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# ENGINEERING & INFRASTRUCTURE REPORT

**FOR PROPOSED RESIDENTIAL DEVELOPMENT**

**AT ELM GROVE, BALLYNAMONA, FERMOY, CORK.**

**PREPARED BY:**

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**PHOENIX HOUSE,**

**MONAHAN ROAD, CORK**

**PREPARED FOR:**

**COOLEENEY DEVELOPMENTS LTD ON BEHALF OF CORK COUNTY COUNCIL**

**JULY, 2023**

## Document Control



| Revision | Description | Date | Prepared | Checked |
|---|---|---|---|---|
| 0 | Issued for Planning Application | 04/07/2023 | CB | WOR |

# Contents



**Appendix:**

- Water Demand & Wastewater Hydraulic Load Calculations for Irish Water
- Foul Water Sewer Calculations
- Storm Water Sewer Calculations
- Klargester Oil Separator information

# 1 Introduction

BRH Design Partners were commissioned by Cooleeney Developments Ltd on behalf of Cork County Council to undertake the design and specification of the Engineering Services for this proposed Residential Development at Elm Grove, Ballynamona, Fermoy, Cork.

The proposed development is located to the north of Fermoy town. This engineering report is part of a Part 8 application to complete the existing estate. 26 houses are not at wallplate level and the planning has lapsed for these houses (Planning Ref: 15/5973). The 26 houses consist of:

6 no. 3 Bedroom Detached Houses
7 no. 3 Bedroom Semi-Detached Houses
1 no. 4 Bedroom Detached Houses
4 no. 3 Bedroom Semi-Detached Houses
2 no. 2 Bedroom Semi-Detached Houses
6 no. 2 Bedroom Semi-Detached Houses

The Site is bounded on the Northern side by a greenfield site, on the Southern side by L1513 'Pike Road', on the Eastern side by an existing house and garden before the 'Dublin Road' and on the Western side by an incomplete housing estate. The site is brownfield in nature and is currently as part of a 'ghost estate', the site is characterised by a gradual sloping topography falling mainly from Southeast to Northwest.

The development will necessitate the construction / provision of new site infrastructure to service the proposed 26 no. houses. Such infrastructure will include proposed foul and surface water drainage, water, electrical and telecommunication services, access roads and common areas.

## 1.1 Scope of this report

This report outlines the proposed means of servicing the development with foul sewers, storm water sewers, storm water attenuation, water supply and other services required to service a housing development.

This report should be read in conjunction with the engineering drawings which illustrate and detail the servicing proposals. It should also be read in conjunction with the submissions of other members of the applicant's design team.

# 2 Foul Sewage Collection & Disposal

Discussions have taken place with Irish Water in terms of foul water discharge form the development. Irish Water have confirmed that there is a pump station in operation to cater for the existing 80 houses in Crann Ard. This pump station does not have capacity to cater for the Elm Grove Development. The Elm grove development consists for of 49 houses, of which 4 are connected to the existing pump station and are completed and handed over. A further 19 houses are substantially complete. The remaining 26 houses are subject to this application. Irish Water have requested a new pump station. To future proof the area the proposed pump station is to be located at the lowest area of the surrounding development lands. Irish Water have requested that the existing pump station be decommissioned which means that the new pump station will be sized to cater for Crann Ard (80 units), Elm Grove (49 units) and the future housing requirement per the development plan of the zoned lands to the north (@ density of 32 units per ha gives circa. 230 units).


*Figure 1 Location of Site, Surroundings and Location of New Irish Water Pumping Station*

BRH Design Partners Ltd are in dialog with Irish Water and a pre-connection enquiry has been received. Irish Water are satisfied with the proposed pump station location.

Houses on the site are served by 150mm Ø and 225 Ø gravity foul sewers which collect foul effluent from each dwelling connection on the site. The application area which consists of the 26 houses will connect into the existing site under construction as permitted under planning permission reference: 15/5973.

The foul sewerage system shall be designed and installed with reference to the guidance contained in the "Code of Practice for Wastewater Infrastructure – Design & Construction Requirements for Self-Lay Developments July 2020 (Rev 2)" published by Irish Water.

The following key guidance criteria has been established. The sewers have been designed on the basis of 6 times Dry Weather Flow (6DWF). Dry weather flow (DWF) is taken as 600 litres per dwelling (3 persons per house and a per capita wastewater flow of 200 litres per head per day) or 0.002 L/Sec per P.E. All sewers have been designed with gradients that ensure self-cleansing velocities are achieved. This is based on a min. flow velocity of 0.75/m/second with a maximum velocity of 2.5/m/second.

In addition to satisfying the criterion on self-cleansing velocity the following conditions shall also apply:

150mm nominal internal diameter gravity sewer shall lay at gradients not flatter than 1:150 where there are at least ten dwelling units connected or 1:60 for up to nine connected dwelling units.

A service connection with a nominal internal diameter of 100mm laid to a gradient not flatter than 1:80, where there is at least one W.C. connected and 1:40 if there is no W.C. connected.

The overall development demand is based of Section 3.6 of the Irish Water Code of Practice for Wastewater Infrastructure. This section states that Dry weather flows (DWF) should be taken as 446 litres per dwelling (2.7 persons per house and a per capita Wastewater flow of 150 litres per head per day along with a 10% unit consumption allowance in line with Section 3.6.3 above and Section 2.2.4 of Appendix B). Development Wastewater Hydraulic Loading is shown below.

| | |
|---|---|
| **TITLE**<br>Site at Elm Grove, Fermoy, Co. Cork | **Job Reference**<br>23041 |
| **SUBJECT**<br>Wastewater Hydraulic Load for Irish Water | **Calc. Sheet No**<br>1 |
| **Calculations by**<br>CB | **Date**<br>04/07/2023 |

***DEMAND***

| | | |
|---|---|---|
| Housing Units | 26 | no. |
| Dry Weather Flow (DWF)[1] | 165 | litres/person/day |
| Average Occupancy Ratio[2] | 2.7 | person/unit |
| Total Site Occupancy | 70.2 | people |
| Normal Length of Day | 24 | hours |
| Total Daily Wastewater Discharge | 11,583 | l/day |
| Peak Flow Factor[3] | 6 | |
| **Post Development Average Discharge** | 0.13 | l/s |
| **Post Development Peak Discharge[4]** | 0.80 | l/s |

Notes:

1. Dry Weather Flow (DWF) is 150 litres per head per day along with a 10% unit consumptionallowance in line with Section 3.6.3 of Irish Water Code of Practice
2. Occupancy ratio of 2.7 persons per dwelling from Irish Water Pre-Connection Enquiry Form
3. The Peak Flow factor is taken as per Appendix C: 1.2.5 Domestic Wastewater Peaking Factors
4. The peak discharge is equal to the Total Wastewater Discharge multiplied by the peak flow factor, expressed in litres/second.
5. The average concentrations of wastewater parameters taken from EPA "Wastewater Treatment Manuals, Treatment Systems for Small Communities, Business, Leisure Centres and Hotels".
6. Assumed Maximum concentration is equal to the average concentration plus 2 times the standard deviation (for the 95%ile) taken

*Figure 2 Development Wastewater Hydraulic Loading*

A gravity foul line will run through Elm Grove estate and through the zoned lands to the north of Elm Grove to the proposed new pump station. A new gravity foul sewer will be installed from F1.04 and will run to the pump station with MHs provided to allow for future connections. A new rising main will run parallel to the new gravity line and then through Elm Grove/Crann Ard until it meets a discharge manhole which is connected to the main public sewer on Pike Road. There is a redundant temporary stormwater bund in the greenfield site close to the line of the gravity sewer and rising main. This was installed a number of years ago as a temporary measure for the Crann Ard estate until the stormwater stormtech infiltration system was installed in that site. This redundant temporary bund will be altered as necessary to facilitate the install of these lines.

The foul sewer connection from Elm Grove to the proposed pumping station shall be made at F1.04 as can be seen in Figure 3Figure 4 below. The pumping station will join to the existing infrastructure on the public road as can be seen in Figure 4 below.

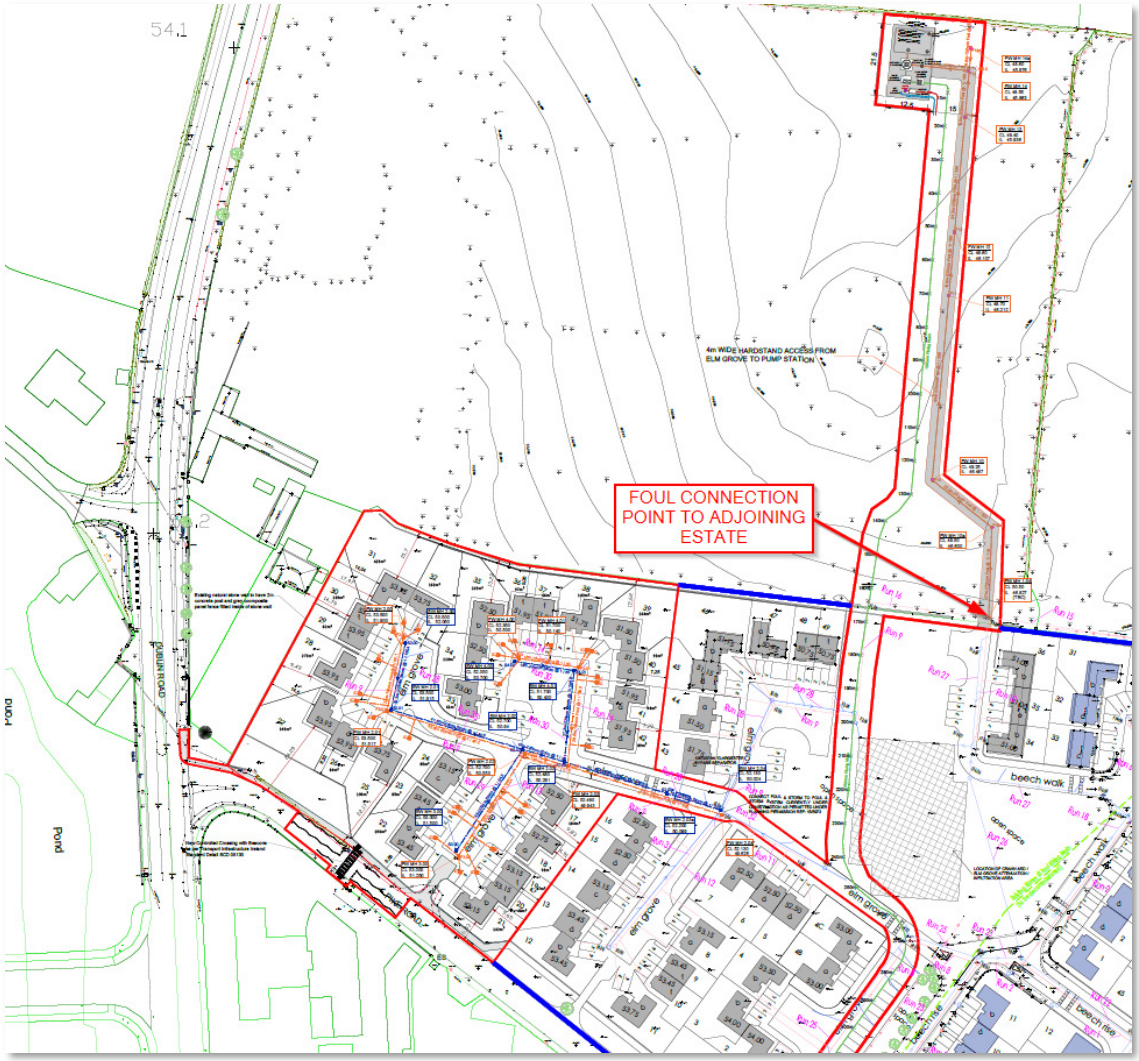



*Figure 3 Foul Sewer Connection Point to adjoining site and onto proposed pumping station.*

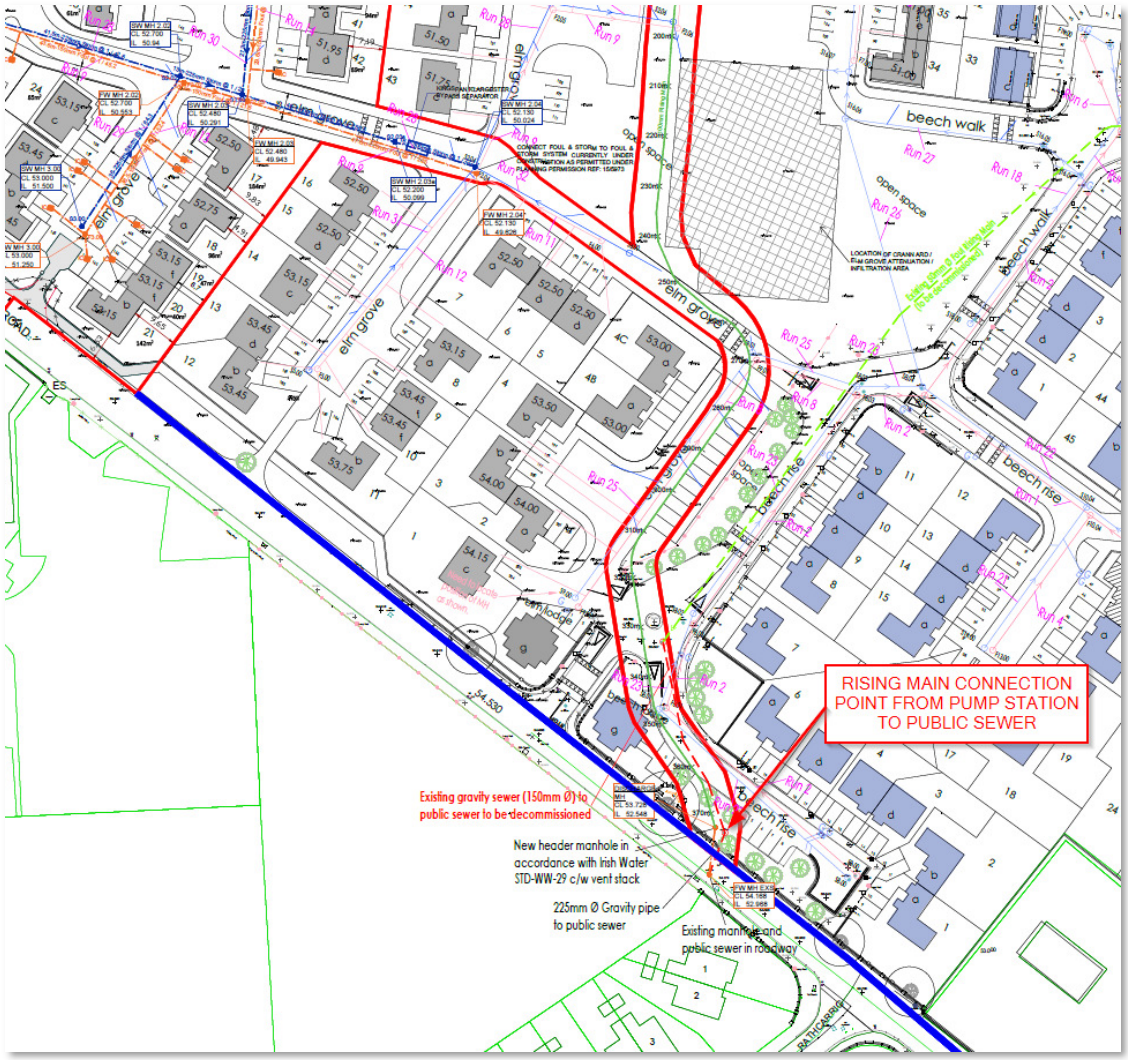



*Figure 4 View of rising main connection point to public road from proposed new pump station*

Details of the foul Sewer are shown on Drawings 0301 and 0304

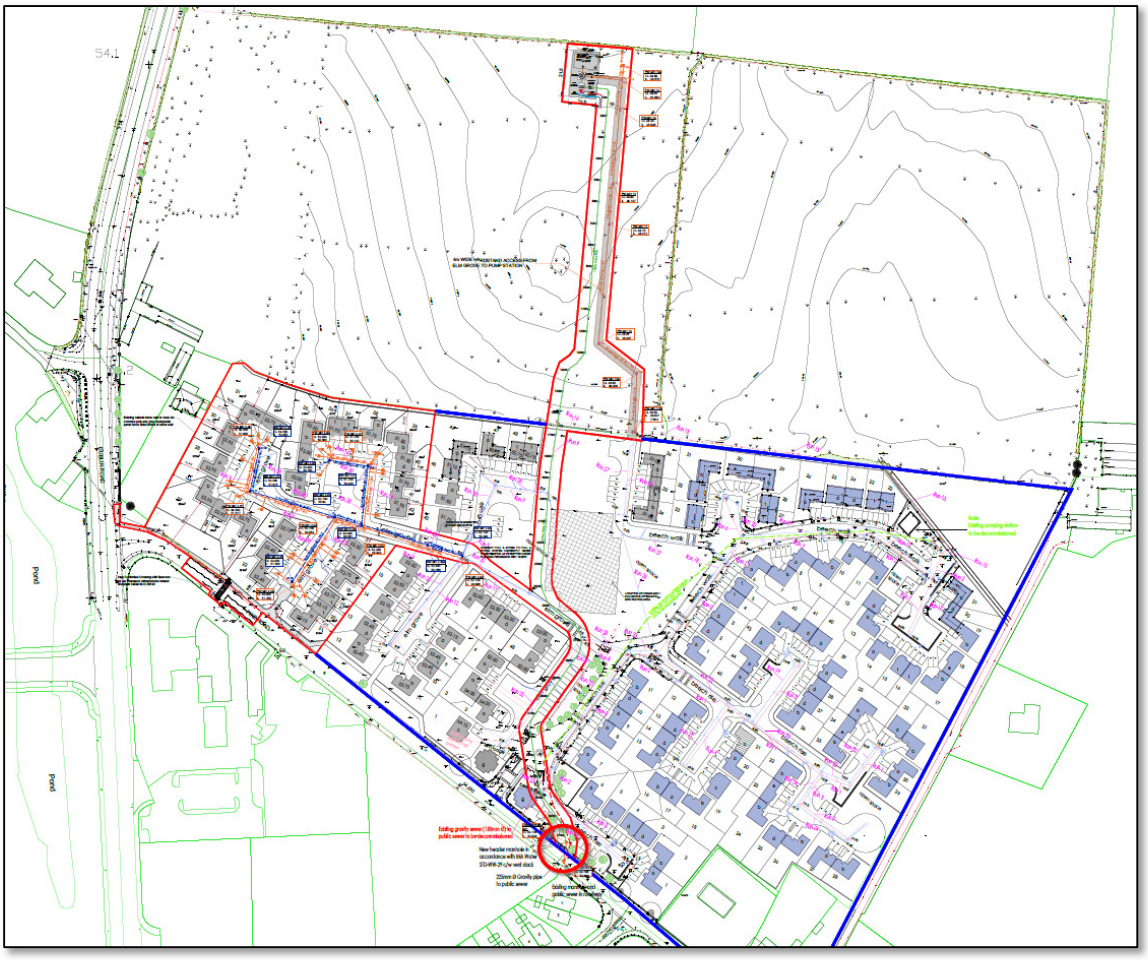


*Figure 5 Overall Foul Layout and Connection Point (Drawing 0304)*

As per discussions with Irish Water, once this pump station is operational and all sewer works are completed the Crann Ard pump station and the rising main which runs through Crann Ard will be decommissioned with the foul now flowing to F1.04 and down to the new pump station.

# 3 Stormwater Disposal

This engineering report is part of a Part 8 application to complete the existing estate. 26 houses are not at wallplate level and the planning has lapsed for these houses (Planning Ref: 15/5973). The stormwater system will tie back into storm system under construction as permitted under Planning permission ref: 15/5973 at S2.04.

**Surface Water System**
In order to reduce the effects of the surface runoff on potential flooding, a Stormwater Management Plan will be applied to surface water discharges. The discharge of water to watercourses will be eliminated by infiltrating directly to ground. See the Drainage Impact Assessment (DIA) and SUDS assessment Report which accompanies this document for further information on these items.

**Surface Water Drainage Network**
The surface water drainage network calculations are included in the appendix. The proposed surface water drains have been designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS), the Department of the Environment's Recommendations for Site Development Works for Housing Areas, the Department of the Environment's Building Regulations "Technical Guidance Document Part H Drainage and Wastewater Disposal" and BS EN 752-2008 Drain and Sewer Systems Outside Buildings.

**Design Criteria:**
The pipe network is designed using rainfall of 50mm/hr for hardstanding areas and 75mm/hr for roof areas. The network was designed to ensure velocities in the network and pipe gradients did not exceed the maximum velocity of 3.0m/s. The minimum velocity allowed was 0.8m/s.

The surface water sewer connection from Elm Grove shall be made at S2.04 as can be seen in Figure 6 below.

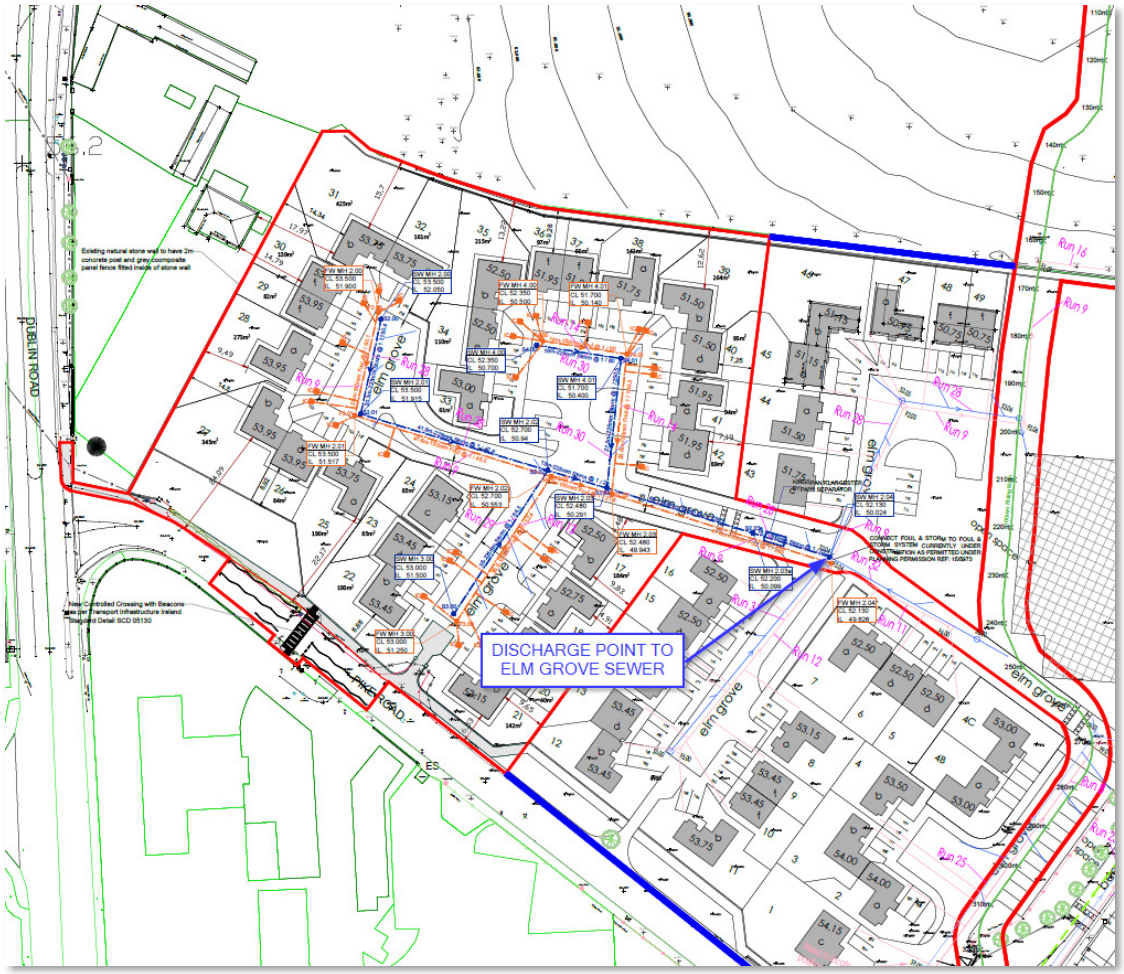



*Figure 6 Storm Water Connection Point*

The layout of the proposed storm water network is shown on the Proposed Stormwater Sewer Layout Plan Drawing No. 0301.

# 4 Water Supply

The watermain connection from Elm Grove shall be made to the 100mm diameter watermain as currently under construction (PL: 15/5973) as can be seen in Figure 7 below.

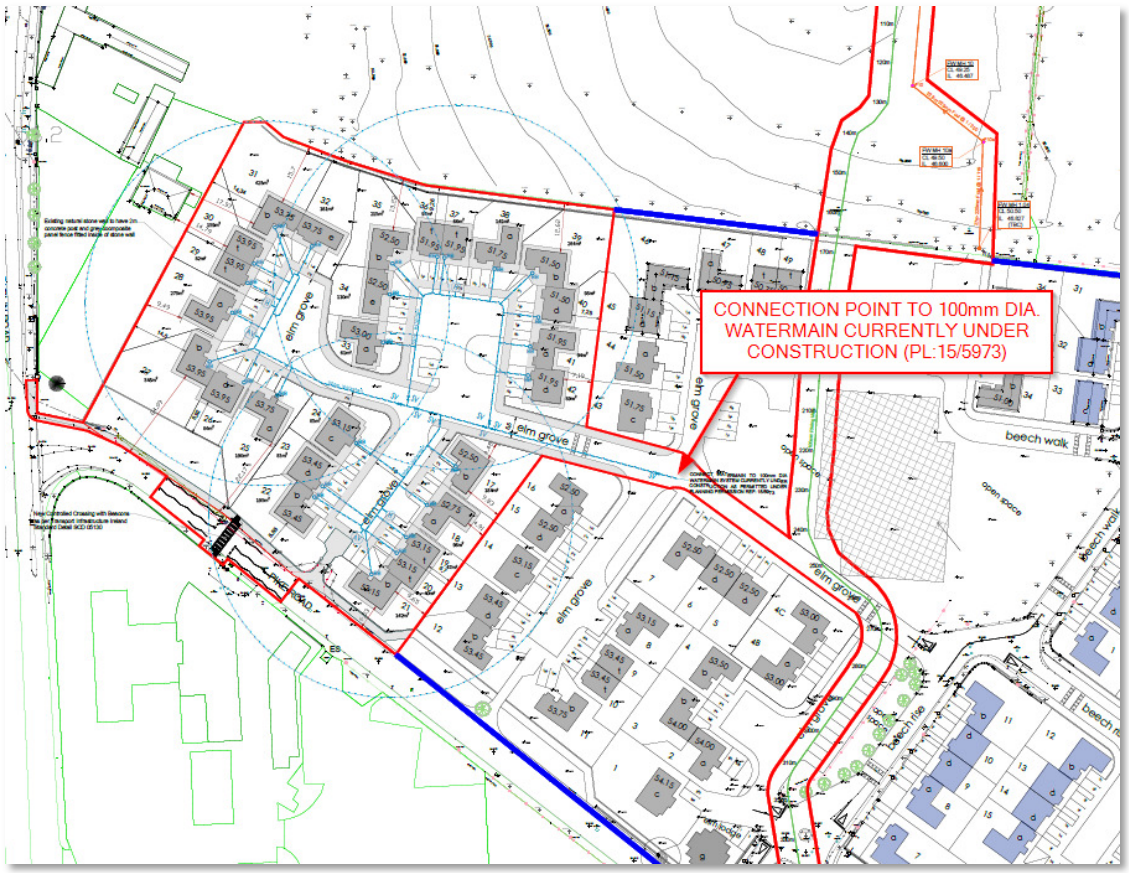



*Figure 7 Watermain Layout (Drawing 0302).*

As the daily demand is less than 20 m3 per day, there is no requirement to install a bulk flow meter to measure water demand of the Development. However, infrastructure may be provided for the measurement of night flows at the entrance to the Development as agreed with Irish Water. This shall be achieved by the installation of a sluice valve on the Main with a domestic sized tapping at either side of the valve linked by a 25mm internal diameter polyethylene pipe to a domestic sized meter located in a Boundary Box.

The overall development demand is based off section 3.7.2 Water Demand Calculations of the Irish Water Code of Practice for Water Infrastructure. Average domestic daily demand in a development can be established based on daily per-capita consumption, house occupancy, number of properties, etc. For design purposes the average daily domestic demand shall be based on a per-capita consumption of 150 l/person/day and an average occupancy ratio of 2.7 persons per dwelling. Development Water Hydraulic Loading is shown below.

| | |
|---|---|
| **TITLE**<br>Site at Elm Grove, Fermoy, Co. Cork | **Job Reference**<br>23041 |
| **SUBJECT**<br>Water Demand for Irish Water | **Calc. Sheet No**<br>1 |
| **Calculations by**<br>WOR | **Date**<br>04/07/2023 |

***DEMAND***

| | | |
|---|---|---|
| Housing Units | 26 | no. |
| Daily Demand per Person | 150 | litres/person/day |
| Average Occupancy Ratio[1] | 2.7 | person/unit |
| Total Site Occupancy | 70.2 | people |
| Average Daily Demand | 10,530 | l/day |
| Average Day in Peak Week[2] | 13,163 | l/day |
| Average Day in Peak Week Factor[3] | 1.25 | |
| Peak Factor for pipe sizing[3] | 5 | |
| **Post Development Peak Water Flow for Pipe Sizing[4]** | 0.61 | l/s |
| **Post Development Average Water Demand** | 0.12 | l/s |

Notes:

1. Occupancy ratio of 2.7 persons per dwelling from Irish Water Code of Practice
2. Average Day in Peak Week is 1.25 times the average daily demand.
3. Peak Factor for pipe sizing from Irish Water Code of Practice.
4. Peak Factor multiplied by Average Day in Peak Week flow

*Figure 8 Water Demand*

The proposed development shall be serviced by a 100mm watermain laid out as shown on the accompanying watermain drawing.

Fire Hydrants will be provided such that each house will be within 46 m. of a Hydrant and these hydrants will be provided so as to be fully accessible to the fire service.

Sluice Valves will be installed on all principal watermain connections to ensure sections of the development or areas of the development can be isolated for maintenance and repair as required. An Air Valve are located at the highest points of the site. There are 100mm loops at all cul de sacs consisting with the loop connecting to at least 4 no. dwellings.

# 5 Other Services / Engineering Matters

Electricity and Telecommunications facilities are available on the adjoining estate and the main road adjoining the site.

A public lighting design has been completed for the development and it is included with this Planning submission under separate cover.

In the context of this proposed development the site can be serviced by connections to and extensions to the existing infrastructure. The final details of provision of these additional services can be agreed with the various service providers when layout details have been finalised and agreed.

# APPENDIX

| | | |
|---|---|---|
| **TITLE** | | **Job Reference** |
| **Site at Elm Grove, Crann Ard, Ballynamona, Fermoy, Co. Cork** | | **23041** |
| **SUBJECT** | | **Calc. Sheet No** |
| **Foul Waste Calculations** | | **1** |
| **Calculations by** | **Checked by** | **Date** |
| **CB** | **WOR** | **20/07/2023** |

**Commentry:**
Design of Foul system Houses 17 to 42

**Design Data (IW Code of Practice 2020)**
Dry weather flow (DWF) is taken as 446 litres per dwelling
0.0312 L/Sec per house
P.E. of 2.7 per dwelling
Self Cleaning Velocity - between 0.75m/s and 2.5m/s

| FW MH | CL | IL | Pipe | Length | Gradient | Diameter | Pipe Cover | No. of Houses | Loading | Disharge when flowing Full Flow | Velocity when flowing Full & Half Full |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | mAOD | mAOD | | m | 1 in | mm | | | L/sec | l/s | m/s |
| 2.00 | 53.5 | 51.9 | 2.00 to 2.01 | 23 | 60.1 | 150 | 1.45 | 6 | 0.1872 | 20 | 1.21 |
| 2.01 | 53.5 | 51.517 | 2.01 to 2.02 | 43.6 | 45.2 | 150 | 1.833 | 8 | 0.2496 | 20.3 | 1.22 |
| 2.02 | 52.7 | 50.553 | 2.02 to 2.03 | 13.2 | 21.6 | 150 | 1.997 | 16 | 0.4992 | 39 | 2.25 |
| 2.03 | 52.48 | 49.943 | 2.03 to 2.04 | 47.6 | 150.2 | 225 | 2.312 | 26 | 0.8112 | 45 | 1.15 |
| 2.04 | 52.13 | 49.626 | | | | | | | | | |
| 3.00 | 53 | 51.25 | 3.00 to 2.02 | 36.5 | 52.4 | 150 | 1.6 | 8 | 0.2496 | 25 | 1.45 |
| 2.02 | 52.7 | 50.553 | | | | | | | | | |
| 4.00 | 52.35 | 50.5 | 4.00 to 4.01 | 18 | 50.0 | 150 | 1.7 | 5 | 0.156 | 21 | 1.38 |
| 4.01 | 51.7 | 50.14 | 4.01 to 2.03 | 29.6 | 150.3 | 150 | 1.41 | 10 | 0.312 | 15 | 0.9 |
| 2.03 | 52.48 | 49.943 | | | | | | | | | |

Discharge & Velocity Determined from hydraulic flow charts based on the Colebrook – White equation for calculating transitional flow.
Roughness factor (ks) used as follows: - Foul and combined sewers ks = 1.5mm. Surface water sewers ks = 0.6mm

| TITLE | | Job Reference |
|---|---|---|
| Site at Elm Grove, Crann Ard, Ballynamona, Fermoy, Co. Cork | | 23041 |
| SUBJECT | | Calc. Sheet No |
| Stormwater Calculations | | 1 |
| Calculations by | Checked by | Date |
| CB | WOR | 20/07/2023 |

**Commentry:**
Design of Stormwater system Elm Grove, Crann Ard, Ballynamona, Fermoy

**Design Data (Taken from DOE Site Works 1998)**

| | | |
|---|---|---|
| RF Intensity Roads | 50 | mm/hr |
| Roads in m/s | 0.01388889 | l/s |
| RF Intensity Roofs | 75 | mm/hr |
| Roofs in m/s | 0.02083333 | m/s |

Self Cleaning Velocity - between 0.8m/s and 3m/s

| SW MH | CL | IL | Pipe | Length | Gradient | Diameter | Pipe Cover | No. of Houses | Additional Rd Hard Surface Area | Additional House Hard Surface Area | Total Rd Hard Surface Area | Total House Hard Surface Area | Discharge Required | Disharge when flowing Full Flow | Velocity when flowing Full & Half Full |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mAOD | mAOD | | m | 1 in | mm | | | $m^2$ | $m^2$ | | $m^2$ | l/s | l/s | m/s |
| 2.00 | 53.5 | 52.05 | 2.00 to 2.01 | 20.3 | 150.4 | 225 | 1.225 | 7 | 405.1 | 750.4 | 405.1 | 750.4 | 21.26 | 42 | 1.12 |
| 2.01 | 53.5 | 51.915 | 2.01 to 2.02 | 41.5 | 42.6 | 225 | 1.36 | 8 | 361.9 | 267.1 | 361.9 | 267.1 | 10.59 | 75 | 1.88 |
| 2.02 | 52.7 | 50.94 | 2.02 to 2.03 | 13 | 20.0 | 225 | 1.535 | 16 | 129.9 | 0 | 129.9 | 0 | 1.80 | 125 | 2.95 |
| 2.03 | 52.48 | 50.291 | 2.03 to 2.03a | 48.1 | 250.5 | 300 | 1.889 | 26 | 305.7 | 0 | 305.7 | 0 | 4.25 | 74 | 1.03 |
| 2.03a | 52.2 | 50.099 | 2.03a to 2.04 | 16.7 | 222.7 | 300 | 1.801 | 26 | 163.7 | 0 | 163.7 | 0 | 2.27 | 76 | 1.04 |
| 2.04 | 52.13 | 50.024 | | | | | | | | | | | | | |
| 3.00 | 53 | 51.5 | 3.00 to 2.02 | 36 | 64.3 | 225 | 1.275 | 8 | 527.1 | 994.8 | 527.1 | 994.8 | 28.05 | 70 | 1.61 |
| 2.02 | 52.7 | 50.94 | | | | | | | | | | | | | |
| 4.00 | 52.35 | 50.7 | 4.00 to 4.01 | 18 | 60.0 | 225 | 1.425 | 5 | 397.8 | 850.2 | 397.8 | 850.2 | 23.24 | 68 | 1.59 |
| 4.01 | 51.7 | 50.4 | 4.01 to 2.03 | 27.3 | 250.5 | 225 | 1.075 | 10 | 198 | 412.3 | 198 | 412.3 | 11.34 | 35 | 0.85 |
| 2.03 | 52.48 | 50.291 | | | | | | | | | | | | | |
| | | | | | | | | TOTALS | 2489.2 | 3274.8 | | | | | |

Discharge & Velocity Determined from hydraulic flow charts based on the Colebrook – White equation for calculating transitional flow.
Roughness factor (ks) used as follows: - Foul and combined sewers ks = 1.5mm. Surface water sewers ks = 0.6mm

| | |
|---|---|
| **TITLE**<br>**Site at Elm Grove, Fermoy, Cork** | **Job Reference**<br>**23041** |
| **SUBJECT**<br>**Wastewater Hydraulic Load for Irish Water** | **Calc. Sheet No**<br>**1** |
| **Calculations by**<br>**CB** | **Date**<br>**04/07/2023** |

***DEMAND***

| | | |
|---|---|---|
| Housing Units | 26 | no. |
| Dry Weather Flow (DWF)[1] | 165 | litres/person/day |
| Average Occupancy Ratio[2] | 2.7 | person/unit |
| Total Site Occupancy | 70.2 | people |
| Normal Length of Day | 16 | hours |
| Total Daily Wastewater Discharge | 11,583 | l/day |
| Peak Flow Factor[3] | 6 | |

| | | |
|---|---|---|
| **Post Development Average Discharge** | 0.20 | l/s |
| **Post Development Peak Discharge[4]** | 1.21 | l/s |

**Notes:**

1. Dry Weather Flow (DWF) is 150 litres per head per day along with a 10% unit consumptionallowance in line with Section 3.6.3 of Irish Water Code of Practice
2. Occupancy ratio of 2.7 persons per dwelling from Irish Water Pre-Connection Enquiry Form
3. The Peak Flow factor is taken as per Appendix C: 1.2.5 Domestic Wastewater Peaking Factors
4. The peak discharge is equal to the Total Wastewater Discharge multiplied by the peak flow factor, expressed in litres/second.
5. The average concentrations of wastewater parameters taken from EPA "Wastewater Treatment Manuals, Treatment Systems for Small Communities, Business, Leisure Centres and Hotels".
6. Assumed Maximum concentration is equal to the average concentration plus 2 times the standard deviation (for the 95%ile) taken

| | |
|---|---|
| **TITLE**<br>**Site at Elm Grove, Fermoy, Cork** | **Job Reference**<br>**23041** |
| **SUBJECT**<br>**Water Demand for Irish Water** | **Calc. Sheet No**<br>**1** |
| **Calculations by**<br>**CB** | **Date**<br>**04/07/2023** |

***DEMAND***

| | | |
|---|---|---|
| Housing Units | 26 | no. |
| Daily Demand per Person | 150 | litres/person/day |
| Average Occupancy Ratio[1] | 2.7 | person/unit |
| Total Site Occupancy | 70.2 | people |
| Average Daily Demand | 10,530 | l/day |
| Average Day in Peak Week[2] | 13,163 | l/day |
| Normal Length of Day[3] | 12 | hours |
| Peak Factor[4] | 1.25 | |

| | | |
|---|---|---|
| **Post Development Peak Water Demand[5]** | 0.30 | l/s |
| **Post Development Average Water Demand** | 0.12 | l/s |
| **Normal Demand[6]** | 0.24 | l/s |

**Notes:**

1. Occupancy ratio of 2.7 persons per dwelling from Irish Water Code of Practice
2. Average Day in Peak Week is 1.25 times the average daily demand.
3. Assumed normal demand is the total daily demand during the normal length of day.
4. Peak Factor for pipe sizing from Irish Water Code of Practice.
5. Peak Factor multiplied by Average Day in Peak Week flow
6. Normal demand is the total daily demand during the normal length of day.

# SEPARATORS

A RANGE OF FUEL/OIL SEPARATORS
FOR PEACE OF MIND

Kingspan

Klargester

60 YEARS OF
Expertise &
1955–2015 Innovation

# Separators

## A RANGE OF FUEL/OIL SEPARATORS FOR PEACE OF MIND

Surface water drains normally discharge to a watercourse or indirectly into underground waters (groundwater) via a soakaway. Contamination of surface water by oil, chemicals or suspended solids can cause these discharges to have a serious impact on the receiving water.

**The Environment Regulators, Environment Agency, England and Wales, SEPA, Scottish Environmental Protection Agency in Scotland and Department of Environment & Heritage in Northern Ireland, have published guidance on surface water disposal, which offers a range of means of dealing with pollution both at source and at the point of discharge from site (so called 'end of pipe' treatment). These techniques are known as 'Sustainable Drainage Systems' (SuDS).**

Where run-off is draining from relatively low risk areas such as car-parks and non-operational areas, a source control approach, such as permeable surfaces or infiltration trenches, may offer a suitable means of treatment, removing the need for a separator.

Oil separators are installed on surface water drainage systems to protect receiving waters from pollution by oil, which may be present due to minor leaks from vehicles and plant, from accidental spillage.

Effluent from industrial processes and vehicle washing should normally be discharged to the foul sewer (subject to the approval of the sewerage undertaker) for further treatment at a municipal treatment works.

### SEPARATOR STANDARDS AND TYPES

A British (and European) standard (EN 858-1 and 858-2) for the design and use of prefabricated oil separators has been adopted. New prefabricated separators should comply with the standard.

### SEPARATOR CLASSES

The standard refers to two 'classes' of separator, based on performance under standard test conditions.

### CLASS I

Designed to achieve a concentration of less than 5mg/l of oil under standard test conditions, should be used when the separator is required to remove very small oil droplets.

### CLASS II

Designed to achieve a concentration of less than 100mg/l oil under standard test conditions and are suitable for dealing with discharges where a lower quality requirement applies (for example where the effluent passes to foul sewer).

Both classes can be produced as full retention separators. The oil concentration limits of 5 mg/l and 100 mg/l are only applicable under standard test conditions. It should not be expected that separators will comply with these limits when operating under field conditions.

### FULL RETENTION SEPARATORS

Full retention separators treat the full flow that can be delivered by the drainage system, which is normally equivalent to the flow generated by a rainfall intensity of 65mm/hr.

On large sites, some short term flooding may be an acceptable means of limiting the flow rate and hence the size of full retention systems.



### BYPASS SEPARATORS

Bypass separators fully treat all flows generated by rainfall rates of up to 6.5mm/hr. This covers over 99% of all rainfall events. Flows above this rate are allowed to bypass the separator. These separators are used when it is considered an acceptable risk not to provide full treatment for high flows, for example where the risk of a large spillage and heavy rainfall occurring at the same time is small.

### FORECOURT SEPARATORS

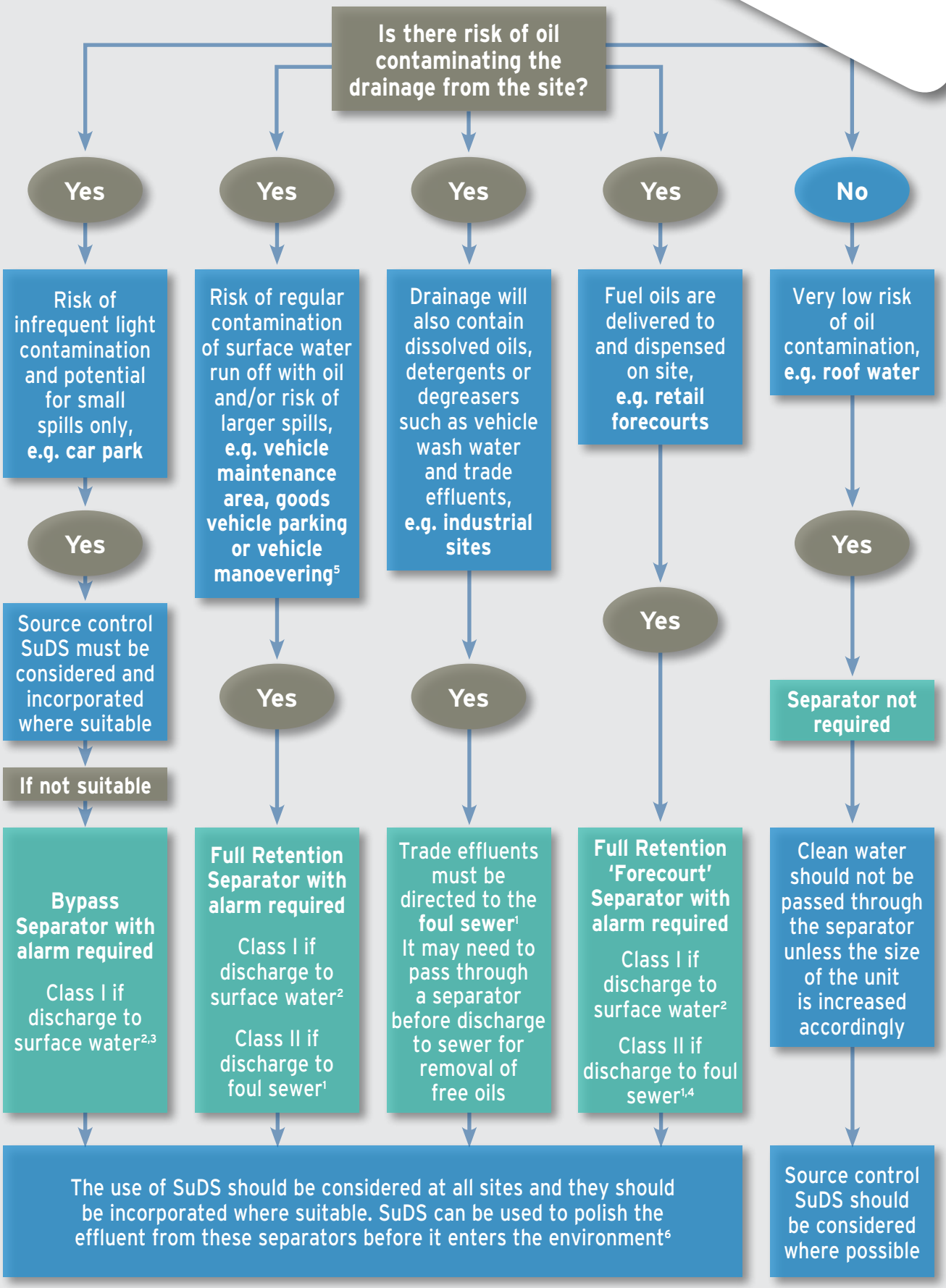
Forecourt separators are full retention separators specified to retain on site the maximum spillage likely to occur on a petrol filling station. They are required for both safety and environmental reasons and will treat spillages occurring during vehicle refuelling and road tanker delivery. The size of the separator is increased in order to retain the possible loss of the contents of one compartment of a road tanker, which may be up to 7,600 litres.

### SELECTING THE RIGHT SEPARATOR

The chart on the following page gives guidance to aid selection of the appropriate type of fuel/oil separator for use in surface water drainage systems which discharge into rivers and soakaways.

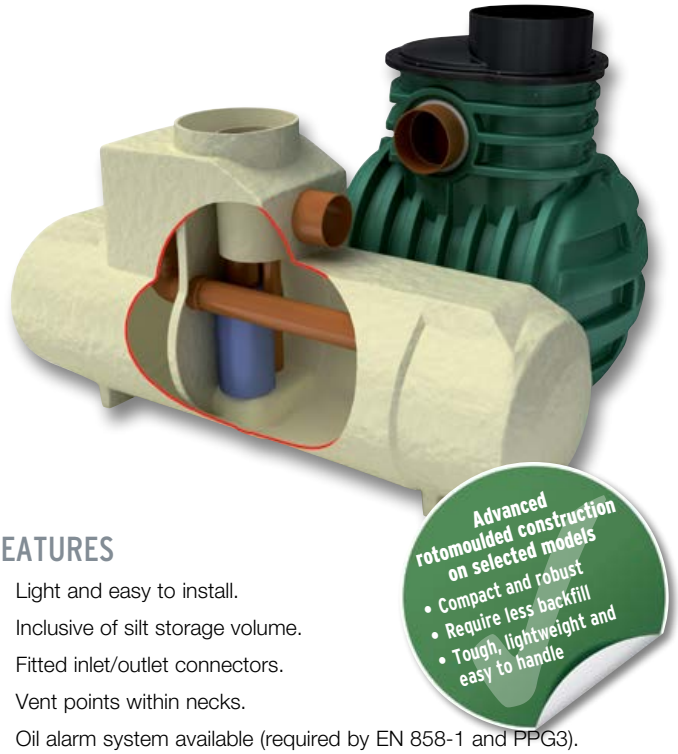
For further detailed information, please consult the Environment Agency Pollution Prevention Guideline 03 (PPG 3) 'Use and design of oil separators in surface water drainage systems' available from their website.

Kingspan Klargester has a specialist team who provide technical assistance in selecting the appropriate separator for your application.




1 You must seek prior permission from your local sewer provider before you decide which separator to install and before you make any discharge.
2 You must seek prior permission from the relevant environmental body before you decide which separator to install.
3 In this case, if it is considered that there is a low risk of pollution a source control SuDS scheme may be appropriate.
4 In certain circumstances, the sewer provider may require a Class 1 separator for discharges to sewer to prevent explosive atmospheres from being generated.
5 Drainage from higher risk areas such as vehicle maintenance yards and goods vehicle parking areas should be connected to foul sewer in preference to surface water.
6 In certain circumstances, a separator may be one of the devices used in the SuDS scheme. Ask us for advice.

# Bypass NSB RANGE




## APPLICATION

Bypass separators are used when it is considered an acceptable risk not to provide full treatment, for very high flows, and are used, for example, where the risk of a large spillage and heavy rainfall occurring at the same time is small, e.g.

- Surface car parks.
- Roadways.
- Lightly contaminated commercial areas.

## PERFORMANCE

Klargester were one of the first UK manufacturers to have separators tested to EN 858-1. Klargester have now added the NSB bypass range to their portfolio of certified and tested models. The NSB number denotes the maximum flow at which the separator treats liquids. The British Standards Institute (BSI) tested the required range of Kingspan Klargester Bypass separators and certified their performance in relation to their flow and process performance assessing the effluent qualities to the requirements of EN 858-1. Klargester bypass separator designs follow the parameters determined during the testing of the required range of bypass separators.

Each bypass separator design includes the necessary volume requirements for:

- Oil separation capacity.
- Oil storage volume.
- Silt storage capacity.
- Coalescer.

The unit is designed to treat 10% of peak flow. The calculated drainage areas served by each separator are indicated according to the formula given by PPG3 NSB = 0.0018A(m2). Flows generated by higher rainfall rates will pass through part of the separator and bypass the main separation chamber.

Class I separators are designed to achieve a concentration of 5mg/litre of oil under standard test conditions.

## FEATURES

- Light and easy to install.
- Inclusive of silt storage volume.
- Fitted inlet/outlet connectors.
- Vent points within necks.
- Oil alarm system available (required by EN 858-1 and PPG3).
- Extension access shafts for deep inverts.
- Maintenance from ground level.
- GRP or rotomoulded construction (subject to model).

To specify a nominal size bypass separator, the following information is needed:-

- The calculated flow rate for the drainage area served. Our designs are based on the assumption that any interconnecting pipework fitted elsewhere on site does not impede flow into or out of the separator and that the flow is not pumped.
- The drain invert inlet depth.
- Pipework type, size and orientation.

### SIZES AND SPECIFICATIONS

| UNIT NOMINAL SIZE | FLOW (l/s) | PEAK FLOW RATE (l/s) | DRAINAGE AREA (m²) | STORAGE CAPACITY (litres) SILT | OIL | UNIT LENGTH (mm) | UNIT DIA. (mm) | ACCESS SHAFT DIA. (mm) | BASE TO INLET INVERT (mm) | BASE TO OUTLET INVERT | STANDARD FALL ACROSS (mm) | MIN. INLET INVERT (mm) | STANDARD PIPEWORK DIA. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NSBP003 | 3 | 30 | 1670 | 300 | 45 | 1700 | 1350 | 600 | 1420 | 1320 | 100 | 500 | 160 |
| NSBP004 | 4.5 | 45 | 2500 | 450 | 60 | 1700 | 1350 | 600 | 1420 | 1320 | 100 | 500 | 160 |
| NSBP006 | 6 | 60 | 3335 | 600 | 90 | 1700 | 1350 | 600 | 1420 | 1320 | 100 | 500 | 160 |
| NSBE010 | 10 | 100 | 5560 | 1000 | 150 | 2069 | 1220 | 750 | 1450 | 1350 | 100 | 700 | 315 |
| NSBE015 | 15 | 150 | 8335 | 1500 | 225 | 2947 | 1220 | 750 | 1450 | 1350 | 100 | 700 | 315 |
| NSBE020 | 20 | 200 | 11111 | 2000 | 300 | 3893 | 1220 | 750 | 1450 | 1350 | 100 | 700 | 375 |
| NSBE025 | 25 | 250 | 13890 | 2500 | 375 | 3575 | 1420 | 750 | 1680 | 1580 | 100 | 700 | 375 |
| NSBE030 | 30 | 300 | 16670 | 3000 | 450 | 4265 | 1420 | 750 | 1680 | 1580 | 100 | 700 | 450 |
| NSBE040 | 40 | 400 | 22222 | 4000 | 600 | 3230 | 1920 | 600 | 2185 | 2035 | 150 | 1000 | 500 |
| NSBE050 | 50 | 500 | 27778 | 5000 | 750 | 3960 | 1920 | 600 | 2185 | 2035 | 150 | 1000 | 600 |
| NSBE075 | 75 | 750 | 41667 | 7500 | 1125 | 5841 | 1920 | 600 | 2235 | 2035 | 200 | 950 | 675 |
| NSBE100 | 100 | 1000 | 55556 | 10000 | 1500 | 7661 | 1920 | 600 | 2235 | 2035 | 200 | 950 | 750 |
| NSBE125 | 125 | 1250 | 69444 | 12500 | 1875 | 9548 | 1920 | 600 | 2235 | 2035 | 200 | 950 | 750 |

Rotomoulded chamber construction  GRP chamber construction  * Some units have more than one access shaft – diameter of largest shown.

# Full Retention NSF RANGE

## APPLICATION

Full retention separators are used in high risk spillage areas such as:

- Fuel distribution depots.
- Vehicle workshops.
- Scrap Yards

## PERFORMANCE

Kingspan Klargester were the first UK manufacturer to have the required range (3-30 l/sec) certified to EN 858-1 in the UK. The NSF number denotes the flow at which the separator operates.

The British Standards Institute (BSI) have witnessed the performance tests of the required range of separators and have certified their performance, in relation to their flow and process performance to ensure that they met the effluent quality requirements of EN 858-1. Larger separator designs have been determined using the formulas extrapolated from the test range.

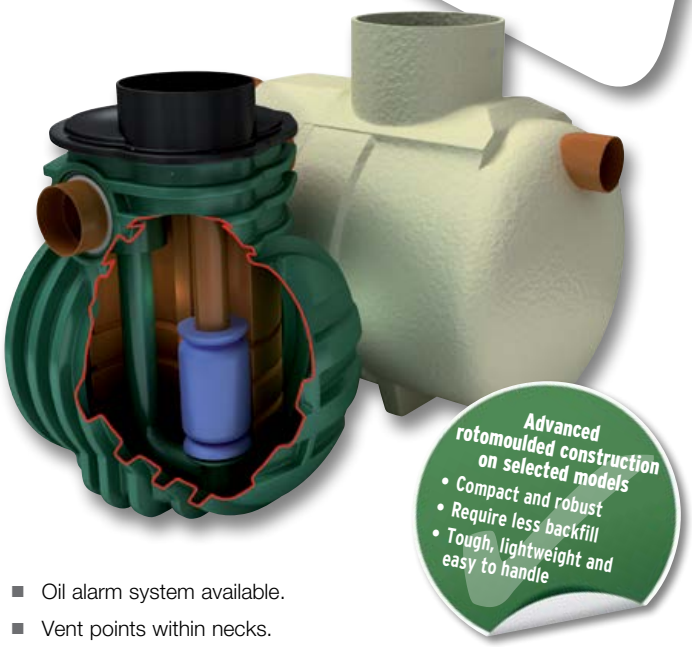
Each full retention separator design includes the necessary volume requirements for:

- Oil separation capacity.
- Silt storage capacity.
- Automatic closure device.
- Oil storage volume.
- Coalescer (Class I units only).

Klargester full retention separators treat the whole of the specified flow.

## FEATURES

- Light and easy to install.
- Class I and Class II designs.
- 3-30 l/sec range independently tested and performance sampled, certified by the BSI.
- Inclusive of silt storage volume.
- Fitted inlet/outlet connectors.




- Oil alarm system available.
- Vent points within necks.
- Extension access shafts for deep inverts.
- Maintenance from ground level.
- GRP or rotomoulded construction (subject to model).

To specify a nominal size full retention separator, the following information is needed:-

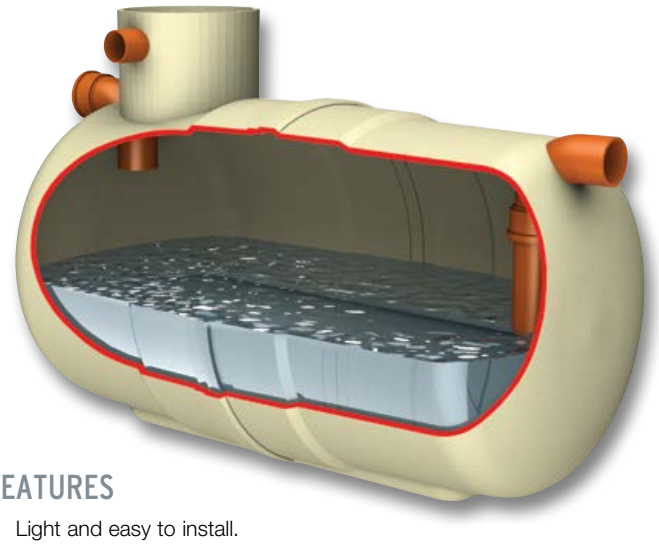
- The calculated flow rate for the drainage area served. Our designs are based on the assumption that any interconnecting pipework fitted elsewhere on site does not impede flow into or out of the separator and that the influent is not pumped.
- The required discharge standard. This will decide whether a Class I or Class II unit is required.
- The drain invert inlet depth.
- Pipework type, size and orientation.

### SIZES AND SPECIFICATIONS

| UNIT NOMINAL SIZE | FLOW (l/s) | DRAINAGE AREA ($m^2$) PPG-3 (0.018) | STORAGE CAPACITY (litres) SILT | OIL | UNIT LENGTH (mm) | UNIT DIA. (mm) | BASE TO INLET INVERT (mm) | BASE TO OUTLET INVERT | MIN. INLET INLET (mm) | STANDARD PIPEWORK DIA. (mm) |
|---|---|---|---|---|---|---|---|---|---|---|
| NSFP003 | 3 | 170 | 300 | 30 | 1700 | 1350 | 1420 | 1345 | 500 | 160 |
| NSFP006 | 6 | 335 | 600 | 60 | 1700 | 1350 | 1420 | 1345 | 500 | 160 |
| NSFA010 | 10 | 555 | 1000 | 100 | 2610 | 1225 | 1050 | 1000 | 500 | 200 |
| NSFA015 | 15 | 835 | 1500 | 150 | 3910 | 1225 | 1050 | 1000 | 500 | 200 |
| NSFA020 | 20 | 1115 | 2000 | 200 | 3200 | 2010 | 1810 | 1760 | 1000 | 315 |
| NSFA030 | 30 | 1670 | 3000 | 300 | 3915 | 2010 | 1810 | 1760 | 1000 | 315 |
| NSFA040 | 40 | 2225 | 4000 | 400 | 4640 | 2010 | 1810 | 1760 | 1000 | 315 |
| NSFA050 | 50 | 2780 | 5000 | 500 | 5425 | 2010 | 1810 | 1760 | 1000 | 315 |
| NSFA065 | 65 | 3610 | 6500 | 650 | 6850 | 2010 | 1810 | 1760 | 1000 | 315 |
| NSFA080 | 80 | 4445 | 8000 | 800 | 5744 | 2820 | 2500 | 2450 | 1000 | 300 |
| NSFA100 | 100 | 5560 | 10000 | 1000 | 6200 | 2820 | 2500 | 2450 | 1000 | 400 |
| NSFA125 | 125 | 6945 | 12500 | 1250 | 7365 | 2820 | 2500 | 2450 | 1000 | 450 |
| NSFA150 | 150 | 8335 | 15000 | 1500 | 8675 | 2820 | 2550 | 2450 | 1000 | 525 |
| NSFA175 | 175 | 9725 | 17500 | 1750 | 9975 | 2820 | 2550 | 2450 | 1000 | 525 |
| NSFA200 | 200 | 11110 | 20000 | 2000 | 11280 | 2820 | 2550 | 2450 | 1000 | 600 |

Rotomoulded chamber construction  GRP chamber construction

# Washdown & Silt



## APPLICATION

This unit can be used in areas such as car wash and other cleaning facilities that discharge directly into a foul drain, which feeds to a municipal treatment facility.

If emulsifiers are present the discharge must not be allowed to enter an NS Class I or Class II unit.

- Car wash.
- Tool hire depots.
- Truck cleansing.
- Construction compounds cleansing points.

## PERFORMANCE

Such wash down facilities must not be allowed to discharge directly into surface water but must be directed to a foul connection leading to a municipal treatment works as they utilise emulsifiers, soaps and detergents, which can dissolve and disperse the oils.

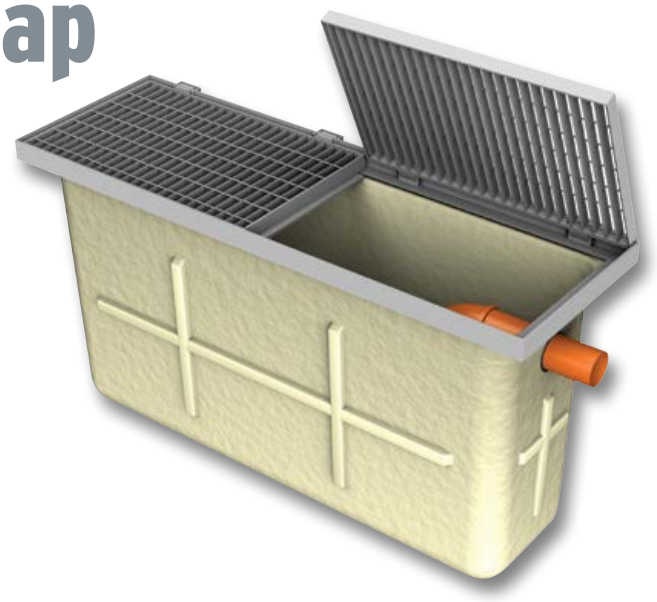
## FEATURES

- Light and easy to install.
- Inclusive of silt storage volume.
- Fitted inlet/outlet connectors.
- Vent points within necks.
- Extension access shafts for deep inverts.
- Maintenance from ground level.

### SIZES AND SPECIFICATIONS

| REF. | TOTAL CAPACITY (litres) | MAX. REC. SILT | MAX. FLOW RATE (l/s) | LENGTH (mm) | DIAMETER (mm) | ACCESS SHAFT DIA. (mm) | BASE TO INLET INVERT (mm) | BASE TO OUTLET INVERT (mm) | STANDARD FALL ACROSS UNIT (mm) | MIN. INLET INVERT (mm) | STANDARD PIPEWORK DIA. (mm) | APPROX EMPTY (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W1/010 | 1000 | 500 | 3 | 1123 | 1225 | 460 | 1150 | 1100 | 50 | 500 | 160 | 60 |
| W1/020 | 2000 | 1000 | 5 | 2074 | 1225 | 460 | 1150 | 1100 | 50 | 500 | 160 | 120 |
| W1/030 | 3000 | 1500 | 8 | 2952 | 1225 | 460 | 1150 | 1100 | 50 | 500 | 160 | 150 |
| W1/040 | 4000 | 2000 | 11 | 3898 | 1225 | 460 | 1150 | 1100 | 50 | 500 | 160 | 180 |
| W1/060 | 6000 | 3000 | 16 | 4530 | 1440 | 600 | 1360 | 1310 | 50 | 500 | 160 | 320 |
| W1/080 | 8000 | 4000 | 22 | 3200 | 2020 | 600 | 2005 | 1955 | 50 | 500 | 160 | 585 |
| W1/100 | 10000 | 5000 | 27 | 3915 | 2020 | 600 | 2005 | 1955 | 50 | 500 | 160 | 680 |
| W1/120 | 12000 | 6000 | 33 | 4640 | 2020 | 600 | 2005 | 1955 | 50 | 500 | 160 | 770 |
| W1/150 | 15000 | 7500 | 41 | 5435 | 2075 | 600 | 1940 | 1890 | 50 | 500 | 160 | 965 |
| W1/190 | 19000 | 9500 | 52 | 6865 | 2075 | 600 | 1940 | 1890 | 50 | 500 | 160 | 1200 |

# Car Wash Silt Trap



## APPLICATION

Car Wash silt trap is designed for use before a separator in car wash applications to ensure effective silt removal.

## FEATURES

- FACTA Class B covers.
- Light and easy to install.
- Maintenance from ground level.

# Forecourt

## APPLICATION

The forecourt separator is designed for installation in petrol filling station forecourts and similar applications. The function of the separator is to intercept hydrocarbon pollutants such as petroleum and oil and prevent their entry to the drainage system, thus protecting the environment against hydrocarbon contaminated surface water run-off and gross spillage.

## PERFORMANCE

Operation ensures that the flow cannot exit the unit without first passing through the coalescer assembly.

In normal operation, the forecourt separator has sufficient capacity to provide storage for separated pollutants within the main chamber, but is also able to contain up to 7,600 litres of pollutant arising from the spillage of a fuel delivery tanker compartment on the petrol forecourt. The separator has been designed to ensure that oil cannot exit the separator in the event of a major spillage, subsequently the separator should be emptied immediately.

## FEATURES

- Light and easy to install.
- Inclusive of silt storage volume.
- Fitted inlet/outlet connectors.
- Vent points within necks.
- Extension access shafts for deep inverts.
- Maintenance from ground level.
- Class I and Class II design.
- Oil storage volume.
- Coalescer (Class I unit only).
- Automatic closure device.
- Oil alarm system available.

## INSTALLATION

The unit should be installed on a suitable concrete base slab and surrounded with concrete or pea gravel backfill. See sales drawing for installation.

If the separator is to be installed within a trafficked area, then a suitable cover slab must be designed to ensure that loads are not transmitted to the unit.

The separator should be installed and vented in accordance with Health and Safety Guidance Note HS(G)41 for filling stations, subject to Local Authority requirements.

### SIZES AND SPECIFICATIONS

| ENVIROCEPTOR CLASS | TOTAL CAP. (litres) | DRAINAGE AREA ($m^2$) | MAX. FLOW RATE (l/s) | LENGTH (mm) | DIAMETER (mm) | ACCESS SHAFT DIA. (mm) | BASE TO INLET INVERT (mm) | BASE TO OUTLET INVERT (mm) | STD. FALL ACROSS UNIT (mm) | MIN. INLET INVERT (mm) | STD. PIPEWORK (mm) | EMPTY WEIGHT (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I | 10000 | 555 | 10 | 3963 | 1920 | 600 | 2110 | 2060 | 50 | 400 | 160 | 500 |
| II | 10000 | 555 | 10 | 3963 | 1920 | 600 | 2110 | 2060 | 50 | 400 | 160 | 500 |
| I | 10000 | 1110 | 20 | 3963 | 1920 | 600 | 2110 | 2060 | 50 | 400 | 200 | 500 |
| II | 10000 | 1110 | 20 | 3963 | 1920 | 600 | 2110 | 2060 | 50 | 400 | 200 | 500 |

# Alarm Systems


British European Standard EN 858-1 and Environment Agency Pollution Prevention Guideline PPG3 requires that all separators are to be fitted with an oil level alarm system and that it should be installed and calibrated by a suitably qualified technician so that it will respond to an alarm condition when the separator requires emptying.

- Easily fitted to existing tanks.
- Excellent operational range.
- Visual and audible alarm.
- Additional telemetry option.

## PROFESSIONAL INSTALLERS

Kingspan Klargester Accredited Installers
Experience shows that correct installation is a prerequisite for the long-lasting and successful operation of any wastewater treatment product. This is why using an installer with the experience and expertise to install your product is highly recommended.

Services include :

- Site survey to establish ground conditions and soil types
- Advice on system design and product selection
- Assistance on gaining environmental consents and building approvals
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- Connection to discharge point and electrical networks
- Waste emptying and disposal

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- OIL/WATER SEPARATORS
- BELOW GROUND STORAGE TANKS
- GREASE & SILT TRAPS

## RAINWATER SOLUTIONS

- BELOW GROUND RAINWATER HARVESTING SYSTEMS
- ABOVE GROUND RAINWATER HARVESTING SYSTEMS


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