

BLUFFTOP RETAINING WALL MAINTENANCE

PREPARED FOR:

OPAL CLIFF WEST HOA
C/o MR. DAVID MEWES, HOA BOARD PRESIDENT
4800 OPAL CLIFF DRIVE,
CAPITOLA, CALIFORNIA 95010

PROJECT ADDRESS:

OPAL CLIFF WEST HOA
4800 OPAL CLIFF DRIVE,
CAPITOLA, CALIFORNIA 95010
APN: 034-251-05

SCOPE OF WORK

- AREAS (TWO LOCATIONS) OF SHOTCRETE WALL REPAIR:
 - AT UP COAST END OF WALL, LOCATION 1, LARGE MASS OF SHOTCRETE, BEDROCK, AND REBAR DISCLOSED, VOID LEFT BY MASS MEASURES APPROX. 11' WIDE x 2' TALL x 1.5' DEEP. NOW EXPOSED BEDROCK/TERRACE CONTACT IS VISIBLE ALONG W/ EXISTING MIRADRAN PANELS AND PVC PIPES.
 - AT SECOND AREA LOCATED APPROX. 15' FROM DOWN COAST PROPERTY LINE, LOCATION 2, BLOCKS OF BEDROCK HAVE BEEN BROKEN OFF LEAVING VOID MEASURING APPROX. 6' WIDE x 5' TALL x 1' DEEP. LOSS OF THESE UNSUPPORTED, BEDROCK BLOCKS WILL EXPOSE BASE OF WALL DRAINAGE SYSTEM AND EASILY ERODED TERRACE DEPOSITS.
 - TO FACILITATE REPAIR IN THESE TWO LOCATIONS, OVERHANGING SHOTCRETE WILL BE TRIMMED AND VEGETATION CLEARED. SHALLOW ROCK BOWELS OF 1" DIA. DRIVING RODS WILL BE INSTALLED AT LEAST 8" ONTO BEDROCK BLUFF FACE BELOW BASE OF WALL AT BOTH REPAIR AREAS. TOTAL UP TO (10) ANCHORS ARE ANTICIPATED. MIRADRAN PANELS CONNECTED TO EXISTING BEHIND WALL DRAIN SYSTEM AND WEEP HOLES WILL BE INSTALLED PRIOR TO SHOTCRETE PLACEMENT. REPAIR SHOTCRETE WILL INCORPORATE STEEL REINFORCEMENT TIED TO STEEL ROCK DOWELS TO MINIMIZE SHRINKAGE CRACK WIDTHS. SPECIFIC EXTENT OF REPAIR AREAS WILL BE CONFIRMED BY HKA (HARO, KASUNICH AND ASSOCIATES) IN FIELD DURING CONSTRUCTION.
- SHOTCRETE WALL REPAIR:
 - AT UP COAST END OF WALL, SMALL PORTION OF BLUFFTOP SHOTCRETE WALL IS OUTFLANKED ALONG 4800/4790 OPAL CLIFF DRIVE PROPERTY LINE. SHOTCRETE IS RESULT OF OVERSPRAY FROM CONSTRUCTION AND IS NOT STRUCTURAL COMPONENT OF BLUFFTOP WALL. IT MEASURES APPROX. 6' TALL x 2' WIDE. IT WILL BE SAW-CUT AND REMOVED SO SHOTCRETE IS FLUSH W/ TERRACE DEPOSITS. THIS WORK WILL BE PERFORMED SO AS TO MINIMIZE DISTURBANCE OF ADJACENT PROPERTY TERRACE DEPOSITS DURING REMOVAL OF SHOTCRETE OVERSPRAY.
- SEAWALL WALL REPAIR:
 - THERE ARE MULTIPLE INSTANCES OF CONCRETE SPALLING ALONG SEAWALL AT BOTTOM OF BLUFF. SPALLED CONCRETE WILL BE PATCHED BY SIMILAR-COLORED AND TEXTURED CONCRETE AS EXISTING SEAWALL. SPALLED AREA WILL BE PROPERLY PREPARED BY CLEANING AND ROUGHING SURFACE PRIOR TO PLACEMENT OF CONCRETE PATCH. THIS ITEM OF WORK WILL INCLUDE DRILLING OUT/CLEANING ALL CHOKED WEEP HOLES.
- PAMPAS GRASS TRIMMING:
 - THERE IS PAMPAS GRASS AND VARIOUS SHRUB AND GRASS GROWTH ON BLUFF SURFACE. PLANTS WILL BE REMOVED TO MINIMIZE FUTURE DAMAGE TO BLUFF SLOPE. HOWEVER, REMOVAL OF VEGETATION WILL BE LIMITED TO CUTTING OFF PLANT TO TOP OF ROOT BALL AND PAINTING ROOT BALL WITH UNDILUTED HERBICIDE. EXPOSED ROOT BALL WILL BE LEFT IN PLACE TO MINIMIZE DISTURBANCE OF FRACTURED ROCK.

SHEET INDEX:

- AERIAL VIEW OF EXISTING BLUFF, VICINITY MAP, SCOPE OF WORK AND PROJECT CONTACTS/CONSULTANTS
- SITE PLAN-EXISTING AND PROPOSED WORK
- PROFILE SECTION A-A', SECTIONS, DETAILS AND NOTES
- STATEMENT OF SPECIAL INSPECTIONS-2019 CBC, STANDARD WALL DRAIN DETAILS



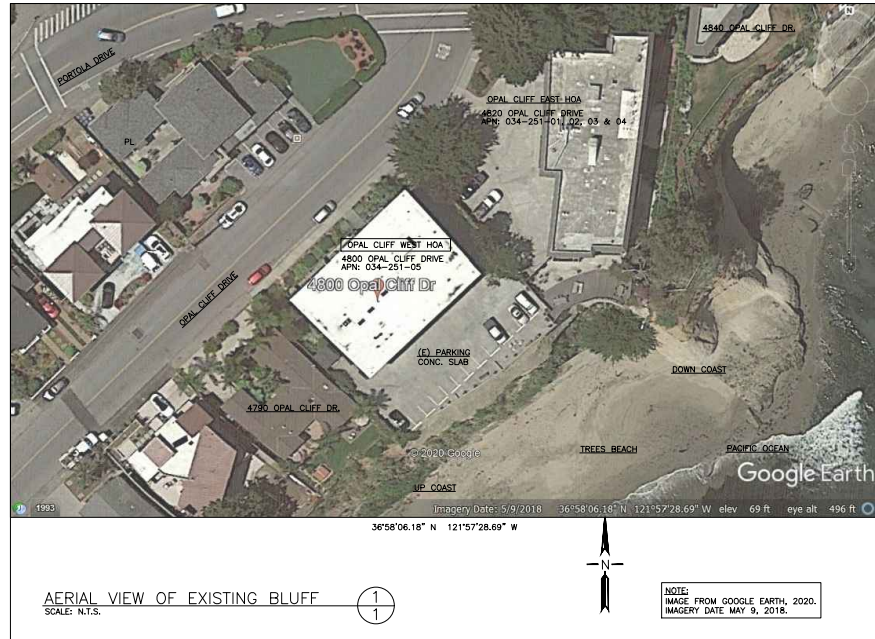
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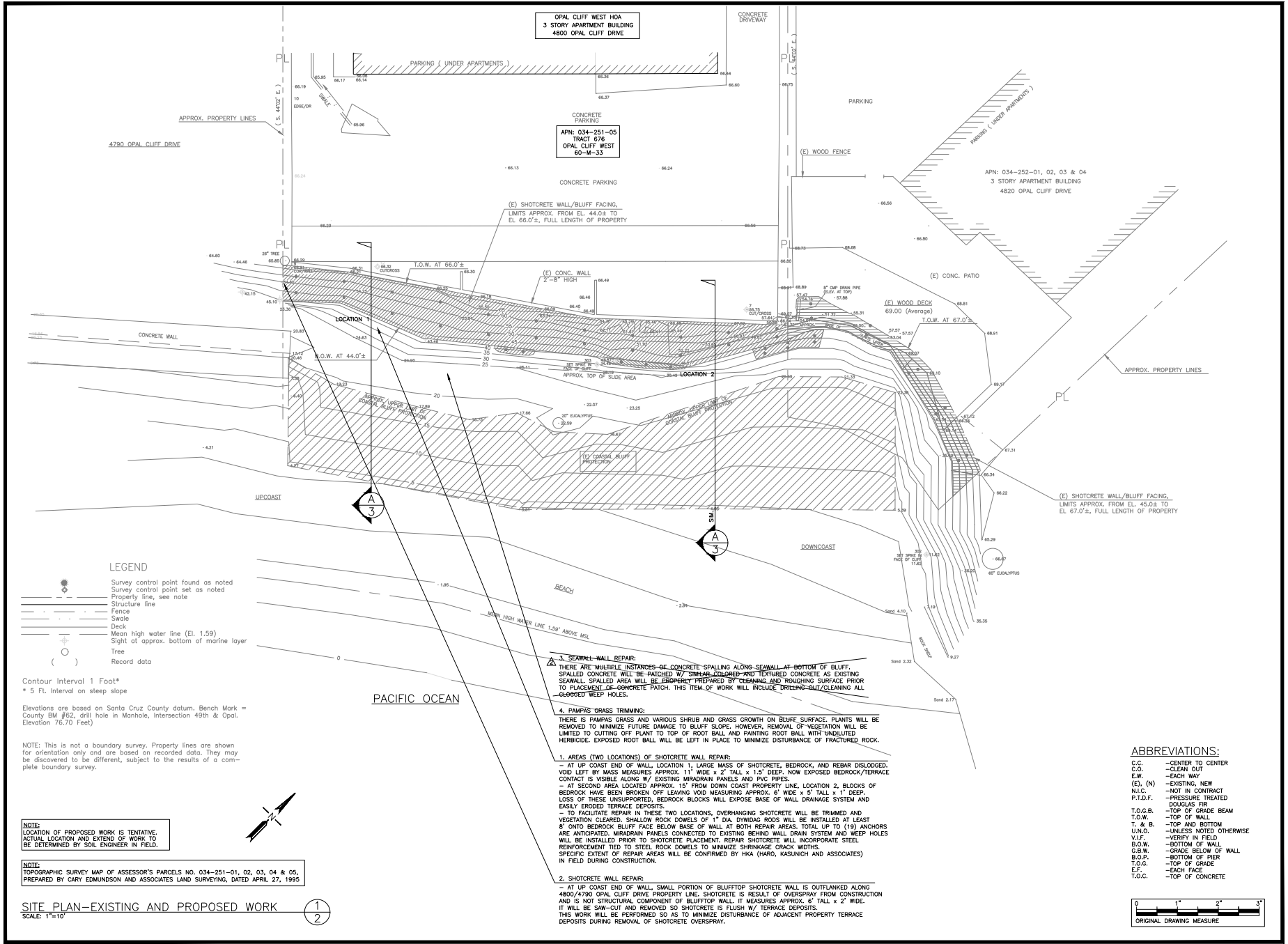
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AERIAL VIEW OF EXISTING
 BLUFF, VICINITY MAP,
 SCOPE OF WORK AND
 PROJECT CONTACTS/
 CONSULTANTS

BLUFFTOP RETAINING
 WALL MAINTENANCE
 OPAL CLIFF WEST HOA
 4800 OPAL CLIFF DRIVE,
 CAPITOLA, CALIFORNIA 95010

FILE NO.	
DATE	10-20-20
PROJECT	20-024
DRAWN BY	Qud CHD D-4800-2020-01
REVISION	12-29-20
REVISION	08-18-21
REVISION	01-06-23
DESIGNED BY:	RM
CHECKED BY:	QED



SOIL ENGINEERING CONSTRUCTION, INC.
 SOIL ENGINEERING CONSTRUCTION INC.
 REGISTERED PROFESSIONAL ENGINEER
 GEORGE E. JENSEN
 No. 20681
 Exp. 09-30-23
 CIVIL
 STATE OF CALIFORNIA

SITE PLAN-EXISTING AND PROPOSED WORK

BLUFFTOP RETAINING WALL MAINTENANCE

OPAL CLIFF WEST HOA
 4800 OPAL CLIFF DRIVE,
 CAPITOLA, CALIFORNIA 95010

FILE NO.	
DATE	10-20-20
PROJECT	10-20-20
DRW. NO.	20-024
REVISION	0481-01-1800-2020-03
REVISION	12-29-20
REVISION	08-18-21
REVISION	01-06-23
DESIGNED BY:	RL
CHECKED BY:	GD

**PROJECT NOTES:
GENERAL NOTES:**

- DESIGN AND CONSTRUCTION TO BE IN ACCORDANCE WITH 2019 CBC, AS AMENDED BY STATE OF CALIFORNIA, AND COUNTY OF SANTA CRUZ CODES AND ORDINANCES.
- ALL DIMENSIONS, CONDITIONS AND LOCATION OF FACILITIES TO BE VERIFIED AND DETERMINED IN FIELD.
- EXACT LOCATION AND EXTENT OF BLUFFTOP RETAINING WALL MAINTENANCE MAY BE ADJUSTED AS FIELD CONDITIONS REQUIRE AT TIME OF CONSTRUCTION. ENGINEER OF RECORD SHALL BE INFORMED ON ANY DEVIATION FROM APPROVED LOCATION OF MAINTENANCE WORK AND WILL SUBMIT TO BUILDING OFFICIALS REVISED CALCULATIONS AND REVISED DRAWINGS FOR APPROVAL.
- ALL EXPOSED STEEL, IF ANY, SHALL BE GALVANIZED OR COATED WITH CORROSION INHIBITING PAINT.
- CAST-IN-PLACE CONCRETE SHALL HAVE MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS:
-REPAIR SECTION OF SHOTCRETE WALL/FACING:
f'c=5,000 PSI, MAXIMUM WATER-CEMENTITIOUS MATERIAL RATIO, BY WEIGHT, NORMAL WEIGHT CONCRETE, TO BE OF 0.40. USE CEMENT TYPE II PORTLAND CEMENT.
CONCRETE TEST SPECIMEN SPECIAL INSPECTION MAY BE REQUIRED.
- REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60 FOR #4 BARS AND ABOVE.
ALL REINFORCING BARS TO BE EPOXY COATED.
- STEEL MEMBERS, IF ANY, SHALL BE:
- ALL WELD FLANGE STEEL MEMBERS SHALL CONFORM TO ASTM A992, GRADE 50.
- MISCELLANEOUS CHANNELS, ANGLES, AND PLATES SHALL CONFORM TO ASTM A36.
- ALL RETROFIT ANCHORS, LEVELERS AND HARDWARE TO BE BY SIMPSON STRONG-TIE COMPANY, INC., OR EQUAL.
- SECTION AT CONSTRUCTION JOINT (C.J.) MAKE CLEAN & ROUGH, OR FORM KEY.
- REINFORCEMENT COVER:
CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH SHALL HAVE MINIMUM 3" CONCRETE COVER,
- CONCRETE EXPOSED TO EARTH OR WEATHER SHALL HAVE MINIMUM 2" CONCRETE COVER FOR #6 BARS AND ABOVE,
1 1/2" FOR #8 BARS AND BELOW.
- SPLICERS OF REBAR TO BE CLASS (B) SPLICE. FOR SHOTCRETE LAP SPLICES OF REINFORCING BARS SHALL UTILIZE NONCONTACT LAP SPLICE METHOD WITH MINIMUM CLEARANCE OF 2 INCHES BETWEEN BARS (2019 CBC, SEC. 1908.4.3).
- EPOXY ADHESIVE, IF ANY, TO BE "SET-XX" BY SIMPSON STRONG-TIE COMPANY, INC., OR EQUAL.
CONCRETE / GROUT PATCH SHALL BE APPROVED HIGH STRENGTH CEMENT BASED COMPOUND.
- SOIL NAIL ANCHOR NOTES:
SEE SOIL NAIL ANCHOR TABLE "A".
AND RELEVANT SECTION DETAILS AND NOTES.
ANCHORS TO BE BY DCI DYWIDAG, OR EQUAL.
ANCHORS SHALL BE DBL CORROSION PROTECTED.
USE ASSOCIATE CENTRALIZERS, IF BAR IS USED, @ 3"-0" C.C.±. HOLE DIA. AT CONTRACTOR'S OPTION, 3" DIA. IS USED IN DESIGN. ALLOW HOLE CONCRETE BACKFILL CURE TIME BEFORE TESTING.
HOLES TO BE TREME PIPE GROUTED FROM BOTTOM OF HOLE FOR ENTIRE BONDED ZONE. GREASE FILLED PVC SLEEVE WILL BE PROVIDED OVER UNBONDED LENGTH TO ASSURE LOAD IS NOT ON BONDED LENGTH. SECOND STAGE OF GROUTING SHALL BE ACCOMPLISHED AFTER ACCEPTED TESTING. ALL WAY UP REMAINING HOLE. FRACTURE GROUTING MAY BE UTILIZED, AT CONTRACTOR'S OPTION, TO ACHIEVE CONSIDERABLY HIGHER SOIL-GROUT BOND CAPACITY. ANCHORS DEPTH MAY BE ADJUSTED BY GEOTECHNICAL CONSULTANT, BASED ON ACTUAL BOND STRENGTH DEVELOPED IN TEST PROGRAM, OR PER ACTUAL SOIL CONDITIONS AT TIME OF DRILLING OPERATION.

PUBLIC WORKS REQUIREMENTS:

- OWNER SHALL APPLY FOR AND OBTAIN TEMPORARY ENCROACHMENT PERMITS, IF APPLICABLE, FROM DEPARTMENT OF PUBLIC WORKS FOR ALL WORK IN RIGHT OF WAY, EASEMENTS OF PROPERTY IN WHICH COUNTY HOLDS INTEREST, INCLUDING DRIVEWAY, SIDEWALKS, SEWER CONNECTIONS, SEWER CLEANOUTS, CURB DRAINS, OR STORM DRAIN CONNECTIONS IN FIELD.
- ALL CONSTRUCTION RELATED ACTIVITIES WHICH REQUIRE COUNTY PERMIT SHALL BE ALLOWED ONLY DURING HOURS OF 8:00 A.M. TO 5:00 P.M., MONDAY THROUGH FRIDAY AND 9:00 A.M. TO 4:00 P.M. SATURDAYS. NO CONSTRUCTION ACTIVITY OR RELATED ACTIVITIES SHALL BE ALLOWED OUTSIDE OF AFOREMENTIONED HOURS OR ON SUNDAYS AND FOLLOWING HOLIDAYS: NEW YEAR'S DAY, PRESIDENT'S DAY, MEMORIAL DAY, 4TH OF JULY, LABOR DAY, THANKSGIVING DAY, AND CHRISTMAS DAY. ALL GASOLINE POWERED CONSTRUCTION EQUIPMENT SHALL BE EQUIPPED WITH AN OPERATING MUFFLER OR BAFFLING SYSTEM AS ORIGINALLY PROVIDED BY MANUFACTURER, AND NO MODIFICATION TO THESE SYSTEMS IS PERMITTED. VERIFY AFOREMENTIONED HOLIDAY SCHEDULE AND HOURS WITH COUNTY OF SANTA CRUZ BUILDING DEPARTMENT.
- CONTRACTOR SHALL ENSURE THAT APPLICABLE BEST MANAGEMENT PRACTICES (BMPs) FROM COUNTY OF SANTA CRUZ STORM WATER POLLUTION PREVENTION PROGRAM (STOPPP) ARE FOLLOWED TO PREVENT DISCHARGE OF SOIL OR ANY CONSTRUCTION MATERIAL INTO GUTTER, STORM DRAIN, OR CREEK.

SITE WORK NOTES:

- THERE ARE NO EXISTING TREES WITHIN AREA OF PROPOSED MAINTENANCE.
- THERE WILL BE NO WORK PERFORMED ON LOWER COASTAL PROTECTION SEAWALL OR ON BEACH.

**STATEMENT OF SPECIAL INSPECTIONS
2019 CBC SEC. 1704:**

- SPECIAL INSPECTION REQUIRED FOR:
- SOILS REPORT/MAINTENANCE REPORT
 - CONCRETE f'c=5,000 PSI
 - SHOTCRETE f'c=5,000 PSI
 - REINFORCING STEEL Fy=60 KSI

- SOILS (2019 CBC TABLE 1705.6):
1. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL. (PERIODICALLY DURING TASK LISTED).
2. OBSERVE DRILLING OPERATIONS AND MAINTAIN COMPLETE AND ACCURATE RECORDS FOR EACH ELEMENT (CONTINUOUS).
3. SOIL ENGINEER'S REPRESENTATIVE TO OBSERVE PROOF TESTING OF SELECTED SOIL NAIL ANCHORS, IF REQUIRED (CONTINUOUS).
4. ANCHOR PROOF TEST LOAD (T.L.) @ 200% D.L., SEE SOIL NAIL ANCHOR TABLE "A".
5. ANCHOR LOCK-OFF LOAD @ 100% D.L., SEE SOIL NAIL ANCHOR TABLE "A".
6. ANCHORS TESTING PROCEDURE TO BE IN GENERAL CONFORMANCE WITH PTI MANUAL (POST TENSIONING INSTITUTE).
- CONCRETE CONSTRUCTION (2019 CBC TABLE 1705.3):
1. INSPECTION OF REINFORCING STEEL AND PLACEMENT (PERIODIC).
2. VERIFYING USE OF REQUIRED DESIGN MIX (PERIODIC).
f'c=5,000 PSI, W/C RATIO=0.40, TYPE I PORTLAND CEMENT. LAB TESTING OF CONCRETE SPECIMENS MAY BE REQUIRED.
- DRAINS/EROSION CONTROL INSPECTION:
1. VERIFY MATERIALS AND PLACEMENT OF DRAINS/EROSION CONTROL. (PERIODICALLY DURING TASK LISTED).
2. FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS AND CORRECTION OF ANY DISCREPANCIES NOTED IN INSPECTIONS SHALL BE SUBMITTED AT POINT IN TIME AGREED UPON BY PERMIT APPLICANT AND BUILDING OFFICIAL PRIOR TO START OF WORK. IF NOT SPECIFICALLY AGREED AND/OR REQUIRED, FINAL REPORT WILL BE SUBMITTED AFTER WORK COMPLETION.

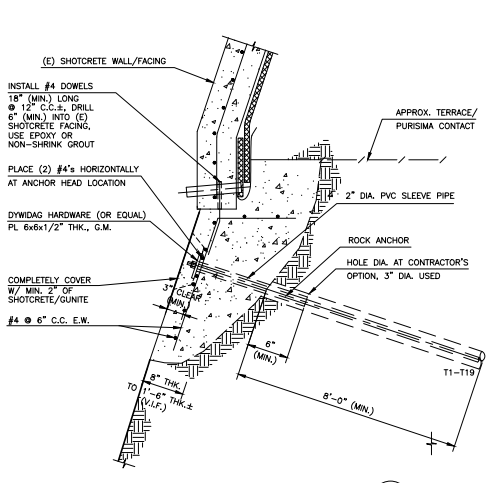
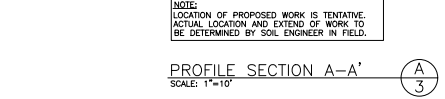
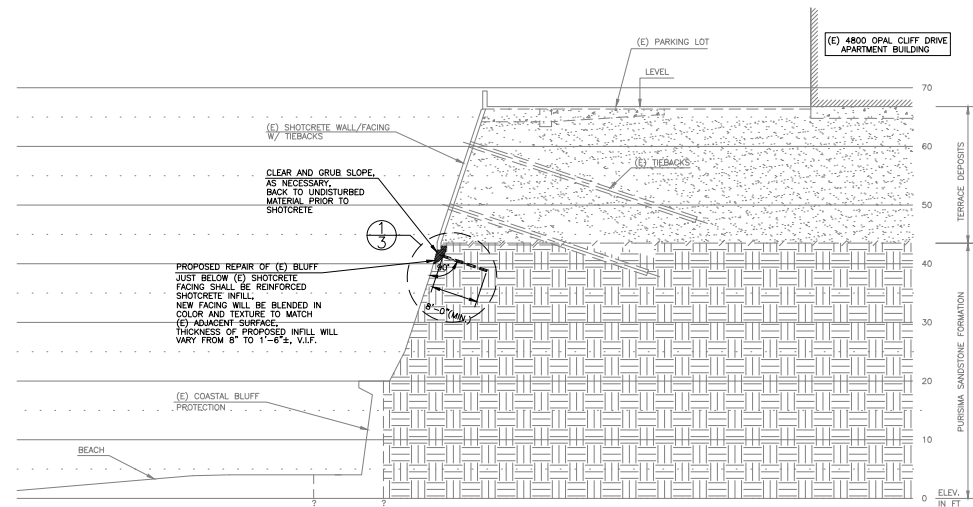
STRUCTURAL DESIGN PARAMETERS:

- REPORT-MAINTENANCE MONITORING, 4800/4820 OPAL CLIFF DRIVE, CAPITOLA, CALIFORNIA BY HARO, KASUNICH AND ASSOCIATES, INC., (FOR SHOTCRETE FACING), PROJ. NO. SC10845, DATED MAY 20, 2015.
REPORT-REPAIR DESIGN CRITERIA AS USED FOR 2015 BLUFF REPAIR:
- ACTIVE PRESSURE=18H
- SEISMIC PRESSURE=14H
- ACTING OVER FULL HEIGHT AND WIDTH OF REPAIR OF COASTAL BLUFF.
- BOND SHAFT FRICTION IN PURISIMA FORMATION 2,120 PSF (AS PROVED BY DESIGN OF PREVIOUS REPAIRS).
- PASSIVE SOIL PRESSURE NEGLECTED FOR DESIGN PURPOSES.
- DRAINED CONDITION.

SHOTCRETE STANDARD NOTES-2019 CBC

- SHOTCRETE SPLICES: LAP SPLICES OF REINFORCING BARS SHALL UTILIZE NONCONTACT LAP SPLICE METHOD WITH MINIMUM CLEARANCE OF 2 INCHES BETWEEN BARS.
- SHOTCRETE PANEL CRITERIA: MAXIMUM SIZE OF AGGREGATE IS 3/8 INCH OR SMALLER. TEST PANELS SHALL HAVE MINIMUM DIMENSIONS OF 12 INCHES BY 12 INCHES. PANELS SHALL BE SHOT IN SAME POSITION AS WORK, DURING COURSE OF WORK AND BY NOZZLEMEN DOING WORK. CONDITIONS UNDER WHICH PANELS ARE CURED SHALL BE SAME AS WORK.
- DESIGN AND CONSTRUCTION TO BE IN ACCORDANCE WITH 2019 CBC, SECTION 1908.

SEE ALSO "STATEMENT OF SPECIAL INSPECTIONS-2019 CBC", SHEET 4



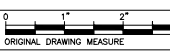
SOIL NAIL ANCHOR TABLE "A"

MARK	DESIGN LOAD (KIPS)	TEST LOAD (KIPS)	LOCK-OFF LOAD (KIPS)	UNBONDED ZONE FEET	BONDED ZONE FEET (MIN.)	TOTAL LENGTH FEET	TOTAL NUMBER EACH	NOTE
T11 TO T19	0.5	1.0	0.5	1.5±	8'	9.5±	19	

NOTES:
- SOIL NAIL ANCHOR, USE 1" DIA. 75 KSI ASTM A615 BAR AND HARDWARE, BY DCI DYWIDAG, OR EQUAL, DCP-DOUBLE CORROSION PROTECTED.
- TESTING: DYNAMIC (SEISMIC) LOADS HAVE CONSERVATIVELY BEEN INCORPORATED INTO DESIGN. ANCHORS USE OF 2008 D.L. DO NOT NEED TO BE TESTED.
IF TESTING WILL BE REQUIRED, TEST TO 200% D.L.
- TEST SELECTED SOIL NAIL ANCHORS, MINIMUM 1 IN 4 ANCHORS (25% OF ALL ANCHORS), TO PROOF LOAD AT 200% DESIGN LOAD CAPACITY (200% D.L.).
- ALL SOIL NAIL ANCHORS TO BE PRE-STRESSED TO FULL DESIGN LOAD (100% D.L.).
- SOIL NAIL ANCHORS TO BE TESTED IN PRESENCE OF REPRESENTATIVE OF H.A.
- ANCHOR TESTING PROCEDURE TO BE IN GENERAL CONFORMANCE WITH PTI MANUAL, FIFTH EDITION, AND SPECIFICALLY IN ACCORDANCE WITH FOLLOWING SECTIONS: PERFORMANCE TESTING SECTION 4.2.7.1 PROOF TESTING SECTION 4.3.7.2 ACCEPTANCE CRITERIA SECTION 4.5.6
- LOCK-OFF ALL SOIL NAIL ANCHORS AFTER SHOTCRETE WALL IS CURED.
- INCLINATION BELOW HORIZONTAL PLANE (PERPENDICULAR TO BLUFF FACE): 20° TO 30° (MAX.).
- DRILLED 3" DIA. ANCHOR HOLES USED FOR DESIGN PURPOSES.
- WORKING SHAFT BOND FRICTION BEYOND UNBONDED ZONE OF REPAIR AREA IN PURISIMA FORMATION 2,120 LBS PER GROUTED FOOT OF ANCHOR LENGTH, AS PROVED BY DESIGN OF PREVIOUS REPAIRS.
- APPROX. TOTAL UP TO (19) ANCHORS ANTICIPATED AS SHOWN ABOVE. TOTAL NUMBER OF EACH MARK IS ESTIMATED ONLY, BASED ON DESIGN SECTION, V.I.F.
- ANCHORS MAY BE INSTALLED AS NECESSARY, PER ENGINEER'S RECOMMENDATION, BASED ON ACTUAL SLOPE SOIL CONDITIONS AT TIME OF CONSTRUCTION.

ABBREVIATIONS:

- C.O. - CENTER TO CENTER
- C.L. - CLEAN OUT
- E.W. - EACH WAY
- (E.) (N) - EXISTING NEW
- N.I.C. - NOT IN CONTRACT
- P.T.D.F. - PRESSURE TREATED DOUGLAS FIR
- T.O.G.B. - TOP OF GRADE BEAM
- T.O.W. - TOP OF WALL
- T. & B. - TOP AND BOTTOM U.N.O.
- V.I.F. - VERIFY IN FIELD
- B.O.W. - BOTTOM OF WALL
- G.B.W. - GRADE BELOW OF WALL
- B.O.P. - BOTTOM OF PIER
- T.O.P. - TOP OF PIER
- T.O.C. - EACH FACE
- T.O.G. - TOP OF CONCRETE



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REGISTERED PROFESSIONAL ENGINEER
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**PROFILE SECTION A-A',
BLUFFTOP RETAINING
WALL MAINTENANCE
NOTES**

OPAL CLIFF WEST HOA
4800 OPAL CLIFF DRIVE,
CAPITOLA, CALIFORNIA 95010

FILE NO.
DATE
PROJECT 10-20-20
DWG. NO. 20-024
REVISION 01 Rev 01-4800-2020-03
REVISION 02 12-28-20
REVISION 03 08-18-21
REVISION 04 01-06-23
DESIGNED BY: ml
CHECKED BY: oed

3 OF 4

SECTION 1907
MINIMUM SLAB PROVISIONS

1907.1 General. The thickness of concrete floor slabs shall comply with the general slab thickness provisions of Section 1908.1. A 6-mil (0.006 inch) 15-mil polyester fiber paper shall be placed between the base course and subgrade and the concrete shall be placed in accordance with the approved repair methods. Materials shall be used to retain vapor transmission through the floor slab.

Exception: A vapor retarder is not required:

- For detached structures adjacent to occupancies in Group R-3, both as garages, entry buildings or other related structures.
- For attached structures having an area of less than 100 square feet and not connected to the main structure.
- For buildings of other occupancies where mitigation of moisture through the slab from below will not be detrimental to the intended occupancy of the building.
- For firewalls, walls, patios and other flatwork that will not be finished as a base slab.
- Where approved based on local conditions.

1907.1.1 **FIELD II Capillary break.** When a vapor retarder is required, a capillary break shall be installed in accordance with the California Green Building Standards Code (CALGreen, Chapter 4, Division 4.1).

SECTION 1908
SHOTCRETE

1908.1 General. Shotcrete is mortar or concrete that is pneumatically projected at high velocity onto a surface. Except as specified in this section, shotcrete shall conform to the requirements of this chapter for reinforced concrete.

1908.1.1 **Compressive strength of shotcrete.** Shotcrete shall not be less than 1,000 psi (70 MPa).

1908.1.2 **Formwork.** Formwork shall be designed to receive shotcrete shall have the entire surface thoroughly cleaned and roughened by a method approved by the enforcing agency, and new prior to receiving shotcrete shall be thoroughly cleaned of all debris, dirt and dust. Concrete and masonry shall be tested before shotcrete is deposited, but not so as to remove material.

1908.1.3 **Proportions and materials.** Shotcrete proportions shall be selected that allow maximum strength and durability with the delivery equipment selected and shall result in finished in-place hardened shotcrete meeting the strength requirements of this code.

1908.1.4 **Aggregate.** Coarse aggregate, if used, shall not exceed 1 1/2 inch (38 mm).

1908.1.5 **Rebound.** Shotcrete shall be applied in any direction to meet these 1/2 inch or other size or larger.

CONCRETE

1908.2 **Joint.** Except where permitted herein, unfinished work shall not be allowed to stand for more than 30 minutes unless edges are sealed to a true edge. For structural elements that will be under compression and for connection joints shotcrete shall be applied to the exposed construction documents, repair joints are permitted. Before placing additional material adjacent to previously applied work, slopes and repair edges shall be cleaned and wet.

1908.2.1 **Formwork.** The formwork shall be removed within approximately 2 hours after application. If breaking, work it off before. If this film is not removed within 2 hours, it shall be removed by thorough wetting or sand blasting. Construction joints over 8 hours old shall be thoroughly cleaned with air and water prior to receiving shotcrete.

1908.2.2 **Damage.** In place shotcrete that exhibits sag, slough, segregation, honeycombing, void pockets or other obvious defects shall be removed and replaced. Shotcrete above sags and sloughs shall be removed and replaced with stiff plastic.

1908.2.3 **Formwork.** During the curing period, specified finish, shotcrete shall be maintained above 40°F (4°C) and in most conditions (ASTM C 1585) maintain above 50°F (10°C) and in winter conditions.

1908.2.4 **Initial curing.** Shotcrete shall be kept continuously moist for 24 hours after shotcreting is complete or shall be sealed with an approved curing compound.

1908.2.5 **Final curing.** Final curing shall continue for seven days after shotcreting, or for three days if high-early-strength cement is used, or until the specified strength is obtained. Final curing shall consist of the initial curing process or the shotcrete shall be covered with an approved plastic retaining cover.

1908.2.6 **Natural curing.** Natural curing shall not be used in lieu of the specified in this section unless the relative humidity remains at or above 85 percent, and is maintained by the registered design professional and approved by the building official.

1908.2.7 **Through tests.** Through tests for shotcrete shall be made by an approved agency on specimens that are representative of the work and that have been soaked for not fewer than 24 hours prior to testing. Where the maximum size aggregate is larger than 3/4 inch (19 mm), specimens shall consist of not less than three 2-inch-diameter (51 mm) cores or 3-inch (76 mm) cubes. Where the maximum size aggregate is 3/4 inch (19 mm) or smaller, specimens shall consist of not less than 2-inch-diameter (51 mm) cores or 2-inch (51 mm) cubes.

1908.2.8 **Sampling.** Specimens shall be taken from the place work or from test pieces, and shall be taken not less than once each shift, but not less than one for each 50 cubic yards (38 m³) of shotcrete.

1908.2.9 **Panel criteria.** Where the maximum-size aggregate is larger than 3/4 inch (19 mm), the test pieces shall have a minimum dimension of 18 inches by 18 inches (457 mm by 457 mm). Where the maximum-size aggregate is 3/4 inch (19 mm) or smaller, the test pieces shall have a minimum dimension of 12 inches by 12 inches (305 mm by 305 mm). Panels shall be shot in the same position as the work, during the course of the work and by the contractor during the work. The conditions under which the panels are cured shall be the same as the work.

1908.2.10 **Approval.** The contractor shall be responsible for obtaining prior to performing the test panel method.

1908.2.11 **Acceptance criteria.** The average compressive strength of three cores from the testpiece work or a single test piece shall equal or exceed 0.95 f'c with a single core less than 0.75 f'c. The average compressive strength of three cores taken from the other work or a single test piece shall equal or exceed f'c, with no individual core less than 0.85 f'c. To check accuracy, testcores represented by extra core or cube strengths shall be retained.

1908.2.12 **Formwork and ground steel for shotcrete.** Formwork shall be built and placed so as to permit escape of air and rebound.

1908.2.13 **Adhesive ground steel.** Where to be used in concrete, shall be placed to establish the thickness, surface plane and form of the shotcrete work. All surfaces shall be redded in these wires.

1908.2.14 **Finishing.** Shotcrete shall be finished in accordance with ACI 308R.

Project No. SC11778
4800 Opal Cliff Drive
23 June 2020
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Deflated shotcrete to be removed and replaced

Approximate location #1 of undermined area in need of repair

Shotcrete, bedrock, rebar debris from #2 undermined location to be removed

SECTION 1909
ADDITIONAL REQUIREMENTS FOR CONCRETE COLLEGS (DGA-858C)

1909.1 General.

1909.1.1 **Dimensional tolerances.** Openings larger than 12 inches (305 mm) in one dimension shall be detailed as the structure drawings.

1909.1.2 **Formwork and materials.** Where special inspection and test shall be conducted with Chapter 17A and this section.

1909.1.3 **Aggregate.** ASTM C 318 Section 26.4.1.1 (a)(1) shall apply. Aggregate shall be non-resilient as determined by the methods in ASTM C 293 Appendix A Methods for Determining Resilience. Due to the proximity of an adjacent structure, the use of a non-resilient aggregate may be used with the addition of an admixture that has been shown to prevent harmful expansion in accordance with Appendix A of ASTM C 293 when approved by the building official.

1909.1.4 **Steel fiber reinforcement.** Not permitted.

1909.1.5 **Consolidation material.** The concrete aggregate shall furnish to the enforcement agency verification that

NOTE:
- CAPTION OF PROPOSED REPAIR LOCATION 1.
- FROM: INSPECTION MONITORING & MAINTENANCE REPORT, BLUFFTOP RETAINING WALL AND SEWALL, 4800 OPAL CLIFF DRIVE, APN 034-251-05, CAPITOLA, CALIFORNIA, BY HARO, KASUNICH AND ASSOCIATES, INC., PROJECT NO. SC11778, DATED JUNE 23, 2020.

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4800 Opal Cliff Drive
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Approximate location #2 of undermined area in need of repair

NOTE:
- CAPTION OF PROPOSED REPAIR LOCATION 2.
- FROM: INSPECTION MONITORING & MAINTENANCE REPORT, BLUFFTOP RETAINING WALL AND SEWALL, 4800 OPAL CLIFF DRIVE, APN 034-251-05, CAPITOLA, CALIFORNIA, BY HARO, KASUNICH AND ASSOCIATES, INC., PROJECT NO. SC11778, DATED JUNE 23, 2020.

REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

TYPE	SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	PERIODIC SPECIAL TESTING	CONCRETE SPECIAL INSPECTION	CONCRETE SPECIAL TESTING
1. Inspect formwork, including plan, elevation, and level placement.	—	X	ACI 318 CH. 20, 20.1.5, 20.2, 20.3, 20.4.1	1908.4	—
2. Reinforcing bar welding.	X	—	ACI 318 CH. 20, 20.4.1	—	—
a. Verify weldability of reinforcing bars used in ACI 318.	X	—	ACI 318 CH. 20, 20.4.1	—	—
b. Inspect high-purity flux welds, maximum 0.5 percent of other welds.	X	—	—	—	—
3. Inspect anchors cast in concrete.	—	X	ACI 318 17.8.2	—	—
4. Inspect anchors post-installed in hardened concrete members.	X	—	ACI 318 17.8.2.4	—	—
a. Adhesive anchors installed in horizontally or vertically aligned orientations to resist tensile loads.	X	—	ACI 318 17.8.2.4	—	—
b. Mechanical anchors and adhesive anchors not defined in 4.	—	X	ACI 318 17.8.2	—	—
5. Verify use of required design aids.	—	X	ACI 318 CH. 19, 19.4.3, 19.4.4	1908.1, 1908.2, 1908.3	—
6. Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content test, and determine the temperature of the concrete.	X	—	ASTM C172, ASTM C11, ACI 318 26.3, 26.12	1908.10	—
7. Inspect concrete and concrete placement for proper application techniques.	X	—	ACI 318 26.5	1908.6, 1908.7, 1908.8	—
8. Verify maintenance of specified curing water and techniques.	—	X	ACI 318 26.5.3, 26.5.5.1	1908.9	—
9. Inspect precast concrete for:	X	—	ACI 318 26.10	—	—
a. Application of prestressing forces, and	X	—	—	—	—
b. Curing of bonded prestressing tendons.	—	X	ACI 318 26.9	—	—
10. Inspect erection of precast concrete members.	—	X	ACI 318 26.9	—	—
11. Verify in-place concrete strength, joint to joint, by means of in-place concrete test and other means of non-destructive test and structural tests.	—	X	ACI 318 26.11.2	—	—
12. Inspect formwork for design, location and dimensions of the concrete member being formed.	—	X	ACI 318 26.11.2(b)	—	—

Part 3: 1 inch x 2 1/4 inch.

a. Where applicable, see Section 1908.1.2. Special inspection for alternate materials.

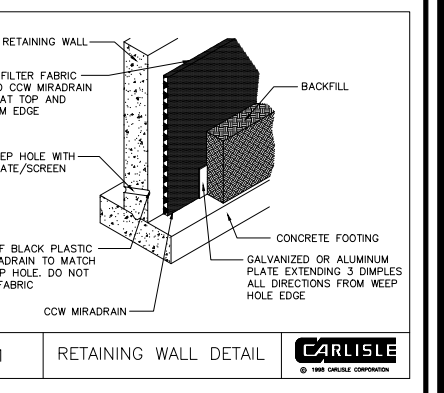
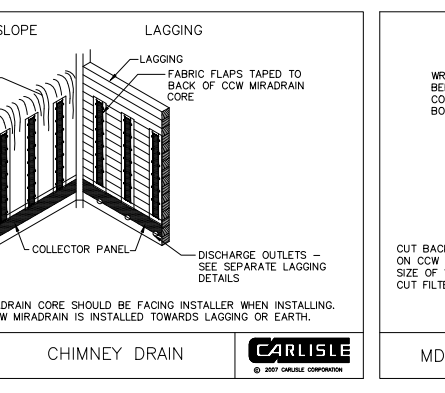
b. Specific requirements for special inspection shall be included in the contract report for the work listed by an approved repair in accordance with 1908.1.1.2 in ACI 318 or other applicable provisions. Where specific requirements for special inspection are not provided, the contractor shall be responsible for the maintenance of the work.

c. Shotcrete shall be applied in accordance with the approved repair methods. Materials shall be used to retain vapor transmission through the floor slab.

REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS

TYPE	CONCRETE SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.	—	X
2. Verify excavations are extended to proper depth and have reached proper material.	—	X
3. Verify soil conditions are adequate to support the structure.	—	X
4. Verify use of proper materials, densities and test techniques during placement and compaction or compaction.	X	—
5. Prior to placement of concrete fill, inspect subgrade and verify that soil has been prepared properly.	—	X
6. Soil Nail Anchors proof test	X	—

SECTION 1910
SOILS



CCW-MIRADRAN-STANDARD DETAILS
SCALE: N.T.S.

NOTE:
PHOTOS 1 AND 4 SHOW AREAS WHERE SHOTCRETE AND THIN SECTION OF UNDERLYING NATURAL MATERIAL HAVE BEEN LOST. PHOTO 1 (LOCATION 1) ON SEC PROJECT DRAWING SHEET 2) IS 11" WIDE, 2" HIGH AND 1.5' DEEP. ITS REPAIR WILL INVOLVE ABOUT 1.2 CUBIC YARDS OF SHOTCRETE AND ABOUT 50 POUNDS OF REINFORCING STEEL. PHOTO 4 (SECOND LOCATION IS ALSO SHOWN ON SEC PROJECT DRAWING SHEET 2) IT IS 6" WIDE, 5" HIGH AND 1' DEEP. ITS REPAIR WILL INVOLVE 1.1 CUBIC YARDS OF SHOTCRETE AND ABOUT 50 POUNDS OF REINFORCING STEEL. IN TOTAL REPAIR WILL COVER 52 SF OF UPPER WALL'S 4125 SF SURFACE AREA (ABOUT 1%).

FILE NO. _____
DATE: 10-20-20
PROJECT: 10-20-20
DWG. NO.: 20-024
REVISED: 08-18-21
REVISION: 01-06-23

DESIGNED BY: RH
CHECKED BY: GED

4 OF 4

SOIL ENGINEERING CONSTRUCTION, INC.
927 ARCADIA STREET, REDWOOD CITY, CALIFORNIA 94063
PHONE (650) 367-8955 FAX (650) 367-8139

REGISTERED PROFESSIONAL ENGINEER
No. 20681
Exp. 09-30-23
CIVIL
STATE OF CALIFORNIA

STATEMENT OF SPECIAL INSPECTIONS-2019 CBC, STANDARD WALL DRAIN DETAILS

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CAPITOLA, CALIFORNIA 95010