

FLOOD RISK ASSESSMENT & DRAINAGE STRATEGY REPORT

PROPOSED DEVELOPMENT

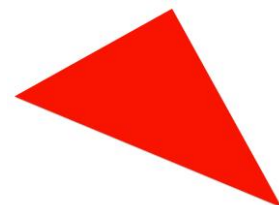
**FLETCHER FOLD ROAD,
BURY, GREATER MANCHESTER**

For

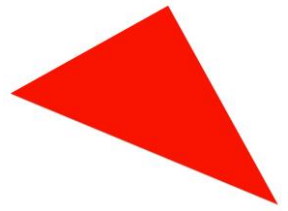
TYSON CONSTRUCTION



**JANUARY 2024
23-B-13497**



EXECUTIVE SUMMARY	
Site Parameters	Site Area – 9,250m² Present Impermeable Area, existing building and hardstanding – 300m² Previous usage impermeable area, building & hardstanding – 4,600m² Post Development Impermeable Area (estimated) – 3,450m² Decrease in Impermeable Area from previous use – 1,150m² NGR – 380600, 408700 Nearest Post Code – BL9 9FY
Flooding	This report has considered flooding from a variety of sources in accordance with NPPF guidelines, and it is believed that the site is not at risk of flooding, nor does the proposed development create a risk of flooding elsewhere.
Surface Water Drainage	Currently there are no surface water sewers or watercourses on the site. The ground conditions have been assessed in a phase 2 site investigation which concluded that soakaway drainage is unlikely to be feasible due to clay soils found. United Utilities have recommended that surface water from the development should discharge via infiltration as a first priority, with discharge into a nearby watercourse as second. UU confirmed is neither of these are possible, they would accept a discharge into their 990mm x 1400mm combined sewer at a rate not exceeding 7.5l/s.
Foul Drainage	There is a 225mm diameter combined sewer within Fletcher Fold Road to the north of the site, and there is a 990mm x 1400mm combined sewer running through the south of the site. United Utilities have confirmed that the development can connect to this larger existing combined sewer at an unrestricted rate at a position convenient to the developer, however this will be reviewed in terms of site levels at design stage, and an alternative connection to the northern sewer may be more viable. UU are to be consulted and permission sought should this be opted for.



CONTENTS

- 1. INTRODUCTION**
- 2. EXISTING SITE DETAILS**
- 3. PROPOSED DEVELOPMENT**
- 4. EFFECTS OF CLIMATE CHANGE**
- 5. PROBABILITY OF FLOODING**
- 6. SW DRAINAGE STRATEGY**
- 7. FW DRAINAGE STRATEGY**
- 8. FLOOD RISK MANAGEMENT MEASURES**
- 9. OFF-SITE IMPACTS**
- 10. STATUTORY CONSULTATIONS**
- 11. RESIDUAL RISKS**
- 12. CONCLUSION**

APPENDIX A - LOCATION & SITE PLAN

APPENDIX B - UNITED UTILITIES SEWER RECORDS

APPENDIX C - PROPOSED SITE PLAN

APPENDIX D - SITE SPECIFIC FLOOD DATA

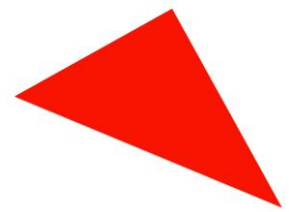
APPENDIX E - RAINFALL INTENSITIES

APPENDIX F - GREENFIELD RUNOFF ESTIMATION

APPENDIX G - PRELIMINARY STORAGE VOLUME ESTIMATE

APPENDIX H - UNITED UTILITIES CONSULTATION RESPONSE

APPENDIX K - PROPOSED DRAINAGE LAYOUT



1.0 INTRODUCTION

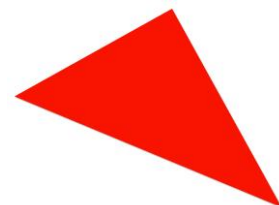
- 1.1 Carley Daines & Partners has been commissioned by Tyson Construction to undertake a Flood Risk Assessment for this site in accordance with the requirements of National Planning Policy Framework (NPPF) and the Technical Guidance Document (TGD) to the National Policy Framework dated March 2020.

2.0 EXISTING SITE DETAILS

- 2.1 The site is located off of Fletcher Fold Road in Bury, Greater Manchester. See location plan in Appendix A. It is a rectangular shaped plot with an approximate area of 9,250m² (0.95ha). It is located at NGR 380600, 408700 and the nearest post code is BL9 9FY. The site is brownfield and is currently a derelict condition with building rubble and overgrown vegetation. The site is secured with perimeter fencing, which an access gate off of Fletcher Fold Road. Vehicle access is off Fletcher Fold Road.
- 2.3 The site was previously occupied by Millwood School prior to its' complete demolition in 2021, which had an adjacent hardstanding car parking area. The site location is in a residential area with properties and surrounding the site in all directions. Approximately 150m to the south east of the site is the River Roch. The site is generally flat on the main plateaux of the development area, with topographical levels staying within a range of approx. 500mm across the site. The site slopes steeply away on the south east boundary by approx. 3.00m from an average ground level of 75.00m to 72.00m AOD.
- 2.4 Currently there are no surface water sewers or watercourses on or near to the site. There are combined sewers present in the area. See United Utilities Sewer Plans in Appendix B. There is a 225mm diameter combined sewer in Fletcher Fold Road, and a 990mm x 1400mm combined sewer crossing the site and the southernmost boundary. It is likely that there are existing connections to the existing sewers from the previous occupation and these may be considered and utilised in the final drainage design.
- 2.5 The Lead Local Flood Authority (LLFA) is Bury Council.
- 2.6 A site specific phase 2 ground investigation was undertaken by HBS in December 2023. The investigation conducted 22 windowless sample boreholes with dynamic probe holes adjacent to seven and two hand dug inspection pits. Made ground was discovered in all locations up to a proven depth of 1.80m bgl. Ground conditions were observed as clay to a proven depth of 2.00m bgl which was generally found above sandy gravel and/ or gravelly sand. There was a shallow water table recorded, with ground water discovered as low as 0.60mbgl.

The report concludes that soakaway drainage is unlikely to be feasible, stating:

"The clay soils encountered are likely to possess infiltration rates of less than 1×10^{-6} m/s and therefore efficient soakaway drainage is unlikely to be feasible. The local authority may still require full scale testing in accordance with BRE 365 to demonstrate that infiltration rates are too low for soakaway drainage.



3.0 PROPOSED DEVELOPMENT

- 3.1 Detail plans have been made available to us by the schemes architect, Pozzoni. The proposed development consists of 43no new residential units together with drainage and parking infrastructure. The accommodation is comprised of 4no two bedroom bungalow units, and a three storey apartment block consisting of 27no one bedroom, and 12no two bedroom apartments. Vehicular access to the new development will be via a new adoptable turning head off of Fletcher Fold Road leading to access to two separate shared surfaces: one leading to 8no driveway spaces for the bungalows; and one leading to a 20 space car park for the apartment building. See the proposed site layout in Appendix C.
- 3.2 The site is located within a flood zone 1, an area with low probability of flooding.
- 3.3 Any residential development of this type is classified in Table 2 of the TG below, as within the "More Vulnerable" category in consideration of flood risk.

Table 2: Flood Risk Vulnerability Classification

Essential Infrastructure • Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines
Highly Vulnerable • Police stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use³. • Installations requiring hazardous substances consent⁴. Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as "essential infrastructure"⁵.
More Vulnerable • Hospitals • Residential institutions such as residential care homes, children's homes, social services homes, prison & hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non-residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities for hazardous waste⁶. • Sites used for holiday or short-let caravans and camping, <i>subject to a specific warning and evacuation plan</i>.
Less Vulnerable • Police, ambulance and fire stations which are <i>not</i> required to be operational during flooding. • Buildings used for shops, financial, professional and other services, restaurants and cafes, hot food takeaways, offices, general industry, storage and distribution, non-residential institutions not included in "more vulnerable" and assembly & leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do <i>not</i> need to remain operational during times of flood. • Sewage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place.)

³ For any proposal involving a change of use of land to a caravan, camping or chalet site, or to a mobile home site or park home site, the Sequential and Exception Tests should be applied.

⁴ See Circular 04/00: *Planning controls for hazardous substances* (paragraph 18) at:
www.communities.gov.uk/publications/planningandbuilding/circular/planningcontrols

⁵ In considering any development proposal for such an installation, local planning authorities should have regard to planning policy on pollution in the National Planning Policy Framework.

⁶ For definition, see *Planning for Sustainable Waste Management: Companion Guide to Planning Policy Statement 10* at
www.communities.gov.uk/publications/planningandbuilding/planningsustainable
See footnote 3.

Water-compatible development

- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.

Essential ancillary sleeping or residential accommodation for staff required by uses in this category *subject to a specific warning and evacuation plan.*

Notes to Table 2:

- This classification is based partly on Department for Environment, Food and Rural Affairs and Environment Agency research on *Flood Risks to People (FD2321/TR2)* and also on the need of some uses to keep functioning during flooding.
- Buildings that combine a mixture of uses should be placed in to the higher of the relevant classes of flood risk sensitivity. Developments that allow uses to be distributed over the site may fall within several classes of flood risk sensitivity.
- The impact of a flood on the particularly uses identified within this flood risk vulnerability classification will vary within each vulnerability class. Therefore, the flood risk management infrastructure and other risk mitigation measures needed to ensure the development is safe may differ between uses within a particular vulnerability classification.

3.3

Table 3 of TG below confirms the anticipated development type is compatible with a location within Flood Zone 1 & 2.

Table 3: Flood Risk Vulnerability & Flood Zone "Compatibility"

Flood risk vulnerability classification (see Table 2)		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	✗	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	✗	✗	✗

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

Notes to Table 3:

This table does not show:

- The application of the Sequential Test which guides development to Flood Zone 1 first, then Zone 2, and then Zone 3;
- Flood risk assessment requirements; or
- the policy aims for each flood zone.

4.0 EFFECTS OF CLIMATE CHANGE

- 4.1 According to paragraphs 11-15 of TG, it is anticipated that Climate Change will bring about an increase in rainfall intensities in the future. Reference should be made to Table 5 below.

Table 5: Recommended national precautionary sensitivity ranges for peak rainfall intensities, peak river flows, offshore wind speeds and wave heights

Parameter	1990 to 2025	2025 to 2055	2055 to 2085	2085 to 2115
Peak rainfall intensity	+5%	+10%	+20%	+30%
Peak river flow	+10%	+20%		
Offshore wind speed	+5%		+10%	
Extreme wave height				

With an estimated design life not exceeding 100 years for residential development, any necessary on-site designs for drainage, soakaways or other suitable disposal methods limiting surface water flows will incorporate rainfall intensities that have been increased by 45% to take account of the effects of climate change up to the year 2124.

5.0 PROBABILITY OF FLOODING

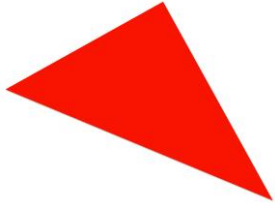
- 5.1 It is a requirement of the National Planning Policy Framework that flooding from all possible sources should be considered. Accordingly, consideration must be given to the possibility of flooding from the following sources:

- rivers & watercourses
- sewers
- sea
- overland flows
- ground water
- reservoirs, canals & artificial sources

Consideration must also be given to the possibility of transferring flooding to other locations off site. Data source used in this section is the Envirocheck Screening Report which is included in the Site-Specific Flood Data in Appendix D. In consideration of the above possible flood sources, the assessed risks are as follows:

5.2 Flooding from Rivers/Watercourses

There are no watercourses on site. The nearest watercourse is the River Roch approximately 150m to the south east, however the site falls away in topography by over 4m at the south eastern boundary and is considerably higher than the levels around the river basin. Reference to the Environment Agency online flood map shows that the site is in Flood Zone 1, a low probability of flooding. There is no historic flooding within 1km of the site. Accordingly, the risk of flooding from the river and or local watercourses can be assessed as LOW.



5.3 **Flooding from the Sea**

The site is approximately 50km from the nearest coastline in Merseyside, and is at an average level of approximately 75m AOD. The risk of flooding from the sea is therefore assessed as ZERO.

5.4 **Flooding from Land**

There are no obvious overland paths of flood water, nor is there any known history of flooding in the area. Flooding from land is therefore assessed as NEGLIGIBLE.

5.5 **Flooding from Ground Water**

From the phase 2 site investigation, the potential for groundwater flooding to occur at surface is rated as low risk. The ground conditions consisting of made ground of granular and cohesive deposits to depths greater than 3m and a variable water table, also greater than 3m, which means that there isn't any viable below ground migration pathways for surface water runoff. Hence, there is no potential for flooding of the development from ground water. The risk is assessed as LOW.

5.6 **Flooding from Sewers**

The capacity of the local sewers in the area is unknown, but there is no history of flooding in the area hence the risk is therefore assessed as VERY LOW.

5.7 **Flooding from Reservoirs, Canals & Artificial Sources**

There are no reservoirs or artificial bodies of water near the site. There is a local canal located approx. 2km to the west of the site. There is no history of the canal causing flooding. Hence the risk is assessed as NEGLIGIBLE.

5.8 **Flooding from Elsewhere**

This flood risk assessment also requires consideration to be given to the possibility of flooding being caused elsewhere. A properly designed and maintained site drainage system will meet the requirements of the sewerage provider, in that the pipelines will not flood at the critical 30 year rainfall event. Furthermore, NPPF guidelines require that all exceedence flows either infiltrate into the ground or are safely contained on site within underground storage areas such that there will be no risk of flooding of vulnerable or critical areas on site or other nearby areas. There is a substantial decrease in permeable area on site, due to the proposed development. It is proposed to mitigate any potential flooding by appropriate infiltration. The risk, therefore, of transferring flooding from elsewhere is VERY LOW.

6.0 **SURFACE WATER DRAINAGE STRATEGY**

- 6.1 It is the Environment Agency, United Utilities, Building Regulations and Local Flood Authority policy for all surface water systems for development sites to be designed using Sustainable Drainage Systems (SuDs) wherever possible.

6.2 Rainfall intensities, see profiles in Appendix E, are as indicated in the table below.

	YR 2	YR 30	YR 100	YR 100 + 45%
Rainfall Intensity mm/hr	91.17	222.84	287.28	416.56

The existing drained area at present, post demolition is negligible, around 300m², however, the former building was only demolished within the last 3 years and prior to this had an existing drained impermeable area on site of 4,600m², the run-off from existing rainfall events post demolition is presently as follows:

	YR 2	YR 30	YR 100
Peak Run-Off Litres/sec	116.37	285.08	367.41

Future run-off, post-development, with a proposed impermeable area on site of 3,450m², peak run-off rates are predicted to be as follows:

	YR 2	YR 30	YR 100	YR 100 + 45% CC
Peak Run-Off Litres/sec	87.28	213.81	275.56	399.56

The post development increase in impermeable area gives a corresponding DEcrease in surface water run-off from the previous site usage of approximately 25%. However, NPPG requires that surface water discharge run-off rates are restricted as close as possible to equivalent greenfield run-off rates, as infiltration is not possible, attention should be paid to the discharge rates evaluation below.

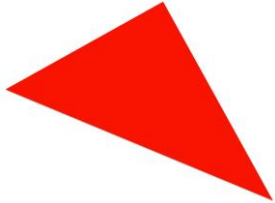
6.3 Discharge Rates

Greenfield run-off rates are included in Appendix F. These have been calculated using the H R Wallingford greenfield run-off rates calculator, based on the IH124 Approach. The greenfield rate for the 1 in 1yr return is calculated as 6.16 l/s, the 1in 30yr return as 12.04 l/s and the 1 in 100yr as 14.73 l/s. Q_{BAR} is calculated as 7.08 l/s and this has been utilised as the governing run-off rate for this report. This can be implemented using a flow control device in the final manhole before discharge.

6.4 Discharge Method

Paragraph 080 of the NPPG: Flood Risk and Coastal Change sets out the following hierarchy of drainage options:

- Into the ground (infiltration)
- To a surface water body
- To a surface water sewer, highway drain or other drainage system
- To a combined sewer



6.5 Soakaways

The first consideration for the disposal of surface water is via soakaways. However the phase 2 site investigation was undertaken to explore the ground types and any contamination to ensure if infiltration would be appropriate. The report found that the ground conditions may not be suitable for infiltration due to a predominant presence of cohesive clay, which has poor infiltration qualities, and made ground, which could contain contamination. Therefore contingencies for other methods of surface water disposal should be considered.

6.6 Watercourse

There are no watercourses in the immediate vicinity of the site, the nearest being the River Roch which is 150m away to the south east, and a private lake immediately south of the site however this would involve crossing a third party private land, permission for both of which are unlikely to be possible. Therefore it is not possible to discharge surface water from the site into a watercourse.

6.7 Sewer

The next consideration is discharge to a sewer – a surface water sewer first followed finally by a combined sewer. There are no dedicated surface water sewers in the area to connect to, therefore the combined sewer crossing would be the last resort option. In United Utilities consultation response (appendix H), it was suggested that should the prior options be explored and deemed not suitable, then United Utilities would consider allowing a connection to the 1,250mm diameter combined water sewer crossing the site near to the south east boundary and that any flow rate does not exceed 7.5l/s.

6.8 Attenuation Storage

As soakaways are not feasible, attenuation storage will be required. Attenuation storage estimates are included in Appendix G. In line with current best practice, storage volumes have been assessed for the 1:30yr return (the design criteria as per Sewers for Adoption) and for the exceedance event of 1:100yr + 45% cc allowance. The respective volumes are a maximum of 131m³ and 305m³. The 1:30yr volume would be in underground pipes / tanks and the exceedance (the difference between the two volumes) could either be underground or above ground if safe storage areas are available. This would be considered at detailed design stage. Furthermore, the attenuation volumes are indicative only and should be verified at detailed design stage.

6.9 Sustainable Drainage Systems

Other options considered are as follows:

Swales, detention basins and ponds

These are not considered to be suitable as this is a small dense inner urban site with no significant area of public open space.

Rainwater Harvesting

The attenuation benefits of rainwater harvesting have been shown to be minimal and can only be realised when the tanks are not full. Also, rwh has been shown to be unsuitable when connecting to combined sewer systems due to risks of backing up and contaminating with sewage.

Green Roofs

Green roofs are not identified on planning drawings. Given the nature of budgeted cost social housing, the significant additional costs involved in installing and maintaining green roofing, plus the additional dead load are not considered to be a practical option. Any benefits would be disproportionate to the likely significant construction and ongoing maintenance costs involved.

Porous / Permeable Paving

The site includes drives and parking areas that would have been considered for permeable paving. However, as the ground conditions have proved infiltration would not be possible due to contamination, permeable paving would actually contribute to further contaminating the ground, and if used must be lined with an Impermeable membrane, with an attached perforated land drain connection to the surface water system. This idea would be cost ineffective and would offer little to no benefit in regards to sustainable drainage, as discharge would still be via the surface water system, therefore permeable paving would not be a preferred option.

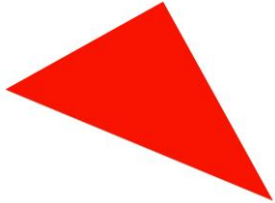
As infiltration into the ground directly would not be possible due to contamination, thus any permeable SuDS feature would need to be lined with an impermeable membrane and routed into the sewer system anyway, the implementation of any such feature unlikely to be enforced by the LLFA/ planning committee and would remain the choice of the client and design team as to what if any solution can provide additional SuDS benefits (albeit minimal) whilst proving cost effective to the developer. As the scheme comprises individual residencies, and no shared areas, there are no practical areas where any such SuDS features could be sites. Any SuDS features that are implemented should be seen as a bonus and a positive step in terms of ecological and environmental consideration, and a compromising gesture given the discharge of surface water into potentially a combined sewerage system.

7.0 FOUL WATER DRAINAGE STRATEGY

- 7.1 There are existing public sewers in the area owned and maintained by United Utilities. Guidance contained within Sewers for Adoption Edition 7 states that design foul flows should be 4,000 litres per dwelling per 24-hour period. With 43 units on the site, the design foul flow will be $4,000 \times 43 \div 24 \div 3,600 = 1.99 \text{ l/s}$.
- 7.2 United Utilities have indicated there is a combined sewer to the south of the site in Well Lane. It is 990 x 1400 and should have capacity to accept small foul flows of the above magnitude. Reference should be made to the United Utilities Consultation Response in Section 10.

8.0 FLOOD RISK MANAGEMENT MEASURES

- 8.1 In the event of extreme emergency, the local authority and other emergency services have contingency plans for dealing with consequences of flooding.
- 8.2 Setting finished floor levels of the buildings at least 150mm above surrounding external ground, and shedding surface water away from the buildings, will avoid the risk of damage to buildings and contents from overland flood flows around the site.
- 8.3 The design of surface water drainage should ensure that there are no uncontrolled off-site overland flood flows created by the proposed development. Where possible, site surfaces should be modelled so that flood flows generated on site from events beyond the stipulated drainage design criteria will flow to, and be contained on site within landscaped or paved areas such that there is no increased risk of flooding to buildings and other vulnerable areas. Such flood flows should not be allowed to flow from the site onto adjoining / adjacent property or highways.

- 
- 8.5 Home owners and landlords will be responsible for the maintenance of private drainage systems on site to ensure satisfactory performance. United Utilities will be responsible for the maintenance of any public sewers on the site.
- 8.6 Any flood flows onto the site from adjoining property will either be regained on site safely or be encouraged to pass across the site such that there is no increased risk of flooding to buildings and other vulnerable areas.

9.0 OFF-SITE IMPACTS

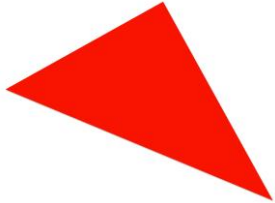
- 9.1 Proposed on-site drainage will be designed and constructed in accordance with Part H of The Building Regulations, Sewers for Adoption, and any additional requirements of United Utilities, Local Councils, and the Environment Agency, as appropriate.
- 9.2 All on-site roofs and pavings are to drain into the design surface water drainage system, thereby ensuring there will be no off-site flood flows generated by the development.
- 9.3 The risk of flood flows entering and leaving the site will remain after development. The risk will be reduced as far as possible because the drainage designs will be such that there will be no flooding during all rainfall events up to and including the critical 30 year storm, and no overland flows from the critical 100 year storm.
- 9.4 By implementation of the flood procedures and by careful design of the flood protection measures as described above, all residual flood-related risks will be minimised as far as possible after the development has been completed.

10.0 UNITED UTILITIES CONSULTATION RESPONSE

- 10.1 United Utilities response dated 30th October 2023 is attached in Appendix H. In summary it states the following:-
- 1) Foul water can discharge to the existing combined sewer network at an unrestricted rate.
 - 2) Surface Water should discharge via infiltration as a first resort, followed by a connection into a nearby watercourse – a reservoir south of the site was highlighted to be explored. However, they did note that if neither of the above is viable then United Utilities would permit connection to the 990 x 1400mm combined sewer running through the south of the site at a discharge rate not exceeding 7.5l/s.

11.0 RESIDUAL RISKS

- 11.1 This Flood Risk Assessment, prepared in accordance with NPPF Guidelines, demonstrates that the risk of on-site flooding from all sources as a result of the proposed development can generally be regarded as being zero to negligible.
- 11.2 Careful design of the future drainage system, together with the introduction of a significant proportion of soft landscaping, suggests that any risks of flooding are likely to be minimised.
- 11.3 Furthermore, it is believed that the risk of transferring flooding elsewhere is negligible and on-site attenuation will reduce this to a level no greater than that which currently exists.
- 11.4 Accordingly, and notwithstanding any other planning issues, it is not considered that the proposed development has any adverse effects on the current site, or the surrounding area in respect of flooding. Providing the advice contained within the Flood Risk Assessment is implemented, there are no adverse residual risks to either the development or the surrounding area.



12.0 CONCLUSIONS

- 12.1 The proposed re-development of the site involves the construction of 43 new dwellings with highways, parking and drainage infrastructure on a brownfield site.
- 12.2 The site is located in FZ1 on the EA Flood Map – an area considered to have the lowest probability of fluvial flooding. Flooding from other sources has been assessed as LOW.
- 12.3 The proposed development will limit proposed hardstanding on site through the introduction of residential gardens and peripheral soft landscaping, to comply with current NPPG recommendations.
- 12.4 The phase 2 site investigation report suggests that infiltration is not feasible. However, conducting infiltration testing in accordance with BRE 365 to determine the grounds suitability to discharge water via infiltration is suggested.
- 12.5 Should the ground conditions be unsuitable for infiltration, the discharge rate will be further reduced to greenfield run-off rates and attenuation provided on site to accommodate all storm events up to and including the 1 in 100yr + 45% cc event.
- 12.6 Positioning of attenuation (where required) will be considered at detailed design stage though storage within the new access road would appear most appropriate.
- 12.7 Other SuDS systems and methods which would discharge water directly into the ground have been considered but are believed to be unsuitable or inappropriate for this development for factors outlined in detail above.

SIGNED (electronically)

A Mulligan

A Mulligan – Civil Engineer.

CARLEY DAINES & PARTNERS

APPENDIX A – LOCATION AND SITE PLAN

13947 - APPENDIX A – SITE LOCATION PLAN – FLETCHER FOLD ROAD, BURY.

Site

Grid Reference

SD 80600 08700

Grid Reference (6 figure)

SD806087

X (Easting) , Y (Northing)

380600 , 408700

Latitude , Longitude (decimal)

53.574539 , -2.2944374

Latitude , Longitude (degs, mins, secs)

53°34'28"N , 002°17'40"W

What3Words :

toned.deep.zoom

Address (near) :

**Redvales, Hollins, Bury, Greater
Manchester. Enoland. BL9 9FY. United**

Postcode (nearest) :

BL9 9FY



APPENDIX B – UNITED UTILITIES SEWER RECORDS

Centre : X : 380637 Y : 408675 Date : 16/04/2018 15:25:30 Scale Approx : 1999.999999999999

The map displays a residential area with a proposed drainage network. The network is shown as a red line system with various pipe sizes and manhole locations indicated. Key features include 'Derby Works', 'Fletcher Fold', 'River Roch', and 'Goshen Sports Centre'. The map is overlaid with a grid and various annotations for the drainage system.

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. The actual positions may be different from those shown on the plan and private service pipes may be shown by a blue broken line. United Utilities Water will not accept liability for any damage caused by the actual position being different from those shown.



United Utilities
helping life flow smoothly

APPENDIX C – PROPOSED SITE PLAN



OPTION B - SITE LAYOUT PLAN
1 : 500

NOTES

ACCOMMODATION SUMMARY	
TYPE	COUNT
Two bedroom bungalow	4
One bedroom apartment	27
Two bedroom apartment	12
Total	43

All accommodation is designed to be accessible and adaptable (Part M4 Category 2)

PARKING PROVISION
Table 2 of Bury Councils SPD 11 requires 1.5 parking spaces in an accessible area, which this is, for a 2 bed dwelling. For sheltered housing the requirement is for 1 space per 3 units.

We have indicated 2 spaces per dwelling for the bungalows which are for sale. For the apartments we have indicated 20 spaces for the 39 dwellings to allow for visitor parking.

Parking provision to be discussed with Bury Council during pre-application discussions.

REFUSE STORAGE PROVISION
Bungalows
4 x 240 litre wheeled bins (general waste, pulvable recycling, mixed recycling and garden waste) to be stored within the garden

Apartments
Storage space for bins will be provided in the kitchens of the apartments. A central refuse store is provided close to the main entrance into which residents will deposit their waste. Those unable to do so will be assisted as part of their care package.

TYPE	REQUIRED*	PROVISION
General waste	4,290 ltr	4 x 1100 ltr
Pulpable recycling	2,145 ltr	2 x 1100 ltr
Mixed recycling	2145 ltr	2 x 1100 ltr
Food waste	390 ltr	2 x 240 ltr

* based on the GD04 Waste Storage and Collection Guidance for New Developments by Manchester City Council. Required provision to be checked with Bury Council as part of pre-application discussions.

CONSIDERATIONS
- Advice to be sought about the need for a substation for the site. Not currently shown.
- Level of electric charging provided in the car park to be decided. Passive wiring will be required to all spaces.
- Awaiting DWG of tree survey to overlay on our drawings. Initial comments from arboriculturalist taken into account but root protection zones to be checked on receipt of drawing.
- Pre-app planning advice to be sought

Notes

The Contractor is to check all dimensions and conditions on site before commencing. Do not scale from this drawing.
This drawing remains the copyright of POZZONI Architecture Ltd.

Scale Bars		TO BE USED ONLY AS GUIDANCE			
1:100	mm	0	1000	3000	5000
1:200	mm	0	5000	8000	
1:500	M	0	5	15	25
1:1250	M	0	10	30	50 70

Rev	Description	By	Date
Client	ARCON HOUSING ASSOCIATION (BOLTON AT HOME)		
Job	FLETCHER FOLD ROAD, BURY		
Drawing	OPTION B - SITE LAYOUT PLAN		
Rev	6071_SK024		
POZ Ref.	POZ-XX-XX-DR-A-SK024		
Date	01/12/23	Scale	1 : 500 @ A2
2D CoOrd	EM	2D CoOrd	EM
3D CoOrd	EM	Approved	SR
Project Status	Planning	Tender	Construction
	Design	Contract	As Built

pozzoni

10-12 Emerald Street
London
WC1N 3QA

+44 20 7078 0079
architects@pozzoni.co.uk

Woodville House
2 Woodville Road
Atrincham
WA14 2FH

+44 161 928 7848
www.pozzoni.co.uk

APPENDIX D – ENVIRONMENT AGENCY FLOOD MAP

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
380639/408664

Created
11 Jan 2024 17:43

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following**:

- bigger than 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

Notes

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

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

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

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2022 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
380639/408664

Scale
1:2500

Created
11 Jan 2024 17:43

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area


0 20 40 60m

APPENDIX E – RAINFALL INTENSITIES

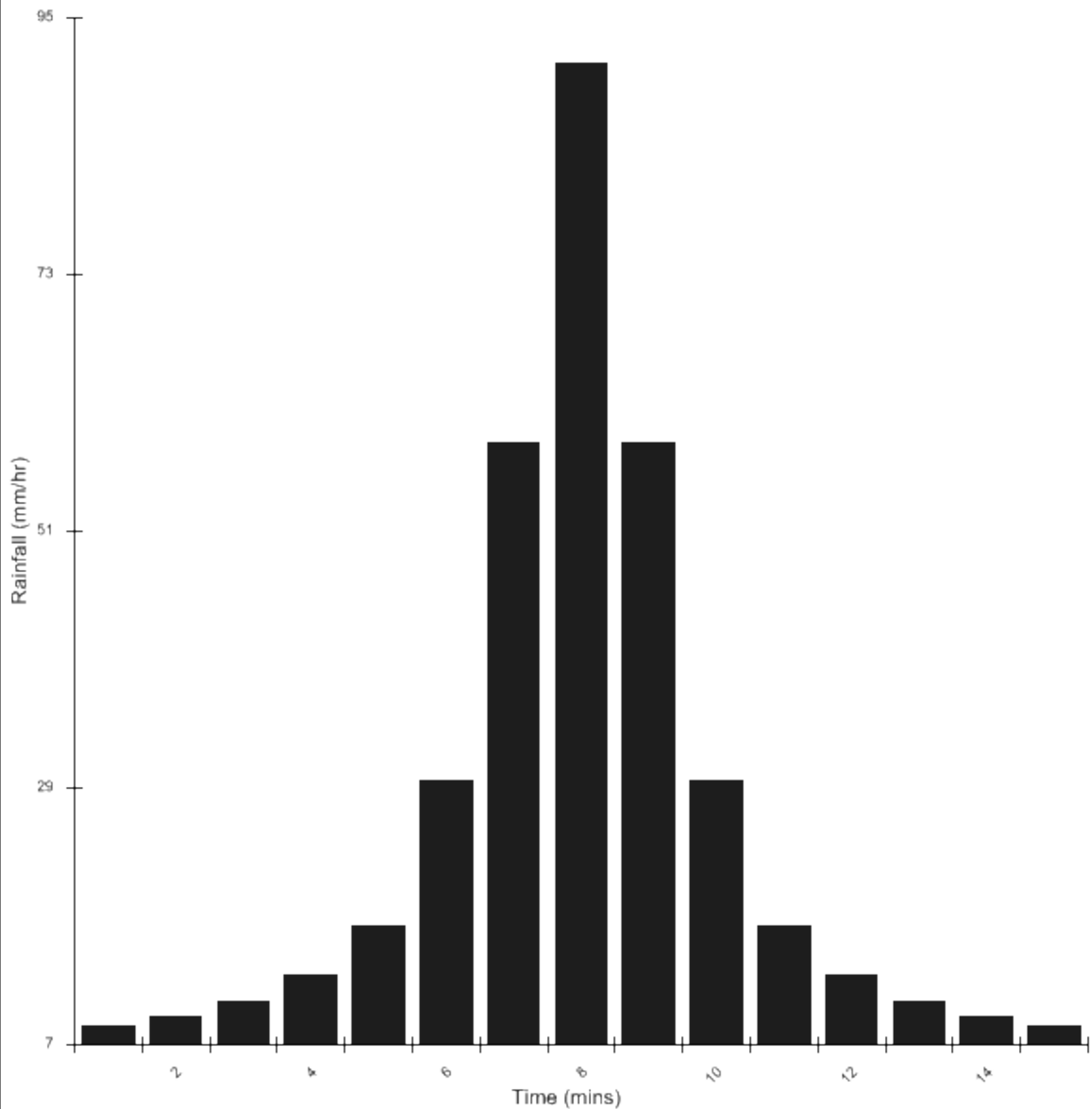
Carley Daines & Partners		Page 1
11 Bridgewater Road Walkden Worsley M25 3JE		
Date 02/10/2018 15:11 File	Designed By K Corrigan Checked By	
Micro Drainage	Network W.12.4	

Rainfall profile

Storm duration (mins) 15

FSR Data

Region	England and Wales
M5-60 (mm)	19.000
Ratio R	0.270
Peak Intensity (mm/hr)	91.179
Ave. Intensity (mm/hr)	25.801
Return Period (years)	1



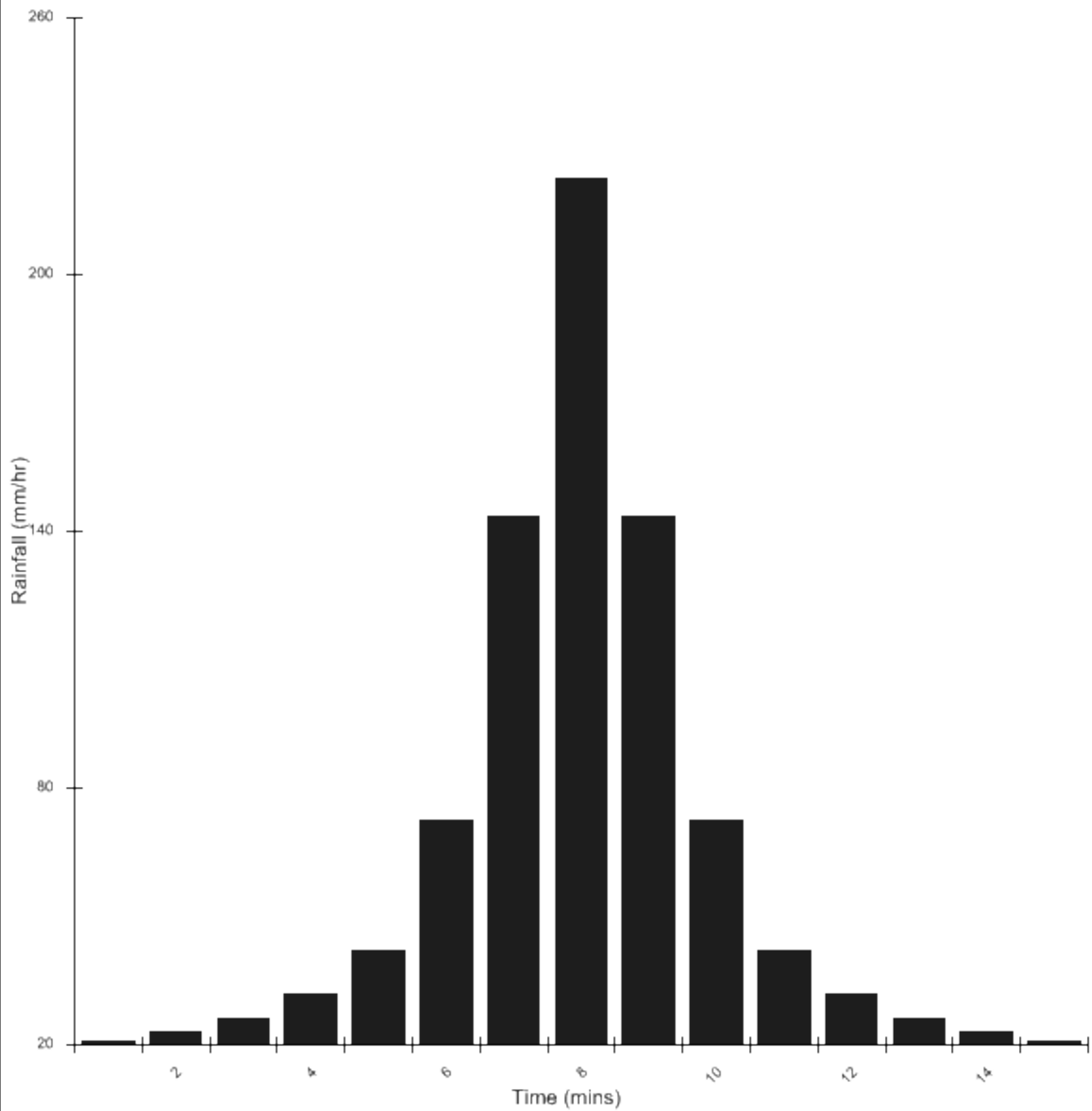
Carley Daines & Partners		Page 1
11 Bridgewater Road Walkden Worsley M25 3JE		
Date 02/10/2018 15:09 File	Designed By K Corrigan Checked By	
Micro Drainage	Network W.12.4	

Rainfall profile

Storm duration (mins) 15

FSR Data

Region	England and Wales
M5-60 (mm)	19.000
Ratio R	0.270
Peak Intensity (mm/hr)	222.834
Ave. Intensity (mm/hr)	63.054
Return Period (years)	30



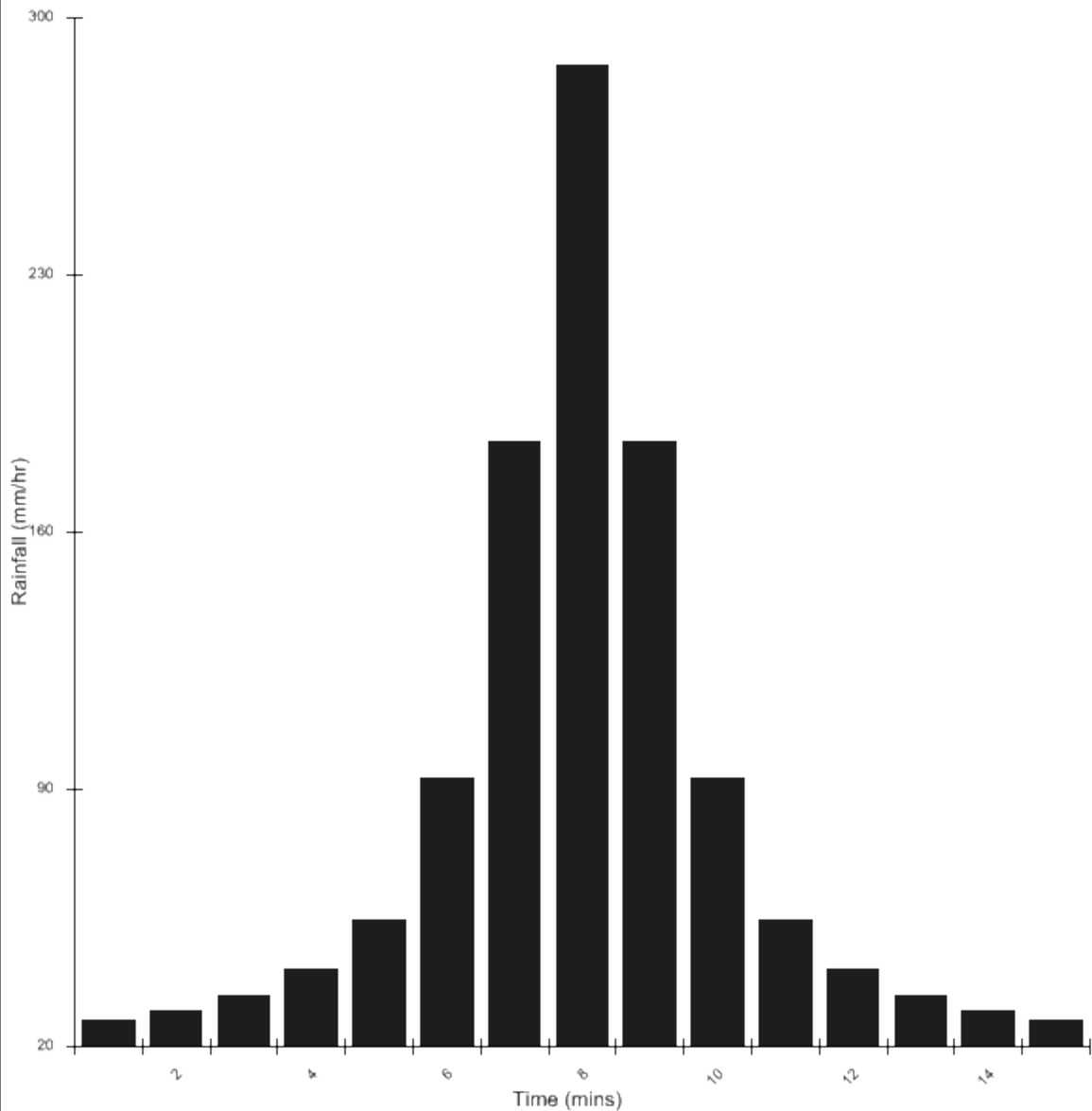
Carley Daines & Partners		Page 1
11 Bridgewater Road Walkden Worsley M25 3JE		
Date 02/10/2018 15:10 File	Designed By K Corrigan Checked By	
Micro Drainage	Network W.12.4	

Rainfall profile

Storm duration (mins) 15

FSR Data

Region	England and Wales
M5-60 (mm)	19.000
Ratio R	0.270
Peak Intensity (mm/hr)	287.276
Ave. Intensity (mm/hr)	81.289
Return Period (years)	100



APPENDIX F – GREENFIELD RUN -OFF ESTIMATION

Calculated by:	Andrew Mulligan
Site name:	Fletcher Fold Road
Site location:	Bury

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	53.57432° N
Longitude:	2.29398° W
Reference:	4216941049
Date:	Jan 11 2024 17:35

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):	0.925
-----------------------	-------

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Notes

(1) Is $Q_{BAR} < 2.0$ l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

Hydrological characteristics

	Default	Edited
SAAR (mm):	1038	1038
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

(3) Is $SPR/SPRHOST \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

Default

Edited

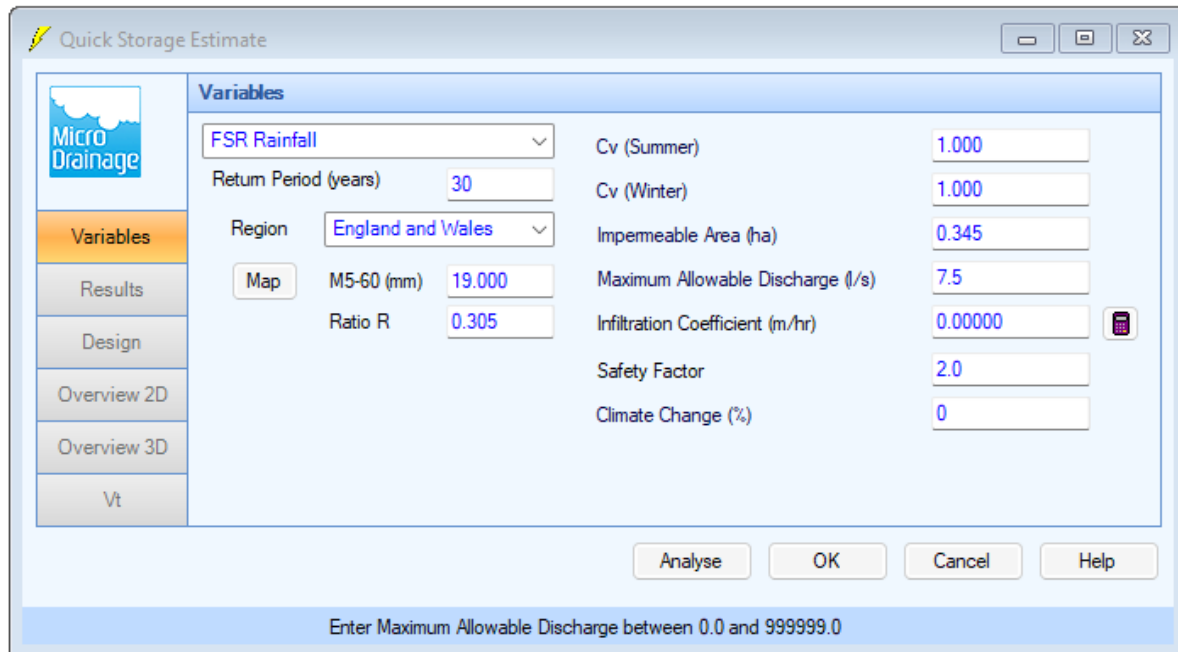
Q_{BAR} (l/s):	7.08	7.08
1 in 1 year (l/s):	6.16	6.16
1 in 30 years (l/s):	12.04	12.04
1 in 100 year (l/s):	14.73	14.73
1 in 200 years (l/s):	16.78	16.78

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

APPENDIX G – PRELIMINARY STORAGE VOLUME ESTIMATE

13947 – FLETCHER FOLD ROAD – PRELIMINARY STORAGE ESTIMATE.

1 IN 30 YEAR STORM – UP TO 131M³ REQUIRED.

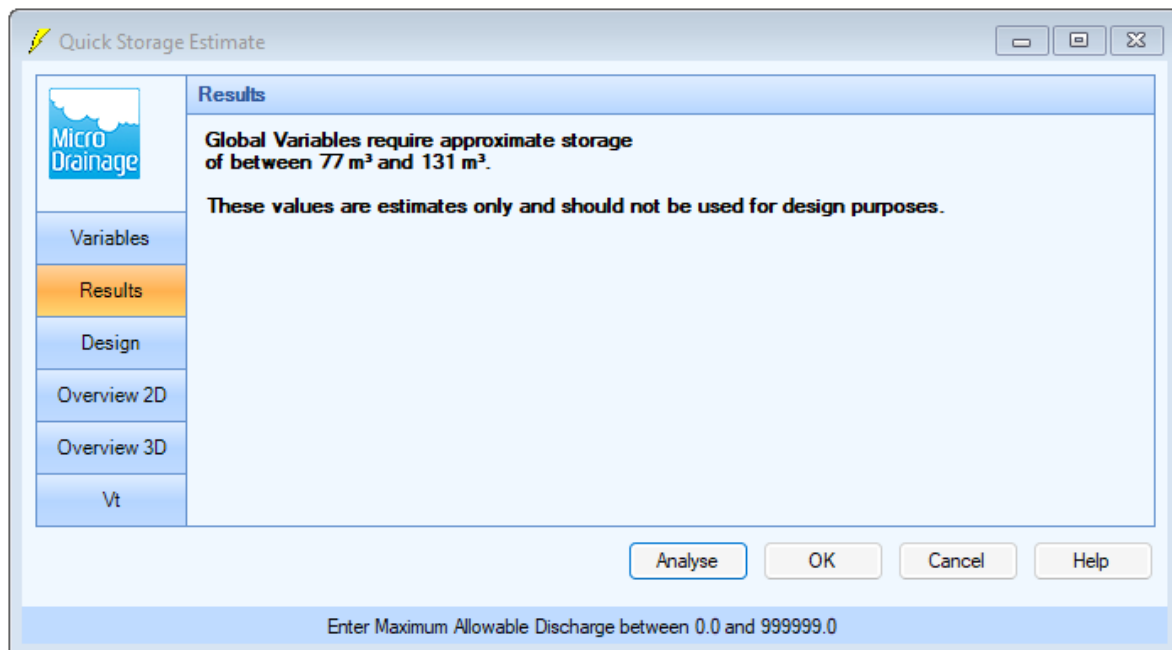


The 'Variables' screen of the 'Quick Storage Estimate' application. It features a sidebar with navigation buttons: Variables (selected), Results, Design, Overview 2D, Overview 3D, and Vt. The main area is titled 'Variables' and contains input fields for various parameters. A status bar at the bottom indicates the range for Maximum Allowable Discharge.

Parameter	Value
FSR Rainfall	FSR Rainfall
Return Period (years)	30
Region	England and Wales
Map	M5-60 (mm)
Ratio R	19.000
Cv (Summer)	1.000
Cv (Winter)	1.000
Impervious Area (ha)	0.345
Maximum Allowable Discharge (l/s)	7.5
Infiltration Coefficient (m/hr)	0.00000
Safety Factor	2.0
Climate Change (%)	0

Buttons: Analyse, OK, Cancel, Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0



The 'Results' screen of the 'Quick Storage Estimate' application. The sidebar shows 'Results' as the selected tab. The main area displays a summary of the storage estimate. A status bar at the bottom is identical to the Variables screen.

Global Variables require approximate storage of between 77 m³ and 131 m³.

These values are estimates only and should not be used for design purposes.

Buttons: Analyse, OK, Cancel, Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0

13947 – FLETCHER FOLD ROAD – PRELIMINARY STORAGE ESTIMATE.

1 IN 100 YEAR STORM (+45% CLIMATE CHANGE) – UP TO 305M³ REQUIRED.

The screenshot shows the 'Quick Storage Estimate' software window with the 'Variables' tab selected. The left sidebar contains buttons for 'Variables', 'Results', 'Design', 'Overview 2D', 'Overview 3D', and 'Vt'. The main area is divided into two columns of input fields. The first column includes 'FSR Rainfall' (dropdown), 'Return Period (years)' (100), 'Region' (England and Wales), a 'Map' button, 'M5-60 (mm)' (19.000), and 'Ratio R' (0.305). The second column includes 'Cv (Summer)' (1.000), 'Cv (Winter)' (1.000), 'Impermeable Area (ha)' (0.345), 'Maximum Allowable Discharge (l/s)' (7.5), 'Infiltration Coefficient (m/hr)' (0.00000), 'Safety Factor' (2.0), and 'Climate Change (%)' (45). At the bottom are 'Analyse', 'OK', 'Cancel', and 'Help' buttons. A status bar at the very bottom reads 'Enter Climate Change between -100 and 600'.

Variable	Value
FSR Rainfall	FSR Rainfall
Return Period (years)	100
Region	England and Wales
M5-60 (mm)	19.000
Ratio R	0.305
Cv (Summer)	1.000
Cv (Winter)	1.000
Impermeable Area (ha)	0.345
Maximum Allowable Discharge (l/s)	7.5
Infiltration Coefficient (m/hr)	0.00000
Safety Factor	2.0
Climate Change (%)	45

The screenshot shows the 'Quick Storage Estimate' software window with the 'Results' tab selected. The left sidebar is the same as the previous window. The main area displays the following text: 'Global Variables require approximate storage of between 196 m³ and 305 m³. These values are estimates only and should not be used for design purposes.' At the bottom are 'Analyse', 'OK', 'Cancel', and 'Help' buttons. The status bar at the very bottom reads 'Enter Climate Change between -100 and 600'.

Global Variables require approximate storage of between 196 m³ and 305 m³.

These values are estimates only and should not be used for design purposes.

APPENDIX H – UNITED UTILITIES CONSULTATION RESPONSE

Andrew Mulligan

From: seweradoptions@uuplc.co.uk
Sent: 30 October 2023 14:10
To: Andrew Mulligan
Subject: RE: Fletcher Fold, Bury - Ref 04838231

Good afternoon Andrew,

Pre Development Enquiry for: Fletcher Fold Road, Bury UU Reference Number : 04838231

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 6723 723 or refer to the link below:

<https://www.unitedutilities.com/builders-developers/working-near-our-assets/>

Foul Water

Foul flow from this site will be allowed to drain into the public combined sewer system.

Our preferred point of discharge would be to the 990x1400mm diameter public combined sewer within your site located to the South of your proposed development at an unrestricted rate.

If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

In accordance with our infrastructure plans we may ask you to change your point of connection. Therefore please contact us when you are ready to formalise your drainage proposals, we would suggest before you submit for Full Planning.

Surface Water

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.

This is outlined as follows, in order of priority:

1. **into the ground (infiltration);**
2. **to a surface waterbody;**
3. **to a surface water sewer or highway drain;**
4. **to a combined sewer.**

For guidance, The [**North West SuDS Pro-Forma**](#) provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Infiltration

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.

A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.

Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:

<https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs>

If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:

<https://www.gov.uk/government/publications/groundwater-protection-position-statements>

Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

Waterbody

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you contact the Lead Local Flood Authority and/or Environment Agency to discuss a point of discharge to the Reservoir located 12m South of the proposed site.

We would encourage you to identify and engage with any third party landowner and riparian owner to agree access and discharge rights to the water body if this is not in your ownership.

Highway Drainage

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you investigate the possibility of draining surface water to the highway drain where this ultimately discharges to a watercourse, by contacting the relevant Highway Authority.

Public Sewer

In accordance with the hierarchy of drainage options within the National Planning Practice Guidance, both discharge to ground via infiltration and discharge to a waterbody should be discounted prior to consideration of discharging surface water to the public sewer system. Evidence should be provided to demonstrate how these have been discounted, as outlined in the North West SuDS pro-forma.

Once evidence is provided as outlined above, United Utilities will consider a connection to the 990x1400mm diameter public combined sewer within your site located South of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 7.5l/s.

As a Water Company, we have no obligation to accept highway drainage into our public sewer network. However, should your proposals include runoff from highways, we would request that consideration is given to SuDS components that deliver source control are incorporated within the design of the scheme to reduce the volume and frequency of discharges of these flows to the public sewer.

Levels

For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist, we recommend that you contact us to discuss further. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.

Land drainage / Overland flows / track drainage

United Utilities have no obligation, and furthermore we do not accept land drainage, overland flows or track drainage into the public sewerage network under any circumstances

Existing Wastewater Assets Crossing the Site

According to our public sewer records there are public sewers located within your site boundary. We will require unrestricted access to the sewer for maintenance purposes, we would ask that you maintain a minimum clearance of 6m which is measured 3m from the centre line of the pipe unless there happens to be a formal easement agreement in place, in which case the specified easement width would apply. If you cannot achieve this then you

may wish to consider diverting and or abandoning the public sewer.

Please be aware that any proposed diversion may require modelling. This process may take up to 6 months in order to reach an acceptable design.

Please refer to the link below to obtain full details of the processes involved with sewer diversions:

<https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-diversions/>

Connection Application

Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:

<https://www.unitedutilities.com/builders-developers/wastewater-services/sewer-connections/sewer-connection/>

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.

If we can be of any further assistance please don't hesitate to contact us further.

Sewer Adoptions You have indicated on your application form that you intend to put the sewers forward for adoption (including any SuDS components that can come within the meaning of a sewer).

United Utilities assess adoption applications based on the current Design & Construction Guidance and local practices which have now replaced 'Sewers For Adoption 6th Edition'.

We recommend that you submit a pre design assessment to the sewer adoption mailbox (SewerAdoptions@uuplc.co.uk) stating pre design assessment in the title

Please refer to links below to obtain further guidance:

<https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-adoptions/>

Site drainage must be designed in accordance with Building Regulations, National Planning Policy, and local flood authority guidelines, we would recommend that you speak and make suitable agreements with the relevant statutory bodies.

If you intend to put forward your wastewater assets for adoption by United Utilities, the proposed detail design will be subject to a technical appraisal by an Adoption Engineer as we need to be sure that the proposals meets the requirements set out in the Design & Construction Guidance. The proposed design should give consideration to long term operability and give United Utilities a safe and cost effective proposal for the lifetime of the assets. In these cases, we strongly recommend that no construction commences until the detailed drainage design, submitted as part of the Section 104 application, has been assessed and accepted in writing by United Utilities. Any work carried out prior to the technical assessment being approved is done entirely at the developer's own risk and could be subject to change.

SuDS

If your development proposal incorporates any SuDS component(s) which interact with a sewer network you plan on offering for adoption to United Utilities; contact should be made with our technical team at your earliest convenience, please complete the 'Section 104 pre-application form : ' and include as much relevant detail as you can. These discussions can help prevent delays later in the development process.

Section 104 Pre application form (1b)

As per the sewerage sector guidance, all SuDS should be designed in accordance with the standards within the Design & construction guidance & the CIRIA SuDS manual (C753)

Codes For Adoption

The new Codes for Adoption are outlined on the Water UK Website. The link below takes you to their webpage:

<https://www.water.org.uk/technical-guidance/developers-services/codes-for-adoption/>

A free copy of the new Design & Construction Guidance can be downloaded via the link below:

<https://www.water.org.uk/sewerage-sector-guidance-approved-documents/>

Many thanks and kind regards,



James Darlington
Developer Engineer
Developer Services & Metering
M: 07917096253
unitedutilities.com

If you have received a great service today why not tell us?

Visit: unitedutilities.com/wow

----- Original Message -----

From: seweradoptions@uuplc.co.uk [seweradoptions@uuplc.co.uk]

Sent: 27/10/2023 11:22

To: andrew.mulligan@carleydaines.co.uk

Subject: Fletcher Fold, Bury - Ref 04838231

Dear Andrew

PRE DEVELOPMENT APPLICATION AT: Fletcher Fold Road, Bury – UU Ref 04838231

Please accept this email as receipt of your application received on 25 October 2023 for the above development. This has now been logged on our system and the job reference is 04838231 we would ask that you quote this reference in all future correspondence.

I have reviewed your application (and attachments) and can confirm this is suitable to be passed to an engineer for technical assessment. You will receive their response on or before 8 November 2023.

Kind regards



Jayne Guest
Customer Advisor Advanced
Developer Services & Metering
Customer Services
Tel: 0345 072 6067
unitedutilities.com

**If you have received a great service today
why not tell us?**

Visit: unitedutilities.com/wow

Did you know we now have a live chat facility available to you Mon to Friday 8 -5pm. You just click on the orange live chat box on our webpage and one of our advisors will be ready to chat to you and help you with your enquiry <https://www.unitedutilities.com/builders-developers/> or you can email us at WastewaterDeveloperServices@uuplc.co.uk



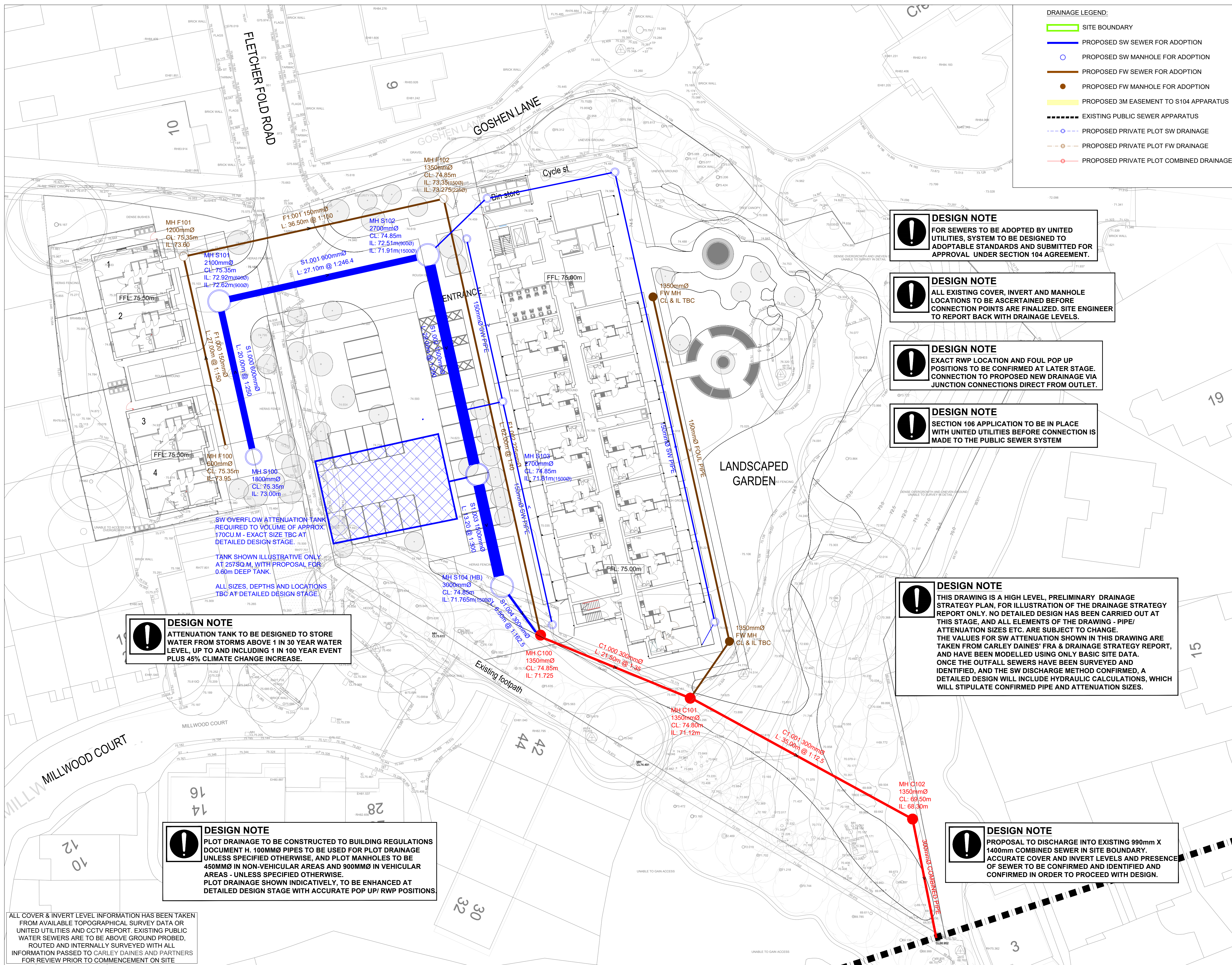
The information contained in this e-mail is intended only for the individual to whom it is addressed. It may contain legally privileged or confidential information or otherwise be exempt from disclosure. If you have received this Message in error or there are any problems, please notify the sender immediately and delete the message from your computer. You must not use, disclose, copy or alter this message for any unauthorised purpose. Neither United Utilities Group PLC nor any of its subsidiaries will be liable for any direct, special, indirect or consequential damages as a result of any virus being passed on, or arising from the alteration of the contents of this message by a third party.

United Utilities Group PLC, Haweswater House, Lingley Mere
Business Park, Lingley Green Avenue, Great Sankey,
Warrington, WA5 3LP
Registered in England and Wales. Registered No 6559020

www.unitedutilities.com
www.unitedutilities.com/subsidiaries

A P P E N D I X K

PRELIMINARY DRAINAGE STRATEGY



1. ALL DRAINAGE WORKS HAVE BEEN DESIGNED AND ARE TO BE CONSTRUCTED IN ACCORDANCE WITH BUILDING REGULATIONS DOCUMENT H-1 "SEWERS FOR ADOPTION 6TH EDITION" SUPPLEMENT GUIDELINES AND STANDARD DETAILS.
2. ALL PIPES SHALL BE 150mm DIA. POLYMER PIPELINE WITH A MINIMUM OF 1:100 FALLOUT PER 1991 PART 4.
3. ALL PRECAST CONCRETE PIPEWORK SHALL BE TO THE CLASS STATED ON THE DRAWINGS IN ACCORDANCE WITH BS 5941. ALL PRECAST CONCRETE PIPEWORK SHALL BE TO THE WEIGHT STATED ON THE DRAWINGS.
4. THE CONTRACTOR MAY ELICTO TO USE REINFORCED PVC COMPLY WITH AS COVERED BY BS 4866:2000 & BSEN 14011. STRUCTURED WALL UPPC PIPES TO COMPLY WITH W5-435-01. (BY PRIOR AGREEMENT WITH THE ENGINEER)
5. ALL LEVELS RELATE TO TOPOGRAPHICAL SURVEY DATA.
6. THE DRAWINGS ARE TO BE USED AS A GUIDE ONLY. THERE ARE NO OTHER RELEVANT DRAWINGS.
7. ALL DRAINAGE CONNECTIONS TO EXISTING MANHOLE SHALL BE 150MM DIAMETER AND UNLESS OTHERWISE STATED TO THE INVERT SHOWN.
8. ALL DRAINAGE CONDUITS SHALL BE 150mm DIAMETER POLYMER PIPELINE WITH A MAXIMUM DEPTH OF 1200mm FOR THE STANDARD UNIT & A MAXIMUM DEPTH OF 3000mm when a 350mm REDUCED DEPTH IS USED.
9. ALL DRAINAGE RUNS TO BE 1000mm DIAMETER AT A NOMINAL FALL OF 1:80 UNLESS NOTED OTHERWISE.
10. ROOFTOP EYES AT START OF EACH DRAINAGE RUN.
11. ALLOW FOR 0.5M OF 'ACC' DRAINAGE CHANNEL PER PROPERTY AT HIGHWAY BOUNDARY.
12. SURFACE WATER FROM PLOT PARKING AREAS MUST NOT DISCHARGE ONTO THE HIGHWAY.
13. ALL DRAINAGE RUNS TO BE 150mm DIA. POLYMER PIPELINE WITH A MINIMUM OF 1:100 FALLOUT PER 1991 PART 4. ALL DRAINAGE RUNS TO BE 150mm DIA. POLYMER PIPELINE WITH A MINIMUM OF 1:100 FALLOUT PER 1991 PART 4. ALL DRAINAGE RUNS TO BE 150mm DIA. POLYMER PIPELINE WITH A MINIMUM OF 1:100 FALLOUT PER 1991 PART 4. ALL DRAINAGE RUNS TO BE 150mm DIA. POLYMER PIPELINE WITH A MINIMUM OF 1:100 FALLOUT PER 1991 PART 4.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ANY EXISTING LEVELS SHOWN ON DRAWINGS ARE CORRECT BEFORE THE WORKS ARE COMINGING.
15. ALL CONNECTIONS TO ADAPTABLE SEWERS SHALL BE MANUFACTURED JUNCTION RINGS.
16. RIGID CONNECTIONS SHALL BE FORMED BY THE USE OF CAST IRON OR POLYMER JUNCTION RINGS.
17. ALL SEWERS FOR ADOPTION WITH GREATER THAN 120M COVER IN ROUNDS OR 0.3M COVER IN RECTANGLES SHALL BE CLASS 5 SEWERS WITH 1200MM DIA. AND SURROUNDING FIELDS SHALL HAVE A MINIMUM OF 150MM DIA. CONCRETE SURROUND. ALL SEWERS FOR ADOPTION WITH GREATER THAN 120M COVER IN ROUNDS OR 0.3M COVER IN RECTANGLES SHALL BE CLASS 5 SEWERS WITH 1200MM DIA. AND SURROUNDING FIELDS SHALL HAVE A MINIMUM OF 150MM DIA. CONCRETE SURROUND. FLEXIBILITY SHALL BE MAINTAINED BY THE USE OF FLEXIBLE JOINTS AT ALL JOINTS. ALL JOINTS SHALL BE IN THE CONCRETE SURROUND AT EACH JOINT PINE.
18. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CHECK ALL SINKS EXISTING AROUND LEVELS OF SURFACE TO COMING AROUND AND THERE ARE ANY DISCREPANCIES.
19. THE CONTRACTOR MUST REPORT TO THE ENGINEER IMMEDIATELY.
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING MANHOLE PRIOR TO CONTRACT START DATE.

DESIGN NOTE
ALL EXISTING COVER, INVERT AND MANHOLE LOCATIONS TO BE ASCERTAINED BEFORE CONNECTION POINTS ARE FINALIZED. SITE ENGINEER TO REPORT BACK WITH DRAINAGE LEVELS.

DESIGN NOTE
EXACT RWP LOCATION AND FOUL POP UP
POSITIONS TO BE CONFIRMED AT LATER STAGE.
CONNECTION TO PROPOSED NEW DRAINAGE VIA
JUNCTION CONNECTIONS DIRECT FROM OUTLET

DESIGN NOTE
SECTION 106 APPLICATION TO BE IN PLACE
WITH UNITED UTILITIES BEFORE CONNECTION IS
MADE TO THE PUBLIC SEWER SYSTEM

DESIGN NOTE

THIS DRAWING IS A HIGH LEVEL, PRELIMINARY DRAINAGE STRATEGY PLAN, FOR ILLUSTRATION OF THE DRAINAGE STRATEGY REPORT ONLY. NO DETAILED DESIGN HAS BEEN CARRIED OUT AT THIS STAGE, AND ALL ELEMENTS OF THE DRAINING - PIPE/ ATTENUATION SIZES ETC. ARE SUBJECT TO CHANGE.

THE VALUES FOR SW ATTENUATION SHOWN IN THIS DRAWING ARE TAKEN FROM CARLEY DAINES' FRA & DRAINAGE STRATEGY REPORT, AND HAVE BEEN MODELLED USING ONLY BASIC SITE DATA.

ONCE THE OUTFALL SEWERS HAVE BEEN SURVEYED AND IDENTIFIED, AND THE SW DISCHARGE METHOD CONFIRMED, A DETAILED DESIGN WILL INCLUDE HYDRAULIC CALCULATIONS, WHICH WILL STIPULATE CONFIRMED PIPE AND ATTENUATION SIZES.

DESIGN NOTE
ATTENUATION TANK TO BE DESIGNED TO STORE WATER FROM STORMS ABOVE 1 IN 30 YEAR WATER LEVEL, UP TO AND INCLUDING 1 IN 100 YEAR EVENT PLUS 45% CLIMATE CHANGE INCREASE.

DESIGN NOTE
 PLOT DRAINAGE TO BE CONSTRUCTED TO BUILDING REGULATIONS DOCUMENT H. 100MMØ PIPES TO BE USED FOR PLOT DRAINAGE UNLESS SPECIFIED OTHERWISE, AND PLOT MANHOLES TO BE 450MMØ IN NON-VEHICULAR AREAS AND 900MMØ IN VEHICULAR AREAS - UNLESS SPECIFIED OTHERWISE.
 PLOT DRAINAGE SHOWN INDICATIVELY, TO BE ENHANCED AT DETAILED DESIGN STAGE WITH ACCURATE POP UP/ RWP POSITIONS.

DESIGN NOTE
 PROPOSAL TO DISCHARGE INTO EXISTING 990mm X 1400mm COMBINED SEWER IN SITE BOUNDARY.
 ACCURATE COVER AND INVERT LEVELS AND PRESENCE OF SEWER TO BE CONFIRMED AND IDENTIFIED AND CONFIRMED IN ORDER TO PROCEED WITH DESIGN.

B	20/05/24	ARCHITECTS LAYOUT REVISED TO LATEST VERSION.
A	23/04/24	DRAINAGE DESIGN ENHANCED.
-	12/01/24	PRELIMINARY ISSUE SUBJECT TO FURTHER DETAILED DESIGN
REV.	DATE	DESCRIPTION

TYSON CONSTRUCTION
BOLTON AT HOME

Carley
Daines and
Partners Limited

11 Bridgewater Road Walkden
Worsley Manchester M28 3JE
Tel 0161 799 2720 Fax 0161 790 3474
E-mail mail@carleydaines.co.uk

TITLE

FLETCHER FOLD ROAD
BURY

PRELIMINARY DRAINAGE STRATEGY DRAWING

Drawn	AM	Checked	DM
Date	12/01/2024	Date	12/01/2024
Scale	1:250	@	A1
Drawing No.	23-B-13947-200		B