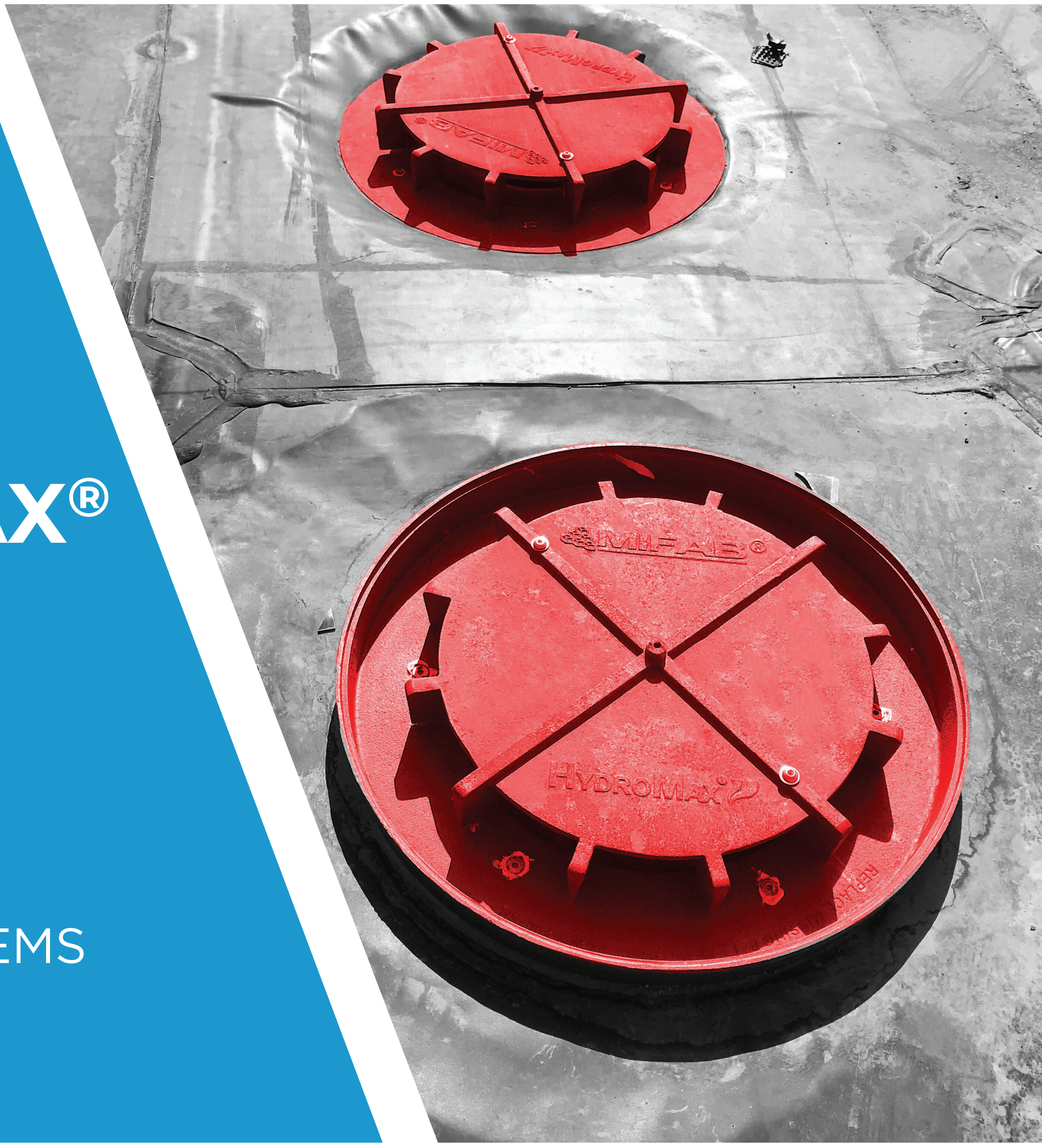
HYDROMAX® CATALOG



SIPHONIC ROOF DRAINAGE SYSTEMS

PRIMARY - OVERFLOW - GUTTER

FOR ANY DESIGN ASSISTANCE CONTACT:
HYDROMAX@MIFAB.COM

LIT-082

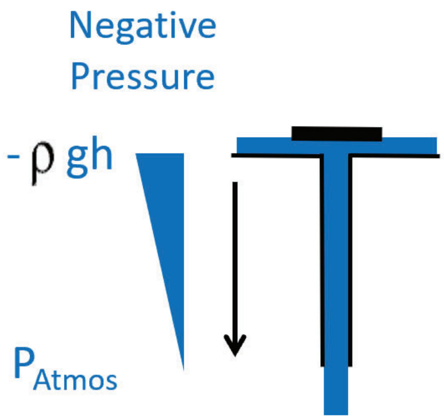
For any design assistance contact: **hydromax@mifab.com**

<table>
<tr><th colspan="2">Top Technical Benefits of Siphonic Roof Drainage</th></tr>
<tr><td rowspan="2">**Smaller Diameter** pipe used:
approximately half the size
of gravity diameter pipe size

Smaller Diameter pipe =
- Smaller Fittings
- Smaller Couplings
-Smaller Hangers
-Smaller Insulation</td><td>Horizontal pipes are installed
without **PITCH – Flat Level**

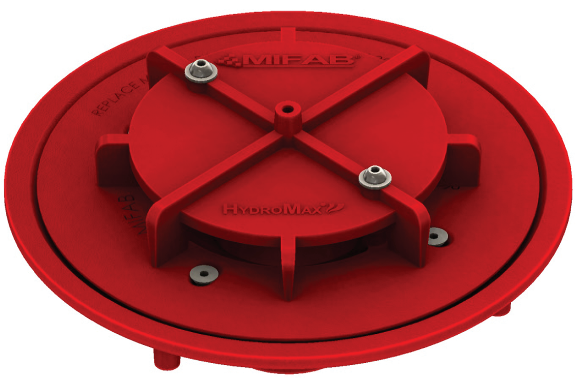
Easy co-ordination of services
for BIM modeling due to
pipework running flat</td></tr>
<tr><td>Fewer pipes =
Reduced construction time and cost</td></tr>
<tr><td>Rainwater downpipes **routed to the Engineer’s Preferred Locations**
- frees up valuable building space</td><td>Routing of rainwater downpipes
to the perimeter of buildings
Eliminates Below Grade Excavation and Drainage Under the Building Floor</td></tr>
<tr><td>A significant **Reduction in Civil Below Grade Drainage**
(common range is
from 20% to 60%)</td><td>Easily route rainwater pipes to
Retention Ponds or **Detention Basins** or **Rainwater Harvesting**</td></tr>
<tr><td colspan="2">MIFAB HydroMax® drains
suck the water quickly off the
the roof **= less ponding than traditional gravity**</td></tr>
</table>

How Does Siphonic Drainage Function?

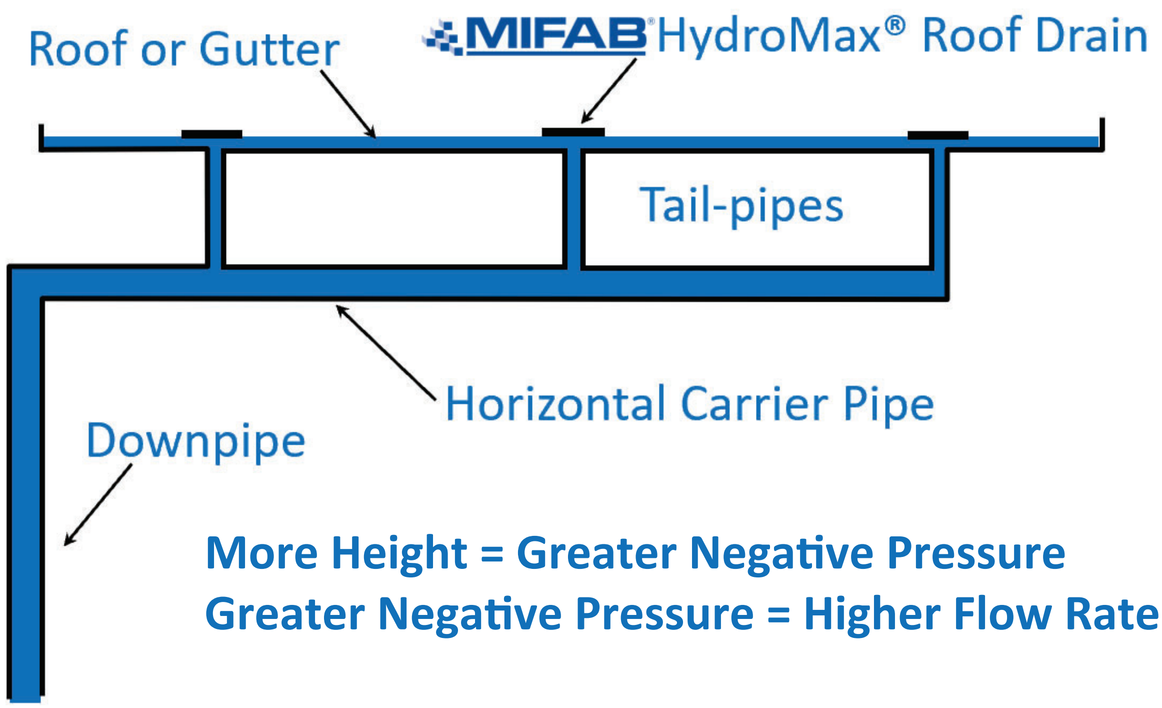


Rainwater (**without air**) falling down the vertical pipe accelerates, creating **negative pressure**, which draws water off the roof **siphonically**.

Primary Siphonic Drain



Overflow Siphonic Drain

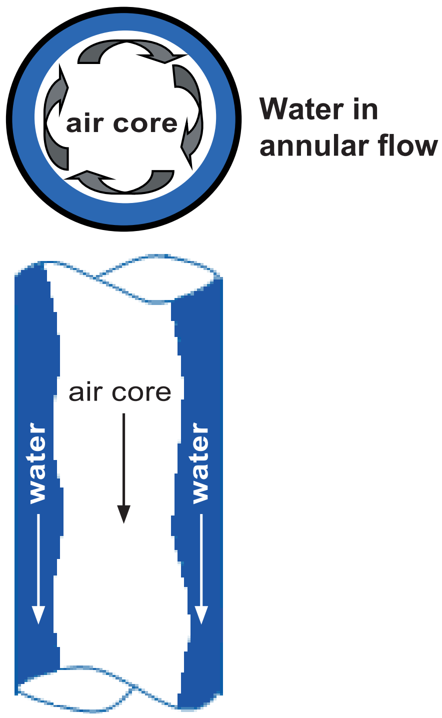


More Height = Greater Negative Pressure
Greater Negative Pressure = Higher Flow Rates

"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	MIFAB® HydroMax® Siphonic



HydroMax® pipe diameters half the size of gravity

Restrictive Factors of Gravity Drainage

1. Gravity drains require **⅔ 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**	

MIFAB® Inc. HydroMax®, 1321 West 119th Street, Chicago, Illinois 60643-5109, USA
Visit www.hydromax.com/faqs.php for the most frequently asked questions.
USA Toll Free: 1-800-465-2736 • Fax: 1-773-341-3049
Canada Toll Free: 1-800-387-3880 • sales@mifab.com

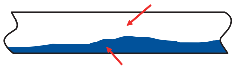
Four Flow Patterns of Siphonic Drainage

Priming of Main Pipe Work

Stage 1
Gravity Flow

Light Rainfall

Approx. 0-10% of Design



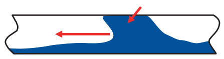
Water always seeks to find its own low point

Stage 2
Plug Flow

Moderate Rainfall

Approx. 10% of Design

Plug of water filling whole pipe at high velocities which achieves self-cleansing.



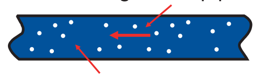
Tests have shown that **self-cleansing** can be achieved at as low as **10% to 15%** of the design rainfall rate.

Stage 3
Bubble Flow

Heavy Rainfall

Approx. 40-70% of Design

Water filling whole pipe

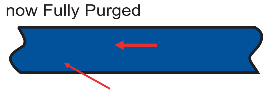


Stage 4
Full-Bore Flow

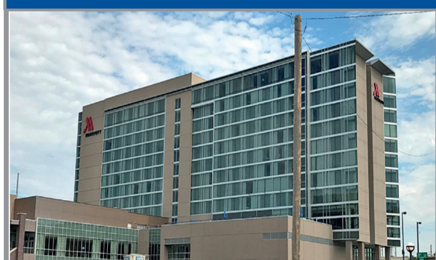
Intense Rainfall

Approx. 70-100% of Design

No more air entry- Air within pipe now Fully Purged



Completed HydroMax® Projects



Marriott

Mercy West Lakes Hospital

Walmart

Wayne State Student Housing

Parking Garage

Little Caesars Arena

Phoenix Sky Harbor

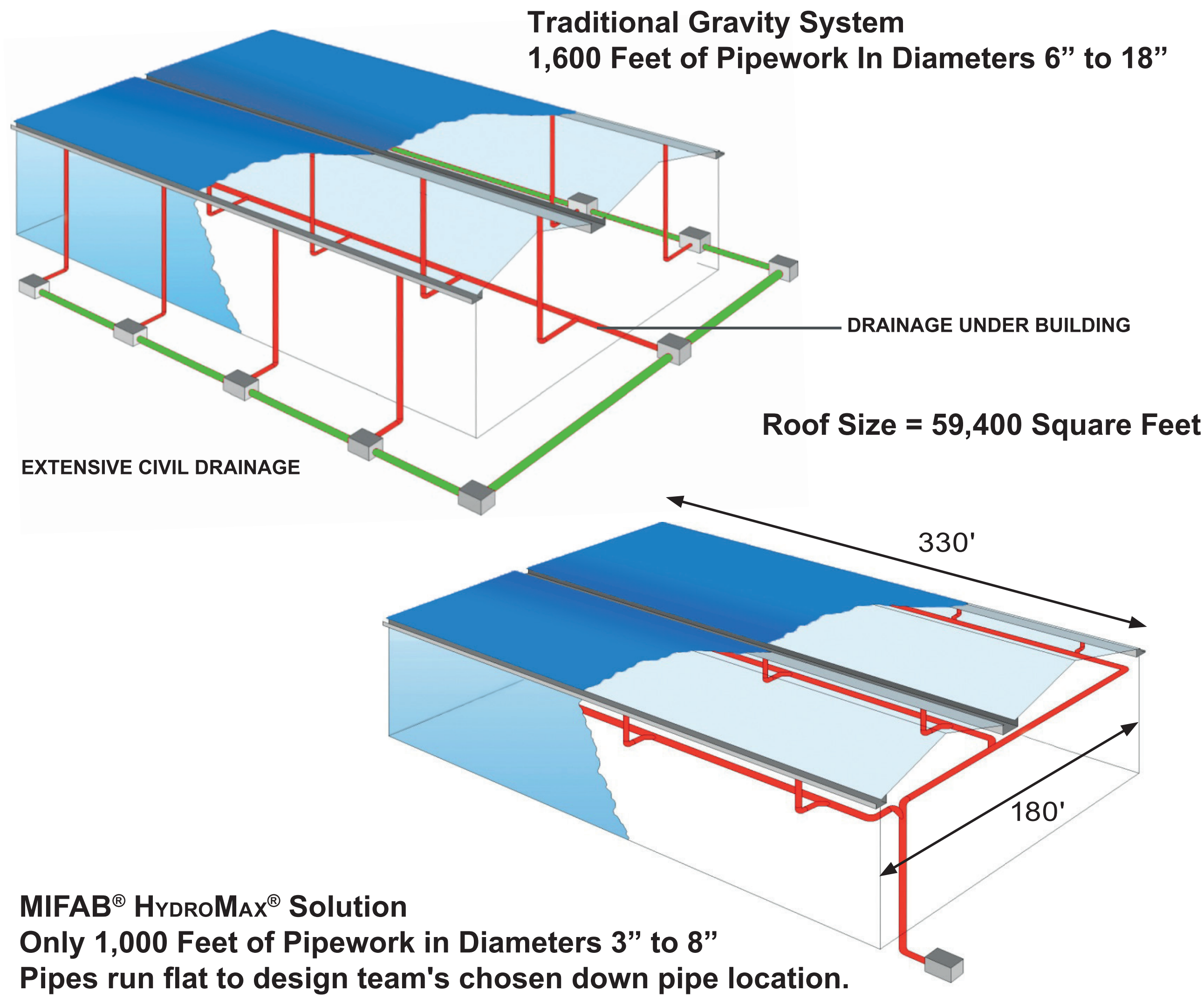
Columbus Crew Soccer Stadium

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



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

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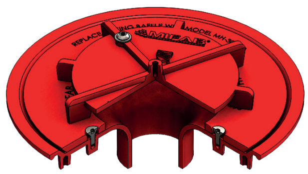
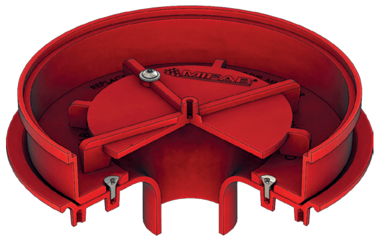
MIFAB® HydroMax® Drain/Cover Options

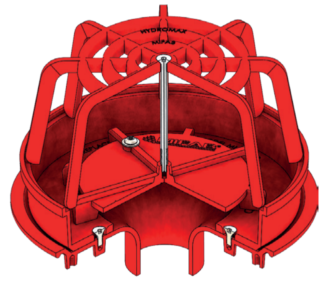
All MIFAB® HydroMax® drains are tested to ASME A112.6.9 and IAPMO listed



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



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



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

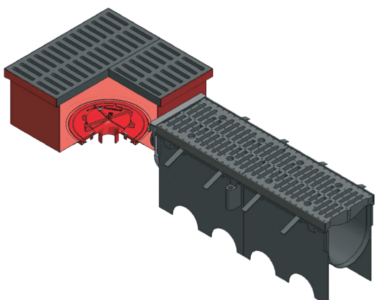
Part # MH-200
2" Terrace Drain

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

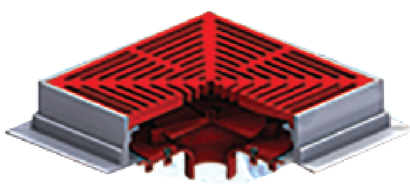
Part # MH-305-G
3" Gutter Drain
(Stainless Steel Spun Body)

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

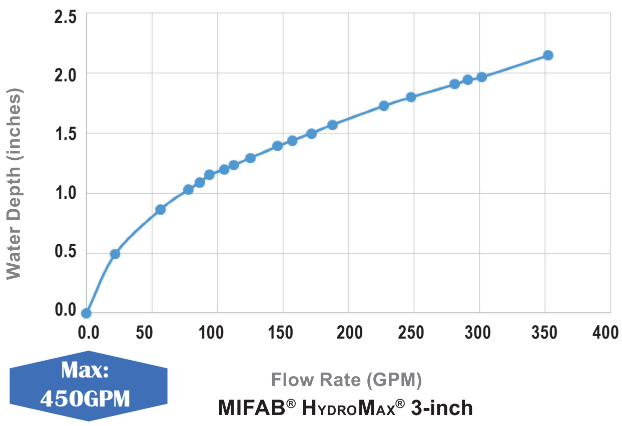


Part # MH-PG-D
Parking Garage/Deck Drain
(3" NH, 4" NH, 5" NH)

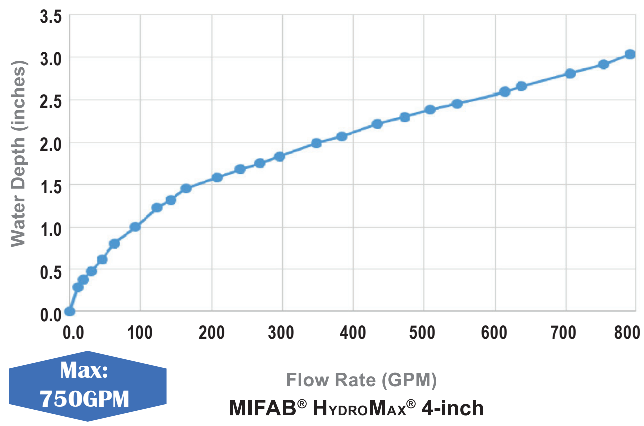
Part #'s MH-F1460, MH-F1580
Siphonic Gravity Break Drain

"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)

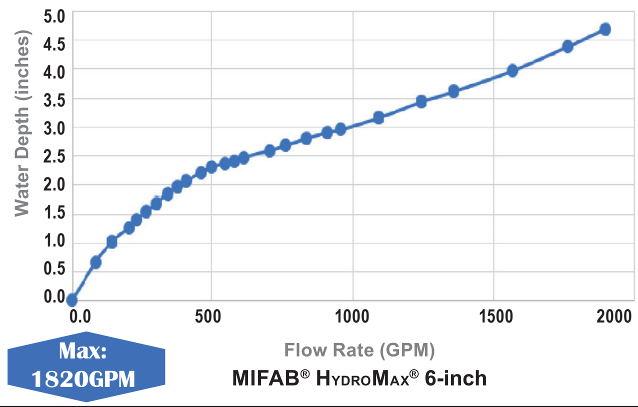
Ponding Curves of HydroMax®



MIFAB® HydroMax® 3-inch



MIFAB® HydroMax® 4-inch



MIFAB® HydroMax® 6-inch

Gravity Drainage Ponding Rates

Model #R1203	Depth	1"	2"	3"	4"	5"	6"
3" Cast Iron Drain with Cast Iron Dome	GPM	25	87	214	225	231	247

Model #R1204	Depth	1"	2"	3"	4"	5"	6"
4" Cast Iron Drain with Cast Iron Dome	GPM	25	90	215	232	240	252

Model #R1206	Depth	1"	2"	3"	4"	5"	6"
6" Cast Iron Drain with Cast Iron Dome	GPM	15	75	210	250	490	715

Gravity Vs. HydroMax®

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

Rainfall Rate Matters

MIN 23GPM

23 GPM @ 2”/hr = 1107 SF
23 GPM @ 3”/hr = 738 SF
23 GPM @ 4”/hr = 553 SF

Min. 50 GPM is better

1,500 SF per Drain

1,500 SF @ 2”/hr = 31 GPM
1,500 SF @ 3”/hr = 47 GPM
1,500 SF @ 4”/hr = 62 GPM

	MH-300	MH-400	MH-600
	1,200 - 1500 SF	24,000 SF	57,000 SF
MIN GPM	23 GPM	75 GPM	160 GPM
MAX GPM	350 GPM	750 GPM	1800 GPM
MAX Square	122' x 122'	155' x 155'	238' x 238'

Roof Drains – Operating Range

Drain	Min Inflow (GPM)	Max Inflow (GPM)
MH-300 & 301 3" DRAIN	23	450
MH-400 & 401 4" DRAIN	75	750
MH-600 & 601 6" DRAIN	160	1820

MIFAB® HydroMax® Roof Area x Rainfall Rate = GPM ready reckoner chart

Rainfall Intensity (inches per hour)

Tributary (Catchment) Area (ft²)	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									23.38	25.97	28.57	31.17	33.77	36.36	38.96	41.56
1000					25.97	31.17	36.36	41.56	46.75	51.95	57.14	62.34	67.53	72.73	77.92	83.12
1500			23.38	31.17	38.96	46.75	54.55	62.34	70.13	77.92	85.71	93.51	101.30	109.09	116.88	124.68
2000			31.17	41.56	51.95	62.34	72.73	83.12	93.51	103.90	114.29	124.68	135.06	145.45	155.84	166.23
2500		25.97	38.96	51.95	64.94	77.92	90.91	103.90	116.88	129.87	142.86	155.84	168.83	181.82	194.81	207.79
3000		31.17	46.75	62.34	77.92	93.51	109.09	124.68	140.26	155.84	171.43	187.01	202.60	218.18	233.77	249.35
3500		36.36	54.55	72.73	90.91	109.09	127.27	145.45	163.64	181.82	200.00	218.18	236.36	254.55	272.73	290.91
4000		41.56	62.34	83.12	103.90	124.68	145.45	166.23	187.01	207.79	228.57	249.35	270.13	290.91	311.69	332.47
4500	23.38	46.75	70.13	93.51	116.88	140.26	163.64	187.01	210.39	233.77	257.14	280.52	303.90	327.27	350.65	374.03
5000	25.97	51.95	77.92	103.90	129.87	155.84	181.82	207.79	233.77	259.74	285.71	311.69	337.66	363.64	389.61	415.58
5500	28.57	57.14	85.71	114.29	142.86	171.43	200.00	228.57	257.14	285.71	314.29	342.86	371.43	400.00	428.57	457.14
6000	31.17	62.34	93.51	124.68	155.84	187.01	218.18	249.35	280.52	311.69	342.86	374.03	405.19	436.36	467.53	498.70
6500	33.77	67.53	101.30	135.06	168.83	202.60	236.36	270.13	303.90	337.66	371.43	405.19	438.96	472.73	506.49	540.26
7000	36.36	72.73	109.09	145.45	181.82	218.18	254.55	290.91	327.27	363.64	400.00	436.36	472.73	509.09	545.45	581.82
7500	38.96	77.92	116.88	155.84	194.81	233.77	272.73	311.69	350.65	389.61	428.57	467.53	506.49	545.45	584.42	623.38
8000	41.56	83.12	124.68	166.23	207.79	249.35	290.91	332.47	374.03	415.58	457.14	498.70	540.26	581.82	623.38	664.94
8500	44.16	88.31	132.47	176.62	220.78	264.94	309.09	353.25	397.40	441.56	485.71	529.87	574.03	618.18	662.34	706.49
9000	46.75	93.51	140.26	187.01	233.77	280.52	327.27	374.03	420.78	467.53	514.29	561.04	607.79	654.55	701.30	748.05
9500	49.35	98.70	148.05	197.40	246.75	296.10	345.45	394.81	444.16	493.51	542.86	592.21	641.56	690.91	740.26	789.61
10000	51.95	103.90	155.84	207.79	259.74	311.69	363.64	415.58	467.53	519.48	571.43	623.38	675.32	727.27	779.22	831.17
10500	54.55	109.09	163.64	218.18	272.73	327.27	381.82	436.36	490.91	545.45	600.00	654.55	709.09	763.64	818.18	872.73
11000	57.14	114.29	171.43	228.57	285.71	342.86	400.00	457.14	514.29	571.43	628.57	685.71	742.86	800.00	857.14	914.29
11500	59.74	119.48	179.22	238.96	298.70	358.44	418.18	477.92	537.66	597.40	657.14	716.88	776.62	836.36	896.10	955.84
12000	62.34	124.68	187.01	249.35	311.69	374.03	436.36	498.70	561.04	623.38	685.71	748.05	810.39	872.73	935.07	997.40
12500	64.94	129.87	194.81	259.74	324.68	389.61	454.55	519.48	584.42	649.35	714.29	779.22	844.16	909.09	974.03	1038.96
13000	67.53	135.06	202.60	270.13	337.66	405.19	472.73	540.26	607.79	675.32	742.86	810.39	877.92	945.45	1012.99	1080.52
13500	70.13	140.26	210.39	280.52	350.65	420.78	490.91	561.04	631.17	701.30	771.43	841.56	911.69	981.82	1051.95	1122.08
14000	72.73	145.45	218.18	290.91	363.64	436.36	509.09	581.82	654.55	727.27	800.00	872.73	945.45	1018.18	1090.91	1163.64
14500	75.32	150.65	225.97	301.30	376.62	451.95	527.27	602.60	677.92	753.25	828.57	903.90	979.22	1054.55	1129.87	1205.19
15000	77.92	155.84	233.77	311.69	389.61	467.53	545.45	623.38	701.30	779.22	857.14	935.07	1012.99	1090.91	1168.83	1246.75
15500	80.52	161.04	241.56	322.08	402.60	483.12	563.64	644.16	724.68	805.19	885.71	966.23	1046.75	1127.27	1207.79	1288.31
16000	83.12	166.23	249.35	332.47	415.58	498.70	581.82	664.94	748.05	831.17	914.29	997.40	1080.52	1163.64	1246.75	1329.87
16500	85.71	171.43	257.14	342.86	428.57	514.29	600.00	685.71	771.43	857.14	942.86	1028.57	1114.29	1200.00	1285.71	1371.43
17000	88.31	176.62	264.94	353.25	441.56	529.87	618.18	706.49	794.81	883.12	971.43	1059.74	1148.05	1236.36	1324.68	1412.99
17500	90.91	181.82	272.73	363.64	454.55	545.45	636.36	727.27	818.18	909.09	1000.00	1090.91	1181.82	1272.73	1363.64	1454.55
18000	93.51	187.01	280.52	374.03	467.53	561.04	654.55	748.05	841.56	935.07	1028.57	1122.08	1215.58	1309.09	1402.60	1496.10
18500	96.10	192.21	288.31	384.42	480.52	576.62	672.73	768.83	864.94	961.04	1057.14	1153.25	1249.35	1345.45	1441.56	1537.66
19000	98.70	197.40	296.10	394.81	493.51	592.21	690.91	789.61	888.31	987.01	1085.71	1184.42	1283.12	1381.82	1480.52	1579.22
19500	101.30	202.60	303.90	405.19	506.49	607.79	709.09	810.39	911.69	1012.99	1114.29	1215.58	1316.88	1418.18	1519.48	1620.78
20000	103.90	207.79	311.69	415.58	519.48	623.38	727.27	831.17	935.07	1038.96	1142.86	1246.75	1350.65	1454.55	1558.44	1662.34
20500	106.49	212.99	319.48	425.97	532.47	638.96	745.45	851.95	958.44	1064.94	1171.43	1277.92	1384.42	1490.91	1597.40	1703.90
21000	109.09	218.18	327.27	436.36	545.45	654.55	763.64	872.73	981.82	1090.91	1200.00	1309.09	1418.18	1527.27	1636.36	1745.45
21500	111.69	223.38	335.06	446.75	558.44	670.13	781.82	893.51	1005.19	1116.88	1228.57	1340.26	1451.95	1563.64	1675.32	1787.01
22000	114.29	228.57	342.86	457.14	571.43	685.71	800.00	914.29	1028.57	1142.86	1257.14	1371.43	1485.71	1600.00	1714.29	1828.57
22500	116.88	233.77	350.65	467.53	584.42	701.30	818.18	935.07	1051.95	1168.83	1285.71	1402.60	1519.48	1636.36	1753.25	
23000	119.48	238.96	358.44	477.92	597.40	716.88	836.36	955.84	1075.32	1194.81	1314.29	1433.77	1553.25	1672.73	1792.21	
23500	122.08	244.16	366.23	488.31	610.39	732.47	854.55	976.62	1098.70	1220.78	1342.86	1464.94	1587.01	1709.09		
24000	124.68	249.35	374.03	498.70	623.38	748.05	872.73	997.40	1122.08	1246.75	1371.43	1496.10	1620.78	1745.45		
24500	127.27	254.55	381.82	509.09	636.36	763.64	890.91	1018.18	1145.45	1272.73	1400.00	1527.27	1654.55	1781.82		
25000	129.87	259.74	389.61	519.48	649.35	779.22	909.09	1038.96	1168.83	1298.70	1428.57	1558.44	1688.31	1818.18		

“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, Soultions AEC, (St. Louis, MO)

Case Study using HydroMax®

How HydroMax® Helped Amazon's Fulfillment Center Drain Smarter—And Save $1.7 Million Southlink Logistics Center – Dallas, TX

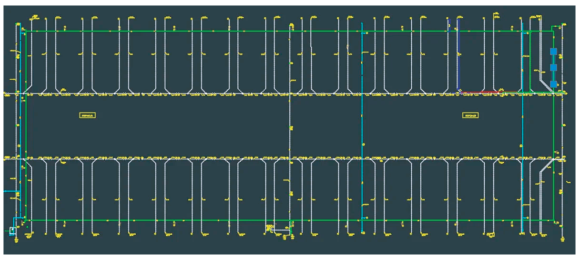
Picture this: A 1-million-square-foot Amazon fulfillment center rising just south of I-20 in Dallas, TX. Towering 40 feet high with 184 loading dock doors and a footprint big enough to house 18 football fields, the Southlink Logistics Center was built for speed, space, and serious volume.

But there was a problem—below the surface.

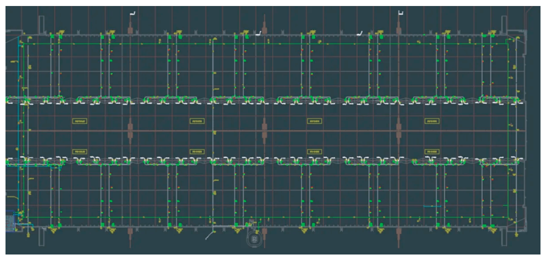
The Drainage Dilemma

The original roof drainage design relied on a traditional gravity system. It called for 62 roof drains connected by nearly 18,000 feet of 12" pipe, sloped downward into the slab. To make that happen, contractors would need to dig 13,600 feet of trenching beneath the building—adding time, cost, and compromising the high-clearance design that made the space valuable in the first place.

Gravity was pulling this project in the wrong direction.



Gravity Scheme



HydroMax® Solution

Enter HydroMax®: A Smarter Solution
HydroMax® flipped the script.

By implementing a custom-engineered siphonic drainage system, HydroMax® eliminated the need for slope and trenching altogether. The design used 32 runs of four siphonic drains each, connected horizontally at high elevation—no digging, no disruption, and no lost headroom.

What would have taken weeks of underground work was now a clean, overhead install that flowed more efficiently -if not better.

The Payoff

- **$1.7 million saved in construction costs**
- **13,600 feet of trenching eliminated**
- **5,000 feet less pipe needed**
- **12" pipe downsized to 10"**
- **40-foot interior clearance fully preserved**

The Result

Amazon got the distribution center it needed. The developer got a faster, cheaper build. And the design team proved that when you think beyond gravity, big things happen.

HydroMax® doesn't just move water. We move projects forward.

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Case Study using HydroMax®

A Federal Facility With Strict Standards—and a Smarter Drainage Solution
USCIS Facility – Irving, TX

A Federal Facility With Strict Standards—and a Smarter Drainage Solution

The USCIS Texas Service Center is a nearly 260,000 sq. ft. high-security administrative facility located just minutes from Dallas-Fort Worth International Airport. Designed to support sensitive operations, the facility required clean architectural lines, efficient use of space, and absolute precision in all building systems—including drainage.

The original drainage design used a conventional gravity system with oversized sloped pipes. This layout posed routing conflicts, reduced architectural flexibility, and risked undermining the visual and structural integrity of the design.

HydroMax® Replaces Complexity With Clarity

HydroMax® proposed a custom siphonic drainage design that allowed for flat, high-level horizontal runs and smaller vertical downpipes placed exactly where they were needed. By eliminating the need for pipe slope, HydroMax® freed up valuable ceiling space, simplified coordination between trades, and supported the project's high-efficiency goals.

The result was a system that not only performed better—but also cost significantly less.

Savings and Performance

- $201K–$235K in total savings compared to the gravity system
- Streamlined installation with fewer coordination delays
- 259,947 sq. ft. of coverage with minimal impact on floor plan
- Improved design flexibility for MEP and architectural teams
- No oversized pipes or awkward reroutes

What the Engineer Had to Say

"The price for the siphonic system came in somewhere between $201,000 & $235,000 less than the conventional system they had originally priced."
– Ron Hall, Director of Plumbing/Fire Protection, Thompson Ehle Company

Bottom Line

By switching to HydroMax®'s engineered siphonic system, the USCIS facility met stringent federal requirements while reducing cost and complexity. This case is a clear example of how intelligent drainage design can support both function and form—especially in critical government infrastructure.

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.

Case Study using HydroMax®

Far too often gravity dictates storm drainage design. Pipe can only run so far with pitch before the pipe drops before minimum clearance heights, resulting in multiple leaders dropping down in the middle of the building with the only solution being to excavate though 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 e°cien t 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 ÿrst 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 ÿtting within their requirements. The biggest beneÿt 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."

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.

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 states 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 buidlings; 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)**

Case Study using HydroMax

MIFAB Systems Score Big at the Red Bull Training Center in New Jersey

Harrison, NJ — The Red Bull Training Center, home to one of Major League Soccer's most elite teams, has recently completed a major plumbing infrastructure upgrade that sets a new standard for sports facility performance and sustainability. At the core of this cutting-edge installation is a suite of MIFAB-engineered siphonic drainage systems, designed to handle complex roof runoff with maximum efficiency and minimal material waste.

The project, led by Contemporary Plumbing & Heating Inc. (CP&H) in collaboration with WSP USA, was driven by Red Bull's pursuit of both engineering innovation and cost efficiency.

Red Bulls pursued this initiative to leverage meaningful cost efficiencies while sustaining their high-performance standards
- Tatsiana Kudzelich, PE, CPD, Plumbing Engineer at WSP.

No Pitch, No Problem: Siphonic Drainage Replaces Conventional Slopes

The facility's expansive roofscape required a solution that could manage heavy stormwater loads without sacrificing ceiling space or requiring sloped piping. MIFAB's siphonic roof drains delivered just that. The system enables horizontal piping to run flat across structural bays, reducing the need for sloped trenches or oversized pipe networks.

Unlike conventional gravity-fed systems, the MIFAB siphonic setup operates under full-bore flow, leveraging air-free negative pressure dynamics to rapidly and efficiently draw water from the roof to the building's underground drainage network.

Dual Drainage Enhancements for Sustainable Surfaces

Another standout feature of the installation was the incorporation of MIFAB area drains designed for slab-level and sub-surface water management. These systems are especially important for athletic facilities that feature large hardscapes and eco-conscious surfaces.

To capture runoff from both pavement and green areas, CP&H installed a layered drainage configuration: Surface water is collected through strategically placed area drains within the facility's finished surfaces.

Below-ground, a network of stone-covered catch basins filters and channels water using specialized grates and access points for maintenance. This dual-layer system ensures both aesthetics and performance—mitigating pooling, erosion, and debris buildup.

Collaboration in Action: Engineering Meets Craftsmanship

MIFAB's contributions were backed by deep technical expertise and close coordination with CP&H field crews and WSP engineers. The result is a drainage network that meets strict performance standards while reducing long-term maintenance costs and installation labor.

From concept to completion, the Red Bull Training Center plumbing infrastructure now reflects the same elite standards seen on the pitch.

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)

Drawing Requirements:

Our team needs the following data to design a Siphonic system in our HydroTechnic™ Program:

☐ **Roof drain locations**

☐ **GPM flow rate through each roof drain (*alternative: sq ft of catchment area feeding each roof drain*)**

☐ **All lengths of vertical and horizontal pipe runs in the system (center of pipe to center of pipe – ft, in):**

- ☐ **Length of initial vertical drop from roof drain**
- ☐ **Lengths of horizontal collector pipe connecting each roof drain**
- ☐ **Length of vertical drop of discharge (and any other horizontal run)**

☐ **Identify point at which Siphonic action ends**

☐ **Primary or Overflow system**

☐ **If surcharging, the height between the center of Siphonic horizontal line at discharge to the manhole grate cover (ft, in)**

GPM CALCULATOR

Insert Rainfall Rate Below

2	Rainfall

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

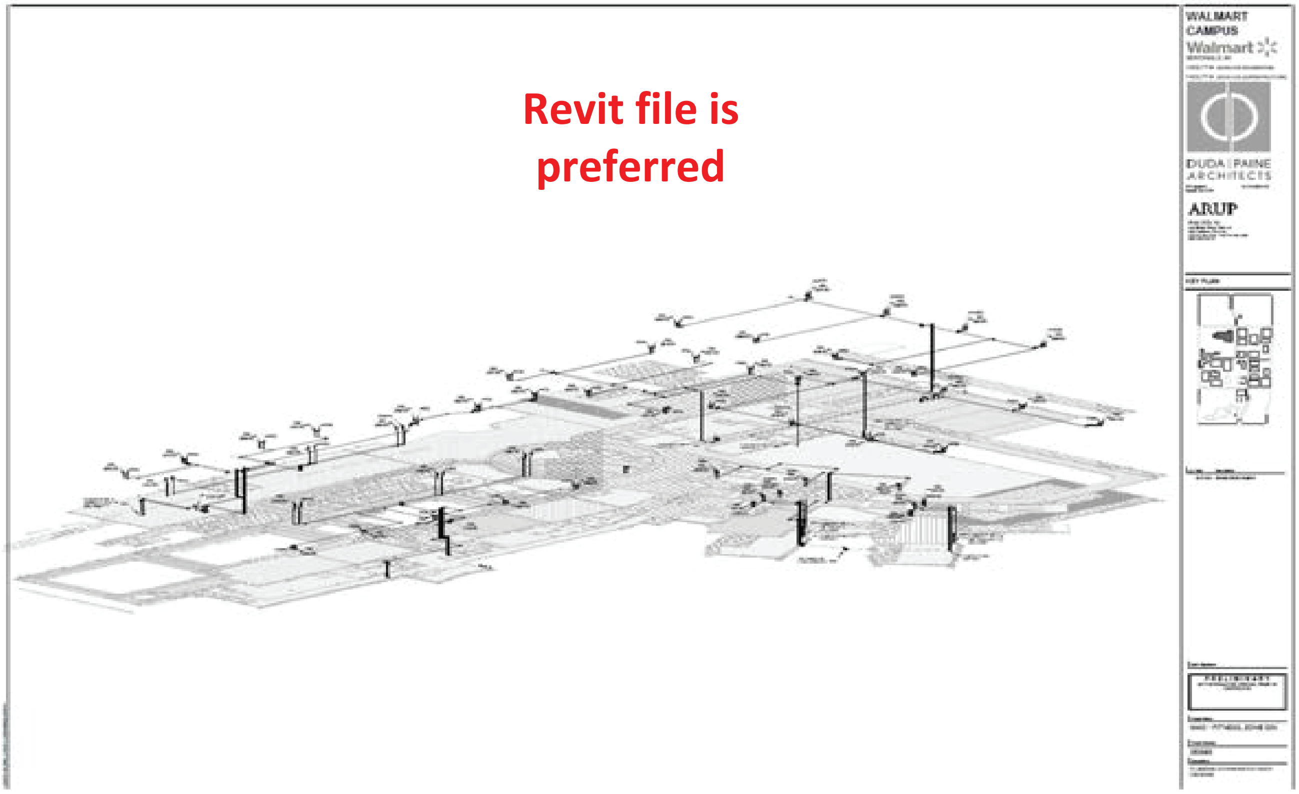
A sizing calculator for determining GPM flow through a drain is available from MIFAB upon request.

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

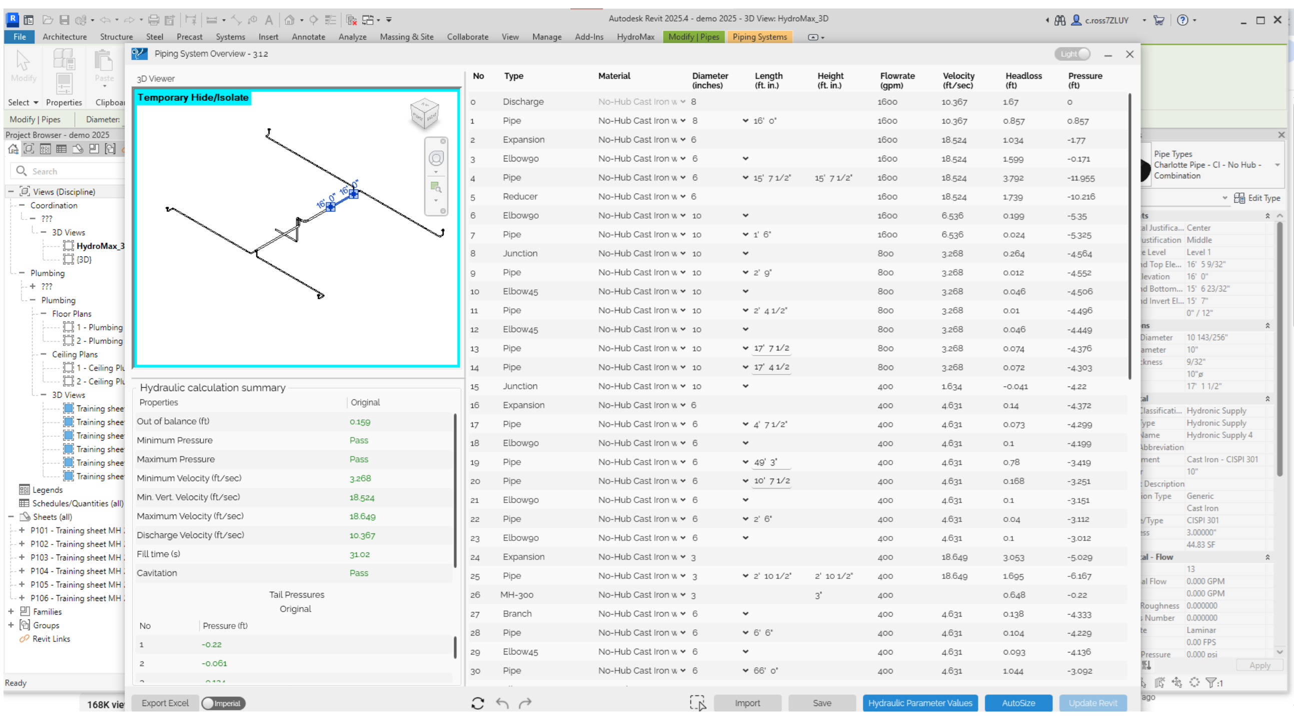
Download our design submission files:
tinyurl.com/HydroMaxDSForm

Mifab HydroMax® Siphonic Guide

Option #1 – Provide a REVIT Model



HYDROMAX® HydroTechnic™ Revit API software.



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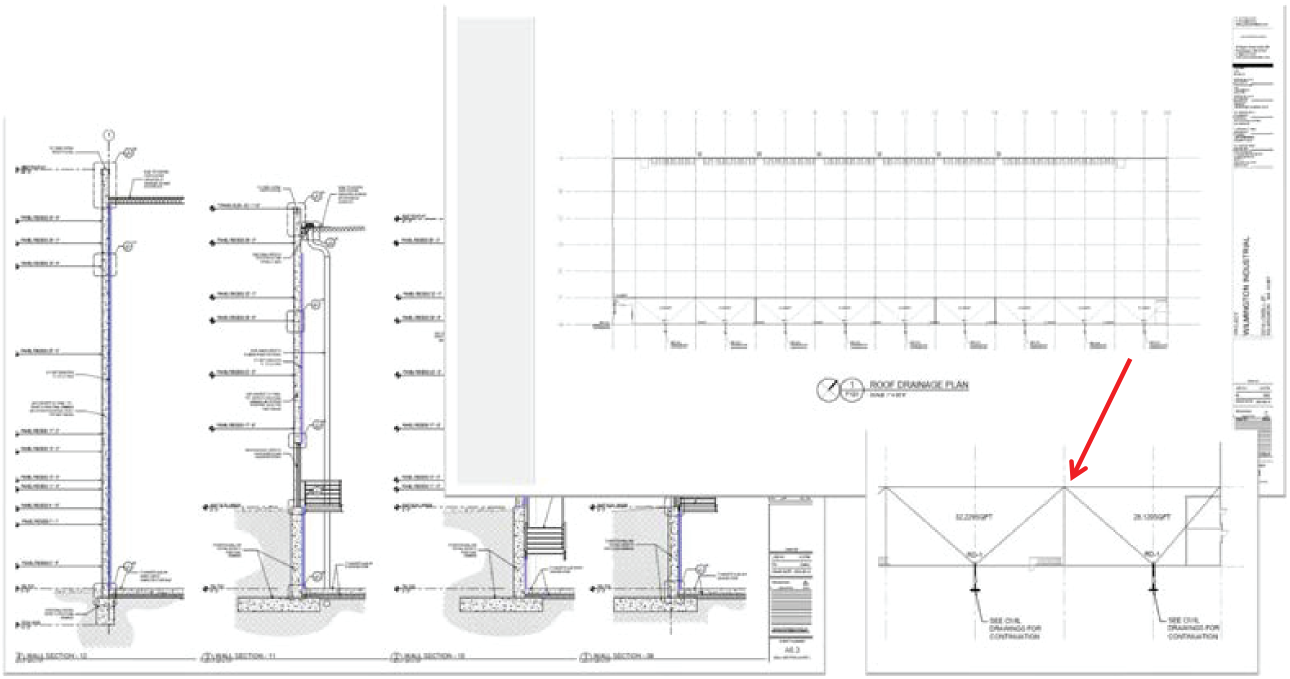
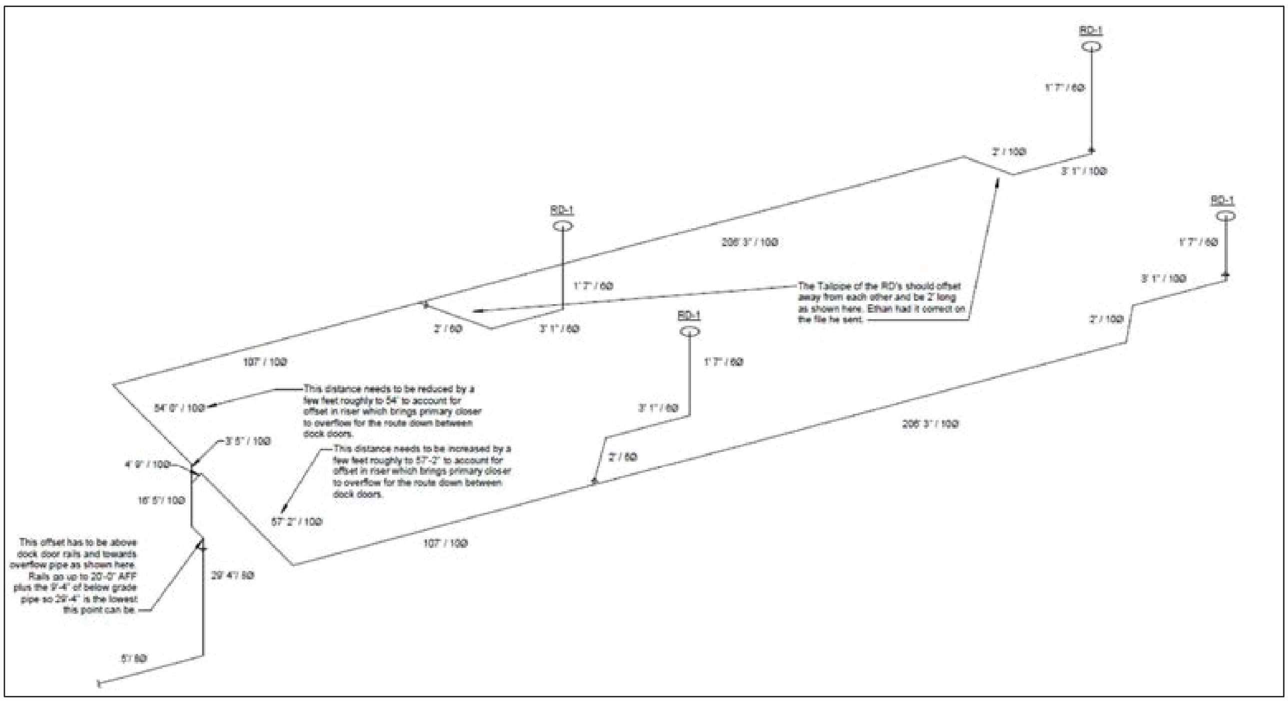
Mifab HydroMax® Siphonic Guide

Option #2 – Roof Plan with Elevation Drawings

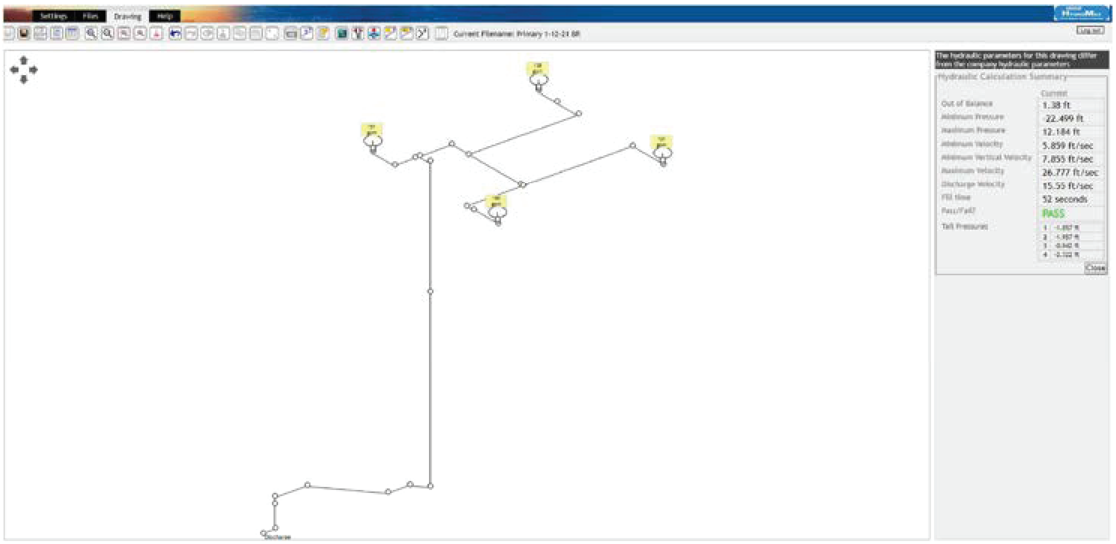


Option #3 – Simple Dimensioned riser drawing

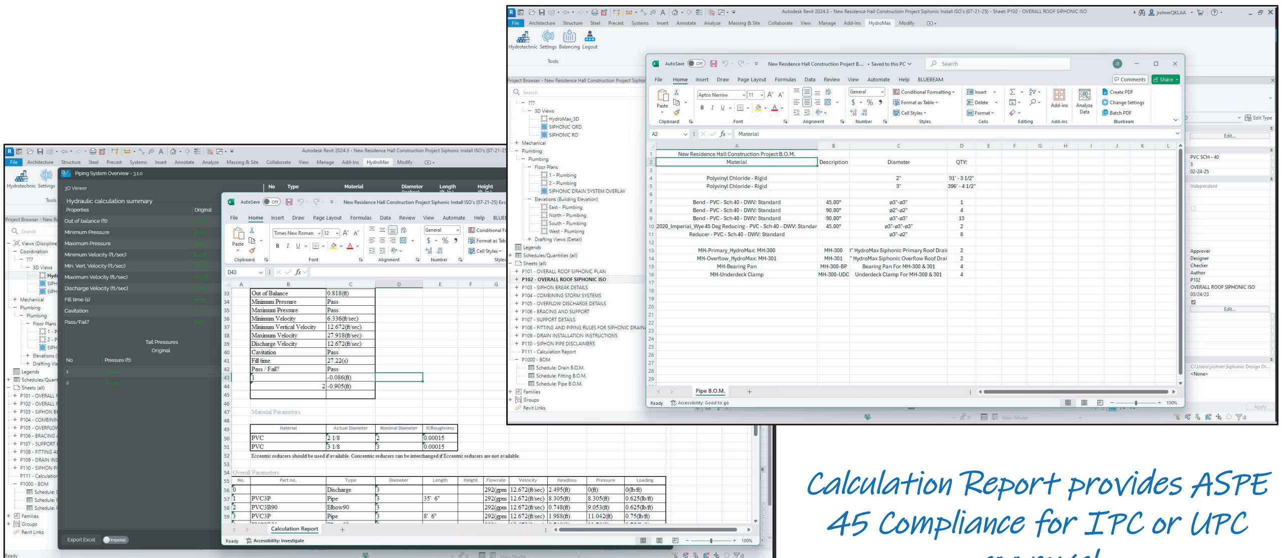


Mifab HydroMax® Siphonic Guide

HydroTechnic™ Siphonic Balancing Program

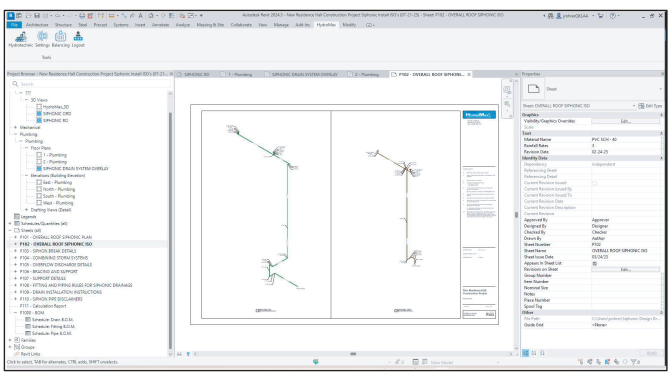


Calculation Report + BOM

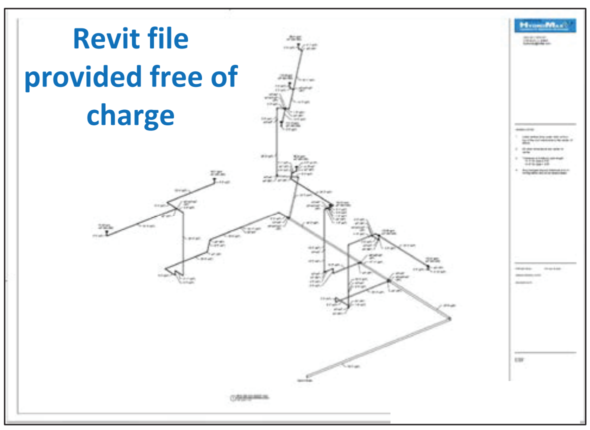


Calculation Report provides ASPE 45 Compliance for IPC or UPC approval

Install ISOs



Revit file provided free of charge



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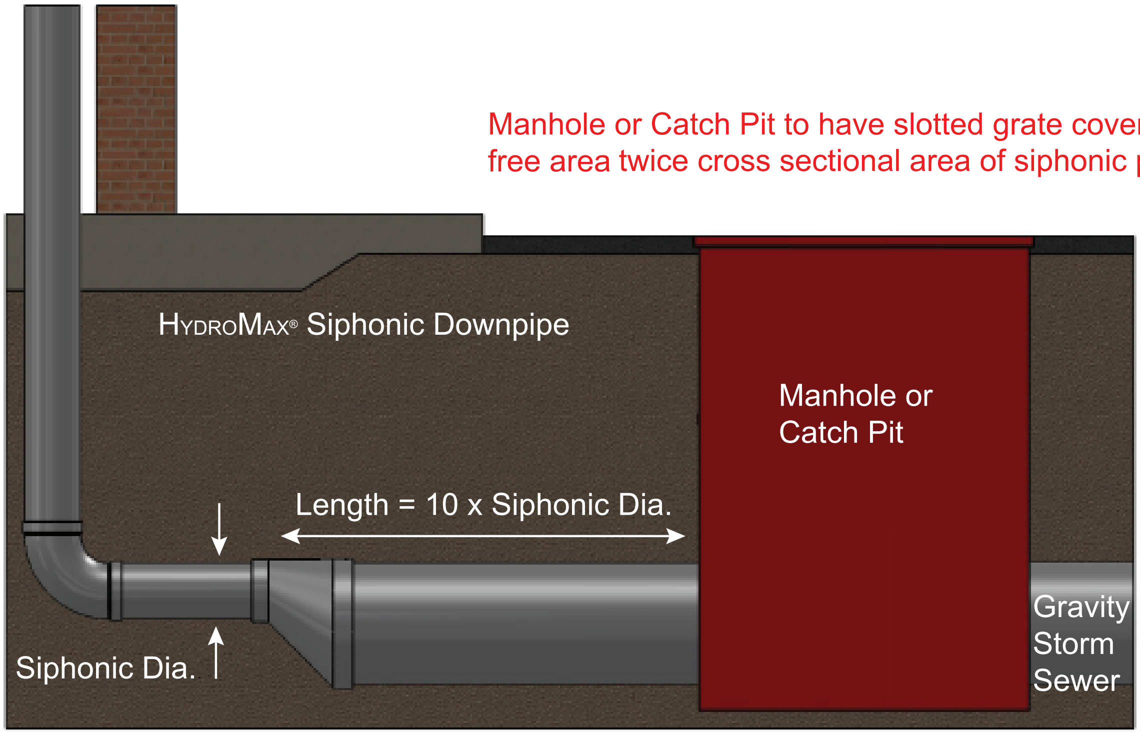
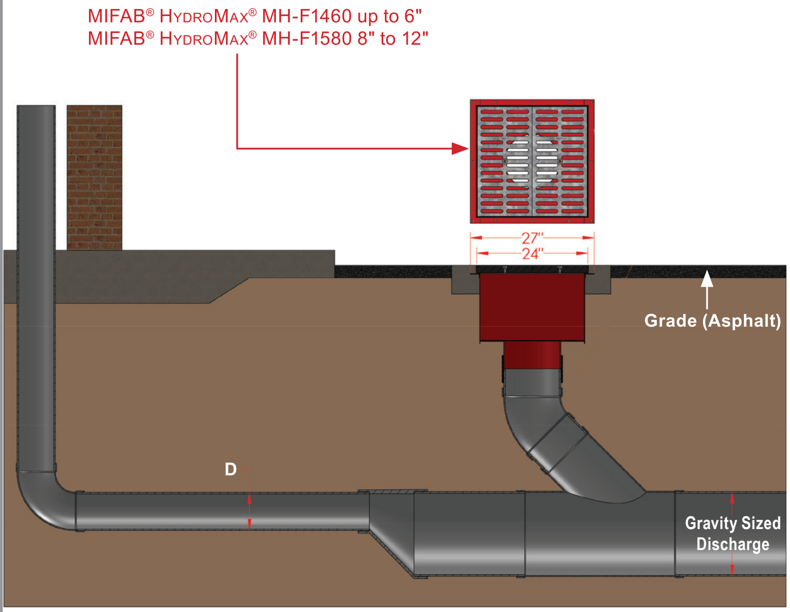
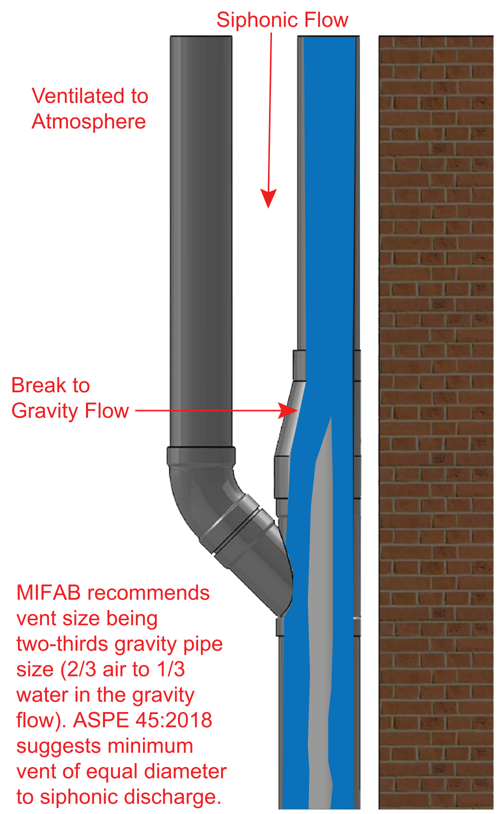
Siphon Breaks



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.



Siphonic Break in Vertical



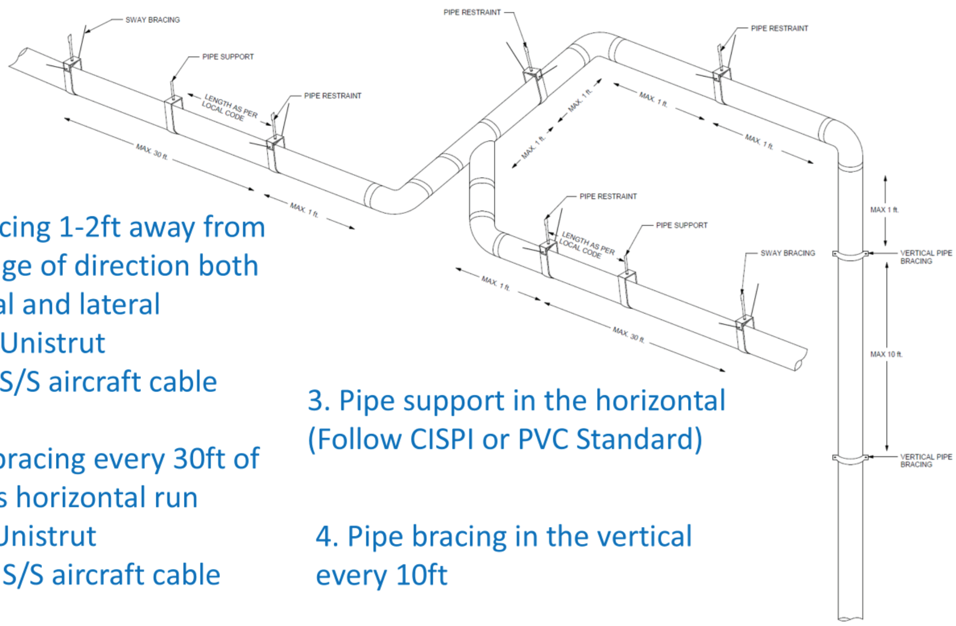
Pipe Bracing Requirements

ASPE45 9.3.4 Standard

9.3.4 Lateral restraints shall be installed every 9.0 m (30 ft) at each branch take-off and at each change in direction. Siphonic designs perform at higher velocities than conventional gravity systems.

Pipe Bracing Requirements

ASPE American Society of Plumbing Engineers



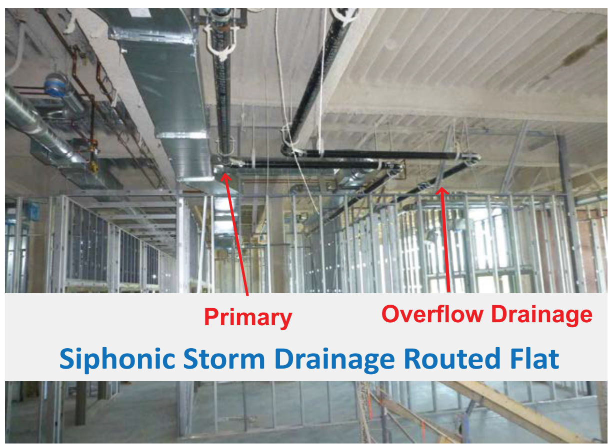
1. Pipe bracing 1-2ft away from every change of direction both longitudinal and lateral
2 ways for Unistrut
4 ways for S/S aircraft cable

2. Lateral bracing every 30ft of continuous horizontal run
1 way for Unistrut
2 ways for S/S aircraft cable

3. Pipe support in the horizontal (Follow CISPI or PVC Standard)

4. Pipe bracing in the vertical every 10ft

CREIGHTON DENTAL
OMAHA, NE



CREIGHTON DENTAL PIPEWORK
OMAHA, NE

IAPMO/ASPE Research Study: Issues with Gravity Roof Drains

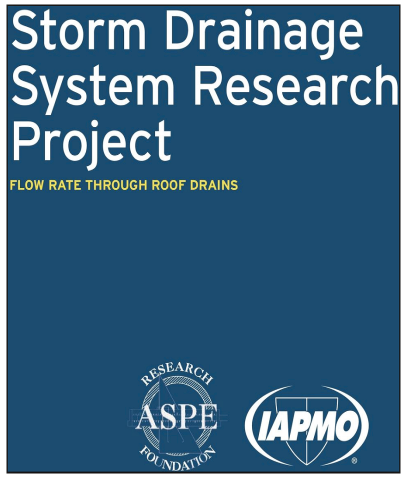
Issue #1: Gravity Roof Drain Standard ASME A112.6.4 does not include a performance test to provide the published roof drain flow rates.
What does this mean? With no prescribed test standard, manufacturers' data cannot be verified or provide an apples to apples comparison.

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 HORIZONTAL STORM DRAINGE PIPING

SIZE OF HORIZONTAL PIPING (inches)	HORIZONTALLY PROJECTED ROOF AREA (square feet) Rainfall rate (inches per hour) 1	2	3	4	5	6
	$^{1}/_{8}$ 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
	$^{1}/_{4}$ 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

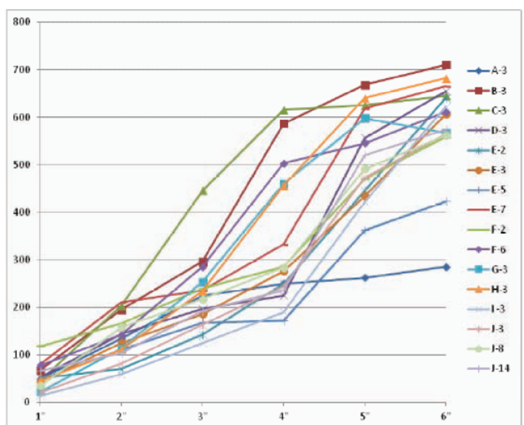
Test No.	Model No.	Description	Type of Strainer	Flow Rate (gpm) Based on Head Height 1"	2"	3"	4"	5"	6"
5	A-5	6" cast iron drain	cast iron dome	10	185	199	238	267	218



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



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

HYDROMAX® PROJECTS

5TH & BROADWAY
NASHVILLE, TN

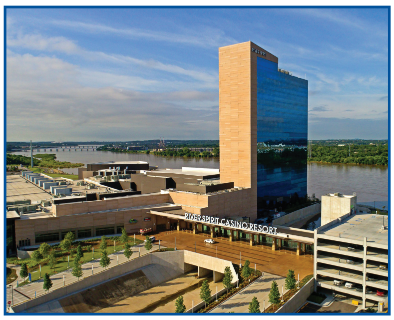
WEGMANS
NATIONWIDE

LINCOLN PARK APARTMENTS
FALL PARK, VA

CHARLES DODGE CITY CENTER
PEMBROKE PINES, FL

IOWA CITY PUBLIC WORKS
IOWA CITY, IA

GEORGIA WORLD CONGRESS CENTER
ATLANTA, GA



RIVER TULSA CASINO
TULSA, OK

BOEING 737 MURRAY PARK
WINNIPEG, MB, CANADA

ASURION HEAD QUARTERS
NASHVILLE, TN

MERCEDES BENZ
WOODSTOCK, AL

MERCEDES BENZ PIPEWORK
WOODSTOCK, AL

COSTCO
MEXICO CITY, MEXICO

"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)

TERMS AND WARRANTIES

QUOTATION TERMS: List Price and discount protected for 30 days from date issued by MIFAB®. Orders received within this period must be released for shipment within 30 days from date of purchase order, otherwise, prices will be those that are in effect at the time of shipment.

PAYMENT TERMS: Terms of payment are Net 30 days from the date of the invoice. All pricing in United States currency. The Buyer shall pay all sales, consumers, and / or any other applicable taxes. Past due accounts will be subject to a 2% per month service charge from the date of the invoice. If any proceedings be instructed by or against Buyer under any bankruptcy or insolvency law, or if Buyer shall fail to make timely payment on this or any other order, or if, in MIFAB's judgement, Buyer's financial situation justifies such action MIFAB® may, at its election, require payment in advance or cancel the order as to any unshipped item and require payment of its reasonable cancellation charges. If Buyer delays completion of manufacture, MIFAB® may elect to require payment according to percentage of completion. Equipment held for Buyer shall be at Buyer's risk and expense. In all cases, regardless of partial payment, title to the Products shall remain with MIFAB® until payment for the Products (including any notes given therefore) has been made in full. Should legal action be necessary to enforce payment of an unpaid invoice, the Buyer will assume full responsibility for any court costs and any reasonable attorny fees. All orders subject to credit check and approval prior to shipment. Confirmed irrevocable letter of credit or cash in advance of shipment is required for accounts without an established line of credit. Minimum invoice amount is $100.00. MIFAB® reserves the right to apply a minimum order charge to equal $100.00. MIFAB's Accounting Department must be notified of potential pricing errors within 30 days of the invoice date. Any terms and conditions stated on Buyer's orders which are inconsistent with MIFAB's quotation and Terms and Warranties shall be of no effect.

RETURNED GOODS RESTOCKING CHARGE: Standard product may be returned within a one year period only with written permission from MIFAB. All products in catalog are not considered Standard. Standard product to be determined by MIFAB®. Returned goods are subject to a 25% restocking charge, plus cost of reconditioning, if necessary, to make material saleable. Material must be returned to MIFAB® freight prepaid only after written permission from MIFAB® to accept the returned material. Buyer must provide copy of the original invoice on which the material was charged. The original outgoing freight cost to ship the order will be deducted from the credit. Credit allowance will be in the form of merchandise credit only-not cash credit which must be used within 12 months of the date of issue. The value of a return must total $100.00 to qualify for credit allowance. Galvanized and acid resistant epoxy coated material will be credited to value of cast iron, and chrome plated at value of nickel bronze. No credit will be allowed for auxiliary tappings, discontinued, or made to order items. Products designated non stock and / or that have been specially made (require a sign off drawing by MIFAB®) are not subject to return or cancellation.

LIMITED WARRANTY: MIFAB® warrants each product against defects in material and workmanship for a period of one year from the date of original shipment. In the event of such defects within the warranty period, MIFAB® will, at its option, replace or recondition the product without charge. This shall constitute the exclusive remedy for breach of warranty, and MIFAB® shall not be responsible for any incidental or consequential damages, including, without limitation, damages or other costs resulting from labor charges, delays, vandalism, negligence, fouling caused by foreign material, damage from adverse water conditions, chemicals, or any other circumstances over which MIFAB® has no control. This warranty shall be invalidated by any abuse, misuse, misapplication or improper installation of the product.

MIFAB® MAKES NO OTHER WARRANTIES EXPRESSED OR IMPLIED AS PROVIDED IN THIS LIMITED WARRANTY.

ILLUSTRATIONS OR TYPICAL INSTALLATIONS: The typical installations for various products in each product section are intended to illustrate the products and their options. Under no circumstances are they to be construed as recommended installation procedures. Consult local codes

NOTE: Prices and terms are subject to change without notice and supersede all previous quotations. The right is reserved to change or modify product design or construction without prior notice and without incurring any obligation to make similar changes and modifications to product previously or subsequently sold. Contact MIFAB® for any clarification.

All sales subject to MIFAB's Terms and Warranties.

DESIGN AND DIMENSIONS ARE SUBJECT TO MODIFICATION. PRICES DO NOT INCLUDE APPLICABLE TAXES.

MIFAB® PRICE BOOKS

MPB-2025-04-USA
SPECIFICATION DRAINAGE
(LIT-067)

CLPB-2025-04
LIGHT COMMERCIAL PRODUCTS
(LIT-048)

AD-2025-05-USA
ACCESS DOORS
(LIT-043)

BEECO-2025
BACKFLOW PREVENTERS, AND ACCESSORIES
(LIT-071)

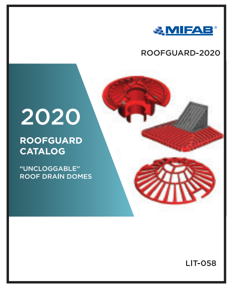
NH-2025
NO HUB COUPLINGS
(LIT-044)

TDPC-2025-04
POLYMER CONCRETE TRENCH DRAINS
(LIT-076)

TD-2025-04
GRP AND STEEL TRENCH DRAINS
(LIT-046)

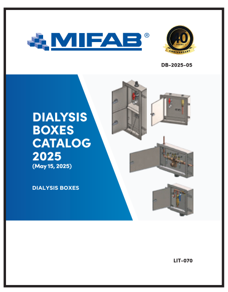
TDSD-2025-04
SHOWER DRAINS
(LIT-077)

TDSS-2025-04
STAINLESS STEEL TRENCH DRAINS
(LIT-072)

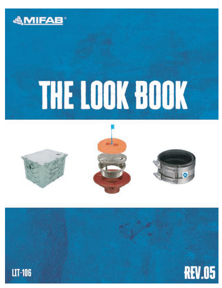


ROOFGUARD-2020
ROOFGUARD ROOF DOMES
(LIT-058)

C-PORT-2023
ROOFTOP RUBBER PIPE SUPPORTS
(LIT-047)



DB-2025-05
DIALYSIS BOXES
(LIT-070)



LOOK BOOK
(LIT-106)

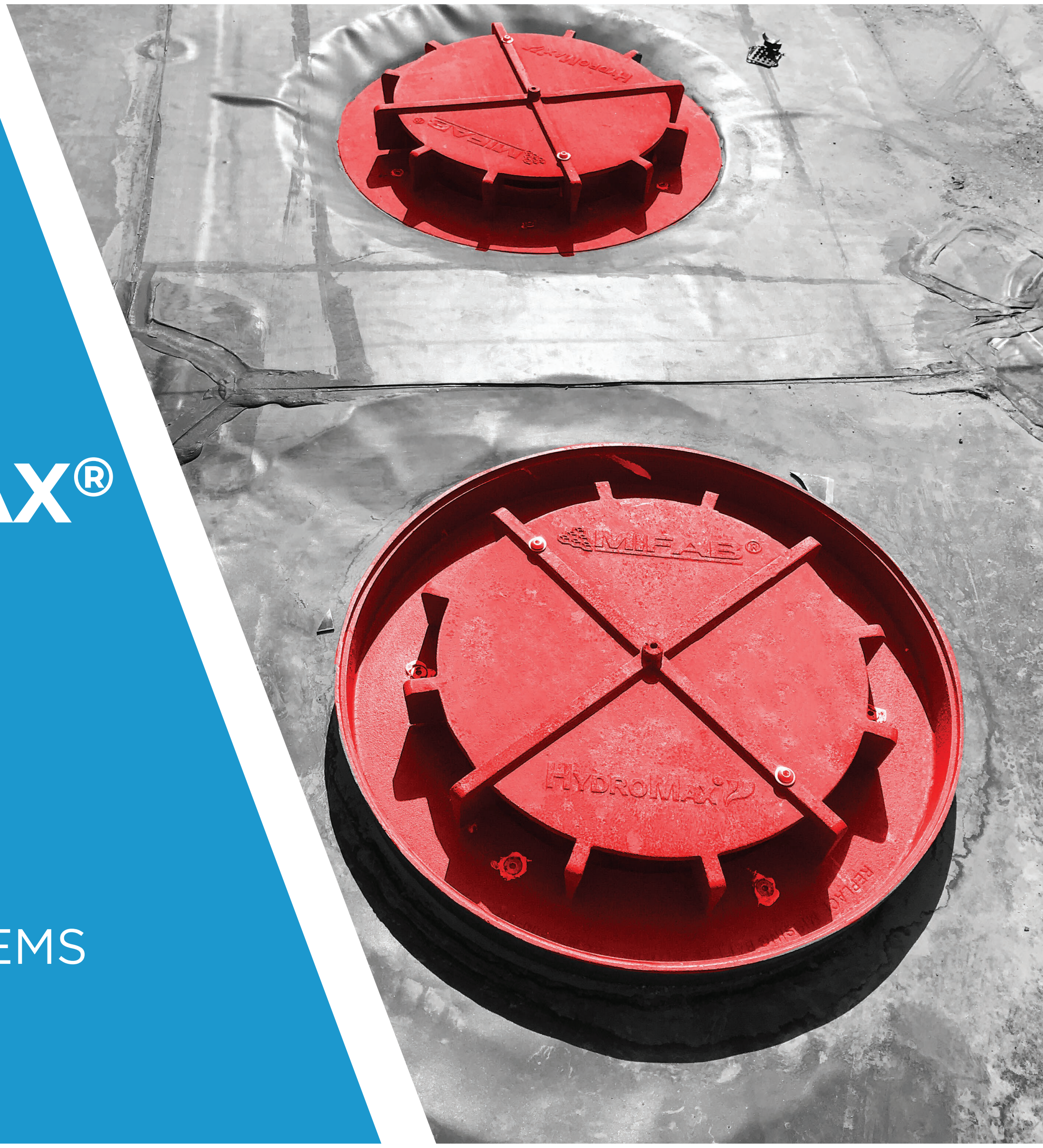
INT-2025
INTERCEPTORS & ACID NEUTRALIZATION TANKS
(LIT-095)

TSP-2025
TRAP SEAL PRIMERS
(LIT-062)

"Walmart uses Hydromax siphonic roof drains and continues to use Hydromax roof drains as a part of our building prototype construction documents." In general, Walmart just states the obvious and let's others draw their conclusions, which would be if the World's largest retailer uses this system it must work."- Todd Franke, Sr. Architect, Walmart Stores, Inc (Bentonville, AR)

MIFAB®

HydroMax
Leaders in Siphonic Drainage



HYDROMAX® CATALOG

SIPHONIC ROOF DRAINAGE SYSTEMS

PRIMARY - OVERFLOW - GUTTER

FOR ANY DESIGN ASSISTANCE CONTACT:
HYDROMAX@MIFAB.COM

LIT-082