

REFERENCE DOCUMENTS:

1. GEOTECHNICAL ENGINEERING INVESTIGATION REPORT BY KRAZAN & ASSOCIATES, INC. DATED OCTOBER 30, 2020
2. ARCHITECTURAL DRAWINGS BY ARCHITECTS ORANGE LAST DATED MAY 26, 2023
3. STRUCTURAL DRAWINGS BY FBA, INC. STRUCTURAL ENGINEERS LAST DATED MAY 26, 2023
4. GRADING PLAN BY BKI ENGINEERS LAST DATED JULY 10th, 2024

SCOPE OF WORK:

1. INSTALL PERMANENT SHORING ALONG PROPERTY LINES AND THROUGHOUT SITE TO ALLOW EXCAVATION FOR NEW DEVELOPMENT AT 825 DRAKE AVENUE.

GENERAL NOTES:

1. CONSTRUCTION SHALL CONFORM TO THE CALIFORNIA BUILDING CODE, 2019 EDITION AS ADOPTED AND MODIFIED BY THE CITY OF SAUSALITO, CA TO BE THE AUTHORITY HAVING JURISDICTION. ALL APPLICABLE SAFETY CODES AND STANDARDS SHALL BE FOLLOWED.
2. SHORING SYSTEM DESIGN CRITERIA BELOW IS BASED ON REFERENCED GEOTECHNICAL DOCUMENTS.
3. GEOTECHNICAL ENGINEER SHALL VERIFY SOIL STRATA DURING SOLDIER BEAM INSTALLATION AND NOTIFY ERWIN O'TOOLE PE (THE SHORING ENGINEER) IF FIELD CONDITIONS ARE DIFFERENT FROM THOSE DESCRIBED IN THE GEOTECHNICAL REPORT.
4. CONTRACTOR SHALL DESIGN AND PROVIDE DEWATERING, IF REQUIRED, TO MAINTAIN WATER LEVEL AT LEAST 3-FEET BELOW THE BOTTOM OF THE EXCAVATION AND 1-FOOT BELOW THE BOTTOM OF ANY HAND-EXCAVATED PITS. DEWATERING SHALL ALSO PREVENT HEAVING OF THE SUB-GRADE OR FLOWING OR RUNNING GROUND AT THE EXCAVATION FACE AND HAND-DOUG PITS. DEWATERING SHALL BE INSTALLED AND MAINTAINED SUCH THAT SOIL PARTICLES ARE NOT REMOVED BY DEWATERING SYSTEM.
 - A. SUBMIT DEWATERING PLAN, IF USED, TO THE GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION.
5. TIEBACKS AND WOOD LAGGING ARE INTENDED TO PERMANENTLY RETAIN THE EXCAVATED BANKS DURING CONSTRUCTION. NEW BUILDINGS SHALL INCORPORATE THE SHORING SYSTEM INTO THE NEW WALLS AND ESURE THERE IS PROPER DRAINAGE.
6. DEMOLITION, GENERAL SITE EXCAVATION, SITE DEWATERING AND REMOVAL OF EXISTING OBSTRUCTIONS AND FOUNDATIONS SHALL BE COORDINATED WITH INSTALLATION OF SHORING SYSTEM TO PREVENT LOSS OF GROUND AND CAVING OF BANKS.
7. THE CONTRACTOR SHALL VERIFY EXISTING GRADES AND PLANNED BOTTOM OF EXCAVATION (BOE) SHOWN ON THESE DRAWINGS. EXCAVATION SHALL NOT EXTEND BELOW THE BOTTOM OF EXCAVATION (BOE) SHOWN ON THE ELEVATION, WITHOUT APPROVAL OF THE SHORING ENGINEER.
8. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, SEE CONTRACT DRAWINGS AND SPECIFICATIONS FOR ALL INFORMATION RELATIVE TO THE NEW AND EXISTING CONSTRUCTION AND CONDITIONS. CONTRACTOR SHALL RESOLVE CONFLICTS ON THE SHORING DRAWINGS AND BETWEEN THE OTHER CONTRACT DRAWINGS WITH THE SHORING ENGINEER BEFORE PROCEEDING WITH CONSTRUCTION.
9. DURING SHORING AND EXCAVATION, THE CONTRACTOR SHALL MONITOR THE SHORING SYSTEM AND ADJACENT IMPROVEMENTS FOR INDICATIONS OF MOVEMENT OR LOSS OF GROUND. THE CONTRACTOR SHALL STOP EXCAVATION OPERATIONS AND BACKFILL AGAINST THE EXCAVATION FACE IF LOSS OF GROUND, DEFLECTION OR DISTRESS OF THE SHORING SYSTEM OR ADJACENT IMPROVEMENTS IS OBSERVED. CONTRACTOR SHALL NOTIFY THE SHORING ENGINEER OR OBSERVED DISTRESS OR MOVEMENT.
10. ALL CHANGES TO THE SHORING SYSTEMS AND ANY INFORMATION REGARDING INSTALLATION OF THE SHORING SYSTEMS OTHER THAN AS SHOWN OR SPECIFIED ON THE DRAWINGS AND NOTES SHALL BE SUBMITTED FOR REVIEW BY THE SHORING ENGINEER AND GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION.
11. PRIOR TO COMMENCEMENT OF WORK, THE CONTRACTOR SHALL REVIEW THE GEOTECHNICAL REPORT AND BECOME FAMILIAR WITH THE CONDITION OF THE ADJACENT IMPROVEMENTS IN ORDER TO SELECT PROPER EQUIPMENT FOR DEMOLITION, EXCAVATION AND RECOMPACTION TO AVOID DAMAGE TO THE ADJACENT PROPERTIES BY EXCESSIVE VIBRATION.
12. DESIGN OF TEMPORARY SLOPES ARE NOT INCLUDED IN THE SCOPE OF WORK. TEMPORARY SLOPES SHOULD BE DESIGNED BY OTHERS AND SHOULD CONFORM TO APPLICABLE CALIFORNIA CODE OF REGULATIONS TITLE 8 SUBCHAPTER 4 CONSTRUCTION SAFETY ORDERS (ALOSHA SAFETY ORDERS)
13. CONTRACTOR PERFORMING THE SHORING AND EXCAVATION WORK SHALL HAVE A MINIMUM OF 5 YEARS OF EXPERIENCE IN CONSTRUCTION OF TIEBACKS, AND PIERS SIMILAR TO THE SCOPE AND MAGNITUDE OF WORK SHOWN ON THE DRAWINGS. CONTRACTOR'S FIELD FOREMAN SUPERINTENDENT SHALL HAVE A MINIMUM OF 2-YEARS EXPERIENCE IN CONSTRUCTION.
14. EXISTING UTILITIES AND OTHER IMPROVEMENTS SHOWN ON THE TOPOGRAPHIC BASE MAP ARE BASED ON RECORD LOCATIONS. ADDITIONAL UTILITIES MAY BE PRESENT OR IN OTHER LOCATIONS. THE CONTRACTOR SHALL CONFIRM AND/OR DETERMINE THE LOCATION OF ALL UTILITIES AND DRILLING CLEARANCE PRIOR TO PROCEEDING WITH DRILLING OPERATIONS. THE CONTRACTOR SHALL CALL UNDERGROUND SERVICE ALERT AT LEAST TWO WORKING DAYS PRIOR TO START OF DRILLING.
 - A. CONTRACTOR SHALL OPEN EXISTING SIDEWALK AND STREET VAULTS MEASURE INVERTS AND CONFIRM CLEARANCE OF TIEBACKS FROM VAULTS AND EXISTING CONDUITS.
 - B. CONSULT THE ENGINEER IF UTILITY LINES, PIPING OR OTHER OBSTRUCTIONS REQUIRE RELOCATION OF SHORING.
15. STOP DRILLING AND CONSULT THE ENGINEER IF UTILITY LINES, PIPING, FOUNDATIONS OR INDICATIONS OF OBSTRUCTIONS ARE ENCOUNTERED DURING DRILLING OF SOLDIER BEAMS OR TIEBACKS. USE CARE IN DRILLING SO THAT THE FOLLOWING INDICATIONS OF UTILITIES OR FOUNDATIONS IN THE WAY ARE RECOGNIZED:
 - A. ABNORMAL RESISTANCE TO DRILLING.
 - B. FOREIGN MATERIAL PULLED FROM THE HOLE.
16. SHORING AND TIEBACKS SHALL NOT EXTEND ON TO ADJACENT PROPERTIES AND STREETS. THE PROJECT OWNER SHALL OBTAIN REQUIRED PERMISSION FROM PROPERTY OWNERS PRIOR TO CONSTRUCTION OF THE SHORING AND TIEBACKS SHOWN.

MATERIALS:

1. STRUCTURAL STEEL:
 - W-FLANGE: ASTM A572, GR 50, OR ASTM A992
 - PLATE AND ANGLE: ASTM A36
2. SELECTION OF MATERIALS AND MIXING AND PLACING OF CONCRETE AND GROUT SHALL BE IN ACCORDANCE WITH THE LOCAL BUILDING CODE AND ACI SPECIFICATIONS.
 - A. GROUT USED IN PENETRATION LENGTH OF THE TIEBACKS SHALL BE LEAN CONCRETE OF SUFFICIENT COMPRESSIVE STRENGTH TO ACHIEVE 3000 PSI AT 28 DAYS. THE SHORING CONTRACTOR SHALL INCREASE THE CEMENT CONTENT OR OTHER MIX PROPERTIES AS REQUIRED SUCH THAT THE ANCHORS WILL BE ABLE TO ACHIEVE THE SPECIFIED DESIGN LOAD AND TEST LOAD. SHORING CONTRACTOR SHALL SUBMIT MIX DESIGNS FOR GROUT.
 - B. LEAN CONCRETE FOR SOLDIER BEAM BACKFILL: 1-1/2 SACKS OF CEMENT PER CUBIC YARD.
 - C. DRYPACK SHALL CONSIST OF 2 PARTS SAND TO 1 PART CEMENT.
3. TIEBACKS TENDONS SHALL BE DEFORMED RODS, CONFORMING TO ASTM 615 GR. 75 OR ASTM A722 GRADE 150 WITH UPSET THREADS OR SEVEN WIRE, 0.8-INCH DIAMETER (AS = 0.217 IN² PER STRAND) UNCOATED STANDS CONFORMING TO ASTM 416 WITH ULTIMATE STRENGTH OF 270 KSI.
4. REINFORCING STEEL SHALL CONFORM TO REQUIREMENTS OF ASTM A615, GRADE 40 FOR #4 AND SMALLER, GRADE 60 FOR #5 AND LARGER.
5. WOOD LAGGING SHALL BE HEM FIR OR DOUGLAS FIR NORTH GRADE NO. 2 OR EQUIVALENT PRESSURE TREATED PER THE LATEST EDITION OF AMERICAN WOOD PRESERVER'S ASSOCIATION STANDARDS USE CATEGORY 4A. LAGGING BOARDS WITH LARGE KNOTS, CRACKS OR OTHER DEFICIENCIES SHALL NOT BE USED.
6. WELDING SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICAN WELDING SOCIETY'S STRUCTURAL WELDING CODE - STEEL (AWS D1.1-08). ALL WELDERS SHALL BE QUALIFIED IN ACCORDANCE WITH AWS. ELECTRODES SHALL BE E70.

MONITORING AND INSPECTION PROGRAM (BY GC OR PROJECT DEVELOPER):

1. PRIOR TO SHORING WORK AT THE SITE, A VISUAL SURVEY SHALL BE MADE AND PHOTOGRAPHS TAKEN OF IMPROVEMENTS AT THE LOCATION OF AND NEAR THE PLANNED SHORING, INCLUDING INTERIORS OF ADJACENT BUILDINGS, TO ESTABLISH EXISTING CONDITIONS. REPORT ANY STRUCTURAL DISTRESS OR ISSUES OF CONCERN TO THE SHORING ENGINEER PRIOR TO CONSTRUCTION. MODIFICATION OR ADDITIONAL SHORING MAY BE NEEDED.
2. ADJACENT BUILDINGS SHALL BE MONITORED (SURVEYED) BY AN INDEPENDENT LICENSED LAND SURVEYOR OR QUALIFIED CIVIL ENGINEER AT THE FOLLOWING APPROXIMATE LOCATIONS. SEE SHORING PLAN & ELEVATIONS FOR MONITORING POINTS.
 - A. ADJACENT BUILDINGS: AT CORNERS AND 20FEET ± ON CENTER ALONG ADJACENT WALLS.
3. MONITORING POINTS SHALL BE SURVEYED FOR HORIZONTAL AND VERTICAL MOVEMENT AT THE FOLLOWING INTERVALS.
 - A. PRIOR TO ANY DEWATERING AND EXCAVATION OR SHORING WORK.
 - B. AFTER DEMOLITION AND PRIOR TO SHORING INSTALLATION.
 - C. ONCE PER WEEK UNTIL EXCAVATION REACHES ITS LOWEST ELEVATION.
 - D. EVERY TWO WEEKS UNTIL MAT FOUNDATION IS COMPLETED.
 - E. EVERY FOUR WEEKS UNTIL THE STREET LEVEL FLOOR SLAB IS CONSTRUCTED OR UNTIL DEWATERING IS FINISHED, WHICHEVER IS LATER.
4. THE CONTRACTOR SHALL STOP EXCAVATION AND NOTIFY ERWIN O'TOOLE PE AND THE GEOTECHNICAL ENGINEER OF RECORD IF MORE THAN 0.03 FEET OF HORIZONTAL OR VERTICAL MOVEMENT IS OBSERVED AT THE UNDERPINNING.
5. SURVEY MONITORING RESULTS SHALL BE SUBMITTED TO THE SHORING CONTRACTOR, ERWIN O'TOOLE PE AND THE GEOTECHNICAL ENGINEER OF RECORD WITHIN 2-DAYS OF FIELD SURVEY MEASUREMENTS.
6. DURING SHORING AND EXCAVATION, THE GENERAL CONTRACTOR SHALL VISUALLY MONITOR THE SHORING SYSTEMS AND NEARBY IMPROVEMENTS ON A DAILY BASIS FOR INDICATIONS OF MOVEMENT. THE CONTRACTOR SHALL STOP EXCAVATION OPERATIONS IF DEFLECTIONS, CRACKING, SEPARATIONS OR OTHER DISTRESS IS OBSERVED AND SHALL IMMEDIATELY NOTIFY

THE SHORING CONTRACTOR AND SHORING ENGINEER.

SPECIAL INSPECTION ITEMS (PROVIDED BY GC OR PROJECT DEVELOPER):

THE FOLLOWING SPECIAL INSPECTION ITEMS SHALL BE PERFORMED BY AN AGENCY SELECTED AND PROVIDED BY THE OWNER OF THE PROJECT IN ACCORDANCE WITH THE SFBC AND APPROVED BY SHORING ENGINEER:

1. TIEBACKS: INTERMITTENT OBSERVATION OF INSTALLATION AND FULL TIME OBSERVATION OF ALL TESTING BY GEOTECHNICAL ENGINEER.
2. LAGGING PLACEMENT: INTERMITTENT OBSERVATION
3. BEARING SOIL (GEOTECHNICAL CONDITIONS): BY GEOTECHNICAL ENGINEER.

DRILLED PIER INSTALLATION PROCEDURE:

1. BEAMS SHALL BE DRILLED AND NOT DRIVEN OR VIBRATED
2. SHORING SUBCONTRACTOR SHOULD BE PREPARED TO USE CASING TO REDUCE CAVING OF HOLES, WHERE NECESSARY
3. IF MORE THAN 1 FT OF GROUNDWATER IS OBSERVED IN THE BOTTOM OF THE DRILLED PIERS BEFORE PLACEMENT OF CONCRETE, THE WATER SHOULD BE PUMPED OUT. IN SOME INSTANCES THE CONCRETE MAY BE PLACED USING TREMIE METHODS IF WATER CANNOT BE PUMPED.
4. BEAMS SHALL BE PLACED TO +1.3" IN TRANSVERSE DIRECTION AND 0.5"+/- IN LINE. PLUMBNESS OF 1% SHALL BE ACHIEVED.
5. BEAMS MAY BE MOVED LONGITUDINALLY ALONG THE FACE OF EXCAVATION TO ALLOW FOR FIELD CONDITIONS ±2", BUT SHALL NOT EXCEED DESIGN SPACING. DURING INSTALLATION OF DRILLED PIERS THE BEAM SPACING TAKES PRECEDENCE OVER BEAM POSITIONING AS SPECIFIED ON THE SHORING PLAN.
6. EOR MAY ALTER SOLDIER BEAM EMBEDMENT DEPTHS IN FIELD AS REQUIRED. THIS WILL DEPEND ON SITE CONDITIONS ENCOUNTERED THAT DIFFER FROM SITE CONDITIONS AND DESIGN CRITERIA PROVIDED IN THE GEOTECHNICAL REPORT.

WOOD LAGGING INSTALLATION PROCEDURE:

1. WHEN FOUR FEET OF EXCAVATION HAS BEEN PERFORMED WOOD LAGGING SHALL BE INSTALLED BETWEEN THE EXPOSED SOLDIER BEAMS.
2. WOOD LAGGING SHALL BE INSTALLED FROM TOP OF SOLDIER BEAMS DOWNWARDS BY INSTALLING ONE END OF THE LAGGING HORIZONTALLY BEHIND EITHER THE FRONT FACING FLANGE OR REAR FACING FLANGE OF THE SOLDIER BEAM (SEE PLAN VIEW ON SH 2.0 AND SH 1.1 FOR DETAILS OF LAGGING INSTALLATION AND POSITIONING), AND THEN INSTALLING THE OTHER END OF THE LAGGING BEHIND THE APPROPRIATE FLANGE OF THE OPPOSITE SOLDIER BEAM.
3. NO MORE THAN FOUR FEET OF SOIL SHALL BE LEFT UNSUPPORTED DURING EXCAVATION WITHOUT INSTALLATION OF WOOD LAGGING.
4. IF LOSS OF GROUND OCCURS DURING PLACEMENT OF WOOD LAGGING EXCAVATION OPERATIONS SHALL CEASE AND ANY VOIDS SHALL BE BACKFILLED WITH GROUT AS NECESSARY.

TIEBACK INSTALLATION PROCEDURE:

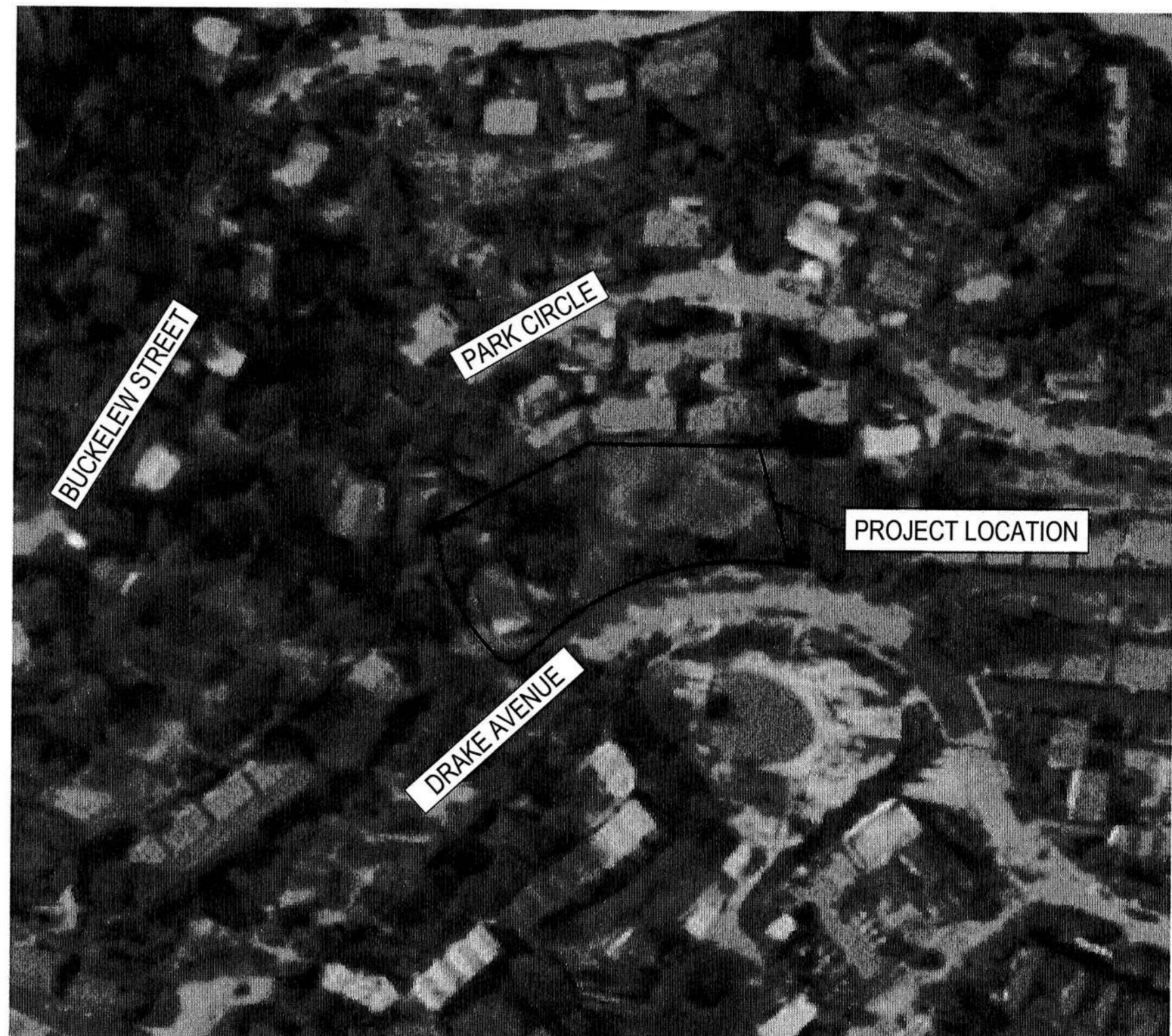
1. REVIEW UTILITY DRAWINGS PRIOR TO DRILLING.
2. TIEBACKS SHALL BE INSTALLED USING A SMOOTH OUTER CASING ADVANCED AS DRILLING PROCEEDS THROUGH FILL TO PREVENT CAVING OF GROUND. DRILL CASING SHALL EXTEND TO THE BOTTOM OF THE DRILL HOLE (TIEBACK LENGTH), CASING NOT MANDATORY IF CONTRACTOR CAN SHOW HOLE REMAINS OPEN WITHOUT ITS USE.
 - A. CONTRACTOR SHALL DESIGN PENETRATION (BONDED) LENGTHS FOR TIEBACKS, GIVEN THE REQUIREMENTS OF THESE DRAWINGS. TIEBACKS SHALL NOT EXTEND BEYOND THE PROPERTY BEING UNDERPINNED.
3. INSTALL TENDON THROUGH THE CASING. BACKFILL TIEBACK WITH GROUT THROUGH THE DRILL CASING. RETRACT CASING AS GROUT OR BACKFILL IS PLACED. CONTRACTOR SHOULD TAKE CARE TO PREVENT LOSS OF BACKFILL (GROUT) INTO NEARBY PROPERTIES OR STRUCTURES.
 - A. COVER THE TENDON IN THE UNBONDED LENGTH WITH SEALED PVC SLEEVE AND PROVIDE A CUSHION OR GAP BETWEEN THE TIEBACK GROUT AND THE BACK OF THE UNDERPINNING PIER TO ALLOW THE ANCHOR TO MOVE DURING TESTING.
 - B. POST GROUT AS REQUIRED TO ACHIEVE TIEBACK TEST LOADS. DURING PRESSURE GROUTING OPERATIONS, CONTRACTOR SHALL OBSERVE IMPROVEMENTS BEYOND TO WATCH FOR VISUAL SIGNS OF HEAVING GROUND, LOSS OR GROUT OR DAMAGE.
4. ALL TIEBACKS SHALL BE TESTED PER BELOW. SHORING CONTRACTOR SHALL PERFORM TIEBACK TESTING WHEN GROUT IN THE PENETRATION LENGTH HAS ATTAINED THE APPROPRIATE COMPRESSIVE STRENGTH AS DETERMINED BY THE SHORING CONTRACTOR.
 - A. ANCHORS SHALL BE STRESSED STRAIGHT AND TRUE. STOP TESTING AND NOTIFY SHORING ENGINEER IF SOLDIER BEAM ROTATION OR KINKING OF TENDON OCCURS.
 - B. SHORING CONTRACTOR SHALL MONITOR THE MOVEMENT OF THE TIEBACK TENDON ANCHORAGE USING A TRIPOD MOUNTED DIAL GAUGE WITH A PRECISION OF 0.001 INCHES.
5. TESTING:
 - A. PERFORMANCE TEST: ONE TIEBACK PERFORMANCE TEST SHALL BE PERFORMED PER ELEVATION. TIEBACKS SHALL BE INCREMENTALLY LOADED TO 1.25 TIMES THE DESIGN LOAD. APPLY AN ALIGNMENT LOAD OF 25 PERCENT OF THE DESIGN LOAD. APPLY TEST LOAD IN INCREMENTS OF 0.25 TIMES THE DESIGN LOAD (HOLD EACH INCREMENTAL LOAD UNTIL MOVEMENT HAS STABILIZED) UNTIL THE TEST LOAD IS REACHED. RECORD THE ELONGATION AT EACH INCREMENT AND AT THE ALIGNMENT LOAD. HOLD THE TEST LOAD FOR 10 MINUTES AND RECORD MOVEMENTS AT 1, 2, 3, 4, 5, 6 AND 10 MINUTES. IF THE DISPLACEMENT BETWEEN THE 1 AND 10 MINUTE HOLD IS GREATER THAN 0.04 INCHES CONTINUE TO HOLD THE TEST LOAD FOR A TOTAL OF 60 MINUTES AND RECORD DISPLACEMENT AT 20, 30, 50 AND 60 MINUTE INTERVALS. CYCLE THE LOAD BACK TO THE ALIGNMENT LOAD AFTER THE FINAL HOLD PERIOD AND RECORD DISPLACEMENT. WHERE THE MEASURED DISPLACEMENT BETWEEN THE 1 AND 10 MINUTE HOLD IS GREATER THAN 0.04 INCHES THE TEST SHOULD BE CONTINUED FOR 60 MINUTES.
 - B. LOCK NUTS OR WEDGES SHALL NOT BE USED DURING PERFORMANCE TESTING.
 - C. PROOF TESTING: ALL TIEBACKS NOT PERFORMANCE TESTED SHALL BE PROOF TESTED TO 1.25 TIMES THE DESIGN LOAD. APPLY AN ALIGNMENT LOAD OF 25 PERCENT OF THE TEST LOAD AND SET THE DIAL GAUGE TO ZERO. APPLY TEST LOAD IN INCREMENTS OF 0.25 TIMES THE DESIGN LOAD (HOLD EACH INCREMENTAL LOAD UNTIL MOVEMENT HAS STABILIZED) UNTIL THE TEST LOAD IS REACHED. RECORD THE ELONGATION AT EACH INCREMENT AND AT THE ALIGNMENT LOAD. HOLD THE TEST LOAD FOR 10 MINUTES AND RECORD MOVEMENTS AT 1, 2, 3, 4, 5, 6 AND 10 MINUTES. IF THE DISPLACEMENT BETWEEN THE 1 AND 10 MINUTE HOLD IS GREATER THAN 0.04 INCHES CONTINUE TO HOLD THE TEST LOAD FOR A TOTAL OF 60 MINUTES AND RECORD DISPLACEMENT AT 20, 30, 50 AND 60 MINUTE INTERVALS. CYCLE THE LOAD BACK TO THE ALIGNMENT LOAD AFTER THE FINAL HOLD PERIOD AND RECORD DISPLACEMENT. WHERE THE MEASURED DISPLACEMENT BETWEEN THE 1 AND 10 MINUTE HOLD IS GREATER THAN 0.04 INCHES THE TEST SHOULD BE CONTINUED FOR 60 MINUTES.
6. TIEBACK TESTS SHALL BE CONSIDERED ACCEPTABLE IF:
 - A. LESS THAN 04 INCHES OF MOVEMENT IS OBSERVED BETWEEN THE 1 AND 10-MINUTE HOLD OR MOVEMENT IS LESS THAN 0.08 INCHES PER LOG CYCLE OF TIME (I.E. 6 TO 60 MINUTE INTERVAL) IF THE TEST HOLD IS CONTINUED FOR 60-MINUTES.
 - B. THE TOTAL DISPLACEMENT BETWEEN THE ALIGNMENT LOAD AND TEST LOAD EXCEEDS 80 PERCENT OF THE THEORETICAL ELASTIC ELONGATION OF THE UNBONDED LENGTH [(TEST LOAD - ALIGNMENT LOAD) X UNBONDED LENGTH DIVIDED BY AREA OF TENDON AND 29,000 KSI]]
 - C. A PULLOUT FAILURE DOES NOT OCCUR. PULLOUT FAILURE IS DEFINED AT THE CONDITION WHEN CONTINUED PUMPING OF THE JACK DOES NOT INCREASE THE LOAD (GAUGE PRESSURE) WHILE THE TIEBACK DISPLACEMENT IS CONTINUING TO INCREASE.
7. IN THE EVENT A TIEBACK FAILS TO MEET THE TEST CRITERIA THE CONTRACTOR MAY CHOOSE TO REGROUT AND RETEST THE TIEBACK OR LOCK OFF THE TIEBACK AT 50% OF THE ULTIMATE LOAD MAINTAINED DURING THE 10-MINUTE HOLD AND PROVIDE ADDITIONAL MAKE-UP TIEBACKS PER BELOW. ISOLATED TIEBACKS.
 - A. SHORING CONTRACTOR SHALL PROVIDE AND TEST ADDITIONAL MAKE-UP TIEBACKS AND ANCHORAGE FOR TIEBACKS THAT FAIL TO MEET THE TEST REQUIREMENTS. MAKE-UP TIEBACKS SHALL HAVE A DESIGN LOAD EQUAL TO THE DIFFERENCE BETWEEN THE LOCKED-OFF LOAD OF THE FAILED TIEBACK AND DESIGN LOAD SHOWN ON THE DRAWINGS. MAKE-UP TIEBACKS SHALL BE INSTALLED 2-FEET BELOW THE FAILED TIEBACK. COST FOR MAKE-UP TIEBACKS AND ASSOCIATED WORK SHALL BE THE RESPONSIBILITY OF THE SHORING CONTRACTOR.
8. CUT THE TENDON 1-INCH FROM THE LOCK NUT OR WEDGES.
9. COMPLETE LAGGING.

ABBREVIATIONS:

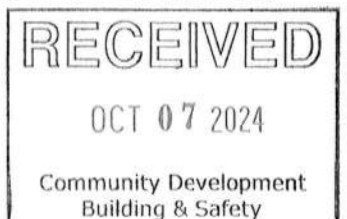
BFB/OF	BOTTOM OF FOOTING	OD	OVER DATUM
BLD	BUILDING	PL	PROPERTY LINE
BOE	BOTTOM OF EXCAVATION	SAD	SEE ARCHITECTURAL DRAWING
BOT	BOTTOM OF TOE, SOLDIER BEAMS AND UNDERPINNING	SCD	SEE CIVIL DRAWING
BS	BOTTOM OF SHORING (LAGGING)	SS	SANITARY SEWER
(E)	EXISTING	SSD	SEE STRUCTURAL DRAWING
EG	EXISTING GRADE	TOS	TOP OF STEEL, TOP OF SHORING
FG	FINISHED GRADE	TYP	TYPICAL
FS	FINISHED SURFACE	UE	UTILITY EASEMENT
HORIZ	HORIZONTAL	UNO	UNLESS NOTED OTHERWISE
MAX	MAXIMUM	VERT	VERTICAL
MIN	MINIMUM	VIF	VERIFY IN FIELD
(N)	NEW	W	WATER
NTS	NOT TO SCALE	WP	WATER PROOFING
OC	ON CENTER	WWF	WELDED WIRE FABRIC
SCHED	SCHEDULE	EQ	EQUAL

DRAWING LIST:

SH 1.0	GENERAL NOTES
SH 1.01	PROJECT DOCUMENTS
SH 1.1	DETAILS I
SH 1.2	DETAILS II
SH 1.3	DETAILS III
SH 1.5	BEAM LIST I
SH 1.51	BEAM LIST II
SH 2.0	PLAN
SH 2.1	DRAINAGE PLAN
SH 3.0	ELEVATIONS I
SH 3.1	ELEVATIONS II
SH 3.2	SECTIONS



1 VICINITY MAP
SCALE: NA



SHORING ENGINEER:
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Erwin O'Toole

SHORING FOR NEW DEVELOPMENT AT 825 DRAKE AVENUE
825 DRAKE AVENUE
MARIN CITY, CA 94065

PROJECT NUMBER: 2020-074
SCALE: AS NOTED
DRAWN BY: JD
CHECKED BY: EOT

GENERAL NOTES

SH 1.0

April 13, 2021

KA Project No. 042-20043

Ms. Kimberly Calica
 AMG & Associates
 P.O. Box 260770
 Encino, California 91426

**RE: Addendum to Geotechnical Engineering Investigation
 Proposed Multi-Family Development
 825 Drake Avenue
 Novato, Marin County, California**

Dear Ms. Calica:

In accordance with the request of Mr. Adam O'Dea of FBA, Inc. Structural Engineers, we are providing this Addendum to our Geotechnical Engineering Investigation for the above-referenced project site. Krazan & Associates, Inc. had previously conducted a Geotechnical Engineering Investigation report dated October 30, 2020 (KA Project No. 042-20043). This addendum provides supplemental mat foundation design parameters, retaining wall information and shoring recommendations.

Mat Foundations

It is understood the proposed structure will be supported on a mat foundation.

It is recommended the upper 18 inches of soil supporting the mat foundation consist of lime-treated clayey soils or non-expansive Engineered Fill. The lime-treated soils or non-expansive Engineered Fill should be compacted to a minimum of 90 percent of maximum density. Preliminary application rate of lime should be 5 percent by dry weight. The lime material should be calcium oxide, commonly known as quick-lime. The clayey soils should be above optimum moisture during the mixing operations.

The potential for structural damage as a result of differential settlement due to the potential effects of soil consolidation associated with applied structural loads can be reduced by supporting the building on a very stiff structural mat-slab foundation. The foundation should be designed to distribute the building loads uniformly onto the supporting subgrade. By designing a relatively stiff mat, the settlement of the structure will be relatively uniform. The foundation should be designed to be sufficiently rigid to prevent the introduction of excess stresses in the superstructure above the foundation.

Support of structures with a mat-slab foundation is a method used to aid in controlling differential settlement of structures over weak soils. The foundation distributes high point loads and line loads over a much broader area resulting in significantly reduced stresses and a more uniform loading condition over

the building area. This reduces the differential settlement of walls and columns that would be expected when supported by dissimilarly loaded footings and footings of differing sizes, and can result in less total settlement of the superstructure when support by the structural slab.

The slab foundation should be designed to resist both bending and punching shear associated with the structural loads and design live loads. With the potential for arching or bending of the slab foundation to occur as a result of differential settlement, we recommend that the slab be designed to span over local areas of settlement and to act as a cantilevered beam to support the perimeter of the building should local settlement occur in areas of the perimeter.

For preliminary purposes, an allowable bearing pressure of 1,500 pounds per square foot may be used for design of the slab. The slab can be designed for isolated concentrated peak stress loads of 2,000 psf for dead-plus-live loads. These values can be increased by 1/4 for short duration loads such as wind and seismic. For preliminary modeling purposes a vertical modulus of subgrade reaction (Kv1), also referred to as a soil spring, of 50 pounds per square inch per inch may be used for in design. Within areas of the mat supported over drilled piers associated with the shoring system, a vertical modulus of subgrade reaction of 100 pounds per square inch per inch may be used in the design. The slab design should ultimately limit slab bending or arching in the lightly loaded mid-slab areas between load bearing columns and walls. Based on the preliminary nature of the project design and a lack of formal design documents, these values should be considered preliminary and should be reevaluated during final design.

Total and differential settlement associated with static and seismic loads is estimated at less than 2 inches and 1 inch, respectively.

Temporary Shoring

If, due to space limitation, excavation near existing structures or roads is performed in a vertical position, braced shorings or shields may be used for supporting vertical excavations. Therefore, in order to comply with the local and state safety regulations, a properly designed and installed shoring system would be required to accomplish planned excavation and installation. A specialty Shoring Contractor should be responsible for the design and installation of such a shoring system during construction.

The lateral pressures provided below may be used in the design of a braced-type shoring system.

Recommended Lateral Earth Pressure for Braced Shoring	
Depth of Excavation Below Ground Surface (feet)	Lateral Soil Pressure (psf)
0	0
0.25 H	50 H
H	50 H

Where H is the total depth of the excavation in feet.

The foregoing does not include excess hydrostatic pressure or surcharge loading. Fifty percent of any surcharge load, such as construction equipment weight, should be added to the lateral load given above.

Since the Contractor has the ultimate responsibility for excavation stability, he may design a different shoring system for the excavation.


The shoring recommendations provided herein are based on soil characteristics derived from limited test borings within the site. Variations in soil conditions will likely be encountered during the excavations. Krazan & Associates, Inc. should be afforded the opportunity to provide field review to evaluate the actual conditions and account for field condition variations not otherwise anticipated in the preparation of this recommendation.

Lateral Earth Pressures and Retaining Walls

Walls retaining horizontal backfill and capable of deflecting a minimum of 0.1 percent of its height at the top may be designed using an equivalent fluid active pressure of 50 and 87 pounds per square foot per foot of depth for drained and undrained conditions, respectively. Walls that are incapable of this deflection or walls that are fully constrained against deflection may be designed for an equivalent fluid at-rest pressure of 70 and 96 pounds per square foot per foot of depth for drained and undrained conditions, respectively. It is recommended a lateral load of 34 psf be applied to retaining walls 6 feet or taller to account for seismic loading. The seismic increment should be applied in a reverse triangular distribution with the zero point at the base of the wall. Expansive soils should not be used for backfill against walls. The wedge of non-expansive backfill material should extend from the bottom of each retaining wall outward and upward at a slope of 2:1 (horizontal to vertical) or flatter. The stated lateral earth pressures do not include the effects of hydrostatic water pressures generated by infiltrating surface water that may accumulate behind the retaining walls; or loads imposed by construction equipment, foundations, or roadways.

The recommendations and limitations provided in our Geotechnical Engineering Investigation report dated October 30, 2020 apply to this letter. This includes removal and recompaction of any existing fill materials encountered during construction.

If you have any questions, or if we may be of further assistance, please do not hesitate to contact our office at (925) 307-1160.

Respectfully submitted,
KRAZAN & ASSOCIATES, INC.

 Dave R. Jarosz
 Managing Engineer
 RGE No. 2698/RGE No. 6018


DRJ:ht

REVISIONS	NO.	DATE	DESC.
	1	03.31.2023	PLAN CHECK COMMENTS
	2	04.28.2023	SUBMITTAL
	3	05.26.2023	CONSTRUCTION SET
	4	02.05.2024	
	5	07.03.2024	
	6	09.11.2024	DRAFT
	7	09.24.2024	DRAFT
	8	10.02.2024	

SHORING ENGINEER:

ERWIN O'TOOLE, PE
 331 MOULTRIE STREET,
 SAN FRANCISCO, CA 94110
 PHONE: 415-531-1009
 EMAIL: erwin@granitesf.com



Erwin O'Toole

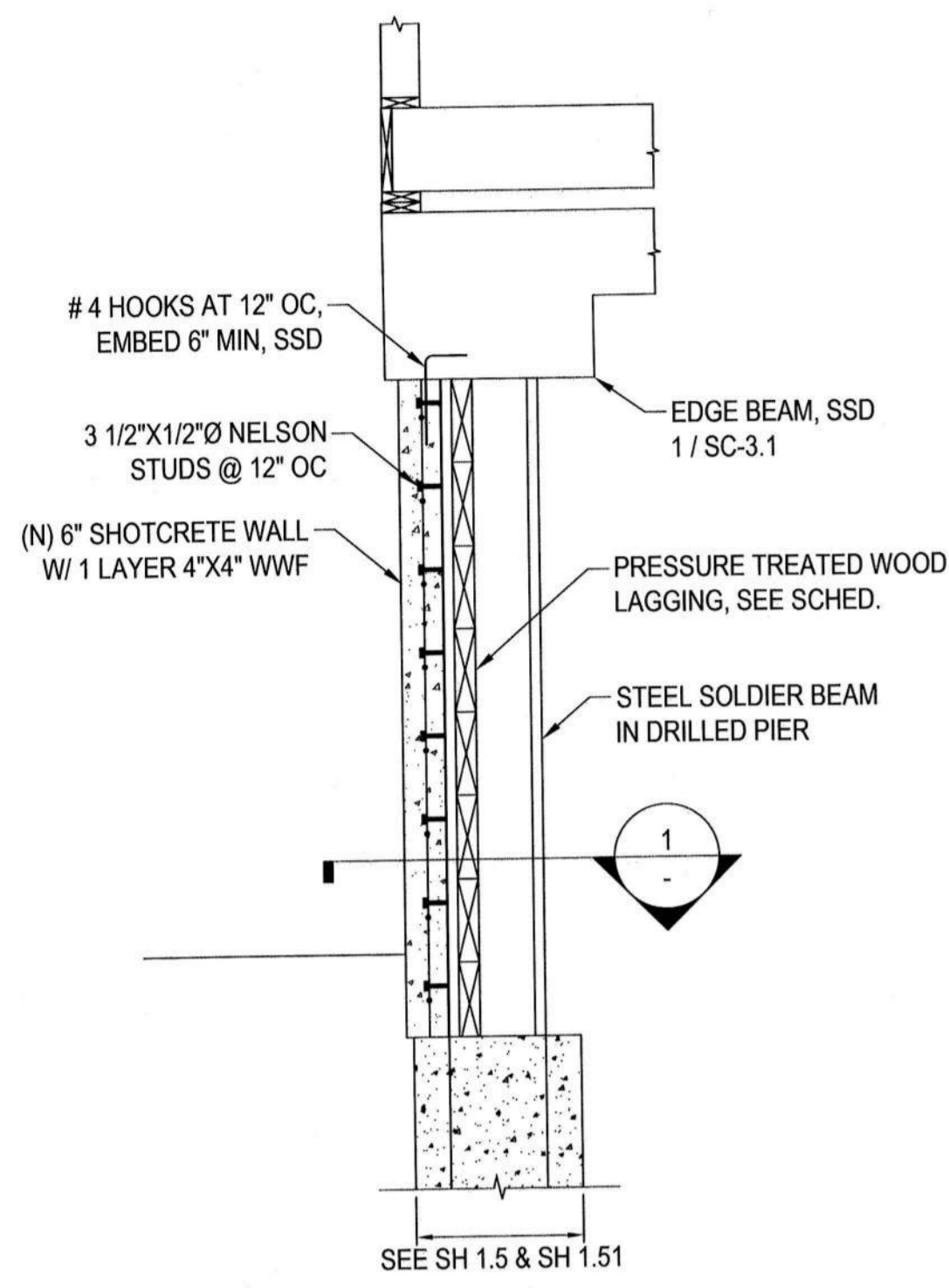
SHORING FOR NEW
 DEVELOPMENT AT
 825 DRAKE AVENUE

825 DRAKE AVENUE
 MARIN CITY, CA 94065

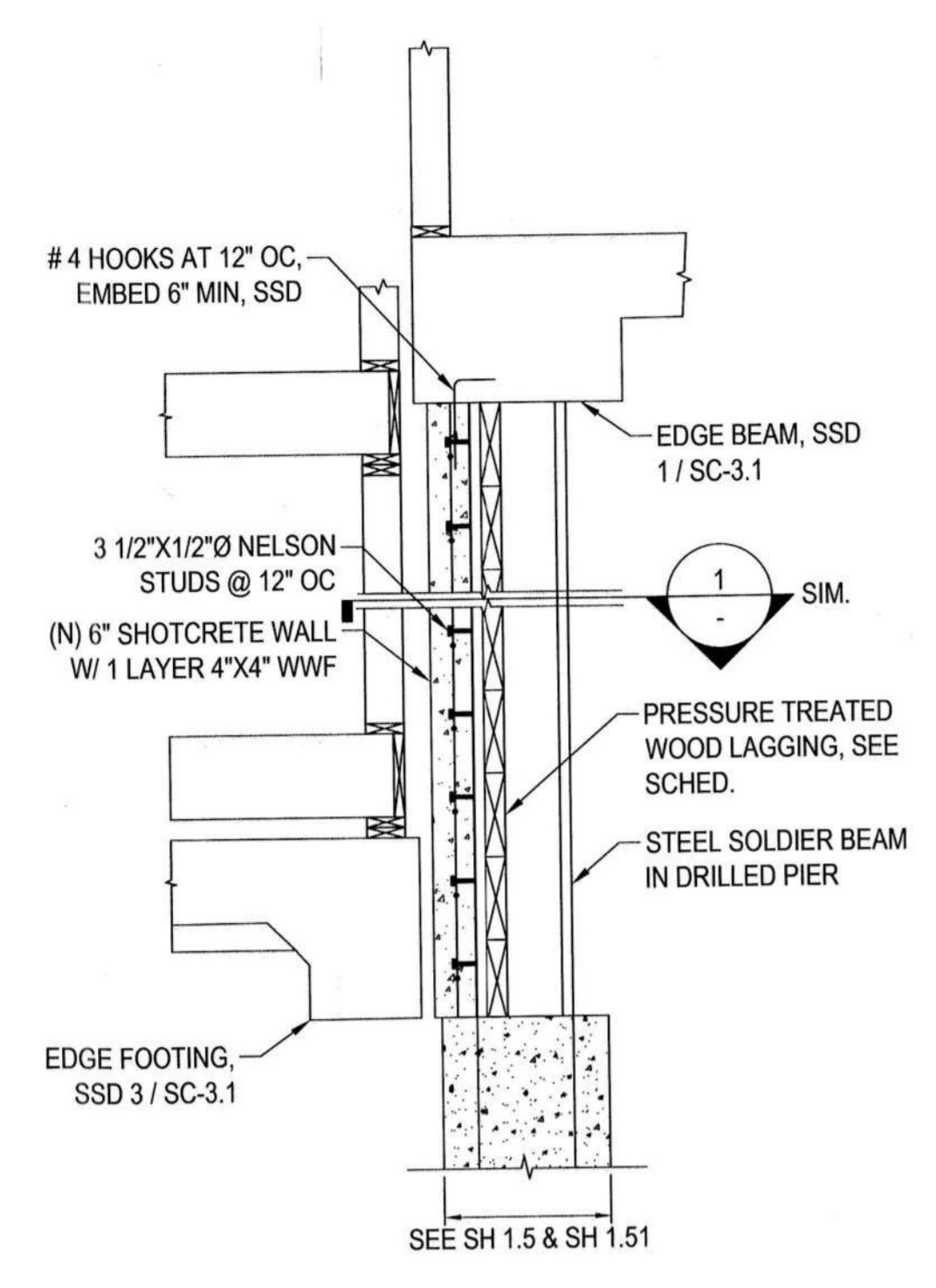
PROJECT NUMBER: 2020 - 074
 SCALE: AS NOTED
 DRAWN BY: JD
 CHECKED BY: EOT

PROJECT DOCUMENTS

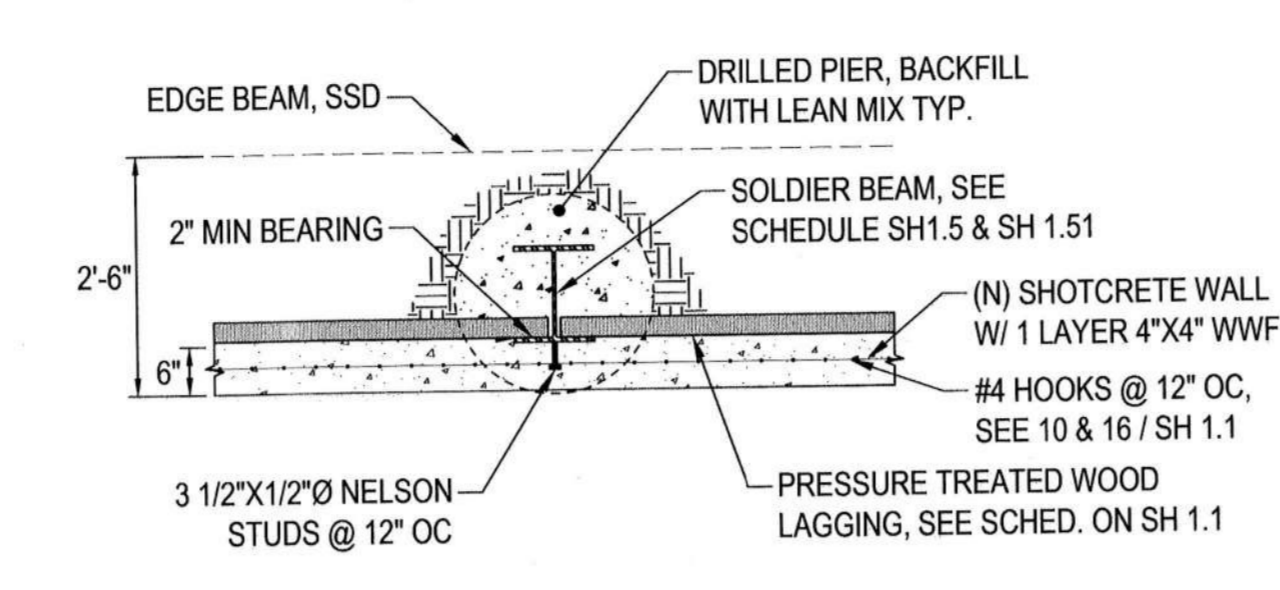
SH 1.01



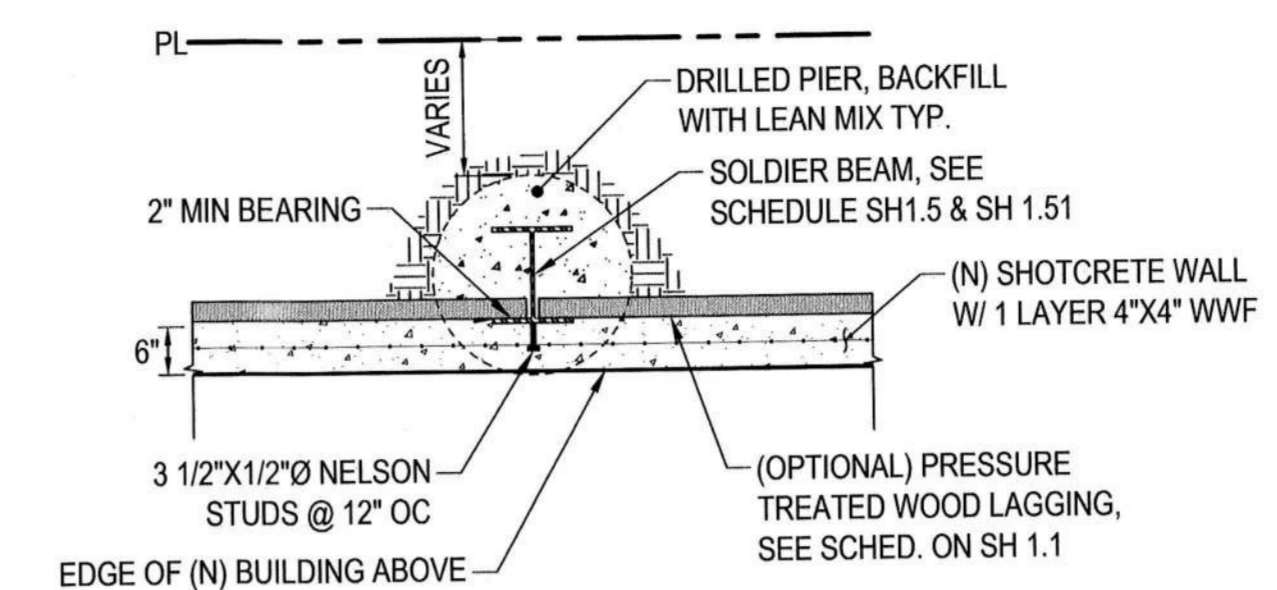
16 SOLDIER BEAM SECTION @ EDGE BEAM
SCALE: 1/4" = 1'-0"



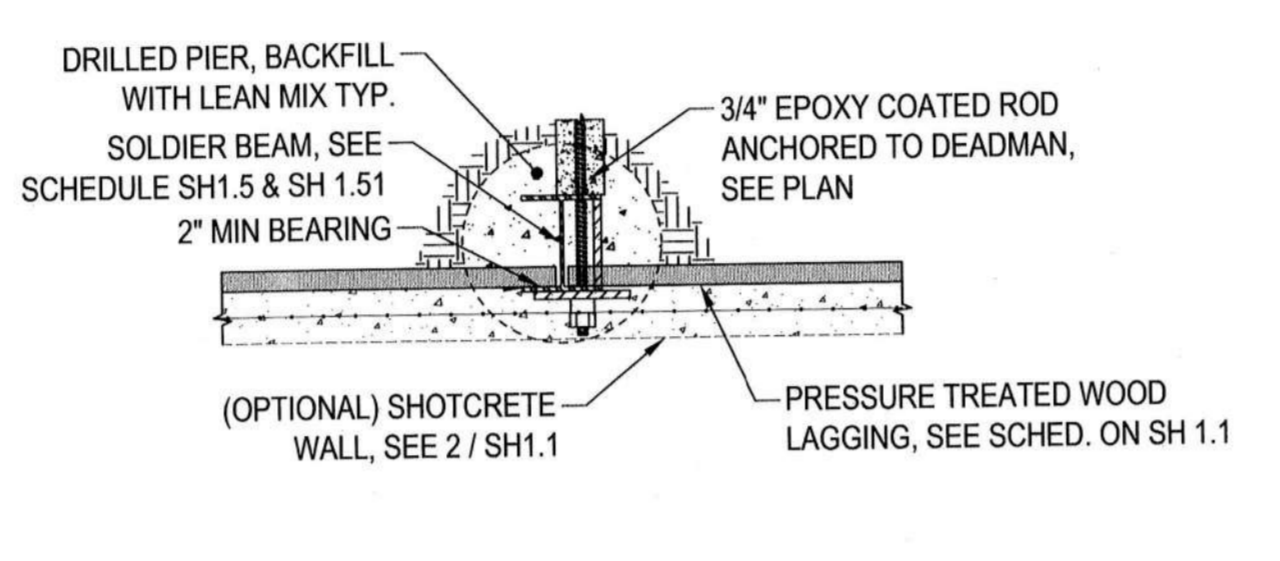
10 SOLDIER BEAM SECTION @ EDGE BEAM
SCALE: 1/4" = 1'-0"



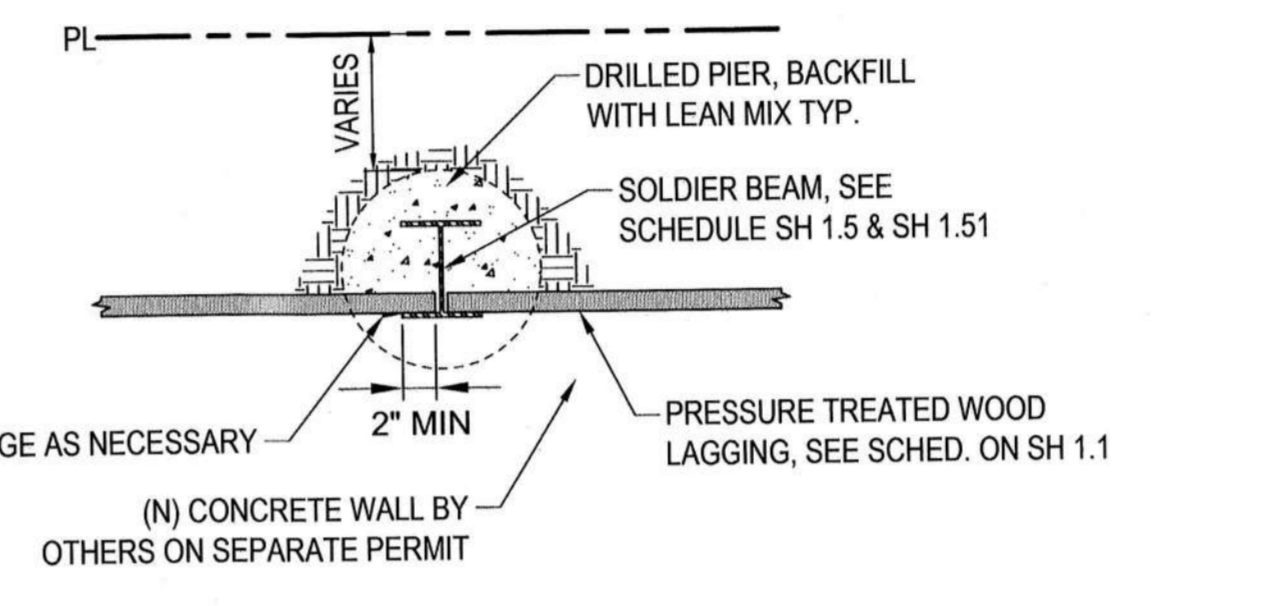
1 SHORING W/ SHOTCRETE FACE & EDGE BEAM
SCALE: 1/2" = 1'-0"



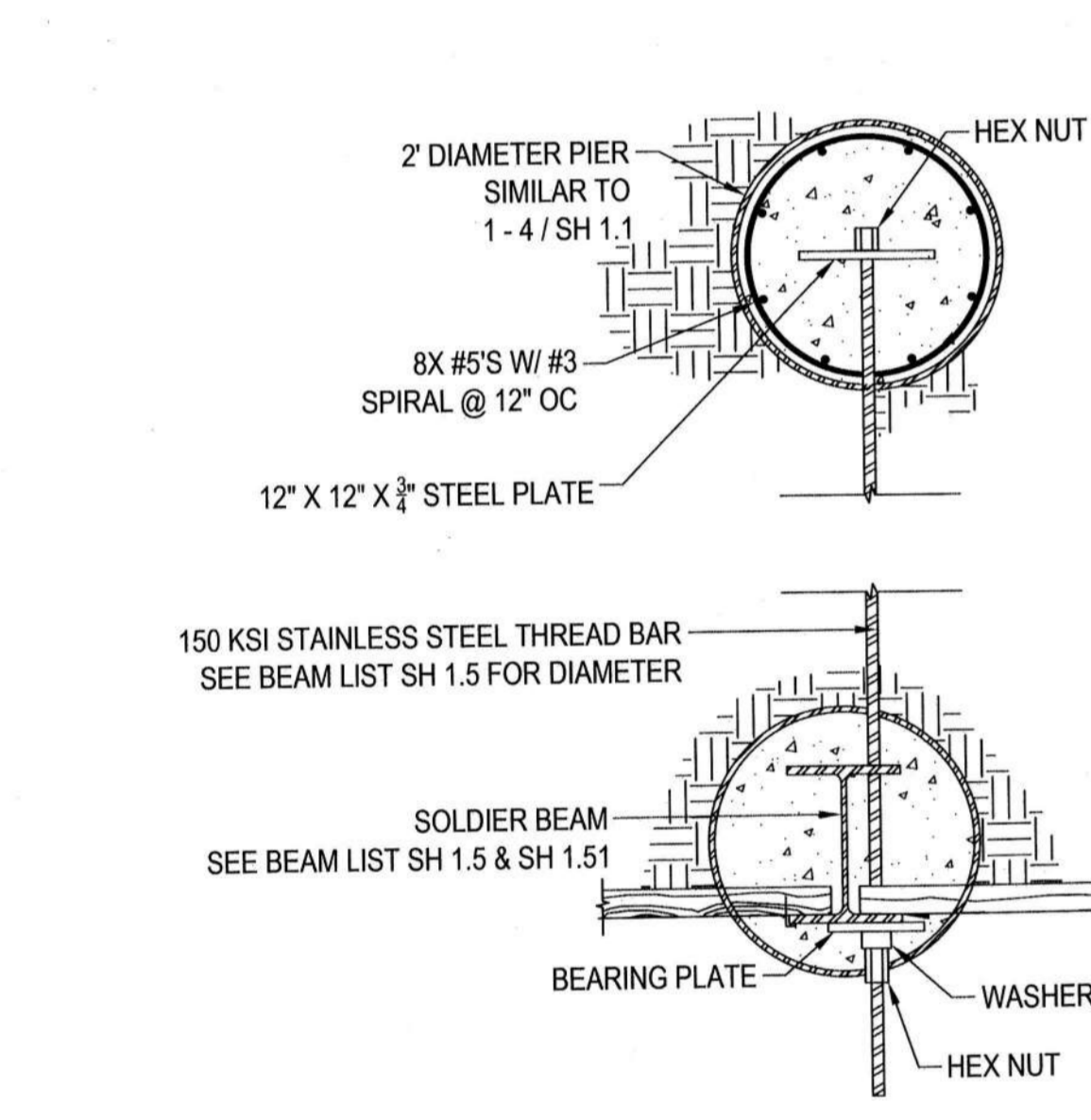
2 SHORING W/ SHOTCRETE FACE
SCALE: 1/2" = 1'-0"



3 SOLDIER BEAM W/ TIEBACK
SCALE: 1/2" = 1'-0"

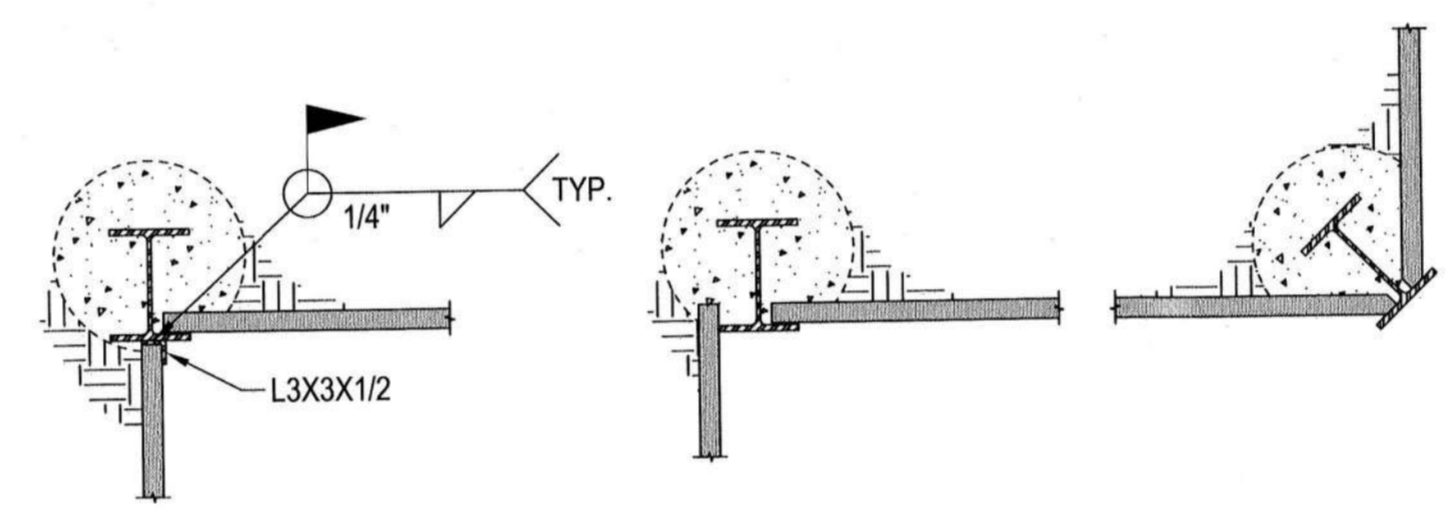


4 SOLDIER BEAM PLAN
SCALE: 1/2" = 1'-0"



17 SOLDIER BEAM & DEADMAN DETAIL
SCALE: 3/4" = 1'-0"

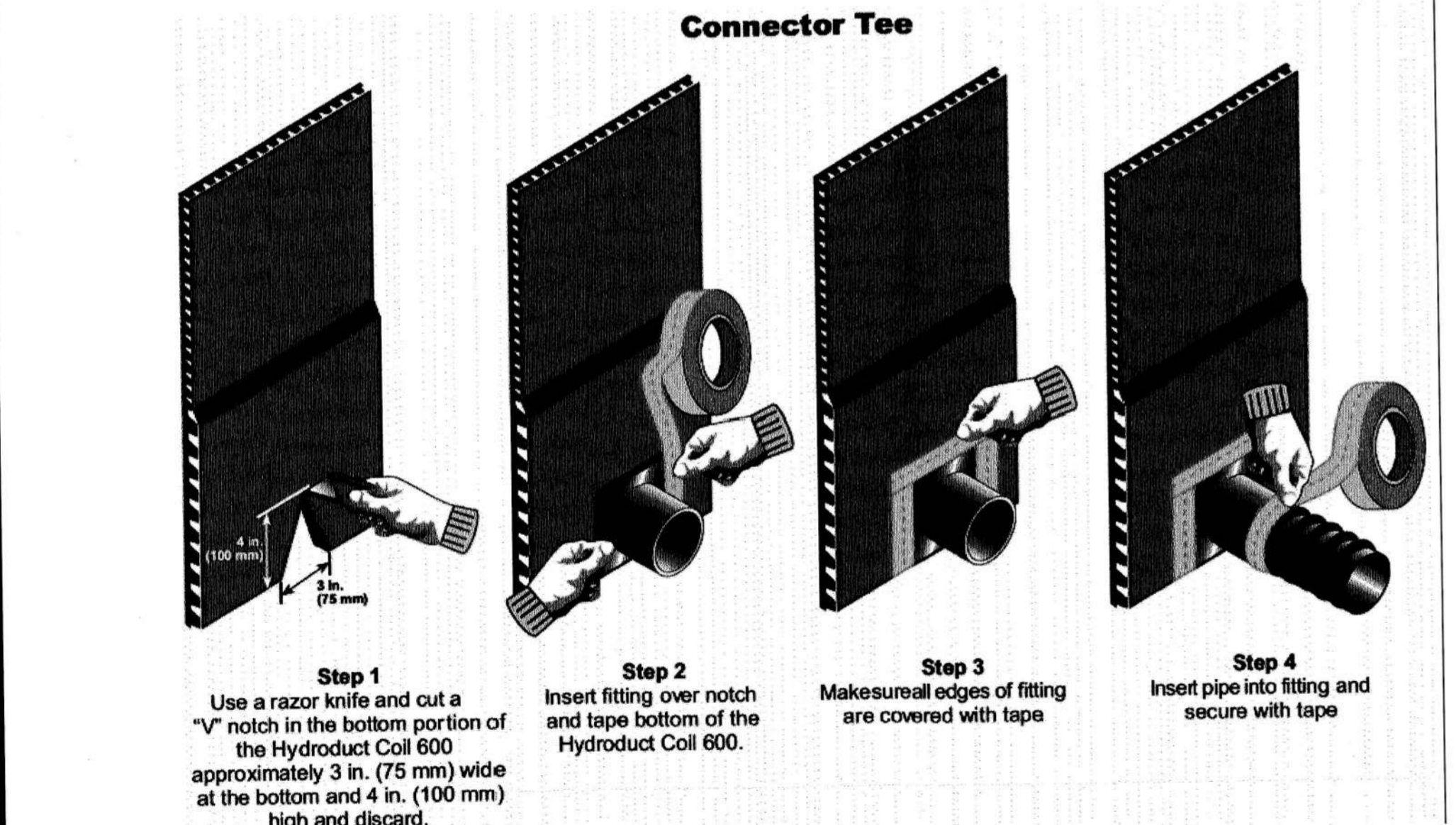
- INSTALLATION OF DEADMAN ANCHOR TIE ROD - METHOD:**
1. DRILL 24" DIAMETER DEADMAN ANCHOR PER PLANS USING 26" OD CASING PIPE IF NEEDED.
 2. PLACE SPECIFIED REBAR CAGE.
 3. PLACE A 15' LONG 24" DIAMETER #16 GAUGE CORRUGATED STEEL PIPE (CSP) AS A CASING TO BE ABANDONED IN PLACE FROM APPROX. 3.5' ABOVE (E) GROUND LEVEL.
 4. POUR DEADMAN CONCRETE TO 12" BELOW THE BOTTOM OF THE TIE ROD.
 5. BACKFILL AROUND THE OUTSIDE OF THE CSP BEFORE THE 26" DIAMETER DRILLING CASING IS REMOVED. THE OBJECTIVE IS TO NOT LOSE ANY GROUND.
 6. DRILL SOLDIER BEAMS AS OUTLINED ON SH 1.5 & SH 1.51.
 7. EXCAVATE AND PLACE LAGGING AS NORMAL TO APPROX. 6" BELOW THE TIE ROD.
 8. DRILL HORIZONTAL TIE ROD PIERCING THE CSP. (CASE HOLE WITH 6" CASING IF NECESSARY).
 9. PLACE ROD IN HORIZONTAL DRILL HOLE.
 10. CLIMB INTO 24" DIAMETER DEADMAN ANCHOR AND PLACE PLATE AND NUT.
 11. FILL REMAINING 8 - 10' OF DEADMAN PIER WITH CONCRETE.
 12. CUT OFF EXCESS CASING.
 13. GROUT TIE ROD HOLE AND REMOVE 6" CASING.
 14. TEST TIE ROD SIMILAR TO A TIEBACK AND OBSERVE DEFLECTIONS ON ENTIRE SYSTEM.



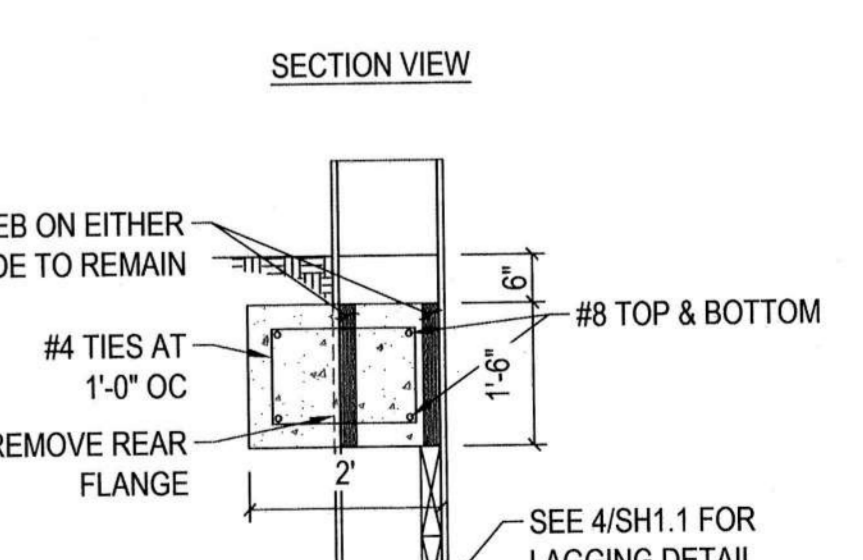
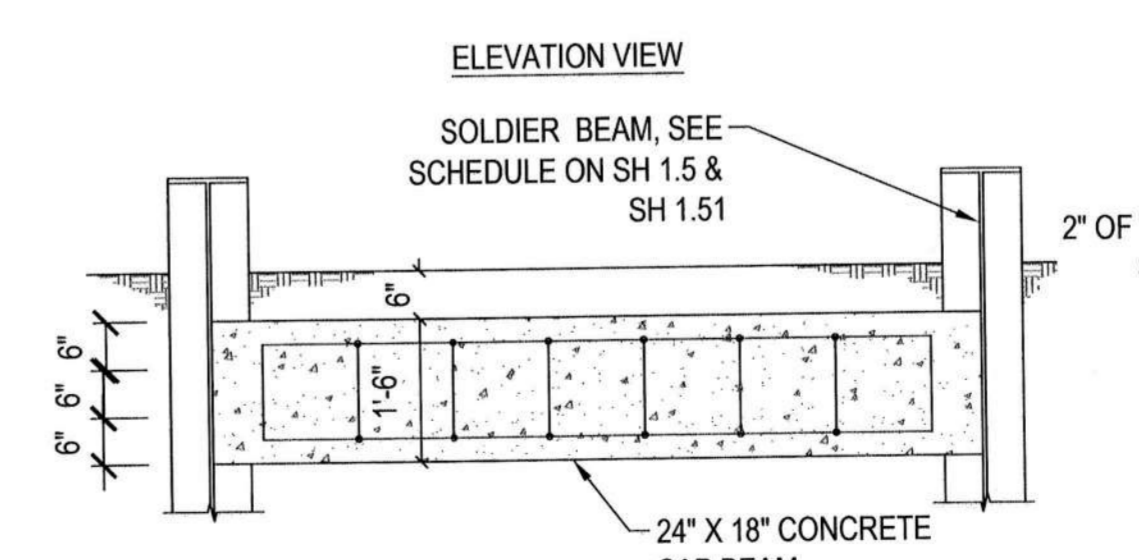
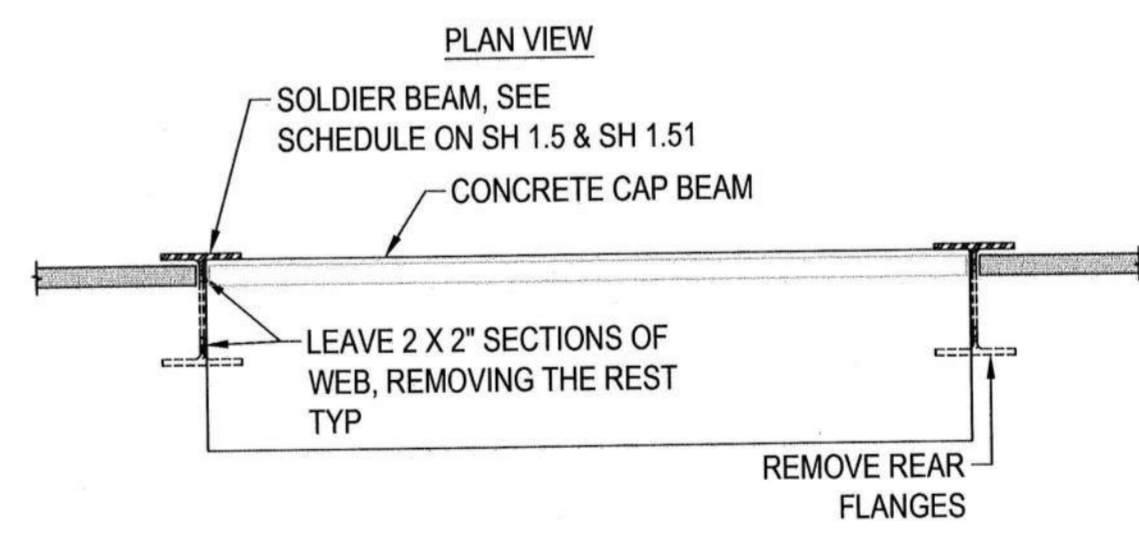
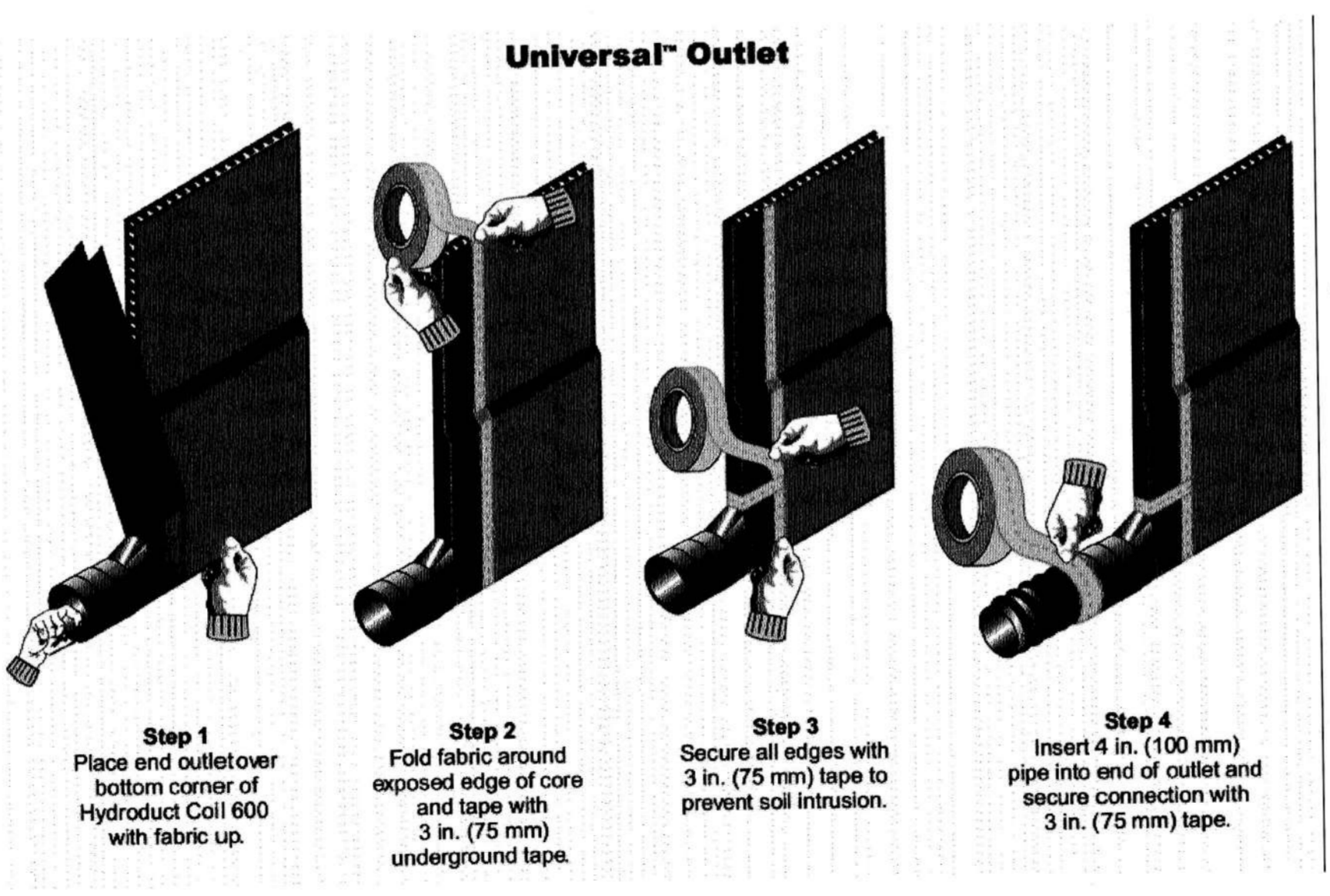
7 CORNER LADING DETAIL
SCALE: 1/2" = 1'-0"

CLEAR SPAN LAGGING SCHEDULE	
SPAN	SIZE
0' TO 8'	4x12
8' TO 10'	4x12

6 LAGGING SCHEDULE
SCALE: NA



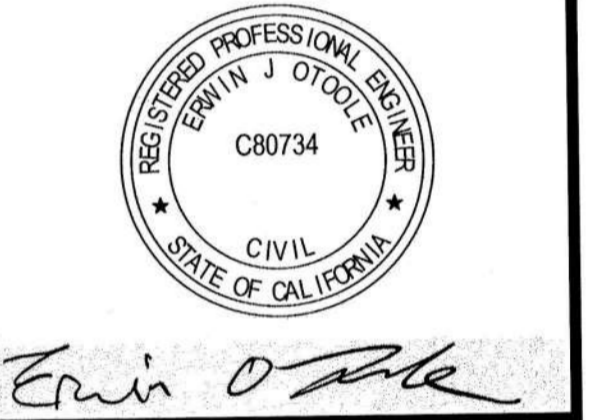
18 MIRAF HYDRODUCT COIL 600 CONNECTOR TEE & UNIVERSAL OUTLET DETAILS
SCALE: NA



19 CONCRETE CAP BEAM DETAILS
SCALE: 1/2" = 1'

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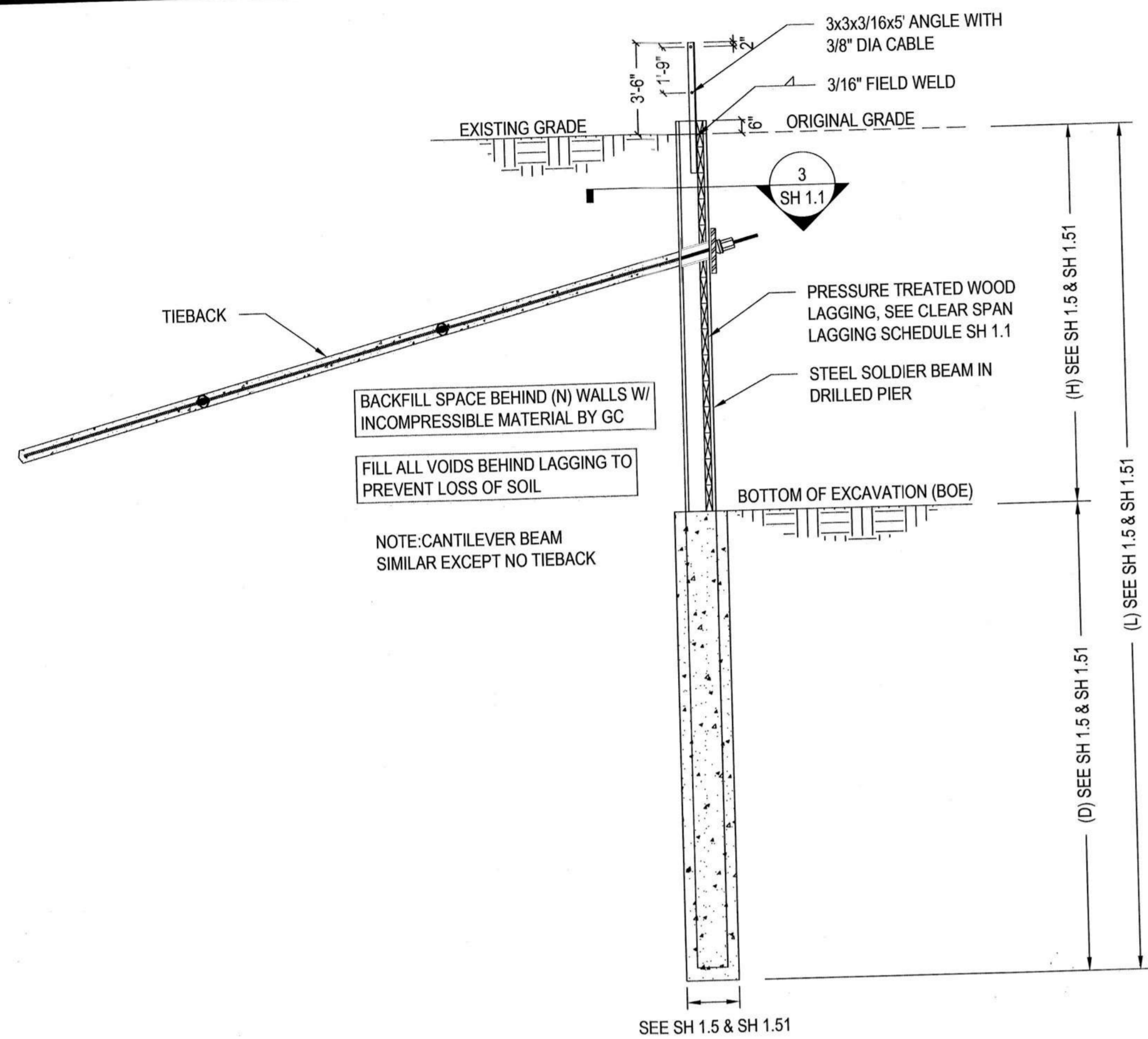


SHORING FOR NEW DEVELOPMENT AT
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MARIN CITY, CA 94065

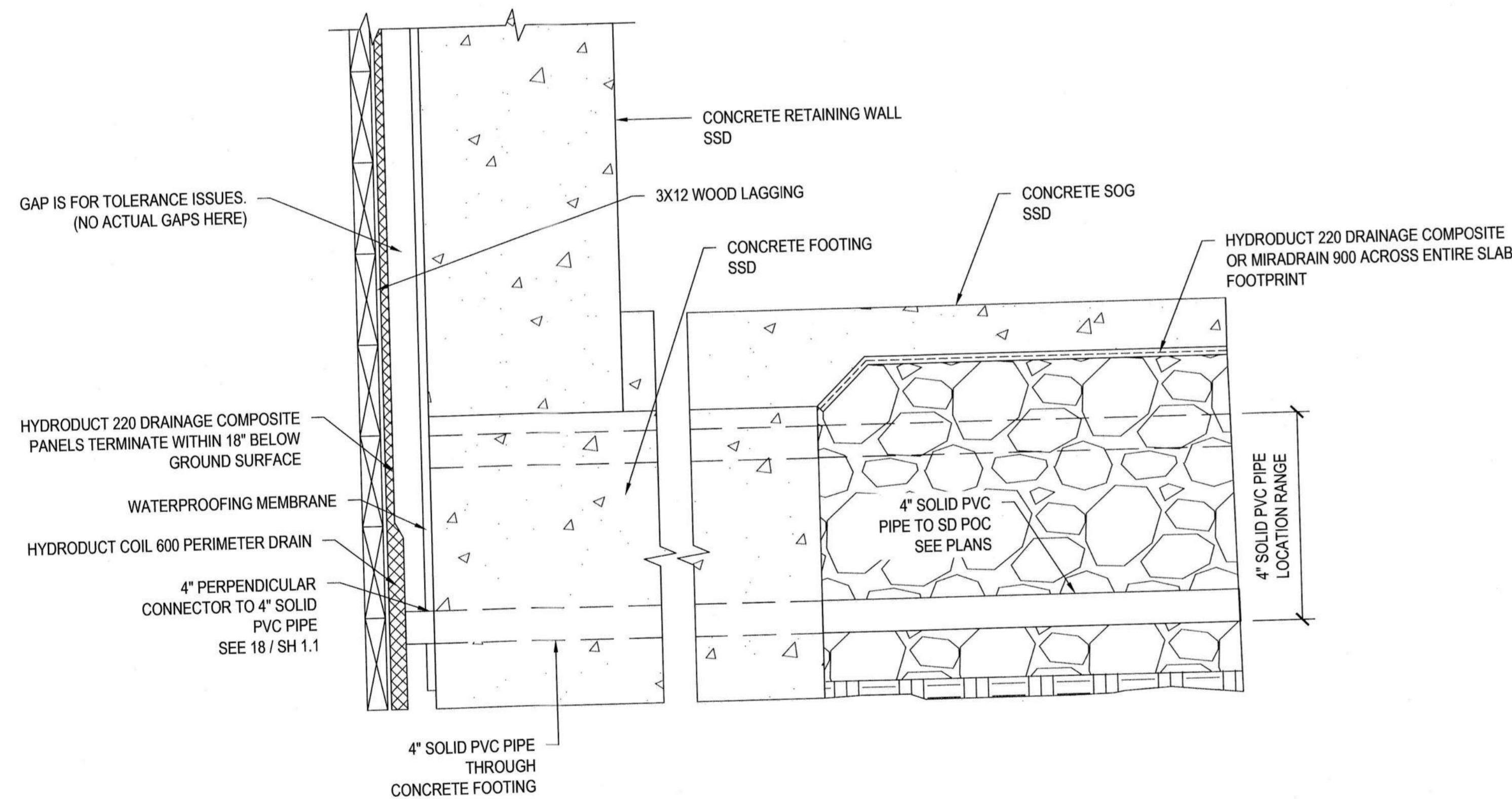
PROJECT NUMBER: 2020-074
SCALE: AS NOTED
DRAWN BY: JD
CHECKED BY: EOT

DETAILS I

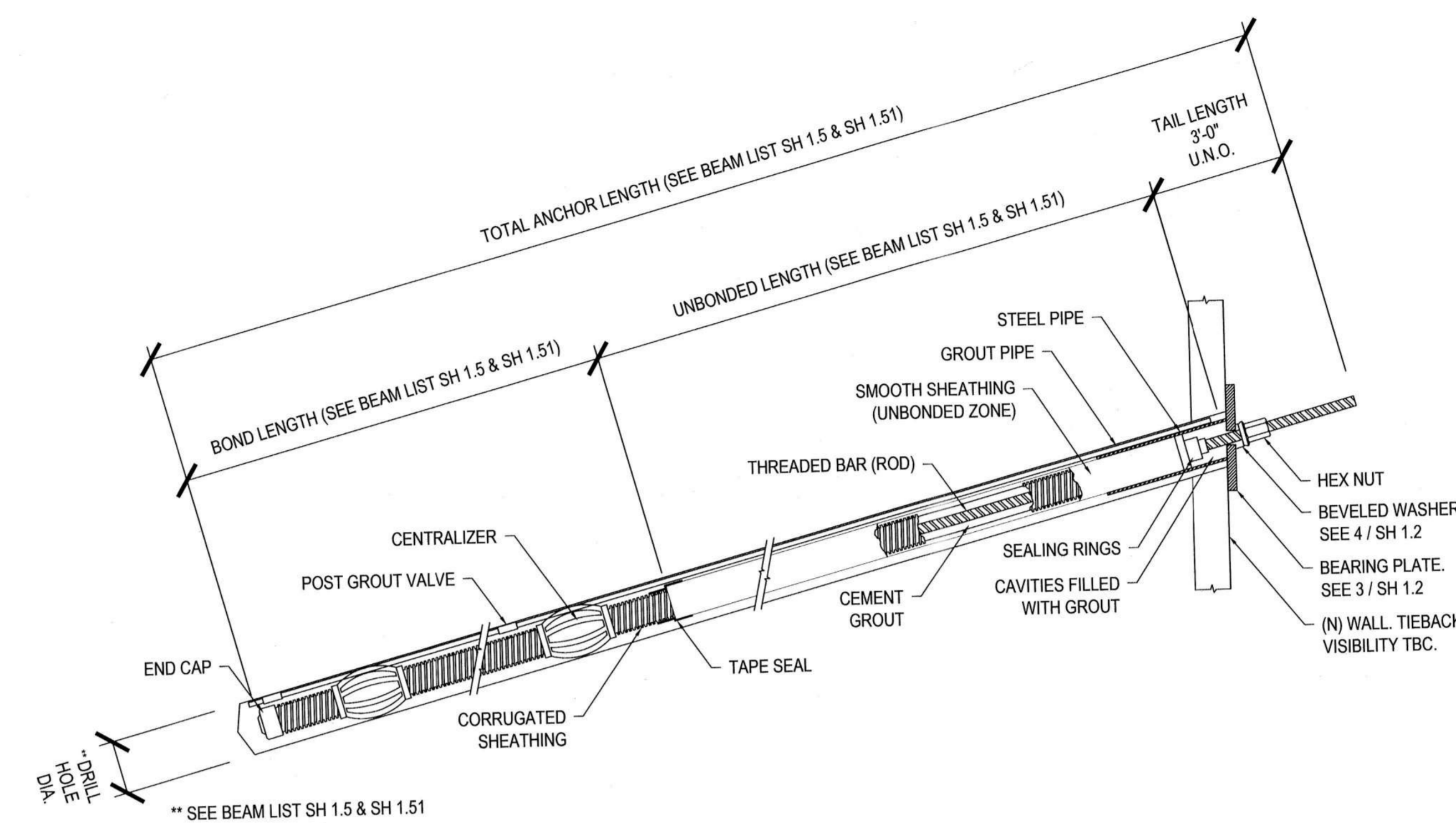
SH 1.1



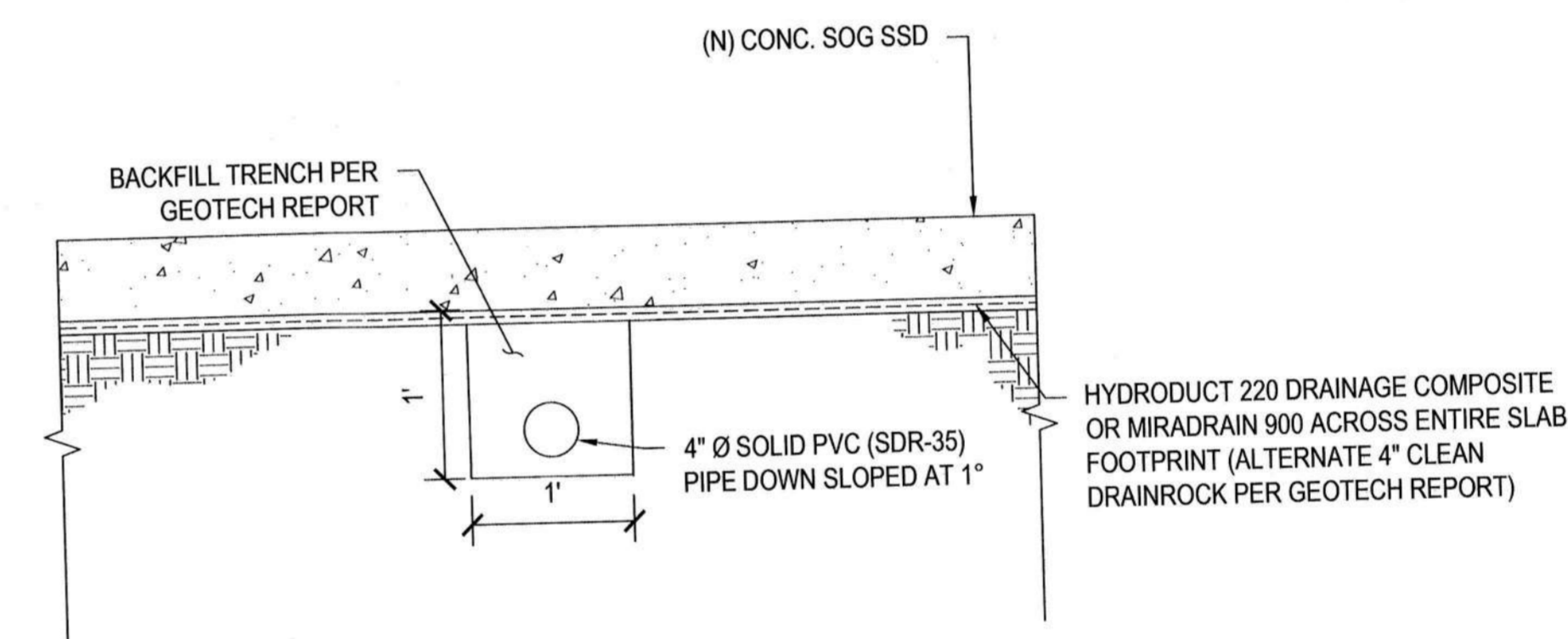
1 SOLDIER BEAM SECTION W/ TIEBACK
SCALE: 1/4" = 1'-0"



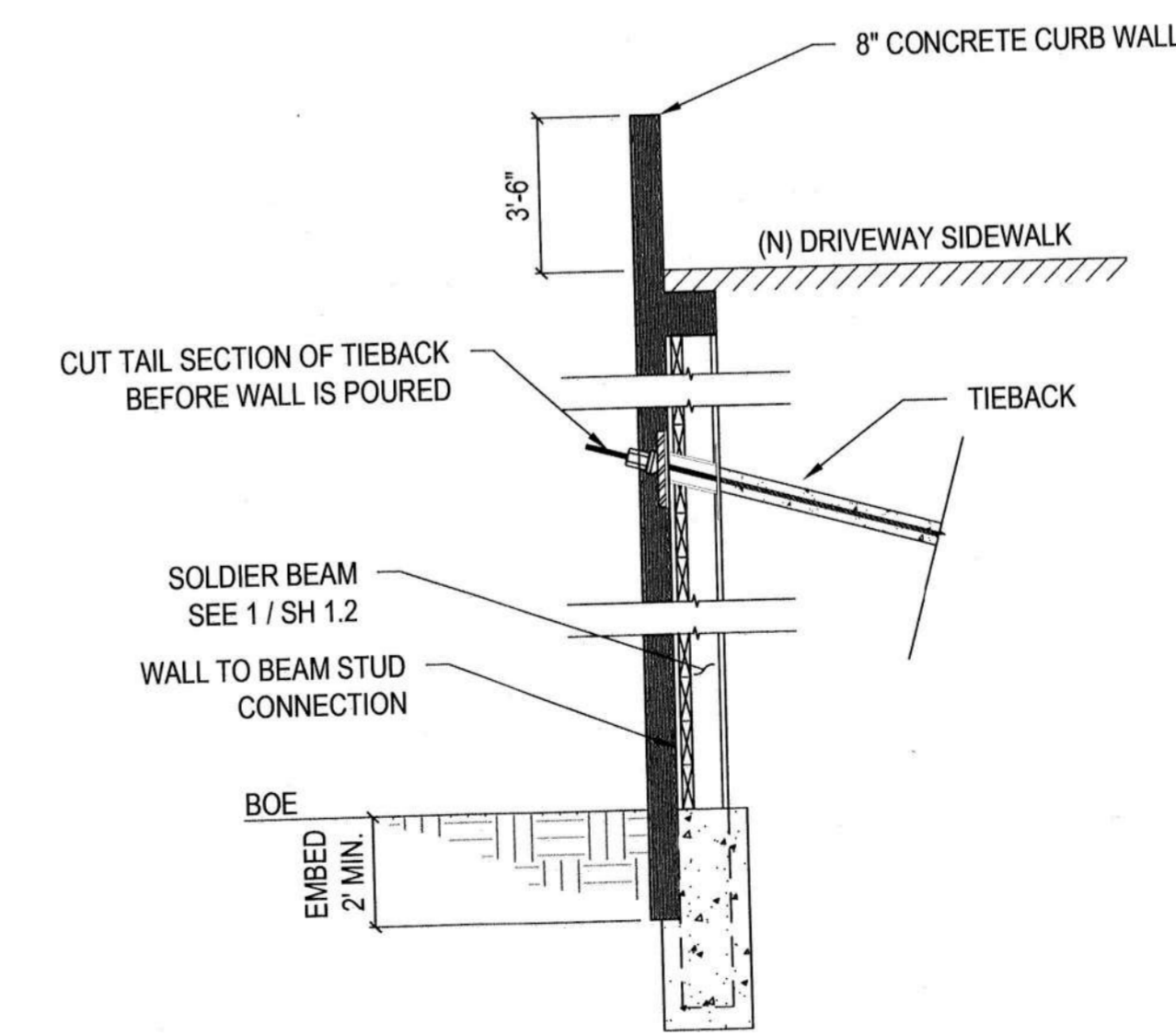
5 WOOD LAGGING / RETAINING WALL DRAINAGE - SECTION
SCALE: 1" = 1'-0"



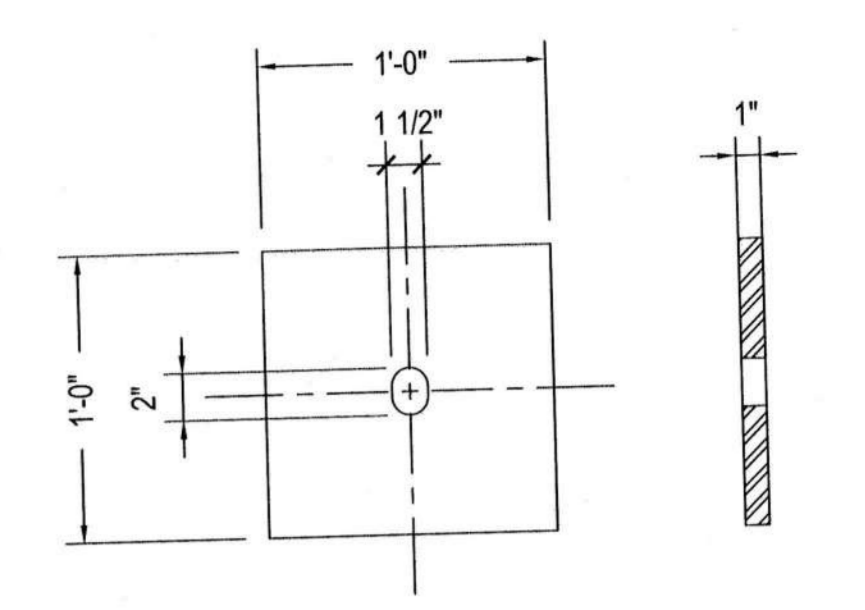
2 PERMANENT TIEBACK DETAIL
SCALE: 1" = 1'-0"



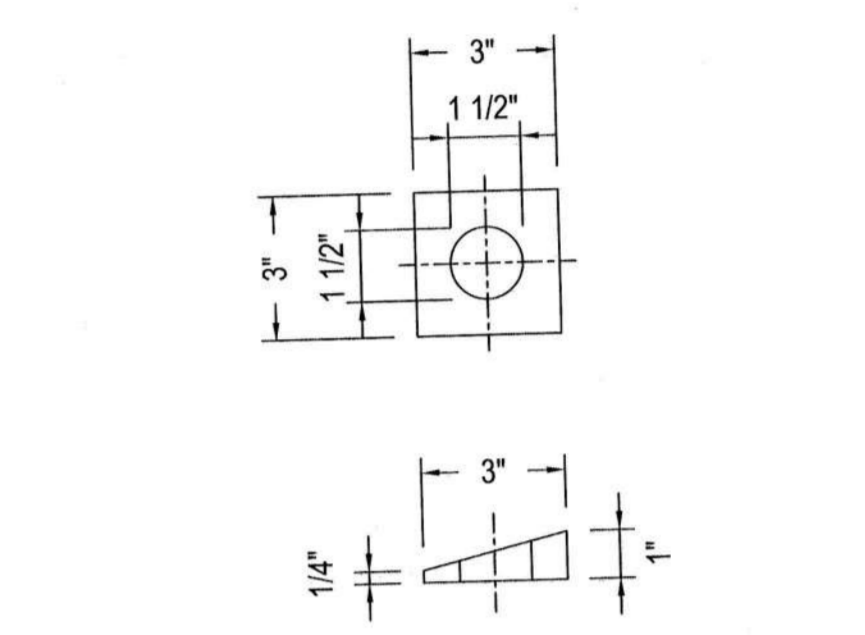
6 UNDERSLAB DRAINAGE SYSTEM - SECTION
SCALE: 1" = 1'-0"



7 SOLDIER BEAMS / DRIVEWAY SIDEWALK WALL
SCALE: 1" = 1'-0"



3 BEARING PLATE DETAIL
SCALE: 1-1/2" = 1'-0"



4 BEVELED WASHER DETAIL
SCALE: 3" = 1'-0"

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Erwin O'Toole

SHORING FOR NEW
DEVELOPMENT AT
825 DRAKE AVENUE

825 DRAKE AVENUE
MARIN CITY, CA 94065

PROJECT NUMBER 2020 - 074	SCALE AS NOTED
DRAWN BY JD	CHECKED BY EOT

DETAILS II

SH 1.2

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Erwin O'Toole

SHORING FOR NEW
 DEVELOPMENT AT
 825 DRAKE AVENUE

825 DRAKE AVENUE
 MARIN CITY, CA 94065

PROJECT NUMBER: 2020 - 074
 SCALE: AS NOTED

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 CHECKED BY: EOT

DETAILS III

SH 1.3

Beam #	Beam size	Spacing	Top of Beam (elev. Ft)	Bottom of Excavation (elev. Ft)	Max Retaining Height ("H" ft.)	Design Height (ft.)	Toe ("D" ft.)	Total Length ("L" ft.)	Beam Drill Hole Diameter (ft.)	Support Type	Support type elevation (ft.)	Tieback / Strut Load (kip)	Tieback Test Load [1.25 load] (kip)	Tieback Bar Diameter (in) or Strut size	Min. Unbonded Length (ft.)	Bonded Length Range (ft.)	Horizontal Angle (deg)
N1	HP14X 89 or equivalent	6	69	65.5	3.5	11	16.5	20	2	Cantilever				N/A			
N2	HP14X 89 or equivalent	6	69.5	65	4.5	11	16.5	21	2	Cantilever				N/A			
N3	HP14X 89 or equivalent	6	69.7	64.75	4.95	11	16.5	21	2	Cantilever				N/A			
N4	HP14X 89 or equivalent	6	70	64.25	5.75	11	16.5	22	2	Cantilever				N/A			
N5	HP14X 89 or equivalent	6	71	64	7	11	16.5	24	2	Cantilever				N/A			
N6	HP14X 89 or equivalent	6	71.5	63	8.5	11	16.5	25	2	Cantilever				N/A			
N7	HP14X 89 or equivalent	6	71.75	62.5	9.25	11	16.5	25.75	2	Cantilever				N/A			
N8	HP16X 121 or equivalent	6	72.25	62	10.25	13	19	29.25	2.5	Cantilever				N/A			
N9	HP16X 121 or equivalent	6	72.75	61.50	11.25	13	19	30.25	2.5	Cantilever				N/A			
N10	HP18X 157 or equivalent	6	73.25	60.50	12.75	15.00	22	34.75	2.5	Cantilever				N/A			
N11	HP18X 157 or equivalent	6	73.75	60.00	13.75	15.00	22	35.75	2.5	Cantilever				N/A			
N12	HP18X 204 or equivalent	6	74.25	59.50	14.75	16.00	23.5	38.25	2.5	Cantilever				N/A			
N13	HP18X 204 or equivalent	6	74.66	58.83	15.83	16.50	25	40.83	2.5	Cantilever				N/A			
N14	HP18X 204 or equivalent	6	75.20	58.25	16.95	16.50	25	41.95	2.5	Cantilever				N/A			
N15	HP18X 204 or equivalent	6	75.50	57.75	17.75	18.50	25	42.75	2.5	Cantilever				N/A			
N16	W10X 77 or equivalent	6	87.50	83.85	3.65	9.00	14.5	18.15	2	Cantilever				N/A			
N17	W10X 77 or equivalent	6	87.75	83.25	4.5	9.00	14.5	19	2	Cantilever				N/A			
N18	W10X 77 or equivalent	6	88.00	83.00	5	9.00	14.5	19.5	2	Cantilever				N/A			
N19	W10X 77 or equivalent	6	88.00	82.55	5.45	9.00	14.5	19.95	2	Cantilever				N/A			
N20	W10X 77 or equivalent	6	87.50	81.75	5.75	9.00	14.5	20.25	2	Cantilever				N/A			
N21	W10X 77 or equivalent	6	86.75	80.75	6	9.00	14.5	20.5	2	Cantilever				N/A			
N22	W10X 77 or equivalent	6	86.00	79.75	6.25	9.00	14.5	20.75	2	Cantilever				N/A			
N23	W10X 77 or equivalent	6	85.00	78.75	6.25	9.00	14.5	20.75	2	Cantilever				N/A			
N24	W10X 77 or equivalent	6	84.25	77.75	6.5	9.00	14.5	21	2	Cantilever				N/A			
N25	W10X 77 or equivalent	6	83.33	76.50	6.83	9.00	14.5	21.33	2	Cantilever				N/A			
N26	W10X 77 or equivalent	6	82.50	75.50	7	9.00	14.5	21.5	2	Cantilever				N/A			
N27	W10X 77 or equivalent	6	81.75	74.50	7.25	9.00	14.5	21.75	2	Cantilever				N/A			
N28	W10X 77 or equivalent	6	80.75	73.50	7.25	9.00	14.5	21.75	2	Cantilever				N/A			
N29	W10X 77 or equivalent	6	80.00	72.50	7.5	9.00	14.5	22	2	Cantilever				N/A			
N30	W10X 77 or equivalent	6	79.50	72.05	7.45	9.00	14.5	21.95	2	Cantilever				N/A			
N31	W10X 77 or equivalent	6	79.10	71.90	7.2	9.00	14.5	21.7	2	Cantilever				N/A			
E1	HP18X 204 or equivalent	6	74.66	57.33	17.33	17.50	25	42.33	2.5	Cantilever				N/A			
E2	HP18X 204 or equivalent	6	73.25	56.75	16.5	16.50	23.5	40	2.5	Cantilever				N/A			
E3	HP18X 204 or equivalent	6	71.75	56.25	15.5	16.50	23.5	39	2.5	Cantilever				N/A			
E4	HP18X 204 or equivalent	6	70.33	55.66	14.67	16.50	23.5	38.17	2.5	Cantilever				N/A			
E5	HP18X 135 or equivalent	6	68.83	55.25	13.58	14.00	23	36.58	2.5	Cantilever				N/A			
E6	HP16X 121 or equivalent	6	67.50	54.50	13	13.00	18.5	31.5	2.5	Cantilever				N/A			
E7	HP16X 121 or equivalent	6	66.00	53.90	12.1	13.00	18.5	30.6	2.5	Cantilever				N/A			
E8	HP16X 121 or equivalent	6	64.50	52.75	11.75	13.00	18.5	30.25	2.5	Cantilever				N/A			
E9	HP16X 121 or equivalent	6	63.25	51.75	11.5	13.00	18.5	30	2.5	Cantilever				N/A			
E10	HP14X 102 or equivalent	6	61.75	50.75	11	11.00	17.5	28.5	2.5	Cantilever				N/A			
E11	HP14X 73 or equivalent	6	60.00	50.00	10	10.00	14.5	24.5	2	Cantilever				N/A			
E12	HP14X 73 or equivalent	6	59.00	50.15	8.85	10.00	14.5	23.35	2	Cantilever				N/A			
E13	HP14X 73 or equivalent	6	56.66	48.83	7.83	10.00	14.5	22.33	2	Cantilever				N/A			
E14	HP14X 73 or equivalent	6	54.33	47.75	6.58	10.00	14.5	21.08	2	Cantilever				N/A			
E15	HP14X 73 or equivalent	6	52.00	46.66	5.34	10.00	14.5	19.84	2	Cantilever				N/A			
E16	HP14X 73 or equivalent	6	50.00	45.66	4.34	10.00	14.5	18.84	2	Cantilever				N/A			
E17	HP14X 73 or equivalent	6	47.50	44.66	2.84	10.00	14.5	17.34	2	Cantilever				N/A			
E18	HP14X 73 or equivalent	6	45.25	43.67	1.58	10.00	14.5	16.08	2	Cantilever				N/A			
W1	W14X 74 or equivalent	6	70	61	9	12	15	24	2	Cantilever				N/A			
W2	W14X 74 or equivalent	6	71	61	10	12	15	25	2	Cantilever				N/A			
W3	W14X 74 or equivalent	3.5	71	61	10	15.5	18.5	29	2	Cantilever				N/A			
W4	W14X 74 or equivalent	3.5	72	61	11	15.5	18.5	30	2	Cantilever				N/A			
W5	W14X 74 or equivalent	3.5	72	61	11	15.5	18.5	30	2	Cantilever				N/A			
W6	W14X 74 or equivalent	3.5	73	61	12	15.5	18.5	31	2	Cantilever				N/A			
W7	W14X 74 or equivalent	3.5	73	61	12	15.5	18.5	31	2	Cantilever				N/A			
W8	W14X 74 or equivalent	3.5	73	61	12	15.5	18.5	31	2	Cantilever				N/A			
W9	W14X 74 or equivalent	3.5	74	61	13	15.5	18.5	32	2	Cantilever				N/A			
W10	W14X 74 or equivalent	3.5	74	61	13	15.5	18.5	32	2	Cantilever				N/A			
W11	W14X 74 or equivalent	3.5	74	61	13	15.5	18.5	32	2	Cantilever				N/A			
W12	W12X 53 or equivalent	3.5	75	61	14	17	15	29	2	Cantilever				N/A			
W13	W14X 74 or equivalent	6	76	61	15	17	15	30	2	Corner				N/A			
W14	HP18X 181 or equivalent	6	77	61	16	19	22	38	2.5	Cantilever				N/A			
W15	HP14X 89 or equivalent	6	78	61	17	17	6	23	2	Tieback	74.33	53	66.3	1	12	20 - 25	15
W16	W12X 53 or equivalent	6	79	61	18	18	5.5	24	2	Tieback	70	80	100.0	1	15	25 - 30	15
W17	W12X 53 or equivalent	6	79	61	18	18	5.5	24	2	Tieback	73	80	100.0	1	15	25 - 30	15
W18	W16X 89 or equivalent	6	79	61.8	17.2	21	5.5	23	2	Deadman	70	96	120.0	1.25	13.8	NA	0
W19	W16X 89 or equivalent	6	79	61.8	17.2	21	5.5	23	2	Deadman	70	96	120.0	1.25	13.5	NA	0
W20	W16X 89 or equivalent	6	79	63.85	15.15	21	5.5	21	2	Deadman	70	96	120.0	1.25	13	NA	0
W21	W18X 97 or equivalent	6	83.02	63.85	19.17	25	6.5	26	2.5	Tieback	70	103	128.8	1.25	14	26 - 30	15
W22	Deadman Piers		78.5	NA		22	22	22	2	Cantilever				N/A			
W23	Deadman Piers		79.25	NA		22	22	22	2	Cantilever				N/A			
W24	Deadman Piers		80	NA		22	22	22	2	Cantilever				N/A			

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825 DRAKE AVENUE
MARIN CITY, CA 94065

PROJECT NUMBER	SCALE
2020 - 074	AS NOTED
DRAWN BY	CHECKED BY
JD	EOT

BEAM LIST I

Beam #	Beam size	Spacing	Top of Beam (elev. Ft)	Bottom of Excavation (elev. Ft)	Max Retaining Height ("H" ft.)	Design Height (ft.)	Toe ("D" ft.)	Total Length ("L" ft.)	Beam Drill Hole Diameter (ft.)	Support Type	Support type elevation (ft.)	Tieback / Strut Load (kip)	Tieback Test Load [1.25 load] (kip)	Tieback Bar Diameter (in) or Strut size	Min. Unbonded Length (ft.)	Bonded Length Range (ft.)	Horizontal Angle (deg)
P1	W18X 97 or equivalent	6	83.25	63.85	19.4	24	9	28	2.5	Tieback	80	185	231.3	1.625	15	47 - 50	15
P2	W18X 97 or equivalent	6	82.5	63.85	18.65	24	9	28	2.5	Tieback	80	185	231.3	1.625	15	47 - 50	15
P3	W16X 89 or equivalent	6	81.75	63.85	17.9	21	7.5	25	2	Tieback	77	150	187.5	1.325	13	38 - 40	15
P4	W16X 89 or equivalent	6	81	63.85	17.15	21	7.5	25	2	Tieback	77	150	187.5	1.325	13	38 - 40	15
P5	W16X 89 or equivalent	6	80	63.85	16.15	21	7.5	24	2	Tieback	77	150	187.5	1.325	13	38 - 40	15
P6	W12X 65 or equivalent	6	79.25	63.85	15.4	18.5	6	21	2	Tieback	77	123	153.8	1.325	10	30 - 35	15
P7	W12X 65 or equivalent	6	78.5	63.85	14.65	18.5	6	21	2	Tieback	77	123	153.8	1.325	10	30 - 35	15
P8	W12X 65 or equivalent	6	78	63.85	14.15	16.5	5	19	2	Tieback	75	105	131.3	1.25	10	26 - 30	15
P9	W12X 65 or equivalent	6	77.5	63.85	13.65	16.5	5	19	2	Tieback	75	105	131.3	1.25	10	26 - 30	15
P10	W12X 65 or equivalent	6	76.75	63.85	12.9	14.5	5.5	18	2	Tieback	73	74	92.5	1	10	20 - 25	15
P11	W12X 65 or equivalent	6	76	63.85	12.15	14.5	5.5	18	2	Tieback	73	74	92.5	1	10	20 - 25	15
P12	W12X 65 or equivalent	6	75	63.85	11.15	14.5	5.5	17	2	Tieback	71	74	92.5	1	10	20 - 25	15
P13	W12X 65 or equivalent	6	74.25	63.85	10.4	14.5	5.5	16	2	Tieback	71	74	92.5	1	10	20 - 25	15
P14	W12X 65 or equivalent	6	72.5	63.85	8.65	14.5	5.5	14	2	Tieback	71	74	92.5	1	10	20 - 25	15
P15	W12X 65 or equivalent	6	71.25	63.85	7.4	14.5	5.5	13	2	Tieback	69	74	92.5	1	10	20 - 25	15
P16	W12X 65 or equivalent	6	71	63.85	7.15	14.5	5.5	13	2	Tieback	69	74	92.5	1	10	20 - 25	15
P17	W12X 65 or equivalent	6	71	63.85	7.15	14.5	5.5	13	2	Tieback	69	74	92.5	1	10	20 - 25	15
P18	W12X 65 or equivalent	6	71	63.85	7.15	14.5	5.5	13	2	Tieback	69	74	92.5	1	10	20 - 25	15
P19	W12X 65 or equivalent	6	71	63.85	7.15	14.5	5.5	13	2	Tieback	69	74	92.5	1	10	20 - 25	15
P20	W12X 65 or equivalent	6	71	63.85	7.15	14.5	5.5	13	2	Tieback	69	74	92.5	1	10	20 - 25	15
P21	W12X 65 or equivalent	6	70.5	63.85	6.65	14.5	5.5	12	2	Tieback	69	74	92.5	1	10	20 - 25	15
P22	W12X 65 or equivalent	6	70.5	63.85	6.65	14.5	5.5	12	2	Tieback	69	74	92.5	1	10	20 - 25	15
P23	W12X 65 or equivalent	6	70.5	63.85	6.65	14.5	5.5	12	2	Tieback	69	74	92.5	1	10	20 - 25	15
P24	W12X 65 or equivalent	6	70.25	63.85	6.4	14.5	5.5	12	2	Tieback	69	74	92.5	1	10	20 - 25	15
P25	W12X 65 or equivalent	6	70	63.85	6.15	14.5	5.5	12	2	Tieback	69	74	92.5	1	10	20 - 25	15
P26	W12X 65 or equivalent	6	70	63.85	6.15	14.5	5.5	12	2	Tieback	69	74	92.5	1	10	20 - 25	15
P27	W12X 65 or equivalent	6	70	63.85	6.15	14.5	5.5	12	2	Tieback	69	74	92.5	1	10	20 - 25	15
P28	W12X 65 or equivalent	6	70	63.85	6.15	14.5	5.5	12	2	Tieback	69	74	92.5	1	10	20 - 25	15
P29	W12X 65 or equivalent	6	70	63.85	6.15	14.5	5.5	12	2	Tieback	69	74	92.5	1	10	20 - 25	15
P30	W12X 65 or equivalent	6	70	63.85	6.15	14.5	5.5	12	2	Tieback	69	74	92.5	1	10	20 - 25	15
P31	HP16X 121 or equivalent	6	69.86	63.85	6.01	11.5	19.5	26	2.5	Tieback	69	74	92.5	1	10	20 - 25	15
P32	HP16X 121 or equivalent	6	69.86	63.85	6.01	11.5	19.5	26	2.5	Tieback	69	74	92.5	1	10	20 - 25	15
P33	HP16X 121 or equivalent	6	69.86	63.85	6.01	11.5	19.5	26	2.5	Tieback	69	74	92.5	1	10	20 - 25	15
P34	W12X 65 or equivalent	6	69.86	63.85	6.01	14.5	5.5	12	2	Tieback	69	74	92.5	1	10	20 - 25	15
P35	W12X 65 or equivalent	6	69.35	63.85	5.5	14.5	5.5	11	2	Tieback	69	74	92.5	1	10	20 - 25	15
P36	W12X 65 or equivalent	6	69.35	61.8	7.55	11.5	5.5	13	2	Cantilever				N/A			
P37	W12X 65 or equivalent	6	67.4	61.8	5.6	11.5	5.5	11	2	Cantilever				N/A			
P38	W12X 65 or equivalent	6	67.4	61.8	5.6	11.5	5.5	11	2	Cantilever				N/A			
A1	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A2	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A3	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A4	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A5	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A6	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A7	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A8	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A9	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A10	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A11	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A12	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A13	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A14	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A15	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A16	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A17	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A18	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A19	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A20	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A21	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A22	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A23	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A24	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A25	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A26	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A27	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A28	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A29	HP18X 135 or equivalent	6	61.8	50.9	10.9	12.5	21	32	2.5	Cantilever				N/A			
A30	HP18X 135 or equivalent	4	67.4	50.9	16.5	20	23.5	40	2	Tieback	61.4	139	173.8	1.375	13	38 - 40	15
A31	HP18X 135 or equivalent	4	67.4	50.9	16.5	20	23.5	40	2	Tieback	61.4	139	173.8	1.375	13	38 - 40	15
A32	W16X 89 or equivalent	5	67.4	50.9	16.5	20	15	32	2	Tieback	61.4	139	173.8	1.375	13	38 - 40	15
A33	W16X 89 or equivalent	5	67.4	50.9	16.5	20	15	32	2	Tieback	61.4	139	173.8	1.375	13	38 - 40	15
A34	W16X 89 or equivalent	5	67.4	50.9	16.5	20	15	32	2	Tieback	61.4	139	173.8	1.375	13	38 - 40	15
A35	W16X 89 or equivalent	6	66.25	50.9	15.35	17	18	33	2	Cantilever				N/A			
A36	W16X 89 or equivalent	6	65.3	50.9	14.4	17	18	32	2	Cantilever				N/A			
A37	W16X 89 or equivalent	6	62.5	50.9	11.6	17	18	30	2	Cantilever				N/A			
A38	W16X 89 or equivalent	6	60	50.9	9.1	10	15	24	2	Cantilever				N/A			
A39	W16X 89 or equivalent	6	58	50.9	7.1	10	15	22	2	Cantilever				N/A			
A40	W16X 89 or equivalent	6	56	50.9	5.1	10	15	20	2	Cantilever				N/A			

REVISIONS	NO.	DATE	DESC.
	1	03.31.2023	PLAN CHECK COMMENTS
	2	04.28.2023	SUBMITTAL
	3	05.26.2023	CONSTRUCTION SET
	4	02.05.2024	
	5	07.03.2024	
	6	09.11.2024	DRAFT
	7	09.24.2024	DRAFT
	8	10.02.2024	

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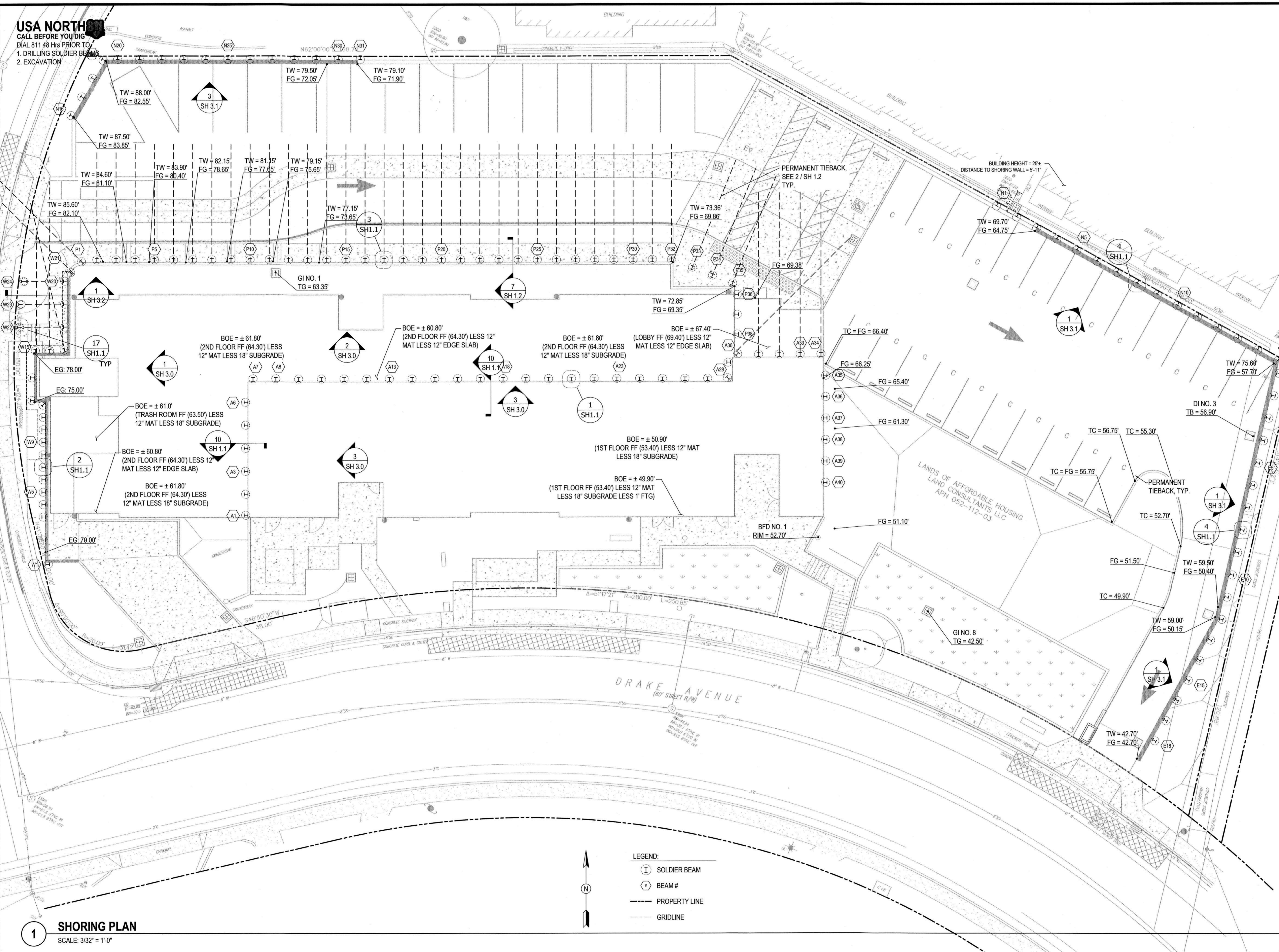
SHORING FOR NEW
DEVELOPMENT AT
825 DRAKE AVENUE
825 DRAKE AVENUE
MARIN CITY, CA 94065

PROJECT NUMBER
2020 - 074
SCALE
AS NOTED
DRAWN BY
JD
CHECKED BY
EOT

BEAM LIST II

USA NORTH

CALL BEFORE YOU DIG
 DIAL 811 48 Hrs PRIOR TO
 1. DRILLING SOLDIER BEAMS
 2. EXCAVATION



- LEGEND:**
- SOLDIER BEAM
 - BEAM #
 - PROPERTY LINE
 - GRIDLINE

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

REVISIONS NO.	DATE	DESC.	PLAN CHECK COMMENTS
1	03.31.2023		SUBMITTAL
2	04.28.2023		CONSTRUCTION SET
3	05.26.2023		
4	02.05.2024		
5	07.03.2024		
6	08.11.2024		DRAFT
7	09.24.2024		DRAFT
8	10.02.2024		

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Erwin O'Toole

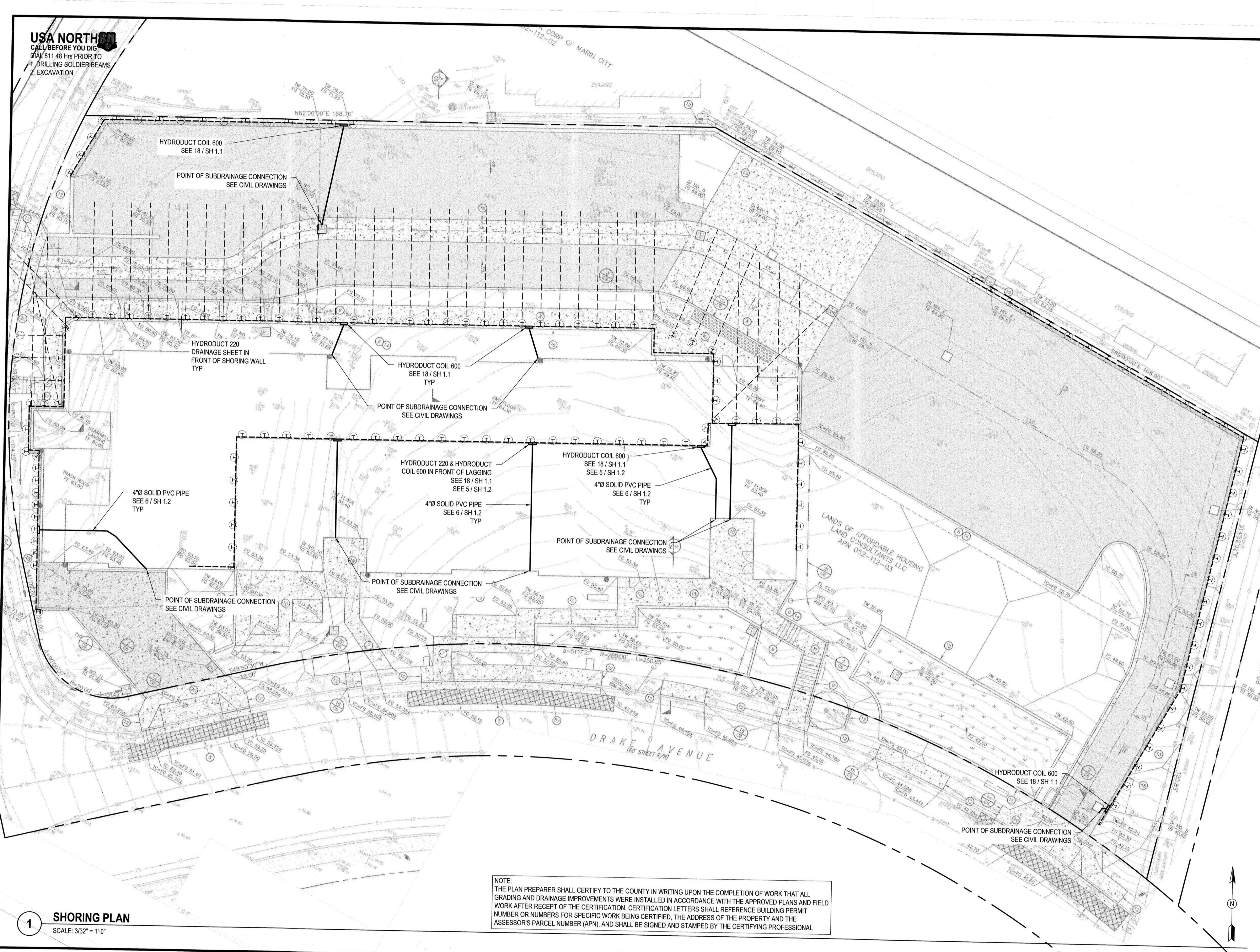
SHORING FOR NEW DEVELOPMENT AT 825 DRAKE AVENUE
 825 DRAKE AVENUE
 MARIN CITY, CA 94065

PROJECT NUMBER	SCALE
2020 - 074	AS NOTED
DRAWN BY	CHECKED BY
JD	EOT

PLAN

SH 2.0

USA NORTH
 CALL BEFORE YOU DIG
 CALL 811 48 Hrs PRIOR TO
 1. DRILLING SOLDIER BEAMS
 2. EXCAVATION



REVISONS	NO.	DATE	DESC.	PLAN CHECK COMMENTS	SUBMITTAL	CONSTRUCTION SET	DRAFT	DRAFT
	1	03.31.2023						
	2	04.28.2023						
	3	05.26.2023						
	4	02.05.2024						
	5	07.03.2024						
	6	09.11.2024						
	7	09.24.2024						
	8	10.02.2024						

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Erwin O'Toole

SHORING FOR NEW
 DEVELOPMENT AT
 825 DRAKE AVENUE
 825 DRAKE AVENUE
 MARIN CITY, CA 94065

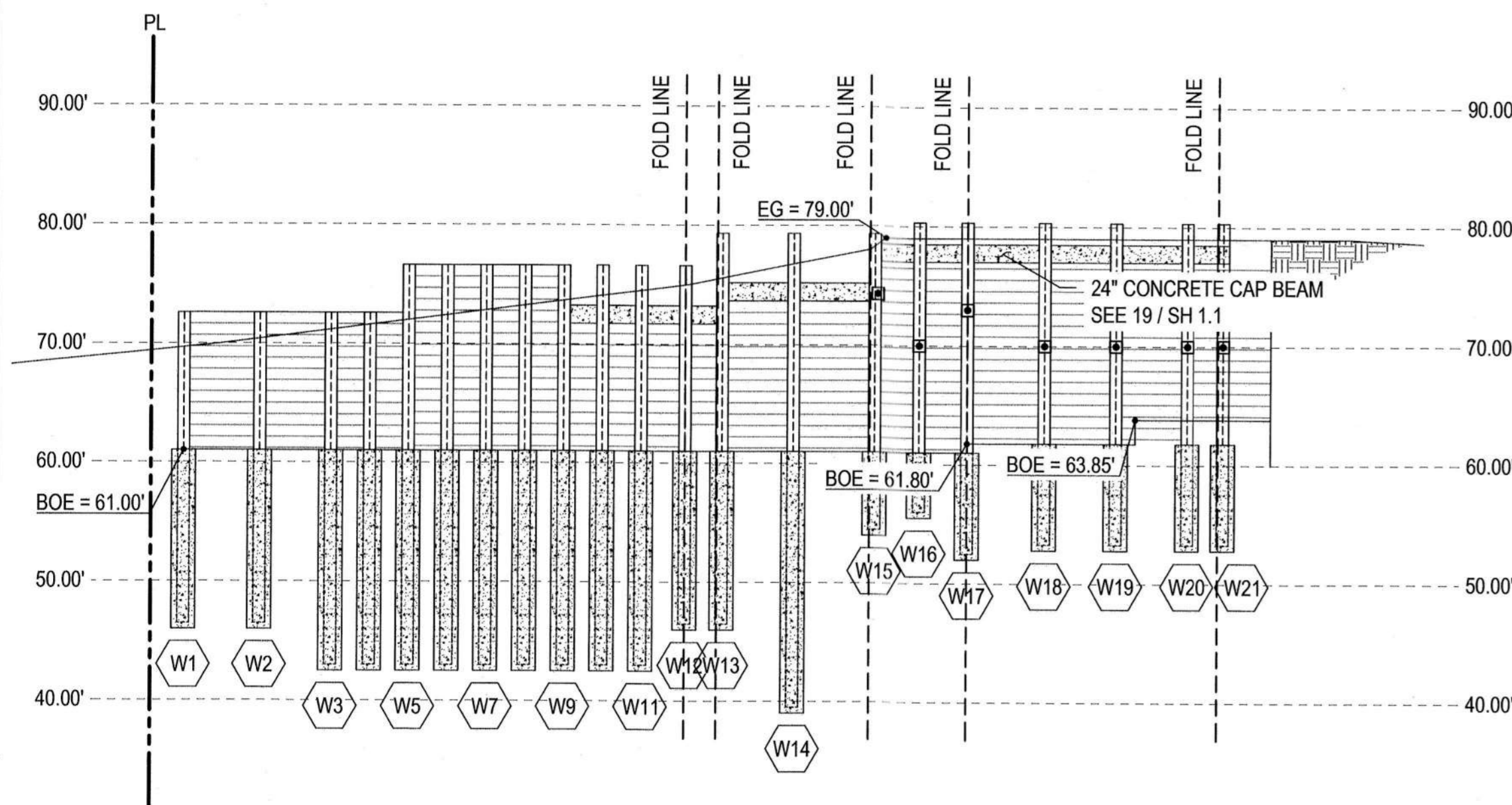
PROJECT NUMBER: 2020-074
 SCALE: AS NOTED
 DRAWN BY: JD
 CHECKED BY: EOT

DRAINAGE PLAN

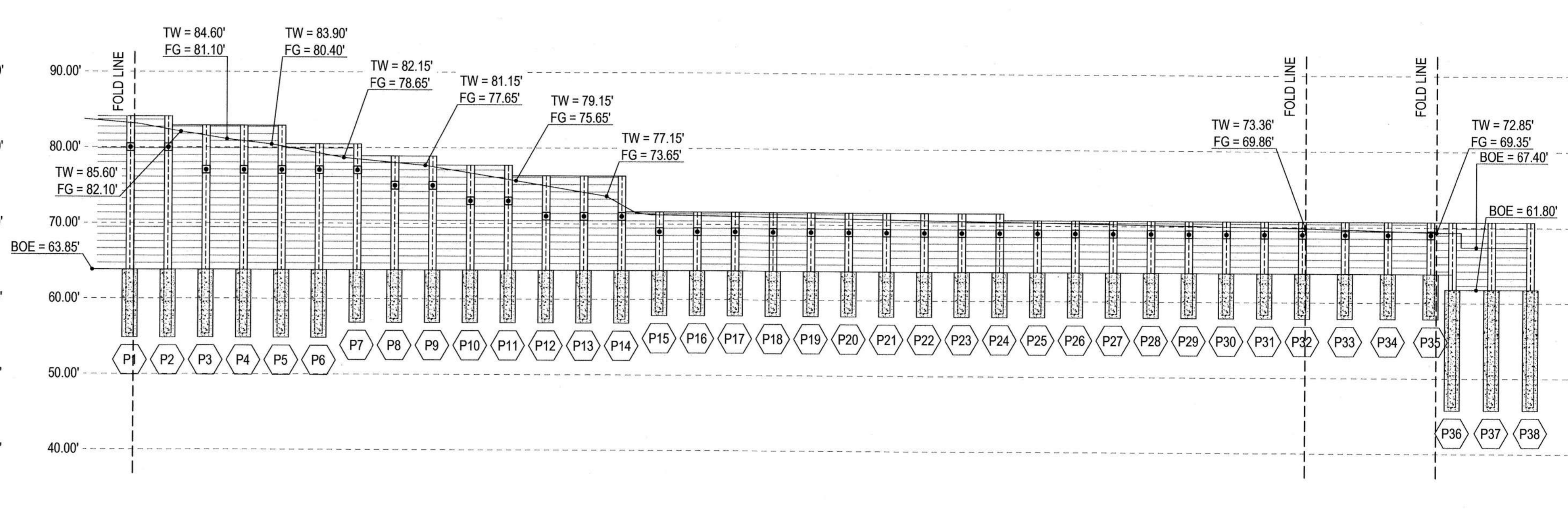
SH 2.1

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

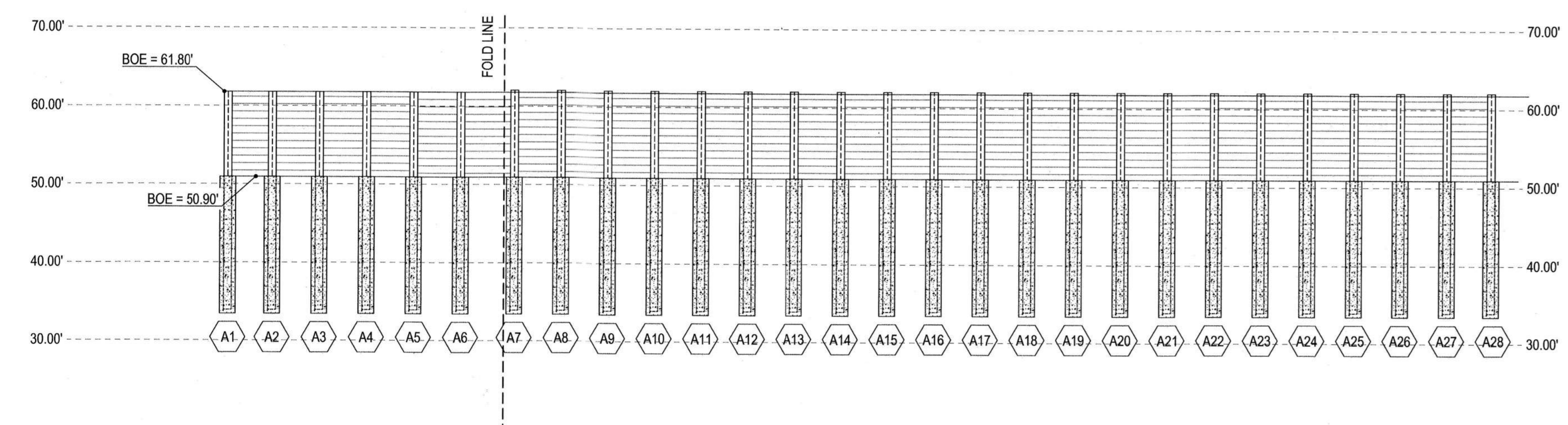
NOTE:
 THE PLAN PREPARER SHALL CERTIFY TO THE COUNTY IN WRITING UPON THE COMPLETION OF WORK THAT ALL GRADING AND DRAINAGE IMPROVEMENTS WERE INSTALLED IN ACCORDANCE WITH THE APPROVED PLANS AND FIELD WORK AFTER RECEIPT OF THE CERTIFICATION. CERTIFICATION LETTERS SHALL REFERENCE BUILDING PERMIT NUMBER OR NUMBERS FOR SPECIFIC WORK BEING CERTIFIED, THE ADDRESS OF THE PROPERTY AND THE ASSESSOR'S PARCEL NUMBER (APN), AND SHALL BE SIGNED AND STAMPED BY THE CERTIFYING PROFESSIONAL



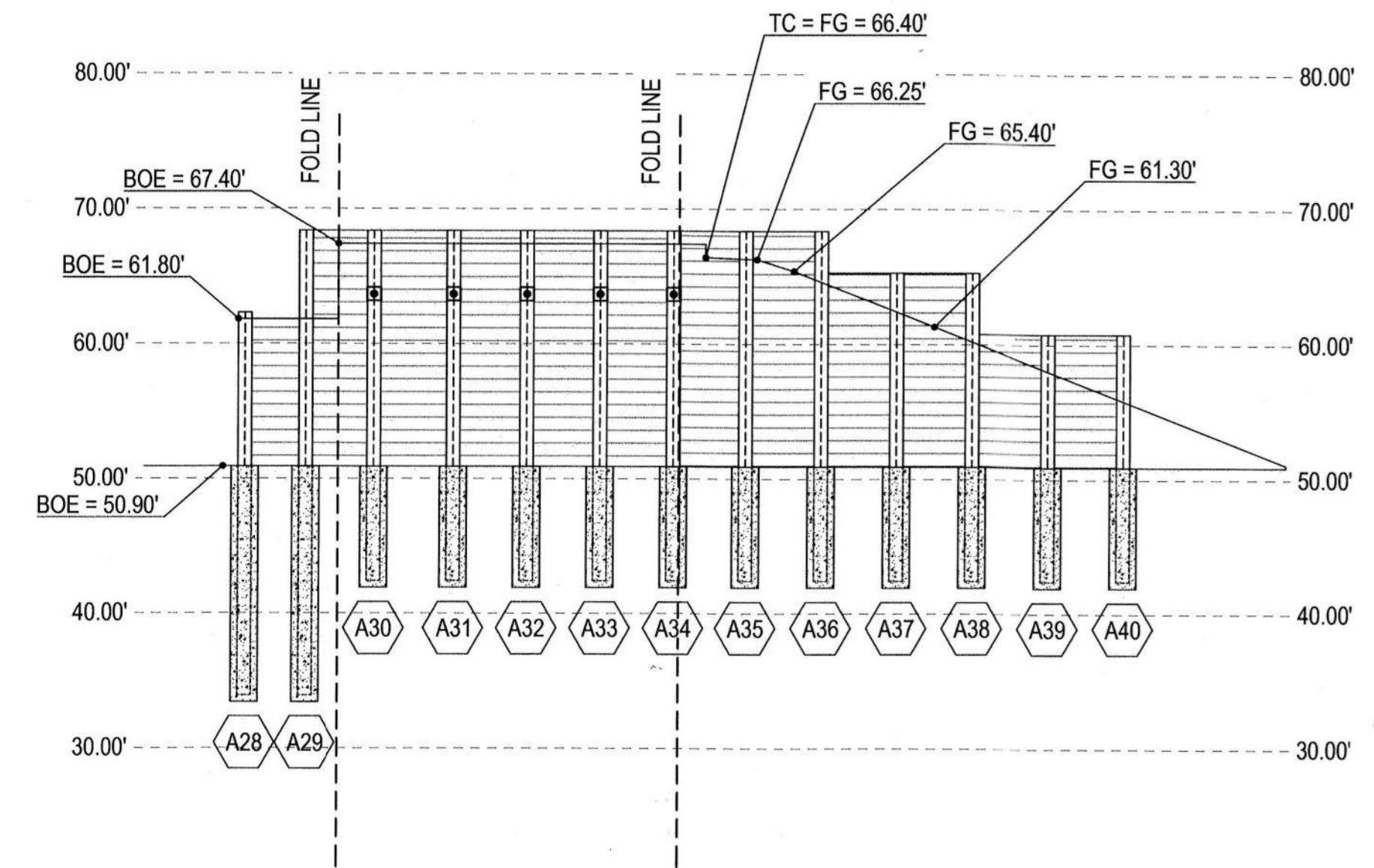
1 WEST ELEVATION
SCALE: 3/32" = 1'-0"



2 REAR EXTERNAL WALL ELEVATION
SCALE: 3/32" = 1'-0"



3 INTERNAL SITE ELEVATION
SCALE: 3/32" = 1'-0"



4 INTERNAL SITE ELEVATION
SCALE: 3/32" = 1'-0"

USA NORTH
CALL BEFORE YOU DIG
DIAL 811 48 Hrs PRIOR TO
1. DRILLING SOLDIER BEAMS
2. EXCAVATION

LEGEND:
 PIT/BEAM #
 TIEBACK ROD
 PROPERTY LINE

REVISIONS	NO.	DATE	DESC.
	1	03.31.2023	PLAN CHECK COMMENTS
	2	04.28.2023	SUBMITTAL
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	5	07.03.2024	
	6	09.11.2024	DRAFT
	7	09.24.2024	DRAFT
	8	10.02.2024	

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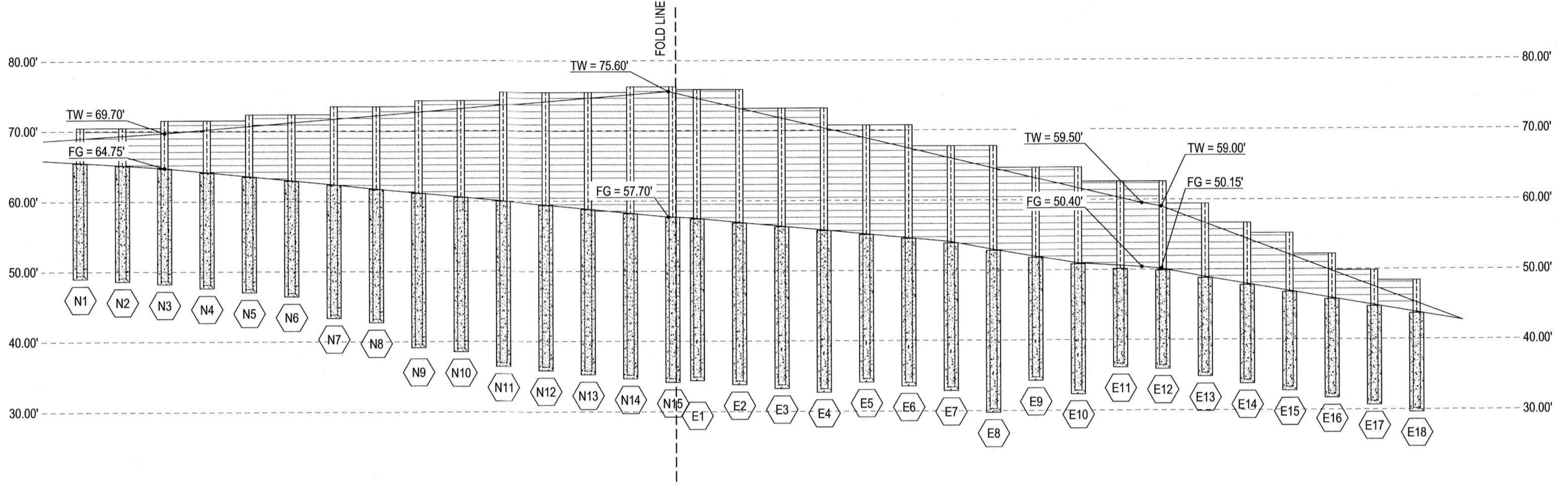
PROJECT NUMBER 2020-074	SCALE AS NOTED
DRAWN BY JD	CHECKED BY EOT

ELEVATIONS
I

LEGEND:

- PIT/BEAM #
- TIEBACK ROD
- PROPERTY LINE

REVISIONS	NO.	DATE	DESC.
	1	03.31.2023	PLAN CHECK COMMENTS
	2	04.28.2023	SUBMITTAL
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	4	02.05.2024	
	5	07.03.2024	
	6	08.11.2024	DRAFT
	7	09.24.2024	DRAFT
	8	10.02.2024	



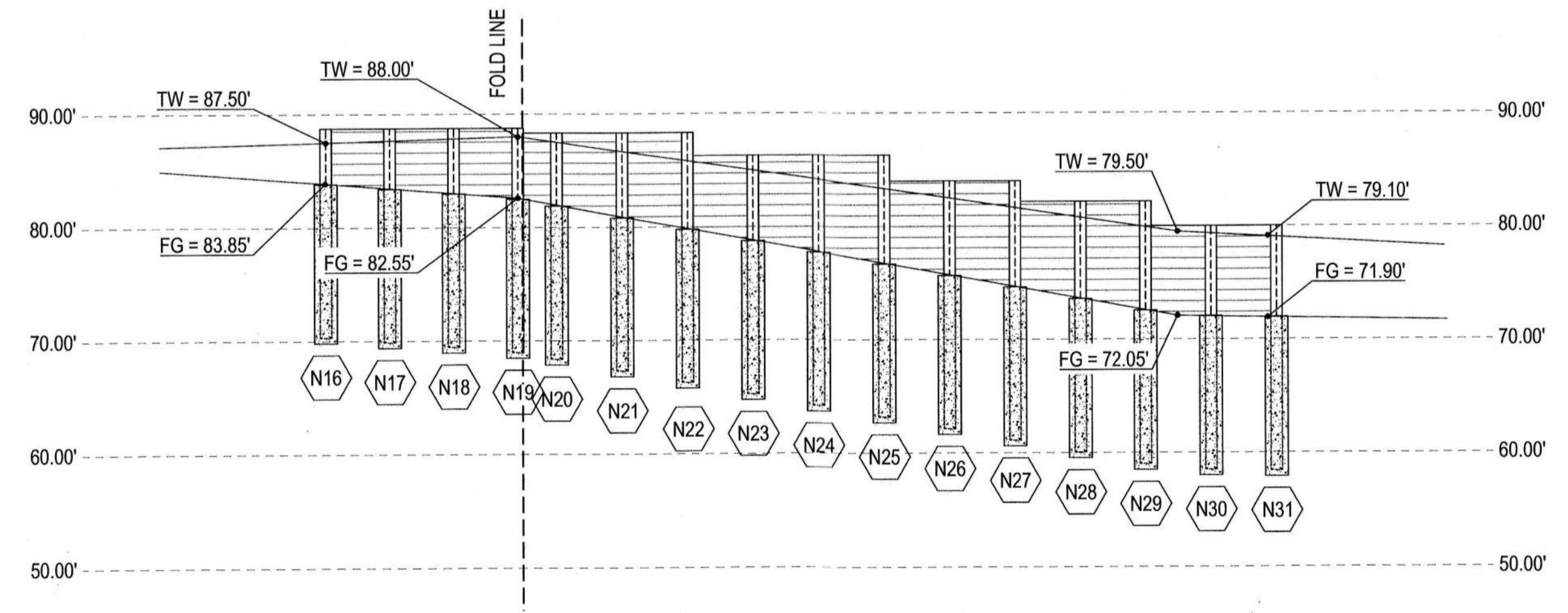
1 NORTHERN & EASTERN ELEVATION
 SCALE: 3/32" = 1'-0"

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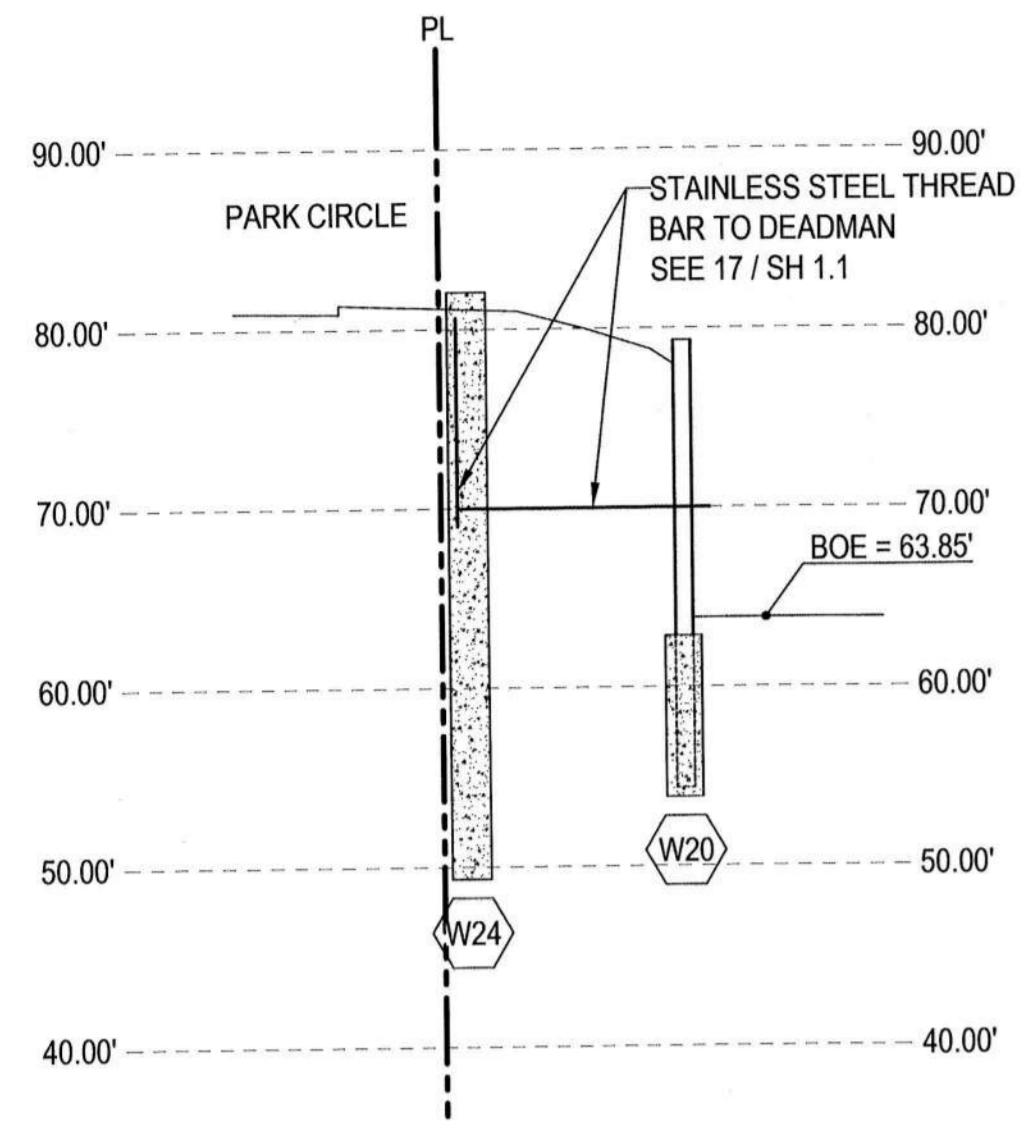
3 NORTH - WESTERN ELEVATION
 SCALE: 3/32" = 1'-0"

PROJECT NUMBER	SCALE
2020-074	AS NOTED
DRAWN BY	CHECKED BY
JD	EOT

ELEVATIONS II

SH 3.1

USA NORTH
 CALL BEFORE YOU DIG
 DIAL 811 48 Hrs PRIOR TO
 1. DRILLING SOLDIER BEAMS
 2. EXCAVATION



1 EAST - WEST SECTION @ PARK CIRCLE - BEAM W20
 SCALE: 3/32" = 1'-0"

REVISIONS	NO.	DATE	DESC.
	1	03.31.2023	PLAN CHECK COMMENTS
	2	04.28.2023	SUBMITTAL
	3	05.26.2023	CONSTRUCTION SET
	4	02.05.2024	
	5	07.03.2024	
	6	09.11.2024	DRAFT
	7	09.24.2024	DRAFT
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SECTIONS

SH 3.2