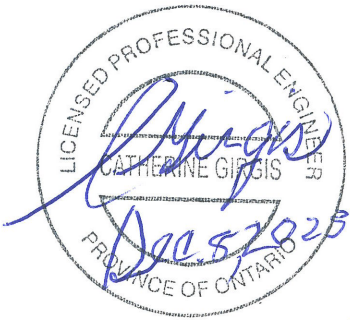


Stormwater Management Report  
*Proposed Fourplex Residential Building*  
*1350 Pelletier Street*  
*Windsor, Ontario*

*Our Project No. 23-a146*

December 8, 2023



Catherine Girgis, P.Eng.  
Project Engineer

SUBMITTED TO:  
The City of Windsor

The principal objective of this report is to provide the proposed storm servicing and stormwater management for the development of a fourplex residential building on property municipally known as 1350 Pelletier Street. This shall include the stormwater storage requirement, in accordance with the storm water management guidelines set out in Windsor/Essex Region Stormwater Management Standards Manual.

### **Introduction**

The site is located between the existing building at 1350 Pelletier Street and an existing house at 1376 Pelletier Street. There is currently an existing commercial building on site. The proposed project consists of the construction of a 2-storey building, driveway and parking spaces on the west side of the lot. The site assessed for stormwater management has a drainage area of approximately 720 square metres. Based on the Essex Regional Conservation Authority mapping system, it was found that the current site is defined by Brookston Clay Loam soil, placing it in a Hydrologic Group D condition.

### **Existing conditions**

The current site is an existing commercial building with the western portion of the site (study area) consisting of grass. The proposed development area of the site has a total area of about 720 square metres. The surface condition breakdown is as follows:

Building	0 square metres
Paved/Hardscape Area	0 square metres
Landscaped Area	720 square metres

The stormwater drainage flows north to south and drains overland towards the public right-of-way. The discharges for the site are as follows:

5-year Event	0.0034 cubic metres per second (3.43 litres per second)
100-year Event	0.0056 cubic metres per second (5.59 litres per second)

### **Proposed Development**

The proposed project includes the construction of a 2-storey residential building, a driveway and four (4) parking spaces. In the developed condition, the surface condition breakdown will be as follows:

Building	254 square metres
Paved/Hardscape Area	183 square metres
Landscaped Area	282 square metres



The proposed system includes the following components:

- Underground storage in pipes, catch basins and manholes;
- 5-year storm storage within the landscape area
- 100-year storage within the landscape and pavement areas
- Outlet control device

The site shall be serviced with a 150 mm diameter storm pipe, which will be connected to a 375 mm diameter storm sewer extension. The outlet control device shall be installed in a 1200 mm diameter manhole located at the front property line.

In addition to the storm water service, the site shall be serviced with a 150 mm diameter sanitary pipe and a 50 mm diameter water service.

### **Storm Water Management**

The storm water management system for the new development was designed and evaluated based on the release rate from the site under existing conditions.

The storm sewers and storage volumes for the 1 in 5-year and 1 in 100-year storms were designed using Modified Rational Method and following the new standards manual, including the flow rate restriction. The stormwater discharge rate shall be restricted to a maximum of 3.4 l/s, equal to the predevelopment flow.

### **Runoff Control**

Based on the establishing of the 5-year and 100-year event flood storage levels and an anticipated elevation of the outlet, it was found that an equivalent of a 35 mm diameter opening is required. An IPEX Tempest LMF ICD RD inlet control device shall be installed, which shall ensure that the flow restriction target is maintained. Refer to Appendix B for manufacturer's brochure.

### **Storage Requirements**

Based on the requirements already noted in this report, it was found that the site would require a minimum storage capacity of 8.9 cubic metres for the 1:5-year storm and 26 cubic metres for the 1:100-year storm. High water levels shall be 184.05 and 184.30 for the 1:5 and 1:100-year rainfall events, respectively.

### **Conclusion**

The design provided herein shall ensure that the minor system and major system proposed for this site will be able to accommodate the proposed development to the site. Moreover, based on the design and analysis provided herein, storm water management strategies will be employed to ensure no excess release from the site.

# **Appendix A**

## **SWM Calculations**



# HADDAD, MORGAN AND ASSOCIATES LTD.

Consulting Engineers

1316 Ouellette Avenue, Windsor, Ontario N8X 1J8

Phone: (519) 973-1177 Fax: (519) 253-2740 e-mail: hma@haddadmorgan.com

## Stormwater Management Calculations

The following storm calculations have been provided for the proposed development in accordance with the Windsor/Essex Regional Stormwater Management Standards Manual.

**Project :** Proposed 4-unit Residential Building

**Project No.** 23-a146

**Location:** 1350 Pelletier Street, Windsor, ON N9B 1R8

**Date:** December 5, 2023

### Pre- Development Condition

		C value (5 yr)	AC value
Total Area	719.3 sq.m.		
Building Area	- sq.m.	0.95	0.00
Pavement Area	- sq.m.	0.95	0.00
Gravel Area	- sq.m.	0.70	0.00
Landscape	719.3 sq.m.	0.20	143.86
<b>C pre-development</b>			<b>0.20</b>
<b>*C Undeveloped</b>			<b>0.20</b>

### Developed Condition

		C value	AC value
Total Area	719.3 sq.m.		
Building Area	253.9 sq.m.	0.95	241.21
Pavement Area	183.1 sq.m.	0.95	173.95
Gravel Area	- sq.m.	0.70	-
Landscape	282.3 sq.m.	0.20	56.46
<b>C developed 100 yr (see below)</b>			<b>0.85</b>
<b>C developed 5 yr</b>			<b>0.66</b>

### Sheet Flow Analysis

Runoff Distance (overland)	32.9 m	
Surface Type	Grass - Dense	
Manning's n	0.24	
Slope	0.5%	
User input add. flow time		minutes
Time of Concentration per Manual	15.85	minutes
+ shallow time		minutes
<b>Total time</b>	<b>15.85</b>	minutes

Runoff Distance (overland)	3.2 m	
Surface Type	Grass - Dense	
Manning's n	0.24	
Slope	1.2%	
User input add. flow time	0	minutes
Time of Concentration per Manual	3.01	minutes
+ pipe flow time	0.59	minutes
<b>Total time</b>	<b>3.59</b>	minutes

C 100 Year Calculation

Impervious %	61%		
Impervious adjust	0	sq.m	
Hydraulic Soil Group			
Storage Depth (mm)			
C 100 year (eq. 3.3.2.2)			
Zero release Storage Volume	66.2	CM	

D
92.05
0.85

Soil Type	Bc Storage Depth in mm	Hydrologic Group D	Storage Depth i in mm
a	68.7		0 0.0
b	69.1		0 0.0
c	84.0		0 0.0
d	92.0	1	92.0

Design Storage I values (a/(T+b)<sup>c</sup>)

2 year	66.06	mm/hr
5 year	85.85	mm/hr
100 year	139.77	mm/hr

123.86	mm/hr
152.72	mm/hr
236.20	mm/hr

Rational Method Calculation

2 year Discharge rate	2.64	L/s
5 year Discharge rate	3.43	L/s
100 Year Discharge rate	5.59	L/s

Restricted Flow Rate

16.24	L/s
20.02	L/s
40.26	L/s

Orifice/Restrictor Calculation

Center of orifice	182.61	m
Surface elevation	184.05	m
Calculated Orifice Size (5 year)	36.50	mm

Cd	0.62
----	------

0.62 = sharp Orifice  
0.80 = tube

Elevation difference	1.43	m
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Orifice Diameter	35	mm
Discharge Rate	3.16	L/s

Control Rate Required	3.43	L/s
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O.K.

An IPEX flow control device shall be installed to control the outflow to the restricted rate.

100 year release:

Free surface Elevation	184.30	m
Discharge Rate	3.42	L/s

Elevation difference	1.68	m
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O.K.

5 year storage Calculation

\*\*

td min.	Intensity mm/hr	Flow Rate L/s	Total Vol. L	Release L	Storage L
3	159.14	20.86	3,756	-	-
4	148.66	19.49	4,678	77	4,601
5	139.57	18.30	5,490	266	5,224
10	107.72	14.12	8,473	1,213	7,260
15	88.40	11.59	10,431	2,160	8,271
20	75.35	9.88	11,854	3,107	8,747
25	65.89	8.64	12,957	4,054	8,903
30	58.69	7.70	13,851	5,001	8,850
35	53.02	6.95	14,599	5,948	8,650
40	48.43	6.35	15,239	6,896	8,344
45	44.63	5.85	15,799	7,843	7,956
50	41.43	5.43	16,294	8,790	7,505
55	38.69	5.07	16,739	9,737	7,002
60	36.32	4.76	17,142	10,684	6,458
65	34.24	4.49	17,510	11,631	5,879
70	32.41	4.25	17,849	12,578	5,271
75	30.79	4.04	18,163	13,525	4,638
80	29.33	3.84	18,455	14,472	3,983
85	28.01	3.67	18,729	15,419	3,310
90	26.82	3.52	18,986	16,366	2,620
91	26.59	3.49	19,036	16,556	2,480

Developed Time of Concentration	3.59
Applied Runoff Coefficient	0.66

Storage Requirement	8,903 L
	8.9 c.m.

Depressed green area	0.3
	0.4
	2.8
Grass	1.0
<b>Total</b>	<b>4.5 c.m.</b>
<b>MH</b>	1
	2.17
<b>CB</b>	2
	1.01
<b>Total</b>	<b>3.18 c.m.</b>
<b>Piping</b>	43.5
	0.77
	12
	0.5
<b>Total</b>	<b>1.3 c.m.</b>

<b>Storage Provided</b>	<b>8.9 c.m.</b>
-------------------------	-----------------

\*\* release rate is based on time interval less time of concentration (no release considered prior to Tc)

Developed Time of Concentration	3.59
Applied Runoff Coefficient	0.85

**100 year storage Calculation**

\*\*

td min.	Intensity mm/hr	Flow Rate L/s	Total Vol. L	Release L	Storage L
5	218.23	37.19	11,158	288	10,870
10	172.68	29.43	17,658	1,315	16,343
15	143.67	24.49	22,038	2,341	19,696
20	123.48	21.05	25,254	3,368	21,886
25	108.56	18.50	27,754	4,394	23,360
30	97.06	16.54	29,777	5,421	24,356
35	87.91	14.98	31,463	6,447	25,016
40	80.44	13.71	32,901	7,473	25,427
45	74.21	12.65	34,150	8,500	25,650
50	68.94	11.75	35,250	9,526	25,724
55	64.42	10.98	36,233	10,553	25,680
60	60.50	10.31	37,118	11,579	25,539
65	57.05	9.72	37,922	12,605	25,317
70	54.01	9.20	38,659	13,632	25,028
75	51.29	8.74	39,339	14,658	24,681
80	48.86	8.33	39,969	15,685	24,284
85	46.66	7.95	40,555	16,711	23,844
90	44.66	7.61	41,104	17,737	23,367
95	42.84	7.30	41619.675	18,764	22,856

Storage Requirement	25,724 L
	26 c.m.

Depressed green area	0.3	2.3
	0.4	9.1
	2.8	
Grass	1.0	
<b>Total</b>	<b>15.9</b>	<b>c.m.</b>
<b>MH</b>	1	2.17
<b>CB</b>	2	1.01
<b>Total</b>	<b>3.18</b>	<b>c.m.</b>
<b>Piping</b>	43.5	0.77
	12	0.5
<b>Total</b>	<b>1.3</b>	<b>c.m.</b>

<b>Parking Lot Storage</b>	<b>7.0 c.m.</b>
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<b>Storage Provided</b>	<b>27 c.m.</b>
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## **Appendix B**

IPEX TEMPEST LMF ICD RD INLET CONTROL DEVICE

# TEMPEST Product Submittal Package R1



**Date: December 6, 2023**

**Customer: Haddad Morgan & Associates Ltd.**

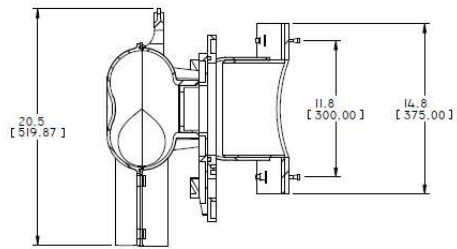
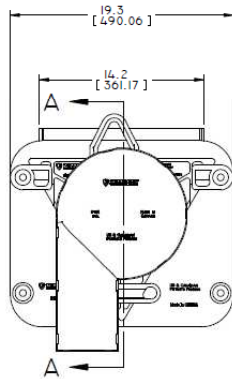
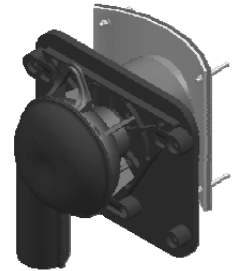
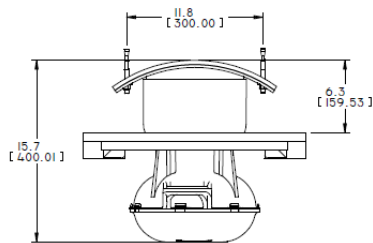
**Contact: Catherine Girgis**

**Location: Windsor**

**Project Name: 1350 Pelletier Street**



# Tempest LMF ICD Rd Shop Drawing



SECTION A-A

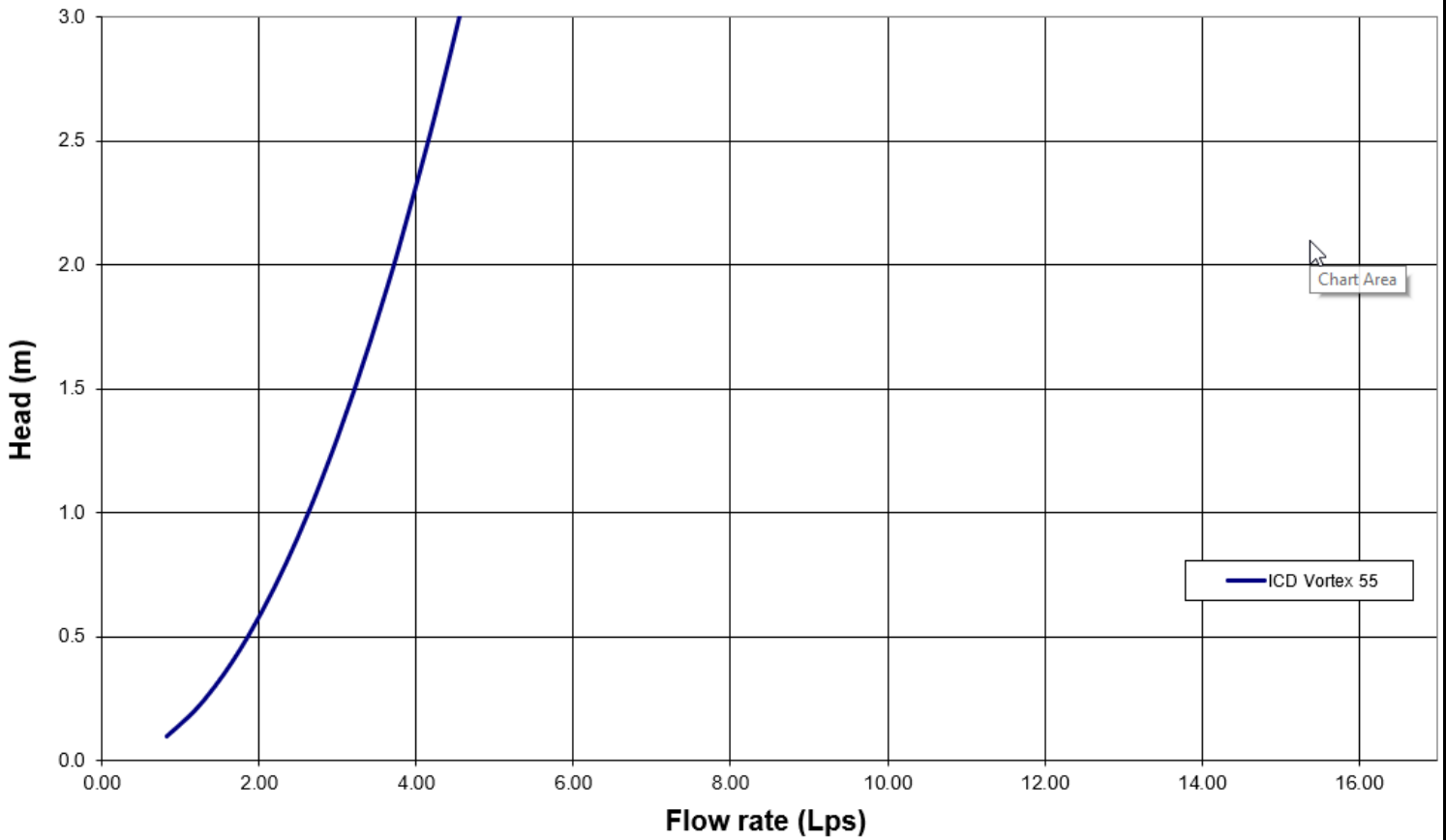


<b>IPEX TECHNOLOGIES INC.</b> 2011-07-26 H. M. MARTIN		PRODUCT DEVELOPMENT 2011-07-26 H. M. MARTIN		PROJECT NUMBER 2011-07-26 H. M. MARTIN	
TITLE LMF ROUND CB ASSEMBLY		SHEET B 1/8		DRAWING NUMBER 2011-07-26	
DATE 2011-07-26		SCALE 1/8" = 1"		SHEET 1 OF 1	
CHECKED BY H. M. MARTIN		DATE 2011-07-26		REV 3	



### Tempest LMF ICD Flow Curve

**Flow: 3.4 L/s**  
**Head: 1.67 m**



## **Square CB Installation Notes:**

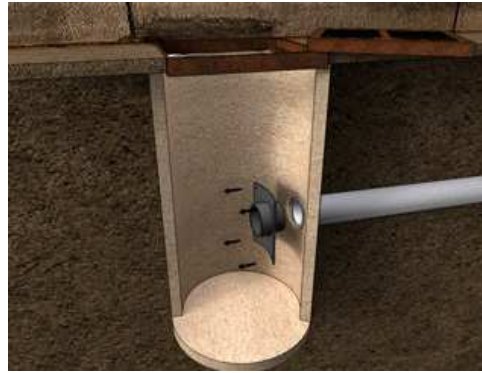
1. Materials and tooling verification:
  - Tooling: impact drill, 3/8'' concrete bit, torque wrench for 9/16'' nut, hand hammer, level, and marker.
  - Material: (4) concrete anchor 3/8x3-1/2, (4) washers, (4) nuts
2. Use the mounting wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8'' concrete bit to make the four holes at a minimum of 1-1/2'' depth up to 2-1/2''. Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Put the nuts on the top of the anchors to protect the threads when you will hit the anchors with the hammer. Remove the nuts on the ends of the anchors
5. Install the wall mounting plate on the anchors and screw the nut in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the wall mounting plate and the catch basin wall.
6. From ground above using a reach bar, lower the device by hooking the end of the reach bar to the handle of the LMF device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the wall mounting plate and has created a seal.





**Round CB Installation Notes:** (Refer to square install notes above for steps 1 , 3, & 4)

2. Use spigot catch basin wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
5. Install the CB spigot wall plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lb-ft). There should be no gap between the CB spigot wall plate and the catch basin wall.
6. Apply solvent cement on the hub of the universal mounting plate and the spigot of the spigot CB wall plate. Slide the hub over the spigot. Make sure the universal mounting plate is at the horizontal and its hub is completely inserted onto the spigot. Normally, the corners of the universal mounting plate hub adapter should touch the catch basin wall.
7. From ground above using a reach bar, lower the ICD device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered into the mounting plate and has created a seal.



**CAUTION/WARNING/DISCLAIM:**

- Verify that the inlet(s) pipe(s) is not protruding into the catch basin. If it is, cut it back so that the inlet pipe is flush with the catch basin wall.
- Any required cement in the installation must be approved for PVC.
- The solvent cement should not be used below 0°C (32°F) or in a high humidity environment. Please refer to the IPEX solvent cement guide to confirm required curing times or attend the IPEX [Online Solvent Cement Training Course](#).
- Call your IPEX representative for more information or if you have any questions about our products.

## **IPEX TEMPEST Inlet Control Devices Technical Specification**

### **General**

Inlet control devices (ICD's) are designed to provide flow control at a specified rate for a given water head level and also provide odour and floatable control where specified. All ICD's will be IPEX Tempest or approved equal.

All devices shall be removable from a universal mounting plate. An operator from street level using only a T-bar with a hook will be able to retrieve the device while leaving the universal mounting plate secured to the catch basin wall face. The removal of the TEMPEST devices listed above must not require any unbolting or special manipulation or any special tools.

High Flow (HF) Sump devices will consist of a removable threaded cap which can be accessible from street level with out entry into the catchbasin (CB). The removal of the threaded cap shall not require any special tools other than the operator's hand.

ICD's must have no moving parts.

### **Materials**

ICD's are to be manufactured from Polyvinyl Chloride (PVC) or Polyurethane material, designed to be durable enough to withstand multiple freeze-thaw cycles and exposure to harsh elements.

The inner ring seal will be manufactured using a Buna or Nitrile material with hardness between Duro 50 and Duro 70.

The wall seal is to be comprised of a 3/8" thick Neoprene Closed Cell Sponge gasket which is attached to the back of the wall plate.

All hardware will be made from 304 stainless steel.

### **Dimensioning**

The Low Medium Flow (LMF), High Flow (HF) and the High Flow (HF) Sump shall allow for a minimum outlet pipe diameter of 200mm with a 600mm deep Catch Basin sump.

### **Installation**

Contractor shall be responsible for securing, supporting and connecting the ICD's to the existing influent pipe and catchbasin/manhole structure as specified and designed by the Engineer.



# THE NEXT GENERATION IN STORM SEWER INLET CONTROLS



## STORM WATER FLOW CONTROL

### THE COST-EFFECTIVE SOLUTION TO YOUR STORM WATER SURCHARGE PROBLEMS

- Conserves sewer system capacity
- System accommodates low to high flows
- Integrated odour and floatable control
- Fast and easy to install and maintain



**IPEX**  
by aliaxis

We build tough products for tough environments®





## THE NEXT GENERATION IN STORM SEWER INLET CONTROLS

### ✓ Reduces Sewer Overflows & Basement Backups

Tempest is a family of cost-effective inlet control devices that work together across a series of catch basins to limit the amount of storm water runoff that can enter a combined sewer system during a storm event. Basement backups and sewer overflows are avoided because storm water surcharges are controlled at the sewer inlet and are allowed to remain in catch basins or temporarily above ground.

### ✓ Integrated Odour & Floatable Control

In addition to flow control, Tempest systems can also alleviate sewer system odour emissions as well as prevent floating debris from entering the sewer system.

### ✓ Wide Range of Models & Pre-set Flow Rates

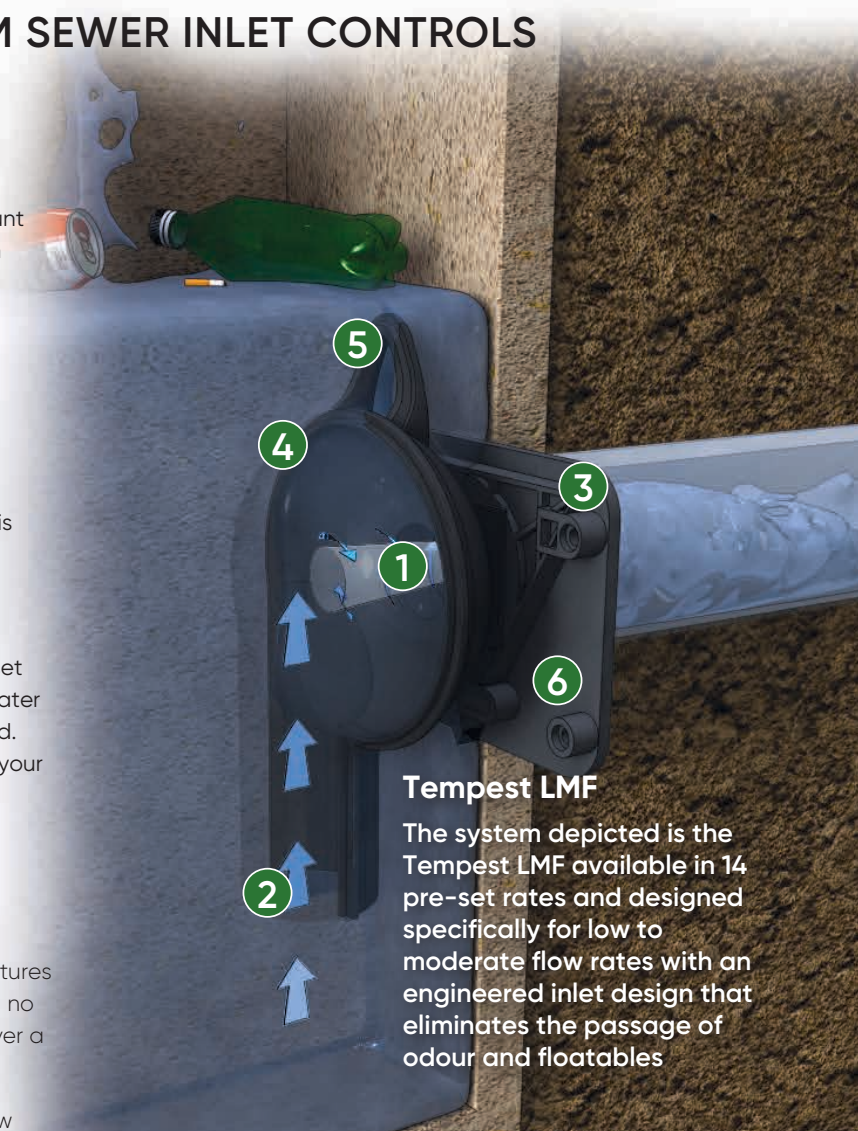
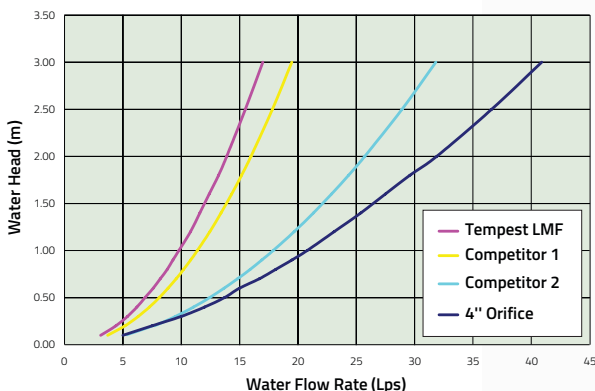
Available in a wide range of patent pending models and pre-set flow rates, Tempest systems can accommodate most storm water flow control requirements from 32 GPM to 270 GPM and beyond. Application specific solutions can also be engineered to meet your unique needs in both wet and dry catch basin environments.

### ✓ Easy to Install & Maintain

Constructed from durable PVC, Tempest units are corrosion free and built to last. The Tempest's light weight design accommodates both square and round catch basins and features a universal back plate and interchangeable components with no moving parts that makes the units quick and easy to install over a catch basin outlet pipe.

These devices also include a quick release mechanism to allow easy access for service without the need to drain the installation.

**Tempest Inlet Control Devices restrict flow to a narrower range than traditional methods regardless of head**



### Tempest LMF

The system depicted is the Tempest LMF available in 14 pre-set rates and designed specifically for low to moderate flow rates with an engineered inlet design that eliminates the passage of odour and floatables

### FEATURES & BENEFITS

- 1 Restricts flow to a narrow range regardless of head
- 2 Unit design prevents the passage of floatables and odours
- 3 Neoprene gasket for air-tight seal\*
- 4 Virtually maintenance free and corrosion free durable PVC construction
- 5 Features a quick release mechanism that's accessed with reach bar. Unit can then be simply lifted out for easy maintenance\*
- 6 Universal back plates available for both square and round catch basins\*

\* Excluding Tempest HF Sump

## THE TEMPEST FAMILY OF SYSTEMS

### TEMPEST LMF



- Restricts:
- ✓ Flow
  - ✓ Odours
  - ✓ Floatables

**LOW to MODERATE FLOW RATES**  
 32 GPM (2 L/s) – 270 GPM (17 L/s)  
 14 pre-set flow rates

The Tempest LMF system features a vortex inlet design that allows a low flow rate to be set and eliminates the passage of odours and floatables and allows for debris and sediment to collect in the structure.

### TEMPEST MHF



- Restricts:
- ✓ Flow

**MEDIUM TO HIGH FLOW RATES**  
 143 GPM (9L/s) or greater  
 Specified pre-set flow rates

The Tempest MHF is a standard orifice plate or plug device designed to allow a specified flow volume through the outlet pipe at a specified head.

### TEMPEST HF & HF SUMP



- Restricts:
- ✓ Flow
  - ✓ Odours
  - ✓ Floatables

**HIGH FLOW RATES**  
 240 GPM (15 L/s) or greater  
 5 pre-set flow rates

The standard Tempest HF system allows a near constant discharge rate to be set and eliminates the passage of odours and floatables and allows for debris and sediment to collect in the structure.

The Tempest HF SUMP system is designed for catch basins & manholes in which there is no sump or the outlet pipe is too low to install standard Tempest device.

### UNIVERSAL BACK PLATES

Available for BOTH square and round catch basins.\*



For square catch basins

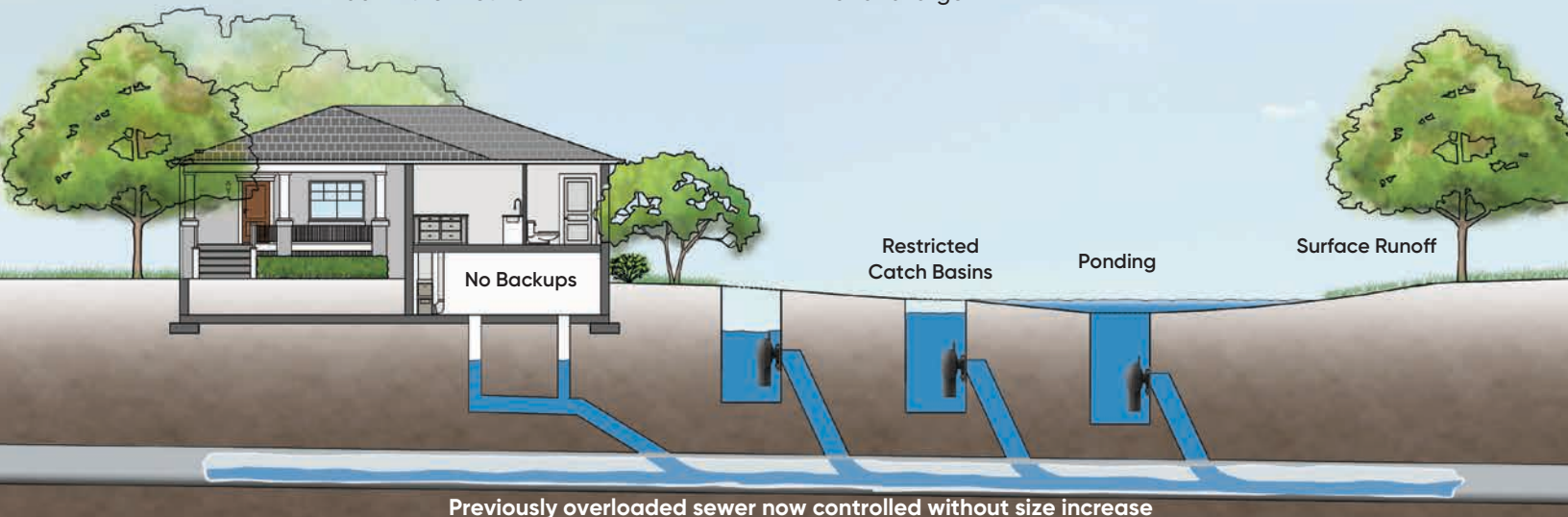


For round catch basins

## SOLUTION: TEMPEST INLET CONTROL SYSTEMS



- Provides control by restricting flow into the sewer system
- Provides temporary ponding in catch basins, parking lots & roadways
- Helps preserve sewer capacity, slows down the inlet flow
- Reduces residential flooding and flash flooding
- Water surcharge is controlled and directed as per engineer design
- Can accommodate outlet pipes 6" and larger





## CUSTOMER SERVICE CENTRE

IPEX Inc.

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ipexna.com

### About the IPEX Group of Companies

As leading suppliers of thermoplastic piping systems, the IPEX Group of Companies provides our customers with some of the largest and most comprehensive product lines. All IPEX products are backed by more than 50 years of experience. With state-of-the-art manufacturing facilities and distribution centers across North America, we have earned a reputation for product innovation, quality, end-user focus and performance.

Markets served by IPEX group products are:

- Electrical systems
- Telecommunications and utility piping systems
- PVC, CPVC, PP, PVDF, PE, ABS, and PEX pipe and fittings
- Industrial process piping systems
- Municipal pressure and gravity piping systems
- Plumbing and mechanical piping systems
- Electrofusion systems for gas and water
- Industrial, plumbing and electrical cements
- Irrigation systems

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A policy of ongoing product improvement is maintained. This may result in modifications of features and/or specifications without notice.



# Volume III: TEMPEST INLET CONTROL DEVICES

Municipal Technical  
Manual Series



SECOND EDITION

LMF (Low to Medium Flow) ICD

HF (High Flow) ICD

MHF (Medium to High Flow) ICD



**IPEX**

by aliaxis

# IPEX Tempest™ Inlet Control Devices

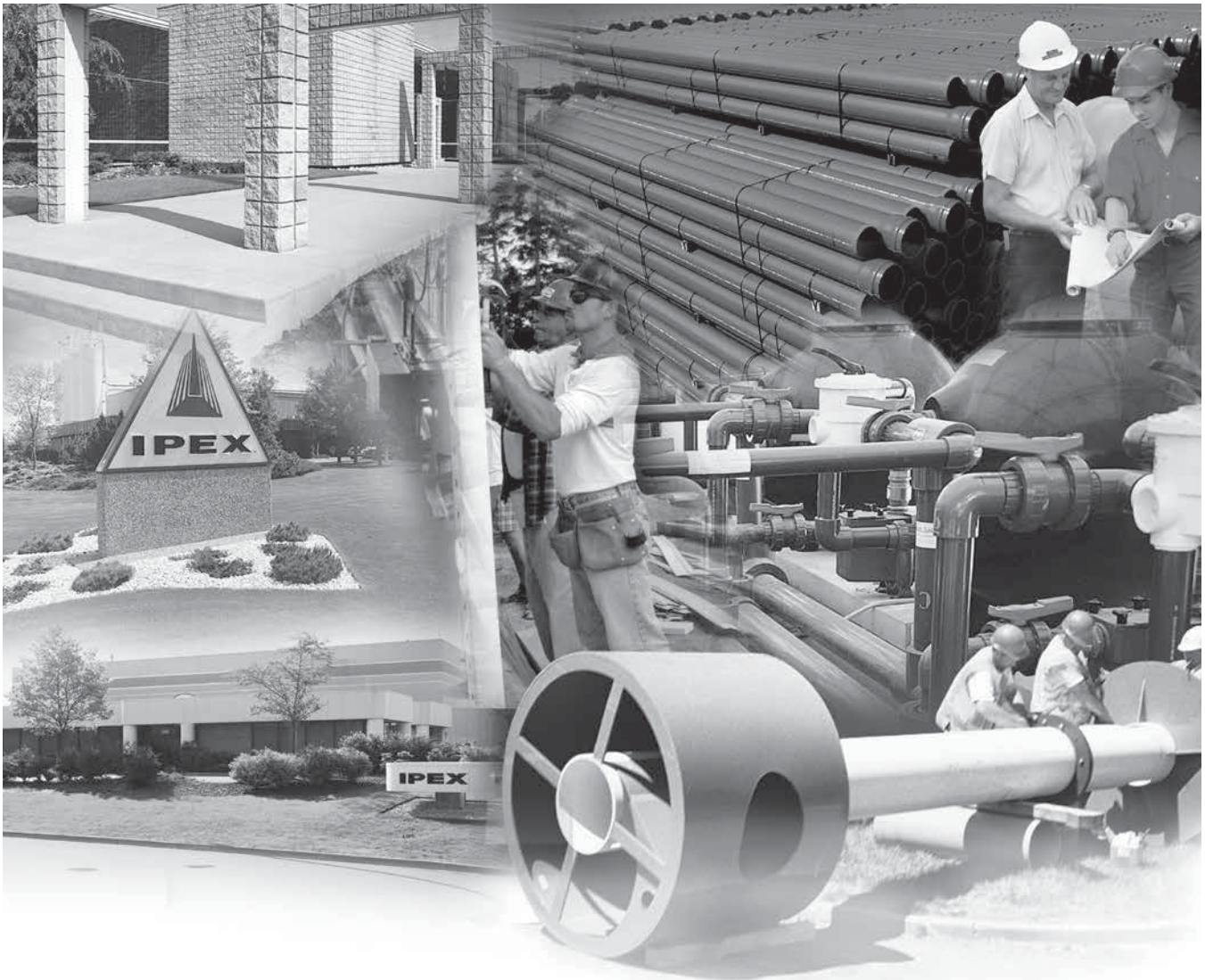
Municipal Technical Manual Series

Vol. I, 2nd Edition

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## ABOUT IPEX

At IPEX, we have been manufacturing non-metallic pipe and fittings since 1951. We formulate our own compounds and maintain strict quality control during production. Our products are made available for customers thanks to a network of regional stocking locations throughout North America. We offer a wide variety of systems including complete lines of piping, fittings, valves and custom-fabricated items.

More importantly, we are committed to meeting our customers' needs. As a leader in the plastic piping industry, IPEX continually develops new products, modernizes manufacturing facilities and acquires innovative process technology. In addition, our staff take pride in their work, making available to customers their extensive thermoplastic knowledge and field experience. IPEX personnel are committed to improving the safety, reliability and performance of thermoplastic materials. We are involved in several standards committees and are members of and/or comply with the organizations listed on this page.

For specific details about any IPEX product, contact our customer service department.

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## TEMPEST INLET CONTROL DEVICES Technical Manual

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**PRODUCT INFORMATION: TEMPEST LOW, MEDIUM FLOW (LMF) ICD**

**Purpose**

To control the amount of storm water runoff entering a sewer system by allowing a specified flow volume out of a catch basin or manhole at a specified head. This approach conserves pipe capacity so that catch basins downstream do not become uncontrollably surcharged, which can lead to basement floods, flash floods and combined sewer overflows.

**Product Description**

Our LMF ICD is designed to accommodate catch basins or manholes with sewer outlet pipes 6" in diameter and larger. Any storm sewer larger than 12" may require custom modification. However, IPEX can custom build a TEMPEST device to accommodate virtually any storm sewer size.

Available in 14 preset flow curves, the LMF ICD has the ability to provide flow rates: 2lps – 17lps (31gpm – 270gpm)

**Product Function**

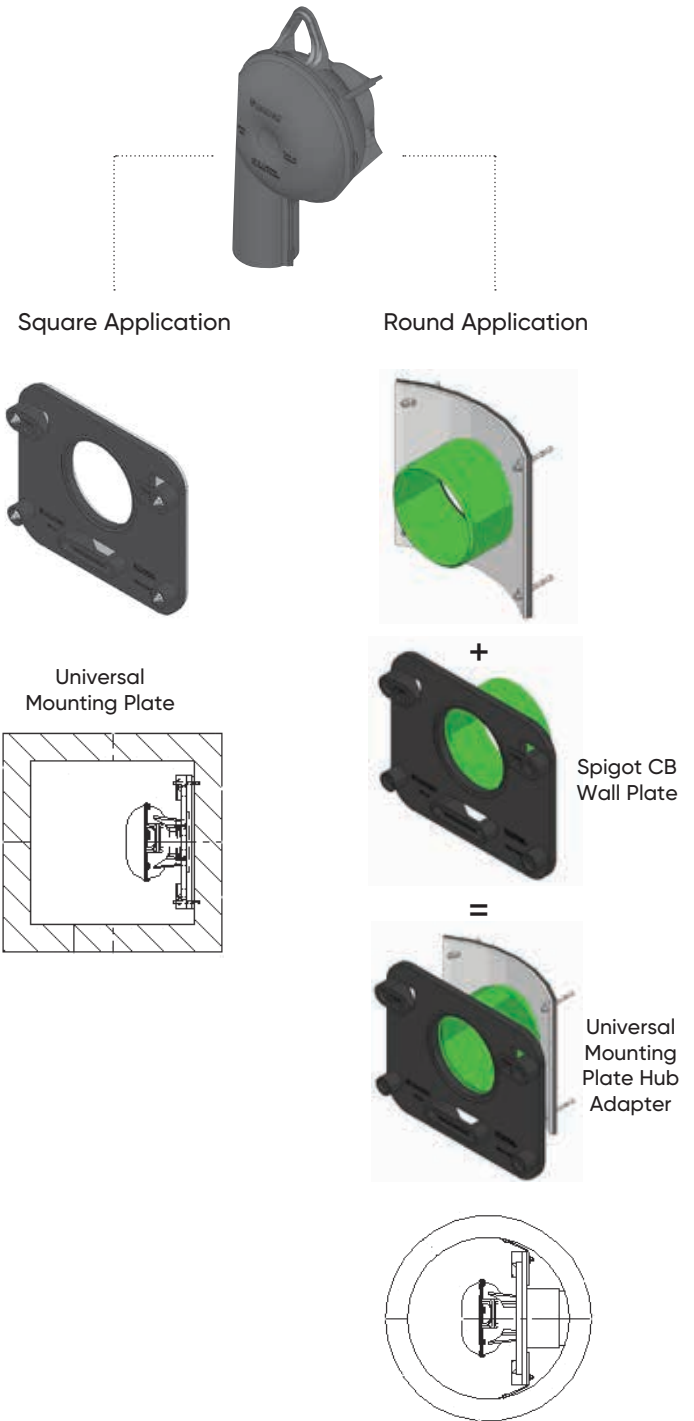
The LMF ICD vortex flow action allows the LMF ICD to provide a narrower flow curve using a larger orifice than a conventional orifice plate ICD, making it less likely to clog. When comparing flows at the same head level, the LMF ICD has the ability to restrict more flow than a conventional ICD during a rain event, preserving greater sewer capacity.

**Product Construction**

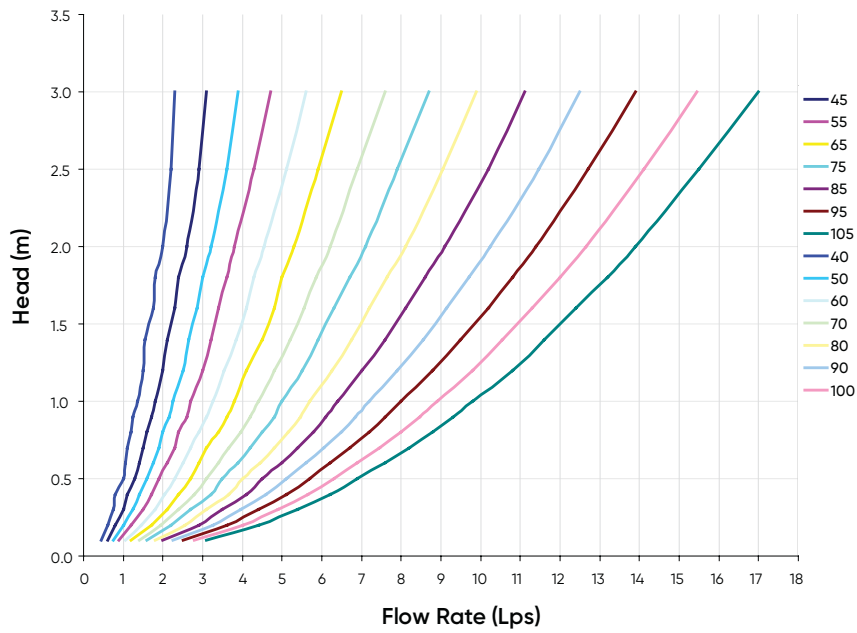
Constructed from durable PVC, the LMF ICD is light weight 8.9 Kg (19.7 lbs).

**Product Applications**

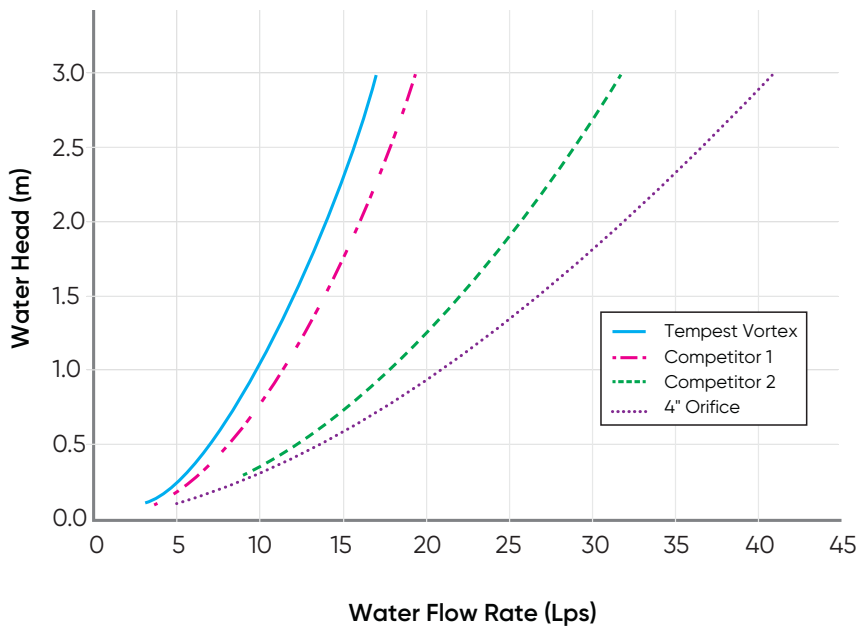
Will accommodate both square and round applications:



**Chart 1: LMF 14 Preset Flow Curves**



**Chart 2: LMF Flow vs. ICD Alternatives**



## PRODUCT INSTALLATION

### Instructions to assemble a TEMPEST LMF ICD into a Square Catch Basin:

#### STEPS:

1. Materials and tooling verification:
  - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level, and marker.
  - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers, (4) nuts, universal mounting plate, ICD device.
2. Use the mounting wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a minimum of 1-1/2" depth up to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the universal mounting plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the wall mounting plate and the catch basin wall.
6. From the ground above using a reach bar, lower the ICD device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the universal mounting plate and has created a seal.



#### WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut down the pipe flush to the catch basin wall.
- Call your IPEX representative for more information or if you have any questions about our products.

### Instructions to assemble a TEMPEST LMF ICD into a Round Catch Basin:

#### STEPS:

1. Materials and tooling verification.
  - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level and marker.
  - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers and (4) nuts, spigot CB wall plate, universal mounting plate hub adapter, ICD device.
2. Use the spigot catch basin wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a depth between 1-1/2" to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the CB spigot wall plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the spigot wall plate and the catch basin wall.
6. Apply solvent cement on the hub of the universal mounting plate, hub adapter and the spigot of the CB wall plate, then slide the hub over the spigot. Make sure the universal mounting plate is at the horizontal and its hub is completely inserted onto the spigot. Normally, the corners of the universal mounting plate hub adapter should touch the catch basin wall.
7. From ground above using a reach bar, lower the ICD device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the mounting plate and has created a seal.



#### WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut back the pipe flush to the catch basin wall.
- The solvent cement which is used in this installation is to be approved for PVC.
- The solvent cement should not be used below 0°C (32°F) or in a high humidity environment. Refer to the IPEX solvent cement guide to confirm the required curing time or visit the IPEX Online Solvent Cement Training Course available at [ipexna.com](http://ipexna.com).
- Call your IPEX representative for more information or if you have any questions about our products.

## PRODUCT TECHNICAL SPECIFICATION

### General

Inlet control devices (ICD's) are designed to provide flow control at a specified rate for a given water head level and also provide odour and floatable control. All ICD's will be IPEX Tempest or approved equal.

All devices shall be removable from a universal mounting plate. An operator from street level using only a T-bar with a hook will be able to retrieve the device while leaving the universal mounting plate secured to the catch basin wall face. The removal of the TEMPEST devices listed above must not require any unbolting or special manipulation or any special tools.

High Flow (HF) Sump devices will consist of a removable threaded cap which can be accessible from street level with out entry into the catchbasin (CB). The removal of the threaded cap shall not require any special tools other than the operator's hand.

ICD's shall have no moving parts.

### Materials

ICD's are to be manufactured from Polyvinyl Chloride (PVC) or Polyurethane material, designed to be durable enough to withstand multiple freeze-thaw cycles and exposure to harsh elements.

The inner ring seal will be manufactured using a Buna or Nitrile material with hardness between Duro 50 and Duro 70.

The wall seal is to be comprised of a 3/8" thick Neoprene Closed Cell Sponge gasket which is attached to the back of the wall plate.

All hardware will be made from 304 stainless steel.

### Dimensioning

The Low Medium Flow (LMF), High Flow (HF) and the High Flow (HF) Sump shall allow for a minimum outlet pipe diameter of 200mm with a 600mm deep Catch Basin sump.

### Installation

Contractor shall be responsible for securing, supporting and connecting the ICD's to the existing influent pipe and catchbasin/manhole structure as specified and designed by the Engineer.

## PRODUCT INFORMATION: TEMPEST HF & MHF ICD

### Product Description

Our HF, HF Sump and MHF ICD's are designed to accommodate catch basins or manholes with sewer outlet pipes 6" in diameter or larger. Any storm sewer larger than 12" may require custom modification. However, IPEX can custom build a TEMPEST device to accommodate virtually any storm sewer size.

Available in 5 preset flow curves, these ICDs have the ability to provide constant flow rates: 9lps (143 gpm) and greater

### Product Function

**TEMPEST HF (High Flow):** designed to manage moderate to higher flows 15 L/s (240 gpm) or greater and prevent the propagation of odour and floatables. With this device, the cross-sectional area of the device is larger than the orifice diameter and has been designed to limit head losses. The HF ICD can also be ordered without flow control when only odour and floatable control is required.



**TEMPEST HF (High Flow) Sump:** The height of a sewer outlet pipe in a catch basin is not always conveniently located. At times it may be located very close to the catch basin floor, not providing enough sump for one of the other TEMPEST ICDs with universal back plate to be installed. In these applications, the HF Sump is offered. The HF Sump offers the same features and benefits as the HF ICD; however, is designed to raise the outlet in a square or round catch basin structure. When installed, the HF sump is fixed in place and not easily removed. Any required service to the device is performed through a clean-out located in the top of the device which can be often accessed from ground level.



**TEMPEST MHF (Medium to High Flow):** The MHF plate or plug is designed to control flow rates 9 L/s (143 gpm) or greater. It is not designed to prevent the propagation of odour and floatables.



### Product Construction

The HF, HF Sump and MHF ICDs are built to be light weight at a maximum weight of 6.8 Kg (14.6 lbs).

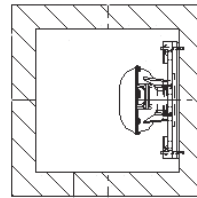
### Product Applications

The HF and MHF ICD's are available to accommodate both square and round applications:



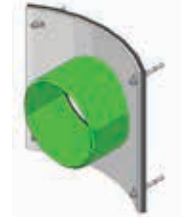
#### Square Application

Universal Mounting Plate



#### Round Application

Spigot CB Wall Plate

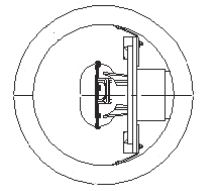


Universal Mounting Plate Hub Adapter

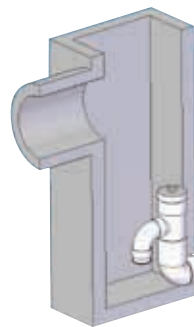


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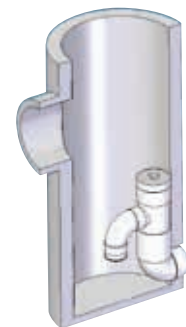
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The HF Sump is available to accommodate low to no sump applications in both square and round catch basins:



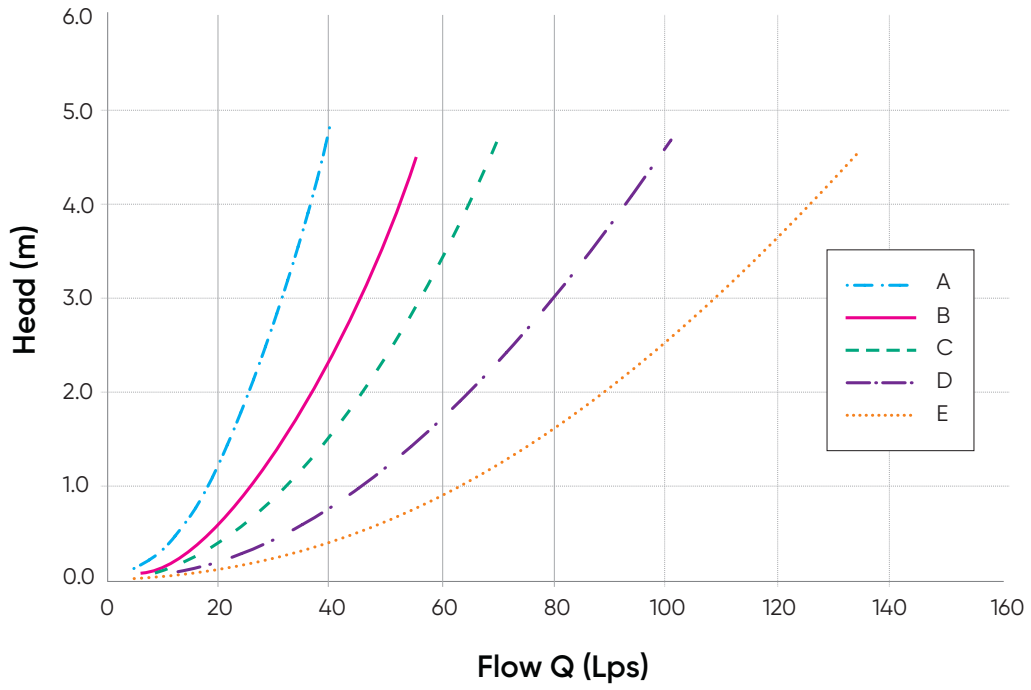
Square Catch Basin



Round Catch Basin



**Chart 3: HF & MHF Preset Flow Curves**



## PRODUCT INSTALLATION

### Instructions to assemble a TEMPEST HF or MHF ICD into a Square Catch Basin:

1. Materials and tooling verification:
  - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level, and marker.
  - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers, (4) nuts, universal mounting plate, ICD device
2. Use the mounting wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a minimum of 1-1/2" depth up to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the universal wall mounting plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the wall mounting plate and the catch basin wall.
6. From the ground above using a reach bar, lower the device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the universal wall mounting plate and has created a seal.

#### WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut down the pipe flush to the catch basin wall.
- Call your IPEX representative for more information or if you have any questions about our products.

### Instructions to assemble a TEMPEST HF or MHF ICD into a Round Catch Basin:

#### STEPS:

1. Materials and tooling verification.
  - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level and marker.
  - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers and (4) nuts, spigot CB wall plate, universal mounting plate hub adapter, ICD device.
2. Use the round catch basin spigot adaptor to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a depth between 1-1/2" to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the spigot CB wall plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the spigot CB wall plate and the catch basin wall.
6. Put solvent cement on the hub of the universal mounting plate, hub adapter and the spigot of the CB wall plate, then slide the hub over the spigot. Make sure the universal mounting plate is at the horizontal and its hub is completely inserted onto the spigot. Normally, the corners of the hub adapter should touch the catch basin wall.
7. From ground above using a reach bar, lower the device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the wall mounting plate and has created a seal.

#### WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut down the pipe flush to the catch basin wall.
- The solvent cement which is used in this installation is to be approved for PVC.
- The solvent cement should not be used below 0°C (32°F) or in a high humidity environment. Refer to the IPEX solvent cement guide to confirm the required curing time or visit the IPEX Online Solvent Cement Training Course available at [www.ipexinc.com](http://www.ipexinc.com).
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## Instructions to assemble a TEMPEST HF Sump into a Square or Round Catch Basin:

### STEPS:

1. Materials and tooling verification:
  - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level, mastic tape and metal strapping
  - Material: (2) concrete anchor 3/8 x 3-1/2, (2) washers, (2) nuts, HF Sump pieces (2).
2. Apply solvent cement to the spigot end of the top half of the sump. Apply solvent cement to the hub of the bottom half of the sump. Insert the spigot of the top half of the sump into the hub of the bottom half of the sump.
3. Install the 8" spigot of the device into the outlet pipe. Use the mastic tape to seal the device spigot into the outlet pipe. You should use a level to be sure that the fitting is standing at the vertical.
4. Use an impact drill with a 3/8" concrete bit to make a series of 2 holes along each side of the body throat. The depth of the hole should be between 1-1/2" to 2-1/2". Clean the concrete dust from the 2 holes.
5. Install the anchors (2) in the holes by using a hammer. Put the nuts on the top of the anchors to protect the threads when you hit the anchors. Remove the nuts from the ends of the anchors.
6. Cut the metal strapping to length and connect each end of the strapping to the anchors. Screw the nuts in place with a maximum torque of 40 N.m (30 lbf-ft). The device should be completely flush with the catch basin wall.



### WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut down the pipe flush to the catch basin wall.
- The solvent cement which is used in this installation is to be approved for PVC.
- The solvent cement should not be used below 0°C (32°F) or in a high humidity environment. Refer to the IPEX solvent cement guide to confirm the required curing time or visit the IPEX Online Solvent Cement Training Course available at [www.ipexinc.com](http://www.ipexinc.com).
- Call your IPEX representative for more information or if you have any questions about our products.

## PRODUCT TECHNICAL SPECIFICATION

### General

Inlet control devices (ICD's) are designed to provide flow control at a specified rate for a given water head level and also provide odour and floatable control where specified. All ICD's will be IPEX Tempest or approved equal.

All devices shall be removable from a universal mounting plate. An operator from street level using only a T-bar with a hook shall be able to retrieve the device while leaving the universal mounting plate secured to the catch basin wall face. The removal of the TEMPEST devices listed above shall not require any unbolting or special manipulation or any special tools.

High Flow (HF) Sump devices shall consist of a removable threaded cap which can be accessible from street level with out entry into the catchbasin (CB). The removal of the threaded cap shall not require any special tools other than the operator's hand.

ICD's shall have no moving parts.

### Materials

ICD's are to be manufactured from Polyvinyl Chloride (PVC) or Polyurethane material, designed to be durable enough to withstand multiple freeze-thaw cycles and exposure to harsh elements.

The inner ring seal will be manufactured using a Buna or Nitrile material with hardness between Duro 50 and Duro 70.

The wall seal is to be comprised of a 3/8" thick Neoprene Closed Cell Sponge gasket which is attached to the back of the wall plate.

All hardware will be made from 304 stainless steel.

### Dimensioning

The Low Medium Flow (LMF), High Flow (HF) and the High Flow (HF) Sump shall allow for a minimum outlet pipe diameter of 200mm with a 600mm deep Catch Basin sump.

### Installation

Contractor shall be responsible for securing, supporting and connecting the ICD's to the existing influent pipe and catchbasin/manhole structure as specified and designed by the Engineer.

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NOTES

# SALES AND CUSTOMER SERVICE

IPEX Inc.

Toll Free: (866) 473-9462

[ipexna.com](http://ipexna.com)

## About the IPEX Group of Companies

As leading suppliers of thermoplastic piping systems, the IPEX Group of Companies provides our customers with some of the largest and most comprehensive product lines. All IPEX products are backed by more than 50 years of experience. With state-of-the-art manufacturing facilities and distribution centers across North America, we have established a reputation for product innovation, quality, end-user focus and performance.

Markets served by IPEX group products are:

- Electrical systems
- Telecommunications and utility piping systems
- PVC, CPVC, PP, ABS, PEX, FR-PVDF and PE pipe and fittings (1/4" to 48")
- Industrial process piping systems
- Municipal pressure and gravity piping systems
- Plumbing and mechanical piping systems
- PE Electrofusion systems for gas and water
- Industrial, plumbing and electrical cements
- Irrigation systems

Products manufactured by IPEX Inc.

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A policy of ongoing product improvement is maintained. This may result in modifications of features and/or specifications without notice.

