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Development at St Claires Villas Lucan

Drainage Report

ONCE Civil & Structural Ltd

Company Registration No. 464217

Contents

1.0 INTRODUCTION

1.1 Instruction

ONCE Civil & Structural Ltd Consulting Engineers have been appointed by John Shenton and Margaret Hanlon to provide civil engineering design services for a proposed mixed use development of a Physiotherapy practice and a one bedroom apartment at St Claires Villas St Claires Villa Lucan Co Dublin K78 XON1.

The following report will address the civil engineering elements, including.

- Surface Water Strategy design, provision of SUDS.
- Foul Sewer design

The planning authority for this development is the South Dublin County Council.

1.2 Existing Site

The existing site is situated along the R835 Lucan Road, Lucan, Co. Dublin . The existing site is currently a 88m^2 Residential Property on a site of 357 m^2.

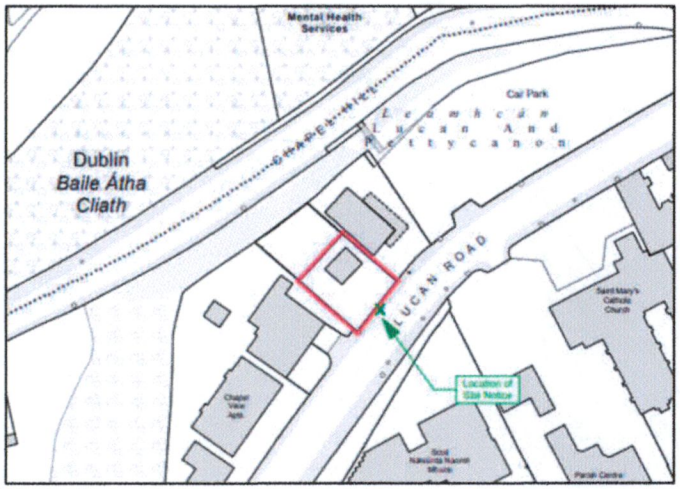


Figure 1, Location Map

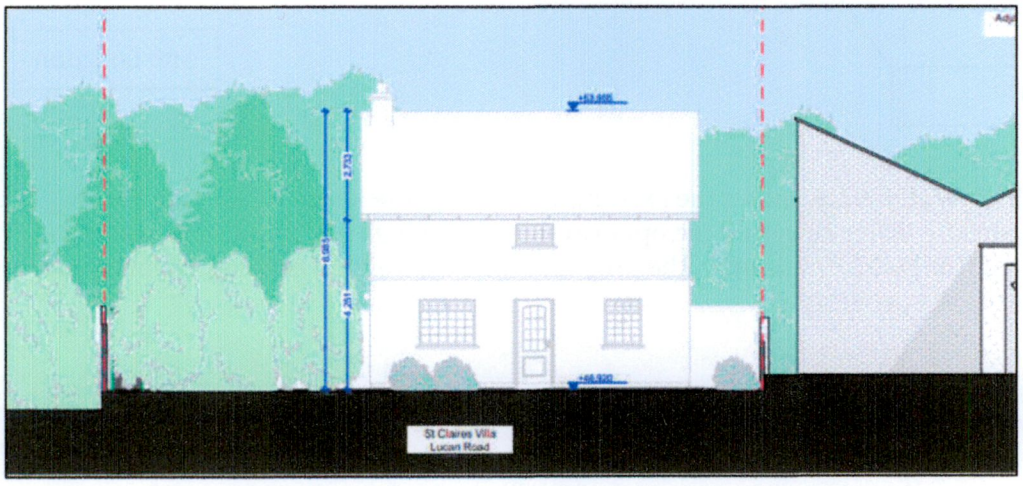
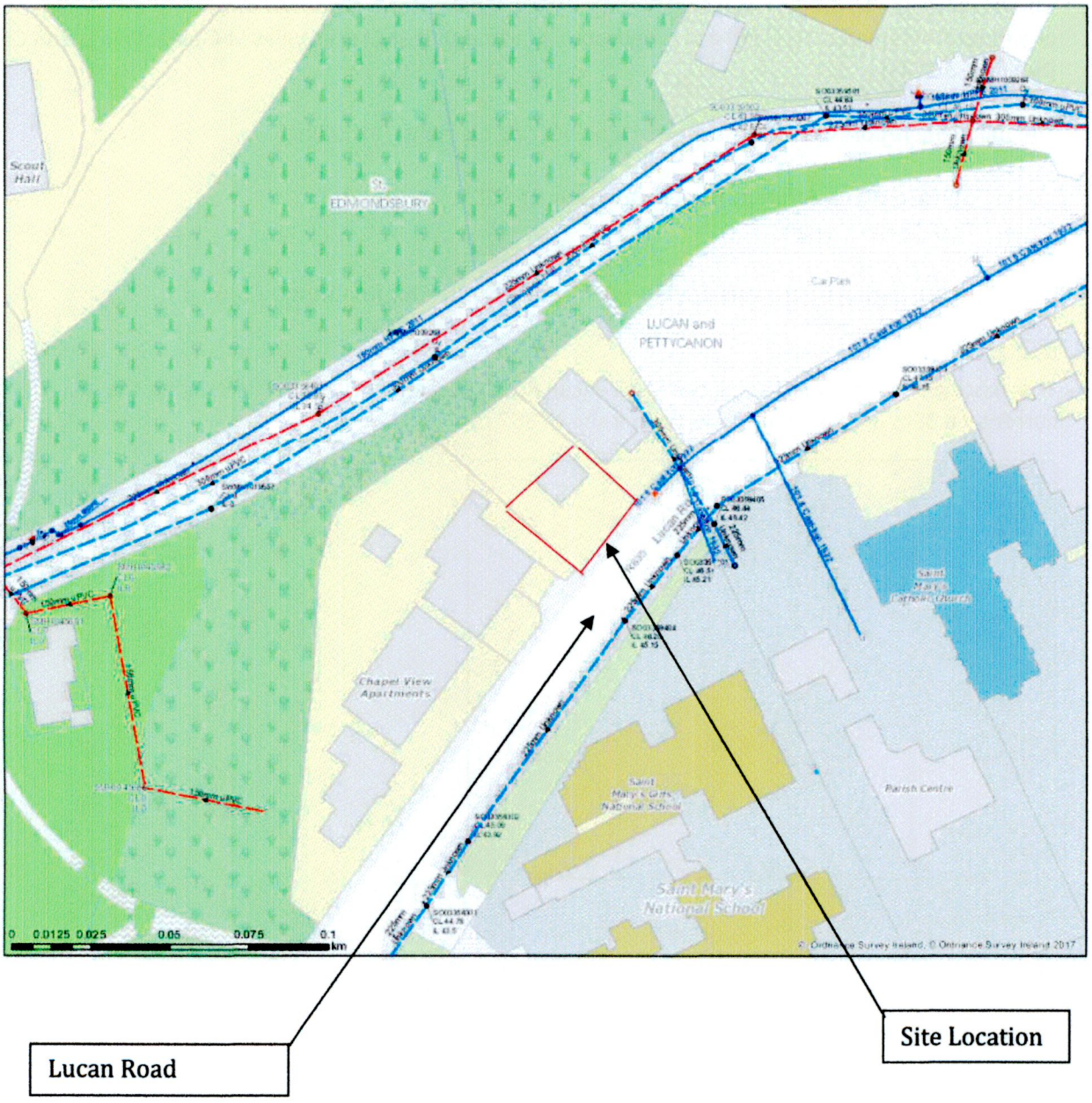


Figure 2, Existing Front Elevation

1.2.2 Existing Service



A review of the Irish Water maps shows the existing services for the Lucan Road. There is an existing 225mm surface water sewer on the opposite side of the road and an existing water main (101mm Cast Iron) which runs up to the proposed site. There is an existing 150mm foul sewer to the West of the property.

1.3 Proposals

The proposed development consists of a mixed use development of a physiotherapy practice and a one bedroom apartment at St. Claires Villa, Lucan, Co. Dublin K78 XON1.

Figure 3, Proposed 3D Front View

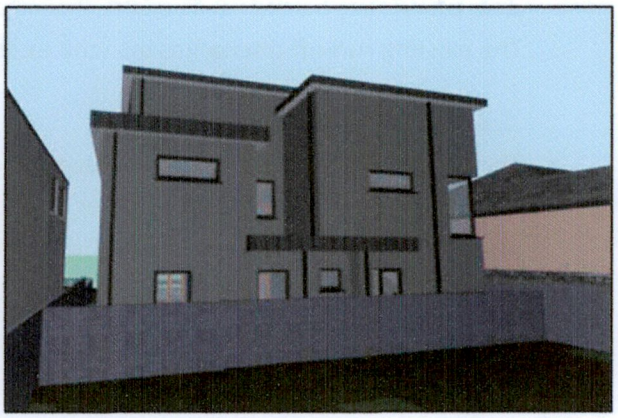


Figure 4, Proposed 3D Rear View

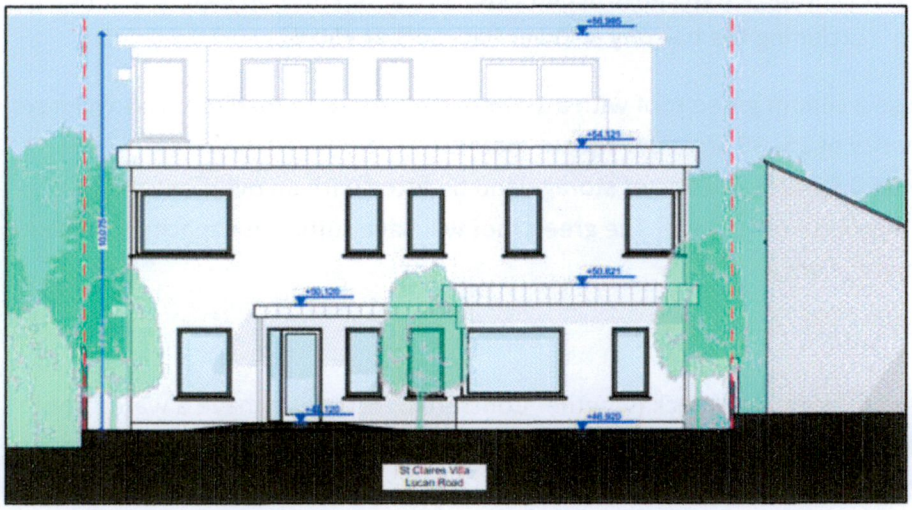


Figure 5, Proposed Front Elevation

2.0 SURFACE WATER DRAINAGE

2.1 Existing Surface Water

The existing run-off discharges into the existing surface water network located on-site.

2.2 Surface Water Policy

The proposed development will consist of 141m^2 of additional hard landscape. To address the additional runoff to the existing pipes and to relieve pressure on the existing network, it has been proposed to use a Green Roof. The Green roof will be situated on all three levels of the flat Roof. (Drawing number 5845-01)

The drainage is designed to comply with policies and guidelines, outlined in the Sustainable Drainage Explanatory Design & Evaluation Guide, Greater Dublin Strategic Drainage Study (GDSDS), the requirements of the South Dublin County Council and SUDs Manuals C697 and C609.

2.4 Surface Water Design

The max total area of additional hard landscape due to the proposed development is approx. 141^2 with 100% impermeability. It is proposed to construct an extensive green roof on all levels of flat roof of the property 156m^2 (Excluding the balcony & lower flat roofs at +50.62)

It has been proposed to use a sedum green roof with a 100mm thick growing medium. This will have an estimated storage capacity of 25- 35 litres per square meter.
The green roof shall provide 0.56 cubic meters of storage and be fitted with an overflow and discharge to the existing pipe network on-site. The green roof will have sufficient capacity to account for flash flooding and climate change.

2.4.1 Green Roof Specification

- *Primary waterproofing layer:* Roof deck (whether Concrete or Screed) to have a waterproof basecoat/membrane.
- *Root barrier*: Plastic root barrier to be placed across the full length of the roof, overlapped and tapped where necessary.
- *Green roof drainage membrane:* Drainage and storage membrane to be placed on root barrier, 20P Drainage and Storage membrane or similar product.
- *Growing Substrate:* To be forms of aggregate and organic material combination. To be spread evenly across the entire area of the roof to the required depth of 100mm.
- *Planting seed/vegetation layer: Seeds/plants to be planted at this stage, following recommendations.*

3.0 Design

3.1 Protection of the property

The design of the surface water runoff is such that it will cater for a storm event of the 100-year critical event without causing any significant unplanned flooding. The design allows for a 30% for climate change in the capacity of the storage.

3.2 Foul Drainage

The Foul Drainage will consist of the foul water discharged from the building. The proposed pipe will be a 110mm Diameter pipe with a gradient of 1:60. The Proposed Manholes will be Irish Water standard - Document Number: IW-CDS-5030-01 (August 2016) Drawing number STD-WW-13. The foul drainage will discharge with a new connection to the existing network on-site.

3.3 Design Calculations

Storm & Foul Drainage have been designed in accordance with the Building Regulations Part H and specifically in accordance with the principles and methods set out in the DOE "Recommendations for Site Development Works for Housing Areas", BS8301: 1985, IS EN752 (2008), IS EN12056: Part 2 (2000) and the recommendations of the 'Greater Dublin Strategic Drainage Study', (GDSDS), and Irish Water Code of Practice.

The following criteria have been applied:

- Pipe Friction (Ks) 1.5mm
- Minimum Velocity 0.75 m/s (self-cleansing velocity)
- Maximum Velocity 3.0 m/s
- Frequency Factor 0.5 for domestic use

The standard drainage details are outlined on drawings 5845-01 and are in accordance with the Greater Dublin Regional Code of Practice for Drainage Works.

All private drainage runs will be uPVC at a fall of 1:60 or 1:80 for 100mm pipework. All-access junctions, inspection chambers and gulley traps are uPVC.
All ground floor sink/showers will be piped separately to ground floor w.c pipes and routed through back inlet gulley traps (BIGT) prior to the external foul collection system.

4.0 Proposed Layout

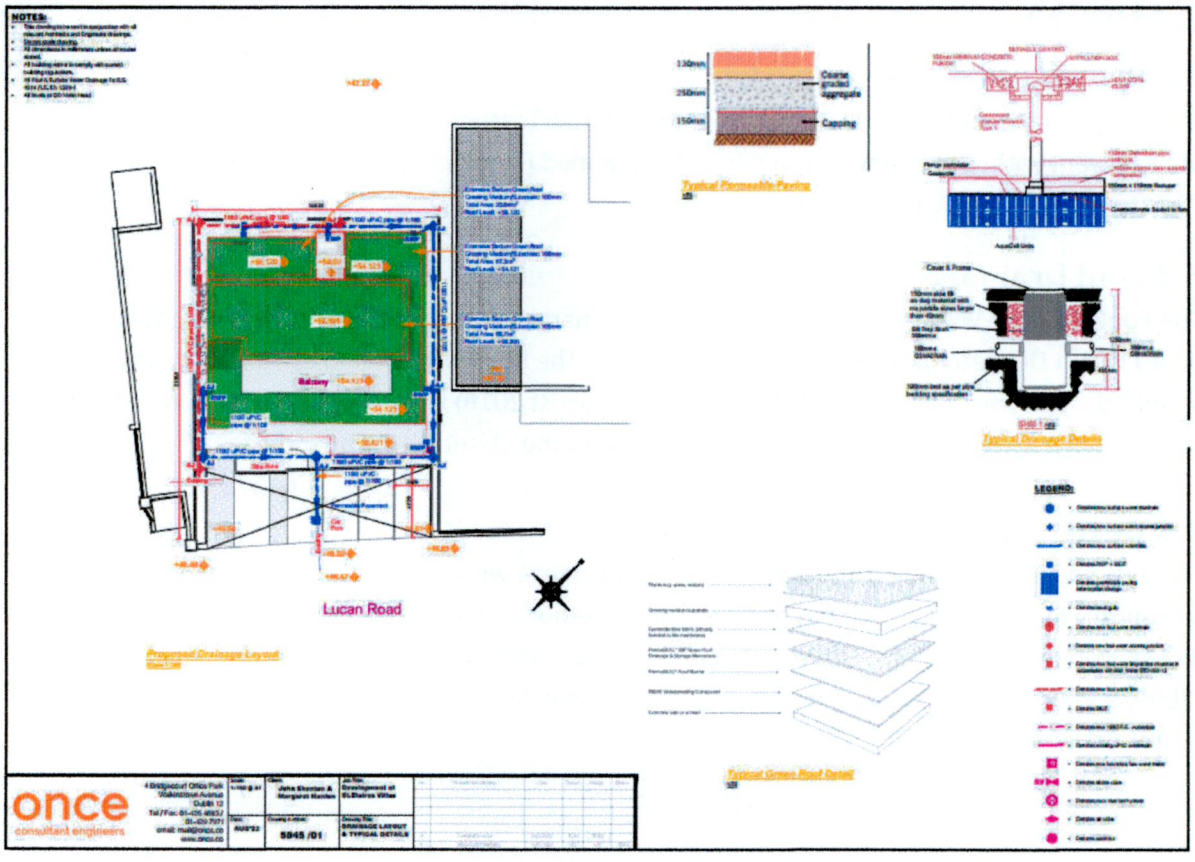


Figure 8, Proposed Layout (5840-01)

The proposed Drainage Layout was produced in a way to attenuate as much run-off as possible to relieve pressure on the existing pipe network. The proposed Green Roof has been designed to hold approx. 0.56m3 of Surface water runoff. This will account for and combat flash floods and climate change. In the case of an overflow, the green roof will be fitted with an overflow pipe to the existing network.

The Foul Pipe network flows from the proposed new building is to connect into the existing foul drainage on site before discharging into the existing public sewer network.

Thomas O Neill

for ONCE Consultant Engineers