

O'Reilly Design
Consulting Structural & Civil Engineers

162 Upper Road,
Carrickfergus, N. Ireland, BT38 8RW
Tel: +44-2890-853769; Mob: +44-797-9693590
E-mail: topni@sky.com
Web www.oreillydesign.co.uk

14th January 2022

Ref: - ORD/SDCoCo/2022/01

**Architects Dept.,
South Dublin County Council,
County Hall,
Tallaght, Dublin 24.**

Subject: "Planning Submission-Drainage Strategy for "Side & Rear Extensions at 657 Whitechurch Road, Rathfarnham, Dublin, D16".

Dear Sirs,

We are acting as consulting engineers in collaboration with Irvine Nash Architects, and have been requested to review the drainage strategy in tandem with the planning submission for the proposed 2-storey rear and side extensions (entailing approx. 55m² ground floor area) to the existing semi-detached house (the existing single-storey ground floor rear extension is to be removed) and internal ground/1st floor re-configuration of the existing property. The proposed development will essentially add 1 No. additional bedroom to the existing 3-bedroom property but more importantly add much needed modern family bathroom and toilet facilities; the age of the property is such that existing toilet facilities fall short of contemporary family requirements. All works on site will be undertaken and/or supervised by the Main Contractor to the requirements set down in the "Code of Practice for Development Works-Drainage". The existing drainage entails a combined foul and surface water system discharging to a 4" private drain running under the rear patio area, under the private driveway of No. 1 Odin Way and into the public 200mm diameter foul sewer located in Odins Way (obtained from Irish Water records). The existing surface water discharge from the existing front roof discharges to a rainwater downpipe located within the demise of adjoining property No. 656 Whitechurch Road; the existing rear elevation roof and hard paved areas discharges to the existing 4" foul drain. The aim is therefore to reduce the surface water discharge into the existing combined water sewer giving a "net reduction" in overall discharge compared to the existing configuration.

Surface Water Drainage

A *sustainable drainage* policy has been incorporated into the design. A SuDS analysis of the site was carried out using the online tools available on www.irishsuds.com. The SuDS analysis determined the following options as feasible for the proposed works.

- Permeable Paving
- Rainwater Harvesting
- Percolation
- Water Butts

The principal SuDS measures to be adopted on site are (i) the replacement of the existing rear hardstanding areas with SuDS compliant permeable paving (note that limiting site dimensions to BRE365 do not allow for the use of a soakaway)

Detail of Permeable Spacers Porous Paving Blocks



(ii) It is proposed that part of the new rear roof should be discharged to an external wall mounted 440litre rainwater harvesting tank which will supply the new ground floor toilet; the proposed system is the 440litre Super-Slim by Bayat Energy Ltd. (details attached) to be installed as per the schematic below:-

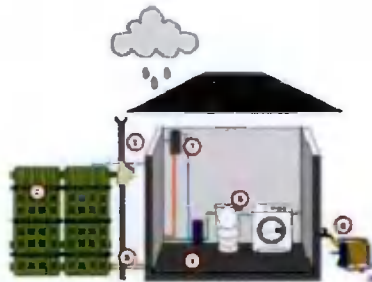


The Super Slim Wall Tank System is modular, easy to install and durable and is manufactured to the highest standards. This proven product incorporates the best features of above ground rainwater harvesting design and is ideal for supplying water for toilet flushing, laundry and micro irrigation. The system features;

- 440 litre Super Slim base tank system (only 19cm wide) with add on tanks in 220 litre increments
- Galvanised steel tank support frame
- Secure inter tank connection
- High performance Frogmouth filter diverter and optional Lazy Lizard finer second stage filter
- Electronically controlled pump that automatically delivers rainwater on demand to connected services
- Mains Top Up Valve
- Requires a single downpipe connection and power point

Simple – Reliable – Affordable

1. Filter diverter
2. Modular tanks
3. Tank outlet
4. On-demand pump
5. Connected services
6. Irrigation via rose gun
7. Top up valve



Foul Water Drainage

The existing foul system will be maintained in its current configuration as there will be no significant increase in foul water loading. The double-storey extension is primarily upgrading existing bathroom facilities to modern standards conversion entailing new ground floor toilet area with shower and new 1st floor ensuite bathroom. The new layout will substantially utilise existing connections and manholes discharging to the rear existing 4” diameter foul pipe located in the rear patio terrace/driveway area; this is turn discharges to the public 200mm diameter foul sewer located in Odins Way; the cctv drainage survey confirms this arrangement.

Foul Sewerage Design Calculations:-

The following calculations are in accordance with 'Sewers for Adoption' & BS 752-4.

From BS752-4, Domestic Flow Rate= 150-300 litres/ occupant/ day.
Therefore, average taken of Domestic Flow Rate = 225 l/p/d

Domestic Peak Design Flow Rate = 6 x Domestic Flow Rate

Number of Occupants in House = 6

Therefore:-

Domestic Flow Rate = $(225 \times 6) / (3600 \times 24) = 0.016 \text{ l/s}$

Domestic Design Flow Rate = $6 \times 0.016 = 0.10 \text{ l/s}$

Capacity of Existing 110mm dia. foul drain @ 1:60 (k=1.5) = **6.2 l/s > 0.10 O.K**

(Refer to Drawg No. S/ORD/461/D100 for drainage layout)

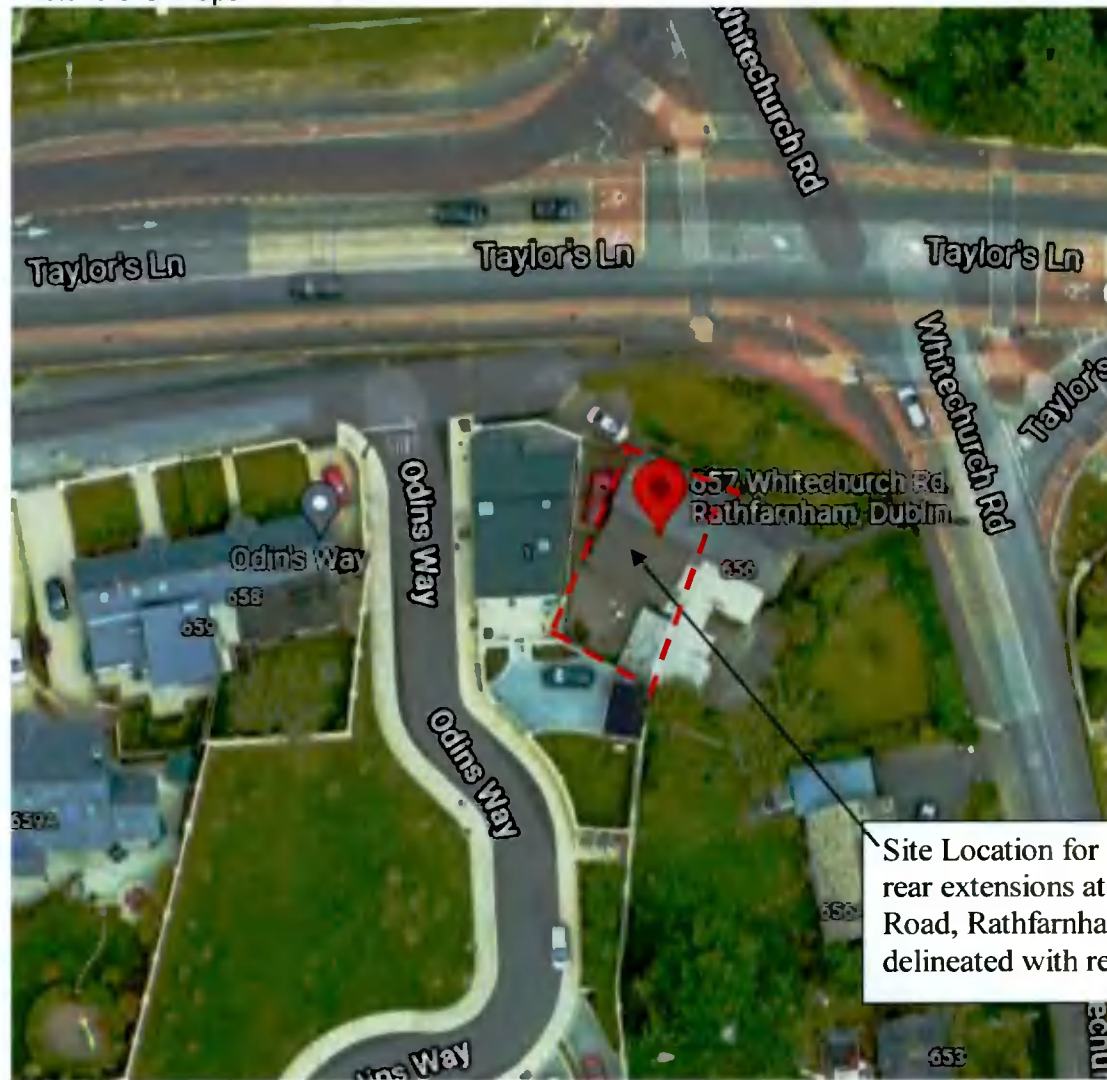
Capacities of Drains

Gradient 1 in...	110mm k = .06	110mm k = .60	110mm k = 1.5	160mm k = .06	160mm k = .06	160mm
©	Capacity in Litres/Second					
5	33.3	25.1	21.6	96.2	73.4	63.5
10	23.3	17.7	15.3	67.4	51.8	44.9
15	18.9	14.5	12.4	54.7	42.2	36.6
20	16.3	12.5	10.8	47.2	36.5	31.6
25	14.5	11.2	9.7	42.0	32.6	28.4
30	13.0	10.2	8.8	38.2	29.8	25.9
35	12.2	9.5	8.2	35.3	27.5	23.9
40	11.3	8.8	7.6	33.0	25.9	22.0
45	10.5	8.3	7.2	31.0	24.1	21.0
50	10.0	7.8	6.7	29.2	23.0	20.0
55	9.5	7.5	6.5	28.0	22.0	19.0
	9.2	7.2	6.2	26.7	21.0	18.0
65	8.6	6.8	5.8	25.4	20.1	17.5
	8.5	6.6	5.6	24.6	19.4	16.8
75	8.0	6.4	5.5	23.8	18.8	16.3
	7.8	6.2	5.3	23.0	18.0	15.7
85	7.5	6.0	5.2	22.2	17.5	15.1
	7.3	5.8	5.0	21.7	17.0	14.5
95	7.1	5.7	4.9	21.0	16.6	14.2
	6.9	5.5	4.8	20.5	16.2	14.0

Flood Risk Assessment

Reference Publications used

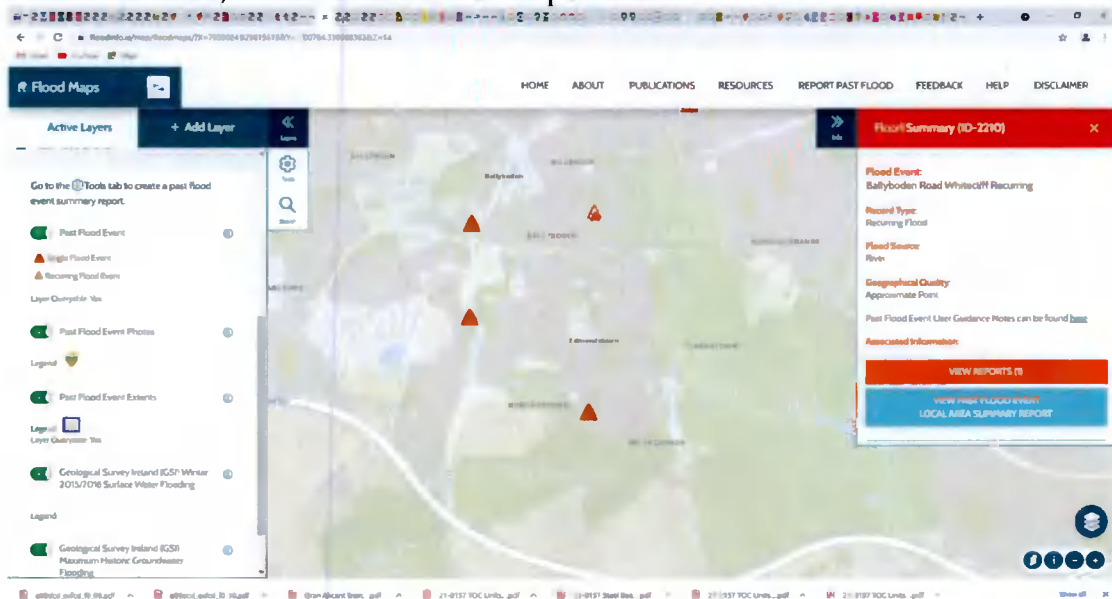
OPW Flood Records – www.floodmaps.ie
OPW Flood Records – www.myplan.ie
OPW Flood Studies update web portal – www.CFRAM.ie
Historic O.S. Maps



The purpose of the flood risk assessment is to both identify and quantify the potential of flooding of the property from all potential flood risks and/or the effect of the increased flood risk to neighbouring properties. The risk will be quantified on a numerical scale from 1 (Very Low) to 5 (Very High). The compilation of the following flood risk assessment is based on a desk study compiling information obtained from the Local Authority along with the Office of Public Works (OPW) flood maps and reports.

A “Flood Risk Assessment” of the site has been carried out utilising a “Screening Appraisal” based on the recommendations contained in “The Planning System and Flood Risk Management-Appendix “A” published by the OPW. The appraisal uses the principals of a “Flood Risk Balance Sheet” looking in particular at the following site specific factors: - **Flood Maps produced by the OPW:** - Records from irishfloodmaps.ie indicate that there has not been any significant flood events in the last 30 years.

The closest recorded localised flooding was recorded in November 1982 at Ballyboden Road-Whitecliff; see extract from 1982 Report below:-



6. Flooding to whitecliff and at Ballyboden Road

Major flooding occurred once more at Ballyboden Road and some less serious flooding as a consequence apparently upstream at No. 38 Whitecliff. You should arrange to construct a high level overflow from the system on Ballyboden Road into the Owendoher River which would function at times of heavy surcharge on the Ballyboden Road sewer. You should ensure of course that surcharging of the sewer could not occur from the river due to presence of this overflow.

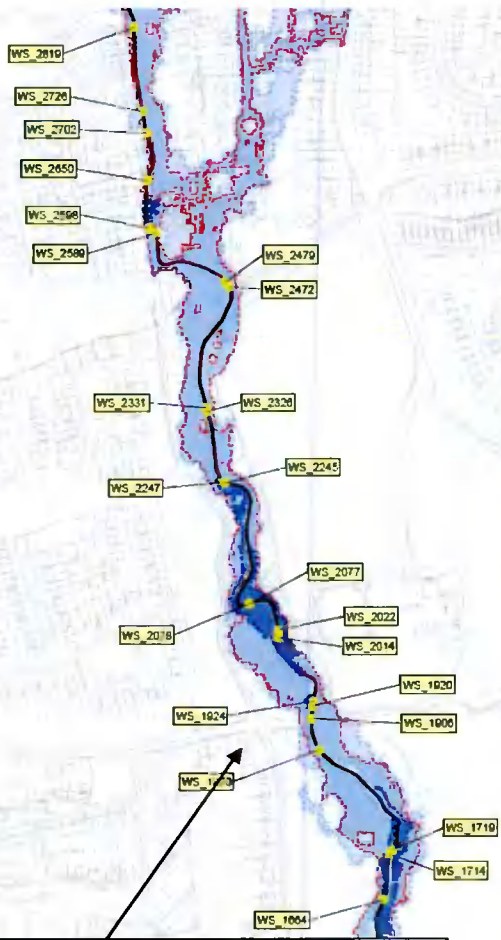
high level

Coastal Flooding:-

The site is located approximately 70.0m AOD and is located approximately 7.5km from the sea although the property is not impacted by coastal flooding...

Fluvial Flooding:-

Fluvial or river flooding occurs where the capacity of the conveying watercourse (river or stream) is exceeded as a result of heavy rainfall or blockage and water overflows the banks of the water course. The property does not fall within the zone of influence of the Dodder Catchment Flood Risk Zone...see CFRAMS extracts below:-



Node Label	Water Level (mOD) per AEP		
	WL 10%	WL 1%	WL 0.1%
OS-1950	81.68	81.94	82.25
OS-1960	74.25	74.66	74.73
OS-1972	74.13	74.52	74.60
OS-1976	70.77	71.21	71.61
OS-1977	70.61	71.10	71.52
OS-1997	68.97	69.26	69.60
OS-1909	68.82	69.10	69.32
OS-1983	68.06	68.36	68.68
OS-1887	67.98	68.28	68.50
OS-2013	66.32	66.63	66.92
OS-2044	66.19	66.50	66.80
OS-2116	66.15	66.46	66.69
OS-2138	64.97	65.28	65.67
OS-2272	69.47	69.79	70.16
OS-2280	69.33	69.62	70.03
OS-2290	68.24	68.57	68.96
OS-2535	66.43	66.76	67.14
OS-2543	66.37	66.68	67.05
OS-2610	66.67	66.94	67.50
OS-2678	64.93	65.33	65.84
OS-2682	64.90	65.30	65.80
OS-2721	64.69	65.09	65.67
OS-2730	64.64	65.03	65.53
OS-2768	64.36	64.73	65.21
OS-2772	64.33	64.71	65.18
WS-1664	76.79	76.73	76.88
WS-1714	75.95	75.69	76.02
WS-1719	75.68	75.62	75.94
WS-1870	73.35	73.32	73.84
WS-1906	72.78	72.73	73.21
WS-1920	72.66	72.62	73.12
WS-1924	72.57	72.54	72.87
WS-2014	71.96	71.92	72.06
WS-2022	68.56	68.39	68.80
WS-2077	68.38	68.18	68.64
WS-2078	68.38	68.17	68.62
WS-2245	66.81	66.63	67.04
WS-2247	66.79	66.61	67.02
WS-2328	65.63	65.46	65.92
WS-2331	65.47	65.31	65.76
WS-2472	63.38	63.20	64.03
WS-2478	63.27	63.14	63.96
WS-2583	61.93	61.70	62.00
WS-2588	61.09	61.20	61.43
WS-2650	60.36	60.37	60.70
WS-2702	59.83	59.84	60.28
WS-2728	59.34	59.36	59.81
WS-2819	58.57	58.59	59.19
WS-2870	57.82	57.83	57.82

Legend:

- 10% AEP Flood Extent (1 in 10 chance in any given year)
- 1% AEP Flood Extent (1 in 100 chance in any given year)
- 0.1% AEP Flood Extent (1 in 1000 chance in any given year)
- Deflooded Area
- High Confidence (+20m) (10% AEP)
- Medium Confidence (+40m) (10% AEP)
- Low Confidence (+40m) (10% and 0.1% AEP)
- High Confidence (+20m) (1% AEP)
- Medium Confidence (+40m) (1% AEP)
- Low Confidence (+40m) (1% AEP)
- River Centreline
- Node Point
- Node Label (refer to table)
- Flow reporting location
- 10% Flow = 128 (10% Flow = 128)
- 1% Flow = 110 (1% Flow = 110)
- 0.1% Flow = 100 (0.1% Flow = 100)
- Peak flow during design flood extent

USER NOTE
 USERS OF THESE MAPS SHOULD REFER TO THE DETAILED DESCRIPTION OF THEIR DERIVATION, LIMITATIONS IN ACCURACY AND GUIDANCE AND CONDITIONS OF USE PROVIDED AT THE FRONT OF THIS BOUND VOLUME. IF THIS MAP DOES NOT FORM PART OF BOUND VOLUME, IT SHOULD NOT BE USED FOR ANY PURPOSE.



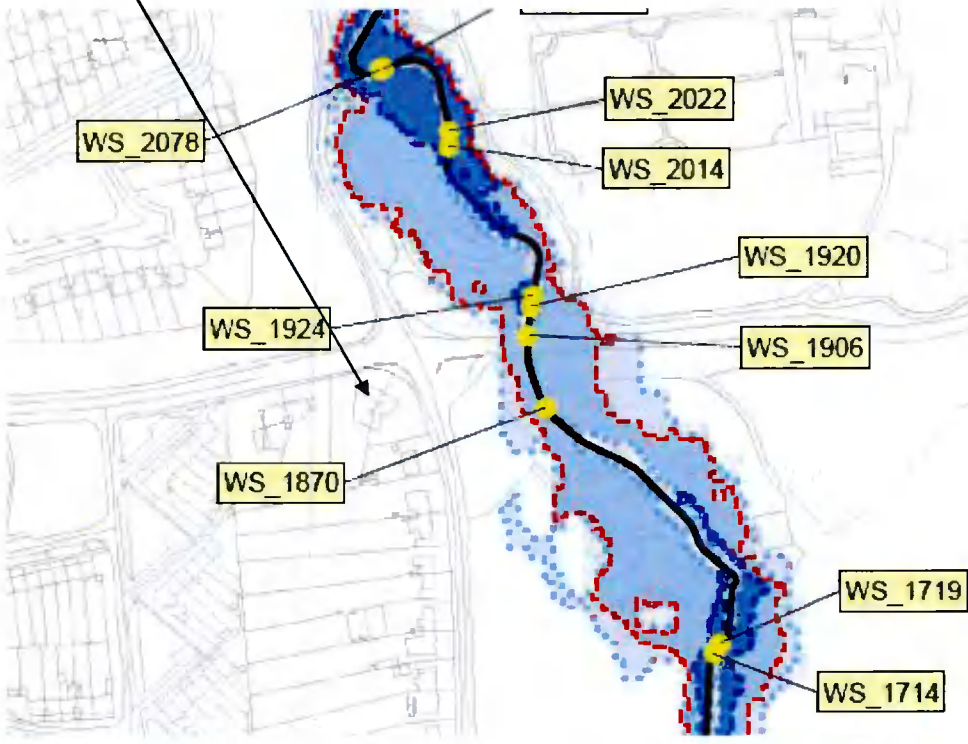
Project
 DODDER CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT STUDY

Map
 PRESENT DAY OWENDOHER & WHITECHURCH

Map Type: FLOOD EXTENT
Source: FLUVIAL FLOODING
Map Area: URBAN AREA
Scenario: CURRENT
 Drawn By: A.A.B Date: 28 November 2010
 Checked By: A.J Date: 29 November 2010
 Approved By: A.G.B Date: 29 November 2010

Figure No: OSWS EXT/UA/CURS 103
Map Series: Page 2 of 8
Drawing Scale: 1:6,000 **Plot Scale:** 1:1 @ A3

Site Location 657 Whitechurch Road, Rathfarnham.



Pluvial Flooding:-

Pluvial or over ground flooding occurs as a result of water flowing over the surface of the ground which can occur where the infiltration of the receiving ground is exceeded. The proposed extension is located within the rear-side patio area of an existing property. The proposed SuDS measures will include the introduction of new soft garden area to the rear, the introduction of permeable paving in the new rear patio terrace area and side passage area replacing existing shed/hard paving areas. These measures will give a net reduction in run-off from the site into the existing foul water sewer network and mitigate against the consequences of other pluvial floods in the area.

If you require any clarification on any matter please do not hesitate to contact us.

Yours Faithfully

Sean O'Reilly

Sean O'Reilly
Eur Ing, C.Eng, B.Sc.(Hons), MIED, MIEI, ICIOB
O'Reilly Design Ltd.

Attachments:-

- (i) Irish Water-Existing Drainage Records
- (ii) Urban Rainwater Harvesting-SuperSlim Tank data

Historical Flood Data (www.floodmaps.ie)



COMHAIRLE CHONTAE ATHA CLIATH
(DUBLIN COUNTY COUNCIL)

Your Ref.
Our Ref. **WJC/SE**

P.O. BOX NO. 174,
46/49 (N) O'CONNELL STREET,
DUBLIN 1.
TELEPHONE **727777**

13th January 1983.

I enclose herewith copies of the official report on flooding dated 26th November, 1982. I also enclose copies of various letters written by re design of schemes, to re flooding with Road's responsibility and to re flooding with Parks responsibility.

In particular I wish to draw your attention to letter addressed to me dated 29th November, 1982 mentioning specific schemes for which follow up action is required.

I would be obliged if you could arrange to have these matters attended to as soon as possible.

Senior Engineer,
Drainage Operations.

unsatisfactory hydraulic conditions applying in some manholes. Please examine this situation to determine if the position could be improved in any way.

4. Bracken Brae Sandyford

This is also an area where we had substantial previous flooding. It is clearly necessary to disconnect surface water connections in Sandyford village and from the cottages on Black Glen Road. Please examine and prepare a scheme for this work, you may require to liaise with _____ in this respect.

5. Beaufield Park Stillorgan

I am requesting _____ to design a surface water scheme for this area. Hopefully we will be able to include it as a small scheme in our 1983 programme.

6. Flooding to Whitecliff and at Ballyboden Road

Major flooding occurred once more at Ballyboden Road and some less serious flooding as a consequence apparently upstream at No. 38 Whitecliff. You should arrange to construct a high level overflow from the system on Ballyboden Road into the Owendoher River which would function at times of heavy surcharge on the Ballyboden Road sewer. You should ensure of course that surcharging of the sewer could not occur from the river due to presence of this overflow.
in. of sewer

7. Flooding at Brighton-Torquay Road junction and downstream on Westminster Road at junctions with Plunkett Avenue and Esinault Road

Very unsatisfactory manholes operate in this area where a mixture of foul and surface water sewers occur at flood times. Please arrange to have an examination carried out on these sewers with a view to improving this situation. You should also liaise with _____ in relation to his design of a Torquay Road surface water system.
Meeting to be held on 11/10/82 at 10.00 am in the office

8. Flooding at Torquay Road

The major flooding in this area occurred due to the absence of a satisfactory surface water outlet system. The position however was appreciably worsened by the apparent action of _____ Developer, in filling in a surface water ditch downstream. You may require to pursue this matter with Building Control following

Irish Water Drainage Records

