COUNTY OF SANTA CLARA
General Construction Specifications

GENERAL CONDITIONS

1. ALL CONSTRUCTION WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE SOILS AND/OR GEOTECHNICAL STUDY PREPARED BY C2EARTH AND DATED FEBRUARY 22, 2021. THIS REPORT IS SUPPLEMENTED BY: 1) THESE PLANS AND SPECIFICATIONS, 2) THE COUNTY OF SANTA CLARA STANDARD DETAILS. 3) THE COUNTY OF SANTA CLARA STANDARD SPECS, 4) STATE OF CALIFORNIA STANDARD DETAILS, 5) STATE OF CALIFORNIA STANDARD SPECIFICATIONS. IN THE EVENT OF CONFLICT THE FORMER SHALL TAKE PRECEDENCE OVER THE LATTER. THE PERFORMANCE AND COMPLETION OF ALL WORK MUST BE TO THE SATISFACTION OF THE COUNTY.
2. DEVELOPER IS RESPONSIBLE FOR INSTALLATION OF THE IMPROVEMENTS SHOWN ON THESE PLANS AND HE OR HIS SUCCESSOR PROPERTY OWNERS ARE RESPONSIBLE FOR THEIR CONTINUED MAINTENANCE.
3. DEVELOPER SHALL BE RESPONSIBLE FOR CORRECTION OF ANY ERRORS OR OMISSIONS IN THESE PLANS. THE COUNTY SHALL BE AUTHORIZED TO REQUIRE DISCONTINUANCE OF ANY WORK AND SUCH CORRECTION AND MODIFICATION OF PLANS AS MAY BE NECESSARY TO COMPLY WITH COUNTY STANDARDS OR CONDITIONS OF DEVELOPMENT APPROVAL.
4. DEVELOPER SHALL OBTAIN ENCROACHMENT PERMITS FROM THE SANTA CLARA VALLEY WATER DISTRICT AND CALIFORNIA DEPARTMENT OF TRANSPORTATION WHERE NEEDED. COPIES OF THESE PERMITS SHALL BE KEPT AT THE JOB SITE FOR REVIEW BY THE COUNTY'S INSPECTOR.
5. DEVELOPER SHALL REMOVE OR TRIM ALL TREES TO PROVIDE AN UNOBSTRUCTED FIFTEEN (15) FOOT VERTICAL CLEARANCE FOR ROADWAY AREA.
6. THIS PLAN AUTHORIZES THE REMOVAL OF ONLY THOSE TREES WITH TRUNK DIAMETERS GREATER THAN 12 INCHES MEASURED 4.5 FEET ABOVE THE GROUND THAT ARE SHOWN TO BE REMOVED UNLESS AN AMENDED PLAN IS APPROVED OR A SEPARATE TREE REMOVAL PERMIT IS OBTAINED FROM THE PLANNING OFFICE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT REMOVAL OF ADDITIONAL TREES HAS BEEN PERMITTED.
7. DEVELOPER SHALL PROVIDE ADEQUATE DUST CONTROL AS REQUIRED BY THE COUNTY INSPECTOR.
8. ALL PERSONS MUST COMPLY WITH SECTION 4442 OF THE PUBLIC RESOURCES CODE AND SECTION 13005 OF THE HEALTH AND SAFETY CODE RELATING TO THE USE OF SPARK ARRESTERS.
9. UPON DISCOVERING OR UNEARTHING ANY BURIAL SITE AS EVIDENCED BY HUMAN SKELETAL REMAINS OR ARTIFACTS, THE PERSON MAKING SUCH DISCOVERY SHALL IMMEDIATELY NOTIFY THE COUNTY CORONER AT (4008) 454-2520 AND LAND DEVELOPMENT ENGINEERING OFFICE AT (408) 299-5730. NO FURTHER DISTURBANCE OF THE SITE MAY BE MADE EXCEPT AS AUTHORIZED BY THE LAND DEVELOPMENT OFFICE IN ACCORD WITH PROVISIONS OF THIS ORDINANCE (COUNTY ORDINANCE CODE SECTION B6-18).
10. THESE PLANS ARE FOR THE WORK DESCRIBED IN THE SCOPE OF WORK ONLY. A SEPARATE PERMIT WILL BE REQUIRED FOR THE SEPTIC LINE CONSTRUCTION.
11. ANY DEVIATION FROM THESE APPROVED PLANS SHALL BE RE-APPROVED IN WRITING BY THE COUNTY ENGINEER PRIOR TO CONSTRUCTION.

CONSTRUCTION STAKING

1. THE DEVELOPER'S ENGINEER IS RESPONSIBLE FOR THE INITIAL PLACEMENT AND REPLACEMENT OF CONSTRUCTION GRADE STAKES. THE STAKES ARE TO BE ADEQUATELY IDENTIFIED, LOCATED, STABILIZED, ETC. FOR THE CONVENIENCE OF CONTRACTORS. LATERAL OFFSET OF STAKES SET FOR CURBS AND GUTTERS SHALL NOT EXCEED 2 1/2 FEET FROM BACK OF CURB.
2. ANY PROPERTY LINE STAKES OR ROAD MONUMENTS DISTURBED DURING CONSTRUCTION SHALL BE REPLACED BY DEVELOPER'S ENGINEER AND LICENSED LAND SURVEYOR.
3. PROPERTY LINE STAKING MUST BE PERFORMED BY THE PROJECT ENGINEER OR LAND SURVEYOR TO ESTABLISH OR RE-ESTABLISH THE PROJECT BOUNDARY AND SHALL BE INSPECTED BY THE COUNTY INSPECTOR PRIOR TO THE BEGINNING OF THE WORK.
4. PROPER CONSTRUCTION STAKES SHALL BE SET IN THE FIELD BY THE PROJECT ENGINEER OR LAND SURVEYOR AND VERIFIED BY THE COUNTY INSPECTOR PRIOR TO THE COMMENCEMENT OF GRADING.

CONSTRUCTION INSPECTION

1. CONTRACTOR SHALL NOTIFY PERMIT INSPECTION UNIT, SANTA CLARA COUNTY PRIOR TO COMMENCING WORK AND FOR FINAL INSPECTION OF WORK AND SITE.
2. THE COUNTY REQUIRES A MINIMUM OF 24 HOURS ADVANCE NOTICE FOR GENERAL INSPECTION, 48 HOURS FOR ASPHALT CONCRETE INSPECTION.
3. INSPECTION BY SANTA CLARA COUNTY SHALL BE LIMITED TO INSPECTION OF MATERIALS AND PROCESSES OF CONSTRUCTION TO OBSERVE THEIR COMPLIANCE WITH PLANS & SPECIFICATIONS BUT DOES NOT INCLUDE RESPONSIBILITY FOR THE SUPERINTENDENT OF CONSTRUCTION, SITE CONDITIONS, EQUIPMENT OR PERSONNEL. CONTRACTOR SHALL NOTIFY THE COUNTY LAND DEVELOPMENT INSPECTOR AT PHONE (408) 299-6868 AT LEAST 24 HOURS PRIOR TO COMMENCING WORK AND FOR FINAL INSPECTION OF WORK AND SITE.
4. DEVELOPER AND/OR HIS AUTHORIZED REPRESENTATIVE MUST SUBMIT WRITTEN REQUEST FOR FINAL INSPECTION AND ACCEPTANCE. SAID REQUEST SHALL BE DIRECTED TO THE INSPECTION OFFICE NOTED ON THE PERMIT FORM.
5. THE CONTRACTOR SHALL PROVIDE TO THE COUNTY CONSTRUCTION INSPECTOR WITH PAD ELEVATION AND LOCATION CERTIFICATES, PREPARED BY THE PROJECT ENGINEER OR LAND SURVEYOR, PRIOR TO COMMENCEMENT OF THE BUILDING FOUNDATION.

SITE PREPARATION (CLEARING AND GRUBBING)

1. EXISTING TREES AUTHORIZED FOR REMOVAL, ROOTS, AND FOREIGN MATERIAL IN AREAS TO BE IMPROVED WILL BE REMOVED TO AN AUTHORIZED DISPOSAL SITE AS FOLLOWS:
   A) TO A MINIMUM DEPTH OF TWO FEET BELOW THE FINISHED GRADE OF PROPOSED ROADWAYS (EITHER PRIVATE OR TO BE DEDICATED TO PUBLIC USE)
   B) FROM AREAS AFFECTED BY THE PROPOSED GRADING EXCEPT WHERE NOTED ON THE PLANS.
2. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER TO MOVE OR RELOCATE UTILITY POLES AND OTHER OBSTRUCTIONS IN THE WAY OF CONSTRUCTION.

UTILITY LOCATION, TRENCHING & BACKFILL

1. CONTRACTOR SHALL NOTIFY USA (UNDERGROUND SERVICE ALERT) AT 1-800-277-2600 A MINIMUM OF 24 HOURS BEFORE BEGINNING UNDERGROUND WORK FOR VERIFICATION OF THE LOCATION OF UNDERGROUND UTILITIES.
2. ACCURATE VERIFICATION AS TO SIZE, LOCATION, AND DEPTH OF EXISTING UNDERGROUND CONDUITS OR FACILITIES SHALL BE THE INDIVIDUAL CONTRACTORS RESPONSIBILITY. PLAN LOCATIONS ARE APPROXIMATE AND FOR GENERAL INFORMATION ONLY.
3. ALL UNDERGROUND INSTALLATIONS SHALL BE IN PLACE AND THE TRENCH BACKFILLED AND COMPACTED BEFORE PLACING AGGREGATE BASE MATERIAL OR SURFACE STRUCTURES. SURFACING MAY BE DONE IF THE UTILITY COMPANY CONCERNED INDICATES BY LETTER THAT IT WILL BORE. UNLESS SPECIFICALLY AUTHORIZED BY THE COUNTY, GAS AND WATER MAINS SHALL BE INSTALLED OUTSIDE THE PAVED AREAS.
4. TRENCH BACKFILL IN EXISTING PAVEMENT AREAS SHALL BE SAND MATERIAL IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF THE STATE SPECIFICATIONS. THE STRUCTURAL SECTION FOR TRENCH REPLACEMENT SHALL CONSIST OF NOT LESS THAN 12 INCHES OF APPROVED AGGREGATE BASE MATERIAL COMPACTED TO A RELATIVE COMPACTION OF AT LEAST 95% AND 4 INCHES OF HOT ASPHALT CONCRETE PLACED IN TWO LIFTS. TRENCH RESTORATION FOR HIGHER TYPE PAVEMENTS SHALL BE MADE IN KIND OR AS DIRECTED BY THE COUNTY.
5. TRENCH BACKFILL IN NEW CONSTRUCTION AREAS SHALL BE SAND MATERIAL COMPACTED TO A RELATIVE COMPACTION OF AT LEAST 90%. THE REQUIREMENT FOR SELECT MATERIAL MAY BE WAIVED BY COUNTY IF THE NATIVE SOIL IS SUITABLE FOR USE AS TRENCH BACKFILL BUT THE COMPACTION REQUIREMENTS WILL NOT BE THEREBY WAIVED.
6. BACKFILL AND TRENCH RESTORATION REQUIREMENTS SHALL APPLY AS MINIMUM STANDARDS TO ALL UNDERGROUND FACILITIES INSTALLED BY OTHER FIRMS OR PUBLIC AGENCIES.

RETAINING WALLS

1. REINFORCED CONCRETE AND CONCRETE MASONRY UNIT RETAINING WALLS SHALL HAVE FOUNDATION AND REINFORCEMENT INSPECTED BY THE COUNTY ENGINEERING INSPECTOR AND ENGINEER OF RECORD PRIOR TO POURING THE FOUNDATION AND FORMING THE WALL.
2. SEGMENTAL BLOCK RETAINING WALLS SHALL HAVE FOUNDATION AND REINFORCEMENT INSPECTED BY THE COUNTY ENGINEERING INSPECTOR.

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GRADING

1. EXCAVATED MATERIAL SHALL BE PLACED IN THE FILL AREAS DESIGNATED OR SHALL BE HAULED AWAY FROM THE SITE TO A COUNTY APPROVED DISPOSAL SITE. WHERE FILL MATERIAL IS TO BE PLACED ON NATURAL GROUND, IS SHALL BE STRIPPED OF ALL VEGETATION. TO ACHIEVE A PROPER BOND WITH THE FILL MATERIAL, THE SURFACE OF THE GROUND SHALL BE SCARIFIED TO DEPTH OF 6" BEFORE FILL IS PLACED. WHERE NATURAL GROUND IS STEEPER THAN 5:1, IT SHALL BE BENCHED AND THE FILL KEYED IN TO ACHIEVE STABILITY. WHERE NEW FILL IS TO BE PLACED ON EXISTING FILL THE EXISTING FILL SHALL BE REMOVED UNTIL MATERIAL COMPACTED TO 90% RELATIVE COMPACTION IS EXPOSED. THEN THE NEW FILL MATERIAL SHALL BE PLACED AS PER THESE CONSTRUCTION NOTES. FILL MATERIAL SHALL BE PLACED IN UNIFORM LIFTS NOT EXCEEDING 6" IN UNCOMPACTED THICKNESS. BEFORE COMPACTION BEGINS, THE FILL SHALL BE BROUGHT TO A WATER CONTENT THAT WILL PERMIT PROPER COMPACTION BY EITHER 1) AERATING THE FILL IF IT IS TOO WET OR 2) MOISTENING THE FILL WITH WATER IF IT IS TOO DRY. EACH LIFT SHALL BE THOROUGHLY MIXED BEFORE COMPACTION TO ENSURE A UNIFORM DISTRIBUTION OF MOISTURE.
2. EXCESS CUT MATERIAL SHALL NOT BE SPREAD OR STOCKPILED ON THE SITE.
3. SURPLUS EARTH FILL MATERIAL SHALL BE PLACED IN A SINGLE (8" MAX) THICK LAYER COMPACTED TO WITHSTAND WEATHERING IN THE AREA(S) DELINEATED ON THE PLAN.
4. NO ORGANIC MATERIAL SHALL BE PLACED IN ANY FILL. NO TREES SHALL BE REMOVED OUTSIDE OF CUT, FILL OR ROADWAY AREAS.
5. THE UPPER 6" OF SUBGRADE BELOW DRIVEWAY ACCESS ROAD OR PARKING AREA SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY.
6. MAXIMUM CUT SLOPE SHALL BE 2 HORIZONTAL TO 1 VERTICAL. MAXIMUM FILL SLOPE SHALL BE 2 HORIZONTAL TO 1 VERTICAL.

LOCATION	CUT (C.Y.)	FILL (C.Y.)	VERT. DEPTH
STORAGE BUILDING			
SECONDARY DWELLING UNIT	100	70	2.0 FILL
HARDSCAPE			
LANDSCAPE			
DRIVEWAY/TURNOUTS	550	80	6.0 CUT
UTILITY IMPROVEMENTS	120	120	
TOTAL	770	270	

NOTE: FILL VOLUMES INCLUDE 10% SHRINKAGE.

EXCESSIVE DIRT/MATERIAL SHALL BE REMOVED AND HAULED TO A COUNTY APPROVED DISPOSAL SITE.

7. NOTIFY SOILS ENGINEER TWO (2) DAYS PRIOR TO COMMENCEMENT OF ANY GRADING WORK TO COORDINATE THE WORK IN THE FIELD.
8. ALL MATERIALS FOR FILL SHOULD BE APPROVED BY THE SOILS ENGINEER BEFORE IT IS BROUGHT TO THE SITE.
9. THE UPPER 6" OF THE SUBGRADE SOIL SHALL BE SCARIFIED, MOISTURE CONDITIONED AND COMPACTED TO A MINIMUM RELATIVE COMPACTION OF 95%
10. ALL AGGREGATE BASE MATERIAL SHALL BE COMPACTED TO A MINIMUM 95% RELATIVE COMPACTION.
11. THE GEOTECHNICAL PLAN REVIEW LETTER MUST BE REVIEWED AND APPROVED BY THE COUNTY GEOLOGIST PRIOR TO FINAL APPROVAL BY THE COUNTY ENGINEER FOR BUILDING OCCUPANCY.
12. THE PROJECT GEOTECHNICAL ENGINEER SHALL PERFORM COMPACTION TESTING AND PRESENT THE RESULTS TO THE COUNTY ENGINEERING INSPECTOR PRIOR TO THE CONSTRUCTION OF ANY PAVED AREA.
13. GRADING WORK BETWEEN OCTOBER 15TH AND APRIL 15TH IS AT THE DISCRETION OF THE SANTA CLARA COUNTY GRADING OFFICIAL.
14. TOTAL DISTURBED AREA FOR THE PROJECT 15,000 SF.
15. WDID NO. n/a.
16. ~~THE INSPECTOR MAY VERIFY THAT A VALID NOTICE OF INTENT (NOI) HAS BEEN ISSUED BY THE STATE AND THAT A CURRENT AND UP TO DATE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IS AVAILABLE ON SITE.~~

TREE PROTECTION

1. FOR ALL TREES TO BE RETAINED WITH A CANOPY IN THE DEVELOPMENT AREA OR INTERFACES WITH THE LIMITS OF GRADING FOR ALL PROPOSED DEVELOPMENT ON SITE, THE TREES SHALL BE PROTECTED BY THE PLACEMENT OF RIGID TREE PROTECTIVE FENCING, CONSISTENT WITH THE COUNTY INTEGRATED LANDSCAPE GUIDELINES, AND INCLUDE THE FOLLOWING:
   A. FENCING SHOULD BE PLACED ALONG THE OUTSIDE EDGE OF THE DRIPLINE OF THE TREE OR GROVE OF TREES.
   B. THE FENCING SHALL BE MAINTAINED THROUGHOUT THE SITE CONSTRUCTION PERIOD AND SHALL BE INSPECTED PERIODICALLY FOR DAMAGE AND PROPER FUNCTION.
   C. FENCING SHALL BE REPAIRED, AS NECESSARY, TO PROVIDE A PHYSICAL BARRIER FROM CONSTRUCTION ACTIVITIES.
   D. SIGNAGE STATING, "WARNING– THIS FENCING SHALL NOT BE REMOVED WITHOUT PERMISSION FROM THE SANTA CLARA COUNTY PLANNING OFFICE (408) 299-5770. COUNTY OF SANTA CLARA TREE PROTECTION MEASURES MAY BE FOUND AT http://www.sccplanning.gov." SHALL BE PLACED ON THE TREE PROTECTIVE FENCING UNTIL FINAL OCCUPANCY.
2. PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ACTIVITY, TREE PROTECTIVE FENCING SHALL BE SECURELY IN PLACED AND INSPECTED BY THE LAND DEVELOPMENT ENGINEERING INSPECTOR.
3. SEE EXISTING TREE PROTECTION DETAILS FOR MORE INFORMATION.

ACCESS ROADS AND DRIVEWAYS

1. DRIVEWAY LOCATIONS SHALL BE AS SHOWN ON THE IMPROVEMENT PLANS WITH CENTERLINE STATIONING. THE MINIMUM CONCRETE THICKNESS SHALL BE 6 INCHES THROUGHOUT (WITH A MAXIMUM APPROACH SLOPE OF 1 1/4 INCHES PER FOOT).
2. ALL DRIVEWAY OR COMMON ACCESS ROAD SECTIONS IN EXCESS OF 15 LONGITUDINAL SLOPE MUST BE PAVED WITH A MINIMUM 2-INCH ASPHALT LIFT OR FULL DEPTH CONCRETE LIFT PRIOR TO ANY COMBUSTIBLE FRAMING.
3. THE OWNER AND PRIME CONTRACTOR ARE RESPONSIBLE FOR MAINTAINING PROJECT SITE ACCESS AND NEIGHBORHOOD ACCESS FOR EMERGENCY VEHICLES AND LOCAL RESIDENTS.
4. ROADWAYS DESIGNATED AS NOT COUNTY MAINTAINED ROADS AS SHOWN ON THE PLAN WILL NOT BE ELIGIBLE FOR COUNTY MAINTENANCE UNTIL THE ROADWAYS ARE IMPROVED (AT NO COST TO THE COUNTY) TO THE PUBLIC MAINTENANCE ROAD STANDARDS APPROVED BY THE BOARD OF SUPERVISORS AND IN EFFECT AT SUCH TIME THAT THE ROADWAYS ARE CONSIDERED FOR ACCEPTANCE INTO THE COUNTY'S ROAD SYSTEM.
5. ALL WORK IN THE COUNTY ROAD RIGHT-OF-WAY REQUIRES AN ENCROACHMENT PERMIT FROM THE ROADS AND AIRPORTS DEPARTMENT. EACH INDIVIDUAL ACTIVITY REQUIRES A SEPARATE PERMIT – I.E. CABLE, ELECTRICAL, GAS, SEWER, WATER, RETAINING WALLS, DRIVEWAY APPROACHES, FENCES, LANDSCAPING, TREE REMOVAL, STORM DRAINAGE IMPROVEMENTS, ETC..

STREET LIGHTING

1. PACIFIC GAS & ELECTRIC ELECTROLIER SERVICE FEE SHALL BE PAID BY THE DEVELOPER AND/OR HIS AUTHORIZED REPRESENTATIVE.

SANITARY SEWER

1. THE SANITARY SEWER AND WATER UTILITIES SHOWN ON THESE PLANS ARE NOT PART OF THIS GRADING PERMIT AND ARE SHOWN FOR REFERENCE ONLY.
2. ALL MATERIALS AND METHODS OF CONSTRUCTION OF SANITARY SEWERS SHALL CONFORM TO THE SPECIFICATIONS OF THE JURISDICTION INVOLVED. INSPECTION OF SANITARY SEWER WORK SHALL BE DONE BY SAID JURISDICTION.

PORTLAND CEMENT CONCRETE

1. CONCRETE USED FOR STRUCTURAL PURPOSES SHALL BE CLASS "A" (6 SACK PER CUBIC YARD) AS SPECIFIED IN THE STATE STANDARD SPECIFICATIONS. CONCRETE PLACED MUST DEVELOP A MINIMUM STRENGTH FACTOR OF 2800 PSI IN A SEVEN-DAY PERIOD. THE CONCRETE MIX DESIGN SHALL BE UNDER THE CONTINUAL CONTROL OF THE COUNTY INSPECTOR.

AIR QUALITY, LANDSCAPING AND EROSION CONTROL

1. WATER ALL ACTIVE CONSTRUCTION AREAS AT LEAST TWICE DAILY.
2. COVER ALL TRUCKS HAULING SOIL, SAND, AND OTHER LOOSE MATERIALS OR REQUIRE ALL TRUCKS TO MAINTAIN AT LEAST TWO FEET OF FREEBOARD.
3. PAVE, APPLY WATER THREE TIMES DAILY, OR APPLY (NON-TOXIC) SOIL STABILIZERS ON ALL UNPAVED ACCESS ROADS, PARKING AREAS AND STAGING AREAS AT CONSTRUCTION SITES.
4. SWEEP DAILY (WITH WATER SWEEPERS) ALL PAVED ACCESS ROADS, PARKING AREAS AND STAGING AREAS AT CONSTRUCTION SITES. THE USE OF DRY POWDER SWEEPING IS PROHIBITED.
5. SWEEP STREETS DAILY (WITH WATER SWEEPERS) IF VISIBLE SOIL MATERIAL IS CARRIED ONTO ADJACENT PUBLIC STREETS. THE USE OF DRY POWDER SWEEPING IS PROHIBITED.
6. ALL CONSTRUCTION VEHICLES, EQUIPMENT AND DELIVERY TRUCKS SHALL HAVE A MAXIMUM IDLING TIME OF 5 MINUTES (AS REQUIRED BY THE CALIFORNIA AIRBORNE TOXIC CONTROL MEASURE TITLE 13, SECTION 2485 OF CALIFORNIA CODE OF REGULATIONS (CCR)). ENGINES SHALL BE SHUT OFF IF CONSTRUCTION REQUIRES LONGER IDLING TIME UNLESS NECESSARY FOR PROPER OPERATION OF THE VEHICLE.
7. ALL VEHICLE SPEEDS ON UNPAVED ROADS SHALL BE LIMITED TO 15 MILES PER HOUR.
8. ALL CONSTRUCTION EQUIPMENT SHALL BE MAINTAINED AND PROPERLY TUNED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. ALL EQUIPMENT SHALL BE CHECKED BY A CERTIFIED MECHANIC AND DETERMINED TO BE RUNNING IN PROPER CONDITION PRIOR TO OPERATION.
9. POST A SIGN THAT IS AT LEAST 32 SQUARE FEET MINIMUM 2 INCHES LETTER HEIGHT VISIBLE NEAR THE ENTRANCE OF CONSTRUCTION SITE THAT IDENTIFIES THE FOLLOWING REQUIREMENTS. OBTAIN ENCROACHMENT PERMIT FOR SIGN FROM ROADS DEPARTMENT OR OTHER APPLICABLE AGENCY IF REQUIRED.
   A. 15 MILES PER HOUR (MPH) SPEED LIMIT
   B. 5 MINUTES MAXIMUM IDLING TIME OF VEHICLES
   C. TELEPHONE NUMBER TO CONTACT THE BAY AREA AIR QUALITY MANAGEMENT DISTRICT REGARDING DUST COMPLAINTS. NOTE PHONE NUMBER OF THE BAY AREA AIR QUALITY MANAGEMENT DISTRICT AIR POLLUTION COMPLAIN HOTLINE OF 1-800-334-6367.
10. ALL FILL SLOPES SHALL BE COMPACTED AND LEFT IN A SMOOTH AND FIRM CONDITION CAPABLE OF WITHSTANDING WEATHERING.
11. ALL EXPOSED DISTURBED AREAS SHALL BE SEEDED WITH BROME SEED SPREAD AT THE RATE OF 5 LB. PER 1000 SQUARE FEET (OR APPROVED EQUAL). SEEDING AND WATERING SHALL BE MAINTAINED AS REQUIRED TO ENSURE GROWTH.
12. ALL DITCHES SHALL BE LINED PER COUNTY STANDARD SD8.
13. ALL STORM DRAINAGE STRUCTURES SHALL BE INSTALLED WITH EFFECTIVE ENTRANCE & OUTFALL EROSION CONTROLS E.G. SACKED CONCRETE RIP-RAP. ENERGY DISSIPATERS SHALL BE INSTALLED AT ALL DITCH OUTFALLS. WHERE OUTFALLS ARE NOT INTO AN EXISTING CREEK OR WATER COURSE, RUNOFF SHALL BE RELEASED TO SHEET FLOW.
14. PRIOR TO GRADING COMPLETION AND RELEASE OF THE BOND, ALL GRADED AREAS SHALL BE RESEEDED IN CONFORMANCE WITH THE COUNTY GRADING ORDINANCE TO MINIMIZE THE VISUAL IMPACTS OF THE GRADE SLOPES AND REDUCE THE POTENTIAL FOR EROSION OF THE SUBJECT SITE.
15. PERMANENT LANDSCAPING SHOWN ON THE ATTACHED LANDSCAPE PLAN MUST BE INSTALLED AND FIELD APPROVED BY THE COUNTY PLANNING OFFICE PRIOR TO FINAL APPROVAL BY THE COUNTY ENGINEER, AND FINAL OCCUPANCY RELEASE BY THE BUILDING INSPECTION OFFICE.
16. THE OWNER SHALL PREPARE AND PRESENT A WINTERIZATION REPORT TO THE COUNTY INSPECTOR FOR REVIEW PRIOR TO OCTOBER 15TH OF EVERY YEAR.
17. THE OWNER, CONTRACTOR, AND ANY PERSON PERFORMING CONSTRUCTION ACTIVITIES SHALL INSTALL AND MAINTAIN CONSTRUCTION BEST MANAGEMENT PRACTICES (BMPS) ON THE PROJECT SITE AND WITHIN THE SANTA CLARA COUNTY ROAD RIGHT-OF-WAY THROUGHOUT THE DURATION OF THE CONSTRUCTION AND UNTIL THE ESTABLISHMENT OF PERMANENT STABILIZATION AND SEDIMENT CONTROL TO PREVENT THE DISCHARGE OF POLLUTANTS INCLUDING SEDIMENT, CONSTRUCTION MATERIALS, EXCAVATED MATERIALS, AND WASTE INTO THE SANTA CLARA COUNTY RIGHT-OF-WAY, STORM SEWER WATERWAYS, ROADWAY INFRASTRUCTURE. BMPS SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING;
   A. PREVENTION OF POLLUTANTS IN STORM WATER DISCHARGES FROM THE CONSTRUCTION SITE AND THE CONTRACTOR'S MATERIAL AND EQUIPMENT LAYDOWN / STAGING AREAS.
   B. PREVENTION OF TRACKING OF MUD, DIRT, AND CONSTRUCTION MATERIALS ONTO THE PUBLIC ROAD RIGHT-OF-WAY.
   C. PREVENTION OF DISCHARGE OF WATER RUN-OFF DURING DRY AND WET WEATHER CONDITIONS ONTO THE PUBLIC ROAD RIGHT-OF-WAY.
18. THE OWNER, CONTRACTOR, AND ANY PERSON PERFORMING CONSTRUCTION ACTIVITIES SHALL ENSURE THAT ALL TEMPORARY CONSTRUCTION FACILITIES, INCLUDING BUT NOT LIMITED TO CONSTRUCTION MATERIALS, DELIVERIES, HAZARDOUS AND NON-HAZARDOUS MATERIAL STORAGE, EQUIPMENT, TOOLS, PORTABLE TOILETS, CONCRETE WASHOUT, GARBAGE CONTAINERS, LAYDOWN YARDS, SECONDARY CONTAINMENT AREAS, ETC. ARE LOCATED OUTSIDE THE SANTA CLARA COUNTY ROAD RIGHT-OF-WAY.
19. EROSION CONTROL PLAN IS A GUIDE AND SHALL BE AMENDED AS NECESSARY TO PREVENT EROSION AND ILLICIT DISCHARGES ON A YEAR AROUND BASIS, DEPENDING ON THE SEASON, WEATHER, AND FIELD CONDITIONS. EROSION CONTROL MEASURES IN ADDITION TO THOSE NOTED IN THE PERMITTED PLANS MAY BE NECESSARY. FAILURE TO INSTALL SITE SITE AND SITUATIONALY APPROPRIATE EROSION CONTROL MEASURES MAY RESULT IN VIOLATIONS, FINES, AND A STOPPAGE OF WORK.

STORM DRAINAGE AND STORMWATER MANAGEMENT

1. DEVELOPER IS RESPONSIBLE FOR ALL NECESSARY DRAINAGE FACILITIES WHETHER SHOWN ON THE PLANS OR NOT AND HE OR HIS SUCCESSOR PROPERTY OWNERS ARE RESPONSIBLE FOR THE ADEQUACY AND CONTINUED MAINTENANCE OF THESE FACILITIES IN A MANNER WHICH WILL PRECLUDE ANY HAZARD TO LIFE, HEALTH, OR DAMAGE TO ADJOINING PROPERTY, CONSISTENT WITH NPDES PERMIT CAS612008 / ORDER NO. R2-2009-0047 AND NPDES PERMIT CAS000004/ ORDER NO. 2013-0001-DWQ.
2. DROP INLETS SHALL BE COUNTY STANDARD TYPE 5 UNLESS OTHERWISE NOTED ON THE PLANS. THE DEVELOPER'S ENGINEER SHALL BE RESPONSIBLE FOR THE PROPER LOCATION OF DROP INLETS. WHERE STREET PROFILE GRADE EXCEEDS 6% DROP INLETS SHALL BE SET AT 500 ANGLE CURB LINE TO ACCEPT WATER OR AS SHOWN ON THE PLANS.
3. WHERE CULVERTS ARE INSTALLED THE DEVELOPER SHALL BE RESPONSIBLE FOR GRADING THE OUTLET DITCH TO DRAIN TO AN EXISTING SWALE OR TO AN OPEN AREA FOR SHEET FLOW.
4. UPON INSTALLATION OF DRIVEWAY CONNECTIONS, PROPERTY OWNERS SHALL PROVIDE FOR THE UNINTERRUPTED FLOW OF WATER IN ROADSIDE DITCHES.
5. THE COUNTY SHALL INSPECT UNDERGROUND DRAINAGE IMPROVEMENTS AND STORMWATER MANAGEMENT FEATURES PRIOR TO BACKFILL.

AS-BUILT PLANS STATEMENT

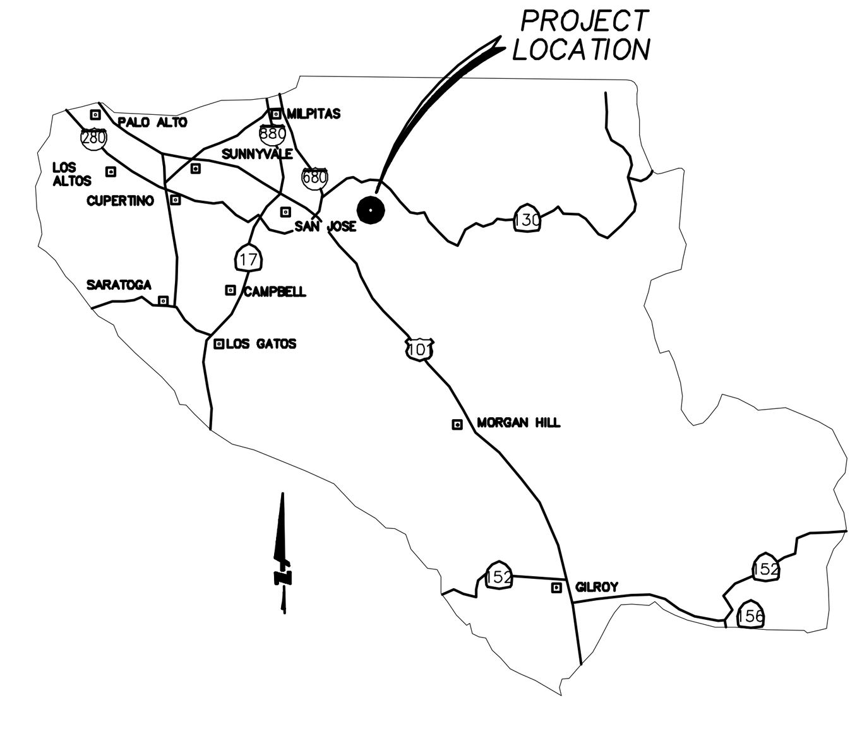
THIS IS A TRUE COPY OF THE AS-BUILT PLANS. THERE (___ WERE) (___ WERE NOT) MINOR FIELD CHANGES – MARKED WITH THE SYMBOL (^). THERE (___WERE) (___ WERE NOT) PLAN REVISIONS INDICATING SIGNIFICANT CHANGES REVIEWED BY THE COUNTY ENGINEER AND MARKED WITH THE SYMBOL △.

DATE ____________ SIGNATURE ____________

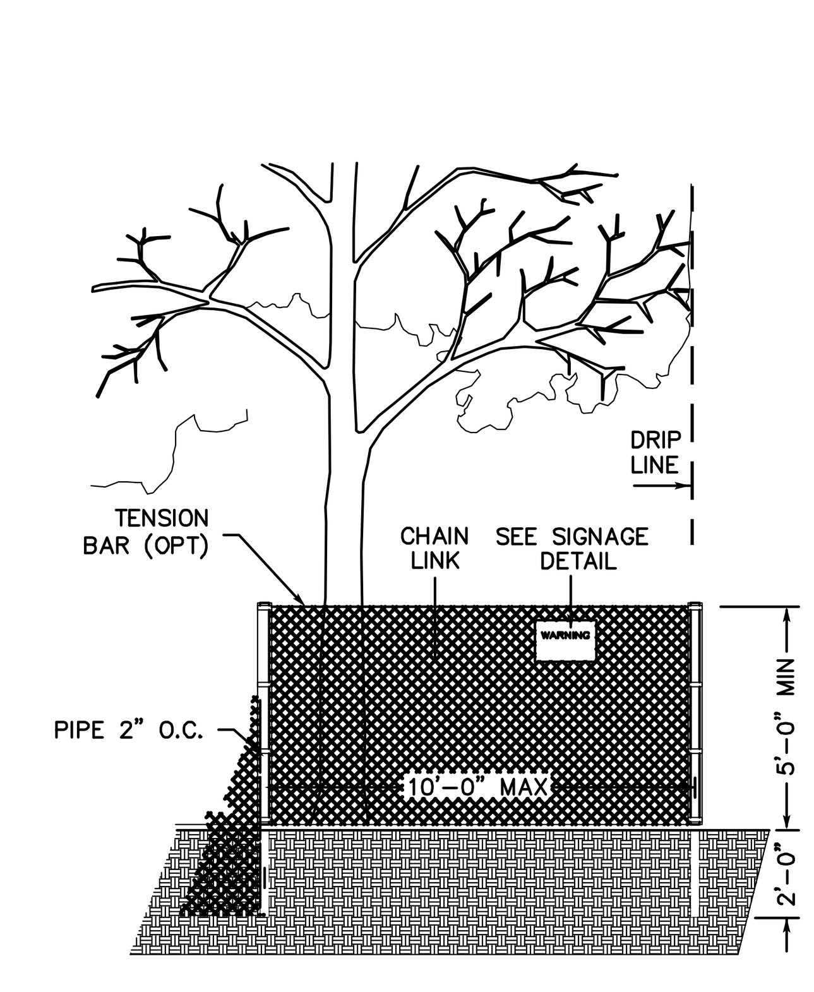
NOTE: THIS STATEMENT IS TO BE SIGNED BY THE PERSON AUTHORIZED BY THE COUNTY ENGINEER TO PERFORM THE INSPECTION WORK. A REPRODUCIBLE COPYOF THE AS-BUILT PLANS MUST BE FURNISHED TO THE COUNTY ENGINEER AFTERCONSTRUCTION.

GEOTECHNICAL ENGINEER OBSERVATION

1. A CONSTRUCTION OBSERVATION LETTER FROM THE RESPONSIBLE GEOTECHNICAL ENGINEER AND ENGINEERING GEOLOGIST DETAILING CONSTRUCTION OBSERVATIONS AND CERTIFYING THAT THE WORK WAS DONE IN ACCORDANCE WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL AND GEOLOGIC REPORTS SHALL BE SUBMITTED PRIOR TO THE GRADING COMPLETION AND RELEASE OF THE BOND.



COUNTY LOCATION MAP



EXISTING TREE PROTECTION DETAILS

1. PRIOR TO THE COMMENCEMENT OF ANY GRADING, TREE PROTECTIVE FENCING SHALL BE IN PLACE IN ACCORDANCE WITH THE TREE PRESERVATION PLAN AND INSPECTED BY A CERTIFIED ARBORIST. THE ARBORIST SHALL MONITOR CONSTRUCTION ACTIVITY TO ENSURE THAT THE TREE PROTECTION MEASURES ARE IMPLEMENTED AND ADHERED TO DURING CONSTRUCTION. THIS CONDITION SHALL BE INCORPORATED INTO THE GRADING PLANS.
2. FENCE SHALL BE MINIMUM 5 FEET TALL CONSTRUCTED OF STURDY MATERIAL (CHAIN-LINK OR EQUIVALENT STRENGTH/ DURABILITY).
3. FENCE SHALL BE SUPPORTED BY VERTICAL POSTS DRIVEN 2 FEET (MIN) INTO THE GROUND AND SPACED NOT MORE THAN 10 FEET APART.
4. TREE FENCING SHALL BE MAINTAINED THROUGHOUT THE SITE DURING THE CONSTRUCTION PERIOD, INSPECTED PERIODICALLY FOR DAMAGE AND PROPER FUNCTION, REPAIRED AS NECESSARY TO PROVIDE A PHYSICAL BARRIER FROM CONSTRUCTION ACTIVITIES, AND REMAIN IN PLACE UNTIL THE FINAL INSPECTION.
5. A SIGN THAT INCLUDES THE WORDS, "WARNING: THIS FENCE SHALL NOT BE REMOVED WITHOUT THE EXPRESSED PERMISSION OF THE SANTA CLARA COUNTY PLANNING OFFICE," SHALL BE SECURELY ATTACHED TO THE FENCE IN A VISUALLY PROMINENT LOCATION.

COUNTY OF SANTA CLARA DEPT. OF ROADS AND AIRPORTS
ISSUED BY: __________ DATE: __________
ENCROACHMENT PERMIT NO. __________

NO WORK SHALL BE DONE IN THE COUNTY'S RIGHT-OF-WAY WITHUOT AN ENCROACHEMENT PERMIT, INCLUDING THE STAGING OF CONSTRUCTION MATERIAL AND THE PLACEMENT OF PORTABLE TOILETS.

ENGINEER'S STATEMENT

I HEREBY STATE THAT THESE PLANS ARE IN COMPLIANCE WITH ADOPTED COUNTY STANDARDS, THE APPROVED TENTATIVE MAP (OR PLAN) AND CONDITIONS OF APPROVAL PERTAINING THERETO FILE NO. XXXXX..

DATE 10-09-2023 ____________ SIGNATURE

57874
R.C.E. NO.

6-30-2024
EXPIRATION DATE

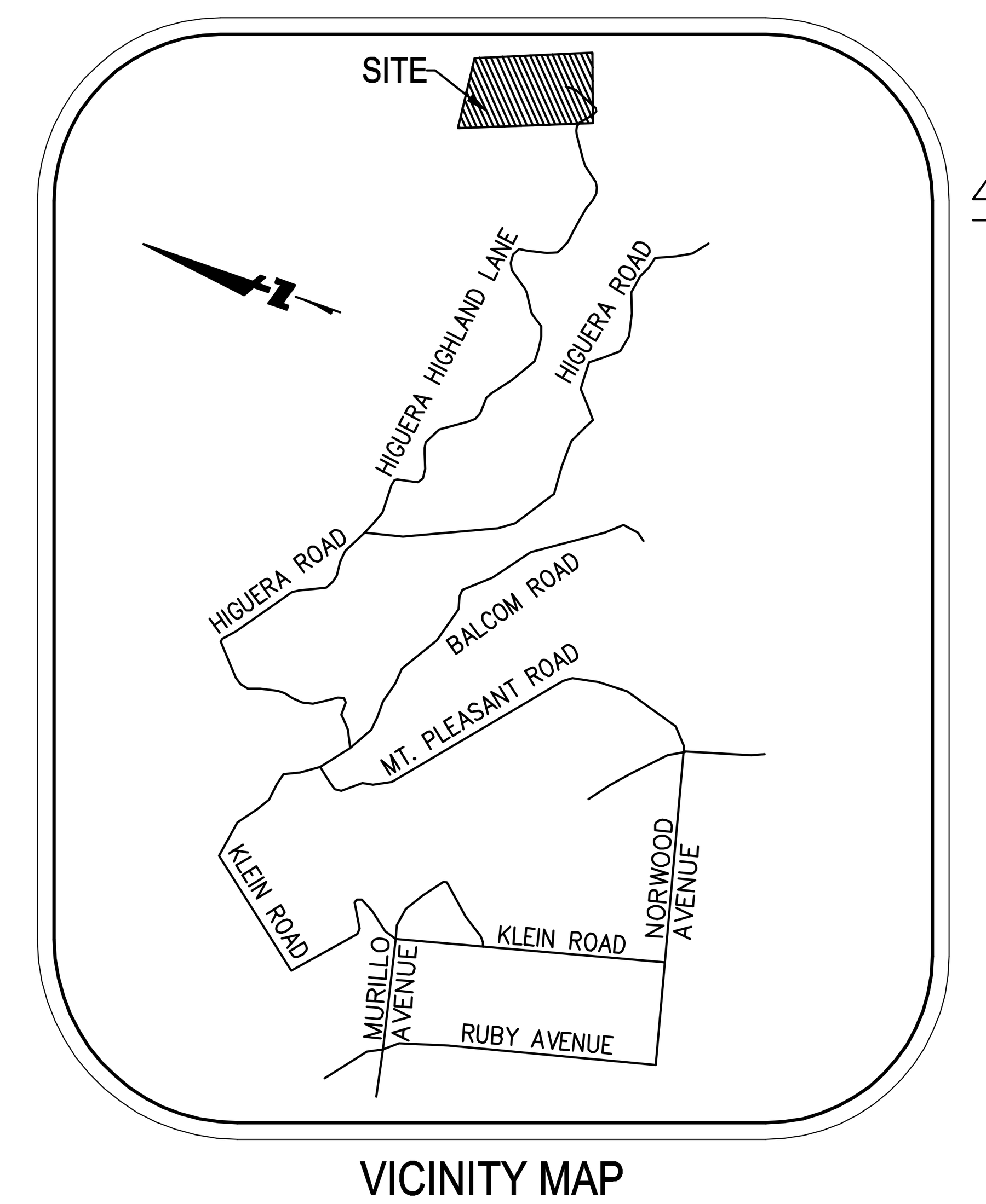
REGISTERED PROFESSIONAL ENGINEER
MITCHEL W. BURLEY
No. 57874
Exp. 6-30-24
CIVIL
STATE OF CALIFORNIA

COUNTY ENGINEER'S NOTE

ISSUANCE OF A PERMIT AUTHORIZING CONSTRUCTION DOES NOT RELEASE THE DEVELOPER, PERMITTEE OF ENGINEER FROM RESPONSIBILITY FOR THE CORRECTION OF ERRORS OR OMISSIONS CONTAINED IN THE PLANS. IF, DURING THE COURSE OF CONSTRUCTION, THE PUBLIC INTEREST REQUIRES A MODIFICATION OF (OR DEPARTURE FROM) THE SPECIFICATIONS OF THE PLANS, THE COUNTY SHALL HAVE THE AUTHORITY TO REQUIRE THE SUSPENSION OF WORK, AND THE NECESSARY MODIFICATION OR DEPARTURE AND TO SPECIFY THE MANNER IN WHICH THE SAME IS TO BE MADE.

DATE ____________ ____________

R.C.E. NO. ____________ EXPIRATION DATE ____________



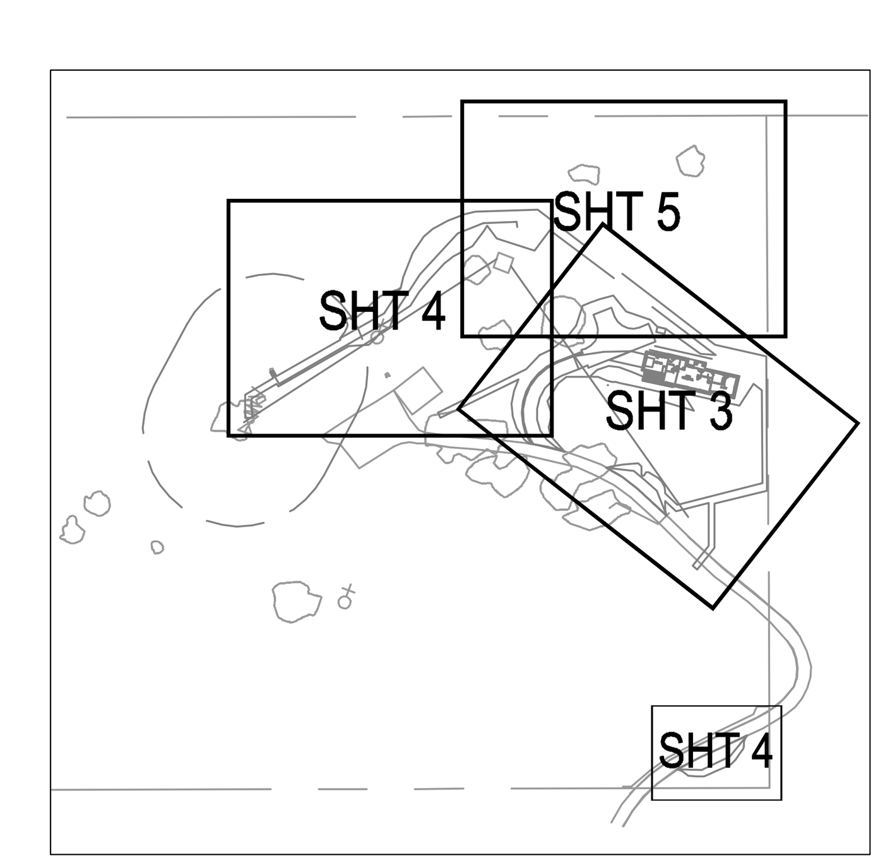
VICINITY MAP
N.T.S.

SURVEY MONUMENT PRESERVATION

1. THE LANDOWNER / CONTRACTOR MUST PROTECT AND ENSURE THE PERPETUATION OF SURVEY MONUMENTS AFFECTED BY CONSTRUCTION ACTIVITIES.
2. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL LOCATE, STAKE, AND FLAG OR OTHERWISE IDENTIFY WITH PAINT OR OTHER MARKINGS ALL PERMANENT SURVEY MONUMENTS OF RECORD AND ANY UNRECORDED MONUMENTS THAT ARE DISCOVERED THAT ARE WITHIN 50 FEET OF THE CONSTRUCTION ACTIVITY.
3. THE LANDOWNER, CONTRACTOR AND/OR ANY PERSON PERFORMING CONSTRUCTION ACTIVITIES THAT WILL OR MAY DISTURB AN EXISTING MONUMENT, CORNER STAKE, OR ANY OTHER PERMANENT SURVEYED MONUMENT SHALL CAUSE TO HAVE A LICENSED LAND SURVEYOR OR CIVIL ENGINEER, AUTHORIZED TO PRACTICE SURVEYING, ENSURE THAT A CORNER RECORD AND/OR RECORD OF SURVEY ARE FILED WITH THE COUNTY SURVEYOR'S OFFICE PRIOR TO DISTURBING SAID MONUMENTS AND RESET PERMANENT MONUMENT(S) IN THE SURFACE OF THE NEW CONSTRUCTION OR SET A WITNESS MONUMENT(S) TO PERPETUATE THE LOCATION IF ANY PERMANENT MONUMENT COULD BE DESTROYED, DAMAGED, COVERED, DISTURBED, OR OTHERWISE OBLITERATED. THE LICENSED LAND SURVEYOR OR CIVIL ENGINEER SHALL FILE A CORNER RECORD OR RECORD OF SURVEY WITH COUNTY SURVEYOR PRIOR TO FINAL ACCEPTANCE OF THE PROJECT BY THE LAND DEVELOPMENT ENGINEERING INSPECTOR.

COUNTY OF SANTA CLARA
LAND DEVELOPMENT ENGINEERING & SURVEYING
GRADING / DRAINAGE PERMIT NO. __________
ISSUED BY: __________ DATE: __________

CHANG RESIDENCE
4015 HIGUERA HIGHLAND LN
PRIMARY RESIDENCE AND JR ADU BUILDING



SCOPE OF WORK

1. THE CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF THE WORK PROPOSED ON THE EROSION CONTROL PLAN. THE ENGINEER OF RECORD IS RESPONSIBLE FOR THE DESIGN OF THE EROSION CONTROL PLANS AND ANY MODIFICATIONS OF THE EROSION CONTROL PLANS TO PREVENT ILLICIT DISCHARGES FROM THE SITE DURING CONSTRUCTION.
2. THE CONTRACTOR WILL GRADE THE SITE PER THE PLAN, INCLUDING THE THE DRIVEWAY SUB-GRADE ELEVATION.
3. ALL BASE ROCK AND PAVEMENT WILL BE INSTALLED PER THE PLANS.
4. A CONSTRUCTION OBSERVATION LETTER FROM THE RESPONSIBLE GEOTECHNICAL ENGINEER AND ENGINEERING GEOLOGIST DETAILING CONSTRUCTION OBSERVATIONS AND CERTIFYING THAT THE WORK WAS DONE IN ACCORDANCE WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL AND GEOLOGIC REPORTS SHALL BE SUBMITTED PRIOR TO THE GRADING COMPLETION AND RELEASE OF THE BOND.
5. THERE ARE NO PROPOSED SITE RETAINING WALLS AS PART OF THE PROJECT.

SHOWN FOR INFORMATION ONLY ARE:

6. SEPTIC AND DOMESTIC AND FIRE WATER SYSTEM IMPROVEMENTS SEPARATE PERMITS FROM THE COUNTY ENVIRONMENTAL HEALTH DEPARTMENT AND THE COUNTY FIRE DEPARTMENT.

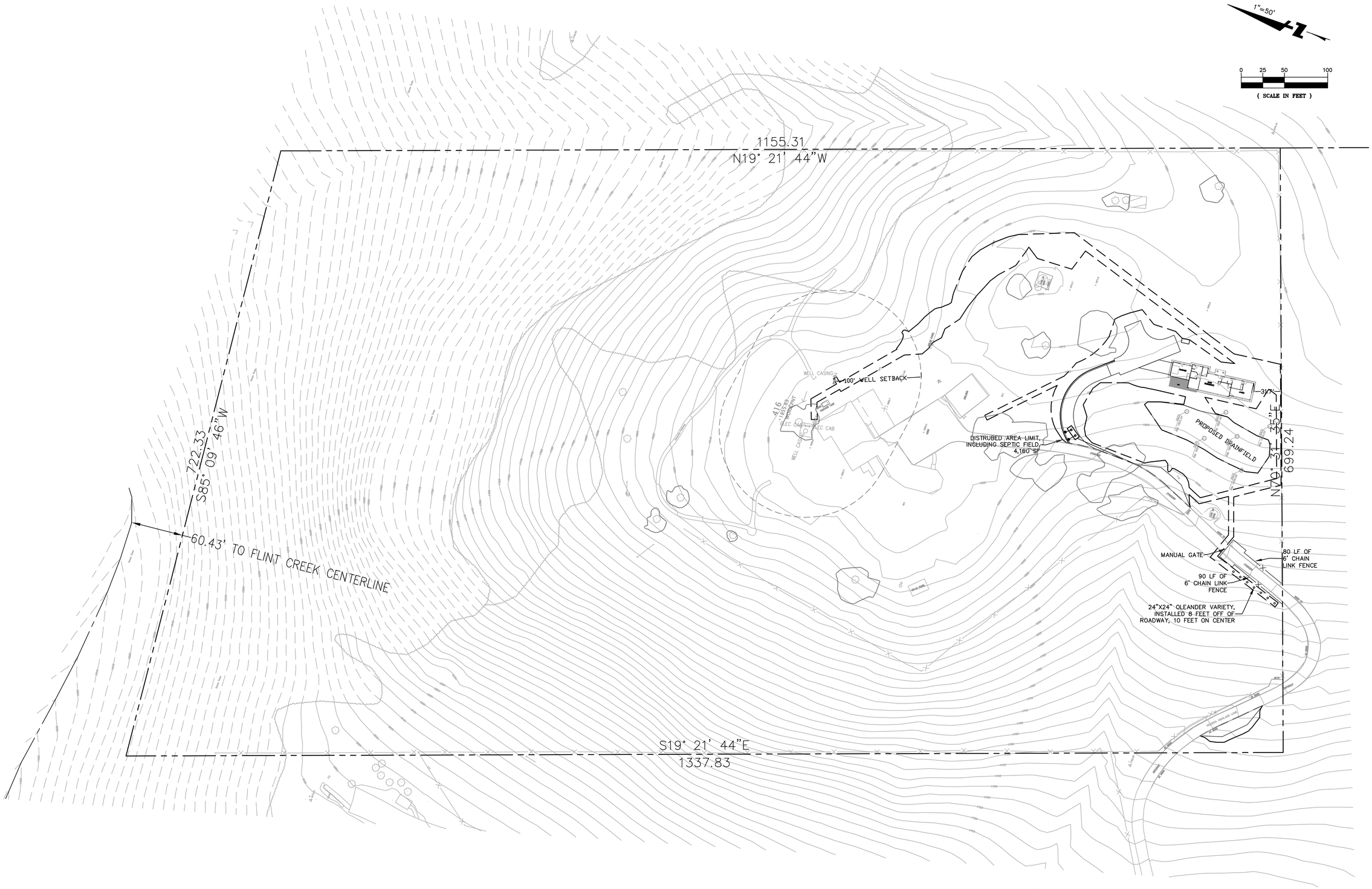
SHEET INDEX

ENGINEER'S NAME: BKF ENGINEERS
MITCH BURLEY
ADDRESS: 1730 NORTH FIRST STREET, #600
SAN JOSE, CA 95112
PHONE NO. 408-467-9100
FAX NO. 408-467-9199

OCTOBER 9, 2023

Revision 1 *Date*	*APN* 654-15-023		*Sheet* 1 *of* 8
Revision 2 *Date*			
Revision 3 *Date*	*Co. File* PLN22-113		

© BKF Engineers



DEFENSIBLE SPACE:
MAINTAIN DEFENSIBLE SPACE SPECIFICATIONS DESCRIBED IN PUBLIC RESOURCE CODE 4291.

BKF
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CHANG RESIDENCE
OVERALL SITE PLAN
4015 HIGUERA HIGHLAND LANE
SANTA CLARA COUNTY CALIFORNIA
SAN JOSE

Revisions	No.

Date 10-09-23
Scale 1" = 50'
Design MWB
Drawn .
Approved .
Job No 20210001

Drawing Number:

2 OF 8

DRAWING NAME: K:\2021\210001_SJ_4015_Higuera_Highland_Lane\ENG\BASE_FILES\CONSULTANT BASE\HH Civil Plans.dwg
PLOT DATE: 10-09-23 PLOTTED BY: BUR

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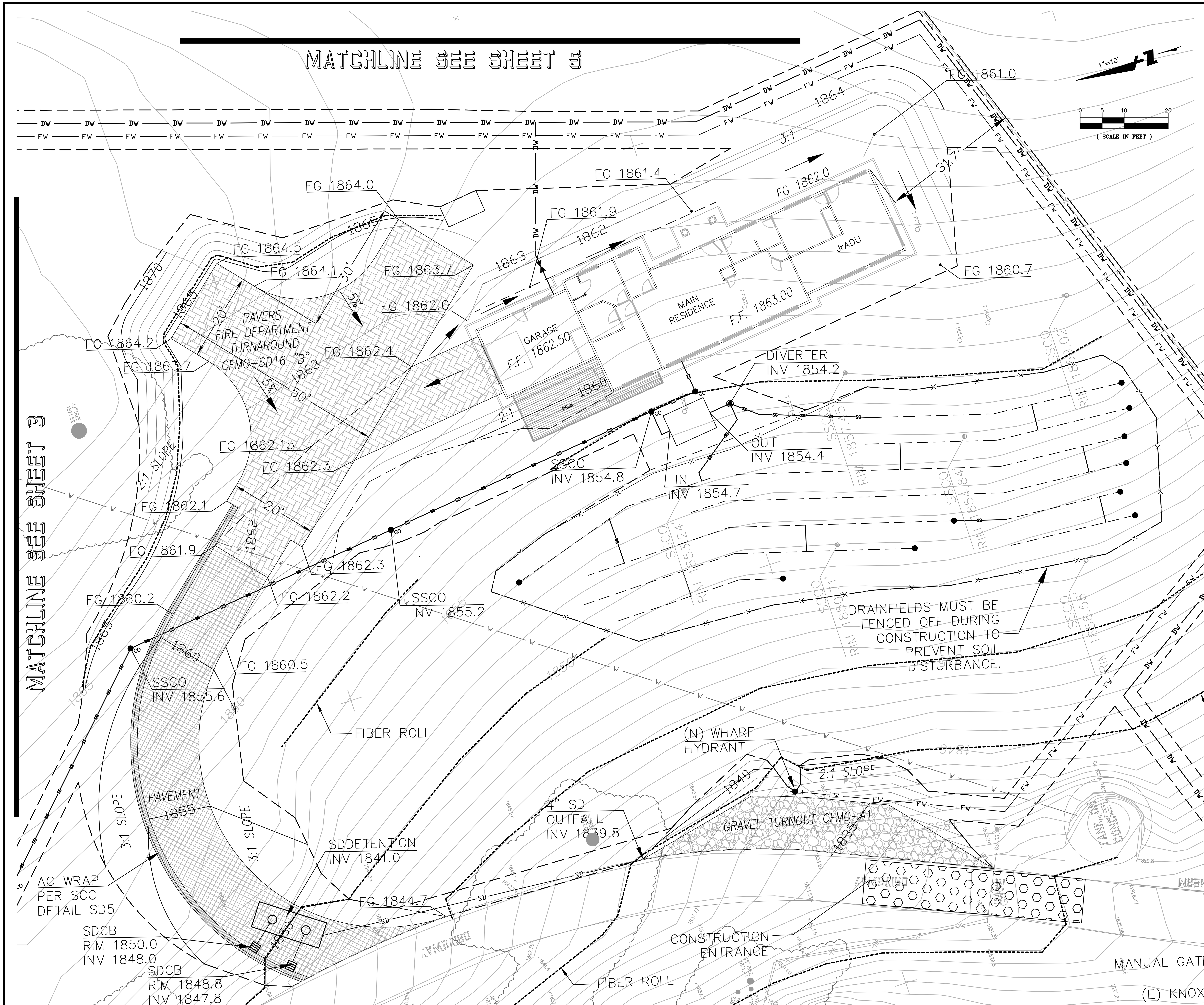

LEGEND

	EDGE OF DRIVEWAY
270	CONTOURS
2%	DRAINAGE ARROW
x327.3	SPOT ELEVATION

0 5 10 20 (SCALE IN FEET)

AREA OF DISTURBANCE = 41,600 SF
EXISTING IMPERVIOUS AREA = 0 SF
PROPOSED IMPERVIOUS AREA = 4,250 SF

3,144 SF STRUCTURE, DECK AND TANKS
1,106 SF DRIVEWAY

EROSION CONTROL LEGEND

FIBER ROLL PER DETAIL SE-5, SHEET 6.

STABILIZED CONSTRUCTION ENTRANCE/EXIT PER DETAIL TC-1, SHEET 5.

ALL DISTURBED AREA SHALL BE TREATED WITH HYDRO-SEEDING.

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CHANG RESIDENCE
GRADING AND DRAINAGE PLAN
4015 HIGUERA HIGHLAND LANE

SAN JOSE SANTA CLARA COUNTY CALIFORNIA

Revisions

Date 10-09-23
Scale 1" = 10'
Design MWB
Drawn .
Approved .
Job No 20210001

Drawing Number:

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PLOT DATE: 10-09-23 PLOTTED BY: BUR

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1"=10'

0 5 10 20

(SCALE IN FEET)

HIGUERA HIGHLAND LANE

AC BERM

GRAVEL TURNOUT CEMO-A1

(N) 1-5,000 GALLON WATER TANK FOR DOMESTIC WATER/FIRE SPRINKLERS

TANK ON CONC

PRESSURE TANK CL

FIBER ROLL

SOLAR PANEL

BUILDINGS

CONC PROPANE TANK

WELL CASING

Dirt

WATERLINE SEE SHEET 2

SSCO
INV 1856.0

SSCO
INV 1856.4

AC WRAP PER SCC DETAIL SD5

3:1 SLOPE

PAVEMENT 1855

SDCB
RIM 1850.0
INV 1848.0

SDCB
RIM

FG 1

1730 N. FIRST STREET
SUITE 600
SAN JOSE, CA 95112
(408) 467-9100
www.bkf.com

BKF

CHANG RESIDENCE
GRADING AND DRAINAGE PLAN
4015 HIGUERA HIGHLAND LANE
SANTA CLARA COUNTY CALIFORNIA

SAN JOSE

Revisions	No.

Date 10-09-23
Scale 1" = 10'
Design MWB
Drawn .
Approved .
Job No 20210001

Drawing Number:

4 OF 8

DRAWING NAME: K:\2021\210001_SJ_4015_Higuera_Highland_Lane\ENG\BASE_FILES\CONSULTANT BASE\HH Civil Plans.dwg
PLOT DATE: 10-09-23 PLOTTED BY: BUR

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CHANG RESIDENCE
GRADING AND DRAINAGE PLAN
4015 HIGUERA HIGHLAND LANE

SAN JOSE SANTA CLARA COUNTY CALIFORNIA

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(408) 467-9100
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Date	10-09-23
Scale	1" = 10'
Design	MWB
Drawn	.
Approved	.
Job No	20210001

No. Revisions

Drawing Number:

5 OF 8

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PLOTTED BY: BUR
PLOT DATE: 10-09-23

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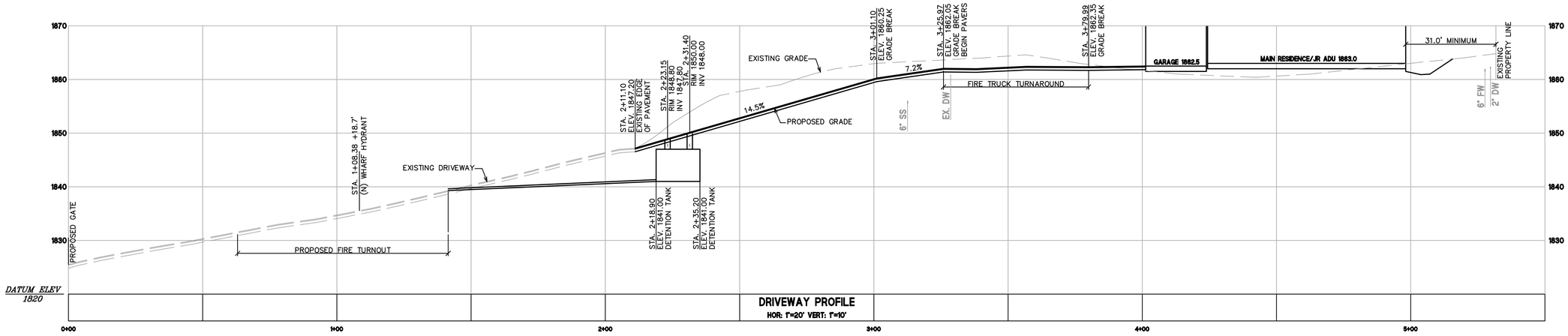
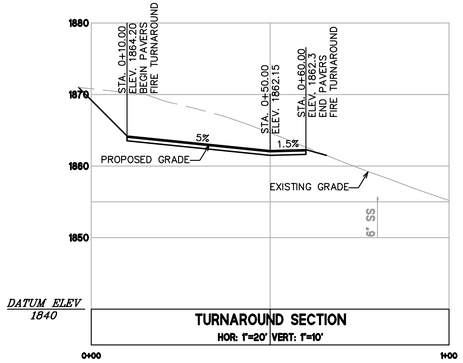
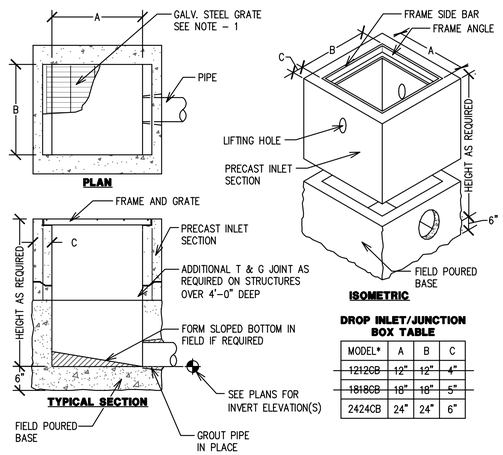






DROP INLET/JUNCTION BOX TABLE

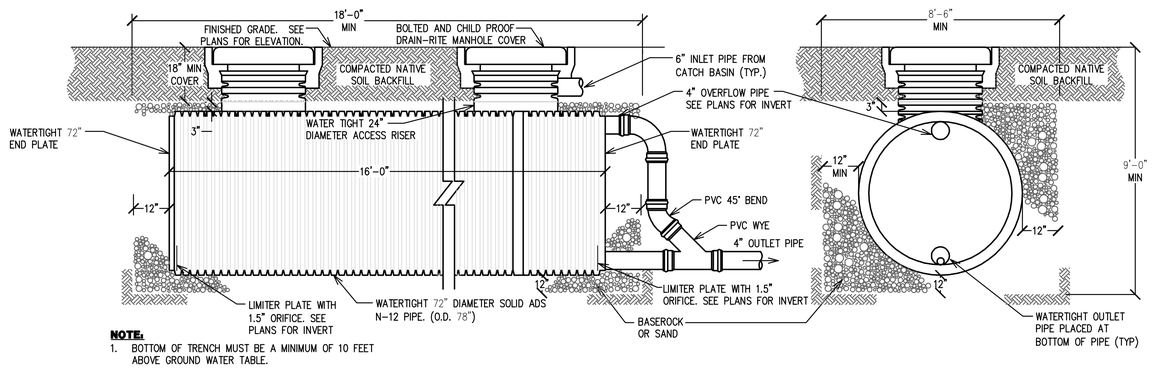
MODEL*	A	B	C
~~1212CB~~	~~12"~~	~~12"~~	~~4"~~
~~1818CB~~	~~18"~~	~~18"~~	~~5"~~
2424CB	24"	24"	6"

NOTE:
FRAMES AND GRATES SHALL BE HEAVY DESIGNED FOR H20 HIGHWAY LOADING. GRATE TO BE BICYCLE PROOF.

CATCH BASIN

SCALE: NO SCALE

CATCH BASIN-002-*MSTR



NOTE:
1. BOTTOM OF TRENCH MUST BE A MINIMUM OF 10 FEET ABOVE GROUND WATER TABLE.

DETENTION SYSTEM

SCALE: NO SCALE

DETENTION SYSTEM SINGLE-024-*MSTR

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CHANG RESIDENCE
DRIVEWAY PROFILE, SECTION AND DETAILS
4015 HIGUERA HIGHLAND LANE
SAN JOSE — SANTA CLARA COUNTY — CALIFORNIA

No.	Revisions

Date 10-09-23
Scale AS SHOWN
Design MWB
Drawn .
Approved .
Job No 20210001

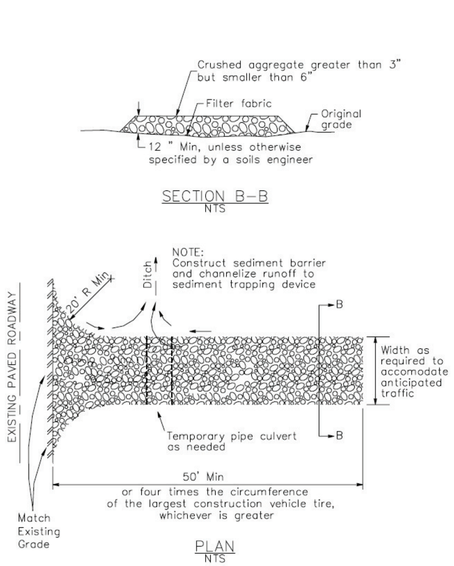
Drawing Number:

6 OF 8

DRAWING NAME: K:\2021\210001_SJ_4015_Higuera_Highland_Lane\ENG\BASE_FILES\CONSULTANT BASE\HH Civil Plans.dwg
PLOT DATE: 10-09-23 PLOTTED BY: BUR

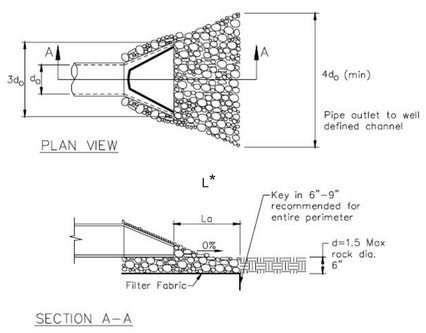
3 Stabilized Construction Entrance/Exit

CASQA Detail TC-1



4 Velocity Dissipation Devices

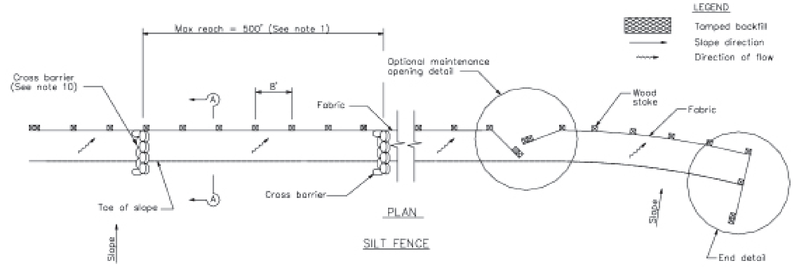
CASQA Detail EC-10



* Length per ABAG Design Standards

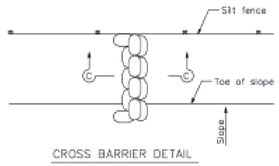
1 Silt Fence

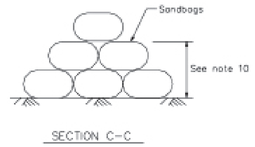
CASQA Detail SE-1



NOTES

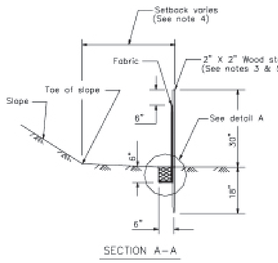
1. Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the linear barrier, in no case shall the reach length exceed 500'.
2. The last 8'–0" of fence shall be turned up slope.
3. Stake dimensions are nominal.
4. Dimension may vary to fit field condition.
5. Stakes shall be spaced at 8'–0" maximum and shall be positioned on downstream side of fence.
6. Stakes to overlap and fence fabric to fold around each stake one full turn. Secure fabric to stake with 4 staples.
7. Stakes shall be driven tightly together to prevent potential flow–through of sediment at joint. The tops of the stakes shall be secured with wire.
8. For end stake, fence fabric shall be folded around two stakes one full turn and secured with 4 staples.
9. Minimum 4 staples per stake. Dimensions shown are typical.
10. Cross barriers shall be a minimum of 1/3 and a maximum of 1/2 the height of the linear barrier.
11. Maintenance openings shall be constructed in a manner to ensure sediment remains behind silt fence.
12. Joining sections shall not be placed at sump locations.
13. Sandbag rows and layers shall be offset to eliminate gaps.

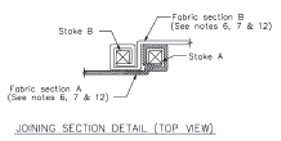


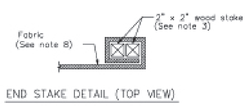


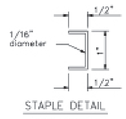
2 Silt Fence

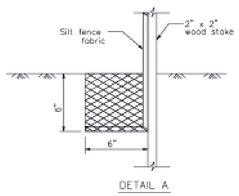
CASQA Detail SE-1

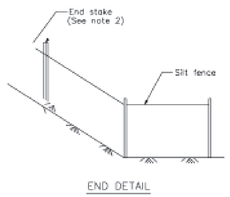


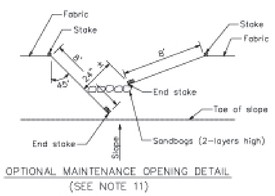












Source for Graphics: California Stormwater BMP Handbook, California Stormwater Quality Association, January 2003.
Available from www.cabmphandbooks.com.

STANDARD BEST MANAGEMENT PRACTICE NOTES

1. Solid and Demolition Waste Management: Provide designated waste collection areas and containers on site away from streets, gutters, storm drains, and waterways, and arrange for regular disposal. Waste containers must be watertight and covered at all times except when waste is deposited. Refer to Erosion & Sediment Control Field Manual, 4th Edition (page C3) or latest.
2. Hazardous Waste Management: Provide proper handling and disposal of hazardous wastes by a licensed hazardous waste material hauler. Hazardous wastes shall be stored and properly labeled in sealed containers constructed of suitable materials. Refer to Erosion & Sediment Control Field Manual, 4th Edition (pages C-5 to C-6) or latest.
3. Spill Prevention and Control: Provide proper storage areas for liquid and solid materials, including chemicals and hazardous substances, away from streets, gutters, storm drains, and waterways. Spill control materials must be kept on site where readily accessible. Spills must be cleaned up immediately and contaminated soil disposed properly. Refer to Erosion & Sediment Control Field Manual, 4th Edition (pages C-7 to C-8, C-13 to C-14) or latest.
4. Vehicle and Construction Equipment Service and Storage: An area shall be designated for the maintenance, where on-site maintenance is required, and storage of equipment that is protected from stormwater run-on and runoff. Measures shall be provided to capture any waste oils, lubricants, or other potential pollutants and these wastes shall be properly disposed of off site. Fueling and major maintenance/repair, and washing shall be conducted off-site whenever feasible. Refer to Erosion & Sediment Control Field Manual, 4th Edition (page C9) or latest.
5. Material Delivery, Handling and Storage: In general, materials should not be stockpiled on site. Where temporary stockpiles are necessary and approved by the County, they shall be covered with secured plastic sheeting or tarp and located in designated areas near construction entrances and away from drainage paths and waterways. Barriers shall be provided around storage areas where materials are potentially in contact with runoff. Refer to Erosion & Sediment Control Field Manual, 4th Edition (pages C-11 to C-12) or latest.
6. Handling and Disposal of Concrete and Cement: When concrete trucks and equipment are washed on-site, concrete wastewater shall be contained in designated containers or in a temporary lined and watertight pit where wasted concrete can harden for later removal. If possible have concrete contractor remove concrete wash water from site. In no case shall fresh concrete be washed into the road right-of-way. Refer to Erosion & Sediment Control Field Manual, 4th Edition (pages C-15 to C-16) or latest.
7. Pavement Construction Management: Prevent or reduce the discharge of pollutants from paving operations, using measures to prevent run-on and runoff pollution and properly disposing of wastes. Avoid paving in the wet season and reschedule paving when rain is in the forecast. Residue from saw-cutting shall be vacuumed for proper disposal. Refer to Erosion & Sediment Control Field Manual, 4th Edition (pages C-17 to C-18) or latest.
8. Contaminated Soil and Water Management: Inspections to identify contaminated soils should occur prior to construction and at regular intervals during construction. Remediating contaminated soil should occur promptly after identification and be specific to the contaminant identified, which may include hazardous waste removal. Refer to Erosion & Sediment Control Field Manual, 4th Edition (pages C-19 to C-20) or latest.
9. Sanitary/Septic Water Management: Temporary sanitary facilities should be located away from drainage paths, waterways, and traffic areas. Only licensed sanitary and septic waste haulers should be used. Secondary containment should be provided for all sanitary facilities. Refer to Erosion & Sediment Control Field Manual, 4th Edition (page C-21) or latest.
10. Inspection & Maintenance: Areas of material and equipment storage sites and temporary sanitary facilities must be inspected weekly. Problem areas shall be identified and appropriate additional and/or alternative control measures implemented immediately, within 24 hours of the problem being identified.

STANDARD EROSION CONTROL NOTES

1. Sediment Control Management:

   Tracking Prevention & Clean Up: Activities shall be organized and measures taken as needed to prevent or minimize tracking of soil onto the public street system. A gravel or proprietary device construction entrance/exit is required for all sites. Clean up of tracked material shall be provided by means of a street sweeper prior to an approaching rain event, or at least once at the end of each workday that material is tracked, or, more frequently as determined by the County Inspector. Refer to Erosion & Sediment Control Field Manual, 4th Edition (pages B-31 to B-33) or latest.

   Storm Drain Inlet and Catch Basin Inlet Protection: All inlets within the vicinity of the project and within the project limits shall be protected with gravel bags placed around inlets or other inlet protection. At locations where exposed soils are present, staked fiber roles or staked silt fences can be used. Inlet filters are not allowed due to clogging and subsequent flooding. Refer to Erosion & Sediment Control Field Manual, 4th Edition (pages B-49 to B-51) or latest.

   Storm Water Runoff: No storm water runoff shall be allowed to drain in to the existing and/or proposed underground storm drain system or other above ground watercourses until appropriate erosion control measures are fully installed.

   Dust Control: The contractor shall provide dust control in graded areas as required by providing wet suppression or chemical stabilization of exposed soils, providing for rapid clean up of sediments deposited on paved roads, furnishing construction road entrances and vehicle wash down areas, and limiting the amount of areas disturbed by clearing and earth moving operations by scheduling these activities in phases.

   Stockpiling: Excavated soils shall not be placed in streets or on paved areas. Borrow and temporary stockpiles shall be protected with appropriate erosion control measures(tarps, straw bales, silt fences, ect.) to ensure silt does not leave the site or enter the storm drain system or neighboring watercourse.
2. Erosion Control: During the rainy season, all disturbed areas must include an effective combination of erosion and sediment control. It is required that temporary erosion control measures are applied to all disturbed soil areas prior to a rain event. During the non-rainy season, erosion control measures must be applied sufficient to control wind erosion at the site.
3. Inspection & Maintenance: Disturbed areas of the Project's site, locations where vehicles enter or exit the site, and all erosion and sediment controls that are identified as part of the Erosion Control Plans must be inspected by the Contractor before, during, and after storm events, and at least weekly during seasonal wet periods. Problem areas shall be identified and appropriate additional and/ or alternative control measures implemented immediately, within 24 hours of the problem being identified.
4. Project Completion: Prior to project completion and signoff by the County Inspector, all disturbed areas shall be reseeded, planted, or landscaped to minimize the potential for erosion on the subject site.
5. It shall be the Owner's/Contractor's responsibility to maintain control of the entire construction operation and to keep the entire site in compliance with the erosion control plan.
6. Erosion and sediment control best management practices shall be operable year round or until vegetation is fully established on landscaped surfaces.

Project Information

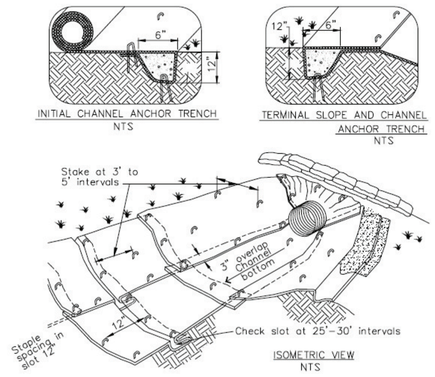
CHANG RESIDENCE - 4015 HIGUERA HIGHLAND LANE
SHEET 7 OF 8

Best Management Practices and Erosion Control Details Sheet 1
County of Santa Clara

BMP-1

7 Geotextiles and Mats

CASQA Detail EC-7

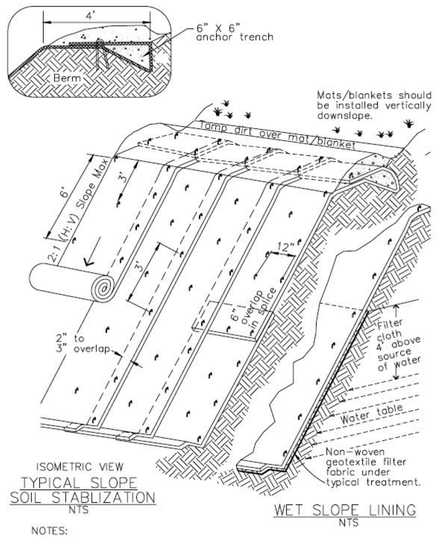


NOTES:
1. Check slots to be constructed per manufacturers specifications.
2. Staking or stapling layout per manufacturers specifications.
3. Install per manufacturer's recommendations

TYPICAL INSTALLATION DETAIL

5 Geotextiles and Mats

CASQA Detail EC-7

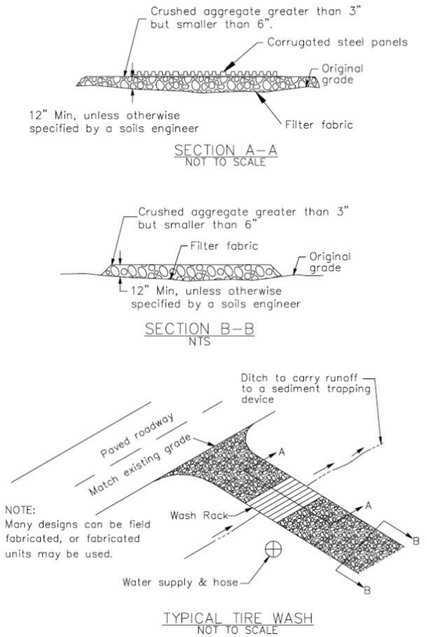


NOTES:
1. Slope surface shall be free of rocks, clods, sticks and grass. Mats/blankets shall have good soil contact.
2. Lay blankets loosely and stake or staple to maintain direct contact with the soil. Do not stretch.
3. Install per manufacturer's recommendations

TYPICAL INSTALLATION DETAIL

3 Entrance/Outlet Tire Wash

CASQA Detail TC-3

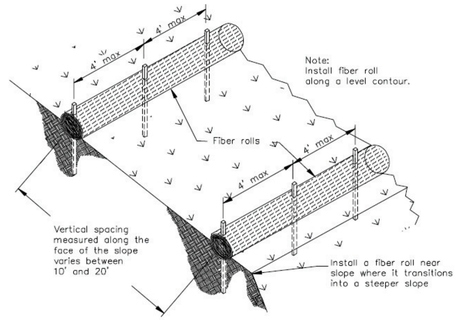


NOTE:
Many designs can be field fabricated, or fabricated units may be used.

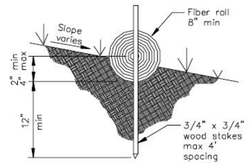
TYPICAL TIRE WASH
NOT TO SCALE

1 Fiber Rolls

CASQA Detail SE-5



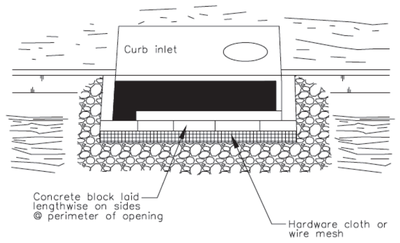
TYPICAL FIBER ROLL INSTALLATION
N.T.S.

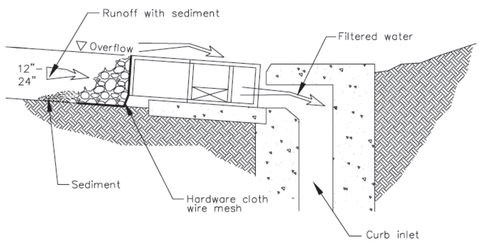


ENTRENCHMENT DETAIL
N.T.S.

8 Storm Drain Inlet Protection

CASQA Detail SE-10

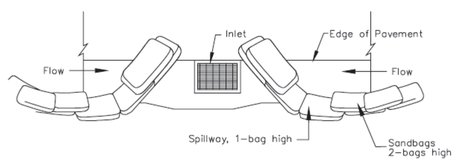




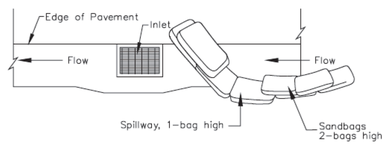
DI PROTECTION – TYPE 4
NOT TO SCALE

6 Storm Drain Inlet Protection

CASQA Detail SE-10



TYPICAL PROTECTION FOR INLET ON SUMP



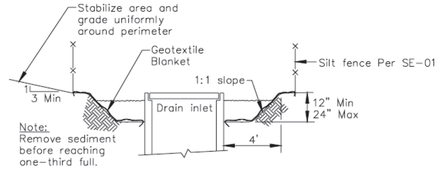
TYPICAL PROTECTION FOR INLET ON GRADE

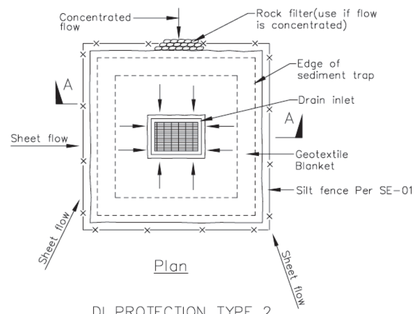
NOTES:
1. Intended for short-term use.
2. Use to inhibit non-storm water flow.
3. Allow for proper maintenance and cleanup.
4. Bags must be removed after adjacent operation is completed
5. Not applicable in areas with high silts and clays without filter fabric.

DI PROTECTION TYPE 3
NOT TO SCALE

4 Storm Drain Inlet Protection

CASQA Detail SE-10



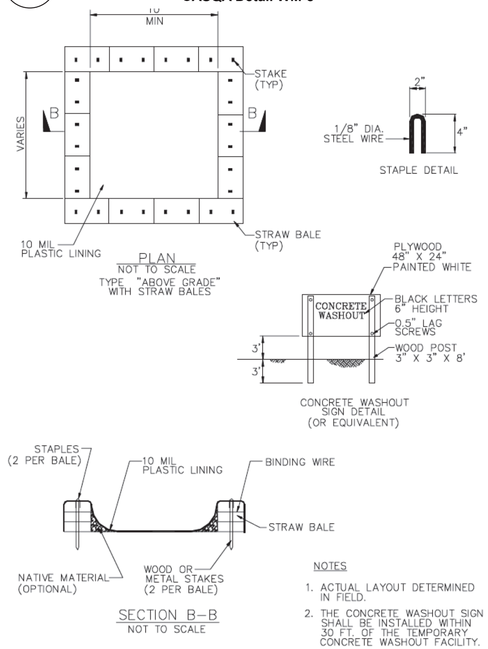


DI PROTECTION TYPE 2
NOT TO SCALE

Notes
1. For use in cleared and grubbed and in graded areas.
2. Shape basin so that longest inflow area faces longest length of trap.
3. For concentrated flows, shape basin in 2:1 ratio with length oriented towards direction of flow.

2 Concrete Waste Management

CASQA Detail WM-8



NOTES
1. ACTUAL LAYOUT DETERMINED IN FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FT. OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

Source for Graphics: California Stormwater BMP Handbook, California Stormwater Quality Association, January 2003.
Available from www.cabmphandbooks.com.

Project Information

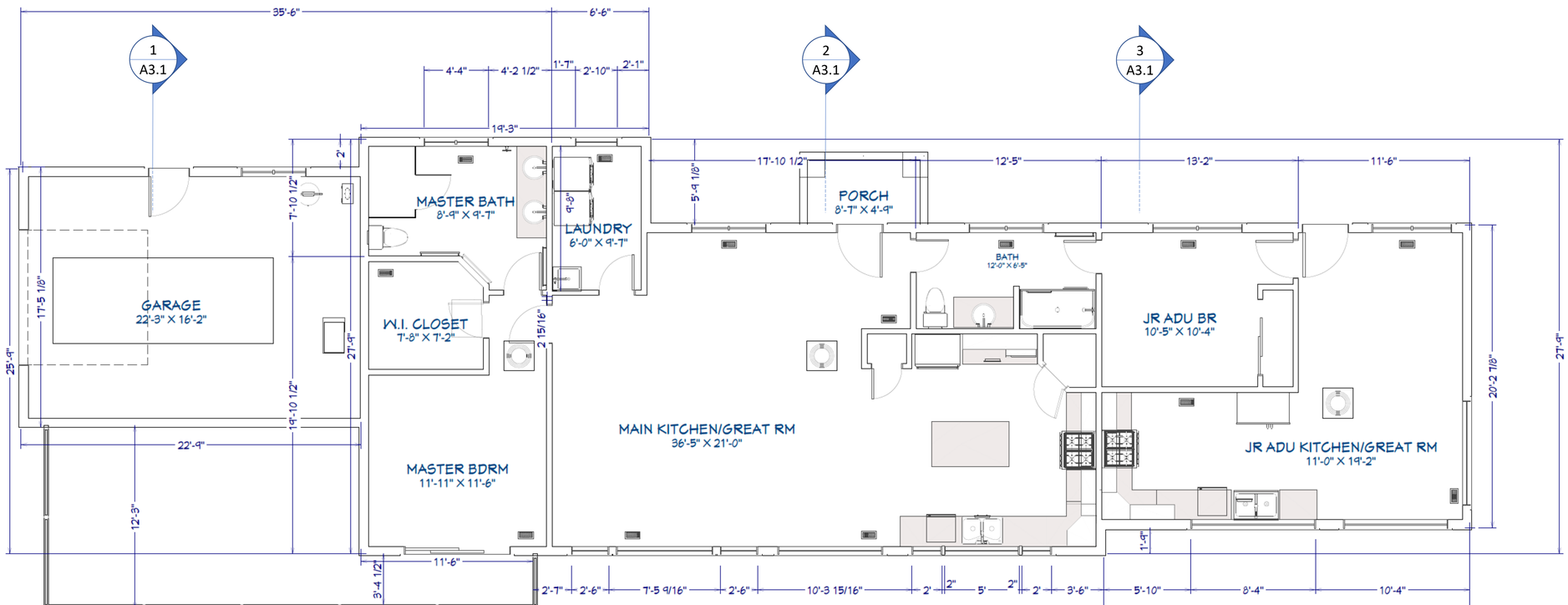
CHANG RESIDENCE - 4015 HIGUERA HIGHLAND LANE

SHEET 8 OF 8

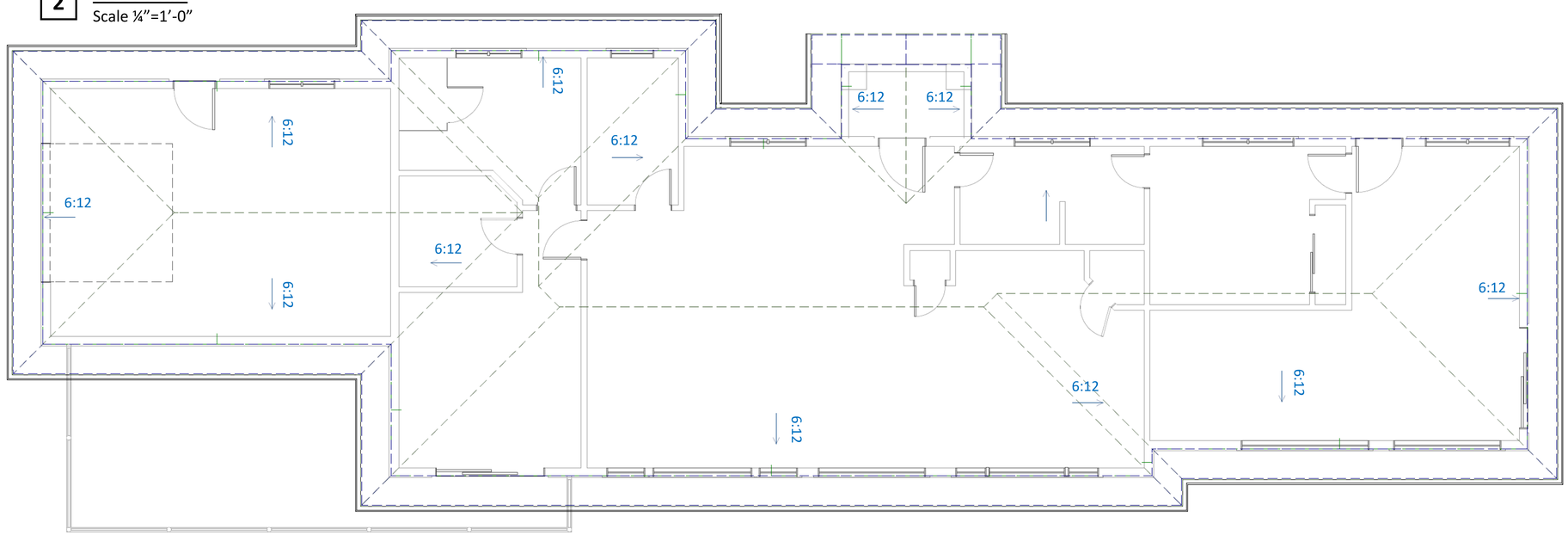
Best Management Practices and Erosion Control Details Sheet 2
County of Santa Clara

BMP-2

1 **Floor Plan**
Scale ¼”=1’-0”



2 **Roof Plan**
Scale ¼”=1’-0”



Project

Chang Wang
Residence/Jr ADU

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San Jose, CA 95148

APN: 654-015-023

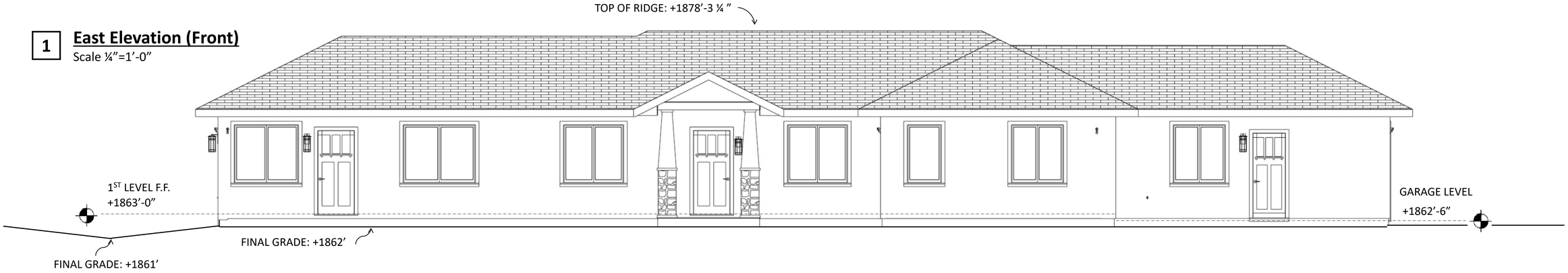
Phone: 650-380-2528
Email: homeofcw@gmail.com

Scale
¼”=1’-0”

A1.1

1 East Elevation (Front)

Scale ¼”=1’-0”



Roof: Owens Corning TruDefinition Duration, Terra Cotta, Item #376825, Model # TK99

Door: Sherwin Williams, 6055 Fiery Brown, LRV 5

Window: Milgard Vinyl, Tan, LRV 25

Trim: Sherwin Williams, 6024 Dressy Rose, LRV 37

Exterior Wall: LaHabra Stucco, 63151 Hanover Base 100, LRV 33

Architecture Accent (Stone Veneer): MSI Natural Earth, Textured Quartz Wall Tile, LRV 30

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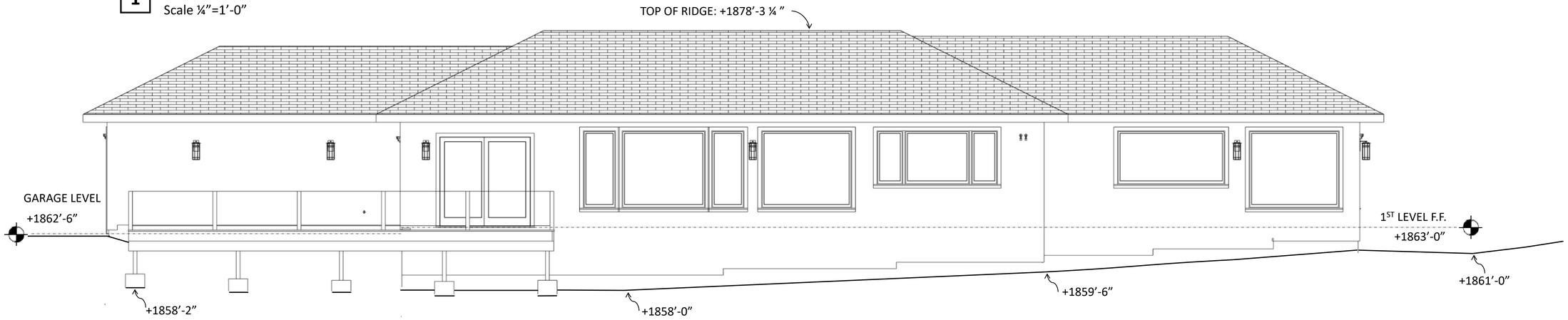
Scale
¼”=1’-0”

A2.1

1 West Elevation (Back)

Scale ¼”=1’-0”



Roof: Owens Corning TruDefinition Duration, Terra Cotta, Item #376825, Model # TK99

Door: Sherwin Williams, 6055 Fiery Brown, LRV 5

Window: Milgard Vinyl, Tan, LRV 25

Trim: Sherwin Williams, 6024 Dressy Rose, LRV 37

Exterior Wall: LaHabra Stucco, 63151 Hanover Base 100, LRV 33

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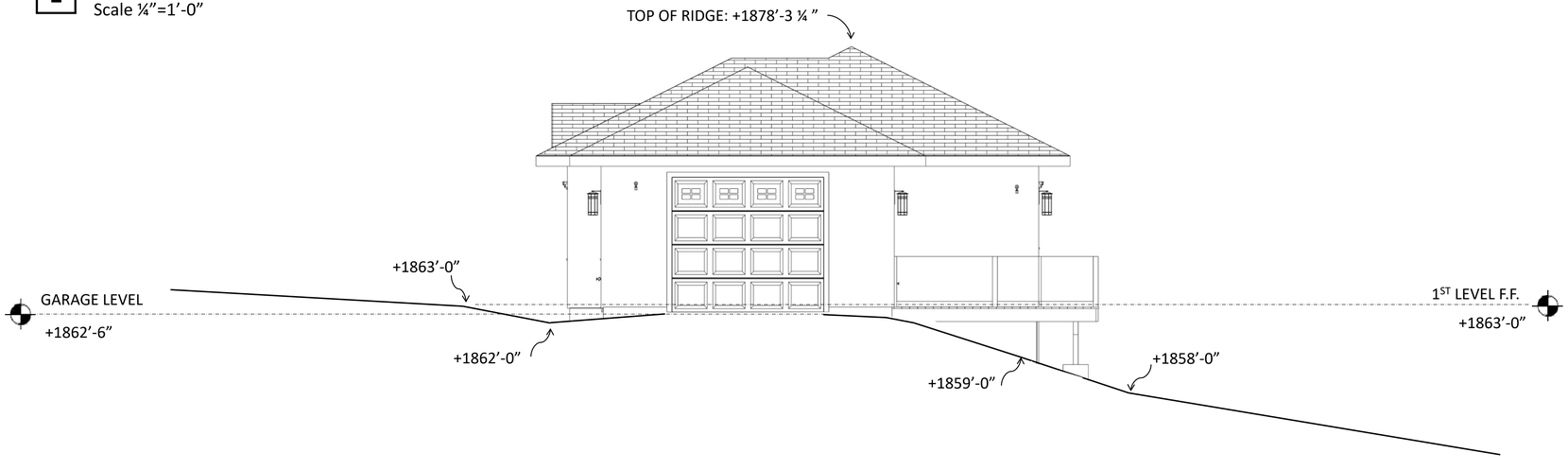
Scale
¼”=1’-0”

A2.2

1 North Elevation

Scale ¼”=1’-0”



Roof: Owens Corning TruDefinition Duration, Terra Cotta, Item #376825, Model # TK99

Garage Door: Sherwin Williams, 6024 Dressy Rose, LRV 37

Trim: Sherwin Williams, 6024 Dressy Rose, LRV 37

Exterior Wall: LaHabra Stucco, 63151 Hanover Base 100, LRV 33

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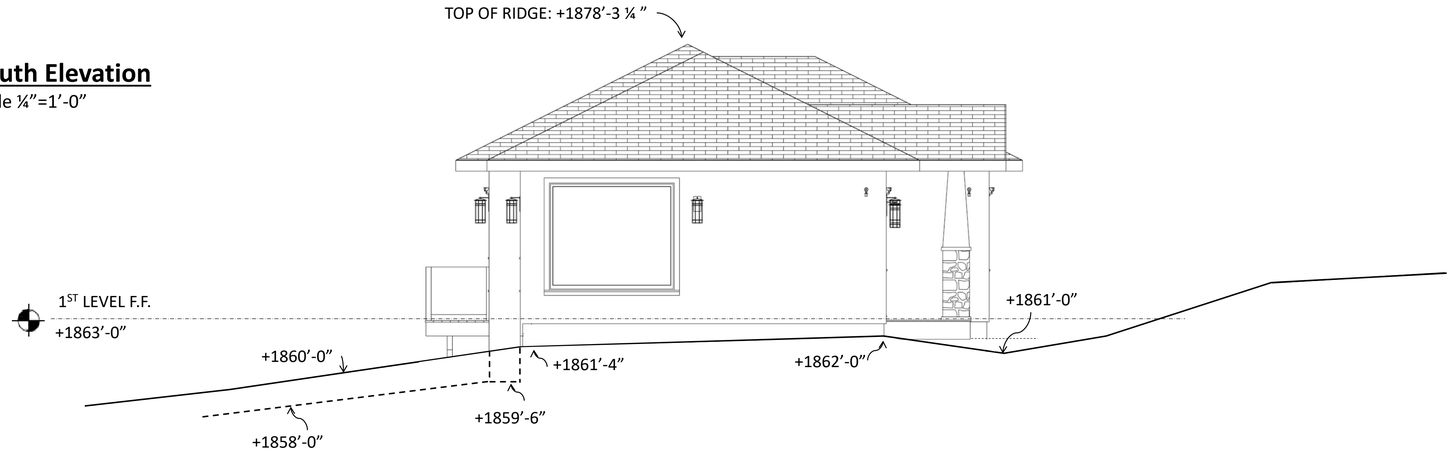
Scale
¼”=1’-0”

A2.3

1 South Elevation

Scale ¼”=1’-0”



Roof: Owens Corning TruDefinition Duration, Terra Cotta, Item #376825, Model # TK99

Window: Milgard Vinyl, Tan, LRV 25

Trim: Sherwin Williams, 6024 Dressy Rose, LRV 37

Exterior Wall: LaHabra Stucco, 63151 Hanover Base 100, LRV 33

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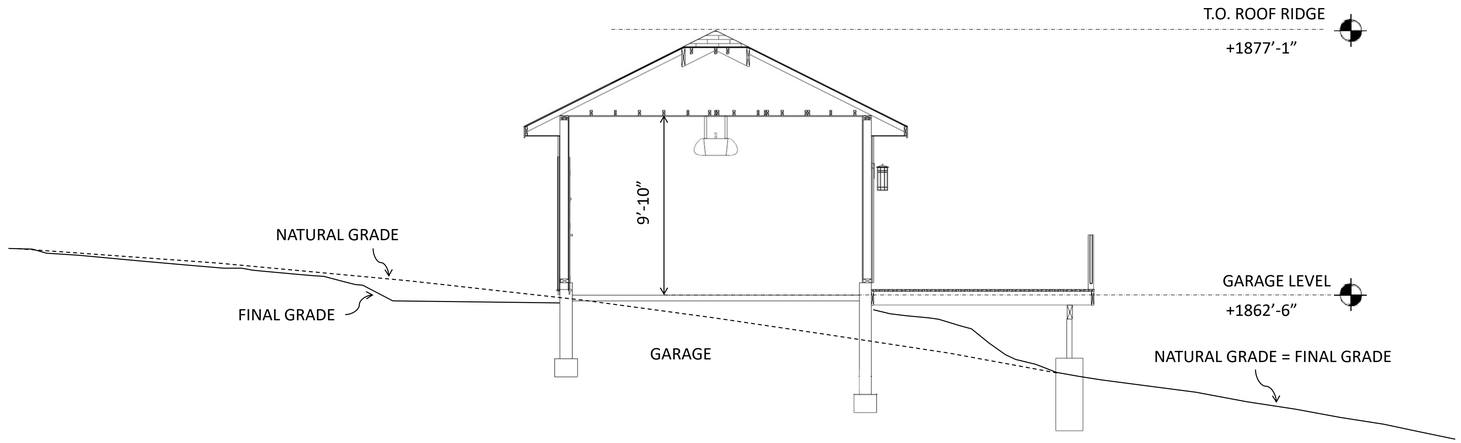
Scale
¼”=1’-0”

A2.4

1 **SECTION**
Scale ¼”=1’-0”



2 **SECTION**
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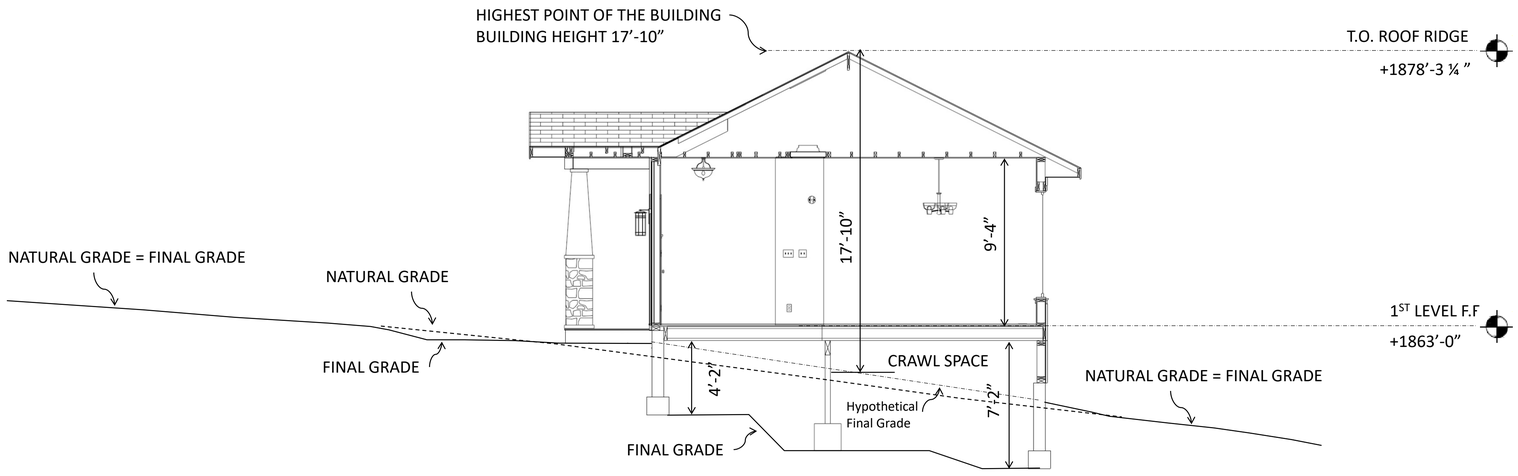
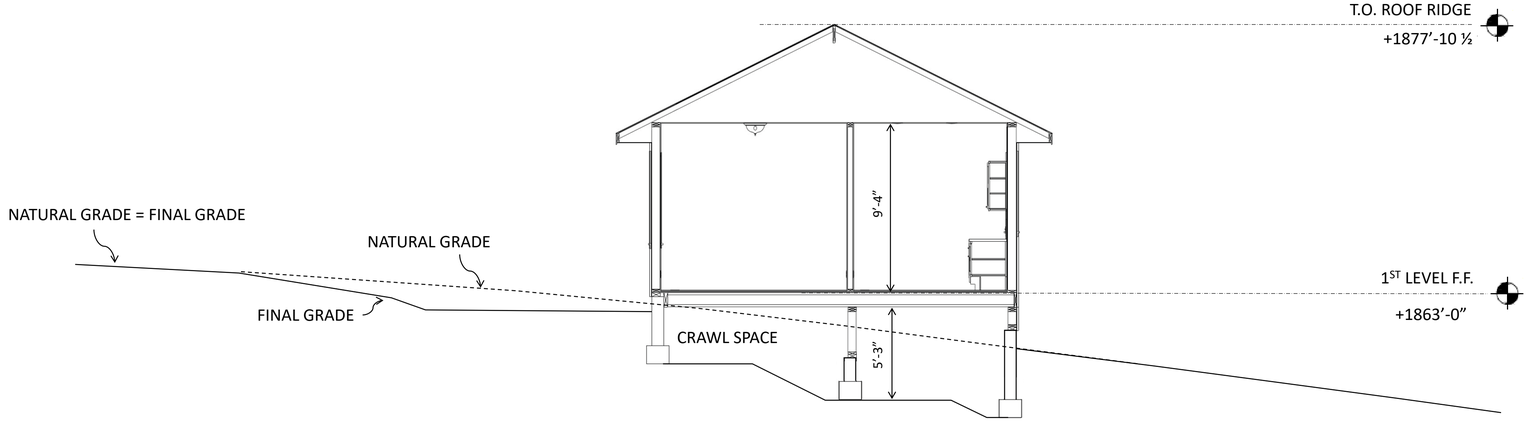


3 **SECTON**
Scale ¼”=1’-0”



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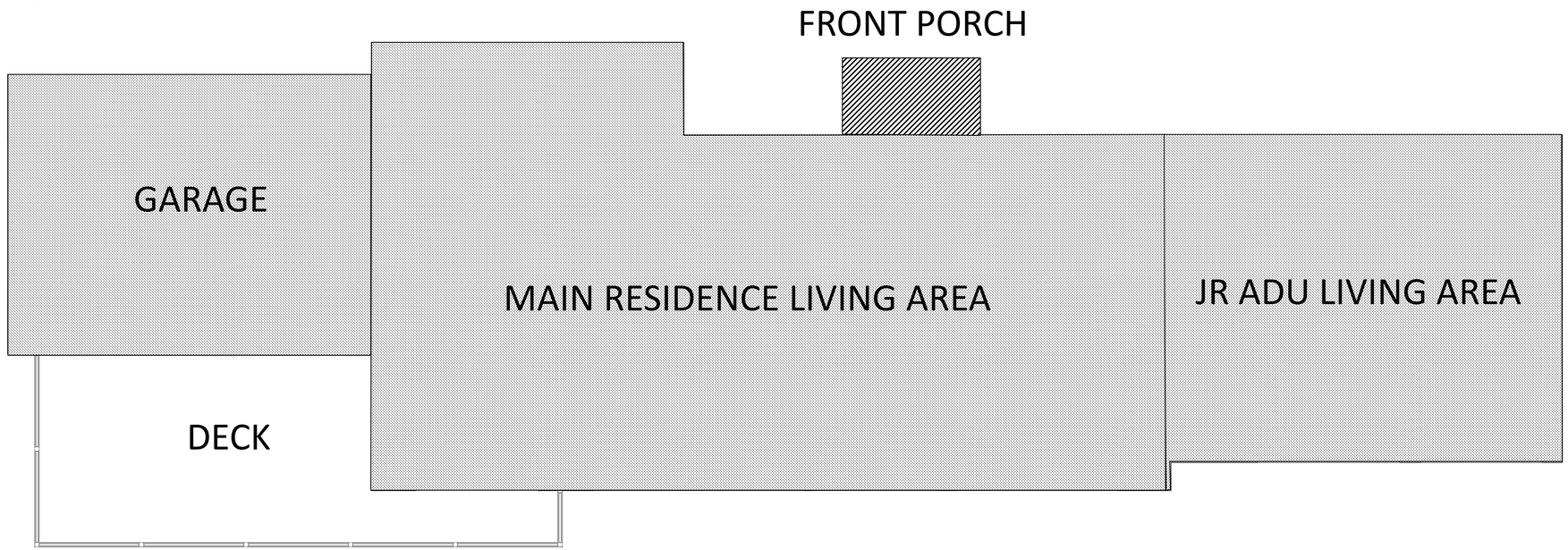
Scale
¼”=1’-0”

A3.1

Gross Floor Area

Scale ¼”=1’-0”



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May 3rd, 2023

= INDICATES LOCATIONS INCLUDED IN THESE CALCULATIONS.

= INDICATES EXTERIOR COVERED LOCATIONS REQUIRED TO BE INCLUDED IN THESE CALCULATIONS.

1st LEVEL	HABITABLE	NON-HABITABLE	CPVERED EXTERIOR	UN-COVERED EXTERIOR
MAIN RESIDENCE LIVING AREA GARAGE FRONT PORCH DECK	1200 SF	400 SF	41 SF	300 SF
ATTACHED JR ADU LIVING AREA	500 SF			

TOTALS 1700 SF + 400 SF + 41 SF = 2141 SF

Scale
¼”=1’-0”

A4.1

Scale 0.8”=50ft

A: Driveway 12’, Shoulder 3’
B: Driveway 12’, Gate Column-Column 17’-7”, Gate Hinge-Hinge 16’-11” (details next page)
C: Fence-Fence 19’-4”
D: Driveway 14’-6”, Shoulder 3’
E: Driveway 13’, Shoulder 3’
F: Driveway 12’, Shoulder >3’
G: Driveway 18’-6”, Shoulder >3’
H: Driveway 15’, Shoulder >4’
I: Driveway 18”, Shoulder 3’
J: 12’ Driveway to Property Line: 175’
K: Property line to the 1st Turnout: 40’
L: Gate to Property Line 80’

Scale 0.8”=50ft

B: Driveway at Gate 12’

B: Gate Column-Column 17’-7”

B: Gate Hinge-Column: 4’’

Gate Hinge-Hinge: 16’-11”

C: Fence-Fence 19’-4”

`

Detention Facility Calculation

Area	250.00 x	154.00	38500 sf	**0.88** acres
t_c	0.0078(L^2/S)^0.385 + 10 =			**11.6** minutes
	L	250 ft		
	S	0.06 ft/ft		
Runoff Coefficeint C =				**0.35**

DRAINAGE SUMMARY:

THE NEW IMPERVIOUS AREA (BUILDING DOWN SPOUTS) WILL BE DIRECTED BY OVERLAND FLOW TO THE RETENTION BASIN/AREA. THE REQUIRED VOLUME OF STORAGE OF 424 CUBIC-FEET WILL BE CONTAINED IN THE 14,000 CUBIC-FOOT RETENTION BASIN/AREA. ONCE THE RETENTION BASIN/AREA IS FULL IT WILL SHEET FLOW TO THE EAST AS IT DOES IN THE CURRENT CONDITION.
3,200 GALLONS

$x_{T,D}$ Depth 10-year storm at **20** (Figure A-2) **0.3491** inches

$x_{T,D} = A_{T,D} + (B_{T,D}MAP)$

T(min)	$A_{T,D}$	$B_{T,B}$
10	0.258682	0.003569
11.6	**0.270371**	**0.003938**
15	0.294808	0.004710

$i_{T,D}$ Intensity $i_{T,D} = x_{T,D}/D$ **1.8031** in/hr

$D = x_{T,D}/60$ min/hr

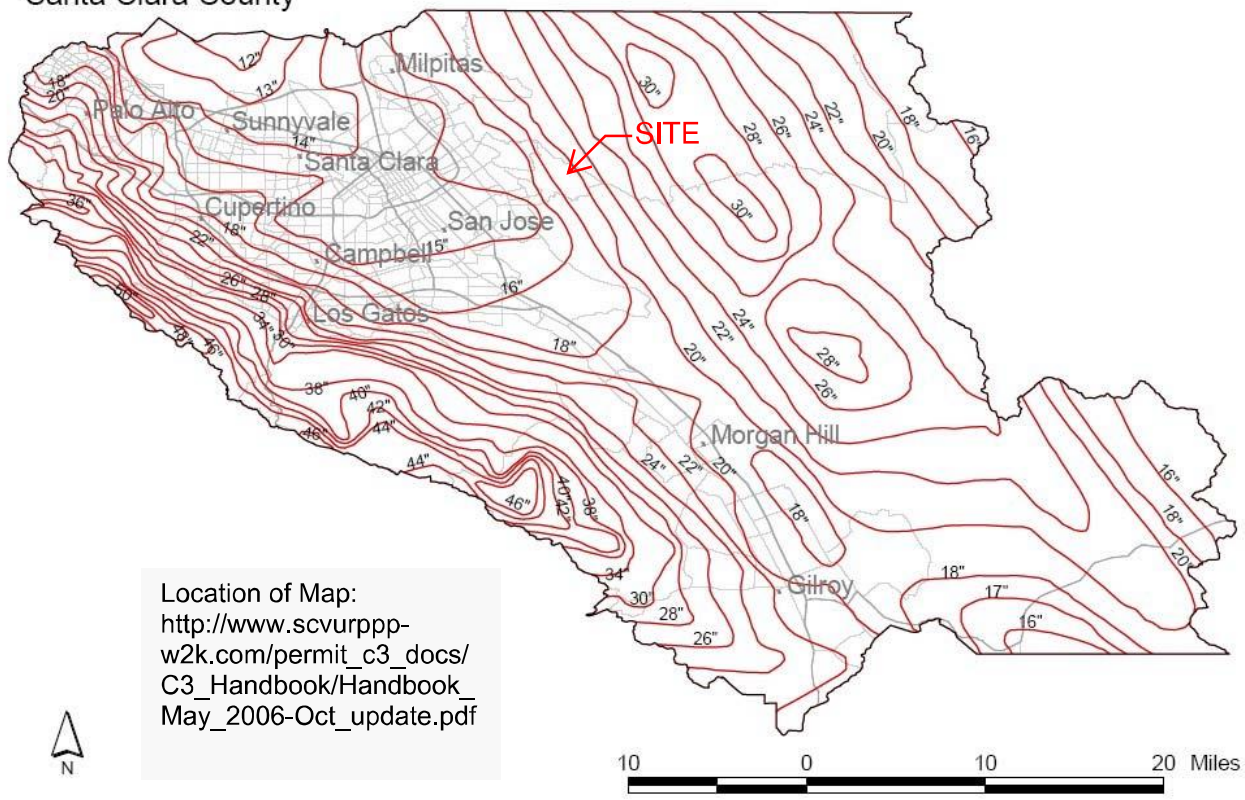
T	$A_{T,D}$	$B_{T,B}$	10-Yr Depth	Volume In	Volume Out	Storage
5-min	0.201876	0.002063	0.2473	461	106	355
10-min	0.258682	0.003569	0.3372	629	212	416
15-min	0.294808	0.004710	0.3984	743	319	**424**
30-min	0.367861	0.007879	0.5412	1009	637	372
1-hr	0.427723	0.014802	0.7534	1405	1274	130
2-hr	0.522608	0.027457	1.1267	2101	2548	-448
3-hr	0.591660	0.038944	1.4484	2700	3822	-1122
6-hr	0.625054	0.070715	2.1808	4066	7645	-3579
12-hr	0.641638	0.111660	3.0982	5776	15289	-9513

10 year - Peak Runoff Rate: CIA = 0.5578 cfs

Future Conditons **6245** sf

Proposed C	% Area			
Roof/Driveway	16.22%	0.85		
Landscape	83.78%	0.35	**0.4311**	**0.58**

Figure A-2
Mean Annual Precipitation Map
Santa Clara County



SOURCE: Santa Clara Valley Water District, Mean Annual Precipitation Map, San Francisco & Monterey Bay Region, 1998

Figure A-2: Mean Annual Precipitation, Santa Clara County

BELGARD®

TRAFFIC LOADING CALCULATION EXAMPLE

The following calculations demonstrate that Belgard permeable interlocking concrete pavement systems satisfy the requirements of meeting or exceeding a 75,000 lb theoretical design load as compared to the required compressive strength of pavers per the requirements in *ASTM C936 Standard Specification for Solid Concrete Interlocking Paving Units (average compressive strength of 8,000 psi).*

(see attached document for additional information on GVWR, Tire Contact Area, Axle Load Distribution, and Contact Area Pressure Calculations)

Step #1) Determine the maximum wheel load:

GVWR = 76,800 lbs
GAWR (front axle) = 22,800 lbs
GAWR (rear axle) = 54,000 lbs

Front Axle Wheel Loads
W_L = 22,800 lb/ 2 tires per axle = 11,400 lbs per tire

Rear Axle Wheel Loads
W_L = 54,000 lb/ 2 axles/4 tires per axle = 6,750 lbs per tire

Step #2) Increase the load by 30% to account for dynamic forces associated with moving vehicles:

Front Axle: $W_{L\text{-Dynamic}}$ = 11,400 lbs x 1.30 = 14,820 lbs per tire
Rear Axle: $W_{L\text{-Dynamic}}$ = 6,750 lbs x 1.30 = 8,775 lbs per tire

Step #3) Determine the tire contact area:

The Contact Area was measured for a Pierce Fire Truck (GVWR = 76,800 lbs) and was determined to be 104 in^2 per front tire, and 90 in^2 per rear tire. (See measurements in the attached document)

Step #4) Determine the stress exerted per tire in the dynamic load:

$$\sigma_{\text{tire}} = \frac{W_{\text{L-dynamic}}}{A_{\text{contact}}} = \frac{14{,}820\ lbs}{104\ in^2} = 142.5\ \frac{lbs}{in^2}$$

Step # 5) Compare Belgard PICP to GVWR = 76,800 lbs:

Belgard permeable interlocking concrete pavers are manufactured to ASTM C936 standards requiring an average compressive strength of 8,000 psi. As illustrated above, the maximum theoretical tire pressure exerted on the pavement surface is 142.50 psi so stresses are effectively transferred to the base and subgrade using Belgard permeable pavers. This significant factor of safety makes Belgard permeable pavers viable solution for a flexible pavement system subjected to Fire Truck Loading.

Design Considerations for
Concrete Paver Surfaced Access Lanes
Subjected to Fire Truck Loading
January 25, 2018

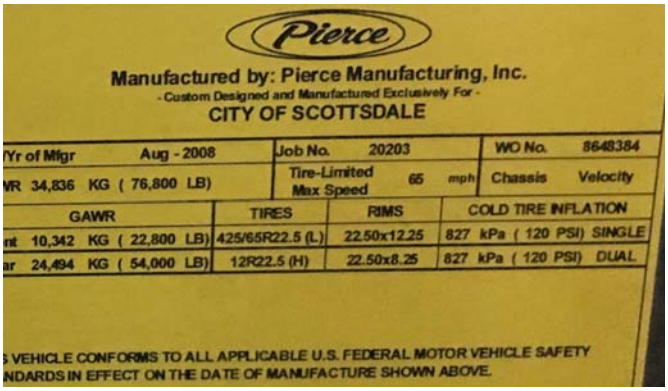
A common question posed by design professionals is the ability of interlocking concrete pavers (ICPs) and permeable interlocking concrete pavers (PICPs) to withstand fire truck loading. This is due to the relatively large axle weights they exert along with the fact that fire trucks are critical service vehicles that must be able to access sites in emergency situations. As with other heavily loaded vehicles, like trash trucks and some delivery vehicles, fire trucks typically exhibit relatively large axle loads which apply critically high service loads for which pavements must be designed.

In terms of structural design for entry, access lane and roadway applications, pavements must be designed to resist rutting, bearing capacity of the supporting pavement system and resistance to repeated axle load applications. Pavement design procedures typically utilize information which describe the strength of the subgrade soils, axle loadings and frequency, and strength of the various layered pavement components. The actual design procedures for flexible and rigid pavements are well documented in Civil Engineering texts with ICPs & PICPs well recognized to behave and follow the design procedures set forth for “flexible” pavement design. References for ICP and PICP pavement design are provided in the Appendix to this report (ASCE 2016, Caltrans 2016, ICPI 2011, UC Davis 2010).

While not a comprehensive primer on pavement design, the focus of this report is to demonstrate that ICP and PICPs are not adversely affected by heavily loaded vehicles and are suitable for use in vehicular areas exposed to fire truck loadings. The primary discussion herein will focus on fire truck loadings on ICP/PICP systems as they relate to:

- Design ESALs applied to the pavement system.
- Fire truck wheel and axle loads relative to the strength of the paver
- Point loads that may occur when the stabilizer outriggers are in place.

Because this document focuses on fire truck loading, data on a typical heavily loaded fire truck was obtained for a “ladder truck” used by the City of Scottsdale, AZ. The vehicle chosen was the heaviest vehicle in the Fire Departments fleet and is considered to be on the upper end of the fire vehicle loading spectrum. A few images of the vehicle and its characteristics are provided below:



City of Scottsdale AZ Ladder Engine

Pierce Manufacturing ID Decal; GVWR - 76,800 lbs
GAWR – Front=22,800 lbs = 11,400 lbs/tire:
GAWR - Rear=54,000 lbs = 27,000 lbs/axle; 6750 lbs/tire
Cold Tire Inflation Pressure – 120 psi (single and dual)
Max Load per Single Tire – 11,400 lbs

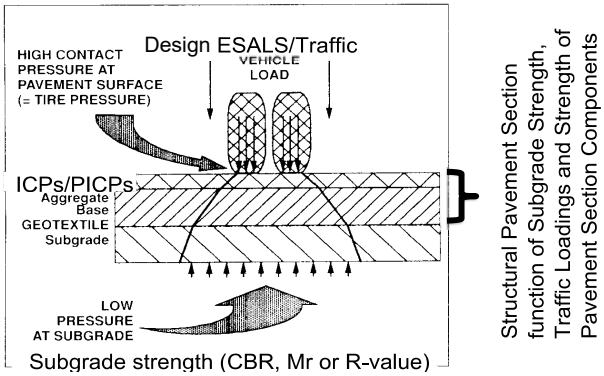
Approximate Front Tire Contact Area = 13” x 8” = 104 in2
Max Load / Tire at 120 psi cold = 11,400 lbs = 95 in^2 minimum contact area

Tire Contact Area = 10” x 9” = 90 sq. in./tire
GAWR Rear = 54,000 lb/2=27,000 lbs=Single Axle Load
Load per Dual set of Tires = 27,000 lbs/4 tires = 6750 lbs
Contact pressure is approximately = 75 psi

DESIGN ESALS

Design references have been developed by several credible organizations including ASCE, ICPI and Caltrans as shown below. In almost all cases, the design guidelines for the structural aspects of the pavements are based on the *1993 AASHTO Guide for Design of Pavement Structures* (AASHTO 1993). As with the design references for ICP and PICPs, the 1993 AASHTO document

calculates the thickness of a roadway cross section required to withstand the applied loads for the given lifespan based on the native soils strength and traffic loading. The supporting soil strength is typically described by a CBR value (California Bearing Ratio), M_r (Resilient Modulus), R-value or some other geotechnical measurement describing the strength of the supporting soil. The traffic loading is typically described by TI (Traffic Index), ESALs (Equivalent Single Axle Loads) or other measurement to express the traffic type and equivalent damage (VLF, Vehicle Load Factor) created by each type of vehicle as compared to the passage of a "standard" 18,000-pound axle load (one 18,000 lb ESAL provides a unit value of 1.0). For perspective on ESALS, passenger cars have a Vehicle Load Factor (VLF) of 0.0004 whereas a fully loaded fire truck as shown above would have a VLF of about 7.0. Hence, it would take about 17,500 autos to effect the same level of deterioration on the pavement as 1 pass of a fire truck. It should be noted that not all fire trucks exhibit this same degradational effect on pavements as most are lighter and exhibit lower axle loads than the Ladder Truck which has a GVWR (Gross Vehicle Weight Rating) of 76,800 lbs.



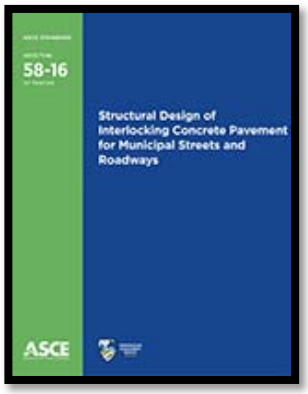
Although it is evident by the VLFs shown above that fire trucks can exert high ESALs on the pavement surface, it is important to note that roads are designed around hundreds of thousands, if not millions of ESALS, so the impact of the occasional fire truck is actually marginal. Notable in the design procedure is that the axle/tire loads applied to the completed pavement system is transferred through the pavement to the subgrade via a series of structural layers which distribute the vehicle loads to a relatively large area of the subgrade. The distribution of the loads through the pavement system enables relatively weak subgrades to support very high concentrated axle/wheel loads much like a snowshoe for a trapper or wide tracks of low ground pressure vehicles to traverse low strength materials which would otherwise not support the weight of applied loads. Along those same lines, pavement design isn't so much about how much a vehicle weighs but rather the load transfer of axle loads through the pavement system and how many passes can be achieved prior to development of unacceptable rutting or excessive pavement deterioration.

To further expand on this subject, pavement sections for standard asphaltic concrete (AC) and aggregate base systems and interlocking concrete pavement (ICP) systems are essentially identical in thickness with the wearing course being the primary difference in the systems. In essence, an 80mm (3-1/8") thick paver laid on 1" of bedding sand provides a layer coefficient of 1.82 which is the same as 4-1/8" of asphaltic concrete having a structural coefficient of 0.44/inch (0.44 x 4-1/8 = 1.82). The aggregate base and subbase section used to distribute the wearing course loads provide the same support to either an AC or ICP system. The above analogy can be verified by comparing section thicknesses for designs done in accordance with AASHTO (AASHTO 1993) and ICPI (ICPI 2011) or ASCE (ASCE 2016) methods.

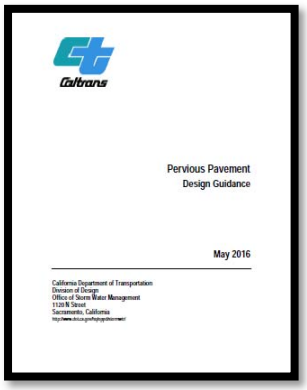
Permeable Interlocking Concrete Pavement systems (PICPs) employ essentially the same wearing surface (typically an 80mm paver underlain by 2" of No. 8 stone) and open graded load transfer/water storage/conveyance layer aggregate (No. 57 and No. 2 stone). Because of the introduction of water and the somewhat less dense structure of the base layers, a somewhat lower

structural coefficient is employed for the components that make up the PICP system than what is used for conventional ICP systems but the design concept is identical.

ICPI – Permeable Interlocking Concrete Pavements



ASCE 58-16 – Structural Design of Interlocking Concrete Pavement for Municipal Streets and Roadways



Caltrans – Porous Pavement Design Guidance

TIRE CONTACT PRESSURES

In terms of being able to withstand the surface pressure exerted by fire truck tires, the gross axle weight rating(GAWR) on a two tire (steering) axle and tandem axle (rear axles) for the 76,800 lb fire truck referenced above is 22,800 lbs and 54,000 lbs, respectively. Each tire is rated at a max load rating of 11,400 lbs at a cold inflation tire pressure of 120 psi. Checking the expected contact area between the pavement and tire yields 11,400 lb/120 psi = 95 in^2 minimum contact area for the front tires. Physical measurements of the actual tire/pavement contact area are shown in the images above and results in an area of about 13" x 8" = 104 in^2 which is within tolerance of the measurement methods employed. Likewise, the measured contact area of the rear tires was determined to be about 10" x 9" = 90 in^2 for each tire or about 90 in^2/tire x 8 tires = 720 in^2 to support 54,000 lb rear axle load resulting in a tire bearing pressure on the pavement of 75 psi. The 75 psi pressure as measured in the fire station bay suggests that the truck was not fully loaded and hence not exerting the full 120 psi pressure of the tire rating. Based on the above, it can be concluded that the 120 psi contact pressure of the tires is reasonable for both front and back tires.

Any concrete paver offered under the Belgard line is made in accordance with ASTM C936, which requires an average compressive strength of 8,000 psi with no individual unit being less than 7,200 psi. So, simply put, the pavers are on average 7200/120 = 60 times stronger in compression than required to withstand the surface pressure that would be exerted under the extreme loading conditions imposed by fire truck traffic.

POINT LOADS

When the stabilizer outriggers are in place, a point load of as much as 45,000 pounds can be applied to the pavement surface. Although significant, when distributed over an "unfactored" stabilizer plate surface area of 0.97 square feet (area of 10x14 inches), this equates to a surface pressure of 322 psi, which again is well within the compressive strength capabilities of Belgard pavers.

PAVER DAMAGE

As a final thought, should one or more pavers become damaged, individual units can be removed and replaced without compromising the structural integrity of the system (instruction manual available upon request).

EXAMPLE PROJECTS

In order to demonstrate the acceptance of Belgard pavers in the local market, a sample list of **permeable interlocking concrete paver (PICP)** installations is provided. The list includes project from CA which are in fire access lanes and subject to heavy vehicle loadings. Similar lists are available for ICPs upon request.

Permeable Paver Installations Subject to Fire Truck Loading

- Shearwater Creek Townhomes 72,000 SF
  - Pujol St, Temecula / Entrances and interior streets – Fire Truck rated
- Villa Catalina Condos 4,100 SF
  - 616 Catalina Ave, Redondo Beach – Entrance and shared motor courtyard – Fire truck rated
- Villa Catalina Condos 5,600 SF
  - 618 Catalina Ave, Redondo Beach – entrance and shared motor courtyard – Fire truck rated
- Hilton Garden Inn 5,700 SF
  - 4216 El Camino Real, Palo Alto – Entrance Fire truck rated
- Buffalo Wild Wings 7,900 SF
  - 845 East Ave, Chico – parking Fire truck rated
- Tahizzle Communities 7,600 SF
  - Truckee, Tahoe
- San Jose Downtown Health Center 12,000 SF
  - 777 E Santa Clara St, San Jose – Drive Entrance/Parking areas/Travel Lanes
- Wisdom Way 8,900 SF
  - 1898 Wisdom Way, Modesto – Parking Lot with Heavy Vehicle Access
- Avanti 64,000 SF
  - 23600 Park Sorrento Calabasas – Entrances and interior streets – Fire Truck rated
- Wren Avenue & Byer St. Pedestrian Crosswalk 9,000 SF
  - Wren Ave. & Byer St, Gilroy – Street crosswalks – Fire truck rated
- Vista Rio Apartments 46,000 SF
  - 3901 Briggs St, Jurupa Valley – Entrances and interior streets – Fire truck rated
- Siena Apartments 69,000 SF
  - 7801 Juniper Ave, Fontana – Entrances and interior streets – Fire truck rated.
- 4100 Del Rey Apartments 7,600 SF
  - 4100 Del Rey Ave, Marina Del Rey – Parking areas – Fire truck rated.
- Fountain Valley Town Center 6,500 SF
  - Fountain Valley – Parking/Fire Truck Rated
- Aldi Store #19 6,200 SF
  - 112 Lakewood Blvd, Downey – Parking Lot/Drive Entrances
- Chick Fil A Restaurant 3,200 SF

- 3771 E Thousand oaks Blvd, Thousand Oaks – Parking areas – Fire truck rated

- ColRich Camel Row 24,000 SF
  - Camel Country Rd & Camel Mtn. Rd, San Diego – Drive Entrances/Community Roadways – Fire Truck Rated
- San Leandro Tech Campus 10,000 SF
  - 1333 Martinez, San Leandro – Entrance to University Parking Lot/Parking Lot/Heavy Traffic/Entrance to Parking Garage
- Gateway Shopping Center / Sprouts Market 20,000 SF
  - 1300 Pinole Valley Rd, Pinole – Shopping Center Entrance/Parking/Drive Aisles
- Bardis Homes – 60,000 ft2
  - Sacramento, CA – Entrances, Streets all pavements through-out new residential development – Fire Truck Rated.
- Northwest Land Park – 90,000 ft2
  – Sacramento, CA – Community Entrances, streets and drive lanes of new housing development – Fire Truck Rated.
- Calvin Christian Church – 6,000 ft2
  – Escondido – Fire Lane access to rear of building.

REFERENCES

AASHTO 1993. Guide for Design of Pavement Structures, American Association of State Highway and Transportation Officials, Washington, DC.

ASCE 2016. Structural Design of Interlocking Concrete Pavement for Municipal Streets and Roadways, ASCE/T&DI/ICPI Standard 58-16, American Society of Civil Engineers, Reston , VA.

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ICPI 2011. Permeable Interlocking Concrete Pavements, Fourth Edition, interlocking Concrete Pavement Institute, Herndon, VA.

UC Davis 2010. Research Report – Laboratory Testing and Modeling for Structural Performance of Fully Permeable Pavements Under Heavy Traffic: Final Report, U.C. Davis, Department of Civil and Environmental Engineering (CTSW-RT-10-249.04), Davis, CA.