

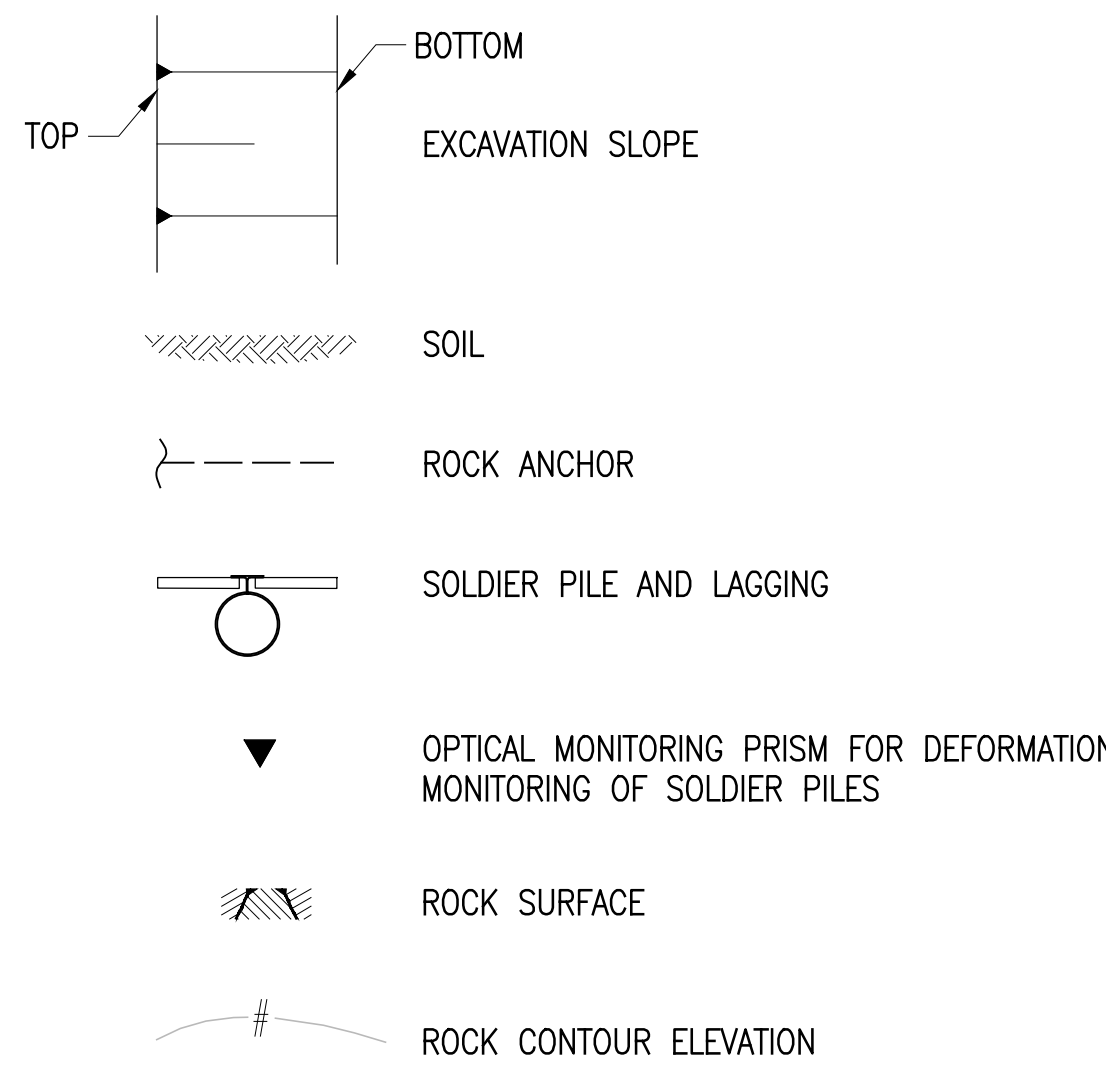
LIST OF DRAWINGS

- SOE-100.00 – SUPPORT OF EXCAVATION – GENERAL AND EXCAVATION NOTES  
SOE-101.00 – SUPPORT OF EXCAVATION – PLAN  
SOE-110.00 – SUPPORT OF EXCAVATION – SECTIONS 1 OF 2  
SOE-111.00 – SUPPORT OF EXCAVATION – SECTIONS 2 OF 2  
SOE-120.00 – SUPPORT OF EXCAVATION – DETAILS

LIST OF ABBREVIATIONS:

- ℄ – CENTERLINE  
DIA. – DIAMETER  
ELEC. – ELECTRICAL  
EL. – ELEVATION  
EXIST. – EXISTING  
FTG. – FOOTING  
NO. – NUMBER  
O.C. – ON CENTER  
℄ – PROPERTY LINE  
SCHED. – SCHEDULE  
SOE – SUPPORT OF EXCAVATION  
TYP. – TYPICAL  
W.P. – WORKING POINT

LIST OF SYMBOLS:



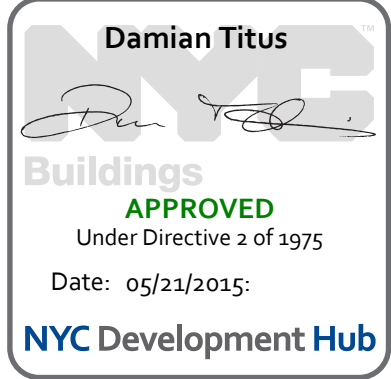
GENERAL NOTES:

- CONTRACTOR MAY ELECT TO SUBMIT VALUE ENGINEERING AND OWN DESIGN FOR SUPPORT OF EXCAVATION, INCLUDING ALL MEASURES REQUIRED TO SUPPORT ADJACENT STRUCTURES, STREETS, SIDEWALKS AND UTILITIES, PREPARED BY A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF NEW YORK FOR REVIEW BY THE ENGINEER-OF-RECORD.
- ELEVATIONS ON PLANS ARE GIVEN RELATIVE TO DATUM NAVD88.
- THE SUPPORT OF EXCAVATION SYSTEM HAS BEEN DESIGNED FOR 600 PSF AT EXISTING GRADE ALONG THE EXTERIOR OF THE SITE.
- MATERIALS:
  - A. ALL STEEL (U.O.N.): ASTM A572, GRADE 50
  - B. SOLDIER PIPE PILES: ASTM A 252, CLASS 3
  - C. TIMBER LAGGING: SOUTHERN PINE OR EQUAL  
FB = 1250 PSI (MIN)  
FV = 175 PSI (MIN)
  - D. STEEL THREAD BAR: ASTM A722, GRADE 150
  - E. ROCK BOLTS: ASTM A615 GRADE 75
  - F. ROCK PIN REINFORCING: ASTM A615, GRADE 60
  - G. GROUT: MIN. 4000 PSI COMPRESSIVE STRENGTH AT 28 DAYS
  - H. WELDING: AWS D1.1, E70XX ELECTRODES
- SOLDIER (DRILLED-IN) PIPE PILES:
  - A. ALL SOLDIER PILES SHALL BE INSTALLED PLUMB IN DRILLED HOLES. ANY DEVIATIONS OF THE PILE ALIGNMENT BEYOND THOSE SPECIFIED SHALL BE BROUGHT TO THE ATTENTION OF THE CONSTRUCTION MANAGER PRIOR TO EXCAVATION.
  - B. ALL PILES SHALL BE FILLED WITH GROUT.
  - C. PILE SPLICES SHALL DEVELOP THE FULL MOMENT AND SHEAR CAPACITY OF THE PILES.
- ALL ANCHORS SHALL BE INSTALLED AND TESTED ACCORDING TO THE DETAILS AND PROCEDURES ON DRAWING SOE-120.00.
- ALL ROCK BOLTS SHALL BE INSTALLED ACCORDING TO THE DETAILS AND PROCEDURES SHOWN ON DRAWING SOE-120.00.
- FOUNDATION PLAN PREPARED BY DeSIMONE CONSULTING ENGINEERS P.L.L.C., DATED 2-28-2014.

GENERAL EXCAVATION NOTES:

- GENERAL EXCAVATION ACROSS THE SITE SHALL NOT EXTEND DEEPER THAN THE SLAB-ON-GRADE GRANULAR FILL SUBGRADE ELEVATION. DEEPER EXCAVATIONS SHALL BE EXCAVATED INDIVIDUALLY, ON A LOCALIZED BASIS DOWN FROM SUBGRADE. CONTRACTOR TO VERIFY ELEVATIONS PRIOR TO COMMENCING WORK.
- CONTRACTOR SHALL VERIFY AND RECORD ROCK ELEVATIONS DURING SOLDIER (DRILLED-IN) PIPE PILE INSTALLATION. ACTUAL TOP OF ROCK ELEVATIONS SHALL BE REPORTED TO THE CONSTRUCTION MANAGER PRIOR TO EXCAVATION.
- SOIL EXCAVATION SHALL NOT PROCEED DEEPER THAN 2 FEET BELOW THE LAST INSTALLED LAGGING. ALL LAGGING SHALL BE PLACED HORIZONTAL AND BACKPACKED PRIOR TO ADVANCING THE EXCAVATION. THE EXCAVATION SHALL BE SEQUENCED SO THAT STABILITY OF ADJACENT STRUCTURES WITHIN 10' OF THE LAGGING IS MAINTAINED AT ALL TIMES.
- ROCK EXCAVATION:
  - A. LINE DRILL AS REQUIRED.
  - B. PLUG ALL SEAMS AND LENSES IN ROCK WITH GROUT AS REQUIRED IF WATER BEARING.
  - C. INSTALL ROCK BOLTS AS REQUIRED AND AS DIRECTED BY THE ENGINEER.
  - D. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING TIMING AND EFFECTS OF BLASTING (IF USED) WITH EXISTING RAILROAD OPERATIONS PER THE RECOMMENDATIONS OF THE OWNER'S BLAST CONSULTANT.
  - E. NO BLASTING SHALL OCCUR WITHIN A 50'-FOOT RADIUS OF NEWLY PLACED CONCRETE STRUCTURES BEFORE 7 DAYS OF CURING, UNLESS WRITTEN PERMISSION IS OBTAINED FROM THE ENGINEER OF RECORD.
  - F. ALL BLASTING OPERATIONS SHALL COMPLY WITH ALL LOCAL AND STATE LAWS, RULES, AND REGULATIONS, AND AMTRAK AND LIRR BLASTING SPECIFICATIONS.
- CONTRACTOR SHALL LOCATE ALL UTILITIES AND EXISTING UNDERGROUND STRUCTURES PRIOR TO INSTALLING SOLDIER PILES, TIEBACKS OR ROCK BOLTS. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING, RELOCATING AND REINSTALLING EXISTING UTILITIES THAT INTERFERE WITH PROPOSED EXCAVATION AND SUPPORT OF EXCAVATION MEMBERS.
- THE CONTRACTOR SHALL PROVIDE ALL MEASURES AND PRECAUTIONS NECESSARY TO PREVENT DAMAGE AND MINIMIZE SETTLEMENT OF EXISTING OR NEW CONSTRUCTION INSIDE OR OUTSIDE PROJECT LIMITS.
- MONITORING:
  - A. CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING MONITORING POINTS ON THE SOE. THE CONTRACTOR SHALL FREQUENTLY READ AND RECORD ALL MOVEMENTS OR SETTLEMENTS DURING EXCAVATION AND REPORT MOVEMENTS TO CONSTRUCTION MANAGER.
  - B. CONTRACTOR SHALL SUBMIT AND CONDUCT A VIBRATION MONITORING PLAN AND PROGRAM AS PER AMTRAK/LIRR REQUIREMENTS AS APPROVED BY ENGINEER.
- THE CONTRACTOR SHALL PROVIDE ALL EQUIPMENT FOR THE DEWATERING SYSTEM IF REQUIRED. THE DEWATERING SYSTEM SHALL MAINTAIN THE WATER LEVEL TO A MINIMUM OF 3 FEET BELOW THE DEEPEST SUBGRADE AT ALL TIMES. THIS LEVEL SHALL BE MAINTAINED UNTIL ALL LOWER LEVEL AND GROUND FLOOR SLABS, PERIMETER WALLS AND WATERPROOFING ARE INSTALLED AND THE PERMANENT BUILDING DRAINAGE SYSTEM IS FULLY OPERATIONAL.
- PROPOSED WORK ON DRAWINGS ARE SUBJECT TO SPECIAL INSPECTION IN ACCORDANCE WITH THE NEW YORK CITY BUILDING CODE.
- NOTIFICATION TO BE PROVIDED TO THE D.O.B. 24-48 HOURS PRIOR TO COMMENCEMENT OF EARTHWORK AS PER BC 3304.3.1.

3



PROJECT  
**Manhattan West  
Southwest Residential  
Tower**

PART OF THE MANHATTAN WEST MASTER PLAN  
West 31st Street & Dyer Avenue  
New York, NY

OWNER/DEVELOPER:

**Brookfield**  
BOP West 31st Street LLC  
Brookfield Properties W 33rd CO L.P.  
Brookfield Place, 250 Vesey Street  
New York, NY 10281

ARCHITECT:

**SLCArchitects, LLP**

1359 BROADWAY  
NEW YORK, NY 10018  
TEL.: (212) 979-8400  
FAX.: (212) 979-8387

DESIGN ARCHITECT / MASTER PLAN ARCHITECT:

**SOM**  
Skidmore, Owings & Merrill LLP  
14 Wall Street New York, NY 10005  
(212) 298-9300

INTERIOR DESIGN:

**ROMAN AND WILLIAMS**  
BUILDINGS AND INTERIORS  
324 LAFAYETTE STREET, 6TH FLOOR  
NEW YORK, NY 10012  
TEL.: (212) 625-3808  
FAX.: (212) 625-3807

LANDSCAPE ARCHITECT:

**JAMES CORNER**  
FIELD OPERATIONS  
475 TENTH AVENUE  
NEW YORK, NY 10018  
TEL.: (212) 433-1450

STRUCTURAL ENGINEER:

**DeSIMONE CONSULTING**  
ENGINEERS, P.L.L.C.  
18 WEST 18TH STREET  
NEW YORK, NY 10011  
TEL.: (212) 532-2211  
FAX.: (212) 481-6108

MECHANICAL ENGINEER:

**COSENTINI ASSOCIATES**  
TWO PENN PLAZA  
NEW YORK, NY 10121  
TEL.: (212) 615-3600  
FAX.: (212) 615-3700

BUILDING ENVELOPE CONSULTANT:

**VIDARIS INC. /**  
**ISRAEL BERGER & ASSOCIATES, INC.**  
232 MADISON AVENUE  
NEW YORK, NY  
TEL.: (212) 689-5389  
FAX.: (212) 689-6449

ENERGY / ENVIRONMENTAL CONSULTANT:

**VIDARIS INC. /**  
**VIRIDIAN ENERGY & ENVIRONMENTAL**  
50 WASHINGTON STREET  
NORWALK, CT 06854  
TEL.: (203) 299-1411  
FAX.: (203) 299-1456

VERTICAL TRANSPORTATION CONSULTANT:

**VAN DEUSEN & ASSOCIATES**  
5 REGENT STREET, SUITE 524  
LIVINGSTON, NJ 07039  
TEL.: (973) 994-9220

ACOUSTICAL CONSULTANT:

**CERAMI ASSOCIATES**  
404 FIFTH AVENUE  
NEW YORK, NY 10018  
TEL.: (212) 370-1776  
FAX.: (212) 370-1736

CIVIL ENGINEER:

**PHILIP HABIB & ASSOCIATES**  
102 MADISON AVENUE, 11TH FL.  
NEW YORK, NY 10016  
TEL.: (212) 929-5656  
FAX.: (212) 929-5605

GEOTECHNICAL ENGINEER:

**MUESER RUTLEDGE**  
CONSULTING ENGINEERS  
225 WEST 34TH STREET  
NEW YORK, NY 10022  
TEL.: (917) 539-9800  
FAX.: (917) 339-9400

DATE:

10-16-2014

05-16-2014

03-14-2014

DESIGN DEVELOPMENT

DATE:

REVISION:

D.O.B. NUMBER:

NB#

NO.:

Scale: AS NOTED

PROJECT:

DRAWING TITLE:

**SUPPORT OF EXCAVATION  
GENERAL AND EXCAVATION  
NOTES**

SEAL & SIGNATURE:

PROJECT No:

DRAWN BY:

CHECKED BY:

DATE:

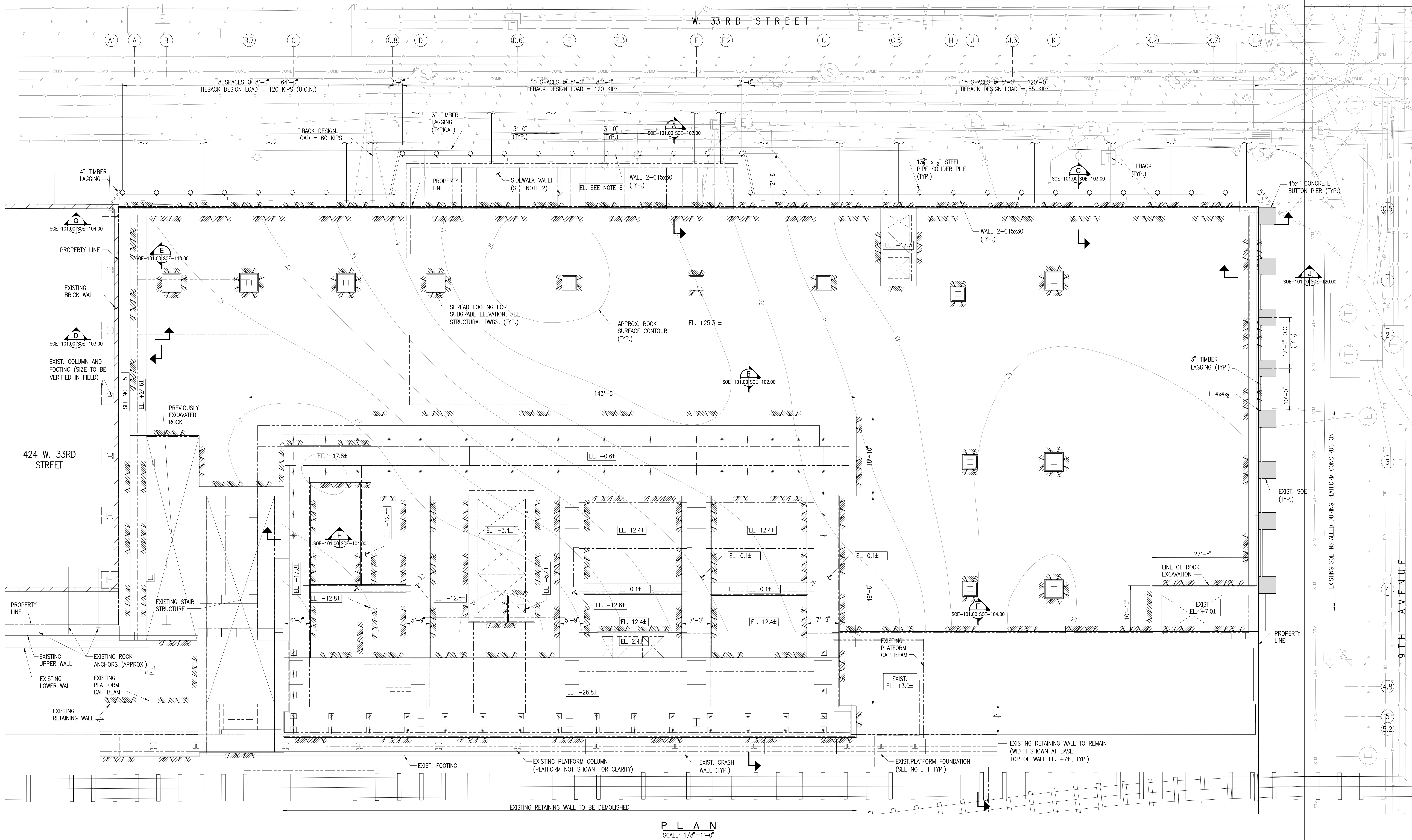
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SOE-100.00

FILE No:

SOE-100.00.dwg





PLAN  
SCALE: 1/8"=1'-0"

NOTES:

1. BEARING PRESSURE AT PLATFORM FOOTINGS AT TIME OF TOWER CONSTRUCTION VARIES BETWEEN 25 TSF AND 40 TSF.
2. AT SIDEWALK VAULT, EXCAVATE TO TOP OF ROCK AND BACK FILL WITH FLOWABLE FILL TO ELEVATION SHOWN ON PLAN.
3. TENSIONED PERMANENT ANCHORS TO BE INSTALLED UNDER 424 W. 33RD STREET ARE NOT SHOWN FOR CLARITY. SEE DRAWING SOE-110.00 FOR SPACING.
4. TENSION TIE DOWNS AFTER CONSTRUCTING CAISSON CAP BETWEEN EXISTING BUILDING AND EXISTING STAIR STRUCTURE. DESIGN LOAD = 60 KIPS.
5. ROCK SUBGRADE AT BASE OF LOFT BUILDING FOUNDATION (V.I.F.)
6. ALL ELEVATION ARE REFERENCED TO BOROUGH OF MANHATTAN DATUM.

SHEET NOTES

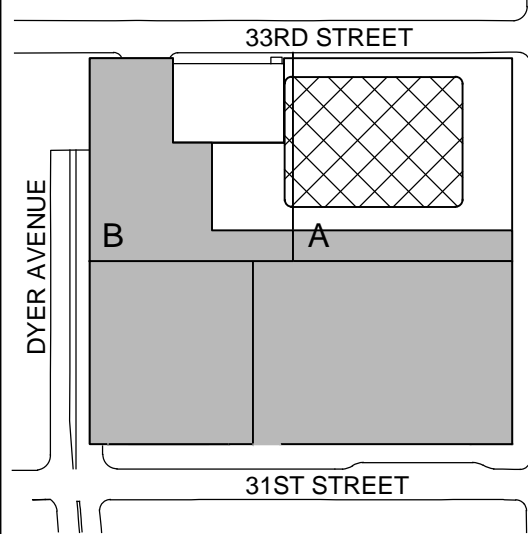
**MANHATTAN WEST:  
NORTH TOWER**  
375 Ninth Avenue, New York, NY 10001  
Client

**Brookfield**  
Brookfield Place  
220 Vesey Street, 15th Floor, New York, NY 10281

Geotechnical Engineering  
Mueser Rutledge Consulting Engineers  
14 Penn Plaza, 225 W. 34th Street, New York, NY 10122

PRELIMINARY  
NOT FOR CONSTRUCTION

Key Plan:

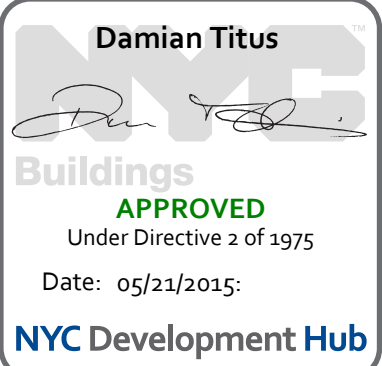


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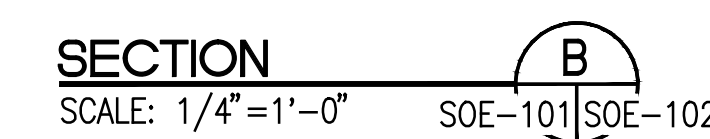
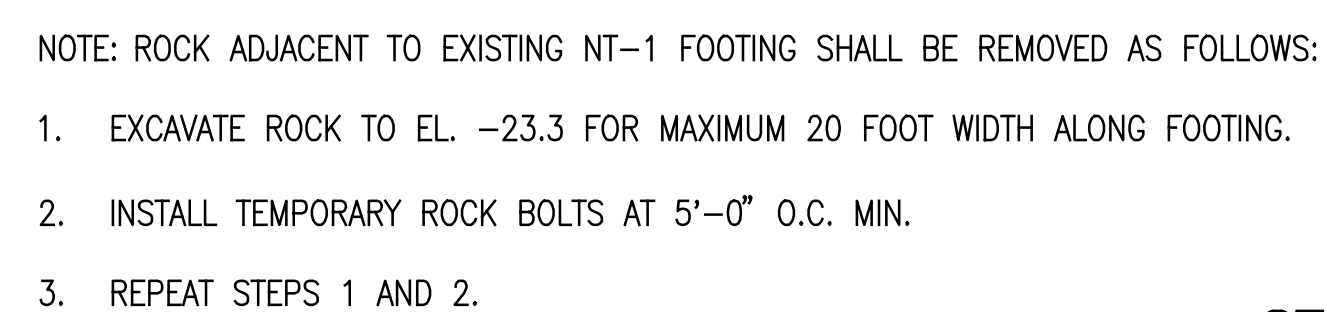
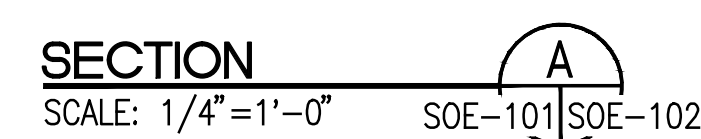
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2	20 DEC 2013	ISSUED FOR FOUNDATION PERMIT
1	28 MAR 2014	ISSUED FOR PERMITS DEVELOPMENT
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Sheet Name:		

SUPPORT OF  
EXCAVATION  
PLAN



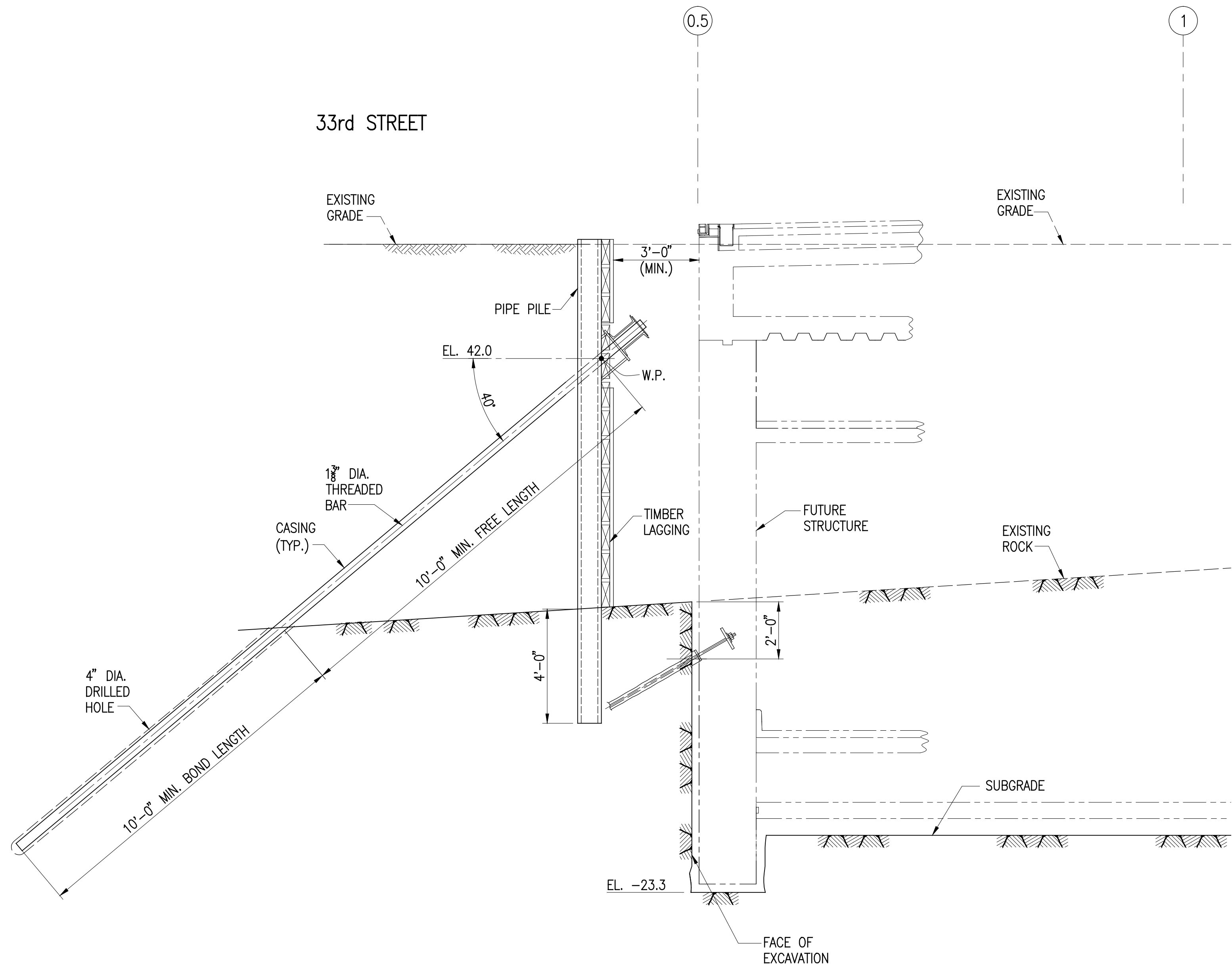
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Date: 20 JUN 2014	Sheet No.: SOE-101.00
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File No.: SOE-101.00	



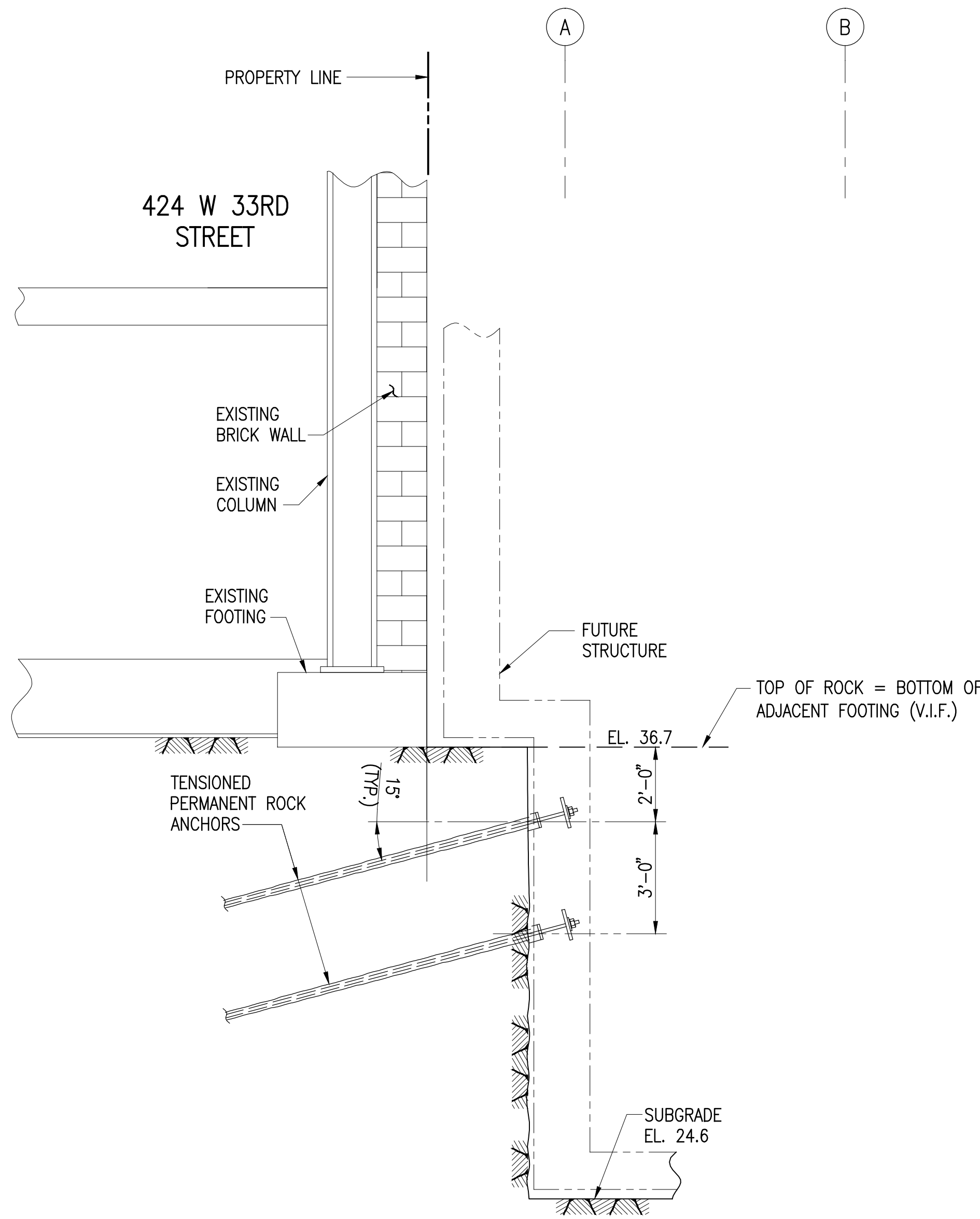


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SECTION C  
SCALE: 3/8"=1'-0" SOE-103



SECTION D  
SCALE: 3/8"=1'-0" SOE-103

SHEET NOTES



**MANHATTAN WEST:  
NORTH TOWER**  
375 Ninth Avenue, New York, NY 10001

Client

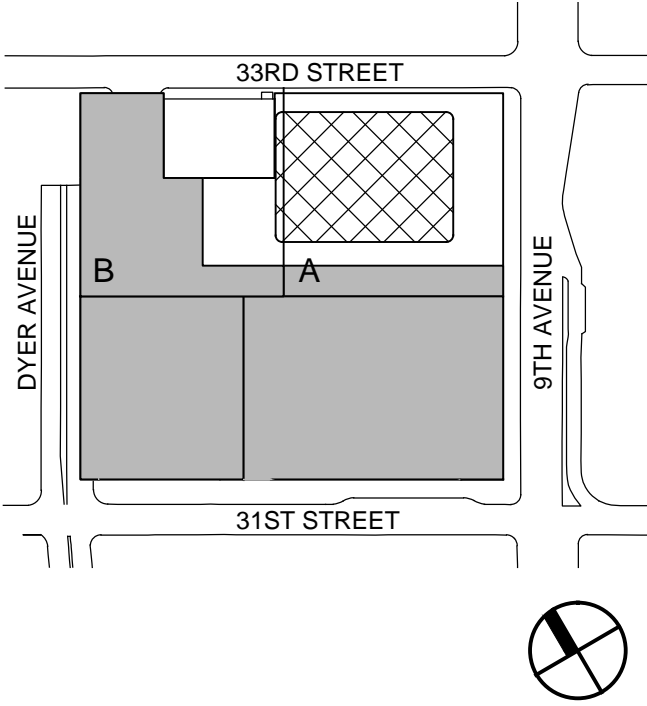
**Brookfield**

Brookfield Place  
250 Vesey Street, 15th Floor, New York, NY 10281

Geotechnical Engineering  
Mueser Rutledge Consulting Engineers  
14 Penn Plaza, 225 W. 34th Street, New York, NY 10122

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NOT FOR CONSTRUCTION

Key Plan:



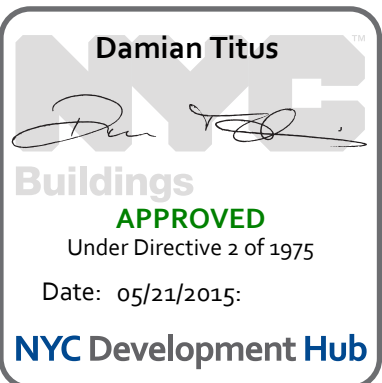
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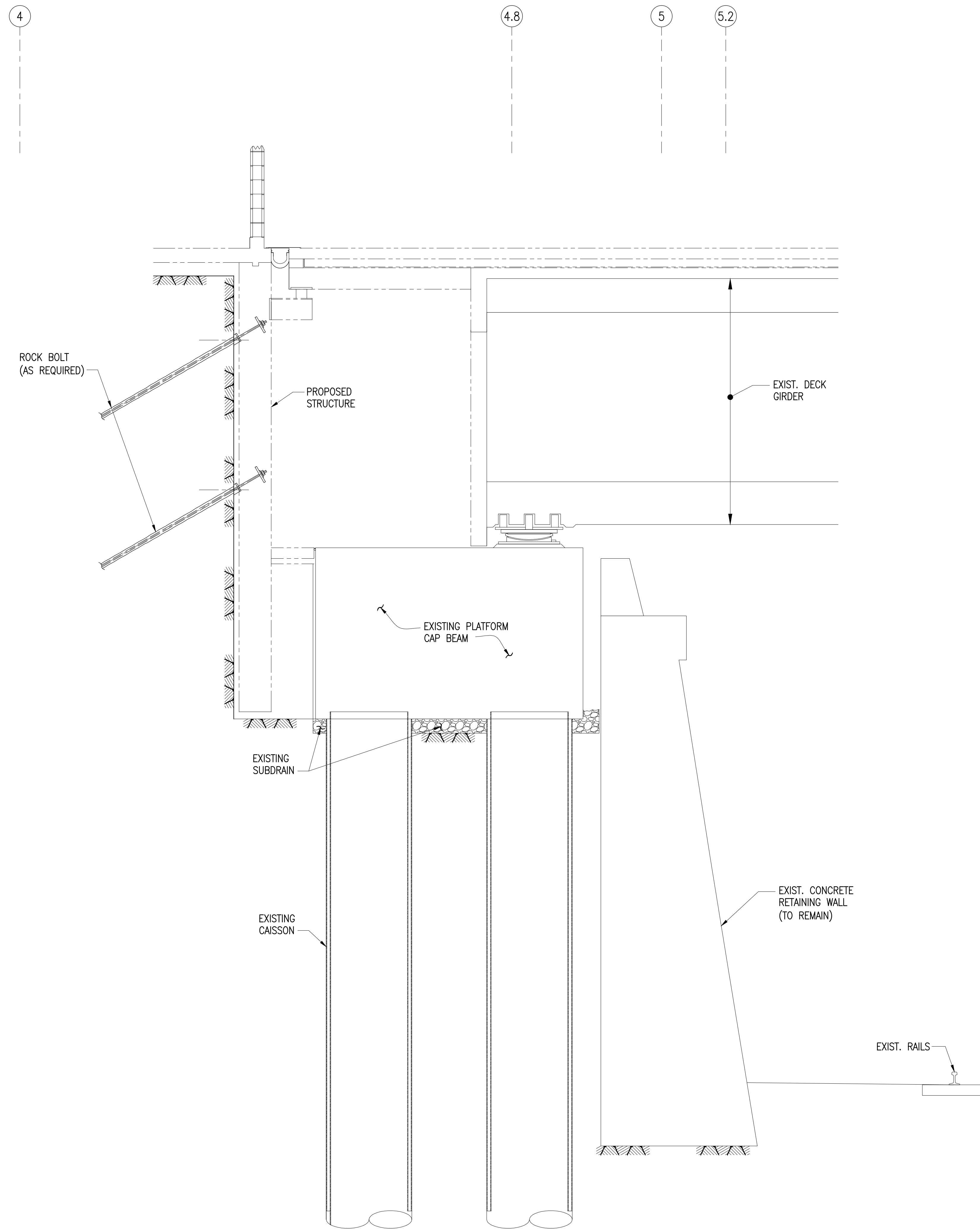
SUPPORT OF  
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Page No.:	4 OF 7

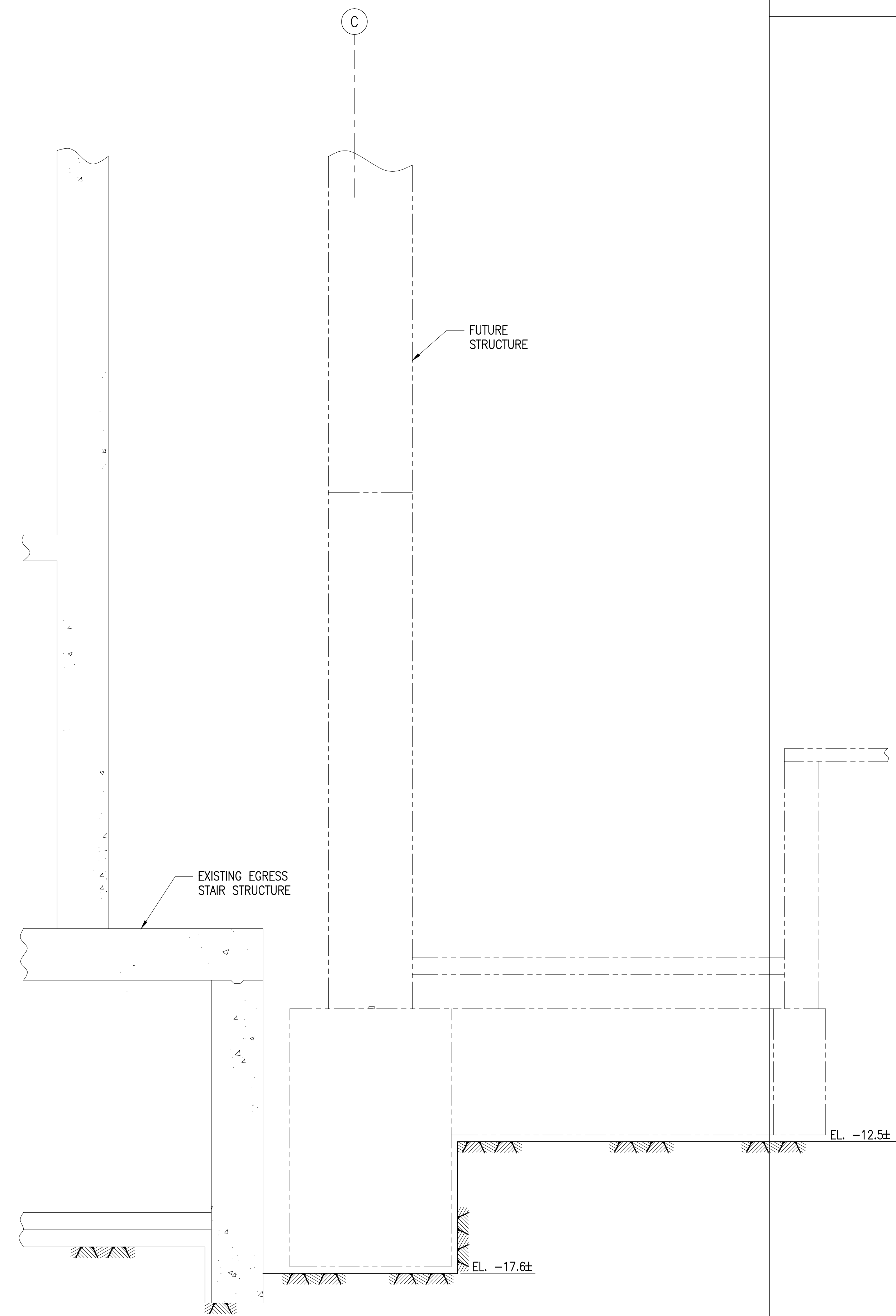


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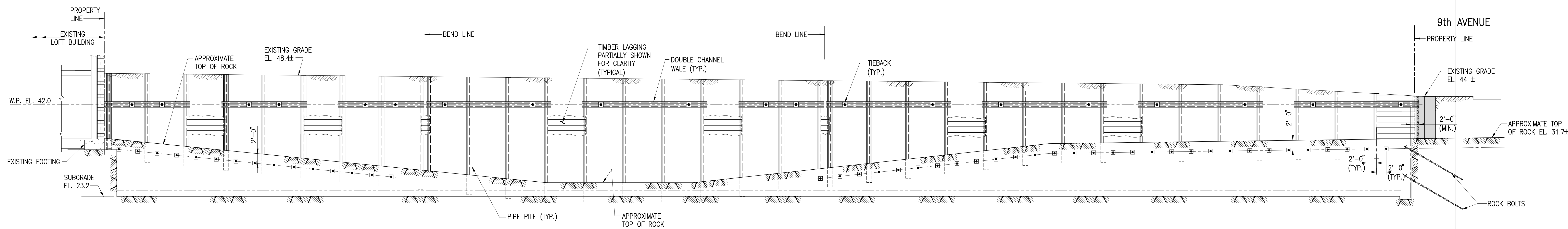


NOTE: SEE EXISTING CONDITION DRAWINGS FOR EXISTING ROCK ELEVATIONS.

SECTION F  
SCALE: 3/8"=1'-0" SOE-101 SOE-104



SECTION H  
SCALE: 3/8"=1'-0" SOE-101 SOE-104



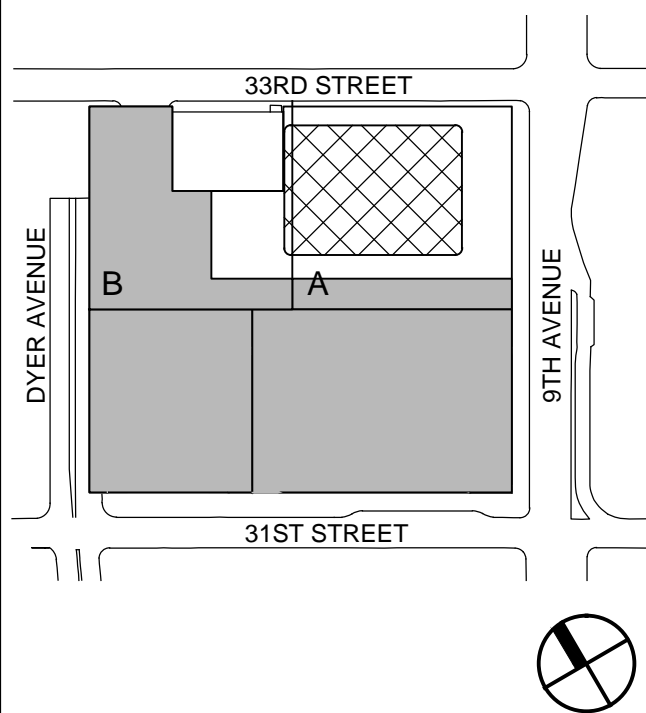
SECTION G  
SCALE: 1/8"=1'-0" SOE-101 SOE-104

## SHEET NOTES

**MANHATTAN WEST:  
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375 Ninth Avenue, New York, NY 10001  
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Geotechnical Engineering  
Mueser Rutledge Consulting Engineers  
14 Penn Plaza, 225 W. 34th Street, New York, NY 10122

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NOT FOR CONSTRUCTION

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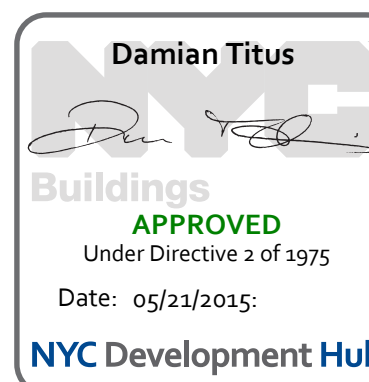


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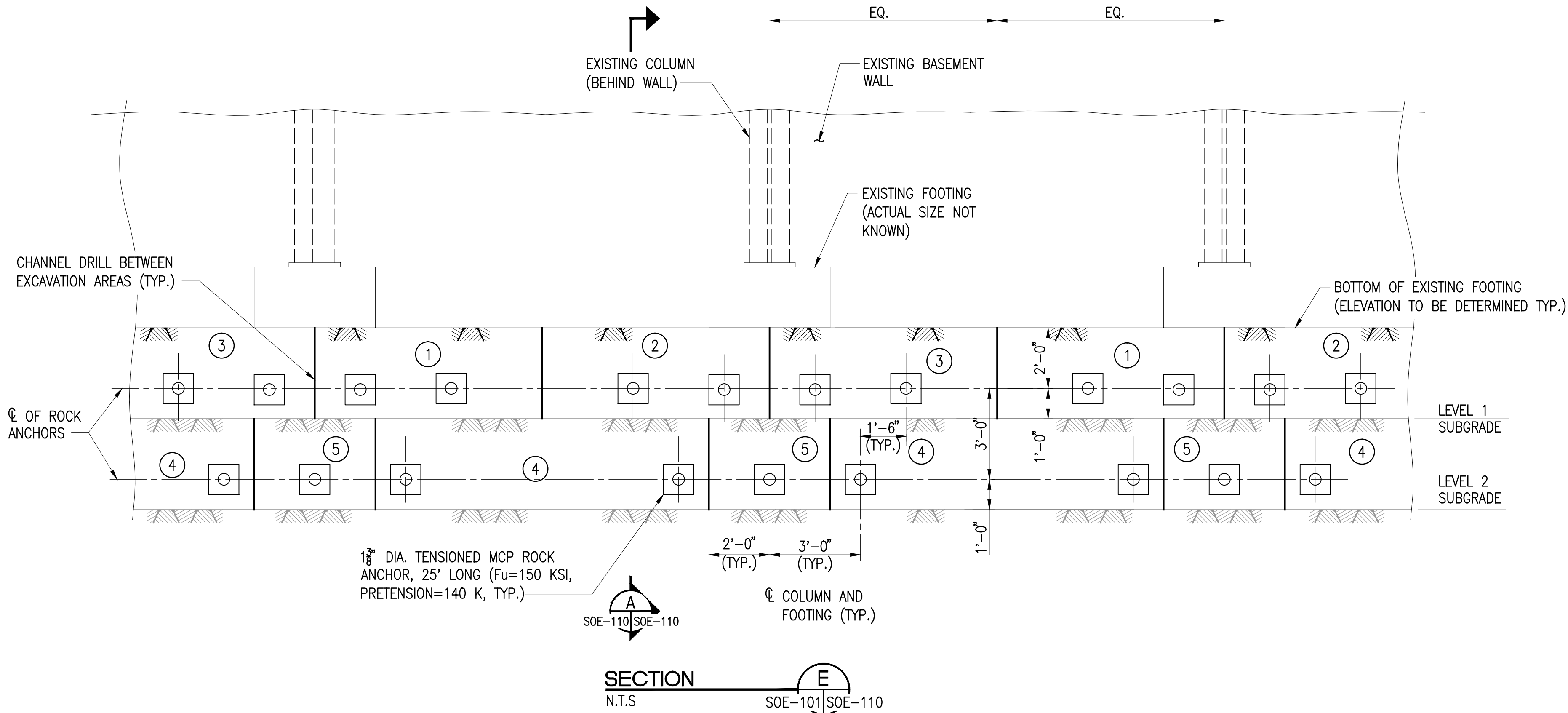
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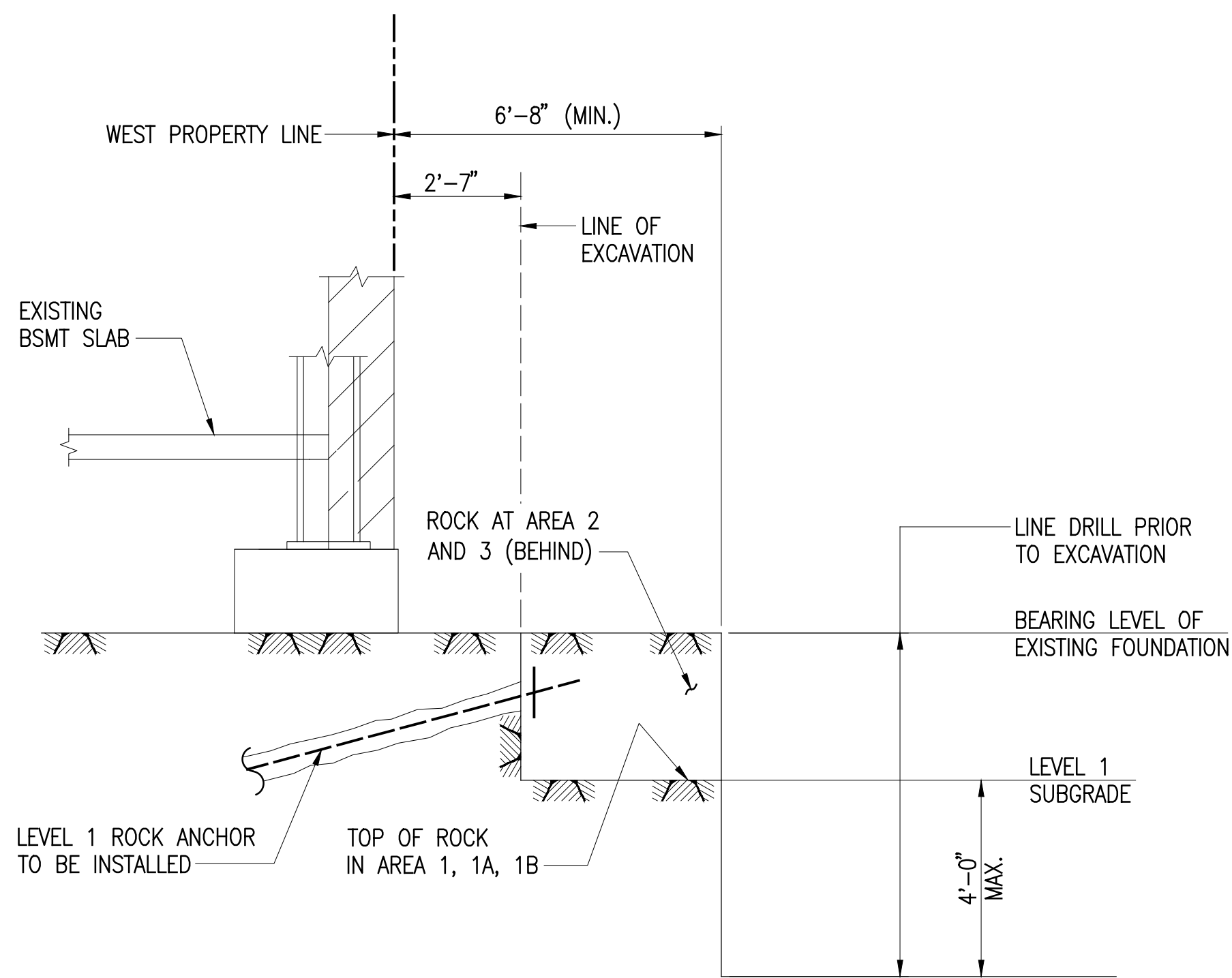
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SOE-104.00





TYPICAL SEQUENCE OF ROCK EXCAVATION AT BUILDING COLUMNS

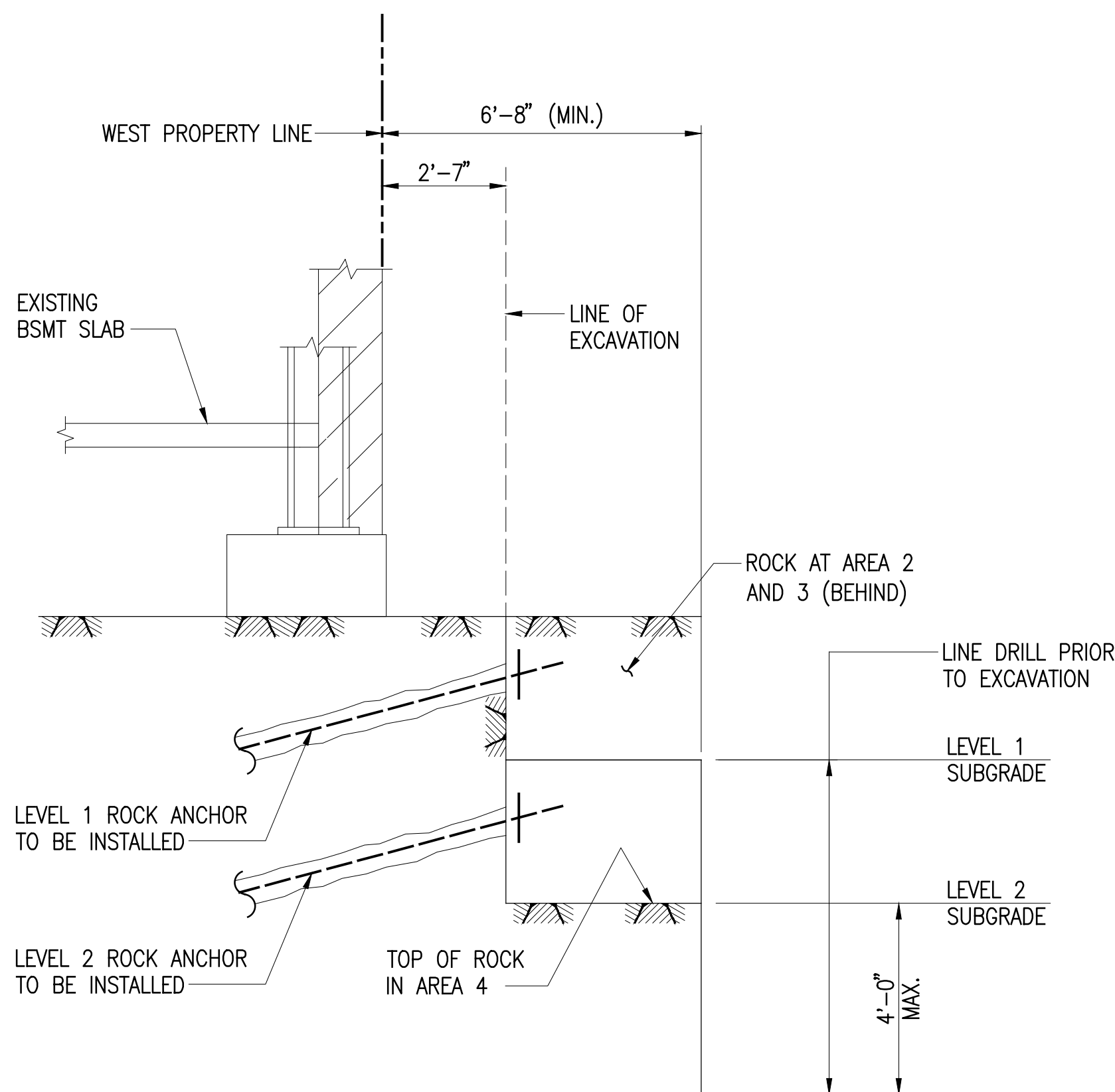


EXCAVATION AT STEP 2.2

SECTION A  
N.T.S. SOE-110 SOE-110

EXCAVATION SEQUENCE AT BUILDING COLUMN:

- EXCAVATE TO BEARING LEVEL OF EXISTING COLUMN FOUNDATIONS.
- LEVEL 1 PERMANENT ANCHOR INSTALLATION BELOW FOOTINGS
  - BEYOND 6'-8" FROM THE WESTERN PROPERTY LINE, EXCAVATE TO A MAXIMUM OF FOUR (4) FEET BELOW LEVEL 1 SUBGRADE (SEE SECTION A AT STEP 2.2 ON THE LEFT SIDE OF THIS DRAWING).
  - WITHIN 6'-8" OF THE WESTERN PROPERTY LINE, EXCAVATE ROCK TO LEVEL 1 SUBGRADE IN AREAS MARKED 1, (SEE SECTION A AT STEP 2.2 ON THE LEFT SIDE OF THIS DRAWING).
  - INSTALL PERMANENT ROCK ANCHORS AND TENSION AS REQUIRED.
  - WITHIN 6'-8" OF THE WESTERN PROPERTY LINE, EXCAVATE ROCK TO LEVEL 1 SUBGRADE IN AREA MARKED (2).
  - INSTALL PERMANENT ROCK ANCHORS AND TENSION AS REQUIRED.
  - WITHIN 6'-8" OF THE WESTERN PROPERTY LINE, EXCAVATE ROCK TO LEVEL 1 SUBGRADE IN AREA MARKED (3).
  - INSTALL PERMANENT ROCK ANCHORS AND TENSION AS REQUIRED.
- LEVEL 2 PERMANENT ANCHOR INSTALLATION
  - INSTALL ANCHORS AT LEVEL 2 USING THE LEVEL 1 CRITERIA STARTING WITH THE LOWEST NUMBERED AREAS (SEE SECTION A EXCAVATION AT STEP 3.1, ON THE RIGHT SIDE OF THIS DRAWING).
- INSTALLATION AT REMAINING PERMANENT ANCHOR LEVELS (INSTALL ANCHORS ON NORTH FACE AS ANCHOR LOCATIONS ARE EXPOSED)
  - EXCAVATE TO A MAXIMUM OF FOUR (4) FEET BELOW THE ANCHOR ELEVATION.
  - INSTALL PERMANENT ROCK ANCHORS AND TENSION AS REQUIRED.
  - REPEAT STEPS 2.1 AND 4.2 UNTIL ALL PERMANENT ROCK ANCHORS HAVE BEEN INSTALLED AND TENSIONED.



EXCAVATION AT STEP 3.1

SECTION A  
N.T.S. SOE-110 SOE-110

SHEET NOTES

DEPT OF BLDGS

12187143

Job Number

ES73072670

Sheet Code

MANHATTAN WEST:  
NORTH TOWER

375 Ninth Avenue, New York, NY 10001

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14 Penn Plaza, 225 W. 34th Street, New York, NY 10122

PRELIMINARY  
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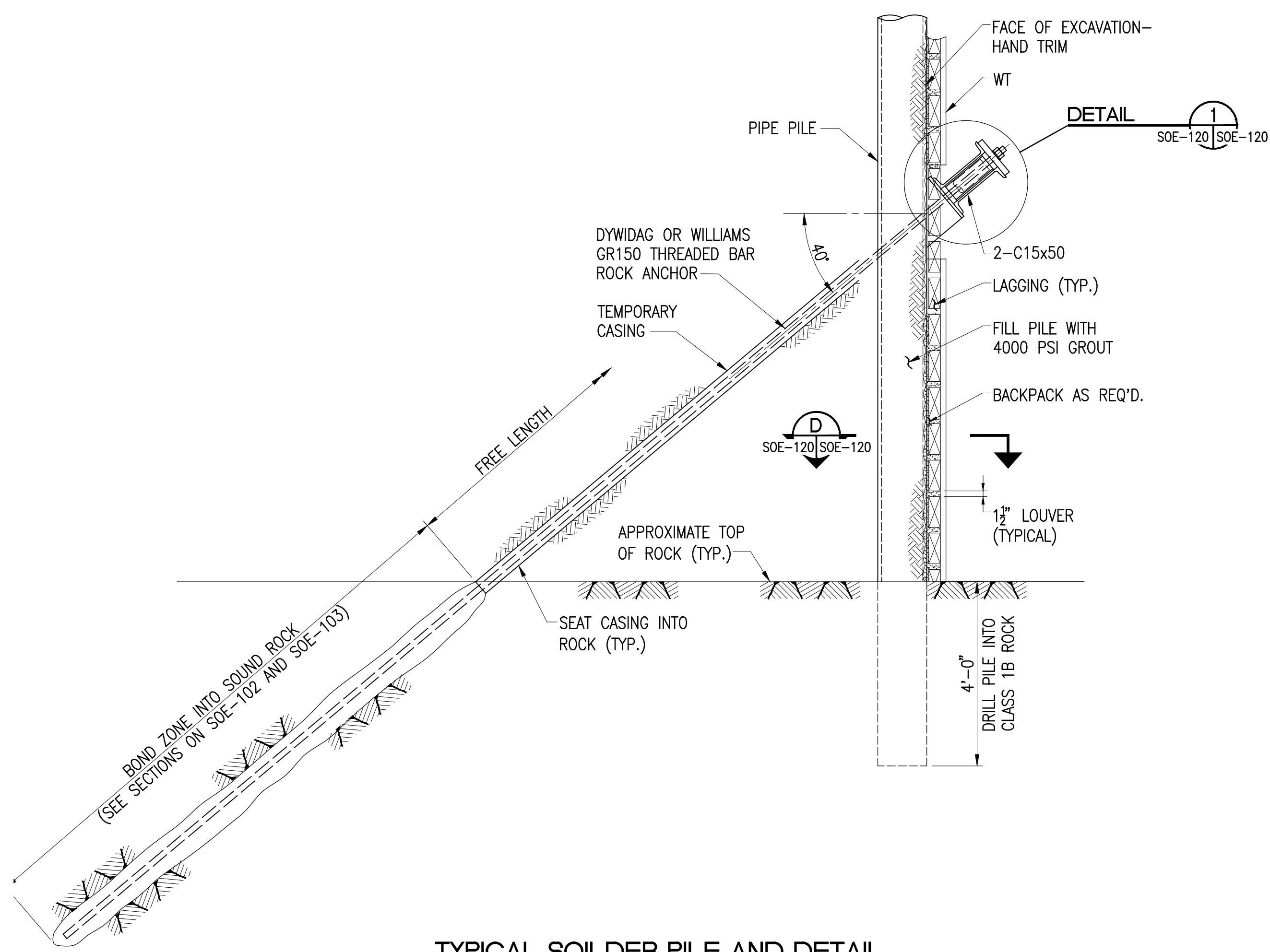
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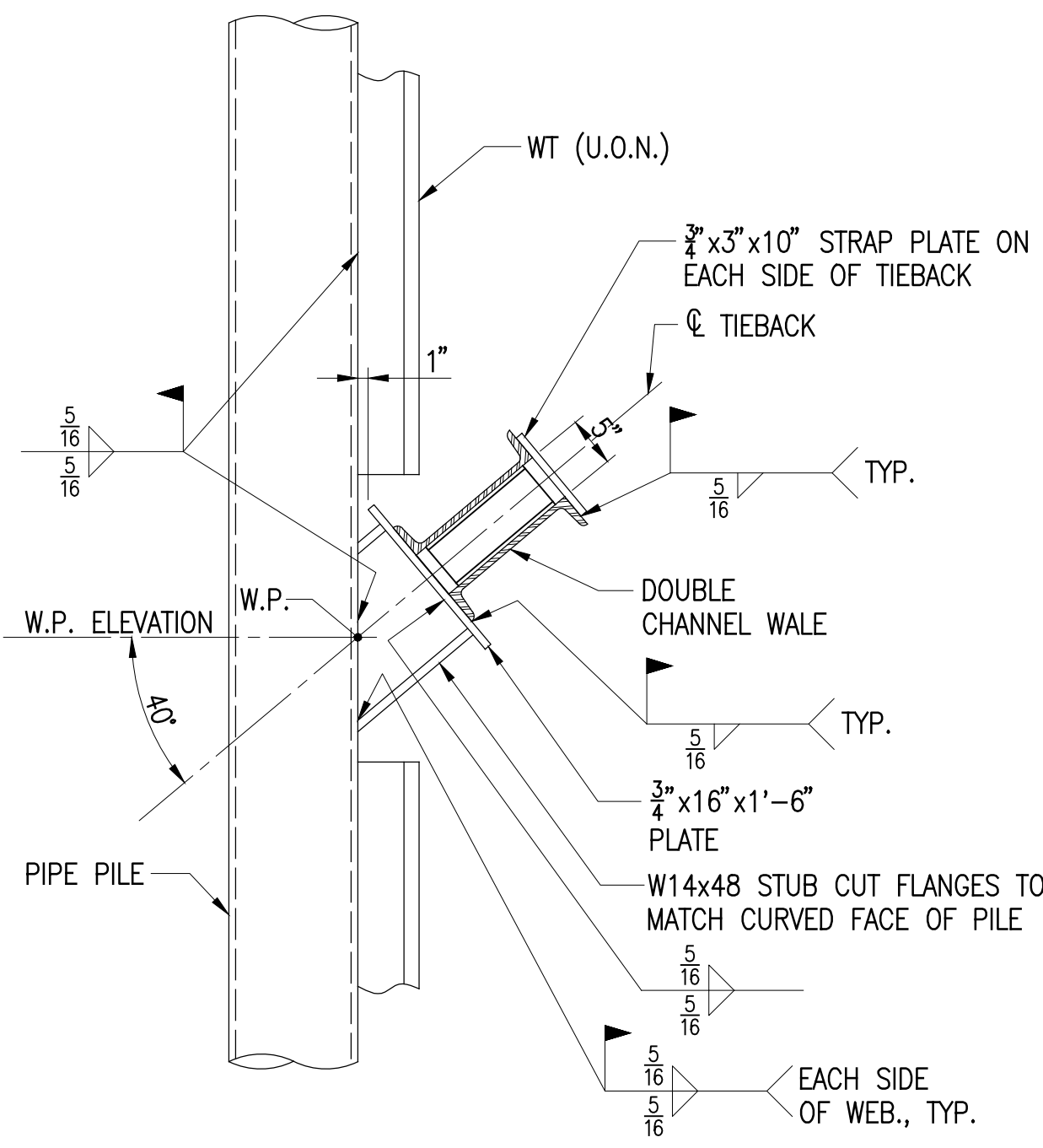
SUPPORT OF  
EXCAVATION  
SEQUENCE  
ADJACENT TO  
EXISTING  
STRUCTURES

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Date:	20 JUNE 2014
Scale:	N.T.S.
File No.:	SOE-110
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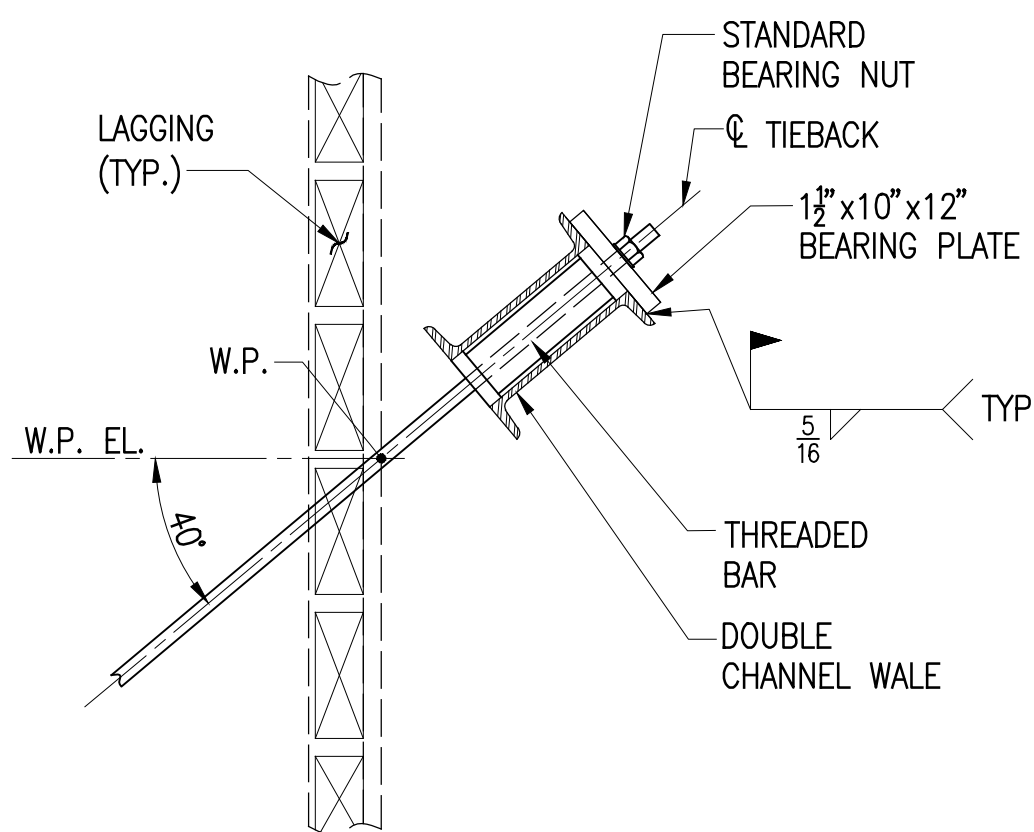




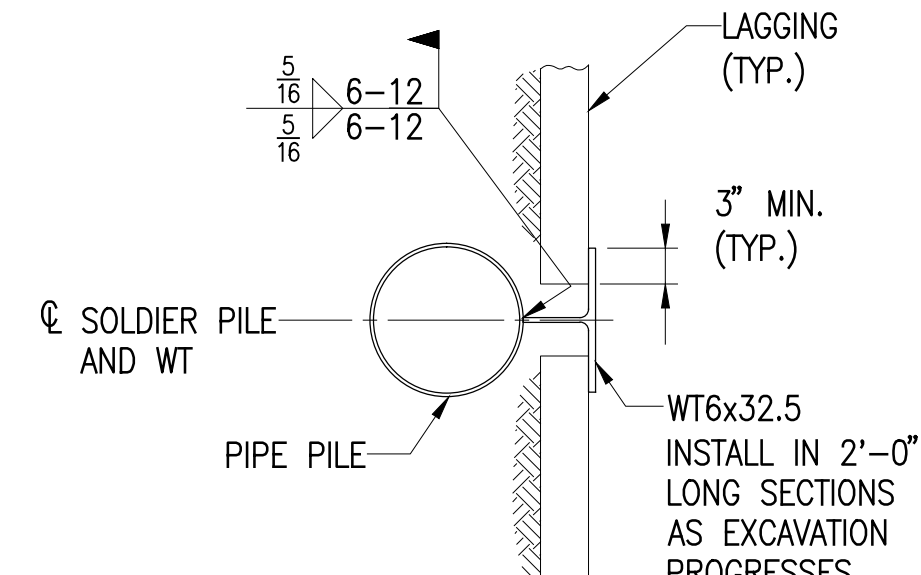
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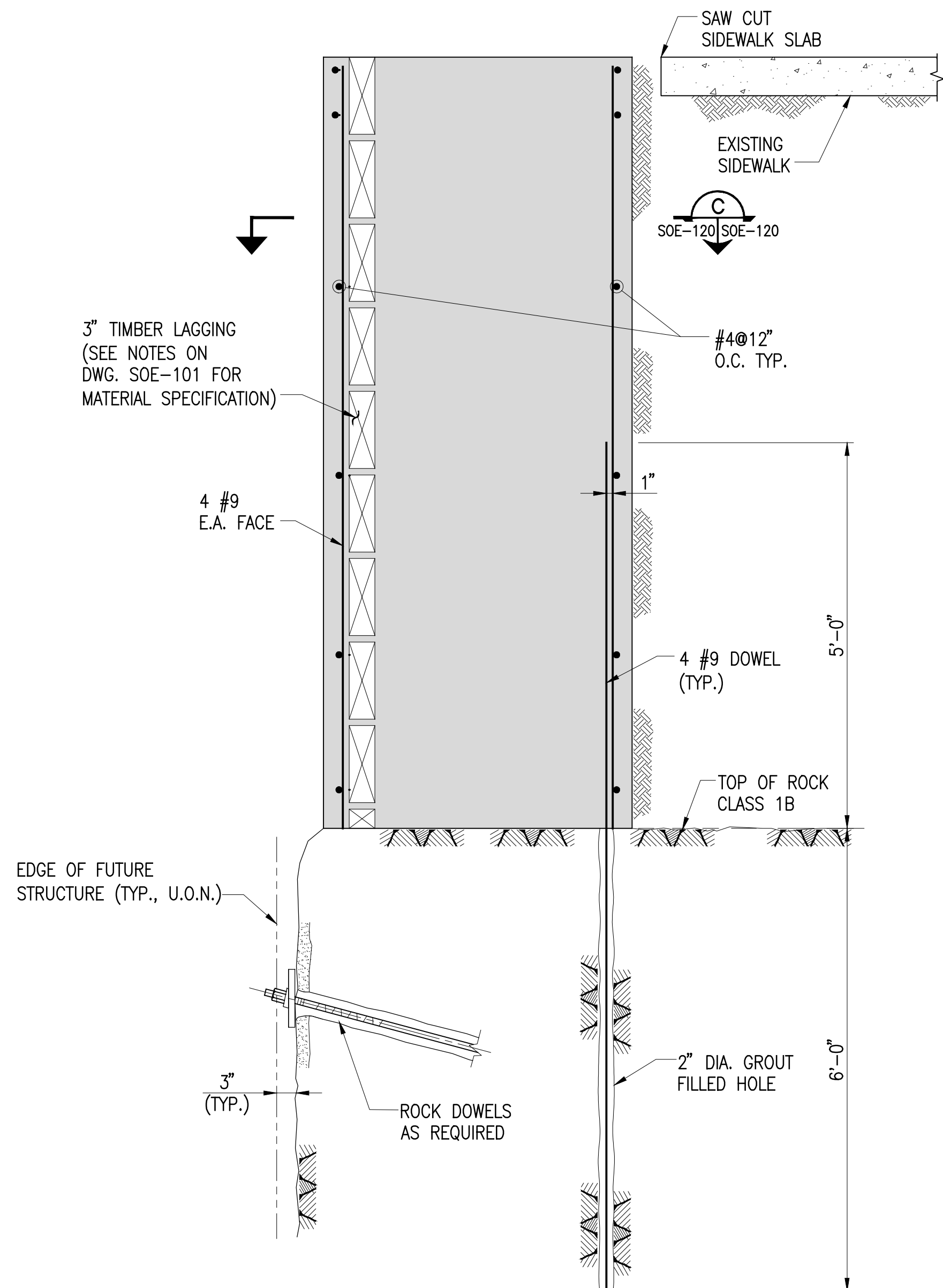
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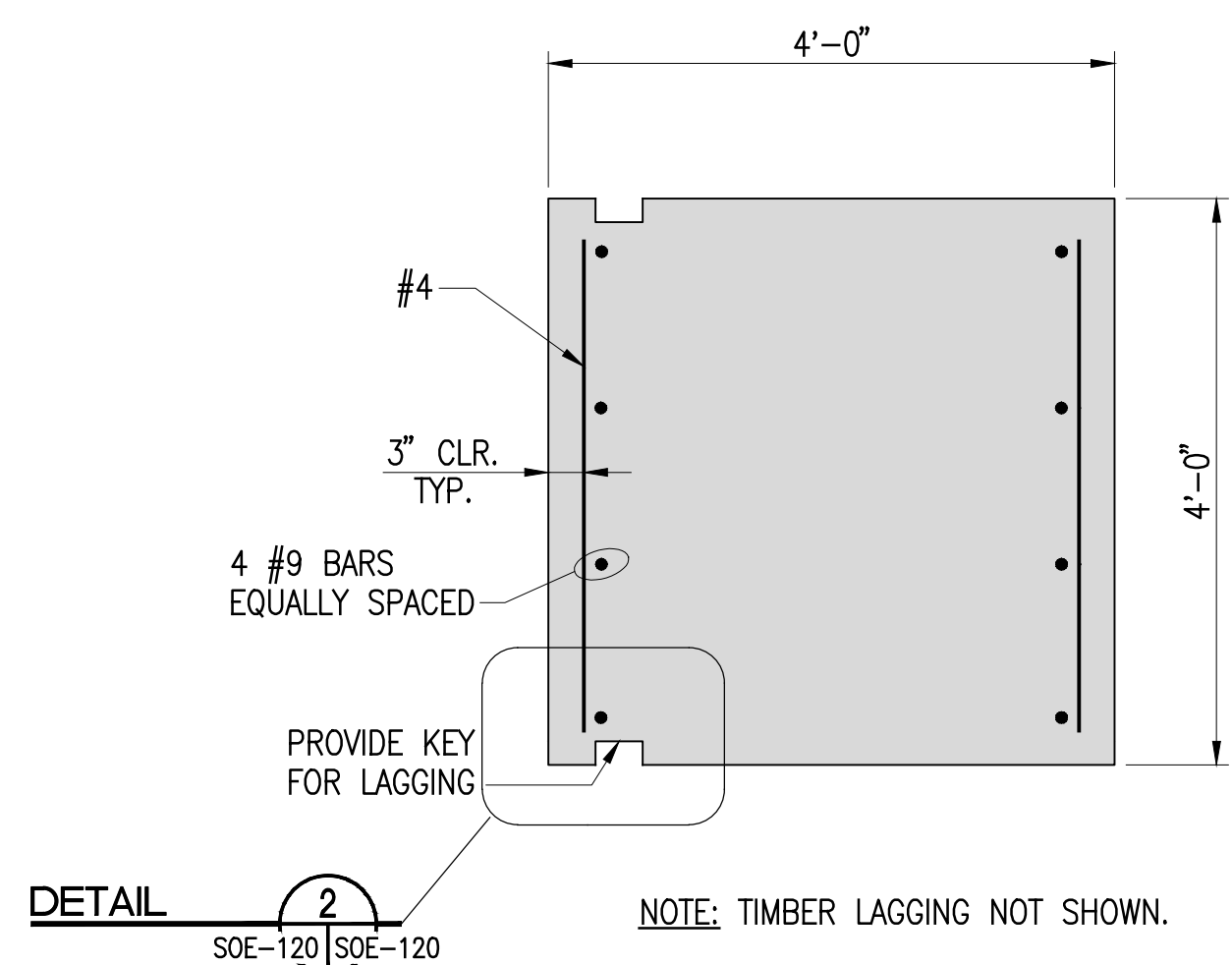
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SCALE: 3/4"=1'-0"



**SECTION**  
SCALE: 3/4"=1'-0" SOE-120 SOE-120

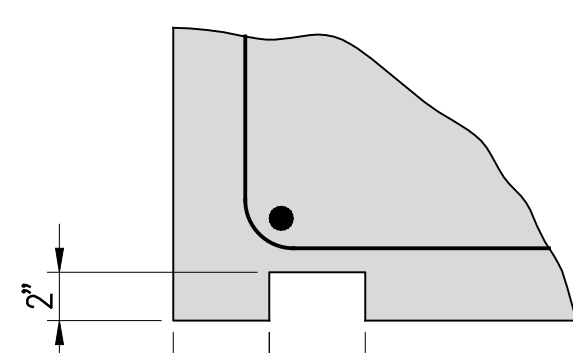


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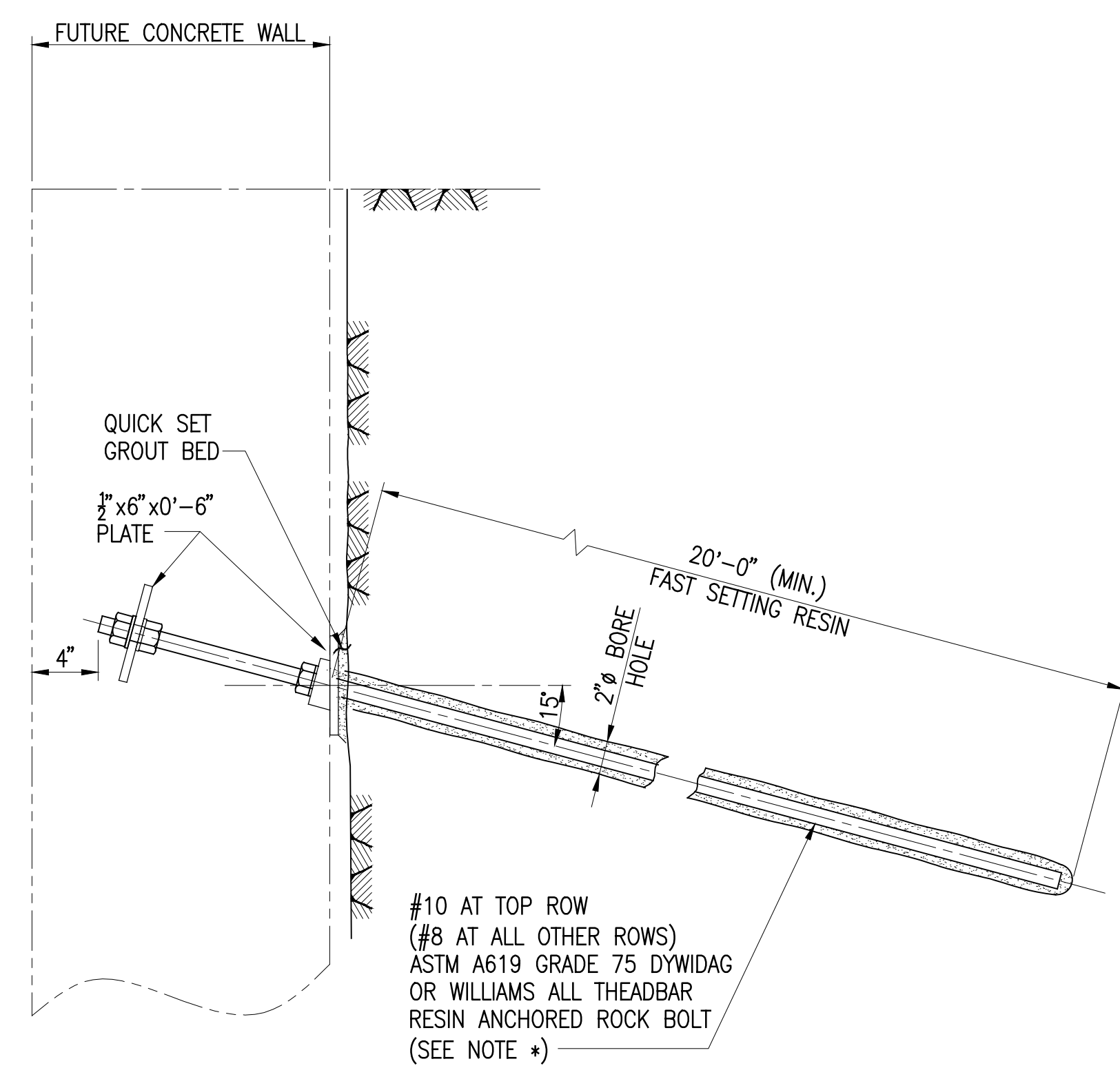


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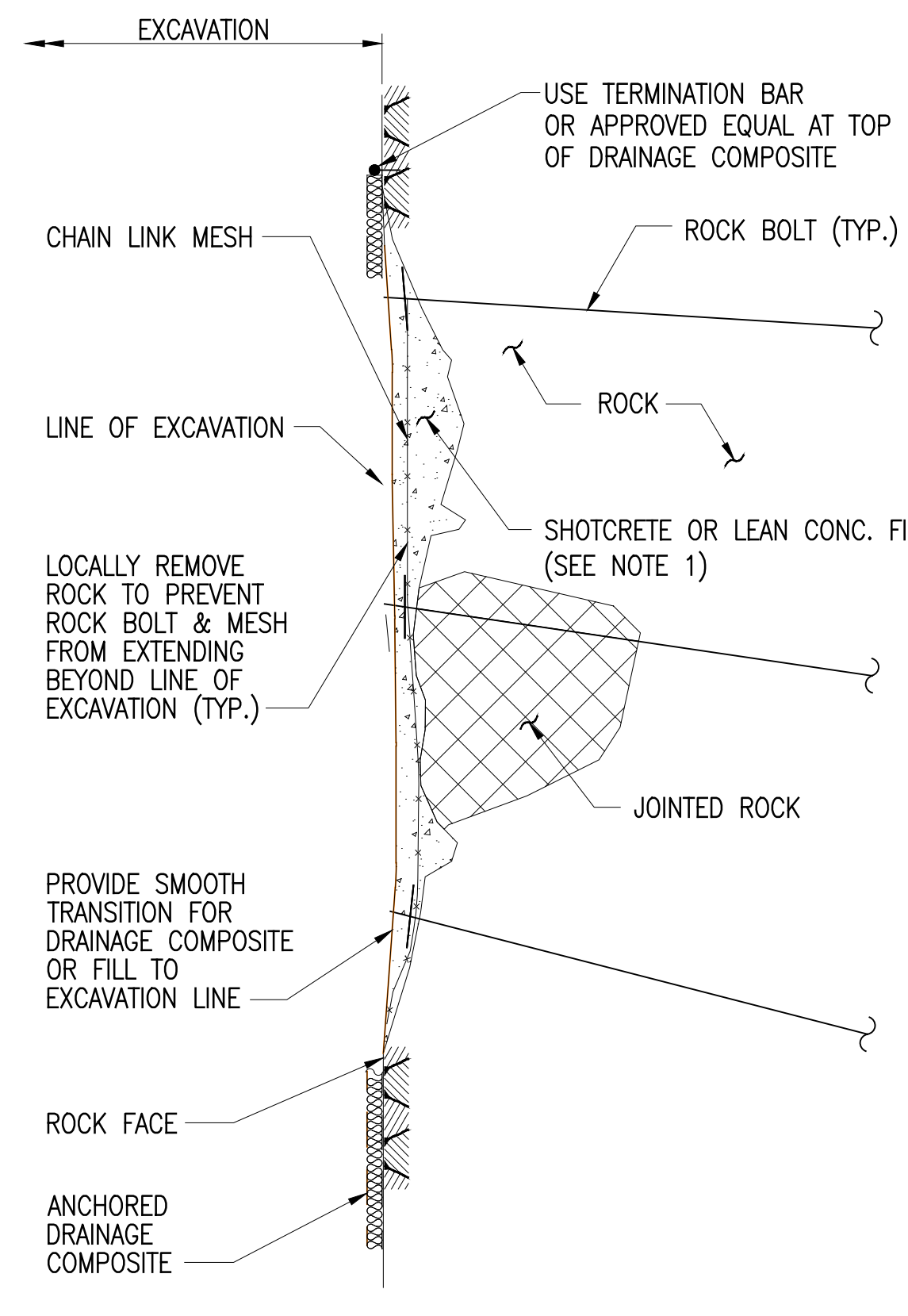
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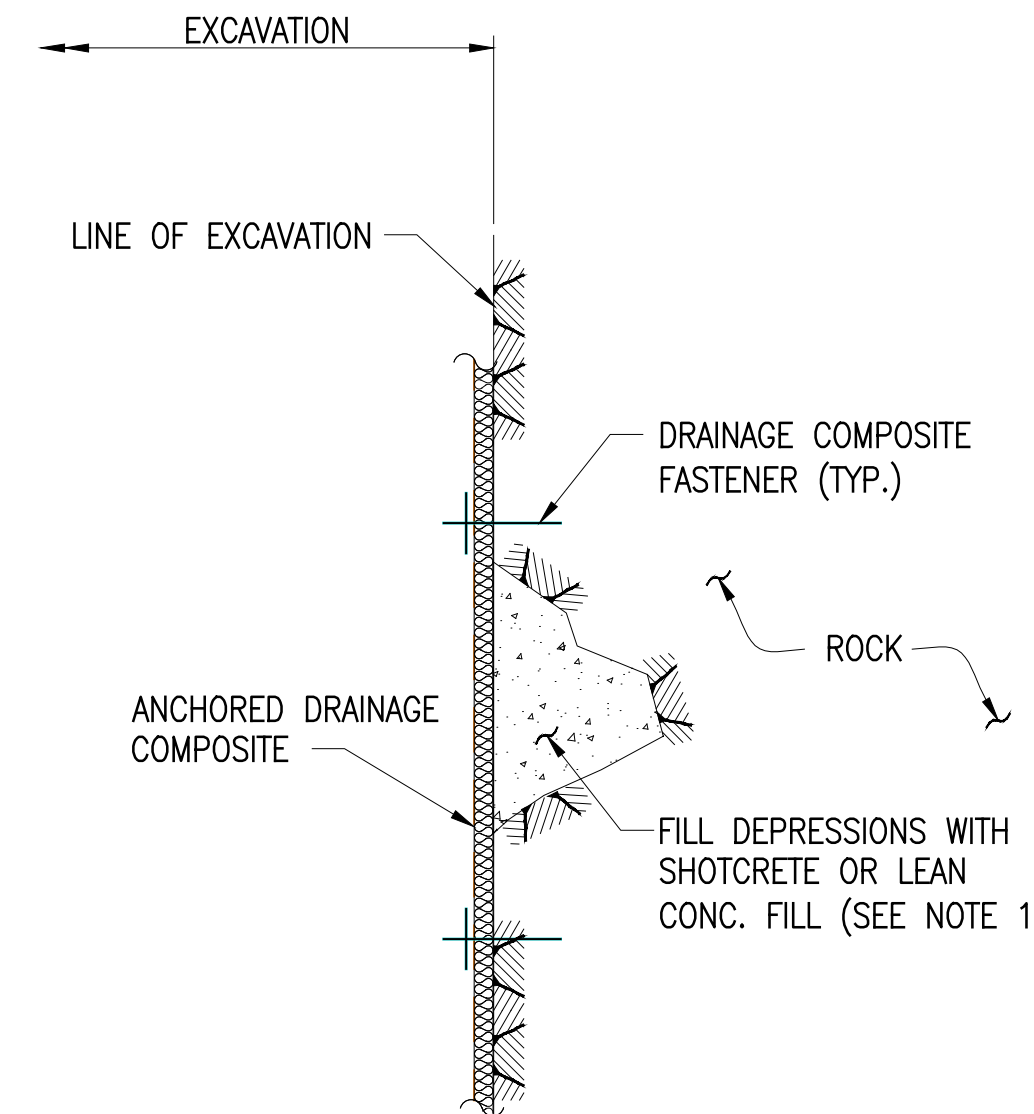
**DETAIL**  
SCALE: 1 1/2"=1'-0" SOE-120 SOE-120



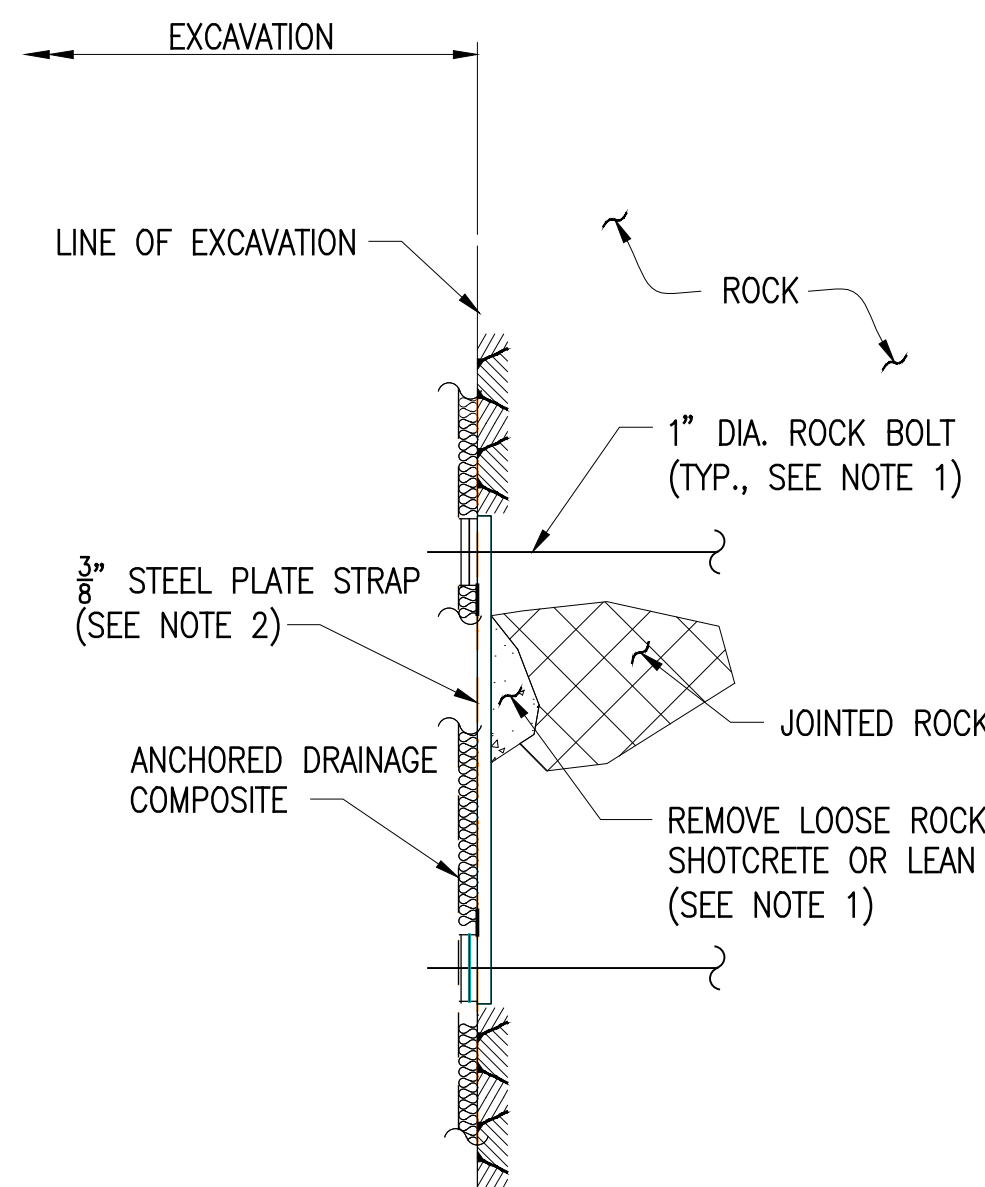
**PERMANENT ROCK ANCHOR DETAIL**  
SCALE: 1 1/2"=1'-0"



**ROCK FACE SUPPORT WITH CHAIN LINK MESH**  
NO SCALE

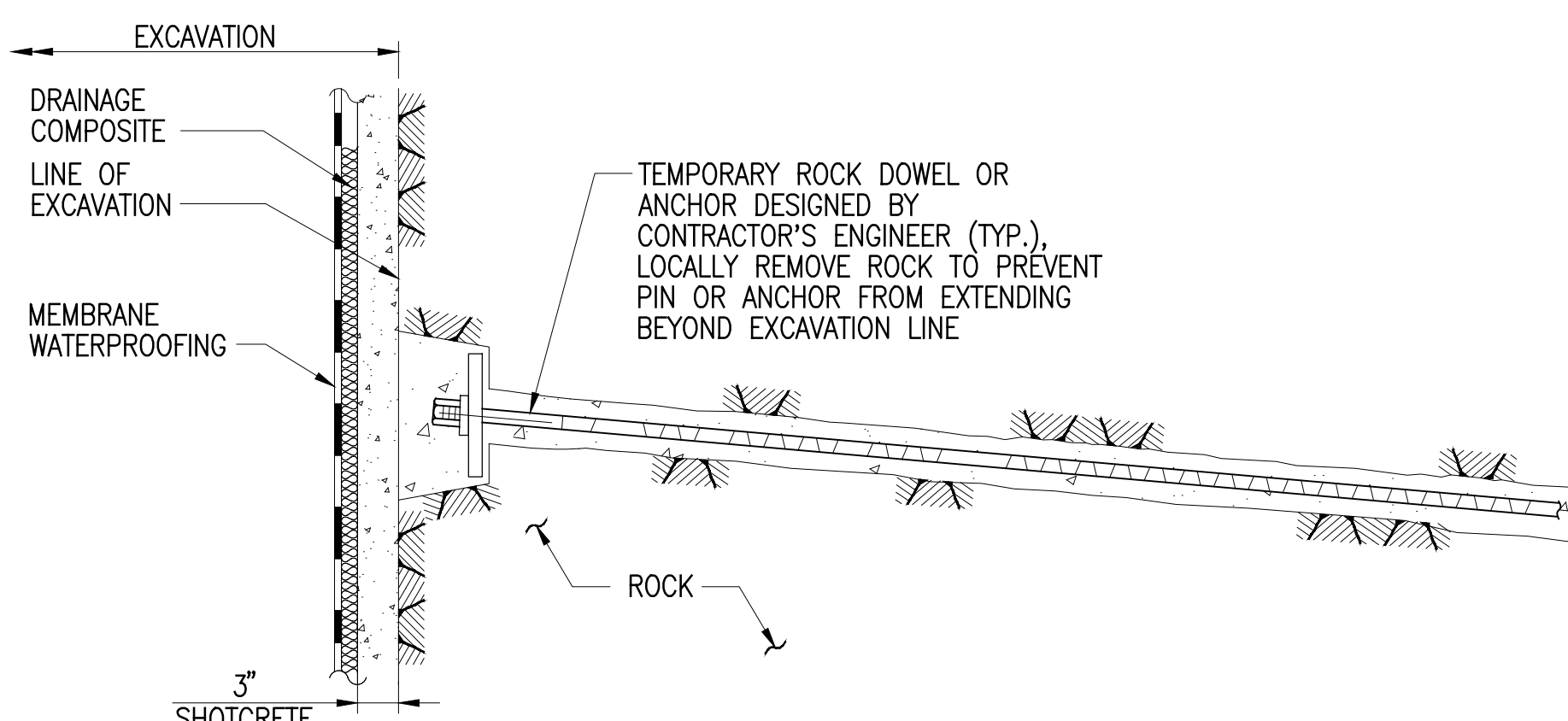


**ROCK SURFACE PREPARATION**  
NO SCALE



**ROCK FACE SUPPORT AT HIGHLY JOINTED AREAS BELOW EXISTING FOUNDATIONS**  
NO SCALE

**NOTE:**  
1. INSTALL 1" DIA PVC PIPE SLEEVES OR DRILL 1" DIA. DRILL HOLES IN SHOTCRETE AND CONCRETE USED TO FILL DEPRESSIONS IN ROCK TO PROVIDE A FLOW PATH FROM THE ROCK SURFACE TO THE DRAINAGE COMPOSITE. DRAIN HOLES SHALL BE ALIGNED WITH ROCK JOINTS AND SPACED NO MORE THAN 2 FEET CENTER TO CENTER. INSTALL WEEP HOLES AND W/W WHERE PATCHED AREA EXCEEDS 20 SQUARE FEET OR IF SEEPAGE IS VISIBLE.



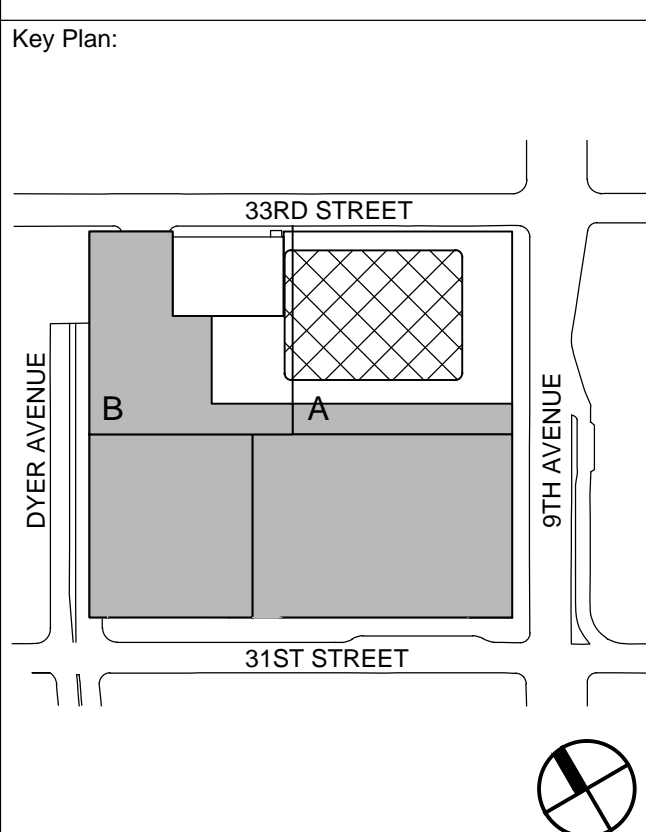
**NOTE:** INTERFACE BETWEEN DRAINAGE COMPOSITE AND PERMANENT PIPING NOT SHOWN. SEE CONTRACT DOCUMENTS

**ROCK FACE SUPPORT IN AREA WITH MEMBRANE WATERPROOFING**  
NO SCALE

## SHEET NOTES

**MANHATTAN WEST: NORTH TOWER**  
375 Ninth Avenue, New York, NY 10001  
Client  
**Brookfield**  
Brookfield Place  
250 Vessey Street, 15th Floor, New York, NY 10281  
Geotechnical Engineering  
Mueser Rutledge Consulting Engineers  
14 Penn Plaza, 225 W. 34th Street, New York, NY 10122

PRELIMINARY  
NOT FOR CONSTRUCTION



No.	Date	Description
1	20 JUNE 2014	ISSUED FOR PERMIT
2		
3		
4		
5		
6		
7		
8		
9		
10		

## SUPPORT OF EXCAVATION DETAILS

Project No.:	B-SCAN Sheet No.:
Date:	20 JUNE 2014
Scale:	AS SHOWN
File No.:	SOE-120
Sheet No.:	SOE-120
Page No.:	7 OF 7

