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VICINITY MAP

GENERAL NOTES

THE EARTH RETENTION DESIGNER IS DEFINED AS THE REGISTERED CIVIL ENGINEER WHOSE STAMP IS ON THESE PLANS.

THE EARTH RETENTION CONTRACTOR IS DEFINED AS THE ORGANIZATION(S) OR PERSON(S) WHO INSTALL THE EARTH SUPPORT SYSTEMS INDICATED ON THESE PLANS.

THE GENERAL CONTRACTOR IS AS DEFINED AS THE ORGANIZATION(S) OR PERSON(S) WITH OVERALL CONTROL OF THE SITE CONSTRUCTION.

THE PROJECT GEOTECHNICAL ENGINEER IS DEFINED AS THE ORGANIZATION OR PERSON WHO AUTHORED THE APPROVED SOILS/GEOLOGY REPORT ASSOCIATED WITH THE PROJECT.

THESE EARTH RETENTION PLANS SHALL BE REVIEWED BY THE PROJECT GEOTECHNICAL ENGINEER PRIOR TO BEGINNING WORK.

LOCATION OF ALL EXISTING FACILITIES, ADJACENT STRUCTURES AND UNDERGROUND AND OVERHEAD UTILITIES SHOWN ARE AS INTERPRETED FROM INFORMATION PROVIDED TO DRS ENGINEERING DURING DESIGN. THE ACTUAL LOCATIONS OF ALL SUCH ITEMS SHALL BE FIELD VERIFIED PRIOR TO COMMENCING CONSTRUCTION OF THE EARTH RETENTION. ANY DISCREPANCIES OR POTENTIAL CONFLICTS BETWEEN EXISTING FACILITIES AND THIS WORK SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE EARTH RETENTION DESIGNER. THE EARTH RETENTION DESIGNER SHALL NOT BE RESPONSIBLE FOR DAMAGE TO EXISTING FACILITIES, STRUCTURES OR UTILITIES DUE TO INCORRECT INTERPRETATION OF EXISTING DRAWINGS OR DATA OR MISSING LOCATION INFORMATION.

AN UNDERGROUND SERVICE ALERT INQUIRY IDENTIFICATION NUMBER MUST BE OBTAINED AT LEAST TWO WORKING DAYS BEFORE STARTING WORK WITH THIS PERMIT. TELEPHONE NUMBER (800) 227-2600.

EXCAVATION SHALL BE CO-ORDINATED WITH THE INSTALLATION OF THE EARTH RETENTION SYSTEM SO AS TO PREVENT LOSS OF GROUND OR SETTLEMENT OF ADJACENT STRUCTURES. HEAVY EQUIPMENT OR CRANES SHALL NOT BE LOCATED ADJACENT TO THE EARTH RETENTION BULKHEAD EXCEPT WHERE SPECIFICALLY PROVIDED FOR IN THE DESIGN.

THE EARTH RETENTION CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT THE EARTH RETENTION IS BUILT IN ACCORDANCE WITH THESE PLANS. IF THERE IS ANY QUESTION REGARDING THESE PLANS, THE CONTRACTOR SHALL REQUEST AN INTERPRETATION BEFORE DOING ANY WORK BY CONTACTING THE EARTH RETENTION DESIGNER.

SITE DRAINAGE AND SITE DEWATERING TO BE PROVIDED BY OTHERS.
THE GENERAL CONTRACTOR SHALL ALSO TAKE THE NECESSARY STEPS TO PROTECT THE PROJECT AND ADJACENT PROPERTY FROM ANY EROSION AND SILTATION THAT RESULT FROM HIS OPERATIONS BY APPROPRIATE MEANS (SAND BAGS, HAY BALES, TEMPORARY DESILTING BASINS, DIKES, EARTH RETENTION, ETC.) UNTIL SUCH TIME THAT THE PROJECT IS COMPLETED AND ACCEPTED FOR MAINTENANCE BY THE OWNER. ALL CONSTRUCTION SHALL CONFORM TO ALL LOCAL CODES, ORDINANCES, RESTRICTIONS AND OSHA REQUIREMENTS.

NO EXCAVATION OR GRADING SHALL COMMENCE UNTIL 10 DAYS AFTER ADJOINING PROPERTY OWNERS HAVE BEEN NOTIFIED IN WRITING AS REQUIRED BY SECTION 3307.1 OF THE CALIFORNIA BUILDING CODE 2013.

THE CONSTRUCTOR SHALL COORDINATE WITH LVMWD STAFF TO POTHOLE THE 24" AND 8" TO VERIFY ACTUAL LOCATION OF THE PIPELINE TO ENSURE THERE IS NO CONFLICT WITH THE PROPOSED SOIL NAILS.

EXCAVATION NOTIFICATION

CALL 1-800-422-4133 A MINIMUM OF TWO DAYS BEFORE COMMENCING EXCAVATION ENSURE ALL RELEVANT UTILITY COMPANIES HAVE CLEARED THE LOCATION. UPDATE ALL DIG ALERT NOTIFICATIONS EVERY TEN DAYS.

IF SOIL NAILS ARE TO BE INSTALLED WITHIN THREE FEET OF A UTILITY, THEN UTILITY MUST BE EXPOSED TO CONFIRM LOCATION AND CLEARANCE DURING DRILLING/DRIVING.

CODES AND SPECIFICATIONS

CALIFORNIA BUILDING CODE	- 2013 EDITION
STEEL DESIGN	- AISC 13th EDITION
CONCRETE DESIGN	- ACI-318-11
SOIL NAIL DESIGN	- FHWA GEOTECHNICAL ENGINEERING CIRCULAR NO. 7 SOIL NAIL WALLS FHWA0-IF-03-017 MARCH 2003

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MATERIALS

STEEL

MISCELLANEOUS STEEL:	ASTM A-36, ASTM A-572 OR A-992 (NEW OR USED IN GOOD CONDITION WITH APPLICABLE CERTIFICATES)
REINFORCING STEEL:	ASTM A-615 - GRADE 60
WELDED WIRE FABRIC:	PLAIN WIRE REINFORCEMENT ASTM A-185 f'y (min) = 65ksi
HEADED STUDS:	H4L MILD STEEL NELSON STUDS TO ASTM A-108
SOIL NAIL BAR:	ASTM A-615 GRADE 75 SOLID BAR
WELDING ELECTRODES:	E-70 ksi

CEMENTITIOUS

CEMENT:	ASTM C-150, TYPE II / V
SHOTCRETE:	f'c (28) = 4000psi MIX DESIGN TO BE SUBMITTED BY EARTH RETENTION CONTRACTOR.
SOIL NAILS GROUT:	NEAT WATER/CEMENT GROUT 0.45 W/C RATIO f'c (28 DAY) = 4000psi MIN.

MISCELLANEOUS

WALL DRAINAGE:	MIRADRAIN 6200XL J-DRAIN 420XL OR EQUIVALENT
EPOXY COATING:	ASTM A775 OR ASTM A934. JOB SITE FABRICATION AND REPAIRS IN ACCORDANCE WITH ASTM D3963.

MEMBERS OR DETAILS MAY BE SUBSTITUTED FOR EQUIVALENT OR BETTER, AS APPROVED BY ENGINEER.

DESIGN CRITERIA

SOIL NAIL DESIGN IS BASED UPON GEOTECHNICAL ENGINEERING CIRCULAR #7 (FHWA0-IF-03-017).

DESIGN IS IN ACCORDANCE WITH THE APPROVED GEOTECHNICAL REPORT FOR THE PROJECT
AUTHOR: GORIAN ASSOCIATES, REF: 2928-0-0-100, DATE: APRIL 24TH 2012 WITH ADD. DATED: MARCH 14 2013.

GEOTECHNICAL DESIGN PARAMETERS ARE AS FOLLOWS:

SEISMIC COEFFICIENT Kh = 0.15
33% INCREASE IN SOIL PARAMETERS FOR SEISMIC ANALYSIS

SOIL PARAMETERS

SOIL TYPE	UNIT WEIGHT PCF	FRICTION ANGLE DEGREES	COHESION PSF	ULTIMATE BOND STRESS PSI	WORKING BOND STRESS PSI
TOPANGA FORMATION ALONG BEDDING	120	26	200	30	15
TOPANGA FORMATION CROSS BEDDING	120	30	500	30	15

WELDING

1. ALL WELDING ELECTRODES SHALL BE E-70XX MINIMUM
2. ALL WELDING SHALL BE DONE BY WELDERS CERTIFIED BY THE GOVERNING LOCAL BUILDING AUTHORITY.
3. ALL FIELD WELDING SHALL BE DONE UNDER THE SUPERVISION OF A DEPUTY INSPECTOR, CERTIFIED BY THE GOVERNING LOCAL BUILDING AUTHORITY (EXCEPT SINGLE PASS FILLET WELDS <=5/16" MAY BE DONE UNDER PERIODIC INSPECTION).
2. ALL WELDING OF REINFORCING SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF THE LATEST EDITION OF AMERICAN WELDING SOCIETY (AWS) D1.1:2010.

GENERAL PROCEDURES

ALL NECESSARY PERMITS SHALL BE OBTAINED (BY OTHERS) PRIOR TO COMMENCEMENT OF INSTALLATION OF THE EARTH RETENTION SYSTEM.

GENERAL CONTRACTOR AND EARTH RETENTION CONTRACTOR WILL FOLLOW ALL APPLICABLE CAL-OSHA REQUIREMENTS IN THE EXECUTION OF THE WORK DESCRIBED HEREIN.

PRIOR TO THE START OF WORK THE EXISTING GRADE ELEVATIONS AND THE LOCATION AND DEPTH OF ALL EXISTING AND NEW UTILITIES SHALL BE DETERMINED BY THE GENERAL CONTRACTOR AND PROVIDED IN WRITING TO THE EARTH RETENTION CONTRACTOR.

LAYOUT OF TEMPORARY EARTH RETENTION LINE AND ELEVATIONS SHALL BE PROVIDED BY GENERAL CONTRACTOR. WHERE APPLICABLE, ALL BUILDING OUTSIDE CORNERS SHALL BE FIELD STAKED AND EARTH RETENTION PILES LOCATED IN RELATIONSHIP TO STAKED BUILDING CORNERS TAKING INTO ACCOUNT ANTICIPATED PILE INSTALLATION TOLERANCES, PILE DEFLECTION DURING EXCAVATION AND ANY REQUIRED WATERPROOFING AND DRAINAGE. PILES MAY BE MOVED UP TO ONE FOOT IN ANY DIRECTION FROM LOCATIONS SHOWN THESE PLANS TO ACCOMMODATE AS STAKED BUILDING LOCATIONS. PILE LOCATIONS SHALL BE VERIFIED BY OTHERS IMMEDIATELY AFTER INSTALLATION OF SOLDIER BEAMS.

A SAFETY RAILING AROUND THE PERIMETER OF THE EXCAVATION, BUILT PER CAL-OSHA STANDARDS, WILL BE PROVIDED PRIOR TO CREATING FALL HAZARDS OVER 6 FEET.

SEQUENCE OF INSTALLATION

EXCAVATION FOR SOIL NAILS SHOULD BE MADE IN VERTICAL LIFTS TO ACCOMMODATE THE VERTICAL NAIL SPACING INDICATED ON THESE PLANS.

WHERE COLD JOINTS BETWEEN VERTICAL LIFTS OF PERMANENT STRUCTURAL SHOTCRETE ARE CREATED, THE PROCEDURE FOR FINISHING CURING, ROUGHENING AND RE-APPLYING SHOTCRETE AT THE COLD JOINT SHOULD BE IN ACCORDANCE WITH ACI-506R-05.

CONSTRUCTION SEQUENCE

1. EXCAVATE A VERTICAL CUT TO APPROX. 2FT BELOW THE UPPER ROW OF SOIL NAILS. WHERE REQUIRED DEMOLISH EXISTING STRUCTURES THAT WILL INTERFERE WITH THE CONSTRUCTION OF THE SOIL NAIL WALL.
2. DRILL AND INSTALL UPPER ROW OF SOIL NAILS.
3. PLACE TEMPORARY FACING DRAINAGE CHIMNEYS AND REINFORCING AND SHOOT TEMPORARY SHOTCRETE FACING.
4. PROOF TEST SOIL NAILS AS REQUIRED FOR THIS NAIL ROW
5. REPEAT STEPS 1 TO 4 FOR SUBSEQUENT SOIL NAIL ROWS UNTIL SUBGRADE IS REACHED.
6. INSTALL PERMANENT FACING, DRAINAGE AND REINFORCING.
7. SHOTCRETE PERMANENT FACING.

SOIL NAIL INSTALLATION

DRILLING:
HOLES SHALL BE DRILLED TO THE DIAMETER, DEPTH AND LINE AS INDICATED ON THE DRAWINGS. THE HOLE SHALL BE DRILLED SO THAT ITS DIAMETER IS NOT MORE THAN 1/4 INCH SMALLER THAN THE SPECIFIED DIAMETER. HOLES SHALL BE DRILLED AT AN INCLINATION AS SHOWN ON THESE DRAWING. TOLERANCES FOR DRILL HOLE LOCATION SHALL BE +ONE FOOT FOR HORIZONTAL AND VERTICAL POSITION AT THE WALL FACE AND WITHIN 2.5 DEGREES OF THE SPECIFIED SOIL NAIL GRADIENT.

HOLES SHALL BE CLEANED TO REMOVE MATERIAL RESULTING FROM DRILLING OPERATIONS. WATER FOR CLEANING HOLES SHALL NOT BE USED UNLESS APPROVED IN WRITING BY THE EARTH RETENTION ENGINEER.

SOIL NAILS SHALL BE INSTALLED IN DRILLED HOLES IN AN EXPEDITIOUS MANNER SO THAT CAVING OR DETERIORATION OF THE DRILLED HOLES DOES NOT OCCUR.

WHERE THE SOIL NAIL CANNOT BE COMPLETELY INSERTED, THE CONTRACTOR SHALL REMOVE THE BAR AND CLEAN OR REDRILL THE HOLE TO PERMIT UNOBSTRUCTED INSTALLATION. PARTIALLY INSTALLED BARS SHALL NOT BE DRIVEN OR FORCED INTO THE DRILLED HOLE AND WILL BE REJECTED. WHEN OPEN-HOLE DRILLING METHODS ARE BEING USED, THE CONTRACTOR SHALL HAVE HOLE CLEANING TOOLS ON SITE SUITABLE FOR CLEANING DRILLED HOLES ALONG THEIR FULL LENGTH JUST PRIOR TO BAR INSERTION AND GROUTING.

AT LOCATIONS WHERE CAVING CONDITIONS ARE ANTICIPATED, SUFFICIENT CASING AND AUGER LENGTHS SHALL BE AVAILABLE ON SITE TO MAINTAIN UNINTERRUPTED INSTALLATION OF SOIL NAILS OR SOLID BARS MAY BE REPLACED WITH SELF-DRILLING BARS PER THE PROCEDURES AND DETAILS ON THESE PLANS.

THE LENGTH OF DRILLED HOLE SHALL BE VERIFIED AND RECORDED BY THE INSPECTOR BEFORE GROUTING.

THE CONTRACTOR SHALL CONSTRUCT TEST SOIL NAILS USING THE SAME EQUIPMENT, METHODS, NAIL INCLINATION, AND DRILL HOLE DIAMETER AS TO BE USED FOR PRODUCTION SOIL NAILS.HOLES FOR PROOF SOIL NAILS SHALL BE OF THE SAME DIAMETER AS THOSE FOR THE PRODUCTION SOIL NAILS THEY REPRESENT.

SOIL NAIL FABRICATION AND HANDLING:
TO THE EXTENT PRACTICABLE, SOILS NAILS SHALL BE SHOP FABRICATED. SOIL NAILS SHALL BE HANDLED AND PROTECTED IN SUCH A MANNER AS TO AVOID CORROSION AND PHYSICAL DAMAGE THERETO.

CENTRALIZERS SHALL BE USED DURING INSTALLATION TO SUPPORT THE SOIL NAIL IN THE CENTER OF THE DRILLED HOLE. CENTRALIZERS SHALL BE SPACED AT A MAXIMUM OF 7.5 FEET ON CENTER ALONG THE LENGTH OF THE BAR, AND A MAXIMUM OF 18 INCHES FROM THE END OF THE BAR.

SOIL NAIL PLACEMENT: PRIOR TO PLACEMENT, SOIL NAILS SHALL BE FREE OF DIRT, DETRIMENTAL RUST OR ANY OTHER DELETERIOUS SUBSTANCES. DRILLED HOLES SHALL BE CLEARED OF ANY LOOSE ROCK FRAGMENTS, SOIL OR OTHER SUBSTANCES WHICH MAY PREVENT THE PROPER PLACEMENT OF THE SOIL NAIL OR GROUT.

SOIL NAILS SHALL BE PLACED IN ACCORDANCE WITH RECOMMENDATIONS OF THE MANUFACTURER. SOIL NAILS SHALL BE SECURELY FASTENED IN PLACE TO PREVENT MOVEMENT DURING GROUTING AND TO ASSURE THAT THE BOND LENGTH OF THE SOIL NAIL IS CENTRALLY LOCATED IN THE DRILL HOLE.

GROUT PREPARATION AND PLACEMENT:
GROUT SHALL BE PUMPED INTO THE SOIL HOLE THROUGH A TREMIE GROUT TUBE PROVIDED BY THE CONTRACTOR FOR THAT PURPOSE UNTIL THE HOLE IS FILLED TO THE TOP OF THE SOIL NAIL ZONE.
THE CONTRACTOR SHALL GROUT THE DRILLED HOLE AFTER INSTALLATION OF THE SOIL NAIL. GROUT SHALL BE INJECTED AT THE LOW END OF THE DRILLED HOLE AND SHALL FILL THE DRILLED HOLE WITH A DENSE GROUT FREE OF VOIDS OR INCLUSION OF FOREIGN MATERIAL. THE CONTRACTOR
SHALL COMPLETELY GROUT THE DRILLED HOLE IN ONE CONTINUOUS OPERATION. COLD JOINTS SHALL NOT BE USED IN GROUT PLACEMENT. PROVISIONS SHALL BE MADE FOR DETERMINING THE TOP OF THE GROUT TO ASSURE ADEQUATE SOIL NAILAGE.

ANY REMAINING VOID AT THE EXTERIOR END OF THE DRILLED HOLE FOR PRODUCTION SOIL NAILS SHALL BE FILLED WITH SHOTCRETE, AND THE SOIL NAIL SECURED AT THE FACE OF THE SHOTCRETE. THE STEEL BEARING PLATE SHALL BE SEATED WITH FULL BEARING ON THE SHOTCRETE SURFACE, AND THE NUT FOR THE SOILNAIL SHALL BE HAND TIGHTENED BEFORE THE INITIAL SET OF THE SHOTCRETE.

ONLY THE BONDED LENGTH OF TEST SOIL NAILS SHALL BE GROUTED.

SOIL NAILS SHALL BE INSTALLED AND GROUTED IN THE SAME WORK SHIFT AS THE DRILLING OPERATION.

AFTER GROUTING, THE SOIL NAIL SHALL REMAIN UNDISTURBED UNTIL THE MINIMUM SPECIFIED GROUT STRENGTH HAS BEEN ATTAINED AND VERIFIED BY GROUT CUBE SAMPLE TESTING.

SOIL NAIL TESTING EQUIPMENT

SOIL NAIL MOVEMENT SHALL BE MONITORED BY THE USE OF A DIAL GAUGES CAPABLE OF MEASURING TO 0.001 INCH. THE DIAL GAUGES SHALL HAVE A MINIMUM STROKE EQUAL TO THE THEORETICAL ELASTIC ELONGATION OF THE TOTAL NAIL LENGTH PLUS 1 INCH. THE DIAL GAUGES SHALL BE ALIGNED WITHIN 5 DEGREES FROM THE AXIS OF THE NAIL.

A HYDRAULIC JACK AND PUMP SHALL BE USED TO APPLY THE TEST LOAD.
THE JACK AND PRESSURE GAUGE SHALL BE CALIBRATED BY AN INDEPENDENT TESTING LABORATORY AS A UNIT. THE PRESSURE GAUGE SHALL BE GRADUATED IN 100 PSI INCREMENTS OR LESS AND SHALL HAVE A RANGE NOT EXCEEDING TWICE THE ANTICIPATED MAXIMUM PRESSURE DURING TESTING. THE MINIMUM RAM TRAVEL OF THE JACK SHALL NOT BE LESS THAN THE THEORETICAL ELASTIC ELONGATION OF THE TOTAL NAIL LENGTH AT THE MAXIMUM TEST LOAD PLUS 1 INCH. THE JACK SHALL BE CAPABLE OF APPLYING EACH LOAD IN LESS THAN 1 MINUTE. THE CONTRACTOR SHALL PROVIDE A RECENT (WITHIN 90DAYS) CALIBRATION CURVES FOR THE JACK AND PRESSURE GAUGE.

THE STRESSING EQUIPMENT SHALL BE PLACED OVER THE NAIL IN SUCH A MANNER THAT THE JACK, BEARING PLATES, LOAD CELL, AND STRESSING ANCHORAGE ARE IN ALIGNMENT. THE JACK SHALL BE POSITIONED AT THE BEGINNING OF THE TEST SUCH THAT UNLOADING AND REPOSITIONING OF THE JACK DURING THE TEST WILL NOT BE REQUIRED.

THE REACTION FRAME SHALL BE SUFFICIENTLY RIGID AND OF ADEQUATE DIMENSION SUCH THAT EXCESSIVE DEFORMATION OF THE TEST APPARATUS REQUIRING REPOSITIONING OF ANY COMPONENTS SHALL BE AVOIDED. WHERE THE REACTION FRAME BEARS DIRECTLY ON THE SHOTCRETE, THE REACTION FRAME SHALL BE DESIGNED TO PRECLUDE FRACTURE OF THE SHOTCRETE. NO PART OF THE REACTION FRAME SHALL BEAR WITHIN 6 INCHES OF THE EDGE OF THE TEST NAIL BLOCKOUT.

GEOTECHNICAL ENGINEER AND GEOLOGIST

THIS PLAN HAS BEEN REVIEWED AND CONFORMS TO RECOMMENDATIONS OF GEOTECHNICAL ENGINEERING / GEOLOGIC REPORTS REFERENCED ABOVE.

GEOTECHNICAL ENGINEER SIGNATURE AND DATE ________________

GEOLOGIST SIGNATURE AND DATE ________________

SOIL NAIL TESTING PROOF TESTS

PROOF TESTS SHALL BE PERFORMED ON FIVE PERCENT (5%) OF THE SOIL NAILS TO VERIFY THE BOND STRESS VALUE ASSUMED IN THE DESIGN. NAILS SHOULD BE TESTED ON EVERY LIFT AND ON DIFFERENT LOCATIONS ALONG THE WALL. PROOF TESTS SHALL BE PERFORMED USING TESTING EQUIPMENT CALIBRATED WITHIN 60 DAYS OF START OF TESTING.

PROOF TEST NAILS DIMENSIONS AND TEST LOADS:

ULTIMATE GROUT/GROUND BOND STRESS	30 psi
ALLOWABLE GROUT/GROUND BOND STRESS	15 psi
HOLE DIAMETER:	4"
PROOF TEST NAIL BONDED LENGTH	12 ft
DESIGN LOAD (DL):	27.1 kip
MAXIMUM TEST LOAD (1.50 DL)	40.6 kip
MINIMUM PROOF TEST NAIL BAR SIZE	#7 Gr 75
90% fy FOR #7 Gr. 75 BAR	41 kip

PROOF TESTS SHALL BE PERFORMED ON PRODUCTION NAILS TO 150% OF THE ALLOWABLE BOND STRESS VALUE USED IN DESIGN. INSTALL THE PROOF TEST NAILS BY THE SAME METHOD THAT IS USED FOR ALL PRODUCTION NAILS, EXCEPT GROUT ONLY THE BOND LENGTH SPECIFIED ON THESE PLANS.

SECURELY BLOCK OUT THE FRONT ONE FOOT OF THE SOIL NAIL HOLE WITH LOOSE SOIL OR OTHER FLEXIBLE MATERIAL TO AVOID PENETRATION OF SHOTCRETE IN THE OPEN HOLE. PERFORM THE PROOF TEST BY LOADING THE SOIL NAIL IN FOLLOWING INCREMENTS.

AL — AL = ALIGNMENT LOAD
0.25 DL — DL = NAIL DESIGN LOAD
0.50 DL
0.75 DL
1.00 DL
1.50 DL

ALL LOAD INCREMENTS SHALL BE MAINTAINED WITHIN 5 PERCENT OF THE INTENDED LOAD. DEPENDING ON THE PERFORMANCE WITHER 10 MINUTE OR 60 MINUTE CREEP TESTS SHALL BE PERFORMED AT THE MAXIMUM TEST LOAD. THE CREEP PERIOD SHALL START AS SOON AS THE MAXIMUM TEST LOAD IS APPLIED AND THE NAIL MOVEMENT WITH RESPECT TO A FIXED REFERENCE SHALL BE MEASURED AND RECORDED AT 1 MINUTE, 2, 3, 5, 6, 10 MINUTES. WHERE NAIL MOVEMENT BETWEEN 1 MINUTE AND 10 MINUTES EXCEEDS 0.04 INCHES, THE MAXIMUM TEST LOAD SHALL BE MAINTAINED AN ADDITIONAL 50 MINUTES AND MOVEMENTS SHALL BE RECORDED AT 20 MINUTE, 30, 50, AND 60 MINUTES.

PROOF TEST ACCEPTANCE CRITERIA:

IF AT THE PROOF TEST LOAD THE MOVEMENT BETWEEN 1 AND 10 MINUTES IS LESS THAN 0.04 INCH, THE TEST IS SUCCESSFUL. IF THE MOVEMENT EXCEEDS 0.04 INCH, THE PROOF TEST LOAD MAY BE HELD FOR AN ADDITIONAL 50 MINUTES AND A CREEP CURVE SHALL BE PLOTTED FOR MOVEMENT BETWEEN 6 AND 60 MINUTES. IF THE CREEP CURVE INDICATES A CREEP RATE OF LESS THAN 0.08 INCHES PER LOG CYCLE TIME, THE TEST IS SUCCESSFUL.

ALL TEST RESULTS SHOULD BE PROVIDED TO THE DESIGNER WITHIN 5 DAYS OF TESTING AND IMMEDIATELY FOR ANY TESTS THAT FAIL TO MEET THE ACCEPTANCE CRITERIA.

SOIL NAIL TESTING VERIFICATION TESTS

AT LEAST TWO (2) VERIFICATION TEST NAILS SHALL BE INSTALLED. COMPLETION OF SUCCESSFUL VERIFICATION TESTS ARE REQUIRED PRIOR TO INSTALLATION OF PRODUCTION NAILS. THE NAILS USED FOR THE VERIFICATION TESTS SHALL BE SACRIFICIAL AND SHALL NOT BE INCORPORATED INTO THE PRODUCTION NAIL SCHEDULE.

VERIFICATION TESTS SHALL BE PERFORMED ON SACRIFICIAL NAILS TO THE ULTIMATE BOND STRESS VALUE. INSTALL THE TEST NAILS BY THE SAME METHOD THAT IS USED FOR PRODUCTION NAILS, EXCEPT GROUT ONLY THE BOND LENGTH SPECIFIED ON THESE PLANS. VERIFICATION TEST NAILS MAY BE PLAIN BAR AND NEED NOT BE EPOXY COATED OR ENCAPSULATED IN HDPE SHEATHING.

VERIFICATION TEST NAILS DIMENSIONS AND TEST LOADS:

ULTIMATE GROUT/GROUND BOND STRESS	30psi
ALLOWABLE GROUT/GROUND BOND STRESS	15psi
HOLE DIAMETER	4"
VERIFICATION TEST NAIL UN-BONDED LENGTH	5ft
VERIFICATION TEST NAIL BONDED LENGTH	10ft
DESIGN LOAD (DL):	22.6 kip
MAXIMUM TEST LOAD (2.00 DL)	45.2 kip
MINIMUM VERIFICATION TEST NAIL BAR SIZE	#8 Gr 75
90% Fy (MAXIMUM TEST LOAD):	53.4 kip

VERIFICATION TEST NAILS SHALL BE INCREMENTALLY LOADED TO TWICE THE DESIGN LOAD AND MOVEMENTS RECORDED IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:

AL	1 MINUTE	AL = ALIGNMENT LOAD
0.25 DL	1 MINUTE	DL = NAIL DESIGN LOAD
0.50 DL	1 MINUTE	
0.75 DL	1 MINUTE	
1.00 DL	1 MINUTE	
1.25 DL	1 MINUTE	
1.50 DL	60 MINUTES	
1.75 DL	1 MINUTE	
2.00 DL	1 MINUTE	

ALL LOAD INCREMENTS SHALL BE MAINTAINED WITHIN 5 PERCENT OF THE INTENDED LOAD. THE VERIFICATION TEST NAIL SHALL BE MONITORED FOR CREEP AT 1.50 DL LOAD INCREMENT. THE CREEP PERIOD SHALL START AS SOON AS THE MAXIMUM TEST LOAD IS APPLIED AND THE NAIL MOVEMENT WITH RESPECT TO A FIXED REFERENCE SHALL BE MEASURED AND RECORDED AT 1 MINUTE, 2, 3, 5, 6, 10, 20, 30, 50 AND 60 MINUTES. THE VERIFICATION TEST NAIL SHALL BE UNLOADED IN INCREMENTS OF 25 PERCENT WITH MEASUREMENTS OF DEFLECTION AT EACH INCREMENT.

UPON SUCCESSFUL COMPLETION OF THE VERIFICATION TEST, THE NAIL SHALL BE LOADED IN 25 PERCENT INCREMENTS. EACH LOAD INCREMENT SHALL BE HELD UNTIL A STABLE READING IS OBTAINED AND THE NAIL EXTENSION AT THAT INCREMENT RECORDED. LOAD SHALL BE INCREASED IN 25% INCREMENTS UNTIL EITHER CONSTANT LOAD RESULTS IN CONTINUOUS EXTENSION OR 90% OF THE YIELD CAPACITY OR 80% OF THE GUARANTEED ULTIMATE CAPACITY OF THE BAR IS REACHED. THE MAXIMUM TEST LOAD ACHIEVED AND THE CORRESPONDING BAR EXTENSION SHALL BE RECORDED.

VERIFICATION TEST ACCEPTANCE CRITERIA:

FOR VERIFICATION TESTS, IF THE CREEP CURVE INDICATES A CREEP RATE OF LESS THAN 0.08 INCHES PER LOG CYCLE TIME, AND THE RATE IS LINEAR OR DECREASING THROUGHOUT THE HOLD LOAD, THE TEST IS SUCCESSFUL.

PERMANENT SOIL NAIL WALL MONITORING

PRIOR TO ANY CONSTRUCTION ACTIVITIES THAT MAY EFFECT ADJACENT PROPERTIES, A COMPLETE EXISTING CONDITION SURVEY SHOULD BE UNDERTAKEN TO OBSERVE AND DOCUMENT THE PRE-CONSTRUCTION CONDITION OF ALL STRUCTURES, INFRASTRUCTURE, SIDEWALKS, ROADWAYS, AND ALL OTHER FACILITIES ADJACENT TO THE SITE. DOCUMENTATION SHALL BE CIRCULATED TO CONTRACTOR, ENGINEER AND OWNER PRIOR TO START OF EXCAVATION.

DURING THE EXCAVATION PHASE THE SOIL NAIL WALL SHALL BE INSPECTED DAILY BY VISUAL OBSERVATION FOR SIGNS OF GROUND OR BUILDING MOVEMENTS IN THE VICINITY OF EACH WORKING FRONT. IN ADDITION, TEMPORARY MONITORING POINTS IN THE UPPER FIVE FEET OF THE WALL SHOULD BE ESTABLISHED TO ENABLE SURVEY MONITORING OF LATERAL WALL DEFLECTIONS AND WALL CREST SETTLEMENT TO BE UNDERTAKEN. MONITORING POINTS SHOULD BE AT A MAXIMUM HORIZONTAL SPACING OF 40FT. SURVEY POINTS SHALL BE MONITORED NO LESS THAN ONCE PER WEEK DURING EXCAVATION AND TWICE A MONTH THEREAFTER UNTIL THE PERMANENT WALL IS COMPLETED. MONITORING REPORTS SHOULD BE CIRCULATED TO CONTRACTOR, ENGINEER AND OWNER WITHIN 24HRS OF DATA COLLECTION.

THE ENGINEER MAY CHOOSE TO MONITOR PARTICULAR STRUCTURES OR AREAS MORE FREQUENTLY USING CRACK MONITORING DEVISES OR ADDITIONAL TEMPORARY BENCHMARKS.

DRS Engineering Inc.
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FAX: (818) 276-1922
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PROJECT NAME

LAS VIRGENES RD STREET IMPROVEMENT

MEADOW CREEK LN & LAS VIRGENES RD
CALABASAS
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GEOTECHNICAL CONSULTANTS

GORIAN AND ASSOCIATES, INC.
3595 OLD CONEJO ROAD
THOUSAND OAKS
CA 91320
TEL: (818) 889-2137
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CIVIL CONSULTANTS

DIAMOND WEST, INC.
24005 VENTURA BLVD., SUITE 100
CALABASAS
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TEL: (818) 444-1800
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OWNER

CALABASAS BLUE, LLC
25340 PRADO DE LOS ARBOLES
CALABASAS
CA 91302
TEL: (818) 225-8395

PERMANENT SOIL NAIL WALLS

NOTES

REGISTERED PROFESSIONAL ENGINEER DAVID R. SALTER C 69911 Exp. 9.30.16 CIVIL STATE OF CALIFORNIA

3/19/2015

REV.	DESCRIPTION	DATE
1	Plan Check Corrections	03.19.15

PROJECT No. 2015-06

DATE	02-24-2015
DRAWN	DRS - ODO
CHECKED	DRS
SCALE	AS SHOWN
SHEET No.	SH-1.0

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2013 CBC
PERMANENT SHOTCRETE REQUIREMENTS

REQUIREMENTS OF 2013 CALIFORNIA BUILDING CODE SECTION 1910.

1910.1 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 PLAIN OR REINFORCED CONCRETE.

1910.2 PROPORTIONS AND MATERIALS.
SHOTCRETE PROPORTIONS SHALL BE SELECTED THAT ALLOW SUITABLE PLACEMENT PROCEDURES USING THE DELIVERY EQUIPMENT SELECTED AND SHALL RESULT IN FINISHED IN-PLACE HARDENED SHOTCRETE MEETING THE STRENGTH REQUIREMENTS OF THIS CODE.

1910.3 AGGREGATE.
COARSE AGGREGATE, IF USED, SHALL NOT EXCEED 3/4 INCH (19.1 MM).

1910.4 REINFORCEMENT.
REINFORCEMENT USED IN SHOTCRETE CONSTRUCTION SHALL COMPLY WITH THE PROVISIONS OF SECTIONS 1910.4.1 THROUGH 1910.4.4.

1910.4.1 SIZE. THE MAXIMUM SIZE OF REINFORCEMENT SHALL BE NO.5 BARS UNLESS IT IS DEMONSTRATED BY PRECONSTRUCTION TESTS THAT ADEQUATE ENCASEMENT OF LARGER BARS WI1L BE ACHIEVED.

1910.4.2 CLEARANCE. WHEN NO.5 OR SMALLER BARS ARE USED, THERE SHALL BE A MINIMUM CLEARANCE BETWEEN PARALLEL REINFORCEMENT BARS OF 21/2 INCHES (64 MM). WHEN BARS LARGER THAN NO.5 ARE PERMITTED, THERE SHALL BE A MINIMUM CLEARANCE BETWEEN PARALLEL BARS EQUAL TO SIX DIAMETERS OF THE BARS USED. WHEN TWO CURTAINS OF STEEL ARE PROVIDED, THE CURTAIN NEARER THE NOZZLE SHALL HAVE A MINIMUM SPACING EQUAL TO 12 BAR DIAMETERS AND THE REMAINING CURTAIN SHALL HAVE A MINIMUM SPACING OF SIX BAR DIAMETERS. EXCEPTION: SUBJECT TO THE APPROVAL OF THE BUILDING OFFICIAL, REQUIRED CLEARANCES SHALL BE REDUCED WHERE IT IS DEMONSTRATED BY PRECONSTRUCTION TESTS THAT ADEQUATE ENCASEMENT OF THE BARS USED IN THE DESIGN WILL BE ACHIEVED.

1910.4.3 SPLICES. LAP SPLICES OF REINFORCING BARS SHALL UTILIZE THE NON CONTACT LAP SPLICE METHOD WITH A MINIMUM CLEARANCE OF 2 INCHES (51 MM) BETWEEN BARS. THE USE OF CONTACT LAP SPLICES NECESSARY FOR SUPPORT OF THE REINFORCING IS PERMITTED WHEN APPROVED BY THE BUILDING OFFICIAL, BASED ON SATISFACTORY PRECONSTRUCTION TESTS THAT SHOW THAT ADEQUATE ENCASEMENT OF THE BARS WILL BE ACHIEVED, AND PROVIDED THAT THE SPLICE IS ORIENTED SO THAT A PLANE THROUGH THE CENTER OF THE SPLICED BARS IS PERPENDICULAR TO THE SURFACE OF THE SHOTCRETE.

1910.4.4 SPIRALLY TIED COLUMNS. SHOTCRETE SHALL NOT BE APPLIED TO SPIRALLY TIED COLUMNS.

1910.5 PRECONSTRUCTION TESTS.
WHEN REQUIRED BY THE BUILDING OFFICIAL, A TEST PANEL SHALL BE SHOT, CURED, CORED OR SAWN, EXAMINED AND TESTED PRIOR TO COMMENCEMENT OF THE PROJECT. THE SAMPLE PANEL SHALL BE REPRESENTATIVE OF THE PROJECT AND SIMULATE JOB CONDITIONS AS CLOSELY AS POSSIBLE. THE PANEL THICKNESS AND REINFORCING SHALL REPRODUCE THE THICKEST AND MOST CONGESTED AREA SPECIFIED IN THE STRUCTURAL DESIGN. IT SHALL BE SHOT AT THE SAME ANGLE, USING THE SAME NOZZLEMAN AND WITH THE SAME CONCRETE MIX DESIGN THAT WILL BE USED ON THE PROJECT. THE EQUIPMENT USED IN PRECONSTRUCTION TESTING SHALL BE THE SAME EQUIPMENT USED IN THE WORK REQUIRING SUCH TESTING, UNLESS SUBSTITUTE EQUIPMENT IS APPROVED BY THE BUILDING OFFICIAL.

1910.6 REBOUND.
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 USED AS AGGREGATE.

1910.7 JOINTS.
EXCEPT WHERE PERMITTED HEREIN, UNFINISHED WORK SHALL NOT BE ALLOWED TO STAND FOR MORE THAN 30 MINUTES UNLESS EDGES ARE SLOPED TO A THIN EDGE. FOR STRUCTURAL ELEMENTS THAT WILL BE UNDER COMPRESSION AND FOR CONSTRUCTION JOINTS SHOWN ON THE APPROVED CONSTRUCTION DOCUMENTS, SQUARE JOINTS ARE PERMITTED. BEFORE PLACING ADDITIONAL MATERIAL ADJACENT TO PREVIOUSLY APPLIED WORK, SLOPING AND SQUARE EDGES SHALL BE CLEANED AND WETTED.

1910.8 DAMAGE.
IN-PLACE SHOTCRETE THAT EXHIBITS SAGS, 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.

1910.9 CURING.
DURING THE CURING PERIODS SPECIFIED HEREIN, SHOTCRETE SHALL BE MAINTAINED ABOVE 40°F AND IN MOIST CONDITION.

1910.9.1 INITIAL CURING. SHOTCRETE SHALL BE KEPT CONTINUOUSLY MOIST FOR 24 HOURS AFTER SHOTCRETING IS COMPLETE OR SHALL BE SEALED WITH AN APPROVED CURING COMPOUND.

1910.9.2 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 MOISTURE-RETAINING COVER.

1910.9.3 NATURAL CURING. NATURAL CURING SHALL NOT BE USED IN LIEU OF THAT SPECIFIED IN THIS SECTION UNLESS THE RELATIVE HUMIDITY REMAINS AT OR ABOVE 85 PERCENT, AND IS AUTHORIZED BY THE REGISTERED DESIGN PROFESSIONAL AND APPROVED BY THE BUILDING OFFICIAL

1910.10 STRENGTH TESTS.
STRENGTH TESTS FOR SHOTCRETE SHALL BE MADE BY AN APPROVED AGENCY ON SPECIMENS THAT ARE REPRESENTATIVE OF THE WORK AND WHICH HAVE BEEN WATER SOAKED FOR AT LEAST 24 HOURS PRIOR TO TESTING. WHEN THE MAXIMUM-SIZE AGGREGATE IS LARGER THAN 3/8 INCH (9.5 MM), SPECIMENS SHALL CONSIST OF NOT LESS THAN THREE 3-INCH-DIAMETER (76 MM) CORES OR 3-INCH (76 MM) CUBES. WHEN THE MAXIMUM-SIZE AGGREGATE IS 3/8 INCH (9.5 MM) OR SMALLER, SPECIMENS SHALL CONSIST OF NOT LESS THAN 2-INCH-DIAMETER (51 MM) CORES OR 2-INCH (51 MM) CUBES.

1910.10.1 SAMPLING. SPECIMENS SHALL BE TAKEN FROM THE IN-PLACE WORK OR FROM TEST PANELS, AND SHALL BE TAKEN AT LEAST ONCE EACH SHIFT, BUT NOT LESS THAN ONE FOR EACH 50 CUBIC YARDS (38.2 M3) OF SHOTCRETE.

1910.10.2 PANEL CRITERIA. WHEN THE MAXIMUM-SIZE AGGREGATE IS LARGER THAN 3/8 INCH (9.5 MM), THE TEST PANELS SHALL HAVE MINIMUM DIMENSIONS OF 18 INCHES BY 18 INCHES (457 MM BY 457 MM). WHEN THE MAXIMUM SIZE AGGREGATE IS 3/8 INCH (9.5 MM) OR SMALLER, THE TEST PANELS SHALL HAVE MINIMUM DIMENSIONS 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 NOZZLEMEN DOING THE WORK. THE CONDITIONS UNDER WHICH THE PANELS ARE CURED SHALL BE THE SAME AS THE WORK.

1910.10.3 ACCEPTANCE CRITERIA. THE AVERAGE COMPRESSIVE STRENGTH OF THREE CORES FROM THE IN-PLACE WORK OR A SINGLE TEST PANEL SHALL EQUAL OR EXCEED 0.85 F'c WITH NO SINGLE CORE LESS THAN 0.75 F'c THE AVERAGE COMPRESSIVE STRENGTH OF THREE CUBES TAKEN FROM THE IN-PLACE WORK OR A SINGLE TEST PANEL SHALL EQUAL OR EXCEED F'c WITH NO INDIVIDUAL CUBE LESS THAN 0.88 F'c TO CHECK ACCURACY, LOCATIONS REPRESENTED BY ERRATIC CORE OR CUBE STRENGTHS SHALL BE RETESTED.

ADDITIONAL
PERMANENT SHOTCRETE REQUIREMENTS

SHOTCRETE SHALL BE APPLIED BY AN EXPERIENCED NOZZLEMAN WHOSE QUALIFICATIONS MEET THE MINIMUM REQUIREMENTS AS SET FORTH IN ACI 506R-05.

EXCEPT AS OTHERWISE INDICATED HEREIN, SHOTCRETE SHALL CONFORM TO THE REQUIREMENTS OF ACI 506R-05

SUBMIT MIX DESIGN TO ENGINEER FOR APPROVAL MAXIMUM SLUMP: 2 1/2" NO ADMIXTURES SHALL BE USED WITHOUT THE APPROVAL OF THE ENGINEER.

THE MIXING TIME FOR MATERIALS DELIVERED BY READY-MIX TRUCKS TO THE JOB SITE SHALL NOT EXCEED TWO HOURS OR 250 REVOLUTIONS OF THE DRUM, WHICHEVER COMES FIRST

ALL REINFORCEMENT SHALL BE CLEAN AND FREE FROM LOOSE MILL SCALE, LOOSE RUST, OIL OR OTHER COATING INTERFERING WITH BOND.

THICKNESS AND REINFORCEMENT COVER TOLERANCES: DESIGN CONCRETE THICKNESS AND CONCRETE COVER OVER REINFORCEMENT IS SHOWN ON THE DRAWINGS. MINIMUM TOLERANCES FOR IN-PLACE THICKNESS SHALL BE MINUS 0.5 INCH. MINUS TOLERANCE ON COVER SHALL BE 0.5 INCH.

SPECIAL INSPECTIONS

SPECIAL INSPECTIONS ARE REQUIRED PER CHAPTER 17 OF THE CALIFORNIA BUILDING CODE.
THE TABLES BELOW INDICATE THE POSSIBLE SPECIAL INSPECTIONS REQUIRED.

SPECIAL INSPECTIONS ARE NOT A SUBSTITUTE FOR INSPECTION BY A CITY INSPECTOR. SPECIALLY INSPECTED WORK INSTALLED OR COVERED WITHOUT THE APPROVAL OF THE CITY INSPECTOR IS SUBJECT TO REMOVAL OR EXPOSURE.

THE DEPUTY INSPECTOR MUST BE APPROVED BY RELEVANT AGENCY IN ADVANCE IN ORDER TO PERFORM THE TYPES OF INSPECTION SPECIFIED

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SCHEDULE THE TIME WITH THE DEPUTY INSPECTOR OR INSPECTION AGENCY PRIOR TO PERFORMING ANY WORK THAT REQUIRES SPECIAL INSPECTION.

SPECIAL INSPECTION REPORTS SHALL BE SUBMITTED TO THE BUILDING DIVISION FOR APPROVAL PRIOR TO CITY INSPECTOR APPROVAL OF THAT WORK.

TABLE 1705.2.2
REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]
1. Material verification of cold-formed steel deck:			
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	—	X	Applicable ASTM material standards
b. Manufacturer's certified test reports.	—	X	
2. Inspection of welding:			
a. Cold-formed steel deck:			
1) Floor and roof deck welds.	—	X	AWS D1.3
b. Reinforcing steel:			
1)Verification of weldability of reinforcing steel other than ASTM A 706.	—	X	AWS D1.4 ACI 318: Section 3.5.2
2) Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement.	X	—	
3) Shear reinforcement.	X	—	
4) Other reinforcing steel.	—	X	

For SI: 1 inch = 25.4 mm.
a. Where applicable, see also Section 1705.11, Special inspections for seismic resistance.

TABLE 1705.3
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]	IBC REFERENCE
1. Inspection of reinforcing steel, including prestressing tendons, and placement.	—	X	ACI 318: 3.5, 7.1-7.7	1910.4
2. Inspection of reinforcing steel welding in accordance with Table 1705.2.2, Item 2b.	—	—	AWS D1.4 ACI 318: 3.5.2	—
3. Inspection of anchors cast in concrete where allowable loads have been increased or where strength design is used.	—	X	ACI 318: 8.1.3, 21.2.8	1908.5, 1909.1
4. Inspection of anchors post-installed in hardened concrete members[b].	—	X	ACI 318: 3.8.6, 8.1.3, 21.2.8	1909.1
5. Verifying use of required design mix.	—	X	ACI 318: Ch. 4, 5.2-5.4	1904.2, 1910.2, 1910.3
6. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	—	ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	1910.10
7. Inspection of concrete and shotcrete placement for proper application techniques.	X	—	ACI 318: 5.9, 5.10	1910.6, 1910.7, 1910.8
8. Inspection for maintenance of specified curing temperature and techniques.	—	X	ACI 318: 5.11-5.13	1910.9
9. Inspection of prestressed concrete: a. Application of prestressing forces. b. Grouting of bonded prestressing tendons in the seismic force-resisting system.	X X	—	ACI 318: 18.20 ACI 318: 18.18.4	—
10. Erection of precast concrete members.	—	X	ACI 318: Ch. 16	—
11. Verification of in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.	—	X	ACI 318: 6.2	—
12. Inspect formwork for shape, location and dimensions of the concrete member being formed.	—	X	ACI 318: 6.1.1	—

For SI: 1 inch = 25.4 mm.
a. Where applicable, see also Section 1705.11, Special inspections for seismic resistance.
b. Specific requirements for special inspection shall be included in the research report for the anchor issued by an approved source in accordance with ACI 355.2 or other qualification procedures. Where specific requirements are not provided, special inspection requirements shall be specified by the registered design professional and shall be approved by the building official prior to the commencement of the work.

TABLE 1705.6
REQUIRED VERIFICATION AND INSPECTION OF SOILS

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
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. Perform classification and testing of compacted fill materials.	—	X
4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.	X	—
5. Prior to placement of compacted fill, observe subgrade and verify that site has been prepared properly.	—	X

TABLE 1705.7
REQUIRED VERIFICATION AND INSPECTION OF DRIVEN DEEP FOUNDATION ELEMENTS

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. Verify element materials, sizes and lengths comply with the requirements.	X	—
2. Determine capacities of test elements and conduct additional load tests, as required.	X	—
3. Observe driving operations and maintain complete and accurate records for each element.	X	—
4. Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any damage to foundation element.	X	—
5. For steel elements, perform additional inspections in accordance with Section 1705.2.	—	—
6. For concrete elements and concrete-filled elements, perform additional inspections in accordance with Section 1705.3.	—	—
7. For specialty elements, perform additional inspections as determined by the registered design professional in responsible charge.	—	—

TABLE 1705.8
REQUIRED VERIFICATION AND INSPECTION OF CAST-IN-PLACE DEEP FOUNDATION ELEMENTS

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. Observe drilling operations and maintain complete and accurate records for each element.	X	—
2. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end-bearing strata capacity. Record concrete or grout volumes.	X	—
3. For concrete elements, perform additional inspections in accordance with Section 1705.3.	—	—

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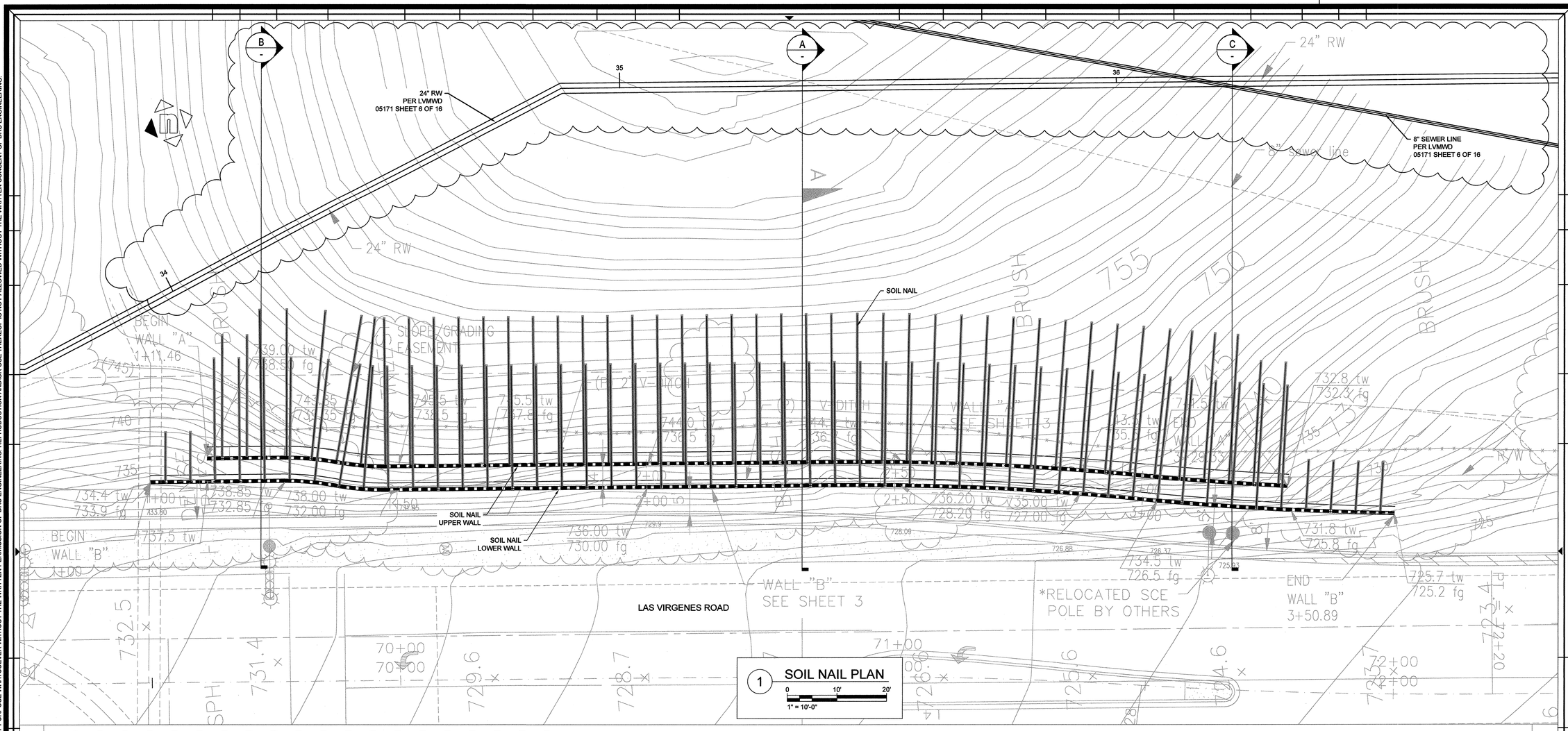
PERMANENT SOIL NAIL WALLS
NOTES

REV.	DESCRIPTION	DATE
1	Plan Check Corrections	03.19.15

PROJECT No. 2015-06

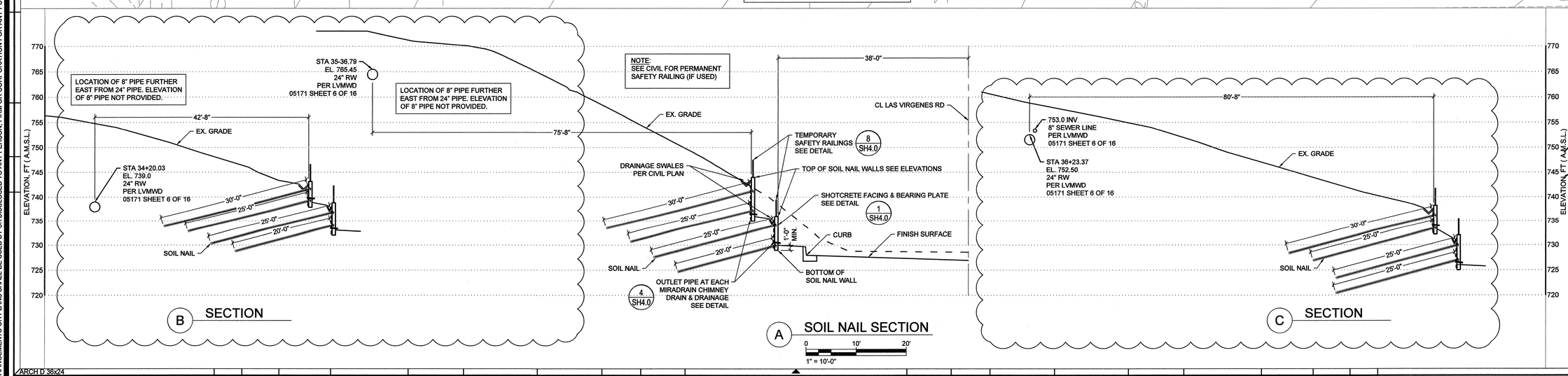
DATE	02-24-2015
DRAWN	DRS - ODO
CHECKED	DRS
SCALE	AS SHOWN

SHEET No. SH-1.1



1 SOIL NAIL PLAN

0 10' 20'
1" = 10'-0"



B SECTION

A SOIL NAIL SECTION

0 10' 20'
1" = 10'-0"

C SECTION

ARCH D 36x24

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PERMANENT SOIL NAIL WALLS

PLAN

REGISTERED PROFESSIONAL ENGINEER
DAVID R. SALTER
C 69411
Exp. 9.30.16
CIVIL
STATE OF CALIFORNIA
3/19/2015

REV.	DESCRIPTION	DATE
1	Plan Check Corrections	03.19.15

PROJECT No. 2015-06

DATE	02-24-2015
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CHECKED	DRS
SCALE	AS SHOWN
SHEET No.	SH-2.0

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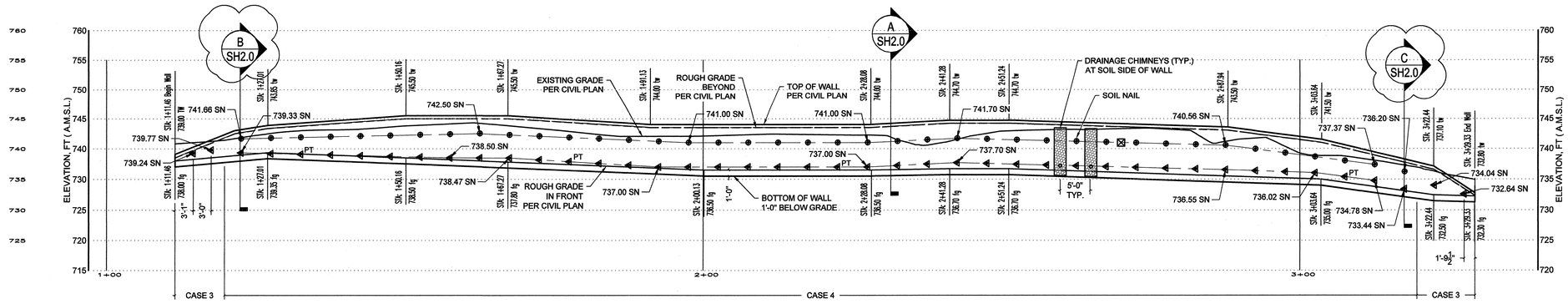
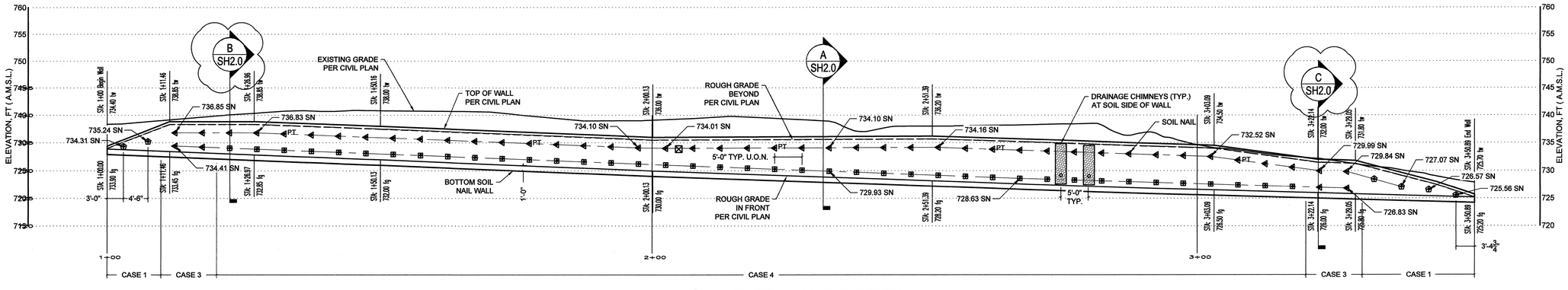


A UPPER WALL ELEVATION

1" = 10'-0"

LEGEND :

tw = TOP OF WALL
fg = FINISH GRADE
SN = SOIL NAIL
#7 GR 75, L = 10 FT LONG. @ 15°
#7 GR 75, L = 15 FT LONG. @ 15°
#7 GR 75, L = 20 FT LONG. @ 15°
#7 GR 75, L = 25 FT LONG. @ 15°
#7 GR 75, L = 30 FT LONG. @ 15°
PT PROOF TEST NAILS
VERIFICATION TEST NAILS



B LOWER WALL ELEVATION

1" = 10'-0"

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PERMANENT SOIL NAIL WALLS

PLAN

REGISTERED PROFESSIONAL ENGINEER DAVID R. SALTER C 60411 Exp. 9.30.16 CIVIL STATE OF CALIFORNIA 3/19/2015

REV.	DESCRIPTION	DATE
1	Plan Check Corrections	03.19.15

PROJECT No. 2015-06

DATE	02-24-2015
DRAWN	DRS - ODO
CHECKED	DRS
SCALE	AS SHOWN

SHEET No. SH-3.0

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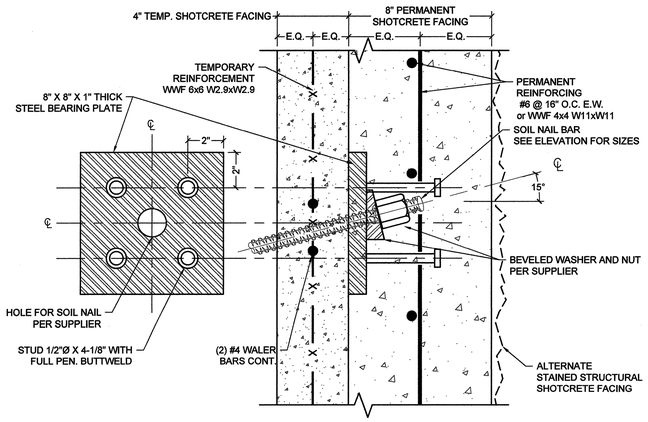
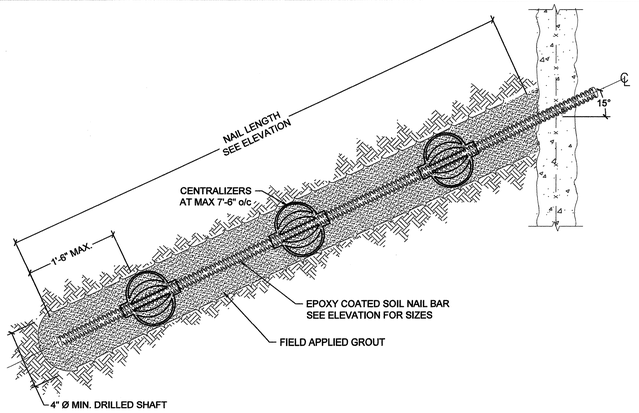


1 PERMANENT SOIL NAIL FACING & BEARING PLATE
Scale: N.T.S.



2 PERMANENT SOIL NAIL EPOXY COATED
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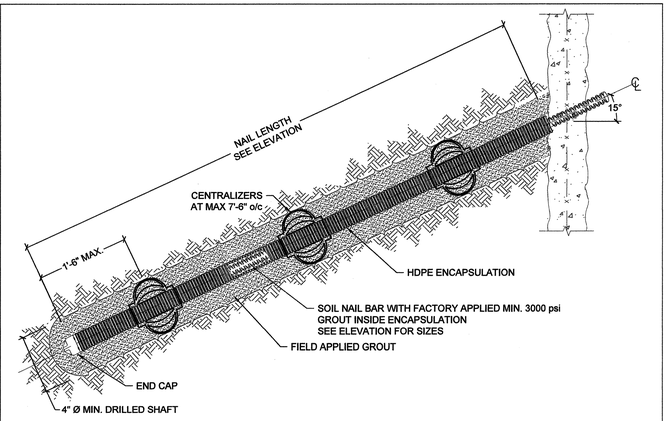

3 PERMANENT SOIL NAIL HDPE ENCAPSULATED (ALTERNATE)
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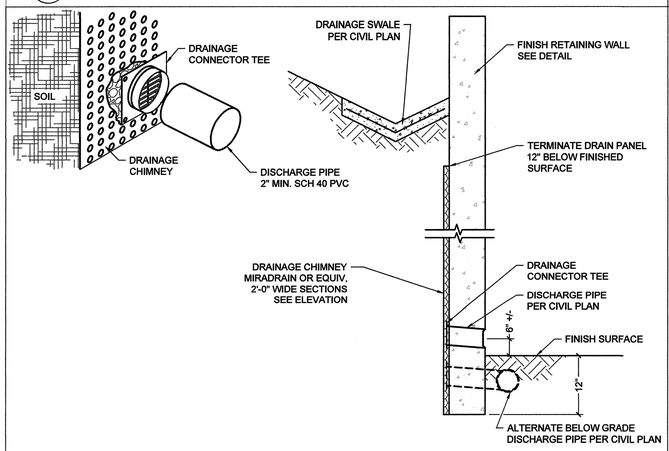
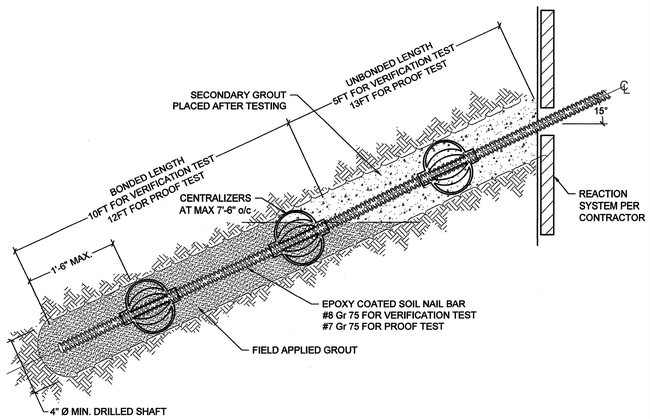
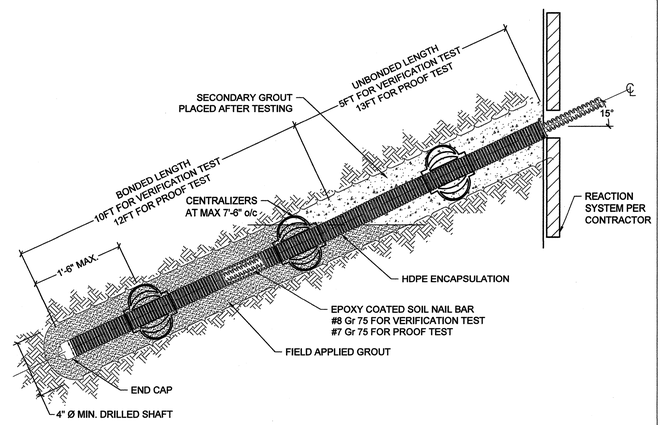


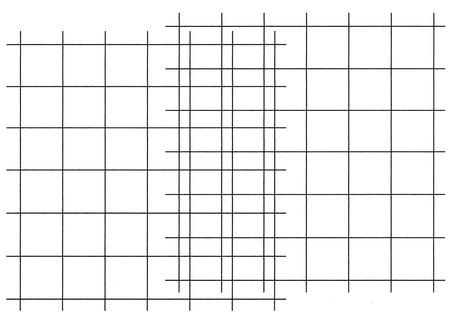
4 PERMANENT SOIL NAIL WALL DRAINAGE
Scale: N.T.S.



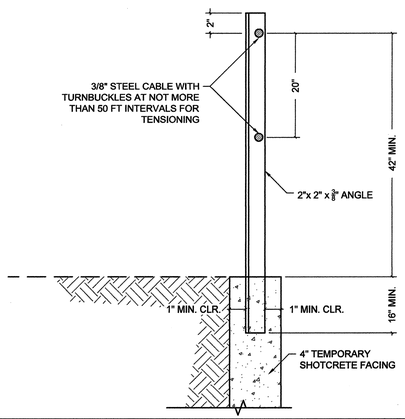
5 VERIFICATION & PROOF TEST SOIL NAIL EPOXY COATED
Scale: N.T.S.



6 VERIFICATION & PROOF TEST SOIL NAIL HDPE ENCAPSULATED (ALTERNATE)
Scale: N.T.S.



7 WWF SPLICE DETAIL
Scale: N.T.S.



NOTE:
ALTERNATIVE SAFETY RAIL DETAIL THAT MEET MINIMUM OSHA STANDARDS MAY BE USED WITH APPROVAL OF THE EARTH RETENTION DESIGNER.

8 TEMPORARY SAFETY RAIL ON SOIL NAIL WALL
Scale: N.T.S.

ARCH D 36x24

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PROJECT NAME
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CA 91302
TEL: (818) 225-8305

PERMANENT SOIL NAIL WALLS DETAILS

REGISTERED PROFESSIONAL ENGINEER
DAVID R. SILVER
No. C 60411
Exp. 9.30.16
CIVIL
STATE OF CALIFORNIA
3/19/2015

REV.	DESCRIPTION	DATE
1	Plan Check Corrections	03.19.15

PROJECT No. 2015-06

DATE	02-24-2015
DRAWN	DRS - ODO
CHECKED	DRS
SCALE	AS SHOWN
SHEET No.	SH-4.0