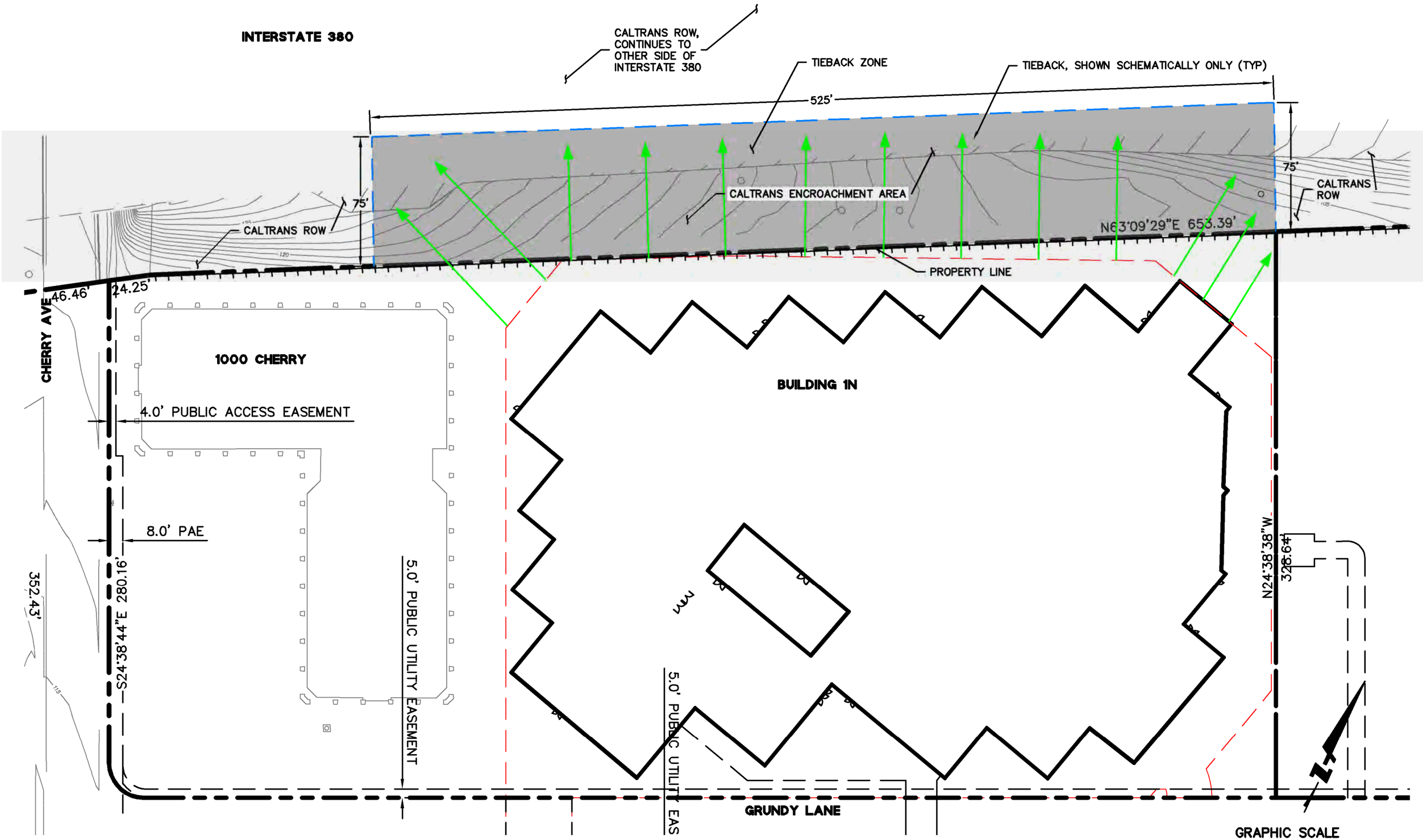
Appendix 5

Phase I Temporary Shoring Plan and Caltrans Encroachment Exhibit



CALTRANS ENCROACHMENT FOR SHORING PURPOSES

BKF ENGINEERS 1/12/2021

TEMPORARY EARTH RETENTION SYSTEM

YOUTUBE PROJECT PHASE 1

SAN BRUNO, CALIFORNIA

SHORING CONTRACTOR:

CASE PACIFIC

6850 NATIONAL DRIVE
LIVERMORE, CA 94550
www.casepacific.com

SHORING ENGINEER:

38 YEARS

PB&A inc.
Structural Engineering
Geo-Structures • EarthRetention
810 5TH AVE. SUITE 100 SAN RAFAEL CALIFORNIA 94901
Website: pbandainc.com Phone: (415) 259 - 0191

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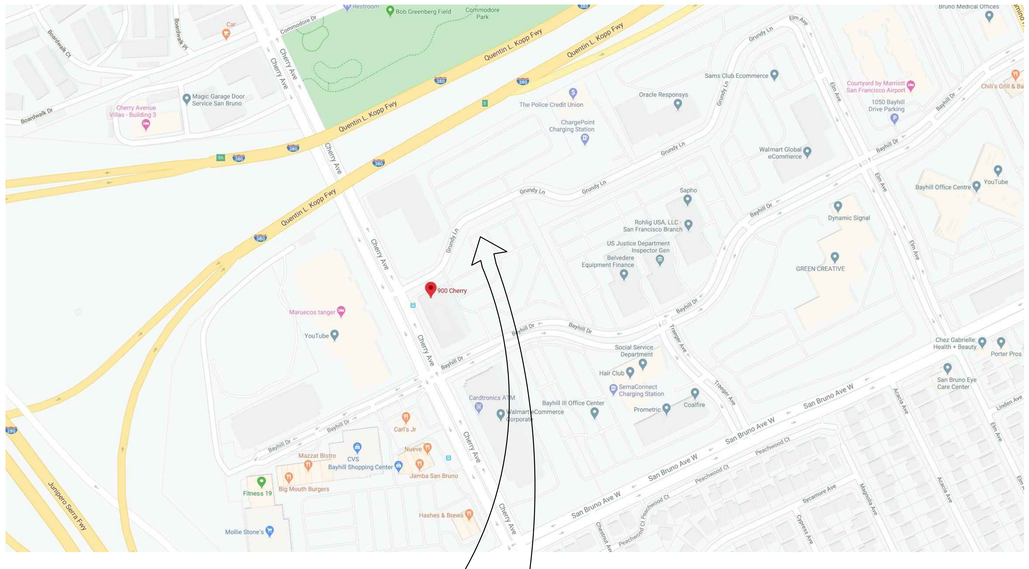
JOB NO. 192300
PERMIT SUBMITTAL: 09/21/2020



THIS SITE

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SITE LOCATION PLAN

GENERAL:

1. SCOPE OF WORK:
   1.1. TEMPORARY SOLDIER PILE WALL WITH TIEBACKS ABOUT THE PERIMETER OF THE SITE.
   1.2. TEMPORARY SOIL NAIL WALL TO PROTECT-IN-PLACE EXISTING SOIL UNDER GRUNDY LANE.

2. ALL CONSTRUCTION SHALL CONFORM TO THE CALIFORNIA BUILDING CODE (2019 ED.) AND ALL APPLICABLE REGULATIONS OF CITY OF SAN FRANCISCO.

3. ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH:
   3.1. THE GUIDELINES ESTABLISHED IN THE "GEOTECHNICAL ENGINEERING CIRCULAR NO. 7 SOIL NAIL WALLS" PUBLISHED BY FEDERAL HIGHWAY ADMINISTRATION, DATED FEBRUARY 2015 PUBLICATION NO. FHWA-NHI-14-007
   3.2. CALTRANS TRENCHING AND SHORING MANUAL 2011 EDITION
   3.3. THE GUIDELINES ESTABLISHED IN THE "GEOTECHNICAL ENGINEERING CIRCULAR NO. 4, GROUND ANCHORS AND ANCHORED SYSTEMS" PUBLISHED BY FEDERAL HIGHWAY ADMINISTRATION, DATED JUNE 1999 PUBLICATION NO. FHWA-IF-99-015
   3.4. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) STEEL DESIGN MANUAL 14TH EDITION
   3.5. AMERICAN WELDING SOCIETY, AWS D1.1 "STRUCTURAL WELDING CODE" 2010
   3.6. AMERICAN CONCRETE INSTITUTE, BUILDING CODE REQUIREMENT FOR STRUCTURAL CONCRETE (ACI 318-19)
   3.7. ANNUAL BOOK OF AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
   3.8. RECOMMENDATION FOR PRESTRESSED ROCK AND SOIL ANCHORS (PTI DC35.1-14) BY POST-TENSIONING INSTITUTE.
   3.9. ALSO COMPLY WITH THE APPLICABLE SECTIONS OF CALTRANS SPECIAL PROVISIONS FOR THE CONSTRUCTION OF SOIL NAIL WALLS AND SOLDIER BEAM WALLS.
   3.10. THE GUIDELINES ESTABLISHED IN THE "MICROPILE DESIGN AND CONSTRUCTION REFERENCE MANUAL", PUBLICATION NO. FHWA NHI-05-039, 2005 PROVIDED BY FHWA, U.S. DEPARTMENT OF TRANSPORTATION.

3. EXCAVATIONS SHALL BE MADE IN COMPLIANCE WITH THE MOST RECENT EDITION OF THE CALIFORNIA CONSTRUCTION SAFETY ORDERS (CAL-OSHA) REGULATIONS.

4. DIMENSIONS, OFFSETS, LINES AND GRADE ELEVATIONS SHOWN ON THIS PLANS ARE FOR REFERENCE ONLY. THE GENERAL CONTRACTOR IS RESPONSIBLE TO COORDINATE DIMENSIONS, OFFSETS, LINES AND GRADE ELEVATIONS WITH THE CIVIL SITE PLAN AT THE SITE AND SHALL ESTABLISH TO INSURE PROPER HORIZONTAL AND VERTICAL ALIGNMENT OF WALLS. THE CONTRACTOR IS RESPONSIBLE TO REPORT ANY DISCREPANCIES AND LACK OF COORDINATION BETWEEN THESE DRAWINGS AND SITE CONDITION TO THE ENGINEER (PB&A, INC.) IN A TIMELY MANNER.

5. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UTILITIES AND OTHER OBSTACLES IN THE FIELD. ALL EXISTING UTILITIES SHOWN ON THESE PLANS ARE FOR REFERENCE ONLY. GENERAL CONTRACTOR IS RESPONSIBLE TO POTHOLE ALL UTILITIES (AS NEEDED) BEFORE WALL CONSTRUCTION IS TO BEGIN. GENERAL CONTRACTOR IS TO REPORT ALL INTERFERENCES BETWEEN THE UTILITIES OR OTHER OBSTACLE WITH THE SOIL NAILS/TIEBACKS TO THE ENGINEER (PB&A, INC.) IN A TIMELY MANNER.

6. THE CONTRACTOR IS RESPONSIBLE TO VERIFY THE INTERFERENCE BETWEEN THE SOIL NAILS/TIEBACKS AT ALL CORNERS AND BENDS. SOIL NAILS/TIEBACKS AT ALL CORNERS AND BENDS MAY BE ROTATED ±5° AND RELOCATED ±6" VERTICALLY OR HORIZONTALLY TO AVOID INTERFERENCE BETWEEN EACH OTHER.

REFERENCE DRAWINGS:

THESE DRAWINGS ARE BASED ON AND MUST BE READ IN CONJUNCTION WITH;

1. YOUTUBE GRUNDY LANE SAN BRUNO, CA 94066 FOUNDATION & MASS EXCAVATION PACKAGE PREPARED BY NISHKIAN MENNINGER, SURFACEDESIGN INC., BKF, AND HLW, DATED 12/16/2019

DESIGN CRITERIA:

THE DESIGN OF THE EARTH RETENTION SYSTEM IS BASED ON THE INFORMATION CONTAINED IN THE "YOUTUBE CAMPUS PHASE I SAN BRUNO, CALIFORNIA GEOTECHNICAL REPORT" DATED JULY 09, 2019 PREPARED BY ENGEO.

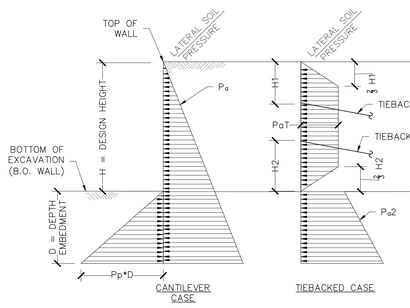
GEOTECHNICAL DESIGN PARAMETERS FOR SOIL NAIL WALLS:

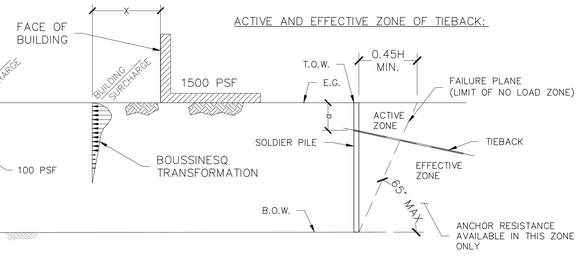
1. COIMA FORMATION
   UNIT WEIGHT OF SOIL, γ = 130 PCF
   FRICTION ANGLE, φ = 40°
   COHESION, C = 0 PSF
   ULTIMATE PULLOUT STRENGTH, μ = 5760 PSF (40.0 PSI) – TO BE VERIFIED BY TESTING PROGRAM

F.O.S. TEMPORARY SOIL NAIL WALLS = 1.35 (STATIC)

*NOTE: GROUNDWATER IS NOT ENCOUNTERED.

GEOTECHNICAL DESIGN PARAMETERS FOR SOLDIER PILE WALLS WITH TIEBACKS:





NOTE FOR BUILDING SURCHARGE:

BUILDING SURCHARGE IS TO BE INCLUDED IN THE DESIGN IF X<0.45H.

ACTIVE EARTH PRESSURE, Pa1 = 35 PCF
ACTIVE EARTH PRESSURE, PaT = 25H PSF
ACTIVE EARTH PRESSURE, Pa2 = 26.5 PCF
PASSIVE EARTH PRESSURE, Pp = 550 PCF

NOTES:

1. ASSUMED ULTIMATE BOND STRESS FOR TIEBACK IS 60 PSI AND IT IS TO BE VERIFIED BY FIELD TESTING.

QUALITY CONTROL AND SPECIAL INSPECTION PROGRAM:

A CERTIFIED TESTING AGENCY WILL PROVIDE THE SPECIAL INSPECTION AND TEST BY SPECIAL INSPECTOR UNDER DIRECT SUPERVISION OF PB&A INC. IN COMPLIANCE WITH SECTION 1701 OF THE CALIFORNIA BUILDING CODE AND 4-333 OF THE CALIFORNIA ADMINISTRATIVE CODE. THE INSPECTOR OF THE TESTING AGENCY MUST HAVE VERIFIABLE EXPERIENCE IN INSPECTING THE CONSTRUCTION OF PERMANENT SOIL NAIL WALLS. SUBMIT QUALIFICATIONS FOR THE STRUCTURAL ENGINEER OF EARTH RETENTION SYSTEM FOR REVIEW AND APPROVAL.

1. ITEMS INSPECTED BY THE TESTING AGENCY. ITEMS BELOW MAY BE INSPECTED UNDER PERIODIC INSPECTION.
   a. DRILLING HOLES AND INSTALLATION OF SOIL NAIL/TIEBACK AND INSPECT ALL REQUIRED ITEMS
   b. TESTING OF SOIL NAIL/TIEBACK.
   c. CONCRETE AND GROUT TAKING OF SPECIMENS AND PLACEMENT
   d. BOLT/ANCHORAGE INSTALL IN CONCRETE
   e. REINFORCING STEEL PLACEMENT
   f. SHOTCRETE
   g. FIELDING WELDING, STRUCTURAL WELDING
   h. STEEL SHOP FABRICATION
   i. INSTALLATION OF SOLDIER PILES, DRILLED HOLES

2. ITEMS OBSERVED BY THE GEOTECHNICAL ENGINEER. VERIFICATION THAT THE SOIL/ROCK STRATA ENCOUNTERED ARE IN GENERAL COMPLIANCE WITH THE FINDINGS OF THE GEOTECHNICAL INVESTIGATION.

3. THE CONTRACTOR SHALL PERFORM LOAD TESTING ON THE INITIAL TEN PROOF TEST SOIL NAILS IN THE PRESENCE OF PB&A. PB&A SHALL VERIFY THE CONTRACTOR'S SOIL NAIL INSTALLATION METHODS AND DESIGN PULLOUT RESISTANCE. ALSO THE COMPLIANCE WITH THE REQUIREMENTS OF QUALITY CONTROL PROGRAM PRESCRIBED HEREIN SHALL BE VERIFIED BY PB&A.

4. PB&A IS TO PERFORM PERIODIC SITE OBSERVATION AND REVIEW TESTING AND MONITORING REPORTS. ANY OBSERVED NONCOMPLIANCE ITEMS ARE TO BE REPORTED TO PB&A, PROJECT INSPECTOR, ARCHITECTS AND THE BUILDING OFFICIAL.

PRE-CONSTRUCTION OF TEST PANELS:

BEFORE BEGINNING CONSTRUCTION, FURNISH AT LEAST 1 PRECONSTRUCTION TEST PANEL FOR EACH SHOTCRETE MIX DESIGN AND NOZZLEMAN USING THE SAME EQUIPMENT THAT WILL BE USED FOR CONSTRUCTION. USE MINIMUM 18 X 18 INCHES FORMS AT LEAST 4" THICK FOR TEST PANELS.

DETERMINE AIR CONTENT FOR SHOTCRETE PRODUCED BY THE WET MIX PROCESS IN ACCORDANCE WITH AASHTO T152 OR T196. BATCH, DELIVER, MIX AND PLACE SHOTCRETE IN ACCORDANCE WITH THE APPLICABLE SECTION OF THE STANDARD SPECIFICATIONS OR SPECIAL PROVISION FOR THE APPLICATION. MAKE PRECONSTRUCTION TEST PANELS WITH FORMS IN A VERTICAL POSITION AND FROM THE SAME SHOOTING POSITION ANTICIPITED FOR CONSTRUCTION. DO NOT DISTURB TEST PANELS WITHIN THE FIRST 24 HOURS AND CURE PANELS IN ACCORDANCE WITH AASHTO T23 WITHOUT IMMERSING PANELS.

DRILL 3" DIA. CORES IN ACCORDANCE WITH AASHTO T24. EXTRACT 6 CORES FROM EACH PRECONSTRUCTION TEST PANEL AND PROVIDE THEM TO THE ENGINEER. THE COMPRESSIVE STRENGTH OF THE SHOTCRETE WILL BE CONSIDERED THE AVERAGE COMPRESSIVE STRENGTH TEST RESULTS OF 3 CYLINDER SPECIMENS FROM THE SAME PRECONSTRUCTION TEST PANEL AT 28 DAYS.

MONITORING PROGRAM:

1. MONITORING OF SETTLEMENT AND MOVEMENT OF SHORING WALLS IS TO BE CARRIED OUT BY A LICENSED SURVEYOR.

2. PRIOR TO THE START OF CONSTRUCTION, MONITORING POINTS ARE TO BE ESTABLISHED AT THE PERIMETER OF THE EXCAVATION WITH TWO POINTS DIRECTLY UNDERNEATH EACH APPLICATION 18'-0" (3 LIFTS) APART. THE POINTS ON THE SOIL NAIL WALLS/SOLDIER BEAM WALLS ARE TO BE ESTABLISHED AS THE WALLS ARE EXPOSED. A PLAN IS TO BE PREPARED WITH INDICATING ALL MONITORING POINTS AND SUBMITTED TO PB&A FOR REVIEW AND APPROVAL. SUGGESTED LOCATIONS OF MONITORING POINTS ARE SHOWN IN THE DRAWINGS.

3. THESE MONITORING POINTS ARE NOT TO BE MORE THAN 50' APART AND ARE TO BE SURVEYED AT A FREQUENCY OF AT LEAST ONCE A WEEK FOR THE DURATION OF THE SHORING CONSTRUCTION. THE FREQUENCY MAY BE INCREASED OR DECREASED AT THE DISCRETION OF THE STRUCTURAL ENGINEER FOR EARTH RETENTION SYSTEM, PB&A INC.. SHOULD ANY DETECTABLE MOVEMENT OR LACK THERE OF WARRANT IT.

4. A LOG OF THE MONITORING SURVEY, COMPLETE WITH A PLAN INDICATING THE LOCATION OF EACH OF THE MONITORING POINTS MUST BE KEPT AND SUBMITTED TO THE STRUCTURAL ENGINEER OF THE EARTH RETENTION SYSTEM (PB&A INC.), THE GEOTECHNICAL ENGINEER OF RECORD, THE PROJECT ENGINEERS, THE ARCHITECT, AND THE OWNER.

FIELD QUALITY CONTROL:

1. TESTING AND INSPECTION SHALL BE PROVIDED BY THE OWNER'S TESTING AGENCY AS SPECIFIED.

2. FREQUENCY TESTS:
   a. APPROVED INSPECTOR SHALL CONTINUOUSLY INSPECT CONSTRUCTION OF SHORING WALLS.

3. PROTECT INSTALLED PRODUCTS UNTIL COMPLETION OF PROJECT.

4. TOUCH-UP, REPAIR OR REPLACE DAMAGED PRODUCTS BEFORE SUBSTANTIAL COMPLETION.

DRAWING LISTS:

SH1.00 TO SH1.02	SHORING GENERAL NOTES
SH2.00 TO SH2.07	SHORING PLAN
SH3.00 TO SH3.06	SHORING ELEVATIONS
SH4.00 TO SH4.02	SHORING SECTIONS
SH5.00 TO SH5.02	SHORING DETAILS
SH6.00 TO SH6.02	SHORING SCHEDULES

CA: 1-800-642-2444
CALL BEFORE YOU DIG
USA
UNDERGROUND SERVICE ALERT
CA: 1-800-642-2444
CALL TWO WORKING DAYS BEFORE YOU DIG

ABBREVIATION:

B.O.	BOTTOM OF	S.P.	SOLDIER PILE
B.O.W.	BOTTOM OF WALL	SPAC.	SPACING
℄	CENTERLINE	THK.	THICKNESS
E.	EXISTING	T.O.	TOP OF
EL.	ELEVATION	T.O.W.	TOP OF WALL
EMBED.	EMBEDMENT	TBD	TO BE DETERMINED
E.G.	EXISTING GRADE	TEMP.	TEMPORARY
F.G.	FINISHED GRADE	TYP.	TYPICAL
F.O.	FACE OF	U.N.O.	UNLESS NOTED OTHERWISE
GR.	GRADE		
INFO.	INFORMATION	S.S.D.	SEE STRUCTURAL DRAWINGS
MAX.	MAXIMUM		
MIN.	MINIMUM		
N.T.S.	NOT TO SCALE		
NECESS.	NECESSARY		
℞	PLATE		
REF.	REFERENCE		
REQ'D	REQUIRED		
SCHE.	SCHEDULE		
STIFF.	STIFFENER		

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San Bruno, CA 94066

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Structural Engineering
Geo-Structures*Earth Retention
832 5TH AVE. SUITE 100 SAN RAFAEL CALIFORNIA 94901
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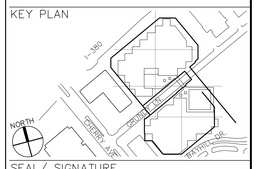
CASE PACIFIC

NO.	DATE	ISSUES
0	09/04/20	PERMIT SUBMITTAL

KEY PLAN



SEAL/ SIGNATURE

REGISTERED PROFESSIONAL ENGINEER
PINHOZ BAHRAMI
CE 26101
SE 2502
Exp.03/31/22
CIVIL
STRUCTURAL
STATE OF CALIFORNIA

SHEET TITLE

SHORING GENERAL NOTES

PROJECT NO.
192300

SCALE: AS INDICATED
DATE: 09/21/2020
CHECKED BY: PB/BM
DRAWN BY: ML
SHEET NO.

SH1.00

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MATERIALS:

SOIL NAIL:

1. SOIL NAIL BAR: THREADED REINFORCING BAR TO CONFORM WITH THE REQUIREMENTS OF ASTM A-615 GR. 75 KSI OR EQUIVALENT.
2. BAR COUPLER SHALL DEVELOP 100% OF FULL ULTIMATE TENSILE STRENGTH OF THE BAR AS CERTIFIED BY THE MANUFACTURER. BEARING PLATES: ASTM A36 GR. 36 KSI.
3. NUTS: HEXAGONAL FITTED WITH BEVELED WASHER OR SPHERICAL SEAT TO PROVIDE UNIFORM BEARING.
4. SOIL NAIL GROUT: SAND/CEMENT MIXTURE WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI PER ASTM C109

REINFORCING STEEL:

1. ASTM A615 GR. 60.

WELDED WIRE FABRIC:

1. ALL WELDED WIRE FABRIC SHALL CONFORM TO REQUIREMENTS OF ASTM A-185 OR A497 GR. 65 KSI.

STEEL FOR SOLDIER PILES:

1. ALL WIDE FLANGE STEEL ARE TO BE MINIMUM ASTM A572 GR. 50 OR EQUAL GRADE.

DRILLED SHAFTS:

1. SHAFTS ARE TO BE MACHINE DRILLED. SHAFTS ARE TO BE ACCURATELY LOCATED SO THAT THE SOLDIER BEAMS ARE IN THE PROPER RELATION TO STRUCTURAL WALLS.
2. PROVIDE PROTECTION AGAINST SLOUGHING OR CAVING AS REQUIRED.
3. DRILLED HOLES TO BE LEFT OPEN OVER-NIGHT SHALL BE SECURED/COVERED WITH PLYWOOD.
4. ALL WATER SHOULD BE REMOVED FROM THE SHAFT PRIOR TO FILLING WITH CONCRETE, IF POSSIBLE. IF ALL WATER CANNOT BE REMOVED BY PUMPING, CONCRETE SHALL BE CAREFULLY PUMPED INTO THE SOLDIER PILE SHAFT FROM THE BOTTOM UP THROUGH A RIGID PIPE AND DESIGN STRENGTH OF CONCRETE SHALL BE INCREASED BY 1000 PSI.
5. DRILLED HOLE FOR SOLDIER PILES IS TO BE FILLED WITH STRUCTURAL CONCRETE WITH A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI BELOW THE BOTTOM OF THE EXCAVATION. DRILLED HOLE TO BE FILLED WITH 2 SACK CLSM ABOVE B.O. WALL LEVEL.

WELDING:

1. ALL WELDING SHALL CONFORM TO A.W.S. D1.1 STANDARDS AND BE DONE BY CERTIFIED WELDERS HAVING A CURRENT CERTIFICATION & USING E70XX ELECTRODES..

TIEBACK

1. TIEBACKS SHALL BE FABRICATED FROM 0.6-INCH DIAMETER, SEVEN-WIRE, LOW RELAXATION STRANDS CONFORMING TO ASTM A-416 WITH A GUARANTEED ULTIMATE MINIMUM STRENGTH OF 270 KSI. STRANDED ANCHORAGE ASSEMBLY SHALL CONFORM TO PTI'S "RECOMMENDATIONS FOR PRESTRESSED ROCK AND SOIL ANCHORS" 5TH EDITION. STRANDS SHALL NOT BE WELDED OR USED FOR GROUNDING WELDING EQUIPMENT.
2. CENTRALIZERS – MANUFACTURED FROM PVC PIPING.
3. GROUT USED IN TIEBACK SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3,000 PSI, MIN. 6 SACKS OF CEMENT PER CUBIC YARD.
4. BEARING PLATES ARE TO BE ASTM A572, GR. 50.
5. NUTS: HEXAGONAL FITTED WITH BEVELED WASHER OR SPHERICAL SEAT TO PROVIDED UNIFORM BEARING.

ALL OTHER MATERIALS FOR SOLDIER PILE WALL:

1. STRUCTURAL STEEL FOR MISCELLANEOUS ITEMS, SUCH AS ANGLES & STIFFENER PLATES, CONFORM TO THE REQUIREMENTS OF ASTM A36 GR. 36.
2. LAGGINGS SHALL BE D.F.# 2 PRESSURE TREATED.

DRAINAGE:

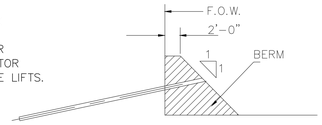
1. PIPE: ASTM 1785 SCHEDULE 40 PVC PERFORATED.

SHOTCRETE:

1. SHOTCRETE SHALL BE PRODUCED BY A WET MIX PROCESS W/ TYPE V CEMENT ACHIEVING A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI IN 7 DAYS AND 4000 PSI IN 28 DAYS. SUBSEQUENT EXCAVATION STEPS SHALL NOT BE COMMENCED UNTIL THE FACING HAS ATTAINED AT LEAST 1000 PSI STRENGTH IN THE AREA OF THE PROPOSED CUT. PROVIDE SHOTCRETE MIX SUBMITTAL FOR THE EARTH RETENTION SYSTEM STRUCTURAL ENGINEER'S REVIEW AND APPROVAL.
2. PROVIDE EQUIPMENT CAPABLE OF DELIVERING THE PREMIXED MATERIAL ACCURATELY, UNIFORMLY AND CONTINUOUSLY THROUGH THE DELIVERY HOSE. PROVIDE A SUPPLY OF CLEAN DRY AIR ADEQUATE FOR MAINTAINING SUFFICIENT NOZZLE VELOCITY FOR ALL PARTS OF THE WORK AND IF REQUIRED, FOR SIMULTANEOUS OPERATION OF A SUITABLE BLOW PIPE FOR CLEARING AWAY REBOUND. THE COMPRESSOR IS TO DELIVER A MINIMUM OF 175 CFM PER OPERATING NOZZLE.
3. SCREED OFF EXCESSIVE MATERIAL TO PROVIDE PLANAR SURFACE. CLEAN AREA AT THE BASE OF EACH LIFT TO ENSURE GOOD JOINTS BETWEEN LIFTS.
4. AFTER EACH STAGE CUT, IN ANTICIPATION OF SHOTCRETING, CLEAN SURFACES OF ALL LOOSE MATERIAL, MUD, REBOUND FROM PREVIOUSLY PLACED SHOTCRETE, AND OTHER FOREIGN MATTER THAT WILL PREVENT BOND OF SHOTCRETE.
5. WHEN A LAYER OF SHOTCRETE IS TO BE COVERED IT SHALL FIRST BE ALLOWED TO DEVELOP ITS INITIAL SET IN AN HOUR, THEN ALL LOOSE MATERIAL AND REBOUND MUST BE REMOVED.
6. FIRMLY POSITION THE WIRE FABRIC AND THE REBARS TO PREVENT VIBRATION WHILE THE SHOTCRETE IS BEING APPLIED. LAP MESH 8" IN BOTH DIRECTIONS. TIE WIRES SHALL BE BENT FLAT IN THE PLANE OF THE MESH AND NOT FORM LARGE KNOTS.
7. CONTROL THICKNESS, METHOD OF SUPPORT, AIR PRESSURE AND WATER CONTENT OF SHOTCRETE TO PRECLUDE SAGGING OR SLOUGHING OFF.
8. SHOTCRETE SHALL BE APPLIED FROM THE BOTTOM UP TO PREVENT THE ACCUMULATION OF REBOUND ON THE SURFACE STILL TO BE COVERED.
9. SHOTCRETE SHALL BE APPLIED BY A QUALIFIED NOZZLEMAN. SUBMIT QUALIFICATION FOR THE STRUCTURAL ENGINEER OF EARTH RETENTION SYSTEM FOR REVIEW AND APPROVAL.
10. COURSE AGGREGATE SHALL NOT EXCEED 3/8 INCH (19 MM).
11. ANY REBOUND OR ACCUMULATED LOOSE AGGREGATE SHALL BE REMOVED FROM THE SURFACES TO BE COVERED PRIOR TO PLACING THE INITIAL OR ANY SUCCEEDING LAYERS OF SHOTCRETE. REBOUND SHALL NOT BE REUSED AS AGGREGATE.
12. WITH THE EXCEPTION OF HORIZONTAL EDGES OF SEQUENTIAL LIFTS OF SHOTCRETE, UNFINISHED WORK SHALL NOT BE ALLOWED TO STAND FOR MORE THAN 30 MINUTES UNLESS ALL EDGES ARE SLOPED TO A THIN EDGE. BEFORE PLACING ADDITIONAL MATERIAL ADJACENT TO PREVIOUSLY APPLIED WORK, SLOPING AND SQUARE EDGES OF HORIZONTAL EDGES OF SEQUENTIAL LEVELS OF SHOTCRETE SHALL BE CLEANED AND WETTED PRIOR TO THE APPLICATION SUBSEQUENT LIFT OF SHOTCRETE BELOW.
13. IN-PLACE SHOTCRETE WHICH EXHIBITS SAGS OR SLOUGHS, SEGREGATION, HONEYCOMBING, SAND POCKETS OR OTHER OBVIOUS DEFECTS SHALL BE REMOVED AND REPLACED. SHOTCRETE ABOVE SAGS AND SLOUGHS SHALL BE REMOVED AND REPLACED WHILE STILL PLASTIC.
14. DURING THE CURING PERIODS SPECIFIED HEREIN, SHOTCRETE SHALL BE MAINTAINED ABOVE 40° F. IN INITIAL CURING, SHOTCRETE SHALL BE KEPT CONTINUOUSLY MOIST FOR 24 HOURS AFTER PLACEMENT IS COMPLETE OR CURED WITH AN APPROVED CURING COMPOUND.
15. STRENGTH TEST FOR SHOTCRETE SHALL BE MADE BY AN APPROVED AGENCY ON SPECIMENS WHICH ARE REPRESENTATIVE OF WORK AND WHICH HAVE BEEN WATER SOAKED FOR AT LEAST 24 HOURS PRIOR TO TESTING.
16. PROVIDE SPECIMEN TAKEN AT LEAST ONCE EACH SHIFT OR LESS THAN ONE FOR EACH 50 CUBIC YARDS OF SHOTCRETE; OR FROM TEST PANELS: MADE NOT LESS THAN ONCE EACH SHIFT OR NOT LESS THAN ONE FOR EACH 50 CUBIC YARDS (38.2 M3) OF SHOTCRETE PLACED. THE TEST PANELS SHALL HAVE A MINIMUM DIMENSION OF 18 X 18 INCHES.
17. PANELS SHALL BE GUNNED IN THE SAME POSITION AS THE WORK, DURING THE COURSE OF THE WORK AND BY NOZZLEMAN DOING THE WORK. THE CONDITION UNDER WHICH THE PANELS ARE CURED SHALL BE THE SAME AS THE WORK.

EXCAVATION PROCEDURE FOR SOIL NAIL WALL IF SLOUGHING OCCURS:

THE GRADING AND EXCAVATION FOR THE PROPOSED RETAINING WALLS MUST BE COORDINATED SUCH THAT OVERBREAK AND SLOUGHING BE MINIMIZED. THE EXCAVATION CONTRACTOR SHALL PROVIDE BENCHES APPROXIMATELY 20' WIDE IN LIFTS. THE ELEVATION OF THE PAD IS APPROXIMATELY 2' BELOW THE LEVEL OF THE NAILS. THE GRADING CONTRACTOR SHALL MAKE VERTICAL CUTS APPROXIMATELY 12" THICKER THAN THE FINAL CUT EXCAVATION. THE GRADING CONTRACTOR SHALL TRIM FINAL 12" AND SPOILS THEREFORE SHALL BE REMOVED BY THE GRADING CONTRACTOR IN THE SUCCESSIVE LIFTS.



IF ENCOUNTER WITH GRANULAR SOIL ESPECIALLY AT TOP ROW AND LOCALIZED SLOUGHING COULD OCCUR IN WHICH CASE THE FOLLOWING SUGGESTED PROCEDURE IS TO BE FOLLOWED;

a. LEAVE A 1:1 BERM, 2' THICK AT TOP IN FRONT OF THE FACE OF THE FINAL CUT.
b. DRILL THRU THE BERM AND FOLLOW THE PROCEDURE FOR INSTALLATION OF THE NAILS AS DESCRIBED ABOVE.
c. CAREFULLY EXCAVATE BETWEEN THE NAILS AND PRIOR TO THE INSTALLATION OF DRAINAGE SYSTEM, WALER BARS, AND WELDED WIRE FABRIC, APPLY A THIN LAYER OF SHOTCRETE IN ORDER TO CONTAIN THE LOOSE SOIL BEFORE THE APPLICATION OF THE FINAL SHOTCRETE WALL. PROVIDE 2" Ø HOLES IN THE FLASH COAT IN THE AREAS WHERE WEEP HOLES ARE TO BE INSTALLED FOR DRAINAGE.

CONSTRUCTION PROCEDURE FOR SOIL NAIL WALL:

1. LINES AND GRADES SHALL BE ESTABLISHED BY THE CONTRACTOR TO INSURE PROPER HORIZONTAL ALIGNMENT OF WALL AND LOCATION OF SOIL NAILS.
2. CONSTRUCTION PROCEDURES SHALL BE ESTABLISHED SUCH THAT EXCAVATIONS OF LIFTS WILL BE IMMEDIATELY FOLLOWED WITH THE INSTALLATION OF THE SOIL NAIL WALL. THE PURPOSE OF THIS TANDEM SEQUENCING IS TO INSURE THAT AN EXPOSED EXCAVATED EMBANKMENT WILL NOT GO UNSUPPORTED FOR LONGER THAN 24 HOURS. THE CONTRACTOR SHALL BASE HIS EXCAVATION PROCEDURES UPON THIS PREMISE.
3. UNDER NO CIRCUMSTANCES WHEN PRECIPITATION IS PRESENT, CAN A CUT SLOPE BE EXPOSED TO WEATHER LONGER THAN 8 HOURS.
4. EXCAVATION SHALL OCCUR IN VERTICAL LIFTS NOT TO EXCEED 6 FT. VERTICALLY IN EACH LIFT ACCORDING TO THE PROCEDURE DESCRIBED ABOVE AND SHALL PROCEED IN THE SAME TANDEM SEQUENCE OF EXCAVATION/INSTALLATION OF SHOTCRETE FACING AS DESCRIBED IN NOTES 1 AND 2.
5. WHERE SLOUGHING OCCURS, RECOMMEND INSTALLATION OF FLASH COAT OF SHOTCRETE APPROXIMATELY 1" THICK.
6. PROVISIONS SHALL BE MADE TO ALLOW FOR 8" LAPPING OF THE WELDED WIRE FABRIC.
7. THE HORIZONTAL WALER REBAR AND VERTICAL REBAR SHALL BE PLACED ALONG EACH ROW OF SOIL NAILS AS SHOWN ON DETAILS.

SOIL NAIL TESTING PROCEDURES:

LOAD TESTING CONSISTS OF VERIFICATION TESTS AND PROOF TESTS. SOIL NAILS SHALL NOT BE TESTED UNTIL ANCHOR LENGTH GROUT HAS ATTAINED A MINIMUM STRENGTH OF 1500 PSI. A MINIMUM 48 HOURS OF WAITING PERIOD SHALL OCCUR BEFORE TESTING THE NAILS. THE TEST MAY BE PERFORMED BEFORE THAT TIME IF THE CONTRACTOR SUBMITS COMPRESSIVE STRENGTH TEST RESULTS VERIFYING THAT THE NAIL GROUT AND SHOTCRETE MIXES BEING USED WILL PROVIDE THE SPECIFIED COMPRESSIVE STRENGTH.

1. ALL TEST SOIL NAILS ARE SACRIFICIAL SOIL NAILS.
2. ONCE THE TESTING PROCEDURE IS COMPLETED, THE UNGROUNDED PORTION OF THE PRODUCTION/TEST NAIL IS TO BE CLEANED AND IS TO BE FREE OF ANY DEBRIS AND DELETERIOUS MATERIAL.
3. AT NO TIME, NAIL LOAD MAY EXCEED 90% OF THE NAIL BAR TENSILE ALLOWABLE LOAD.
4. TESTING RESULTS NEED TO BE SUBMITTED TO STRUCTURE ENGINEER OF EARTH RETENTION SYSTEM FOR REVIEW AND APPROVAL.
5. TEST PROCEDURE IS TO FOLLOW THE "LONG NAIL/ SHORT NAIL SYSTEM" PER MANUFACTURER'S RECOMMENDATIONS.

VERIFICATION TEST (2 * DESIGN LOAD, M):

AT LEAST ONE VERIFICATION TEST PER WALL IS TO BE PERFORMED PRIOR TO INSTALLATION OF PROOF TESTING AND PRODUCTION NAILS TO CONFIRM THE CONTRACTOR'S DRILLING AND INSTALLATION METHODS AND TO VERIFY THE REQUIRED NAIL NOMINAL BOND STRENGTH.

VERIFICATION TEST LOADING SCHEDULE:
AL (ALIGNMENT LOAD) = 0.05M (1 MIN. HOLD)
0.50M (10 MIN. HOLD)
0.75M (10 MIN. HOLD)
1.00M (10 MIN. HOLD)
1.25M (10 MIN. HOLD)
1.50M (CREEP TEST-60 MIN. HOLD)
1.75M (10 MIN. HOLD)
2.00M (10 MIN. HOLD) (MAXIMUM LOAD)

1. MEASURE AND RECORD NAIL MOVEMENTS DURING THE CREEP PORTION OF THE TEST IN INCREMENTS OF 1 MINUTE, 2, 3, 5, 6, 10, 20, 30, 50, AND 60 MINUTES. MAINTAIN THE LOAD DURING THE CREEP TEST WITHIN 2 PERCENT OF THE INTENDED LOAD BY THE USE OF LOAD CELL.

PROOF TEST (1.5 * DESIGN LOAD, M):

TEST 5% OF TOTAL SOIL NAILS OR LOCATIONS PROVIDED IN SHEETS SH4.00.

PROOF TEST LOADING SCHEDULE:
AL (ALIGNMENT LOAD) = 0.05M (UNTIL MOVEMENT STABILIZES)
0.25M (UNTIL MOVEMENT STABILIZES)
0.50M (UNTIL MOVEMENT STABILIZES)
0.75M (UNTIL MOVEMENT STABILIZES)
1.00M (UNTIL MOVEMENT STABILIZES)
1.25M (UNTIL MOVEMENT STABILIZES)
1.50M (CREEP TEST, SEE BELOW) (MAXIMUM LOAD)

1. THE CREEP PERIOD SHALL START AS SOON AS THE MAXIMUM TEST LOAD (1.50M) IS APPLIED AND THE NAIL MOVEMENT SHALL BE MEASURED AND RECORDED AT 1 MINUTE, 2, 3, 5, 6, AND 10 MINUTES. WHERE THE NAIL MOVEMENT BETWEEN 1 MINUTE AND 10 MINUTES EXCEEDS 1 mm (0.04 in), MAINTAIN THE MAXIMUM TEST LOAD FOR AN ADDITIONAL 50 MINUTES AND RECORD MOVEMENTS AT 20, 30, AND 50 MINUTES. MAINTAIN ALL LOAD INCREMENTS WITHIN 5 PERCENT OF THE INTENDED LOAD.

WHERE, M= DESIGN LOAD
$M = \mu \times L \times \pi \times D)/2.0$ (FS) = 45.22 KIPS
μ= NOMINAL BOND STRENGTH PROVIDED IN "DESIGN PARAMETERS FOR SOIL NAIL WALLS" SECTION
π= 3.14
L= BOND LENGTH (10'-0" MIN.)
D= DRILL HOLE DIAMETER (6")

1. THE VALUE OF M IS LINEARLY DEPENDENT ON THE GROUTED LENGTH, L. THE GIVEN VALUE OF M IS ONLY FOR BONDED LENGTH L=10 FT. FOR OTHER VALUES OF L, AS MEASURED IN THE FIELD, THE VALUE OF M NEEDS TO BE ADJUSTED ACCORDINGLY.
2. TESTING RESULTS NEED TO BE SUBMITTED TO PB&A FOR REVIEW AND APPROVAL.

PROCEDURE IN CASE OF A TEST NAIL FAILURE

1. REVIEW THE DRILLING AND GROUTING PROCEDURE OF THE ALREADY INSTALLED FAILED SOIL NAIL. PLACE TWO NEW TEST SOIL NAILS APPROXIMATELY 6 FEET AWAY ON BOTH SIDES OF THE FAILED TEST SOIL NAIL. APPLY MODIFIED GROUTING AND DRILLING METHOD IF APPLICABLE.
2. TEST THE NEWLY INSTALLED TEST SOIL NAILS. IF THEY PASS THE TEST CONTINUE USING THE MODIFIED GROUTING AND DRILLING METHOD.
3. IF THE NEWLY INSTALLED TEST SOIL NAILS FAIL, THE ENGINEER OF RECORD OF THE EARTH RETENTION SYSTEM IS TO EVALUATE THE RESULTS AND DETERMINE THE APPROPRIATE REMEDIAL ACTION.

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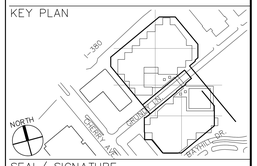
0	09/04/20	PERMIT SUBMITTAL

KEY PLAN



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SHEET TITLE

SHORING GENERAL NOTES

PROJECT NO.
192300

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DRAWN BY: ML
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SH1.01

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SOIL NAIL TESTING PROCEDURES (CONTINUED:

TEST NAIL ACCEPTANCE CRITERIA

1. FOR VERIFICATION TESTS, THE TOTAL CREEP MOVEMENT IS LESS THAN 2 mm (0.08 in) BETWEEN THE 6- AND 60-MINUTE READINGS AND THE CREEP RATE IS LINEAR OR DECREASING THROUGHOUT THE CREEP TEST LOAD HOLD PERIOD.

2. FOR PROOF TESTS, THE TOTAL CREEP MOVEMENT IS LESS THAN 1 mm (0.04 in) DURING THE 10-MINUTE READING OR THE TOTAL CREEP MOVEMENT IS LESS THAN 2 mm (0.08 in) BETWEEN THE 60-MINUTE READING AND THE CREEP RATE IS LINEAR OR DECREASING THROUGHOUT THE CREEP TEST LOAD HOLD PERIOD.

3. FOR VERIFICATION AND PROOF TESTS, THE TOTAL MEASURED MOVEMENT AT THE MAXIMUM TEST LOAD EXCEEDS 80 PERCENT OF THE THEORETICAL ELASTIC ELONGATION OF THE TEST NAIL UNBONDED LENGTH.

$$\Delta L = \frac{P\ UL}{EA}$$

WHERE, P= MAXIMUM LOAD
UL= UNBONDED LENGTH (FROM BACK OF THE REFERENCE PLATE TO TOP OF THE GROUT LENGTH)
A= CROSS-SECTIONAL AREA OF THE NAIL BAR
E= YOUNG'S MODULUS OF STEEL (29000 KSI)

4. A PULLOUT FAILURE DOES NOT OCCUR AT MAXIMUM TEST LOADS.

CONSTRUCTION PROCEDURE FOR SOLDIER BEAM WALL W/ TIEBACK:

1. DRILL HOLE AND PLACE SOLDIER BEAM TO THE DEPTH INDICATED AT THE LOCATIONS SHOWN ON PLAN AND ALIGN.

2. FILL THE DRILLED HOLE WITH THE MATERIAL SPECIFIED IN MATERIAL SECTION.

3. EXCAVATE AND PLACE LAGGING TO PREVENT LOSS OF GROUND. PLACEMENT OF LAGGING BELOW THE DEPTH OF EXCAVATION MAY CEASE, W/ WRITTEN PERMISSION FROM THE SHORING ENGINEER IN APPROPRIATE LOCATIONS AND AS GROUND CONDITIONS WARRANT. LAGGING SHALL BE LOWERED AND INSTALLED SIMULTANEOUSLY AS THE EXCAVATION PROCEEDS.

4. EXCAVATE AND LAG IN LIFTS TO NOT MORE THAN 2'-0" BELOW THE LEVEL OF THE TIEBACK OR AS SOIL STABILITY ALLOWS (5' MAX.). AN APPROPRIATE BERM IS TO BE CREATED SO THAT THE DRILL RIG CAN DRILL THE HOLE FOR THE TIEBACKS.

5. THEN DRILL HOLE FOR THE TIEBACKS TO THE SUGGESTED DEPTH AS NECESSARY. FILL THE DRILLED HOLE THROUGHOUT WITH GROUT TIEBACKS MAY BE REGROUTED AS NECESSARY TO ASSURE COMPLIANCE WITH THE TESTING SCHEDULE.

6. TEST TIEBACKS NO EARLIER THAN 72 HOURS AFTER GROUTING ACCORDING TO THE PROCEDURE DESCRIBED ON TIEBACK TESTING PROCEDURE.

7. CONTINUE EXCAVATION AND LAG.

8. ANY LOSS OF GROUND FROM BEHIND LAGGING IS TO BE REPLACED WITH NATIVE SOIL. IF EXCESSIVE CAVING OCCURS, FILL VOIDS WITH 1-SACK CLSM.

TIEBACK TESTING PROCEDURE:

THE FIRST TWO TIEBACKS ARE TO BE PERFORMANCE TESTED. THEREAFTER, MINIMUM 5% OF THE REMAINING TIEBACKS OR TIEBACKS MARKED AS '*P' ARE TO BE PERFORMANCE TESTED.

THEREAFTER, ALL TIEBACKS EXCEPT MARKED AS '*P' ON ELEVATIONS AND SCHEDULES SHALL BE PROOF TESTED IN ACCORDANCE WITH FHWA-IF-99-15 "GEOTECHNICAL ENGINEERING CIRCULAR NO. 4, GROUND ANCHORS AND ANCHOR SYSTEMS".

TESTING SHALL BE PERFORMED BY INCREMENTALLY LOADING THE TIEBACK IN ACCORDANCE WITH THE SCHEDULES SHOWN BELOW. AT EACH LOAD INCREMENT THE MOVEMENT OF THE END OF THE TIEBACK SHALL BE RECORDED TO THE NEAREST .001" WITH RESPECT TO AN INDEPENDENT FIXED REFERENCE POINT NOT ATTACHED TO THE SHORING WALL. THE ANCHOR LOAD SHALL BE MEASURED WITH A PRESSURE GAUGE CALIBRATED WITH THE JACK, WHICH SHALL BE ACCURATE ENOUGH TO READ 200 PSI CHANGES IN HYDRAULIC PRESSURE, OR A 4-KIP (4000 POUNDS) DIFFERENTIAL IN FORCE, WHICHEVER IS THE LESSER. THE EQUIPMENT SHALL BE CALIBRATED WITHIN A MONTH PRIOR TO TESTING. THE PUMP SHALL BE CAPABLE OF APPLYING EACH LOAD INCREMENT IN LESS THAN ONE MINUTE, AND SHALL MAINTAIN THE TEST LOAD AS REQUIRED DUE TO CREEP OF THE TIEBACKS AND/OR MOVEMENT OF THE WALL.

FOR EACH PROOF TEST THE FOLLOWING INFORMATION SHALL BE RECORDED:

a. TIEBACK NUMBER AND LOCATION.

b. INSTALL FREE LENGTH AND BONDED LENGTH OF THE TIEBACK.

DURING TIEBACK TESTING, THE FOLLOWING INFORMATION SHALL BE RECORDED FOR EACH LOAD INCREMENT AND CORRESPONDING OBSERVATION PERIOD:

a. LOAD SEQUENCE NUMBER AND % OF DESIGN LOAD: MAXIMUM LOAD PER SCHEDULE.

b. DIAL PRESSURE AND CORRESPONDING LOAD IN KIPS (200 PSI INCREMENTS).

c. OBSERVATION PERIOD IN MINUTES AND/OR SECONDS FROM THE TIME AT WHICH THE SPECIFIED LOAD IS REACHED.

d. MOVEMENT OF THE END OF THE TIEBACKS TO THE NEAREST .001 INCH. ZERO MOVEMENT SHALL BE ASSUMED AT THE INITIAL ALIGNMENT LOAD (AL), WHICH IS SEQUENCE NUMBER 1.

e. IN THE EVENT A TIEBACK FAILS TO MEET THE TEST CRITERIA, THE SHORING CONTRACTOR IS TO REGROUT AND RETEST THE TIEBACK. IF THE REGROUTING AND RETESTING FAILS, LOCK-OFF THE TIEBACK AT NOT MORE THAN 50% OF THE LOAD MAINTAINED DURING THE 10-MINUTE HOLD AND PROVIDE ADDITIONAL MAKE-UP TIEBACK PER BELOW.

f. SHORING CONTRACTOR SHALL PROVIDE AND TEST ADDITIONAL MAKE-UP TIEBACK. MAKE-UP TIEBACK SHALL HAVE A DESIGN LOAD EQUAL TO THE DIFFERENCE BETWEEN THE LOCK-OFF LOAD OF THE FAILED TIEBACK AND DESIGN LOAD SHOWN IN THE TIEBACK SCHEDULES. MAKE-UP TIEBACK SHALL BE INSTALLED 2'-0" BELOW THE FAILED TIEBACK.

PROOF TEST

ALL TIEBACKS SHALL BE PROOF TESTED. THE PROOF TEST SHALL BE PERFORMED BY INCREMENTALLY LOADING THE TIEBACKS IN ACCORDANCE WITH THE SCHEDULE SHOWN BELOW. AT EACH INCREMENT THE LOAD SHALL BE MAINTAINED UNTIL THE RATE OF TIEBACK MOVEMENT IS CLEARLY APPROACHING ZERO. THE MINIMUM OBSERVATION PERIOD SHALL BE ONE MINUTE. THE 1.33DL MAXIMUM TEST LOAD SHALL BE HELD FOR AT LEAST 10 MINUTES, AND AS MUCH AS 60 MINUTES, AS DESCRIBED BELOW. INCREMENTS OF LOADS SHALL BE IN ACCORDANCE OF THE SCHEDULE. FOR FINAL SEQUENCE MAXIMUM TEST LOAD, THE TIEBACK SHALL BE LOADED TO 1.33DL AND THE TIEBACK MOVEMENT SHALL BE RECORDED FOR OBSERVATION PERIODS OF 1, 2, 3, 4, 5, 6, AND 10 MINUTES. IF THE TOTAL ELONGATION BETWEEN 1 MINUTE AND 10 MINUTES DOES NOT EXCEED .04 INCHES, THEN THE TIEBACK SHALL BE CONSIDERED ACCEPTABLE AND THE TEST MAY BE DISCONTINUED. IF THE ELONGATION BETWEEN 1 MINUTE AND 10 MINUTES EXCEEDS .04 INCHES, THEN MONITORING OF TIEBACK MOVEMENT SHALL CONTINUE FOR AN ADDITIONAL 50 MINUTES, WITH MOVEMENTS RECORDED AT 15, 20, 25, 30, 45 AND 60 MINUTES SO THAT A CREEP CURVE CAN BE PLOTTED. AT THE END OF THE PROOF TEST THE TIEBACK SHALL BE LOCKED OFF AT LOCK-OFF LOAD, AS SPECIFIED IN THE SCHEDULE. THE MAXIMUM 1.33DL TEST LOAD ELONGATION IS MEASURED FOR 60 MINUTES, THE TIEBACK WILL BE CONSIDERED ACCEPTABLE IF THE ELONGATION DOES NOT EXCEED 0.08".

PERFORMANCE TEST

TIEBACKS AS MARKED AS '(P)' ON SCHEDULES ARE TO BE PERFORMANCE TESTED. THE PERFORMANCE TEST SHALL BE PERFORMED BY CYCLICALLY LOADING THE TIEBACKS IN ACCORDANCE WITH THE SCHEDULE AS SHOWN. INITIALLY ALIGNMENT LOAD SHALL BE APPLIED TO ENSURE THAT THE TEST EQUIPMENT IS PLACED AT THE PROPER POSITION. THE DISPLACEMENT READING IS ZEROED UPON THE STABILIZATION OF THE ALIGNMENT LOAD. AT EACH CYCLE, THE INCREMENTAL MOVEMENT AT EACH LOAD STEP AND THE RESIDUAL DISPLACEMENT AT THE END OF THE CYCLE WHEN REDUCED BACK TO ALIGNMENT LOAD SHALL BE RECORDED. AT THE END OF CYCLE 6, A TEST LOAD OF 1.5DL SHALL BE HELD FOR 10 MINUTES PRIOR TO REDUCING THE LOAD TO THE LOCK-OFF LOAD. DURING THIS 10 MINUTES LOAD HOLD TIME, TIEBACK MOVEMENT SHALL BE RECORDED FOR OBSERVATION PERIODS OF 1, 2, 3, 4, 5, 6, AND 10 MINUTES. IF THE TOTAL ELONGATION BETWEEN 1 MINUTE AND 10 MINUTES DOES NOT EXCEED 0.04 INCHES, THEN THE TIEBACK SHALL BE CONSIDERED ACCEPTABLE AND THE TEST MAY BE DISCONTINUED. IF THE ELONGATION BETWEEN 1 MINUTE AND 10 MINUTES EXCEEDS 0.04 INCHES, THEN MONITORING OF TIEBACK MOVEMENT SHALL CONTINUE FOR AN ADDITIONAL 50 MINUTES, WITH MOVEMENTS RECORDED AT 20, 30, 40, 50 AND 60 MINUTES SO THAT A CREEP CURVE CAN BE PLOTTED. AT THE END OF THE TEST, THE TIEBACK SHALL BE LOCKED OFF AT LOCK-OFF LOAD AS SPECIFIED IN THE LOAD SCHEDULE. THE MAXIMUM 1.5DL TEST LOAD ELONGATION IS MEASURED FOR 60 MINUTES, THE TIEBACK WILL BE CONSIDERED ACCEPTABLE IF THE ELONGATION DOES NOT EXCEED 0.08".

TIEBACK PROOF TEST SCHEDULE
LOADING SEQUENCE
ALIGNMENT LOAD
0.25 DESIGN LOAD
0.50 DESIGN LOAD
0.75 DESIGN LOAD
1.00 DESIGN LOAD
1.25 DESIGN LOAD
1.33 DESIGN LOAD

TIEBACK PERFORMANCE TEST SCHEDULE						
CYCLE	APPLIED LOAD					
1	0.25DL	AL				
2	0.25DL	0.50DL	AL			
3	0.25DL	0.50DL	0.75DL	AL		
4	0.25DL	0.50DL	0.75DL	1.00DL	AL	
5	0.25DL	0.50DL	0.75DL	1.00DL	1.25DL	AL
6	0.25DL	0.50DL	0.75DL	1.00DL	1.25DL	1.50DL

LOCK OFF LOAD FOR TIEBACK = 0.8xDL

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CASE PACIFIC

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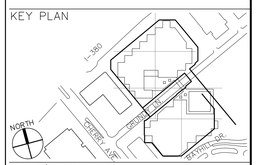
0	09/04/20	PERMIT SUBMITTAL

KEY PLAN



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SHEET TITLE

SHORING SCHEDULE

PROJECT NO.
192300

SCALE: AS INDICATED
DATE: 09/21/2020

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SHEET NO.

SH1.02

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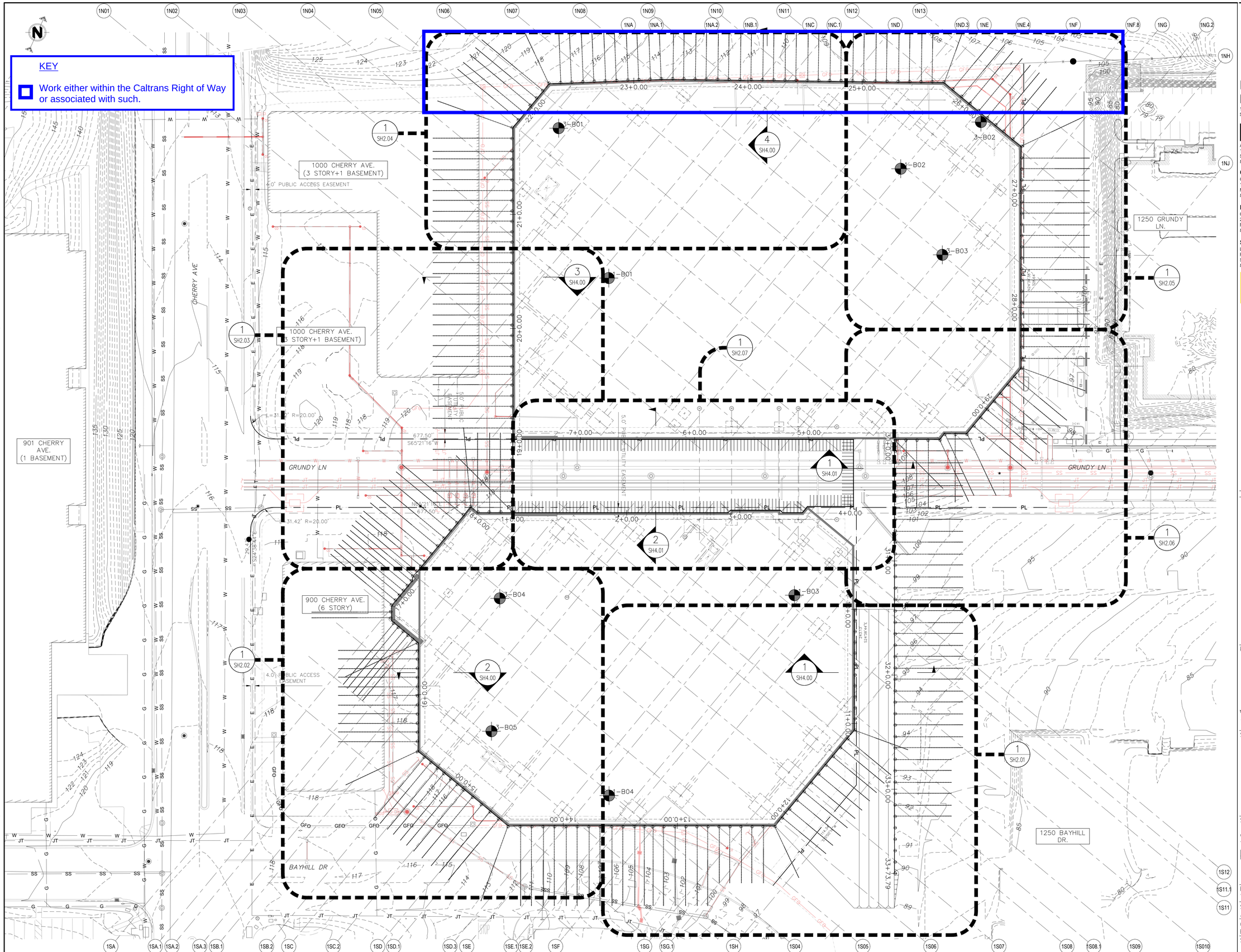

1 SHORING KEY PLAN

SCALE: 1"=30'_XREF_XREF_XREF_XREF

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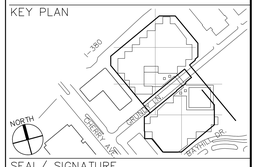
KEY PLAN



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SHEET TITLE

SHORING KEY PLAN

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SHEET NO.	

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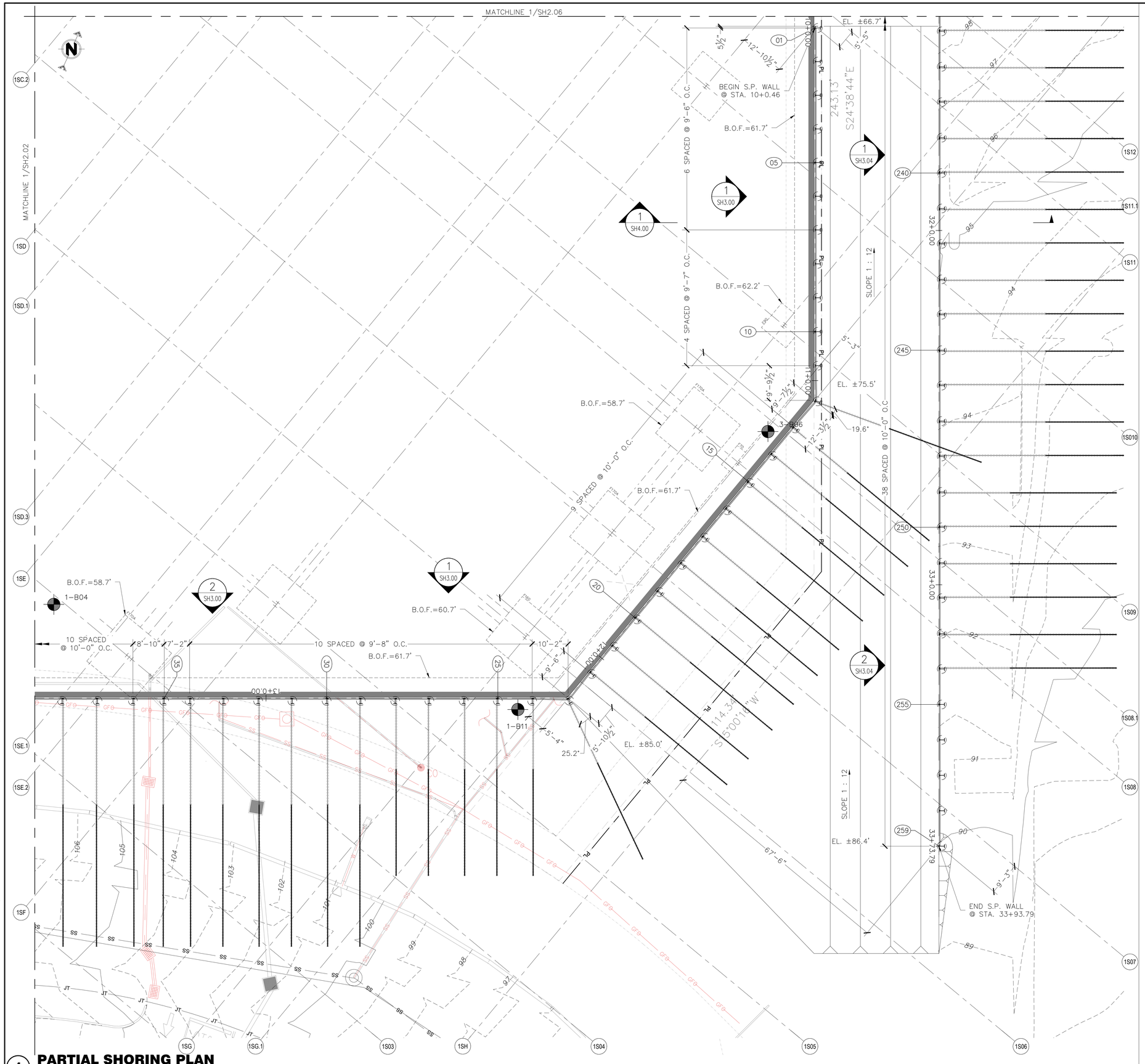

1 PARTIAL SHORING PLAN

SCALE: 3/32" = 1'-0"

LEGENDS:

ANGLE ORIENTATION

S-PILE WORK POINT

X.X — DENOTES S-PILE NUMBER

TIEBACK, SEE SCHED.

XX.XX — DENOTES PAD ELEVATION

B01 — DENOTES BORING NUMBER AND LOCATION

01 — DENOTES WORK POINT NUMBER

DENOTES GRADE BEAM/ FOUNDATION LINE

DENOTES (N) UTILITY REFERENCE ONLY AND TO BE RELOCATED AS NECESSARY

—UTIL— DENOTES (E) UTILITY

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Website: pbaandsc.com Phone: (415) 259 - 9373

CASE PACIFIC

KEY PLAN

SEAL/ SIGNATURE

REGISTERED PROFESSIONAL ENGINEER
PEDROZ BARRIOS
CE 26101
SE 2502
Exp.03/31/22
CIVIL
STRUCTURAL
STATE OF CALIFORNIA

SHEET TITLE

SHORING PLAN

PROJECT NO.
192300

SCALE:	DATE:
AS INDICATED	09/21/2020
CHECKED BY:	DRAWN BY:
PB/BM	ML

SHEET NO.

SH2.01

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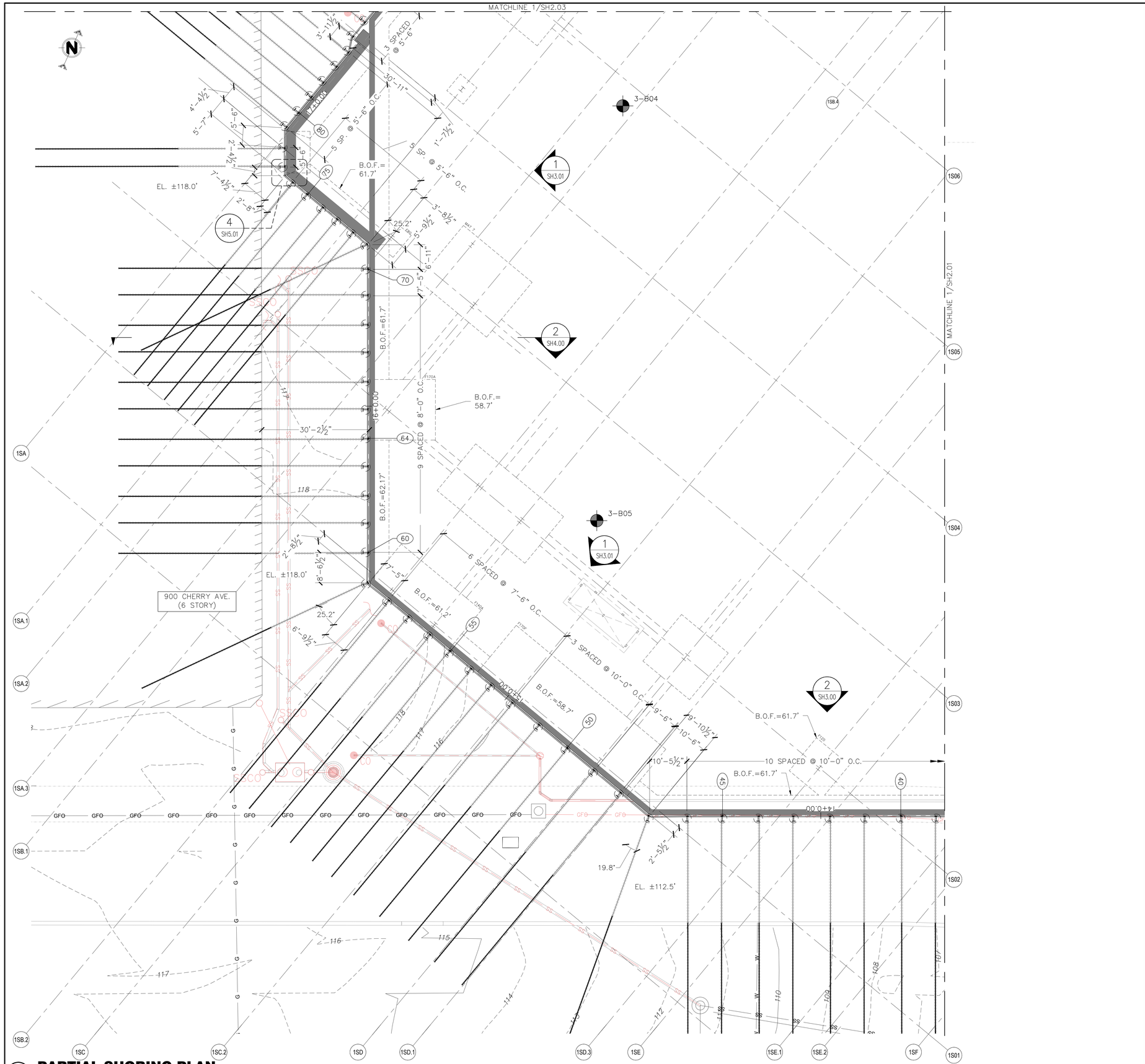

1 PARTIAL SHORING PLAN

SCALE: 3/32" = 1'-0"

LEGENDS:

ANGLE ORIENTATION

S-PILE WORK POINT

X.X — DENOTES S-PILE NUMBER

TIEBACK, SEE SCHED.

XX.XX — DENOTES PAD ELEVATION

B01 — DENOTES BORING NUMBER AND LOCATION

01 — DENOTES WORK POINT NUMBER

DENOTES GRADE BEAM/ FOUNDATION LINE

DENOTES (N) UTILITY REFERENCE ONLY AND TO BE RELOCATED AS NECESSARY

— —UTIL— — DENOTES (E) UTILITY

FOUNDATION & MASS EXCAVATION

1000 Cherry Avenue
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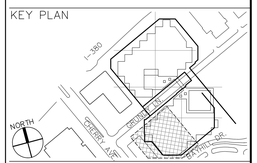
CASE PACIFIC

KEY PLAN



SEAL/ SIGNATURE

REGISTERED PROFESSIONAL ENGINEER
BARIOZ BARIOZ
CE 26101
SE 2502
Exp.03/31/22
CIVIL & STRUCTURAL
STATE OF CALIFORNIA

SHEET TITLE

SHORING PLAN

PROJECT NO.
192300

SCALE:	DATE:
AS INDICATED	09/21/2020
CHECKED BY:	DRAWN BY:
PB/BM	ML

SHEET NO.

SH2.02

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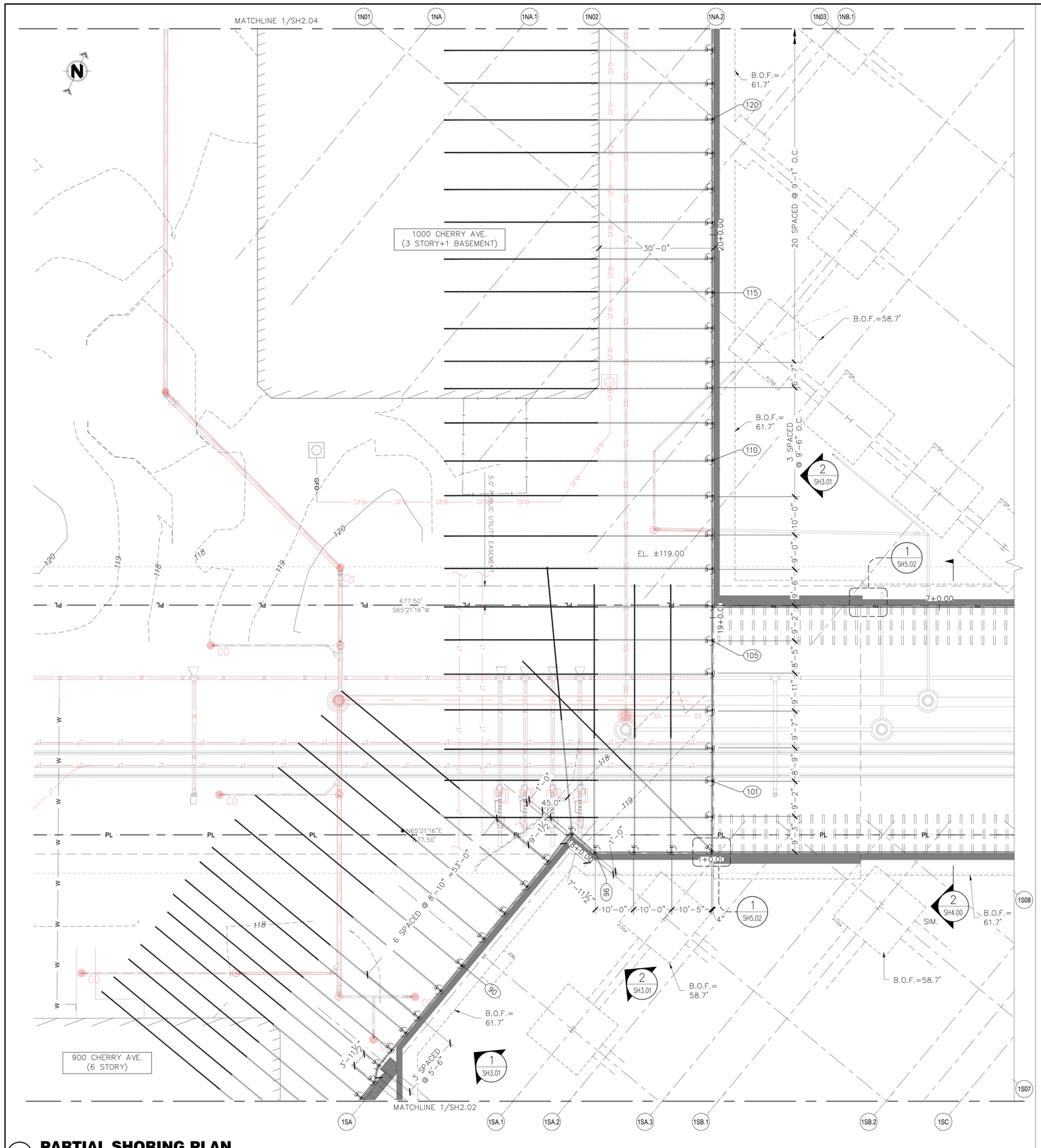
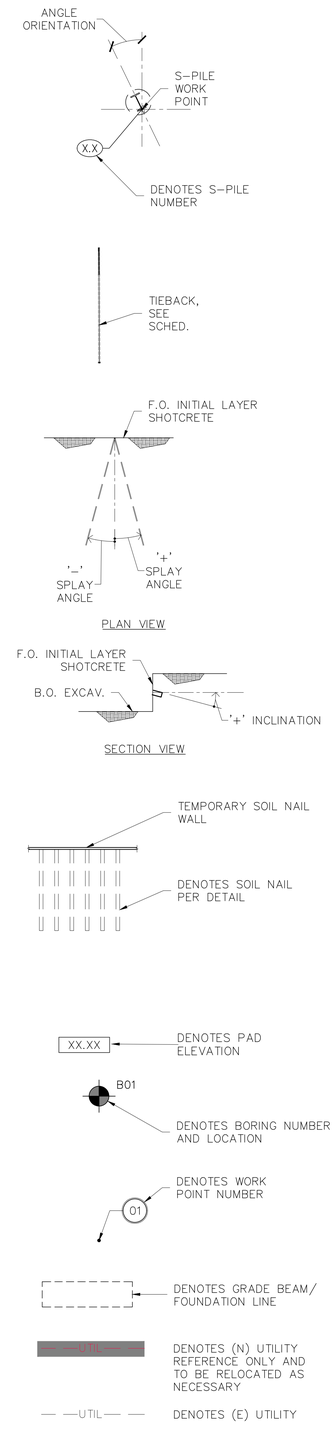


1 PARTIAL SHORING PLAN

SCALE: 3/32" = 1'-0"

LEGENDS:



FOUNDATION & MASS EXCAVATION

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38 YEARS PB&A inc. Structural Engineering Geostructures • Earth Retention
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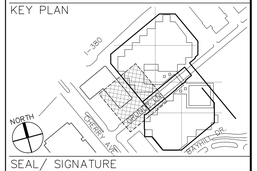
CASE PACIFIC

KEY PLAN



SEAL/ SIGNATURE

REGISTERED PROFESSIONAL ENGINEER
BITROZ BAKHTIAR
CE 26101
SE 2502
Exp.03/31/22
CIVIL & STRUCTURAL
STATE OF CALIFORNIA

SHEET TITLE

SHORING PLAN

PROJECT NO. 192300	
SCALE: AS INDICATED	DATE: 09/21/2020
CHECKED BY: PB/BM	DRAWN BY: ML
SHEET NO.	SH2.03

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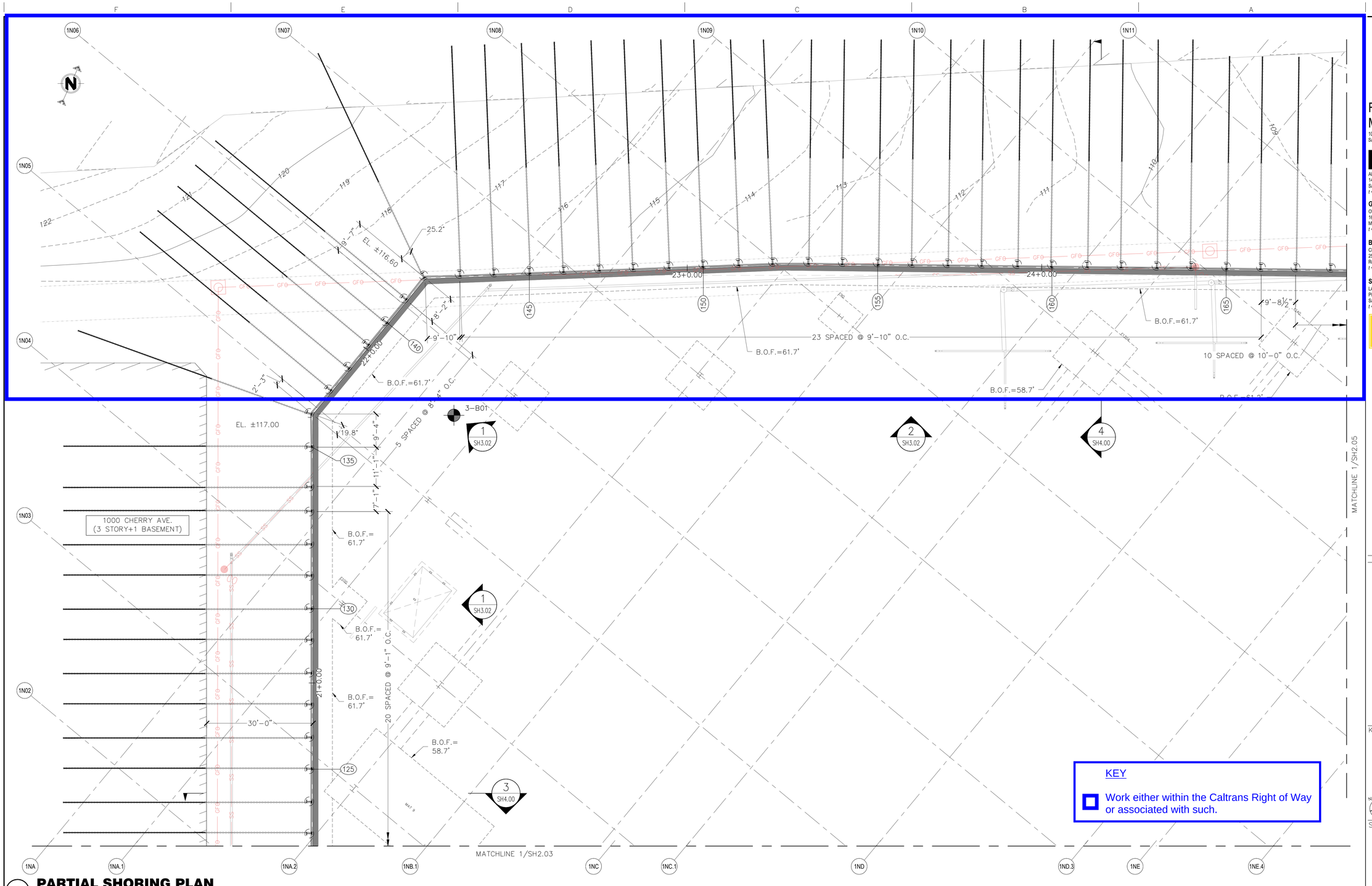


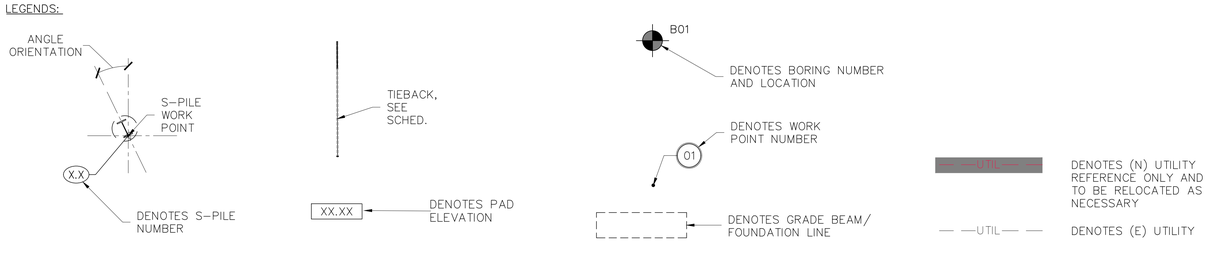
KEY

Work either within the Caltrans Right of Way or associated with such.

1 PARTIAL SHORING PLAN

SCALE: 3/32" = 1'-0"

LEGENDS:



1. TOP OF SLAB EL.= 66.2' (66'-2¼")
2. TOP OF FOOTING IS 1'-6" BELOW TOP OF SLAB ELEVATION UNLESS NOTED OTHERWISE.
3. TOP OF FOOTING ELEVATION IS NOTED AS -X'.XX'.
4. SEE SH3.00 TO SH3.06 FOR ELEVATIONS OF TOP AND BOTTOM OF WALL.
5. DRILLED HOLE FOR SOLDIER PILES ARE 30"ø TYPICAL.
6. LAGGINGS ARE 4X12 TYPICAL FOR SPACING LESS THAN AND EQUAL TO 10'-6".
7. LAGGINGS ARE DOUBLE LAYER OF 4X12 FOR SPACING MORE THAN 10'-6".

FOUNDATION & MASS EXCAVATION

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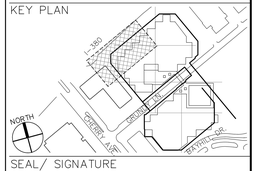
CASE PACIFIC

KEY PLAN



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SHEET TITLE

SHORING PLAN

PROJECT NO.
192300

SCALE:	DATE:
AS INDICATED	09/21/2020
CHECKED BY:	DRAWN BY:
PB/BM	ML

SHEET NO.

SH2.04

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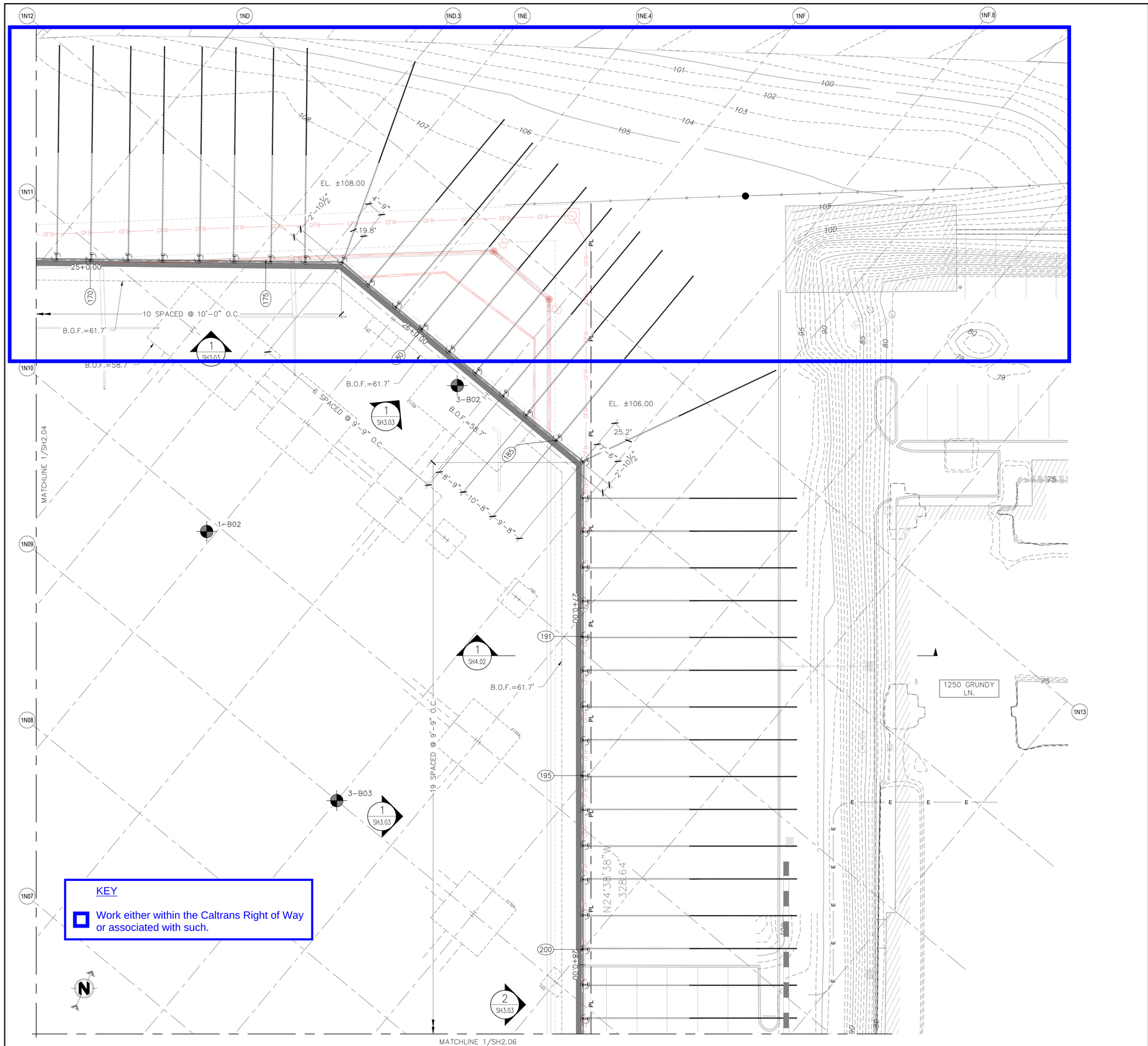
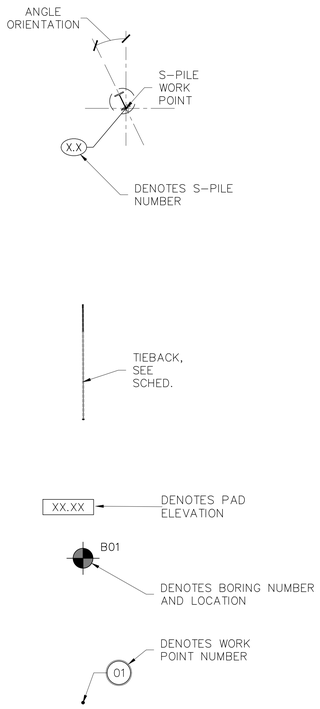


1 PARTIAL SHORING PLAN

SCALE: 3/32" = 1'-0"

LEGENDS:



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FOUNDATION & MASS EXCAVATION

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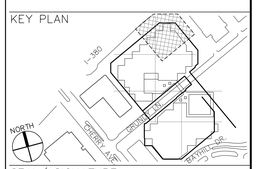
CASE PACIFIC

KEY PLAN



SEAL/ SIGNATURE

REGISTERED PROFESSIONAL ENGINEER PIROUZ BAKHSHI CE 26101 SE 2502 Exp.03/31/22 CIVIL & STRUCTURAL STATE OF CALIFORNIA

SHEET TITLE

SHORING PLAN

PROJECT NO. 192300	
SCALE: AS INDICATED	DATE: 09/21/2020
CHECKED BY: PB/BM	DRAWN BY: ML
SHEET NO.	

SH2.05

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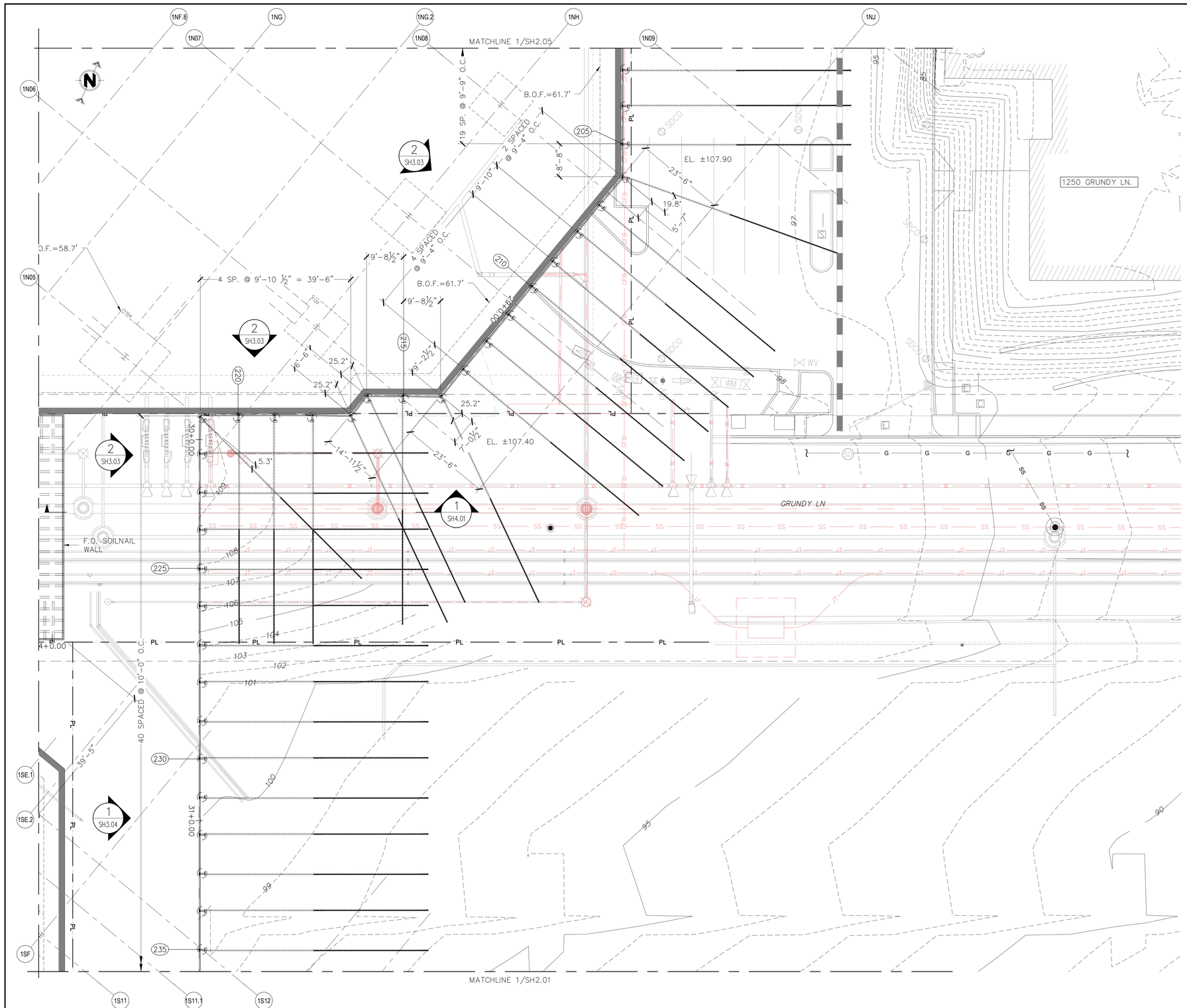
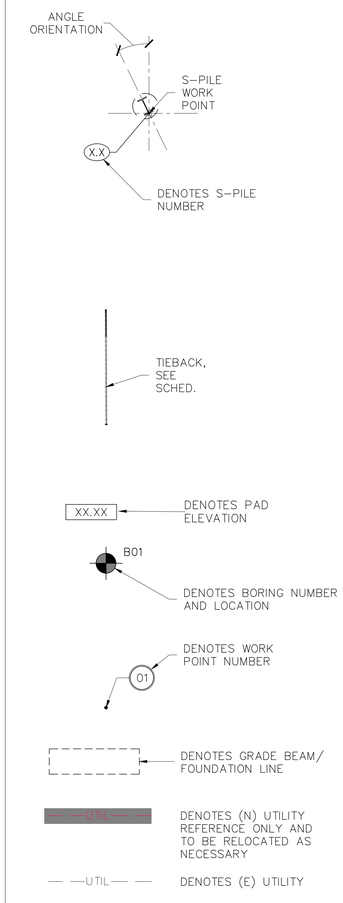


1 PARTIAL SHORING PLAN

SCALE: 3/32" = 1'-0"

LEGENDS:



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FOUNDATION & MASS EXCAVATION

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CASE PACIFIC

KEY PLAN

SEAL/ SIGNATURE

REGISTERED PROFESSIONAL ENGINEER
PEYMOZ BARAHI
CE 26101
SE 2502
Exp.03/31/22
CIVIL
STRUCTURAL
STATE OF CALIFORNIA

SHEET TITLE

SHORING PLAN

PROJECT NO. 192300	
SCALE: AS INDICATED	DATE: 09/21/2020
CHECKED BY: PB/BM	DRAWN BY: ML
SHEET NO. SH2.06	

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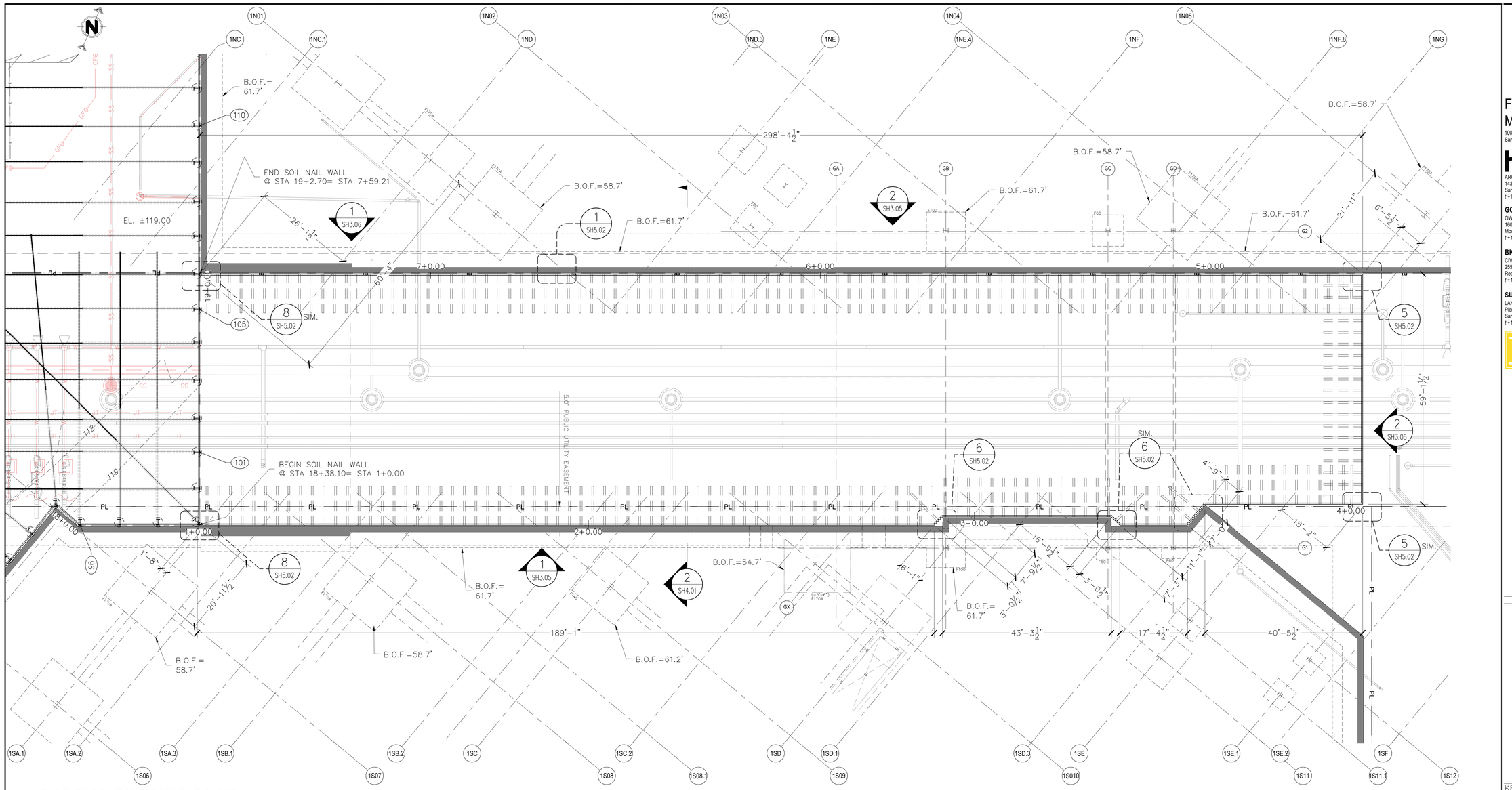
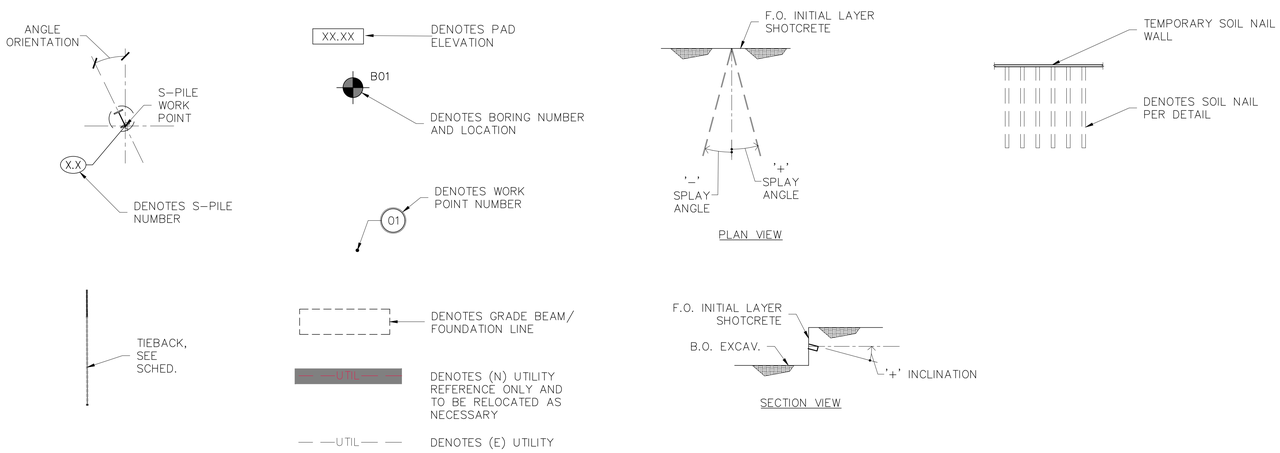


1 PARTIAL SHORING PLAN

SCALE: 3/32" = 1'-0"

LEGENDS:



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FOUNDATION & MASS EXCAVATION

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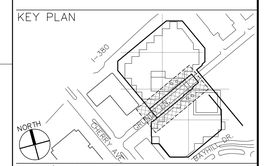
Website: pbaindsc.com Phone: (415) 259 - 9373

CASE PACIFIC

KEY PLAN



SEAL/ SIGNATURE

REGISTERED PROFESSIONAL ENGINEER
FIROOZ BAHAR
CE 26101
SE 2502
Exp.03/31/22
CIVIL & STRUCTURAL
STATE OF CALIFORNIA

SHEET TITLE

SHORING PLAN

PROJECT NO. 192300	
SCALE: AS INDICATED	DATE: 09/21/2020
CHECKED BY: PB/BM	DRAWN BY: ML
SHEET NO. SH2.07	

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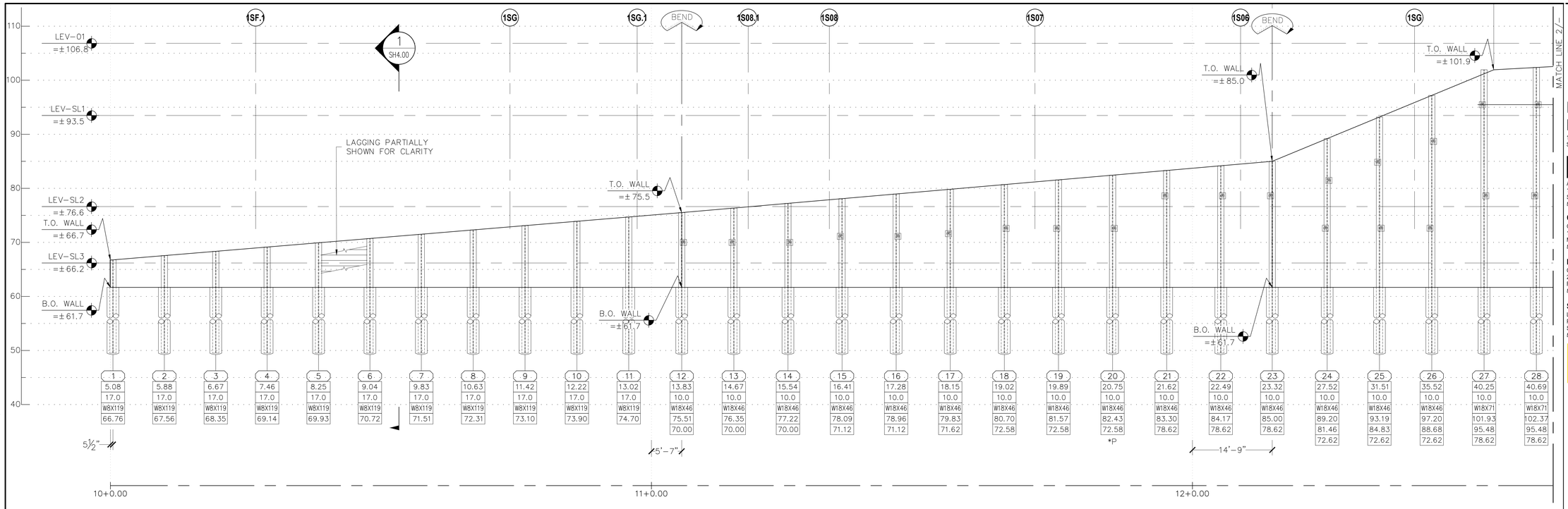

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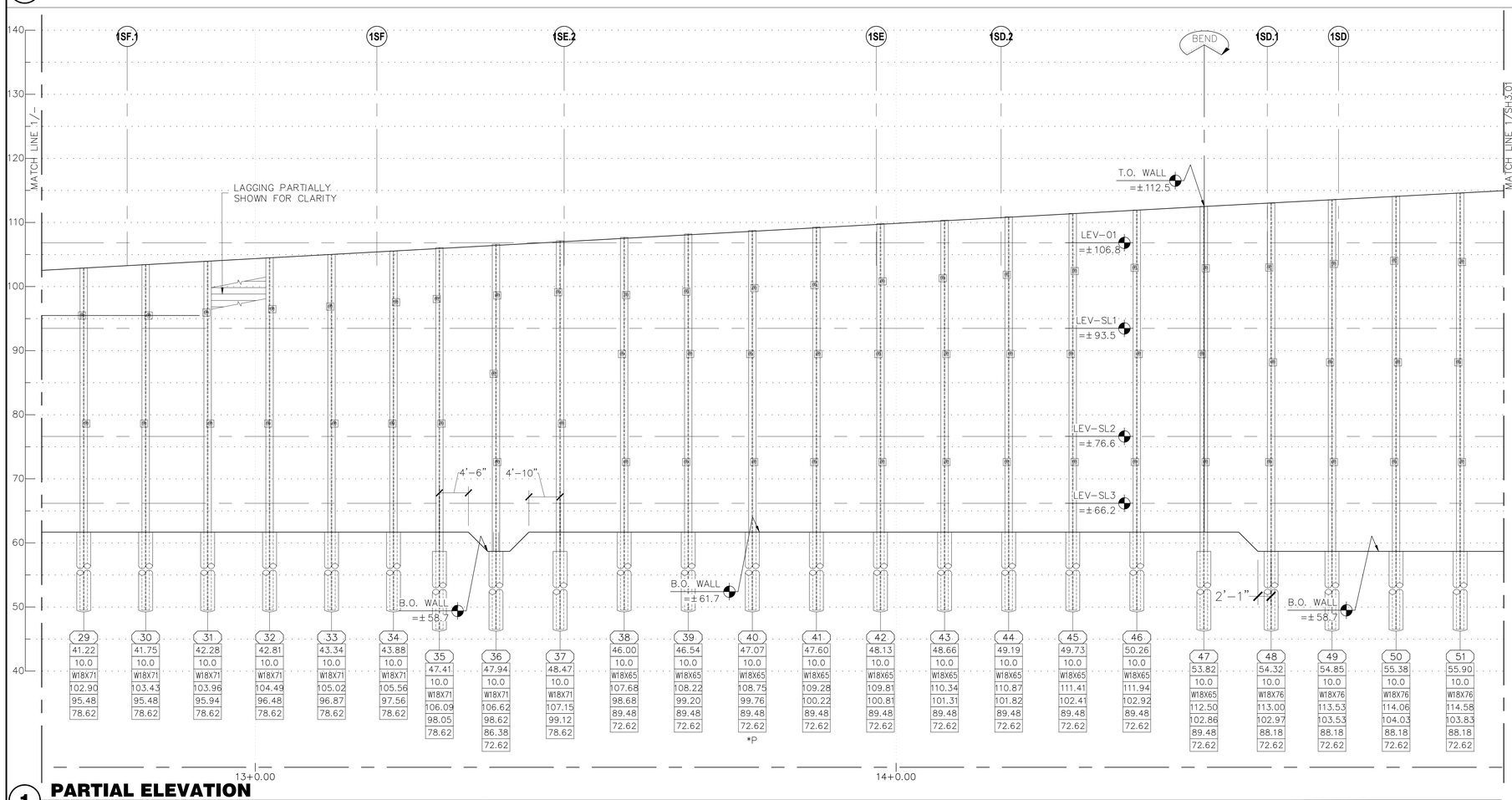
17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
W8X119	W8X119	W8X119	W8X119	W8X119	W8X119	W8X119	W8X119	W8X119	W8X119	W8X119	W18X46	W18X46	W18X46	W18X46	W18X46	W18X46	W18X46	W18X46	W18X46	W18X46	W18X46	W18X46	W18X46	W18X46	W18X46	W18X71	W18X71
66.76	67.56	68.35	69.14	69.93	70.72	71.51	72.31	73.10	73.90	74.70	75.51	76.35	77.22	78.09	78.96	79.83	80.70	81.57	82.43	83.30	84.17	85.00	89.20	93.19	97.20	101.93	102.37
											70.00	70.00	70.00	71.12	71.12	71.62	72.58	72.58	72.58	78.62	78.62	78.62	81.46	84.83	88.68	95.48	95.48
																			*P				72.62	72.62	72.62	78.62	78.62

1 PARTIAL ELEVATION

SCALE: 1/8" = 1'–0"



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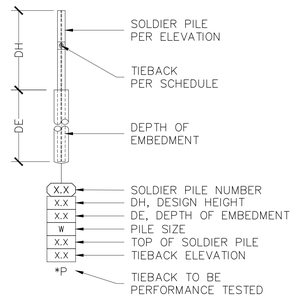
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
W18X71	W18X71	W18X71	W18X71	W18X71	W18X71	W18X71	W18X71	W18X71	W18X65	W18X65	W18X65	W18X65	W18X65	W18X65	W18X65	W18X65	W18X65	W18X65	W18X76	W18X76	W18X76	W18X76
102.90	103.43	103.96	104.49	105.02	105.56	106.09	106.62	107.15	107.68	108.22	108.75	109.28	109.81	110.34	110.87	111.41	111.94	112.50	113.00	113.53	114.06	114.58
95.48	95.48	95.94	96.48	96.87	97.56	98.05	98.62	99.12	98.68	99.20	99.76	100.22	100.81	101.31	101.82	102.41	102.92	102.86	103.00	103.53	104.03	103.83
78.62	78.62	78.62	78.62	78.62	78.62	78.62	86.38	99.12	89.48	89.48	89.48	89.48	89.48	89.48	89.48	89.48	89.48	89.48	88.18	88.18	88.18	88.18
							72.62	78.62	72.62	72.62	72.62	72.62	72.62	72.62	72.62	72.62	72.62	72.62	72.62	72.62	72.62	72.62
											*P											

1 PARTIAL ELEVATION

SCALE: 1/8" = 1'–0"

LEGENDS:



NOTES:

1. SEE SH6.00 TO SH6.02 FOR TIEBACK SCHEDULES.
2. LAGGINGS ARE 4X12 TYPICAL FOR SPACING LESS THAN AND EQUAL TO 10'–6".
3. LAGGINGS ARE DOUBLE LAYER OF 4X12 FOR SPACING MORE THAN 10'–0".

FOUNDATION & MASS EXCAVATION

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CASE PACIFIC

NO.	DATE	ISSUES
0	09/04/20	PERMIT SUBMITTAL

KEY PLAN

SEAL/ SIGNATURE

REGISTERED PROFESSIONAL ENGINEER
PATRICK BRYANT
CE 26101
SE 2502
Exp.03/31/22
CIVIL & STRUCTURAL
STATE OF CALIFORNIA

SHEET TITLE

SHORING ELEVATIONS

PROJECT NO.
192300

SCALE: AS INDICATED
DATE: 09/21/2020

CHECKED BY: PB/BM
DRAWN BY: ML

SHEET NO.

SH3.00

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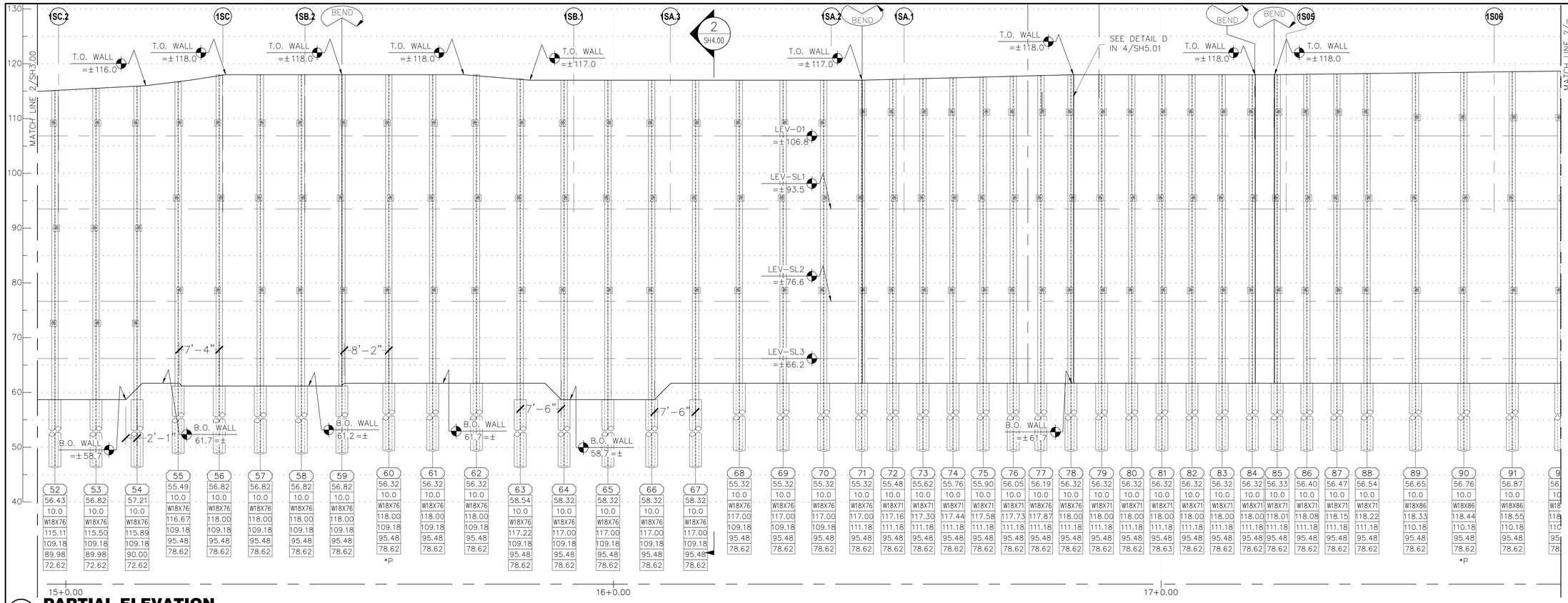
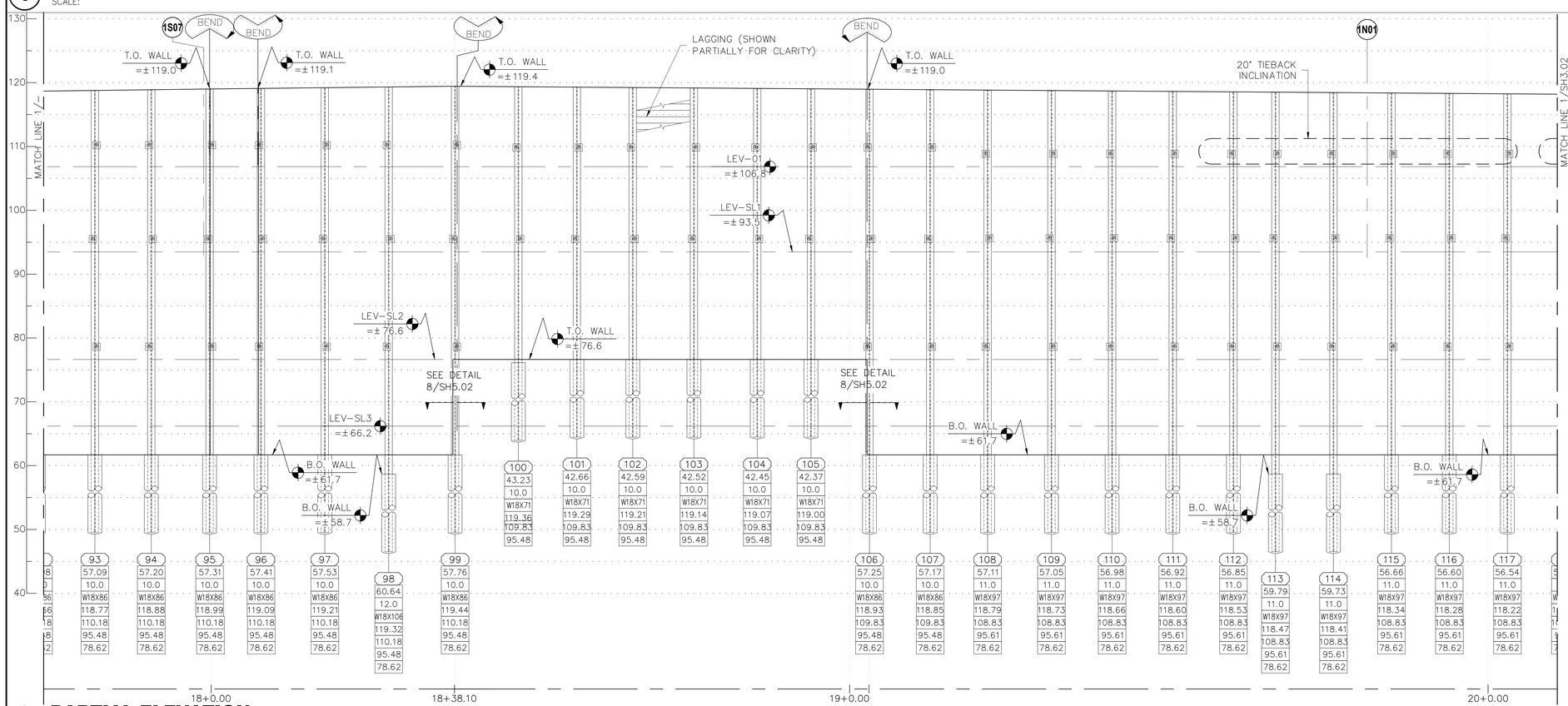


1 PARTIAL ELEVATION

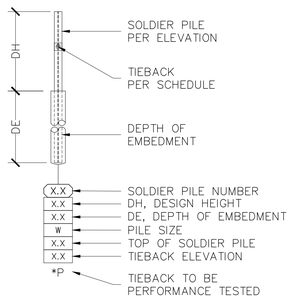
SCALE: 1/8" = 1'-0"



2 PARTIAL ELEVATION

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

LEGENDS:



NOTES:

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CASE PACIFIC

NO.	DATE	ISSUES
0	09/04/20	PERMIT SUBMITTAL

KEY PLAN

SEAL/ SIGNATURE

SHEET TITLE

SHORING ELEVATIONS

PROJECT NO. 192300

SCALE: AS INDICATED | DATE: 09/21/2020

CHECKED BY: PB/BM | DRAWN BY: ML

SHEET NO.

SH3.01

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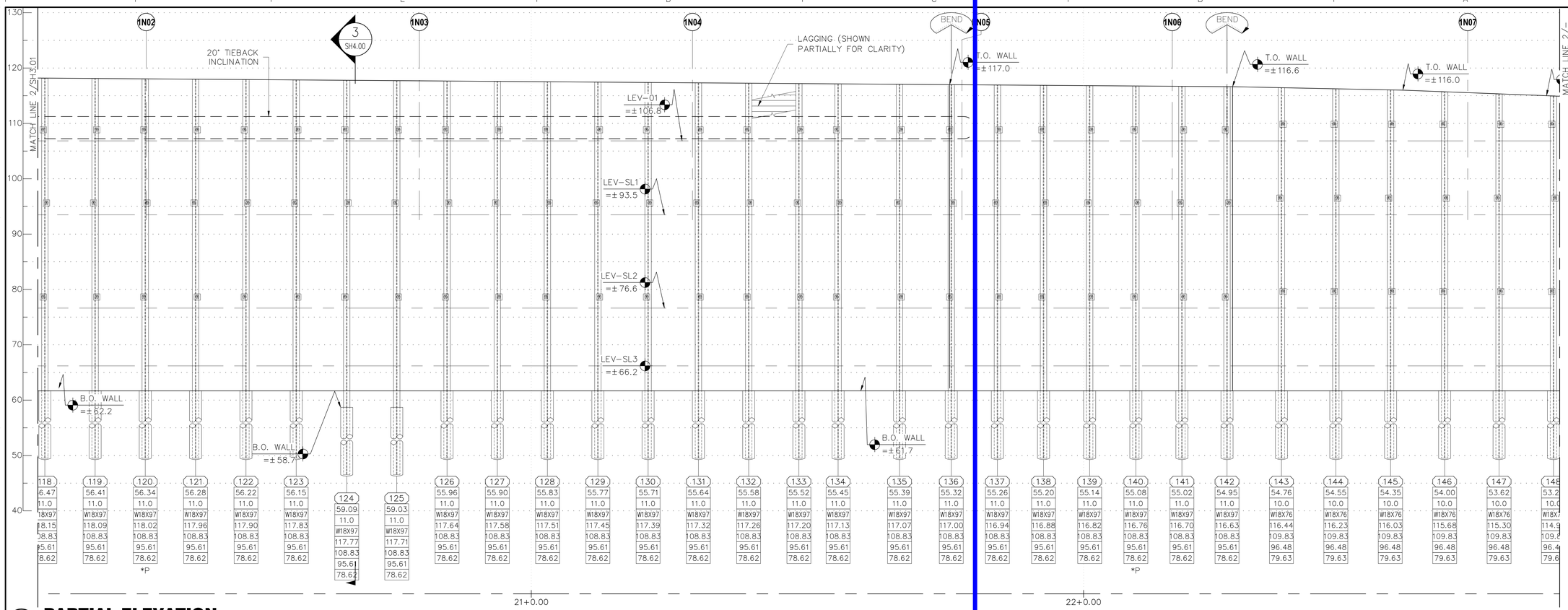
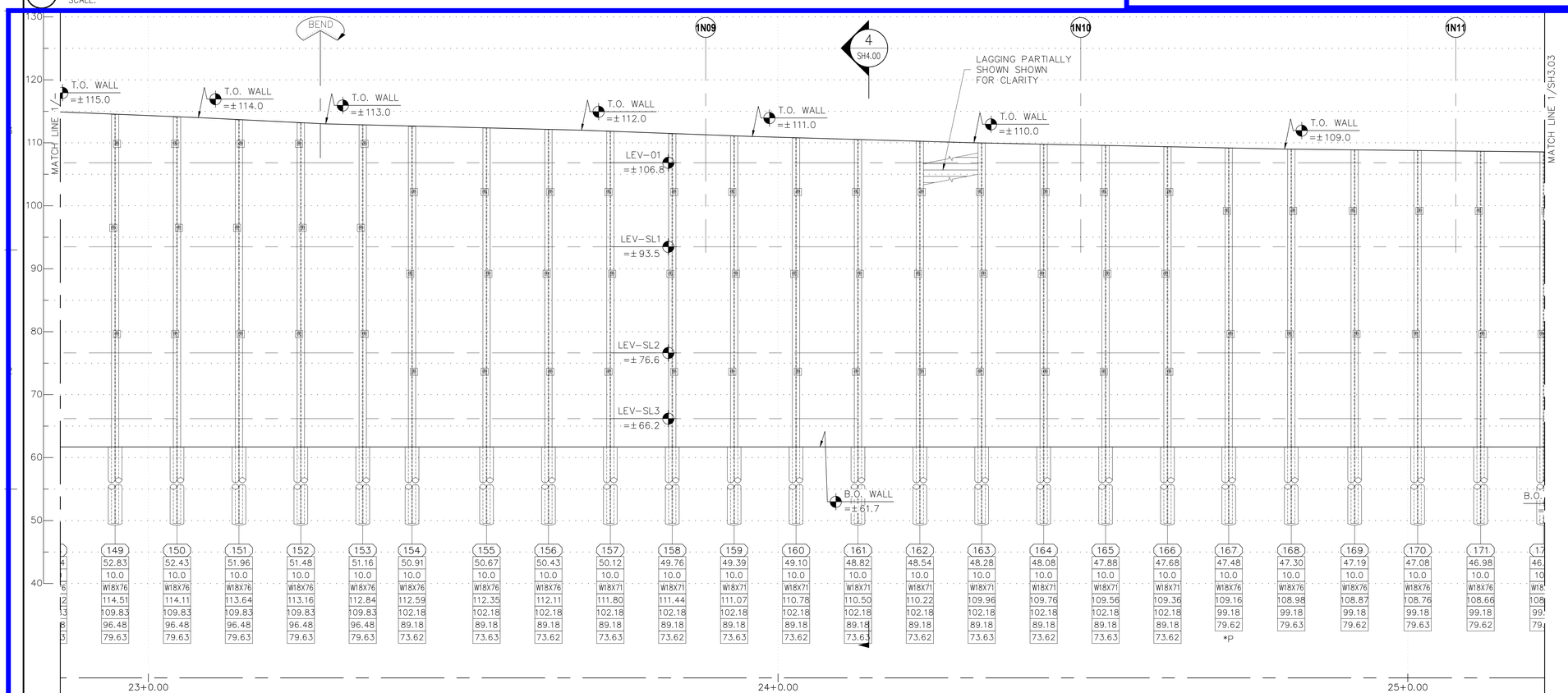


1 PARTIAL ELEVATION

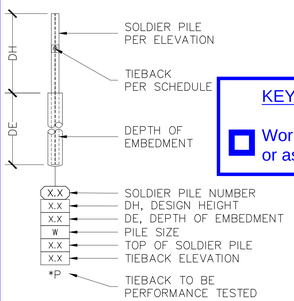
SCALE: 1/8" = 1'-0"



2 PARTIAL ELEVATION

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

LEGENDS:



NOTES:

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KEY

Work either within the Caltrans Right of Way or associated with such.

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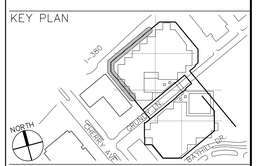
CASE PACIFIC

NO.	DATE	ISSUES
0	09/04/20	PERMIT SUBMITTAL

KEY PLAN



SEAL/ SIGNATURE

REGISTERED PROFESSIONAL ENGINEER PITROZ BARKAT CE 26101 SE 2502 Exp.03/31/22 CIVIL & STRUCTURAL STATE OF CALIFORNIA

SHEET TITLE

SHORING ELEVATIONS

PROJECT NO. 192300

SCALE: AS INDICATED | DATE: 09/21/2020

CHECKED BY: PB/BM | DRAWN BY: ML

SHEET NO.

SH3.02

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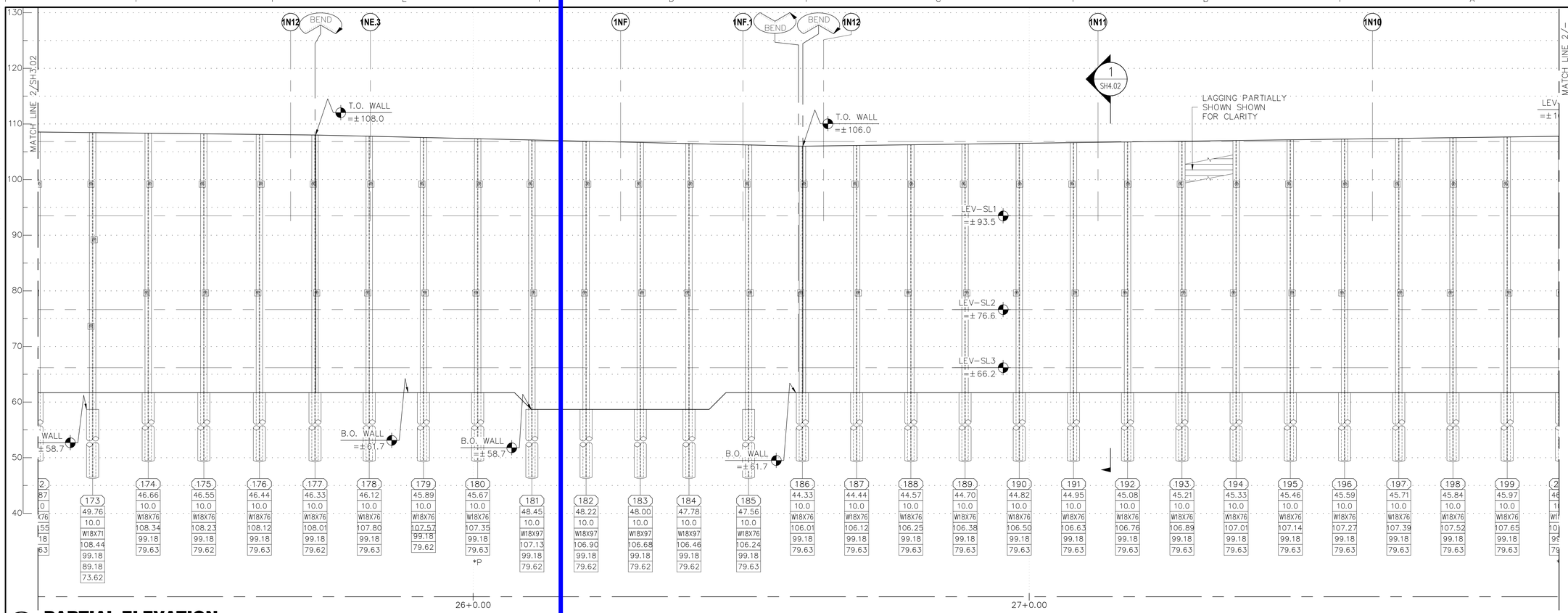
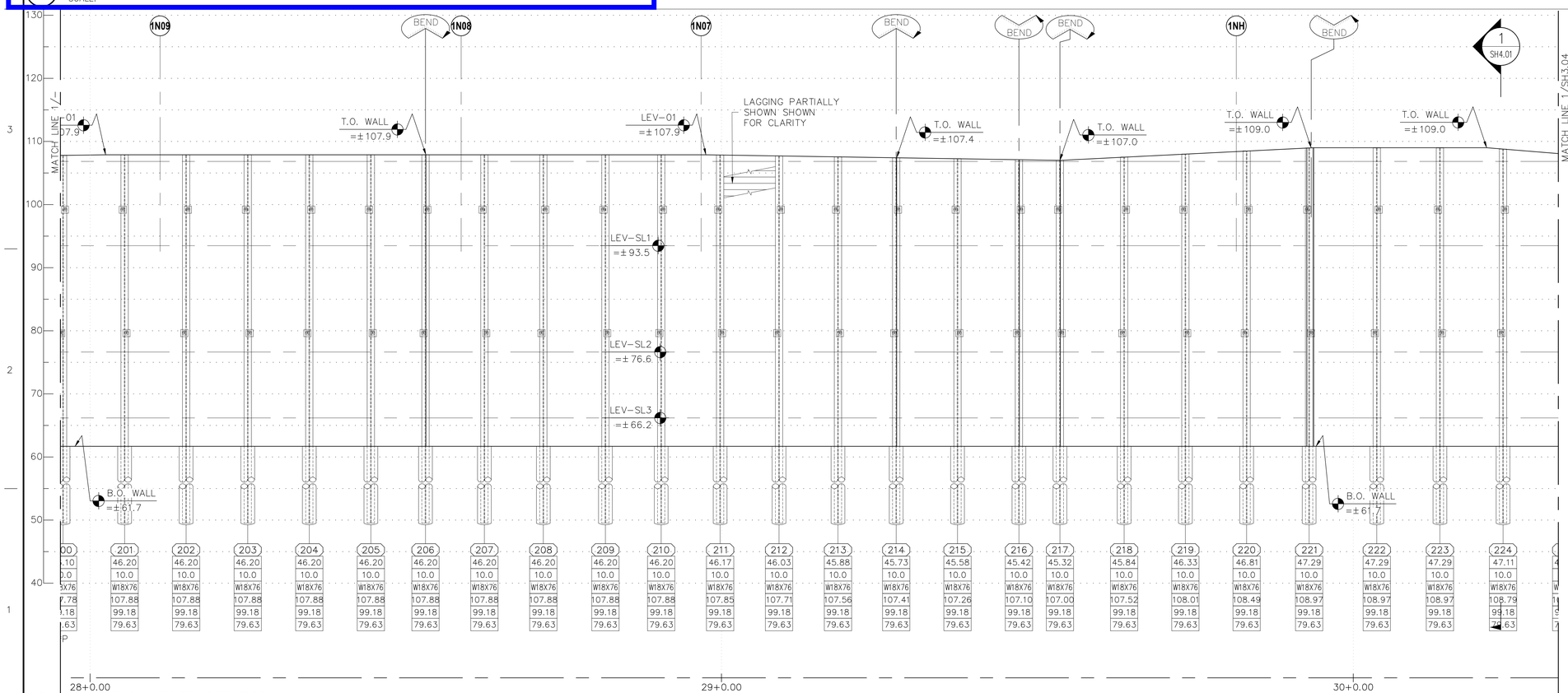


1 PARTIAL ELEVATION

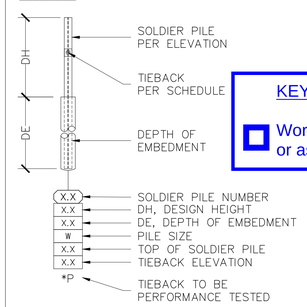
SCALE: 1/8" = 1'-0"



2 PARTIAL ELEVATION

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

LEGENDS:



NOTES:

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KEY

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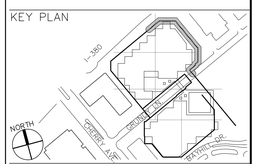
Website: pbandassoc.com Phone: (415) 258 - 8215

CASE PACIFIC

NO.	DATE	ISSUES
0	09/04/20	PERMIT SUBMITTAL

KEY PLAN



SEAL/ SIGNATURE

REGISTERED PROFESSIONAL ENGINEER
BIRAMIZ BARAMI
CE 26101
SE 2502
Exp.03/31/22
CIVIL & STRUCTURAL
STATE OF CALIFORNIA

SHEET TITLE

SHORING ELEVATIONS

PROJECT NO. 192300

SCALE: AS INDICATED

DATE: 09/21/2020

CHECKED BY: PB/BM

DRAWN BY: ML

SHEET NO.

SH3.03

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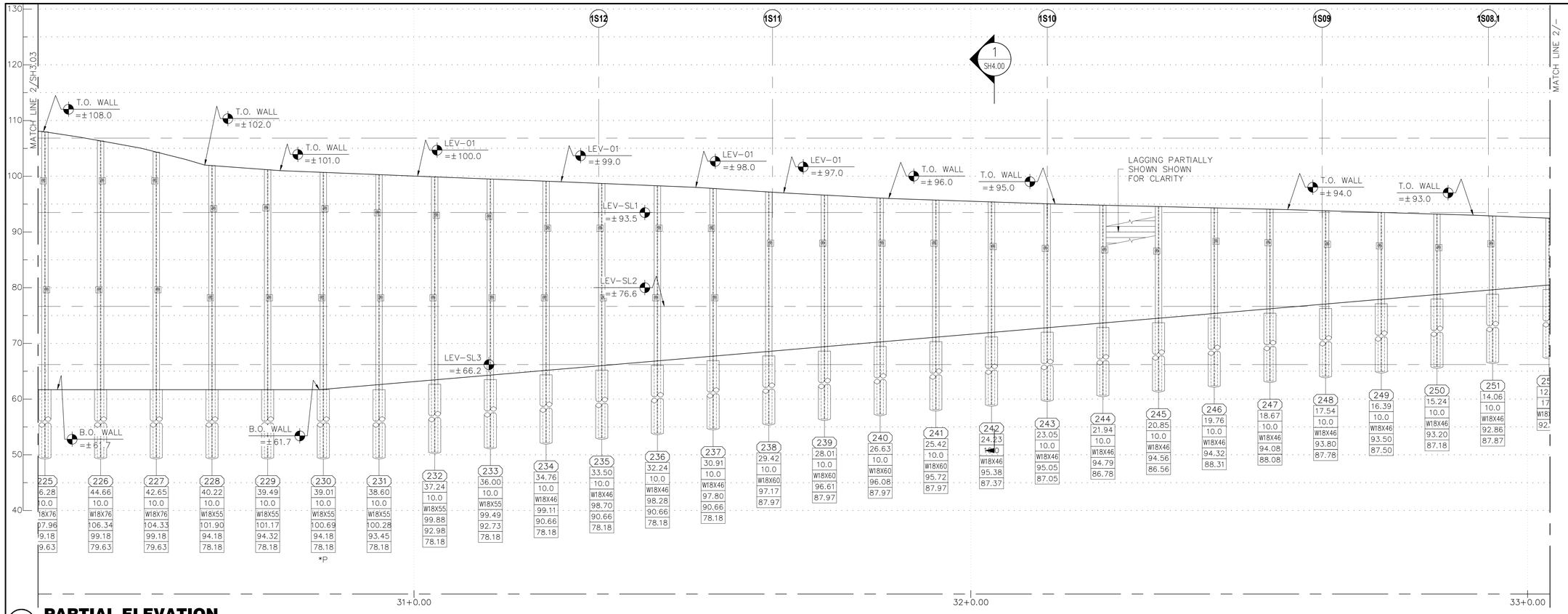
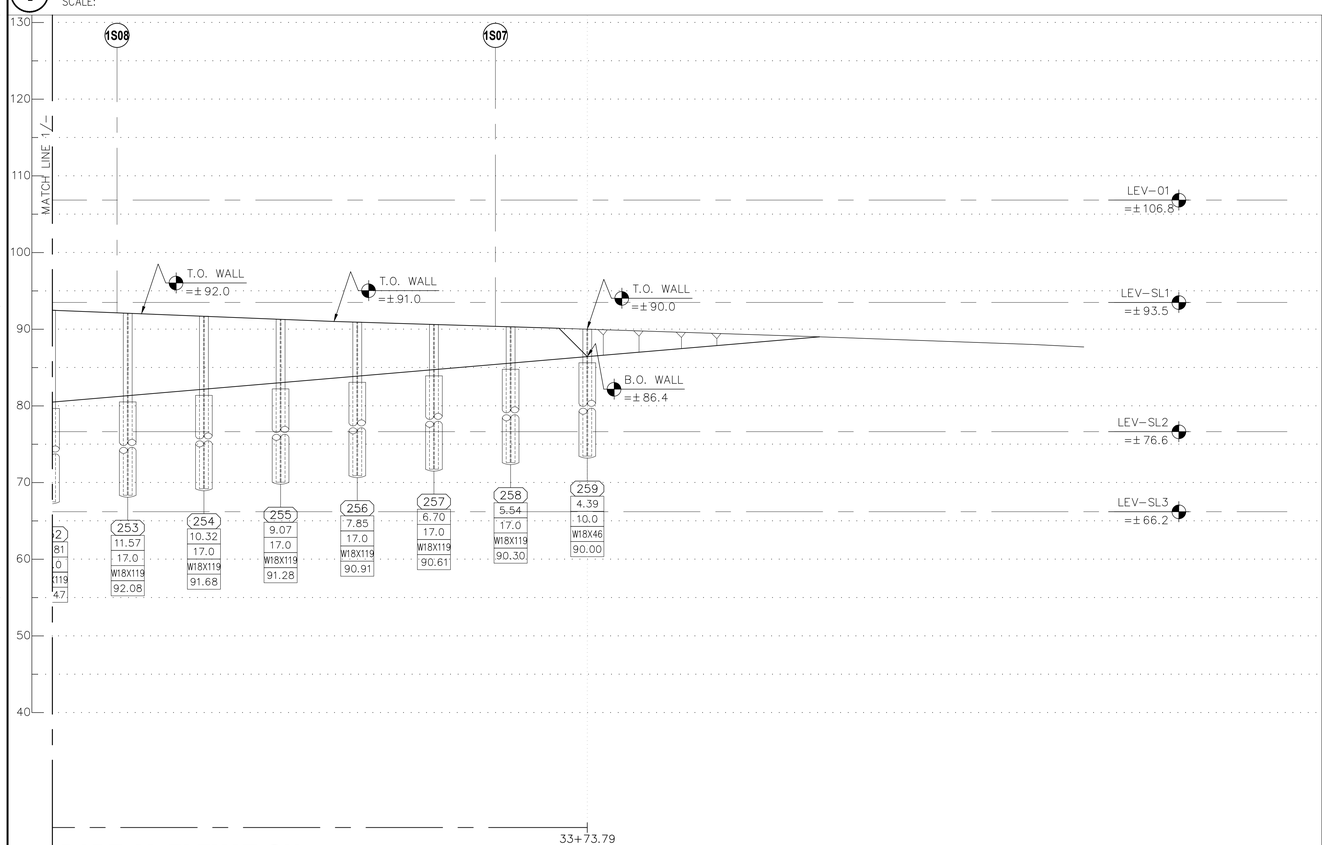


1 PARTIAL ELEVATION

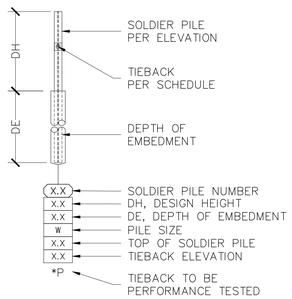
SCALE: 1/8" = 1'-0"



2 PARTIAL ELEVATION

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

LEGENDS:



NOTES:

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FOUNDATION & MASS EXCAVATION

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CASE PACIFIC

NO.	DATE	ISSUES
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KEY PLAN

SEAL/ SIGNATURE

SHEET TITLE

SHORING ELEVATIONS

PROJECT NO.
192300

SCALE: AS INDICATED
DATE: 09/21/2020

CHECKED BY: PB/BM
DRAWN BY: ML

SHEET NO.

SH3.04

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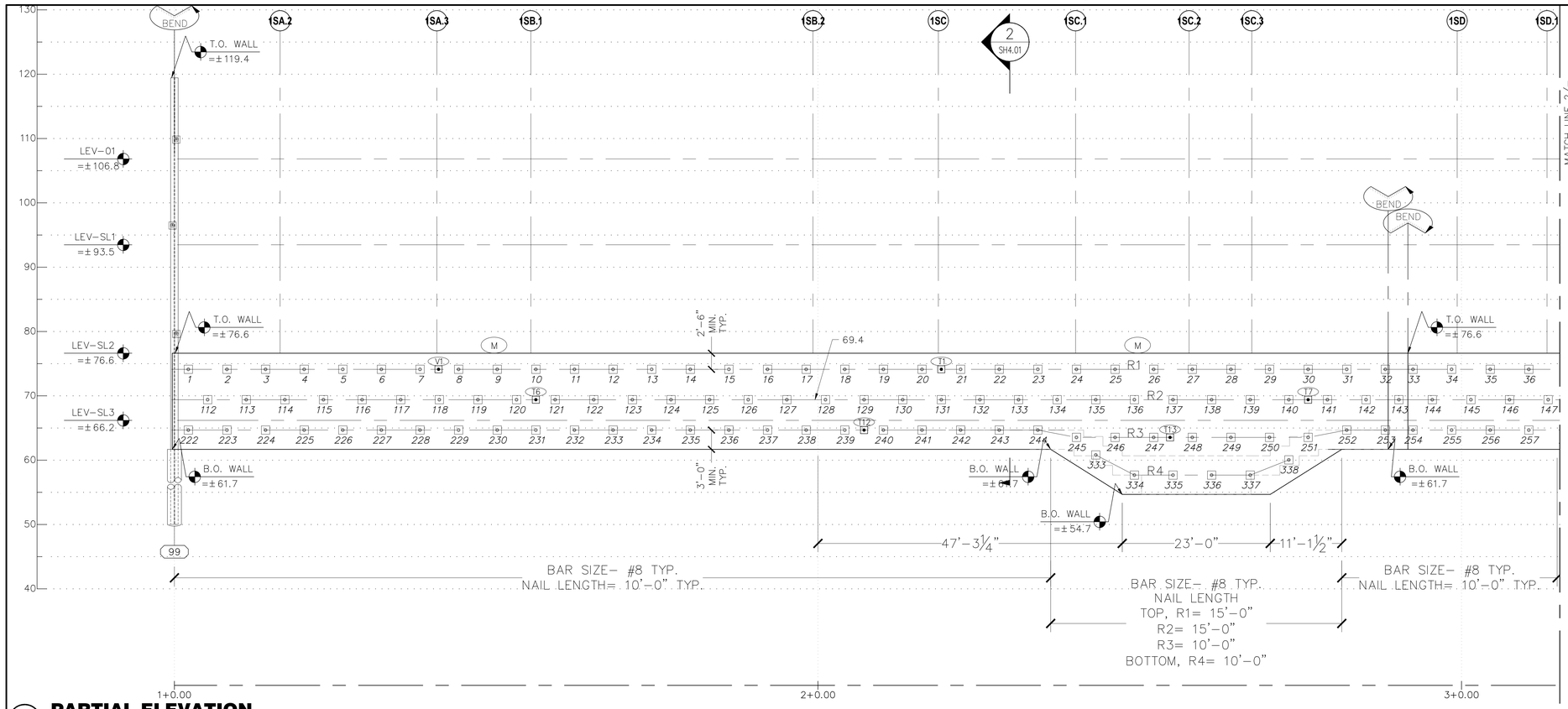


1 PARTIAL ELEVATION

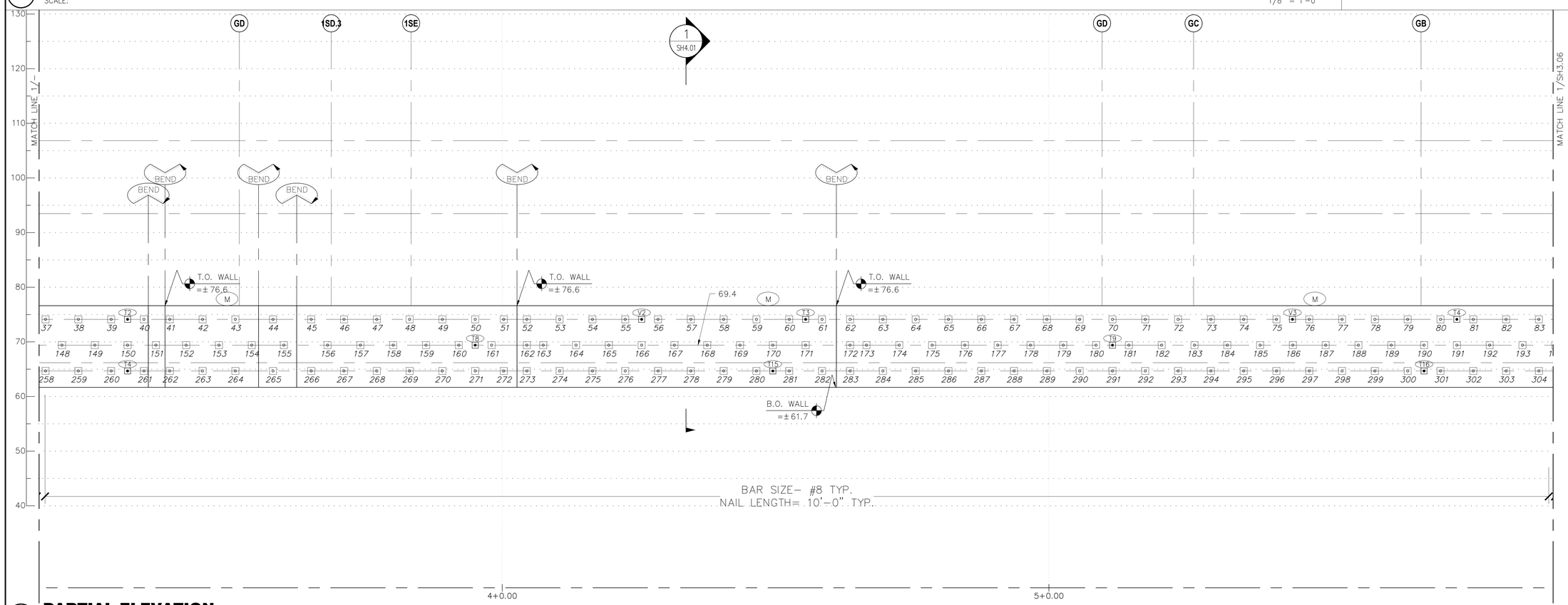
SCALE: 1/8" = 1'-0"

LEGENDS:

- SOIL NAIL
- SOIL NAIL NUMBER
- PROOF TEST NAIL
- VERIFICATION TEST NAIL
- SUGGESTED LOCATION OF MONITORING POINT

NOTE:

1. SHOTCRETE FACING IS 4" THICK TYPICAL.



2 PARTIAL ELEVATION

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

FOUNDATION & MASS EXCAVATION

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CASE PACIFIC

NO.	DATE	ISSUES
0	09/04/20	PERMIT SUBMITTAL

KEY PLAN

SEAL/ SIGNATURE

REGISTERED PROFESSIONAL ENGINEER
PATROZ BAKHEET
CE 26101
SE 2502
Exp.03/31/22
CIVIL & STRUCTURAL
STATE OF CALIFORNIA

SHEET TITLE

SHORING ELEVATIONS

PROJECT NO.
192300

SCALE:	DATE:
AS INDICATED	09/21/2020
CHECKED BY: PB/BM	DRAWN BY: ML

SHEET NO.

SH3.05

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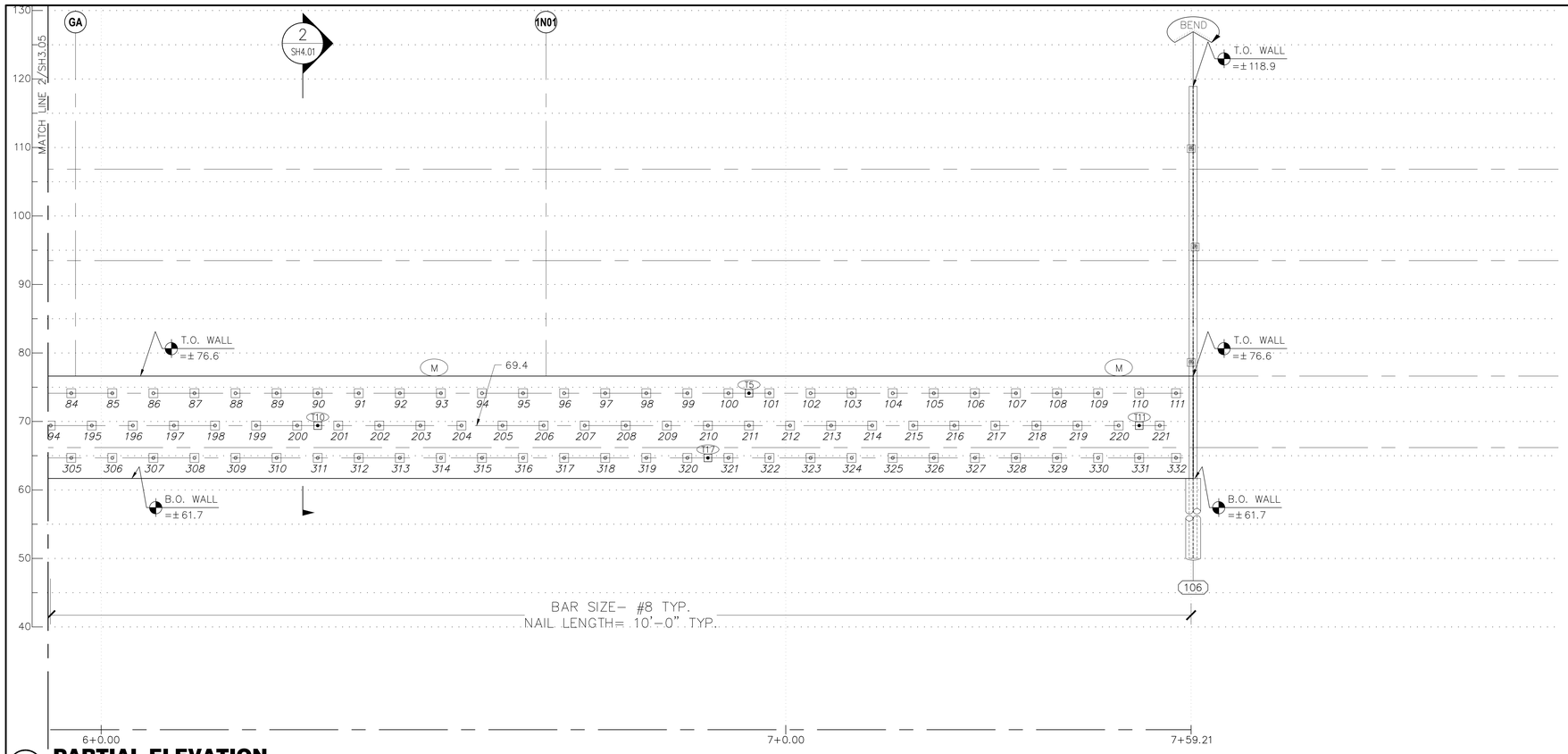

1 PARTIAL ELEVATION

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

LEGENDS:

- SOIL NAIL
- 1 — SOIL NAIL NUMBER
- T1 — PROOF TEST NAIL
- V1 — VERIFICATION TEST NAIL
- M — SUGGESTED LOCATION OF MONITORING POINT

NOTE:

1. SHOTCRETE FACING IS 4" THICK TYPICAL.

FOUNDATION & MASS EXCAVATION

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CASE PACIFIC

NO.	DATE	ISSUES
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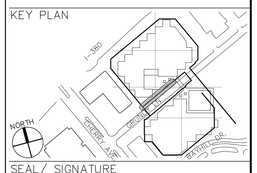
KEY PLAN



SEAL/ SIGNATURE

REGISTERED PROFESSIONAL ENGINEER
PITHOZ BANGUIS
CE 26101
SE 2502
Exp.03/31/22
CIVIL & STRUCTURAL
STATE OF CALIFORNIA

SHEET TITLE

SHORING ELEVATION

PROJECT NO.
192300

SCALE: AS INDICATED
DATE: 09/21/2020

CHECKED BY: PB/BM
DRAWN BY: ML

SHEET NO.

SH3.06

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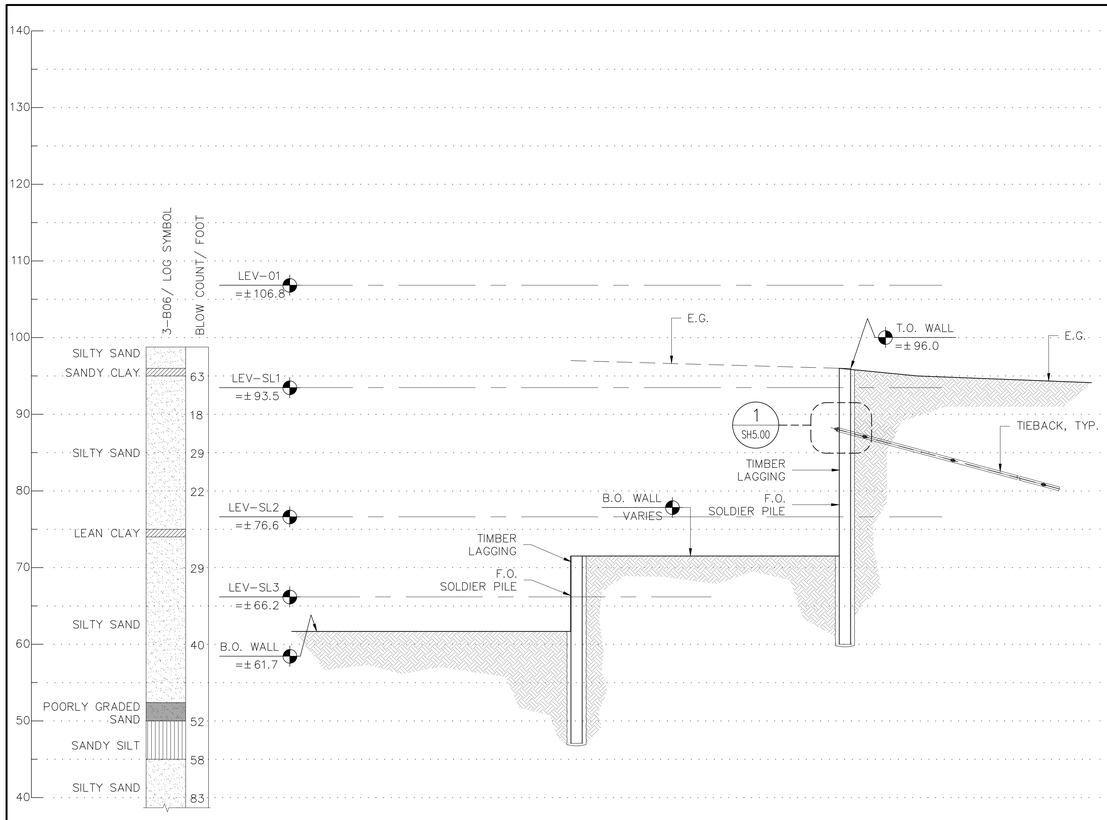

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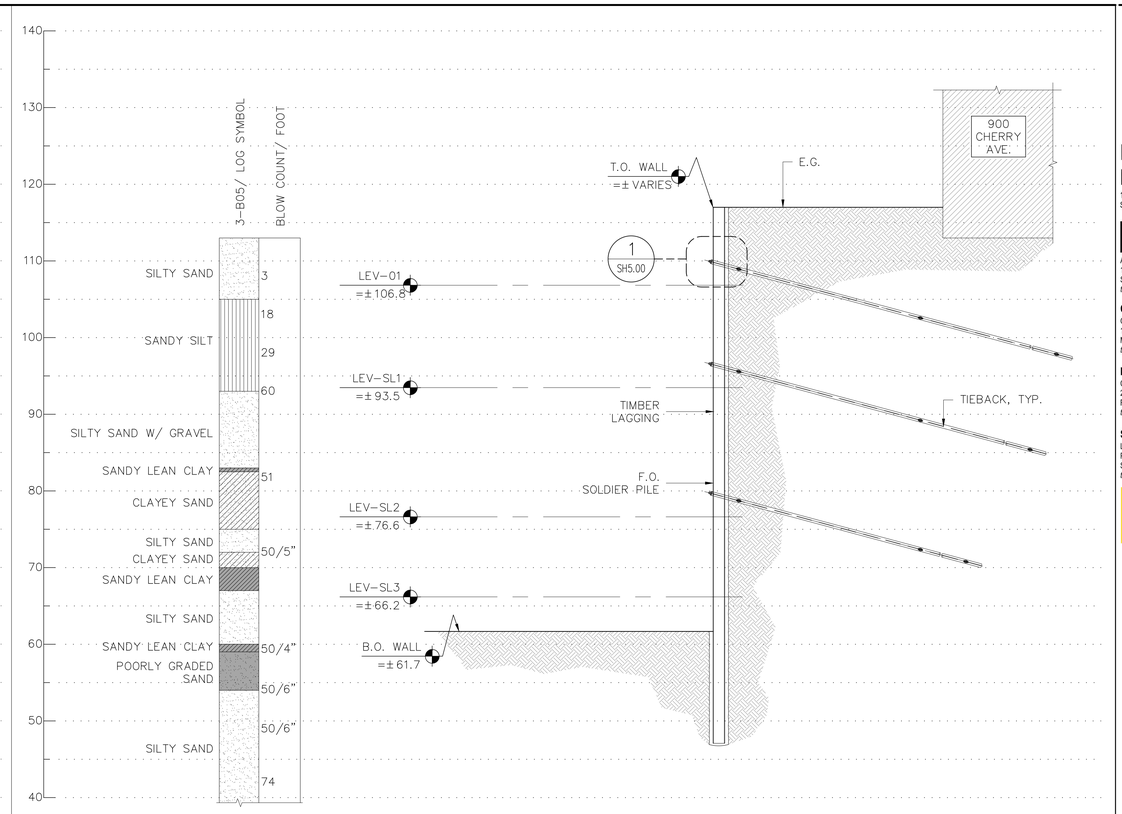
SCALE: 1/8" = 1'-0"



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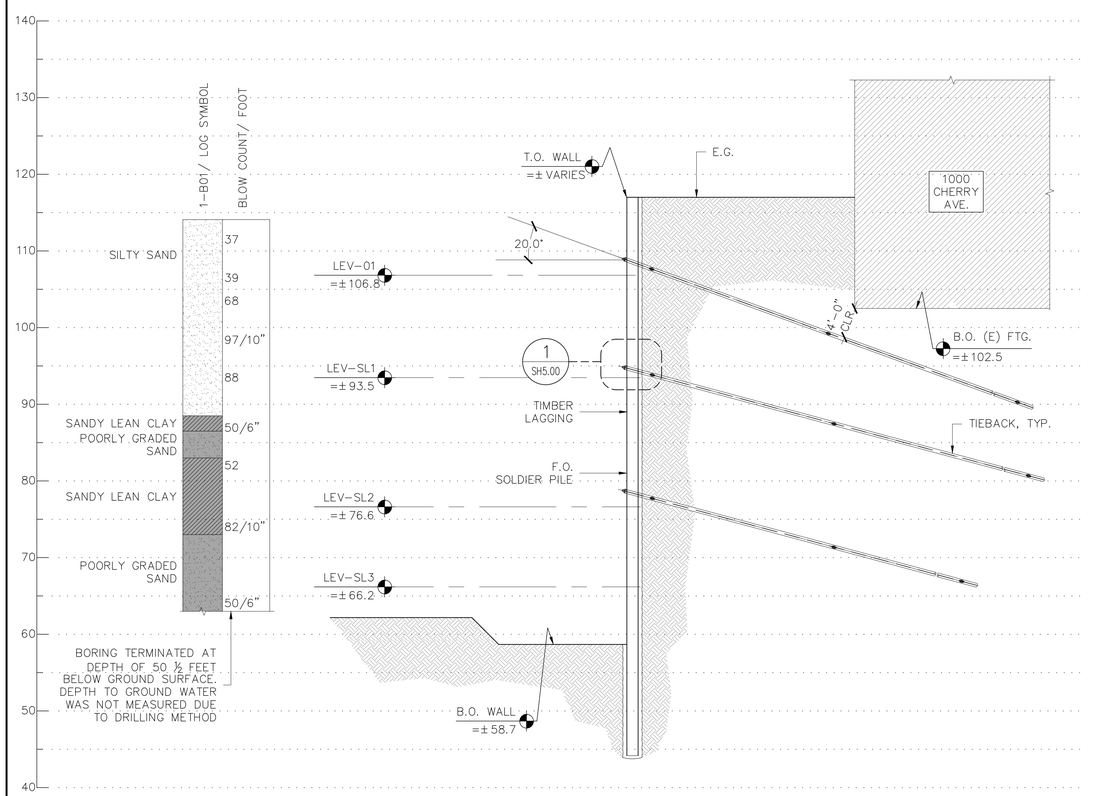

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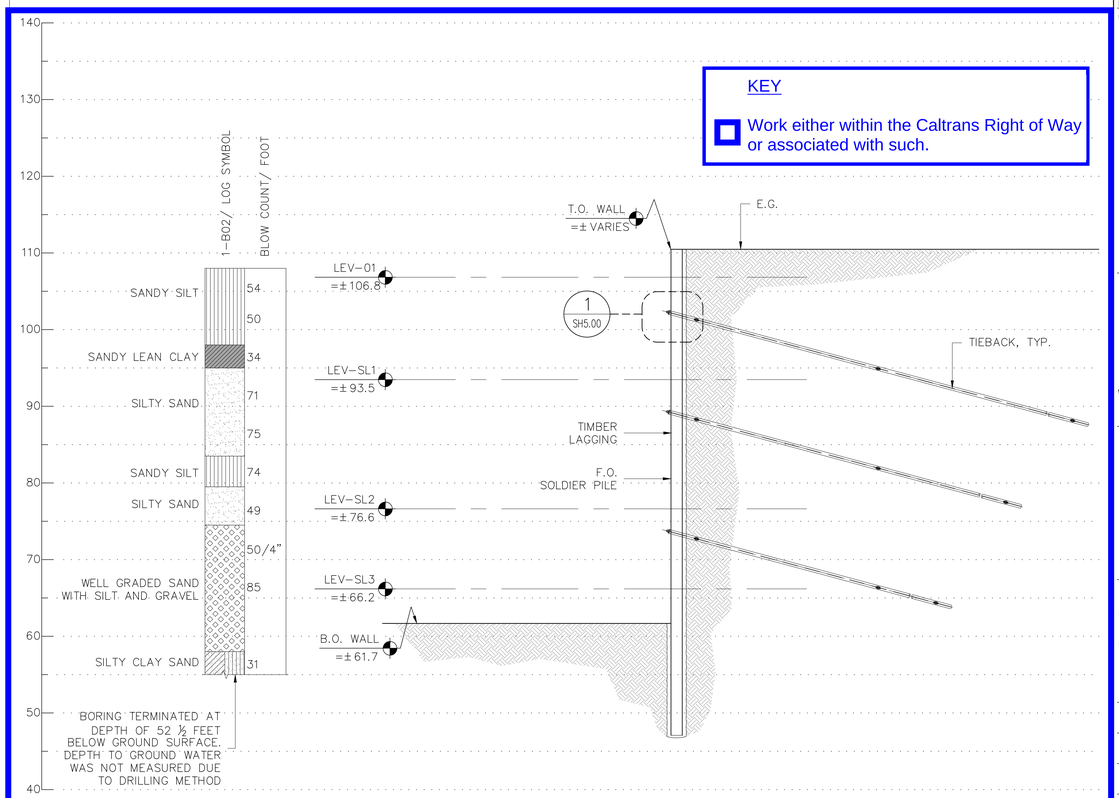

4 SECTION

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

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CASE PACIFIC

NO.	DATE	ISSUES
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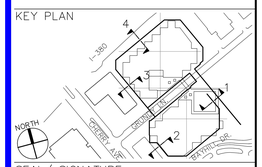
KEY PLAN



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SHEET TITLE

SHORING SECTIONS

PROJECT NO.
192300

SCALE:	DATE:
AS INDICATED	09/21/2020
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PB/BM	ML

SHEET NO.

SH4.00

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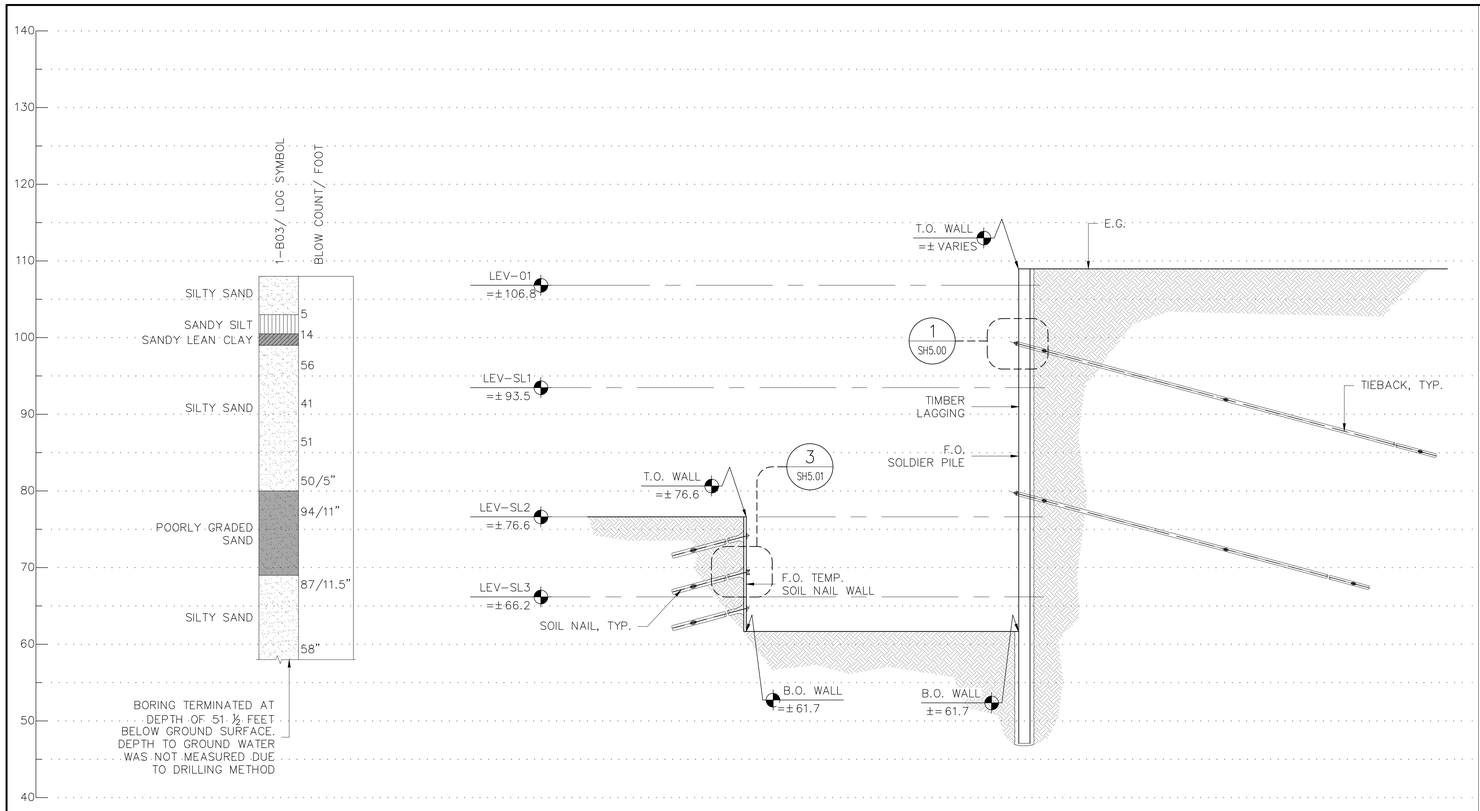

1 SECTION

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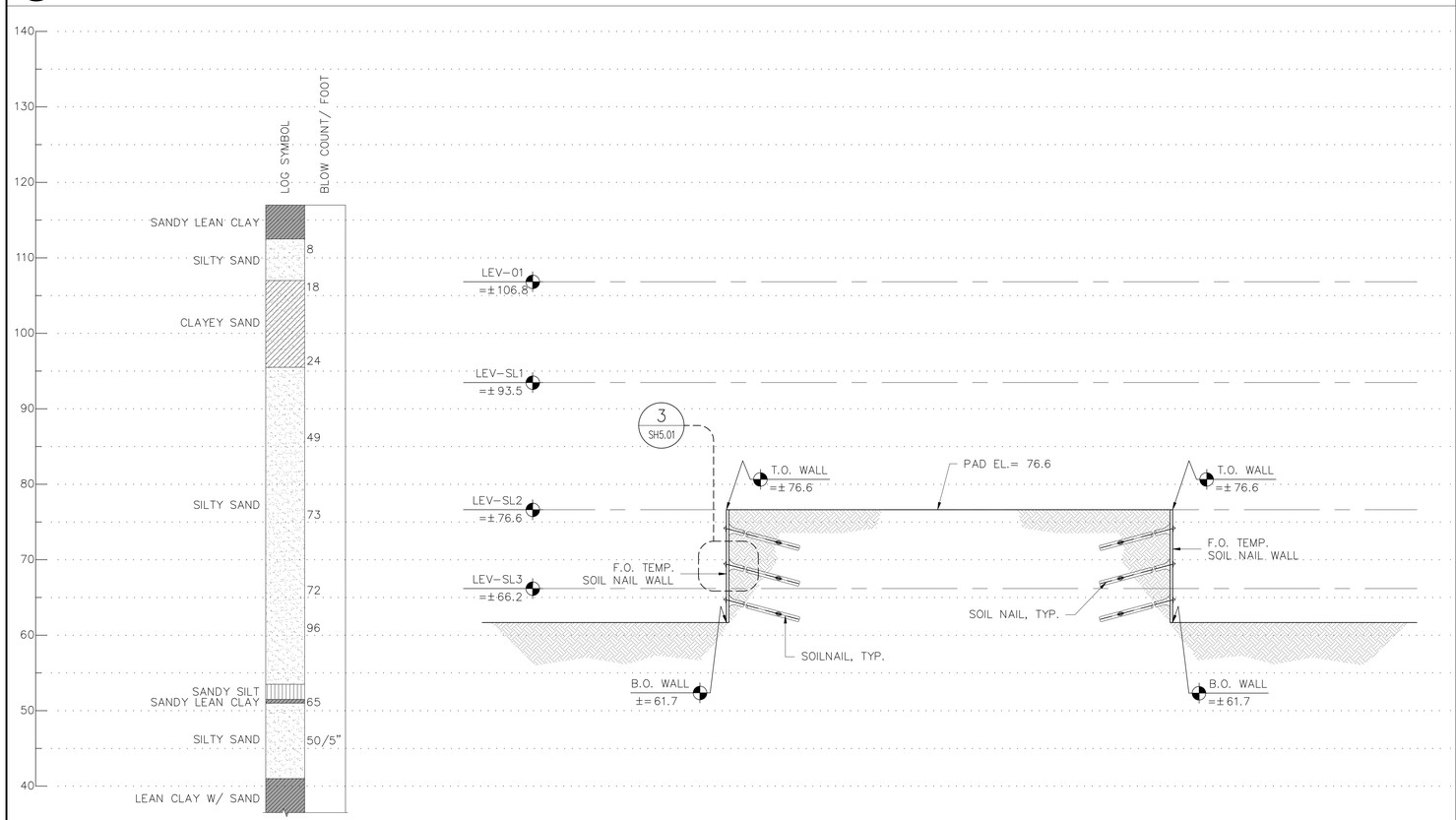

2 SECTION

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

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KEY PLAN

SEAL/ SIGNATURE

REGISTERED PROFESSIONAL ENGINEER PATROZ BAKHSHI CE 26101 SE 2502 Exp.03/31/22 CIVIL & STRUCTURAL STATE OF CALIFORNIA

SHEET TITLE

SHORING SECTIONS

PROJECT NO. 192300

SCALE: AS INDICATED | DATE: 09/21/2020

CHECKED BY: PB/BM | DRAWN BY: ML

SHEET NO.

SH4.01

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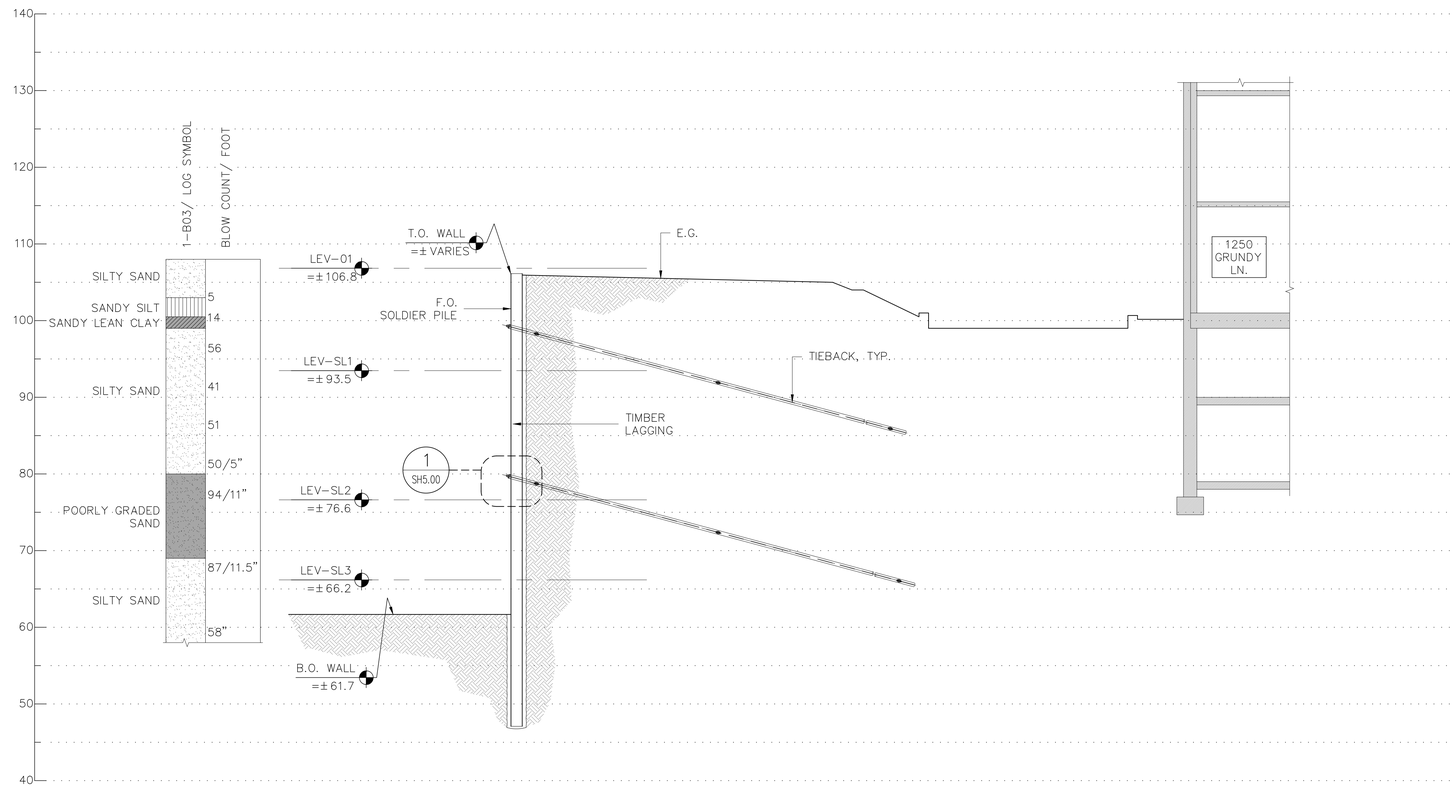

1 SECTION

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

FOUNDATION & MASS EXCAVATION

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CASE PACIFIC

NO.	DATE	ISSUES
0	09/04/20	PERMIT SUBMITTAL

KEY PLAN

SEAL/ SIGNATURE

REGISTERED PROFESSIONAL ENGINEER
PATROZ BAKHSHI
CE 26101
SE 2502
Exp.03/31/22
CIVIL & STRUCTURAL
STATE OF CALIFORNIA

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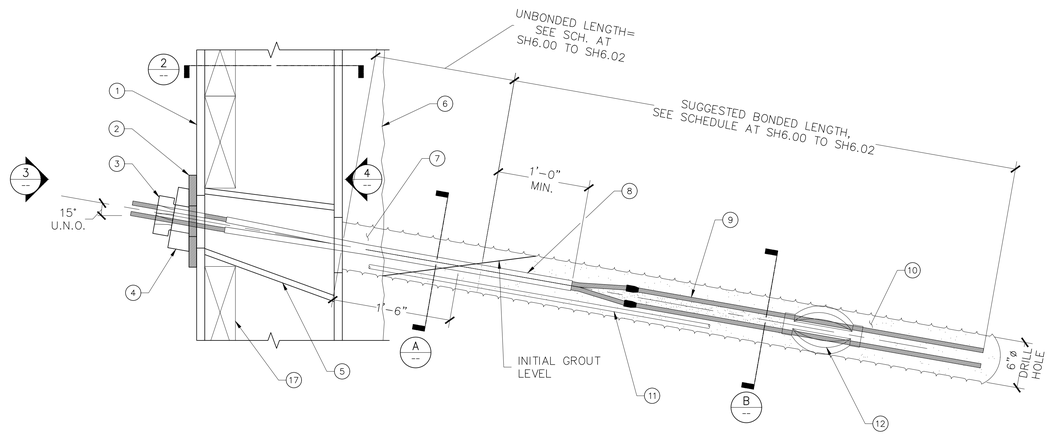
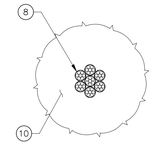


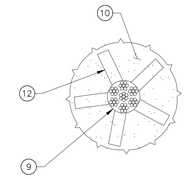
1 TEMPORARY TIEBACK DETAIL

SCALE: 1 1/2" = 1'-0"



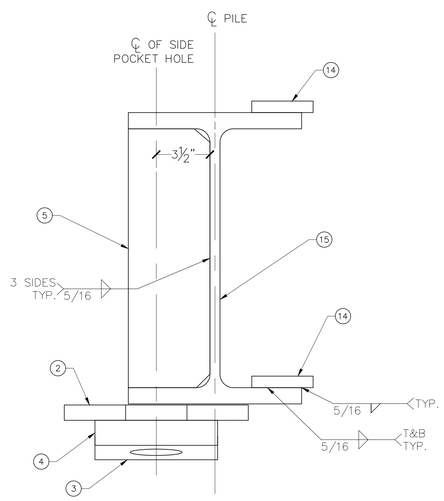
A ANCHOR SECTION AT UNBONDED LENGTH

SCALE: 3" = 1'-0"



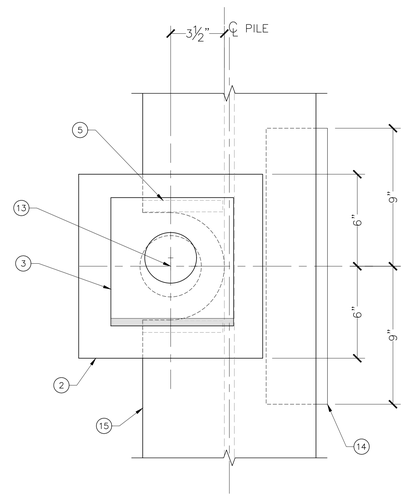
B ANCHOR SECTION AT BONDED LENGTH

SCALE: 3" = 1'-0"



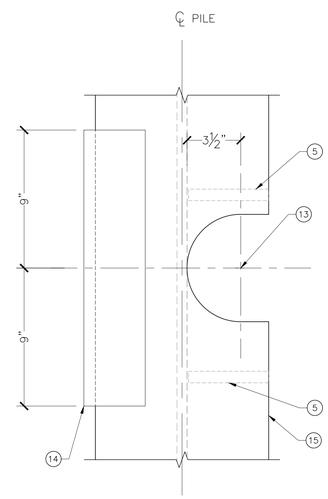
2 PLAN VIEW DETAILS

SCALE: 3" = 1'-0"



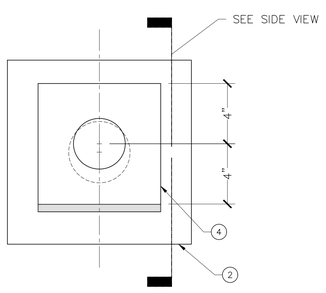
3 FRONT POCKET AND BEARING PLATE DETAIL

SCALE: 3" = 1'-0"

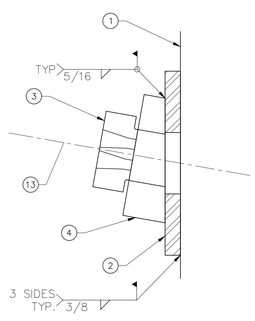


4 BACK POCKET DETAIL

SCALE: 3" = 1'-0"



FRONT VIEW



SIDE VIEW

5 WEDGE AND BEARING PLATE DETAILS

SCALE: 3" = 1'-0"

LEGEND

1. FACE OF PILE
2. 12" SQ. FRONT BEARING PL W/ CENTERED HOLE (TO BE DETERMINED BY MANU. SPEC.)
   UPTO 4 STRANDS, USE 1¾" THICK PL
   MORE THAN 4 STRANDS, USE 2" THICK PL
3. WEDGE GRIPPER
4. 8" SQ. WEDGE PLATE SEAT
5. ¾" THICK STIFFENER PL
6. BACK OF DRILLED HOLE
7. LEAVE GAP IN GROUT BEHIND SOLDIER PILE FINAL GROUT TO BE FILLED AFTER TESTING
8. EXTRUDED AND GREASED SHEATHING IN UNBONDED ZONE
9. BARE 7 STRANDS IN BONDED ZONE
10. CEMENT GROUT FIELD GROUTED
11. POST GROUT TUBE AS REQUIRED
12. CENTRALIZER @ 10'-0" O.C. (3'-0" FROM TIP OF DRILLED HOLE)
13. ℄ TIEBACK
14. ADD PL ¾" THK. X 4" WIDE X 1'-6" LONG
15. SOLDIER PILE
16. EDGE OF 7"ø CUT HOLE AT SOLDIER PILE
17. LAGGING, SEE SH2.01 TO SH2.07

ABBREVIATION

MANU.	MANUFACTURER
O.C.	ON CENTER
SCH.	SCHEDULE
SPEC.	SPECIFICATION
SQ.	SQUARE
T&B	TOP AND BOTTOM
TYP.	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE

FOUNDATION & MASS EXCAVATION

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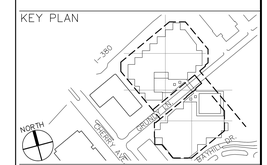

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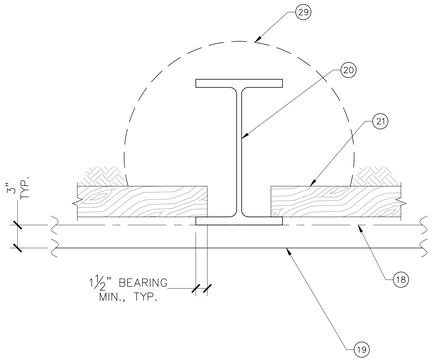
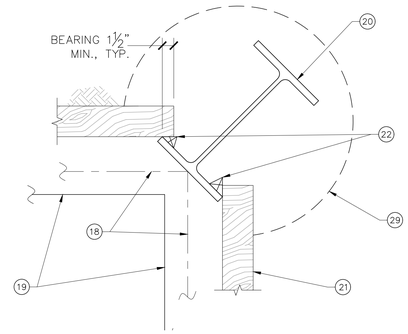
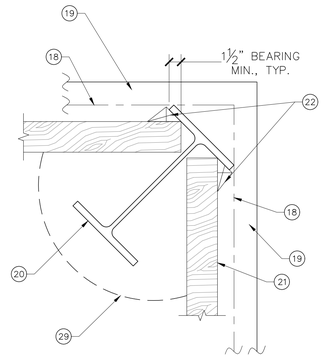


1 TYPICAL LAGGING DETAIL
SCALE: 1 1/2" = 1'-0"



2 LAGGING DETAIL AT OUTSIDE CORNER
SCALE: 1 1/2" = 1'-0"



3 LAGGING DETAIL AT INSIDE CORNER
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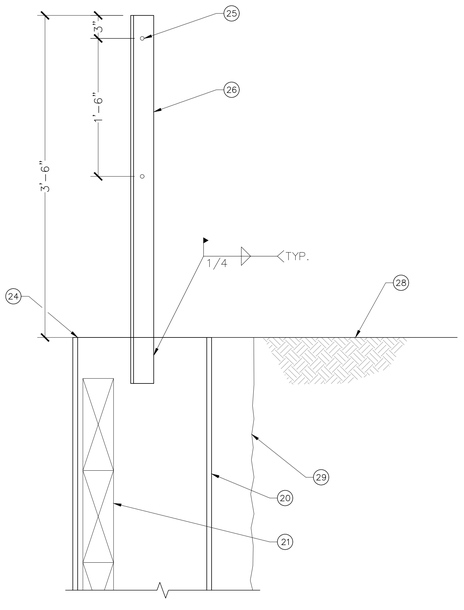
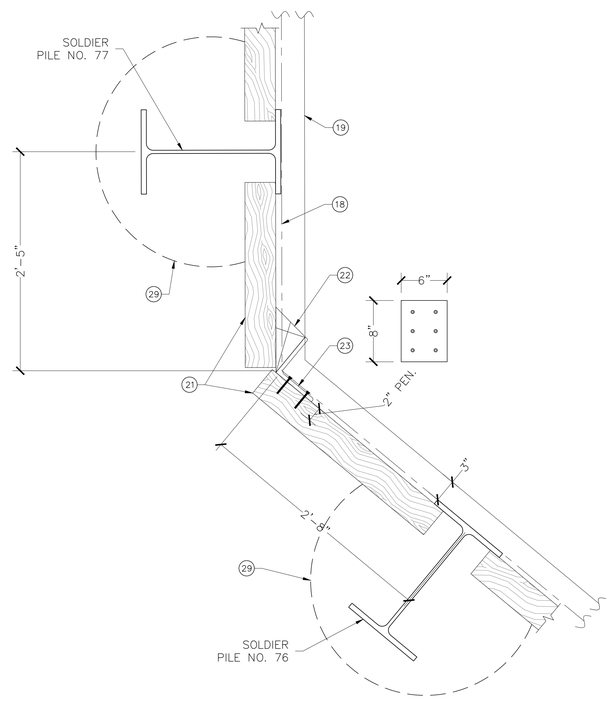


5 SOLDIER PILE SAFETY RAILING (OPTIONAL)
SCALE: 1 1/2" = 1'-0"



4 CORNER DETAIL - PILE NOS. 76 & 77
SCALE: 1 1/2" = 1'-0"

LEGEND

18	FACE OF SHORING
19	FACE OF BUILDING
20	SOLDIER PILE
21	LAGGING, SEE SH2.01 TO SH2.07
22	TIGHT PACK WITH WOOD WEDGE
23	ANGLE IRON 6X6X½ X 8" LONG WITH (6) ½"ø LAG SCREWS
24	TOP OF PILE
25	HOLE FOR ½"ø GALVANIZED CABLE
26	GUARDRAIL L3x3x⅜ X 4'-0" LONG
28	EXISTING GRADE
29	30"ø SHAFT

ABBREVIATION

MIN.	MINIMUM
O.C.	ON CENTER
PEN.	PENETRATION
SQ.	SQUARE
TYP.	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE

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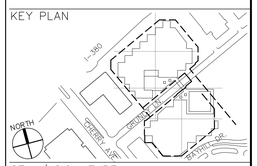

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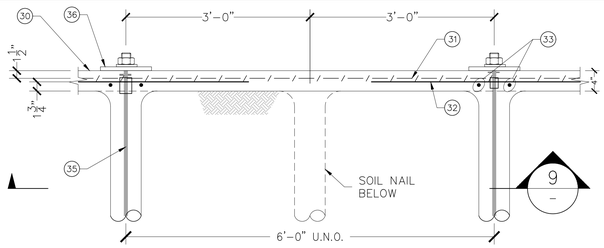
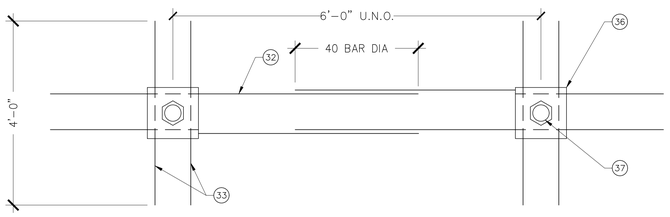


1 TEMPORARY SOILNAIL DETAIL
SCALE: 1" = 1'-0"



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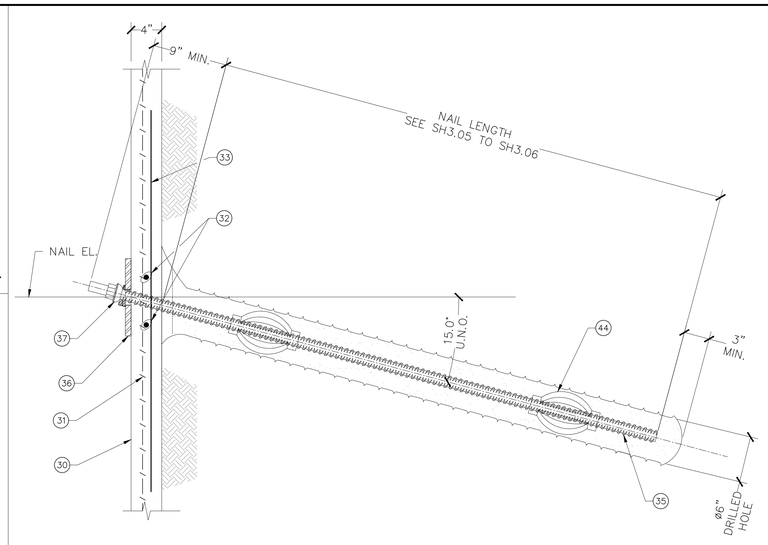

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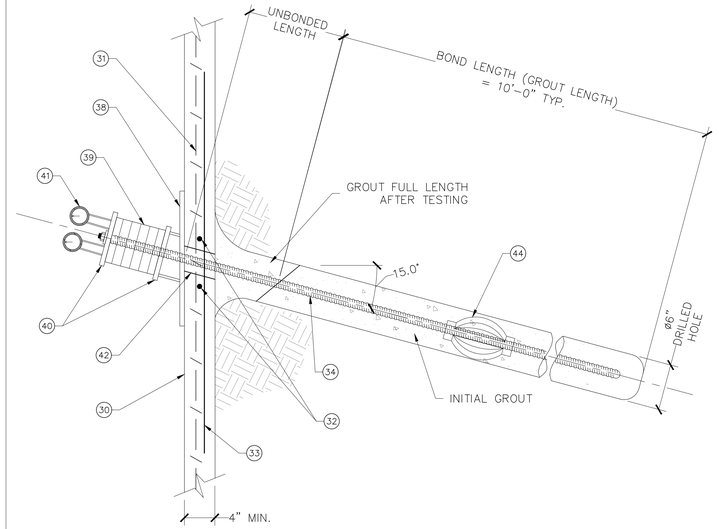

4 TEST-NAIL DETAIL
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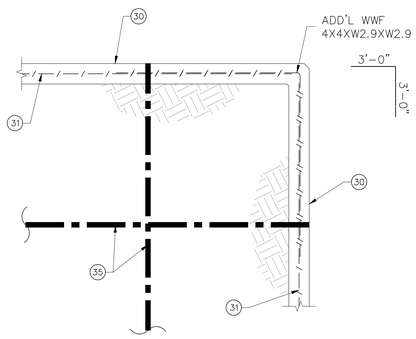
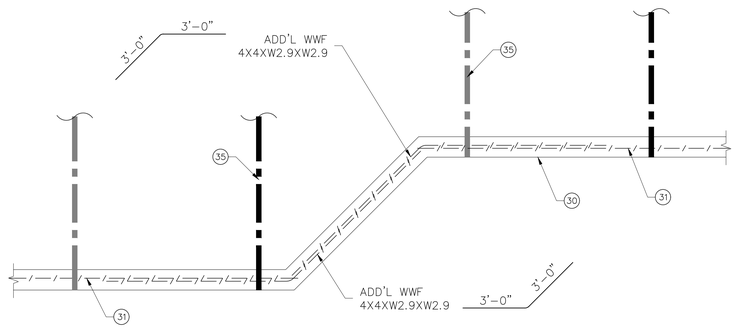
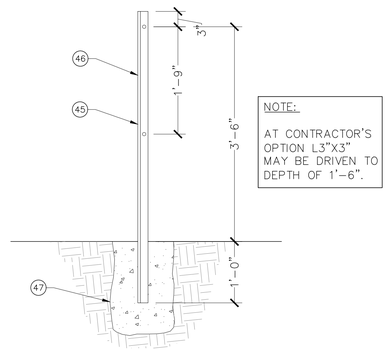


5 CORNER WALL DETAIL
SCALE: 1" = 1'-0"



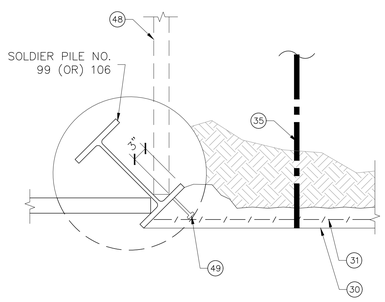
6 CORNER WALL DETAIL
SCALE: 1" = 1'-0"



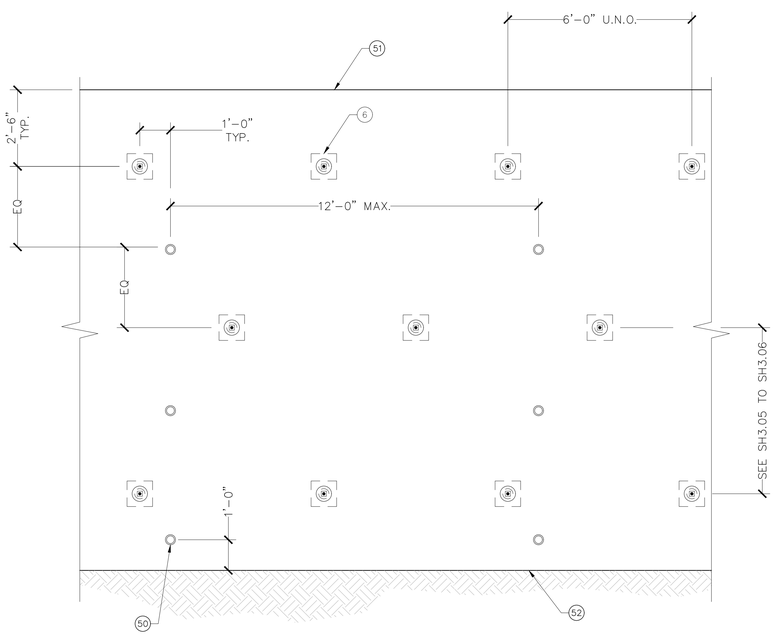
NOTE:

AT CONTRACTOR'S OPTION L3"X3" MAY BE DRIVEN TO DEPTH OF 1'-6".

7 SOIL NAIL SAFETY RAILING (OPTIONAL)
SCALE: 1" = 1'-0"



8 SOLDIER PILE TO SOILNAIL WALL TRANSITION DETAIL
SCALE: 1" = 1'-0"



9 PARTIAL WALL ELEVATION DETAIL
SCALE: NTS

LEGEND

30	FACE OF 4" INITIAL LAYER SHOTCRETE WALL
31	WELDED WIRE FABRIC 4X4 – W2.9XW2.9
32	(2) #4 HORIZ. WALER BARS BY 4'-0" AT EACH LEVEL OF SOIL NAILS
33	(2) #4 VERT. BARS BY 4'-0" CENTERED @ NAIL TIP
34	TEST NAIL
35	SOIL NAIL, TYP.
36	BEARING PL ¼"X0'-8"X0'-8" W/ +1/16" OVERSIZED HOLE FOR SOIL NAIL
37	BEVELED WASHER AND NUT
38	TEST PL 1"X18"X1'-6"
39	HYDRAULIC JACK
40	JACK SUPPORT
41	DIAL GAUGE ATTACHED TO SUPPORT INDEPENDENT OF WALL
42	PVC BLOCKOUT
44	PLASTIC CENTRALIZER @ 10'-0" O.C., MIN 2 PER NAIL
45	L3X3X⅜ – 36 KSI 6'-0" O.C.
46	HOLE FOR ½"ø GALVANIZED CABLE
47	HAND DUG PIT 12" SQ. X 1'-6" DEEP FILL W/ 200 PSI SLURRY MIX
48	TIMBER LAGGING, ABOVE
49	NELSON TYPE S3L, ¾–3⅞ MS, PART NO. 101-098-127 @ 24" O.C.
50	3" PVC OUTLET WEEP HOLE, TYP.
51	TOP OF WALL
52	BOTTOM OF WALL

ABBREVIATION

ADD'L	ADDITIONAL
HORZ.	HORIZONTAL
MIN.	MINIMUM
O.C.	ON CENTER
SCH.	SCHEDULE
SQ.	SQUARE
T&B	TOP AND BOTTOM
TYP.	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
VERT.	VERTICAL

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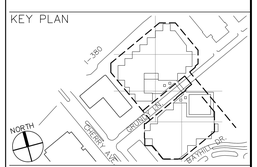
CASE PACIFIC

NO.	DATE	ISSUES
0	09/04/20	PERMIT SUBMITTAL

KEY PLAN



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REGISTERED PROFESSIONAL ENGINEER
PIROOZ BARAHI
CE 26101
SE 2502
Exp.03/31/22
CIVIL
STRUCTURAL
STATE OF CALIFORNIA

SHEET TITLE

SHORING DETAILS

PROJECT NO.
192300

SCALE: AS INDICATED
DATE: 09/21/2020
CHECKED BY: PB/BM
DRAWN BY: ML
SHEET NO.

SH5.02

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PILE NO.	W SHAPE	DESIGN HEGHT (FT)	EMBED (FT)	TOTAL LENGTH (FT)	TOP OF PILE ELEV.(FT)	TB1 (TOP)						TB2						TB3					
						ELEV (FT)	DL (KIP)	TL(KIP)	UBL (FT)	BL (FT)	NO. STRANDS	ELEV (FT)	DL (KIP)	TL(KIP)	UBL (FT)	BL (FT)	NO. STRANDS	ELEV (FT)	DL (KIP)	TL(KIP)	UBL (FT)	BL (FT)	NO. STRANDS
1	W18X119	4.58	17	22	66.76		–	–	–	–	–		–	–	–	–	–		–	–	–	–	–
2	W18X119	5.38	17	23	67.56		–	–	–	–	–		–	–	–	–	–		–	–	–	–	–
3	W18X119	6.17	17	24	68.35		–	–	–	–	–		–	–	–	–	–		–	–	–	–	–
4	W18X119	6.96	17	24	69.14		–	–	–	–	–		–	–	–	–	–		–	–	–	–	–
5	W18X119	7.75	17	25	69.93		–	–	–	–	–		–	–	–	–	–		–	–	–	–	–
6	W18X119	8.54	17	26	70.72		–	–	–	–	–		–	–	–	–	–		–	–	–	–	–
7	W18X119	9.34	17	27	71.52		–	–	–	–	–		–	–	–	–	–		–	–	–	–	–
8	W18X119	10.13	17	28	72.31		–	–	–	–	–		–	–	–	–	–		–	–	–	–	–
9	W18X119	10.92	17	28	73.1		–	–	–	–	–		–	–	–	–	–		–	–	–	–	–
10	W18X119	11.71	17	29	73.89		–	–	–	–	–		–	–	–	–	–		–	–	–	–	–
11	W18X119	12.5	17	30	74.68		–	–	–	–	–		–	–	–	–	–		–	–	–	–	–
12	W18X46	13.29	10	24	75.47	70	100	133	15	15	3												
13	W18X46	14.17	10	25	76.35	70	100	133	15	15	3												
14	W18X46	15.04	10	26	77.22	70	100	133	15	15	3												
15	W18X46	15.91	10	26	78.09	71.12	100	133	15	15	3												
16	W18X46	16.78	10	27	78.96	71.12	100	133	15	15	3												
17	W18X46	17.65	10	28	79.83	71.62	100	133	15	15	3												
18	W18X46	18.52	10	29	80.7	72.58	100	133	15	15	3												
19	W18X46	19.39	10	30	81.57	72.62	100	133	15	15	3												
20	W18X46	20.25	10	31	82.43	73.19	100	133	15	15	3												
21	W18X46	21.12	10	32	83.3	78.62	100	133	15	15	3												
22	W18X46	21.99	10	32	84.17	78.67	100	133	15	15	3												
23	W18X46	23.01	10	34	85.19	78.62	100	133	15	15	3												
24	W18X46	27.02	10	38	89.2	81.46	132	176	15	20	4	72.62	132	176	15	20	4						
25	W18X46	31.02	10	42	93.2	84.84	132	176	15	20	4	72.62	132	176	15	20	4						
26	W18X46	35.02	10	46	97.2	88.68	132	176	15	20	4	72.62	132	176	15	20	4						
27	W18X71	39.75	10	50	101.93	88.68	195	260	15	29	6	72.62	210	280	15	31	6						
28	W18X71	40.19	10	51	102.37	95.48	195	260	16	29	6	78.62	210	280	15	31	6						
29	W18X71	40.72	10	51	102.9	95.48	195	260	16	29	6	78.62	210	280	15	31	6						
30	W18X71	41.25	10	52	103.43	95.48	195	260	16	29	6	78.62	210	280	15	31	6						
31	W18X71	41.78	10	52	103.96	95.94	195	260	16	29	6	78.62	210	280	15	31	6						
32	W18X71	42.31	10	53	104.49	96.48	195	260	16	29	6	78.62	210	280	15	31	6						
33	W18X71	42.84	10	53	105.02	96.87	195	260	17	29	6	78.62	210	280	15	31	6						
34	W18X71	43.38	10	54	105.56	97.56	195	260	17	29	6	78.62	210	280	15	31	6						
35	W18X71	43.91	10	54	106.09	98.05	195	260	17	29	6	78.62	210	280	15	31	6						
36	W18X71	44.44	10	55	106.62	98.62	195	260	17	29	6	78.62	210	280	15	31	6						
37	W18X71	44.97	10	55	107.15	99.12	195	260	18	29	6	78.62	210	280	15	31	6						
38	W18X65	45.5	10	56	107.68	98.68	185	247	18	28	6	89.48	190	253	15	29	6	72.62	190	253	15	29	6
39	W18X65	46.04	10	57	108.22	99.2	185	247	18	28	6	89.48	190	253	15	29	6	72.62	190	253	15	29	6
40	W18X65	46.57	10	57	108.75	99.76	185	247	18	28	6	89.48	190	253	15	29	6	72.62	190	253	15	29	6
41	W18X65	47.1	10	58	109.28	100.22	185	247	18	28	6	89.48	190	253	15	29	6	72.62	190	253	15	29	6
42	W18X65	47.63	10	58	109.81	100.81	185	247	19	28	6	89.48	190	253	15	29	6	72.62	190	253	15	29	6
43	W18X65	48.16	10	59	110.34	101.31	185	247	19	28	6	89.48	190	253	15	29	6	72.62	190	253	15	29	6
44	W18X65	48.69	10	59	110.87	101.82	185	247	19	28	6	89.48	190	253	15	29	6	72.62	190	253	15	29	6
45	W18X65	49.23	10	60	111.41	102.41	185	247	19	28	6	89.48	190	253	15	29	6	72.62	190	253	15	29	6
46	W18X65	49.76	10	60	111.94	102.92	185	247	19	28	6	89.48	190	253	15	29	6	72.62	190	253	15	29	6
47	W18X65	50.29	10	61	112.47	102.86	185	247	19	28	6	89.48	190	253	15	29	6	72.62	190	253	15	29	6
48	W18X76	53.82	10	64	113	102.97	226	301	21	34	7	88.18	222	296	15	33	7	72.62	217	289	15	32	7
49	W18X76	54.35	10	65	113.53	103.53	226	301	21	34	7	88.18	222	296	15	33	7	72.62	217	289	15	32	7
50	W18X76	54.88	10	65	114.06	104.03	226	301	21	34	7	88.18	222	296	15	33	7	72.62	217	289	15	32	7
51	W18X76	55.4	10	66	114.58	103.83	226	301	21	34	7	88.18	222	296	15	33	7	72.62	217	289	15	32	7
52	W18X76	55.93	10	66	115.11	109.18	160	213	24	24	5	89.98	161	215	15	24	5	72.62	213	284	15	32	7
53	W18X76	56.32	10	67	115.5	109.18	160	213	24	24	5	89.98	161	215	15	24	5	72.62	213	284	15	32	7
54	W18X76	56.71	10	67	115.89	109.18	160	213	24	24	5	90	161	215	15	24	5	72.62	213	284	15	32	7
55	W18X71	54.99	10	65	116.67	109.18	160	213	23	24	5	95.48	161	215	16	24	5	78.62	213	284	15	32	7
56	W18X71	56.32	10	67	118	109.18	160	213	23	24	5	95.48	161	215	16	24	5	78.62	213	284	15	32	7
57	W18X71	56.32	10	67	118	109.18	160	213	23	24	5	95.48	161	215	16	24	5	78.62	213	284	15	32	7
58	W18X71	56.32	10	67	118	109.18	160	213	23	24	5	95.48	161	215	16	24	5	78.62	213	284	15	32	7
59	W18X71	56.32	10	67	118	109.18	160	213	23	24	5	95.48	161	215	16	24	5	78.62	213	284	15	32	7
60	W18X71	55.82	10	66	118	109.18	160	213	22	24	5	95.48	161	215	16	24	5	78.62	213	284	15	32	7
61	W18X71	55.82	10	66	118	109.18	160	213	22	24	5	95.48	161	215	16	24	5	78.62	213	284	15	32	7
62	W18X71	55.82	10	66	118	109.18	160	213	22	24	5	95.48	161	215	16	24	5	78.62	213	284	15	32	7
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65	W18X71	54.82	10	65	117	109.18	160	213	22	24	5	95.48	161	215	16	24	5	78.62	213	284	15	32	7
66	W18X71	54.82	10	65	117	109.18	160	213	22	24	5	95.48	161	215	16	24	5	78.62	213	284	15	32	7
67	W18X71	54.82	10	65	117	109.18	160	213	22	24	5	95.48	161	215	16	24	5	78.62	213	284	15	32	7
68	W18X71	54.82	10	65	117	109.18	160	213	22	24	5	95.48	161	215	16	24	5	78.62	213	284	15	32	7
69	W18X71	54.82	10	65	117	109.18	160	213	22	24	5	95.48	161	215	16	24	5	78.62	213	284	15	32	7
70	W18X71	54.82	10	65	117	109.18	160	213	22	24	5	95.48	161	215	16	24	5	78.62	213	284	15	32	7
71	W18X71	54.82	10	65	117.01	111.18	160	213	23	24	5	95.48	161	215	16	24	5	78.62	213	284	15	32	7
72	W18X71	54.98	10	65	117.16	111.18	146	195	23	22	5	95.48	176	235	16	26	6	78.62	187	249	15	28	6
73	W18X71	55.12	10	66	117.3	111.18	146	195	23	22	5	95.48	176	235	16	26	6	78.62	187	249	15	28	6
74	W18X71	55.26	10	66	117.44	111.18	146	195	23	22	5	95.48	176	235	16	26	6	78.62	187	249	15	28	6
75	W18X71	55.4	10	66	117.58	111.18	146	195	23	22	5	95.48	176	235	16	26	6	78.62	187	249	15	28	6
76	W18X71	55.55	10	66	117.73	111.18	146	195	23	22	5	95.48	176	235	16	26	6	78.62	187	249	15	28	6
77	W18X76	55.69	10	66	117.87	111.18	146	195	23	22	5	95.48	176	235	16	26	6	78.62	187	249	15	28	6
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82	W18X71	55.82	10	66	118	111.18	146	195	23	22	5	95.48	176	235	16	26	6	78.62	187	249	15	28	6
83	W18X71	55.82	10	66	118	111.18	146	195	23	22	5	95.48	176	235	16	26	6	78.62	187	249	15	28	6
84	W18X71	55.82	10	66	118	111.18	146	195	23	22	5	95.48	176	235	16	26	6	78.62	187	249	15	28	6
85	W18X71	55.82	10	66	118.01	111.18	146	195	23	22	5	95.48	176	235	16	26	6	78.62	187	249	15	28	6
86	W18X71	55.9	10	66	118.08	111.18	146	195	23	22	5	95.48	176	235	16	26	6	78.62	187	249	15	28	6
87	W18X71	55.97	10	66	118.15	111.18	146	195	23	22	5	95.48	176	235	16	26	6	78.62	187	249	15	28	6
88	W18X71	56.04	10	67	118.22	111.18	227	302	23	34	7	95.48	211	281	16	32	6	78.62	276	368	15	41	8
89	W18X86	56.15	10	67	118.33	110.18	227	302	23	34	7	95.48	211	281	16	32	6	78.62	276	368	15	41	8
90	W18X86	56.26	10	67	118.44	110.18	227	302	23	34	7	95.48	211	281	16	32	6	78.62	276	368	15	41	8
91	W18X86	56.37	10	67	118.55	110.18	227	302	23	34	7	95.48	211	281	16	32	6	78.62	276	368	15	41	8
92	W18X86	56.48	10	67	118.66	110.18	227	302	23	34	7	95.48	211	281	16	32	6	78.62	276	368	15	41	8
93	W18X86	56.59	10	67	118.77	110.18	227	302	23	34	7	95.48	211	281	16	32	6	78.62	276	368	15	41	8

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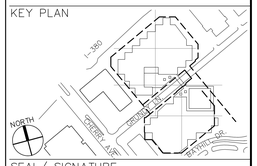
CASE PACIFIC

NO.	DATE	ISSUES
0	09/04/20	PERMIT SUBMITTAL

KEY PLAN



SEAL/ SIGNATURE

SHEET TITLE

SHORING SCHEDULES
SOLDIER PILES AND TIEBACKS

PROJECT NO.
192300

SCALE: AS INDICATED
DATE: 09/21/2020

CHECKED BY: PB/BM
DRAWN BY: ML

SHEET NO.
SH6.00

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PILE NO.	W SHAPE	DESIGN HEGHT (FT)	EMBED (FT)	TOTAL LENGTH (FT)	TOP OF PILE ELEV.(FT)	TB1 (TOP)						TB2						TB3					
						ELEV (FT)	DL (KIP)	TL(KIP)	UBL (FT)	BL (FT)	NO. STRANDS	ELEV (FT)	DL (KIP)	TL(KIP)	UBL (FT)	BL (FT)	NO. STRANDS	ELEV (FT)	DL (KIP)	TL(KIP)	UBL (FT)	BL (FT)	NO. STRANDS
94	W18X86	57.2	10	68	118.88	110.18	227	302	23	34	7	95.48	211	281	16	32	6	78.62	276	368	15	41	8
95	W18X86	27.31	10	38	118.99	110.18	227	302	15	34	7	95.48	211	281	15	32	6	78.62	276	368	15	41	8
96	W18X86	57.41	10	68	119.09	110.18	227	302	23	34	7	95.48	211	281	16	32	6	78.62	276	368	15	41	8
97	W18X86	57.53	10	68	119.21	110.18	227	302	23	34	7	95.48	211	281	16	32	6	78.62	276	368	15	41	8
98	W18X106	60.64	12	73	119.32	110.18	236	314	25	35	7	95.48	235	313	18	35	7	78.62	325	433	15	48	10
99	W18X86	57.76	10	68	119.44	110.18	227	302	23	34	7	95.48	211	281	16	32	6	78.62	276	368	15	41	8
100	W18X71	43.23	10	54	119.36	109.83	195	260	16	29	6	95.48	210	280	15	31	6						
101	W18X71	42.66	10	53	119.29	109.83	195	260	16	29	6	95.48	210	280	15	31	6						
102	W18X71	42.59	10	53	119.21	109.83	195	260	16	29	6	95.48	210	280	15	31	6						
103	W18X71	42.52	10	53	119.14	109.83	195	260	16	29	6	95.48	210	280	15	31	6						
104	W18X71	42.45	10	53	119.07	109.83	195	260	16	29	6	95.48	210	280	15	31	6						
105	W18X71	42.37	10	53	119	109.83	195	260	16	29	6	95.48	210	280	15	31	6						
106	W18X86	57.25	10	68	118.93	109.83	227	302	23	34	7	95.48	211	281	16	32	6	78.62	276	368	15	41	8
107	W18X86	57.17	10	68	118.85	109.83	227	302	23	34	7	95.48	211	281	16	32	6	78.62	276	368	15	41	8
108	W18X97	57.11	11	69	118.79	108.83	235	313	22	35	7	95.61	205	273	16	31	6	78.62	275	366	15	41	8
109	W18X97	57.05	11	69	118.73	108.83	235	313	22	35	7	95.61	205	273	16	31	6	78.62	275	366	15	41	8
110	W18X97	56.98	11	68	118.66	108.83	235	313	22	35	7	95.61	205	273	16	31	6	78.62	275	366	15	41	8
111	W18X97	56.92	11	68	118.6	108.83	235	313	22	35	7	95.61	205	273	16	31	6	78.62	275	366	15	41	8
112	W18X97	56.85	11	68	118.53	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
113	W18X97	59.79	11	71	118.47	108.83	218	290	24	33	7	95.61	188	251	18	28	6	78.62	280	373	15	42	8
114	W18X97	59.73	11	71	118.41	108.83	218	290	24	33	7	95.61	188	251	18	28	6	78.62	280	373	15	42	8
115	W18X97	56.66	11	68	118.34	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
116	W18X97	56.6	11	68	118.28	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
117	W18X97	56.54	11	68	118.22	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
118	W18X97	56.47	11	68	118.15	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
119	W18X97	56.41	11	68	118.09	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
120	W18X97	56.34	11	68	118.02	108.83	218	327	22	33	7	95.61	188	282	16	28	7	78.62	280	420	15	42	9
121	W18X97	56.28	11	68	117.96	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
122	W18X97	56.22	11	68	117.9	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
123	W18X97	56.15	11	68	117.83	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
124	W18X97	59.09	11	71	117.77	108.83	218	290	24	33	7	95.61	188	251	18	28	6	78.62	280	373	15	42	8
125	W18X97	59.03	11	71	117.71	108.83	218	290	24	33	7	95.61	188	251	18	28	6	78.62	280	373	15	42	8
126	W18X97	55.96	11	67	117.64	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
127	W18X97	55.9	11	67	117.58	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
128	W18X97	55.83	11	67	117.51	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
129	W18X97	55.77	11	67	117.45	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
130	W18X97	55.71	11	67	117.39	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
131	W18X97	55.64	11	67	117.32	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
132	W18X97	55.58	11	67	117.26	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
133	W18X97	55.52	11	67	117.2	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
134	W18X97	55.45	11	67	117.13	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
135	W18X97	55.39	11	67	117.07	108.83	235	313	22	35	7	95.61	205	273	16	31	6	78.62	275	366	15	41	8
136	W18X97	55.32	11	67	117	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
137	W18X97	55.26	11	67	116.94	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
138	W18X97	55.2	11	67	116.88	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
139	W18X97	55.14	11	67	116.82	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
140	W18X97	55.08	11	67	116.76	108.83	218	327	22	33	7	95.61	188	282	16	28	7	78.62	280	420	15	42	9
141	W18X97	55.02	11	67	116.7	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
142	W18X97	54.95	11	66	116.63	108.83	218	290	22	33	7	95.61	188	251	16	28	6	78.62	280	373	15	42	8
143	W18X76	54.76	10	65	116.44	109.83	179	239	23	27	6	96.48	206	274	17	31	6	79.63	259	345	15	39	8
144	W18X76	54.55	10	65	116.23	109.83	179	239	23	27	6	96.48	206	274	17	31	6	79.63	259	345	15	39	8
145	W18X76	54.35	10	65	116.03	109.83	179	239	23	27	6	96.48	206	274	17	31	6	79.63	259	345	15	39	8
146	W18X76	54	10	64	115.68	109.83	179	239	23	27	6	96.48	206	274	17	31	6	79.63	259	345	15	39	8
147	W18X76	53.62	10	64	115.3	109.83	179	239	23	27	6	96.48	206	274	17	31	6	79.63	259	345	15	39	8
148	W18X76	53.24	10	64	114.92	109.83	179	239	23	27	6	96.48	206	274	17	31	6	79.63	259	345	15	39	8
149	W18X76	52.83	10	63	114.51	109.83	179	239	23	27	6	96.48	206	274	17	31	6	79.63	259	345	15	39	8
150	W18X76	52.43	10	63	114.11	109.83	179	239	23	27	6	96.48	206	274	17	31	6	79.63	259	345	15	39	8
151	W18X76	51.96	10	62	113.64	109.83	179	239	23	27	6	96.48	206	274	17	31	6	79.63	259	345	15	39	8
152	W18X76	51.48	10	62	113.16	109.83	179	239	23	27	6	96.48	206	274	17	31	6	79.63	259	345	15	39	8
153	W18X76	51.16	10	62	112.84	109.83	179	239	23	27	6	96.48	206	274	17	31	6	79.63	259	345	15	39	8
154	W18X76	50.91	10	61	112.59	102.18	179	239	19	27	6	89.18	206	274	15	31	6	73.62	259	345	15	39	8
155	W18X76	50.67	10	61	112.35	102.18	179	239	19	27	6	89.18	206	274	15	31	6	73.62	259	345	15	39	8
156	W18X76	50.43	10	61	112.11	102.18	179	239	19	27	6	89.18	206	274	15	31	6	73.62	259	345	15	39	8
157	W18X71	50.12	10	61	111.8	102.18	194	259	19	29	6	89.18	173	231	15	26	5	73.63	192	345	15	29	8
158	W18X71	49.76	10	60	111.44	102.18	194	259	19	29	6	89.18	173	231	15	26	5	73.63	192	345	15	29	8
159	W18X71	49.39	10	60	111.07	102.18	194	259	19	29	6	89.18	173	231	15	26	5	73.63	192	345	15	29	8
160	W18X71	49.1	10	60	110.78	102.18	194	259	19	29	6	89.18	173	231	15	26	5	73.63	192	345	15	29	8
161	W18X71	48.82	10	59	110.5	102.18	194	259	19	29	6	89.18	173	231	15	26	5	73.63	192	345	15	29	8
162	W18X71	48.54	10	59	110.22	102.18	194	259	19	29	6	89.18	173	231	15	26	5	73.63	192	345	15	29	8
163	W18X71	48.28	10	59	109.96	102.18	194	259	19	29	6	89.18	173	231	15	26	5	73.63	192	345	15	29	8
164	W18X71	48.08	10	59	109.76	102.18	194	259	19	29	6	89.18	173	231	15	26	5	73.63	192	345	15	29	8
165	W18X71	47.88	10	58	109.56	102.18	194	259	19	29	6	89.18	173	231	15	26	5	73.63	192	345	15	29	8
166	W18X71	47.68	10	58	109.36	102.18	194	259	19	29	6	89.18	173	231	15	26	5	73.63	192	345	15	29	8
167	W18X76	47.48	10	58	109.16	99.18	207	311	18	31	7	79.63	240	360	15	36	8						
168	W18X76	47.3	10	58	108.98	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
169	W18X76	47.19	10	58	108.87	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
170	W18X76	47.08	10	58	108.76	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
171	W18X76	46.98	10	57	108.66	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
172	W18X76	46.87	10	57	108.55	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
173	W18X71	49.76	10	60	109.36	99.18	194	259	19	29	6	89.18	173	231	15	26	5	73.63	192	345	15	29	8
174	W18X76	46.66	10	57	108.34	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
175	W18X76	46.55	10	57	108.23	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
176	W18X76	46.44	10	57	108.12	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
177	W18X76	46.33	10	57	108.02	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
178	W18X76	46.12	10	57	107.8	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
179	W18X76	45.89	10	56	107.57	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
180	W18X76	45.67	10	56	107.35	99.18	207	311	18	31	7	79.63	240	360	15	36	8						
181	W18X97	48.45	10	59	107.13	99.18	185	247	19	28	6	79.63	271	361	15	40	8						
182	W18X97	48.22	10	59	106.9	99.18	185	247	19	28	6	79.63	271	361	15	40	8						
183	W18X97	48	10	58	106.68	99.18	185	247	19	28	6	79.63	271	361	15	40	8						
184	W18X97	47.78	10	58	106.46	99.18	185	247	19	28	6	79.63	271	361	15	40	8						
185	W18X76	47.56	10	58	106.24	99.18	207	276	19	31	6	79.63	240	320	15	36	7						

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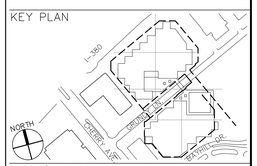
CASE PACIFIC

NO.	DATE	ISSUES
0	09/04/20	PERMIT SUBMITTAL

KEY PLAN



SEAL/ SIGNATURE

REGISTERED PROFESSIONAL ENGINEER
PATRICK BARNES
CE 26101
SE 2502
Exp.03/31/22
CIVIL & STRUCTURAL
STATE OF CALIFORNIA

SHEET TITLE

SHORING SCHEDULES
SOLDIER PILES AND TIEBACKS

PROJECT NO.
192300

SCALE: AS INDICATED
DATE: 09/21/2020

CHECKED BY: PB/BM
DRAWN BY: ML

SHEET NO.

SH6.01

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PILE NO.	W SHAPE	DESIGN HEGHT (FT)	EMBED (FT)	TOTAL LENGTH (FT)	TOP OF PILE ELEV.(FT)	TB1 (TOP)						TB2						TB3					
						ELEV (FT)	DL (KIP)	TL(KIP)	UBL (FT)	BL (FT)	NO. STRANDS	ELEV (FT)	DL (KIP)	TL(KIP)	UBL (FT)	BL (FT)	NO. STRANDS	ELEV (FT)	DL (KIP)	TL(KIP)	UBL (FT)	BL (FT)	NO. STRANDS
186	W18X76	44.33	10	55	106.01	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
187	W18X76	44.44	10	55	106.12	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
188	W18X76	44.57	10	55	106.25	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
189	W18X76	44.7	10	55	106.38	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
190	W18X76	44.82	10	55	106.5	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
191	W18X76	44.95	10	55	106.63	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
192	W18X76	45.08	10	56	106.76	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
193	W18X76	45.21	10	56	106.89	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
194	W18X76	45.33	10	56	107.01	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
195	W18X76	45.46	10	56	107.14	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
196	W18X76	45.59	10	56	107.27	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
197	W18X76	45.71	10	56	107.39	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
198	W18X76	45.84	10	56	107.52	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
199	W18X76	45.97	10	56	107.65	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
200	W18X76	46.1	10	57	107.78	99.18	207	311	18	31	7	79.63	240	360	15	36	8						
201	W18X76	46.2	10	57	107.88	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
202	W18X76	46.2	10	57	107.85	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
203	W18X76	46.2	10	57	107.88	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
204	W18X76	46.2	10	57	107.88	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
205	W18X76	46.2	10	57	107.88	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
206	W18X76	46.2	10	57	107.88	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
207	W18X76	46.2	10	57	107.88	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
208	W18X76	46.2	10	57	107.88	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
209	W18X76	46.2	10	57	107.88	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
210	W18X76	46.2	10	57	107.88	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
211	W18X76	46.17	10	57	107.85	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
212	W18X76	46.03	10	57	107.71	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
213	W18X76	45.88	10	56	107.56	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
214	W18X76	45.73	10	56	107.41	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
215	W18X76	45.58	10	56	107.26	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
216	W18X76	45.42	10	56	107.11	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
217	W18X76	45.32	10	56	107.03	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
218	W18X76	45.84	10	56	107.52	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
219	W18X76	46.33	10	57	108.01	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
220	W18X76	46.81	10	57	108.49	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
221	W18X76	47.29	10	58	108.97	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
222	W18X76	47.29	10	58	108.97	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
223	W18X76	47.29	10	58	108.97	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
224	W18X76	47.11	10	58	108.79	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
225	W18X76	46.28	10	57	107.96	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
226	W18X76	44.66	10	55	106.34	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
227	W18X76	42.65	10	53	104.33	99.18	207	276	18	31	6	79.63	240	320	15	36	7						
228	W18X55	40.22	10	51	101.9	94.18	145	193	16	22	5	78.18	175	233	15	26	5						
229	W18X55	39.49	10	50	101.17	94.32	145	193	16	22	5	78.18	175	233	15	26	5						
230	W18X55	39.01	10	50	100.69	94.18	145	218	16	22	5	78.18	175	263	15	26	6						
231	W18X55	38.6	10	49	100.28	93.45	145	193	15	22	5	78.18	175	233	15	26	5						
232	W18X55	37.24	10	48	99.88	92.98	145	193	15	22	5	78.18	175	233	15	26	5						
233	W18X55	36	10	46	99.49	92.73	145	193	15	22	5	78.18	175	233	15	26	5						
234	W18X46	34.76	10	45	99.11	90.66	132	176	15	20	4	78.18	131	175	15	20	4						
235	W18X46	33.5	10	44	98.7	90.66	132	176	15	20	4	78.18	131	175	15	20	4						
236	W18X46	32.24	10	43	98.28	90.66	132	176	15	20	4	78.18	131	175	15	20	4						
237	W18X46	30.91	10	41	97.8	90.66	132	176	15	20	4	78.18	131	175	15	20	4						
238	W18X60	29.42	10	40	97.17	87.97	142	189	15	21	5												
239	W18X60	28.01	10	39	96.61	87.97	142	189	15	21	5												
240	W18X60	26.63	10	37	96.08	87.97	142	189	15	21	5												
241	W18X60	25.42	10	36	95.72	87.97	142	189	15	21	5												
242	W18X46	24.23	10	35	95.38	87.37	103	137	15	16	3												
243	W18X46	23.05	10	34	95.05	87.05	103	137	15	16	3												
244	W18X46	21.94	10	32	94.79	86.78	103	137	15	16	3												
245	W18X46	20.85	10	31	94.56	86.56	103	137	15	16	3												
246	W18X46	19.76	10	30	94.32	88.31	103	137	15	16	3												
247	W18X46	18.67	10	29	94.08	88.08	103	137	15	16	3												
248	W18X46	17.54	10	28	93.8	87.78	103	137	15	16	3												
249	W18X46	16.39	10	27	93.5	87.5	103	137	15	16	3												
250	W18X46	15.24	10	26	93.2	87.18	103	137	15	16	3												
251	W18X46	14.06	10	25	92.86	87.87	103	137	15	16	3												
252	W18X119	12.81	17	30	92.47																		
253	W18X119	11.57	17	29	92.08																		
254	W18X119	10.32	17	28	91.68																		
255	W18X119	9.07	17	27	91.28																		
256	W18X119	7.85	17	25	90.91																		
257	W18X119	6.7	17	24	90.61																		
258	W18X119	5.54	17	23	90.3																		
259	W18X46	4.39	10	15	90																		

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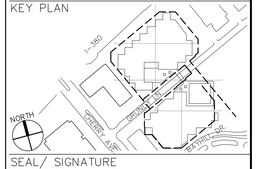
CASE PACIFIC

NO.	DATE	ISSUES
0	09/04/20	PERMIT SUBMITTAL

KEY PLAN



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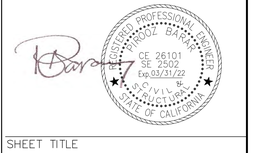

SHEET TITLE

SHORING SCHEDULES

SOLDIER PILES AND TIEBACKS

PROJECT NO.
192300

SCALE:
AS INDICATED

DATE:
09/21/2020

CHECKED BY:
PB/BM

DRAWN BY:
ML

SHEET NO.

SH6.02

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