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Engineering Services Report

Proposed Residential Development

Tinakilly, Rathnew, Co. Wicklow

Client: Keldrum Limited

Job No. A034

August 2022

CS CONSULTING GROUP

ENGINEERING SERVICES REPORT

PROPOSED RESIDENTIAL DEVELOPMENT, TINAKILLY, RATHNEW, CO. WICKLOW

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BS 1192 FIELD	**A034-CSC-ZZ-XX-RP-C-0001-P4**

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A034	LJ	GF	OS	09.08.2023	P4
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1.0 INTRODUCTION

Cronin & Sutton Consulting Engineers (CS Consulting) have been commissioned by Keldrum Limited to prepare an Engineering Services Report for a proposed 352-unit Large-scale Residential Development (LRD) at Tinakilly, Rathnew, Co. Wicklow.

This report assesses the proposed development under the following headings:

- Stormwater Drainage Infrastructure
- Foul Drainage Infrastructure
- Potable Water Infrastructure

In preparing this report, CS Consulting has referred to the following:

- Wicklow County Development Plan 2022-2028
- Wicklow Town – Rathnew Development Plan 2013-2019
- Regional Code of Practice for Development Works, Version 6
- Greater Dublin Regional Code of Practice for Drainage Works
- British Standard BS EN 752:2008 (Drains and Sewer Systems Outside Buildings)
- Part H of the Building Regulations (Building Drainage)
- Irish Water Code of Practice for Water Infrastructure
- Irish Water Code of Practice for Wastewater Infrastructure
- Greater Dublin Strategic Drainage Study

This report should be read in conjunction with all other engineering drawings and documents submitted by CS Consulting as part of this planning submission, as well as relevant other documentation submitted by the other members of the project design team.

2.0 SITE LOCATION AND PROPOSED DEVELOPMENT

2.1 Site Location

The site of the proposed development is located at Tinakilly, Rathnew, Co. Wicklow, in the operational area of Wicklow County Council. The area enclosed by the planning application boundary extends to approximately 16.8ha.

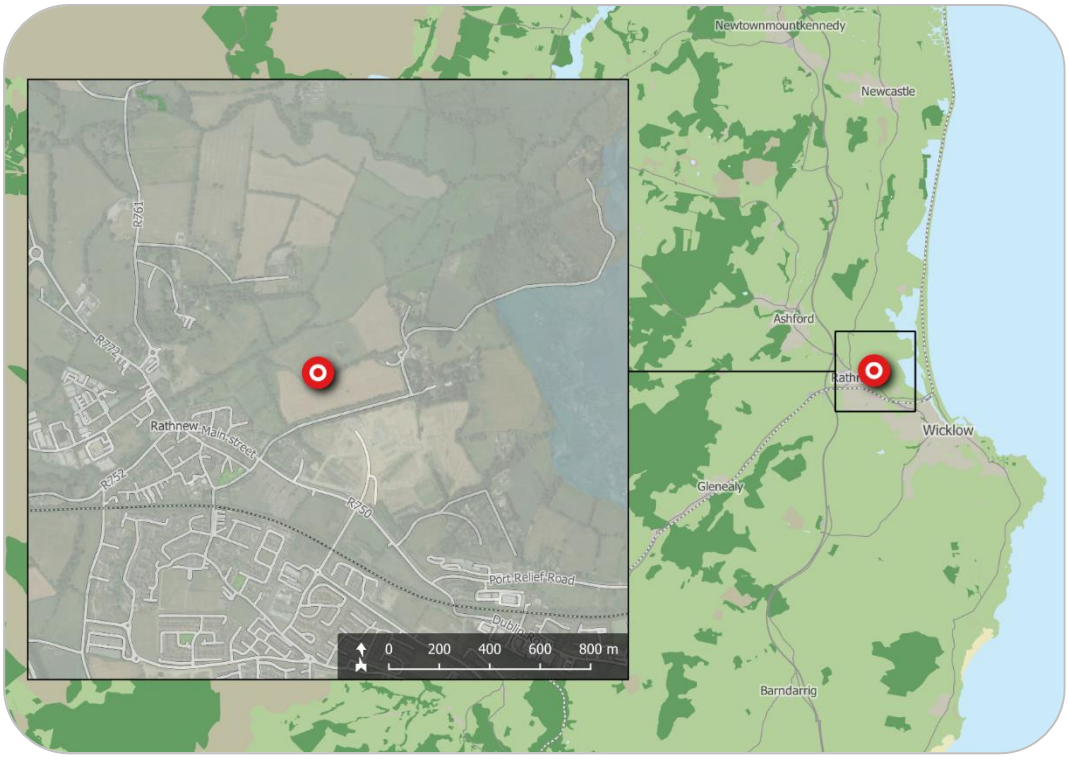

Figure 1 – Location of proposed development site
(*map data and imagery: EPA, NTA, OSM Contributors, Google*)

The location of the proposed development site is shown in **Figure 1** above; the indicative extents of the development site and the area subject to this application, as well as relevant elements of the surrounding road network, are shown in more detail in **Figure 2**.

Figure 2 – Site extents and environs
(*map data and imagery: NTA, OSM Contributors, Google*)

The development is bounded to the south by Tinakilly Avenue, to the east by the grounds of the Tinakilly Country House hotel, and on all other sides by agricultural lands.

2.2 Existing Land Use

The subject site is greenfield.

2.3 Description of Proposed Development

Briefly described, the proposed development will consist of the following:

I. Construction of 352 no. residential units comprising 220 no. 2-4 bedroom houses and 132 no. 1-3 bedroom apartments.

II. Provision of private, communal and public open space. Provision of a new park to the north and west of the site (c.4.34ha).

III. All internal residential access roads and cyclist/pedestrian paths serving the proposed development.

IV. Provision of car and bicycle parking.

V. Proposed pedestrian connections and landscape revisions to a section of Tinakilly Avenue included in permitted application WCC Ref. 22/837.

VI. All vehicular and pedestrian connections between Tinakilly Park and Rathnew Village via a new section of the Rathnew Inner Relief Road.

VII. All associated site development works, services provision, infrastructural and drainage works, provision of ESB substations, bin stores, bicycle stores, car parking, public lighting, landscaping, open space, and boundary treatment works.

VIII. No further changes to development permitted under WCC Refs. 17/219 (ABP Ref. PL27.301261), 20/1000, 21/411, 22/837, or 21/1333.

The proposed development includes the completion of the Rathnew Inner Relief Road (RIRR), connecting the R750 and R761 regional roads, and the provision of 3no. new junctions on this road. It is also proposed under this application to restrict vehicular access along Tinakilly Avenue between the R750 and the RIRR, with vehicular access to the Tinakilly Country House hotel instead provided from the RIRR.

3.0 STORMWATER DRAINAGE

3.1 Existing Stormwater Drainage

The development site topography is generally characterised by a consistent fall to the north and to the west. All stormwater runoff from the main body of the site currently drains to the following 2no. existing watercourses that run along the northern boundary and the western boundary of the proposed development site (see **Figure 3**):

- The Rathnew Stream, which forms the northern boundary of the development site proper.
- The Rossana Lower stream, which forms the western boundary of the development site.

3.2 Proposed Stormwater Drainage Arrangements

The proposed development comprises five principal catchments for the collection and disposal of stormwater runoff from impermeable areas:

- Catchment A of 5.93ha, representing the majority of the site to the east of the proposed Rathnew Inner Relief Road.
- Catchment B of 3.16ha, including the southernmost section of the Rathnew Inner Relief Road proposed under this application, as well as areas to the west and east of this.
- Catchment C of 1.30ha, comprising the north-east corner of the development site.
- Catchment D of 0.44ha, representing the central section of the Rathnew Inner Relief Road proposed under this application.
- Catchment E of 0.62ha, representing the northern section of the Rathnew Inner Relief Road proposed under this application.

Areas outside these defined catchments shall not be significantly developed and shall maintain their current natural drainage patterns.

Refer to the following CS Consulting drawings for full details of the development's proposed stormwater drainage arrangements:

- **A034-CSC-ZZ-XX-DR-C-0005 / 0006** (Drainage Layout)
- **A034-CSC-ZZ-XX-DR-C-0036** (Catchment Surface Water)
- **A034-CSC-ZZ-XX-DR-C-0037 / 0038** (SuDS Layout)

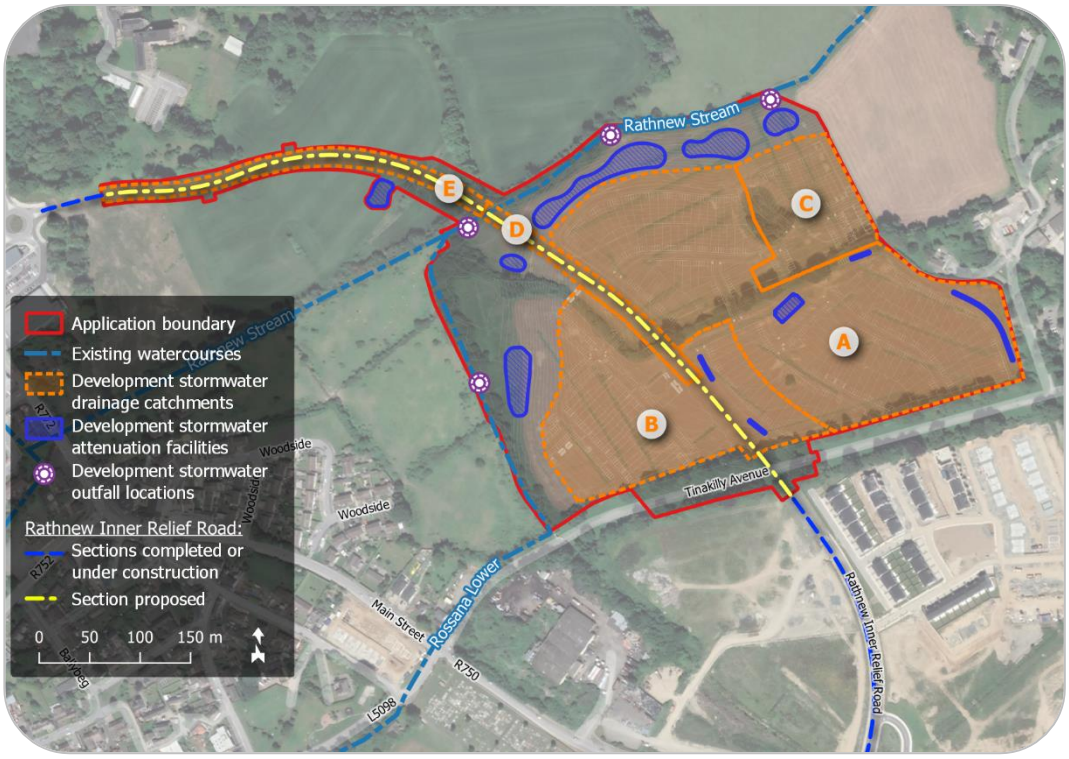

Figure 3 – Proposed stormwater drainage arrangements
(*map data and imagery: EPA, OSM Contributors, Google*)

The GDSDS and the Regional Code of Practice for Drainage Works require that a development's stormwater drainage arrangements satisfy four main criteria:

- Criterion 1: River Water Quality Protection – satisfied by providing interception storage and treatment of run-off within SuDS features, e.g. wetlands or bio-retention areas.

- Criterion 2: River Regime Protection - satisfied by attenuating run-off from the site.
- Criterion 3: Level of Service (flooding) for the site – satisfied by the site being outside the 1000-year coastal and fluvial flood extent areas. Pluvial flood risk addressed by development designed to accommodate a 100-year extreme storm as noted in GDSDS. Planned flood routing for storms greater that 100-year level considered in design and development run-off contained on site.
- Criterion 4: River Flood Protection – attenuation and/or long-term storage provided within the SuDS features.

In accordance with the requirements of Wicklow County Council, the proposed development shall incorporate Sustainable Drainage Systems (SuDS) features. These serve a dual purpose in managing stormwater within new developments.

3.2.1 Stormwater discharge attenuation

The primary role of SuDS features is to restrict post development stormwater run-off to greenfield discharge rates. The development is to retain storm water volumes predicted to be experienced during extreme rainfall events. This is defined as the volume of storm water generated during a 1-in-100-year storm event, increased by 20% to account for the predicted effects of climate change.

3.2.2 Initial treatment of stormwater runoff

The second function of SuDS features is to permit stormwater quality to be improved before disposal and, where applicable, to allow stormwater to infiltrate into the ground on site rather than discharging to the public drainage system or to watercourses.

Stormwater runoff from the proposed development's five defined catchment areas shall drain to internal swales and stormwater detention

basins. These SuDS features allow some direct infiltration of stormwater, and also provide attenuation storage to cater for extreme rainfall events. All stormwater from the development's drainage network shall discharge to the existing Rathnew Stream and Rossana Lower stream, at the development site's northern and western boundaries, respectively. Flow control devices shall restrict the discharge rate to the greenfield runoff rates established for each catchment.

The proposed new stormwater drainage infrastructure has been designed and will be constructed in accordance with:

i) The Greater Dublin Strategic Drainage Study (GDSDS), Volume 2
ii) The Greater Dublin Regional Code of Practice for Drainage Works
iii) British Standard BS EN 752:2008 (Drains and Sewer Systems Outside Buildings)
iv) Part H of the Building Regulations (Building Drainage)

3.3 Proposed Sustainable Drainage System (SuDS) Measures

Wicklow County Council requires that all developments adhere to their policy of implementing Sustainable Drainage Systems (SuDS). SuDS not only entail restricting stormwater discharge during extreme storm events but also improving the overall quality of the discharged stormwater, and reusing water on site where feasible. The features proposed shall reduce run-off volumes and pollution concentrations and enhance groundwater recharge and biodiversity.

The proposed SuDS features within the subject development shall consist of:

a) Low water usage sanitary appliances to reduce the volume of potable water required for use within buildings

b) Installation of online water butts to capture rainwater from roof areas and to store this for local use, landscaping and maintenance purposes, further reducing reliance on the potable water network.

c) Permeable paving for car-parking bays to allow rainwater to dissipate into the ground, mimicking the current natural arrangement.

d) Swales to capture the rainwater from the internal network and permit infiltration.

e) Attenuation tank with permeability to allow for infiltration.

f) Holding the majority of stormwater collected during extreme storm events in suitably designed detention basins and wetlands, which also allow for infiltration.

3.4 Attenuation Storage

The restriction of post development run-off to greenfield discharge rates is to be achieved primarily through the provision of onsite attenuation storage, which shall retain excess runoff during extreme rainfall events and allow this to be discharged at a controlled rate.

In order to comply with Wicklow County Council's requirements, the subject site must retain stormwater generated on site during a 1-in-100-year storm event (increased by 20% for predicted climate change effects) and limit stormwater discharge from the site to the greenfield discharge rate.

Surface water drainage from the development will be designed in accordance with the requirements of Wicklow County Council.

The greenfield runoff rate at the development site has been established as 6.56 l/s/ha. A total attenuation storage volume of 3,369m^3 is required for the development site, and a total attenuation storage volume of 3,453m^3 is provided. Refer to the stormwater attenuation calculations attached as **Appendix A**.

The development comprises 5no. catchment areas for stormwater collection and disposal. These are shown on CS Consulting drawing **A034-CSC-ZZ-XX-DR-C-0036** and are described below.

3.4.1 Catchment A

Catchment A has an area of 5.93ha. The greenfield runoff rate has been established as 38.9 l/s and the attenuation storage requirement is 1,708m³. Total attenuation storage of 1,708m³ (1,328m³ + 380m³) is provided for this catchment. Stormwater from this catchment shall discharge to the Rathnew Stream via a flow restrictor device, at a maximum rate of 38.9 l/s.

3.4.2 Catchment B

Catchment B has an area of 3.16ha. The greenfield runoff rate has been established as 20.7 l/s and the attenuation storage requirement is 972m³. Total attenuation storage of 975m³ is provided for this catchment. Stormwater from this catchment shall discharge to the Rossana Lower stream via a flow restrictor device, at a maximum rate of 20.7 l/s.

3.4.3 Catchment C

Catchment C has an area of 1.30ha. The greenfield runoff rate has been established as 8.5 l/s and the attenuation storage requirement is 300m³. Attenuation storage of 310m³ (210m³ + 100m³) is provided for this catchment. Stormwater from this catchment shall discharge to the Rathnew Stream via a flow restrictor device, at a maximum rate of 8.5 l/s.

3.4.4 Catchment D

Catchment D has an area of 0.44ha. The greenfield runoff rate has been established as 2.9 l/s and the attenuation storage requirement is 160m³. Attenuation storage of 160m³ is provided for this catchment.

Stormwater from this catchment shall discharge to the Rathnew Stream via a flow restrictor device, at a maximum rate of 2.9 l/s.

3.4.5 Catchment E

Catchment E has an area of 0.62ha. The greenfield runoff rate has been established as 4.0 l/s and the attenuation storage requirement is 229m^3. Attenuation storage of 300m^3 is provided for this catchment. Stormwater from this catchment shall discharge to the Rathnew Stream via a flow restrictor device, at a maximum rate of 4.0 l/s.

4.0 FOUL DRAINAGE

4.1 Existing Foul Arrangements

No existing public foul drainage infrastructure is present within or adjacent to the development site. As part of the adjacent development to the south (permitted under WCC reg. ref. 17/219 / ABP ref. 30126118), a new 225mm diameter foul sewer is however under construction within the permitted southern section of the Rathnew Inner Relief Road. This shall commence in proximity to the development site's southern boundary and shall outfall to the foul drain at the junction of the new Relief Road and the R750.

All effluent generated in Rathnew is conveyed to the Regional Wastewater Treatment Plant (Wicklow Wastewater Treatment Plant - EPA Licence Number D0012-01). This currently has a reserve organic capacity of approx. 15,000 PE (population equivalent).

4.2 Foul Effluent Generation

The proposed development shall consist of 352no. residential units. The Irish Water *Code of Practice for Wastewater Infrastructure* specifies an average foul effluent flow rate of 165 litres per person per day for domestic dwellings (150 litres per person per day, plus a 10% allowance for external infiltration) and an average occupancy of 2.7 persons per residential unit. The development's applicable design population is therefore 950 people (950pe), and the maximum average effluent flow (dry weather flow or DWF) to be generated by the proposed development may be calculated as:

$$DWF = 950pe \times 165l/day/pe = 156{,}750l/day = 1.814l/s$$

The peak effluent flow (Design Flow) is calculated by applying a domestic peak factor (Pf_{DOM}) of 4.5 (applicable to developments with a population between 751 and 1,000):

$$Design\ Flow = DWF \times Pf_{DOM} = 1.814l/s \times 4.5 = 8.163l/s$$

4.3 Proposed Foul Drainage Arrangements

The proposed development will require a new separate foul drainage network to collect and convey foul effluent. The drainage network for the proposed development has been designed in accordance with:

- EN BS 752:2008 Drain & Sewer Systems Outside Buildings
- the Irish Water Code of Practice for Wastewater Infrastructure

Given the topography of the site, the development's gravity foul drainage network shall comprise two distinct parts:

- a northern section, which shall fall to the south and outfall into a new foul pumping station located at the site's southern boundary; and
- a southern section, which shall fall to the south and outfall into a foul manhole located at the site's southern boundary in the Rathnew Inner Relief Road (RIRR).

The proposed pumping station shall pump the collected foul effluent via 80mm and 150mm diameter rising mains to an approved standoff manhole in the new section of the RIRR to be built as part of this development, close to the development's southern boundary. From this point, the effluent shall discharge to a 225mm diameter foul sewer to be laid in this new section of the relief road; this in turn shall connect to the new 225mm diameter foul sewer currently under construction within the southernmost section of the RIRR (permitted under WCC reg. ref. 17/219 / ABP ref. 30126118).

The proposed pumping station will be located within a secure compound, with 2.4m high paladin fencing and a 5m wide access gate. The pump

chamber will contain duty and assist pump sets and 24-hour storage will be provided in the form of a concrete tank with a high level overflow and low level return. The control panel will be fitted with a high level alarm and text/web alert system to ensure prompt response in the event of an emergency.

Refer to CS Consulting drawings **A034-CSC-ZZ-XX-DR-C-0005** and **A034-CSC-ZZ-XX-DR-C-0006** for full details of the development's proposed foul drainage arrangements.

4.4 Irish Water Liaison

A Confirmation of Feasibility (CoF) has been issued by Irish Water in respect of the proposed development's potable water supply and foul drainage arrangements. As part of the LRD application process, CS Consulting subsequently issued the proposed drainage arrangement and proposed watermain layout to Irish Water for approval, following which Irish Water issued a Statement of Design Acceptance (SoDA). Copies of the CoF and SoDA documents are attached as **Appendix B** to this report.

5.0 POTABLE WATER

5.1 Existing Water Supply Infrastructure

An existing 315mm diameter public watermain is located along the northern side of the R750, approx. 300m to the south of the development site. As part of the adjacent development to the south (permitted under WCC reg. ref. 17/219 / ABP ref. 30126118), new watermains connecting to this are under construction within the permitted southern section of the Rathnew Inner Relief Road (RIRR):

- a 225mm diameter watermain along the eastern side of the RIRR.
- a 160mm diameter watermain along the western side of the RIRR.

An existing 2" (51mm approx.) diameter watermain is also in place in Tinakilly Avenue, running along the development site's southern boundary.

4.3 Potable Water Demand

The proposed development shall consist of 352no. residential units. The Irish Water *Code of Practice for Water Infrastructure* specifies an average potable water demand of 150 litres per person per day for domestic dwellings, and an average occupancy of 2.7 persons per residential unit. The development's applicable design population is therefore 950 people (950pe), and the average potable water demand of the proposed development may be calculated as:

$$Avg.Demand = 950pe \times 150l/day/pe = 142{,}500l/day = 1.649l/s$$

The peak potable water demand is calculated by applying a domestic peak factor (Pf_{DOM}) of 5, in accordance with the Irish Water *Code of Practice for Water Infrastructure*:

$$Peak\ Demand = Avg.Demand \times Pf_{DOM} = 1.649l/s \times 5 = 8.245l/s$$

5.2 Proposed Water Supply Arrangements

It is proposed to continue the 225mm diameter and 160mm diameter watermains along the eastern and western sides of the RIRR, which are currently under construction (as permitted under WCC reg. ref. 17/219 / ABP ref. 30126118), and to supply the proposed development with potable water via new 150mm diameter and 100mm diameter connections to these.

The development's proposed water supply network has been designed in accordance with the specifications and requirements of Irish Water, as well as with the Department of the Environment's 'Recommendation for Site Development Works' and the requirements of Wicklow County Council. In particular:

- Hydrants are positioned within 46m of all parts of the dwelling units.
- Air valves are located at the high points of loops.
- Scour valves are located at the low point of loops.
- The proposed residential 100mm watermains have been designed as ring mains.
- Each residential building has an individual service connection, with a water meter located within the footpath.
- Bulk water meters are provided at the development's 2no. proposed connections to the public watermains along the eastern and western sides of the RIRR.

The proposed watermain infrastructure and routing plan is shown on CS Consulting drawing **A034-CSC-ZZ-XX-DR-C-0004**, included with this submission.

5.3 Irish Water Liaison

A Confirmation of Feasibility (CoF) has been issued by Irish Water in respect of the proposed development's potable water supply and foul drainage arrangements. As part of the LRD application process, CS Consulting subsequently issued the proposed drainage arrangement and proposed watermain layout to Irish Water for approval, following which Irish Water issued a Statement of Design Acceptance (SoDA). Copies of the CoF and SoDA documents are attached as **Appendix B** to this report.

6.0 DEVELOPMENT INFRASTRUCTURE PHASING

It is proposed to proceed with construction of the development's road, water supply, and drainage infrastructure in accordance with the following phasing sequence (see **Figure 4**):

- Phase R1 – south-east section of Rathnew Inner Relief Road within application boundary.
- Phase R2 – final north-western section of Rathnew Inner Relief Road within application boundary.
- Phase 1 – Infrastructure to serve 217no. residential units.
- Phase 2 – Infrastructure to serve 76no. residential units.
- Phase 3 – Infrastructure to serve 59no. residential units.

Figure 4 – Proposed infrastructure phasing sequence
(*background map imagery: Google*)

Refer to CS Consulting drawing **A034-CSC-ZZ-XX-DR-C-0046** for a more detailed illustration of the proposed infrastructure phasing areas.

Phase R1 shall be constructed as part of the development's initial enabling works, prior to the construction of any residential units. Phases 1 to 3 shall commence in numerical order, each in advance of the residential units to be constructed in that area, and may overlap. Phase R2 represents final completion of the Rathnew Inner Relief Road (RIRR); this phase shall be timed such that the RIRR is fully operational prior to the occupation of the 107th residential unit within the subject development.

6.1 Phase R1

Phase R1 comprises construction of the Rathnew Inner Relief Road along a distance of 380m, from the southern boundary of the application site. This includes:

- Closure of Tinakilly Avenue and construction of the new access junction to serve the Tinakilly House hotel.
- Construction of the 2no. access junctions to serve the subject development.
- Pedestrian footpaths and cycle tracks along this section of the RIRR.
- 225mm and 160mm watermains along either side of the RIRR.
- Principal stormwater sewers, foul sewers, and foul rising main to serve the subject development.
- Stormwater drainage and attenuation facilities to accommodate runoff from this section of the RIRR.

6.2 Phase 1

Phase 1 comprises the construction of infrastructure to serve 217no. residential units (137no. houses, 16no. duplex units, and 64no. apartments). This includes:

- Internal roads, footpaths, and car parking.
- Construction of the development's foul pumping station and foul rising main to connect to that in the RIRR.
- Internal watermains, stormwater sewers, and foul sewers to serve all residential units in this area.
- Stormwater drainage and attenuation facilities to accommodate all runoff from this area.

6.3 Phase 2

Phase 2 comprises the construction of infrastructure to serve 76no. residential units (24no. houses, 12no. duplex units, 32no. apartments, and 8no. maisonettes). This includes:

- Internal roads, footpaths, and car parking.
- Internal watermains, stormwater sewers, and foul sewers to serve all residential units in this area.
- Stormwater drainage and attenuation facilities to accommodate runoff from this area that is not already catered for by Phase 1 infrastructure.

6.4 Phase 3

Phase 3 comprises the provision of connections for 59no. houses to the infrastructure already constructed under Phase 1.

6.5 Phase R2

Phase R2 comprises construction of the final 430m section of the Rathnew Inner Relief Road, completing the link between the Phase R1 section and the section constructed under reg. ref. 21/1333, to the north-west. This includes:

- Pedestrian footpaths and cycle tracks along this section of the RIRR.
- Stormwater drainage and attenuation facilities to accommodate runoff from this section of the RIRR.

RECEIVED: 14/08/2023

Appendix A

Stormwater Attenuation Calculations

Project: PROPOSED RESIDENTIAL DEVELOPMENT
Project No.: A034 (CATCHMENT A - REFER TO DRAWINGS FOR CATCHMENT EXTENTS)
Calculation: Attenuation 100-year - Total Site
Calcs By: JF
Checked By: RFM
Date: 14.07.2022

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Site Location:	TINAKILLY		
Design Storm Return Period:	100 years		
Climate Change Factor:	20 %		
Soil Type:	2		
Total Site Area:	5.930 ha	REFER TO DRAWINGS FOR AREAS BREAKDOWN	
Hardstanding	3.950 ha	.....@	80% Impervious
Softstanding	1.980 ha	.....@	20% Impervious
	ha	.....@	0% Impervious
	ha	.....@	0% Impervious
Effective Impermeable Area:	3.556 ha		

Allowable Outflow	**Calculate**	0.144	
IH124: QBAR = 0.00108 x AREA$^{0.89}$ x SAAR$^{1.17}$ x SOIL$^{2.17}$			
AREA:	0.0593 km^2		
SAAR:	986 mm		
SOIL:	0.45		
QBAR/ha	6.56 l/s/ha		
Allowable Outflow	**38.9 l/s**	Minimum Allowable Discharge = 2l/s/ha	

Storage required =	**1708 m^3**	STORAGE ESTIMATE ONLY - REFER TO MICRODRAINAGE CALCS FOR NETWORK SIMULATION AND ACTUAL VOLUMES PROVIDED

Duration (min)	Rainfall 100-Year (mm)	Rainfall 100-Year with CCF (mm)	Intensity (mm/hr)	Discharge (Q = 2.71iA) (l/s)	Proposed Runoff (m^3)	Contiguous Land Runoff (m^3)	Total Runoff (m^3)	Allowable Outflow (m^3)	Storage Required (m^3)
5	14.1	16.9	203.0	1957	587	0	587	12	575
10	19.7	23.6	141.8	1367	820	0	820	23	797
15	23.1	27.7	110.9	1069	962	0	962	35	927
30	28.6	34.3	68.6	661	1191	0	1191	70	1121
60	35.4	42.5	42.5	409	1474	0	1474	140	1334
120	43.7	52.4	26.2	253	1819	0	1819	280	1539
180	49.5	59.4	19.8	191	2061	0	2061	420	1641
240	54.1	64.9	16.2	156	2252	0	2252	560	1692
360	61.2	73.4	12.2	118	2548	0	2548	840	1708
540	69.3	83.2	9.2	89	2885	0	2885	1260	1625
720	75.7	90.8	7.6	73	3151	0	3151	1680	1471
1080	85.7	102.8	5.7	55	3568	0	3568	2520	1047
1440	93.6	112.3	4.7	45	3897	0	3897	3361	536
2880	106.2	127.4	2.7	26	4421	0	4421	6721	-2300
4320	116.6	139.9	1.9	19	4854	0	4854	10082	-5228
5760	125.8	151.0	1.6	15	5237	0	5237	13442	-8205
8640	141.7	170.0	1.2	11	5899	0	5899	20163	-14264
11520	155.6	186.7	1.0	9	6478	0	6478	26885	-20407
14400	168.1	201.7	0.8	8	6998	0	6998	33606	-26608
17280	179.8	215.8	0.7	7	7485	0	7485	40327	-32842
23040	200.9	241.1	0.6	6	8364	0	8364	53769	-45405
28800	220.2	264.2	0.6	5	9167	0	9167	67211	-58044
36000	242.4	290.9	0.5	5	10091	0	10091	84014	-73923

Project: PROPOSED RESIDENTIAL DEVELOPMENT
Project No.: A034 (CATCHMENT B - REFER TO DRAWINGS FOR CATCHMENT EXTENTS)
Calculation: Attenuation 100-year - Total Site
Calcs By: JF
Checked By: RFM
Date: 14.07.2022

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Site Location:	TINAKILLY		
Design Storm Return Period:	100 years		
Climate Change Factor:	20 %		
Soil Type:	2		
Total Site Area:	3.160 ha	REFER TO DRAWINGS FOR AREAS BREAKDOWN	
Hardstanding	2.250 ha	.....@	80% Impervious
Softstanding	0.910 ha	.....@	20% Impervious
	ha	.....@	0% Impervious
	ha	.....@	0% Impervious
Effective Impermeable Area:	1.982 ha		

Allowable Outflow	**Calculate**	0.144	
IH124: QBAR = 0.00108 x AREA$^{0.89}$ x SAAR$^{1.17}$ x SOIL$^{2.17}$			
AREA:	0.0316 km^2		
SAAR:	986 mm		
SOIL:	0.45		
QBAR/ha	6.56 l/s/ha		
Allowable Outflow	**20.7 l/s**	Minimum Allowable Discharge = 2l/s/ha	

Storage required =	**972 m^3**	STORAGE ESTIMATE ONLY - REFER TO MICRODRAINAGE CALCS FOR NETWORK SIMULATION AND ACTUAL VOLUMES PROVIDED

Duration (min)	Rainfall 100-Year (mm)	Rainfall 100-Year with CCF (mm)	Intensity (mm/hr)	Discharge (Q = 2.71iA) (l/s)	Proposed Runoff (m^3)	Contiguous Land Runoff (m^3)	Total Runoff (m^3)	Allowable Outflow (m^3)	Storage Required (m^3)
5	14.1	16.9	203.0	1091	327	0	327	6	321
10	19.7	23.6	141.8	762	457	0	457	12	445
15	23.1	27.7	110.9	596	536	0	536	19	517
30	28.6	34.3	68.6	369	664	0	664	37	626
60	35.4	42.5	42.5	228	821	0	821	75	747
120	43.7	52.4	26.2	141	1014	0	1014	149	865
180	49.5	59.4	19.8	106	1149	0	1149	224	925
240	54.1	64.9	16.2	87	1255	0	1255	298	957
360	61.2	73.4	12.2	66	1420	0	1420	448	972
540	69.3	83.2	9.2	50	1608	0	1608	672	936
720	75.7	90.8	7.6	41	1757	0	1757	895	861
1080	85.7	102.8	5.7	31	1989	0	1989	1343	645
1440	93.6	112.3	4.7	25	2172	0	2172	1791	381
2880	106.2	127.4	2.7	14	2464	0	2464	3582	-1117
4320	116.6	139.9	1.9	10	2706	0	2706	5372	-2667
5760	125.8	151.0	1.6	8	2919	0	2919	7163	-4244
8640	141.7	170.0	1.2	6	3288	0	3288	10745	-7457
11520	155.6	186.7	1.0	5	3610	0	3610	14326	-10716
14400	168.1	201.7	0.8	5	3901	0	3901	17908	-14007
17280	179.8	215.8	0.7	4	4172	0	4172	21489	-17317
23040	200.9	241.1	0.6	3	4662	0	4662	28653	-23991
28800	220.2	264.2	0.6	3	5109	0	5109	35816	-30706
36000	242.4	290.9	0.5	3	5625	0	5625	44770	-39145

Project: PROPOSED RESIDENTIAL DEVELOPMENT
Project No.: A034 (CATCHMENT C - REFER TO DRAWINGS FOR CATCHMENT EXTENTS)
Calculation: Attenuation 100-year - Total Site
Calcs By: JF
Checked By: RFM
Date: 14.07.2022

CS CONSULTING GROUP
DUBLIN - LONDON - LIMERICK

Site Location:	TINAKILLY		
Design Storm Return Period:	100 years		
Climate Change Factor:	20 %		
Soil Type:	2		
Total Site Area:	1.300 ha	REFER TO DRAWINGS FOR AREAS BREAKDOWN	
Hardstanding	0.680 ha	.....@	80% Impervious
Softstanding	0.620 ha	.....@	20% Impervious
	ha	.....@	0% Impervious
	ha	.....@	0% Impervious
Effective Impermeable Area:	0.668 ha		

Allowable Outflow	**Calculate**	0.144	
IH124: QBAR = 0.00108 x AREA$^{0.89}$ x SAAR$^{1.17}$ x SOIL$^{2.17}$			
AREA:	0.0130 km^2		
SAAR:	986 mm		
SOIL:	0.45		
QBAR/ha	6.56 l/s/ha		
Allowable Outflow	**8.5 l/s**	Minimum Allowable Discharge = 2l/s/ha	

Storage required =	**300 m^3**	STORAGE ESTIMATE ONLY - REFER TO MICRODRAINAGE CALCS FOR NETWORK SIMULATION AND ACTUAL VOLUMES PROVIDED

Duration (min)	Rainfall 100-Year (mm)	Rainfall 100-Year with CCF (mm)	Intensity (mm/hr)	Discharge (Q = 2.71iA) (l/s)	Proposed Runoff (m^3)	Contiguous Land Runoff (m^3)	Total Runoff (m^3)	Allowable Outflow (m^3)	Storage Required (m^3)
5	14.1	16.9	203.0	368	110	0	110	3	108
10	19.7	23.6	141.8	257	154	0	154	5	149
15	23.1	27.7	110.9	201	181	0	181	8	173
30	28.6	34.3	68.6	124	224	0	224	15	208
60	35.4	42.5	42.5	77	277	0	277	31	246
120	43.7	52.4	26.2	47	342	0	342	61	280
180	49.5	59.4	19.8	36	387	0	387	92	295
240	54.1	64.9	16.2	29	423	0	423	123	300
360	61.2	73.4	12.2	22	479	0	479	184	294
540	69.3	83.2	9.2	17	542	0	542	276	266
720	75.7	90.8	7.6	14	592	0	592	368	224
1080	85.7	102.8	5.7	10	670	0	670	553	118
1440	93.6	112.3	4.7	8	732	0	732	737	-5
2880	106.2	127.4	2.7	5	831	0	831	1473	-643
4320	116.6	139.9	1.9	4	912	0	912	2210	-1298
5760	125.8	151.0	1.6	3	984	0	984	2947	-1963
8640	141.7	170.0	1.2	2	1108	0	1108	4420	-3312
11520	155.6	186.7	1.0	2	1217	0	1217	5894	-4677
14400	168.1	201.7	0.8	2	1315	0	1315	7367	-6053
17280	179.8	215.8	0.7	1	1406	0	1406	8841	-7435
23040	200.9	241.1	0.6	1	1571	0	1571	11787	-10216
28800	220.2	264.2	0.6	1	1722	0	1722	14734	-13012
36000	242.4	290.9	0.5	1	1896	0	1896	18418	-16522

Project: PROPOSED RESIDENTIAL DEVELOPMENT
Project No.: A034 (CATCHMENT D - REFER TO DRAWINGS FOR CATCHMENT EXTENTS)
Calculation: Attenuation 100-year - Total Site
Calcs By: JF
Checked By: RFM
Date: 14.07.2022

CS CONSULTING GROUP
DUBLIN - LONDON - LIMERICK

Site Location:	TINAKILLY		
Design Storm Return Period:	100 years		
Climate Change Factor:	20 %		
Soil Type:	2		
Total Site Area:	0.443 ha	REFER TO DRAWINGS FOR AREAS BREAKDOWN	
Hardstanding	0.370 ha	.....@	80% Impervious
Softstanding	0.073 ha	.....@	20% Impervious
	ha	.....@	0% Impervious
	ha	.....@	0% Impervious
Effective Impermeable Area:	0.311 ha		

Allowable Outflow	**Calculate**	0.144	
IH124: QBAR = 0.00108 x AREA$^{0.89}$ x SAAR$^{1.17}$ x SOIL$^{2.17}$			
AREA:	0.0044 km^2		
SAAR:	986 mm		
SOIL:	0.45		
QBAR/ha	6.56 l/s/ha		
Allowable Outflow	**2.9 l/s**	Minimum Allowable Discharge = 2l/s/ha	

Storage required =	**160 m^3**	STORAGE ESTIMATE ONLY - REFER TO MICRODRAINAGE CALCS FOR NETWORK SIMULATION AND ACTUAL VOLUMES PROVIDED

Duration (min)	Rainfall 100-Year (mm)	Rainfall 100-Year with CCF (mm)	Intensity (mm/hr)	Discharge (Q = 2.71iA) (l/s)	Proposed Runoff (m^3)	Contiguous Land Runoff (m^3)	Total Runoff (m^3)	Allowable Outflow (m^3)	Storage Required (m^3)
5	14.1	16.9	203.0	171	51	0	51	1	50
10	19.7	23.6	141.8	119	72	0	72	2	70
15	23.1	27.7	110.9	93	84	0	84	3	81
30	28.6	34.3	68.6	58	104	0	104	5	99
60	35.4	42.5	42.5	36	129	0	129	10	118
120	43.7	52.4	26.2	22	159	0	159	21	138
180	49.5	59.4	19.8	17	180	0	180	31	149
240	54.1	64.9	16.2	14	197	0	197	42	155
360	61.2	73.4	12.2	10	223	0	223	63	160
540	69.3	83.2	9.2	8	252	0	252	94	158
720	75.7	90.8	7.6	6	275	0	275	126	150
1080	85.7	102.8	5.7	5	312	0	312	188	123
1440	93.6	112.3	4.7	4	340	0	340	251	89
2880	106.2	127.4	2.7	2	386	0	386	502	-116
4320	116.6	139.9	1.9	2	424	0	424	753	-329
5760	125.8	151.0	1.6	1	457	0	457	1004	-547
8640	141.7	170.0	1.2	1	515	0	515	1506	-991
11520	155.6	186.7	1.0	1	566	0	566	2008	-1443
14400	168.1	201.7	0.8	1	611	0	611	2511	-1899
17280	179.8	215.8	0.7	1	654	0	654	3013	-2359
23040	200.9	241.1	0.6	1	731	0	731	4017	-3286
28800	220.2	264.2	0.6	0	801	0	801	5021	-4220
36000	242.4	290.9	0.5	0	881	0	881	6276	-5395

Project: PROPOSED RESIDENTIAL DEVELOPMENT
Project No.: A034 (CATCHMENT D - REFER TO DRAWINGS FOR CATCHMENT EXTENTS)
Calculation: Attenuation 100-year - Total Site
Calcs By: JF
Checked By: RFM
Date: 14.07.2022

CS CONSULTING GROUP
DUBLIN - LONDON - LIMERICK

Site Location:	TINAKILLY		
Design Storm Return Period:	100 years		
Climate Change Factor:	20 %		
Soil Type:	2		
Total Site Area:	0.617 ha	REFER TO DRAWINGS FOR AREAS BREAKDOWN	
Hardstanding	0.530 ha	.....@	80% Impervious
Softstanding	0.087 ha	.....@	20% Impervious
	ha	.....@	0% Impervious
	ha	.....@	0% Impervious
Effective Impermeable Area:	0.441 ha		

Allowable Outflow	**Calculate**	0.144
IH124: QBAR = 0.00108 x AREA$^{0.89}$ x SAAR$^{1.17}$ x SOIL$^{2.17}$		
AREA:	0.0062 km^2	
SAAR:	986 mm	
SOIL:	0.45	
QBAR/ha	6.56 l/s/ha	
Allowable Outflow	**4.0 l/s**	Minimum Allowable Discharge = 2l/s/ha

Storage required =	**229 m^3**	STORAGE ESTIMATE ONLY - REFER TO MICRODRAINAGE CALCS FOR NETWORK SIMULATION AND ACTUAL VOLUMES PROVIDED

Duration (min)	Rainfall 100-Year (mm)	Rainfall 100-Year with CCF (mm)	Intensity (mm/hr)	Discharge (Q = 2.71iA) (l/s)	Proposed Runoff (m^3)	Contiguous Land Runoff (m^3)	Total Runoff (m^3)	Allowable Outflow (m^3)	Storage Required (m^3)
5	14.1	16.9	203.0	243	73	0	73	1	72
10	19.7	23.6	141.8	170	102	0	102	2	99
15	23.1	27.7	110.9	133	119	0	119	4	116
30	28.6	34.3	68.6	82	148	0	148	7	141
60	35.4	42.5	42.5	51	183	0	183	15	168
120	43.7	52.4	26.2	31	226	0	226	29	197
180	49.5	59.4	19.8	24	256	0	256	44	212
240	54.1	64.9	16.2	19	280	0	280	58	221
360	61.2	73.4	12.2	15	316	0	316	87	229
540	69.3	83.2	9.2	11	358	0	358	131	227
720	75.7	90.8	7.6	9	391	0	391	175	216
1080	85.7	102.8	5.7	7	443	0	443	262	181
1440	93.6	112.3	4.7	6	484	0	484	350	134
2880	106.2	127.4	2.7	3	549	0	549	699	-151
4320	116.6	139.9	1.9	2	603	0	603	1049	-446
5760	125.8	151.0	1.6	2	650	0	650	1399	-749
8640	141.7	170.0	1.2	1	732	0	732	2098	-1366
11520	155.6	186.7	1.0	1	804	0	804	2797	-1993
14400	168.1	201.7	0.8	1	869	0	869	3497	-2628
17280	179.8	215.8	0.7	1	929	0	929	4196	-3267
23040	200.9	241.1	0.6	1	1038	0	1038	5595	-4556
28800	220.2	264.2	0.6	1	1138	0	1138	6993	-5855
36000	242.4	290.9	0.5	1	1253	0	1253	8741	-7489

Appendix B

Irish Water Confirmation of Feasibility (CoF)

and Statement of Design Acceptance (SoDA)

CONFIRMATION OF FEASIBILITY

Uisce Éireann
Bosca OP448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office
Cork City.

www.water.ie

Owen Sullivan

19-22 Dame Street
Dublin 2
Co. Dublin
D02E278

18 October 2022

Our Ref: CDS20007402 Pre-Connection Enquiry
Tinakilly, Wicklow, Co. Wicklow

Dear Applicant/Agent,

We have completed the review of the Pre-Connection Enquiry.

Irish Water has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Multi/Mixed Use Development of 350 unit(s) at Tinakilly, Wicklow, Co. Wicklow, (the **Development)**.

Based upon the details provided we can advise the following regarding connecting to the networks;

- **Water Connection** - Feasible without infrastructure upgrade by Irish Water
- **Wastewater Connection** - Feasible Subject to upgrades

The connection is feasible. Irish water plan to carry out upgrades to the Bollarney pumping station and there is also an LNRP for the network downstream of Bollarney PS which will be sized to designed to accommodate the additional load from this development. Some local network upgrades and extensions may be required depending on the connection point, these will be determined at connection stage. This may be subject to change.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Irish Water infrastructure. Before the Development can be connected to our network(s) you must submit a connection application and be granted and sign a connection agreement with Irish Water.

As the network capacity changes constantly, this review is only valid at the time of its completion. As soon as planning permission has been granted for the Development, a completed connection application should be submitted. The connection application is available at www.water.ie/connections/get-connected/

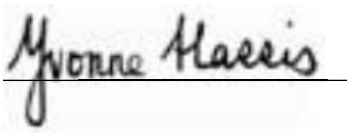
Where can you find more information?

- **Section A -** What is important to know?
- **Section B -** Details of Irish Water's Network(s)

This letter is issued to provide information about the current feasibility of the proposed connection(s) to Irish Water's network(s). This is not a connection offer and capacity in Irish Water's network(s) may only be secured by entering into a connection agreement with Irish Water.

For any further information, visit **www.water.ie/connections**, **email newconnections@water.ie** or contact 1800 278 278**.**

Yours sincerely,



Yvonne Harris
Head of Customer Operations

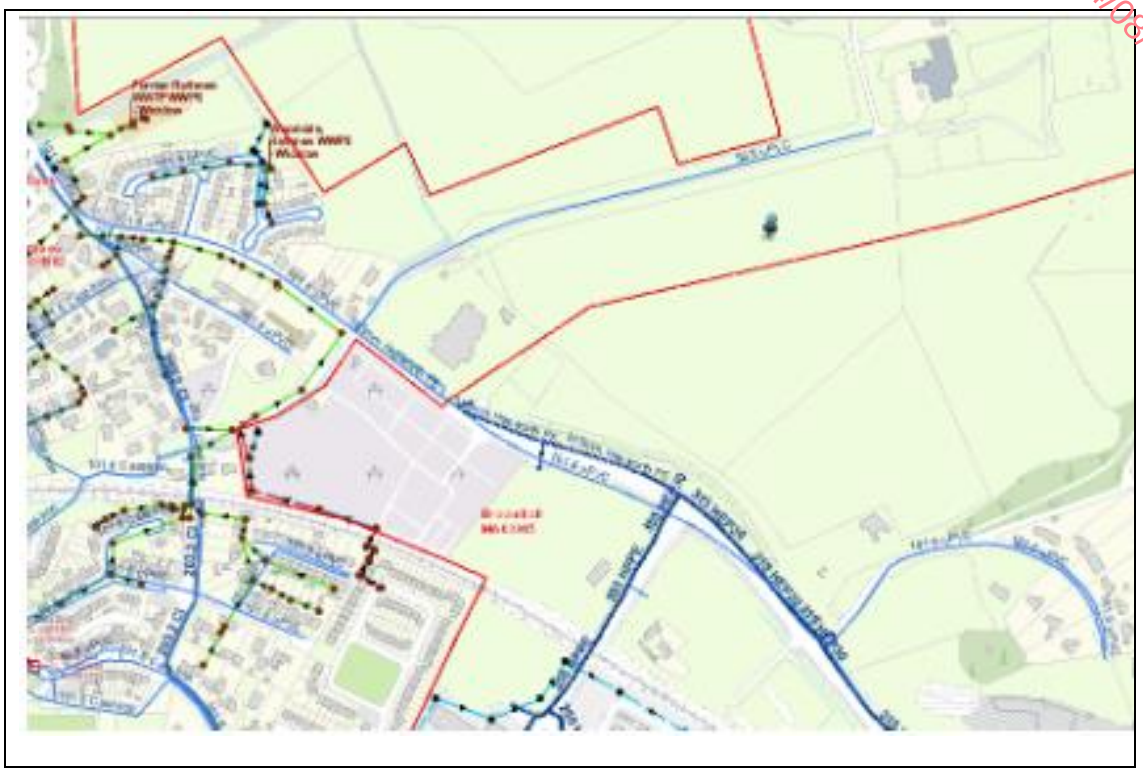
Section A - What is important to know?

What is important to know?	Why is this important?
Do you need a contract to connect?	• Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Irish Water's network(s). • Before the Development can connect to Irish Water's network(s), you must submit a connection application and be granted and sign a connection agreement with Irish Water.
When should I submit a Connection Application?	• A connection application should only be submitted after planning permission has been granted.
Where can I find information on connection charges?	• Irish Water connection charges can be found at: https://www.water.ie/connections/information/charges/
Who will carry out the connection work?	• All works to Irish Water's network(s), including works in the public space, must be carried out by Irish Water*. *Where a Developer has been granted specific permission and has been issued a connection offer for Self-Lay in the Public Road/Area, they may complete the relevant connection works
Fire flow Requirements	• The Confirmation of Feasibility does not extend to fire flow requirements for the Development. Fire flow requirements are a matter for the Developer to determine. • **What to do?** - Contact the relevant Local Fire Authority
Plan for disposal of storm water	• The Confirmation of Feasibility does not extend to the management or disposal of storm water or ground waters. • **What to do?** - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges.
Where do I find details of Irish Water's network(s)?	• Requests for maps showing Irish Water's network(s) can be submitted to: datarequests@water.ie

What are the design requirements for the connection(s)?	• The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this Development shall comply with ***the Irish Water Connections and Developer Services Standard Details and Codes of Practice,*** available at www.water.ie/connections
Trade Effluent Licensing	• Any person discharging trade effluent** to a sewer, must have a Trade Effluent Licence issued pursuant to section 16 of the Local Government (Water Pollution) Act, 1977 (as amended). • More information and an application form for a Trade Effluent License can be found at the following link: https://www.water.ie/business/trade-effluent/about/ **trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended)

Section B – Details of Irish Water's Network(s)

The map included below outlines the current Irish Water infrastructure adjacent the Development: To access Irish Water Maps email datarequests@water.ie



Reproduced from the Ordnance Survey of Ireland by Permission of the Government. License No. 3-3-34

Note: The information provided on the included maps as to the position of Irish Water's underground network(s) is provided as a general guide only. The information is based on the best available information provided by each Local Authority in Ireland to Irish Water.

Whilst every care has been taken in respect of the information on Irish Water's network(s), Irish Water assumes no responsibility for and gives no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided, nor does it accept any liability whatsoever arising from or out of any errors or omissions. This information should not be solely relied upon in the event of excavations or any other works being carried out in the vicinity of Irish Water's underground network(s). The onus is on the parties carrying out excavations or any other works to ensure the exact location of Irish Water's underground network(s) is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

RECEIVED: 14/08/2023

Owen Sullivan
CS Consulting Group
19-22 Dame Street
Dublin 2
D02E278

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

28 June 2023

Re: Design Submission for Tinakilly, Wicklow, Co. Wicklow (the "Development") (the "Design Submission") / Connection Reference No: CDS20007402

Dear Owen Sullivan,

Many thanks for your recent Design Submission.

We have reviewed your proposal for the connection(s) at the Development. Based on the information provided, which included the documents outlined in Appendix A to this letter, Irish Water has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Irish Water infrastructure. Before you can connect to our network you must sign a connection agreement with Irish Water. This can be applied for by completing the connection application form at www.water.ie/connections. Irish Water's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities (CRU)(https://www.cru.ie/document_group/irish-waters-water-charges-plan-2018/).

You the Customer (including any designers/contractors or other related parties appointed by you) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development which is necessary to facilitate connection(s) from the boundary of the Development to Irish Water's network(s) (the "**Self-Lay Works**"), as reflected in your Design Submission. Acceptance of the Design Submission by Irish Water does not, in any way, render Irish Water liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Irish Water representative:
Name: Antonio Garzón
Phone: 0874760587
Email: antonio.garzon@water.ie

Yours sincerely,

Yvonne Harris

Yvonne Harris
Head of Customer Operations

Appendix A

Document Title & Revision

- A034-CSC-ZZ-XX-DR-C-0004_Proposed Watermain Layout
- A034-CSC-ZZ-XX-DR-C-0006_Proposed Drainage Layout-Sheet 2 of 2
- A034-CSC-ZZ-XX-DR-C-0050_Foul Longsections-Sheet 1
- A034-CSC-ZZ-XX-DR-C-0051_Foul Longsections-Sheet 2
- A034-CSC-ZZ-XX-DR-C-0052_Foul Longsections-Sheet 3
- A034-CSC-ZZ-XX-DR-C-0053_Foul Longsections-Sheet 4

Additional Comments

The design submission will be subject to further technical review at connection application stage.

Irish Water cannot guarantee that its Network in any location will have the capacity to deliver a particular flow rate and associated residual pressure to meet the requirements of the relevant Fire Authority, see Section 1.17 of Water Code of Practice.

This Statement of Design Acceptance does not extend to proposed pump station and rising main arrangements. The pump station and rising main will be vested at connection application stage.

*For further information, visit **www.water.ie/connections***

Notwithstanding any matters listed above, the Customer (including any appointed designers/contractors, etc.) is entirely responsible for the design and construction of the Self-Lay Works. Acceptance of the Design Submission by Irish Water will not, in any way, render Irish Water liable for any elements of the design and/or construction of the Self-Lay Works.

NOTE:

1. ALL PIPE WORK, VALVES, CHAMBERS, NETWORK ARRANGEMENTS AND ALL ASSOCIATED WATERMAIN WORKS TO COMPLY WITH THE IRISH WATER INFRASTRUCTURE STANDARD DETAILS.
2. ALL NEW WATERMAIN MATERIAL SHALL BE IN ACCORDANCE WITH SECTION 3.9 OF THE IRISH WATER CODE OF PRACTICE. MDPE PIPES SHALL BE OF A TYPE PE-80 AND HAVE AN SDR-11 RATING. THEY SHALL CONFORM TO IS EN 12201: PART 1, PART 2 AND PART 3.
3. THE PROPOSED 150mm WATERMAINS WILL BE LOCATED A MINIMUM OF 300mm FROM THE WASTEWATER INFRASTRUCTURE IN ACCORDANCE WITH SECTION 3.5.18 OF THE IRISH WATER WASTEWATER CODE OF PRACTICE AND TYPICAL SERVICE LAYOUT DISTANCES (HORIZONTAL AND VERTICAL) SHALL BE AS PER IRISH WATER STANDARD DETAIL STD-W-11.
4. AIR PRESSURE TESTS TO ALL WORKS TO BE TAKEN IN CHARGE TO IRISH WATER CODE OF PRACTICE SECTION 4.10.
5. MANIFOLD CHAMBERS WILL BE USED TO PROVIDE A COMMUNAL BOX FOR THE APARTMENT BLOCK AND THAT EACH DWELLING UNIT WILL HAVE IT'S OWN SUPPLY PIPE AND METER AND STOP VALVE. ALL METERS IN THE MANIFOLD SHALL BE TAGGED TO INDICATE WHICH PROPERTY IS SUPPLIED AND ANY UNUSED OUTLETS WILL BE BLANKED OFF IN ACCORDANCE WITH SECTION 3.15.3 OF THE IRISH WATER WASTEWATER CODE OF PRACTICE.
6. BULK METERS SHALL COMPLY WITH SECTION 3.15.4 OF THE IRISH WATERS CODE OF PRACTICE FOR WATER INFRASTRUCTURE.
7. EACH HOUSE SHALL HAVE AN INDIVIDUAL CONNECTION WITH BOUNDARY BOX AS PER SECTION 3.15.2 OF THE IRISH WATERS CODE OF PRACTICE FOR WATER INFRASTRUCTURE. IN SOME CASES THE HOUSE SERVICE CONNECTION IS GREATER THAN 15m IN LENGTH. A SERVICE CONNECTION OF 32mmø TO BE USED IN LOCATIONS WHERE THE SERVICE CONNECTION IS GREATER THAN 15m IN LENGTH, FOLLOWING APPROVAL FROM IRISH WATER.
8. THE PROPOSED WATERMAINS WILL BE LOCATED A MINIMUM OF 300mm FROM THE WASTEWATER INFRASTRUCTURE IN ACCORDANCE WITH SECTION 3.5.18 OF THE IRISH WATER WASTEWATER CODE OF PRACTICE.
9. WATERMAIN T-JUNCTIONS SHALL BE AT 90 DEGREE ANGLES AS PER IRISH WATER DETAIL STD-W-07.
10. THRUST BLOCKS TO BE PROVIDED AT DEAD ENDS, BENDS, TEE JUNCTIONS, VALVE CHAMBERS (AS PER DETAILS) OR ANY ABRUPT CHANGE IN VERTICAL OR HORIZONTAL DIRECTION AND AT ANY LOCATION WHERE WATER PRESSURE IS LIKELY TO DISTORT THE PIPE LINE INSTALLATION OR CAUSE DISPROPORTIONATE MOVEMENT. THRUST BLOCKS TO BE IN ACCORDANCE WITH SECTION 4.9 OF THE IRISH WATER CODE OF PRACTICE AND IRISH WATER STANDARD DETAIL STD-W-28.
11. ANY NEW PLANTING OF TREES, SHRUBS ETC. TO BE IN STRICT ACCORDANCE WITH THE IRISH WATER STANDARD DETAIL STD-W-12A. ANY PROPOSED WATERMAIN LOCATED IN PROXIMITY TO EXISTING TREES SHALL BE IN ACCORDANCE WITH STANDARD IRISH WATER DETAIL STD-W-12.
12. SCOUR VALVE TO BE LOCATED AT SITE LOW POINT. THE SCOUR CHAMBER IS TO BE PROVIDED WITH A NON-RETURN VALVE TO PREVENT BACK FLOW TO THE WATER SUPPLY NETWORK AND AGREED WITH THE LOCAL AUTHORITY. SCOUR VALVE AND CHAMBER TO COMPLY WITH SECTION 3.16.4 AND 3.21 OF THE IRISH WATER CODE OF PRACTICE.
13. NOTE: THE FIRE SAFETY CERTIFICATE HAS NOT BEEN COMPLETED YET, BUT AS PART OF THIS DEVELOPMENT, IT IS CONFIRMED THAT HYDRANTS SHALL NOT BE LOCATED ANY MORE THAN 46m FROM ANY PART OF THE DEVELOPMENT UNITS.
14. INDICATOR AND MARKER POSTS TO BE PROVIDED AT ALL CHAMBERS AS PER SECTION 3.23 OF THE IRISH WATER CODE OF PRACTICE FOR WATER
15. ALL HYDRANTS TO BE IN COMPLIANCE WITH SECTION 3.5.25 OF THE IRISH WATER CODE OF PRACTICE FOR WATER
16. AIR VALVE AND HYDRANTS COVERS, WHERE LOCATED IN GRASS AREAS, SHALL BE SURROUNDED BY A CONCRETE PLINTH, 200mm ALL ROUND AND 100mm DEEP, FORMED WITH C20/25 CONCRETE , 20mm AGGREGATE SIZE, AND BEDDED IN CLAUSE 804 MATERIAL. THE PLINTH SHALL INCORPORATE MILD STEEL REINFORCEMENT LINKS AND SHALL HAVE A BULL-NOSE FINISH AROUND ITS EXTERNAL PERIMETER AS PER SECTION 3.18 OF WATER CODE OF PRACTICE.

LEGEND:

- EXISTING WATERMAIN REFER TO WCC REF. 20/1000 AND 21/411
- PROPOSED WATERMAIN
- PROPOSED SLUICE VALVE (S.V.)
- PROPOSED AIR VALVE (A.V.)
- PROPOSED SCOUR VALVE (Sc.V)
- PROPOSED HYDRANT (H.)
- BOUNDARY BOX (B)
- THRUST BLOCK (TB)
- PROPOSED BULK METER (Me)
- EXTENT OF WORKS

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Rev. No.	Date	REVISION NOTE	Drn. By	Chkd. By
P1	12.12.2022	ISSUED FOR PLANNING	SC	NB
P2	02.06.2023	UPDATED TO NEW SITE PLAN	JF	NB
P3	16.06.2023	ISSUED FOR PLANNING	SC	NB
P3	16.06.2023	ISSUED FOR PLANNING	SC	NB
P4	26.06.2023	ISSUED FOR IW SODA	JF	NB

Client	STW
Project	Residential Development at Tinakilly, Wicklow LRD Development
Title	Proposed Watermain Layout
Dwg. No.	A034-CSC-ZZ-XX-DR-C-0004

Date	Drn by	Chkd by	Aprvd by	Scale	Revision
Oct 2022	SC	NB	OS	1:500 @ A0	P4

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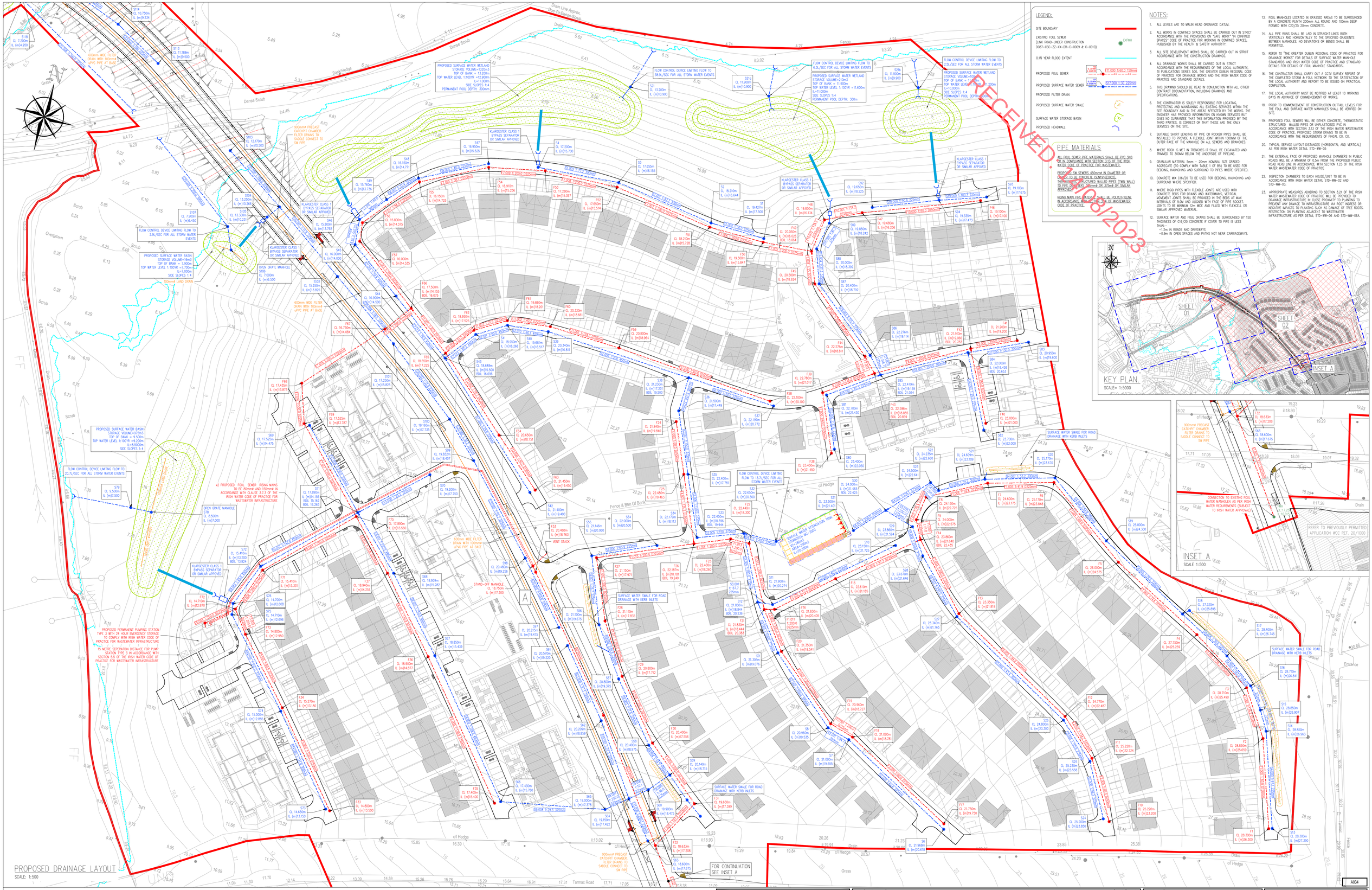

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Rev. No.	Date	REVISION NOTE	Drn. By	Chkd. By
P1	12.12.2022	ISSUED FOR PLANNING	SC	NB
P2	01.06.2023	ISSUED FOR IW SODA	JF	NB
P3	16.06.2023	ISSUED FOR PLANNING	SC	NB
P4	20.06.2023	RED LINE BOUNDARY UPDATED	SC	NB
P5	28.06.2023	IW SODA Response	JF	NB

Client	STW
Project	Residential Development at Tinakilly, Wicklow LRD Development
Title	Proposed Drainage Layout Sheet 2 of 2
Dwg. No.	A034-CSC-ZZ-XX-DR-C-0005
Date	Oct 2022
Drn by	SC
Chkd by	NB
Aprvd by	OS
Scale	1:500 @ A0
Revision	P5

A034

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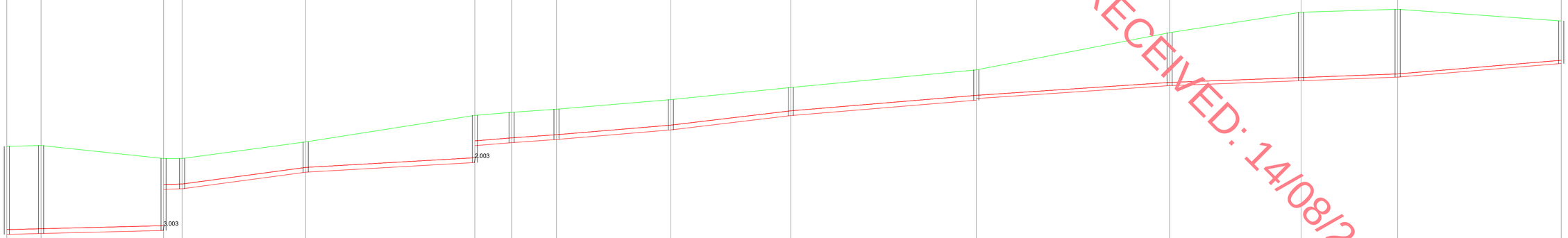
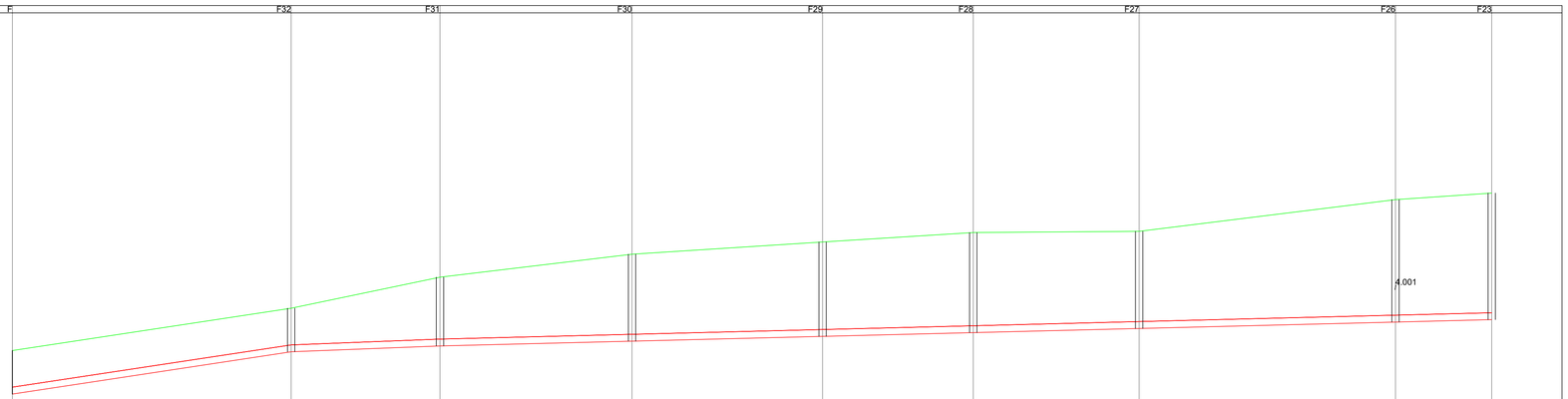


Hor Scale 500
Ver Scale 100

MH Name	F23	F22	F21	F15	F14	F9	F8	F7	F6	F5	F4	F3	F2	F1
PN	F1.013	F1.012	F1.010	F1.009	F1.008	F1.007	F1.006	F1.005	F1.004	F1.003	F1.002	F1.001	F1.000	
Dia (mm)	225	225	225	225	225	225	225	225	225	225	150	150	150	
Slope (1:X)	200.0	200.0	37.3	67.3	61.8	70.4	59.8	41.9	60.0	74.6	134.2	134.2	60.0	
Cover Level (m)	22.400	22.440	21.830	21.830	22.610	23.860	24.000	24.150	24.600	25.170	26.000	27.750	28.710	28.850	28.300
Invert Level (m)	18.260	18.300 18.300	18.444 20.365	20.405 20.405	21.185 21.185	21.640 22.435	22.575 22.575	22.725 22.725	23.175 23.175	23.848 23.848	24.575 24.860	25.259 25.259	25.490 25.490	25.659 25.659	26.300
Length (m)	8.060	28.815	29.070	39.764	8.652	10.556	26.899	28.204	43.633	45.461	30.921	22.713	38.473		



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MH Name	F	F32	F31	F30	F29	F28	F27	F26	F23
PN	F1.021	F1.020	F1.019	F1.018	F1.017	F1.016	F1.015	F1.014	
Dia (mm)	225	225	225	225	225	225	225	225	
Slope (1:X)	33.0	127.4	200.0	200.0	200.0	200.0	200.0	200.0	
Cover Level (m)	17.250	18.633	19.650	20.400	20.800	21.110	21.150	22.187	22.400
Invert Level (m)	15.825	17.208 17.208	17.399 17.399	17.556 17.556	17.712 17.712	17.835 17.835	17.971 17.971	18.181 18.181	18.260
Length (m)	45.612	24.359	31.429	31.188	24.655	27.159	41.943	15.748	

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Rev. No.	Date	REVISION NOTE	Drn. By	Chkd. By
P1	02.06.2023	ISSUED FOR IW SODA	JF	NB

Client	STW
Project	Residential Development at Tinakilly, Wicklow LRD Development
Title	Foul Longsections Sheet 1 of 4
Dwg. No.	A034-CSC-ZZ-XX-DR-C-0050

Date	Drn by	Chkd by	Aprvd by	Scale	Revision
June 2023	JF	NB	OS	AS SHOWN @ A1	P1

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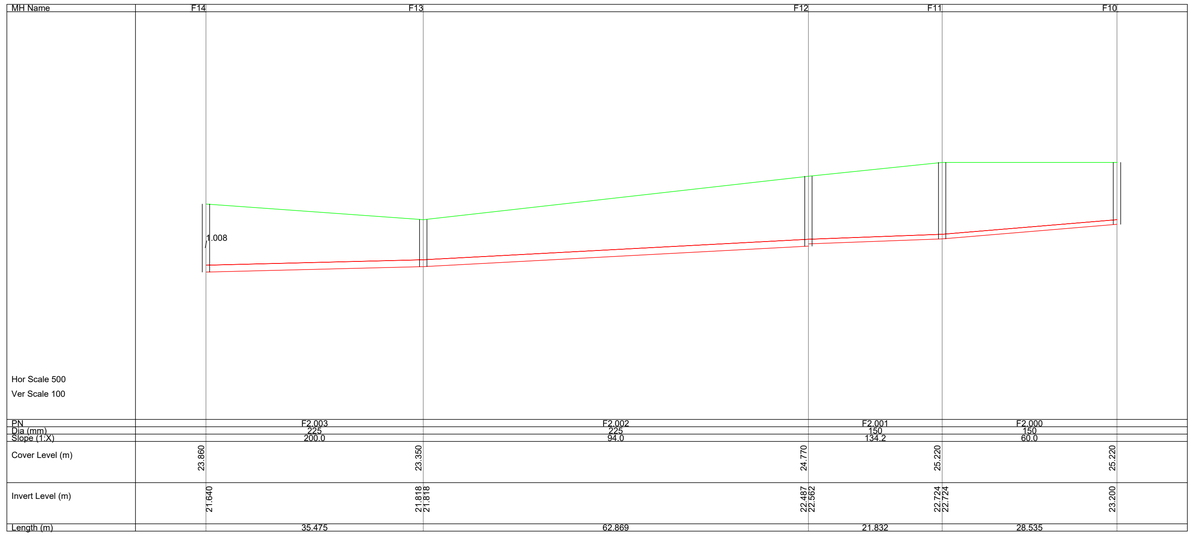

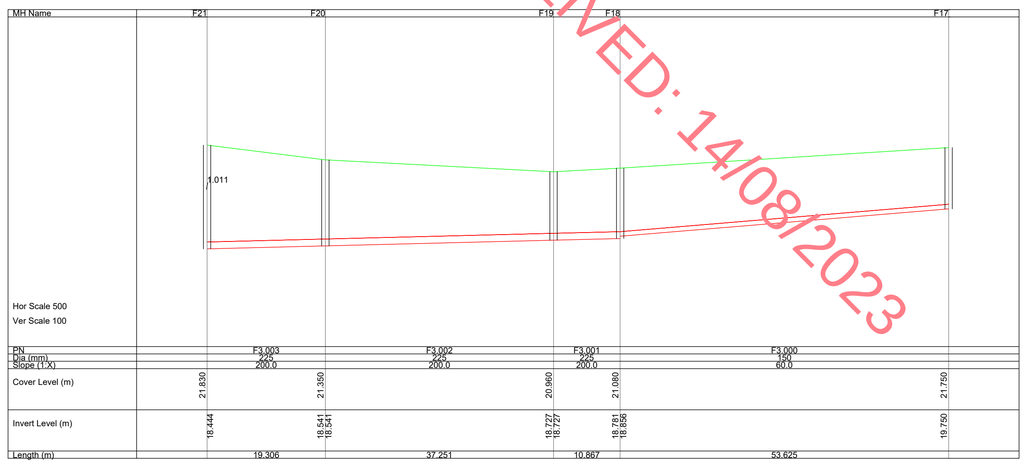

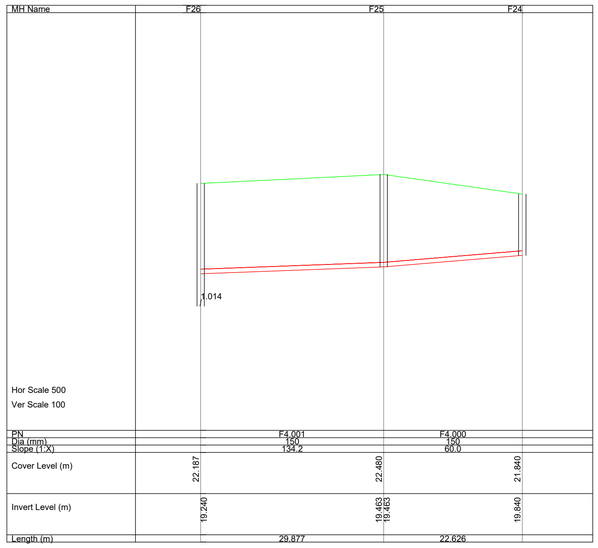

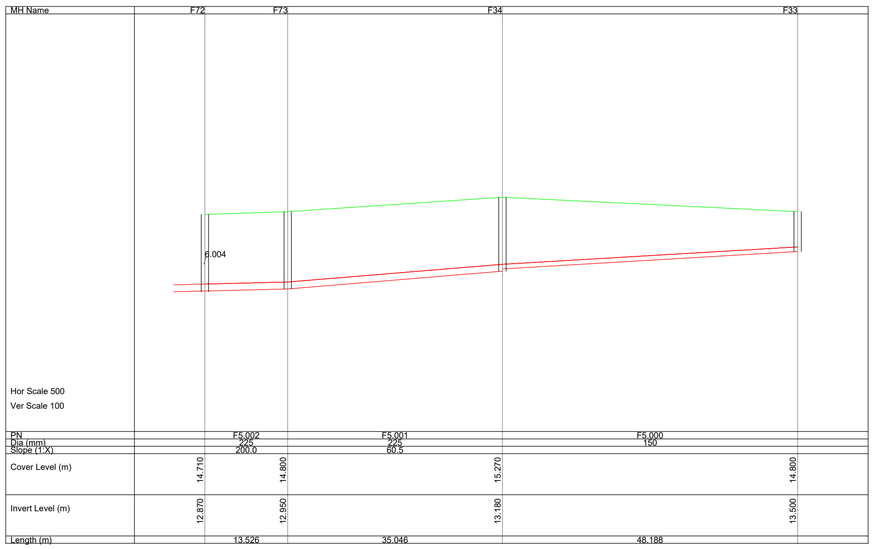

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Rev. No.	Date	REVISION NOTE	Drn. By	Chkd. By
P1	02.06.2023	ISSUED FOR IW SODA	JF	NB

Client	STW
Project	Residential Development at Tinakilly, Wicklow LRD Development
Title	Foul Longsections Sheet 2 of 4
Dwg. No.	A034-CSC-ZZ-XX-DR-C-0051

Date	Drn by	Chkd by	Aprvd by	Scale	Revision
June 2023	JF	NB	OS	AS SHOWN @ A1	P1

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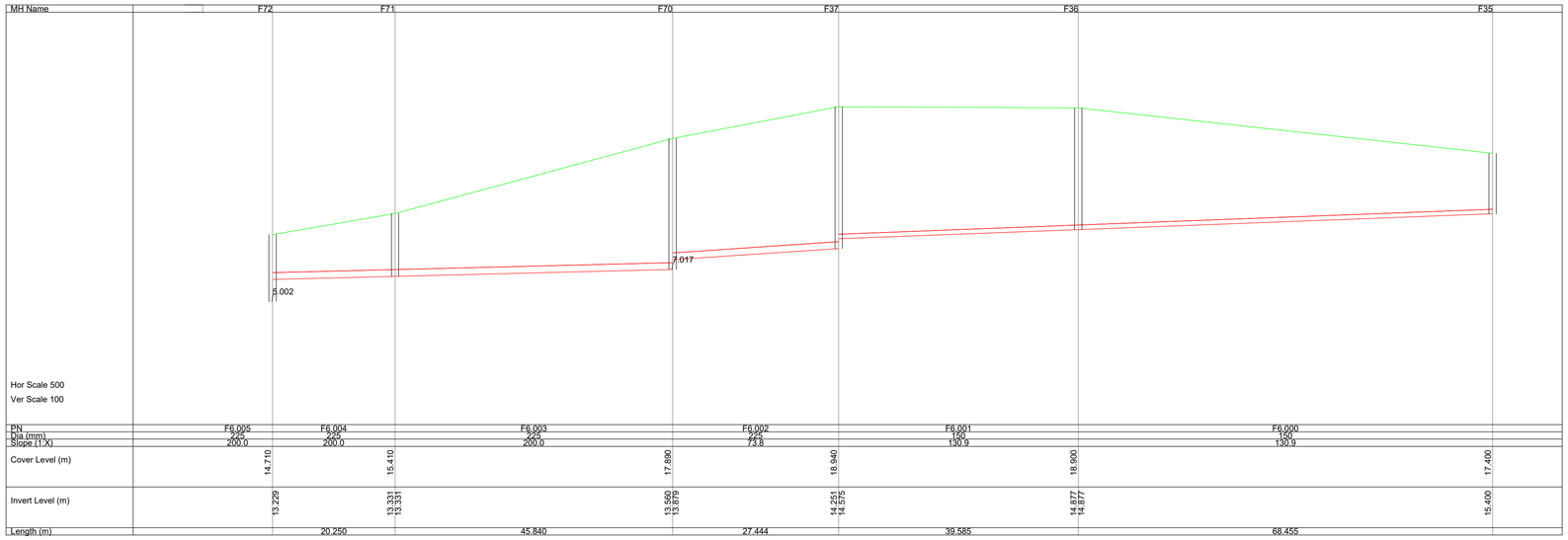
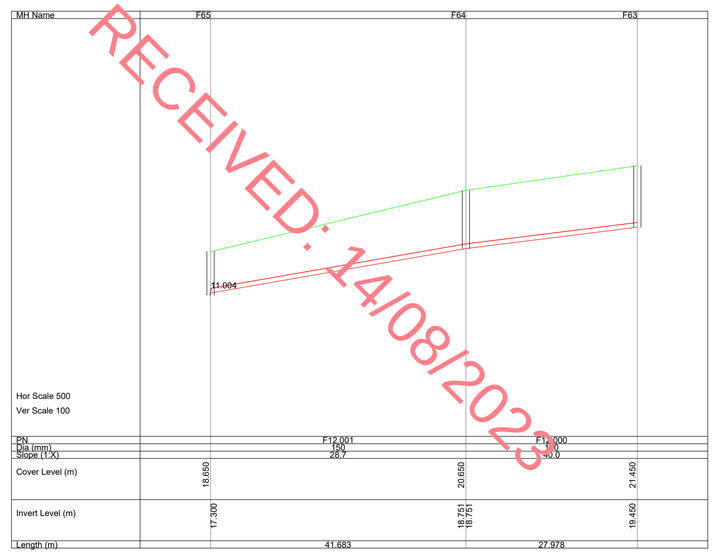


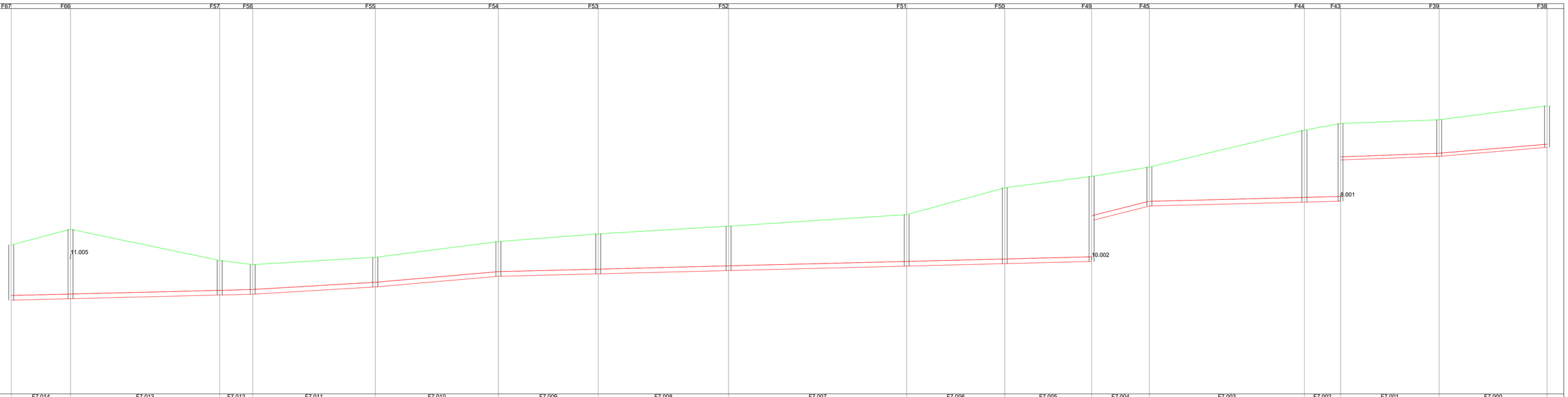
MH Name	F72	F71	F70	F37	F36	F35
PN	F6.005	F6.004	F6.003	F6.002	F6.001	F6.000
Dia (mm)	225	225	225	225	150	150
Slope (1:X)	200.0	200.0	200.0	73.8	130.9	130.9
Cover Level (m)	14.710	15.410	17.890	18.940	18.900	17.400
Invert Level (m)	13.229	13.331 / 13.331	13.560 / 13.879	14.251 / 14.575	14.677 / 14.677	15.400
Length (m)	20.250	45.840	27.444	39.585	68.455	

Hor Scale 500
Ver Scale 100



MH Name	F65	F64	F63
PN	F12.001	F12.000	
Dia (mm)	150	150	
Slope (1:X)	28.7	40.0	
Cover Level (m)	18.650	20.650	21.450
Invert Level (m)	17.300	18.751 / 18.751	19.450
Length (m)	41.683	27.978	

Hor Scale 500
Ver Scale 100



MH Name	F67	F66	F57	F56	F55	F54	F53	F52	F51	F50	F49	F45	F44	F43	F39	F38
PN	F7.014	F7.013	F7.012	F7.011	F7.010	F7.009	F7.008	F7.007	F7.006	F7.005	F7.004	F7.003	F7.002	F7.001	F7.000	
Dia (mm)	225	225	225	225	225	225	225	225	225	225	225	225	225	150	150	
Slope (1:X)	200.0	200.0	200.0	64.4	58.1	200.0	200.0	200.0	200.0	200.0	25.0	200.0	200.0	134.2	60.0	
Cover Level (m)	16.750	17.500	16.000	15.800	16.150	16.910	17.280	17.650	18.210	19.500	20.050	20.500	22.276	22.596	22.780	23.450
Invert Level (m)	14.084	14.155 / 14.155	14.325 / 14.325	14.375 / 14.375	14.725 / 14.725	15.236 / 15.236	15.357 / 15.357	15.514 / 15.514	15.728 / 15.728	15.847 / 15.847	18.026 / 18.026	18.624 / 18.624	18.811 / 18.811	18.855 / 20.839	21.017 / 21.017	21.450
Length (m)	14.302	35.976	7.951	29.550	29.689	24.053	31.443	42.938	23.637	20.951	13.935	37.364	8.708	23.795	26.007	

Hor Scale 500
Ver Scale 100

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Rev. No.	Date	REVISION NOTE	Drn. By	Chkd. By
P1	02.06.2023	ISSUED FOR IW SODA	JF	NB
P2	26.06.2023	IW SODA RESPONSE	JF	NB

Client	STW
Project	Residential Development at Tinakilly, Wicklow LRD Development
Title	Foul Longsections Sheet 3 of 4
Dwg. No.	A034-CSC-ZZ-XX-DR-C-0052

Date	Drn by	Chkd by	Aprvd by	Scale	Revision
June 2023	JF	NB	OS	AS SHOWN @ A1	P2

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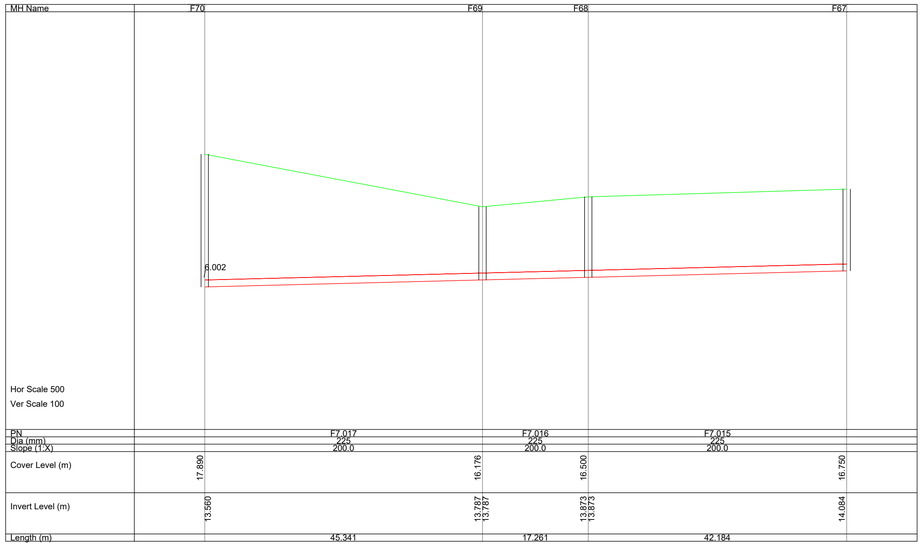

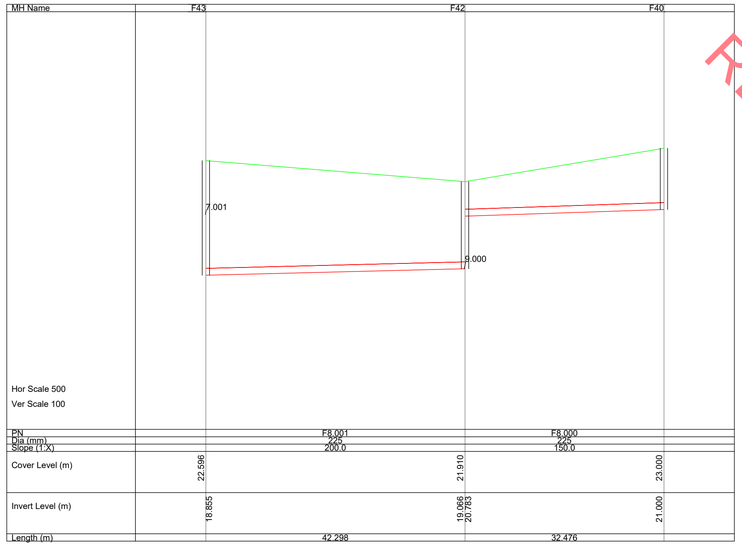

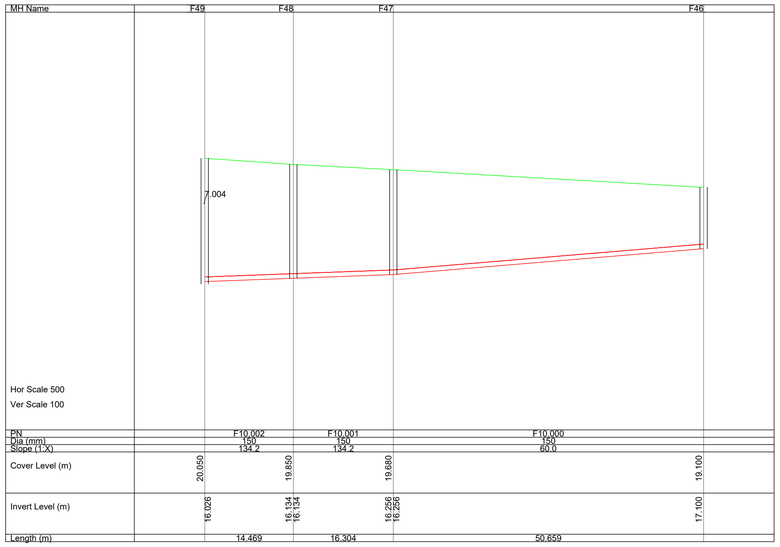

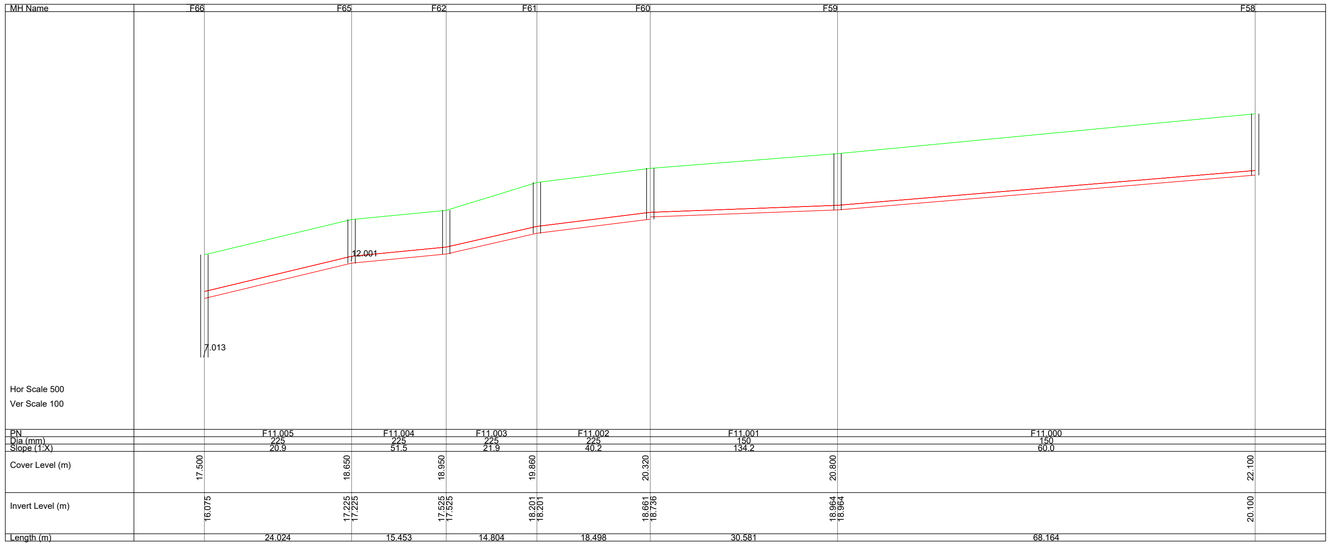

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Client	STW
Project	Residential Development at Tinakilly, Wicklow LRD Development
Title	Foul Longsections Sheet 4 of 4
Dwg. No.	A034-CSC-ZZ-XX-DR-C-0053

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June 2023	JF	NB	OS	AS SHOWN @ A1	P1

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