

3<sup>rd</sup> Annual  
Delaware County  
Sustainability Conference

## Creating Circularity for Recycled Glass in the Delaware Valley

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HIGHLY FRICTIONAL • NON-LEACHING • ROT-RESISTANT • NON-FLAMMABLE • DURABLE • SAFE

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made in the USA from recycled container glass





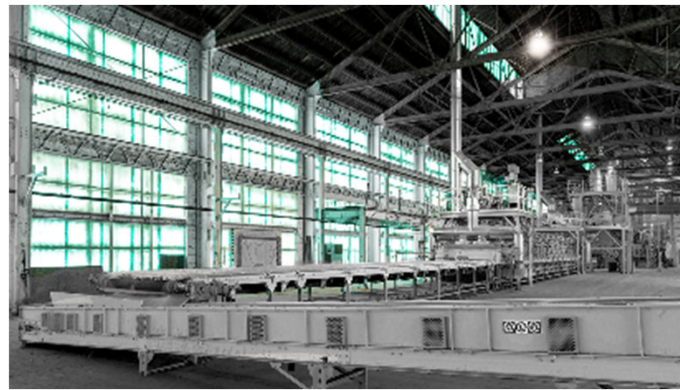


**Made From  
100% Recycled  
Curbside Glass**





# Manufacturing









# UL-FGA<sup>®</sup>



**Ultra-Lightweight**

(15.0 pcf)

**Good Insulator**

**High Friction  
Angle** (54°)

**Seismic Designs**

**Frost Resistant**

**Capillary Break**

**Free-Draining**

**Load-Bearing**

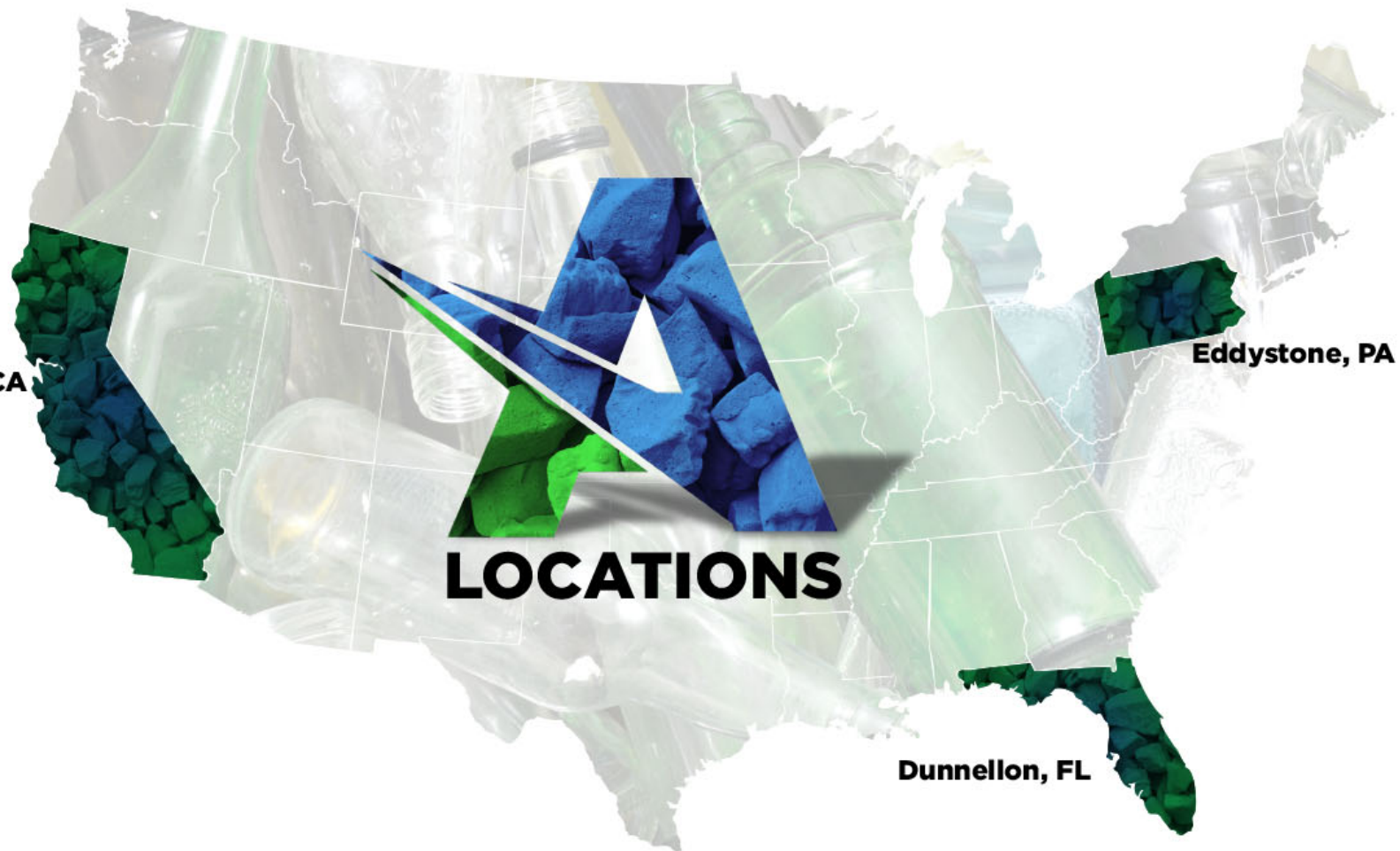


**Modesto, CA**

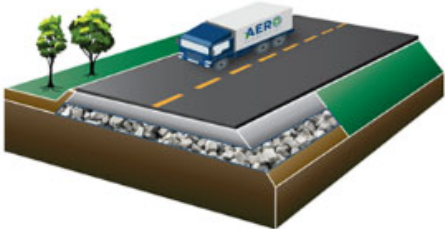
**Eddystone, PA**

# **LOCATIONS**

**Dunnellon, FL**



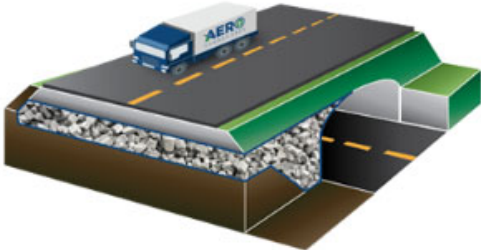
# INFRASTRUCTURE



**Embankments**



**Retaining Walls & Bridge Abutments**

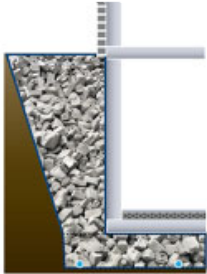


**Tunnels & Culverts**

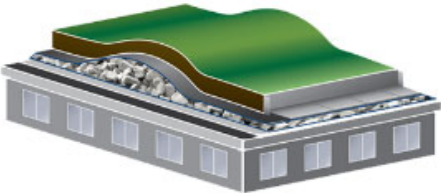


**Utilities**

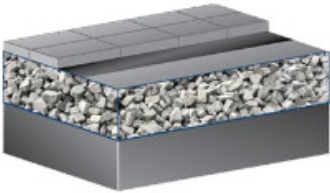
# COMMERCIAL AND RESIDENTIAL CONSTRUCTION



**Foundation Walls & Slabs**



**Greenroofs**



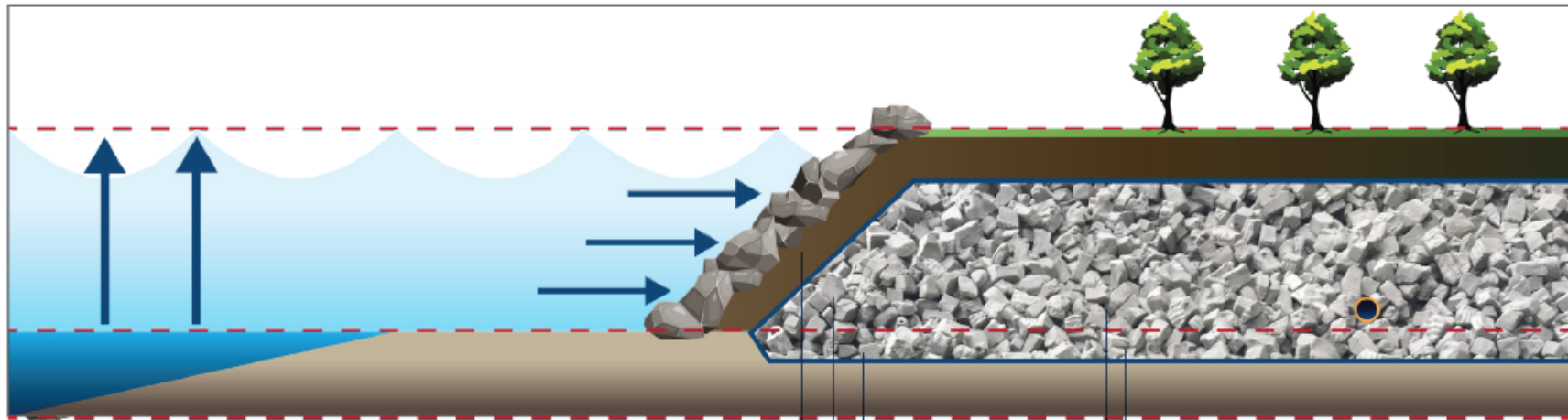
**Plaza Decks**





# Sea Levels & Severe Weather

# Application Areas - Resiliency



## UL-FGA BENEFITS

- Quick & easy to install
- Ultra-lightweight
- Frost proof
- Stability
- Excellent drainage properties
- Not weather sensitive

## STABILITY

Designs up to 45° without additional reinforcement

## ULTRA-LIGHTWEIGHT

80% lighter than gravel.  
No foundation required

## LOAD CARRYING CAPACITY

Can be used for all load classes

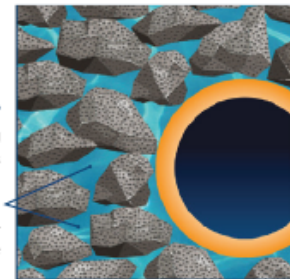


## RODENT RESISTANT

Resists burrowing animals and insects

## STORMWATER STORAGE

40% void space for additional stormwater storage and promotes infiltration











Ultra-lightweight Foamed Glass Aggregate

# I-95 EMERGENCY REPAIR

Philadelphia, PA

Made in USA from 99% Recycled Container Glass





Sunday, June 11<sup>th</sup>, 2023



Section of overpass  
that collapsed

Southbound I-95

Northbound I-95

# I-95 Emergency Repair

Philadelphia, PA



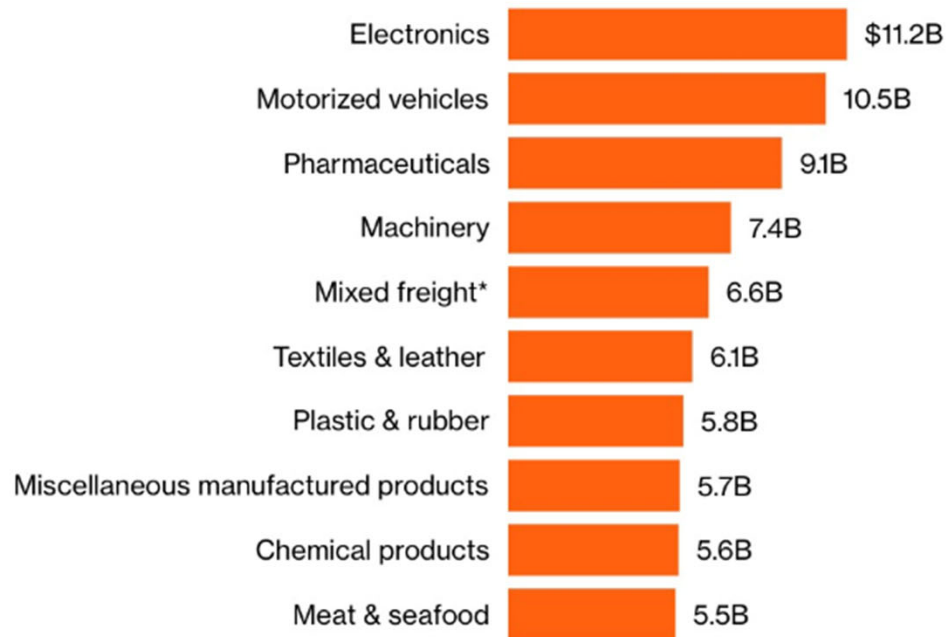
# I-95 Emergency Repair

Philadelphia, PA



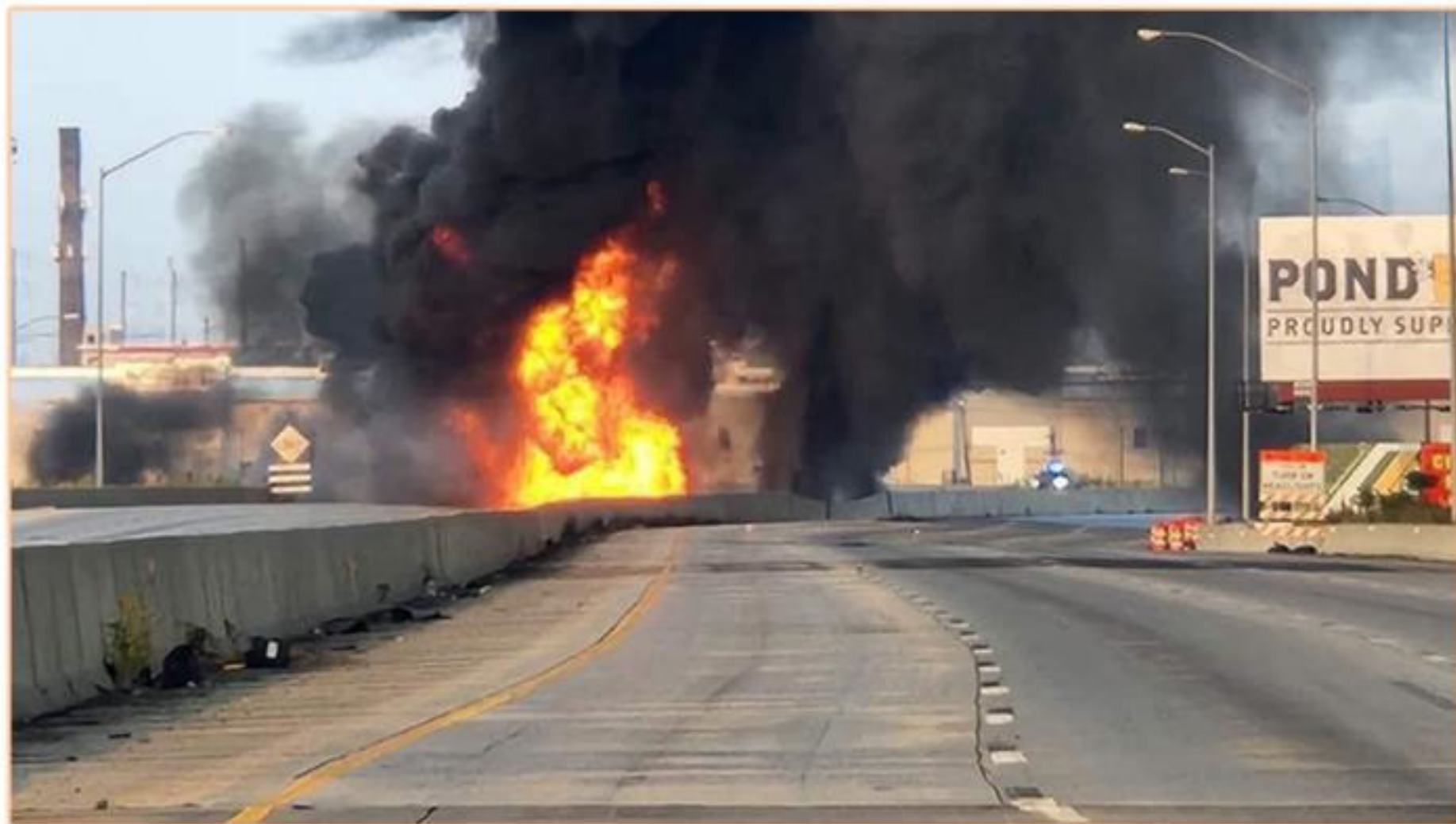
## I-95 Carries Freight Through Northeast US

In 2021, trucks carried 21 million tons of freight worth \$104 billion through the Philadelphia region, largely over I-95. The top categories:



Source: Bureau of Transportation Statistics

Note: Mixed freight includes office supplies, hardware, restaurant supplies, etc.





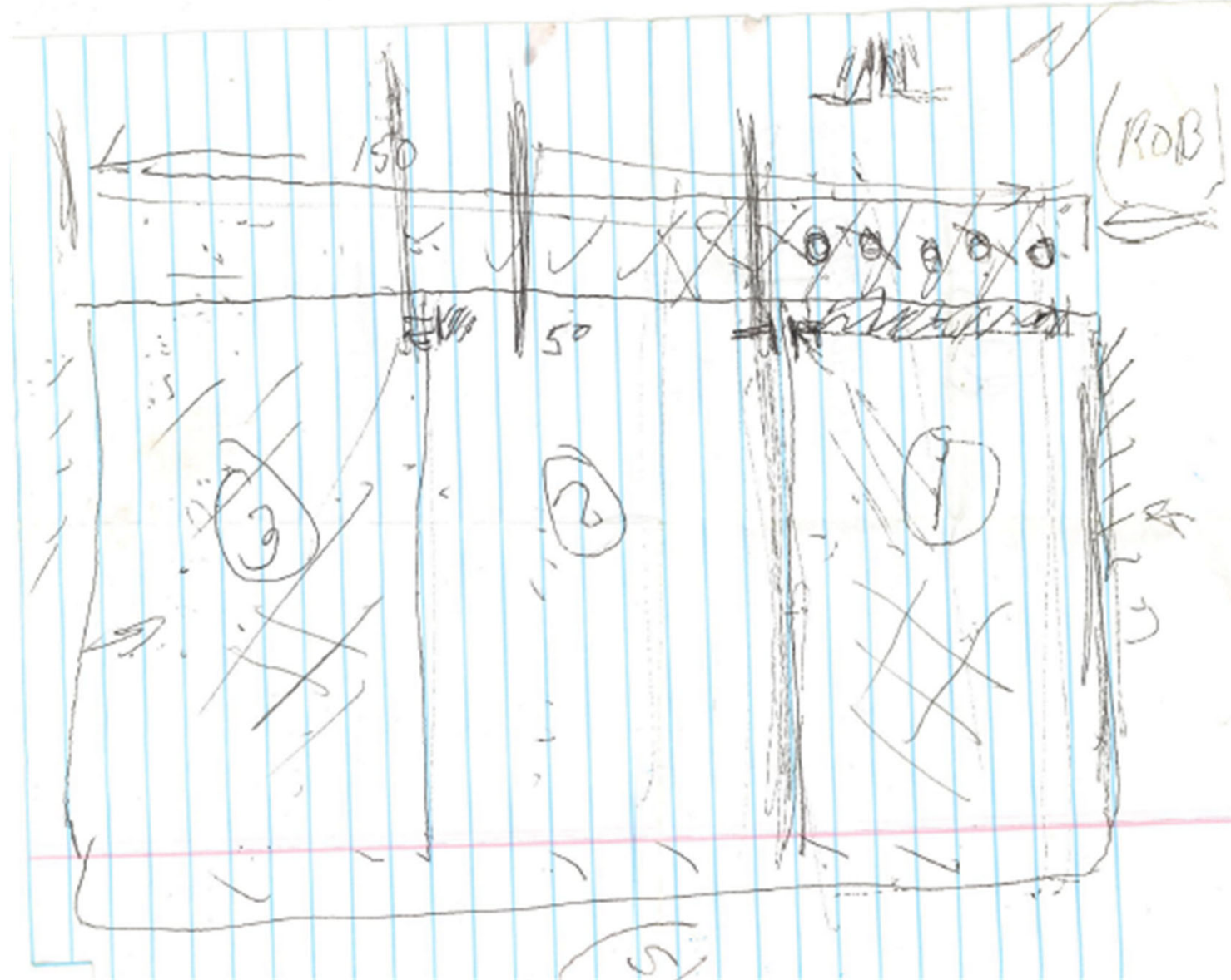


# **I-95 Emergency Repair**

Philadelphia, PA

# The Plan

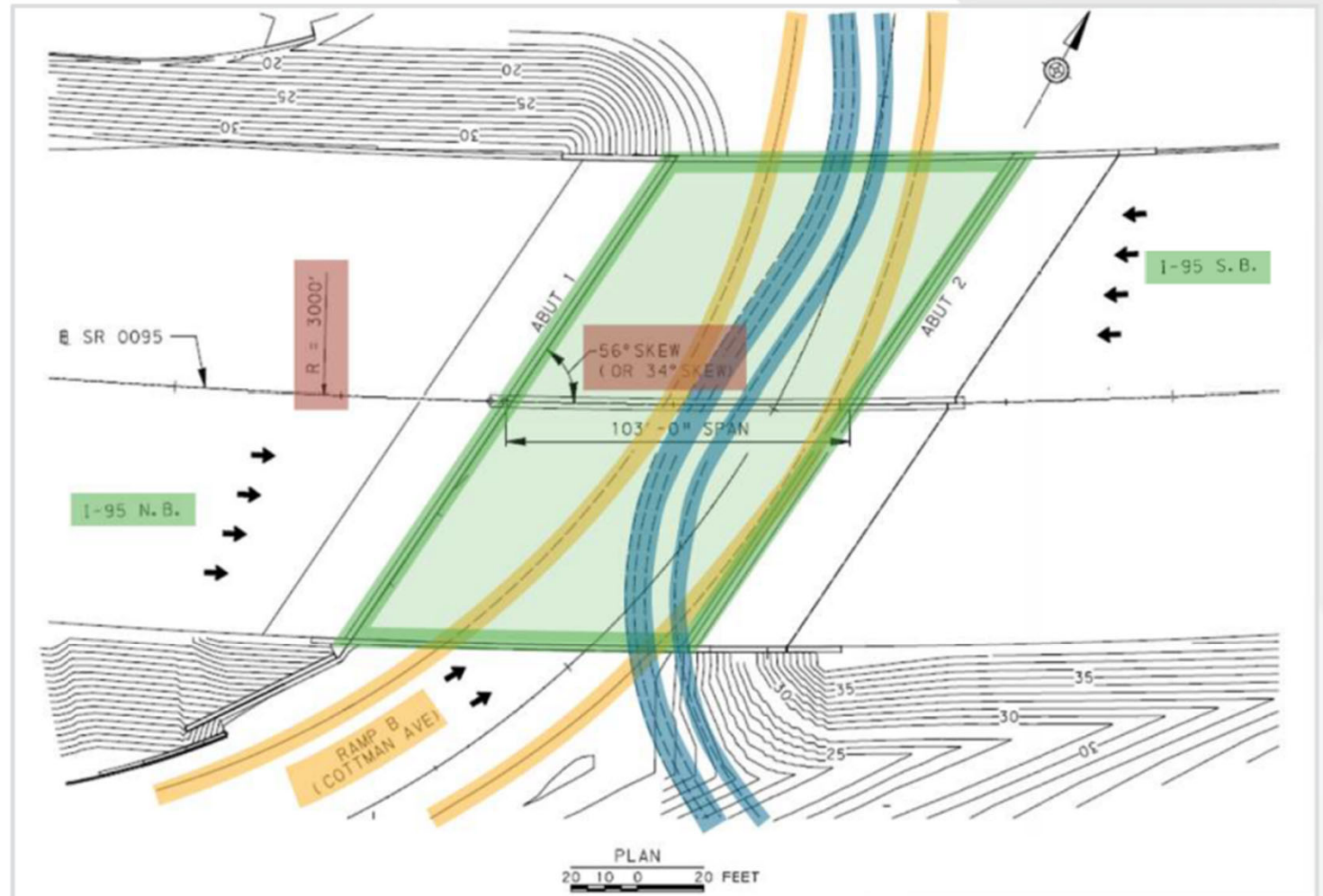
- Rob Buckley of Buckley & CO. Presented to PADOT Secretary Mike Carroll & Harold Windisch (District Engineer for PADOT)
- Illustrates the basic idea of backfilling the center section of I-95
- Drawing is prepared not to scale (NTS)





# Existing Bridge

- 8 Steel Plate Girders
- Concrete Deck
- 103' Span
- 56° skew (34° skew)
- 3000' Radius
- Superelevated
- Bifurcated median barrier
- 74' - 7 ¾" width













## 6/12/23 Monday

- 12:00 PM Governor Shapiro signed a Proclamation of Disaster Emergency
- 6:45 PM the Shapiro Administration, PennDOT & City Officials provided an update
- The Governor stated that the temporary rebuild would take approximately 3 MONTHS to complete







“Highest priority infrastructure project in the US”

# Wednesday 6/14 Press Conference - On-site



- Governor announces repair will take 3 months
- Will use “new” innovative material – Foam Glass Aggregate manufactured in Delaware County





## **Aero Aggregates Briefing**



# **First PADOT Project**

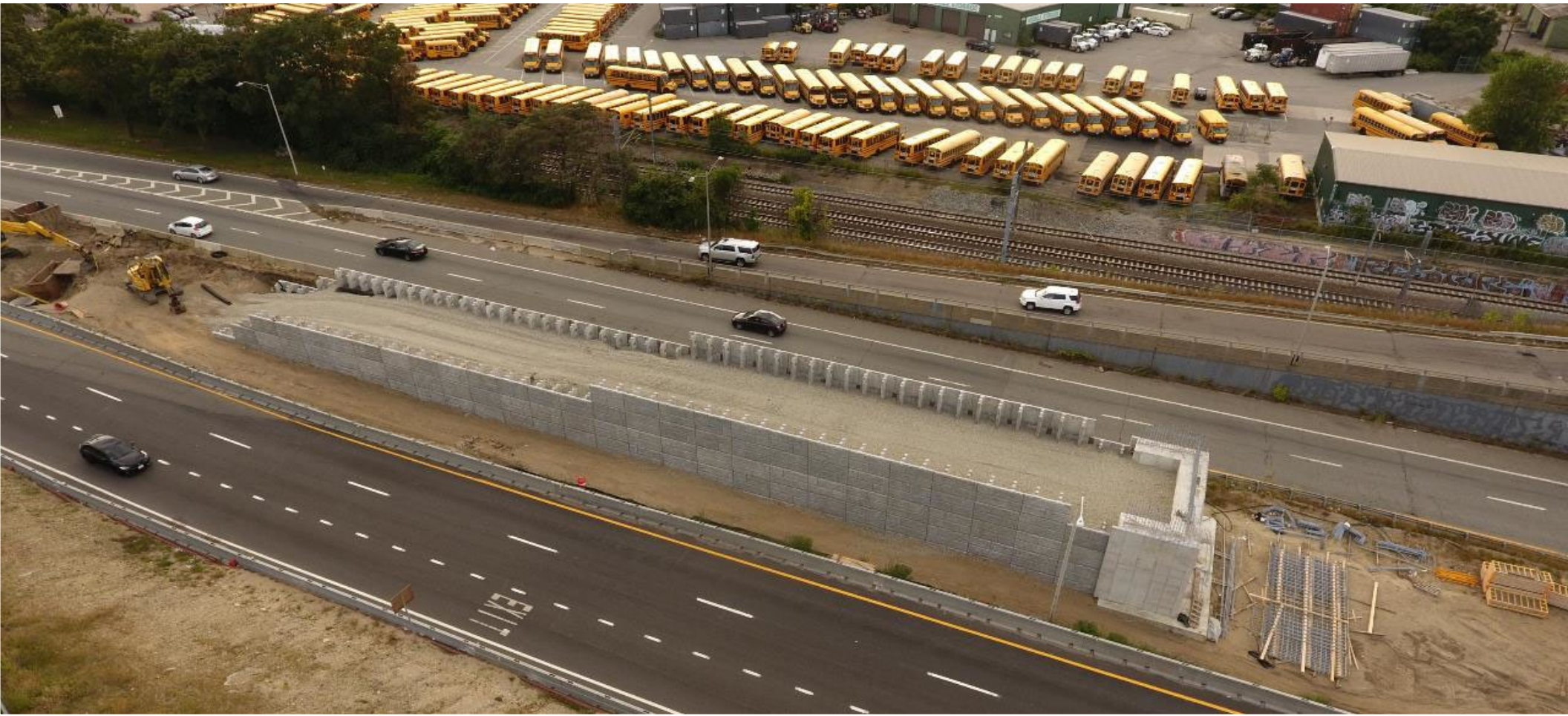
2017 Cottman Avenue





# **I-95 Girard Avenue Ramp**

JJ Anderson - Philadelphia, PA



# **Route 6/10 Interchange Reconstruction**

Providence, RI



**Accelerated  
Construction:  
Delivered up to  
3,200 cy/day**



# **PHL – RON Apron**



PADOT  
Chestnut Street  
Buckley & Co.





# Hilton Garden Inn Camden, NJ



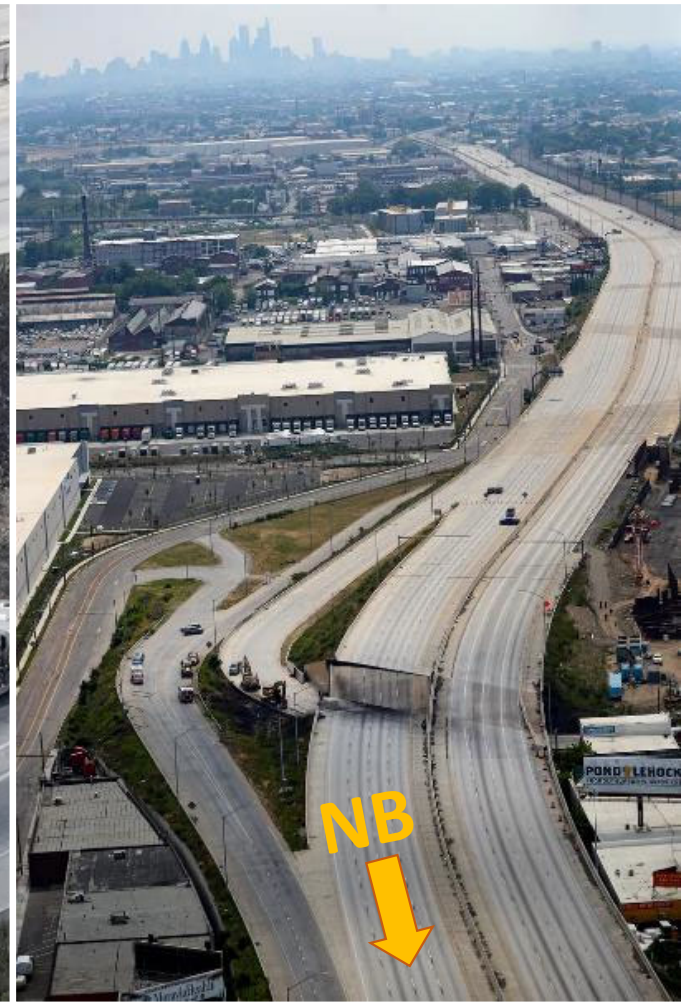
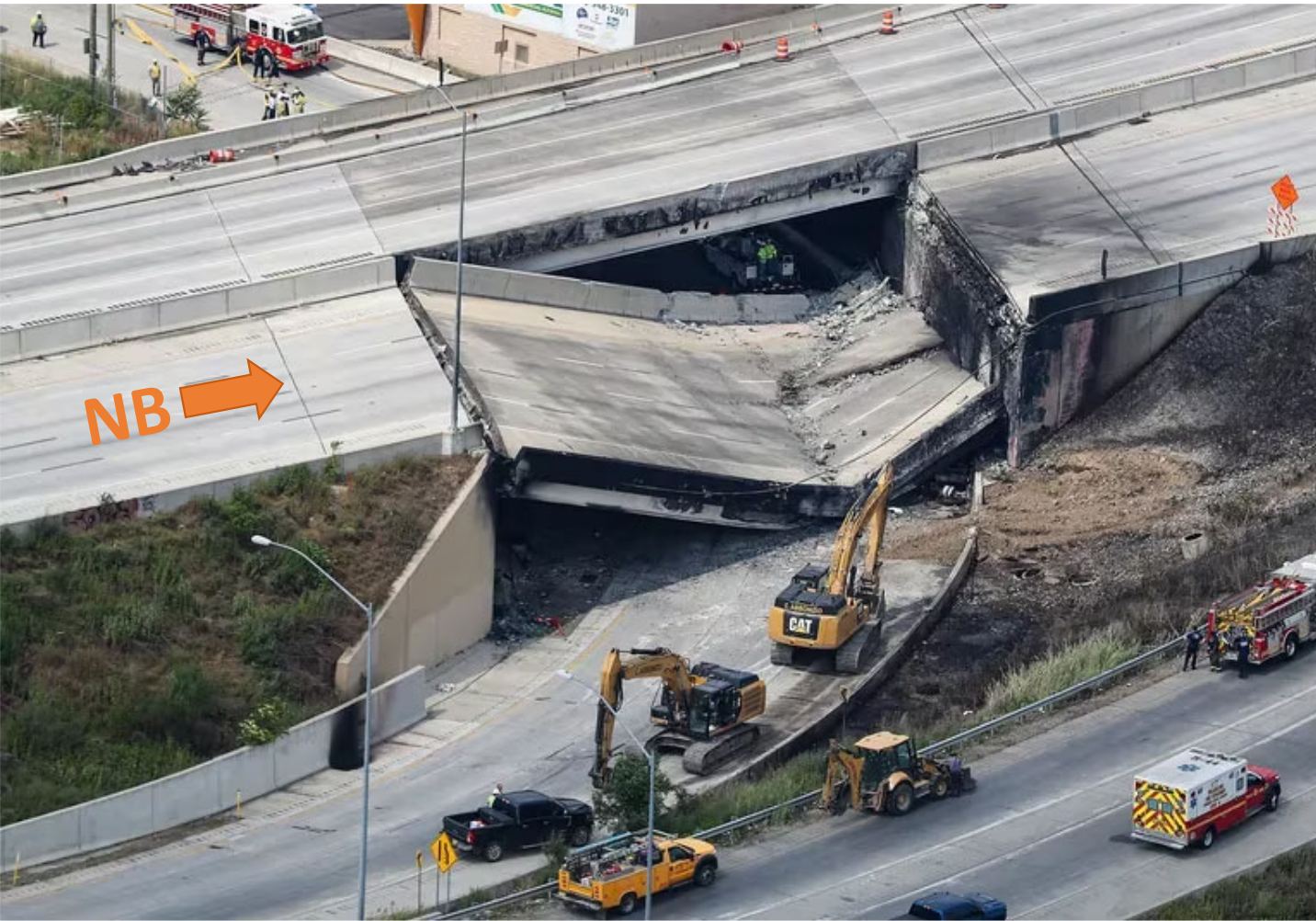
**Foundation Walls  
& Slabs**



# Philadelphia City Hall – Starbucks Kiosk







# Post-Collapse/ Pre-Demo

Philadelphia, PA





# **I-95 Emergency Repair**

Philadelphia, PA





# **Solution for Rapid Repair**

Philadelphia, PA





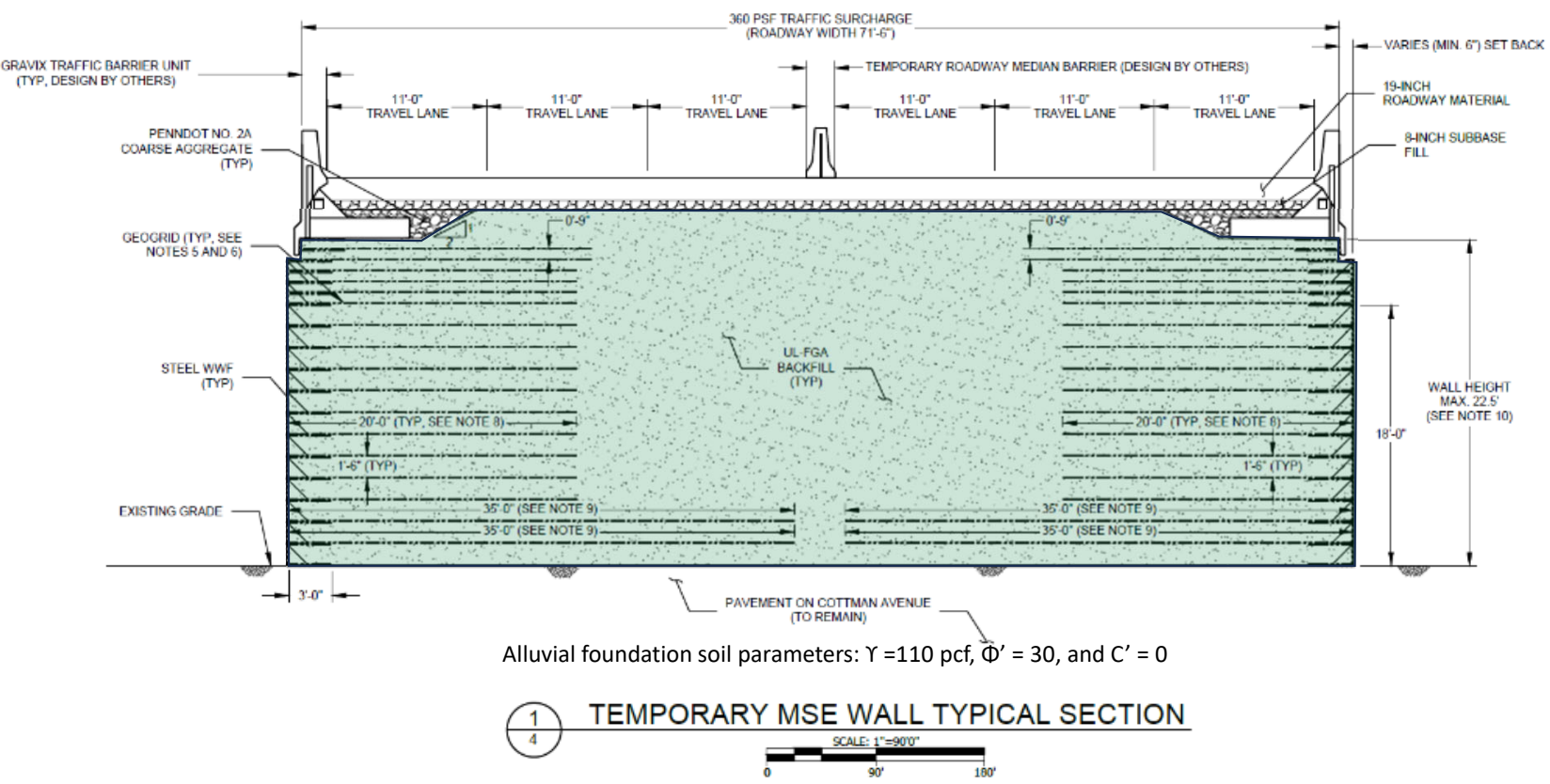
# **Solution for Rapid Repair**

Philadelphia, PA





June 15<sup>th</sup> 4 days after collapse



- ✓ Protects the 86" dia. Sewer Main
- ✓ Fast Delivery and Construction
- ✓ No Weather Delays
- ✓ Permeable/Minimize Stormwater Issues

# I-95 Emergency Repair

## Philadelphia, PA



# Terminal 1 JFK Airport















Aero Delivered 8,000 CY

88 walking floor trucks  
VS  
600 triaxial trucks





# High Strength Geogrid Placement









# **Geogrid Placement and Overlap**

Philadelphia, PA







# NBC Sports ARENA



C\_De\_portable\_1 N MLInor St on ramp

## ROAD CLOSURE

DETOUR TO XFINITY LIVE! FOR AN I-95 LIVE STREAM WATCH PARTY SATURDAY & SUNDAY

ALL DAY SPECIALS: \$95 CENT WINGS  
\$2.95 BUD LIGHTS & MICHELON ULTRAS

xfinityLive!







# Compaction

Skid Steer



**First lifts of MSE Wall**





## FOAM GLASS PLACEMENT

- Started on Friday the 15th
- Near vertical face
- Setback was thickness of WWB



**I-95 Prior to subbase and paving**





**Gravix Barrier**  
Parapet Barrier with a moment slab



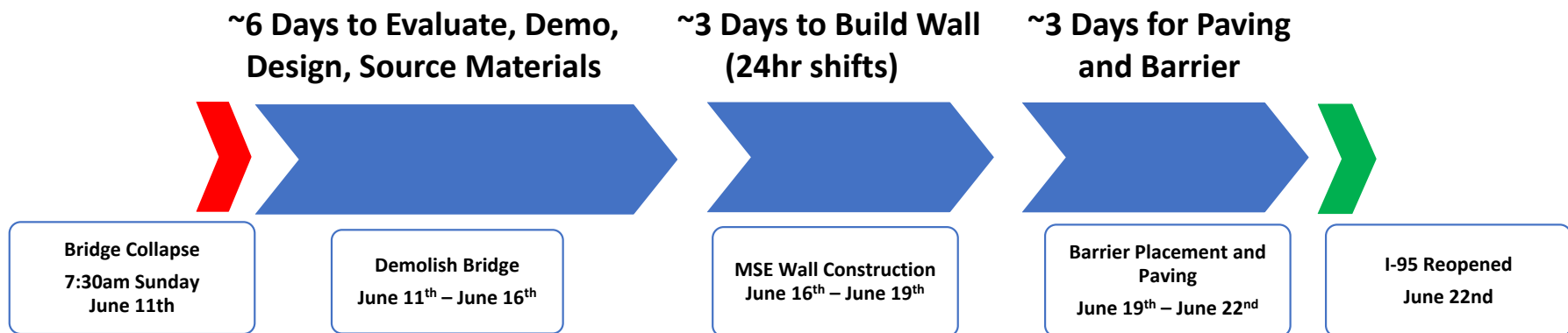




# From Rendering to Reality



# Timeline



**I-95 Re-opened on 12<sup>th</sup> day Post-Collapse**





# **I-95 Emergency Repair**

Philadelphia, PA



# **I-95 Emergency Repair**

Philadelphia, PA





**BUCKLEY & COMPANY INC.**  
Philadelphia, PA  
REBUILDING PHILADELPHIA  
EMERGENCY JOB

**AER**  
CONSTRUCTION

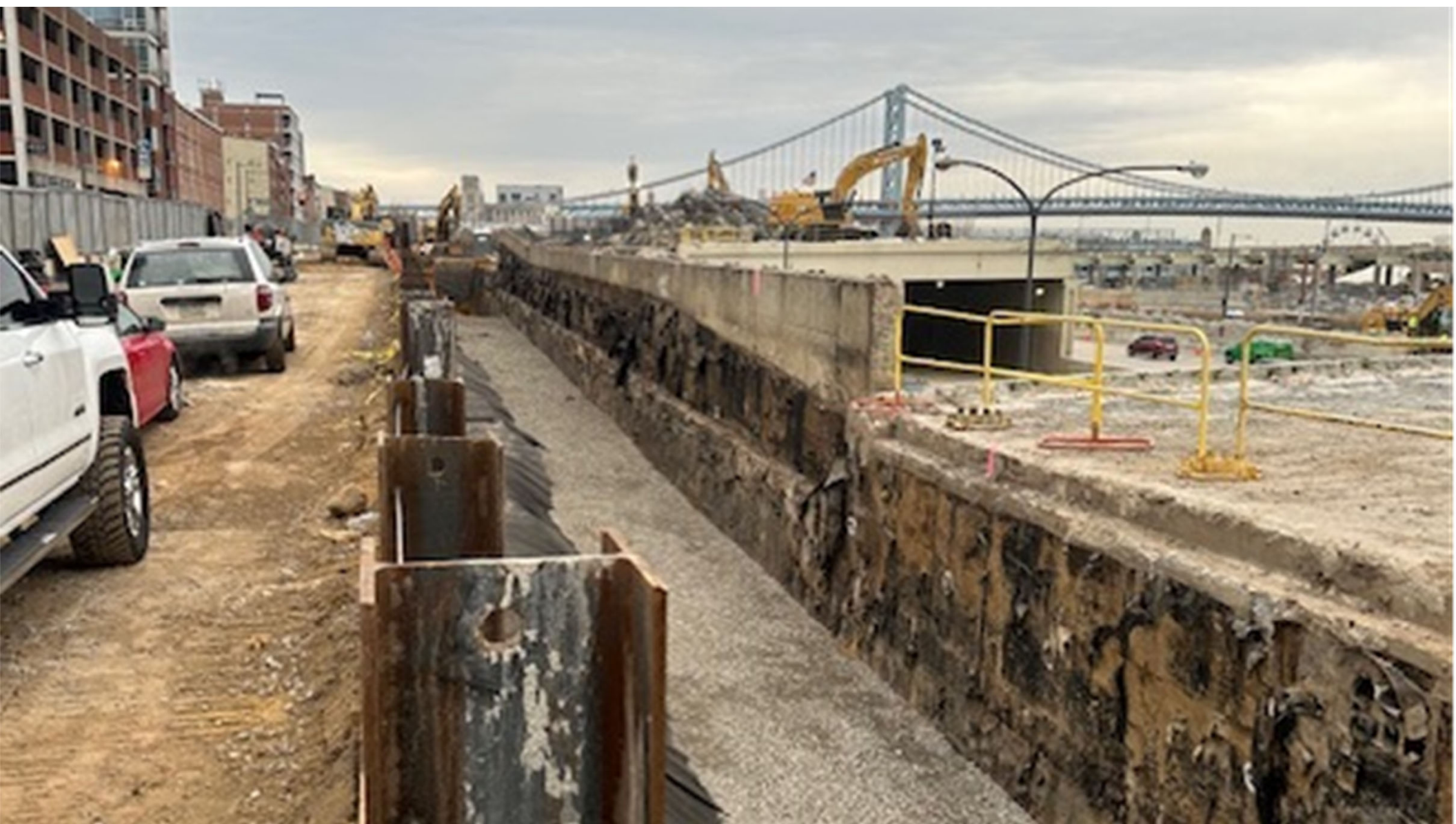






Reuse of FGA on PADOT CAP Project









Courtesy of Schnabel Engineering/Elevated Angles



**AERO HAS DIVERTED THE EQUIVALENT OF  
MORE THAN 500 MILLION 12 OZ BOTTLES  
FROM LANDFILL**

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**IF PLACED END-TO-END, THE BOTTLES WOULD  
WRAP 3 TIMES AROUND THE EARTH**







**THANK YOU**

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