REPORT ON: **Planning Application - New Library Boyle**

CLIENT: **Roscommon CoCo**

LOCATION: **Boyle, Co. Roscommon.**

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Report No.21023-KCE-RP-C-00-0001

Planning Proposal New Library Boyle

PLANNING APPLICATION

Document Title: Planning Proposal New Library Boyle

Document Ref(s): 21023-KCE-RP-C-00-0001

Date	Edition/Rev	Status	Originator	Checked	Approved
24th November 2021	P01	Planning	N Murphy	J. Killian	J. Killian
02nd February 2022	P02	Planning	N Murphy	J. Killian	J. Killian

Contents:

1 Introduction to Drainage

The development will consist of the construction of a new Library building behind the existing Royal Hotel in Boyle, Co. Roscommon along with all ancillary site works.

1.1 Site Location

The site is located to the rear of the existing Royal Hotel in Boyle, Co. Roscommon as shown on the site location map below. The site is adjacent to the River Boyle to the north.

Figure 1: Site Location

2 Water Supply

2.1 Existing Services

There is an existing 100mm uPVC Watermain in the Carrick Road to the south of the site.

2.2 Proposed Services

It is proposed to make a new connection to the existing water main on the Carrick Road near the existing petrol station. A new 125(OD) HDPE pipe will be provided to service the proposed development.

It is proposed to install Electromagnetic Flowmeter or similar approved by Irish Water on the new watermain. The proposed watermain within the site is fully valved, with no dead ends all loops having a minimum of one hydrant within the loop. All hydrants have been spaced in accordance with Irish Water Guidelines.

All sluice valves, air valves and hydrants to be as per site layout drawing. Refer to the Irish Water details for sluice valves, hydrants, air valves and watermain details etc

Refer to drawing 21023-KCE-00-DR-C-00-0001 for proposed watermain layout.

2.3 Water Consumption

Water consumption for the development is calculation below as per Irish Water Guidelines:

New Library

Office Staff
10 (PE) x 100 l/day = 1,000 litres
Library Visitors
100 (PE) x 10 l/day = 1,000 litres

Total = 2,000 litres

Average Demand = 2,000 / (12x60x60) = 0.05 l/s
Peak Demand = 0.05 l/s x 1.75 = 0.08 l/s

3 Foul Water

3.1 Existing Services

The is an existing foul sewer drainage to the rear of the Royal Hotel building which is currently being redeveloped. This runs to the main Irish Water sewer on the Carrick Road.

3.2 Proposed Services

It is proposed to install local foul sewer drainage around the new Library Building and discharge via gravity to the existing foul sewer manhole to the rear of the Royal Hotel as per drawing 21023-KCE-00-DR-C-00-0001 in line with Irish Water Guidelines and Code of Practice.

Foul sewers have been designed in accordance with the Building Regulations TGD Document H and in accordance with the principles and methods set out in BS8301: 1985 and the DoELG Recommendations for Site Development Works. For IW to take charge, the developer provided infrastructure is to comply with IW-CDS-5030-1,2,3.

The following criteria have been applied;

Discharge units –	As per Irish Water Guidelines
• Pipe Ks	0.6mm
• Minimum Velocity	0.75m/s
• Maximum Velocity	3.0m/s

3.3 Estimate of foul/wastewater flows

New Library

Office Staff
10 (PE) x 100 l/day = 1,000 litres
Library Visitors
100 (PE) x 10 l/day = 1,000 litres

Total = 2,000 litres

Average Demand = 2,000 / (12x60x60) = 0.05 l/s
Peak Demand = 0.05 l/s x 1.75 = 0.08 l/s

4 Surface Water

4.1 Existing Services

There is no existing surface sewer network servicing the development.

4.2 Proposed Services

The surface water drainage is designed in accordance with GDSDS with 20% climate change factored. It is proposed that all surface water run-off from the new development will be collected by gravity drainage and discharged to a Wavin Aquacell attenuation tank. The water is then to be discharged to the existing Boyle River with restricted flow of 2.0 l/s provided by a hydrobrake in the final manhole. There will also be a TIDEFLEX TF-1 valve installed on the outfall pipe to prevent water from coming back into the network, refer to appendix C for details of this valve.

An allowable surface water outflow of 6.5 l/s/ha was calculated for the site using the modified rational method and the following parameters were applied;

• Roads, pavements, driveways	100% impermeable
• Roofs	100% impermeable
• Green Areas	10% impermeable
• Return period	1:100 years (20% climate change allowed for)
• Pipe Roughness (Ks)	0.6 mm

An allowable outflow of 5.0 litres / sec / hectare is applied to the developed area 0.053 H. The flow will be restricted by a hydrobrake in the final manhole.

Using this outflow, the attenuation for the 1 in 100-year event was calculated. Please see attached attenuation calculations in Appendix A including Qbar calculation & stormwater tank sizing. It is proposed to provide 32 m3 capacity wavin aquacell attenuation tank. The site dimensions of the attenuation area will be 10 x 4 x 0.8 m dp. We note that the attenuation has been sized to cater for 20% climate change.

4.3 Attenuation Details

The outflow from the site area is restricted to 5.0 l/s/ha. Using this outflow, the attenuation for different return periods were calculated,

Hardstanding and Roof area = 530 m²

Catchment Area:	Impermeable Area	: 0.053 Ha
	Allowable Outflow	: 5.0 l/s Ha
	Calculated Allowable discharge	: 0.27 l/s
	Maximum storage required	: 27m³
	Return Period	: 100 years
	Storm duration	: 720min
	Allow for 20% Climate Change	: 32m³

SuDS design summary:

- Surface water runoff from roofs and hardstanding areas shall be routed to wavin aquacell attenuation / infiltration systems.

Appendix A: Attenuation / SUDS Calculations

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 180214, Northing: 302565,

	Interval		Years											
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.6,	3.6,	4.2,	5.0,	5.5,	5.9,	7.3,	8.8,	9.8,	11.2,	12.4,	13.4,	14.8,	15.9,	16.9,	N/A ,
10 mins	3.7,	5.1,	5.8,	6.9,	7.7,	8.3,	10.2,	12.3,	13.6,	15.6,	17.3,	18.6,	20.6,	22.2,	23.5,	N/A ,
15 mins	4.3,	6.0,	6.9,	8.2,	9.0,	9.7,	11.9,	14.4,	16.1,	18.3,	20.3,	21.9,	24.3,	26.1,	27.6,	N/A ,
30 mins	5.7,	7.8,	8.9,	10.5,	11.6,	12.4,	15.1,	18.1,	20.1,	22.8,	25.2,	27.1,	29.9,	32.1,	33.9,	N/A ,
1 hours	7.5,	10.2,	11.5,	13.5,	14.9,	15.9,	19.2,	22.8,	25.2,	28.4,	31.3,	33.5,	36.8,	39.4,	41.5,	N/A ,
2 hours	10.0,	13.2,	14.9,	17.4,	19.1,	20.3,	24.3,	28.7,	31.5,	35.4,	38.8,	41.4,	45.3,	48.3,	50.8,	N/A ,
3 hours	11.7,	15.5,	17.4,	20.2,	22.1,	23.5,	27.9,	32.8,	36.0,	40.3,	44.0,	46.9,	51.2,	54.5,	57.2,	N/A ,
4 hours	13.2,	17.3,	19.4,	22.4,	24.4,	26.0,	30.8,	36.1,	39.5,	44.1,	48.1,	51.2,	55.8,	59.3,	62.2,	N/A ,
6 hours	15.5,	20.2,	22.6,	26.0,	28.3,	30.0,	35.4,	41.3,	45.0,	50.1,	54.6,	57.9,	63.0,	66.8,	70.0,	N/A ,
9 hours	18.2,	23.6,	26.3,	30.2,	32.7,	34.6,	40.7,	47.2,	51.4,	57.0,	61.9,	65.6,	71.1,	75.4,	78.8,	N/A ,
12 hours	20.5,	26.3,	29.3,	33.5,	36.2,	38.3,	44.9,	51.9,	56.4,	62.4,	67.7,	71.6,	77.5,	82.0,	85.7,	N/A ,
18 hours	24.1,	30.7,	34.1,	38.8,	41.9,	44.3,	51.6,	59.4,	64.3,	71.0,	76.7,	81.1,	87.6,	92.5,	96.5,	N/A ,
24 hours	27.1,	34.3,	38.0,	43.1,	46.5,	49.0,	56.9,	65.3,	70.6,	77.8,	83.9,	88.5,	95.5,	100.7,	104.9,	119.3,
2 days	35.8,	44.0,	48.0,	53.6,	57.2,	59.8,	68.1,	76.8,	82.1,	89.3,	95.4,	99.9,	106.7,	111.7,	115.8,	129.4,
3 days	43.2,	52.1,	56.4,	62.4,	66.2,	69.0,	77.7,	86.6,	92.1,	99.4,	105.5,	110.1,	116.8,	121.8,	125.9,	139.3,
4 days	50.0,	59.6,	64.1,	70.4,	74.4,	77.3,	86.3,	95.4,	101.1,	108.5,	114.7,	119.3,	126.1,	131.1,	135.1,	148.5,
6 days	62.5,	73.0,	78.0,	84.8,	89.1,	92.2,	101.7,	111.3,	117.1,	124.8,	131.2,	135.9,	142.7,	147.8,	151.9,	165.2,
8 days	74.1,	85.4,	90.7,	97.9,	102.4,	105.7,	115.6,	125.6,	131.6,	139.5,	146.0,	150.8,	157.7,	162.8,	166.9,	180.3,
10 days	85.0,	97.1,	102.6,	110.2,	114.9,	118.3,	128.6,	138.9,	145.0,	153.1,	159.7,	164.5,	171.6,	176.7,	180.8,	194.2,
12 days	95.6,	108.2,	114.1,	121.9,	126.8,	130.3,	140.9,	151.4,	157.7,	165.8,	172.5,	177.4,	184.6,	189.8,	193.9,	207.3,
16 days	116.0,	129.6,	135.8,	144.1,	149.2,	153.0,	164.0,	174.9,	181.4,	189.7,	196.6,	201.6,	208.8,	214.0,	218.2,	231.6,
20 days	135.6,	150.0,	156.5,	165.2,	170.5,	174.4,	185.8,	196.9,	203.5,	212.0,	219.0,	224.0,	231.3,	236.5,	240.7,	254.1,
25 days	159.5,	174.6,	181.4,	190.4,	195.9,	199.9,	211.6,	223.0,	229.7,	238.3,	245.3,	250.4,	257.7,	263.0,	267.1,	280.5,

NOTES:
N/A Data not available
These values are derived from a Depth Duration Frequency (DDF) Model
For details refer to:
'Fitzgerald D. L. (2007), Estimates of Point Rainfall Frequencies, Technical Note No. 61, Met Eireann, Dublin',
Available for download at www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies_TN61.pdf

Storm Sewer Design by the Modified Rational Method: Q_{bar}	
Date 24th November 2021	Proposed Library Boyle
Page 1 of 1	Designed By. N. Murphy B.E. MIEI

Permissible out flow for a catchment <,=,24Ha in area

QBAR=0.00108*(area)^0.89*(saar)^1.17*(soil)^2.17

Parameter	Description	Units	Value	
Area=	Total Site Area	km^2	0.00053	
Saar=	Standard Annual Rainfall	mm	1085	
Soil	Soil Index with value between 0.15-0.50	-	0.3	
Qbar=	Mean annual peak flow	m^3/s	0.00034	m^3/Sec

Calculated Qbar	0.3426	Litre/sec

Qbar = Allowable ouflow form total site	0.343	litre/sec
Alowable discharge rate	6.465	litre/sec/Hectare
Minimum Discharge Rate	5.00	litre/sec/Hectare
Revised outflow from site	0.265	litre/sec

Storm water storage requirements	
Date: 24th November 2021	Proposed Library boyle
21023	Designed By. NM
PAGE 1 OF 2	

KILLIAN CONSULTING ENGINEERS

EXTREME RAINFALL RETURN PERIODS
LOCATION: Boyle Co. Roscommon

AVERAGE ANNUAL RAINFALL 1085 mm

RAINFALL IN mm FOR A RANGE OF DURATION AND RETURN PERIOD

	Return Period in Years								
Duration	**0.5**	**1**	**2**	**5**	**10**	**20**	**30**	**50**	**100**
5	2.6	3.6	4.2	5.9	7.3	8.8	9.8	11.2	13.4
10	3.7	5.1	5.8	8.3	10.2	12.3	13.6	15.6	18.6
15	4.3	6.0	6.9	9.7	11.9	14.4	16.1	18.3	21.9
30	5.7	7.8	8.9	12.4	15.1	18.1	20.1	22.8	27.1
60	7.5	10.2	11.5	15.9	19.2	22.8	25.2	28.4	33.5
120	10.0	13.2	14.9	20.3	24.3	28.7	31.5	35.4	41.4
240	13.2	17.3	19.4	26.0	30.8	36.1	39.5	44.1	51.2
360	15.5	20.2	22.6	30.0	35.4	41.3	45.0	50.1	57.9
720	20.5	26.3	29.3	38.3	44.9	51.9	56.4	62.4	71.6
1,440	27.1	34.3	38.0	49.0	56.9	65.3	70.6	77.8	88.5

Proposed Development Site Area =	**0.05**	**ha**
Allowable Outflow per hectare =	**5.00**	**Litre/sec/ha**

Storm Water Storage Requirements		
Date: 24th November 2021	Proposed Library boyle	
21023	Designed By. NM	
PAGE 2 OF 2		

KILLIAN CONSULTING ENGINEERS

SURFACE WATER STORAGE : FOR 100 YEAR STORM

Proposed Development Site Area =	0.053	ha

Proposed Impermeable Area				
Hard Surfaces & Roofs	0.05	100%		0.053
Total Impermeable Area				**0.053**

Allowable Outflow =	**5.00**	**Litre/sec/ha**
	0.27	**l/s**

Rainfall Intensity as Recorded in Athlone 1 in 1000

1 Hectare = 10,000m^2

Duration	Rainfall	Intensity	Rainfall	Proposed Imperm. Area	Proposed Run-off	Allowable Outflow	Storage Required
(min)	(mm)	(mm/hr)	(m^3/ha)	(ha)	(m^3)	(m^3)	(m^3)
5	13.4	160.80	134	0.053	7	0	7
10	18.6	111.60	186	0.053	10	0	10
15	21.9	87.60	219	0.053	12	0	11
30	27.1	54.20	271	0.053	14	0	14
60	33.5	33.50	335	0.053	18	1	17
120	41.4	20.70	414	0.053	22	2	20
240	51.2	12.80	512	0.053	27	4	23
360	57.9	9.65	579	0.053	31	6	25
720	71.6	5.97	716	0.053	38	11	27
1,440	88.5	3.69	885	0.053	47	23	24

Maximum Storage Required =	27	m^3
Add 20% for Climate Change	32	m^3

Appendix B: Wavin Aquacell and Hydrobrake Details

Product Datasheet

AquaCell Plus-R

Product description

AquaCell Plus-R has been designed primarily for use in applications where inspectability is required, and is suitable for use in all applications from landscaped areas to heavily trafficked areas.

Technical specification

Product code / SAP code	6LB250 / 4064832	**Void ratio**	95%
Colour	Black	**Material**	Recycled PP
Dimensions	1m x 0.5m x 0.4m	**Vertical loading**	70.2 tonnes/m^2 (702 kN/m^2)
Weight	12.7kg	**Lateral loading**	15.1 tonnes/m^2 (151 kN/m^2)
Storage volume	190 litres		

Maximum installation depths

Typical soil type	**Maximum depth of installation – to base of units (m)[1]**				
	Soil weight kN/m^3	**Angle of internal friction φ (degrees)[2, 3]**	**Landscaped areas**	**Vehicle mass <9 tonnes[4, 5]**	**Vehicle mass <44 tonnes**
Over consolidated stiff clay	20	24	4.67	4.42	4.17
Silty sandy clay	19	26	5.03	4.78	4.53
Loose sand and gravel	18	30	5.86	5.61	5.36
Medium dense sand and gravel	19	34	6.87	6.62	6.37
Dense sand and gravel	20	38	7.82	7.57	7.30

Minimum cover depths

	Landscaped areas	**Car parks with vehicle mass <3 tonnes[5]**	**Car parks with vehicle mass <9 tonnes**	**Car parks with vehicle mass <12 tonnes**	**Low speed roads with vehicle mass <60 tonnes**
Minimum cover depth (m)	0.30	0.50	0.69	0.81	1.30

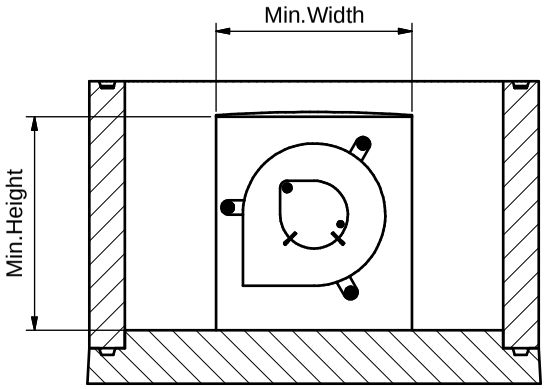
1. Without groundwater present below base of units – AquaCell Plus-R may be used where groundwater is present, contact Wavin for technical advice.
2. Loosening of dense sand or softening of clay by water can occur during installation. The designer should allow for any such likely effects when choosing an appropriate value of φ.
3. The design is very sensitive to small changes in the assumed value of φ, therefore, it should be confirmed by a chartered geotechnical engineer. In clay soils, it may be possible to utilise cohesion in some cases.
4. Applicable for car parks or other areas trafficked only by cars or occasional refuse collection trucks or similar vehicles (typically one per week).
5. This category should be used when considering landscaped areas that may be trafficked by ride on mowers.

Assumptions made:

- Ground surface is horizontal
- Shear planes or other weaknesses are not present within the structure of the soil

Wavin Ireland Ltd | Balbriggan | Co Dublin | K32 K840
Tel 01 8020200 | **Email** info.ie@wavin.com | **Website** www.wavin.ie

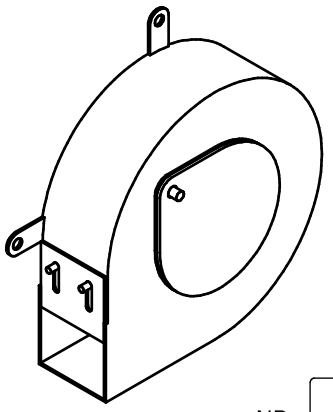
June 2021



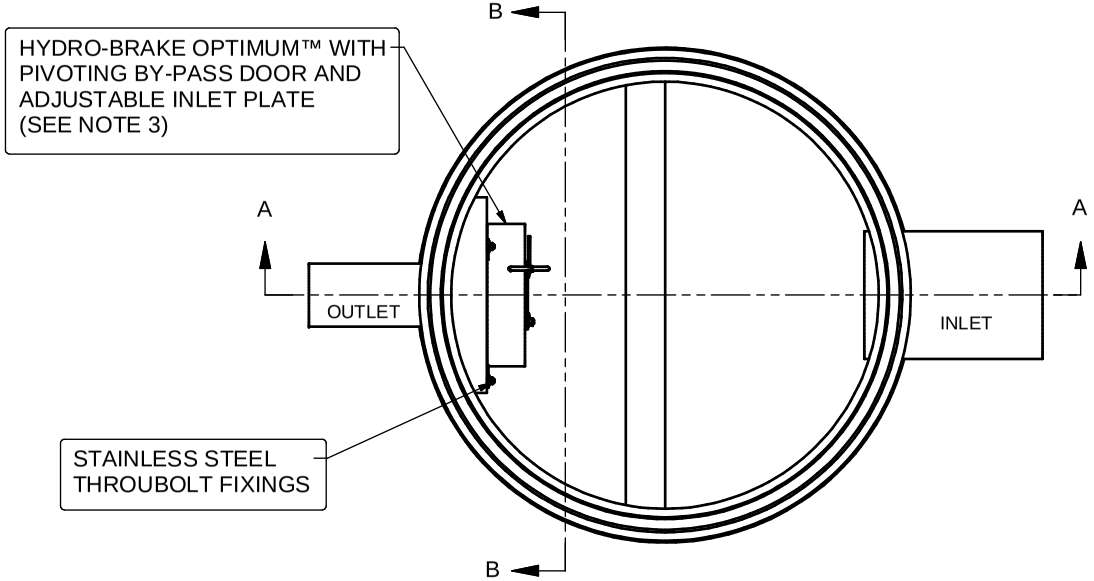
Section B-B
(view on mounting block)

Technical Specification Criteria		
BBA Approved	Head (m)	Flow (L/s)
Design Point		
Flush Flow		
Kick Flow		
Optimisation		

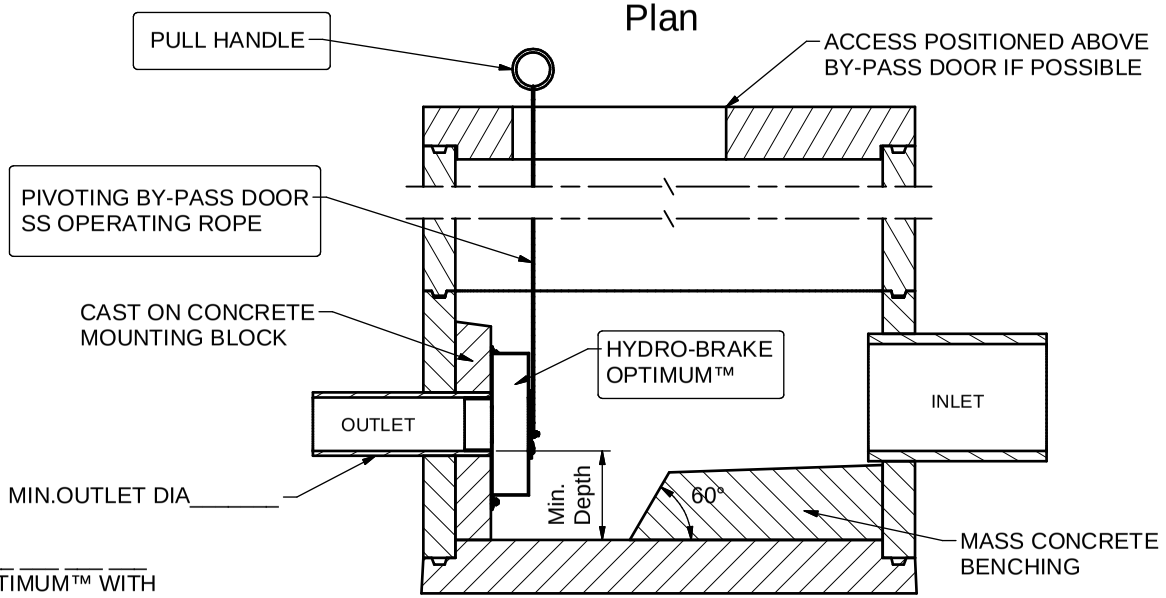
Physical Specification	
Min. Block Width	
Min Block Height	
Min. Sump Depth	
Min Outlet Diameter	



NB: [ ] = HRD TECHNOLOGIES SCOPE OF SUPPLY



Plan



Section A - A

BBA APPROVED S__ ___ __ ___
HYDRO-BRAKE OPTIMUM™ WITH ADJUSTABLE INLET PLATE

PROJECTION

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT GENERAL ARRANGEMENT & DETAIL DRAWINGS.

2. ALL COMPONENTS SHALL BE MANUFACTURED IN ACCORDANCE WITH THE PRODUCTION SPECIFICATION HRD-FM09/15.

3. HYDRO-BRAKE OPTIMUM™ IS ALSO AVAILABLE WITH ALTERNATIVE MOUNTING ARRANGEMENTS (E.G. CURVED BACKPLATE, PUSH-FIT)

REV	BY	DATE	DESCRIPTION
A	WCJ	01/08/2014	FIRST ISSUE

REVISION HISTORY

Date: 01/08/2014 | Scale:

Drawn By: wjones | Checked By: | Approved By:

Title:
HYDRO-BRAKE OPTIMUM™
FOR SURFACE WATER
WITH ADJUSTABLE INLET PLATE

GENERAL ARRANGEMENT

HRD Technologies Ltd
Unit B 10/11
Greenogue Square
Greenoge Business Park
Rathcoole
Co Dublin
Tel: 01 4013964
Fax: 01 4013978
enquiries@hrdtec.com

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETRES.

TOLERENCING INFORMATION IS FOUND IN PRODUCTION SPECIFICATION HRD-FM09/15

Approximate Weight: N/A
Finish:
Treatment:
Sheet Size: A3 | Sheet: 1 OF 1
Next Assembly:
PROJECT (Wipe No.):
Drawing No.: HBO-SA1 | Rev: A

Appendix C: TIDEFLEX TF-1 VALVE

Tideflex® Technologies

Technical Data

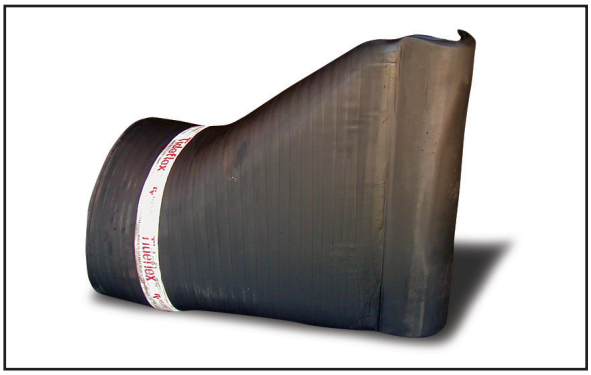
Series TF-1—Tideflex® Check Valve

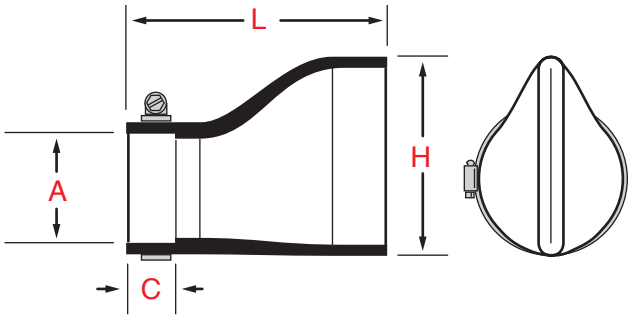
Features & Benefits

- Ideal for manhole installations
- Lightweight, all-elastomer design
- Seals around entrapped solids
- Cost-effective, maintenance-free design

Materials of Construction

- Elastomers available in Pure Gum Rubber, Neoprene, Hypalon®, Chlorobutyl, Buna-N, EPDM, and Viton®





We are pleased to announce the introduction of the revolutionary TF-1 Check Valve. It functions and operates under the same simple principle of operation as the original TF-2 Tideflex®.

This design is ideal for existing manhole installations where the invert of the pipe is close to the floor of the vault. There are many check valves in interceptors, manholes, and vaults. These vaults are designed so that there would be a maximum gravity head; thus, the invert pipe is as close to the base as possible. The TF-1 allows installations in such applications.

The Tideflex® Technologies Series TF-1 Tideflex® Check Valve is designed for applications in manholes, where the bottom of the manhole is close to the invert of the pipe. The TF-1 configuration allows the valve to be properly installed without manhole modification, ensuring positive backflow prevention and a lifetime of maintenance-free performance.

Pipe O.D. (A)	Length (L)	Bill Height (H)	Cuff Length (C)
4	10	8	1 1/2
5	10	8	1 1/2
6	16	12	2
8	18	16	2
10	23	19	3
12	27	23	4
14	27	23	4
16	35	30	5
18	36	34	6
20	44	37	8
22	44	37	8
24	48	43	8
26	48	43	8
28	48	43	8
30	56	55	9
32	56	55	9
36	67	69	10
38	67	69	10
40	67	69	10
42	61	71	10
44	61	71	10
48	66	78	10
50	66	78	10
54	66	78	10
58	66	78	10
60	73	91	14
68	73	91	14
72	96	115	16

Numbers indicate maximum dimensions in inches.