

**GREEN INFRASTRUCTURE AND INNOVATIVE APPROACHES  
FOR  
ALTERNATIVE STORMWATER MANAGEMENT**

**Monday, May 8, 2026**

**Location:  
online**

## SPEAKER

**Richard Tornese, P.E.**

**Director**

**Broward County Highway Construction & Engineering Division**

### EXPERIENCE

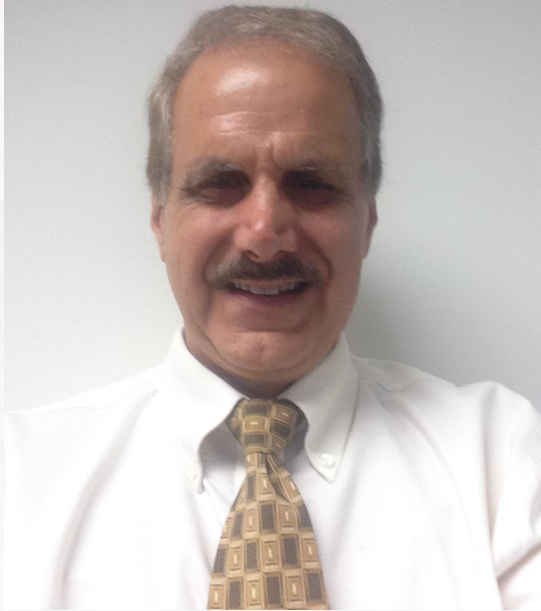
- 43 years of experience associated with transportation and land development
- Experience includes management of Major Highway Design and Construction Projects

### EDUCATION

- BS in Civil Engineering, University of Central Florida.

### MEMBERSHIPS AND CERTIFICATION

- Professional Engineer – Florida
- Member - Florida Green Book Committee





## PEAKER

**Nirmal Datta, P.E.**

**Capital Program Administrator**

**Broward County Highway Construction & Engineering Division**

### EXPERIENCE

- 30 years of experience associated with transportation and land development
- Experience includes management of Major Highway Design and Construction Projects

### EDUCATION

- Master of Engineering, Lamar University, Texas.

### MEMBERSHIPS AND CERTIFICATION

- Professional Engineer – Florida and Texas
- ASCE Member
- ASHE Member

# PRESENTATION AGENDA

- 1 The presentation will review traditional “gray” stormwater design vs “green” stormwater infrastructure .**
- 2 Benefit of green stormwater infrastructure**
- 3 Use of TRUEGRID for stormwater infrastructure.**
- 4 Marshalling Yard and other completed projects using TRUEGRID product.**

# WHAT IS GREEN STORMWATER INFRASTRUCTURE

Traditional "gray" stormwater is designed to move urban stormwater away from the built environment and includes curbs, gutters, drains, piping, and collection systems. Generally, traditional gray infrastructure collects and conveys stormwater from impervious surfaces, such as roadways, parking lots and rooftops, into a series of piping that ultimately discharges untreated stormwater into a local water body.

Whereas "green" stormwater infrastructure is designed to mimic nature and capture rainwater where it falls.

**Green infrastructure reduces and treats stormwater at its source while also providing multiple community benefits such as:**

- **Reducing localized flooding**
- **Improving community aesthetics**
- **Encouraging more neighborhood socialization**
- **Improving economic health by increasing property values and providing jobs opportunities for small businesses**
- **Decreasing the economic and community impacts of flooding, delivering environmental, social, and economic benefits.**

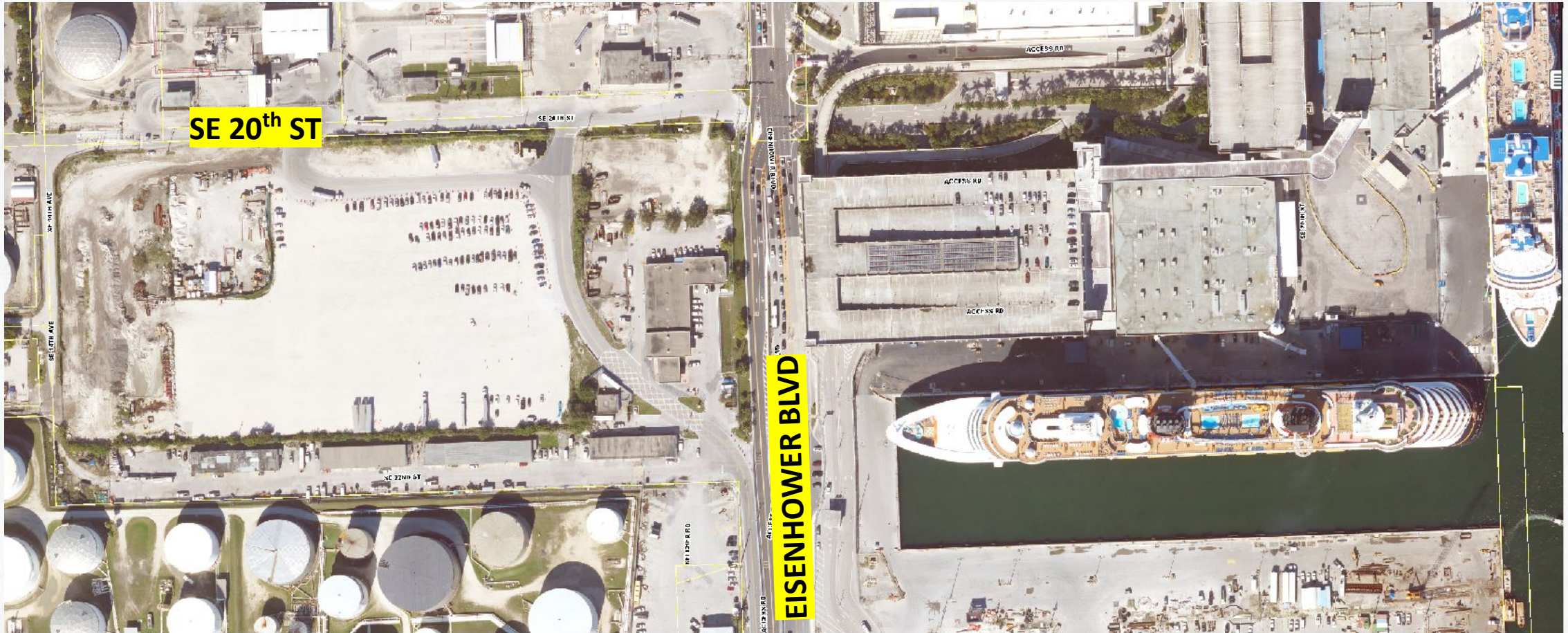
# WHEN TO USE OF GREEN INFRASTRUCTURE

**According to EPA, consider the using of green infrastructure when:**

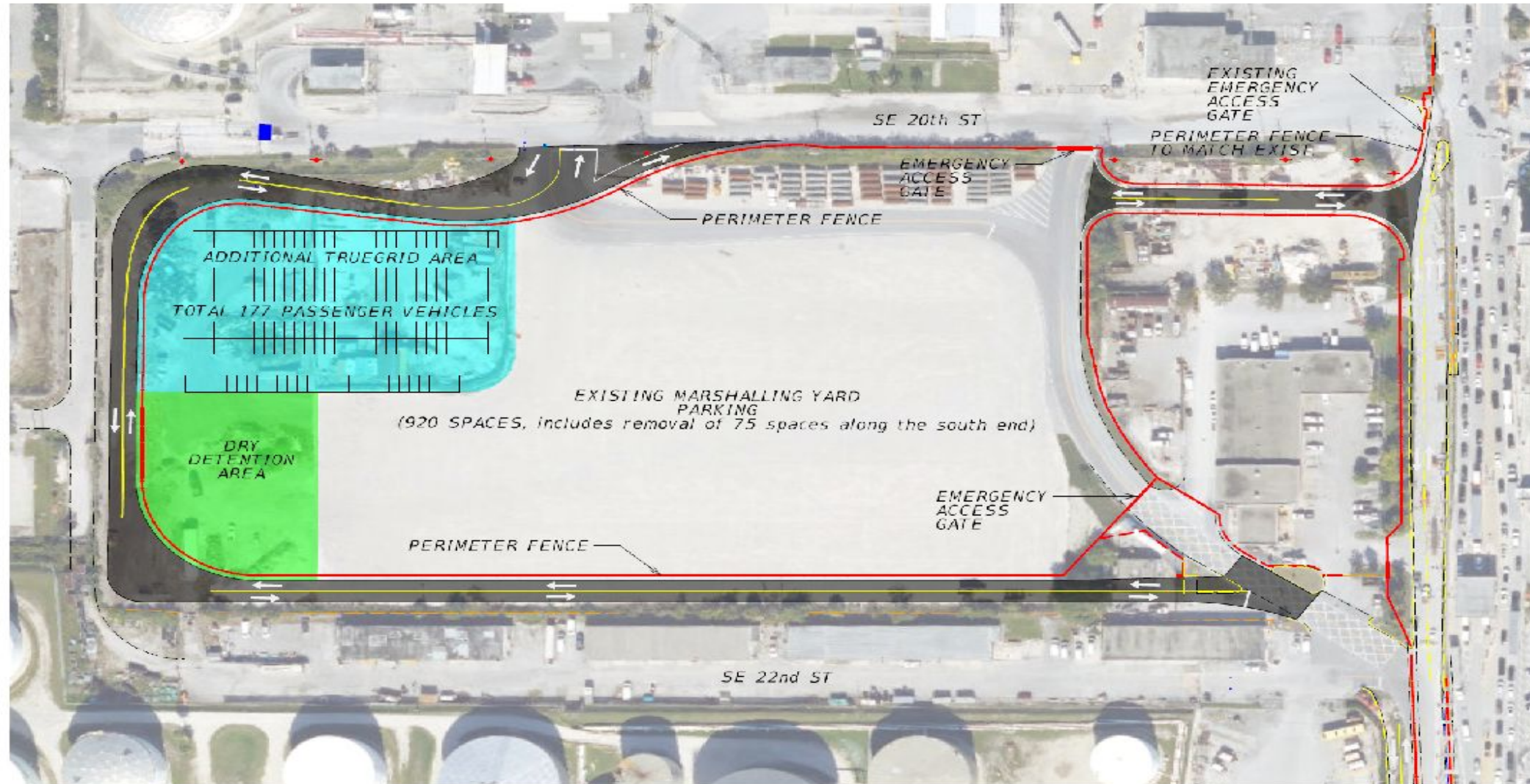
- **Repairing, resurfacing or replacing roadways and parking lots**
- **Repairing or replacing damaged sidewalks and curbs**
- **Upgrading or replacing utilities in the public right-of-way (e.g., sanitary sewer systems, storm sewer systems, drinking water supply lines)**
- **Redeveloping vacant or abandoned properties**

# MARSHALLING YARD PROJECT

**Project Location:** This project is located Southwest corner of SE 20<sup>th</sup> Street and Eisenhower Blvd within the Port Everglades/City of Fort Lauderdale.



# MARSHALLING YARD PROJECT PLAN



# MARSHALLING YARD PROJECT

**Project Objective:** Create parking facilities that can be used by the By-Pass Road Contractors, convention center events and new Omni Hotel.

**Project Size:** About 11 acres -920 new passenger cars parking facility

**How this Project evolved:** Broward County Convention Center has expanded over 1.2 million square feet of event space and 29 storied-801 room of OMNI hotel building. To meet the parking need, Marshalling Yard Project has been created.

**Project Concept and final design:** Broward County Highway Construction and Engineering Division - In-house design Team.

**Construction:** True Grid Pavers and Weekley Asphalt Inc.

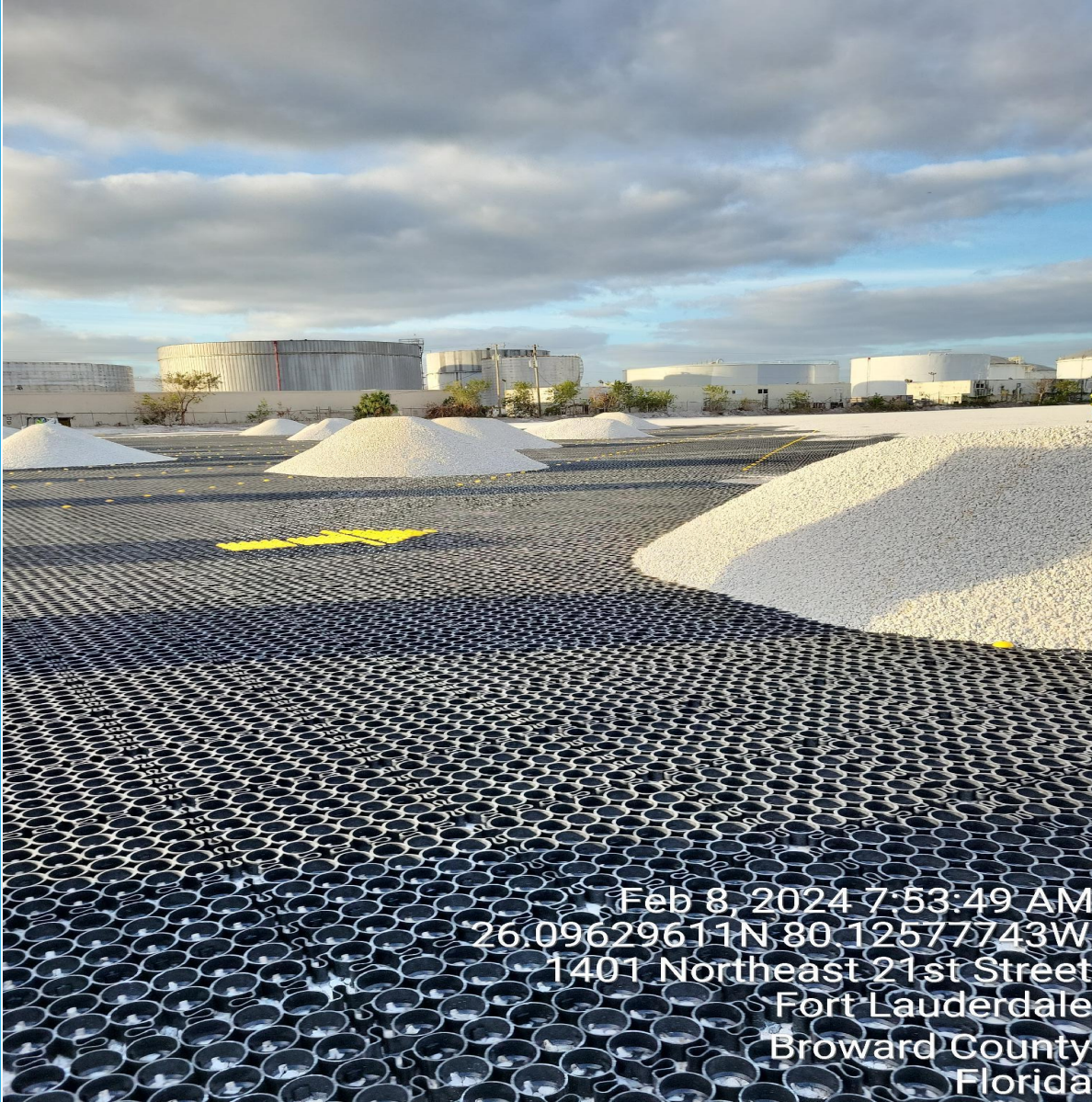
**CEI Team:** F & J Engineering Group

# MARSHALLING YARD PROJECT –BEFORE CONSTRUCTION

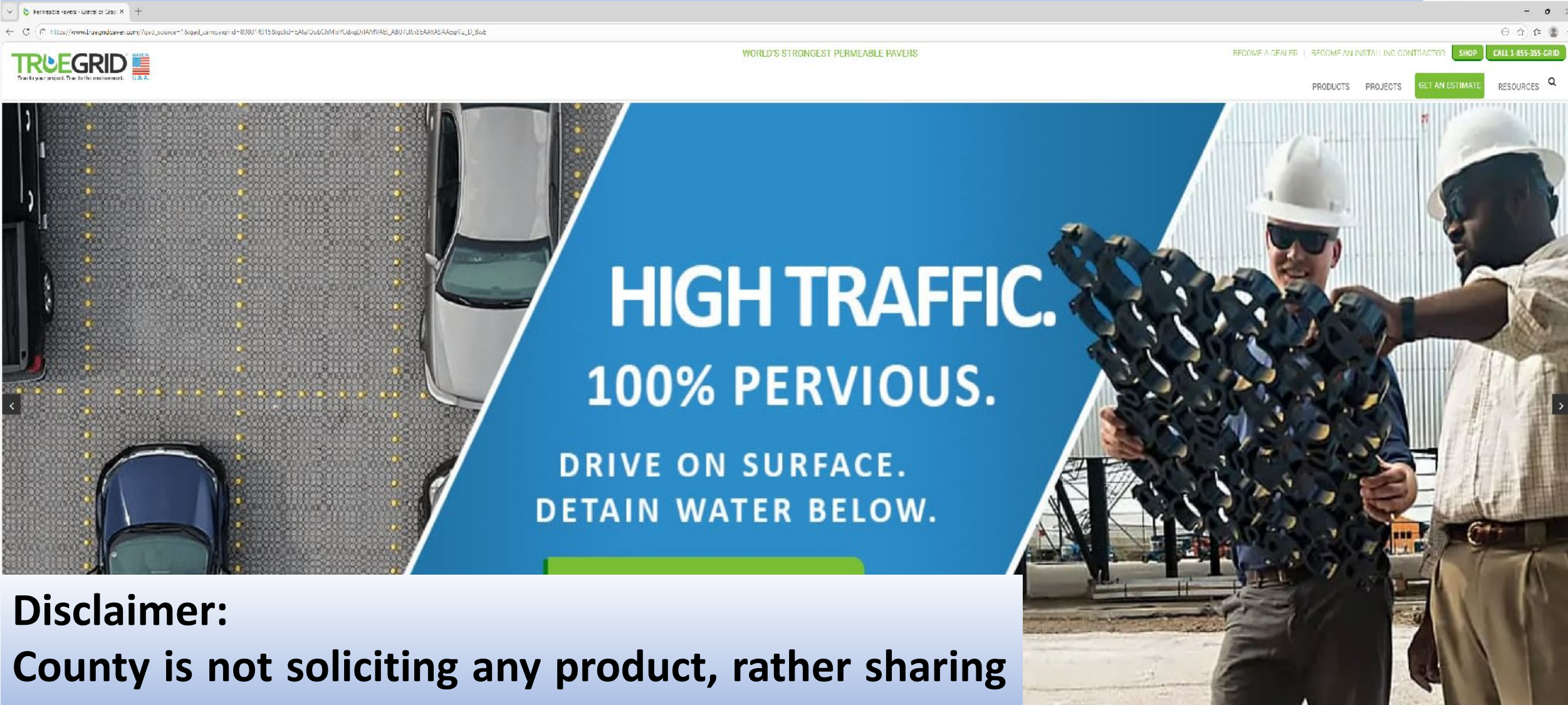


**Water Ponding within the Marshalling Yard facility**

# MARSHALLING YARD PROJECT – CONSTRUCTION



# WHAT IS TRUEGRID PERMEABLE PAVERS



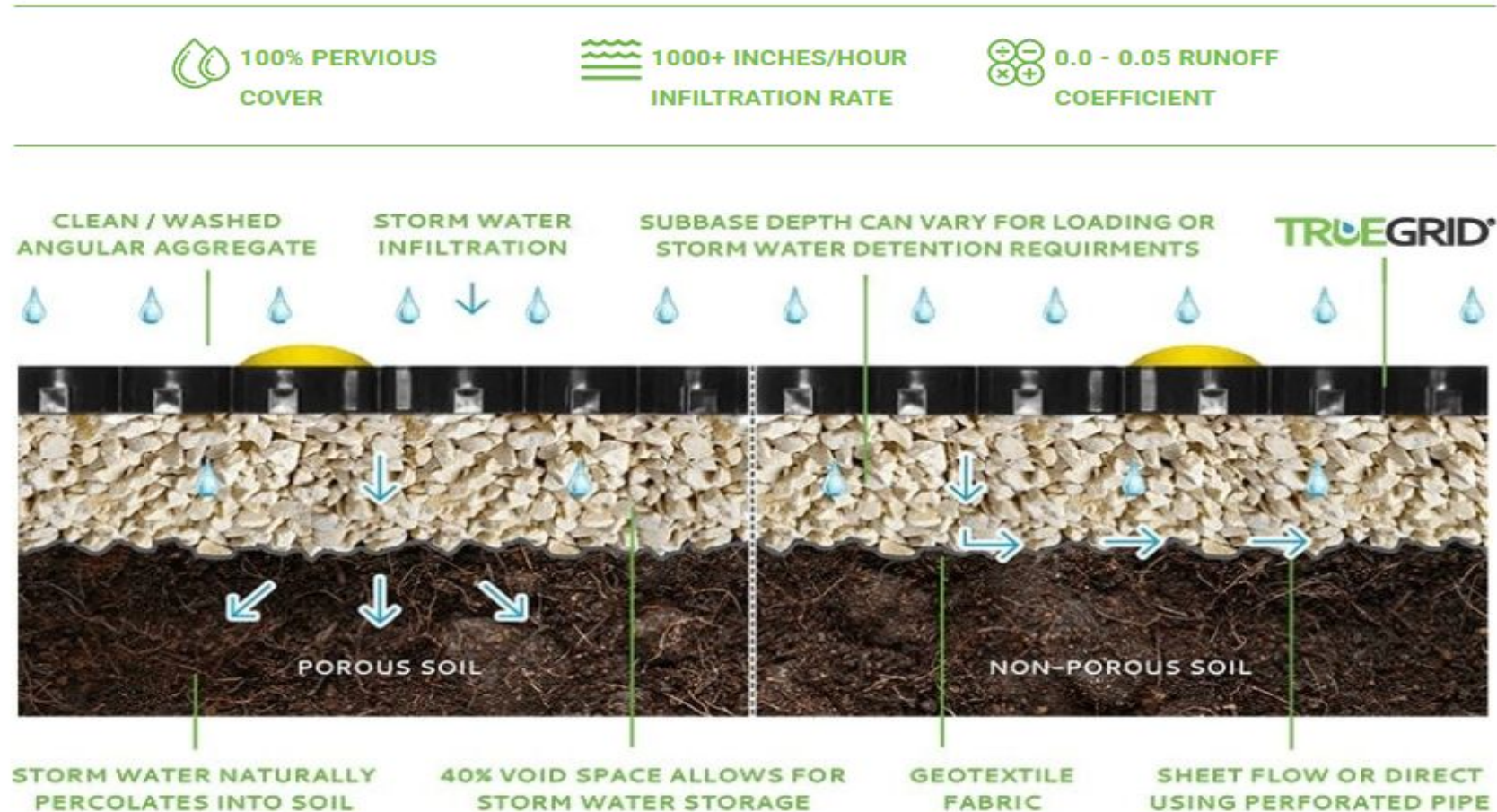
## Disclaimer:

County is not soliciting any product, rather sharing our project experience.

# HOW TRUEGRID PERMEABLE PAVERS WORKS

## WORKS IN ALL CLIMATES AND SOILS

### STORM WATER DETENTION

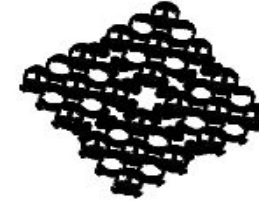


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# TRUEGRID PERMEABLE PAVERS CROSS-SECTION

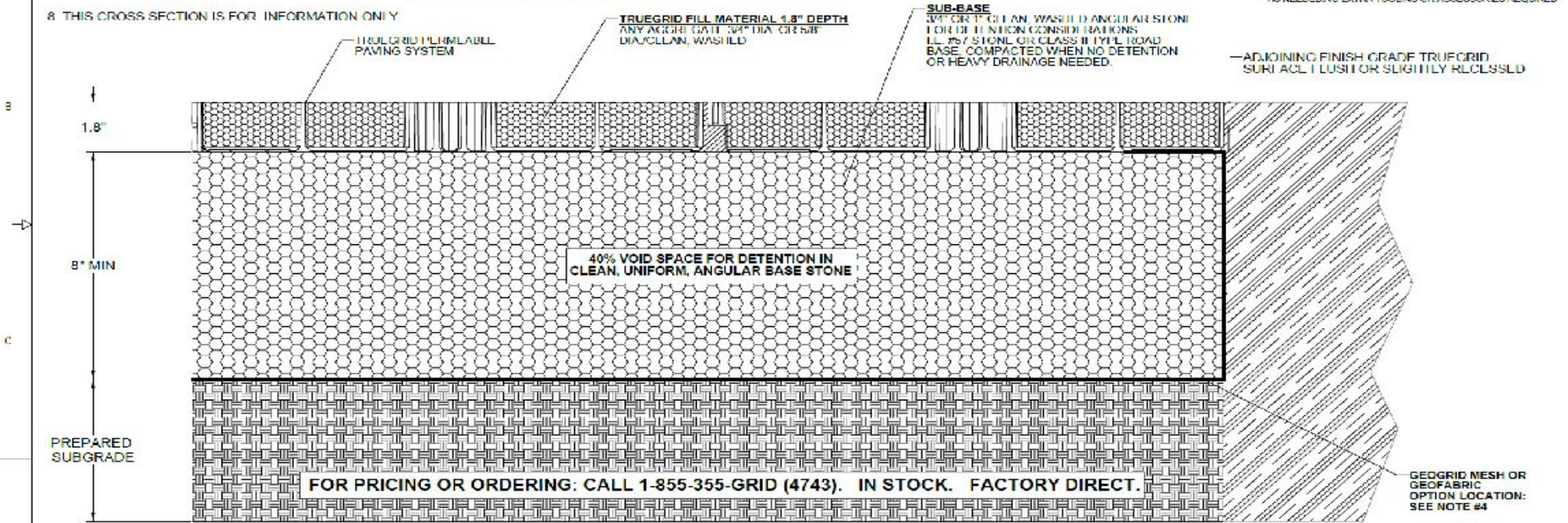
**NOTES:**

1. SUB-BASE DEPTH AND PREPARATION IS DEPENDENT ON SITE CONDITIONS PLUS LOADING REQUIREMENTS.
2. TRUEGRID PRO PLUS PRODUCTS DESIGNED FOR LOAD CAPACITIES OF 120,000 LBS PER SQ. FT. TRUEGRID PRODUCTS STRENGTHEN WITH FILL MATERIAL.
3. TRUEGRID PRO PLUS PRODUCTS ARE SUFFICIENTLY RATED FOR H-20/HIS-201 LOADING AND GREATER.
4. GEOGRID MESH OR GEOFABRIC MAY BE REQUIRED BETWEEN SUB-GRADE & SUB-BASE FOR CERTAIN SOILS AND SITE SPECIFIC REQUIREMENTS.
5. INCREASE SUB-BASE DEPTH FOR INCREASED STORM WATER DETENTION.
6. NO STAKING NECESSARY WITH TRUEGRID PRO PLUS WHEN SLOPE IS BELOW 10 DEGREES. ASSESS PROJECT, AS NEEDED.
7. FINAL ENGINEERED CROSS SECTION AGGREGATES AND DEPTH SHOULD ALLOW FOR EXPECTED INFILTRATION RATES, STORAGE CAPACITIES, OUTFLOW RATES, AND OTHER SITE SPECIFIC CONDITIONS AND LOAD REQUIREMENTS.
8. THIS CROSS SECTION IS FOR INFORMATION ONLY.



**TRUEGRID BLOCK REFERENCE VIEW**  
PREASSEMBLED & DELIVERED IN 4' X 4' SHEETS, RECONFIGURED AS NEEDED NO EXTRA TOOLS OR ACCESSORIES REQUIRED

—ADJOINING FINISH GRADE TRUEGRID SURFACE MUST BE LUSHT OR SLIGHTLY RECESSED



**APPLICATION:**  
HEAVY LOAD PARKING LOT, FIRE LANES,  
EQUIPMENT YARD, SERVICE ROADS.

**GRAVEL FILL HEAVY LOAD TRUEGRID PRO PLUS**

1-855-355-GRID (4743) CLIENT APPROVED

**MADE IN U.S.A.**

TRUEGRIDPAVER.COM

CALL FOR LATEST SPECIFICATIONS AND TECHNICAL INFORMATION. THIS PRODUCT IS AVAILABLE IN 4' X 4' SHEETS. SEE NOTE #4 FOR MORE INFORMATION. THIS PRODUCT IS AVAILABLE IN 4' X 4' SHEETS. SEE NOTE #4 FOR MORE INFORMATION. THIS PRODUCT IS AVAILABLE IN 4' X 4' SHEETS. SEE NOTE #4 FOR MORE INFORMATION.

APPROVAL INFORMATION		TRUEGRID	
DESIGNED BY	DATE	TRUEGRID GRAVEL FILL INSTALLATION (HEAVY LOAD)	
4. Tully	08/20/16		
DESIGNED BY	DATE		
J. Tully	08/20/16		
APPROVED BY	DATE		
C. Price	08/20/16		
APPROVED BY	DATE		
J. Tully	08/20/16		
SCALE: 1/8" = 1'-0"		10' GRAVEL	03
SHEET			01

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# TRUEGRID PERMEABLE PAVERS VIDEO



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# CHALLENGES, LESSONS LEARNED, KEY TAKEAWAY

- 1) Vegetation growth over time –Maintenance required
- 2) ADA Compatibility –finer aggregate required for ADA Compatibility
- 3) Heavier equipment may damage the TrueGrid cells



# MARSHALLING YARD PROJECT COST & SCHEDULE

- 1) Design Cost –N/A –Design completed by County in-house design group
- 2) Total Construction Cost \$ 4 M
- 3) Ongoing O & M cost - \$ 50,000 per year
- 4) Metrics for Success – Historical flooding/Water ponding eliminated
- 5) Project completed (Design and Construction) within a year

# Replicability-Other Completed projects –with TrueGrid



Marten  
Transport  
90,000 sf  
PRO PLUS  
for truck and  
passenger  
vehicle  
parking  
151  
Wetherbee  
rd., Orlando  
FL 32824

# Replicability-Other Completed projects –with TrueGrid



Hallandale  
Beach Project  
16,000 sf PRO  
PLUS for public  
parking lot  
203 NE 3rd St,  
Hallandale  
Beach FL 33009  
Approved  
through city of  
Hallandale  
Beach

# Thank you for Attending!

Contact Information:

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