

# Sustainability, More Than Just CO<sub>2</sub>

**Dr. Aaron Fisher PhD**

VP of Business Development  
ERNEST MAIER

[afisher@emcoblock.com](mailto:afisher@emcoblock.com)

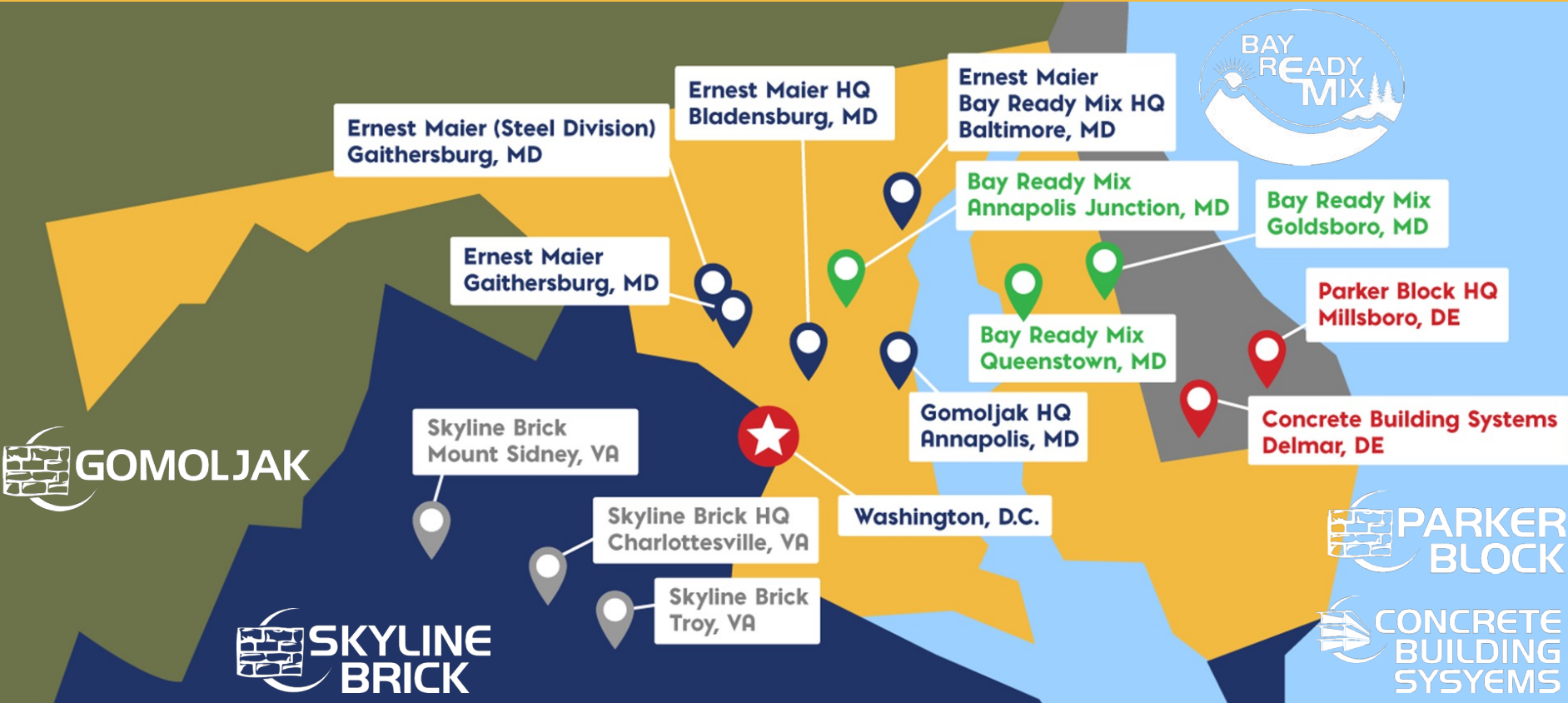
(202) 510-5545

[ernestmaier.com](http://ernestmaier.com) | [pavedrain.com](http://pavedrain.com)



# EST. 1926 ERNEST MAIER

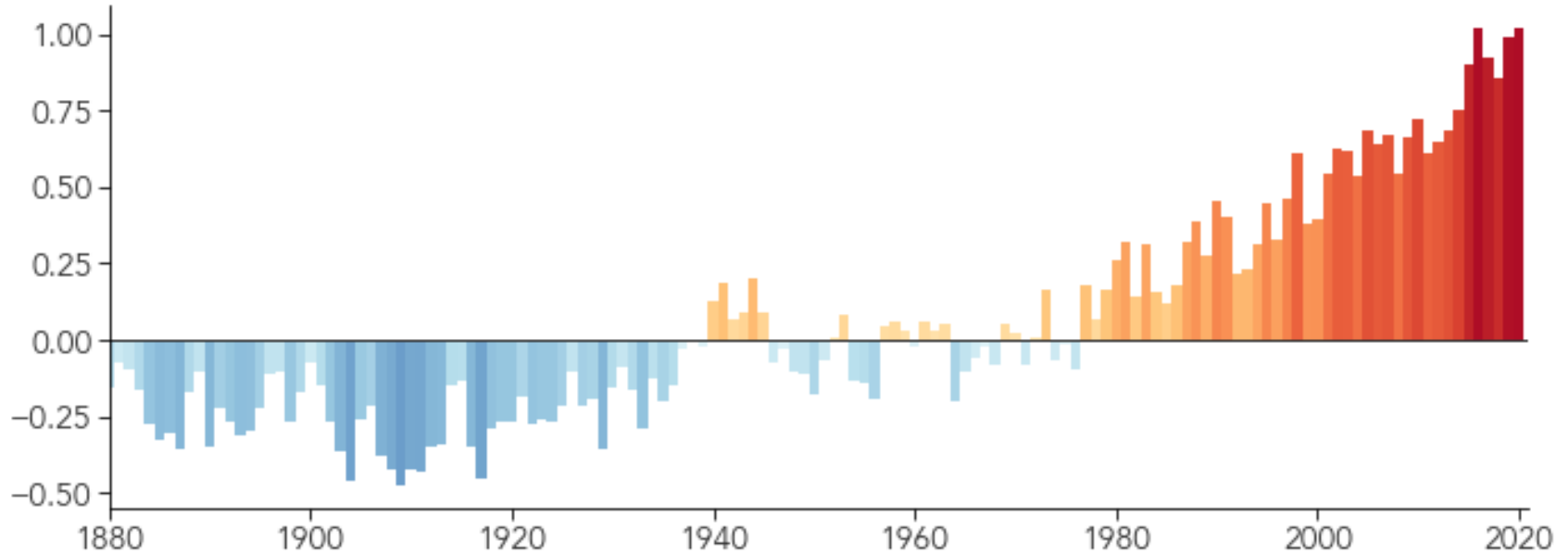
MORE THAN JUST BLOCKS



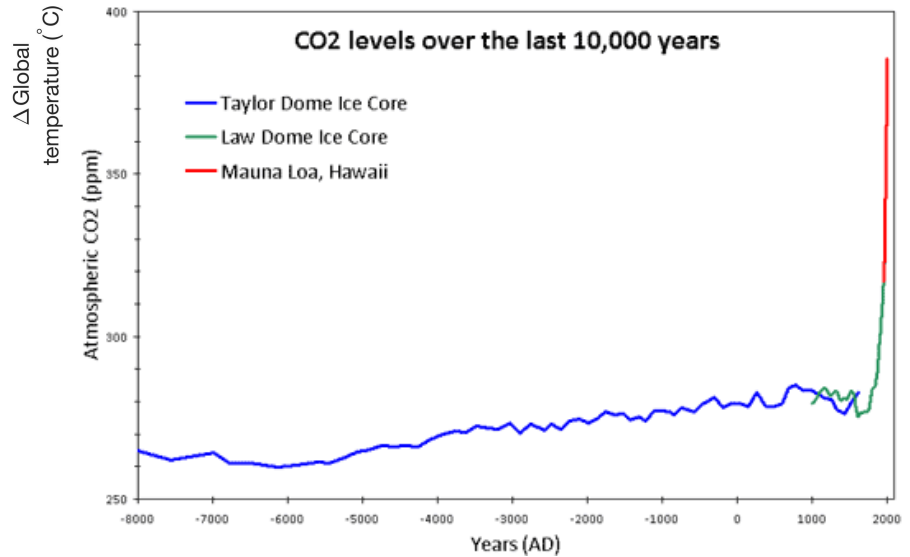
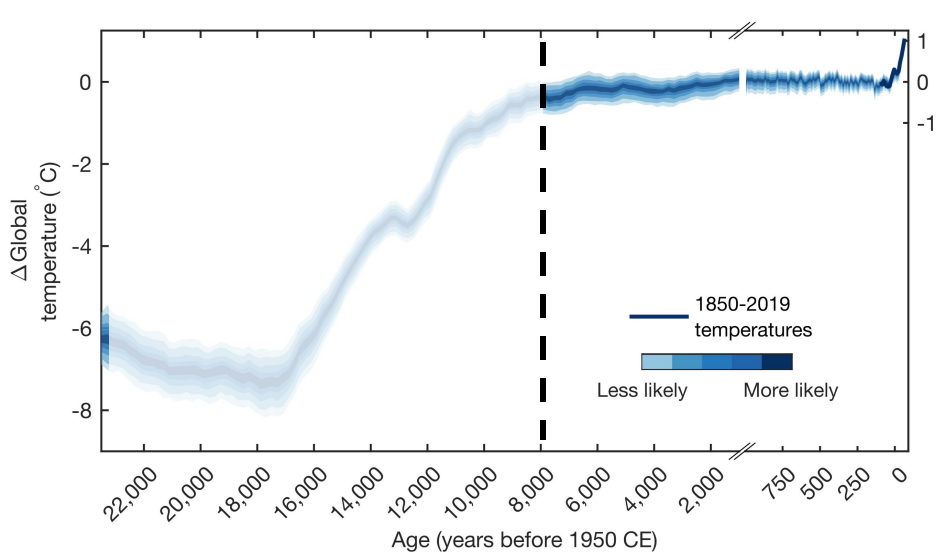
# Trending Towards an Extreme

## 2020 in Statistical Tie for Warmest Year on Record

Global Temperature Anomaly (°C compared to the 1951-1980 average)



# An Extreme Without Precedent



## UN Definition of Sustainability

meeting the needs of the present  
without compromising the ability of  
future generations to meet their own  
needs

**NOTHING ABOUT CO<sub>2</sub>**



# Elements of Sustainability + Resiliency

- Longer Lasting
- Denser Development
- Resiliency
- Fire Safety
- Energy Efficiency
- Water
- Adaptation
- CO<sub>2</sub>



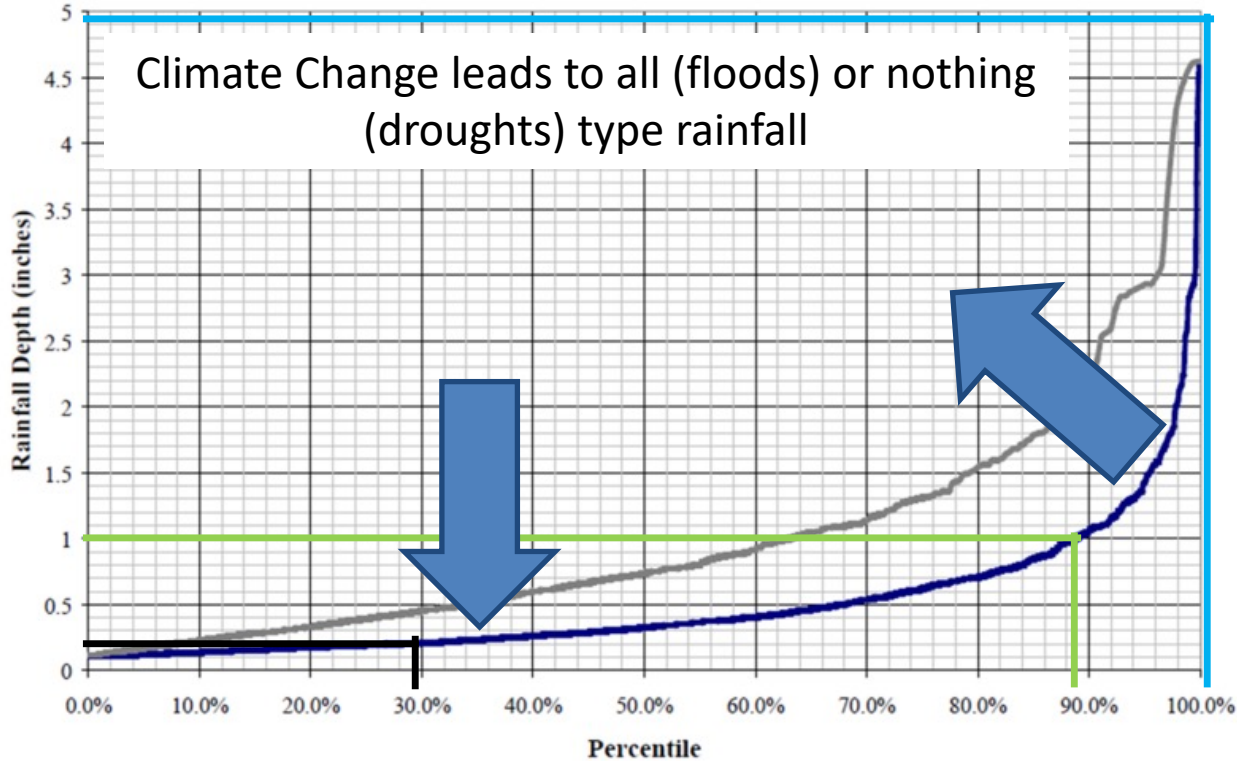
# Stormwater Regulations

Exist because impermeable surfaces change hydrological properties over the natural environment.

Need management practices to avoid flooding, runoff, and other issues



# Rainfall Precipitation



Traditional permeable pavement can handle ~1" rainfall events; 90% of events.

Normal pavement can handle ~0.1"-0.25"; 30% of events

While an improvement it still misses 1 out of every 10 events. **All it takes is one**





Reduced maintenance  
Better stormwater performance



# Not a Traditional Paver

Interlocking  
Concrete Paver

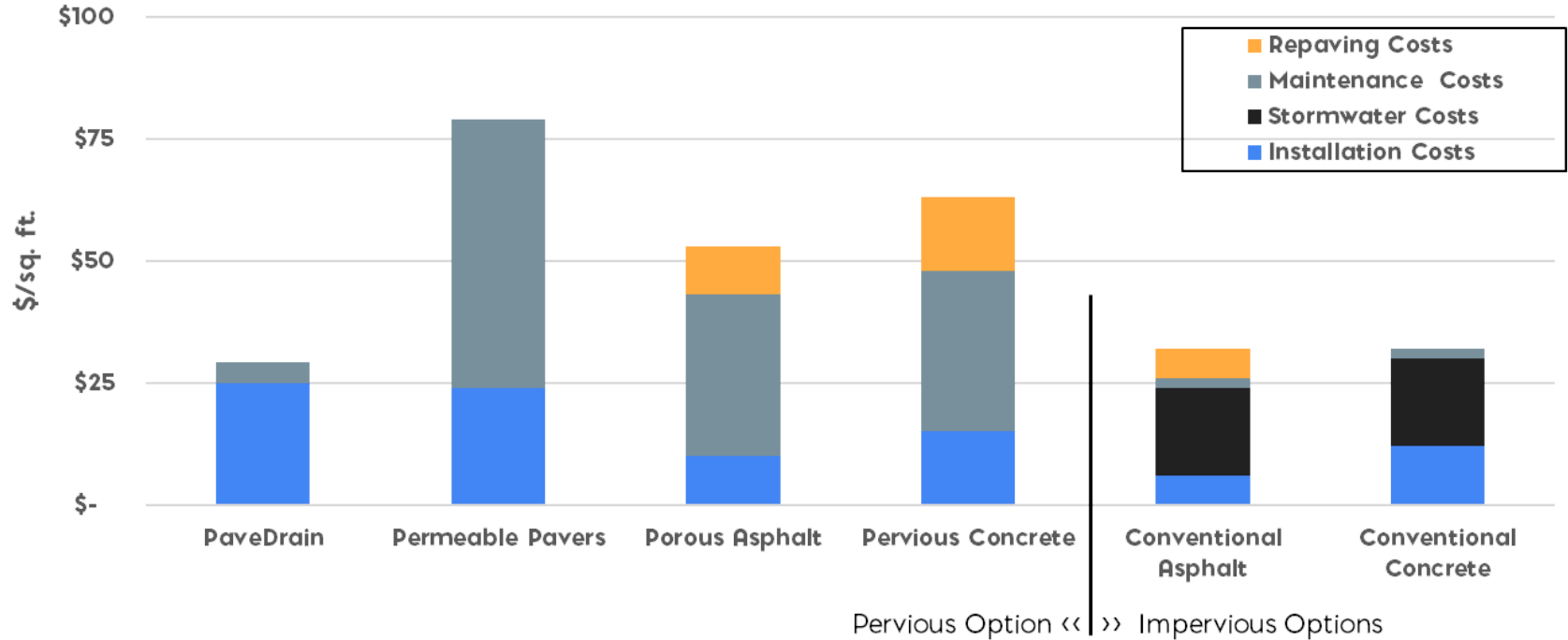


Articulating  
Concrete Block

- **Bigger Blocks**
  - 12" x 12" x 5.65"
  - 45 – 48 lbs.
- **Open Joints**
- **Traffic Rated (Trucks)**

similar, but not the same

# Total Costs @ 10 Years



# Baltimore City



# Decentralized Stormwater Management





# Permeable Roadway Options with ACBs

---

# Infiltration Rate



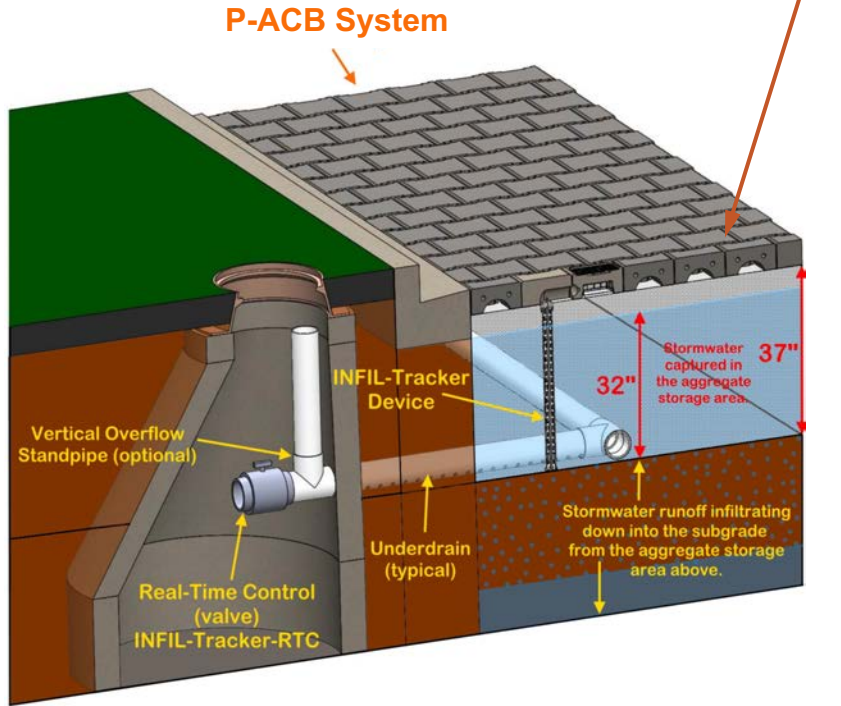
Open Joints =  
High Infiltration  
Rates

Table 1: Summary of Infiltration Rates Tested of Various Surfaces

| Surface Material | Infiltration rate (in/hr) | Mass of infiltrated water (lb) | Diameter of infiltration ring (in) | Time (sec)        |
|------------------|---------------------------|--------------------------------|------------------------------------|-------------------|
| PaveDrain        | 1,640                     | 40.0                           | 12.187                             | 19.53/18.42/24.53 |
| Porous pavers    | 3.2                       | 2.54                           | 12.187                             | 683               |
| Porous concrete  | 2.4                       | 3.80                           | 12.187                             | 1,380             |
| Porous asphalt   | 3.1                       | 5.58                           | 12.187                             | 1,515             |

# Soil Infiltration

**+Tipping Bucker Rain Gauge**  
Provides site-specific, time-stamped rainfall data



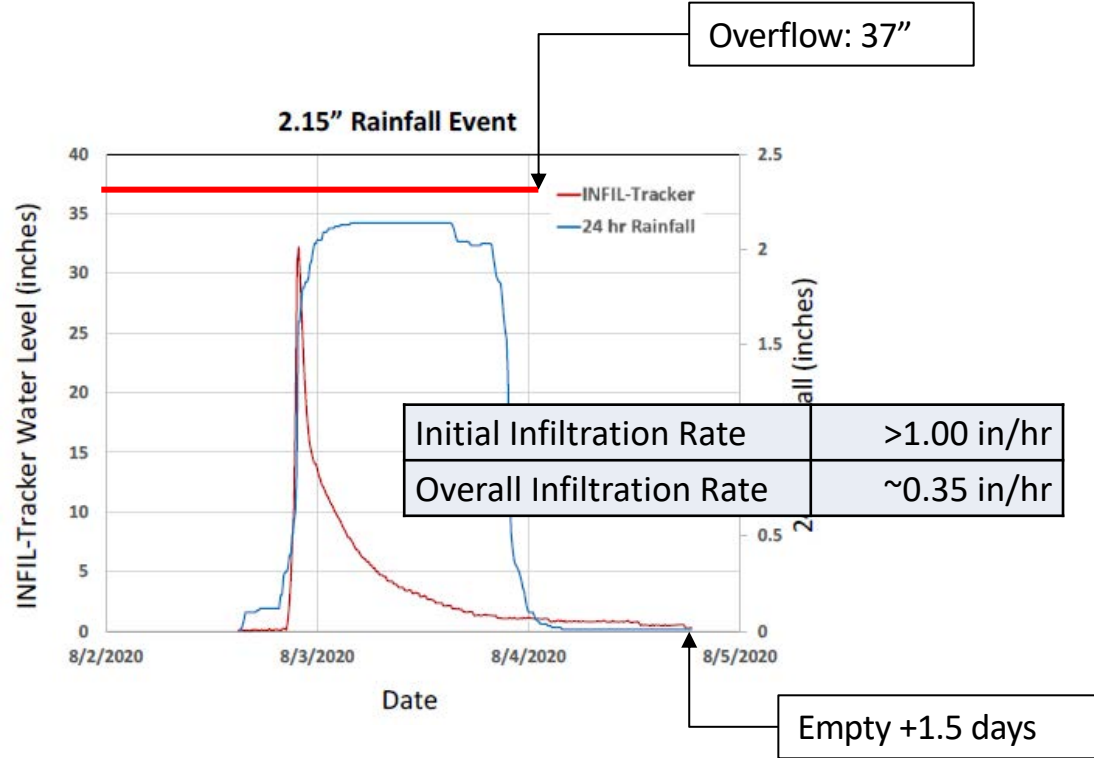
**Water Level Logger**





# Van Norman Alley-Cudahy, WI

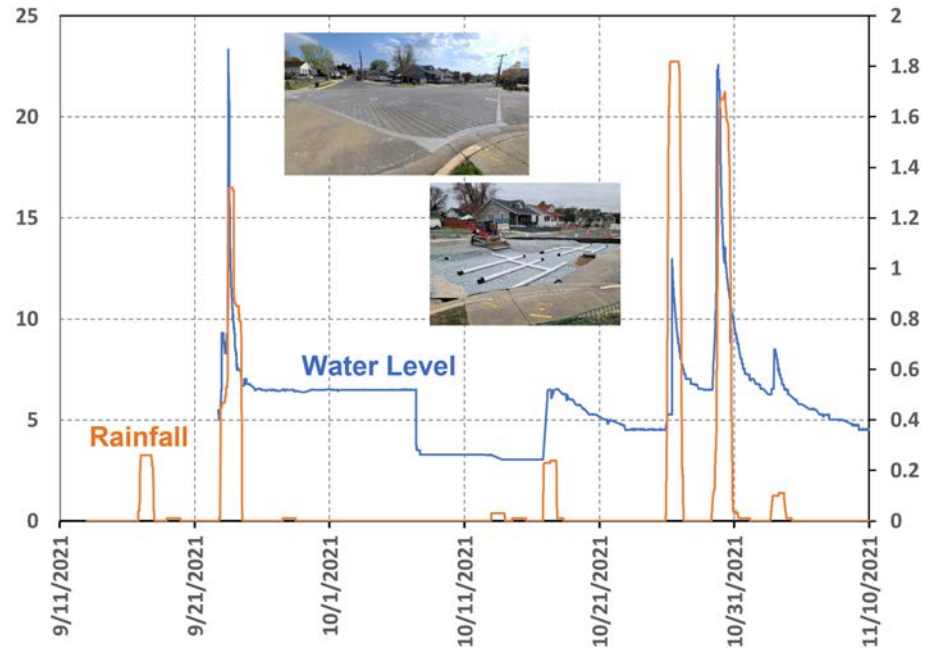
|                        |            |
|------------------------|------------|
| Impervious Cover       | 28,000 SF  |
| P-ACB                  | 850 SF     |
| Run-On Ratio           | 33:1       |
| Soil Infiltration Rate | 0.04 in/hr |



# Right-of-Way in Prince George's County

- 2,350 SF intersection (ROW)
- Soil tests confirmed D soils (clay)
- Elevated water table

|                                | Expected | Actual                           |
|--------------------------------|----------|----------------------------------|
| ESD Volume (ft <sup>3</sup> )  | 376      | 1645                             |
| Soil Infiltration Rate (in/hr) | 0.04     | >5.00- initial<br>~0.40- overall |



Preliminary data- Study with UMD

# The PaveDrain Maintenance Advantage

- ❑ Permeable surfaces start with massive infiltration, but clog quickly
  - ❑ P-ACB highest initial rates of infiltration
  - ❑ Open joints are easier to clean
  
- ❑ Superior to green infrastructure
  - ❑ No plants to maintain
  - ❑ Keep nature, natural
  - ❑ Drought tolerant
  
- ❑ Documented with multiple university and governmental studies
  - University of Central Florida – Stormwater Academy
  - EPA
  - University of Louisville – TMDL Removal
  - City of Detroit, MI (TetraTech Study)
  - UMD Study (ongoing)



# Abuse Test at Univ. of Central FL



**Brought back to 90+% of original infiltration rate**



# You Don't Collect The Leaves Before They Fall

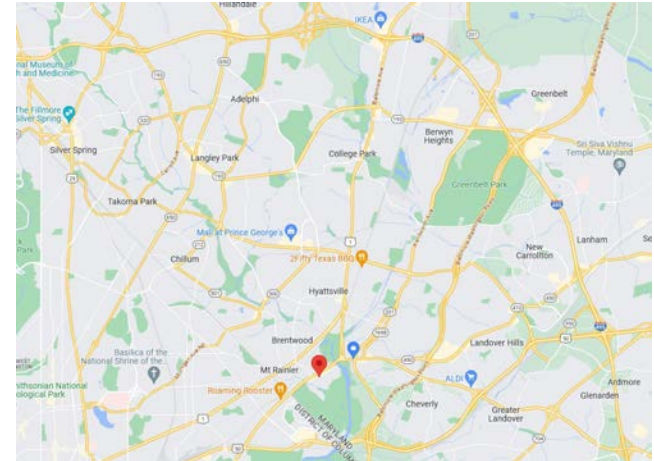
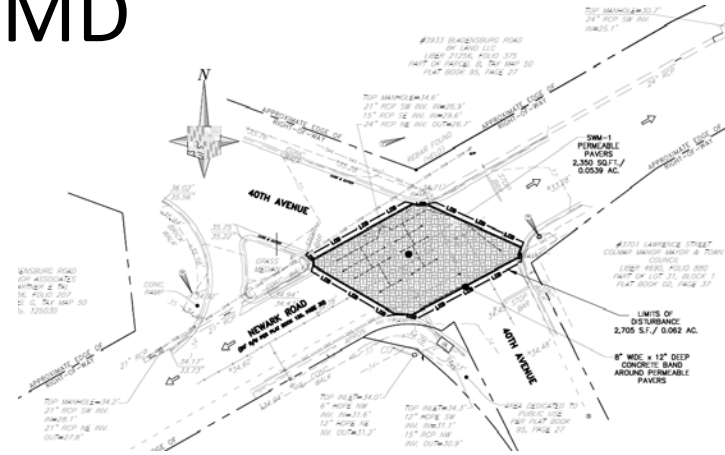


**Maintain As Needed, Not As Scheduled**  
**Skip The Preventative Maintenance On Your Stormwater BMPs**

This message brought to you by PaveDrain | [www.pavedrain.com](http://www.pavedrain.com)

# Colmar Manor, MD

- Installed March 2021
- No Maintenance 2+ Years
- 3x credit over BMP Manual
- Best Ultra-Urban BMP- Finalist



# Other P-ACB Benefits

- Never have to replace joint filler (sand/stone dust)
- High void space avoids freeze-thaw and frost heaving challenges
- Can seal after installation to prevent salt damage
- Able to function in high water levels (e.g., sunny day flooding)
- Long lifetime of concrete (40 years)
- Single person can replace an ACB unit with a block extractor
- Increases resiliency of traditional paving surfaces



Dr. Aaron Fisher PhD

VP of Business Development

Ernest Maier

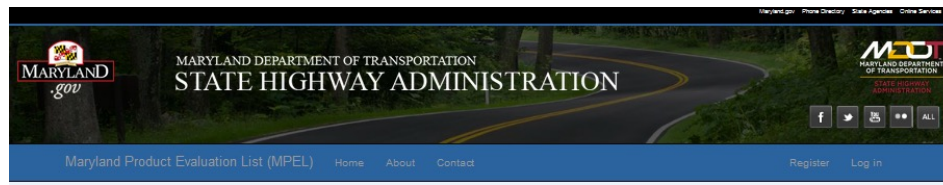
[afisher@emcoblock.com](mailto:afisher@emcoblock.com)





# Approvals

- MDOT since 2015
- DOT
  - Florida
  - Georgia
  - Indiana
  - Maryland
  - Wisconsin
- MDE since 2012 and most MD counties



## Search Evaluations

Search Criteria:

Product Name:  Clear

Vendor Name:  Clear

Manufacturer Name:  Clear

Category:  Clear

Area:

Date From:  To:

## List of Product Evaluations

Show  entries

| Date ^               | Product Name ^ | Status ^ | Details                      |
|----------------------|----------------|----------|------------------------------|
| 11/4/2015 1:15:46 PM | PaveDrain      | Approved | <a href="#">View Details</a> |

Showing 1 to 1 of 1 entries

[Previous](#) [1](#) [Next](#)

© 2023 - MPPEL 2.0

# Manufacturer Warranty

- **3 years**-500 in/hr (w/ maintenance)
- **6 years**-8 in/hr (w/o maintenance)
- Restrictions
  - Proper installation
  - Voided if loose aggregate stored on surface (sand, stone, soil, mulch, etc)
  - Other terms as specified





**The ACB Difference –  
HEAVY Applications**

