

## CASE STUDY- Charlotte Hornets Performance Enhancement Center

### Charlotte, NC (to be installed in 2026)

The Charlotte Hornets Performance Enhancement Center, scheduled for installation in 2026, will include a Purple Roof system designed to optimize stormwater management through rooftop retention and detention strategies. This system will be a crucial component of the building's stormwater management plan, providing storage, reducing peak runoff and regulating discharge rates efficiently.

#### Project Scope and Design

The project features two distinct Purple Roof profiles spanning Levels 6 and 7:

- 4+2+2 Vegetated Profile: 24,911 square feet
- Paver+2+2 Hardscape Profile: 20,635 square feet

The Level 7 roof will manage stormwater for both itself and the upper roof (exposed TPO), ensuring controlled flow and optimized water retention through its layered profile. The Purple Roof system was selected for its ability to integrate stormwater management seamlessly within the architectural design and structural limitations. By incorporating both vegetated and hardscape surfaces, the system offers a flexible approach to balancing aesthetics, functionality, and performance.

#### Replacing Traditional Stormwater Infrastructure

One of the key advantages of implementing the Purple Roof system was its ability to replace an equally-sized traditional stormwater storage tank (19,000 cf = 7.8 ocean containers), which would have occupied critical square footage within the building's footprint. This alternative not only preserves valuable usable space but also eliminates the need for extensive foundation-stage construction, reducing project complexity and expediting the overall construction timeline. The Purple-Roof system is not a requirement for any preceding trade, therefore it does not significantly impact the critical path of the overall construction schedule.

#### A Model for Green Infrastructure in Sports Facilities

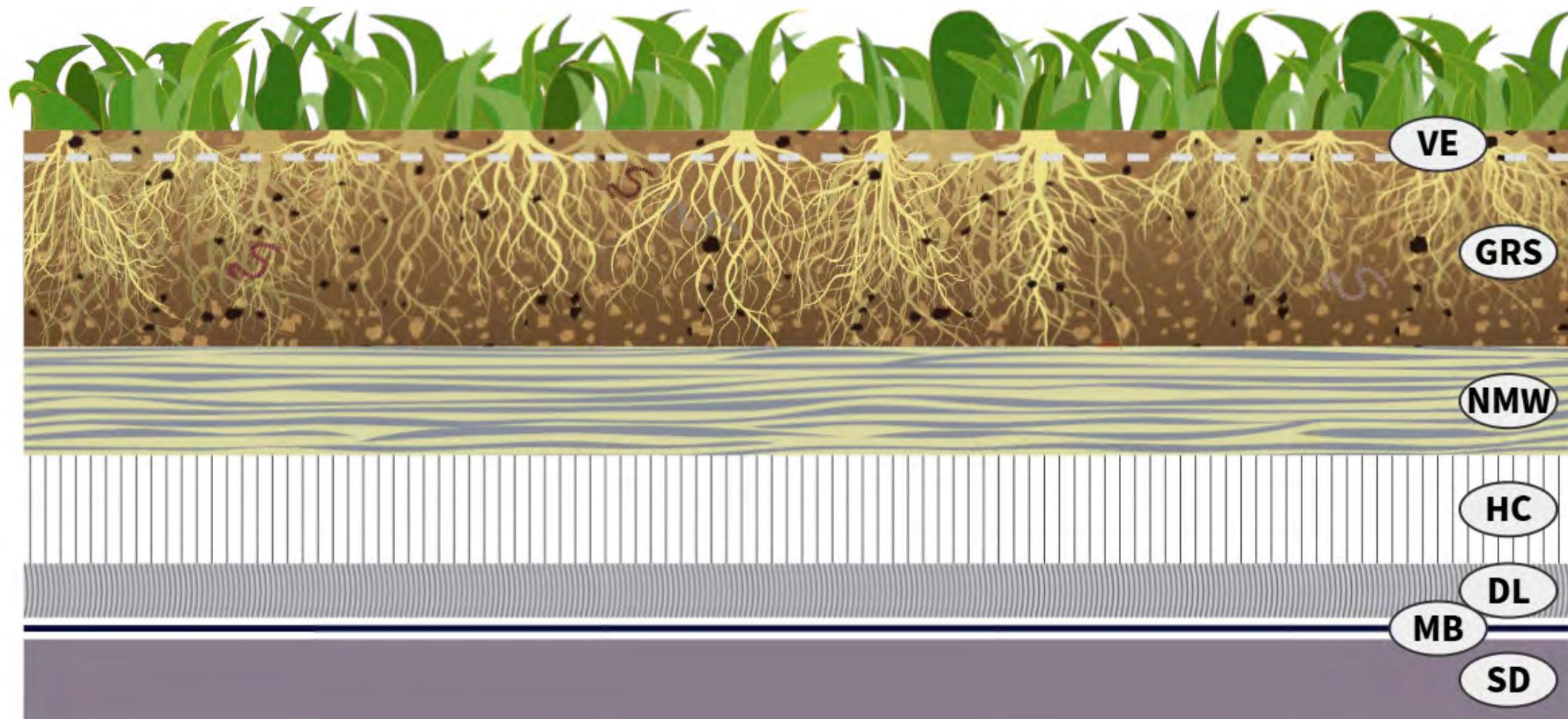
This project represents an advanced application of green roof technology in a high-performance sports facility, demonstrating how stormwater management can be seamlessly integrated into the structural and functional requirements of today's buildings. The Charlotte Hornets Performance Enhancement Center serves as an example of innovative, space-efficient, and sustainable stormwater solutions in large-scale urban developments.



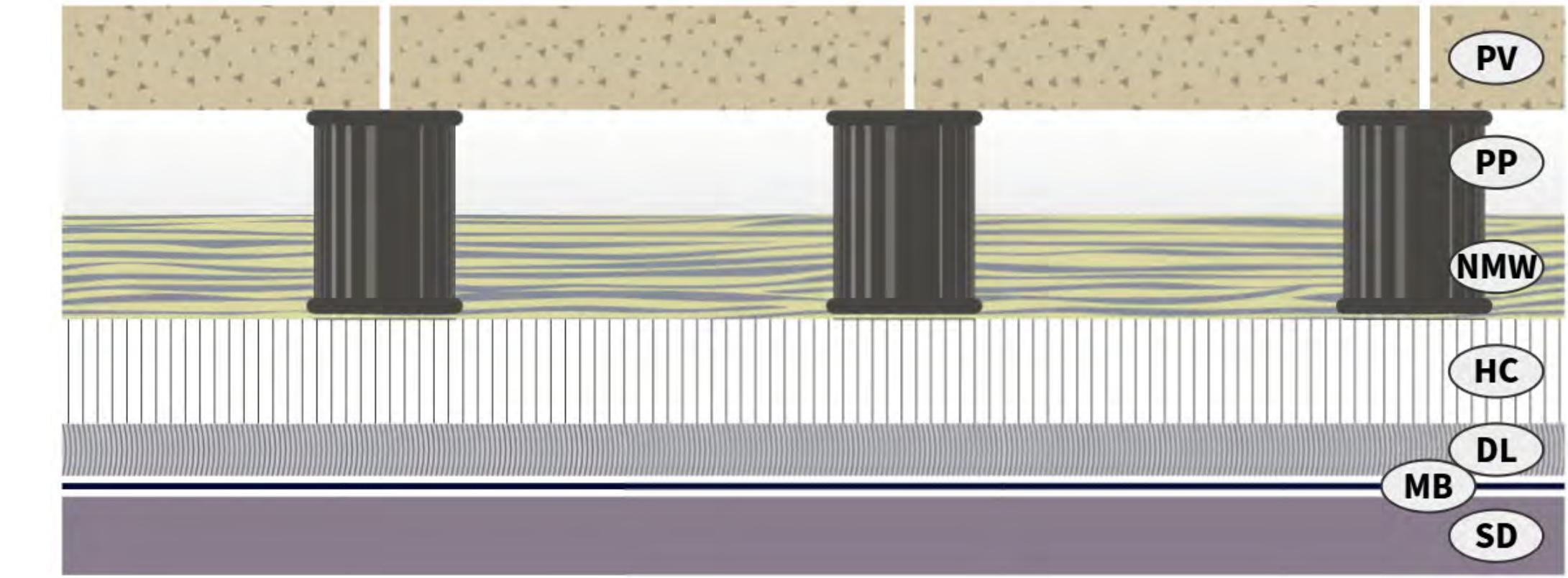
# Purple-Roof®

 sempergreen®  
USA

Vegetated 4+2+2 profile



Hardscape Paver+2+2 profile



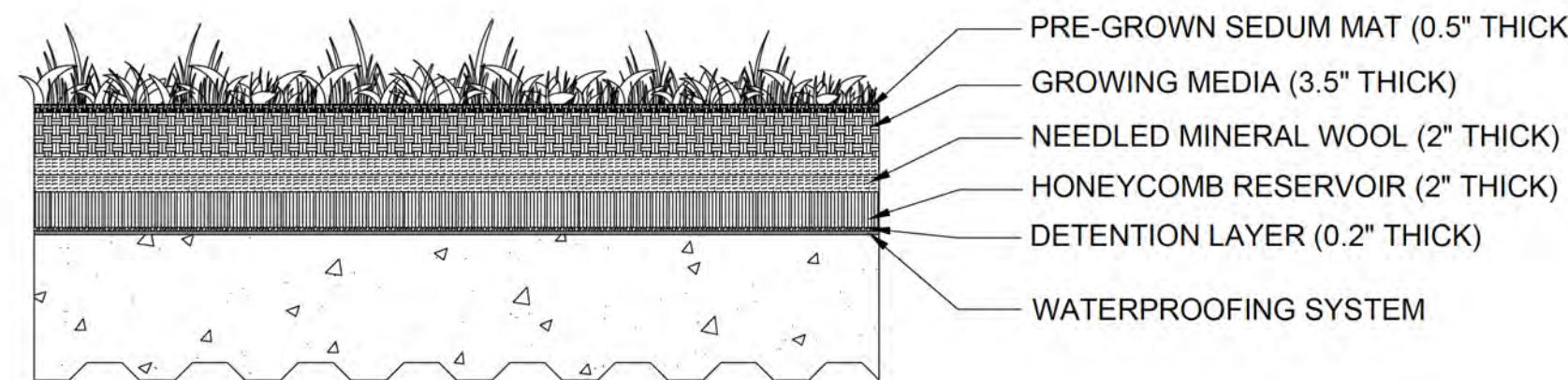
| property                            | value                      | standard              |
|-------------------------------------|----------------------------|-----------------------|
| total thickness                     | 8.49 inches                |                       |
| dry weight                          | 20.85 lbs/sf               | FLL B.2 & ASTM E-2399 |
| max dead load (wet)                 | 41.04 lbs/sf               | FLL B.2 & ASTM E-2399 |
| max live load ***                   | 13.26 lbs/sf               | FLL B.2 & ASTM E-2399 |
| max combined dead and live load *** | 54.3 lbs/sf                | FLL B.2 & ASTM E-2399 |
| max retention storage volume        | 2.4 gals/sf<br>3.85 inches | FLL B.2 & ASTM E2399  |
| max detention storage volume        | 2.4 gals/sf<br>3.85 inches | GRD 2151              |
| anticipated max flow rate**         | 0.2 cf/s/acre              | ASTM D4716++          |
| typical plant palette               | grasses and sedums         |                       |



| property                            | value                      | standard              |
|-------------------------------------|----------------------------|-----------------------|
| total thickness                     | 8.49 inches                |                       |
| dry weight                          | 24.86 lbs/sf               | FLL B.2 & ASTM E-2399 |
| max dead load (wet)                 | 34.39 lbs/sf               | FLL B.2 & ASTM E-2399 |
| max live load ***                   | 10.82 lbs/sf               | FLL B.2 & ASTM E-2399 |
| max combined dead and live load *** | 45.21 lbs/sf               | FLL B.2 & ASTM E-2399 |
| max retention storage volume        | 1.1 gals/sf<br>1.76 inches | FLL B.2 & ASTM E2399  |
| max detention storage volume        | 1.6 gals/sf<br>2.57 inches | GRD 2151              |
| anticipated max flow rate**         | 0.2 cf/s/acre              | ASTM D4716++          |



## Construction Details

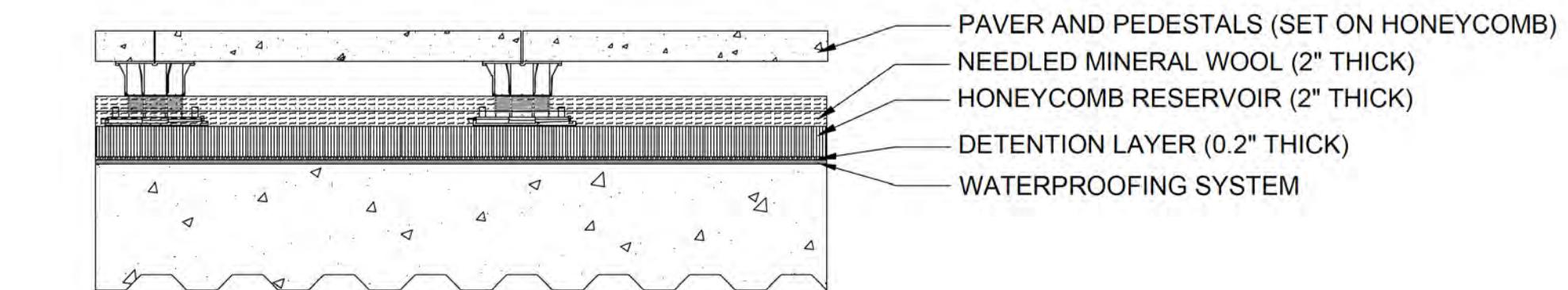


NOTE: ORGANIC MATTER CONTENT OF ALL GROWING MEDIA SHALL BE 10% BY VOLUME MINIMUM.

### 01 PURPLE ROOF - VEGETATED TYPICAL SECTION

FOR INFORMATION ONLY - SEE ARCHITECTURAL PLANS FOR DETAILS

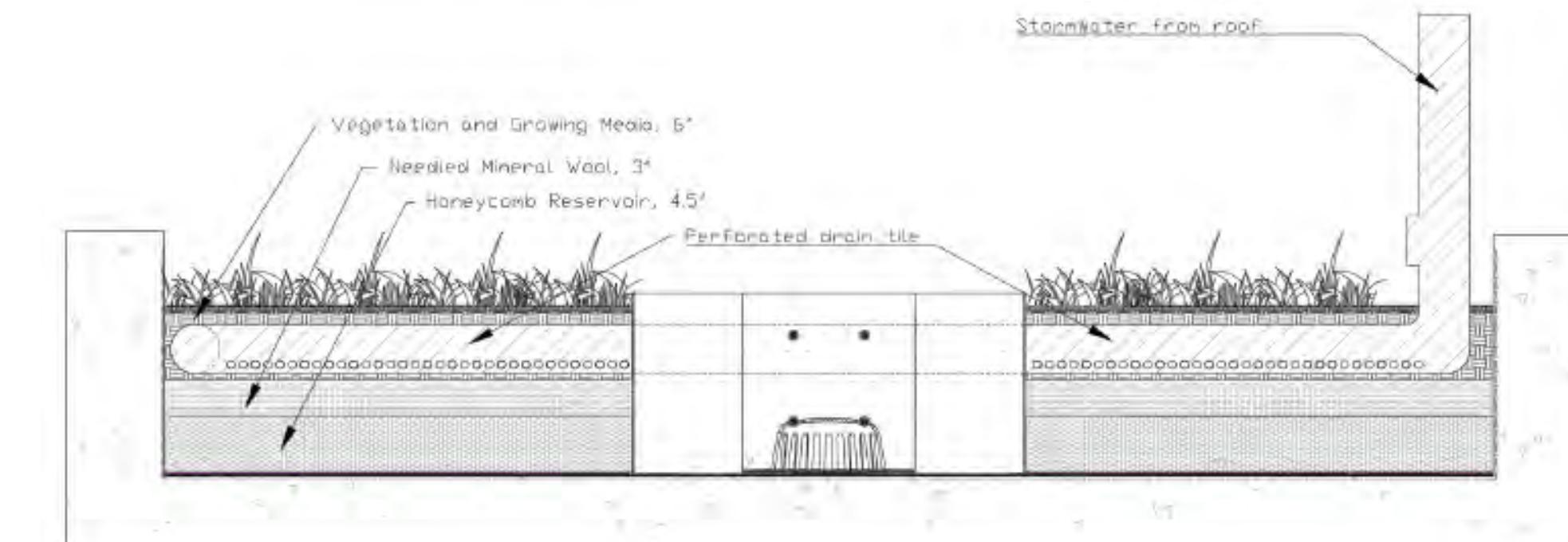
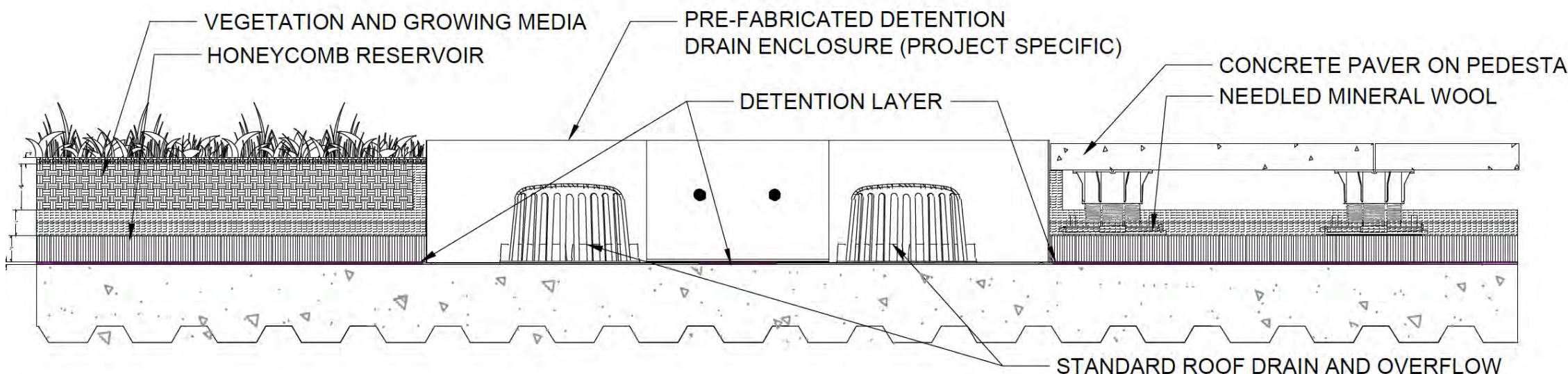
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### 02 PURPLE ROOF - PAVER TYPICAL SECTION

FOR INFORMATION ONLY - SEE ARCHITECTURAL PLANS FOR DETAILS

N.T.S.



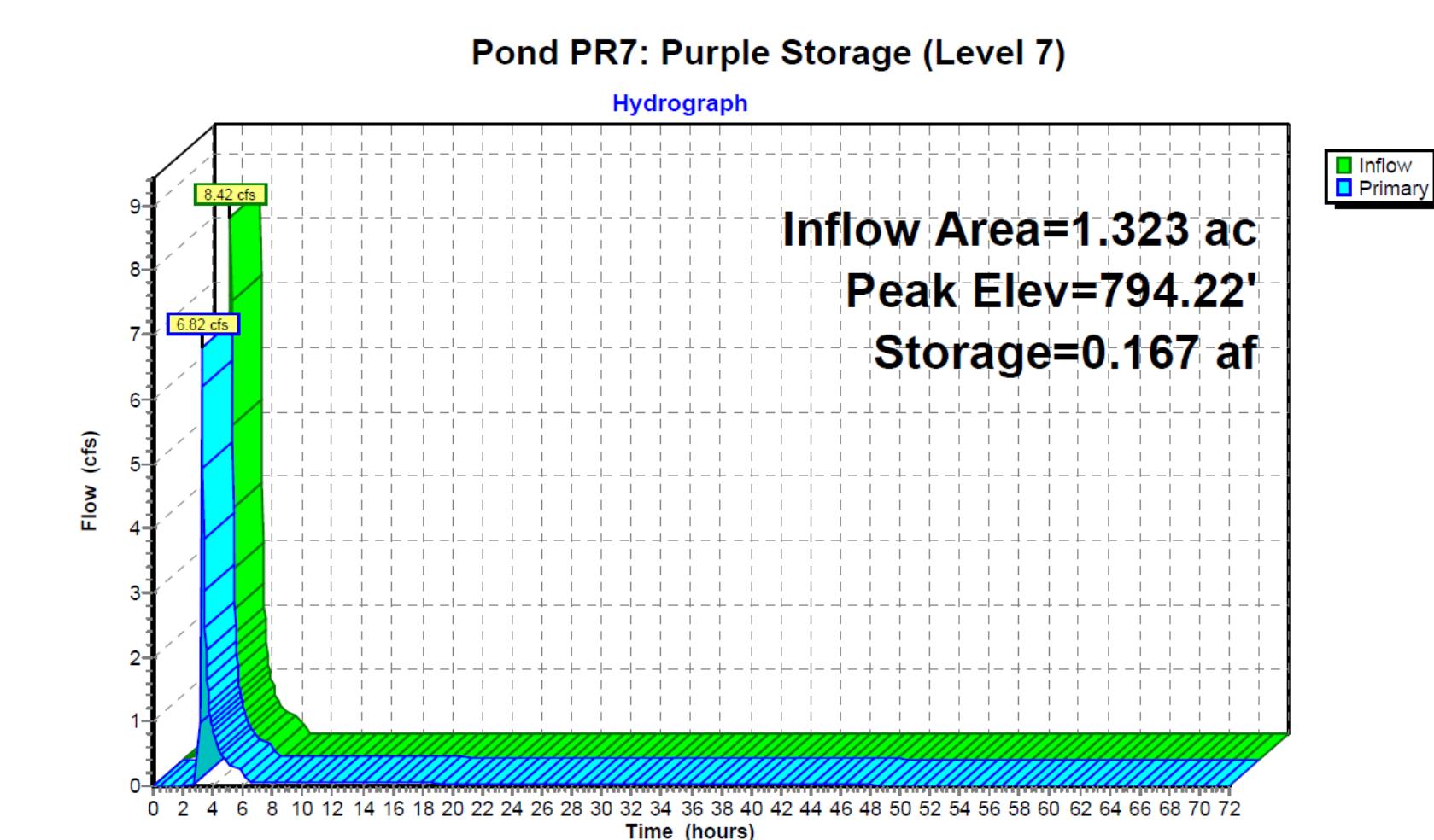
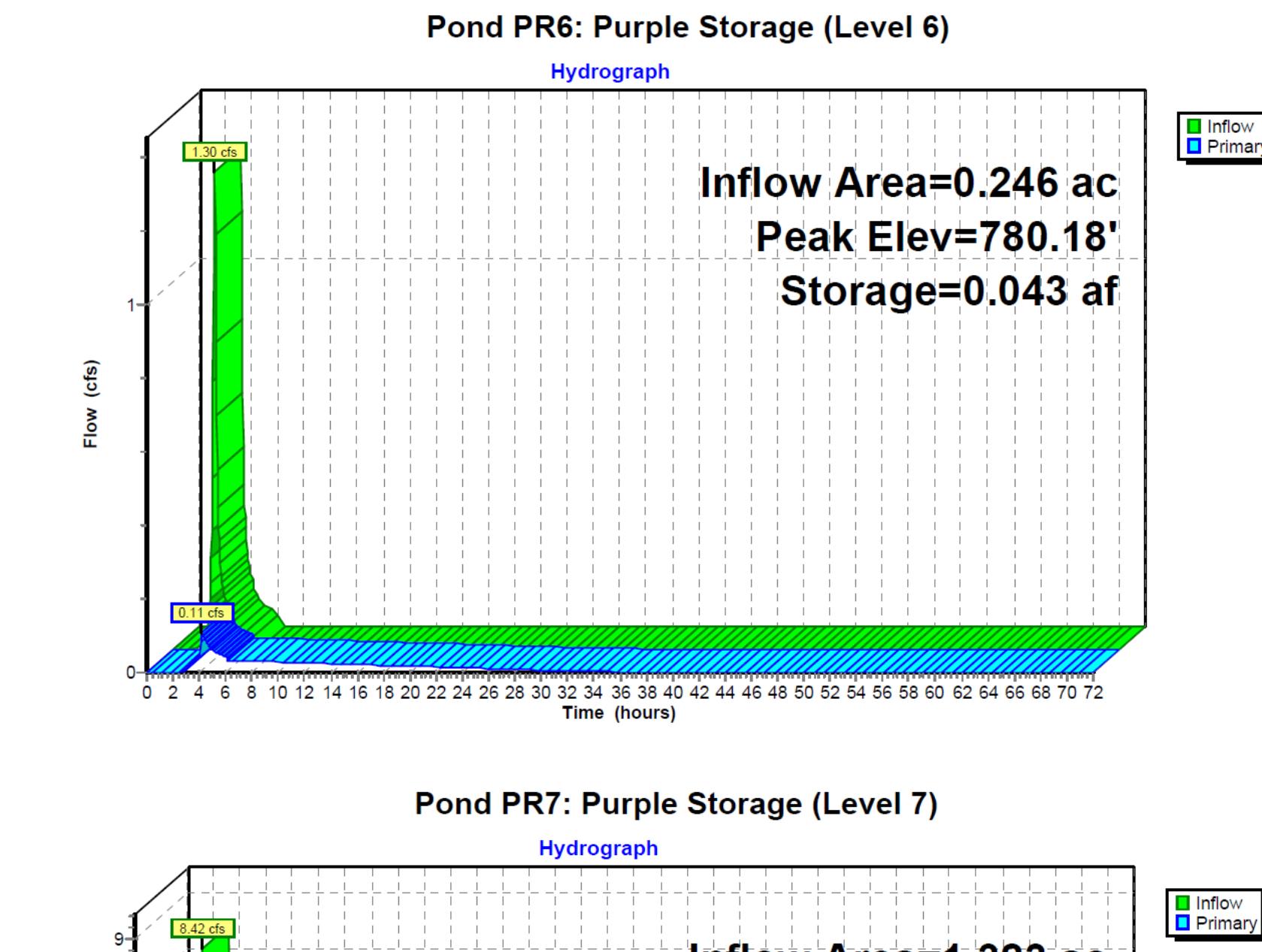
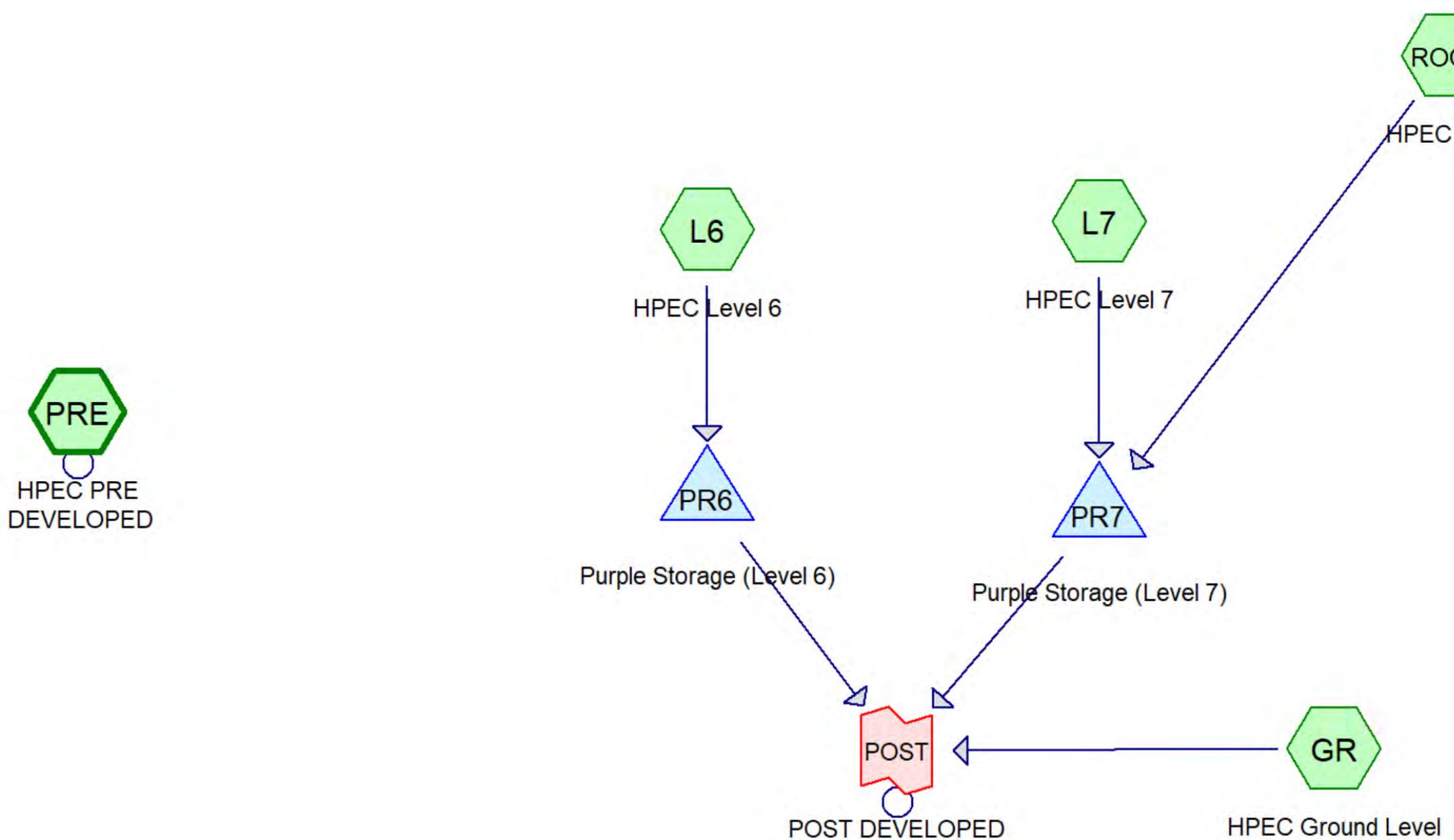
Construction Detail - stormwater leader from upper roof

### 03 PURPLE ROOF - TYPICAL DRAIN SECTION

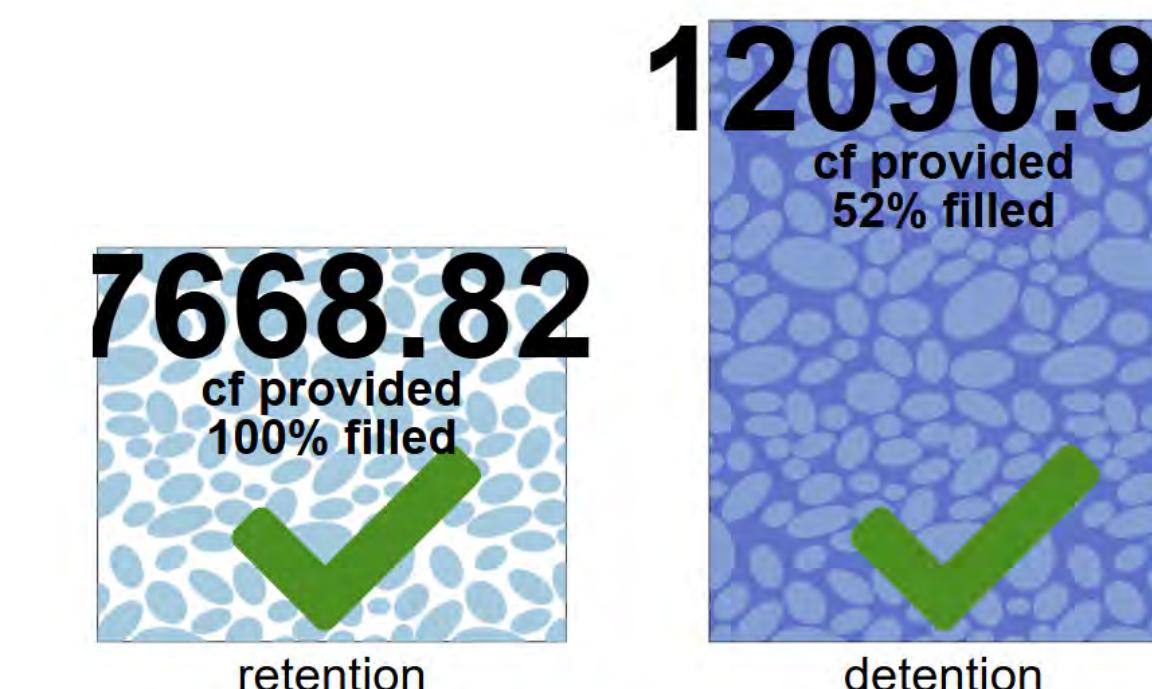
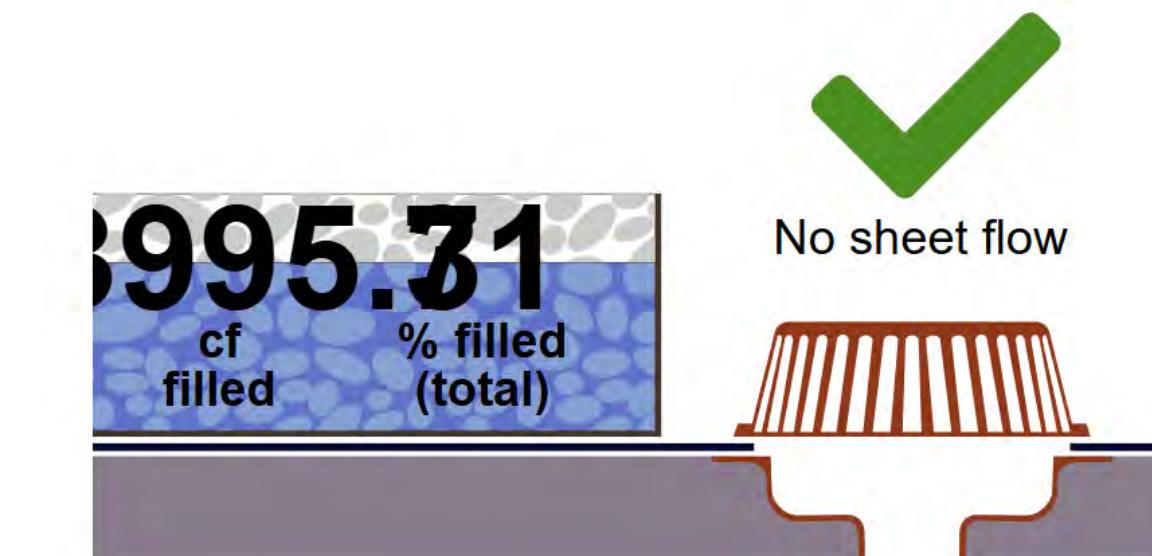
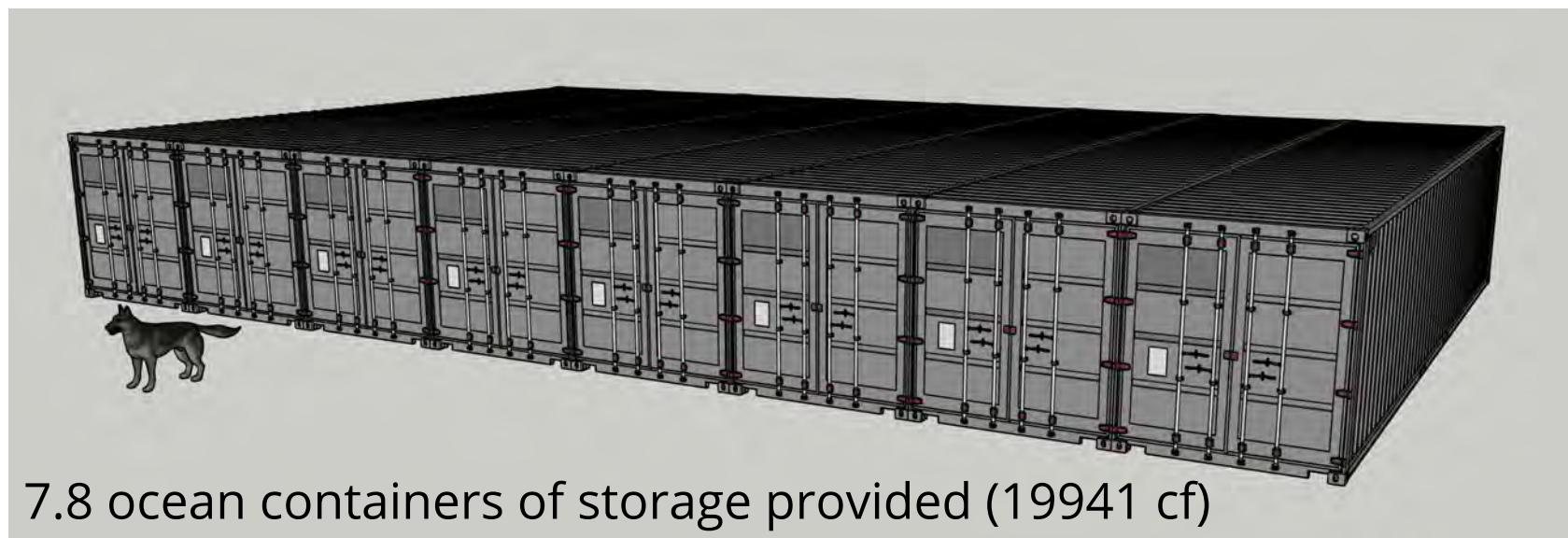
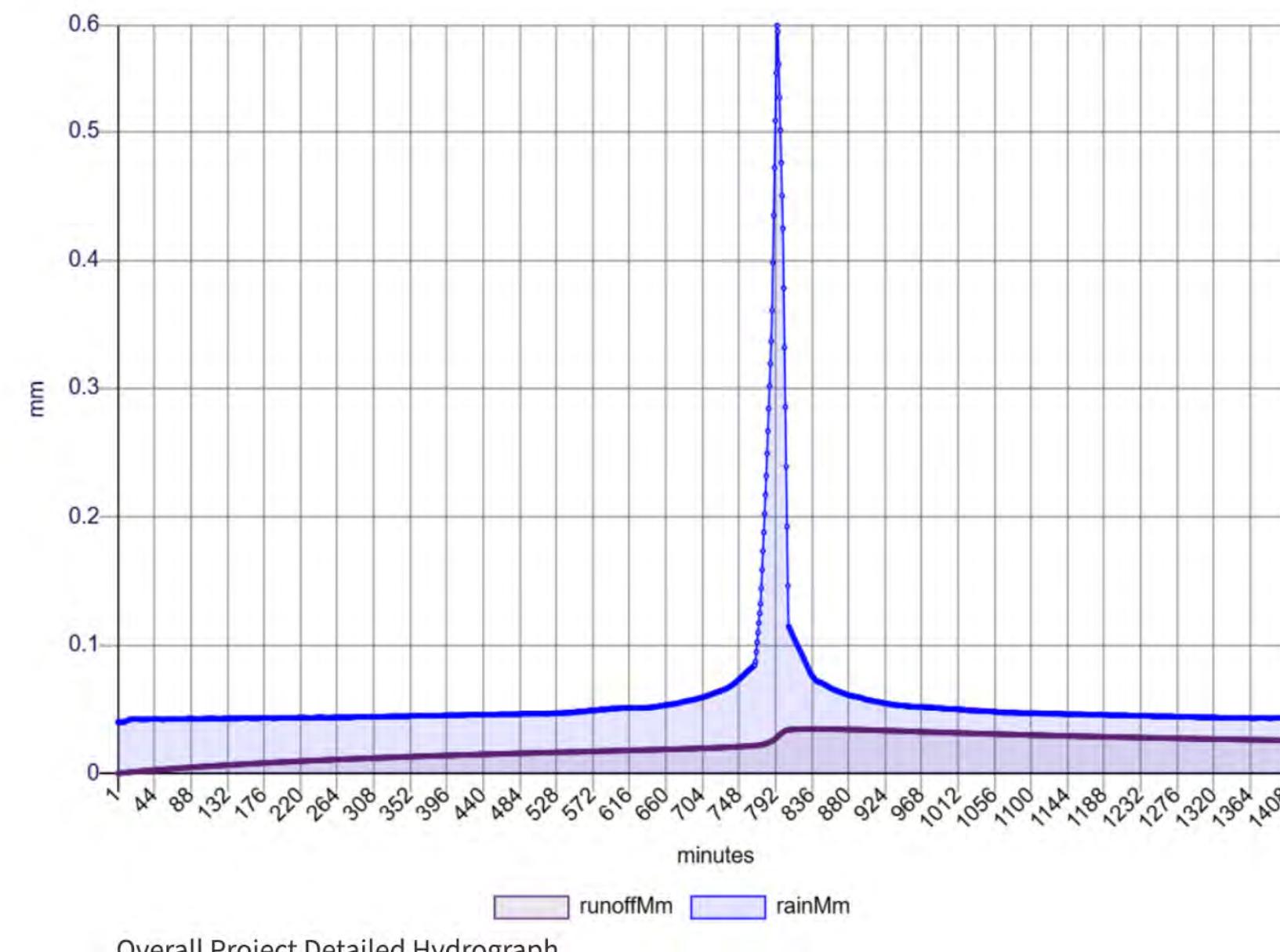
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## HydroCAD Calculations & Hydrographs

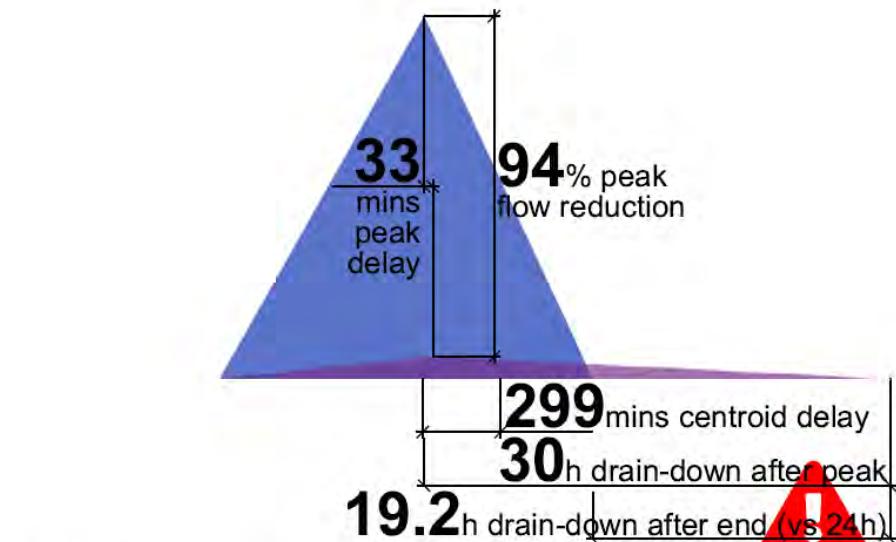


## Stormwater Metrics



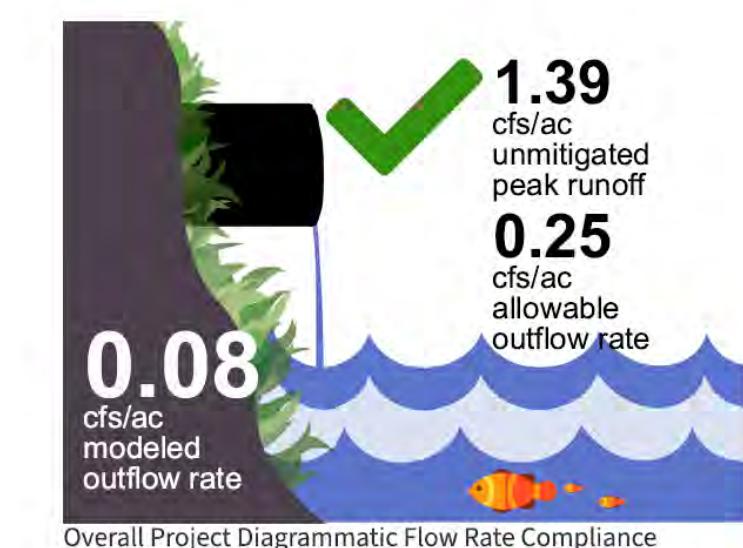
|                   | target cf | target in | modeled cf | modeled in | model / target % | % filled |
|-------------------|-----------|-----------|------------|------------|------------------|----------|
| retention storage | N/A       | N/A       | 7811       | 4          | N/A              | 100%     |
| detention storage | N/A       | N/A       | 12130      | 6          | N/A              | 52%      |
| combined storage  | N/A       | N/A       | 19941      | 10         | N/A              | 71%      |

Overall Project Storage Summary Table



| target minutes          | modeled total hours | modeled total minutes | complies |     |
|-------------------------|---------------------|-----------------------|----------|-----|
| runoff delay (centroid) | N/A                 | 5                     | 299      | YES |
| runoff delay (peak)     | N/A                 | 0.6                   | 33       | YES |
| drain-down after peak   | N/A                 | 30                    | 1798     | YES |
| drain down after end    | 24                  | 19.2                  | 1152     | YES |

Overall Project Delay Summary Table  
Design Storm: Type II distribution, 3.2 in total volume, 1440 minutes total duration

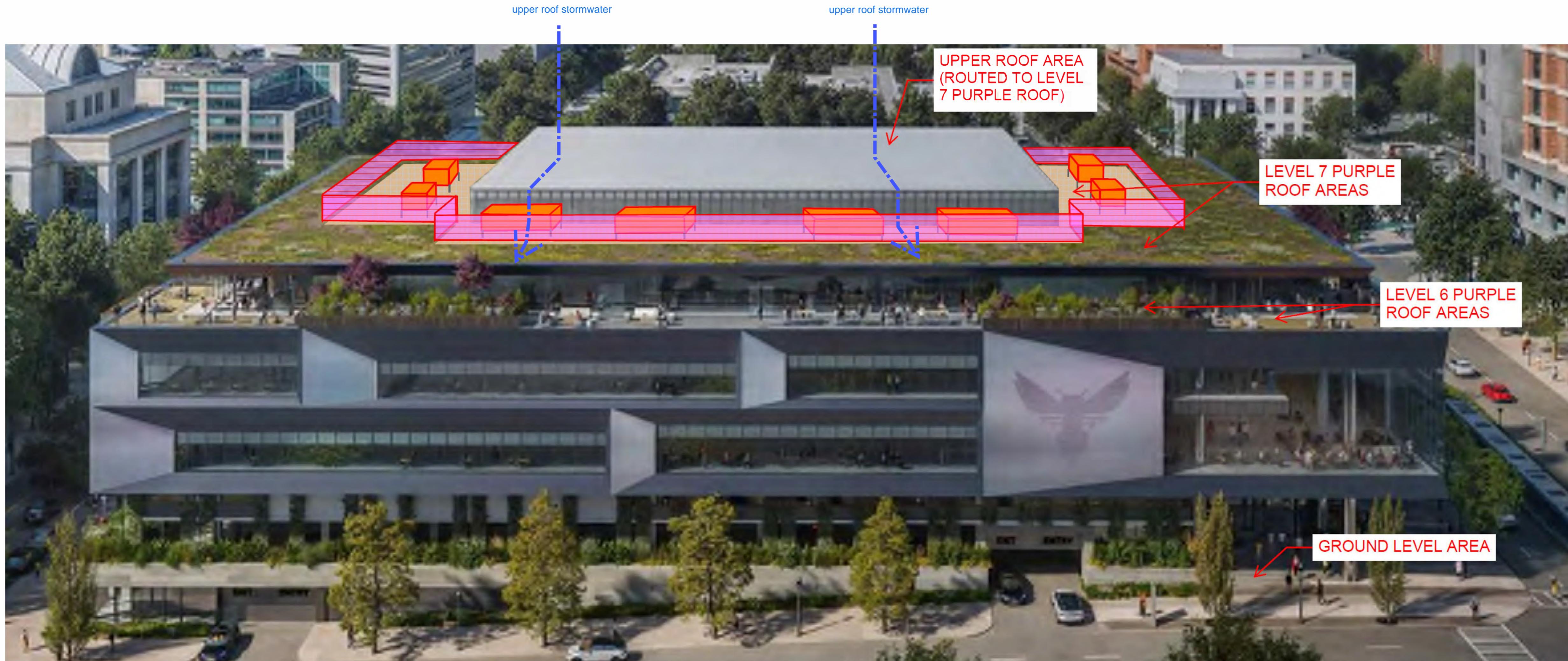


| target cfsAc       | modeled cfsAc | model / target % | % reduction |
|--------------------|---------------|------------------|-------------|
| unmitigated runoff | N/A           | 1.39             | N/A         |
| peak flow rate     | 0.25          | 0.08             | 33% 94%     |

Overall Project Flow Rate Summary Table  
Design Storm: Type II distribution, 3.2 in total volume, 1440 minutes total duration

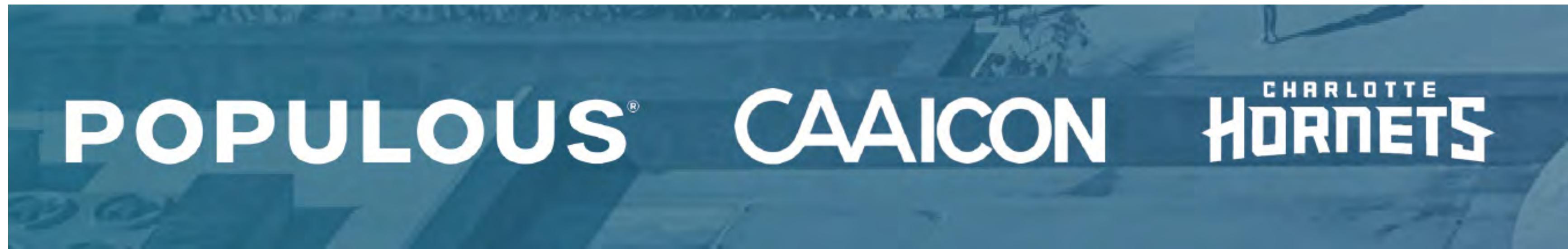
# Purple-Roof®

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USA





## PROJECT TEAM



### Civil Engineering

Land Design  
223 North Graham Street  
Charlotte, NC 28202  
704.333.0325

### Landscape Architecture

Populous Architects, P.C.  
4800 Main Street  
Kansas City, MO 64112  
816.221.1500

### Structural Engineering

Thornton Tomasetti  
120 Broadway, Floor 19  
New York, NY 10271  
917.661.7800



# Purple-Roof®

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USA

Traditional roof & tank



# Purple-Roof®

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USA

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