





TRANSIT AUTHORITY GENERAL NOTES

- 1. THE NYC TRANSIT (NYCT) RESERVES THE RIGHT TO PLACE INSPECTORS, FLAGMEN OR OTHER PERSONNEL IN THE SUBWAY STRUCTURES DURING CONSTRUCTION OF THE PROJECT LINKED BY A TELEPHONE SYSTEM, IF DEEMED NECESSARY, TO OBSERVE THE EFFECTS OF THE CONSTRUCTION ON THE TRANSIT FACILITIES. NYCT FURTHER RESERVES THE RIGHT TO PLACE SUCH PERSONNEL WHENEVER, IN ITS OPINION, THE PROJECT CONDITIONS WARRANT SUCH PLACEMENT, REGARDLESS OF DISTANCE. THE COST OF SUCH PERSONNEL INSTALLATION AND ANY RE-ROUTES OR DIVERSIONS OF SERVICE, WORK TRAINS, ETC., MADE NECESSARY BY THE PROJECT, MUST BE BORNE BY THE PROJECT OR THE RESPONSIBLE NEW YORK CITY/STATE AGENCY.
2. ALL ROCK EXCAVATION ADJACENT TO THE TRANSIT STRUCTURE IS TO BE CHANNEL DRILLED TWO FEET BELOW SUBGRADE.
3. IF TOP OF ROCK IS FOUND BELOW SUBWAY STRUCTURE, THE SUBWAY STRUCTURE MUST BE UNDERPINNED IN ACCORDANCE WITH DRAWINGS TO BE SUBMITTED TO NYCT FOR APPROVAL.
4. IF ROCK IS SOFT OR SEAMY, LATERAL SUPPORTS MUST BE PROVIDED BELOW THE SUBWAY STRUCTURE IN ACCORDANCE WITH DRAWINGS TO BE SUBMITTED TO NYCT FOR APPROVAL.
5. BLASTING WILL BE PERMITTED ONLY WITH LIGHT CHARGES SUBJECT TO THE APPROVAL OF NYCT'S ENGINEER AND IN ACCORDANCE WITH THE REGULATIONS OF THE FIRE DEPARTMENT. THE CONTRACTOR SHALL PROVIDE A DETAILED MONITORING PLAN, PROVIDING FOR MEASUREMENTS OF BOTH PARTICLE VELOCITY AND DISPLACEMENTS AT CRITICAL LOCATIONS OF THE NYCT STRUCTURE. THE MONITORING PLAN SHALL INCLUDE THRESHOLD AND UPSET LEVELS OF BOTH PARTICLE VELOCITY AND SETTLEMENT TOGETHER WITH AN ACTION PLAN FOR THEIR IMPLEMENTATION. THE CONTRACTOR SHALL SECURE AN APPROVED SEISMOLOGIST TO INSTALL AND OPERATE SUITABLE VELOCITY GAUGES TO CONTINUOUSLY MONITOR PARTICLE VELOCITY AND AN INDEPENDENT LICENSED SURVEYOR TO MONITOR DISPLACEMENTS. THE PRESENCE OF A QUALIFIED TECHNICIAN FROM MONITORING COMPANY IS NECESSARY TO PROVIDE THE VIBRATION READING UPON REQUEST OF NYCT ENGINEER. THE THRESHOLD MAXIMUM PARTICLE VELOCITY ABOVE AMBIENT CAUSED BY THE BLASTING WILL BE 0.5 INCH PER SECOND. VALUES EXCEEDING THIS LEVEL WILL BE REVIEWED AND EVALUATED BY NYCT'S ENGINEER. IN NO CASE WILL PARTICLE VELOCITIES EXCEED THE UPSET LEVEL OF 2.0 INCHES PER SECOND.
6. BEFORE PLACING CONCRETE, THE SUBGRADE OF THE FOUNDATIONS IN THE VICINITY OF THE SUBWAY STRUCTURE IS TO BE INSPECTED AND APPROVED BY NYCT'S ENGINEER.
7. IF ANY PORTION OF THE SUBWAY STRUCTURE OR FINISH IS DAMAGED, IT SHALL BE REPAIRED OR REPLACED WITH THE SAME MATERIALS IN PLACE, SUBJECT TO THE APPROVAL OF NYCT'S ENGINEER AND AT THE EXPENSE OF THE PROJECT.
8. EXCAVATION EMBANKMENTS ARE TO BE SHORED AND BRACED. DRAWINGS INDICATING A SUGGESTED METHOD OF CONSTRUCTION ARE TO BE SUBMITTED TO NYCT FOR APPROVAL IN CONJUNCTION WITH THE PROJECT'S CONTRACT DRAWINGS. IN CASE OF EXCAVATION UNDERMINING THE SUBWAY STRUCTURE, UNDERPINNING MAY BE REQUIRED. DRAWINGS FOR UNDERPINNING ARE TO BE SUBMITTED TO NYCT FOR APPROVAL.
9. TEMPORARY SHORING MAY BE PLACED IN DIRECT CONTACT WITH NYCT STRUCTURES ONLY IF THE NYCT STRUCTURE IS SHOWN TO BE ABLE TO SUPPORT ALL ANTICIPATED LOADS THAT CAN BE TRANSFERRED THROUGH THE TEMPORARY STRUCTURES WITHOUT DAMAGING THE EXISTING STRUCTURE. AT THE COMPLETION OF THE PROJECT, THESE TEMPORARY SHORING AND BRACING SYSTEMS ARE TO BE REMOVED OR CUT-OFF AS APPROVED BY NYCT.
10. WHEN PILES ARE TO BE DRIVEN OR DRILLED ADJACENT TO THE SUBWAY STRUCTURE, BORING DATA, PILE LAYOUTS, SPECIFICATIONS AND INSTALLATION PROCEDURES ARE TO BE SUBMITTED TO NYCT FOR APPROVAL. VELOCITY METERS ARE TO BE INSTALLED IN THE SUBWAY TUNNEL AT CRITICAL LOCATIONS TO MONITOR INDUCED VIBRATIONS, INDUCED DISPLACEMENTS ALONG THE TUNNEL STRUCTURE AND TRACK INVERT ARE TO BE MONITORED DURING DRIVING OR DRILLING. THE THRESHOLD MAXIMUM PARTICLE VELOCITY ABOVE AMBIENT CAUSED BY THE DRIVING OR DRILLING WILL BE 0.5 INCH PER SECOND. VALUES EXCEEDING THIS LEVEL WILL BE REVIEWED AND EVALUATED BY NYCT'S ENGINEER. IN NO CASE WILL PARTICLE VELOCITIES EXCEED THE UPSET LEVEL OF 2.0 INCHES PER SECOND.
11. NO PILES ARE PERMITTED TO BE INSTALLED BY ANY METHOD WITHIN THREE FEET OF SUBWAY STRUCTURE, MEASURED FROM THE EDGE OF THE PILE OR CASING TO THE WALL. CLOSED-END PILES WILL NOT BE PERMITTED TO BE DRIVEN WITHIN TEN FEET OF THE SUBWAY STRUCTURE.
12. ALL PILES ARE TO BE PLACED WITHIN A PRECAUTIONED CASED HOLE TO THE INFLUENCE LINE. THE CASING SHALL BE CLEANED WITHOUT DISTURBING THE SOIL OUTSIDE THE CASING AND THE PILE TO BE PLACED WITHIN THE CASING FOR INSTALLATION. THE PILES MAY THEN BE DRIVEN BEYOND THE INFLUENCE LINE WITHIN THE CASING.
13. THE INFLUENCE LINE SHALL START AT THE BOTTOM OF THE SUBWAY STRUCTURE AND EXTEND FROM 1H:1V TO 2H:1V SLOPE DEPENDING ON THE SOIL PROPERTIES AND GROUND WATER TABLE. FOR PILES INSTALLED WITHIN TEN FEET OF THE SUBWAY STRUCTURE, THE CASING SHALL BE EXTENDED UP TO THE BOTTOM OF THE SUBWAY STRUCTURE.
14. ALL PILES ARE TO BE DRIVEN OR DRILLED A MINIMUM OF TEN FEET BELOW THE INTERSECTION OF THE PILE CENTERLINE AND THE INFLUENCE LINE OF THE SUBWAY STRUCTURE.
15. THE USE OF "DOWN-THE-HOLE -HAMMERS" FOR INSTALLATION OF PILES THROUGH OVERBURDEN AND FILL WILL BE PERMITTED ONLY TO REMOVE BOULDERS. IT WILL NOT BE PERMITTED AS A MATTER OF COURSE TO ADVANCE THE HOLE. THEIR USE TO CONSTRUCT ROCK SOCKETS WILL NOT BE ALLOWED WITHIN 5 FEET OF THE NYCT STRUCTURE. THE USE OF MACHINE UTILIZING AIR FOR SOIL REMOVAL WILL NOT BE ALLOWED.
16. VIBRATORY HAMMERS WILL NOT BE PERMITTED WITHIN 75 FEET OF SUBWAY STRUCTURES. HOERAMS WILL NOT BE PERMITTED WITHIN 25 FEET OF SUBWAY STRUCTURES.
17. DYNAMIC COMPACTION METHODS USING DROPPED HEAVY WEIGHTS CANNOT BE CONDUCTED WITHIN 1000 FEET OF ANY NYCT STRUCTURE UNLESS IT IS SHOWN THAT INDUCED SETTLEMENTS AND VIBRATIONS WILL NOT DAMAGE THESE STRUCTURES. A SUITABLE MONITORING PLAN INCLUDING SETTLEMENT AND VIBRATION MEASUREMENTS MUST BE APPROVED BY NYCT'S ENGINEER FOR ALL SUCH OPERATIONS WITHIN THESE DISTANCES.
18. THERE SHALL BE NO MACHINE EXCAVATION WITHIN 3 FEET OF NYCT STRUCTURES, POWER DUCT LINES, OR ANY OTHER FACILITIES UNTIL THEY HAVE BEEN CAREFULLY EXPOSED BY HAND EXCAVATION.
19. ALL DEWATERING OPERATIONS CONDUCTED WITHIN 500 FEET OF THE NYCT STRUCTURE MUST BE PERFORMED IN ACCORDANCE WITH DRAWINGS AND PROCEDURES SUBMITTED TO NYCT FOR APPROVAL. THE DISTANCE FROM THE STRUCTURE TO THE DEWATERING OPERATION CAN BE REDUCED PROVIDED THAT SOIL CONDITIONS AT THE SITE INDICATE THAT THE RADIUS OF INFLUENCE OF THE DEWATERING IS LESS THAN 500 FEET. FOR DEWATERING WITHIN THE RADIUS OF INFLUENCE, THE DEWATERING PROGRAM MUST BE SHOWN TO HAVE NEGLIGIBLE INFLUENCE ON SETTLEMENTS OF THE NYCT STRUCTURE.
20. SUBWAY ENTRANCES (VENTILATORS, ETC.) ARE TO BE UNDERPINNED OR SHORED AND BRACED IF DIRECTED BY NYCT'S ENGINEER.
21. NYCT, AT ITS DISCRETION, RESERVES THE RIGHT TO REQUIRE THE PROJECT TO CLOSE OR MAINTAIN AND PROTECT EXISTING SUBWAY ENTRANCES, VENTILATORS, ETC. ADJACENT TO THE PROJECT DURING CONSTRUCTION. SUCH CONSTRUCTION MAY INCLUDE UNDERPINNING, SHORING, BRACING AND ERECTION OF SUITABLE BARRICADES AND/OR CANOPIES AND SHIELDS. SUCH PROTECTION SHALL BE IN ACCORDANCE WITH DRAWINGS SUBMITTED TO NYCT FOR APPROVAL.
22. IF SHIELDS ARE TO BE INSTALLED TO PROTECT NYCT FACILITIES AND/OR THE PUBLIC PLANS SHOWING THE LOCATION, TYPE AND METHOD OF ATTACHMENT TO THE TRANSIT STRUCTURE MUST BE SUBMITTED TO NYCT FOR APPROVAL.
23. ALL LUMBER AND PLYWOOD USED FOR PROTECTION OF SUBWAY FACILITIES MUST BE FIRE RETARDANT.
24. SUBWAY EMERGENCY EXITS MUST BE KEPT CLEAR AT ALL TIMES.
25. IN EXCAVATING OVER OR NEAR THE SUBWAY ROOF, SPECIAL CARE SHALL BE EXERCISED SO THAT THE THIN CONCRETE PROTECTION OF THE SUBWAY WATERPROOFING IS NOT DAMAGED.
26. BURNING OF, WELDING TO OR DRILLING THROUGH EXISTING STEEL STRUCTURES WILL NOT BE PERMITTED EXCEPT AS SHOWN ON DRAWINGS APPROVED BY NYCT.
27. HORIZONTAL AND VERTICAL CONTROL SURVEY DATA OF THE EXISTING NYCT STRUCTURE IS TO BE TAKEN BY A LICENSED LAND SURVEYOR TO MONITOR ANY MOVEMENTS THAT OCCUR DURING CONSTRUCTION AND TO SHOW THAT THE INDUCED MOVEMENTS ARE WITHIN ALLOWABLES NOTED BELOW. IF ANY MOVEMENTS EXCEED ALLOWABLES, REMEDIATION AS APPROVED BY NYCT SHALL BE PERFORMED.

Table with 3 columns: STRUCTURE, NOTIFY NYCT ENGINEER, STOP WORK. Rows include ELEVATED (1/8 INCH, 1/4 INCH) and SUBWAY (1/4 INCH, 1/2 INCH).

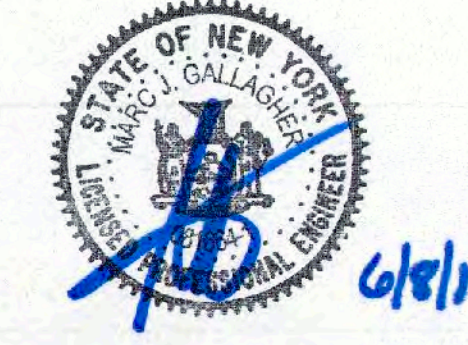
- 28. BUS ROUTES AFFECTED BY THE PROJECT WILL OR MAY REQUIRE BUS DIVERSIONS. THESE ARRANGEMENTS SHALL BE MADE THROUGH:
MS. SARAH WYSS
ACTING DIRECTOR, OPERATIONS PLANNING
NEW YORK CITY TRANSIT
2 BROADWAY, ROOM 417.82
NEW YORK, NEW YORK 10004
TELEPHONE NUMBER 646/252-5517
WHEN IMPACTING ANY BUS STOP, SPECIAL OPERATIONS MUST BE NOTIFIED TWO WEEKS IN ADVANCE.
29. DUCT LINES MUST BE MAINTAINED AND PROTECTED DURING CONSTRUCTION. ANY INTERFERENCE WITH DUCT LINES SHOULD BE REPORTED TO NYCT INSPECTOR. WHEN A DUCT LINE CONTAINING CABLES IS TO BE REMOVED, OR WHEN MASONRY ADJACENT THEREIN IS TO BE REMOVED, PENETRATED, OR DRILLED, THE WORK SHALL BE DONE WITH HAND LABOR ENTIRELY, USING HAMMER AND CHISEL. JACKHAMMERS, BULL POINTS OR OTHER POWER EQUIPMENT SHALL NOT BE USED.
30. WHERE MANHOLES ARE ENCOUNTERED:
a) THEY SHALL BE PROTECTED AND RAISED OR LOWERED AS REQUIRED, TO MATCH THE NEW STREET GRADE.
b) IF MANHOLE COVERS ARE RAISED OR LOWERED, PROTECT CABLES IN MANHOLE BY WOOD SHEETING OF 2" NOMINAL THICKNESS.
c) PRIOR TO THE START OF CONSTRUCTION OPERATIONS AFFECTING MANHOLES AND DUCT LINES, SEVEN DAYS NOTICE MUST BE GIVEN TO MR. JOHN MALVASIO, P.E., ASSISTANT CHIEF ENGINEERING OFFICER, MAINTENANCE-OF-WAY, AT 718/694-1358.
31. CONSTRUCTION WORK DONE NEAR VENT GRATINGS AND HATCHES SHALL BE AS FOLLOWS:
a) UNLESS APPROVED BY THE NYCT'S ENGINEER, ALL VENT GRATINGS AND HATCHES SHOULD REMAIN OUTSIDE THE CONSTRUCTION SITE, SEPARATED BY A CONSTRUCTION FENCE. PROTECTIVE SHIELDS MUST BE PROVIDED OVER VENT GRATINGS AS REQUIRED BY NYCT'S ENGINEER.
b) NO BUILDING MATERIAL, VEHICLES OR CONSTRUCTION EQUIPMENT IS TO BE STORED OR RUN OVER VENT, GRATINGS, HATCHES OR EMERGENCY EXITS.
c) DETAILS OF SIDEWALK RECONSTRUCTION AROUND VENT GRATINGS, HATCHES AND EMERGENCY EXITS ARE TO BE SUBMITTED TO NYCT FOR APPROVAL.
32. TRACTORS, CRANES, EXCAVATORS, ETC. USED IN THE VICINITY OF THE ELEVATED STRUCTURES SHALL BE ISOLATED FROM THE GROUND. SINCE THE ELEVATED STRUCTURE IS USED AS A NEGATIVE RETURN PATH, WITH A CONSEQUENT POTENTIAL BETWEEN IT AND THE GROUND, ANY CONTACT BETWEEN THE STRUCTURE AND GROUNDED EQUIPMENT COULD RESULT IN BURNING OF THE STEEL.
33. TEMPORARY CONSTRUCTION SHEDS, BARRICADES OR PLYWOOD PARTITIONS MUST BE A MINIMUM OF 5'-0" FROM EDGE OF FINISHED PLATFORM.
34. STATION AREAS OR STAIRWAY/CLOSINGS: THE GENERAL REQUIREMENTS FOR STATION AREAS OR STAIRWAY/CLOSINGS ARE AS FOLLOWS:
a) ONLY ONE STAIRWAY AT EACH STATION WILL BE PERMITTED TO BE CLOSED AT THE SAME TIME. APPROVALS FOR CLOSING ANY STAIRWAY MUST BE OBTAINED FROM THE DIVISION OF STATION OPERATIONS AT LEAST THREE WEEKS IN ADVANCE.
b) MR. ASHOK PATEL, DIRECTOR, OFFICE OF STATION PROGRAMS; TELEPHONE 718/694-1695 OF THE DIVISION OF STATIONS MUST BE NOTIFIED ONE WEEK PRIOR TO THE ACTUAL CLOSING AND REOPENING OF THE ENTRANCE.
c) SIGNAGE MUST BE SUPPLIED AND POSTED AT LEAST ONE WEEK IN ADVANCE, ADVISING THE PUBLIC OF THE PROPOSED SUBWAY STAIR CLOSING. HOWEVER, IF IT IS AN ENTIRE ENTRANCE CLOSING, SIGNAGE MUST BE POSTED TWO WEEKS IN ADVANCE.
d) THE STREET ENTRANCE STAIRWAY SHOULD NOT BE CLOSED UNLESS MANPOWER AND MATERIALS ARE AVAILABLE TO COMMENCE WORK ON DATES PERMITTED.
e) ONCE THE CLOSING IS EFFECTED, CONSTRUCTION SIGNS MUST BE PLACED AT APPROPRIATE LOCATIONS ON THE BARRICADES AT THE STREET AND MEZZANINE LEVELS, STATING THE CONTRACTOR'S NAME, 24 HOUR EMERGENCY TELEPHONE NUMBER, CONTRACT NUMBER, THE DURATION OF THE CLOSING, DIRECTION TO AN ALTERNATE ENTRANCE/EXIT, AND AN APOLOGY FOR THE INCONVENIENCE TO OUR CUSTOMERS.
f) EXISTING STATION SIGNAGE MUST BE ADJUSTED TO REFLECT ANY CHANGES IN ACCESS/EGRESS.
g) BARRICADES ARE TO BE PAINTED AND KEPT GRAFFITI FREE AT ALL TIMES. THE CONTRACTOR MUST MAINTAIN THE BARRICADED AREA CLEAN OF ALL DEBRIS.
h) ALL MATERIALS ARE TO BE PROPERLY STORED AND SECURED AWAY FROM PASSENGER TRAFFIC.
i) THE CONTRACTOR MUST REMOVE ALL WASTE MATERIAL AND BARRICADES FROM ALL STATION AREAS WHEN CONSTRUCTION IS COMPLETED.
j) INSPECTION OF THE AREA UNDER CONSTRUCTION BY AUTHORIZED STATION DEPARTMENT EMPLOYEES SHALL NOT BE INHIBITED.
k) IF STREETLIGHTS ON THE SIDEWALKS ARE AFFECTED, TEMPORARY LIGHTS SHALL BE PROVIDED.
35. IF NEW CONCRETE CONSTRUCTION IS ADDED TO EXISTING CONCRETE, DOWELS AND KEYWAYS ARE TO BE USED IN ACCORDANCE WITH NYCT STANDARDS.
36. IF THE PROJECT INVOLVES CONSTRUCTION OR ALTERATION OF A SUBWAY FACILITY ON PRIVATE PROPERTY, THE PROPERTY OWNERS WILL BE REQUIRED TO ENTER INTO AN AGREEMENT WITH NYCT PERTAINING TO ALL WORK AFFECTING THE TRANSIT FACILITIES AND CLEARLY DEFINING LIMITS AND RESPONSIBILITY FOR MAINTENANCE AND LIABILITY.
37. WHEREVER A NEW SIDEWALK IS BEING PLACED ADJACENT TO NYCT STRUCTURES THE FOLLOWING WILL BE REQUIRED:
a) THE TOP OF THE NEW SIDEWALK SHALL BE FLUSH WITH THE SUBWAY VENT GRATINGS, HATCHES AND EMERGENCY EXITS.
b) THE SLOPE OF THE NEW SIDEWALK SHALL BE SUCH THAT THE DRAINAGE BE AWAY FROM THESE STRUCTURES.
c) A 1/2" PREMOLDED FILLER SHALL BE INSTALLED BETWEEN THE NEW SIDEWALK AND NYCT STRUCTURE.
d) WHERE SIDEWALK ELEVATIONS ARE BEING CHANGED DETAILS OF PROPOSED WORK AROUND NYCT STRUCTURES ARE TO BE SUBMITTED FOR APPROVAL.
38. BEFORE ENTERING NYCT PROPERTY, CONTRACTOR OR SUBCONTRACTOR'S PERSONNEL SHALL HAVE ATTENDED NYCT TRACK SAFETY TRAINING AND EXPECT TO FOLLOW NYCT RULES AND REGULATIONS AS PER TRAINING AND ENGINEER INSTRUCTIONS.
39. BEFORE THE START OF ANY WORK, THE CONTRACTOR SHALL MAKE AN EXAMINATION, IN THE PRESENCE OF NYCT'S ENGINEER, OF THE INTERIOR AND EXTERIOR OF NYCT SUBWAY OR OTHER STRUCTURE ADJACENT TO THE PROPOSED WORK. THE PERSON OR PERSONS AUTHORIZED BY THE CONTRACTOR TO MAKE THESE EXAMINATIONS SHALL BE APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL TAKE ALL PHOTOGRAPHS AS MAY BE NECESSARY OR ORDERED TO INDICATE THE EXISTING CONDITION OF NYCT STRUCTURE. ONE COPY OF EACH PHOTOGRAPH, EIGHT INCHES BY TEN INCHES IN SIZE, AND THE NEGATIVE IS TO BE SUBMITTED TO MR. JOHN MALVASIO, P.E., ASSISTANT CHIEF ENGINEERING OFFICER, MAINTENANCE-OF-WAY, 130 LIVINGSTON STREET, ROOM 8044D, BROOKLYN, NEW YORK 11201, TELEPHONE 718/694-1358 BEFORE THE START OF CONSTRUCTION.
40. ALL ARCHITECTURAL DETAILS (TOKEN BOOTHS, RAILINGS, DOORS, ETC.) ARE TO CONFORM TO THE LATEST NYCT STANDARDS. THESE STANDARDS ARE AVAILABLE AT NYCT.
41. STANDARD NYCT INSURANCE CLAUSES ARE TO BE MADE PART OF THE PROJECT'S CONTRACT DRAWINGS. PROOF THAT THE NECESSARY INSURANCE IS IN EFFECT WILL BE REQUIRED BEFORE WORK CAN COMMENCE.
42. AT THE CLOSE OF ANY PROJECT INVOLVING CONSTRUCTION OR ALTERATIONS TO TRANSIT FACILITIES, ONE SET OF VELLUMS OR MYLARS, FIVE SETS OF 35MM MICROFILM, AND ELECTRONIC COPIES COMPLYING TO MICROSTATION/DWG FORMAT OF "APPROVED AS-BUILTS" MUST BE PROVIDED TO NYCT FOR ITS RECORDS. FOR DETAILS OF SPECIFIC REQUIREMENTS CONTACT NYCT UNDERSTATION PROJECTS.

- 43. AT LEAST SEVEN WORKING DAYS PRIOR TO THE START OF CONSTRUCTION OPERATIONS, NOTIFICATION MUST BE GIVEN TO MR. JOHN MALVASIO, P.E., ASSISTANT CHIEF ENGINEERING OFFICER, MAINTENANCE-OF-WAY, AT 718/694-1358. THE CONTRACTOR TO PROVIDE TEMPORARY OFFICES NEAR THE JOB SITE FOR NYCT INSPECTORS CONTAINING A DESK AND TELEPHONE.
NYCT "NOT FOR BENEFIT" INSURANCE REQUIREMENTS
SECTION A: INSURANCE REQUIREMENTS
THE PERMITEE AT ITS SOLE COST AND EXPENSE SHALL CARRY AND MAINTAIN POLICIES OF INSURANCE AT ALL TIMES DURING THE PERIOD OF PERFORMANCE UNDER THIS AGREEMENT AS HEREIN SET FORTH BELOW:
1. WORKERS' COMPENSATION: INCLUDING EMPLOYER'S LIABILITY INSURANCE WITH LIMITS OF LIABILITY NOT LESS THAN \$2,000,000 WHICH MAY BE MET BY A COMBINATION OF PRIMARY AND EXCESS INSURANCE MEETING THE STATUTORY LIMITS OF NEW YORK STATE.
2. COMMERCIAL GENERAL LIABILITY: (ISO 2003 FORM OR EQUIVALENT) APPROVED BY PERMITTOR IN THE PERMITEE'S NAME WITH LIMITS OF LIABILITY IN THE AMOUNT OF NOT LESS THAN \$3,000,000 FOR EACH OCCURRENCE ON A COMBINED SINGLE LIMIT BASIS FOR INJURIES TO PERSONS (INCLUDING DEATH) AND DAMAGE TO PROPERTY, \$3,000,000 GENERAL AGGREGATE AND \$3,000,000 IN THE AGGREGATE WITH RESPECT TO PRODUCTS/COMPLETED OPERATIONS. THE LIMITS MAY BE PROVIDED IN THE FORM OF A PRIMARY POLICY OR COMBINATION OF PRIMARY AND UMBRELLA/EXCESS POLICY. WHEN THE MINIMUM CONTRACT AMOUNTS CAN ONLY BE MET WHEN APPLYING THE UMBRELLA/EXCESS POLICY, THE UMBRELLA/EXCESS POLICY MUST FOLLOW FORM OF THE POLICY AND BE EXTENDED TO BE BROKEN DOWN TO BECOME PRIMARY IN THE EVENT PRIMARY LIMITS ARE REDUCED OR AGGREGATE LIMITS ARE EXHAUSTED. SUCH INSURANCE SHALL BE PRIMARY AND NON-CONTRIBUTORY TO ANY OTHER VALID AND COLLECTIBLE INSURANCE AND MUST BE EXHAUSTED BEFORE IMPLICATING ANY PERMITTOR/MTA POLICY AVAILABLE.
SUCH POLICY SHOULD BE WRITTEN ON AN OCCURRENCE FORM, AND SHALL INCLUDE THE FOLLOWING COVERAGES:
• ADDITIONAL INSURED ENDORSEMENT (I.S.O. FORM CG 20 28 07/04) VERSION OR EQUIVALENT APPROVED BY THE PERMITTOR, SHALL NAME THE INDEMNITEES AS REFERENCED UNDER SECTION B OF THIS AGREEMENT AS ADDITIONAL INSUREDS;
• CONTRACTUAL LIABILITY ASSUMED BY THE PERMITEE UNDER THIS AGREEMENT;
• PERSONAL AND ADVERTISING INJURY;
• PRODUCTS-COMPLETED OPERATIONS;
• INDEPENDENT CONTRACTORS;
• "XCL" (EXPLOSION, COLLAPSE AND UNDERGROUND HAZARDS) WHERE NECESSARY;
• CONTRACTUAL LIABILITY EXCLUSION, APPLICABLE TO CONSTRUCTION OR DEMOLITION OPERATIONS TO BE PERFORMED WITHIN 50 FEET OF RAILROAD TRACKS, MUST BE REMOVED, WHERE NECESSARY;
3. BUSINESS AUTOMOBILE LIABILITY: (ISO FORM CA 00 01 10 01 OR EQUIVALENT) APPROVED BY THE PERMITTOR IS REQUIRED IF PERMITEE'S VEHICLE ENTERS PERMITTOR'S PROPERTY. THE INSURANCE MUST BE IN THE NAME OF THE PERMITEE OR ITS CONTRACTOR ENTERING THE PERMITTOR PROPERTY WITH LIMITS OF LIABILITY IN THE AMOUNT OF NOT LESS THAN \$2,000,000 EACH ACCIDENT FOR CLAIMS FOR BODILY INJURIES (INCLUDING DEATH) TO PERSONS AND FOR DAMAGE TO PROPERTY ARISING OUT OF THE OWNERSHIP, MAINTENANCE OR USE OF ANY OWNED, HIRED OR NON-OWNED MOTOR VEHICLE.
4. RAILROAD PROTECTIVE LIABILITY: (ISO-RM OR EQUIVALENT FORM) APPROVED BY PERMITTOR COVERING THE WORK TO BE PERFORMED AT THE DESIGNATED JOB SITE AND AFFORDING PROTECTION FOR DAMAGES ARISING OUT OF BODILY INJURY OR DEATH, PHYSICAL DAMAGE TO OR DESTRUCTION OF PROPERTY, INCLUDING DAMAGE TO THE INSURED'S OWN PROPERTY AND CONFORMING TO THE FOLLOWING:
• THE POLICY SHALL BE ISSUED TO THE "NAMED INSUREDS" LISTED UNDER SECTION B.
• THE LIMIT OF LIABILITY SHALL BE NOT LESS THAN \$2,000,000 PER OCCURRENCE, SUBJECT TO A \$6,000,000 ANNUAL AGGREGATE;
• POLICY MUST BE ENDORSED TO PROVIDE COVERAGE FOR CLAIMS ARISING FROM INJURY TO EMPLOYEES COVERED BY FEDERAL EMPLOYER'S LIABILITY ACT (FECA);
• INDICATE THE NAME AND ADDRESS OF THE DESIGNATED CONTRACTOR, PROJECT LOCATION AND DESCRIPTION OF WORK, AND PERMIT NUMBER IF APPLICABLE;
• EVIDENCE OF RAILROAD PROTECTIVE LIABILITY INSURANCE, MUST BE PROVIDED IN THE FORM OF A POLICY, A DETAILED INSURANCE SCHEDULE (ACCORD OR MANUSCRIPT FORM) WILL BE ACCEPTED PENDING ISSUANCE OF THE POLICY, WHICH MUST BE PROVIDED WITHIN 30 DAYS FROM THE EFFECTIVE DATE.
5. ENVIRONMENTAL INSURANCE: IN THE EVENT ENVIRONMENTAL OR POLLUTION EXPOSURES EXIST, THE PERMITEE SHALL REQUIRE THE ENVIRONMENTAL CONTRACTOR OR SUB-CONTRACTOR TO PROVIDE THE APPLICABLE INSURANCE COVERING SUCH EXPOSURE. THE LIMITS AND TYPES OF INSURANCE PROVIDED MUST BE SATISFACTORY TO THE PERMITTOR AND APPROVED PRIOR TO THE START OF THE WORK.
SECTION B: INDEMNITEES (ADDITIONAL INSUREDS / NAMED INSUREDS)
NEW YORK CITY TRANSIT AUTHORITY (NYCT), THE MANHATTAN AND BRONX SURFACE TRANSIT OPERATING AUTHORITY ("MABSTA"), THE STATEN ISLAND RAPID TRANSIT OPERATING AUTHORITY ("SIRTA"), THE METROPOLITAN TRANSPORTATION AUTHORITY ("MTA") INCLUDING ITS SUBSIDIARIES AND AFFILIATES, MTA CAPITAL CONSTRUCTION ("MTACC"), MTA BUS COMPANY ("MTA BUS"), AND THE CITY OF NEW YORK ("CITY" AS OWNER) AND THE RESPECTIVE AFFILIATES AND SUBSIDIARIES EXISTING CURRENTLY OR IN THE FUTURE AND SUCCESSORS TO EACH INDEMNIFIED PARTIES LISTED HEREIN.
SECTION C: GENERAL INSURANCE REQUIREMENTS
1. INSURANCE COMPANIES: ALL OF THE INSURANCE REQUIRED BY THIS ARTICLE SHALL BE WITH COMPANIES LICENSED OR AUTHORIZED TO DO BUSINESS IN THE STATE OF NEW YORK WITH AN A.M. BEST COMPANY RATING OF NOT LESS THAN A-/VII OR BETTER AND REASONABLY APPROVED BY THE PERMITTOR/MTA.
2. FORMS: ALL FORMS SHALL COMPLY WITH THE INSURANCE SERVICES OFFICE, INC. ("ISO") OR ITS EQUIVALENT APPROVED BY THE INSURANCE DEPARTMENT OF THE STATE OF NEW YORK.
3. POLICY DEDUCTIBLE / SELF INSURED RETENTION: INSURANCE MAY CONTAIN A DEDUCTIBLE AND/OR SELF-INSURED RETENTION AND SHALL NOT EXCEED \$100,000. THE PERMITEE SHALL BE RESPONSIBLE FOR ALL CLAIM EXPENSES AND LOSS PAYMENTS WITHIN THE DEDUCTIBLE OR SELF-INSURED RETENTION.
4. POLICY TERMS: THESE POLICIES MUST: (I) BE WRITTEN IN ACCORDANCE WITH THE REQUIREMENTS OF THE PARAGRAPHS ABOVE, AS APPLICABLE; (II) BE ENDORSED IN FORM ACCEPTABLE TO INCLUDE A PROVISION THAT SHOULD THE POLICY BE CANCELED, MATERIALLY CHANGED, OR NOT RENEWED, NOTICE SHALL BE DELIVERED IN ACCORDANCE WITH THE INSURANCE POLICY PROVISIONS TO THE PERMITTOR/MTA; AND (III) STATE OR BE ENDORSED TO PROVIDE THAT THE COVERAGE AFFORDED UNDER THE PERMITEE'S POLICIES SHALL APPLY ON A PRIMARY AND NOT ON AN EXCESS OR CONTRIBUTING BASIS WITH ANY POLICIES WHICH MAY BE AVAILABLE TO THE PERMITTOR/MTA, AND ALSO THAT THE PERMITEE'S POLICIES, PRIMARY AND EXCESS, MUST BE EXHAUSTED BEFORE IMPLICATING ANY PERMITTOR/MTA POLICY AVAILABLE. (IV) IN ADDITION, PERMITEE'S POLICIES SHALL STATE OR BE ENDORSED TO PROVIDE THAT, IF A SUBCONTRACTOR'S POLICY CONTAINS ANY PROVISION THAT MAY ADVERSELY AFFECT WHETHER PERMITEE'S POLICIES ARE PRIMARY AND MUST BE EXHAUSTED BEFORE IMPLICATING ANY PERMITTOR/MTA POLICY AVAILABLE, PERMITEE'S AND SUBCONTRACTOR'S POLICIES SHALL NEVERtheless BE PRIMARY AND MUST BE EXHAUSTED BEFORE IMPLICATING ANY PERMITTOR/MTA POLICY AVAILABLE. AT LEAST TWO (2) WEEKS PRIOR TO THE EXPIRATION OF THE POLICIES, THE PERMITEE SHALL ENDEAVOR TO PROVIDE EVIDENCE OF RENEWAL OR REPLACEMENT POLICIES OF INSURANCE, WITH TERMS AND LIMITS NO LESS FAVORABLE THAN THE EXPIRING POLICIES.
SECTION D: SUBMISSION OF INSURANCE
CERTIFICATES OF INSURANCE MAY BE SUPPLIED AS EVIDENCE OF POLICIES EXCEPT FOR RAILROAD PROTECTIVE LIABILITY. HOWEVER, IF REQUESTED BY THE PERMITTOR, THE PERMITEE SHALL DELIVER TO THE PERMITTOR WITHIN FORTY-FIVE (45) DAYS A COPY OF SUCH POLICIES, CERTIFIED BY THE INSURANCE CARRIER AS BEING TRUE AND COMPLETE. IF A CERTIFICATE OF INSURANCE IS SUBMITTED, IT MUST: (1) BE PROVIDED ON THE PERMITTOR'S CERTIFICATE OF INSURANCE; (2) BE SIGNED BY AN AUTHORIZED REPRESENTATIVE OF THE INSURANCE CARRIER OR PRODUCER AND NOTARIZED; (3) DISCLOSE ANY DEDUCTIBLE, SELF-INSURED RETENTION, SUB-LIMIT, AGGREGATE LIMIT OR ANY EXCLUSIONS TO THE POLICY THAT MATERIALLY CHANGE THE COVERAGE; (4) INDICATE THE ADDITIONAL INSUREDS AS REQUIRED HEREIN UNDER SECTION B; THE PERMITEE MUST PROVIDE A COPY OF THE ADDITIONAL INSURED ENDORSEMENT (ISO) FORM CG 20 28 07/04 OR ITS EQUIVALENT AND MUST REFERENCE THE POLICY INFORMATION; (5) INDICATE PROJECT NAME AND LOCATION ON THE CERTIFICATE; AND (6) EXPRESSLY REFERENCE THE INCLUSION OF ALL REQUIRED ENDORSEMENTS.
THE PERMITEE OR ITS CONTRACTOR/SUBCONTRACTOR PERFORMING THE WORK SHALL FURNISH EVIDENCE OF ALL POLICIES BEFORE ANY WORK IS STARTED TO THE APPROPRIATE DEPARTMENT.
NEW AGREEMENTS: RENEWAL INSURANCE:
MTA/NYCT MOW ENGINEERING MTA RISK INSURANCE MANAGEMENT
ATTENTION: MR. JOHN MALVASIO ATTENTION: RUTH APOSTOL
130 LIVINGSTON STREET 2 BROADWAY, 21ST FLOOR
BROOKLYN, NY 11201 NEW YORK, NY 10004
SECTION E: NO LIMIT OF LIABILITY
THE MINIMUM AMOUNTS OF INSURANCE REQUIRED IN THE DETAIL DESCRIPTION OF POLICIES ABOVE SHALL NOT BE CONSTRUED TO LIMIT THE EXTENT OF THE PERMITEE'S LIABILITY UNDER THIS AGREEMENT.

- SECTION F: RIGHT TO REQUEST ADDITIONAL INSURANCE
PERMITEE FURTHER AGREES TO PROVIDE, AT PERMITEE'S SOLE COST AND EXPENSE, SUCH INCREASED OR EXPANDED INSURANCE COVERAGE AS PERMITTOR MAY FROM TIME TO TIME AS DEEM APPROPRIATE.
SECTION G: EVENT OF DEFAULT
IF, AT ANY TIME DURING THE PERIOD OF THIS AGREEMENT, INSURANCE AS REQUIRED IS NOT IN EFFECT, OR PROOF THEREOF IS NOT PROVIDED TO THE PERMITTOR, THE PERMITEE SHALL HAVE THE OPTIONS TO: (I) DIRECT THE PERMITEE TO SUSPEND WORK OR OPERATION WITH NO ADDITIONAL COST OR EXTENSION OF TIME DUE ON ACCOUNT THEREOF; OR (II) TREAT SUCH FAILURE AS AN EVENT OF DEFAULT.
SECTION H: NOTICE OF CLAIM
THE PERMITEE SHALL IMMEDIATELY FILE WITH NYCT/MTA'S TORT DIVISION (WITH A COPY TO THE PROJECT MANAGER), 130 LIVINGSTON STREET, 11TH FLOOR, BROOKLYN, NEW YORK 11201, A NOTICE OF ANY OCCURRENCE LIKELY TO RESULT IN A CLAIM AGAINST NYCT/MTA AND SHALL ALSO FILE WITH THE TORTS DIVISION DETAILED SWORN PROOF OF INTEREST AND LOSS WITH THE CLAIM. THIS PARAGRAPH SHALL SURVIVE THE EXPIRATION OR EARLIER TERMINATION OF THE CONTRACT.
SECTION I: APPROVED BUILDINGS
Under Directive 2 of 1975
Date: 06/15/2017
NYC Development Hub
Damian Titus
CETRARUDDY
SUPPORT OF EXCAVATION - NYCT NOTES (SHEET 1 OF 1)
SOE-002.00
N.T.S.
1529.00 121190772
CETRARUDDY ARCHITECTURE INC.
334 BROADWAY NEW YORK, NY 10013 2ND FLOOR NEW YORK, NY 10013
WWW.CETRARUDDY.COM

45 BROAD STREET NEW YORK NY 10004

Table listing project contacts and firms: John A. Cetraro (State of New York Registered Architect), Madison 45 Broad Development, LLC, Cetraruddy Architecture DP, WSP Group, BureauAppold Engineering, LANGAN, MPPF LLC/M. Paul Friedberg & Partners, Ventresca Design, LLC, BureauAppold Engineering.



SUPPORT OF EXCAVATION - NYCT NOTES (SHEET 1 OF 1)

SOE-002.00

N.T.S. 1529.00 121190772

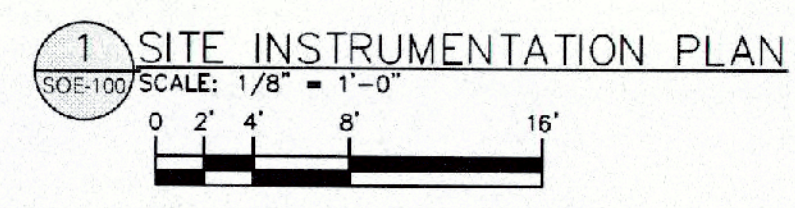
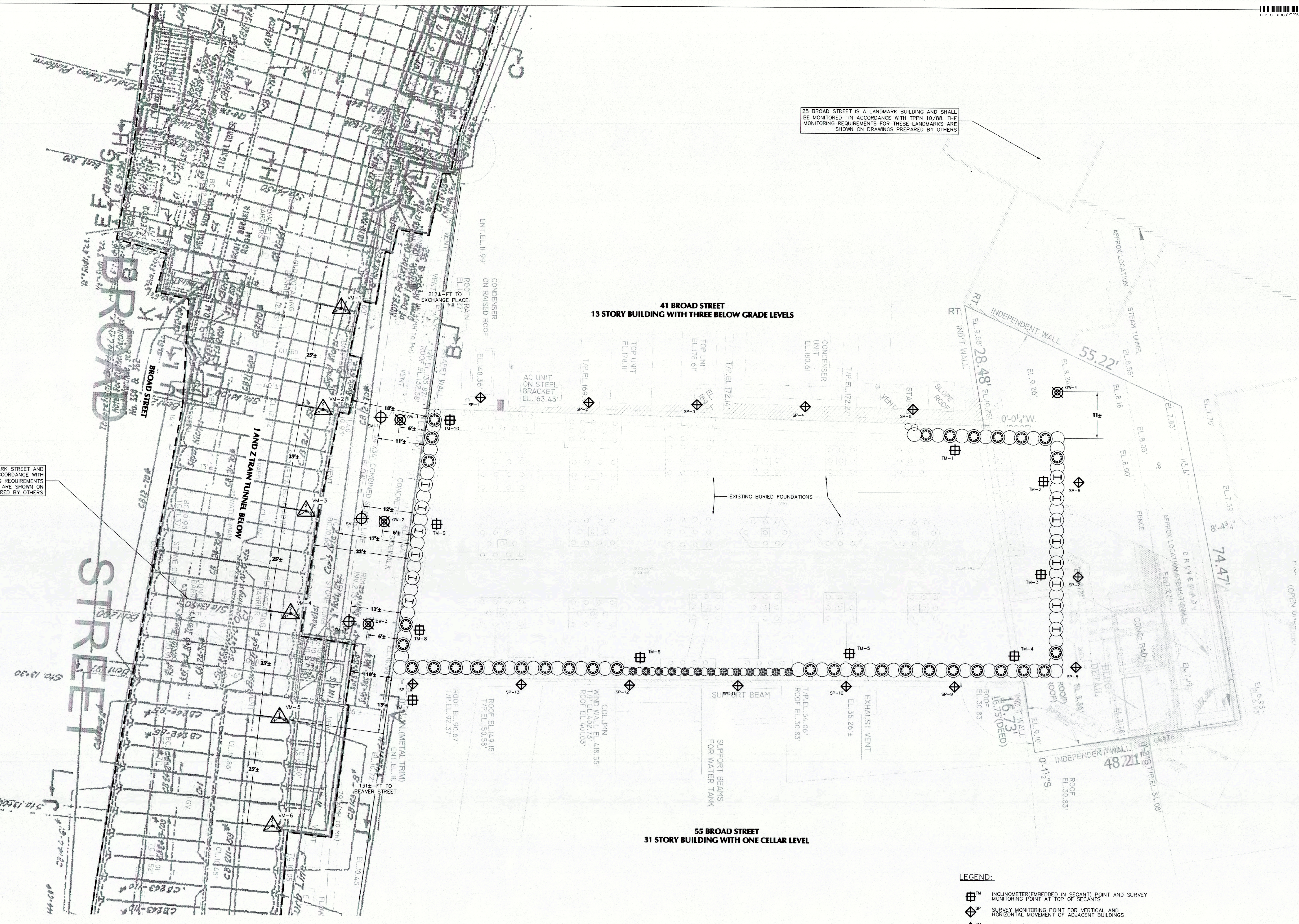


**45 BROAD STREET**  
NEW YORK NY 10004

<p><b>John A. Cetra</b> State of New York Registered Architect No. 018951</p> <p><b>CetraRuddy Architecture PC</b> 584 Broadway Suite 401 New York, NY 10012 212.941.9801</p>	<p><b>Madison 45 Broad Development, LLC</b> 105 Madison Avenue New York, NY 10016</p>
<p><b>WSP Group</b> 228 East 45th Street, 3rd Fl New York, NY 10017 212.687.9888</p>	<p><b>BuroHappold Engineering</b> 100 Broadway New York, NY 10005 212.334.2025</p>
<p><b>LANGAN</b> 21 Poon Plaza 250 West 31st Street, 8th Fl New York, NY 10001 212.479.5400</p>	<p><b>MFPF LLC / M. Paul Friedberg &amp; Partners</b> 120 Broadway, Floor 2D New York, NY 10005 212.477.6366</p>
<p><b>Ventresca Design, LLC</b> 4402 Eleventh St, Suite 203 Long Island City, NY 11101 212.650.0033</p>	<p><b>BuroHappold Engineering</b> 100 Broadway New York, NY 10005 212.334.2025</p>

BROAD STREET IS A LANDMARK STREET AND SHALL BE MONITORED IN ACCORDANCE WITH TPN 10/88. THE MONITORING REQUIREMENTS FOR THESE LANDMARKS ARE SHOWN ON DRAWINGS PREPARED BY OTHERS.

25 BROAD STREET IS A LANDMARK BUILDING AND SHALL BE MONITORED IN ACCORDANCE WITH TPN 10/88. THE MONITORING REQUIREMENTS FOR THESE LANDMARKS ARE SHOWN ON DRAWINGS PREPARED BY OTHERS.

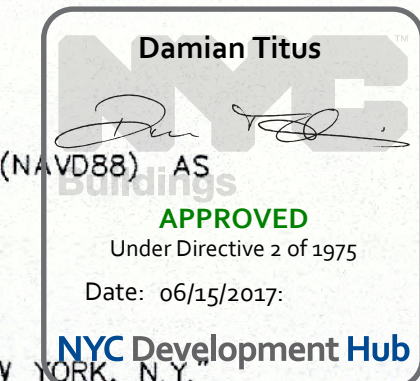


**LEGEND:**

- INCLINOMETER (EMBEDDED IN SEGMENT) POINT AND SURVEY MONITORING POINT AT TOP OF SEGMENTS
- SURVEY MONITORING POINT FOR VERTICAL AND HORIZONTAL MOVEMENT OF ADJACENT BUILDINGS
- VIBRATION AND SETTLEMENT MONITORING POINT
- SURFACE MARKER FOR VERTICAL MOVEMENT OF SIDEWALKS
- GROUNDWATER OBSERVATION WELL (30FT DEEP)
- PROPERTY LINE

**GENERAL NOTES:**

1. ELEVATIONS REFERENCED HEREIN REFER TO THE NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88) AS ESTABLISHED BY THE NATIONAL GEODETIC SURVEY (NGS).  
NAVD88 = NYCT - 98.447'  
NAVD88 = EPMD + 1.85'
2. SURVEY TAKEN FROM THE DRAWING TITLED "MAP OF PROPERTY LOCATED: 45 BROAD STREET, NEW YORK, NY" BY EMPIRE STATE LAYOUT, INC., DATED 21 JANUARY 2016, AND LAST REVISED 21 SEPTEMBER 2016.
3. EXISTING FOUNDATION LAYOUT TAKEN FROM DRAWING TITLED "EXISTING FOUNDATION PLAN", DATED 7 MAY 2007.
4. PLAN SHOWING EXISTING FOOTINGS AND EXISTING WALLS TO REMAIN WERE OBTAINED FROM DRAWINGS TITLED "SUB-CELLAR FRAMING PLAN", PREPARED BY GACE, DATED 19 MAY 2016.
5. THE APPROXIMATE EXTENTS OF THE NEW YORK CITY TRANSIT (NYCT) STRUCTURE WERE TAKEN FROM THE FOLLOWING DRAWINGS:
  - a. ROUTE NO. 45 SECTION NO. 2, BROAD STREET SO, WILLIAMS ST. TO BEAVER ST., STA 9+30 TO STA 13+30, STRUCTURAL PLAN, SIDEWALK PLAN AND ROOF PLAN, DWG. NO. 338 DATED MARCH 16, 1928.
  - b. ROUTE NO. 45 SECTION NO. 2, BROAD STREET STATION SOUTH END, STA 13+30 TO STA 17+05, STRUCTURAL PLAN, ROOF PLAN, DWG. NO. 346, DATED APRIL 11, 1928.
6. SEE SOE-001 FOR MONITORING NOTES.
7. SEE SOE-002 FOR NEW YORK CITY TRANSIT NOTES.
8. THERE ARE DESIGNATED LANDMARKS WITHIN 90'-FEET OF THE SITE. THESE STRUCTURES NEED TO BE MONITORED IN ACCORDANCE WITH TPN 10/88. THE MONITORING REQUIREMENTS FOR THESE LANDMARK STRUCTURES ARE SHOWN ON DRAWINGS PREPARED BY OTHERS.
9. ADJACENT BUILDING MONITORING SHOWN IS A MINIMUM REQUIRED FOR SOE. SEE FULL MONITORING PLAN OF ADJACENT BUILDINGS PROVIDED BY OTHERS.



2017.04.13	NYCT - 4th SUBMISSION
2017.02.21	EM CONSTRUCTION DOCUMENTS - UPDATED
2017.03.13	REVISED FOR FOUNDATION BID
2017.03.07	NYCT - 3rd SUBMISSION
2015.02.01	EM CONSTRUCTION DOCUMENTS
2016.12.30	NYCT - 2nd SUBMISSION
2016.11.07	FOUNDATION AND EXCAVATION FOR BID
2016.04.22	SEBLED FOR DESIGN DEVELOPMENT



**SITE INSTRUMENTATION PLAN**  
(SHEET 1 OF 1)

**SOE-100.00**

AS SHOWN	121190772
1529.00	121190772



# 45 BROAD STREET

NEW YORK NY 10004

John A. Catra  
State of New York  
Registered Architect  
No. 018861

Madison 45 Broad  
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105 Madison Avenue  
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New York, NY 10005  
212.334.2025

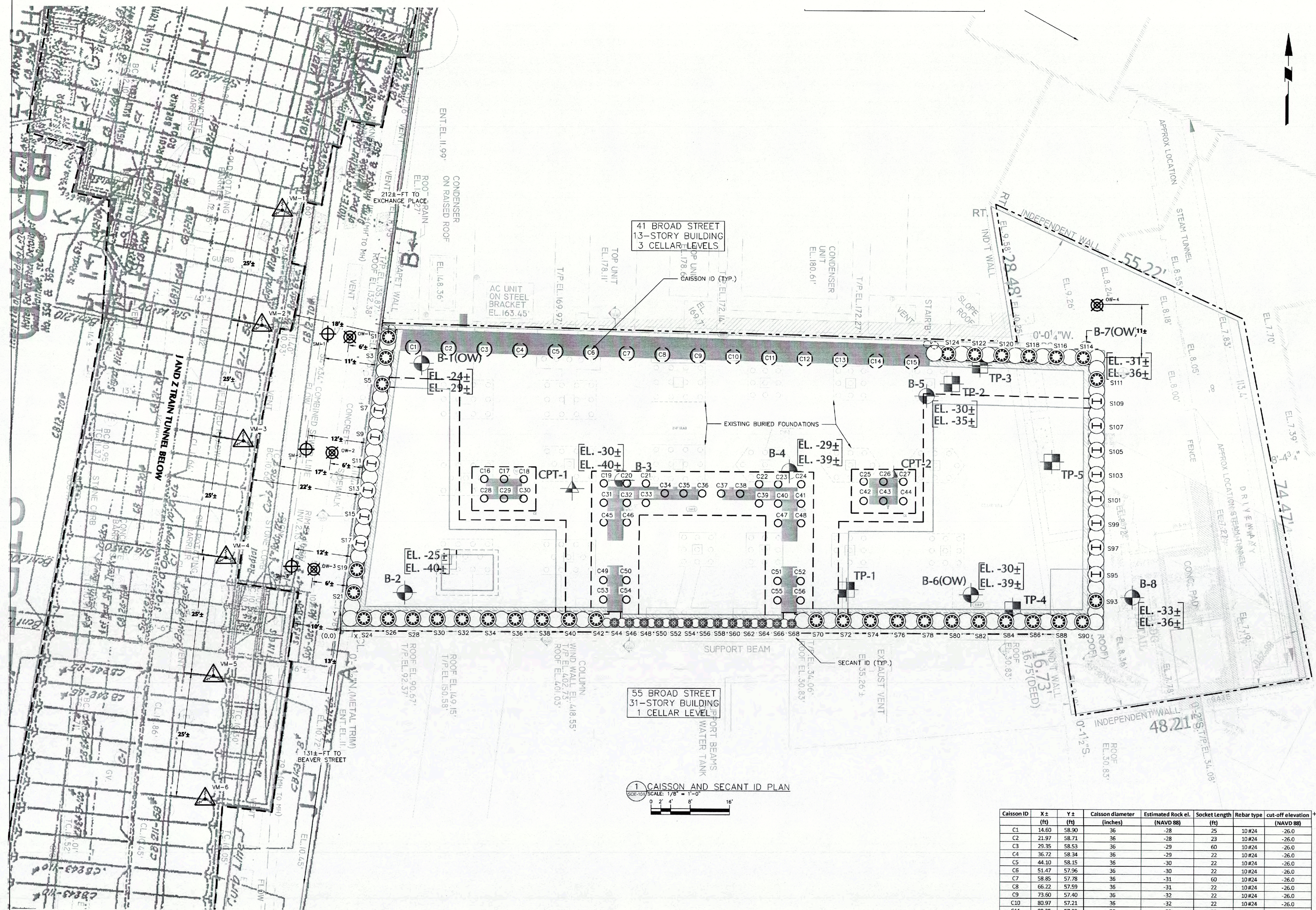
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Langan  
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20th Floor, Room 2010  
New York, NY 10001  
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MPPF LLC / M. Paul  
Friedberg & Partners  
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New York, NY 10005  
212.478.5400

Ventresca Design, LLC  
44-02 17th St, Suite 203  
Long Island City, NY 11101  
212.650.0033

BuroHappold Engineering  
100 Broadway  
New York, NY 10005  
212.334.2025



1 CAISSON AND SECANT ID PLAN  
SCALE: 1/8" = 1'-0"

- LEGEND:**
- EL. -25± PROPERTY LINE
  - EL. -40± APPROXIMATE TOP OF ROCK WITH DECOMPOSED ROCK
  - S1 SECANT ID
  - C1 CAISSON ID
  - VM VIBRATION AND SETTLEMENT MONITORING POINT
  - SM SURFACE MARKER FOR VERTICAL MOVEMENT OF SIDEWALKS
  - GW GROUNDWATER OBSERVATION WELL (30FT DEEP)

- GENERAL NOTES:**
1. ELEVATIONS REFERENCED HEREIN REFER TO THE NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88) AS ESTABLISHED BY THE NATIONAL GEODETIC SURVEY (NGS).  
NAVD88 = NYCT - 98.447'  
NAVD88 = BRPD + 1.65'
  2. BASE PLAN TAKEN FROM DRAWING TITLED "FOUNDATION(SUB-CELLAR 2) PLAN", DWG. NO. FD-100.00 BY WSP, DATED 10 MARCH 2017.
  3. THE ESTIMATED TOP OF ROCK AT CAISSON LOCATIONS WERE INTERPRETED FROM BORING DATA (SEE GEOTECHNICAL REPORT DATED 29 APRIL 2016) AND ASSUMED TO VARY ABOUT 5 FT±.
  4. BORINGS B-1 THROUGH B-6 WERE DRILLED BETWEEN 29 AUGUST 2007 AND 6 SEPTEMBER 2007 BY CRAIG TEST BORING UNDER THE FULL TIME SPECIAL INSPECTION OF A LANGAN ENGINEER.
  5. BORINGS B-7 AND B-8, AND CONE PENETRATION TESTS, CPT-1 AND CPT-2, WERE DRILLED BETWEEN 29 JANUARY 2016 AND 1 FEBRUARY 2016 BY CRAIG TEST BORING UNDER THE FULL TIME SPECIAL INSPECTION OF A LANGAN ENGINEER.
  6. TEST PIT, TP-1, WAS EXCAVATED BETWEEN 17 AND 22 FEBRUARY 2016 BY COFFEY CONTRACTING UNDER THE FULL TIME SPECIAL INSPECTION OF A LANGAN ENGINEER.
  7. TEST PITS TP-2 THROUGH TP-5 WERE PERFORMED BETWEEN 1 AND 5 DECEMBER 2016.
  8. SEE SOE-001 FOR GENERAL NOTES.
  9. SEE SOE-002 FOR NEWYORK CITY TRANSIT NOTES.

CAISSON ID	X± (ft)	Y± (ft)	CAISSON DIAMETER (inches)	ESTIMATED ROCK EL. (NAVD 88)	SOCKET LENGTH (ft)	REBAR TYPE	CUT-OFF ELEVATION ± (NAVD 88)
C1	14.60	58.90	36	-28	25	10#24	-26.0
C2	21.97	58.71	36	-28	23	10#24	-26.0
C3	29.35	58.53	36	-29	60	10#24	-26.0
C4	36.72	58.36	36	-29	22	10#24	-26.0
C5	44.10	58.18	36	-30	22	10#24	-26.0
C6	51.47	57.96	36	-30	22	10#24	-26.0
C7	58.85	57.78	36	-31	60	10#24	-26.0
C8	66.22	57.59	36	-31	22	10#24	-26.0
C9	73.60	57.42	36	-32	22	10#24	-26.0
C10	80.97	57.21	36	-32	22	10#24	-26.0
C11	88.35	57.02	36	-33	50	10#24	-26.0
C12	95.72	56.84	36	-33	22	10#24	-26.0
C13	103.10	56.65	36	-34	21	10#24	-26.0
C14	110.47	56.46	36	-34	20	10#24	-26.0
C15	117.85	56.27	36	-35	60	10#24	-26.0
C16	125.22	56.07	36	-36	18	8#24	-29.0
C17	132.60	55.88	36	-36	18	8#24	-29.0
C18	140.00	55.68	36	-37	18	8#24	-29.0
C19	147.40	55.48	36	-39	60	8#24	-29.0
C20	154.80	55.28	36	-39	60	8#24	-29.0
C21	162.20	55.08	36	-40	20	8#24	-29.0
C22	169.60	54.88	36	-39	20	8#24	-29.0
C23	177.00	54.68	36	-39	60	8#24	-29.0
C24	184.40	54.48	36	-39	60	8#24	-29.0
C25	191.80	54.28	36	-39	15	8#24	-29.0
C26	199.20	54.08	36	-39	15	8#24	-29.0
C27	206.60	53.88	36	-39	15	8#24	-29.0
C28	214.00	53.68	36	-39	15	8#24	-29.0
C29	221.40	53.48	36	-39	18	8#24	-29.0
C30	228.80	53.28	36	-38	18	8#24	-29.0
C31	236.20	53.08	36	-37	60	8#24	-29.0
C32	243.60	52.88	36	-37	20	8#24	-29.0
C33	251.00	52.68	36	-37	20	8#24	-29.0
C34	258.40	52.48	36	-37	20	8#24	-29.0
C35	265.80	52.28	36	-38	20	8#24	-29.0
C36	273.20	52.08	36	-39	20	8#24	-29.0
C37	280.60	51.88	36	-40	60	8#24	-29.0
C38	288.00	51.68	36	-40	20	8#24	-29.0
C39	295.40	51.48	36	-40	18	8#24	-29.0
C40	302.80	51.28	36	-40	18	8#24	-29.0
C41	310.20	51.08	36	-40	60	8#24	-29.0
C42	317.60	50.88	36	-40	60	8#24	-29.0
C43	325.00	50.68	36	-40	15	8#24	-29.0
C44	332.40	50.48	36	-40	15	8#24	-29.0
C45	339.80	50.28	36	-39	15	8#24	-29.0
C46	347.20	50.08	36	-39	15	8#24	-29.0
C47	354.60	49.88	36	-38	15	8#24	-29.0
C48	362.00	49.68	36	-37	15	8#24	-29.0
C49	369.40	49.48	36	-37	20	8#24	-29.0
C50	376.80	49.28	36	-40	20	8#24	-29.0
C51	384.20	49.08	36	-40	18	8#24	-29.0
C52	391.60	48.88	36	-39	16	8#24	-29.0
C53	399.00	48.68	36	-40	20	8#24	-29.0
C54	406.40	48.48	36	-40	20	8#24	-29.0
C55	413.80	48.28	36	-40	20	8#24	-29.0
C56	421.20	48.08	36	-40	20	8#24	-29.0

SECANT ID	X± (ft)	Y± (ft)	SECANT TYPE	ESTIMATED ROCK EL. (NAVD 88)	SOCKET LENGTH (ft)	REBAR TYPE	CUT-OFF ELEVATION ± (NAVD 88)
S1	9.58	60.36	Secondary-Type B	-28	12	10#20	-11.0
S2	9.99	58.90	Primary	-29	1	N/A	-11.0
S3	9.03	56.18	Secondary-Type B	-29	12	10#20	-11.0
S4	8.68	53.45	Primary	-30	1	N/A	-11.0
S5	8.31	50.72	Secondary-Type C	-30	50	14#28	-11.0
S6	7.96	48.00	Primary	-31	1	N/A	-11.0
S7	7.59	45.27	Secondary-Type A	-31	5	W24x192	-11.0
S8	7.24	42.54	Primary	-32	1	N/A	-11.0
S9	6.88	39.82	Secondary-Type A	-32	5	W24x192	-11.0
S10	6.52	37.09	Primary	-33	1	N/A	-11.0
S11	6.16	34.36	Secondary-Type A	-33	5	W24x192	-11.0
S12	5.81	31.64	Primary	-34	1	N/A	-11.0
S13	5.44	28.91	Secondary-Type A	-34	5	W24x192	-11.0
S14	5.09	26.18	Primary	-35	1	N/A	-11.0
S15	4.73	23.46	Secondary-Type A	-35	5	W24x192	-11.0
S16	4.37	20.73	Primary	-36	1	N/A	-11.0
S17	4.01	18.01	Secondary-Type A	-36	5	W24x192	-11.0
S18	3.65	15.28	Primary	-37	1	N/A	-11.0
S19	3.29	12.55	Secondary-Type C	-37	50	14#28	-11.0
S20	2.94	9.83	Primary	-38	1	N/A	-11.0
S21	2.57	7.86	Secondary-Type B	-38	12	10#20	-11.0
S22	2.32	5.15	Primary	-39	1	N/A	-11.0
S23	1.98	2.54	Primary	-40	1	N/A	0.0
S24	4.74	2.54	Secondary-Type C	-40	15	14#28	0.0
S25	2.24	2.54	Primary	-40	1	N/A	0.0
S26	9.74	2.54	Secondary-Type C	-40	20	14#28	0.0
S27	12.24	2.54	Primary	-40	1	N/A	0.0
S28	14.74	2.54	Secondary-Type C	-40	15	14#28	0.0
S29	17.24	2.54	Primary	-40	1	N/A	0.0
S30	19.74	2.54	Secondary-Type C	-40	20	14#28	0.0
S31	22.24	2.54	Primary	-40	1	N/A	0.0
S32	24.74	2.54	Secondary-Type C	-40	15	14#28	0.0
S33	27.24	2.54	Primary	-40	1	N/A	0.0
S34	29.74	2.54	Secondary-Type C	-40	60	14#28	0.0
S35	32.24	2.54	Primary	-40	1	N/A	0.0
S36	35.49	2.54	Secondary-Type B	-40	12	10#20	0.0
S37	38.24	2.54	Primary	-40	1	N/A	0.0
S38	40.99	2.54	Secondary-Type C	-39	20	14#28	0.0
S39	43.74	2.54	Primary	-39	1	N/A	0.0
S40	46.49	2.54	Secondary-Type B	-39	12	10#20	0.0
S41	49.24	2.54	Primary	-39	1	N/A	0.0
S42	51.99	2.54	Secondary-Type C	-39	50	14#28	0.0
S43	54.29	1.92	Primary	-39	1	N/A	0.0
S44	55.70	1.92	Secondary-Type D	-39	12	14#28	0.0
S45	57.20	1.92	Primary	-39	1	N/A	0.0
S46	58.70	1.92	Secondary-Type D	-39	12	14#28	0.0
S47	60.20	1.92	Primary	-39	1	N/A	0.0
S48	61.70	1.92	Secondary-Type D	-39	12	14#28	0.0
S49	63.20	1.92	Primary	-39	1	N/A	0.0
S50	64.70	1.92	Secondary-Type D	-39	12	14#28	0.0
S51	66.20	1.92	Primary	-39	1	N/A	0.0
S52	67.70	1.92	Secondary-Type D	-39	12	14#28	0.0
S53	69.20	1.92	Primary	-38	1	N/A	0.0
S54	70.70	1.92	Secondary-Type D	-38	12	14#28	0.0
S55	72.20	1.92	Primary	-38	1	N/A	0.0
S56	73.70	1.92	Secondary-Type D	-38	60	14#28	0.0
S57	75.20	1.92	Primary	-38	1	N/A	0.0
S58	76.70	1.92	Secondary-Type D	-38	12	14#28	0.0
S59	78.20	1.92	Primary	-38	1	N/A	0.0
S60	79.70	1.92	Secondary-Type D	-38	12	14#28	0.0
S61	81.20	1.92	Primary	-38	1	N/A	0.0
S62	82.70	1.92	Secondary-Type D	-38	12	14#28	0.0
S63	84.20	1.92	Primary	-38	1	N/A	0.0
S64	85.70	1.92	Secondary-Type D	-38	12	14#28	0.0
S65	87.20	1.92	Primary	-38	1	N/A	0.0
S66	88.70	1.92	Secondary-Type D	-37	12	14#28	0.0
S67	90.21	1.92	Primary	-37	1	N/A	0.0
S68	91.70	1.92	Secondary-Type D	-37	12	14#28	0.0
S69	93.21	2.54	Primary	-37	1	N/A	0.0
S70	94.71	2.54	Secondary-Type C	-37	50	14#28	0.0
S71	99.42	2.54	Primary	-37	1	N/A	0.0
S72	102.17	2.54	Secondary-Type B	-37	12	10#20	0.0
S73	104.92	2.54	Primary	-37	1	N/A	0.0
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S96	153.38	15.09	Primary	-36	1	N/A	11.0
S97	153.38	17.84	Secondary-Type A	-36	5	W24x192	11.0



# 45 BROAD STREET

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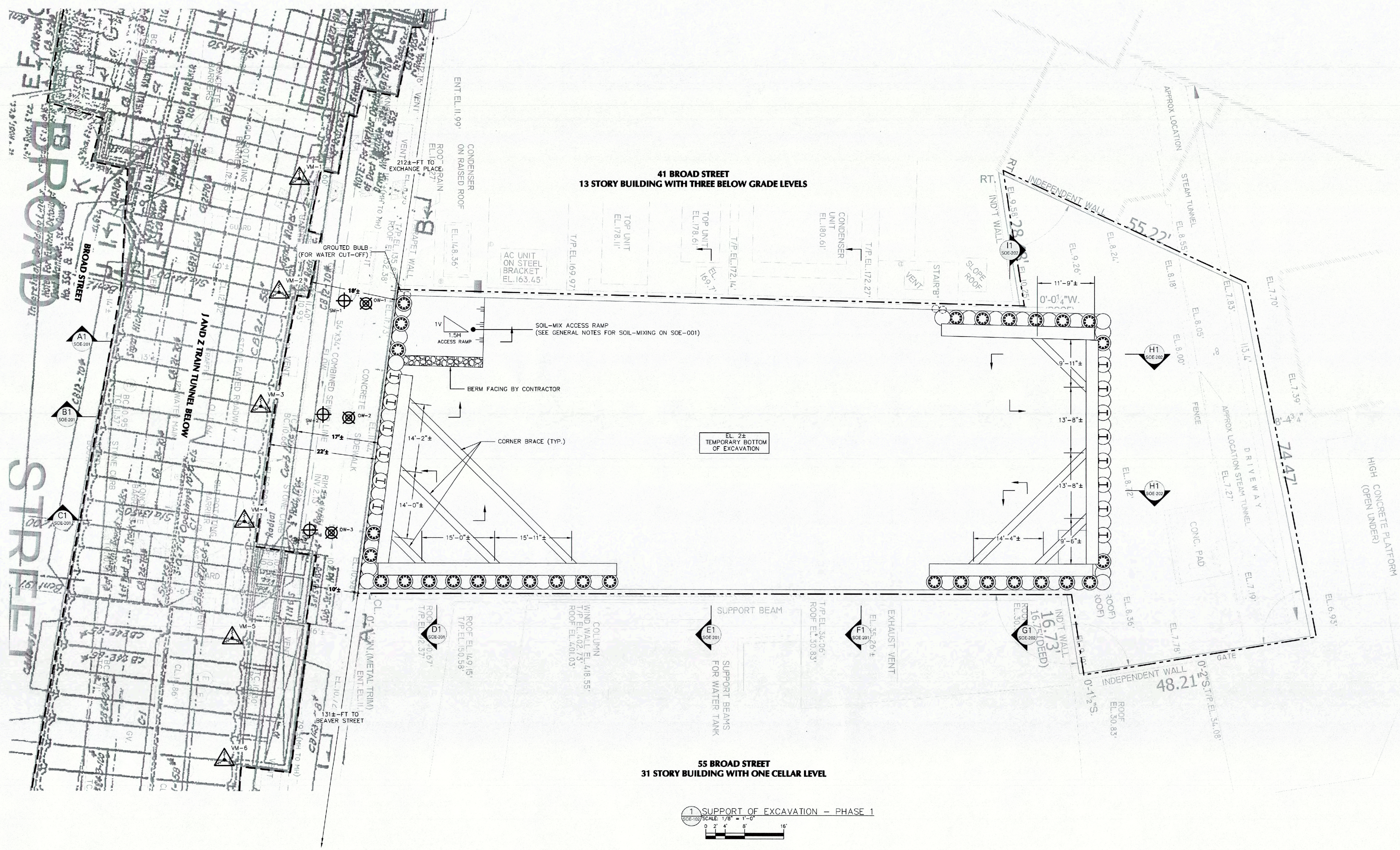
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55 BROAD STREET  
31 STORY BUILDING WITH ONE CELLAR LEVEL

41 BROAD STREET  
13 STORY BUILDING WITH THREE BELOW GRADE LEVELS

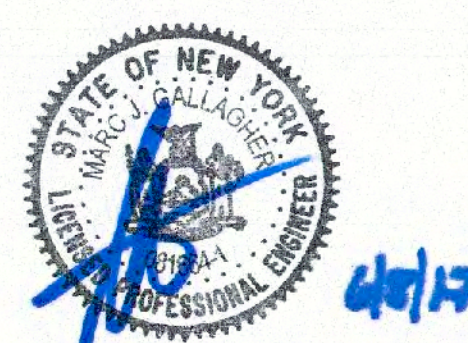
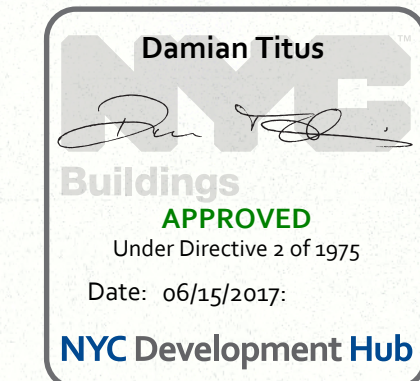
1 SUPPORT OF EXCAVATION - PHASE 1  
SCALE 1/8" = 1'-0"

- LEGEND:**
- PROPERTY LINE
  - ▲<sup>VM</sup> VIBRATION AND SETTLEMENT MONITORING POINT
  - ⊕<sup>SM</sup> SURFACE MARKER FOR VERTICAL MOVEMENT OF SIDEWALKS
  - ⊗<sup>GW</sup> GROUNDWATER OBSERVATION WELL (30FT DEEP)

- GENERAL NOTES:**
1. ELEVATIONS REFERENCED HEREIN REFER TO THE NORTH AMERICAN VERTICAL DATUM 1988 (NAV88) AS ESTABLISHED BY THE NATIONAL GEODETIC SURVEY (NGS).  
NAV88 = NYCT = 98.447  
NAV88 = EPWD = 1.65'
  2. BASE PLAN TAKEN FROM DRAWING TITLED "FOUNDATION (SUB-CELLAR 2) PLAN", DWG. NO. F0-100.00 BY WSP, DATED 10 MARCH 2017.
  3. SURVEY TAKEN FROM THE DRAWING TITLED "MAP OF PROPERTY LOCATED: 45 BROAD STREET, NEW YORK, N.Y." BY EMPIRE STATE LAYOUT, INC., DATED 21 JANUARY 2016, AND LAST REVISED 21 SEPTEMBER 2016.
  4. THE APPROXIMATE EXTENTS OF THE NEW YORK CITY TRANSIT (NYCT) STRUCTURE WERE TAKEN FROM THE FOLLOWING DRAWINGS:
    - a. ROUTE NO. 45 SECTION NO. 2, BROAD STREET SQ. WILLIAMS ST. TO BEAVER ST., STA 9+30 TO STA 13+30, STRUCTURAL PLAN, SIDEWALK PLAN AND ROOF PLAN, DWG. NO. 338, DATED MARCH 16, 1928.
    - b. ROUTE NO. 45 SECTION NO. 2, BROAD STREET STATION SOUTH END, STA 13+30 TO STA 17+05, STRUCTURAL PLAN, ROOF PLAN, DWG. NO. 346, DATED APRIL 11, 1928.
  5. REFER TO SOE-101 FOR SECANT PILE INFORMATION.
  6. REFER TO SOE-200 SERIES FOR SECTIONS.
  7. REFER TO SOE-300 SERIES FOR ELEVATIONS.
  8. REFER TO SOE-400 SERIES FOR DETAILS.

- PHASE 1 - EXCAVATION SEQUENCE:**
1. DRILL ALL SECANT PILES ON THE EAST, WEST AND NORTH FROM GROUND SURFACE.
  2. CONSTRUCT A 10-FOOT WIDE, ACCESS BERM AT 1.5H:1V SLOPE FROM SIDEWALK USING SOIL-MIXING, AS SHOWN ON THIS DRAWING. THE SOIL-MIXED BERM SHALL BE ARMORED ON THE SOUTH SIDE BY GABION WALLS OR APPROVED ALTERNATE.
  3. EXCAVATE THE ENTIRE SITE TO EL. 2±.
  4. DRILL SECANTS ON THE SOUTH SHOWN ON PHASE 1 DRAWING FROM EL. 2±.
  5. INSTALL THE FIRST TIER WALERS AND CORNER BRACES AT ALL THREE CORNERS AS SHOWN.

2017.04.13	NYCT - 4th SUBMISSION
2017.05.21	60% CONSTRUCTION DOCUMENTS - UPDATED
2017.05.13	REVISED FOR FOUNDATION BID
2017.03.07	NYCT - 3rd SUBMISSION
2017.03.01	60% CONSTRUCTION DOCUMENTS
2016.12.30	NYCT - 2nd SUBMISSION
2016.11.07	FOUNDATION AND EXCAVATION FOR BID
2016.04.22	ISSUED FOR DESIGN DEVELOPMENT



SUPPORT OF EXCAVATION  
PLAN - STAGE 1  
(SHEET 1 OF 3)

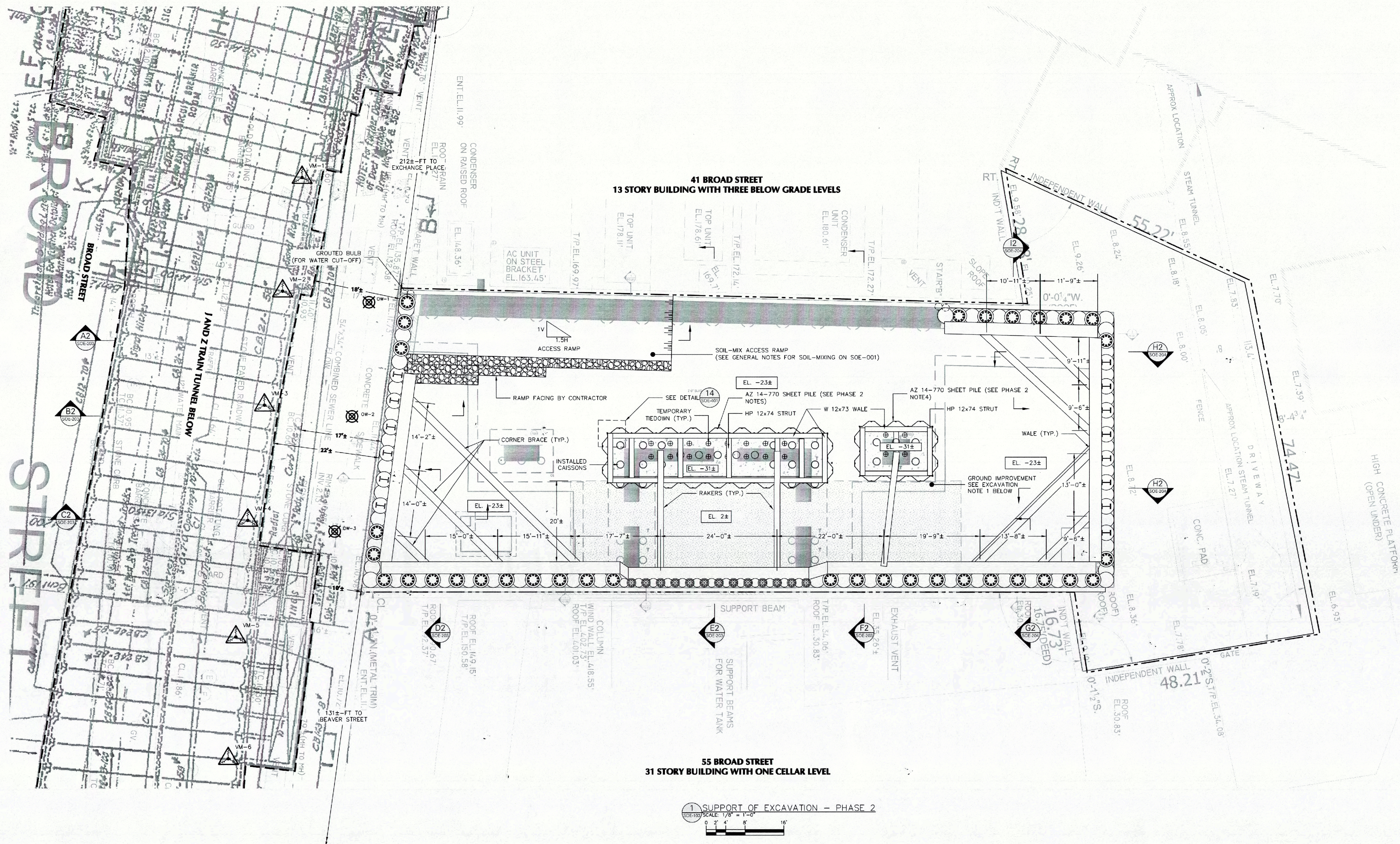
**SOE-102.00**

AS SHOWN		
1529.00		121190772

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<p>WSP Group 225 West 45th Street, 3rd Fl New York, NY 10017 212.687.9688</p>	<p>BuroHappold Engineering 100 Broadway New York, NY 10005 212.334.2025</p>
<p>LANGAN 21 Penn Plaza 200 West 31st Street, 8th Fl New York, NY 10001 212.479.5400</p>	<p>MPFP LLC / M. Paul Friedberg &amp; Partners 120 Broadway, Floor 20 New York, NY 10005 212.477.8368</p>
<p>Ventresca Design, LLC 4402 Eleventh St, Suite 203 Long Island City, NY 11101 212.960.0033</p>	<p>BuroHappold Engineering 100 Broadway New York, NY 10005 212.334.2025</p>

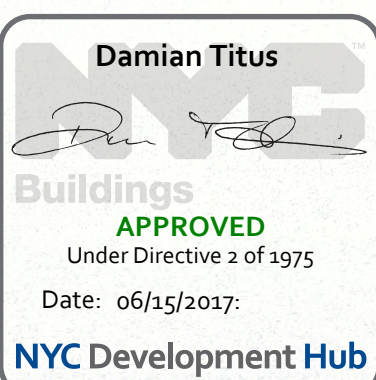


**1 SUPPORT OF EXCAVATION - PHASE 2**  
SCALE: 1/8" = 1'-0"  
0' 2' 4' 8' 16'

- LEGEND:**
- PROPERTY LINE
  - ▲ VIBRATION AND SETTLEMENT MONITORING POINT
  - ⊕ SURFACE MARKER FOR VERTICAL MOVEMENT OF SIDEWALKS
  - ⊗ GROUNDWATER OBSERVATION WELL (30FT DEEP)

- GENERAL NOTES:**
- ELEVATIONS REFERENCED HEREIN REFER TO THE NORTH AMERICAN VERTICAL DATUM 1988 (NAV88) AS ESTABLISHED BY THE NATIONAL GEODETIC SURVEY (NGS).  
NAV88 = NYCT - 98.447'  
NAV88 = BPMD + 1.65'
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  - THE APPROXIMATE EXTENTS OF THE NEW YORK CITY TRANSIT (NYCT) STRUCTURE WERE TAKEN FROM THE FOLLOWING DRAWINGS:
    - ROUTE NO. 45 SECTION NO. 2, BROAD STREET SO. WILLIAMS ST. TO BEAVER ST., STA 9+30 TO STA 13+30, STRUCTURAL PLAN, SIDEWALK PLAN AND ROOF PLAN, DWG. NO. 338, DATED MARCH 16, 1928;
    - ROUTE NO. 45 SECTION NO. 2, BROAD STREET STATION SOUTH END, STA 13+30 TO STA 17+05, STRUCTURAL PLAN, ROOF PLAN, DWG. NO. 346, DATED APRIL 11, 1928
  - REFER TO SOE-101 FOR SECANT PILE INFORMATION.
  - REFER TO SOE-200 SERIES FOR SECTIONS.
  - REFER TO SOE-300 SERIES FOR ELEVATIONS.
  - REFER TO SOE-400 SERIES FOR DETAILS.

- PHASE 2 - EXCAVATION SEQUENCE:**
- PERFORM SOIL MIXING TO ABOUT 20-FOOT NORTH IN FRONT OF THE SOUTH SECANT PILE WALL. THE SOIL-MIXING SHALL EXTEND FROM EL. 2± TO TOP OF DECOMPOSED ROCK. CONTRACTOR SHALL PROVIDE A SOIL-CEMENT MIXTURE WITH 200 PSI UNCONFINED COMPRESSIVE STRENGTH.
  - INSTALL ALL REMAINING SECANTS ALONG SOUTH WALL FROM EL. 2±.
  - AFTER THE IMPROVED SOIL HAS ACHIEVED SUFFICIENT STRENGTH, EXCAVATE AND INSTALL MIDDLE AND BOTTOM TIERS OF WALERS AND CORNER-BRACES (EL. -7± AND EL. -17±) AT ALL CORNERS. SOIL-MIX AREA TO REMAIN AT EL. 2±.
  - EXCAVATE SITE TO EL. -20± (EXCEPT FOR SOIL MIX AREA), MAINTAIN SOIL-MIX ACCESS RAMP ALONG NORTHWEST OF SITE AS EXCAVATION PROGRESSES.
  - DRILL CAISSONS SHOWN HEREIN, WITHIN THE CAISSON CAP FOOTPRINT FROM EL. -20±.
  - INSTALL SHEET PILES AROUND THE CENTRAL CAISSON CAP. EXCAVATE CAISSON CAP TO EL. -31±, INSTALL CAISSON CAP REINFORCEMENT AND SLEEVES FOR TIEDOWNS, AND POUR CONCRETE FOR THE CAISSON CAP.
  - INSTALL AND PRESTRESS THE TEMPORARY TIEDOWNS AS SPECIFIED ON SOE-001.
  - TRENCH THROUGH THE SOIL-CEMENT MIX BLOCK, AND INSTALL THE TOP TIER RAKERS ALONG THE SOUTH SECANT WALL.



SUPPORT OF EXCAVATION  
PLAN - STAGE 2  
(SHEET 2 OF 3)

**SOE-103.00**

AS SHOWN  
1529.00 121190772

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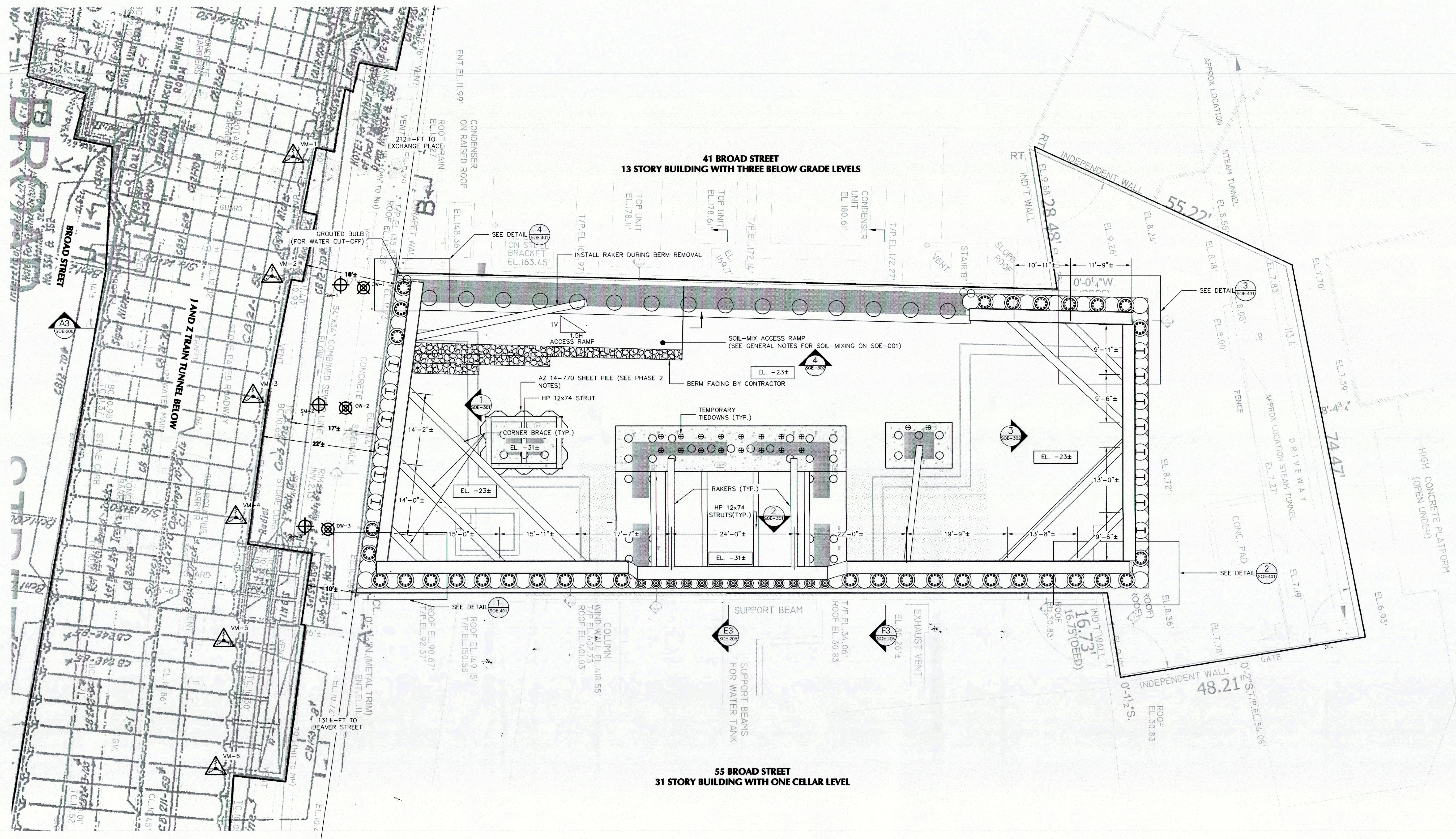
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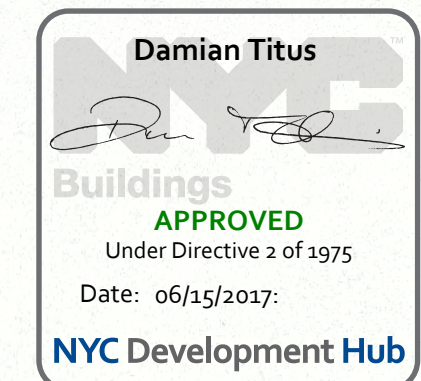
**1 SUPPORT OF EXCAVATION - PHASE 3**  
SCALE: 1/8" = 1'-0"  
0' 2' 4' 8' 16'

- LEGEND:**
- PROPERTY LINE
  - ▲ VIBRATION AND SETTLEMENT MONITORING POINT
  - ⊕ SURFACE MARKER FOR VERTICAL MOVEMENT OF SIDEWALKS
  - ⊗ GROUNDWATER OBSERVATION WELL (30FT DEEP)

- GENERAL NOTES:**
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NAV88 = NYCT - 98.447'  
NAV88 = BMD + 1.65'
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  3. SURVEY TAKEN FROM THE DRAWING TITLED "MAP OF PROPERTY LOCATED: 45 BROAD STREET, NEW YORK, N.Y." BY EMPIRE STATE LAYOUT, INC., DATED 21 JANUARY 2016, AND LAST REVISED 21 SEPTEMBER 2016.
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  5. REFER TO SOE-101 FOR SECANT PILE INFORMATION.
  6. REFER TO SOE-200 SERIES FOR SECTIONS.
  7. REFER TO SOE-300 SERIES FOR ELEVATIONS.
  8. REFER TO SOE-400 SERIES FOR DETAILS.

- PHASE 3 - EXCAVATION SEQUENCE:**
1. REMOVE THE SOIL-MIXED BLOCK AS REQUIRED TO INSTALL THE SECOND TIER OF RAKERS AND WALERS.
  2. INSTALL SHEET PILES AND STRUTS AS SHOWN ON THE DRAWING TO COMPLETE THE CAISSON CAP INSTALLATION WITHIN THE CORE.
  3. INSTALL REMAINING FOUNDATIONS EXCEPT THE NORTHWEST CORNER UNDER THE ACCESS BERM.
  4. BRACE THE WEST WALL AT THE ACCESS BERM LATERALLY USING RAKERS, AS THE SOIL-MIXED BERM IS REMOVED.
  5. CONSTRUCT FINAL CAISSONS AND CAP AT THE NORTHWEST CORNER.

2017.04.13	NYCT - 4th SUBMISSION
2017.03.21	6th CONSTRUCTION DOCUMENTS - UPDATED
2017.03.13	REVISED FOR FOUNDATION BID
2017.03.07	NYCT - 3rd SUBMISSION
2017.03.01	6th CONSTRUCTION DOCUMENTS
2016.12.30	NYCT - 2nd SUBMISSION
2016.11.07	FOUNDATION AND EXCAVATION FOR BID
2016.04.22	ISSUED FOR DESIGN DEVELOPMENT



**SOE-104.00**

AS SHOWN	121190772
1529.00	

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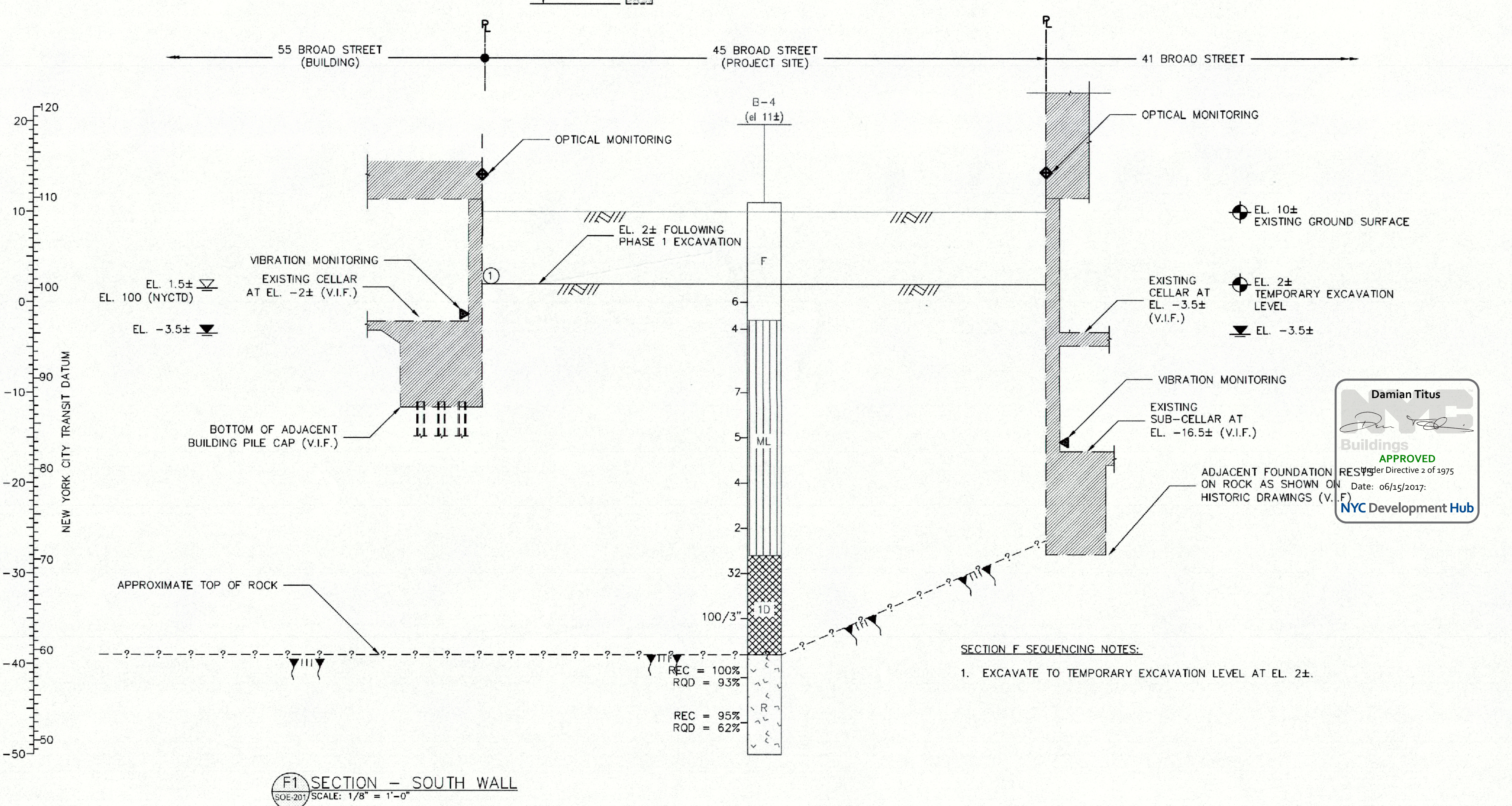
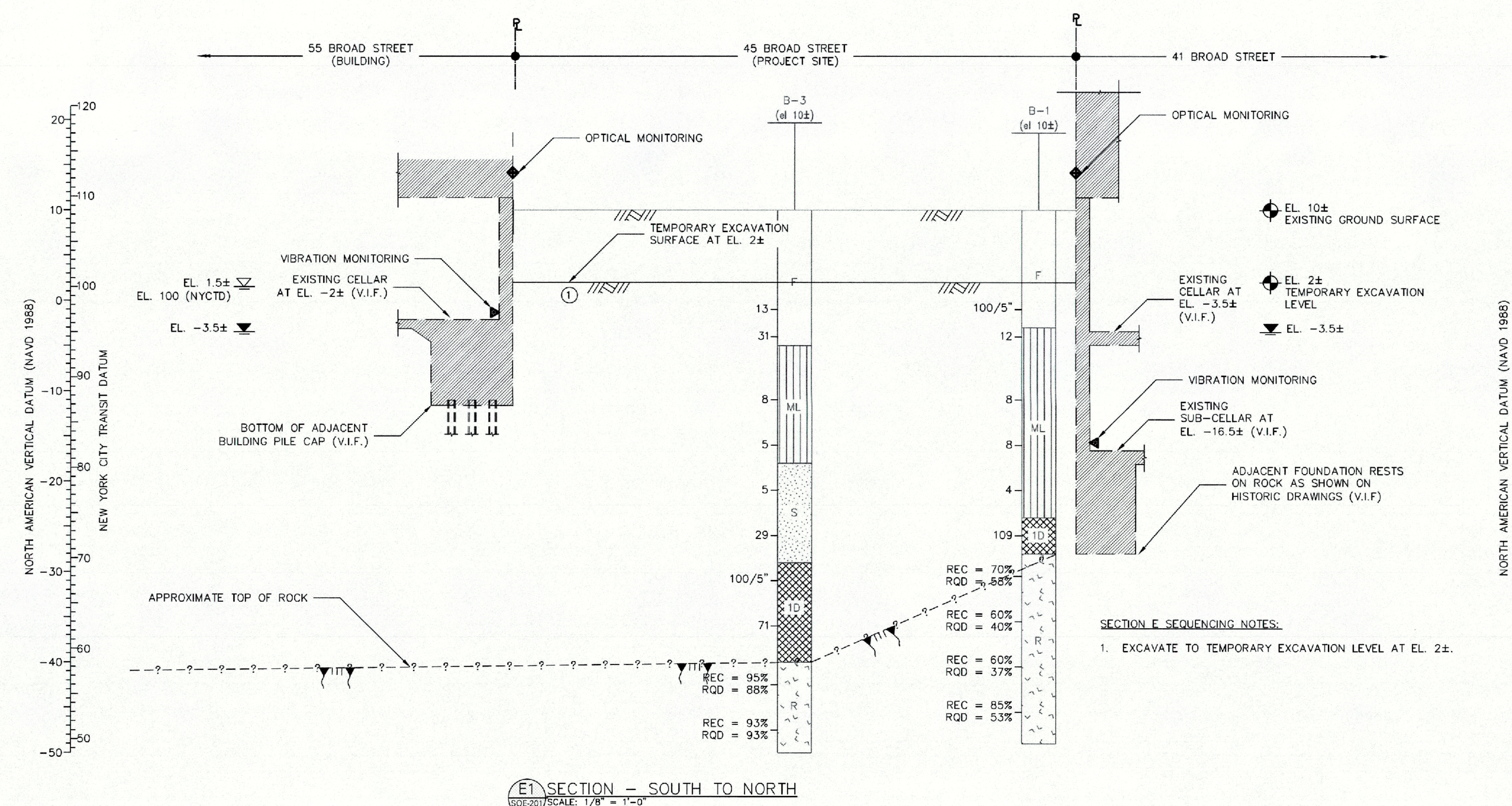
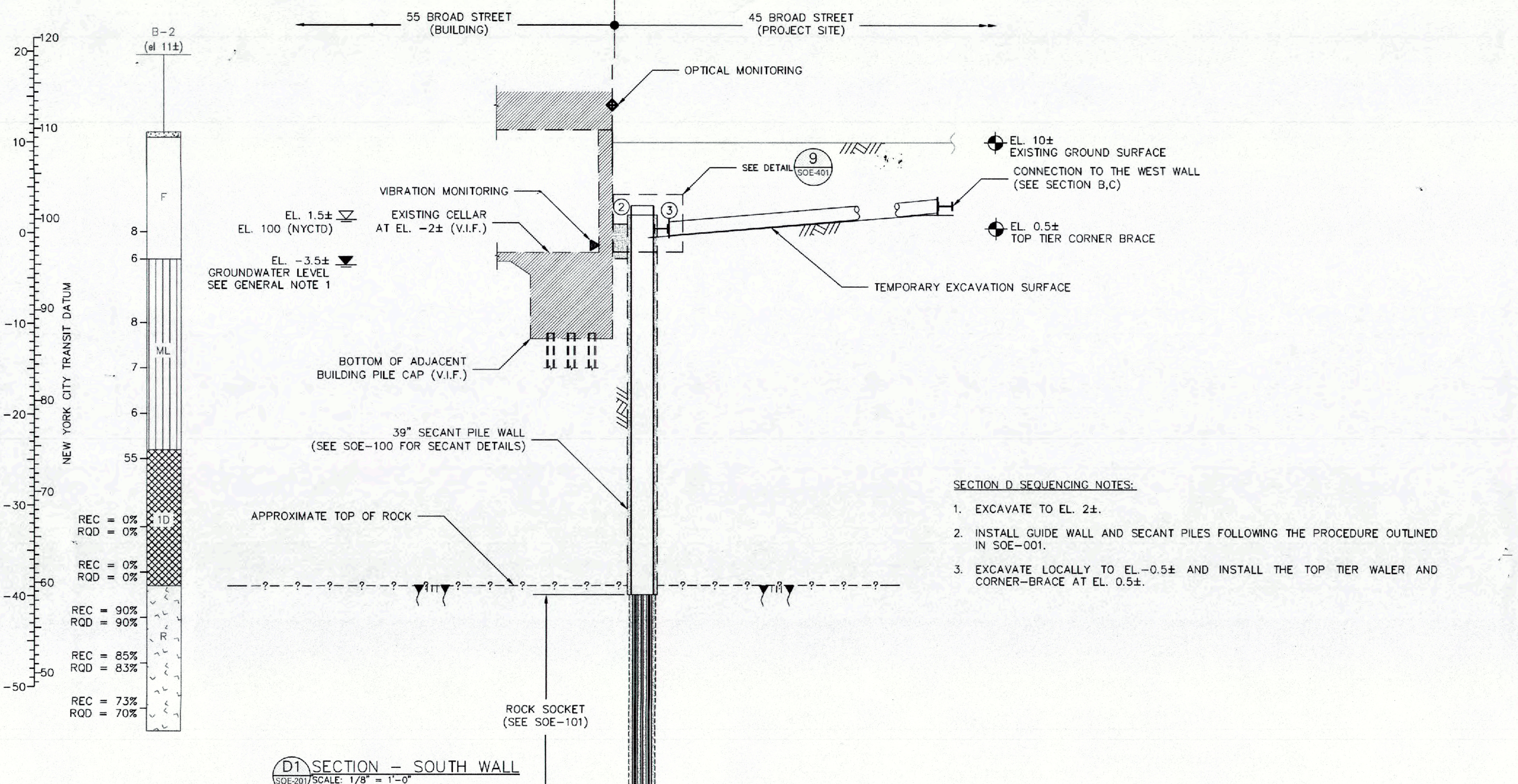
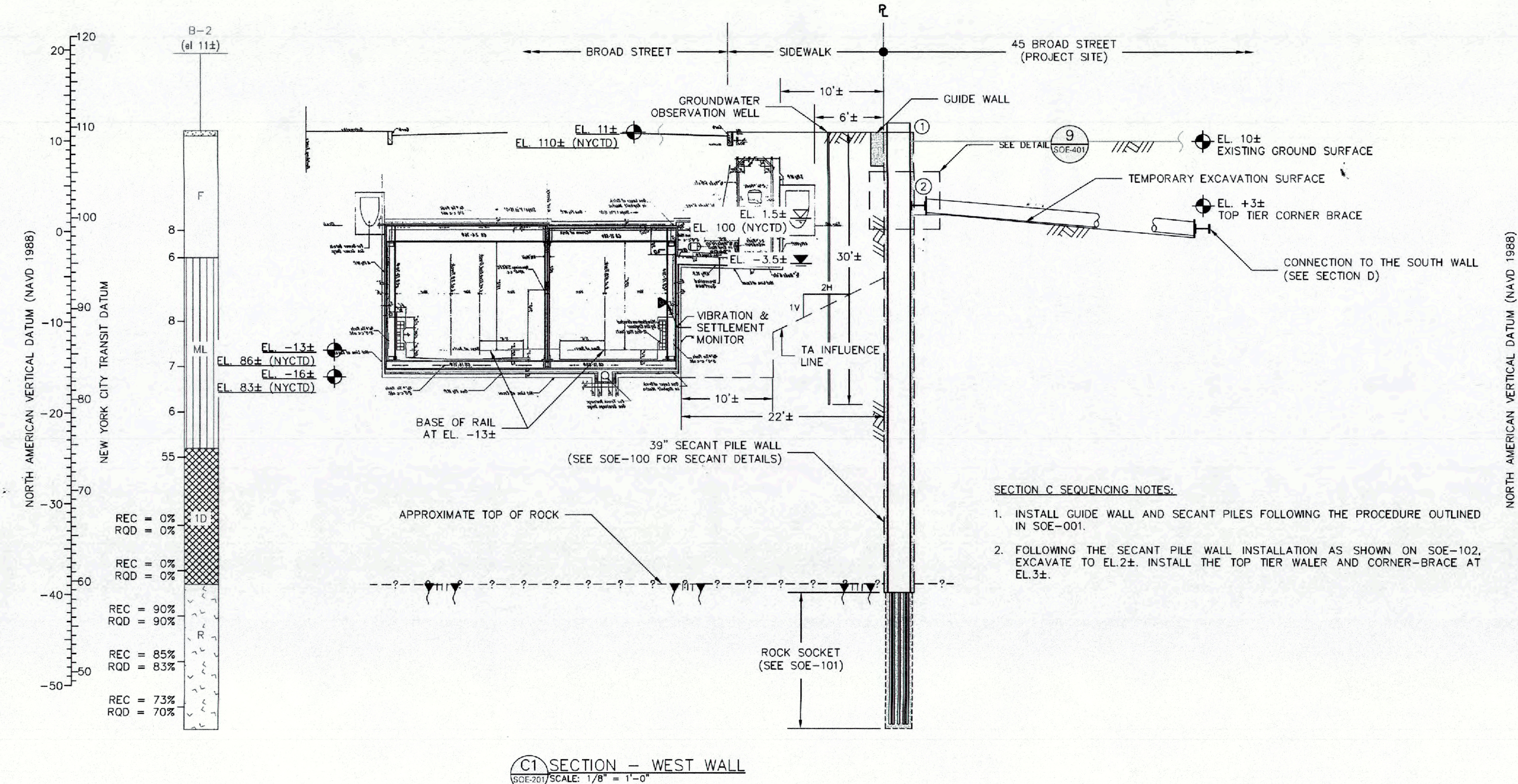
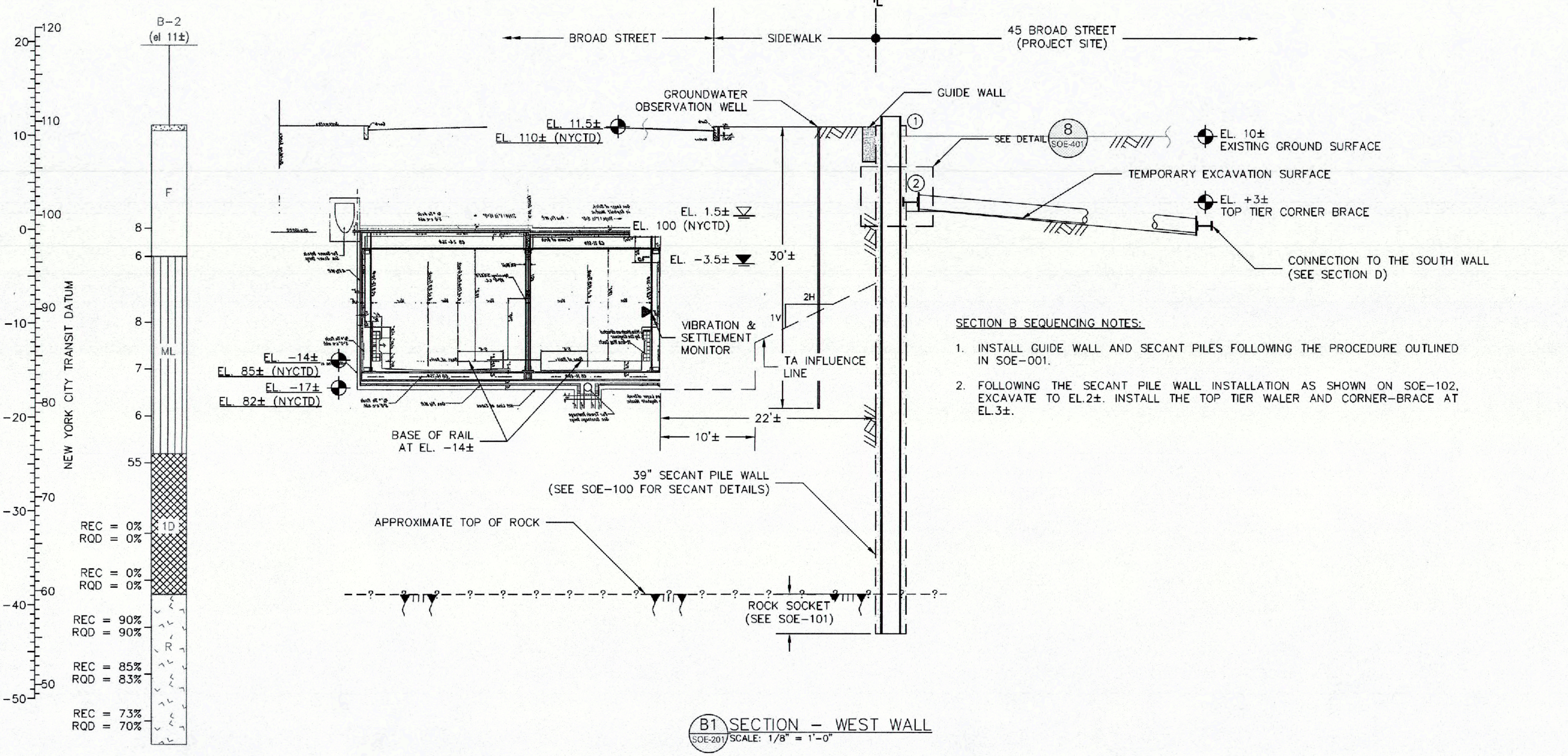
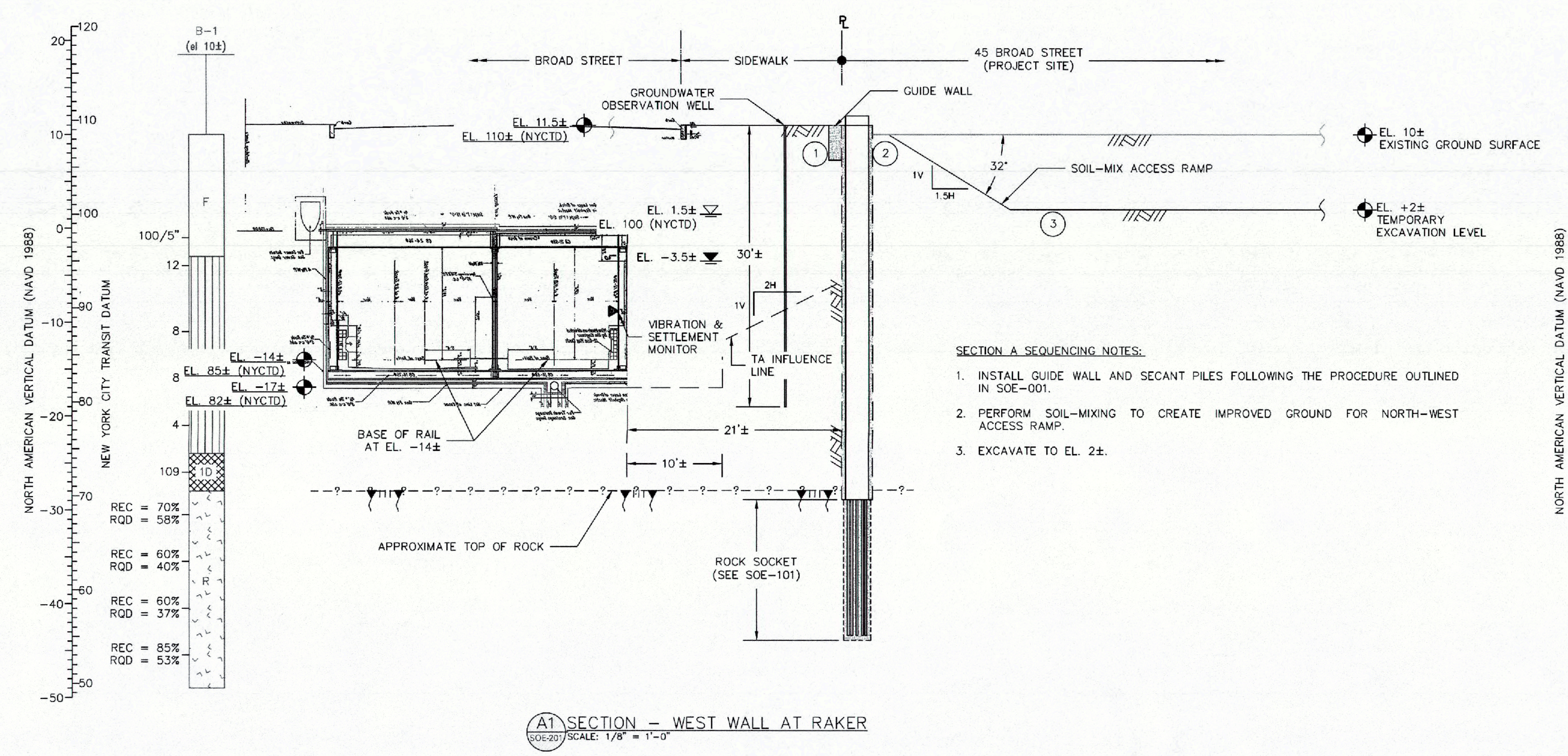
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2017.04.13 NYCT-4th SUBMISSION  
2017.03.21 60% CONSTRUCTION DOCUMENTS - UPDATED  
2017.03.15 REVISED FOR FOUNDATION BID  
2017.03.07 NYCT-3rd SUBMISSION  
2017.03.01 60% CONSTRUCTION DOCUMENTS  
2016.12.20 NYCT-2nd SUBMISSION  
2016.11.07 FOUNDATION AND EXCAVATION FOR BID  
2016.04.22 ISSUED FOR DESIGN DEVELOPMENT

APPROVED  
Damian Titus  
NYC Development Hub

SUPPORT OF EXCAVATION  
PHASE 1 SECTIONS  
(SHEET 1 OF 2)

**SOE-201.00**

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1529.00 121190772

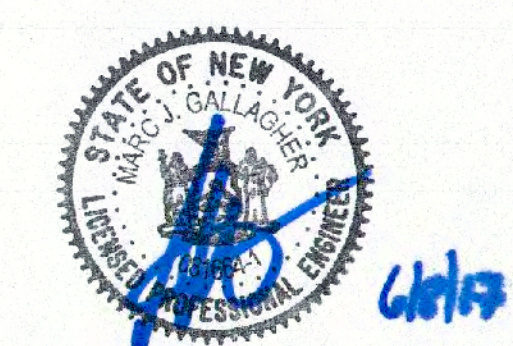
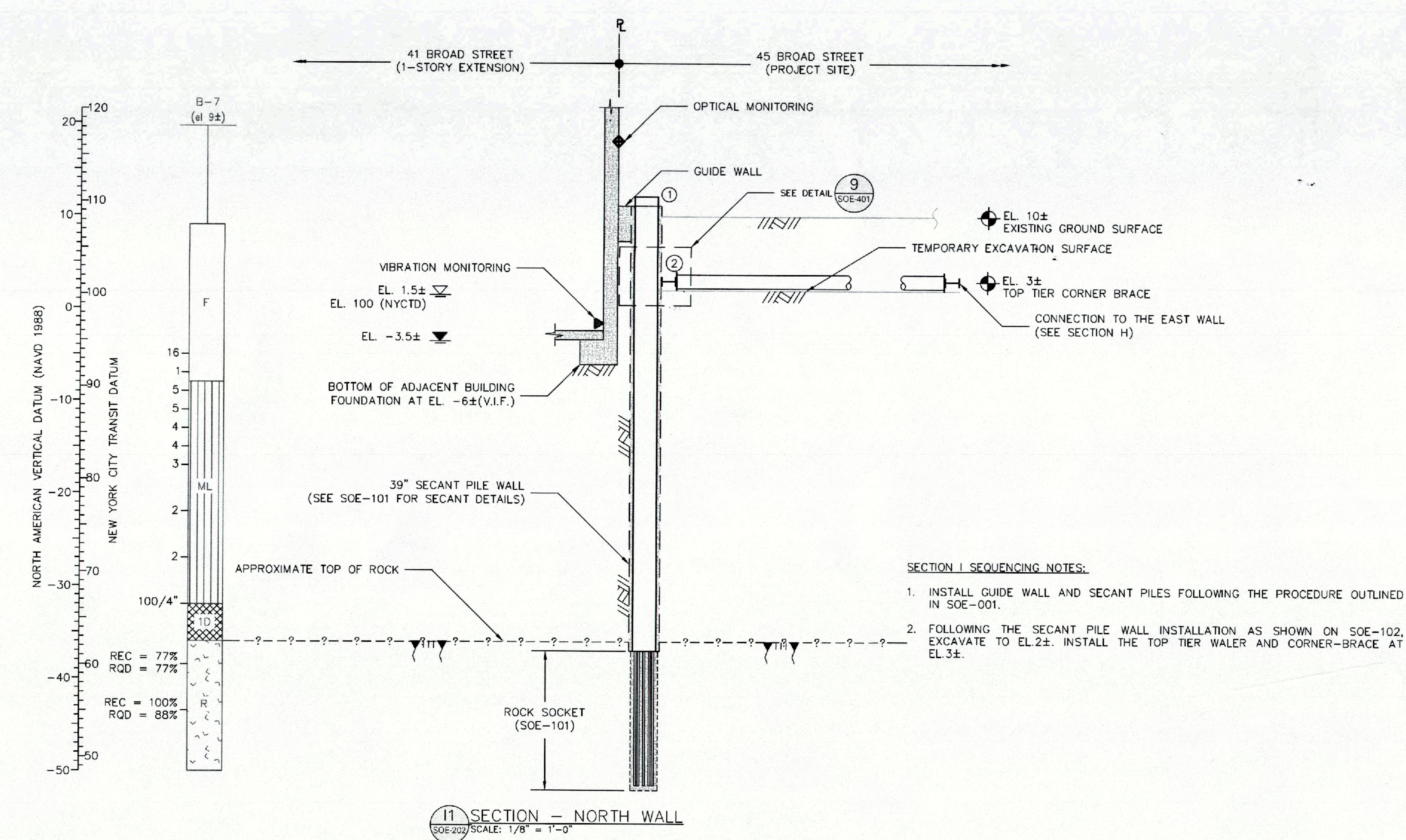
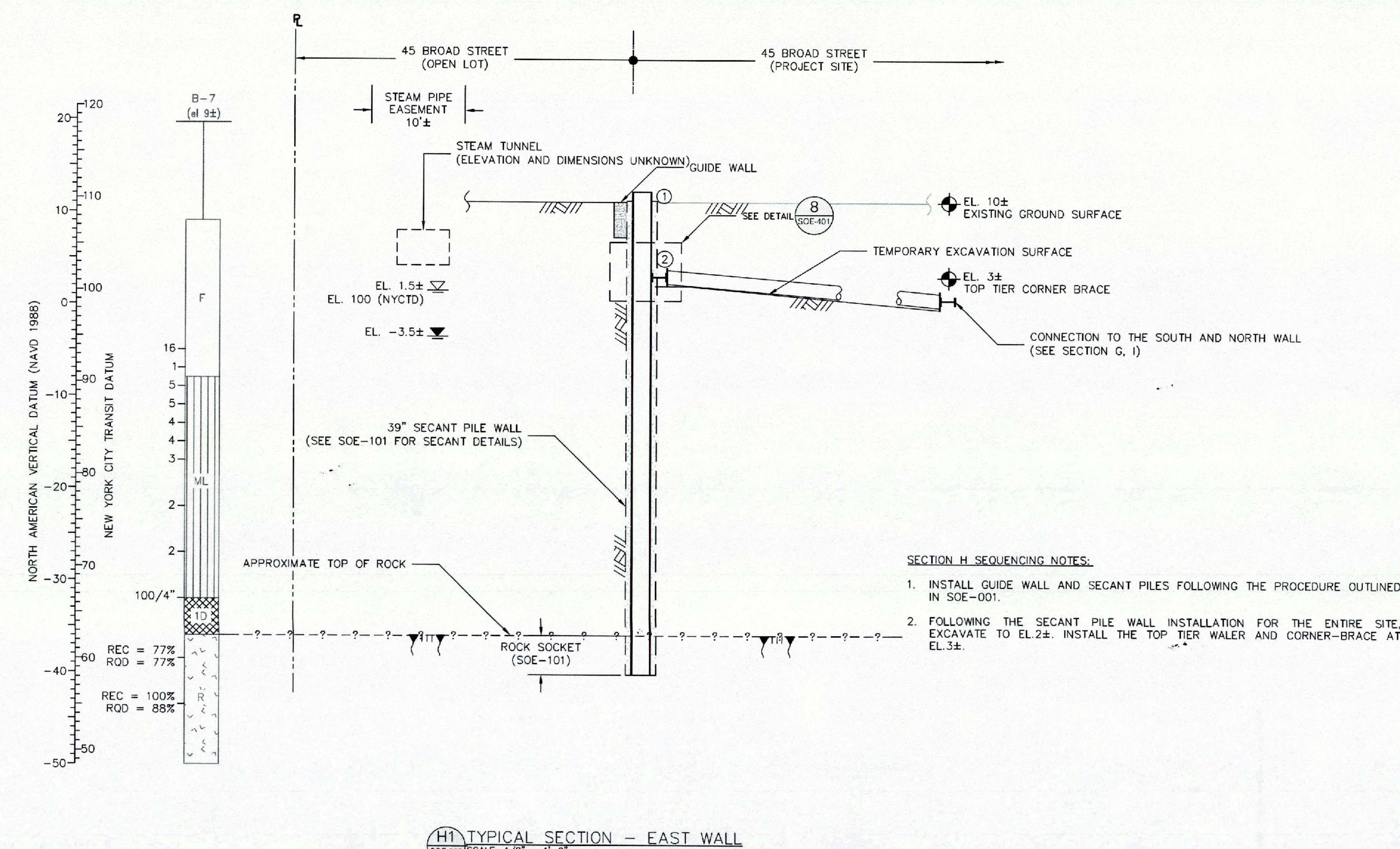
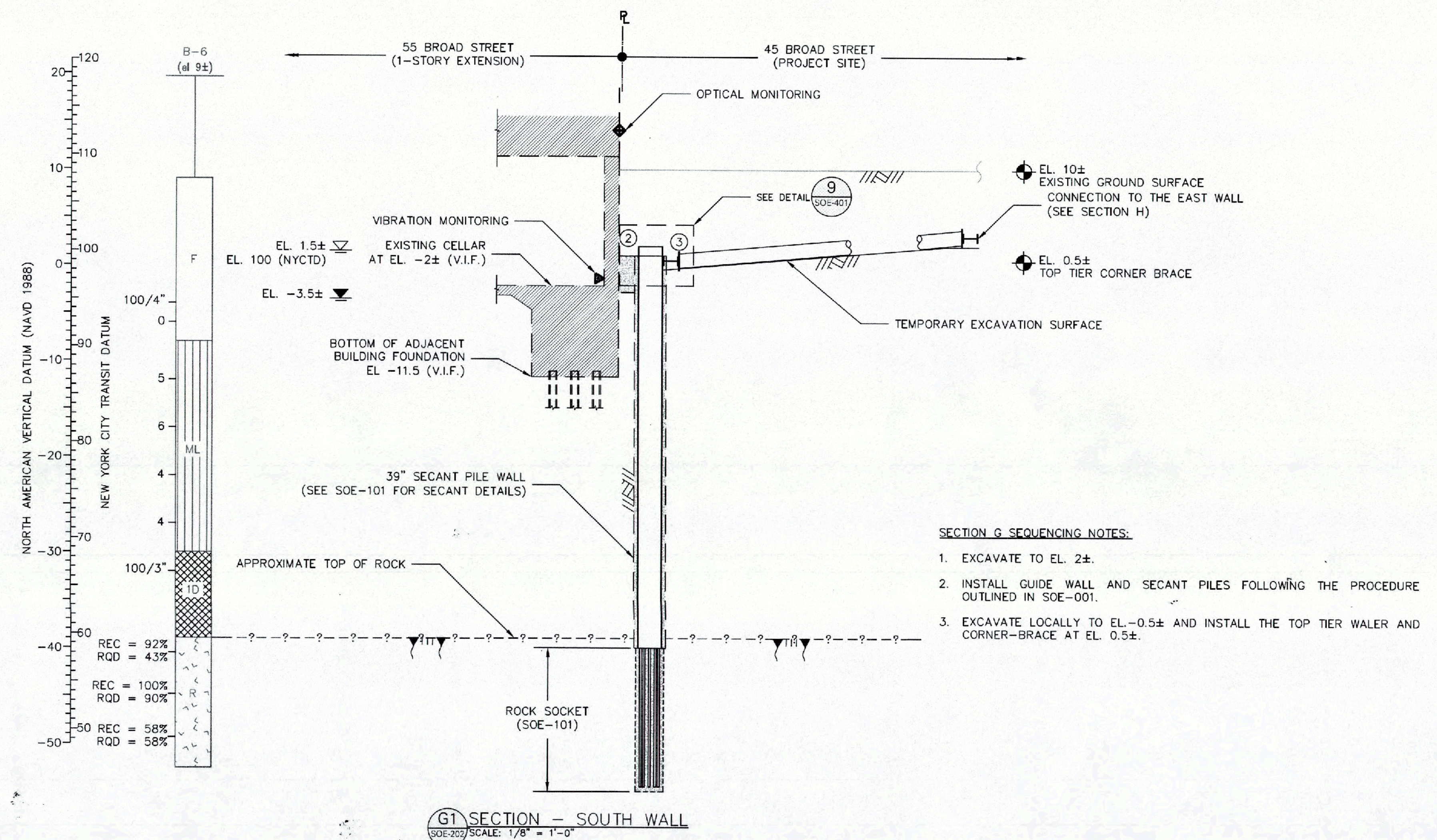
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SUPPORT OF EXCAVATION PHASE 1 SECTIONS (SHEET 2 OF 2)

**SOE-202.00**

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1529.00		121190772

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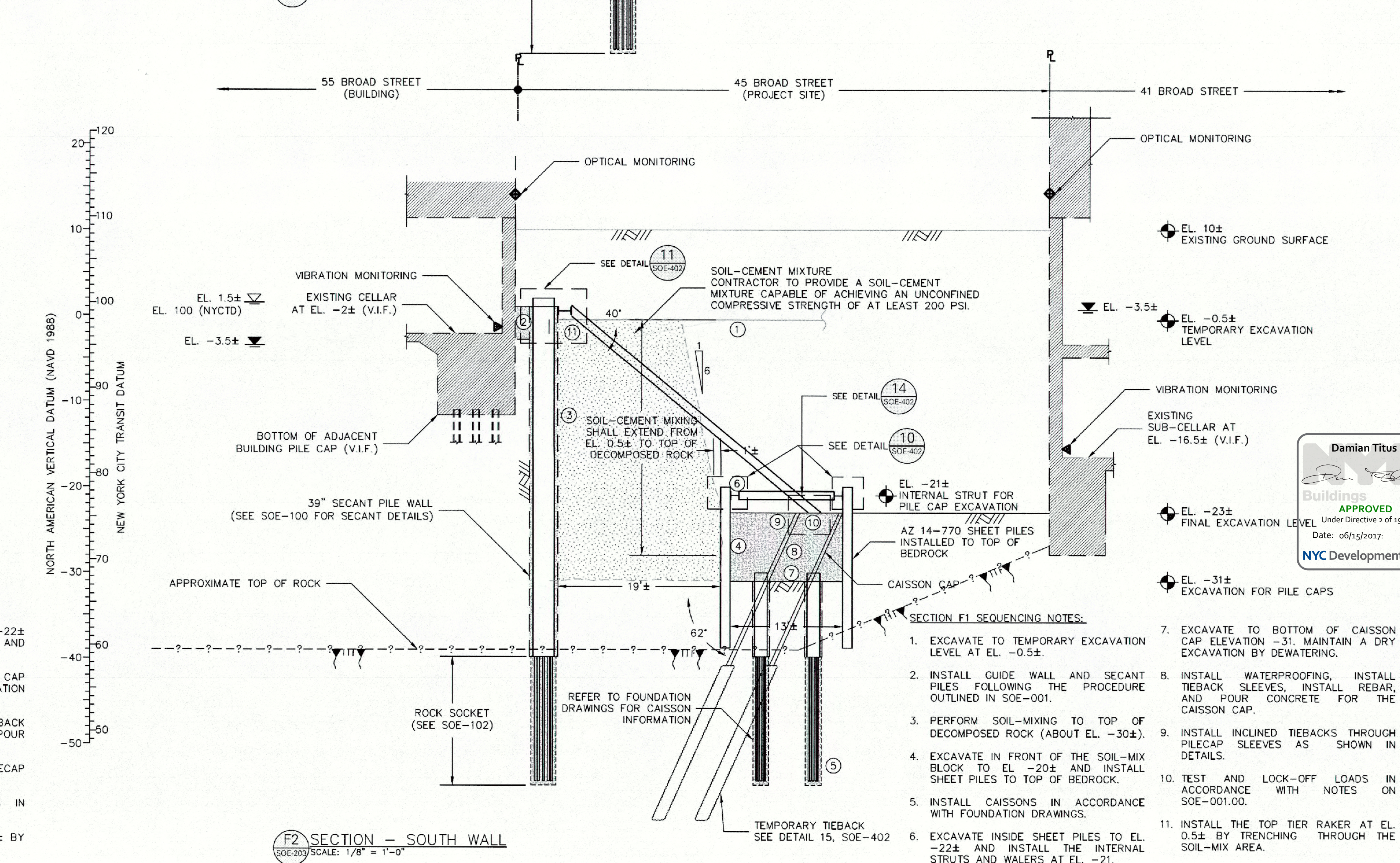
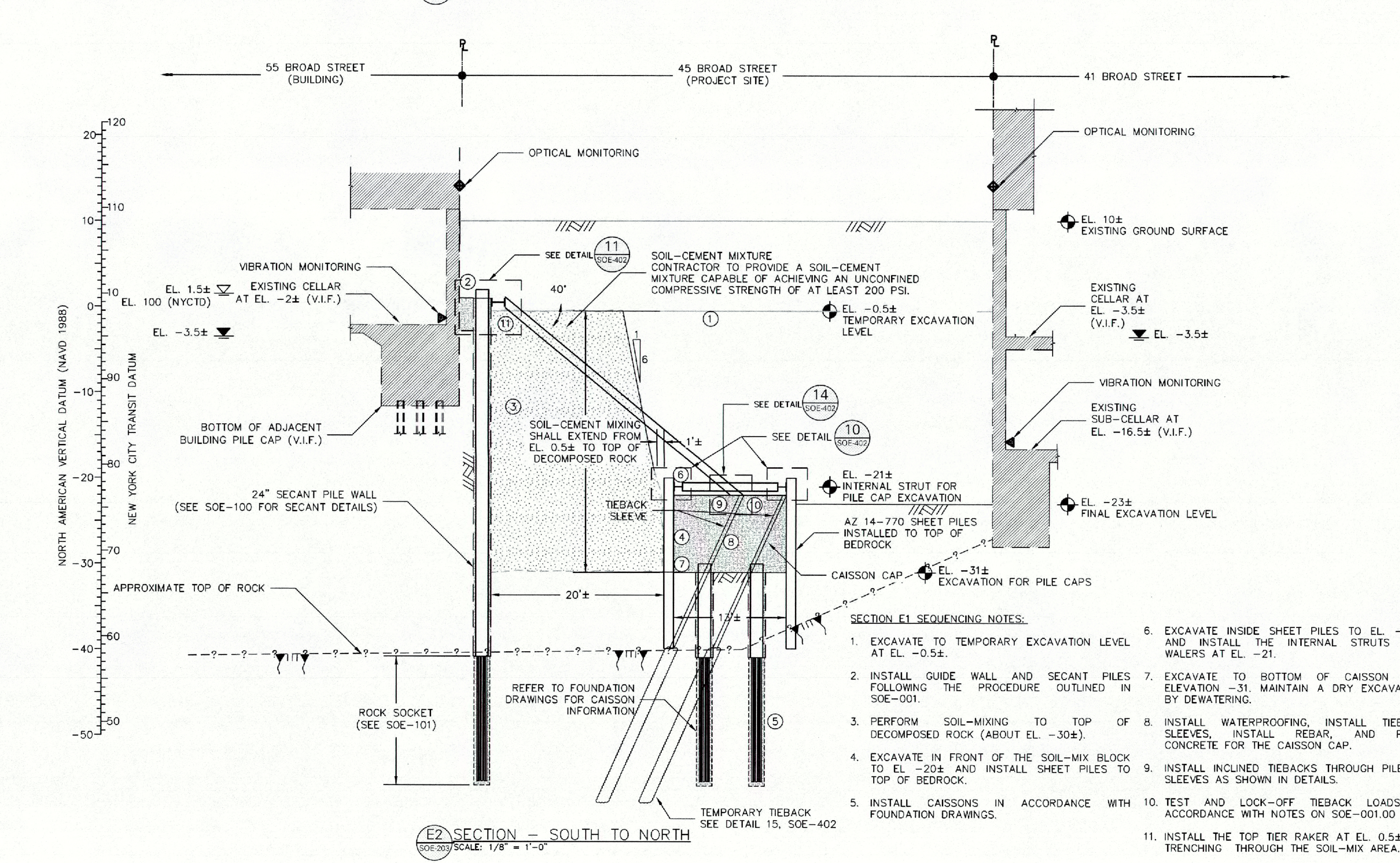
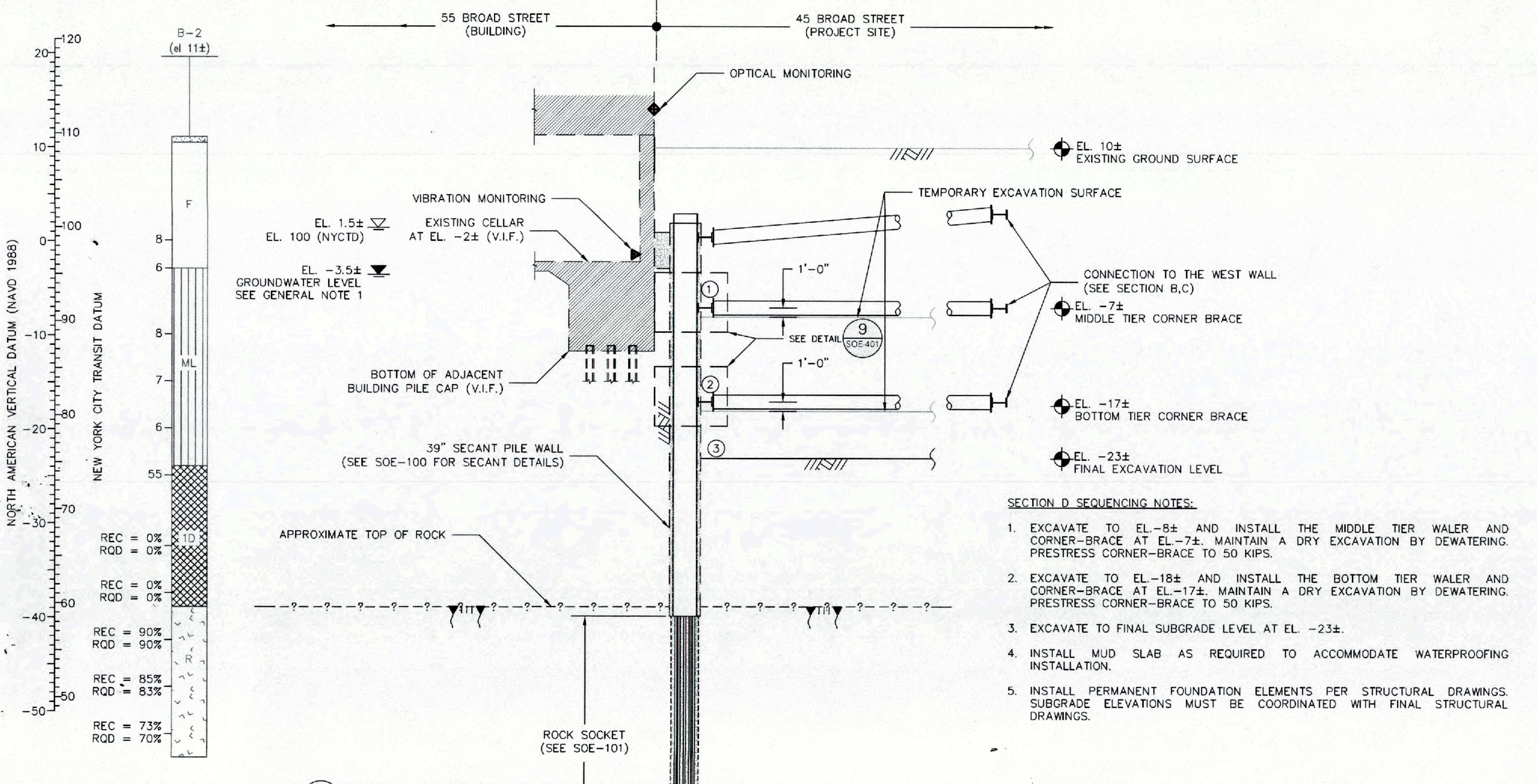
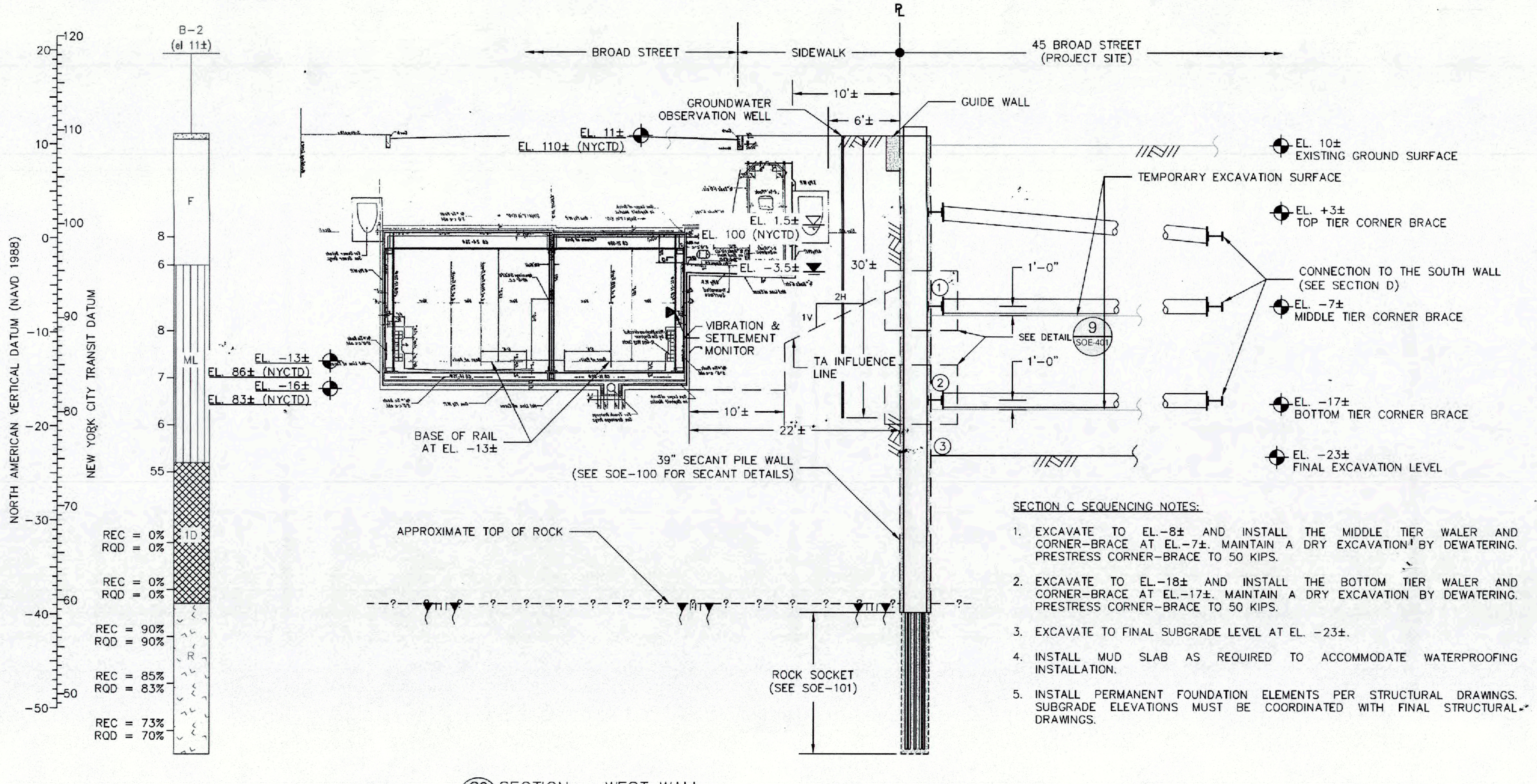
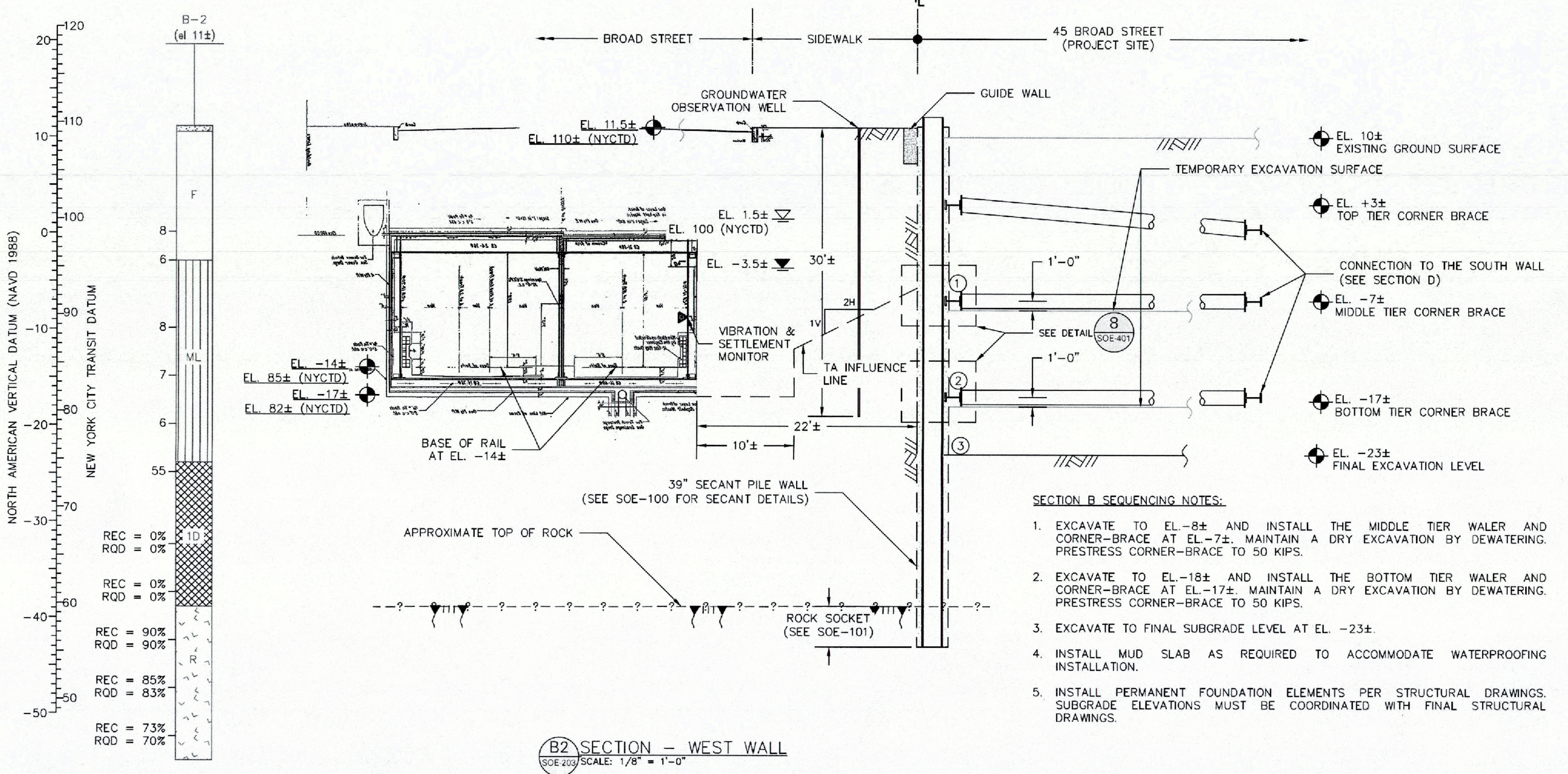
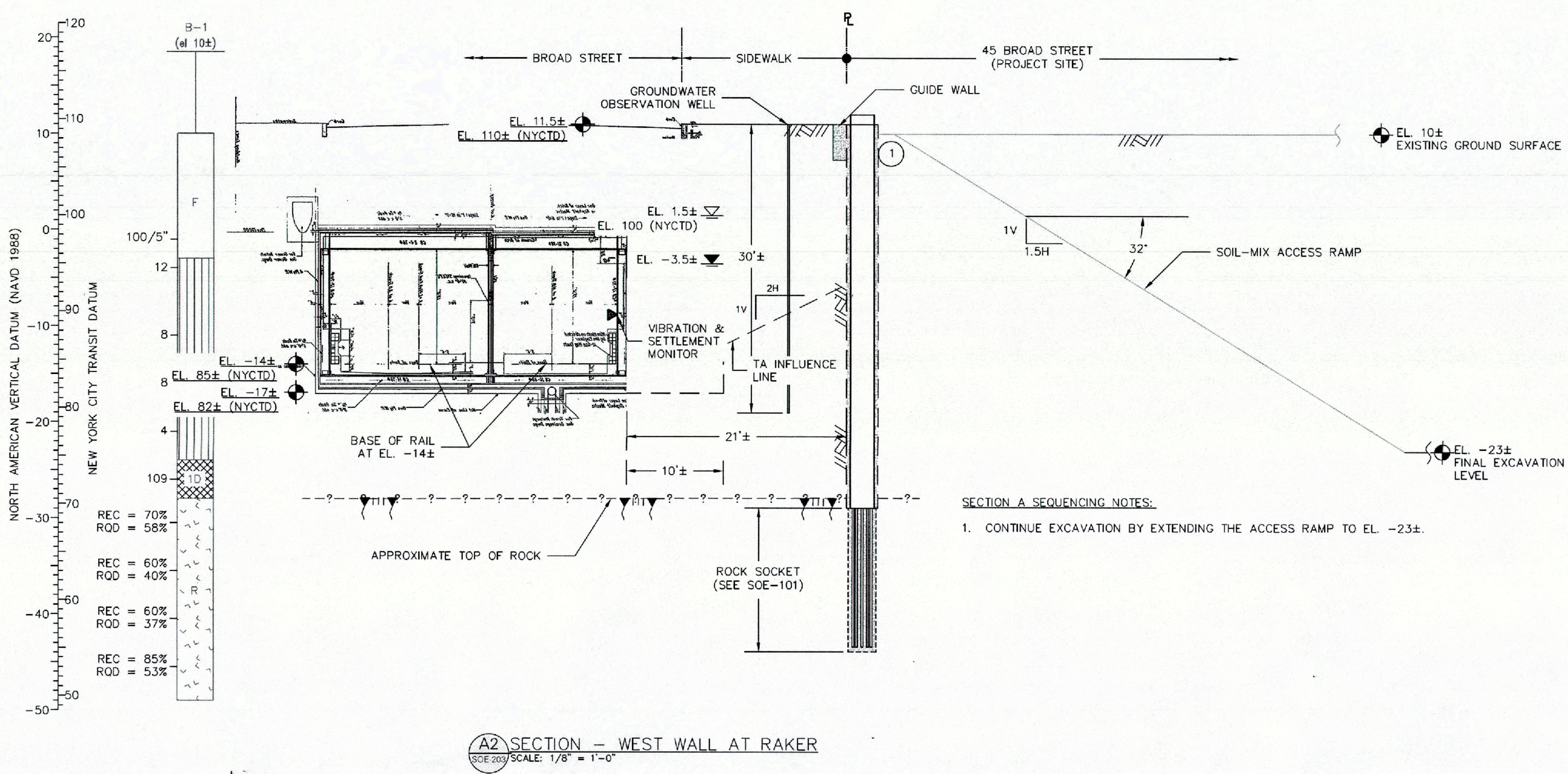
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BuroHappold Engineering  
100 Broadway, Floor 20  
New York, NY 10005  
212.334.2025

MFPF LLC / M. Paul  
Friedberg & Partners  
120 Broadway, Floor 20  
New York, NY 10005  
212.477.6368



2017.04.13	NYCT-46 SUBMISSION
2017.03.21	6% CONSTRUCTION DOCUMENTS - UPDATED
2017.03.13	REVISED FOR FOUNDATION BID
2017.03.07	NYCT-36 SUBMISSION
2017.03.01	6% CONSTRUCTION DOCUMENTS
2016.12.28	NYCT-26 SUBMISSION
2016.11.07	FOUNDATION AND EXCAVATION FOR BID
2016.04.22	ISSUED FOR DESIGN DEVELOPMENT

APPROVED  
Under Direction of 2015  
Date: 06/05/2015

NYC Development Hub

**CETRARUDDY**

SUPPORT OF EXCAVATION  
PHASE 2 SECTIONS  
(SHEET 1 OF 2)

**SOE-203.00**

AS SHOWN	1529.00	121190772
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# 45 BROAD STREET

NEW YORK NY 10004

**John A. Cetra**  
State of New York  
Registered Architect  
No. 018861  
CetraRuddy Architecture PC  
584 Broadway Suite 401  
New York, NY 10012  
212.841.8901

**Madison 45 Broad Development, LLC**  
105 Madison Avenue  
New York, NY 10016

**WSP Group**  
228 East 45th Street, 3rd Fl  
New York, NY 10017  
212.857.9888

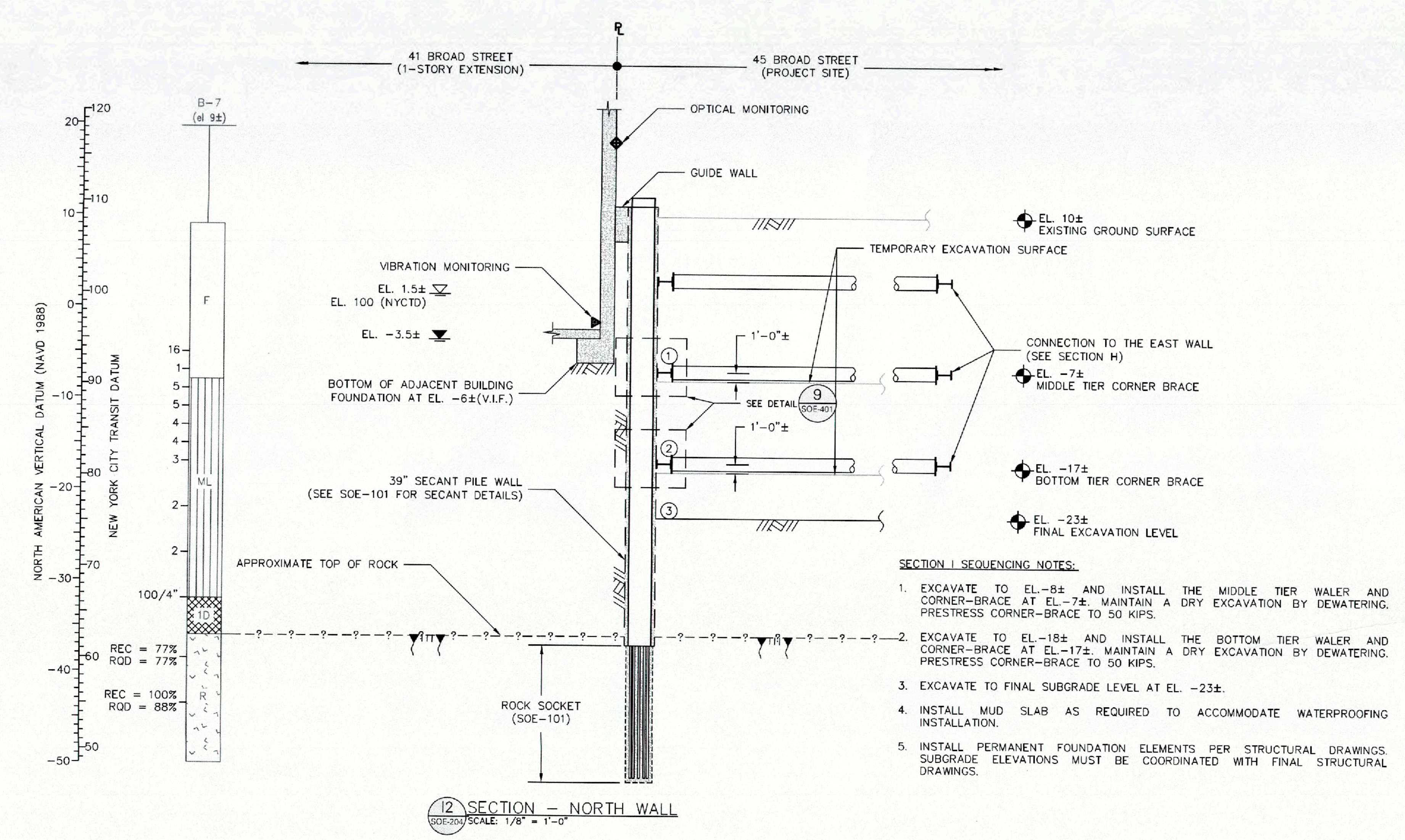
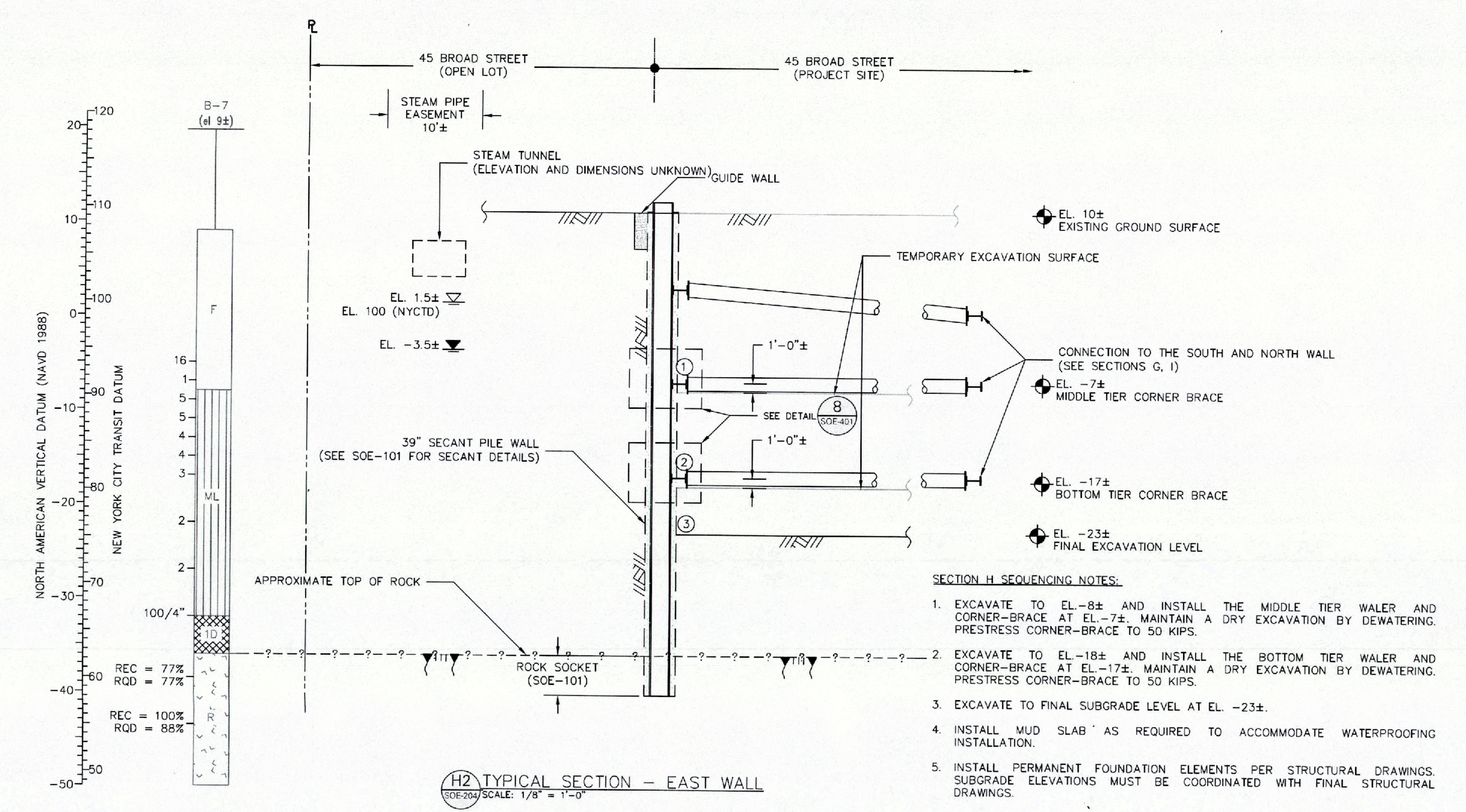
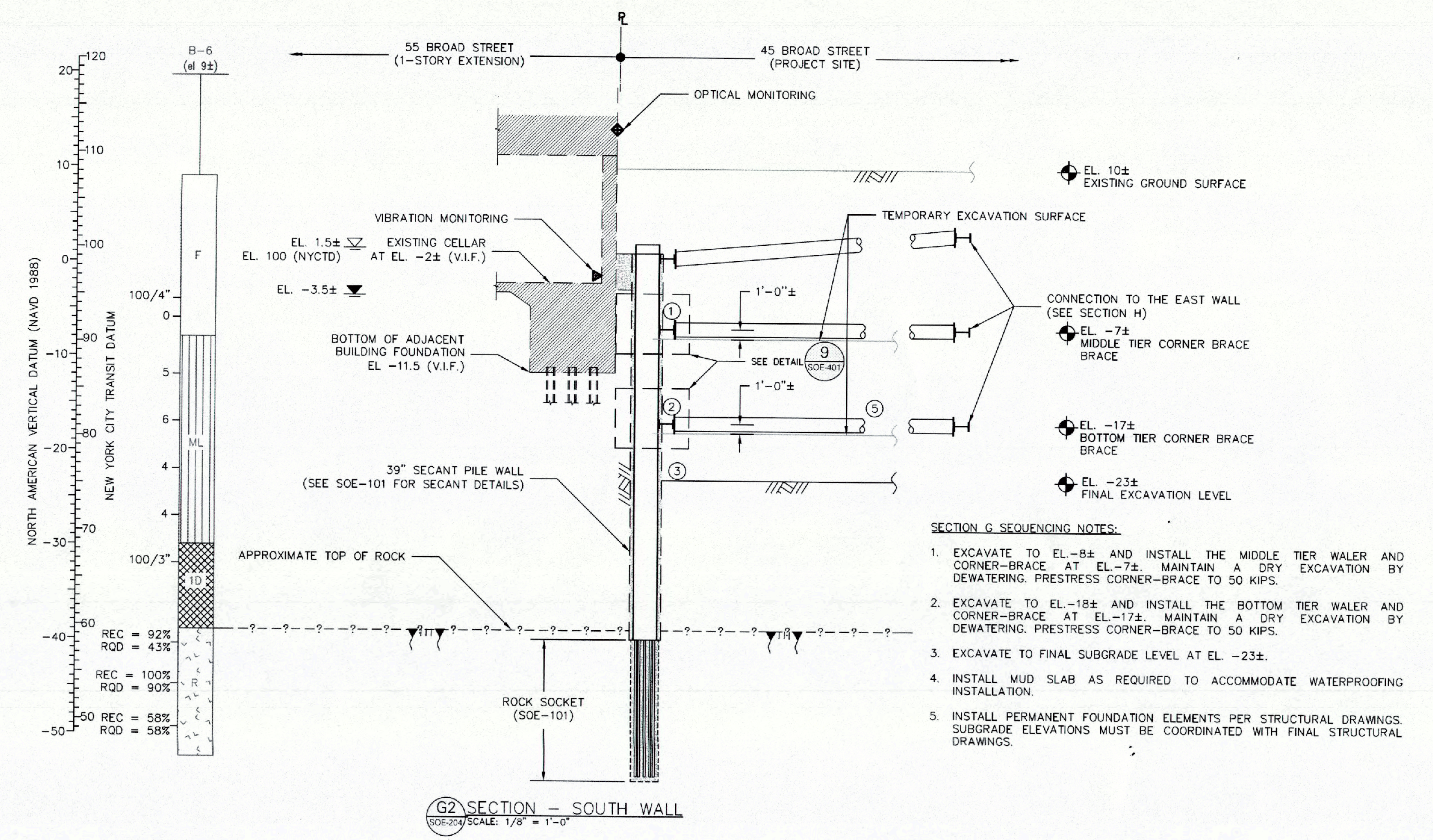
**BuroHappold Engineering**  
100 Broadway  
New York, NY 10005  
212.334.2023

**LANGAN**  
21 Park Plaza  
360 West 31st Street, 8th Fl  
New York, NY 10001  
212.479.5400

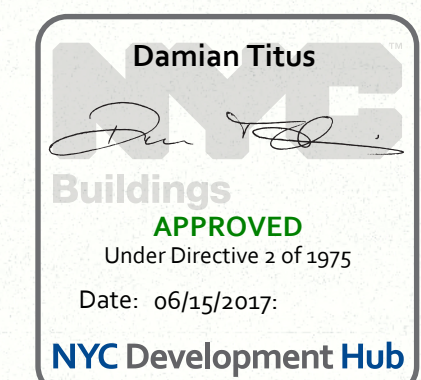
**MPPF LLC / M. Paul Friedberg & Partners**  
120 Broadway Floor 20  
New York, NY 10005  
212.477.8366

**Ventresca Design, LLC**  
14-07 Eleventh St, Suite 203  
Long Island City, NY 11101  
212.600.0333

**BuroHappold Engineering**  
100 Broadway  
New York, NY 10005  
212.334.2023



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2017.03.13	REVISED FOR FOUNDATION BID
2017.03.07	NYCT - 36 SUBMISSION
2017.03.01	60% CONSTRUCTION DOCUMENTS
2016.12.20	NYCT - 2nd SUBMISSION
2016.11.07	FOUNDATION AND EXCAVATION FOR BID
2016.04.22	ISSUED FOR DESIGN DEVELOPMENT



SUPPORT OF EXCAVATION  
PHASE 2 SECTIONS  
(SHEET 2 OF 2)

**SOE-204.00**

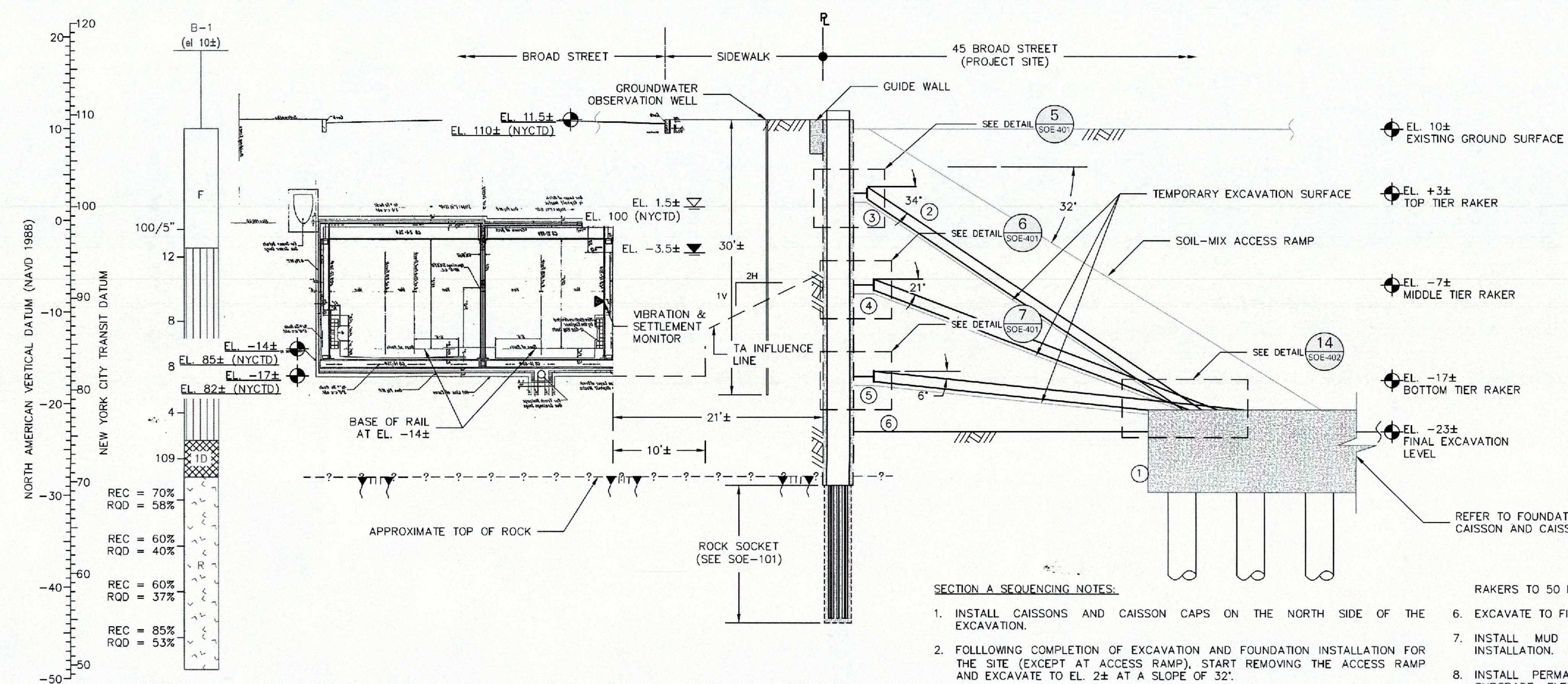
AS SHOWN	DATE	NO. OF SHEETS	TOTAL SHEETS
1529.00		1	121190772



# 45 BROAD STREET

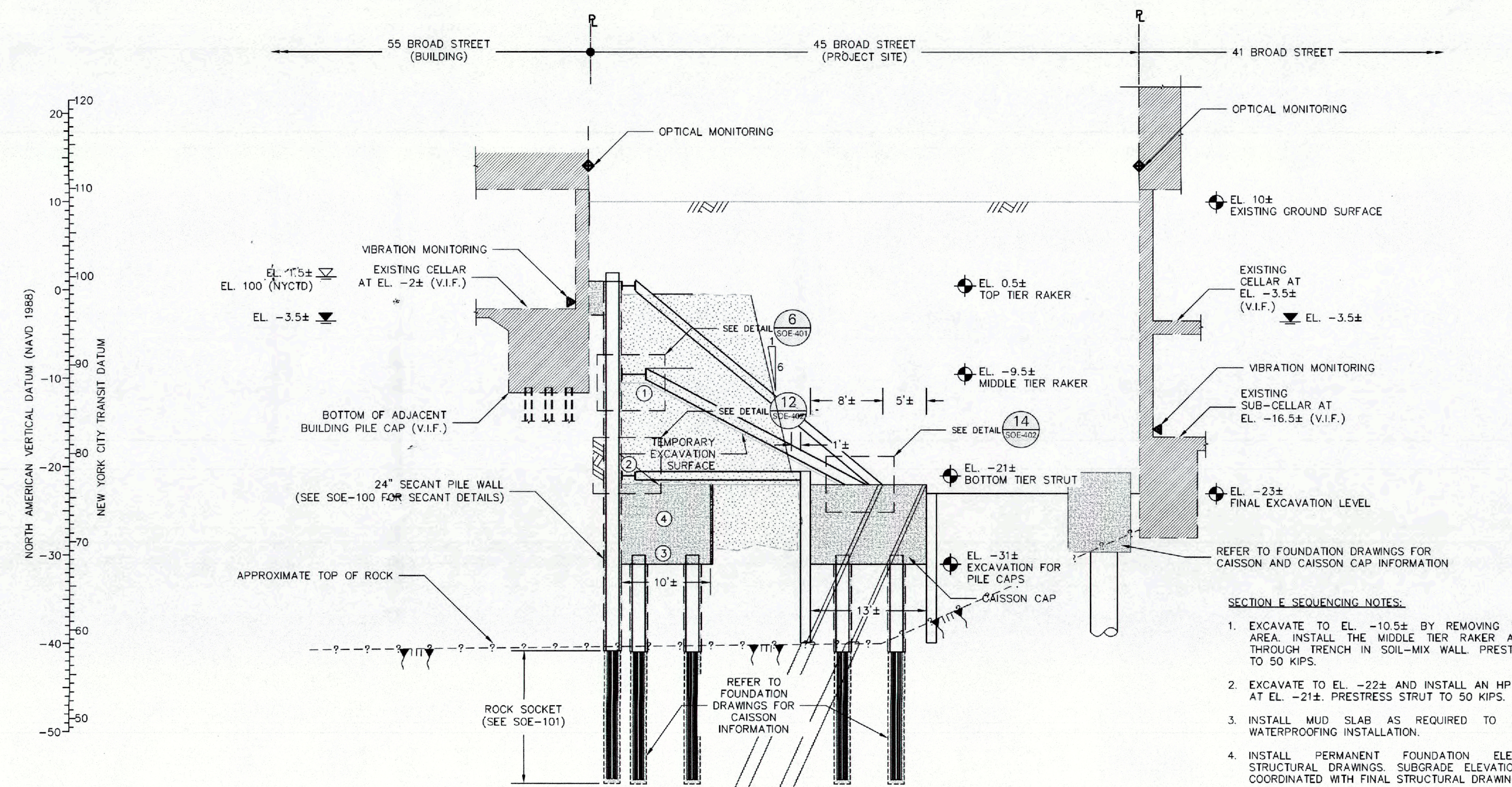
NEW YORK NY 10004

John A. Cetra State of New York Registered Architect No. 018661	Madison 45 Broad Development, LLC 105 Madison Avenue New York, NY 10016
CetraRuddy Architecture DPC 544 Broadway Suite 401 New York, NY 10012 212.941.9801	BuroHappold Engineering 100 Broadway New York, NY 10005 212.334.2025
WSP Group 232 East 46th Street, 3rd Fl New York, NY 10017 212.687.9888	BuroHappold Engineering 100 Broadway New York, NY 10005 212.334.2025
LANGAN 21 Penn Plaza 100 Broadway, Floor 30 New York, NY 10001 212.479.5400	MFPF LLC / M. Paul Friedberg & Partners 100 Broadway, Floor 30 New York, NY 10005 212.479.5400
Ventresca Design, LLC 44-02 Glenwood St, Suite 203 Long Island City, NY 11101 212.503.0033	BuroHappold Engineering 100 Broadway New York, NY 10005 212.334.2025



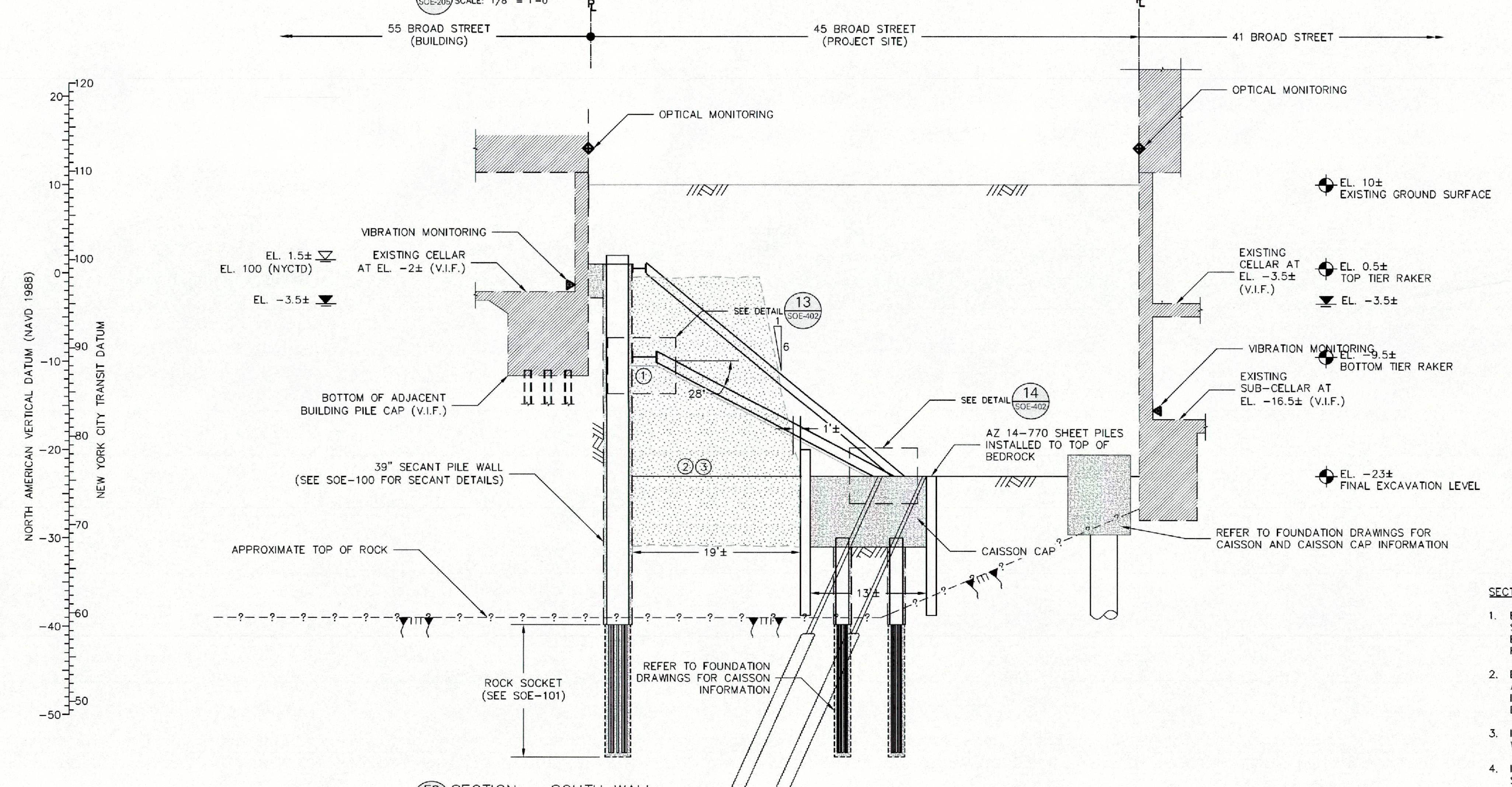
- SECTION A SEQUENCING NOTES:**
1. INSTALL CAISSONS AND CAISSON CAPS ON THE NORTH SIDE OF THE EXCAVATION.
  2. FOLLOWING COMPLETION OF EXCAVATION AND FOUNDATION INSTALLATION FOR THE SITE (EXCEPT AT ACCESS RAMP), START REMOVING THE ACCESS RAMP AND EXCAVATE TO EL. 2± AT A SLOPE OF 32°.
  3. INSTALL TOP TIER WALKER AND RAKER AT EL. 3±. PRESTRESS RAKERS TO 50 KIPS.
  4. CONTINUE EXCAVATING THE ACCESS RAMP. EXCAVATE TO EL. -8± AT A SLOPE OF 21° AND INSTALL MIDDLE TIER RAKER AT EL. -7±. MAINTAIN A DRY EXCAVATION BY DEWATERING. PRESTRESS RAKERS TO 50 KIPS.
  5. EXCAVATE TO EL. -18± AT A SLOPE OF 6° AND INSTALL BOTTOM TIER RAKER AT EL. -17±. MAINTAIN A DRY EXCAVATION BY DEWATERING. PRESTRESS RAKERS TO 50 KIPS.
  6. EXCAVATE TO FINAL SUBGRADE LEVEL AT EL. -23±.
  7. INSTALL MUD SLAB AS REQUIRED TO ACCOMMODATE WATERPROOFING INSTALLATION.
  8. INSTALL PERMANENT FOUNDATION ELEMENTS PER STRUCTURAL DRAWINGS. SUBGRADE ELEVATIONS MUST BE COORDINATED WITH FINAL STRUCTURAL DRAWINGS.

**A3 SECTION - WEST WALL AT RAKER**  
SCALE: 1/8" = 1'-0"



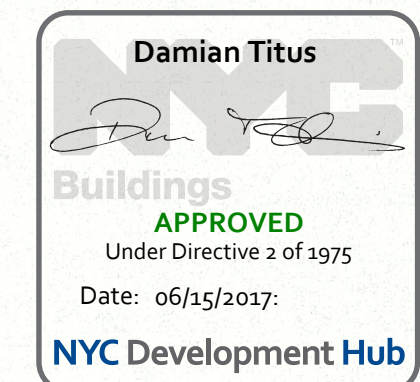
- SECTION E SEQUENCING NOTES:**
1. EXCAVATE TO EL. -10.5± BY REMOVING THE SOIL-MIX AREA. INSTALL THE MIDDLE TIER RAKER AT EL. -9.5± THROUGH TRENCH IN SOIL-MIX WALL. PRESTRESS RAKERS TO 50 KIPS.
  2. EXCAVATE TO EL. -22± AND INSTALL AN HP 12x74 STRUT AT EL. -21±. PRESTRESS STRUT TO 50 KIPS.
  3. INSTALL MUD SLAB AS REQUIRED TO ACCOMMODATE WATERPROOFING INSTALLATION.
  4. INSTALL PERMANENT FOUNDATION ELEMENTS PER STRUCTURAL DRAWINGS. SUBGRADE ELEVATIONS MUST BE COORDINATED WITH FINAL STRUCTURAL DRAWINGS.

**E3 SECTION - SOUTH TO NORTH**  
SCALE: 1/8" = 1'-0"



- SECTION F SEQUENCING NOTES:**
1. EXCAVATE DOWN TO EL. -10.5± BY REMOVING THE SOIL-MIX AREA. INSTALL THE BOTTOM TIER RAKER AT EL. -9.5± THROUGH TRENCH IN SOIL-MIX WALL. PRESTRESS RAKERS TO 50 KIPS.
  2. EXCAVATE TO FINAL SUBGRADE EL. -31. INSTALL MUD SLAB AS REQUIRED TO ACCOMMODATE WATERPROOFING INSTALLATION. MAINTAIN A DRY EXCAVATION BY DEWATERING.
  3. INSTALL MUD SLAB AS REQUIRED TO ACCOMMODATE WATERPROOFING INSTALLATION.
  4. INSTALL PERMANENT FOUNDATION ELEMENTS PER STRUCTURAL DRAWINGS. SUBGRADE ELEVATIONS MUST BE COORDINATED WITH FINAL STRUCTURAL DRAWINGS.

**F3 SECTION - SOUTH WALL**  
SCALE: 1/8" = 1'-0"

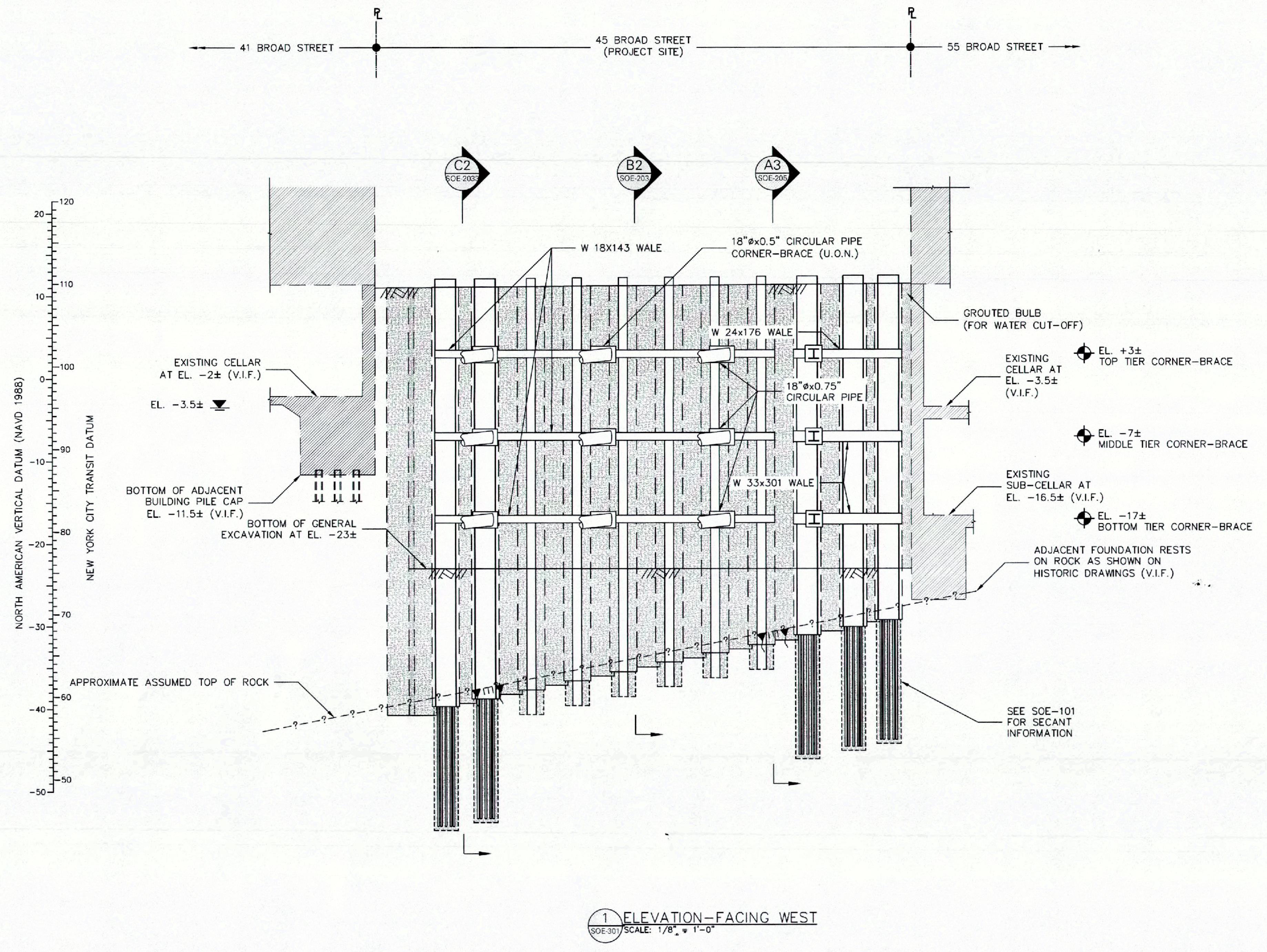


SUPPORT OF EXCAVATION  
PHASE 3 SECTIONS  
(SHEET 1 OF 1)

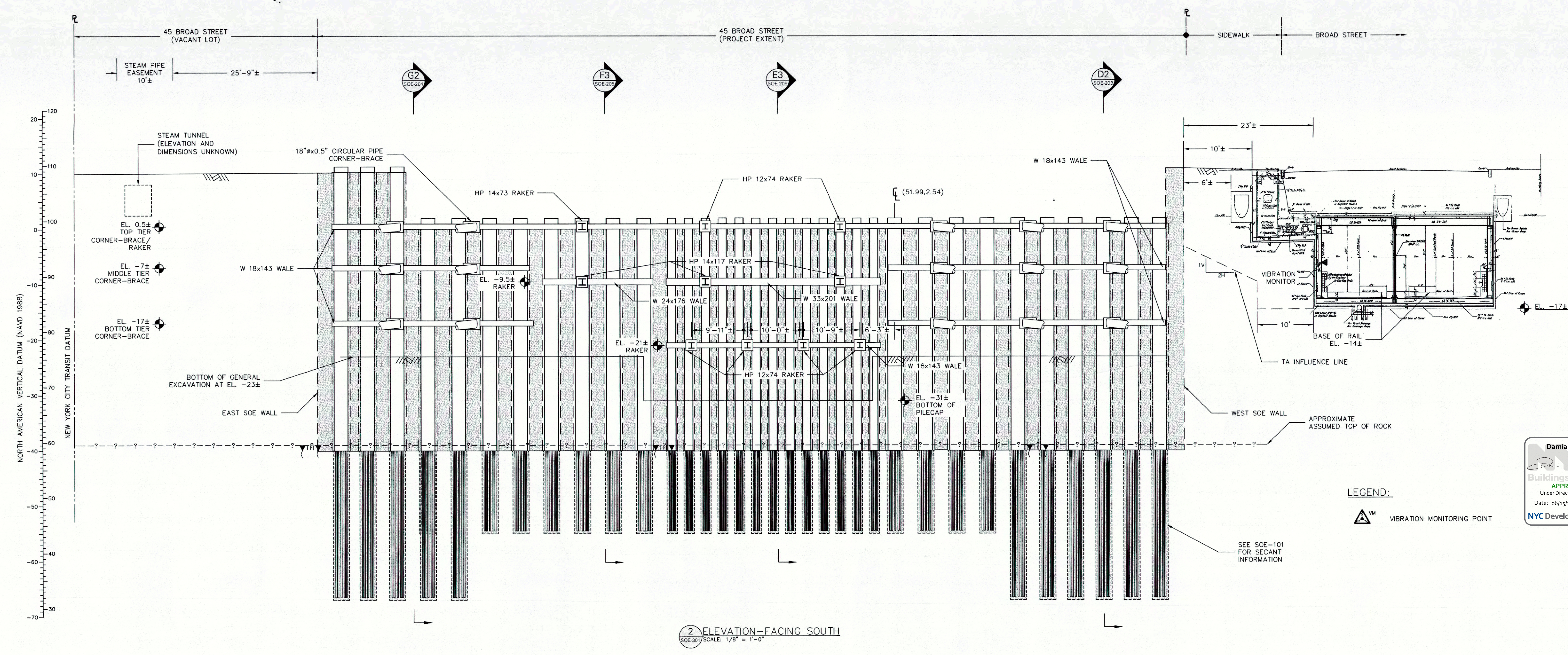
**SOE-205.00**

AS SHOWN	12190772
1529.00	12190772



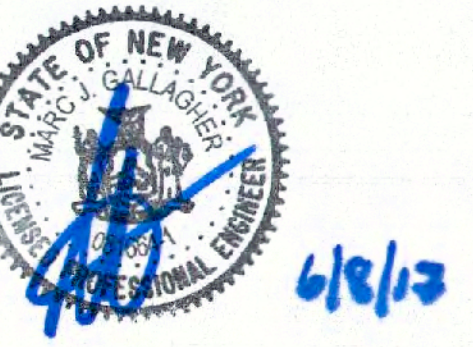


1 ELEVATION - FACING WEST  
SCALE: 1/8" = 1'-0"



2 ELEVATION - FACING SOUTH  
SCALE: 1/8" = 1'-0"

<p><b>John A. Cetra</b> State of New York Registered Architect No. 018861 CetraRuddy Architecture PC 254 Broadway Suite 401 New York, NY 10012 212.941.9801</p>	<p><b>Madison 45 Broad Development, LLC</b> 105 Madison Avenue New York, NY 10016</p>
<p><b>WSP Group</b> 228 East 45th Street, 3rd Fl New York, NY 10017 212.687.8888</p>	<p><b>BuroHappold Engineering</b> 100 Broadway New York, NY 10005 212.334.2025</p>
<p><b>LANGAN</b> 21 Pine Plaza 300 West 31st Street, 8th Fl New York, NY 10001 212.479.5400</p>	<p><b>MPFP LLC / M. Paul Friedberg &amp; Partners</b> 120 Broadway, Floor 20 New York, NY 10005 212.477.0388</p>
<p><b>Ventresca Design, LLC</b> 4422 Eleventh St, Suite 203 Long Island City, NY 11101 212.909.0033</p>	<p><b>BuroHappold Engineering</b> 100 Broadway New York, NY 10005 212.334.2025</p>



**Damian Titus**  
Building  
APPROVED  
Under Directive 2 of 1975  
Date: 06/12/2027  
NYC Development Hub



SUPPORT OF EXCAVATION ELEVATIONS - 1 (SHEET 1 OF 2)

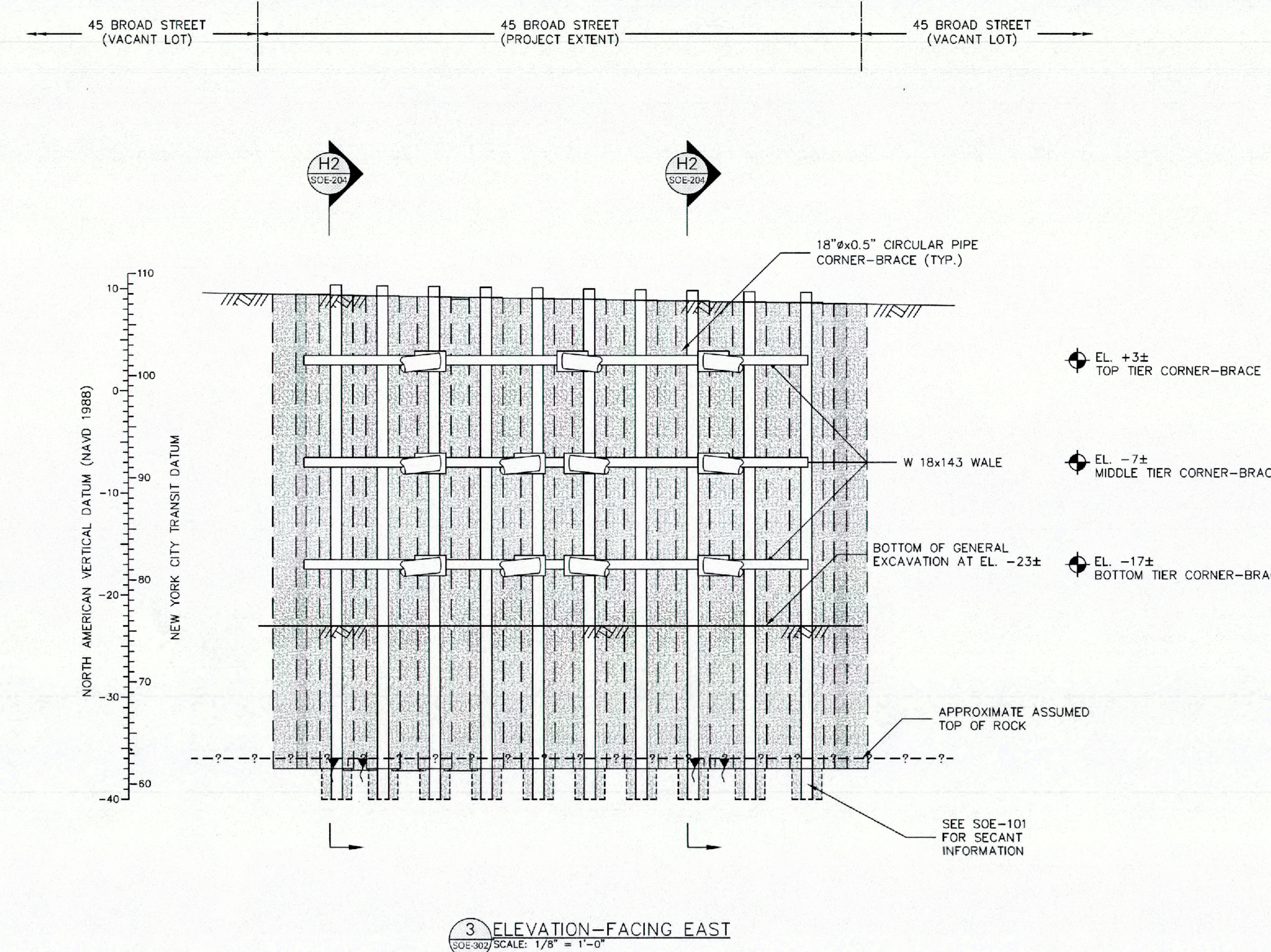
**SOE-301.00**

AS SHOWN	1529.00	121190772
<p>CETRARUDDY ARCHITECTURE PC 584 BROADWAY NEW YORK NY 10012 212.941.9801 F 212.915.8840 WWW.CETRARUDDY.COM</p>		

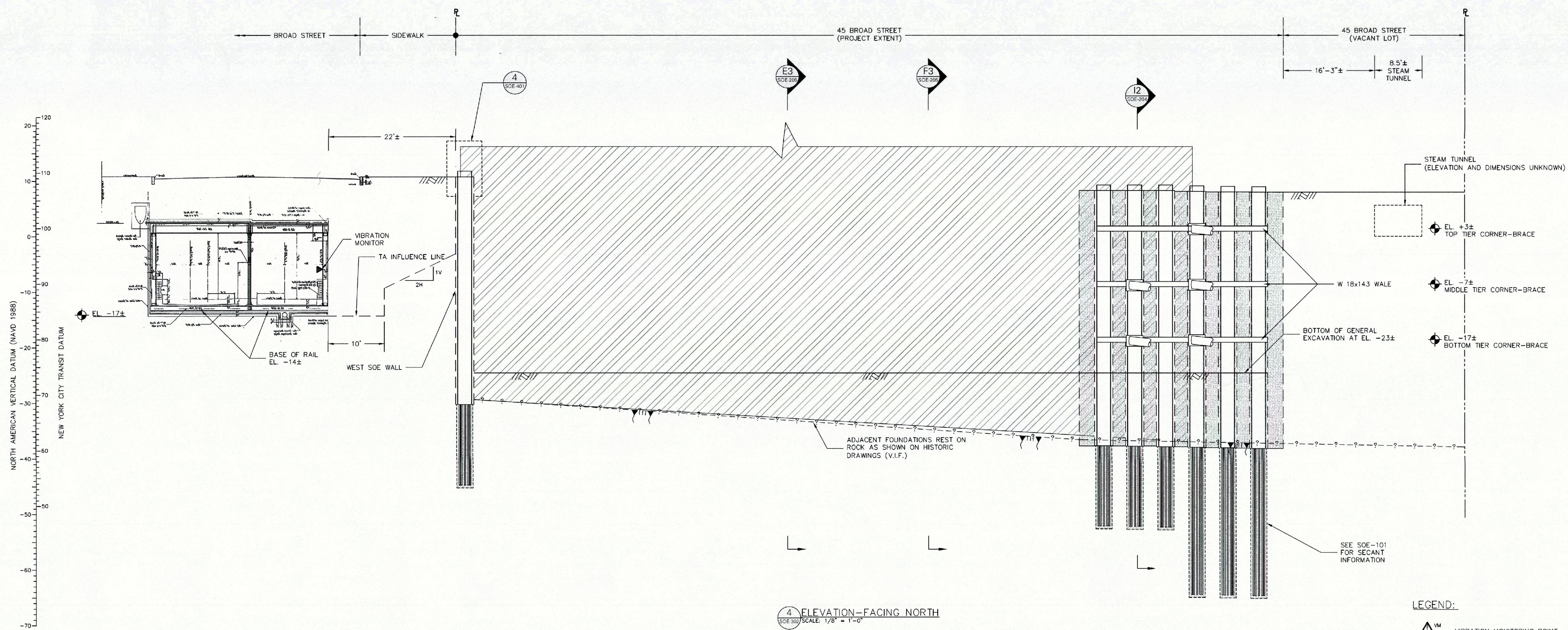


**45 BROAD STREET**  
NEW YORK NY 10004

John A. Cetra State of New York Registered Architect No. 018861	Madison 45 Broad Development, LLC 105 Madison Avenue New York, NY 10018
CetraRuddy Architecture DPC 284 Broadway Suite 401 New York, NY 10012 212.541.9801	BuroHappold Engineering 100 Broadway New York, NY 10005 212.334.2025
WSP Group 228 East 45th Street, 3rd Fl New York, NY 10017 212.687.9688	BuroHappold Engineering 100 Broadway New York, NY 10005 212.334.2025
LANGAN 21 Penn Plaza 300 West 31st Street, 8th Fl New York, NY 10001 212.479.5400	MFPF LLC / M. Paul Friedberg & Partners 100 Broadway, Floor 20 New York, NY 10005 212.477.5365
Ventresca Design, LLC 44-02 Eleventh St, Suite 203 Long Island City, NY 11101 212.565.0033	BuroHappold Engineering 100 Broadway New York, NY 10005 212.334.2025



**3 ELEVATION—FACING EAST**  
SCALE: 1/8" = 1'-0"

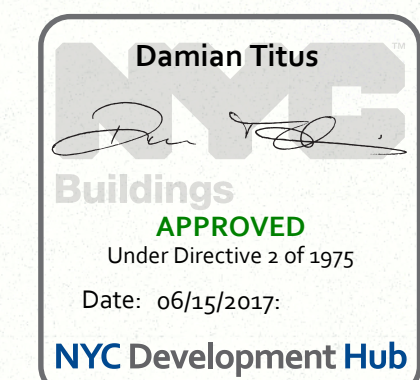


**4 ELEVATION—FACING NORTH**  
SCALE: 1/8" = 1'-0"

**LEGEND:**  
▲<sup>TM</sup> VIBRATION MONITORING POINT



2017.04.13	NYCT - 4th SUBMISSION
2017.03.21	6th CONSTRUCTION DOCUMENTS - UPDATED
2017.03.15	REVISED FOR FOUNDATION BID
2017.03.07	NYCT - 3rd SUBMISSION
2017.03.01	6th CONSTRUCTION DOCUMENTS
2016.12.30	NYCT - 2nd SUBMISSION
2016.11.07	FOUNDATION AND EXCAVATION FOR BID
2016.04.22	ISSUED FOR DESIGN DEVELOPMENT



SUPPORT OF EXCAVATION  
ELEVATIONS - 2  
(SHEET 2 OF 2)

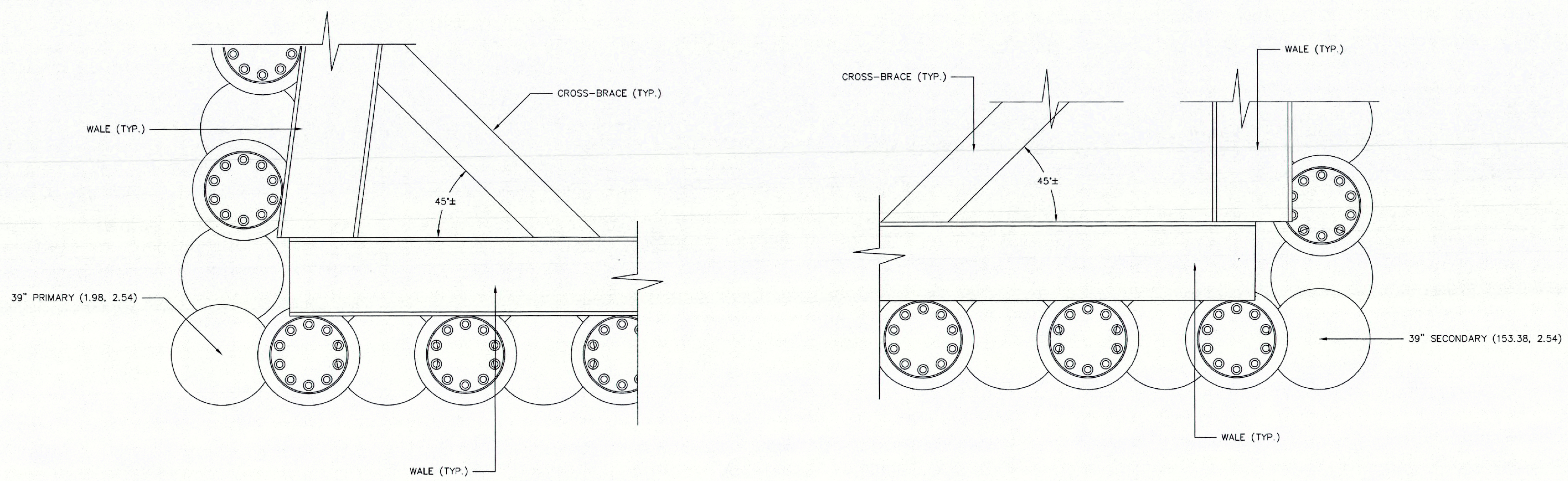
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AS SHOWN	121190772
1529.00	121190772
CETRARUDDY ARCHITECTURE DPC 184 BROADWAY NEW YORK NY 10012 T 212 541 9801 F 212 541 9440 WWW.CETRARUDDY.COM	



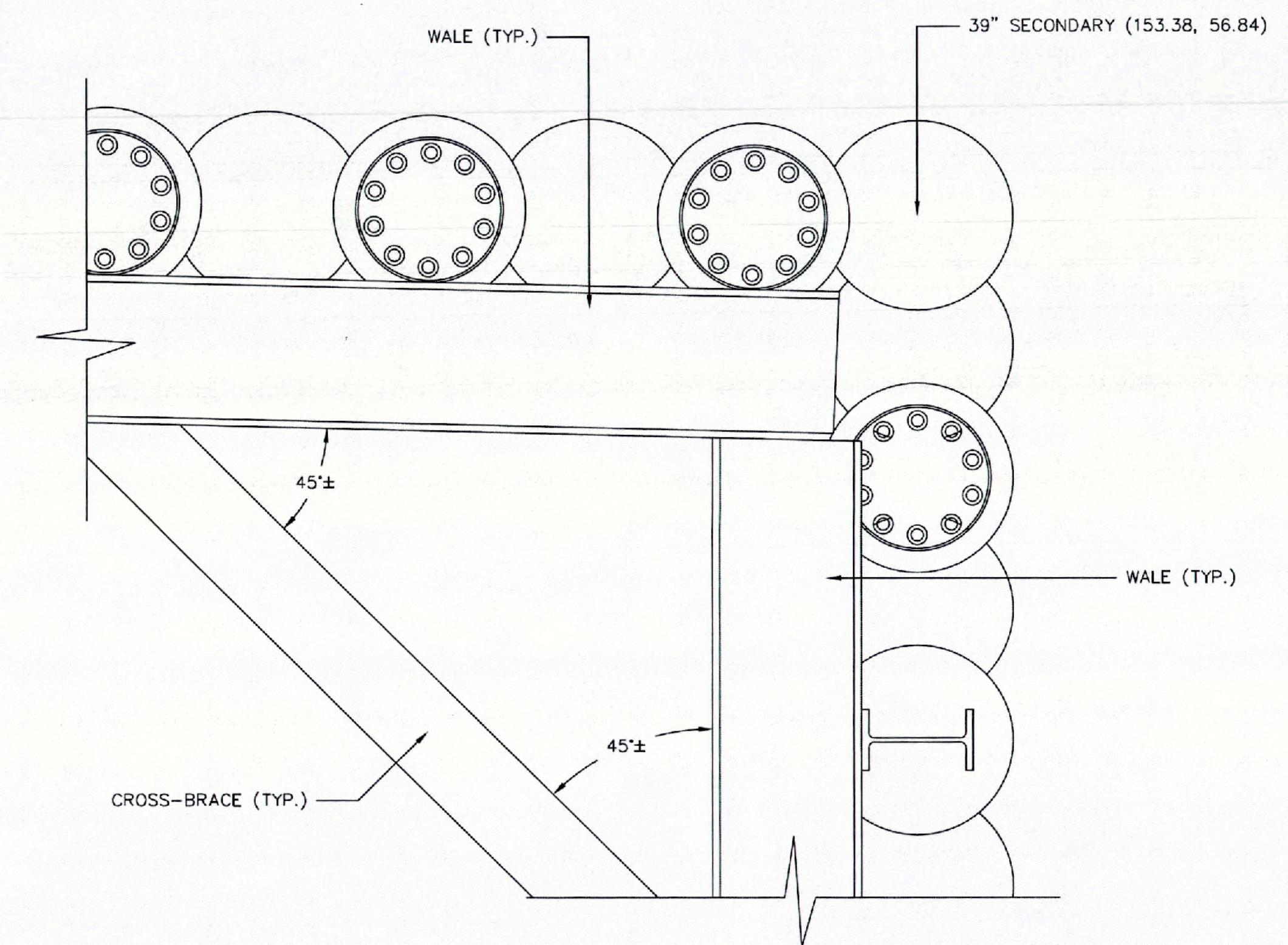
**45  
BROAD  
STREET**  
NEW YORK NY 10004

<p><b>John A. Cetra</b> State of New York Registered Architect No. 016881</p>	<p><b>Madison 45 Broad Development, LLC</b> 105 Madison Avenue New York, NY 10016</p>
<p><b>CetraRuddy Architecture DPC</b> 504 Broadway Suite 401 New York, NY 10012 212.941.9901</p>	<p><b>BuroHappold Engineering</b> 100 Broadway New York, NY 10005 212.334.2025</p>
<p><b>WSP Group</b> 228 East 45th Street, 3rd Fl New York, NY 10017 212.687.9888</p>	<p><b>BuroHappold Engineering</b> 100 Broadway New York, NY 10005 212.334.2025</p>
<p><b>LANGAN</b> 21 Penn Plaza 360 West 114th Street, 8th Fl New York, NY 10001 212.479.5400</p>	<p><b>MPPP LLC / M. Paul Friedberg &amp; Partners</b> 120 Broadway, Floor 20 New York, NY 10005 212.477.6366</p>
<p><b>Ventresca Design, LLC</b> 44-02 Eleventh St, Suite 203 Long Island City, NY 11101 212.690.0033</p>	<p><b>BuroHappold Engineering</b> 100 Broadway New York, NY 10005 212.334.2025</p>

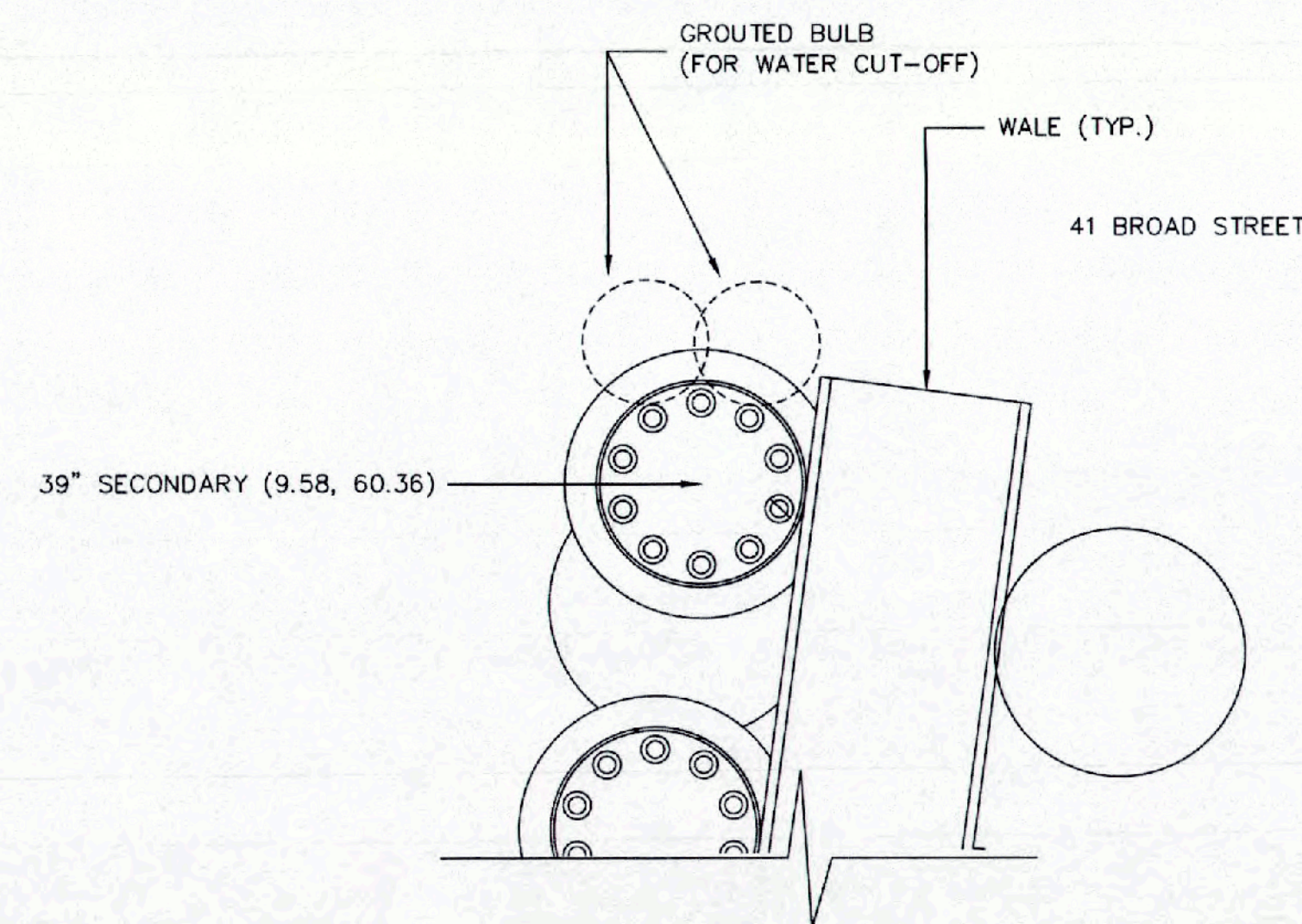


**1** **SOUTHWEST - CORNER DETAIL**  
SCALE: 1/2" = 1'-0"

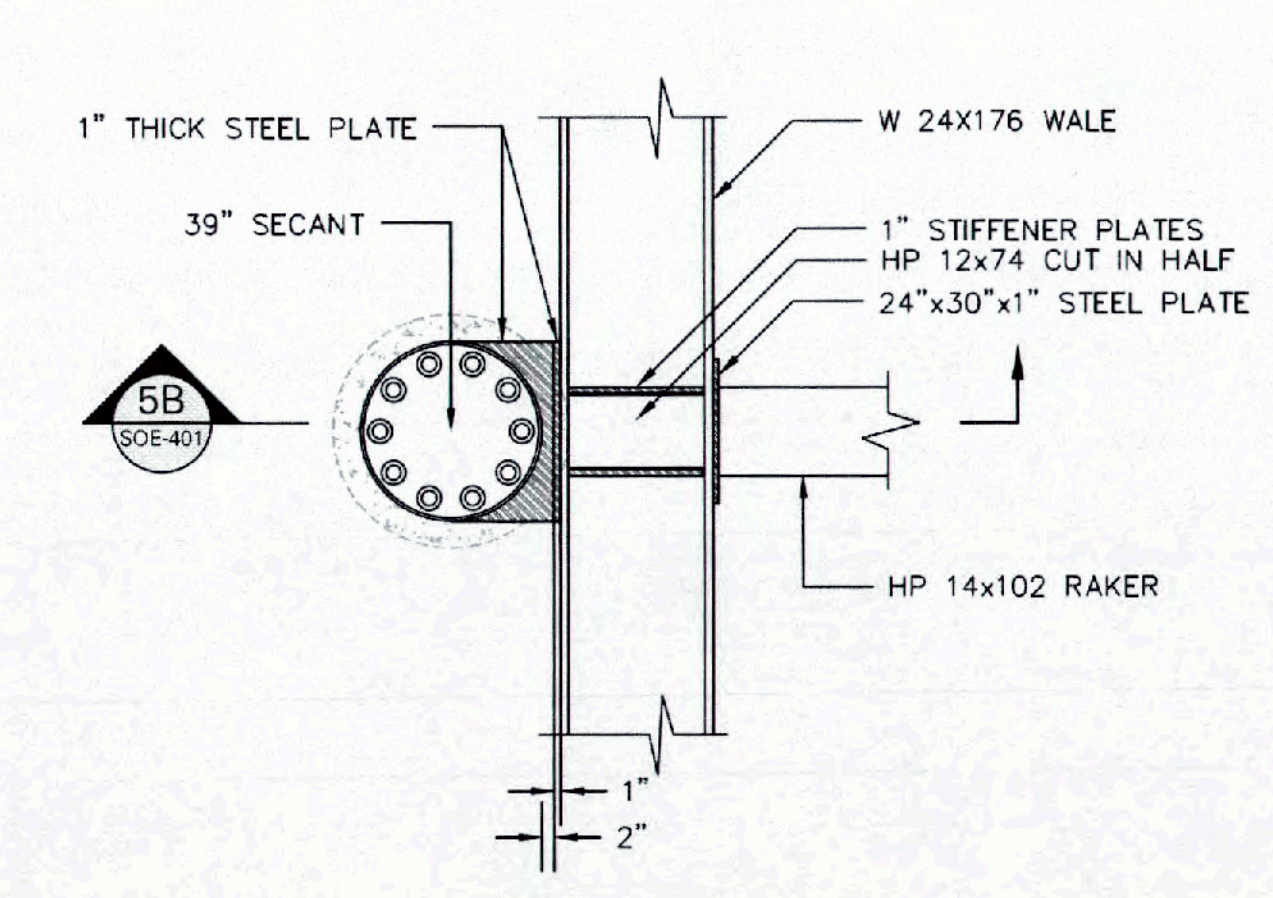
**2** **SOUTHEAST - CORNER DETAIL**  
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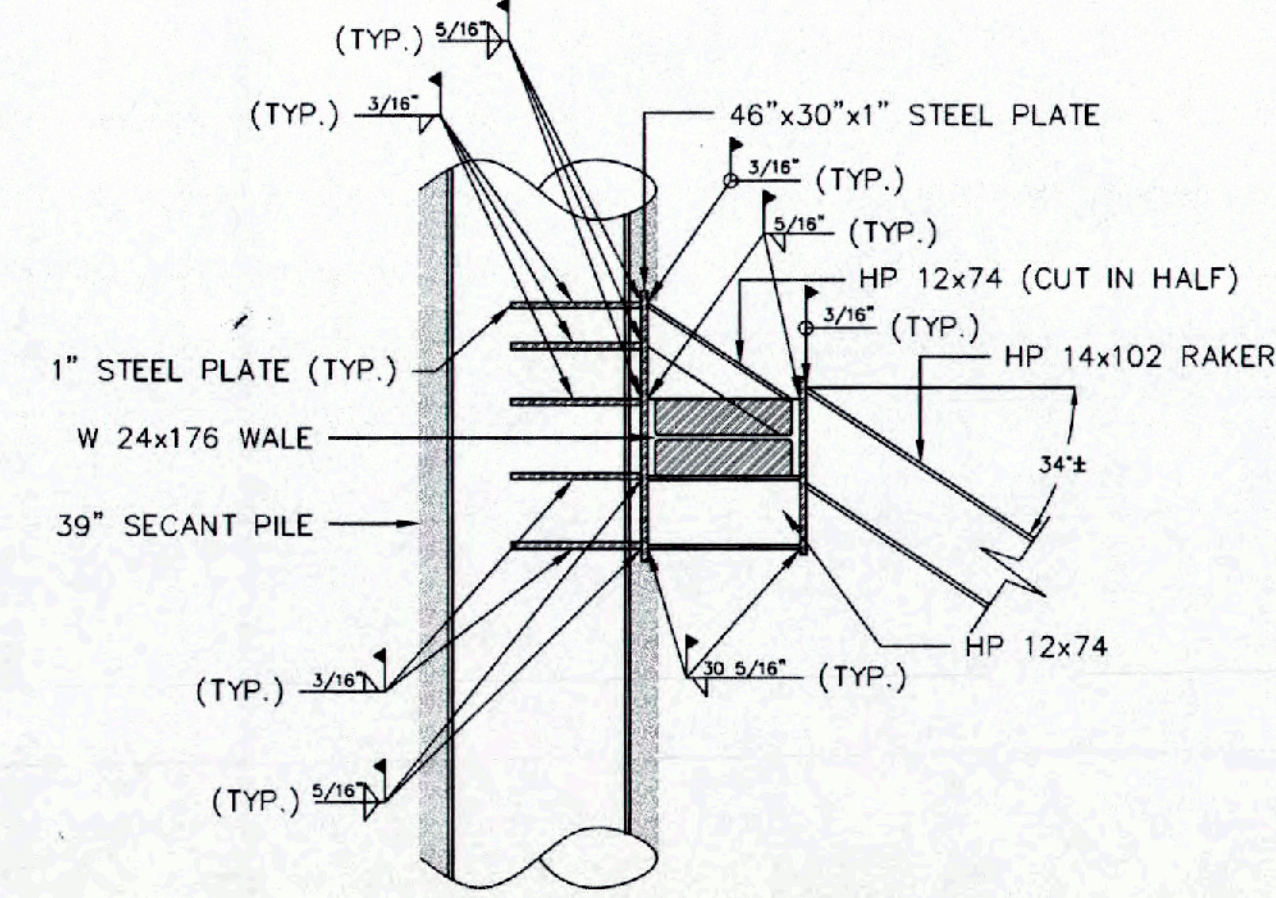
**3** **NORTHEAST - CORNER DETAIL**  
SCALE: 1/2" = 1'-0"



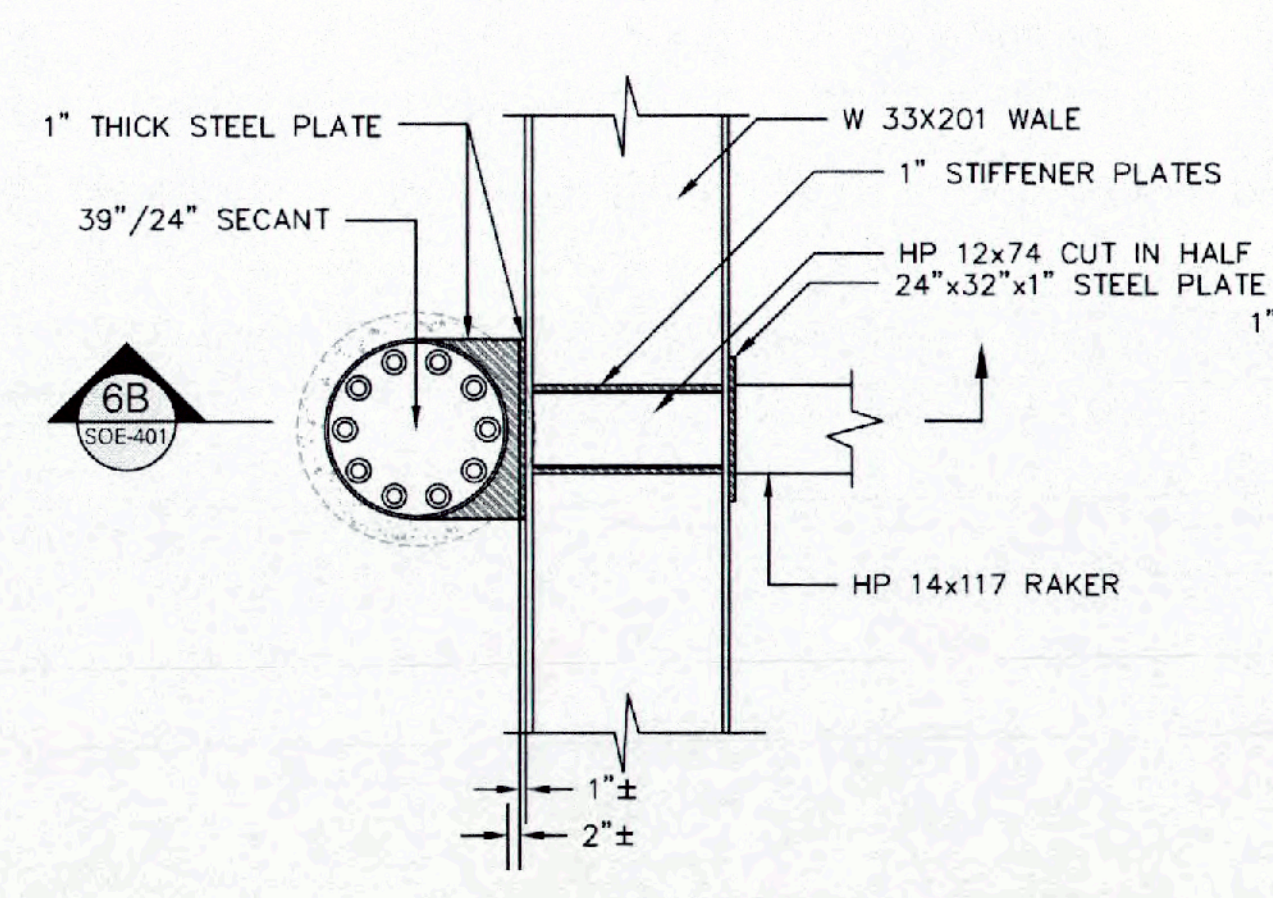
**4** **NORTHWEST - CORNER DETAIL**  
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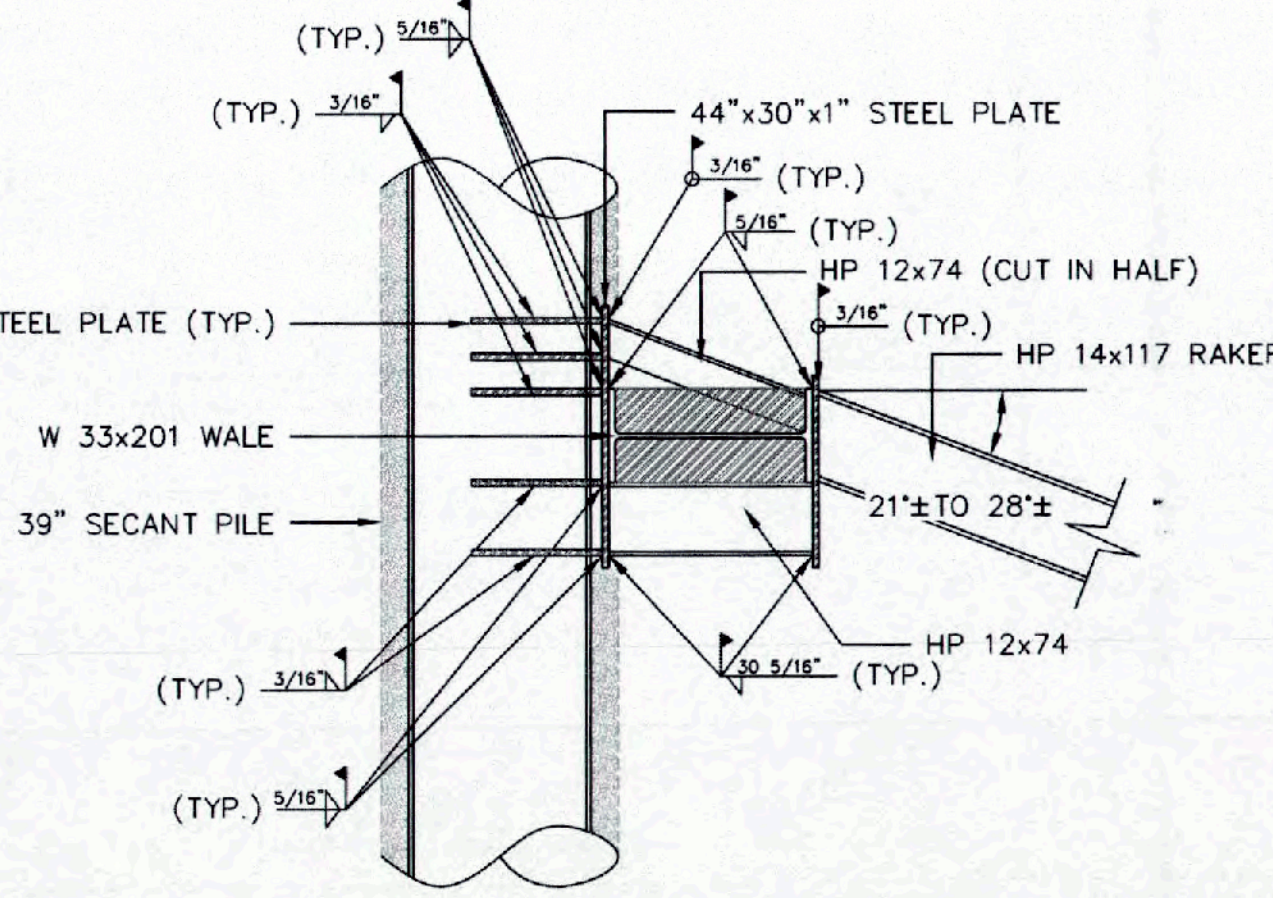
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SCALE: 3/8" = 1'-0"



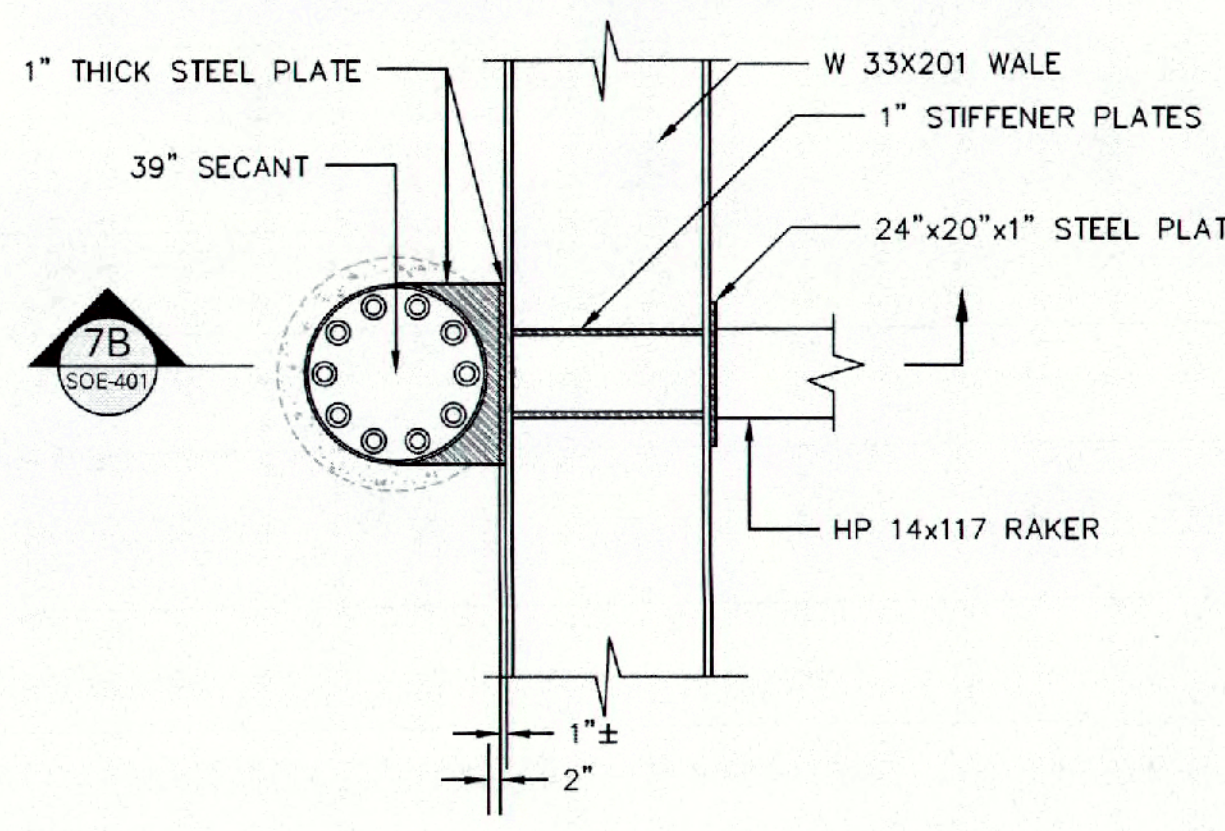
**5B** **SECANT PILE-RAKER CONNECTION - SECTION**  
SCALE: 3/8" = 1'-0"



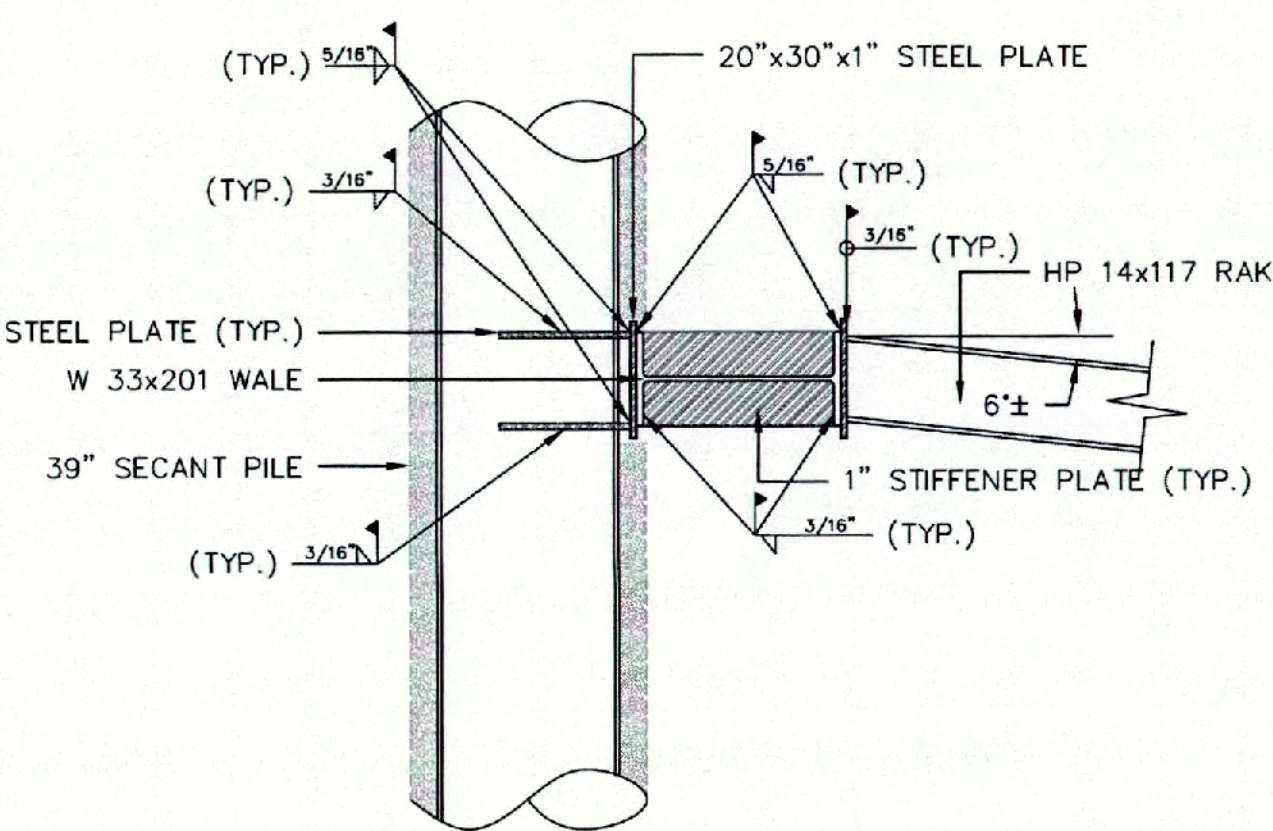
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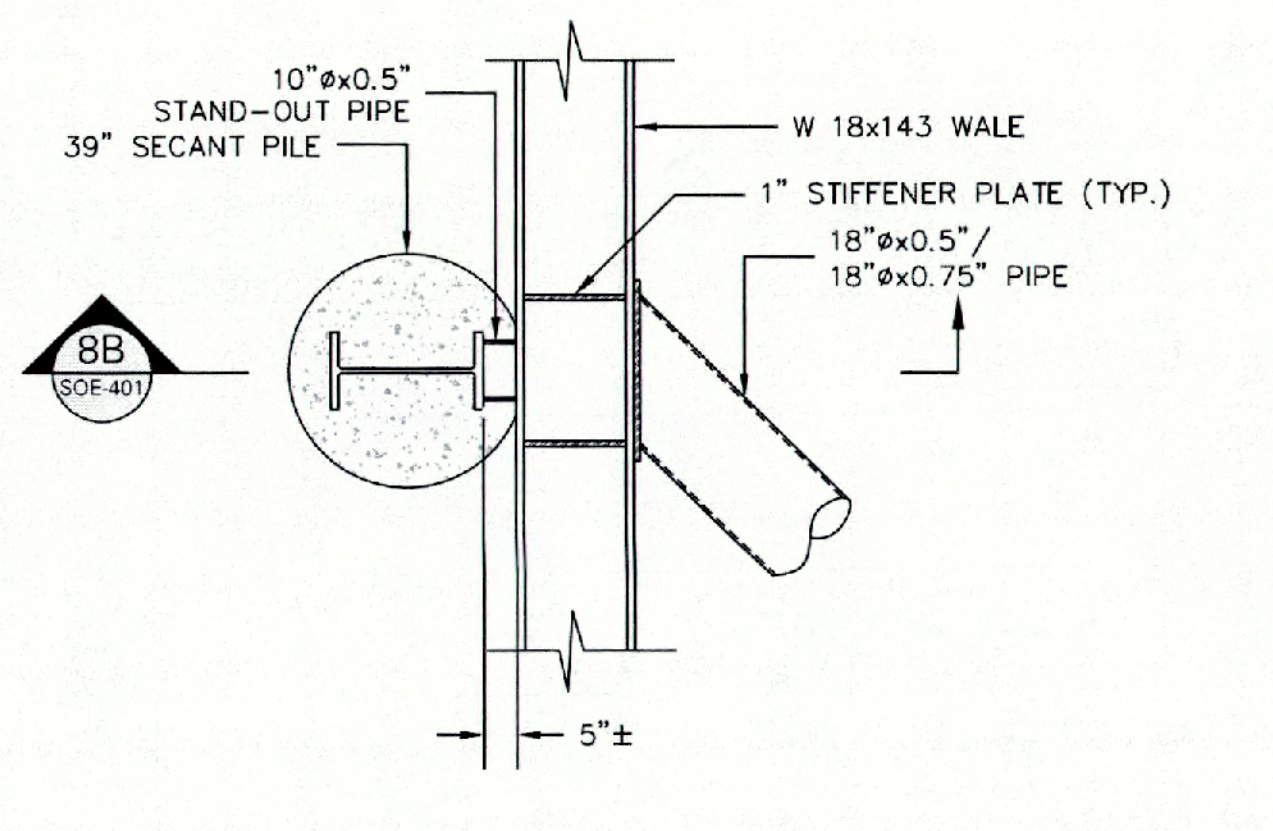
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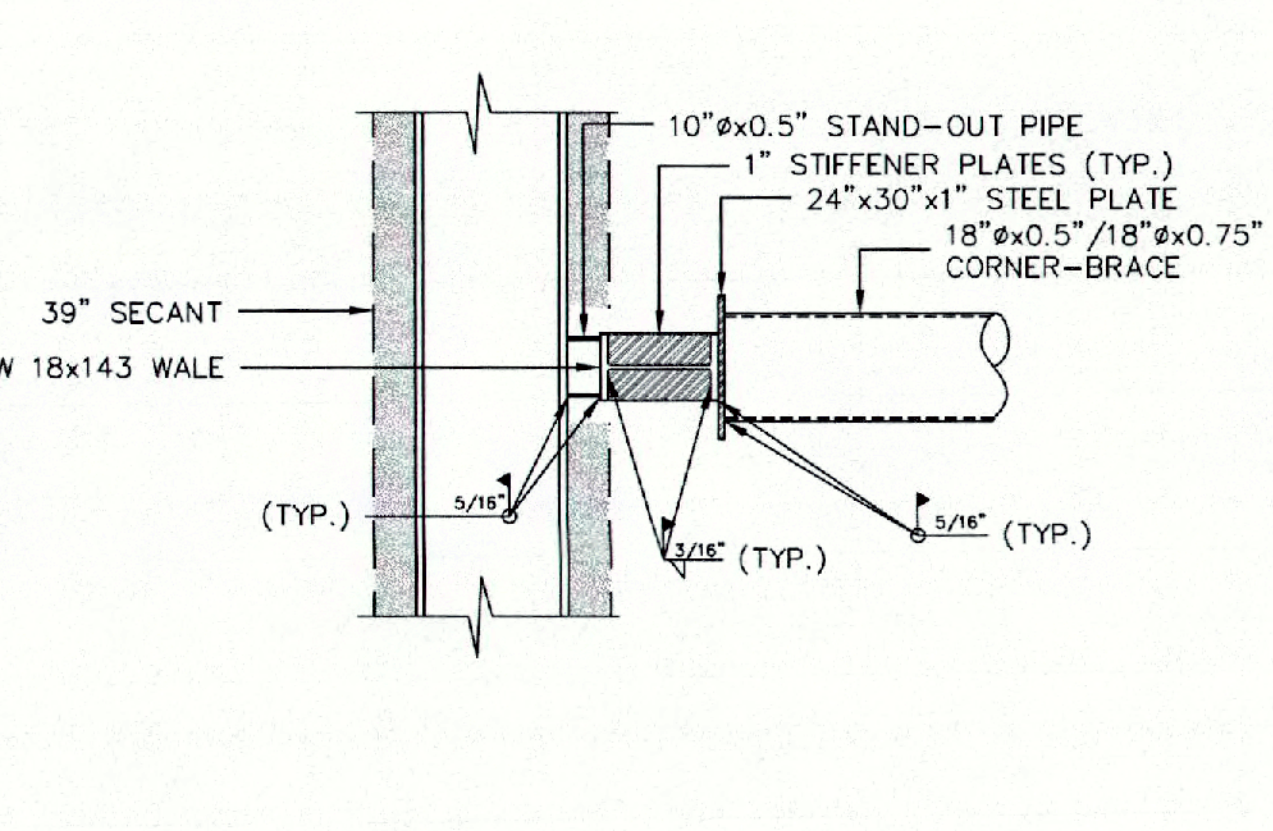
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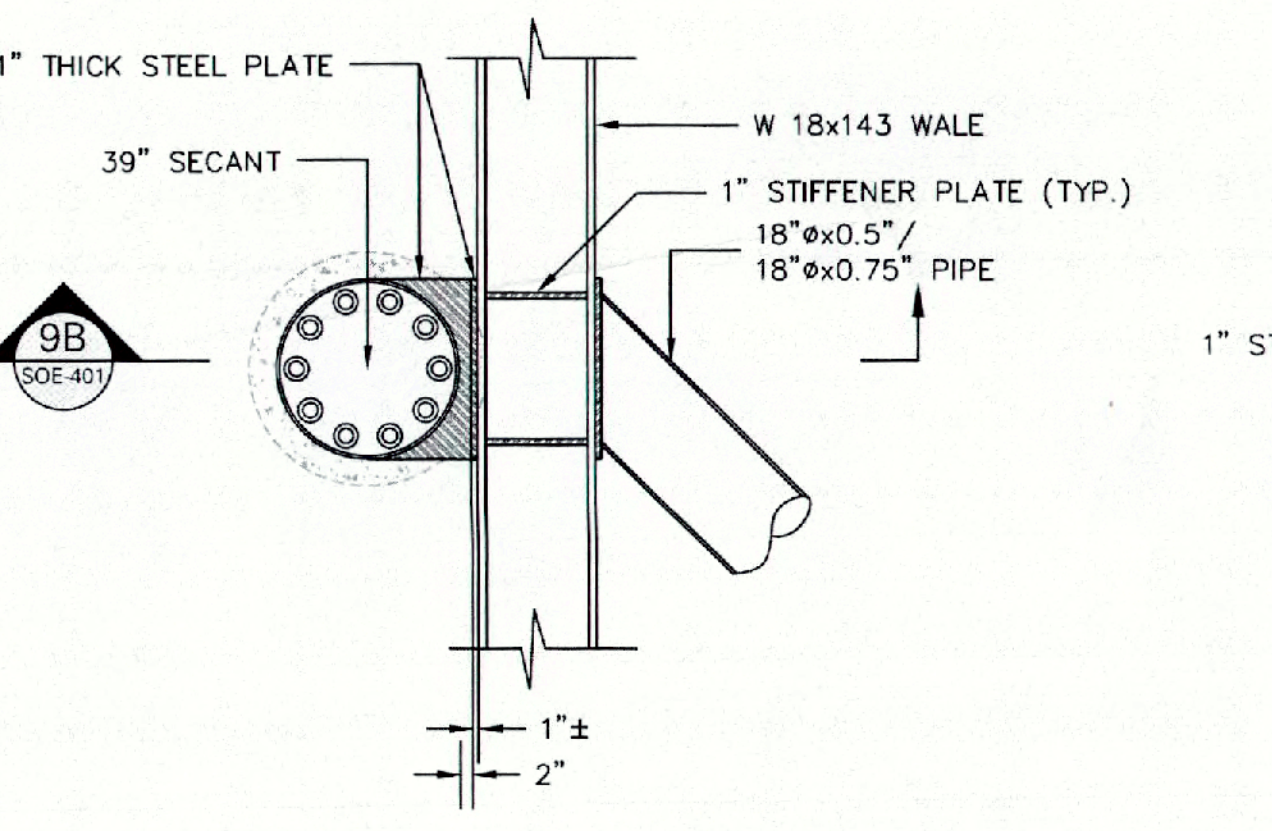
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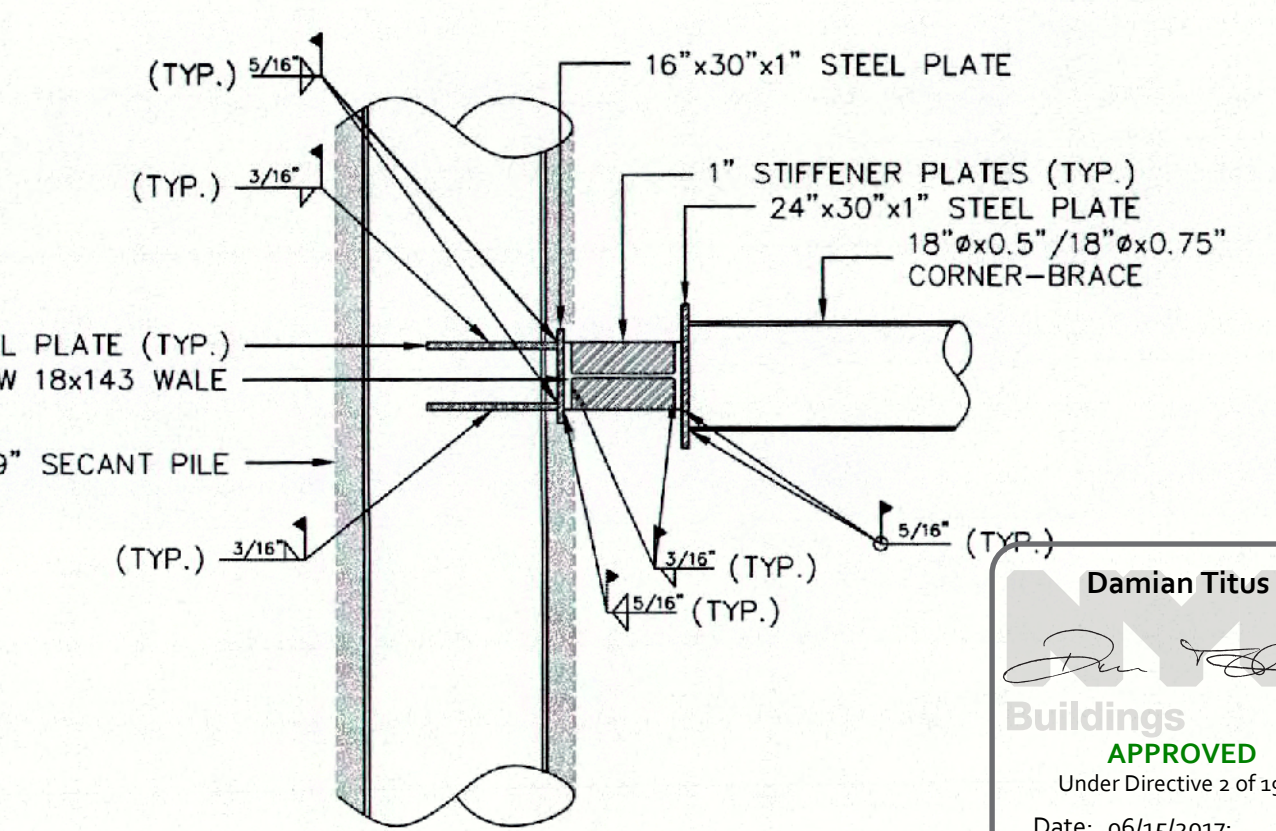
**8A** **SECANT PILE-BRACE CONNECTION - PLAN**  
SCALE: 3/8" = 1'-0"



**8B** **SECANT PILE-BRACE CONNECTION - SECTION**  
SCALE: 3/8" = 1'-0"



**9A** **SECANT PILE-BRACE CONNECTION - PLAN**  
SCALE: 3/8" = 1'-0"



**9B** **SECANT PILE-BRACE CONNECTION - SECTION**  
SCALE: 3/8" = 1'-0"



**Damian Titus**  
APPROVED  
Under Directive 3 of 1975  
Date: 06/15/2027  
NYC Development Hub

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**SUPPORT OF EXCAVATION  
DETAILS - 1  
(SHEET 1 OF 4)**

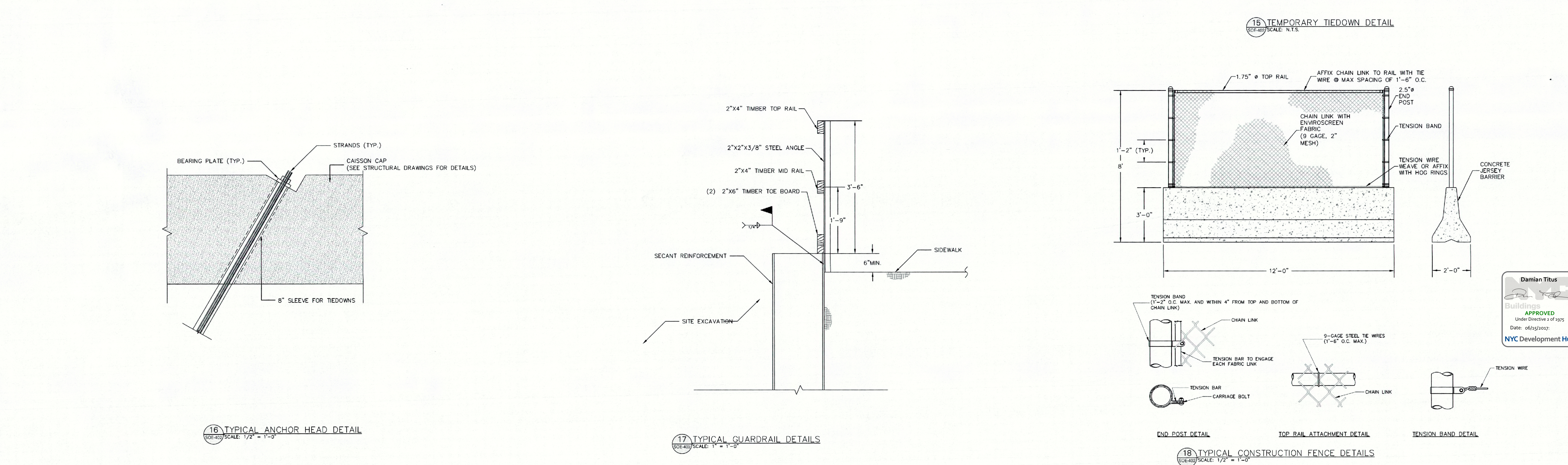
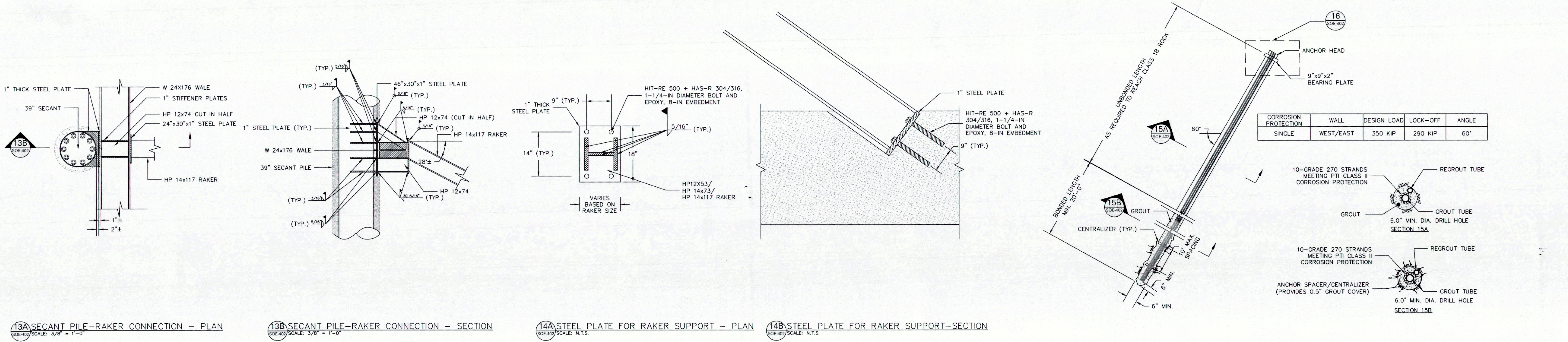
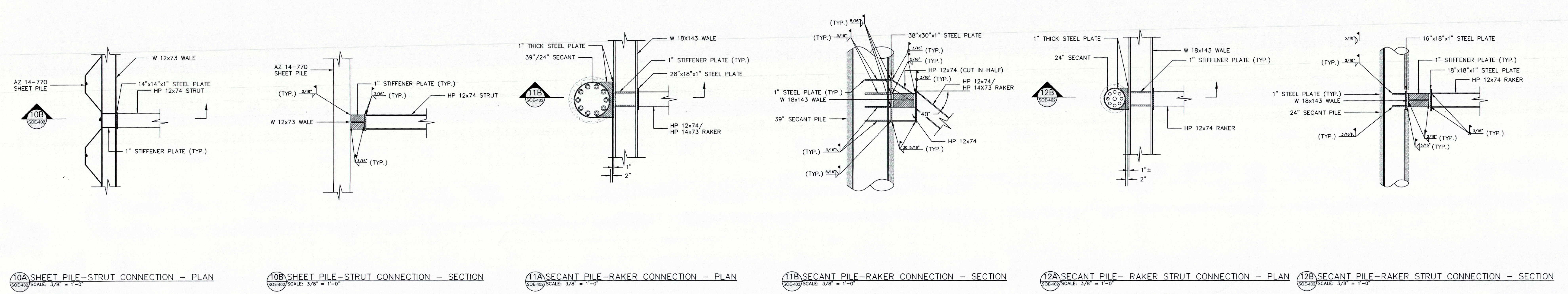
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AS SHOWN	DATE	121190772
1529.00	DATE	121190772

CETRA RUDDY ARCHITECTURE DPC  
504 BROADWAY NEW YORK, NY 10012 T 212 941 9901 F 212 941 9440  
WWW.CETRA RUDDY.COM



<p>John A. Cetra State of New York Registered Architect No. 018861</p> <p>CetraRuddy Architecture PC 584 Broadway Suite 401 New York, NY 10012 212.941.8801</p>	<p>Madison 45 Broad Development, LLC 105 Madison Avenue New York, NY 10016</p>
<p>WSP Group 228 East 46th Street, 3rd Fl New York, NY 10017 212.687.8888</p>	<p>BuroHappold Engineering 100 Broadway, Floor 20 New York, NY 10005 212.334.2025</p>
<p>LANGAN 21 Penn Plaza 360 West 37th Street, 8th Fl New York, NY 10001 212.479.5400</p>	<p>MPEF LLC / M. Paul Friedberg &amp; Partners 100 Broadway, Floor 20 New York, NY 10005 212.477.6366</p>
<p>Ventresca Design, LLC 14-02 Elmhurst St, Suite 203 Long Island City, NY 11101 212.500.0333</p>	<p>BuroHappold Engineering 100 Broadway New York, NY 10005 212.334.2025</p>



2017.04.13	NYCT - 4th SUBMISSION
2017.03.21	60% CONSTRUCTION DOCUMENTS - UPDATED
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SUPPORT OF EXCAVATION  
DETAILS - 2  
(SHEET 2 OF 4)

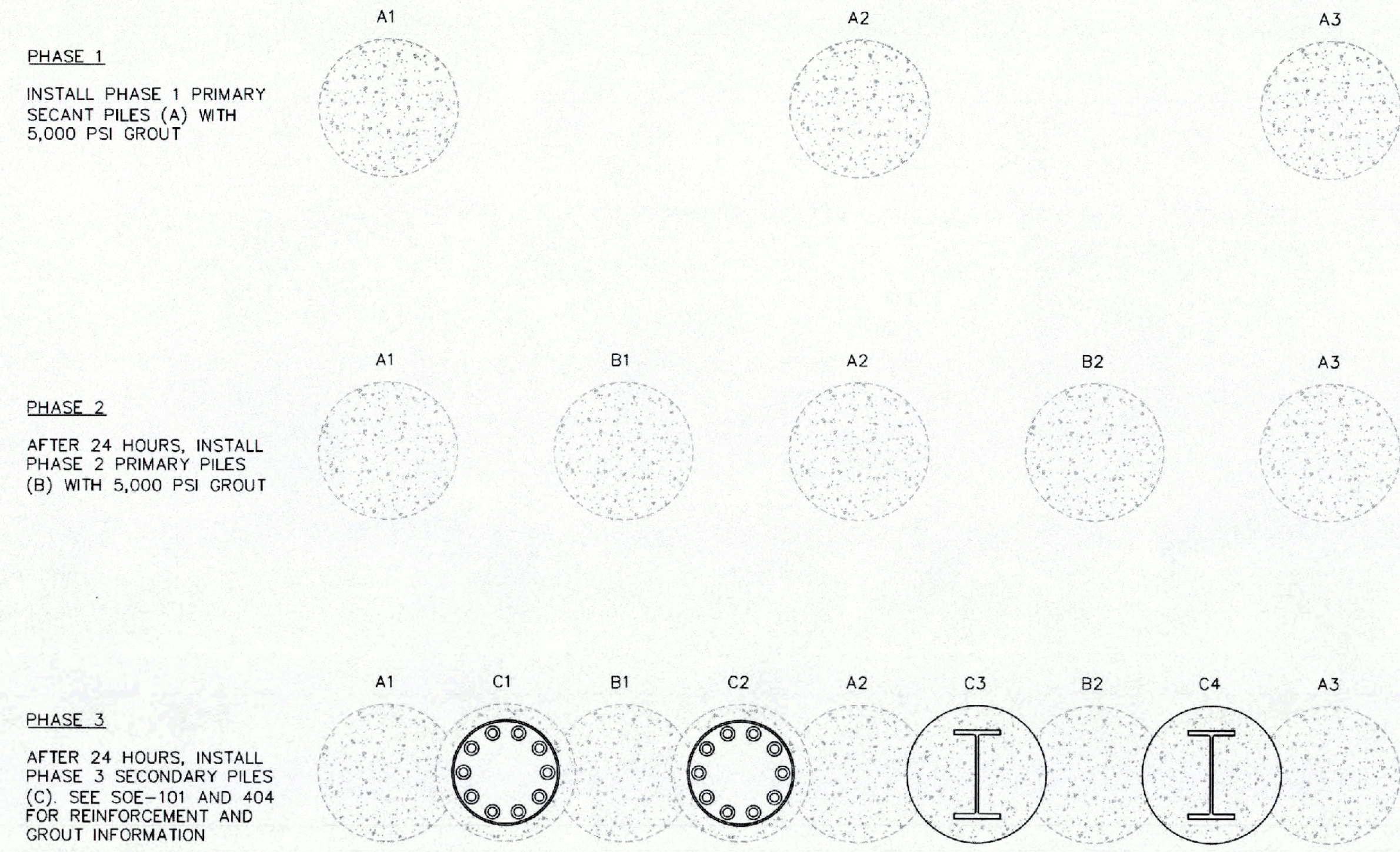
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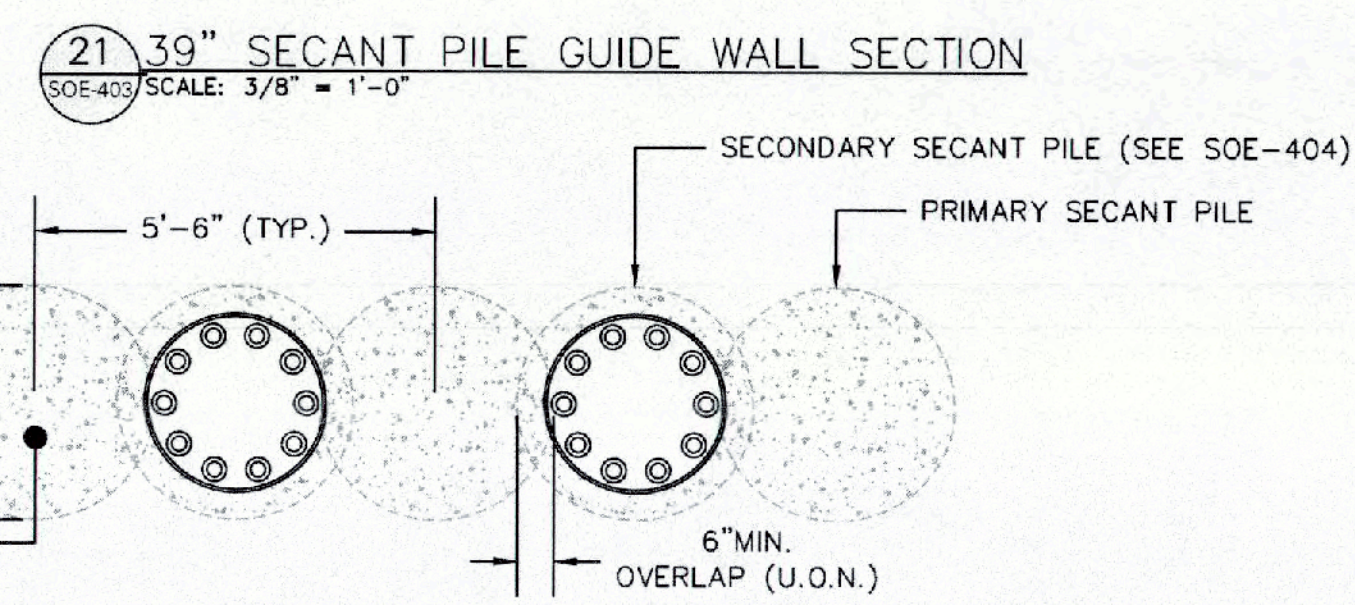
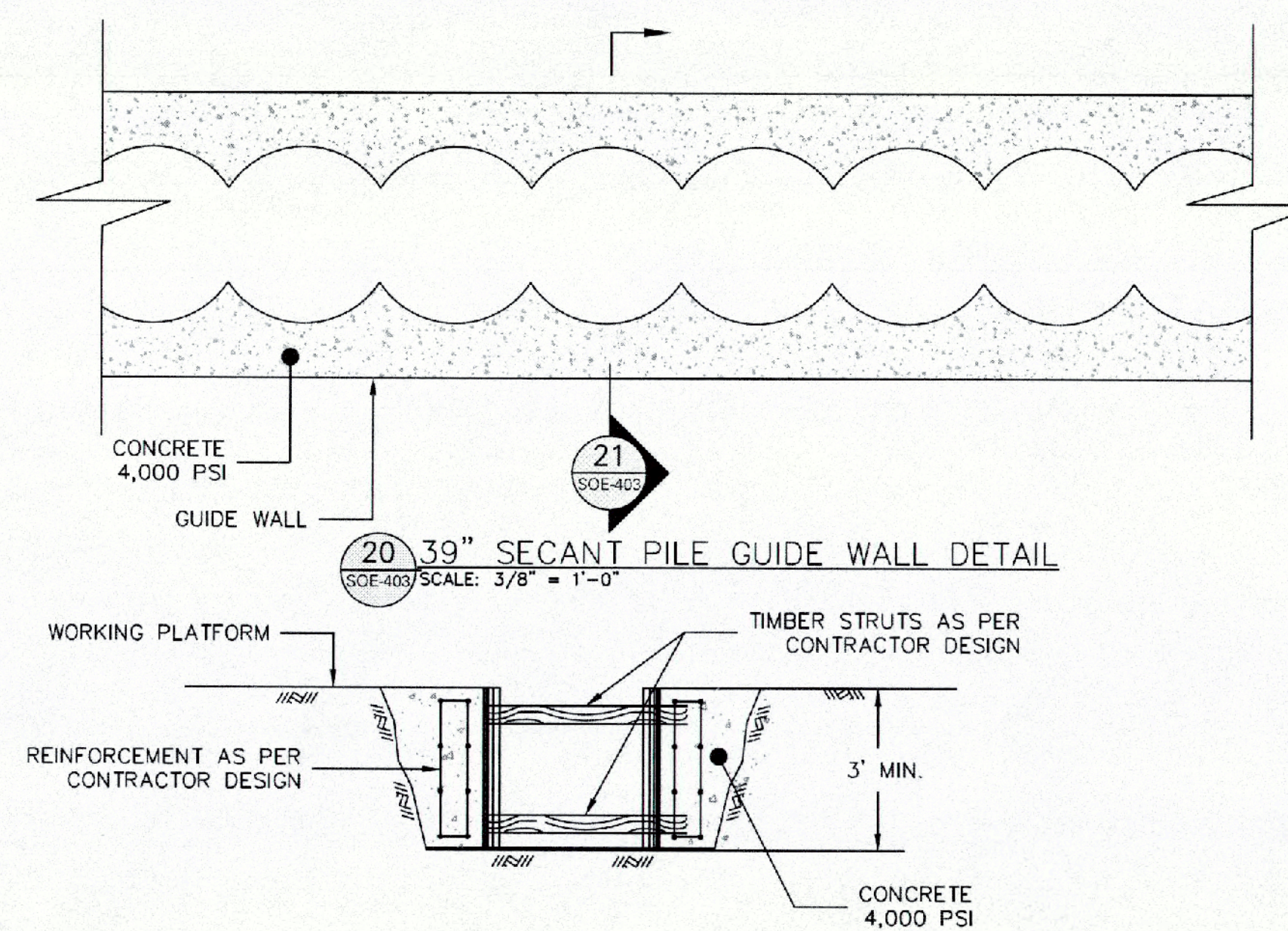


John A. Cetra State of New York Registered Architect No. 018851	Madison 45 Broad Development, LLC 100 Madison Avenue New York, NY 10016
CetraRuddy Architecture DP 364 Broadway Suite 401 New York, NY 10012 212.541.9501	BuroHappold Engineering 100 Broadway New York, NY 10005 212.334.2005
WSP Group 128 East 45th Street, 3rd Fl New York, NY 10017 212.487.8888	MPFP LLC / M. Paul Friedberg & Partners 120 Broadway, Floor 20 New York, NY 10005 212.477.8388
LANGAN 21 Park Plaza 360 West 31st Street, 8th Fl New York, NY 10001 212.478.6600	BuroHappold Engineering 100 Broadway New York, NY 10005 212.334.2005
Metresca Design, LLC 14-02 Eleventh St, Suite 203 Long Island City, NY 11101 212.609.0933	

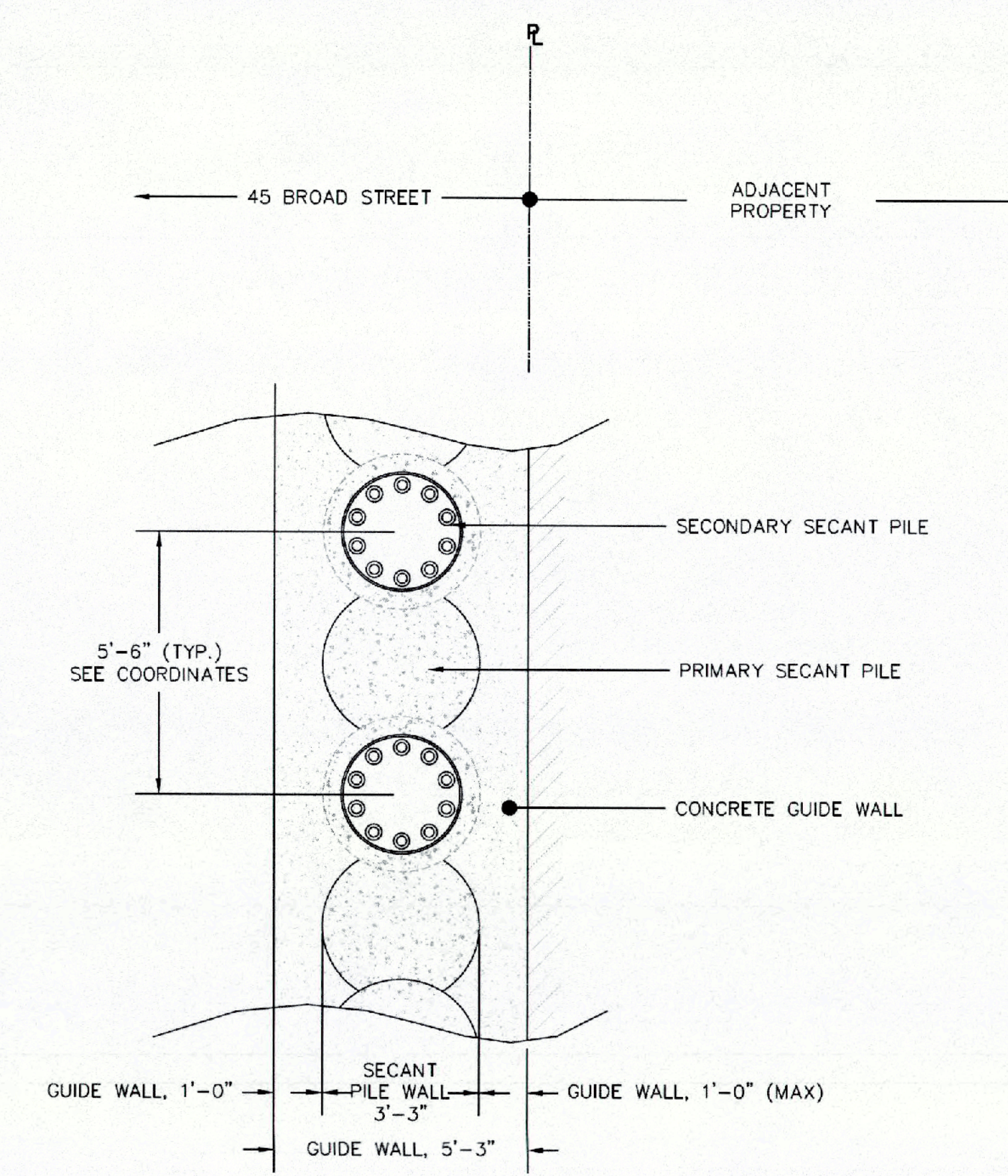
**39" SECANT DETAILS**



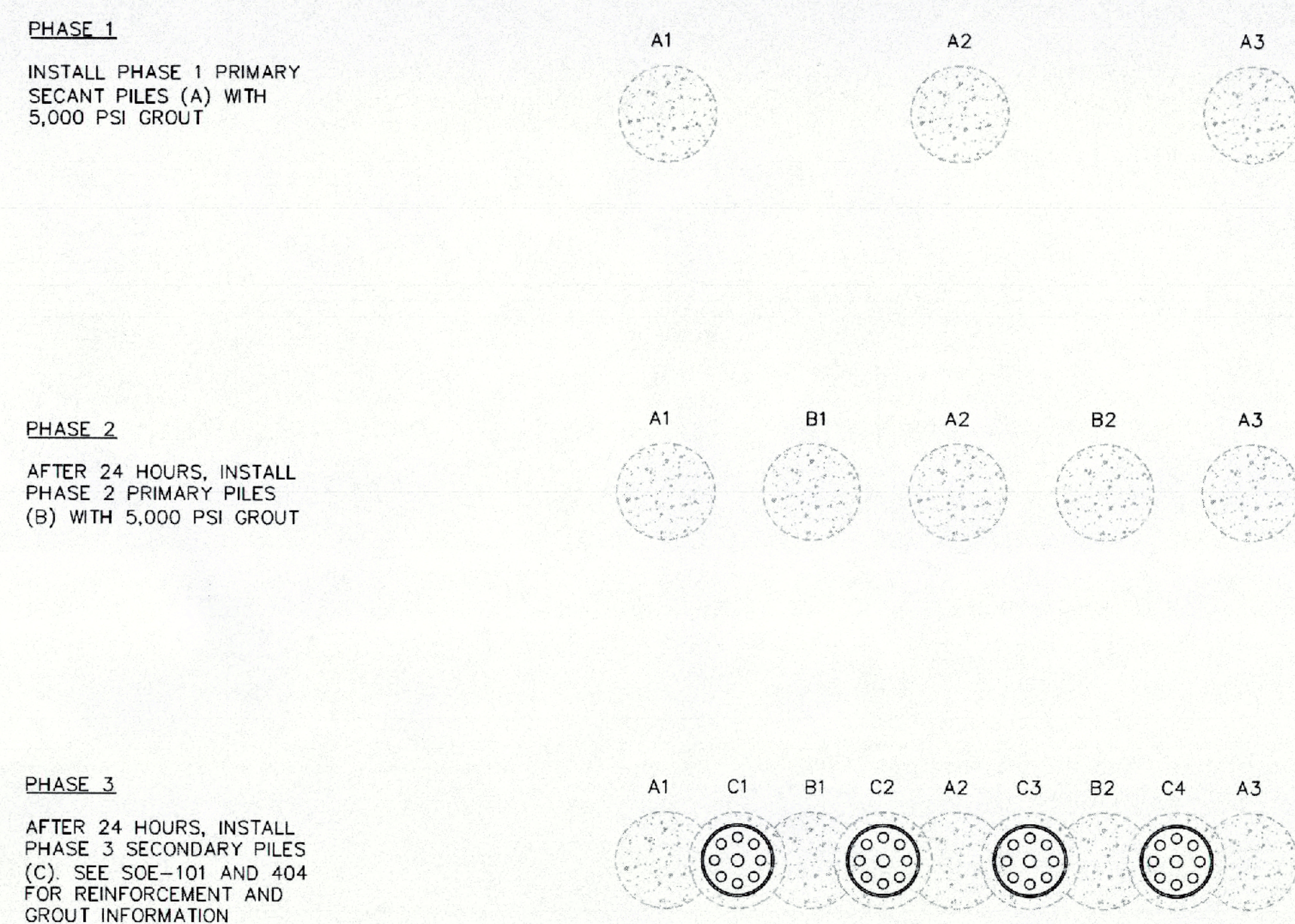
**19 39" SECANT PILE WALL SEQUENCING**  
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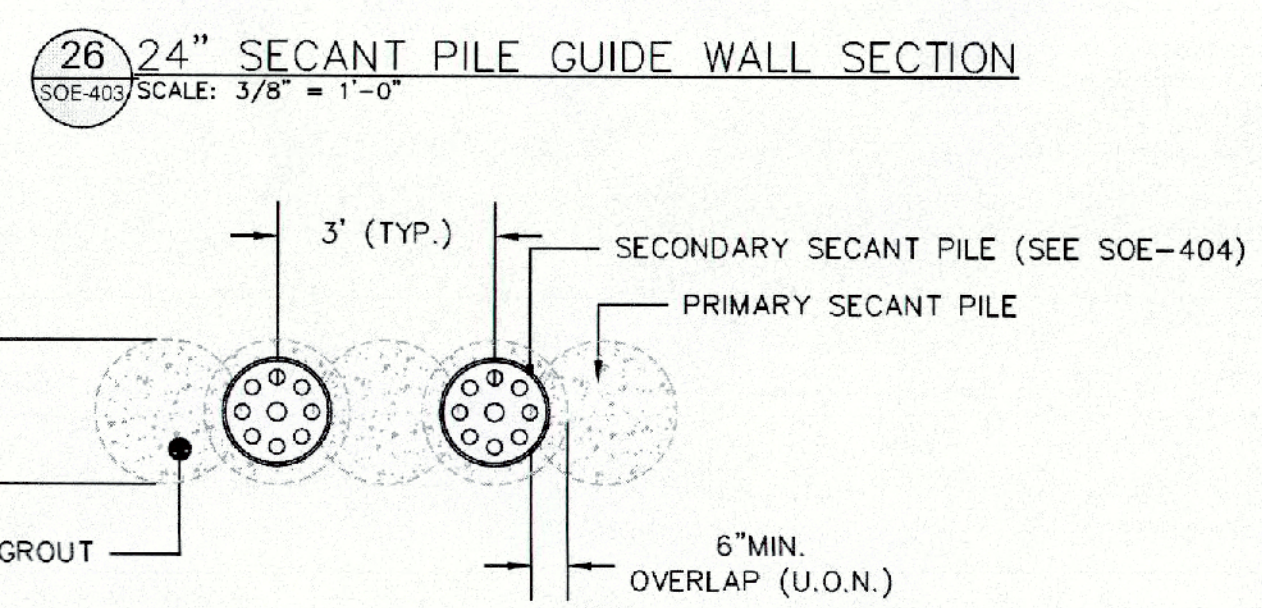
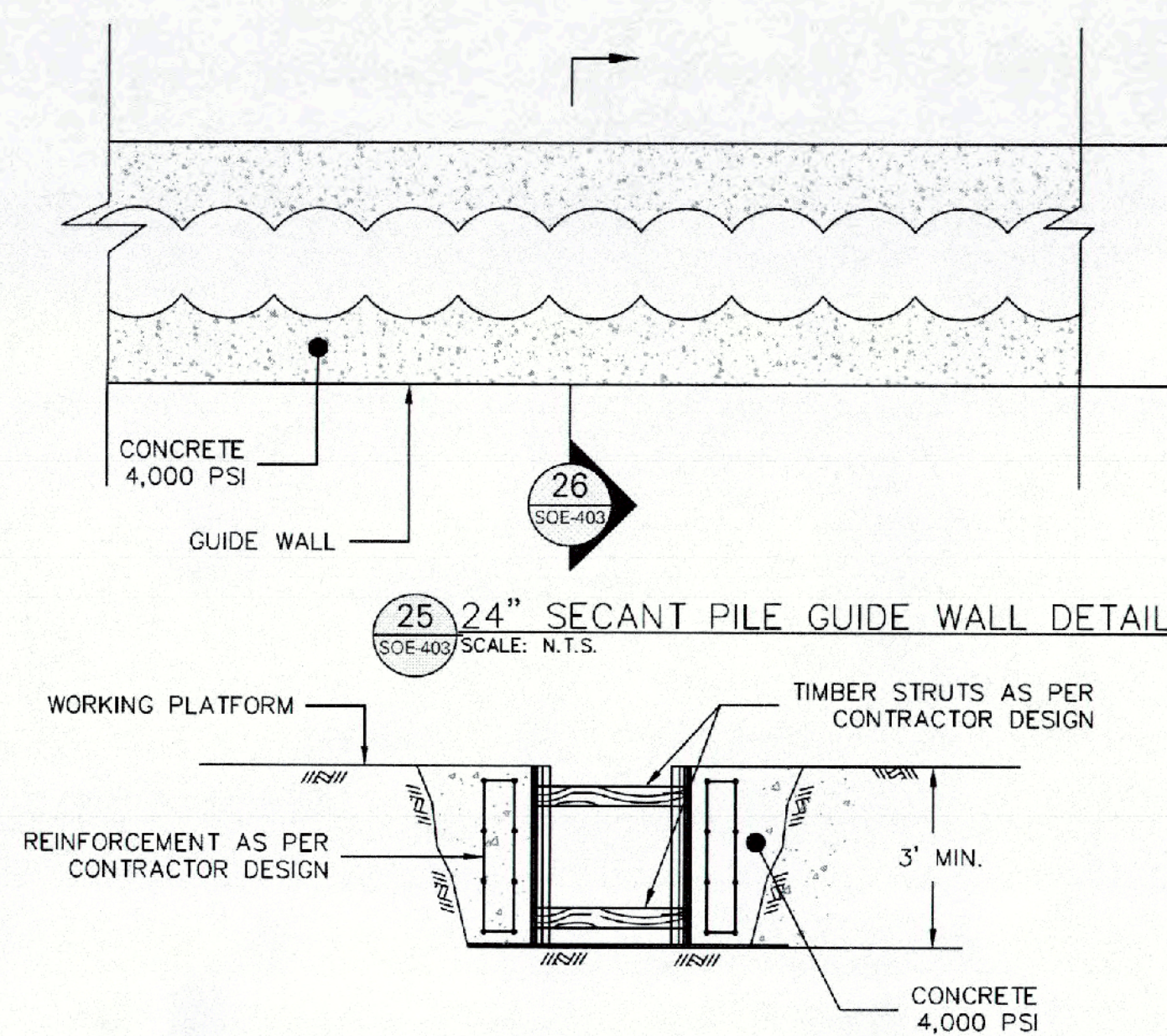
**22 39" SECANT PILE WALL DETAIL**  
SOE-403 SCALE: 3/8" = 1'-0"



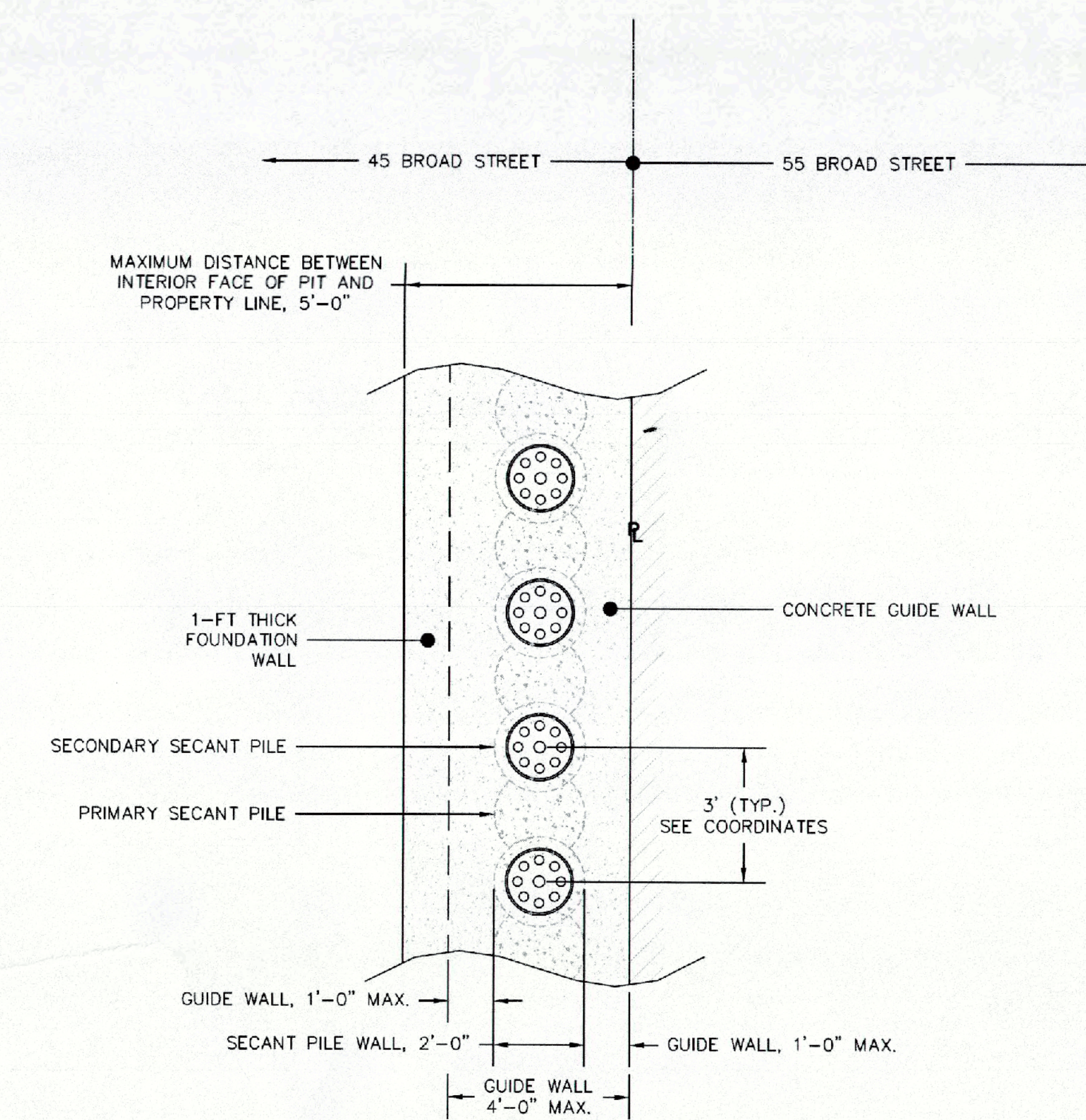
**24" SECANT DETAILS**



**24 24" SECANT PILE WALL SEQUENCING**  
SOE-403 SCALE: 3/8" = 1'-0"



**27 24" SECANT PILE WALL DETAIL**  
SOE-403 SCALE: 3/8" = 1'-0"



SUPPORT OF EXCAVATION  
DETAILS - 3  
(SHEET 3 OF 4)

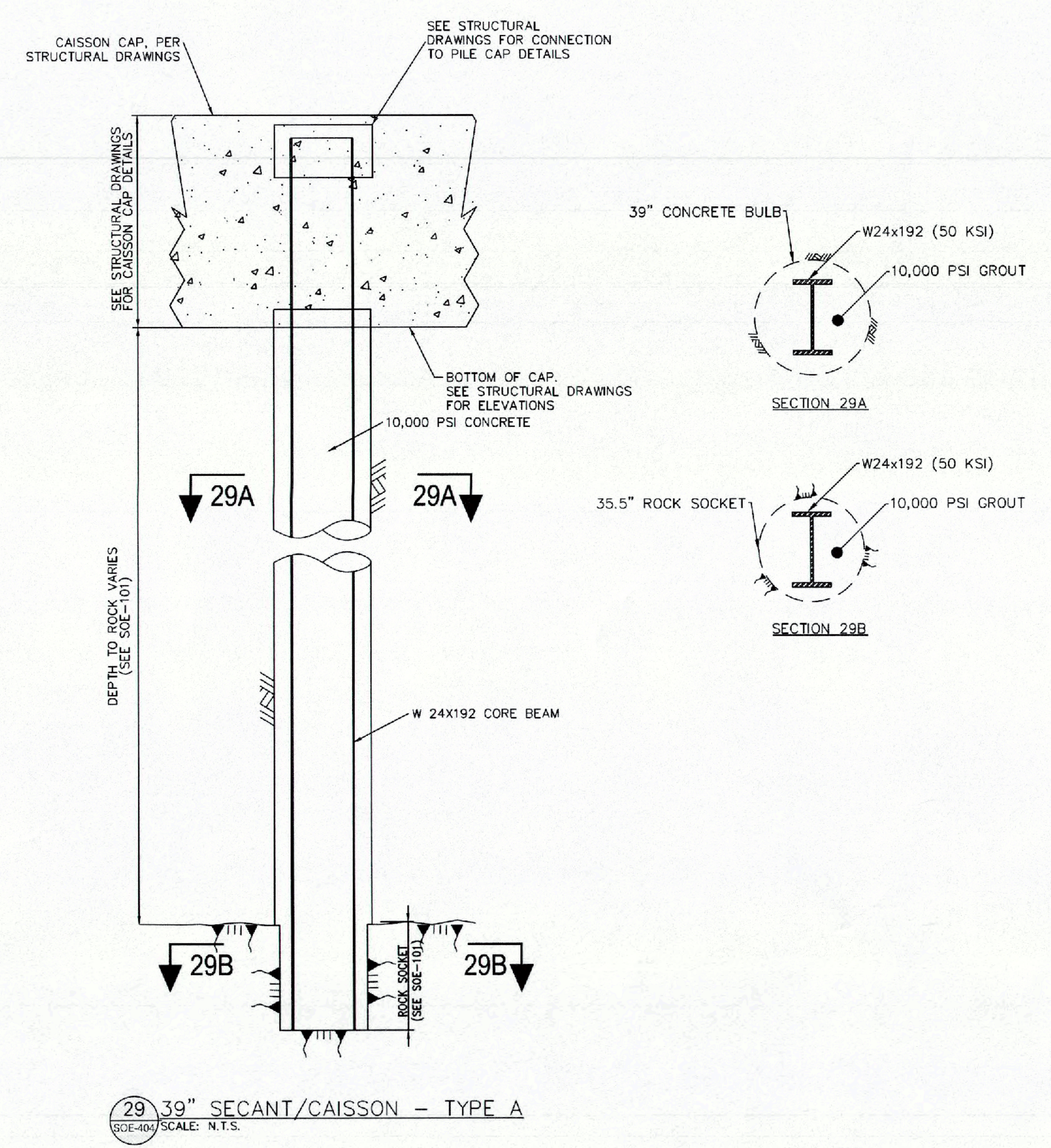
**SOE-403.00**

AS SHOWN	121190772
1529.00	

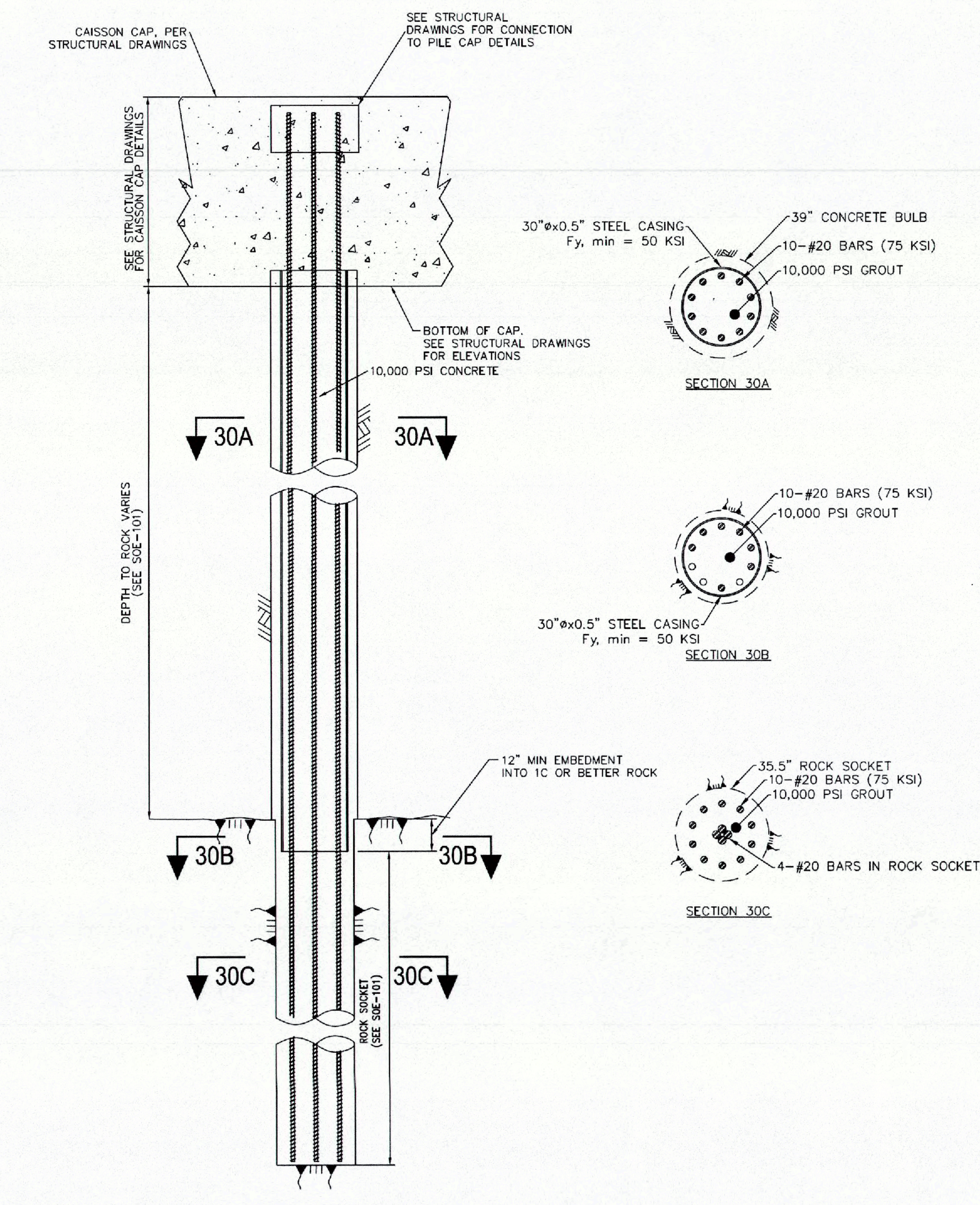
CETRA RUDDY ARCHITECTURE INC  
364 BROADWAY NEW YORK NY 10012 T 212.541.9501 F 212.541.9440  
WWW.CETRA RUDDY.COM



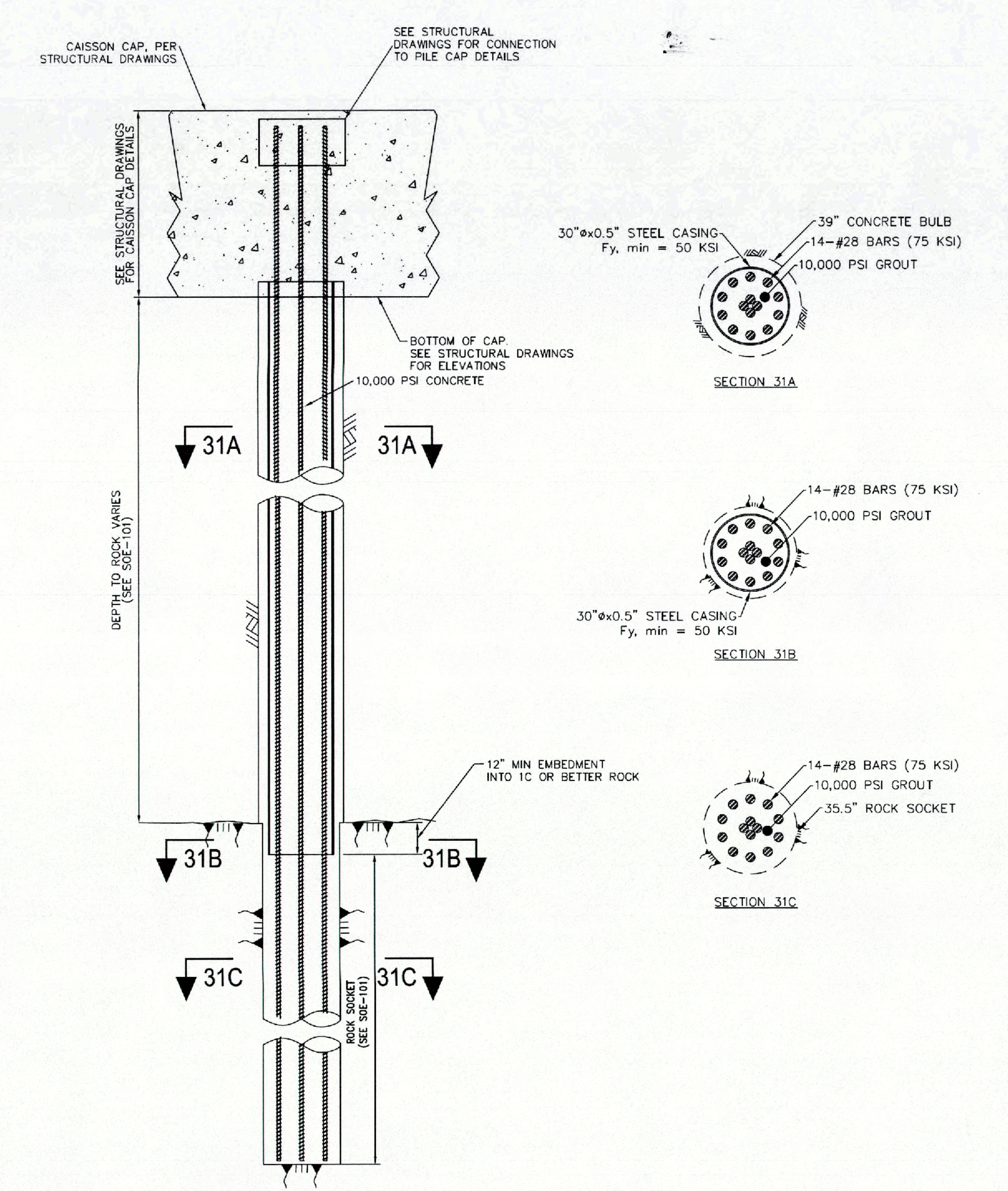
John A. Cetra State of New York Registered Architect No. 016861	Madison 45 Broad Development, LLC 105 Madison Avenue New York, NY 10016
CetraRuddy Architecture DPC 144 Broadway Suite 401 New York, NY 10012 212.941.9901	BuroHappold Engineering 100 Broadway New York, NY 10005 212.334.0025
WSP Group 228 East 45th Street, 3rd Fl New York, NY 10017 212.687.8868	MFPF LLC / M. Paul Friedberg & Partners 120 Broadway, Floor 2D New York, NY 10005 212.477.0385
LANGAN 21 Park Plaza 300 West 31st Street, 8th Fl New York, NY 10001 212.479.5400	Ventresca Design, LLC 44-02 Eavesway St, Suite 203 Long Island City, NY 11101 212.600.0033



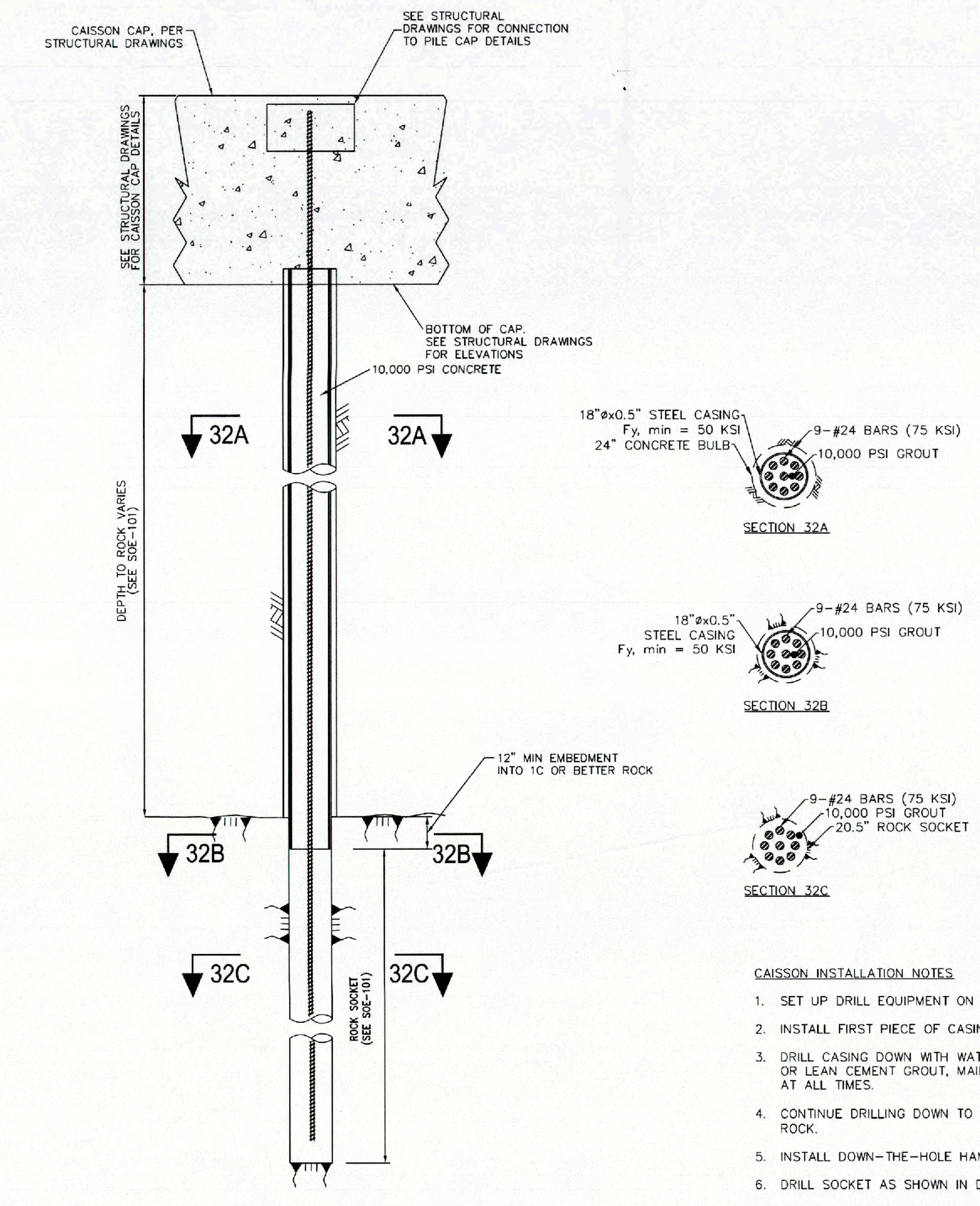
29 39" SECANT/CAISSON - TYPE A  
SCALE: N.T.S.



30 39" 2100 TONS SECANT/CAISSON - TYPE B  
SCALE: N.T.S.



31 39" 3200 TONS SECANT/CAISSON - TYPE C  
SCALE: N.T.S.



32 24" 1200 TONS SECANT/CAISSON - TYPE D  
SCALE: N.T.S.

- CAISSON INSTALLATION NOTES
1. SET UP DRILL EQUIPMENT ON PROPER LOCATION AND PLUMB THE MAST.
  2. INSTALL FIRST PIECE OF CASING WITH CARBIDE CUTTING TEETH.
  3. DRILL CASING DOWN WITH WATER AND POLYMER DRILLING MUD, BENTONITE SLURRY OR LEAN CEMENT GROUT, MAINTAINING INTERNAL FLUSH AND POSITIVE FLUID HEAD AT ALL TIMES.
  4. CONTINUE DRILLING DOWN TO ROCK AND SEAT CASING FIRMLY 12" MINIMUM INTO ROCK.
  5. INSTALL DOWN-THE-HOLE HAMMER.
  6. DRILL SOCKET AS SHOWN IN DETAILS.
  7. REMOVE HAMMER AND INNER RODS, AND FLUSH HOLE CLEAN.
  8. INSPECT CLEANED HOLE USING A DOWN-THE-HOLE CAMERA PROVIDED BY THE CONTRACTOR.
  9. INSTALL CAISSON REINFORCEMENT.
  10. PUMP CONCRETE/GROUT THROUGH TREMIE PIPE UNTIL GOOD CONCRETE/GROUT FLOWS OUT OF THE TOP OF THE CAISSON.
  11. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR USING MEANS AND METHODS TO INSTALL THE CAISSONS WITHOUT ADVERSELY AFFECTING THE ADJACENT AND SURROUNDING STRUCTURES, BUILDINGS, STREETS, AND UTILITIES.
  12. MONITOR ADJACENT STRUCTURES DURING CONSTRUCTION.



2017.01.15	NYCT - 4th SUBMISSION
2017.03.21	FOR CONSTRUCTION DOCUMENTS - UPDATED
2017.03.13	REVISED FOR FOUNDATION BID
2017.03.07	NYCT - 3rd SUBMISSION
2017.03.01	FOR CONSTRUCTION DOCUMENTS
2016.12.30	NYCT - 2nd SUBMISSION
2016.11.07	FOUNDATION AND EXCAVATION FOR BID
2016.04.22	ISSUED FOR DESIGN DEVELOPMENT



SUPPORT OF EXCAVATION  
DETAILS - 4  
(SHEET 4 OF 4)

SOE-404.00

AS SHOWN	DATE	121190772
1259.00	DATE	121190772

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