MICROPILE GENERAL NOTES

1. DESIGN BASIS
   A. 2015 INTERNATIONAL BUILDING CODE

2. REFERENCE CODES:
   A. AISC-ASD STEEL MANUAL, 9TH EDITION
   B. ACI 318-11 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE"
   C. PUBLICATION NO. FHWA-SA-97-070 "MICROPILE DESIGN AND CONSTRUCTION GUIDELINES."
   D. PUBLICATION NO. FHWA NHI-05-039 "MICROPILE DESIGN AND CONSTRUCTION" DECEMBER 2005

3. FOUNDATION:
   A. SOIL INFORMATION WAS DERIVED FROM THE GEOTECHNICAL ENGINEERING REPORT TITLED PREPARED BY NORTHWEST COLORADO CONSULTANTS, INC. (NWCC JOB NUMBER: 20-12000) DATED 12/30/2020.

4. MATERIALS:
   A. BARS:
      BARS TO BE GRADE 75 OR GRADE 150 OF SIZE INDICATED ON MICROPILE PLANS. REINFORCEMENT BARS SHALL MEET ASTM A 615/AASHTO M31 (GR. 75) OR ASTM A 722/AASHTO M275 (GR. 150) SPECIFICATIONS. MINIMUM THICKNESS OF EPOXY COATING SHALL BE 0.010 INCH. EPOXY COATING SHALL BE IN ACCORDANCE WITH ASTM A775 OR ASTM A934. CENTRALIZERS SHALL BE PROVIDED FOR ALL MICROPILES AS INDICATED PER PLAN. CENTRALIZERS SHALL BE FABRICATED FROM SCHEDULE 40 PVC PIPE.
   B. GROUT:
      GROUT SHALL BE PORTLAND CEMENT TYPE I OR TYPE II, MEETING ASTM C150 SPECIFICATIONS AND POTABLE WATER. THE MAXIMUM WATER/CEMENT RATIO SHALL BE 0.45. THE MINIMUM 28 DAY COMPRESSIVE STRENGTH OF THE GROUT SHALL BE 4,000 PSI. GROUT MAY CONTAIN SIKA CO. INTERPLAST-N SHRINKAGE COMPENSATING CEMENT IN THE MAXIMUM AMOUNT OF 1% BY WEIGHT OF CEMENT.
   C. CASING:
      CASING SHALL BE OF DIAMETER AND WALL THICKNESS INDICATED ON MICROPILE SCHEDULE. PIPE SHALL CONFORM TO ASTM A53 GRADE B DESIGNATION (MINIMUM YIELD STRESS OF 36 KSI) OR API N-80 SPECIFICATIONS (MINIMUM YIELD STRESS OF 80 KSI). API PIPE SHALL BE FREE FROM DEFECTS AND DOCUMENTATION OF MINIMUM STRENGTH SHALL BE PROVIDED TO COGGINS ENGINEER.
   D. PLATES AND SHAPES:
      STRUCTURAL SHAPES SHALL CONFORM TO ASTM A36/AASHTO M183 OR ASTM A572/AASHTO M223, GRADE 36.

5. ALL DIMENSIONS ON DRAWINGS SHALL BE VERIFIED BY GENERAL CONTRACTOR PRIOR TO BEGINNING OF WORK.

6. PROCEDURE:
   A. ALL UTILITIES WITH EQUIPMENT OR FACILITIES SERVING AN AREA WITHIN 300 FEET OF THE PLANNED CONSTRUCTION SHALL BE NOTIFIED PRIOR TO MICROPILE INSTALLATION THAT SUCH WORK IS TO TAKE PLACE. GENERAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING INSTALLATION OF MICROPILES WITH UTILITIES.
   B. ADVANCE DRILL BIT FULL MICROPILE LENGTH UTILIZING ROTARY PERCUSSION DRILLING TECHNIQUES. AFTER COMPLETION OF DRILLING INSERT BAR WITH CENTRALIZERS AND TREMIE PIPE ATTACHED. GROUT FULL LENGTH OF MICROPILE. UPON COMPLETION OF GROUTING INSERT PIPE INTO DRILL HOLE. ADJUST TOP OF PIPE AND BAR TO PROPER ELEVATION.
   C. INSTALL BEARING PLATE AND HARDWARE.
   D. MICROPILE INSTALLATION SHALL BE MONITORED AND RECORDED. MONITORED AND RECORDED DATA SHALL INCLUDE TOTAL DEPTH, GROUT PRESSURE (PRIMARY AND POST GROUT), GROUT QUANTITIES (PRIMARY AND POST GROUT), SOIL/ROCK ENCOUNTERED DURING INSTALLATION, AND ANY OBSTRUCTION OR IRREGULARITIES.

7. ENGINEER'S APPROVAL MUST BE SECURED FOR ALL SUBSTITUTIONS.

8. THE REQUIREMENTS OF THE LATEST EDITION OF THE "OSHA CONSTRUCTION STANDARDS", SHALL BE COMPLIED WITH BY ALL CONTRACTORS, FABRICATORS AND SUPPLIERS.

VERIFICATION COMPRESSION TEST PROCEDURE

METHODOLOGY:
PRIOR TO THE START OF PRODUCTION MICROPILES, ONE VERIFICATION COMPRESSION LOAD TEST SHALL BE PERFORMED TO A LOAD OF 2 TIMES THE SERVICE LOAD. TESTING SHALL BE CONDUCTED BY LOADING THE MICROPILE IN THE SEQUENCE INDICATED BELOW.

EQUIPMENT:
STRESSING EQUIPMENT USED FOR TESTING SHALL HAVE A CURRENT (LESS THAN 12 MONTHS OLD) CALIBRATION CERTIFICATE TO A LOAD OF AT LEAST 100 TONS, WITH THE CALIBRATION CURVES BEING MADE AVAILABLE FOR REVIEW BY THE ENGINEER. PILE MOVEMENTS IN A DIRECTION COLLINEAR TO THE LINE OF ACTION OF THE PILE SHALL BE RECORDED BY TWO DIAL GAGES WITH A MINIMUM RESOLUTION OF 0.001 INCHES.

VERIFICATION COMPRESSION LOAD TEST LOADING SEQUENCE

INCREMENT	LOAD	HOLD TIME	INCREMENT	LOAD	HOLD TIME
1	AL (0.10 P)	1 MINUTE	17	1.00 P	1 MINUTE
2	0.25 P	1 MINUTE	18	1.25 P	1 MINUTE
3	0.50 P	1 MINUTE	19	AL	1 MINUTE
4	AL	1 MINUTE	20	0.25 P	1 MINUTE
5	0.25 P	1 MINUTE	21	1.00 P	1 MINUTE
6	0.50 P	1 MINUTE	22	1.25 P	1 MINUTE
7	0.75 P	1 MINUTE	23	1.33 P	60 MINUTES (CREEP TEST LOAD HOLD)
8	AL	1 MINUTE	24	AL	1 MINUTE
9	0.25 P	1 MINUTE	25	0.25 P	1 MINUTE
10	0.50 P	1 MINUTE	26	0.50 P	1 MINUTE
11	0.75 P	1 MINUTE	27	0.75 P	1 MINUTE
12	1.00 P	1 MINUTE	28	1.00 P	1 MINUTE
13	AL	1 MINUTE	29	1.25 P	1 MINUTE
14	0.25 P	1 MINUTE	30	1.50 P	1 MINUTE
15	0.50 P	1 MINUTE	31	1.75 P	1 MINUTE
16	0.75 P	1 MINUTE	32	2.00 P	10 MINUTE
			33	AL	1 MINUTE

NOTE:
1 KIP = 1,000 POUNDS = 0.50 TONS
P = 54 KIPS (SERVICE LOAD)
AL = ALIGNMENT LOAD

COGGINS & SONS, INC.

Caisson Drilling, Excavation Shoring, Tieback Anchors

9512 TITAN PARK CIRCLE
LITTLETON, COLORADO 80125
TEL: 303-791-9911
FAX: 303-791-0967

PROPOSED MICROPILES
SSRC - BASE AREA IMPROVEMENTS
2305 MOUNT WERNER CIRCLE
STEAMBOAT SPRINGS, CO 80487

SHEET NO.	INDEX OF SHEETS
XBS - 1	COVER SHEET
XBS - 2	PLAN VIEW & DETAILS

FOR
SAUNDERS CONSTRUCTION INC.
86 INVERNESS PLACE NORTH
CENTENNIAL, CO 80112
PH: 303-699-9000

NOTE:
BEFORE CONSTRUCTION COMMENCES, A UTILITY LOCATE MUST BE PERFORMED TO FIELD VERIFY THE LOCATION OF ALL UTILITIES IN THE VICINITY OF THE SITE. THE EARTH RETENTION DESIGN WILL BE REVIEWED AND DRAWINGS REVISED, IF REQUIRED, WHEN FINAL UTILITY LOCATIONS BECOMES AVAILABLE.

DIMENSIONS OBTAINED FROM RFI - 025 DATED JUNE 21, 2021:
- MARTIN / MARTIN ENGINEERS (STRUCTURAL)

NO.	DATE	REVISIONS DESCRIPTION
1	07-12-21	ADJUST MICROPILES PER EMAILS FROM MARTIN / MARTIN DATED 07/07/21 AND 07/09/21. MOVE LOCATIONS OF MICROPILES PER RESULTS FROM LOAD TEST

COLORADO LICENSED
JOHN HYDE HART
PROFESSIONAL ENGINEER
7/19/21

NOT VALID WITHOUT DATE & ORIGINAL SIGNATURE

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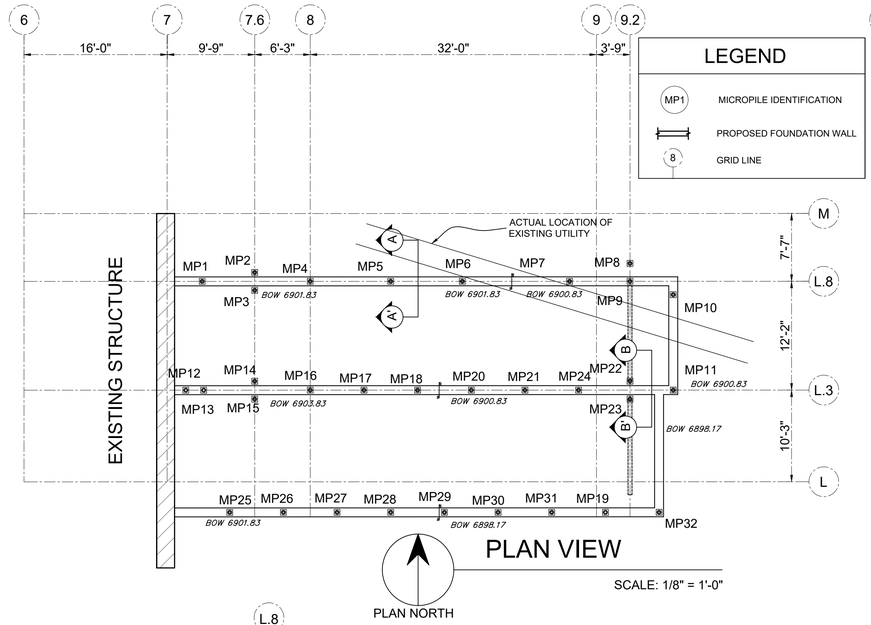
JOB NO. : 5776
ISSUED: 2021.07.06
DWN BY: JHH

DWG. NO.
XBS-1

SHT. 1 OF 2



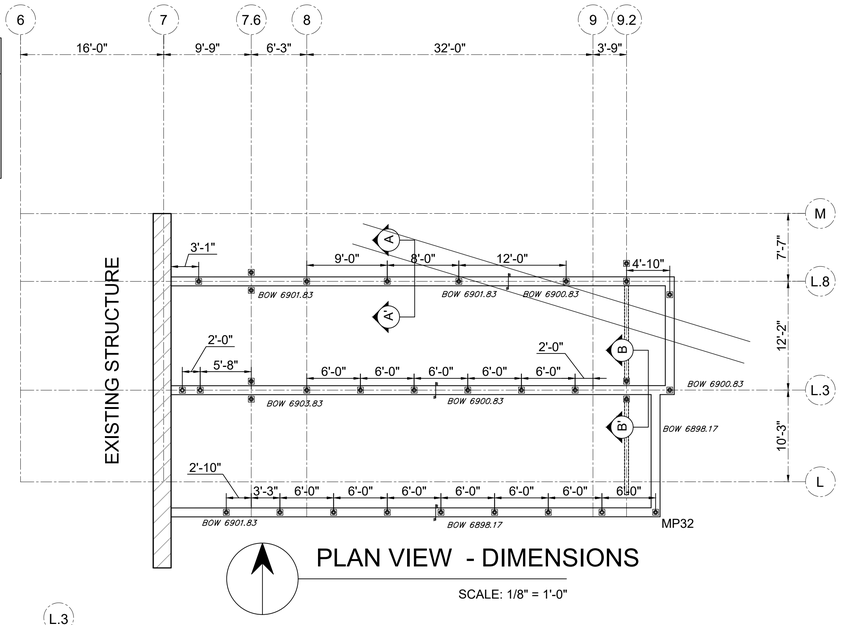
PLAN VIEW

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

PLAN NORTH

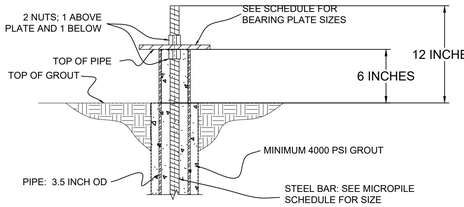
LEGEND

MP1	MICROPILE IDENTIFICATION
	PROPOSED FOUNDATION WALL
8	GRID LINE



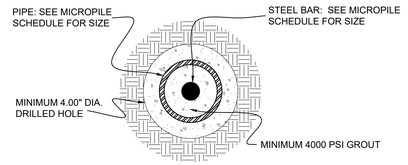
PLAN VIEW - DIMENSIONS

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



B 2|2 DETAIL HEAD

NOT TO SCALE



C 2|2 DETAIL TOP VIEW

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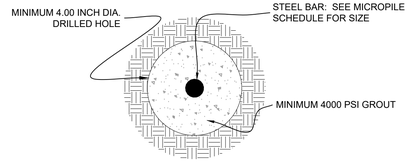
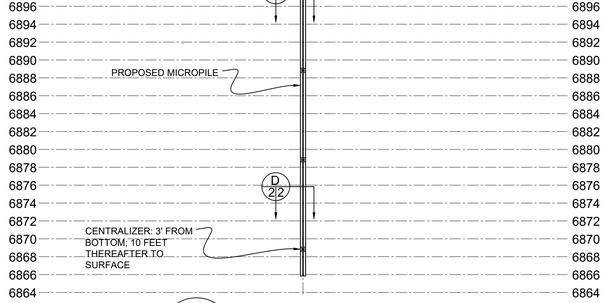
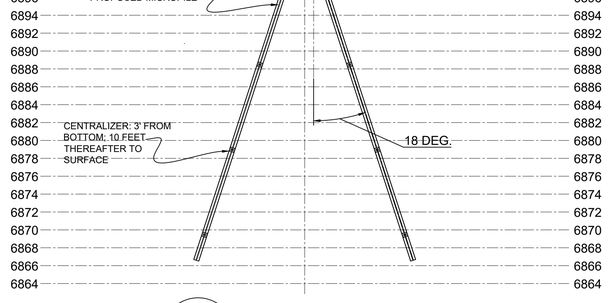


D 2|2 DETAIL TOP VIEW



A-A' 2|2 CROSS SECTION A-A'

SCALE: NOT TO SCALE



A-A' 2|2 CROSS SECTION A-A'

SCALE: NOT TO SCALE

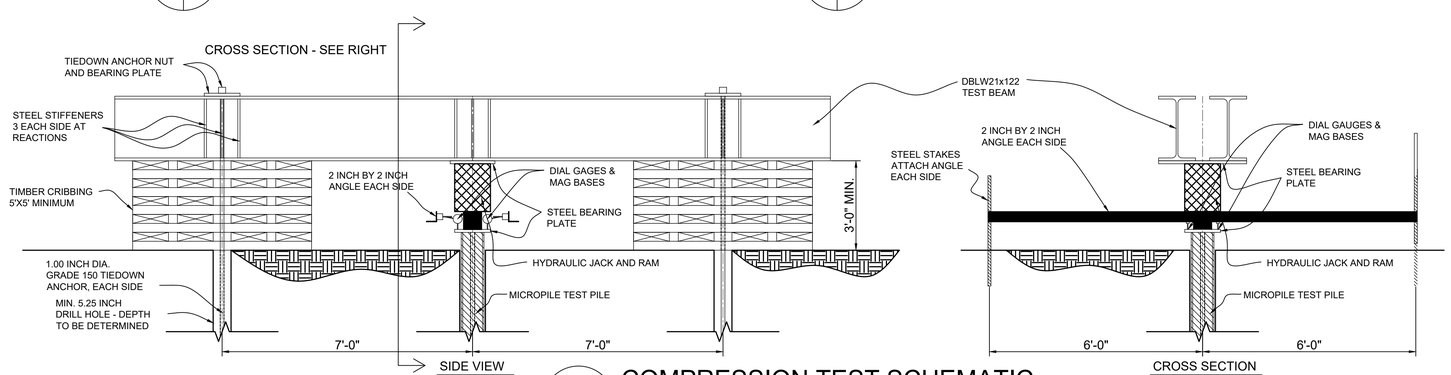
MICROPILE DRILL ELEVATION

MICROPILE NO.	TOP OF GROUT	TOP OF PIPE
MP1 - MP6	6901.83	6902.33
MP7 - MP11	6900.83	6901.33
MP12 - MP18	6903.83	6904.33
MP20 - MP24	6900.83	6901.33
MP19	6898.17	6898.67
MP25 - MP28	6901.83	6902.33
MP29 - MP32	6898.17	6898.67

MICROPILE SCHEDULE

MICROPILE NO.	BAR GRADE (ksi)	DIAMETER OF BAR (IN)	BAR LENGTH (ft.)	DRILL LENGTH (ft.)	PIPE GRADE (ksi)	DIAMETER OF PIPE (in.)	PIPE WALL THICKNESS (in.)	PIPE LENGTH (ft.)	SERVICE LOAD (kips)		BEARING PLATE SIZE
									COMP.	TENSION	
MP1 - MP32	150	1.00	37	36	36	3.500	0.216	5	54	0	8"X8"X1"

NOTE: MP 22 AND MP 23 ARE BATTERED
18 DEGREES FROM VERTICAL



COMPRESSION TEST SCHEMATIC

NOT TO SCALE

COLORADO LICENSED JOHN HYDE HART 38740 7/14/21 PROFESSIONAL ENGINEER

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