



Reconstruction of 26th Street and Retaining Wall

Between Charles Street and St. Paul Street

September 18, 2014

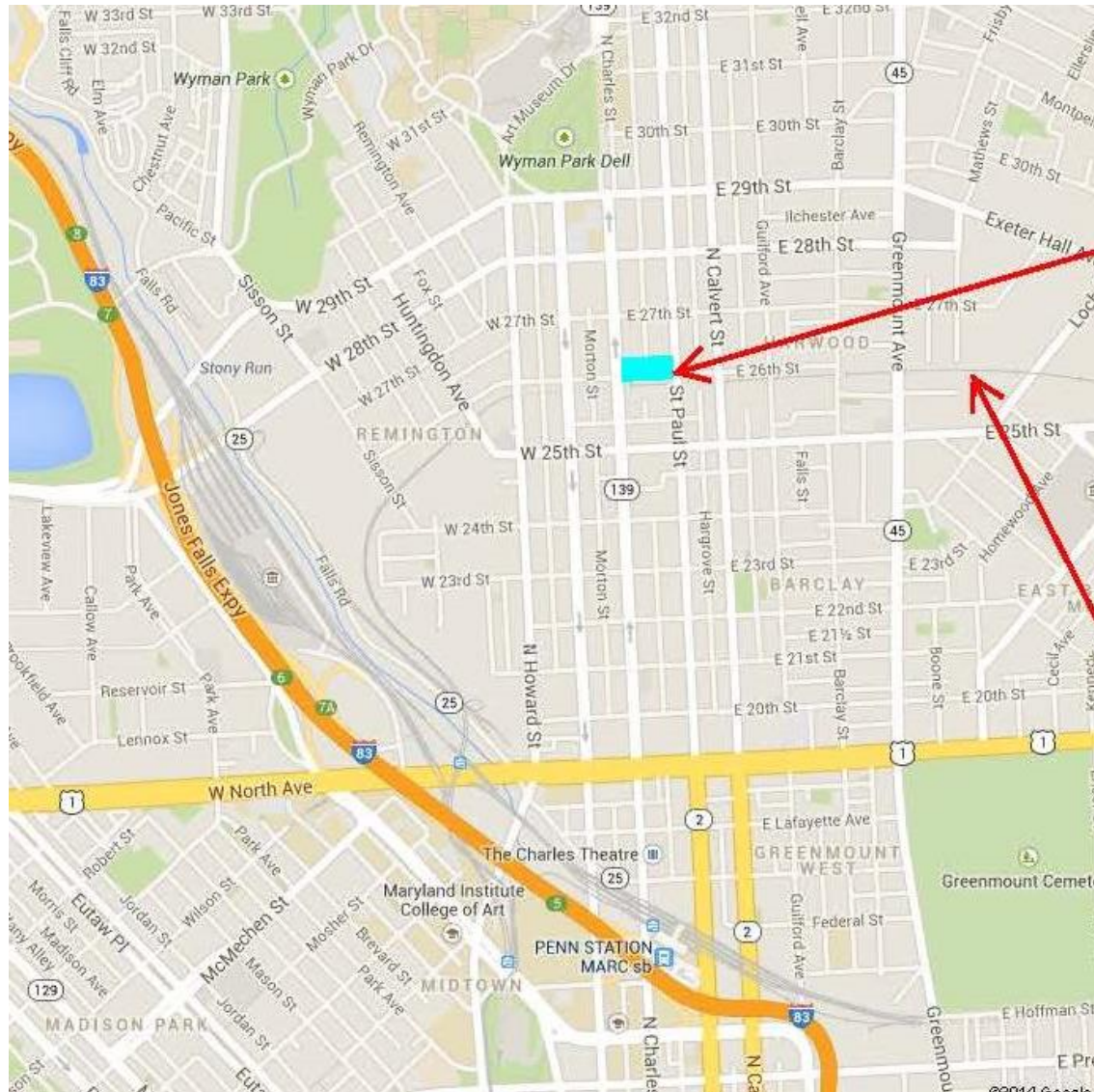
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**CONCRETE
GENERAL, INC.**

**HAYWARD
BAKER** Geotechnical Construction



Location of the Project



Retaining Wall Failure along 26th Street

CSX Rail Continues Northbound





26th Street Wall Collapse





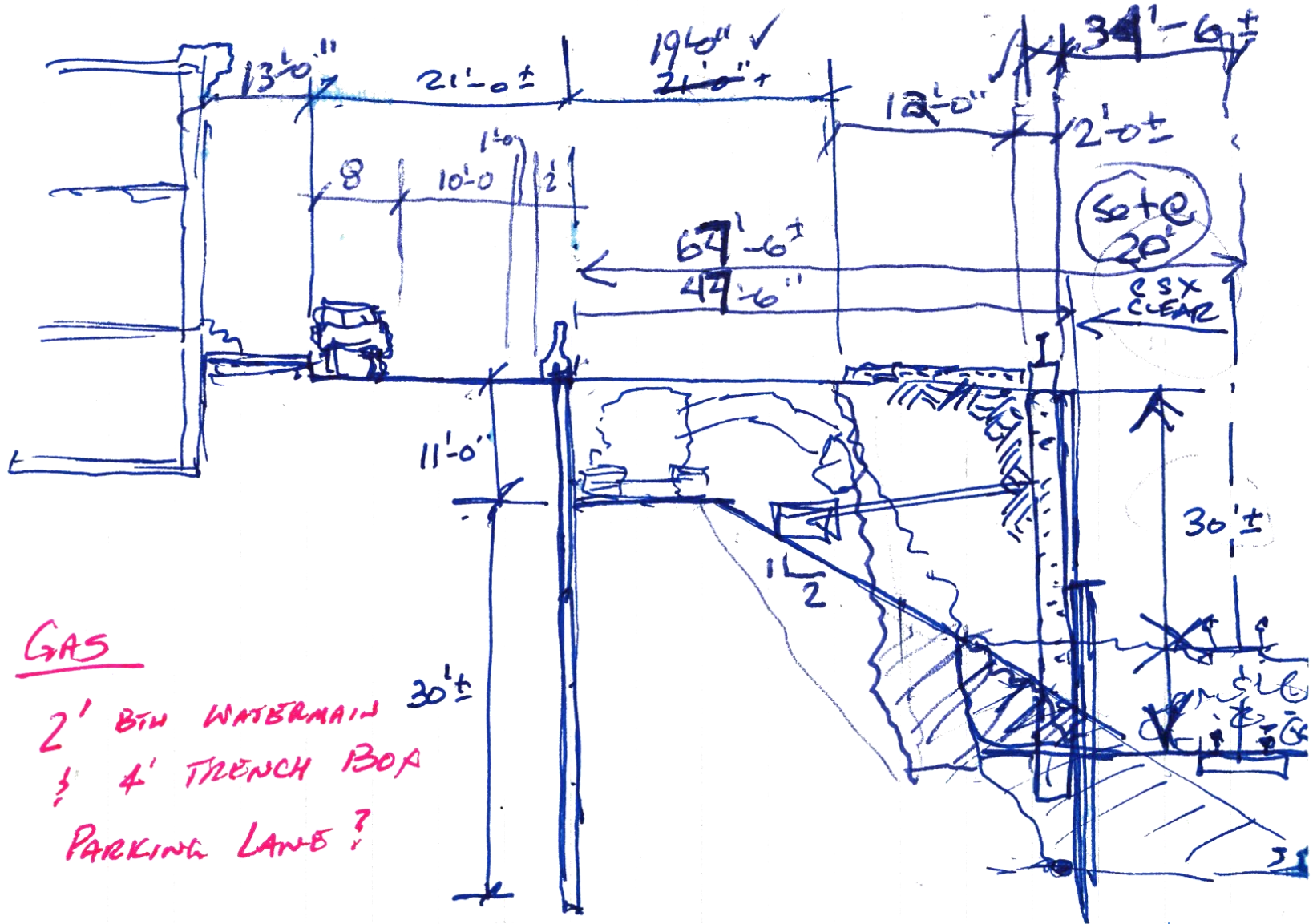
26th Street Wall Collapse



04/30/2014



26th Street Wall Collapse





Baltimore Sun Photo



26th Street Wall Collapse





- ◆ Remove Cars from the Street Level
- ◆ Remove Cars and Soil from the tracks
- ◆ Take Gas Line out of service
- ◆ Relocate Residents
- ◆ Protect Slope from Water
- ◆ Install Monitoring Points on 26th St.
- ◆ Install Soldier Piles

Removal of Material from Tracks



Baltimore Sun Photo



26th Street Wall Collapse

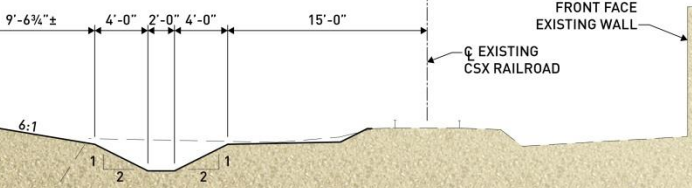
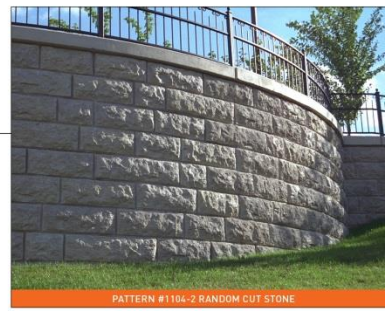
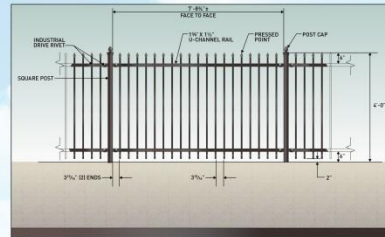
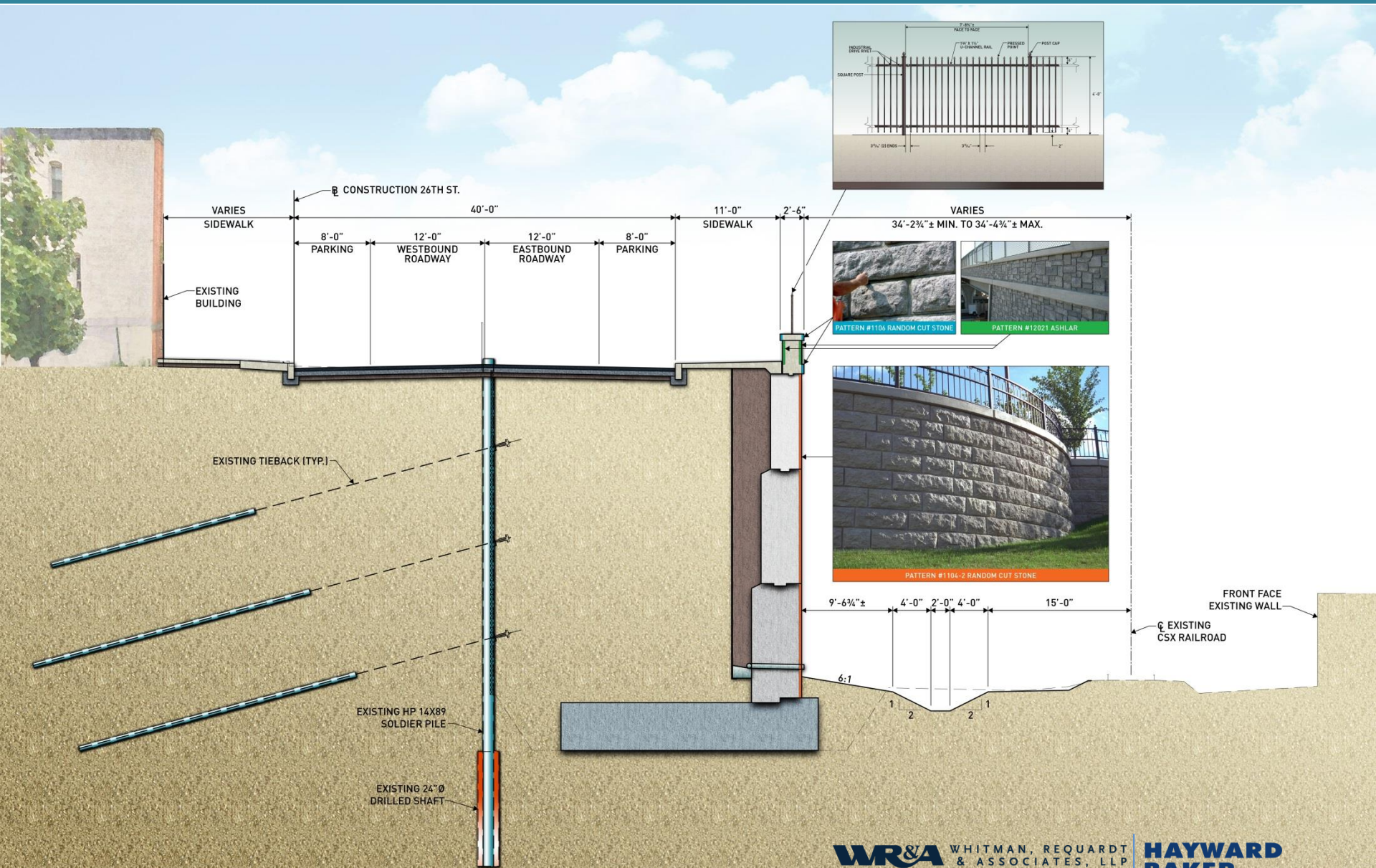




26th Street Wall Collapse



The Fix - Design Concept



Looking towards St. Paul Street, before failure

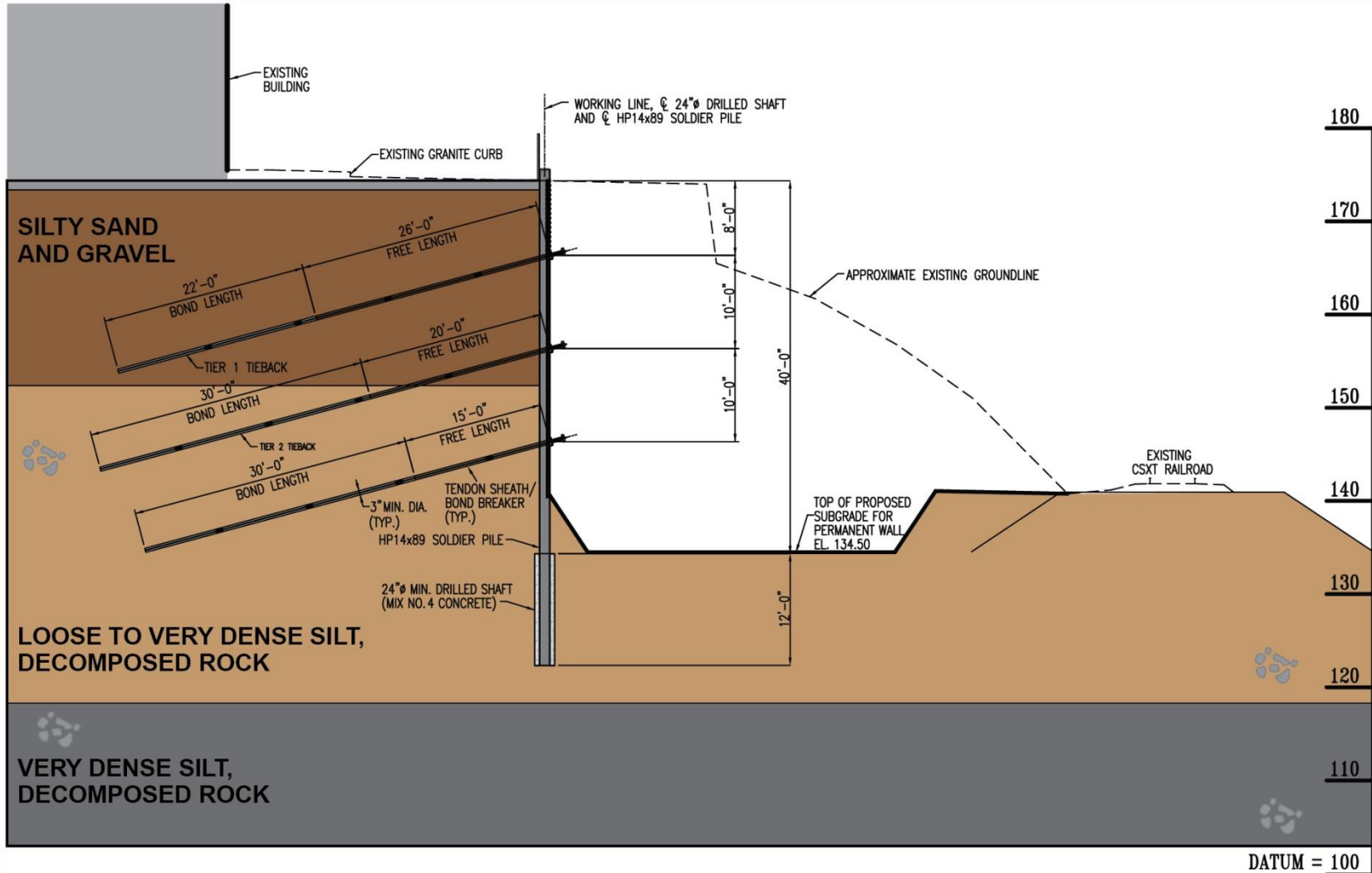


Looking towards St. Paul Street, new wall



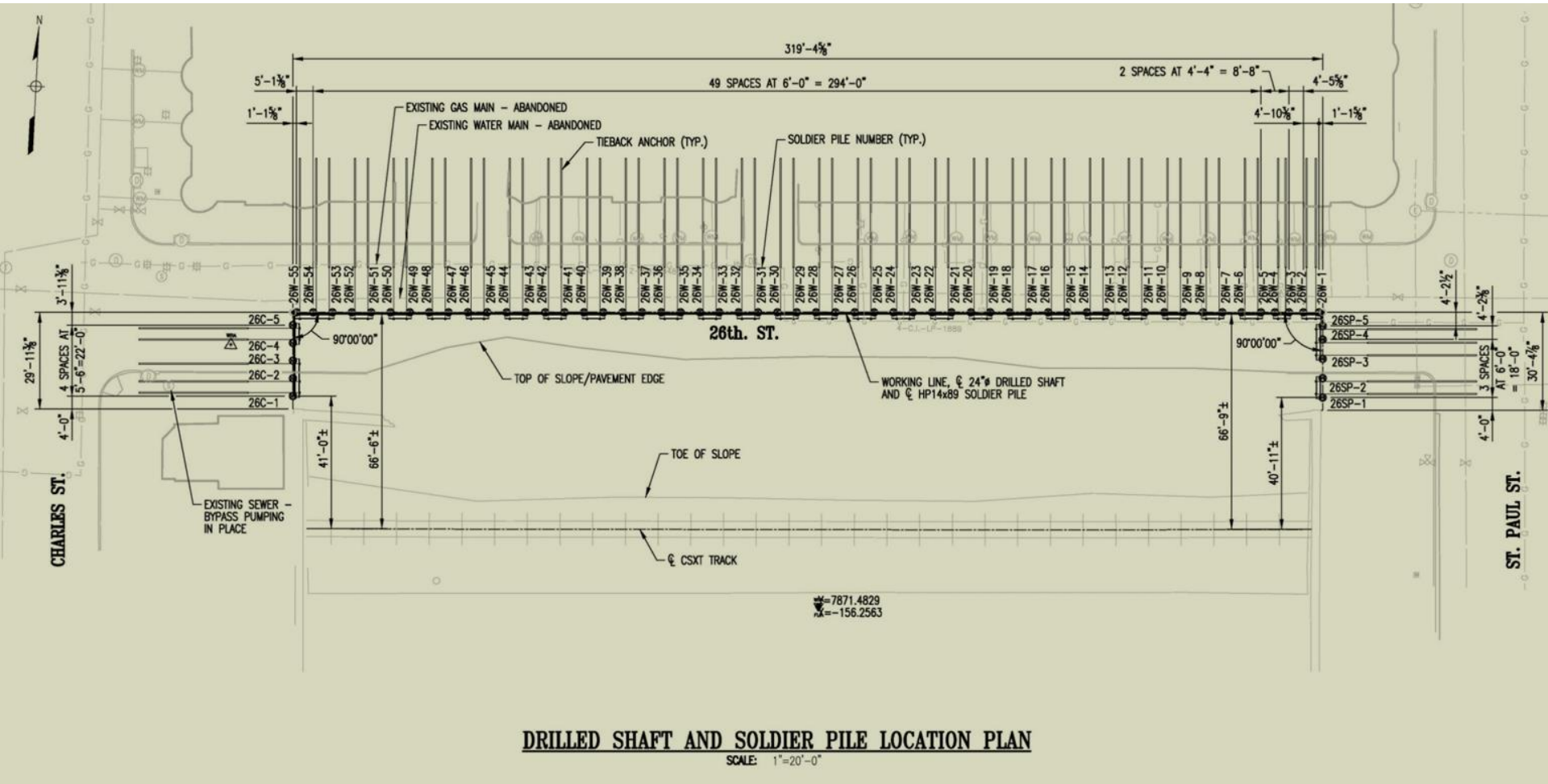


Soldier Pile Wall Design





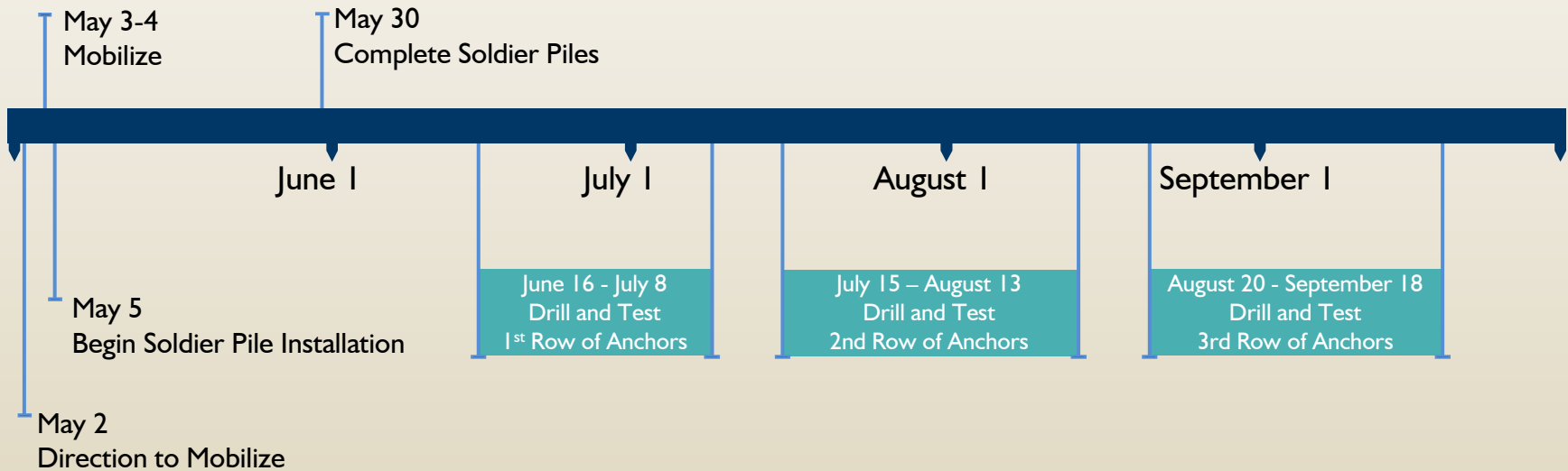
Soldier Pile Wall Design



Soldier Piles with Anchors Selected for Temporary Wall for the following reasons:

1. Soldier Pile material (HP14x89) could be obtained quickly
2. Stabilization of the ground surface was possible without working on the track side
3. The wall could be constructed through saturated conditions

Soldier Pile Installation





Soldier Pile Installation

Safety Step: Determine Safe Distance to Work from Slope.





Soldier Pile Installation



20 ft.

A safe distance of 20 ft. from the curb line was established for all heavy equipment (drills, cranes, excavators). This left approximately 10' from the scarp.



Soldier Pile Installation

Rules are Rules. 27th Street Detour.





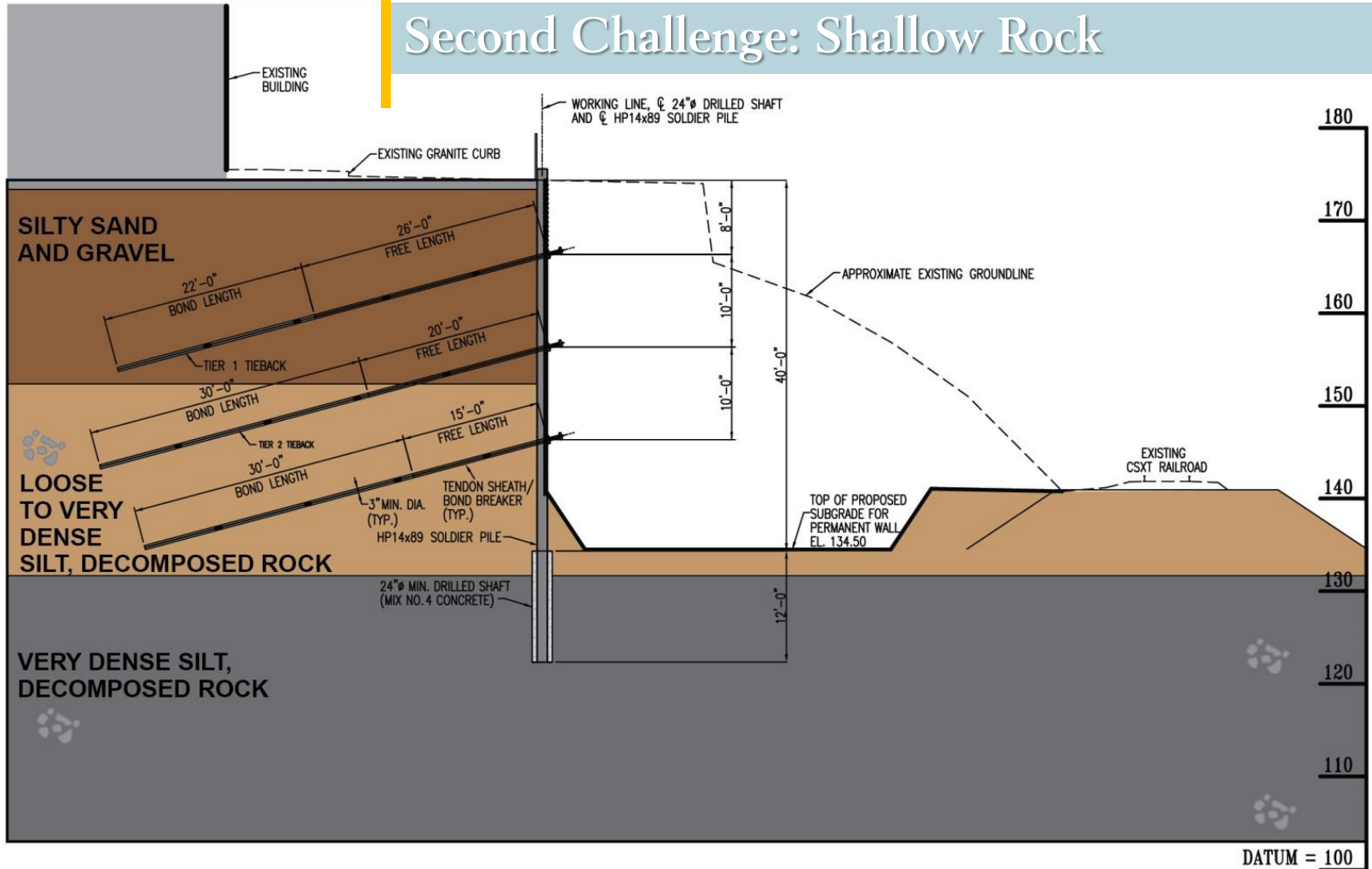
Soldier Pile Installation



First Challenge: Due to collapsing soils, temporary casing required.



Second Challenge: Shallow Rock

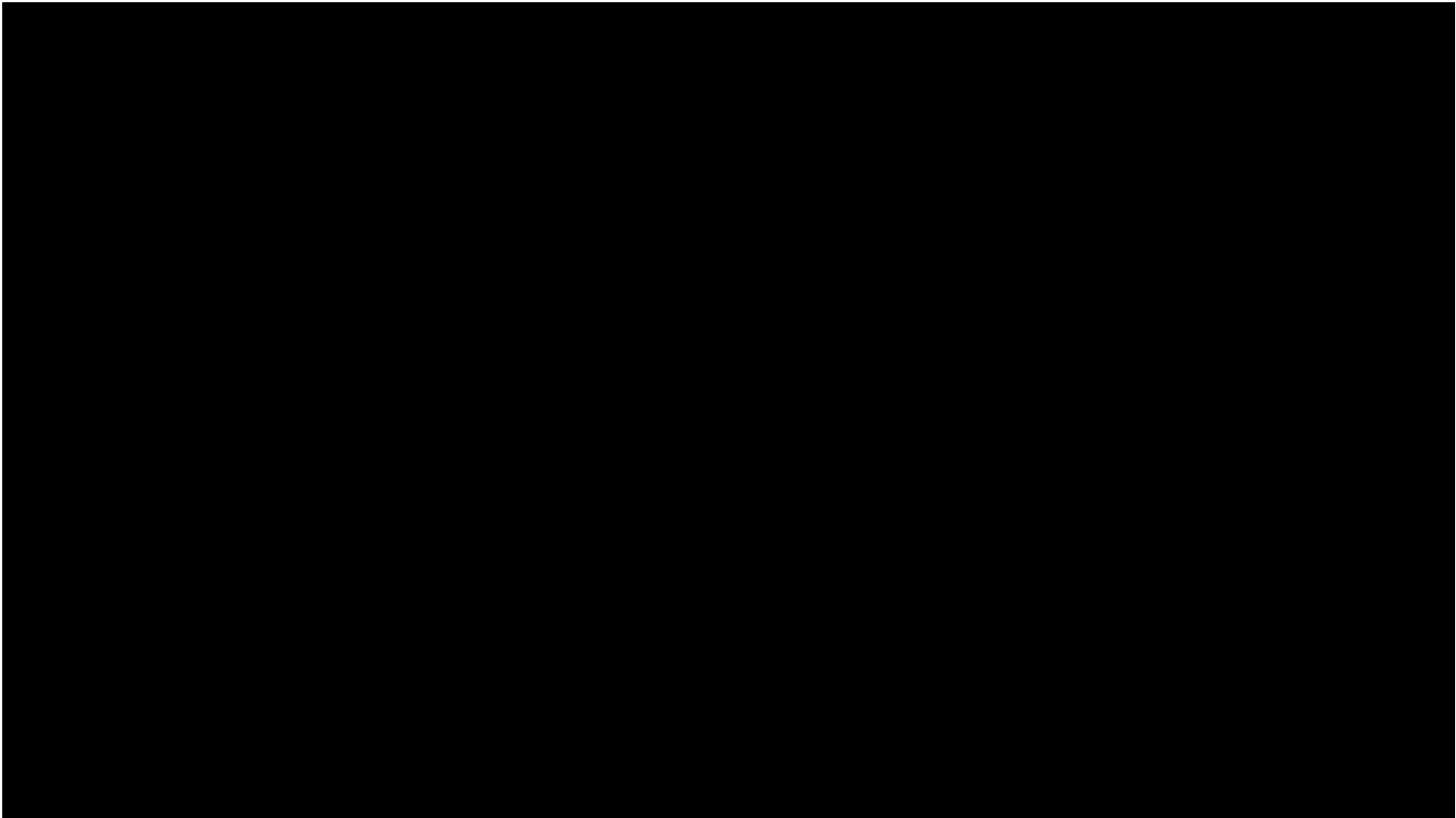


Second Challenge: Shallow Rock





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Anchor Installation

Post Grouting increased capacity of 2nd row anchors by 15-30%.





Anchor Installation

All anchors locked off at 100% of DL.





Anchor Installation

Supplemental Anchors placed in the unused bays.



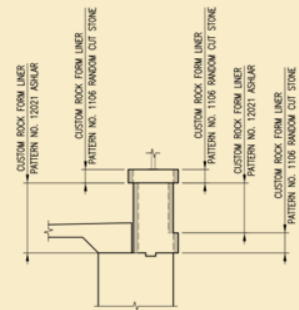
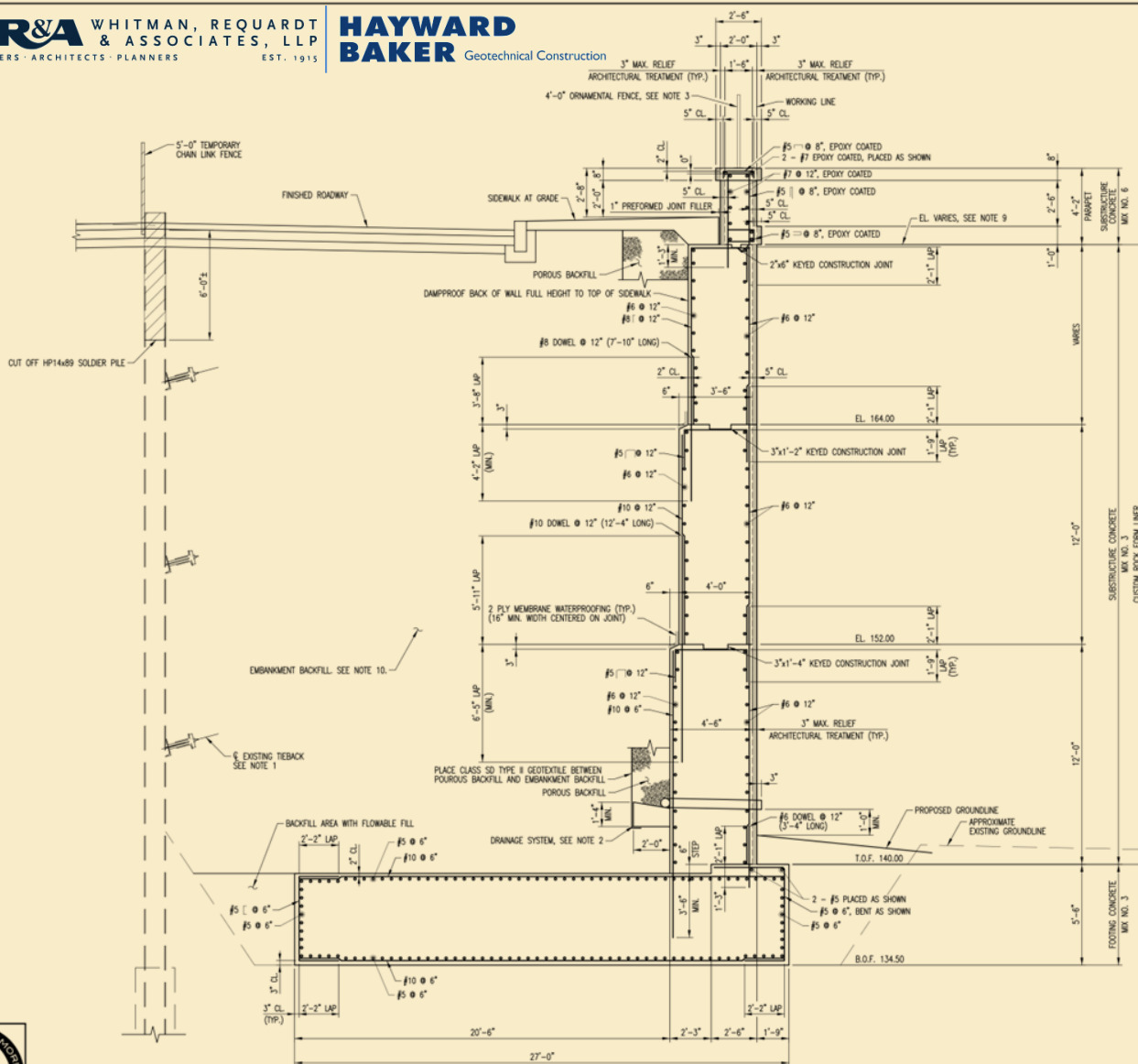


Permanent Wall

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REVISIONS			
NO.	DESCRIPTION	DATE	BY



- NOTES:**
- CONTRACTOR SHALL DE-TENSION TEMPORARY TIEBACK ANCHORS AS BACKFILLING OPERATIONS REACH TIEBACK LOCATIONS. FOR REQUIREMENTS, SEE DWG. 5001 AND 5002.
 - FOR DRAINAGE SYSTEM DETAILS, SEE STANDARD NO. RW(01.01)-80-100 (SYSTEM B) ON DWG. 5004.
 - FOR ORNAMENTAL FENCE DETAILS, SEE DWG. DE01.
 - THE CONTRACTOR HAS THE OPTION OF LAPPING STEM REINFORCEMENT AND DOWELS AS SHOWN OR EXTENDING DOWEL REINFORCEMENT WITH NO SPlicing. HOWEVER, NO ADDITIONAL COMPENSATION TO THE CONTRACTOR WILL BE ALLOWED FOR WHICHEVER ALTERNATIVE IS SELECTED.
 - MAXIMUM FACTORED BEARING RESISTANCE SHALL NOT EXCEED 12,000 PSF AND SHALL BE VERIFIED BY THE ENGINEER PRIOR TO PLACEMENT OF REINFORCING STEEL OR CONCRETE FOR FOOTING.
 - ARCHITECTURAL FINISH SHALL EXTEND 1'-0" MIN. BELOW PROPOSED GROUNDLINE ALONG FRONT FACE OF RETAINING WALL.
 - ALL REINFORCEMENT IN TRAFFIC BARRIER SHALL BE EPOXY COATED.
 - ADJUST REINFORCEMENT SPACING AS NEEDED TO AVOID FENCE ANCHORS AND MAINTAIN 8" MAX. DOWEL SPACING.
 - FOR TOP OF WALL ELEVATIONS, SEE DWG. GP01.
 - THE CONTRACTOR SHALL VERIFY THROUGH TESTING THAT A MINIMUM PHİ ANGLE OF 32 DEGREES IS ACHIEVED FOR THE COMPACTED BACKFILL BEHIND THE RETAINING WALL.

TYPICAL SECTION
SCALE: 3/8"=1'-0"

CITY OF BALTIMORE
DEPARTMENT OF TRANSPORTATION
CONTRACT NO. TR14022

RECONSTRUCTION OF 26th ST. AND RETAINING WALL
BETWEEN CHARLES STREET AND ST. PAUL STREET

TYPICAL SECTION - 2

DATE: JULY, 2014
TRANSPORTATION ENGINEERING & CONSTRUCTION DIVISION SHEET 8 OF 15
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DRAWN BY: JPS
EXAMINED BY: JAG



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