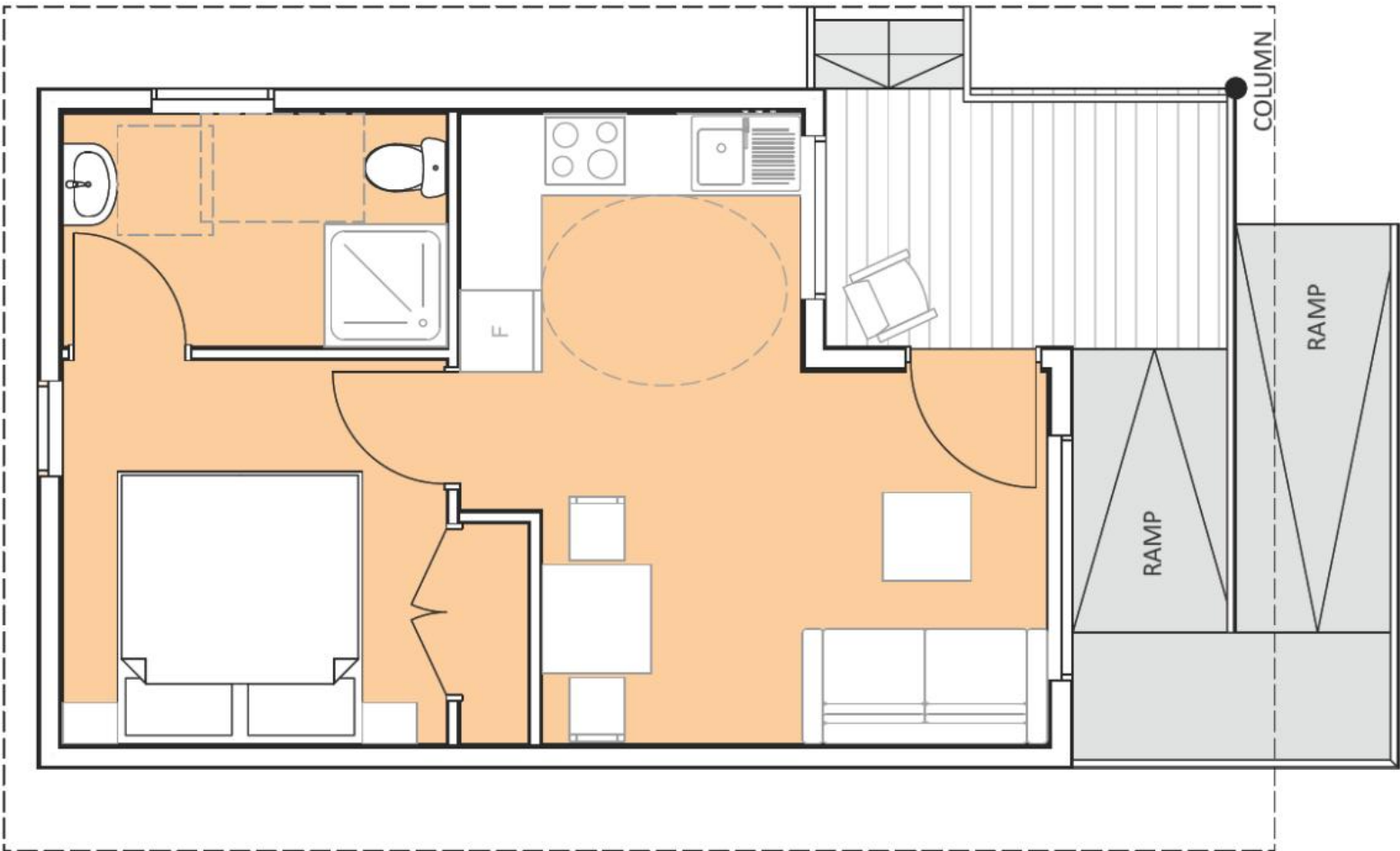
REFUSED

on

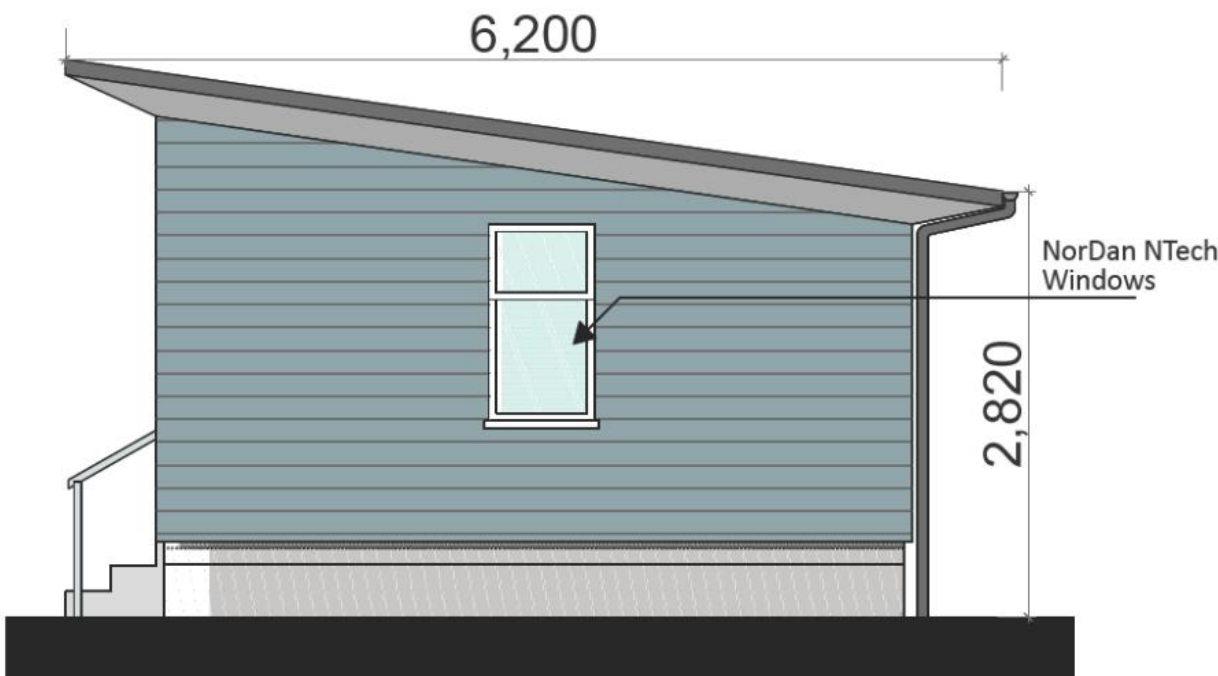
10.07.2023

Signed by

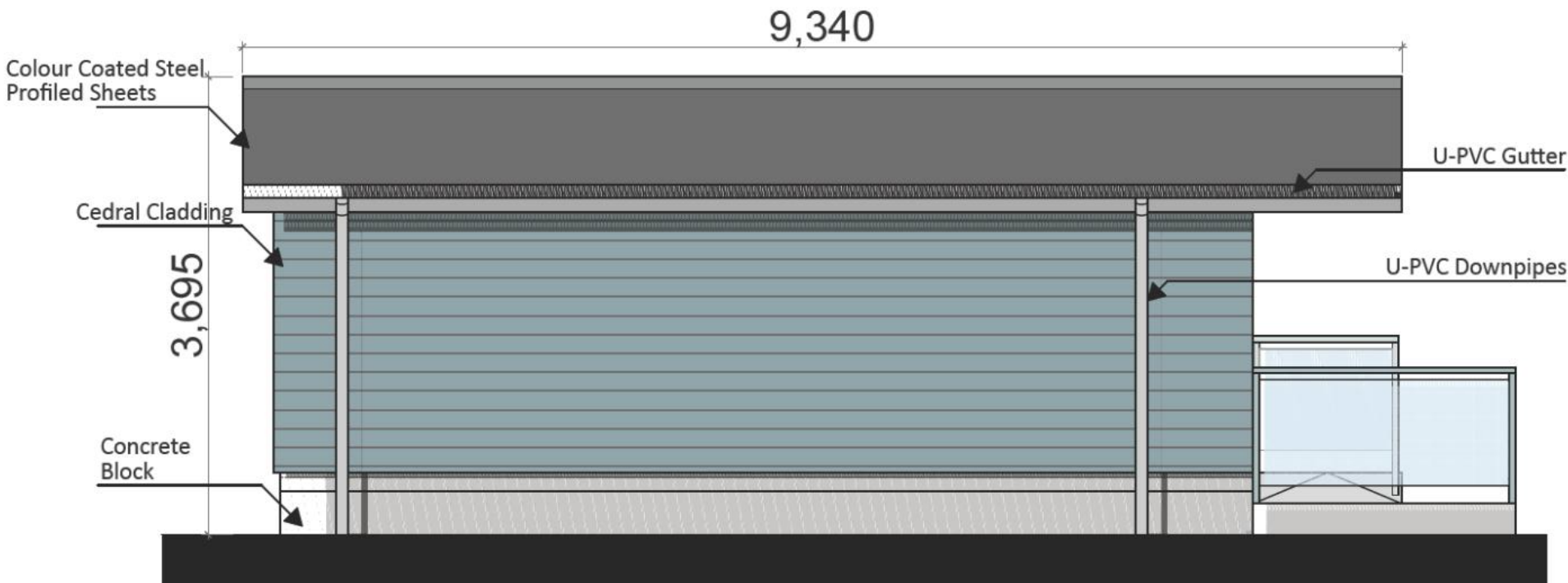
On behalf of Renfrewshire Council



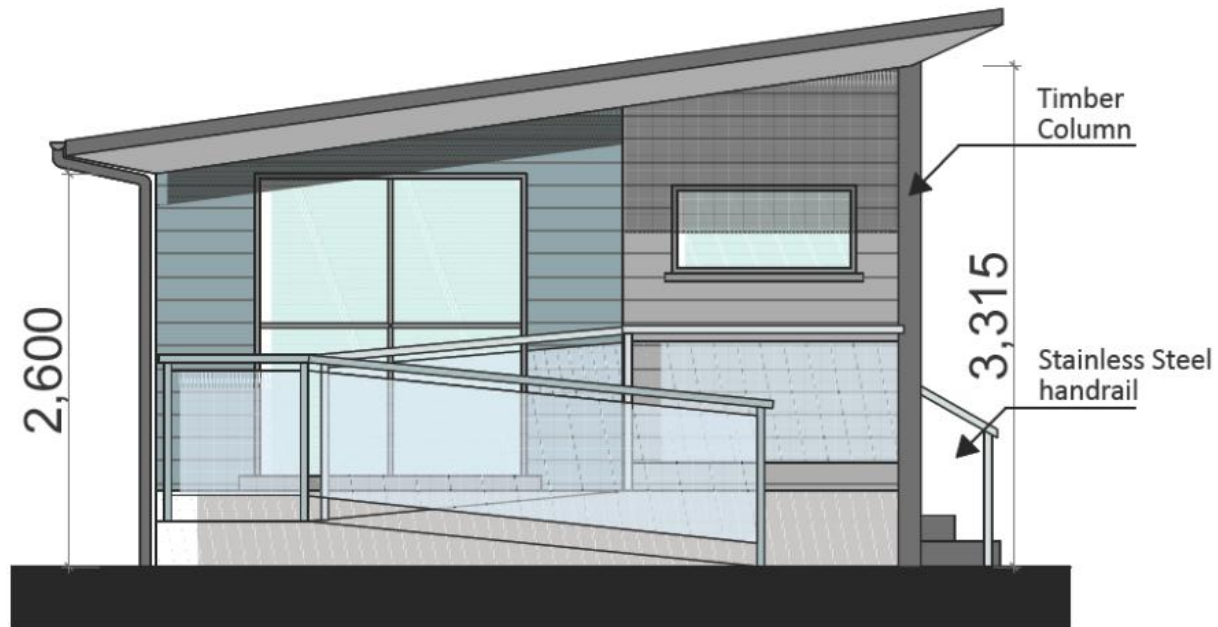
FLOOR PLAN



END ELEVATION



SIDE ELEVATION



FRONT ELEVATION



SIDE ELEVATION



FOR INFORMATION

FOR COMMENT

FOR CLIENT APPROVAL

FOR CONSTRUCTION

This drawing has been reviewed against the CDM risk register and notes provided to fully describe all residual risks identified.
Signed:

REVISION HISTORY

REV	DATE	DRW	REVISION NOTES	CHK	APP

Notes:

Do not scale from drawings. Figured dimensions only to be taken from this drawing. All dimensions are to be checked on site before work is carried out. If in doubt, ask.
All dimensions are in millimetres unless otherwise stated.
This drawing must be read in conjunction with all other architects detail drawings, schedules and specifications.
Any discrepancies to be notified in writing to Architect immediately.

Refer to Engineers' drawings for all structural information
All building works to comply in all respects to current Building Standards for country in which site is located.
All electrical work to be carried out in accordance with the latest edition of the Institute of Electrical Engineers Regulations and to the approval of the Local Authority.
All drainage work to be carried out in consultation with the Local Authority Inspectors and to be tested to the satisfaction of the Local Authority.

This drawing must not be copied in whole or in part without prior written permission of ICDP Ltd

©ICDP Ltd



Moorpark House, 11 Orton Place, Glasgow, G51 2HF 0141 445 3974
info@icdparchitects.com www.icdparchitects.com

PROJECT

Development at East Fulwood Farm

CLIENT

Lyndsey Martin

PLANNING APPLICATION

DATE	DRAWN	SCALE	PAPER SIZE
Oct '22	CF	1:50	A2

NAME: Elevations - One Bedroom Chalet

PROJECT	ORIG NATOR	ZONE	LEVEL	TYPE	ROLE	NUMBER
GW22723 - ICDP	-	00	-	XX	-	DR - A - L(-)03

STATUS: SUITABILITY DESCRIPTION:

REVISION: REVISION DESCRIPTION:

CLADDING SYSTEM



Cedral Lap
Installed in a traditional shiplap style, giving your facade beautiful, deep shadow lines.

Length 3600 mm
Width 190 mm
Thickness 10 mm
Weight per plank 11.2 kg

The Ocean range

C06 Grey Green™	C10 Blue Grey™	C62 Violet Blue™	C15 Dark Grey	C18 Slate Grey

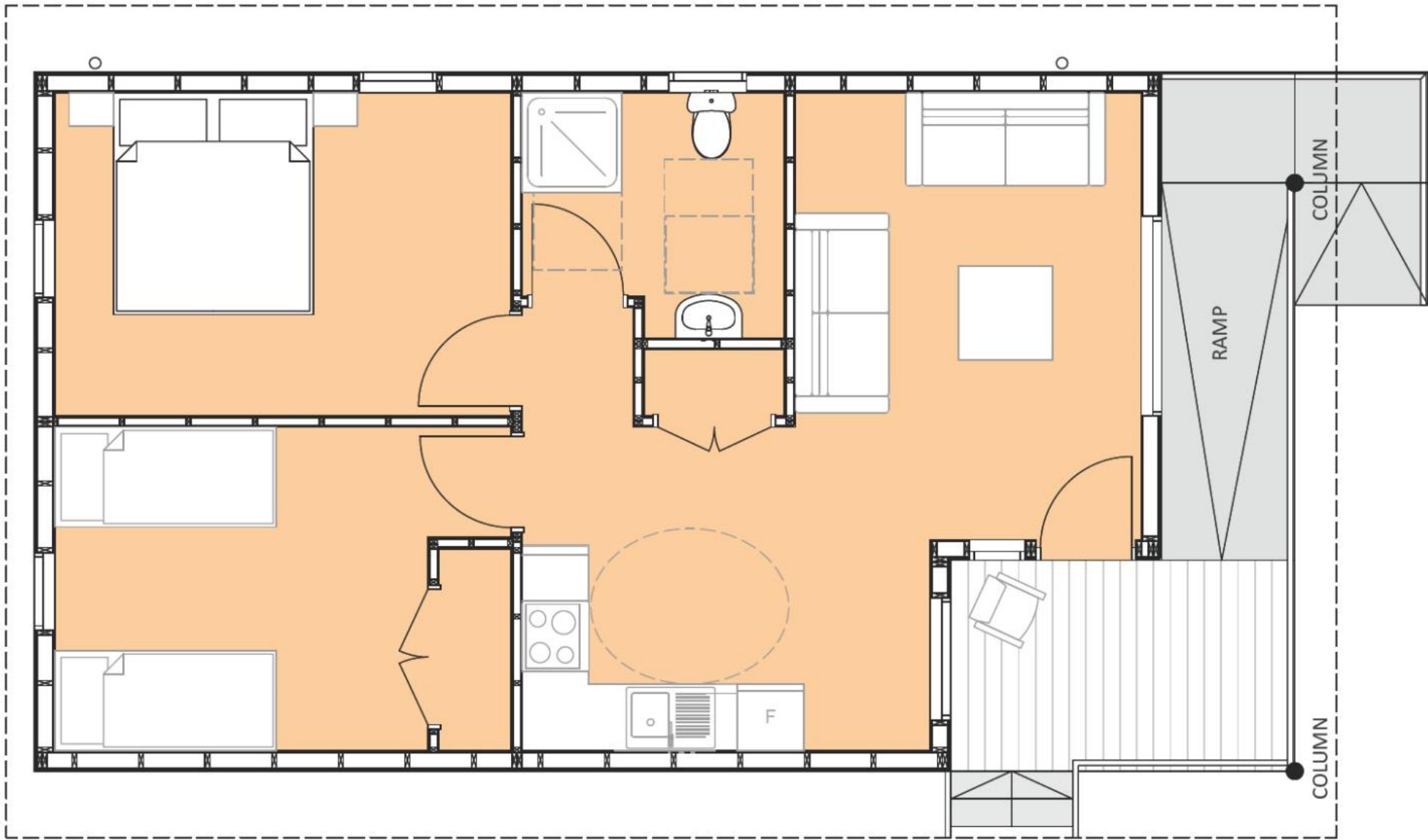
RENFREWSHIRE COUNCIL
Town and Country Planning (Scotland)
Act 1997

Application No. **22/0706/PP**

REFUSED
on **10.07.2023**

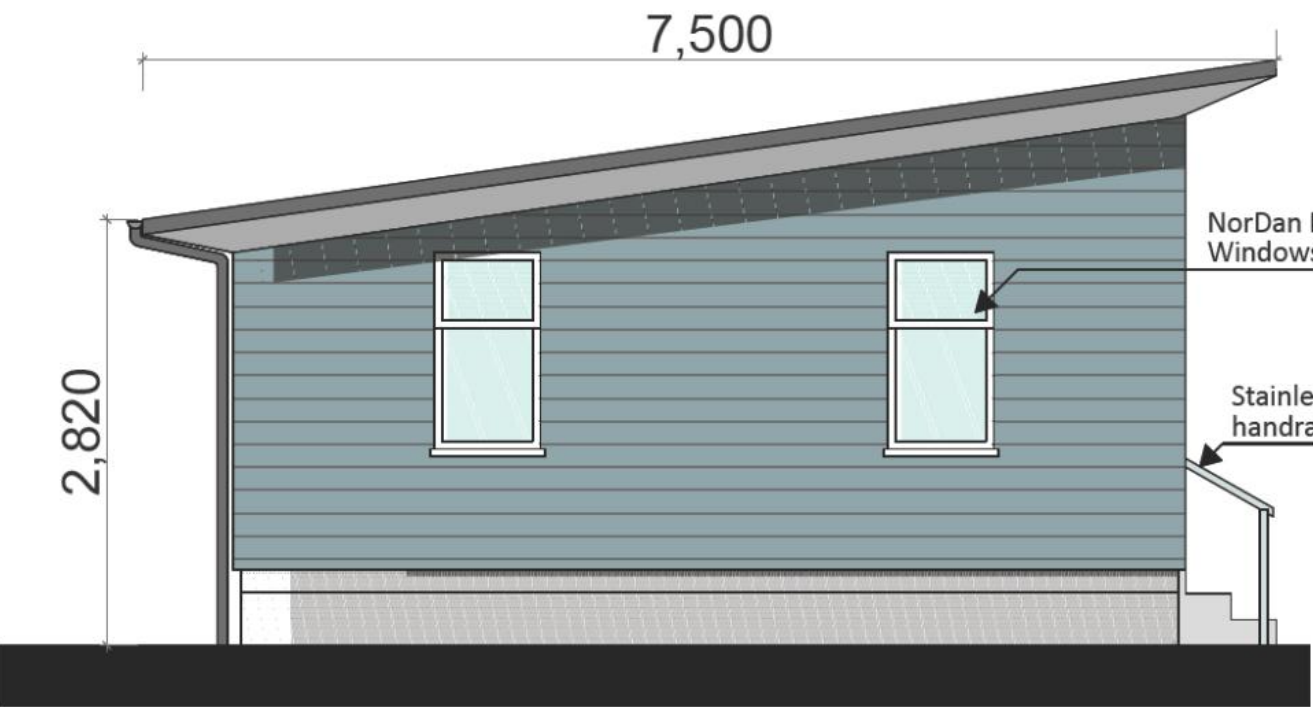
Signed by 

On behalf of Renfrewshire Council



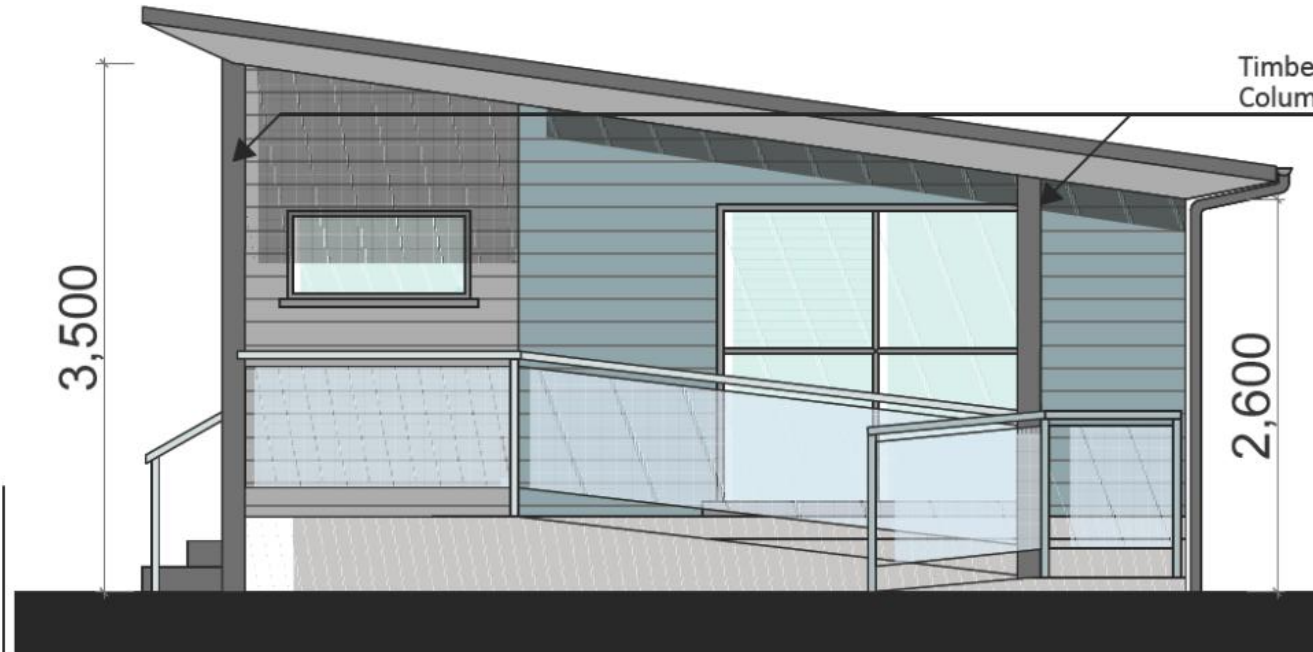
FLOOR PLAN

10,160



END ELEVATION

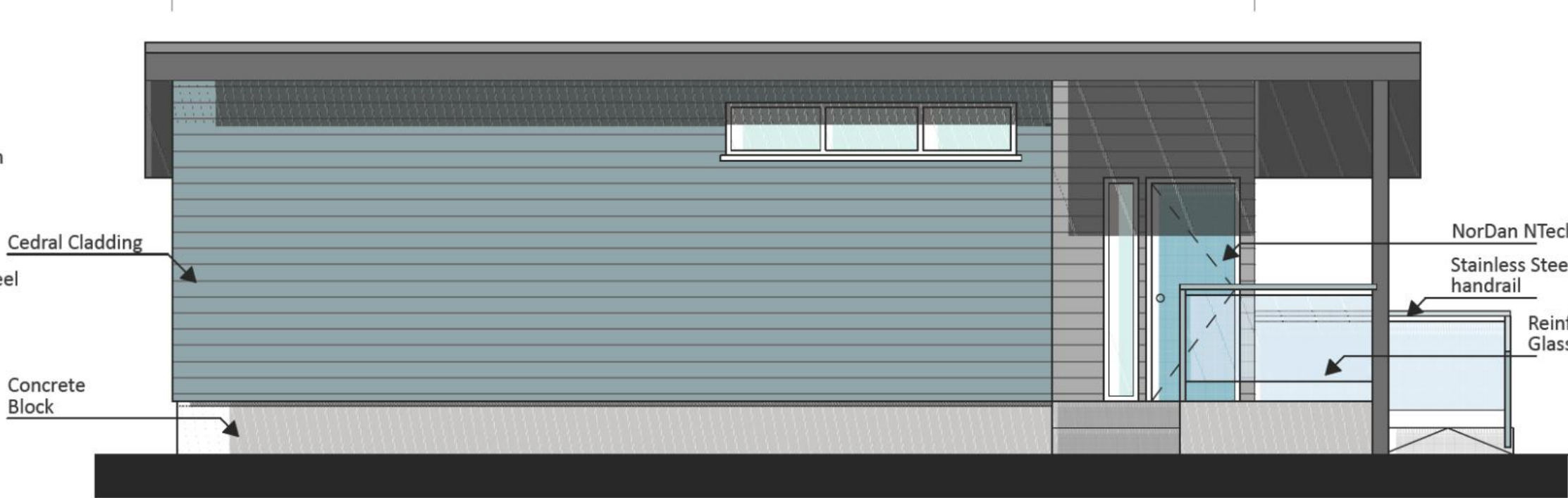
6,300



FRONT ELEVATION

1,885

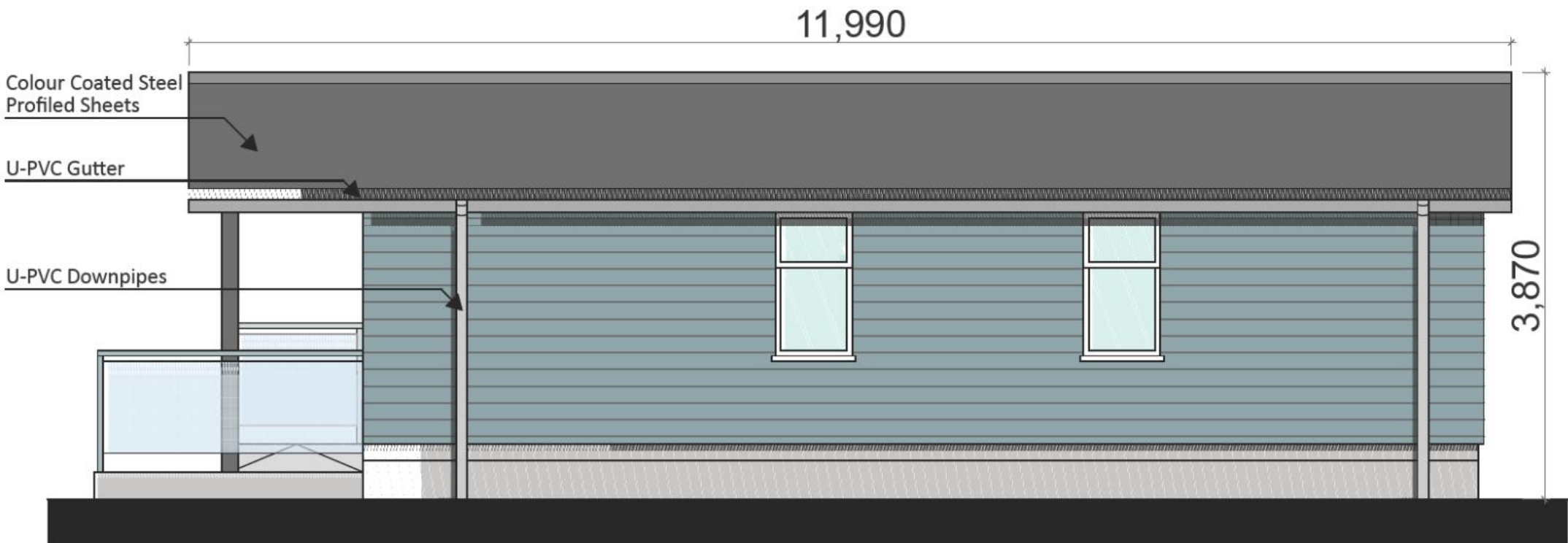
4,415



SIDE ELEVATION

8,260

1,900



SIDE ELEVATION

11,990

3,870



FOR INFORMATION
FOR COMMENT
FOR CLIENT APPROVAL
FOR CONSTRUCTION

This drawing has been reviewed against the CDM risk register and notes provided to fully describe all residual risks identified.
Signed:

REVISION HISTORY					
REV	DATE	DRW	REVISION NOTES	CHK	APP

Notes:

Do not scale from drawings. Figured dimensions only to be taken from this drawing. All dimensions are to be checked on site before work is carried out. If in doubt, ask.
All dimensions are in millimetres unless otherwise stated.
This drawing must be read in conjunction with all other architects detail drawings, schedules and specifications.
Any discrepancies to be notified in writing to Architect immediately.

Refer to Engineers' drawings for all structural information
All building works to comply in all respects to current Building Standards for country in which site is located.
All electrical work to be carried out in accordance with the latest edition of the Institute of Electrical Engineers Regulations and to the approval of the Local Authority.
All drainage work to be carried out in consultation with the Local Authority Inspectors and to be tested to the satisfaction of the Local Authority.

This drawing must not be copied in whole or in part without prior written permission of ICDP Ltd

©ICDP Ltd

ICDP ARCHITECTS

Moorpark House, 11 Orton Place, Glasgow, G51 2HF 0141 445 3974
info@icdparchitects.com www.icdparchitects.com

PROJECT
Development at East Fulwood Farm

CLIENT
Lyndsey Martin

PLANNING APPLICATION

DATE Oct '22	DRAWN CF	SCALE 1:50	PAPER SIZE A2
-----------------	-------------	---------------	------------------

NAME: Elevations - Two Bedroom Chalet

PROJECT	ORIG NATOR	ZONE	LEVEL	TYPE	ROLE	NUMBER
GW22723 - ICDP	-	00	- XX	- DR	- A	- L(-)02

STATUS: SUITABILITY DESCRIPTION:
REVISION: REVISION DESCRIPTION:

RENFREWSHIRE COUNCIL

Town and Country Planning (Scotland)

Act 1997

Application No. **22/0706/PP**

REFUSED
on

10.07.2023

Signed by

On behalf of Renfrewshire Council

Mast

East Fulwood

7m

East Fulwood
Cottage

Drain

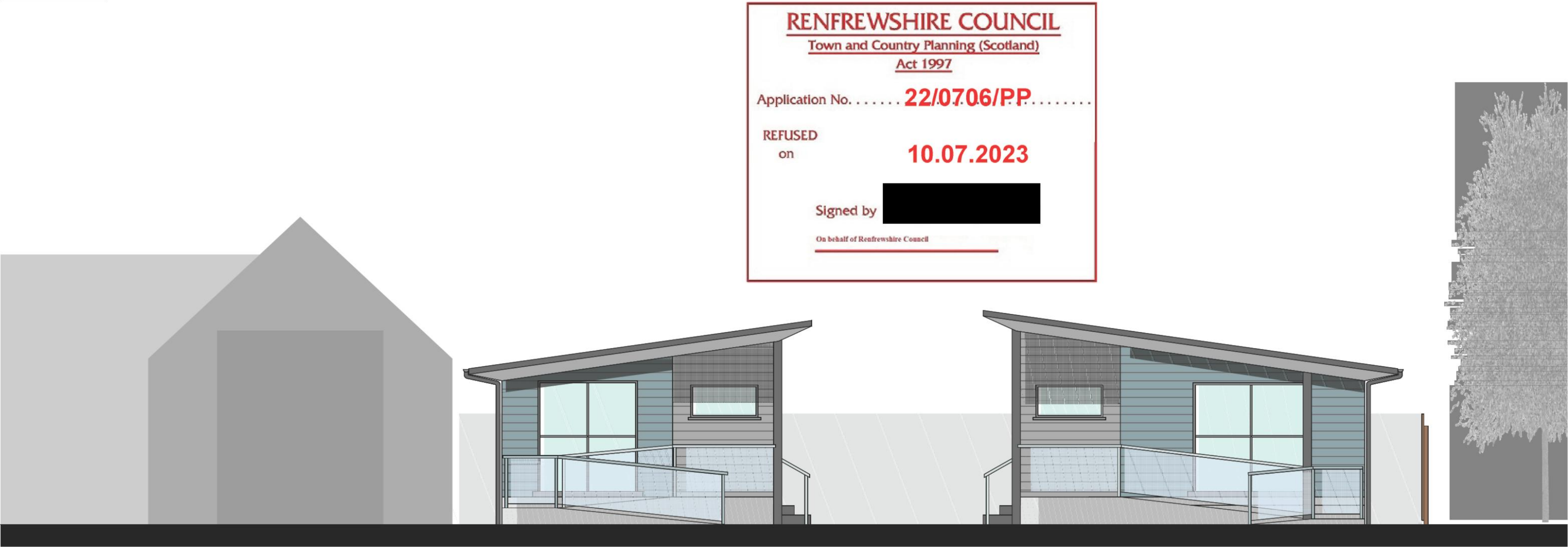
B790

Drain

N



EAST ELEVATION



NORTH ELEVATION



EXISTING SITE 1



EXISTING SITE 2



EXISTING SITE 3

FOR INFORMATION
FOR COMMENT
FOR CLIENT APPROVAL
FOR CONSTRUCTION

This drawing has been reviewed against the CDM risk register and notes provided to fully describe all residual risks identified.
Signed:

REVISION HISTORY					
REV	DATE	DRW	REVISION NOTES	CHK	APP

Notes:

Do not scale from drawings. Figured dimensions only to be taken from this drawing. All dimensions are to be checked on site before work is carried out. If in doubt, ask.

All dimensions are in millimetres unless otherwise stated.

This drawing must be read in conjunction with all other architects detail drawings, schedules and specifications.

Any discrepancies to be notified in writing to Architect immediately.

Refer to Engineers' drawings for all structural information

All building works to comply in all respects to current Building Standards for country in which site is located.

All electrical work to be carried out in accordance with the latest edition of the Institute of Electrical Engineers Regulations and to the approval of the Local Authority.

All drainage work to be carried out in consultation with the Local Authority Inspectors and to be tested to the satisfaction of the Local Authority.

This drawing must not be copied in whole or in part without prior written permission of ICDP Ltd

©ICDP Ltd

ICDP ARCHITECTS

Moorpark House, 11 Orton Place, Glasgow, G51 2HF 0141 445 3974
info@icdparchitects.com www.icdparchitects.com

PROJECT
Development at East Fulwood Farm

CLIENT
Lyndsey Martin

PLANNING APPLICATION

DATE Oct '22	DRAWN CF	SCALE 1:50	PAPER SIZE A1
-----------------	-------------	---------------	------------------

NAME: Site Elevations & Pictures

PROJECT	ORIGINATOR	ZONE	LEVEL	TYPE	ROLE	NUMBER
GW22723	- ICDP	- 00	- XX	- DR	- A	- L(-)04

STATUS:
S01

REVISION:
REVISION DESCRIPTION:

RENFREWSHIRE COUNCIL

Town and Country Planning (Scotland)

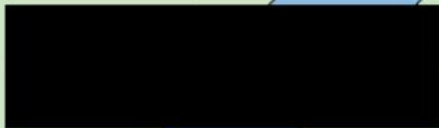
Act 1997

Application No. **22/0706/PP**

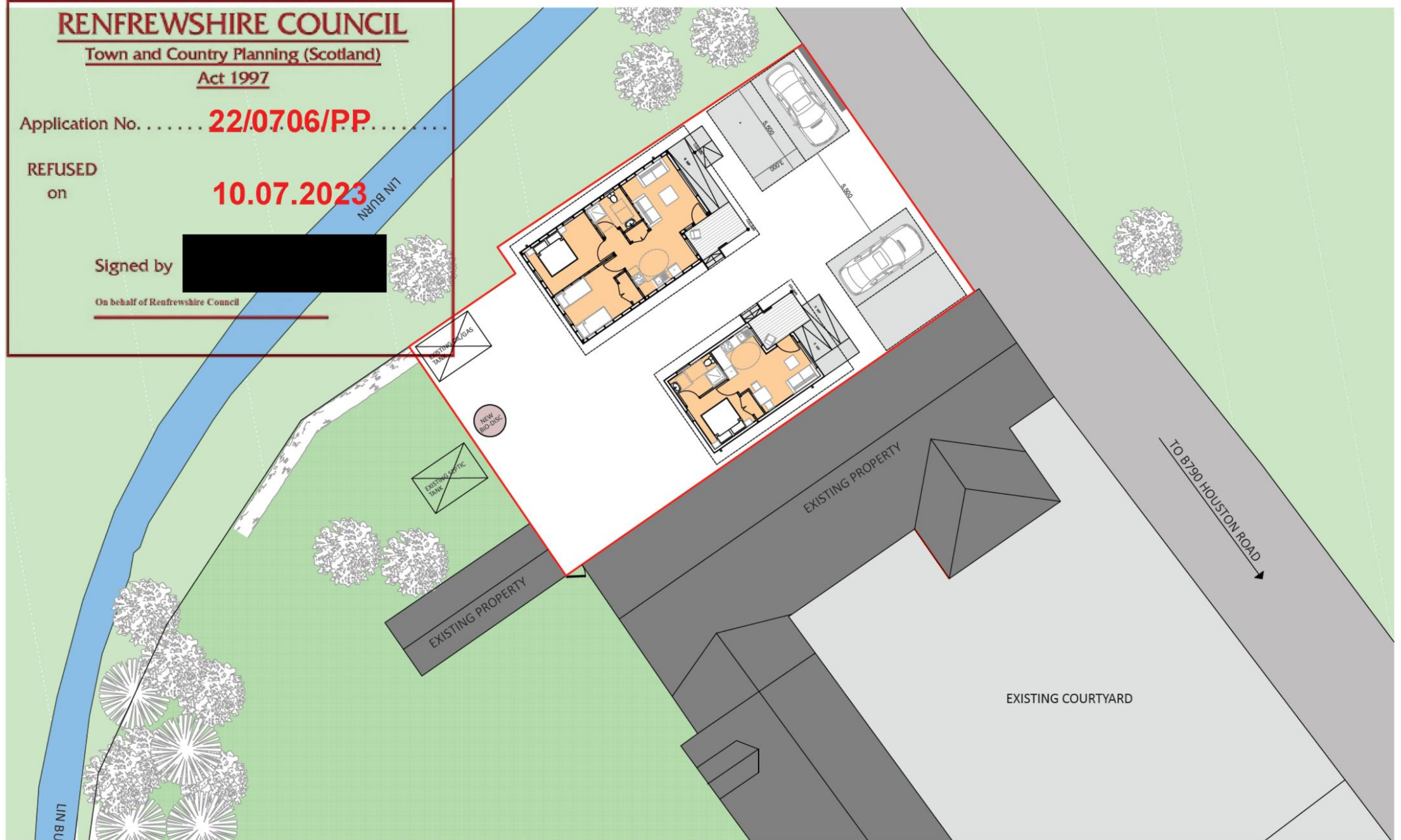
REFUSED
on

10.07.2023

Signed by



On behalf of Renfrewshire Council



ICDP
ARCHITECTS

Moorpark House, 11 Orton Place, Glasgow, G51 2HF 0141 445 3974
info@icdparchitects.com www.icdparchitects.com

FILE LOCATION

PROJECT
Development at East Fulwood Farm

CLIENT
Lyndsey Martin

PLANNING APPLICATION

DATE
14/10/2022

DRAWN
CF

SCALE
1:200

PAPER SIZE
A3

NAME:
SITE PLAN

PROJECT	ORIGINATOR	ZONE	LEVEL	TYPE	ROLE	NUMBER
---------	------------	------	-------	------	------	--------

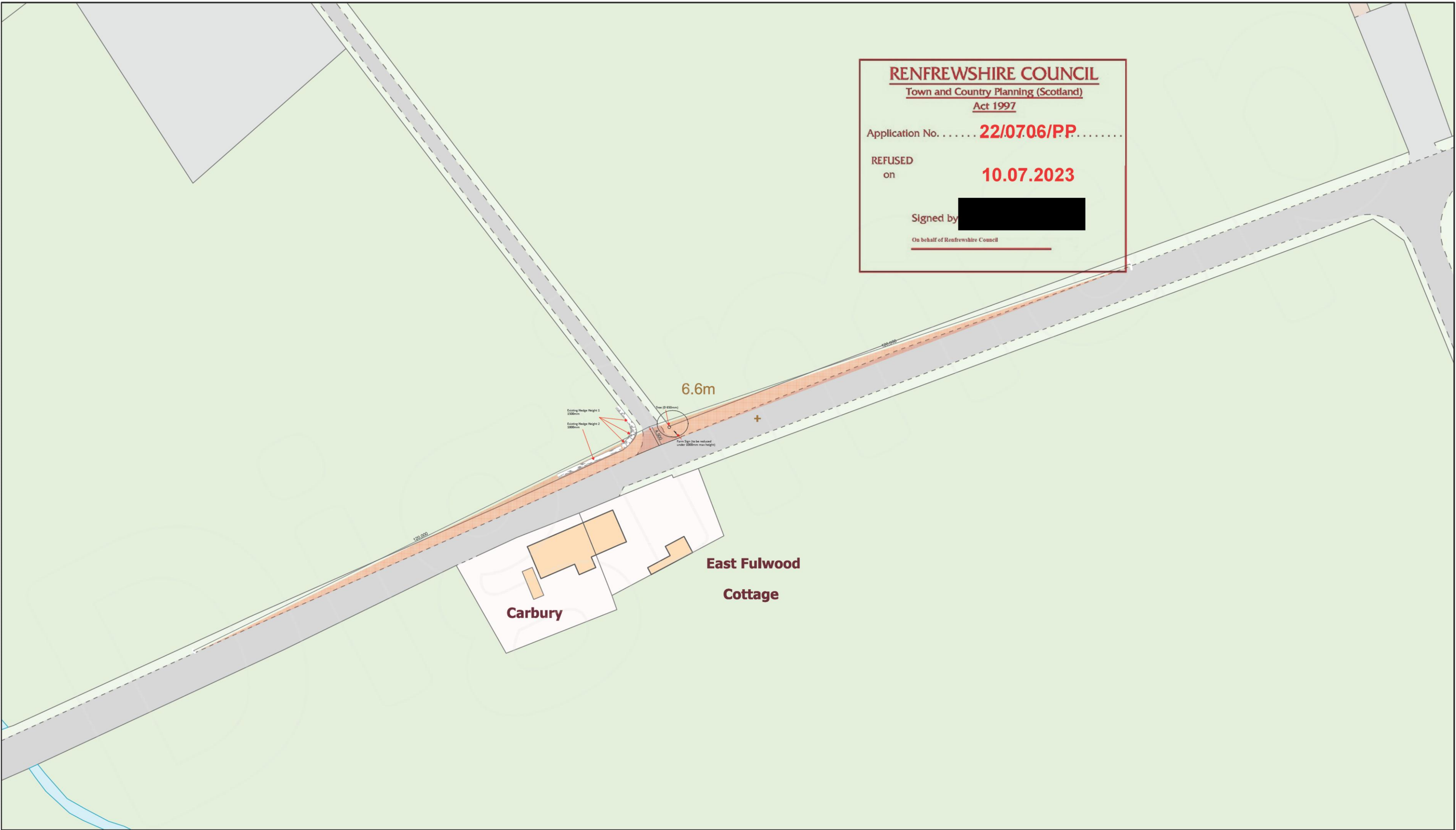
**GW227- ICDP - 00 - XX - DR - A - L(--)01
23**

REV	DATE	DRW	REVISION NOTES	CHK	APP
REVISION HISTORY					
STATUS:			SUITABILITY DESCRIPTION:		
REVISION:			REVISION DESCRIPTION:		

FOR INFORMATION
FOR COMMENT
FOR CLIENT APPROVAL
FOR CONSTRUCTION

This drawing has been reviewed against the CDM risk register and notes provided to fully describe all residual risks identified.
Signed:

REVISION HISTORY					
REV	DATE	DRW	REVISION NOTES	CHK	APP



Projection: British National Grid
16 March 2023 09:51



Notes:
Do not scale from drawings. Figured dimensions only to be taken from this drawing. All dimensions are to be checked on site before work is carried out. If in doubt, ask.
All dimensions are in millimetres unless otherwise stated.
This drawing must be read in conjunction with all other architects detail drawings, schedules and specifications.
Any discrepancies to be notified in writing to Architect immediately.
Refer to Engineers' drawings for all structural information.
All building works to comply in all respects to current Building Standards for country in which site is located.
All electrical work to be carried out in accordance with the latest edition of the Institute of Electrical Engineers Regulations and to the approval of the Local Authority.
All drainage work to be carried out in consultation with the Local Authority Inspectors and to be tested to the satisfaction of the Local Authority.
This drawing must not be copied in whole or in part without prior written permission of ICDP Ltd.
©ICDP Ltd

ICDP ARCHITECTS
Moorpark House, 11 Orton Place, Glasgow, G51 2HF 0141 445 3974
info@icdparchitects.com www.icdparchitects.com

PROJECT
Development at East Fulwood Farm
CLIENT
Lyndsey Martin

DATE Mar '23	DRAWN CF	SCALE As Shown	PAPER SIZE A1
-----------------	-------------	-------------------	------------------

NAME: Junction Splay

PROJECT	ORIGINATOR	ZONE	LEVEL	TYPE	ROLE	NUMBER
GW22723	- ICDP	- 00	- XX	- DR	- A	- L(-)05

STATUS: S01	SUITABILITY DESCRIPTION: REVISION DESCRIPTION:
----------------	---



Looking Right From 4.5m position



Looking Left From 4.5m position



Existing hedge and sign at >1.05m

RENFREWSHIRE COUNCIL

Town and Country Planning (Scotland)

Act 1997

Application No.

22/0706/PP

REFUSED

on

10.07.2023

Signed by

On behalf of Renfrewshire Council



Full Junction View & Areas to be cut back



Area to be cut back & 4.5m location

From: DC <dc@renfrewshire.gov.uk>
Sent: 02 Mar 2023 08:07:39
To: dc.bs@renfrewshire.gov.uk
Cc:
Subject: FW: Consultation Letter for Planning Application Ref:22/0706/PP
Attachments: 22-0706-PP - reply.doc, RC Agricultural Questionnaire V1.5.pdf

From: DC <dc@renfrewshire.gov.uk>
Sent: 01 March 2023 09:22
To: DC <dc@renfrewshire.gov.uk>
Cc: James Weir <james.weir@renfrewshire.gov.uk>
Subject: FW: Consultation Letter for Planning Application Ref:22/0706/PP

From: Marion Maxwell <marion.maxwell@renfrewshire.gov.uk>
Sent: 01 March 2023 09:05
To: DC <dc@renfrewshire.gov.uk>
Subject: Consultation Letter for Planning Application Ref:22/0706/PP

Please find memo and agricultural questionnaire attached in respect of above.

Regards

Marion Maxwell
Environmental Health Officer
Renfrewshire Council
Communities and Housing Services
Renfrewshire House
Cotton Street
Paisley
PA1 1BR

Tel no – 07535596615
Dept no – 0300 300 0380
Customer Services 0300 300 0300
Email – marion.maxwell@renfrewshire.gov.uk
Dept email - e-prot.es@renfrewshire.gov.uk

MEMORANDUM

Communities and Housing

Director: Mary Crearie

Tel: 07535596615 Fax: 0141 618 7500
My Ref: CH/MM/LC
Your Ref: 22/0706/PP
Ask For: Marion Maxwell
Date: 28 February 2023



To: Gwen McCracken, Development Standards Manager
Chief Executive's Service

From: Colin Hunter
Environmental Health Manager- Public Health

Application Number: 22/0706/PP

LOCATION: "East Fulwood Farm House", Houston Road,
Inchinnan, Renfrewshire

This application is for the erection of 2 chalets on farmland.

Please find attached Renfrewshire Councils agricultural questionnaire. Due to the time elapsed since the 2021 application it is recommended that this is completed again by the applicant.

Marion Maxwell
Environmental Health Officer

FAO James Weir
Renfrewshire Council
By Email

17th April 2023

Dear James

**Re: 22/0706/PP | Erection of two Chalets | East Fulwood Farm House Houston Road
Inchinnan Renfrew
Our Ref: GLA4296**

I refer to your consultation request received in this office on 27th March 2023.

The proposed development has been examined from an aerodrome safeguarding perspective and does not conflict with safeguarding criteria. We, therefore, have no objection to this proposal.

Given the nature of the proposed development it is possible that a crane may be required during its construction. We would, therefore, draw the applicant's attention to the requirement within the British Standard Code of Practice for the safe use of Cranes, for crane operators to consult the aerodrome before erecting a crane in close proximity to an aerodrome. This is explained further in Advice Note 4 – Cranes (available at <https://www.aoa.org.uk/policy-campaigns/operations-safety/>).

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] MacDonald
Safeguarding Manager
Glasgow Airport
[REDACTED]
[REDACTED]

Mr James Weir
Planning Department
Renfrewshire Council

Our Ref: 8696
Your Ref: 22/0706/PP

SEPA Email Contact:
planning.south@sepa.org.uk

By email only to: dc@renfrewshire.gov.uk

18 May 2023

Dear Mr Weir

Town and Country Planning (Scotland) Acts

22/0706/PP

Erection of two chalets

East Fulwood Farm House, Houston Road, Inchinnan, Renfrew, PA4 9LX

Thank you for your consultation which was received by SEPA on 27 March 2023 in relation to the above application. The reason for consultation was stated as flood risk.

Advice for the planning authority

The [Transitional Arrangements for National Planning Framework 4 letter](#), issued by the Chief Planner, Fiona Simpson, on 8 February 2023, states that: "From 13 February, on adoption and publication by Scottish Ministers, NPF4 will form part of the statutory development plan, along with the LDP applicable to the area at that time and its supplementary guidance. NPF4 will supersede National Planning Framework 3 and Scottish Planning Policy (SPP) (2014). NPF3 and SPP will no longer represent Scottish Ministers' planning policy and should not therefore form the basis for, or be a consideration to be taken into account, when determining planning applications on or after 13 February." Our advice given below is based on the NPF4 policy.



Chairman
Bob Downes

OFFICIAL **CEO**
Nicole Paterson

Angus Smith Building
6 Parklands Avenue
Eurocentral
Holytown
North Lanarkshire
ML1 4WQ

Tel: 03000 99 66 99
www.sepa.org.uk

We **object in principle** to this application and recommend that planning permission is refused. This is because the proposed development is expected to put people or property at risk of flooding, which is contrary to National Planning Framework 4.

In the event that the planning authority proposes to grant planning permission contrary to this advice on flood risk, the Town and Country Planning (Notification of Applications) (Scotland) Direction 2009 provides criteria for the referral to the Scottish Ministers of such cases. You may therefore wish to consider if this proposal falls within the scope of this Direction.

1. Flood risk

- 1.1 Under NPF4, all new development must now avoid the floodplain associated with the 1 in 200-year event, with an allowance for climate change. This is defined in NPF4: “at risk of flooding or in a flood risk area means land or built form with an annual probability of being flooded of greater than 0.5% which must include an appropriate allowance for future climate change.” Therefore, under current policy, we require an assessment of the 1 in 200-year level plus an appropriate allowance for climate change, as outlined in SEPA’s Climate Change (CC) allowances for flood risk assessment in land use planning.
- 1.2 Based on the SEPA Future Flood Maps, the entirety of the proposed site is shown to be at risk of flooding from the Lin Burn during a 0.5% AEP + Climate Change event. You can view the SEPA Flood Maps at: [Flood Maps | SEPA - Flood Maps | SEPA](#) .
- 1.3 In accordance with NPF4 – Policy 22, promotion of flood avoidance as a first principle is key, concurrent to reducing the vulnerability of existing development to flooding. The information derived from our Future Flood Maps indicate that the proposed site for the erection of the two chalet dwellings is likely to flood and may put people and property at risk. The proposal also does not meet any of the four exceptional circumstances criteria listed in Policy 22 a) i – iv) which might justify development in a flood risk area.
- 1.4 We are satisfied that the FRA conducted by Terrenus in April 2022 is based on appropriate



methods and its representation of flood risk at the site is in line with other available evidence. The FRA methods employed to derive flow estimations are varied and use of the higher Rainfall Runoff Peak Flow value adopts a precautionary approach (which is welcomed by SEPA). The flow estimations presented are similar to the values returned by our own analysis and appear to be appropriate.

- 1.5 However, we note that Figure 2A indicates ground levels derived from the spot height survey, with the majority of the site shown to be below 6.0mAOD. Table D indicates that water levels throughout the site during a 200yr + CC storm event would be between 6.15 – 6.18mAOD. Figure 11 also indicates that flooding under a Q200 + CC fluvial storm event would fully inundate the site, as suggested by the SEPA Future Flood Maps.
- 1.6 In summary, the FRA submitted for this proposal indicates that the site would be inundated under a 200yr + CC event. The proposal is therefore in contravention of NPF4 requirements for avoidance of a flood risk area. Consequently, we object in principle to the application and recommend that planning permission is refused.

2. Other planning matters

- 2.1 For all other planning matters, please see our [triage framework and standing advice](#) which are available on our website: www.sepa.org.uk/environment/land/planning/.

Advice for the applicant

3. Regulatory advice

- 3.1 Details of regulatory requirements and good practice advice, for example in relation to private drainage, can be found on the [regulations section](#) of our website. If you are unable to find the advice you need for a specific regulatory matter, please contact a member of the local compliance team at: GGCE@sepa.org.uk



If you have any queries relating to this letter, please contact us by email, via:

planning.south@sepa.org.uk

Yours sincerely

Peter Minting

Planning Officer

Planning Service

Disclaimer: This advice is given without prejudice to any decision made on elements of the proposal regulated by us, as such a decision may take into account factors not considered at this time. We prefer all the technical information required for any SEPA consents to be submitted at the same time as the planning or similar application. However, we consider it to be at the applicant's commercial risk if any significant changes required during the regulatory stage necessitate a further planning application or similar application and/or neighbour notification or advertising. We have relied on the accuracy and completeness of the information supplied to us in providing the above advice and can take no responsibility for incorrect data or interpretation, or omissions, in such information. If we have not referred to a particular issue in our response, it should not be assumed that there is no impact associated with that issue. For planning applications, if you did not specifically request advice on flood risk, then advice will not have been provided on this issue. Further information on our consultation arrangements generally can be found on our [website planning pages - www.sepa.org.uk/environment/land/planning/](http://www.sepa.org.uk/environment/land/planning/).



Chairman
Bob Downes

CEO
Nicole Paterson

Angus Smith Building
6 Parklands Avenue
Eurocentral
Holytown
North Lanarkshire
ML1 4WQ

Tel: 03000 99 66 99
www.sepa.org.uk

**Environment and Communities
Roads Development Team
Observations on Planning Application**

Our Ref: 32/04

Planning Contact James Weir
Tel: 07483 370666
Email: james.weir@renfrewshire.gov.uk
Roads Contact: Stephen Boyle

Planning Application No: 22/0706/PP Dated 8 February 2023 Received *

Applicant	Mrs Lyndsey Martin
Proposed Development	Erection of two Chalets
Location	East Fulwood Farm House Houston Road Inchinnan Renfrew PA4 9LX
Type of Consent	Planning Permission-Full

RECOMMENDATION - NO OBJECTIONS / SUBJECT TO CONDITIONS

Proposals Acceptable Y or N	Proposals Acceptable Y or N	Proposals Acceptable Y or N
1. General	3. New Roads	4. Servicing & Car Parking
Provision & links for:-		
Pedestrian *	(a) Widths *	(a) Servicing Arrangements *
Cyclists *	(b) Pedestrian Provision *	(b) Parking Provision *
Public transport *	(c) Layout (Horizontal/Vertical Alignment) *	(c) Layout of Parking Bays/garages *
Loading *		(d) Drainage
Parking *	(d) Turning facilities (Circles/Hammerheads) *	
	(e) Junction Details (Locations/Radii/sightlines) *	
(a) General impact of development *	(f) Provision for P.U. Services *	5. Signing
(b) Safety Audit Required *	(g) SUDS *	(a) Location *
(c) Traffic Impact Analysis *	(h) other	(b) Illumination *
2. Existing Roads		
(a) Pedestrian Provision *		
(b) Type of Connection (Road Junc/Footway Crossing) *		
(c) Locations(s) of Connection(s) *		
(d) Sightlines *		

Comments

vegetation will need cut back to ensure adequate visibility for drivers egressing from the access.

Conditions

1. A visibility sightline of 4.5m x 120m at a height of 1.05m above the road surface shall be provided in either direction of the access.

Notes for intimation to Applicant

(i) Construction Consent (s21)	REQUIRED / NOT REQUIRED
(ii) Road Bond (S17)*	REQUIRED / NOT REQUIRED
(iii) Road Openings Permit (s56)*	REQUIRED / NOT REQUIRED

Signedjohn everett..... Date28/02/23.....
Head of Operations & Infrastructure

