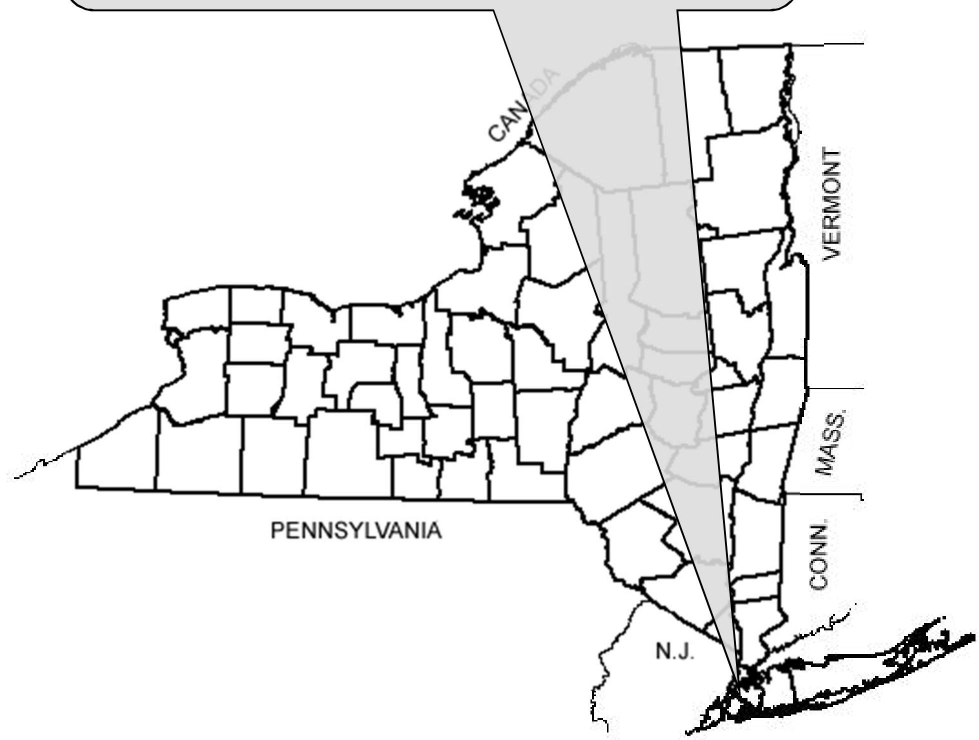
TRANSPORTATION PROJECT REPORT

FINAL DESIGN REPORT/ ENVIRONMENTAL ASSESSMENT (DR/EA) APPENDICES

January 2016

East Midtown Waterfront Esplanade and Greenway
P.I.N. X776.00 and X770.14
East 41st Street to East 60th Street on East River,
New York City



U.S. Department of Transportation Federal Highway Administration

New York State Department of Transportation

Project Sponsors:

NYC Economic Development Corporation

NYC Department of Transportation

NYC Department of Parks & Recreation

APPENDIX C
Transportation Information

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NEW YORK CITY DOT

Department of Transportation

POLLY TROTTENBERG, Commissioner

To Marilyn Lee, Assistant Vice-President
New York City Economic Development Corporation

From: Naim Rasheed, Director
Traffic Planning

Re: East Midtown Waterfront Esplanade and Greenway
Environmental Assessment Statement
CEQR No.: 13SBS004M

Date December 18, 2014

The Office of Project Analysis/CEQR has completed its review of the above referenced Environmental Assessment Statement (EAS). The lead agency for the proposed action is the New York City Department of Small Business Services (NYCDSBS). The New York City Economic Development Corporation (NYCEDC), in coordination with NYCDOT and the New York City Department of Parks & Recreation (NYCDPR), is proposing to construct the East Midtown Waterfront Esplanade and Greenway Project between East 41st and East 60th Streets in Manhattan, consisting of the Outboard Detour Roadway (ODR) Esplanade, United Nations (UN) Esplanade, and two upland bridge connections at the termini of East 48th and 54th Streets to the waterfront. The Build year is 2025.

We concur with the lead agency's determination that detailed traffic, pedestrian and parking analyses are not warranted for the proposed action following the 2014 CEQR Technical Manual Level I (trip generation) and Level II (trip assignments) screening assessments. NYCEDC will plan, design and implement the proposed project in close partnership with NYCDOT and NYCDPR. In addition, NYCEDC will involve NYCDOT in the review process during the preliminary and final design phases. The following NYCDOT's outstanding issues related to project coordination, design, ownership, and maintenance will be resolved by NYCEDC:

1. Ownership and maintenance of the esplanade and upland bridge connections will be determined. An MOU for the maintenance of the esplanade and connections will be established as necessary.
2. NYCDOT will participate in the review process relating to all future modifications to traffic control devices, geometric alignment, striping and signs, as well as any additional modification that would be warranted to accommodate bicyclists and pedestrians utilizing the proposed upland bridge connections during preliminary and final design. All designs/drawings should meet AASHTO and NYCDOT specifications.
3. NYCEDC has coordinated the proposed project with the NYPD Counterterrorism, UN and UNDC, and will continue to coordinate with these entities as planning and design evolves. NYCDOT will participate in all future coordination. While NYCEDC has indicated the

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proposed East 48th Street upland bridge connection would not interfere with the future UN loading docks which will be located within the City's ROW via revocable consent, any issues regarding UN access and the loading dock will be resolved during preliminary and final design.

4. Structural provisions for ramp security in the ROW near First Avenue (48th Street upland connection) and Sutton Place (54th Street upland connection) will be considered to secure the ramps from unauthorized vehicular access. This will require further review and approval by NYPD and NYCDOT during preliminary and final design. If a revocable consent will not be required for the upland connection, because it is a City project, any required security hardening structures will be included, as appropriate, in an MOU for construction and maintenance. Funding to be provided by the UN for maintenance purposes will be allocated to the maintenance of any required security hardening structures.
5. NYCEDC will coordinate construction of the esplanade and upland bridge connections with NYCDOT, as a portion of the FDR Drive is scheduled for rehabilitation in Fiscal Year 2019. This includes coordinating the construction contracts for both projects.

If you have any questions or need additional information, please call me at (212) 839-7710 or Michele Samuelsen-Jaiswal at (212) 839-7758.

c: D/C R. Russo, D/C R. Collyer, B/C M. Forgione, N. Mesa (OEC), S. Amron (Law Dept.), H. Adasko (EDC), R. Habashy (NYSDOT), D. Fenichel, A. Vyas, A. Borock, M. Craven, S. Barkho, J. Benson, W. Lee, N. Haiman, E. Schnell, T. Wright, S. Ahmed, M. Samuelsen-Jaiswal, File

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User Demand Projection and Analysis

Table 1A 04.08.14

Projection of Estimated Time of Construction (ETC) EMWE User Demand and Levels of Service (LOS)

Assumptions and Calculations		Value
1. Mode Split:		
Cyclists in Bike Path		65%
Walkers in Bike Path		3%
Joggers in Bike Path		2%
Skaters in Bike Path		1%
Walkers in Pedestrian Path		15%
Joggers in Pedestrian Path		12%
Skaters in Pedestrian Path		2%
Total		100%
2. Base Year		2011
3. Annual Growth Rate		3.1%
4. Estimated Time of Completion (ETC) _ EMWE Full Build Out		2025
5. Design Year ETC+10		2035
6. ETC Growth Rate: (@ 3.1% per year)		43.4%
7. Expected Latent Demand for EMWE at ETC (From HRG experience during First year)		72%
8. East Side 12-Hour cyclists (2011) at 50th Street Screenline -- See Table 4 (NYCDOT Screenline Counts: First, Second,Third, Lexington)		4409
9. Expanded East Side avenues 2011 Weekday 12-Hour Users' Volumes to ETC (4409*1.434)		6323
10. 12-Hr Weekday Latent Demand on EMWE at ETC (1.72*6323) (From HRG experience)		10875
11. Percentage of East Side Avenues cyclists Expected to Divert to EMWE (Using HRG 67% diversion for 4 east side avenues)		67%
12. Total 12-Hour Weekday East Side cyclists from Latent Demand at ETC (67%*10875)		7286
13. Saturday Volume/ Weekday Volume Ratio		1.135
14. Total 12-Hour Saturday Demand (1.135*7286) -- ETC Saturday Daily Demand		8270
15. Percentage of Peak Hour Volume to 12-Hour Volume		12%
16. Saturday Peak Hour Volumes at ETC (12%*8270)		992
17. Total EMWE users at ETC (Total Cyclists/65% cyclists)		1527
18. Total # of Users in each mode on EMWE at ETC (Sat. Pk Hr):	1527	
Cyclists		992
Walkers		275
Joggers		214
Skaters		46
19. Total # of Users in each mode on the Bike Path at ETC (Sat Pk Hr):	1084	
Cyclists		992
Walkers		46
Joggers		31
Skaters		15
20. Design Bicycle Volume in one direction (992/2) [Sat Pk Hr]		496
21. Total # of Users in each mode on the Ped Path at ETC (Sat Pk Hr)	443	
Cyclists		0
Walkers		229
Joggers		183
Skaters		31
22. Bike LOS Grade: B (Score 3.52 > 2.75 (Mid-D Score)[Ref 2006 SUPLOS Calculator]; Ped Path: LOS B (Surge Condition)		

Table 1B 04.08.14

Projection of Design Year (ETC+10) EMWE User Demand and Levels of Service (LOS)

Assumptions and Calculations		Value
1. Mode Split:		
Cyclists in Bike Path		65%
Walkers in Bike Path		3%
Joggers in Bike Path		2%
Skaters in Bike Path		1%
Walkers in Pedestrian Path		15%
Joggers in Pedestrian Path		12%
Skaters in Pedestrian Path		2%
Total		100%
2. Base Year		2011
3. Annual Growth Rate		3.1%
4. Estimated Time of Completion (ETC) _ EMWE Full Build Out		2025
5. Design Year ETC+10		2035
6. ETC Growth Rate: (@ 3.1% per year)		74.4%
7. Expected Latent Demand for EMWE at ETC (From HRG experience during First year)		72%
8. East Side 12-Hour cyclists (2011) at 50th Street Screenline -- See Table 4 (NYCDOT Screenline Counts: First, Second,Third, Lexington)		4409
9. Expanded East Side avenues 2011 Weekday 12-Hour Users' Volumes to ETC+10 (4409*1.744)		7689
10. 12-Hr Weekday Latent Demand on EMWE at ETC+10 (1.72*7689) (From HRG experience)		13226
11. Percentage of East Side Avenues cyclists Expected to Divert to EMWE (Using HRG 67% diversion for 4 east side avenues)		67%
12. Total 12-Hour Weekday East Side cyclists from Latent Demand at ETC+10 (67%*13226)		8861
13. Saturday Volume/ Weekday Volume Ratio		1.135
14. Total 12-Hour Saturday Demand (1.135*8861) -- ETC+10 Saturday Daily Demand		10057
15. Percentage of Peak Hour Volume to 12-Hour Volume		12%
16. Saturday Peak Hour Volumes at ETC+10 (12%*10057)		1207
17. Total EMWE users at ETC+10 (Total Cyclists/65% cyclists)		1857
18. Total # of Users in each mode on EMWE at ETC+10 (Sat. Pk Hr):	1857	
Cyclists		1207
Walkers		334
Joggers		260
Skaters		56
19. Total # of Users in each mode on the Bike Path at ETC+10 (Sat Pk Hr):	1318	
Cyclists		1207
Walkers		56
Joggers		37
Skaters		19
20. Design Bicycle Volume in one direction (1207/2) [Sat Pk Hr]		603
21. Total # of Users in each mode on the Ped Path at ETC+10 (Sat Pk Hr)	538	
Cyclists		0
Walkers		279
Joggers		223
Skaters		37
22. Bike LOS Grade: C (Score 3.37 > 2.75 (Mid-D Score)[Ref 2006 SUPLOS Calculator]; Ped Path: LOS B (Surge Condition)		

Table 4
New York City Year 2011 12-Hour Bicycle Screenline Count at 50th Street

Facility	Spring (May)	Summer (Aug)	Fall (Sept)	East Side Average
First Avenue	689	1122	1062	958
Second Avenue	1093	1245	1386	1241
Third Avenue	1281	1214	1292	1262
Lexington Avenue	886	1028	930	948
Park Avenue	1405	1084	831	
Madison Avenue	865	914	831	
Fith Avenue	1047	1323	1390	
Sixth Avenue	1468	1635	1584	
Seventh Avenue	791	895	867	
Broadway	1303	674	1238	
Eighth Avenue	1491	1432	1618	
Ninth Avenue	1536	1353	1555	
Tenth Avenue	702	556	399	
Eleventh Avenue	572	529	600	
Twelve Avenue	150	109	120	
Hudson River Greenway	5267	5486	5676	
	20546	20599	21379	4409

Source: NYCDOT

New York City 12-Hour Bicycle Screenline Count*
New York City Department of Transportation
Bureau of Traffic Operations

Facility	2000	2001	2002	2003	2004	2005	2006	2007***			2008			2009			2010			2011			2012		
		(Aug)	(Aug-Oct**)	(Aug-Sept)	(Jul-Aug)	(Aug)	(Sept)	Spring (May)	Summer (Jul-Aug)	Fall (Sept)	Spring (May)	Summer (Aug)	Fall (Sept)	Spring (May)	Summer (Aug)	Fall (Sept)	Spring (May)	Summer (Aug)	Fall (Sept)	Spring (May)	Summer (Aug)	Fall (Sept)	Spring (May)	Summer (Aug)	Fall (Sept)
First Ave	379	312	266	357	343	541	632	430	245	395	278	344	379	369	777	677	638	907	938	689	1,122	1,062	987	1,295	935
Second Ave	797	354	707	648	645	696	829	764	711	624	667	785	519	886	1,013	1,045	970	1,121	1,262	1,093	1,245	1,386	1,092	1,505	1,261
Third Ave	710	447	641	454	711	694	962	795	936	549	985	1,023	701	966	1,067	1,170	1,201	1,132	1,341	1,281	1,214	1,292	951	1,292	827
Lexington Ave	498	382	456	486	345	393	808	649	776	787	650	593	722	772	727	801	1,004	807	960	886	1,028	930	529	1,022	656
Park Ave (a)	905	597	433	907	756	990	1,175	1,210	1,037	884	778	1,155	900	1,061	694	898	1,389	1,064	1,300	1,405	1,084	831	877	1,284	901
Madison Ave	686	609	610	729	623	344	1,018	688	891	1,129	596	723	739	728	813	979	858	905	1,061	865	914	831	916	1,085	907
Fifth Ave	588	427	617	937	810	946	1,683	825	596	971	1,285	917	1,237	1,216	1,131	1,144	894	1,202	1,534	1,047	1,323	1,390	1,458	1,353	1,645
Sixth Ave	1,329	1,132	1,053	1,433	1,358	1,315	1,182	1,327	941	1,002	715	1,028	1,134	849	1,367	1,360	1,445	1,549	1,475	1,468	1,635	1,584	1,209	1,637	1,817
Seventh Ave	584	627	473	721	557	464	1,029	761	618	502	594	459	704	863	756	741	949	816	740	791	895	867	749	N/A	755
Broadway (b)	810	412	664	791	739	689	1,144	1,040	899	873	525	611	536	722	771	894	1,065	1,009	1,206	1,303	674	1,238	N/A	661	748
Eighth Ave	1,160	1,443	715	783	1,138	845	1,212	656	598	1,337	742	745	854	1,038	1,171	1,226	1,525	1,312	1,527	1,491	1,432	1,618	914	1,477	1,082
Ninth Ave	798	754	599	845	963	794	1,069	1,048	866	847	949	1,001	1,105	1,132	1,191	1,385	1,277	1,315	1,480	1,536	1,353	1,555	850	1,428	1,092
Tenth Ave	568	213	414	501	238	172	325	514	403	467	483	510	459	536	538	642	657	529	714	702	556	399	474	634	562
Eleventh Ave (a)	442	149	165	137	323	264	535	370	387	229	311	316	322	422	451	479	558	547	584	572	529	600	309	601	349
Twelfth Ave (a)	72	11	3	85	42	55	36	63	87	129	38	115	70	116	68	87	108	120	131	150	109	120	102	128	72
Hudson River Greenway (c)		2,113	2,366	2,885	2,686	2,037	1,958	2,404	2,392	2,963	2,384	4,581	3,597	3,287	5,520	5,440	3,985	5,036	5,629	5,267	5,486	5,676	5,573	6,170	4,622
Subtotal	**10,326**	**9,982**	**10,182**	**12,699**	**12,277**	**11,239**	**15,597**	13,544	12,383	13,688	11,980	14,906	13,978	14,963	18,055	18,968	18,523	19,371	21,882	20,546	20,599	21,379	16,990	21,572	18,231
Brooklyn Br. (c)	762	867	981	1,049	1,422	1,349	1,284	1,574	1,689	1,616	1,728	1,781	1,892	1,845	2,376	2,172	2,212	2,528	2,683	2,668	2,514	1,896	1,573	2,568	2,022
Queensboro Br. (c)	546	667	517	1,331	1,099	976	1,158	1,100	1,244	1,533	2,001	1,836	1,377	1,676	2,423	2,556	2,173	3,070	2,619	2,164	3,433	3,333	2,199	3,416	2,535
Williamsburg Br. (c)	733	792	1,117	1,387	974	1,609	2,566	1,644	2,284	2,842	2,743	2,864	3,397	3,423	3,966	4,330	3,934	5,110	4,693	4,264	4,479	4,235	3,546	4,745	4,560
Manhattan Bridge (c, d)		147	546	661	856	829	1,578	1,280	1,522	1,137	2,609	2,127	1,960	2,385	2,365	2,683	2,929	2,771	3,356	4,286	3,067	3,849	3,017	3,749	3,837
Staten Island Ferry	389	253	104	354	303	290	105	341	266	149	188	373	312	143	309	332	354	284	399	365	346	386	146	384	174
Subtotal	**2,430**	**2,726**	**3,265**	**4,782**	**4,654**	**5,053**	**6,691**	5,939	7,005	7,277	9,269	8,981	8,938	9,472	11,439	12,073	11,602	13,763	13,750	13,747	13,839	13,699	10,481	14,862	13,128
Grand Total	**12,756**	**12,708**	**13,447**	**17,481**	**16,931**	**16,292**	**22,288**	19,483	19,388	20,965	21,249	23,887	22,916	24,435	29,494	31,041	30,125	33,134	35,632	34,293	34,438	35,078	27,471	36,434	31,359

(a) Two-way roadway
(b) Class II bike lane
(c) Class I bike path
(d) Path reopened 2001
* 7:00AM-7:00PM
** Monday Count
***Starting in 2007, counts were conducted three times per year (Spring, Summer and Fall)

New York City 18-Hour Bicycle Screenline Count*
New York City Department of Transportation
Bureau of Traffic Operations

Facility	2007			2008			2009			2010			2011			2012		
	May	August	Sept	May	August	Sept	May	August	Sept	May	August	Sept	May	Aug	Sept	May	Aug	Sept
First Ave	616	348	577	453	512	595	572	1,070	977	922	1,338	1,387	1,061	1,606	1,621	1,398	1,896	1,429
Second Ave	1,177	1,027	745	937	1,166	872	1,222	1,505	1,591	1,451	1,679	1,925	1,690	1,831	2,052	1,603	2,208	1,694
Third Ave	1,238	1,120	696	1,215	1,271	924	1,260	1,524	1,655	1,592	1,700	2,009	1,773	1,921	1,979	1,459	2,029	1,280
Lexington Ave	768	1,011	1,027	820	810	990	1,031	1,034	1,138	1,306	1,183	1,353	1,306	1,448	1,361	746	1,471	940
Park Ave (a)	1,599	1,349	1,283	1,166	1,706	1,325	1,652	1,038	1,522	2,033	1,547	1,884	2,003	1,665	1,241	1,251	1,940	1,259
Madison Ave	813	1,074	1,388	888	929	912	1,038	1,042	1,197	1,213	1,196	1,387	1,222	1,260	1,173	1,245	1,488	1,192
Fifth Ave	1,066	734	1,207	1,593	1,017	1,563	1,517	1,348	1,396	1,196	1,596	1,906	1,410	1,937	1,921	2,013	1,881	2,224
Sixth Ave	1,858	1,358	1,396	990	1,386	1,630	1,242	1,860	2,042	2,047	2,180	2,270	2,165	2,433	2,353	1,724	2,486	2,819
Seventh Ave	1,002	789	610	1,027	788	934	1,370	1,085	1,092	1,478	1,203	1,145	1,201	1,320	1,295	1,220	N/A	1,210
Broadway (b)	1,472	1,184	1,123	671	888	656	942	1,037	1,222	1,338	1,339	1,557	1,796	903	1,702	N/A	902	1,139
Eighth Ave	888	762	1,923	990	1,088	1,159	1,453	1,728	1,760	2,098	1,993	2,347	2,086	2,177	2,482	1,515	2,225	1,865
Ninth Ave	1,505	1,142	1,383	1,541	1,552	1,682	1,868	1,944	2,291	2,013	2,154	2,327	2,426	2,086	2,412	1,556	2,210	1,747
Tenth Ave	826	636	632	721	739	790	865	851	1,004	1,047	939	1,035	1,145	909	677	821	1,071	955
Eleventh Ave (a)	462	469	345	412	434	427	520	622	609	691	733	770	717	727	781	407	824	493
Twelfth Ave (a)	84	108	159	60	141	87	149	95	110	143	175	166	195	145	180	135	176	238
Hudson River Greenway (c)	3,027	3,351	3,646	3,463	5,700	5,178	3,842	7,082	6,895	5,304	6,372	6,971	6,925	7,335	7,095	7,077	8,088	5,497
Subtotal	18,401	16,462	18,140	16,947	20,127	19,724	20,543	24,865	26,501	25,872	26,501	26,501	29,121	29,703	30,325	24,170	30,895	25,981
Brooklyn Br. (c)	2,035	2,287	2,036	2,107	2,669	2,675	2,227	3,015	2,633	2,745	3,279	3,362	3,321	3,272	2,469	2,080	3,324	2,580
Queensboro Br. (c)	1,480	1,656	1,880	2,429	2,208	1,881	2,246	3,216	3,316	2,993	4,015	3,627	2,761	4,611	4,342	3,013	4,509	3,488
Williamsburg Br. (c)	2,299	3,174	3,765	3,701	3,760	4,477	4,481	5,431	5,745	5,675	6,848	6,263	5,999	6,531	6,128	5,180	6,890	6,331
Manhattan Bridge (c, d)	1,634	2,881	1,847	3,919	3,215	2,555	3,173	3,155	3,642	4,048	3,525	4,313	5,346	3,940	5,619	4,084	5,000	5,025
Staten Island Ferry	404	338	191	241	420	430	188	419	458	441	372	560	475	481	521	252	529	250
Subtotal	7,852	10,336	9,719	12,397	12,272	12,018	12,315	15,236	15,794	15,902	18,039	18,125	17,902	18,835	19,079	14,609	20,252	17,674
Grand Total	26,253	26,798	27,859	29,344	32,399	31,742	32,858	40,101	42,295	41,774	44,540	44,626	47,023	48,538	49,404	38,779	51,147	43,655

(a) Two-way roadway
(b) Class II bike lane
(c) Class I bike path
(d) Path reopened 2001
* 6:00AM-12:00AM

NEW YORK CITY DOT

Level of Service (LOS)

July 2006

Shared-Use Path Level of Service Calculator

A USER'S GUIDE

U.S. Department of Transportation
Federal Highway Administration

Research, Development, and Technology
Turner-Fairbank Highway Research Center
6300 Georgetown Pike
McLean, VA 22101-2296

Pedestrian and Bicycle Safety

3. LOS FOR SHARED-USE PATHS

WHAT IS LOS?

For motor vehicles on roadways, HCM defines LOS as a "quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience."[(3)] HCM defines six levels of service for a particular facility type and uses letters A to F to represent them, from best to worst. Each LOS represents a range of operating conditions. Safety is not explicitly included in the measures that establish motor vehicle LOS.

The trail LOS model developed through this research is similar to that which is used for motor vehicle LOS. Listed below are some key similarities and differences.

Similarities include:

- The trail LOS model uses six levels of service categories and the letters A to F are used to represent them, from best to worst.
- Maintaining an optimum speed (for the bicyclist) is a key criterion.
- Service measures are primarily related to freedom to maneuver. These include meetings, active passes, delayed passes, and the perceived ability to pass.
- Safety is not included in the set of measures that establish service levels.

The key difference is:

- Trail LOS does not factor in travel time or traffic interruptions such as signals or stop signs at grade crossings.

It is important to note a host of other factors the reader may want to consider in a trail users' assessment of comfort and enjoyment of a trail, such as the following:

- Pavement/surface condition and materials.
- Weather.
- Frequency and design of curves.
- Presence and degree of grade changes (hills).
- Proximity to adjacent motor vehicle traffic.
- Quality of scenery.
- Physical setting.
- Quality of bicycling equipment in use.
- Perceived safety of the surrounding neighborhood.

Just as motor vehicle LOS measures a limited aspect of the experience of driving and does not take into account the quality of the vehicle in which a person travels, the scenery along the road, etc., the trail LOS model has similar limitations. While such factors of trail design are important to the user's experience, they will be left to further research.

THE SHARED-USE PATH LOS MODEL

The Shared-Use Path LOS (SUPLOS) model is a mathematical formula that uses select inputs describing conditions along a trail to calculate an LOS score. A key task in model development was to determine what inputs should be used and what mathematical relationships existed among them. The goal was to develop a formula that would yield scores consistent with the evaluation of similar conditions made by participants in the perception survey. A secondary objective was to use only those inputs that are truly necessary and most readily available.

Using a variety of statistical methods, the operational and user perception survey variables were examined to evaluate which variables had the most influence in determining the grades users gave to the different conditions represented in the video clips. A model (mathematical equation) was built that would use the most significant factors as inputs to generate LOS scores and grades. The model was tested and adjusted to ensure that it generated grades that closely correlated to the perception scores that trail users gave each video clip.

The equation in figure 1, below, is the basic SUPLOS model. Appendix B provides additional details about the factors used in the model. For a complete explanation of the derivation of the model see chapter 7 of the Final Report.[8]

$$\text{SUPLOS} = 5.446 - 0.00809(E) - 15.86(RW) - 0.287(CL) - (DPF)$$

Figure 1. Equation. Basic SUPLOS model.

Where:

E = Events = Meetings per minute + 10 (active passes per minute)
RW = Reciprocal of path width (i.e., 1/path width, in feet)
CL = 1 if trail has a centerline, 0 if trail has no centerline
DPF = Delayed pass factor

The SUPLOS model generates a LOS score between zero and five. Table 5 describes the SUPLOS scale, which shows how raw scores correspond to letter grades. An A is the highest score, excellent, and an F is the lowest score.

Table 5. SUPLOS scale.

LOS Score	LOS Grade	
$X \geq 4.0$	A	Best
$3.5 \leq X < 4.0$	B	↓
$3.0 \leq X < 3.5$	C	
$2.5 \leq X < 3.0$	D	
$2.0 \leq X < 2.5$	E	
$X < 2.0$	F	Worst

INTERPRETING SHARED-USE PATH LOS GRADES

In general, grades A–C can be considered acceptable levels of service and D–F can be considered degraded levels of service. The LOS descriptions in table 6 provide a more refined framework.

A benefit of this LOS model is that it provides a uniform quantitative measurement for use throughout the United States and North America. However, each political jurisdiction and trail managing agency certainly has latitude to adopt different policies covering acceptable levels of service for trails within their own communities, as is the case with roadway levels of service. To some degree, determining what scores and grades are acceptable can vary for each different application of the model. For example, a jurisdiction may elect to establish a policy to ensure that new trails meet a higher performance standard than the standard considered acceptable for existing trails.

Table 6. Interpreting SUPLOS grades.

A: **Excellent.** Trail has optimum conditions for individual bicyclists and retains ample space to absorb more users of all modes, while providing a high-quality user experience. Some newly built trails will provide grade-A service until they have been discovered or until their ridership builds up to projected levels.

B: **Good.** Trail has good bicycling conditions, and retains significant room to absorb more users, while maintaining an ability to provide a high-quality user experience.

C: **Fair.** Trail has at least minimum width to meet current demand and to provide basic service to bicyclists. A modest level of additional capacity is available for bicyclists and skaters; however more pedestrians, runners, or other slow-moving users will begin to diminish LOS for bicyclists.

D: **Poor.** Trail is nearing its functional capacity given its width, volume, and mode split. Peak-period travel speeds are likely to be reduced by levels of crowding. The addition of more users of any mode will result in significant service degradation. Some bicyclists and skaters are likely to adjust their experience expectations or to avoid peak-period use.

E: **Very Poor.** Given trail width, volume, and user mix, the trail has reached its functional capacity. Peak-period travel speeds are likely to be reduced by levels of crowding. The trail may enjoy strong community support because of its high usage rate; however, many bicyclists and skaters are likely to adjust their experience expectations, or to avoid peak-period use.

F: **Failing.** Trail significantly diminishes the experience for at least one, and most likely for all user groups. It does not effectively serve most bicyclists; significant user conflicts should be expected.

LOS SCORES FOR 15 STUDY TRAILS

Table 7 provides LOS scores and grades for 15 trails studied as part of this research. This table includes two-way and one-way user volumes, mode splits, trail widths, and presence of centerline variables. It also provides a data profile for the average trail and its corresponding LOS score and grade (3.15, C).

Shared Use Path Flow Analysis Tool

Trail Level of Service (LOS) Calculator

Draft Spreadsheet Based on Federal Highway Administration Shared Use Path Study

North Carolina State University and Toole Design Group

Trail LOS Scale	
LOS Score	**LOS Grade**
X≥4.0	A
3.5≤X<4.0	B
3.0≤X<3.5	C
2.5≤X<3.0	D
2.0≤X<2.5	E
X<2.0	F

ROW #1

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							User Perception		Delayed Passings Adjustment				Prelim LOS Score	Trail Level of Service	
EMWE	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**								*Adj. Factor (subtract from User Percep. score)*						
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	Score	Grade	Percent	# Per Hr	Pre Adj Fac	Fin Adj Fac	Prelim LOS Score	LOS Score	LOS Grade
Build ETC (2025)	15.0	1	542	91.6%	4.2%	2.8%	1.4%	0.0%	100.0%	3.72	B	####	23.62	0.20	0.20	3.52	3.52	B

*Default mode split is 55% adult bicyclists, 20% pedestrians, 10% runners, 10% in-line skaters, and 5% child bicylists.

Click Here for Default Mode Split

ROW #2

Total Mode Split Does Not Add Up to 100.0%

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							User Perception		Delayed Passings Adjustment				Prelim LOS Score	Trail Level of Service	
EMWE	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**								*Adj. Factor (subtract from User Percep. score)*						
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	Score	Grade	Percent	# Per Hr	Pre Adj Fac	Fin Adj Fac	Prelim LOS Score	LOS Score	LOS Grade
Build ETC (2025)	15.5	1								4.14	A	0.00%	0.00	0.00	0.00	4.14	4.14	A

*Default mode split is 55% adult bicyclists, 20% pedestrians, 10% runners, 10% in-line skaters, and 5% child bicylists.

Click Here for Default Mode Split

ROW #3

Total Mode Split Does Not Add Up to 100.0%

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							User Perception		Delayed Passings Adjustment				Prelim LOS Score	Trail Level of Service	
EMWE	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**								*Adj. Factor (subtract from User Percep. score)*						
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	Score	Grade	Percent	# Per Hr	Pre Adj Fac	Fin Adj Fac	Prelim LOS Score	LOS Score	LOS Grade
Build ETC (2025)	16.0	1								4.17	A	0.00%	0.00	0.00	0.00	4.17	4.17	A

*Default mode split is 55% adult bicyclists, 20% pedestrians, 10% runners, 10% in-line skaters, and 5% child bicylists.

Click Here for Default Mode Split

ROW #4

Total Mode Split Does Not Add Up to 100.0%

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							User Perception		Delayed Passings Adjustment				Prelim LOS Score	Trail Level of Service	
EMWE	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**								*Adj. Factor (subtract from User Percep. score)*						
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	Score	Grade	Percent	# Per Hr	Pre Adj Fac	Fin Adj Fac	Prelim LOS Score	LOS Score	LOS Grade
Build ETC (2025)	17.0	1								4.23	A	0.00%	0.00	0.00	0.00	4.23	4.23	A

*Default mode split is 55% adult bicyclists, 20% pedestrians, 10% runners, 10% in-line skaters, and 5% child bicylists.

Click Here for Default Mode Split

ROW #5

Total Mode Split Does Not Add Up to 100.0%

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							User Perception		Delayed Passings Adjustment				Prelim LOS Score	Trail Level of Service	
EMWE	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**								*Adj. Factor (subtract from User Percep. score)*						
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	Score	Grade	Percent	# Per Hr	Pre Adj Fac	Fin Adj Fac	Prelim LOS Score	LOS Score	LOS Grade
Build ETC (2025)	18.0	1								4.28	A	0.00%	0.00	0.00	0.00	4.28	4.28	A

*Default mode split is 55% adult bicyclists, 20% pedestrians, 10% runners, 10% in-line skaters, and 5% child bicylists.

Click Here for Default Mode Split

MODEL ASSUMPTIONS

Trail volume represents the actual number of users counted in the field (the model adjusts this volume based on a peak hour factor of 0.85).

Bicyclists will pass all trail users that are traveling less than 12.8 miles per hour (average bicyclist speed)

Shared Use Path Flow Analysis Tool

Trail Level of Service (LOS) Calculator

Draft Spreadsheet Based on Federal Highway Administration Shared Use Path Study

North Carolina State University and Toole Design Group

Trail LOS Scale	
LOS Score	**LOS Grade**
$X \geq 4.0$	A
$3.5 \leq X < 4.0$	B
$3.0 \leq X < 3.5$	C
$2.5 \leq X < 3.0$	D
$2.0 \leq X < 2.5$	E
$X < 2.0$	F

ROW #1

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							User Perception		Delayed Passings Adjustment				Prelim LOS Score	Trail Level of Service	
EMWE	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**								*Adj. Factor (subtract from User Percep. score)*						
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	Score	Grade	Percent	# Per Hr	Pre Adj Fac	Fin Adj Fac	Prelim LOS Score	LOS Score	LOS Grade
Build ETC+10 (2035)	15.0	1	659	91.6%	4.2%	2.8%	1.4%	0.0%	100.0%	3.64	B	####	32.48	0.27	0.27	3.37	3.37	C

*Default mode split is 55% adult bicyclists, 20% pedestrians, 10% runners, 10% in-line skaters, and 5% child bicylists.

Click Here for Default Mode Split

ROW #2 *Total Mode Split Does Not Add Up to 100.0%*

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							User Perception		Delayed Passings Adjustment				Prelim LOS Score	Trail Level of Service	
EMWE	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**								*Adj. Factor (subtract from User Percep. score)*						
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	Score	Grade	Percent	# Per Hr	Pre Adj Fac	Fin Adj Fac	Prelim LOS Score	LOS Score	LOS Grade
Build ETC+10 (2035)	15.5	1								4.14	A	0.00%	0.00	0.00	0.00	4.14	4.14	A

*Default mode split is 55% adult bicyclists, 20% pedestrians, 10% runners, 10% in-line skaters, and 5% child bicylists.

Click Here for Default Mode Split

ROW #3 *Total Mode Split Does Not Add Up to 100.0%*

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							User Perception		Delayed Passings Adjustment				Prelim LOS Score	Trail Level of Service	
EMWE	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**								*Adj. Factor (subtract from User Percep. score)*						
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	Score	Grade	Percent	# Per Hr	Pre Adj Fac	Fin Adj Fac	Prelim LOS Score	LOS Score	LOS Grade
Build ETC+10 (2035)	16.0	1								4.17	A	0.00%	0.00	0.00	0.00	4.17	4.17	A

*Default mode split is 55% adult bicyclists, 20% pedestrians, 10% runners, 10% in-line skaters, and 5% child bicylists.

Click Here for Default Mode Split

ROW #4 *Total Mode Split Does Not Add Up to 100.0%*

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							User Perception		Delayed Passings Adjustment				Prelim LOS Score	Trail Level of Service	
EMWE	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**								*Adj. Factor (subtract from User Percep. score)*						
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	Score	Grade	Percent	# Per Hr	Pre Adj Fac	Fin Adj Fac	Prelim LOS Score	LOS Score	LOS Grade
Build ETC+10 (2035)	17.0	1								4.23	A	0.00%	0.00	0.00	0.00	4.23	4.23	A

*Default mode split is 55% adult bicyclists, 20% pedestrians, 10% runners, 10% in-line skaters, and 5% child bicylists.

Click Here for Default Mode Split

ROW #5 *Total Mode Split Does Not Add Up to 100.0%*

Segment Name	Path Width	Centerline	Volume (users per hour in 1 direction) and Mode Split							User Perception		Delayed Passings Adjustment				Prelim LOS Score	Trail Level of Service	
EMWE	Closest 0.5 ft.	0=No Centerline	*Volume*	*Mode Split (%)**								*Adj. Factor (subtract from User Percep. score)*						
Name	Width (ft)	1=Centerline	One-Way (per hour)	Adult Bicyclists	Pedestrians	Runners	In-Line Skaters	Child Bicyclists	All Modes	Score	Grade	Percent	# Per Hr	Pre Adj Fac	Fin Adj Fac	Prelim LOS Score	LOS Score	LOS Grade
Build ETC+10 (2035)	18.0	1								4.28	A	0.00%	0.00	0.00	0.00	4.28	4.28	A

*Default mode split is 55% adult bicyclists, 20% pedestrians, 10% runners, 10% in-line skaters, and 5% child bicylists.

Click Here for Default Mode Split

MODEL ASSUMPTIONS

Trail volume represents the actual number of users counted in the field (the model adjusts this volume based on a peak hour factor of 0.85).

Bicyclists will pass all trail users that are traveling less than 12.8 miles per hour (average bicyclist speed)

II

Construction Technical Memo

AECOM
20 Exchange Place, 13th Floor, New York, NY 10005
T 212.991.2100 F 212.510.2599 www.aecom.com

Technical Memorandum

Date: June 28, 2013

To: New York City Department of Environmental Protection
New York City Economic Development Corporation

From: AECOM

Subject: **East Midtown Waterfront Esplanade**
Methodology and Approach for the Construction Air Quality and Noise Analyses

This technical memorandum outlines our proposed methodology to conduct the construction air quality and noise assessments in the City Environmental Quality Review (CEQR) Environmental Assessment Statement (EAS) for the proposed East Midtown Waterfront Esplanade (EMWE). This approach intends to provide the City review agencies, particularly the New York City Department of Environmental Protection (DEP), an opportunity to comment prior to the analysis.

1. Introduction

The New York City Economic Development Corporation (NYCEDC), in partnership with the New York City Department of Transportation (NYCDOT), and the New York City Department of Parks and Recreation (NYCDPR), is proposing to construct the EMWE over the East River, between East 41st and East 60th Streets, in the Borough of Manhattan, New York City. The EMWE project will construct a new waterfront esplanade, approximately 0.96 mile long, for pedestrian and bicycle use, with a total of approximately 273,500 square feet of affected area (approximately 226,500 square feet over the East River). The esplanade averages 40 feet wide, with two 50 foot wide, 150 foot long nodes at East 48th and East 54th Streets. Offsets from the bulkhead range from approximately 10 feet to 30 feet wide. Overall, the project will provide approximately 5 acres of new open space.

Construction Scenario

The proposed esplanade consists of two sections: the UN Esplanade from East 41st to East 53rd Streets; and the Outboard Detour Roadway (ODR) Esplanade from East 53rd to East 60th Streets. Access will be from the south and north ends, as well as from potential upland connections at East 42nd, East 48th, and East 54th Streets The project is currently scheduled to be built in two phases, with the ODR Esplanade estimated to be completed by 2018 and the UN Esplanade and upland connections estimated to be completed by 2024.

The entire construction of the esplanade will occur over an expected 60-month time period. The major construction components, such as pile installation, filling, etc., will occur during permitted months for periods of up to three continuous months for the UN Esplanade and ODR Esplanade, respectively. The rest of esplanade construction will occur on and off over the rest of 60 months, depending on seasonal factors, and with minimal activity in winter and the UN recession time. Therefore, the expected construction activity would occur within a much shorter duration as compared to the entire construction period. Moreover, the construction activity would not occur at a given location for any long duration, and would rather progress from time to time along the esplanade similar to a roadway construction.

Pile Driving Elements (up to Six Months)

For the UN esplanade, approximately 105 piles will be necessary. These piles will be 48-inch diameter steel piles whose length on average is approximately 64 feet with a 5/8-inch thick wall. Individual pile lengths will vary depending on rock elevations which are referenced in a separately prepared geotechnical report.

Approximately 85 of the piles will require rock sockets and will be drilled into the bedrock. Once seated on rock, piles will be fitted with a drilling rig capable of drilling within the pile to the required rock socket depth. After the piles are driven into place, and any required sockets are drilled, reinforcing cages will be lowered into the socket and approximately 160 cubic feet of grout/concrete will be poured into each pile. Approximately 20 of the piles will not require rock sockets and can be vibrated into the sediment to the top of rock.

Construction of the ODR esplanade will occur over a 30 month time period. It is anticipated that work below the Spring High Tide Line (pile driving, filling, etc.) will occur during permitted months for periods of up to three continuous months in duration. For the ODR esplanade, approximately 94 piles will be necessary. Individual pile lengths will vary depending on rock elevations which are referenced in the separately prepared geotechnical report. It is expected that 34 piles will be 54-inch diameter steel piles with a 5/8-inch thick wall approximately 30 feet in length, while 60 piles will be 24-inch diameter steel piles with a 5/8-inch thick wall approximately 30 feet in length. All of the piles will require rock sockets and will be drilled into the bedrock in the similar way as described for the UN esplanade.

The equipment that will be used for the pile installation is summarized in **Table 1.** During the pile driving, it is understood that a crane with an attached pile driving drill will be stationed on a barge adjacent to the proposed piles. Pile installation will be accomplished by as many as two crews operating at a time, working an average eight hour workday and utilizing up to three barges. It is expected that two of the barges will hold 250 ton cranes and one barge will be used for materials.

Table 1
Equipment Required for Pile Installation for the ODR and UN Esplanades
(Three months of usage for each)

Equipment	# Required
Barge Mounted 250 Ton Crane	2
Sheetpile Vibratory Hammer	1
Pile Vibratory Hammer	1
Compressors	2
Generators	2
Rock Socket Drilling Rig	1
Tugboats	2
Flat Deck Barges	1
Concrete Delivery Barges	1
Concrete Pumping Barges	1
Pile Delivery Barges	1
Hopper Scow	1
Dump Scow	1

It is anticipated that concrete will be produced offsite and delivered to the work place by barge and pumped. After the piles are filled, the pile caps and all other structural members that occur above the spring high tide line would be constructed offsite, and then put in place on site by a 250 ton crane operating from a barge. A second barge would be used during this phase for materials.

Remaining Elements of Construction

Subsequent phases of esplanade construction will include placement of the concrete and asphalt, placement of esplanade furniture (e.g., benches, etc.) and landscaping, which would be supplied and provided to the construction site by trucks. **Table 2** describes the equipment that may be necessary for proposed esplanade construction during the entire construction period. It should be noted that equipment listed will be utilized as necessary and that they will not be operated on a continuous basis together all the time.

Table 2
Equipment Required for Esplanade Construction

Equipment	# Required
Compressors for surface tools	2
Concrete pump	1
Crane 100t	1
Excavator	1
Mini Excavator	1
Front End loader	1
Generators	2
Water Pumps	1
Forklift	2
Vibratory Compactor Roller	1
Truck Concrete	1
Truck- delivery and haul away	1
Pickup trucks	2

It is anticipated that there will be less than ten trips per day during the peak period by trucks delivering materials and workers to the project site. **Table 3** summarizes the number of anticipated daily one way peak construction vehicle trips in-land to a waterfront staging area.

Table 3
Daily One Way Peak Construction Trips In-land to Waterfront staging area

Item	# Peak Daily Trips to Staging Area
Concrete Trucks	4
Heavy Equipment (i.e., Excavator)	2
Trucks –for Deliveries	4
Trucks – for Haul away	4
Pick-up Trucks	8
Crew vehicles	2

2. Air Quality Impact Analysis

As noted in the *CEQR Technical Manual*, generally, if a transportation analysis is not needed with regard to construction activities, an air quality or noise assessment of construction vehicles is also likely not warranted. It is expected that the EMWE would not require any detailed construction transportation analyses, as fewer than 50 construction related vehicle trips would be generated through any single intersection during peak periods, and construction activities would not require closing, narrowing, or other-wise impeding any moving lanes, roadways, key pedestrian facilities (in an area with high pedestrian activity near sensitive land uses), parking lanes and/or parking spaces, bicycle routes and facilities, bus lanes or routes, or access points to transit.

An assessment of air quality and noise for construction activities is likely not warranted if the project's construction activities:

- Are considered short-term;
- Are not located near sensitive receptors;
- Do not involve construction of multiple buildings where there is a potential for on-site receptors on buildings to be completed before the final build-out; and
- The pieces of diesel equipment that would operate in a single location at peak construction are limited in number.

If a project either does meet one or more of the criteria above or one of the above criteria is unknown at the time of review, a preliminary air quality or noise assessment is not automatically required. Instead, as noted in the *CEQR Technical Manual*, various factors should be considered, such as the types of construction equipment, the nature and extent of any commitment to use the Best Available Technology (BAT) for construction equipment, the physical relationship of the project site to nearby sensitive receptors, the type of construction activity, and the duration of any heavy construction activity.

Proposed Qualitative Analysis

As previously noted above, the actual overall construction period is anticipated to be much shorter than 60 months, due to seasonal factor and the recession time for the United Nations. Moreover, the construction activity occurring at a specific site (location) would be relatively short in duration, as it will progress away from the specific site once the adjacent esplanade segment is completed. As such, the usage of most equipment at a specific site/location would be relatively short, generating only temporary adverse construction air quality impacts. Therefore, an air quality dispersion modeling for this short-term construction impact at specific location in the neighborhood is not warranted.

For potential on-road truck traffic air quality impact, the CEQR-established screening threshold for both Carbon Monoxide (CO) and fine Particulate Matter (PM2.5) would not be exceeded, according to the predicted truck and commuter vehicle trips previously shown in **Table 2**. As such, the EAS will qualitatively discuss construction period air quality impacts in the neighborhood along the esplanade.

For project-generated sensitive receptors on the esplanade, the potential air quality impacts particularly from the FDR traffic will also be discussed qualitatively, since these park receptors would experience free-flow traffic along FDR that is typically not of air quality concerns, as compared to the congested intersections. Furthermore, air quality conditions at these receptors are similar to those existing waterfront receptors adjacent to FDR Drive along the East River and Route 9A along the Hudson River, and it can be anticipated that potential adverse air quality impacts to the project-induced sensitive receptors would not be significant.

3. Noise Impact Analysis

Per *CEQR Technical Manual,* construction noise, generated by pile driving, truck traffic, blasting, demolition, *etc.*, is generally analyzed only when it affects a sensitive receptor over a long period of time. Based upon experience cited in the *CEQR Technical Manual*, unless ambient noise levels are very low and/or construction source levels are very high, and there are no structures that provide shielding, it is unusual for construction sources to have significant impacts at distances beyond 1,500 feet in New York City. Therefore, further analysis should be performed if the proposed project would cause construction equipment to be operating within 1,500 feet of a receptor for a period of time exceeding two years. In some circumstances, however, even a shorter term construction phase may affect highly sensitive locations (such as schools, hospitals, etc.), warranting further quantitative analysis.

Proposed Qualitative Analysis

For the same reasons discussed above in the air quality analysis approach, the construction period noise affecting specific existing noise sensitive receptors is considered relatively short in duration. This will be discussed qualitatively with a disclosure of typical construction equipment noise reference levels.

For project-generated sensitive receptors on the esplanade, existing ambient noise levels measured in September 2012 on the Waterside Pier (former Con Edison Pier) near the terminus of East 39th Street, immediately adjacent to the FDR Drive, will be used to disclose the likely noise levels where the esplanade will be constructed.

4. Conclusion

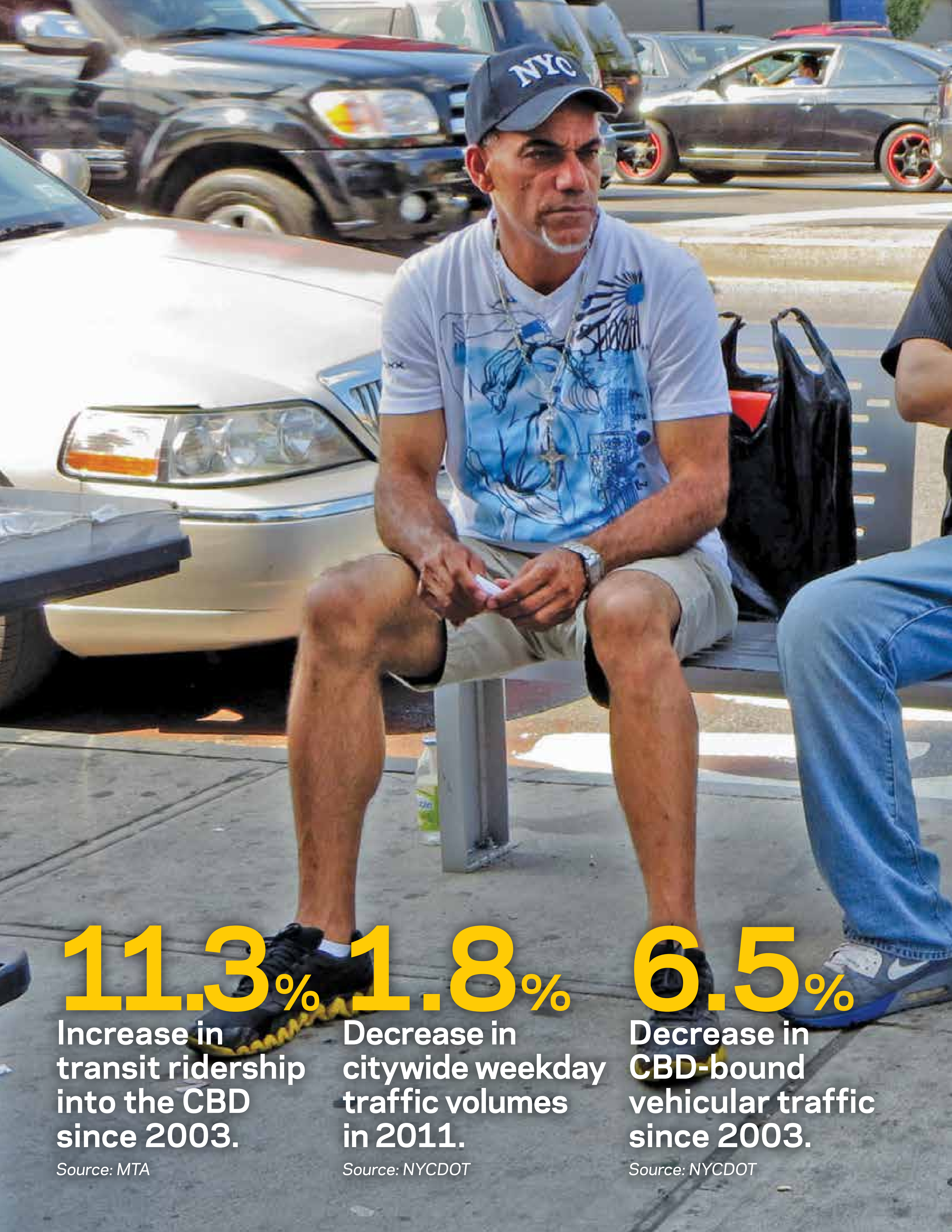
The NYCEDC, and its consultant, AECOM, request your concurrence with the above methodology. It is our intent to proceed with the approaches noted above as soon as possible, as they are part of the critical path item in the development of the EMWE.

III

NYCDOT 2012 Sustainable Streets Index

2012 Sustainable Streets Index

New York City Department of Transportation



11.3%
Increase in transit ridership into the CBD since 2003.
Source: MTA

1.8%
Decrease in citywide weekday traffic volumes in 2011.
Source: NYCDOT

6.5%
Decrease in CBD-bound vehicular traffic since 2003.
Source: NYCDOT

4%
Increase in year-round cycling in 2012.
Source: NYCDOT

58%
Increase in year-round cycling since 2008.
Source: NYCDOT

86%
Increase in winter cycling since 2008.
Source: NYCDOT

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HALL

Letter from the Commissioner

Dear Fellow New Yorkers:

I am very pleased to issue the 2012 edition of the *Sustainable Streets Index*, New York City DOT's annual report on transportation trends and the performance of street improvement projects.

Since the release of Mayor Bloomberg's PlaNYC in 2007 and DOT's adoption of its *Sustainable Streets* strategic plan in 2008, DOT has developed a range of ambitious programs to upgrade the City's streetscape. An intensive focus on safety for all people using City streets underlies this work, with an emphasis on pedestrians as the most vulnerable group.

The project profiles in this *Index* strongly reflect DOT's concerted work to re-engineer streets with above-average crash histories, and to meet community concerns about vehicle speeds through designs that emphasize visibility, predictability and additional space for pedestrians. Results from project after project show impressive reductions in crashes that injure people. This critical work has produced the safest five years in a century of record keeping, with the fewest traffic fatalities ever recorded in New York City.

DOT's streetscape strategy also promotes a high quality experience in the city's public spaces. In this edition, we review results from DOT's remake of Brooklyn's Grand Army Plaza, which, thanks to redesigned pedestrian connections and traffic circulation, now invites people to walk through the famous archway at the plaza's center, instead of detouring around a tangle of traffic. New public space is also prominent in DOT's successful overhaul of traffic performance in Jackson Heights, an initiative generated by local stakeholders and elected officials.

Transportation efficiency does not take a back seat. Updating traffic operations and bus routing in Downtown Flushing has led to faster travel times *and* significantly improved safety in a key business and commuting hub. Similarly in Washington Heights, DOT's review of signal timing, lane configuration, and curb regulations has reduced congestion and crashes on West 181st Street. Most recently, the launch of Citi Bike has given New Yorkers a quick and convenient new option for getting around town. In the first three months, riders have already used Citi Bike to make over 2.5 million trips.

In executing our streetscape strategy, DOT has been meticulous in measuring and documenting results. The *Sustainable Streets Index* is a key element in tracking program and project performance and reporting it to New Yorkers. Continual research and review feeds back into future project design and provides the public with the opportunity to make highly informed choices about the future of the City's streetscape.

Under Mayor Bloomberg, New York has undertaken the most ambitious and thorough update of an American city streetscape in generations. NYCDOT's focus on performance, data and documentation has allowed us to deliver world-class improvements in traffic safety, mobility and the public realm. These changes provide a strong foundation for a thriving New York City throughout the 21st Century.

Sincerely,

Janette Sadik-Khan
Commissioner

Executive Summary

With New York City's economy rebounding, subway and bus ridership has resumed pre-recession growth while auto traffic remains essentially flat. Subway ridership increased 2.5% in 2011 and a further 1.8% in 2012. Bus ridership posted a 0.8% rise in 2012, the first increase since 2008. Citywide weekday traffic volumes, by contrast, were down 1.8% in 2011 (figures for 2012 are not yet available), and are essentially unchanged over the past four years, despite job growth of 3% since 2009. These figures show that in the wake of the recession, New Yorkers are driving less and using transit more, resuming the trend that was evident during growth years of the mid-2000s. Since 2003, citywide transit ridership has increased 9.5% while citywide traffic declined by 3.9%.

These trends are even more pronounced for travel into Manhattan's Central Business District (CBD – the area south of 60th Street). Since 2009, transit ridership is up 2.9%, while the number of vehicles entering the CBD has been roughly flat and the average speed of vehicles in the CBD has increased by 0.3%. Going back to 2003, transit ridership into the CBD is up 11.3% while vehicular traffic decreased 6.5%.

Across the five boroughs, DOT has continued to support this vitality by working to make transportation safer and more efficient for people and commerce alike. This fifth annual Sustainable Streets Index reviews traffic and transit trends in New York City, reports CBD traffic speeds based on taxi Global Positioning System (GPS) data, and presents data-driven indicators on the impact of eleven major DOT projects involving changes in street operations. A new feature this year uses taxi GPS data to assess wet weather impacts on traffic flow.

While the Project Indicators are only a sample of DOT's work to improve New York City's streets, they reflect how the agency is making our infrastructure greener, safer and more efficient for everyone. Below are some of the highlights from this year's featured projects:

- At Seventh Avenue and West 23rd Street, new pedestrian islands and improved traffic patterns resulted in a 61% decrease in crashes with injuries. Traffic is also moving better, with average delays down 25% for the intersection.
- On Slosson Avenue and Todt Hill Road on Staten Island, the incidence of speeding declined 55% after DOT implemented a set of community-requested traffic calming measures.
- In the heart of Downtown Flushing, crashes with injuries declined 10% after DOT expanded sidewalk space and reduced vehicle conflicts. At the same time, travel times are up to 37% shorter in peak hours.
- At Grand Army Plaza, traffic, crosswalk, and sidewalk improvements have led to a 19% reduction in crashes with injuries while reconnecting this landmark public space with neighboring communities.
- In Citi Bike's first three months of operation, customers logged 2,545,867 trips covering a total distance of 5,550,424 miles.

Traffic and Transit Trends

Summary

In 2011, New York City continued to show signs of recovery from the 2008 recession: citywide employment grew by over two percent and the city's population continued to rise. On the transportation front, this job and population growth resulted in a modest rise in transit use—driven by growing subway ridership—while citywide traffic volumes decreased. This pattern mirrors the transportation trend of the past 15 years: during periods of economic growth in New York City transit use has increased, while traffic has generally been flat or declined. After declines in both transit and traffic volumes during the recession that started in 2008, the city has now resumed the pattern of growing transit use and flat or declining auto use. New York City continues to add new jobs without increases in traffic volumes or congestion levels in the urban core.

Traffic

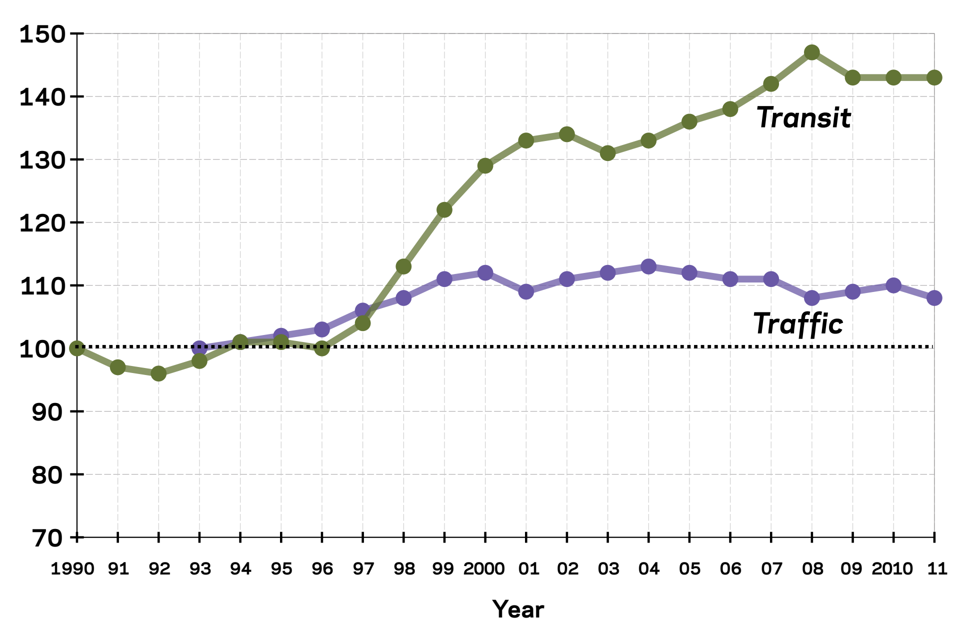
Both traffic citywide and traffic into the Manhattan central business district (CBD) experienced declines in 2011: citywide traffic was down 1.8% and traffic into the CBD declined by 1.7%. Traffic levels were consistently down or flat at most monitored locations: traffic volumes on the bridges between the Bronx and Queens, the bridges between Brooklyn and Queens, the George Washington Bridge and the Verrazano-Narrows Bridge were all down 3-7% since 2008, while the Bronx-Manhattan crossings were up 1%. Daily traffic into the Manhattan CBD from New Jersey has decreased 3% since 2008.

DOT's four East River Bridges into the CBD – the Ed Koch Queensboro Bridge, Williamsburg Bridge, Manhattan Bridge and Brooklyn Bridge – as a whole have not experienced a noticeable change in traffic volumes since 2008. However, due to ongoing construction on the Brooklyn Bridge, with overnight closures for Manhattan-bound traffic that began in 2011 and resulted in a 17% drop in daily traffic, the other three bridges have seen traffic increases. The most significant increase was seen on the Manhattan Bridge (32%).

Citywide traffic volumes decreased by 1.8% in 2011.

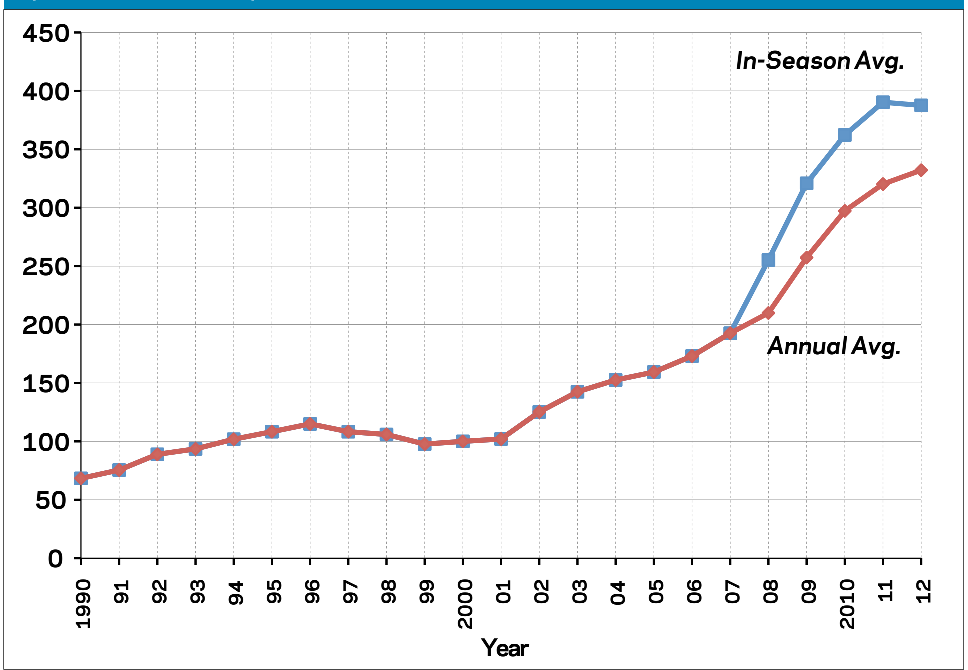
- 0.4% increase in citywide transit ridership in 2011.
- 1.8% decrease in citywide weekday traffic volumes in 2011.
- 9.5% increase in citywide transit ridership since 2003.
- 3.9% decrease in citywide traffic since 2003.

Citywide Transit and Traffic
(Traffic indexed to 1993/Transit indexed to 1990)



- 4% increase in annual average cycling in 2012.
- 1% decrease in in-season cycling (April-October).
- 58% increase in annual cycling since 2008.
- 52% increase in in-season cycling since 2008.

Bicycle Commuting
(Indexed to 2000)



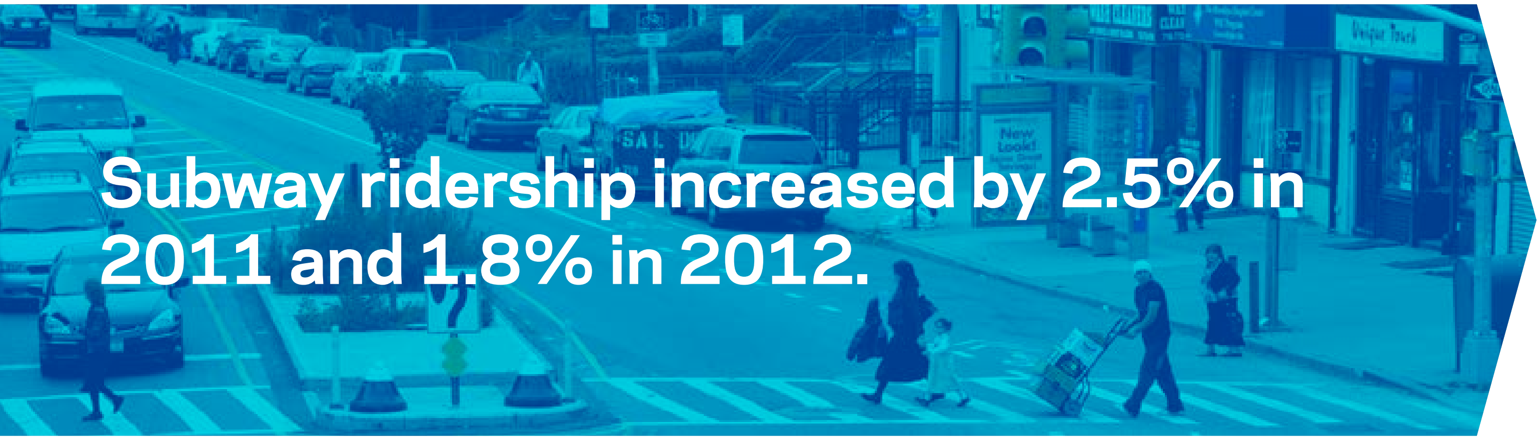
Transit

2011 was the first full year to include the 2010 MTA service cuts, which reduced or eliminated service on 110 bus routes and eliminated the V and W trains. The MTA also raised fares at the end of 2010, increasing the price of unlimited and single ride MetroCards. Despite the reduction in service and the increase in fares, citywide transit ridership did not decrease, instead experiencing a 0.4% increase. Continuing the trend of the last decade, increases in transit use have been powered by a growth in subway ridership, while local bus ridership has either been flat or in decline. On a whole, subway ridership is up over 4% between 2008 and 2011, while local bus ridership has decreased by 9% during the same period. Some of the decrease in bus ridership has been offset by the popularity of new Select Bus Service (SBS) routes. Since implementation in 2008, ridership is up 11% on the Bx12 SBS. Ridership is also up 8% on the M15 SBS, implemented in 2010, and 2% on the newest SBS route: the M34 SBS, which was implemented in 2011.

Other key trends

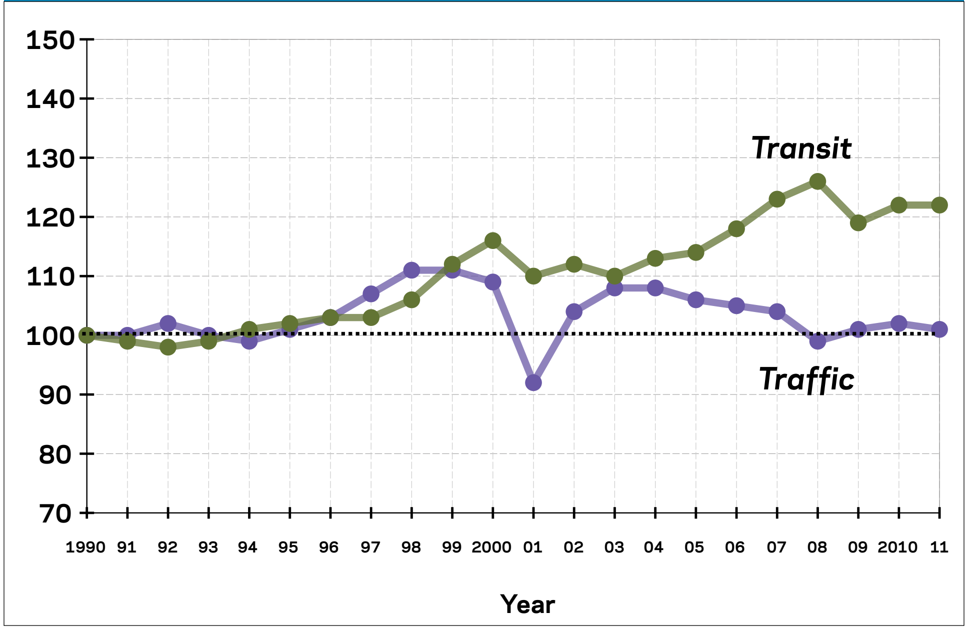
Other key trends for the city and the Manhattan CBD based on 2011 data and more limited 2012 data include:

- Citywide employment continued its upward trend in 2012. Employment grew by 2% in 2012, building on an increase of 2.3% in 2011 and bringing job numbers in the city back to 2008 levels.
- Subway ridership continued its upward trend. Citywide weekday subway ridership rose by 1.8% in 2012, building on an increase of 2.5% in 2011. Ridership now exceeds peak 2008 levels.
- Bus ridership increased in 2012, the first year to show an increase since 2008. Bus ridership is up 0.8% in 2012, after a decrease of 4.3% in 2011. Weekday bus ridership is now down 7.8% since the pre-financial crisis peak in 2008.
- In 2012, commuter cycling reporting was expanded to include summaries for both in-season cycling (April-October) and total annual cycling (including winter counts in December-February) periods. While in-season cycling decreased by 1% in 2012, the increase in winter cycling increased the year-round total by 4%.



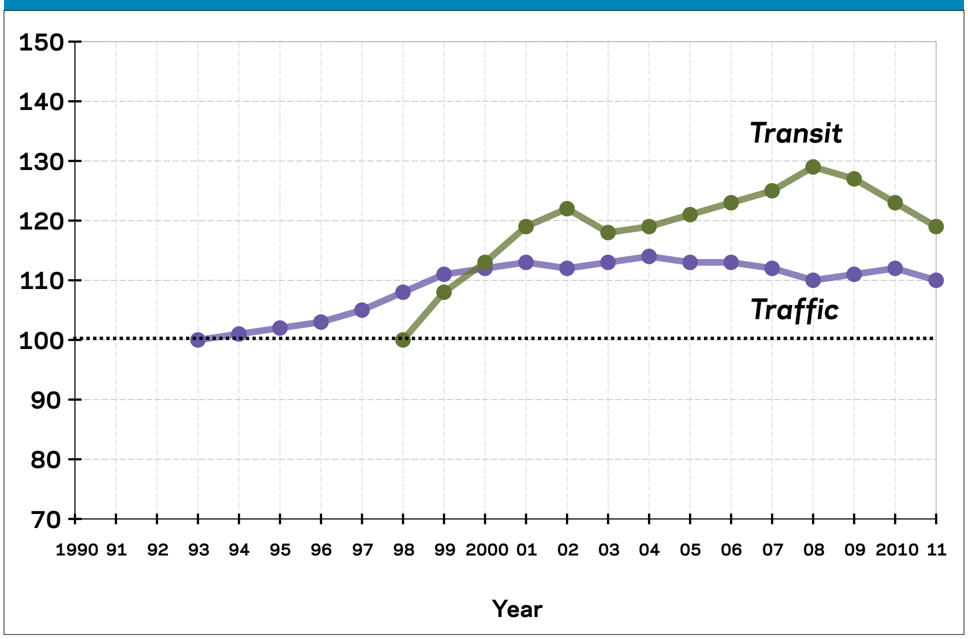
- No change in bus and subway ridership into the CBD in 2011.
- 1.7% decrease in CBD-bound vehicular traffic in 2011.
- 11.3% increase in transit ridership into the CBD since 2003.
- 6.5% decrease in CBD-bound vehicular traffic since 2003.

Transit and Traffic into the CBD
(Indexed to 1990)



- 3.6% decrease in bus ridership outside of the Manhattan CBD in 2011.
- 1.8% decrease in traffic volumes outside the Manhattan CBD in 2011.
- 0.8% increase in bus ridership outside of the Manhattan CBD since 2003.
- 3.3% decrease in traffic volumes outside of the Manhattan CBD since 2003.

Transit and Traffic Outside the CBD
(Traffic indexed to 1993/Transit indexed to 1998)

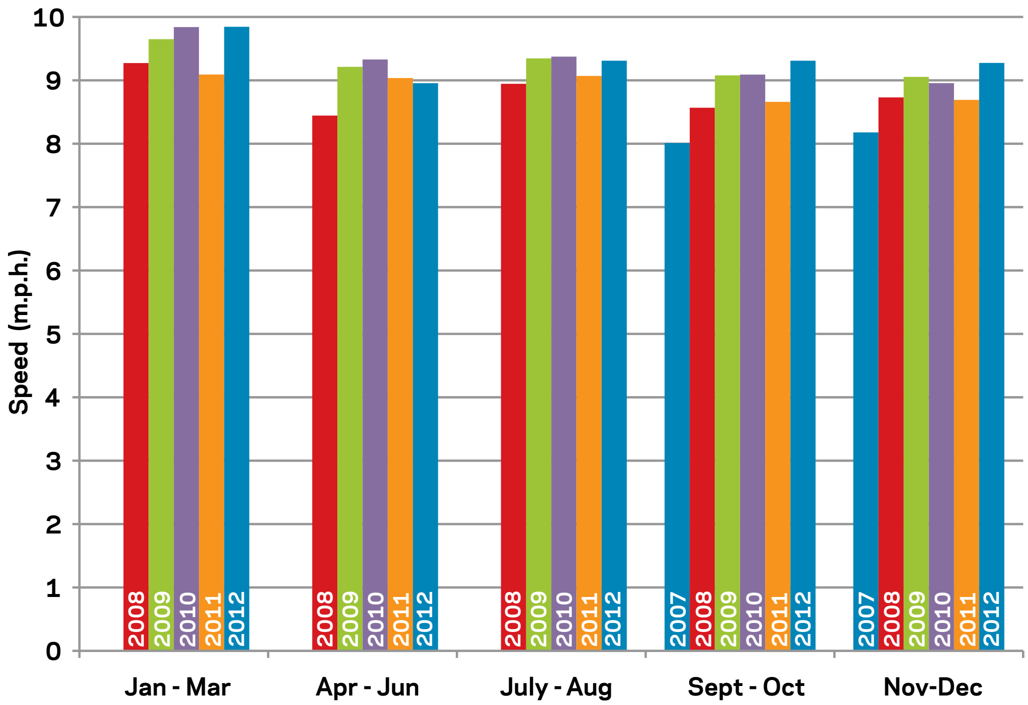


Note: Borough-level bus ridership is not available prior to 1998. Subway ridership is not shown because data for subway trips made exclusively outside the CBD cannot be separated from data for trips beginning or ending inside the CBD. Note that a large majority of subway trips that begin outside the Manhattan CBD are CBD-bound.

Manhattan Traffic Speeds

Weekday CBD Taxi Speeds from 8:00 a.m. - 6:00 p.m.

- Average taxi speeds in the Manhattan CBD were 9.3 m.p.h. in 2012, up from 8.9 m.p.h. in 2011.
- CBD speeds have increased 6.7% since 2008.

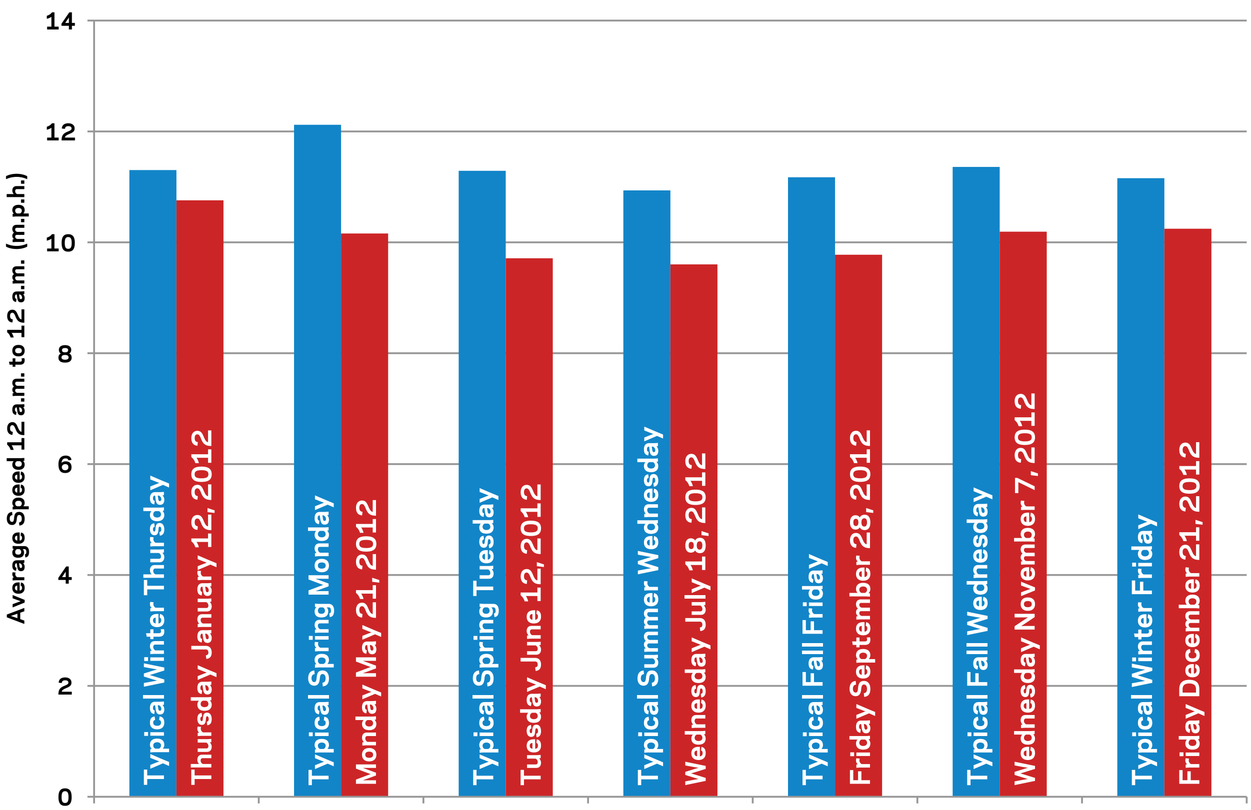


Methodology

All yellow taxicabs are equipped with GPS devices which create electronic trip sheets for all customer-carrying taxi trips 24 hours a day, seven days a week. The data includes time and location of trip origin and trip destination, time elapsed, distance traveled, and fare. The system records approximately 13 million trips per month. DOT receives the taxi GPS data from the Taxi and Limousine Commission (TLC) in order to study travel patterns and analyze vehicle traffic speeds to support agency policymaking and operations. The taxi speed data are based on the distance and duration of the entire trip for customer-carrying taxi rides within CBD. Speeds reflect both time in motion and time spent stopped in traffic or at red lights. DOT has usable data from fall 2007 to the present.

Manhattan CBD Traffic Speeds on the Seven Rainiest Days

- Overall, precipitation tends to be associated with slower Manhattan traffic. On days with at least one inch of precipitation, taxi speeds in the Manhattan CBD were, on average, 11.9% slower than days with little or no precipitation.
- The average CBD taxi speeds on days with at least one inch of precipitation was 10.1 m.p.h., compared to 11.4 m.p.h. on days with little or no precipitation.



Methodology

Data for "typical" days covers all days with recorded precipitation of less than one inch of precipitation over the 12 months ending November 30, 2012; this period was used to ensure that the seasons were complete and contiguous. Weekends, holidays and the date of Hurricane Sandy were excluded. In the remaining sample, there were seven days in which precipitation (rain or melted snowfall) exceeded one inch.

2012 Manhattan Traffic Speeds Day By Day

JANUARY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

FEBRUARY

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29			

APRIL

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

MAY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

JULY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

AUGUST

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

OCTOBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

NOVEMBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	28	28	

Fastest Day

- 2008: Sunday, June 1 (15.1 m.p.h.)
- 2009: Thursday, January 1 (13.9 m.p.h.)
- 2010: Sunday, July 4 (14.2 m.p.h.)
- 2011: Sunday, August 28 (16.3 m.p.h.)
- 2012: Tuesday, December 25 (14.8 m.p.h.)

Fastest Non-Holiday Weekday

- 2008: Friday, May 11 (12.4 m.p.h.)
- 2009: Monday, September 28 (11.9 m.p.h.)
- 2010: Monday, January 4 (11.8 m.p.h.)
- 2011: Monday, January 3 (11.6 m.p.h.)
- 2012: Sunday, February 5 (13.3 m.p.h.)

MARCH

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

JUNE

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

SEPTEMBER

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

DECEMBER

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Slowest Day

- 2008: Wednesday, September 24 (7.0 m.p.h.)
- 2009: Monday, December 21 (8.0 m.p.h.)
- 2010: Wednesday, December 29 (6.4 m.p.h.)
- 2011: Friday, January 28 (6.9 m.p.h.)
- 2012: Tuesday, May 15 (8.3 m.p.h.)

This calendar shows average daily speeds in the Manhattan CBD, 6 a.m. to 6 p.m.

Key Findings:

- Based on Taxi GPS data, the average daily Manhattan travel speed was 10.2 miles per hour
- January had the largest number of "fastest days"
- May had the largest number of "slowest days"
- January, February, March and August were the fastest months for Manhattan traffic speeds
- May, June, July and December were the slowest months for Manhattan traffic speeds
- All national holidays were among the top 100 fastest days of the year
- Excluding days during and following Hurricane Sandy, the fastest average Manhattan travel speed was recorded on December 25th (14.8 miles per hour)

Key:

The 25 fastest days (average speed between 14.8 m.p.h. and 12.3 m.p.h.). Most occur on major holidays or on Sundays in January or July.

The next 75 fastest days (average daily speed between 12.3 m.p.h. and 11.0 m.p.h.). Most occur on weekends during spring or fall seasons, or immediately before or after holidays.

Between the 100 fastest days and 100 slowest days are the 165 days with average daily speeds between 10.9 m.p.h. and 9.5 m.p.h. Most are weekdays during the winter and spring seasons.

The next 75 slowest days (9.5 to 8.9 m.p.h.) fall into mid-week weekdays in the summer and fall seasons.

The 25 slowest days (8.9 to 8.3 m.p.h.) are concentrated in May, June and July, and in November and December.

Hurricane Sandy & Aftermath

2012 Holidays

January	New Year's Day Observed (2) Martin Luther King Jr. Day (16)
February	President's Day (20)
April	Easter Sunday (8)
May	Memorial Day (28)
July	Independence Day (4)
September	Labor Day (3)
October	Columbus Day (8)
November	Veteran's Day Observed (12) Thanksgiving (22)
December	Christmas Day (25)

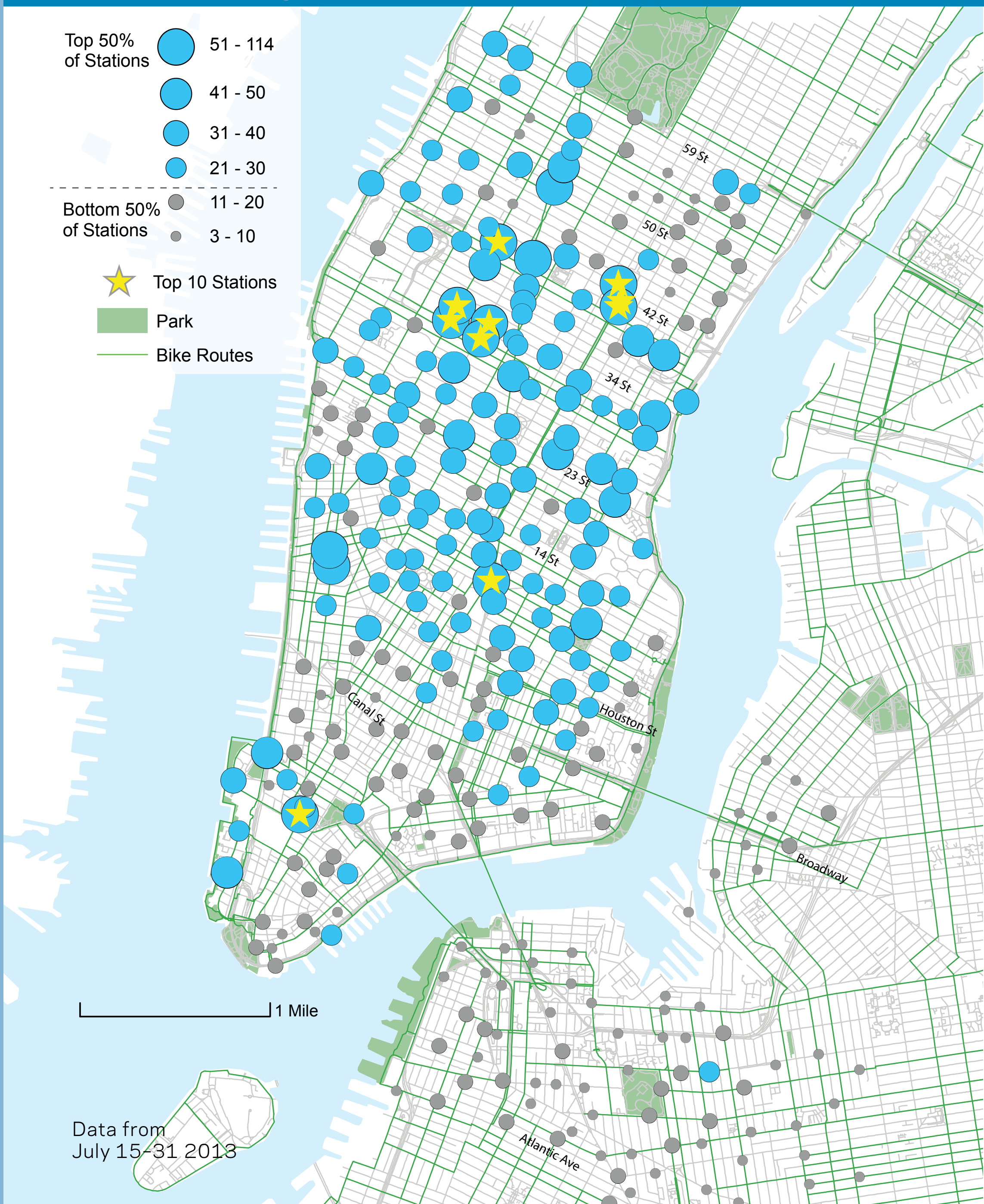
Bike Share

On May 27, 2013, New York City launched Citi Bike, the nation's largest bike share system, with 6,000 bikes available at 328 stations located in Manhattan below 59th Street and in sections of western Brooklyn.

The first three months of the program have been a resounding success. Over 75,000 New Yorkers have signed up for annual memberships. In addition, New Yorkers and visitors have bought over 180,000 24-hour or seven-day passes. In the third month of operation (July 27 to August 26), Citi Bike users logged

- **2,545,867** trips have been taken on Citi Bike as of August 26, 2013
- **5,550,424** miles have been traveled on Citi Bikes as of August 26, 2013
- **44,083** trips were taken on Citi Bikes in the **24 hours** ending as of 5 pm on August 17, the highest one day total on record.
- Planning for Citi Bike involved over **400** meetings with community boards, elected officials, civic associations, property owners, and other stakeholders.
- **65,000** location suggestions were received through the bike share website.

Total Trips by Origin, Weekdays 7–10 a.m.

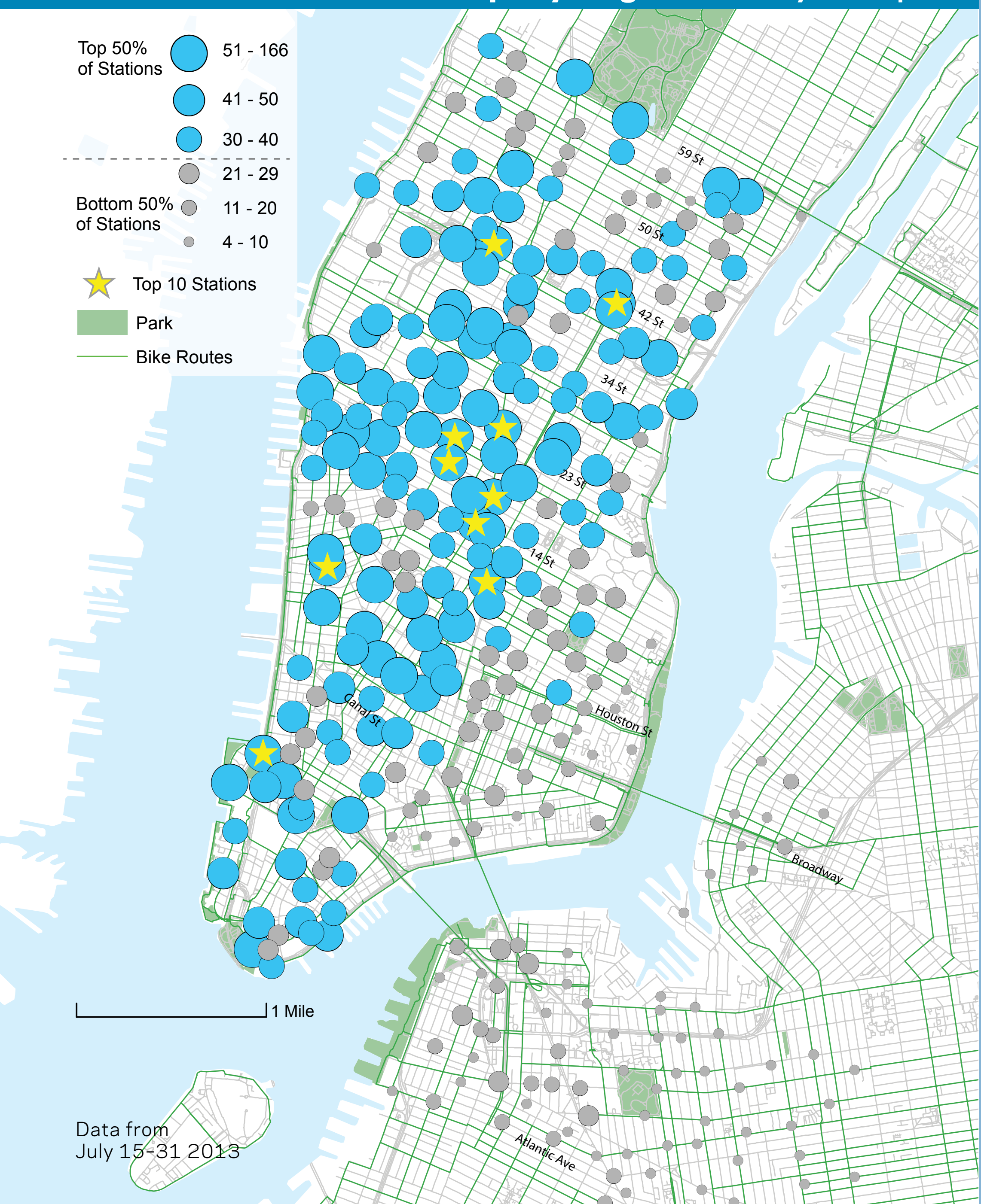


over 36,000 trips a day on average, traveling almost 70,000 miles each day. Since the program launched Citi Bike members have taken over 2.5 million trips and traveled 5.6 million miles.

New York City was well prepared for the program: DOT added over 300 miles of bike lanes over the past six years, including over 30 miles of lanes fully separated from car traffic. As a result of these efforts as well an aggressive bike safety campaign, there have been only 8 accidents involving Citi Bikers and no serious injuries.

The system is easy to use: members use electronic keys to access a bike at their origin station and then dock that bike at their destination station. Annual members can make unlimited trips up to 45 minutes with no additional cost; 24-hour and 7-day users can make unlimited trips up to 30 minutes with no additional cost. Citi Bike is funded entirely through subscription fees and a $41 million sponsorship from Citi and $6.5 million sponsorship from MasterCard. There is no City subsidy for the program.

Total Trips by Origin, Weekdays 5-8 p.m.



The **five busiest stations** in the last two weeks of July were:

- Grand Central Terminal: **479** trips per day
- East 17th Street and Broadway (Union Square): **338** trips per day
- West Street and Chambers Street: **336** trips per day
- Lafayette Street and East 8th Street (Astor Place): **296** trips per day
- West 21st Street and Sixth Avenue: **295** trips per day

Neighborhood-Wide Transportation Improvements

1. Jackson Heights
2. Downtown Flushing

Safety, Pedestrian & Bicycle Improvements

3. Seventh Avenue and West 23rd Street
4. Grand Army Plaza
5. Macombs Road
6. Harlem River Park Gateway
7. Broadway and West 230th Street
8. Broadway, Amsterdam Avenue and West 71st Street
9. Slosson Avenue/Todt Hill Road

Congestion Reduction

10. West 181st Street

Freight Movement Improvements

11. Maspeth Bypass

Project Indicators

To fulfill provisions of Local Law 23 of 2008 (Intro 199), this section reports performance indicators for major roadway projects involving "changes in street operations, such as lane reapportionments, lane reconfigurations, significant adjustments in traffic and parking regulations and changes in traffic signal timing." The performance indicators are formulated to assess the effectiveness of DOT projects in improving system performance and encouraging more sustainable means of transportation.

This section reports on ten major DOT projects that were implemented in 2011 and one (Downtown Flushing) from 2010. DOT collected before and after performance indicators for each of the 11 projects. The indicators measure safety; vehicle, cyclist, and pedestrian volumes; transit ridership; and travel times through the project area.

The 11 projects selected for evaluation reflect the multimodal character of DOT's projects. They include safety, pedestrian and bicycle improvements; transit mobility improvements; congestion reduction; and public spaces enhancements. The projects are distributed throughout the five boroughs, and reflect a range of neighborhood conditions, from the busy commercial streets of Downtown Flushing to the residential and industrial areas of Maspeth. Reflecting the unique needs of each community and its streets, the projects used a range of design strategies to accomplish their goals, and a range of metrics to measure their performance. In addition to their basis in rigorous, data-driven research and engineering, these projects are also informed by DOT's commitment to community engagement.

Highlights from the project performance indicators include:

- Developed with a diverse coalition of community partners, DOT's improvements to Brooklyn's Grand Army Plaza have reconnected a landmark public space with its neighbors while making this complex intersection safer for everyone – crashes with injuries are down 25% since the project was completed.
- By installing new medians and pedestrian spaces on Macombs Road, DOT helped to reduce the number of crashes with injuries by 35%, making this Bronx street safer for the families living there.
- At the gateway to New York City's newest waterfront open space – Harlem River Park – a combination of pedestrian safety treatments and greenstreets has made the shoreline more accessible in an area where parks are scarce. In addition, the streets are now safer for pedestrians and drivers alike, with injury crashes declining 27%.

Jackson Heights

In 2011, DOT carried out a comprehensive set of improvements in the heart of Jackson Heights, the culmination of a community-driven planning process that started in 2009, funded in part by Congressman Joseph Crowley. Local residents, business owners and civic leaders worked with DOT to identify their most pressing concerns and guide the development of solutions. DOT created a range of opportunities for public participation, including community workshops, neighborhood walk-throughs, an innovative web portal that allowed DOT staff to receive and respond to comments at any time, and a Community Advisory Committee to facilitate ongoing involvement of key stakeholders.

The project addressed traffic safety, sidewalk crowding, vehicle congestion, parking availability, slow bus service and a lack of public open space. Focused on the area where 73rd Street, 37th Road, Broadway and Roosevelt Avenue converge, the core improvements were carried out in the second half of 2011. Updated curb regulations were introduced in spring 2012, offering a better use of space for deliveries and customer parking. Further

Community-driven plan produced improved safety, less congestion, faster bus travel, and a vibrant and popular plaza.

37th Road Plaza viewed from the West

parking improvements were implemented in 2013 with the introduction of the variable-rate PARK Smart program.

There are fewer injury-causing crashes; problematic traffic bottlenecks have been eliminated; buses are faster and more efficient; and the 37th Road plaza is a popular gathering spot year-round, home to frequent public events and a boon to adjacent businesses.

- Total crashes with injuries declined **26%**
- Traffic queues decreased up to **75%**
- Southbound travel time on 75th Street decreased by **25%** during the morning peak and **13%** in the evening
- Traffic is moving faster in both directions on Broadway (**8.5%** eastbound; **41%** westbound)
- Q47 bus speeds increased up to **25%**
- Key crosswalks widened from **12** to **40** feet

Vehicle Travel Times
Before/After Improvements

			Time (Mins)		
Street	**From**	**To**	**Before**	**After**	**Change**
73rd St SB	35th Ave	Broadway	2.5	2.2	-12%
74th St NB	37th Road	35th Ave	1.7	2.6	53%
76th St SB	35th Ave	41st Ave	5.6	3	-46%
81st St NB	41st Ave	35th Ave	3.9	2.9	-26%
82nd St SB	35th Ave	41st Ave	5	3.3	-34%
Broadway EB	BQE	Baxter Ave	5.4	5	-7%
Broadway WB	Baxter Ave	BQE	6	3.8	-37%
Roosevelt Ave EB	BQE	82nd St	3.8	4.8	26%
Roosevelt Ave WB	82nd St	BQE	3.4	4.6	35%

Crashes with Injuries
73rd Street / 37 Road / Broadway, 74th Street / Roosevelt Avenue, 74th Street / 37 Road, 73rd Street / Broadway

	Before* (three previous years)			After
Total Crashes with Injuries	12	17	17	11.4
Number of Crashes with Injuries to:				
Motor Vehicle Occupants	4	5	3	3.8
Pedestrians	5	8	12	5.1
Bicyclists	3	4	2	2.5

*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through May 2013) at annual rate. See page 46 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.

Downtown Flushing

Downtown Flushing is a thriving community with a dense concentration of businesses and residents. The area serves as one of the largest intermodal transportation hubs in New York City with the 7 train, the Long Island Rail Road, 20 bus routes, and commuter vans all converging in the downtown. Sidewalks and roadways are congested. Pedestrian traffic regularly spills into the street in many areas, disrupting traffic and posing safety risks. Of particular concern was the intersection of Union Street and Northern Boulevard, which had the greatest number of crashes with pedestrian injuries in the entire borough.

To ease congestion and improve safety in Downtown Flushing, DOT worked with Community Board 7, local

Reorganizing traffic and buses in downtown Flushing improved safety and reduced congestion for all street users

Facing north on Main Street at Roosevelt Avenue business owners and elected officials to analyze and discuss several options to improve pedestrian and traffic safety and reduce congestion. The MTA and NYCEDC were also important partners in the study.

- Total crashes with injuries down **10%**
- Crashes with injuries to vehicle occupants down **26%**
- Crashes with injuries to bicyclists down **31%**
- Travel times along the eastbound and westbound Northern Boulevard decreased by **16%** and **15%** in the PM peak hour, respectively, and **34%** and **37%** in the Saturday Midday peak hour

Change in Travel Time
Northern Boulevard (Eastbound)

Time Period	Overall Travel Time Reduction
Weekday Morning Peak Hour	-7%
Weekday Midday Peak Hour	-5%
Weekday Evening Peak Hour	-16%
Saturday Midday Peak Hour	-34%

Crashes with Injuries
Northern Boulevard from Prince Street to Bowne Street, Main Street from Northern Boulevard to 41st Avenue, Union Street at 35th Avenue, Union Street at Roosevelt Avenue

	Before* (three previous years)			After
Total Crashes with Injuries	58	74	84	64.9
Number of Crashes with Injuries to:				
Motor Vehicle Occupants	20	25	31	18.7
Pedestrians	35	43	45	42.4
Bicyclists	3	6	8	3.9

*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through May 2013) at annual rate. See page 46 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.

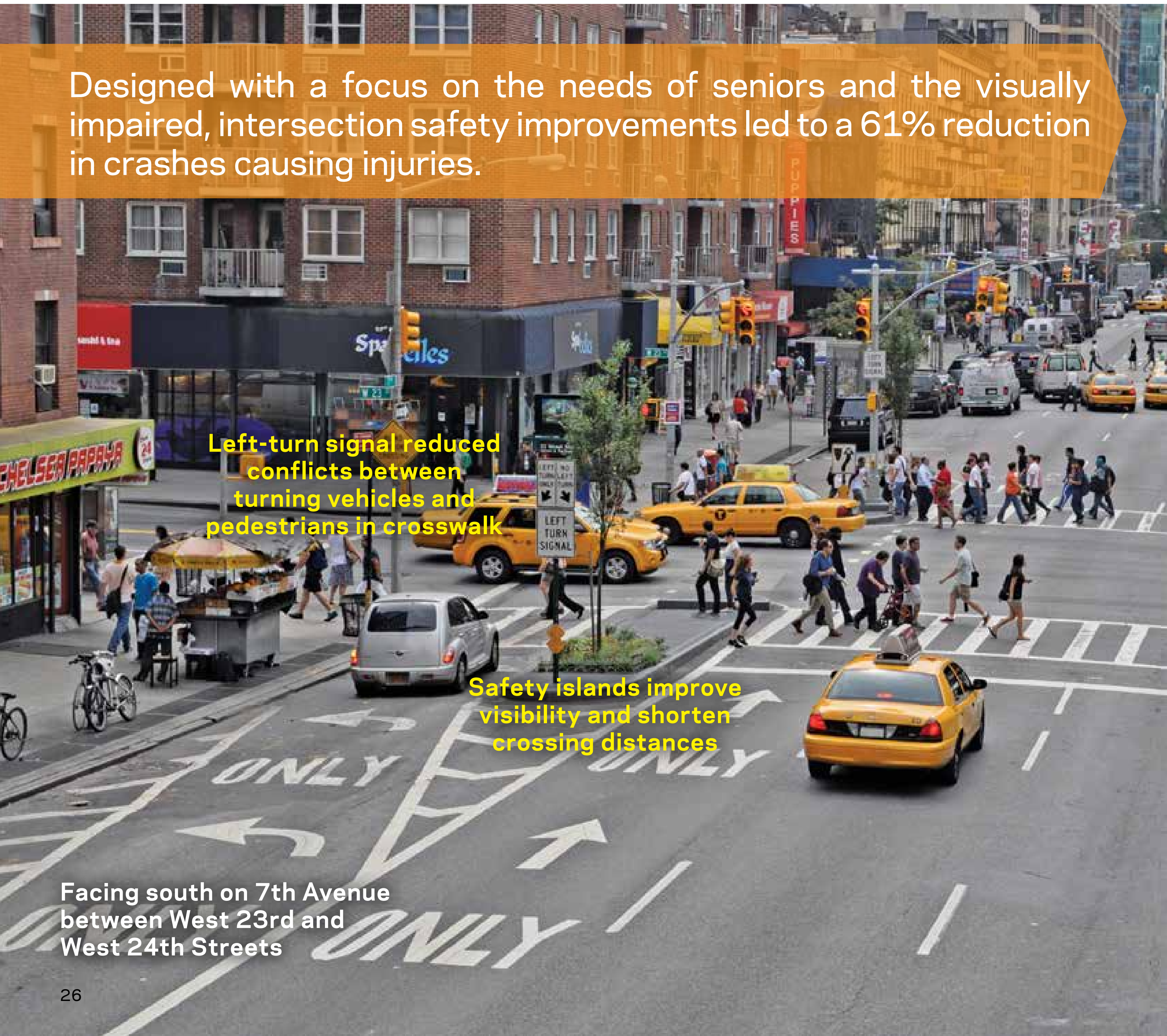
Seventh Avenue at West 23rd Street

The intersection of Seventh Avenue and West 23rd Street has had one of the city's highest rates of crashes involving pedestrians, including many senior citizens. Truck traffic, critical to businesses in Chelsea and the Fashion District, is heavy in the area. West 23rd Street and Seventh Avenue also have heavy pedestrian volumes and traffic signals allowed turning drivers and pedestrians to proceed simultaneously.

As part of the Safe Streets for Seniors program, DOT worked with Manhattan Community Board 4 and other community stakeholders to develop a set of safety improvements. Of specific concern were visually impaired pedestrians accessing the nearby VISIONS service organization. DOT worked with VISIONS staff and clients to ensure that their needs were met.

In the completed project, DOT installed two planted pedestrian safety islands on Seventh Avenue, increasing the visibility of pedestrians and shortening crossing distances. To reduce potential conflicts between pedestrians and turning vehicles, a left turn lane was placed

Designed with a focus on the needs of seniors and the visually impaired, intersection safety improvements led to a 61% reduction in crashes causing injuries.



Facing south on 7th Avenue between West 23rd and West 24th Streets between the island and the curb. Left turns were prohibited altogether from 23rd Street (westbound) to Seventh Avenue (southbound), eliminating the simultaneous conflicts of crossing pedestrians and oncoming traffic. To help people with visual impairments, DOT also installed Audible Pedestrian Signals (APS) at all four corners, and worked with stakeholders in the community to select the audio cues.

Audible signals let visually-impaired pedestrians know when it is safe to cross

- Total crashes with injuries down **61%** [statistically significant]
- Crashes with injuries to vehicle occupants down **77%** [statistically significant]
- Crashes with injuries to pedestrians down **68%**
- The average delay for a vehicle to clear the intersection declined by **7 seconds**

Average Vehicular Delay (seconds)

Location	Before	After
23rd Street Eastbound	41.5	34.0
23rd Street Westbound	23.5	31.4
7th Avenue Southbound	22.1	11.9
Overall Intersection	28.0	20.9

Crashes with Injuries
7th Avenue at West 23rd Street

	Before* (three previous years)			After
Total Crashes with Injuries	10	15	10	4.5
Number of Crashes with Injuries to:				
Motor Vehicle Occupants	4	5	4	1
Pedestrians	5	9	5	2
Bicyclists	1	1	1	1.5

*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through May 2013) at annual rate. See page 46 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.

Grand Army Plaza

With the Soldiers' & Sailors' Memorial Arch at its heart, Grand Army Plaza was intended to be a gracious hub to the historic neighborhoods and public spaces that surround it. As traffic increased, however, the center of the plaza became cut off from Prospect Park and largely inaccessible to pedestrians. In 2006, a diverse coalition of local stakeholders formed the Grand Army Plaza Coalition (GAPCo) in order to develop a new vision for the landmark space and advocate for implementation. Since that time, DOT has worked with GAPCo and its partners to improve the public space while ensuring safety and efficiency for all users. In 2007, DOT installed pedestrian connections between the Arch, Prospect Park and Eastern Parkway. In 2011, DOT built on these improvements by comprehensively redesigning Grand Army Plaza pedestrian connections and traffic circulation. The design includes additional crosswalks to provide new and shorter crossings and

New pedestrian access reconnects a grand public space to the surrounding neighborhoods.

Facing Grand Army Plaza from the northwest on Flatbush Avenue bike connections, pedestrian safety islands and a new traffic signal to eliminate a difficult merge on the west side of the plaza. In addition to reducing conflicts among street users, the project redefined the center of the Plaza, inviting people to walk through the Arch rather than detour around a whirl of traffic.

- Total crashes with injuries down **19%**
- Crashes with injuries to vehicle occupants down **25%**
- Crashes with injuries to pedestrians down **17%**
- **53%** increase in foot traffic through the center of the Plaza on weekday evenings


Facing north on Grand Army Plaza at Flatbush Avenue

Crashes with Injuries
Grand Army Plaza

	Before* (three previous years)			After
Total Crashes with Injuries	27	26	31	22.7
Number of Crashes with Injuries to:				
Motor Vehicle Occupants	22	22	24	17.1
Pedestrians	5	2	2	2.5
Bicyclists	1	2	5	3.2

*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through May 2013) at annual rate. See page 46 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.

Macombs Road

Crash rates on Macombs Road had been among the highest in the Bronx. From 2006 to 2010, 112 people were injured on this short (0.62 mi) corridor and one pedestrian was killed. Following community reports of frequent speeding, DOT's investigation found up to 70% of drivers exceeding the speed limit on an average weekday.

To combat dangerous driving, DOT worked with the community to redesign the street to reflect its proper context: a residential street with relatively low traffic volumes. Through a combination of road markings and median islands, DOT narrowed travel lanes to discourage speeding and weaving. DOT also reconfigured several intersections to prevent high-speed turns and reduce the crossing distance for pedestrians. DOT also worked with NYC Parks & Recreation to plant trees in the newly expanded pedestrian areas. As a result of these improvements, the total number of crashes with injuries has declined

Traffic calming measures led to a reduction in crashes with injuries and improved the pedestrian environment on this West Bronx corridor.

Facing north on Macombs Road at Cromwell Avenue

35%; the incidence of crashes with injuries to pedestrians is down 43%. In the coming year, additional safety improvements will be installed at the intersection of Macombs and University Avenue.

- Total crashes with injuries down **35%**
- Crashes with injuries to vehicle occupants down **25%**
- Crashes with injuries to pedestrians down **43%**
- Crossing distance shortened from **140** feet to **44** feet at Cromwell Avenue and Macombs Road


Facing south on Macombs Road at Cromwell Avenue

Crashes with Injuries
Macombs Road between University Avenue and Jerome Avenue

	Before* (three previous years)			After
Total Crashes with Injuries	13	22	13	10.4
Number of Crashes with Injuries to:				
Motor Vehicle Occupants	10	8	6	6
Pedestrians	3	13	7	4.4
Bicyclists	1	1	0	0

*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through May 2013) at annual rate. See page 46 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.

Harlem River Park Gateway

Harlem River Park has become the city's latest successful waterfront park. Although there are pedestrian overpasses over the Harlem River Drive, it can be difficult for pedestrians and cyclists to reach these park access points.

To improve the connection between the park and surrounding neighborhoods, DOT worked with the Department of Parks and Recreation and community groups on enhancements to the pedestrian approaches to the overpasses at four locations:

- East 135th Street and Madison Avenue;
- East 138th Street and Fifth Avenue;
- East 139th Street and Fifth Avenue; and
- 142nd Street and Fifth Avenue.

Redesigned intersections in upper Manhattan helped to connect residents with a major new park and improved safety for all street users.

Facing east on East 135th Street at Madison Avenue

The final plans included new pedestrians safety islands, sidewalk extensions, new crosswalks and expanded Greenstreet areas.

- Total crashes with injuries down **27%**
- Crashes with injuries to vehicle occupants down **41%** [statistically significant]
- Crashes with injuries to pedestrians down **15%**
- **2,405** square feet of new pedestrian space
- **25%** more green signal time for Madison Avenue motorists

Facing north on Fifth Avenue south of 142nd Street / Harlem River Drive

Crashes with Injuries
5th Avenue from 135 Street to 142 Street
Madison Avenue from 135 Street to 138 Street

	Before* (three previous years)			After
Total Crashes with Injuries	28	22	22	17.5
Number of Crashes with Injuries to:				
Motor Vehicle Occupants	15	16	13	8.7
Pedestrians	10	5	8	6.5
Bicyclists	3	1	1	2.2

*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through May 2013) at annual rate. See page 46 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.

Broadway and West 230th Street

Bronx Community Board 8 asked DOT to develop a plan to enhance safety at Broadway and West 230th Street in Kingsbridge. Identified as an accident prone location by the NYPD, this intersection had long crosswalks and multiple conflicts between motor vehicles and pedestrians. The steel columns supporting the elevated #1 train on Broadway further complicated the intersection.

DOT installed new pedestrian safety islands, creating safe pedestrian space and shorter crossing distances. In conjunction with new roadway markings, the islands also served to calm traffic and clarify the intersection for drivers. Traffic signals now include a "Barnes' Dance" during which all vehicles are stopped at red lights while pedestrians are allowed to cross. This approach eliminates conflicts between pedestrians and turning vehicles.

Pedestrian safety islands and shorter crosswalks made crossing the street safer and easier, especially for seniors and children.

New markings and signs improve the safe flow of traffic through the intersection

Facing east on West 230th Street at Broadway

- Community Board 8 requested safety improvements at this location with high volumes of pedestrians, especially children and seniors
- Crossing distance reduced by **79 feet**
- Total crashes with injuries decreased **49%**
- Crashes with injuries to vehicle occupants decreased **75%** [statistically significant]
- **No change** in vehicle volumes after the improvements were implemented


Facing east on West 230th Street at Broadway

Crashes with Injuries
Broadway at West 230th Street

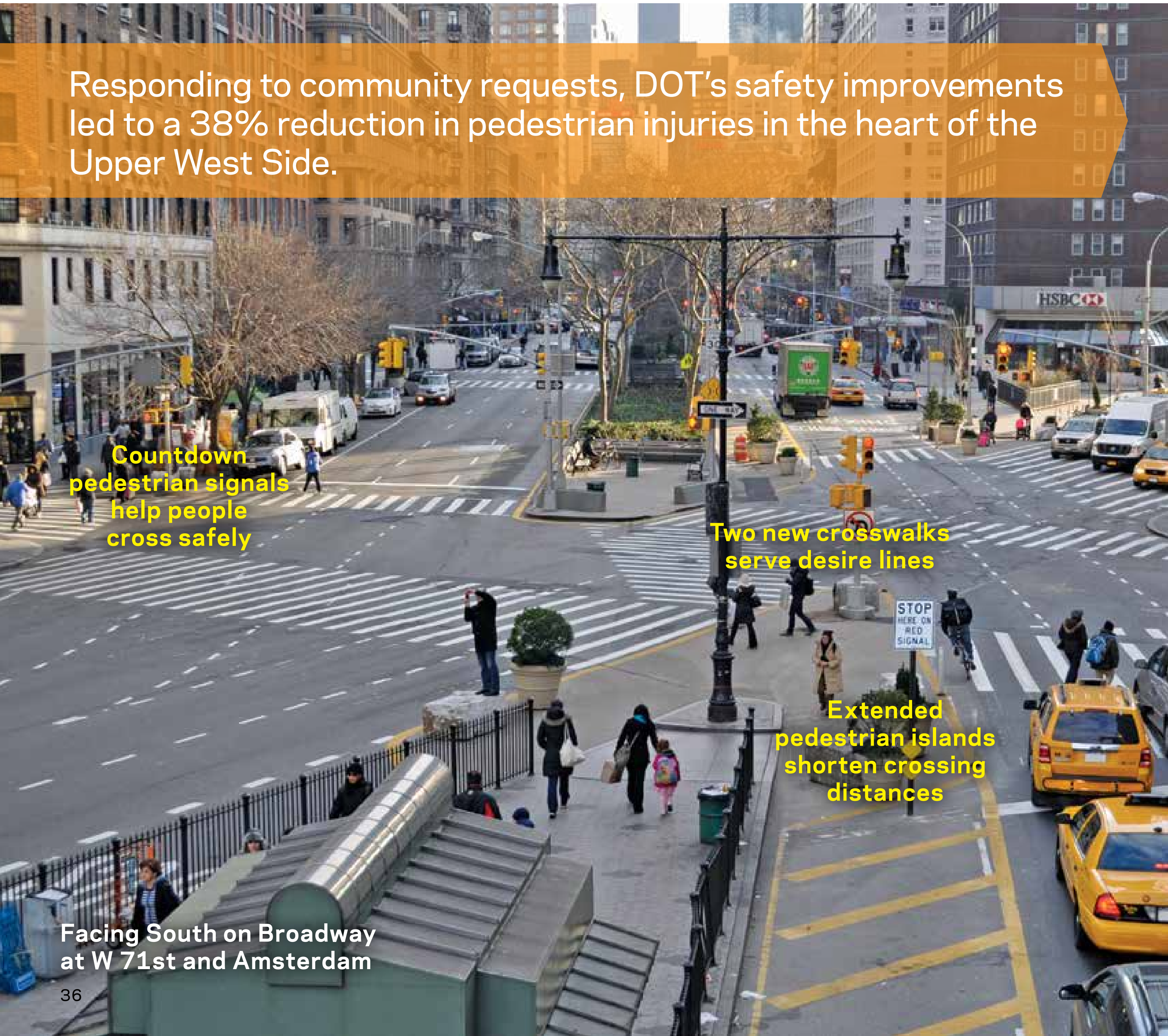
	Before* (three previous years)			After
Total Crashes with Injuries	26	24	12	10.6
Number of Crashes with Injuries to:				
Motor Vehicle Occupants	20	14	8	3.5
Pedestrians	4	10	4	6.4
Bicyclists	2	0	0	1.4

*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through May 2013) at annual rate. See page 46 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.

Broadway at West 71st Street and Amsterdam Avenue

Local officials and members of the community asked DOT to improve pedestrian safety at this busy Upper West Side crossroads. Its complex 6-legged geometry creates challenges for pedestrians, drivers and cyclists alike. Another factor is the 72nd Street subway station, which draws significant pedestrian traffic right to the center of the intersection. To help relieve pedestrian overcrowding on the medians, DOT created extensions with markings and granite blocks. In addition to providing more pedestrian space, these areas increase people's visibility to traffic and reduce crossing distances. DOT also added two new crosswalks at major pedestrian "desire lines" – routes that had not been designated crossings but which many people used nonetheless. One of these desire lines runs through the center of

Responding to community requests, DOT's safety improvements led to a 38% reduction in pedestrian injuries in the heart of the Upper West Side.



Facing South on Broadway at W 71st and Amsterdam the intersection, connecting the subway station with the Broadway Mall to the south. By improving pedestrian access and providing a buffer against passing traffic, DOT's project strengthens the 71st Street Greenstreets and Broadway Malls as functional public spaces.

- Safety enhancements requested by Manhattan Borough President Scott Stringer, Assembly Member Linda Rosenthal, Community Board 7 and other community groups.
- **3,000 sq ft** of new pedestrian space
- Crossing distance reduced by **27%**
- Crashes with injuries declined **8%**
- No significant impact on vehicle travel times

Vehicle Travel Times
Before and After Improvements

	Before	After	% Change
W 66th St to W 75th St via Amsterdam Ave & W 75th to W 66th St via Broadway	7:46	7:29	-4%
W 66th St to W 75th St via Broadway/ Amsterdam Ave & W 75th to W 66th St via Broadway/ Amsterdam	7:20	7:26	+1%

Crashes with Injuries
Broadway/Amsterdam/W71

	Before* (three previous years)			After
Total Crashes with Injuries	7	5	1	4
Number of Crashes with Injuries to:				
Motor Vehicle Occupants	0	1	0	0.7
Pedestrians	4	3	1	2
Bicyclists	4	1	0	1.3

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Slosson Avenue/Todt Hill Road

In the wake of several high-profile crashes, Staten Island Borough President James Molinaro asked DOT to find ways to improve safety on this Mid-Island corridor. To address frequent speeding, DOT redesigned the roadway with narrower moving lanes and a wide striped median, a proven design technique that guides motorists to drive at an appropriate speed. The new layout also includes new left-turn bays, improving traffic flow at key intersections. DOT paid special attention to the safety needs of the area's schoolchildren. New crosswalk markings and pedestrian-focused signal timing were developed in discussions with stakeholders at local schools. To provide additional protection at certain locations,

New roadway markings made travel lanes slimmer and more visible, leading to a dramatic reduction in speeding and crashes.

Facing south on Slosson Avenue at Todt Hill Road

DOT also installed guardrails at the road edge to prevent road departure crashes. DOT analyzed traffic and crash data before and after implementation and found that speeding decreased 55% while crashes declined by 30%.

- Safety improvements requested by Borough President, community groups and local schools after several high profile crashes
- Prior to improvements, crash rate was in the **95th percentile** for corridors in Staten Island
- Continuation of successful **traffic calming** measures previously installed on Slosson Avenue between Victory Blvd and Lightner Ave
- **55%** decrease in speeding
- **Reduced delays** at entrance to Staten Island Expressway

Crashes with Injuries along Todt Hill Road
Lighting Avenue to Tillman Street

	Before	After	% Change
Slosson Av N/B from Windsor Rd to Victory Blvd	11%	7%	-36%
Slosson Av S/B from Windsor Rd to Victory Blvd	22%	3%	-86%
Todt Hill Rd N/B from Fine Blvd to Valleyview Pl	51%	20%	-61%
Todt Hill Rd S/B from Fine Blvd to Valleyview Pl	72%	29%	-60%
Todt Hill Rd N/B from Tillman St to Lincoln St	88%	54%	-39%
Todt Hill Rd S/B from Tillman St to Lincoln St	78%	41%	-47%
Average			-55%

Crashes with Injuries along
Slosson Avenue from Lightner Avenue to Todt Hill Road
Todt Hill Road from Slosson Avenue to Tillman Street

	Before* (three previous years)			After
Total Crashes with Injuries	2	4	3	3.8
Number of Crashes with Injuries to:				
Motor Vehicle Occupants	2	4	3	3.8
Pedestrians	0	0	0	0
Bicyclists	0	0	0	0

*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through May 2013) at annual rate. See page 46 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.

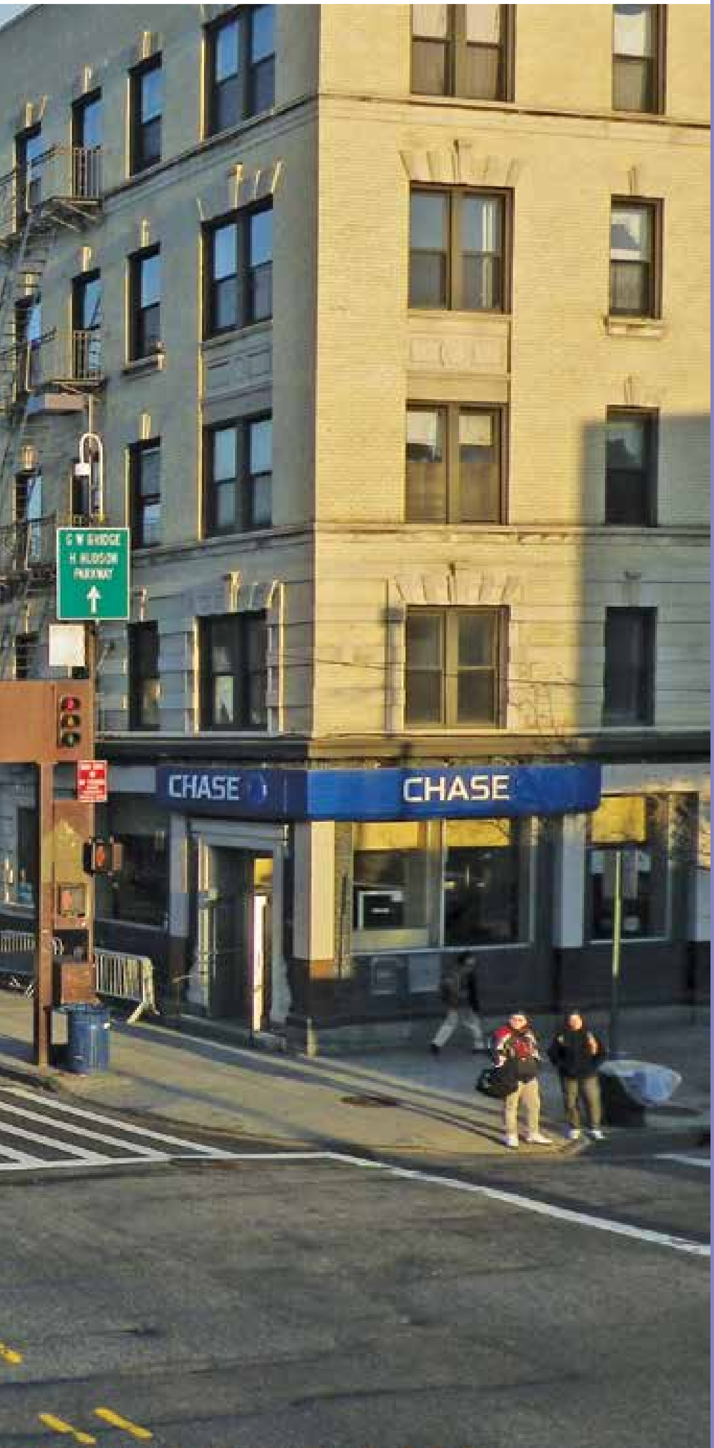
West 181st Street

West 181st Street is a neighborhood retail corridor in the heart of Washington Heights. It is also a crosstown street connecting Manhattan and the Bronx that carries significant through traffic, including drivers hoping to avoid back-ups on the Cross Bronx Expressway and highway approaches to the George Washington Bridge.

When West 181st Street is gridlocked, no one benefits – least of all the residents of Washington Heights. DOT worked with a Citizens Advisory Committee made up of residents, corridor businesses and local leaders to develop a plan that considers the unique needs of each block of 181st Street. The implemented plan includes

This street redesign reduced gridlock while improving traffic safety on a “Main Street” in Washington Heights.

Facing west on West 181st Street at St. Nicholas Avenue new turn restrictions, turn bays, signal timing, bus lanes, and delivery windows for commercial vehicles. The cumulative impact of these elements has been a dramatic improvement in both traffic flow and safety.



- **20-40%** shorter travel times in both directions
- Total crashes with injuries down **19%** [statistically significant]
- Crashes with injuries to vehicle occupants down **41%**
- Crashes with injuries to pedestrians down **56%** [statistically significant]

West 181st Street Travel Times

	Time	Before	After	% Change
Eastbound	AM Peak	8.23	5.63	-32%
	Midday	9.41	6.11	-35%
	PM Peak	12.89	8.14	-37%
	Saturday Peak	12.43	7.49	-40%
Westbound	AM Peak	5.59	4.48	-20%
	Midday	6.97	4.99	-28%
	PM Peak	7.15	5.24	-27%
	Saturday Peak	9.88	6.18	-37%

Crashes with Injuries
West 181st Street from Riverside Drive to Amsterdam Avenue

	Before* (three previous years)			After
Total Crashes with Injuries	88	108	96	38.8
Number of Crashes with Injuries to:				
Motor Vehicle Occupants	47	60	60	21.9
Pedestrians	40	42	32	14.8
Bicyclists	2	8	5	2.1

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Maspeth Bypass

Trucks are critical to the economic life of the city, especially in industrial areas like the Maspeth Industrial Business Zone (IBZ) in Queens. However, the IBZ is adjacent to residential neighborhoods where heavy truck traffic impairs quality of life.

Prior to 2011, Grand and Flushing Avenues were designated as through truck routes between the Queens-Midtown Expressway/Long Island Expressway (LIE) and the Brooklyn line. While this routing provided a connection from LIE to the IBZ along Newtown Creek, it channeled regional truck traffic through the heart of residential Maspeth. In response to requests from the community and elected officials, DOT assessed alternative routes that could be less disruptive to residents while serving the needs of truckers and local businesses, and led an in-depth outreach program with all stakeholder groups.

The resulting plan shifts truck traffic from Grand and Flushing Avenues to a preferred bypass route that connects to the LIE without passing through residential Maspeth. DOT also made changes to the street network to ensure that the Maspeth Bypass was as direct and convenient as possible so that truckers would make the

DOT redesigned streets and legal truck routes in Maspeth to direct trucks away from residential streets while maintaining truck access to important industries.

Aerial view of improvements at intersection of Maspeth Avenue / Maurice Avenue / 58th Street / 56th Terrace switch. DOT reconfigured the multi-legged intersection of Maspeth Avenue and Maurice Avenue to safely accommodate truck through movements and turns, and converted several streets to one-way operation.

In addition to helping traffic flow at a key point in the Bypass, the improvements have led to a 59% decrease in reported vehicle crashes.

- **20%** decrease in peak-hour truck traffic on residential Grand Avenue
- Ongoing DOT monitoring and NYPD enforcement
- **32%** increase in peak-hour truck traffic using Maspeth Bypass route

Truck Volumes on Maspeth Bypass
Before and After Improvements

	Before	After	Change
AM Peak	350	487	39%
Midday Peak	315	409	30%
PM Peak	172	213	24%
All Peak Periods	837	1109	32%

Truck Volumes on Grand Avenue
Before and After Implementation

	Before	After	Change
AM Peak	463	346	-25%
Midday Peak	387	304	-21%
PM Peak	170	164	-4%
All Peak Periods	1020	814	-20%

Crashes with Injuries
Maspeth Avenue / Maurice Avenue / 58th Street / 56th Terrace, 57th Place / Maspeth Avenue, 56th Terrace / Rust Street

	Before* (three previous years)			After
Total Crashes with Injuries	5	4	3	6
Number of Crashes with Injuries to:				
Motor Vehicle Occupants	3	2	3	4
Pedestrians	1	2	0	2
Bicyclists	1	0	0	0

*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through May 2013) at annual rate. See page 46 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.

Citywide trends
(All data in thousands)

Year	New York City population*	New York City employment	Citywide traffic**	Transit ridership***
1990	7,336	3,564		5,206
1991	7,375	3,373		5,047
1992	7,429	3,280		4,977
1993	7,506	3,289	4,066	5,086
1994	7,570	3,320	4,089	5,236
1995	7,633	3,337	4,137	5,259
1996	7,698	3,367	4,192	5,187
1997	7,773	3,440	4,292	5,424
1998	7,858	3,527	4,408	5,893
1999	7,948	3,619	4,503	6,335
2000	8,018	3,718	4,535	6,737
2001	8,071	3,689	4,430	6,921
2002	8,094	3,581	4,502	6,979
2003	8,144	3,531	4,566	6,801
2004	8,184	3,549	4,589	6,919
2005	8,214	3,602	4,541	7,069
2006	8,251	3,666	4,523	7,205
2007	8,275	3,745	4,505	7,401
2008	8,364	3,790	4,407	7,638
2009	8,392	3,687	4,428	7,446
2010	8,175	3,708	4,468	7,419
2011	8,245	3,798	4,388	7,450

* Populations for interim years between the decennial census (1990, 2000, 2010) are estimates, which may trend higher than populations ultimately reported by the decennial census.
** Sum of all daily weekday traffic volumes at Borough and City boundaries
*** Sum of average daily boardings on NYCT subways and buses, MTA Bus Co. local routes, and privately operated local buses

Travel into the CBD
(All data in thousands)

Year	Ferry ridership in NYC	Daily vehicles entering the CBD	Daily transit riders entering the CBD	CBD commuter cycling*
1990	87	760	2,174	3.3
1991	84	759	2,154	3.6
1992	81	776	2,127	4.3
1993	81	761	2,157	4.5
1994	82	754	2,206	4.9
1995	82	771	2,210	5.2
1996	84	782	2,237	5.6
1997	84	814	2,249	5.2
1998	85	842	2,294	5.1
1999	103	843	2,431	4.7
2000	85	831	2,517	4.8
2001	n/a	696	2,390	4.9
2002	129	792	2,441	6.0
2003	119	817	2,392	6.9
2004	102	822	2,454	7.4
2005	100	805	2,472	7.7
2006	97	801	2,566	8.4
2007	101	791	2,683	9.3
2008	105	756	2,743	12.3
2009	105	771	2,586	15.5
2010	110	778	2,662	17.5
2011	115**	764	2,662	18.8

* This figure is for cyclists entering and leaving the Manhattan core at the East River bridges, Hudson River Greenway at 50th St., and on the Staten Island Ferry, weekdays 7 a.m.-7 p.m. The values for 1990-2006 are based on a three year rolling average; the value for 2007 is the average of 3 counts taken in May, August and September of that year; the values for 2008 and 2009 are the average of 10 counts taken between April and October.
** Based on both NYMTC Hub Bound Report and Mayor's Management Report data.

Daily vehicle traffic into the CBD, by sector of entry
(All data in thousands)

Year	New Jersey	60th Street	Queens	Brooklyn
1990	101	349	104	206
1991	98	357	104	200
1992	101	382	108	185
1993	102	370	107	182
1994	104	358	107	185
1995	104	361	117	189
1996	106	375	119	182
1997	107	377	131	199
1998	109	389	138	206
1999	112	393	135	203
2000	112	387	131	201
2001	67	369	127	133
2002	104	377	133	178
2003	110	383	139	185
2004	110	384	133	195
2005	108	377	133	187
2006	110	364	141	186
2007	110	353	136	192
2008	103	341	132	180
2009	104	346	138	183
2010	105	351	135	187
2011	100	349	138	177

Daily transit riders into the CBD, by sector of entry
(All data in thousands)

Year	New Jersey	60th Street	Queens	Brooklyn
1990	264	754	521	598
1991	257	764	522	579
1992	250	747	503	594
1993	254	755	515	601
1994	272	790	521	593
1995	269	800	525	587
1996	283	799	525	601
1997	299	785	534	601
1998	292	795	552	624
1999	312	866	571	645
2000	332	877	596	682
2001	325	843	553	668
2002	335	869	559	645
2003	333	857	526	647
2004	350	864	535	674
2005	356	876	553	656
2006	372	911	557	695
2007	390	926	597	738
2008	388	977	596	746
2009	385	889	565	711
2010	405	902	580	738
2011	401	906	583	737

Travel outside the CBD
(All data in thousands)

Year	Daily vehicle traffic outside the CBD *	Daily bus ridership **
1990		
1991		
1992		
1993	3,305	
1994	3,335	
1995	3,366	
1996	3,410	
1997	3,478	
1998	3,566	1,749
1999	3,660	1,883
2000	3,704	1,983
2001	3,734	2,080
2002	3,710	2,131
2003	3,749	2,062
2004	3,767	2,077
2005	3,736	2,115
2006	3,722	2,160
2007	3,714	2,192
2008	3,651	2,262
2009	3,657	2,218
2010	3,690	2,154
2011	3,624	2,077

* Sum of all daily traffic volumes at borough and city boundaries, excluding volumes at points entering the Manhattan CBD.
** Sum of all average daily boardings on local bus routes operated by NYCT, MTA Bus Co., and private operators. During years for which complete data are only available for NYCT local routes (2002-2005), private and MTA Bus Co. local route data are estimates.

Daily vehicle traffic outside the CBD, two-way vehicle volumes at borough or city boundaries *(All data in thousands)*

Year	Nassau-Queens	The Bronx-Manhattan	The Bronx-Queens *	Verrazano Narrows Bridge
1990		540		
1991				
1992		537	272	183
1993	892	542	266	178
1994	897	526	274	181
1995	893	522	277	185
1996	896	531	273	185
1997	907	547	272	183
1998	920	560	286	195
1999	947	563	291	195
2000	940	579	295	203
2001	947	569	294	219
2002	944	552	300	212
2003	969	550	299	206
2004	966	552	312	206
2005	959	561	297	194
2006	935	557	309	207
2007	952	558	304	201
2008	952	539	309	204
2009	956	544	299	202
2010	964	550	298	204
2011	970	545	289	195

* Sum of two-way daily traffic on the Throgs Neck, Bronx-Whitestone, and Triboro Bridge (Bronx toll plaza only)

Daily bus ridership outside the CBD, by borough*
(All data in thousands)

Year	Upper Manhattan **	The Bronx	Queens	Brooklyn	Staten Island
1990					
1991					
1992					
1993					
1994					
1995					
1996					
1997					
1998	96	453	515	602	83
1999	109	483	556	648	89
2000	116	505	589	680	93
2001	122	528	614	721	96
2002	128	535	623	749	96
2003	126	515	599	728	93
2004	131	523	593	737	93
2005	132	529	620	741	94
2006	130	543	647	744	96
2007	130	545	685	736	97
2008	130	567	725	740	100
2009	128	558	710	723	98
2010	126	545	707	683	94
2011	121	520	695	652	90

* Average daily boardings on NYCT, MTA Bus Co., and private local bus routes.
** Includes data only from routes that operate exclusively north of 60th Street in Manhattan.

Daily vehicle traffic outside the CBD, two-way vehicle volumes at borough or city boundaries *(All data in thousands)*

Year	George Washington Bridge	Westchester-The Bronx	Staten Island-New Jersey	Queens-Brooklyn
1990	273			
1991				
1992	268		145	
1993	261	506	141	519
1994	260	516	144	537
1995	266	532	144	547
1996	275	548	147	554
1997	282	555	152	580
1998	297	566	157	587
1999	318	584	167	595
2000	318	591	165	614
2001	309	607	177	612
2002	311	620	179	592
2003	319	620	175	612
2004	315	627	174	615
2005	304	633	172	615
2006	312	625	176	601
2007	291	636	170	601
2008	293	599	166	590
2009	290	609	166	592
2010	292	617	168	597
2011	280	602	170	574

Crash (accident) data reported in the Project Indicators section is derived from accident reports filed with NYPD. Accident reports are primarily completed by police officers at the scene although they may also be filed by private citizens, generally those involved in the accident. Information from crash reports is entered into an NYPD database. The NYPD database includes the location, time, and number of injuries in all crashes reported to the NYPD. No distinctions of severity are made among the reported injuries. "Non-reportable" crashes, which by definition involve no personal injuries and property damage of less than $1,000, are not included in the NYPD database. There is also no distinction between intersection and midblock crashes, so data on all the crashes along a corridor may include midblock crashes on the adjacent perpendicular blocks, thereby slightly overestimating the total number of crashes on the corridor. Before-and-after analyses of NYPD crash data is considered reliable since the same methodology is used for all data.

The tables in the Project Indicators section show the number of crashes in each of the three years prior to project implementation and after implementation. The "after" data is generally for 12 to 18 months, through May 2013. "After" data is reported at an annual rate.

In analyzing crash data, DOT took account of the annual variability in crashes over the 10 years prior to project implementation, and trends in the number of crashes citywide. The result of the analysis shows whether differences between the pre- and post-implementation crash rates are statistically significant, using a 90% level of confidence. The text notes where statistically significant changes occur.

The analysis of crash data comprises an initial assessment of project impacts. A more definitive analysis requires several years of post-implementation data to determine whether a significant change in the crash rate occurred after implementation. Note that in many cases, the post-implementation rate based on about one year of data is not statistically significant, but would be statistically significant if the post-implementation crash rate is sustained over several years.

List of Abbreviations

APS	Audible Pedestrian Signal
BID	Business Improvement District
BQE	Brooklyn-Queens Expressway (I-278)
CAC	Community Advisory Committee
CB	Community Board
CBD	Central Business District
DOT	New York City Department of Transportation
DPR	New York City Department of Parks & Recreation
DSNY	New York City Department of Sanitation
EDC	New York City Economic Development Corporation
GAPCo	Grand Army Plaza Coalition
GPS	Global Positioning System
IBZ	Industrial Business Zone
LIE	Long Island Expressway (I-495)
MTA	Metropolitan Transportation Authority
NYCT	New York City Transit
NYMTC	New York Metropolitan Transportation Council
NYPD	New York City Police Department
SBS	Select Bus Service
TLC	New York City Taxi and Limousine Commission

New York City Department of Transportation

Janette Sadik-Khan
Commissioner

Bruce Schaller
Deputy Commissioner
Traffic and Planning

This report was developed by the New York City Department of Transportation's Division of Traffic and Planning. Deputy Commissioner Bruce Schaller directed the project team which consisted of Jamie Carrington, Will Carry, Tom Maguire, Mike Marsico, Stanislav Parfenov, and Andrew Weeks. Ben Killen and David Moidel of Creative Services are responsible for all the graphic elements and general production of the 2012 Sustainable Streets Index.

In addition, the following DOT officials and staff members provided content and input in the creation of this document:

Zamir Alam, Nichole Altmix, Joshua Benson, Rich Carmona, Tom Cocola, Ann Marie Doherty, Margaret Forgione, Nathan Gray, Greg Haas, Delila Hall, Seth Hostetter, Stacey Hodge, Christopher Hrones, Terra Ishee, Catherine Matera, Constance Moran, Wanda Matos, Jesse Mintz-Roth, Jon Orcutt, Joseph Palmieri, Joon Park, Nicholaas Peterson, Sean Quinn, Megan Quirk, Naim Rasheed, Heather Richardson, Matthew Roe, Sandra Rothbard, Ryan Russo, Luis Sanchez, David Stein, Rob Viola, Ilana Wagner, Andy Wiley-Schwartz, Heidi Wolf and Ellen Zielinski.

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New York City Department of Transportation

61%
Reduction in crashes involving injuries at West 23rd Street and 7th Avenue after adding pedestrian islands and other safety measures.
Source: NYCDOT

55%
Reduction in speeding along Slosson Avenue and Todt Hill Road after narrowing the roadway and adding turn lanes.
Source: NYCDOT

41%
Improvement in travel speeds on Broadway in Jackson Heights after simplifying traffic movements.
Source: NYCDOT

34%

Shorter travel times for drivers in Downtown Flushing after simplifying traffic movements and signal timings.

Source: NYCDOT

25-65%

Faster average speeds on West 181st Street after improvements to traffic patterns, signal timings and delivery.

Source: NYCDOT

96%

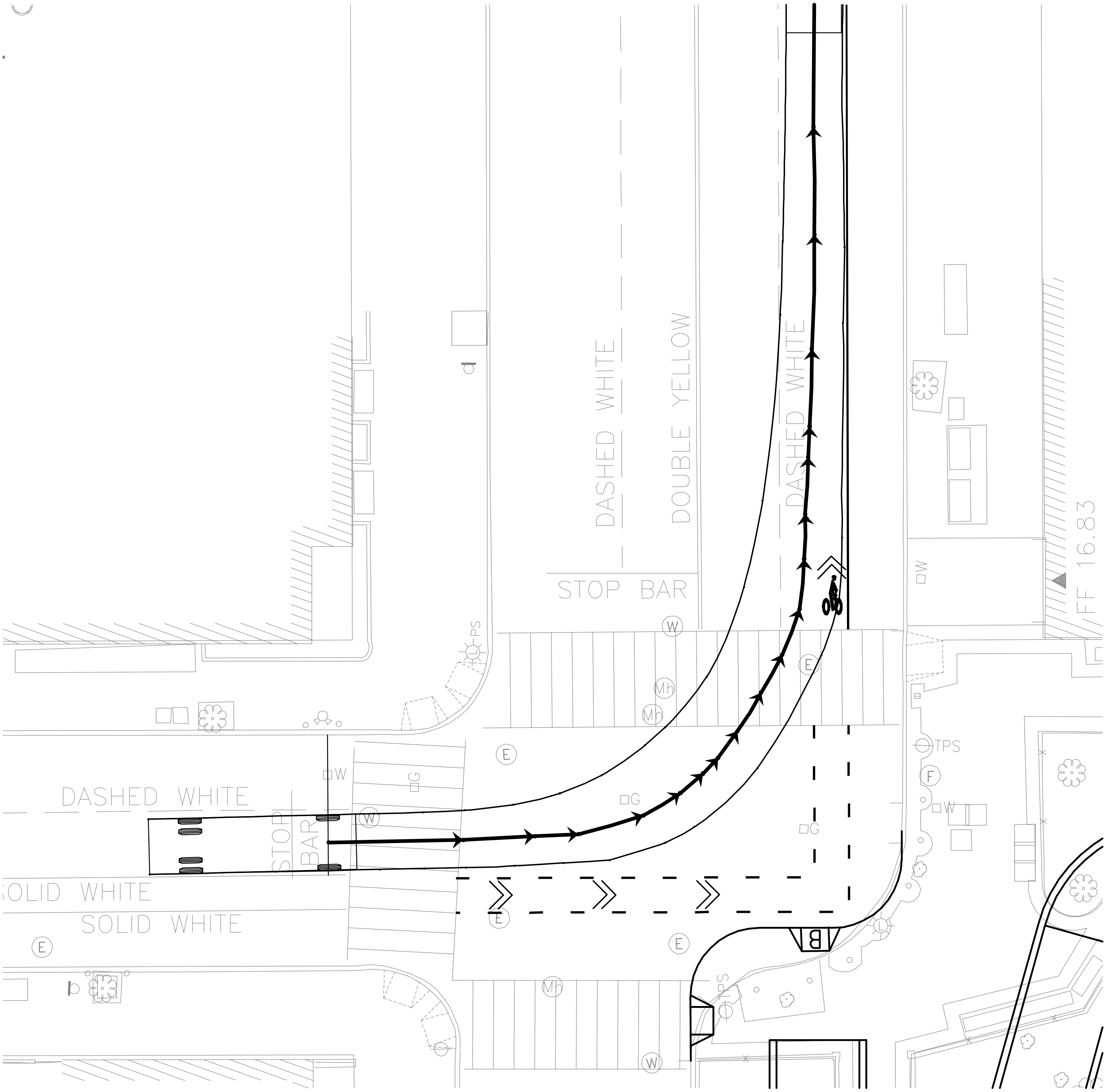
Increase in pedestrian volumes through the center of Grand Army Plaza on weekday evenings.

Source: NYCDOT


NEW YORK CITY
DOT

IV

Turning Movement Plans: Upland Bridge Connections at City Streets



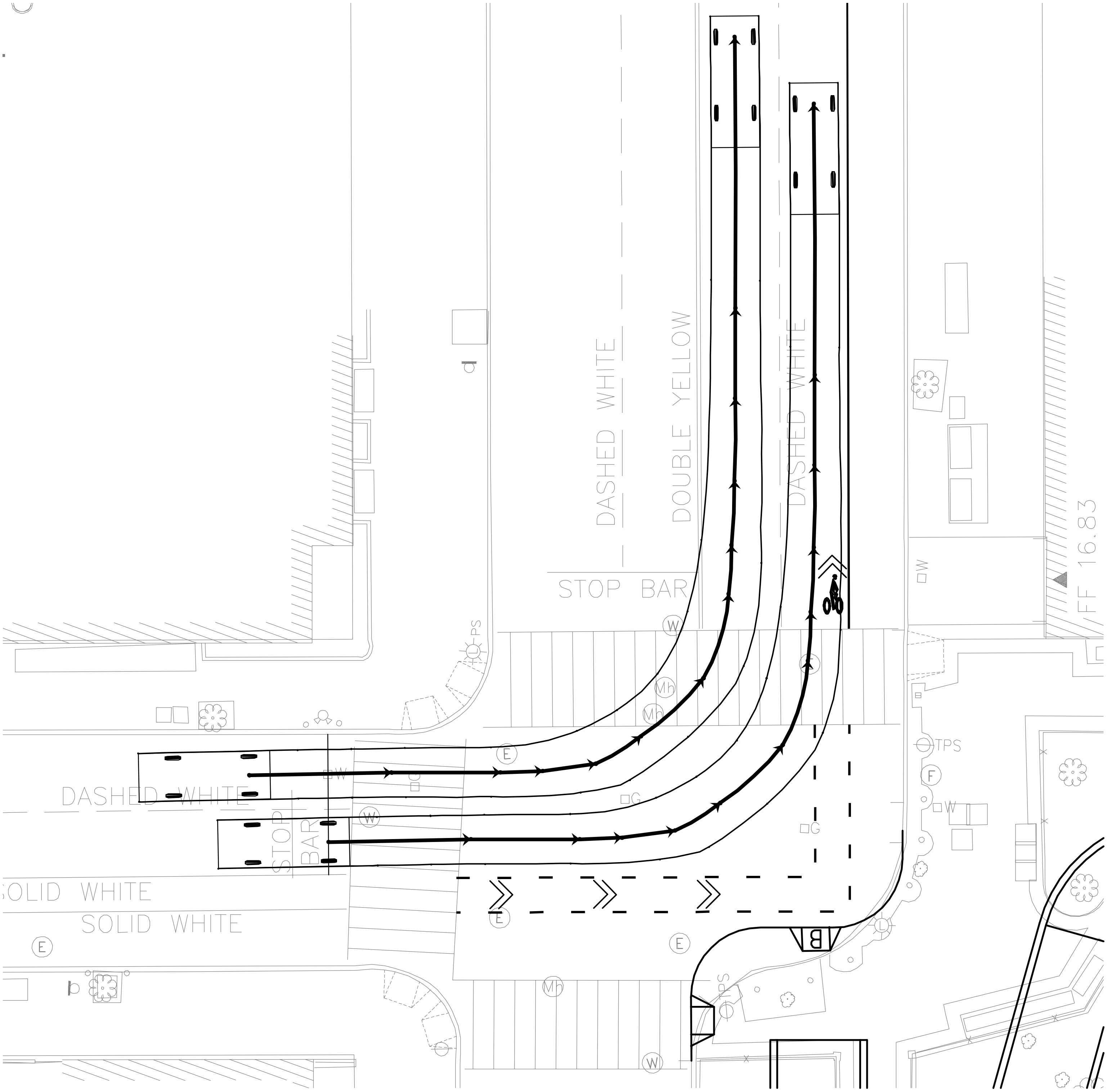
SU TURNING RADIUS PLAN

INTERSECTION OF SUTTON PLACE AND 54th STREET

N.T.S.

NOTES:

1. ALL VEHICLE TURNS SHOWN ARE BASED ON AUTOTURN FOR AN AASHTO SU VEHICLE.

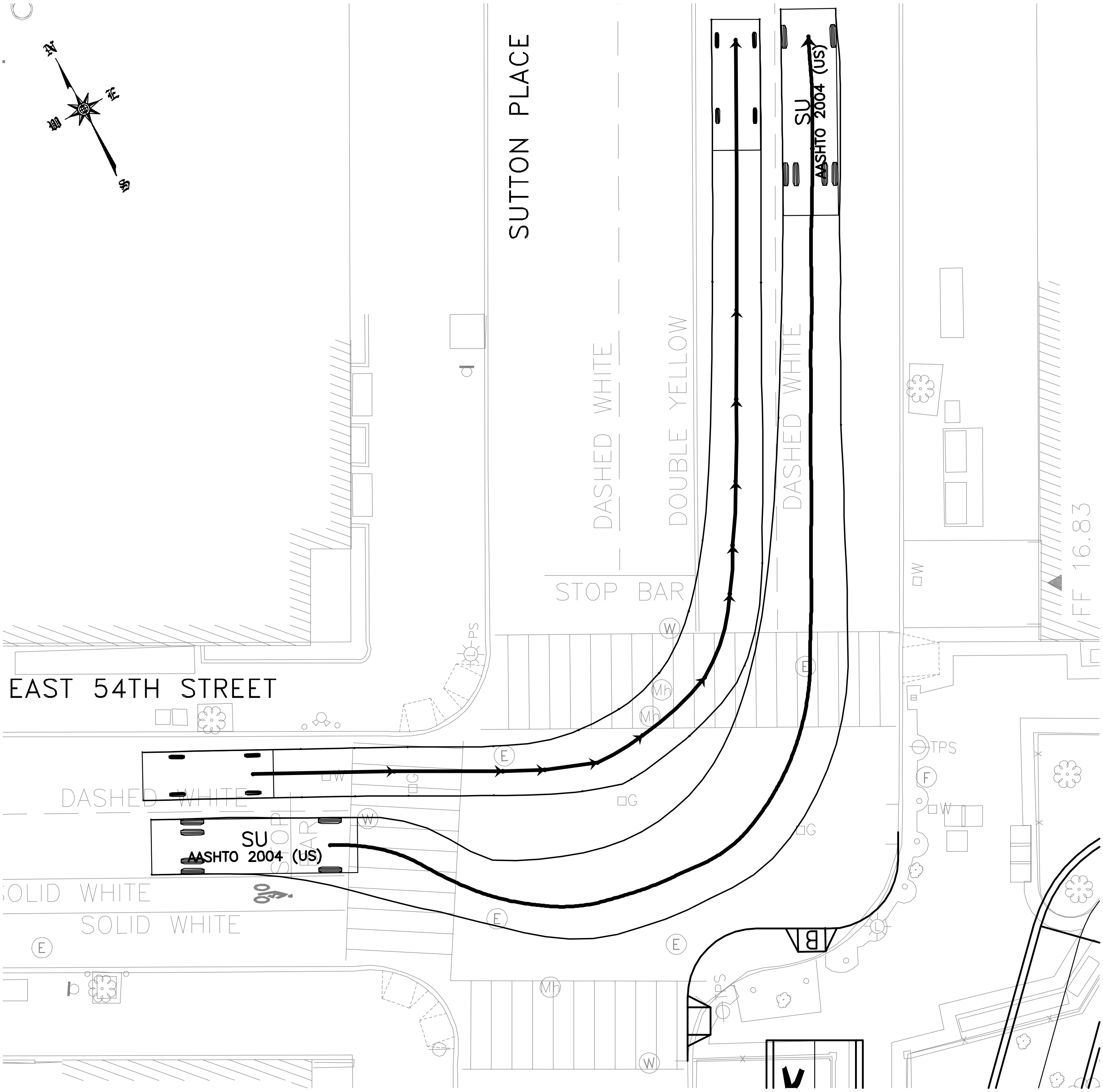


P TURNING RADIUS PLAN
INTERSECTION OF SUTTON PLACE AND 54th STREET

N.T.S.

NOTES:

1. ALL VEHICLE TURNS SHOWN ARE BASED ON AUTOTURN FOR AN AASHTO P VEHICLE.

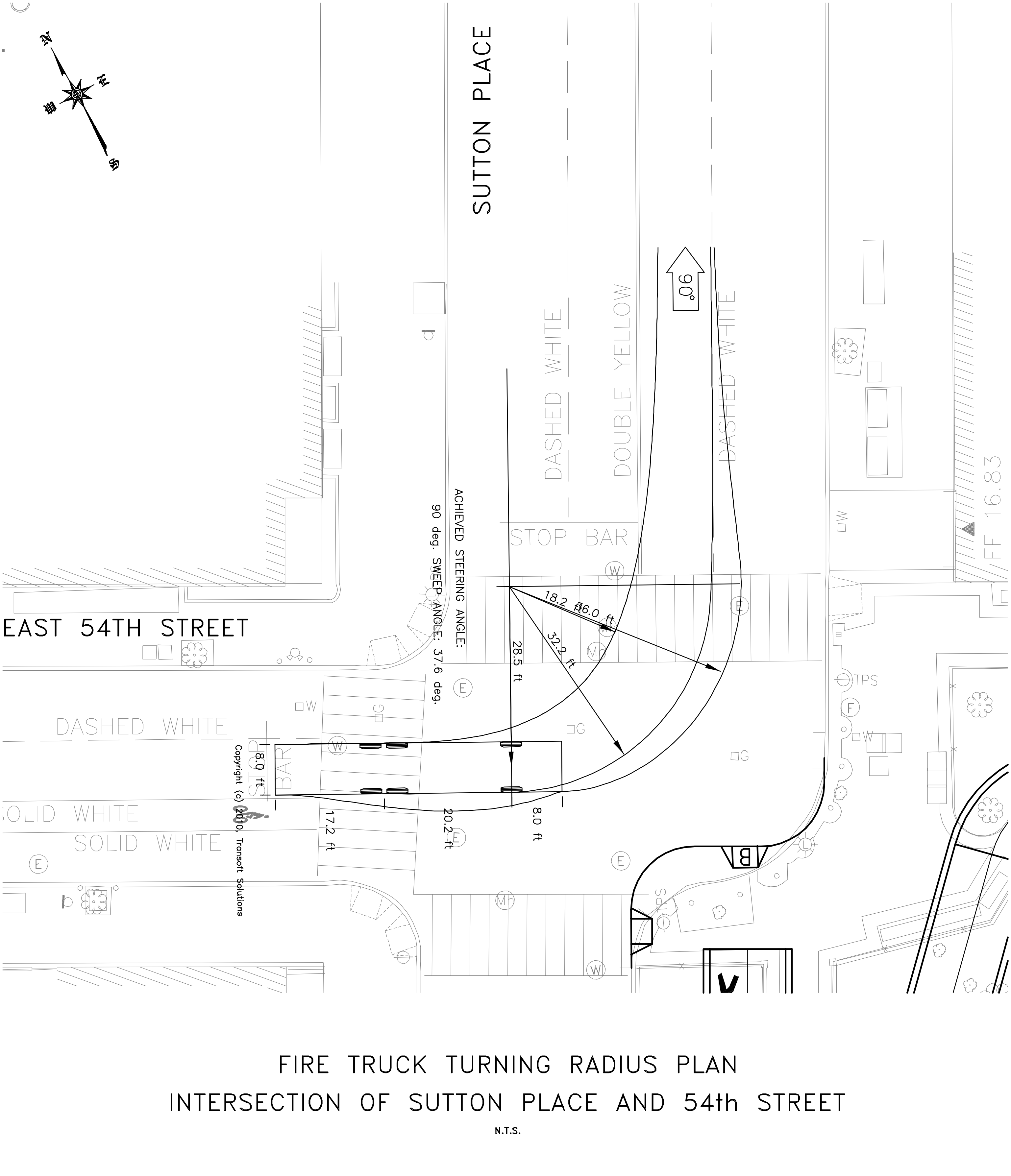


P & SU TURNING RADIUS PLAN
INTERSECTION OF SUTTON PLACE AND 54th STREET

N.T.S.

NOTES:

1. ALL VEHICLE TURNS SHOWN ARE BASED ON AUTOTURN FOR AN AASHTO SU AND AN AASHTO P VEHICLE.

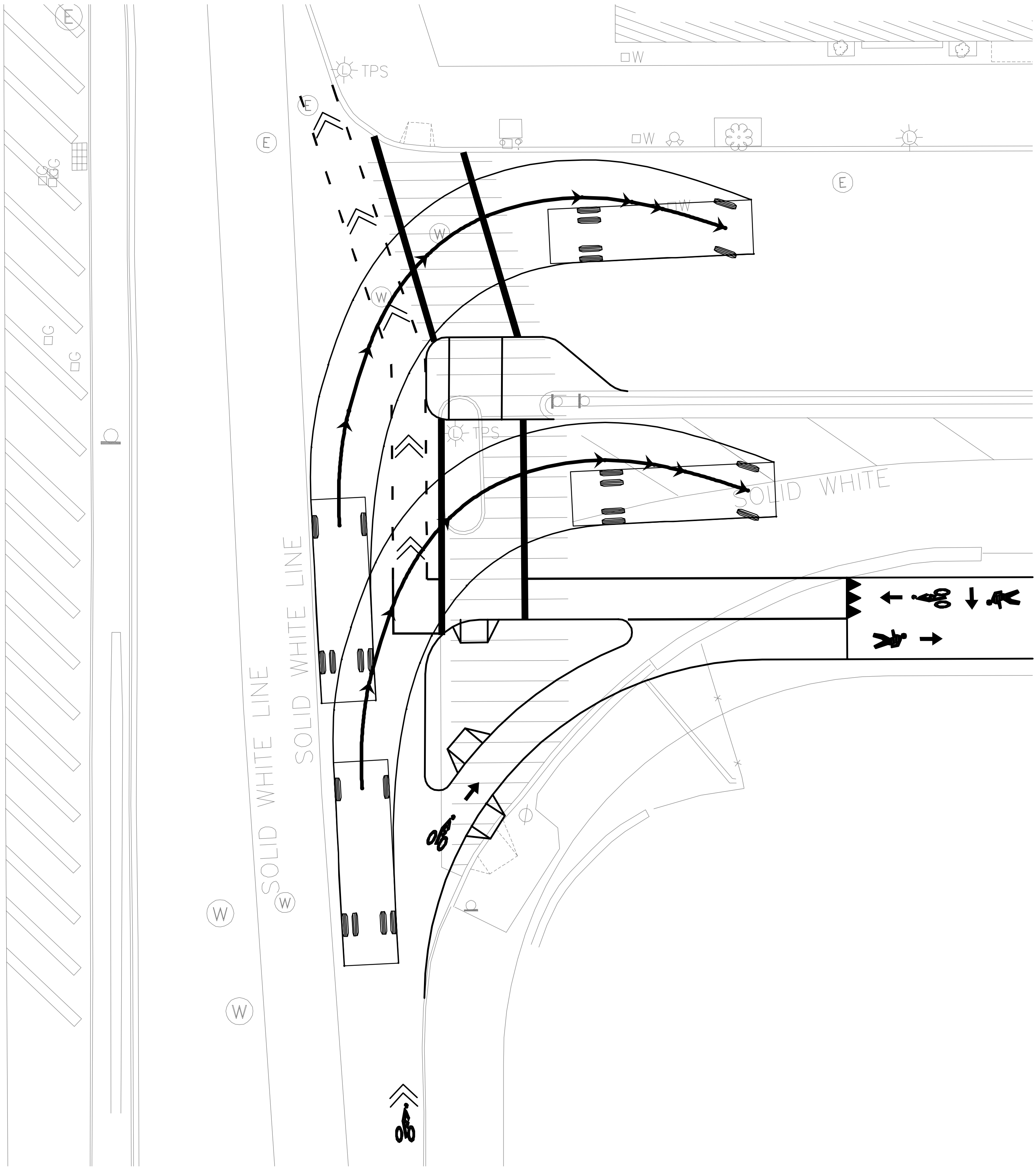


FIRE TRUCK TURNING RADIUS PLAN
INTERSECTION OF SUTTON PLACE AND 54th STREET

N.T.S.

NOTES:

1. ALL VEHICLE TURNS SHOWN ARE BASED ON AUTOTURN FOR AN FDNY FIRE TRUCK.



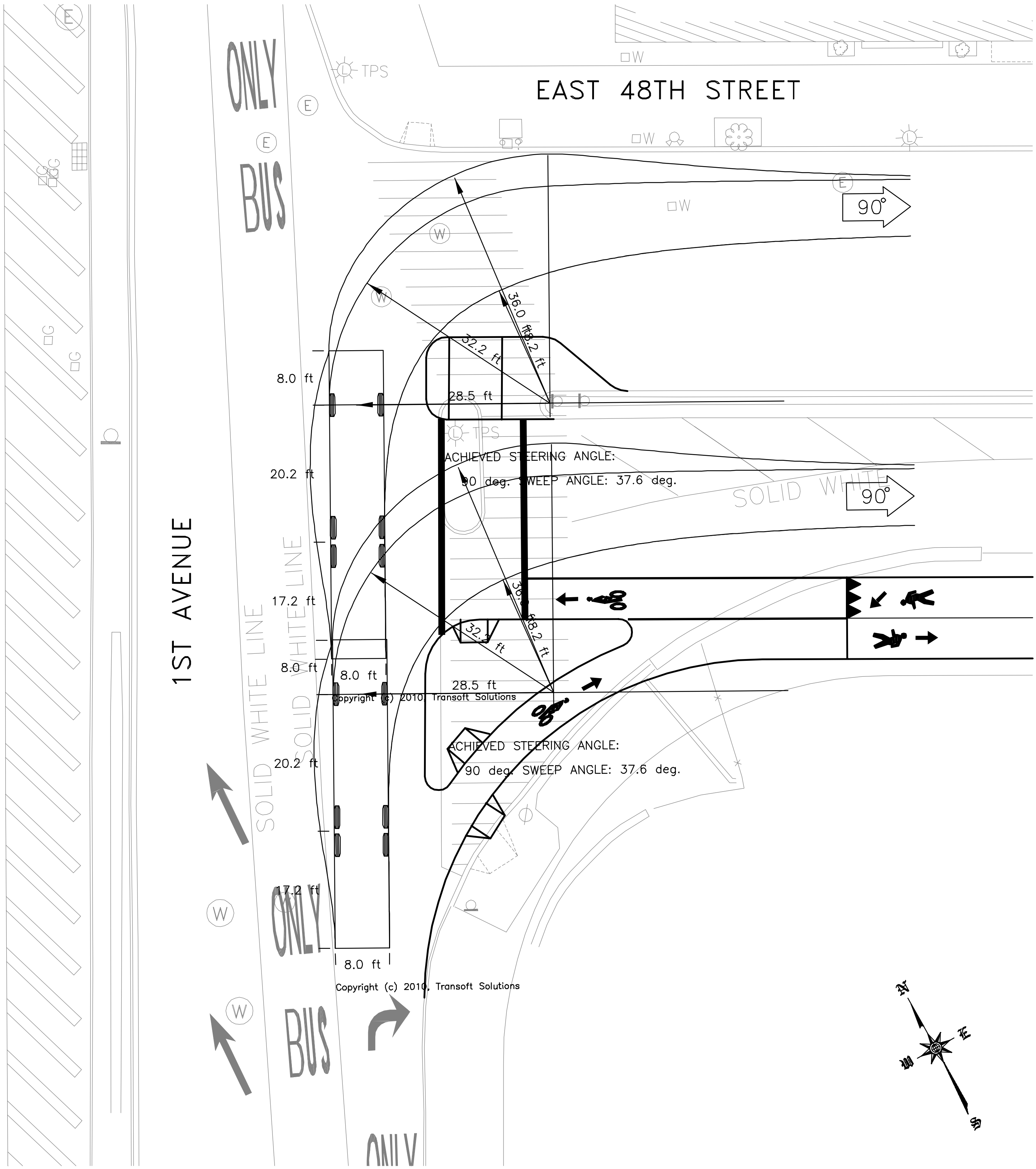
SU TURNING RADIUS PLAN

INTERSECTION OF 1st AVENUE AND 48th STREET

N.T.S.

NOTES:

1. ALL VEHICLE TURNS SHOWN ARE BASED ON AUTOTURN FOR AN AASHTO SU VEHICLE.



FIRE TRUCK TURNING RADIUS PLAN

INTERSECTION OF 1st AVENUE AND 48th STREET

N.T.S.

NOTES:

1. ALL VEHICLE TURNS SHOWN ARE BASED ON AUTOTURN FOR AN FDNY FIRE TRUCK.

V

NYC Guide Sign Design Standards

Guide Sign Standards

Street Network Signs

Guide Signs

On street network routes guide signs should be 24” wide to maintain consistency. Sign height will be determined by the number of destinations shown. See Specification Sheets for details, arrow and text placement.

Single destination sign: 24” x 36”

BIKE SYMBOL: 14” x 8”

TEXT: 3”

Dual destination sign: 24” x 36”

BIKE SYMBOL: 14” x 8”

TEXT: 3”

Triple destination sign: 24” x 42”

BIKE SYMBOL: 14” x 8”

TEXT: 3”

No more than 3 destinations will be noted on a single sign.

Greenway Medallions

A greenway medallion should be placed underneath the guide sign on the street network at the last sign before entering a greenway route.

Greenway medallion: 16”

Note specific greenway name on sign order

Greenway Signs

On greenway routes, guide signs should be 18” wide to maintain consistency. Sign height will be determined by the number of destinations shown. See Specification Sheets for details, arrow and text placement.

Single destination sign: 18” x 24”

BIKE SYMBOL: 10” x 6”

TEXT: 2”

Dual destination sign: 18” x 24”

BIKE SYMBOL: 10” x 6”

TEXT: 2”

Triple destination sign: 18” x 30”

BIKE SYMBOL: 10” x 6”

TEXT: 2”

No more than 3 destinations will be noted on a single sign.

Greenway Medallions

A greenway medallion should be placed underneath the all guide signs on a greenway route

Greenway medallion: 16”

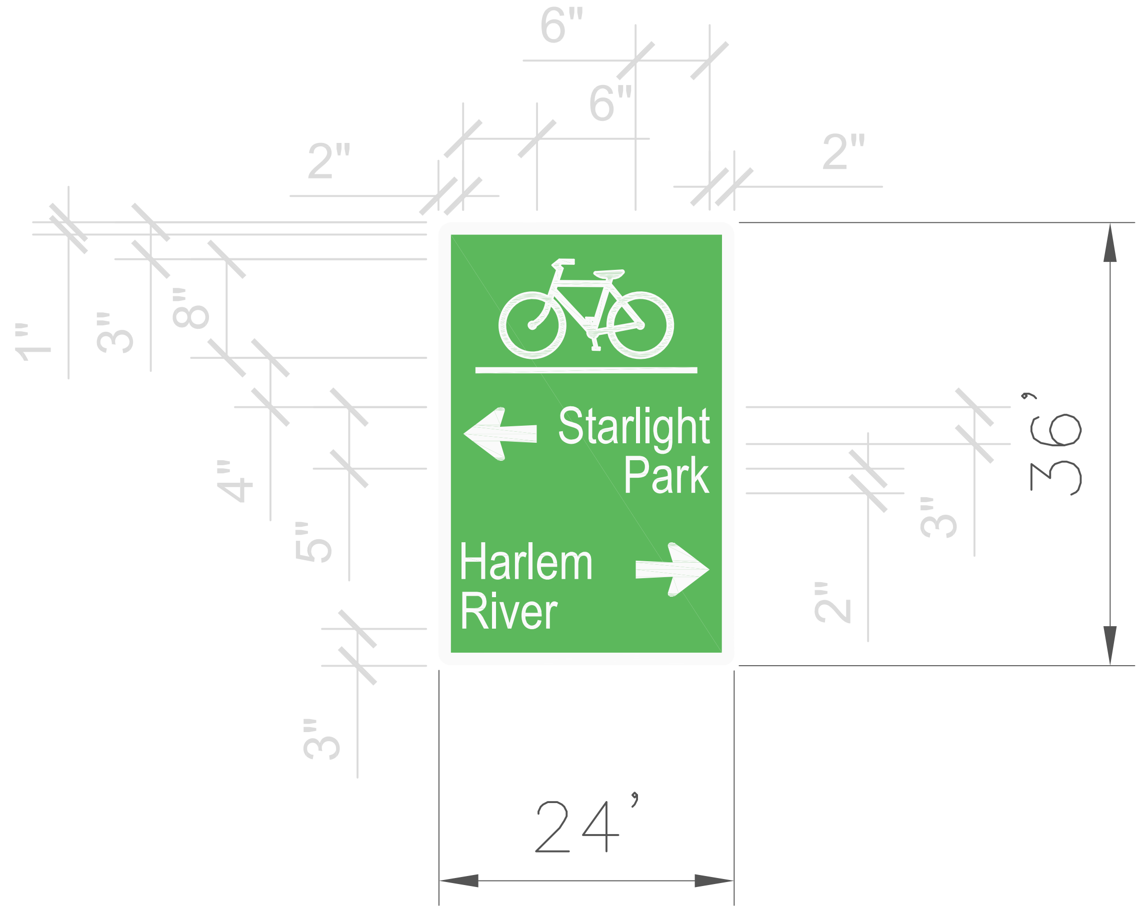
Note specific greenway name on sign order

Single Destination Sign, Street Network

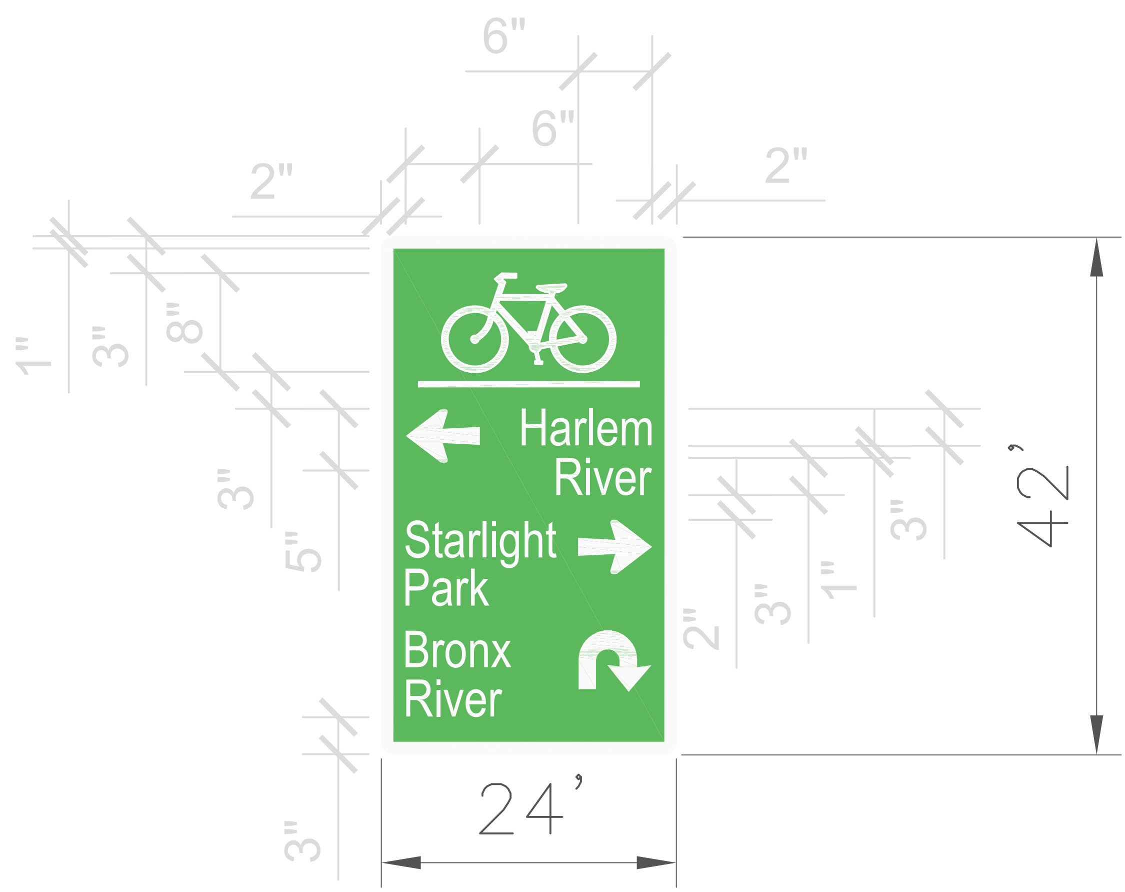
1 Destination (24" x 36", 3" text)

Multiple Destination Signs, Street Network

2 Destination (24" x 36", 3" text)

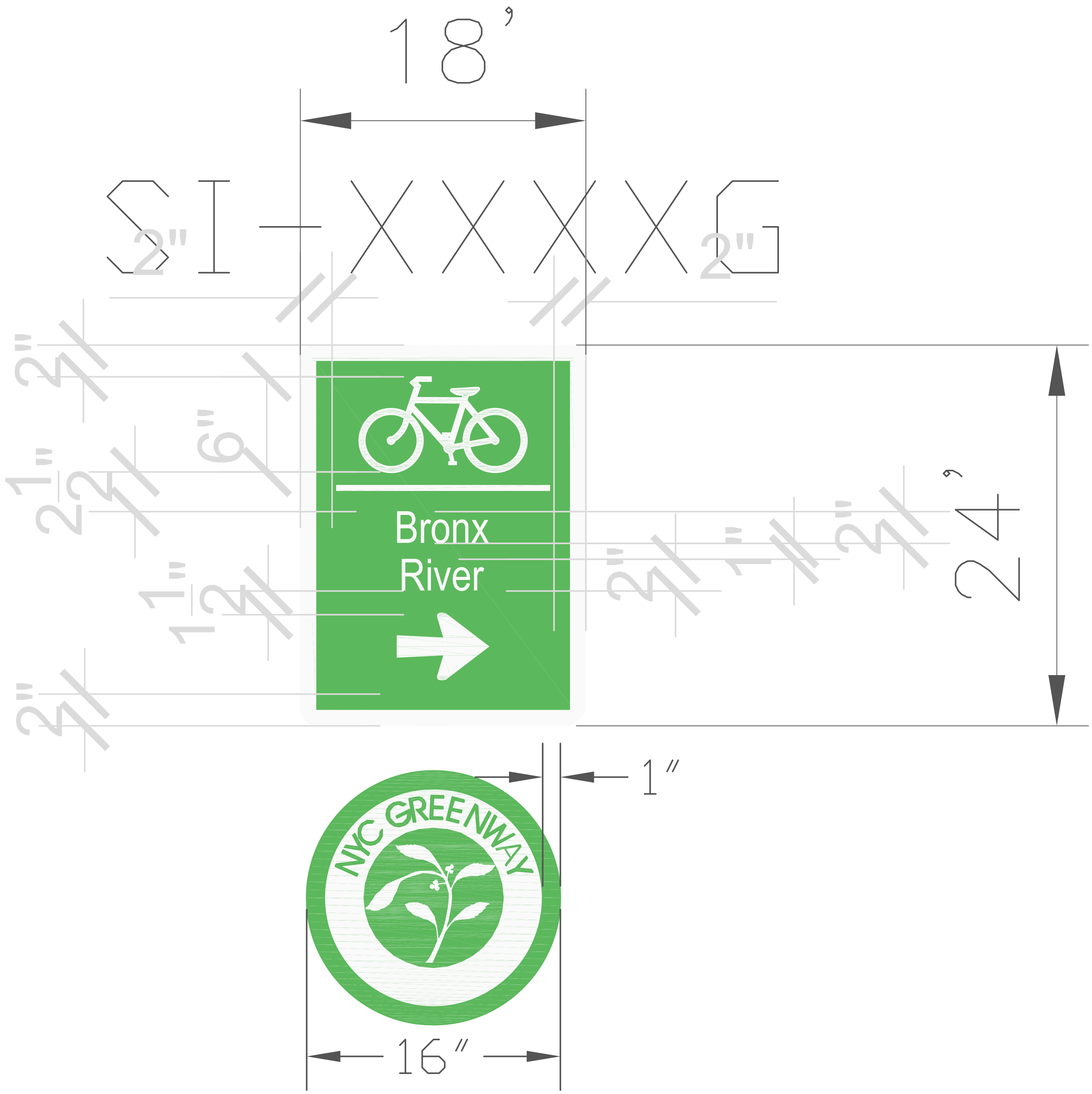


3 Destination (24" x 42", 3" text)



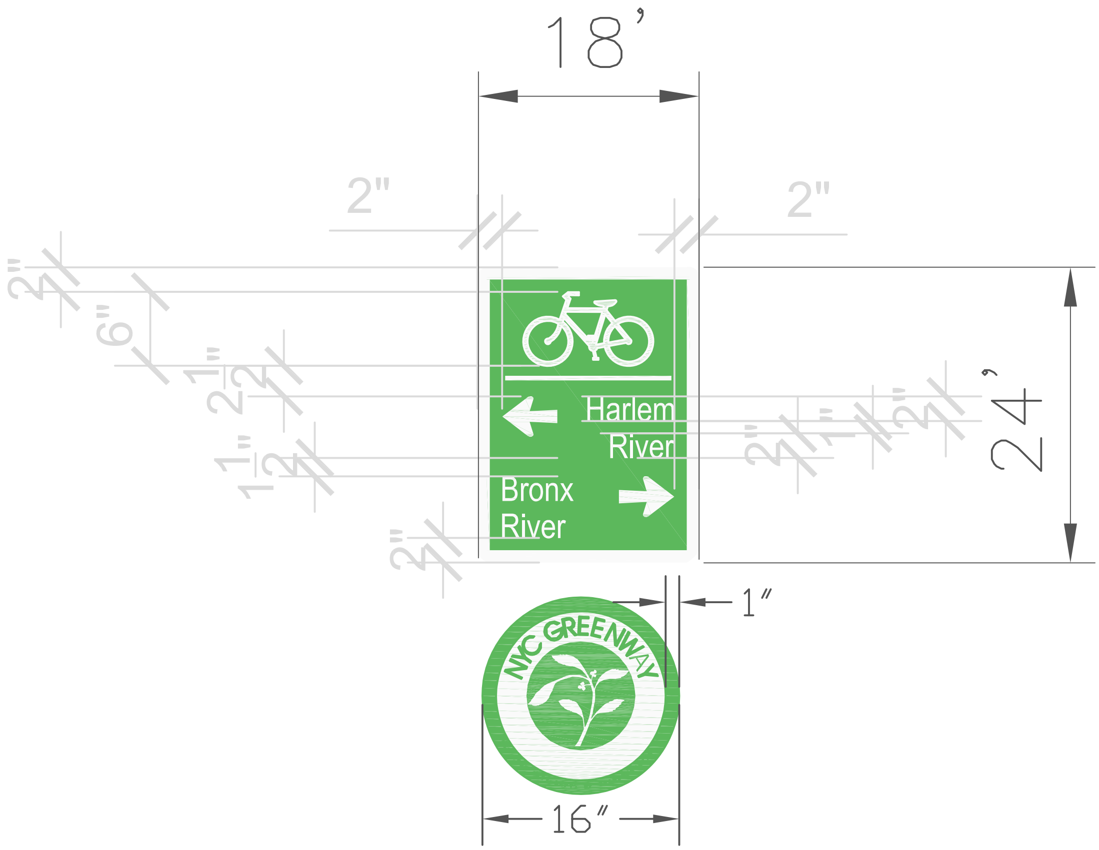
Single Destination Signs,Greenway

1 Destination (18" x 24", 2" text)

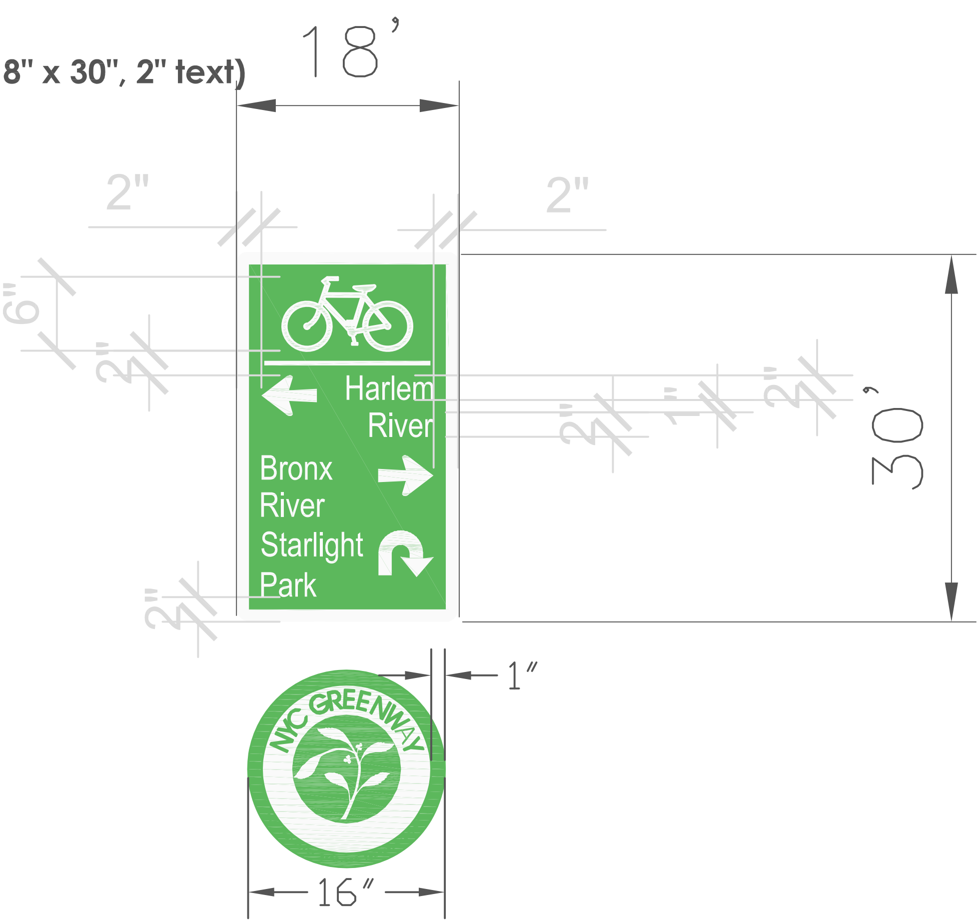


Multiple Destination Signs,Greenway

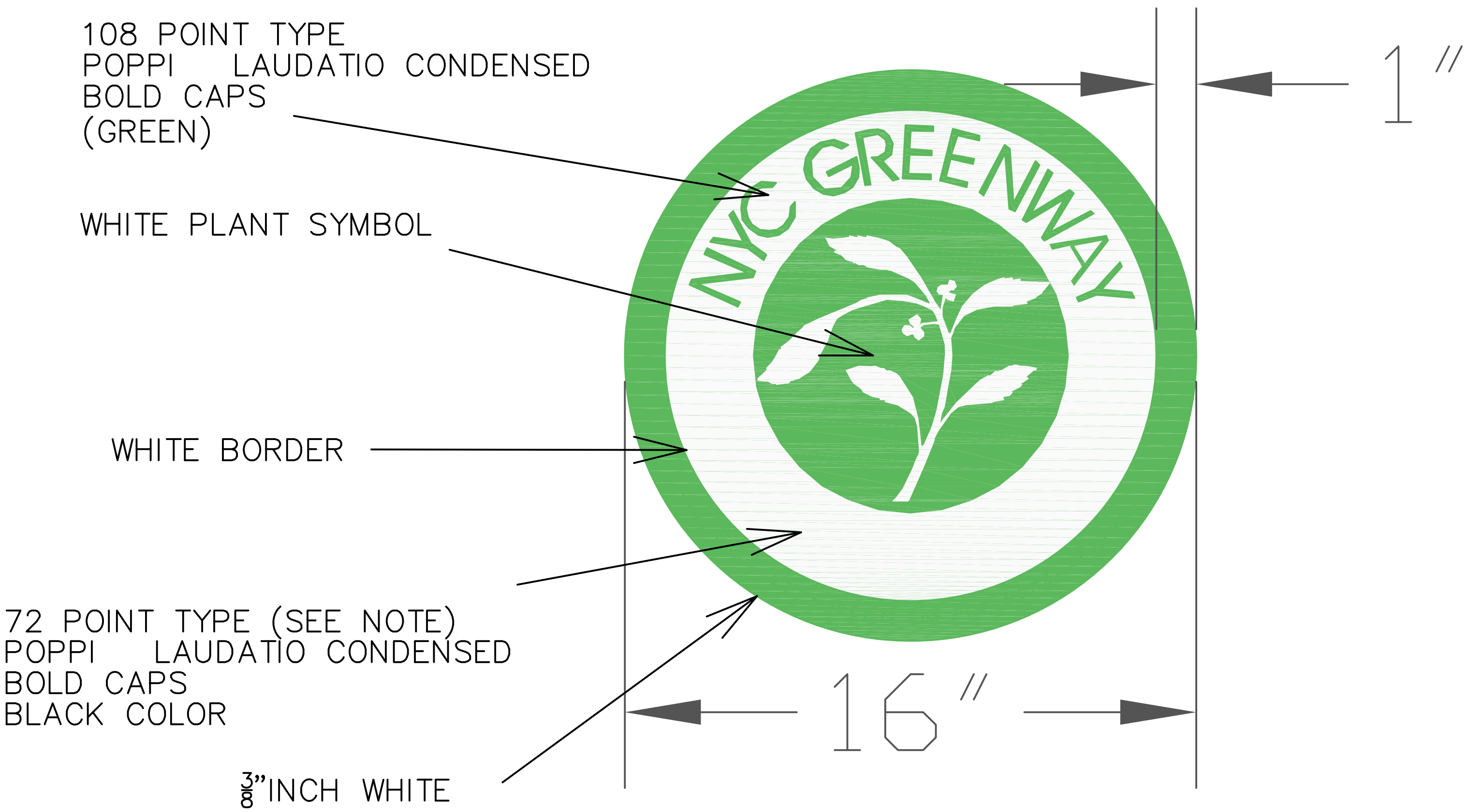
2 Destination (18" x 24", 2" text)



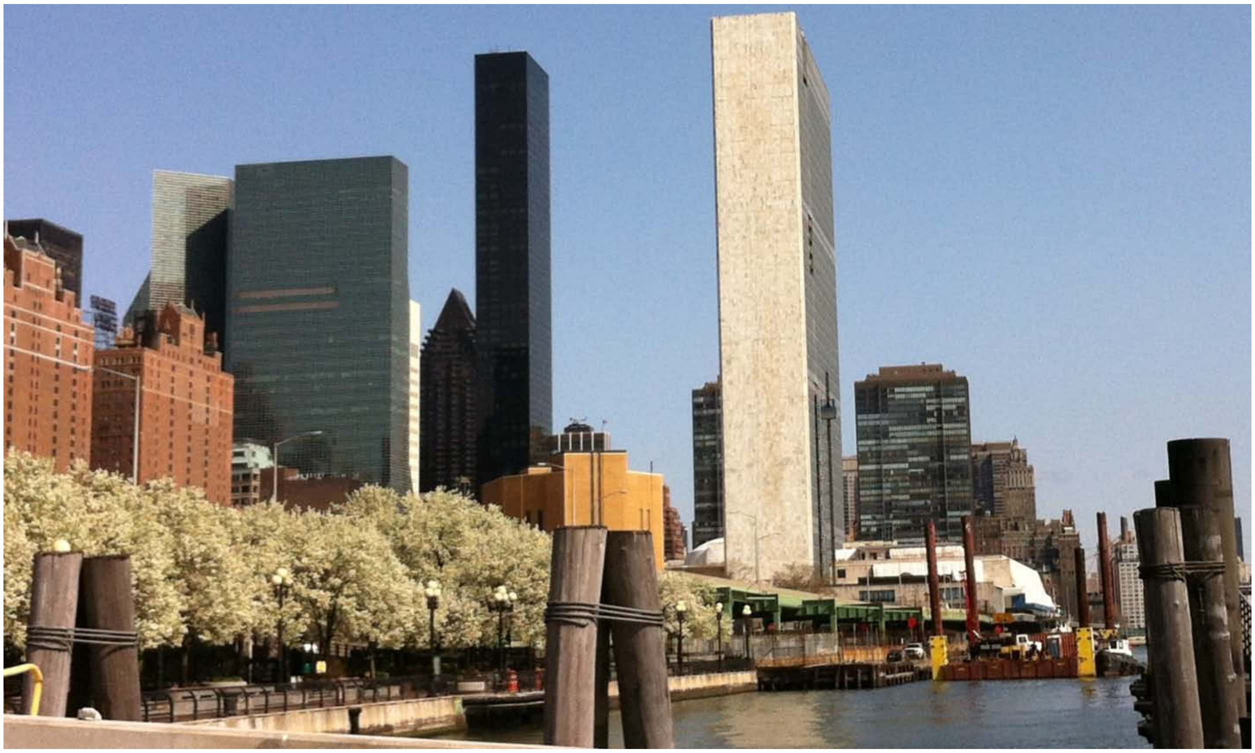
3 Destination (18" x 30", 2" text)



Greenway Medallion



APPENDIX D
Geotechnical Information



SUBSURFACE EXPLORATION GEOTECHNICAL REPORT

East Midtown Waterfront Esplanade & Greenway, New York City

Prepared By:

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20 Exchange Place
New York, New York 10005

June 2012 (Revised Aug 2012)

GEOTECHNICAL SUBSURFACE EXPLORATION REPORT
East Midtown Waterfront Esplanade & Greenway, New York City

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1 Introduction

1.1 Project Overview

The East Midtown Waterfront Esplanade consists of a pier supported esplanade along the East River in Manhattan. The project extends from 37th Street in the south to 60th Street in the north. The new facility will provide park space and bikeway lanes continuously along this stretch. The structure is intended to be a pier supported structure for the length of the project that will be built between the bulkhead and pier head lines of the East River. The project will tie back to the street grid via pedestrian bridges.

1.2 Background and Existing Data Review

A review of the existing geotechnical information at Waterside Pier, UN Esplanade and ODR Esplanade of New York City has been completed. The purpose of this review was to summarize the subsurface conditions at these locations and provide recommendations on any further investigations that may be required to provide sufficient understanding of the conditions to enable development of foundation system for proposed esplanade.

This review considers the existing information and recommends a boring program for all three locations – Waterside Pier, UN Esplanade and ODR Esplanade. Utilizing existing data from past work along the FDR areas and performing additional borings where information was lacking.

The majority of data utilized was subsurface information from the investigations performed as part of the design and construction of the FDR Drive temporary roadway detour and the associated fendering system. Additionally AECOM's geotechnical staff researched record MTA drawings of the tunnels that cross the site in order to ensure the boring program would not put any existing tunnels at risk during the investigation. Approximate locations of tunnels are also shown on the soil profiles created from this investigation. However the Contractor is urged to fully survey and research tunnel locations prior to construction, as the locations, depths and dimensions shown are approximate.

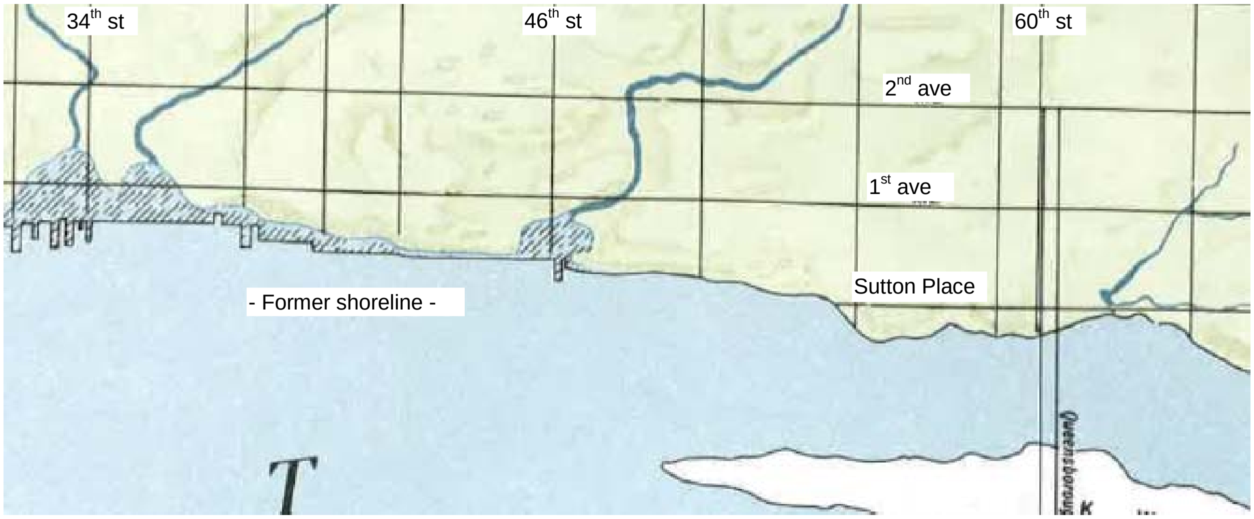
2 Subsurface Exploration

2.1 Geological History of Site

The formation of drainage features in this region began 8,000 to 10,000 years ago when the last advance of the Wisconsin Glacier began to melt and retreat northward. At the height of the last ice age the Wisconsin Ice Sheet covered all of Canada and much of the northern United States. The glacier stopped its advance in New York City. The ice sheet covered all of Manhattan and continued as far as northern Staten Island. The terminal moraine, known as the "Harbor Hill Moraine", stretches from Staten Island, through Brooklyn and Queens and out across Long Island to the tip of Montauk Point. This terminal moraine of the glacier created a large inland lake, Glacial Lake Hackensack, which persisted for several thousand years on the north and western shores of Staten Island, Manhattan and parts of New Jersey.

The Hudson and East Rivers formed as this terminal moraine was breached at the Verrazano Narrows and have run on their present course for thousands of years. The waterfront edge however varied over time. In the last 300 years the waterfront in this area has been filled with man-made fill to form the current bulkhead line. At this site, particularly in the south, considerable fill has been added along the waterfront to create the present shoreline. In the north, the shoreline more closely resembles the native shoreline and the rock is nearly at the surface at the water's edge.

The following image from Townsend MacCoun map "1609 The Island of Manhattan at the time its discovery showing its elevations, water courses, marshes and shore line", based on 1867 survey by General Viele, illustrates the former shoreline along this project site.



The bedrock type consists almost entirely of Manhattan Schist for the stretch of this alignment as indicated on the boring logs. In some cases, there are minor inclusions of quartz or quartz banding within the rock. Manhattan Schist is metamorphic rock of schist or gneiss, known for its foliations of black mica; it also may have crystalline pegmatite or aplite dikes and quartz veins. It is typically a hard durable rock with good strength properties; however, near vertical seams of decomposed mica schist which may be unsuitable for bearing have been found in the borings and extending to depths noted in tunnel crossings.

2.2 Buried structures

Note that there are multiple tunnels crossing the proposed site under the East River; including several subway tubes and the Midtown Tunnel tubes. Extreme caution should be used when installing foundations. All tunnel locations should be surveyed prior to construction and MTA/DOT should be consulted during construction. Contractor should follow all monitoring requirements of MTA/DOT during construction period. In addition to these facilities multiple outfalls transect the site and will need to be avoided during construction. Contractor is responsible for identifying, locating, surveying, monitoring and protecting all such structures.

2.3 Boring Program

The boring program consisted of drilling a total of fifteen (15) water borings and three (3) land borings. The boring program was designed to supplement the available data in the north of the site. There were 28 borings available along the proposed alignment of the esplanade, all of which occurred in the north section of the project. These record borings and the newly performed boring were combined to characterize the soil along the proposed alignment. Soil profiles were created to generalize the soil and rock conditions of the site and can be seen in Figures 6-10. The borings logs for the borings performed in this contract are included in Appendix A; and the existing record borings are shown in Appendices B & C.

The borings done in this contract were performed by Warren George Inc., from March 19th, 2012 to May 28th, 2012, from a jacked barge fitted with a truck based drill rig. All borings were cased below the mudline and supported with bentonite as needed to maintain an open hole. All borings were drilled to rock and rock cores performed to collect rock recovery data and determine the rock quality designation as required by the NYC building code to classify the rock foundation design properties. Soil samples were collected at 5 foot intervals from the mudline down to bedrock and samples were characterized according to NYC Building Code criteria. Samples were collected using a 2-inch outside diameter Split Spoon Sampler with Standard Penetration Tests (SPT's) in accordance with ASTM D-1586. The number of blows per foot of penetration (N values) were recorded on the boring logs and are shown on the soil profiles.

Rock was cored using a 2.375-inch outside diameter NX core barrel in accordance with ASTM D-2113 to ensure the boring was completed in competent bedrock. The percent of recovery (REC) and Rock Quality Designation (RQD) were recorded on the boring logs and are shown on the soil profiles. The RQD, in fractured rock cores, indicates what percentage of the core consisted of pieces larger than 4 inches. In the NYC Building Code, recommendations are based on the RQD percentages. This parameter indicates the level and frequency of fracturing of the bedrock mass. This is typically an indicator of weathering of the rock mass. In this case, rock properties used in the design will be based on the NYC Building Code and recommended corresponding strength capacities and the RQD is one factor used in determining the category of rock in the building code. See Appendix E for tabulated RQD values.

All borings were inspected full time by a professionally licensed AECOM Geotechnical Engineer. Conditions encountered varied throughout the site; the following is a discussion of the conditions observed at each segment of the project site.

3 Subsurface Condition

3.1 Waterside Pier

To determine the subsurface conditions at Waterside Pier, two (2) water borings W-1, W-4, were drilled from a truck mounted drill rig atop a spud barge situated near the pier, and three (3) land borings L-1, L-3, L-4 were drilled through the deck of the waterside pier. Borings were performed between March 19th, 2012 and April 11th, 2012 under the observation of a geotechnical engineer from AECOM.

At this location the subsurface condition consists of 3 layers of soil above rock. At the mudline, a layer of very soft silts and clays were encountered that varied in thickness form 5 feet to 45 thick, with the thickest deposits near the southern end of Waterside Pier. This soil has little or no strength and N values WOH to 2. The mudline under the existing Waterside Pier was generally elevation -5' or -6' (MLW datum). Beneath the soft sediments the second layer consisting mainly of medium density sands, with various amounts of silts and clays interbedded. The N values of this layer ranged from 0 to 100 but many of the higher blow count can be attributed to obstructions and debris within the soil matrix and the majority of N values were generally in the 10 to 30 range. Note that several obstructions were encountered within this layer, boulders, debris, wood, plastic and other obstructions; see boring logs for details. The third layer consists of very dense glacial till composed of sand gravel and clay with N values ranging from 50 to 118. Finally, bedrock was encountered at a depth ranging from 95' to 116' (MLW datum). Note that, boulders and weathered rock were encountered above the bedrock along this area. The REC of rock ranged from 27% to 90% and the RQD of rock ranged from 0% to 85%.

The boring logs are included in Appendix A and a soil profile illustrating conditions is shown in the figures.

3.2 UN Esplanade

To determine the subsurface conditions at UN Esplanade, nine (9) water borings labeled W-2, W-15, W-14, W-13, W-12, W-11, W-10, W-9, W-3 were drilled from a truck mounted drill rig atop a spud barge situated near the bulkhead line. Borings were performed between April 11th, 2012 and May 23rd, 2012 under the observation of a geotechnical engineer from AECOM. Additional reference water borings, including F-1, F-2, F-3, which were drilled as part of the Outer Roadway Detour fendering system by NYS DOT in 2000 were also used to evaluate this segment of the project.

At this location the subsurface condition also consists of 3 layers of soil above rock. At the mudline a layer of very soft silts and clays were encountered that varied in thickness form 5 feet to 10 thick with little or no strength, N values WOH to 2. The mudline was generally observed to be elevation -40'+/-(MLW datum) in the borings performed between from 42nd street to 48th street and dropping to as deep as -66' (MLW datum) at 51st street. Beneath the soft sediments the second layer consisting mainly of medium density sands, with various amounts of silts and clays interbedded, ranged in thickness from 0 to 50 ' thick. The N values of this layer ranged from 0 to 55, but many of the higher blow count can be attributed to obstructions and debris within the soil matrix and the majority of N values were generally in the 10 to 30 range. Note that several obstructions were encountered within this layer, including boulders and cobbles, see boring logs for details. The third layer consists of very dense glacial till composed of sand gravel and clay with N values ranging from 14 to 99. This layer ranged in thickness from 2 to 20 feet. Finally, bedrock was encountered at a depth ranging from 56' to 100' (MLW datum). Note that, boulders and weathered rock were encountered above the bedrock along this area. The REC of rock ranged from 20% to 100% and the RQD of rock ranged from 0% to 100%.

The boring logs are included in Appendix A and Appendix C and a soil profile illustrating conditions is shown in the figures.

3.3 ODR Esplanade

To determine the subsurface conditions at ODR Esplanade, three (3) water borings labeled W-6, W-7, W-8 were drilled from a truck mounted drill rig atop a spud barge situated near the bulkhead line between March 24th, 2012 and March 25th, 2012 under the observation of a geotechnical engineer from AECOM. Note that water boring W-5 was also intended to be in this segment, but Warren George Inc. was unable to set the barge in this location due to the sharp drop off in bedrock. Land boring LB-2 was also planned for this area was also cancelled.

Additional reference water borings including F-4, F-5, F-6, F-7, F-8, F-9, F-10, F-11, F-12, BR-1, BR-2, BR-3, BR-5, BR-7, BR-10, BR-17, BR-19, BR-20, BR-21, BR-24, BR-25, BR-27, BR-29, BR-30, BR-31 which were drilled as part of the Outer Roadway Detour roadway and the associated fendering system by NYS DOT in 2000 were used to evaluate the conditions in this area of the project.

At this location, the subsurface condition consists of mainly a thin layer of sediment over rock with the thickness generally less than 10 feet except for the northern most end near 59th and 60th streets where the rock drops off sharply and the thickness of soil increases to more than 50 feet above the rock. At the mudline, a layer of very soft silts and clays was only encountered in the northern end and was generally less than 5 feet thick. The mudline in this area generally ranged from elevation -10' or -42' (MLW datum) with mudline elevation decreasing with distance from shore. Beneath the soft sediments the second layer consisting mainly of medium density sands, with various amounts of silts and clays interbedded. The N values of this layer ranged from 14 to 125, see boring logs for details. In this area due to the thin nature of the sediment and high elevation of rock, it appears that the glacial soils are minimal and most deposits are more recent deposits. Rock depth ranged in this section from -21 feet to -100 feet below MLW. Note that, weathered rock was encountered above the bedrock along this area. The REC of rock ranged from 0% to 100% and the RQD of rock ranged from 0% to 100%.

The boring logs are included in Appendix A, Appendix B and Appendix C and a soil profile illustrating conditions is shown in the figures.

4 Geotechnical Assessment

4.1 Waterside Pier

A soil profile of subsurface conditions was developed in the Waterside Pier area, see attached figures. The actual soil conditions may vary from those presented in the soil profiles due to the variability in both the north south and east west directions. This area is characterized by a thick layer of sediment well suited for driven piles and it is unlikely rock socket would be required in this area. However, note that several obstructions were identified within the soil layers. It is anticipated the proposed steel piles driven to bedrock will be well suited for these conditions. However note that pre-spudding may be required in some locations due to potential boulders or obstructions.

4.2 UN Esplanade

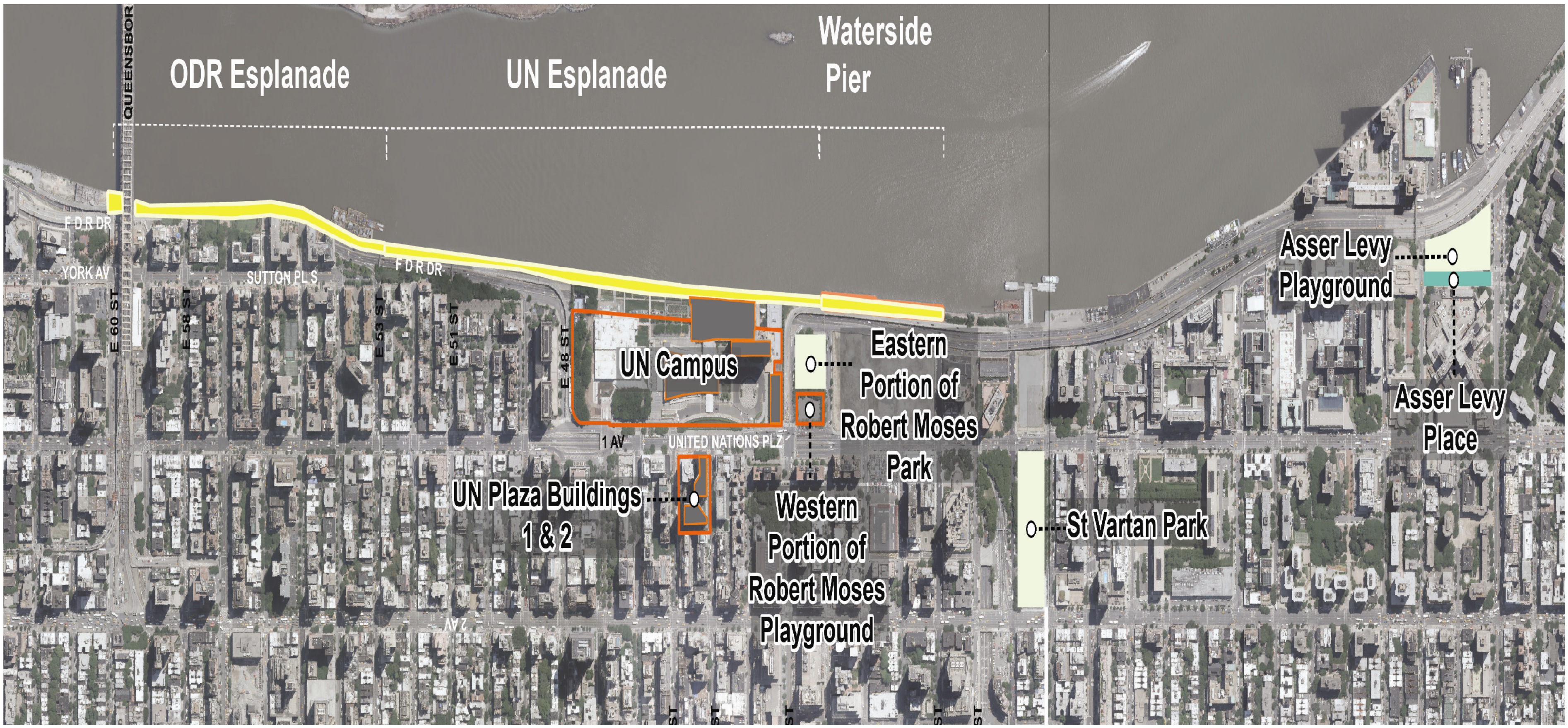
A soil profile of subsurface conditions was developed in the UN Esplanade area, see attached figures. The actual soil conditions may vary from those presented in the soil profiles due to the variability in both the north south and east west directions. This area is characterized by a layer of sediment that varies in thickness significantly along this section of the project site. Driven piles may have trouble achieving lateral capacity in area where bedrock is high and rock sockets may be required. Analysis should be performed to determine lateral capacity and determine which areas will require rock sockets. Where rock sockets are required, it may be more advantageous to utilize a drilled shaft foundation rather than driven piles. Alternatively sockets can be drilled within the driven pipe pile In areas where shallow bedrock exists, the recommendations in 4.3 below may also be advisable.

4.3 ODR Esplanade

A soil profile of subsurface conditions was developed in the ODR Roadway area, see attached figures. The actual soil conditions may vary from those presented in the soil profiles due to the variability in both the north south and east west directions. This area is characterized by a thin layer of sediment, therefore this area is not well suited for driven piles and instead it is likely a drilled pile with a rock socket is better suited to support a pier structure in this area of the site. Due to the lack of overburden soils in this area it may be advantageous to drill the rock sockets in advance in this area similar to the strategy employed on the prior construction of the ODR temporary roadway that previously existed here; with pipe piles inserted into the drilled sockets. This is due to the shallow soils and strong currents and variability of the rock surface here; under these conditions it may be difficult to seat the casing on bedrock well enough to enable drilling a traditional rock socket drilled from within the pile.

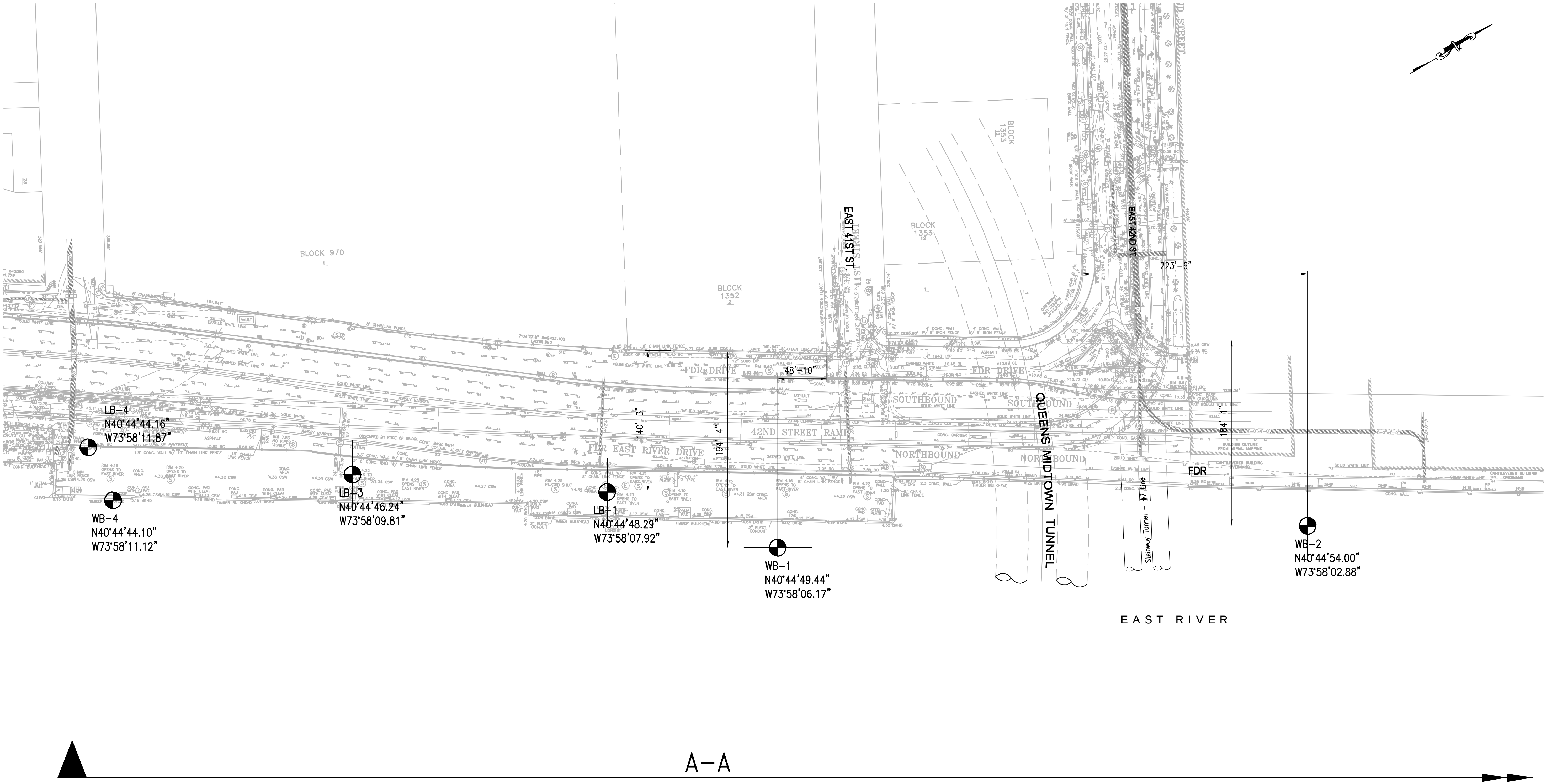
Figures

Site Location Map



ODR Esplanade
UN Esplanade
Waterside Pier
QUEENSBOR
F D R DR
YORK AV
SUTTON PL S
F D R DR
E 60 ST
E 58 ST
E 53 ST
E 51 ST
E 48 ST
UN Campus
1 AV
UNITED NATIONS PLZ
Eastern Portion of Robert Moses Park
Western Portion of Robert Moses Playground
UN Plaza Buildings 1 & 2
St Vartan Park
Asser Levy Playground
Asser Levy Place
2 AV

Boring Location Plans



PLAN
SCALE: 1"=30'-0"

GRAPHIC SCALE: 1" = 50'-0"
50' 25' 0 25' 50' 100' 150'

INFORMATION CONFIDENTIAL:
It is a violation of the professional license law for any person to alter this drawing in any way, unless acting under the direction of a licensed engineer/registered architect. The altering engineer/architect shall affix his/her seal and the notation "altered by" followed by his/her signature and date of alteration.

Current AECOM Cadd Standards, Guidelines And Criteria Shall Be Followed To The Greatest Extent Practicable For Engineering Design And Plan Preparation

REV.	DATE	DESCRIPTION	BY / SUB.	APP.

DESIGNED BY: K.ARMFIELD
DRAWN BY: F.LIZANO
CHECKED BY: K.ARMFIELD
APPROVED BY:
SUBMITTAL DATE: 6/20/2012

NYCEDC
New York City Economic Development Corporation

AECOM

AECOM USA, Inc.
605 Third Avenue
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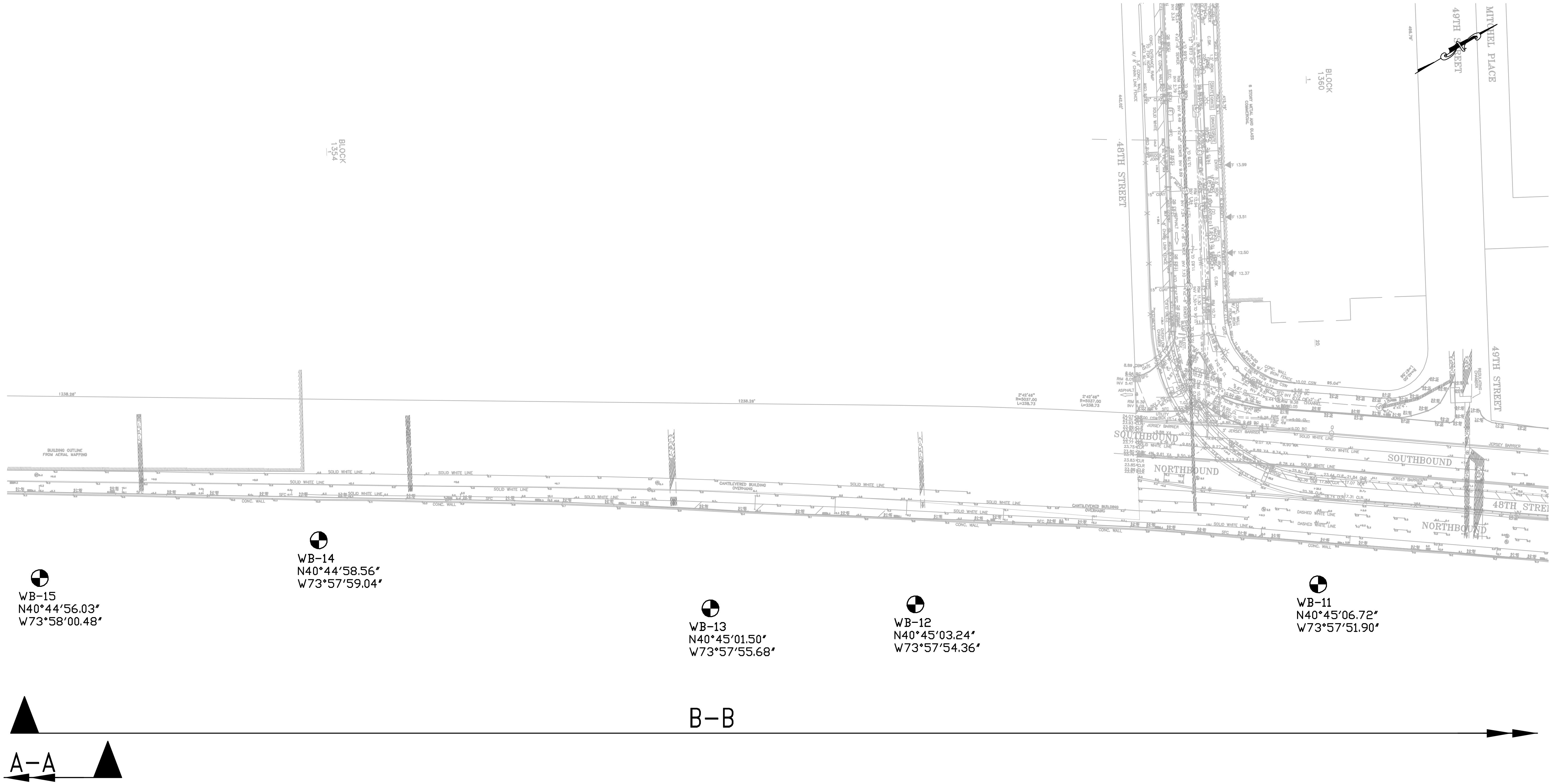
www.aecom.com

EAST MIDTOWN WATERFRONT ESPLANADE AND GREENWAY

BORING LOCATION PLAN 1

CONTRACT NO. 38430001
DRAWING NO. STA/SEGMENT: ___ DISCIPLINE/SEQUENCE: B-001
REVISION: ___
SHEET NO. 1 OF 4
SCALE 1"=50'



PLAN
SCALE: 1"=30'-0"

GRAPHIC SCALE: 1" = 50'-0"

INFORMATION CONFIDENTIAL:
It is a violation of the professional license law for any person to alter this drawing in any way, unless acting under the direction of a licensed engineer/registered architect. The altering engineer/architect shall affix his/her seal and the notation "altered by" followed by his/her signature and date of alteration.

Current AECOM Cadd Standards, Guidelines And Criteria Shall Be Followed To The Greatest Extent Practicable For Engineering Design And Plan Preparation

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CHECKED BY: K.ARMFIELD
APPROVED BY:
SUBMITTAL DATE: 6/20/2012

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EAST MIDTOWN WATERFRONT ESPLANADE AND GREENWAY

BORING LOCATION PLAN 2

CONTRACT NO. 38430001
DRAWING NO. STA/SEGMENT — DISCIPLINE/SEQUENCE B-002
REVISION — SHEET NO. 2 OF 4
SCALE 1"=50'

INFORMATION CONFIDENTIAL:

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Current AECOM Cadd Standards, Guidelines And Criteria Shall Be Followed To The Greatest Extent Practicable For Engineering Design And Plan Preparation

REV.	DATE	DESCRIPTION	BY / SUB.	APP.

DESIGNED BY: K.ARMFIELD
DRAWN BY: F.LIZANO
CHECKED BY: K.ARMFIELD
APPROVED BY:
SUBMITTAL DATE: 6/20/2012

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EAST MIDTOWN WATERFRONT ESPLANADE AND GREENWAY

BORING LOCATION PLAN 3

CONTRACT NO. 38430001
DRAWING NO. STA/SEGMENT ____ DISCIPLINE/SEQUENCE B-003
REVISION ____ SHEET NO. 3 OF 4
SCALE 1"=50'

PLAN
SCALE: 1"=30'-0"

GRAPHIC SCALE: 1" = 50'-0"
50' 25' 0 25' 50' 100' 150'

INFORMATION CONFIDENTIAL:
It is a violation of the professional license law for any person to alter this drawing in any way, unless acting under the direction of a licensed engineer/registered architect. The altering engineer/architect shall affix his/her seal and the notation "altered by" followed by his/her signature and date of alteration.

Current AECOM Cadd Standards, Guidelines And Criteria Shall Be Followed To The Greatest Extent Practicable For Engineering Design And Plan Preparation

REV.	DATE	DESCRIPTION	BY / SUB.	APP.

DESIGNED BY: K.ARMFIELD
DRAWN BY: F.LIZANO
CHECKED BY: K.ARMFIELD
APPROVED BY:
SUBMITTAL DATE: 6/20/2012

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EAST MIDTOWN WATERFRONT ESPLANADE AND GREENWAY

BORING LOCATION PLAN 4

CONTRACT NO. 38430001
DRAWING NO. STA/SEGMENT ___ DISCIPLINE/SEQUENCE B-001
REVISION ___
SHEET NO. 4 OF 4
SCALE 1"=50'

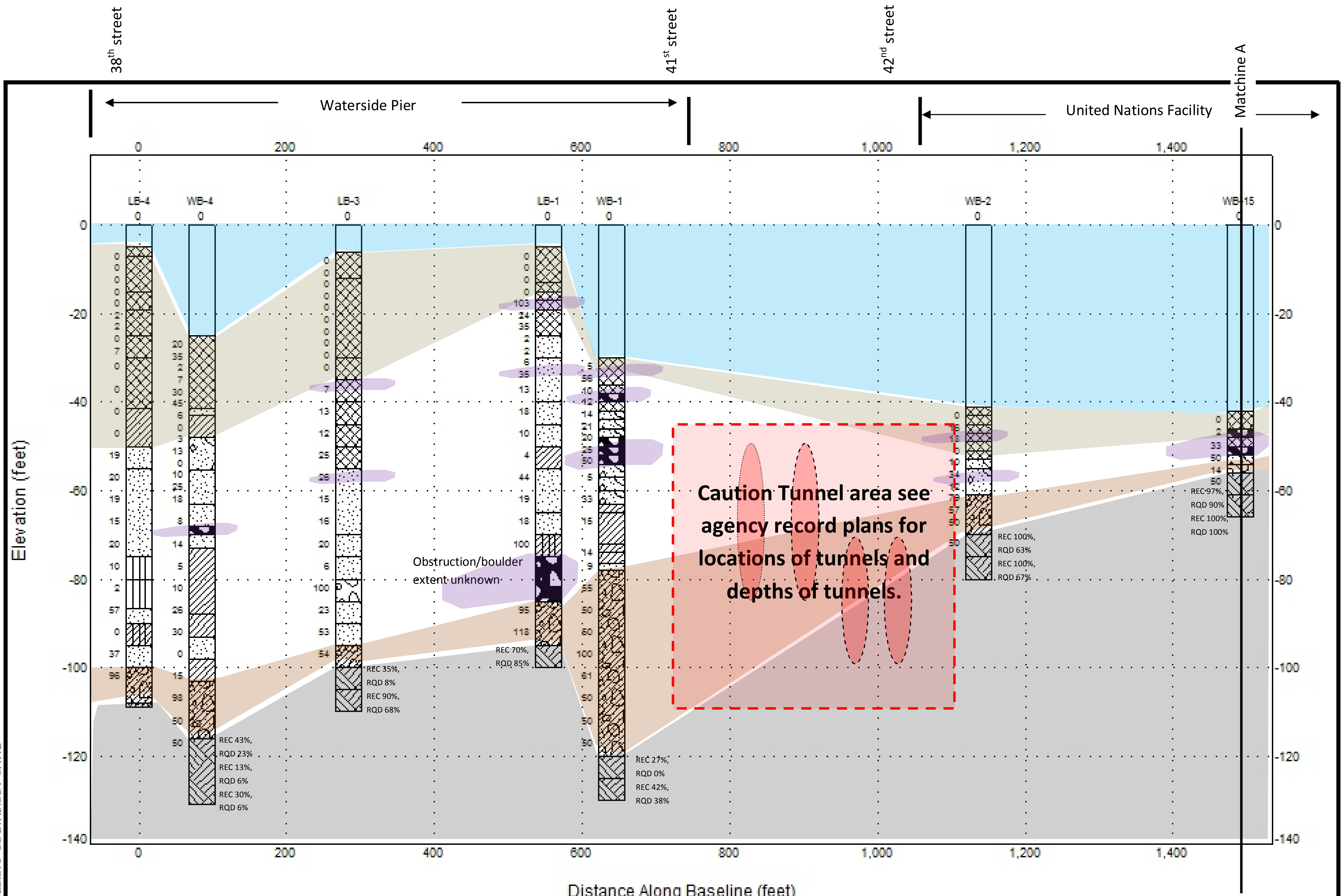
Subsurface Profiles:

Section A-A

Section B-B

Section C-C

Section D-D



Notes:

1. Caution, multiple tunnels transect the project site; record drawings from Agencies should be reviewed to determine exact depths and locations. Locations shown herein are approximate.

2. Multiple outfalls also transect the project site, see Civil drawings for details.

3. Multiple obstructions were encountered during the boring program; Contactor should anticipate obstructions during pile driving. There may be additional obstruction beyond those identified during the boring program.

4. Note that rock varies significantly over short distances throughout this site, both in the north -south and in the east-west directions.

5. Street locations are approximate; see plan view for locations of borings.

6. Weathered rock was present above hard rock, note REC/RQD values.

7. Note, boring contactor had difficulty setting barge, due to rock variability and shallow overburden in some locations.

AECOM

20 Exchange Place, NY, NY 10005

Client: EDC

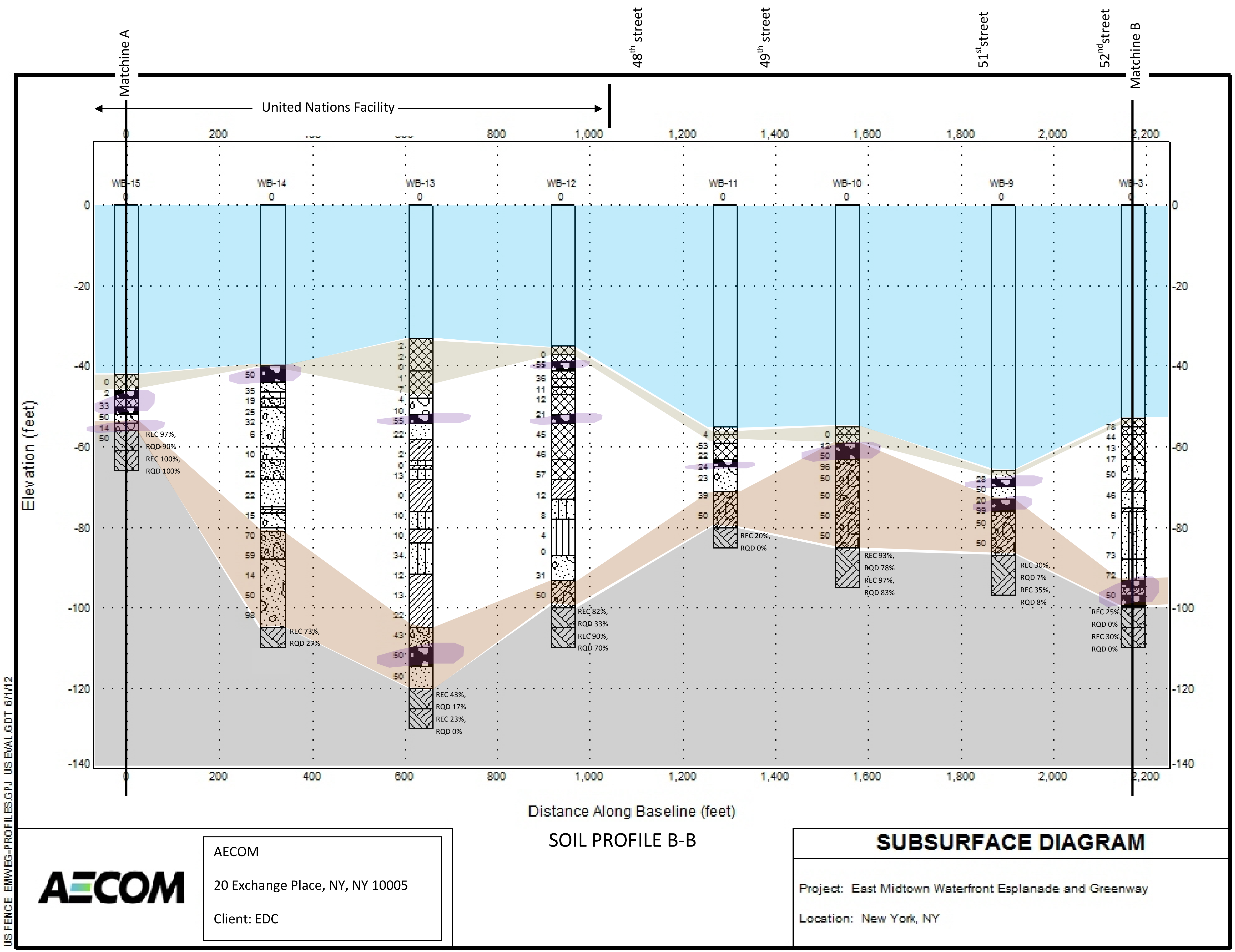
SOIL PROFILE A-A

SUBSURFACE DIAGRAM

Project: East Midtown Waterfront Esplanade and Greenway

Location: New York, NY

US FENCE EMWEG-PROFILES.GPJ US EVAL.GDT 6/1/12



SOIL PROFILE B-B

Notes:

1. Caution, multiple tunnels transect the project site; record drawings from Agencies should be reviewed to determine exact depths and locations. Locations shown herein are approximate.

2. Multiple outfalls also transect the project site, see Civil drawings for details.

3. Multiple obstructions were encountered during the boring program; Contactor should anticipate obstructions during pile driving. There may be additional obstruction beyond those identified during the boring program.

4. Note that rock varies significantly over short distances throughout this site, both in the north -south and in the east-west directions.

5. Street locations are approximate; see plan view for locations of borings.

6. Weathered rock was present above hard rock, note REC/RQD values.

7. Note, boring contactor had difficulty setting barge, due to rock variability and shallow overburden in some locations.

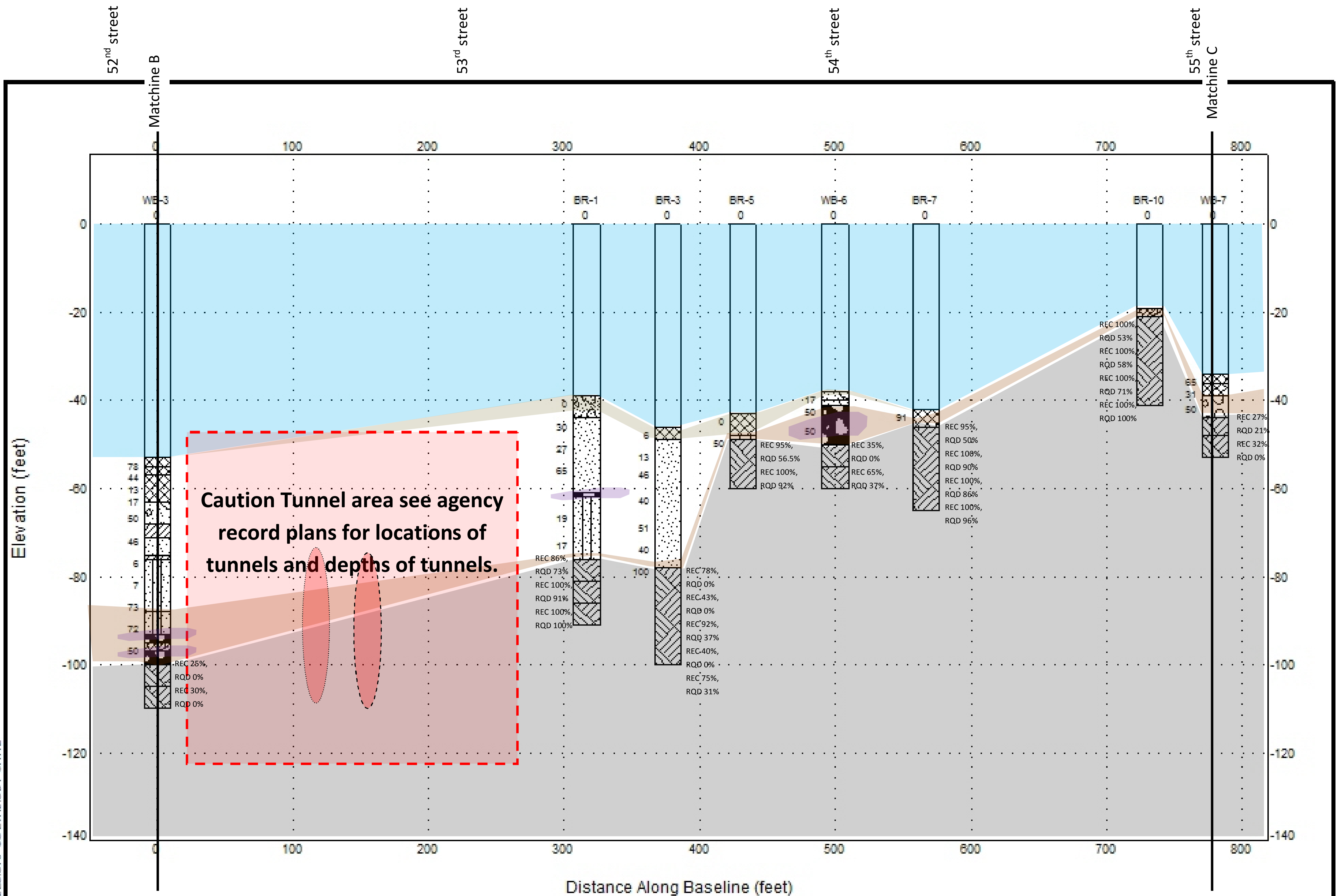
AECOM

AECOM
20 Exchange Place, NY, NY 10005
Client: EDC

SUBSURFACE DIAGRAM

Project: East Midtown Waterfront Esplanade and Greenway

Location: New York, NY



Notes:

1. Caution, multiple tunnels transect the project site; record drawings from Agencies should be reviewed to determine exact depths and locations. Locations shown herein are approximate.

2. Multiple outfalls also transect the project site, see Civil drawings for details.

3. Multiple obstructions were encountered during the boring program; Contactor should anticipate obstructions during pile driving. There may be additional obstruction beyond those identified during the boring program.

4. Note that rock varies significantly over short distances throughout this site, both in the north -south and in the east-west directions.

5. Street locations are approximate; see plan view for locations of borings.

6. Weathered rock was present above hard rock, note REC/RQD values.

7. Note, boring contactor had difficulty setting barge, due to rock variability and shallow overburden in some locations.

- Obstruction extent unknown
- Water
- Rock
- Glacial Till
- Very Soft Clay/Silt
- Silty Clayey Sand Mixture

AECOM

AECOM
20 Exchange Place, NY, NY 10005
Client: EDC

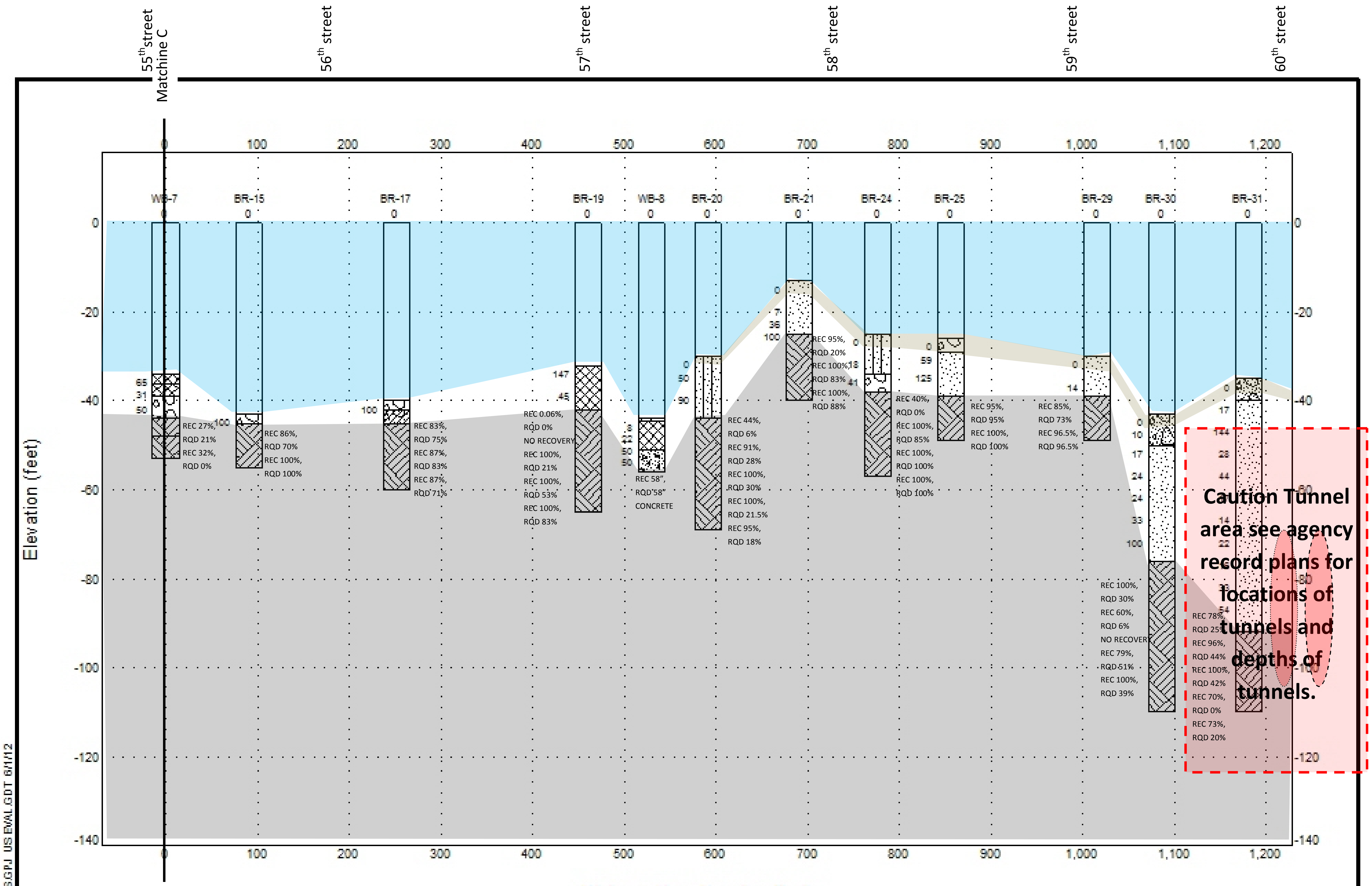
SOIL PROFILE C-C

SUBSURFACE DIAGRAM

Project: East Midtown Waterfront Esplanade and Greenway

Location: New York, NY

US FENCE EMWEG-PROFILES.GPJ US EWALGDT 6/1/12



Notes:

1. Caution, multiple tunnels transect the project site; record drawings from Agencies should be reviewed to determine exact depths and locations. Locations shown herein are approximate.

2. Multiple outfalls also transect the project site, see Civil drawings for details.

3. Multiple obstructions were encountered during the boring program; Contactor should anticipate obstructions during pile driving. There may be additional obstruction beyond those identified during the boring program.

4. Note that rock varies significantly over short distances throughout this site, both in the north -south and in the east-west directions.

5. Street locations are approximate; see plan view for locations of borings.

6. Weathered rock was present above hard rock, note REC/RQD values.

7. Note, boring contactor had difficulty setting barge, due to rock variability and shallow overburden in some locations.

- Obstruction extent unknown
- Water
- Rock
- Glacial Till
- Very Soft Clay/Silt
- Silty Clayey Sand Mixture

AECOM

AECOM
20 Exchange Place, NY, NY 10005
Client: EDC

SOIL PROFILE D-D

SUBSURFACE DIAGRAM

Project: East Midtown Waterfront Esplanade and Greenway

Location: New York, NY

Appendices

Appendix A: Borings

BORING NUMBER LB-1

AECOM

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY
DATE STARTED 3/19/12 **COMPLETED** 3/23/12
GROUND ELEVATION 0 ft **HOLE SIZE** 4.5-inch
DRILLING CONTRACTOR/DRILLER Warren George, Inc./E. Cardona
HAMMER WT. 140 lbs **CLASSIFICATION METHOD** Burmister
DRILLING METHOD Mud Rotary with Casing/Truck
HAMMER Safety
LOGGED BY A. Siddique **CHECKED BY** K. Armfield
NORTHING 40.746747 **EASTING** 73.968867
NOTES Top 30 ft 4.5" casing, 30-85 ft 3" casing
SAMPLER 2" OD Split Spoon **GWT** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
0					WATER. (0-ft : Mean Low Water)
5					5.0 / -5.0
	SS 1	42	10-0-0-0 (0)		Black Silty CLAY, trace f Sand, smell gasoline (blow count zero means either weight of rod or weight of hammer)
	SS 2	29	0-0-0-0 (0)		
10	SS 3	100	0-0-0-0 (0)		
	SS 4	100	0-0-0-0 (0)		
	SS 5	42	0-47-56-30 (103)		Black Silty CLAY, trace f Sand, smell gasoline, Bottom 6": wood
15	SS 6	50	11-10-14-22 (24)		Black Silty CLAY, some decomposed wood, trace f Sand, smell gasoline
	SS 7	50	38-29-6-2 (35)		Decomposed wood, Bottom 6": Greenish gray mf SAND, little f Gravel
20	SS 8	0	1-1-1-3 (2)		Black Silty CLAY, little f Sand
	SS 9	83	0-0-2-2 (2)		
25					25.0 / -25.0
	SS 10	8	5-4-2-4 (6)		Dark gray f SAND, little Silt, trace m Gravel, smell gasoline
30	SS 11	50	11-15-20-24 (35)		Black micacious SAND, trace f Gravel, trace Silt, trace brick, smell gasoline
35	SS 12	50	8-6-7-6 (13)		
40					

(Continued Next Page)

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
40	SS 13	42	11-10-8-6 (18)		Black micacious SAND, some mf Gravel, smell gasoline
45	SS 14	25	3-7-3-3 (10)		Gray cf SAND, little Silt, organic smell
50	SS 15	42	35-2-2-9 (4)		50.0 / -50.0 Gray CLAY, organic smell
55	SS 16	38	87-18-26-27 (44)		55.0 / -55.0 Gray cf SAND, trace mf Gravel, Bottom 6": wood, smell gasoline
60	SS 17	42	12-9-10-11 (19)		
65	SS 18	42	15-8-10-10 (18)		Gray cf SAND, some m Gravel, smell gasoline
70	SS 19	13	100		70.0 / -70.0 Gray Silty CLAY
75	RC 1	25 (15)			75.0 / -75.0 BOULDERS, REC = 25%, RQD = 15%
80	RC 2	0 (0)			
85			60-40-55-		85.0 / -85.0 Gray micacious cm SAND, trace f Gravel (Decomposed bedrock)

The information contained in this log is not warranted to show the actual subsurface condition. The Contractor agrees that he will make no claims against AECOM if he finds that the actual conditions do not conform to those indicated by this log.

(Continued Next Page)

CLIENT NY City Economic Development Corporation

PROJECT NAME East Midtown Waterfront Esplanade and Greenway

PROJECT NUMBER 60221358

PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
	SS 20	17	100 (95)		Gray micacious cm SAND, trace f Gravel (Decomposed bedrock) *(continued)*
90	SS 21	0	90-48-70-100 (118)		
95				95.0	-95.0
	RC 3	90 (85)			MICA SCHIST, gray, hard, slightly weathered, thinly bedded, massive to broken, REC = 90%, RQD = 85%
100				100.0	-100.0
					Bottom of hole at 100.0 feet.
105					
110					
115					
120					
125					
130					

BORING NUMBER LB-3

AECOM

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY
DATE STARTED 3/26/12 **COMPLETED** 3/28/12
GROUND ELEVATION 0 ft **HOLE SIZE** 4.5-inch
DRILLING CONTRACTOR/DRILLER Warren George, Inc./E. Cardona
HAMMER WT. 140 lbs **CLASSIFICATION METHOD** Burmister
DRILLING METHOD Mud Rotary with Casing/Truck
HAMMER Safety
LOGGED BY A. Siddique **CHECKED BY** K. Armfield
NORTHING 40.746178 **EASTING** 73.9693917
NOTES Top 55 ft 4.5" casing, 55-100 ft 3" casing
SAMPLER 2" OD Split Spoon **GWT** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
0					WATER. (0-ft : Mean Low Water)
5					
6.0					-6.0
	SS 1	25	0-0-0-0 (0)		Black Silty CLAY (blow count zero means either weight of rod of hammer).
10	SS 2	29	0-0-0-0 (0)		
	SS 3	38	0-0-0-0 (0)		
	SS 4	50	0-0-0-0 (0)		Black Silty CLAY, trace f Sand, smell gasoline
15	SS 5	100	0-0-0-0 (0)		
	SS 6	100	0-0-0-0 (0)		
	SS 7	75	0-0-0-0 (0)		
20	SS 8	100	0-0-0-0 (0)		
25	SS 9	100	0-0-0-0 (0)		
30	SS 10	25	0-0-0-0 (0)		Black mf SAND, trace Silt, smell gasoline
35	SS 11	42	2-4-3-2 (7)		Top 18": Same, Bottom 6": Decomposed wood
40					

The information contained in this log is not warranted to show the actual subsurface condition. The Contractor agrees that he will make no claims against AECOM if he finds that the actual conditions do not conform to those indicated by this log.

(Continued Next Page)

AECOM

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
40	SS 12	63	18-9-4-11 (13)		Black cf SAND, little m Gravel, trace Silt, smell gasoline
45	SS 13	54	6-5-7-28 (12)		Black and pink cf SAND, some cm Gravel, little Silt
50	SS 14	29	10-13-12-6 (25)		Same, piece of brick at the spoon tip
55	SS 15	33	5-14-12-15 (26)		55.0 -55.0 Light brown f SAND, some Silt
60	SS 16	67	2-6-9-13 (15)		
65	SS 17	100	10-7-9-11 (16)		
70	SS 18	25	0-7-13-13 (20)		Brownish gray f SAND, little Silt
75	SS 19	100	0-3-3-6 (6)		Brownish gray mf SAND, little Silt
80	SS 20	75	100/4"		80.0 -80.0 Gray cm GRAVEL, little mf Sand
85					85.0 -85.0 Greenish brown cf SAND, trace Gravel (till)

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

The information contained in this log is not warranted to show the actual subsurface condition. The Contractor agrees that he will make no claims against AECOM if he finds that the actual conditions do not conform to those indicated by this log.

(Continued Next Page)

BORING NUMBER LB-3

AECOM

CLIENT NY City Economic Development Corporation

PROJECT NAME East Midtown Waterfront Esplanade and Greenway

PROJECT NUMBER 60221358

PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG		MATERIAL DESCRIPTION	
	SS 21	33	29-11-12-9 (23)			Greenish brown cf SAND, trace Gravel (till) *(continued)*	
90	SS 22	100	25-23-30-45 (53)			Light brown, mf SAND, trace Silt	
95	SS 23	100	23-22-32-38 (54)		95.0	Gray micacious mf SAND, trace f Gravel (decomposed bedrock)	-95.0
100	RC 1	35 (8)			100.0	MICA SCHIST, gray, soft, moderately weathered, very thinly bedded, slightly broken to very broken REC =35%, RQD = 8%	-100.0
105	RC 2	90 (68)				MICA SCHIST, gray, medium, moderately weathered, very thinly bedded, massive to very broken, REC = 90%, RQD = 68%	
110					110.0	Bottom of hole at 110.0 feet.	-110.0
115							
120							
125							
130							

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

BORING NUMBER LB-4

AECOM

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY
DATE STARTED 3/29/12 **COMPLETED** 3/30/12
GROUND ELEVATION 0 ft **HOLE SIZE** 4.5-inch
DRILLING CONTRACTOR/DRILLER Warren George, Inc./E. Cardona
HAMMER WT. 140 lbs **CLASSIFICATION METHOD** Burmister
DRILLING METHOD Mud Rotary with Casing/Truck
HAMMER Safety
LOGGED BY A. Siddique **CHECKED BY** K. Armfield
NORTHING 40.745101 **EASTING** 73.969006
NOTES 55 ft 4.5" casing
SAMPLER 2" OD Split Spoon **GWT** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
0					WATER. (0-ft : Mean Low Water)
5.0					-5.0
	SS 1	25	0-0-0-0 (0)		Black CLAY, trace Silt (blow count zero means either weight of rod or weight of hammer)
	SS 2	17	0-0-0-0 (0)		Black CLAY, trace Silt, Hydrogen Sulfide smell
10	SS 3	50	0-0-0-0 (0)		
	SS 4	96	0-0-0-0 (0)		
	SS 5	58	0-0-0-0 (0)		
15	SS 6	42	2-1-1-1 (2)		Black CLAY, little f Gravel, trace Silt, trace f Sand
	SS 7	17	1-1-1-1 (2)		
20	ST 1	79			Black organic CLAY, trace Silt
	SS 8	0	0-0-0-0 (0)		
25.0					-25.0
	SS 9	29	0-4-3-2 (7)		Black f SAND, little Silt, trace organic, smell gasoline
30	SS 10	13	0-0-0-0 (0)		Black cm SAND, little f Gravel, trace coal smell gasoline
35	SS 11	8	0-0-0-0 (0)		
40					

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

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(Continued Next Page)

CLIENT NY City Economic Development Corporation

PROJECT NAME East Midtown Waterfront Esplanade and Greenway

PROJECT NUMBER 60221358

PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	MATERIAL DESCRIPTION	
40	SS 12	50	0-0-0-0 (0)	Black cm SAND, little f Gravel, trace coal smell gasoline *(continued)*	
41.5				Black organic CLAY, smell gasoline	-41.5
45	SS 13	17	0-0-0-0 (0)		
50.0				Light brown, mf SAND, trace f Gravel, trace Silt	-50.0
50	SS 14	46	0-3-16-18 (19)		
55.0				Light brown, f SAND, some Silt	-55.0
55	SS 15	75	5-7-13-14 (20)		
60	SS 16	88	0-8-11-15 (19)		
65	SS 17	100	4-4-11-13 (15)		
70	SS 18	79	0-8-12-15 (20)		
75.0				Gray and brown, SILT, some Clay, little f Sand, trace f Gravel	-75.0
75	SS 19	50	0-4-6-8 (10)		
80	SS 20	100	1-1-1-1 (2)	Gray SILT, some Clay, little f Sand	
85					

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AECOM

BORING NUMBER LB-4

CLIENT NY City Economic Development Corporation

PROJECT NAME East Midtown Waterfront Esplanade and Greenway

PROJECT NUMBER 60221358

PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	
86.5	SS 21	100	5-12-45-12 (57)		Gray cf SAND	-86.5
90.0	SS 22	96	0-0-0-0 (0)		Gray Silty CLAY, trace f Sand	-90.0
95.0	SS 23	63	4-19-18-24 (37)		Gray and brown cf SAND, trace+ mf Gravel (till)	-95.0
100.0	SS 24	58	32-41-55-80 (96)		Gray Decomposed bedrock	-100.0
109.0					Tricone roller bit refusal at 119 ft. Bottom of hole at 109.0 feet.	-109.0

Depth scale: 90, 95, 100, 105, 110, 115, 120, 125, 130

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CLIENT NY City Economic Development Corporation

PROJECT NAME East Midtown Waterfront Esplanade and Greenway

PROJECT NUMBER 60221358

PROJECT LOCATION New York, NY

DATE STARTED 4/4/12 **COMPLETED** 4/11/12

GROUND ELEVATION 0 ft **HOLE SIZE** 4.5-inch

DRILLING CONTRACTOR/DRILLER Warren George, Inc./R. Verpent

HAMMER WT. 140 lbs **CLASSIFICATION METHOD** Burmister

DRILLING METHOD Rotary Wash/Diedrich D-120

HAMMER Safety

LOGGED BY Z. Haider **CHECKED BY** K. Armfield

NORTHING 40.747067 **EASTING** 73.96838

NOTES 85 ft of casing pushed or driven.

SAMPLER 2" OD Split Spoon **GWT** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	
0					WATER. (0-ft : Mean Low Water)	
30					30.0	-30.0
	SS 1	17	5-1-4-4 (5)		Black cm SAND, some Coal fragments, trace f Gravel, slight Petroleum odor (FILL).	
	SS 2	20	3-6-50/3"			
35	SS 3	33	19-5-5-3 (10)			
	SS 4	38	5-3-9-9 (12)		Top 1": Gray mf GRAVEL. Bottom: Black cm SAND, little Silt, trace f Gravel (FILL).	
					38.0	-38.0
					Probable BOULDER.	
40					40.0	-40.0

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

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CLIENT NY City Economic Development Corporation

PROJECT NAME East Midtown Waterfront Esplanade and Greenway

PROJECT NUMBER 60221358

PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
40	SS 6	17	3-3-11-17 (14)		Black cm SAND, trace f Gravel, trace Plastic, Petroleum odor (FILL).
				42.0	-42.0
	SS 7	63	15-12-9-16 (21)		Black cm SAND, trace f Gravel, trace Organic.
45	SS 8	38	15-10-10-5 (20)		Black cm SAND, and f Gravel, trace Organic.
	SS 9	79	10-13-12-13 (25)		Black mf SAND, some Silt, trace f Gravel, trace Organic.
				48.0	-48.0
50	SS 10	0	50/3"		Gray m GRAVEL at Spoon tip.
	RC 1	21			Gray to black BOULDER.
				54.0	-54.0
55	SS 11	29	2-3-2-3 (5)		Gray cm SAND, some f Gravel, trace Organic.
60	SS 12	8	7-15-18-9 (33)		Brown mf SAND, and mf Gravel, little Silt, strong Petroleum odor.
				63.0	-63.0
65	SS 13	54	8-6-9-8 (15)		Brown Silty CLAY, little f Gravel, trace f Sand.
70	UD 1	100			
	SS 14	100	4-5-9-10 (14)		Top: Gray Silty CLAY. Bottom 6": Gray Silty CLAY, trace mf Sand.
75	SS 15	67	3-4-5-11 (9)		Top: SAME.
				76.5	-76.5
					Bottom 6": Gray mf SAND, little Silt.
				78.0	-78.0
					Gray decomposed mica SCHIST.
80	SS 16	50	15-32-23-30 (55)		
85	SS	44	37-50/3"		

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CLIENT NY City Economic Development Corporation

PROJECT NAME East Midtown Waterfront Esplanade and Greenway

PROJECT NUMBER 60221358

PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
	17				Gray decomposed mica SCHIST. *(continued)*
90	SS 18	50	29-50/2"		
95	SS 19	60	19-50-50/3"		
100	SS 20	59	26-42-39-50/4"		
105	SS 21	63	35-50/2"		
110	SS 22	20	50/5"		
115	SS 23	50	50/2"		
120	RC 2	27 (0)			120.0 Mica SCHIST, gray, soft, moderately weathered, broken. -120.0
125	RC 3	42 (38)			Mica SCHIST, gray, medium, moderately to slightly weathered, medium spaced joints.
130					130.0 Bottom of hole at 130.0 feet. -130.0

BORING NUMBER WB-2

AECOM

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY
DATE STARTED 4/11/12 **COMPLETED** 4/13/12
GROUND ELEVATION 0 ft **HOLE SIZE** 4.5-inch
DRILLING CONTRACTOR/DRILLER Warren George, Inc./R. Verpent
HAMMER WT. 140 lbs **CLASSIFICATION METHOD** Burmister
DRILLING METHOD Rotary Wash/Diedrich D-120
HAMMER Safety
LOGGED BY Z. Haider **CHECKED BY** K. Armfield
NORTHING 40.748333 **EASTING** 73.967467
NOTES 100 ft of casing pushed or driven.
SAMPLER 2" OD Split Spoon **GWT** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
0					WATER. (0-ft: Mean Low Water)
5					
10					
15					
20					
25					
30					
35					
40					

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

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BORING NUMBER WB-2

AECOM

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
40					
41.0					-41.0
	SS 1	21	0-0-0-0 (0)		Black mf SAND, some Clay, little mf Gravel, trace Wood (FILL).
45	SS 2	25	8-5-11-2 (16)		Black mf SAND, some mf Gravel, trace Silt (FILL).
	SS 3	29	7-13-5-12 (18)		Black mf SAND, some mf Gravel, trace Silt, trace Brick fragments (FILL).
	SS 4	13	2-0-0-0 (0)		Dark gray cmf SAND, little f Gravel (FILL).
50	SS 5	17	17-5-5-3 (10)		Dark gray cmf SAND, little f Gravel, trace Brick fragments (Petroleum odor).
	SS 6	41	8-8-26-50/4"		Gray cm SAND, little mf Gravel (FILL).
53.0					-53.0
55	SS 7	13	23-8-4-5 (12)		Gray to brown cmf SAND, some mf Gravel, trace Silt.
	SS 8	71	20-46-33-43 (79)		Gray to brown cmf SAND, some mf Gravel, little Silt.
60	SS 9	29	7-7-50/2"		
61.0					-61.0
					Gray decomposed mica SCHIST.
65	SS 10	50	50/2"		
70.0					-70.0
70	SS 11		50/0"		Mica SCHIST, gray, hard, moderately to slightly weathered, top 4-ft closely to medium spaced joints and bottom 1-ft very closely to closely spaced joints.
	RC 1	100 (63)			
75	RC 2	100 (67)			Mica SCHIST, gray, hard, moderately to slightly weathered, closely to medium spaced joints.
80.0					-80.0
80					Bottom of hole at 80.0 feet.
85					

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BORING NUMBER WB-3

AECOM

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY
DATE STARTED 5/18/12 **COMPLETED** 5/23/12
GROUND ELEVATION 0 ft **HOLE SIZE** 4.5-inch
DRILLING CONTRACTOR/DRILLER Warren George, Inc./L. Ramos
HAMMER WT. 140 lbs **CLASSIFICATION METHOD** Burmister
DRILLING METHOD Rotary Wash/ Acker B-20
HAMMER Donut
LOGGED BY Z. Haider **CHECKED BY** K. Armfield
NORTHING 40.754033 **EASTING** 73.96245
NOTES 100 ft of casing pushed or driven.
SAMPLER 2" OD Split Spoon **GWT** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
0					WATER. (0-ft: Mean Low Water)
5					
10					
15					
20					
25					
30					
35					
40					

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

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AECOM

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG		MATERIAL DESCRIPTION	
40						WATER. (0-ft: Mean Low Water) *(continued)*	
53.0					53.0	Dark gray cm GRAVEL, little cm Sand (FILL).	-53.0
	SS 1	8	37-40-38-24 (78)				
	SS 2	17	19-33-11-10 (44)			Dark gray cm SAND, trace mf Gravel (FILL).	
	SS 3	33	30-9-4-4 (13)			Dark gray cm SAND, some f Gravel, trace Glass fragments (FILL).	
	SS 4	50	7-7-10-11 (17)				
63.0					63.0	Gray cm SAND, trace f Gravel.	-63.0
	SS 5	100	49-50/4"				
68.0					68.0	Brown Silty CLAY, trace mf Sand.	-68.0
71.0	SS 6	67	9-7-39-41 (46)		71.0	Gray cm SAND, little mf Gravel.	-71.0
75.2					75.2	Gray to brown Silty CLAY, trace f Sand.	-75.2
76.2	SS 7	58	4-2-4-7 (6)		76.2	Gray to brown mf SAND, little Silt.	-76.2
	SS 8	54	3-4-3-3 (7)				
85			25-43-30-				

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BORING NUMBER WB-3

AECOM

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	
	SS 9	50	29 (73)		Gray to brown mf SAND, little Silt. *(continued)*	
					Gray cf SAND, little f Gravel.	
90	SS 10	50	22-25-47-29 (72)			
93.0					Probable GRAVEL and COBBLE.	-93.0
95 / 95.0	SS 11	50	50/2"		Gray decomposed Mica SCHIST.	-95.0
97.0					Probable GRAVEL and COBBLE.	-97.0
100 / 100.0	RC 1	25 (0)			Mica SCHIST, gray, very soft to soft, highly weathered, broken.	-100.0
105	RC 2	30 (0)			Mica SCHIST, gray, very soft to soft, highly weathered, broken (bottom 6-inch very soft).	
110 / 110.0					Bottom of hole at 110.0 feet.	-110.0
115						
120						
125						
130						

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

BORING NUMBER WB-4

AECOM

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY
DATE STARTED 3/26/12 **COMPLETED** 4/3/12
GROUND ELEVATION 0 ft **HOLE SIZE** 4.5-inch
DRILLING CONTRACTOR/DRILLER Warren George, Inc./R. Verpent
HAMMER WT. 140 lbs **CLASSIFICATION METHOD** Burmister
DRILLING METHOD Rotary Wash/Diedrich D-120
HAMMER Safety
LOGGED BY Z. Haider **CHECKED BY** K. Armfield
NORTHING 40.745583 **EASTING** 73.969756
NOTES 100 ft of casing pushed.
SAMPLER 2" OD Split Spoon **GWT** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
0					WATER. (0' : Mean Low Water)
25.0					Black cm SAND, little Coal fragments (FILL). (-25.0)
	SS 1	13	9-9-11-11 (20)		
	SS 2	46	11-13-22-39 (35)		
30	SS 3	17	5-1-1-5 (2)		
	SS 4	8	3-3-4-4 (7)		
35	SS 5	58	5-11-19-15 (30)		

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CLIENT NY City Economic Development Corporation

PROJECT NAME East Midtown Waterfront Esplanade and Greenway

PROJECT NUMBER 60221358

PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	Stratum Depth	MATERIAL DESCRIPTION	Elevation
35	SS 6	58	8-24-21-12 (45)		Black cm SAND, little Coal fragments (FILL). *(continued)*	
	SS 7	67	4-2-4-13 (6)			
40	SS 8	0	0-0-0-0 (0)			
				41.5	Black cm SAND, trace Silt, trace Organic.	-41.5
	SS 9	38	1-2-1-1 (3)			
				43.0	Black Organic Silty CLAY (Petroleum Odor).	-43.0
	SS 10	42	11-7-6-8 (13)			
45	SS 11	46	0-0-0-0 (0)			
				48.0	Black mf SAND, little f Gravel, trace Silt (Petroleum odor).	-48.0
50	SS 12	13	7-5-5-10 (10)			
55	SS 13	75	13-12-13-13 (25)	55.5	Gray mf SAND, trace Silt.	-55.5
60	SS 14	79	9-8-10-11 (18)			
				63.0	Gray to reddish brown mf SAND, little Silt.	-63.0
65	SS 15	100	6-4-4-5 (8)			
				68.0	Probable BOULDER.	-68.0
70				70.0	Top 1": Gray mf GRAVEL. Bottom Gray to reddish brown mf SAND, little Silt.	-70.0
	SS 16	63	9-6-8-10 (14)			
				73.0	Gray Silty CLAY, trace mf Sand.	-73.0
75						

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CLIENT NY City Economic Development Corporation

PROJECT NAME East Midtown Waterfront Esplanade and Greenway

PROJECT NUMBER 60221358

PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
75	SS 17	92	4-2-3-3 (5)		Gray Silty CLAY, trace mf Sand. *(continued)*
80	SS 18	100	0-3-7-8 (10)		
85	SS 19	83	4-10-16-15 (26)		
					88.0 ——— -88.0
90	SS 20	67	23-14-16-18 (30)		Gray Silty CLAY, and f Sand.
					93.0 ——— -93.0
95	SS 21	33	0-0-0-0 (0)		Gray mf SAND, trace Silt.
					98.0 ——— -98.0
100	SS 22	100	4-4-11-8 (15)		Gray Silty CLAY, some f Sand.
					103.0 ——— -103.0
					Gray decomposed mica SCHIST.
105	SS 23	86	47-48-50/2"		
110	SS 24	55	50-50/5"		
115					

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CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG		MATERIAL DESCRIPTION	
115	SS 25	63	50-50/2"		116.0	Gray decomposed mica SCHIST. *(continued)*	-116.0
	RC 1	43 (23)				Mica SCHIST, gray, very soft, highly weathered, closely spaced joints.	
120							
	RC 2	13 (7)					
125							
	RC 3	30 (7)					
130					131.0		-131.0
						Bottom of hole at 131.0 feet.	
135							
140							
145							
150							
155							

CLIENT NY City Economic Development Corporation		**PROJECT NAME** East Midtown Waterfront Esplanade and Greenway	
PROJECT NUMBER 60221358		**PROJECT LOCATION** New York, NY	
DATE STARTED 5/24/12	**COMPLETED** 5/24/12	**GROUND ELEVATION** 0 ft	**HOLE SIZE** 4.5-inch
DRILLING CONTRACTOR/DRILLER Warren George, Inc./L. Ramos		**HAMMER WT.** 140 lbs	**CLASSIFICATION METHOD** Burmister
DRILLING METHOD Rotary Wash/ Acker B-20		**HAMMER** Donut	
LOGGED BY Z. Haider	**CHECKED BY** K. Armfield	**NORTHING** 40.7553	**EASTING** 73.9613
NOTES 50 ft of casing pushed.		**SAMPLER** 2" OD Split Spoon	**GWT** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	
0					WATER. (0-ft: Mean Low Water)	
38.0						-38.0
38.0–40	SS 1	46	8-7-10-33 (17)		Dark gray cm SAND, some mf Gravel.	

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CLIENT NY City Economic Development Corporation **PROJECT NAME** East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358 **PROJECT LOCATION** New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG		MATERIAL DESCRIPTION	
40	SS 2	67	50/3"		41.0	Dark gray cm SAND, little mf Gravel.	-41.0
						Probable COBBLE and BOULDER.	
45	SS 3	0	50/1"				
50					50.0		-50.0
	RC 1	35 (0)				Mica SCHIST, gray, medium, highly weathered, broken.	
55	RC 2	65 (37)				Mica SCHIST, gray, medium, moderately weathered, closely spaced fracture.	
60					60.0		-60.0
						Bottom of hole at 60.0 feet.	
65							
70							
75							
80							
85							

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

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BORING NUMBER WB-7

AECOM

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY
DATE STARTED 5/25/12 **COMPLETED** 5/25/12
GROUND ELEVATION 0 ft **HOLE SIZE** 4.5-inch
DRILLING CONTRACTOR/DRILLER Warren George, Inc./L. Ramos
HAMMER WT. 140 lbs **CLASSIFICATION METHOD** Burmister
DRILLING METHOD Rotary Wash/ Acker B-20
HAMMER Donut
LOGGED BY Z. Haider **CHECKED BY** K. Armfield
NORTHING 40.755483 **EASTING** 73.960733
NOTES 44-ft of casing pushed.
SAMPLER 2" OD Split Spoon **GWT** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation
0					WATER. (0-ft: Mean Low Water)	
34.0						-34.0
35	SS 1	17	46-38-27-20 (65)		Gray mf GRAVEL, some cm Sand (FILL).	
	SS 2	38	14-13-18-21 (31)		Gray cm SAND, some mf Gravel, trace mf Brick fragments (FILL).	
39.0						-39.0
40					Gray to white cm GRAVEL.	

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CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	
40	SS 3	33	50/3"		Gray to white cm GRAVEL. *(continued)*	
44.0						-44.0
45	RC 1	56 (44)			Mica SCHIST, gray, medium, moderately weathered, closely spaced joints. Tip of of the barrel rock is completely broken. 48-inch run because core barrel is was jammed.	
50	RC 2	53 (0)			Mica SCHIST, gray, completely weathered, broken.	
53.0						-53.0
					Bottom of hole at 53.0 feet.	
55						
60						
65						
70						
75						
80						
85						

BORING NUMBER WB-8

AECOM

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY
DATE STARTED 5/25/12 **COMPLETED** 5/29/12
GROUND ELEVATION 0 ft **HOLE SIZE** 4.5-inch
DRILLING CONTRACTOR/DRILLER Warren George, Inc./L. Ramos
HAMMER WT. 140 lbs **CLASSIFICATION METHOD** Burmister
DRILLING METHOD Rotary Wash/ Acker B-20
HAMMER Donut
LOGGED BY Z. Haider **CHECKED BY** K. Armfield
NORTHING 40.757067 **EASTING** 73.95935
NOTES 45 ft of casing pused.
SAMPLER 2" OD Split Spoon **GWT** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
0					WATER. (0-ft: Mean Low Water)
5					
10					
15					
20					
25					
30					
35					
40					

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

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AECOM

BORING NUMBER WB-8

CLIENT NY City Economic Development Corporation

PROJECT NAME East Midtown Waterfront Esplanade and Greenway

PROJECT NUMBER 60221358

PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
40					WATER. (0-ft: Mean Low Water) *(continued)*
44.0					-44.0
44.5 – 45	SS 1	79	0-0-8-21 (8)		Black cm SAND. (-44.5)
					Gray soil mixed GROUT.
	SS 2	62	2-5-17-50/3"		
	SS 3	80	50/5"		
50	SS 4		50/0"		
51.0					-51.0
55	RC 1	97 (97)			Gray CONCRETE.
56.0					-56.0
					Bottom of hole at 56.0 feet.
60					
65					
70					
75					
80					
85					

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

BORING NUMBER WB-9

AECOM

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY
DATE STARTED 5/16/12 **COMPLETED** 5/18/12
GROUND ELEVATION 0 ft **HOLE SIZE** 4.5-inch
DRILLING CONTRACTOR/DRILLER Warren George, Inc./L. Ramos
HAMMER WT. 140 lbs **CLASSIFICATION METHOD** Burmister
DRILLING METHOD Rotary Wash/ Acker B-20
HAMMER Donut
LOGGED BY Z. Haider **CHECKED BY** K. Armfield
NORTHING 40.7534 **EASTING** 73.96303
NOTES 80 ft of casing pushed or driven.
SAMPLER 2" OD Split Spoon **GWT** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
0					WATER. (0-ft: Mean Low Water)
5					
10					
15					
20					
25					
30					
35					
40					

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

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(Continued Next Page)

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	
40					WATER. (0-ft: Mean Low Water) *(continued)*	
66.0	SS 1	13	16-13-15-21 (28)		Gray mf SAND, trace f Gravel.	-66.0
68.0	SS 2	0	50/3"		Probable GRAVEL / COBBLE.	-68.0
70.0	SS 3	58	6-8-12-14 (20)		Gray mf SAND.	-70.0
	SS 4	92	38-49-50/1"			
73.0					Probable BOULDER.	-73.0
76.0					Gray weathered Mica SCHIST.	-76.0
	SS 5	38	50-50/2"			
	SS 6	67	50/3"			
85						

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AECOM

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
					Gray weathered Mica SCHIST. *(continued)*
87.0					-87.0
					Mica SCHIST, gray, soft to medium, moderately weathered, closely to very closely spaced joints.
90	RC 1	30 (7)			
95	RC 2	35 (8)			
97.0					-97.0
					Bottom of hole at 97.0 feet.
100					
105					
110					
115					
120					
125					
130					

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

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AECOM

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY
DATE STARTED 5/14/12 **COMPLETED** 5/15/12
GROUND ELEVATION 0 ft **HOLE SIZE** 4.5-inch
DRILLING CONTRACTOR/DRILLER Warren George, Inc./L. Ramos
HAMMER WT. 140 lbs **CLASSIFICATION METHOD** Burmister
DRILLING METHOD Rotary Wash/ Acker B-20
HAMMER Donut
LOGGED BY Z. Haider **CHECKED BY** K. Armfield
NORTHING 40.75285 **EASTING** 73.9635
NOTES 80 ft of casing pushed or driven.
SAMPLER 2" OD Split Spoon **GWT** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
0					WATER. (0-ft: Mean Low Water)
5					
10					
15					
20					
25					
30					
35					
40					

(Continued Next Page)

CLIENT NY City Economic Development Corporation

PROJECT NAME East Midtown Waterfront Esplanade and Greenway

PROJECT NUMBER 60221358

PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
40					WATER. (0-ft: Mean Low Water) *(continued)*
55.0					-55.0
55	SS 1	29	0-0-0-0 (0)		Top 2": Black cm SAND, trace f Gravel (FILL). Bottom: Black mf GRAVEL, trace cm Sand, Coal fragments (FILL)
	SS 2	33	0-0-12-14 (12)		Same as bottom of first spoon.
59.0					-59.0
60	SS 3	0	50		Probable BOULDERS.
63.0					-63.0
	SS 4	10	50-47-49-50/3"		Gray weathered Mica SCHIST.
65	SS 5	67	50/3"		
70	SS 6	100	50/3"		
75	SS 7	38	50-50/2"		
80	SS 8	80	50/5"		
85.0					-85.0
85					Mica SCHIST, gray, hard, slightly weathered, closely to medium spaced joints.

(Continued Next Page)

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
	RC 1	93 (78)			Mica SCHIST, gray, hard, slightly weathered, closely to medium spaced joints. *(continued)*
90	RC 2	97 (83)			
95					95.0 -95.0
					Bottom of hole at 95.0 feet.
100					
105					
110					
115					
120					
125					
130					

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

BORING NUMBER WB-11

AECOM

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY
DATE STARTED 5/10/12 **COMPLETED** 5/11/12
GROUND ELEVATION 0 ft **HOLE SIZE** 4.5-inch
DRILLING CONTRACTOR/DRILLER Warren George, Inc./L. Ramos
HAMMER WT. 140 lbs **CLASSIFICATION METHOD** Burmister
DRILLING METHOD Rotary Wash/Diedrich D-120
HAMMER Safety
LOGGED BY Z. Haider **CHECKED BY** K. Armfield
NORTHING 40.751867 **EASTING** 73.9644167
NOTES 75 ft of casing pushed or driven.
SAMPLER 2" OD Split Spoon **GWT** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
0					WATER. (0-ft: Mean Low Water)
5					
10					
15					
20					
25					
30					
35					
40					

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CLIENT NY City Economic Development Corporation

PROJECT NAME East Midtown Waterfront Esplanade and Greenway

PROJECT NUMBER 60221358

PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	
40					WATER. (0-ft: Mean Low Water) *(continued)*	
45						
50						
55				55.0		-55.0
	SS 1	13	2-2-2-3 (4)		Black to dark gray mf GRAVEL, trace cm Sand (FILL).	
	SS 2	17	9-20-33-37 (53)		Black to dark gray mf GRAVEL, little cm Sand (FILL).	
60	SS 3	21	3-7-15-14 (22)		Black to dark gray cm SAND, some mf Gravel (FILL).	
	SS 4	50	9-13-11-12 (24)			
				63.0		-63.0
					Probable BOULDERS.	
65				65.0		-65.0
	SS 5	13	9-12-11-14 (23)		Gray cm SAND, little mf Gravel.	
70	SS 6	18	5-13-26-26/4"	71.0		-71.0
					Gray decomposed Mica SCHIST.	
75	SS 7	33	38-50/3"			
80				80.0		-80.0
	RC 1	20 (0)			Mica SCHIST, gray, soft, highly weathered, broken.	
85				85.0		-85.0

Bottom of hole at 85.0 feet.

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY
DATE STARTED 5/9/12 **COMPLETED** 5/10/12
GROUND ELEVATION 0 ft **HOLE SIZE** 4.5-inch
DRILLING CONTRACTOR/DRILLER Warren George, Inc./L. Ramos
HAMMER WT. 140 lbs **CLASSIFICATION METHOD** Burmister
DRILLING METHOD Rotary Wash/Diedrich D-120
HAMMER Safety
LOGGED BY Z. Haider **CHECKED BY** K. Armfield
NORTHING 40.7509 **EASTING** 73.9651
NOTES 112 ft of casing pushed or driven.
SAMPLER 2" OD Split Spoon **GWT** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	
0					WATER. (0-ft: Mean Low Water)	
35.0						-35.0
	SS 1	46	0-0-0-0 (0)		Black to brown cm SAND, little Silt, little f Gravel (FILL).	
	SS 2	38	10-32-23-26 (55)		Brown to black cm SAND, some mf Gravel, trace Silt (FILL).	
39.0						-39.0
40					Probable BOULDERS and COBBLE.	

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CLIENT NY City Economic Development Corporation | **PROJECT NAME** East Midtown Waterfront Esplanade and Greenway

PROJECT NUMBER 60221358 | **PROJECT LOCATION** New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	MATERIAL DESCRIPTION
40				Probable BOULDERS and COBBLE. *(continued)*
41.0				-41.0
	SS 3	29	24-15-21-17 (36)	Gray mf GRAVEL, little c Sand, trace Brick fragments (FILL).
43.0				-43.0
	SS 4	8	10-5-6-8 (11)	Gray mf GRAVEL, trace c Sand.
45	SS 5	4	2-5-7-12 (12)	Gray mf GRAVEL.
47.0				-47.0
50	SS 6		14-5-16-17/0"	
52.0				-52.0
				Probable BOULDER.
54.0				-54.0
55	SS 7	13	10-26-19-14 (45)	Gray mf GRAVEL.
60	SS 8	8	18-29-17-16 (46)	
63.0				-63.0
65	SS 9	67	13-26-31-26 (57)	Black cm SAND, little mf Gravel (Petroleum odor at spoon tip).
68.0				-68.0
70	SS 10	63	4-6-6-6 (12)	Gray Silty CLAY, little f Sand.
73.0				-73.0
75	SS 11	54	0-3-5-7 (8)	Brown mf SAND, little Silt.
78.0				-78.0
80	SS 12	100	1-2-2-2 (4)	Brown to gray Clayey SILT, trace f Sand.
	ST 1	100		
85	SS 13	75	0-0-0-0 (0)	

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BORING NUMBER WB-12

AECOM

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG		MATERIAL DESCRIPTION	
						Brown to gray Clayey SILT, trace f Sand. *(continued)*	
					87.0		-87.0
						Gray cm SAND, trace mf Gravel.	
90	SS 14	54	6-20-11-13 (31)				
					93.0		-93.0
						Gray decomposed Mica SCHIST (from drilling fluid).	
95	SS 15	0	50				
100					100.0		-100.0
	RC 1	82 (33)				Mica SCHIST, gray, soft to medium, moderately to highly weathered, medium to closely spaced joints.	
105	RC 2	90 (70)				Mica SCHIST, gray, hard, moderately weathered, medium to closely spaced joints.	
110					110.0		-110.0
						Bottom of hole at 110.0 feet.	
115							
120							
125							
130							

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

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BORING NUMBER WB-13

AECOM

CLIENT NY City Economic Development Corporation

PROJECT NAME East Midtown Waterfront Esplanade and Greenway

PROJECT NUMBER 60221358

PROJECT LOCATION New York, NY

DATE STARTED 4/30/12 **COMPLETED** 5/8/12

GROUND ELEVATION 0 ft **HOLE SIZE** 4.5-inch

DRILLING CONTRACTOR/DRILLER Warren George, Inc./L. Ramos

HAMMER WT. 140 lbs **CLASSIFICATION METHOD** Burmister

DRILLING METHOD Rotary Wash/Diedrich D-120

HAMMER Safety

LOGGED BY Z. Haider **CHECKED BY** K. Armfield

NORTHING 40.7504167 **EASTING** 73.965467

NOTES 118 ft of casing pushed or driven.

SAMPLER 2" OD Split Spoon **GWT** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
0					WATER. (0-ft: Mean Low Water)
33.0					Black cm SAND, some f Gravel (FILL). (Elev. -33.0)
	SS 1	17	1-1-1-1 (2)		
35	SS 2	21	1-1-1-1 (2)		
	SS 3	17	1-0-0-0 (0)		
40	SS		1-1-0-0		

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CLIENT NY City Economic Development Corporation

PROJECT NAME East Midtown Waterfront Esplanade and Greenway

PROJECT NUMBER 60221358

PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)
40	4	0	(1)
	SS 5	29	4-3-4-4 (7)
45	SS 6	25	4-3-1-1 (4)
	SS 7	33	21-4-6-7 (10)
50	SS 8	13	3-18-37-32 (55)
55	SS 9	67	14-12-10-21 (22)
60	SS 10	100	0-0-2-7 (2)
	ST 1	75	0-0-0-0 (0)
65	SS 11	83	2-4-9-10 (13)
70	SS 12	100	0-0-0-0 (0)
75	SS 13	67	3-4-6-6 (10)
80	SS 14	88	3-4-6-12 (10)
85			

Depth (ft)	MATERIAL DESCRIPTION	Elevation
	Black cm SAND, some f Gravel (FILL). *(continued)*	
	Black f GRAVEL, little cm Sand.	
48.0	Gray mf GRAVEL.	-48.0
52.0	Probable BOULDER.	-52.0
54.0	Gray cm SAND.	-54.0
58.0	Gray to brown SILTY CLAY, trace f Sand.	-58.0
63.5	Gray mf SAND, little Silt.	-63.5
64.5	Gray to brown Silty CLAY, little f Sand.	-64.5
65.5	Gray f SAND, some Silt.	-65.5
68.0	Gray to brown Silty CLAY, little f Sand.	-68.0
76.0	Brown f SAND, some Silt.	-76.0
80.5	Brown to gray Silty CLAY, little f Sand.	-80.5
84.0	Brown to gray f SAND, some Silt.	-84.0

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BORING NUMBER WB-13

AECOM

CLIENT NY City Economic Development Corporation **PROJECT NAME** East Midtown Waterfront Esplanade and Greenway

PROJECT NUMBER 60221358 **PROJECT LOCATION** New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG		MATERIAL DESCRIPTION	
	SS 15	92	6-14-20-19 (34)			Brown to gray f SAND, some Silt. *(continued)*	
90	SS 16	100	5-6-6-7 (12)		91.5		-91.5
						Brown to gray Silty CLAY, trace f Sand.	
95	ST 17	75	5-7-6-13 (13)				
100	SS 18	79	6-9-13-21 (22)				
105					105.0		-105.0
	SS 19	33	14-22-21-27 (43)			Gray mf GRAVEL, some cm Sand.	
110	SS 20		50/0"			Reddish brown to gray BOULDER.	
	RC 1	18					
115					114.5		-114.5
	SS 21		50/0"			Gray cm SAND (from drilling fluid).	
120					120.0		-120.0
	RC 2	43 (17)				Mica SCHIST, gray, medium, moderately weathered, closely spaced joints.	
125	RC 3	23 (0)				Mica SCHIST, gray, medium, highly weathered, broken.	
130					130.0		-130.0
						Bottom of hole at 130.0 feet.	

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

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CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY
DATE STARTED 4/20/12 **COMPLETED** 4/27/12
GROUND ELEVATION 0 ft **HOLE SIZE** 4.5-inch
DRILLING CONTRACTOR/DRILLER Warren George, Inc./R. Verpent
HAMMER WT. 140 lbs **CLASSIFICATION METHOD** Burmister
DRILLING METHOD Rotary Wash/Diedrich D-120
HAMMER Safety
LOGGED BY Z. Haider **CHECKED BY** K. Armfield
NORTHING 40.7496 **EASTING** 73.9664
NOTES 100 ft of casing pushed or driven.
SAMPLER 2" OD Split Spoon **GWT** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
0					WATER. (0-ft: Mean Low Water)
5					
10					
15					
20					
25					
30					
35					
40					40.0 -40.0

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

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BORING NUMBER WB-14

AECOM

CLIENT NY City Economic Development Corporation | **PROJECT NAME** East Midtown Waterfront Esplanade and Greenway

PROJECT NUMBER 60221358 | **PROJECT LOCATION** New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG		MATERIAL DESCRIPTION	
40	SS 1		50/0"			Probable BOULDER.	
					44.0		-44.0
45	SS 2	17	21-26-9-11 (35)			Top 1": Gray mf GRAVEL. Bottom: Gray cm SAND, some mf Gravel.	
					46.5		-46.5
	SS 3	29	12-8-11-12 (19)			Gray mf GRAVEL.	
	SS 4	25	10-15-10-11 (25)			Gray mf GRAVEL and cm Sand.	
50					50.0		-50.0
	SS 5	25	13-21-11-14 (32)			Gray cm SAND, some mf Gravel.	
55	SS 6	38	4-3-3-2 (6)				
60	SS 7	21	15-7-3-4 (10)			Gray SAND, trace f Gravel.	
					63.0		-63.0
						Gray f GRAVEL, some cm Sand.	
65	SS 8	4	6-9-13-11 (22)				
					68.0		-68.0
70	SS 9	67	7-8-14-17 (22)			Top: Gray to brown mf SAND, trace Silt. Bottom 4": Gray cm SAND, trace f Gravel.	
75					75.5	Top: SAME.	-75.5
	SS 10	38	8-7-8-11 (15)		76.5	Middle: Brown to gray Silty CLAY, trace f Sand.	-76.5
						Bottom: Gray cm SAND, trace f Gravel.	
80	SS 11	62	10-21-49-50/3"		81.0	Top: SAME.	-81.0
						Gray f GRAVEL, little c Sand.	
85	SS		7-25-34				

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

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CLIENT NY City Economic Development Corporation

PROJECT NAME East Midtown Waterfront Esplanade and Greenway

PROJECT NUMBER 60221358

PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
	12	11	(59)		Gray f GRAVEL, little c Sand. *(continued)*
88.0					Gray cm SAND, trace mf Gravel. (-88.0)
90	SS 13	33	3-9-5-7 (14)		
95	SS 14	38	15-50/2"		
100	SS 15	40	12-48-50/3"		
105.0	RC 1	73 (27)			Mica SCHIST, gray, medium, moderately weathered, upper 2.5 ft is broken and bottom 2.5 ft closely spaced joints. (-105.0)
110	RC 2	100 (50)			Mica SCHIST, gray, medium, moderately weathered, upper 1 ft is broken and bottom 4 ft closely spaced joints.
115.0					Bottom of hole at 115.0 feet. (-115.0)
120					
125					
130					

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

BORING NUMBER WB-15

AECOM

CLIENT NY City Economic Development Corporation		**PROJECT NAME** East Midtown Waterfront Esplanade and Greenway	
PROJECT NUMBER 60221358		**PROJECT LOCATION** New York, NY	
DATE STARTED 4/17/12	**COMPLETED** 4/19/12	**GROUND ELEVATION** 0 ft	**HOLE SIZE** 4.5-inch
DRILLING CONTRACTOR/DRILLER Warren George, Inc./R. Verpent		**HAMMER WT.** 140 lbs	**CLASSIFICATION METHOD** Burmister
DRILLING METHOD Rotary Wash/Diedrich D-120		**HAMMER** Safety	
LOGGED BY Z. Haider	**CHECKED BY** K. Armfield	**NORTHING** 40.748967	**EASTING** 73.9668
NOTES 100 ft of casing pushed or driven.		**SAMPLER** 2" OD Split Spoon	**GWT** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
0					WATER. (0-ft: Mean Low Water)
5					
10					
15					
20					
25					
30					
35					
40					

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

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AECOM

CLIENT NY City Economic Development Corporation
PROJECT NAME East Midtown Waterfront Esplanade and Greenway
PROJECT NUMBER 60221358
PROJECT LOCATION New York, NY

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	
40–42.0					WATER. (0-ft: Mean Low Water) *(continued)*	-42.0
42.0–46.0	SS 1	0	0-0-0-0 (0)		Gray cmf SAND, some mf Gravel (FILL).	-46.0
	SS 2	8	20-1-1-1 (2)			
46.0–48.0					Probable BOULDER.	-48.0
48.0–50.0	SS 3	17	17-15-18-19 (33)		Black cm SAND, little f Gravel, trace Brick fragments (FILL).	-50.0
50.0–52.0	SS 4		50/0"		Probable BOULDER.	-52.0
52.0–54.0	SS 5	50	7-6-8-15 (14)		Gray cm SAND, little mf Gravel.	-54.0
54.0–56.0	SS 6	9	26-50/5"		Gray mf GRAVEL.	-56.0
56.0–66.0	RC 1	97 (90)			Mica SCHIST, gray, medium to hard, moderately to slightly weathered, closely to medium spaced joints.	
	RC 2	100 (100)			SAME.	-66.0
66.0					Bottom of hole at 66.0 feet.	

GENERAL BH / TP / WELL EMWEG.GPJ GINT US.GDT 6/1/12

Appendix B:

Record Borings F.D.R. Drive Temporary Detour Structure

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION	11	HOLE	BR-1
COUNTY	N.Y.N.Y.	LINE	
PIN	X071.022	STA.	D1+063.00
PROJECT	F.D.R. 53St. - 63St.	OFFSET	
SOIL SERIES		SURF. ELEV.	
COORD. LOC.		DEPTH TO WATER	below5.00'
DATE START	4-27-00	DATE FINISH	4-28-00

CASING O.D.	125 mm	100 mm	WEIGHT OF	135 kg	HAMMER 450 mm
SAMPLER O.D.	50 mm	28 mm	WEIGHT OF	63 kg	HAMMER 750 mm

DEPTH BEL 0	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
							" 0" Manhattan Datum (mean low water)	
							Water to 12M	
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
12.0								
		J-1	WOR	WOR			Gr m-f GRAVEL, little c-f Sand,	
					WOR	WOR		
13.5								
		J-2	8	14			Bl c-f SAND, Tr Silt, tr f Gravel	
					16	12		
15.05								

THE SUBSURFACE INFORMATION SHOWN HEREON WAS OBTAINED FOR STATE DESIGN AND ESTIMATE PURPOSES. IT IS MADE AVAILABLE TO AUTHORIZED USERS ONLY THAT THEY MAY HAVE ACCESS TO THE SAME INFORMATION AVAILABLE TO THE STATE. IT IS PRESENTED IN GOOD FAITH, BUT IS NOT INTENDED AS A SUBSTITUTE FOR INVESTIGATIONS, INTERPRETATION OR JUDGMENT OF SUCH AUTHORIZED USERS.

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 1 OF 2
HOLE BR-1

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC.
DATE START 4-27-00 DATE FINISH 4-28-00

HOLE BR-1
LINE
STA. D1+063.00
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 15	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
		J-3	14	16			Bl c-f SAND and GRAVEL, tr Silt	
					11	8		
16.5								
		J-4	58	34			Same	
					31	12		
18.0								
		B-1					19.9- 20.2 Cored boulder (1' run) broke through into soil recovery 4" boulder	
19.5								
		J-5	6	9			Gr Br c-f SAND, little Silt, tr f Gravel	
					10	14		
21.0								
		J-6	14	9			Gr Br c-f SAND and SILT	
					8	10		
22.5								
		C-1					23.15 - 24.65 Bl Gr mica SCHIST moderately weathered, moderately REC 52" = 86% RQD 44" = 73 %	
24.0								
		C-2					24.65 - 26.15 Bl Gr mica SCHIST w Quartz REC 60" = 100% RQD 55" = 91%	
25.5								
		C-3					26.15 - 27.65 Sound Rock REC 60 " = 100% RQD 60" = 100%	
27.0								
							Bottom of boring 27-65M	
28.5								
30.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 2 OF 2
HOLE BR-1

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
JECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC.
DATE START 03-14-00

HOLE BR 2
LINE
STA. D1+084.00
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'
DATE FINISH 03-16-00

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 0	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm				DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
			0/150	150/30	300/4	450/60		
							"0" MANHATTAN DATAM (MEAN HIGH WATER)	
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
		S	4	1			No Recovery	
					0	1		
		S1	12	8			Bl m-f GRAVEL and SAND , tr Silt	
12.0					2	6		
		S2	8	12			Bl c-f SAND,little m-f Gravel, TR+ Silt	

					13	8	
13.5							
		S3	31	7			Bl & Gr m-f GRAVEL, little c-f Sand, Tr Silt
J5					2	4	

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR S. LARENZA
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 1 **OF** 2
HOLE BR-2

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC.
DATE START 3-14-00 DATE FINISH 3-16-00

HOLE BR-2
LINE
STA. D1+084.00
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 15	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
		S-4	100				Dk Gr m-f GRAVEL,tr Sand, tr silt	
			3"					
16.5								
		S	31	100			No Recovery (2 attempts)	
18.0								
		S-5	75	82			Gr c-f SAND,little m-f Gravel	
					52	72		
19.5								
		S-6	58	100			Gr c-f SAND,little m-f Gravel,tr Silt	
21.0								
		C-1					21.9-22.2 Weathered, fractured mica Schist	
							REC.9.5" =79% RQD 46%	
		C-2					22.2-22.5 same w Clay seam at 22.5	
22.5							REC. 8" = 66% RQD 0%	
		C-3					22.5-24 Same	
							REC.48"= 80% RQD= 0%	
24.0								
		C-4					24-25.5 same	
							REC.51" = 85% RQD 140= 23%	
25.5								
		C-5					25.5-27 same	
							REC.60" 100% RQD 33"=55%	
27.0								
		C-6					27-28.5 same	
							REC.49" =81% RQD 0 %	
28.5								
							Bottom of boring 28.5M	
30.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR S. LARENZA
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 2 OF 3
HOLE BR-2

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC.
DATE START 3-14-00 DATE FINISH 3-15-00

HOLE BR-3
LINE
STA. D1+084.00
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 0	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
							"0" MANHATTAN DATAM (MEAN HIGH WATER)	
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
12.0								
13.5								
		S-1	2	3			Bl. Debris trace (+) Silt. Rec. 75mm	
					3	4		
15.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. RIVERA
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 1 OF 3
HOLE BR-3

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC.
DATE START 3-14-00 DATE FINISH 3-15-00

HOLE BR-3
LINE
STA. D1+084.00
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 15	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
		S-2	33	11			Bl. c-f SAND, little m-f Gravel, trace (+) Silt. Rec. 200mm	
					2	13		
16.5								
		S-3	13	22			Bn. c-f SAND, little (-) Gravel, trace Silt. Rec. 400mm	
					24	57		
18.0								
		S-4	10	20			Same.	
					20	30		
19.5								
		S-5	17	27			Gr. c-f SAND, little m-f Gravel, trace Silt. Rec. 150mm	
21.0					24	27		
		S-6	33	23			Same.	
22.5					17	14		
		S-7	100				Gr. c-f SAND, little m-f Gravel, trace Silt (decomposed mica schist).	
24.0		C-1					23.65 - 24.8 weathered fractured mica schist	
							REC. 37.5" = 78% RQD 0%	
		C-2					24.8 - 26.1 same	
							REC. 22" = 43% RQD 0%	
25.5								
		C-3					26.1 -27.6 bl. and gr. mica SCHIST with Quartz	
							REC. 55" = 92% RQD 22" = 37%	
27.0								
		C-4					27.6 - 29.1 bl. and gr.weathered & fractured mica SCHIST	
							REC. 24" = 40% RQD 0%	
28.5								
		C-5					29.1 - 30.6 same	
							REC. 45" = 75% RQD 19" = 31%	
30.05							BOTTOM OF BORING 30.6 M	

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. RIVERA
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 2 OF 3
HOLE BR-3

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC.
DATE START 3-16-00 DATE FINISH 3-16-00

HOLE BR-5
LINE
STA. D1+108.00
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 0	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
							0 Manhattan Datum (mean high water)	
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
12.0								
13.5		S-1	WOR	WOR			Black Debris-	
					WOR	WOR		
15.05		S-2	50/2"				Bl m-f GRAVEL	

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B.Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 1 OF 2
HOLE BR-5

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION	11	HOLE	BR-5
COUNTY	N.Y.N.Y.	LINE	
PIN	X071.022	STA.	D1+108.00
PROJECT	F.D.R. 53 St. - 63 St.	OFFSET	
SOIL SERIES		SURF. ELEV.	
COORD. LOC.		DEPTH TO WATER	below5.00'
DATE START	3-16-00	DATE FINISH	3-16-00

CASING O.D.	125 mm	100 mm	WEIGHT OF	135 kg	HAMMER 450 mm
SAMPLER O.D.	50 mm	28 mm	WEIGHT OF	63 kg	HAMMER 750 mm

DEPTH BEL 15	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
		C-1					14.85-16.35 Bl & Gr Slightly weathered, modertately fractured mica Schist REC. 57"= 95% RQD 34"= 56.5%	
16.5		C-2					16.65-18.22 Bl & Gr slightly weathered , mica Schist REC.63.5"=100% RQD 58"= 92%	
18.0							Bottom of Boring 18.22M	
19.5								
21.0								
22.5								
24.0								
25.5								
27.0								
28.5								
30.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR	B.Rivera
SOIL & ROCK DESCRIP.	
CHIEF INSPECTOR	P. CALISE
REGIONAL SOILS ENGR.	J. TANG
STRUCTURE NAME/NO.	

SHEET 2 OF 2
HOLE BR-5

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC.
DATE START 4-28-00 DATE FINISH 0 4-28-00

HOLE BR-7
LINE
STA. D1+138.50
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 0	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
							" 0" Manhattan Datum (mean low water)	
							Water to 12.75M	
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
12.0								
		J-1	35	41			Bl c-f SAND, some m-f Gravel, tr Silt w Brick	
					50/3			
13.5								
		C-1					13.95 - 15.45 Bl Gr mica SCHIST w Quartz moderately weathered, Fractured REC 57" = 95% RQD 30" = 50%	
15.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 1 OF 2
HOLE BR-7

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC.
DATE START 4-28-00   DATE FINISH 4-28-00

HOLE BR-7
LINE
STA. D1+138.50
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm   100 mm   WEIGHT OF 135 kg   HAMMER 450 mm
SAMPLER O.D. 50 mm   28 mm   WEIGHT OF 63 kg   HAMMER 750 mm

DEPTH BEL 15	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
		C-2					15.45 - 16.95 Bl Gr mica SCHIST w Quartz REC 60" = 100% RQD 54" = 90%	
16.5								
		C-3					16.95 - 18.45 same REC 60 " = 100% RQD 52" = 86%	
18.0								
		C-4					18.45 - 19.95 same (sound rock) REC 60" = 100% RQD 58" = 96%	
19.5								
							Bottom of boring 19.95M	
21.0								
22.5								
24.0								
25.5								
27.0								
28.5								
30.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 2 OF 2
HOLE BR-7

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC.
DATE START 4-24-00 DATE FINISH 4-24-00

HOLE
LINE
STA. D1+138.50
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 30	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm				DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
			0/150	150/30	300/4	450/60		
31.5								
33.0								
34.5								
36.0								
37.5								
39.0								
40.5								
42.0								
43.5								
45.05								

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 3 OF 3
HOLE

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC.
DATE START 4-21-00 DATE FINISH 4-21-00

HOLE BR-9
LINE
STA.
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 0	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
							" 0" Manhattan Datum (mean low water)	
							Water to 12.75M	
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
12.0								
		J-1	10	14			No Recovery	
					14	23		
13.5		J-	50/0					
		C-1					13.5- 15 Bl Gr mica SCHIST w Quartz	
							REC 57"= 95% RQD 23"= 38%	
15.05								

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 1 OF 2
HOLE BR-9

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC.
DATE START 4-21-00
DATE FINISH 4-21-00

HOLE BR-9
LINE
STA.
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 15	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
		C-2					16-16.5 Same REC 60"= 100% RQD 60"= 100%	
16.5		C-3					16.5-18 same REC 60"= 100% RQD 51"= 85%	
18.0		C-4					18-19.5 sound mica SCHIST REC 60"= 100% RQD 60"= 100%	
19.5							Bottom of boring 19.5M	
21.0								
22.5								
24.0								
25.5								
27.0								
28.5								
30.05								

THE SUBSURFACE INFORMATION SHOWN HEREON WAS OBTAINED FOR STATE DESIGN AND ESTIMATE PURPOSES. IT IS MADE AVAILABLE TO AUTHORIZED USERS ONLY THAT THEY MAY HAVE ACCESS TO THE SAME INFORMATION AVAILABLE TO THE STATE. IT IS PRESENTED IN GOOD FAITH, BUT IS NOT INTENDED AS A SUBSTITUTE FOR INVESTIGATIONS, INTERPRETATION OR JUDGMENT OF SUCH AUTHORIZED USERS.

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B.Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 2 OF 2
HOLE BR-9

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC.
DATE START 3-29-00 DATE FINISH 3-29-00

HOLE BR-10
LINE
STA. D1+199.51
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BELO	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
							0 MANHATTAN DATUM (MEAN HIGH WATER)	
1.5								
3.0								
4.5								
6.0							5.85-6.45 On Rock ledge, roller bit 2' to get bite on rock	
		C -1					6.45-7.95 Bl Gr mica SCHIST w/Quartz REC. 60" = 100% RQD 32" = 53%	
7.5								
		C-2					7.95-9.45 same REC. 60" = 100% RQD 35" = 58%	
9.0								
		C-3					9.45-10.95, same moderately weathered, moderately fractured REC. 60" = 100% RQD 43" = 71%	
10.5								
		C-4					10.95-12.45 Sound Mica SCHIST REC. 60" = 100% RQD 60 = 100%	
12.0								
							Bottom of boring 12.45M	
13.5								
15.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 1 OF 1
HOLE BR-10

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC.
DATE START 5-2-00 DATE FINISH 5-2-00

HOLE BR_13
LINE
STA.
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 0	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
							" 0" Manhattan Datum (mean low water)	
							Water to 12.80M	
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
12.0								
		J-1	100/6"				Bl m-f GRAVEL, little c-f Sand, tr Silt (decomposed rock)	
							12.80- 13.85 soft highly weathered rock	
13.5								
		C-1					Bl Gr mica SCHIST (slightly weathered)	
							REC 50" = 83% RQD 46" = 75%	
15.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 1 OF 2
HOLE BR-13

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC.
DATE START 5-2-00 DATE FINISH 5-2-00

HOLE BR-13
LINE
STA.
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 15	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
		C-2					15.35 - 16.85 Same REC 52" = 87% RQD 50" = 83%	
16.5								
		C-3					16.85 - 18.35 Same REC 52" = 87% RQD 42" = 71%	
18.0								
							Bottom of boring 16.34M	
19.5								
21.0								
22.5								
24.0								
25.5								
27.0								
28.5								
30.05								

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 2 OF 2
HOLE BR-13

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION	11	HOLE	BR-15
COUNTY	N.Y.N.Y.	LINE	
PIN	X071.022	STA.	D1+260.50
PROJECT	F.D.R. 53St. - 63St.	OFFSET	
SOIL SERIES		SURF. ELEV.	
COORD. LOC.		DEPTH TO WATER	below5.00'
DATE START	3-28-00	DATE FINISH	3-28-00

CASING O.D.	125 mm	100 mm	WEIGHT OF	135 kg	HAMMER 450 mm
SAMPLER O.D.	50 mm	28 mm	WEIGHT OF	63 kg	HAMMER 750 mm

DEPTH BEL 0	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
12.0								
							ELV.13.	
		S-1	100				Bl m-f GRAVEL, little c-f Sand, tr Silt	
13.5							Elv	
		C-1					13.85-15.35 Bl Gr mica SCHIST.	
							REC. 52" = 86% RQD 42" = 70%	
15.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR	B. Rivera
SOIL & ROCK DESCRIP.	
CHIEF INSPECTOR	P. CALISE
REGIONAL SOILS ENGR.	J. TANG
STRUCTURE NAME/NO.	
SHEET	1 OF 2
HOLE	BR-15

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC.
DATE START
DATE FINISH

HOLE BR-15
LINE
STA. D1+260.50
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D.	125 mm	100 mm	WEIGHT OF	135 kg	HAMMER	450 mm
SAMPLER O.D.	50 mm	28 mm	WEIGHT OF	63 kg	HAMMER	750 mm

DEPTH BEL 15	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
		C-1					15.35 - 16.85 Same REC.60" = 100% RQD 60" = 100%	
16.5								
							Bottom of boring 16.85M	
18.0								
19.5								
21.0								
22.5								
24.0								
25.5								
27.0								
28.5								
30.05								

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 2 OF 2
HOLE BR-15

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC.
DATE START 5-2-00 DATE FINISH 5-2-00

HOLE BR_17
LINE
STA. D1+321.50
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D.	125 mm	100 mm	WEIGHT OF	135 kg	HAMMER	450 mm
SAMPLER O.D.	50 mm	28 mm	WEIGHT OF	63 kg	HAMMER	750 mm

DEPTH BEL 0	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
							" 0" Manhattan Datum (mean low water)	
							Water to 12.80M	
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
12.0								
		J-1	100/6"				Bl m-f GRAVEL, little c-f Sand, tr Silt (decomposed rock)	
							12.80- 13.85 soft highly weathered rock	
13.5								
		C-1					13.85 - 15.35 Bl Gr mica SCHIST (slightly weathered) REC 50" = 83% RQD 46" = 75%	
15.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.
SHEET 1 OF 2
HOLE BR-17

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION	11	HOLE	BR-17
COUNTY	N.Y.N.Y.	LINE	
PIN	X071.022	STA.	D1+321.50
PROJECT	F.D.R. 53 St. - 63 St.	OFFSET	
SOIL SERIES		SURF. ELEV.	
COORD. LOC.		DEPTH TO WATER	below5.00'
DATE START	5-2-00	DATE FINISH	5-2-00

CASING O.D.	125 mm	100 mm	WEIGHT OF	135 kg	HAMMER 450 mm
SAMPLER O.D.	50 mm	28 mm	WEIGHT OF	63 kg	HAMMER 750 mm

DEPTH BEL 15	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
		C-2					15.35 - 16.85 Same REC 52" = 87% RQD 50" = 83%	
16.5		C-3					16.85 - 18.35 Same REC 52" = 87% RQD 42" = 71%	
18.0							Bottom of boring 18.35M	
19.5								
21.0								
22.5								
24.0								
25.5								
27.0								
28.5								
30.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 2 OF 2
HOLE BR-17

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11 | HOLE BR-19

COUNTY N.Y.N.Y. | LINE

PIN X071.022 | STA. D1+382.50

PROJECT F.D.R. 53St. - 63St. | OFFSET

SOIL SERIES | SURF. ELEV.

COORD. LOC. | DEPTH TO WATER below5.00'

DATE START 3-17-00 | DATE FINISH 3-17-00

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm

SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 0	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
							0 MANHATTAN DATUM (mean high water)	
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
		S-1	15	89			Bl ,gr c-f SAND , some m-f Gravel,tr+ Silt w debris	
10.5					58	21		
		S-2	45	19			Bn c-f SAND,some m-f Gravel, tr+ Silt	
12.0					26	23		
							---12.85----1	
		C-1					12.85-13.85 Bl & Gr mica Schist & Quartz REC.4"=.06% RQD= 0%	
13.5								
15.05		C-2					14.9-16.Bl mica Schist, moderately weathered, highly fractured	

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B.Rivera

SOIL & ROCK DESCRIP.

CHIEF INSPECTOR P. CALISE

REGIONAL SOILS ENGR. J. TANG

STRUCTURE NAME/NO.

SHEET 1 OF 3

HOLE BR-19

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION	11	HOLE	BR-19
COUNTY	N.Y.N.Y.	LINE	
PIN	X071.022	STA.	D1+382.50
PROJECT	F.D.R. 53 St. - 63 St.	OFFSET	
SOIL SERIES		SURF. ELEV.	
COORD. LOC.		DEPTH TO WATER	below5.00'
DATE START	3-17-00	DATE FINISH	3-17-00

CASING O.D.	125 mm	100 mm	WEIGHT OF	135 kg	HAMMER	450 mm
SAMPLER O.D.	50 mm	28 mm	WEIGHT OF	63 kg	HAMMER	750 mm

DEPTH BEL 15	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
							C-2 REC 60"=100% RQD 13"= 21%	
16.5		C-3					16.5-17.9 Bl Gr mica Schist Weathered , Moderately fractured REC 60= 100% RQD32"= 53%	
18.0		C-4					17.9-19.4same REC 60" 100% RQD 83%	
							Bottm of boring 19.4M	
19.5								
21.0								
22.5								
24.0								
25.5								
27.0								
28.5								
30.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR	B.Rivera
SOIL & ROCK DESCRIP.	
CHIEF INSPECTOR	P. CALISE
REGIONAL SOILS ENGR.	J. TANG
STRUCTURE NAME/NO.	

SHEET 2 OF 2

HOLE BR-19

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION	11	HOLE	BR-20
COUNTY	N.Y.N.Y.	LINE	
PIN	X071.022	STA.	D1+413.00
PROJECT	F.D.R. 53St. - 63St.	OFFSET	
SOIL SERIES		SURF. ELEV.	
COORD. LOC.		DEPTH TO WATER	below5.00'
DATE START	3-27-00	DATE FINISH	3-28-00

CASING O.D.	125 mm	100 mm	WEIGHT OF	135 kg	HAMMER	450 mm
SAMPLER O.D.	50 mm	28 mm	WEIGHT OF	63 kg	HAMMER	750 mm

DEPTH BELO	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
		S-	WOR	WOR			No Recovery	
					WOR	WOR		
10.5		S-1	15	30				
					20	50	Gr c-f SAND, tr silt	
12.0		S-2	95	50			Bn Gr c-f SAND, little f Gravel, tr Silt	
					40	41		
13.5								
		C-1					13.5-15.0 Gr Mica SCHIST Highly weathered, highly fractured REC. 26.5" = 44% RQD 4" = 6%	
15.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR	B. Rivera
SOIL & ROCK DESCRIP.	
CHIEF INSPECTOR	P. CALISE
REGIONAL SOILS ENGR.	J. TANG
STRUCTURE NAME/NO.	
SHEET	1 OF 2
HOLE	BR-20

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC.
DATE START 3-27-00 DATE FINISH 3-28-00

HOLE BR-20
LINE
STA. D1+413.00
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D.	125 mm	100 mm	WEIGHT OF	135 kg	HAMMER	450 mm
SAMPLER O.D.	50 mm	28 mm	WEIGHT OF	63 kg	HAMMER	750 mm

DEPTH BEL 15	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
		C-2					15-16.5 same REC. 55" = 91% RQD 17 = 28%	
16.5		C-3					16.5-18 same REC. 60" = 100 % RQD 18' = 30%	
18.0		C-4					18-19.5 same REC. 60" = 100% RQD 13" = 21.5%	
19.5		C-5					19.5-21 same REC. 57" = 95% RQD 11" = 18%	
21.0							Bottom of boring 21M	
22.5								
24.0								
25.5								
27.0								
28.5								
30.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 2 OF 2
HOLE BR-20

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC.
DATE START 3-27-00 DATE FINISH 3-27-00

HOLE BR-21
LINE
STA. D1+443.00
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 0	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
							0 MANHATTAN DATUM (MEAN HIGH WATER)	
							Boring taken 11.4 M off the wall, barge aground at original boring site.	
1.5								
3.0								
		S-1	WOR	WOR			Bl SILT, little c-f Sand, little m-f Gravel (river mud)	
4.5					WOR	WOR		
		S-2	12	5			Bl c-f SAND, tr Silt, tr f Gravel.	
6.0					2	12		
		S-3	21	16			same	
					20	100		
		S-4	14	100			same	
7.5								
		C-1					7.65 - 9.15 Bl Gr mica SCHIST, weathered and fractured	
							REC. 57" = 95% RQD 12" = 20%	
9.0								
		C-2					9.15 - 10.65 Bl Gr mica SCHIST, slightly weathered,moderately fractured	
							REC. 60" = 100% RQD 50" = 83%	
10.5		C-3					10.65 - 12.15 same	
							REC. 60" = 100% RQD 53" = 88%	
12.0								
							Bottom of Boring 12.15M	
13.5								
15.05								

THE SUBSURFACE INFORMATION SHOWN HEREON WAS OBTAINED FOR STATE DESIGN AND ESTIMATE PURPOSES. IT IS MADE AVAILABLE TO AUTHORIZED USERS ONLY THAT THEY MAY HAVE ACCESS TO THE SAME INFORMATION AVAILABLE TO THE STATE. IT IS PRESENTED IN GOOD FAITH, BUT IS NOT INTENDED AS A SUBSTITUTE FOR INVESTIGATIONS, INTERPRETATION OR JUDGMENT OF SUCH AUTHORIZED USERS.

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B.Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 1 OF 1
HOLE BR-21

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC.
DATE START 4-25-00   DATE FINISH 4-25-00

HOLE BR-24
LINE
STA. D1+473.00
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 0	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
							" 0" Manhattan Datum (mean low water)	
							Water to 7.75M	
1.5								
3.0								
4.5								
6.0								
7.5								
							-7.	
		J-1	WOR	WOR			Bl c-f SAND, some m-f Gravel, tr Silt	
					WOR	WOR		
9.0								
		J-2	8	8			Bl c-f SAND, little m-f Gravel, little Silt	
					10	4		
10.5								
		J-3	15	21			Gr m-f GRAVEL, some c-f Sand, tr + Silt	
					20	19		
							1	
		C-1					11.5-13 Soft Weathered mica SCHIST (top 3' of run washed away)	
12.0							REC 24"= 40% RQD 0	
		C-2					13-14.5 Slightly Weathered mica SCHIST	
13.5							REC 60"= 100% RQD 52"= 85%	
		C-3					14.5-16 Sound Mica SCHIST	
15.05							REC 60"= 100% RQD 60"= 100%	

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 1 OF 3
HOLE BR-24

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION	11	HOLE	BR-24
COUNTY	N.Y.N.Y.	LINE	
PIN	X071.022	STA.	D1+473.00
PROJECT	F.D.R. 53 St. - 63 St.	OFFSET	
SOIL SERIES		SURF. ELEV.	
COORD. LOC.		DEPTH TO WATER	below5.00'
DATE START	4-25-00	DATE FINISH	4-25-00

CASING	O.D.	125 mm	100 mm	WEIGHT OF	135 kg	HAMMER	450 mm
SAMPLER	O.D.	50 mm	28 mm	WEIGHT OF	63 kg	HAMMER	750 mm

DEPTH BEL 15	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
		C-4					16-17.5 Same	
16.5							REC 60"= 100% RQD 60" 100%	
							Bottom of boring 17.5M	
18.0								
19.5								
21.0								
22.5								
24.0								
25.5								
27.0								
28.5								
30.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR	B. Rivera
SOIL & ROCK DESCRIP.	
CHIEF INSPECTOR	P. CALISE
REGIONAL SOILS ENGR.	J. TANG
STRUCTURE NAME/NO.	

SHEET 2 OF 2

HOLE BR-24

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC.
DATE START 3-24-00 DATE FINISH 3-24-00

HOLE BR-25
LINE
STA. D1+498.50
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 0	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
							O Manhattan datum (mean high water)	
1.5								
3.0								
4.5								
6.0								
7.5								
		S-1	WOR	WOR			Bl. Rd. m-f GRAVEL, trace + c-f Sand, trace Silt w red brick	
					WOR	WOR		
9.0		S-2	16	22			Bl. c-f SAND, little m-f Gravel, trace + Silt	
					37	54		
10.5		S-3	51	86			Same	
					39	56		
12.0		C-1					11.85 - 13.35 Bl. Gr. Mica SCHIST	
							Rec. 57" = 95% RQD 57" = 95%	
13.5		C-2					13.35 - 14.86 Same	
							Rec. 60" - 100% RQD 60" = 100%	
15.05							Bottom of Boring	

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. RIVERA
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 1 OF 1
HOLE BR-25

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC.
DATE START 3-24-00 DATE FINISH 3-24-00

HOLE BR-25
LINE
STA.
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BELO	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
0							O Manhattan datum (mean high water)	
1.5								
3.0								
4.5								
6.0								
7.5								
		S-1	WOR	WOR			Bl. Rd. m-f GRAVEL, trace + c-f Sand, trace Silt w red brick	
					WOR	WOR		
9.0		S-2	16	22			Bl. c-f SAND, little m-f Gravel, trace + Silt	
					37	54		
10.5		S-3	51	86			Same	
					39	56		
12.0		C-1					11.85 - 13.35 Bl. Gr. Mica SCHIST	
							Rec. 57" = 95% RQD 57" = 95%	
13.5		C-2					13.35 - 14.86 Same	
							Rec. 60" - 100% RQD 60" = 100%	
15.05							Bottom of Boring	

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. RIVERA
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 1 OF 1
HOLE BR-25

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC.
DATE START 3-23-00 DATE FINISH 3-24-00

HOLE BR-27
LINE
STA. D1+521.00
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 0	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
1.5								
3.0								
4.5								
		S-1	WOR	WOR			Bl c-f SAND, little m-f Gravel,tr Silt	
					WOR	WOR		
6.0								
		S-2	6	4			same	
					2	3		
7.5								
		S-3	5	1			Bl c-f SAND, tr f Gravel, Tr Silt	
					1	1		
9.0								
		S4	4	12			same	
					14	10		
10.5		C-1					9.9- 11.4 Recovered 1" limestone boulder REC 2% - RQD 0%	
							Reduced boring w 3" (75mm) casing	
							Could not advance boring beyond 11M , obstruction, lost water could not seat	
							casing. Boring abandoned, moved 2' east and restarted. New Boring BR-27A	
12.0								
13.5								
15.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B.Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 1 OF 1
HOLE BR-27

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC.
DATE START 3-22-00 DATE FINISH 3-22-00

HOLE BR-29
LINE
STA. D1+546.50
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 0	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
		S-1	WOR	WOR			Bl c-f SAND, little m-f Gravel, little Silt	
					WOR	WOR		
10.5								
		S-2	4	6			same (refusal)	
					8	100		
12.0		C-1					11.85-13.35 Bl Gr mica SCHIST slightly weathered, slightly fractured	
							REC. 51"= 85% RQD44"= 73%	
13.5		C-2					13.35-14.85 same w Quartz	
							REC. 58"= 96.5% RQD 58"= 96.5%	
15.05							Bottom of boring 14.85M	

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 1 OF 13
HOLE BR-29

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC.
DATE START 5-5-00 DATE FINISH 5-8-00

HOLE BR-30
LINE
STA. D1+568.00
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 0	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
							" 0" Manhattan Datum (mean low water)	
							Water to 13.2M	
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
12.0								
13.5		J-	WOR	1			No recovery	
					WOR	1		
		J-1	1	4			Bl GR m-f GRAVEL, tr f Sand	
					6	9		
15.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera/ Gregory
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 1 OF 32
HOLE BR-30

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC.
DATE START 5-5-00 DATE FINISH 5-8-00

HOLE BR-30
LINE
STA. D1+568.00
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D.	125 mm	100 mm	WEIGHT OF	135 kg	HAMMER	450 mm
SAMPLER O.D.	50 mm	28 mm	WEIGHT OF	63 kg	HAMMER	750 mm

DEPTH BEL 15	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
		J-2	8	9			Bl Bg c-f SAND, little m-f Gravel, tr Silt	
					8	8		
16.5								
		J-3	20	10			Same	
					14	8		
18.0								
		J-4	41	13			Same	
					11	9		
19.5								
		J-5	26	20			Same	
					13	12		
21.0								
		J-6	100				Gr m-f GRAVEL, little c-f Sand	
		J-7	24	100			Gr c-f SAND, little m-f Gravel	
22.5								
		C-1					23.15 - 24.65 Gr mica SCHIST weathered highly fractured REC 48" = 100% RQD 18" = 30%	
24.0								
		C-2					24.65 - 26.15 same REC 36" = 60% RQD 4" = 6%	
25.5								
		C-3					26.15 - 27.65 No Recovery	
27.0								
		J-8					Highly weathered (decomposed) Rock	
		C-4					27.65 - 29.15 No Recovery	
28.5								
		J-9					Highly weathered (decomposed) rock	
30.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B . Rivera/Gregory
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 2 OF 3
HOLE BR-30

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC.
DATE START 5-5-00 DATE FINISH 5-8-00

HOLE BR-30
LINE
STA. D1+568.00
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 30	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
		C-5					30.65 - 32.15 Bl Gr mica SCHIST w Quartz mod weathered fractured REC 47.5" = 79% RQD 30.5" = 51%	
31.5								
		C-6					32.15 - 33.65 same REC 60" = 100% RQD 23" = 39%	-
33.0								
							Bottom of boring 33.65M	
34.5								
36.0								
37.5								
39.0								
40.5								
42.0								
43.5								
45.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera/Gregory
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 3 OF 3
HOLE BR-30

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC.
DATE START 3-20-00 DATE FINISH 3-21-00

HOLE BR-31
LINE
STA. D1+593.00
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 15	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
		S-4	10	13			Bl c-f SAND, Tr silt, Tr f Gravel	
					15	10		
16.5								
		S-5	12	28			Bl c-f SAND, tr m-f Gravel, tr Silt	
					16	35		
18.0								
		S-6	7	9			Bl Br c-f SAND, tr Silt, Tr f Gravel	
					8	7		
19.5								
		S-7	8	7			same	
					7	7		
21.0								
		S-8	11	10			br m-f SAND, tr + Silt	
					12	18		
22.5								
		S-9	7	9			Same	
					7	9		
24.0								
		S-10	42	18			br c-f SAND, little m-f Gravel, tr Silt	
					15	21		
25.5								
		S-11	26	24			Gr Bl c-f SAND and Gravel, tr Silt	
					30	43		
27.0								
		S-12	100					
		C-1					27.9-29.1 Bl Gr mica SCHIST highly weathered, highly fractured	
							REC.47"= 78% RQD 15"= 25%	
28.5								
		C-2					29.1-30.6 same	
							REC. 57"= 96% RQD 26.5"= 44%	
30.05								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 2 OF 3
HOLE BR-31

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC.
DATE START 3-20-00 DATE FINISH 3-21-00

HOLE BR-31
LINE
STA. D1+593.00
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 30	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
		C-3					30.6-31.75 same	
							REC. 30"=100% RQD. 14"= 42%	
31.5								
		C-4					31.75-31.95 Bl Gr mica SCHIST w Quartz	
							REC. 17=70% RQD. 0%	
		C-5					31.95-33.45 same	
							REC. 44"= 73% RQD. 12"=20%	
33.0								
							Bottom of boring 33.45M	
34.5								
36.0								
37.5								
39.0								
40.5								
42.0								
43.5								
45.05								

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 3 OF 3
HOLE BR-31

SM 282f (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC.
DATE START 3-20-00
DATE FINISH

HOLE BR-31
LINE
STA. D1+593.00
OFFSET
SURF. ELEV.
DEPTH TO WATER below5.00'

CASING O.D. 125 mm 100 mm WEIGHT OF 135 kg HAMMER 450 mm
SAMPLER O.D. 50 mm 28 mm WEIGHT OF 63 kg HAMMER 750 mm

DEPTH BEL 0	BLOWS ON CASIN	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/30	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
		S-1	WOR	WOR			Bl m-f GRAVEL, and SAND	
					WOR	WOR		
12.0								
		S-2	5	9			Bl c-f SAND , little m-f Gravel, Tr Silt w mica (Gravel in tip)	
					8	7		
13.5								
		S-3	8	52			Bl c-f SAND, little m Gravel, tr + Silt	
					92	56		
15.05								

THE SUBSURFACE INFORMATION SHOWN HEREON WAS OBTAINED FOR STATE DESIGN AND ESTIMATE PURPOSES. IT IS MADE AVAILABLE TO AUTHORIZED USERS ONLY THAT THEY MAY HAVE ACCESS TO THE SAME INFORMATION AVAILABLE TO THE STATE. IT IS PRESENTED IN GOOD FAITH, BUT IS NOT INTENDED AS A SUBSTITUTE FOR INVESTIGATIONS, INTERPRETATION OR JUDGMENT OF SUCH AUTHORIZED USERS.

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO.

SHEET 1 OF 3
HOLE BR-31

Appendix C:

Record Borings F.D.R. Drive Temporary Detour Structure Fendering System

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC. N-65083.3867 E-303213.3269
DATE START 4-12-00 DATE FINISH 4-13-00

HOLE F-3
LINE
STA.
OFFSET
SURF. ELEV. -18.45M
DEPTH TO WATER in river

CASING O.D. 125 mm I.D. 100 mm WEIGHT OF HAMMER-CASING 135 kg HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm WEIGHT OF HAMMER-SAMPLER 63 kg HAMMER FALL-SAMPLER 250 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300.5	300/450	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
0								
		C-5					C-5 45.9 - 47.4 No Recovery. Very soft highly weathered mica SCHIST	
1.5								
		J-15	96	50			47.4 - 47.55 Gr. Micaceous SILT M-NPL	11
							Bottom of boring 47.55M	
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
12.0								
13.5								
15.0								

THE SUBSURFACE INFORMATION SHOWN HEREON WAS OBTAINED FOR STATE DESIGN AND ESTIMATE PURPOSES. IT IS MADE AVAILABLE TO AUTHORIZED USERS ONLY THAT THEY MAY HAVE ACCESS TO THE SAME INFORMATION AVAILABLE TO THE STATE. IT IS PRESENTED IN GOOD FAITH, BUT IS NOT INTENDED AS A SUBSTITUTE FOR INVESTIGATIONS, INTERPRETATION OR JUDGMENT OF SUCH AUTHORIZED USERS.

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. S. Bevins
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG

STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 3 OF 3
HOLE F-3

SH 282E (9/21)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC. N-65083.3867 E-303213.3269
DATE START 4-12-00 DATE FINISH 4-13-00

HOLE F-3
LINE
STA.
OFFSET
SURF. ELEV. -18.45M
DEPTH TO WATER in river

CASING O.D. 125 mm I.D. 100 mm WEIGHT OF HAMMER-CASING 135 kg HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm WEIGHT OF HAMMER-SAMPLER 63 kg HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300	300/450	450/600	DESCRIPTION OF SOIL AND ROCK		MOIST CONT %
30									
31.5		J-9	WOR	WOR	5	2	Gr. Clayey SILT w/ Lyrs. Of Gr. Silty CLAY	M-PL	43
33.0		J-10	WOR	WOR	9	19	Gr. Silty Fine SAND w/ Poc. of Br. Clayey SILT & Mica	M-LPL	37
34.5		J-	11	5	40	45	No Recovery (2 attempts)		
36.0		J-11	57	30	23	25	Blk. Sandy GRAVEL w/ Mica	M-NPL	8
							Elev. -37.5M		
37.5		C-1					No Recovery. Very soft highly weathered mica SCHIST		
39.0		C-2					No Recovery Same		
40.5		J-12	43	100			Gr. Micaceous SILT		16
		J-13	100				Gr. Micaceous SILT		14
42.0		C-3					No Recovery Same		
43.5		J-14	12	71	100		Gr. Micaceous SILT		9
		C-4					No Recovery Same		
45.0									

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. S. Bevins
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 2 OF 3
HOLE F-3

SM 2321 (9/1)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC. N-65083.3867 E-303213.3269
DATE START 4-12-00 DATE FINISH 4-13-00

HOLE F-3
LINE
STA.
OFFSET
SURF. ELEV. -18.45M
DEPTH TO WATER in river

CASING O.D. 125 mm I.D. 100 mm WEIGHT OF HAMMER-CASING 135 kg HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm WEIGHT OF HAMMER-SAMPLER 63 kg HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300.5	300/450	450/600	DESCRIPTION OF SOIL AND ROCK		MOIST CONT %
15									
16.5							Water to 18.45M		
18.0							Elev. - 18.45		
		J-1	5	5	10	10	Br. Sandy GRAVEL	M-NPL	7
19.5		J-2	10	16	21	26	Br. Silty SAND w/ Gravel pcs & Mica	M-NPL	14
21.0		J-3	16	20	23	27	Br. Silty SAND w/ Gravel pcs & Mica	M-NPL	18
22.5		J-4	10	8	8	8	Br. Fine Sandy SILT w/ Pocs. of Br. Silty CLAY	M-PL	35
24.0		J-5	5	5	6	9	Br. Fine Sandy SILT w/ Mica	M-NPL	31
25.5		J-6	4	4	5	6	Br. Fine Sandy SILT w/ Mica	M-NPL	26
27.0		J-7	WOR	3	4	5	Br. Fine Sandy SILT w/ Mica	M-NPL	21
28.5		J-8	WOR	WOR	2	2	Br. Clayey SILT w/ Mica	M-PL	36
30.0									

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. S. Bevins
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 1 OF 3
HOLE F-3

SM 4646 (9/1)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

HOLE F-4
LINE
STA.
OFFSET
SURF. ELEV. -20.25M
DEPTH TO WATER in river

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC. N-65155.1094 E-303226.9305
DATE START 5-1-00
DATE FINISH 5-2-00

CASING O.D. 125 mm I.D. 100 mm WEIGHT OF HAMMER-CASING 135 kg HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm WEIGHT OF HAMMER-SAMPLER 63 kg HAMMER FALL-SAMPLER 750 mm

DEPTH BELO W	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300.5	300/450	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
0							"0" Manhattan Datum (mean high water)	
							Water to 20.25M	
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
12.0								
13.5								
15.0								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. Dietz
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG

STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 1 OF 3
HOLE F-4

DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC. N-65155.1094 E-303226.9305
DATE START 5-1-00 DATE FINISH 5-2-00

HOLE F-4
LINE
STA.
OFFSET
SURF. ELEV. -20.25M
DEPTH TO WATER in river

CASING O.D. 125 mm I.D. 100 mm WEIGHT OF HAMMER-CASING 135 kg HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm WEIGHT OF HAMMER-SAMPLER 63 kg HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300.5	300/450	450/600	DESCRIPTION OF SOIL AND ROCK		MOIST CONT %
15									
16.5									
18.0									
19.5							Elv -20.25		
		J-1	WOR	WOR	4	6	Br. Sandy GRAVEL	M-NPL	8
21.0									
		J-2	6	6	8	12	Rd. Sandy GRAVEL w/ Shells	M-NPL	17
22.5									
		J-3	15	13	8	6	Gr. Silty SAND w/ pcs. Gravel and Mica	M-NPL	16
24.0									
		J-4	10	35	10	8	Br. Silty SAND w/ Mica	M-NPL	24
25.5									
		J-5	27	25	37	35	Br. Silty SAND w/ Mica	M-NPL	27
27.0									
		J-6	WOR	WOR	WOR	WOR	Br. Silty Fine SAND w/ Mica	M-NPL	26
28.5									
		J-7	7	7	10	11	Br. Silty SAND w/ pcs. GRAVEL And Mica	M-NPL	13
30.0									

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. Dietz
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 2 OF 3
HOLE F-4

SM 2821 (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC. N-65155.1094 E-303226.9305
DATE START 5-1-00
DATE FINISH 5-2-00
CASING O.D. 125 mm 100 mm
SAMPLER 50 mm 28 mm
WEIGHT OF HAMMER- 135 kg
WEIGHT OF HAMMER- 63 kg
HAMMER FALL 450
HAMMER FALL- 750

HOLE F-4
LINE
STA.
OFFSET
SURF. ELEV. -20.25M
DEPTH TO WATER in river

DEPT H FIELD	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/3	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
30								
		J-8	3	10	8	9	Br. Silty SAND w/ pcs. GRAVEL and Mica M-NPL	13
31.5							Elv -31.95	
		C-1					31.95 - 33.45 Bl Gr mica SCHIST w Quartz slightly weathered REC 57" = 95% RQD 52" = 86 %	
33.0								
		C-2					33.45 - 34.95 same REC 60" = 100% RQD 53" = 88 %	
34.5								
		C-3					34.95 - 36.45 same REC 60" = 100 % RQD 54" = 90%	
36.0							Bottom of boring 36.45M	
37.5								
39.0								
40.5								
42.0								
43.5								
45.0								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. Dietz
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND SYSTEM
SHEET 3 OF 3
HOLE F-4

SM 202C (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

HOLE F-5
LINE
STA.
OFFSET
SURF. ELEV. -15.45M
DEPTH TO WATER in river

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC. N-65226.6027 E-303240.1489
DATE START 4-17-00
DATE FINISH 4-17-00

CASING O.D. 125 mm   I.D. 100 mm   WEIGHT OF HAMMER-CASING 135 kg   HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm   I.D. 28 mm   WEIGHT OF HAMMER-SAMPLER 63 kg   HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300.5	300/450	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
0							" 0" Manhattan Datum (mean low water) Water to15.45M	
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
12.0								
13.5								
15.0								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. S. Bevins
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG

STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 1 OF 2
HOLE F-5

SN 2822 (9/2)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

HOLE F-5
LINE
STA.
OFFSET

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC. N-65226.6027 E-303240.1489
DATE START 4-17-00 DATE FINISH 4-17-00

SURF. ELEV. -15.45M
DEPTH TO WATER in river

CASING O.D. 125 mm I.D. 100 mm WEIGHT OF HAMMER-CASING 135 kg HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm WEIGHT OF HAMMER-SAMPLER 63 kg HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300.5	300/450	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
-15							El 15.45M	
		J-1	25	50/3"			Gr Silty SAND Gravelly W-NPL	26
16.5		J-2	27	25	24	29	Gr Silty SAND w/ Gravel Pcs. M-NPL -18M	13
18.0		C-1					18-19.5 Gr Weathered, fractured mica Schist w Quartz seams REC. 44"=73% RQD 22"=36%	
19.5		C-2					19.5-21 Gr slightly weathered mica SCHIST REC 57"=95% RQD 51"=84%	
21.0		C-3					21-22.5 Same REC 60"=100% RQD 88%	
22.5		C-4					22.5-24 same REC 60"=100% RQD 88%	
24.0							Bottom of boring 24M	
25.5								
27.0								
28.5								
30.0								

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B.Rivera
SOIL & ROCK DESCRIP. S.Bevins
CHIEF INSPECTOR P.CALISE
REGIONAL SOILS ENGR. J.TANG
STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND SYSTEM
SHEET 2 OF 2
HOLE F-5

SM 282E (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC. N-65376.9486 E-303257.7731
DATE START 4-14-00 DATE FINISH 4-14-00

HOLE F-7
LINE
STA.
OFFSET
SURF. ELEV. -15M
DEPTH TO WATER in river

CASING O.D. 125 mm I.D. 100 mm WEIGHT OF HAMMER-CASING 135 kg HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm WEIGHT OF HAMMER-SAMPLER 63 kg HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300.5	300/450	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
0							"0" Manhattan Datum (mean low water)	
							Water to 15M	
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
12.0								
13.5								
15.0								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG

STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 1 OF 2
HOLE F-7

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC. N-65376.9486 E-303257.7731
DATE START 4-14-00
DATE FINISH 4-14-00

HOLE F-7
LINE
STA.
OFFSET
SURF. ELEV. -15M
DEPTH TO WATER in river

CASING O.D. 125 mm I.D. 100 mm
SAMPLER O.D. 50 mm I.D. 28 mm
WEIGHT OF HAMMER-CASING 135 kg
WEIGHT OF HAMMER-SAMPLER 63 kg
HAMMER FALL-CASING 450 mm
HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300.5	300/450	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
15		C-1					15- 16.5 Gr Bl Mica SCHIST (sound) REC 60" = 100% RQD 60" = 100%	
16.5		C-2					16.5- 18 same REC 60" = 100% RQD 60" = 100%	
18.0		C-3					19 -19.5 same REC 60" = 100% RQD 58" = 98%	
19.5							Bottom of boring 19.5M	
21.0								
22.5								
24.0								
25.5								
27.0								
28.5								
30.0								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP.
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 2 OF 2
HOLE F-7

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC. N-65522.7163 E-303265.9951
DATE START 4-18-00 DATE FINISH 4-18-00

HOLE F-9
LINE
STA.
OFFSET
SURF. ELEV. -17.65M
DEPTH TO WATER in river

CASING O.D. 125 mm I.D. 100 mm WEIGHT OF HAMMER-CASING 135 kg HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm WEIGHT OF HAMMER-SAMPLER 63 kg HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300.5	300/450	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
0							"0" Manhattan Datum (mean low water)	
							Water to 17.65M	
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
12.0								
13.5								
15.0								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. S. Bevins
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG

STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 1 OF 2
HOLE F-9

SM 2022 (9/1)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

HOLE F-9
LINE
STA.
OFFSET
SURF. ELEV. -17.65M
DEPTH TO WATER in river

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC. N-65522.7163 E-303265.9951
DATE START 4-18-00
DATE FINISH 4-18-00

CASING O.D. 125 mm   I.D. 100 mm   WEIGHT OF HAMMER-CASING 135 kg   HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm   I.D. 28 mm   WEIGHT OF HAMMER-SAMPLER 63 kg   HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300	300/450	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
15								
16.5							Elv. -17.65	
		J-1	2	3	2	8	Gr. Silty SAND w/ Occ. Gravel & Mica M-NPL	18
18.0								
		J-2	4	16	20	22	Gr. Silty SAND w/ Occ. Gravel & Mica M-NPL	17
19.5								
							Gr. Micaceous SILT w/ Gravel Pcs. M-NPL	12
21.0		J-3	100/4"				21 - 22.5 Bl Gr weathered (soft) mica SCHIST w medium fractures REC 45" = 75% RQD 27" = 45%	
		C-1						
22.5		C-2					22.5 - 24 same REC 51" = 85% RQD 32" = 53%	
24.0		C-3					24 - 25.5 same REC 51" = 85% RQD 38" = 63%	
25.5		C-4					25.5 - 26.7 same REC 32" = 66% RQD 29" = 60%	
27.0		C-5					26.7 - 28.2 highly weathered, highly fractured mica SCHIST REC 36" = 60% RQD 0	
28.5		C-6					28.2 - 28.8 (core block) 2' run same REC 24" = 100% RQD 0	
		C-7					28.8 - 30.3 weathered, fractured mica SCHIST REC 36" = 51% RQD 20" = 30%	
30.0							Bottom of Boring 30.3M	

28.3

THE SUBSURFACE INFORMATION SHOWN HEREON WAS OBTAINED FOR STATE DESIGN AND ESTIMATE PURPOSES. IT IS MADE AVAILABLE TO AUTHORIZED USERS ONLY THAT THEY MAY HAVE ACCESS TO THE SAME INFORMATION AVAILABLE TO THE STATE. IT IS PRESENTED IN GOOD FAITH, BUT IS NOT INTENDED AS A SUBSTITUTE FOR INVESTIGATIONS, INTERPRETATION OR JUDGMENT OF SUCH AUTHORIZED USERS.

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. S. Bevins
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 2 OF 2
HOLE F-9

EH 282E (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC. N-65595.6005 E-303270.1059
DATE START 5-4-00 DATE FINISH 5-4-00

HOLE F-10
LINE
STA.
OFFSET
SURF. ELEV. -19.5M
DEPTH TO WATER in river

CASING O.D. 125 mm I.D. 100 mm WEIGHT OF HAMMER-CASING 135 kg HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm WEIGHT OF HAMMER-SAMPLER 63 kg HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300.5	300/450	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
0							"0" Manhattan Datum (mean high water)	
							Water to 19.5M	
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
12.0								
13.5								
15.0								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. Dietz
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG

STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 1 OF 3
HOLE F-10

SM 202C (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

HOLE F-10
LINE
STA.
OFFSET

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC. N-65595.6005 E-303270.1059
DATE START 5-4-00
DATE FINISH 5-4-00
SURF. ELEV. -19.5M
DEPTH TO WATER in river

CASING O.D. 125 mm 100 mm — WEIGHT OF HAMMER 135 kg — HAMMER FALL 150
SAMPLER 50 mm 28 mm — WEIGHT OF HAMMER 63 kg — HAMMER FALL 750

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300	300/450	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
15								
16.5								
18.0							Elv - 19.5	
19.5		J-1	3	4	4	7	Gr. Silty SAND w/ GRAVEL pcs. M-NPL	20
21.0		J-2	10	11	30	33	Br. Sandy GRAVEL M-NPL	12
22.5		J-3	41	40	67	100/6	Gr. Silty SAND w/ Gravel pcs. and Mica M-NPL	13
							Elv -24	
24.0		C-1					24 - 25.5 Bl Gr Mica SCHIST moderately weathered, moderately fractured REC 52" = 86% RQD 43" = 71%	
25.5		C-2					25.5 - 27 Bl Gr Mica SCHIST mod- highly weathered, highly fractured REC 49" = 81% RQD 12" = 20%	
27.0		C-3					27 -28.5 Bl Gr Mica SCHIST mod weathered slightly fractured REC 59 = 98% RQD 53" = 88%	
28.5		C-4					28.5 - 30 same REC 60" = 100% RQD 53" = 88%	
30.0								

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. Dietz
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 2 OF 3
HOLE F-10

SM 282C (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

HOLE F-10
LINE
STA.
OFFSET

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC. N-65595.6005 E-303270.1059
DATE START 5-4-00
DATE FINISH 5-4-00
SURF. ELEV. -19.5M
DEPTH TO WATER in river

CASING O.D. 125 mm I.D. 100 mm
SAMPLER O.D. 50 mm I.D. 28 mm
WEIGHT OF HAMMER-CASING 135 kg
WEIGHT OF HAMMER-SAMPLER 63 kg
HAMMER FALL-CASING 450 mm
HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300.5	300/450	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
30		C-5					30 - 31.5 Same REC 60" = 100% RQD 53" = 88%	
31.5							Bottom of boring 31.5M	
33.0								
34.5								
36.0								
37.5								
39.0								
40.5								
42.0								
43.5								
45.0								

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. Dietz
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 3 OF 3
HOLE F-10

DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

HOLE F-11
LINE
STA.
OFFSET

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC. N-65668.4839 E-303274.2172
DATE START 4-19-00 DATE FINISH 4-20-00

SURF. ELEV. -21.45M
DEPTH TO WATER in river

CASING O.D. 125 mm I.D. 100 mm WEIGHT OF HAMMER-CASING 135 kg HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm WEIGHT OF HAMMER-SAMPLER 63 kg HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300	300/450	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
0							"0" Manhattan Datum (mean high water)	
							Water to 21.45M	
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
12.0								
13.5								
15.0								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. Dietz
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG

STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 1 OF 3
HOLE F-11

SH 282C (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC. N-65668.4839 E-303274.2172
DATE START 4-19-00 DATE FINISH 4-20-00
CASING O.D. 125 mm 100 mm WEIGHT OF HAMMER- 135 kg HAMMER FALL- 450
SAMPLER 50 mm 28 mm WEIGHT OF HAMMER- 63 kg HAMMER FALL- 750

HOLE F-11
LINE
STA.
OFFSET
SURF. ELEV. -21.45M
DEPTH TO WATER in river

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/3	300/4	450/60	DESCRIPTION OF SOIL AND ROCK		MOIST CONT %
15									
16.5									
18.0									
19.5							Elv. -21.45M		
21.0		J-1	WOR	WOR	WOR	WOR	Br. Sandy GRAVEL w/ pcs. Red Brick	M-NPL	8
22.5		J-2	15	11	8	16	Br. Silty SAND w/ pcs. Gravel, Mica, Red Brick and Shells	M-NPL	18
24.0		J-3	WOR	WOR	5	7	Br. Silty SAND w/ pcs. Gravel, Mica, Red Brick and Shells	M-NPL	21
25.5		J-4	21	20	19	21	Br. Silty SAND w/ pcs. Gravel, Mica, Red Brick and Shells	M-NPL	13
27.0		J-	14	12	12	16	No Recovery (2 attempts)		
28.5		J-5	5	10	12	13	Br. Silty Fine SAND w/ Mica	M-NPL	20
30.0									

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. Dietz
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 2 OF 3
HOLE F-11

SM 282E (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

HOLE F-11
LINE
STA.
OFFSET

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SURF. ELEV. -21.45M
SOIL SERIES
DEPTH TO WATER in river
COORD. LOC. N-65668.4839 E-303274.2172
DATE START 4-19-00
DATE FINISH 4-20-00
CASING O.D. 125 mm I.D. 100 mm.
WEIGHT OF HAMMER-CASING 135 kg
HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm
WEIGHT OF HAMMER-SAMPLER 63 kg
HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300.5	300/450	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
30								
		J-6A	9	9			Br. Silty Fine SAND w/ Mica M-NPL	17
		J-6B			50	45	Br. Silty SAND w/ pcs. Gravel And Mica M-NPL	10
31.5								
		C-1					31.8 - 33.3 Boulders into soil then into bedrock at the bottom of the run last 6"	
							TOP OF ROCK 33M	
33.0								
		C-2					33.3 - 34.8 Bl Gr highly weathered mica SCHIST w Sand seams REC 17" = 28% RQD 0	
34.5								
		C-3					34.8 - 36.3 Bl Gr weathered, highly fractured mica SCHIST REC 56" = 93 RQD 17" = 28%	
36.0								
		C-4					36.3 - 37.8 same moderately fractured REC 51" = 85% RQD 31" = 51%	
37.5								
		C-5					37.8 - 39.3 same REC 60" = 100% RQD 29" = 48%	
39.0								
		C-6					39.3 - 40.8 Bl Gr sound mica SCHIST REC 60" = 100% RQD 60" = 100%	
40.5								
		C-7					40.8 - 42.3 same REC 60" = 100% RQD 60" = 100%	
							ELV. 42.3M	
42.0							Bottom of boring	
43.5								
45.0								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. Dietz
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 3 OF 3
HOLE F-11

SM 282E (9/2)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

HOLE F-12
LINE
STA.
OFFSET

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SURF. ELEV. -20.5M
SOIL SERIES
DEPTH TO WATER in river
COORD. LOC. N-65741.3668 E-303278.3276
DATE START 5-3-00
DATE FINISH 5-3-00

CASING O.D. 125 mm I.D. 100 mm WEIGHT OF HAMMER-CASING 135 kg HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm WEIGHT OF HAMMER-SAMPLER 63 kg HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300.5	300/450	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
0							"0" Manhattan Datum (mean high water)	
							Water to 20.5M	
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
12.0								
13.5								
15.0								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. Dietz
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG

STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 1 OF 1
HOLE F-12

RECEIVED
MAY 08 2003
FDR RECONSTRUCTION

DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC. N-65741.3668 E-303278.3276
DATE START 5-3-00 DATE FINISH 5-3-00

HOLE F-12
LINE
STA.
OFFSET
SURF. ELEV. -20.5M
DEPTH TO WATER in river

CASING O.D. 125 mm 100 mm WEIGHT OF HAMMER- 135 kg HAMMER FALL- 450
SAMPLER 50 mm 28 mm WEIGHT OF HAMMER- 63 kg HAMMER FALL- 750

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/3	300/4	450/00	DESCRIPTION OF SOIL AND ROCK		MOIST CONT %
15									
16.5									
18.0									
19.5							Elv -20.5		
		J-1	WOR	WOR	1	1	Br. Sandy GRAVEL w/ pcs. Glass, Shells and Red Brick	M-NPL	10
21.0									
		J-2	1	2	2	1	Br. Silty SAND w/ pcs. GRAVEL and Mica	M-NPL	29
22.5									
		J-3	30	9	11	13	Blk. Sandy GRAVEL w/ Shells and Wood pcs	M-NPL	10
24.0									
		J-4	9	16	17	12	Br. Silty SAND w/ pcs. GRAVEL, Mica and Shells	M-NPL	24
25.5							Note: Drill rods dropped from 25.5 - 28 (very soft material)		
27.0									
		J-5	11	14	20	26	Br. Silty Fine SAND w/ Mica	M-NPL	24
28.5									
		J-6	14	16	100/6"		Br. Silty Fine SAND w/ Mica	M-NPL	25
30.0							Top of rock 30M		

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. Dietz
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 2 OF 3
HOLE F-12

SM 282E (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC. N-65741.3668 E-303278.3276
DATE START 5-3-00 DATE FINISH 5-3-00

HOLE F-12
LINE
STA.
OFFSET
SURF. ELEV. -20.5M
DEPTH TO WATER in river

CASING O.D. 125 mm I.D. 100 mm WEIGHT OF HAMMER-CASING 135 kg HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm WEIGHT OF HAMMER-SAMPLER 63 kg HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300.5	300/450	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
30		C-1					30-31.5 weathered, fractured mica SCHIST REC 46" = 76% RQD 30" = 50%	
31.5		C-2					31.5-33 Sound mica SCHIST REC 60" = 100% RQD 55" = 90%	
33.0		C-3					33-34.5 SAme REC 60" = 100% RQD 100%	
34.5		C-4					34.5-36 Same REC 60" = 100% RQD 60" = 100%	
36.0							Bottom of boring 36M	
37.5								
39.0								
40.5								
42.0								
43.5								
45.0								

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. Dietz
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 3 OF 3
HOLE F-12

SN 282E (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC. N-65814.2506 E-303282.4375
DATE START 4-24-00
DATE FINISH 4-24-00
CASING O.D. 125 mm 100 mm
SAMPLER 50 mm 28 mm
WEIGHT OF HAMMER - 135 kg
WEIGHT OF HAMMER - 63 kg
HOLE F-13
LINE
STA.
OFFSET
SURF. ELEV. -22.95M
DEPTH TO WATER in river
HAMMER FALL - 450
HAMMER FALL - 750

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/3	300/4	450/60	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
15								
16.5								
18.0								
19.5								
21.0								
22.5							Elv. -22.95M	
		J-	WOR	WOR	WOR	WOR	No Recovery	
		J-	WOR	WOR	WOR	WOR	No Recovery	
24.0		J-1	19	12	4	4	Gr. Silty Fine SAND w/ Mica M-NPL	26
25.5		J-2	WOR	WOR	5	4	Gr. and Red Silty CLAY M-PL	40
27.0		J-3	13	12	11	18	Gr. Micaceous SILT w/ pcs. Gravel M-NPL	13
28.5		C-1					Elv. -28.65M 28.65 - 30.15 Mica SCHIST (sound) REC 51" = 85% RQD 40" = 66%	
30.0								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. Dietz
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 2 OF 3
HOLE F-13

RECEIVED
MAY 08 2003
FOR RECONSTRUCTION

SM 262E (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC. N-65814.2506 E-303282.4375
DATE START 4-24-00
DATE FINISH 4-24-00

HOLE F-13
LINE
STA.
OFFSET
SURF. ELEV. -22.95M
DEPTH TO WATER in river

CASING O.D. 125 mm I.D. 100 mm WEIGHT OF HAMMER-CASING 135 kg HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm WEIGHT OF HAMMER-SAMPLER 63 kg HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300	300/450	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
30		C-2					30.15 - 31.65 same w Quartz REC 60" = 100% RQD 60" = 100%	
31.5		C-3					31.65 - 32.86 (4' run) Same REC 48" = 100% RQD 45" = 95%	
							Bottom of boring 32.86M	
33.0								
34.5								
36.0								
37.5								
39.0								
40.5								
42.0								
43.5								
45.0								

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. Dietz
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 3 OF 3
HOLE F-13

DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC. N-64939.9452 E-303186.1222
DATE START 4-10-00 DATE FINISH 4-11-00

HOLE F-1
LINE
STA.
OFFSET
SURF. ELEV. -19.65M
DEPTH TO WATER in river

CASING O.D. 125 mm I.D. 100 mm WEIGHT OF HAMMER-CASING 135 kg HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm WEIGHT OF HAMMER-SAMPLER 63 kg HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300.5	300/450	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
0							"0" Manhattan Datum (mean low water) Water to 19.65M	
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
12.0								
13.5								
15.0								

COPY

THE SUBSURFACE INFORMATION SHOWN HEREON WAS OBTAINED FOR STATE DESIGN AND ESTIMATE PURPOSES. IT IS MADE AVAILABLE TO AUTHORIZED USERS ONLY THAT THEY MAY HAVE ACCESS TO THE SAME INFORMATION AVAILABLE TO THE STATE. IT IS PRESENTED IN GOOD FAITH, BUT IS NOT INTENDED AS A SUBSTITUTE FOR INVESTIGATIONS, INTERPRETATION OR JUDGMENT OF SUCH AUTHORIZED USERS.

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. S. Bevins
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG

STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 1 OF 1
HOLE F-1

SH 282E (921)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC. N-64939.9452 E-303186.1222
DATE START 4-10-00 DATE FINISH 4-11-00

HOLE F-1
LINE
STA.
OFFSET
SURF. ELEV. -19.65M
DEPTH TO WATER in river

CASING O.D. 125 mm I.D. 100 mm WEIGHT OF HAMMER-CASING 135 kg HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm WEIGHT OF HAMMER-SAMPLER 63 kg HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300.5	300/450	450/600	DESCRIPTION OF SOIL AND ROCK		MOIST CONT %
15									
16.5									
18.0							Elev. - 19.5		
19.5		J-1	1	4	3	5	Br. Silty SAND w/ Occ Gravel & Mica	M-NPL	17
21.0		J-2	5	8	12	16	Br. Silty SAND w/ Occ Gravel & Mica	M-NPL	22
22.5		J-3A	12	19			Br. Clayey SILT w/ Pocs. of Gr. Silty CLAY	M-PL	40
		J-3B			20	18	Br. Silty SAND w/ Mica	M-NPL	25
24.0		J-4	30	28	24	12	Br. Silty Coarse SAND w/ Mica	M-NPL	21
25.5		J-5	13	6	6	14	Br. Silty SAND w/ Occ Gravel & Mica	M-NPL	21
27.0		J-6	100				Br. Sandy GRAVEL Silty w/ Mica	M-NPL	9
							Elev - 28.5M		
28.5		C-1					28.5-30 Gr highly weathered, highly fractured mica SCHIST REC 17" = 28% RQD = 0		
30.0									

THE SUBSURFACE INFORMATION SHOWN HEREON WAS OBTAINED FOR STATE DESIGN AND ESTIMATE PURPOSES. IT IS MADE AVAILABLE TO AUTHORIZED USERS ONLY THAT THEY MAY HAVE ACCESS TO THE SAME INFORMATION AVAILABLE TO THE STATE. IT IS PRESENTED IN GOOD FAITH, BUT IS NOT INTENDED AS A SUBSTITUTE FOR INVESTIGATIONS, INTERPRETATION OR JUDGMENT OF SUCH AUTHORIZED USERS.

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. S. Bevins
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 2 OF 3
HOLE F-1

SM 282E (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC. N-64939.9452 E-303186.1222
DATE START 4-10-00 DATE FINISH 4-11-00

HOLE F-1
LINE
STA.
OFFSET
SURF. ELEV. -19.65M
DEPTH TO WATER in river

CASING O.D. 125 mm I.D. 100 mm WEIGHT OF HAMMER-CASING 135 kg HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm WEIGHT OF HAMMER-SAMPLER 63 kg HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300.5	300/450	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
30		C-2					30-31.5 Weathered highly fractured Mica SCHIST REC 60" = 100% RQD = 46%	
31.5		C-3					31.5-33 Highly weathered, highly fractured Mica SCHIST REC 34" = 56% RQD = 0	
33.0		C-4					33-34.5 highly weathered, highly fractured Mica SCHIST REC 36" = 60% RQD = 11" = 18%	
34.5		C-5					34.5- 36 Moderately weathered Mica SCHIST REC. 59" = 98% RQD 45" = 75%	
36.0		C-6					36-37.5 Mica SCHIST REC 60" = 100% RQD 49" = 81.5%	
37.5							Bottom of boring 37.5M	
39.0								
40.5								
42.0								
43.5								
45.0								

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THE SUBSURFACE INFORMATION SHOWN HEREON WAS OBTAINED FOR STATE DESIGN AND ESTIMATE PURPOSES. IT IS MADE AVAILABLE TO AUTHORIZED USERS ONLY THAT THEY MAY HAVE ACCESS TO THE SAME INFORMATION AVAILABLE TO THE STATE. IT IS PRESENTED IN GOOD FAITH, BUT IS NOT INTENDED AS A SUBSTITUTE FOR INVESTIGATIONS, INTERPRETATION OR JUDGMENT OF SUCH AUTHORIZED USERS.

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. S. Bevins
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 3 OF 3
HOLE F-1

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53St. - 63St.
SOIL SERIES
COORD. LOC. N-65011.6668 E-303199.7241
DATE START 4-26-00 DATE FINISH 4-26-00

HOLE F-2
LINE
STA.
OFFSET
SURF. ELEV. -19M
DEPTH TO WATER in river

CASING O.D. 125 mm I.D. 100 mm WEIGHT OF HAMMER-CASING 135 kg HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm WEIGHT OF HAMMER-SAMPLER 63 kg HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300	300/450	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
0							"0" Manhattan Datum (mean high water)	
							Water to 19M	
1.5								
3.0								
4.5								
6.0								
7.5								
9.0								
10.5								
12.0								
13.5								
15.0								

THE SUBSURFACE INFORMATION SHOWN HEREON WAS OBTAINED FOR STATE DESIGN AND ESTIMATE PURPOSES. IT IS MADE AVAILABLE TO AUTHORIZED USERS ONLY THAT THEY MAY HAVE ACCESS TO THE SAME INFORMATION AVAILABLE TO THE STATE. IT IS PRESENTED IN GOOD FAITH, BUT IS NOT INTENDED AS A SUBSTITUTE FOR INVESTIGATIONS, INTERPRETATION OR JUDGMENT OF SUCH AUTHORIZED USERS.

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. Dietz
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG

STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 1 OF 3
HOLE F-2

SH 282C (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC. N-65011.6668 E-303199.7241
DATE START 4-26-00 DATE FINISH 4-26-00

HOLE F-2
LINE
STA.
OFFSET
SURF. ELEV. -19M
DEPTH TO WATER in river

CASING O.D. 125 mm I.D. 100 mm WEIGHT OF HAMMER-CASING 135 kg HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm WEIGHT OF HAMMER-SAMPLER 63 kg HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300.5	300/450	450/600	DESCRIPTION OF SOIL AND ROCK		MOIST CONT %
15							Water to 19m		
16.5									
18.0							Elv. -19M		
		J-1	WOR	WOR	WOR	WOR	Br. Sandy GRAVEL	M-NPL	6
19.5									
		J-2	15	11	14	12	Br. Silty SAND Gravelly	M-NPL	18
21.0									
		J-3	19	18	15	22	Br. Sandy GRAVEL	M-NPL	15
22.5									
		J-4	1	1	1	1	Gr. and Rd. Clayey SILT	M-LPL	39
24.0									
		J-5	10	8	15	12	Gr. Silty SAND w/ pcs. Gravel	M-NPL	10
25.5							Gr. Micaceous SILT	M-NPL	10
		J-6	100/4"						
		C-1					26.3 - 27.8 Soft highly weathered mica SCHIST w Quartz REC 23.5" = 44% RQD 0		
27.0									
		C-2					27.8 - 29.3 No Recovery (very soft highly weathered rock)		
28.5									
		J-7	100/4"				Gr. Micaceous SILT	M-NPL	15
		C-3					29.5 - 31 Same REC 45" = 75% RQD 28" = 46%		
30.0									

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CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. Dietz
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 2 OF 3
HOLE F-2

SH 282E (92)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
SOIL MECHANICS BUREAU
SUBSURFACE EXPLORATION LOG

REGION 11
COUNTY N.Y.N.Y.
PIN X071.022
PROJECT F.D.R. 53 St. - 63 St.
SOIL SERIES
COORD. LOC. N-65011.6668 E-303199.7241
DATE START 4-26-00 DATE FINISH 4-26-00

HOLE F-2
LINE
STA.
OFFSET
SURF. ELEV. -19M
DEPTH TO WATER in river

CASING O.D. 125 mm I.D. 100 mm WEIGHT OF HAMMER-CASING 135 kg HAMMER FALL-CASING 450 mm
SAMPLER O.D. 50 mm I.D. 28 mm WEIGHT OF HAMMER-SAMPLER 63 kg HAMMER FALL-SAMPLER 750 mm

DEPTH BELOW	BLOWS ON CASING	SAMPLE NO.	BLOWS ON SAMPLER PER 150 mm 0/150	150/300.5	300/150	450/600	DESCRIPTION OF SOIL AND ROCK	MOIST CONT %
30								
		C-4					31 - 32.5 soft highly weathered fractured mica SCHIST REC 12" = 20% RQD 8" = 13%	
31.5								
		C-5					32.5 - 34 Weathered Mica SCHIST REC 48" = 80% RQD 28" = 46%	
33.0								
		C-6					34 - 35.5 same REC 29" = 48% RQD 16" = 26%	
34.5								
		C-7					35.5 - 37 same REC 50" = 83% RQD 31" = 51%	
36.0								
							Bottom of boring 37M	
37.5								
39.0								
40.5								
42.0								
43.5								
45.0								

V

THE SUBSURFACE INFORMATION SHOWN HEREON WAS OBTAINED FOR STATE DESIGN AND ESTIMATE PURPOSES. IT IS MADE AVAILABLE TO AUTHORIZED USERS ONLY THAT THEY MAY HAVE ACCESS TO THE SAME INFORMATION AVAILABLE TO THE STATE. IT IS PRESENTED IN GOOD FAITH, BUT IS NOT INTENDED AS A SUBSTITUTE FOR INVESTIGATIONS, INTERPRETATION OR JUDGMENT OF SUCH AUTHORIZED USERS.

CONTRACTOR WARREN GEORGE INC.

DRILL RIG OPERATOR B. Rivera
SOIL & ROCK DESCRIP. Dietz
CHIEF INSPECTOR P. CALISE
REGIONAL SOILS ENGR. J. TANG
STRUCTURE NAME/NO. OUTBOARD DETOUR ROADWAY AND FENDER SYSTEM
SHEET 3 OF 3
HOLE F-2

Appendix D:

Record Borings 35th Street Ferry Pier

McLaren ENGINEERING GROUP

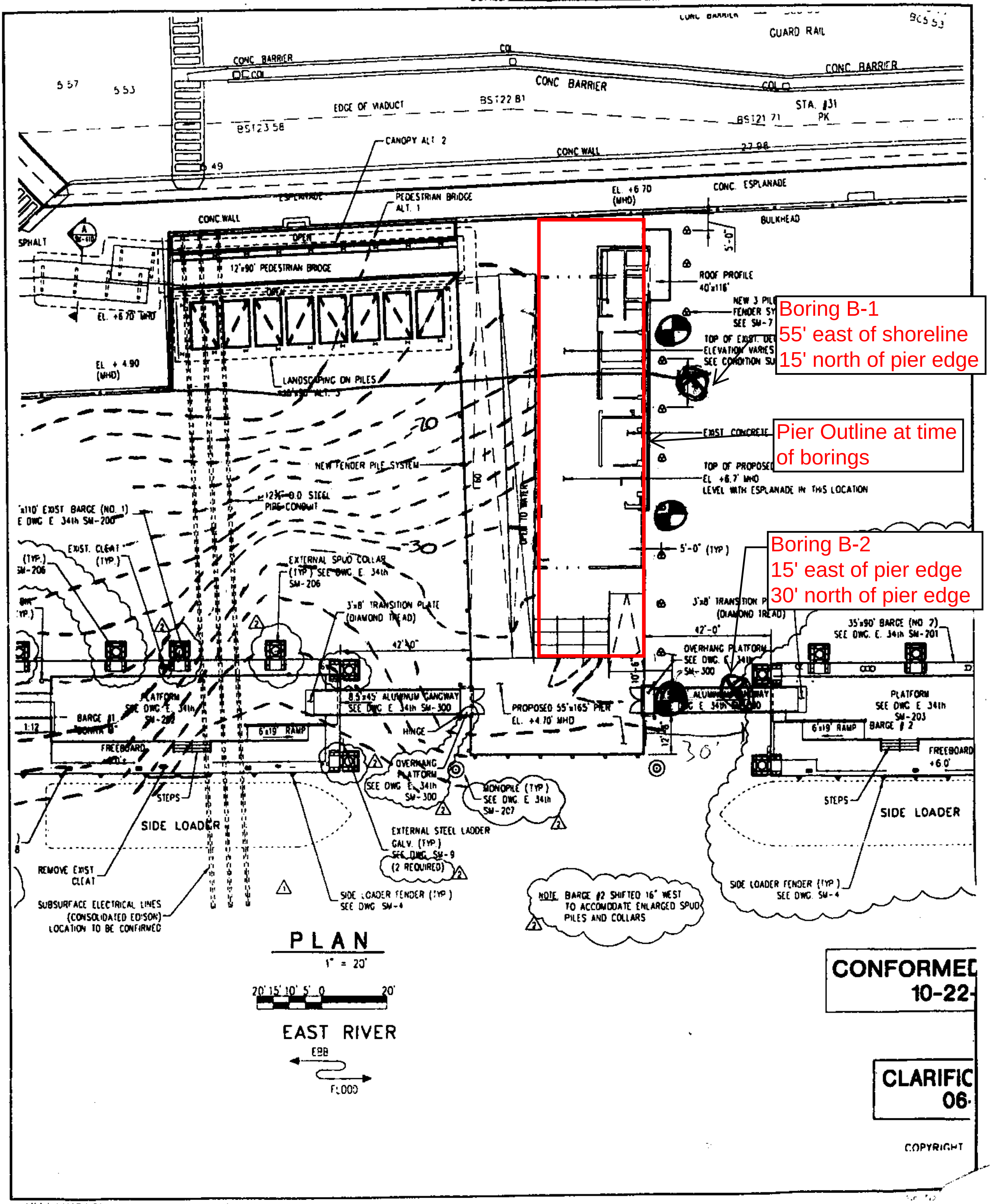
SHEET NO. ______ OF ______

CALCULATED BY ______ DATE 7/6/05

CHECKED BY ______ DATE ______

REVISIONS ______

SCALE ______



Bus.: (845) 365-9710 Fax.: (845) 365-9713
CMI Subsurface Investigations, Inc.
375 Western Highway Tappan, New York 10983

BORING NO. B-1
SHEET 1 of 3

BORING LOG

PROJECT: EAST / HARLEM RIVER FERRY LANDINGS
LOCATION: EAST 34TH STREET & EAST RIVER, NY, NY
CLIENT: McLAREN ENGINEERING GROUP
INSPECTOR:
DRILLER: GREG MARNEY
HELPER: TOM TEREBS

PROJECT NO.
START DATE: 7/13/05
FINISH DATE: 7/14/05
RIG: CME-75

DEPTH (FEET)	SAMPLE NO.	DEPTH (FROM/TO)	SOIL BLOWS / 6" 0"-6"	6"-12"	12"-18"	18"-24"	RECOVERY (INCHES)	ROCK CORE RUN (IN.)	REC. (IN.)	DEPTH (FROM/TO)	SOIL/ROCK DESCRIPTION & REMARKS	CASING BLOWS
	S1	0/2	WEIGHT OF RODS				24				BLACK ORGANIC SILT, MOIST, VERY SOFT	
5	C1	5/7	SHELBY TUBE				0				SHELBY ATTEMPTED, NO RECOVERY.	
	S2	7/9	WEIGHT OF RODS				24				BLACK ORGANIC SILTY CLAY, MOIST, PLASTIC, VERY SOFT.	
10	S3	10/12	WEIGHT OF RODS				21				OLIVE GREY CLAYEY SILT, TRACE OF F SAND, MOIST, VERY SOFT.	
15	S4	15/17	WEIGHT OF RODS				20				BLACK ORGANIC CLAY, MOIST, PLASTIC, VERY SOFT.	
20	C2	20/22	SHELBY TUBE				0				SHELBY ATTEMPTED, NO REC.	
	S5	22/24	WEIGHT OF RODS				6				BLACK SILT, LITTLE CLAY, MOIST, VERY LOOSE.	
25	S6	25/27	WEIGHT OF RODS				14				GREY F-M SAND, SOME SILT, TRACE CLAY, MOIST, VERY LOOSE	
30	S7	30/32	3	2	7	12	24				TAN GREY SILT, LITTLE F-M SAND, MOIST, LOOSE -	
35	S8	35/37	8	10	12	12	17				TAN SILTY F SAND, MOIST, MEDIUM DENSE -	

TOOLS & EQUIPMENT USED

CASING SIZE	5"	SPOON SIZE	2"
CASING HAMMER	300LB	SPOON HAMMER	140LB
HAMMER FALL - CASING	30"	HAMMER FALL - SPOON	30"
CORE BARREL USED		DRILLING MUD USED	2 BAGS
CORE BIT USED		UNDISTURBED SAMPLER	
AUGER SIZE		STANDBY TIME	
MISCELLANEOUS ITEMS			

GROUND WATER DATA

DATE	TIME	DEPTH (FT.)

OBSERVATION WELL

DEPTH (FT.)	DIAMETER (IN.)	SCREEN LENGTH (FT)

- DRILLER'S LOG -

Bus.: (845) 365-9710 Fax.: (845) 365-9713
CMI Subsurface Investigations, Inc.
375 Western Highway Tappan, New York 10983

BORING NO. B-1
SHEET 2 of 3

BORING LOG

PROJECT EAST / HARLEM RIVER FERRY LANDINGS
LOCATION EAST 34TH ST & EAST RIVER, NY, NY
CLIENT McLAREN ENGINEERING GROUP
INSPECTOR
DRILLER GREG MANEY
HELPER TOM TSEABIS
PROJECT NO.
START DATE 7/13/05
FINISH DATE 7/14/05
RIG CME-75

DEPTH (FEET)	SAMPLE NO.	DEPTH (FROM/TO)	SOIL BLOWS / 6" 0"-6"	6"-12"	12"-18"	18"-24"	RECOVERY (INCHES)	ROCK CORE RUN (IN.)	REC. (IN.)	DEPTH (FROM/TO)	SOIL/ROCK DESCRIPTION & REMARKS	CASING BLOWS
40	S9	40/42	8	9	9	9	8				TAN SILT, LITTLE F SAND, MOIST, MEDIUM DENSE.	
45	S10	45/47	1	2	17	22	14				RED BROWN F SAND, LITTLE SILT, MOIST, MEDIUM DENSE	
50	S11	50/52	4	4	5	8	22				GRADING TO LOOSE.	
55	S12	55/57	1	2	12	13	22				GRADING TO MEDIUM DENSE.	
60	S13	60/62	6	6	7	9	18				– SAME –	
65	S14	65/67	7	9	11	11	16				– SAME –	
70	S15	70/72	7	9	12	14	16				– SAME –	
75	S16	75/77	7	6	6	5	20				GRADING TO LITTLE CLAY.	

TOOLS & EQUIPMENT USED

CASING SIZE	5"	SPOON SIZE	2"
CASING HAMMER	300 LB	SPOON HAMMER	140 LB
HAMMER FALL - CASING	30"	HAMMER FALL - SPOON	30"
CORE BARREL USED		DRILLING MUD USED	ZEOGEL
CORE BIT USED		UNDISTURBED SAMPLER	
AUGER SIZE		STANDBY TIME	
MISCELLANEOUS ITEMS			

GROUND WATER DATA

DATE	TIME	DEPTH (FT.)

OBSERVATION WELL

DEPTH (FT.)	DIAMETER (IN.)	SCREEN LENGTH (FT)

– DRILLER'S LOG –

Bus.: (845) 365-9710 Fax.: (845) 365-9713

CMI Subsurface Investigations, Inc.

375 Western Highway Tappan, New York 10983

BORING NO. B-1

SHEET 3 of 3

BORING LOG

PROJECT: EAST / HARLEM RIVER FERRY LANDINGS
LOCATION: EAST 34TH ST & EAST RIVER, NY, NY
CLIENT: McLAREN ENGINEERING GROUP
INSPECTOR:
DRILLER: GREG MARSH
HELPER: TOM TSERBIS

PROJECT NO.:
START DATE: 7/13/05
FINISH DATE: 7/14/05
RIG: CME-75

DEPTH (FEET)	SAMPLE NO.	DEPTH (FROM/TO)	SOIL BLOWS / 6" 0"-6"	6"-12"	12"-18"	18"-24"	RECOVERY (INCHES)	ROCK CORE RUN (IN.)	REC. (IN.)	DEPTH (FROM/TO)	SOIL/ROCK DESCRIPTION & REMARKS	CASING BLOWS
80	S17	80/82	2	3	4	4	24				OLIVE GREY CLAY, LITTLE SILT, MOIST, PLASTIC, MEDIUM STIFF	
85	C3	85/87	SHELBY		TUBE		24				TUBE COLLECTED/FULL REC.	
	S18	87/89	6	7	7	14	24				OLIVE GREY SILT, SOME CLAY, MOIST, MEDIUM DENSE.	
90												
95												
100	S19	100/102	4	4	4	13	24				GRADING TO LOOSE.	
105												
110	S20	110/112	5	6	7	13	24				GRADING TO MEDIUM DENSE.	
											BORING TERMINATED 112'(FT) BELOW THE MUDLINE	
115												

TOOLS & EQUIPMENT USED

CASING SIZE		SPOON SIZE	
CASING HAMMER		SPOON HAMMER	
HAMMER FALL - CASING		HAMMER FALL - SPOON	
CORE BARREL USED		DRILLING MUD USED	
CORE BIT USED		UNDISTURBED SAMPLER	
AUGER SIZE		STANDBY TIME	
MISCELLANEOUS ITEMS			

GROUND WATER DATA

DATE	TIME	DEPTH (FT.)

OBSERVATION WELL

DEPTH (FT.)	DIAMETER (IN.)	SCREEN LENGTH (FT)

– DRILLER'S LOG –

Bus.: (845) 365-9710 Fax.: (845) 365-9713

CMI Subsurface Investigations, Inc.

375 Western Highway Tappan, New York 10983

BORING NO. B-2

SHEET 1 of 2

BORING LOG

PROJECT: EAST / HARLEM RIVER FERRY LANDINGS
LOCATION: EAST 34TH STREET & EAST RIVER, NY, NY
CLIENT: McLAREN ENGINEERING GROUP
INSPECTOR: ______ DRILLER: GREG MARNEY HELPER: TOM TSERBAS

PROJECT NO. ______
START DATE ______
FINISH DATE ______
RIG: CME-75

DEPTH (FEET)	SAMPLE NO.	DEPTH (FROM/TO)	SOIL BLOWS / 6" 0"-6"	6"-12"	12"-18"	18"-24"	RECOVERY (INCHES)	ROCK CORE RUN (IN.)	ROCK CORE REC. (IN.)	DEPTH (FROM/TO)	SOIL/ROCK DESCRIPTION & REMARKS	CASING BLOWS
	S1	0/2	WEIGHT OF RODS				1				BROWN F-M SAND, SOME SHELL FRAGMENTS, MOIST, VERY LOOSE.	
5	C1	5/7	UNDISTURBED SAMPLE				Ø				TUBE ATTEMPTED	
	S2	7/9	WEIGHT OF RODS				24				BLACK ORGANIC CLAY, SOME SILT, MOIST, PLASTIC, VERY SOFT.	
10	S3	10/12	19	16	7	10	18				OLIVE BROWN F-M SAND, LITTLE SILT, MOIST, MEDIUM DENSE.	
15	S4	15/17	9	9	8	12	14				GRADING TO F SAND, SOME SILT.	
20	S5	20/22	6	6	8	9	16				– SAME –	
25	S6	25/27	4	5	5	10	18				– SAME –	
30	S7	30/32	2	4	3	3	16				OLIVE BROWN SILT, TRACE OF CLAY, MOIST, LOOSE.	
35	S8	35/37	3	5	10	10	18				GRADING TO MEDIUM DENSE.	

TOOLS & EQUIPMENT USED

CASING SIZE	5"	SPOON SIZE	2"
CASING HAMMER	300LB	SPOON HAMMER	140LB
HAMMER FALL - CASING	30"	HAMMER FALL - SPOON	30"
CORE BARREL USED		DRILLING MUD USED	ZEOGEL
CORE BIT USED		UNDISTURBED SAMPLER	
AUGER SIZE		STANDBY TIME	
MISCELLANEOUS ITEMS			

GROUND WATER DATA

DATE	TIME	DEPTH (FT.)

OBSERVATION WELL

DEPTH (FT.)	DIAMETER (IN.)	SCREEN LENGTH (FT)

– DRILLER'S LOG –

BORING NO. B-2 SHEET 1 OF 2

Bus.: (845) 365-9710 Fax.: (845) 365-9713
CMI Subsurface Investigations, Inc.
375 Western Highway Tappan, New York 10983

BORING NO. B-2
SHEET 2 of 2

BORING LOG

PROJECT: EAST / HARLEM RIVER FERRY LANDINGS
LOCATION: EAST 34TH STREET + EAST RIVER, NY, NY
CLIENT: McLAREN ENGINEERING GROUP
INSPECTOR:
DRILLER: GREG MARNEY HELPER: TOM [illegible]
PROJECT NO.:
START DATE:
FINISH DATE:
RIG: CME-75

DEPTH (FEET)	SAMPLE NO.	DEPTH (FROM/TO)	SOIL BLOWS / 6" 0"-6"	6"-12"	12"-18"	18"-24"	RECOVERY (INCHES)	ROCK CORE RUN (IN.)	REC. (IN.)	DEPTH (FROM/TO)	SOIL/ROCK DESCRIPTION & REMARKS	CASING BLOWS
40	S9	40/42	6	6	6	7	17				OLIVE BROWN SILT, MOIST, MEDIUM DENSE.	
45	S10	45/47	6	7	10	16	19				OLIVE BROWN F SAND, LITTLE SILT, MOIST, MEDIUM DENSE.	
50	S11	50/52	4	2	3	3	21				RED GREY SILTY CLAY, MOIST, PLASTIC, SLIGHTLY STIFF.	
55	S12	55/57	WEIGHT OF RODS				24				GRADING TO VERY SOFT.	
60	S13	60/62	WEIGHT OF RODS				7				- SAME -	
65	S14	65/67	8	20	22	18	14				OLIVE BROWN FM SAND AND F GRAVEL, MOIST, DENSE	
70	S15	70/72	100/1"	SPT	REFUSAL		0				~~SPT REFUSAL~~. ROCK ENCOUNTERED.	
75											BORING TERMINATED 70' (FT) BELOW THE MUDLINE.	

TOOLS & EQUIPMENT USED

CASING SIZE	5"	SPOON SIZE	2"
CASING HAMMER	300 LB	SPOON HAMMER	140 LB
HAMMER FALL - CASING	30"	HAMMER FALL - SPOON	30"
CORE BARREL USED		DRILLING MUD USED	REVGEL
CORE BIT USED		UNDISTURBED SAMPLER	
AUGER SIZE		STANDBY TIME	
MISCELLANEOUS ITEMS			

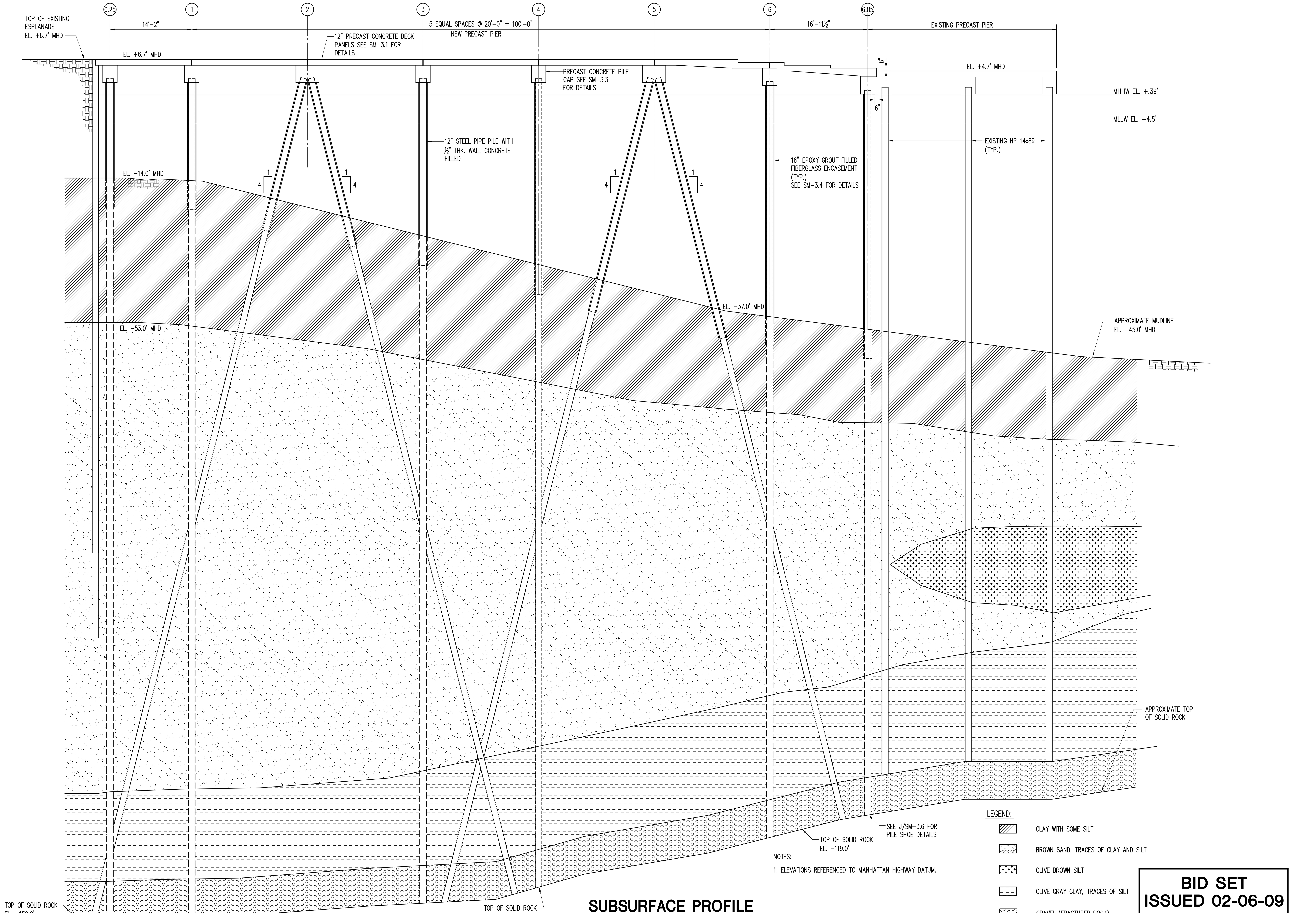
GROUND WATER DATA

DATE	TIME	DEPTH (FT.)

OBSERVATION WELL

DEPTH (FT.)	DIAMETER (IN.)	SCREEN LENGTH (FT)

- DRILLER'S LOG -



NOTES:

1. ELEVATIONS REFERENCED TO MANHATTAN HIGHWAY DATUM.

SUBSURFACE PROFILE

1/8" = 1'-0"

BID SET
ISSUED 02-06-09

EAST/HARLEM RIVER FERRY LANDINGS

Prepared for
New York City Economic Development Corporation

New York City Department of Transportation

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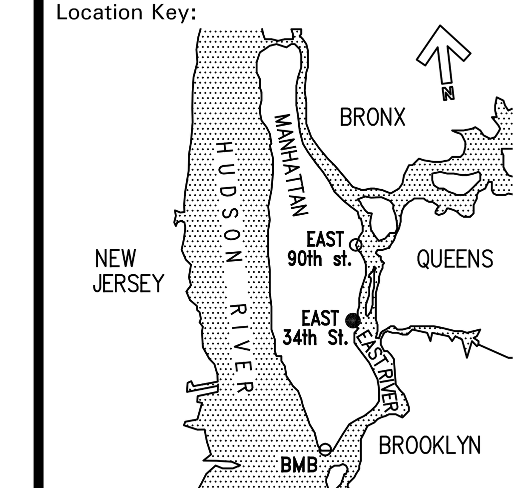


Seal:

Revision:

No.	Date	Description

Issue date: 02-01-2008 Drawn by: WYC
Scale: AS NOTED Design By: MCM
Checked By: JHR
M.G.M. JOB #100311.90

Sheet Title:
PROPOSED PIER SECTION

Drawing Number:
SM-2.2

FILE NAME: Q:\Cad\100\100311.90\Current\SM-2.2 Proposed Pier Section.dwg PLOT TIME: Thu, 05 Feb 2009 - 5:19pm LAST SAVE: Thu, 05 Feb 2009 - 5:12pm BY: RCurti

Appendix E:

Tabulated Rock Depths and RQD Results

East Midtown Esplanade 2012 Borings

BORING #	Latitude	Longitude	NORTHING	EASTING	Mud Depth	Rock Depth	Total Depth
LB 1	40°44’48.29” N	73°58’07.92” W	211,338.33	992,878.61	5	95	100
LB 2	40°45’34.18” N	73°57’27.59” W	215,983.85	995,978.52	no access, boring deleted		
LB 3	40°44’46.24” N	73°58’09.81” W	211,130.81	992,731.22	6	100	110
LB 4	40°44’44.16” N	73°58’11.87” W	210,920.25	992,572.74	5	109	109
WB 1	40°44’49.44” N	73°58’06.18” W	211,454.76	993,010.51	30	120	130
WB 2	40°44’54.00” N	73°58’02.88” W	211,916.34	993,264.33	41	70	80
WB 3	40°45’14.52” N	73°57’44.82” W	213,993.59	994,653.46	53	100	110
WB 4	40°44’44.10” N	73°58’11.12” W	210,914.20	992,630.47	25	116	131
WB 5	40°45’32.05” N	73°57’28.80” W	215,768.25	995,885.51	no access, boring deleted		
WB 6	40°45’19.08” N	73°57’40.68” W	214,455.65	994,971.87	38	50	60
WB 7	40°45’19.74” N	73°57’38.64” W	214,522.08	995,128.83	34	44	53
WB 8	40°45’25.44” N	73°57’33.66” W	215,099.12	995,511.82	44	concrete	56
WB 9	40°45’12.24” N	73°57’46.92” W	213,762.78	994,491.94	66	87	97
WB 10	40°45’10.26” N	73°57’48.60” W	213,562.34	994,362.73	55	85	95
WB 11	40°45’06.72” N	73°57’51.90” W	213,203.98	994,108.90	55	80	85
WB 12	40°45’03.24” N	73°57’54.36” W	212,851.71	993,919.71	35	100	110
WB 13	40°45’01.50” N	73°57’55.68” W	212,675.58	993,818.19	33	120	130
WB 14	40°44’58.50” N	73°58’58.92” W	212,370.54	988,951.03	40	105	115
WB 15	40°44’56.28” N	73°58’00.48” W	212,147.15	993,448.96	42	56	66

New York State Plane Coordinates, NY - Long Island Zone in US feet

Depths in US feet below Mean Low Water

Listing of the Core Sample Recovery and Rock Quality Designation

boring	sample	Rec	RQD	quality
WB4	RC1	43	23	poor
WB4	RC2	16	6	poor
WB4	RC1	30	6	poor
LB3	RC1	35	8	poor
LB3	RC2	90	68	moderate
LB1	RC1	90	85	good
WB1	RC1	27	0	poor
WB1	RC2	42	38	fair
WB2	RC1	100	63	moderate
WB2	RC2	100	67	moderate
WB15	RC1	97	90	excellent
WB15	RC2	100	100	excellent
WB14	RC1	73	27	fair
WB13	RC2	43	17	poor
WB13	RC3	23	0	poor
WB12	RC1	82	33	fair
WB12	RC2	90	70	moderate
WB11	RC1	20	0	poor
WB10	RC1	93	78	moderate
WB10	RC2	97	83	moderate
WB9	RC1	30	7	poor
WB9	RC2	35	8	poor
WB3	RC1	25	0	poor
WB3	RC2	30	0	poor
BR-1	C-1	86	73	moderate
BR-1	C-2	100	91	excellent
BR-1	C-3	100	100	excellent
BR-3	C-1	78	0	poor
BR-3	C-2	43	0	poor
BR-3	C-4	40	0	poor
BR-3	C-5	75	31	fair
BR-3	C-3	92	37	fair
BR-5	C-1	95	56.5	moderate
BR-5	C-2	100	92	excellent
WB6	RC1	35	0	poor
WB6	RC2	62	32	fair
BR-7	C-1	95	50	moderate
BR-7	C-3	100	86	good
BR-7	C-2	100	90	excellent
BR-7	C-4	100	96	excellent
BR-10	C-3	100	43	fair
BR-10	C-1	100	53	moderate
BR-10	C-2	100	58	moderate
BR-10	C-4	100	100	excellent
WB7	RC1	27	21	poor

RQD quality
poor<25
fair=25-50
moderate=50-75
good=75-90
excellent>90

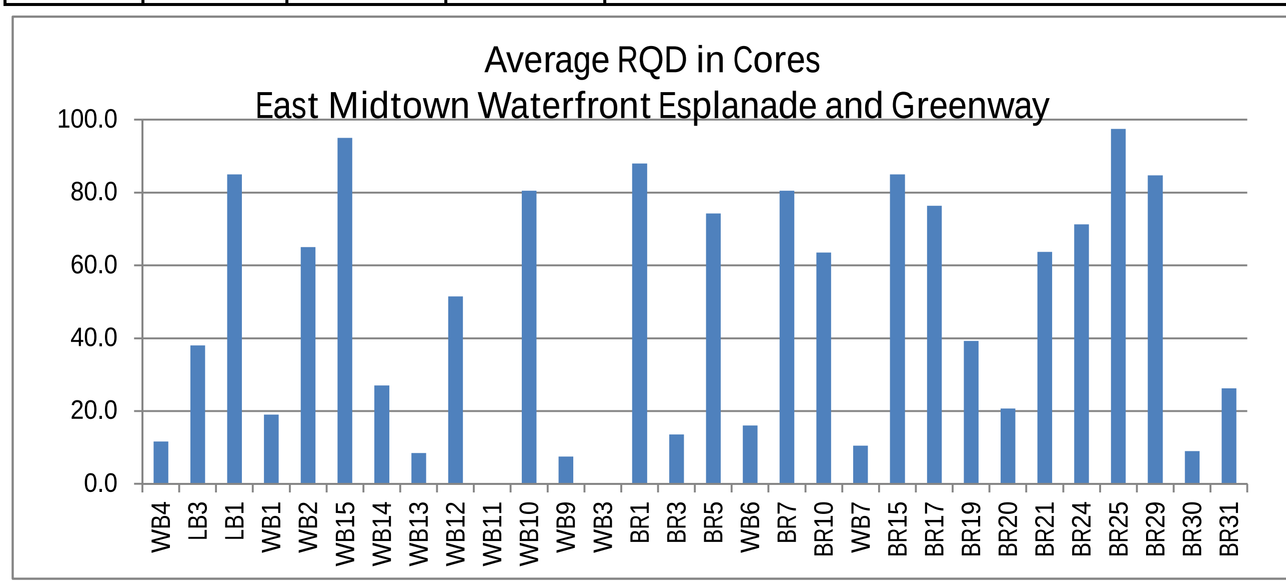
boring	sample	Rec	RQD	quality
WB7	RC2	32	0	poor
BR-15	C-1	86	70	moderate
BR-15	C-2	100	100	excellent
BR-17	C-3	87	71	moderate
BR-17	C-1	83	75	good
BR-17	C-2	87	83	good
BR-19	C-1	6	0	poor
BR-19	C-2	100	21	poor
BR-19	C-3	100	53	moderate
BR-19	C-4	100	83	good
BR-20	C-1	44	6	poor
BR-20	C-5	95	18	poor
BR-20	C-4	100	21.5	poor
BR-20	C-2	91	28	fair
BR-20	C-3	100	30	fair
BR-21	C-1	95	20	poor
BR-21	C-2	100	83	good
BR-21	C-3	100	88	good
BR-24	C-1	40	0	poor
BR-24	C-2	100	85	good
BR-24	C-3	100	100	excellent
BR-24	C-4	100	100	excellent
BR-25	C-1	95	95	excellent
BR-25	C-2	100	100	excellent
BR-29	C-1	85	73	moderate
BR-29	C-2	97	96.5	excellent
BR-30	C-3	0	0	poor
BR-30	C-4	0	0	poor
BR-30	C-2	60	6	poor
BR-30	C-1	100	30	fair
BR-31	C-4	70	0	poor
BR-31	C-5	73	20	poor
BR-31	C-1	78	25	fair
BR-31	C-3	100	42	fair
BR-31	C-2	96	44	fair
BR-13	C-3	87	71	moderate
BR-13	C-1	83	75	good
BR-13	C-2	87	83	good
BR-2	C-2	66	0	poor
BR-2	C-3	80	0	poor
BR-2	C-6	81	0	poor
BR-2	C-4	85	23	poor
BR-2	C-1	79	46	fair
BR-2	C-5	100	55	moderate
BR-27A	C-1	90	81.5	good
BR-27A	C-2	100	96.8	excellent

boring	sample	Rec	RQD	quality
BR-9	C-1	95	38	fair
BR-9	C-3	100	85	good
BR-9	C-2	100	100	excellent
BR-9	C-4	100	100	excellent
F1	C-1	28	0	poor
F1	C-3	56	0	poor
F1	C-4	60	18	poor
F1	C-2	100	46	fair
F1	C-5	98	75	good
F1	C-6	100	81.5	good
F10	C-2	81	20	poor
F10	C-1	86	71	moderate
F10	C-3	98	88	good
F10	C-4	100	88	good
F10	C-5	100	88	good
F11	C-1	0	0	poor
F11	C-2	28	0	poor
F11	C-3	93	28	fair
F11	C-5	100	48	fair
F11	C-4	85	51	moderate
F11	C-6	100	100	excellent
F11	C-7	100	100	excellent
F12	C-1	76	50	moderate
F12	C-2	100	90	excellent
F12	C-3	100	100	excellent
F12	C-4	100	100	excellent
F13	C-1	85	66	moderate
F13	C-3	100	95	excellent
F13	C-2	100	100	excellent
F2	C-1	44	0	poor
F2	C-2	0	0	poor
F2	C-4	20	13	poor
F2	C-6	48	26	fair
F2	C-3	75	46	fair
F2	C-5	80	46	fair
F2	C-7	83	51	moderate
F3	C-1	0	0	poor
F3	C-2	0	0	poor
F3	C-3	0	0	poor
F3	C-4	0	0	poor
F3	C-5	0	0	poor
F3	C-6	0	0	poor
F4	C-1	100	86	good
F4	C-2	100	88	good
F4	C-3	100	90	excellent
F5	C-1	73	30	fair

boring	sample	Rec	RQD	quality
F5	C-2	95	84	good
F5	C-3	100	88	good
F5	C-4	100	88	good
F7	C-1	100	100	excellent
F7	C-2	100	100	excellent
F7	C-3	100	100	excellent
F9	C-5	60	0	poor
F9	C-6	100	0	poor
F9	C-7	51	30	fair
F9	C-1	75	45	fair
F9	C-2	85	53	moderate
F9	C-4	66	60	moderate
F9	C-3	85	63	moderate

Summary of the Core Sample Rock Quality Designation and Elevation (for soil profile sequence)

boring	avg RQD	# core runs	top core EL	top of rock = top of core unless otherwise noted
WB4	11.7	3	-116.0	13 feet of decomposed mica schist above
LB3	38.0	2	-100.0	
LB1	85.0	1	-95.0	
WB1	19.0	2	-120.0	42 feet of decomposed mica schist above
WB2	65.0	2	-70.0	9 feet of decomposed mica schist above
WB15	95.0	2	-56.0	
WB14	27.0	1	-105.0	
WB13	8.5	2	-120.0	
WB12	51.5	2	-100.0	estimated 7 feet of decomposed mica schist above
WB11	0.0	1	-80.0	9 feet of decomposed mica schist above
WB10	80.5	2	-85.0	22 feet of decomposed mica schist above
WB9	7.5	2	-87.0	11 feet of decomposed mica schist above
WB3	0.0	2	-100.0	
BR1	88.0	3	-76.0	
BR3	13.6	5	-77.6	
BR5	74.3	2	-48.7	
WB6	16.0	2	-50.0	
BR7	80.5	4	-45.8	
BR10	63.5	4	-21.2	roller bit 2 feet into solid ledge
WB7	10.5	2	-44.0	
BR15	85.0	2	-45.4	
BR17	76.3	3	-45.4	3 to 4 feet of soft weathered rock above
BR19	39.3	4	-42.2	
BR20	20.7	5	-44.3	
BR21	63.7	3	-25.1	
BR24	71.3	4	-37.7	
BR25	97.5	2	-38.9	
BR29	84.8	2	-38.9	
BR30	9.0	4	-76.0	
BR31	26.2	5	-91.5	



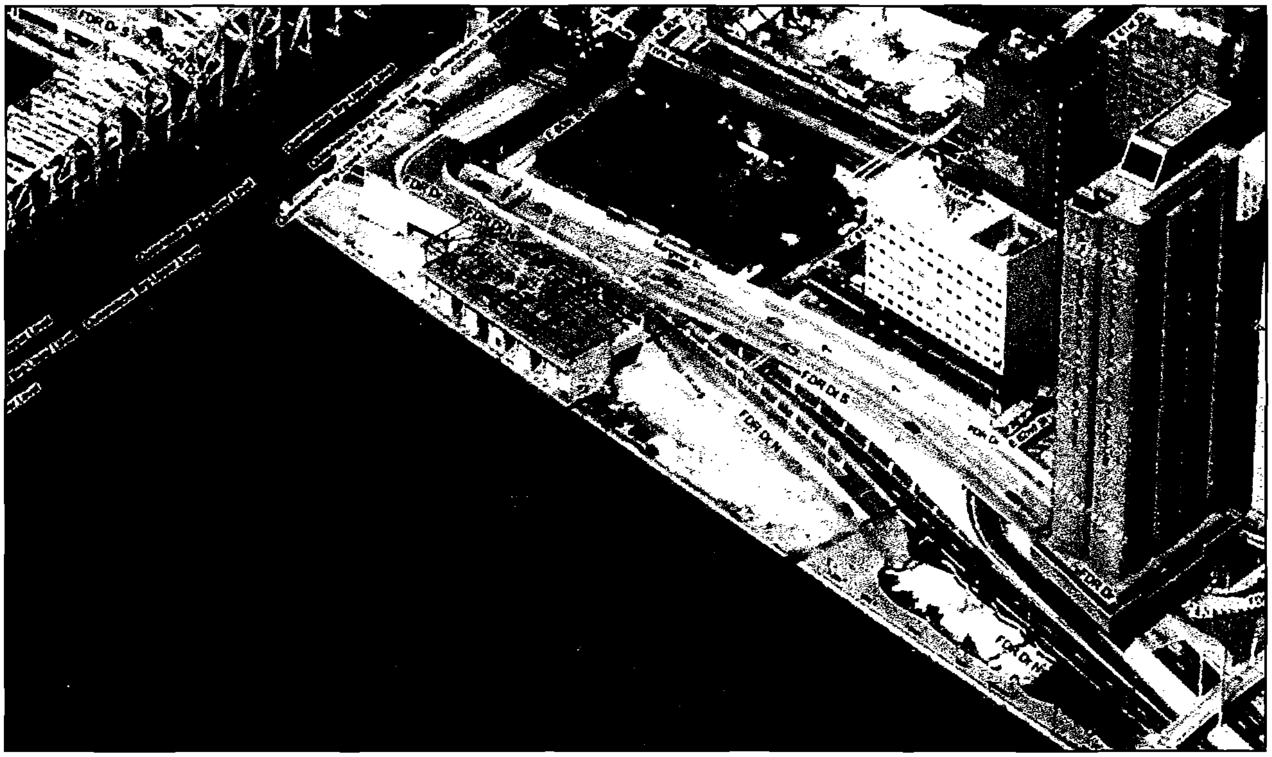
APPENDIX E
Existing Structures Information

Table of Contents

- Underwater Inspection and Rehabilitation of Heliport Site at East 60th Street and FDR Drive, Borough of Manhattan (Andrew Haswell Green Park)
- East Midtown Waterfront Esplanade Marine Structures Condition Survey & Structural Assessment (Waterside Pier and ODR Caissons)

TECHNICAL REPORT

UNDERWATER INSPECTION AND REHABILITATION OF HELIPORT SITE AT EAST 60th STREET AND FDR DRIVE BOROUGH OF MANHATTAN



Submitted to

NEW YORK CITY DEPARTMENT OF PARKS & RECREATION
PROJECT No. M108-109M

MAY 2011

Submitted by

Gandhi Engineering, Inc.
(Prime Consultant)

M.G. McLaren, P.C.
(Subconsultant)

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EXECUTIVE SUMMARY

This report covers the results of underwater inspection of the Heliport Site at 60th Street along the FDR Drive in the Borough of Manhattan, performed by M.G. McLaren, P.C.; and recommendations made by Gandhi Engineering, Inc. to rehabilitate the site and convert it into a park designed by the Department of Parks and Recreation (DPR). The site is approximately 440 ft. long along the East River and 90 ft. wide. The heliport pier (relieving platform) is 440 ft. long and approximately 50 ft. wide.

Within the project limits there were 2,647 piles of which McLaren was able to inspect 1,897 piles (72 percent). Of the 1,897 piles inspected, 1,548 were wrapped (82 percent), and the remaining 349 piles were not wrapped most likely due to access restrictions. Comparison with the results of a previous inspection performed in 1995 indicated that the average diameter of the pile was reduced from 17 inches to 14 inches between 1995 and 2010, or there was an average section loss of 40%. Therefore, it became obvious that the pier must be restored so that it can take not only the loads from the newly planned park, but also must have a long life to provide a fair return on the investment made by the DPR.

Gandhi developed six schemes and their cost estimates as outlined below:

Scheme 1 - 24" x 24" grade beams and 18" diameter drilled shafts supporting 20" existing slab in relieving platform area + dead load and superimposed live loads.
Cost Estimate: $16,775,200

Scheme 2 - 18" structural slab on 18" drilled shaft in relieving platform area.
Cost Estimate: $19,677,988

Scheme 3 - 18" structural slab on 18" drilled shaft in entire heliport area.
Cost Estimate: $31,190,533

Scheme 4 - 12" slab on grade on compacted fill and pipe piles in relieving platform area.
Cost Estimate: $22,479,138

Scheme 5 - 12" structural slab on 18" drilled shaft in relieving platform areas (no surcharge loads)

Cost Estimate: $18,008,188

Scheme 6: 12" structural slab supported on 12" diameter pipe piles in relieving platform area (no surcharge loads).

Cost Estimate: $20,785,138

Our recommendations are based on the availability of funding:

1. If there are no funds available, we recommend performing an underwater inspection once every two years, and monitoring certain piles at each such inspection, some protected and some unprotected, distributed evenly under the relieving platform, measure their diameters, and analyze the remaining load carrying capacity of these piles. The estimated cost of such inspection with a report is approximately $100,000 using 2011 prices.
2. If funding is available, we recommend using Scheme 1 with the construction of the park designed by the DPR. The estimated cost of structural strengthening and rehabilitation is $16,775,200.

1. INTRODUCTION

1.1 Background of the site

The Heliport site from East 60th Street to East 63rd Street in Manhattan was a part of the East River Drive Improvement Project from East 49th to East 99th Street. It was initiated in 1939 by the Borough President's Office in Manhattan. The contract documents were prepared by the Department of Borough Works. The Heliport site when built in the 1940s was originally used as a Marine Transfer station to transfer garbage collected by garbage trucks into barges which would then take it to Staten Island and dump it into a landfill. The Sanitation Department discontinued the use of the site as a marine transfer station, but kept the site to store sanitation trucks and dump excess snow into the East River.

On October 18, 1968 Mayor Lindsay announced that the City had granted Pan American World Airways (Pan Am) permission to operate a heliport at the 58,000 SF triangular site between East 60th and East 63rd Streets. After Pan Am went bankrupt, the site was vacant for many years.

In 1995, the New York City Economic Development Corporation (NYCEDC) selected Goodkind & O'Dea, Inc. (now Dewberry-Goodkind) to investigate the site, and prepare a report containing findings of underwater inspection of piles, recommendations for remedial measures for the piles, and cost estimates. The average diameter of timber piles was found to be 17 inches in 1995. The piles were wrapped for protection from marine borers in 1999 to 2000.

1.2 Description of the site

The site is approximately 90 feet wide in an east-west direction and 90 feet long in a north-south direction. The east boundary is the East River and the west boundary is a sloping wall along the ramp from the East River Pavilion to the heliport level (Figure 1-1)*. The north boundary is a chain-link fence with a gate (Figure 1-2). The south boundary is the north wall of the sanitation garage (Figure 1-3). The sloping wall is shown in 1-4.

*The figures are provided at the end of each section.

Access to the heliport site is possible by stairs through a gate which is normally locked (Figure 1-5). There are several landing platforms of the stairs (Figure 1-6). The steps are in need of repairs, as can be seen in Figure 1-7. A close-up of the north face of the sanitation garage is shown in Figure 1-8. The view looking south from the garage is shown in Figure 1-9.

Access to the site by vehicles is reached by using a ramp from East 60th Street which goes over the FDR Drive and then turns north sloping down towards the heliport site. A partial view of the ramp can be seen in Figure 1-10. The metal fence on the left in Figure 1-10 has a gate to the East River Pavilion. In reality, the roof of the sanitation garage becomes the East River Pavilion (Figure 1-11). The remaining portion of the ramp is shown in Figure 1-12. The area under the ramp is enclosed by double doors which were locked during our field visit (Figure 1-13).

The access to the site is restricted by 1) the chain link fence and the gate at the north end (Figure 1-14), 2) a small gate with barbed wire at the top and attached to the sanitation garage wall (Figure 1-15), and 3) the wide gate shown in Figure 1-9. Because of these gates, people walking, jogging, or bicycling along the East River esplanade are forced to make a detour at East 63rd Street and reconnect with the esplanade south of the Queensboro Bridge or the 59th Street Bridge (Figure 1-16). It is hoped that construction of the new park will permit access to the people along the East River.

1.3 Site Utilities

The new park will have to address and take into account the existing utilities that we were able to identify during our site visit. These are:

1. The lamp post on top of the sloping wall (Figure 1-17)
2. The electrical conduit along the east boundary (Figure 1-18)
3. The fire hydrant and its valve box (Figure 1-19)
4. Two manhole covers to the right of the double white lines shown in Figure 1-21. A close-up of the left cover is seen in Figure 1-22.
5. A manhole cover with grating below the first letter "w" on the left side in Figure 1-23.

6. Sewer outfall passing under the site as indicated by the New York City Department of Environmental Protection (DEP) notice board (Figure 1-24).
7. Conduits attached to the north wall of the sanitation garage and the utility box to the left of the gate (Figure 1-25).

It is possible that there may be some more utilities (e.g. sewer) that we were not able to identify because the ground was covered with stored salt, stones, fertilizer, and other debris during our site visits. New design of the park would need to address these and other utilities found during the final design.

1.4 Scope of Work

Sometime between 2000 and 2010, the project site was transferred to the New York City Department of Parks & Recreation (DPR), with the intention of converting the site into a park. The park designed by the Design Department of DPR envisioned a sloping ground with a fill of more than 25 feet at the high end and a fill of 3 to 4 feet at the low end. The existing site, which is flat and about 40 feet wide by 440 feet long, consists of a relieving platform 50 feet wide by 440 feet long. The remaining site with a 40 foot width consists of a fill primarily of construction materials, with questionable bearing capacity.

Gandhi Engineering, Inc. (Gandhi) was retained by the DPR to investigate the site including underwater inspection of piles, many of which were wrapped during the 1999-2000 rehabilitation program by the NYCEDC. M.G. McLaren, P.C. (McLaren) was selected by Gandhi with the approval of the DPR to assist with the underwater inspection. The inspection program was modified to include unwrapping of some piles and determining condition of the unwrapped piles. Gandhi was also asked to prepare various rehabilitation schemes and their cost estimates to support loads anticipated from the proposed new park.

Figure 1-1. Heliport site looking north from the top of the sanitation garage.

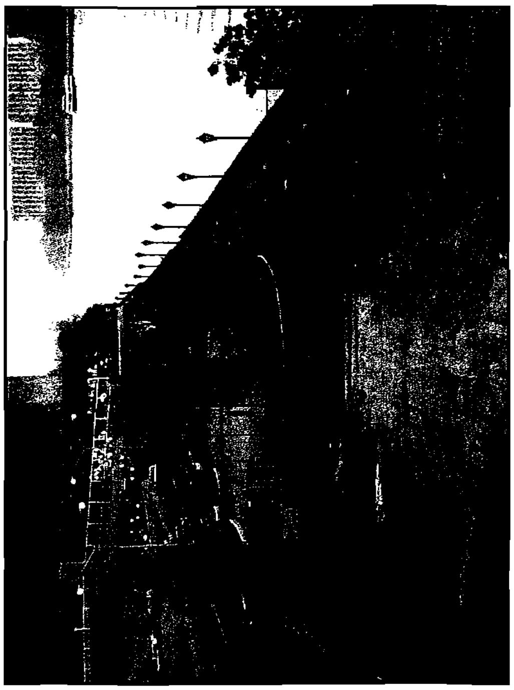


Figure 1-2. Close-up of chain-link fence and gate at the north end of the site.

Figure 1-3. Heliport site looking south from north end of the site.

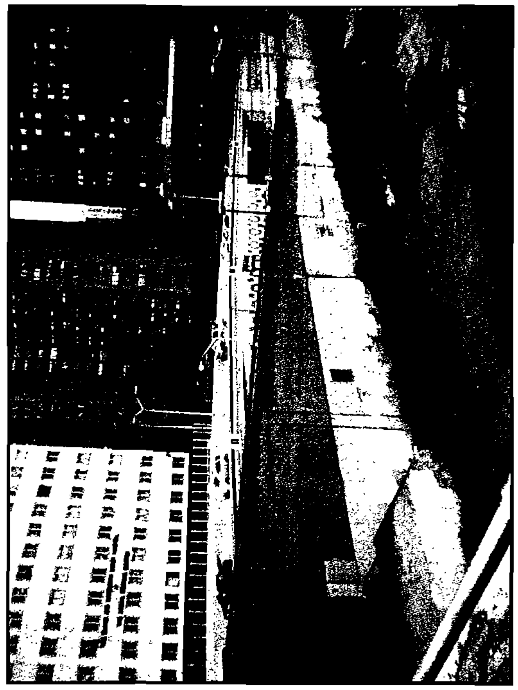


Figure 1-4. Sloping wall supporting the ramp from the top of sanitation garage or East River Pavilion.

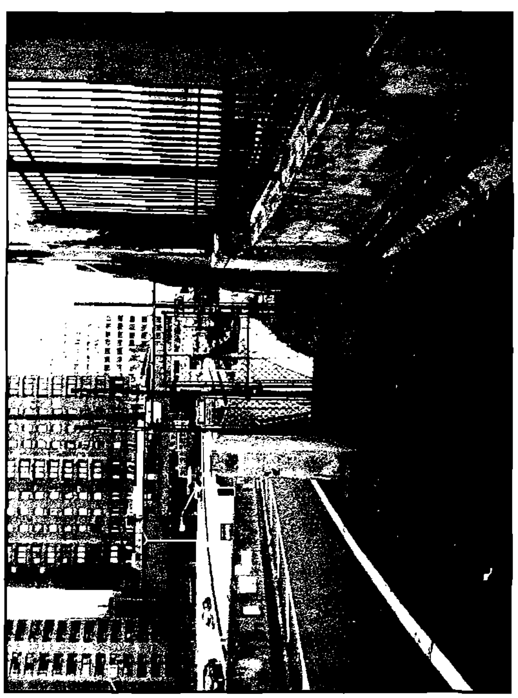


Figure 1-5. Locked gate to the stairs between the East River Pavilion at the top and heliport site at the bottom.

Figure 1-6. Stairs between the East River Pavilion and the heliport site.

Figure 1-7. Close-up of steps needing repairs.

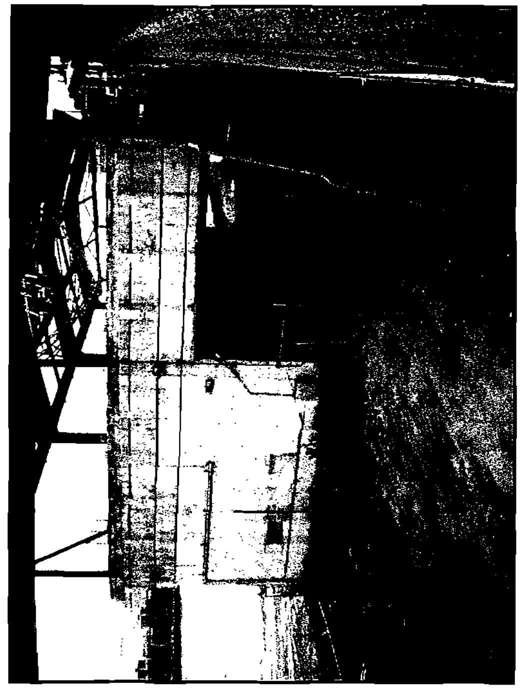


Figure 1-8. Close-up of the north face of the sanitation garage.

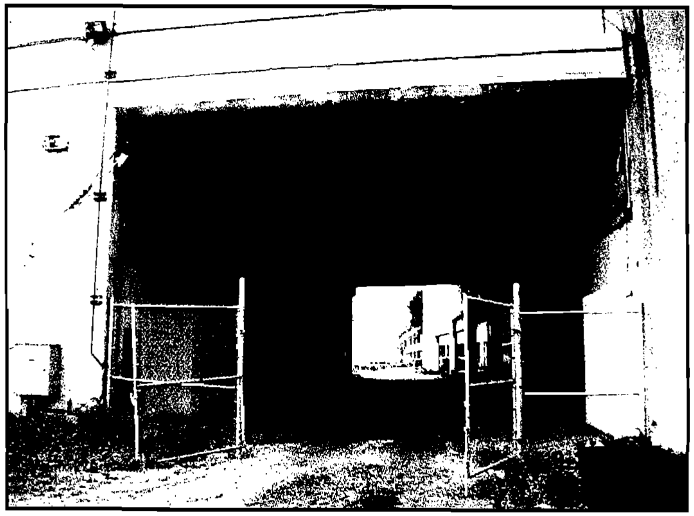


Figure 1-9. View looking south from the gate to the sanitation garage.

Figure 1-10. View of ramp looking south from north end of East River Pavilion.

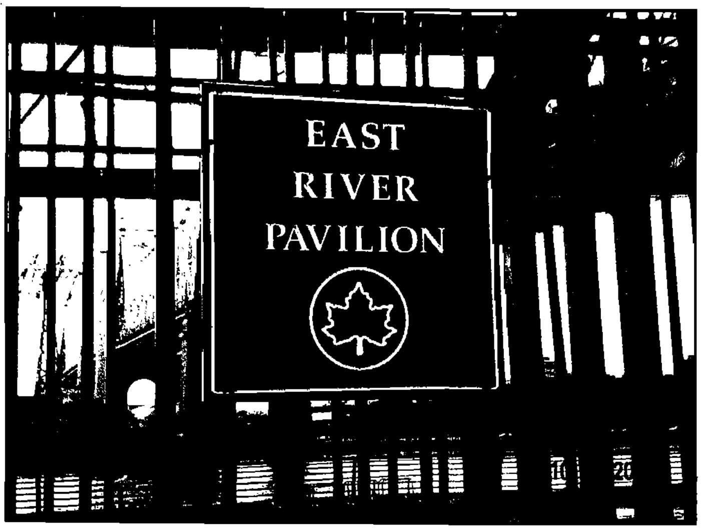


Figure 1-11. Sign near the entrance to the East River Pavilion showing the NYC Department of Parks and Recreation emblem.

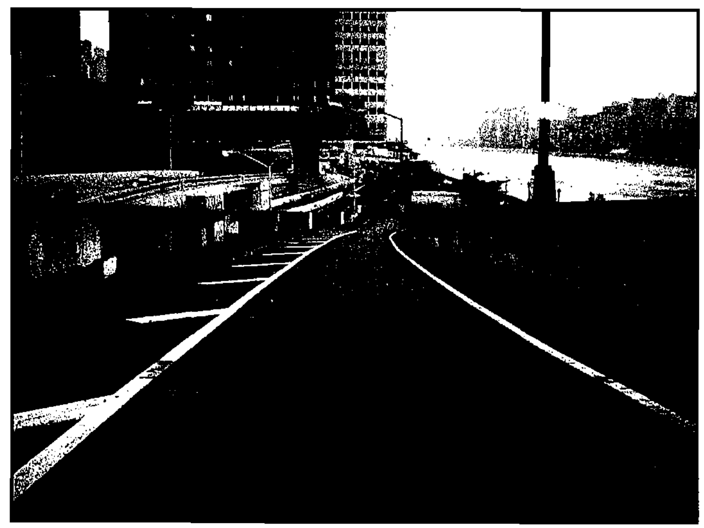


Figure 1-12. Ramp to heliport site looking north from near the entrance to the East River Pavilion.

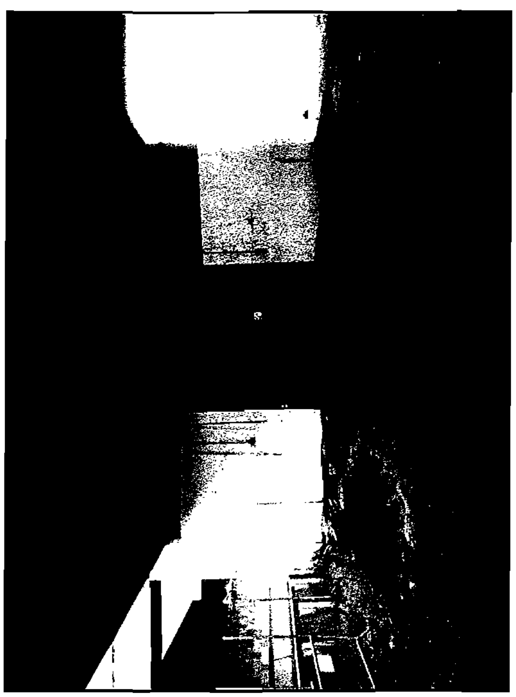


Figure 1-13. Door to the enclosed space underneath the sloping ramp in Figure 1-12 (previous page).

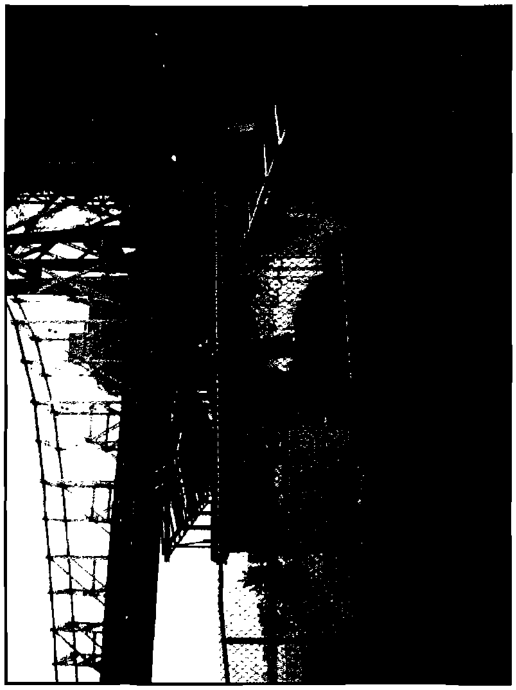


Figure 1-14. Gate at the bottom of the ramp to the heliport site looking south. (The same gate looking north is shown in Figure 1-2).

Figure 1-15. Small gate to the left of the sanitation garage wall blocking pedestrian movement along the East River esplanade.

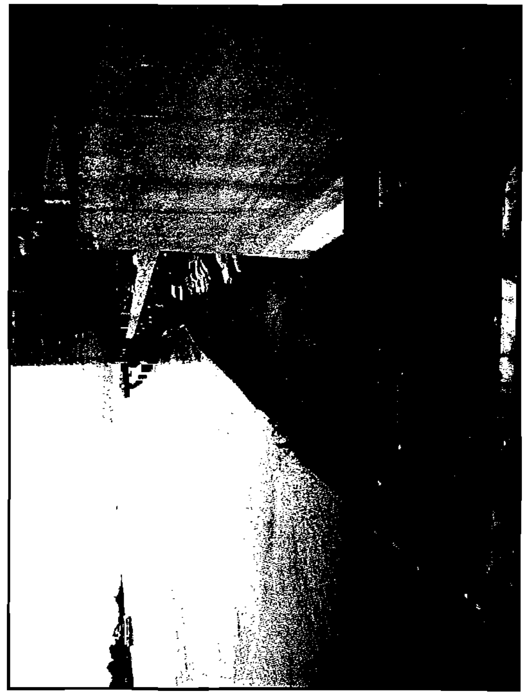


Figure 1-16. Looking south from the Pavilion.

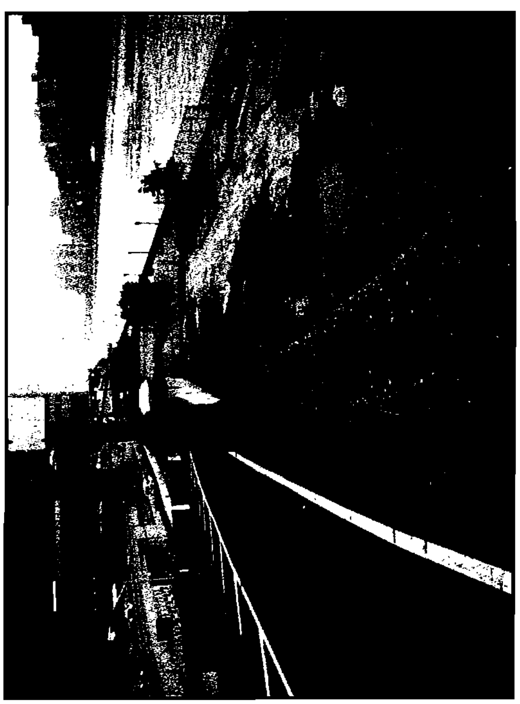


Figure 1-17. Lamp post on top of sloping wall supporting the ramp.

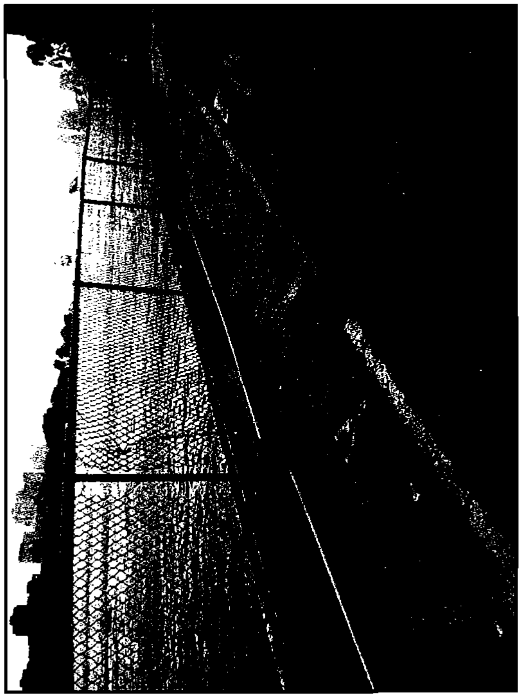


Figure 1-18. Electrical conduit along the chain-link fence and the edge of the site.

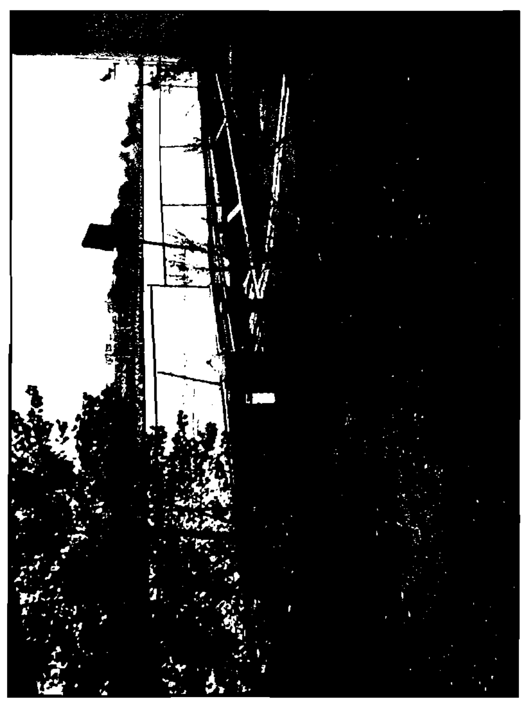


Figure 1-19. Fire hydrant.

Figure 1-20. Valve box for the fire hydrant.

Figure 1-21. Two manhole covers to the right of the double white lines.

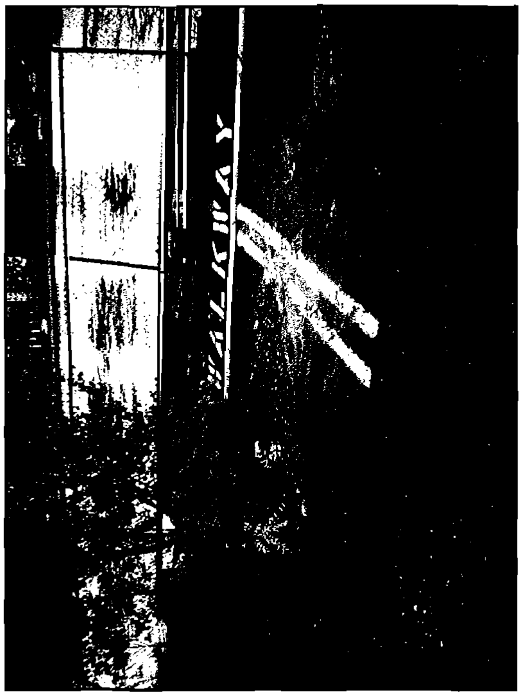


Figure 1-22. Close up of the manhole cover shown in figure 1-21.

Figure 1-23. Manhole cover with grating below letter "W" on the left side.

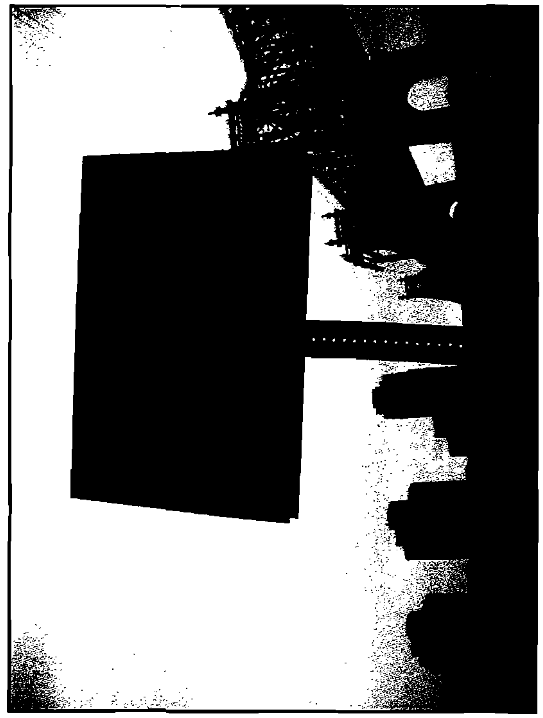


Figure 1-24. DEP notice of sewer outfall underneath the site.

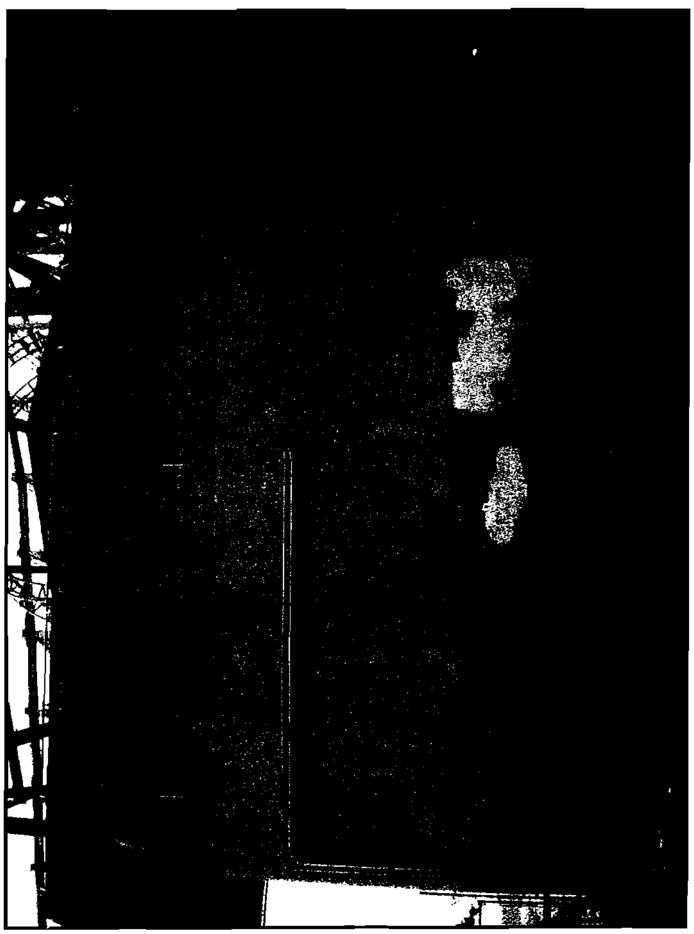


Figure 1-25. Conduits attached to wall and utility box mounted on the wall (to the left of the gate).

2. UNDERWATER INSPECTION AND FINDINGS

2.1 Underwater Inspection

M.G. McLaren, P.C. performed the underwater visual inspection of 1,897 piles from a total number of 2,647 piles using the pile plan originally developed by Goodkind & O'Dea for the New York City Economic Development Corporation.

We have reproduced an aerial map of the site downloaded from Google (Figure 2-1). This map shows the sanitation garage with the pavilion, the heliport site, and the esplanade park. This area is a part of a massive relieving platform and is supported by steel and timber piles. We have reproduced the pile plans (Figures 2-2 through 2-5) with the permission of the New York City Department of Parks and Recreation.

Figure 2-6, also developed by Goodkind & O'Dea, is reproduced to show the cross-section of the relieving platform.

2.2 Findings

The findings listed below are summarized from the Existing Conditions Report prepared by M.G. McLaren, P.C. and which forms a part of this report.

1. There were 2,647 piles within the project limits, which included areas outside of the footprint of the proposed park on both the north and south sides.
2. McLaren was able to visually inspect 1,897 piles (72 percent). Of the 1,897 piles inspected, 1,548 were wrapped (82 percent) and the remaining 349 piles were not wrapped most likely due to access restrictions.
3. While the piles are not in immediate danger of collapse, there has been serious reduction in their diameters, and as a result in their load carrying capacity.
4. The wrapped piles were inspected for marine borer activity. The two species of marine borers found in New York Harbor are Limnoria and Teredo. About 86 percent of the piles had either trace or minor marine borer infestation; 11 percent had minor infestation and 3 percent had moderate marine borer infestation.
5. The average diameter of the piles measured during the 1995 inspection was about 17 inches. The average diameter measured in the 2010 inspection was about 14 inches. There was a section loss of over 40 percent.
6. The 1995 analysis performed by Goodkind & O'Dea indicated that the heliport pier was capable of supporting 100 pounds per square foot of live load with an average pile diameter reduced to about 10½ inches.
7. It is not possible to predict with any certainty when the average diameter of the pile will reduce to about 10½ inches. Additional pile loss seems very likely at an unknown but probably increasing rate as explained below.
8. Marine borers cannot survive in highly polluted waters. With stricter environmental laws protecting the navigable waters from pollution in New York harbor, the activity of marine borers is likely to increase in the future.

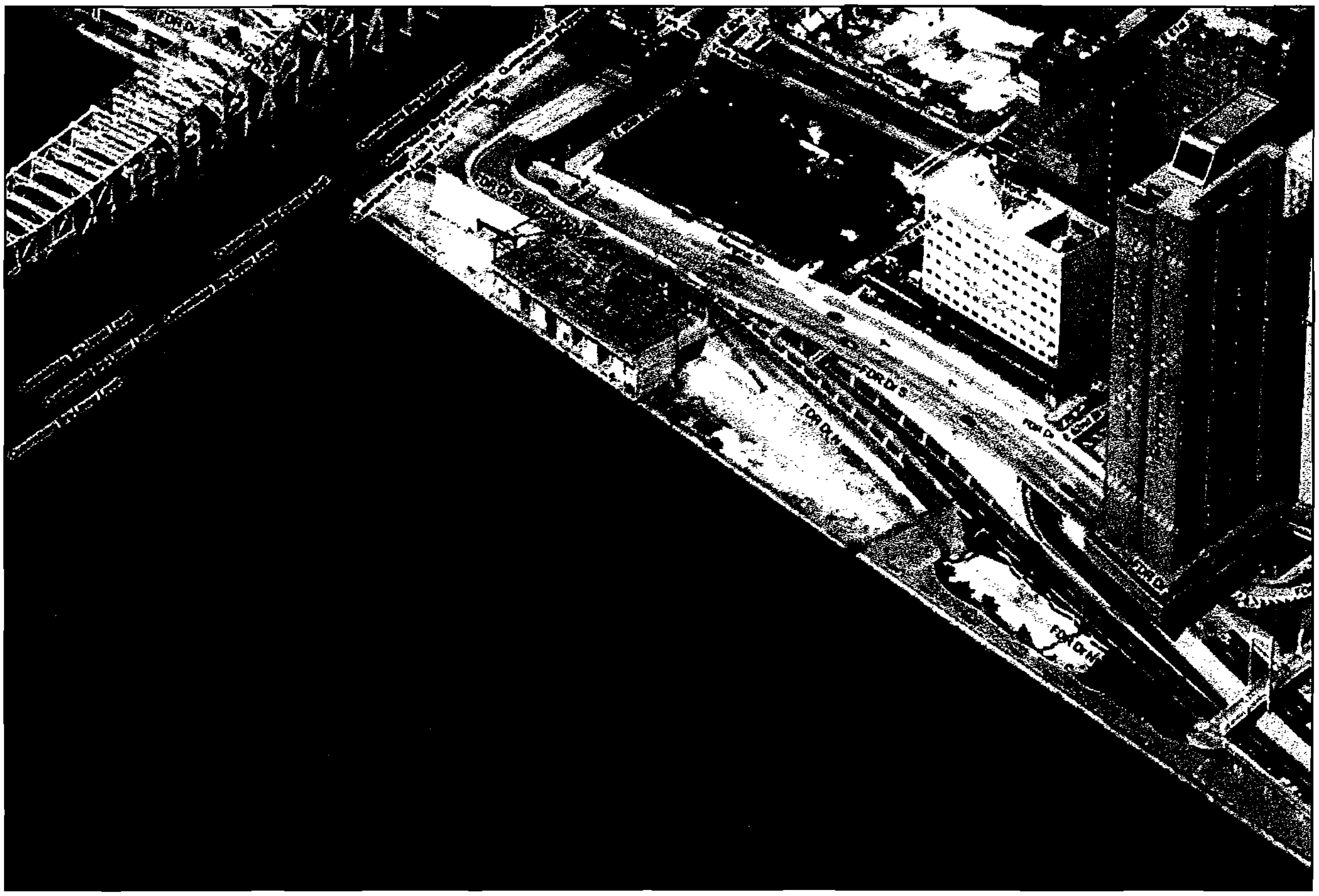


Figure 2-1. Heliport site supported on relieving platform

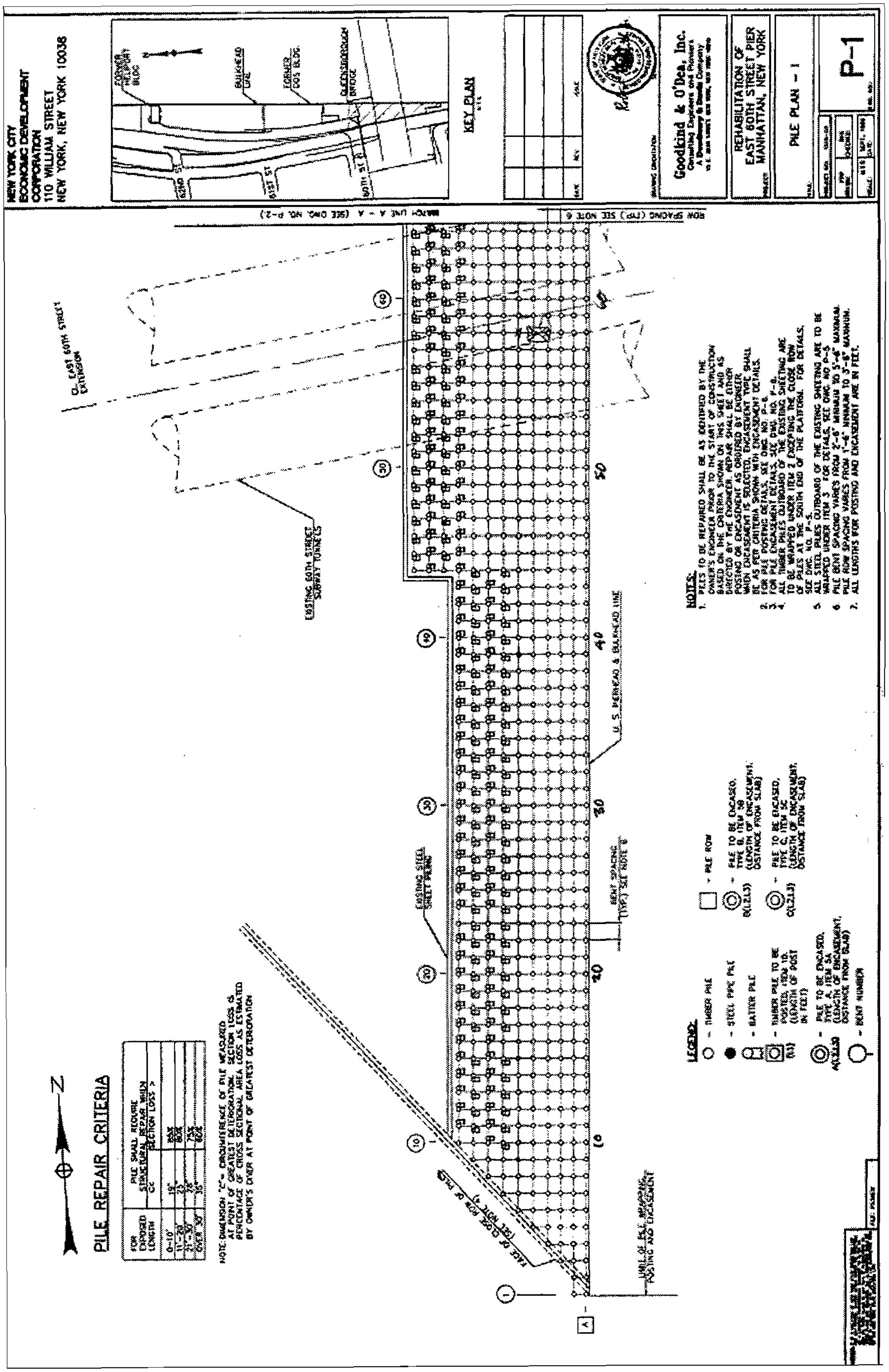


Figure 2.2. Existing pile plan from Column Lines 1 to 64.

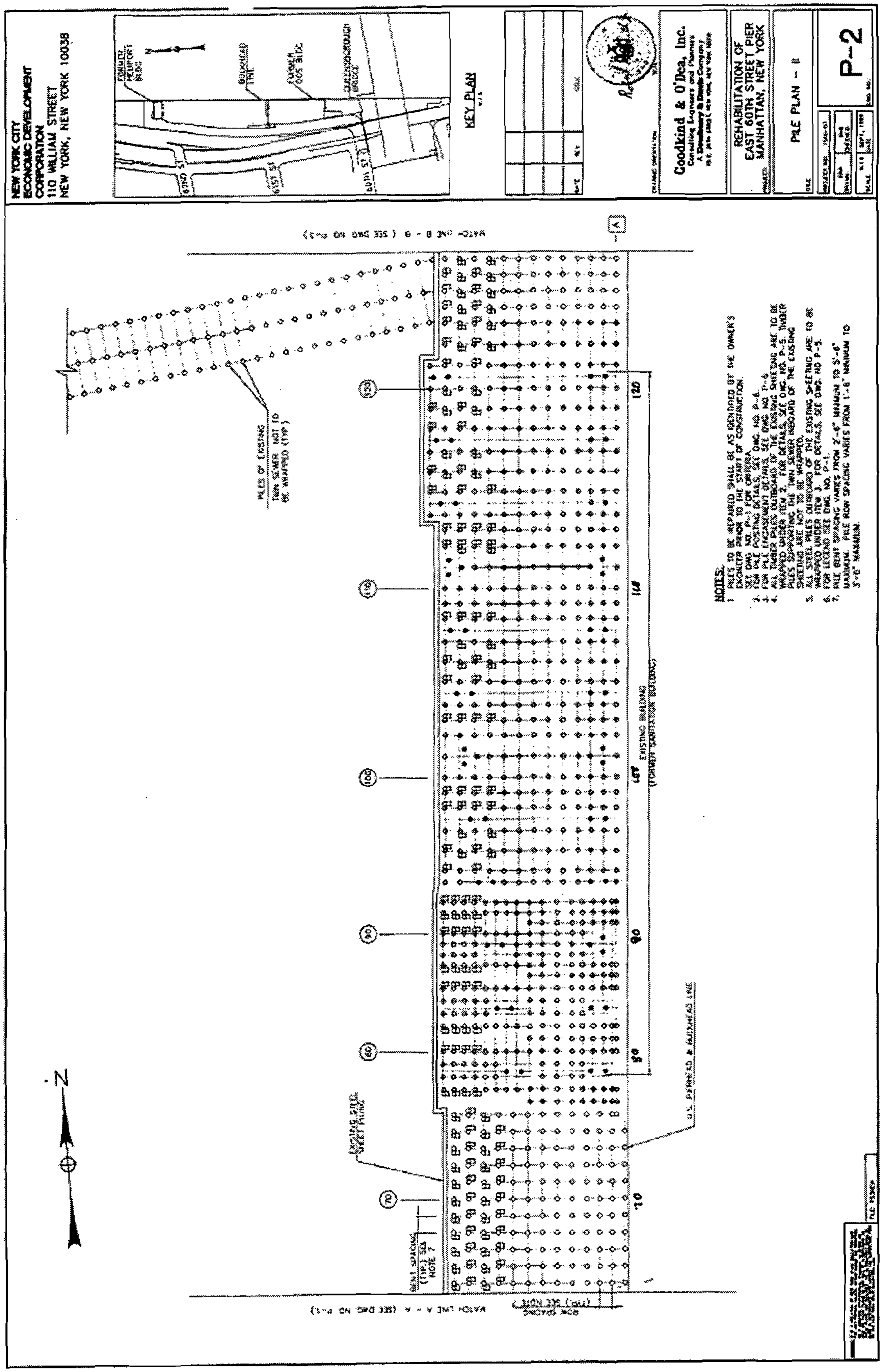


Figure 2.3. Existing pile plan from Column Lines 65 to 127.

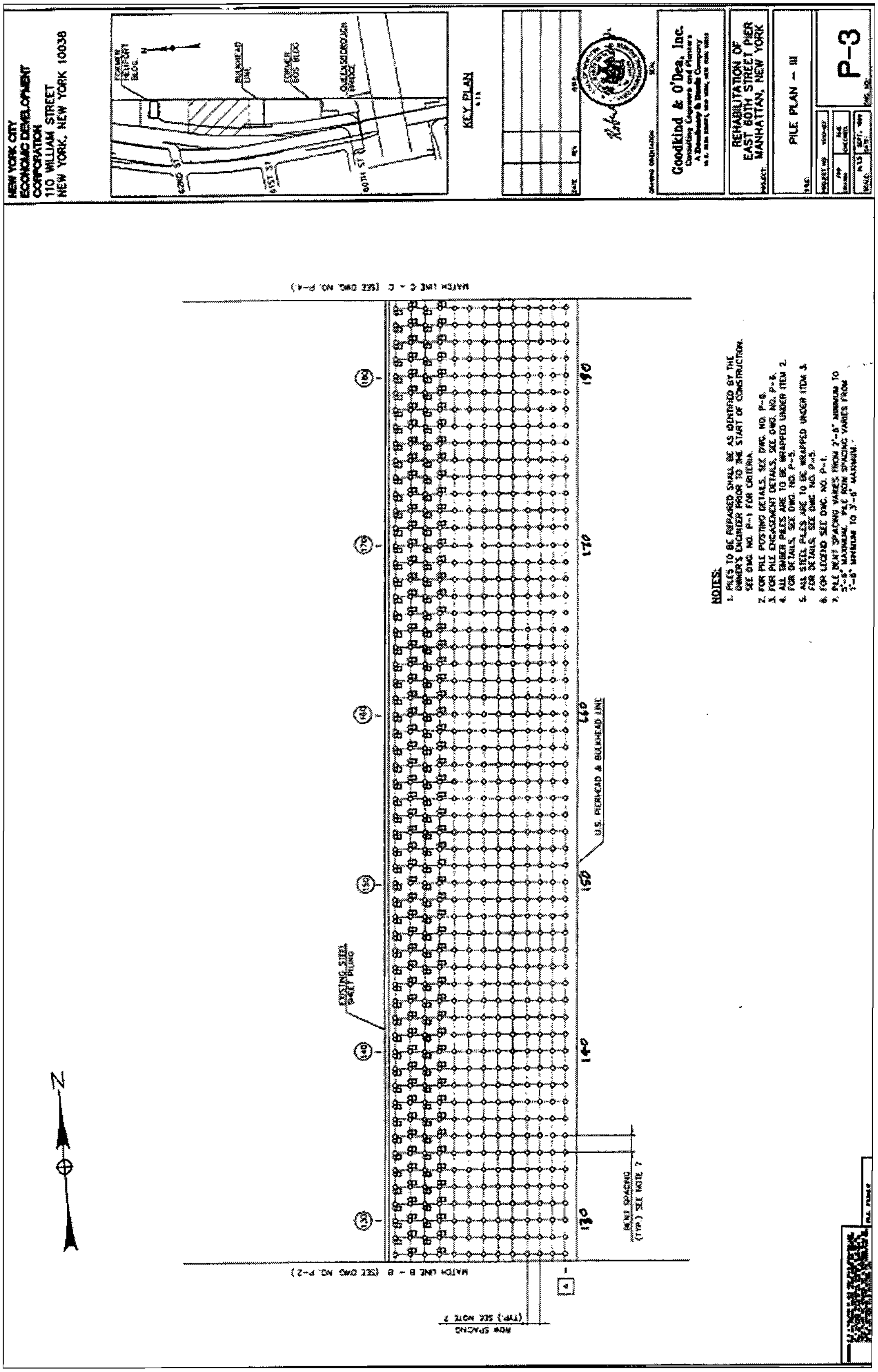


Figure 2.4. Existing pile plan from Column Lines 128 to 184.

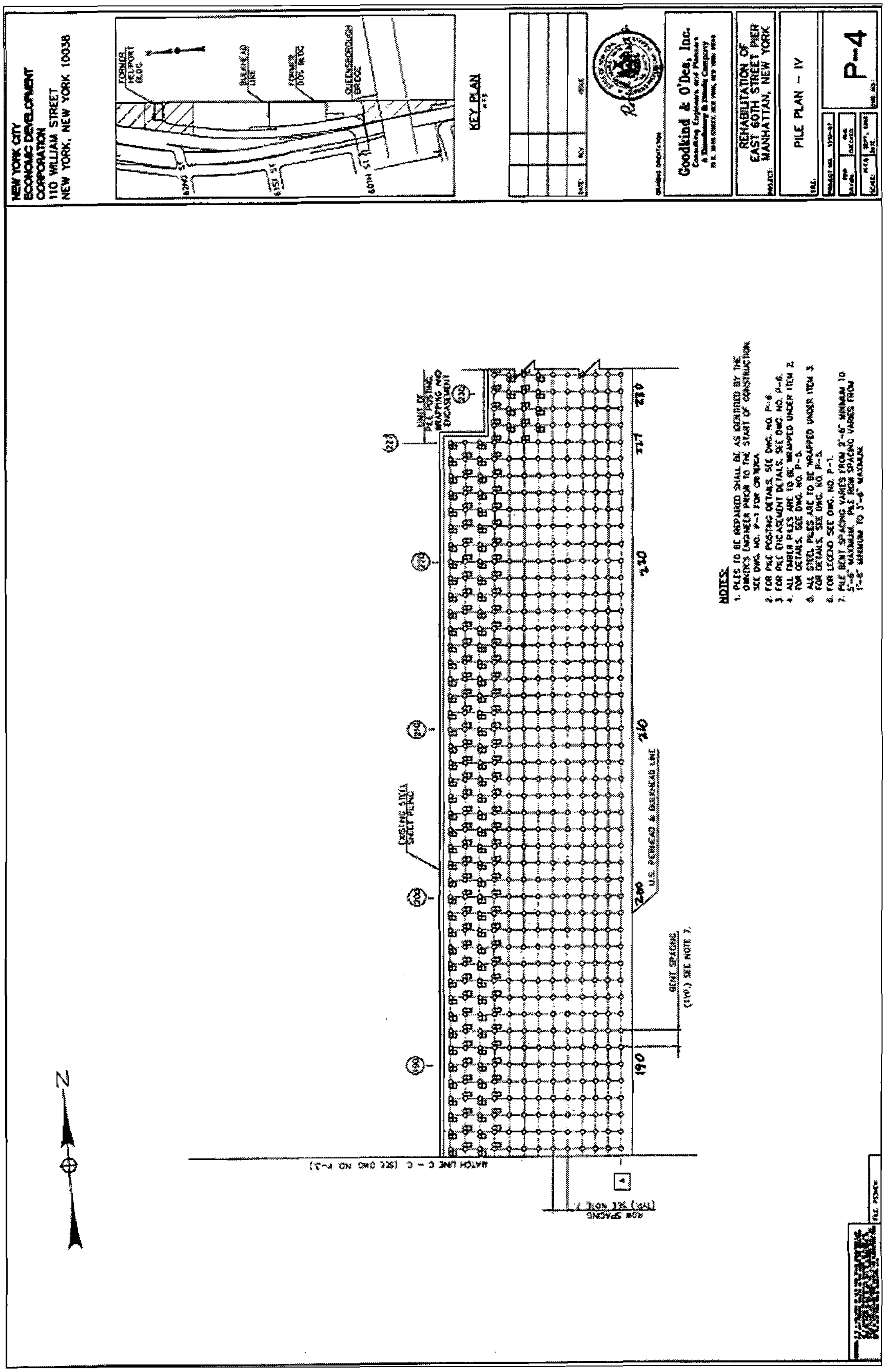


Figure 2.5. Existing pile plan from Column Lines 185 to 231.

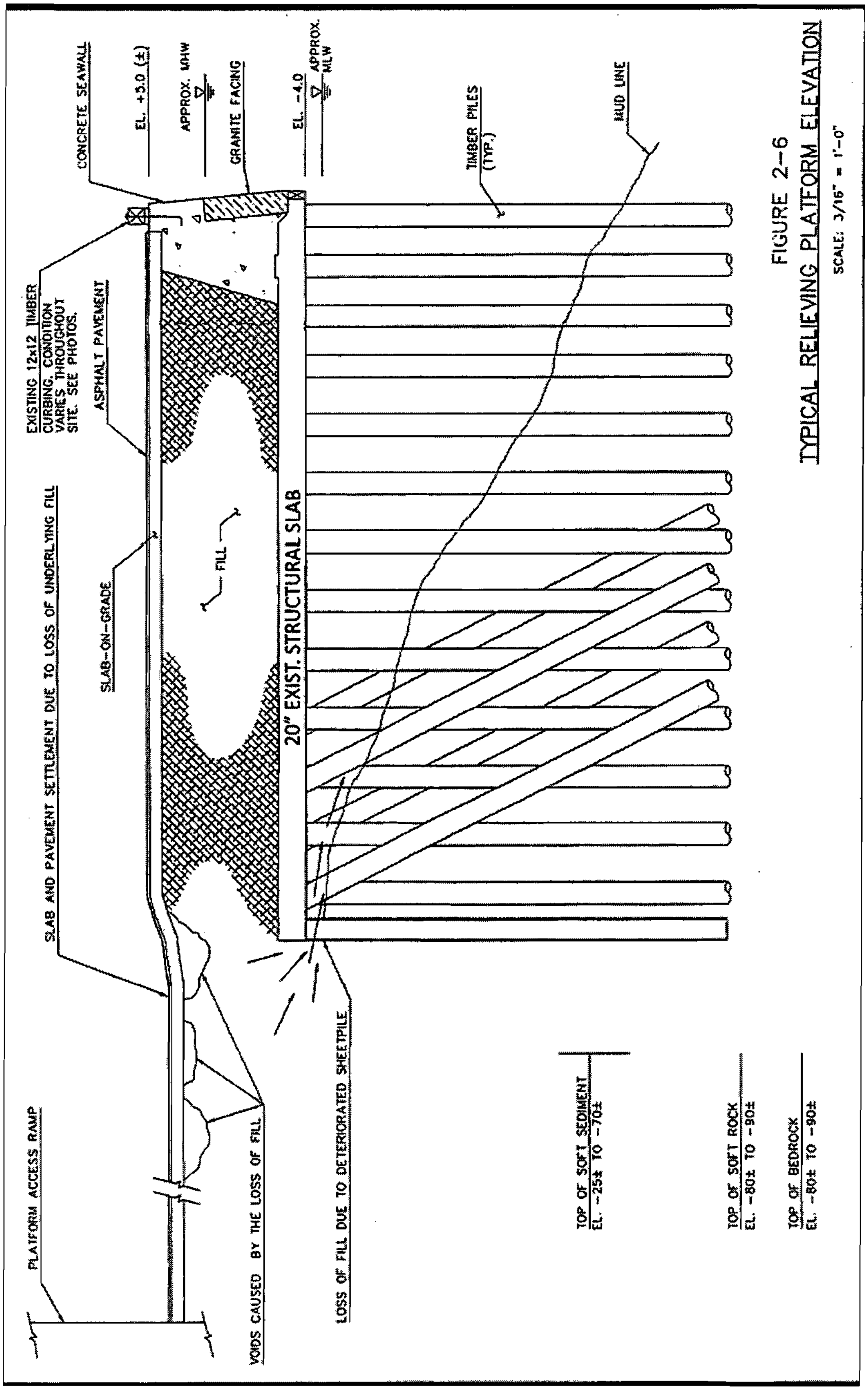


Figure 2.6. Elevation of typical relieving platform.

3. PROPOSED SCHEMES AND COST ESTIMATES

We have developed six schemes. The existing site and the typical cross-section of the relieving platform are shown in Figures 3-1 and 3-2. The summary of cost items used in preparing Tables 3-1 through 3-6 is provided in Table 3-0.

Table 3.0 Individual Cost Items – E-60TH Street Heliport at FDR Drive

(Include 21% OH and Profit; don't include 25% Contingency)

	Area of Relieving Platform: 50' x 440' =	22,000 SF
	Area of Heliport 90' x 440' =	39,600 SF
	No. of 18" Drilled Shafts	108
	No. of 12" dia. Concrete-filled Pipe Piles	360
1.	Cost of an 18" dia. drilled shaft 85' long =	$63,750
2.	Cost of 108, 18" dia. drilled shafts to cover the Relieving Platform area =	$6,885,000
3.	Cost of a single 12" dia. concrete-filled pipe pile (L=85')	$25,500
4.	Cost of 360, 12" dia. concrete-filled pipe piles	$9,180,000
5.	Cost of 12" thick structural slab in Relieving Platform area =	$1,760,000
6.	Cost of 18" thick structural slab in Relieving Platform area =	$2,640,000
7.	Cost of Removal and Disposal of Existing Surcharge at the Relieving Platform Depth = 7.33 ft. (from -2.33 to +5.0), Area 22,000 SF	$4,837,8000
8.	Cost of 90' L x 32' H x 2' W Reinforced Concrete Wall connected to Sanitation Building	$400,000
9.	Cost of sloping Retaining Wall along the Ramp 440' L x 17' (Av.H) x 1.5'	$1,000,000

3.1 Scheme 1

There is a possibility that with less pollution in the East River, the marine borers may increase their activities, and a time may come when the existing piles may become incapable of supporting the dead load of the 20 inch thick concrete slab, the fill, and superimposed live load.

Our Scheme 1 addresses this possibility. We are proposing a system of 36 grade beams supported on 108 drilled shafts 18-in. in diameter, and the 20-in. thick slab with dead and live loads is hung from these grade beams. This requires use of divers at low tide to work under the 20-in. thick slab to build the connection between the slab and the grade beams. We have shown two details, one where the divers are able to go under the slab and the other where they are not.

The details are shown in Figures 3-3, 3-4, and 3-5. The detailed cost estimate is shown in Table 3-1. The cost estimate of Scheme 1 is $16,775,200. Under weak economy, it is possible that the projected cost could be lower in the range of 5 to 10 percent.

Table 3-1. Cost Estimate for Heliport Scheme 1

1. 108, 18" dia. Caissons 85 ft. long.	$6,885,000
2. 26 Grade Beams 24" x 24" @ $28,500 each	$741,000
3. Removal and disposal of existing fill above the relieving platform area.	$4,837,800
4. Select structural fill.	$900,000
5. New steel sheet pile behind the existing sheet piles.	$500,000
Subtotal	$13,863,800
21% OH and Profit	$2,911,400
Total	$16,775,200

3.2 Scheme 2

This Scheme involves drilling 108, 18-inch diameter drilled shafts passing through the 20-in thick slab and supporting a new 18-in thick structural slab which is capable of supporting the dead load and superimposed live load of the park designed by the DPR.

Figures 3-6 and 3-7 show the plan and cross-section, respectively, and Table 3-2 the cost estimate of this Scheme.

Table 3-2. Cost Estimate for Heliport Scheme 2

1. Drive 108, 18" dia. drilled shafts.	$6,885,000
2. Cost of 18" thick structural slab in entire site (39,600 SF).	$2,640,000
3. Retaining wall along Sanitation Garage.	$400,000
4. Independent sloping retaining wall along the ramp with variable height.	$1,000,000
5. Cost of removal and disposal of existing fill above the relieving platform.	$4,837,800
6. Cost of select structural fill $\left(\frac{7.33 \; x \; 50 \; x \; 440}{27}\right) x \; \$150/cy$	$900,000
7. New sheet piles behind the existing sheet piles.	$500,000
Subtotal	$16,262,800
21% OH and Profit	$3,415,188
Total	$19,677,988

3.3 Scheme 3

This scheme is identical to Scheme 2, however, the drilled shafts are used for the entire site which is 440 ft. long and 90 ft. wide.

Figures 3-8 and 3-9 show the plan and cross-section respectively, and Table 3-3 the cost estimate of this Scheme.

Table 3-3. Cost Estimate for Heliport Scheme 3

1. Drive 210, 18" dia. drilled shafts.	$13,387,500
2. Cost of 18" thick structural slab in entire site (39,600 SF).	$4,752,000
3. Retaining wall along Sanitation Garage.	$400,000
4. Independent sloping retaining wall along the ramp with variable height.	$1,000,000
5. Cost of removal and disposal of existing fill above the relieving platform.	$4,837,800
6. Cost of select structural fill $\left(\frac{7.33 \: x \: 50 \: x \: 440}{27}\right) \: x \: \$150/cy$	$900,000
7. New sheet piles behind the existing sheet piles.	$500,000
Subtotal	$25,777,300
21% OH and Profit	$5,413,233
Total	$31,190,533

3.4 Scheme 4

This Scheme, instead of drilled shafts, uses 12-inch diameter pipe piles filled with concrete in the relieving platform area, and a 12-inch thick slab is built on compacted fill to support the dead and superimposed live loads.

Figures 3-10 and 3-11 show the plan and cross-section, respectively, and Table 3-4 the cost estimate of this Scheme.

Table 3-4. Cost Estimate for Heliport Scheme 4

1. Cost of 360, 12" dia. 85 ft. long pipe piles.	$9,180,000
2. Slab on grade on compacted fill in relieving platform area.	$1,760,000
3. Retaining wall along Sanitation Garage.	$400,000
4. Sloping retaining wall along ramp.	$1,000,000
5. Cost of removal and disposal of existing fill above relieving platform.	$4,837,800
6. Cost of select structural fill.	$900,000
7. Cost of sheet piles behind the existing sheet piles.	$500,000
Subtotal	$18,577,800
21% OH and Profit	$3,901,338
Total	$22,479,138

3.5 Scheme 5

Recognizing the possibility that funding may not be available to implement the construction of park designed by the DPR, we developed two schemes, 5 and 6, that do not consider surcharge loads. In this scheme, we propose to use 18-in. diameter drilled shafts to support a 12-in. thick structural slab in the relieving platform area.

Figures 3-12 and 3-13 show the plan and cross-section, respectively, and Table 3-5 the cost estimate of this scheme.

Table 3-5. Cost Estimate for Heliport Scheme 5

1. Drive 18" dia., 85 ft. long 108 drilled shafts.	$6,855,000
2. Provide 12" structural slab in relieving platform area.	$1,760,000
3. Cost of removal and disposal of fill above the relieving platform.	$4,837,800
4. Select structural fill.	$900,000
5. Steel sheet pile behind the existing sheet pile.	$500,000
Subtotal	$14,882,800
21% OH and Profit	$3,125,388
Total	$18,008,188

3.6 Scheme 6

In this scheme, we are proposing to use 12-in. diameter pipe piles filled with concrete to support 12-in. thick structural slab in the relieving platform area.

Figures 3-14 and 3-15 show this plan and cross-section, respectively, and Table 3-6 the cost estimate.

Table 3-6. Cost Estimate for Heliport Scheme 6

1. 360, 12" dia. pipe piles 85 ft. long	$9,180,000
2. Provide 12" structural slab in relieving platform area.	$1,760,000
3. Cost of removal and disposal of fill above the relieving platform.	$4,837,800
4. Select structural fill.	$900,000
5. Steel sheet pile behind the existing sheet pile.	$500,000
Subtotal	$17,177,800
21% OH and Profit	$3,607,338
Total	$20,785,138

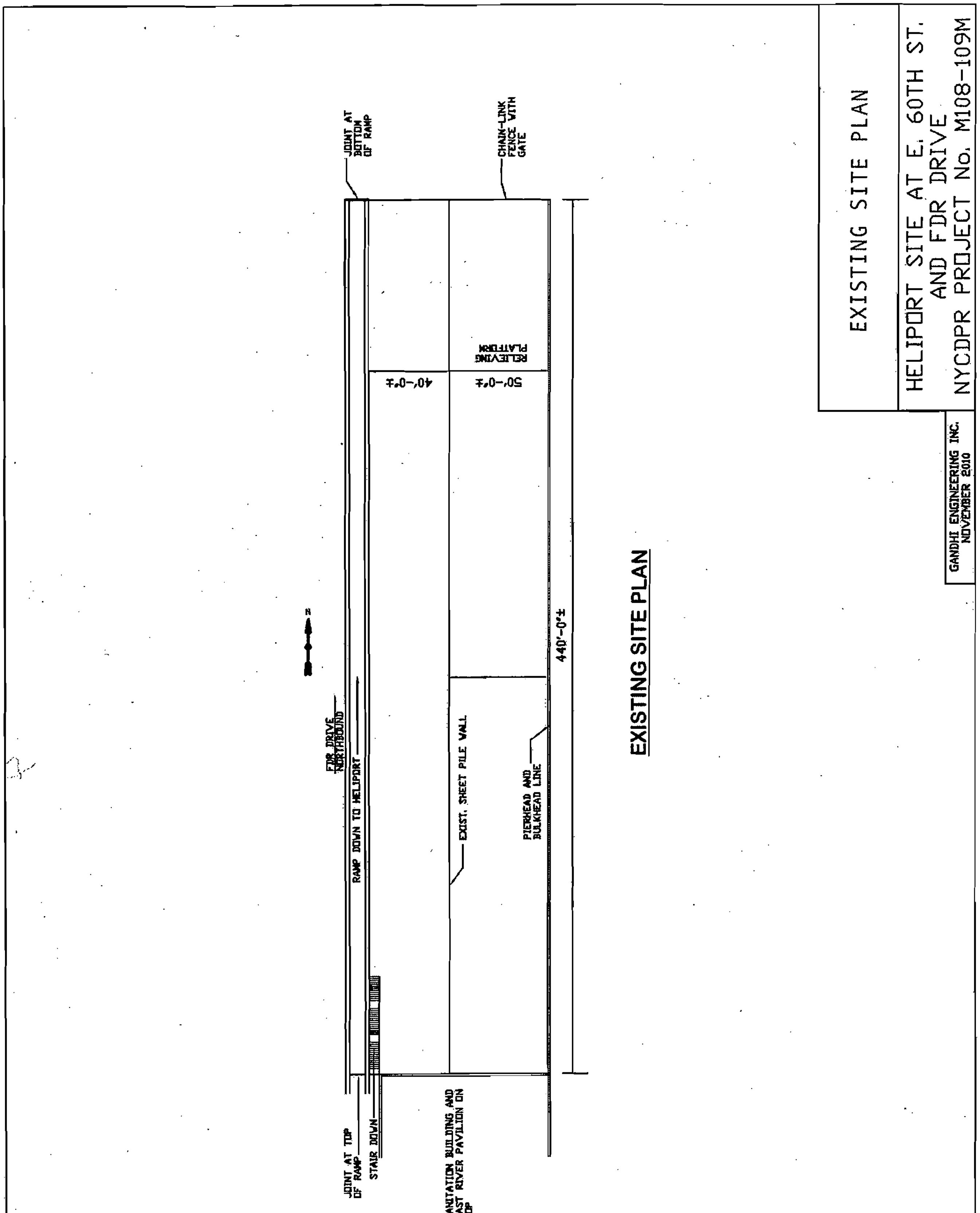
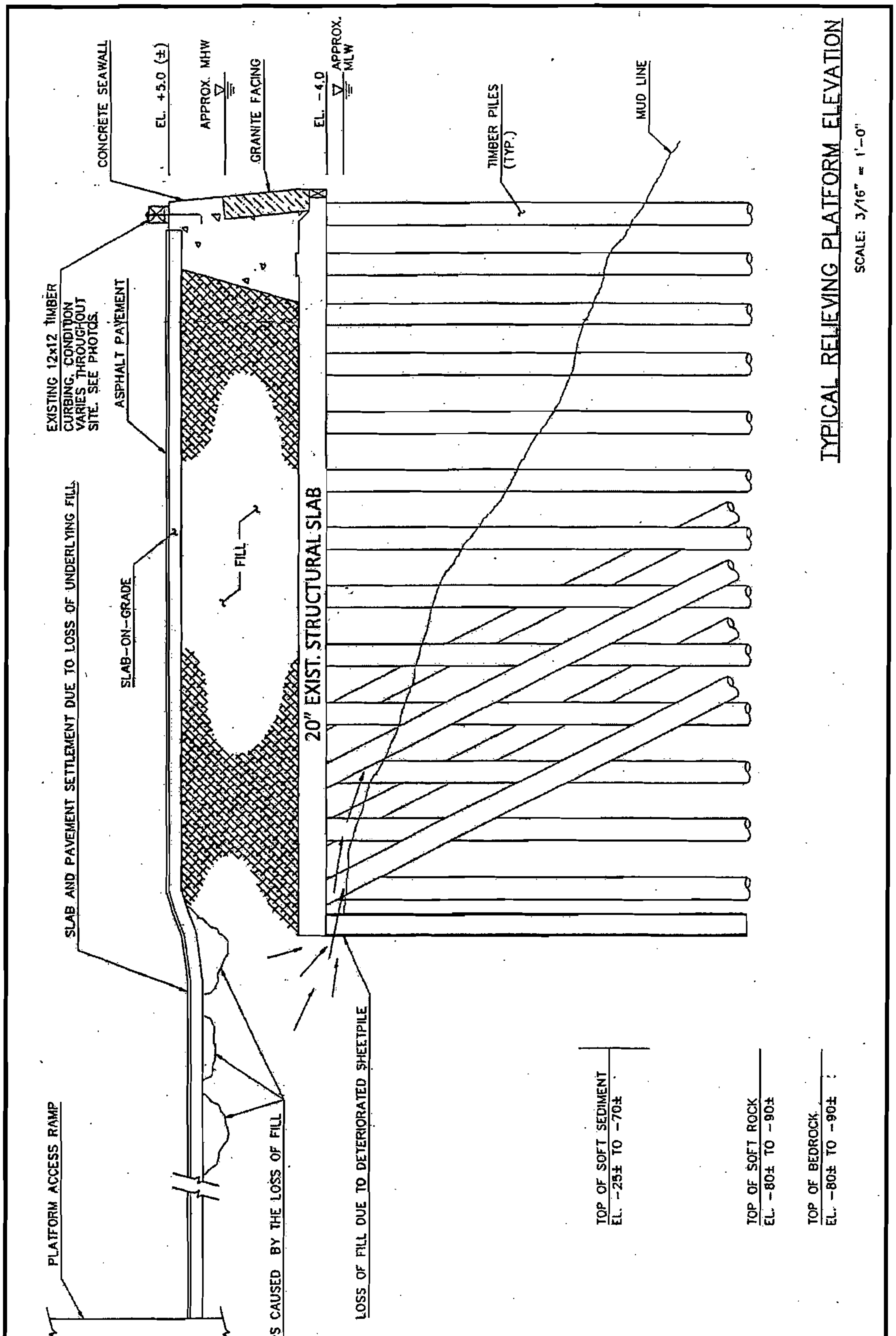

EXISTING SITE PLAN
HELIPORT SITE AT E. 60TH ST. AND FDR DRIVE
NYCDPR PROJECT No. M108-109M
GANDHI ENGINEERING INC.
NOVEMBER 2010
JOINT AT BOTTOM OF RAMP
CHAIN-LINK FENCE WITH GATE
RELIEVING PLATFORM
40'-0"±
50'-0"±
N
FDR DRIVE NORTHBOUND
RAMP DOWN TO HELIPORT
EXIST. SHEET PILE WALL
PIERHEAD AND BULKHEAD LINE
440'-0"±
EXISTING SITE PLAN
JOINT AT TOP OF RAMP
STAIR DOWN
SANITATION BUILDING AND EAST RIVER PAVILION ON TOP

Figure 3-1



TYPICAL RELIEVING PLATFORM ELEVATION
SCALE: 3/16" = 1'-0"
CONCRETE SEAWALL
EL. +5.0 (±)
APPROX. MHW
GRANITE FACING
EL. -4.0
APPROX. MLW
TIMBER PILES (TYP.)
MUD LINE
EXISTING 12x12 TIMBER CURBING. CONDITION VARIES THROUGHOUT SITE. SEE PHOTOS.
ASPHALT PAVEMENT
SLAB AND PAVEMENT SETTLEMENT DUE TO LOSS OF UNDERLYING FILL
SLAB-ON-GRADE
FILL
20" EXIST. STRUCTURAL SLAB
PLATFORM ACCESS RAMP
VOIDS CAUSED BY THE LOSS OF FILL
LOSS OF FILL DUE TO DETERIORATED SHEETPILE
TOP OF SOFT SEDIMENT
EL. -25± TO -70±
TOP OF SOFT ROCK
EL. -80± TO -90±
TOP OF BEDROCK
EL. -80± TO -90±

Figure 3-2

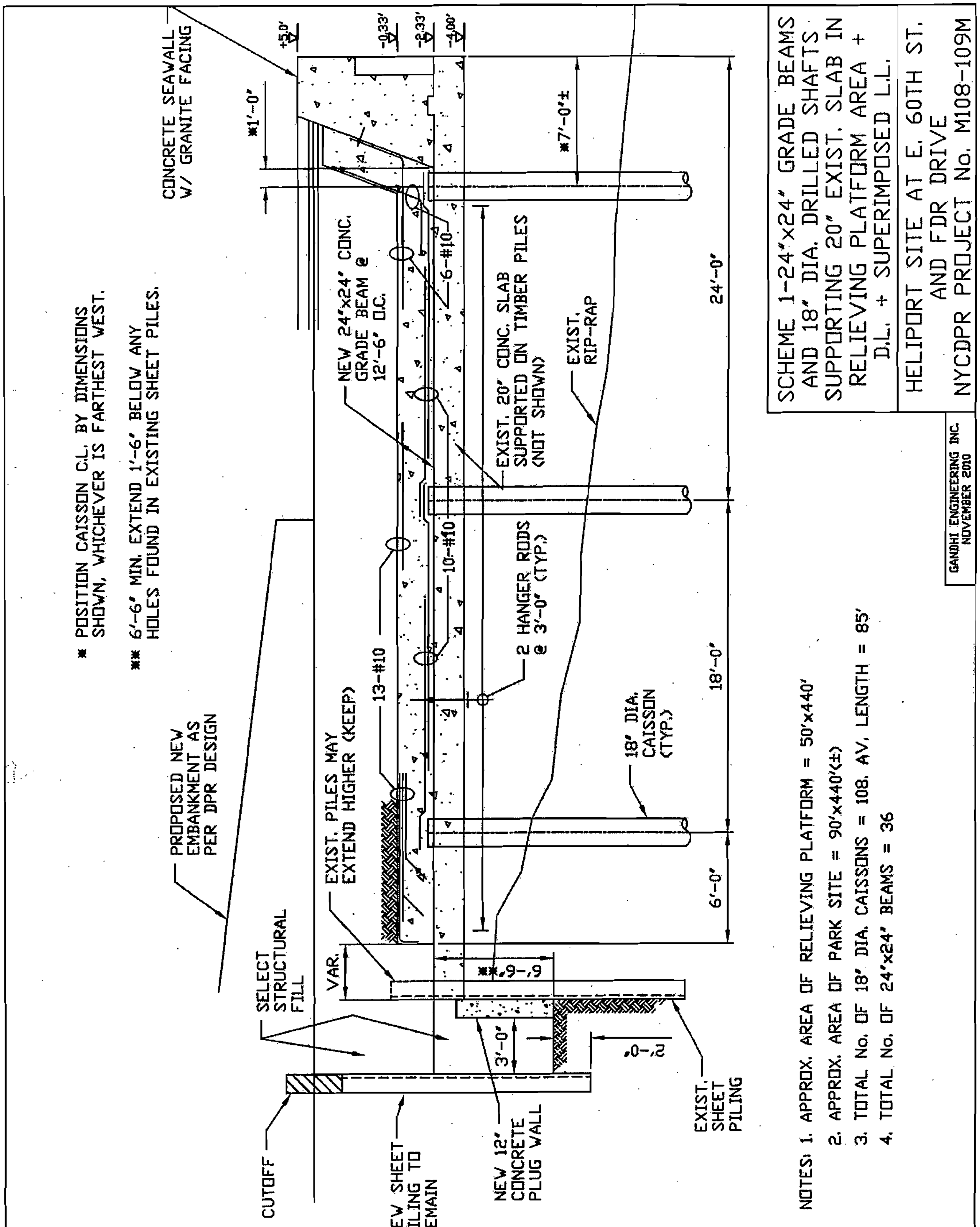
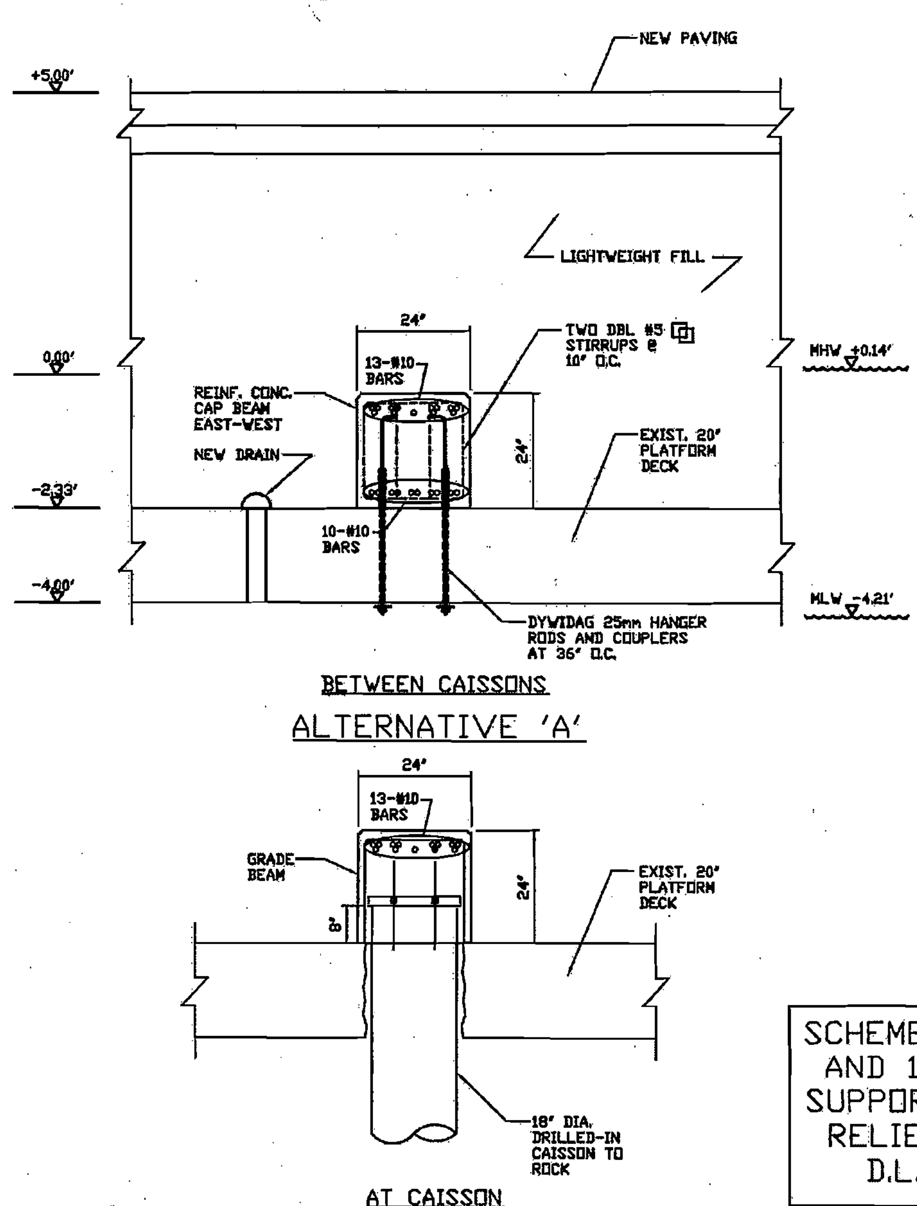

* POSITION CAISSON C.L. BY DIMENSIONS SHOWN, WHICHEVER IS FARTHEST WEST.
** 6'-6" MIN. EXTEND 1'-6" BELOW ANY HOLES FOUND IN EXISTING SHEET PILES.
CONCRETE SEAWALL W/ GRANITE FACING
+5.0'
-0.33'
-2.33'
-4.00'
*1'-0"
*7'-0"±
PROPOSED NEW EMBANKMENT AS PER DPR DESIGN
NEW 24"x24" CONC. GRADE BEAM @ 12'-6" O.C.
6-#10
10-#10
13-#10
EXIST. 20" CONC. SLAB SUPPORTED ON TIMBER PILES (NOT SHOWN)
EXIST. RIP-RAP
2 HANGER RODS @ 3'-0" (TYP.)
18" DIA. CAISSON (TYP.)
EXIST. PILES MAY EXTEND HIGHER (KEEP)
SELECT STRUCTURAL FILL
VAR.
6'-6"**
3'-0"
2'-0"
24'-0"
18'-0"
6'-0"
CUTOFF
NEW SHEET PILING TO REMAIN
NEW 12" CONCRETE PLUG WALL
EXIST. SHEET PILING
NOTES: 1. APPROX. AREA OF RELIEVING PLATFORM = 50'x440'
2. APPROX. AREA OF PARK SITE = 90'x440'(±)
3. TOTAL No. OF 18" DIA. CAISSONS = 108, AV. LENGTH = 85'
4. TOTAL No. OF 24"x24" BEAMS = 36
SCHEME 1-24"x24" GRADE BEAMS AND 18" DIA. DRILLED SHAFTS SUPPORTING 20" EXIST. SLAB IN RELIEVING PLATFORM AREA + D.L. + SUPERIMPOSED L.L.
HELIPORT SITE AT E. 60TH ST. AND FDR DRIVE
NYCDPR PROJECT No. M108-109M
GANDHI ENGINEERING INC. NOVEMBER 2010

Figure 3-3



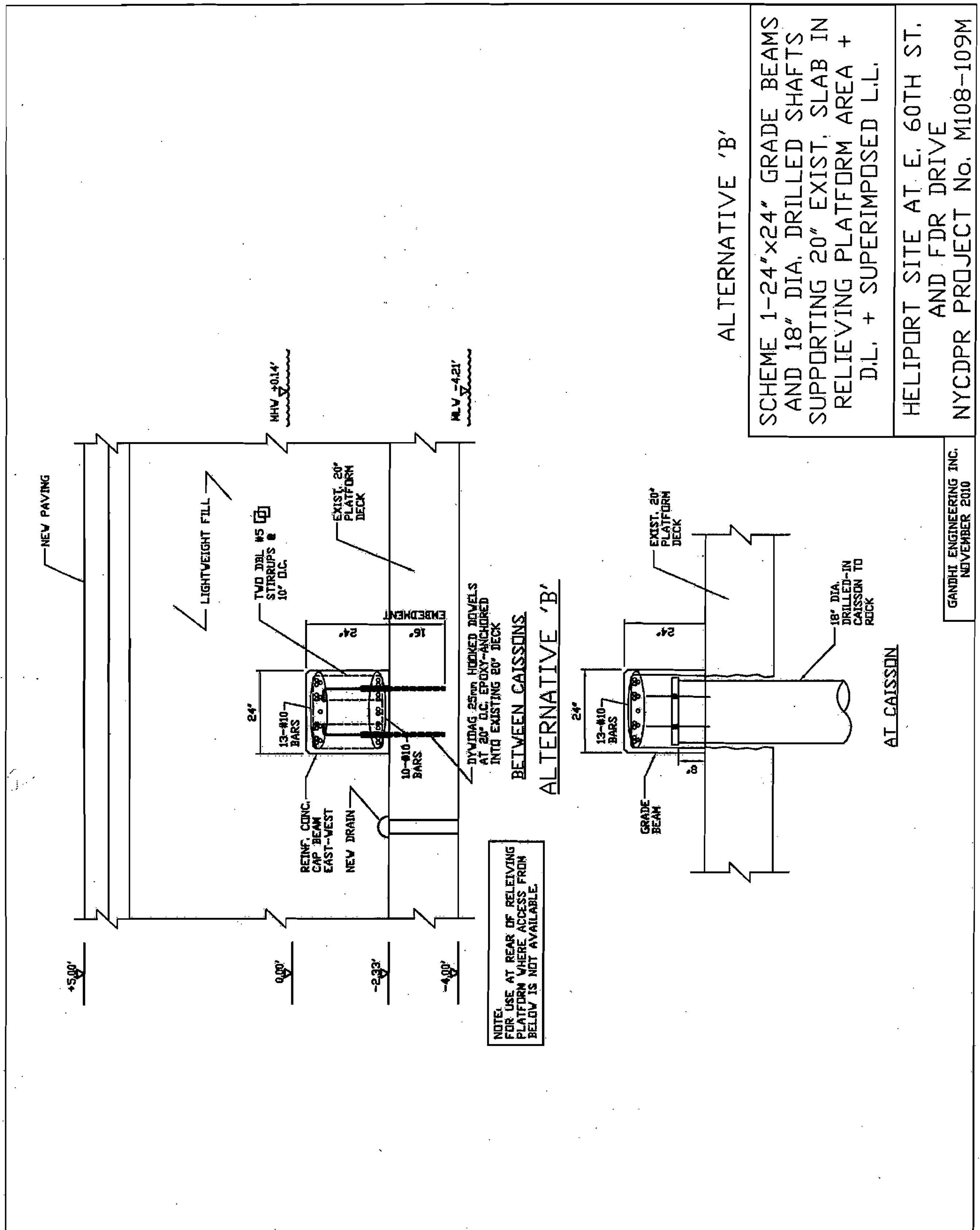
ALTERNATIVE 'A'

SCHEME 1-24"x24" GRADE BEAMS AND 18" DIA. DRILLED SHAFTS SUPPORTING 20" EXIST. SLAB IN RELIEVING PLATFORM AREA + D.L. + SUPERIMPOSED L.L.

HELIPORT SITE AT E. 60TH ST. AND FDR DRIVE
NYCDPR PROJECT No. M108-109M

GANDHI ENGINEERING INC.
NOVEMBER 2010

Figure 3-4



ALTERNATIVE 'B'
SCHEME 1-24"x24" GRADE BEAMS AND 18" DIA. DRILLED SHAFTS SUPPORTING 20" EXIST. SLAB IN RELIEVING PLATFORM AREA + D.L. + SUPERIMPOSED L.L.
HELIPORT SITE AT E. 60TH ST. AND FDR DRIVE
NYCDPR PROJECT No. M108-109M
GANDHI ENGINEERING INC.
NOVEMBER 2010
NEW PAVING
LIGHTWEIGHT FILL
TWO DBL #5 STIRRUPS @ 10" O.C.
EXIST. 20" PLATFORM DECK
EMBEDMENT
24"
16"
13-#10 BARS
10-#10 BARS
DYWIDAG 25mm HOOKED DOWELS AT 20" O.C. EPOXY-ANCHORED INTO EXISTING 20" DECK
REINF. CONC. CAP BEAM EAST-WEST
NEW DRAIN
MHW +0.14'
MLW -4.21'
+5.00'
0.00'
-2.33'
-4.00'
NOTE: FOR USE AT REAR OF RELEIVING PLATFORM WHERE ACCESS FROM BELOW IS NOT AVAILABLE.
BETWEEN CAISSONS
ALTERNATIVE 'B'
EXIST. 20" PLATFORM DECK
18" DIA. DRILLED-IN CAISSON TO ROCK
GRADE BEAM
AT CAISSON
8"

Figure 3-5

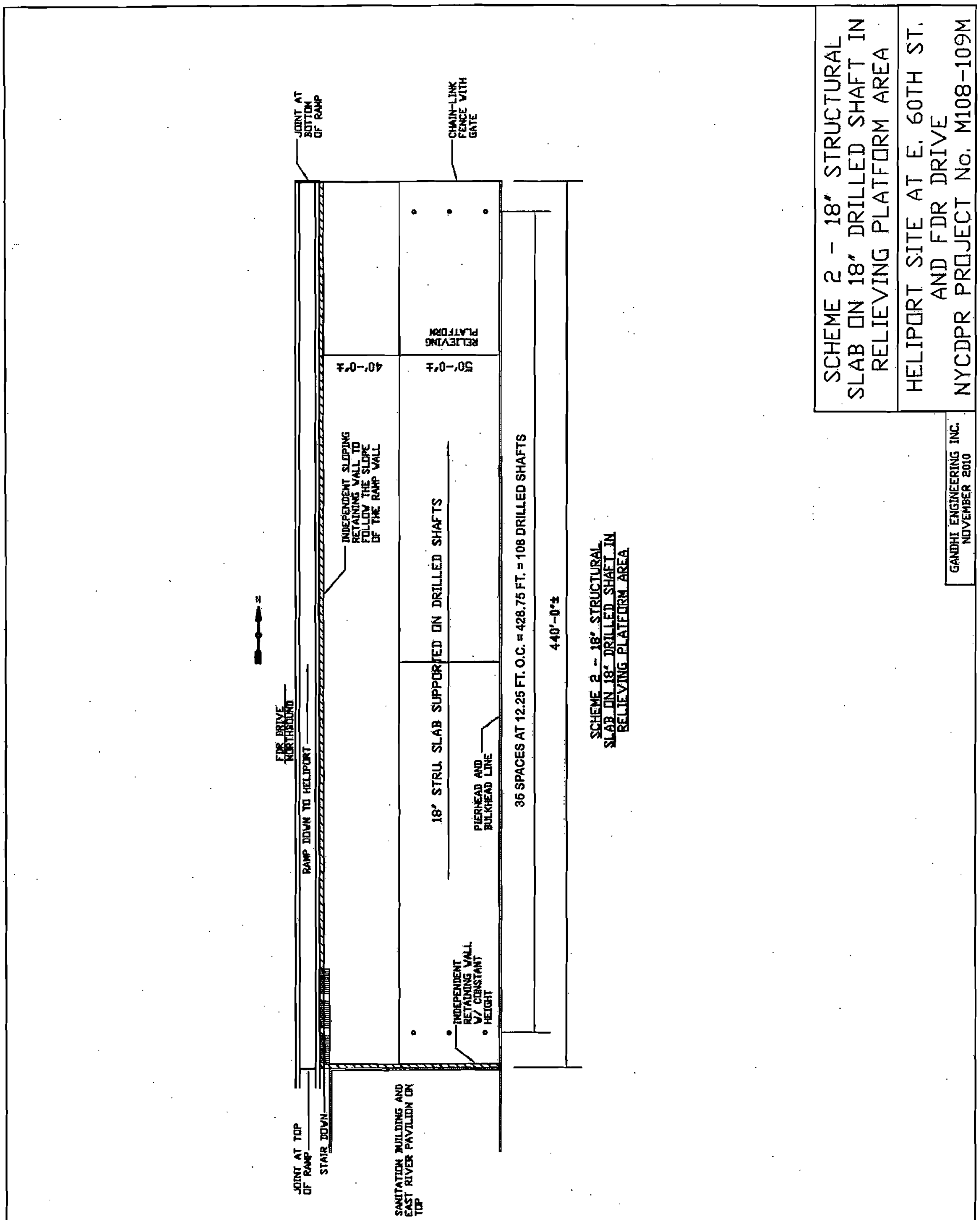

SCHEME 2 - 18" STRUCTURAL SLAB ON 18" DRILLED SHAFT IN RELIEVING PLATFORM AREA
HELIPORT SITE AT E. 60TH ST. AND FDR DRIVE
NYCDPR PROJECT No. M108-109M
GANDHI ENGINEERING INC.
NOVEMBER 2010
JOINT AT BOTTOM OF RAMP
CHAIN-LINK FENCE WITH GATE
RELIEVING PLATFORM
40'-0"±
50'-0"±
INDEPENDENT SLOPING RETAINING WALL TO FOLLOW THE SLOPE OF THE RAMP WALL
18" STRU. SLAB SUPPORTED ON DRILLED SHAFTS
FDR DRIVE NORTHBOUND
RAMP DOWN TO HELIPORT
PIERHEAD AND BULKHEAD LINE
36 SPACES AT 12.25 FT. O.C. = 428.75 FT. = 108 DRILLED SHAFTS
440'-0"±
SCHEME 2 - 18" STRUCTURAL SLAB ON 18" DRILLED SHAFT IN RELIEVING PLATFORM AREA
INDEPENDENT RETAINING WALL W/ CONSTANT HEIGHT
JOINT AT TOP OF RAMP
STAIR DOWN
SANITATION BUILDING AND EAST RIVER PAVILION ON TOP

Figure 3-6

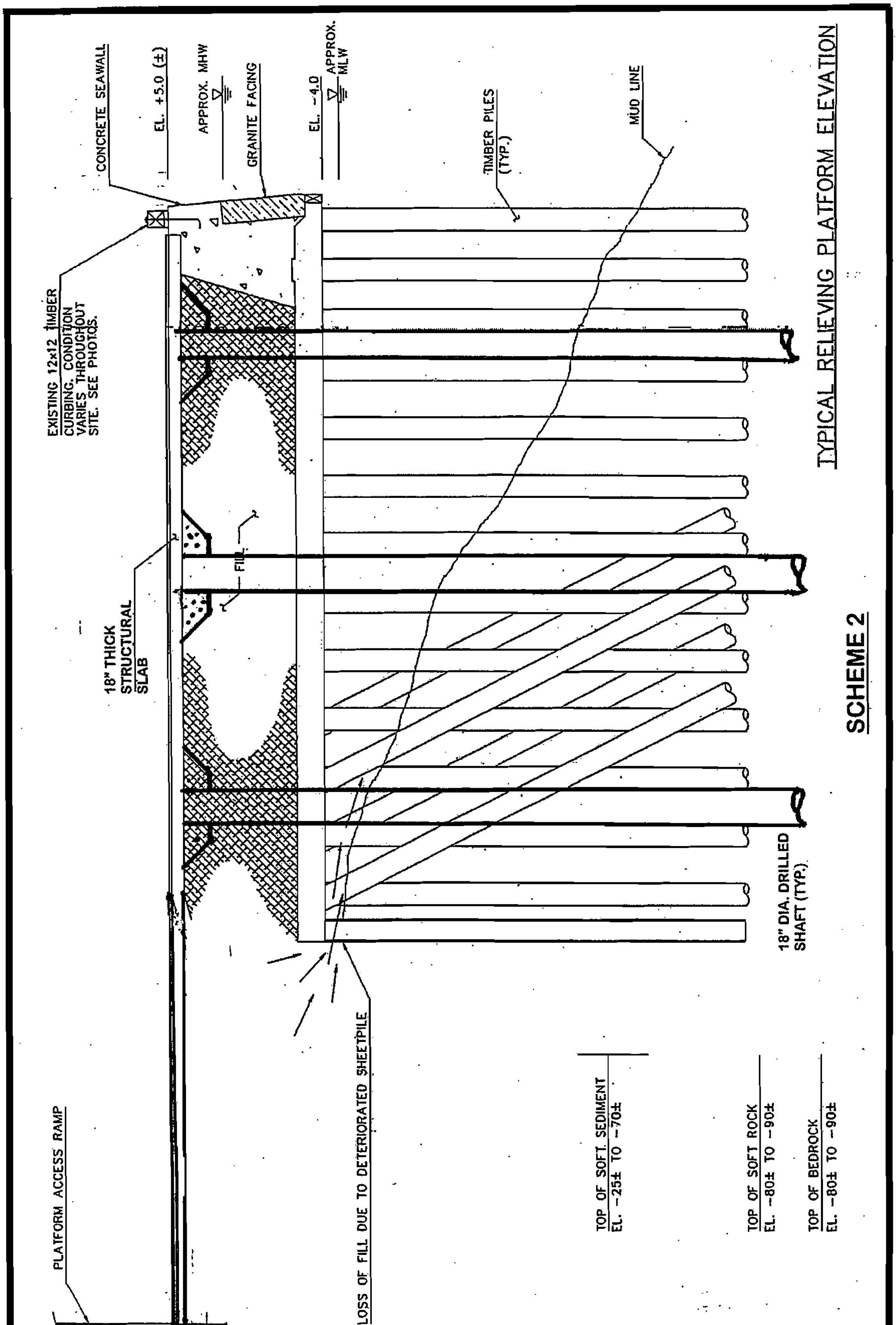

TYPICAL RELIEVING PLATFORM ELEVATION
SCHEME 2
CONCRETE SEAWALL
EL. +5.0 (±)
APPROX. MHW
GRANITE FACING
EL. -4.0
APPROX. MLW
TIMBER PILES (TYP.)
MUD LINE
EXISTING 12x12 TIMBER CURBING. CONDITION VARIES THROUGHOUT SITE. SEE PHOTOS.
18" THICK STRUCTURAL SLAB
FILL
18" DIA. DRILLED SHAFT (TYP.)
PLATFORM ACCESS RAMP
LOSS OF FILL DUE TO DETERIORATED SHEETPILE
TOP OF SOFT SEDIMENT
EL. -25± TO -70±
TOP OF SOFT ROCK
EL. -80± TO -90±
TOP OF BEDROCK
EL. -80± TO -90±

Figure 3-7

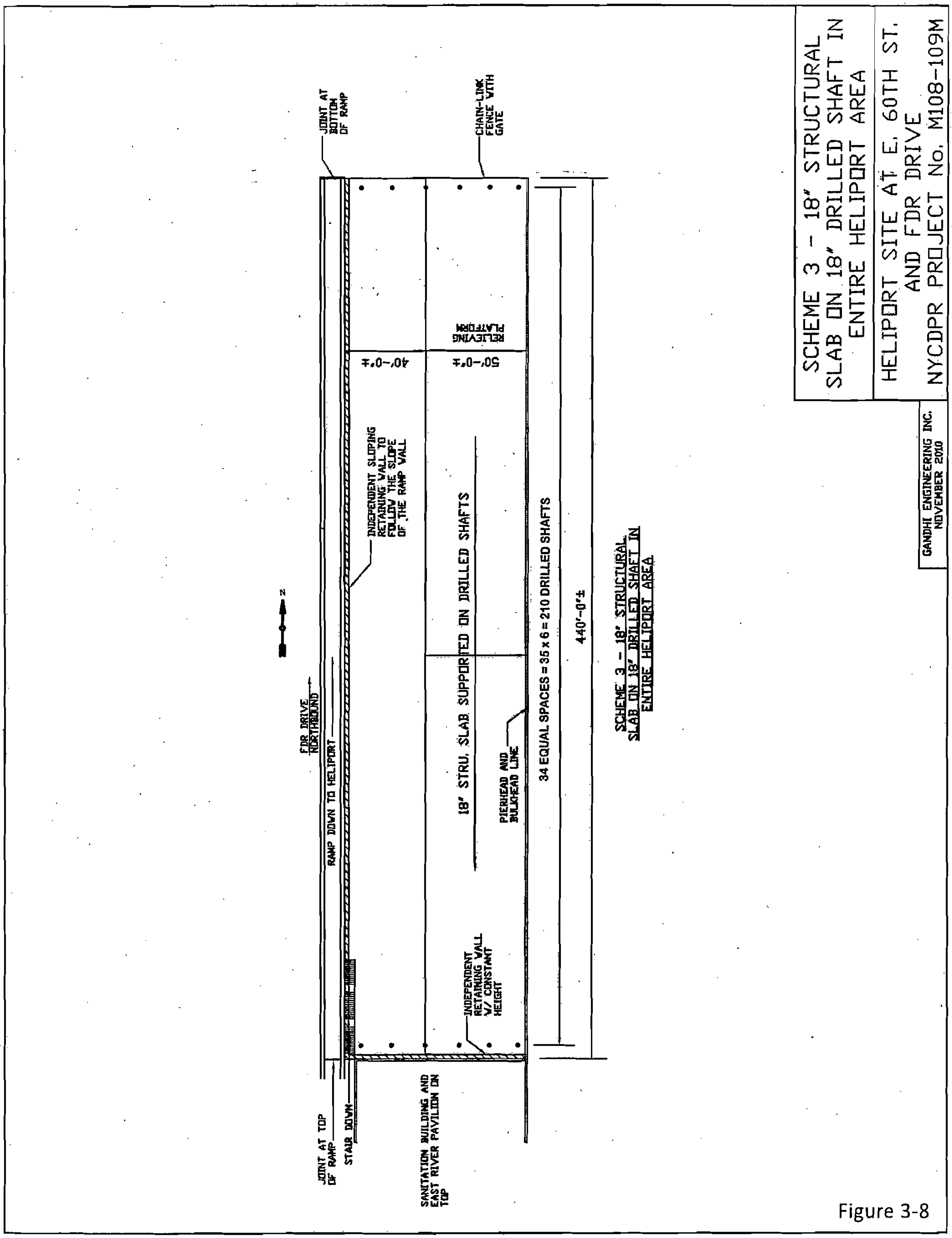

SCHEME 3 - 18" STRUCTURAL SLAB ON 18" DRILLED SHAFT IN ENTIRE HELIPORT AREA
HELIPORT SITE AT E. 60TH ST. AND FDR DRIVE
NYCDPR PROJECT No. M108-109M
GANDHI ENGINEERING INC. NOVEMBER 2010
JOINT AT BOTTOM OF RAMP
CHAIN-LINK FENCE WITH GATE
RELIEVING PLATFORM
40'-0"±
50'-0"±
INDEPENDENT SLOPING RETAINING WALL TO FOLLOW THE SLOPE OF THE RAMP WALL
18" STRU. SLAB SUPPORTED ON DRILLED SHAFTS
34 EQUAL SPACES = 35 x 6 = 210 DRILLED SHAFTS
440'-0"±
SCHEME 3 - 18" STRUCTURAL SLAB ON 18" DRILLED SHAFT IN ENTIRE HELIPORT AREA
N
FDR DRIVE NORTHBOUND
RAMP DOWN TO HELIPORT
PIERHEAD AND BULKHEAD LINE
INDEPENDENT RETAINING WALL W/ CONSTANT HEIGHT
JOINT AT TOP OF RAMP
STAIR DOWN
SANITATION BUILDING AND EAST RIVER PAVILION ON TOP

Figure 3-8

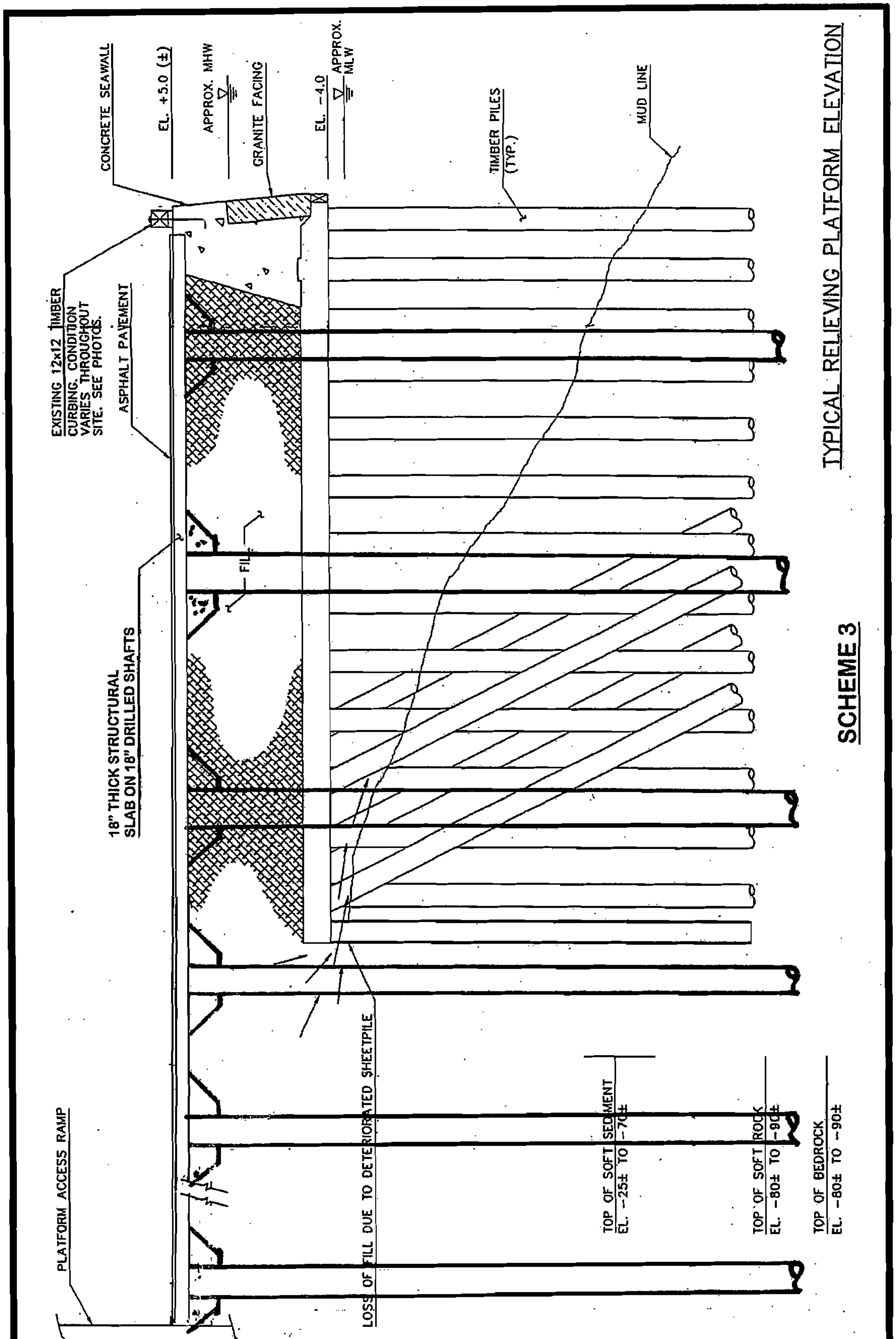
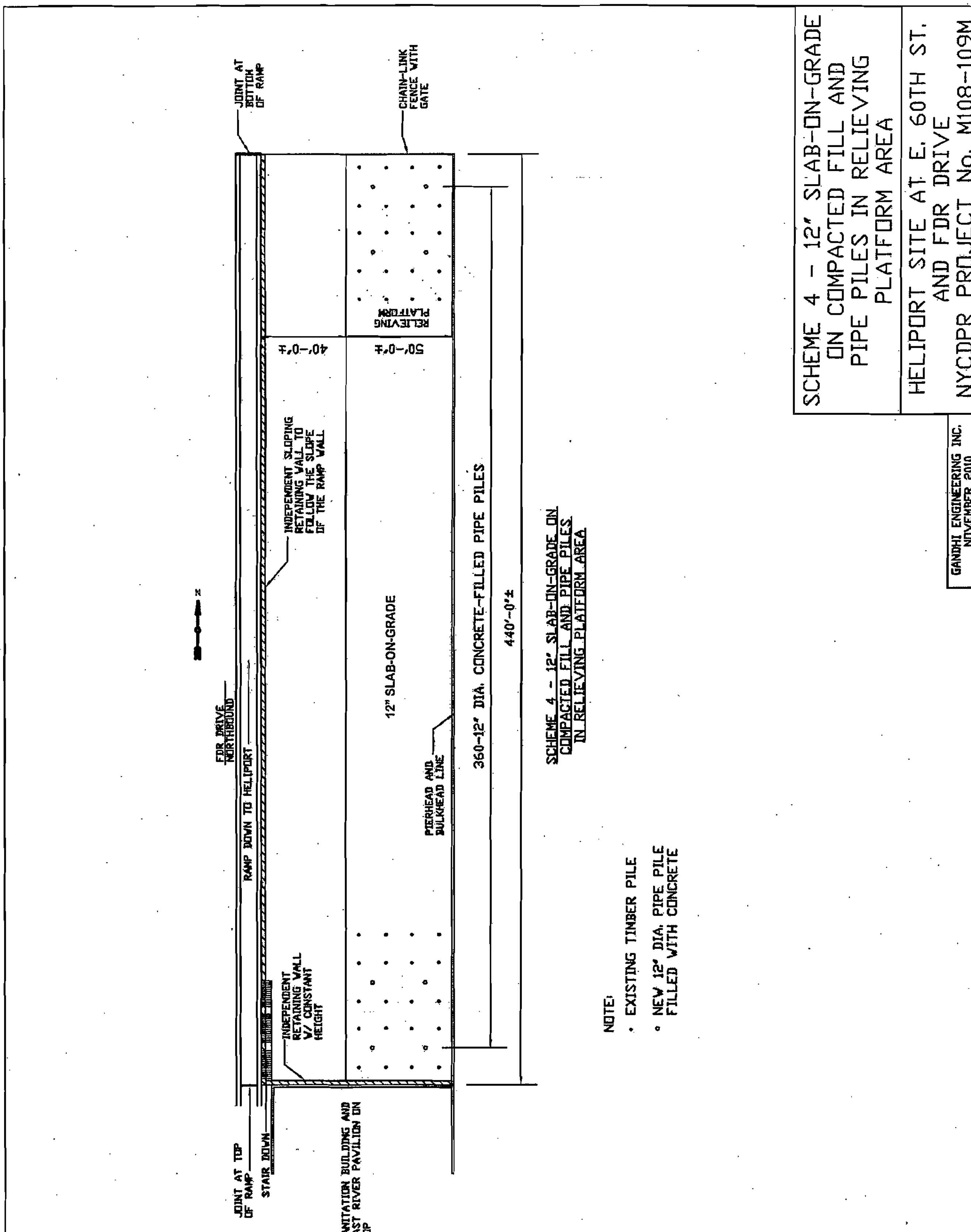
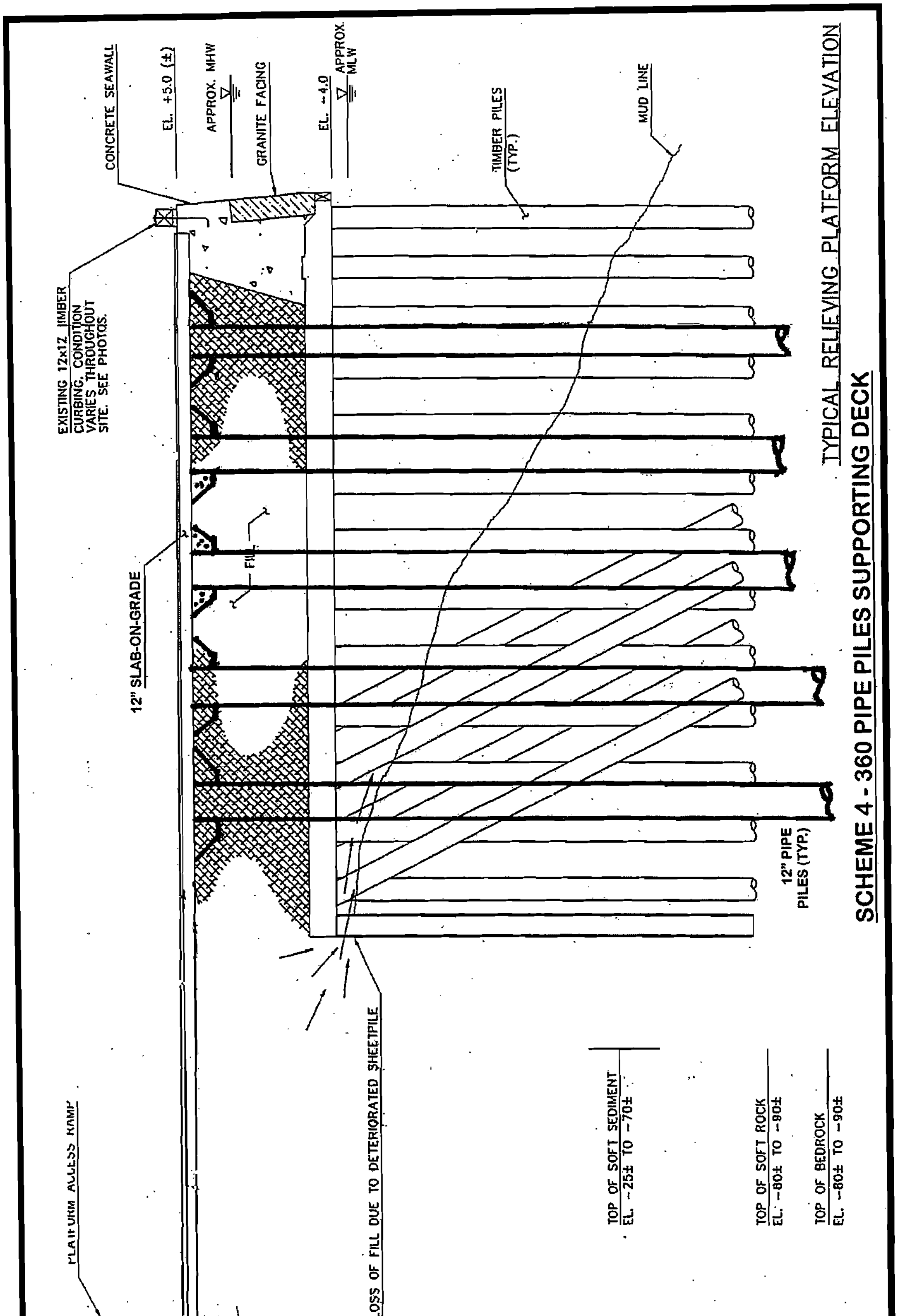

CONCRETE SEAWALL
EL. +5.0 (±)
APPROX. MHW
GRANITE FACING
EL. -4.0
APPROX. MLW
TIMBER PILES (TYP.)
MUD LINE
TYPICAL RELIEVING PLATFORM ELEVATION
EXISTING 12x12 TIMBER CURBING. CONDITION VARIES THROUGHOUT SITE. SEE PHOTOS.
ASPHALT PAVEMENT
18" THICK STRUCTURAL SLAB ON 18" DRILLED SHAFTS
FILL
SCHEME 3
LOSS OF FILL DUE TO DETERIORATED SHEETPILE
PLATFORM ACCESS RAMP
TOP OF SOFT SEDIMENT EL. -25± TO -70±
TOP OF SOFT ROCK EL. -80± TO -90±
TOP OF BEDROCK EL. -80± TO -90±

Figure 3-9



SCHEME 4 - 12" SLAB-ON-GRADE ON COMPACTED FILL AND PIPE PILES IN RELIEVING PLATFORM AREA
HELIPORT SITE AT E. 60TH ST. AND FDR DRIVE
NYCDPR PROJECT No. M108-109M
GANDHI ENGINEERING INC. NOVEMBER 2010
JOINT AT BOTTOM OF RAMP
CHAIN-LINK FENCE WITH GATE
RELIEVING PLATFORM
40'-0"±
50'-0"±
INDEPENDENT SLOPING RETAINING WALL TO FOLLOW THE SLOPE OF THE RAMP WALL
N
FDR DRIVE NORTHBOUND
RAMP DOWN TO HELIPORT
12" SLAB-ON-GRADE
360-12" DIA. CONCRETE-FILLED PIPE PILES
440'-0"±
SCHEME 4 - 12" SLAB-ON-GRADE ON COMPACTED FILL AND PIPE PILES IN RELIEVING PLATFORM AREA
PIERHEAD AND BULKHEAD LINE
INDEPENDENT RETAINING WALL W/ CONSTANT HEIGHT
NOTE:
· EXISTING TIMBER PILE
◦ NEW 12" DIA. PIPE PILE FILLED WITH CONCRETE
JOINT AT TOP OF RAMP
STAIR DOWN
SANITATION BUILDING AND EAST RIVER PAVILION ON TOP

Figure 3-10



CONCRETE SEAWALL
EL. +5.0 (±)
APPROX. MHW
GRANITE FACING
EL. -4.0
APPROX. MLW
TIMBER PILES (TYP.)
MUD LINE
TYPICAL RELIEVING PLATFORM ELEVATION
SCHEME 4 - 360 PIPE PILES SUPPORTING DECK
EXISTING 12x12 TIMBER CURBING, CONDITION VARIES THROUGHOUT SITE. SEE PHOTOS.
12" SLAB-ON-GRADE
FILL
12" PIPE PILES (TYP.)
LOSS OF FILL DUE TO DETERIORATED SHEETPILE
TOP OF SOFT SEDIMENT EL. -25± TO -70±
TOP OF SOFT ROCK EL. -80± TO -90±
TOP OF BEDROCK EL. -80± TO -90±

Figure 3-11

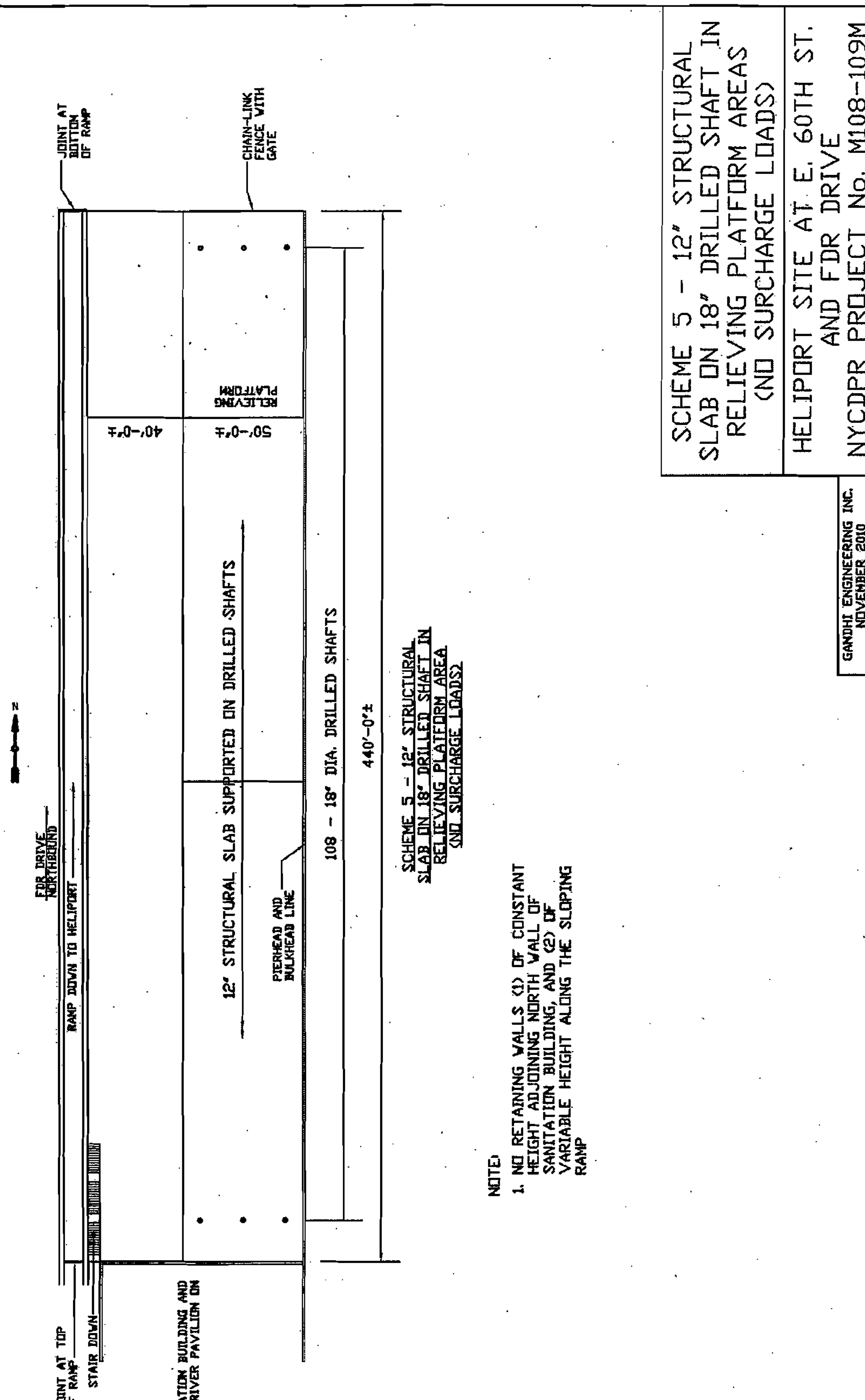

SCHEME 5 - 12" STRUCTURAL SLAB ON 18" DRILLED SHAFT IN RELIEVING PLATFORM AREAS (NO SURCHARGE LOADS)
HELIPORT SITE AT E. 60TH ST. AND FDR DRIVE
NYCDPR PROJECT No. M108-109M
GANDHI ENGINEERING INC. NOVEMBER 2010
JOINT AT BOTTOM OF RAMP
CHAIN-LINK FENCE WITH GATE
RELIEVING PLATFORM
40'-0"±
50'-0"±
N
FDR DRIVE NORTHBOUND
RAMP DOWN TO HELIPORT
12" STRUCTURAL SLAB SUPPORTED ON DRILLED SHAFTS
PIERHEAD AND BULKHEAD LINE
108 - 18" DIA. DRILLED SHAFTS
440'-0"±
SCHEME 5 - 12" STRUCTURAL SLAB ON 18" DRILLED SHAFT IN RELIEVING PLATFORM AREA (NO SURCHARGE LOADS)
NOTE:
1. NO RETAINING WALLS (1) OF CONSTANT HEIGHT ADJOINING NORTH WALL OF SANITATION BUILDING, AND (2) OF VARIABLE HEIGHT ALONG THE SLOPING RAMP
JOINT AT TOP OF RAMP
STAIR DOWN
SANITATION BUILDING AND EAST RIVER PAVILION ON TOP

Figure 3-12

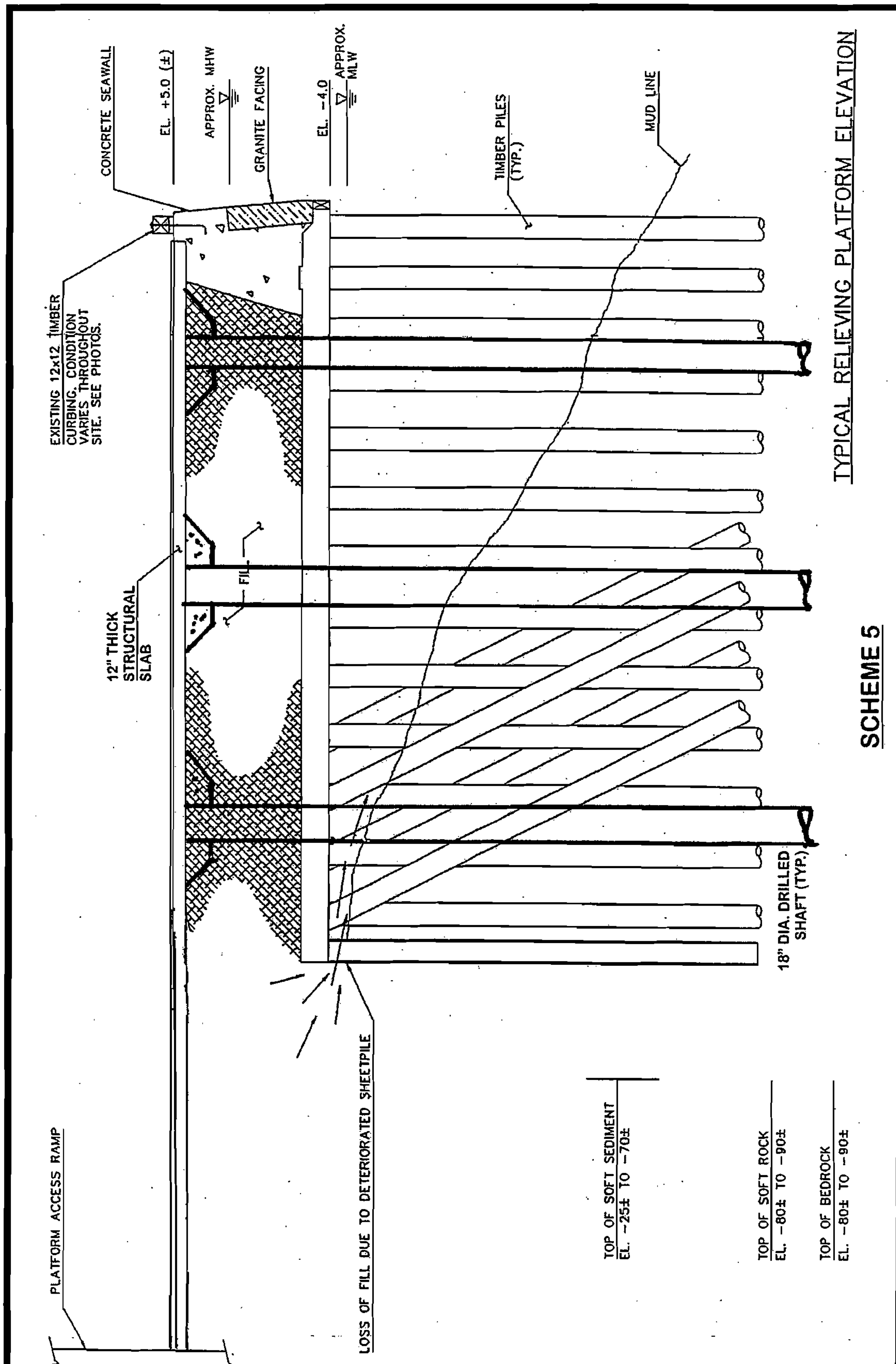

TYPICAL RELIEVING PLATFORM ELEVATION
SCHEME 5
CONCRETE SEAWALL
EL. +5.0 (±)
APPROX. MHW
GRANITE FACING
EL. -4.0
APPROX. MLW
TIMBER PILES (TYP.)
MUD LINE
EXISTING 12x12 TIMBER CURBING. CONDITION VARIES THROUGHOUT SITE. SEE PHOTOS.
12" THICK STRUCTURAL SLAB
FILL
18" DIA. DRILLED SHAFT (TYP.)
LOSS OF FILL DUE TO DETERIORATED SHEETPILE
PLATFORM ACCESS RAMP
TOP OF SOFT SEDIMENT EL. -25± TO -70±
TOP OF SOFT ROCK EL. -80± TO -90±
TOP OF BEDROCK EL. -80± TO -90±

Figure 3-13

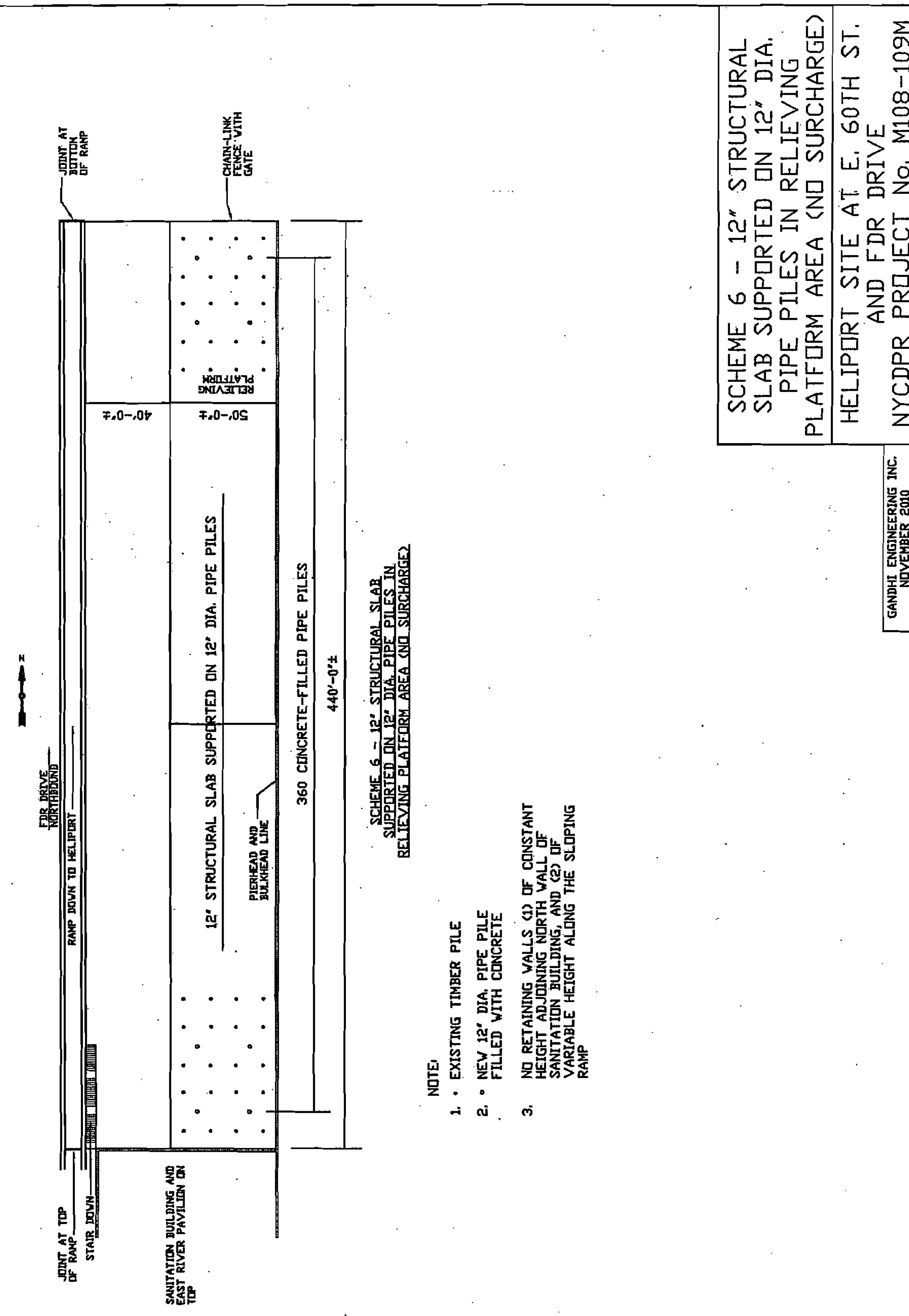

SCHEME 6 – 12" STRUCTURAL SLAB SUPPORTED ON 12" DIA. PIPE PILES IN RELIEVING PLATFORM AREA (NO SURCHARGE)
HELIPORT SITE AT E. 60TH ST. AND FDR DRIVE
NYCDPR PROJECT No. M108-109M
GANDHI ENGINEERING INC.
NOVEMBER 2010
JOINT AT BOTTOM OF RAMP
CHAIN-LINK FENCE WITH GATE
RELIEVING PLATFORM
40'-0"±
50'-0"±
FDR DRIVE NORTHBOUND
N
RAMP DOWN TO HELIPORT
12" STRUCTURAL SLAB SUPPORTED ON 12" DIA. PIPE PILES
PIERHEAD AND BULKHEAD LINE
360 CONCRETE-FILLED PIPE PILES
440'-0"±
SCHEME 6 – 12" STRUCTURAL SLAB SUPPORTED ON 12" DIA. PIPE PILES IN RELIEVING PLATFORM AREA (NO SURCHARGE)
NOTE:
1. • EXISTING TIMBER PILE
2. ∘ NEW 12" DIA. PIPE PILE FILLED WITH CONCRETE
3. NO RETAINING WALLS (1) OF CONSTANT HEIGHT ADJOINING NORTH WALL OF SANITATION BUILDING, AND (2) OF VARIABLE HEIGHT ALONG THE SLOPING RAMP
JOINT AT TOP OF RAMP
STAIR DOWN
SANITATION BUILDING AND EAST RIVER PAVILION ON TOP

Figure 3-14

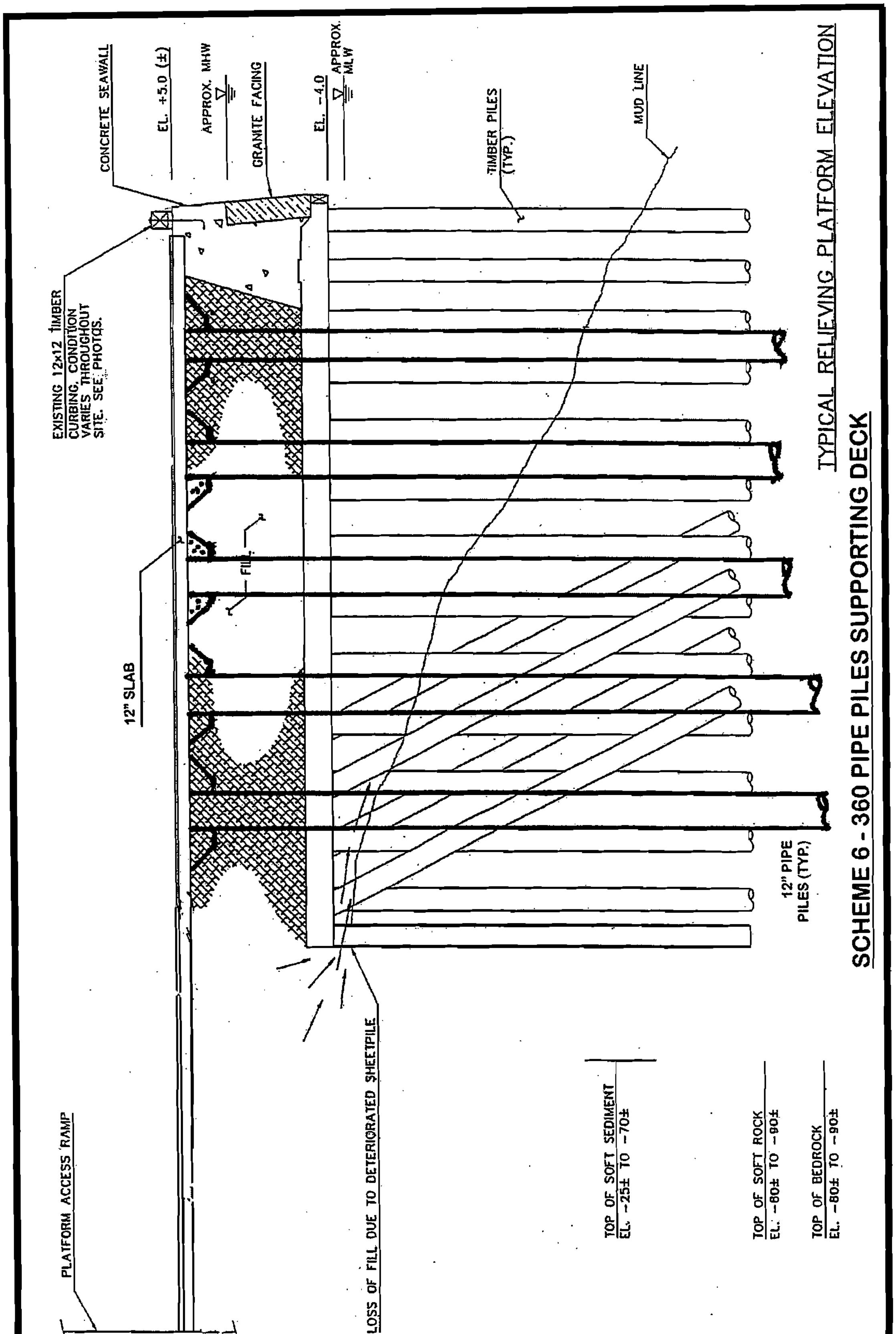

CONCRETE SEAWALL
EL. +5.0 (±)
APPROX. MHW
GRANITE FACING
EL. -4.0
APPROX. MLW
TIMBER PILES (TYP.)
MUD LINE
TYPICAL RELIEVING PLATFORM ELEVATION
EXISTING 12x12 TIMBER CURBING. CONDITION VARIES THROUGHOUT SITE. SEE PHOTOS.
FILL
12" SLAB
12" PIPE PILES (TYP.)
SCHEME 6 - 360 PIPE PILES SUPPORTING DECK
PLATFORM ACCESS RAMP
LOSS OF FILL DUE TO DETERIORATED SHEETPILE
TOP OF SOFT SEDIMENT EL. -25± TO -70±
TOP OF SOFT ROCK EL. -80± TO -90±
TOP OF BEDROCK EL. -80± TO -90±

Figure 3-15

4. RECOMMENDATIONS

It is our understanding that the DPR currently has no funds to rehabilitate / strengthen the existing pier, and it may be difficult in the near future to obtain the funds necessary to rehabilitate the pier, and build the park due to the worst economic slowdown since the Great Depression in the 1930s.

We make the following two recommendations:

1. If there are no funds available to rehabilitate the pier, we recommend performing an underwater inspection once every two years, and monitoring certain piles by measuring their diameters at each such inspection. The piles should include both protected and exposed, and should be evenly distributed under the relieving platform. Based on the measured diameters, the load carrying capacity of the platform should be calculated. The estimated cost of one such inspection is estimated at $100,000 using 2011 prices.

2. If funding is available, then we recommend to rehabilitate the relieving platform using Scheme 1 and to build the new park designed by the DPR. The estimated cost for this rehabilitation is $16,775,200 using 2011 prices; and it does not include the cost of a new park.

AECOM

East Midtown Waterfront Esplanade

Marine Structures Condition

Survey & Structural Assessment

Prepared for

New York City Economic Development Corporation

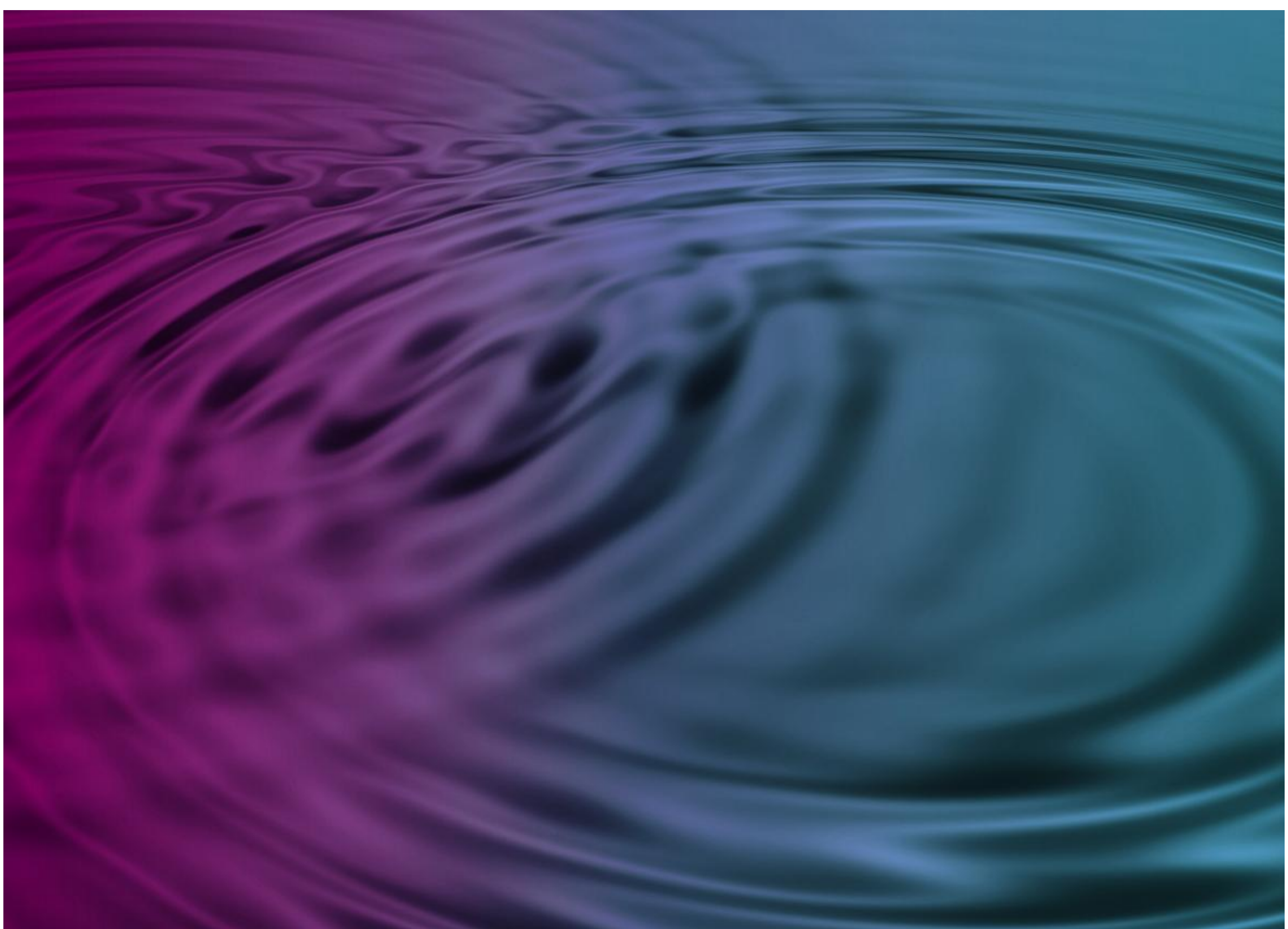
Prepared by

AECOM

20 Exchange Place\New York, NY, 10005

www.aecom.com

January 2011



East Midtown Waterfront Esplanade-

Marine Structures Condition Survey & Structural Assessment

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4. 371016 - McLaren Engineering Group, Existing Conditions Plan, 04/17/09
5. 371017 - McLaren Engineering Group, Demolition Plan, 04/17/09
6. 371020 - McLaren Engineering Group, Existing and Repair Pile Bent Section - 1, 04/17/09
7. 371021 - McLaren Engineering Group, Existing and Repair Pile Bent Section - 2, 04/17/09

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Executive Summary

<u>Waterside Pier</u>

AECOM has been engaged by the NYCEDC to perform a condition survey and structural assessment, and to prepare construction documents for the rehabilitation or replacement of the Waterside Pier affording long term use as part of the envisioned esplanade. The approach for the condition inspection entailed a visual and tactile survey of the piles, pile caps, and soffit and deck elements comprising the Waterside Pier, followed by laboratory analysis of samples taken. The conclusion for the main elements examined:

- The concrete deck was found to be in poor condition and at the current rate of chloride ingress, preventative works will not be feasible, and it requires replacement.
- Approximately 22% of the timber support piles are in advance or severe condition. The recommended remediation for these piles is to install a concrete jacket around hour-glassing deterioration zones found predominantly in and above the tidal zone and to encapsulate the remaining pile length to two feet below the mud line. All other repurposed piles should receive similar encapsulating repairs to preserve existing conditions and to achieve 75 year life expectancy of the pier.
- More than 50% of the timber piles are no longer bearing on deteriorated timber pile cap. Instead of replacing pile caps, AECOM recommends integrating the concrete jacket repair into the proposed new deck. This will also eliminate having to replace the severe/ missing diagonal and low-water timber bracing and repairing battered timber piling.
- There is currently not enough information available to assess the south platform caissons on south side. Thickness measurements recorded suggests the steel is non-structural casing used as formwork for concrete infill. Further tests would need to be performed to access the condition of the concrete inside if this element were repurposed, however AECOM recommends such tests not occur as the caissons are tied together with concrete walls extending into tidal zone that will remain subject to repeated deterioration and spalling, and as such recommend these caissons not to be reused.

<u>Outboard Detour Roadway Esplanade Conversion Project (ODR) Caissons</u>

AECOM has also been assigned by the NYCEDC to survey the existing/ remaining ODR caissons for repurposed use as part of the foundations for the new esplanade.

These uncoated caissons have less than 10% section loss and can be repurposed as part of the envisioned esplanade, and with recoating or encapsulation will further extend life expectancy.

1.0 Introduction

1.1 Project Scope

AECOM has been engaged by the New York City Economic Development Corporation (NYCEDC) to perform a condition survey and assessment, and to prepare construction documents for the rehabilitation and/or replacement of the Waterside Pier affording long term repurposed use.

The objectives of the work are principally to:

- Conduct a visual inspection and diagnostic testing of structural elements to determine the extent of deterioration
- Determine the future deterioration profile and remaining service life of primary structural elements
- Develop remediation options to maintain the structure to design capacity
- Prepare cost estimates of the various repair and replacement options
- Provide recommendations and cost budget for remedial works

At this time this report presents the detailed condition survey results of Waterside Pier, which encompasses inspection, sampling and testing undertaken in October 2011, as well as survey result of ODR caissons undertaken in December 2011. One page summary sheets for each location where diagnostic testing was undertaken, are presented in Appendix F.

1.2 Waterside Pier

Waterside Pier is located on the west bank of the East River between E38th St and E41st Street in Manhattan. It is 834 feet in length and is currently not in use. The load limits for the structure currently restrict vehicular access and no public access is allowed.

Waterside Pier comprises a south platform and a north platform. Both platforms are high-level relieving platforms typically composed of a concrete deck slab supported by timber pile caps and piles. The South Platform is 472 ft long and the North Platform is 362 feet long. The piles are arranged in 129 east-west-spanning bents, and each bent contains a 12-inch by 12-inch timber pile cap. Along the outboard edge of the pier, a 12-inch by 12-inch north-south "ranger" cap spans transverse to the pile caps. A timber fender system is affixed directly to the outboard side of the primary structure. Previous reports indicate that the concrete slab is a 15-inch thick concrete slab, reinforced with #7 bottom steel at six inches on-center in the longitudinal direction and #5 rebar at twelve inches on-center in the transverse direction, and the top steel is 6x6-W4xW4 welded wire fabric. To the west abutting the Waterside Pier structure is a concrete seawall atop a low-level platform - considered part of the FDR Drive and representing the western limit of the Waterside Pier structure. Previous reports[1] have stationed the pier, beginning with Station 0+00 at the south edge and ending with Station 4+72 at the north edge of the South Platform, and up to Station 8+34 at the northernmost edge of the North Platform. A chain-link fence marks the boundary between the platforms any impedes vehicles from entering onto the North Platform. Vehicular access to the pier is thru a locked gate on the South Platform only. Refer to Appendix B for drawings of the structure.[1]

In-keeping with the nomenclature of the 2008 and 2010 inspection/assessment reports, the platforms are segregated as follows:

- South Platform - Section 1 (0+00 to 0+82)
- South Platform - Section 2 (0+82 to 1+54)
- South Platform - Section 3 (1+54 to 2+85)
- South Platform - Section 4 (2+85 to 4+72)
- North Platform - Section 5 (4+72 to 8+35)

---

[1] McLaren Report 2008 and 2010

This division relates largely to the change in structure elements and conditions previously discovered. The general arrangement of the wharf is presented in drawings in Appendix A.

The sections of wharf which were inspected by divers are shown in Figures 3 to 8 in Appendix B. The location of test cores is also indicated on these drawings.

1.3 Outer Detour Roadway (ODR) Esplanade Caissons

ODR Esplanade involves investigating existing conditions for the reuse of 24 structural steel caissons. The caissons are constructed of 3/4inch thick steel and have an outer diameter of 54 inches. They were originally installed in the East River in 2002 to support the temporary ODR roadway during the reconstruction of a portion of the FDR Drive. EDC would like to repurpose these caissons, as contributing support structures for a new esplanade structure between approximately 52rd Street and 58th Street. It is anticipated that the caissons will be retrofitted as permanent supports, and that a new system of tie-backs (if necessary) to the existing bulkhead and FDR structure, or other necessary piling, will support the new esplanade structure. Consideration for the maintenance of the FDR bulkhead in the proposed design is required. A preliminary feasibility assessment conducted in 2008 confirmed the viability of this reuse program.

The caissons that were inspected by divers are shown in Figure 2 in Appendix B.

1.4 Programming Requirements (Waterside Pier)

1.4.1 Loads

Design loads will be determined in the concept phases, and design will follow the New York City Building Code, and ASCE 7 Minimum Design Loads for Building and Other Structures. The Waterside Pier, whether rehabilitated or new construction, will be designed to support uniform reuse loads and further improvements may be constructed in phases after park design is finalized.

Assumptions used as place holders are:

- Unit weight of concrete = 150 lb/ft3
- Architectural Finishes = 150psf to 350psf, or more (will be vetted during Concept Design)
- Live Load =100psf for pedestrians
- Snow Load = 30psf
- Impact = 15%

1.4.2 Exposure Environment

Waterside Pier is located in the East River in a relatively turbulent location with wave action at the site generally limited to small to medium waves generated by general harbour traffic as well as the adjacent east river fast ferry terminal, and from fetch. The water is sea water at seabed level and brackish water at the surface. The salinity of the water varies with tidal movements, storm runoff and mixing due to turbulence and wind effects.

1.4.2.1 Tide Levels

National Ocean Service data (NOAA) was used to derive tide levels at the site. Utilizing data collected during the 1983-2001 tidal epoch for Stations 8518750 (The Battery), 8518699 (Williamsburg Bridge) and 8518687 (Queensboro Bridge), tidal conditions near the E41st St location in Manhattan Borough Datum (MBD) are approximated as follows:

Highest Observed Water Level (HOWL)	+5.53 ft.
Mean Higher High Water (MHHW)	+0.57 ft.
Mean High Water (MHW)	+0.24 ft.
Manhattan Borough Datum	+0.00 ft
Mean Low Water (MLW)	-4.06 ft.
Mean Lower Low Water (MLLW)	-4.26 ft.
Lowest Observed Water Level (LOWL)	-8.55 ft.

1.4.2.2 Expected Tide Levels due to Climate Change

It is noted that forecast sea level rise due to climate change is projected to increase up to 23 inches by 2080, and with rapid ice melting increase by up to 55 in. above existing tide levels. Refer Table 1 and Table 2 for data.

Table 1[2] – Expected Tide Level Adjustment due to Climate Change

	Baseline (1971 to 2000)	2020s	2050s	2080s
Sea level rise	N/A	5.1 to 12.7cm (+2 to 5 in.)	17.8 to 30.5cm (+7 to 12 in.)	30.5 to 58.4cm (+12 to 23 in.)
Sea level rise (Rapid ice melting)	N/A	12.7 to 25.4cm (+5 to 10 in.) -	48.3 to 73.7cm (+19 to 29 in.)	104.1 to 139.7cm (+41 to 55 in.)

Table 2[3] - Expected Tide Level Adjustment due to Climate Change

	Baseline (1971 to 2000)	2020s	2050s	2080s
Sea level rise Global Climate Model Based	N/A	+1 to 5 in.	+5 to 12 in.	+8 to 23 in.
Sea level rise (Rapid ice melting)	N/A	+4 to 10 in.	+17 to 29 in.	+37 to 55 in

Based on drawing A99038-16 in Appendix A, the Waterside Pier existing top of deck elevation is +4.28 feet in Manhattan Borough Datum. In consideration of the above discussed and wave climatology for the site, the top of new deck elevation would be established higher than currently exists. Recommendations on minimum deck elevations will be studied during Concept Design.

1.4.3 Design Life

For the purposes of the rehabilitation or for new structure, the design life is defined as the number of years the structure will remain serviceable to the loads defined in Section 1.4.1. The design life of the structure is planned as 75 years.

[2] Source: C. Rosenzweig and W. Solecki, New York City Panel on Climate Change, “Climate Change Adaption in New York City: Building a Risk Management Response,” *Annals of the New York Academy of Sciences* ``96, (2010)

[3] ClimAID, Responding to Climate Change in new York State: The Synthesis Report of the Integrated Assessment for Effective Climate Change Adaptation Strategies in New York State., Nov 1, 2010

2.0 List of Previous Reports

The following reports were reviewed as part of the scope of this work and used as background to the investigation:

- United Engineers & Constructors, 'Consolidated Edison Company of New York Inc. Waterside Generating Station: Waterfront Facilities Inspection Report', 1993.
- Sidney M. Johnson and Associates, 'Consolidated Edison Waterfront Inspection Waterside Generating Station, 1996.
- Mueser Rutledge Consulting Engineers, 'Consolidated Edison Company: Waterfront Inspection - Waterside Generating Station, 1999.
- SMJ Engineering Associates of New York, 'Inspection Report of Findings for Waterside Dock Between E. 38th St. And E. 41st St. New York, New York. August 2004.
- The McLaren Engineering Group, 'Repair Design and Condition Survey: The Waterside Dock East 38th St. – East 42st St. New York City, NY. November 2008.
- The McLaren Engineering Group, 'Load Rating Report: The Waterside Dock East 38th St. –East 41st St. New York City, NY. March 2010.

3.0 Site Investigation and Testing Methodology

This section summarizes the methodology by which the conditions of waterfront structures were assessed.

AECOM surveyed the Waterside Pier from 17th of October to the 21st of October 2011 accompanied by Fathom Solutions LLC Diving Services. Topside site inspections and deck concrete testing were carried out by AECOM engineers, while under deck and underwater inspections of concrete, timber and steel elements was performed by Fathom. Laboratory testing was undertaken by AECOM's Laboratory Services Division.

The approach adopted for the condition assessment entailed a visual and tactile survey of the piles, pile caps, soffit and deck elements, followed by laboratory analysis of samples. The diver determined the extent of deterioration for visually inspected portions of the structure by estimating remaining cross-sectional area, and/or observing broken piles, displaced piles, non-bearing piles, marine borer activity, ect. The "hands-on" inspections included measurements of water depth and remaining cross-sections, and probing timber elements with a pick probe. All elements were inspected and rated following NYCEC- Waterfront Inspection Manual Procedures. Appendix C describes deterioration due to marine organism and other factors in detail. In order to determine with reasonable certainty the appropriate types of repairs for each pile condition classification, a detailed inspection was undertaken at representative locations for each of the 5 sections of the Waterside Pier. The pile and pile cap condition summary percentages are those of the detailed inspected areas, and may be extrapolated for estimating repairs for the entire structure.

Fathom Solutions surveyed the ODR caissons on 6th of December 2011 and on the 13th of December 2011. The diver took UTM on 4 sides at 3 elevations – 2 feet above mud, at waterline, and at mid depth; mid depth UTMs may be omitted if water depth was less than 8 feet. The diver also noted any significant damage or deterioration.

3.1 Visual Survey

The first phase of the condition assessment was a visual survey of structural elements to determine the type, geographical spread and size of defective areas.

The Inspection encompassed:

- Visual survey of all elements, tactile using hammers and pick probing to assess existing deterioration
- Limited delamination survey of the concrete deck
- Determining the condition of the structure based on the EDC inspection manual
- Photographic survey of a selection of elements
- Selection of locations for Covermeter Survey, and for core testing and analysis

3.2 Testing

The second phase of the condition assessment involved the following on site testing:

- Non destructive testing (NDT) - covermeter survey of deck concrete at core test locations
- Retrieval of concrete cores for laboratory testing

Laboratory testing of the concrete deck comprised the following:

- Locating the steel reinforcement, assessing the condition of steel reinforcement and confirming the reinforcement cover
- Chloride content for the full depth of the full penetration cores at minimum 12 depth increments through the concrete for establishing corrosion mechanism/threat to reinforcing steel
- Compressive strength for partial penetration cores to determine the compressive strength at various locations across the pier

Detailed testing of Waterside Pier and ODR steel caissons included the following:

- Surface preparation of steel to remove scale and marine growth
- Measurement of remaining steel thickness with an ultrasonic thickness tester at three elevations
- Estimation of pitting depth
- Reporting of any zero thickness areas

4.0 Assessment of Condition

This section presents the results of the investigations undertaken to assess the condition of individual structural elements. The summary of notes from the diving inspection are located in Appendix D, and one page test summary sheets for topside testing are provided in Appendix F.

The results are divided into the four main structure elements (i.e. timber piles, pile caps, concrete deck, and timber fender and accessories).

4.1 Timber Piles (Waterside Pier)

4.1.1 Visual Condition Observed

The following observations were identified from the visual inspection of the timber piles by divers. The inspection was undertaken in accordance with the New York City Economic Development Corporation Waterside Facilities Maintenance management System Inspection Guidelines Manual.

Piles described as advance and severe general had 25% or more of section loss in the upper 6 to 8 feet. It is important to note the percentages presented in Table 3 and in discussion are based on piles inspected by underwater inspection and swim by.

4.1.1.1 South Platform (Bent 0 to Bent 55)

- Typically in moderate condition, 62%, and 8% in minor condition. The remaining 28% were in advanced to severe condition above low water in the upper 6 to 8 feet portion of each pile.
- The worst deterioration was typically observed in pile rows A and B.
- Piles previously rated advanced to severe are experiencing continued section loss over increased length and numerous new piles have deteriorated into this category.

4.1.1.2 North Platform (Bent 55 to Bent 129)

- The majority of timber piles (73%) are in moderate condition, therefore in better condition than piles in the south platform and 14% of the piles were in minor condition. The remaining 13% were in advanced to severe condition above low water within the upper 6 to 8 feet region.

Table 3 Timber Pile Visual Inspection Results (See Figures 3 to 8 in Appendix B for limits of Sections)

Pile Disrepair Percentages					
Condition	South Platform				North Platform
	Section 1	Section 2	Section 3	Section 4	Section 5
Minor	30%	19%	2%	0%	14%
Moderate	44%	58%	67%	74%	73%
Advanced	15%	17%	21%	9%	11%
Severe	11%	6%	10%	17%	2%

4.1.2 Remaining Service Life

Typically the worst deterioration was observed in the upper 6 to 8 feet of pile with isolated deterioration extending lower. The majority of piles in both the north and south platform were in moderate condition. Given the rate of deterioration observed since last inspected in 2008, it is likely that the all piles will be in advanced condition within the next 10 years.

As has been observed on a number of similarly constructed structures, piles can appear to be sound and rated as moderate condition, but have lost considerable interior section due to moisture ingress from the pile cap level, and/ or from marine border activity. This is likely to have occurred in this structure at various locations given the generally poor condition of the timber pile caps on this structure. Therefore estimations of moderate /minor are likely to be low compared with the actual condition.

In order to satisfy a 75 year design life, all repurposed piles will require either rehabilitation otherwise the structure should be replaced, refer Section 5.0.

4.2 Pile Caps (Waterside Pier)

4.2.1 Visual Condition Observed

The following observations were identified from the visual inspection of the timber pile caps by divers. The limits of the detailed visual inspection are described in Appendix B. The inspection was undertaken in accordance with the New York City Economic Development Corporation Waterfront Facilities Maintenance management System Inspection Guidelines Manual.

South Platform (Bent 0 to Bent 55)

- The timber pile caps are typically in fair condition having sufficient section and providing adequate bearing.
- Approximately 10% of pile caps are heavily deteriorated and not providing for pile bearing.

North Platform (Bent 55 to Bent 129)

- The North platform consists of three deck types, typical thickness (15"), thickened deck >15" including drop down concrete areas. The thicker deck is assumed to have served as support for ConEd crane way or speciality equipment.
- It is approximated that 80% of the caps beneath the regular thickness and thickened deck areas have widespread lack of bearing for the deck; reducing the load-carrying capacity throughout a significant portion of this section of the platform.

Table 4 - Pile Caps Visual Inspection Results

	South Platform	North Platform
Pile Caps Requiring Replacement (%)	10%	80%

4.2.2 Remaining Service Life

The pile caps are expected to continue to deteriorate and are difficult to remediate as replacement is labour intensive, and encapsulation is not an effective repair option due to geometric constraints. Further, it is not recommended to install new timber pile caps as they will not be able to satisfy a 75 year life extension, therefore it is recommended that the new deck be designed without timber pile caps, and instead be designed as either a two-way slab without concrete caps or as a one-way slab using precast panel planks and precast caps. Refer Section 5.0 for additional information on the new deck.

4.3 Deck (Waterside Pier)

4.3.1 Visual Condition Observed

Extensive delamination and spalling of concrete occurs on an estimated 15% of the overall soffit area with exposed and corroded reinforcement visible in the extreme circumstance. Topside, cracking of the deck is extensive and covering all deck areas. Further the deck was constructed having an atypical pattern of cold concrete joints and expansion joints. Core samples from representative locations along the wharf were tested for compressive strength and for chloride penetration; results are summarized below:

4.3.1.1 South Platform (Bent 0 through 55)

Compressive strength ranged from 4,640 to 6,200 psi, which is within range typically specified for cast-in-place marine construction work. The average chloride concentration at rebar depth (roughly 2-1/2" as evident from core samples taken) was 0.08% (wt/concrete). This is greater than that required for activation of corrosion (0.06% wt/concrete) at all locations, meaning corrosion of the reinforcement is active and will be ongoing even if the concrete is repaired, or if barrier coatings are applied.

4.3.1.2 North Platform (Bent 55 through 129)

Compressive strength of 3,830 psi fall marginally below typical strengths specified in marine construction. The average chloride concentration at rebar depth (roughly 2-1/2" as evident from core sample taken) was 0.07% (wt/concrete). This is greater than that required for activation of corrosion (0.06% wt/concrete) at all locations, meaning corrosion of the reinforcement is active and will be ongoing even if the concrete is repaired, or if barrier coatings are applied.

Portions of this North Platform are built as deep beams that extend to roughly low water (in support of a previous use, likely a crane runway), which makes repairs to the deep beam soffit concrete in this area arduous work.

Table 5 Summary of Testing of Reinforced Concrete Deck

TESTING	RESULTS
Cover	Cover to main bars was found to be approximately 2.5 in.
Steel Condition	Longitudinal bars appeared to have some surface corrosion, Longitudinal bars and transverse bars were observed to be no. 6 bar
Laboratory testing	Chloride testing indicated that all of the deck locations had reached the corrosion threshold at cover depth.

Laboratory data test certificates are attached in Appendix G. Summary sheets showing the results of chloride testing, chloride ingress modelling and Covermeter data are presented in Appendix F.

4.3.2 Remaining Service Life

At all locations tested, the chloride levels were found to be high at the bar depth, indicating that corrosion had initiated several years ago. Using the chloride profiles obtained from the deck, the deterioration was modelled based on chloride ingress from both directions. The modelling indicated that the deck is nearing the end of its service life, which correlates with the large percentage of spalled or delaminated concrete areas found during the visual inspection.

Barrier coatings and concrete patch repairs will provide no long-term (less than 20 years) durability and electrochemical methods such as cathodic protection or chloride extraction will have limited success due to a lack of electrical continuity in the reinforcement of the structure, and typically are not cost effective given the circumstances. Refer Appendix C for further discussion of repair options for reinforced concrete.

In order to satisfy a 75 years design life, a new deck designed for future loads is recommended.

4.4 Caissons

4.4.1 Waterside Pier Caissons

The caissons were ultrasonically tested to measure the remaining thickness of steel section. The results are presented in Table 6 and readings were taken at the caisson between Bents 21 and 22. The following are typical observations of the condition of the steel caissons:

- The caissons are typically exposed concrete from mid tide level and above due to tidal zone completely deteriorating it. The exposed concrete in the tidal zone was in minor condition, with no significant deterioration observed.
- The steel casing was typically in place below MLW. The steel typically exhibited pits with approximate depth of 1/8 in pitting.
- Surface is generally rough with no remaining coating evident.

Table 6 Summary of UT Measurements for Waterside Pier

	Depth Below Water		
Face of Caisson	**12'**	**18'**	**25'**
East	No readings; Steel easily removed	0.165" 0.125"	0.290"
North	No readings; Steel easily removed	0.120" 0.120" 0.120"	0.125"
South	0.120" 0.120" 0.120"	0.120" 0.120"	0.125" 0.120" 0.120" 0.125"
West	No readings; Steel easily removed	0.120" 0.335" 0.335" 0.335" *	0.125" 0.125"

* Reading taken over smooth steel

4.4.2 ODR Esplanade Caissons

The caissons were ultrasonically tested to measure the remaining thickness of steel section on sixteen of the twenty four piles. The results are presented in Table 7. The following are typical observations of the condition of the steel caissons:

- The caissons are typically in good condition, experiencing minor amount of section loss, less than 10%.
- Surface generally clean steel (unpainted) with little or no pitting.

Table 7 Summary of UT Measurements for ODR

Pile No.	Location of Reading	North Face	South Face	East Face	West Face	Overall Length of Pile
1	Top	0.72	0.725	0.7	0.725	36' 6"
	Mid	0.685	0.69	0.7	0.69	
	Bottom	0.735	0.725	0.72	0.725	
2	Top	0.655	0.655	0.65	0.6	**36'**
	Mid	0.7	0.705	0.69	0.685	
	Bottom	0.73	0.725	0.735	0.73	
3	Top	0.685	0.69	0.69	0.685	36'
	Mid	0.7	0.71	0.715	0.7	
	Bottom	0.725	0.735	0.73	0.73	
4	Top	0.68	0.685	0.66	0.69	33' 6"
	Mid	0.73	0.705	0.715	0.715	
	Bottom	0.725	0.7	0.73	0.725	
5	Top	0.67	0.66	0.665	0.69	40' 6"
	Mid	0.705	0.69	0.7	0.73	
	Bottom	0.735	0.715	0.725	0.725	
6	Top	0.685	0.67	0.68	0.665	42'
	Mid	0.705	0.715	0.7	0.715	
	Bottom	0.725	0.72	0.73	0.715	
7	Top	0.665	0.695	0.685	0.67	19' 10"
	Mid	Shallow	Shallow	Shallow	Shallow	
	Bottom	0.7	0.695	0.72	0.73	
8	Top	0.715	0.7	0.7	0.695	15' 10"
	Mid	Shallow	Shallow	Shallow	Shallow	
	Bottom	0.735	0.715	0.715	0.7	
9	Top	0.7	0.695	0.69	0.685	17'
	Mid	Shallow	Shallow	Shallow	Shallow	
	Bottom	0.735	0.715	0.72	0.72	
10	Top	0.685	0.69	0.7	0.685	43'
	Mid	0.7	0.715	0.715	0.72	
	Bottom	0.735	0.73	0.725	0.725	
11	Top	0.69	0.69	0.715	0.695	43'
	Mid	0.715	0.72	0.72	0.735	
	Bottom	0.7	0.725	0.735	0.72	
12	Top	0.7	0.715	0.695	0.69	47' 6"
	Mid	0.715	0.7	0.725	0.72	
	Bottom	0.725	0.72	0.73	0.735	
13	Top	0.685	0.7	0.71	0.695	45' 6"
	Mid	0.725	0.705	0.715	0.725	
	Bottom	0.735	0.725	0.725	0.73	
14						48'
15						49'
16	Top	0.695	0.705	0.7	0.7	49'
	Mid	0.715	0.725	0.73	0.72	
	Bottom	0.725	0.73	0.73	0.735	
17						47'
18						36'
19	Top	0.7	0.665	0.685	0.675	27'
	Mid	0.715	0.725	0.725	0.715	
	Bottom	0.735	0.72	0.73	0.735	
20						24'
21						14' (7' of water)
22	Top	0.695	0.675	0.68	0.7	11' 8"
	Mid	Shallow	Shallow	Shallow	Shallow	
	Bottom	0.725	0.7	0.73	0.72	
23	Top	0.715	0.7	0.695	0.7	13'
	Mid	Shallow	Shallow	Shallow	Shallow	
	Bottom	0.725	0.735	0.72	0.72	
24						17'

Top= waterline Mid= mid depth Bottom= 2' above the mudline

4.4.3 Remaining Life

4.4.3.1 Waterside Pier Caissons

The caissons comprise concrete filled steel pipe. The steel pipe is thought to have been used for formwork during construction due to the thin cross-section observed during the inspection. It is thought this area of the pier (Section 3) may have past supported atypical loading from large equipment.

Based on the UTM's and observation, it was concluded that the steel casing around the Waterside Pier Caissons were non-structural forms. At this time we have no information about the condition of the concrete inside the form, therefore cannot make an accurate assessment of the life expectancy of the caissons.

4.4.3.2 ODR Esplanade Caissons

The steel caissons are in good structural condition. Their remaining life may be extended by coating or encapsulating the uncoated steel to control deterioration that commence once the uncoated caisson were installed.

4.5 Timber Fendering and Accessories (Waterside Pier)

4.5.1 Visual Condition Observed

The timber fendering and timber fender piles are heavily deteriorated and collapsing along the entire length of Waterside Pier. The deterioration ranges from loose and heavily corroded hardware, to missing sections of fendering where piles are broken and fender beams have fallen into the water.

The timber diagonal and low water cross-bracing and associated hardware were in poor condition. The timber has typically lost significant cross section where it is not already entirely missing and the hardware generally snaps off when inspected.

4.5.2 Remaining Service Life

Based on an expected service life of 40 years for new timber fender piles and fendering, and given the age of the structure which is minimum 70 years, the fendering has no remaining service life. In order to satisfy the 75 year design life it will be necessary to remove and replace all timber fenders and fender piles including associated hardware. Ongoing inspection in addition to replacement of all fendering will be necessary every 40 years to ensure they remain serviceable if timber is used, otherwise longer service life may be achieved by using plastic- based materials.

All timber bracing and associated hardware should be removed across the structure (both North and South Platforms), with other means of bracing the pier introduced. See the Remedial Options Section 5.2.2.

5.0 Remedial Options and Cost Estimates

Outlined in this section are proposed remedial options and cost estimates for Waterside Pier based on the findings of the inspections as outlined in Section 4.0. The appropriate remedial solution will be selected based on the following durability requirements:

1. Current condition of the structure,
2. Predicted rate and extent of deterioration (in the absence and following the implementation of a repair solution such as patch repair as discussed below),
3. Environmental conditions,
4. Service life
5. Suitability and anticipated life of each repair solutions,
6. Cost of the remedial options, both the initial cost and the life-cycle cost

5.1 Rehabilitation

5.1.1 Concrete Deck (Waterside Pier)

As discussed in Section 4.3 it is not feasible to extend the life of the existing deck primarily for the following reasons:

- The concrete has high concentrations of chlorides in both the top side and soffit of the deck
- The concrete area requiring patch repair is very high, and patch repairs are known to have limited life and are likely to lead to macro-cell corrosion effects
- Electrochemical methods such as cathodic protection would be difficult due to a lack of rebar electrical continuity due to the type of construction.

As such, a new deck is recommended for this site.

Given the current condition of the deck, the available options for managing the rate of corrosion ingress into the structure are outlined in the Table 8 below.

Table 8 Remediation Options for the Concrete Deck

Remediation Option	Indicative Initial Costs	Consequence
Repair and electrochemical remediation*	High Capital Cost	Requires design and documentation, in addition to ongoing monitoring and maintenance of the system. System would require appreciable rehabilitation work every 20 years.
Replace Deck	High Capital cost	Little to no maintenance, and would provide long term durability.

5.1.2 Timber Pile Rehabilitation (Waterside Pier)

In order to provide an adequate life extension and provide the required capacity for future use, the tight spacing of piles suggests that not all piles will require remediation. The number and placement of piles necessary to meet this demand will be determined after investigating different concepts options for the Waterfront Pier, but general speaking, repairing every third piles yields 250 allow SDL+LL, and every other pile yields 450 allow SDL+LL.

Pile repair/preservation for repurposed piles includes epoxy encapsulations over the full length of all piles to 2’ below mudline, with concrete encasement pile extensions in and above the tidal zone to strengthen advanced deterioration areas and to bridge the gap and tie into the new raised concrete deck.

The following table outlines remediation options examined for the Waterfront Pier to extend the service life of timber elements in marine environments.

Table 9. Remediation Options for Timber Elements.

Repair Type	Considered Use	Comment on Parameters	Anticipated Life
Epoxy Encapsulation	For piles that have moderate section loss.	This method involves installing a protective jacket around the pile with spacers to hold it in position. The gap between the jacket and the pile is then filled with a suitable flow able epoxy grout. Suppliers have recommended the epoxy encapsulation method suitable for timber piles that have necked up to 15 to 20% at the tidal zone. Loss of section down to 80 to 100mm residual diameter can still be restored by the epoxy encapsulation method. The advantages of epoxy types of encapsulation is as follows: - Relatively fast installation with subsequent cost saving on labour and disruptions, - High protection to marine organism attack, - High flexural capacity, - Low volume of material is required  The disadvantages of epoxy types of pile encapsulation is as follows: - Difficult to calculate the structural capacity of the composite system, - High cost of material, makes it not cost effective for advanced/severely deteriorated piles	Can extended/achieve the service life but the installation needs to ensure that the material does not leave any entrapped voids under the casing.

Table 9. Remediation Options for Timber Elements Continued

Repair Type	Considered Use	Comment on Parameters	Anticipated Life
Concrete Jacket	For piles that have significant section loss.	They can be constructed using either a heavy-duty woven nylon fabric or a steel formwork. Fabrication, placement of the steel reinforcement cage and pouring of concrete require an experienced contractor. This solution can be relatively costly and would require tight control and supervision to ensure that a suitable mix is designed and that the necessary concrete cover is systematically achieved. The advantages of encapsulating deteriorated piles with a concrete jacket are as follows: • Relatively low material cost (less than epoxy), • Tried and tested procedure, • The method can be applied to piles with extremely small diameters or missing section, • The length of encapsulation is easily varied to suit the extent of deterioration, • One of the most effective systems for long length pile protection. The disadvantages of concrete jacketing are as follows: • Marine organisms can still enter the timber above and below the jacketed area, • The labour intensive procedure can have unforeseen installation time variation, • Relatively large volume of material required (rather than an epoxy system), • Long length pours can damage the fabric formwork because of the weight of the concrete, • Inadequate length installed (i.e. timber remaining exposed at the tidal zone) can limit the service life to the timber pile durability, • Increased dead load on structure. 	Can extend/achieve the service life depending on the condition of the timber pile
New Driven Pile	Where piles have failed	This option provides an assurance of material quality if tight controls are set in place.	Recommend installing new 14" diameter steel pipe rather than timber; increased life to achieves design life

5.1.3 Steel Caissons Piles (ODR)

Since the caissons were originally used to temporarily support a roadway, their design axial capacities are likely higher than will occur repurposed to support a pedestrian walkway/bikeway. Depending on the concept design proposed, the caissons may have to be braced with additional piles or bracing.

Since the piles are uncoated, they will continue to deteriorate. In order to achieve a design life of 75 years, the caissons will need to be encapsulated. Another consideration would be to apply a splash zone compound to the caisson affording lesser life expectancy and recurring maintenance.

5.2 New Structure (Waterside Pier)

5.2.1 Concrete Deck

Options include a formed cast-in-place deck having no pile caps, or a composite deck using PCPS planks with cast-in-place overlay and new precast concrete pile caps. These options will be further developed during concept design.

5.2.2 Piles

Steel pipe or PCPS concrete piles of nominal diameter (18”-24” range) at 10 foot centers and bents at 30 foot centers, or larger caisson-type piles (greater than 36”) affording larger pile and pile bent spacing to support cost effectiveness. These options will be further developed during concept design use of concrete piles is limited in area where rock elevation is high.

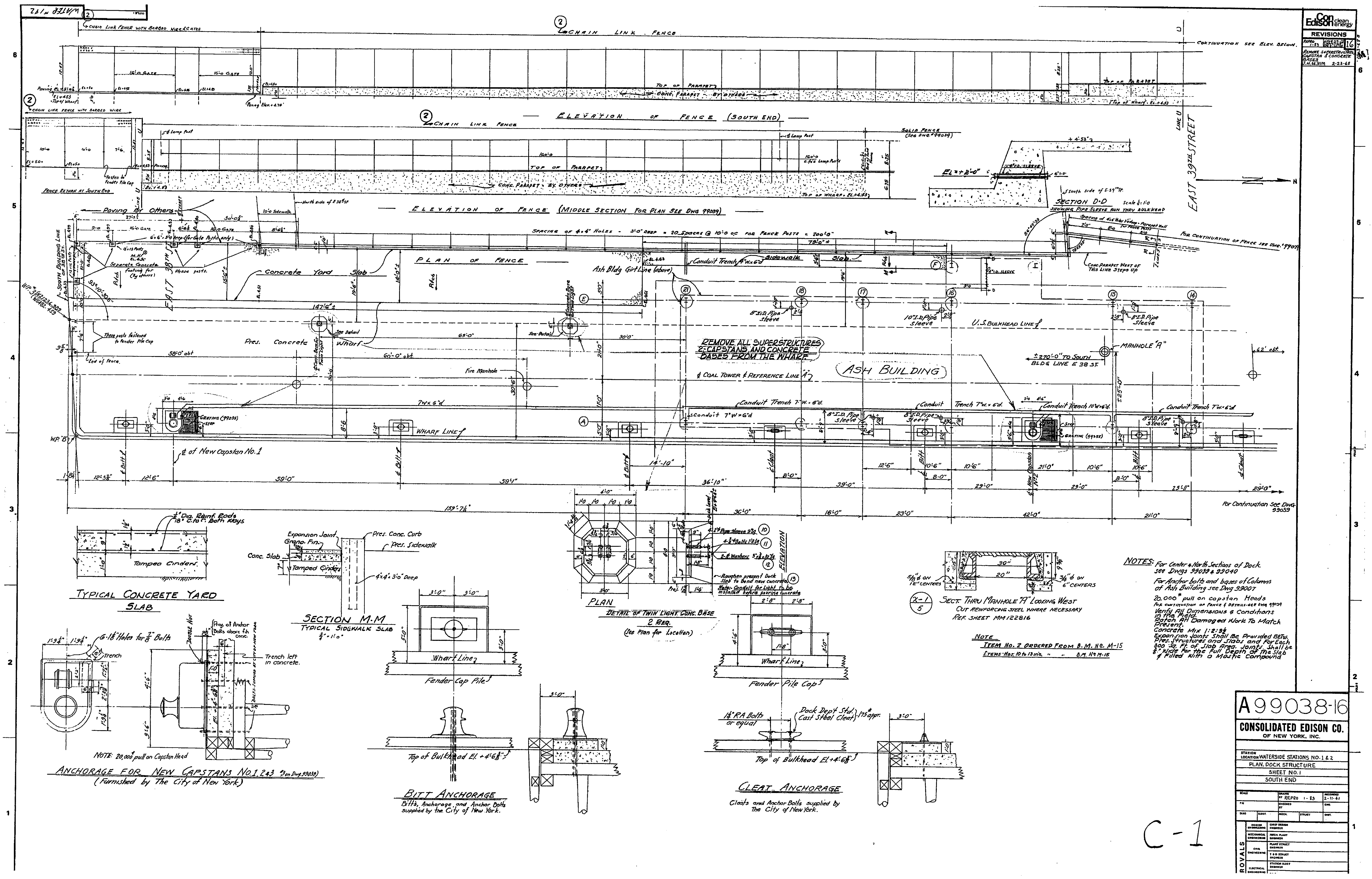
5.3 Cost Estimates

A cost estimate will be completed during concept design.

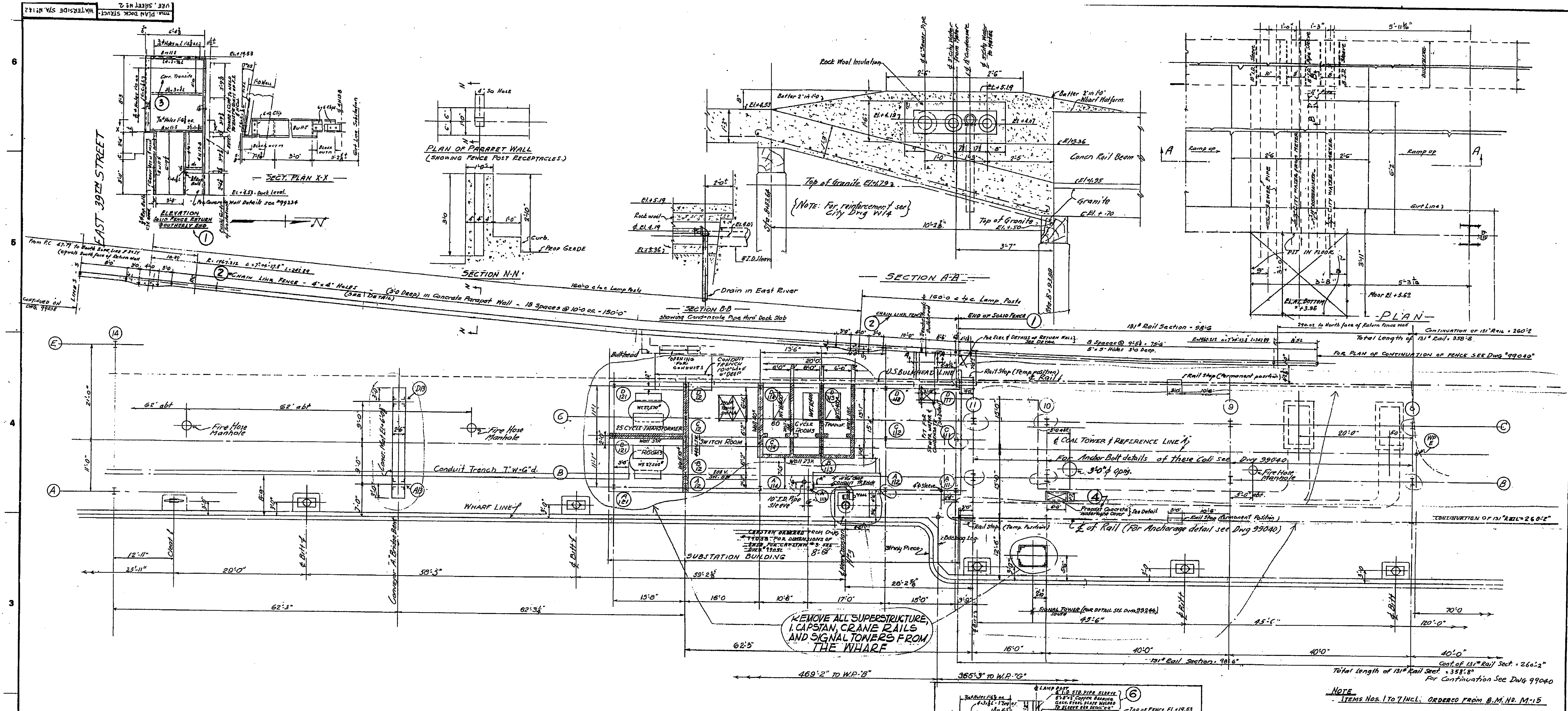
Appendix A

Reference Drawings

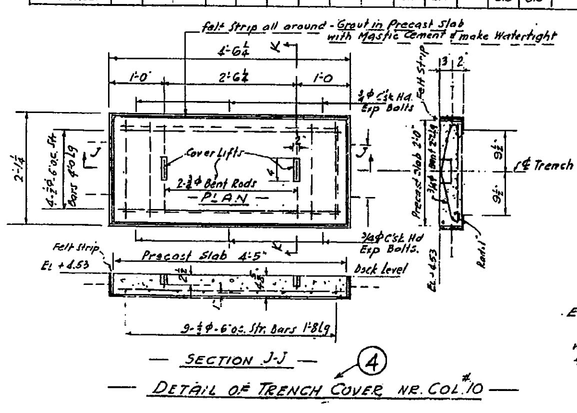
DRAWING NUMBER	DRAWING TITLE
A99038-16	Plan, Dock Structure, Sheet 1 South End
A99039-16	Plan, Dock Structure, Sheet 2 Middle Section
A99040-14	Plan, Dock Structure, Sheet 3 North Section
371016	McLaren Engineering Group, Existing Conditions Plan, 04/17/09
371017	McLaren Engineering Group , Demolition Plan, 04/17/09
371020	McLaren Engineering Group , Existing and Repair Pile Bent Section - 1, 04/17/09
371021	McLaren Engineering Group , Existing and Repair Pile Bent Section – 2, 04/17/09

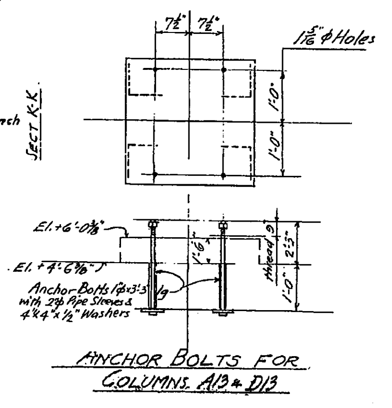


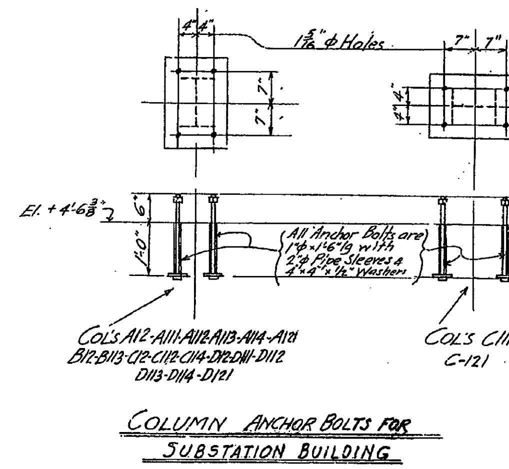
ELEVATION OF FENCE (SOUTH END)
ELEVATION OF FENCE (MIDDLE SECTION FOR PLAN SEE DWG 99039)
PLAN OF FENCE
EAST 38TH STREET
EAST 39TH STREET
SECTION D-D
REMOVE ALL SUPERSTRUCTURES 2-CAPSTANS AND CONCRETE BASES FROM THE WHARF
ASH BUILDING
MANHOLE "A"
WHARF LINE
TYPICAL CONCRETE YARD SLAB
SECTION M-M
TYPICAL SIDEWALK SLAB
PLAN
DETAIL OF TWIN LIGHT CONC. BASE
2 REQ.
(See Plan for Location)
ELEVATION
SECT. THRU MANHOLE "A" LOOKING WEST
CUT REINFORCING STEEL WHERE NECESSARY
REF. SHEET MM122816
NOTE
ITEM No. 2 ORDERED FROM B.M. No. M-15
NOTES: For Center & North Sections of Dock see Dwgs 99039 & 99040
For Anchor bolts and bases of Columns of Ash Building see Dwg 99007
20,000# pull on capstan Heads
Verify All Dimensions & Conditions in the Field.
Patch All Damaged Work To Match Present.
Concrete Mix 1:2:3½
Expansion Joints Shall Be Provided Betw. Pres. Structures and Slabs and For Each 300 Sq. Ft. of Slab Area. Joints Shall be ½" Wide For the Full Depth of the Slab & Filled With a Mastic Compound
NOTE: 20,000# pull on Capstan Head
ANCHORAGE FOR NEW CAPSTANS No. 1, 2 & 3
(Furnished by The City of New York.)
BITT ANCHORAGE
Bitts, Anchorage and Anchor Bolts supplied by the City of New York.
CLEAT ANCHORAGE
Cleats and Anchor Bolts supplied by The City of New York.
Fender Cap Pile
Fender Pile Cap
Top of Bulkhead El. +4'-6⅝"
REVISIONS
REMOVE SUPERSTRUCTURES CAPSTAN & CONCRETE BASES
A99038-16
CONSOLIDATED EDISON CO.
OF NEW YORK, INC.
STATION LOCATION WATERSIDE STATIONS NO. 1 & 2
PLAN, DOCK STRUCTURE
SHEET NO. 1
SOUTH END
DRAWN BY REPRO 1-83
RECORDED 2-11-41
C-1

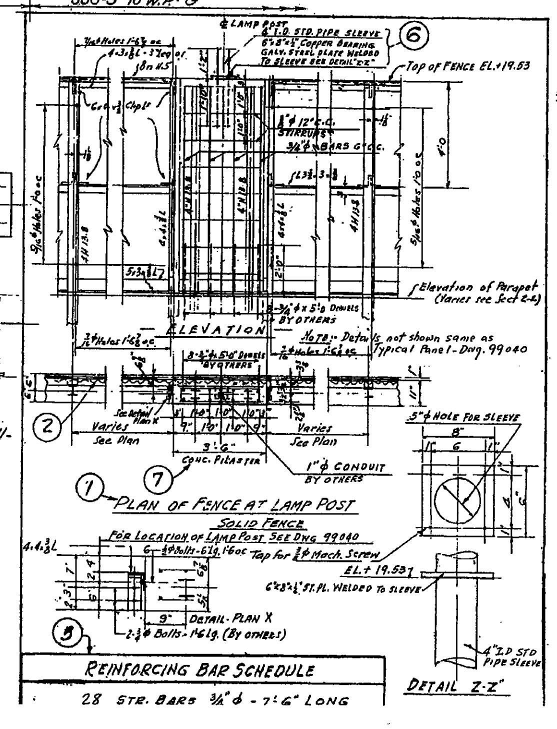


COLUMN LOADS AT BASE IN KIPS WIND AT 20#/□'	B9	C9	B10	C10	B11	C11	B12	C12	A13	D13	A 111	C 111	D 111	A 112	C 112	D 112	A 113	B 113	D 113	A 114	C 114	D 114	A 12	D 12	A 121	C 121	D 121
Dead Load	21.0	32.0	15.0	23.0	9.0	5.0	30.0	67.0	82.0	82.0	12.0	17.0	12.0	14.0	26.0	20.0	17.0	30.0	37.0	28.0	47.0	31.0	57.0	48.0	11.0	15.0	11.0
Live Load	29.0	35.0	21.0	25.0	9.0	7.0	44.0	83.0	66.0	66.0	4.0	9.0	4.0	11.0	27.0	29.0	15.0	44.0	43.0	29.0	70.0	32.0	45.0	36.0	13.0	25.0	13.0
Dead & Live L.	50.0	67.0	36.0	48.0	18.0	12.0	74.0	150.0	148.0	148.0	16.0	26.0	16.0	25.0	53.0	49.0	32.0	74.0	80.0	57.0	117.0	63.0	102.0	84.0	24.0	40.0	24.0
E & W Wind Vertical	±14	±14	±10.0	±10.0	±4.0	±4.0	±24.	±14.	±27.	±27	±4.0	—	±4.0	±8.0	—	±8.0	±8.0	—	±8.0	±8.0	—	±8.0	±24.0	±14.0	±4.0	—	±4.0
E & W Wind Shear	6	6	4	4	1.0	1.0	16.	4	6.0	6.0	3.0	—	3.0	5.0	—	5.0	5.0	—	5.0	6.0	—	6.0	16.0	8.0	3.0	—	3.0









NOTES:

For Anchorage details of Bitts, Cleats & Capstans see Dwg 99038.
Wall Loads indicated are total Loads applied over area crosshatched.
Transformer Loads as indicated.

Uniform Dead Loads on Dock Deck:
160#/□' for Transf'r & Switch Rooms
100#/□' for other parts of Bldg.

Live Load over entire area of Bldg.:
150#/□' in addition to Transf'r Loads

For South & North Sections of Dock see Dwgs 99038 & 99040

20,000# pull on capstan head.

For continuation of Solid Fence - Elevation and Details - See Dwg. # 99040
For continuation of Chain Link Fence - See Dwg. 99038
Bolts & Rivets for Fence Structure 3/4" φ unless noted
Holes 13/16" φ unless noted

FOR CONSTRUCTION

REVISIONS
REPRO. 1/83 16
REMOVE SUPERSTRUCTURE, CAPSTAN, SIGNAL TOWER, RAILS & TRANSF. RM. J.H. 6631 M.L.

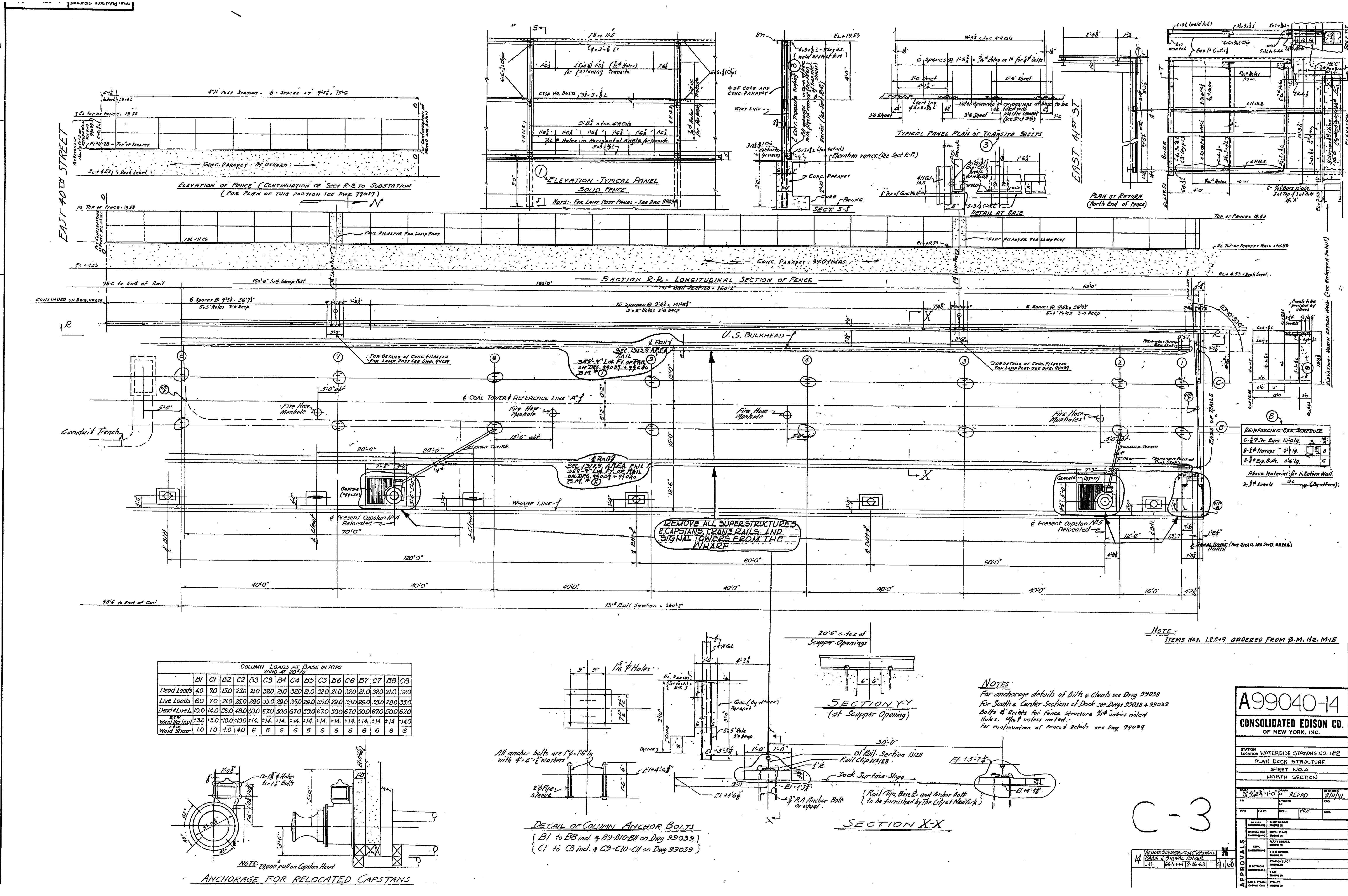
A99039-16

CONSOLIDATED EDISON CO. OF NEW YORK, INC.

WATERSIDE STATIONS NO. 1 & 2
PLAN DOCK STRUCTURE
SHEET NO. 2
MIDDLE SECTION

SCALE 1/8" & 3/4" = 1'-0"
REPRO. 1/83
2/11/41

C-2



COLUMN LOADS AT BASE IN KIPS WIND AT 20#/□'																
	B1	C1	B2	C2	B3	C3	B4	C4	B5	C5	B6	C6	B7	C7	B8	C8
Dead Loads	4.0	7.0	15.0	23.0	21.0	32.0	21.0	32.0	21.0	32.0	21.0	32.0	21.0	32.0	21.0	32.0
Live Loads	6.0	7.0	21.0	25.0	29.0	35.0	29.0	35.0	29.0	35.0	29.0	35.0	29.0	35.0	29.0	35.0
Dead & Live L.	10.0	14.0	36.0	48.0	50.0	67.0	50.0	67.0	50.0	67.0	50.0	67.0	50.0	67.0	50.0	67.0
E & W Wind Vertical	±3.0	±3.0	±10.0	±10.0	±14.	±14.	±14.	±14.	±14.	±14.	±14.	±14.	±14.	±14	±14	±14.0
E & W Wind Shear	1.0	1.0	4.0	4.0	6	6	6	6	6	6	6	6	6	6	6	6

NOTES

For anchorage details of Bitts & Cleats see Dwg 99038
For South & Center Sections of Dock see Dwgs 99038 & 99039
Bolts & Rivets for Fence Structure 3/4 ¢ unless noted
Holes. 13/16 ¢ unless noted.
For continuation of Fence & Details see Dwg 99039

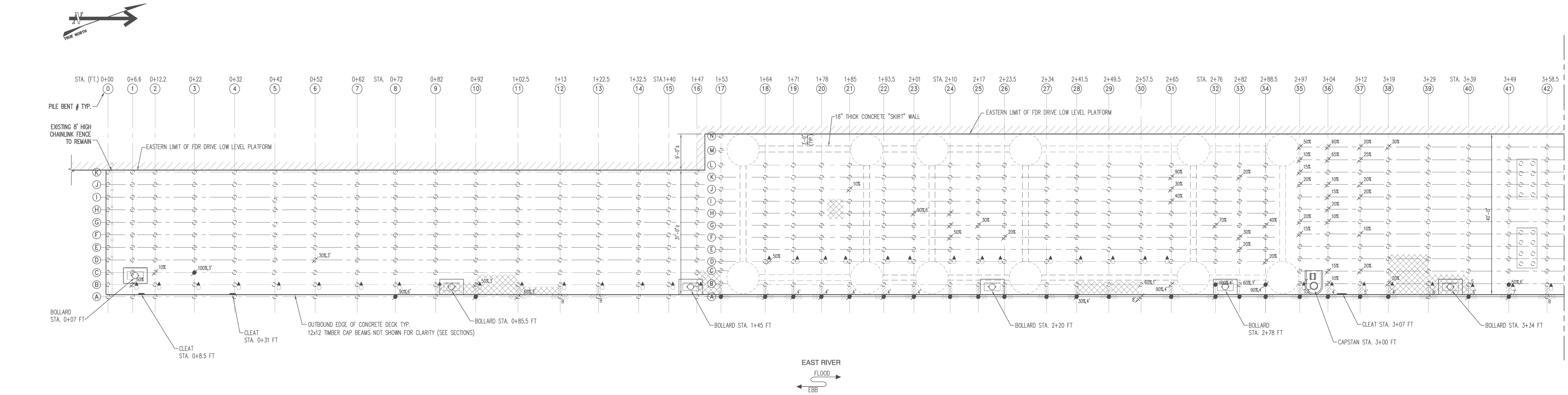
A99040-14

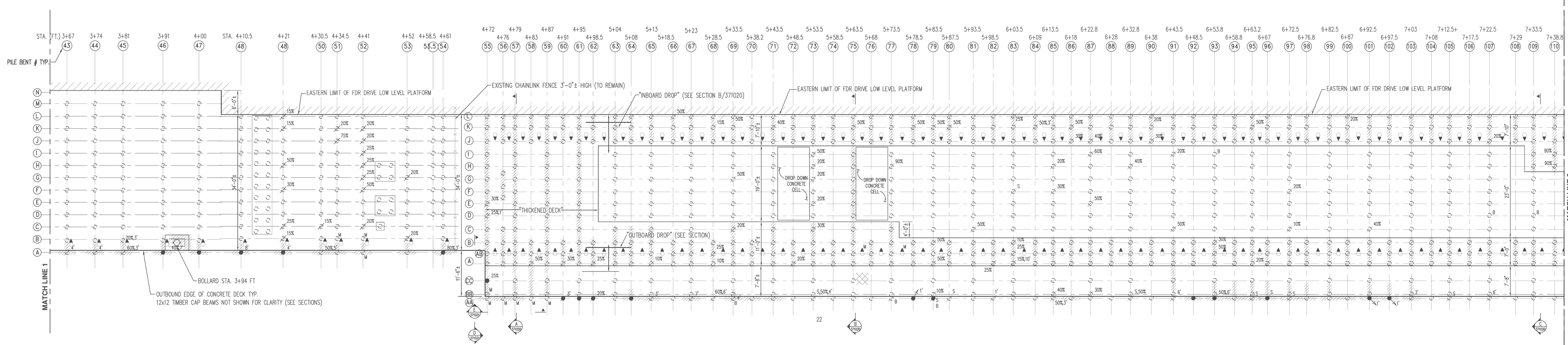
CONSOLIDATED EDISON CO.
OF NEW YORK, INC.

STATION LOCATION WATERSIDE STATIONS NO. 1 & 2
PLAN DOCK STRUCTURE
SHEET NO. 3
NORTH SECTION

SCALE 1/8", 3/8", 3/4" = 1'-0" | DRAWN BY REPRO | RECORDED 2/11/41

14	REMOVE SUPERSTRUCTURE CAPSTANS RAILS & SIGNAL TOWER	J.H.	66311-M	2-26-68	4/1/68

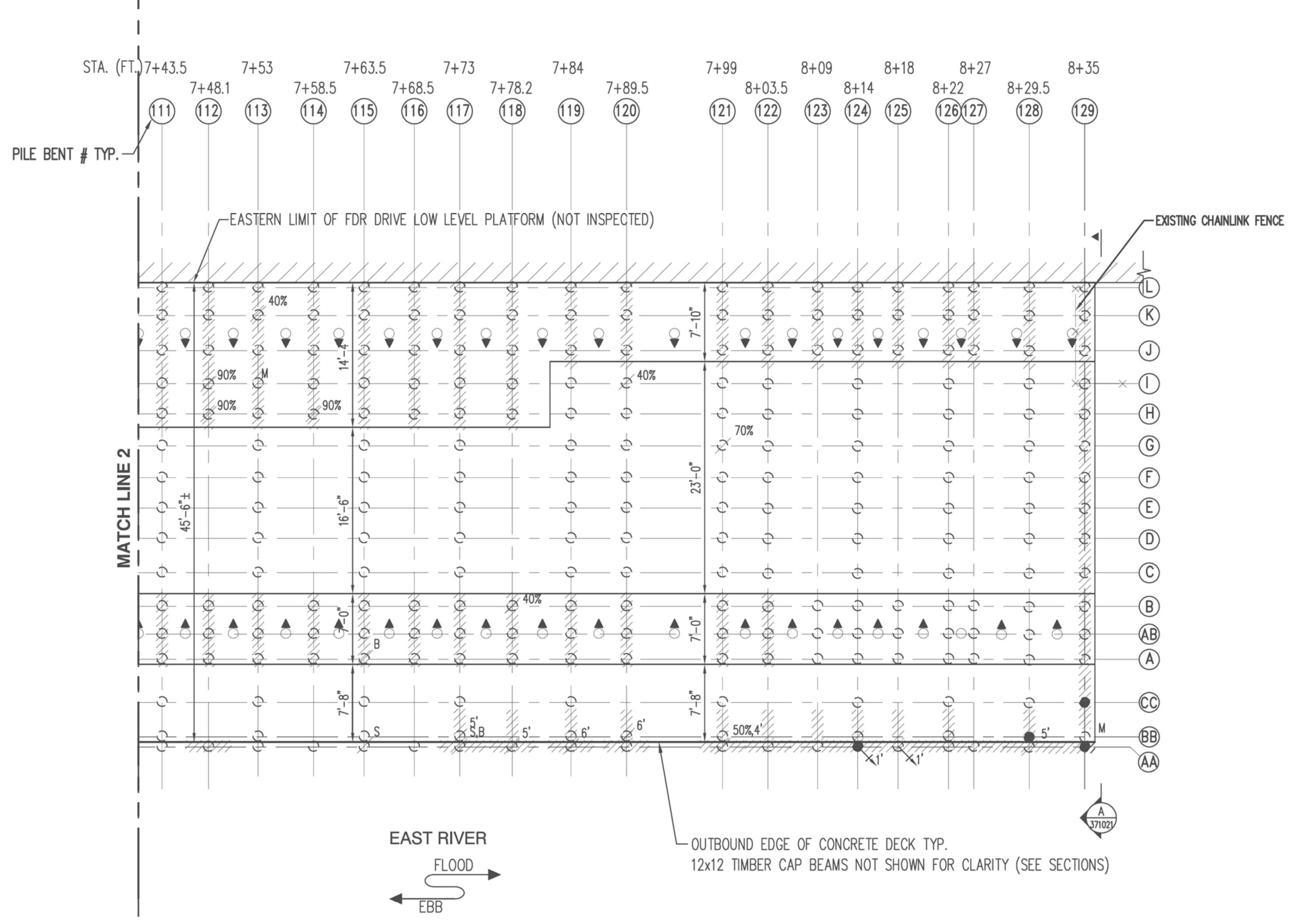


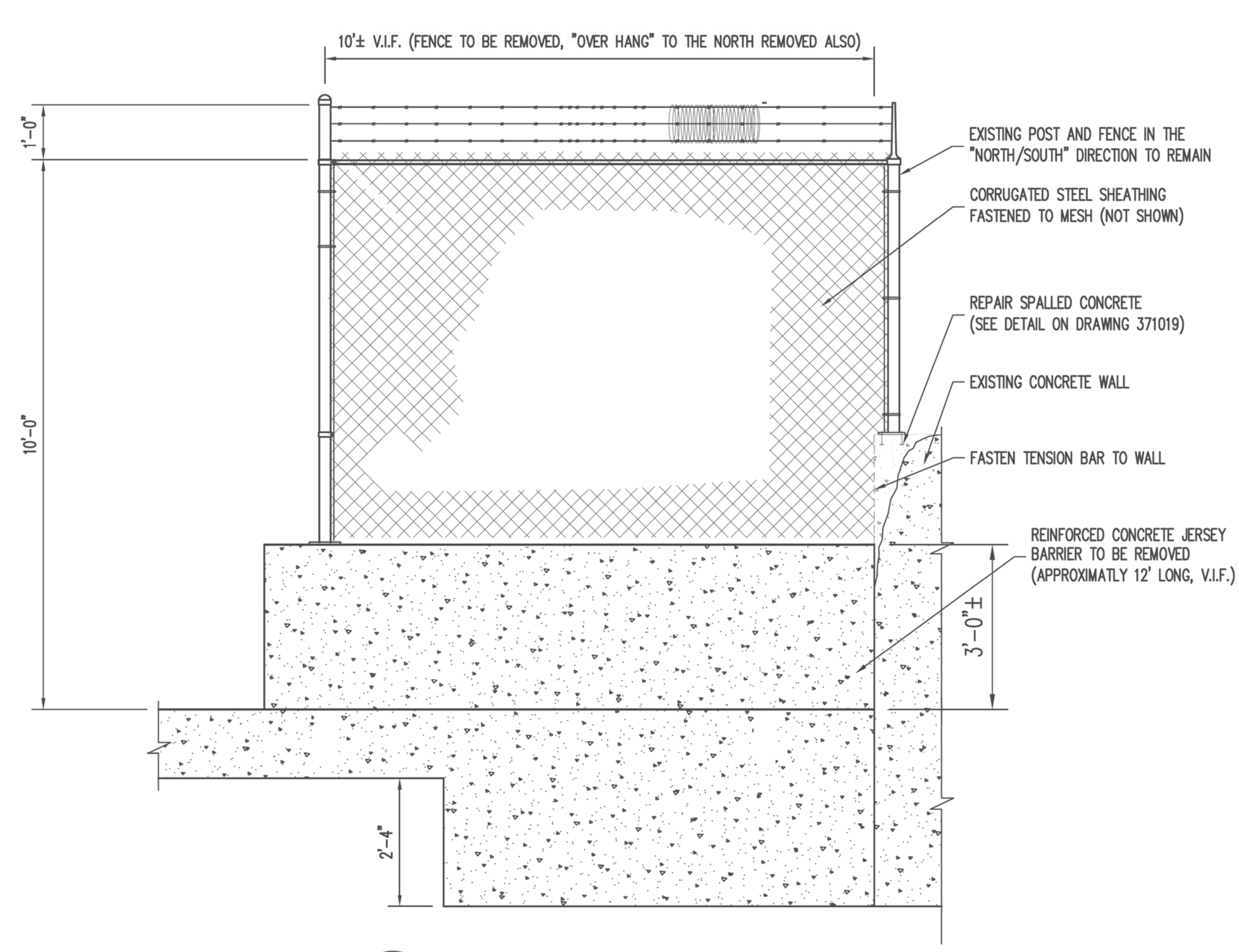


EXISTING CONDITIONS PLAN
(HIGH LEVEL TIMBER RELIEVING PLATFORM)

1: 10'

SCALE: 1" = 10'





A (371016) EXISTING FENCE SECTION

1/2"=1'-0"

NOTE:
EXISTING FENCE SECTION IS SHOWN AS "SCHEMATIC", CONTRACTOR SHALL CONFIRM ALL DIMENSIONS AND CONDITIONS PRIOR TO BIDDING.

LEGEND:

- TIMBER PILE
- TIMBER BATTER PILE
- NON-BEARING TIMBER PILE
- DETERIORATED PILE, 3' INDICATES LENGTH OF DETERIORATION @ TOP OF PILE (IF APPLICABLE)
- DETERIORATED PILE, "S" DENOTES SPLIT PILE
- PILE WITH 30% LOSS OF CROSS-SECTIONAL AREA
- M DENOTES MISSING PILE
- B DENOTES BROKEN TIMBER PILE
- SPALLED DECK SOFFIT W/ EXPOSED STEEL REINFORCING
- DETERIORATED OR MISSING PILE CAP
- TOP OF PILE DISPLACED 1' IN THE DIRECTION INDICATED

NOTE:
1. BATTER PILES BETWEEN BENTS 55 TO 128 TYPICALLY EXHIBIT INSUFFICIENT BEARING DUE TO CAP DETERIORATION.
2. WORK THIS DRAWING WITH DRAWING 371020 AND 371021.

REVISION
USE .1 SIZE TEXT ONLY

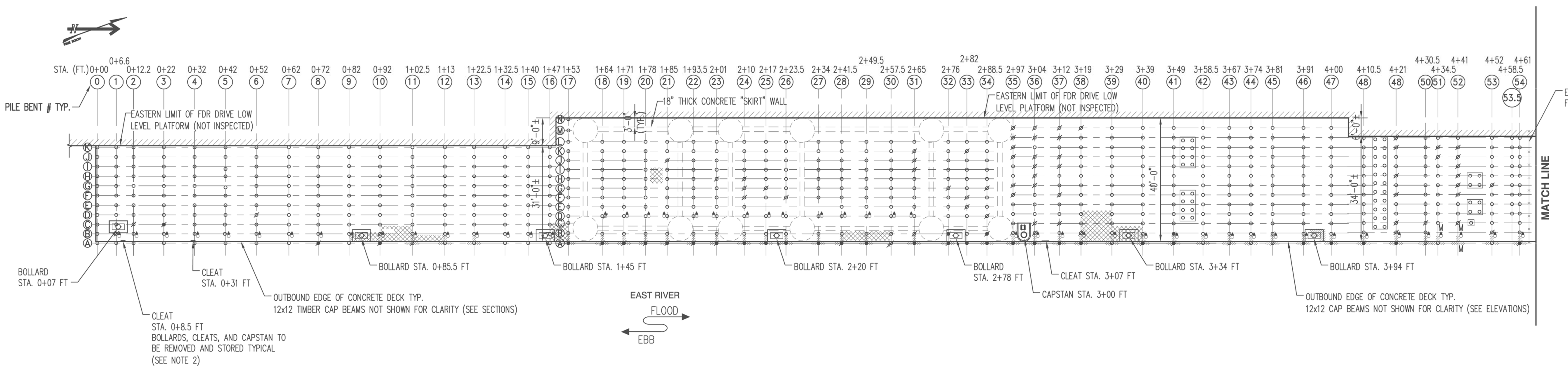
00 — RELEASED FOR CONSTRUCTION WITH SPEC. # FME-039-08 PROJECT # 50484-08 McLAREN ENGINEERING GROUP 04/17/09.

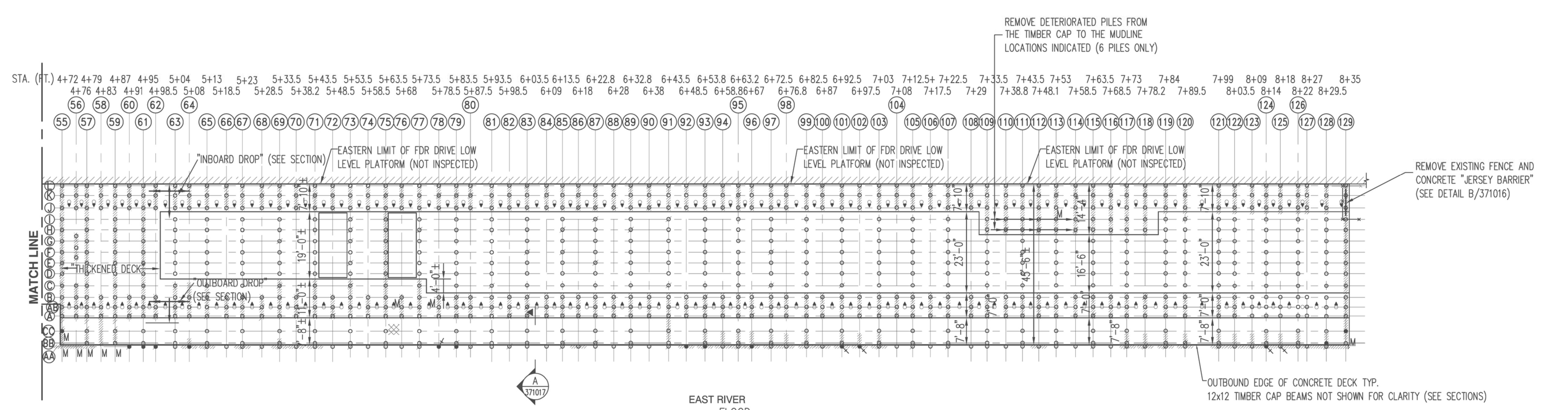
REVISION SIGNATURES	
REV	PROJECT ENGINEER
00	I. LITROVNIK

DWG. NO.	371016-00
CON EDISON	DWG. TYPE: COMPANY; DWG. SIZE: A
LOCATION:	WATERSIDE DOCK
TITLE:	EXISTING CONDITION PLAN
– APPROVALS –	
ENGINEERING MANAGER:	D. AZZOLINI
PROJECT ENGINEER:	I. LITROVNIK
DESIGNER:	B. MOODY
DRAWN BY:	J. MAGYAWE
SCALE: AS NOTED	DISCIPLINE CODE: SB

McLaren ENGINEERING GROUP
E-mail: mgmclaren@mgmclaren.com
100 Snake Hill Road, West Nyack, NY 10994
Tel. (845) 353-6400 Fax. (845) 353-6509

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED





DEMOLITION PLAN

1" = 20'

SCALE: 1" = 20'

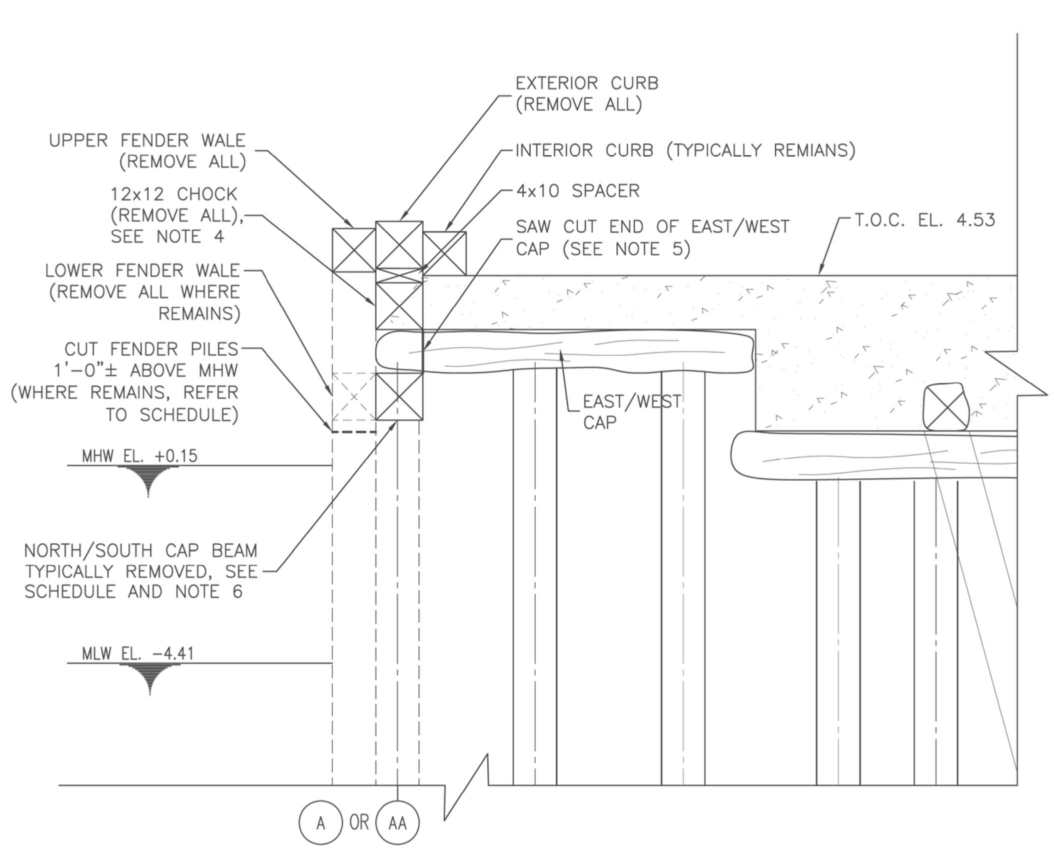
NOTES:

1. REMOVE AND DISPOSE OF ALL TIMBER FENDER ELEMENTS AND OTHER TIMBER EDGE CONSTRUCTION ACCORDING TO THE TIMBER EDGE CONSTRUCTION DEMOLITION SCHEDULE (THIS DRAWING).
2. REMOVE ALL BOLLARDS, CLEATS, AND CAPSTANS AS THEY ARE IDENTIFIED ON THE ABOVE PLAN. THESE MOORING ELEMENTS ARE TO BE STORED ON-SITE AT THE LOCATION TO BE PROVIDED BY CON EDISON.
3. FOR ADDITIONAL DEMOLITION OF EXISTING STRUCTURAL ELEMENTS, REFER TO REPAIR PLAN AND SECTIONS, SEQUENCING OF DEMOLITION AND REPAIR ON DRAWING 371018 THRU 371022.
4. THERE ARE TWO 12x12 CHOCKS (TOP AND BOTTOM) FROM BENT 125 TO 129.
5. THE END OF THE EAST/WEST CAP SHALL BE SAW CUT FLUSH WITH THE CONCRETE DECK (FOR EXCEPTION SEE NOT 6).
6. WHERE THE NORTH/SOUTH CAP PROVIDES SOUND BEARING BETWEEN THE EXISTING TIMBER PILE AND THE EAST/WEST CAP, A PORTION OF THE NORTH/SOUTH CAP (APPROXIMATELY 18" LONG) SHALL REMAIN IN PLACE TO MAINTAIN BEARING IN THIS CASE TO THE EAST/WEST TIMBER CAP BEAM.
7. WORK THIS DRAWING WITH DRAWINGS 371016, 371020, AND 371021.

LEGEND:

- TIMBER PILE
- TIMBER BATTER PILE
- NON-BEARING TIMBER PILE
- DETERIORATED PILE, 3' INDICATES LENGTH OF DETERIORATION @ TOP OF PILE (IF APPLICABLE)
- DETERIORATED PILE, "S" DENOTES SPLIT PILE
- PILE WITH 30% LOSS OF CROSS-SECTIONAL AREA
- DENOTES MISSING PILE
- DENOTES BROKEN TIMBER PILE
- SPALLED DECK SOFFIT W/ EXPOSED STEEL REINFORCING
- DETERIORATED OR MISSING PILE CAP
- TOP OF PILE DISPLACED 8' IN THE DIRECTION INDICATED

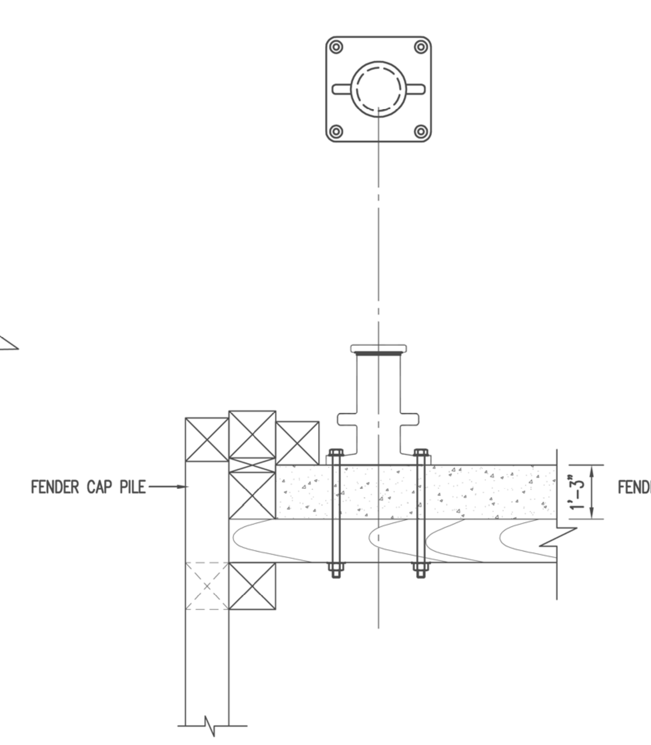
NOTE:
BATTER PILES BETWEEN BENTS 55 TO 128 TYPICALLY EXHIBIT INSUFFICIENT BEARING DUE TO CAP DETERIORATION



A / 371017 TYPICAL EXISTING - TIMBER "EDGE" CONSTRUCTION

3/8" = 1'-0"

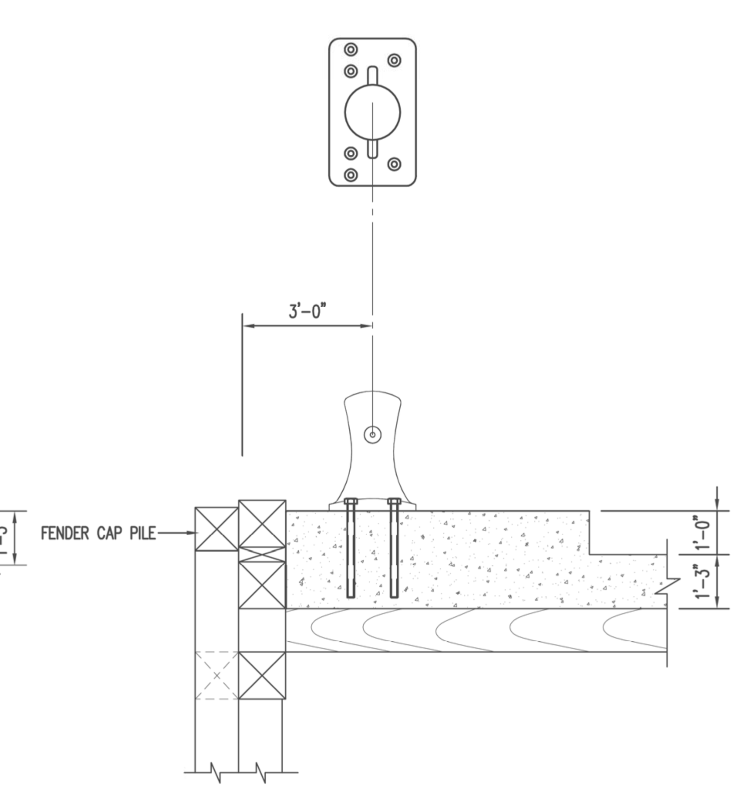
(FOR REQUIRED DEMOLITION AT THE DOCK EDGE, SEE TIMBER AND PILES DEMOLITION SCHEDULE THIS DRAWING)



BOLLARD AT STATION 0+07 TO BE REMOVED

3/8" = 1'-0"

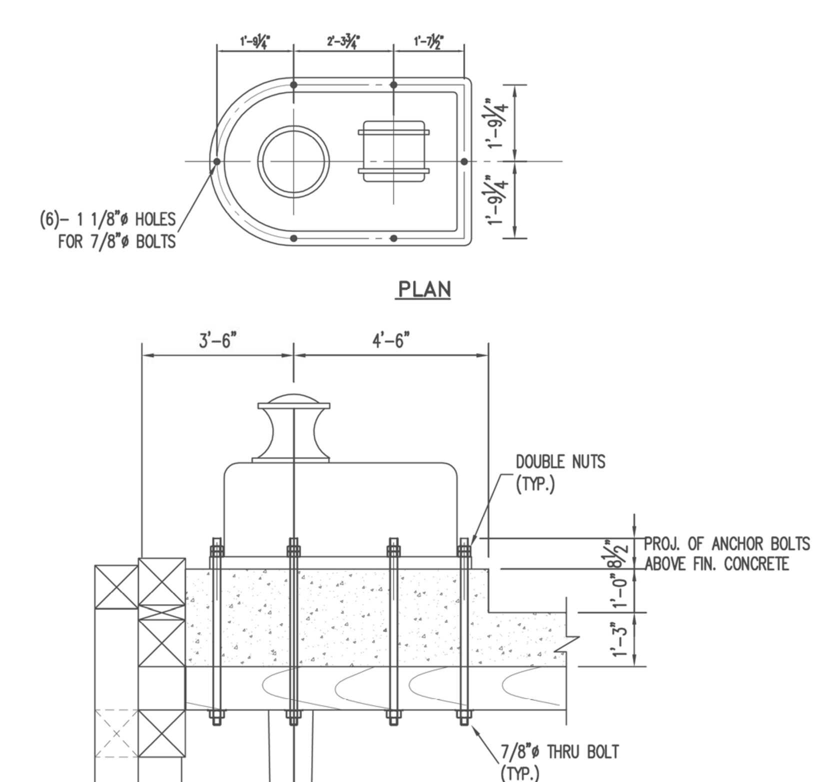
CONFIRM ANCHORAGE IN THE FIELD



TYPICAL BOLLARD TO BE REMOVED

3/8" = 1'-0"

CONFIRM ANCHORAGE IN THE FIELD



CAPSTAN AT STATION 3+00 TO BE REMOVED

3/8" = 1'-0"

CONFIRM ANCHORAGE IN THE FIELD

TIMBER AND PILES DEMOLITION SCHEDULE

Span/Bent #'s	Upper FW (LF)	Lower FW (LF)	Ext. curb (LF)	4x12 spacer (LF)	12 chock (LF)	N/S cap (LF)		Trim End of E/W Cap?	
								Bent #	Yes/No
10 to 11	3	10.5	0	0	0	10.5		11	Y
11 to 12	0	0	0	0	0	5.25		12	Y
12 to 13	0	0	0	0	0	0		13	Y
13 to 14	0	0	0	0	0	7.5		14	N
14 to 15	0	7.5	0	0	0	0		15	N
15 to 16	0	7	0	0	0	0		16	N
16 to 17	0	6	1.2	0	1.2	6		17	Y
17 to 18	0	0	11	0	11	0		18	Y
18 to 19	0	0	0	3.5	7	0		19	Y
19 to 20	3.5	0	0	7	7	0		20	Y
20 to 21	7	0	7	7	7	0		21	Y
21 to 22	8.5	0	8.5	8.5	8.5	0		22	Y
22 to 23	7.5	0	7.5	7.5	7.5	0		23	Y
23 to 24	0	0	9	9	9	0		24	Y
24 to 25	0	0	7	7	7	0		25	Y
25 to 26	0	0	6.5	6.5	6.5	0		26	Y
26 to 27	0	0	10.5	10.5	10.5	0		27	Y
27 to 28	0	0	7.5	7.5	7.5	0		28	Y
28 to 29	0	0	8	8	8	0		29	Y
29 to 30	2.4	0	8	8	8	0		30	Y
30 to 31	0	0	7.5	7.5	7.5	0		31	Y
31 to 32	0	0	11	11	11	0		32	Y
32 to 33	0	0	6	6	6	0		33	Y
33 to 34	3.25	0	6.5	6.5	6.5	0		34	Y
34 to 35	8.5	0	0	8.5	8.5	8.5		35	Y
35 to 36	3.5	7	0	7	7	7		36	Y
36 to 37	8	0	0	8	8	0		37	Y
37 to 38	7	0	7	7	7	7		38	Y
38 to 39	7.5	7.5	10	10	10	10		39	N
39 to 40	0	10	10	10	10	10		40	Y
40 to 41	10	10	10	10	10	10		41	Y
41 to 42	9.5	0	9.5	9.5	9.5	9.5		42	N
42 to 43	8.5	8.5	8.5	8.5	8.5	8.5		43	Y
43 to 44	7	0	7	7	7	7		44	N
44 to 45	7	7	7	7	7	7		45	N
45 to 46	10	0	10	10	10	5		46	Y
46 to 47	9	0	9	9	9	0		47	N
47 to 48	10.5	0	10.5	10.5	10.5	0		48	N
48 to 49	10.5	0	10.5	10.5	10.5	0		49	Y
49 to 50	9.5	0	9.5	9.5	9.5	9.5		50	Y
50 to 51	4	0	4	4	4	4		51	Y
51 to 52	6.5	0	6.5	6.5	6.5	0		52	Y
52 to 53	11	5.5	11	11	11	0		53	Y
53 to 54	9	0	9	9	9	9		54	Y
54 to 55	11	11	11	11	11	11		55	N
55 to 56	0	0	4	0	0	0		56	N
56 to 57	0	0	3	0	0	0		57	Y
57 to 58	0	0	0	4	8	0		58	Y
58 to 59	0	0	0	4	8	0		59	Y
59 to 60	0	0	0	4	4	0		60	Y
60 to 61	0	0	4	4	4	0		61	Y
61 to 62	0	0	3.5	3.5	3.5	0		62	Y
62 to 63	5.5	0	5.5	5.5	5.5	2.75		63	Y
63 to 64	4	0	4	4	4	0		64	Y
64 to 65	5	0	5	5	5	0		65	Y
65 to 66	5.5	0	5.5	5.5	5.5	5.5		66	N
66 to 67	4.5	0	4.5	4.5	4.5	4.5		67	N
67 to 68	5.5	5.5	5.5	5.5	5.5	5.5		68	N
68 to 69	5	5	5	5	5	5		69	N
69 to 70	4.7	0	4.7	4.7	4.7	4.7		70	N
70 to 71	5.3	0	5.3	5.3	5.3	5.3		71	N
71 to 72	5	0	5	5	5	5		72	N
72 to 73	5	0	5	5	5	5		73	N
73 to 74	0	0	5	5	5	5		74	N
74 to 75	0	0	5	5	5	5		75	N
75 to 76	0	4.5	4.5	4.5	4.5	4.5		76	N
76 to 77	0	5.5	5.5	5.5	5.5	5.5		77	N
77 to 78	0	0	0	5	5	5		78	Y
78 to 79	0	0	0	0	5	5		79	N
79 to 80	0	4	0	0	4	4		80	N
80 to 81	0	6	0	0	6	6		81	N
81 to 82	5	5	5	5	5	5		82	N
82 to 83	5	5	5	5	5	5		83	N
83 to 84	5.5	0	5.5	5.5	5.5	5.5		84	N
84 to 85	4.5	0	4.5	4.5	4.5	4.5		85	N
85 to 86	4.5	0	4.5	4.5	4.5	4.5		86	N
86 to 87	4.8	0	4.8	4.8	4.8	4.8		87	N
87 to 88	5.2	5.2	5.2	5.2	5.2	5.2		88	N
88 to 89	4.8	4.8	4.8	4.8	4.8	4.8		89	N
89 to 90	5.2	0	5.2	5.2	5.2	5.2		90	N
90 to 91	5.5	0	5.5	5.5	5.5	5.5		91	N
91 to 92	5	0	5	5	5	0		92	Y
92 to 93	5.3	0	5.3	5.3	5.3	0		93	Y
93 to 94	5	0	5	5	5	0		94	Y
94 to 95	4.4	0	4.4	4.4	4.4	4.4		95	N
95 to 96	3.8	0	3.8	3.8	3.8	3.8		96	N
96 to 97	5.5	0	5.5	5.5	5.5	5.5		97	Y
97 to 98	4.3	4.3	4.3	4.3	4.3	4.3		98	N
98 to 99	5.7	5.7	5.7	5.7	5.7	5.7		99	N
99 to 100	0	0	4.5	4.5	4.5	4.5		100	Y
100 to 101	0	0	0	0	5.5	0		101	Y
101 to 102	0	0	5	5	5	0		102	Y
102 to 103	0	0	5.5	5.5	5.5	0		103	Y
103 to 104	0	5	5	5	5	5		104	N
104 to 105	0	4.5	4.5	4.5	4.5	4.5		105	N
105 to 106	0	5	5	5	5	5		106	N
106 to 107	0	5	5	5	5	5		107	N
107 to 108	0	0	6.5	6.5	6.5	6.5		108	N
108 to 109	0	0	4.5	4.5	4.5	4.5		109	N
109 to 110	0	5.3	5.3	5.3	5.3	5.3		110	N
110 to 111	0	4.7	4.7	4.7	4.7	4.7		111	N
111 to 112	0	0	4.6	4.6	4.6	4.6		112	N
112 to 113	0	0	4.9	4.9	4.9	4.9		113	N
113 to 114	0	0	5.5	5.5	5.5	5.5		114	N
114 to 115	0	0	5	5	5	5		115	N
115 to 116	0	0	0	5	5	5		116	N
116 to 117	0	0	0	0	2.25	4.5		117	Y
117 to 118	0	0	0	0	0	1.3		118	Y
118 to 119	0	0	0	0	0	0		119	N
119 to 120	0	0	0	0	0	5.5		120	N
120 to 121	0	9.5	0	0	0	9.5		121	N
121 to 122	0	4.5	0	4.5	4.5	4.5		122	N
122 to 123	0	0	0	5.5	5.5	5.5		123	N
123 to 124	0	0	5	5	5	5		124	Y
124 to 125	0	0	4	4	4	4		125	N
125 to 126	0	0	4	4	8	0		126	N
126 to 127	0	5	5	5	10	0		127	N
127 to 128	0	2.5	2.5	2.5	5	0		128	N
128 to 129	0	5.5	5.5	5.5	11	3		129	N
Total:	343.65	214.5	562.7	609.5	672.95	419			56

NOTES:

1. IN ADDITION TO THE ELEMENTS IDENTIFIED IN THE ABOVE SCHEDULE, REMOVE THE (6) TIMBER PILES IDENTIFIED AT BENTS 110, 112 AND 114. APPROXIMATELY, A TOTAL OF 72 LF OF PILE TO BE REMOVED (FROM TIMBER CAP TO MUDLINE).
2. IN ADDITION TO THE ELEMENTS IDENTIFIED IN THE ABOVE SCHEDULE, CUT REMAINING TIMBER FENDER PILES (OR OTHER NON-BEARING PILES) AT ELEVATION +1.15' MHD (1' ABOVE MHW ELEVATION) AT BENT NUMBERS (12, 20, 21, 35, 39, 42, 43, 44, 53, 54, 65, 69, 75, 85, 89, 105, 107, & 121).

REVISION
USE .1 SIZE TEXT ONLY
00
RELEASED FOR CONSTRUCTION WITH SPEC. # FME-039-08 PROJECT # 50484-08 McLAREN ENGINEERING GROUP 04/17/09.

REVISION SIGNATURES	
REV	PROJECT ENGINEER
00	I. LITROVNIK

DWG. NO. 371017-00

CON EDISON | DWG. TYPE: COMPANY | DWG. SIZE: A

LOCATION: WATERSIDE DOCK

TITLE: DEMOLITION PLAN

– APPROVALS –

ENGINEERING MANAGER: D. AZZOLINI
PROJECT ENGINEER: I. LITROVNIK
DESIGNER: B. MOODY
DRAWN BY: J. MAGYAWE
SCALE: AS NOTED
DISCIPLINE CODE: SB

McLaren ENGINEERING GROUP
E-mail: mgmclaren@mgmclaren.com
100 Snake Hill Road, West Nyack, NY 10994
Tel. (845) 353-6400 Fax. (845) 353-6509

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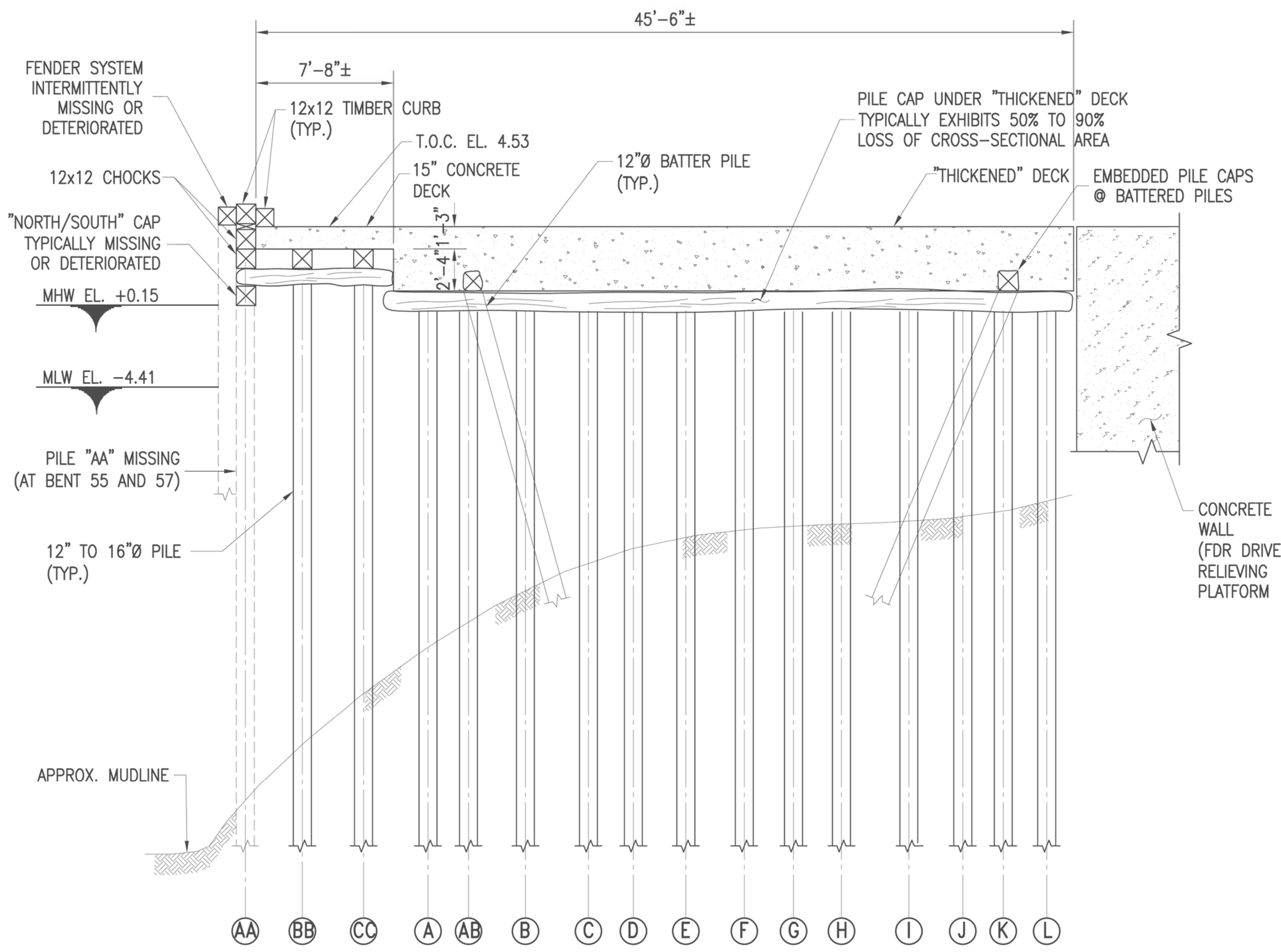
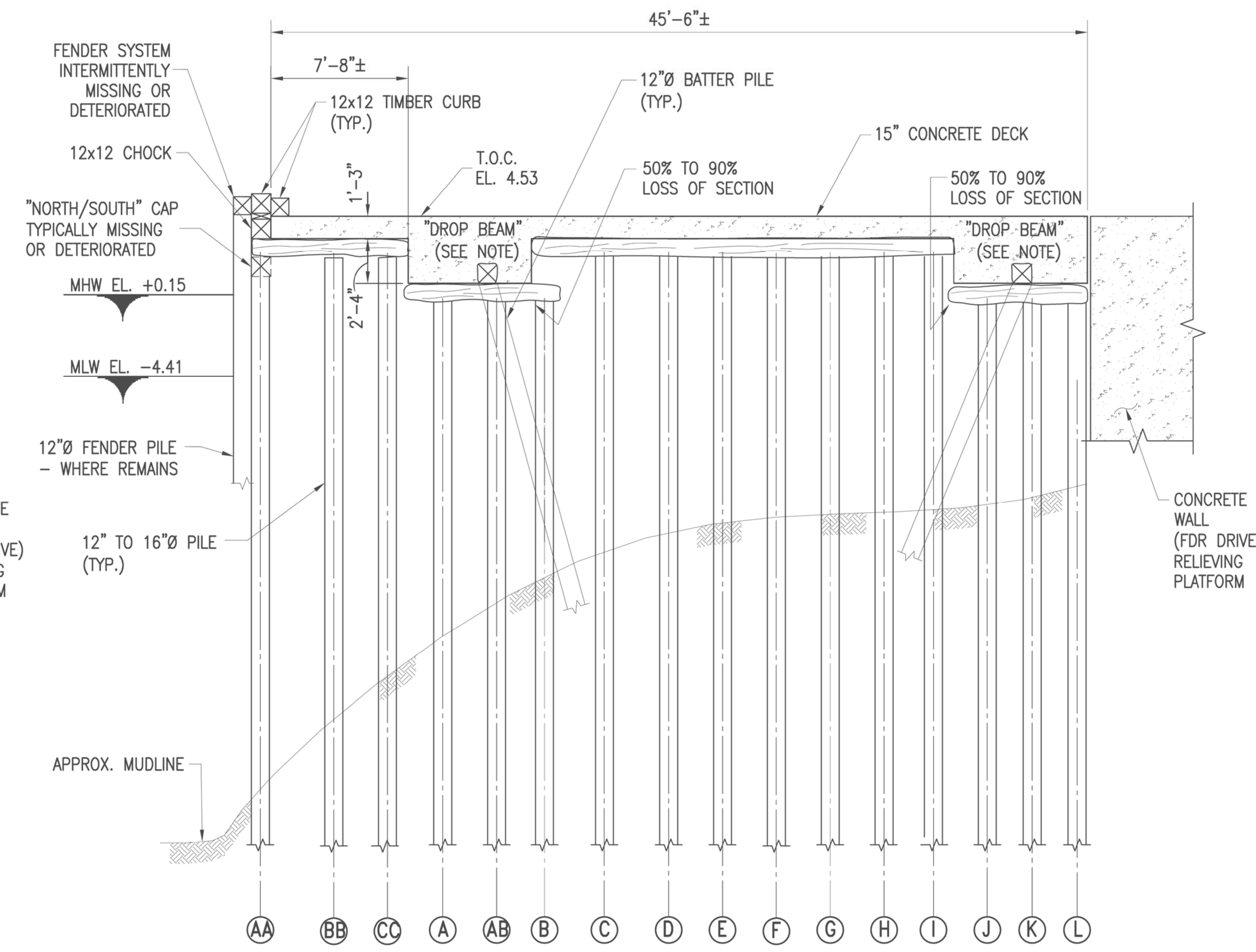


A 371020 EXISTING SECTION – PILE BENT NUMBER 57

TYPICAL FOR "ODD NUMBERED" BENTS 55 THRU 61, EVEN NUMBERED BENTS ARE SIMILAR (SEE PLAN)

8' 4' 0 8' FEET
SCALE: 3/16" = 1'-0"

NOTE:
TIMBER PILE CAP AT "THICKENED" DECK TYPICALLY EXHIBITS 50% TO 90% LOSS OF CROSS-SECTIONAL AREA RESULTING IN DIMINISHED PILE BEARING.

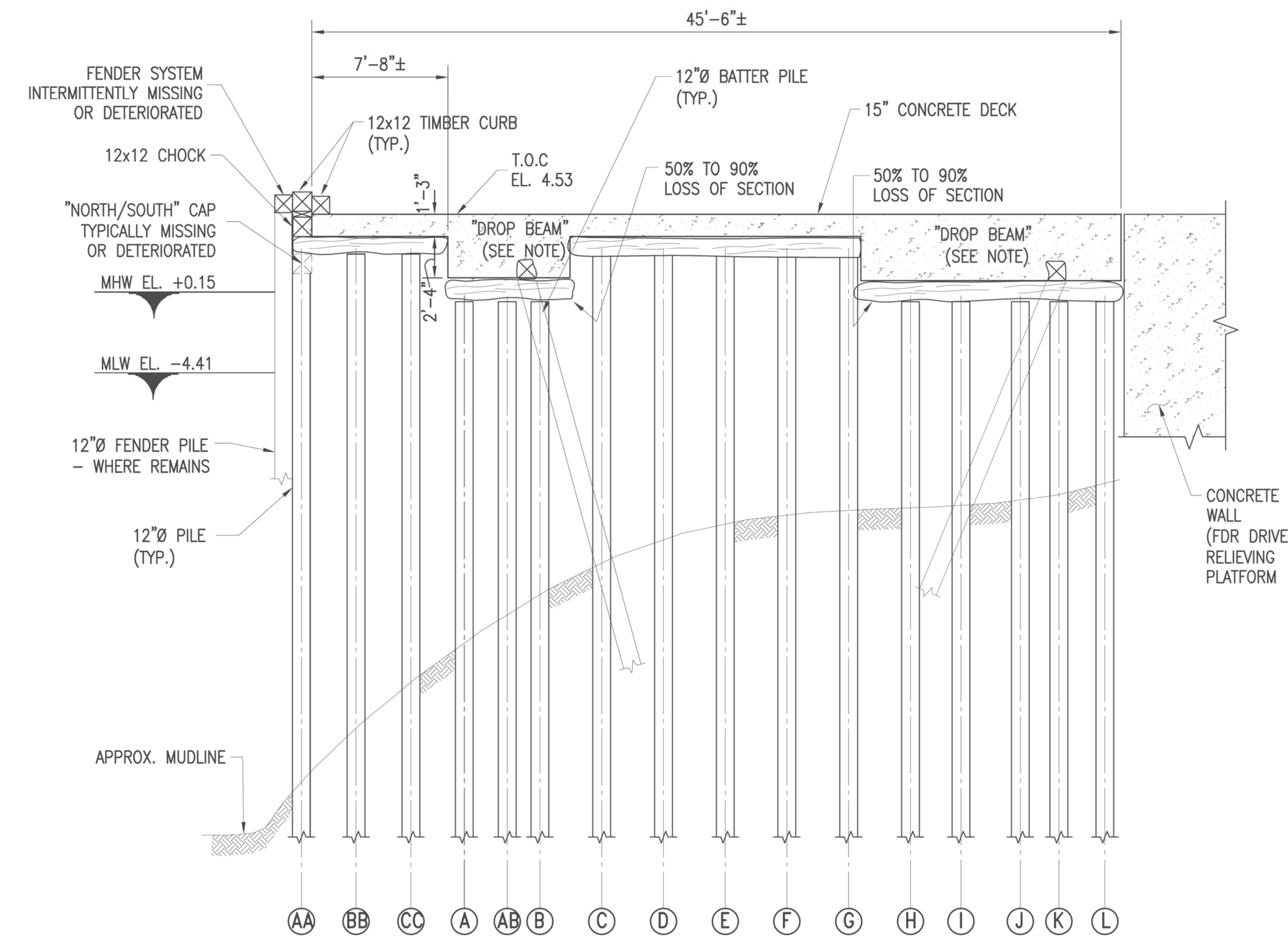


B 371020 EXISTING SECTION – PILE BENT 75

TYPICAL FOR "ODD NUMBERED" BENTS 62 THRU 108, EVEN NUMBERED BENTS ARE SIMILAR (SEE PLAN)

8' 4' 0 8' FEET
SCALE: 3/16" = 1'-0"

NOTE:
TIMBER PILE CAP AT "DROP BEAM" TYPICALLY EXHIBITS 50% TO 90% LOSS OF CROSS-SECTIONAL AREA RESULTING IN DIMINISHED PILE BEARING.

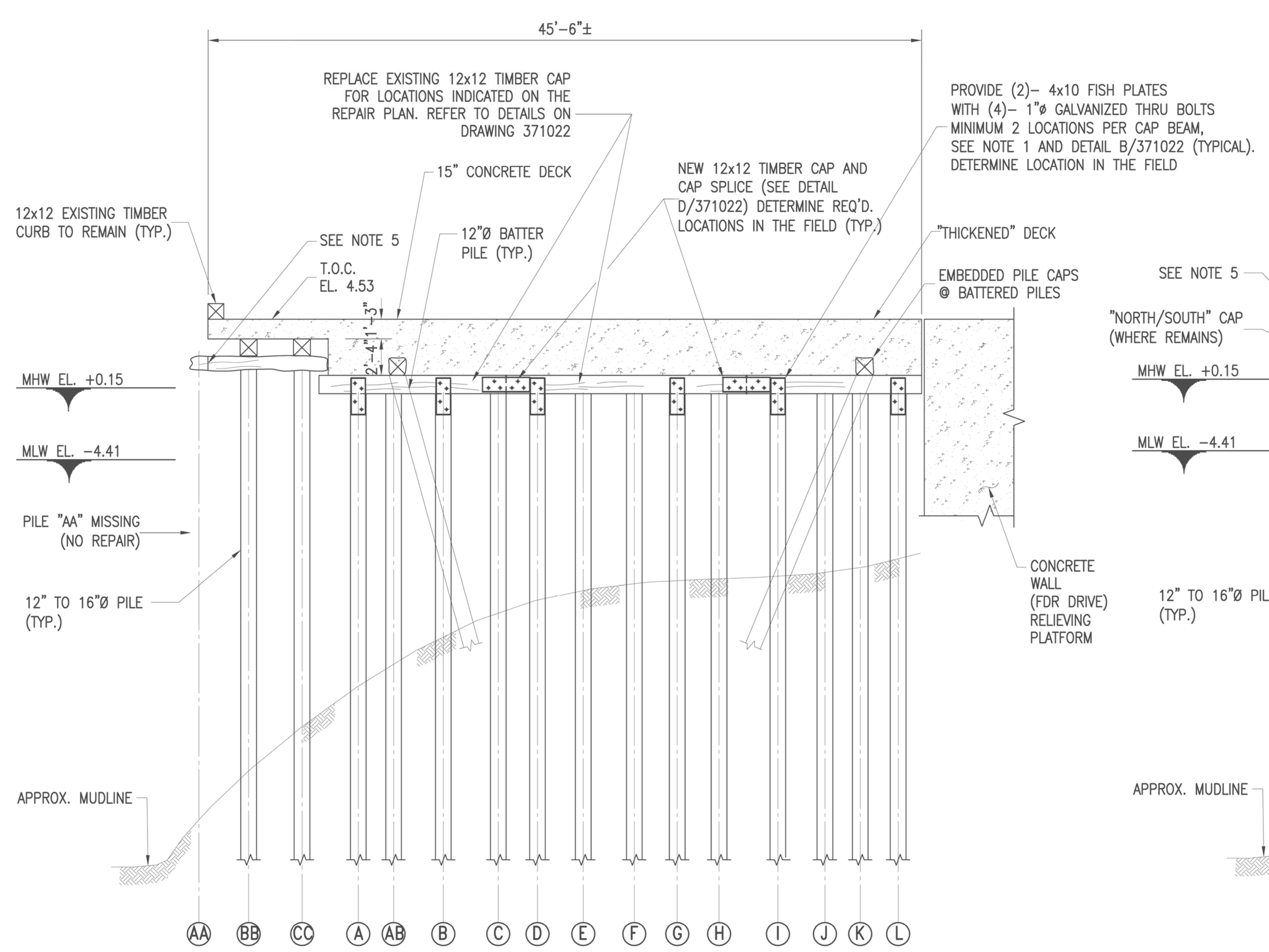


C 371020 EXISTING SECTION – PILE BENT 109

TYPICAL FOR "ODD NUMBERED" BENTS 109 THRU 118, EVEN NUMBERED BENTS ARE SIMILAR (SEE PLAN)

8' 4' 0 8' FEET
SCALE: 3/16" = 1'-0"

NOTE:
TIMBER PILE CAP AT "DROP BEAM" TYPICALLY EXHIBITS 50% TO 90% LOSS OF CROSS-SECTIONAL AREA RESULTING IN DIMINISHED PILE BEARING.

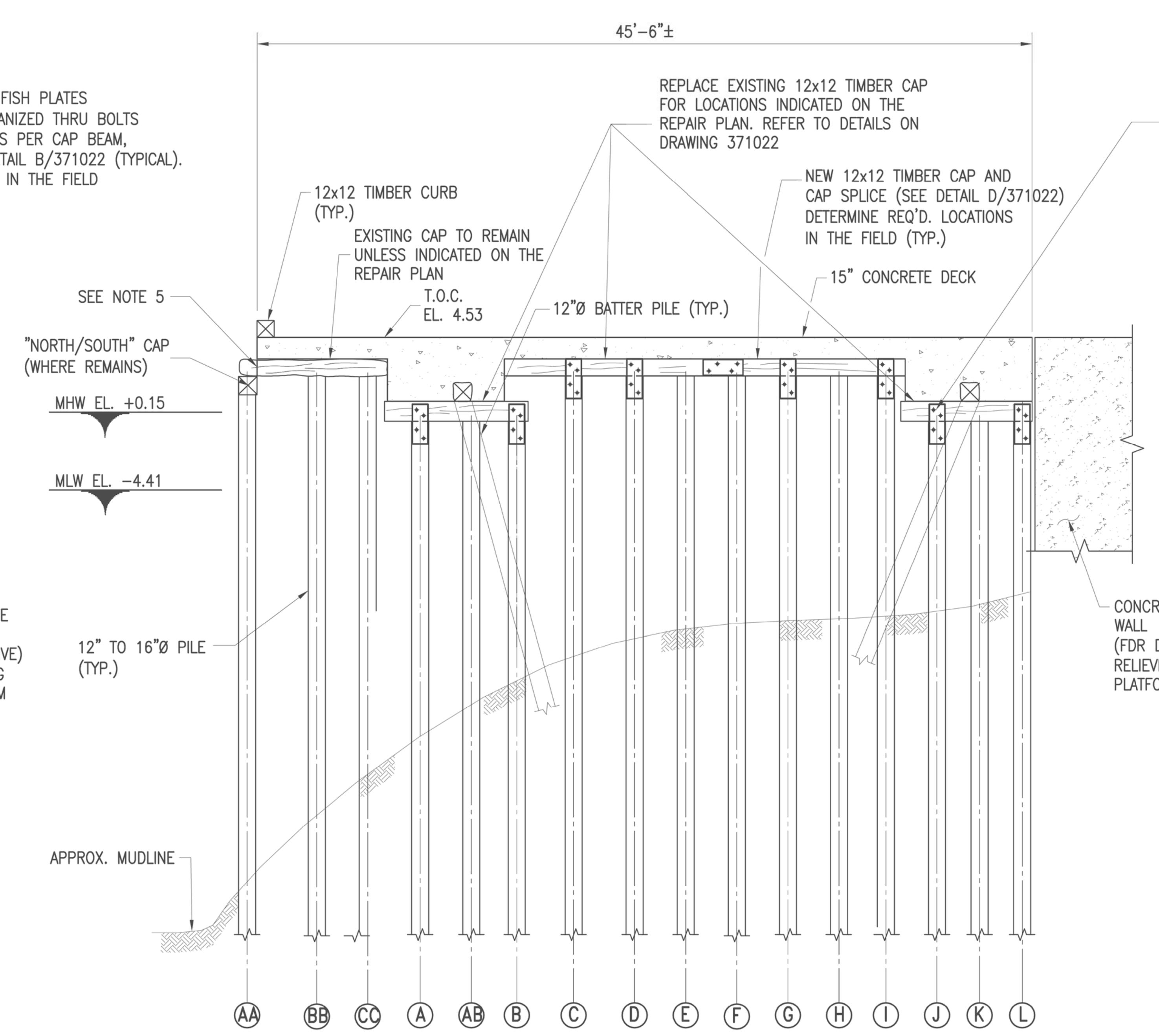


D 371020 REPAIR SECTION – PILE BENT NUMBER 57

1. TYPICAL FOR "ODD NUMBERED" BENTS 55 THRU 61
2. FOR REPAIR IN THIS AREA FOR BENTS 55 AND 57, SEE DRAWING 371021.

8' 4' 0 8' FEET
SCALE: 3/16" = 1'-0"

GENERAL NOTES :
1. WHERE BATTERED PILE (OR TIMBER BRACING REMNANTS) INTERFERES WITH FISHPLATE INSTALLATION, THE FOLLOWING ACTIONS SHALL BE TAKEN AT NO ADDITIONAL COST TO THE OWNER:
   A. DEMOLISH PORTION OF BATTERED PILE (OR BRACING REMNANT) TO ALLOW INSTALLATION OF THE FISHPLATE.
   B. LENGTHEN FISHPLATE AS NECESSARY AND CONNECT FISHPLATE TO PILE AND CAP.
   C. IN EXTREME CASE PROVIDE ALTERNATE CONNECTION (SEE DETAIL F/371022) WHERE AND WHEN DIRECTED.
2. FENDER SYSTEM AND TIMBER ALONG THE PIER EDGE IS TO BE REMOVED ACCORDING TO DRAWING 371017.
3. WORK THIS DRAWING WITH DRAWINGS 371019, 371021, AND AND 371022.
4. FOR TIMBER TREATMENT AND OTHER REQUIREMENTS SEE DRAWINGS 371015 AND PROJECT SPECIFICATION FME 039-08.
5. WHERE NORTH/SOUTH CAP IS MISSING OR HAS BEEN REMOVED, TRIM THE OUTBOARD END OF THE EAST WEST CAP BEAM FLUSH WITH THE EXISTING CONCRETE DECK.

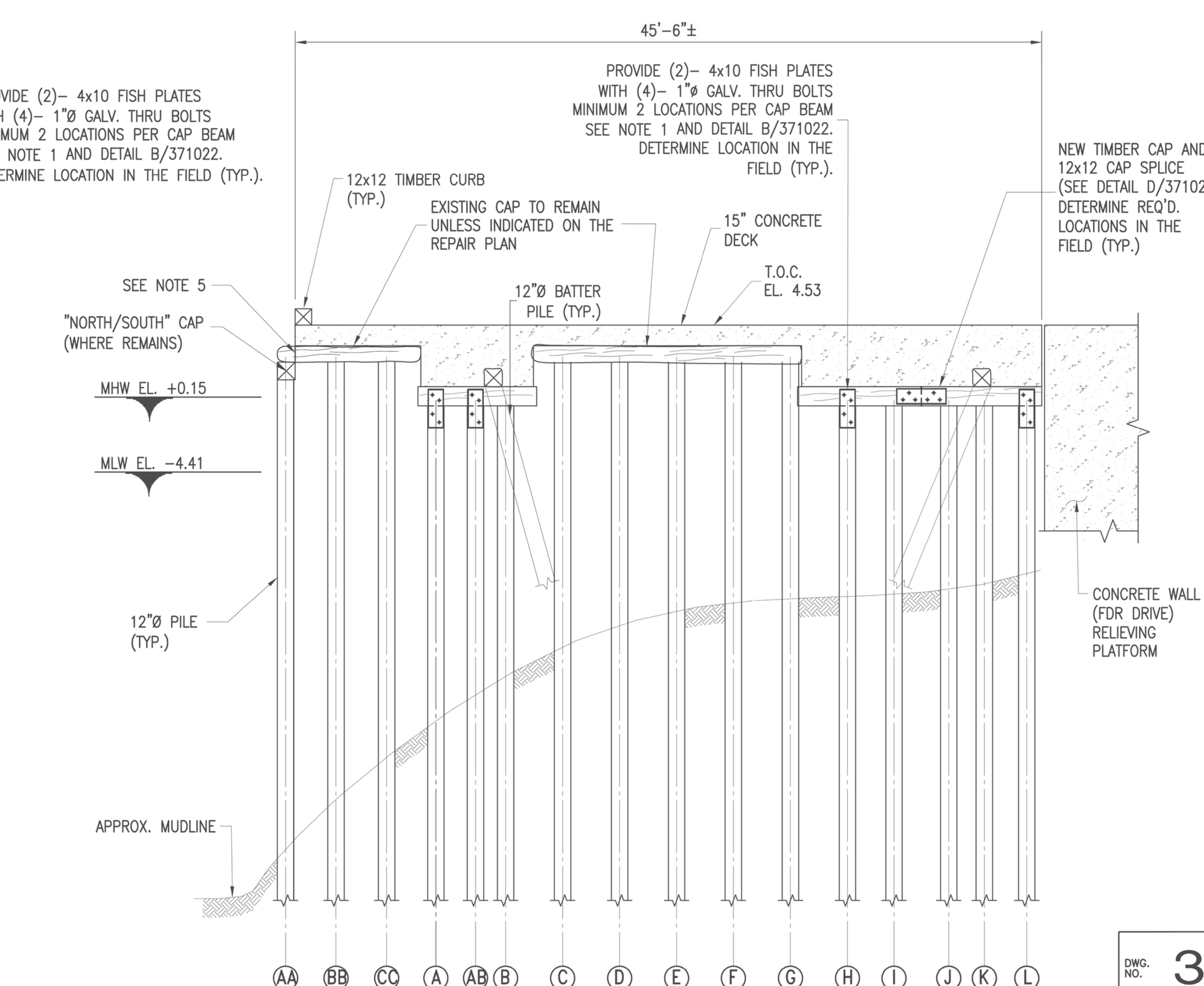


PROVIDE (2)– 4x10 FISH PLATES WITH (4)– 1"Ø GALV. THRU BOLTS MINIMUM 2 LOCATIONS PER CAP BEAM SEE NOTE 1 AND DETAIL B/371022. DETERMINE LOCATION IN THE FIELD (TYP.).

E 371020 REPAIR SECTION – PILE BENT 75

TYPICAL FOR "ODD NUMBERED" BENTS 63 THRU 108. BENTS 119, 121, 123, 125, AND 127 ARE SIMILAR (SEE PLAN)

8' 4' 0 8' FEET
SCALE: 3/16" = 1'-0"



F 371020 REPAIR SECTION – PILE BENT 109

TYPICAL FOR "ODD NUMBERED" BENTS 109 THRU 118,

8' 4' 0 8' FEET
SCALE: 3/16" = 1'-0"

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USE .1 SIZE TEXT ONLY
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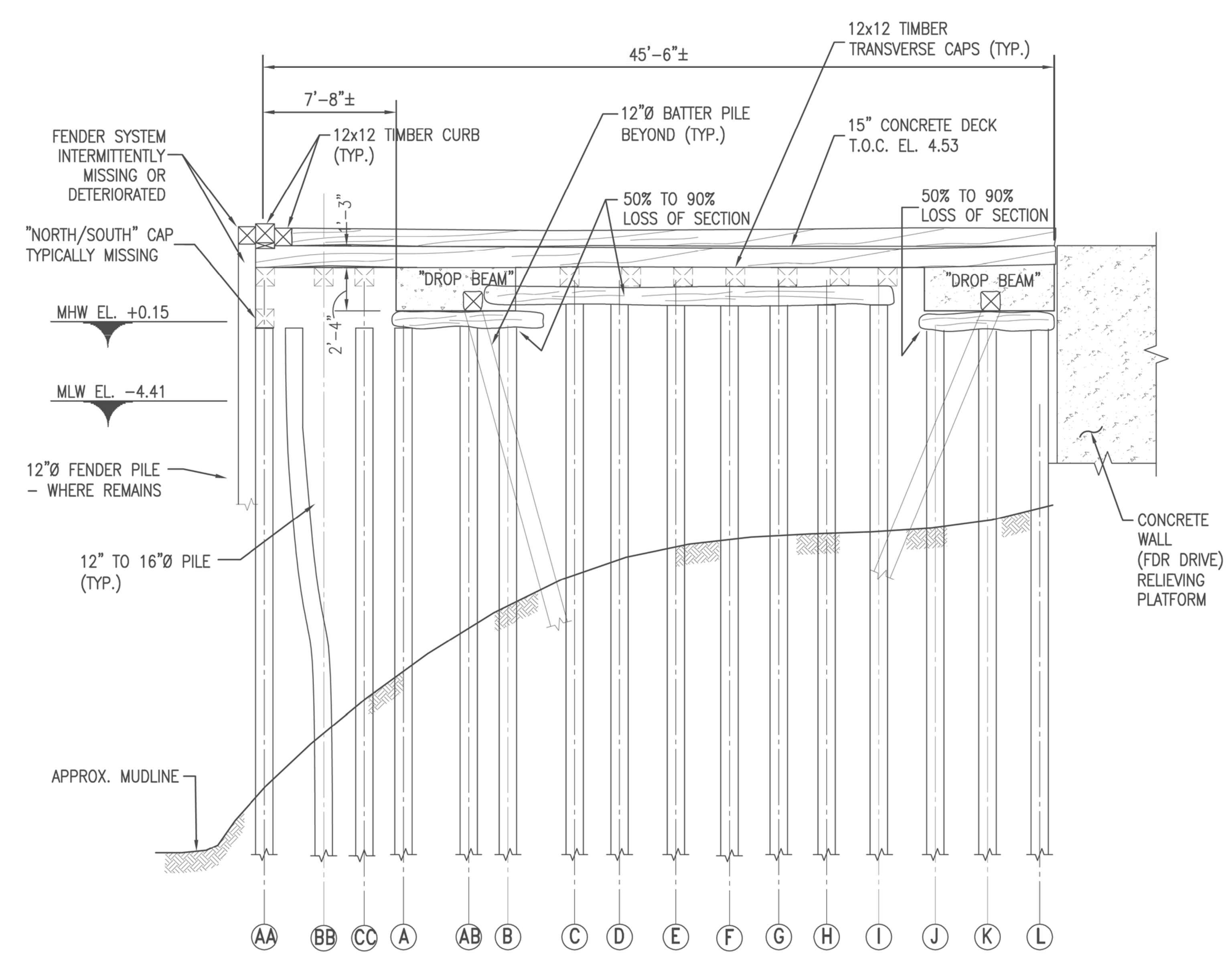
REVISION SIGNATURES	
REV	PROJECT ENGINEER
00	I. LITROVNIK

DWG. NO. 371020-00
CON EDISON
DWG. TYPE COMPANY
DWG. SIZE A
LOCATION: WATERSIDE DOCK
TITLE: EXISTING AND REPAIR PILE BENT SECTIONS – 1

– APPROVALS –
ENGINEERING MANAGER: D. AZZOLINI
PROJECT ENGINEER: I. LITROVNIK
DESIGNER: B. MOODY
DRAWN BY: J. MAGYAWE
SCALE: AS NOTED
DISCIPLINE CODE: SB

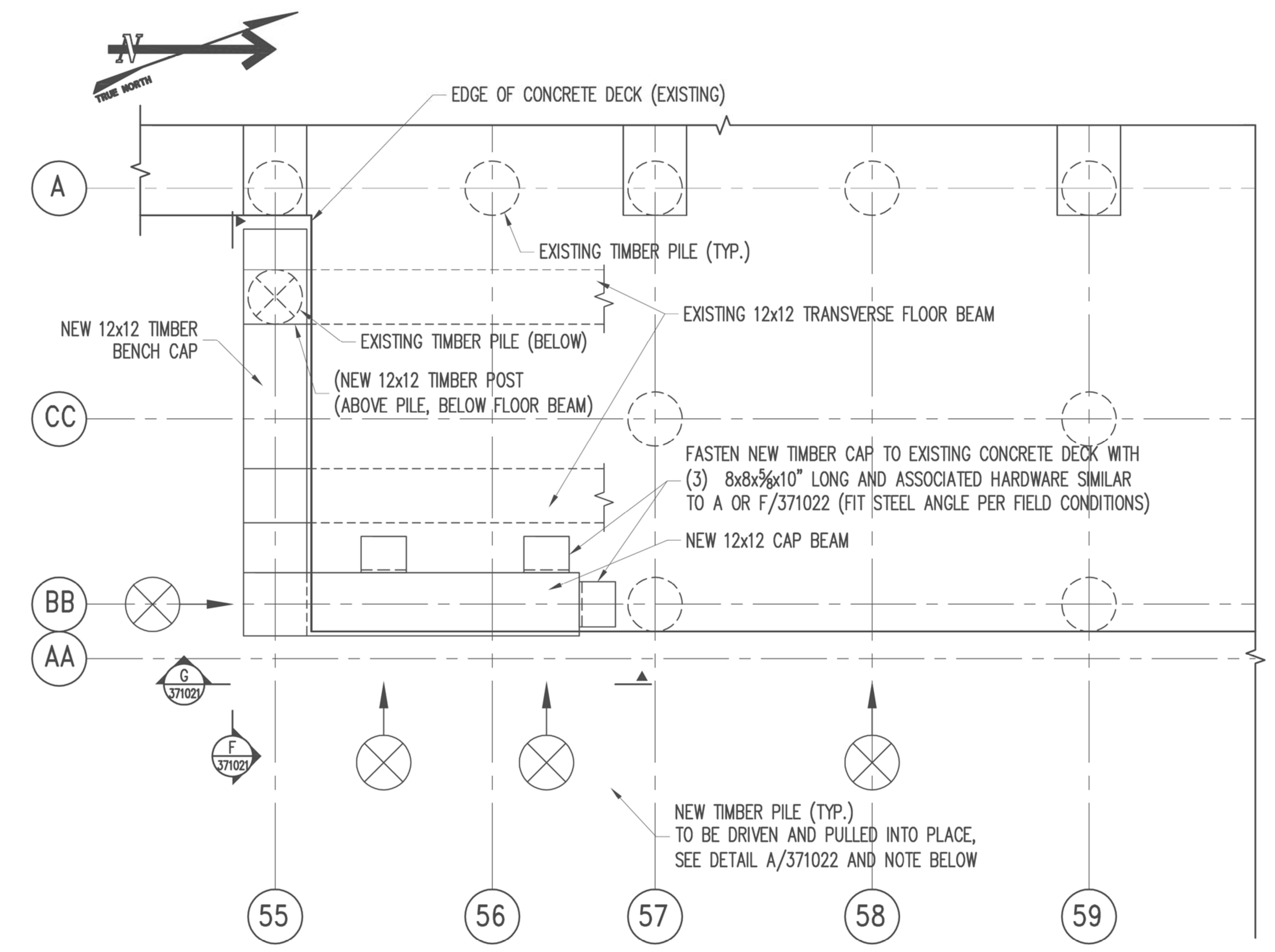
COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED



A (371021) EXISTING SECTION – PILE BENT 129

SCALE: 3/16" = 1'-0"

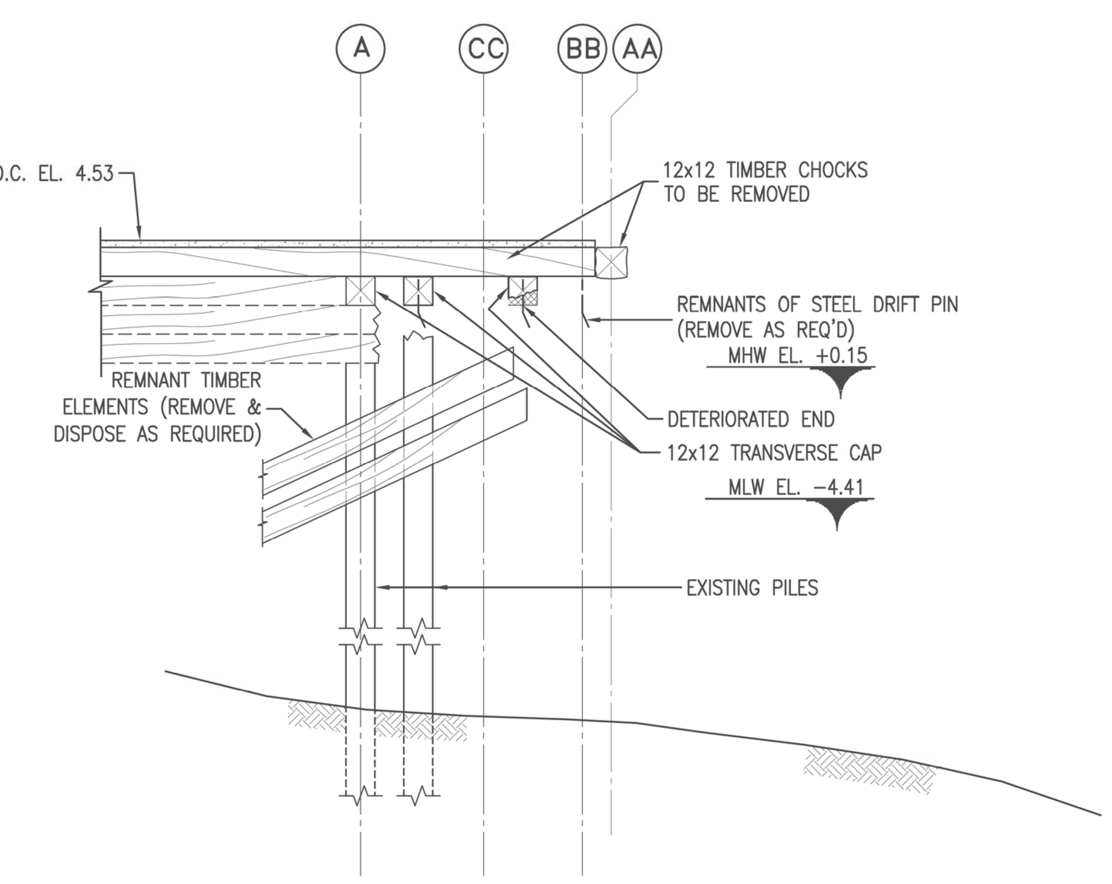
NOTE:
TIMBER PILE CAP AT "DROP BEAM" AND UNDER TRANSVERSE CAPS TYPICALLY EXHIBITS 50% TO 90% LOSS OF CROSS-SECTIONAL AREA RESULTING IN DIMINISHED PILE BEARING.



REPAIR PART PLAN (CORNER AT STATION 4+72)

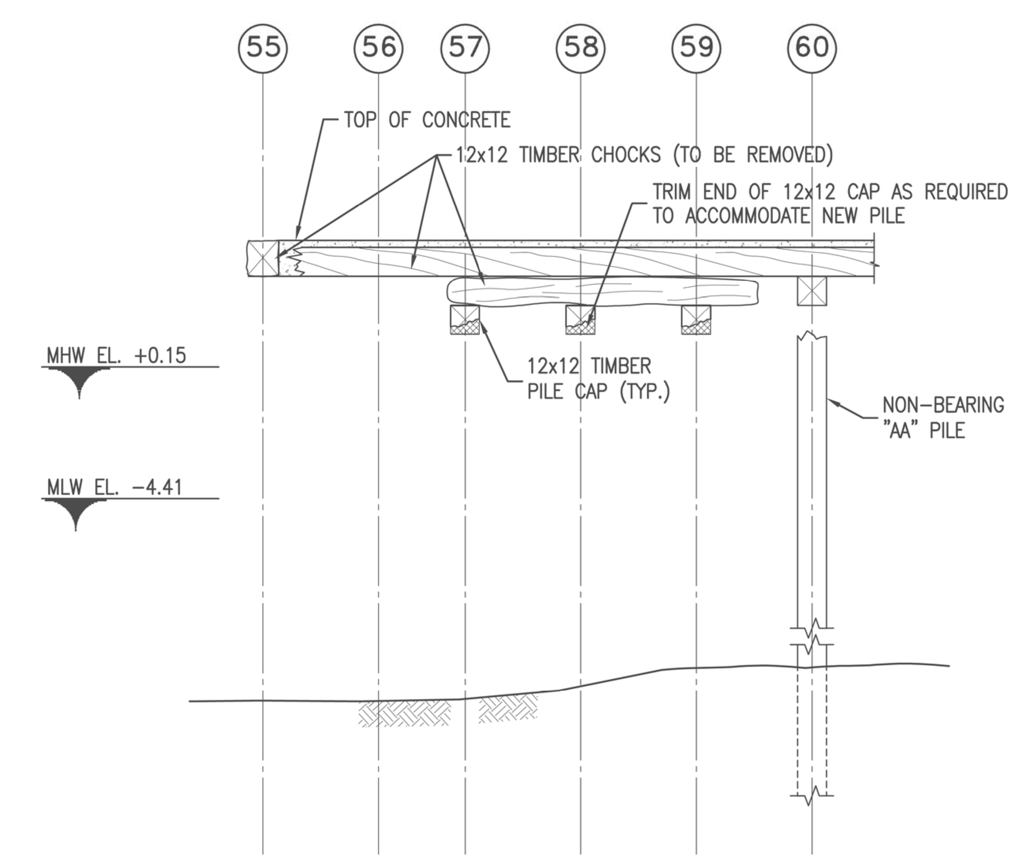
SCALE: 1/2" = 1'-0"

NOTE:
IN CASE OF OBSTRUCTION FROM ORIGINAL PILE, SHIFT NEW PILE AS REQUIRED (12"±) AND PULL INTO FINAL LOCATION.



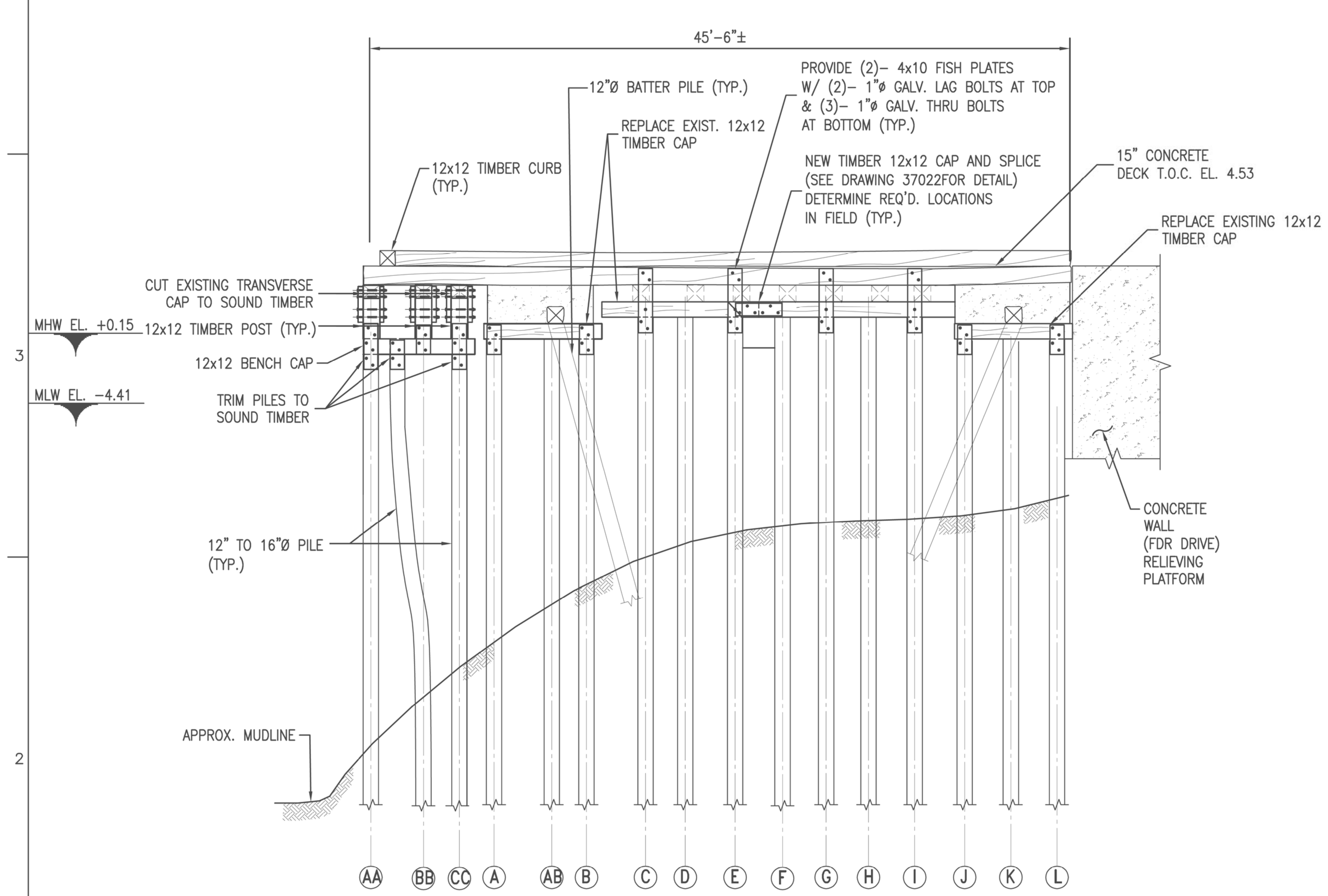
D (371021) EXISTING SECTION (EAST END, BENT 55)

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



E (371021) EXISTING SECTION EDGE ALONG STA 4+72 TO 4+79

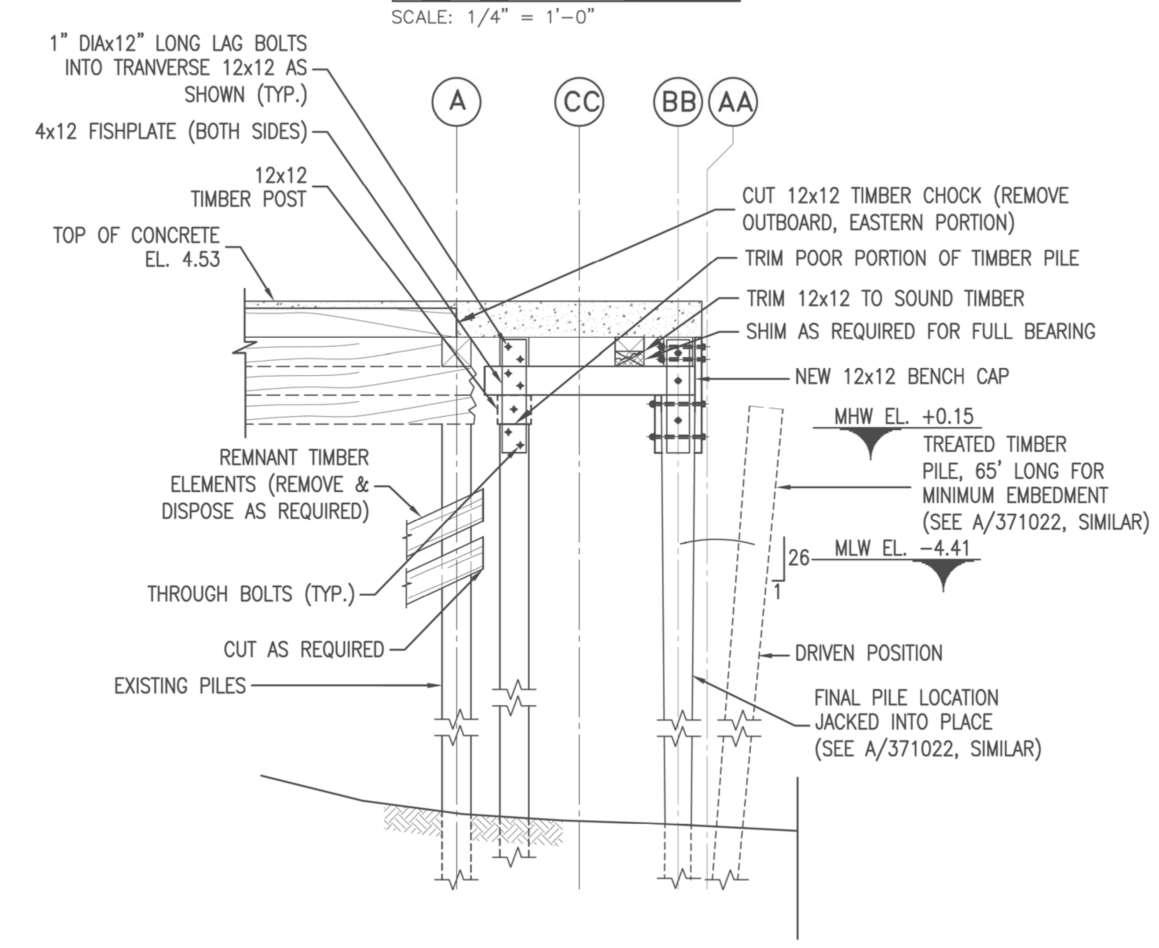
SCALE: 1/4" = 1'-0"



C (371021) REPAIR SECTION – PILE BENT 129

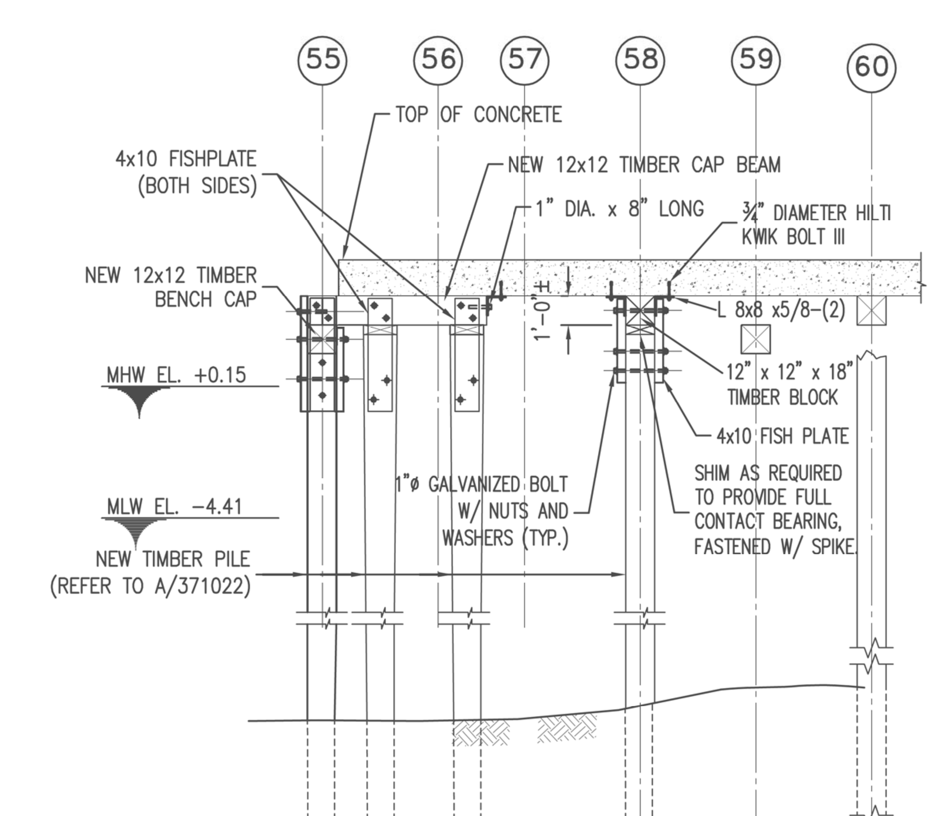
SCALE: 3/16" = 1'-0"

NOTE:
TIMBER PILE CAP AT "DROP BEAM" TYPICALLY EXHIBITS 50% TO 90% LOSS OF CROSS-SECTIONAL AREA RESULTING IN DIMINISHED PILE BEARING.



F (371021) REPAIR SECTION (EAST END, BENT 55)

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



G (371021) REPAIR SECTION EDGE ALONG STA 4+72 TO 4+79

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

REVISION USE .1 SIZE TEXT ONLY	
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REVISION SIGNATURES	
REV	PROJECT ENGINEER
00	I. LITROVNIK

DWG. NO. 371021-00

CON EDISON — DWG. TYPE: COMPANY — DWG. SIZE: A

LOCATION: WATERSIDE DOCK

TITLE: EXISTING AND REPAIR PILE BENT SECTIONS – 2

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DISCIPLINE CODE:	SB

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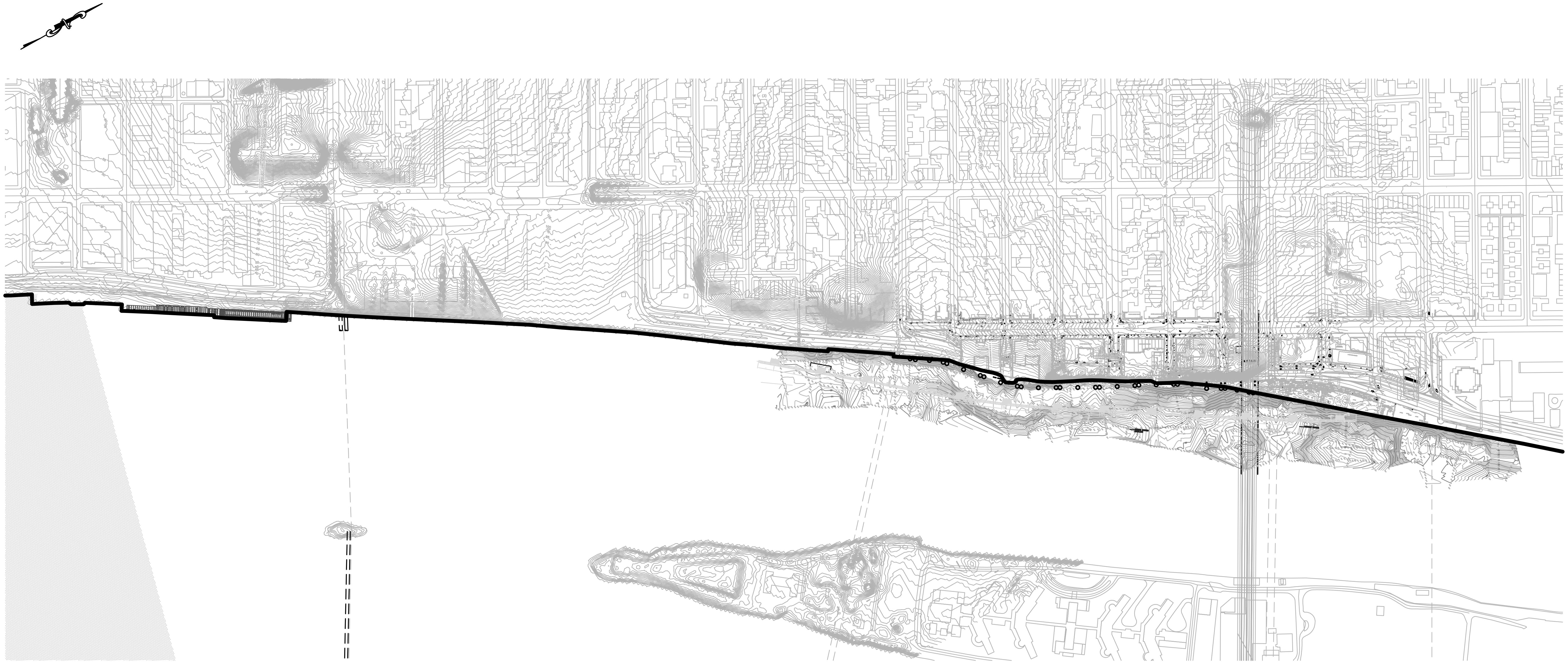
Appendix B

AECOM Drawings



GRAPHIC SCALE: 1" = 500'-0"

500' 250' 0 250' 500' 1000'

AECOM

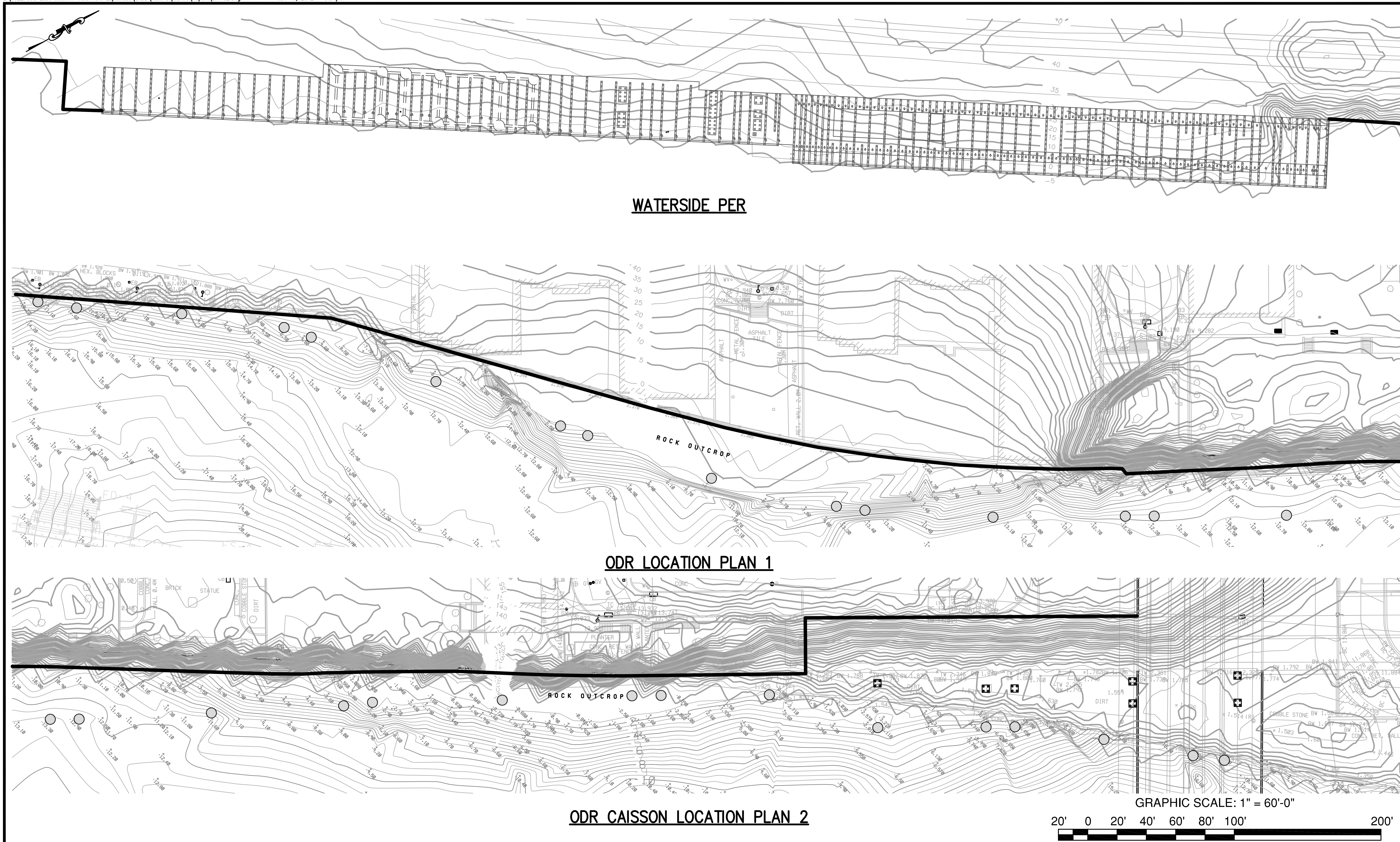
-

Figure - 1

EAST MIDTOWN WATERFRONT ESPLANADE

Vicinity Map

L:\60221358 East Midtown Waterfront Esplanade\CADD\Task 3\Marine\Report\SK-02.dwg Jan 16, 2012 - 3:31pm



AECOM

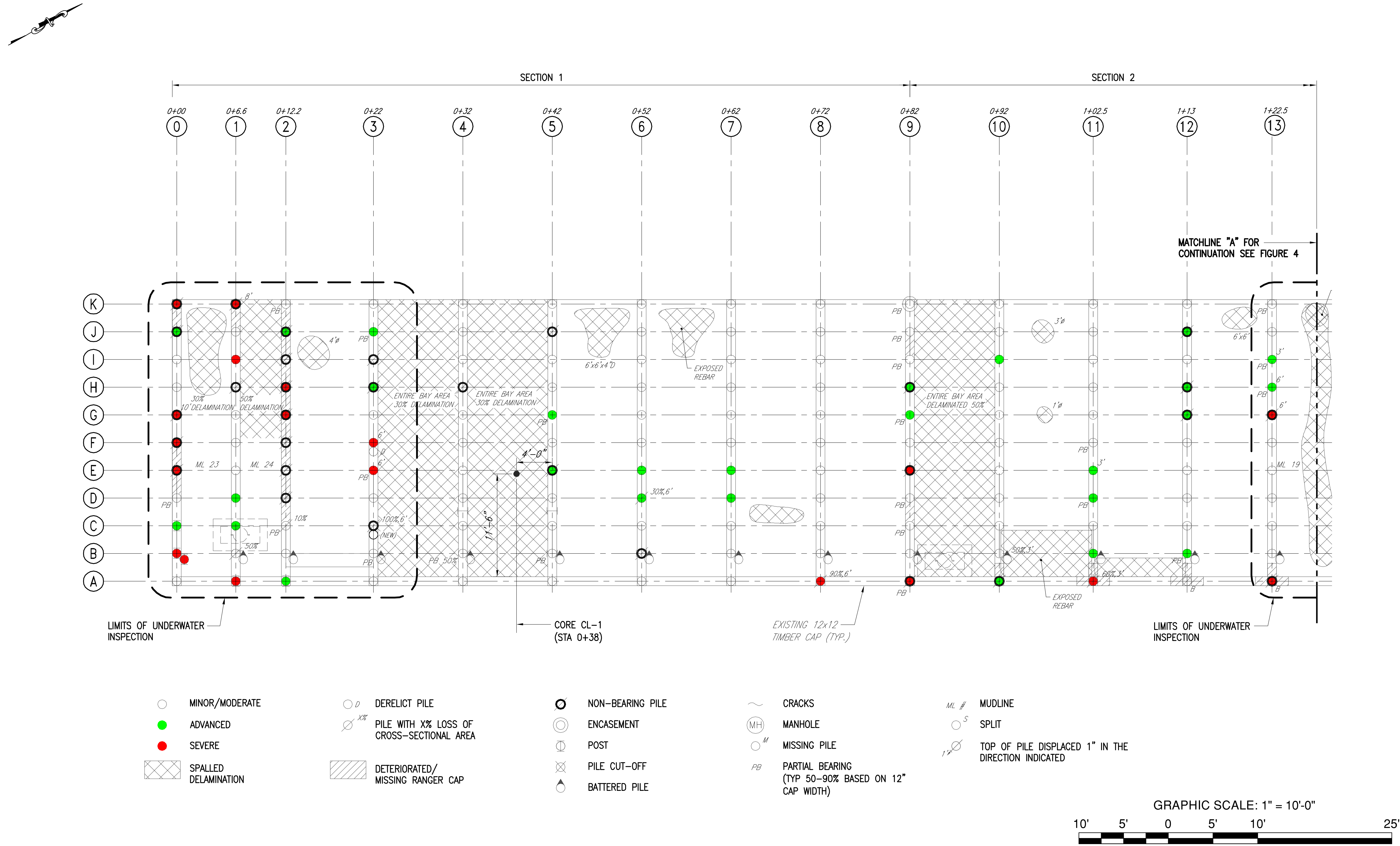
Figure - 2

EAST MIDTOWN WATERFRONT ESPLANADE

Location Plan

-

C:\Users\lizanof\appdata\local\temp\AcPublish_5300\SK-03.dwg Jan 16, 2012 - 3:33pm

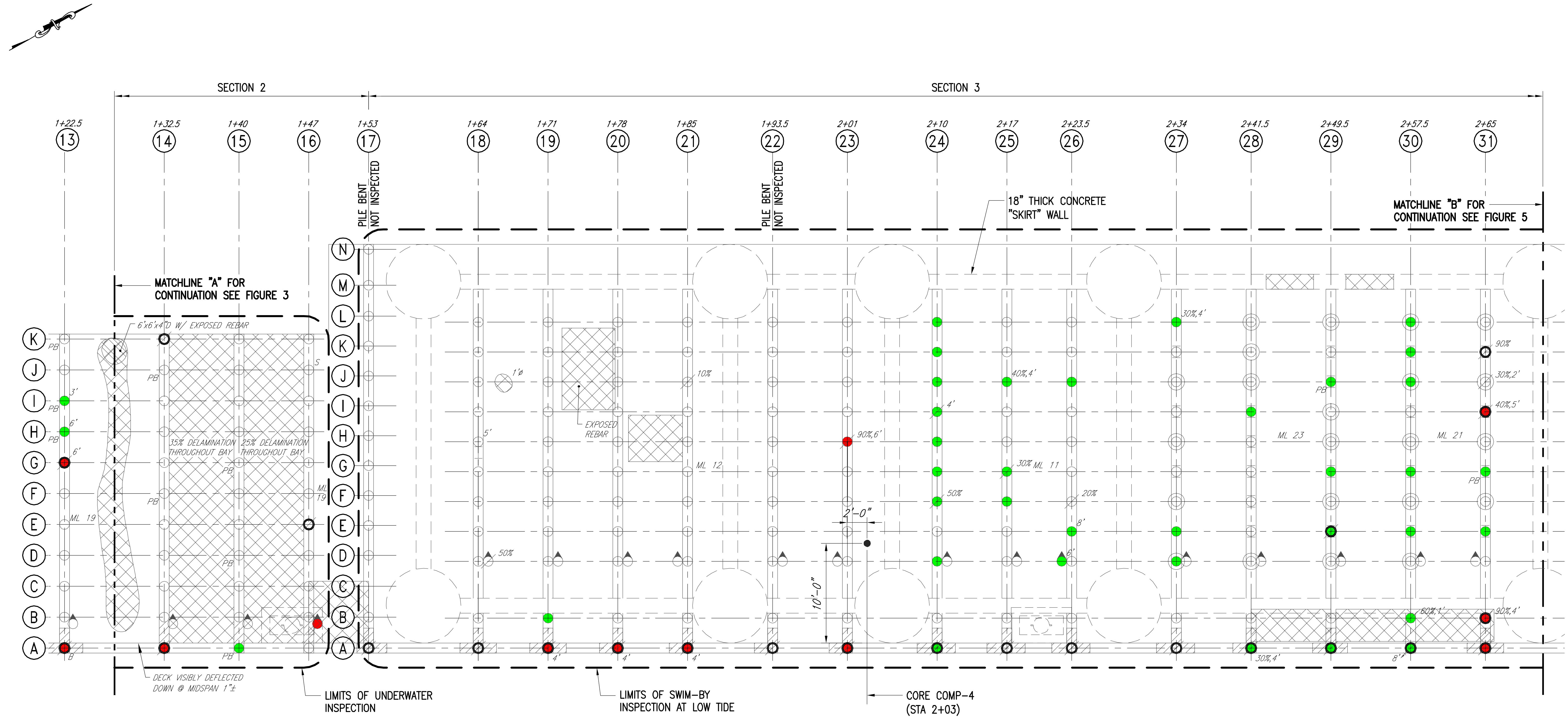


AECOM

Figure - 3
WATERSIDE PIER
Part Plan - 1

-

L:\60221358 East Midtown Waterfront Esplanade\CADD\Task 3\Marine\Report\SK-04.dwg Jan 16, 2012 – 3:33pm



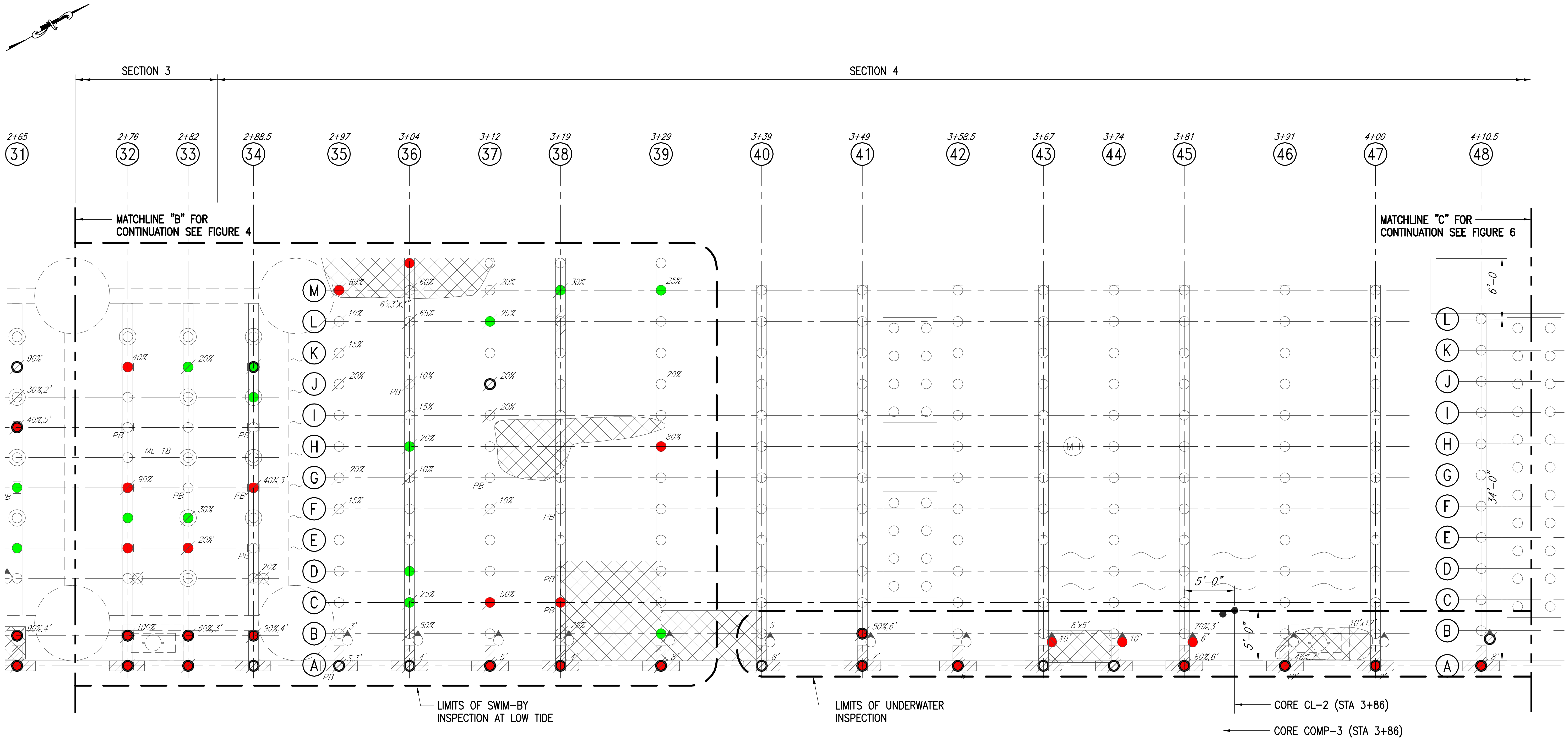
	MINOR/MODERATE		DERELICT PILE		NON-BEARING PILE		CRACKS	ML #	MUDLINE
	ADVANCED	X%	PILE WITH X% LOSS OF CROSS-SECTIONAL AREA		ENCASEMENT	MH	MANHOLE	S	SPLIT
	SEVERE				POST	M	MISSING PILE	1"	TOP OF PILE DISPLACED 1" IN THE DIRECTION INDICATED
	SPALLED DELAMINATION		DETERIORATED/ MISSING RANGER CAP		PILE CUT-OFF	PB	PARTIAL BEARING (TYP 50–90% BASED ON 12" CAP WIDTH)		
					BATTERED PILE				

GRAPHIC SCALE: 1" = 10'-0"

10' 5' 0 5' 10' 25'

AECOM

Figure - 4
WATERSIDE PIER
Part Plan - 2



MINOR/MODERATE
ADVANCED
SEVERE
SPALLED DELAMINATION

D DERELICT PILE
X% PILE WITH X% LOSS OF CROSS-SECTIONAL AREA
DETERIORATED/ MISSING RANGER CAP

NON-BEARING PILE
ENCASEMENT
POST
PILE CUT-OFF
BATTERED PILE

CRACKS
MH MANHOLE
M MISSING PILE
PB PARTIAL BEARING (TYP 50-90% BASED ON 12" CAP WIDTH)

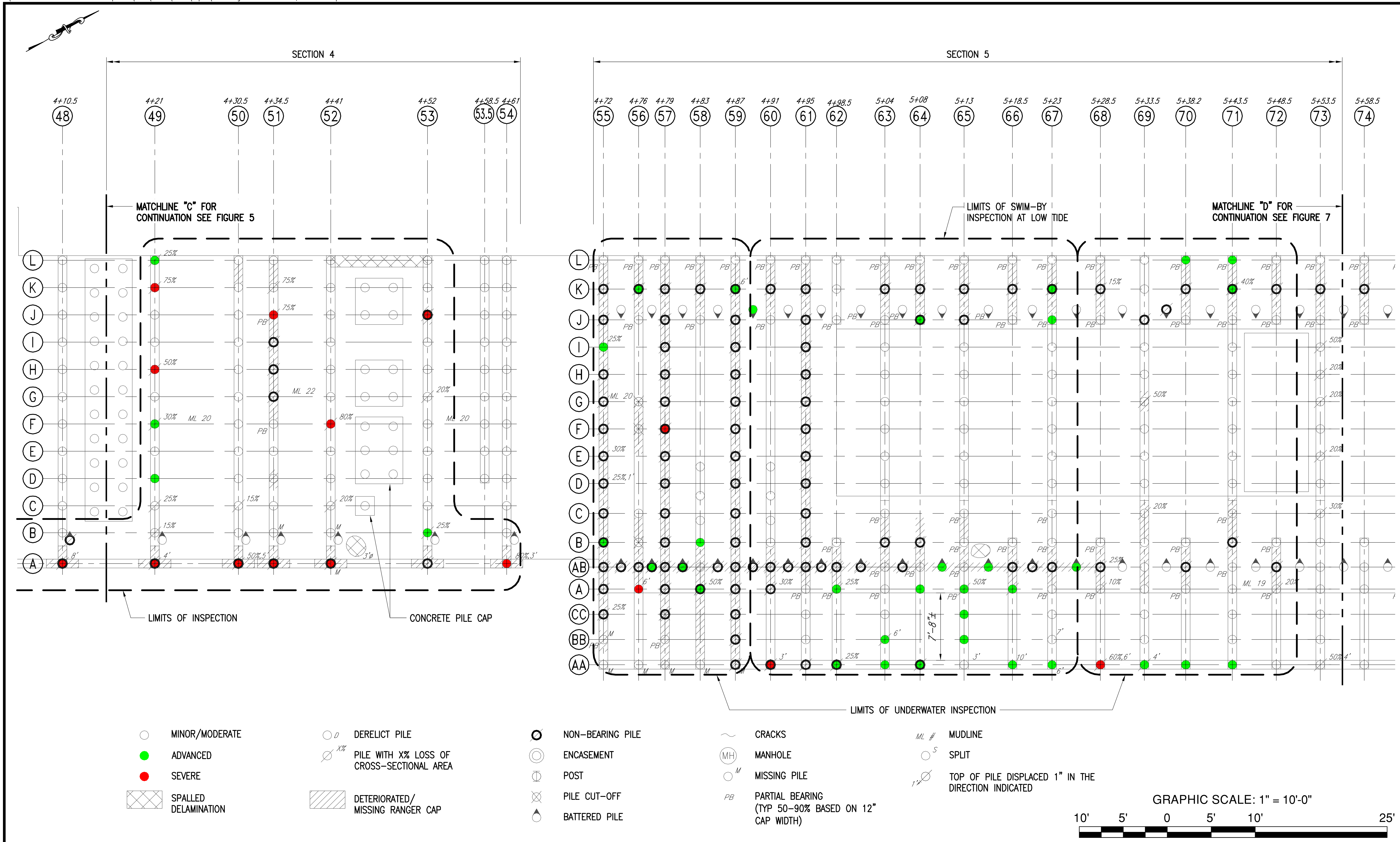
ML # MUDLINE
S SPLIT
1" TOP OF PILE DISPLACED 1" IN THE DIRECTION INDICATED

GRAPHIC SCALE: 1" = 10'-0"

10' 5' 0 5' 10' 25'

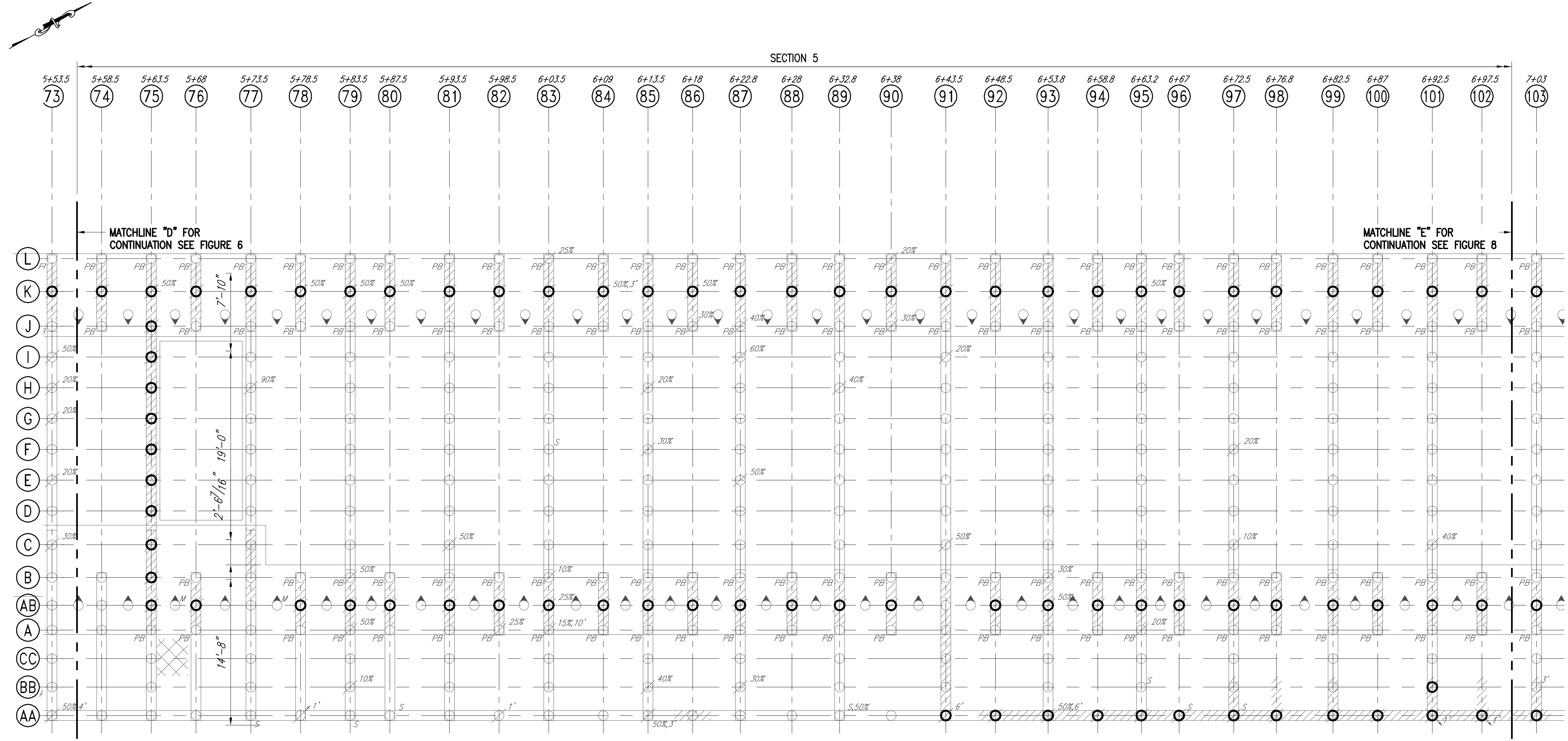
AECOM

Figure - 5
WATERSIDE PIER
Part Plan - 3



AECOM

Figure - 6
WATERSIDE PIER
Part Plan - 4



MINOR/MODERATE

ADVANCED

SEVERE

SPALLED DELAMINATION

D DERELICT PILE

X% PILE WITH X% LOSS OF CROSS-SECTIONAL AREA

DETERIORATED/ MISSING RANGER CAP

NON-BEARING PILE

ENCASEMENT

POST

PILE CUT-OFF

BATTERED PILE

CRACKS

MH MANHOLE

M MISSING PILE

PB PARTIAL BEARING (TYP 50-90% BASED ON 12" CAP WIDTH)

ML MUDLINE

S SPLIT

1" TOP OF PILE DISPLACED 1" IN THE DIRECTION INDICATED

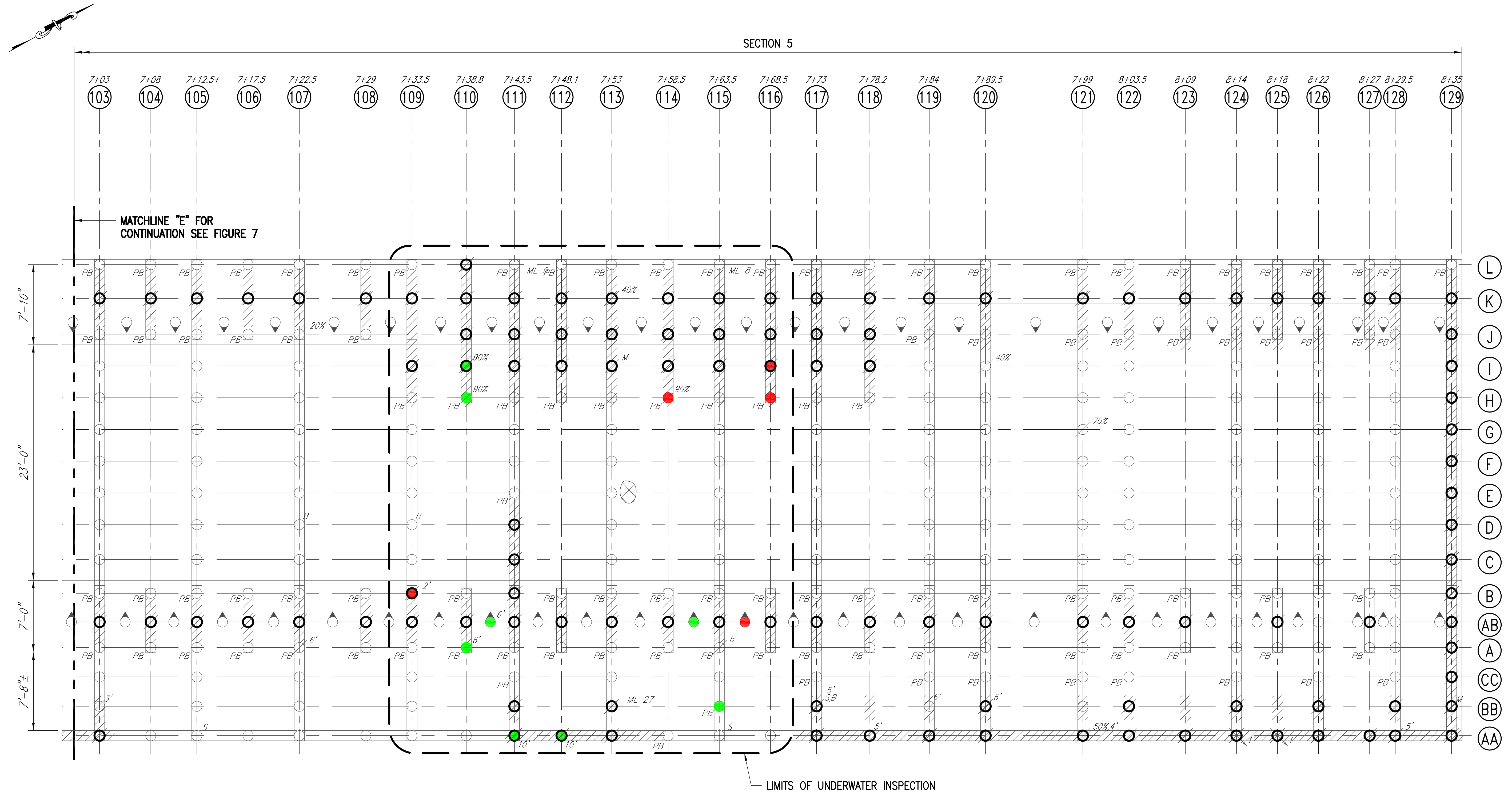
GRAPHIC SCALE: 1" = 10'-0"

10' 5' 0 5' 10' 25'

AECOM

-

Figure - 7
WATERSIDE PIER
Part Plan - 5



	MINOR/MODERATE		DERELICT PILE		NON-BEARING PILE		CRACKS		MUDLINE
	ADVANCED		PILE WITH X% LOSS OF CROSS-SECTIONAL AREA		ENCASEMENT	MH	MANHOLE		SPLIT
	SEVERE				POST		MISSING PILE		TOP OF PILE DISPLACED 1" IN THE DIRECTION INDICATED
	SPALLED DELAMINATION		DETERIORATED/ MISSING RANGER CAP		PILE CUT-OFF	PB	PARTIAL BEARING (TYP 50-90% BASED ON 12" CAP WIDTH)		
					BATTERED PILE				

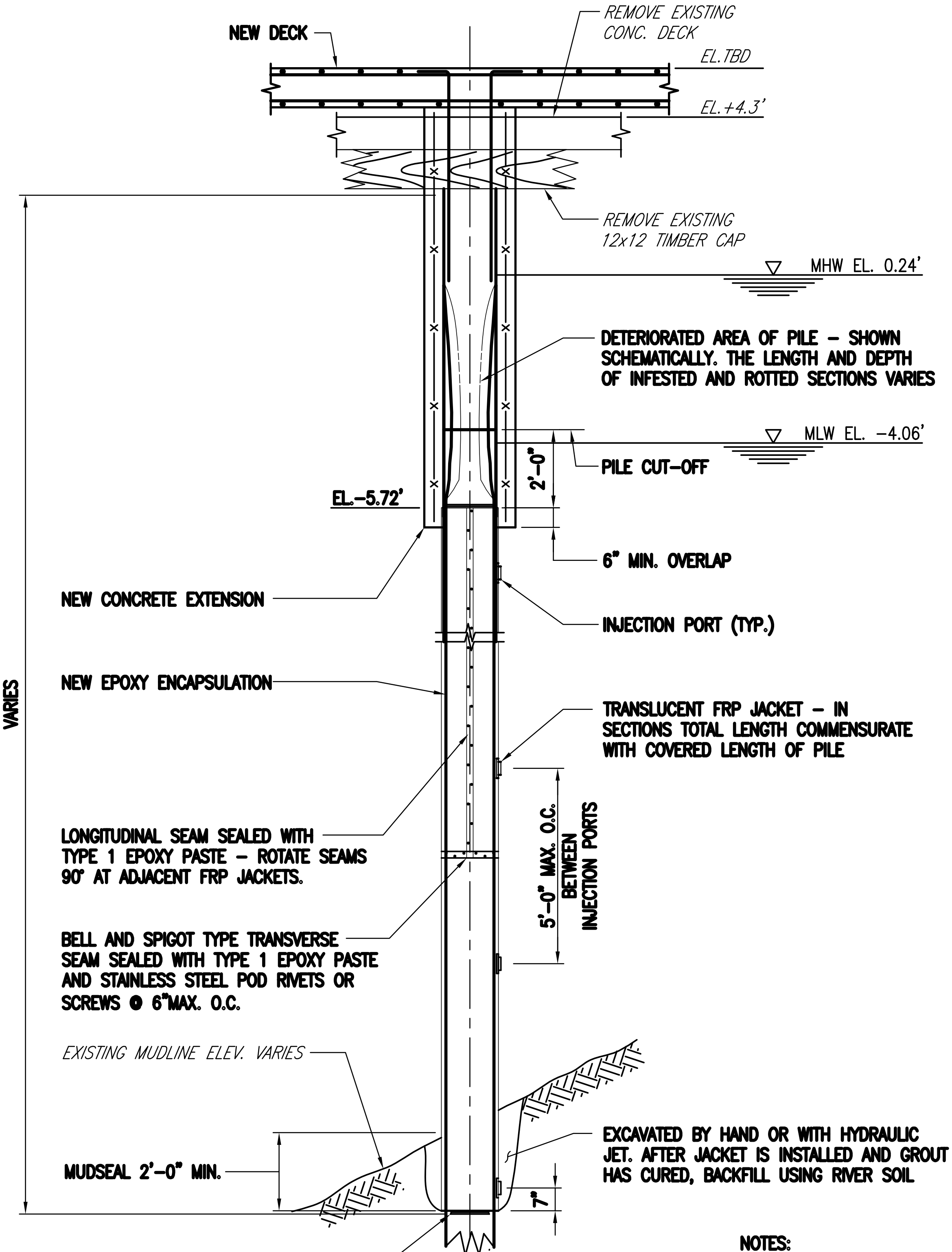
GRAPHIC SCALE: 1" = 10'-0"

10' 5' 0 5' 10' 25'

AECOM

Figure - 8
WATERSIDE PIER
Part Plan - 6

-



NOTES:
1. DATUM IS MBD.
2. PILE CUT-OFF ELEVATION MAY BE LOWER AT PILES EXHIBITING LONGER LENGTHS OF ADVANCED OR SEVERE DETERIORATION.

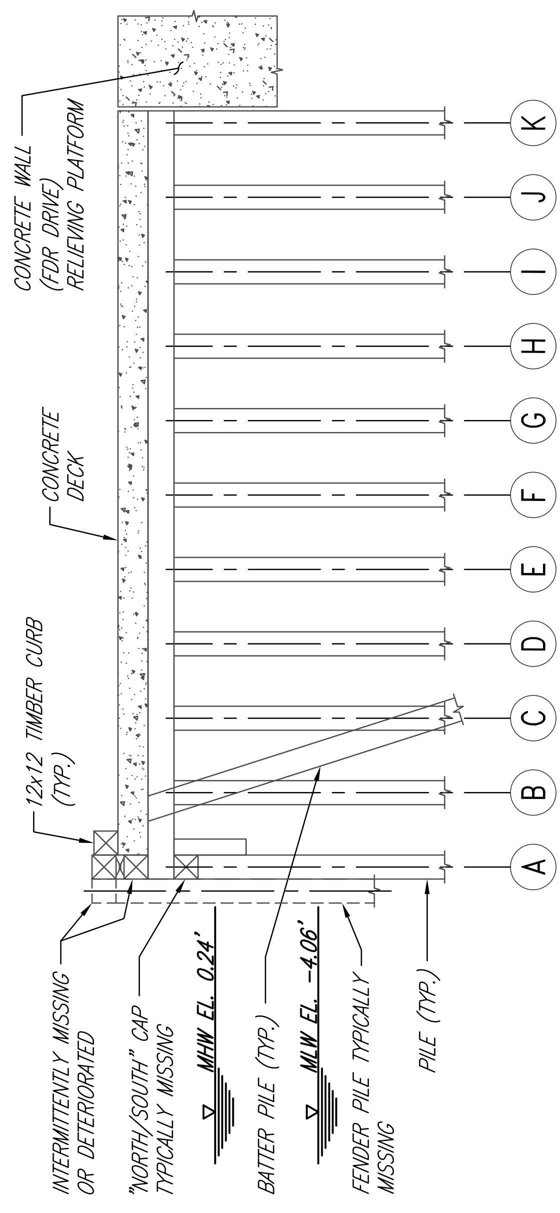
TYPICAL TIMBER PILE REPAIR

1/4"=1'-0" 6' 4' 2' 0

AECOM

Figure 9
WATERSIDE PIER
TYPICAL TIMBER PILE REPAIR

-



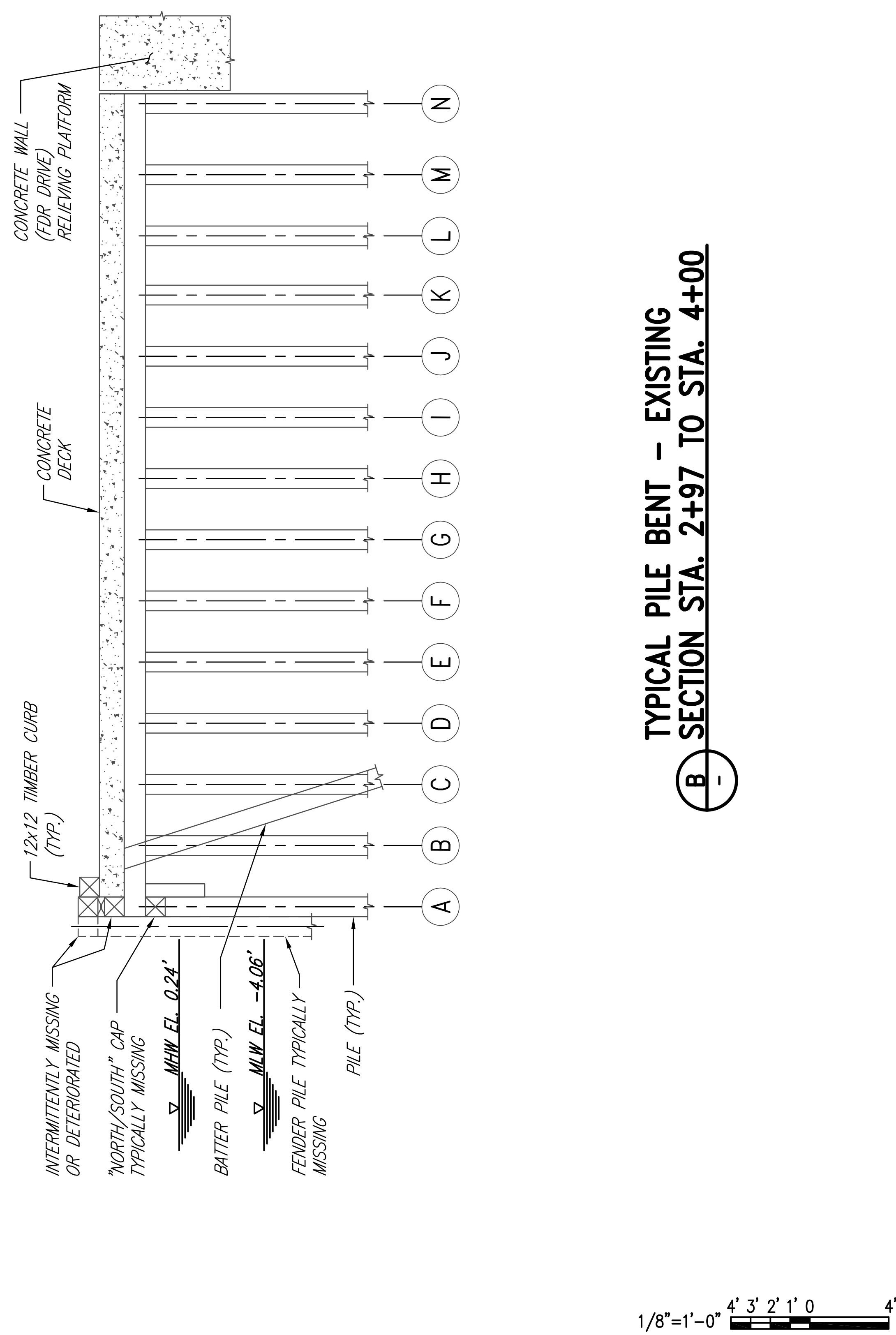
TYPICAL PILE BENT – EXISTING
SECTION STA. 0+00 TO STA. 1+47
A
–

1/8"=1'-0" 4' 3' 2' 1' 0 4'

AECOM

Figure 10
WATERSIDE PIER
SECTION

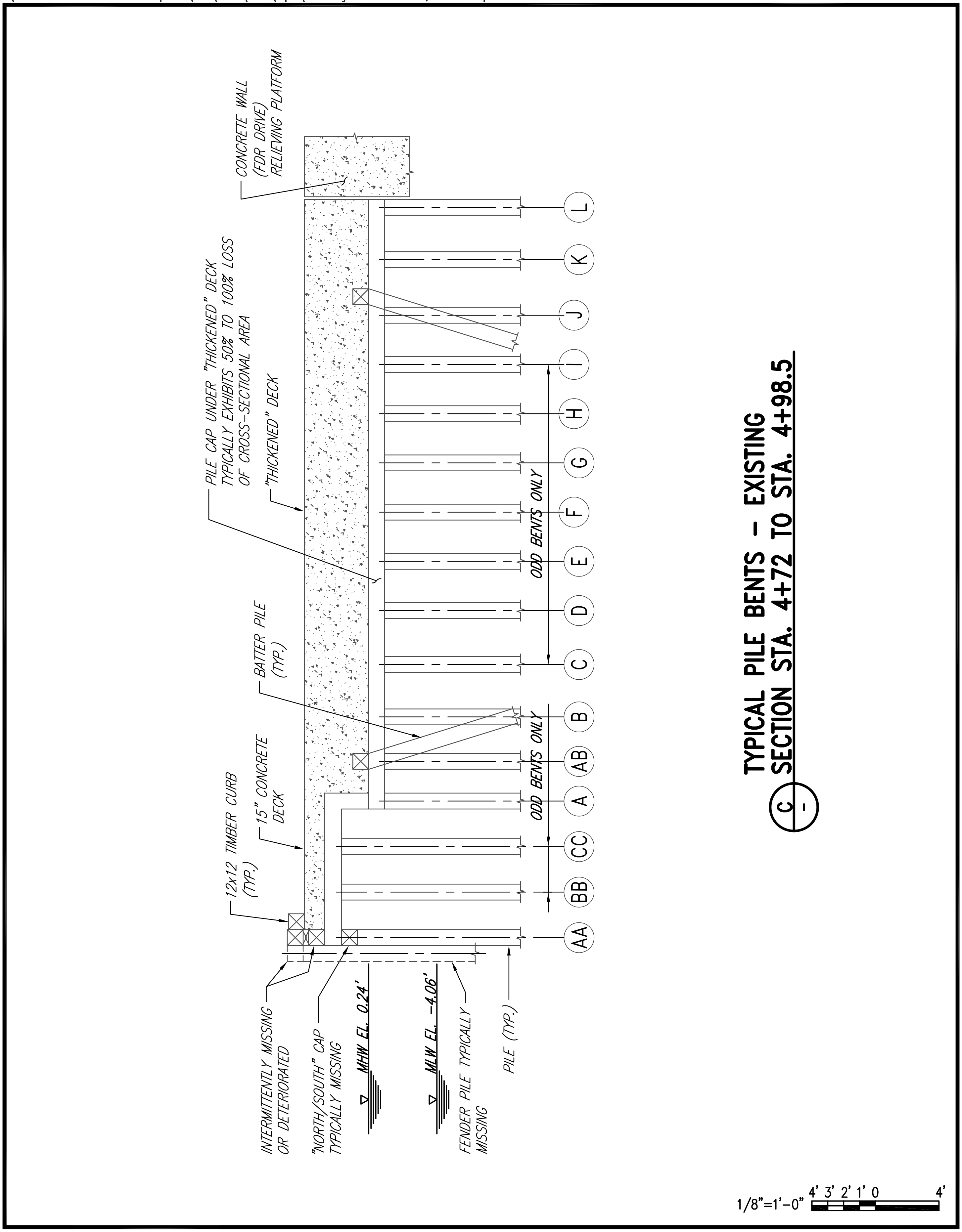
-



AECOM

Figure 11
WATERSIDE PIER
SECTION

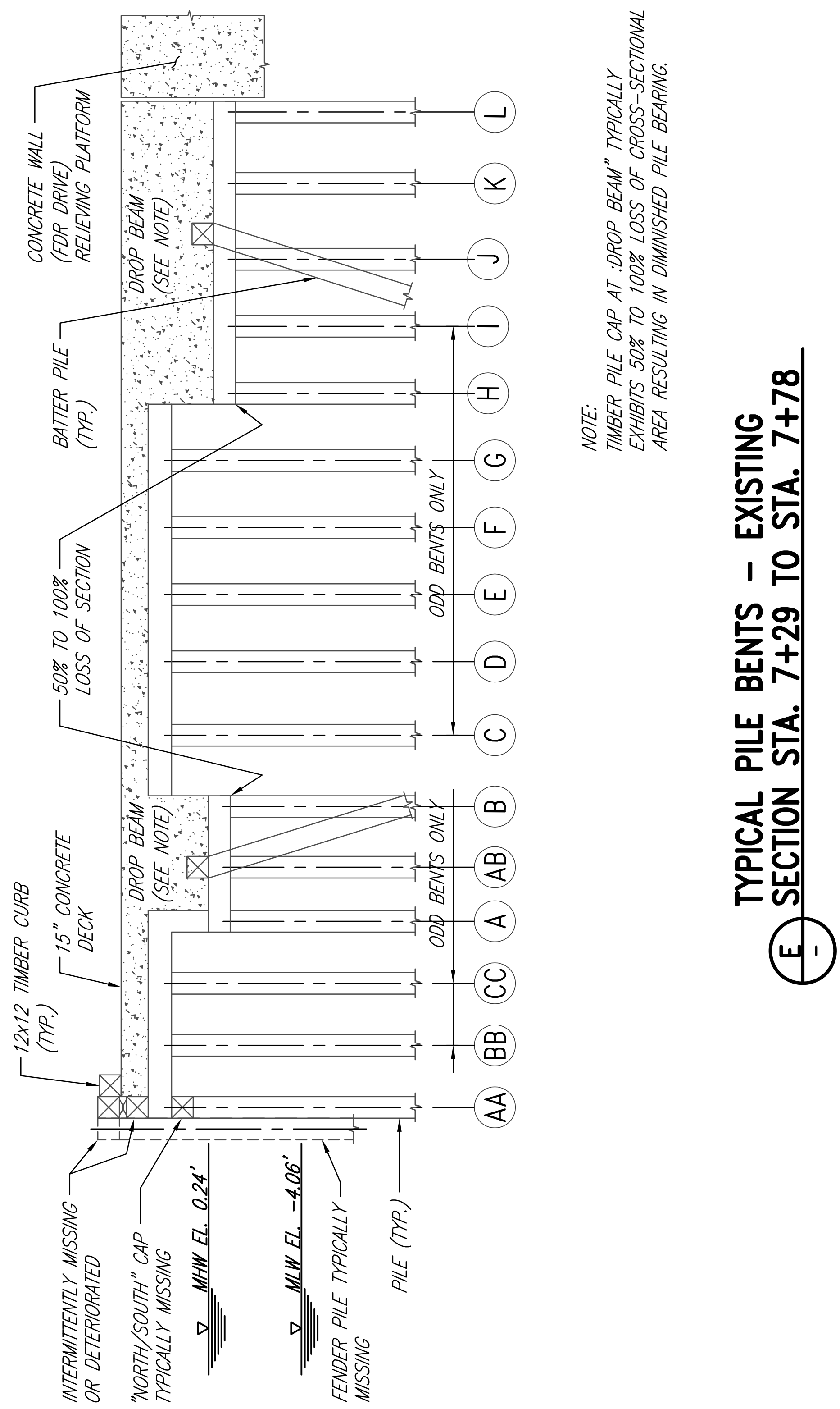
-



AECOM

Figure 12
WATERSIDE PIER
SECTION

-



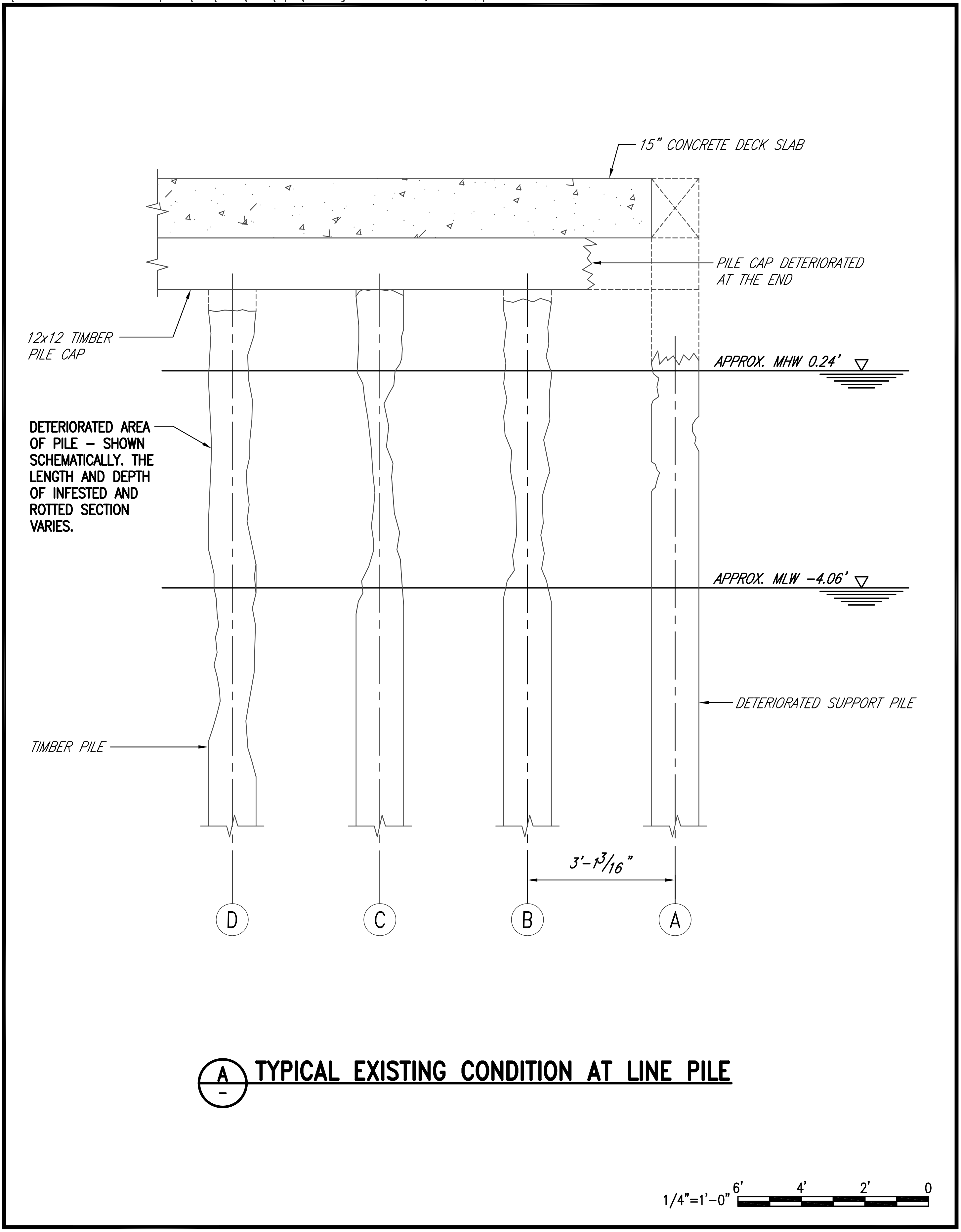
TYPICAL PILE BENTS – EXISTING
E – SECTION STA. 7+29 TO STA. 7+78

1/8"=1'-0" 4' 3' 2' 1' 0 4'

AECOM

Figure 13
WATERSIDE PIER
SECTION

-



AECOM

Figure 14
WATERSIDE PIER
SECTION

-

Appendix C

Discussion of Testing Techniques and Interpretation of Results

Table of Contents

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4.2.2 Corrosion Propagation 10

1.0 Introduction

This document supplements the *Condition Assessment Reports* presenting the findings of the inspections undertaken of Waterfront Pier. The present document forms an appendix to the main report and describes the nature of site investigations undertaken, the testing methodology, the procedure for determining the residual service life of structural elements, as well as a discussion of the various remediation options available.

2.0 Deterioration of Structural Materials

2.1 Concrete Elements

One of the most common mechanisms of concrete deterioration in the marine environment is chloride ingress in Concrete.

a) Chloride Ingress in Concrete

Chloride ions may contaminate the concrete from the following sources:

- Material supplies and during material storage,
- Water used during concrete batching, in-situ concrete placement or curing,
- Atmospheric deposition via airborne particles,
- Ingress by diffusion or capillary action from the sea,
- Ingress through construction defects such as honeycombing,
- Ingress through construction joints,
- Ingress through plastic shrinkage, drying shrinkage, settlement or other forms of cracking.

Typically, the penetration of sufficient levels of chloride ions to the depth of steel leads to the depassivation of the reinforcement and the initiation of corrosion.

Propagation Phase

Following the depassivation of steel in concrete, corrosion will be initiated if enough water and oxygen is present to sustain it; this is termed the propagation phase. The significant increase in volume of the reinforcing steel as it corrodes causes the development of tensile stresses within the concrete that will ultimately result in cracking and spalling (see Figure 2-1).

Figure 2-1: Examples of large cracking and spalling with exposed reinforcement as a result of chloride attack.

2.2 Timber Elements

Timber elements in a marine environment are subject to various types of deterioration in different micro-climates. The life of a timber pile is governed by the species of timber, whether it be red gum, ironbark etc, and by its resistance to attack by rainwater or termites in the above/high water zones and by crustaceans, marine borer decay, etc, in the tidal and inter-tidal zones.

The types of organisms/modes of deterioration that our investigation encompassed are outlined below.

a) Timber Pile Deterioration due to Marine Organisms

Subterranean Termites

Subterranean Termites generally live in timber located above the high water and salt splash level. They prefer the softer heartwood and, as such, their presence can be concealed even when they have caused significant levels of damage to timber elements. Often, following termite damage, only a shell will be left concealing the significant damage within the timber. It is common for termites to gain access to timber through ‘dirt’ tunnels that can be seen when termites have to travel over sections of steel or concrete or between timber elements. Decay of exposed piles above the high water zone is usually caused by rot associated with rainwater damage or termite infestation. For sheltered piles, such as those located beneath concrete deck slabs/timber decking, the prime cause of damage is termite infestation.

Marine Borers

Marine borers commonly tunnel into piling for shelter and their damage can go unnoticed until it becomes extensive. The holes are produced at the larval stage as the developing organism progressively tunnels into the timber feeding on the starch. The holes are generally shallow and above the tidal zone and therefore pose a problem only by providing collection points for moisture and assisting with the propagation of rotting. They also provide an access to the heartwood for crustaceans. Toredos can produce longitudinal holes in the heartwood that can result in significant damage at depth.

Crustaceans

Crustaceans only burrow beneath the timber surface and can remain undetected until the surface is broken down by wave action. Activity of crustaceans is mostly confined to underwater piling and wharf structures and the result is slow and steady removal of timber. ‘Necking’ of a timber pile into an hourglass shape is often a result of additional burrowing and subsequent surface breakdown. Deterioration of the timber piles can also occur in the surface layer of the mud where there is not enough oxygen to support these marine organisms.

b) Timber Pile Deterioration due to other Factors

Weathering

When wood is exposed externally to sunlight, rain and dew, initially dark colours become paler through leaching and bleaching and pale colours darken because of oxidation, but in time all surfaces exposed to the elements become silver-grey. This colour change is confined to the surface layers, which are composed mainly of cellulose. The lignin that cements the wood cells together is degraded by long exposure to weather and is washed away, together with sugars, starches and extractives.

Splitting

Splitting occurs when the surface layer of the timber, especially at the tidal zone is broken down at the surface. The weakening is caused by borer and crustacean attack that leads to necking of the pile as the cross-sectional area is reduced in a localised region. Water accumulates within the splits leading to further reduction of section by crustaceans and other marine growth.

Cracking

Cracking is due to the stresses induced when the surface timber dries and shrinks whilst the core remains saturated and incompressible. The splits propagate as inner regions of the member dry out. Water leakage from deck joints can filter into the centre of the timber member causing expansion of the heartwood and cracking of the element. The effects of this differential drying shrinkage between the sapwood and heartwood can split the element all the way through in some cases.

Wood Rot / Decay

The decay of timber by rotting can occur in both wet and dry wood conditions. Wharf structures are usually susceptible to the type of conditions that initiate the natural process of decomposition of timber due to fungal rot. This decay process can also support some plant growth like moss that can break down the timber material.

Impact

Accidental impact by vessels may damage or bring the element out of alignment.

3.0 Diagnostic Test Methods

3.1 Concrete Elements

For each test module the tests outlined below are typically undertaken. Each of these provides results that, when analysed in a holistic way, help estimate the current and future rate of deterioration.

3.1.1 Reinforcement Cover Survey

The thickness of the concrete cover largely determines the level of corrosion protection provided to the reinforcement against environmental contaminants. An electromagnetic cover meter is typically used to determine the location and depth of steel reinforcement. This technique uses a search-head to create an electromagnetic field. When the search-head is located over the steel reinforcement, the electromagnetic field is perturbed and the calibrated instrument provides a measurement of the cover to reinforcement.

This test is used to select breakout sites and to expose the reinforcement to identify its spacing. Steel is also exposed for visual inspection, assessment of reinforcement condition and calibrating the covermeter results to the actual measured steel depth. Figure 3-1 shows an example of an area where covermeter testing was conducted prior to concrete coring and further detailed testing.

Figure 3-1: Painted grid following a typical cover survey on a concrete element.

3.1.2 Chloride Content Analysis

Chloride ions can attack and destabilise the passive oxide layer that protects steel reinforcement in concrete. A chloride content of approximately 0.06% by weight of concrete (or approximately 0.4% by weight of cement depending on the cementitious content) is typically considered a threshold value for corrosion initiation. The purpose of this test is to determine the extent of chloride ingress in the concrete, and from this estimate the surface chloride and chloride diffusion rate to be used for modelling of deterioration over time.

Concrete core samples are taken in areas identified, sealed in plastic bags and then logged. The cores are then sent to a certified laboratory where the cores are sliced into several depth increments down to the reinforcement level. Each sample is then crushed and pulverised to a fine powder. The laboratory testing procedure based on AASHTO Designation T-260-84 use a titration method to determine the total chloride content, i.e. acid-soluble, of each sample.

3.2 Steel Caissons

For each test module the steel piles are cleaned and a visual inspection along with Ultrasonic Thickness Testing (UTT) is undertaken. The following information is recorded:

- Areas of zero thickness (size and distance from soffit),
- Depth of pitting,
- Condition of steel below seabed,
- Condition (overall pile rating, good, fair or poor),
- Presence, condition and extent of protective systems (e.g. wrapping/cathodic protection).

UTT is undertaken to determine the remaining steel thickness at the following three levels:

- 12’ below deck level,
- 16’ below deck level, and
- 25’ below deck level.

At each test location the following information is recorded:

- Measurement of the residual steel thickness,
- Distance from the deck soffit,

3.3 Timber Elements

For each test module the timber piles are cleaned and a visual inspection. The following information is recorded after a visual inspection:

- Any pile movement,
- Characteristics of marine growth (depth and density),
- Cracks/splits (length and depth of cracks in pile surface),
- Presence and extent of marine borer attack,
- Presence and extent of termite attack,
- Presence, condition and extent of protective systems (e.g. wrapping/concrete jackets),
- Condition (overall pile rating, good, fair or poor),
- Additional comments.

4.0 Assessment of Residual Service Life

4.1 Future Deterioration

Future deterioration of asset elements can be estimated by analysing the inspection data and understanding the mechanisms of deterioration. The model of future deterioration can be refined and made more accurate with periodic diagnostic testing, for instance every 5 – 10 years.

The deterioration mechanisms of timber, steel and reinforced concrete are discussed earlier in this methodology report. The following section provides a brief discussion of the predictive modelling of deterioration of reinforced concrete. The future deterioration of steel and timber elements will be provided in a later edition of this document.

4.2 Reinforced Concrete Elements

Deterioration of reinforced concrete elements over time is typically divided into the corrosion initiation phase and the corrosion propagation phase as illustrated in Figure 4-1

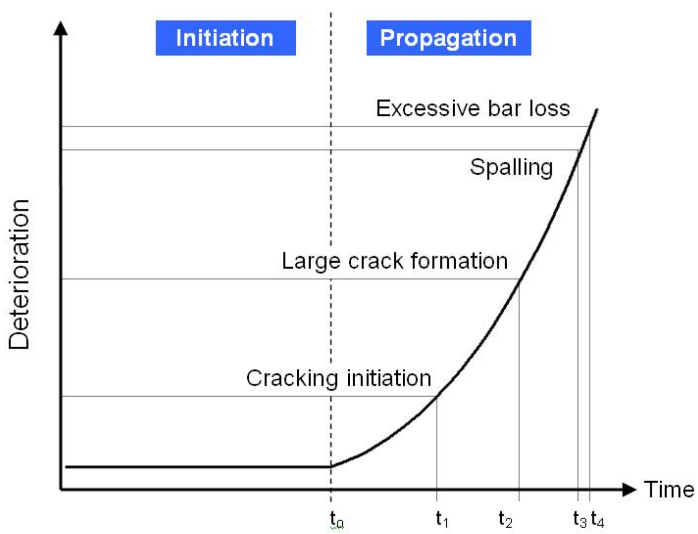

Figure 4-1. Deterioration stage for reinforced concrete[1]

Corrosion initiation is normally caused by either carbonation or chloride ingress as discussed in Section 2.1.

The propagation phase and the time for the various levels of deterioration to be reached is then based upon the corrosion rate, the build up of corrosion product and the resultant tensile stresses imposed upon the concrete. It can be noted that the levels of deterioration in the propagation phase correlate with the condition ratings as outlined in Section **Error! Reference source not found.**.

[1] K. Tuuti, Report No 4, Corrosion of steel in concrete. Stockholm, Sweden, Swedish Cement & Concrete Institute (1982) & P. Bamforth, "Probabilistic performance based durability design of concrete structures.", pub Thomas Telford, (London, UK) (1997)

4.2.1 Corrosion Initiation

In maritime structures deterioration is dominated by the chloride related corrosion mechanism.

A number of predictive models exist for modelling of the time to initiation due to chloride ingress into reinforced concrete elements and are typically based upon Crank's solution of Fick's second law of diffusion, as shown Equation 2 below:

$$C_{x,t} = C_s \left[1 - \mathrm{erf}\left(\frac{x}{2\sqrt{D.t}}\right)\right] \qquad \text{Equation 1}$$

Where $C_{x,t}$ = chloride concentration (%) at depth x (m) and time t (s)

C_s = surface chloride concentration (%)

D = diffusion coefficient (m^2/s)

The diffusion coefficient has been shown to change with time for different blends of cementitious materials. This change with time can be accounted for by applying an empirical constant, m (equation 3). The m values change depending upon the type of cementitious material and also the source of the material. Actual values of m have been published in the literature and for a concrete mix using 100% Ordinary Portland Cement or OPC a m value of -0.264 is typically used.

$$D_{ca(t)} = D_{t_1}\left(\frac{t_1}{t}\right)^m \qquad \text{Equation 2}$$

Where $D_{ca(t)}$ is the diffusion coefficient at time t (m^2/s), D_{t1} is the diffusion coefficient at time of testing t_1 (m^2/s), t_1= is the time at test (s), t is the time (s) and m is the age factor depending on mix proportions.

The chloride concentration has been reported to typically build up to a maximum value and the rate at which this occurs does affect the diffusion. However, in marine structures this period may be taken as being instantaneous and does not need to be considered. Thus at the time of the inspection $D_{ca(t)}$ is determined from the chloride profile and by applying equation 2.

The error function, erf, (also called the Gauss error function) is a mathematical, non-elementary function used in probability, statistics and partial differential equations. A typical diffusion profile is presented in Figure 4-2 below.

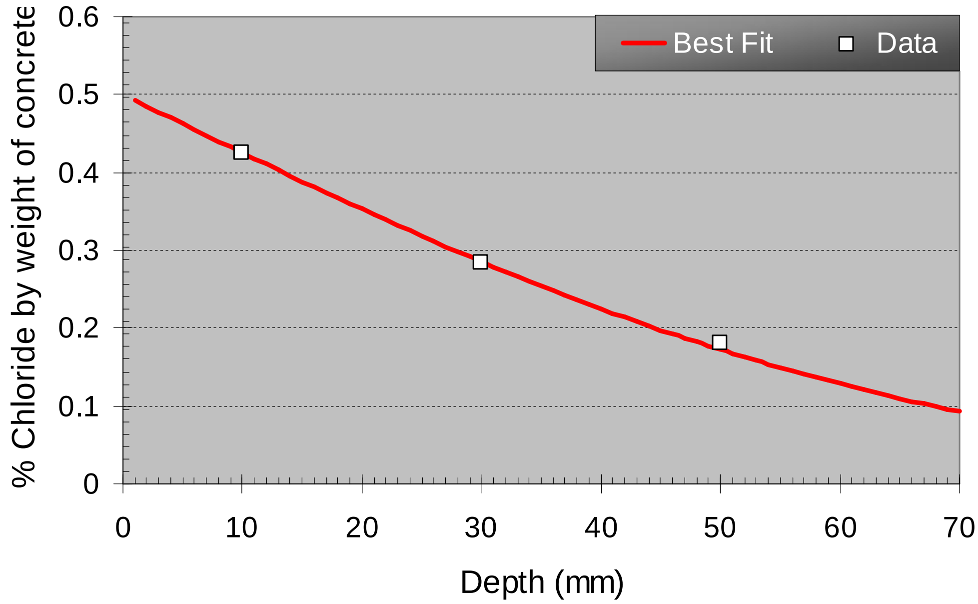

Figure 4-2: Typical example of curve fitting of chloride profile (chloride content versus depth of concrete).

By fitting a curve of this form to the chloride data obtained from the concrete cores the apparent values of C_s and D can be determined. These values can then be used to determine future ingress of chlorides into the structure. When enough samples are obtained from similar elements a statistical analysis can be performed to determine the time to initiation with some level of confidence (using a reliability analysis). The time of corrosion initiation may then be estimated by determining when the chloride level at the bar reached (if the steel is currently corroding) or will attain (if corrosion has not started) the threshold value generally taken as 0.06% of chloride by weight of concrete (or approximately 0.4% by weight of cement depending on the cementitious content).

It can be seen from some graphs presenting the chloride results in Appendix E that the profiles do not always follow the typical diffusion trend. For these elements, no modelling of future deterioration is possible as the data does not fit a diffusion profile and thus no sensible C_s or D values can be determined.

4.2.2 Corrosion Propagation

In order to determine the time to cracking, spalling and structural failure, it is necessary to determine the evolution of corrosion rate from initiation up to time t. An exponential relationship between chloride concentration and corrosion rate can be used as per Equation 4 below:

$$CR = 0.55 \times e^{b.C_x} \qquad \text{Equation 3}$$

Where b is a constant, C_x is the chloride content by weight of sample at the bar and CR is the corrosion rate in micron/year. The lower and upper limits for this equation are defined as 0 (when C_x is less than the threshold value) and 60 micron/year (respectively) up until the concrete has spalled. After the concrete has spalled the corrosion rate is taken as the corrosion rate of exposed steel in that environment. Using equation 4 the total penetration, P(t)from initiation (t_i)to time t is given by Equation 5 below:

$$P(t) = \sum_{t_i}^{t} CR \qquad \text{Equation 4}$$

Once the current corrosion rate and the current level of damage (section loss) have been established, the future deterioration may be predicted. This can include the time until cracking or until structural failure. A number of empirical models for the time to cracking exist but are still in the development stage. One such model is CONTECVET[2], Equation 6:

$$P_{cr} = \frac{\left(83.8 + 7.4\frac{c}{d_b} - 22.6 f_{ct.sp}\right)}{1000} \qquad \text{Equation 5}$$

Where P_{cr} is the corrosion penetration at which a crack is initiated, c is the cover, d_b the bar diameter and $f_{ct.sp}$ the tensile splitting strength. The same model can be used to estimate time to spalling by setting a maximum crack width. Following spalling the residual cross section and a suitable corrosion rate for exposed steel in the splash zone can then be used to determine when structural failure will occur by setting a safety margin for the loss of section, such as 10%. At the point where A_{res}/A <90% the structure is considered unsafe and the end of useful service life has been reached.

[2] CONTECTVET, A Validated User Manual for Assessing the Residual Service Life of Concrete Structures (2001)

Appendix D

Diving Inspection Report and Markup

General Notes and Key----by SMZ
ConEd Waterside Pier Inspection by Fathom Solutions LLC

This is a typed reproduction of the general notes and keys from the various sections of the field markup drawing. This is not necessarily verbatim. Clarifications and modifications of the original field notes may be included.

<u>Key:</u>

ADV	Advanced
SV	Severe
Typ.	Typical
MN	Minor
MD	Moderate
Elev	Elevation
MLW	Mean Low Water
WL	Waterline
WSEL	Water surface elevation
NB	No pile bearing
PB	Partial bearing (typ. 50-99% based on 12" cap width)
FP	Fish plate
Conc	Concrete
Stl	Steel
w/exp	With exposed rebar
Del	Delamination
•D	Derelict pile
Ex	Extra
Vert	Vertical
Enc	Encapsulated pile
Hz	Horizontal
√	Confirmed/Agree/Affirm
IΘI	Posted pile
H	Cap splice
4'ф	4 foot diameter
MH	Manhole
¤	Recommended location for deck coring
N	North
S	South
E	East
W	West
LWB	Low water brace
®PE	Partial fiberglass encasement of pile
OBSV	Observed
HL	Hairline crack
e/effl	With efflorescence
Surf	Surface
RR	Riprap
MB	Marine Borers
ML	Mud line (stream bottom)
(No)	Not observed (previous investigation note/finding)
x(30')	30' sounding depth (circled or "x" in front of measurement)
14:30	and time sounding was taken
###	ADV-SV cap (or missing)

Sections 1 & 2 (10/17/11):

- ADV-SV piles should typically be repaired (post and encapsulate) to below the low water brace connection.
- Piles typ. MN-MD below MLW bolt connection elev., where typ. hollowed out.
- MN surface loss due to Limnoria below the MLW, but no significant hour-glassing reduction.
- Extensive debris the outboard side of dock at the bottom.
- Diagonal bracing has ADV-SV deterioration throughout facility.
- Pile caps cast into back wall (esplanade platform fascia to the west).
- Underdeck concrete is typ. spalled with exposed and heavily corroded steel reinforcement in all bollard areas along outboard rows.
- Underdeck concrete typ. exhibits map cracking with efflorescence throughout, with delaminated areas over up to 50% of bottom surface by area, typ. the worst between back rows F-K along the esplanade fascia wall. Several bays (spans between bents) have progressed to open spalls along the esplanade wall between rows I-K.
- Cap splices noted are general locations – not every splice is shown on markup notes.
- Edge/ranger caps (N-S) are typ. ADV-SV throughout Section 1.

Sections 1-2 Top of curb to WL measurements (10/17/11):
**Subtract 12" to get top of deck to WL measurement.
5.3 ft @12:00
4.5 ft @13:00
5.0 ft @14:30

Section 3 (10/18/11):

- LWB and diagonal brace either missing or SV throughout.
- End grain decay on exposed caps (ADV-SV) outside of wall.
- ADV-SV deterioration of piles typ. in top 6' below cap, unless otherwise noted, which is generally at the lower bolted brace connection elev.
- Caissons are typ/ exposed concrete w/MN deterioration in the tide zone. Stl casing in place typ. below MLW. Stl typ. has pits <1/8" depth and rough surface w/no coating remaining.
- For posted piles, length of ADV-SV deterioration measurements are from bottom of post, not the cap.
- D-row batter piles on Bents 27-34 are cutoff approx. 10' below the cap to accommodate the encasement repairs on the adjacent plumb pile.
- Underdeck at Bents 27-34 has corrugated metal forms left in place.

Section 3 Top of deck to WSEL measurements (10/18/11):
5.3 ft @11:30
5.1 ft @12:00
4.5 ft @14:30

UTM Readings for offshore caisson at Bents 21-22 (10/22/11 @ 11:15-12:15):

Side	Depth=12'	Depth=18'	Depth=25' (ML)
E	No readings; Stl easily removed	0.165" 0.125"	0.290"
N	No readings; Stl easily removed	0.120" 0.120" 0.120"	0.125"
S	0.120" 0.120" 0.120"	0.120" 0.120"	0.125" 0.120" 0.120"
W	No readings; Stl easily removed	0.120" 0.335" 0.335" 0.335" ←stl fairly smooth	0.125" 0.125"

*stl sample taken and photographed from west face @ depth=12'
**stl surface heavily pitted and rough – difficult to obtain readings
***stl peeling away at depth=12' on west face, with top of stl at approx. depth=6'
****WL at approx 9.5' below top of deck, or 1' above bottom of skirt wall, at time of UTM's.

Section 4 (10/19/11):

- Deck approx. 13" +- thick at outboard edge.
- MD piles typically still exhibit marine borer activity, including traces of Limnoria and Toredo, while MN piles are typ. free of MB activity.
- For ADV-SV piles, deterioration is typ. confined to upper portion of pile from cap to low water brace bolt connection at approx. 6-8' below the cap, unless otherwise noted.
- Occasional riprap, typ. DOT Class 2 type, observed at offshore rows A-G on the bottom; however, very intermittent coverage with mud predominant. Size approx. 12"x8"x4".
- Encasement recommended for ADV-SV piles, typ. 8 ft long min. at top of pile; however, full length encasement preferred due to marine borer activity.

Section 4 Top of deck to WSEL measurements (10/19/11):

6.5 ft @10:00
4.8 ft @10:40
3.8 ft @12:05

Section 5 – North Platform (10/20-21/11):

- Cap SV in all areas of thickened deck throughout North Platform. In areas of normal thickness deck, caps are typ. MN-MD.
- Riprap at seabed at rows AA-C/D typ, and mud typ. inboard of D row.
- Deck thickness (normal, not thickened) is approx. 13"+-. The deck is approx. 3' to 3.5' thicker in the "thickened" areas, with the bottom of the concrete elevation varying due to form deflection upon original pour.
- Diagonal and horizontal bracing V throughout.
- N-S pile caps at J-batter row typ. SV.
- E-W pile caps @ J-L rows typ. SV.
- N-S pile cap @ row AB typ. SV.
- Esplanade fascia wall appears to be in good condition (MN) throughout the facility; however, the low wale is typ. ADV-SV or missing.
- Offshore edge @ AA row on both platforms has significant debris on the bottom.
- J-row plumb to batter connection (single bolt) is typ. missing spacer block between piles.
- Connection hardware typ. ADV-SV throughout facility due to heavy corrosion losses.
- Vertical blocking @ AA-row offshore typ. ADV-SV or missing.

Section 5 Top of deck to WSEL measurements (10/20/11):
5.6 ft @08:34
6.2 ft @09:45
4.3 ft @14:00

Section 5 Top of deck to WSEL measurements (10/21/11):
6.4 ft @08:15
7.0 ft @08:42
8.0 ft @10:00

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SUMMARY OF NOTES AND RECOMMENDATIONS FOR CON ED WATERSIDE DOCK AT 38TH-41ST EAST RIVER, MANHATTAN, NY

Organization of Investigation Notes

All investigation notes for the facility were recorded on a drawing markup, which consisted of a 34 inch by 44 inch hardcopy of the Existing Condition Plan presented in the March 2010 Load Rating Report by McLaren Engineering Group. The deliverable documentation for this project consists of the drawing markup, this summary letter of findings and recommendations, photographs of typical conditions, photograph logs and underwater dive videos. The investigation and note-taking effort followed the ranking conventions and annotations described in the NYCEDC waterfront structures investigation guide, per the scope of work.

The investigation and notes are organized based on the structure and section designations in the March 2010 Load Rating Report by McLaren Engineering Group. The dock is divided into the north and south platforms, with the north platform divided into four sections and the south platform treated as the fifth section. Section 1, the narrowest portion of the dock, is comprised of Bents 1-9, spanning from Station 0+00 at the south end to Station 0+82. Section 2 is comprised of Bents 10-17, spanning from Station 0+82 to Station 1+53. Section 3, which includes the concrete caisson and skirt wall structure, is comprised of Bents 18-34, spanning from Station 1+53 to Station 2+90. Section 4, which includes the intermediate concrete pedestal bents, is comprised of Bents 35-54, spanning from Station 2+90 to Station 4+72. Section 5, which includes the wider north platform in its entirety, is comprised of Bents 55-129, spanning from Station 4+72 to Station 8+35. Note that the arrangement of sections described here may vary slightly in comparison to that used in a previous 2008 condition assessment report generated by McLaren Engineering Group, which was not available for review prior to this inspection.

Investigation Methodology

The dock investigation proceeded sequentially by section, in a south to north direction, generally with one section investigated per day during October 17-21, 2011. Due to favorable low tides throughout the week, and the concentration of deterioration in the tidal zone, as much of each section as possible was investigated above water via skiff prior to commencing dive operations each day. The exception to this methodology was the northern portion of Section 3, which consisted of north-south skirt walls that prevented access to the pile bents. Ultrasonic thickness measurements of the caissons in Section 3 were conducted on the final day of investigations, as well as more in-depth under deck observations in Sections 1 and 2.

The condition of the timber ranger/edge caps and fender system elements was generally disregarded throughout the facility, due to plans to demolish these severely deteriorated components.

Findings

South Platform (Sections 1-4)

The South Platform overall condition rating of “Fair” determined in the previous 2008 investigation is still applicable. Although deterioration as significantly progressed in localized areas, the primarily structural elements do not appear to be overstressed and load-bearing capacity is likely similar to that determined in previous analysis in 2010. A general exception to this overall condition rating would be the outboard A to B rows throughout the South Platform, which typically exhibit the advanced to severe deterioration associated with a “Poor” condition rating. This investigation confirmed previous findings regarding the timber fender system, exterior pile rows, and the concrete under deck, although deterioration has progressed in all areas. An investigation of the topside deck condition was not conducted as part of this effort.

The timber substructure of the South Platform generally consists of 12-16 inch round piles, 12x12 inch pile caps, and horizontal and diagonal bracing. Deterioration of timber piles throughout the South Platform primarily consisted of section loss due to marine borers and/or rot, and was typically confined to the upper 6 to 8 feet of the pile in the tide zone above the lowest bolted brace connection. Piles described as advanced and severe generally had 25% or more of section loss in this top portion, unless otherwise specified in the investigation notes.

The deterioration of the timber piles appears to have increased significantly since the 2008 condition assessment upon which the Existing Conditions Plan is apparently based. Piles previously rated advanced to severe and experienced continued section loss over increased lengths, and numerous new piles have decayed into these categories. As a general condition trend, the A-row piles are in advanced to severe condition and are not bearing under the pile caps. The piles within the enclosure formed by the caissons and skirt walls in section 3 are typically in minor to moderate condition, while a significant portion of those exposed in Sections 1 through 3 of the South Platform are in advanced to severe condition. There are also a significant portion of the advanced and severe piles, as well as some moderate piles, that have 50% or less cross-section bearing under the pile cap.

The timber piles of Bents 27-31 of Section 3, within the northern portion of the concrete caisson structure, have been extensively repaired with partial encapsulations and postings. While the encapsulations themselves appeared to be in good/minor condition, marine borer activity was typically observed on the piles below the repairs. Pile postings were generally in a more deteriorated state, with timber fish plates and the cutoff top of the pile losing significant section due to marine borers and rot. In many cases, the post component was observed to be non-bearing due to section loss at the top of the pile, leaving the bolted connections to take the load in shear. The deterioration of the posting repairs has likely resulted in a significant reduction of both axial and lateral capacity of the piles in this area.

All areas of the steel-encased concrete caissons and skirt walls in Section 3 of the North Platform were observed as part of this investigation. The steel casing was typically not present in the tide zone due to corrosion losses, with steel section gradually regained below the mean low water elevation. The exposed concrete in the tidal zone was in minor condition, with no significant deterioration observed. The steel was cleaned of corrosion byproducts at various elevations down to the mud line, and ultrasonic thickness measurements were attempted on the offshore caisson between Bents 21 and 22. Due to the heavy pitting and very rough steel surface typically observed at all elevations of the steel casings, reliable UTM’s were difficult to obtain. Measured thickness was typically approximately 0.120 to 0.125 inches in areas of good steel section. Based on UTM’s and observations, it is likely the steel casings were nonstructural forms. The undersides of the skirt walls typically exhibited edge spalling and up to 1 foot of section loss throughout the thickness in the worst areas, but the deterioration was moderate and did not appear structurally significant.

The underside of the concrete deck exhibited cracking with efflorescence, delamination and spalling with exposed and corroding rebar. The deterioration appears to have increased since the previous investigation, both in extent and degree. The west/rear portion of the deck in Sections 1 and 2, south of the concrete caisson structure in Section 3, exhibited widespread delamination of up to 50 percent of the deck underside by area. The source of this localized deterioration is likely wave infiltration beneath the pier from the significant southeast fetch, breaking against the esplanade fascia and repetitively wetting the cracked deck underside. New areas of spalling with exposed and corroding rebar were also observed in this rearward area of the South Platform, as well as in the soffit area along the outboard rows, which were not notated on the existing conditions drawing from the previous investigation. Depth of spalling was typically about 4 inches throughout, to the lowest course of structural reinforcement. Reinforcement corrosion was typically advanced to severe, with areas on the outboard experiencing full steel section loss. Periodic checks of deck thickness supported previous findings of approximately 15 inches.

North Platform (Section 5)

The North Platform, Section 5, is in overall "Poor" condition due to advanced to severe deterioration of pile caps, creating a widespread lack of bearing that reduces load-carrying capacity throughout a significant portion of the platform. The findings of this investigation agree with those of the previous investigation, with additional deterioration observed in piles previously flagged, as well as new piles. In general, the piles under the North Platform are in much better condition than those of the South Platform, with far fewer requiring rehabilitation. In contrast, the pile caps are in far worse condition under the North Platform than under the South Platform. Caps beneath the "drop" areas of thickened deck are typically in good condition with only minor to moderate deterioration, whereas those under normal thickness decks in Section 5 are in poor to critical condition. The underside of the deck of the North Platform is generally in satisfactory condition, with only minor to moderate deterioration in the form of intermittent map cracking with efflorescence.

Recommendations

South Platform (Sections 1-4)

The following recommendations are based upon our understanding of the goals for rehabilitating the facility, which is likely as a continuation of the riverside esplanade park and pedestrian recreation path. It is assumed that repairs will occur on a one-time basis with expected lifespan of 20 to 30 years, probably without significant recurring maintenance. The previous 2010 load rating report described this recurring maintenance as pile encasements installed as-needed due to continued pile deterioration. The previous recommendations included ongoing inspections to monitor deterioration, which this investigation also recommends on a 5-year rotation.

The timber piles in advanced to severe condition, having at least 25% section loss, should be fully encapsulated from the pile cap to approximately 2 feet below the mud line. Although partial encapsulation of the piles within the upper 6 to 8 feet in the tidal zone may be effective in treating a majority of the current deterioration observed at the facility, the presence of marine borers and their observed activity below existing partial encapsulations in Section 3 illustrates the limited effectiveness of this approach in the long-term. The previous 2010 load rating report recommends full length encapsulations for deteriorated piles with 25 percent or more section loss, a preference which this investigation supports. For the same reasons, pile posting is not recommended as a long-term stand-alone repair option for this facility.

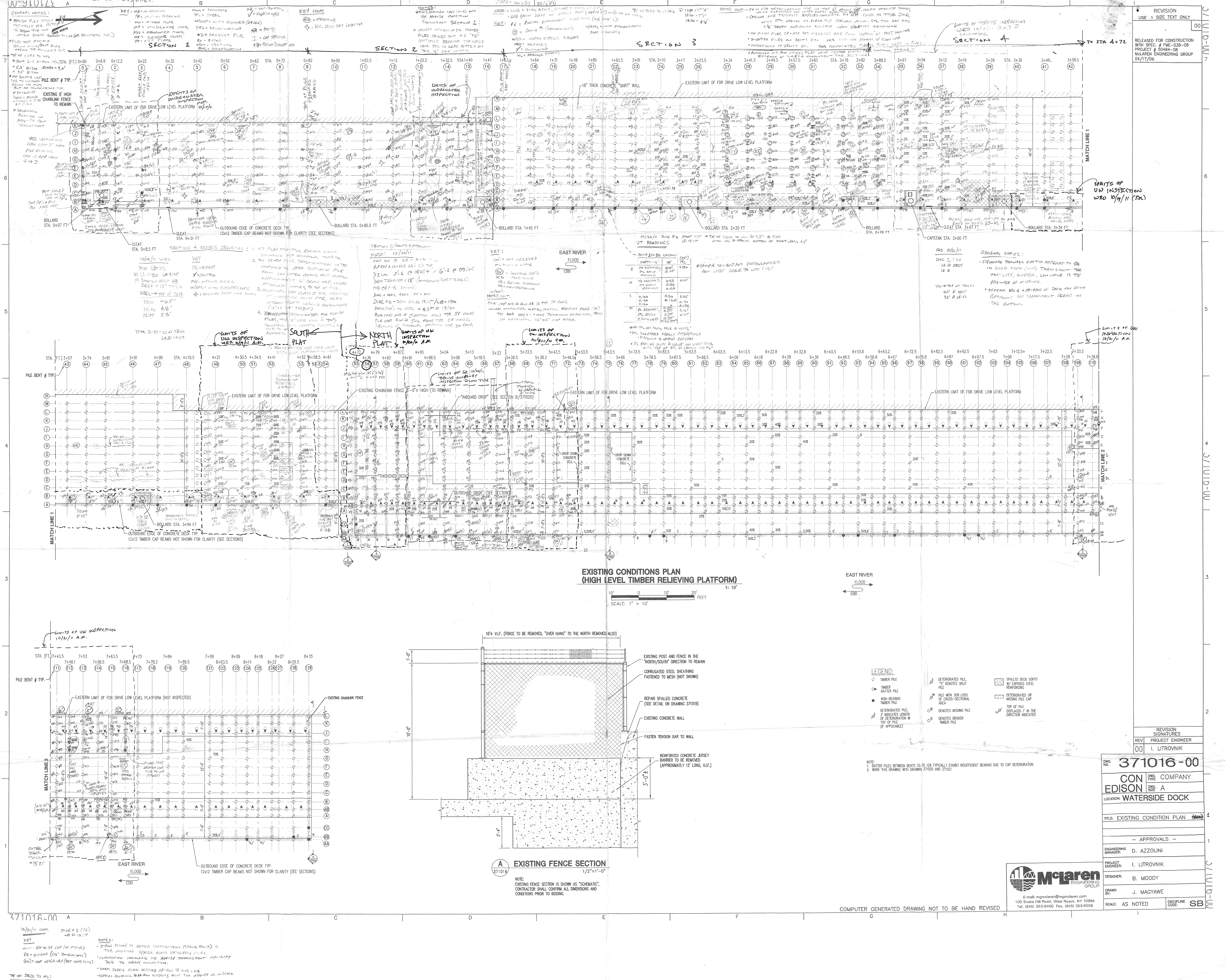
Pile bearing under the cap remains an issue for deteriorated piles under the South Platform, due to section loss in both the piles and caps. Prior to encapsulation, bearing should be restored through the use of shims or short post repairs for deteriorated piles. Pile post repairs should not be employed by themselves, without later encasement, due to the presence of marine borers and desired life expectancy of the facility without subsequent major repair efforts being made. As recommended in the previous 2008 investigation, pile caps with advanced to severe deterioration should also be replaced to restore bearing and proper load distribution to the deck. Timber diagonal bracing, typically severe or not-existent throughout the facility is not necessary for the intended park-like reuse of the facility and should be abandoned in place.

The previous load rating report recommended that cracked, delaminated and spalled areas of the deck be repaired and restored to “Good”, full load-bearing condition. Based on this latest investigation, the likely conversion of the facility to park use and the intended lifespan of repairs to be implemented, the more cost-effective recommendation is that only areas of cracking with efflorescence, and not widespread delamination or spalling, be considered for rehabilitation. Areas of spalling and significant delamination should be demolished, which in the South Platform would typically include the outboard soffit area (Rows A-C) and intermittent portions of the inboard back rows near the esplanade platform. The timber substructure under demolished deck areas could be abandoned in place, creating open bays similar those in the rehabilitated portion of the East River esplanade platform in lower Manhattan in the vicinity of Wall Street and South Street. Alternatively, with more effort and cost, areas of delamination and spalling with adequate remaining steel reinforcement could be repaired by removing deteriorated concrete, cleaning and coating steel reinforcing elements, and shotcreting (or similar method) the underside of the deck. The previous load rating report recommendations included a deck overlay and drainage work to preserve the topside concrete and reduce water infiltration, which appears reasonable for deck areas to be rehabilitated.

Recommendations--continued

North Platform (Section 5)

The recommendations for the North Platform assume this portion of the facility is to be repurposed as a continuation of the riverside esplanade, similar to the South Platform. The highest priority repair is the replacement of pile caps with advanced to severe deterioration. Piles with advanced to severe deterioration should be repaired to restore bearing and encapsulated, similar to recommendations for the South Platform. Timber bracing and fenders should be abandoned in place. Similar to the South Platform, the generally advanced to severely deteriorated outboard rows AA to BB of piles and caps, and soffit edge of deck above, should be demolished. Cracking in the deck underside should be repaired in Section 5, and previously recommended topside repairs carried out.


EXISTING CONDITIONS PLAN
(HIGH LEVEL TIMBER RELIEVING PLATFORM)
1: 10'
SCALE: 1" = 10'
EAST RIVER
FLOOD
EBB
MATCH LINE 1
MATCH LINE 2
PILE BENT # TYP.
EASTERN LIMIT OF FDR DRIVE LOW LEVEL PLATFORM
EASTERN LIMIT OF FDR DRIVE LOW LEVEL PLATFORM (NOT INSPECTED)
18" THICK CONCRETE "SKIRT" WALL
EXISTING 8' HIGH CHAINLINK FENCE TO REMAIN
EXISTING CHAINLINK FENCE 8'-0"± HIGH (TO REMAIN)
EXISTING CHAINLINK FENCE
"INBOARD DROP" (SEE SECTION B/371020)
"OUTBOARD DROP" (SEE SECTION)
THICKENED DECK
DROP DOWN CONCRETE CELL
OUTBOUND EDGE OF CONCRETE DECK TYP.
12x12 TIMBER CAP BEAMS NOT SHOWN FOR CLARITY (SEE SECTIONS)
BOLLARD STA. 0+07 FT
CLEAT STA. 0+8.5 FT
CLEAT STA. 0+31 FT
BOLLARD STA. 0+85.5 FT
BOLLARD STA. 1+45 FT
BOLLARD STA. 2+20 FT
BOLLARD STA. 2+70 FT
CAPSTAN STA. 3+00 FT
CLEAT STA. 3+07 FT
BOLLARD STA. 3+34 FT
BOLLARD STA. 3+94 FT
TO STA 4+72
SECTION 1
SECTION 2
SECTION 3
SECTION 4
LIMITS OF UW INSPECTION
EXISTING FENCE SECTION
1/2"=1'-0"
10'± V.I.F. (FENCE TO BE REMOVED, "OVER HANG" TO THE NORTH REMOVED ALSO)
EXISTING POST AND FENCE IN THE "NORTH/SOUTH" DIRECTION TO REMAIN
CORRUGATED STEEL SHEATHING FASTENED TO MESH (NOT SHOWN)
REPAIR SPALLED CONCRETE (SEE DETAIL ON DRAWING 371019)
EXISTING CONCRETE WALL
FASTEN TENSION BAR TO WALL
REINFORCED CONCRETE JERSEY BARRIER TO BE REMOVED (APPROXIMATELY 12' LONG, V.I.F.)
NOTE:
EXISTING FENCE SECTION IS SHOWN AS "SCHEMATIC", CONTRACTOR SHALL CONFIRM ALL DIMENSIONS AND CONDITIONS PRIOR TO BIDDING.
LEGEND:
TIMBER PILE
TIMBER BATTER PILE
NON-BEARING TIMBER PILE
DETERIORATED PILE, X INDICATES LENGTH OF DETERIORATION @ TOP OF PILE (IF APPLICABLE)
DETERIORATED PILE, "S" DENOTES SPLIT PILE
PILE WITH 30% LOSS OF CROSS-SECTIONAL AREA
DENOTES MISSING PILE
DENOTES BROKEN TIMBER PILE
SPALLED DECK SOFFIT W/ EXPOSED STEEL REINFORCING
DETERIORATED OR MISSING PILE CAP
TOP OF PILE DISPLACED 1" IN THE DIRECTION INDICATED
NOTE:
1. BATTER PILES BETWEEN BENTS 55 TO 128 TYPICALLY EXHIBIT INSUFFICIENT BEARING DUE TO CAP DETERIORATION.
2. WORK THIS DRAWING WITH DRAWING 371020 AND 371021.
REVISION
USE .1 SIZE TEXT ONLY
00
RELEASED FOR CONSTRUCTION WITH SPEC. # FME-039-08
PROJECT # 50484-08
McLAREN ENGINEERING GROUP
04/17/09
REVISION SIGNATURES
REV
PROJECT ENGINEER
00
I. LITROVNIK
DWG. NO. 371016-00
CON EDISON
DWG. TYPE COMPANY
DWG. SIZE A
LOCATION: WATERSIDE DOCK
TITLE: EXISTING CONDITION PLAN
— APPROVALS —
ENGINEERING MANAGER: D. AZZOLINI
PROJECT ENGINEER: I. LITROVNIK
DESIGNER: B. MOODY
DRAWN BY: J. MAGYAWE
SCALE: AS NOTED
DISCIPLINE CODE: SB
McLaren ENGINEERING GROUP
E-mail: mgmclaren@mgmclaren.com
100 Snake Hill Road, West Nyack, NY 10994
Tel. (845) 353-6400 Fax. (845) 353-6509
COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED
371016-00

Fathom Solutions LLC
Complete Underwater Resource

December 20, 2011

AECOM
Bill Demuth
605 Third Avenue
New York , NY 10158

RE: Phase II Notes---Con Ed Waterside Pier

Dear Mr. Demuth:

The following are findings from our inspection efforts in support of the Phase II work at the Con Ed Waterside pier.

Phase 2 Structural Inspection Scope of Work

- **Inspect the in-water steel pipe caissons (16 estimated) in vicinity of 52nd thru 58th Streets, from top to mud line. Take UTM on 4 sides at 3 elevations – 2 feet above mud, at waterline, and at mid depth; mid depth UTMs may be omitted if water depth is less than 8 feet. Note any significant damage or deterioration. Video the entire length of each caisson top to mud line. Record mud line depth at each caisson measured from top of caisson to nearest foot.**

The findings of the UTMs are located in the table on page two of this report. The DVD video inspection has a narrative of each pile throughout the inspection.

- **Back at the Pier Esplanade structure (you previously inspected for us), you had mentioned there was an abundance of coal piled below the platform – confirm the limit of this coal pile.**

The coal pile measures 6' wide, 14'; long, and is 4' deep.

- **Back at the Pier Esplanade structure (you previously inspected for us), confirm whether the timber pile caps are cast into the rearward seawall or if they simply abut it.**

The pile caps are cast into the rearward seawall.

Please feel free to contact us with any questions regarding this report.

The dive supervisor onsite was Kevin Shepard. His cell phone is 860-388-7054. kevin@fathom-solutions.com

Regards:

Victoria Preston
Owner
vpreston@fathom-solutions.com
860-388-7049

UNDERWATER ULTRASONIC THICKNESS MEASUREMENTS (UTM Readings)

Pile #	Elevation of Reading	North Side	South Side	East Side	West Side	Overall Length of Pile
1	**Top**	.720	.725	.700	.725	36’ 6”
	Mid	.685	.690	.700	.690	
	Bottom	.735	.725	.720	.725	
2	**Top**	.655	.655	.650	.600	36’
	Mid	.700	.705	.690	.685	
	Bottom	.730	.725	.735	.730	
3	**Top**	.685	.690	.690	.685	36’
	Mid	.700	.710	.715	.700	
	Bottom	.725	.735	.730	.730	
4	**Top**	.680	.685	.660	.690	33’ 6”
	Mid	.730	.705	.715	.715	
	Bottom	.725	.700	.730	.725	
5	**Top**	.670	.660	.665	.690	40’ 6”
	Mid	.705	.690	.700	.730	
	Bottom	.735	.715	.725	.725	
6	**Top**	.685	.670	.680	.665	42’
	Mid	.705	.715	.700	.715	
	Bottom	.725	.720	.730	.715	
7	**Top**	.665	.695	.685	.670	19’ 10”
	Mid	Shallow	Shallow	Shallow	Shallow	
	Bottom	.700	.695	.720	.730	
8	**Top**	.715	.700	.700	.695	15’ 10”
	Mid	Shallow	Shallow	Shallow	Shallow	
	Bottom	.735	.715	.715	.700	
9	**Top**	.700	.695	.690	.685	17’
	Mid	Shallow	Shallow	Shallow	Shallow	
	Bottom	.735	.715	.720	.720	
10	**Top**	.685	.690	.700	.685	43’
	Mid	.700	.715	.715	.720	
	Bottom	.735	.730	.725	.725	
11	**Top**	.690	.690	.715	.695	43’
	Mid	.715	.720	.720	.735	
	Bottom	.700	.725	.735	.720	
12	**Top**	.700	.715	.695	.690	47’ 6”
	Mid	.715	.700	.725	.720	
	Bottom	.725	.720	.730	.735	
13	**Top**	.685	.700	.710	.695	45’ 6”
	Mid	.725	.705	.715	.725	
	Bottom	.735	.725	.725	.730	
14						48’
15						49’
16	**Top**	.695	.705	.700	.700	49’
	Mid	.715	.725	.730	.720	
	Bottom	.725	.730	.730	.735	
17						47’
18						36’
19	**Top**	.700	.665	.685	.675	27’
	Mid	.715	.725	.725	.715	
	Bottom	.735	.720	.730	.735	
20						24’
21						14’ (7’ of water)
22	**Top**	.695	.675	.680	.700	11’ 8”
	Mid	Shallow	Shallow	Shallow	Shallow	
	Bottom	.725	.700	.730	.720	
23	**Top**	.715	.700	.695	.700	13’
	Mid	Shallow	Shallow	Shallow	Shallow	
	Bottom	.725	.735	.720	.720	
24						17’

Top= waterline **Mid= mid depth** **Bottom= 2’ above the mudline**

Appendix E

Photographs

Appendix E Photographs

Photo 1 – Waterside Pier South Platform: Deteriorated timber bracing.

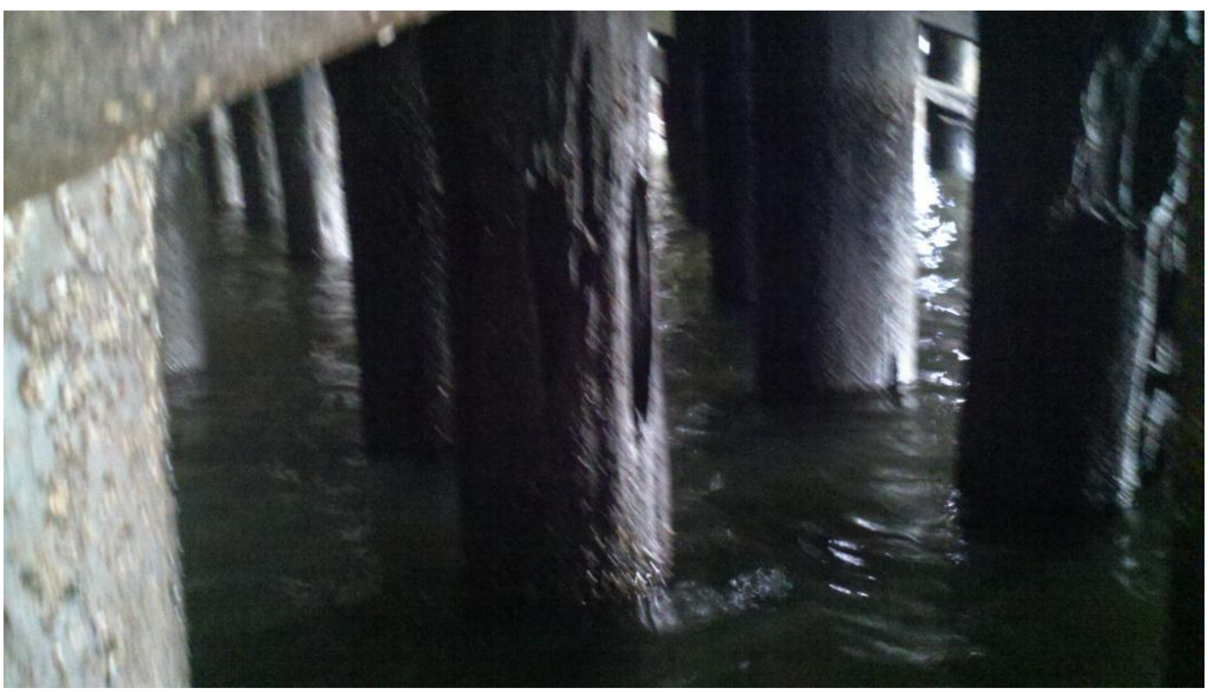


Photo 2 – Waterside Pier South Platform: Typical pile condition showing moderate to advanced deterioration in upper 6' to 8'.

Photo 3 – Waterside Pier North Platform: Typical condition of timber fendering.

Photo 4 – Waterside Pier North Platform: Typical condition of pile cap – note completely eroded pile cap.

Photo 5 – Waterside Pier North Platform: Typical condition of pile cap – note completely eroded pile cap.

Photo 6 – Waterside Pier North Platform: Typical spall of reinforced concrete deck between bent rows.

Photo 7 – Top of Platform with typical spall and delaminating

Photo 8 – Top of Platform with typical spall and vegetation

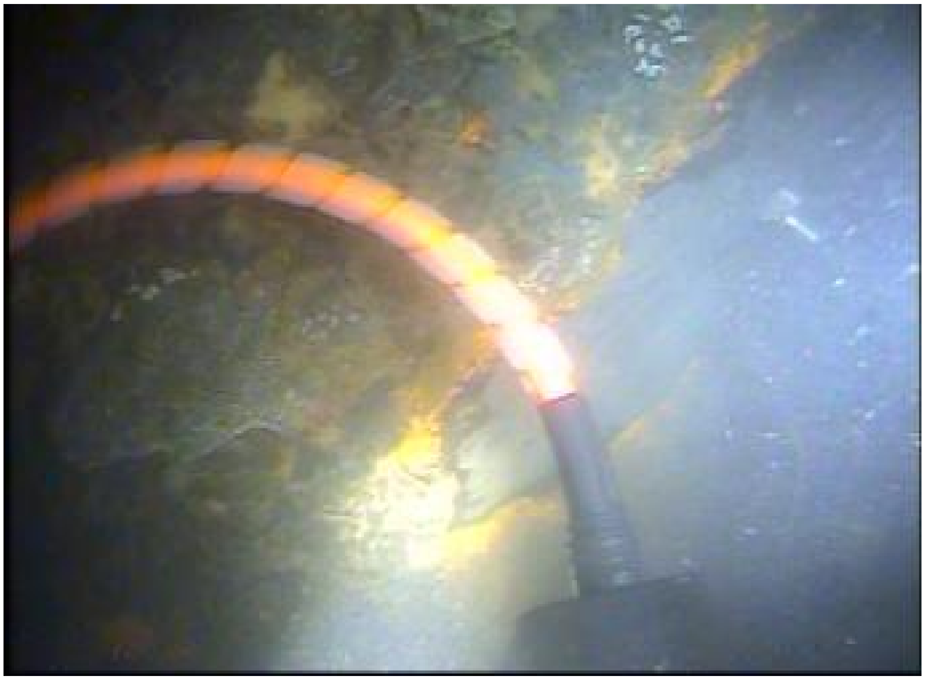


Photo 9 – ODR: UV Measurement Caisson 1

Photo 10– ODR UV Measurement Caisson 7

Photo 11– Waterside Pier Coal Pile measures 6 feet wide by 14 feet long, 4 feet deep located below the platform

Photo 12- Timber Piles cast into the rearward seawall

Appendix F

Investigation Summary Sheets

Core ID: Cl 1-1

Sampling Date: 21-Oct-11

TEST LOCATION	
Station No.	0+38
Location	Top of deck

TEST RESULTS

Transverse Cover 0 readings

	in.		*in.*		*in.*
MIN	0	MAX	0	AVERAGE	N/A

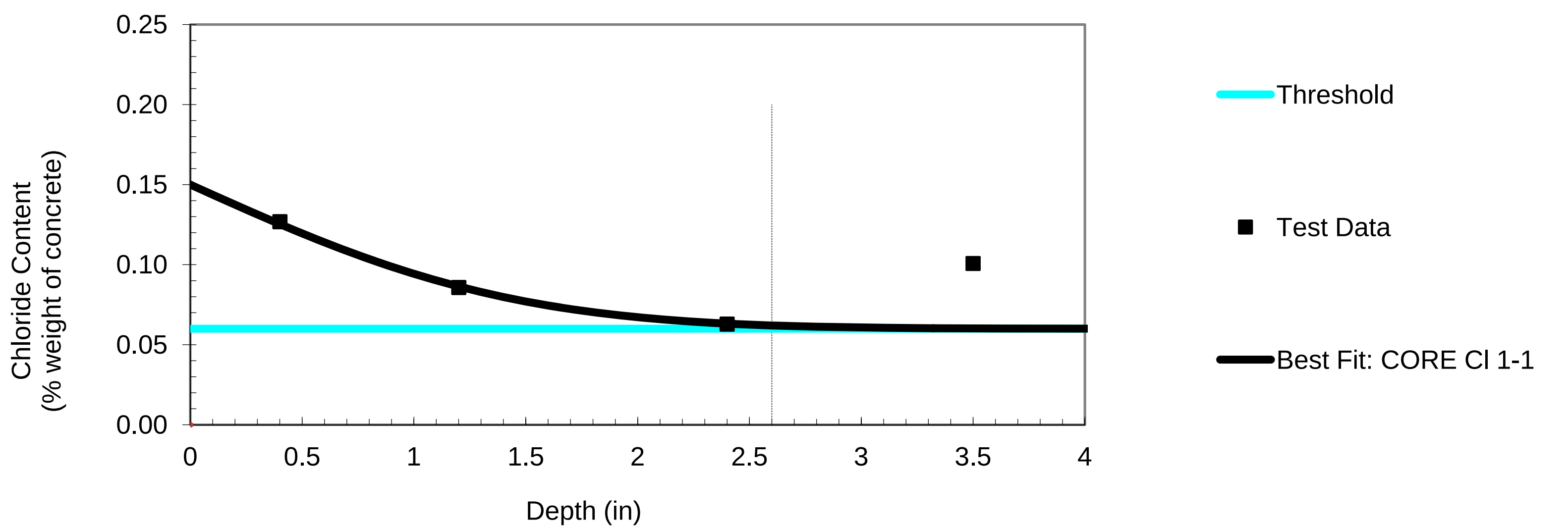
Longitudinal Cover *4 readings*

	in.		*in.*		*in.*
MIN	0	MAX	2.8	AVERAGE	2.5

Cover Measured from Core

Type	*in*
Transverse	N/A

CHLORIDE PROFILE



Core ID: Cl 1-2

Sampling Date: 21-Oct-11

TEST LOCATION

Station No.	0+38
Location	Soffit of deck

TEST RESULTS

Transverse Cover 0 readings

	in.		in.		in.
MIN	0	MAX	0	AVERAGE	

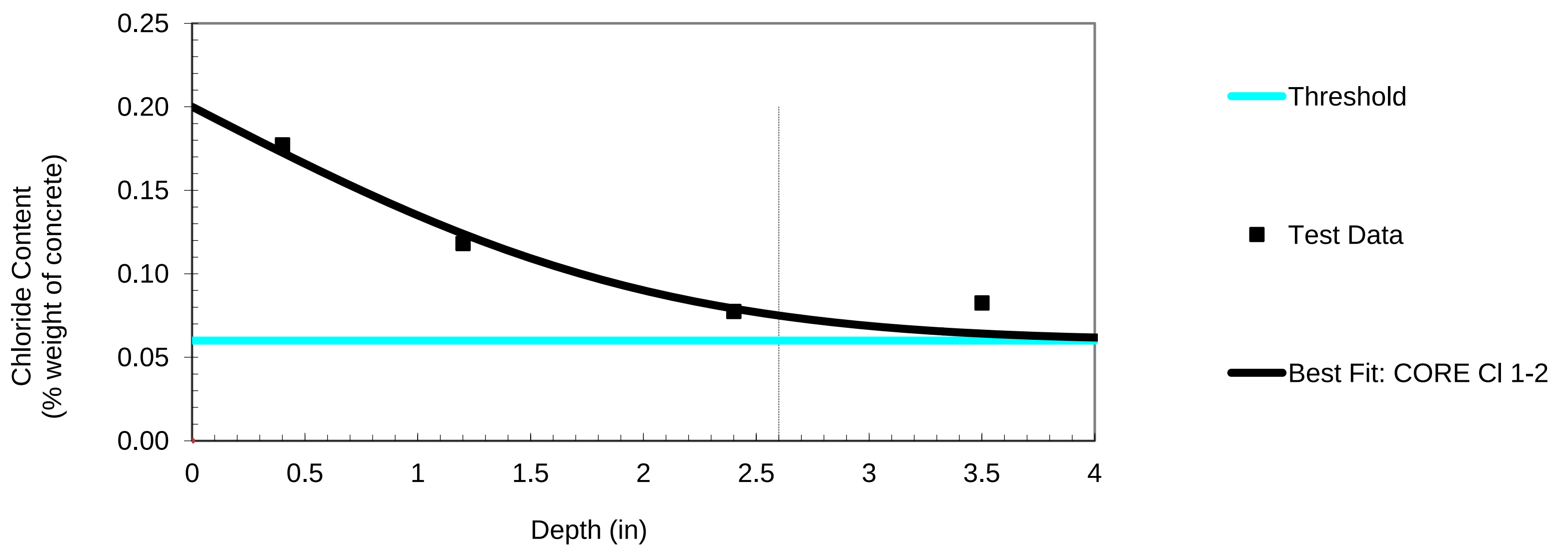
Longitudinal Cover *4 readings*

	in.		in.		in.
MIN	0	MAX	2.36	AVERAGE	2.1

Cover Measured from Core

Type	*in.*
Transverse	N/A

CHLORIDE PROFILE



Core ID: Cl 2-1

Sampling Date: 21-Oct-11

TEST LOCATION

Station No.	3+86
Location	Top of deck

TEST RESULTS

Transverse Cover 0 readings

	in.		*in.*		*in.*
MIN	0	MAX	0	AVERAGE	N/A

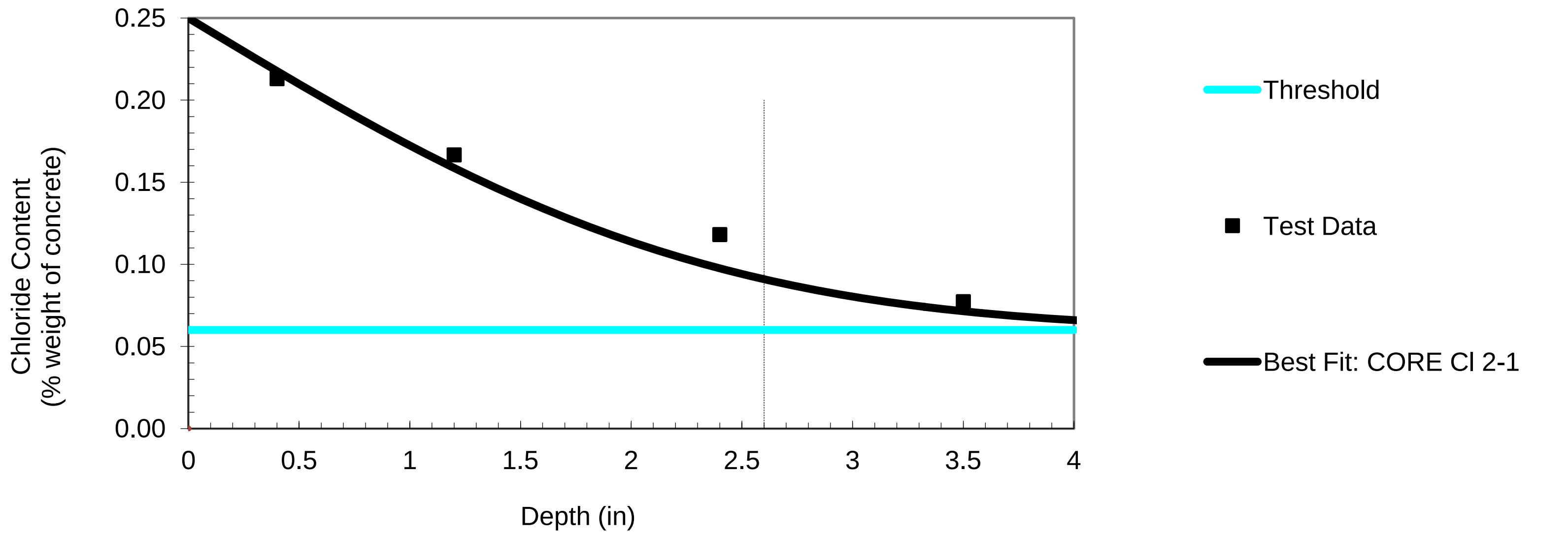
Longitudinal Cover *4 readings*

	in.		*in.*		*in.*
MIN	0	MAX	3.5	AVERAGE	2.9

Cover Measured from Core

Type	*in.*
Transverse	N/A

CHLORIDE PROFILE



Core ID: Cl 2-2

Sampling Date: 21-Oct-11

TEST LOCATION

Station No.	3+86
Location	Soffit of Deck

TEST RESULTS

Transverse Cover 4 readings

	in.		in.		in.
MIN	2	MAX	2.6	AVERAGE	2.3

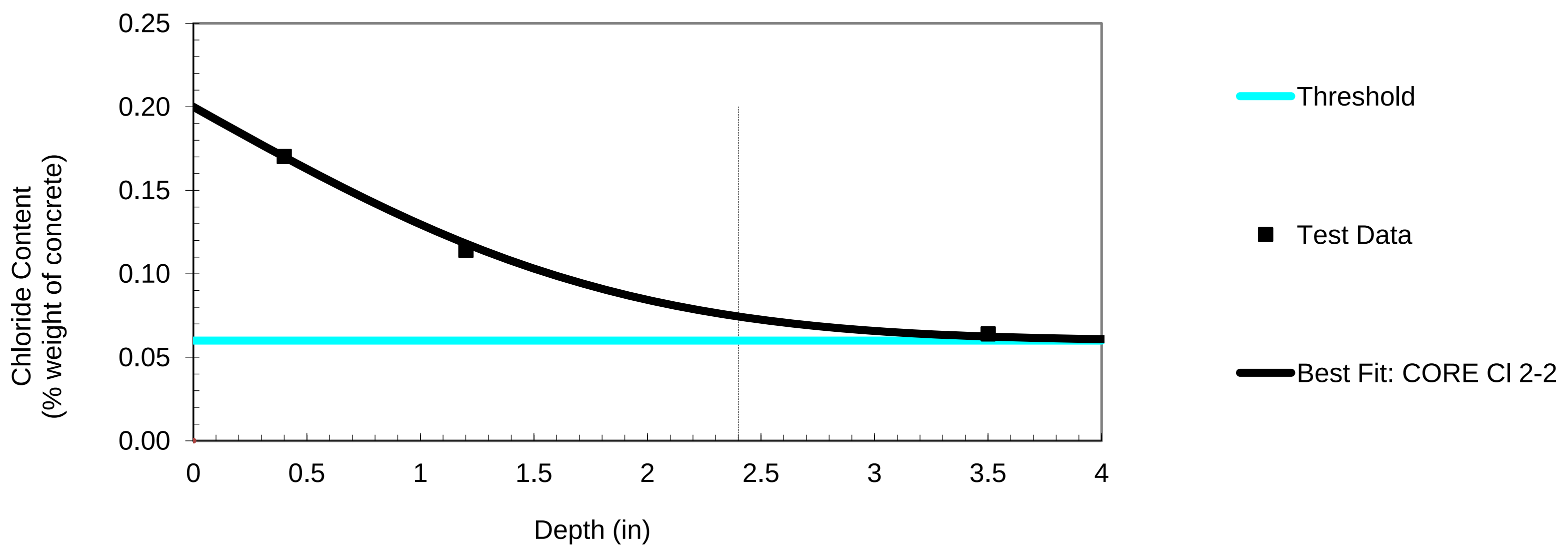
Longitudinal Cover *4 readings*

	in.		in.		in.
MIN	0	MAX	4	AVERAGE	3.5

Cover Measured from Core

Type	*in.*	*Type*	*in.*
Transverse	3.3	Longitudinal	2.4

CHLORIDE PROFILE



Core ID: Cl 3-1

Sampling Date: 21-Oct-11

TEST LOCATION

Station No.	7+97
Location	Top of Deck

TEST RESULTS

Transverse Cover 0 readings

	in.		in.		in.
MIN	0	MAX	0	AVERAGE	N/A

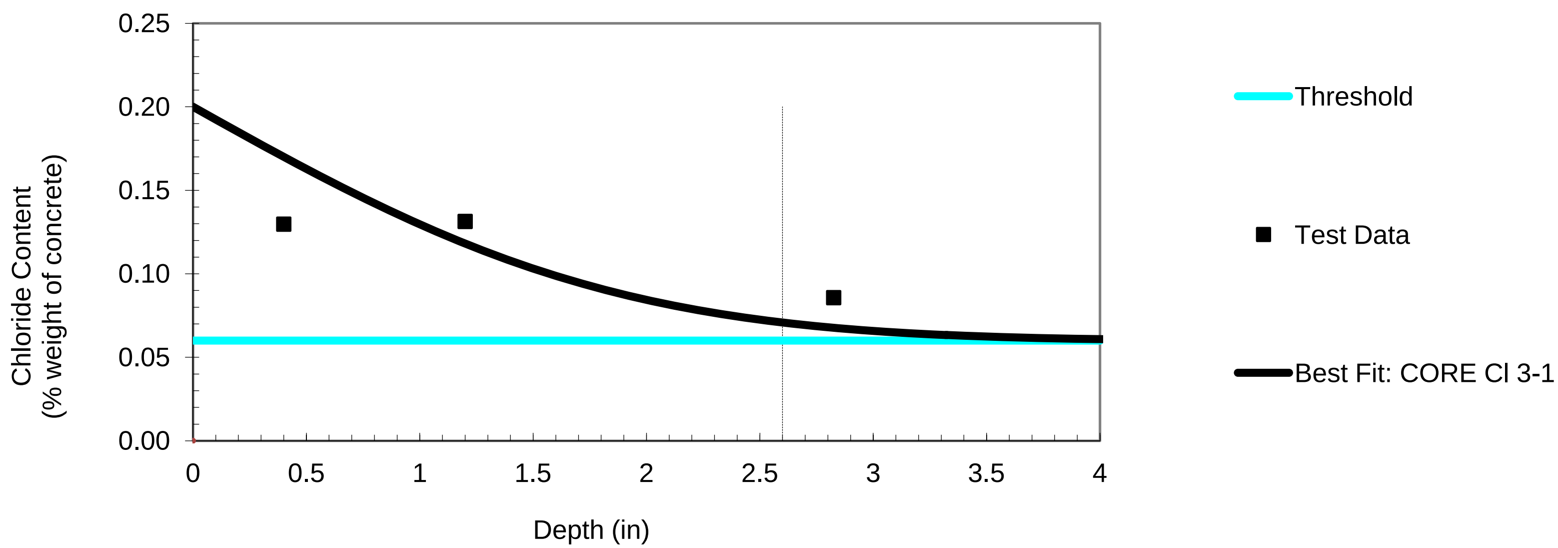
Longitudinal Cover *4 readings*

	in.		in.		in.
MIN	0	MAX	3.5	AVERAGE	2.9

Cover Measured from Core

Type	*in.*
Longitudinal	2.6

CHLORIDE PROFILE



Core ID: Cl 3-2

Sampling Date: 21-Oct-11

TEST LOCATION

Station No.	7+97
Location	Soffit deck

TEST RESULTS

Transverse Cover 0 readings

	in.		*in.*		*in.*
MIN	0	MAX	0	AVERAGE	N/A

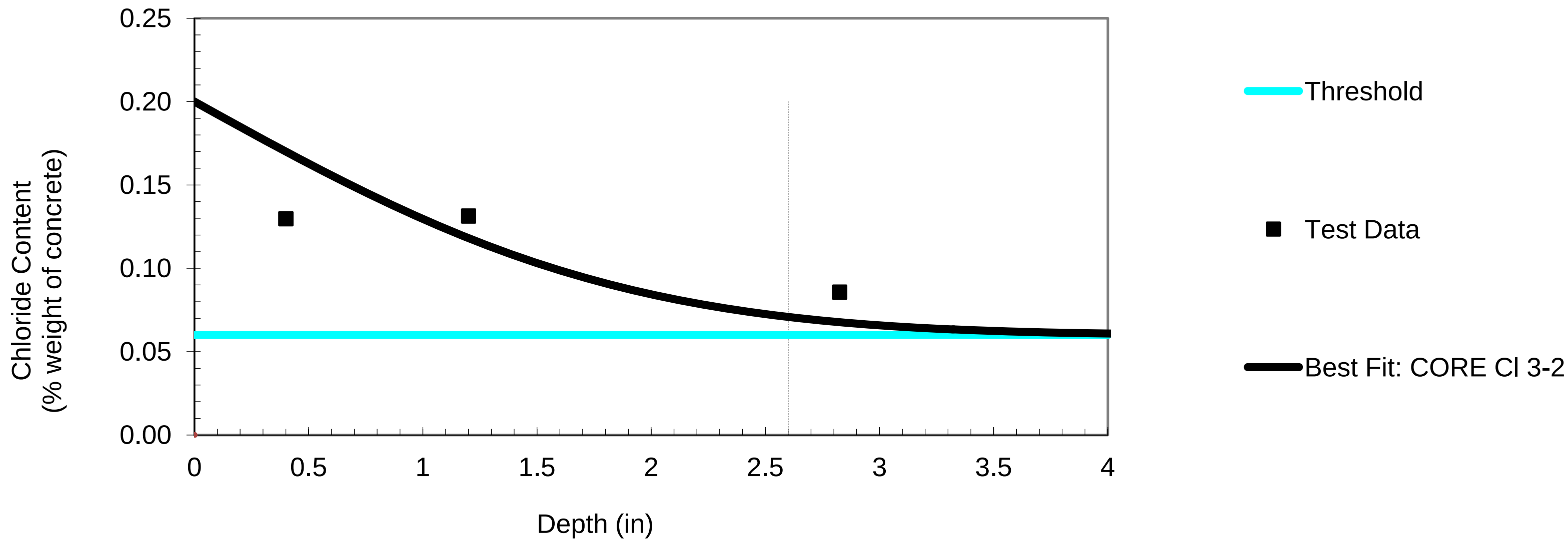
Longitudinal Cover *4 readings*

	in.		*in.*		*in.*
MIN	0	MAX	2.7	AVERAGE	2.4

Cover Measured from Core

Type	*in.*
Longitudinal	2.25

CHLORIDE PROFILE



Appendix G

Laboratory Test Certificates

AECOM

Compressive Strength of Concrete Cores
ASTM C-42

Laboratory Services Group *750 Corporate Woods Parkway Vernon Hills, Il 60061* *Phone: (847) 279-2500 Fax: (847) 279-2550*

AECOM Project No.: **60221358** **11/4/11**
Project Name: **East Midtown Waterfront Esplanade**
Location: **New York, NY**

Date Sampled: **-**
Date Received: **10/27/11**
Date Tested: **10/31/11**

Test Condition: As Received
Required Strength: -

Summary of Test Results

Core No.	Ht. (in.)	Cap Ht. (in.)	Dia. (in.)	Area $(in)^2$	H/D Ratio	Corr. Factor	Load (lb)	Strength (psi)	Weight (gm.)	Unit Wt. (pcf) *	Location
CS1	7.00	7.23	3.66	10.53	1.98	0.9984	66450	6,300	2838.0	146.8	
CS2	6.99	7.25	3.68	10.61	1.97	0.9976	40750	3,830	2829.0	145.3	
CS3	7.15	7.34	3.67	10.58	2.00	1.0000	49160	4,640	3003.0	151.3	
CS4	4.66	4.94	3.67	10.60	1.34	0.9408	64270	5,710	1904.0	147.0	

Note: * Unit Weight Calculated Using Weight/Volume Relationship at Time of Test

Sampling and Testing for Total Chloride Ion in Concrete and Concrete Raw Materials

AASHTO Designation T-260-84

Acid Soulble Method

Laboratory Services Group *750 Corporate Woods Parkway Vernon Hills, Illinois 60061 Phone: (847) 279-2500 Fax: (847) 279-2550*

AECOM Project No.: **60221358** **11/22/2011**
Project Name: **East Midtown Waterfront Esplanade**
Location: **New York, NY**

Summary of Test Results

Specimen Number	Depth (in)	Acid Soluble, % by Wt. of Concrete	lbs CL^-/yd^3
A1	**0.2-0.6**	**0.1269**	**4.969**
A2	**1.0-1.4**	**0.0858**	**3.361**
A3	**2.2-2.6**	**0.0629**	**2.461**
A4	**3.3-3.7**	**0.1008**	**3.947**
A5	**5.7-6.2**	**0.0822**	**3.220**
B1	**0.2-0.6**	**0.1773**	**6.940**
B2	**1.0-1.4**	**0.1182**	**4.627**
B3	**2.2-2.6**	**0.0775**	**3.034**
B4	**3.3-3.7**	**0.0826**	**3.235**
B5	**5.7-6.2**	**0.0879**	**3.440**
B6	**8.2-8.6**	**0.0833**	**3.263**
C1	**0.2-0.6**	**0.2131**	**8.343**
C2	**1.0-1.4**	**0.1667**	**6.527**
C3	**2.2-2.6**	**0.1182**	**4.627**
C4	**3.3-3.7**	**0.0773**	**3.028**
C5	**5.7-6.2**	**0.0740**	**2.899**
C6	**8.0-8.3**	**0.0641**	**2.509**
D1	**0.2-0.6**	**0.1703**	**6.668**
D2	**1.0-1.4**	**0.1141**	**4.468**
D3	**2.2-2.6**	**0.0591**	**2.313**
D4	**3.3-3.7**	**0.0641**	**2.508**
D5	**5.7-6.2**	**0.0649**	**2.542**
D6	**8.0-8.3**	**0.0673**	**2.634**
E1	**0.2-0.6**	**0.1298**	**5.082**
E2	**1.0-1.4**	**0.1314**	**5.145**
E3	**2.0-Base**	**0.0858**	**3.358**
F1	**0.2-0.6**	**0.0840**	**3.289**
F2	**1.0-1.4**	**0.0956**	**3.744**
F3	**2.2-2.6**	**0.0875**	**3.426**
F4	**3.5-3.9**	**0.0717**	**2.806**
F4A	**5.9-6.4**	**0.0706**	**2.764**
F4B	**8.4-8.9**	**0.0685**	**2.684**
F5	**11.0-Base**	**0.0591**	**2.313**

Note: A unit weight of 145 pcf is assumed for normal structural weight concrete when the actual unit weight is unknown.

Appendix H- To be developed during concept design

Calculations

Appendix I- To be developed during concept design

Detailed Cost Estimates

APPENDIX F
Miscellaneous Project Information

Table of Contents

- Memorandum of Understanding (MOU) between The Mayor of the City of New York, The Temporary President of the New York State Senate and The Speaker of the New York State Assembly, dated October 4, 2011
- Shared Use Path (Bikepath) Design Criteria
- Stopping Sight Distance and Length of Vertical Curves
- Section 4(f) Documentation
- Smart Growth Screening Tool Checklist

MEMORANDUM OF UNDERSTANDING

AMONG

THE MAYOR OF THE CITY OF NEW YORK,

THE TEMPORARY PRESIDENT OF THE NEW YORK STATE SENATE

AND

THE SPEAKER OF THE NEW YORK STATE ASSEMBLY

DATED AS OF OCTOBER 4, 2011

WHEREAS, pursuant to Section 1 of Chapter 137 of the 2011 Session Laws of the State of New York (the "Act"), amending Chapter 345 of the 1968 Session Laws of the State of New York, as amended, the City of New York (the "City") is authorized to discontinue and alienate certain parkland, as described in the Act (as depicted on Exhibit A hereto, the "Project Site"), consistent with the provisions of Chapter 345 of the laws of 1968, as amended;

WHEREAS, pursuant to Section 2 of the Act, the authorization as described above for the City to discontinue as parkland and alienate the Project Site is subject to and conditional upon the completion and signing of a memorandum of understanding among the parties hereto, after consultation with the members of the Senate, the Assembly, and the City Council of the City of New York representing the area in which the Project Site is located (such officials, and their successors, being referred to as the "State Senator", the "State Assemblymember", and the "Councilmember", respectively) (such memorandum of understanding, as may be amended in accordance with Section 12 hereof, being referred to as the "Section 2 MOU", the "Eastside Greenway and Parkland MOU", or "this MOU"), and in the absence of the Section 2 MOU being completed and signed on or before October 10, 2011, the provisions of the Act will expire and be deemed repealed;

WHEREAS, pursuant to a Memorandum of Understanding dated as of June 15, 2011 (the "June 2011 MOU"), the Mayor of the City (the "Mayor") agreed that he would not sign the Section 2 MOU without the concurrence of the State Senator and the State Assemblymember;

WHEREAS, as evidenced by the letters attached hereto as Exhibit B, the Councilmember, the State Senator and the State Assemblymember have been fully consulted in connection with this MOU as provided in the Act, and this MOU has the concurrence of the State Senator and the State Assemblymember, as provided in the June 2011 MOU;

WHEREAS, in accordance with Section 11 of the Act, the Mayor, simultaneously with the signature of this MOU by the parties hereto, will notify the legislative bill drafting commission of the completion and signing of the Section 2 MOU;

WHEREAS, this MOU provides for the de-mapping of Asser Levy Place and the mapping of same as parkland, the mapping of Con Ed Waterside Pier, and the potential mapping of public open space along the East River between 41st and 60th Streets, each of which may be used to satisfy the requirements of the legislation with regard to replacement parkland; and

WHEREAS, it is the intent and purpose of the parties hereto that this MOU fully satisfies the condition of Section 2 of the Act that an MOU be completed and signed by the parties hereto, such that the Act does not and will not expire, but will continue in full force and effect;

NOW, THEREFORE, the parties hereto, pursuant to and in furtherance of the Act, hereby stipulate and agree as follows:

1. Eastside Greenway and Park Board. An Eastside Greenway and Park Board ("EGAP Board") is hereby established to provide oversight, monitoring and guidance of the "Eastside Greenway and Park Fund", as described in Section 2 below. The EGAP Board shall consist of eleven (11) members, as follows, each of whom will serve at the pleasure of the person by whom each is appointed and until (except for death or disability) a successor is appointed as provided in this sentence: six (6) ex-officio members appointed by the Mayor, one of whom shall be designated as Chair by the Mayor, one (1) member appointed by the Manhattan Borough President, one (1) member appointed by the Member of the US Congress whose district includes the Project Site, and one (1) member appointed by each of the City Councilmember, the State Senator and the State Assemblymember (the latter five (5) members being sometimes referred to as the "Non-Mayoral Members"). Any member may act through a designee. The EGAP Board shall convene no less than semi-annually. Except as otherwise provided in this MOU, the EGAP Board shall act by an affirmative vote of a simple majority (six (6)) of its members. The EGAP Board shall adopt bylaws at its initial meeting, which bylaws shall be consistent with the terms and provisions of this MOU. Meetings of the EGAP Board shall be open to the public.

2. Eastside Greenway and Park Fund. An Eastside Greenway and Park Fund ("EGAP Fund") is hereby established, to be held by the City or an instrumentality thereof as a special purpose fund. The EGAP Fund shall receive, hold, and make disbursements from dedicated funding for the projects listed in Exhibit C hereto or additions or substitutions thereof as provided in this MOU (funds held in the EGAP Fund from time to time are hereinafter referred to as the "Special Purpose Funds"; projects listed in Exhibit C hereto or additions or substitutions thereof as provided in this MOU, the "Projects", and as may be categorized in Exhibit C or upon addition, substitution, or reprioritization as provided in this MOU, the "Group 1", "Group 2" or "Group 3" Projects). The EGAP Board shall receive, on an annual basis, a statement of deposits, withdrawals, sources, uses and earnings in,

from, and on the EGAP Fund and, if and to the extent separate accounts are established for operating and maintenance and capital improvement endowments for any Esplanade Project, a statement of deposits, withdrawals, sources, uses and earnings in, from, and on any such operating and maintenance and capital improvement. Upon request and reasonable notice, all records pertaining to the EGAP Fund and any separate accounts established for operating and maintenance and capital improvement endowments for any Esplanade Project shall be made available to any member of the EGAP Board for examination.

3. Special Purpose Funds, Sources and Uses. The following shall be delivered for deposit into the EGAP Fund:

(a) Solely as a condition to the disposition of the Project Site, the sum of $3 million to be paid by the United Nations Development Corporation ("UNDC") (UNDC having been notified by the City of the entity that will hold the EGAP Fund) (the "Initial Contribution"), such amount to be used by or on behalf of the City towards the Group 1 Projects as listed in Exhibit C, and, if and to the extent that any portion thereof is available after the completion of the Group 1 Projects, towards the "Non-Esplanade Projects" as defined in paragraph (b) of this Section 3 and listed in Exhibit C hereto.

(b) Solely as a condition to the disposition of the Project Site, simultaneously with issuance by UNDC of the UNDC Consolidation Project Bonds referred to in Section 5 below, the "Second Contribution", as defined in Section 5 below, the sum of $70 million to be paid by UNDC, such amount to be applied to Group 2 and Group 3 Projects, or substitutions thereof as provided in this MOU. Of the Second Contribution, $57 million shall be applied initially to Project 2a as described in Exhibit C hereto (the "ODR Esplanade") and $13 million shall be applied initially to Projects other than Projects 2a, 3a, and 3b (Projects 2a, 3a, and 3b collectively "Esplanade Projects"; and all Group 2 and Group 3 Projects, or substitutions thereof, other than Projects 2a, 3a, and 3b collectively "Non-Esplanade Projects"). Any funds applied initially to Project 2a that are available after completion of Project 2a shall be applied thereafter to the other Esplanade Projects. Second Contribution funds applied initially to the Non-Esplanade Projects may be applied instead to any of the Esplanade Projects upon affirmative vote of a majority of the Non-Mayoral Members of the EGAP Board.

(c) The "Third Contribution", as defined in Section 7 below, such amount to be applied to Group 2 and 3 Projects, or substitutions thereof as provided in this MOU. Of the Third Contribution, 85% shall be applied to the Esplanade Projects and 15% shall be applied to the Non-Esplanade Projects. Any Third Contribution funds applied initially to the Esplanade Projects that are available after completion of all of the Esplanade Projects shall be applied thereafter to the Non-Esplanade Projects. Third Contribution funds applied initially to the Non-Esplanade Projects may be applied instead to any of the Esplanade Projects upon affirmative vote of a majority of the Non-Mayoral Members of the EGAP Board.

(d) Any portion of the "Waterside Pier Funds", as defined in paragraph (a) of Section 6, not needed for the rehabilitation of the Waterside Pier, provided that such funding shall be used solely for the purpose of making additional improvements to the Waterside Pier.

(e) Any earnings in, from, and on any existing funds in the EGAP Fund.

The City or an instrumentality thereof shall be permitted to make disbursements of the Special Purpose Funds as needed solely for the purposes set forth in, and in a manner consistent with, this MOU.

4. Conditions Precedent to Alienation of the Project Site. The following provisions in this Section 4 are set forth solely as conditions to authorization for the City to dispose of the Project Site to UNDC in accordance with the Act (and not as covenants), subject to the provisions of the Act concerning such disposition not related to this MOU. If said conditions are not satisfied, the City is not permitted to dispose of the Project Site to UNDC pursuant to the Act or this MOU. Upon satisfaction of said conditions, as set forth below, and subject to the provisions of the Act concerning disposition of the Project Site not related to this MOU, the City is irrevocably permitted to dispose of the Project Site to UNDC for purposes of the Act:

(a) The making of the deliveries for deposit to the EGAP Fund as provided in paragraphs (a) and (b) of Section 3 above;

(b) UNDC shall have executed a lease with the United Nations ("UN") for the entirety of the building to be developed for the consolidation of the facilities of the UN at the Project Site (such development project, the "UN Consolidation Project" and such building the "Consolidation Building"), and the UN shall separately agree that, provided that the City disposes of the Project Site to UNDC in accordance with the Act, (i) the UN shall extend the term of its existing leases with UNDC (the "Existing UNDC-UN Leases") for space at One and Two UN Plaza (One and Two UN Plaza being referred to as the "Existing UNDC Properties") from April 2018 to March 2023 and (ii) beginning on April 1, 2017 or, if earlier, upon substantial completion of the Consolidation Building, and continuing during the period of such extension, the UN shall pay additional rent, in an amount equal to real estate taxes attributable to such space, to UNDC, for payment by UNDC to the City's General Fund. Notwithstanding the foregoing, the UN may pay such additional rent, equal to such real estate taxes, through agreements other than the Existing UNDC-UN Leases.

(c) UNDC shall have agreed with the City that after March 2023, if it still controls the Existing UNDC Properties, and provided the Consolidation Building has been leased from UNDC to the UN, it shall lease space that the UN leases at the Existing UNDC Properties at a market rent, including an amount equal to real estate taxes, and such amount paid to UNDC equal to real estate taxes, together with such market rent paid to UNDC net of amounts required for UNDC to comply with applicable bond covenants or other obligations of UNDC, shall be paid by UNDC to the City's General Fund; and

(d) The City shall have completed or shall have caused to be completed the Group 1 Projects

Upon the satisfaction of the conditions set forth above in this Section 4, the City or an instrumentality thereof shall notify the EGAP Board of same and the City shall be irrevocably permitted to dispose of the Project Site subject to the provisions of the Act concerning disposition of the Project Site not related to this MOU and subject to Section 16 of this MOU.

5. UN Consolidation Project Bonds. It is intended that, at the same time as UNDC makes the deposit as provided in paragraph (b) of Section 3 above, UNDC will issue bonds ("UNDC Consolidation Project Bonds") to pay costs associated with the UN Consolidation Project, and that UNDC Consolidation Project Bonds will yield a deposit to the EGAP Fund of $70 million (the "Second Contribution), which amount shall be deposited into the EGAP Fund at the time of issuance of the UNDC Consolidation Project Bonds.

6. Waterfront and Park Projects.

(a) Waterside Pier Rehabilitation. At the time of this MOU, the City, or an instrumentality thereof, shall have taken possession of the pier formerly leased to Consolidated Edison Inc. located between East 38th and East 41st Streets and generally depicted in Exhibit D attached hereto (the "Waterside Pier") and shall have received from Consolidated Edison Inc. funds in an amount agreed upon by the City and Consolidated Edison, Inc. (the "Waterside Pier Funds") for the structural rehabilitation of the Waterside Pier. The Waterside Pier Funds shall be expended for the rehabilitation of the Waterside Pier, except to the extent any portion thereof is not needed for such purpose, in which case such portion shall be delivered for deposit into the EGAP Fund, provided that such funding be allocated solely for the purpose of providing additional improvements to and maintenance and operation of the Waterside Pier. As soon as reasonably practicable following the execution and delivery of this MOU, the City or an instrumentality thereof shall commence the structural rehabilitation of the Waterside Pier, using only the Waterside Pier Funds. Upon the completion of the rehabilitation of the Waterside Pier, the City shall undertake the designation and mapping of the rehabilitated Waterside Pier as parkland.

(b) Improvement of Eastern Portion of Robert Moses Playground. It is intended that after the execution and delivery of this MOU, the Councilmember will make reasonable efforts to assist in appropriating funds for certain improvements to the eastern portion of Robert Moses Playground that is not part of the Project Site. If such funds are so appropriated, as soon as reasonably practicable thereafter, the City or an instrumentality thereof shall commence and complete such improvements, which, for example purposes only, may include one or more of the following: reconfiguration or addition of active recreation uses such as basketball, handball, volleyball, children's bicycle riding, or other sports, or resurfacing of existing facilities.

(c) Waterfront and Park Projects.

(i) General. Subsequent to the disposition to UNDC of the Project Site, and as soon as reasonably practicable thereafter, the City or an instrumentality thereof shall commence and pursue all Group 2 and Group 3 Projects, as described in Exhibit C hereto, and additions thereto and substitutions thereof as provided under this MOU, the cost of which shall be payable solely from Special Purpose Funds, and thereafter shall seek to complete the same to the extent such funds are available. Without limitation to the provisions set forth in Section 11 below, each of the Non-Mayoral Members shall have full standing to pursue equitable remedies against the City if the City does not commence, diligently pursue, and complete any of the Projects in the indicated order of priority (as may be changed pursuant to this MOU) for which there are sufficient Special Purpose Funds, in a manner consistent with the conditions set forth in this MOU.

(ii) Project Proposal, Comment, and Approval. The EGAP Board shall receive conceptual drawings, a proposed project schedule, including project construction commencement and construction completion dates, and a list of anticipated approvals (collectively a "Project Proposal") for each Project prior to the commencement of design development documents for any such Project. Any member of the U.S. Congress, the Senate, the Assembly, or the City Council of the City of New York who represents the site in which a Project is proposed to be located but does not have the right to appoint a member of the EGAP Board (such official an "Affected Elected Official") shall also receive a Project Proposal for such Project, which shall be delivered to such Affected Elected Officials simultaneously with the delivery of the Project Proposal to the EGAP Board. Members of the EGAP Board may provide comments on such Project Proposal to the City to ensure that the implementation of the Project occurs in a manner consistent with the description set forth in Exhibit C and the conditions set forth in this MOU. Any Affected Elected Official may also provide comments on such Project Proposal to the City and to the EGAP Board. Prior to the commencement of design development documents for any such Project, the City shall consider and respond in writing to any comments from any EGAP Member or Affected Elected Official that the City receives within thirty (30) days of delivery of the Project Proposal to such EGAP Member or Affected Elected Official. The City may at its discretion alter a Project Proposal in response to such comments. Upon approval of a Project Proposal for a Non-Esplanade Project by the EGAP Board acting upon an affirmative vote of not less than six (6) of the members of the EGAP Board that includes not less than three (3) Non-Mayoral Members (such vote, a "Special Majority Vote"), with the written concurrence of all Affected Elected Officials, the City shall proceed with such Project, and shall not proceed otherwise.

(iii) Semi-Annual Reporting. Upon request of a majority of the Non-Mayoral Members of the EGAP Board, the City or an instrumentality thereof shall provide, but shall have no obligation to provide more often than semi-annually, updates on the structural rehabilitation of the Waterside Pier, the improvements to the eastern portion of Robert Moses Playground provided for in paragraph (b) of this Section 6 above if funding is appropriated for such improvements, and all Projects listed in Exhibit C (with respect to status of permit applications, design development, schedules, and other matters as the EGAP Board may reasonably request).

(iv) Other Funding. If and to the extent that other funding may be secured by any of the Non-Mayoral Members for a Project listed in Exhibit C, the parties shall work to ensure such funds are incorporated into the budget for the applicable Project.

(v) Non-Esplanade Project Addition, Substitution, and Reprioritization. A Non-Esplanade Project in Group 2 or Group 3 may be added, removed, substituted, or reprioritized solely in accordance with the procedures outlined as follows. Any added, substituted, or reprioritized Non-Esplanade Project shall be of an estimated cost not to exceed available Special Purpose Funds for Non-Esplanade Projects, as further detailed below. Any added, substituted, and reprioritized Non-Esplanade Projects are subject to discretionary public approvals.

(1) The Non-Mayoral Members may initiate one or more additional or substitute Non-Esplanade Projects or change the priority of Non-Esplanade Projects by sending a letter, signed by not less than four (4) Non-Mayoral Members (a "Non-Mayoral Supermajority"), to the City and the other members of the EGAP Board (including a Non-Mayoral member who is not a signatory to such letter, if any) detailing such proposal. Such addition, substitution, or reprioritization shall be subject only to a determination by the City or an instrumentality thereof that such additional, substitute, or reprioritized Non-Esplanade Project is physically feasible and affordable given (x) the amount of Special Purpose Funds available for Non-Esplanade Projects; (y) the cost of such Non-Esplanade Project, including reasonably expected escalations ; and (z) the total budget of all other Non-Esplanade Projects for which Project Proposals have been approved at the time (such physically feasible and affordable project a "Feasible Project"). The foregoing notwithstanding, a substitute Non-Esplanade Project may not be proposed for any site that (x) is the subject of a pending ULURP or other land use application for a different use by the City; or (y) a site the City has previously approved for another purpose (pursuant to a public land use review process), unless the City has not taken active steps in the form of expenditures to proceed with such use prior to the proposed substitution. Except in the case of a "Delayed Project" (defined below), any proposed substitution or change in priority of a Non-Esplanade Project made at the initiation of a Non-Mayoral Supermajority as provided above shall

be received by the City before a Project Proposal has been approved for the affected Project (or substitution thereof). As soon as reasonably practicable after an additional, substitute, or reprioritized Non-Esplanade Project proposed by a Non-Mayoral Supermajority is determined to be a Feasible Project, the City or an instrumentality thereof shall provide to the EGAP Board a Project Proposal for such additional, substitute, or reprioritized Non-Esplanade Project, which shall thenceforth be treated in the same manner as if it were listed as a Non-Esplanade Project in Exhibit C hereto.

(2) A determination by the City or an instrumentality thereof that a proposed additional, substitute, or reprioritized Non-Esplanade Project is not a Feasible Project shall be subject to the provisions set forth in paragraph (c)(v)(5) of this Section 6. Each of the Non-Mayoral Members shall have standing under this MOU to challenge such determination.

(3) The City may initiate an additional or substitute Non-Esplanade Project or change the priority of a Non-Esplanade Project, subject to a determination by the City that such Non-Esplanade Project is a Feasible Project, provided that such addition, substitution, or reprioritization is approved by the EGAP Board acting by Special Majority Vote. Prior to such vote, the EGAP Board must be given thirty (30) days written notice by the City, or an instrumentality thereof, of such proposed addition, substitution, or reprioritization.

(4) If the commencement or completion of any Non-Esplanade Project is delayed, or once commenced, work is halted for, in any such case, a two-year period, or if a permit required for a Non-Esplanade Project is denied and all permitted resubmissions, and all regulatory, administrative and judicial appeals have been exhausted or the time for bringing such appeals has elapsed, such Project shall be considered a "Delayed Project". In such case, such Delayed Project may be substituted in accordance with and subject to the conditions set forth above in this Section 6 (including without limitation sufficiency of Special Purpose Funds as described above in this Section 6), except that the requirement that such substitution shall not occur after approval of the Project Proposal for the affected Project shall be inapplicable. The foregoing notwithstanding, no substitution shall be made for a Project for which construction has commenced, and such construction is at least 75% completed, without the unanimous affirmative vote of the EGAP Board.

(5) A determination that a proposed additional, substitute, or reprioritized Non-Esplanade Project is not a Feasible Project shall not be made until the City or instrumentality thereof has procured and received from a qualified third-party consultant approved by the EGAP Board a report on such feasibility and affordability, which the City shall cause to be completed not later than 180 days from the date the

City receives the Non-Mayoral Supermajority letter referred in to paragraph (c)(v)(1) above in this Section 6. The City or an instrumentality thereof shall furnish the EGAP Board with a copy of the final report promptly upon its completion. The City or instrumentality thereof shall in good faith consider such report in rendering such determination. The cost of all reports to be undertaken pursuant to this Section 6 shall be paid from Special Purpose Funds available for Non-Esplanade Projects.

(6) No substitution, removal, addition, or reprioritization may be made under the terms of this MOU for any of the Esplanade Projects. Any such substitution, removal, addition or reprioritization shall require amendment to this MOU as provided in Section 12 below.

(d) The Esplanade Projects shall be dedicated for park purposes. Upon the completion of each Esplanade Project, the City in its discretion may undertake the designation and mapping of the completed Esplanade Project as parkland.

7. Disposition or Refinancing of UN Plaza Buildings 1 and 2. For purposes of this MOU, a disposition by the City and UNDC of their respective interests in the Existing UNDC Properties is referred to as a "Disposition", and a refinancing of UNDC's interests in the Existing UNDC Properties made in lieu of a Disposition at the request of the Mayor is referred to as a "Refinancing". A Disposition or Refinancing shall be undertaken for the purpose of generating proceeds for distribution as provided below in this Section 7. A Refinancing will be undertaken only if such Refinancing will result in Net Proceeds equal to or greater than the Net Proceeds that would be generated by a Disposition pursuant to Section 8 below, as demonstrated by comparison to an actual response to an RFP from a qualified respondent that the City would be permitted to accept without a waiver pursuant to Section 8(c). In any such event, the City shall distribute or with the cooperation of UNDC shall cause to be distributed as follows the proceeds of a Disposition or Refinancing (net of all costs and expenses, including costs of issuance in the case of a Refinancing and repayment of any outstanding bonds previously issued by UNDC to the extent required by applicable bond covenants; the proceeds of a Disposition or Refinancing net of any and all such costs and expenses are referred to in this MOU as "Net Proceeds"):

(a) The City's General Fund shall receive for deposit 100% of Net Proceeds until the City's General Fund receives the actual Break Even Amount (the "Break-Even Amount"), as set forth in Exhibit E hereto;

(b) Thereafter, the EGAP Fund shall receive 100% of the remaining Net Proceeds until the EGAP Fund has received an amount from the Net Proceeds equal to $120 million escalated at 3% per annum from January 1, 2010 to the date of the Disposition or Refinancing (such sum, the "Second Traunch");

(c) Thereafter, the City's General Fund and EGAP Fund shall share any remaining Net Proceeds equally (the 50% share for the EGAP Fund being referred to as the "Third Traunch"), until the EGAP Fund has received from the Net Proceeds, when aggregated with the Second Traunch, an amount equal to $150 million escalated at 3% per annum from January 1, 2010 to the date of the Disposition or Refinancing (the Second Traunch and Third Traunch, if any, being referred to as the "Third Contribution"); and

(d) Thereafter, the City's General Fund shall receive all remaining Net Proceeds.

Net insurance proceeds payable to the City on account of a casualty event in connection with its interest in the Existing UNDC Properties shall, when paid, be treated comparably to the Net Proceeds of a Refinancing or Disposition for purposes of this MOU.

8. Disposition Process.

General. The City, with the cooperation of UNDC shall issue a Request for Proposals for a Disposition (an "RFP") from time to time, as provided in this Section 8, until there is a Disposition or Refinancing.

(a) The first RFP shall be issued no later than the earlier of April 1, 2018 or four (4) years after substantial completion of the Consolidation Building. "Substantial completion" means the Consolidation Building is generally ready for occupancy, notwithstanding that 'punch list' or other minor work has yet to be completed. The second RFP shall be issued no later than the earlier of April 1, 2021 or three (3) years after the date the first RFP is issued. Thereafter, the City shall issue one or more new RFPs not less than once every four (4) years, as may be required to result in a Disposition or Refinancing.

(b) The City, with the cooperation of UNDC and unless there has been a Refinancing, shall accept a response to an RFP from a qualified respondent and, subject to compliance with the Public Authorities Accountability Act and other applicable provisions of law (such as the State Environmental Quality Review Act and the City Environmental Quality Review procedure) and required non-Mayoral City discretionary disposition approvals (such as approvals required by the City Planning Commission and the City Council under Sections 197-c and d of the New York City Charter and the Manhattan Borough Board pursuant to Section 384(b)(4) of the New York City Charter), and unless there has been a Refinancing, as may be applicable, must proceed with the Disposition, if such response will result in Net Proceeds equal to or greater than the total of the Break-Even Amount and the Second Traunch. Prior to April 1, 2028, the City shall not accept a response to an RFP which does not result in Net Proceeds equal to or greater than the total of the Break-Even Amount and the Second Traunch.

(c) The foregoing notwithstanding, upon a request by the City, the EGAP Board, acting by Special Majority Vote, may approve a waiver of any of the requirements or conditions set forth above in this Section 8. On or subsequent to April 1, 2028, the City may elect to accept any response, regardless of Net Proceeds, without any approval from the EGAP Board.

9. Completion of Projects. As soon as reasonably practicable subsequent to the deposit in the EGAP Fund of the Third Contribution, the City shall, subject to City discretionary approvals and the requirements under Section 6 of this MOU, commence and pursue all Projects to the extent not previously commenced or pursued and to the extent Special Purpose Funds are available, and thereafter shall seek to complete the same to the extent that Special Purpose Funds are available.

10. Satisfaction of Certain Requirements Under the Act. It is hereby stipulated and agreed that the execution and delivery of this MOU by the parties hereto satisfies in full each and every provision and term of the Act which requires an MOU to be completed and signed as provided in Section 2 of the Act, subject to the satisfaction of any conditions or obligations set forth in this MOU required to be satisfied prior to the alienation of parkland described in section 1 of the Act.

11. Remedies, Limitation of Liability. The covenants, terms and conditions of this MOU constitute the binding obligations of the parties hereto, and may be enforced in a court of law through the application of equitable remedies or available remedies at law. Under no circumstances and in no event, however, shall any official signing on behalf of a party hereto or in its capacity as an elected official, or any member of the EGAP Board, have any personal liability whatsoever under this MOU or the Act.

12. Amendments in Writing. This MOU may be amended in writing, signed by the signatories to this MOU, or their successors-in-function, provided any amendment is first approved by the EGAP Board acting by Special Majority Vote. The EGAP Board shall be given thirty (30) days written notice in advance of such vote. This MOU may not otherwise be amended.

13. Counterpart Signatures. This MOU may be executed in separate counterpart signature pages, which, when taken together, shall constitute one and the same instrument.

14. Notice. Notices or other communication to be delivered to the City, or an instrumentality thereof, under this MOU shall be delivered in writing to The City of New York, City Hall, New York, New York 10007, Attn: Deputy Mayor for Economic Development, with a copy to New York City Law Department ("Law Department"), 100 Church Street, New York, New York 10007, Attn: Chief, Economic Development Division, or to such other party and/or address as the City or the Law Department may notify the EGAP Board in writing. Notices or other communications to be delivered to the EGAP Board, or members thereof, under this MOU shall be delivered in writing to the offices of the governmental officials responsible for the appointment of such members, or to other party and/or address as each such member may notify the City (or other party of which such member has been notified by the City) in writing.

15. Periodic Reporting. The City shall provide periodic, but at least annual, reports to the President Pro Tempore of the New York State Senate and to the Speaker of the New York State Assembly on the progress of funding and construction of the projects hereunder.

16. Termination. This MOU as well as the authorization to discontinue and alienate certain parkland identified as the Project Site shall terminate if the Project Site has not been disposed of to UNDC by December 31, 2015. Upon such termination, all remaining Special Purpose Funds (less set-asides for payment of obligations accrued at such time that are payable from Special Purpose Funds) shall be paid to the City's General Fund.

(remainder of this page is intentionally left blank; signature page follows)

AGREED:

______________________________ Date: 10/5/11

Michael R. Bloomberg, Mayor, The City of New York

______________________________ Date: 10/5/11

Sheldon Silver, Speaker of the New York State Assembly

______________________________ Date: ______________

Dean Skelos, Temporary President, New York State Senate

AGREED:

____ Date:__________________
Michael R. Bloomberg, Mayor, The City of New York

____ Date:__________________
Sheldon Silver, Speaker of the New York State Assembly

____ Date: 10-6-11
Dean Skelos, Temporary President, New York State Senate

EXHIBIT A

PROJECT SITE

EXHIBIT B

LETTER ACKNOWLEDGING CONSULTATION AND CONCURRENCE IN CONNECTION WITH THE EASTSIDE GREENWAY AND PARKLAND MEMORANDUM OF UNDERSTANDING

ACKNOWLEDGEMENT OF CONSULTATION AND CONCURRENCE

Pursuant to Chapter 137 of the 2011 Session Laws of the State of New York, amending Chapter 345 of the 1968 Session Laws of the State of New York, which requires the consultation of the State Senator for the 26th District of the State of the New York (the "State Senator"), the Assemblymember for the 74th District of the State of New York (the "State Assemblymember"), and the City Councilmember for the 4th District of the City of New York (the "City Councilmember"), and that certain memorandum of understanding dated June 15, 2011, among the Mayor of the City of New York (the "Mayor"), the State Senator and the State Assemblymember, which requires the concurrence of the State Senator and the State Assemblymember, in connection with the consolidation of United Nations facilities and the alienation, replacement, mapping and improvement of certain waterfront and park improvements, each elected official whose name and signature is set forth below hereby acknowledges and stipulates, for their respective selves, that he or she has been consulted in the preparation and completion of that certain Memorandum of Understanding dated as of October 4, 2011 (the "Eastside Greenway and Parkland MOU") among the Mayor, the Temporary President of the New York State Senate, and the Speaker of the New York State Assembly. Furthermore, (i) in connection with that Memorandum of Understanding among the Mayor, the State Senator, and the State Assemblymember dated June 15, 2011, each of the State Senator and the State Assemblymember hereby acknowledges and stipulates, and (ii) the City Councilmember hereby acknowledges and stipulates, on behalf of their respective selves that she or he, respectively, concurs with the terms and provisions of the Eastside Greenway and Parkland MOU.

This instrument may be executed in separate counterpart signature pages, each of which, when taken together, shall constitute one and the same instrument.

AGREED:

Liz Krueger ______________________ Date: Oct 5, 2011

Liz Krueger, Senator, 26th District, State of New York

______________________ Date: October 5, 2011

Brian Kavanagh, Member of the Assembly, 74th District, State of New York

______________________ Date: Oct 5, 2011

Daniel R. Garodnick, City Council Member, 4th District, City of New York

EXHIBIT C

WATERFRONT AND PARK PROJECTS

Group 1 Projects

1a. The de-mapping of Asser Levy Place and mapping of Asser Levy Place as parkland. The City shall close Asser Levy Place to vehicular traffic and make the existing streetbed available for public use for active recreation.

1b. The completion of required design work for the submission of applications, if deemed necessary, for all approvals and permits required from New York State Department of Environmental Conservation ("DEC"), the U.S. Army Corps of Engineers ("Army Corps") and the U.S. Coast Guard ("Coast Guard"), for the Waterside Pier Rehabilitation 38th – 41st Streets) and the submission of such applications.

1c. The completion of required design work for the submission of applications for all approvals and permits required from DEC, the Army Corps and the Coast Guard, for the Outboard Detour Roadway ("ODR") Esplanade (53rd – 60th Streets) and the submission of such applications.

1d. The completion of required design work for the submission of applications for all approvals and permits required from DEC, Coast Guard, and Army Corps, for the UN Esplanade (41st – 51st Streets).

Group 2 Esplanade Project

2a. The completion of the construction of the ODR Esplanade (53rd – 60th Streets) along the East River, including the establishment of an associated 20-year operating and maintenance and capital improvement endowment determined by the City based on actual costs of comparable projects. The goal of the project is to create a connection from the existing esplanade area to the north allowing the public increased access to the waterfront with the maximum amount of open space feasible given permitting constraints and design, engineering and cost considerations, within the funds applied to this Project 2a pursuant to paragraph (b) of Section 3 of this MOU, for passive and active recreation uses, including a bikeway, a walkway, and seating where possible.

Group 2 Non-Esplanade Projects

2b. The completion of certain St. Vartan Park Improvements. For example purposes only, such improvements may include one or more of the following: reconfiguration or addition of active recreation uses such as basketball, handball, roller hockey, volleyball or other sports, new seating, plantings, and other passive amenities, or resurfacing of existing facilities.

2c. The completion of additional public amenities relating to the Waterside Pier, that are in addition to and separate from the structural rehabilitation of the Waterside Pier, for passive and active recreation uses.

2d. The completion of certain public open space physical improvements within the neighborhood known as Tudor City, bounded by Second and First Avenues and East 40th and East 44th Streets.

Group 3 Esplanade Projects

3a. The completion of the UN Esplanade (41st – 51st Streets) along the East River, including an associated 20-year operating, maintenance, and capital improvement endowment determined by the City based on actual costs of comparable projects. The goal of the project is to create a connection between the Waterside Pier to the south and the ODR Esplanade to the north to bridge the gap in the greenway and allow the public increased access to the waterfront with the maximum amount of open space feasible given permitting constraints and design, engineering, and cost considerations, within the funds applied to Esplanade Projects pursuant to paragraph (c) of Section 3 of this MOU, for passive and active recreation uses, including a bikeway, a walkway, and seating areas where possible.

3b. The completion of upland connection(s) to the waterfront improvements described herein ("Esplanade Connectors"), including such a connection at 37th Street and at least one additional connector between 37th and 42nd Streets and/or 48th and 54th Streets, and including an associated 20-year operating, maintenance, and capital improvement endowment for any such connectors, determined by the City based on actual costs of comparable projects.

Group 3 Non-Esplanade Projects

3c. Build full amenities for Asser Levy Playground Expansion (including the added parkland area referred to in paragraph 1a above in this Exhibit C), as well as additional improvements to the existing Asser Levy Playground. For example purposes only, such improvements may include one or more of the following: reconfiguration or addition of active recreation uses such as basketball, handball, roller hockey, volleyball or other sports, new seating, plantings, and other passive amenities, or resurfacing of existing facilities.

Improvements to Non-Public Property

If any Project or part thereof, or any addition, substitution or modification thereof, is to be undertaken on non-publicly owned property, then disbursement of EGAP Funds shall be conditional upon the delivery of a restrictive covenant, with priority over all other liens and security interests in such property, to be signed in favor of the City and recorded against the land where such public open space improvements have been made, requiring that such improvements be available for public use for the duration of their useful life in the manner of public park land. Such public open space physical improvements shall be fully accessible to the public at no charge.

EXHIBIT D

WATERSIDE PIER

EXHIBIT E

SCHEDULE FOR CALCULATING BREAK-EVEN AMOUNTS

The Break-Even Amount shall be calculated,at the time of Disposition[1], as the difference between (A) and (B), below, such difference escalated at a per annum rate of 6.25% from January 1, 2010 to the date of Disposition.

(A) $278,700,000 (shown in **Column B** in the table below), reduced by

(B) the sum of the following amounts:

(i) the amount set forth, with respect to projected net lease payments for the space occupied by the UN at the Existing UNDC Properties (the "UN Space"), in **Column C**, corresponding to the applicable year of Disposition; or, if Disposition is on or after March 31, 2023, $45,600,000; PLUS

(ii) if the Disposition occurs after March 31, 2023, the net present value (discounted to January 1, 2010, using a discount rate of 6.25% per annum) (the "NPV") of the actual net lease payments received by the City's General Fund for the period subsequent to March 31, 2023 through the date of the Disposition, in respect of the UN Space (as illustrated in **Column D**, subject to adjustment); PLUS

(iii) real property taxes(or payments in lieu thereof) in respect of the UN Space ("RE Taxes") for the period from the date of this MOU through December 31, 2060, calculated as the sum of:

(A) (1) $26,865,028, or (2) if the date of the Disposition is subsequent to the earlier of March 31, 2017 and the completion of the Consolidation Building, (x) the NPV of the actual RE Taxes paid to the City's General Fund for the period ending on the earlier of the date of Disposition and March 31, 2023, plus (y) if the date of Disposition is prior to March 31, 2023, the NPV of the projected RE Taxes for the period from the date of Disposition through March 31, 2023, calculated assuming payment of full taxes based on the most recent assessed value for real property tax purposes made by the New York City Department of Finance as of the date of Disposition ("Assessed Value") of the UN Space, increasing at a rate of 3% per annum from the date of such assessment through March 31, 2023 (as illustrated in **Column E**, subject to adjustment); PLUS

(B) (1) $124,990,057 if the Disposition is on or prior to March 31, 2023, or (2) if the date of the Disposition is subsequent to March 31, 2023, (x) the NPV of the actual RE Taxes paid to the City's General Fund for the period subsequent to March 31, 2023 through the date of

[1] The terms and provisions of this Schedule E would also apply to a Refinancing (in lieu of a Disposition).

Disposition plus (y) the NPV of the projected RE Taxes for the period from the date of Disposition through December 31, 2060, calculated assuming payment of full taxes based on the Assessed Value of the UN Space, increasing at a rate of 3% per annum from the date of such assessment through December 31, 2060 (as illustrated in **Column F**, subject to adjustment); PLUS

(iv) the NPV of the actual mortgage recording taxes and real property transfer taxes received in connection with the Disposition.

Calculations shall be adjusted for partial lease years and partial tax years.

The following table is illustrative of the Break-Even Amount calculation. All figures set forth in such table, with the exception of those set forth in **Columns B** and **C** are subject to adjustment for actual UN net lease payments and actual RE Taxes (where applicable) prior to and through the date of Disposition or Refinancing as set forth above (table on page following):

A	B	C	D	E	F	G	H
Disposition Year	Projected Income to City if no Consolidation Bldg.	Cumulative Rent to City under Existing UNDC-UN Lease	Cumulative Market Rents (Post Existing UNDC-UN Lease)	Cumulative Real Estate Taxes between March 31, 2017 and March 31, 2023	Cumulative Real Estate Taxes post March 31, 2023	Break-Even Values [B-C-D-E-F]	Break-Even Values escalated at 6.25%
	(in 2010 Dollars)	*(in 2010 Dollars)*	*(in 2010 Dollars)*	*(in 2010 Dollars)*	*(in 2010 Dollars)*	(in 2010 dollars)	(in nominal dollars)
	Fixed	Fixed	To be adjusted based on actual amounts received	Fixed if sale occurs before 2017 (adjusted based on actual amounts if sale occurs thereafter)	Fixed if sale occurs before 2023 (adjusted based on actual amounts if sale occurs after 2023)	Break-Even Value below shall be further reduced for any MRT/RPTT proceeds actually received	
2011	$278,700,000	($4,600,000)	$0	($26,865,028)	($124,990,057)	$122,200,000	$129,837,500
2012	$278,700,000	($9,000,000)	$0	($26,865,028)	($124,990,057)	$117,800,000	$132,985,156
2013	$278,700,000	($13,100,000)	$0	($26,865,028)	($124,990,057)	$113,700,000	$136,378,931
2014	$278,700,000	($17,100,000)	$0	($26,865,028)	($124,990,057)	$109,700,000	$139,804,897
2015	$278,700,000	($20,900,000)	$0	($26,865,028)	($124,990,057)	$105,900,000	$143,397,194
2016	$278,700,000	($24,500,000)	$0	($26,865,028)	($124,990,057)	$102,300,000	$147,180,158
2017	$278,700,000	($27,900,000)	$0	($26,865,028)	($124,990,057)	$98,900,000	$151,181,574
2018	$278,700,000	($31,200,000)	$0	($26,865,028)	($124,990,057)	$95,600,000	$155,270,661
2019	$278,700,000	($34,400,000)	$0	($26,865,028)	($124,990,057)	$92,400,000	$159,452,899
2020	$278,700,000	($37,400,000)	$0	($26,865,028)	($124,990,057)	$89,400,000	$163,918,098
2021	$278,700,000	($40,300,000)	$0	($26,865,028)	($124,990,057)	$86,500,000	$168,513,397
2022	$278,700,000	($43,000,000)	$0	($26,865,028)	($124,990,057)	$83,800,000	$173,456,781
2023	$278,700,000	($45,600,000)	$0	($26,865,028)	($124,990,057)	$81,200,000	$178,579,759
2024	$278,700,000	($45,600,000)	($14,600,000)	($26,865,028)	($124,990,057)	$66,600,000	$165,625,002
2025	$278,700,000	($45,600,000)	($28,700,000)	($26,865,028)	($124,990,057)	$52,500,000	$130,344,702
2026	$278,700,000	($45,600,000)	($42,400,000)	($26,865,028)	($124,990,057)	$38,800,000	$102,361,626
2027	$278,700,000	($45,600,000)	($55,600,000)	($26,865,028)	($124,990,057)	$25,600,000	$71,751,655
2028	$278,700,000	($45,600,000)	($68,300,000)	($26,865,028)	($124,990,057)	$12,900,000	$38,416,864
2029	$278,700,000	($45,600,000)	($80,600,000)	($26,865,028)	($124,990,057)	$600,000	$1,898,458

East Midtown Esplanade
Shared Use Path (Bikepath) Design Criteria

Reference: AASHTO Guide for the Development of Bicycle Facilities, 4th Edition (2012) (hereafter referred to as "AASHTO")

1. **Width of Shared Use Path**: Total Bikepath width, including travel lanes and shoulders, of **18 feet** is being used. A minimum of 14 feet is required, from AASHTO Section 5.2.1(page 5-3), considering anticipated use by different kinds of users (bicyclists, skaters, pedestrians). A width greater than 14 feet can be justified based on "anticipated user volumes and mixes" and use of the FHWA Shared Use Path Level of Service Calculator (Section 5.2.1, 4th para).
2. **Location of Theoretical Grade Line (TGL)**:
   See attached typical section. Bikepath has two 7.5-foot travel lanes, a 1-foot shoulder on southbound (west) side and 2-foot shoulder on northbound (east) side. A 2-foot wide parapet is on west side of bikepath. The bikepath traveled way centerline and TGL is 2' + 1' shoulder + 7.5' foot travel lane = **10.5 feet offset from the west edge of parapet.**
3. **Design Speed:** Use a design speed of **18 mph** for bikepath with grades less than 2 percent (AASHTO Section 5.2.4, page 5-13 1st bulleted item).
4. **Minimum Radius for Horizontal Curves:** A minimum radius for horizontal curves of **200 feet** is being used. Use Table 5-2 showing minimum radii at 20-degree lean angle (page 5-14 in Section 5.2.5). For 18 mph design speed, the minimum radius based on lean angle is 60 feet.
5. **Cross Slope:** Recommended is **1 percent**, maximum is **2 percent** (AASHTO Section 5.2.6, 1st para.) "1 percent cross slopes are recommended on shared use paths, to better accommodate people with disabilities and to provide enough slope to convey surface drainage in most situations".
6. **Superelevation:** Not needed (AASHTO Section 5.2.6, 2nd paragraph, top of page 5-16).
7. **Stopping Sight Distance:** Use either AASHTO Figures 5-6 and 5-6 or the equation in Table 5-4, both in Section 5.2.8, to calculate minimum stopping sight distance.
8. **Minimum Length of Vertical Curve:** Use either AASHTO Figure 5-8 or the equation in Table 5-5, both in Section 5.2.8, to compute the minimum length of crest vertical curve based on stopping sight distance.
9. **Horizontal Sight Distance for Horizontal Curves:** Use AASHTO Figure 5-9, Figure 5-10 or the equation in Table 5-6, all in in Section 5.2.8, to compute the horizontal sight offset (HSO) as defined in Figure 5-9.

REFERENCE: AASHTO GUIDE TO BICYCLE FACILITIES, 2012	Calculated by:	JH	8/30/2013
Minimum Stopping Sight Distance	Checked by:	PB	8/30/2013

AASHTO Section 5.28 Table 5-4

S = V^2/(30*(f+/-G)) + 3.67V

where S = stopping sight distance
V = velocity (mph)
f = coefficient of friction (use 0.16 for typ. Bike)
G = grade (feet/feet)

V =	18	mph	
f =	0.16		
G =	0.005	feet/feet	
S =	131.5	feet	
V =	18	mph	
f =	0.16		
G =	-0.005	feet/feet	
S =	135.7	feet	Say 136 feet

Length of Crest Vertical Curve to Provide Sight Distance
AASHTO Section 5.28 Table 5-5 corrected from Errata list

If S < L, L = AS^2/(100((2h1)^0.5 +(2h2)^0.5)^2)

L = minimum length of vertical curve, feet

A =	1	percent		A =	2	percent	
S =	136	feet		S =	136	feet	
h1 =	4.5	feet	eye height typ. Bicyclist	h1 =	4.5	feet	eye height typ. Bicyclist
h2 =	0	feet	object height	h2 =	0	feet	object height
L =	20.55111	feet		L =	41.10222	feet	
A =	1.16	percent		A =	2.5	percent	
S =	136	feet		S =	136	feet	
h1 =	4.5	feet		h1 =	4.5	feet	eye height typ. Bicyclist
h2 =	0	feet		h2 =	0	feet	object height
L =	23.83929	feet	Say 24 feet	L =	51.37778	feet	

Horizontal Sight Distance
AASHTO Section 5.2.8 Table 5-6 corrected from Errata list

Add the sum of stopping sight distances for bicyclists traveling in opposite directions around a horizontal curve
(top of AASHTO page 5-23)
S = 136 + 136 = 272 feet
HSO = R*cos(1-(28.65*S/R)) HSO is horizontal sightline offset, the distance from centerline of lane to obstruction (ft)
R = radius of centerline of lane = 200' minimum - 7.5/2

R =	196.25	feet	
S =	272	feet	(bicyclists traveling in opposite directions)
HSO =	45.3	feet	

Use centerline striping to separate path users travelling in opposite directions
Assuming use of centerline striping, compute HSD for path users travelling in same direction

R =	196.25	feet
S =	136	feet
HSO =	11.7	feet

Alyssa Cobb Konon
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NYC Parks

City of New York
Parks & Recreation

The Arsenal
Central Park
New York, NY 10065
www.nyc.gov/parks

December 16, 2013

Holly Frey, Cultural Resource Coordinator; Jim Lau, Design Supervisor
New York State Department of Transportation, Region 11
Hunters Point Plaza,
47-40 21st Street
Long Island City, NY 11101

Re: East Midtown Waterfront Esplanade and Greenway – 4(f) Assessment

Dear Ms. Frey and Mr. Lau:

The New York City Department of Parks and Recreation (DPR) has reviewed the Section 4(f) assessment, as set forth in 23 CFR Part 774, for the use of a portion of Sutton Parks as part of the East Midtown Waterfront Esplanade and Greenway. DPR believes that the East Midtown Waterfront Esplanade and Greenway project will not adversely affect the activities, features, and attributes that qualify Sutton Parks for protection under Section 4(f).

The proposed project would involve the construction of an approximately 0.96-mile long esplanade and associated improvements along the East River from East 41st Street to East 60th Street. As indicated in the Draft Design Report/Environmental Assessment dated October 2013, the project would include, among other components, construction of a ramp for pedestrian and bicycle access to the proposed esplanade from Sutton Parks (aka Sutton Place Park) at the terminus of East 54th Street. The ramp structure would occupy approximately 0.2 acres of the park property.

The portion of Sutton Parks between East 53rd and East 54th Streets is primarily a passive recreation resource, consisting of sitting areas with benches, pathways, and plantings. As described in the 4(f) assessment memorandum, the ramp would conflict with the existing location of a sundial and bronze armillary sphere. These elements would be relocated within the park and maintained for public viewing. The creation of the upland bridge connection to the new East Midtown Waterfront Esplanade is not anticipated to limit the continued use of the park as a passive open space. Any trees that would be potentially impacted or removed in order to construct the ramp would be protected or replaced as required by DPR's Forestry Division, with restitution to be provided to DPR in compliance with Local Law 3 of 2010.

The ramp would serve as an extension of park use by providing ADA-compliant access from Sutton Parks to the East River and the expanded recreational facilities that would be available as part of the new esplanade. By creating a safe and accessible connection across the FDR Drive, which currently presents a formidable barrier for pedestrians and bicyclists, the project would be expected to enhance waterfront and open space access and increase available recreation opportunities in the neighborhood.

This assessment is based on the understanding that the project moves forward with a design substantially similar to the preferred alternative (Alternative 2 - Separated Bicycle and Pedestrian Paths) indicated in the Draft Design Report/Environmental Assessment prepared by AECOM USA, Inc. and dated October 2013 and that the associated potential disturbances are consistent with those described in the Section 4(f) Impacts memorandum prepared by AECOM and dated

NYC Parks

October 11, 2013. Please feel free to contact me at 212-360-3402 if you have any further questions regarding this matter.

Regards,

Alyssa Cobb Konon
Assistant Commissioner

cc: Bradford B. Shilling, P.E., NYSDOT
Owen Wells, AICP, DPR

U.S. Department of Transportation
Federal Highway Administration

New York Division

Leo W. O'Brien Federal Bldg.
Suite 719
Albany, NY 12207
518-431-4127
518-431-4121 (fax)
NewYork.fhwa@dot.gov

December 31, 2014

In Reply Refer To:
HED-NY

Mr. Tapas Sanyal, P.E.
Regional Local Project Liaison
New York State Department of Transportation, Region 11
Hunters Point Plaza, 7th Floor
47-40 21st Street
Long Island City, NY 11101

Subject: PIN X776.00/PIN X770.14, East Midtown Waterfront Esplanade
New York County

Dear Mr. Sanyal

In response to NYSDOT Region 11's December 5th request, FHWA concurs with the Section 4(f) *de minimis* determination for the subject project. The proposed use of the Section 4(f) property is considered minor and will not adversely affect the activities, features, and attributes that qualify Sutton Parks for protection under Section 4(f). The December 16, 2013 letter from City of New York Parks and Recreation affirms this. Therefore, the requirements of 23 CFR Part 774 have been met for this project and shall be documented as such in the Design Report..

If you have any questions, please contact me at (518)431-8874.

Sincerely,

R F Beers

Richard F. Beers Jr., Senior Area Engineer

cc: H. Frey, NYSDOT Reg. 11

Smart Growth Screening Tool

PIN **X776.00 and X770.14**

Prepared By: New York City Economic Development Corporation

Smart Growth Screening Tool (STEP 1)

NYSDOT & Local Sponsors – Fill out the Smart Growth Screening Tool until the directions indicate to **STOP** for the project type under consideration. For all other projects, complete answering the questions. For any questions, refer to Smart Growth Guidance document.

Title of Proposed Project: East Midtown Waterfront Esplanade and Greenway

Location of Project: East 41st Street to East 60th Street on East River, New York City

Brief Description: The proposed project is an approximately 0.96 mile long esplanade located along the Manhattan side of the East River in New York, New York. The espalande would be offset approximately 30 feet from the eastern side of the Franklin D. Roosevelt East River (FDR) Drive (Route 907L), from East 41st Street to East 60th Street. The proposed project would include two new upland pedestrian bridge connections to connect the landside west of the FDR Drive to the esplanade at East 48th Street and at East 54th Street.

A. Infrastructure:

Addresses SG Law criterion a. –
(To advance projects for the use, maintenance or improvement of existing infrastructure)

1. Does this project use, maintain, or improve existing infrastructure?

Yes ☒ **No** ☐ **N/A** ☐

Explain: (use this space to expand on your answers above – the form has no limitations on the length of your narrative)

Although the proposed esplanade would be new construction, it would connect to two existing piers, closing a gap in the Manhattan Waterfront Greenway. At its southern end, the esplanade would connect into Waterside Pier, which is being rehabilitated. At its northern end, the esplanade would connect with a reconstructed pier on which Andrew Haswell Green Park is located. In addition, the northern section of the esplanade would be built on 20 caissons that were installed in the East River in 2002 to support a temporary roadway during the reconstruction of a portion of the FDR Drive.

Maintenance Projects Only

a. Continue with screening tool for the four (4) types of maintenance projects listed below, as defined in **NYSDOT PDM Exhibit 7-1 and described in 7-4:**
https://www.dot.ny.gov/divisions/engineering/design/dqab/pdm

- Shoulder rehabilitation and/or repair;
- Upgrade sign(s) and/or traffic signals;
- Park & ride lot rehabilitation;
- 1R projects that include single course surfacing (inlay or overlay), per Chapter 7 of the NYSDOT Highway Design Manual.

b. For all other maintenance projects, **STOP here.** Attach this document to the programmatic Smart Growth Impact Statement and signed Attestation for Maintenance projects.

For all other projects (other than maintenance), continue with screening tool.

B. Sustainability:

NYSDOT defines Sustainability as follows: A sustainable society manages resources in a way that fulfills the community/social, economic and environmental needs of the present without compromising the needs and opportunities of future generations. A transportation system that supports a sustainable society is one that:

- Allows individual and societal transportation needs to be met in a manner consistent with human and ecosystem health and with equity within and between generations.
- Is safe, affordable, and accessible, operates efficiently, offers choice of transport mode, and supports a vibrant economy.
- Protects and preserves the environment by limiting transportation emissions and wastes, minimizes the consumption of resources and enhances the existing environment as practicable.

For more information on the Department's Sustainability strategy, refer to Appendix 1 of the Smart Growth Guidance and the NYSDOT web site, www.dot.ny.gov/programs/greenlites/sustainability

(Addresses SG Law criterion j **:** to promote sustainability by strengthening existing and creating new communities which reduce greenhouse gas emissions and do not compromise the needs of future generations, by among other means encouraging broad based public involvement in developing and implementing a community plan and ensuring the governance structure is adequate to sustain and implement.)

1. Will this project promote sustainability by strengthening existing communities?

Yes ☒ **No** ☐ **N/A** ☐

2. Will the project reduce greenhouse gas emissions?

Yes ☒ **No** ☐ **N/A** ☐

Explain: (use this space to expand on your answers above)

The esplanade would expand sustainable transportation choices in the area through the construction of a separate pathway for pedestrians and bicyclists. The proposed project would allow for enhanced protection of the aquatic environment within the river and the identified habitats located in the area, while supporting public recreation and connection to the upland community. The tree planting/placements would help increase the resilience of the natural environment over the river, and mitigate the urban heat island effect. The esplanade is consistent with several City-wide planning initiatives, such as PlanNYC 2030, PlanNYC: A Strong, More Resilient New York, and NYC's Waterfront Revitalization Program, as well as several of the stated goals of Manhattan Community Board 6's 197-A Plan.

C. Smart Growth Location:

Plans and investments should preserve our communities by promoting its distinct identity through a local vision created by its citizens.

(Addresses SG Law criteria b and c**:** to advance projects located in municipal centers; to advance projects in developed areas or areas designated for concentrated infill development in a municipally approved comprehensive land use plan, local waterfront revitalization plan and/or brownfield opportunity area plan.)

1. Is this project located in a developed area?

Yes ☒ **No** ☐ **N/A** ☐

2. Is the project located in a municipal center?

Yes ☒ **No** ☐ **N/A** ☐

3. Will this project foster downtown revitalization?

Yes ☒ **No** ☐ **N/A** ☐

4. Is this project located in an area designated for concentrated infill development in a municipally approved comprehensive land use plan, waterfront revitalization plan, or Brownfield Opportunity Area plan?

Yes ☒ **No** ☐ **N/A** ☐

Explain: (use this space to expand on your answers above)

The proposed project is located along on the East River in Manhattan, within the Midtown CBD. The project would support the economic development of the upland area, especially the adjacent large vacant area to the southwest (the former ConEdison site), as the proposed esplanade would be an attractive element for the neighborhood that could spur other redevelopment initiatives.

D. Mixed Use Compact Development:

Future planning and development should assure the availability of a range of choices in housing and affordability, employment, education transportation and other essential services to encourage a jobs/housing balance and vibrant community-based workforce.

(Addresses SG Law criteria e and i: to foster mixed land uses and compact development, downtown revitalization, brownfield redevelopment, the enhancement of beauty in public spaces, the diversity and affordability of housing in proximity to places of employment, recreation and commercial development and the integration of all income groups; to ensure predictability in building and land use codes.)

1. Will this project foster mixed land uses?

   Yes ☒ **No** ☐ **N/A** ☐

2. Will the project foster brownfield redevelopment?

   Yes ☐ **No** ☐ **N/A** ☒

3. Will this project foster enhancement of beauty in public spaces?

   Yes ☒ **No** ☐ **N/A** ☐

4. Will the project foster a diversity of housing in proximity to places of employment and/or recreation?

   Yes ☐ **No** ☐ **N/A** ☒

5. Will the project foster a diversity of housing in proximity to places of commercial development and/or compact development?

   Yes ☐ **No** ☐ **N/A** ☒

6. Will this project foster integration of all income groups and/or age groups?

   Yes ☒ **No** ☐ **N/A** ☐

7. Will the project ensure predictability in land use codes?

   Yes ☐ **No** ☐ **N/A** ☒

8. Will the project ensure predictability in building codes?

   Yes ☐ **No** ☐ **N/A** ☒

Explain: (use this space to expand on your answers above)

The proposed project would support the economic development of the upland area, including mixed used development, especially in the adjacent large vacant area to the southwest (the former ConEdison site), as the esplanade would be an attractive element for the neighborhood that could spur other redevelopment initiatives. The proposed project would provide recreational and passive amenities for a variety of users among different age groups, including education signage and connections to upland areas due west of the esplanade. Amenities would include plantings and attractive lighting, benches and railings. Although the surrounding area is zoned commercial (C5-2), higher-density residential (R8B, R10), and heavy manufacturing (M3-2), the espalande would not be subject to zoning.

E. Transportation and Access:

NYSDOT recognizes that Smart Growth encourages communities to offer a wide range of transportation options, from walking and biking to transit and automobiles, which increase people's access to jobs, goods, services, and recreation.

(Addresses SG Law criterion f: to provide mobility through transportation choices including improved public transportation and reduced automobile dependency.)

1. Will this project provide public transit?

   Yes ☐ **No** ☒ **N/A** ☐

2. Will this project enable reduced automobile dependency?

   Yes ☒ **No** ☐ **N/A** ☐

3. Will this project improve bicycle and pedestrian facilities (such as shoulder widening to provide for on-road bike lanes, lane striping, crosswalks, new or expanded sidewalks or new/improved pedestrian signals)?

   Yes ☒ **No** ☐ **N/A** ☐

   (Note: Question 3 is an expansion on question 2. The recently passed Complete Streets legislation requires that consideration be given to complete street design features in the planning, design, construction, reconstruction and rehabilitation, but not including resurfacing, maintenance, or pavement recycling of such projects.)

   Explain: (use this space to expand on your answers above)

   There are no transit providers operating within the project limits and the proposed project would not result in a change to existing bus service provided immediately adjacent to the projec area. The proposed project would expand sustainable transportation choices and ensure the reliability and quality of the City's transportation network. The proposed esplanade would allow for pedestrians and bicyclists to travel along the East Midtown Waterfront along a separate pathway from automobiles. This would make bicycling safer and more convenient and further enhance pedestrian access and safety.

F. Coordinated, Community-Based Planning:

Past experience has shown that early and continuing input in the transportation planning process leads to better decisions and more effective use of limited resources. For information on community based planning efforts, the MPO may be a good resource if the project is located within the MPO planning area.

(Addresses SG Law criteria g and h: to coordinate between state and local government and inter-municipal and regional planning; to participate in community based planning and collaboration.)

1. Has there been participation in community-based planning and collaboration on the project?

   Yes ☒ **No** ☐ **N/A** ☐

2. Is the project consistent with local plans?

   Yes ☒ **No** ☐ **N/A** ☐

3. Is the project consistent with county, regional, and state plans?

   Yes ☒ **No** ☐ **N/A** ☐

4. Has there been coordination between inter-municipal/regional planning and state planning on the project?

   Yes ☒ **No** ☐ **N/A** ☐

   Explain: (use this space to expand on your answers above)

   A Public Involvement Plan has been prepared and a Community Working Group focused on the East Midtown Waterfront Esplanade was formed. In addition, the Eastside Greenway and Park (EGAP) Board was formed. The esplanade is consistent with several City-wide planning initiatives, such as PlanNYC 2030, PlanNYC: A Strong, More Resilient New York, and NYC's Waterfront Revitalization Program, as well as several of the stated goals of Manhattan Community Board 6's 197-A Plan.

G. Stewardship of Natural and Cultural Resources:

Clean water, clean air and natural open land are essential elements of public health and quality of life for New York State residents, visitors, and future generations. Restoring and protecting natural assets, and open space, promoting energy efficiency, and green building, should be incorporated into all land use and infrastructure planning decisions.

(Addresses SG Law criterion d :To protect, preserve and enhance the State's resources, including agricultural land, forests surface and ground water, air quality, recreation and open space, scenic areas and significant historic and archeological resources.)

1. Will the project protect, preserve, and/or enhance agricultural land and/or forests?

   Yes ☐ **No** ☐ **N/A** ☒

2. Will the project protect, preserve, and/or enhance surface water and/or groundwater?

Yes ☒ **No** ☐ **N/A** ☐

3. Will the project protect, preserve, and/or enhance air quality?

Yes ☒ **No** ☐ **N/A** ☐

4. Will the project protect, preserve, and/or enhance recreation and/or open space?

Yes ☒ **No** ☐ **N/A** ☐

5. Will the project protect, preserve, and/or enhance scenic areas?

Yes ☒ **No** ☐ **N/A** ☐

6. Will the project protect, preserve, and/or enhance historic and/or archeological resources?

Yes ☒ **No** ☐ **N/A** ☐

Explain: (use this space to expand on your answers above)

The proposed project would remove any contaminated sediments encountered within the area (underwater) during construction. On-site stormwater source controls would be implemented to clean and slowly release stormwater runoff with controlled discharge rates to the East River, as appropriate. Air quality would be protected by the proposed project through the expansion of non-automobile transportation choices and the inclusion of trees and other plantings. The proposed project would provide extensive waterfront open space and recreational amenities, as well as links with existing or planned public park and waterfront walkways to both the south and north. There are 11 historic architectural resources in the area of potential effect (APE) of the proposed esplanade. Only one resource - the FDR Drive - would be directly affected by the proposed esplanade, through the introduction of pedestrian overpasses. However, introduction of two additional overpasses would be in keeping with the character of the existing setting and would not alter the characteristics that contribute to its significance. The proposed esplanade would not significantly obstruct views of the East River from those resources that are historically significant in part due to river views.

Smart Growth Impact Statement (STEP 2)

NYSDOT: Complete a Smart Growth Impact Statement (SGIS) below using the information from the Screening Tool.

Local Sponsors: The local sponsors are **not** responsible for completing a Smart Growth Impact Statement. Proceed to **Step 3**.

Smart Growth Impact Statement

PIN: X776.00 and X770.14

Project Name: East Midtown Waterfront Esplanade and Greenway

Pursuant to ECL Article 6, this project is compliant with the New York State Smart Growth Public Infrastructure Policy Act. This project has been determined to meet the relevant criteria, to the extent practicable, described in ECL Sec. 6-0107. Specifically, the project:

- Criterion a. : To advance projects for the use, maintenance or improvement of existing infrastructure : Consistent : Although the proposed esplanade would be new construction, it would connect to two existing piers, closing a gap in the Manhattan Waterfront Greenway. The southern end would connect into Waterside Pier and the northern end would connect with Andrew Haswell Green Park.
- Criterion b. : To advance projects in municipal centers : Consistent : The project is located along on the East River in Manhattan, within the Midtown Central Business District.
- Criterion c. : To advance projects in developed areas or areas designated for concentrated infill development in a municipally approved comprehensive land use plan, local waterfront revitalization and/or brownfield opportunity area plan : Consistent : The project is located in developed areas and is on NYC's Waterfront Revitalization Program.
- Criterion d. : To protect, preserve and enhance the state's resources including agricultural land, forest surface and ground water, air quality, recreation and open space, scenic areas and significant historic and archeological resources : Consistent : The project would remove any contaminated sediments encountered during the construction. On-site stormwater source controls would be implemented to clean and slowly release stormwater runoff. Air quality would be improved by the expansion of non-automobile transportation choices and inclusion of trees and plantings. The proposed project would provide extensive waterfront open space and recreational amenities. FDR drive - historic resource would be directly affected by the proposed project. However, the new pdedestrian overpasses would be in keeping with the character of the existing setting and would not alter the characteristics that contribute to its significance.
- Criterion e. : To foster mixed land uses and compact development, downtown revitalization, brownfield redevelopment, the enhancement of beauty in public spaces, the diversity and affordability of housing in proximity to places of employment, recreation and commercial development and the integration of all income groups : Consistent : The project would support

mixed use development and would enchance beauty in public spaces by plantings, attractive lighting, benches and railing. The project would provide recreational and passive amenities for a variety of users among different age groups.

- Criterion f. : To provide mobility through transportation choices including improved public transportation and reduced automobile dependency : Consistent : The project would allow for pedestrians and bicyclists to travel along the East Midtown Waterfront along a separate pathway from automobiles. This would provide safer, healthful, and emission free alternative to motor vehicle travel.
- Criterion g. : To coordinate between state and local government and municipal and regional planning : Consistent : The esplanade is consistent with several City-wide planning initiatives, such as PlaNYC 2030, NYC's Waterfront Revitalization Program, as well as several of the stated goals of Manhattan Community Board 6's 197-A Plan. The project is on New York Metropolitan Transportation Council's Transportation Improvement Program (TIP).
- Criterion h. : To participate in community-based planning and collaboration : Consistent : A Public Involvement Plan has been prepared and a community working group was formed. In addition, the Eastside Greenway and Park (EGAP) was formed.
- Criterion i. : To ensure predictability in building and land use codes : Not Applicable : The project is not related to predicting the building and land use codes.
- Criterion j. : To promote sustainability by strengthening existing and creating new communities which reduce greenhouse gas emission and do not compromise the needs of future generations, by among other means encouraging broad based public involvement in developing and implementing a community plan and ensuring the governance structure is adequate to sustain and implement : Consistent : The esplanade would expand sustainable transportation choices in the area through the construction of a separate pathway for pedestrians and bicyclists. The tree planting/placements would help increase the resilience of the natural environment over the river and mitigate the urban heat island effect. The proposed emission free alternative to motor vehicle travel will reduce greenhouse gas emissions.

This publically supported infrastructure project complies with the state policy of maximizing the social, economic and environmental benefits from public infrastructure development. The project will not contribute to the unnecessary costs of sprawl development, including environmental degradation, disinvestment in urban and suburban communities, or loss of open space induced by sprawl.

Review & Attestation Instructions (STEP 3)

Local Sponsors: Once the Smart Growth Screening Tool is completed, the next step is to submit the project certification statement **(Section A)** to Responsible Local Official for signature. After signing the document, the completed Screening Tool and Certification statement should be sent to NYSDOT for review as noted below.

NYSDOT: For state-let projects, the Screening Tool and SGIS is forwarded to Regional Director/ RPPM/Main Office Program Director or designee for review, and upon approval, the attestation is signed **(Section B.2).** For locally administered projects, the sponsor's submission and certification statement is reviewed by NYSDOT staff, the appropriate box **(Section B.1)** is checked, and the attestation is signed (Section B.2).

A. CERTIFICATION (LOCAL PROJECT)

I HEREBY CERTIFY*, to the best of my knowledge, all of the above to be true and correct.*

Preparer of this document:

NLWeymouth
Signature

6/26/2015
Date

Sr. Environmental Planner, AECOM
Title

Nicole L Weymouth
Printed Name

Responsible Local Official (for local projects):

T.G.
Signature

7/2/15
Date

EVP, NYC EDC
Title

Thomas McKnight
Printed Name

B. ATTESTATION (NYSDOT)

1. ***I HEREBY:***

   ☒ *Concur with the above certification, thereby attesting that this project is in compliance with the State Smart Growth Public Infrastructure Policy Act*

   ☐ *Concur with the above certification, with the following conditions (information requests, confirming studies, project modifications, etc.):*

   (Attach additional sheets as needed)

   ☐ do not concur with the above certification, thereby deeming this project ineligible to be a recipient of State funding or a subrecipient of Federal funding in accordance with the State Smart Growth Public Infrastructure Policy Act.

2. ***NOW THEREFORE,*** pursuant to ECL Article 6, this project is compliant with the New York State Smart Growth Public Infrastructure Policy Act, to the extent practicable, as described in the attached Smart Growth Impact Statement.

NYSDOT Commissioner, Regional Director, MO Program Director, Regional Planning & Programming Manager (or official designee):

Uchenna Madu — 7/10/15

Signature — Date

Director - Planning & Project Development — Uchenna Madu

Title — Printed Name

APPENDIX G
Public Involvement (PI) Plan

PUBLIC INVOLVEMENT PLAN

October 2013

EAST MIDTOWN WATERFRONT ESPLANADE AND GREENWAY

BOROUGH OF MANHATTAN

PIN X776.00
PIN X770.14

NYC Economic Development Corporation

NYC Department of Transportation

NYC Department of Parks and Recreation

U.S. Department of Transportation Federal Highway Administration

NEW YORK STATE DEPARTMENT OF TRANSPORTATION
ANDREW M. CUOMO, Governor JOAN MCDONALD, Commissioner

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CHAPTER 1 – Current Project Status

1.1. Background Information

This Public Involvement Plan was prepared in accordance with the *Public Involvement Manual, Appendix 2 of New York State Department of Transportation (NYSDPOT) Project Development Manual, (January 2004)*. This plan will be updated as necessary as the project develops.

NYSDOT Project Identification Number: (PIN)	X776.00 & X770.14
NYSDOT Contract "D" Number:	D 033424 D 033360
Project Title:	East Midtown Waterfront Esplanade and Greenway
Location: City/Town(s)/ County(s):	New York City, New York County
Sponsor:	NYC Economic Development Corporation
Contact Person:	Cali Gorewitz, Project Manager (212) 312-3617

Current Phase: Scoping ☐; Phase I-IV ☒; Phase V-VI ☐; Construction ☐; Other ☐

Funding: Fed-Aid NHS ☐; Fed-Aid Non-NHS ☒; 100% State ☐

Project Type (s): NEPA Class I ☐; NEPA Class II ☒; NEPA Class III ☒; SEQR Non-Type II ☒; SEQR Type II ☐

Project Scope of Work

The New York City Economic Development Corporation ("NYCEDC"), acting on behalf of New York City (the "City") and in partnership with the New York City Department of Transportation ("NYCDOT") and the New York City Department of Parks and Recreation ("NYCDPR"), initiated a project to complete planning, engineering and conceptual design for the East Midtown Waterfront Esplanade and Greenway project located between East 41st and 60th Streets in Manhattan. The project includes the UN Esplanade (41st -53rd Streets), ODR Esplanade (53rd-60th Streets), and potential Upland Connections at 48th and 54th Streets to the waterfront, herein, the East Midtown Waterfront Esplanade and Greenway Project (altogether, the "Proposed Project"). The Proposed Project will connect to the Andrew Haswell Green Park to the north and the Waterside Pier to the south, both of which the City is working to improve.

The Proposed Project included the following components (each individually, a "Sub-Project", and collectively, the "Sub-Projects"):

- UN Esplanade from 41st Street – 53rd Street ("UN Esplanade")
- ODR Esplanade from 53rd Street -60th Street ("ODR Esplanade")
- Potential Upland Connections at 48th Street and 54th Street

For each Sub-Project, the Consultant Team is providing engineering, landscape architectural and related design services for the Proposed Project including:

- Civil, marine, structural and geotechnical engineering
- Landscape architecture and architecture
- Traffic engineering and planning
- Environmental assessment, mitigation design and regulatory support
- Surveying
- Lighting design
- Cost estimating

Scoping Update

- **No Right-of-Way (ROW) Acquisition is required.** The extent of ROW acquisition is determined based on the selected conceptual design. A title search was conducted and ROW acquisition is not anticipated based on current concept designs.
- **Previously defined "Esplanade North" is now redefined as the "ODR Esplanade."** All references to Esplanade North in previous Scoping Documents can be understood as the ODR Esplanade.
- **42nd Street Connector removed from Scope.** No 42nd Street Connector based on security concerns due to its adjacency to the United Nations campus.

Proposed Project Schedule as of Date Prepared

Scoping Approval	March 2013
Design Approval	2014
PS&E	UN Esplanade, 2016; ODR Esplanade, 2018
Construction Begins	UN Esplanade, 2017; ODR Esplanade, 2019
Construction Completion	UN Esplanade, 2019; ODR Esplanade, 2025

* Upland Connections completed concurrent with Proposed Project as funding becomes available

1.2. Previous Public Involvement Stakeholders and Issues

The Manhattan Waterfront Greenway is a 32-mile route that circumnavigates the island of Manhattan. The greenway is intended to transform underutilized waterfront into public space for both recreational and commuting use. Despite much important progress in recent years on new waterfront public space in the City of New York, a major gap exists in the Manhattan Waterfront Greenway between East 41st Street and East 60th Street on the East River. Disconnected from the water by the FDR Drive and the campus of the United Nations, the communities of East Midtown have few connections to the waterfront.

In recent years, a number of planning efforts have examined how to address the gap in the Manhattan Waterfront Greenway while simultaneously providing new recreation amenities to the Midtown East community. Agency coordination included efforts by the local Community Board through a 197(a) plan, the Municipal Art Society, the Department of City Planning, as well as efforts by the United Nations and the United Nations Development Corporation. The City of New York has established several policy goals as defined in *Vision 2020: NYC Comprehensive Waterfront Plan (2011)* and the *Manhattan Waterfront Greenway Master Plan (2004*). The first goal of the *Comprehensive Waterfront Plan* is to expand waterfront public access, improving connectivity and continuity. The report states that "the overall continuity of waterfront public access can be improved by targeting gaps in otherwise continuous stretches of public access."

A Memorandum of Understanding (MOU) between the City and State of New York signed in October 2011 provided a framework for the United Nations to expand its campus located in East Midtown and established a funding mechanism for the Proposed Project, enabling the project to move forward. The MOU also established the Eastside Greenway and Park Board (EGAP Board). Formed in October 2011, it includes 11 members representing the City and elected officials to provide oversight, monitoring, and guidance for the Proposed Project amongst other open space improvements in the East Midtown community. Subsequently, the EGAP Board created the Community Working Group in order to streamline community participation, education and engagement. It includes 23 neighborhood, city-wide and regional organizations.

The community has also identified the urgent need for improved bicycling safety in the area for which the inclusion of the bikeway onto the Proposed Project would reduce the number of incidents bicyclists encounter while traveling in the East Midtown community. Additionally, this project supports components found in the New York State Department of Transportation's (NYSDOT) Long Range Transportation Plan (LRTP) which establishes goals through 2035 and calls for the increase of regional mobility and accessibility through the 15% increase of miles of bikeway and a 10% improvement in bicycle level of service by 2035.

The Proposed Project would accomplish several critical policy goals established by the City in *Vision 2020: NYC Comprehensive Waterfront Plan (2011)* and the *Manhattan Waterfront Greenway Master Plan (2004)*, and other planning documents. As described below, the Proposed Project purpose includes:

(1) Connect the existing gap in the Manhattan Waterfront Greenway between East 41st and 60th Streets along the East River, providing system continuity to existing sections to the north and south.
(2) Provide public access to the waterfront and new open space for the densely populated communities of East Midtown where virtually no access currently exists.
(3) Provide a safe recreation area for a wide range of users, including children, the disabled and elderly.
(4) Provide opportunities for water-dependent and water-related uses.
(5) Promote New Yorkers' understanding of and relationship to the East River/Hudson River Estuary as a natural feature and historical landscape.

For information on public involvement and public involvement milestones refer to the project website at http://www.nycedc.com/project/east-midtown-waterfront. Comments from the public can be submitted via the project website or email at EastMidtownWaterfront@nycedc.com.

CHAPTER 2 - Context Identification

2.1. Identify Stakeholders

Internal Stakeholders:

- New York City Economic Development Corporation
- New York City Department of Transportation
- New York City Department of Parks and Recreation

External Stakeholders:

New York City Agencies:

- New York City Police Department (Counter-Terrorism, Harbor Unit)
- Fire Department City of New York
- Department of Parks and Recreation
- Department of City Planning
- Department of Transportation
- Department of Environmental Protection
- Mayor's Office of Emergency Management
- Metropolitan Transportation Authority

New York State Agencies:

- Department of Environmental Conservation
- Department of State
- Department of Transportation

Federal Agencies:

- US Coast Guard
- Army Corps of Engineers
- National Marine Fisheries
- Federal Highway Administration

Other

- Harbor Operations Steering Committee
- Area Maritime Security Committee

Eastside Greenway and Park Board (EGAP Board) Members:

Mayoral appointees

- Robert K. Steel, Deputy Mayor for Economic Development, Chairperson
- Nanette Smith, Chief of Staff to First Deputy Mayor Patricia E. Harris
- Veronica White, Commissioner, Department of Parks & Recreation
- Mark Page, Director, Office of Management and Budget
- Janette Sadik-Khan, Commissioner, Department of Transportation
- Marjorie Tiven, Commissioner, Commission for the United Nations, Consular Corps and Protocol

Elected officials

- Assemblymember Brian Kavanagh
- State Senator Liz Krueger
- Council Member Daniel R. Garodnick
- US Representative Carolyn Maloney

- Manhattan Borough President Scott M. Stringer

Community Stakeholders (Community Working Group):

- Metropolitan Waterfront Alliance
- Municipal Art Society
- New Yorkers for Parks
- Partnerships for Parks
- Transportation Alternatives
- Kips Bay Neighborhood Alliance
- Murray Hill Neighborhood Association
- Solar One
- Stuyvesant Cove Park Association
- Stuyvesant Town-Peter Cooper Village Tenants Association
- Sutton Area Community
- Manhattan Community Board 6
- Manhattan Community Board 8
- East Midtown Coalition for Sensible Development
- East Sixties Neighborhood Association
- Tudor City Association
- Turtle Bay Association
- Waterside Tenants Association
- Manhattan East Community Association
- Beekman Place Association
- East Midtown Partnership
- Friends of Dag Hammarskjold Plaza
- Bike NY

2.2. Identify Potential Concerns

Through various public forums and meetings, as well as through extensive outreach to Local, State, and Federal agencies, several potential concerns have been identified. These concerns are being addressed or are anticipated as the concept designs and environmental review advance in coordination with stakeholders.

- Potential security concerns for upland connection at 42nd Street due to adjacency to United Nations campus; this component has been removed from the Proposed Project.
- Visual impacts of the esplanade from adjacent open spaces and upland residences
- Potential impacts on designated or potentially eligible landmarks
- Construction impacts to local marine ecology
- Suitable upland connections and general accessibility for a diverse range of users
- Separated bike and pedestrian pathways for safe bicycle and pedestrian safety
- Increased esplanade widths at upland connections landings to avoid bicycle and pedestrian conflicts
- Public awareness of construction schedule for local residents and other stakeholders
- Awareness to maritime community of location of construction supporting equipment and barges

2.3. Community Impact Assessment

The community impact assessment is a process to evaluate the effects of a transportation action on a community and its quality of life. This process, when appropriate, is for complex projects with the potential to significantly affect the community. The approach is outlined in the *FHWA publication Community Impact Assessment (PD-96-036, September 1996)*.

The Proposed Project does not have the potential to significantly adversely impact the community. The Proposed Project will lead to an increase in publicly accessible open space and other recreational amenities and is located in the community district with the least amount of parkland—just 26 acres compared to the average of 198 acres for other Manhattan districts. The presence of the FDR Drive and the United Nations campus has restricted much needed waterfront access and strained open space options. Latest census figures show a steadily growing population, particularly in young children and the elderly, pointing to a vital need for adequate active park space in the area. This project will provide new active and passive recreation opportunities for local residents, employees, and visitors.

CHAPTER 3 – Plan Public Involvement Objectives

3.1. Anticipated Level of Public Involvement

Public engagement has been vital to the design, development, and implementation strategy of this project. During the initial development of the Proposed Project concept, three public information meetings hosted by local elected officials in the community and were attended by hundreds of people between June and October 2011. The project team coordinates regularly with the local Community Board and other stakeholders.

A Community Working Group focused on the East Midtown Waterfront Esplanade was formed in April 2012 in order to streamline community participation, education and engagement. It includes 23 neighborhood, city-wide and regional organizations and met in May 2012 and June 2013. The next meeting is expected in fall 2013. As part of the public review for our permitting and environmental review requirements, we will have open public comment periods for additional community feedback.

Extensive outreach and public notification has continued through public involvement techniques such as email and public notifications of meetings and the development of a project website located at http://www.nycedc.com/project/east-midtown-waterfront. Over the past couple of years, over 20 articles about the project have been published in the NY Times, blogs, and other print media.

3.2. Structured Decision Making

Local leadership is committed to this project as indicated by the creation of the Eastside Greenway and Park (EGAP) Board. Formed in October 2011, it includes 11 members representing the City and elected officials to provide oversight, monitoring, and guidance for the Proposed Project amongst other open space improvements in the East Midtown community. The EGAP Board met in April 2012 and June 2013 and the next EGAP Board meeting is expected in fall 2013. The project team has met with 18 city, state, and federal agencies (listed as external stakeholders) about this project to coordinate the concept design.

3.3. Effective Communication Methods

Several communication methods and meeting formats have facilitated the development of the Proposed Project concept designs. In general, the community consultation process has sought to:

1. Inform stakeholders of project and proposed project scope/needs.
2. Gather information on the area needs
3. Collect input on desired design, programming, potential upland connections and other amenities
4. Summarize information gained from initial outreach
5. Seek consensus on preferred design alternative
6. Update stakeholders on progress and discuss any changes.
7. Reengage with stakeholders as needed

3.4. Public Education and Outreach

- Meetings with public officials: Project team has briefed local elected leaders on the project at least 6 times since June 2011
- Public information meetings: 3 public meetings between June and October 2011 hosted by elected officials; East Side Greenway and Park public meetings in April 2012 and June 2013; East Midtown Waterfront Community Working Group meetings in May 2012 and June 2013
- Other public involvement techniques: email, project website, phone calls. Over 20 articles about the project have been published in the NY Times, blogs, and other print media
- See Appendices for complete record of community outreach

CHAPTER 4 – Action Steps

4.1 Responsibilities

A Regional Public Information Officer (PIO) is not required to be assigned to the project team consisting of NYCEDC in partnership with NYCDOT and NYCDPR (altogether, the “Public Involvement Team”). The Public Involvement Team will ensure that:

- Planned public involvement actions take place and that outcomes are documented.
- Public involvement information is shared with all project team members.
- Public involvement plans are updated to suit changing circumstances and as projects advance from scoping through construction.

4.3 Schedule for Public Involvement Activities

An additional EGAP Board meeting followed by another Community Working Group meeting is anticipated this fall 2013. There will be continued outreach to other public officials and agencies as needed.

During final design development, there will be outreach to the EGAP Board, public officials and agencies as needed.

During construction the Public Involvement Team will notify the public of the proposed construction schedule and impacts through coordination with community stakeholders, as well as keep the public informed through the Community Working Group, use of signage, and the project website.

4.4 Resources and Communication Methods

- Continued Agency outreach
- Coordination with the Eastside Greenway and Park Board
- Outreach to the Community Working Group, as needed
- Project Website
- Appropriate signage
- Maritime communication

CHAPTER 5 – Implement Monitor and Update Public Involvement Plan

5.1 Implementation and Monitoring

The Public Involvement Plan, Eastside Greenway and Park Board, and Community Working Group informs the strategy for maintaining contact with affected residents, community groups, and other stakeholders concerning design development and construction activity schedule and impacts.

5.2 Documentation and Updates

The EGAP Board and Community Working Group are expected to continue regular meetings as the concept design progresses. The Public Involvement Team shall:

- During preliminary and final design, update the EGAP Board and Community Working Group regarding any changes
- Ensure that post-design activities, such as value engineering, do not make changes to previous NYSDOT commitments without considering impacts to stakeholders.
- Comply with Federal and New York State regulatory requirements.
- Fully document for the project record how and why decisions were made.

5.3 Construction PI Plan to be Prepared During Project Design

The Public Involvement Team will update the Public Involvement Plan as needed during final design anticipated to be in 2016 to consider any potential construction impacts from the Proposed Project. The objectives during construction phase are to:

- Inform and maintain contact with affected residents and stakeholders concerning construction activity schedule and impacts.
- Maintenance and protection of traffic (MPT)
- Minimizing community economic impacts during construction
- Post-construction community feedback
- Host public meetings as needed during pre-construction and construction.
- Public meetings during construction
- Highway message signs and other necessary means of public noticing if traffic disturbed

APPENDIX H

PIN X776.00 and X770.14
LOCALLY ADMINISTERED
FEDERAL AID PROJECT (PLAFAP)
DESIGN REPORT CHECKLIST

Locally Administered Federal Aid Project
Design Report Checklist – Revised 4/8/2010

PIN: X776.00 and X770.14 Project: East Midtown Waterfront Esplanade Borough of Manhattan	1st Review	2nd Review
	DR Rec'd: 12/18/13	DR Rec'd: 5/08/14
	Review Due: 2/19/14	Review Due: 7/15/14

OK	***NA***	***Date Resolved***	***Design Issues***
X		7/15/14	Project consistent with initiation document (IPP, Project Proposal, TEP application etc.) and all approved scope change requests.
X		7/15/14	Project evolution contains description of all approved scope changes since project was approved for funding
			Existing conditions described adequately (As applicable):
X		7/15/14	Functional class of all affected roads listed correctly –**NOTE**:If NHS or on State Highway, special requirements apply. See PLAFAP, Chapter 8, Section 8.1 and Table 8-1.
X		7/15/14	Existing highway section(s) adequately described in report and shown on plan in Appendix
X		7/15/14	Posted Speed(s) indicated
X		7/15/14	Appropriate current & projected traffic volumes included
X		7/15/14	All existing non-standard features listed
X		7/15/14	Appropriate accident analysis included
X		7/15/14	Existing structures identified
X		7/15/14	All utilities and owners within project limits identified
	X	7/15/14	All railroads (owners and operators) identified
X		7/15/14	Pedestrian / bicyclist facilities adequately described in report and shown on plan in Appendix
X		7/15/14	All other existing conditions adequately described
X		7/15/14	Project Needs adequately described
X		7/15/14	Project Objectives clearly stated, appropriate
			Design Criteria (As applicable):
X		7/15/14	Using appropriate standard(s)? (Ch. 2, Ch. 4, 3R, Bridge, etc.)
X		7/15/14	Use of rural / urban standards OK?
X		7/15/14	Design speed(s) reasonable, meet minimum? Basis sound?
X		7/15/14	Existing terrain type OK?

OK	**NA**	***Date Resolved***	***Design issues***			
X		7/15/14	Engineering support information provided to justify project design including traffic, accidents, pavement, etc.			
			Critical Design Elements Noted:			
				OK	**NA**	
X		7/15/14	design speed	X		Horizontal clearance (with & w/o curb)
X		7/15/14	lane width	X		vertical clearance
X		7/15/14	shoulder width	X		pavement cross slope
X		7/15/14	Grade		X	Rollover
X		7/15/14	horizontal curvature	X		pedestrian accommodation
	X	7/15/14	super elevation		X	bridge roadway width
X		7/15/14	stopping sight distance	X		structural capacity
X		7/15/14	Pedestrian accommodation: all projects must meet ADA law. If on State highway or NHS, must also meet Chapter 18, NYSDOT HDM requirements.			
X		7/15/14	Bike projects must meet AASHTO's *Guide for the Development of Bicycle Facilities (see Design Criteria Bikeways) and NYSDOT HDM Chapter 17*			
	X	7/15/14	Parking lots must meet AASHTO's *Guide for the Design of Park-and-Ride Facilities*			
X		7/15/14	Building projects must meet NYS Uniform Fire Prevention and Building Code, National Electric Code			
	X	7/15/14	Historic Preservation projects must meet US Secretary of the Interior's *Standards for the Treatment of Historic Properties*			

OK	**NA**	***Date Resolved***	***Environmental Issues***
X		7/15/14	SEQRA – Lead Agency identified, process completed and documented (Type II – legal language included; Unlisted – Short EAF; Non-Type II – Full EAF)
X		7/15/14	The NEPA classification is satisfactory and has been determined in accordance with the guidance provided in the PLAFAP, Chapter 7, Sections 7.3/7.4/7.5; Chapter 8, Sections 8.2/8.6

OK	NA	Date Resolved	Environmental Issues (continued)
X		7/15/14	NEPA – Appropriate classification, language included in report
X		7/15/14	NEPA Checklist completed and included in Appendix; report contains supporting documentation for NEPA checklist items as necessary:
X		7/15/14	Endangered species letters (USF&WS, NYSDEC) included
X		7/15/14	SHPO determination made, FHWA concurrence obtained
X		7/15/14	DEC stream classification included; construction conditions noted
X		7/15/14	Wetlands (State, Federal) impacts addressed; EO 11990 satisfied
X		7/15/14	Parks (Federal, State, Local) impacts addressed; 4(f) addressed
X		7/15/14	NYCDEP – documentation of coordination
X		7/15/14	Air quality language included; required analysis done for non-exempt projects
X		7/15/14	Noise addressed
X		7/15/14	Coastal Zone – Dept of State consistency determination
X		7/15/14	Coast Guard Jurisdiction Checklist
X		7/15/14	Hazardous Waste/Asbestos addressed
X		7/15/14	Farmland addressed
X		7/15/14	Critical Environmental Areas addressed
X		7/15/14	SPDES determination made and addressed/SWPPP required?
			All environmental issues addressed, procedures completed and documentation included in report
OK	**NA**	**Date Resolved**	**General**
X		7/15/14	All required permits, including HWP, identified
X		7/15/14	Public participation adequately addressed and documented (i.e.- Public Information Meeting)
X		7/15/14	Report contains plans, profiles and typical sections, including bridges

OK	NA	Date Resolved	General (continued)
X		7/15/14	Field trip confirms that all significant environmental and technical issues are addressed; digital "before" photos taken at recorded locations
X		7/15/14	Format of report is consistent with NYSDOT Local Project Manual
X		7/15/14	Certifications by Responsible Local Official accompany Final Design Report
X		7/15/14	Detailed Project Cost Estimate included
X		7/15/14	Specifications and Standards to be used for the project are discussed in the DAD
OK	**NA**	**Date Resolved**	**Right-of-Way**
X		7/15/14	Appropriate *existing* right-of-way / property boundaries described in report and shown on plans in Appendix
	X	7/15/14	Appropriate *proposed* right-of-way / property acquisitions described in report and shown on plans in Appendix
	X	7/15/14	Proposed property acquisitions are appropriate in size and type (TE, PE or FEE)
	X	7/15/14	Table of Anticipated ROW (Property) Acquisitions included (table includes property owner(s), deed reference (liber and page), original parcel size, type of acquisition, amount of property to be acquired, reason(s) for acquiring the property, and remarks)
	X	7/15/14	Field trip confirms that all right-of-way issues are addressed
	X	7/15/14	NEPA checklist completed correctly with respect to property thresholds
	X	7/15/14	ROW estimate, Form 353C, complete and reasonable

Estimated Costs vs. Programmed Funds		
	Estimated Costs	Programmed
ROW Acquisition	$0	$0
From Design Report	$0	$0
Consultant Agreement	$0	$0
Construction	Total: $220M (2010$)	
Highway	$ -	$ -
Traffic & Street Lighting	$ -	$ -
Utilities	$ TBD	$ TBD
Betterments	$ TBD	$ TBD
Railroad Force Account	$ 0	$ 0
Inspection	$ TBD	$ TBD

G If Estimated "**CAPPED**" Costs exceed Programmed Costs, then add appropriate language to *Design Review Letter*

Unique Situations		
Reviewer	Situation	Resolution

OK to Seek NEPA Determination, Design Approval, and to Issue Authorization to Proceed with Detailed Design and Right-of-Way Acquisition			**Review for information only**
Reviewer #1	Reviewer #2		

APPENDIX I
NEPA CHECKLIST

NEPA ASSESSMENT CHECKLIST

(Revised 12-29-03)

Date: **7/10/2013**
PIN: **X776.00;**
X770.14
Project Description: **East Midtown Waterfront Esplanade (EMWE) Project**

Answer the following questions by checking YES or NO.

I. **THRESHOLD QUESTION**

1. Does the project involve unusual circumstances as described in 23 CFR '771.117(b)? **YES**☒ **NO**☐

☒ If **YES**, the project does not qualify as a Categorical Exclusion and an EA or EIS is required. You may STOP COMPLETING THE CHECKLIST.

- OR-

☐ If **NO**, continue…

II. AUTOMATIC CATEGORICAL EXCLUSION

2. Is the project an action listed as an Automatic Categorical Exclusion in 23 CFR '771.117(c) (C List) and/or is the project an element-specific project classified by FHWA as a Categorical Exclusion on July 22, 1996? **YES**☐ **NO**☐

☐ If **YES** to question 2, the project qualifies for a C List Categorical Exclusion, "Automatic Categorical Exclusion". You may STOP COMPLETING THE CHECKLIST. The checklist should be included in the appendix of the Final Design Report (or Project Scoping Report/Final Design Report). The CATEGORICAL EXCLUSION DETERMINATION memo is to be sent to the appropriate Main Office Design liaison unit with a copy of the Final Design Report (or Project Scoping Report/Final Design Report). A copy of the CATEGORICAL EXCLUSION DETERMINATION memo must also be sent to the Office of Budget and Finance, Project and Letting Management, and others (see sample DETERMINATION memo attached).

(Note - Even if YES to question 2, there may be specific environmental issues that still require an action such as an EO 11990 Wetland Finding or a determination of effect on cultural resources. The project is still an Automatic Categorical Exclusion but the necessary action must be taken, such as obtaining FHWA's signature on the wetland finding. Refer to the appropriate section of the Environmental Procedures Manual for guidance.)

-OR-

☐ If **NO** to question 2 above, continue below…

III. PROGRAMMATIC CATEGORICAL EXCLUSION

3. Is the project on new location or does it involve a change in the functional classification or added mainline capacity (add through-traffic lanes)? **YES**☐ **NO**☐

Clarification:

4. Is this a Type I project under 23 CFR 772, "Procedures for Abatement of Highway Traffic Noise and Construction"? **YES**☐ **NO**☐
Clarification:

5. If the project is located within the limits of a designated sole source aquifer area or the associated stream flow source area, is the drainage pattern altered? **YES**☐ **NO**☐
Clarification:

6. Does the project involve changes in travel patterns? **YES**☐ **NO**☐
Clarification:

7. Does the project involve the acquisition of more than minor amounts of temporary or permanent right-of-way (a minor amount of right-of-way is defined as not more than 10 percent of a parcel for parcels under 4 ha (10 acres) in size, 0.4 ha (1 acre) of a parcel 4 ha to 40.5 ha (10 to 100 acres) in size and 1 percent of a parcel for parcels greater than 40.5 ha (100 acres) in size? **YES**☐ **NO**☐
Clarification:

8. Does the project require a Section 4(f) evaluation and determination in accordance with the FHWA guidance? **YES**☐ **NO**☐
Clarification:

9. Does the project involve commercial or residential displacement? **YES**☐ **NO**☐
Clarification:

10. If Section 106 applies, does FHWA's determination indicate an opinion of adverse effect? **YES**☐ **NO**☐
Clarification:

11. Does the project require a ACOE Nationwide Permit #23 – Approved Categorical Exclusion?* **YES**☐ **NO**☐
Clarification:

12. Does the project require any work in wetlands requiring an "Individual" Executive Order 11990 Wetland Finding?* **YES**☐ **NO**☐
Clarification:

* Corrections as per memo dated 8/22/96, from M. Sengenberger & M. Ivey to Reg. Environmental Contacts

13. Has it been determined that the project will significantly encroach upon a flood plain based on preliminary hydraulic analysis and consideration of EO 11988 criteria as appropriate? **YES**☐ **NO**☐
Clarification:

14. Does the project involve construction in, across or adjacent to a river designated as a component proposed for or included in the National System of Wild and Scenic Rivers? **YES**☐ **NO**☐
Clarification:

15. Does the project involve any change in access control? **YES**☐ **NO**☐
Clarification:

16. Does the project involve any known hazardous materials sites or previous land uses with potential for hazardous material remains within the right-of-way? **YES**☐ **NO**☐
Clarification:

17. Does the project occur in an area where there are Federally listed endangered or threatened species or critical habitat? **YES**☐ **NO**☐
Clarification:

18. Is the project, pursuant to EPM Chapter 1A and Table 2 and Table 3 of 40 CFR Parts 51 and 93, non-exempt or does it exceed any ambient air quality standard? **YES**☐ **NO**☐
Clarification:

19. Does the project lack consistency with the New York State Coastal Zone Management Plan and policies of the Department of State, Office of Coastal Zone Management? **YES**☐ **NO**☐
Clarification:

20. Does the project impact or acquire any Prime or Unique Farmland as defined in 7 CFR Part 657 of the Federal Farmland Protection Policy Act <u>and</u> are there outstanding compliance activities

necessary? (<u>Note:</u> Interpret compliance activity to mean completion of Form AD 1006.) **YES**☐ **NO**☐
Clarification:

☐ If **NO** for questions, 3-20, go on to answer question 21…

-OR- ____

☐ If **YES** to any question 3-20, project will not qualify as a Programmatic Categorical Exclusion. Answer questions 21 and 22 for documentation only and go on to question 23…

21. Does the project involve the use of a temporary road, detour or ramp closure? **YES**☐ **NO**☐
Clarification:

☐ If **NO** to questions 3-20 and **NO** to question 21, the project qualifies as a <u>Programmatic Categorical Exclusion</u>. You may STOP COMPLETING THE CHECKLIST. The checklist should be included in the appendix of the Final Design Report (or Scope Summary Memorandum/Final Design Report). The CATEGORICAL EXCLUSION DETERMINATION memo is to be sent to the appropriate Main Office Design liaison unit with a copy of the Final Design Report (or Scope Summary Memorandum/Final Design Report). A copy of the Categorical Exclusion memo must also be sent to the Office of Budget and Finance, Project and Letting Management, and others.

-OR- ____

☐ If **YES** to question 21, preparer should complete question 22 (i-v). If questions 3-20 are **NO** and 21 is **YES**, the project will still qualify as a Programmatic Categorical Exclusion if questions 22 (i-v) are **YES**.

22. Since the project involves the use of temporary road, detour or ramp closure, will all of the following conditions be met:

i. Provisions will be made for pedestrian access, where warranted, and access by local traffic and so posted. **YES**☐ **NO**☐
Clarification:

ii. Through-traffic dependent business will not be adversely affected. **YES**☐ **NO**☐
Clarification:

iii. The detour or ramp closure, to the extent possible, will not interfere with any local special event or festival. **YES**☐ **NO**☐
Clarification:

iv. The temporary road, detour or ramp closure does not substantially change the environmental consequences of the action. **YES**☐ **NO**☐

Clarification:

v. There is no substantial controversy associated with the temporary road, detour or ramp closure. **YES**☐ **NO**☐

Clarification:

☐ If questions 3-20 are **NO**, 21 is **YES** and 22 (i-v) are YES, the project qualifies for a <u>Programmatic Categorical Exclusion</u>. You may STOP COMPLETING THE CHECKLIST. The checklist should be included in the appendix of the Final Design Report (or Scope Summary Memorandum/Final Design Report). The CATEGORICAL EXCLUSION DETERMINATION memo should be sent to the appropriate Main Office Design liaison unit with a copy of the Final Design Report (or Scope Summary Memorandum/Final Design Report.) A copy of the CATEGORICAL EXCLUSION DETERMINATION memo must also be sent to the Office of Budget and Finance, Project and Letting Management, and others.

-OR-

☐ If questions 3-20 are **NO** or effect is **clarified**, 21 is **YES** and any part of 22 is **NO**, go on to question 23.

23. Is the project section listed in 23 CFR '771.117(d) (D List) or is the project an action similar to those listed in 23 CFR '771.117(d)? **YES**☐ **NO**☐

For those questions which precluded a Programmatic Categorical Exclusion, documentation should be provided for any **YES** response to questions 3-20 or for a **NO** response to any part of questions 22 (i-v). This documentation, as well as the checklist, should be included in the Design Approval Document, i.e., Final Design Report, etc., to be submitted to the Main Office/FHWA Design liaison unit for submission to the FHWA Division for classification of the project as a D List Categorical Exclusion, "<u>Categorical Exclusion with Documentation</u>".

APPENDIX J

SHPO DOCUMENTATION

OFFICE OF PARKS · RECREATION · HISTORIC PRESERVATION
NEW YORK STATE

New York State Office of Parks, Recreation and Historic Preservation

Division for Historic Preservation • Peebles Island, PO Box 189, Waterford, New York 12188-0189

518-237-8643

www.nysparks.com

September 13, 2013

Holly Frey, RLS,ASLA
NYSDOT Region 11
Hunters Point Plaza
47-40 21st Street
Long Island City, NY 11101

Re: FHWA
East Midtown Waterfront Esplanade PIN X776.00
East River from East 41st Street to East 60th Street
New York County
13PR02723

Dear Ms. Frey;

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted documents in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include other potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental quality Review Act (New York Environmental Conservation Law Article 8).

Our Archeology Unit has No Archeological Concerns since the proposed Esplanade will be 30 to 50 feet from the bulkhead. Our Survey Unit has evaluated the historic resources within the APE, as noted below:

- Sutton Place Historic District and Ed Koch Queensboro Bridge – Listed on the State and National Registers of Historic Places.
- Lamppost; east 58th Street south of Sutton Place – Eligible for listing on the State and National Registers of Historic Places.
- FDR Drive – Eligible for listing on the State and National Registers of Historic Places.
- Queens-Midtown Tunnel and Ventilation Building – Eligible for listing on the State and National Registers of Historic Places.
- United National Headquarters – Eligible for listing on the State and National Registers of Historic Places.
- 1 Beekman Place – Eligible for listing on the State and National Registers of Historic Places.
- 435 East 52nd Street/River House – Eligible for listing on the State and National Registers of Historic Places.
- 45 Sutton Place South/Cannon Point South – Eligible for listing on the State and National Registers of Historic Places.
- 25 Sutton Place South/Cannon Point North – Eligible for listing on the State and National Registers of Historic Places.
- 1 Sutton Place South – Eligible for listing on the State and National Registers of Historic Places.

We understand that the proposed Esplanade will be offset from the FDR, will have pedestrian overpasses at East 42nd Street, East 48th Street and East 54th Street, and will reuse existing caissons and not impact the existing bulkhead. As designs for the pedestrian overpasses and access points to the Esplanade are designed, please analyze the potential effects of these actions on the identified historic resources.

If you have any questions, please feel free to contact me at 518-237-8643 extension 3282, or via email at beth.cumming@parks.ny.gov. Please refer to the OPRHP Project Review (PR) number in any future correspondences regarding this project.

Sincerely,

Beth A. Cumming
Historic Site Restoration Coordinator
e-mail: Beth.cumming@parks.ny.gov

enc: Resource Evaluation

via e-mail

New York State Office of Parks, Recreation and Historic Preservation

Andrew M. Cuomo
Governor

Rose Harvey
Commissioner

Division for Historic Preservation • Peebles Island, PO Box 189, Waterford, New York 12188-0189
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November 13, 2013

Holly Frey, RLS,ASLA
NYSDOT Region 11
Hunters Point Plaza
47-40 21st Street
Long Island City, NY 11101

Re: FHWA
East Midtown Waterfront Esplanade PIN X776.00
East River from East 41st Street to East 60th Street
New York County
13PR02723

Dear Ms. Frey;

Thank you for continuing to consult with the New York State Historic Preservation Office (SHPO). We have reviewed the submitted documents in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include other potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental quality Review Act (New York Environmental Conservation Law Article 8).

We have reviewed the e-mail and attachments from Marilyn Lee dated November 4, 2013. Based upon our review, we concur that the proposed Esplanade will have No Adverse Effect upon historic resources. If there are substantive changes or unexpected conditions, consultation with our office should resume.

If you have any questions, please feel free to contact me at 518-237-8643 extension 3282, or via email at beth.cumming@parks.ny.gov.

Sincerely,

Beth A. Cumming
Senior Historic Site Restoration Coordinator
e-mail: Beth.cumming@parks.ny.gov

cc: M. Lee – NYC EDC

via e-mail

U.S. Department
of Transportation
Federal Highway Administration

New York Division

Leo W. O'Brien Federal Building
11A Clinton Avenue, Suite 719
Albany, NY 12207
518-431-4127
Fax: 518-431-4121
New York.FHWA@dot.gov

December 8, 2014

In Reply Refer To:
HED-NY

Mr. Tapas Sanyal, P.E.
Regional Local Project Liaison
New York State Department of Transportation, Region 11
Hunters Point Plaza, 7th Floor
47-40 21st Street
Long Island City, NY 11101

Subject: PIN X776.00/PIN X770.14, East Midtown Waterfront Esplanade
New York County

Dear Mr. Sanyal

Please refer to your November 19 request for our review and concurrence that the requirements of 36 CFR Part 800 have been met for the subject project. We concur with the November 13th SHPO's opinion that the proposed project will have No Adverse Impact upon historic resources in or eligible for inclusion in the National Registers of Historic Places. Therefore, the proposed project will have No Adverse Impact and the Section 106 process is complete.

If you have any questions, please contact me at (518)431-8874.

Sincerely,

Richard F. Beers, Jr.
Senior Area Engineer

cc: Ruth Pierpont, Director, NYSOPRHP
Wm. Brian Yates, NYSOPRHP
Peter Dunleavy, NYSDOT, POD 4-1
H. Frey, NYSDOT Reg. 11
R. Davies, FHWA

APPENDIX K
CEQR EAS and Determination

City Environmental Quality Review
ENVIRONMENTAL ASSESSMENT STATEMENT (EAS) FULL FORM

Please fill out and submit to the appropriate agency (see instructions)

Part I: GENERAL INFORMATION

PROJECT NAME East Midtown Waterfront Esplanade and Greenway

1. *Reference Numbers*

CEQR REFERENCE NUMBER (to be assigned by lead agency) 13SBS004M	BSA REFERENCE NUMBER (if applicable) N/A
ULURP REFERENCE NUMBER (if applicable) N/A	OTHER REFERENCE NUMBER(S) (if applicable) (*e.g.*, legislative intro, CAPA) N/A

2a. *Lead Agency Information* NAME OF LEAD AGENCY: New York City Department of Small Business Services			**2b.** *Applicant Information* NAME OF APPLICANT: New York City Economic Development Corporation		
NAME OF LEAD AGENCY CONTACT PERSON: Andrew Schwartz, First Deputy Commissioner			NAME OF APPLICANT'S REPRESENTATIVE OR CONTACT PERSON: Marilyn Lee, Assistant Vice President		
ADDRESS 110 William Street, 7th Floor			ADDRESS 110 William Street, 6th Floor		
CITY New York	STATE NY	ZIP 10038	CITY New York	STATE NY	ZIP 10038
TELEPHONE (212) 513-6248	EMAIL aschwartz@sbs.nyc.gov		TELEPHONE (212) 312-3834	EMAIL mlee@nycedc.com	

3. *Action Classification and Type*

SEQRA Classification

☐ UNLISTED ☒ TYPE I: Specify Category (see 6 NYCRR 617.4 and NYC Executive Order 91 of 1977, as amended): 617.4.b (9), (10)

Action Type (refer to Chapter 2, "Establishing the Analysis Framework" for guidance)

☐ LOCALIZED ACTION, SITE SPECIFIC ☒ LOCALIZED ACTION, SMALL AREA ☐ GENERIC ACTION

4. *Project Description*

See attached Project Description.

Project Location

BOROUGH Manhattan	COMMUNITY DISTRICT(S) 6 & 8	STREET ADDRESS N/A
TAX BLOCK(S) AND LOT(S) See Project Description		ZIP CODE 10017 & 10022

DESCRIPTION OF PROPERTY BY BOUNDING OR CROSS STREETS East River between East 41st Street and East 60th Street (see attached figure)

EXISTING ZONING DISTRICT, INCLUDING SPECIAL ZONING DISTRICT DESIGNATION, IF ANY N/A | ZONING SECTIONAL MAP NUMBER 8d

5. *Required Actions or Approvals* (check all that apply)

City Planning Commission: ☐ YES ☒ NO ☐ UNIFORM LAND USE REVIEW PROCEDURE (ULURP)

☐ CITY MAP AMENDMENT	☐ ZONING CERTIFICATION	☐ CONCESSION
☐ ZONING MAP AMENDMENT	☐ ZONING AUTHORIZATION	☐ UDAAP
☐ ZONING TEXT AMENDMENT	☐ ACQUISITION—REAL PROPERTY	☐ REVOCABLE CONSENT
☐ SITE SELECTION—PUBLIC FACILITY	☐ DISPOSITION—REAL PROPERTY	☐ FRANCHISE
☐ HOUSING PLAN & PROJECT	☐ OTHER, explain:	

☐ SPECIAL PERMIT (if appropriate, specify type: ☐ modification; ☐ renewal; ☐ other); EXPIRATION DATE:

SPECIFY AFFECTED SECTIONS OF THE ZONING RESOLUTION

Board of Standards and Appeals: ☐ YES ☒ NO

☐ VARIANCE (use)

☐ VARIANCE (bulk)

☐ SPECIAL PERMIT (if appropriate, specify type: ☐ modification; ☐ renewal; ☐ other); EXPIRATION DATE:

SPECIFY AFFECTED SECTIONS OF THE ZONING RESOLUTION

Department of Environmental Protection: ☒ YES ☐ NO If "yes," specify:

Other City Approvals Subject to CEQR (check all that apply)

☐ LEGISLATION ☒ FUNDING OF CONSTRUCTION, specify: Capital Funds

- [ ] RULEMAKING
- [x] CONSTRUCTION OF PUBLIC FACILITIES
- [ ] 384(b)(4) APPROVAL
- [x] OTHER, explain: Waterfront Revitalization Program (WRP)
- [ ] POLICY OR PLAN, specify:
- [ ] FUNDING OF PROGRAMS, specify:
- [ ] PERMITS, specify:

Other City Approvals Not Subject to CEQR (check all that apply)

- [x] PERMITS FROM DOT'S OFFICE OF CONSTRUCTION MITIGATION AND COORDINATION (OCMC)
- [x] LANDMARKS PRESERVATION COMMISSION APPROVAL
- [x] OTHER, explain: SBS

State or Federal Actions/Approvals/Funding: [ ] YES [ ] NO If "yes," specify: US Coast Guard Section 9 Bridge Permit and Navigation and Navigable Waters Permit; NEPA EA; 11990 Wetlands Finding; USACE Section 404 Nationwide Permit #15; USFWS & NMFS Endangered Species Act consultation; National Historic Preservation Act Section 106 consultation, Abandoned Shipwreck Act of 1987; NYSDEC Water Quality Certificate, Incidental Take of E/T Species, Tidal Wetlands, Protection of Waters, SPDES; NYOGS Underwater Lands; NYSDOS CZMA Consistency Determination; SEQRA EAF

6. *Site Description:* *The directly affected area consists of the project site and the area subject to any change in regulatory controls. Except where otherwise indicated, provide the following information with regard to the directly affected area.*

Graphics: *The following graphics must be attached and each box must be checked off before the EAS is complete. Each map must clearly depict the boundaries of the directly affected area or areas and indicate a 400-foot radius drawn from the outer boundaries of the project site. Maps may not exceed 11 x 17 inches in size and, for paper filings, must be folded to 8.5 x 11 inches.*

- [x] SITE LOCATION MAP
- [x] ZONING MAP
- [x] SANBORN OR OTHER LAND USE MAP
- [x] TAX MAP
- [x] FOR LARGE AREAS OR MULTIPLE SITES, A GIS SHAPE FILE THAT DEFINES THE PROJECT SITE(S)
- [x] PHOTOGRAPHS OF THE PROJECT SITE TAKEN WITHIN 6 MONTHS OF EAS SUBMISSION AND KEYED TO THE SITE LOCATION MAP

Physical Setting (both developed and undeveloped areas)

Total directly affected area (sq. ft.): 226,500
Waterbody area (sq. ft.) and type: 217,800
Roads, buildings, and other paved surfaces (sq. ft.): 8,700
Other, describe (sq. ft.): N/A

7. *Physical Dimensions and Scale of Project* (if the project affects multiple sites, provide the total development facilitated by the action)

SIZE OF PROJECT TO BE DEVELOPED (gross square feet): 226,500
NUMBER OF BUILDINGS: N/A
GROSS FLOOR AREA OF EACH BUILDING (sq. ft.): N/A
HEIGHT OF EACH BUILDING (ft.): N/A
NUMBER OF STORIES OF EACH BUILDING: N/A

Does the proposed project involve changes in zoning on one or more sites? [ ] YES [x] NO
If "yes," specify: The total square feet owned or controlled by the applicant:
The total square feet not owned or controlled by the applicant:

Does the proposed project involve in-ground excavation or subsurface disturbance, including, but not limited to foundation work, pilings, utility lines, or grading? [x] YES [ ] NO
If "yes," indicate the estimated area and volume dimensions of subsurface disturbance (if known):
AREA OF TEMPORARY DISTURBANCE: TBD sq. ft. (width x length)
VOLUME OF DISTURBANCE: 95,150 cubic ft. (width x length x depth)
AREA OF PERMANENT DISTURBANCE: 1,750 sq. ft. (width x length)

8. *Analysis Year* [CEQR Technical Manual Chapter 2]

ANTICIPATED BUILD YEAR (date the project would be completed and operational): 2025
ANTICIPATED PERIOD OF CONSTRUCTION IN MONTHS: 96
WOULD THE PROJECT BE IMPLEMENTED IN A SINGLE PHASE? [ ] YES [x] NO | IF MULTIPLE PHASES, HOW MANY? 2
BRIEFLY DESCRIBE PHASES AND CONSTRUCTION SCHEDULE: Phase I start 2017, complete 2019; Phase 2 start 2021, complete 2025

9. *Predominant Land Use in the Vicinity of the Project* (check all that apply)

- [x] RESIDENTIAL
- [ ] MANUFACTURING
- [x] COMMERCIAL
- [x] PARK/FOREST/OPEN SPACE
- [x] OTHER, specify: Transportation

DESCRIPTION OF EXISTING AND PROPOSED CONDITIONS

The information requested in this table applies to the directly affected area. The directly affected area consists of the project site and the area subject to any change in regulatory control. The increment is the difference between the No-Action and the With-Action conditions.

	EXISTING CONDITION	NO-ACTION CONDITION	WITH-ACTION CONDITION	INCREMENT
LAND USE				
Residential	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," specify the following:				
Describe type of residential structures				
No. of dwelling units				
No. of low- to moderate-income units				
Gross floor area (sq. ft.)				
Commercial	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," specify the following:				
Describe type (retail, office, other)				
Gross floor area (sq. ft.)				
Manufacturing/Industrial	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," specify the following:				
Type of use				
Gross floor area (sq. ft.)				
Open storage area (sq. ft.)				
If any unenclosed activities, specify:				
Community Facility	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," specify the following:				
Type				
Gross floor area (sq. ft.)				
Vacant Land	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," describe:				
Publicly Accessible Open Space	☒ YES ☐ NO	☒ YES ☐ NO	☒ YES ☐ NO	
If "yes," specify type (mapped City, State, or Federal parkland, wetland—mapped or otherwise known, other):	Open spaces at E. 51st , E. 54th & E. 60th Streets	Open spaces at E. 51st, E. 54th and E. 60th Streets	Proposed upland bridge connecting to existing open space at E. 54th St; additional open space provided by Proposed Project	Net increase of approximately 5 acres of publicly accessible open space.
Other Land Uses	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," describe:				
PARKING				
Garages	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," specify the following:				
No. of public spaces				
No. of accessory spaces				
Operating hours				
Attended or non-attended				
Lots	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," specify the following:				
No. of public spaces				
No. of accessory spaces				
Operating hours				
Other (includes street parking)	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," describe:				
POPULATION				
Residents	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	

	EXISTING CONDITION	NO-ACTION CONDITION	WITH-ACTION CONDITION	INCREMENT
If "yes," specify number:				
Briefly explain how the number of residents was calculated:				
Businesses	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," specify the following:				
No. and type				
No. and type of workers by business				
No. and type of non-residents who are not workers				
Briefly explain how the number of businesses was calculated:				
Other (students, visitors, concert-goers, *etc.*)	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If any, specify type and number:				
Briefly explain how the number was calculated:				
ZONING				
Zoning classification	N/A	N/A	N/A	N/A
Maximum amount of floor area that can be developed	N/A	N/A	N/A	N/A
Predominant land use and zoning classifications within land use study area(s) or a 400 ft. radius of proposed project	C5-2, R8B, R10, M3-2; mixed use residential, commercial, Transportation	same	same	same

Attach any additional information that may be needed to describe the project.

If your project involves changes that affect one or more sites not associated with a specific development, it is generally appropriate to include total development projections in the above table and attach separate tables outlining the reasonable development scenarios for each site.

Part II: TECHNICAL ANALYSIS

INSTRUCTIONS: For each of the analysis categories listed in this section, assess the proposed project's impacts based on the thresholds and criteria presented in the CEQR Technical Manual. Check each box that applies.

- If the proposed project can be demonstrated not to meet or exceed the threshold, check the "no" box.
- If the proposed project will meet or exceed the threshold, or if this cannot be determined, check the "yes" box.
- For each "yes" response, provide additional analyses (and, if needed, attach supporting information) based on guidance in the CEQR Technical Manual to determine whether the potential for significant impacts exists. Please note that a "yes" answer does not mean that an EIS must be prepared—it means that more information may be required for the lead agency to make a determination of significance.
- The lead agency, upon reviewing Part II, may require an applicant to provide additional information to support the Full EAS Form. For example, if a question is answered "no," an agency may request a short explanation for this response.

	YES	NO
1. *LAND USE, ZONING, AND PUBLIC POLICY*: CEQR Technical Manual Chapter 4		
(a) Would the proposed project result in a change in land use different from surrounding land uses?	☐	☒
(b) Would the proposed project result in a change in zoning different from surrounding zoning?	☐	☒
(c) Is there the potential to affect an applicable public policy?	☒	☐
(d) If "yes," to (a), (b), and/or (c), complete a preliminary assessment and attach.		
(e) Is the project a large, publicly sponsored project?	☒	☐
o If "yes," complete a PlaNYC assessment and attach.		
(f) Is any part of the directly affected area within the City's Waterfront Revitalization Program boundaries?	☒	☐
o If "yes," complete the Consistency Assessment Form.		
2. *SOCIOECONOMIC CONDITIONS*: CEQR Technical Manual Chapter 5		
(a) Would the proposed project:		
o Generate a net increase of more than 200 residential units *or* 200,000 square feet of commercial space?	☐	☒
▪ If "yes," answer *both* questions 2(b)(ii) and 2(b)(iv) below.		
o Directly displace 500 or more residents?	☐	☒
▪ If "yes," answer questions 2(b)(i), 2(b)(ii), and 2(b)(iv) below.		
o Directly displace more than 100 employees?	☐	☒
▪ If "yes," answer questions under 2(b)(iii) and 2(b)(iv) below.		
o Affect conditions in a specific industry?	☐	☒
▪ If "yes," answer question 2(b)(v) below.		
(b) If "yes" to any of the above, attach supporting information to answer the relevant questions below. If "no" was checked for each category above, the remaining questions in this technical area do not need to be answered.		
i. Direct Residential Displacement		
o If more than 500 residents would be displaced, would these residents represent more than 5% of the primary study area population?	☐	☐
o If "yes," is the average income of the directly displaced population markedly lower than the average income of the rest of the study area population?	☐	☐
ii. Indirect Residential Displacement		
o Would expected average incomes of the new population exceed the average incomes of study area populations?	☐	☐
o If "yes:"		
▪ Would the population of the primary study area increase by more than 10 percent?	☐	☐
▪ Would the population of the primary study area increase by more than 5 percent in an area where there is the potential to accelerate trends toward increasing rents?	☐	☐
o If "yes" to either of the preceding questions, would more than 5 percent of all housing units be renter-occupied and unprotected?	☐	☐
iii. Direct Business Displacement		
o Do any of the displaced businesses provide goods or services that otherwise would not be found within the trade area, either under existing conditions or in the future with the proposed project?	☐	☐
o Is any category of business to be displaced the subject of other regulations or publicly adopted plans to preserve,	☐	☐

	YES	NO
enhance, or otherwise protect it?		
iv. Indirect Business Displacement		
o Would the project potentially introduce trends that make it difficult for businesses to remain in the area?	☐	☐
o Would the project capture retail sales in a particular category of goods to the extent that the market for such goods would become saturated, potentially resulting in vacancies and disinvestment on neighborhood commercial streets?	☐	☐
v. Effects on Industry		
o Would the project significantly affect business conditions in any industry or any category of businesses within or outside the study area?	☐	☐
o Would the project indirectly substantially reduce employment or impair the economic viability in the industry or category of businesses?	☐	☐
3. *COMMUNITY FACILITIES*: CEQR Technical Manual Chapter 6		
(a) Direct Effects		
o Would the project directly eliminate, displace, or alter public or publicly funded community facilities such as educational facilities, libraries, health care facilities, day care centers, police stations, or fire stations?	☐	☒
(b) Indirect Effects		
i. Child Care Centers		
o Would the project result in 20 or more eligible children under age 6, based on the number of low or low/moderate income residential units? (See Table 6-1 in Chapter 6)	☐	☒
o If "yes," would the project result in a collective utilization rate of the group child care/Head Start centers in the study area that is greater than 100 percent?	☐	☐
o If "yes," would the project increase the collective utilization rate by 5 percent or more from the No-Action scenario?	☐	☐
ii. Libraries		
o Would the project result in a 5 percent or more increase in the ratio of residential units to library branches? (See Table 6-1 in Chapter 6)	☐	☒
o If "yes," would the project increase the study area population by 5 percent or more from the No-Action levels?	☐	☐
o If "yes," would the additional population impair the delivery of library services in the study area?	☐	☐
iii. Public Schools		
o Would the project result in 50 or more elementary or middle school students, or 150 or more high school students based on number of residential units? (See Table 6-1 in Chapter 6)	☐	☒
o If "yes," would the project result in a collective utilization rate of the elementary and/or intermediate schools in the study area that is equal to or greater than 100 percent?	☐	☐
o If "yes," would the project increase this collective utilization rate by 5 percent or more from the No-Action scenario?	☐	☐
iv. Health Care Facilities		
o Would the project result in the introduction of a sizeable new neighborhood?	☐	☒
o If "yes," would the project affect the operation of health care facilities in the area?	☐	☐
v. Fire and Police Protection		
o Would the project result in the introduction of a sizeable new neighborhood?	☐	☒
o If "yes," would the project affect the operation of fire or police protection in the area?	☐	☐
4. *OPEN SPACE*: CEQR Technical Manual Chapter 7		
(a) Would the project change or eliminate existing open space?	☒	☐
(b) Is the project located within an under-served area in the Bronx, Brooklyn, Manhattan, Queens, or Staten Island?	☐	☒
(c) If "yes," would the project generate more than 50 additional residents or 125 additional employees?	☐	☐
(d) Is the project located within a well-served area in the Bronx, Brooklyn, Manhattan, Queens, or Staten Island?	☐	☒
(e) If "yes," would the project generate more than 350 additional residents or 750 additional employees?	☐	☐
(f) If the project is located in an area that is neither under-served nor well-served, would it generate more than 200 additional residents or 500 additional employees?	☐	☒
(g) If "yes" to questions (c), (e), or (f) above, attach supporting information to answer the following:		
o If in an under-served area, would the project result in a decrease in the open space ratio by more than 1 percent?	☐	☐
o If in an area that is not under-served, would the project result in a decrease in the open space ratio by more than 5	☐	☐

	YES	NO
percent?		
o If "yes," are there qualitative considerations, such as the quality of open space, that need to be considered? Please specify:	☐	☐
5. *SHADOWS*: CEQR Technical Manual Chapter 8		
(a) Would the proposed project result in a net height increase of any structure of 50 feet or more?	☐	☒
(b) Would the proposed project result in any increase in structure height and be located adjacent to or across the street from a sunlight-sensitive resource?	☒	☐
(c) If "yes" to either of the above questions, attach supporting information explaining whether the project's shadow would reach any sunlight-sensitive resource at any time of the year.		
6. *HISTORIC AND CULTURAL RESOURCES*: CEQR Technical Manual Chapter 9		
(a) Does the proposed project site or an adjacent site contain any architectural and/or archaeological resource that is eligible for or has been designated (or is calendared for consideration) as a New York City Landmark, Interior Landmark or Scenic Landmark; that is listed or eligible for listing on the New York State or National Register of Historic Places; or that is within a designated or eligible New York City, New York State or National Register Historic District? (See the GIS System for Archaeology and National Register to confirm)	☒	☐
(b) Would the proposed project involve construction resulting in in-ground disturbance to an area not previously excavated?	☒	☐
(c) If "yes" to either of the above, list any identified architectural and/or archaeological resources and attach supporting information on whether the proposed project would potentially affect any architectural or archeological resources.		
7. *URBAN DESIGN AND VISUAL RESOURCES*: CEQR Technical Manual Chapter 10		
(a) Would the proposed project introduce a new building, a new building height, or result in any substantial physical alteration to the streetscape or public space in the vicinity of the proposed project that is not currently allowed by existing zoning?	☐	☒
(b) Would the proposed project result in obstruction of publicly accessible views to visual resources not currently allowed by existing zoning?	☐	☒
(c) If "yes" to either of the above, please provide the information requested in Chapter 10.		
8. *NATURAL RESOURCES*: CEQR Technical Manual Chapter 11		
(a) Does the proposed project site or a site adjacent to the project contain natural resources as defined in Section 100 of Chapter 11?	☒	☐
o If "yes," list the resources and attach supporting information on whether the project would affect any of these resources.		
(b) Is any part of the directly affected area within the Jamaica Bay Watershed?	☐	☒
o If "yes," complete the Jamaica Bay Watershed Form and submit according to its instructions.		
9. *HAZARDOUS MATERIALS*: CEQR Technical Manual Chapter 12		
(a) Would the proposed project allow commercial or residential uses in an area that is currently, or was historically, a manufacturing area that involved hazardous materials?	☐	☒
(b) Does the proposed project site have existing institutional controls (*e.g.*, (E) designation or Restrictive Declaration) relating to hazardous materials that preclude the potential for significant adverse impacts?	☐	☒
(c) Would the project require soil disturbance in a manufacturing area or any development on or near a manufacturing area or existing/historic facilities listed in Appendix 1 (including nonconforming uses)?	☐	☒
(d) Would the project result in the development of a site where there is reason to suspect the presence of hazardous materials, contamination, illegal dumping or fill, or fill material of unknown origin?	☐	☒
(e) Would the project result in development on or near a site that has or had underground and/or aboveground storage tanks (*e.g.*, gas stations, oil storage facilities, heating oil storage)?	☐	☒
(f) Would the project result in renovation of interior existing space on a site with the potential for compromised air quality; vapor intrusion from either on-site or off-site sources; or the presence of asbestos, PCBs, mercury or lead-based paint?	☐	☒
(g) Would the project result in development on or near a site with potential hazardous materials issues such as government-listed voluntary cleanup/brownfield site, current or former power generation/transmission facilities, coal gasification or gas storage sites, railroad tracks or rights-of-way, or municipal incinerators?	☐	☒
(h) Has a Phase I Environmental Site Assessment been performed for the site?	☒	☐
o If "yes," were Recognized Environmental Conditions (RECs) identified? Briefly identify:	☐	☒
(i) Based on the Phase I Assessment, is a Phase II Investigation needed?	☐	☒
10. *WATER AND SEWER INFRASTRUCTURE*: CEQR Technical Manual Chapter 13		
(a) Would the project result in water demand of more than one million gallons per day?	☐	☒
(b) If the proposed project located in a combined sewer area, would it result in at least 1,000 residential units or 250,000 square feet or more of commercial space in Manhattan, or at least 400 residential units or 150,000 square feet or more of commercial space in the Bronx, Brooklyn, Staten Island, or Queens?	☐	☒

	YES	NO
(c) If the proposed project located in a separately sewered area, would it result in the same or greater development than that listed in Table 13-1 in Chapter 13?	☐	☒
(d) Would the project involve development on a site that is 5 acres or larger where the amount of impervious surface would increase?	☒	☐
(e) If the project is located within the Jamaica Bay Watershed or in certain specific drainage areas, including Bronx River, Coney Island Creek, Flushing Bay and Creek, Gowanus Canal, Hutchinson River, Newtown Creek, or Westchester Creek, would it involve development on a site that is 1 acre or larger where the amount of impervious surface would increase?	☐	☒
(f) Would the proposed project be located in an area that is partially sewered or currently unsewered?	☐	☒
(g) Is the project proposing an industrial facility or activity that would contribute industrial discharges to a Wastewater Treatment Plant and/or contribute contaminated stormwater to a separate storm sewer system?	☐	☒
(h) Would the project involve construction of a new stormwater outfall that requires federal and/or state permits?	☐	☒
(i) If "yes" to any of the above, conduct the appropriate preliminary analyses and attach supporting documentation.		
11. *SOLID WASTE AND SANITATION SERVICES*: CEQR Technical Manual Chapter 14		
(a) Using Table 14-1 in Chapter 14, the project's projected operational solid waste generation is estimated to be (pounds per week): N/A		
o Would the proposed project have the potential to generate 100,000 pounds (50 tons) or more of solid waste per week?	☐	☒
(b) Would the proposed project involve a reduction in capacity at a solid waste management facility used for refuse or recyclables generated within the City?	☐	☒
o If "yes," would the proposed project comply with the City's Solid Waste Management Plan?	☐	☐
12. *ENERGY*: CEQR Technical Manual Chapter 15		
(a) Using energy modeling or Table 15-1 in Chapter 15, the project's projected energy use is estimated to be (annual BTUs): N/A		
(b) Would the proposed project affect the transmission or generation of energy?	☐	☒
13. *TRANSPORTATION*: CEQR Technical Manual Chapter 16		
(a) Would the proposed project exceed any threshold identified in Table 16-1 in Chapter 16?	☐	☒
(b) If "yes," conduct the appropriate screening analyses, attach back up data as needed for each stage, and answer the following questions:		
o Would the proposed project result in 50 or more Passenger Car Equivalents (PCEs) per project peak hour?	☐	☒
If "yes," would the proposed project result in 50 or more vehicle trips per project peak hour at any given intersection? ***It should be noted that the lead agency may require further analysis of intersections of concern even when a project generates fewer than 50 vehicles in the peak hour. See Subsection 313 of Chapter 16 for more information.*	☐	☐
o Would the proposed project result in more than 200 subway/rail or bus trips per project peak hour?	☐	☒
If "yes," would the proposed project result, per project peak hour, in 50 or more bus trips on a single line (in one direction) or 200 subway/rail trips per station or line?	☐	☐
o Would the proposed project result in more than 200 pedestrian trips per project peak hour?	☒	☐
If "yes," would the proposed project result in more than 200 pedestrian trips per project peak hour to any given pedestrian or transit element, crosswalk, subway stair, or bus stop?	☐	☒
14. *AIR QUALITY*: CEQR Technical Manual Chapter 17		
(a) *Mobile Sources*: Would the proposed project result in the conditions outlined in Section 210 in Chapter 17?	☐	☒
(b) *Stationary Sources*: Would the proposed project result in the conditions outlined in Section 220 in Chapter 17?	☐	☒
o If "yes," would the proposed project exceed the thresholds in Figure 17-3, Stationary Source Screen Graph in Chapter 17? (Attach graph as needed)	☐	☐
(c) Does the proposed project involve multiple buildings on the project site?	☐	☒
(d) Does the proposed project require federal approvals, support, licensing, or permits subject to conformity requirements?	☐	☒
(e) Does the proposed project site have existing institutional controls (*e.g.*, (E) designation or Restrictive Declaration) relating to air quality that preclude the potential for significant adverse impacts?	☐	☒
(f) If "yes" to any of the above, conduct the appropriate analyses and attach any supporting documentation.		
15. *GREENHOUSE GAS EMISSIONS*: CEQR Technical Manual Chapter 18		
(a) Is the proposed project a city capital project or a power generation plant?	☒	☐
(b) Would the proposed project fundamentally change the City's solid waste management system?	☐	☒
(c) Would the proposed project result in the development of 350,000 square feet or more?	☐	☒
(d) If "yes" to any of the above, would the project require a GHG emissions assessment based on guidance in Chapter 18?	☐	☒
o If "yes," would the project result in inconsistencies with the City's GHG reduction goal? (See Local Law 22 of 2008; § 24-	☐	☐

	YES	NO
803 of the Administrative Code of the City of New York). Please attach supporting documentation.		
16. *NOISE*: CEQR Technical Manual Chapter 19		
(a) Would the proposed project generate or reroute vehicular traffic?	☐	☒
(b) Would the proposed project introduce new or additional receptors (see Section 124 in Chapter 19) near heavily trafficked roadways, within one horizontal mile of an existing or proposed flight path, or within 1,500 feet of an existing or proposed rail line with a direct line of site to that rail line?	☒	☐
(c) Would the proposed project cause a stationary noise source to operate within 1,500 feet of a receptor with a direct line of sight to that receptor or introduce receptors into an area with high ambient stationary noise?	☐	☒
(d) Does the proposed project site have existing institutional controls (*e.g.*, (E) designation or Restrictive Declaration) relating to noise that preclude the potential for significant adverse impacts?	☐	☒
(e) If "yes" to any of the above, conduct the appropriate analyses and attach any supporting documentation.		
17. *PUBLIC HEALTH*: CEQR Technical Manual Chapter 20		
(a) Based upon the analyses conducted, do any of the following technical areas require a detailed analysis: Air Quality; Hazardous Materials; Noise?	☒	☐
(b) If "yes," explain why an assessment of public health is or is not warranted based on the guidance in Chapter 20, "Public Health." Attach a preliminary analysis, if necessary. See Public Health chapter of the attached Supplemental Studies to the EAS		
18. *NEIGHBORHOOD CHARACTER*: CEQR Technical Manual Chapter 21		
(a) Based upon the analyses conducted, do any of the following technical areas require a detailed analysis: Land Use, Zoning, and Public Policy; Socioeconomic Conditions; Open Space; Historic and Cultural Resources; Urban Design and Visual Resources; Shadows; Transportation; Noise?	☒	☐
(b) If "yes," explain why an assessment of neighborhood character is or is not warranted based on the guidance in Chapter 21, "Neighborhood Character." Attach a preliminary analysis, if necessary. See Neighborhood Character chapter of the attached Supplemental Studies to the EAS		
19. *CONSTRUCTION*: CEQR Technical Manual Chapter 22		
(a) Would the project's construction activities involve:		
○ Construction activities lasting longer than two years?	☒	☐
○ Construction activities within a Central Business District or along an arterial highway or major thoroughfare?	☒	☐
○ Closing, narrowing, or otherwise impeding traffic, transit, or pedestrian elements (roadways, parking spaces, bicycle routes, sidewalks, crosswalks, corners, *etc.*)?	☒	☐
○ Construction of multiple buildings where there is a potential for on-site receptors on buildings completed before the final build-out?	☐	☒
○ The operation of several pieces of diesel equipment in a single location at peak construction?	☒	☐
○ Closure of a community facility or disruption in its services?	☐	☒
○ Activities within 400 feet of a historic or cultural resource?	☒	☐
○ Disturbance of a site containing or adjacent to a site containing natural resources?	☒	☐
○ Construction on multiple development sites in the same geographic area, such that there is the potential for several construction timelines to overlap or last for more than two years overall?	☒	☐
(b) If any boxes are checked "yes," explain why a preliminary construction assessment is or is not warranted based on the guidance in Chapter 22, "Construction." It should be noted that the nature and extent of any commitment to use the Best Available Technology for construction equipment or Best Management Practices for construction activities should be considered when making this determination. See Construction chapter of the attached Supplemental Studies to the EAS		

20. *APPLICANT'S CERTIFICATION*

I swear or affirm under oath and subject to the penalties for perjury that the information provided in this Environmental Assessment Statement (EAS) is true and accurate to the best of my knowledge and belief, based upon my personal knowledge and familiarity with the information described herein and after examination of the pertinent books and records and/or after inquiry of persons who have personal knowledge of such information or who have examined pertinent books and records.

Still under oath, I further swear or affirm that I make this statement in my capacity as the applicant or representative of the entity that seeks the permits, approvals, funding, or other governmental action(s) described in this EAS.

APPLICANT/REPRESENTATIVE NAME	SIGNATURE	DATE
Nicole L. Weymouth	NLWeymouth	01/14/2015

PLEASE NOTE THAT APPLICANTS MAY BE REQUIRED TO SUBSTANTIATE RESPONSES IN THIS FORM AT THE DISCRETION OF THE LEAD AGENCY SO THAT IT MAY SUPPORT ITS DETERMINATION OF SIGNIFICANCE.

Part III: DETERMINATION OF SIGNIFICANCE (To Be Completed by Lead Agency)

INSTRUCTIONS: In completing Part III, the lead agency should consult 6 NYCRR 617.7 and 43 RCNY § 6-06 (Executive Order 91 or 1977, as amended), which contain the State and City criteria for determining significance.

1. For each of the impact categories listed below, consider whether the project may have a significant adverse effect on the environment, taking into account its (a) location; (b) probability of occurring; (c) duration; (d) irreversibility; (e) geographic scope; and (f) magnitude.

IMPACT CATEGORY	Potentially Significant Adverse Impact YES	NO
Land Use, Zoning, and Public Policy	☐	☐
Socioeconomic Conditions	☐	☐
Community Facilities and Services	☐	☐
Open Space	☐	☐
Shadows	☐	☐
Historic and Cultural Resources	☐	☐
Urban Design/Visual Resources	☐	☐
Natural Resources	☐	☐
Hazardous Materials	☐	☐
Water and Sewer Infrastructure	☐	☐
Solid Waste and Sanitation Services	☐	☐
Energy	☐	☐
Transportation	☐	☐
Air Quality	☐	☐
Greenhouse Gas Emissions	☐	☐
Noise	☐	☐
Public Health	☐	☐
Neighborhood Character	☐	☐
Construction	☐	☐

2. Are there any aspects of the project relevant to the determination of whether the project may have a significant impact on the environment, such as combined or cumulative impacts, that were not fully covered by other responses and supporting materials? ☐ YES ☐ NO

   If there are such impacts, attach an explanation stating whether, as a result of them, the project may have a significant impact on the environment.

3. Check determination to be issued by the lead agency:

☐ Positive Declaration: If the lead agency has determined that the project may have a significant impact on the environment, and if a Conditional Negative Declaration is not appropriate, then the lead agency issues a *Positive Declaration* and prepares a draft Scope of Work for the Environmental Impact Statement (EIS).

☐ Conditional Negative Declaration: A *Conditional Negative Declaration* (CND) may be appropriate if there is a private applicant for an Unlisted action AND when conditions imposed by the lead agency will modify the proposed project so that no significant adverse environmental impacts would result. The CND is prepared as a separate document and is subject to the requirements of 6 NYCRR Part 617.

☐ Negative Declaration: If the lead agency has determined that the project would not result in potentially significant adverse environmental impacts, then the lead agency issues a *Negative Declaration*. The *Negative Declaration* may be prepared as a separate document (see template) or using the embedded Negative Declaration on the next page.

4. *LEAD AGENCY'S CERTIFICATION*

TITLE	LEAD AGENCY
NAME	DATE
SIGNATURE	

NEGATIVE DECLARATION (Use of this form is optional)

Statement of No Significant Effect

Pursuant to Executive Order 91 of 1977, as amended, and the Rules of Procedure for City Environmental Quality Review, found at Title 62, Chapter 5 of the Rules of the City of New York and 6 NYCRR, Part 617, State Environmental Quality Review, assumed the role of lead agency for the environmental review of the proposed project. Based on a review of information about the project contained in this environmental assessment statement and any attachments hereto, which are incorporated by reference herein, the lead agency has determined that the proposed project would not have a significant adverse impact on the environment.

Reasons Supporting this Determination

The above determination is based on information contained in this EAS, which that finds the proposed project:

No other significant effects upon the environment that would require the preparation of a Draft Environmental Impact Statement are foreseeable. This Negative Declaration has been prepared in accordance with Article 8 of the New York State Environmental Conservation Law (SEQRA).

TITLE	LEAD AGENCY
NAME	DATE
SIGNATURE	

THE CITY OF NEW YORK
DEPARTMENT OF SMALL BUSINESS SERVICES
NEW YORK, NY 10038

NEGATIVE DECLARATION

CEQR Number: 13SBS004M Date Issued: May 14, 2015

NAME: East Midtown Waterfront Esplanade and Greenway

LOCATION: East River, Borough of Manhattan
Adjacent to the FDR Drive (Route 907L), from East 41st to East 60th Street

SEQRA CLASSIFICATION: Type 1 pursuant to 6 NYCRR Part 617.4(9)

Description

The New York City Economic Development Corporation (NYCEDC), in coordination with the New York City Department of Transportation (NYCDOT) and the New York City Department of Parks & Recreation (NYCDPR), is proposing to construct the East Midtown Waterfront Esplanade and Greenway Project (the Proposed Project) between East 41st and East 60th Streets in Manhattan, consisting of the Outboard Detour Roadway (ODR) Esplanade, United Nations (UN) Esplanade, and two upland bridge connections to the waterfront.

The Proposed Project will fill a major gap in the Manhattan Waterfront Greenway, while improving access to the East River, enhancing bicycle and pedestrian connectivity, and creating waterfront amenities for public use and enjoyment, in accordance with *Vision 2020: New York City Comprehensive Waterfront Plan* and PlaNYC.

Statement of No Significant Effect

Pursuant to Executive Order 91 of 1977, as amended, and the Rules of Procedure for City Environmental Quality Review, found at Title 62, Chapter 5 of the Rules of the City of New York and 6 NYCRR, Part 617, State Environmental Quality Review, the Department of Small Business Services (DSBS) assumed the role of lead agency for the environmental review of the proposed project. Based on a review of information about the project contained in an Environmental Assessment Statement (EAS) dated December 2013, DSBS has determined that the proposed project would not have a significant adverse impact on the environment.

Reasons Supporting this Determination

The above determination is based on the EAS dated December 2013 and incorporated by reference herein. The EAS finds that:

1. The Proposed Project would not have significant adverse impacts in the following areas: Land Use, Zoning, and Public Policy; Socioeconomic Conditions; Community Facilities;

Open Space; Shadows; Historic and Cultural Resources; Urban Design and Visual Resources; Natural Resources; Hazardous Materials; Water and Sewer Infrastructure; Solid Waste and Sanitation Services; Energy; Transportation; Air Quality; Greenhouse Gas Emissions; Noise; Public Health; Neighborhood Character; or Construction.

2. The development of the Proposed Project would provide more public waterfront access and is consistent with City land use goals and policies. The Proposed Project would benefit the adjacent residential and mixed-use neighborhoods by providing additional open space amenities for residents of and visitors to the area. The Proposed Project would be constructed beyond the pierhead line; therefore, it would not be subject to zoning regulations. Regardless, the project would be consistent with the Special Regulations Applying in the Waterfront Area (Article VI) of the zoning resolution, which guides development along the City's waterfront, including pier and similar type structures. The esplanade would meet the definition of a "waterfront-enhancing" use in Article 6, Section 2 of the New York City *Zoning Resolution*. The Proposed Project is consistent with the goals and objectives of the following public policy initiatives:

   - PlaNYC 2030
   - PlaNYC: A Stronger, More Resilient New York
   - NYC Waterfront Revitalization Program (WRP)
   - New York City Waterfront Vision and Enhancement Strategy (WAVES)
   - Manhattan CB-6 197-A Plan

   Actions located within New York City's Coastal Management Zone generally require submission of the New York City Waterfront Revitalization Program Consistency Assessment Form. NYSDOS and the New York City Department of City Planning concurred with the certification that this project is consistent with NYC's WRP, pursuant to the New York State Coastal Management Program, and will be conducted in a manner consistent with such program. Therefore, no significant adverse land use, zoning, or public policy impacts are anticipated as a result of the Proposed Project.

3. The Proposed Project would not change the use of any of open spaces so that it would no longer serve the same user population, nor would the Proposed Project limit public access to these open spaces or result in significant amounts of increased noise, air pollutant emissions, odors, or shadows (post-construction) that would affect their usefulness. The proposed Upland Bridge Connection at East 54th Street would include a pedestrian ramp that would impact 0.2 acres along the northern edge of Sutton Parks, a small, triangular park located west of the FDR Drive between East 53rd and East 54th Streets. Although the sundial, bronze armillary sphere, and several trees within the park would be impacted, the seating and general use of the park as a passive recreation resource would not be limited. The Proposed Project would facilitate the construction of a new open space resource in the community, the new waterfront esplanade, that would expand public recreation amenities over those that currently exist in the surrounding East Midtown area, creating a more useful and desirable area. Therefore, there would be no significant adverse direct or indirect impact to open space as a result of the Proposed Project.

4. The proposed esplanade and upland bridge connection structures would be of minimal bulk and height, well below 50 feet. Therefore, no significant adverse shadow impacts are expected as a result of the Proposed Project.
5. The proposed esplanade would be substantially contiguous to three historic resources that have been previously evaluated and eight resources that are eligible for listing on the State or National Registers of Historic Places. Only one resource, the FDR Drive, would be directly affected by the proposed action. However, introduction of two additional overpasses would be in keeping with the character of the existing setting and would not alter the characteristics that contribute to its significance. In terms of indirect effects, the proposed esplanade would not diminish the integrity of the setting the setting of the eleven (11) historic architectural resources from which it would be visible. In a letter dated November 13, 2013, the New York State Office of Parks, Recreation, and Historic Preservation (OPRHP) concluded that the proposed esplanade would have no adverse effect upon historic resources.
6. A preliminary analysis of impacts to urban design and visual resources indicates that the Proposed Project would be consistent with the urban design of the surrounding area and would improve the experience of a pedestrian in the project area by increasing and improving the views of the East River. The Proposed Project is expected to have significant, positive effects to the existing visual corridor. The constructed esplanade would minimally affect the block forms of the surrounding area and would not alter any street patterns, hierarchies or streetscape elements. In most cases the esplanade structure would not block views of the East River from cross-streets, parks, and residences. The impacts of the Proposed Project on visual resources would not be significant since the obstructed views of the East River would be replaced by improved waterfront exposure with increased viewing opportunities for pedestrians and cyclists.
7. Based on the analysis provided in the Biological Assessment, the Proposed Project may have the potential to adversely affect individual transient shortnose and Atlantic sturgeon and marine turtles in the immediate vicinity of pile placement. However, the Proposed Project would not jeopardize the continued existence of their corresponding populations. In addition, the Essential Fish Habitat (EFH) study concluded that while construction activities may affect individual fish in the immediate vicinity of the Proposed Project, they would not adversely affect populations of EFH fish species or their habitats. Upon cessation of construction activities, changes within the Proposed Project area would not inhibit fish movement, increase or decrease water velocity, substantially reduce potential long-term food resources, or affect water quality. The Proposed Project would occupy portions of the water column and shade a portion of the river that is currently unshaded. Although some impacts to the marine environment may occur from the Proposed Project; it is projected that, based on the quality of the habitat and the dimensions of the esplanade, the project would not cause significant environmental impacts to the marine environment.
8. No significant adverse impacts related to hazardous materials are anticipated as a result of the Proposed Project. Screening for potential impacts from hazardous materials found

that the potential risk for involvement with documented or undocumented inactive hazardous waste/contaminated materials under the Proposed Project is low.

9. The Proposed Project would result in development of a new waterfront greenway, which would not require significant amounts of potable water or generate any sanitary waste. The project is subject to State Pollutant Discharge Elimination System (SPDES) requirements regulating stormwater discharges. The Proposed Project would create an estimated 4.8 acres of new impervious surface over the East River, but relatively small areas of soil disturbance at Upland Bridge Connection touchdown areas and pier foundations. A Stormwater Pollution Prevention Plan (SWPPP) would be required for the Proposed Project. Stormwater and runoff management as part of the project design would ensure that there are no significant adverse impacts to surface water quality associated with the project.

10. There would be no significant adverse transportation impacts associated with the Proposed Project. It is expected that users would walk or ride bicycles to and from the esplanade and greenway, and not drive vehicles. The Proposed Project would not generate any new substantial vehicular or truck trips during any peak time periods and a minimal number of new transit trips (i.e., subway and bus trips). The projected number of users for the entire esplanade would result in fewer than 200 combined bicycle and pedestrian trips during the Saturday peak hour traversing any of the three access points.

11. The Proposed Project would not generate a substantial number of vehicular trips; therefore, no significant adverse mobile source noise impacts due to project-generated vehicular traffic are anticipated. The Proposed Project involves the placement of a new sensitive receptor (the proposed waterfront esplanade) in an area with expected high ambient noise levels resulting from the FDR Drive traffic. The monitored noise levels collected indicate that the project area is considered marginally unacceptable for general external noise exposure, and the monitored levels are above the acceptable general external noise level for outdoor areas requiring serenity and quiet. However, due to the level of activity present at most open space areas and parks throughout the City, these relatively low and moderate noise levels are often not achievable. Visitors to the proposed esplanade would use the passive area on a voluntary basis, and as such, be able to relocate if they feel that noise levels are too high, on an individual by individual basis. Therefore, no significant adverse noise impacts would occur as a result of the Proposed Project.

12. The Proposed Project would not introduce any unusual circumstances that have potential public health consequences related to other issues. Therefore, significant adverse impacts to public health are not expected to occur as a result of the Proposed Project.

13. The Proposed Project would not cause significant adverse impacts regarding land use, zoning, and public policy; socioeconomic conditions; open space; shadows; historic and cultural resources; urban design and visual resources; transportation; or noise. It is not expected to result in any significant adverse neighborhood character impacts and would not result in a significant adverse impact to a defining feature of the neighborhood. In

effect, the proposed esplanade would have a positive effect on preserving and enhancing neighborhood character.

14. There would be no significant adverse construction impacts as a result of the Proposed Project. Construction of the ODR Esplanade is expected to occur over a 30-month period and construction of the UN Esplanade is expected to occur over a 60-month period. Based on the projected low volume of construction-related vehicles during construction, no potential traffic impacts or noise from on-road trucks are anticipated to occur. It is anticipated that air emissions from on-road truck traffic and non-road construction equipment would be temporary and minor. The noise increase as a result of operating construction equipment, particularly during pile driving activities, would be noticeable. A construction noise control plan, incorporating certain noise control measures, will be developed and implemented, following the requirements set forth in Local Law of Subchapter 4 of Chapter 2 of Title 24 "Construction Noise Management" and Chapter 28 of Title 15 "Citywide Construction Noise Mitigation." By implementing these noise control measures, it is anticipated that noise from non-road construction equipment would not have an adverse impact on the community. The implementation of the remedial action plan (RAP) and construction health and safety plan (CHASP) would ensure no significant adverse impacts from hazardous materials as a result of the construction activities. Based on the analysis provided in the BA, it is concluded that while the proposed esplanade may have the potential to adversely affect individual transient shortnose and Atlantic sturgeon and marine turtles in the immediate vicinity of pile placement, resulting in an incidental take, the Proposed Project is not likely to jeopardize the continued existence of their corresponding populations.

15. No other significant effects upon the environment that would require the preparation of an Environmental Impact Statement are foreseeable.

This Negative Declaration was prepared in accordance with Article 8 of the New York State Environmental Conservation Law.

Andrew Schwartz
Deputy Commissioner

5-14-15
Date

cc: Hardy Adasko, NYCEDC
Owen Wells, NYCDPR
Naim Rasheed, NYCDOT

APPENDIX L

PEDESTRIAN GENERATOR CHECKLIST

Exhibit 18-1 Pedestrian Generator Checklist

P.I.N.: X776.00 and X770.14 Project Location: Borough of Manhattan

PEDESTRIAN GENERATOR CHECKLIST		
Note: The term "generator" in this document refers to both pedestrian generators (where pedestrians originate) and destinations (where pedestrians travel to). A check of" yes" indicates a potential need to accommodate pedestrians and coordination with the Regional Bicycle and Pedestrian Coordinator is necessary during project scoping. Answers to the following questions should be checked with the local municipality to ensure accuracy.		
1.	Is there an existing or planned sidewalk, trail, or pedestrian-crossing facility?	**YES**X **NO**□
2.	Are there bus stops, transit stations or depots/terminals located in or within 800 m of the project area?	**YES**X **NO**□
3.	Is there more than occasional pedestrian activity? Evidence of pedestrian activity may include a worn path.	**YES**X **NO**□
4.	Are there existing or approved plans for generators of pedestrian activity in or within 800m of the project that promote or have the potential to promote pedestrian traffic in the project area, such as schools, parks, playgrounds, places of employment, places of worship, post offices, municipal buildings, restaurants, shopping centers, or other commercial areas, or shared-use paths?	**YES**X **NO**□
5.	Are there existing or approved plans for seasonal generators of pedestrian activity in or within 800 m of the project that promote or have the potential to promote pedestrian traffic in the project area, such as ski resorts, state parks, camps, amusement parks?	**YES**X **NO**□
6.	Is the project located in a residential area within 800 m of existing or planned pedestrian generators such as those listed in 4 above?	**YES**X **NO**□
7.	From record plans, were pedestrian facilities removed during a previous highway reconstruction project?	**YES**□ **NO**X
8.	Did a study of secondary impacts indicate that the project promotes or is likely to promote commercial and/or residential development within the intended life cycle of the project?	**YES**□ **NO**X
9.	Does the community's comprehensive plan call for development of pedestrian facilities in the area?	**YES**X **NO**□
10.	Based on the ability of students to walk and bicycle to school, would the project benefit from engineering measures under the Safe-Routes-To-School program? Eligible infrastructure-related improvements must be within a 3.2 km radius of the project.	**YES**□ **NO**X

Note: This checklist should be revisited due to a project delay or if site conditions or local planning changes during the project development process.

Comments: The New York City Economic Development Corporation (NYCEDC), working with the NYSDOT, is proposing the construction of a new approximately one mile long waterfront esplanade over the East River, between East 41st and East 60th streets in the Borough of Manhattan, New York City. In addition to the proposed esplanade, two new upland bridge connections are proposed to connect the landside (west of FDR East River Drive) to the esplanade (east of FDR East River Drive).

Regional Bicycle and Pedestrian Coordinator: New York City Department of Transportation

Project Designer: AECOM

APPENDIX M
SEQRA EA and Determination

Full Environmental Assessment Form
Part 1 - Project and Setting

Instructions for Completing Part 1

Part 1 is to be completed by the applicant or project sponsor. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification.

Complete Part 1 based on information currently available. If additional research or investigation would be needed to fully respond to any item, please answer as thoroughly as possible based on current information; indicate whether missing information does not exist, or is not reasonably available to the sponsor; and, when possible, generally describe work or studies which would be necessary to update or fully develop that information.

Applicants/sponsors must complete all items in Sections A & B. In Sections C, D & E, most items contain an initial question that must be answered either "Yes" or "No". If the answer to the initial question is "Yes", complete the sub-questions that follow. If the answer to the initial question is "No", proceed to the next question. Section F allows the project sponsor to identify and attach any additional information. Section G requires the name and signature of the project sponsor to verify that the information contained in Part 1is accurate and complete.

A. Project and Sponsor Information.

<table>
<tr><td colspan="3">Name of Action or Project:
East Midtown Waterfront Esplanade and Greenway</td></tr>
<tr><td colspan="3">Project Location (describe, and attach a general location map):
Manhattan side of the East River in New York, NY; offset approximately 30 feet from the eastern side of FDR Drive from East 41st and East 60th Streets (see Figure 1)</td></tr>
<tr><td colspan="3">Brief Description of Proposed Action (include purpose or need):
The Proposed Project is a proposed 0.96 mile long esplanade located along the Manhattan side of the East River in New York, New York. The Proposed Project includes the United Nations Esplanade from East 41st to 53rd Streets, the Outboard Detour Roadway Esplanade from East 53rd to 60th Streets, and two new upland pedestrian bridge connections at East 48th Street and at East 54th Street.

The City of New York has established several waterfront-related policy goals within its Vision 2020: NYC Comprehensive Waterfront Plan (2011) and the Manhattan Waterfront Greenway Master Plan (2004). The proposed project is consistent with two common goals addressed in these documents including:

Goal 1: Expand waterfront public access – improving connectivity and continuity by targeting gaps in otherwise continuous stretches of public access.
Goal 2: Enliven the waterfront – provide a range of attractive uses integrated with adjacent upland communities and encourage the integration of water-dependent and water-enhancing uses within the waterfront.</td></tr>
<tr><td rowspan="2">Name of Applicant/Sponsor:
New York City Department of Small Business Services</td><td colspan="2">Telephone: 212-513-6428</td></tr>
<tr><td colspan="2">E-Mail: DKonon@nycedc.com</td></tr>
<tr><td colspan="3">Address: 110 William Street, 6th Floor</td></tr>
<tr><td>City/PO: New York</td><td>State: NY</td><td>Zip Code: 10038</td></tr>
<tr><td rowspan="2">Project Contact (if not same as sponsor; give name and title/role):</td><td colspan="2">Telephone:</td></tr>
<tr><td colspan="2">E-Mail:</td></tr>
<tr><td colspan="3">Address:</td></tr>
<tr><td>City/PO:</td><td>State:</td><td>Zip Code:</td></tr>
<tr><td rowspan="2">Property Owner (if not same as sponsor):
City of New York</td><td colspan="2">Telephone:</td></tr>
<tr><td colspan="2">E-Mail:</td></tr>
<tr><td colspan="3">Address:</td></tr>
<tr><td>City/PO:</td><td>State:</td><td>Zip Code:</td></tr>
</table>

B. Government Approvals

B. Government Approvals Funding, or Sponsorship. ("Funding" includes grants, loans, tax relief, and any other forms of financial assistance.)

Government Entity		If Yes: Identify Agency and Approval(s) Required	Application Date (Actual or projected)
a. City Council, Town Board, or Village Board of Trustees	☐Yes ☑No		
b. City, Town or Village Planning Board or Commission	☐Yes ☑No		
c. City Council, Town or Village Zoning Board of Appeals	☐Yes ☑No		
d. Other local agencies	☑Yes ☐No	NYC Dept of City Planning, NYC Waterfront Revitalization Program Consistency Assessment	
e. County agencies	☐Yes ☑No		
f. Regional agencies	☐Yes ☑No	NYSDEC, Water Quality Certificate; NYSOGS, Grant or Easement of Lands Underwater; NYSDOS, Coastal Zone Consistency Determination	
g. State agencies	☑Yes ☐No		
h. Federal agencies	☑Yes ☐No	USCG, Navigation and Navigable Waters Permit; USACE, Nationwide Permit #15	

i. Coastal Resources.

i. Is the project site within a Coastal Area, or the waterfront area of a Designated Inland Waterway? ☑Yes ☐No

If Yes,

ii. Is the project site located in a community with an approved Local Waterfront Revitalization Program? ☑Yes ☐No

iii. Is the project site within a Coastal Erosion Hazard Area? ☐Yes ☑No

C. Planning and Zoning

C.1. Planning and zoning actions.

Will administrative or legislative adoption, or amendment of a plan, local law, ordinance, rule or regulation be the only approval(s) which must be granted to enable the proposed action to proceed? ☐Yes ☑No

- **If Yes,** complete sections C, F and G.
- **If No,** proceed to question C.2 and complete all remaining sections and questions in Part 1

C.2. Adopted land use plans.

a. Do any municipally- adopted (city, town, village or county) comprehensive land use plan(s) include the site where the proposed action would be located? ☐Yes ☑No

If Yes, does the comprehensive plan include specific recommendations for the site where the proposed action would be located? ☐Yes ☐No

b. Is the site of the proposed action within any local or regional special planning district (for example: Greenway Brownfield Opportunity Area (BOA); designated State or Federal heritage area; watershed management plan; or other?) ☐Yes ☑No

If Yes, identify the plan(s):

c. Is the proposed action located wholly or partially within an area listed in an adopted municipal open space plan, or an adopted municipal farmland protection plan? ☐Yes ☑No

If Yes, identify the plan(s):

C.3. Zoning
a. Is the site of the proposed action located in a municipality with an adopted zoning law or ordinance. ☑Yes☐No If Yes, what is the zoning classification(s) including any applicable overlay district? Area over the East River where the majority of the proposed esplanade would be constructed is not zoned. Areas adjacent to the project are zoned C5-2 Central Commercial (Restricted); R8B Higher Density Residential; M3-2 Heavy Manufacturing; R10 Higher Density Residential
b. Is the use permitted or allowed by a special or conditional use permit? ☑Yes☐No
c. Is a zoning change requested as part of the proposed action? ☐Yes☑No If Yes, *i.* What is the proposed new zoning for the site? ________
C.4. Existing community services.
a. In what school district is the project site located? NYC Department of Education
b. What police or other public protection forces serve the project site? New York City Police Department
c. Which fire protection and emergency medical services serve the project site? New York City Fire Department
d. What parks serve the project site? Glick Park, Robert Moses Playground, McArthur Park, Peter Detmold Park, Sutton Parks, Andrew Haswell Green

D. Project Details

D.1. Proposed and Potential Development
a. What is the general nature of the proposed action (e.g., residential, industrial, commercial, recreational; if mixed, include all components)? Recreational
b. a. Total acreage of the site of the proposed action? 5.2 acres b. Total acreage to be physically disturbed? 5.2 acres c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? 0 acres
c. Is the proposed action an expansion of an existing project or use? ☑Yes☐No *i.* If Yes, what is the approximate percentage of the proposed expansion and identify the units (e.g., acres, miles, housing units, square feet)? % 3 Units: miles (1 mile out of 32 mile Manhattan Waterfront Greenway)
d. Is the proposed action a subdivision, or does it include a subdivision? ☐Yes☑No If Yes, *i.* Purpose or type of subdivision? (e.g., residential, industrial, commercial; if mixed, specify types) ________ *ii.* Is a cluster/conservation layout proposed? ☐Yes☑No *iii.* Number of lots proposed? ________ *iv.* Minimum and maximum proposed lot sizes? Minimum ________ Maximum ________
e. Will proposed action be constructed in multiple phases? ☑Yes☐No *i.* If No, anticipated period of construction: _____ months *ii.* If Yes: • Total number of phases anticipated 2 • Anticipated commencement date of phase 1 (including demolition) _____ month 2017 year • Anticipated completion date of final phase _____ month 2025 year • Generally describe connections or relationships among phases, including any contingencies where progress of one phase may determine timing or duration of future phases: Funding of the first phase (UN Esplanade) could impact start date of the second phase (ODR Esplanade).

f. Does the project include new residential uses? ☐Yes ☑No
If Yes, show numbers of units proposed.

	One Family	Two Family	Three Family	Multiple Family (four or more)
Initial Phase				
At completion of all phases				

g. Does the proposed action include new non-residential construction (including expansions)? ☑Yes ☐No
If Yes,
i. Total number of structures 1
ii. Dimensions (in feet) of largest proposed structure: N/A height; 40 width; and 5,069 length
iii. Approximate extent of building space to be heated or cooled: N/A square feet

h. Does the proposed action include construction or other activities that will result in the impoundment of any liquids, such as creation of a water supply, reservoir, pond, lake, waste lagoon or other storage? ☐Yes ☑No
If Yes,
i. Purpose of the impoundment: ____
ii. If a water impoundment, the principal source of the water: ☐ Ground water ☐ Surface water streams ☐ Other specify: ____
iii. If other than water, identify the type of impounded/contained liquids and their source. ____
iv. Approximate size of the proposed impoundment. Volume: ____ million gallons; surface area: ____ acres
v. Dimensions of the proposed dam or impounding structure: ____ height; ____ length
vi. Construction method/materials for the proposed dam or impounding structure (e.g., earth fill, rock, wood, concrete): ____

D.2. Project Operations

a. Does the proposed action include any excavation, mining, or dredging, during construction, operations, or both? ☑Yes ☐No
(Not including general site preparation, grading or installation of utilities or foundations where all excavated materials will remain onsite)
If Yes:
i. What is the purpose of the excavation or dredging? Excavation is for pile installation.
ii. How much material (including rock, earth, sediments, etc.) is proposed to be removed from the site?
- Volume (specify tons or cubic yards): 3,524 CY
- Over what duration of time? 6 months in 2 phases

iii. Describe nature and characteristics of materials to be excavated or dredged, and plans to use, manage or dispose of them.
Fill, silt, rubble, bedrock; materials to be hauled away for disposal at an appropriate facility.
iv. Will there be onsite dewatering or processing of excavated materials? ☐Yes ☑No
If yes, describe. ____
v. What is the total area to be dredged or excavated? 0.04 acres
vi. What is the maximum area to be worked at any one time? 3 acres
vii. What would be the maximum depth of excavation or dredging? 60 feet
viii. Will the excavation require blasting? ☐Yes ☑No
ix. Summarize site reclamation goals and plan: ____

b. Would the proposed action cause or result in alteration of, increase or decrease in size of, or encroachment into any existing wetland, waterbody, shoreline, beach or adjacent area? ☑Yes ☐No
If Yes:
i. Identify the wetland or waterbody which would be affected (by name, water index number, wetland map number or geographic description): NYSDEC mapping identifies waters (East River) within and adjacent to the project as littoral zone (LZ).

ii. Describe how the proposed action would affect that waterbody or wetland, e.g. excavation, fill, placement of structures, or alteration of channels, banks and shorelines. Indicate extent of activities, alterations and additions in square feet or acres:

The esplanade would be built on the East River (0.96 miles long x 40-50 feet wide; ~220,000 sf). Pile installation would result in 0.04 acres of benthic disturbance. The esplanade would encroach but not impact the rock outcroppings along the bulkhead. During construction, barges may extend up to 135 feet into the West Channel of the East River but would not affect the navigability of the river.

iii. Will proposed action cause or result in disturbance to bottom sediments? ☑ Yes ☐ No

If Yes, describe: Permanent impact from piles of 0.04 acres; temporary disturbance during construction.

iv. Will proposed action cause or result in the destruction or removal of aquatic vegetation? ☐ Yes ☑ No

If Yes:

- acres of aquatic vegetation proposed to be removed: ________
- expected acreage of aquatic vegetation remaining after project completion: ________
- purpose of proposed removal (e.g. beach clearing, invasive species control, boat access): ________
- proposed method of plant removal: ________
- if chemical/herbicide treatment will be used, specify product(s): None

v. Describe any proposed reclamation/mitigation following disturbance:

Coverage of open water habitat to be offset by projet-related improvements at several off-site locations within the New York Harbor.

c. Will the proposed action use, or create a new demand for water? ☐ Yes ☑ No

If Yes:

i. Total anticipated water usage/demand per day: ________ gallons/day

ii. Will the proposed action obtain water from an existing public water supply? ☐ Yes ☐ No

If Yes:

- Name of district or service area: ________
- Does the existing public water supply have capacity to serve the proposal? ☐ Yes ☐ No
- Is the project site in the existing district? ☐ Yes ☐ No
- Is expansion of the district needed? ☐ Yes ☐ No
- Do existing lines serve the project site? ☐ Yes ☐ No

iii. Will line extension within an existing district be necessary to supply the project? ☐ Yes ☐ No

If Yes:

- Describe extensions or capacity expansions proposed to serve this project: ________
- Source(s) of supply for the district: ________

iv. Is a new water supply district or service area proposed to be formed to serve the project site? ☐ Yes ☐ No

If, Yes:

- Applicant/sponsor for new district: ________
- Date application submitted or anticipated: ________
- Proposed source(s) of supply for new district: ________

v. If a public water supply will not be used, describe plans to provide water supply for the project: ________

vi. If water supply will be from wells (public or private), maximum pumping capacity: ________ gallons/minute.

d. Will the proposed action generate liquid wastes? ☐ Yes ☑ No

If Yes:

i. Total anticipated liquid waste generation per day: ________ gallons/day

ii. Nature of liquid wastes to be generated (e.g., sanitary wastewater, industrial; if combination, describe all components and approximate volumes or proportions of each): ________

iii. Will the proposed action use any existing public wastewater treatment facilities? ☐ Yes ☑ No

If Yes:

- Name of wastewater treatment plant to be used: ________
- Name of district: ________
- Does the existing wastewater treatment plant have capacity to serve the project? ☐ Yes ☐ No
- Is the project site in the existing district? ☐ Yes ☐ No
- Is expansion of the district needed? ☐ Yes ☐ No

- Do existing sewer lines serve the project site? ☐Yes ☑No
- Will line extension within an existing district be necessary to serve the project? ☐Yes ☑No

  If Yes:
  - Describe extensions or capacity expansions proposed to serve this project: ______

iv. Will a new wastewater (sewage) treatment district be formed to serve the project site? ☐Yes ☑No

If Yes:
- Applicant/sponsor for new district: ______
- Date application submitted or anticipated: ______
- What is the receiving water for the wastewater discharge? ______

v. If public facilities will not be used, describe plans to provide wastewater treatment for the project, including specifying proposed receiving water (name and classification if surface discharge, or describe subsurface disposal plans):

N/A

vi. Describe any plans or designs to capture, recycle or reuse liquid waste: ______

N/A

e. Will the proposed action disturb more than one acre and create stormwater runoff, either from new point sources (i.e. ditches, pipes, swales, curbs, gutters or other concentrated flows of stormwater) or non-point source (i.e. sheet flow) during construction or post construction? ☑Yes ☐No

If Yes:

i. How much impervious surface will the project create in relation to total size of project parcel?

_____ Square feet or 5.0 acres (impervious surface)

_____ Square feet or 5.2 acres (parcel size)

ii. Describe types of new point sources. None

iii. Where will the stormwater runoff be directed (i.e. on-site stormwater management facility/structures, adjacent properties, groundwater, on-site surface water or off-site surface waters)?

Runoff from bike path to discharge to flow-through stormwater planters in the median (use soil infiltration and biogeochemical processes to treat before discharge to the river). Runoff from the pedestrian path will be screened to capture trash and debris before discharge to the river.

- If to surface waters, identify receiving water bodies or wetlands: East River
- Will stormwater runoff flow to adjacent properties? ☐Yes ☑No

iv. Does proposed plan minimize impervious surfaces, use pervious materials or collect and re-use stormwater? ☑Yes ☐No

f. Does the proposed action include, or will it use on-site, one or more sources of air emissions, including fuel combustion, waste incineration, or other processes or operations? ☑Yes ☐No

If Yes, identify:

i. Mobile sources during project operations (e.g., heavy equipment, fleet or delivery vehicles)

None

ii. Stationary sources during construction (e.g., power generation, structural heating, batch plant, crushers)

compressors for surface tools, generators, barge-mounted concrete batch plant

iii. Stationary sources during operations (e.g., process emissions, large boilers, electric generation)

None

g. Will any air emission sources named in D.2.f (above), require a NY State Air Registration, Air Facility Permit, or Federal Clean Air Act Title IV or Title V Permit? ☐Yes ☑No

If Yes:

i. Is the project site located in an Air quality non-attainment area? (Area routinely or periodically fails to meet ambient air quality standards for all or some parts of the year) ☐Yes ☐No

ii. In addition to emissions as calculated in the application, the project will generate:
- ______Tons/year (short tons) of Carbon Dioxide (CO_2)
- ______Tons/year (short tons) of Nitrous Oxide (N_2O)
- ______Tons/year (short tons) of Perfluorocarbons (PFCs)
- ______Tons/year (short tons) of Sulfur Hexafluoride (SF_6)
- ______Tons/year (short tons) of Carbon Dioxide equivalent of Hydroflourocarbons (HFCs)
- ______Tons/year (short tons) of Hazardous Air Pollutants (HAPs)

h. Will the proposed action generate or emit methane (including, but not limited to, sewage treatment plants, landfills, composting facilities)? ☐Yes ☑No

If Yes:

i. Estimate methane generation in tons/year (metric): ______

ii. Describe any methane capture, control or elimination measures included in project design (e.g., combustion to generate heat or electricity, flaring): ______

i. Will the proposed action result in the release of air pollutants from open-air operations or processes, such as quarry or landfill operations? ☐Yes ☑No

If Yes: Describe operations and nature of emissions (e.g., diesel exhaust, rock particulates/dust):

j. Will the proposed action result in a substantial increase in traffic above present levels or generate substantial new demand for transportation facilities or services? ☐Yes ☑No

If Yes:

i. When is the peak traffic expected (Check all that apply): ☐ Morning ☐ Evening ☐ Weekend ☐ Randomly between hours of ______ to ______.

ii. For commercial activities only, projected number of semi-trailer truck trips/day: ______

iii. Parking spaces: Existing ______ Proposed ______ Net increase/decrease ______

iv. Does the proposed action include any shared use parking? ☐Yes ☐No

v. If the proposed action includes any modification of existing roads, creation of new roads or change in existing access, describe:

vi. Are public/private transportation service(s) or facilities available within ½ mile of the proposed site? ☐Yes ☐No

vii Will the proposed action include access to public transportation or accommodations for use of hybrid, electric or other alternative fueled vehicles? ☐Yes ☐No

viii. Will the proposed action include plans for pedestrian or bicycle accommodations for connections to existing pedestrian or bicycle routes? ☐Yes ☐No

k. Will the proposed action (for commercial or industrial projects only) generate new or additional demand for energy? ☐Yes ☑No

If Yes:

i. Estimate annual electricity demand during operation of the proposed action: ______

ii. Anticipated sources/suppliers of electricity for the project (e.g., on-site combustion, on-site renewable, via grid/local utility, or other): ______

iii. Will the proposed action require a new, or an upgrade to, an existing substation? ☐Yes ☐No

l. Hours of operation. Answer all items which apply.

i. During Construction:

- Monday - Friday: 7:00 AM to 7:00 PM
- Saturday: 7:00 AM to 7:00 PM
- Sunday: 7:00 AM to 7:00 PM
- Holidays: 7:00 AM to 7:00 PM

ii. During Operations:

- Monday - Friday: 6:00 AM to 10:00 PM
- Saturday: 6:00 AM to 10:00 PM
- Sunday: 6:00 AM to 10:00 PM
- Holidays: 6:00 AM to 10:00 PM

m. Will the proposed action produce noise that will exceed existing ambient noise levels during construction, operation, or both? ☑ Yes ☐ No

If yes:

i. Provide details including sources, time of day and duration: During a portion of construction (approximately three months of each phase) pile installation activities will occur during daytime hours. The area has high ambient noise levels. The majority of piles will be drilled in place; only a small number will be installed by vibratory hammer. Noise attenuating measures will be used if needed.

ii. Will proposed action remove existing natural barriers that could act as a noise barrier or screen? ☐ Yes ☑ No

Describe: ______

n.. Will the proposed action have outdoor lighting? ☑ Yes ☐ No

If yes:

i. Describe source(s), location(s), height of fixture(s), direction/aim, and proximity to nearest occupied structures:

Lighting would be installed along the length of the esplanade, designed according to NYCDOT's Division of Street Lighting illumination levels. The nearest occupied structure is located across or above the FDR Drive.

ii. Will proposed action remove existing natural barriers that could act as a light barrier or screen? ☐ Yes ☑ No

Describe: ______

o. Does the proposed action have the potential to produce odors for more than one hour per day? ☐ Yes ☑ No

If Yes, describe possible sources, potential frequency and duration of odor emissions, and proximity to nearest occupied structures: ______

p. Will the proposed action include any bulk storage of petroleum (**combined capacity of over 1,100 gallons**) or chemical products 185 **gallons in above ground storage or any amount in underground storage?** ☐ Yes ☑ No

If Yes:

i. Product(s) to be stored ______

ii. Volume(s) ______ per unit time ______ (e.g., month, year)

iii. Generally describe proposed storage facilities: ______

q. Will the proposed action (commercial, industrial and recreational projects only) use pesticides (i.e., herbicides, insecticides) during construction or operation? ☐ Yes ☑ No

If Yes:

i. Describe proposed treatment(s): ______

ii. Will the proposed action use Integrated Pest Management Practices? ☐ Yes ☐ No

r. Will the proposed action (commercial or industrial projects only) involve or require the management or disposal of solid waste (excluding hazardous materials)? ☐ Yes ☑ No

If Yes:

i. Describe any solid waste(s) to be generated during construction or operation of the facility:

- Construction: ______ tons per ______ (unit of time)
- Operation : ______ tons per ______ (unit of time)

ii. Describe any proposals for on-site minimization, recycling or reuse of materials to avoid disposal as solid waste:

- Construction: ______
- Operation: ______

iii. Proposed disposal methods/facilities for solid waste generated on-site:

- Construction: ______
- Operation: ______

s. Does the proposed action include construction or modification of a solid waste management facility? ☐ Yes ☑ No

If Yes:

i. Type of management or handling of waste proposed for the site (e.g., recycling or transfer station, composting, landfill, or other disposal activities): ______

ii. Anticipated rate of disposal/processing:

- ______ Tons/month, if transfer or other non-combustion/thermal treatment, or
- ______ Tons/hour, if combustion or thermal treatment

iii. If landfill, anticipated site life: ______ years

t. Will proposed action at the site involve the commercial generation, treatment, storage, or disposal of hazardous waste? ☐ Yes ☑ No

If Yes:

i. Name(s) of all hazardous wastes or constituents to be generated, handled or managed at facility: ______

ii. Generally describe processes or activities involving hazardous wastes or constituents: ______

iii. Specify amount to be handled or generated ______ tons/month

iv. Describe any proposals for on-site minimization, recycling or reuse of hazardous constituents: ______

v. Will any hazardous wastes be disposed at an existing offsite hazardous waste facility? ☐ Yes ☐ No

If Yes: provide name and location of facility: ______

If No: describe proposed management of any hazardous wastes which will not be sent to a hazardous waste facility:

N/A

E. Site and Setting of Proposed Action

E.1. Land uses on and surrounding the project site

a. Existing land uses.

i. Check all uses that occur on, adjoining and near the project site.

☑ Urban ☐ Industrial ☑ Commercial ☐ Residential (suburban) ☐ Rural (non-farm)

☐ Forest ☐ Agriculture ☑ Aquatic ☑ Other (specify): Recreational

ii. If mix of uses, generally describe:

Surrounding land uses include commercial office buildings (UN Headquarters), high-rise residential buildings, and small parks/open spaces.

b. Land uses and covertypes on the project site.

Land use or Covertype	Current Acreage	Acreage After Project Completion	Change (Acres +/-)
• Roads, buildings, and other paved or impervious surfaces	0.2	5.2	+5.0
• Forested	0	0	0
• Meadows, grasslands or brushlands (non-agricultural, including abandoned agricultural)	0	0	0
• Agricultural (includes active orchards, field, greenhouse etc.)	0	0	0
• Surface water features (lakes, ponds, streams, rivers, etc.)	5.0	0	-5.0
• Wetlands (freshwater or tidal)	0	0	0
• Non-vegetated (bare rock, earth or fill)	0	0	0
• Other Describe: ______			

c. Is the project site presently used by members of the community for public recreation? *i.* If Yes: explain: Project site within a small portion of Sutton Parks and the walkway along river (E 51st to 54th) is immediately adjacent to site.	☑ Yes ☐ No
d. Are there any facilities serving children, the elderly, people with disabilities (e.g., schools, hospitals, licensed day care centers, or group homes) within 1500 feet of the project site? If Yes, *i.* Identify Facilities: Multiple schools and day care centers west of the proposed esplanade.	☑ Yes ☐ No
e. Does the project site contain an existing dam? If Yes: *i.* Dimensions of the dam and impoundment: • Dam height: ______ feet • Dam length: ______ feet • Surface area: ______ acres • Volume impounded: ______ gallons OR acre-feet *ii.* Dam's existing hazard classification: ______ *iii.* Provide date and summarize results of last inspection:	☐ Yes ☑ No
f. Has the project site ever been used as a municipal, commercial or industrial solid waste management facility, or does the project site adjoin property which is now, or was at one time, used as a solid waste management facility? If Yes: *i.* Has the facility been formally closed? ☐ Yes ☐ No • If yes, cite sources/documentation: ______ *ii.* Describe the location of the project site relative to the boundaries of the solid waste management facility: *iii.* Describe any development constraints due to the prior solid waste activities: ______	☐ Yes ☑ No
g. Have hazardous wastes been generated, treated and/or disposed of at the site, or does the project site adjoin property which is now or was at one time used to commercially treat, store and/or dispose of hazardous waste? If Yes: *i.* Describe waste(s) handled and waste management activities, including approximate time when activities occurred:	☐ Yes ☑ No
h. Potential contamination history. Has there been a reported spill at the proposed project site, or have any remedial actions been conducted at or adjacent to the proposed site? If Yes: *i.* Is any portion of the site listed on the NYSDEC Spills Incidents database or Environmental Site Remediation database? Check all that apply: ☐ Yes ☐ No ☐ Yes – Spills Incidents database Provide DEC ID number(s): ______ ☐ Yes – Environmental Site Remediation database Provide DEC ID number(s): ______ ☐ Neither database *ii.* If site has been subject of RCRA corrective activities, describe control measures: ______ *iii.* Is the project within 2000 feet of any site in the NYSDEC Environmental Site Remediation database? ☑ Yes ☐ No If yes, provide DEC ID number(s): C231013, C231014, V00429, V00537, V00544 *iv.* If yes to (i), (ii) or (iii) above, describe current status of site(s): C231013 - remediation complete; C231014 - Certificate of Completion; V00429 - remediation complete; V00537 - No Further Action; V00544 - Remedial Investigation underway	☐ Yes ☑ No

v. Is the project site subject to an institutional control limiting property uses? ☐ Yes ☑ No

- If yes, DEC site ID number: ____________
- Describe the type of institutional control (e.g., deed restriction or easement): ____________
- Describe any use limitations: ____________
- Describe any engineering controls: ____________
- Will the project affect the institutional or engineering controls in place? ☐ Yes ☐ No
- Explain: ____________

E.2. Natural Resources On or Near Project Site

a. What is the average depth to bedrock on the project site? 63 feet

b. Are there bedrock outcroppings on the project site? ☑ Yes ☐ No
If Yes, what proportion of the site is comprised of bedrock outcroppings? <5 %

c. Predominant soil type(s) present on project site:

Silty clayey sand mixture	88 %
Very soft clay/silt	10 %
Sandy loam/Loamy sand	2 %

d. What is the average depth to the water table on the project site? Average: N/A feet

e. Drainage status of project site soils:

- ☑ Well Drained: 2 % of site
- ☐ Moderately Well Drained: N/A % of site
- ☑ Poorly Drained 98 % of site Submerged sediments of the East River

f. Approximate proportion of proposed action site with slopes:

- ☑ 0-10%: 100 % of site
- ☐ 10-15%: ____ % of site
- ☐ 15% or greater: ____ % of site

g. Are there any unique geologic features on the project site? ☐ Yes ☑ No
If Yes, describe: ____________

h. Surface water features.

i. Does any portion of the project site contain wetlands or other waterbodies (including streams, rivers, ponds or lakes)? ☑ Yes ☐ No

ii. Do any wetlands or other waterbodies adjoin the project site? ☑ Yes ☐ No

If Yes to either *i* or *ii*, continue. If No, skip to E.2.i.

iii. Are any of the wetlands or waterbodies within or adjoining the project site regulated by any federal, state or local agency? ☑ Yes ☐ No

iv. For each identified regulated wetland and waterbody on the project site, provide the following information:

- Streams: Name East River Classification Section 303(d) Priority Water
- Lakes or Ponds: Name ____________ Classification ____________
- Wetlands: Name Rock outcrops adjacent to project site Approximate Size 0.2 acres
- Wetland No. (if regulated by DEC) ____________

v. Are any of the above water bodies listed in the most recent compilation of NYS water quality-impaired waterbodies? ☑ Yes ☐ No

If yes, name of impaired water body/bodies and basis for listing as impaired:
East River (PCBs, other toxics)

i. Is the project site in a designated Floodway? ☐ Yes ☑ No

j. Is the project site in the 100 year Floodplain? ☑ Yes ☐ No

k. Is the project site in the 500 year Floodplain? ☑ Yes ☐ No

l. Is the project site located over, or immediately adjoining, a primary, principal or sole source aquifer? ☐ Yes ☑ No
If Yes:
i. Name of aquifer: ____________

m. Identify the predominant wildlife species that occupy or use the project site: Anadromous fish species (alewife, blueback herring, American shad); Various benthic invertebrate species (crabs) Avian species adapted to an urban environment	
n. Does the project site contain a designated significant natural community? If Yes: *i.* Describe the habitat/community (composition, function, and basis for designation): ______ *ii.* Source(s) of description or evaluation: ______ *iii.* Extent of community/habitat: • Currently: ______ acres • Following completion of project as proposed: ______ acres • Gain or loss (indicate + or -): ______ acres	☐Yes ☑No
o. Does project site contain any species of plant or animal that is listed by the federal government or NYS as endangered or threatened, or does it contain any areas identified as habitat for an endangered or threatened species? National Marine Fisheries Service (NMFS) identified several Federally-listed species that may occur in the East River; however, a Biological Assessment and Essential Fish Habitat Study found that no critical habitat exist for Atlantic sturgeon, shortnose sturgeon or four marine turtle species.	☐Yes ☑No
p. Does the project site contain any species of plant or animal that is listed by NYS as rare, or as a species of special concern? New York Natural Heritage Program found that breeding habitat for the State-endangered Peregrine falcon has been documented at or near the project site; however, the esplanade is unlikely to impact the falcons as it is low to the water and would not serve as an obstacle to the flight, nor would the project serve as a suitable nesting structure. In addition, the esplanade would provide limited habitat for their prey species.	☑Yes ☐No
q. Is the project site or adjoining area currently used for hunting, trapping, fishing or shell fishing? If yes, give a brief description of how the proposed action may affect that use: Walkway east of FDR Drive between East 51st and East 54th Streets is used for recreational fishing; Proposed Action will enhance opportunities for similar uses.	☑Yes ☐No
E.3. Designated Public Resources On or Near Project Site	
a. Is the project site, or any portion of it, located in a designated agricultural district certified pursuant to Agriculture and Markets Law, Article 25-AA, Section 303 and 304? If Yes, provide county plus district name/number: ______	☐Yes ☑No
b. Are agricultural lands consisting of highly productive soils present? *i.* If Yes: acreage(s) on project site? ______ *ii.* Source(s) of soil rating(s): ______	☐Yes ☑No
c. Does the project site contain all or part of, or is it substantially contiguous to, a registered National Natural Landmark? If Yes: *i.* Nature of the natural landmark: ☐ Biological Community ☐ Geological Feature *ii.* Provide brief description of landmark, including values behind designation and approximate size/extent: ______	☐Yes ☑No
d. Is the project site located in or does it adjoin a state listed Critical Environmental Area? If Yes: *i.* CEA name: ______ *ii.* Basis for designation: ______ *iii.* Designating agency and date: ______	☐Yes ☑No

e. Does the project site contain, or is it substantially contiguous to, a building, archaeological site, or district which is listed on, or has been nominated by the NYS Board of Historic Preservation for inclusion on, the State or National Register of Historic Places? If Yes: *i*. Nature of historic/archaeological resource: ☐ Archaeological Site ☑ Historic Building or District *ii*. Name: Sutton Place Historic District, Ed Koch Queensboro Bridge, Lamppost and eight (8) S/NRHP-eligible resources. *iii*. Brief description of attributes on which listing is based: See Cultural Resources Findings Documentation	☑ Yes ☐ No
f. Is the project site, or any portion of it, located in or adjacent to an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory?	☐ Yes ☑ No
g. Have additional archaeological or historic site(s) or resources been identified on the project site? If Yes: *i*. Describe possible resource(s): ______ *ii*. Basis for identification: ______	☐ Yes ☑ No
h. Is the project site within fives miles of any officially designated and publicly accessible federal, state, or local scenic or aesthetic resource? If Yes: *i*. Identify resource: ______ *ii*. Nature of, or basis for, designation (e.g., established highway overlook, state or local park, state historic trail or scenic byway, etc.): ______ *iii*. Distance between project and resource: ______ miles.	☐ Yes ☑ No
i. Is the project site located within a designated river corridor under the Wild, Scenic and Recreational Rivers Program 6 NYCRR 666? If Yes: *i*. Identify the name of the river and its designation: ______ *ii*. Is the activity consistent with development restrictions contained in 6NYCRR Part 666?	☐ Yes ☑ No ☐ Yes ☐ No

F. Additional Information
Attach any additional information which may be needed to clarify your project.

If you have identified any adverse impacts which could be associated with your proposal, please describe those impacts plus any measures which you propose to avoid or minimize them.

G. Verification
I certify that the information provided is true to the best of my knowledge.

Applicant/Sponsor Name ______________________ Date ______________________

Signature ______________________ Title ______________________

PRINT FORM

Figure 1 – Project Location Map

Full Environmental Assessment Form
Part 2 - Identification of Potential Project Impacts

Part 2 is to be completed by the lead agency. Part 2 is designed to help the lead agency inventory all potential resources that could be affected by a proposed project or action. We recognize that the lead agency's reviewer(s) will not necessarily be environmental professionals. So, the questions are designed to walk a reviewer through the assessment process by providing a series of questions that can be answered using the information found in Part 1. To further assist the lead agency in completing Part 2, the form identifies the most relevant questions in Part 1 that will provide the information needed to answer the Part 2 question. When Part 2 is completed, the lead agency will have identified the relevant environmental areas that may be impacted by the proposed activity.

If the lead agency is a state agency **and** the action is in any Coastal Area, complete the Coastal Assessment Form before proceeding with this assessment.

Tips for completing Part 2:

- Review all of the information provided in Part 1.
- Review any application, maps, supporting materials and the Full EAF Workbook.
- Answer each of the 18 questions in Part 2.
- If you answer **"Yes"** to a numbered question, please complete all the questions that follow in that section.
- If you answer **"No"** to a numbered question, move on to the next numbered question.
- Check appropriate column to indicate the anticipated size of the impact.
- Proposed projects that would exceed a numeric threshold contained in a question should result in the reviewing agency checking the box "Moderate to large impact may occur."
- The reviewer is not expected to be an expert in environmental analysis.
- If you are not sure or undecided about the size of an impact, it may help to review the sub-questions for the general question and consult the workbook.
- When answering a question consider all components of the proposed activity, that is, the "whole action".
- Consider the possibility for long-term and cumulative impacts as well as direct impacts.
- Answer the question in a reasonable manner considering the scale and context of the project.

1. Impact on Land
Proposed action may involve construction on, or physical alteration of, the land surface of the proposed site. (See Part 1. D.1) ☐ NO ☑ YES
If "Yes", answer questions a - j. If "No", move on to Section 2.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may involve construction on land where depth to water table is less than 3 feet.	E2d	☑	☐
b. The proposed action may involve construction on slopes of 15% or greater.	E2f	☑	☐
c. The proposed action may involve construction on land where bedrock is exposed, or generally within 5 feet of existing ground surface.	E2a	☑	☐
d. The proposed action may involve the excavation and removal of more than 1,000 tons of natural material.	D2a	☑	☐
e. The proposed action may involve construction that continues for more than one year or in multiple phases.	D1e	☐	☑
f. The proposed action may result in increased erosion, whether from physical disturbance or vegetation removal (including from treatment by herbicides).	D2e, D2q	☑	☐
g. The proposed action is, or may be, located within a Coastal Erosion hazard area.	B1i	☑	☐
h. Other impacts: ______________________		☐	☐

2. Impact on Geological Features

The proposed action may result in the modification or destruction of, or inhibit access to, any unique or unusual land forms on the site (e.g., cliffs, dunes, minerals, fossils, caves). (See Part 1. E.2.g)

If "Yes", answer questions a - c. If "No", move on to Section 3.

☑ NO ☐ YES

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. Identify the specific land form(s) attached: ________________	E2g	☐	☐
b. The proposed action may affect or is adjacent to a geological feature listed as a registered National Natural Landmark. Specific feature: ________________	E3c	☐	☐
c. Other impacts: ________________		☐	☐

3. Impacts on Surface Water

The proposed action may affect one or more wetlands or other surface water bodies (e.g., streams, rivers, ponds or lakes). (See Part 1. D.2, E.2.h)

If "Yes", answer questions a - l. If "No", move on to Section 4.

☐ NO ☑ YES

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may create a new water body.	D2b, D1h	☑	☐
b. The proposed action may result in an increase or decrease of over 10% or more than a 10 acre increase or decrease in the surface area of any body of water.	D2b	☑	☐
c. The proposed action may involve dredging more than 100 cubic yards of material from a wetland or water body.	D2a	☑	☐
d. The proposed action may involve construction within or adjoining a freshwater or tidal wetland, or in the bed or banks of any other water body.	E2h	☐	☑
e. The proposed action may create turbidity in a waterbody, either from upland erosion, runoff or by disturbing bottom sediments.	D2a, D2h	☑	☐
f. The proposed action may include construction of one or more intake(s) for withdrawal of water from surface water.	D2c	☑	☐
g. The proposed action may include construction of one or more outfall(s) for discharge of wastewater to surface water(s).	D2d	☑	☐
h. The proposed action may cause soil erosion, or otherwise create a source of stormwater discharge that may lead to siltation or other degradation of receiving water bodies.	D2e	☑	☐
i. The proposed action may affect the water quality of any water bodies within or downstream of the site of the proposed action.	E2h	☑	☐
j. The proposed action may involve the application of pesticides or herbicides in or around any water body.	D2q, E2h	☑	☐
k. The proposed action may require the construction of new, or expansion of existing, wastewater treatment facilities.	D1a, D2d	☑	☐

l. Other impacts: ______________		☑	☐

4. Impact on groundwater

The proposed action may result in new or additional use of ground water, or may have the potential to introduce contaminants to ground water or an aquifer. (See Part 1. D.2.a, D.2.c, D.2.d, D.2.p, D.2.q, D.2.t) ☑NO ☐YES

If "Yes", answer questions a - h. If "No", move on to Section 5.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may require new water supply wells, or create additional demand on supplies from existing water supply wells.	D2c	☐	☐
b. Water supply demand from the proposed action may exceed safe and sustainable withdrawal capacity rate of the local supply or aquifer. Cite Source: ______________	D2c	☐	☐
c. The proposed action may allow or result in residential uses in areas without water and sewer services.	D1a, D2c	☐	☐
d. The proposed action may include or require wastewater discharged to groundwater.	D2d, E2l	☐	☐
e. The proposed action may result in the construction of water supply wells in locations where groundwater is, or is suspected to be, contaminated.	D2c, E1f, E1g, E1h	☐	☐
f. The proposed action may require the bulk storage of petroleum or chemical products over ground water or an aquifer.	D2p, E2l	☐	☐
g. The proposed action may involve the commercial application of pesticides within 100 feet of potable drinking water or irrigation sources.	E2h, D2q, E2l, D2c	☐	☐
h. Other impacts: ______________		☐	☐

5. Impact on Flooding

The proposed action may result in development on lands subject to flooding. (See Part 1. E.2) ☐NO ☑YES

If "Yes", answer questions a - g. If "No", move on to Section 6.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may result in development in a designated floodway.	E2i	☑	☐
b. The proposed action may result in development within a 100 year floodplain.	E2j	☐	☑
c. The proposed action may result in development within a 500 year floodplain.	E2k	☐	☑
d. The proposed action may result in, or require, modification of existing drainage patterns.	D2b, D2e	☑	☐
e. The proposed action may change flood water flows that contribute to flooding.	D2b, E2i, E2j, E2k	☑	☐
f. If there is a dam located on the site of the proposed action, is the dam in need of repair, or upgrade?	E1e	☑	☐

g. Other impacts: ______		☑	☐

6. Impacts on Air

The proposed action may include a state regulated air emission source. ☑NO ☐YES
(See Part 1. D.2.f., D,2,h, D.2.g)
If "Yes", answer questions a - f. If "No", move on to Section 7.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. If the proposed action requires federal or state air emission permits, the action may also emit one or more greenhouse gases at or above the following levels:			
i. More than 1000 tons/year of carbon dioxide (CO_2)	D2g	☐	☐
ii. More than 3.5 tons/year of nitrous oxide (N_2O)	D2g	☐	☐
iii. More than 1000 tons/year of carbon equivalent of perfluorocarbons (PFCs)	D2g	☐	☐
iv. More than .045 tons/year of sulfur hexafluoride (SF_6)	D2g	☐	☐
v. More than 1000 tons/year of carbon dioxide equivalent of hydrochloroflourocarbons (HFCs) emissions	D2g	☐	☐
vi. 43 tons/year or more of methane	D2h	☐	☐
b. The proposed action may generate 10 tons/year or more of any one designated hazardous air pollutant, or 25 tons/year or more of any combination of such hazardous air pollutants.	D2g	☐	☐
c. The proposed action may require a state air registration, or may produce an emissions rate of total contaminants that may exceed 5 lbs. per hour, or may include a heat source capable of producing more than 10 million BTU's per hour.	D2f, D2g	☐	☐
d. The proposed action may reach 50% of any of the thresholds in "a" through "c", above.	D2g	☐	☐
e. The proposed action may result in the combustion or thermal treatment of more than 1 ton of refuse per hour.	D2s	☐	☐
f. Other impacts: ______		☐	☐

7. Impact on Plants and Animals

The proposed action may result in a loss of flora or fauna. (See Part 1. E.2. m.-q.) ☑NO ☐YES
If "Yes", answer questions a - j. If "No", move on to Section 8.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may cause reduction in population or loss of individuals of any threatened or endangered species, as listed by New York State or the Federal government, that use the site, or are found on, over, or near the site.	E2o	☐	☐
b. The proposed action may result in a reduction or degradation of any habitat used by any rare, threatened or endangered species, as listed by New York State or the federal government.	E2o	☐	☐
c. The proposed action may cause reduction in population, or loss of individuals, of any species of special concern or conservation need, as listed by New York State or the Federal government, that use the site, or are found on, over, or near the site.	E2p	☐	☐
d. The proposed action may result in a reduction or degradation of any habitat used by any species of special concern and conservation need, as listed by New York State or the Federal government.	E2p	☐	☐

e. The proposed action may diminish the capacity of a registered National Natural Landmark to support the biological community it was established to protect.	E3c	☐	☐
f. The proposed action may result in the removal of, or ground disturbance in, any portion of a designated significant natural community. Source: ______	E2n	☐	☐
g. The proposed action may substantially interfere with nesting/breeding, foraging, or over-wintering habitat for the predominant species that occupy or use the project site.	E2m	☐	☐
h. The proposed action requires the conversion of more than 10 acres of forest, grassland or any other regionally or locally important habitat. Habitat type & information source: ______	E1b	☐	☐
i. Proposed action (commercial, industrial or recreational projects, only) involves use of herbicides or pesticides.	D2q	☐	☐
j. Other impacts: ______		☐	☐

8. Impact on Agricultural Resources

The proposed action may impact agricultural resources. (See Part 1. E.3.a. and b.) ☑ NO ☐ YES

If "Yes", answer questions a - h. If "No", move on to Section 9.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may impact soil classified within soil group 1 through 4 of the NYS Land Classification System.	E2c, E3b	☐	☐
b. The proposed action may sever, cross or otherwise limit access to agricultural land (includes cropland, hayfields, pasture, vineyard, orchard, etc).	E1a, Elb	☐	☐
c. The proposed action may result in the excavation or compaction of the soil profile of active agricultural land.	E3b	☐	☐
d. The proposed action may irreversibly convert agricultural land to non-agricultural uses, either more than 2.5 acres if located in an Agricultural District, or more than 10 acres if not within an Agricultural District.	E1b, E3a	☐	☐
e. The proposed action may disrupt or prevent installation of an agricultural land management system.	El a, E1b	☐	☐
f. The proposed action may result, directly or indirectly, in increased development potential or pressure on farmland.	C2c, C3, D2c, D2d	☐	☐
g. The proposed project is not consistent with the adopted municipal Farmland Protection Plan.	C2c	☐	☐
h. Other impacts: ______		☐	☐

9. Impact on Aesthetic Resources The land use of the proposed action are obviously different from, or are in sharp contrast to, current land use patterns between the proposed project and a scenic or aesthetic resource. (Part 1. E.1.a, E.1.b, E.3.h.) *If "Yes", answer questions a - g. If "No", go to Section 10.*	☑ NO		☐ YES
	Relevant Part I Question(s)	**No, or small impact may occur**	**Moderate to large impact may occur**
a. Proposed action may be visible from any officially designated federal, state, or local scenic or aesthetic resource.	E3h	☐	☐
b. The proposed action may result in the obstruction, elimination or significant screening of one or more officially designated scenic views.	E3h, C2b	☐	☐
c. The proposed action may be visible from publicly accessible vantage points: i. Seasonally (e.g., screened by summer foliage, but visible during other seasons) ii. Year round	E3h	 ☐ ☐	 ☐ ☐
d. The situation or activity in which viewers are engaged while viewing the proposed action is: i. Routine travel by residents, including travel to and from work ii. Recreational or tourism based activities	E3h E2q, E1c	 ☐ ☐	 ☐ ☐
e. The proposed action may cause a diminishment of the public enjoyment and appreciation of the designated aesthetic resource.	E3h	☐	☐
f. There are similar projects visible within the following distance of the proposed project: 0-1/2 mile ½ -3 mile 3-5 mile 5+ mile	D1a, E1a, D1f, D1g	☐	☐
g. Other impacts: ______________________________		☐	☐

10. Impact on Historic and Archeological Resources The proposed action may occur in or adjacent to a historic or archaeological resource. (Part 1. E.3.e, f. and g.) *If "Yes", answer questions a - e. If "No", go to Section 11.*	☐ NO		☑ YES
	Relevant Part I Question(s)	**No, or small impact may occur**	**Moderate to large impact may occur**
a. The proposed action may occur wholly or partially within, or substantially contiguous to, any buildings, archaeological site or district which is listed on or has been nominated by the NYS Board of Historic Preservation for inclusion on the State or National Register of Historic Places.	E3e	☑	☐
b. The proposed action may occur wholly or partially within, or substantially contiguous to, an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory.	E3f	☑	☐
c. The proposed action may occur wholly or partially within, or substantially contiguous to, an archaeological site not included on the NY SHPO inventory. Source: ______________________________	E3g	☑	☐

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
d. Other impacts: ______		☑	☐
e. If any of the above (a-d) are answered "Yes", continue with the following questions to help support conclusions in Part 3:			
i. The proposed action may result in the destruction or alteration of all or part of the site or property.	E3e, E3g, E3f	☑	☐
ii. The proposed action may result in the alteration of the property's setting or integrity.	E3e, E3f, E3g, E1a, E1b	☑	☐
iii. The proposed action may result in the introduction of visual elements which are out of character with the site or property, or may alter its setting.	E3e, E3f, E3g, E3h, C2, C3	☑	☐

11. Impact on Open Space and Recreation

The proposed action may result in a loss of recreational opportunities or a reduction of an open space resource as designated in any adopted municipal open space plan.
(See Part 1. C.2.c, E.1.c., E.2.q.)
If "Yes", answer questions a - e. If "No", go to Section 12.

☑ NO ☐ YES

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may result in an impairment of natural functions, or "ecosystem services", provided by an undeveloped area, including but not limited to stormwater storage, nutrient cycling, wildlife habitat.	D2e, E1b E2h, E2m, E2o, E2n, E2p	☑	☐
b. The proposed action may result in the loss of a current or future recreational resource.	C2a, E1c, C2c, E2q	☑	☐
c. The proposed action may eliminate open space or recreational resource in an area with few such resources.	C2a, C2c E1c, E2q	☑	☐
d. The proposed action may result in loss of an area now used informally by the community as an open space resource.	C2c, E1c	☑	☐
e. Other impacts: Proposed pedestrian bridge at East 54th Street would have minor impact on Sutton Parks.		☑	☐

12. Impact on Critical Environmental Areas

The proposed action may be located within or adjacent to a critical environmental area (CEA). (See Part 1. E.3.d)
If "Yes", answer questions a - c. If "No", go to Section 13.

☑ NO ☐ YES

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may result in a reduction in the quantity of the resource or characteristic which was the basis for designation of the CEA.	E3d	☐	☐
b. The proposed action may result in a reduction in the quality of the resource or characteristic which was the basis for designation of the CEA.	E3d	☐	☐
c. Other impacts: ______		☐	☐

13. Impact on Transportation
The proposed action may result in a change to existing transportation systems. ☐ NO ☑ YES
(See Part 1. D.2.j)
If "Yes", answer questions a - g. If "No", go to Section 14.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. Projected traffic increase may exceed capacity of existing road network.	D2j	☑	☐
b. The proposed action may result in the construction of paved parking area for 500 or more vehicles.	D2j	☑	☐
c. The proposed action will degrade existing transit access.	D2j	☑	☐
d. The proposed action will degrade existing pedestrian or bicycle accommodations.	D2j	☑	☐
e. The proposed action may alter the present pattern of movement of people or goods.	D2j	☐	☑
f. Other impacts: ______		☐	☐

14. Impact on Energy
The proposed action may cause an increase in the use of any form of energy. ☑ NO ☐ YES
(See Part 1. D.2.k)
If "Yes", answer questions a - e. If "No", go to Section 15.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action will require a new, or an upgrade to an existing, substation.	D2k	☐	☐
b. The proposed action will require the creation or extension of an energy transmission or supply system to serve more than 50 single or two-family residences or to serve a commercial or industrial use.	D1f, D1q, D2k	☐	☐
c. The proposed action may utilize more than 2,500 MWhrs per year of electricity.	D2k	☐	☐
d. The proposed action may involve heating and/or cooling of more than 100,000 square feet of building area when completed.	D1g	☐	☐
e. Other Impacts: ______		☐	☐

15. Impact on Noise, Odor, and Light
The proposed action may result in an increase in noise, odors, or outdoor lighting. ☑ NO ☐ YES
(See Part 1. D.2.m., n., and o.)
If "Yes", answer questions a - f. If "No", go to Section 16.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may produce sound above noise levels established by local regulation.	D2m	☐	☐
b. The proposed action may result in blasting within 1,500 feet of any residence, hospital, school, licensed day care center, or nursing home.	D2m, E1d	☐	☐
c. The proposed action may result in routine odors for more than one hour per day.	D2o	☐	☐

d. The proposed action may result in light shining onto adjoining properties.	D2n	☐	☐
e. The proposed action may result in lighting creating sky-glow brighter than existing area conditions.	D2n, E1a	☐	☐
f. Other impacts: ______________________		☐	☐

16. Impact on Human Health
The proposed action may have an impact on human health from exposure to new or existing sources of contaminants. (See Part 1.D.2.q., E.1. d. f. g. and h.) ☑ NO ☐ YES

If "Yes", answer questions a - m. If "No", go to Section 17.

	Relevant Part I Question(s)	No,or small impact may cccur	Moderate to large impact may occur
a. The proposed action is located within 1500 feet of a school, hospital, licensed day care center, group home, nursing home or retirement community.	E1d	☐	☐
b. The site of the proposed action is currently undergoing remediation.	E1g, E1h	☐	☐
c. There is a completed emergency spill remediation, or a completed environmental site remediation on, or adjacent to, the site of the proposed action.	E1g, E1h	☐	☐
d. The site of the action is subject to an institutional control limiting the use of the property (e.g., easement or deed restriction).	E1g, E1h	☐	☐
e. The proposed action may affect institutional control measures that were put in place to ensure that the site remains protective of the environment and human health.	E1g, E1h	☐	☐
f. The proposed action has adequate control measures in place to ensure that future generation, treatment and/or disposal of hazardous wastes will be protective of the environment and human health.	D2t	☐	☐
g. The proposed action involves construction or modification of a solid waste management facility.	D2q, E1f	☐	☐
h. The proposed action may result in the unearthing of solid or hazardous waste.	D2q, E1f	☐	☐
i. The proposed action may result in an increase in the rate of disposal, or processing, of solid waste.	D2r, D2s	☐	☐
j. The proposed action may result in excavation or other disturbance within 2000 feet of a site used for the disposal of solid or hazardous waste.	E1f, E1g E1h	☐	☐
k. The proposed action may result in the migration of explosive gases from a landfill site to adjacent off site structures.	E1f, E1g	☐	☐
l. The proposed action may result in the release of contaminated leachate from the project site.	D2s, E1f, D2r	☐	☐
m. Other impacts: ______________________		☐	☐

17. Consistency with Community Plans

The proposed action is not consistent with adopted land use plans. ☑ NO ☐ YES
(See Part 1. C.1, C.2. and C.3.)
If "Yes", answer questions a - h. If "No", go to Section 18.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action's land use components may be different from, or in sharp contrast to, current surrounding land use pattern(s).	C2, C3, D1a E1a, E1b	☐	☐
b. The proposed action will cause the permanent population of the city, town or village in which the project is located to grow by more than 5%.	C2	☐	☐
c. The proposed action is inconsistent with local land use plans or zoning regulations.	C2, C2, C3	☐	☐
d. The proposed action is inconsistent with any County plans, or other regional land use plans.	C2, C2	☐	☐
e. The proposed action may cause a change in the density of development that is not supported by existing infrastructure or is distant from existing infrastructure.	C3, D1c, D1d, D1f, D1d, Elb	☐	☐
f. The proposed action is located in an area characterized by low density development that will require new or expanded public infrastructure.	C4, D2c, D2d D2j	☐	☐
g. The proposed action may induce secondary development impacts (e.g., residential or commercial development not included in the proposed action)	C2a	☐	☐
h. Other: ______________________________		☐	☐

18. Consistency with Community Character

The proposed project is inconsistent with the existing community character. ☑ NO ☐ YES
(See Part 1. C.2, C.3, D.2, E.3)
If "Yes", answer questions a - g. If "No", proceed to Part 3.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may replace or eliminate existing facilities, structures, or areas of historic importance to the community.	E3e, E3f, E3g	☐	☐
b. The proposed action may create a demand for additional community services (e.g. schools, police and fire)	C4	☐	☐
c. The proposed action may displace affordable or low-income housing in an area where there is a shortage of such housing.	C2, C3, D1f D1g, E1a	☐	☐
d. The proposed action may interfere with the use or enjoyment of officially recognized or designated public resources.	C2, E3	☐	☐
e. The proposed action is inconsistent with the predominant architectural scale and character.	C2, C3	☐	☐
f. Proposed action is inconsistent with the character of the existing natural landscape.	C2, C3 E1a, E1b E2g, E2h	☐	☐
g. Other impacts: ______________________________		☐	☐

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PART 3 – EVALUATION OF THE MAGNITUDE AND IMPORTANCE OF PROJECT IMPACTS

1 Impact on Land: *Proposed action may involve construction on, or physical alteration of, the land surface of the proposed site.*

The East Midtown Waterfront Esplanade and Greenway, hereafter referred to as the "Proposed Project" is a proposed approximately 0.96 mile long esplanade located along the Manhattan side of the East River in New York, New York. The Proposed Project is offset approximately 30 feet from the eastern side of the Franklin D. Roosevelt East River (FDR) Drive (Route 907L), from East 41st Street to East 60th Street, which together define the project limits.

The Proposed Project includes:

- The United Nations Esplanade ("UN Esplanade") located along the waterfront adjacent to the United Nations Headquarters and other high-rise developments from East 41st to 53rd Streets.
- The Outboard Detour Roadway Esplanade ("ODR Esplanade") located along the waterfront from East 53rd to 60th Streets, where the portions of the proposed esplanade would be placed over existing ODR caissons.
- Two new upland pedestrian bridge connections ("Upland Bridge Connections") are also proposed to connect the landside west of the FDR Drive to the esplanades at East 48th Street and at East 54th Street.

<u>c. The proposed action may involve construction on land where bedrock is exposed, or generally within 5 feet of existing ground surface.</u>

Bedrock outcroppings are located adjacent to the project site, within the East River near East 54th Street. The Proposed Project would avoid any impacts to the outcroppings. No blasting would occur during construction; therefore, there would be no risk of fracturing bedrock to allow water or pollutants to percolate into groundwater.

<u>e. The proposed action may involve construction that continues for more than one year or in multiple phases</u>:

The Proposed Project is currently anticipated to be built in the following phases:

Phase 1: The ODR Esplanade is estimated to be completed by 2019; and
Phase 2: The UN Esplanade is estimated to be completed by 2025, including proposed Upland Bridge Connections as funding becomes available.

It is expected that the piles will be drilled into bedrock and placed over the course of a three-month period during each of the two phases. Staging for the construction would take place on up to four barges. Two of the barges would hold 250 ton cranes and at least one additional barge would be used for materials. Two of the barges may be placed next to each other, extending up to 135 feet (15-foot buffer, plus 60-feet long and 60-feet wide) into the East River beyond the edge of the esplanade under construction. There would be negligible impact to navigation within the West Channel.

The number of anticipated daily one way peak construction trips in-land to a waterfront staging area would be as follows:

- Concrete Trucks (4)
- Heavy equipment (i.e., excavator) (2)
- Trucks (deliveries) (4)
- Trucks (Haul away) (4)
- Pick-up trucks (8)
- Crew vehicles (2)

While, the corridor for the Proposed Project is located directly east of the FDR Drive, the Proposed Project would not require any closings or impediments to the FDR Drive or other roadways, key pedestrian facilities, parking lanes, bicycle routes or transit services. Based on the projected low volume of construction-related vehicles during construction, no potential traffic impacts are anticipated to occur during construction.

The area already contains high background ambient noise levels, so much of the noise measured in the area results from vehicular traffic along the FDR Drive. These noise levels are comparable to other noise levels in a number of open space areas situated within a range of substantial noise generators. Construction of the Proposed Project would not result in noise increments above ambient noise levels in the area.

Construction of the Upland Bridge Connections to the Proposed Project would require temporary erosion and sediment controls at touchdown areas and pier foundations where existing soil or fill is disturbed during construction. Erosion and sedimentation control plans would be developed and incorporated into the project.

3 **Impacts on Surface Water**: *Proposed action may affect one or more wetlands or other surface water bodies (e.g., streams, rivers, ponds or lakes).*

Construction of the esplanade over the East River would increase the amount of impervious surface by approximately 5 acres. A Stormwater Pollution Prevention Plan (SWPPP) would be required for the Proposed Project. Runoff from the bike path is proposed to discharge to flow-through stormwater planters constructed in the median. The stormwater planters are an infiltration or filtering practice which use soil infiltration and biogeochemical processes to improve water quality. The treated runoff would flow into perforated underdrains near the bottom of the planter. The underdrains would be connected to downspouts placed through the concrete deck and structure to the river below. Situations where discharges of treated stormwater could cause erosion or disturbance of the river mudline or silt bottom below the esplanade would be avoided or mitigated with baffles if needed to reduce discharge velocities.

Drainage slots through the pedestrian path parapet will discharge the gutter flows from the pedestrian path to the river below. Installation of screens to capture trash and debris at the slot openings are an option to provide a minimum level of treatment of the pedestrian path runoff. The screens would be designed to facilitate regular maintenance intervals.

<u>c. The p*roposed action may involve dredging more than 100 cubic yards of material from a wetland or water body.*</u>

There would be no dredging as part of the Proposed Project. In order to facilitate the placement of the support piles, it is estimated that 3,524 cubic yards of material (in the form of fill, silt, rubble and bedrock) would be need to be *excavated*. The material would be hauled off-site and disposed of in an appropriate facility. Project related improvements at several off-site locations within the New York Harbor have been identified as credits to offset the project debits. The improvements generally involve in-kind pier, structure, and debris removals with the intent of restoring the littoral zone/benthic habitat.

A Biological Assessment (BA) was prepared pursuant to Section 7 of the Endangered Species Act (ESA), as amended**.** That document details the expected effects on these species which include: shortnose sturgeon (*Acipenser brevirostrum*), five Distinct Population Segments (DPS) of Atlantic sturgeon (*Acipenser oxyrinchus*), one DPS of loggerhead sea turtle (*Caretta caretta*), Kemp's ridley sea turtle (*Lepidochelys kempii*), green sea turtle (*Chelonia mydas*), and leatherback turtle (*Dermochelys coriacea*). Designated critical habitat is not present within the Proposed Project area for these listed species. Based on the analysis provided in the BA, it is concluded that while the proposed esplanade may have the potential to adversely affect individual transient shortnose and Atlantic sturgeon and marine turtles in the immediate vicinity of pile placement, resulting in an incidental take, the Proposed Project is not likely to jeopardize the continued existence of their corresponding populations.

An Essential Fish Habitat (EFH) study was prepared pursuant to the Magnuson Fishery Conservation and Management Act (MSFCMA) to analyze potential impacts to federally-managed fishes and invertebrates from the proposed construction. The effects evaluated in the EFH include those associated with expected pile driving and drilling, the re-suspension of sediment, increased vessel traffic associated with construction, and effects associated with the addition of permanent structure within the East River (e.g. shading).

The results of the EFH assessment are:

- Minor increases in turbidity and sedimentation may be generated by the proposed construction activities; however, these increases would be exceedingly small and localized;
- If eggs and larvae are present during construction, they could be affected by any increases in turbidity, however these increases would be insignificant;
- During construction activities, adult and juvenile fish may leave the area of construction and move to nearby suitable locations outside the area of disturbance;
- After construction, there would may be a reduction in benthic organisms in and adjacent to areas that were affected by construction activities (spud pile footprints, anchor drag, etc.) but they would recover quickly;
- Underwater acoustic energy at levels that may injure fish would likely not occur. Steel piles would be installed with drilled shafts and driven with a vibratory hammer. An impact hammer may be necessary to seat piles; however, it is anticipated the seating of a pile could be accomplished at low energy with only a few hammer blows;
- The removal of water column and benthic EFH would have exceedingly small and insignificant, long-term impacts; and
- The Proposed Project would not impact the water flow and circulation of the East River's West Channel.

Based on the analysis provided in the EFH assessment, it is concluded that, while construction activities may affect individual fish in the immediate vicinity of the Proposed Project, they would not adversely affect populations of EFH fish species or their habitats. Any impacts would be exceedingly small and insignificant. The impacts would not threaten the long-term survivability of EFH managed species or their potential prey species. Upon cessation of construction activities, changes within the Proposed Project area would not inhibit fish movement, increase or decrease water velocity, substantially reduce potential long-term food resources, or affect water quality.

d. The proposed action may involve construction within or adjoining a freshwater or tidal wetland, or in the bed or banks of any other water body.

See discussion of impacts from construction of the Proposed Action on the East River above.

It has been determined that there are NYSDEC regulated tidal wetlands within the study area associated with the East River. As per NYSDEC mapping, the waters within and adjacent to the project area are mapped as LZ (littoral zone). NYSDEC regulates tidal wetlands between the spring high tide line and 6 feet below mean low water. Care will be taken during design to avoid and minimize any impact to these wetlands. A shading study conducted in the summer of 2013 indicated the potential for these wetlands to be in partial shading during mid-morning hours. The wetlands consist of sparsely vegetated rocks.

5 Impacts on Flooding: The p*roposed action may result in development on lands subject to flooding.*

b. The proposed action may result in development within a 100 year floodplain.
The Proposed Project would be within the 100 year floodplain of the East River, as indicated by FEMA on the GIS data base. In accordance with the provisions of 6 NYCRR 502, *Flood Plain Management for State Projects*, the practicality of alternatives to any floodplain encroachments were considered and evaluated. The results of this evaluation indicate that the amount of flood plain area would not change with any reasonable alternative. Additionally, this evaluation finds that (1) a significant encroachment to

the floodplain would not occur with the Proposed Project, (2) there is no significant potential for interruption or termination of a transportation facility which is needed for emergency vehicles, and (3) the Proposed Project would have no significant impacts on natural beneficial floodplain values.

The Proposed Project would be constructed at 2.20-ft above the 2088 mean high water line of the East River that would be expected to withstand major storm events and sea level rise that may occur as a result of climate change.

c. The proposed action may result in development within in a 500 year floodplain.

See above.

10 Impact on Historic and Archeological Resources: The proposed action may occur in or adjacent to a historic or archaeological resource.

a. The proposed action may occur wholly or partially within, or substantially contiguous to, any building, archaeological site or district which is listed on or has been nominated by the NYS Board of Historic Preservation for inclusion on the State or National Register of Historic Places.

Three resources within the historic architectural APE have been previously evaluated:

- Sutton Place Historic District – S/NRHP-listed resource
- Ed Koch Queensboro Bridge – S/NRHP-listed and LPC-designated resource
- Lamppost – LPC-designated resource

In addition, 27 resources over 50 years old were identified in the historic architectural APE. Of these, eight resources appear to be historically and/or architecturally significant, and retain integrity. In a letter dated August 15, 2013, NYSHPO determined the eight resources S/NRHP-eligible and concurred that the remaining resources were not eligible (see Appendix B). These S/NRHP-eligible resources include:

- FDR Drive
- Queens Midtown Tunnel and Ventilation Building
- UN Headquarters
- 1 Beekman Place
- River House – 435 East 52nd Street
- Cannon Point South – 45 Sutton Place
- Cannon Point North – 25 Sutton Place
- 1 Sutton Place South

Only one resource would be directly affected by the proposed esplanade, the FDR Drive. The highway would be impacted by the introduction of pedestrian overpasses that would provide access to the esplanade from the west side of the highway. However, because the FDR Drive is currently spanned by a number of overpasses, introduction of two additional overpasses would be in keeping with the character of the existing setting, and would therefore not alter the characteristics that contribute to its significance. As a result, the Proposed Project would have no adverse effect on the FDR Drive.

In terms of indirect effects, the proposed esplanade would be visible from the 11 historic architectural resources. Of these 11 resources, the significance of six resources (Sutton Place Historic District, 1 Beekman Place, River House, Cannon Point North, Cannon Point South, and 1 Sutton Place South) is tied, in part, to river views. Therefore, construction of the proposed esplanade has the potential to impact the setting of these resources. Similarly, the proposed esplanade would also be visible from five resources (Ed Koch Queensboro Bridge, Lamppost, FDR Drive, Queens-Midtown Tunnel and Ventilation Building, and UN Headquarters) whose significance is not specifically tied to river views, although the river is in their viewshed. Of these, one (Lamppost) is a historic replica, and as a result, the project would have no effect on it.

In terms of the six resources whose river views are integral to their significance, the proposed esplanade would be constructed at a lower elevation, and would only be approximately 40-feet wide. While the proposed esplanade would be visible, it would not obstruct views of the East River, or of the resources from the river. Therefore, the proposed esplanade would not diminish the integrity of the setting of these resources because the setting would generally remain the same. Similarly, for the five resources where river views are not integral to their significance, the proposed esplanade would also have no adverse effect because it would not diminish the integrity of their setting. Therefore, overall, construction of the proposed esplanade would not adversely affect historic architectural resources in the APE. A final determination by OPRHP is still pending.

11 Impact on Open Space and Recreation: The proposed action may result in a loss of recreational opportunities or a reduction of an open space resource as designated by any adopted municipal open space plan.

b. The proposed action may result in the loss of a current or future recreational resource.

The Upland Bridge Connection at 54th Street would include a pedestrian ramp (built to ADA specifications) that would impact 0.2 acres along the northern edge of Sutton Parks, a small publicly-owned open space west of the FDR Drive between East 53rd and 54th Streets. The seating and general use of the park would not be affected; however, direct views of the water would be partially obstructed by the pedestrian ramp. The pedestrian bridge would effectively extend the park use across the FDR Drive, providing direct access to improved, unobstructed views of the East River, with additional amenities.

13 Impact on Transportation: The proposed action may result in a change to existing transportation systems.

e. The proposed action may alter the present pattern of movement of people or goods.

The Proposed Project would fill in an existing gap in the Manhattan Waterfront Greenway along the East River. The Proposed Project would connect the pedestrian-bicycle routes north and south of the project limits in accordance with the New York City Bicycle Network.

The bicycle networks that could provide an alternative route to the existing Manhattan Waterfront Greenway along the east side of Manhattan include northbound bicycle lanes on First Avenue and southbound bicycle lanes on Second Avenue, with east/west connections as designated by the New York City Bicycle Network. However, the gaps in the First Avenue lanes between East 49th and East 60th Streets and the Second Avenue lanes between East 34th and 60th Streets (due to vehicular traffic congestion in those areas) means that those lanes cannot provide adequate bicycle connectivity and continuity.

The Proposed Project would reroute pedestrians and bicyclists from First and Second Avenues to the Manhattan Waterfront Greenway.

APPENDIX N
Executive Order 11990
Wetland Finding

Federal Highway Administration
New York State Department of Transportation

East Midtown Waterfront Esplanade and Greenway DR/EA
P.I.N. X776.00 and X770.14
East 41st Street to East 60th Street on the East River, New York City, New York
Executive Order 11990 Wetland Finding

This action complies with Executive Order 11990, Protection of Wetlands.

Approved ______________________ FHWA ______________ Date

Approved ______________________ NYSDOT 12·5-2014 Date

Federal Highway Administration
New York State Department of Transportation

East Midtown Waterfront Esplanade and Greenway DR/EA
P.I.N. X776.00 and X770.14
East 41st Street to East 60th Street on the East River, New York City, New York
Executive Order 11990 Wetland Finding

This statement sets forth the basis for a finding that there is no practical alternative to the construction of the East Midtown Waterfront Esplanade and Greenway that would reduce impacts to tidal wetlands. The DR/EA has satisfactorily addressed project effects on wetlands in accordance with Executive Order 11990 on “No Net Loss” of wetlands.

Project Description

The East Midtown Waterfront Esplanade and Greenway (“Proposed Project”) is a proposed approximately 0.96 mile long esplanade located along the Manhattan side of the East River in New York, New York. The Proposed Project is offset approximately 30 feet from the eastern side of the Franklin D. Roosevelt East River (“FDR”) Drive (Route 907L), from East 41st Street to East 60th Street, which together define the project limits.

The Proposed Project includes:

- The United Nations Esplanade (“UN Esplanade”) located along the waterfront adjacent to the United Nations Headquarters and other high-rise developments from East 41st to 53rd Streets.
- The Outboard Detour Roadway Esplanade (“ODR Esplanade”) located along the waterfront from East 53rd to 60th Streets, where a portion of the proposed esplanade would be placed over existing ODR caissons.
- Two new upland pedestrian bridge connections (“Upland Bridge Connections”) are also proposed to connect the landside west of the FDR Drive to the Proposed Project at East 48th Street and at East 54th Street.

Alternatives Considered

A No-Action and two build alternatives are evaluated in detail within the DR/EA. Under the No-Action Alternative, no additional esplanade would be constructed along the East River waterfront between East 41st and East 60th Streets. There would be no new waterfront access or new open space created; therefore, the purpose and need would not be achieved. Alternative 1, Single Shared-Use Path, would involve construction of a 40-foot wide shared-use esplanade, offset approximately 30 feet eastward from the bulkhead along the shoreline, from East 41st to 60th Streets that would accommodate bicyclists and pedestrians (walkers, joggers, skaters) within a shared pathway. Alternative 2, Separated Bicycle and Pedestrian Paths, would similarly involve construction of a 40-foot wide esplanade, offset approximately 30 feet eastward from the bulkhead, from East 41st to 60th Streets. However, Alternative 2 would include a two-way bicycle-only path (“bike path”) that would provide Class I operations and a separate pedestrian path. Under both build alternatives, Upland Bridge Connections at East 48th and East 54th Streets would be provided. At the location of each bridge connection, the proposed esplanade would be widened an additional 10 feet (for a total 50 feet) into the East River to provide safe circulation space and to incorporate water dependent uses.

As a result of conflicts between bicyclists and pedestrians and other users on the shared path, Alternative 1 would operate at a poor level of service conditions (LOS "E" and "F" in the morning and evening peak periods, respectively) and below the level of service required under NYSDOT guidelines. In contrast, acceptable level of service conditions (LOS "C" in both peak periods) would be achieved with Alternative 2, which has separate bicycle and pedestrian paths. Both alternatives would involve approximately the same amount of landside and waterside construction activities and associated potential impacts, including wetland impacts. Therefore, the Preferred Alternative is Alternative 2, Separate Bicycle and Pedestrian Paths.

Determination of Wetlands and Mitigation within the Project

No freshwater wetlands exist within the limits of the Proposed Project over the East River. It has been determined that there are tidal wetlands within the study area that are regulated by the U.S. Army Corps of Engineers ("USACE") under Section 404 of the Clean Water Act. The wetlands are associated with the East River and consist of sparsely vegetated rock outcrops between East 55th Street and East 58th Street.

The Proposed Project would be offset approximately 30 feet from the Manhattan shoreline. This separation avoids direct impacts to tidal wetlands located at rock outcrops. However, a shading study of the potential effects of the Proposed Project indicated the potential for these wetlands to be in partial shading during mid-morning hours. The final design process will consider wetland impacts by attempting to avoid wetlands and minimizing impacts when wetlands cannot be avoided.

Proposed activities will require a USACE Section 404 wetlands permit. Permits would be obtained prior to commencement of construction; the Proposed Project would adhere to any conditions or requirements stipulated in the permits. Because the Proposed Project would likely meet the conditions of Nationwide Permit #15 (U.S. Coast Guard Approved Bridges) and have direct impacts to less than 0.10 acre of wetlands, no wetland mitigation would be required.

Should it become necessary to modify or otherwise revise this preliminary finding with the completion of the project's design phases, an updated Wetland Finding will be prepared and circulated for review and concurrence.

Finding

In accordance with Executive Order 11990 and based upon the above consideration, it is determined that there is no practicable alternative to the proposed new construction in the vicinity of wetlands. The Proposed Project includes all practicable measures to minimize harm to the wetlands which may result from such use.

APPENDIX O

USCG Comments on the DR/EA

December 23, 2015

United States Coast Guard, Permit Application

A Public Comment period for the U.S. Coast Guard permit application for the East Midtown Waterfront Esplanade and Greenway was open from June 17 to July 17, 2015. Comments were received from the U.S. Coast Guard and the New York Police Department, Counterterrorism Division. The comments and responses are presented in the table below.

Response to Comments
December 23, 2015

No.	Comment	By	Response from EDC
1	After reviewing Public Notice 1-145 Proposed Construction of the East Midtown Waterfront Esplanade Bridge at New York, NY, Tennessee Gas Pipeline does not have facilities within this area.	David Wood, Project Manager – Ops, Kinder Morgan	Comment acknowledged.

No.	Comment	By	Response from EDC
2	The proposed plan indicates that the esplanade structure "has been designed to withstand vessel impact by limiting damage to localized sections and preventing a complete failure of the esplanade." The NYPD-CTD would like to know what size vessel would cause such a failure and what constitutes localized failure. Previous designs presented to NYPD-CTD could not survive a strike by a runaway barge or other typical vessels that travel the East River daily. Previous explanations of what localized failure means is that a 100 foot section would fail dumping its occupants into the East River. Since this structure is a bridge, it has to be designed according to the Federal Highway Authority (FHWA) specifications. The FHWA & other agencies like NYC DOT use the "level of service" criteria to establish acceptable crowding conditions on walkways/sidewalks. The levels of service range from passing (not crowded) to failing (overcrowded). Levels of service "C" & "D" are considered acceptable. Under the proposed plan, if a 100 foot section (40 ft wide) were to fail at a FHWA Level of Service "c" or "D", that would result in approximately 166 to 266 people falling into the East River. (http://www.fhwa.dot.gov/pubications/research/safety/pedbike/98107/section3.cfm) [see Table 4 and Figure 5]	Sgt. Martin Wingert, NYPD Counterterrorism Division	The project is currently in conceptual design; therefore, vessel impact criteria for the structure have not yet been finalized. However, as currently envisioned, a runaway barge or large ferry, such as those servicing Staten Island or Governors Island, would be likely to cause structural failure to a localized section of the esplanade. These vessels could cause failure ranging from yielding of steel elements, cracked concrete section (as occurred at Yankee Pier at Governors Island circa 1980), or permanent deformation/lateral displacement of the esplanade requiring closure until the structure is repaired, up to extreme impact events resulting in yielding of piling and potential collapse of the deck super-structure. Most structures built within NY Harbor are vulnerable to these types of failure. The esplanade is considered an important recreational asset, but should not warrant the same level of protection as a heavily traveled roadway. FHWA guidelines were used to determine LOS. Using AASHTO standards, the Method III approach was used to determine fender protection requirements. This method indicates that an esplanade fender protection system is not required. Other recreational waterfront structures in the harbor do not have fender protection, using a similar rationale.

No.	Comment	By	Response from EDC
3	The 2004 Outboard Detour Roadway (ODR) which was the impetus for this project had a bumper system that ran the entire length of the ODR to protect it from the "that the 2,100 vessels a year that pass through that stretch of water would not strike the roadway." (New York Times, 12/26/06, http://www.nytimes.com/2006/12/26/nyregion/26park.html?ref=nyregion&r=O). The NYPD-CTD would like to ensure equal protection of pedestrians that was afforded vehicles on the FDR.	Sgt. Martin Wingert, NYPD Counterterrorism Division	The ODR was critical infrastructure that could not be out of service. The esplanade is for recreational use only. Although a bumper system would offer protection, it is not a code requirement to provide one.
4	Rescue operations by first responders (USCG, NYPD & FDNY) for aided cases in that 30 foot buffer created between the esplanade and the FDR bulkhead would be extremely difficult to perform in the currents of the East River.	Sgt. Martin Wingert, NYPD Counterterrorism Division	The project is in currently in conceptual design. As design progresses the offset from the bulkhead may be adjusted if there are significant safety concerns.
5	The elevation of the structure above the water will pose a threat to small boats that may get drawn under or into the structure.	Sgt. Martin Wingert, NYPD Counterterrorism Division	The project is currently in conceptual design. As design progresses the elevation above water may be adjusted or other features incorporated to ensure public safety. While a hanging fender system attached to the side of the esplanade could impede recreational vessels from being drawn under the structure, it could also impede access for maintenance and require maintenance itself due to damage from debris or ice. Signage to warn people to stay at least 100 feet away could also be incorporated.

No.	Comment	By	Response from EDC
6	The full esplanade upon completion will be over a mile long (5,613 ft) with only four egress points some as far as one-quarter mile apart. The NYPD-CTD would like to see how a fully occupied esplanade (ie. Macy's 4th of July Celebration) could be safely evacuated without creating pinch points or crushing hazards typical in crowd disasters. (see the NIST report on The Station Fire 2003, http://www.nist.gov/manuscript-publication-search.cfm ?pub id=100988 & the Analysis of the Love Parade Disaster http://www.epjdatascience.com/content/pdf/epjds7 .pdf)	Sgt. Martin Wingert, NYPD Counterterrorism Division	The maintenance entity for the esplanade (yet to be determined) will evaluate safety concerns during crowd disasters, in consultation with NYPD and FDNY, prior to opening.
7	Will the esplanade be capable of supporting vehicles such as an ambulance? If no, the limited access & egress points will hamper emergency response. Response by first responders will be by foot and all equipment must be hand carried.	Sgt. Martin Wingert, NYPD Counterterrorism Division	Yes, an ambulance could be supported.
8	NYPD-CTD would like to know what the allowable occupancy for this structure is and who has oversight and enforcement responsibilities. CTD is aware that since this proposed esplanade structure is a bridge it does not adhere to the normal life safety protections as set forth by the NYC Building Code. This structure is surrounded by water on three sides and evacuating to a safe haven or area of refuge is not easily achieved on this structure.	Sgt. Martin Wingert, NYPD Counterterrorism Division	Oversight or enforcement responsibility is likely to be undertaken by a City agency to be determined. It is agreed that NYC Building Code may not govern allowable occupancy for this structure. This concern as well as safety and evacuation concerns will be addressed as part of the design process.

No.	Comment	By	Response from EDC
9	NYPD-CTD would like to see how vessels could dock at this structure to effect evacuations.	Sgt. Martin Wingert, NYPD Counterterrorism Division	Two berths are envisioned, as depicted at/near the 49th and 54th Street nodes. The berths would comprise two piles supporting a timber frame/face, with cleats for the vessels to tie to. Details regarding access between the vessel and esplanade would be refined during the design stages. It is possible to position two large diameter floating fenders (e.g., Seagard-type) in front of the timber face to provide standoff/relief.
10	This proposed structure pose significant security issues adjacent to the United Nations Campus and should be closed during the annual UN General Assembly events as is First Avenue during these proceedings. This structure will become likely surpass Dag Hammarskjold as the preferred protest location for various activist groups year round. The structure will increase the amount of time necessary for security sweeps of the area in the vicinity of the UN by the NYPD.	Sgt. Martin Wingert, NYPD Counterterrorism Division	Closures of this recreational facility are anticipated, as required. In addition, the maintenance entity would coordinate with the Coast Guard regarding evacuation planning for the UN.
11	a. The proposed esplanade is close to the Federal navigation channel making it susceptible to wake, surge, and/or allision damage during, and after, construction is completed. If a permit is issued for this project, the Coast Guard does not intend to place any operational limitations on commercial vessels using the adjacent waterway after installation of the esplanade.	W.M. Grossman, CG Sector	The esplanade structure will be designed to handle wakes, waves, and surge effects from natural environmental conditions and vessels navigating alongside the esplanade. As currently conceptualized, the esplanade would be able to withstand a 10K impact load. EDC acknowledges that the Coast Guard has no intention of placing operational controls on vessel traffic after the esplanade is constructed, and any mitigation measures to limit risk associated with vessel allisions would need to be designed into the structure rather than through operational restrictions on vessels.

No.	Comment	By	Response from EDC
12	b. The four foot vertical clearance at mean high water will restrict, if not prohibit, the ability of Federal, State, and local response agencies from responding to distress calls that involve persons in the water between the Manhattan shoreline and the esplanade.	W.M. Grossman, CG Sector	The project is in currently in conceptual design. As design progresses the clearance may be adjusted if there are significant safety concerns.
13	We request that any permit you issue require the permittee to: a. Ensure all project construction details are published in the First Coast Guard District Local Notice to Mariners prior to beginning any work.	W.M. Grossman, CG Sector	Construction schedule and methods will be published prior to construction.
14	b. Provide a presentation at a Port of NY/NJ Harbor Operations Committee meeting. This presentation must include a description and proposed timeline of the esplanade construction. Work impacting the Federal navigation channel must be kept to a minimum and may be delayed due to the needs of tug & barge or ship traffic. Please contact Ms. Lucy Ambrosino, Port Authority of NY/NJ at lambrosi@panynj.gov to arrange your presentation.	W.M. Grossman, CG Sector	EDC presented to the Harbor Ops Steering Committee on 9/2 and to the full Committee on 9/16.
15	c. Provide a follow-on detailed presentation of the proposed esplanade construction at Sector New York. Attendees will include representatives from the tug & barge industry, vessel pilots, and the USCG. Requests to temporarily obstruct the navigable waters of the East River during construction or future repairs/maintenance must be identified at this meeting (i.e. two breasted barges operating as a single unit).	W.M. Grossman, CG Sector	Arrangements for a follow-on presentation will be made, if necessary.

No.	Comment	By	Response from EDC
16	d. If necessary, request the establishment of a Regulated Navigation Area or Limited Access Area during construction as per 33 CFR 165.5. This request must be submitted in writing to SECNY (spw). This request would require the USCG to open a Federal Docket and publish a notice and comment rulemaking as per 33 CFR Subpart 1.05 – Rulemaking. This request may not be granted, or changes to the construction/maintenance operations may be required, based upon the public comments received.	W.M. Grossman, CG Sector	This request will be made, if necessary.
17	e. No water based work or shore based diving operations will be authorized during enforcement of the United Nations security zone (33 CFR 165.164) between East 35th Street and the Queensboro/Ed Koch bridge while the United Nations General Assembly is in progress. All water based equipment must be removed from the security zone during enforcement operations. The United Nations General Assembly is held annually in the September-October timeframe. Other enforcement dates/times may be necessary.	W.M. Grossman, CG Sector	Comment acknowledged.
18	f. Notify the National Oceanic and Atmospheric Administration of the project completion and specifications so they may initiate the appropriate chart and Coast Pilot corrections. This must be submitted online at <http://ocsdata.ncd.noaa.gov/idrs/discrepa ncy.aspx>.	W.M. Grossman, CG Sector	NOAA will be notified after construction is complete.
	g. Ensure any current, or future, outdoor lighting is located or shielded so that it is not confused with any aids to navigation and does not interfere with navigation on the adjacent waterway. If installed, the lights must be white and non-flashing.	W.M. Grossman, CG Sector	Comment acknowledged.