

# CONFLUENCE OF TECHNOLOGY AND CIVIL ENGINEERING

Presented By



**TOWN  
+GOWN:  
NYC**

**N | V | 5**

7.17.2024

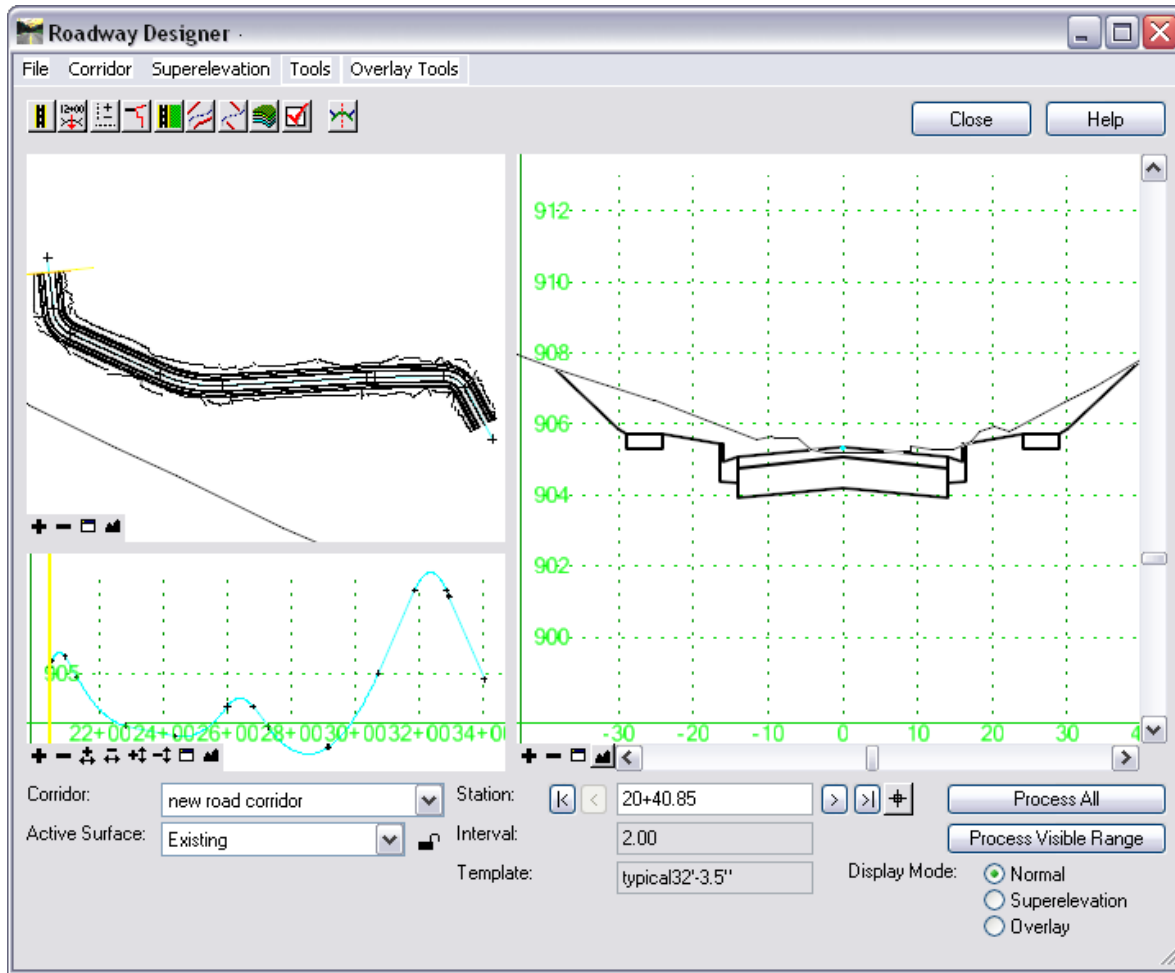
# AGENDA

**1:00 - 1:15 PM Welcome and Introduction Thu-Loan Dinh/NYC DDC**

**1:15 - 1:40 PM Confluence of Technology and Civil Engineering Jospeh Menzer/NV5**

**1:40 - 2:00 PM Open Discussion**

# CHANGE



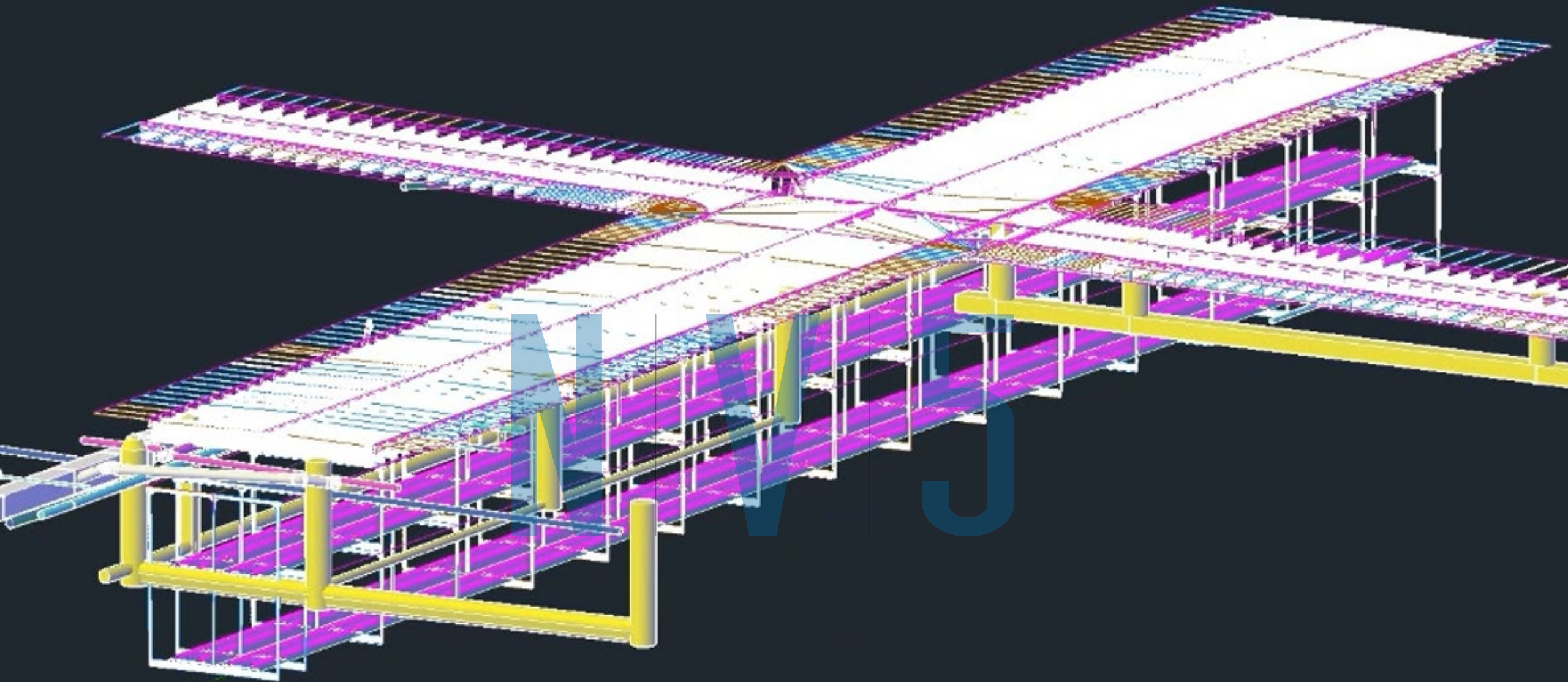
In-Roads Screenshot

E13 fx =SUM(H5:H11)

	A	B	C	D	E	F	G	H
1								
2	<b>Calculate Cut and Fill Volume</b>							
3								
4		<b>Station</b>	<b>Distance</b>	<b>Fill Area</b>	<b>Cut Area</b>	<b>Fill Volume</b>	<b>Cut Volume</b>	<b>Volume</b>
5		0+030	0	412.33	380	0	0	0
6		0+060	30	490	762.09	13534.95	17131.35	-3596.4
7		0+090	30	0	231.21	4900	14899.5	-9999.5
8		0+120	30	799.65	432	7996.5	9948.15	-1951.65
9		0+150	30	987.12	673.32	26801.55	16579.8	10221.75
10		0+180	30	1000.4	0	29812.8	6733.2	23079.6
11		0+210	30	548.77	763.83	23237.55	7638.3	15599.25
12								
13	<b>Volume of the Place</b>				<b>33353.05</b>			

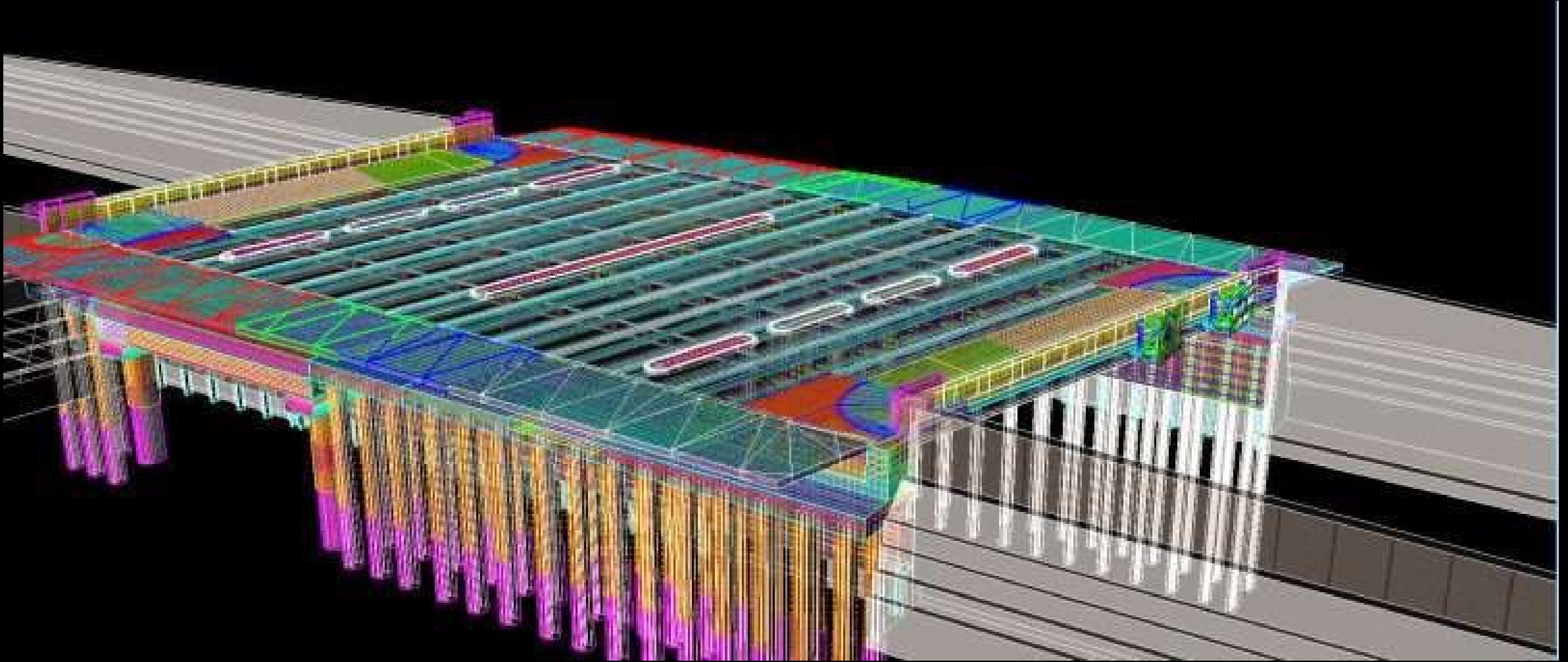
## Excel Cut/Fill Calculations



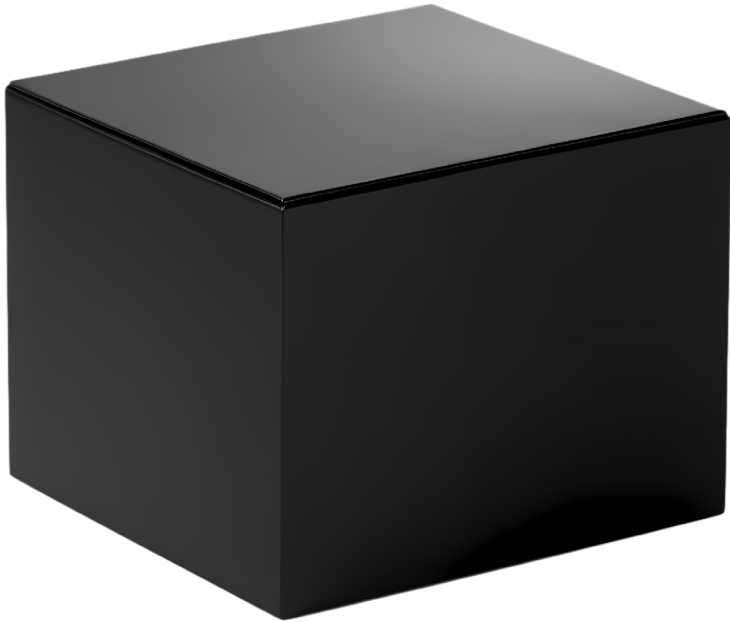


**LEXINGTON AVENUE  
PEDESTRIAN SAFETY MODEL  
48<sup>th</sup> – 49<sup>th</sup> Streets**

**Used a digital twin as the primary contract document and public outreach tool.**



# Root Cause of Almost Every Engineering Issue

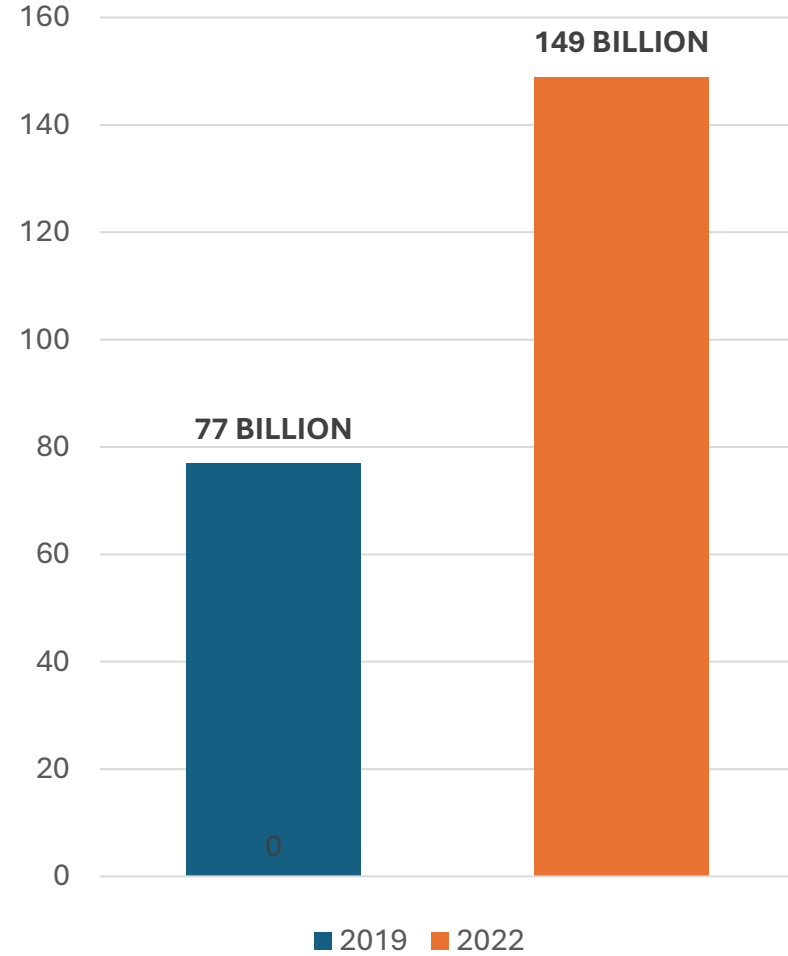


**Unknowns**

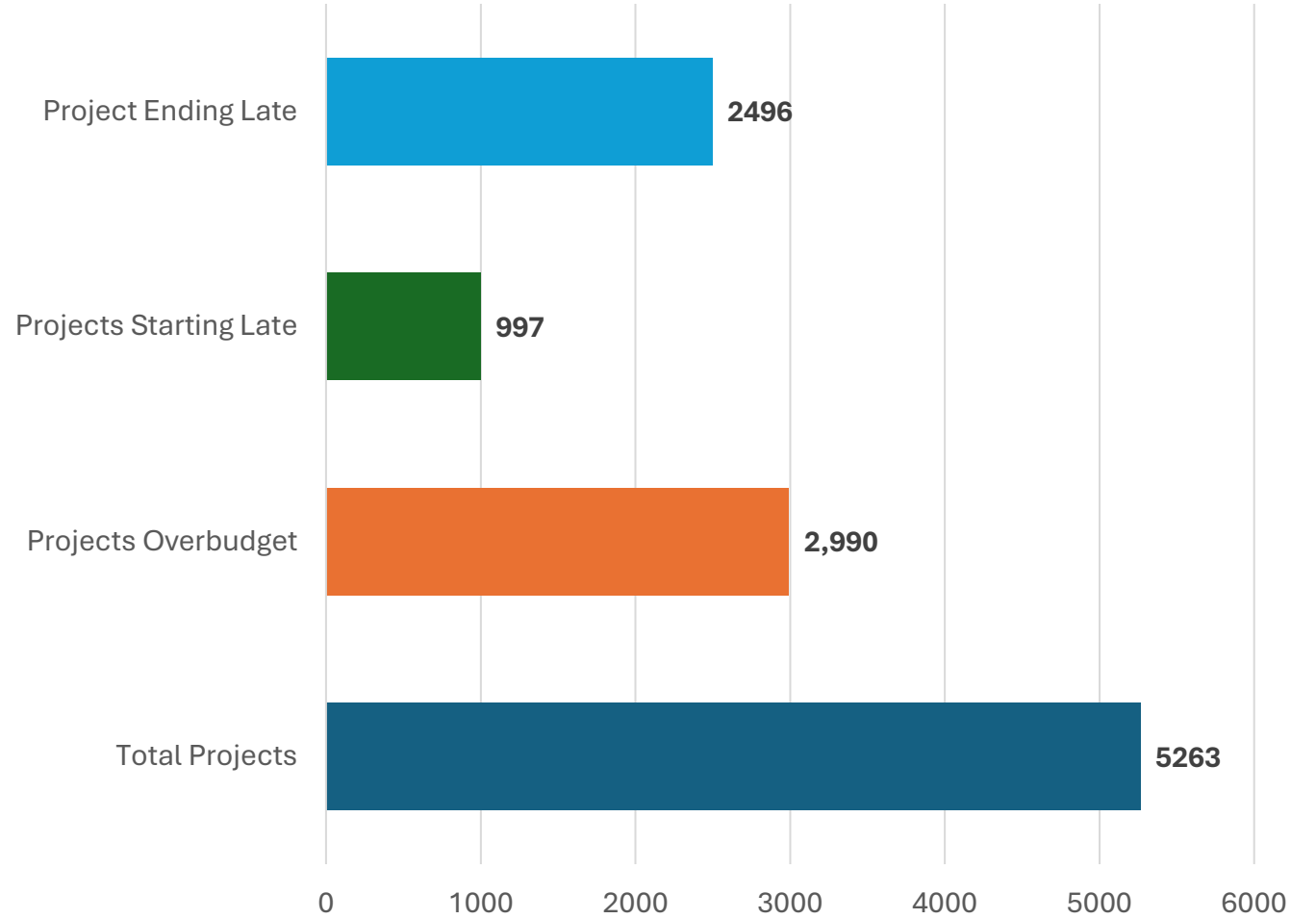


**Miscommunication**

## CAPITAL COSTS



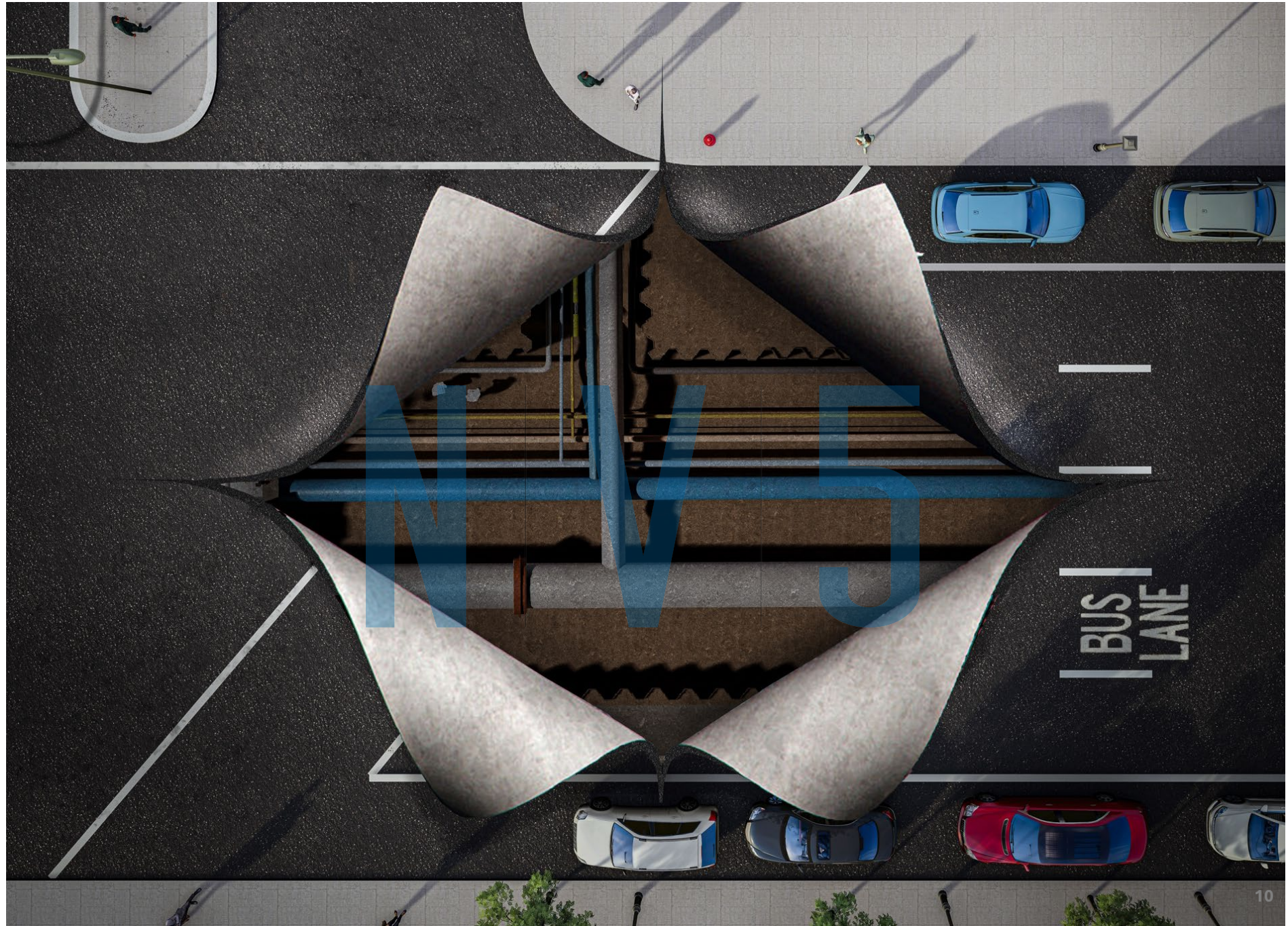
## OVERBUDGET, STARTING LATE, ENDING LATE



**So Where Do  
We Start**

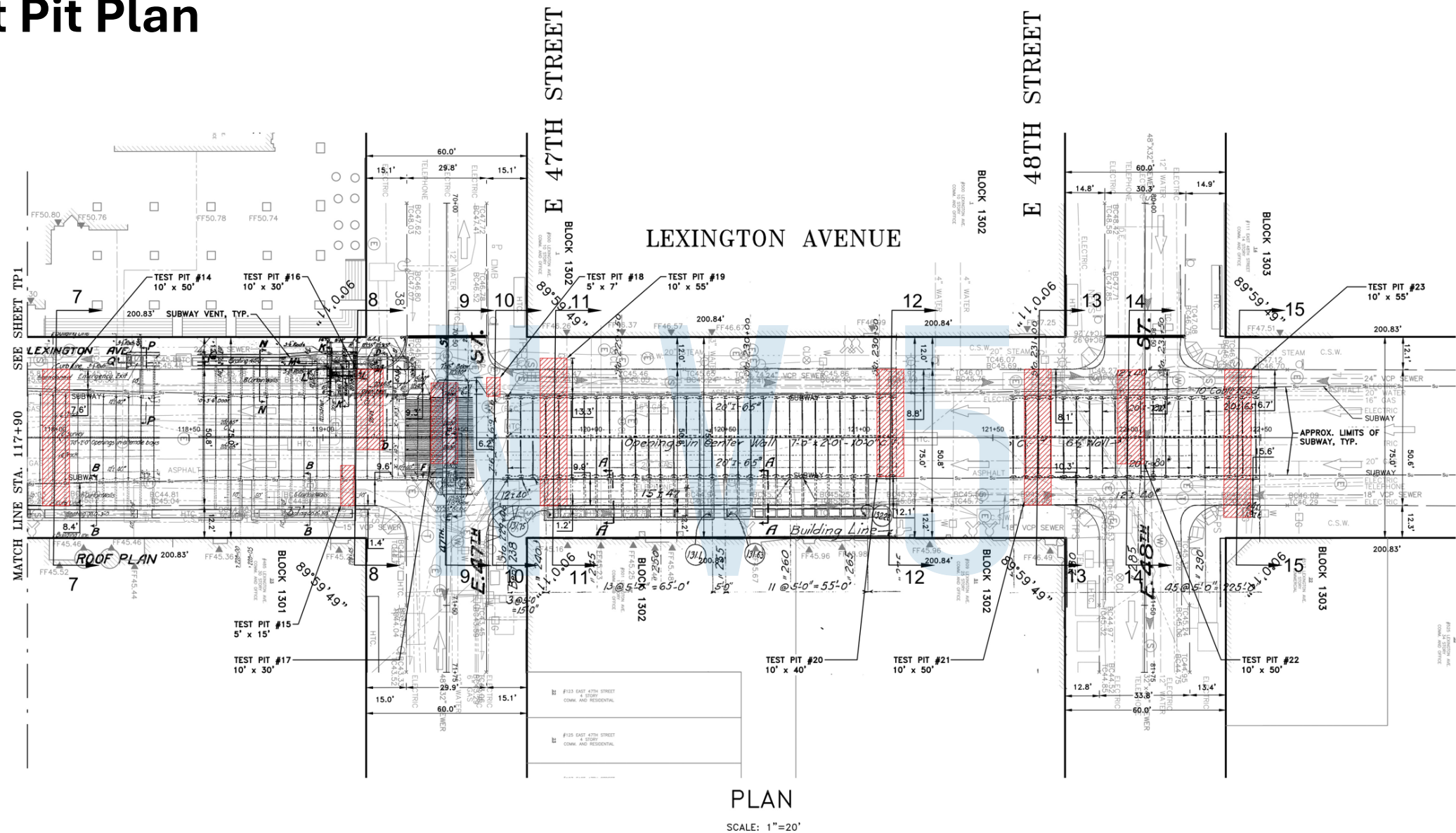


**If only we  
could peel  
back the street  
to see what  
was below**

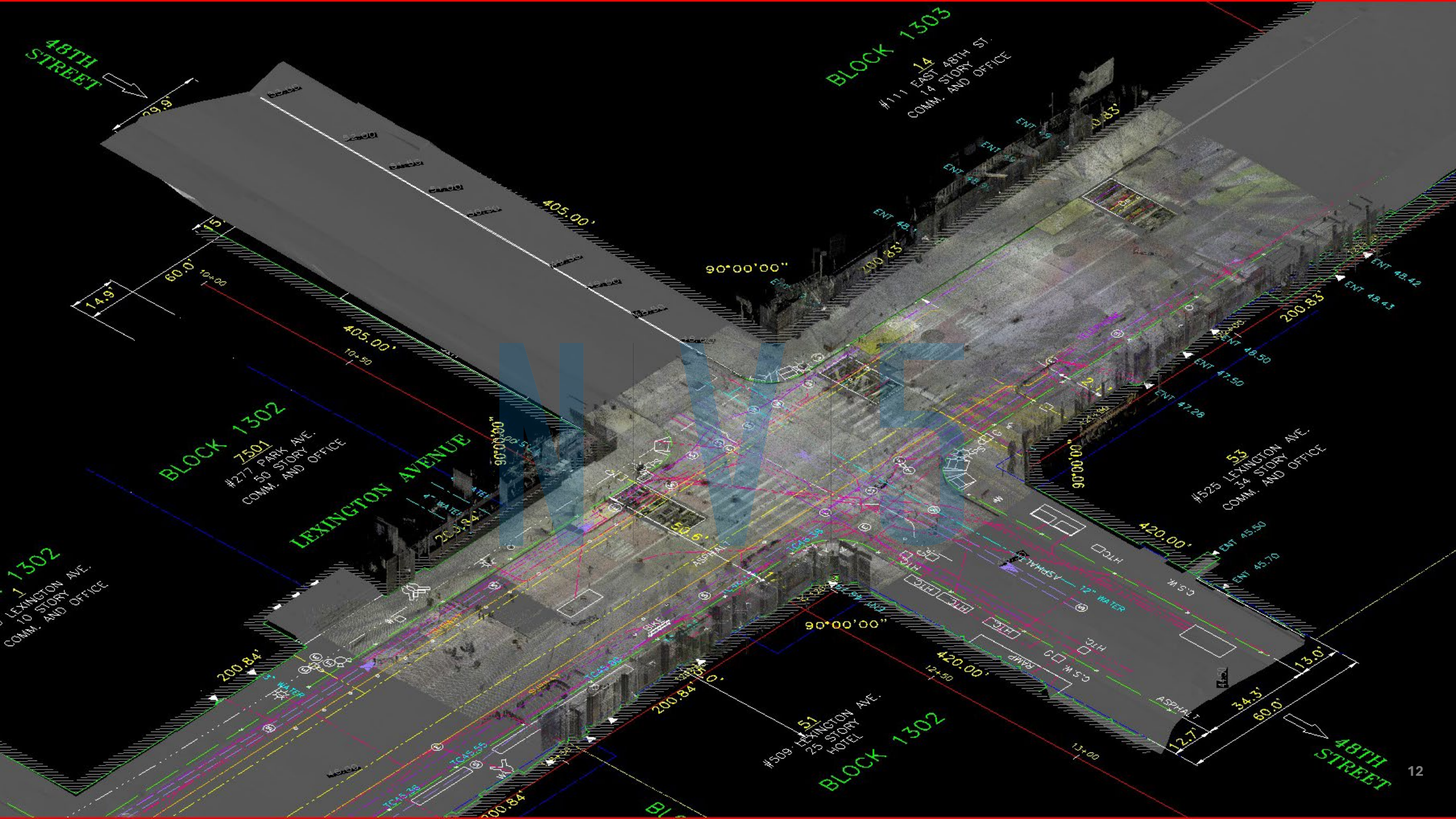




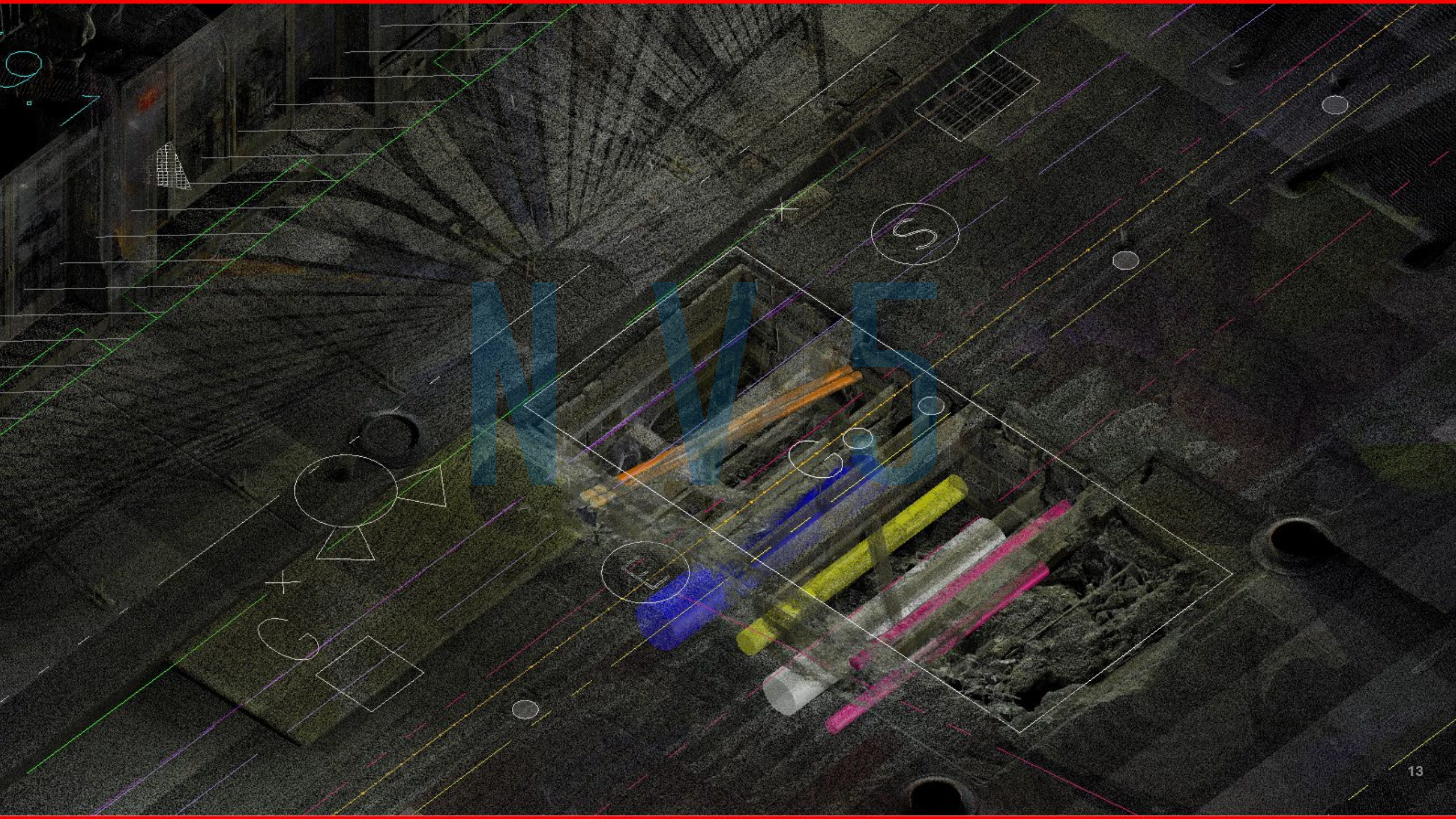
# Test Pit Plan



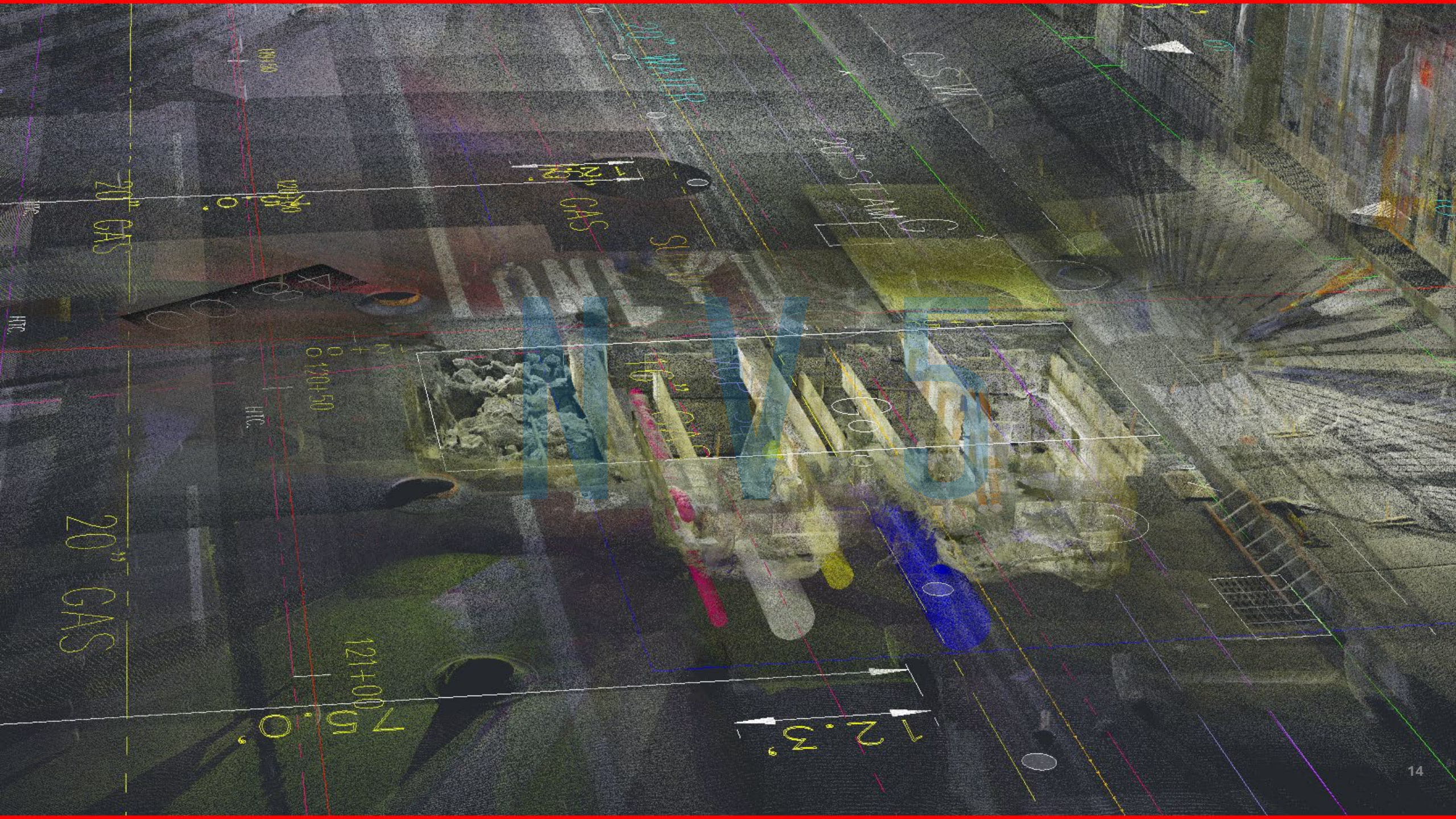










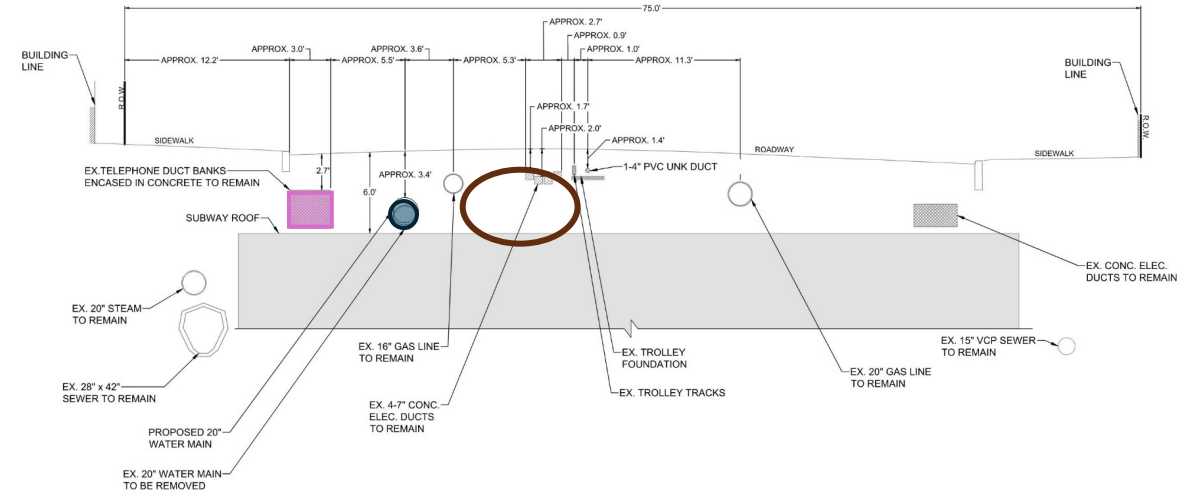




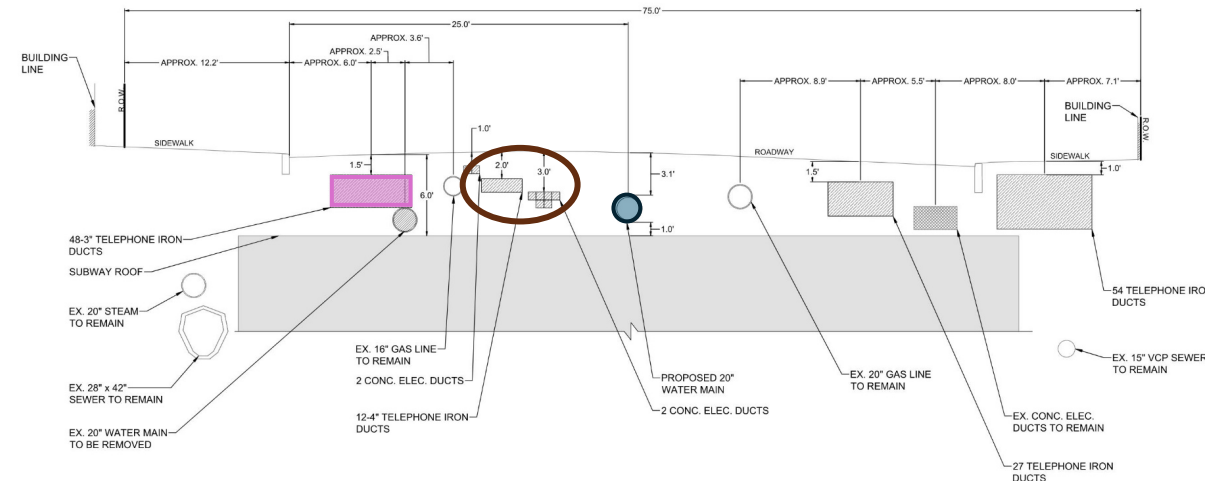
Based on Record Documents we were contemplating having to find a new lane for the water main, but based on actual field data the water main can be re-laid without interrupting the telecommunications systems

Telephone and Electrical Ducts were shown to be clustered adjacent to an existing Gas Line, but in reality they were not there at all.

This was forcing us to find a new lane for the watermain out towards the middle of the street. This would have required extended house connections, significant traffic impacts.

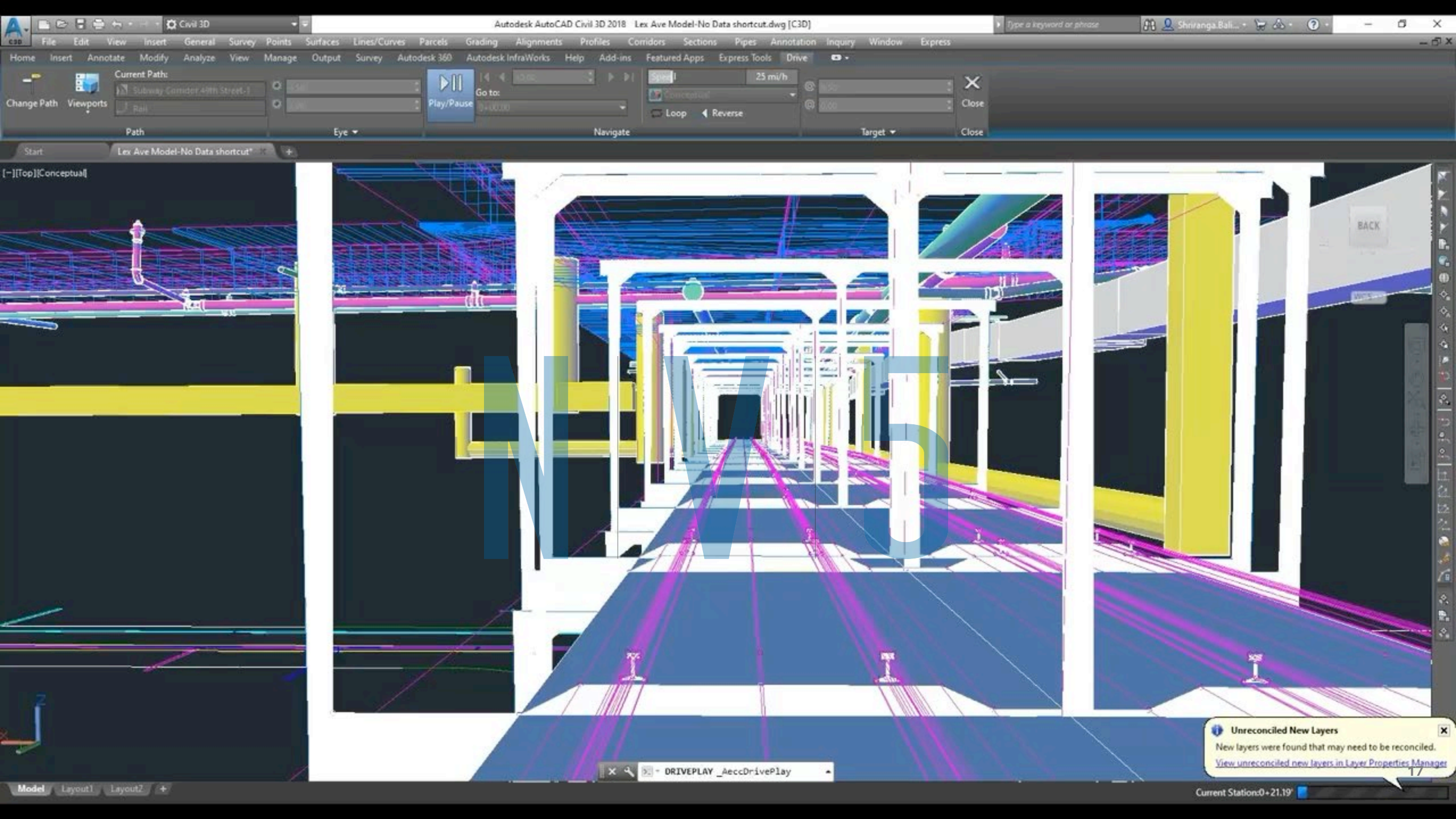


## FIELD VERIFIED SECTION



## RECORD SECTION

# Next Steps

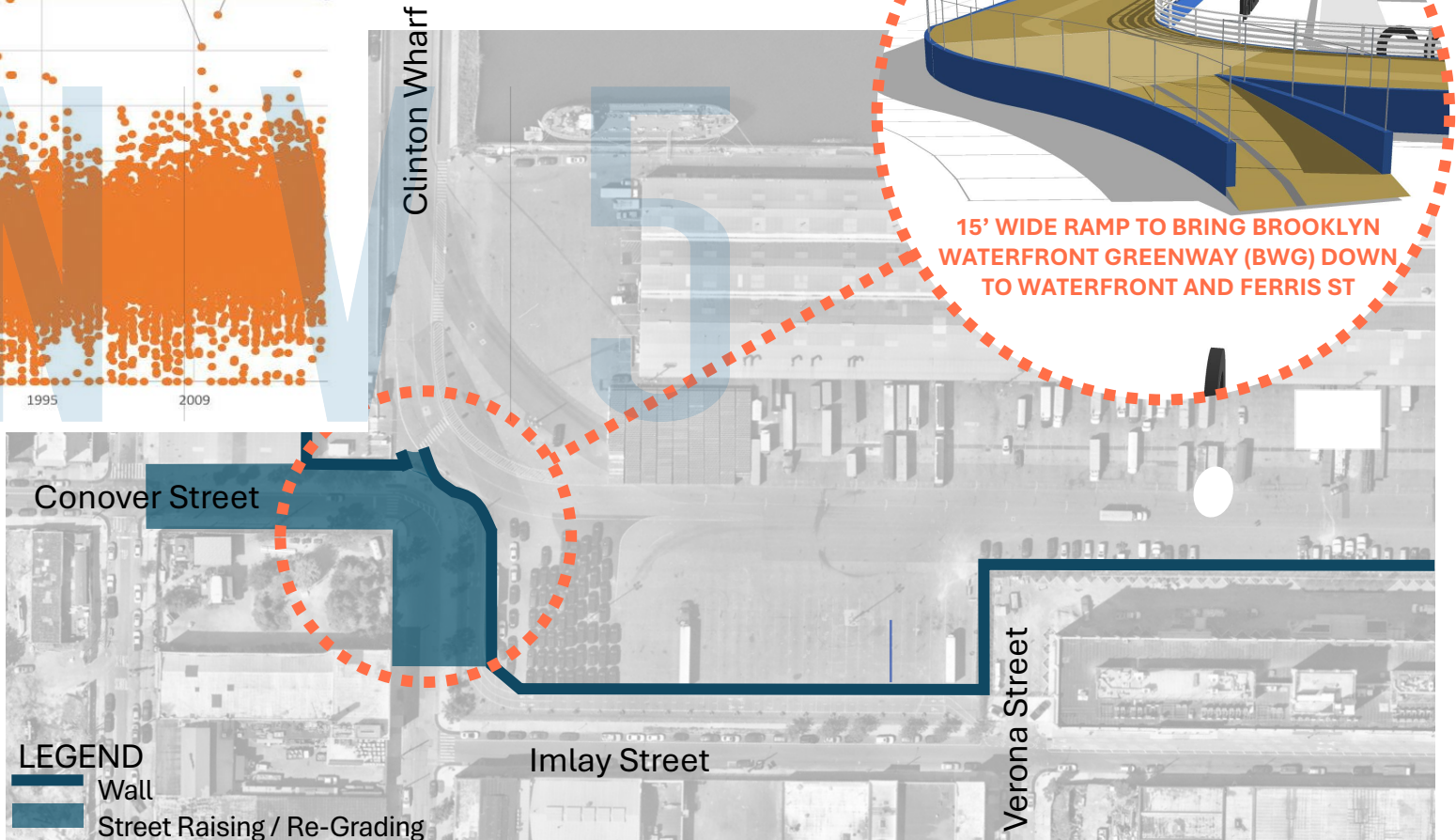
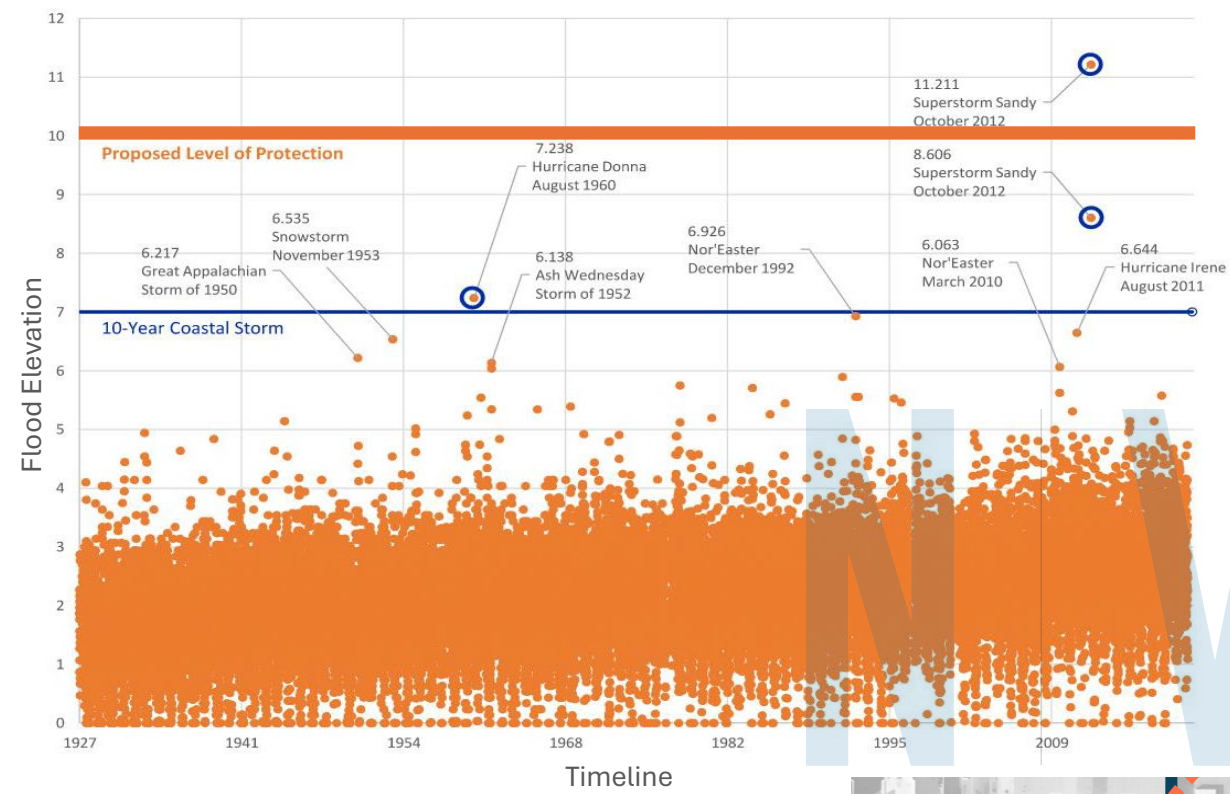






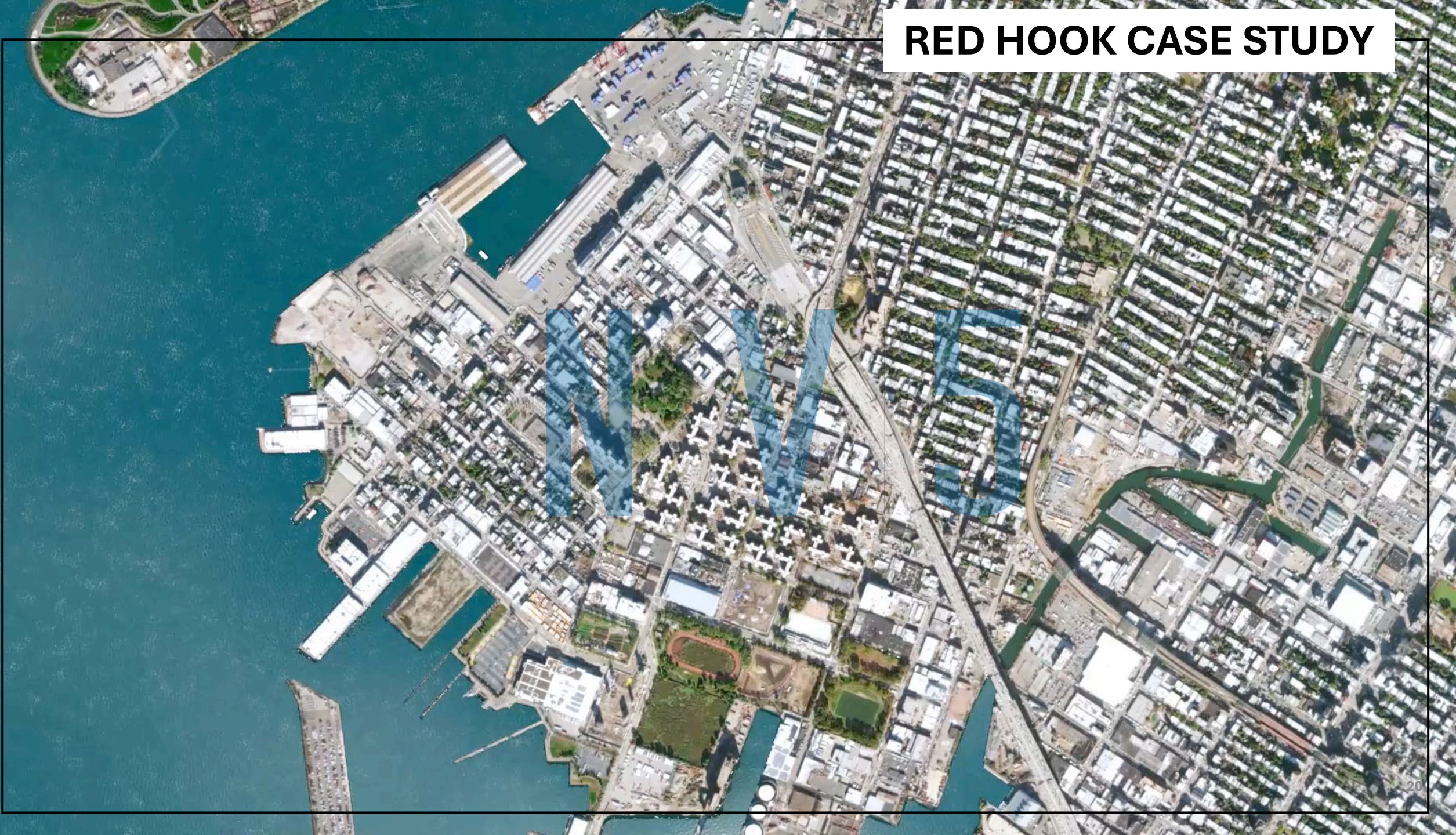


# RED HOOK CASE STUDY





# RED HOOK CASE STUDY





# RED HOOK CASE STUDY

Atlantic Basin – Area 2  
Pioneer and Conover Streets  
10-ft Elevation





# RED HOOK CASE STUDY



# Going Further





NV5

NV5

49TH-48TH STREET
SETUP MPT
SEGMENT 1
SAWCUT
EXCAVATE
INSTALL WATER MAIN
BACKFILL
TEMPORARY ASPHALT



360 degree Model

# THANK YOU