



**CERTIFIED
MANAGEMENT SYSTEM
ISO 9001:2015**

"The HydroMax Siphonic storm drainage system is an excellent value engineered alternative as the end user benefits from the reduced ponding and cost savings."

-Ed Hosbach, Chief Estimator, Dixie Plumbing (Pompano Beach, FL)

HydroMax[®] - 2019

Go to
www.mifab.com
for the most
current product
specification
sheets.

The World is Awakening to A New Dawn in Drainage



For help with any project please email
HYDROMAX@MIFAB.com
to request a Design Submission Form

The Engineered Rainwater Solution
MIFAB[®] **HydroMax**[®] **Siphonic Roof Drainage System**
LIT-082

Top Technical Benefits of Siphonic Roof Drainage

Smaller Diameter pipe used:
 approximately half the size of
 gravity diameter pipe size



Smaller Diameter pipe =

- Smaller Fittings
- Smaller Couplings
- Smaller Hangers
- Smaller Insulation

Horizontal pipes are installed
 without **PITCH – Flat Level**

Easy co-ordination of services for
 BIM modeling due to pipework
 running flat

**Fewer pipes = Reduced
 construction time and cost**

Rainwater downpipes **routed to
 the Engineer’s Preferred Locations**
 - frees up valuable building space

Routing of rainwater downpipes
 to the perimeter of buildings
**Eliminates Below Grade
 Excavation and Drainage Under
 the Building Floor**

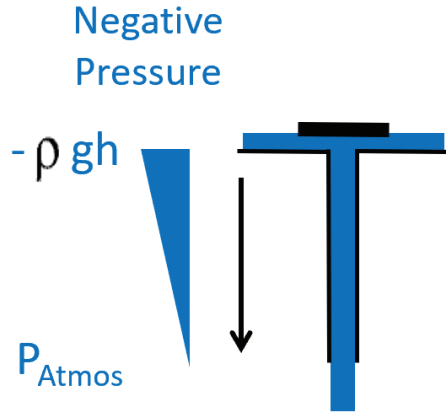
A significant **Reduction in
 Civil Drainage**
 (common range is
 from 20% to 60%)

Easily route rainwater pipes to
Retention Ponds or **Detention
 Basins** or Rainwater Harvesting

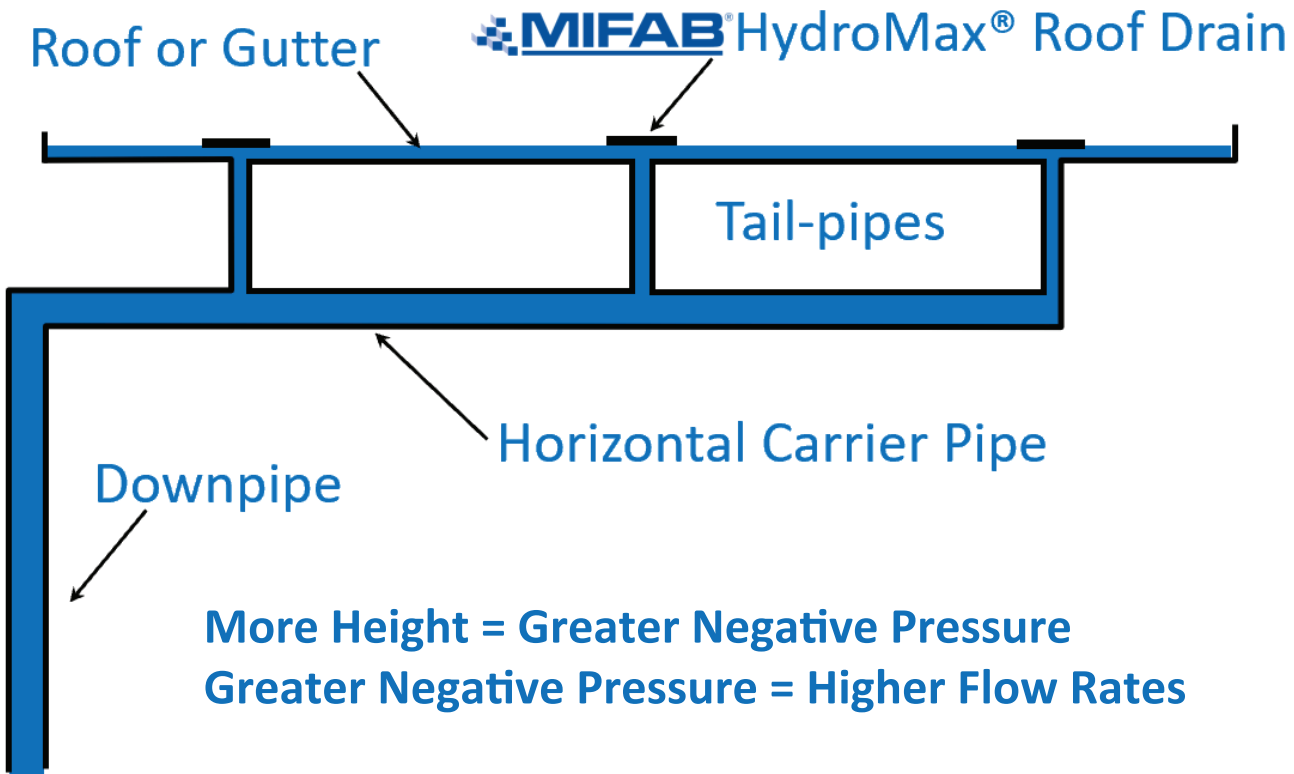
More efficient water discharge =
 Reduced ponding on the roof
 compared to traditional gravity
 drains creating **Safer Overall Roofs**

IPC 2015 Code Compliance
 MIFAB® HydroMax® siphonic roof
 drains have performance graphs
 from testing to siphonic roof
 drains standard ASME A112.6.9

How Does Siphonic Drainage Function?



Rainwater (**without air**) falling down the vertical pipe accelerates, creating **negative pressure**, which draws water off the roof **siphonically**.



More Height = Greater Negative Pressure
Greater Negative Pressure = Higher Flow Rates

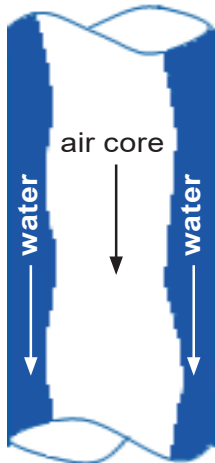
"In the course of the challenging storm design for the Embry Riddle Aeronautical University Student Union Building, HydroMax Siphonic Drainage enabled us to achieve a design solution that conventional storm system could not offer. We were enabled to incorporate smaller size cast iron, PVC and copper pipes within the HydroMax Siphonic system which provided technical benefits as well as cost savings." -Kaz Kazeminia, Principal, OCI Associates, Inc. (Orlando, FL)

System Comparison

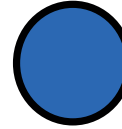
Traditional Gravity



Water in annular flow



MIFAB® HydroMAX® Siphonic



No Air



HydroMAX® pipe diameters half the size of gravity

Restrictive Factors of Gravity Drainage

1. Gravity drains require ⅓ air to transport ⅓ water = bigger diameter pipes

2. The vortex formation of a gravity roof drain results in the water being transported in an inefficient spiral motion

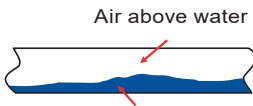
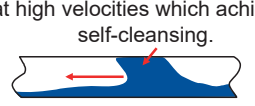
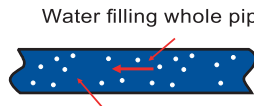
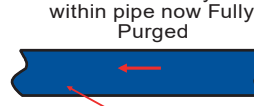
3. The flow of water in gravity drainage is dictated by pitch, which limits the distance a pipe can travel

4. The pitch also dictates the location of discharge, rather than the design team's choice of where to route










5. The driving force is directly correlated to the depth of ponding

6. No Performance Test within ASME A112.6.4 Gravity Drain Standard to provide GPM flow rates = unidentified ponding on roof

Four Flow Patterns of Siphonic Drainage

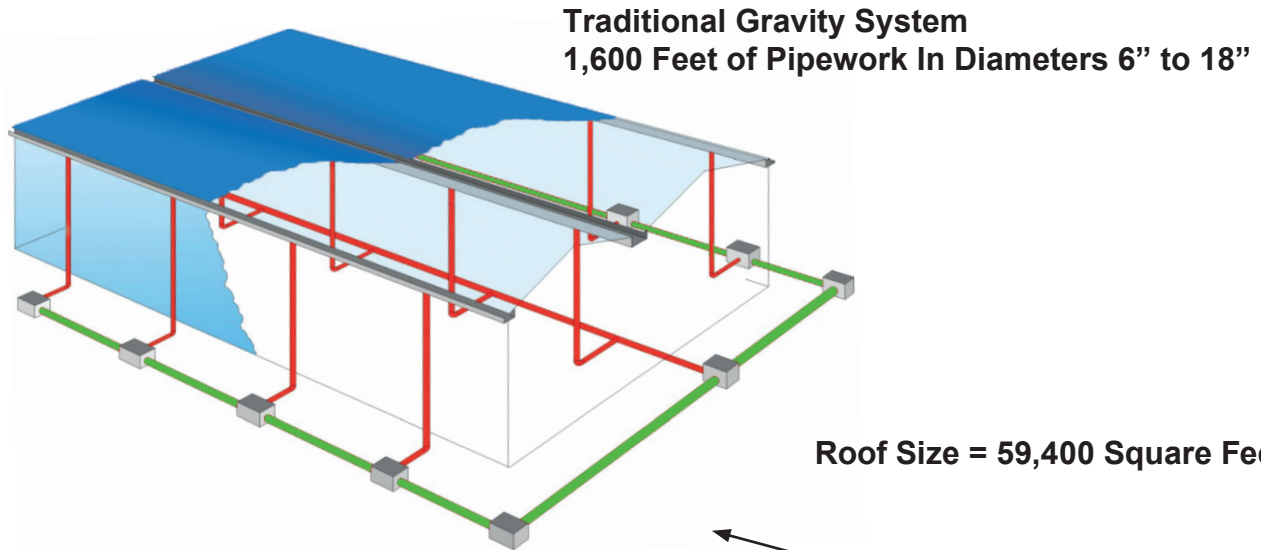
Priming of Main Pipe Work			
<p>Stage 1 Gravity Flow Light Rainfall 0%-10% of Design</p> <p>Air above water</p>  <p>Gravity flow in pipework</p>	<p>Stage 2 Plug Flow Moderate Rainfall 10%-40% of Design</p> <p>Plug of water filling whole pipe at high velocities which achieves self-cleansing.</p>  <p>Air pockets driven down pipework</p> <p>Tests have shown that self-cleansing can be achieved at as low as 10% to 15% of the design rainfall rate.</p>	<p>Stage 3 Bubble Flow Heavy Rainfall 40%-70% of Design</p> <p>Water filling whole pipe</p>  <p>Air bubbles in suspension carried at high velocity</p>	<p>Stage 4 Full-Bore Flow Intense Rainfall 70%-100% of Design</p> <p>No more air entry – Air within pipe now Fully Purged</p>  <p>Water filling whole pipe</p>

Completed HydroMax® Projects

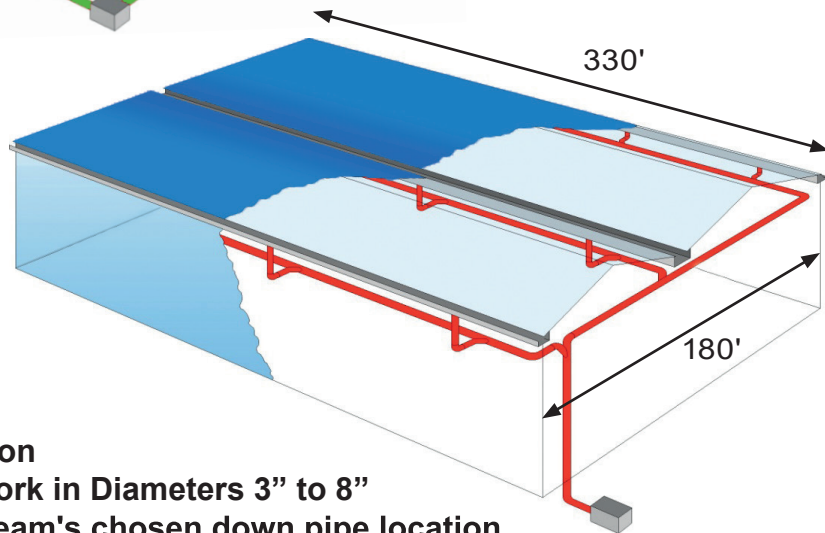
		
Marriott	Mercy West Lakes Hospital	Walmart
		
Wayne State Student Housing	Parking Garage	Little Caesars Arena
		
Phoenix Sky Harbor	Marina Heights	Disney Springs

"Henderson Engineers, Inc. has designed HydroMax siphonic roof drain systems for hundreds of buildings in the United States using the HydroTechnic calculation program. HydroTechnic is an excellent tool that equips the mechanical designer with an understanding of siphonic system operation and provides an excellent graphical interface."
 -Arron Cooper, PE, Vice President, Henderson Engineers Inc. (Bentonville, AR)

Gravity Layout vs. Siphonic Layout



Roof Size = 59,400 Square Feet



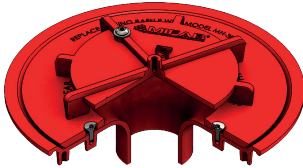
MIFAB® HYDROMAX® Solution
 Only 1,000 Feet of Pipework in Diameters 3" to 8"
 Pipes run flat to design team's chosen down pipe location.

Costs Savings Using A Siphonic System

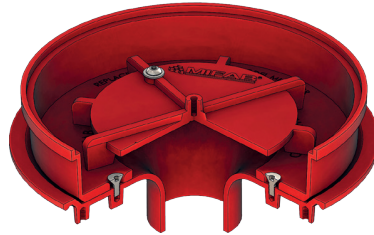
- | | | |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------|
| 1. Reduction in Pipe Diameters | 5. Elimination of Under-Slab Excavation | 7. Reduction of Civil Excavation |
| 2. Fewer Drains | 6. Reduced Material Costs for Pipes, Fittings, Couplings, Hangers, and Insulation | 8. Reduction of Manholes |
| 3. Reduction of Down Pipes | | 9. Labor Savings from Less Pipe to Hang |
| 4. Less Pipework | | |

MIFAB® HydroMax® Drain/Cover Options

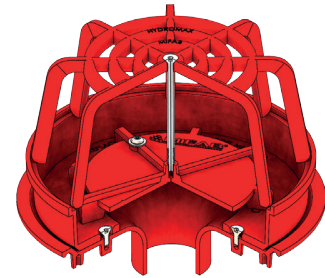
All MIFAB® HydroMax® drains are tested to ASME A112.6.9 and IAPMO listed



Part # MH-300
Roof Drain Assembly
 (3" NH, 4" NH, 5" NH, 6" NH)



Part # MH-301
Overflow Roof Drain
 (3" NH, 4" NH, 5" NH, 6" NH)



Part # MH-301-DG
Overflow with Debris Guard
 (3" NH, 4" NH, 5" NH, 6" NH)



Part # MH-200
2" Terrace Drain



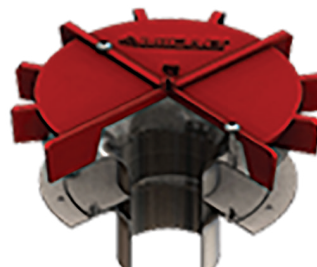
Part # MH-205-G
2" Gutter Drain
 (Stainless Steel Spun Body)



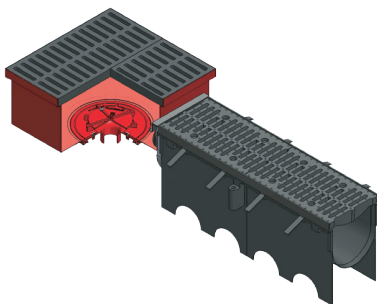
Part # MH-305-G
3" Gutter Drain
 (Stainless Steel Spun Body)



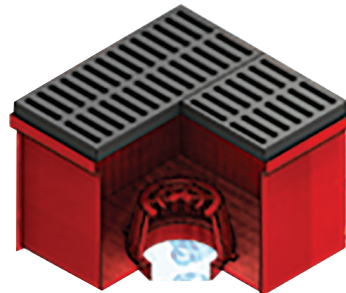
Part # MH-505-G
5" Gutter Drain
 (Stainless Steel Spun Body)



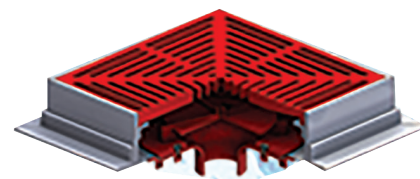
Part # MH-505-G-OF
5" Gutter Overflow Drain
 (Stainless Steel Spun Body)



Part # MH-T
Siphonic Trench Assembly



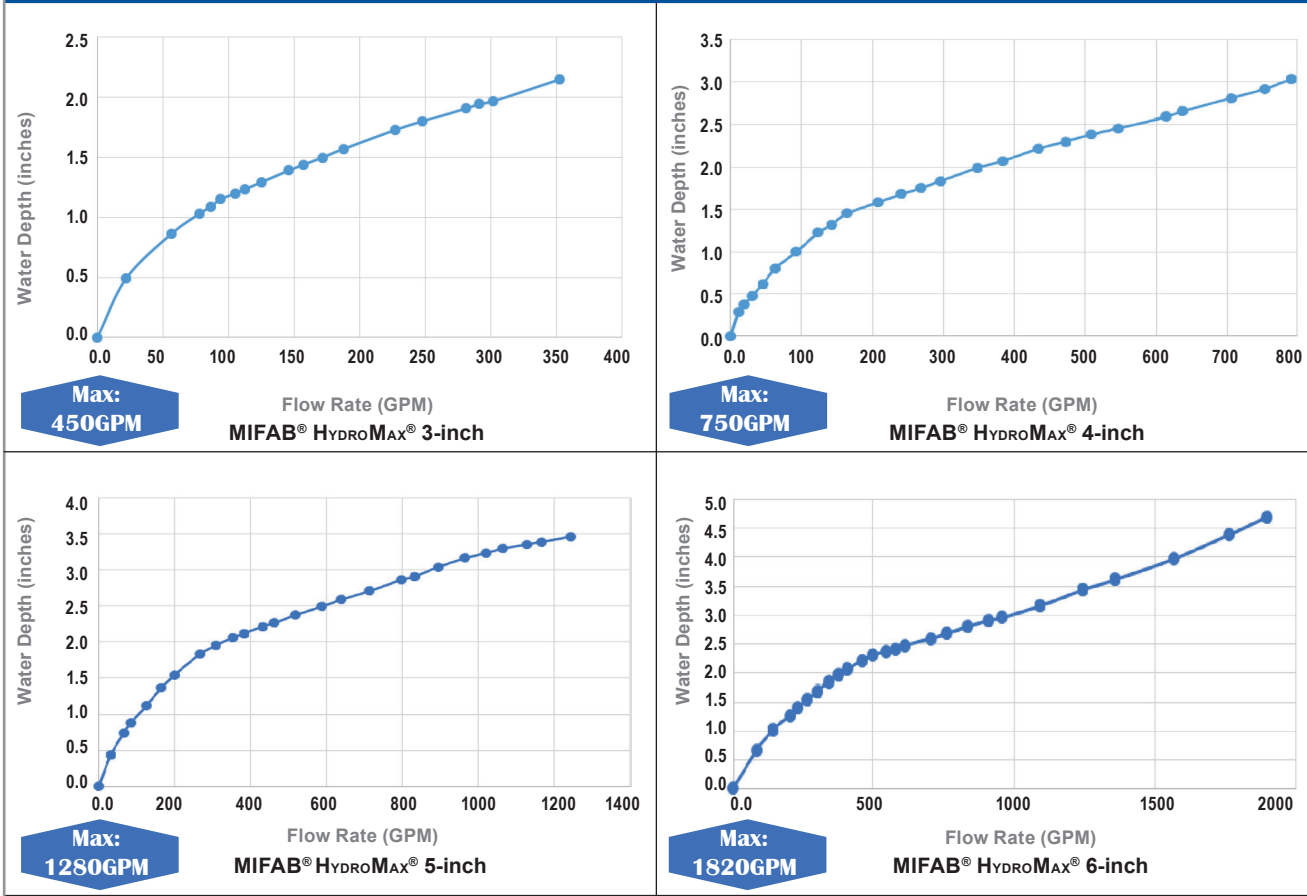
Part #'s MH-F1460, MH-F1580
Siphonic Gravity Break Drain



Part # MH-PG-D
Parking Garage/Deck Drain
 (3" NH, 4" NH, 5" NH)

"Just wanted to let you all know that on our weekly conference call today the contractor said that the price for the siphonic system came in "somewhere between \$201,000 & \$235,000 less" than the conventional system they had originally priced."
 - Engineering Firm Email (Atlanta, GA)

Ponding Curves of HydroMax®



**Gravity Drainage
 Ponding Rates**

Model #	Depth	1"	2"	3"	4"	5"	6"
Model #R1203	3" Cast Iron Drain with Cast Iron Dome	25	87	214	225	231	247
Model #R1204	4" Cast Iron Drain with Cast Iron Dome	25	90	215	232	240	252
Model #R1205	5" Cast Iron Drain with Cast Iron Dome	27	100	230	295	440	720
Model #R1206	6" Cast Iron Drain with Cast Iron Dome	15	75	210	250	490	715

3" Drain			4" Drain			5" Drain			6" Drain		
Depth	Gravity	HydroMax®	Depth	Gravity	HydroMax®	Depth	Gravity	HydroMax®	Depth	Gravity	HydroMax®
1"	25 GPM	75 GPM	1"	25 GPM	93 GPM	1"	27 GPM	115 GPM	1"	15 GPM	140 GPM
2"	87 GPM	310 GPM	2"	90 GPM	350 GPM	2"	100 GPM	350 GPM	2"	75 GPM	400 GPM
3"	214 GPM		3"	215 GPM	785 GPM	3"	230 GPM	890 GPM	3"	210 GPM	990 GPM
4"	225 GPM		4"	232 GPM		4"	295 GPM		4"	250 GPM	1580 GPM
5"	231 GPM		5"	240 GPM		5"	440 GPM		5"	490 GPM	
6"	247 GPM		6"	252 GPM		6"	720 GPM		6"	715 GPM	

Max SqFt at Alternate Rainfall Rates

Drain	GPM	Design Rainfall Rate			
		2"	3"	4"	5"
Absolute Min GPM	23	1,107 sq ft	738 sq ft	554 sq ft	443 sq ft
MH-300/MH-301	MAX GPM	19,972 sq ft	13,315 sq ft	9,986 sq ft	7,989 sq ft
MH-400/MH-401		36,094 sq ft	24,063 sq ft	18,047 sq ft	14,438 sq ft
MH-500/MH-501		61,601 sq ft	41,067 sq ft	30,801 sq ft	24,641 sq ft
MH-600/MH-601		87,588 sq ft	58,392 sq ft	43,794 sq ft	35,036 sq ft

Tributary (Catchment) Area (ft²)	Rainfall Intensity (inches per hour)																Roof Drains Operating Range
	MIFAB® HydroMax® Roof Area x Rainfall Rate = GPM ready reckoner chart																
	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	
500																	MH-300 & 301
1000																	3" Drain
1500																	Min Inflow (GPM) 23
2000																	Max Inflow (GPM) 450
2500																	MH-400 & 401
3000																	4" Drain
3500																	Min Inflow (GPM) 75
4000																	Max Inflow (GPM) 750
4500																	MH-500 & 501
5000																	5" Drain
5500																	Min Inflow (GPM) 120
6000																	Max Inflow (GPM) 1280
6500																	MH-600 & 601
7000																	6" Drain
7500																	Min Inflow (GPM) 160
8000																	Max Inflow (GPM) 1820
8500																	MH-600 & 601
9000																	6" Drain
9500																	Min Inflow (GPM) 160
10000																	Max Inflow (GPM) 1820
10500																	
11000																	
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"No Kidding? I was always under the impression that siphonic typically required more ponding than roof drains would usually incur. That is really good to know!" -Kyle Jones, Soutions AEC, (St. Louis, MO)

Case Study using HydroMax®

Far too often gravity dictates storm drainage design. Pipe can only run so far with pitch before crossing over into livable space, in times requiring a leader to drop down in the middle of the building with the only solution being to excavate through the interior of the building a long distance (still accounting for pitch) to reach the civils. But what if that excavation could be eliminated completely from the schedule? What if the pipe could run tight to the ceiling for a long run? What if the pipe diameter could be smaller while still providing the same GPM flow rates?



Do I have your attention yet? Let me introduce you to Siphonic roof drainage.

Recently, the Waldinger Corporation was tasked with helping build a state-of-the-art manufacturing facility for Viega LLC in McPherson, Kansas. Viega is building the 204,000-square-foot plant to expand production of its ProPress® Copper product line and create a master distribution facility.



THE WALDINGER CORPORATION

As a way to provide value engineering on the project, the team over at the Waldinger Corporation looked at every option available to help provide the best product, with the most efficient pricing possible to bring the strongest solution to the table. They enlisted the help of Professional Engineering Consultants (PEC) to help with the engineering on the project.

In the first round of designs, the Viega project was needing 3 separate storm drainage lines, each containing 7 gravity drains apiece, to appropriately discharge that amount of roof area. Additionally, they noticed the initial design would not allow for the storm drainage to travel all the way to the exterior wall, causing the need for internal downpipes leading to excavation inside of the building footprint on all 3 runs. This issue was caused by the limitations of a traditional gravity storm drainage system; had the discharge pipe run all the way to the exterior wall, the piping itself would have limited the ceiling space causing the piping to drop below the required clearance height and possibly become a forklift hazard.

Working with the MIFAB® HydroMax® design assist team, PEC was able to completely transform the initial design by creating a siphonic system fitting within their requirements. The biggest benefit in this given scenario was the ability to route the discharge pipe to the engineer's desired location. Whereas in the initial design, the leaders caused the need for excavation, in the HydroMax Siphonic design the pipe work runs without pitch, enabling the storm drainage piping to run high and tight all the way to the west exterior wall of the building. This ability to run the storm drainage to the exterior wall eliminated the need for excavation, as well as reduced the pipe size diameters.

Barry George with PEC commented, "With long runs, bridge cranes, and equipment the leaders needed to fit within the structure limits. The siphoning drains system was the ideal solution."



Case Study using HydroMax®

How does siphonic drainage create a reduction in pipe size diameter? A traditional gravity system relies on air to push water through the system (two-thirds air and one-third water). Siphonic drainage utilizes the entire pipework, filling it completely with water, which allows on average half the diameter pipe to be used in the same scenario.

Also adding to the cost savings associated with smaller diameter pipe are smaller diameter fittings, smaller hangers, smaller couplings and less strenuous labor to install. Additionally, because a siphonic drain is so much more efficient at discharging water (can run up to 26.2 ft/s compared to gravity's 3 ft/s), PEC's siphonic system for Viega was able to function with three runs each containing four drains, reducing the total number of drains from 21 down to 12 for both the primary and overflow. Equally important, because a siphonic system runs completely flat, the systems were able to be installed parallel, giving the contractor the ability to prefab the threaded rod needed for the hangers.



As a result, the team was able to provide Viega with a more efficient system, while saving an enormous amount of money and labor. **The Waldinger Corporation stated that on this particular project they were able to see a 23% saving in material and labor.**

As Viega continues to expand, siphonic systems have been used on a number of their buildings; most recently in its racking facility to enable space savings providing even more storage space.

If you would like more information on how to utilize HydroMax® Siphonic Drainage on your next project, please feel free to contact our team at hydromax@mifab.com for a design submission form – we would be more than happy to help answer any questions/put together a design.

"We have been utilizing the MIFAB siphonic roof drain products and design services for several years. The HydroTechnic's design team is very helpful and willing to assist us in meeting the expectations of our customers. The siphonic roof drain system is a great value engineering offer that we can offer to our customers and clients. The siphonic design is a proven cost savings over traditional gravity system designs." -Dan Zimmerman, Mechanical Manager, The Waldinger Corporation (Omaha, NE)


How to Submit a Design to MIFAB® HydroMax®

Rainfall Rate	
Pipe Material	

(PVC or Cast Iron? – if multiple materials used, please identify on ISO drawing)

Please provide an ISO riser drawing of the piping design including:

- A. Sketch up path of your preferred routing to optimize benefits using Mifab HydroMax® routing flat
- B. Show the routing from each roof drain to the discharge
- C. Provide all the center-to-center distances (ft, in) of the piping **(diameters not needed)**
 - i. Both vertical and horizontal dimensions needed
- D. Provide GPM's per drain OR Define the catchment area (sq. ft.) each roof drain is collecting
- E. If surcharging, the height between the center of siphonic horizontal line at discharge to the manhole grate cover

GPM CALCULATOR 

Insert Rainfall Rate Below

ROOF AREA #	SQ. FEET	Q	GPM
A1	0	0.00	0.000
A2	0	0.00	0.000
A3	0	0.00	0.000
A4	0	0.00	0.000
A5	0	0.00	0.000
A6	0	0.00	0.000
A7	0	0.00	0.000
A8	0	0.00	0.000
A9	0	0.00	0.000
A10	0	0.00	0.000

A sizing calculator for determining GPM flow through a drain is available from MIFAB upon request.

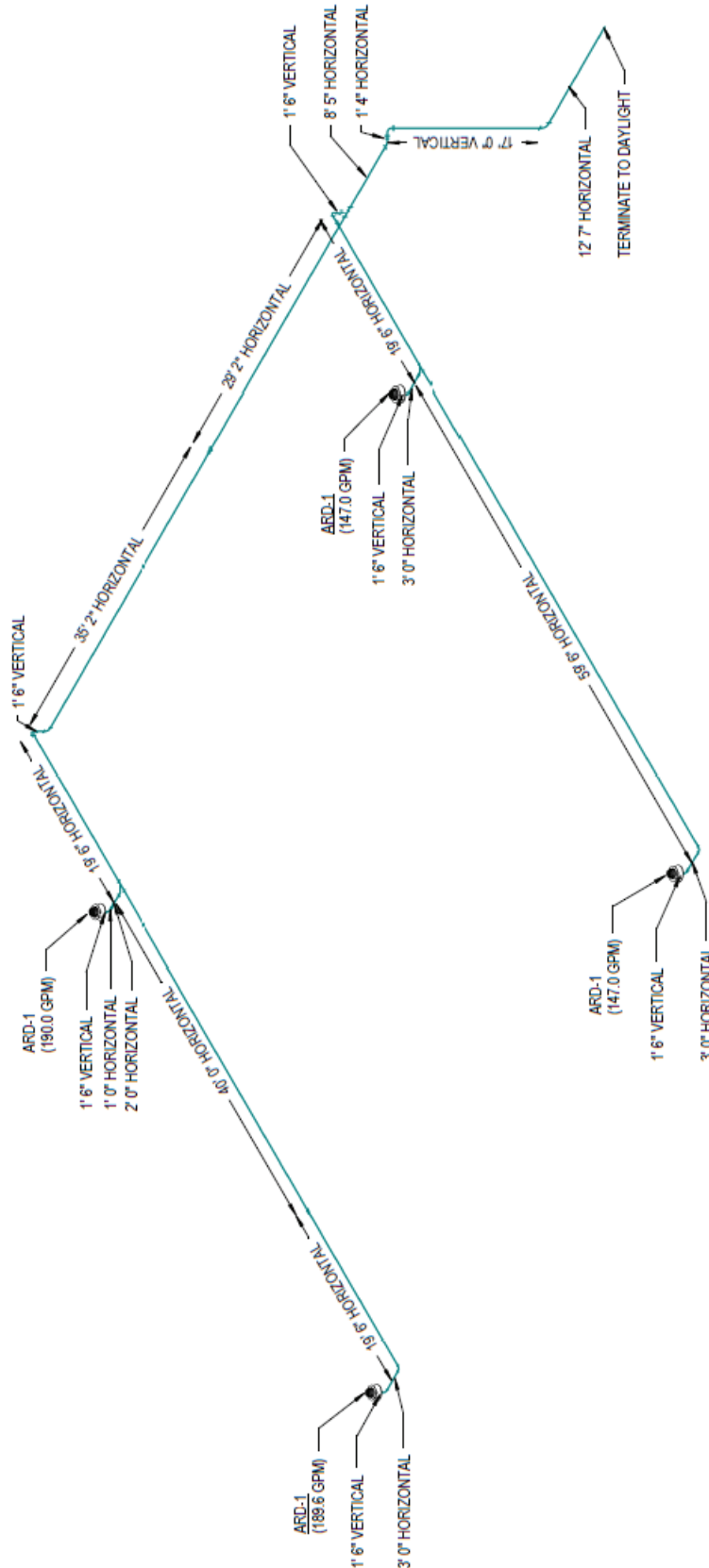
Users only needs to know **Rainfall Rate** and **SqFt Feeding the Drain**

To allow our design team to identify any additional potential benefits and cost savings (or any technical issues) please provide the following in REVIT or CAD files (PDF's are acceptable, but could increase design time):

We only require the following drawings detailing:

- A. Roof plans with GPM's per drain location Or showing calculated catchment areas
- B. Preferred piping routes and discharge points
 - a. (Floor Plans directly below roof and any level pipe runs on)
- C. Elevation from drain to horizontal
- D. Elevation showing all vertical elements (carrier pipe to discharge)
- E. Sectional and External drawings

Example of ISO Riser Drawing



"MIFAB's HydroTechnic design software is easy to use and provides an abundance of information to place on my drawings which lessens confusion in the field. The technical staff at MIFAB have been extremely helpful, always available to answer questions with quick turnaround, no matter the time of day." -Amanda Dolber, PE, EBS Engineering (Buffalo, NY)

Why Use MIFAB® HydroTechnic™ Design Software?

Our HydroTechnic Design software is:

1. Online Based - easy for sharing, no special download required
2. Easy to reconfigure design when changes in the field arise
3. Software is indepently tested by 3rd party certified to be 100% in compliance with ASPE 45 standards when a **"PASS"** is shown (refer to letter from CRM in this booklet)
4. We have a Design Assist Team in Chicago to help with projects **FREE OF CHARGE**

How to Create a Design

Element Type

Object	Pipe <input checked="" type="radio"/> Drain <input type="radio"/>
Material	CI no-hub
Diameter	3"

Direction and Angle

	X	Y	Z
+	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Length:

Slope: feet-inches

Insert Add

Easy to use graphic input to create a design within the HydroTechnic Software

BILL OF MATERIAL	DESCRIPTION	DIAMETER (Inches)	QUANTITY (feet)
CI no-hub	MH-300 with Dome (23 to 415 GPM)		5
CI no-hub	Hubless Cast Iron Pipe 2"	2	30
CI no-hub	Hubless Cast Iron Pipe 3"	3	60
CI no-hub	Hubless Cast Iron Pipe 4"	4	90
CI no-hub	Hubless Cast Iron Pipe 6"	6	50
CI no-hub	Hubless Cast Iron Pipe 8"	8	40
			each
CI no-hub	eigth bend 2"	2	1
CI no-hub	eigth bend 3"	3	2
CI no-hub	eigth bend 5"	5	2
CI no-hub	eigth bend 8"	8	1
CI no-hub	Quarter bend - short sweep 2"	2	4
CI no-hub	Quarter bend - short sweep 3"	3	3
CI no-hub	Quarter bend - short sweep 5"	5	1
CI no-hub	Quarter bend - short sweep 6"	6	1
CI no-hub	Quarter bend - short sweep 8"	8	3
CI no-hub	Coupling 2"	2	25
CI no-hub	Coupling 3"	3	34
CI no-hub	Coupling 5"	5	20
CI no-hub	Coupling 6"	6	11
CI no-hub	Coupling 8"	8	16
CI no-hub	Reducer 3/2"		10
CI no-hub	Reducer 5/3"		2
CI no-hub	Reducer 6/5"		1
CI no-hub	Reducer 8/5"		1
CI no-hub	Reducer 8/6"		3
CI no-hub	45° Y branch 5/3"		2
CI no-hub	45° Y branch 6/3"		1
CI no-hub	45° Y branch 8/5"		1
CI no-hub	Access Point 8"		1

Hydraulic Calculation Summary

	Previous	Current
Out of Balance	8.303 ft	1.293 ft
Minimum Pressure	-25.878 ft	-25.878 ft
Maximum Pressure	7.302 ft	7.302 ft
Minimum Velocity	6.898 ft/sec	6.898 ft/sec
Minimum Vertical Velocity	7.292 ft/sec	7.292 ft/sec
Maximum Vertical Velocity	25.281 ft/sec	25.281 ft/sec
Discharge Velocity	18.838 ft/sec	18.838 ft/sec
Fill time	40 seconds	40 seconds
Pass/Fail?	FAIL	PASS
Tail Pressures		
1	-1.938 ft	1 -1.938 ft
2	-0.645 ft	2 -0.645 ft
3	1.111 ft	3 1.111 ft
4	-8.948 ft	4 -0.817 ft
5	-1.292 ft	5 -1.292 ft

Close

Discharge

BOM available for Cost Estimating

Calculation Report available for Engineering review

No.	Type	Material	Diameter (inches)	Length (feet-inches)	HEIGHT (feet-inches)	XYZ	Flowrate (gpm)	Velocity (ft/sec)	Headloss (ft)	Pressure (ft)
0	Discharge		10				2609.388	10.659	1.765	0
1	Pipe	CI-No-Hub	10	3' 1 1/2"		-X	2609.388	10.659	0.133	0.133
2	Pipe	CI-No-Hub	10	3' 1 1/2"		-X	2609.388	10.659	0.133	0.265
3	90° radius bend	CI-No-Hub	10				2609.388	10.659	0.53	0.795
4	Expansion	CI-No-Hub	8				2609.388	10.659	0.607	-1.275
5	Pipe	CI-No-Hub	8	9' 7"	9 7	+Z	2609.388	10.659	1.352	-9.506
6	Reducer	CI-No-Hub	8				2609.388	10.659	0.74	-8.766
7	Pipe	CI-No-Hub	8	19' 2"	19 2	+Z	2609.388	10.659	0.814	-24.443

Independent 3rd party certification on MIFAB® HYDROMAX® HydroTechnic™ software.

CRM Rainwater Drainage Consultancy Ltd

17 April 2015

Bill Ross
HydroMax Inc. Ltd.,
Balnagowan,
Eassie
Glamis
Forfar
DD8 1SG

CRM Building
85 Worsley Rd
Farnworth
Bolton
BL4 9LU
Tel. 01204 701934
Email: rdc@cmrainwater.co.uk

Dear Sirs,

Hydromax™ outlets and HydroTechnic™ software

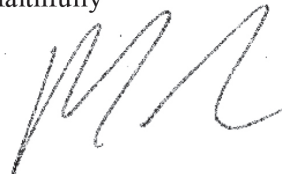
We at CRM, one of Europe's leading independent Consultant's for Siphonic Roof Drainage, along with HR Wallingford (formerly named Hydraulic Research, Wallingford) one of the world's leading research and test facilities for hydraulics, worked together on testing the HydroMax™ siphonic roof drainage system and HydroTechnic™ analytical design software program.

We are pleased to confirm that the system functioned well under all test conditions and satisfied the performance requirements of the current ruling standards for roof drainage design, ASPE/ANSI 45:2013. The HydroTechnic™ analytical design program has been proven to be extremely accurate, a fact endorsed by HR Wallingford (who were previously commissioned by a UK Governmental Department to analyse siphonic roof drainage systems). We believe that due to its technically advanced calculation process, HydroTechnic™ produces calculations of unsurpassed accuracy together with user friendly features including the ability to calculate with varying piping materials.

We can confirm that the HydroMax 3", 4", 5" and 6" have been tested in accordance with standard ASME 112.6.9-2005.

Please contact me if you require any further information.

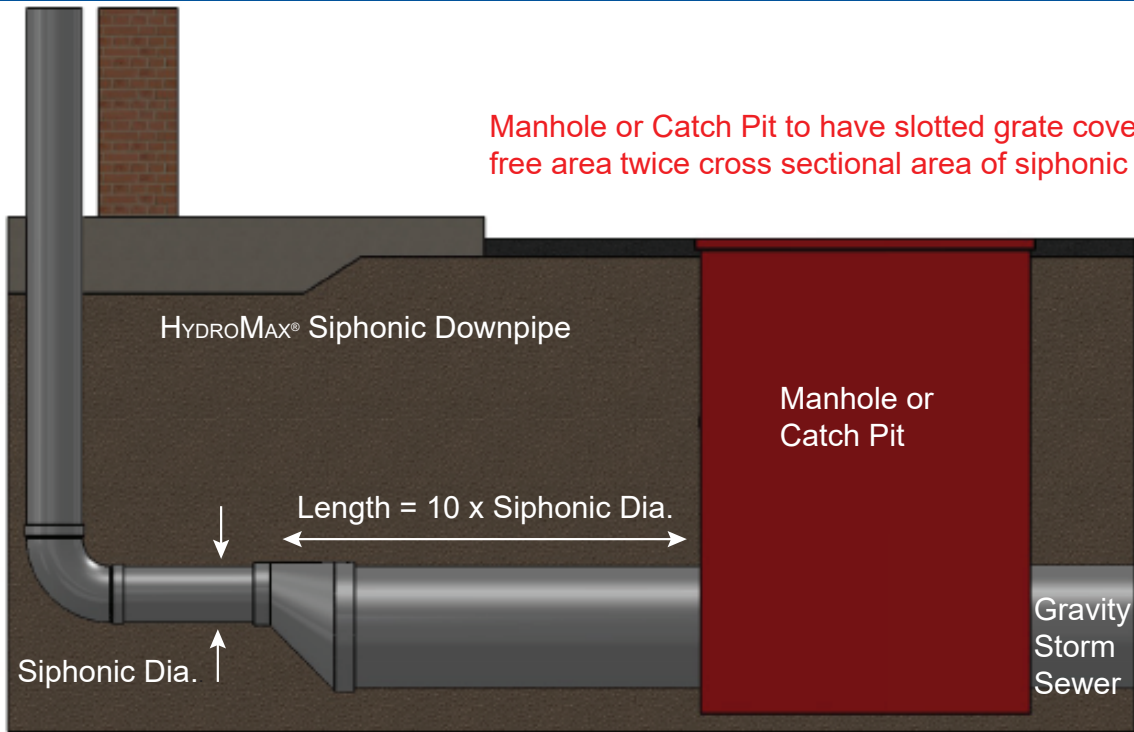
Yours faithfully



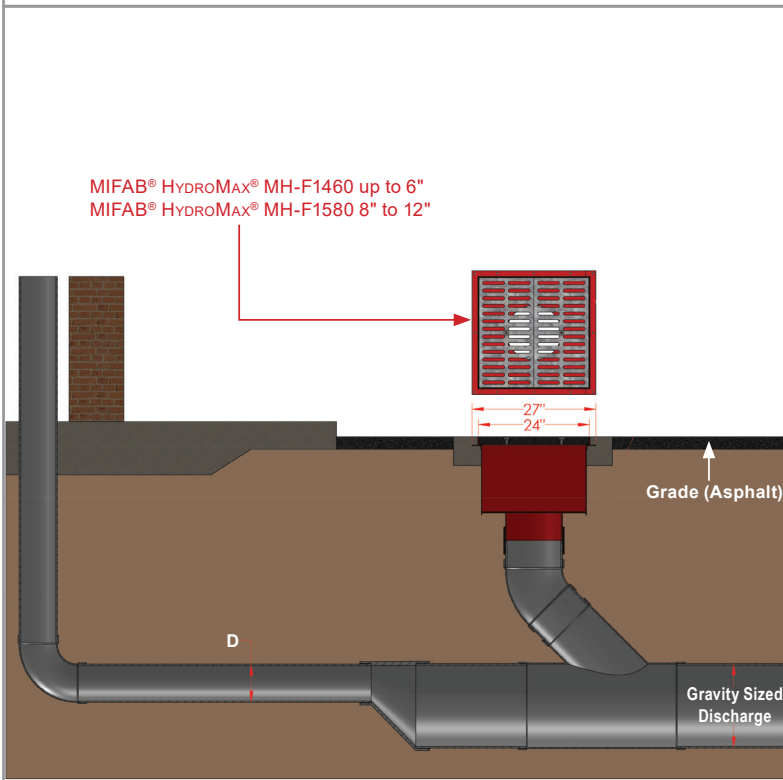
Dr. Malcolm Wearing BEng PhD CEng MICE MCIWEM

"I have been a regular user of MIFAB's HydroTechnic software since 2017. The program's intuitive user interface, coupled with the world-class support we receive from MIFAB, consistently results in fully optimized system designs with significant cost and performance benefits." -Ed Yelin, CPD, Erdman Anthony & Associates (Rochester, NY)

Siphon Breaks



Flare out discharge pipework 10 x siphonic pipe diameter in length from manhole and expect at least 2 step-ups in diameter for the transition to gravity pipe size.



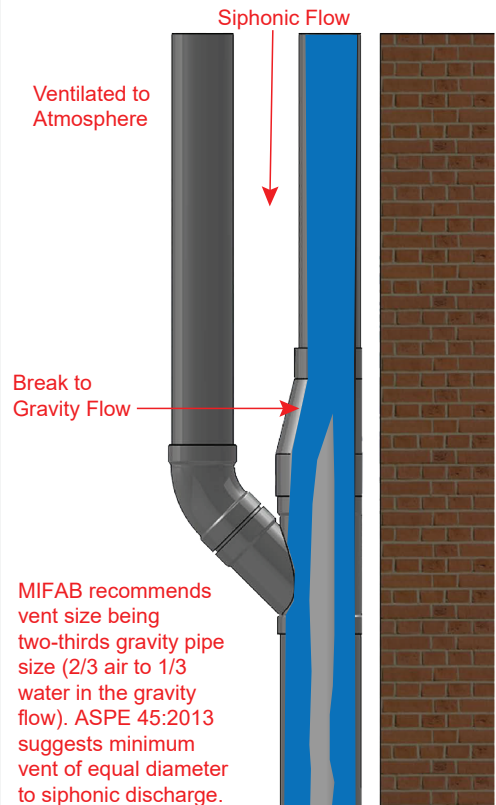
MIFAB® HYDROMAX® MH-F1460 up to 6"
 MIFAB® HYDROMAX® MH-F1580 8" to 12"

27"
 24"

Grade (Asphalt)

Gravity Sized Discharge

Siphonic Break in Vertical

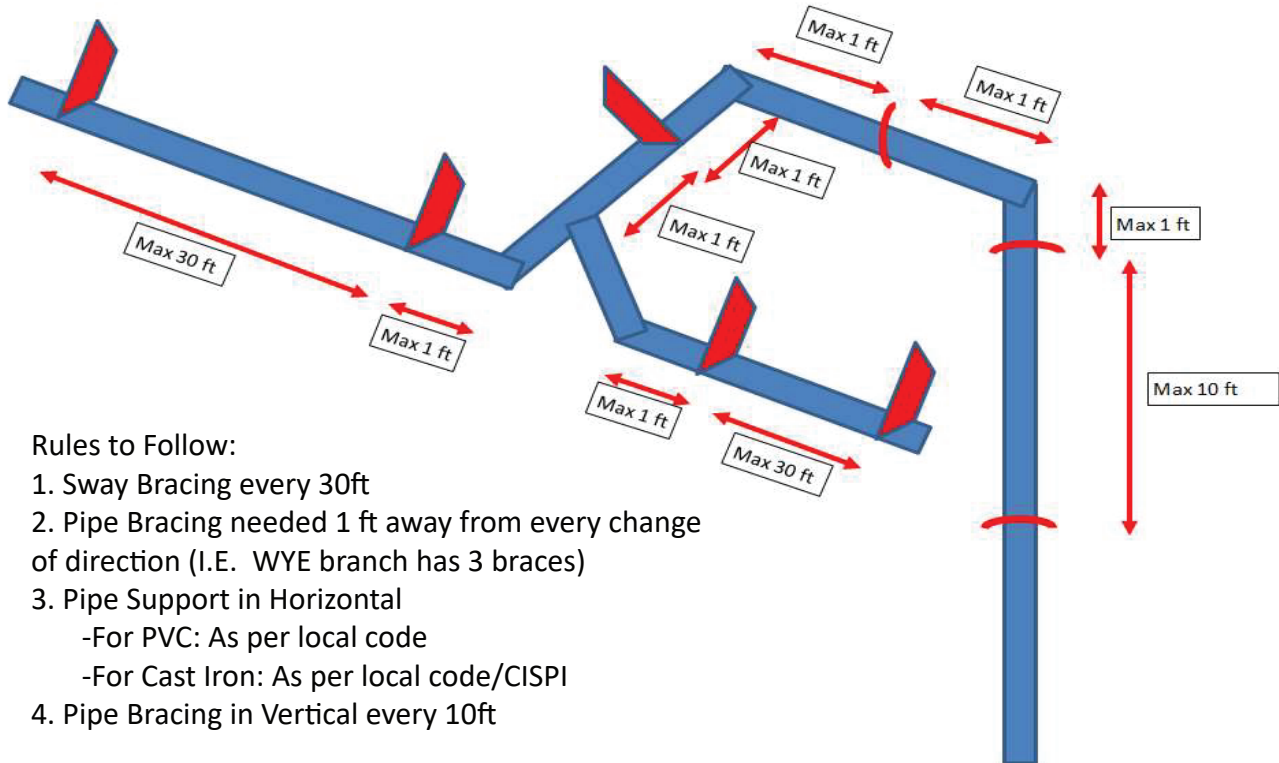


MIFAB recommends vent size being two-thirds gravity pipe size (2/3 air to 1/3 water in the gravity flow). ASPE 45:2013 suggests minimum vent of equal diameter to siphonic discharge.

Pipe Bracing Requirements

ASPE45 9.3.4 Standard

If the distance from the top of a suspended pipe to the point of connection of the hanger rod is greater than 0.46m (18in.), lateral restraints shall be installed every 9.0m (30ft) at each branch take-off and at each change of direction



Rules to Follow:

1. Sway Bracing every 30ft
2. Pipe Bracing needed 1 ft away from every change of direction (I.E. WYE branch has 3 braces)
3. Pipe Support in Horizontal
 - For PVC: As per local code
 - For Cast Iron: As per local code/CISPI
4. Pipe Bracing in Vertical every 10ft

2015 IPC Code (And 2018)

SECTION 1105 - ROOF DRAINS

1105.2 Roof drain flow rate. The published roof drain flow rate, based on the head of water above the roof drain, shall be used to size the storm drainage system in accordance with Section 1106. The flow rate used for sizing the storm drainage piping shall be based on the maximum anticipated ponding at the roof drain.

SECTION 1108 - SECONDARY (EMERGENCY) ROOF DRAINS

1108.2 Separate systems required. Secondary roof drain systems shall have the end point of discharge separate from the primary system. Discharge shall be above grade in a location that would normally be observed by the building occupants or maintenance personnel.

"HydroMax is the most innovative, cost effective roof drainage system solution on the market."
 -Mark Evans, Principal, Evans and Associates (Atlanta, GA)

IAPMO/ASPE Research Study: Issues with Gravity Roof Drains

Issue #1: Gravity Roof Drain Standard ASME A112.6.4 does not include a performance test to provide the published roof drain flow rates.

What does this mean? With no prescribed test standard, manufacturers' data cannot be verified or provide an apples to apples comparison.

Issue #2: Gravity Roof Drains can't handle the GPM flow rates being required through traditional sizing methods.

What does this mean? According to the chart below, a 10,066sq ft area with a 3" rainfall rate would require a 6" roof drain; however, that would require 314GPM to flow through the drain to be properly sized. Looking at a sample 6" drain from the study it can be seen that (1) 6" roof drain would not be able to handle the 314GPM needed according to the sizing table; in reality (2) 6" roof drains would be needed.

TABLE 1106.3
 SIZE OF HORIZONTALLY PROJECTED ROOF AREA

SIZE OF HORIZONTAL PIPING (inches)	HORIZONTALLY PROJECTED ROOF AREA (square feet)					
	Rainfall rate (inches per hour)					
	1	2	3	4	5	6
$\frac{1}{8}$ unit vertical in 12 units horizontal (1-percent slope)						
3	3,288	1,644	1,096	822	657	548
4	7,520	3,760	2,506	1,800	1,504	1,253
5	13,360	6,680	4,453	3,340	2,672	2,227
6	21,400	10,700	7,133	5,350	4,280	3,566
8	46,000	23,000	15,330	11,500	9,200	7,600
10	82,800	41,400	27,600	20,700	16,580	13,800
12	133,200	66,600	44,400	33,300	26,650	22,200
15	218,000	109,000	72,800	59,500	47,600	39,650

$\frac{1}{4}$ unit vertical in 12 units horizontal (2-percent slope)						
3	4,640	2,320	1,546	1,160	928	773
4	10,600	5,300	3,533	2,650	2,120	1,766
5	18,880	9,440	6,293	4,720	3,776	3,146
6	30,200	15,100	10,066	7,550	6,040	5,033
8	65,200	32,600	21,733	16,300	13,040	10,866

Test No.	Model No.	Description	Type of Strainer	Flow Rate (gpm) Based on Head Height					
				1"	2"	3"	4"	5"	6"
5	A-5	6" cast iron drain	cast iron dome	10	185	199	238	267	218

Storm Drainage System Research Project

FLOW RATE THROUGH ROOF DRAINS

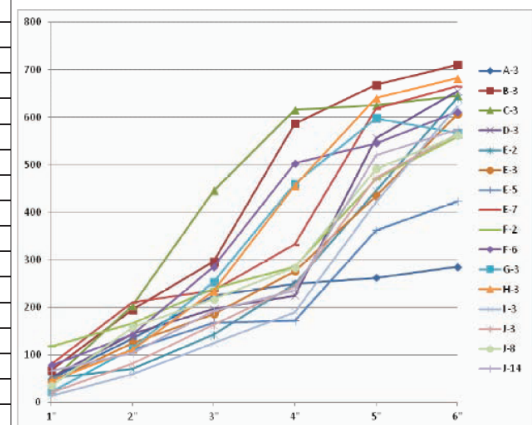


Issue #3: All Gravity Drains have different GPM flow capacities .

What does this mean? GPM flow rate matters. When selecting a drain based only on diameter, there is no way to guarantee it can handle the needed flow rate through the drain.

Test No.	Model No.	Description	Type of Strainer	Flow Rate (gpm) Based on Head Height					
				1"	2"	3"	4"	5"	6"
3	A-3	4" cast iron drain	cast iron dome	49	134	225	250	262	285
8	B-3	4" cast iron drain	cast iron dome	67	195	296	587	668	710
12	C-3	4" cast iron drain	poly dome	45	203	445	615	625	645
17	D-3	4" cast iron drain	aluminum dome	52	144	196	225	556	655
20	E-2	4" PVC drain	poly dome	51	70	142	250	445	640
21	E-3	4" PVC drain	aluminum dome	44	125	186	276	434	606
23	E-5	4" cast iron drain	poly dome	47	110	168	172	362	423
25	E-7	4" cast iron drain	cast iron dome	80	210	235	332	618	665
28	F-2	4" cast iron drain	cast iron dome	118	166	239	286	470	558
32	F-6	4" cast iron drain	cast iron dome	78	142	285	503	545	611
37	G-3	4" PVC drain	ABS dome	22	113	253	460	598	567
41	H-3	4" cast iron drain	cast iron dome	46	111	234	456	640	682
46	I-3	4" PVC drain	poly dome	14	59	125	190	422	622
49	J-3	4" cast iron drain	cast iron dome	21	81	163	244	472	564
54	J-8	4" cast iron drain	brass dome	35	158	217	284	491	562
59	J-14	4" cast iron drain	brass dome	66	103	192	235	520	574

4" ROOF DRAIN COMPARISON OF TEST RESULTS
 ROOF DRAIN WITH OFFSET DRAIN PIPE



2019 List of MIFAB® HydroMax® Preferred Installers

To be verified as a **preferred installer** by MIFAB®, a contractor must meet the following criteria:

1. Complete a pre-install call checklist lead by MIFAB®
2. Finish 3 projects working with our software/design assist team
3. Install over \$250,000 worth of HydroMax® Siphonic Drainage



JESCO, Inc.
 Construction



THE WALDINGER CORPORATION

Pre-Install Call Checklist

MIFAB® HydroMax® is the **only** siphonic manufacturer that holds a pre-install call before shipping any project to make sure the contractor understands 3 things:

1. How HydroMax® functions,
2. That the system must be installed as designed, and
3. Who to contact for any design changes needed during install.

- CONTACT ENGINEER OF RECORD **PRIOR TO ANY DIMENSIONAL CHANGES OR ROUTE DEVIATION**
 - These changes will be quickly resolved, but must be identified by the contractor prior to pipe insulation
- How does Siphonic drainage work
- Horizontal piping installed with No Pitch
- Reduction in vertical & increase in horizontal permitted
- PIPE RESTRAINT IS CRITICAL** (Improperly restrained pipe will move):
 - Pipe restraints located 1' from fitting on each change of direction (i.e. a wye branch to have 3 restraints)
 - Sway bracing needed every 30 foot
 - PVC pipe hangers support per local code
 - Cast Iron pipe hangers support per local code/CISPI
 - Pipe bracing in vertical every 10 foot
- Tail pipe connections enter horizontal pipe on the side, not drop-in from the top
- Concentric vs. Eccentric Reducers: Pipe crown stays flat in eccentric; Concentric is measured to centerline of pipe
- Pipe measurement lengths in HydroTechnic program are center of fitting to center of fitting
- Cleanouts ARE NOT REQUIRED. If used, they should be removable spool pieces DWV style, no extended T branches
- Outside dimension of the roof hole opening is critical on deck mount installations (install sheets available)
- Trim roof membrane to fit inside of clamping ring
- Venting is required where Siphonic system breaks to gravity. Manhole to have slotted grate, not solid.
 - Review location of manhole relative to footprint of the building
- Clean construction debris from drain pipe work; make sure baffle plates are installed
- CONTACT ENGINEER OF RECORD **PRIOR TO ANY DIMENSIONAL CHANGES OR ROUTE DEVIATION**

"Working with HydroMax and MIFAB, is incredibly easy and convenient. You can layout your siphonic piping design as you would traditionally, send your routing to them, and they will size the system for you! They are an email or phone call away from getting me the answers I need when I need them, and they train the contractors prior to installation. I would recommend HydroMax and MIFAB Siphonic Roof Drains systems for all sorts of projects." -Genaine Bailey, PD, OCI Associates, Inc. (Orlando, FL)

NOTES

*"We chose to use a siphonic drainage system on a recent warehouse project because the client wanted all piping to be above the bottom of the roof joists. The Mifab team were very helpful with the design process and were very easy to work with."
-Frank Westhoff, PE, Owner, Westhoff Engineering (Plano, TX)*

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Contact MIFAB® or your local representative for your applicable discount structure.

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COMPLETE MIFAB BINDER
 (all product booklets inside)
 Lit # 001B



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 Lit # 067



NH-2017
 Lit # 044



CLPB-2019
 Lit # 048



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HYDROMAX-2019
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ROOFGUARD-2018
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"MIFAB products are by far the best, easy to install and so well thought out. The drains, cleanouts, and floor sinks are interchangeable. No other manufacturer makes their products so simple to use. MIFAB is the only way to go." - Joe Boyle, Boyle Plumbing and Contracting (New Brumfels, TX)



CERTIFIED
MANAGEMENT SYSTEM
ISO 9001:2015

"It saves ceiling space by being able to run flat on the horizontals, saves money by utilizing smaller pipe sizing, and works more efficiently than traditional gravity systems."

-Genaine Bailey, PD, OCI Associates, Inc. (Orlando, FL)

HYDROMAX[®] - 2019

The World is Awakening to A New Dawn in Drainage



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