

# Agreement for Adoption of Development Sewers, Lateral Drains and Associated Works communicating with a public sewer in a New Development (Article 161) Guidance Notes

- Please note**
- **Current legislation is [Water and Sewerage Services \(Northern Ireland\) Order 2006, as amended Water and Sewerage Services Act \(Northern Ireland\) 2016](#). Under the [Water and Sewerage Services Act \(Northern Ireland\) 2016](#). It is a legal requirement that all sewers, from 23rd May 2016 be offered to Northern Ireland Water for adoption under Article 161 procedures.**
  - **Any person proposing to connect a sewer to the public sewer will require written approval to connect, on the basis of a mandatory Article 161 Agreement, for the future Adoption of the Associated Drainage issued and authorised by Northern Ireland Water.**
  - **No watermains will be laid on site until you have applied for an Article 161 agreement which covers the section of the development where the watermain is to be laid. Watermains laid will not be connected to Northern Ireland Water's live main until an Article 161 Agreement is in place.**
  - **[Northern Ireland Water are no longer accepting hard / paper copy Article 161 applications . All applications must be submitted via the Northern Ireland Water Self Service Portal.](#)**

Northern Ireland Water is responsible for the wastewater services of over 650,000 customers. Any new sewers offered for adoption in residential / non-residential developments must comply with the requirements of the 'Sewers for Adoption (NI) Current Edition'.

Where the Article 161 application is for a site that is to be served by outfall sewers requisitioned from Northern Ireland Water (Article 154) it should be noted that in some cases release of the Article 161 Agreement will not be possible until the design of the requisitioned sewer is complete. Design of the requisitioned sewer can take on average 8 to 9 months and you are advised to consider this when making application for requisition of outfall sewers or for the approval of sewers, lateral drains and associated works being considered for adoption in a new development.

## Applying for the approval of a new sewer to be adopted

Until you have completed a Pre-Development Enquiry, or where required a Waste Water Impact Assessment, you will not be able to apply for an Article 161 assessment. When you have completed the Pre-Development process, which will identify a point of connection, you must apply for approval of any drainage system serving 2 or more properties, inclusive of lateral drains, for adoption at a future date under Article 161. **Any person proposing to connect a sewer to the public sewer will require formal approval to connect, on the basis of a mandatory Sewer Adoption Agreement (Article 161).**

**Please note that the proposed development should have valid full planning permission prior to making a submission via the Self Service Portal.**

**If it is proposed that Northern Ireland Water are to complete the connection under Article 163**

- you will be required to make the Article 161 application for assessment and the drainage design agreed in principle, prior to the connection being approved.
- the Article 163 connection should be completed in advance of the Article 161 Agreement being authorised.

You are required to submit an Article 161 Application via the Self Service Portal where you will be guided through what documentation is a mandatory requirement. A list of the required documentation is available at 'Appendix A' below.

**The design of the drainage systems must be in accordance with the 'Sewers for Adoption (NI) Current Edition'**

**Please note that if the proposed drainage traverses an Adjoining Owners land, the third party land owner will be required to sign the Article 161 Agreement agreeing to said drainage to be laid through their land and the associated protected strip once adopted. All signatures will be via the Adobe Sign electronic process.**

**Land drainage and groundwater will not be permitted to discharge into the public sewerage systems either directly or via private drains or sewers.**

The use of a Wastewater Pumping Station will be considered if no practical gravity solution is applicable. Please refer to [www.niwater.com/services-for-developers\\_multi-unit-developments\\_wastewater-services\\_further-guidance-notes/](http://www.niwater.com/services-for-developers_multi-unit-developments_wastewater-services_further-guidance-notes/) for the current Wastewater Pumping Station specification.

The use of a Wastewater Treatment Works will be considered if required as a result of the outcome of a Waste Water Impact Assessment. Please refer to [developerservices@niwater.com](mailto:developerservices@niwater.com) for the current Wastewater Treatment Works specification.

Under the Street Works (NI) Order 1995 a Street Works Licence is required by any person or organisation who wishes to place or retain apparatus in a street. This may be applicable from the boundary of the site to the public sewer or watercourse.

- If the connection is proposed within an adopted road/street the excavation/reinstatement can be completed by Northern Ireland Water **or an approved contractor, who must have a street works licence issued from DfI Roads for the location.**
- Northern Ireland Water is an approved Utility Contractor and can carry out the full service connection including the excavation and reinstatement, the cost of this service will be included in the quotation, via the Self Service Portal (New Connections). **If it is proposed that Northern Ireland Water are to complete the connection under Article 163, this must be completed in advance of the Article 161 Agreement being authorised.**
- Northern Ireland Water, under the prescribed charges, will make the connection to the sewer, only after the mandatory Sewer Adoption (Article 161) has been applied for and under assessment by Northern Ireland Water, prior to any connections being made, and lay the associated sewers and manholes within the street.

It should be noted that the applicant will be charged for reassessing submissions that do not meet the specific standards. A re-submission fee will be charged for:

- Submission of amended designs.
- Failure to submit drawings incorporating amendments previously requested by Northern Ireland Water.
- There is no fee for the first re-submission of the design drawings that incorporate previously requested amendments, however there will be a fee for every re-submission thereafter.
- For an amendment to any details noted on an issued Article 161 Agreement.

**It is an offence to connect to the public sewer without first obtaining the consent of Northern Ireland Water.**

The drainage work should not commence on site until an authorised Article 161 Agreement is in place, any appropriate charges paid and any other conditions complied with. However if any drainage is laid in advance, it is at the developer's risk as it may need replaced to receive Northern Ireland Water approval.

**Consent to Discharge**

Where the drainage for a site cannot be achieved by means of a gravity connection you should consider the installation of a Wastewater Pumping Station. The use of a Wastewater Pumping Station should be agreed with Northern Ireland Water at an early design stage. Where it is determined that a Wastewater Pumping Station is required, you must apply to Northern Ireland Environment Agency (NIEA) for a 'consent to discharge' allowing sufficient time for the Water Order Consent to be evaluated and issued by NIEA. You must not agree to any conditions without first obtaining notification from Northern Ireland Water that a Wastewater Pumping Station is required to serve the proposed site. A Water Order Consent from NIEA is essential prior to the application for an Article 161 Agreement if a Wastewater Pumping Station is required. If the emergency overflow discharges to a watercourse, a consent to discharge from DfI Rivers will also be required.

Where, as a result of a Waste Water Impact Assessment, it has been determined that a Wastewater Treatment Works is required, you must apply to Northern Ireland Environment Agency (NIEA) for a 'consent to discharge' allowing sufficient time for the Water Order Consent to be evaluated and issued by NIEA. A Water Order Consent from NIEA is essential prior to the application for an Article 161 Agreement if a Wastewater Treatment Works is required. If the emergency overflow discharges to a watercourse, a consent to discharge from DfI Rivers will also be required.

Northern Ireland Water legislation permits the refusal of surface water connections to the public sewer network, and the applicant to consider alternative means for disposal. If a 'consent to discharge' is required for the discharge from surface water sewers, that are to be offered for adoption, to a watercourse the developer must make an initial enquiry with DfI Rivers Agency to obtain their approval, prior to the submission of the Article 161 application. A valid copy of the consent must be uploaded with the application.

In the event of surface water discharging to a river or other watercourse through an outfall, the riparian owner will be required to grant legal easements to Northern Ireland Water. If the developer is the riparian owner and is already entering into a Deed of Grant of Easement with Northern Ireland Water in respect of sewers being laid in land which is to remain private, the rights to discharge may be included in the Deed of Grant. If not, a Deed of Grant is to be entered into by the riparian owner in order to grant rights to discharge to the river or other watercourse via the outfall. They will be required to sign the Article 161 Agreement as a third party land owner.

If the proposed discharge location is in the control of or regulated by a body such as a Crown Estates, although the developer may have obtained the consent of the associated body to construct the works, Northern Ireland Water will also need legal easements as it does not have statutory powers to discharge through the outfall. A valid copy of the consent must be uploaded with the application.

The developer will be responsible for the legal costs and reasonable expenditure of Northern Ireland Water in connection with the grant of legal easements.

### **Highway Drainage**

The developers' attention is drawn to Article 172 of the Water and Sewerage Services (Northern Ireland) Order 2006 as amended, Water and Sewerage Services Act (Northern Ireland) 2016, which states that a public sewer may be used by agreement for discharge of highway drainage. However, 'Sewers for Adoption' states that the sewerage undertaker is not obliged to accept highway drainage to the existing public sewerage system. In areas where the existing sewer network is known to be already overloaded, or where there are viable alternatives to using the existing sewer network to serve highway drainage, the developer will be required to investigate alternative methods of disposing of highway drainage and runoff with the relevant Highway Authority.

### **Article 161 Applications (60 working day timescale)**

Developers are required to submit the Article 161 Application via the Self Service Portal.

The submitted application will have a high level triage assessment and following successful completion will be issued with a request for payment of the application fee. The applicant will not be able to amend an application once it has been submitted, however if it is no longer required the applicant will have the opportunity to request for it to be withdrawn. No application fee refunds will be granted for a withdrawn application. The completed application will be checked for compliance with the requirements of the 'Sewers for Adoption (NI) Current Edition'.

When all necessary information is provided to enable us to process your application, you will be notified via the Self Service Portal of:

- the acceptability of the proposal, and any conditions that may be applied;
- the inspection fee required prior to construction. This will cover our costs associated with administration / legal fees, inspection of the works;
- the cost of the Northern Ireland Water Bond Surety;
- the inspection fees, bond surety and signatures will all be requested / completed via the Self Service Portal.

Details of Northern Ireland Water charges can be found in the current Scheme of Charges. It should be noted that the fees quoted will remain valid for a period of 13 weeks from the date issued. If not accepted by receipt of the signed agreement and payment within this time frame, the quotation may be subject to revision, to meet changes in the Scheme of Charges, other financial influences, processes or specifications within the company.

Northern Ireland Water is required to give you a decision as to whether your application is being granted or refused, or the conditions of approval.

### **Notification of Intention to Construct Works**

Before commencement of the works you must have submitted all necessary documentation and payments to allow for the Authorising of the Article 161 Agreement by Northern Ireland Water and as a legal agreement entered into by both parties, Northern Ireland Water must be notified at least five days, via the Self Service Portal, in advance of the commencement date. During

construction Northern Ireland Water, Developer Services may visit your site at their discretion.

***If construction of sewers commences prior to the authorisation of the Article 161 Agreement by Northern Ireland Water, the developer continues at their own risk as they may need replaced to receive Northern Ireland Water approval.***

***Connection to a public sewer, through an Article 163 by Northern Ireland Water, will not be approved until the Article 161 has been applied for and the drainage design agreed in principle by Northern Ireland Water.***

**Please note that:**

- ***once the Article 161 Agreement is authorised with the Bond Surety in place it is non-transferable. If a site is sold on to another developer, Northern Ireland Water will not release the original Bond Surety until such times as the new Developer has entered into an Article 161 Agreement with Northern Ireland Water and set up their Bond Surety.***
- ***if there is any deviation from the authorised design, the developer will be required to liaise with the Northern Ireland Water Technical Adviser, via the Self Service Portal, to discuss the proposed changes prior to construction. This change request may incur an additional fee.***

### **Notice of Completion and Application for 50% Reduction of the Northern Ireland Water Bond Surety (OPTIONAL STAGE in the adoption process - 60 working day timescale)**

When the sewer installation works are substantially complete, including construction of all sewers and manholes etc in keeping with the Northern Ireland Water approved drainage layout, and where line and level of the development roads are established, but the development drainage system is not yet eligible for an application for a Preliminary Certificate of Completion you may apply for a 50% reduction of the Northern Ireland Water Bond Surety. **Please note that a 50% bond reduction can not be considered for a site that incorporates a Wastewater Pumping Station, Wastewater Treatment or Geocellular Structure.** You should submit the application via the Self Service Portal (50% adoption). If it is determined that the development is eligible for consideration for a Preliminary Certificate of Completion the 50% Bond Reduction Application will be rejected. You will be asked to confirm whether the drainage has been laid in accordance with the approved drainage layout. You should submit all of the information and documentation requested on the Northern Ireland Self Service Portal when submitting the application.

- a copy of the as constructed drainage layout will be required ***if the drainage has not been laid in accordance with the approved drainage layout.***  
All revisions must have been agreed with Northern Ireland Water prior to or during construction and a note added to the revised drawing indicating who within Northern Ireland Water the revisions were agreed, and on what date. It is not necessary to include a manhole schedule if the final wearing course has not been laid with the manhole covers set accordingly.
- a recent relevant CCTV survey and associated report must be uploaded to the separate Northern Ireland Water Sharepoint / Extranet site and the associated link to the Sharepoint / Extranet folder must be included within the application. If you do not have access to this please contact [developerservices@niwater.com](mailto:developerservices@niwater.com) to request the documentation to apply for the associated licence / permission.

Northern Ireland Water will contact the developer to arrange a mutually agreed suitable time to allow the flush test to be completed (this must be witnessed by Northern Ireland Water personnel) and to complete the inspection. The developer should supply the personnel to lift the manhole covers as required. If after the inspection and witnessing of the flush test we are satisfied that the work has been constructed to the approved standard, and any identified remedial works rectified, we will issue a notification stating that the '50% Reduction of the Northern Ireland Water Bond Surety' has been granted and the Bond provider notified. If it is a Cash Bond, the developer will receive 50% of the bond value in due course.

### **Notice of Completion and Application for Preliminary Certificate of Completion (60 working day timescale)**

When the works are complete a minimum of 51% of the premises served by the sewers are occupied (allowing for all sewer lines to be live), you are required to submit an application via the Self Service Portal (Preliminary Adoption) for the associated site. You are required to submit an application. The manhole schedule should detail the manhole reference, manhole diameter, cover level, invert level, downstream pipe diameter and, downstream pipe length. An Article 161 Adoption Developer Checklist is available in 'Appendix C' listing elements that should be checked prior to making an adoption application.

Northern Ireland Water will contact the developer to arrange a mutually suitable time to complete the inspection, where the developer should supply the personnel to lift the manhole covers as required. If after the inspection we are satisfied that the work has been constructed to the approved standard and any identified remedial works rectified, you will be notified via the Self Service Portal of the issuing of the Preliminary Certificate of Completion. The Bond provider will also be notified. If it is a Cash Bond, the developer will receive the associated bond value in due course.

The sewers, lateral drains and associated works remains the responsibility of the developer for a maintenance period of a minimum of 12 months and during this period you must carry out and pay for any repairs or maintenance. Suitably qualified personnel should regularly maintain Pumping Stations and Wastewater Treatment Works in accordance with the equipment manufacturer's specification.

### **CCTV Survey**

When submitting the application for Preliminary Certificate of Completion of the sewers, and if you have completed a CCTV survey, to validate whether the constructed drainage has no defects, please upload a recent relevant CCTV survey and associated report to the separate Northern Ireland Water Sharepoint / Extranet site and the associated link to the Sharepoint / Extranet folder within the application. If you do not have access to this please contact [developerservices@niwater.com](mailto:developerservices@niwater.com) to request the documentation to apply for the associated licence / permission.

### **Health and Safety Plan/CDM Regulations**

The developer's Health and Safety Plan, prepared in accordance with the Construction (Design and Management) (Northern Ireland) Regulations 2015, may be required, if you are aware of any issues that may affect Northern Ireland Water future maintenance of the associated drainage, to be submitted no later than 8 weeks before the end of the maintenance period. This will include all appropriate certificates/manuals etc.

### **Final Inspection / Adoption (60 working day timescale)**

At the end of the maintenance period, it is no longer a requirement to submit an application for Final Adoption, as you will receive a notification via the Self Service Portal, of Northern Ireland Water's intention to arrange a mutually suitable date / time for inspection. The developer should supply the personnel to lift the manhole covers as required.

If your development drainage layout includes a Wastewater Pumping Station or Wastewater Treatment Works, you must provide an Asset Date Return (BUDI Return) before a Final Adoption Certificate can be processed / released. The BUDI Return should be supplied by the company responsible for the M&E provision, where they have previously been trained by Northern Ireland Water in the upload of the relevant data. You should provide the name of the Northern Ireland Water Technical Adviser for your site to the company who is completing the BUDI Return. The BUDI Return must include all Processes, Units, Assets and Components on the site and follow Northern Ireland Water's 'C001 Code of Practice for Submitting Asset Records', NIW's 'C003 Asset Tagging Guidelines' and NIW's Asset Data Hierarchy 'ADH Definitions' guidance document.

If outstanding works, and any outstanding issues, such as completion of land transfer or easement agreements, are completed a Final Certificate of Adoption will be issued via the Self Service Portal and the remainder of the bond released. The bond provider will also be notified. If it is a Cash Bond, the developer will receive the associated bond value in due course.

When the final certificate of adoption has been authorised by Northern Ireland Water the maintenance responsibility and ownership of the associated drainage system hereby transfers to Northern Ireland Water.

Should you require any further information or assistance please contact Developer Services Coordination Team:

**Developer Services Servicing Team**

**Northern Ireland Water**

**Tel:** 03458 770 003

**Email:** [developerservices@niwater.com](mailto:developerservices@niwater.com)

**For more information on how Northern Ireland Water lawfully processes personal data please view our Privacy Notice at;**

<https://www.niwater.com/privacy/>

# Article 161- Self Service Portal

## Required documents

### Drainage Approval

**Site Location Plan** - 1:1250 / 1:2500 Map showing the site boundary outlined in red, any other land owned by the Developer outlined in blue and any public right of way outlined in green.

**Greenland Map** - 1:1250 / 1:2500 Map showing the area of land owned by the Developer, where drainage will be laid, outlined in green.

**Stat Charges Map** - 1:1250 / 1:2500 Map showing the area of land served by the drainage constructed by the Developer (inclusive of third party lands) outlined in red.

**Land Registry Map** - to be dated within 3 months prior to date of application for the Article 161.

**Land Registry Folio** - to be dated within 3 months prior to date of application for the Article 161.

**Drainage Layout** - proposed drainage layout, with drainage being offered for consideration colour coded as per the Sewers for Adoption NI current edition.

**Drainage Long Sections** - Levels to Ordnance Datum (Belfast).

**Flow Control Manhole Detail** - where applicable.

**Hydraulic Calculations** - In Causeway Flow (.pfd) or Microdrainage (.mdx) format and in accordance with NIW Sewers for Adoption (NI) current edition. No other format will be accepted.

**Drainage Area Catchment Plan** - to indicate contributing areas for each leg of storm sewer.

**Geocellular Tank Design** - where applicable. (see 'Appendix B' below for checklist).

**Pumping Station Design** - where applicable. Including Layout, Sections, Panel Drawing and Pump Selection in accordance with the current Pumping Station Specification.

**Treatment Works Design** - where applicable. In accordance with the current Wastewater Treatment Works Specification.

**Consent to Discharge** - where applicable, if it is proposed to discharge the storm drainage to the sea or a lough. Consent is required from the associated governing body.

**Schedule 6 Discharge Consent** - where applicable, if the proposed storm drainage is proposed to discharge to a watercourse. Consent is required from DfI Rivers.

**Streetworks License** - where applicable. Consent is required from DfI Roads.

**NIEA Water Order Consent** - where applicable, for proposed Wastewater Pumping Stations or Wastewater Treatment Works.

**Building Control Approval** - where applicable, if the storm runoff from individual properties are proposed to discharge to individual / private soakaways.

### Drainage Adoption

**As Constructed Drainage layout** - to include the drainage covered under the Article 161 Agreement and Manhole schedule, with Cover levels and invert levels to Ordnance Datum (Belfast).

**As Constructed Wastewater Pumping Station or Wastewater Treatment Works WPS / WWTW Site layout** - where applicable, to include the Operations & Maintenance Manual.

**ACE Map** - required for a Wastewater Pumping Station or Wastewater Treatment Works, indicating the boundary which will form part of land transfer procedures, with the land to be transferred to be outlined in red and right of way outlined in yellow.

**Asset Records Return (BUDI Return)** - where applicable, for a Wastewater Pumping Station or Wastewater Treatment Works, to be completed by the M&E provider prior to final adoption.

**CCTV Survey & Report** - a link to a recent, relevant CCTV survey and associated report, by a Northern Ireland Water approved CCTV provider must be included within the application, after it has been checked for completeness and that there are no defects.

## Appendix B NI Water - Geocellular Attenuation Storage Check List

CHECK ITEM	YES	NO
Is the proposed Geocellular Attenuation Tank to be constructed within 3m depth below finished ground levels at any point?		
Is the proposed Geocellular Attenuation Tank to be constructed below non-trafficked area?		
Is the ground water table minimum 1m below invert level of the tank?		
Has proposed Geocellular Attenuation Tank a rectangular shape?		
Is the proposed system designed as on-line or off-line parallel format?		
Is the proposed Geocellular Attenuation Tank to be constructed more than $h^* + 2m$ away from foundation or trafficked/loaded pavements?		
Is the proposed Geocellular Attenuation Tank to be constructed more than $h^* + 10m$ away from sloping ground or stockpiles?		
Is the proposed Geocellular Attenuation Tank to be constructed more than $h^* + 5D^{**}$ away from piles supporting vertical loadings and $h^* + 8D^{**}$ for piles supporting horizontal loadings?		
Is the proposed Geocellular Attenuation Tank to be constructed more than $h^* + 2.14H^{***}$ away from the front of any retaining walls?		
Is the appropriate ventilation provided to the Geocellular Attenuation Tank? (Typically 110mm dia vent per 7500m <sup>2</sup> catchment area)		
Is the proposed system provided with maintenance provisions allowing for inspection and cleaning at minimum 15m intervals?		
Is the proposed system equipped with silt interception sized to allow for loadings described by Table 8.1 CIRIA C737?		
Are inlet and outlet pipework arrangements constructed with minimum 150mm dia pipes and providing unrestricted flow?		
Is the system provided with an appropriately sized overflow protecting the site from potential flooding in case the control device is blocked?		
Is the proposed Geocellular Attenuation Tank and all connections sealed with the hot-jointed impermeable heavy duty geo-membrane minimum 1mm thickness installed by certified contractor (UKCAS Certificate Scheme for Welding and Inspection Personnel)?		
Is the proposed Geocellular Attenuation Tank protected by geotextile fleece (minimum 300g/mm <sup>2</sup> ) and minimum 100mm protective layer of sand or non-angular gravel?		

$h^*$  is depth of tank installation  
 $D^{**}$  is pile diameter  
 $H^{***}$  is the depth of the retaining wall

# Appendix C - Article 161 Adoption Developer Checklist



Site Ref:

Manhole Ref:

Site Address / Name:

Checked by:

Date checked:

Please refer to Sewers for Adoption (NI) Current Edition			Tick if complete
<b>GENERAL ITEMS</b>			
Dwelling occupancy rate	Over 50% of total houses to be constructed	<b>If occupancy rate is not met do not apply</b>	
Road and footpath surfaces	Minimum base coat required on all surfaces		
<b>COVER &amp; OPENING</b>			
Cover	675mm x 675mm	In line with opening in the cover slab	
	BS EN 124 Class D400	For roads & pedestrian zones bearing traffic	
	BS EN 124 Class B125	For footways, verge & gardens etc	
Brick	Class "B" engineering brick or precast or concrete risers		
	1 to 4 rows	Ensure when using 1 or 4 rows of brick to meet criteria under ladders and steps	
Cover slab opening	675x675mm	Cover slab to be set 230mm from edge of manhole rings	
<b>RINGS</b>			
Diameter	1200 min.	For large diameter rings their size should be 900mm larger than the diameter of the pipe.	
Joints	Joints between all units (slabs/rings) should be sealed	Manholes chambers should not have leaks or noticeable weeps.	
Rings	Should not be cracked / broken		
	Lifting eyes	Seal with mortar	
<b>LADDER &amp; STEPS</b>			
Dimensions	Distance to top step from ground level 675mm max		
	Minimum distance from ring to tread 230mm		
	Maximum distance between treads to be 300mm		
Ladder	Required when ground level to benching is 3 meters or greater.		
	No steps required where invert is 1200mm or less		
<b>BENCHING &amp; CHANNEL</b>			
Min width of benching	500mm	Side for steps / ladder	
	225mm	Other side	
Benching gradient	Between 1:10 & 1:30	Benching to be rubbed up smooth finish	
Channel opening	Channel opening to be 100mm minimum from wall	Main channel to be cut half channel	
Channel material	Preformed uPVC winged channels		
	For concrete pipelines cut pipes may be used	For large diameter channels may be formed in-situ	
Lateral connections	Lateral connections to be cut to half channel up to a minimum of 200mm from manhole wall		
	Connections to main channel should be brought in at half channel level	Connection to be in direction of flow and should not extend into the channel	
Backdrop	Rodding eyes should be cut flush to the wall		
<b>OTHER ITEMS</b>			
Toe hold	Required when channel is greater than or equal to 600mm		
Safety chain	Required when channel is greater than or equal to 600mm	Hang chain at 10 and 2 o'clock position Chain to hang to half depth of pipe	
Outfalls	Flap Valve installed, wing wall constructed	Discharge to be in direction of flow	