

DRAINAGE STRATEGY AND CALCULATIONS



Client: **Rontec**

Site Address: **Home Park Service Station,
89 Outland Road,
Plymouth, PL2 3DE**

Project Number: **23396**

Reference (Revision): **CALC01 (-)**

Date: **October 2023**

Author: George Dermentzoglou Date: October 2023

Checker: Sebastian Reid Date: October 2023

Job No.	23396	Sheet No.	i
Calcs by:	George D	Date	Oct 23

CLIENT:	Rontec
PROJECT TITLE:	Home Park
ARCHITECT:	Jennings Design

EXISTING SITE AND PROPOSALS

The existing site is a Petrol Filling Station in full operation with a sales building, a forecourt area with underground filling tanks and a landscaped area with trees, bushes and hedges. It is located at 89 Outland Road at Plymouth and is bounded with Outland Road to the east and south, Lyndhurst Road to the west and private properties to the north. The site falls from north to south with existing levels vary from 55.60 to 50.30m AOD.

The proposals include an extension of the existing sales building to the back, and a new compound area at the side of the building. The proposed roof of the extension as well as the existing roof will fall towards a new valley gutter, which will collect rainwater. The existing tarmac area back of the building will be broken out and will be landscaped with grass and similar vegetation to match existing planting.

FLOOD RISK

The site is located in Flood Zone 1, as indicated in the Environment Agency flood map that can be found in the appendices, an area with a low risk of flooding from rivers or sea. The flooding risk from surface water, reservoirs and groundwater are also low hence no mitigation measures are required. The proposals do not increase the impermeable area of the site nor amend any existing levels, therefore the flooding risk will remain unchanged.

EXISTING DRAINAGE SYSTEM

The site has an existing private drainage system, which has been investigated and the Underground Utility survey is included in the appendices. It consists of a surface water system, which collects water from the roof, yard and forecourt area, and a combined water system which picks foul connections from the building and a small area of the roof and hardstanding area. Water from the forecourt area passes through an interceptor before it connects into the combined system. Both systems connect into an outfall combined manhole, west of the site, which has an existing combined connection into South West Water combined sewer in Lyndhurst Road. No flooding issues or problems with the existing system being over capacity have been reported. Any blockages detected on site should be cleared as soon as possible.

SURFACE WATER HIERARCHY

The existing site is brownfield and has a medium risk of contamination risk due to the ongoing operation of the Petrol Filling Station since 1960s. The bedrock underlying the site is a secondary aquifer A and the groundwater contained there is of high vulnerability. A previous site investigation has indicated made ground to a depth of 1.2m BGL, underlain by mudstone to a depth of 5.0m BGL. Considering these facts, infiltration into the ground is not a viable option for this site.

In addition to the above, there is no available watercourse in close proximity.

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South West Water drainage records do not show any surface water sewer in the vicinity except combined sewers in Outland Road and Lyndhurst Road. Please refer to the associated plan in the appendices.

Therefore, it is proposed the site to retain the existing combined connection into the public combined sewer in Lyndhurst Road.

SURFACE WATER STRATEGY

The development proposals will result in an overall reduction of the existing impermeable area by 30m². The roof of the proposed extension will be mainly constructed in an already hardstanding area and the tarmac area at the back of the building will be landscaped. Therefore, there will be no increase of the existing surface water flows and the capacity of the existing surface and combined systems will not be exceeded.

Rainwater from the whole roof will be collected by a new valley gutter between the existing and proposed building and will discharge into the existing system via downpipes on either side of the roof. Water from the proposed compound area will drain naturally, following the external levels, into the existing gully and channel drain, located at the west side of the building, replicating how the existing area drains.

A surface water pipe, picking up water from the roof, located at the back of the existing sales building will be abandoned to allow the construction of the proposed extension.

SUSTAINABLE DRAINAGE SYSTEMS

The following SuDS methods have been considered but discounted as a part of this development:

- Rainwater Harvesting – This has been considered, but there is no demand for the water recovered within the scheme for the type and use of the development.
- Rain Gardens – These have been considered to be used in the landscaped area at the back of the building extension but is not practical due to the existing ground levels.
- Permeable Paving – Permeable pavements could be suggested for the site but, due to the pollution risk of the underlying aquifer and groundwater, have been excluded.
- Green Roofs – This option is potentially the most feasible for the type of the proposed development and could be accommodated at both existing and proposed roofs. Rainwater will still be conveyed into the main system via downpipes, but the flows will be significantly reduced allowing a gradual and manageable discharge into the existing drainage system.

FOUL WATER STRATEGY

The proposed sales building extension will include toilet and similar facilities that require connection to the foul system. The existing foul water connection from the existing building is proposed to be retained and accommodate any new foul flows. In case the proposed building layout do not allow for this, a foul system on the back and side of the building extension will be required with a connection to the existing combined manhole, where foul is currently discharges into.

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CODES OF PRACTICE:

Drainage Outfall Details	Proposed Discharge Outfall Point	As existing system, public combined sewer
	Soakaways Viable	No, risk of contamination to highly vulnerable groundwater, made ground to 1.2m BGL and mudstone to 5.0m BGL
	Watercourse Discharge Available	No watercourse in close proximity
	Surface Water Sewer	No public sewer in close proximity
	Foul Water / Combined Sewer	Yes, public combined sewer in Lyndhurst Road with an existing connection from site
	Invert Level of Outfall	As existing
Drainage Assessment	Total Site Area	2,700 m ² / 0.2700 ha
	Existing Impermeable Area	1,415 m ² / 0.1415 ha
	Proposed Impermeable Area	1,385 m ² / 0.1385 ha
	Impermeable Area Reduction	-30 m ²
	Proposed Sales Building Extension	113 m ²
Flood Risk	Fluvial flooding from rivers and sea	Low risk
	Pluvial flooding from surface water	Low risk
	Flooding from reservoirs	Low risk
	Flooding from groundwater	Low risk
	Flooding from existing sewers	Low risk
SuDS Details	Water Quality Methods Used	None proposed
	Hydrocarbon Interceptor	Not required
	Silt Capture	Not required
	Ponds / Swales	None proposed
	Permeable Pavement	None proposed
Appendices	Topographical Survey Utility Survey Proposed Site Layout Environment Agency Flood Map South West Water drainage records Drawing 23396-DCE-XX-XX-D-C-100-P01 Drainage Strategy & Impermeable Areas	



SCHEDULE OF AREAS	
Site Area - Application Boundary	0.27H / 0.66A
Existing Shop Gross External Area	137m ² / 1475ft ²
Existing Shop Gross Internal Area	123m ² / 1324ft ²
Existing Shop Retail Area	61m ² / 656ft ²
Proposed Shop Gross External Area	250m ² / 2691ft ²
Proposed Shop Gross Internal Area	231m ² / 2486ft ²
Proposed Retail Area	148m ² / 1593ft ²

GENERAL NOTES

This drawing has been prepared for planning purposes only by Jennings Design Limited on behalf of Rontec Service Stations 1A Limited taken from Malcolm Hughes Land Surveyors Topographical Survey. Site boundary taken from Title Plan.

This drawing to be read in conjunction with ;
140329 PLNG-01 Existing Site Layout
140329 PLNG-02 Existing Site Elevations
140329 PLNG-03 Existing Building Layout and Elevations
140329 PLNG-04 Proposed Site Layout
140329 PLNG-05 Proposed Site Elevations
140329 PLNG-06 Proposed Building Elevations
140329 PLNG-07 Proposed Floor - Roof Plan
140329 PLNG-08 Block Plan
140329 PLNG-09 Site Location Plan

APPLICATION BOUNDARY

PROPOSAL
Extension to rear of existing sales building and installation of new secure compound.

SITE PREPARATION
Existing low retaining wall to rear of sales building to be demolished with trees and vegetation removed to allow for extension. Existing ground taken down to reduced levels and removed from site.

BUILDING MATERIALS
See building elevation drawings for breakdown of all various building materials.

COMPOUND
To comprise of a tanalised timber framework externally clad in vertical close boarded tanalised fence slats 2000mm high complete with double lockable access gates.

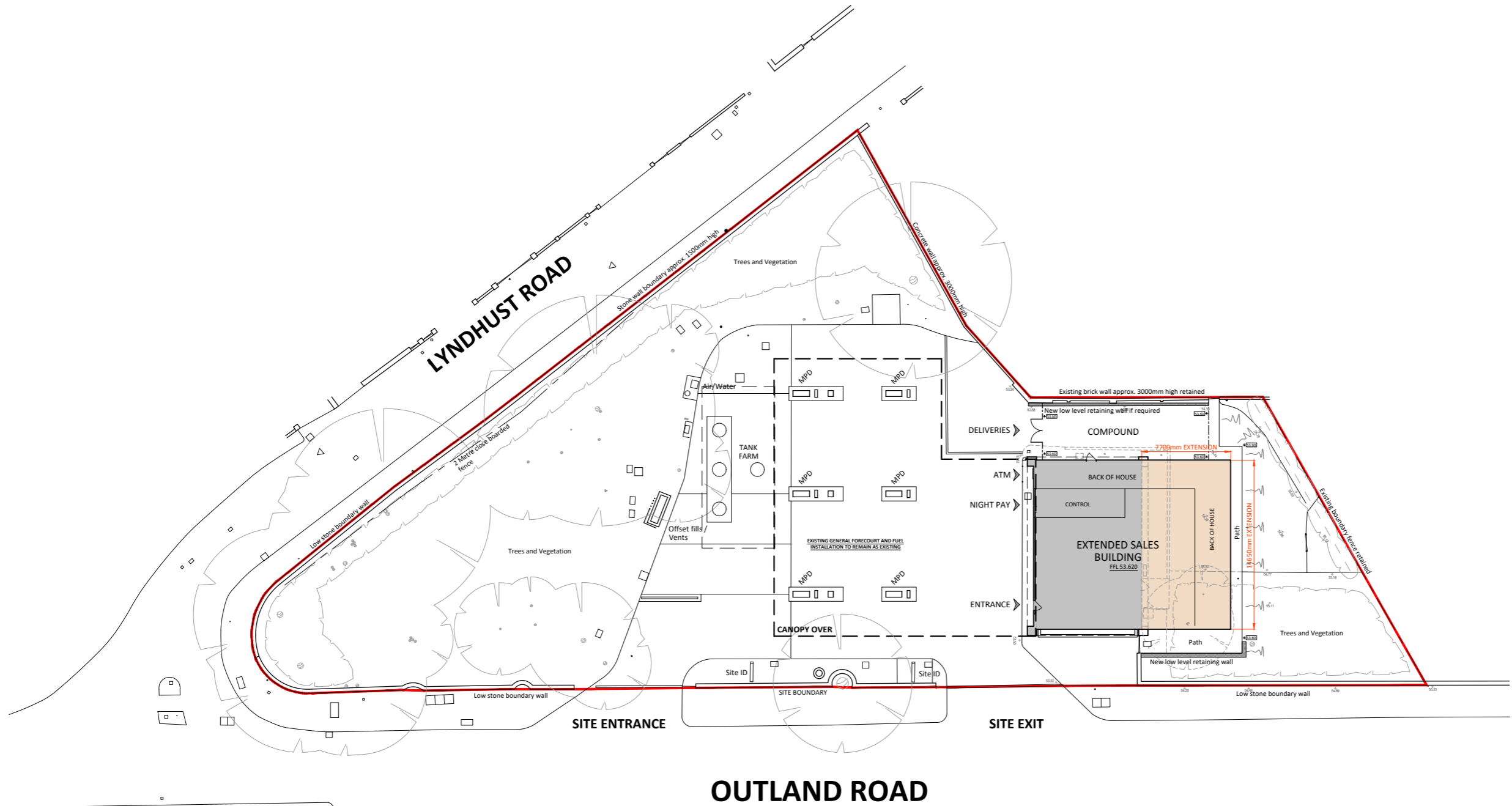
FORECOURT/CANOPY
Existing forecourt/canopy to be retained as existing.

FUEL SYSTEM
Existing Tank farm, Offset fills and Tank vents to remain as existing.

BOUNDARY
Existing boundary treatments to remain as existing.

ILLUMINATION
Illumination to compound by means of low energy floodlights mounted to walls of sales building.

+14.46 Proposed Levels
+54.20 Existing Levels



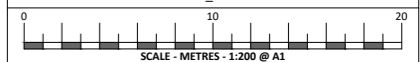
PLANNING PHASE	
PROJECT	SALES BUILDING EXTENSION HOME PARK SERVICE STATION 89 OUTLAND ROAD, PLYMOUTH, DEVON, PL2 3DE
TITLE	PROPOSED SITE LAYOUT
CLIENT	Rontec Service Stations 1A Ltd



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Drawn: DS Check: NJJ Scale: 1:200 @ A1 Date: July 2023

Plan Number: 140329_PLNG-04



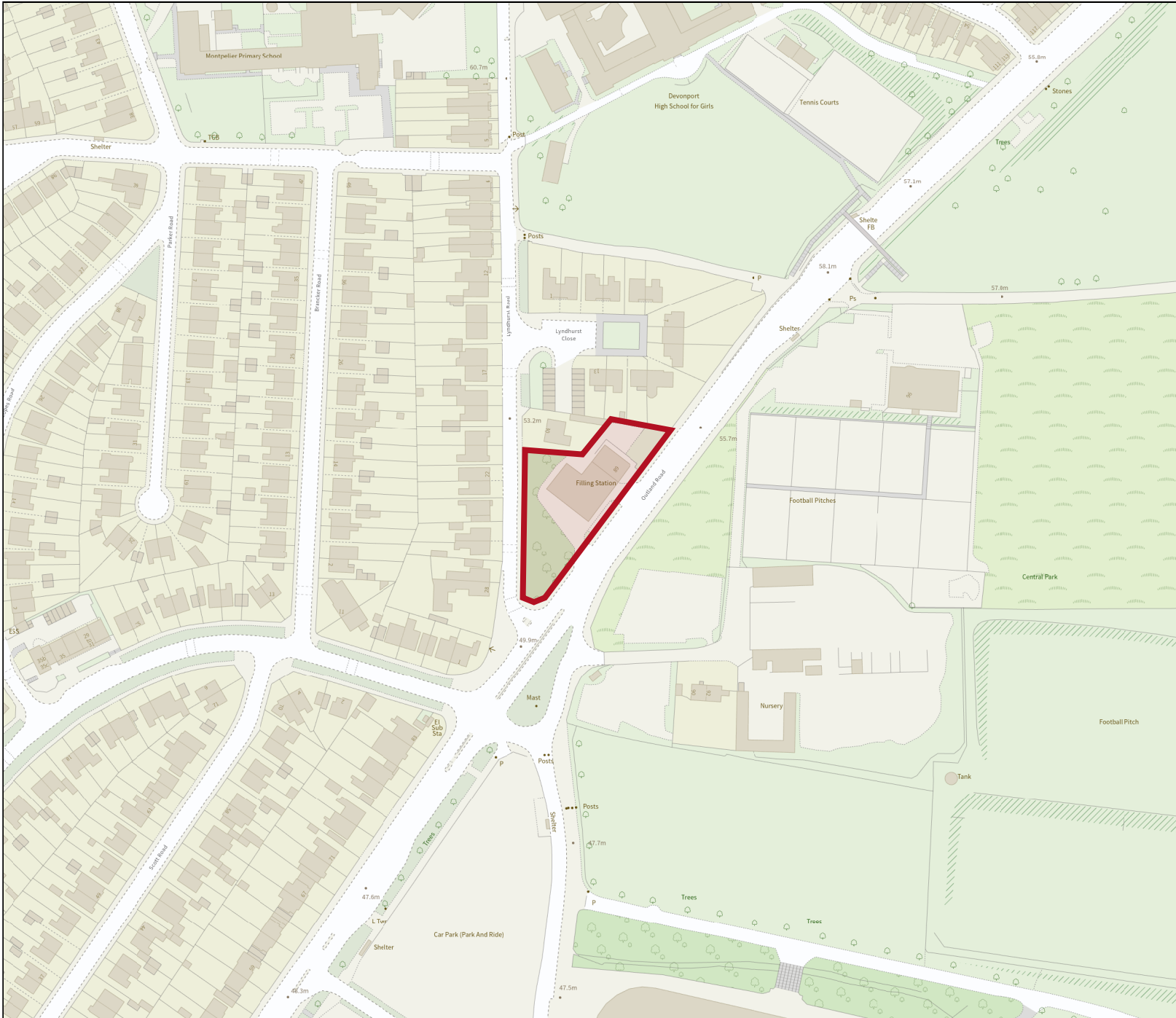
Flood map for planning





Your reference
Home Park PFS

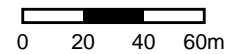
Location (easting/northing)
247129/56746

Scale
1:2500

Created
18 Oct 2023 17:08



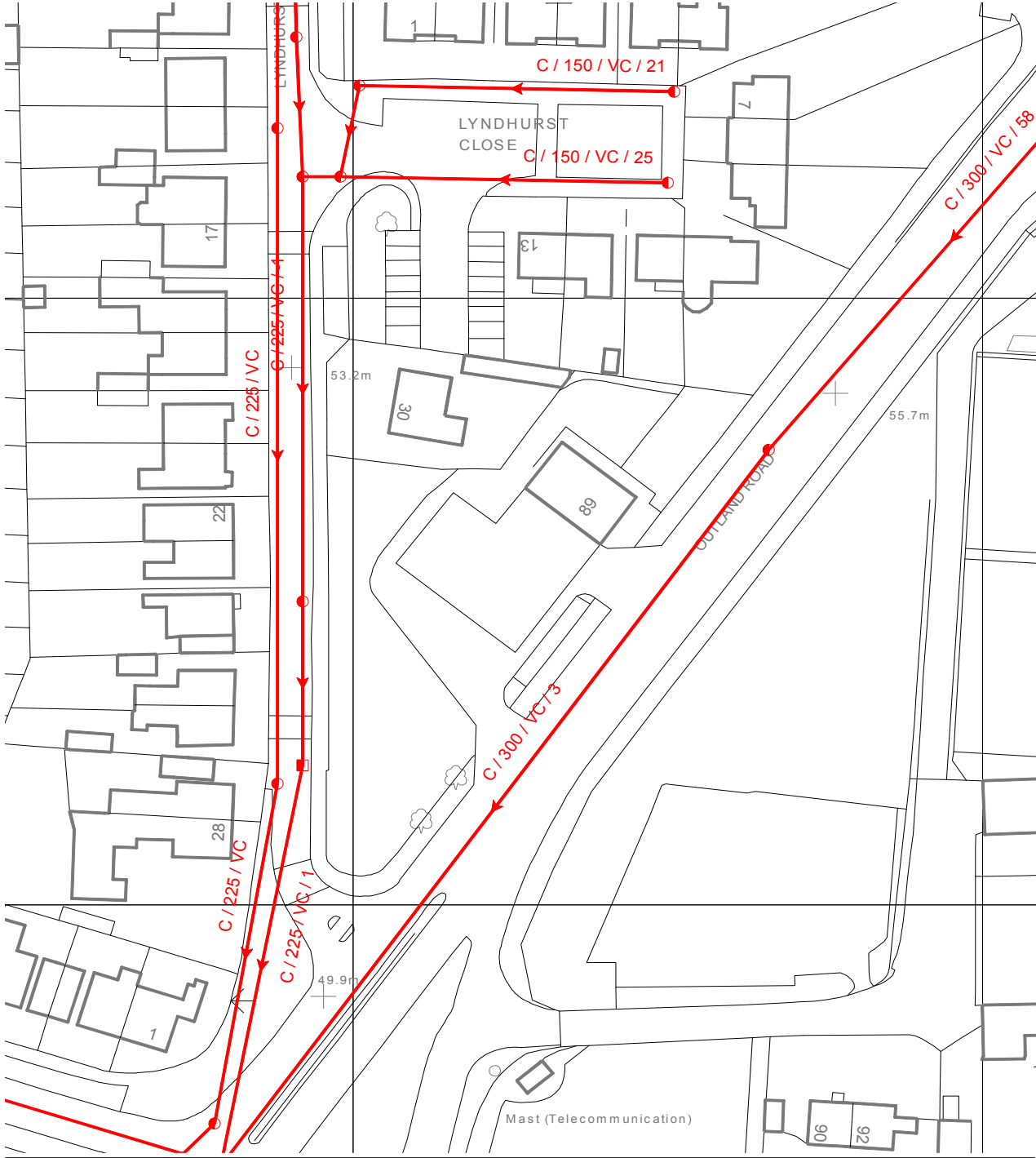
-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area





DRAINAGE

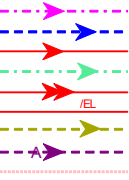
1 LYNDHURST CLOSE, PLYMOUTH PL23DN



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Sewer Pipe Details

- Public - Foul
- Public - Surface
- Public - Combined
- Public - Treated
- Pumping Main
- Elevated
- Unverified
- Abandoned
- Highway



Common Shapes

- Circular
- Rectangular
- Unknown

- Barrel
- Trapezoidal
- Egg Shape

- B
- T
- E
- U Shaped
- Horseshoe
- Oval

- US
- H
- OV

Common Materials

- Vitrified Clay
- Pre Cast Concrete
- Concrete

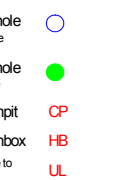
- Alkathene
- Asbestos Cement
- Polyvinylchloride

- AK
- AC
- PVC
- Medium Density Polyvinylchloride
- Unplasticised Polyvinylchloride
- Unknown

- MDPE
- UPVC
- U

Sewerage Structures

- Manhole Foul
- Manhole Surface
- Manhole Combined
- Manhole Private
- Soakaway
- Catchpit
- Washout
- Hatchbox
- Buried
- Unable to Locate
- UL





NORTH

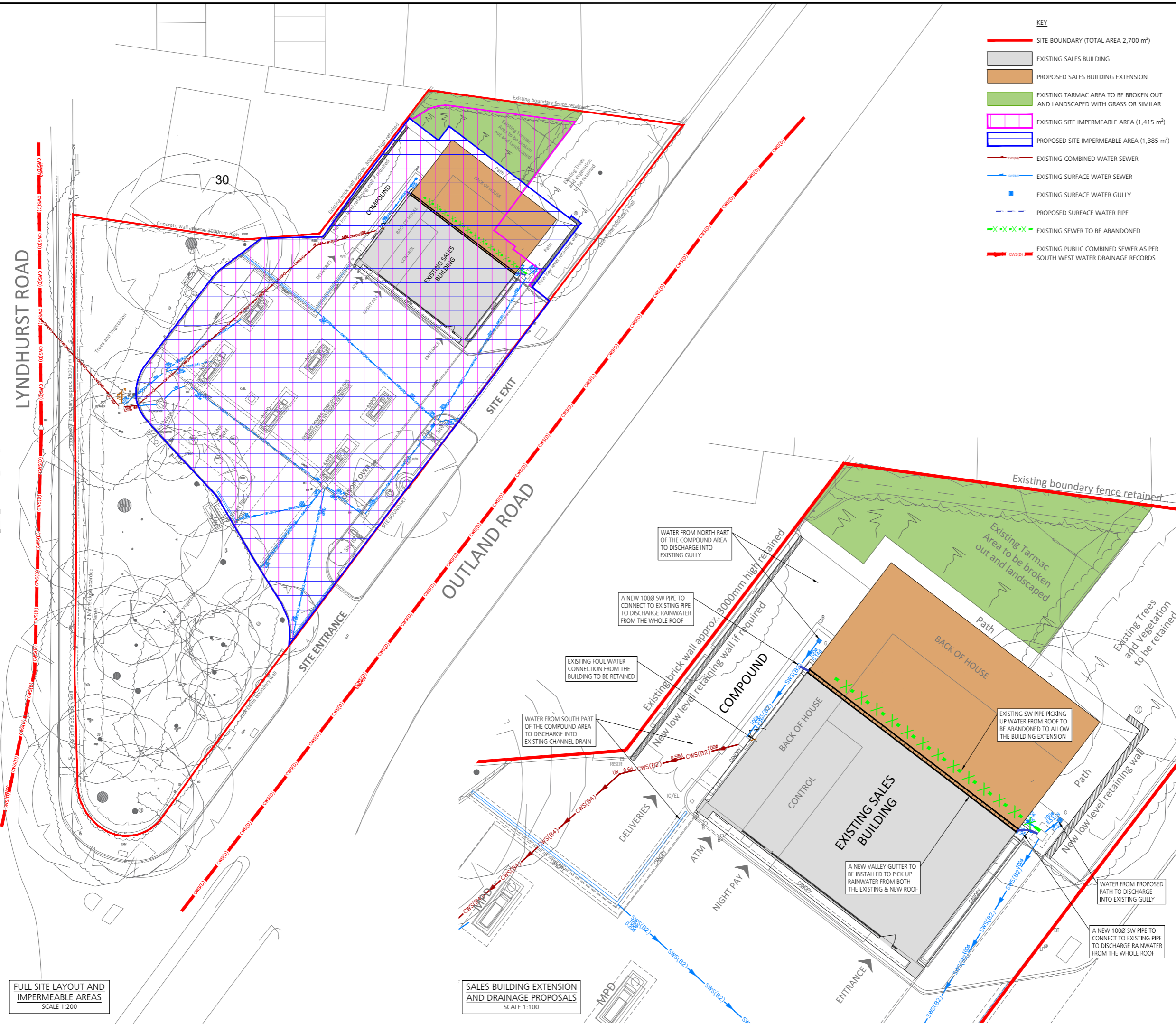
22

LYNDHURST ROAD

OUTLAND ROAD

FULL SITE LAYOUT AND IMPERMEABLE AREAS
SCALE 1:200

SALES BUILDING EXTENSION AND DRAINAGE PROPOSALS
SCALE 1:100



KEY

- SITE BOUNDARY (TOTAL AREA 2,700 m²)
- EXISTING SALES BUILDING
- PROPOSED SALES BUILDING EXTENSION
- EXISTING TARMAC AREA TO BE BROKEN OUT AND LANDSCAPED WITH GRASS OR SIMILAR
- EXISTING SITE IMPERMEABLE AREA (1,415 m²)
- PROPOSED SITE IMPERMEABLE AREA (1,385 m²)
- EXISTING COMBINED WATER SEWER
- EXISTING SURFACE WATER SEWER
- EXISTING SURFACE WATER GULLY
- PROPOSED SURFACE WATER PIPE
- x EXISTING SEWER TO BE ABANDONED
- EXISTING PUBLIC COMBINED SEWER AS PER SOUTH WEST WATER DRAINAGE RECORDS

DO NOT SCALE

DESIGNERS HAZARD IDENTIFICATION

IT IS ASSUMED THAT ALL WORKS WILL BE UNDERTAKEN BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT. IN ADDITION TO THE HAZARDS TYPICALLY ASSOCIATED WITH THE TYPES OF CONSTRUCTION DETAILED ON THIS DRAWING, ANY KNOWN ABNORMAL HAZARDS SPECIFIC TO THIS SCHEME HAVE BEEN IDENTIFIED.



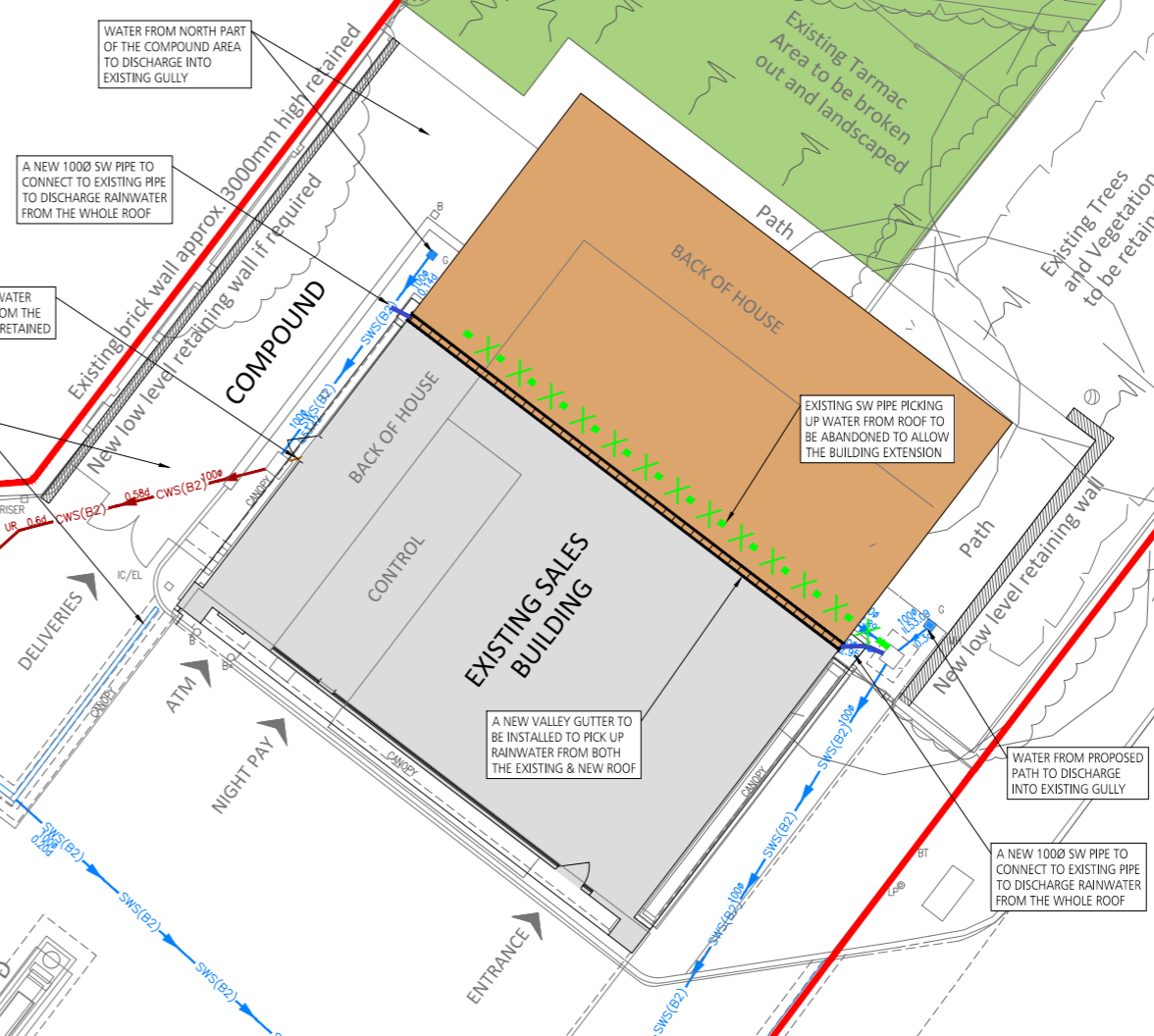
ABNORMAL HAZARD REFERENCE

GENERAL NOTES

1. DO NOT SCALE FROM THIS DRAWING.
2. THIS DRAWING IS TO BE REPRODUCED IN COLOUR.
3. IF ANY DISCREPANCIES ARE FOUND IN THIS DRAWING, PLEASE REPORT TO DUDLEYS CONSULTING ENGINEERS.
4. THIS DRAWING IS BASED ON THE FOLLOWING DRAWINGS:
 - 4.1. 60127/1 TOPOGRAPHICAL SURVEY BY MALCOLM HUGHES DATED MAY 2023.
 - 4.2. 60127/UG1 UNDERGROUND SERVICES SURVEY BY MALCOLM HUGHES DATED MAY 2023.
 - 4.3. 140329-PLNG-04 PROPOSED SITE LAYOUT BY JENNINGS DESIGN DATED JULY 2023.
5. ALL WORK TO BE UNDERTAKEN IN ACCORDANCE WITH THE CURRENT EDITION OF THE BUILDING REGULATIONS, SEWERAGE SECTOR CODES OF PRACTICE, AND THE RELEVANT LOCAL HIGHWAY AUTHORITY STANDARDS.

DRAINAGE NOTES

6. THE EXISTING SITE IS BROWNFIELD WITH A RISK OF CONTAMINATION DUE TO THE OPERATION OF THE PETROL FILLING STATION.
7. THE GROUNDWATER WITHIN THE SECONDARY AQUIFER A BELOW THE SITE IS OF HIGH VULNERABILITY.
8. A PREVIOUS SITE INVESTIGATION INDICATED MADE GROUND TO A DEPTH OF 1.2m BGL, UNDERLAIN BY MUDSTONE TO DEPTH OF 5.0m BGL.
9. THE ABOVE POINTS DO NOT SUPPORT THE INFILTRATION INTO THE GROUND METHOD.
10. THERE IS NO WATERCOURSE IN CLOSE PROXIMITY.
11. THERE IS NO PUBLIC SURFACE WATER SEWER IN THE AREA ACCORDING TO SOUTH WEST WATER SEWER RECORDS.
12. THE SITE HAS AN EXISTING COMBINED CONNECTION INTO A PUBLIC COMBINED SEWER IN LYNDHURST ROAD AND THIS CONNECTION IS PROPOSED TO BE RETAINED.
13. THE PROPOSED SALES BUILDING EXTENSION OF 113m² WILL NOT INCREASE THE TOTAL SITE IMPERMEABLE AREA AS THE TARMAC AREA AT THE BACK OF THE EXISTING BUILDING IS PROPOSED TO BE BROKEN OUT AND LANDSCAPED.
14. THE IMPERMEABLE AREAS SHOWN ON THIS DRAWING INDICATE A REDUCTION OF 30m² (EXISTING - PROPOSED) AND THEREFORE THE PROPOSALS DO NOT INCREASE THE SITE IMPERMEABILITY NOR THE RISK OF FLOODING.



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DATE	REVISION DESCRIPTION	BY	CHK.	REV.

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PROJECT: HOME PARK SERVICE STATION
89 OUTLAND ROAD,
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JOB: 23396

TITLE: DRAINAGE STRATEGY & IMPERMEABLE AREAS

SCALE: AS SHOWN	PAPER: A1	STATUS: PRELIMINARY
DRAWING NO.: 23396-DCE-XX-XX-D-C-100	REV.: P01	