CAD CIVILS

CAD Civils
Courtleigh House
74-75 Lemon Street
Truro . Cornwall
TR1 2PN

01872 630040

studio@cadarchitects.co.uk
www.cadarchitects.co.uk

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Registered in England No 4104241 **VAT No** 768 6249 77 **Registered Office** Chy Nyverow . Newham Road . Truro . TR1 2DP

1.0 INTRODUCTION

1.1 Our Clients are Mr and Mrs Reginald Price. This Flood Risk Assessment is provided in support of a planning permission application for the development of the site in terms of the addition of two wings to convert an existing detached bungalow (3 bed) into a small courtyard development of 4 one-bed single storey mews cottages. This Flood Risk Assessment is required by the virtue of the fact the site lies within a Critical Drainage Area.

2.0 SITE APPRAISAL

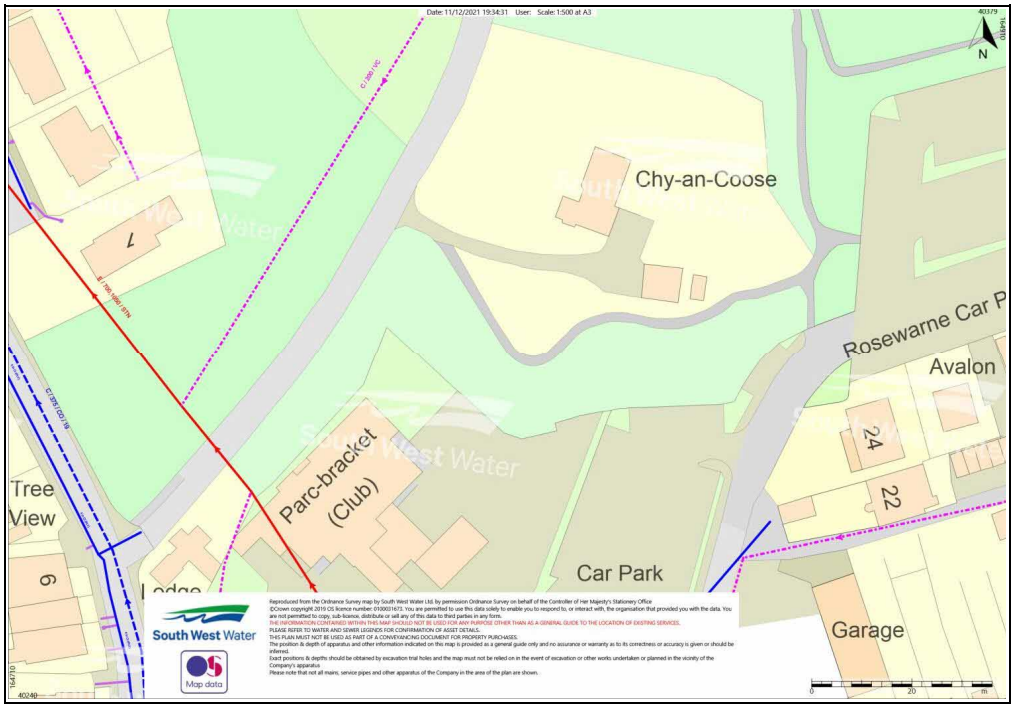
2.1 The National Grid Reference for the site is SW64825, 40340. The postcode for the property is TR14 8FD.

2.2 The site location is shown on architectural drawing numbered A105-04-GA-2-A submitted with the planning permission application. The location plan shows the adjacent road network and street names.

2.3 The Cornwall Council Strategic Flood Risk Assessment and Interactive maps (located at https://map.cornwall.gov.uk/website/ccmap/) show that:

- There are no rivers or watercourses within the vicinity of the site
- The site lies within flood risk zone 1
- The site does not lie in a surface water flood risk area
- The site does not lie in a tidal extreme zone
- The site lies within the Camborne, Pool, Illogan and Redruth Critical Drainage Area
- The site lies within the West Cornwall and the Fal catchment boundary

2.4 South West Water's Internet Mapping Service shows there are public sewers to the west and southwest of the application site.



Public foul sewer
Public combined sewer
Public surface water sewer

3.0 ASSESSMENT OF PROPOSALS

3.1 The proposed site layout is shown on architectural drawing numbered A106-04-GA-1-A:

.1 The application site is served by an existing access way. The impermeable roof area in the pre-development setting is 145m^2. The amount of impermeable roof area in the proposed setting is 270m^2. All new paths and patios within the curtilage of the dwellings will be permeable pavement construction. Consequently, the net increase in impermeable area is 125m^2 which, in an area-wide / catchment context is negligible.

.2 The existing bungalow is served by a combined drain, which conveys both foul and surface to the public foul sewer to the west of the property:

.1 In the proposed scheme, the surface water and foul water will be separated out. Only foul water will be discharged to the public foul sewer using the original connection. This means that the surface water runoff from 145m^2 of impermeable roof area will be removed from the public foul sewer.

.2 The flow rate from 270m^2 of impermeable roof area, based on Approved Document H, is 6l/s including an allowance for climate change (50%).

.3 Consideration of options for the discharge of surface water runoff:

.1 For the CPIR CDA (Critical Drainage Area) there is a presumption in favour of draining surface water to a watercourse or surface water sewer. There are no watercourses in the vicinity of the site. The nearest public surface water sewer is located in Tehidy Road to the southeast of the development site. A connection to the public sewer would involve the construction of 110m of pipeline under roads, the crossing of a public DN1050 trunk combined sewer and 4 new manholes, one of which would be located in the public highway. The construction cost of this solution is disproportionate to the proposal.

.2 Where it is deemed unviable to drain to a watercourse or surface water sewer, the minimum drainage standards laid down in the CPIR CDA allows for surface water drainage by infiltration to be assessed. Using the HR Wallingford infiltration systems design tool, and taking an average soil infiltration rate, f = 5.0 x 10^{-5}m/s, a rectangular (modular cell) soakaway 4.0m long x 2.0m wide by 1.0m deep would be required for the 1:10 year event, with surface water up to the 1:100 year storm event (+ 50% climate change allowance) being managed on site. This is a far more cost-effective and practicable solution.

.3 In the event that the ground is not conducive to drainage by infiltration then, subject to SWW approval, an attenuated discharge to the public foul water sewer is a possibility.

.4 The site is located in a built up residential area where there are several natural features such as walls and fences that break up the landscape, and significantly reduce the possibility of overland surface flows. There is no history of flooding. Consequently, the proposed development is not at risk of flooding from surrounding land use.

.5 Any overland flows resulting from overwhelming or blockage of the drainage system will be shallow and/or slow moving. By setting floor levels at 150mm above adjacent external ground levels, the proposed dwellings will be adequately protected from flooding.

4.0 SUMMARY

4.1 The design of a suitable surface water drainage system is achievable within the confines of the site. The preferred, most cost-effective solution is based on an infiltration system. The detailed design will meet the drainage standards laid down by the Local Lead Flood Authority.

4.2 Exceedance pathways have been considered. It is anticipated all surface water run-off, up to the 1:100 year event (+ a climate change factor) can be safely managed on site without increasing the flood risk either on the site or downstream of the site.

Lapin P., CEng., BSc (Hons)., MICE
For and on behalf of CAD Civils

HR WALLINGFORD INFILTRATION SYSTEMS DESIGN TOOL

GEOMETRY	
Rectangular soakaway 1	
Width (m)	2
Length (m)	4
Diameter (m)	
Soakaway base area (m2)	8

PARAMETERS	
Porosity	0.95
Effective porosity	
Infiltration coefficient (m/h)	0.18
Factor of safety	1.5

AREA TO BE DRAINED	
Contributing area	
Roof area	275
Total area (m2)	275

DESIGN RAINFALL	
M5-60 rainfall depth (mm)	17
Rainfall ratio r	0.3
Climate change factor	1.5
FEH factor	1
Return period (years)	10

Rainfall Duration (h)	Intensity (mm/h)
0.083333333	123.808
0.166666667	91.463
0.25	73.42
0.5	48.695
1	31.62
2	19.763
4	12.411
6	9.229
10	6.433
24	3.53

RESULTS	
Maximum water depth (m)	0.98
Time for half-emptying (h)	1.86