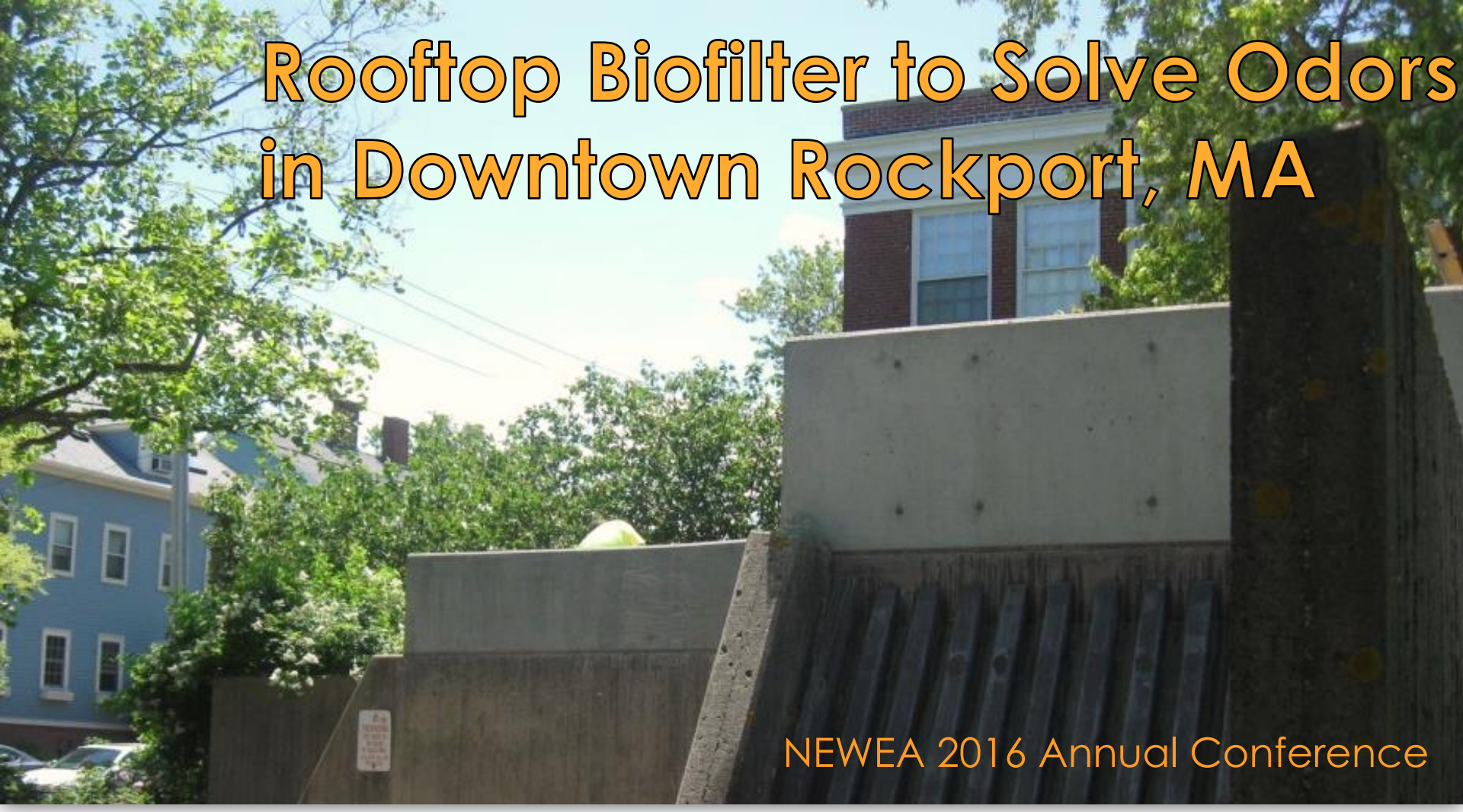
Rooftop Biofilter to Solve Odors in Downtown Rockport, MA



NEWEA 2016 Annual Conference

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2009 WWTP Aeration Biofilter Media Replacement

5,000 cfm

2012 Headworks Upgrade & Odor Control

900 cfm


Dock Square
Dock Square
Dock Square
Dock Square
Tuck's Candy Factory
Lula's Pantry
R3 Sons Fun Emporium
TBT Post
Mt Pleasant St
Nine Lives Cafe
Sugar Buff Bake Shop
Mt Pleasant St
Katie's Gift Shop
Stone Barn Ln
Stone Barn Ln
Stone Barn Ln
Sand Castle
Mt Pleasant St
T-Wharf
T-Wharf
Broadway
Mt Pleasant St
Flav's Red
N. Gallery
Dock Square
Pump Station

Presentation Overview

1 Project Considerations – Why the roof??

2 Project Approach

3 Structural and Architectural Aspects

4 Biofilter Design Components

5 The Outcome

6 Questions

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Project Considerations

- Dock Square Pump Station
- Located within
  - Downtown shopping center
  - Historic District
- Limited space available onsite
- Flooding issues at the Pump Station

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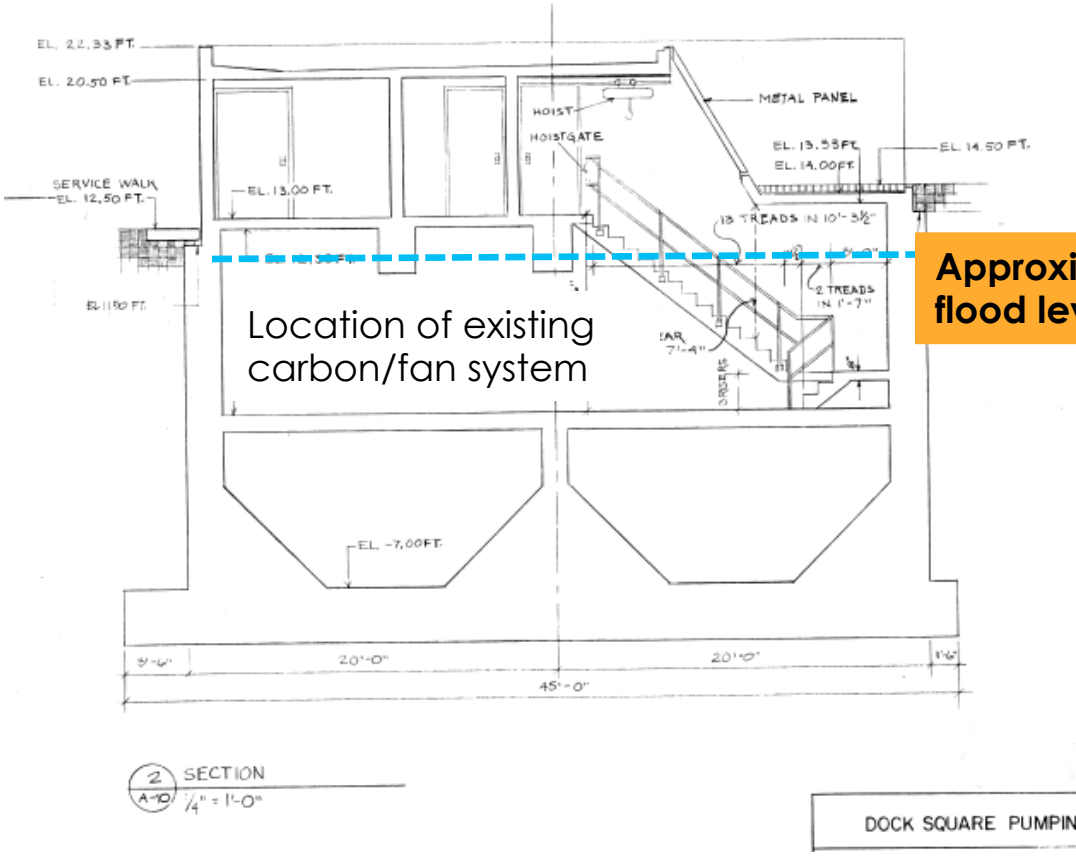
Existing Pump Station

- History of consistent flooding in the wet well room



Approximate flood level

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Why the Roof?

- Public Perception
  - Out of sight
- Avoid disruption of existing site/historical elements
- Existing pump station flooding

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Why a Biofilter?

- Low profile system
- Flexibility with design
- Technology that will work for this application
- Local media source available

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Project Approach

- Complete technical memorandum to evaluate applicability of putting a biofilter on the roof
- Obtain approval from Historical Commission
- Pending approval – move forward with design
- Goal of construction in 2014

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Historical Commission

Pump Station renderings to get buy-in on the proposed system

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Historical Commission

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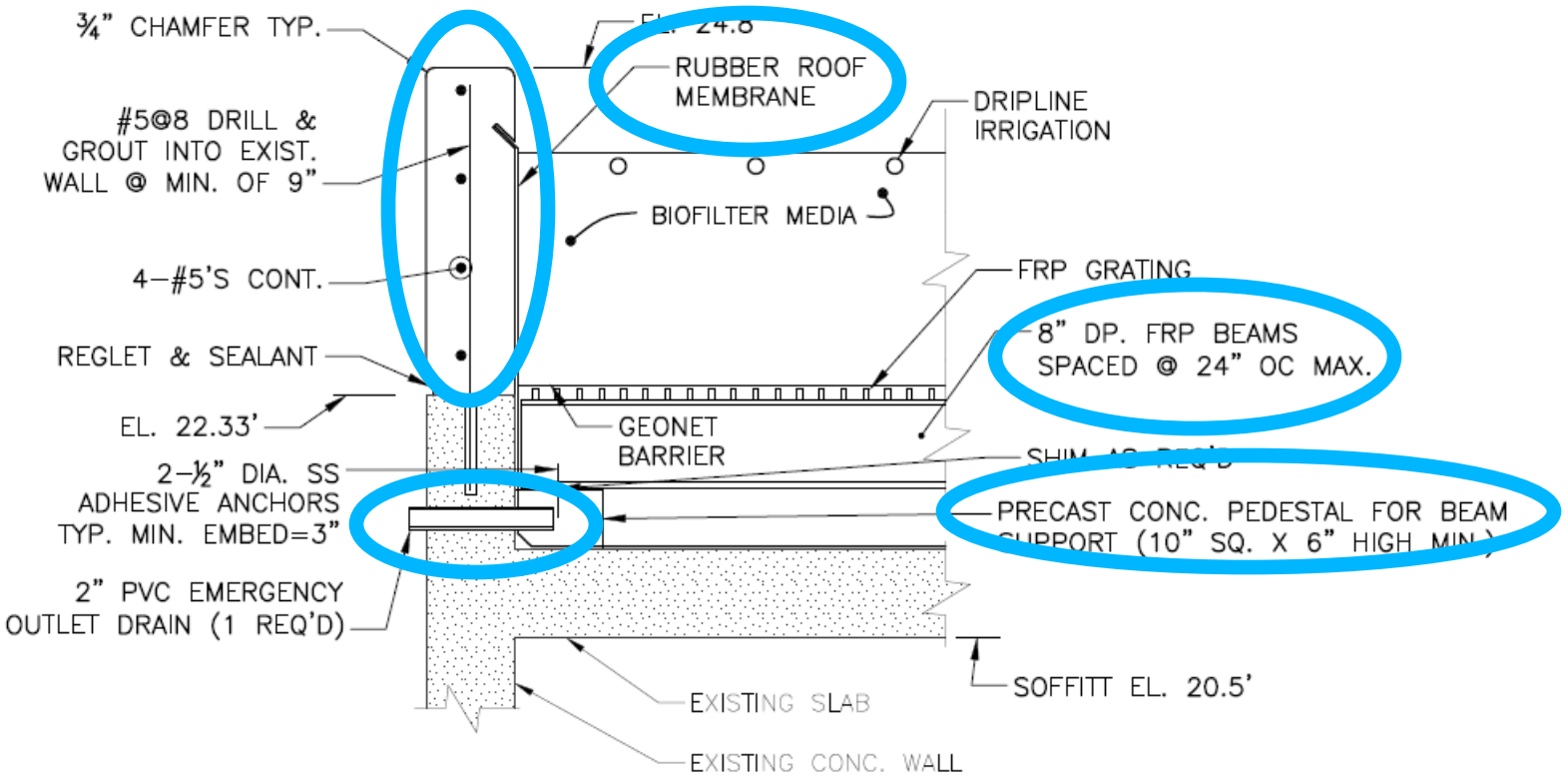
Structural/Architectural Aspects

- Distribution of load
- Parapet wall design
- Media support system
- Leak proof roofing system

Structural Aspects



1 S-101 TYP. EDGE CONDITION

SCALE: 3/4" = 1'-0"

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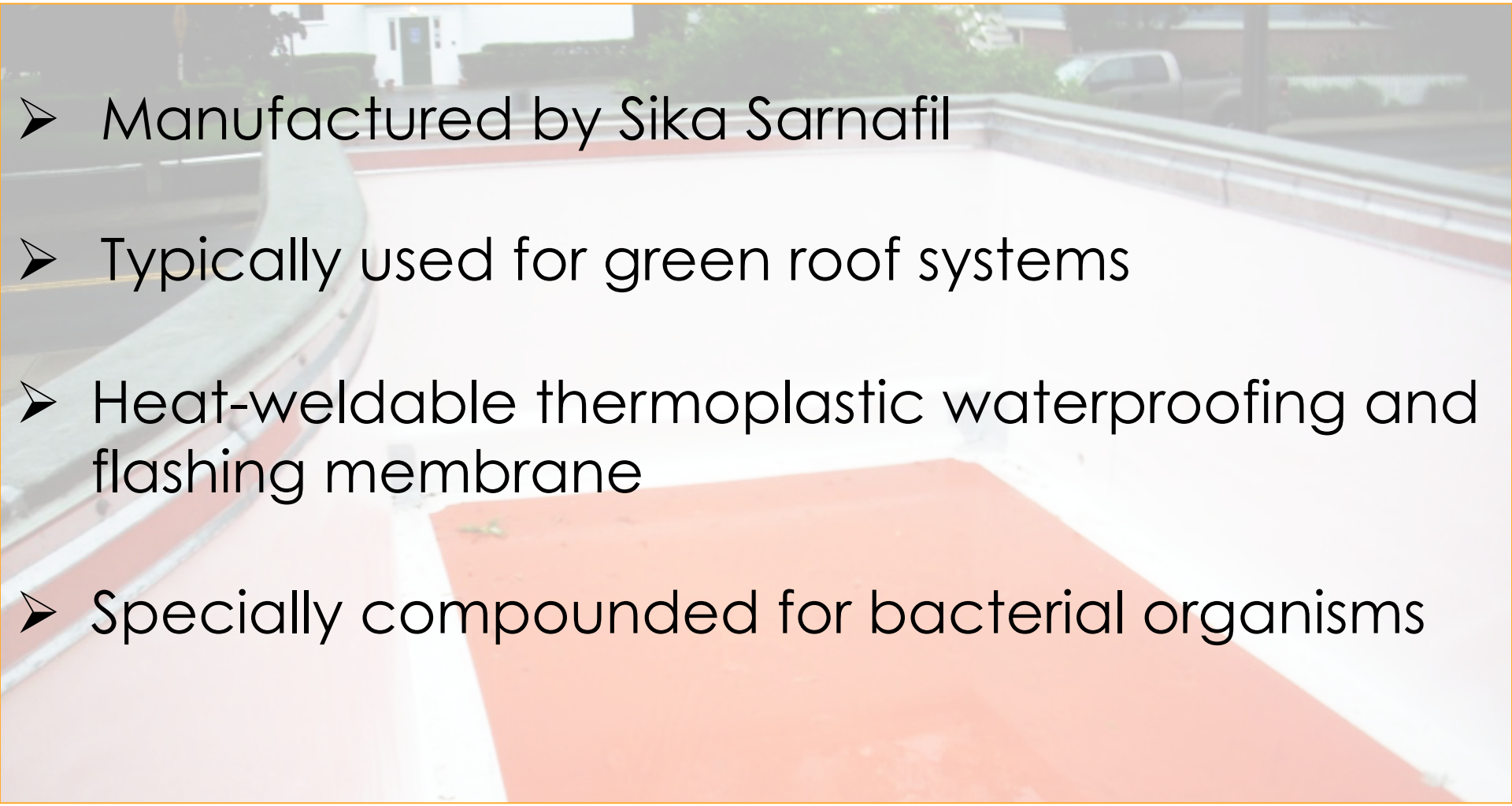
Parapet Wall

Roof Membrane System



- Manufactured by Sika Sarnafil
- Typically used for green roof systems
- Heat-weldable thermoplastic waterproofing and flashing membrane
- Specially compounded for bacterial organisms

Biofilter Design Components

- FRP Fan
- Media support system
- Air plenum
- Geonet filter barrier
- Dripline Irrigation

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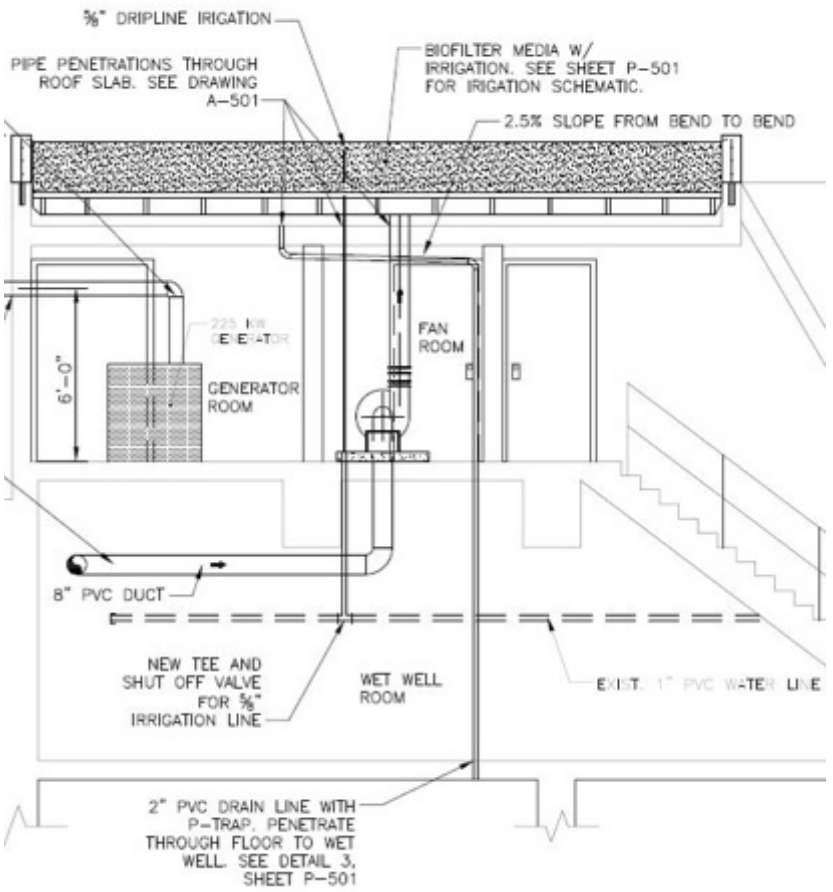
Biofilter Design Components



FRP Fan:
Ventilate air from Wet well (below) at 6 ACH

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Biofilter Design Components

Media Support System: FRP Beams & FRP Grating

Tri-Planar Geonet Media Barrier

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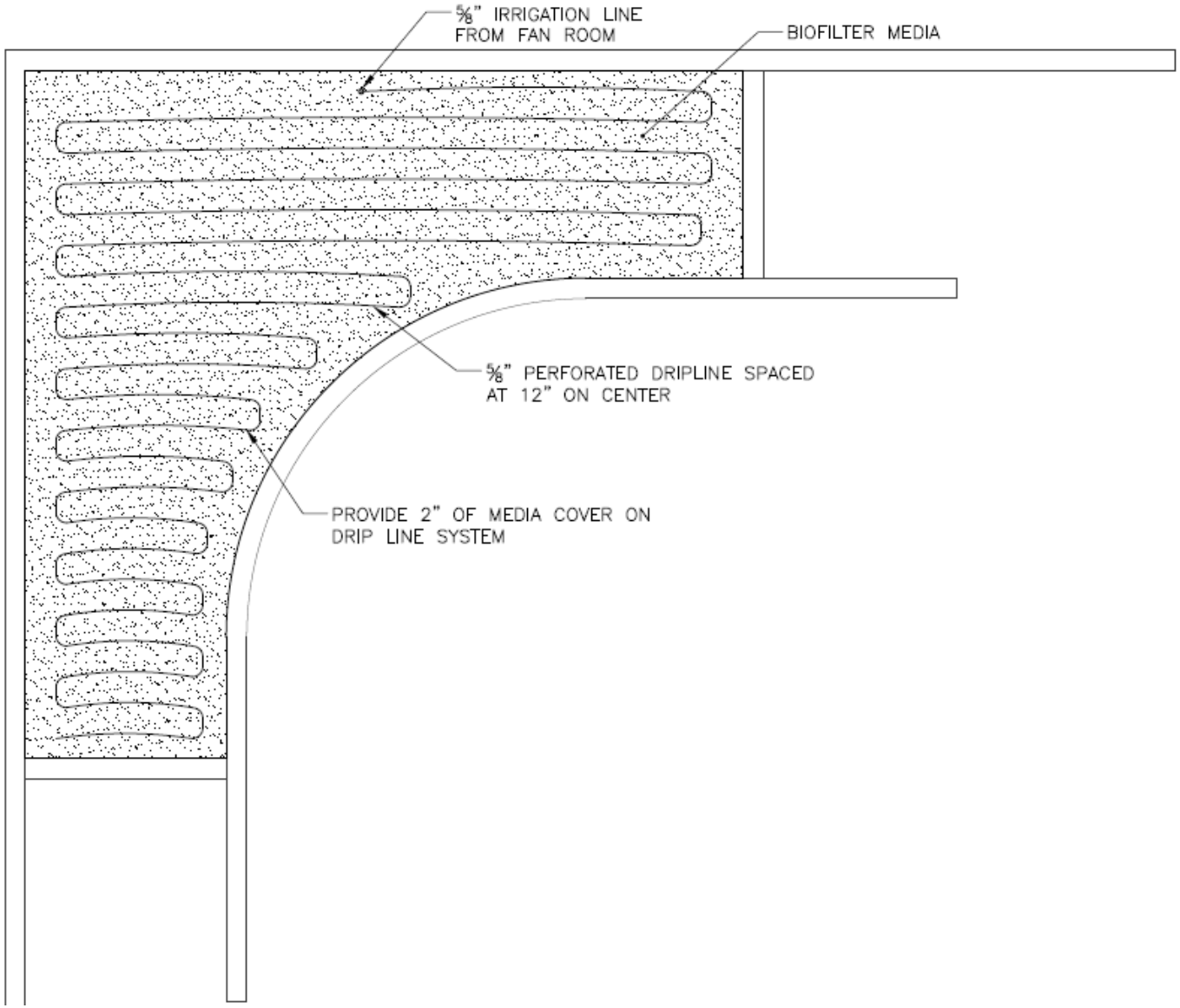
Biofilter Irrigation



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The result – a rooftop biofilter

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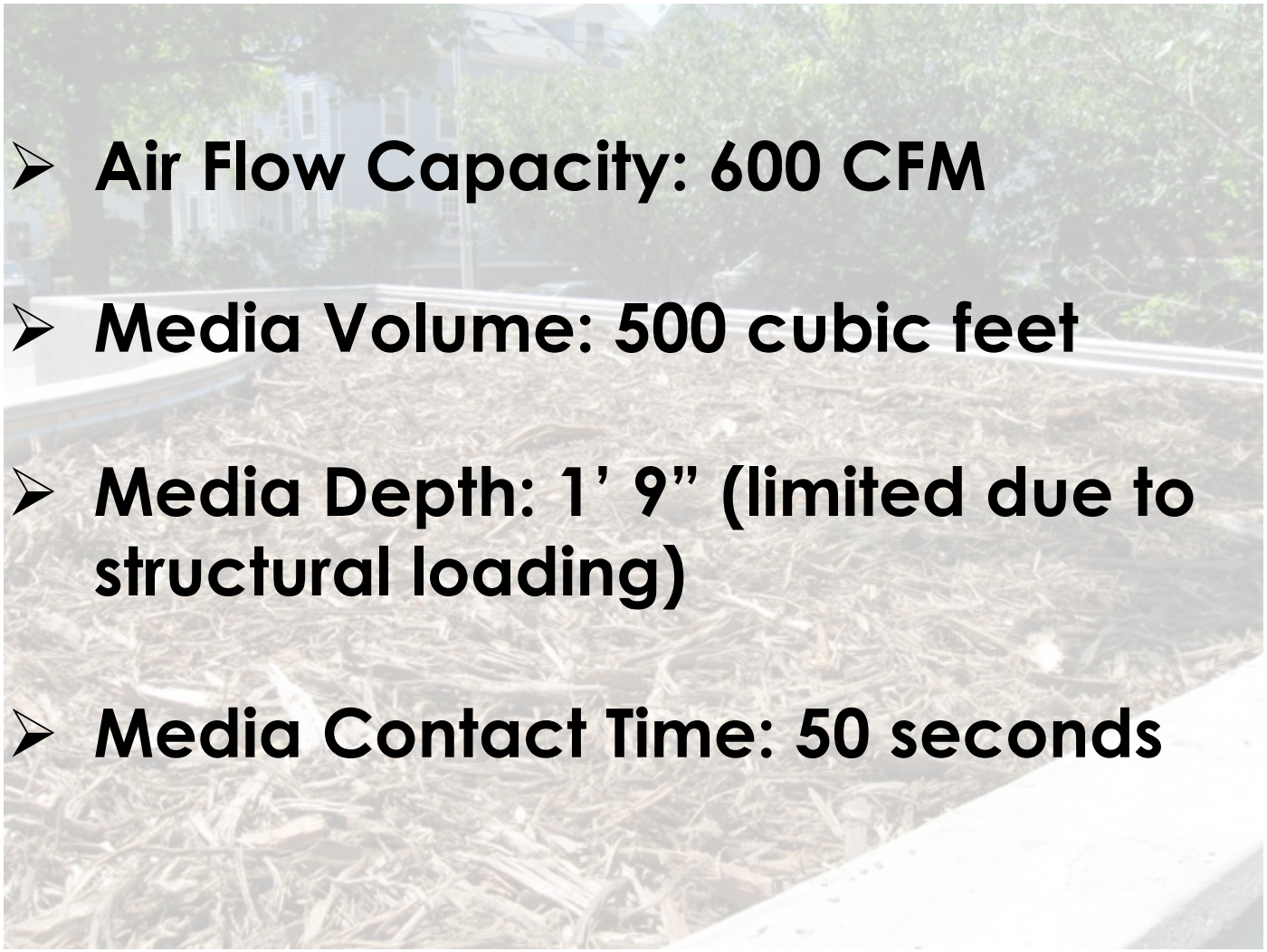
The result – a rooftop biofilter



- Air Flow Capacity: 600 CFM
- Media Volume: 500 cubic feet
- Media Depth: 1’ 9” (limited due to structural loading)
- Media Contact Time: 50 seconds

The result – a rooftop biofilter

- Engineers estimate: $255,000
- Awarded Construction Cost: $215,000
- No Change Orders
- System Startup – August/September 2014

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Questions?

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