

Initial Study Attachment 1



County of Santa Cruz

MITIGATION MONITORING AND REPORTING PROGRAM for Application No. 181586

PLANNING DEPARTMENT

701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123

| No. | Mitigation Measures | Responsibility for Compliance | Method of Compliance | Timing of Compliance |
|-----------------------------|--|-------------------------------|--|---|
| Biological Resources | | | | |
| BIO-1 | <p>To minimize impacts to dusky-footed woodrat:</p> <ul style="list-style-type: none"> • At least two weeks prior to commencement of development activities (including tree removal), a qualified biologist shall survey the project disturbance area to confirm wood rat nest locations that may be affected by the proposed development. • Where dusky-footed woodrat houses are identified, disturbance of the species and their nests shall be avoided by creating a no disturbance buffer around the nests with high visibility fencing. • If dusky-footed woodrat houses are identified in the project disturbance area, and avoidance is not possible, County Environmental Planning staff shall be notified immediately, and the following conditions shall be adhered to: <ul style="list-style-type: none"> • Prior to nest disturbance, the biologist shall obtain from CDFW a scientific collection permit for the trapping of the dusky-footed wood rats. • Nests shall be disturbed/dismantled only during the non-breeding season, between October 1 and December 31. • Prior to nest disturbance, wood rats shall be trapped at dusk of the night set for relocation of the nest(s). • Any existing nest that may be disturbed by construction activities shall be mostly dismantled and the material spread in the vicinity of identified nest relocation site(s). • In order to avoid the potential health effects associated with handling rodents and their milieu, all workers involved in the handling of the wood rats or the nest materials should wear protective gear to prevent inhalation of contaminant particulates, contact with conjunctiva (eyes), and protection against flea bites; a respirator, eye protection and skin protection should all be used. • Dismantling shall be done by hand, allowing any animals not trapped to escape either along existing woodrat trails or toward other available habitat. • If a litter of young is found or suspected, nest material shall be replaced, and the nest left alone for 2-3 weeks before a recheck to verify that young are capable of independent survival before proceeding with nest dismantling. • Woody debris shall be collected from the area and relocated nests shall be partially constructed in an area determined by the qualified biologist to be both suitable for the wood rats and far enough away from the construction activities that they will not be impacted. • Rats that were collected at dusk shall be released hours before dawn near the newly constructed nests to allow time for rats to find refuge. | Applicant | Compliance monitored by the County Planning Department | During construction and site grading operations |
| BIO-2 | <p>To minimize impacts to nesting birds:</p> <ul style="list-style-type: none"> • If removal of vegetation, grading activity, or other use of heavy equipment begins outside the February 1 | Applicant | Compliance monitored by the County Planning | During construction and site |

| No. | Mitigation Measures | Responsibility for Compliance | Method of Compliance | Timing of Compliance |
|--------------|---|-------------------------------|--|---|
| | <p>to August 31 breeding season, there will be no need to conduct a preconstruction survey for active nests.</p> <ul style="list-style-type: none"> • Trees intended for removal shall be removed during the period of September 1st through January 31st, in order to avoid the nesting season. • If removal of vegetation, grading activity, or other use of heavy equipment is to commence between February 1st and August 31st, a survey for active bird nests shall be conducted by a qualified biologist within 15 days prior to the start of such activity. The survey area shall include the project area, and a survey radius around the project area of 50 feet for MBTA birds and 250 feet for birds of prey. • If no active nest of a bird of prey or MBTA bird is found then no further avoidance and minimization measures are necessary. • If active nest(s) of MBTA birds or birds of prey are found in the survey area, an avoidance buffer of 50 feet for MBTA birds and 250 feet for birds of prey shall be established around the active nest(s). The biologist shall monitor the nest, and advise the applicant when all young have fledged the nest. Removal of vegetation, grading activity, or other use of heavy equipment may begin after fledging is complete. • If the biologist determines that a smaller avoidance buffer will provide adequate protection for nesting birds, a proposal for alternative avoidance/protective measures, potentially including a smaller avoidance buffer and construction monitoring, may be submitted to Environmental • Planning staff for review and approval prior to removal of vegetation, grading activity, or other use of heavy equipment. • If removal of vegetation, grading activity, or other use of heavy equipment stops for more than two weeks during the nesting season (February 1st - August 31st) a new survey shall be conducted prior to re-commencement of construction. | | Department | grading operations |
| BIO-3 | <p>To minimize impacts to oak woodlands and riparian woodland habitat:</p> <ul style="list-style-type: none"> • There are existing greenhouse structures and paving located within the 50-foot riparian buffer zone. These structures shall be removed and the natural soil substrate re-habilitated prior to installing replacement plantings in accordance with the with the Restoration Planting Plan outlined below. • The Tree Protection Guidelines and Restrictions in Appendix G of the attached Arborist Report shall be adhered to. • No work (other than demolition of existing improvements and restoration of riparian habitat) shall occur within areas identified as riparian woodland habitat. • Prior to construction, high visibility construction fencing or flagging shall be installed around the limits of disturbance to prevent inadvertent grading or other disturbance within the surrounding sensitive habitats. No work-related activity including equipment staging, vehicular access, grading, and vegetation removal shall be allowed outside of the limits of work. • No excess soil, chemicals, debris, equipment or other materials shall be stored outside the designated limits of work. • Upon project completion, areas of exposed soil shall be re-vegetated with locally native erosion control species. Non-native grasses or forbs may not be used for erosion control. • Tree removal shall be limited to those depicted in the Arborist Report. Trees to be retained that are located adjacent to construction shall be protected in accordance with the Tree Protection Guidelines and Restrictions in Appendix G of the Arborist Report. • Implementation of standard erosion control best management practices and riparian habitat protection measures shall be adhered to prior, during, and after the construction period to minimize impacts to the | Applicant | Compliance monitored by the County Planning Department | During construction and site grading operations |

| No. | Mitigation Measures | Responsibility for Compliance | Method of Compliance | Timing of Compliance |
|--------------|--|-------------------------------|--|---|
| | <p>intermittent drainage.</p> <ul style="list-style-type: none"> The applicant shall install a low split-rail type fence or other permanent barrier between the retained woodlands (and oak woodland mitigation areas) and the residential development. | | | |
| BIO-4 | <p>To compensate for impacts resulting from removal of, or damage to, native trees within oak woodlands:</p> <ul style="list-style-type: none"> All permanently impacted areas of oak woodland habitat shall be compensated for at a 2:1 replacement ratio by creating oak woodland habitat in designated mitigation areas on site. All native oak trees removed or damaged during construction shall be replaced in-kind at a minimum 2:1 replacement ratio within designated oak woodland mitigation areas on site. Additional restoration plantings shall occur at sizes and ratios determined by the restoration specialist to establish 2:1 replacement of oak woodland habitat while maximizing plant health and survivability of individual trees and shrubs. A final Restoration Planting Plan shall be prepared by a certified arborist, or restoration professional and submitted to Environmental Planning staff for approval prior to implementation. The approved Restoration Planting Plan shall be implemented prior to final building inspection and shall include the following minimum elements: <ul style="list-style-type: none"> Establishment of designated oak woodland mitigation area(s) on site to achieve a 2:1 habitat replacement ratio. Methods for rehabilitating soil substrate in areas identified for oak woodland restoration that were previously covered in asphalt or other development. Species, size and locations of all trees intended for removal. Species, size and locations of all trees and shrubs being planted. Information regarding the methods of irrigation for replacement plantings. 5-year management plan for maintenance and monitoring of restored areas to maintain 100% survival of installed container stock in years 1-3, and at least 80% survival in years 4-5. Replacement plants shall be installed as needed during the monitoring period to meet survival rates. Annual reports shall be submitted to the County Planning Department by December 31 of each monitoring year. A management strategy to control cover of target invasive weeds (e.g., thistles, Cape ivy, calla lily, and others) to less than 5% each year. Prior to final building inspection approval, planting of oak woodland mitigation area(s) shall be inspected and approved by Environmental Planning staff. | Applicant | Compliance monitored by the County Planning Department | During construction and site grading operations |

Initial Study Attachment 2

TENTATIVE IMPROVEMENT PLANS

3300 MAPLETHORPE LANE SOQUEL, CALIFORNIA 95060

APN: 037-121-60

CIVIL SHEET INDEX

- 00.1 - COVER SHEET
- 00.2 - LOT LINE ADJUSTMENT EXHIBIT
- 00.3 - TENTATIVE MAP
- C1.1 - EXISTING SITE/DEMOLITION PLAN
- C2.1 - HORIZONTAL CONTROL PLAN
- C3.1 - GRADING PLAN
- C4.1 - UTILITY PLAN
- C5.1 - FIRE SUPPRESSION/WATER PLAN
- C6.1 - STORMWATER MANAGEMENT PLAN
- C7.1 - EROSION CONTROL PLAN
- C7.2 - EROSION CONTROL DETAILS
- C8.1 - DETAILS
- C8.2 - DETAILS
- C8.3 - DETAILS
- C8.4 - DETAILS

CIVIL ENGINEER:

C2G/CIVIL CONSULTANTS GROUP, INC.
4444 SCOTT'S VALLEY DRIVE, STE. 6
SCOTT'S VALLEY, CA 95066
831.438.4420

GEOTECHNICAL:

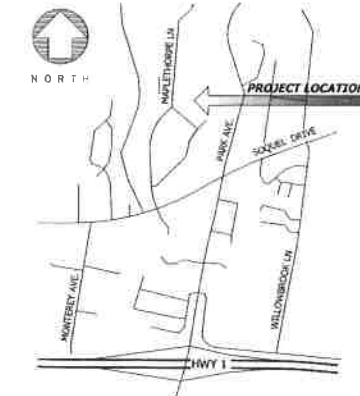
DEES & ASSOCIATES
501 MISSION STREET, SUITE 8A
SANTA CRUZ, CA 95060
831.427.1770

SURVEYOR:

ALPHA SURVEY
4444 SCOTT'S VALLEY DRIVE
SCOTT'S VALLEY, CA 95066
831.438.4420

ARBORIST:

KURT FOOTS
ARBORIST CONSULTANT
826 MONTEREY AVENUE
CAPITOLA, CA 95010
831.359.3607
kurtfoots@outlook.com



VICINITY MAP
SCALE: NTS

CONTRACTOR RESPONSIBILITY

CONTRACTOR AGREES THAT HE SHOULD ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY, DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, AND THAT REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED DURING WORKING HOURS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND THE DESIGN PROFESSIONALS HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR DESIGN PROFESSIONAL.

DISCREPANCIES

IF THERE ARE ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND EXISTING CONDITIONS WHICH WILL AFFECT THE WORK, THE CONTRACTOR SHALL BRING SUCH DISCREPANCIES TO THE DESIGN PROFESSIONAL FOR ADJUSTMENT BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER FITTING OF ALL WORK AND FOR THE COORDINATION OF ALL TRADES, SUBCONTRACTORS, AND PERSONS ENGAGED UPON THIS CONTRACT.

EROSION CONTROL NOTE

- IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE AND MAINTAIN EROSION CONTROL MEASURES AS REQUIRED THROUGHOUT THE LIFE OF THE PROJECT IN CONFORMANCE WITH THE CITY OF SCOTT'S VALLEY AND THE ASSOCIATION OF BAY AREA GOVERNMENTS.
- CONTRACTOR TO PROVIDE BACK-UP EROSION PREVENTION MEASURES (SOIL STABILIZATION) WITH SEDIMENT CONTROL MEASURES SUCH AS STRAW WATTLES, SILT FENCE, GRAVEL INLET FILTERS, AND/OR SEDIMENT TRAPS OR BASINS. ENSURE CONTROL MEASURES ARE ADEQUATE, IN PLACE, AND IN OPERABLE CONDITIONS. SEDIMENT CONTROLS, INCLUDING INLET PROTECTION, ARE NECESSARY BUT SHOULD BE A SECONDARY DEFENSE BEHIND GOOD EROSION CONTROL MEASURES.
- ALL EROSION PREVENTION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED AND REPAIRED THROUGHOUT THE SEASON. REPLACEMENT SUPPLIES SHOULD BE KEPT ON SITE.
- SITE INSPECTIONS SHALL BE CONDUCTED BEFORE AND AFTER EACH STORM EVENT, AND EVERY 24 HOURS FOR EXTENDED STORM EVENTS, TO IDENTIFY AREAS THAT CONTRIBUTE TO EROSION AND SEDIMENT PROBLEMS OR ANY OTHER POLLUTANT DISCHARGES. IF ADDITIONAL MEASURES ARE NEEDED, REVISE THE EROSION CONTROL PLAN AND IMPLEMENT THE MEASURES IMMEDIATELY. DOCUMENT ALL INSPECTION FINDINGS AND ACTIONS TAKEN.
- CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICES DURING CONSTRUCTION FOR CONTROL OF STORM WATER RUNOFF (E.G. GRAVEL BAGS AT CATCH BASIN INLETS).

NOTE:

CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS. CALL USA (800) 227-2600. CONTRACTOR TO NOTIFY ENGINEER OF ANY APPARENT CONFLICTS FOR RESOLUTION PRIOR TO START OF CONSTRUCTION.

GENERAL NOTES

- NO CHANGE TO THE PLANS SHALL BE PERMITTED WITHOUT PRIOR WRITTEN APPROVAL BY THE OWNER OR OWNERS REPRESENTATIVES AND THE CITY OF SANTA CRUZ.
- CONTRACTOR SHALL VERIFY LOCATIONS, ELEVATIONS AND INVERTS OF EXISTING UTILITY PRIOR TO COMMENCEMENT OF WORK AND SHALL NOTIFY OWNER OR OWNERS REPRESENTATIVES OF VARIANCE FROM THOSE SHOWN ON THE PLANS.
- UNDERGROUND FACILITIES AND UTILITIES HAVE BEEN SHOWN BASED ON RECORD DRAWINGS AND VISIBLE EVIDENCE FOUND IN FIELD. NO WARRANTY IS MADE REGARDING THE COMPLETENESS OR ACCURACY OF SUCH INFORMATION. PRIOR TO CONSTRUCTION, DETERMINE THE EXACT LOCATION OF UNDERGROUND FACILITIES AND UTILITIES, AND PRESERVE SAME FROM DAMAGE. PRIOR TO CONSTRUCTION, VERIFY LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AT THE CROSSING POINTS WITH PROPOSED UTILITIES. THE CONTRACTOR SHALL NOTIFY THE OWNER OR OWNERS REPRESENTATIVES IF CONDITIONS DIFFER FROM THOSE SHOWN ON THE DRAWINGS AND SHALL NOT BEGIN CONSTRUCTION UNTIL THE CHANGE CONDITION HAS BEEN EVALUATED. CONTACT UNDERGROUND SERVICES ALERT (USA) (1-800-227-2600) TWO (2) WORKING DAYS PRIOR TO DIGGING. REPAIR UNDERGROUND UTILITIES DAMAGED BY CONSTRUCTION OPERATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL DAMAGES ASSOCIATED WITH CONTRACTOR'S FAILURE TO EXACTLY LOCATED AND PRESERVE UNDERGROUND FACILITIES AND UTILITIES.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION WITH THE APPROPRIATE UTILITY COMPANIES AND/OR AGENCIES TO VERIFY THE EXISTENCE AND/OR LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO COMMENCEMENT OF WORK. AND SHALL NOTIFY U.S.A. @ (800) 227-2600 AT LEAST 48 HOURS IN ADVANCE OF EXCAVATION.
- IF ANY INDICATIONS OF ARCHEOLOGICAL REMAINS ARE ENCOUNTERED DURING GRADING ACTIVITIES FOR ANY DEVELOPMENT WITHIN THE PROJECT SITE, ALL WORK SHALL BE HALTED WITHIN 200 FOOT RADIUS OF THE FIND. OWNER SHALL RETAIN A QUALIFIED ARCHEOLOGIST RETAINED TO DETERMINE THE NATURE OF THE DISCOVERY AND RECOMMEND APPROPRIATE EVALUATION PROCEDURES.

CONSTRUCTION SURVEYING / STAKING

CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL SURVEYING AND OR STAKING BY A LICENSED SURVEYOR FOR ALL CONSTRUCTION PURPOSES.

GENERAL UTILITY NOTE:

THE SANITARY SEWER SYSTEM IS PRIVATE, SUBJECT TO REQUIREMENTS OF THE SANTA CRUZ COUNTY SANITATION DISTRICT. REFER TO THE HOME OWNERS' ASSOCIATION DOCUMENTS, INCLUDING COARS FOR MAINTENANCE REQUIREMENTS FOR SANITARY SEWER SYSTEM.

UNAUTHORIZED CHANGES AND USES

CAUTION: THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THE PLANS.

THE WITHIN PLANS ARE COPYRIGHTED AS AN UNPUBLISHED WORK BY C2G/CIVIL CONSULTANTS GROUP, INC. ALL IDEAS, DESIGNS, ARRANGEMENTS AND PLANS INDICATED OR REPRESENTED BY THESE DRAWINGS ARE OWNED BY, AND THE PROPERTY OF C2G/CIVIL CONSULTANTS GROUP, INC. AND WERE CREATED, EVOLVED AND DEVELOPED FOR USE ON, AND IN CONNECTION WITH, THE SPECIFIED PROJECT. NONE OF SUCH IDEAS, DESIGNS, ARRANGEMENTS OR PLANS SHALL BE USED BY OR DISCLOSED TO ANY PERSON, FIRM OR CORPORATION FOR ANY PURPOSE WHATSOEVER WITHOUT THE WRITTEN PERMISSION OF C2G/CIVIL CONSULTANTS GROUP, INC.

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PROJECT DATUM

ELEVATIONS ARE DERIVED FROM A GPS OBSERVATION AND BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). THEY ARE NOT TIED TO A PUBLISHED BENCHMARK ON SAID DATUM.

UTILITY PROVIDERS

WATER: SOQUEL CREEK WATER DISTRICT
GAS AND ELECTRIC: PACIFIC GAS AND ELECTRIC
SANITARY SEWER: SANTA CRUZ COUNTY SANITATION DISTRICT
STORM DRAIN SYSTEM: CITY OF SANTA CRUZ

GEOTECHNICAL NOTE

"GEOTECHNICAL INVESTIGATION" FOR PROPOSED 12-LOT SUBDIVISION 3300 MAPLETHORPE LANE SOQUEL, CA 95060 APN# 037-121-60

PROJECT NUMBER SCR-1183

DECEMBER 2017

PREPARED BY:

DEES & ASSOCIATES, INC.
GEOTECHNICAL ENGINEERS
501 MISSION STREET SUITE 8A
SANTA CRUZ, CA 95060
831.427.1770

ABBREVIATIONS

| | |
|--------|-------------------------------|
| AS | AGGREGATE BASE |
| AC | ASPHALT CONCRETE |
| BFC | BOTTOM FACE OF CURB |
| BFS | BOTTOM FACE OF STEP |
| B/STEP | BOTTOM FACE OF STEP |
| BFW | BOTTOM FACE OF WALL |
| BW | BACK OF WALL |
| BFP | BACKFLOW PREVENTER |
| E | ELECTRICAL (P&E) |
| (E) | EXISTING |
| EP | EDGE OF PAVEMENT |
| CB | CATCH BASIN |
| FH | FIRE HYDRANT |
| FL | FLOW LINE |
| FG | FINISHED GROUND |
| FS | FINISHED SURFACE |
| G | GAS |
| GV | GATE VALVE |
| HYD | HYDRANT |
| HE | MATCH EXISTING OVERHEAD LINES |
| OH | OVERHEAD |
| POC | POINT OF CONNECTION |
| SS | SANITARY SEWER |
| SSCO | SANITARY SEWER CLEAN OUT |
| SD | STORM DRAIN |
| SDDI | STORM DRAIN DROP INLET |
| STA | STATION |
| TC | TOP OF CURB |
| T/STEP | TOP OF STEP |
| SW | TOP OF SIDEWALK |
| W | WATER |
| WM | WATER METER |
| WV | WATER VALVE |

LEGEND

| PROPOSED | EXISTING | DESCRIPTION |
|----------|----------|---------------------------------|
| | | STORM MANHOLE |
| | | DRAIN/DROP INLET |
| | | AREA DRAIN |
| | | SEWER MANHOLE |
| | | GATE VALVE |
| | | UTILITY POLE |
| | | SEWER LATERAL |
| | | WET UTILITY POINT OF CONNECTION |
| | | WATER SERVICE & WATER METER |
| | | FIRE HYDRANT |
| | | CLEAN OUT |
| | | STORM DRAIN |
| | | SANITARY SEWER |
| | | WATER MAIN |
| | | ELECTRICAL |
| | | FIRE SUPPRESSION |
| | | JOINT TRENCH |
| | | PROPERTY LINE |
| | | CENTER LINE |
| | | CONTOURS |
| | | OVERLAND RELEASE |
| | | VALLEY GUTTER |
| | | RETAINING WALL |

| REVISIONS | BY |
|-----------------------------------|----|
| 1. COUNTY COMMENTS DATED 12/11/18 | DD |
| 2. COUNTY COMMENTS DATED 04/04/19 | DD |

COVER

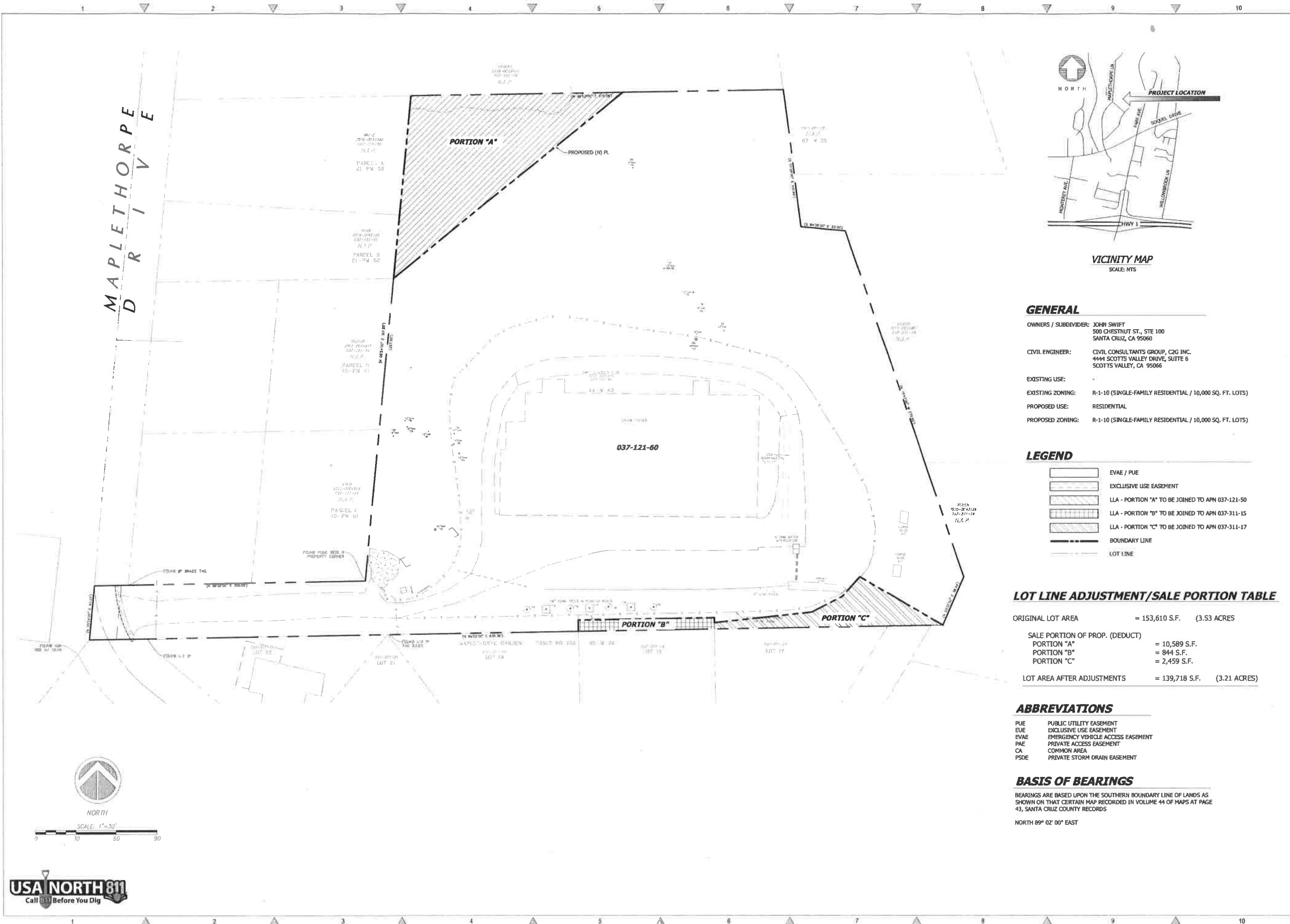
C2G CIVIL CONSULTANTS GROUP, INC.
Engineers/Planners
4444 Scott's Valley Drive / Suite 6
Scott's Valley, CA 95066
T (831) 438-4420 F (831) 438-4420

TRACT 1609
3300 MAPLETHORPE LANE
SOQUEL, CA
APN: 037-121-60

| | |
|--------------|----------|
| Date: | 12.18.18 |
| Scale: | 1" = 50' |
| Drawn: | DD/JB |
| Job: | 480-00 |
| Sheet: | C0.1 |
| Of 15 Sheets | |

PRELIMINARY - NOT FOR CONSTRUCTION





VICINITY MAP
SCALE: NTS

GENERAL

OWNERS / SUBDIVIDER: JOHN SWIFT
500 CHESTNUT ST., STE 100
SANTA CRUZ, CA 95060

CIVIL ENGINEER: CIVIL CONSULTANTS GROUP, C2G INC.
4444 SCOTT VALLEY DRIVE, SUITE 6
SCOTT VALLEY, CA 95066

EXISTING USE: -

EXISTING ZONING: R-1-10 (SINGLE-FAMILY RESIDENTIAL / 10,000 SQ. FT. LOTS)

PROPOSED USE: RESIDENTIAL

PROPOSED ZONING: R-1-10 (SINGLE-FAMILY RESIDENTIAL / 10,000 SQ. FT. LOTS)

LEGEND

- E/A/E / P/E
- EXCLUSIVE USE EASEMENT
- LLA - PORTION "A" TO BE JOINED TO APN 037-121-50
- LLA - PORTION "B" TO BE JOINED TO APN 037-311-15
- LLA - PORTION "C" TO BE JOINED TO APN 037-311-17
- BOUNDARY LINE
- LOT LINE

LOT LINE ADJUSTMENT/SALE PORTION TABLE

| | | |
|--------------------------------|----------------|--------------|
| ORIGINAL LOT AREA | = 153,610 S.F. | (3.53 ACRES) |
| SALE PORTION OF PROP. (DEDUCT) | | |
| PORTION "A" | = 10,589 S.F. | |
| PORTION "B" | = 844 S.F. | |
| PORTION "C" | = 2,459 S.F. | |
| LOT AREA AFTER ADJUSTMENTS | = 139,718 S.F. | (3.21 ACRES) |

ABBREVIATIONS

- PUE PUBLIC UTILITY EASEMENT
- EUE EXCLUSIVE USE EASEMENT
- EVAE EMERGENCY VEHICLE ACCESS EASEMENT
- PAE PRIVATE ACCESS EASEMENT
- CA COMMON AREA
- PSDE PRIVATE STORM DRAIN EASEMENT

BASIS OF BEARINGS

BEARINGS ARE BASED UPON THE SOUTHERN BOUNDARY LINE OF LANDS AS SHOWN ON THAT CERTAIN MAP RECORDED IN VOLUME 44 OF MAPS AT PAGE 43, SANTA CRUZ COUNTY RECORDS

NORTH 89° 02' 00" EAST

| REVISIONS | BY |
|--------------------------------|----|
| COUNTY COMMENTS DATED 12/21/18 | DD |
| COUNTY COMMENTS DATED 04/04/19 | DD |

LOT LINE ADJUSTMENT EXHIBIT

C2G / CIVIL CONSULTANTS GROUP, INC.
Engineers/Planners
3044 Scotts Valley Drive / Suite 6
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TRACT 1609 MAPLETHORPE LANE SOQUEL, CA APN: 037-121-60

Date: 12.18.18
Scale: 1" = 30'
Drawn: DD/JB
Job: 480-00
Sheet: **C0.2**
Of 15 Sheets





GENERAL

OWNERS / SUBDIVIDER: JOHN SWIFT
500 CHESTNUT ST., STE 100
SANTA CRUZ, CA 95060

CIVIL ENGINEER: CIVIL CONSULTANTS GROUP, C2G INC.
4444 SCOTTS VALLEY DRIVE, SUITE 6
SCOTTS VALLEY, CA 95066

SURVEYOR: ALPHA SURVEY
4444 SCOTTS VALLEY DRIVE
SCOTTS VALLEY, CA 95066
831.438.4420

EXISTING USE: R-1-10 (SINGLE-FAMILY RESIDENTIAL / 10,000 SQ. FT. LOTS)

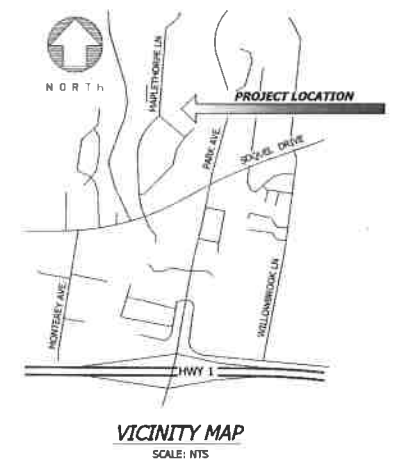
EXISTING ZONING: R-1-10 (SINGLE-FAMILY RESIDENTIAL / 10,000 SQ. FT. LOTS)

PROPOSED USE: RESIDENTIAL

PROPOSED ZONING: R-1-10 (SINGLE-FAMILY RESIDENTIAL / 10,000 SQ. FT. LOTS)

LEGEND

- RIPARIAN AREA
- EVAE / PUE
- EXCLUSIVE USE EASEMENT
- BOUNDARY LINE
- LDT LINE
- EASEMENT LINE



LOT DENSITY CALCULATIONS

| | | |
|--|-----------------------|------------------|
| TOTAL LOT AREA | = 139,718 S.F. | (3.21 ACRES) |
| NET DEVELOPABLE AREA | = 18,707 S.F. | |
| RIPARIAN AREA | = 3,915 S.F. | |
| 30% SLOPES OUTSIDE SALE AREAS & RIPARIAN | = 7,096 S.F. | |
| FLAG PORTION | = 7,096 S.F. | |
| TOTAL | = 110,000 S.F. | (2.53 ACRES) |
| DENSITY FOR R-1-10 | = 10,000 S.F. PER LOT | |
| 110,000 S.F. / 10,000 S.F. | = | 11.0 LOTS |

Planned Unit Development Standards

| Zoning Ord Standard | Lot 1 (Proposed) | Lot 2 (Proposed) | Lot 3 (Proposed) | Lot 4 (Proposed) | Lot 5 (Proposed) | Lot 6 (Proposed) | Lot 7 (Proposed) | Lot 8 (Proposed) | Lot 9 (Proposed) | Lot 10 (Proposed) | Lot 11 (Proposed) |
|-------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------------|-------------------|
| Lot Size | 4,744 sf | 4,911 sf | 3,218 sf | 3,218 sf | 3,824 sf | 3,448 sf | 3,218 sf | 3,218 sf | 4,367 sf | 2,892 sf | 2,682 sf |
| Lot Coverage | 24.8% | 23.9% | 34.5% | 34.5% | 30.8% | 34.2% | 34.5% | 27.5% | 38.5% | 37.3% | 40.2% |
| Floor Area Ratio | 0.50 | 0.456 | 0.44 | 0.63 | 0.63 | 0.565 | 0.63 | 0.63 | 0.456 | 0.576 | 0.643 |
| Front Setback | 20' | 10' | 16' | 8' | 8' | 8' | 12' | 8' | 10' | 8' | 3' |
| Side Setback | 10' | 14' & 15' | 8' & 15' | 5' & 5' | 5' & 5' | 5' & 10' | 6' & 9' | 5' & 5' | 13' & 6' | 5' & 9' | 5' & 4' |
| Corner Lot Side Setback | 20' | | | 5' | | | | 6' | | | |
| Rear Setback | 15' | 13' | 19' | 16' | 16' | 17' | 16' | 16' | 20' | 15' | 13' |

County Local Road Standards

| Zoning Ord Standard | Planned Unit Development Standards |
|-----------------------|---|
| 56' R/W | 24' wide access common area throughout development excluding access to Lot 9 |
| 36' Street | 20' street with 4' raised sidewalk (24' total) along entrance corridor serving entire project |
| Separated 4' Sidewalk | 20' street with integrated 4' sidewalk (24' total) along internal access drives demarcated by texture and color |
| | 12' driveway access to Lot 9 |

SURVEYOR'S STATEMENT

THE SUBJECT PROJECT SITE WAS SURVEYED (BOTH BOUNDARY AND TOPOGRAPHIC) BY ALPHA LAND SURVEYS, INC.

ELEVATION DATUM

ELEVATIONS ARE DERIVED FROM A GPS OBSERVATION AND BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88), THEY ARE NOT TIED TO A PUBLISHED BENCHMARK ON SAID DATUM.

BASIS OF BEARINGS

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NORTH 89° 02' 00" EAST

EASEMENT NOTES

THE AREA DESIGNATED AS EMERGENCY VEHICLE ACCESS EASEMENT (EVAE) IS FOR EMERGENCY VEHICLE ACCESS.

THE PRIVATE ACCESS EASEMENT (PAE) IS NOT DEDICATED FOR USE BY THE GENERAL PUBLIC, BUT IS FOR THE USE OF THE OWNERS OF PARCEL A FOR, BUT NOT LIMITED TO, ACCESS, INGRESS AND EGRESS.

THE PUBLIC UTILITY EASEMENT (PUE) IS DEDICATED FOR PUBLIC USE OF UTILITIES, INCLUDING ACCESS, CONSTRUCTION, INSTALLATION AND MAINTENANCE OF WORKS, IMPROVEMENTS AND THEIR APPURTENANCES FOR THE PURPOSES OF INSTALLATION AND MAINTENANCE OF PUBLIC UTILITY FACILITIES.

ABBREVIATIONS

| | |
|------|-----------------------------------|
| PUE | PUBLIC UTILITY EASEMENT |
| EUE | EXCLUSIVE USE EASEMENT |
| EVAE | EMERGENCY VEHICLE ACCESS EASEMENT |
| PAE | PRIVATE ACCESS EASEMENT |
| CA | COMMON AREA |
| PSDE | PRIVATE STORM DRAIN EASEMENT |

MAP REFERENCES

(A) 44-M-43
(B) 21-PM-52
(C) 40-PM-61
(D) DEED
(E) 65-M-74
(F) 87-M-35

PROJECT BENCHMARK

PROJECT BENCHMARK LOCATED WITHIN MAPLETHORPE DRIVE A GEAR INSIDE A ROAD MONUMENT BOX AT THE INTERSECTION OF COLLEEN WAY. ELEV. = 174.04'

COUNTY BENCHMARK

STD BRASS CAP STAMPED 'COUNTY OF SANTA CRUZ' AT THE INTERSECTION OF SOQUEL DR AND PORTER GULCH RD ON THE SWLY CONC. CURB MEDIAN PLANTER STRIP DIVIDER. NAVD ELEVATION: 172.1

| REVISIONS | BY |
|----------------------------------|----|
| 1 COUNTY COMMENTS DATED 12/21/18 | DD |
| 2 COUNTY COMMENTS DATED 04/04/19 | DD |

TENTATIVE MAP

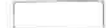



C2G / CIVIL CONSULTANTS GROUP, INC.
Engineers/Planners
4444 Scotts Valley Drive / Suite 6
SCOTTS VALLEY, CA 95066
T (831) 438-4420 F (831) 438-4420

TRACT 1609 MAPLETHORPE LANE SOQUEL, CA APN: 037-121-60

Date: 12.18.18
Scale: 1" = 30'
Drawn: DD/JB
Job: 480-00
Sheet: **C0.3**
Of 15 Sheets



LEGEND

-  EXISTING AC TO REMAIN
-  EXISTING AC TO BE REMOVED
-  EXISTING CONCRETE TO REMAIN
-  EXISTING CONCRETE TO BE REMOVED

GENERAL NOTES

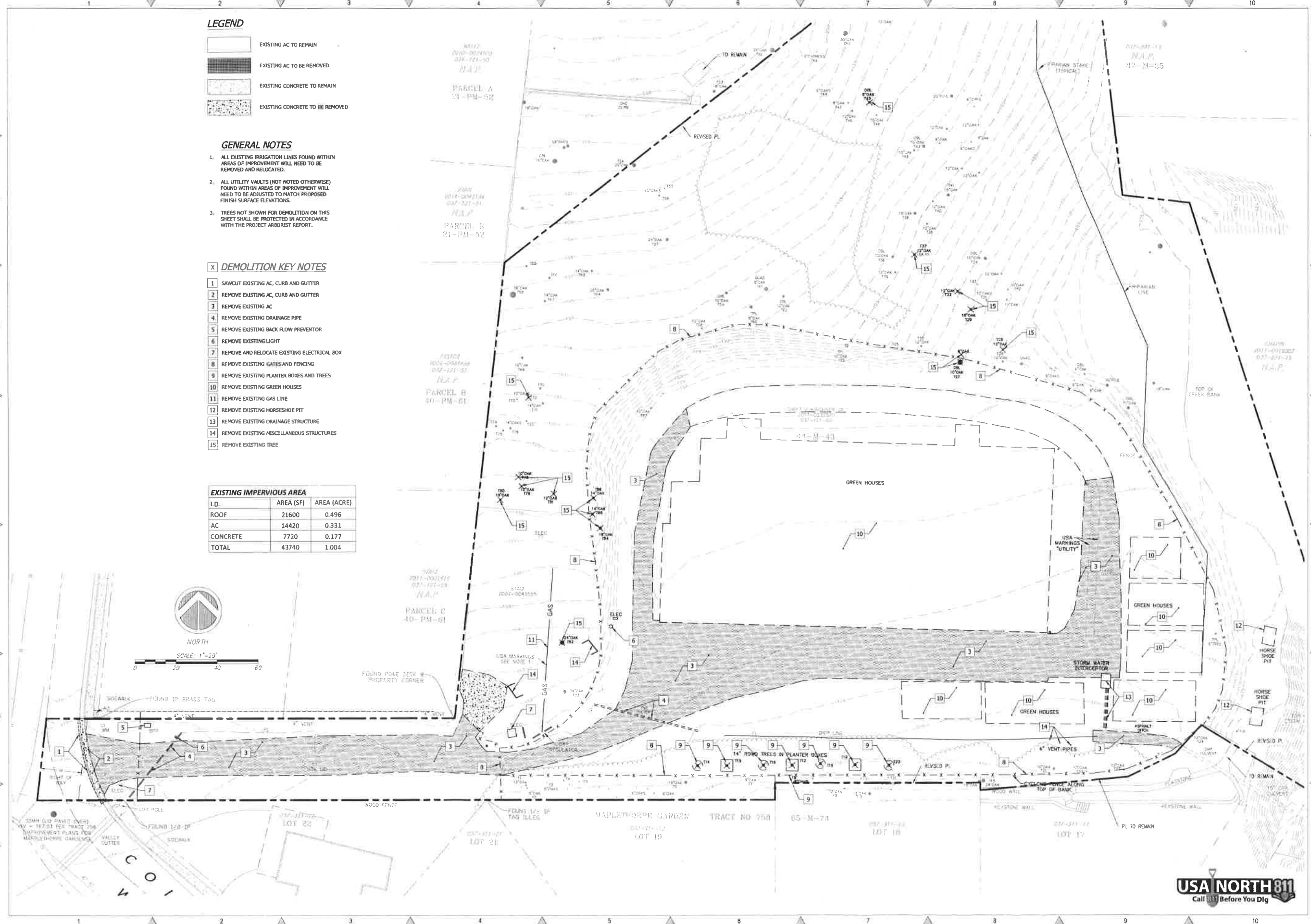
1. ALL EXISTING IRRIGATION LINES FOUND WITHIN AREAS OF IMPROVEMENT WILL NEED TO BE REMOVED AND RELOCATED.
2. ALL UTILITY VAULTS (NOT NOTED OTHERWISE) FOUND WITHIN AREAS OF IMPROVEMENT WILL NEED TO BE ADJUSTED TO MATCH PROPOSED FINISH SURFACE ELEVATIONS.
3. TREES NOT SHOWN FOR DEMOLITION ON THIS SHEET SHALL BE PROTECTED IN ACCORDANCE WITH THE PROJECT ARBORIST REPORT.

X DEMOLITION KEY NOTES

- 1 SAWCUT EXISTING AC, CURB AND GUTTER
- 2 REMOVE EXISTING AC, CURB AND GUTTER
- 3 REMOVE EXISTING AC
- 4 REMOVE EXISTING DRAINAGE PIPE
- 5 REMOVE EXISTING BACK FLOW PREVENTOR
- 6 REMOVE EXISTING LIGHT
- 7 REMOVE AND RELOCATE EXISTING ELECTRICAL BOX
- 8 REMOVE EXISTING GATES AND FENCING
- 9 REMOVE EXISTING PLANTER BOXES AND TREES
- 10 REMOVE EXISTING GREEN HOUSES
- 11 REMOVE EXISTING GAS LINE
- 12 REMOVE EXISTING HORSESHOE PIT
- 13 REMOVE EXISTING DRAINAGE STRUCTURE
- 14 REMOVE EXISTING MISCELLANEOUS STRUCTURES
- 15 REMOVE EXISTING TREE

EXISTING IMPERVIOUS AREA

| I.D. | AREA (SF) | AREA (ACRE) |
|----------|-----------|-------------|
| ROOF | 21600 | 0.496 |
| AC | 14420 | 0.331 |
| CONCRETE | 7720 | 0.177 |
| TOTAL | 43740 | 1.004 |



| REVISIONS | BY |
|----------------------------------|----|
| 1 COUNTY COMMENTS DATED 12/11/18 | DD |
| 2 COUNTY COMMENTS DATED 04/04/19 | DD |

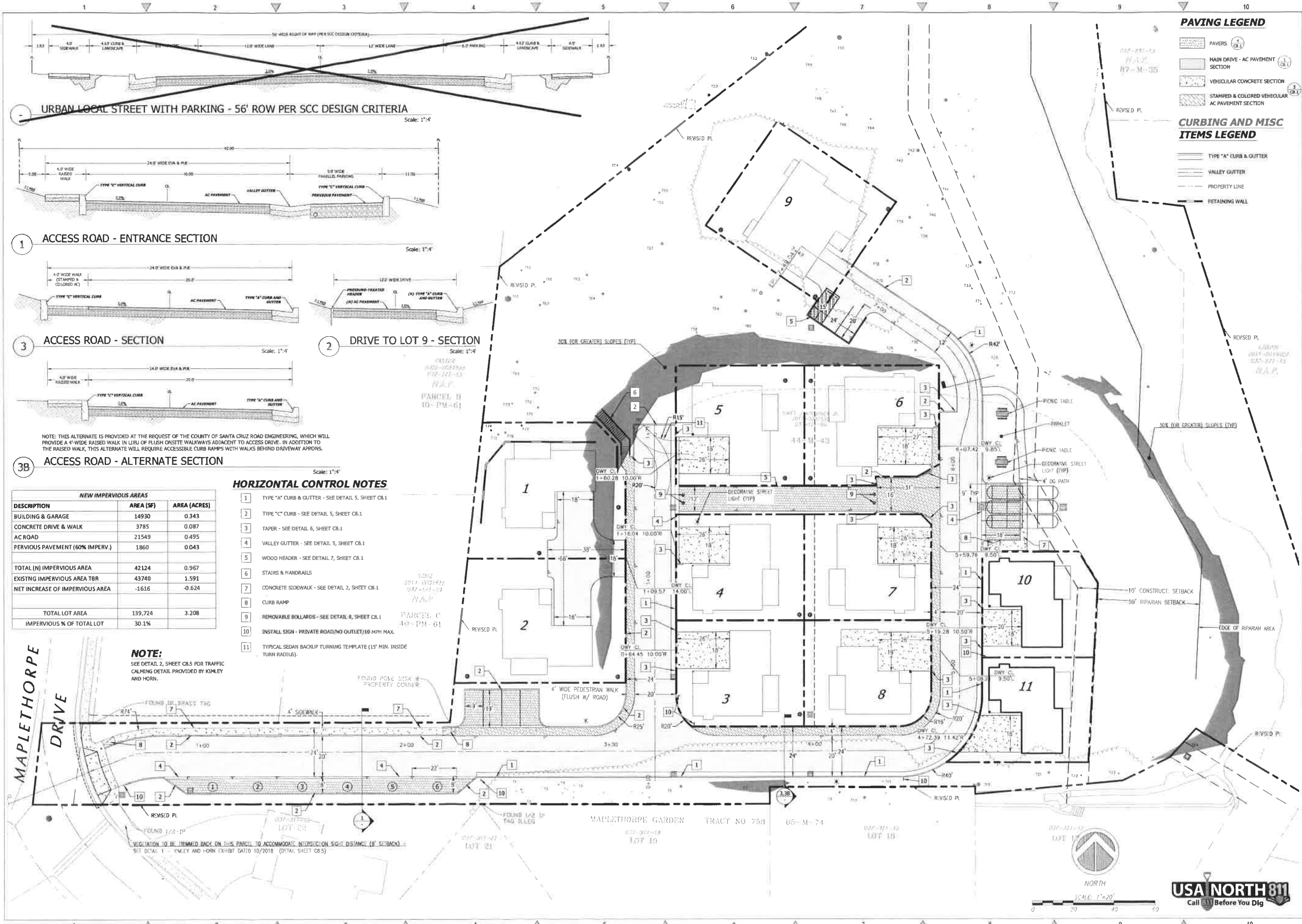
**EXISTING SITE AND
DEMOLITION PLAN**

C2G / CIVIL CONSULTANTS GROUP, INC.
 Engineers/Planners
 4444 Soquel Valley Drive / Suite 6
 SOQUEL, CA 95076
 T (408) 438-4420 F (408) 438-4420

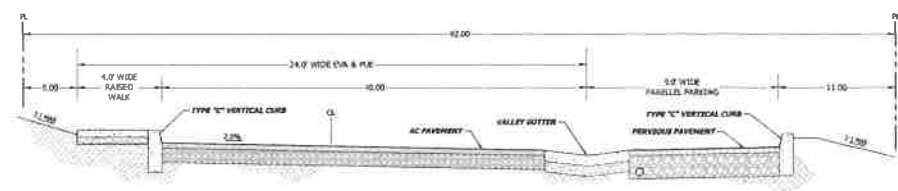
**TRACT 1609
3300 MAPLETHORPE LANE
SOQUEL, CA
APN: 037-121-60**

Date: 12.18.18
 Scale: 1" = 20'
 Drawn: DD/JB
 Job: 480-00
 Sheet:

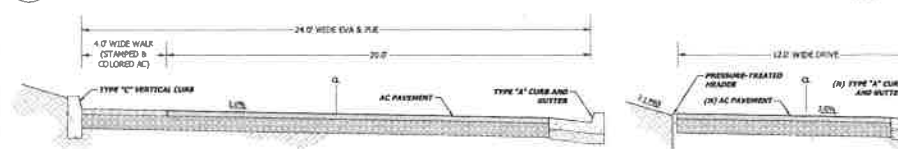




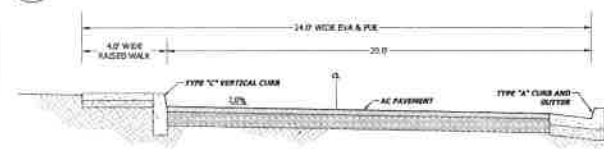
URBAN LOCAL STREET WITH PARKING - 56' ROW PER SCC DESIGN CRITERIA
Scale: 1"=4'



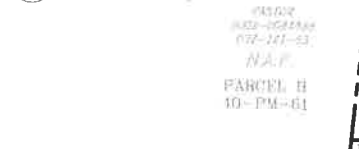
1 ACCESS ROAD - ENTRANCE SECTION
Scale: 1"=4'



3 ACCESS ROAD - SECTION
Scale: 1"=4'



2 DRIVE TO LOT 9 - SECTION
Scale: 1"=4'



3B ACCESS ROAD - ALTERNATE SECTION
Scale: 1"=4'

NEW IMPERVIOUS AREAS

| DESCRIPTION | AREA (SF) | AREA (ACRES) |
|--|----------------|---------------|
| BUILDING & GARAGE | 14930 | 0.343 |
| CONCRETE DRIVE & WALK | 3785 | 0.087 |
| AC ROAD | 21549 | 0.495 |
| PERVIOUS PAVEMENT (60% IMPERV.) | 1860 | 0.043 |
| TOTAL (N) IMPERVIOUS AREA | 42124 | 0.967 |
| EXISTING IMPERVIOUS AREA TBR | 43740 | 1.591 |
| NET INCREASE OF IMPERVIOUS AREA | -1616 | -0.624 |
| TOTAL LOT AREA | 139,724 | 3.208 |
| IMPERVIOUS % OF TOTAL LOT | 30.1% | |

HORIZONTAL CONTROL NOTES

- 1 TYPE "A" CURB & GUTTER - SEE DETAIL 5, SHEET C8.1
- 2 TYPE "C" CURB - SEE DETAIL 5, SHEET C8.1
- 3 TAPER - SEE DETAIL 6, SHEET C8.1
- 4 VALLEY GUTTER - SEE DETAIL 5, SHEET C8.1
- 5 WOOD HEADER - SEE DETAIL 7, SHEET C8.1
- 6 STAIRS & HANDRAILS
- 7 CONCRETE SIDEWALK - SEE DETAIL 2, SHEET C8.1
- 8 CURB RAMP
- 9 REMOVABLE BOLLARDS - SEE DETAIL II, SHEET C8.1
- 10 INSTALL SIGN - PRIVATE ROAD/NO OUTLET/10 MPH MAX.
- 11 TYPICAL SEDAN BACKUP TURNING TEMPLATE (15' MIN. INSIDE TURN RADIUS).

NOTE:
SEE DETAIL 2, SHEET C8.5 FOR TRAFFIC CALMING DETAIL PROVIDED BY KIMLEY AND HORN.

PAVING LEGEND

- PAVERS (C&I)
- MAIN DRIVE - AC PAVEMENT SECTION
- VEHICULAR CONCRETE SECTION
- STAMPED & COLORED VEHICULAR AC PAVEMENT SECTION

CURBING AND MISC ITEMS LEGEND

- TYPE "A" CURB & GUTTER
- VALLEY GUTTER
- PROPERTY LINE
- RETAINING WALL

REVISIONS

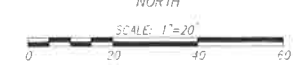
| NO. | DATE | BY |
|-----|----------|----|
| 1 | 12/21/18 | DD |
| 2 | 04/04/19 | DD |

HORIZONTAL CONTROL PLAN

C2G / CIVIL CONSULTANTS GROUP, INC.
Engineers/Planners
4444 South Valley Drive / Suite 6
South Valley, CA 95046
T: (925) 438-4430 F: (925) 438-4408

TRACT 1609 MAPLETHORPE LANE
3300 MAPLETHORPE LANE
SOQUEL, CA
APN: 037-121-60

Date: 12.18.18
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Sheet: **C2.1**
Of 15 Sheets



GENERAL GRADING NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE PROJECT'S GEOTECHNICAL REPORT.
2. ALL AREAS TO RECEIVE FILL SHALL BE STRIPPED TO A DEPTH TO BE DETERMINED BY THE GEOTECHNICAL ENGINEER. ANY (E) A.C. OR P.C.C. PAVING SHALL BE SCARIFIED & REMOVED & SUBGRADE PREPARED & COMPACTED AS SHOWN IN THESE PLANS.
3. ALL MATERIAL TO BE USED AS FILL WITHIN BUILDING PAD AREAS & PARKING OR DRIVEWAY AREAS TO BE FREE OF ALL VEGETATION & FOREIGN MATTER AND SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER.
4. ALL BUILDING PADS TO BE COMPACTED TO 90% RELATIVE COMPACTION; DRIVEWAY & STREET AREAS TO BE COMPACTED TO 95% RELATIVE COMPACTION PER ASTM D1557-91.
5. BUILDING PAD TO BE LEVEL SIDE-TO-SIDE, FRONT-TO-REAR, UNLESS OTHERWISE SHOWN.
6. BUILDING PAD SHALL CONSIST OF 24" OF SELECT IMPORT (WITH A PI OF LESS THAN 10) INSTALLED UNDER BUILDING SLAB. PREPARATION SHALL EXTEND 5' BEYOND ALL EXTERIOR FACES OF THE BUILDING.
7. STRIPPINGS MAY BE PLACED IN PLANTING AREAS; ALL EXCESS STRIPPING SHALL BE HAULED OFF. PAVING DEBRIS SHALL BE HAULED OFF TO AN APPROVED DISPOSAL SITE.
8. ALL WORK SHOWN OR NOTED IN THESE PLANS SHALL BE IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER, ALL LOCAL, STATE AND FEDERAL MINIMUM STANDARDS AND THE LATEST EDITION OF THE UNIFORM BUILDING CODE.
9. CONTRACTOR SHALL PROTECT ALL EXISTING SITE IMPROVEMENTS NOT IDENTIFIED FOR REMOVAL DURING CONSTRUCTION; CONTRACTOR SHALL REPAIR ANY DAMAGE TO AS-NEW CONDITION AT THEIR SOLE EXPENSE.
10. CONTRACTOR SHALL VERIFY ALL EXISTING SITE CONDITIONS, SITE DIMENSIONS AND GRADES PRIOR TO THE START OF CONSTRUCTION.
11. ALL GRADING AND RELATED WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE STANDARD REQUIREMENTS OF THE COUNTY OF SANTA CRUZ.
12. GRADING SLOPES FOR BOTH CUT AND FILL SHALL NOT EXCEED 2(H):1(V) UNLESS OTHERWISE DIRECTED BY THE GEOTECHNICAL ENGINEER.
13. ALL SOFTSCAPE GRADES ADJACENT TO (N) BUILDINGS SHALL BE 6" (MIN.) BELOW FINISH FLOOR.
14. CONTRACTOR SHALL GRADE TO ENSURE DRAINAGE FLOWS AWAY FROM (N) BUILDINGS.
15. ALL EXCESS EARTHWORK SHALL BE PLACED ON SITE AT AN APPROVED LOCATION.

ADDITIONAL GRADING NOTES:

- OBJECTIVE IS A BALANCED SITE.
- AFTER REMOVING EXISTING ON-SITE A.C. PAVING, NEW ROADWAYS WILL BE CUT AND BUILDING PADS ESTABLISHED.
- UTILITY SPOILS WILL BE USED IN COMMUNITY "PARK" AREA TO MAINTAIN GRADING BALANCE.

EARTHWORK QUANTITIES

NOTE: THE EARTHWORK QUANTITIES SHOWN HEREON ARE EXCLUSIVE OF WALL FOOTINGS, EXISTING PAVEMENT REMOVAL AND OVER DICATION AND RECOMPACTION, UTILITY TRENCH SPOILS & SOIL EXPANSION AND CONTRACTION FACTORS.

| ITEM | DESCRIPTION | CUT (cu yds) | FILL (cu yds) |
|------|-------------|--------------|---------------|
| 1 | EG VS. FG | 1,450 | 845 |

NET VOLUME = 605 CU. YDS. OF EXPORT

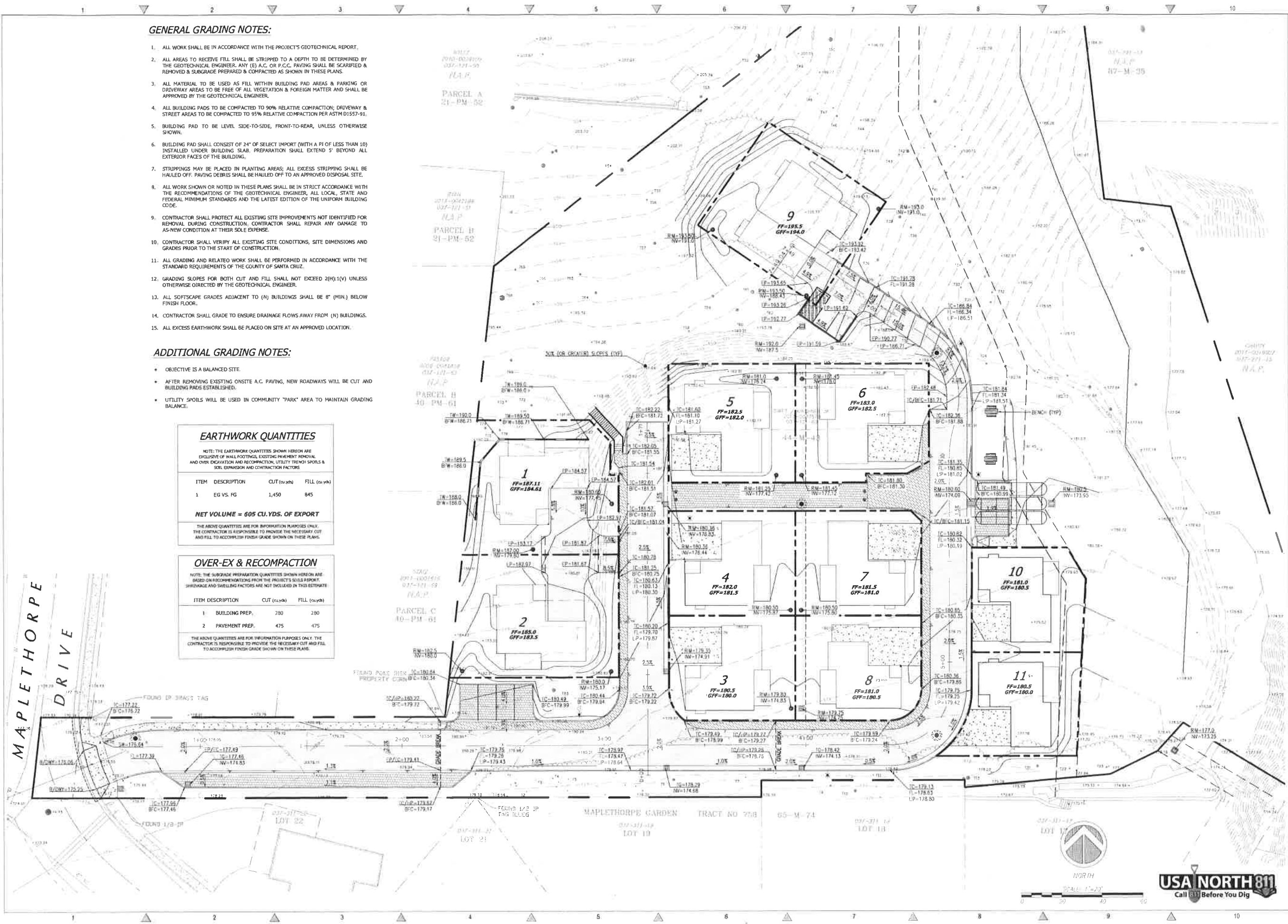
THE ABOVE QUANTITIES ARE FOR INFORMATION PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE THE NECESSARY CUT AND FILL TO ACCOMPLISH FINISH GRADE SHOWN ON THESE PLANS.

OVER-EX & RECOMPACTION

NOTE: THE SUBGRADE PREPARATION QUANTITIES SHOWN HEREON ARE BASED ON RECOMMENDATIONS FROM THE PROJECT'S SOILS REPORT. SHRINKAGE AND SWELLING FACTORS ARE NOT INCLUDED IN THIS ESTIMATE.

| ITEM | DESCRIPTION | CUT (cu yds) | FILL (cu yds) |
|------|----------------|--------------|---------------|
| 1 | BUILDING PREP. | 280 | 280 |
| 2 | PAVEMENT PREP. | 475 | 475 |

THE ABOVE QUANTITIES ARE FOR INFORMATION PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE THE NECESSARY CUT AND FILL TO ACCOMPLISH FINISH GRADE SHOWN ON THESE PLANS.



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|----------------------------------|----|
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GRADING PLAN

C2G CIVIL CONSULTANTS GROUP, INC.
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 of 15 Sheets



SCALE: 1"=20'



UNDERGROUND NOTES

1. STORM DRAIN PIPE SHALL BE SDR-35 P.V.C., A.D.S. N-12 SMOOTH INTERIOR CORRUGATED POLYETHYLENE PIPE OR APPROVED SUBSTITUTE, OR AS NOTED ON PLAN. ALL DRAINAGE PIPE SHALL BE SHIPPED, STORED, AND INSTALLED PER THE PIPE MANUFACTURER'S RECOMMENDATIONS.
2. ALL CONCRETE DRAINAGE INLETS CALLED OUT ON THE PLANS SHALL BE CHRISTY BRAND PRECAST CONCRETE OR EQUIVALENT. ALL STRUCTURES SHALL BE STORED, HANDLED, AND INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS. ALL GRATES IN PAVEMENT AREAS SHALL BE ADA COMPLIANT.
3. ALL CONCRETE DRAINAGE INLETS CALLED OUT ON THE PLANS SHALL HAVE A HEAVY RATED FRAME WITH A ADA COMPLIANT GRATE. CATCH BASINS THAT HAVE SILT AND GREASE TRAPS SHALL BE INCLUDED IN THE PROJECT MONITORING AND MAINTENANCE PLAN.
4. SANITARY SEWER TRENCH BACKFILL SHALL CONFORM TO CITY OF SANTA CRUZ SEWER PIPE TRENCH DETAIL.
5. JETTING OF BACKFILL MATERIALS TO ACHIEVE COMPACTION IS NOT ALLOWED.
6. ALL THE WATER PIPING SHALL BE ANWW CLASS 150 OR APPROVED EQUAL, ALL VALVES, ANGLES, AND THRUST BLOCKS SHALL BE INSTALLED PER CURRENT CPC SPECIFICATIONS.
7. ALL FIRE SERVICE PIPING AND APPURTENANCES SHALL CONFORM TO NFPA STANDARDS AND SPECIFICATIONS.
8. ANY EXISTING UTILITIES THAT ARE REQUIRED TO BE RELOCATED AS A PART OF THIS CONSTRUCTION SHALL BE RELOCATED AT THE DEVELOPER'S EXPENSE.

GENERAL UTILITY NOTES

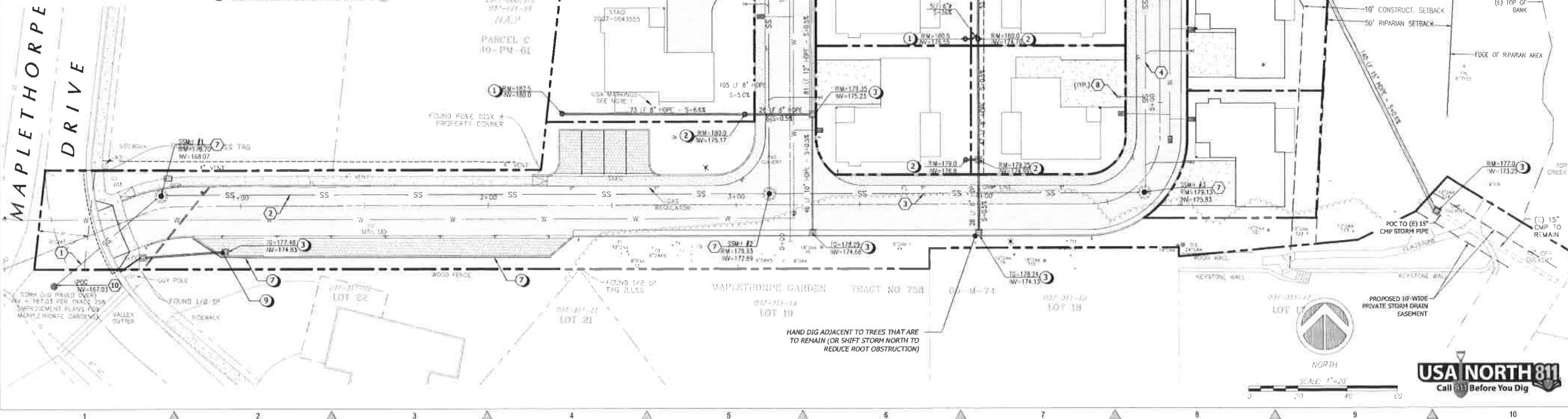
1. NO CHANGE TO THE PLANS SHALL BE PERMITTED WITHOUT PRIOR WRITTEN APPROVAL BY THE OWNER OR OWNERS REPRESENTATIVES, THE CITY OF SANTA CRUZ, AND THE SANTA CRUZ COUNTY SANITATION DISTRICT.
2. CONTRACTOR SHALL VERIFY LOCATIONS, ELEVATIONS AND INVERTS OF EXISTING UTILITY PRIOR TO COMMENCEMENT OF WORK AND SHALL NOTIFY OWNER OR OWNERS REPRESENTATIVES OF VARIANCE FROM THOSE SHOWN ON THE PLANS.
3. UNDERGROUND FACILITIES AND UTILITIES HAVE BEEN SHOWN BASED ON RECORD DRAWINGS AND VISIBLE EVIDENCE FOUND IN FIELD. NO WARRANTY IS MADE REGARDING THE COMPLETENESS OR ACCURACY OF SUCH INFORMATION. PRIOR TO CONSTRUCTION, DETERMINE THE EXACT LOCATION OF UNDERGROUND FACILITIES AND UTILITIES, AND PRESERVE SAME FROM DAMAGE. PRIOR TO CONSTRUCTION, VERIFY LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AT THE CROSSING POINTS WITH PROPOSED UTILITIES. THE CONTRACTOR SHALL NOTIFY THE OWNER OR OWNERS REPRESENTATIVES IF CONDITIONS DIFFER FROM THOSE SHOWN ON THE DRAWINGS AND SHALL NOT BEGIN CONSTRUCTION UNTIL THE CHANGED CONDITION HAS BEEN EVALUATED. CONTACT UNDERGROUND SERVICES ALERT (USA) (1-800-227-2600) TWO (2) WORKING DAYS PRIOR TO DIGGING. REPAIR UNDERGROUND UTILITIES DAMAGED BY CONSTRUCTION OPERATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL DAMAGES ASSOCIATED WITH CONTRACTOR'S FAILURE TO EXACTLY LOCATED AND PRESERVE UNDERGROUND FACILITIES AND UTILITIES.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION WITH THE APPROPRIATE UTILITY COMPANIES AND/OR AGENCIES TO VERIFY THE EXISTENCE AND/OR LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO COMMENCEMENT OF WORK. AND SHALL NOTIFY U.S.A. @ (800) 227-2600 AT LEAST 48-HOURS IN ADVANCE OF EXCAVATION.
5. IF ANY INDICATIONS OF ARCHEOLOGICAL REMAINS ARE ENCOUNTERED DURING GRADING ACTIVITIES FOR ANY DEVELOPMENT WITHIN THE PROJECT SITE, ALL WORK SHALL BE HALTED WITHIN 200 FOOT RADIUS OF THE FIND. OWNER SHALL RETAIN A QUALIFIED ARCHEOLOGIST RETAINED TO DETERMINE THE NATURE OF THE DISCOVERY AND RECOMMEND APPROPRIATE EVALUATION PROCEDURES.
6. THE SANITARY SEWER SYSTEM IS PRIVATE. SUBJECT TO REQUIREMENTS OF THE SANTA CRUZ COUNTY SANITATION DISTRICT. REFER TO THE HOME OWNERS' ASSOCIATION DOCUMENTS, INCLUDING CCBRS FOR MAINTENANCE REQUIREMENTS FOR THE SANITARY SEWER SYSTEM.
7. ALL SANITARY SEWER IMPROVEMENTS ARE AND WILL REMAIN PRIVATELY OWNED AND MAINTAINED. INSTALLATION OF ALL SANITARY IMPROVEMENTS SHALL BE INSPECTED BY THE SANTA CRUZ COUNTY SANITATION DISTRICT AUTHORIZED INSPECTOR PRIOR TO COVERING.
8. MARK THE STUB OUT OF EACH LATERAL (NOT MORE THAN 1 FOOT BEHIND THE BACK OF SIDEWALK OR CURB) WITH 4x4 REDWOOD OF PTDF POST 6' LONG, 3" BURIED IN THE SOIL, WITH A LARGE "S" PAINTED IN WHITE PAINT ON ONE FACE OF THE POST.

SANITARY SEWER NOTES:

1. 52 LF OF 6" SDR-35 PIPE @ 2.0% SLOPE
2. 241 LF OF 6" SDR-35 PIPE @ 2.0% SLOPE
3. 147 LF OF 6" SDR-35 PIPE @ 2.0% SLOPE
4. 186 LF OF 6" SDR-35 PIPE @ 2.0% SLOPE
5. 83 LF OF 4" SDR-35 PIPE @ 10.4% SLOPE
6. 136 LF OF 6" SDR-35 PIPE @ 2.0% SLOPE
7. SANITARY SEWER MANHOLE PER DETAIL 1, SHEET C8.2
8. SANITARY SEWER LATERAL WITH C/O PER DETAIL 4, SHEET C8.2
9. SANITARY SEWER CLEANOUT PER DETAIL 3, SHEET C8.2
10. POINT OF CONNECTION TO EXISTING SEWER SYSTEM

STORM DRAIN NOTES:

1. STORM DRAIN AREA DRAIN (SDAD) PER DETAIL 6, SHEET C8.2
2. STORM DRAIN AREA DRAIN (SDAD) PER DETAIL 5, SHEET C8.2
3. STORM DRAIN DROP INLET (SDDI) PER DETAIL 9, SHEET C8.2
4. STORM DRAIN DROP INLET (SDDI) PER DETAIL 10, SHEET C8.2
5. POINT OF CONNECTION TO CHAMBER SYSTEM
6. INLET W/ FLOW RESTRICTOR
7. INFILTRATION CHAMBERS
8. INSTALL IMPERMEABLE FABRIC ALONG SOUTHERLY SIDE OF PERVIOUS PAVERS
9. INLET W/ FLOW RESTRICTOR FOR DMA #2
10. PERVIOUS PAVERS W/ DEEPEMED SECTION FOR STORMWATER RETENTION & DETENTION OF DMA #2



| REVISIONS | BY |
|-----------------------------------|----|
| 1. COUNTY COMMENTS DATED 12/21/18 | DD |
| 2. COUNTY COMMENTS DATED 04/04/19 | DD |

UTILITY PLAN

C2G / CIVIL CONSULTANTS GROUP, INC.
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**TRACT 1609
 3300 MAPLETHORPE LANE
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| Date: | 12.18.18 |
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| Sheet: | C4.1 |
| Of 15 Sheets | |

UNDERGROUND NOTES

1. STORMDRAIN PIPE SHALL BE SDR-26 P.V.C., A.D.S. N-12 SMOOTH INTERIOR CORRUGATED POLYETHYLENE PIPE OR APPROVED SUBSTITUTE, DR. AS NOTED ON PLAN. ALL DRAINAGE PIPE SHALL BE SHIPPED, STORED, AND INSTALLED PER THE PIPE MANUFACTURER'S RECOMMENDATIONS.
2. ALL CONCRETE DRAINAGE INLETS CALLED OUT ON THE PLANS SHALL BE CHRISTY BRAND PRECAST CONCRETE OR EQUIVALENT. ALL STRUCTURES SHALL BE STORED, HANDLED, AND INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS. ALL GRATES IN PAVEMENT AREAS SHALL BE ADA COMPLIANT.
3. ALL CONCRETE DRAINAGE INLETS CALLED OUT ON THE PLANS SHALL HAVE A HEAVY RATED FRAME WITH A ADA COMPLIANT GRATE. CATCH BASINS THAT HAVE SILT AND GREASE TRAPS SHALL BE INCLUDED IN THE PROJECT MONITORING AND MAINTENANCE PLAN.
4. SANITARY SEWER TRENCH BACKFILL SHALL CONFORM TO CITY OF SANTA CRUZ SEWER PIPE TRENCH DETAIL.
5. JETTING OF BACKFILL MATERIALS TO ACHIEVE COMPACTION IS NOT ALLOWED.
6. ALL THE WATER PIPING SHALL BE AWWA CLASS 150 OR APPROVED EQUAL, ALL VALVES, ANGLES, AND THRUST BLOCKS SHALL BE INSTALLED PER CURRENT CPC SPECIFICATIONS.
7. ALL FIRE SERVICE PIPING AND APPURTENANCES SHALL CONFORM TO NFPA STANDARDS AND SPECIFICATIONS.
8. ANY EXISTING UTILITIES THAT ARE REQUIRED TO BE RELOCATED AS A PART OF THIS CONSTRUCTION SHALL BE RELOCATED AT THE DEVELOPERS EXPENSE.

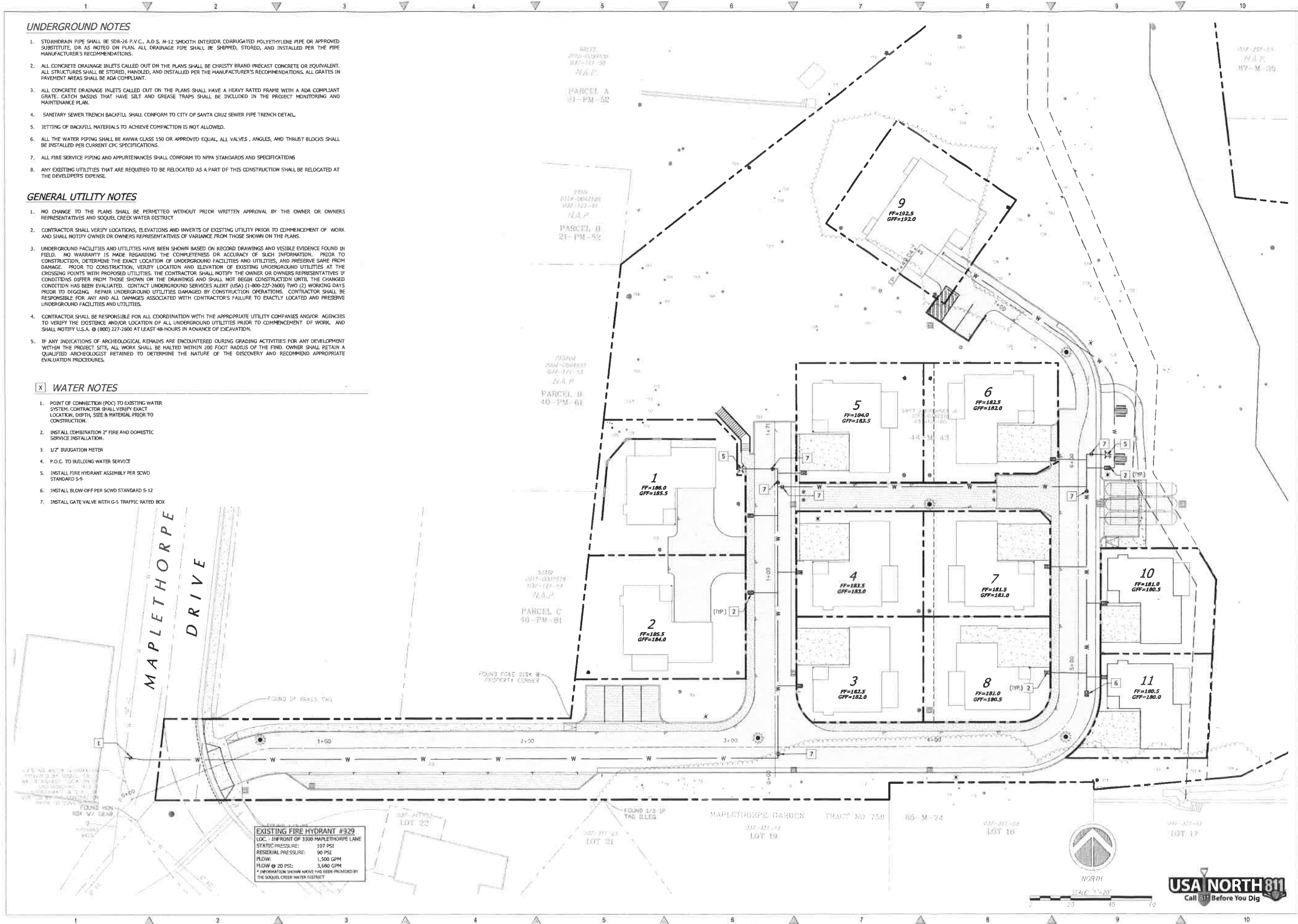
GENERAL UTILITY NOTES

1. NO CHANGE TO THE PLANS SHALL BE PERMITTED WITHOUT PRIOR WRITTEN APPROVAL BY THE OWNER OR OWNERS REPRESENTATIVES AND SOQUEL CREEK WATER DISTRICT.
2. CONTRACTOR SHALL VERIFY LOCATIONS, ELEVATIONS AND INVERTS OF EXISTING UTILITY PRIOR TO COMMENCEMENT OF WORK AND SHALL NOTIFY OWNER OR OWNERS REPRESENTATIVES OF VARIANCE FROM THOSE SHOWN ON THE PLANS.
3. UNDERGROUND FACILITIES AND UTILITIES HAVE BEEN SHOWN BASED ON RECORD DRAWINGS AND VISIBLE EVIDENCE FOUND IN FIELD. NO WARRANTY IS MADE REGARDING THE COMPLETENESS OR ACCURACY OF SUCH INFORMATION. PRIOR TO CONSTRUCTION, DETERMINE THE EXACT LOCATION OF UNDERGROUND FACILITIES AND UTILITIES, AND PRESERVE SAME FROM DAMAGE. PRIOR TO CONSTRUCTION, VERIFY LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AT THE CROSSING POINTS WITH PROPOSED UTILITIES. THE CONTRACTOR SHALL NOTIFY THE OWNER OR OWNERS REPRESENTATIVES IF CONDITIONS DIFFER FROM THOSE SHOWN ON THE DRAWINGS AND SHALL NOT BEGIN CONSTRUCTION UNTIL THE CHANGED CONDITION HAS BEEN EVALUATED. CONTACT UNDERGROUND SERVICES ALERT (USA) (1-800-227-2600) TWO (2) WORKING DAYS PRIOR TO DIGGING. REPAIR UNDERGROUND UTILITIES DAMAGED BY CONSTRUCTION OPERATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL DAMAGES ASSOCIATED WITH CONTRACTOR'S FAILURE TO EXACTLY LOCATED AND PRESERVE UNDERGROUND FACILITIES AND UTILITIES.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION WITH THE APPROPRIATE UTILITY COMPANIES AND/OR AGENCIES TO VERIFY THE EXISTENCE AND/OR LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO COMMENCEMENT OF WORK. AND SHALL NOTIFY U.S.A. @ (800) 227-2600 AT LEAST 48-HOURS IN ADVANCE OF EXCAVATION.
5. IF ANY INDICATIONS OF ARCHEOLOGICAL REMAINS ARE ENCOUNTERED DURING GRADING ACTIVITIES FOR ANY DEVELOPMENT WITHIN THE PROJECT SITE, ALL WORK SHALL BE HALTED WITHIN 200 FOOT RADIUS OF THE FIND. OWNER SHALL RETAIN A QUALIFIED ARCHEOLOGIST RETAINED TO DETERMINE THE NATURE OF THE DISCOVERY AND RECOMMEND APPROPRIATE EVALUATION PROCEDURES.

[X] WATER NOTES

1. POINT OF CONNECTION (POC) TO EXISTING WATER SYSTEM. CONTRACTOR SHALL VERIFY EXACT LOCATION, DEPTH, SIZE & MATERIAL PRIOR TO CONSTRUCTION.
2. INSTALL COMBINATION 2" FIRE AND DOMESTIC SERVICE INSTALLATION.
3. 1/2" BURIGATION METER
4. P.O.C. TO BUILDING WATER SERVICE
5. INSTALL FIRE HYDRANT ASSEMBLY PER SCWD STANDARD S-9
6. INSTALL BLOW-OFF PER SCWD STANDARD S-12
7. INSTALL GATE VALVE WITH G-5 TRAFFIC RATED BOX

EXISTING FIRE HYDRANT #929
 LOC. - IN FRONT OF 3300 MAPLETHORPE LANE
 STATIC PRESSURE: 107 PSI
 RESIDUAL PRESSURE: 90 PSI
 FLOW: 1,500 GPM
 FLOW @ 20 PSI: 3,600 GPM
 * INFORMATION SHOWN ABOVE HAS BEEN PROVIDED BY THE SOQUEL CREEK WATER DISTRICT



| REVISIONS | BY |
|-----------------------------------|----|
| 1. COUNTY COMMENTS DATED 12/21/18 | DD |
| 2. COUNTY COMMENTS DATED 04/04/19 | DD |

FIRE SUPPRESSION AND DOMESTIC WATER PLAN

C2G / CIVIL CONSULTANTS GROUP, INC.
 Engineers/Planners
 4444 Scotts Valley Drive / Suite 6
 Scotts Valley, CA 95066
 T: (831) 438-4430 F: (831) 438-4420

**TRACT 1609
 3300 MAPLETHORPE LANE
 SOQUEL, CA
 APN: 037-121-60**

Date: 12.18.18
 Scale: 1" = 20'
 Drawn: DD/JB
 Job: 480-00
 Sheet:

C5.1
 of 15 Sheets

USA NORTH 811
 Call Before You Dig

GENERAL EROSION CONTROL NOTES

- IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE AND MAINTAIN EROSION CONTROL MEASURES AS REQUIRED THROUGHOUT THE LIFE OF THE PROJECT IN CONFORMANCE WITH THE CITY OF SCOTT'S VALLEY.
- CONTRACTOR TO PROVIDE BACK-UP EROSION PREVENTION MEASURES (SOIL STABILIZATION) WITH SEDIMENT CONTROL MEASURES SUCH AS STRAW WATTLES, SILT FENCE, GRAVEL INLET FILTERS, AND/OR SEDIMENT TRAPS OR BASINS. EROSION CONTROL MEASURES ARE ADEQUATE, IN PLACE, AND IN OPERABLE CONDITIONS. SEDIMENT CONTROLS, INCLUDING INLET PROTECTION, ARE NECESSARY BUT SHOULD BE A SECONDARY DEFENSE BEHIND GOOD EROSION CONTROL MEASURES.
- ALL EROSION PREVENTION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED AND REPAIRED THROUGHOUT THE SEASON. REPLACEMENT SUPPLIES SHOULD BE KEPT ON SITE.
- SITE INSPECTIONS SHALL BE CONDUCTED BEFORE AND AFTER EACH STORM EVENT, AND EVERY 24 HOURS FOR EXTENDED STORM EVENTS, TO IDENTIFY AREAS THAT CONTRIBUTE TO EROSION AND SEDIMENT PROBLEMS OR ANY OTHER POLLUTANT DISCHARGES. IF ADDITIONAL MEASURES ARE NEEDED, REVISE THE EROSION CONTROL PLAN AND IMPLEMENT THE MEASURES IMMEDIATELY. DOCUMENT ALL INSPECTION FINDINGS AND ACTIONS TAKEN.
- CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICES DURING CONSTRUCTION FOR CONTROL OF STORM WATER RUNOFF.
- BETWEEN OCTOBER 15 AND APRIL 15, EXPOSED SOIL SHALL BE PROTECTED FROM EROSION AT ALL TIMES. HAY BALES, FILTER BERMS, OR OTHER MEANS SHALL BE EMPLOYED TO PREVENT TURBID RUNOFF TO ADJOINING PROPERTIES.
- UNNECESSARY GRADING AND DISTURBING OR SOIL SHALL BE AVOIDED.
- ANY EXCESS MATERIAL SHALL BE DISPOSED OF OFF-SITE OR STOCKPILED IN A MANNER TO AVOID RUNOFF ONTO ADJOINING PROPERTIES.
- UPON COMPLETION OF CONSTRUCTION, ALL REMAINING EXPOSED AREAS SHALL BE PERMANENTLY RE-VEGETATED PER LANDSCAPE PLANS.
- ANY MATERIAL STOCKPILED DURING CONSTRUCTION SHALL BE COVERED WITH PLASTIC.
- DURING CONSTRUCTION, NO TURBID SITE WATER SHALL BE PERMITTED TO ENTER STORM DRAIN SYSTEM. USE OF SILT AND GREASE TRAPS, FILTER BERMS, OR HAY BALES MAY BE USED TO PREVENT SUCH DISCHARGE.
- CONTRACTOR SHALL NOTIFY THE CITY OF SCOTT'S VALLEY 48 HOURS BEFORE ANY EARTHWORK IS BEGUN.
- ALL CONSTRUCTION SHALL CONFORM "EXCAVATION, GRADING, EROSION AND SEDIMENT CONTROL REGULATIONS" PER DSA. NO CLEARING, GRADING, OR EXCAVATION SHALL TAKE PLACE BETWEEN OCTOBER 15, AND APRIL 15 UNLESS THERE IS AN APPROVED WINTER EROSION CONTROL PLAN. ALL DISTURBED SOIL SHALL BE SEEDED, MULCHED, OR OTHERWISE PROTECTED BY OCTOBER 15.

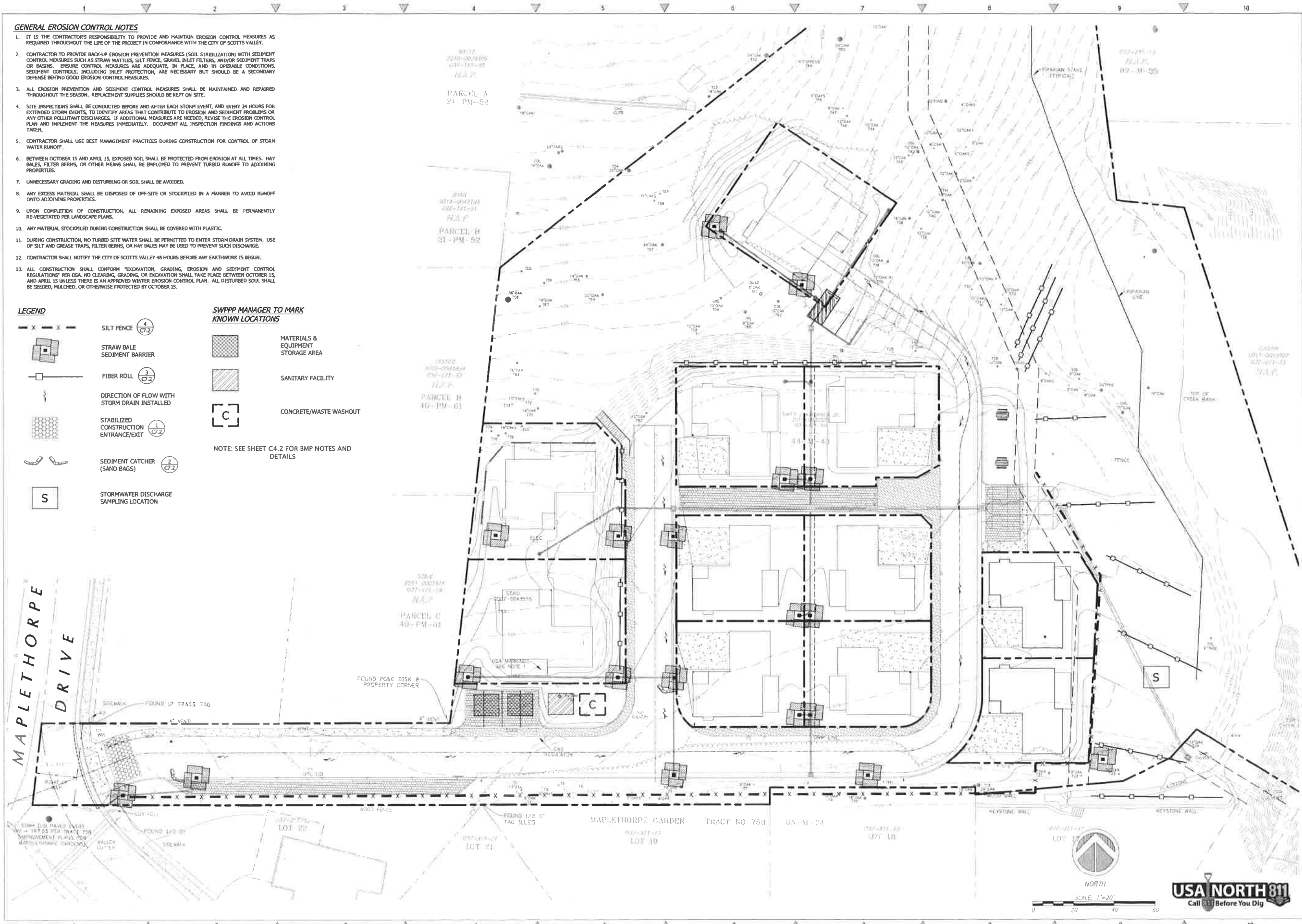
LEGEND

- SILT FENCE (4/2)
- STRAW BALE SEDIMENT BARRIER
- FIBER ROLL (3/2)
- DIRECTION OF FLOW WITH STORM DRAIN INSTALLED
- STABILIZED CONSTRUCTION ENTRANCE/TEXT (1/2)
- SEDIMENT CATCHER (SAND BAGS) (2/2)
- STORMWATER DISCHARGE SAMPLING LOCATION (S)

SWPPP MANAGER TO MARK KNOWN LOCATIONS

- MATERIALS & EQUIPMENT STORAGE AREA
- SANITARY FACILITY
- CONCRETE/WASTE WASHOUT (C)

NOTE: SEE SHEET C4.2 FOR BMP NOTES AND DETAILS



| REVISIONS | BY |
|----------------------------------|----|
| 1 COUNTY COMMENTS DATED 12/11/18 | DD |
| 2 COUNTY COMMENTS DATED 04/04/19 | DD |

EROSION CONTROL PLAN

C2G / CIVIL CONSULTANTS GROUP, INC.
 Engineers/Planners
 4444 Scotts Valley Drive / Suite 6
 Scotts Valley, CA 95066
 T: (925) 438-4400 F: (925) 438-4420

TRACT 1609 MAPLETHORPE LANE
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| Sheet: | C7.1 |
| Of 15 Sheets | |



EROSION CONTROL BMP'S

ALL CONSTRUCTION SITES
 DELINEATE CLEARING LIMITS, SENSITIVE OR CRITICAL AREAS, TREES, DRAINAGE COURSES, AND BUFFER ZONES TO PREVENT EXCESSIVE OR UNNECESSARY DISTURBANCE AND EXPOSURE OF SOIL.

1. IDENTIFY ALL STORM DRAINS, DRAINAGE SWALES AND CREEKS LOCATED NEAR THE CONSTRUCTION SITE AND MAKE SURE ALL SUBCONTRACTORS ARE AWARE OF THEIR LOCATIONS TO PREVENT POLLUTANTS FROM ENTERING THEM.
2. PRESERVE EXISTING VEGETATION, WHERE REQUIRED AND WHEN FEASIBLE, TO THE MAXIMUM EXTENT PRACTICABLE.
3. PHASE GRADING OPERATIONS, TO THE EXTENT POSSIBLE, TO LIMIT AREAS OF DISTURBANCE AND TIME OF EXPOSURE.
4. AVOID AND/OR MINIMIZE IMPACTS OF EXCAVATION AND GRADING DURING WET WEATHER AND IMMEDIATELY PRECEDING EXPECTED WET WEATHER.
5. MINIMIZE CUTS AND FILLS.
6. IMPLEMENT MEASURES TO MINIMIZE EROSION, MANAGE STORM WATER RUNOFF, AND PREVENT POLLUTANTS FROM CONSTRUCTION ACTIVITIES FROM ENTERING STORM DRAINS.
7. ALIGN TEMPORARY AND PERMANENT ROADS AND DRIVEWAYS ALONG SLOPE CONTOURS.
8. WASH VEHICLES AT AN APPROPRIATE OFF-SITE FACILITY. IF EQUIPMENT MUST BE WASHED ON-SITE, USE WASH DOWN AREAS DEVELOPED FOR SPECIFIC SITE REQUIREMENTS AND APPROVED BY THE CITY REPRESENTATIVE. DO NOT USE SOAPS, SOLVENTS, DEGREASERS, OR STEAM CLEANING EQUIPMENT, AND PREVENT WASH WATER FROM ENTERING STORM DRAINS.

MINIMIZE SOIL MOVEMENT

1. STOCKPILED SOIL AND MATERIALS SHOULD BE COVERED AND STABILIZED WITH TARPS, GEOTEXTILE FABRIC, HYDROSEEDING AND/OR EROSION CONTROL BLANKETS.
2. CREATE A BERM AND/OR INSTALL SILT FENCING AROUND STOCKPILED MATERIALS TO PREVENT STORM WATER RUNOFF FROM TRANSPORTING SEDIMENT OFFSITE.
3. USE STANDARD EROSION CONTROL SEEDING, PLANTING, MULCHING, GEOTEXTILE FABRIC AND/OR EROSION CONTROL BLANKETS TO STABILIZE DISTURBED SOIL AND REDUCE THE POTENTIAL FOR EROSION.
4. USE OTHER SOIL STABILIZERS AS APPROVED BY THE CITY OF CAPITOLA.

STRUCTURES TO CONTROL AND CONVEY RUNOFF

1. CONVEY RUNOFF BY USE OF EARTH DIKES, DRAINAGE SWALES AND/OR DITCHES WHEN FEASIBLE.
2. USE SLOPE DRAINS TO COLLECT AND CONVEY WATER FOR DISCHARGE BELOW SLOPES WHEN FEASIBLE.
3. USE VELOCITY DISSIPATION DEVICES, FLARED CULVERT END SECTIONS AND/OR CHECK DAMS TO REDUCE RUNOFF VELOCITY AND MITIGATE EROSION WHEN FEASIBLE.

CAPTURE SEDIMENT

1. USE TERRACING, RIPRAP, SAND BAGS, ROCKS, APPROVED TEMPORARY VEGETATION AND/OR OTHER APPROVED BMP'S ON SLOPES TO REDUCE RUNOFF VELOCITY AND TRAP SEDIMENTS. DO NOT USE ASPHALT RUBBLE OR OTHER DEMOLITION DEBRIS FOR THIS PURPOSE.
2. PROTECT STORM DRAIN INLETS FROM SEDIMENT-LADEN RUNOFF. STORM DRAIN INLET PROTECTION DEVICES INCLUDE GRAVEL BAGS, FILTER FABRIC FENCES AND BLOCK AND GRAVEL FILTERS.

OTHER RUNOFF CONTROLS

1. TEMPORARY SEDIMENT BASIN
2. SEDIMENT TRAP
3. BRUSH OR ROCK FILTER
4. SILT FENCE
5. SAND OR GRAVEL BAG BARRIER

TRACKING CONTROL

1. IMPLEMENT MEASURES AS NECESSARY TO MINIMIZE TRACKING OF SOIL OFF SITE.
2. USE DRY SWEEPING METHODS WHEN CLEANING SEDIMENTS FROM STREETS, DRIVEWAYS AND PAVED AREAS BY HAND, WHEN USING MECHANICAL STREET SWEEPERS, USE FINE WATER SPRAY TO REDUCE DUST AND IMPROVE SEDIMENT REMOVAL WHILE MINIMIZING RUNOFF.

PAINT WORK

1. DO NOT CLEAN PAINT BRUSHES OR RINSE PAINT CONTAINERS INTO A STREET, GUTTER, STORM DRAIN, OR CREEK.
2. FOR WATER-BASED PAINTS, PAINT OUT BRUSHES TO THE EXTENT POSSIBLE AND RINSE TO A DRAIN LEADING TO THE SANITARY SEWER (I.E., INDOOR PLUMBING).
3. FOR OIL-BASED PAINTS, PAINT OUT BRUSHES TO THE EXTENT POSSIBLE, AND FILTER AND REUSE THINNERS AND SOLVENTS. DISPOSE OF UNUSABLE THINNERS, OIL-BASED PAINT, SLUDGES AND RESIDUE AS HAZARDOUS WASTE.
4. NON-HAZARDOUS PAINT CHIPS AND DUST FROM DRY STRIPPING AND SAND BLASTING MAY BE SWEEPED UP OR COLLECTED IN PLASTIC DROP CLOTHS AND DISPOSED OF AS TRASH. CHEMICAL PAINT STRIPPING RESIDUE AND CHIPS AND DUST FROM MARINE PAINTS OR PAINTS CONTAINING LEAD OR TRIBUTYL TIN MUST BE DISPOSED OF AS A HAZARDOUS WASTE.
5. WHEN STRIPPING OR CLEANING BUILDING EXTERIORS WITH HIGH-PRESSURE WATER, COVER OR BERM STORM DRAIN INLETS. COLLECT (MOP OR VACUUM) BUILDING CLEANING WATER FOR DISPOSAL IN A PRE-AUTHORIZED MANNER.
6. RECYCLE RETURN TO SUPPLIER OR DONATE UNWANTED WATER-BASED (LATEX) PAINT.
7. DRIED LATEX PAINT MAY BE DISPOSED OF IN THE TRASH.

CEMENT AND CONCRETE WORK

1. AVOID MIXING EXCESS AMOUNTS OF FRESH CONCRETE OR CEMENT MORTAR ON-SITE.
2. STORE DRY AND WET CONCRETE AND CEMENT UNDER COVER, PROTECTED FROM RAINFALL AND RUNOFF.
3. WASH OUT CONCRETE TRANSIT MIXERS ONLY IN DESIGNATED WASH-OUT AREAS. WHENEVER POSSIBLE, RECYCLE WASHOUT BY PUMPING BACK INTO MIXERS FOR REUSE. DO NOT DISPOSE OF WASHOUT INTO THE STREET, STORM DRAINS, DRAINAGE DITCHES, OR CREEKS. DESIGNATED WASH-OUT AREAS MUST BE MAINTAINED TO PREVENT OVER FLOW.
4. WHENEVER POSSIBLE, RETURN CONTENTS OF MIXER BARREL TO THE OFF-SITE YARD FOR RECYCLING. DISPOSE OF SMALL AMOUNTS OF EXCESS CONCRETE, GROUT, AND MORTAR IN THE TRASH.

ROADWORK/PAVEMENT

1. APPLY CONCRETE, ASPHALT, AND SEAL COAT DURING DRY WEATHER TO PREVENT CONTAMINANTS FROM CONTACTING STORMWATER RUNOFF.
2. COVER STORM DRAIN INLETS AND MANHOLES WHEN PAVING OR APPLYING SEAL COAT, SLURRY SEAL, FOG SEAL, AND SIMILAR MATERIALS.
3. ALWAYS PARK PAVING MACHINES OVER DRIP PANS OR ABSORBENT MATERIALS, SINCE THEY TEND TO DRIP CONTINUOUSLY.
4. WHEN MAKING SAW-CUTS IN PAVEMENT, USE AS LITTLE WATER AS POSSIBLE. COVER POTENTIALLY AFFECTED STORM DRAIN INLETS COMPLETELY WITH FILTER FABRIC DURING THE SAWING OPERATION AND CONTAIN THE SLURRY BY WET-VACUUMING, OR BY PLACING STRAW BALE, SANDBAGS, OR GRAVEL DAMS AROUND THE CATCH BASINS. AFTER THE LIQUID DRAINS OR EVAPORATES, SHOVEL OR VACUUM THE SLURRY RESIDUE FROM THE PAVEMENT OR GUTTER AND REMOVE FROM SITE.
5. WASH DOWN EXPOSED AGGREGATE CONCRETE ONLY WHEN THE WASH WATER CAN: (1) FLOW ONTO A DIRT AREA; (2) DRAIN ONTO A BERMED SURFACE FROM WHICH IT CAN BE PUMPED AND DISPOSED OF PROPERLY; OR (3) BE VACUUMED FROM THE AREA ALONG THE CURB WHERE SEDIMENT HAS ACCUMULATED BY

10. ALLOW AGGREGATE RINSE TO SETTLE, AND PUMP THE WATER TO THE SANITARY SEWER IF ALLOWED BY YOUR LOCAL WASTEWATER AUTHORITY.
11. DO NOT WASH SHEEPINGS FROM EXPOSED AGGREGATE CONCRETE INTO A STREET OR STORM DRAIN. COLLECT AND RETURN TO APPROPRIATE BASE STOCKPILE, OR DISPOSE WITH TRASH.
12. RECYCLE BROKEN CONCRETE AND ASPHALT.

HAZARDOUS MATERIAL SPILL PREVENTION, SPILL REPORTING AND RESPONSE

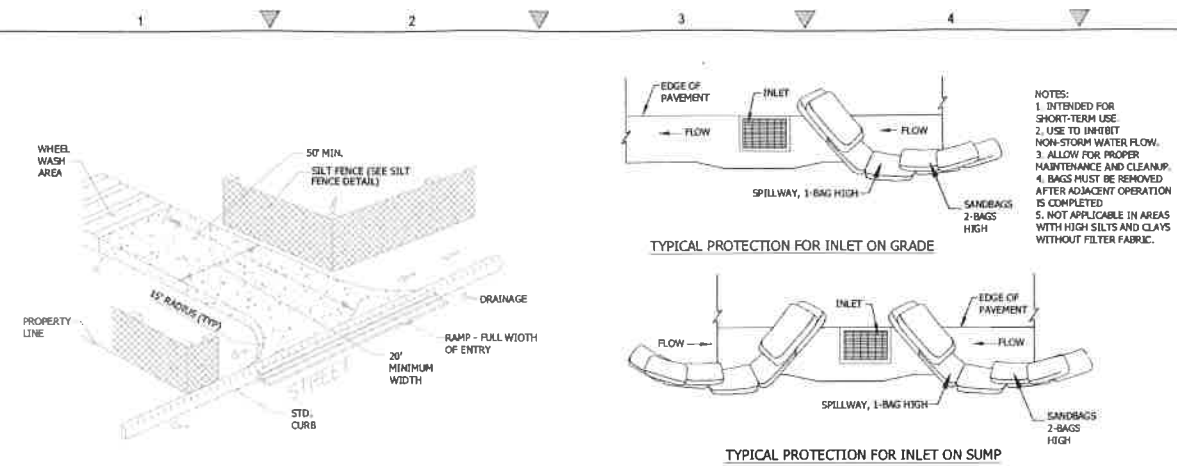
1. ALL HAZARDOUS MATERIALS SHALL BE STORED SO THAT THEY ARE PROTECTED FROM UNCLEMANT WEATHER AND VANDALISM.
2. MOTOR VEHICLES SHALL NOT BE FUELED ON THE PROJECT SITE.
3. SPILL CONTAINMENT MEASURES MUST BE MADE PRIOR TO FUELING WHEN FUELING EQUIPMENT OTHER THAN MOTOR VEHICLES.
4. VEHICLE MAINTENANCE, OTHER THAN EMERGENCY REPAIRS, SHALL NOT BE PERFORMED ON THE PROJECT SITE.
5. APPROPRIATE EMERGENCY SPILL CONTAINMENT SUPPLIES SHALL BE MAINTAINED ON SITE BY THE CONTRACTOR.
6. SPILLS GREATER THAN ONE QUART SHALL BE IMMEDIATELY REPORTED TO THE CITY'S REPRESENTATIVE AND COUNTY INSPECTOR.
7. SPILLS SHALL BE DIKED OR CONTAINED BY TRAINED PERSONNEL TO PREVENT THE SPILLED HAZARDOUS MATERIAL FROM ENTERING THE STORM WATER SYSTEM OR LEAVING THE PROJECT SITE.
8. SPILLS OF LESS THAN FIVE (5) GALLONS SHALL BE ABSORBED USING AN APPROPRIATE MATERIAL. ALL CONTAMINATED MATERIALS SHALL BE CONTAINED, REMOVED FROM THE JOBSITE AND DISPOSED IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.
9. SPILLS IN EXCESS OF FIVE (5) GALLONS SHALL BE ABSORBED USING AN APPROPRIATE MATERIAL AND PLACED IN CONTAINERS UNDER THE DIRECTION OF THE COUNTY OFFICE OF ENVIRONMENTAL HEALTH AND SAFETY.
10. ANY CONTAMINATED SOIL SHALL BE REMOVED BY THE CONTRACTOR AND REPLACED WITH ACCEPTABLE FRESH SOIL.
11. RESPONSE SHALL BE CARRIED OUT BY APPROPRIATELY TRAINED PERSONNEL UTILIZING SAFE PRACTICES.

GOOD HOUSEKEEPING PRACTICES

1. DO NOT WASH DOWN PAVEMENT OR SURFACES WHERE SILT HAS BEEN DEPOSITED OR MATERIALS HAVE SPILLED. USE DRY CLEANUP METHODS.
2. AVOID CONTAMINATING CLEAN RUNOFF FROM AREAS ADJACENT TO YOUR SITE BY USING BERMS AND/OR TEMPORARY OR PERMANENT DRAINAGE DITCHES TO DIVERT WATER FLOW AROUND THE SITE.
3. COVER EXPOSED PILES OF SOIL, CONSTRUCTION MATERIALS AND WASTES WITH PLASTIC SHEETING OR TEMPORARY ROOFS. BEFORE IT RAINS, SWEEP AND REMOVE MATERIALS FROM SURFACES THAT DRAIN TO STORM DRAINS, CREEKS, OR CHANNELS.
4. PLACE TRASH CANS AROUND THE SITE TO REDUCE POTENTIAL LITTER. DISPOSE OF NON-HAZARDOUS CONSTRUCTION WASTES IN COVERED DUMPSTERS OR RECYCLING RECEPTACLES. RECYCLE LEFTOVER MATERIALS WHENEVER POSSIBLE.
5. DISPOSE OF ALL WASTES PROPERLY. MATERIALS THAT CAN NOT BE REUSED OR RECYCLED MUST BE TAKEN TO AN APPROPRIATE LANDFILL OR DISPOSED OF AS HAZARDOUS WASTE, AS APPROPRIATE.
6. COVER OPEN DUMPSTERS WITH PLASTIC SHEETING OR A TARP DURING RAINY WEATHER. SECURE THE SHEETING OR TARP AROUND THE OUTSIDE OF THE DUMPSTER. IF THE DUMPSTER HAS A COVER, CLOSE IT.
7. TRAIN YOUR EMPLOYEES AND INFORM CONTRACTORS AND SUBCONTRACTORS ABOUT STORM WATER MANAGEMENT REQUIREMENTS AND THEIR RESPONSIBILITIES FOR COMPLIANCE.

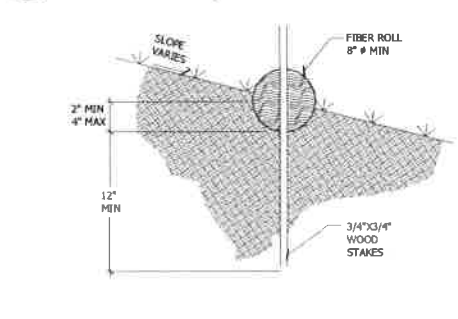
EROSION CONTROL NOTES

1. EROSION CONTROL MEASURES FOR WIND, WATER, MATERIAL STOCKPILES, AND TRACKING SHALL BE IMPLEMENTED ON ALL PROJECTS AT ALL TIMES AND SHALL INCLUDE SOURCE CONTROL, INCLUDING PROTECTION OF STOCKPILES, PROTECTION OF ALL DISTURBED AREAS, PROTECTION OF ACCESSES, AND PERIMETER CONTAINMENT MEASURES. EROSION CONTROL SHALL BE PLACED PRIOR TO THE COMMENCEMENT OF GRADING AND SITE DISTURBANCE ACTIVITIES UNLESS THE PUBLIC WORKS DEPARTMENT DETERMINES TEMPORARY MEASURES TO BE UNNECESSARY BASED UPON LOCATION, SITE CHARACTERISTICS OR TIME OF YEAR. THE INTENT OF EROSION CONTROL MEASURES SHALL BE TO KEEP ALL GENERATED SEDIMENTS FROM ENTERING A SWALE, DRAINAGE WAY, WATERCOURSE, ATMOSPHERE, OR MIGRATE ONTO ADJACENT PROPERTIES OR ONTO THE PUBLIC RIGHT-OF-WAY.
2. SITE INSPECTIONS AND APPROPRIATE MAINTENANCE OF ALL EROSION CONTROL MEASURES/DEVICES SHALL BE CONDUCTED AND DOCUMENTED AT ALL TIMES DURING CONSTRUCTION AND ESPECIALLY PRIOR TO, DURING, AND AFTER RAIN EVENTS.
3. THE DEVELOPER SHALL BE RESPONSIBLE FOR THE PLACEMENT AND MAINTENANCE OF ALL EROSION CONTROL MEASURES/DEVICES AS SPECIFIED BY THE APPROVED PLAN UNTIL SUCH TIME THAT THE PROJECT IS ACCEPTED AS COMPLETE BY THE PUBLIC WORKS DEPARTMENT OR UNTIL RELEASED FROM THE CONDITIONS OF APPROVAL OF THEIR GENERAL PERMIT. EROSION CONTROL MEASURES/DEVICES MAY BE RELOCATED, DELETED OR ADDITIONAL MEASURES/DEVICES MAY BE REQUIRED DEPENDING ON THE ACTUAL CONDITIONS ENCOUNTERED DURING CONSTRUCTION. ADDITIONAL EROSION CONTROL MEASURES/DEVICES SHALL BE PLACED AT THE DISCRETION OF THE ENGINEER OF WORK, COUNTY INSPECTOR, SWPPP MONITOR, OR RWQCB INSPECTOR. GUIDELINES FOR DETERMINING APPROPRIATE EROSION CONTROL DEVICES SHALL BE INCLUDED IN THE PLANS WITH ADDITIONAL MEASURES/DEVICES NOTED FROM THE APPROX OF THE PUBLIC IMPROVEMENT STANDARDS.
4. EROSION CONTROL DEVICES SHALL BE THE FIRST ORDER OF WORK AND SHALL BE IN PLACE AT ALL TIMES DURING CONSTRUCTION. ADDITIONAL MEASURES/DEVICES SHALL BE AVAILABLE DURING THE RAINY SEASON (BETWEEN OCTOBER 15 AND APRIL 15) OR ANYTIME WHEN THE RAIN PROBABILITY EXCEEDS 30%. THESE MEASURES/DEVICES SHALL BE AVAILABLE, INSTALLED, AND/OR APPLIED AFTER EACH AREA IS GRADED AND NO LATER THAN FIVE (5) WORKING DAYS AFTER COMPLETION OF EACH AREA.
5. THE CONTRACTOR, DEVELOPER, AND ENGINEER OF WORK SHALL BE RESPONSIBLE TO REVIEW THE PROJECT SITE PRIOR TO OCTOBER 15 (RAINY SEASON) AND TO COORDINATE AN IMPLEMENTATION PLAN FOR WET WEATHER EROSION CONTROL DEVICES. A LOCAL BASED STANDBY CREW FOR EMERGENCY WORK SHALL BE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON (OCTOBER 15 THROUGH APRIL 15). NECESSARY MATERIALS SHALL BE AVAILABLE AND STOCK PILED AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OR MAINTENANCE OF TEMPORARY DEVICES WHEN RAIN IS THREATENING.
6. IN THE EVENT OF A FAILURE, THE DEVELOPER AND/OR HIS REPRESENTATIVE SHALL BE RESPONSIBLE FOR CLEANUP AND ALL ASSOCIATED COSTS OR DAMAGE. IN THE EVENT THAT DAMAGE OCCURS WITHIN THE RIGHT-OF-WAY AND THE COUNTY IS REQUIRED TO PERFORM CLEANUP, THE OWNER SHALL BE RESPONSIBLE FOR COUNTY REIMBURSEMENT OF ALL ASSOCIATED COSTS OR DAMAGE.
7. IN THE EVENT OF FAILURE AND/OR LACK OF PERFORMANCE BY THE OWNER AND/OR CONTRACTOR TO CORRECT EROSION CONTROL RELATED PROBLEMS THE PUBLIC WORKS DEPARTMENT MAY REVOKE ALL ACTIVE PERMITS AND RECOMMEND THAT COUNTY CODE ENFORCEMENT PROVIDE A WRITTEN NOTICE OR STOP WORK ORDER IN ACCORDANCE WITH SECTION 22.52.140 (23.10) OF THE LAND USE ORDINANCE.
8. PERMANENT EROSION CONTROL SHALL BE PLACED AND ESTABLISHED WITH 90% COVERAGE ON ALL DISTURBED SURFACES OTHER THAN PAVED OR GRAVEL SURFACES, PRIOR TO FINAL INSPECTION. PERMANENT EROSION CONTROL SHALL BE FULLY ESTABLISHED PRIOR TO FINAL ACCEPTANCE. TEMPORARY EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL PERMANENT MEASURES IS ESTABLISHED.
9. THE COUNTY AIR POLLUTION CONTROL DISTRICT (APCD) MAY HAVE ADDITIONAL PROJECT SPECIFIC EROSION CONTROL REQUIREMENTS. THE CONTRACTOR, DEVELOPER, AND ENGINEER OF WORK SHALL BE RESPONSIBLE FOR MAINTAINING SELF REGULATION OF THESE REQUIREMENTS.
10. ALL PROJECTS INVOLVING SITE DISTURBANCE OF ONE ACRE OR GREATER SHALL COMPLY WITH THE REQUIREMENTS OF THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES). THE DEVELOPER SHALL SUBMIT A NOTICE OF INTENT (NOI) TO COMPLY WITH THE GENERAL PERMIT FOR CONSTRUCTION ACTIVITY WITH THE REGIONAL WATER QUALITY CONTROL BOARD (RWQCB). THE DEVELOPER SHALL PROVIDE THE COUNTY WITH THE WASTE DISCHARGE IDENTIFICATION NUMBER (WQID #) OR WITH VERIFICATION THAT AN EXEMPTION HAS BEEN GRANTED BY RWQCB. WQID NO. _____ PERSON TO CONTACT 24 HOURS A DAY IN THE EVENT THERE IS AN EROSION CONTROL/SEDIMENTATION PROBLEM (STORM WATER COMPLIANCE OFFICER): _____ LOCAL PHONE NO. _____



1 ROCKED CONSTRUCTION ENTRANCE
 Scale: NTS

2 INLET PROTECTION DETAIL
 Scale: NTS



CONSTRUCTION SPECIFICATIONS

LOCATE FIBER ROLLS ON LEVEL CONTOURS SPACED AS FOLLOWS:

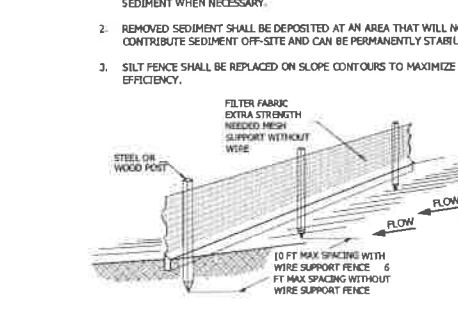
- SLOPE INCLINATION OF 4:1 (H:V) OR FLATTER: FIBER ROLLS SHOULD BE PLACED AT A MAXIMUM INTERVAL OF 20 FT.
- SLOPE INCLINATION BETWEEN 4:1 AND 2:1 (H:V): FIBER ROLLS SHOULD BE PLACED AT A MAXIMUM INTERVAL OF 15 FT. (A CLOSER SPACING IS MORE EFFECTIVE).
- SLOPE INCLINATION OF 2:1 (H:V) OR GREATER: FIBER ROLLS SHOULD BE PLACED AT A MAXIMUM INTERVAL OF 10 FT. (A CLOSER SPACING IS MORE EFFECTIVE).
- TURN THE ENDS OF THE FIBER ROLL UP SLOPE TO PREVENT RUNOFF FROM GOING AROUND THE ROLL. STAKE FIBER ROLLS INTO A 2 TO 4 IN. DEEP TRENCH WITH A WIDTH EQUAL TO THE DIAMETER OF THE FIBER ROLL.
- DRIVE STAKES AT THE END OF EACH FIBER ROLL AND SPACE 4 FT MAXIMUM ON CENTER.
- USE WOOD STAKES WITH A NOMINAL CLASSIFICATION OF 0.75 BY 0.75 IN. AND A MINIMUM LENGTH OF 24 IN.
- IF MORE THAN ONE FIBER ROLL IS PLACED IN A ROW, THE ROLLS SHOULD BE OVERLAPPED, NOT ABUTTED. REPAIR OR REPLACE SPLIT, TORN, UNRAVELING OR SLUMPING FIBER ROLLS.

IF THE FIBER ROLL IS USED AS A SEDIMENT CAPTURE DEVICE, OR AS AN EROSION CONTROL DEVICE TO MAINTAIN SHEET FLOWS, SEDIMENT THAT ACCUMULATES IN THE BMP MUST BE PERIODICALLY REMOVED IN ORDER TO MAINTAIN BMP EFFECTIVENESS. SEDIMENT SHOULD BE REMOVED WHEN SEDIMENT ACCUMULATION REACHES ONE-HALF THE DESIGNATED SEDIMENT STORAGE DEPTH, USUALLY ONE-HALF THE DISTANCE BETWEEN THE TOP OF THE FIBER ROLL AND THE ADJACENT GROUND SURFACE. SEDIMENT REMOVED DURING THE MAINTENANCE MAY BE INCORPORATED INTO EARTHWORK ON THE SITE OR DISPOSED AT AN APPROPRIATE LOCATION.

INSTALL A FIBER ROLL NEAR SLOPE WHERE IT TRANSITIONS INTO A STEEPER SLOPE

3 FIBER ROLLS
 Scale: NTS

- NOTE:**
1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY.
 2. REMOVED SEDIMENT SHALL BE DEPOSITED AT AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.
 3. SILT FENCE SHALL BE REPLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.



CONSTRUCTION SPECIFICATIONS

THE HEIGHT OF A SILT FENCE SHALL NOT EXCEED 36 INCHES. STORAGE HEIGHT SHALL NEVER EXCEED 18". THE FENCE LINE SHALL FOLLOW THE CONTOUR AS CLOSELY AS POSSIBLE.

IF POSSIBLE, THE FILTER FABRIC SHALL BE CUT FROM A CONTINUOUS ROLL TO AVOID THE USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED ONLY AT A SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP AND BOTH ENDS SECURELY FASTENED TO THE POST.

POSTS SHALL BE SPACED A MAXIMUM OF 10 FEET APART AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 12 INCHES). WHEN EXTRA STRENGTH FABRIC IS USED WITHOUT THE WIRE SUPPORT FENCE, POST SPACING SHALL NOT EXCEED 6 FEET. TURN THE ENDS OF THE FENCE UPHILL.

A TRENCH SHALL BE EXCAVATED APPROXIMATELY 4 INCHES WIDE AND 6 INCHES DEEP ALONG THE LINE OF POSTS AND UPSLOPE FROM THE BARRIER.

WHEN STANDARD-STRENGTH FILTER FABRIC IS USED, A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY DUTY WIRE STAPLES AT LEAST 1 INCH LONG. THE WIRES OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 2 INCHES AND SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE.

THE STANDARD-STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE, AND 6 INCHES OF THE FABRIC SHALL EXTEND INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.

WHEN EXTRA-STRENGTH FILTER FABRIC AND CLOSER POST SPACING ARE USED, THE WIRE MESH SUPPORT FENCE MAY BE ELIMINATED. IN SUCH A CASE, THE FILTER FABRIC IS STAPLED OR WIRED DIRECTLY TO THE POSTS.

THE TRENCH SHALL BE BACKFILLED AND THE SOIL COMPACTED OVER THE TOE OF THE FILTER FABRIC.

SILT FENCES PLACED AT THE TOE OF A SLOPE SHALL BE SET AT LEAST 6 FEET FROM THE TOE IN ORDER TO INCREASE PONDING VOLUME.

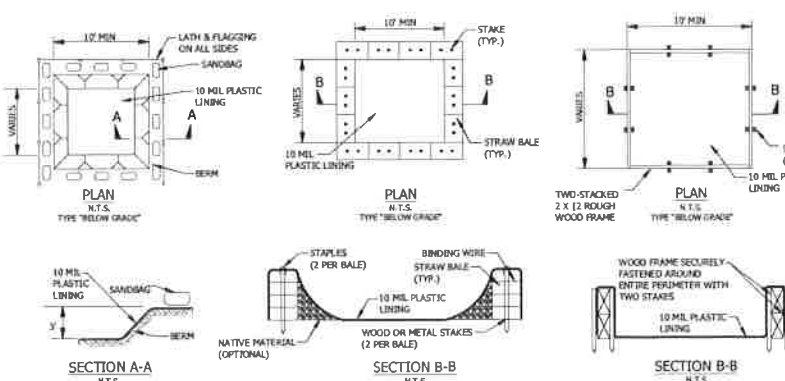
SILT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED, AND ANY SEDIMENT STORED BEHIND THE SILT FENCE HAS BEEN REMOVED.

INSPECTION AND MAINTENANCE

SILT FENCES AND FILTER BARRIERS SHALL BE INSPECTED WEEKLY AND AFTER EACH SIGNIFICANT STORM (1" IN 24 HR.). ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY. SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/3 HEIGHT OF THE FENCE OR 9 INCHES MAXIMUM.

THE REMOVED SEDIMENT SHALL VEGETATE OR OTHERWISE STABILIZED.

4 SILT FENCE
 Scale: NTS



5 CONCRETE WASHOUT
 Scale: NTS

- NOTES:**
1. ACTUAL LAYOUT DETERMINED IN FIELD.
 2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 50 FT. OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

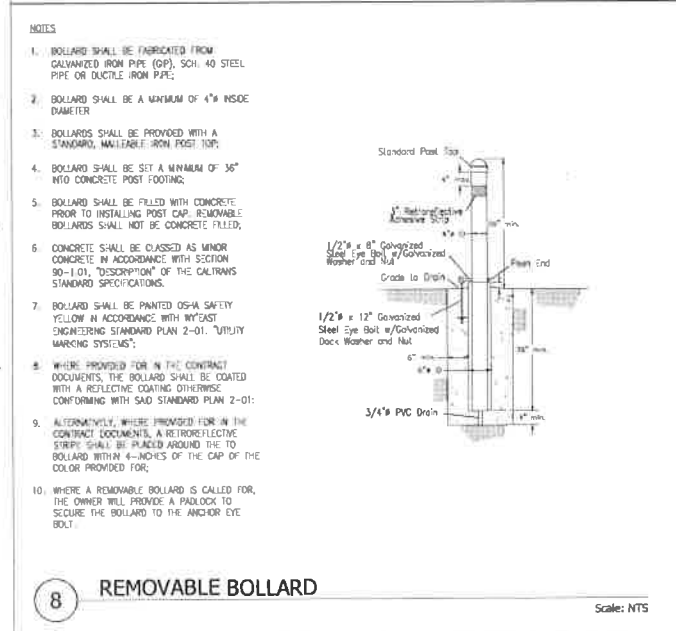
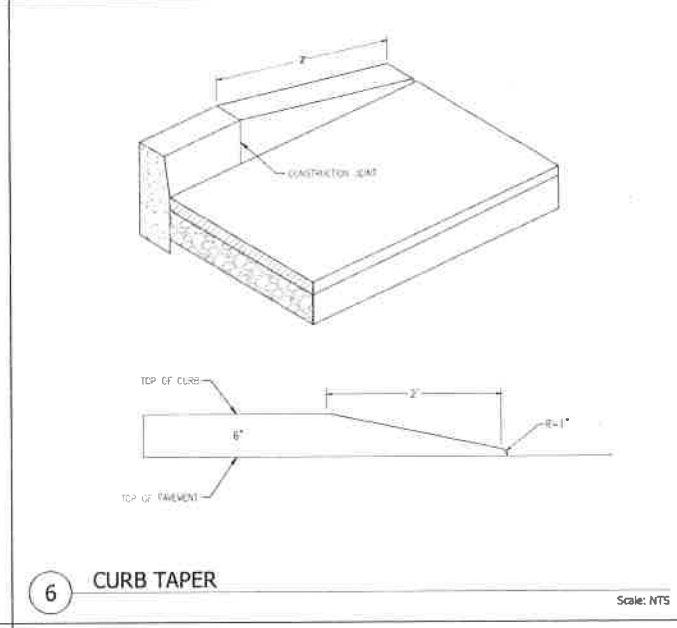
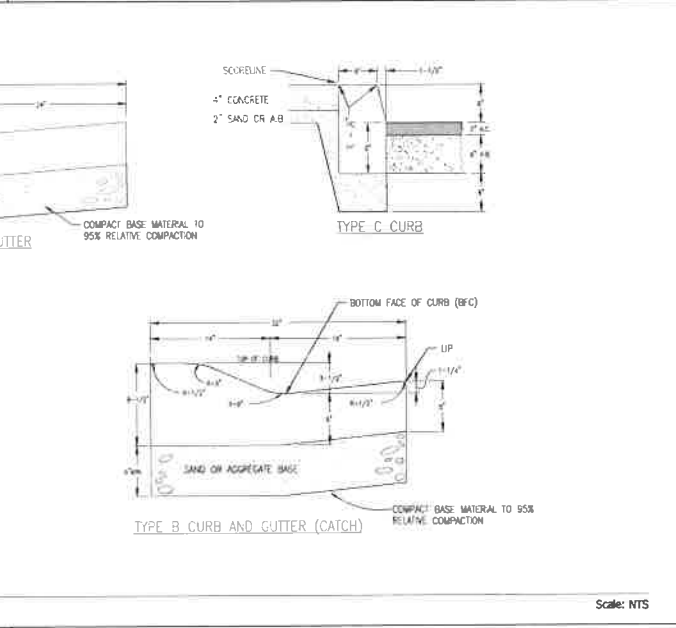
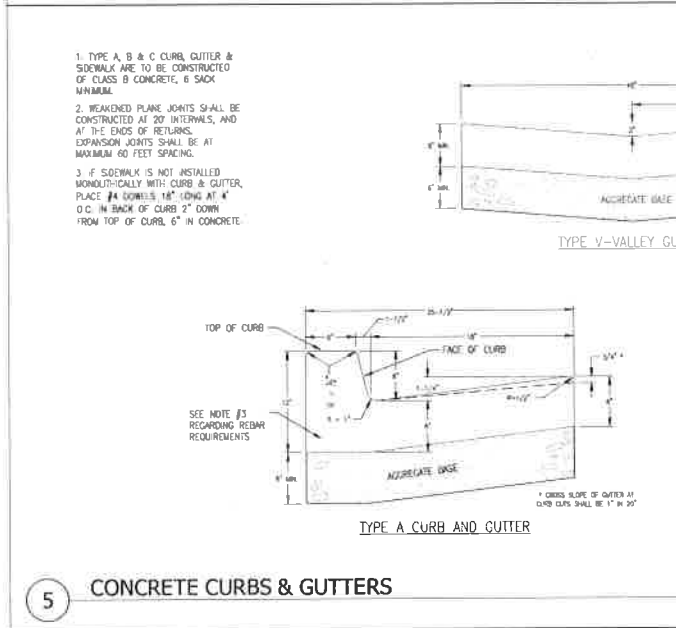
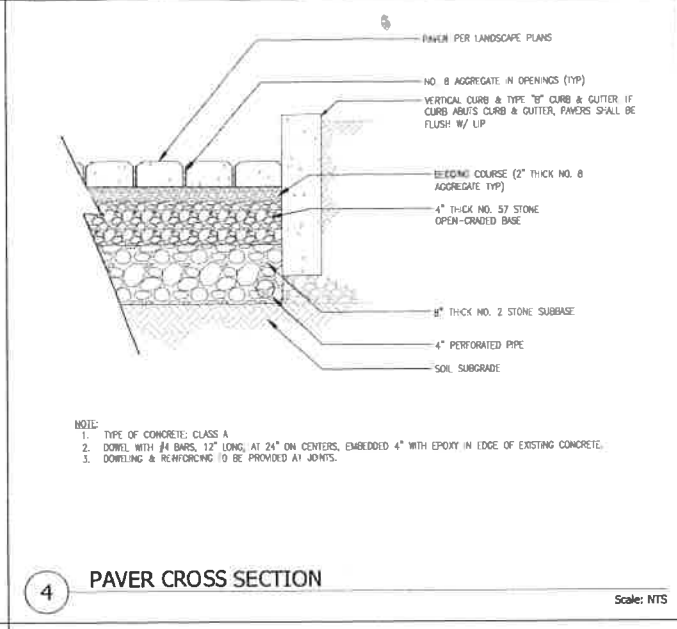
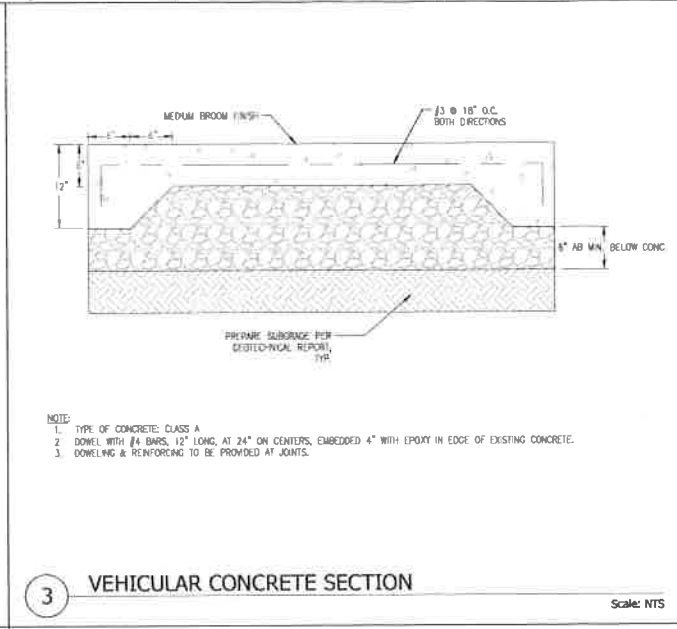
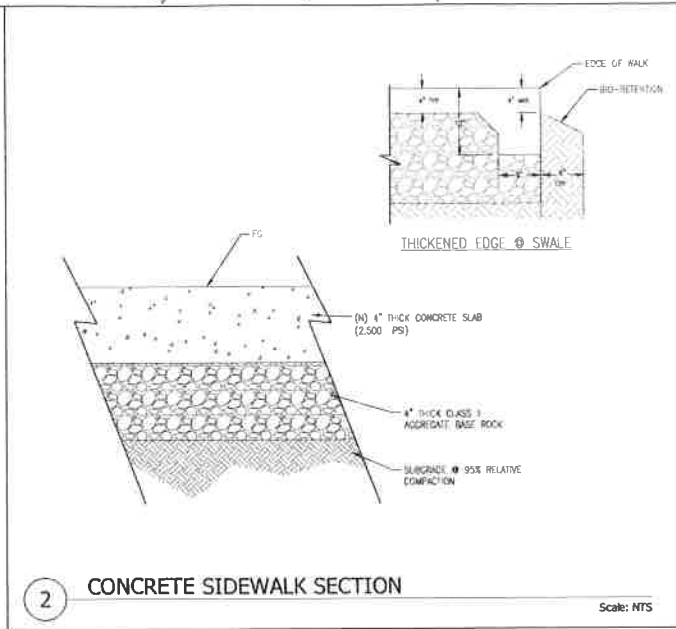
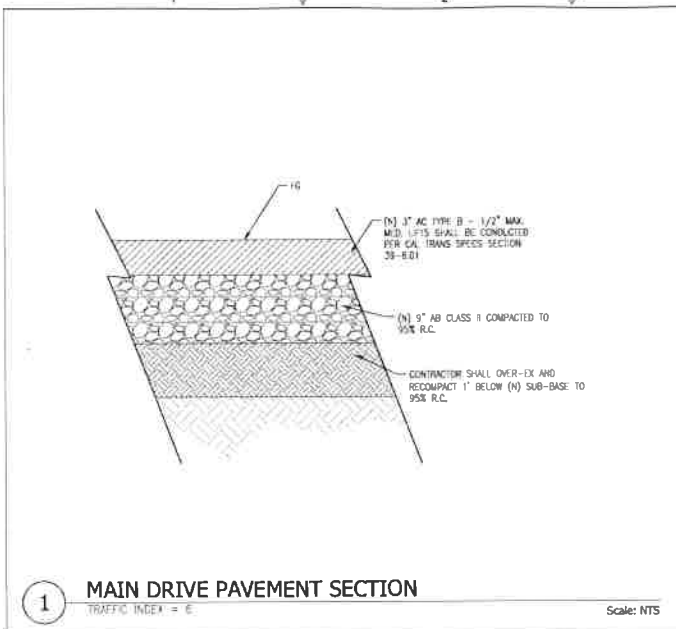
| REVISIONS | BY |
|-----------------------------------|----|
| 1. COUNTY COMMENTS DATED 12/21/18 | DD |
| 2. COUNTY COMMENTS DATED 04/04/19 | DD |

EROSION CONTROL DETAILS

C2G / CIVIL CONSULTANTS GROUP, INC.
 Engineers/Planners
 4444 Scots Valley Drive / Suite 6
 Soquel, CA 95068
 T: (831) 438-4620 F: (831) 438-4640

TRACT 1609 MAPLETHORPE LANE
3300 MAPLETHORPE LANE
SOQUEL, CA
APN: 037-121-60

Date: 12.18.18
 Scale: NONE
 Drawn: DD/JB
 Job: 480-00
 Sheet: **C7.2**
 of 15 Sheets



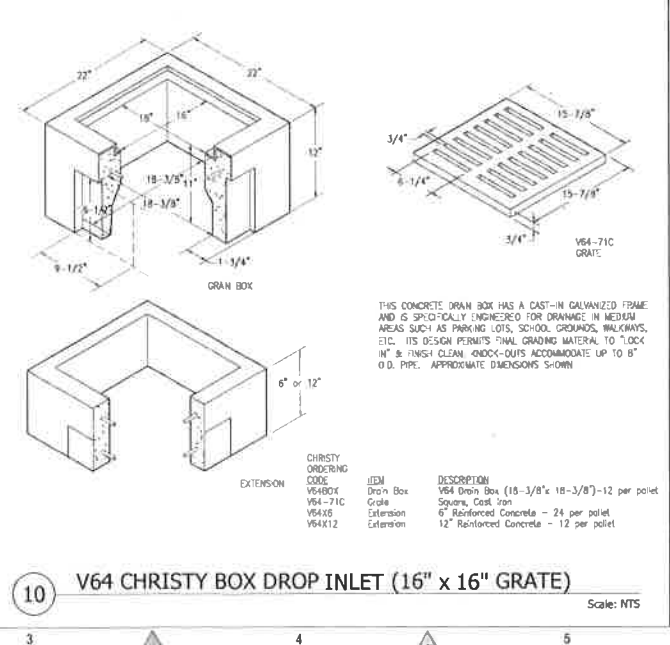
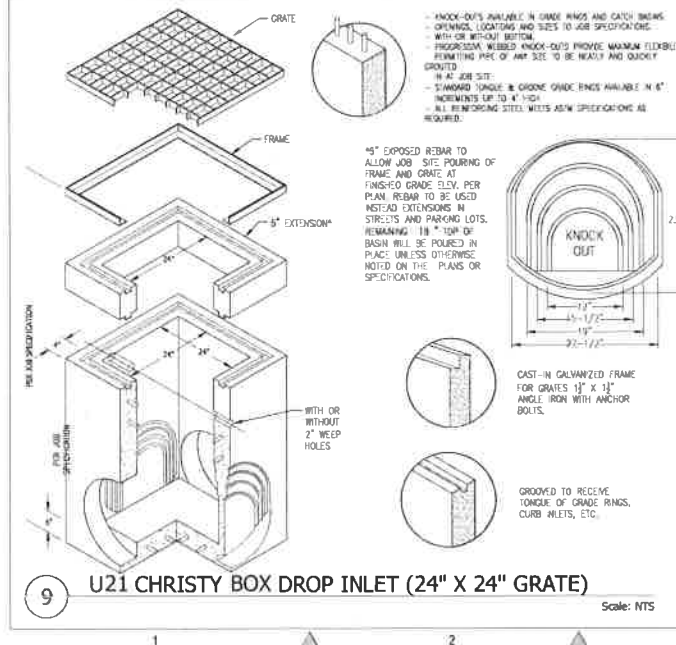
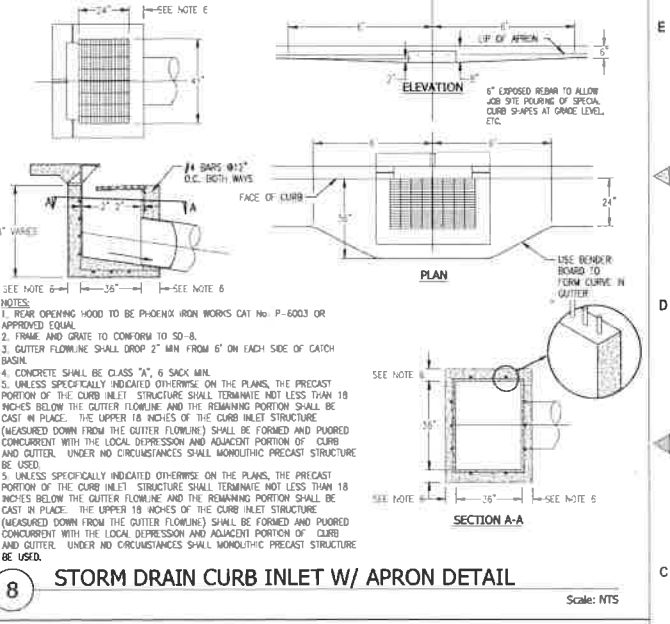
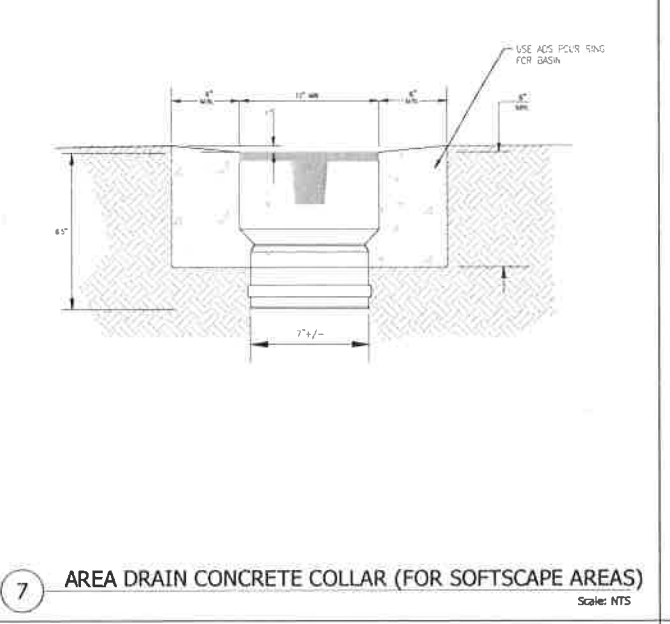
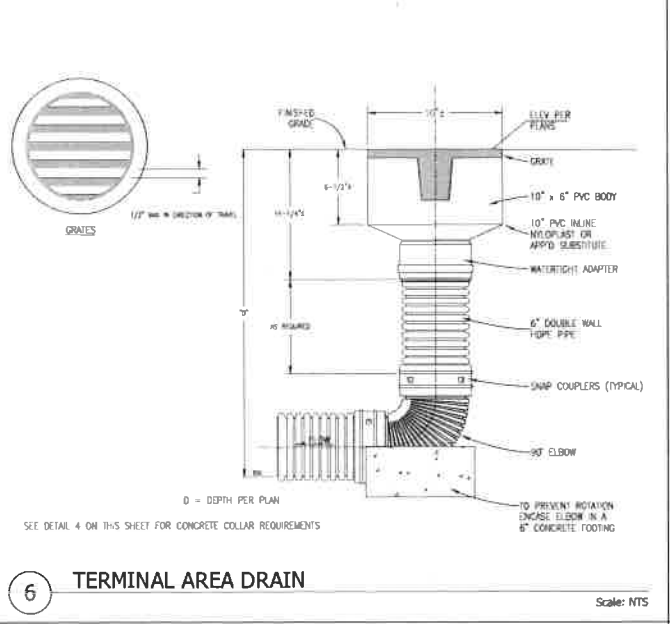
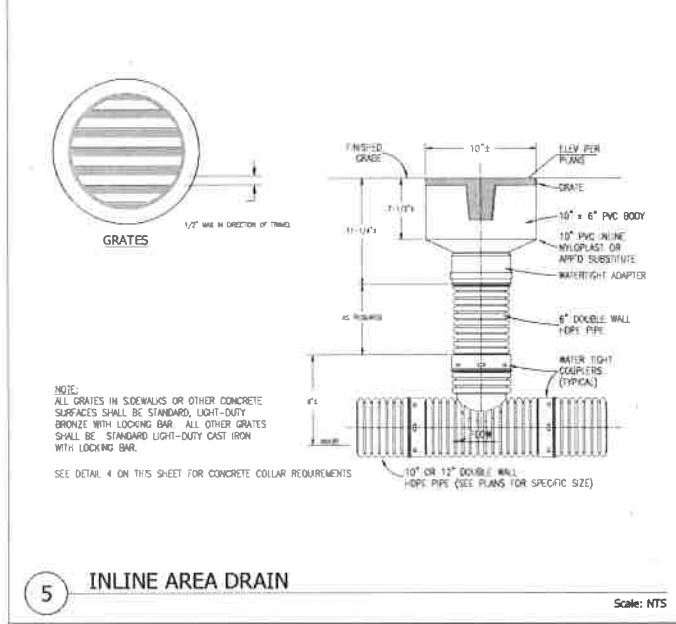
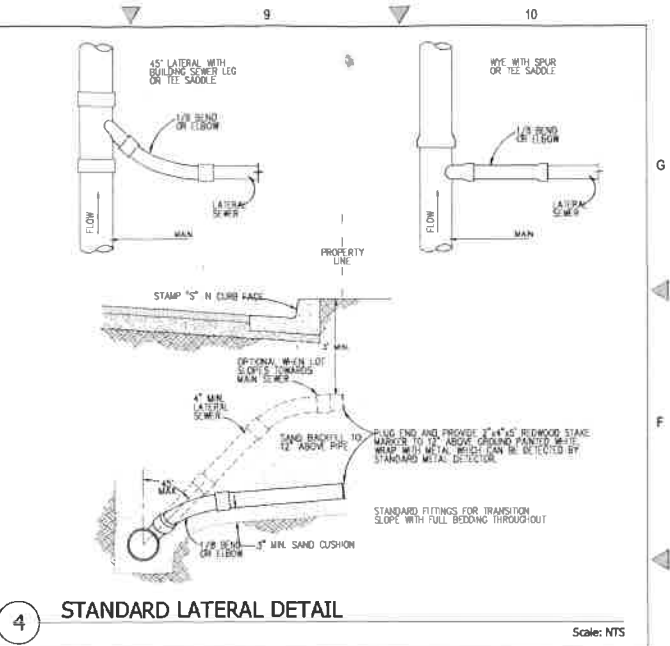
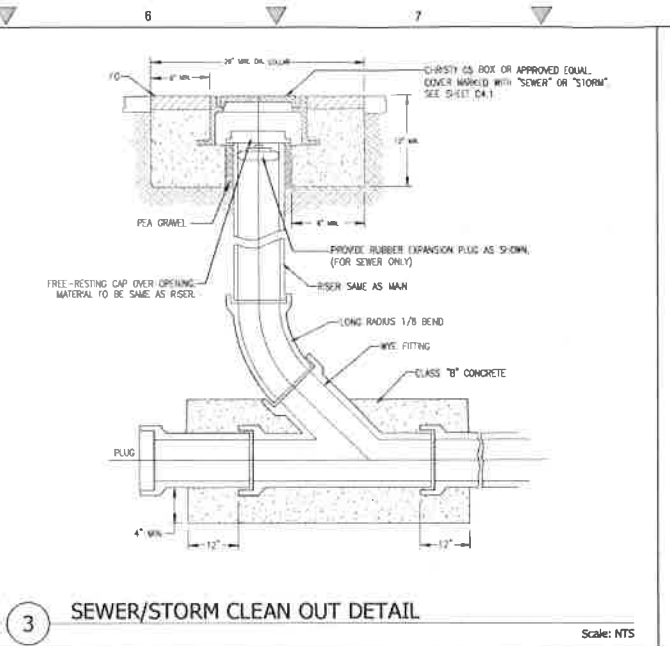
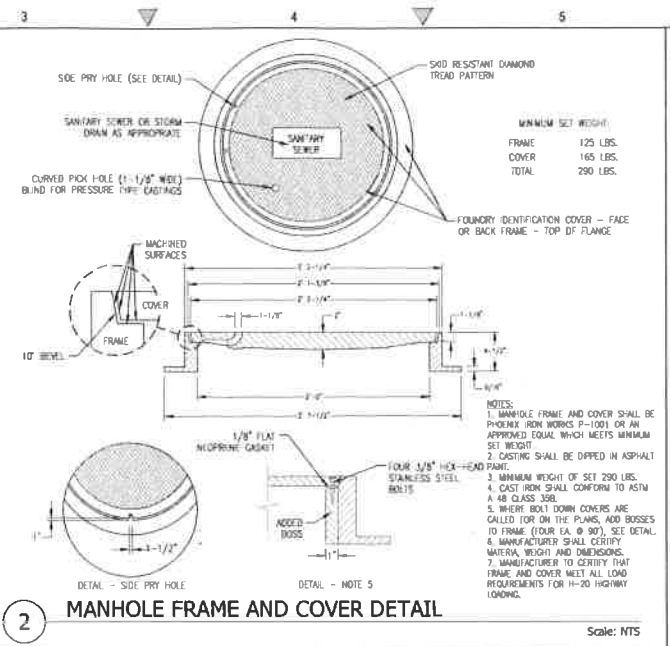
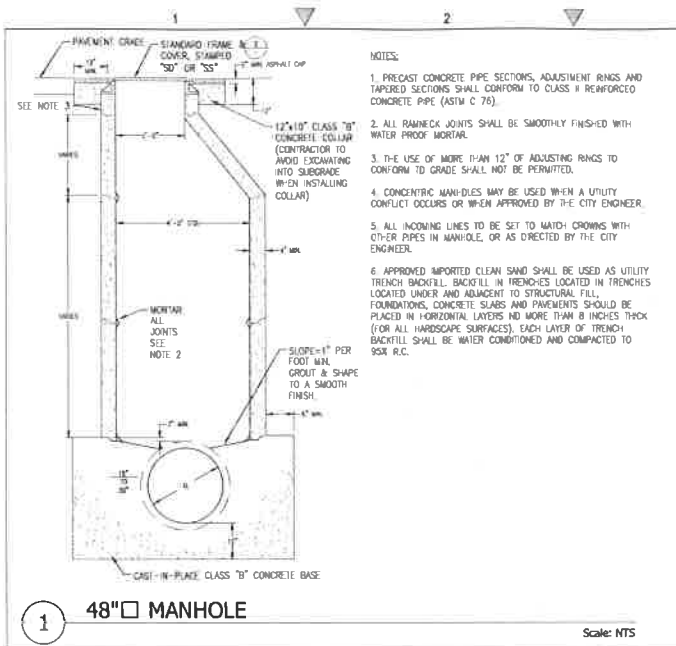
| REVISIONS | BY |
|--------------------------------|----|
| COUNTY COMMENTS DATED 12/21/18 | DD |
| COUNTY COMMENTS DATED 04/04/19 | DD |

DETAILS

C2G CIVIL CONSULTANTS GROUP, INC.
Engineers/Planners
4444 Scots Valley Drive / Suite 6
Scots Valley, CA 95066
P: (925) 438-9101 F: (925) 438-4420

**TRACT 1609 MAPLETHORPE LANE
3300 MAPLETHORPE LANE
SOQUEL, CA
APN: 037-121-60**

| | |
|--------------|-------------|
| Date: | 12.18.18 |
| Scale: | AS SHOWN |
| Drawn: | DD/JB |
| Job: | 480-00 |
| Sheet: | C8.1 |
| of 15 Sheets | |



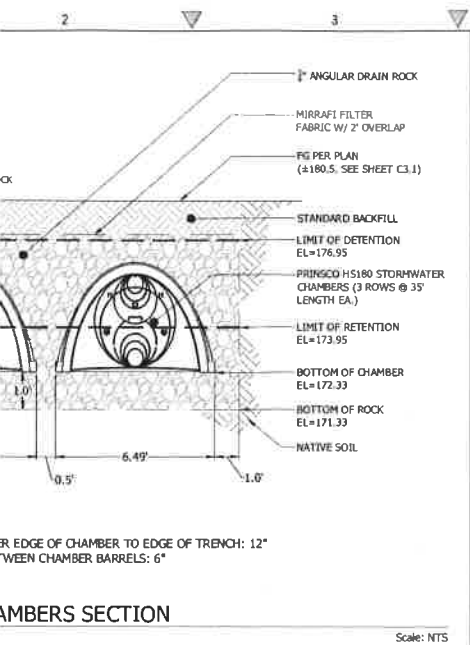
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| COUNTY COMMENTS DATED 12/21/18 | DD |
| COUNTY COMMENTS DATED 04/04/19 | DD |

DETAILS

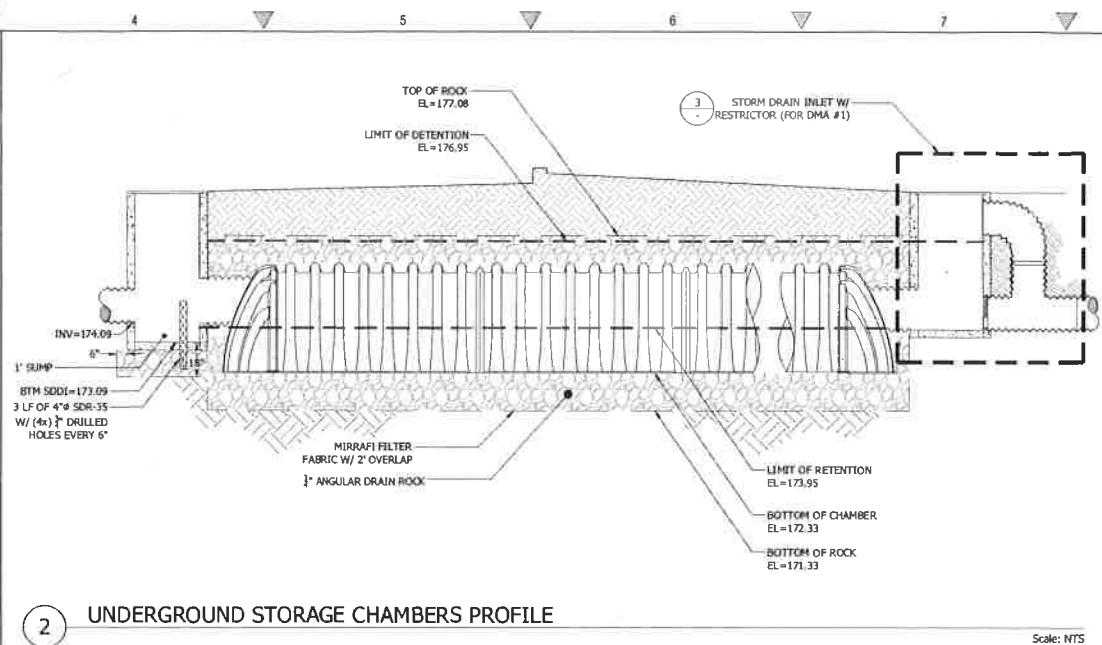
C2G / CIVIL CONSULTANTS GROUP, INC.
Engineers/Planners
4444 Scots Valley Drive / Suite 6
Scots Valley, CA 95066
(916) 338-4400

**TRACT 1609 MAPLETHORPE LANE
3300 MAPLETHORPE LANE
SOQUEL, CA
APN: 037-121-121-60**

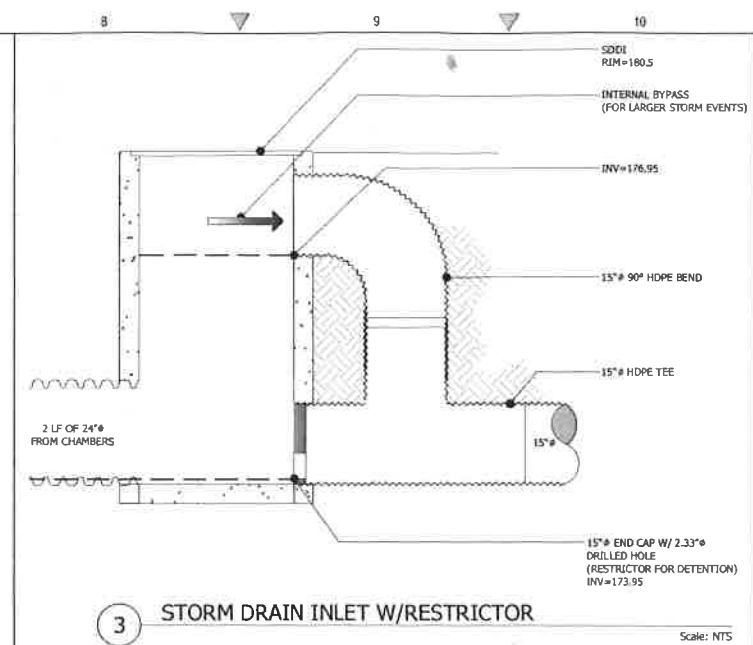
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Sheet: C8.2
Of 15 Sheets



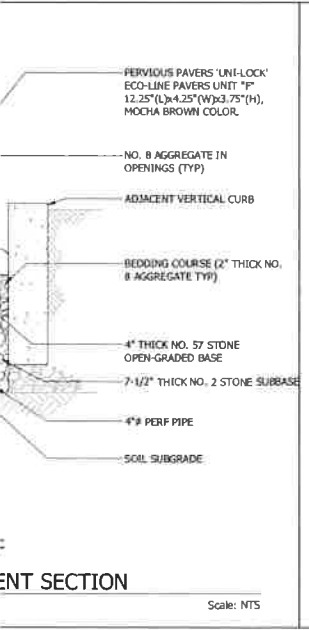
1 CHAMBERS SECTION



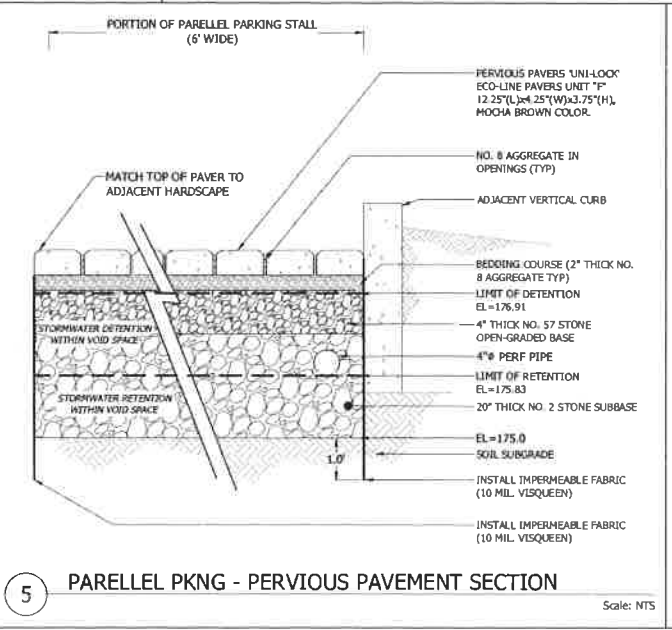
2 UNDERGROUND STORAGE CHAMBERS PROFILE



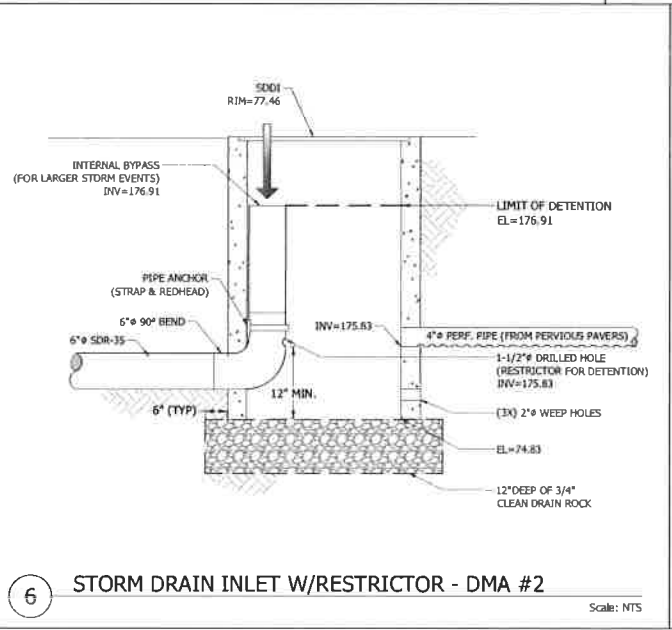
3 STORM DRAIN INLET W/RESTRICTOR



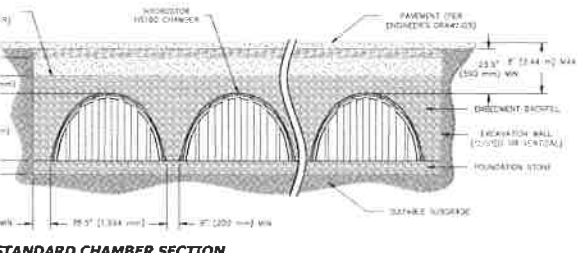
4 PAVEMENT SECTION



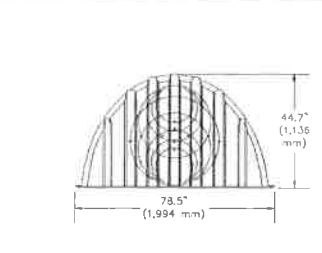
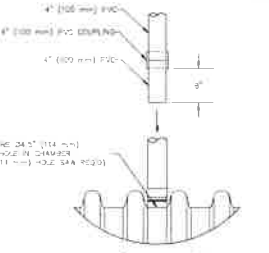
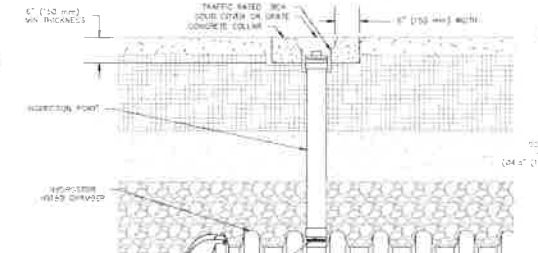
5 PARELLEL PKNG - PERVIOUS PAVEMENT SECTION



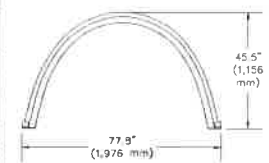
6 STORM DRAIN INLET W/RESTRICTOR - DMA #2



7 STANDARD CHAMBER SECTION



| Chamber Specifications | |
|--------------------------|---|
| Chamber Size (L x W x H) | 88.7\" x 77.8\" x 45.5\" (2,253 x 1,976 x 1,156 mm) |
| Installed Length | 85.3\" (2,167 mm) |
| Chamber Storage | 113.6 m ³ (3,22 m ³) |
| Min. Installed Storage* | 150.0 m ³ (5,10 m ³) |
| Weight | 127 lbs (57.5 kg) |
| Chambers / Palet | 13 |
| Approx. Weight / Palet | 2,500 lbs (1,173 kg) |



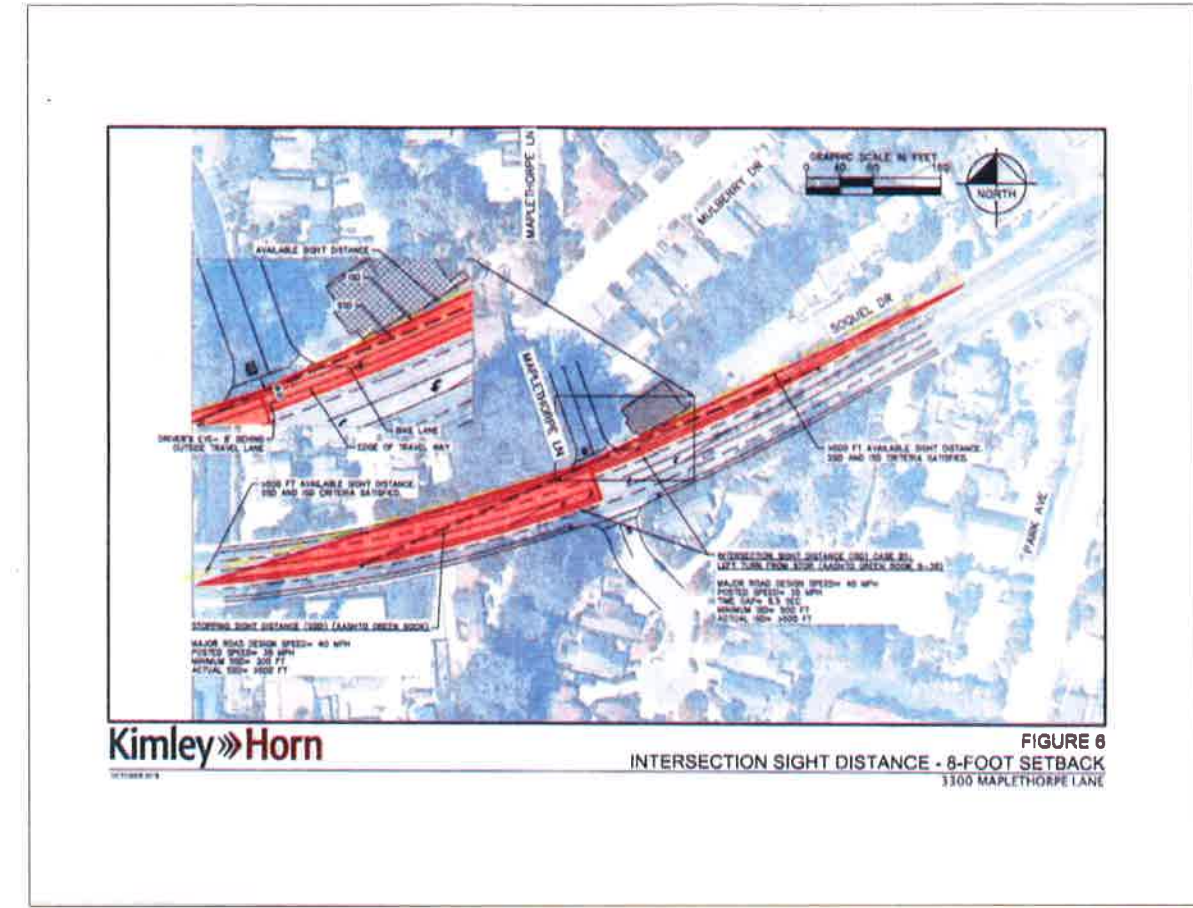
| REVISIONS | | BY |
|-----------|--------------------------------|----|
| 1 | COUNTY COMMENTS DATED 12/21/18 | DD |
| 2 | COUNTY COMMENTS DATED 04/04/19 | DD |

DETAILS

C2G CIVIL CONSULTANTS GROUP, INC.
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 4444 Scotts Valley Drive / Suite 6
 Scotts Valley, CA 95066
 T (925) 436-4120 F (925) 436-4420

TRACT 1609
 MAPLETHORPE LANE
 SOQUEL, CA
 APN: 037-121-60

1 2 3 4 5 6 7 8 9 10



1 INTERSECTION SIGHT DISTANCE

Scale: NTS



2 TRAFFIC CALMING

Scale: NTS

| REVISIONS | BY |
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| COUNTY COMMENTS DATED 12/21/18 | DB |
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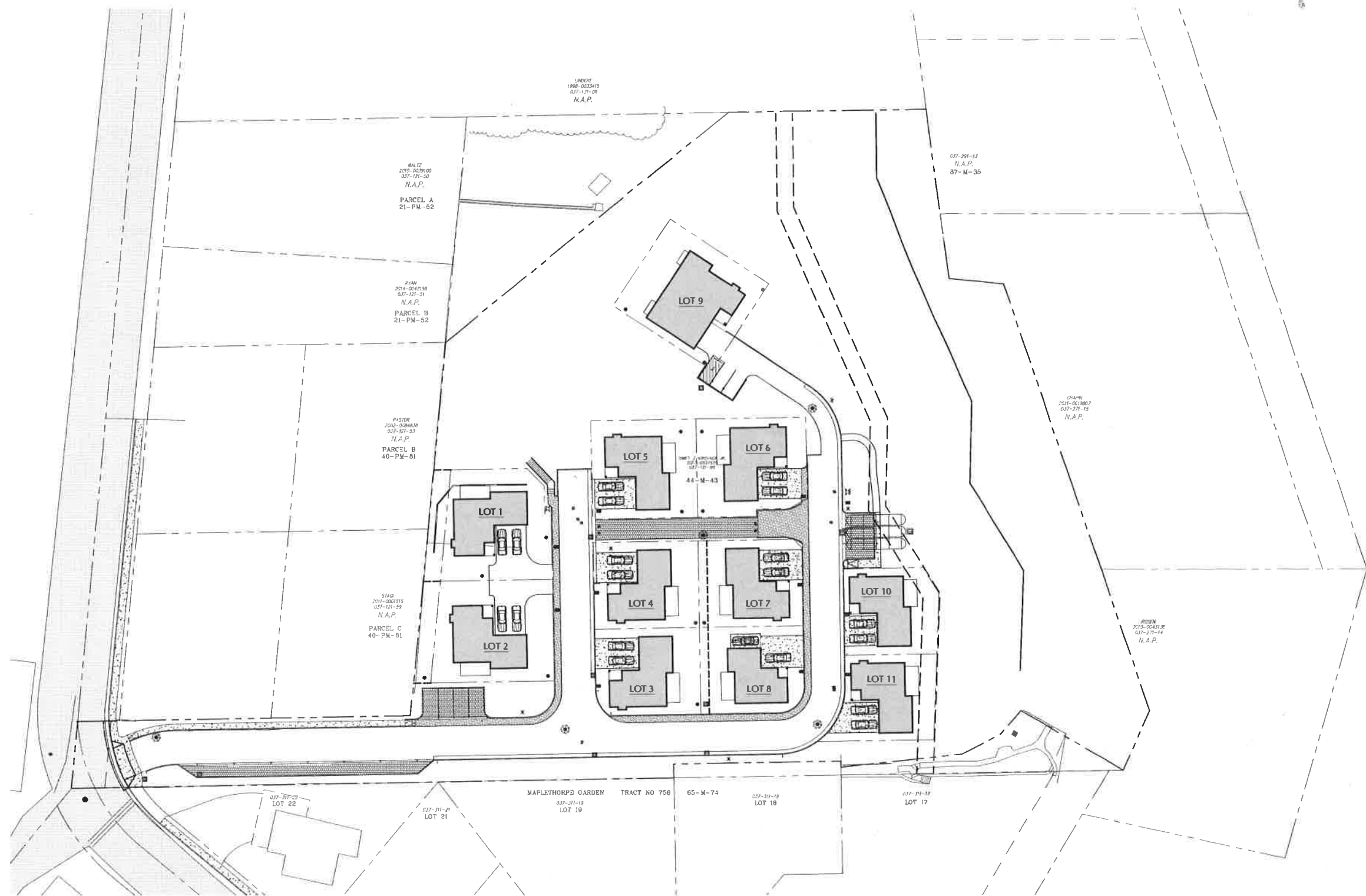
DETAILS

C2G CIVIL CONSULTANTS GROUP, INC.
 Engineers/Planners
 4444 South Valley Drive / Suite 6
 T. (916) 398-4425 F. (916) 398-4426

TRACT 1609
 3300 MAPLETHORPE LANE
 SOQUEL, CA
 APN: 037-121-60

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| Date: | 12.18.18 |
| Scale: | AS SHOWN |
| Drawn: | DD//B |
| Job: | 480-00 |
| Sheet: | C8.4 |
| Of 15 Sheets | |

1 2 3 4 5 6 7 8 9 10



1 SITE PLAN
SCALE: 1"=30'-0"



WILLIAM C. KEMPF
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831 459-0951
bill@wckempf.com

RESIDENTIAL DEVELOPMENT AT
3300 MAPLETHORPE LANE
SOQUEL, CALIFORNIA
SCHEMATIC SITE PLAN

DRAWING DATE:
FEBRUARY 14, 2019
APN:
037-121-60
CLIENT NAME:
JOHN SWIFT
PROJECT NAME:
3300 MAPLETHORPE LANE

| REVISIONS | | |
|-----------|-------------|---------|
| No. | DESCRIPTION | DATE |
| 1 | PLANNING | 4/23/02 |
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A1





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RESIDENTIAL DEVELOPMENT AT
3300 MAPLETHORPE LANE
SOQUEL, CALIFORNIA
PROPOSED ELEVATIONS (LOTS 1, 2, 5, 6)

DRAWING DATE:
FEBRUARY 14, 2019
APN:
037-121-60
CLIENT NAME:
JOHN SWIFT
PROJECT NAME:
3300 MAPLETHORPE LANE

| REVISIONS | | |
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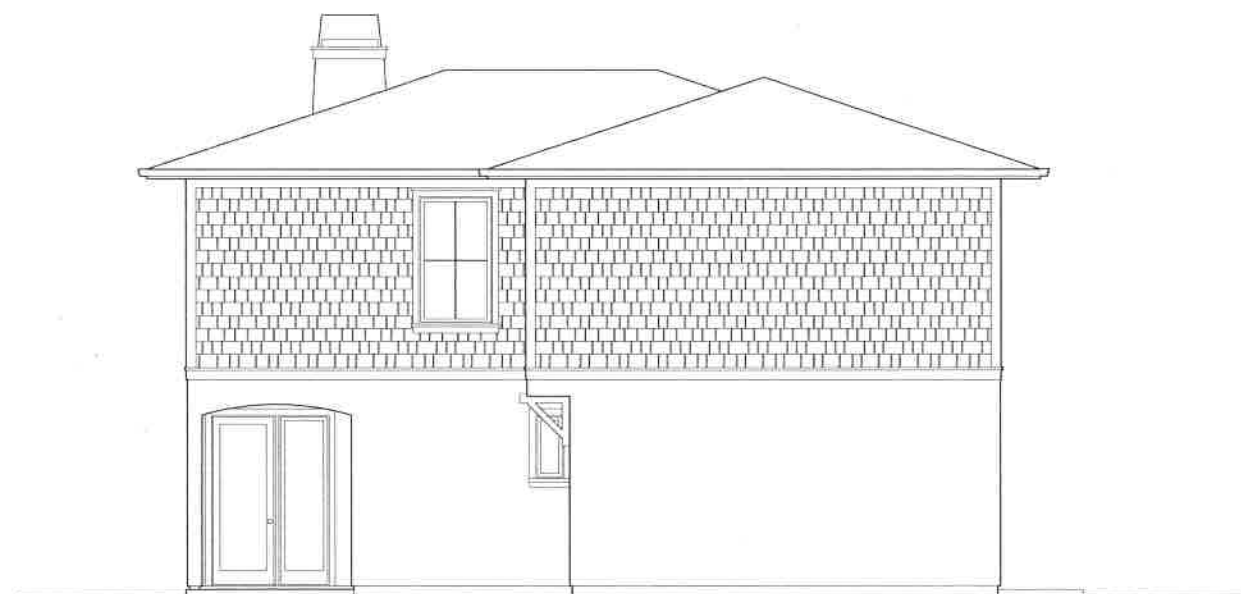
A2.2



② SIDE ELEVATION
SCALE: 1/4"=1'-0"



① FRONT ELEVATION
SCALE: 1/4"=1'-0"



④ SIDE ELEVATION
SCALE: 1/4"=1'-0"



③ BACK ELEVATION
SCALE: 1/4"=1'-0"



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831 459-0951
bill@wckempff.com

RESIDENTIAL DEVELOPMENT AT
3300 MAPLETHORPE LANE
SOQUEL, CALIFORNIA
ELEVATIONS (LOT 9)

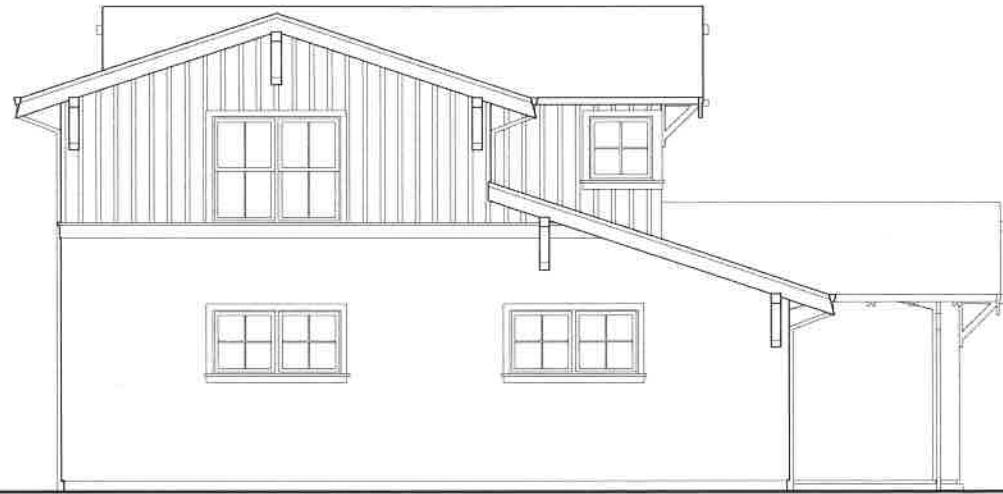
DRAWING DATE:
FEBRUARY 14, 2019
APN:
037-121-60
CLIENT NAME:
JOHN SWIFT
PROJECT NAME:
3300 MAPLETHORPE LANE

| REVISIONS | | |
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| No. | DESCRIPTION | DATE |
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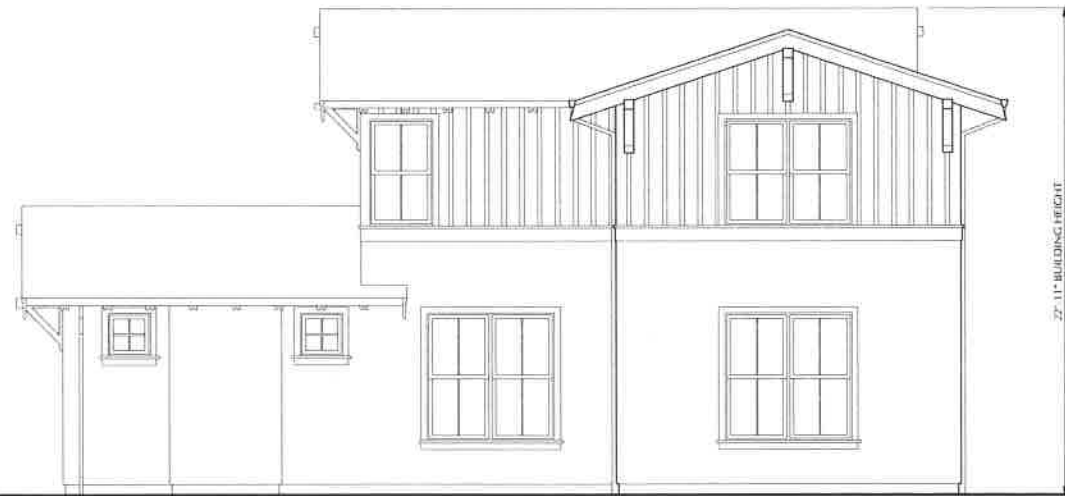
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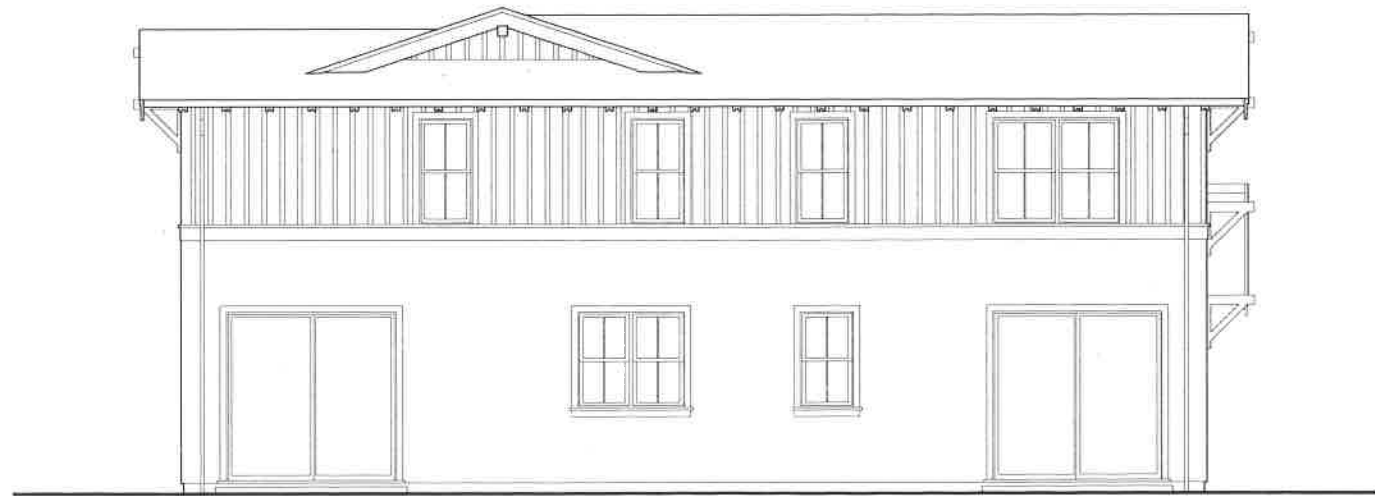
② SIDE ELEVATION
SCALE: 1/4"=1'-0"



① FRONT ELEVATION
SCALE: 1/4"=1'-0"



④ SIDE ELEVATION
SCALE: 1/4"=1'-0"



③ BACK ELEVATION
SCALE: 1/4"=1'-0"



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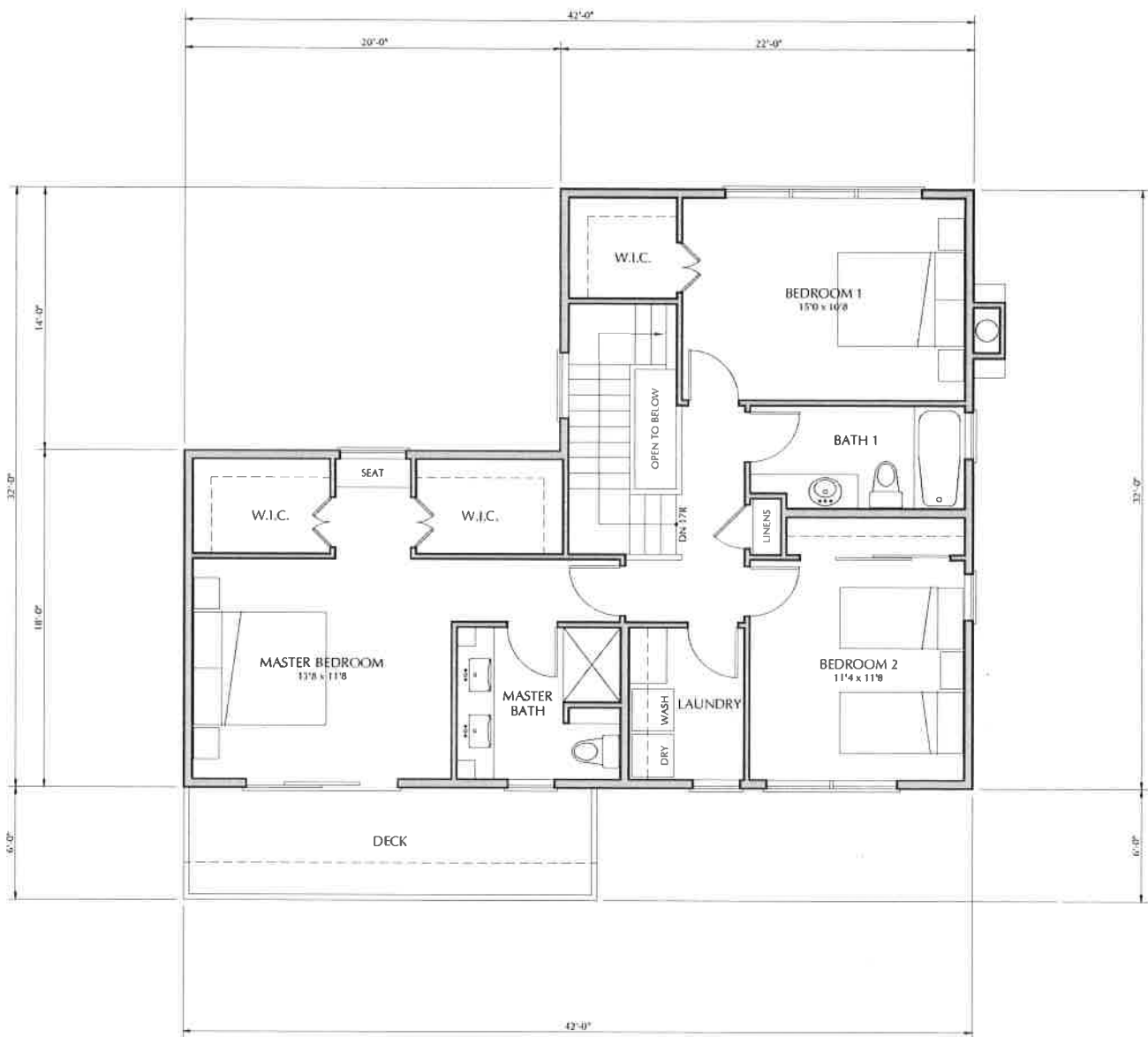
RESIDENTIAL DEVELOPMENT AT
3300 MAPLETHORPE LANE
SOQUEL, CALIFORNIA
PROPOSED FLOOR PLANS (LOTS 10-11)

DRAWING DATE:
FEBRUARY 14, 2019
APN:
037-121-60
CLIENT NAME:
JOHN SWIFT
PROJECT NAME:
3300 MAPLETHORPE LANE

| REVISIONS | | |
|-----------|-------------|------|
| No | DESCRIPTION | DATE |
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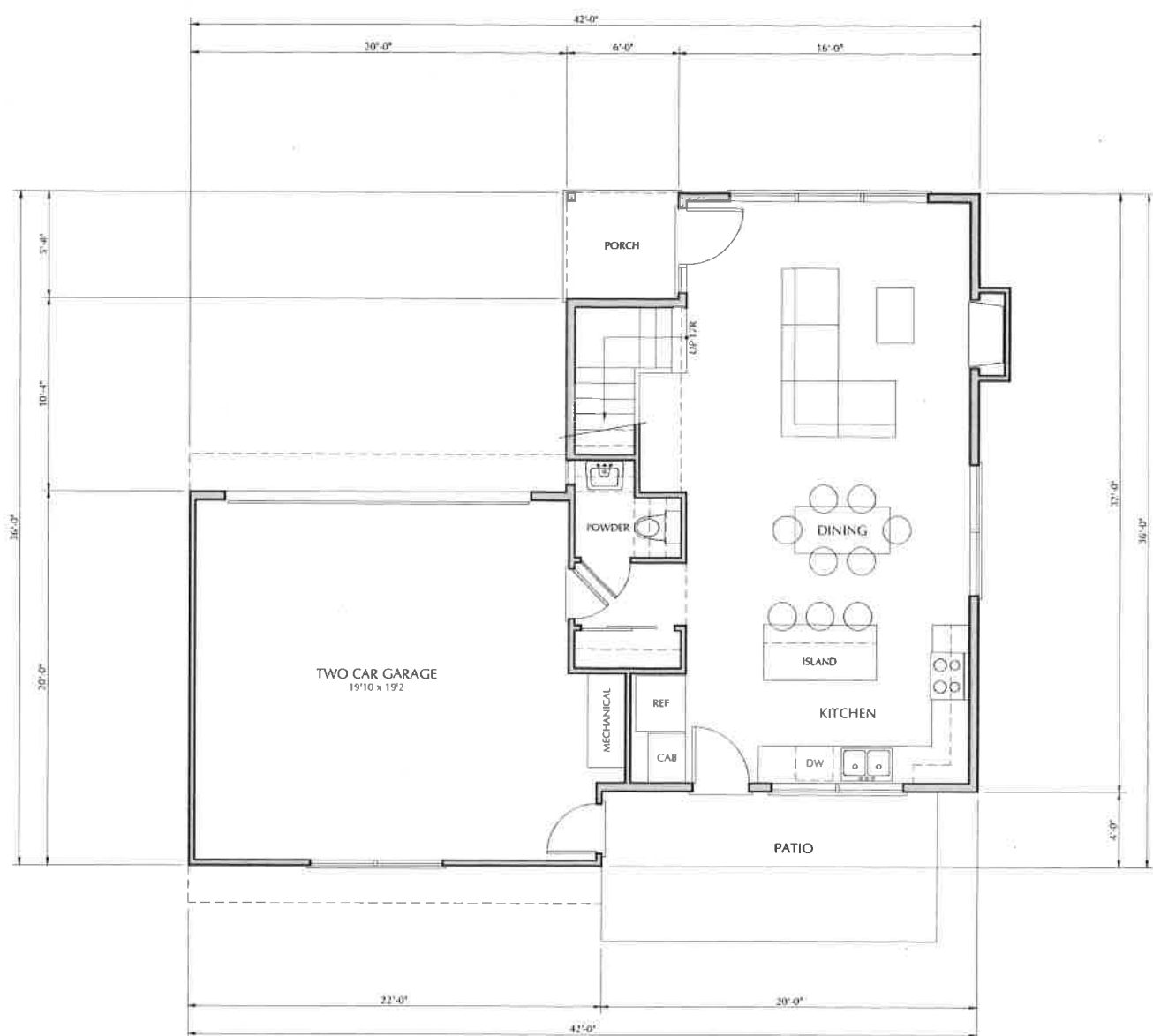
A6.1



2 SECOND FLOOR PLAN
SCALE: 1/4"=1'-0"

BUILDING AREAS

| | |
|---------------------|------------|
| FIRST FLOOR HEATED | 648 S.F. |
| SECOND FLOOR HEATED | 984 S.F. |
| TOTAL HEATED | 1,632 S.F. |
| GARAGE | 430 S.F. |



1 FIRST FLOOR PLAN
SCALE: 1/4"=1'-0"



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RESIDENTIAL DEVELOPMENT AT
3300 MAPLETHORPE LANE
SOQUEL, CALIFORNIA
PROPOSED ELEVATIONS (LOTS 10-11)

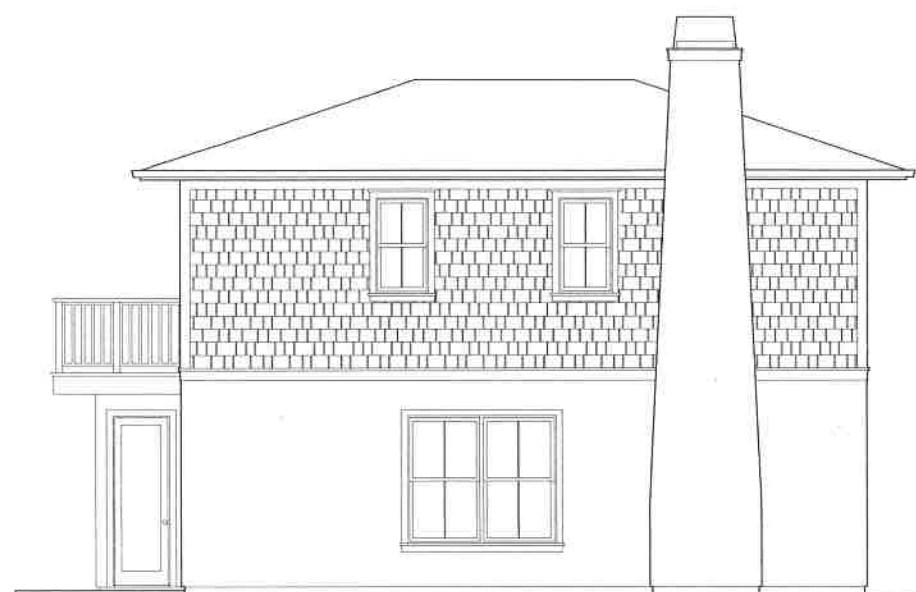
DRAWING DATE:
FEBRUARY 14, 2019
APN:
037-121-60
CLIENT NAME:
JOHN SWIFT
PROJECT NAME:
3300 MAPLETHORPE LANE

| REVISIONS | | |
|-----------|-------------|------|
| No | DESCRIPTION | DATE |
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A6.2

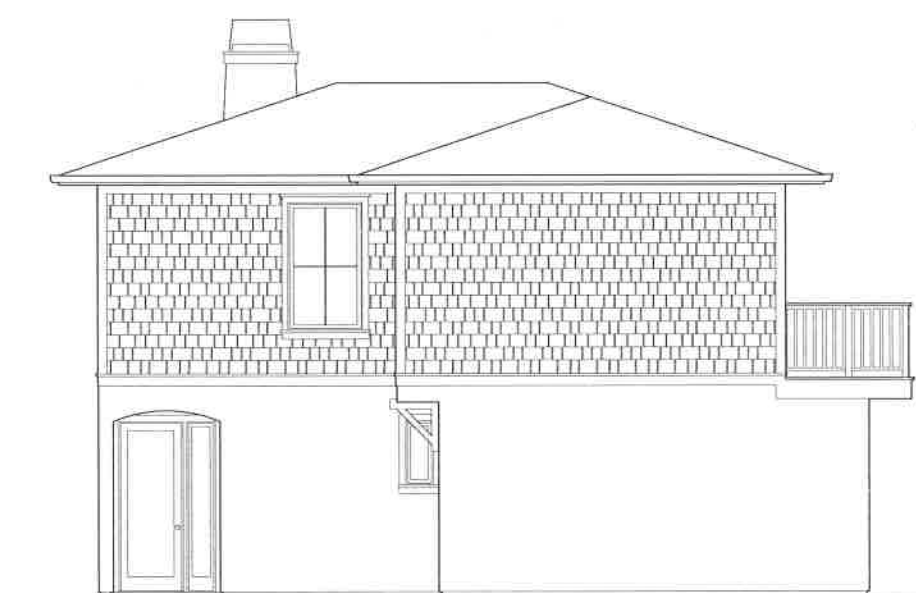


② SIDE ELEVATION
SCALE: 1/4"=1'-0"



ASPHALT COMPOSITION ROOFING SHINGLES
FIBER CEMENT BOARD SHINGLE SIDING
VINYL WINDOWS WITH WOOD TRIM
CEMENT PLASTER FINISH

① FRONT ELEVATION
SCALE: 1/4"=1'-0"



④ SIDE ELEVATION
SCALE: 1/4"=1'-0"



24'-0" BUILDING HEIGHT

③ BACK ELEVATION
SCALE: 1/4"=1'-0"

Plant Palette

Front Yards and Entry Drive

| KEY | QTY | SIZE | BOTANICAL NAME | COMMON NAME |
|----------------------|-----|------|--|-----------------------|
| TREES | | | | |
| PC | 6 | 15 | <i>Pistacia chinensis</i> Keith Davis | Chinese Pistache |
| U | 1 | 15 | <i>Lagerströmia indica</i> Tuscarora | Crape Myrtle |
| SHRUBS | | | | |
| N | 5 | | <i>Nandina</i> Gulf Stream | Myrtle |
| B | 5 | | <i>Bougainvillea</i> or Lady Banks Rose trained on fence as vine | |
| CV | 5 | | <i>Dielsia</i> vegeta | Farrington Lily |
| LC | 5 | | <i>Loasipedium</i> Parakeety | |
| WF | 5 | | <i>Westringia</i> Morning Light or compacta | Compact Westringia |
| AP | 5 | | <i>Arctostaphylos</i> Pacific Mist | Manzanita |
| GROUND COVERS | | | | |
| AN | 1 | | <i>Angaranthus</i> | Kangaroo Paws |
| K | 1 | | <i>Kryphia</i> hybrid Bee's Sunset | Red Hot Poker |
| SL | 1 | | <i>Salvia leucantha</i> | Mexican Sage |
| U | 1 | | <i>Colletaria</i> Little John | Compact Bottle Brush |
| R | 1 | | <i>Rosmarinus</i> Huntington Carpet | Prostrate Rosemary |
| P | 1 | | <i>Limonium</i> perezii | Sea Statice |
| W | 1 | | <i>Lorandea</i> Wings of Night | |
| T | 1 | | <i>Teucrium</i> chamaecarys | |
| L | 1 | | <i>Lomandra</i> Breca | |
| S | 1 | | <i>Santolina</i> virens | Green Lavender Cotton |
| LM | 1 | | <i>Lantana montevidensis</i> purple | |
| LY | 1 | | <i>Lantana</i> Screaming Yellow | Low yellow Lantana |
| CO | 1 | | <i>Coreia</i> Carmine Balls or Ivory Balls | Australian Fuchsia |
| O | 1 | | <i>Osteospermum</i> fuicoum | African Daisy |
| A | 1 | | <i>Arctostaphylos</i> Point Reyes | Low Manzanita |

Landscape Notes

- 1) Final building permit drawings to include a detailed Irrigation Plan, Details, Specs and calculate that follow the Soquel Creek Water District Water Efficient Landscape Ordinance.
- 2) Exact location of plants on site to be adjusted to as best coordinate with sprinkler head locations, lights, drainage, features, and swales.
- 3) Use 3" deep top dress mulch in areas with shrubs and trees in new shrub areas that are not in the Riparian Woodland or Oak Woodland vegetation areas. Provide owner with different mulch samples and prices including nitroated redwood swidul and Vision Recycling Wander Mulch mahogany (dark brown) color. Bid the Wander Mulch.
- 4) Initial plants for all plant circles shown on the plan even if they aren't labeled. Call for clarification for bidding purposes. If no one is available to answer questions, assume that any plant circle is a 6" to 8" wide 5 gal. size and any circle labeled larger is 24" box size.
- 5) The plan's schematic. Don't install plants too close to edges of paving or buildings. Be sure plants are not blocking sprinkler spray excessively. Keep vines and hoses/irrigation away from trees.
- 6) See specs concerning soil amendments and fertilizer. For bidding purposes call the soil fertility test is done, bid 6 cubic yards of nitroated redwood swidul and 16 pounds of 12-12-12 fertilizer mixed into the top 6" to 8" of soil after ripping out a 12" deep, except under existing tree canopies, in Riparian Woodland area in Oak Woodland areas or on steep slopes.
- 7) For plants that are to be removed, get rid of any stumps or roots that would keep new plants from growing well.
- 8) Raze and follow the contractor report by the project architect for tree protection and installing new Dats. Project arborist is Kurt Fouk (831) 359-3077, turf@kurtfouk.com.
- 9) Road area follow the Biotic Report by Biotic Resources Group - Kathy Lyons (831) 476-4803, bgr@crucio.com.
- 10) Planting and irrigation in rear yards to be done by the future owner/occupant.
- 11) Front yards, common landscape areas, Oak Woodland, and Riparian Woodland areas are to be maintained by the HOA and professional landscape maintenance company.

Plant Palette

Oak Woodland - Min 17870 sq ft (more provided)

| KEY | QTY | SIZE | BOTANICAL NAME | APPROX. SPACING | COMMON NAME |
|---------------------------------|--------|---------|--------------------------------|-----------------|-----------------|
| TREES | | | | | |
| QA15 | 26 | 15 gal. | <i>Quercus agrifolia</i> | 30' | Coast Live Oak |
| QA1 | 12 | 1 gal. | <i>Quercus agrifolia</i> | 30' | Coast Live Oak |
| SN | 10 | 1 gal. | <i>Sambucus nigra</i> | 10' | Blue Elderberry |
| SHRUBS AND GROUND COVERS | | | | | |
| HA | 1 gal. | | <i>Heteromeles arbutifolia</i> | 6' | Toyon |
| RC | 1 gal. | | <i>Rosa californica</i> | 6' | CA Rose |
| FC | 1 gal. | | <i>Franseria californica</i> | 6' | Co'leberry |
| BP | 1 gal. | | <i>Baccharis pilularis</i> | 6' | Coyle Bush |
| I | 1 gal. | | <i>Isis douglasiana</i> | 4' | Native Iris |

Fence Legend

- 1) Existing white wood fence - repair or replace as required with matching fence
- 2) 4 foot high solid wood fence - 4x4 PT posts 4 feet OC, 1x6 horiz. surfaced redwood with 1 inch spaces between
- 3) 6 foot high wire fence - 4x4 PT posts 8 feet OC, 2x4 horiz. redwood rails on edge top or bottom, solid 2x4 galv. wire mesh
- 4) 3 foot high rail fence at edge of Oak Woodland and Riparian Woodland revegetation areas - 4x4 PT posts 6 feet OC, 1 1/2 inch rough redwood 2x4 rails spaced evenly and starting 2 inches above grade

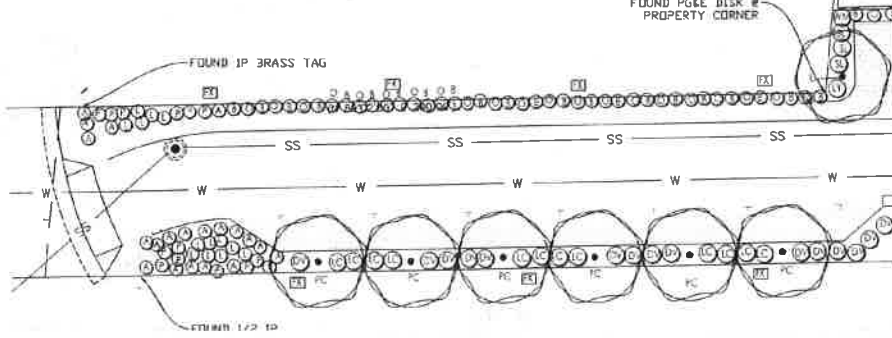
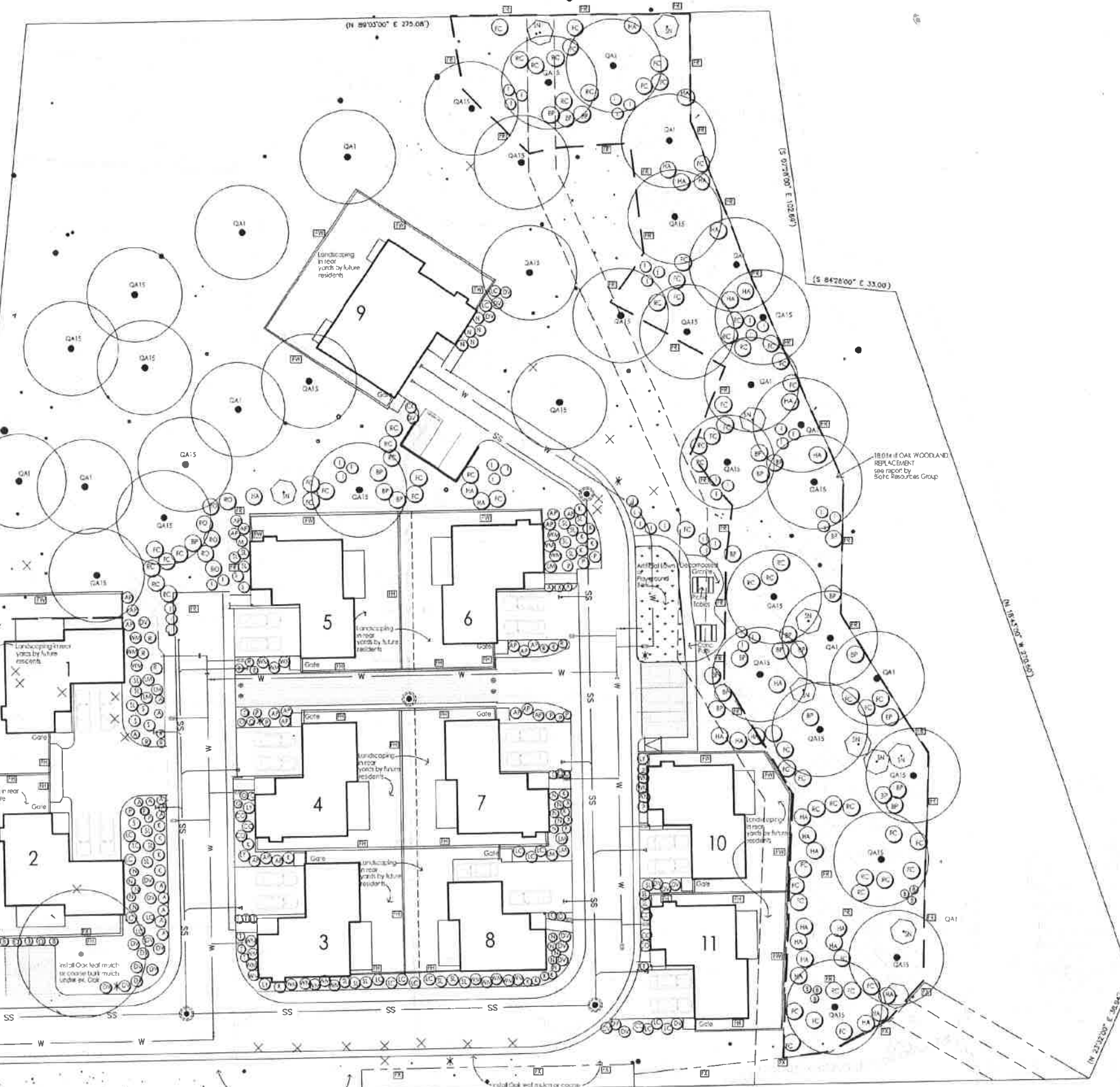
Erosion Control Seeding

Install on all bare areas in Riparian Woodland and Oak Woodland Areas lbs. per acre

| lbs. per acre | BOTANICAL NAME | COMMON NAME |
|---------------|-----------------------------|------------------|
| 16 lbs/acre | <i>Bromus carinatus</i> | California Brome |
| 16 lbs/acre | <i>Elymus galeus</i> | Blue Wild Rye |
| 10 lbs/acre | <i>Festuca occidentalis</i> | Western Fescue |
| 4 lbs/acre | <i>Triticum wheatonii</i> | Torncat Clover |
| 10 lbs/acre | <i>Steris</i> Hybrid Wheat | |

Irrigation Notes

1. See sheet L3 and L4 for specifications and details in final irrigation construction drawings.
2. This system is designed to operate with minimum 5 GPM at minimum 55 dynamic p.s.i. at the point of connection. If this condition is not met contact the Landscape Architect for possible redesign. If pressure exceeds 75 p.s.i. at point of connection install a Wilkins 600 1" pressure regulator. This is supposed to be on all the lines.
3. Dr' electric tape should be installed with any pressure lines not buried in the same trench with control wires and with any lines of any kind under paving not in a trench with control wires.
4. Install a manual shut off valve of each irrigation point of connection and at each group of valves.
5. Controllers should be set to water between 8:00 p.m. and 10:00 a.m. to avoid watering during times of higher wind or temperature and programmed with repeat cycles to avoid runoff.
6. Irrigation schedule should reflect time of year and plant maturity. Reduce the schedule after the establishment period of 2 to 3 months as the plants can get by with less water and after the first year when plants are even more established.
7. Post a copy of the average year irrigation base schedule close to or in the controller and make sure the landscape maintenance person and owner get a copy. The routing of spigot lines is schematic on the plan. Do not put valves too close to trees. Stay 8" to 12" away if possible. Do not put pressure lines under trees. Install line in planting areas instead of under paving wherever possible.
8. Typical controller location is on outside wall however, check with the owner and General Contractor for final location as it can be coordinated with the electrical supply.
9. At the point of connection at each home install a manual shut off valve. Keep anti-siphon valves in inconspicuous places, installed 6" to 12" above highest sprinkler or drip emitter on the circuit. Keep valves out of paint.
10. Irrigation schedule should reflect time of year and plant maturity. Reduce the schedule after the establishment period of 2 to 3 months as the plants can get by with less water and after the first year when plants are even more established.
11. Post a copy of the average year irrigation base schedule close to or in the controller and make sure the landscape maintenance person and owner get a copy. Native plants in common areas should only need supplemental irrigation for 3 to 5 years depending on the weather.
12. A controller has been specified that will stop irrigation from happening during rain periods. The controller will change its program based on current weather conditions and ET information.
13. The contractor is responsible for the cost of an irrigation audit done by a certified Irrigation Auditor as required by Soquel Creek Water District. The contractor is also responsible for the cost of connection of anything that the Irrigation Auditor says needs to be connected. Include these expenses in the bid. There is no surt.
14. High flow sensors that detect and report high flow conditions caused by system damage or malfunction are recommended for the common area - Hunter Flow-Clk. It should be installed just up stream from the master valve.
15. Landscape irrigation and maintenance shall include:
 - a. Irrigation systems shall be inspected regularly to correct misaligned, clogged, or broken lines, air emitters, mixing heads, slucx valves, and leaks. The irrigation meter shall be read periodically to check consumption and detect and leakage.
 - b. Irrigation equipment shall be maintained in good working condition and properly adjusted to ensure water efficiency. Any broken or malfunctioning equipment including but not limited to main and lateral lines or control valves shall be repaired promptly with identical or improved equipment to maintain the original design integrity.
 - c. A regular landscape maintenance schedule is required and shall include, but is not limited to: watering and dechlorinating hot areas (none on the project), reseed/mulch, fertilizing, pruning and weeding in all landscape areas. See the 3-1/2 hr Maintenance Schedule.
 - d. The owner is encouraged to implement sustainable or environmentally friendly practices for overall landscape maintenance.
16. See B 5 x 11 (Formal Outdoor Water Use Efficiency Checklist, Hydrozone Information Table, Max. Allowed Water Allowance, and Estimated Total Water Use



| Revision | |
|----------|--------------------|
| 12/10/18 | Irrigation Concept |
| 4/18/19 | Site revised |
| 6/2/19 | Free TB and road |
| | buiboul removed |

GREGORY LEWIS LANDSCAPE ARCHITECT
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3300 Maplethorpe Lane
 Soquel, CA
 Tract 1609 APN 037-121-60

Planting Plan
 1"=20'-0"
 0' 20' 40'

| | |
|--------|----------|
| Date: | 12/15/18 |
| Scale: | As Noted |
| Drawn: | Greg |
| Sheet: | L1 |

Irrigation Legend

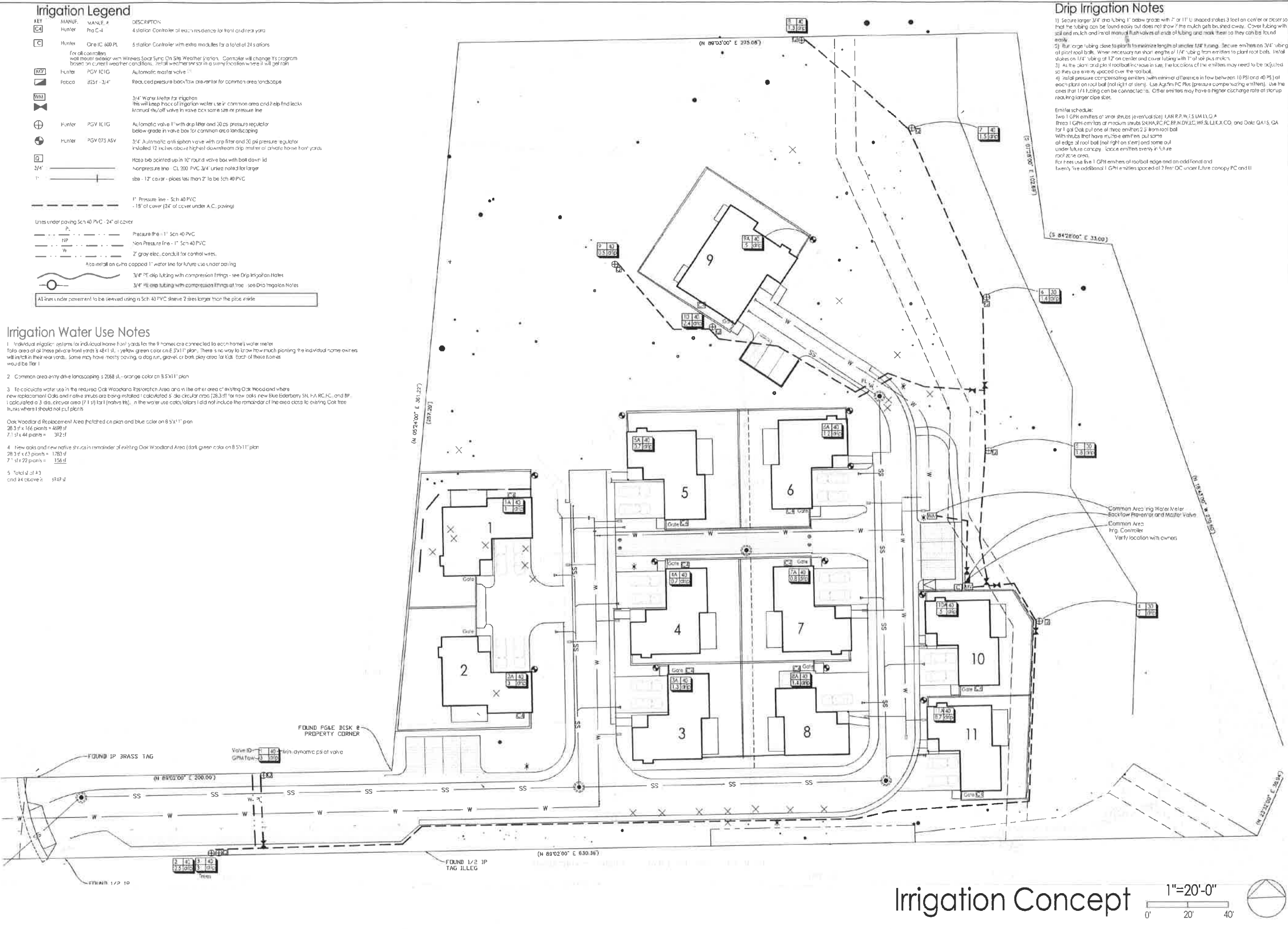
| KEY | MANUF. | MANUF. # | DESCRIPTION |
|-----|--------|---------------|---|
| CA | Hunter | Pro C-4 | 4 station Controller for residential front and rear yard |
| C | Hunter | One IC 600 PL | 6 station Controller with extra modules for a total of 24 stations For all controllers not shown, set with Wireless Solar Sync On Site Weather Station. Controller will change its program based on current weather conditions. If a wet weather sensor in a sunny location where it will get rain. |
| AV | Hunter | PGV ICIG | Automatic master valve |
| FP | Fesco | 823r - 3/4" | Reduced pressure backflow preventer for common area landscape |
| WM | | | 3/4" Water Meter for irrigation This will keep track of irrigation water use in common area and help find leaks. Manual shut off valve in valve box same size as pressure line. |
| + | Hunter | PGV ICIG | Automatic valve 1" with drip filter and 30 psi pressure regulator below grade in valve box for common area landscaping |
| + | Hunter | PGV 075 ASV | 3/4" Automatic anti siphon valve with drip filter and 30 psi pressure regulator installed 12 inches above highest downstream drip emitter at private home front yards. |
| 0 | | | Hose bib pointed up in 10" round valve box with bolt down lid. Nonpressure line - CL 200 PVC, 3/4" unless noted for larger size - 12" cover - pipes less than 2" to be Sch 40 PVC |
| 1" | | | 1" Pressure line - Sch 40 PVC - 18" of cover (24" of cover under A.C. paving) |
| | | | Lines under paving Sch 40 PVC - 24" of cover |
| P | | | Pressure line - 1" Sch 40 PVC |
| NP | | | Non Pressure line - 1" Sch 40 PVC |
| W | | | 2" gray elec. conduit for control wires. |
| | | | As per installation on capped 1" water line for future use under paving |
| | | | 3/4" PE drip tubing with compression fittings - see Drip Irrigation Notes |
| | | | 3/4" PE drip tubing with compression fittings at tree - see Drip Irrigation Notes |
| | | | All areas under pavement to be served using a Sch 40 PVC sleeve 2 sizes larger than the pipe inside |

Irrigation Water Use Notes

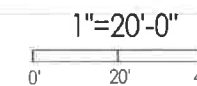
- Individual irrigation systems for individual home front yards for the 9 homes are connected to each home's water meter. Total area of all these private front yards is 48,111 sq. ft. (yellow green color on 8.5x11" plan). There is no way to know how much watering the individual home owners will install in their front yards. Some may have mostly paving, a dog run, gravel, or bark play area for kids. Each of these homes would be fair.
- Common area entry drive landscaping is 2,068 sq. ft. (orange color on 8.5x11" plan).
- To calculate water use in the required Oak Woodland Restoration Area and in the other area of existing Oak Woodland where new replacement Oaks and native shrubs are being installed: calculated 5.36 ac circular area (28,311 sq. ft.) for new oak; new Blue Elderberry, SK, LA, RC, JC, and BP. I calculated a 3.36 ac circular area (18,111 sq. ft.) for native trees. In the water use calculations I did not include the remainder of the area close to existing Oak trees where I should not cut plants.
- Oak Woodland Replacement Area (hatched on plan and blue color on 8.5x11" plan):
28.3 ac x 166 plants = 4,698 plants
7.1 ac x 44 plants = 312 plants
- New oak and new native shrubs in remainder of existing Oak Woodland Area (dark green color on 8.5x11" plan):
28.3 ac x 63 plants = 1,783 plants
7.1 ac x 22 plants = 156 plants
- Total of 43
and 44 above = 5,947 plants

Drip Irrigation Notes

- Secure larger 3/4" and tubing 1" below grade with 7" or 11" U shaped stakes 3 feet on center or closer so that the tubing can be found easily if it does not show if the mulch gets brushed away. Cover tubing with soil and mulch and install manual flush valves at ends of tubing and mark them so they can be found easily.
 - Run drip tubing close to plants to minimize length of emitter 1/4" tubing. Set use emitters on 3/4" tubing at plant root balls. When necessary run short lengths of 1/4" tubing from emitters to plant root balls. Install stakes on 1/4" tubing of 12" on center and cover tubing with 1" of top soil mulch.
 - As the plant grows if root ball increases in size, the locations of the emitters may need to be adjusted so they are evenly spaced over the root ball.
 - Install pressure compensating emitters with minimal difference in flow between 10 PSI and 40 PSI of each plant on root ball (not right at stem). Use Agrifilm PC Plus (pressure compensating emitters). Use the ones that 1/4" tubing can be connected to. Other emitters may have a higher discharge rate at their top root ball size.
- Emitter schedule:
Two 1 GPH emitters of small shrubs (eventual size) LAN R.P.W.T.S LM U.D.A
Three 1 GPH emitters of medium shrubs (eventual size) LAN R.P.W.T.S LM U.D.A
Four 1 GPH emitters of large shrubs (eventual size) LAN R.P.W.T.S LM U.D.A
With shrubs that have multiple emitters, put some at edge of root ball (not right at stem) and some out under future canopy. Space emitters evenly in future root ball area.
For trees use five 1 GPH emitters of root ball edge and an odd total and twenty five additional 1 GPH emitters spaced at 2 feet OC under future canopy PC and II.



Irrigation Concept



| | |
|---|--|
| Revision | 12/10/18 Irrigation Concept 4/18/19 Site revised 4/21/19 Tree TB and root bubble removed |
| #2776 | |
| GREGORY LEWIS LANDSCAPE ARCHITECT | |
| 738 Park Way Santa Cruz, CA 95065 (831) 298-0860 | |
| glandscap@reglobal.net | |
|  | |
|  | |
| 3300 Maplethorpe Lane | |
| Soquel, CA | |
| Tract 1609 APN 037-121-60 | |
| Date | 10/1/18 |
| Scale | As Noted |
| Drawn | Greg |
| Check | |
| Sheet | L2 |

Initial Study Attachment 3

MEMORANDUM

To: John Swift, Swift Consulting Services, Inc.

From: Frederik Venter, Jacob Mirabella, and Colin Ogilvie, Kimley-Horn and Associates, Inc.

Date: February 25, 2019

Subject: 3300 Maplethorpe Lane Traffic Impact Study and Traffic Calming

Executive Summary

This memorandum presents the traffic impact study findings for the 3300 Maplethorpe Lane development (Project) in Santa Cruz County, California.

Project Description

Eleven (11) new single-family homes are planned to be constructed at 3300 Maplethorpe Lane in Santa Cruz County, California. The existing land use on the Project site comprises approximately 20,000 square feet of active greenhouse for wholesale nursery sales, which will be demolished with construction of the Project. The objective of this study is to evaluate Maplethorpe Lane, Mulberry Drive, and Colleen Way, as well as the intersection of Soquel Drive & Mulberry Drive to determine potential traffic calming and operational improvement options. The low trip generation of the proposed Project does not warrant a full traffic study, however, operational analysis was performed based on input from the community.

Intersection Evaluation

Operations: The intersection of Soquel Drive and Maplethorpe Lane was evaluated under existing and existing plus project conditions using Highway Capacity Manual (HCM) 2000 methodologies. Weekday AM and PM peak hour traffic operations were analyzed. Project trips were distributed based on the existing traffic flows. The existing and existing plus project intersection operating conditions are acceptable based on the Santa Cruz County General Plan criteria.

Safety: Existing available sight distance concerns at the intersection of Soquel Drive & Maplethorpe Lane for southbound vehicles were analyzed according to American Association of State Highway and Transportation Officials (AASHTO) methodology. Due to existing sight constraints from the building on the northeast corner of the intersection, sight distance is not adequate from the standard 14.5-foot setback from the traveled way, but sight distance is adequate when vehicles pull forward closer to the traveled way, which is how this intersection operates currently. In order to improve sight distance, it is recommended to trim the existing landscaping to the east to a maximum height of 2-3 feet.

Traffic Calming Evaluation

Speed data was collected using tube counters on Maplethorpe Lane, Mulberry Drive, and Colleen Way, because neighbors raised concerns about speeding in the neighborhood. The 85th percentile speed on all roads were close to the posted speed limit. One condition that was described by local residents, and through site observations confirmed, is the encroachment of northbound left turning vehicles from Mulberry Drive onto Colleen Way into the opposing traffic lane at the intersection. Alternative traffic calming measures are

proposed as follows to deter left turning vehicles from Mulberry Drive to Colleen Way from encroaching on opposing traffic, including “Armadillo” raised pavement markers.

1. Introduction

Eleven (11) new homes are planned to be constructed at 3300 Maplethorpe Lane in Santa Cruz County, California. The existing land use on the Project site is approximately 20,000 square feet of greenhouse for wholesale nursery use, which will be demolished with construction of the Project. Based on information provided by the Client, local neighborhood feedback requests traffic calming in the project vicinity. The community has raised concerns about speeding on Maplethorpe Lane/Collen Way/Mulberry Drive and also expressed challenges with making southbound left-turns from Maplethorpe Lane onto Eastbound Soquel Drive. Potential solutions are desired to improve this situation. The objective of this study is to evaluate the roadways in the neighborhood and evaluate operations at the intersection of Soquel Drive & Mulberry Drive.

The existing driveway from the site exits at the intersection of Colleen Way and Maplethorpe Lane. Sight distance at the driveway, as is evident along the remainder of Maplethorpe Lane, is constrained. A trailer from the neighbor to the south is parked in county right of way which could impede sight distance for vehicles exiting the driveway. It is anticipated that a sidewalk will be constructed along the frontage of the driveway, which will result in this trailer being parked deeper into the property, and thereby improving sight distance.

Figure 1 shows the Project Location Map, which includes the study intersection and roadways. The Project site plan is shown in **Figure 2**.



2. Operations Evaluation

TRAFFIC COUNT DATA AND FIELD OBSERVATIONS

For this traffic study, turning movement counts were collected at the intersection of Soquel Drive and Maplethorpe Lane from 7:00am to 9:00am and 4:00 to 6:00pm on Tuesday, September 25, 2018. 24-hour segment counts and speed measurements were collected on Thursday, September 27, 2018 along Maplethorpe Lane, Mulberry Drive and Colleen Way, and 24-hour count data was also collected at the south end of both Maplethorpe Lane and Mulberry Drive on September 19, 2018. **Figure 1** shows the approximate locations where data was collected. Traffic count data is summarized in **Table 1** and attached in the **Appendix**.

Table 1: Daily Traffic Counts

| Roadway | NB (ADT) | SB (ADT) | Two-Way (ADT) |
|---|----------|----------|---------------|
| Data Collected on September 27, 2018 | | | |
| Maplethorpe Lane | 58 | 48 | 106 |
| Mulberry Drive | 328 | 334 | 662 |
| Colleen Way | 193 | 190 | 383 |
| Data Collected on September 19, 2018 | | | |
| Maplethorpe Lane | 89 | 55 | 144 |
| Mulberry Drive | 351 | 345 | 696 |

Notes:

1. All directional movements have been converted to northbound and southbound. NB = Uphill, SB = Downhill
2. ADT = Average Daily Traffic (24-hour count)

As shown above, a maximum of approximately 696 motor vehicles were observed traveling north and south on Mulberry Drive throughout the day closer to the intersection with Maplethorpe Lane. Colleen Way and Maplethorpe Lane count data show lower volumes than Mulberry Drive, with approximately 383 vehicles observed on Colleen Way and 144 vehicles on Maplethorpe Lane. AM peak hour volume data along the study roadways in both directions indicate relatively low volumes of 10 vehicles on Maplethorpe Lane, 56 vehicles on Mulberry Lane, and 31 vehicles on Colleen Way. PM peak hour volume data along the study roadways also indicate relatively low volumes of 15 vehicles on Maplethorpe Lane, 64 vehicles on Mulberry Lane, and 39 vehicles on Colleen Way. Note that 64 vehicles during a peak hour indicates that, on average, approximately 1 vehicle would be observed every minute during the period of highest demand.

Speed Data

Speed data was collected on Maplethorpe Lane (just north of Mulberry Drive), Mulberry Drive and Colleen Way on September 27, 2018. Speed data is included in the **Appendix**. The posted speed limit on Mulberry Drive is 25 miles per hour and is also assumed to be the speed limit for Maplethorpe Lane and Colleen Way. Typically, if residential roads are not sign posted, the default maximum allowable speed is 25 mph. As described below, operating speeds were observed to be near or below the speed limit.

The 85th percentile speed on Maplethorpe is approximately 15-mph, based on 106 data points averaged for both directions. Maplethorpe Lane is a narrow roadway with five existing speed bumps that contribute to this low operating speed.

The 85th percentile speed on Mulberry Drive is 26-mph, based on 662 data points averaged in both directions. This is one mile per hour above the 25-mph speed limit.

The 85th percentile speed on Colleen Way is 23-mph, based on 383 data points averaged in both directions. **Table 2** summarizes the speed data for each study roadway segment.

The measured 85th-percentile speeds mostly fall within the speed limits and the 95th-percentile speeds indicate some speeding but not at the level that causes concerns. It should be noted that typically, speeding drivers live in the local neighborhood.

Table 2: Speed Data

| Roadway | 85th Percentile (mph) | 95th Percentile (mph) |
|-------------------------|-----------------------|-----------------------|
| Maplethorpe Lane | 15 | 18 |
| NB | 14 | 17 |
| SB | 15 | 18 |
| Mulberry Drive | 26 | 29 |
| NB | 25 | 29 |
| SB | 27 | 29 |
| Colleen Way | 23 | 25 |
| NB | 23 | 25 |
| SB | 22 | 24 |

Notes:

1. All directional movements have been converted to northbound and southbound. NB = Uphill, SB = Downhill

Field Observations

Site visits were conducted on Tuesday, September 18, 2018 and Friday, September 28, 2018 to observe existing traffic operations.

From field observations during the AM peak hour (7:00am to 9:00am), few queues were witnessed and the average vehicle did not wait long to make a left turn. The maximum observed queue was two (2) vehicles, while the average left turn delay was 25 seconds per vehicle. The turning sight distance is challenging, especially looking east and requires drivers to pull up across the crosswalk and bike lane to the edge of the travel lane. No excessive speed was noticeably witnessed on Maplethorpe Lane or Mulberry Drive. Of note, several vehicles parked on Maplethorpe Lane near the intersection and the drivers walked west on Soquel Drive.

TRIP GENERATION

Trip generation estimates were prepared using the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition* (2017).

ITE Land Use Code (LUC) 817 (Nursery - Garden Center) and LUC 818 (Nursery - Wholesale) provides data and methodologies that can be used to estimate trips generated by nursery land uses. ITE defines nurseries as “a free-standing building that can include greenhouses, outside storage and planting areas, office and shipping facilities” The site is currently permitted to function as either LUC 817 or LUC 818. The difference between LUC 817 and LUC 818 is that LUC 817 primarily serves the general public and LUC 818 primarily provides service to contractors and suppliers. Based on ITE data, LUC 817 (Garden Center) would generate more trips than LUC 818 (Wholesale). The wholesale nursery is a comparable land use to what the existing site could function as. Therefore, LUC 818 (Nursery – Wholesale) was used to estimate the potential trips that could be generated by the existing nursery. Based on this analysis, the existing site could generate up to approximately 780 daily trips, 48 AM peak hour trips, and 104 PM peak hour trips.

The proposed residential project is anticipated to generate 104 Daily trips, 8 AM peak hour trips, and 11 PM peak hour trips. Therefore, the net new trip generation for the Project (assuming credit for the existing nursery land use’s trip generation potential, LUC 818), is -676 daily trips, -40 AM peak hour trips, and -93 PM peak hour trips. Note that as a LUC 817, the trip generation for the existing site would be far greater.

Table 3 shows the wholesale nursery trip credits and the proposed project’s trip generation.

Table 3: Project Trip Generation

| Land Uses | Project Size | DAILY | AM PEAK HOUR | | | PM PEAK HOUR | | | | |
|--|--------------|-------------|-----------------|------------|----------|--------------|-----------------|------------|----------|------------|
| | | Total | Total Peak Hour | IN | / | OUT | Total Peak Hour | IN | / | OUT |
| Trip Generation Rates¹ | | | | | | | | | | |
| Existing Nursery (Wholesale) ² | | 39.00 | 2.40 | 43% | / | 57% | 5.18 | 49% | / | 51% |
| Proposed Single-Family Detached Housing ³ | | 9.44 | 0.74 | 25% | / | 75% | 0.99 | 63% | / | 37% |
| Existing Trip Credits | | | | | | | | | | |
| Existing Nursery (Wholesale) | 20.00 KSF | -780 | -48 | 21 | / | 27 | 104 | 51 | / | 53 |
| Proposed Project Trips | | | | | | | | | | |
| Single-Family Detached Housing | 11 DU | 104 | 8 | 2 | / | 6 | 11 | 7 | / | 4 |
| Net New Trips | | -676 | -40 | -19 | / | -21 | -93 | -44 | / | -49 |

Notes:

1. Trip Generation LU 210 (Single-Family Detached Housing) average rates used (Institute of Transportation Engineers (ITE), "Trip Generation," 10th Edition, 2017).
2. ITE land use code 818 (Nursery – Wholesale) used for existing nursery use. Average trip generation rates used. ITE does not provide best fit equation for this land use.
3. ITE land use code 210 (Single-Family Detached Housing) used for proposed residential use. ITE average trip generation rates used.

Source: Kimley-Horn and Associates, Inc., 2019

TRIP DISTRIBUTION AND ASSIGNMENT

Project trip distribution were estimated for Existing and Existing Plus Project Conditions based on the existing turning movement counts at the intersection of Soquel Drive & Maplethorpe Lane and the Proposed 11 single-family residential dwelling units.

LEVEL OF SERVICE ANALYSIS

Analysis of potential impacts at roadway intersections are based on the concept of Level of Service (LOS). The LOS of an intersection is a qualitative measure used to describe operational conditions. LOS ranges from A (best), which represents minimal delay, to F (worst), which represents heavy delay and a facility that is operating at or near its functional capacity. Levels of Service for this study were determined using methods defined in the *Highway Capacity Manual 2000 (HCM)* using *Synchro 9* traffic analysis software.

HCM methodologies include procedures for analyzing side-street stop-controlled (SSSC), all-way stop-controlled (AWSC), and signalized intersections. The SSSC procedure defines LOS as a function of average control delay for each minor street approach movement. The AWSC and signalized intersection procedures define LOS as a function of average control delay for the overall intersection.

Table 4 relates the operational characteristics associated with each LOS category for signalized and unsignalized intersections.

Table 4 – Intersection Level of Service Definitions

| Level of Service | Description | Signalized (Avg. control delay per vehicle sec/veh.) | Unsignalized (Avg. control delay per vehicle sec/veh.) |
|------------------|---|---|---|
| A | Free flow with no delays. Users are virtually unaffected by others in the traffic stream | Less than 10 | less than 10 |
| B | Stable traffic. Traffic flows smoothly with few delays. | less than or equal to 10 to 20 | less than or equal to 10 to 15 |
| C | Stable flow but the operation of individual users becomes affected by other vehicles. Modest delays. | less than or equal to 20 to 35 | less than or equal to 15 to 25 |
| D | Approaching unstable flow. Operation of individual users becomes significantly affected by other vehicles. Delays may be more than one cycle during peak hours. | less than or equal to 35 to 55 | less than or equal to 25 to 35 |
| E | Unstable flow with operating conditions at or near the capacity level. Long delays and vehicle queuing. | less than or equal to 55 to 80 | less than or equal to 35 to 50 |
| F | Forced or breakdown flow that causes reduced capacity. Stop and go traffic conditions. Excessive long delays and vehicle queuing. | greater than or equal to 80 | greater than or equal to 50 |

Sources: Transportation Research Board, *Highway Capacity Manual 2010*, National Research Council.

Project impacts are determined by comparing conditions without the proposed Project to those with the proposed Project. Significant impacts for intersections are created when traffic from the proposed Project causes the LOS to fall below the maintaining agency’s LOS threshold or causes deficient intersections to deteriorate further per the criteria indicated below.

Intersection Thresholds of Significance for Traffic Impacts

Consistent with the significant impact criteria documented in the Santa Cruz County General Plan, the County considers LOS C as the objective, but accepts LOS D as the minimum acceptable at both signalized and unsignalized study intersections where costs, right-of-way requirements, or environmental impacts of maintaining LOS under this policy are excessive, capacity enhancement may be considered infeasible. The following conditions would result in a significant impact at a County intersection:

1. If the intersection operates at an acceptable LOS (i.e. LOS A, B, C, or D) without the Project during the weekday peak hour and degrades to an unacceptable LOS (i.e. LOS E or F) with the Project during the weekday peak hour.

- If the intersection operates at an unacceptable LOS (i.e. LOS E or F) without the Project during the weekday peak hour and the Project adds trips.

Existing and Existing Plus Project Analysis

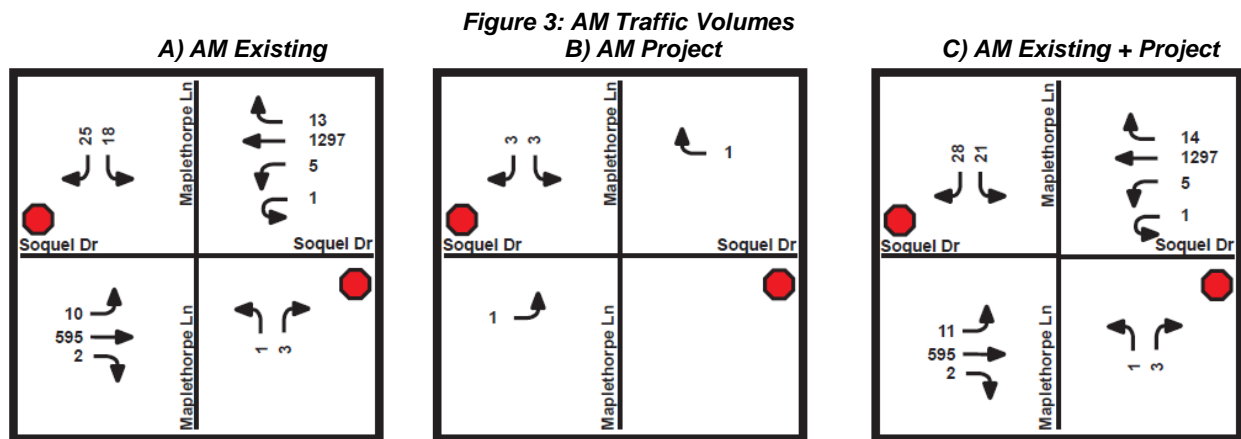
The intersection of Soquel Drive and Maplethorpe Lane was evaluated under existing and existing plus project conditions using Highway Capacity Manual (HCM) 2000 unsignalized side-street stop control methodologies. Weekday AM and PM peak hours were analyzed. Project trips were distributed based on the existing traffic counts, and calibrates to reflect field conditions, as described below. For analysis purposes the proposed project trips for the homes were added to the existing counts, which captures any current use of the site and mimics what the neighbors will experience.

Model Calibration

HCM 2000 methodology was used in the analysis because it provided more accurate model calibration. Geometrically, a short southbound right turn pocket was added to the model, even though it is not striped, because the approach is wide enough that under actual conditions was observed to be used as separate left and right turn lanes. The southbound left turn delay was measured in the field to be an average of 25 seconds. The Synchro model was calibrated to mimic the field-measured delay as close as possible. The signalized intersection of Park Avenue and Soquel Drive, 650 feet to the east, creates gaps in the flow of traffic. The gaps result in platooned arrival patterns. The calibrated model indicates an average delay of approximately 30.6 seconds per vehicle during the existing AM peak hour conditions, which is higher than the average field measurement. Therefore, the analysis findings represent slightly conservative delay.

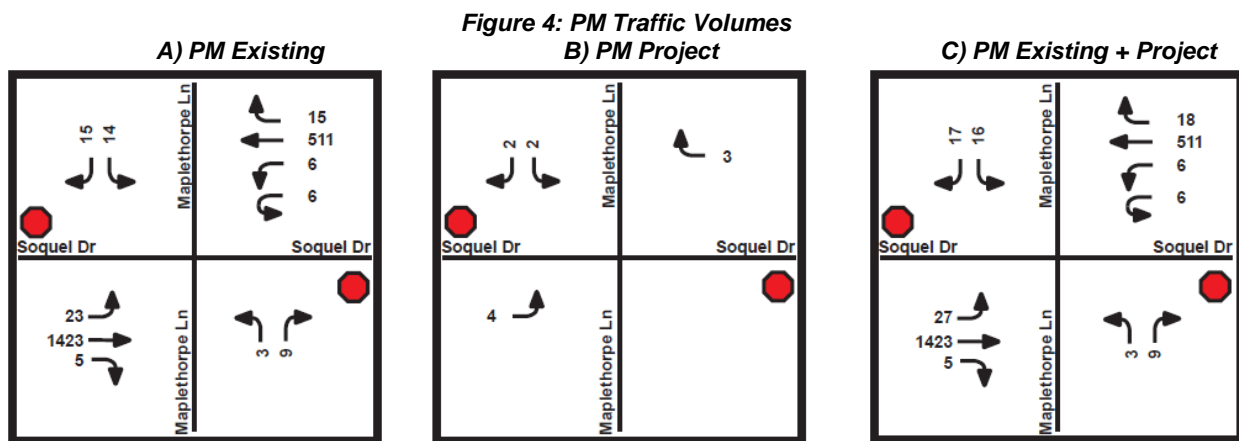
AM Peak

The analysis indicates that the AM peak demand at the study intersection occurs from 7:45am to 8:45am. During this peak, the intersection operates at an overall LOS A. The southbound side-street approach operates at an LOS D under existing conditions. Under existing plus project conditions, the overall intersection is LOS A and the side-street operates at a LOS D. This peak’s side-street delay and LOS is better than the City’s minimum requirements; therefore, the intersection operates at acceptable conditions. **Figure 3** below shows the AM traffic volumes for all analysis conditions. **Table 5** shows the existing analysis results and existing plus project analysis results with SSSC.



PM Peak

The analysis indicates that the PM peak demand at the study intersection occurs from 4:15pm to 5:15pm. During this peak, the intersection operates at an overall LOS A. The southbound side-street approach operates at an LOS D under existing conditions. Under existing plus project conditions, the overall intersection is LOS A and the side-street operates at a LOS D. This peak's side-street delay and LOS is better than the City's minimum requirements; therefore, the intersection operates at acceptable conditions. **Figure 4** below shows the PM traffic volumes for all analysis conditions. **Table 5** shows the existing analysis results and existing plus project analysis results with SSSC.



The existing and existing plus project operating conditions are acceptable according to the Santa Cruz County General Plan criteria, and no mitigations for the study intersection are recommended.

Table 5 – Existing and Existing Plus Project Conditions Intersection Level of Service

| # | Intersection | Maintaining Agency | Control Type | Existing Conditions | | | | | | Existing Plus Project Conditions | | | | | |
|---|----------------------------|--------------------|--------------|---------------------|-------|-----|--------------|-------|-----|----------------------------------|-------|-----|--------------|-------|-----|
| | | | | AM Peak Hour | | | PM Peak Hour | | | AM Peak Hour | | | PM Peak Hour | | |
| | | | | Movement | Delay | LOS | Movement | Delay | LOS | Movement | Delay | LOS | Movement | Delay | LOS |
| 1 | Soquel Dr / Maplethorpe Ln | County | SSSC | Overall | 1.0 | - | Overall | 1.1 | - | Overall | 1.2 | - | Overall | 1.2 | - |
| | Worst Approach | | | SB | 30.6 | D | SB | 25.9 | D | SB | 32.3 | D | SB | 27.5 | D |

Notes:

- 1. Analysis performed using HCM 2000 methodologies.
- 2. Delay indicated in seconds/vehicle.
- 3. County of Santa Cruz LOS standard is D.
- 4. Intersections that operate below maintaining agency’s LOS standard are highlighted and shown in **bold**.

INTERSECTION SIGHT DISTANCE

The American Association of State Highway and Transportation Officials (AASHTO) methodology, published in 2011 and titled *A Policy on Geometric Design of Highways and Streets, 6th Edition, (Green Book)* was used in this analysis. AASHTO sight distance analysis is composed into two components: intersection sight distance and stopping sight distance. Intersection sight distance correlates to the time and space needed for a vehicle on the minor road to complete a turn on to the major road. In our case, this is the southbound left turn from Maplethorpe Lane to eastbound Soquel Drive. AASHTO Green Book Case B1, p. 9-38, methodology was used to determine intersection sight distance. Stopping sight distance correlates to the required length for a vehicle on the major road to completely stop if a vehicle, or other object, enters their path. This is deemed the minimum acceptable sight distance requirement.

Line of sight is determined vertically from a 3.5-foot driver eye height to a 4.25-foot object height. The design speed is assumed to be 40 miles per hour, since the posted speed limit is 35 miles per hour on Soquel Drive. A time gap of 8.5 seconds, increased from the 7.5 second default because the left turn movement crosses more than two lane widths, was used for the required gap in vehicles on the major road for a left turn to be completed from the minor road. Using these variables, the minimum intersection sight distance is 500 feet and the minimum stopping sight distance is 300 feet.

The critical variable for determining actual sight distance is the vehicle and driver's eye setback. The AASHTO standard setback is 14.5 feet from the edge of the vehicle traveled way. Due to existing constraints, a 14.5-foot setback provides insufficient sight distance. Therefore, sight distance was analyzed from two other locations: 1) the car is stopped at the outside edge of the bike lane (13-foot setback from travel-way) and 2) the car is stopped at the outside edge of the vehicular travel lane (8-foot setback from travel-way), which is how the intersection currently operates.

13-Foot Setback from Travel-Way

Figure 5 shows the intersection and stopping sight distance for a 13-foot setback from the vehicular traveled way. This assumes that a vehicle has stopped at the stop bar, confirmed that no crossing pedestrians are present, pulled forward and stopped before the bike lane. The bike lane is not impeded in this scenario.

Both intersection and stopping sight distance criteria are satisfied looking right to the west. Stopping sight distance criteria is satisfied looking left to the east, but intersection sight distance criteria is not satisfied.

8-Foot Setback from Travel-Way

Figure 6 shows the intersection and stopping sight distance for an 8-foot setback from the vehicular traveled way. This assumes that a vehicle has stopped at the stop bar, confirmed that no crossing pedestrians are present, pulled forward and stopped before the bike lane. The vehicle then confirms that there are no oncoming bikes and pulls forward to the edge of traveled way, temporarily blocking the bike lane, before completing the left turn. If a bike approaches Maplethorpe Lane while a vehicle is still waiting to complete the left turn, the bike will have adequate stopping sight distance to stop.

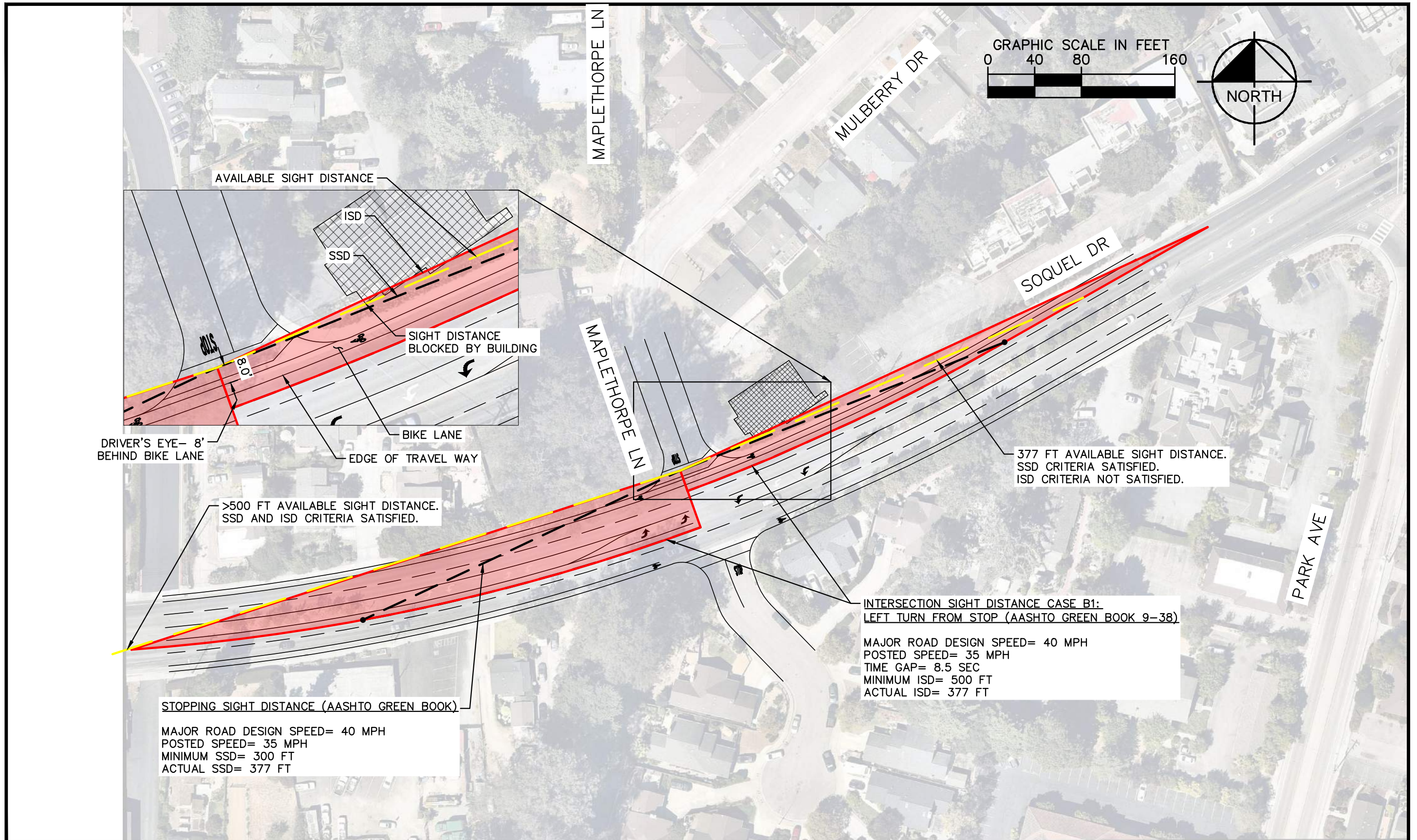
Both intersection and stopping sight distance criteria are satisfied in both directions from an 8-foot setback.

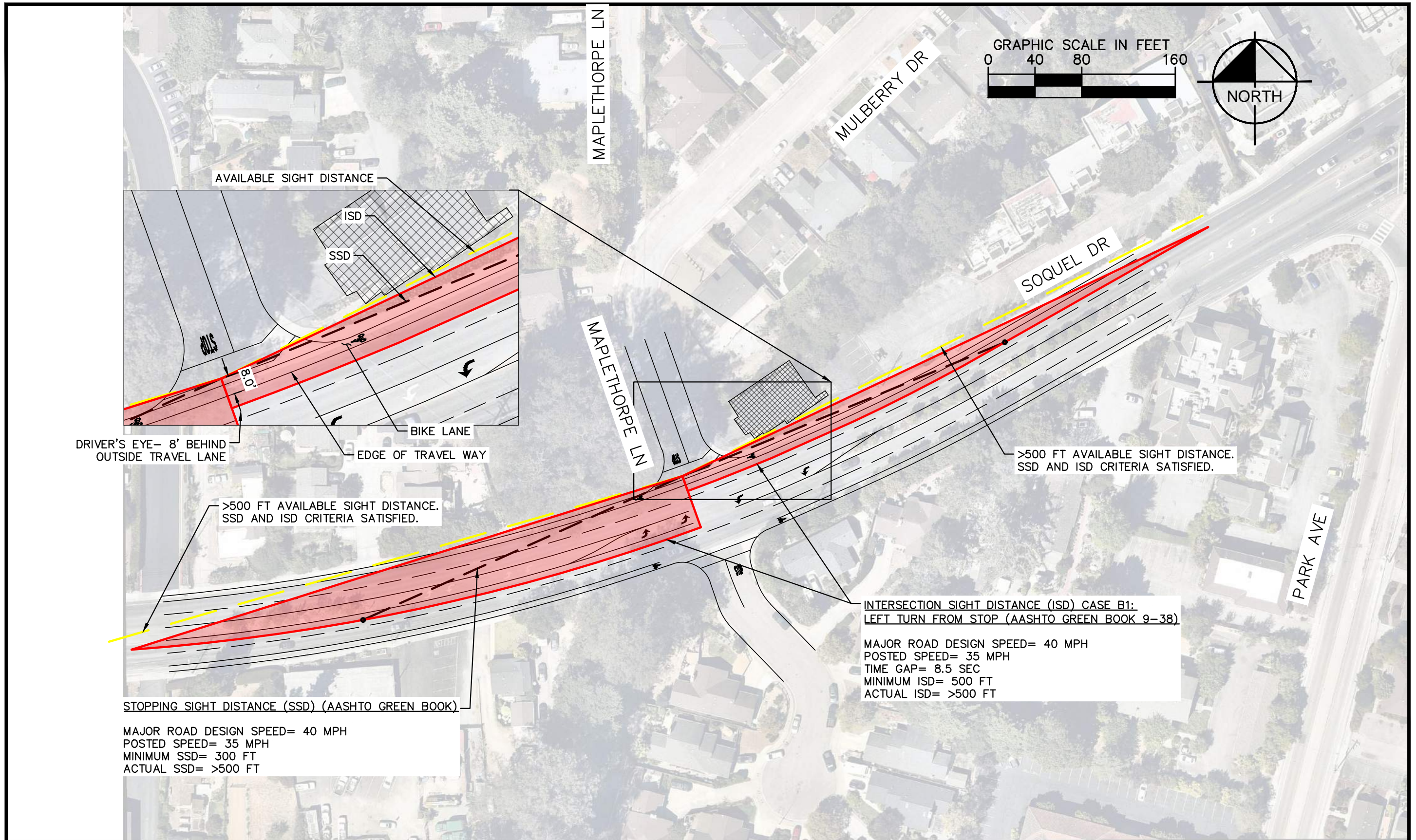
Due to existing sight constraints from the building on the northeast corner of the intersection, sight distance is not adequate from the standard 14.5-foot setback but sight distance is adequate when vehicles pull forward closer to the traveled way. In order to improve sight lines, it is recommended to trim the existing ground landscaping to the east to a maximum height of 2.5 feet. The Santa Cruz County Code 13.30.110 specifies the following:

No person shall allow to exist any of the following, on property either owned by that person or property for which the person is responsible, as specified by Chapters 13.30 and 15.20 of this code:

(e) The existence of any branches or foliage which interfere with visibility on, or use of, or access to, any portion of any street improved for vehicular or pedestrian travel;"

It is recommended that a maximum height of 2.5 feet be maintained to provide a better field of vision and account for change of grade east of Maplethorpe Lane.





3. Traffic Calming

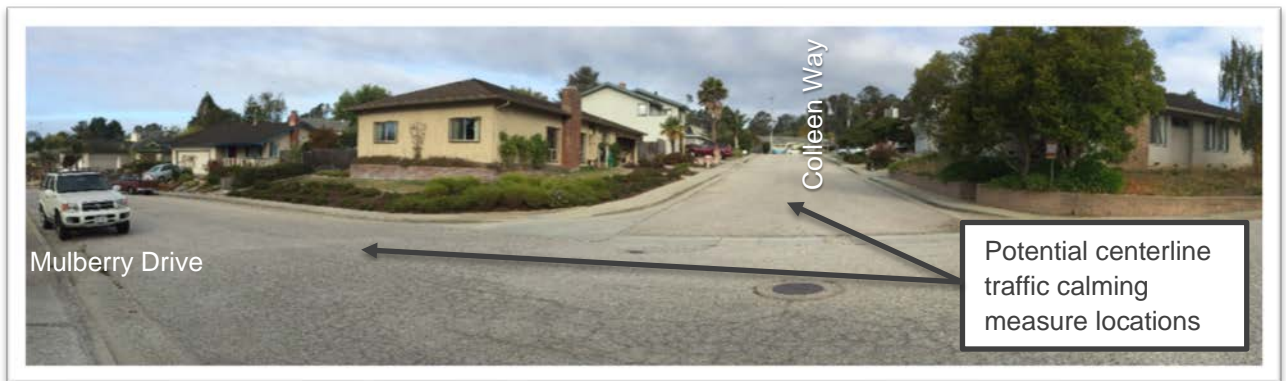
As discussed previously, speed data shows that operating speeds of drivers are close to the speed limits along the study roadways. Additionally, Maplethorpe Lane has speed bumps as shown in **Figure 7**.

Figure 7: Existing Maplethorpe Lane Speed Bumps



From field observations and local neighborhood feedback, it is common for northbound left turns at Mulberry Drive and Colleen Way intersection to cut across the opposing lane (**Figure 8**). Traffic calming measures could be implemented to force drivers to take the left turn more slowly and stay within their travel lane.

Figure 8: Mulberry Drive & Colleen Way Intersection



One alternative that could accomplish this improvement is “armadillo” raised pavement markers along the centerline of both Mulberry Drive and Colleen Way. See **Figure 9** and **Figure 10** examples for

application. This treatment could be implemented at a low-cost and without a reduction in on-street parking.

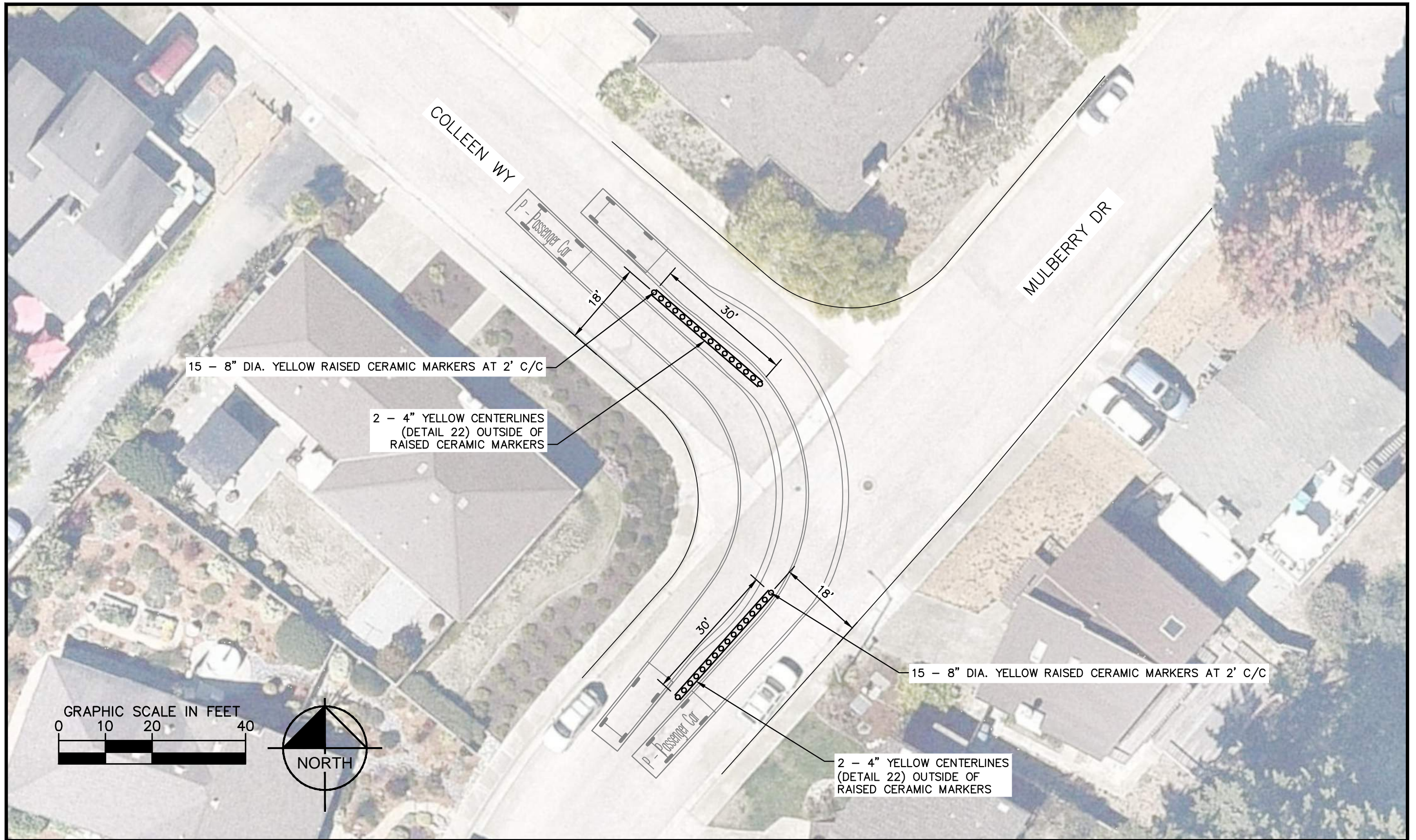
Figure 9: "Armadillo" Raised Pavement Markers (Cupertino, CA)



Figure 10: "Armadillo" Raised Pavement Markers on 41st Ave North of Capitola Road (Capitola, CA)



Figure 11 depicts the layout of applying the large raised pavement markers at Mulberry Drive and Colleen Way.



APPENDIX

TUBE COUNTS

VOLUME

Maplethorpe Ln N/O Mulberry Dr

Day: Wednesday
Date: 9/19/2018

City: Santa Cruz
Project #: CA18_8473_001

| DAILY TOTALS | | | | | NB | SB | EB | WB | Total | | |
|----------------|--------------|--------------|----|----|--------------|----------------|--------------|--------------|-------|----|--------------|
| | | | | | 89 | 55 | 0 | 0 | 144 | | |
| AM Period | NB | SB | EB | WB | TOTAL | PM Period | NB | SB | EB | WB | TOTAL |
| 00:00 | 0 | 0 | 0 | 0 | | 12:00 | 4 | 2 | 0 | 0 | 6 |
| 00:15 | 1 | 0 | 0 | 0 | 1 | 12:15 | 3 | 1 | 0 | 0 | 4 |
| 00:30 | 0 | 0 | 0 | 0 | | 12:30 | 1 | 1 | 0 | 0 | 2 |
| 00:45 | 0 | 1 | 0 | 0 | 1 | 12:45 | 3 | 11 | 1 | 5 | 16 |
| 01:00 | 0 | 0 | 0 | 0 | | 13:00 | 1 | 1 | 0 | 0 | 2 |
| 01:15 | 0 | 0 | 0 | 0 | | 13:15 | 0 | 1 | 0 | 0 | 1 |
| 01:30 | 0 | 0 | 0 | 0 | | 13:30 | 2 | 1 | 0 | 0 | 3 |
| 01:45 | 0 | 0 | 0 | 0 | | 13:45 | 1 | 4 | 1 | 4 | 8 |
| 02:00 | 0 | 0 | 0 | 0 | | 14:00 | 1 | 1 | 0 | 0 | 2 |
| 02:15 | 0 | 0 | 0 | 0 | | 14:15 | 1 | 1 | 0 | 0 | 2 |
| 02:30 | 1 | 0 | 0 | 0 | 1 | 14:30 | 0 | 0 | 0 | 0 | |
| 02:45 | 0 | 1 | 0 | 0 | 1 | 14:45 | 0 | 2 | 0 | 2 | 4 |
| 03:00 | 0 | 0 | 0 | 0 | | 15:00 | 3 | 1 | 0 | 0 | 4 |
| 03:15 | 0 | 0 | 0 | 0 | | 15:15 | 4 | 1 | 0 | 0 | 5 |
| 03:30 | 0 | 0 | 0 | 0 | | 15:30 | 2 | 0 | 0 | 0 | 2 |
| 03:45 | 0 | 0 | 0 | 0 | | 15:45 | 2 | 11 | 2 | 4 | 15 |
| 04:00 | 0 | 0 | 0 | 0 | | 16:00 | 1 | 1 | 0 | 0 | 2 |
| 04:15 | 0 | 2 | 0 | 0 | 2 | 16:15 | 3 | 1 | 0 | 0 | 4 |
| 04:30 | 0 | 0 | 0 | 0 | | 16:30 | 5 | 0 | 0 | 0 | 5 |
| 04:45 | 0 | 0 | 2 | 0 | 2 | 16:45 | 2 | 11 | 1 | 3 | 14 |
| 05:00 | 0 | 1 | 0 | 0 | 1 | 17:00 | 2 | 1 | 0 | 0 | 3 |
| 05:15 | 0 | 0 | 0 | 0 | | 17:15 | 1 | 1 | 0 | 0 | 2 |
| 05:30 | 0 | 0 | 0 | 0 | | 17:30 | 1 | 0 | 0 | 0 | 1 |
| 05:45 | 0 | 0 | 1 | 0 | 1 | 17:45 | 3 | 7 | 1 | 3 | 10 |
| 06:00 | 2 | 1 | 0 | 0 | 3 | 18:00 | 1 | 2 | 0 | 0 | 3 |
| 06:15 | 0 | 0 | 0 | 0 | | 18:15 | 2 | 2 | 0 | 0 | 4 |
| 06:30 | 0 | 1 | 0 | 0 | 1 | 18:30 | 2 | 2 | 0 | 0 | 4 |
| 06:45 | 0 | 2 | 1 | 3 | 5 | 18:45 | 2 | 7 | 0 | 6 | 13 |
| 07:00 | 1 | 0 | 0 | 0 | 1 | 19:00 | 2 | 0 | 0 | 0 | 2 |
| 07:15 | 0 | 2 | 0 | 0 | 2 | 19:15 | 1 | 1 | 0 | 0 | 2 |
| 07:30 | 1 | 1 | 0 | 0 | 2 | 19:30 | 0 | 0 | 0 | 0 | |
| 07:45 | 0 | 2 | 0 | 3 | 5 | 19:45 | 2 | 5 | 0 | 1 | 6 |
| 08:00 | 4 | 2 | 0 | 0 | 6 | 20:00 | 1 | 1 | 0 | 0 | 2 |
| 08:15 | 1 | 0 | 0 | 0 | 1 | 20:15 | 0 | 0 | 0 | 0 | |
| 08:30 | 0 | 2 | 0 | 0 | 2 | 20:30 | 1 | 1 | 0 | 0 | 2 |
| 08:45 | 0 | 5 | 1 | 5 | 10 | 20:45 | 1 | 3 | 0 | 2 | 5 |
| 09:00 | 0 | 1 | 0 | 0 | 1 | 21:00 | 2 | 0 | 0 | 0 | 2 |
| 09:15 | 1 | 2 | 0 | 0 | 3 | 21:15 | 0 | 0 | 0 | 0 | |
| 09:30 | 3 | 1 | 0 | 0 | 4 | 21:30 | 0 | 0 | 0 | 0 | |
| 09:45 | 0 | 4 | 0 | 4 | 8 | 21:45 | 0 | 2 | 0 | 0 | 2 |
| 10:00 | 0 | 1 | 0 | 0 | 1 | 22:00 | 0 | 0 | 0 | 0 | |
| 10:15 | 2 | 0 | 0 | 0 | 2 | 22:15 | 0 | 0 | 0 | 0 | |
| 10:30 | 0 | 2 | 0 | 0 | 2 | 22:30 | 0 | 0 | 0 | 0 | |
| 10:45 | 1 | 3 | 2 | 5 | 8 | 22:45 | 0 | 0 | 0 | 0 | |
| 11:00 | 1 | 0 | 0 | 0 | 1 | 23:00 | 0 | 0 | 0 | 0 | |
| 11:15 | 2 | 0 | 0 | 0 | 2 | 23:15 | 0 | 0 | 0 | 0 | |
| 11:30 | 2 | 2 | 0 | 0 | 4 | 23:30 | 1 | 0 | 0 | 0 | 1 |
| 11:45 | 2 | 7 | 0 | 2 | 9 | 23:45 | 0 | 1 | 0 | 0 | 1 |
| TOTALS | 25 | 25 | | | 50 | TOTALS | 64 | 30 | | | 94 |
| SPLIT % | 50.0% | 50.0% | | | 34.7% | SPLIT % | 68.1% | 31.9% | | | 65.3% |

| DAILY TOTALS | | | | | NB | SB | EB | WB | Total |
|-----------------|-------|-------|-------|-------|-----------------|-------|-------|-------|-------|
| | | | | | 89 | 55 | 0 | 0 | 144 |
| AM Peak Hour | 11:30 | 08:30 | | 11:30 | PM Peak Hour | 16:15 | 17:45 | | 12:00 |
| AM Pk Volume | 11 | 6 | | 16 | PM Pk Volume | 12 | 7 | | 16 |
| Pk Hr Factor | 0.688 | 0.750 | | 0.667 | Pk Hr Factor | 0.600 | 0.875 | | 0.667 |
| 7 - 9 Volume | 7 | 8 | 0 | 15 | 4 - 6 Volume | 18 | 6 | 0 | 24 |
| 7 - 9 Peak Hour | 07:30 | 07:15 | | 07:15 | 4 - 6 Peak Hour | 16:15 | 16:00 | | 16:15 |
| 7 - 9 Pk Volume | 6 | 5 | 0 | 10 | 4 - 6 Pk Volume | 12 | 3 | 0 | 15 |
| Pk Hr Factor | 0.375 | 0.625 | 0.000 | 0.417 | Pk Hr Factor | 0.600 | 0.750 | 0.000 | 0.750 |

VOLUME

Mulberry Dr E/O Maplethorpe Ln

Day: Wednesday
Date: 9/19/2018

City: Santa Cruz
Project #: CA18_8473_002

| DAILY TOTALS | | | | | | NB | SB | EB | WB | Total | | | |
|----------------|----|----|-------|-------|-------|----------------|----|-----|-------|-------|-------|----|----|
| | | | | | | 0 | 0 | 351 | 345 | 696 | | | |
| AM Period | NB | SB | EB | WB | TOTAL | PM Period | NB | SB | EB | WB | TOTAL | | |
| 00:00 | 0 | 0 | 0 | 0 | | 12:00 | 0 | 0 | 8 | 7 | 15 | | |
| 00:15 | 0 | 0 | 0 | 0 | | 12:15 | 0 | 0 | 9 | 4 | 13 | | |
| 00:30 | 0 | 0 | 0 | 0 | | 12:30 | 0 | 0 | 9 | 2 | 11 | | |
| 00:45 | 0 | 0 | 0 | 0 | | 12:45 | 0 | 0 | 3 | 29 | 6 | 19 | 48 |
| 01:00 | 0 | 0 | 0 | 0 | | 13:00 | 0 | 0 | 7 | 7 | 14 | | |
| 01:15 | 0 | 0 | 1 | 0 | 1 | 13:15 | 0 | 0 | 4 | 9 | 13 | | |
| 01:30 | 0 | 0 | 0 | 0 | | 13:30 | 0 | 0 | 4 | 1 | 5 | | |
| 01:45 | 0 | 0 | 0 | 1 | 0 | 13:45 | 0 | 0 | 6 | 21 | 5 | 22 | 43 |
| 02:00 | 0 | 0 | 1 | 0 | 1 | 14:00 | 0 | 0 | 4 | 6 | 10 | | |
| 02:15 | 0 | 0 | 0 | 1 | 1 | 14:15 | 0 | 0 | 6 | 2 | 8 | | |
| 02:30 | 0 | 0 | 0 | 0 | | 14:30 | 0 | 0 | 9 | 7 | 16 | | |
| 02:45 | 0 | 0 | 0 | 1 | 0 | 14:45 | 0 | 0 | 5 | 24 | 7 | 22 | 46 |
| 03:00 | 0 | 0 | 0 | 0 | | 15:00 | 0 | 0 | 9 | 5 | 14 | | |
| 03:15 | 0 | 0 | 0 | 0 | | 15:15 | 0 | 0 | 6 | 2 | 8 | | |
| 03:30 | 0 | 0 | 0 | 0 | | 15:30 | 0 | 0 | 4 | 4 | 8 | | |
| 03:45 | 0 | 0 | 0 | 0 | | 15:45 | 0 | 0 | 6 | 25 | 4 | 15 | 40 |
| 04:00 | 0 | 0 | 0 | 1 | 1 | 16:00 | 0 | 0 | 14 | 9 | 23 | | |
| 04:15 | 0 | 0 | 1 | 0 | 1 | 16:15 | 0 | 0 | 11 | 6 | 17 | | |
| 04:30 | 0 | 0 | 0 | 0 | | 16:30 | 0 | 0 | 7 | 6 | 13 | | |
| 04:45 | 0 | 0 | 1 | 2 | 1 | 16:45 | 0 | 0 | 4 | 36 | 7 | 28 | 64 |
| 05:00 | 0 | 0 | 0 | 3 | 3 | 17:00 | 0 | 0 | 14 | 4 | 18 | | |
| 05:15 | 0 | 0 | 0 | 0 | | 17:15 | 0 | 0 | 5 | 7 | 12 | | |
| 05:30 | 0 | 0 | 0 | 3 | 3 | 17:30 | 0 | 0 | 5 | 4 | 9 | | |
| 05:45 | 0 | 0 | 1 | 1 | 7 | 17:45 | 0 | 0 | 10 | 34 | 9 | 24 | 58 |
| 06:00 | 0 | 0 | 0 | 4 | 4 | 18:00 | 0 | 0 | 9 | 7 | 16 | | |
| 06:15 | 0 | 0 | 2 | 3 | 5 | 18:15 | 0 | 0 | 6 | 2 | 8 | | |
| 06:30 | 0 | 0 | 0 | 3 | 3 | 18:30 | 0 | 0 | 8 | 7 | 15 | | |
| 06:45 | 0 | 0 | 0 | 2 | 3 | 18:45 | 0 | 0 | 9 | 32 | 10 | 26 | 58 |
| 07:00 | 0 | 0 | 1 | 5 | 6 | 19:00 | 0 | 0 | 9 | 2 | 11 | | |
| 07:15 | 0 | 0 | 0 | 4 | 4 | 19:15 | 0 | 0 | 6 | 4 | 10 | | |
| 07:30 | 0 | 0 | 2 | 15 | 17 | 19:30 | 0 | 0 | 10 | 1 | 11 | | |
| 07:45 | 0 | 0 | 1 | 4 | 13 | 19:45 | 0 | 0 | 5 | 30 | 1 | 8 | 38 |
| 08:00 | 0 | 0 | 6 | 11 | 17 | 20:00 | 0 | 0 | 4 | 2 | 6 | | |
| 08:15 | 0 | 0 | 6 | 6 | 12 | 20:15 | 0 | 0 | 8 | 0 | 8 | | |
| 08:30 | 0 | 0 | 5 | 10 | 15 | 20:30 | 0 | 0 | 2 | 2 | 4 | | |
| 08:45 | 0 | 0 | 7 | 24 | 5 | 20:45 | 0 | 0 | 3 | 17 | 1 | 5 | 22 |
| 09:00 | 0 | 0 | 3 | 6 | 9 | 21:00 | 0 | 0 | 4 | 0 | 4 | | |
| 09:15 | 0 | 0 | 3 | 6 | 9 | 21:15 | 0 | 0 | 0 | 1 | 1 | | |
| 09:30 | 0 | 0 | 8 | 8 | 16 | 21:30 | 0 | 0 | 3 | 1 | 4 | | |
| 09:45 | 0 | 0 | 5 | 19 | 8 | 21:45 | 0 | 0 | 2 | 9 | 0 | 2 | 11 |
| 10:00 | 0 | 0 | 3 | 7 | 10 | 22:00 | 0 | 0 | 4 | 1 | 5 | | |
| 10:15 | 0 | 0 | 2 | 4 | 6 | 22:15 | 0 | 0 | 3 | 2 | 5 | | |
| 10:30 | 0 | 0 | 3 | 2 | 5 | 22:30 | 0 | 0 | 1 | 2 | 3 | | |
| 10:45 | 0 | 0 | 4 | 12 | 8 | 22:45 | 0 | 0 | 0 | 8 | 2 | 7 | 15 |
| 11:00 | 0 | 0 | 4 | 2 | 6 | 23:00 | 0 | 0 | 2 | 0 | 2 | | |
| 11:15 | 0 | 0 | 6 | 5 | 11 | 23:15 | 0 | 0 | 0 | 1 | 1 | | |
| 11:30 | 0 | 0 | 6 | 6 | 12 | 23:30 | 0 | 0 | 0 | 2 | 2 | | |
| 11:45 | 0 | 0 | 2 | 18 | 10 | 23:45 | 0 | 0 | 0 | 2 | 0 | 3 | 5 |
| TOTALS | | | 84 | 164 | 248 | TOTALS | | | 267 | 181 | 448 | | |
| SPLIT % | | | 33.9% | 66.1% | 35.6% | SPLIT % | | | 59.6% | 40.4% | 64.4% | | |

| DAILY TOTALS | | | | | | NB | SB | EB | WB | Total | |
|-----------------|-------|-------|-------|-------|-------|-----------------|-------|-------|-------|-------|-------|
| | | | | | | 0 | 0 | 351 | 345 | 696 | |
| AM Peak Hour | | | 11:45 | 07:30 | 07:30 | PM Peak Hour | | | 15:45 | 16:00 | 16:00 |
| AM Pk Volume | | | 28 | 45 | 60 | PM Pk Volume | | | 38 | 28 | 64 |
| Pk Hr Factor | | | 0.778 | 0.750 | 0.882 | Pk Hr Factor | | | 0.679 | 0.778 | 0.696 |
| 7 - 9 Volume | 0 | 0 | 28 | 69 | 97 | 4 - 6 Volume | 0 | 0 | 70 | 52 | 122 |
| 7 - 9 Peak Hour | | | 08:00 | 07:30 | 07:30 | 4 - 6 Peak Hour | | | 16:00 | 16:00 | 16:00 |
| 7 - 9 Pk Volume | 0 | 0 | 24 | 45 | 60 | 4 - 6 Pk Volume | 0 | 0 | 36 | 28 | 64 |
| Pk Hr Factor | 0.000 | 0.000 | 0.857 | 0.750 | 0.882 | Pk Hr Factor | 0.000 | 0.000 | 0.643 | 0.778 | 0.696 |

SPEED

Maplethorpe Ln N/O Mulberry Dr

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_001n

North Bound

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|------|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------|
| | | | 5 | ↔ | 9% | 12 | ↔ | 21% | 8 | ↔ | 14% | 33 | ↔ | 57% |

| Street Name | Direction | Percentiles | | | | | ADT |
|----------------|-------------|-------------|------|---------|------|------|-----|
| | | 15th | 50th | Average | 85th | 95th | |
| Maplethorpe Ln | North Bound | 7 | 10 | 11 | 14 | 17 | 58 |
| Maplethorpe Ln | South Bound | 7 | 11 | 11 | 15 | 18 | 48 |

SPEED

Maplethorpe Ln N/O Mulberry Dr

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_001s

South Bound

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|------|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------|
| | | | 8 | ↔ | 17% | 9 | ↔ | 19% | 9 | ↔ | 19% | 22 | ↔ | 46% |

| Street Name | Direction | Percentiles | | | | | ADT |
|----------------|-------------|-------------|------|---------|------|------|-----|
| | | 15th | 50th | Average | 85th | 95th | |
| Maplethorpe Ln | North Bound | 7 | 10 | 11 | 14 | 17 | 58 |
| Maplethorpe Ln | South Bound | 7 | 11 | 11 | 15 | 18 | 48 |

SPEED

Maplethorpe Ln N/O Mulberry Dr

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_001

Summary

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|--------------------|------------|------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------------|
| 15:00 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 15:15 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 15:30 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 15:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:00 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 16:15 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 16:30 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 16:45 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 17:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 17:30 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 17:45 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 18:00 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 18:15 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 18:30 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 18:45 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 19:00 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 19:15 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 19:30 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 19:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20:45 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 21:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21:15 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 21:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21:45 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 22:00 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 22:15 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 22:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22:45 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 23:00 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 23:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Totals | 94 | 12 | | | | | | | | | | | | 106 |
| % of Totals | 89% | 11% | | | | | | | | | | | | 100% |

| | | | | | | | | | | | | | | | |
|---------------------------------|---------------|-------|-----|---|------------------|---|-----|---|---------------|---|-----|---|-------------------------|-------|-----|
| AM Volumes | 32 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | |
| % AM | 30% | 4% | | | | | | | | | | | | 34% | |
| AM Peak Hour | 08:45 | 08:45 | | | | | | | | | | | | 08:45 | |
| Volume | 15 | 3 | | | | | | | | | | | | 18 | |
| PM Volumes | 62 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 70 | |
| % PM | 58% | 8% | | | | | | | | | | | | 66% | |
| PM Peak Hour | 13:00 | 12:30 | | | | | | | | | | | | 13:00 | |
| Volume | 11 | 2 | | | | | | | | | | | | 13 | |
| Directional Peak Periods | AM 7-9 | | | | NOON 12-2 | | | | PM 4-6 | | | | Off Peak Volumes | | |
| All Classes | Volume | | % | | Volume | | % | | Volume | | % | | Volume | % | |
| | 13 | ↔ | 12% | | 21 | ↔ | 20% | | 17 | ↔ | 16% | | 55 | ↔ | 52% |

| Street Name | Direction | Percentiles | | | | | |
|----------------|-----------|-------------|------|---------|------|------|-----|
| | | 15th | 50th | Average | 85th | 95th | ADT |
| Maplethorpe Ln | Summary | 7 | 11 | 11 | 15 | 18 | 106 |

SPEED

Maplethorpe Ln N/O Mulberry Dr

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_001

Summary

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|------|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------|
|------|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------|

SPEED

Maplethorpe Ln N/O Mulberry Dr

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_001n

North Bound

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|--------------------|------------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------------|
| 00:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 05:00 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 06:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:00 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 08:00 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 09:00 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| 10:00 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 11:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12:00 PM | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 13:00 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 14:00 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 15:00 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 16:00 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 17:00 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 18:00 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 19:00 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 20:00 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 21:00 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 22:00 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 23:00 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Totals | 53 | 5 | | | | | | | | | | | | 58 |
| % of Totals | 91% | 9% | | | | | | | | | | | | 100% |

| | | | | | | | | | | | | | | |
|---------------------------------|---------------|-------|----|----|------------------|-----|---|--------|---------------|----|--------|-----|-------------------------|-------|
| AM Volumes | 15 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| % AM | 26% | 2% | | | | | | | | | | | | 28% |
| AM Peak Hour | 09:00 | 09:00 | | | | | | | | | | | | 09:00 |
| Volume | 7 | 1 | | | | | | | | | | | | 8 |
| PM Volumes | 38 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42 |
| % PM | 66% | 7% | | | | | | | | | | | | 72% |
| PM Peak Hour | 18:00 | 12:00 | | | | | | | | | | | | 12:00 |
| Volume | 6 | 1 | | | | | | | | | | | | 6 |
| Directional Peak Periods | AM 7-9 | | | | NOON 12-2 | | | | PM 4-6 | | | | Off Peak Volumes | |
| All Speeds | Volume | | % | | Volume | | % | Volume | | % | Volume | | % | |
| | 5 | ↔ | 9% | 12 | ↔ | 21% | 8 | ↔ | 14% | 33 | ↔ | 57% | | |

| Street Name | Direction | Percentiles | | | | | |
|----------------|-------------|-------------|------|---------|------|------|-----|
| | | 15th | 50th | Average | 85th | 95th | ADT |
| Maplethorpe Ln | North Bound | 7 | 10 | 11 | 14 | 17 | 58 |
| Maplethorpe Ln | South Bound | 7 | 11 | 11 | 15 | 18 | 48 |

SPEED

Maplethorpe Ln N/O Mulberry Dr

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_001s

South Bound

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|--------------------|------------|------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------------|
| 00:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04:00 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 05:00 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 06:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:00 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 08:00 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 09:00 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 10:00 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 11:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12:00 PM | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 13:00 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 14:00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 15:00 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 16:00 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 17:00 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 18:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19:00 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 20:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22:00 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 23:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Totals | 41 | 7 | | | | | | | | | | | | 48 |
| % of Totals | 85% | 15% | | | | | | | | | | | | 100% |

| | | | | | | | | | | | | | | |
|---------------------------------|---------------|-------|-----|---|------------------|-----|---|--------|---------------|----|--------|-----|-------------------------|-------|
| AM Volumes | 17 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 |
| % AM | 35% | 6% | | | | | | | | | | | | 42% |
| AM Peak Hour | 08:00 | 09:00 | | | | | | | | | | | | 08:00 |
| Volume | 7 | 2 | | | | | | | | | | | | 7 |
| PM Volumes | 24 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 |
| % PM | 50% | 8% | | | | | | | | | | | | 58% |
| PM Peak Hour | 13:00 | 13:00 | | | | | | | | | | | | 13:00 |
| Volume | 6 | 1 | | | | | | | | | | | | 7 |
| Directional Peak Periods | AM 7-9 | | | | NOON 12-2 | | | | PM 4-6 | | | | Off Peak Volumes | |
| All Speeds | Volume | | % | | Volume | | % | Volume | | % | Volume | | % | |
| | 8 | ↔ | 17% | 9 | ↔ | 19% | 9 | ↔ | 19% | 22 | ↔ | 46% | | |

| Street Name | Direction | Percentiles | | | | | |
|----------------|-------------|-------------|------|---------|------|------|-----|
| | | 15th | 50th | Average | 85th | 95th | ADT |
| Maplethorpe Ln | North Bound | 7 | 10 | 11 | 14 | 17 | 58 |
| Maplethorpe Ln | South Bound | 7 | 11 | 11 | 15 | 18 | 48 |

SPEED

Maplethorpe Ln N/O Mulberry Dr

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_001

Summary

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|--------------------|------------|------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------------|
| 00:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04:00 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 05:00 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 06:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:00 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 08:00 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| 09:00 | 12 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| 10:00 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 11:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12:00 PM | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| 13:00 | 11 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| 14:00 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 15:00 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 16:00 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| 17:00 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 18:00 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 19:00 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 20:00 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 21:00 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 22:00 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 23:00 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Totals | 94 | 12 | | | | | | | | | | | | 106 |
| % of Totals | 89% | 11% | | | | | | | | | | | | 100% |

| | | | | | | | | | | | | | | |
|---------------------------------|-------------------|-------|---------------|---|-----|--------|------------------|-----|--------|---|---------------|--------|-------------------------|-------|
| AM Volumes | 32 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 |
| % AM | 30% | 4% | | | | | | | | | | | | 34% |
| AM Peak Hour | 09:00 | 09:00 | | | | | | | | | | | | 09:00 |
| Volume | 12 | 3 | | | | | | | | | | | | 15 |
| PM Volumes | 62 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 70 |
| % PM | 58% | 8% | | | | | | | | | | | | 66% |
| PM Peak Hour | 13:00 | 13:00 | | | | | | | | | | | | 13:00 |
| Volume | 11 | 2 | | | | | | | | | | | | 13 |
| Directional Peak Periods | All Speeds | | AM 7-9 | | | | NOON 12-2 | | | | PM 4-6 | | Off Peak Volumes | |
| | Volume | | Volume | | % | Volume | | % | Volume | | % | Volume | | % |
| | 13 | ↔ | 21 | ↔ | 12% | 17 | ↔ | 16% | 55 | ↔ | 52% | | | |

| Street Name | Direction | Percentiles | | | | | |
|----------------|-----------|-------------|------|---------|------|------|-----|
| | | 15th | 50th | Average | 85th | 95th | ADT |
| Maplethorpe Ln | Summary | 7 | 11 | 11 | 15 | 18 | 106 |

VOLUME

Maplethorpe Ln N/O Mulberry Dr

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_001

| DAILY TOTALS | | | | | NB | SB | EB | WB | Total | | |
|----------------|--------------|--------------|----|----|--------------|----------------|--------------|--------------|-------|----|--------------|
| | | | | | 58 | 48 | 0 | 0 | 106 | | |
| AM Period | NB | SB | EB | WB | TOTAL | PM Period | NB | SB | EB | WB | TOTAL |
| 00:00 | 0 | 0 | 0 | 0 | | 12:00 | 1 | 0 | 0 | 0 | 1 |
| 00:15 | 0 | 0 | 0 | 0 | | 12:15 | 3 | 1 | 0 | 0 | 4 |
| 00:30 | 0 | 0 | 0 | 0 | | 12:30 | 2 | 1 | 0 | 0 | 3 |
| 00:45 | 0 | 0 | 0 | 0 | | 12:45 | 0 | 6 | 0 | 2 | 8 |
| 01:00 | 0 | 0 | 0 | 0 | | 13:00 | 1 | 1 | 0 | 0 | 2 |
| 01:15 | 0 | 0 | 0 | 0 | | 13:15 | 0 | 2 | 0 | 0 | 2 |
| 01:30 | 0 | 0 | 0 | 0 | | 13:30 | 4 | 3 | 0 | 0 | 7 |
| 01:45 | 0 | 0 | 0 | 0 | | 13:45 | 1 | 6 | 1 | 7 | 13 |
| 02:00 | 0 | 0 | 0 | 0 | | 14:00 | 1 | 1 | 0 | 0 | 2 |
| 02:15 | 0 | 0 | 0 | 0 | | 14:15 | 1 | 0 | 0 | 0 | 1 |
| 02:30 | 0 | 0 | 0 | 0 | | 14:30 | 0 | 0 | 0 | 0 | 0 |
| 02:45 | 0 | 0 | 0 | 0 | | 14:45 | 1 | 3 | 0 | 1 | 4 |
| 03:00 | 0 | 0 | 0 | 0 | | 15:00 | 0 | 4 | 0 | 0 | 4 |
| 03:15 | 0 | 0 | 0 | 0 | | 15:15 | 1 | 0 | 0 | 0 | 1 |
| 03:30 | 0 | 0 | 0 | 0 | | 15:30 | 1 | 0 | 0 | 0 | 1 |
| 03:45 | 0 | 0 | 0 | 0 | | 15:45 | 0 | 2 | 0 | 4 | 6 |
| 04:00 | 0 | 0 | 0 | 0 | | 16:00 | 1 | 2 | 0 | 0 | 3 |
| 04:15 | 0 | 1 | 0 | 0 | 1 | 16:15 | 0 | 1 | 0 | 0 | 1 |
| 04:30 | 0 | 0 | 0 | 0 | | 16:30 | 1 | 1 | 0 | 0 | 2 |
| 04:45 | 0 | 1 | 2 | 0 | 1 2 | 16:45 | 1 | 3 | 1 | 5 | 8 |
| 05:00 | 0 | 0 | 0 | 0 | | 17:00 | 0 | 0 | 0 | 0 | 0 |
| 05:15 | 0 | 0 | 0 | 0 | | 17:15 | 2 | 2 | 0 | 0 | 4 |
| 05:30 | 1 | 1 | 0 | 0 | 2 | 17:30 | 2 | 1 | 0 | 0 | 3 |
| 05:45 | 0 | 1 | 0 | 1 | 2 | 17:45 | 1 | 5 | 1 | 4 | 9 |
| 06:00 | 0 | 0 | 0 | 0 | | 18:00 | 2 | 0 | 0 | 0 | 2 |
| 06:15 | 0 | 0 | 0 | 0 | | 18:15 | 1 | 0 | 0 | 0 | 1 |
| 06:30 | 0 | 0 | 0 | 0 | | 18:30 | 1 | 0 | 0 | 0 | 1 |
| 06:45 | 0 | 0 | 0 | 0 | | 18:45 | 2 | 6 | 0 | 0 | 6 |
| 07:00 | 0 | 0 | 0 | 0 | | 19:00 | 0 | 1 | 0 | 0 | 1 |
| 07:15 | 1 | 1 | 0 | 0 | 2 | 19:15 | 2 | 1 | 0 | 0 | 3 |
| 07:30 | 0 | 0 | 0 | 0 | | 19:30 | 0 | 1 | 0 | 0 | 1 |
| 07:45 | 0 | 1 | 0 | 1 | 2 | 19:45 | 0 | 2 | 0 | 3 | 5 |
| 08:00 | 1 | 4 | 0 | 0 | 5 | 20:00 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 1 | 1 | 0 | 0 | 2 | 20:15 | 0 | 0 | 0 | 0 | 0 |
| 08:30 | 0 | 0 | 0 | 0 | | 20:30 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 2 | 4 | 2 | 7 | 4 11 | 20:45 | 3 | 3 | 0 | 0 | 3 |
| 09:00 | 4 | 1 | 0 | 0 | 5 | 21:00 | 0 | 0 | 0 | 0 | 0 |
| 09:15 | 2 | 3 | 0 | 0 | 5 | 21:15 | 1 | 0 | 0 | 0 | 1 |
| 09:30 | 2 | 2 | 0 | 0 | 4 | 21:30 | 0 | 0 | 0 | 0 | 0 |
| 09:45 | 0 | 8 | 1 | 7 | 1 15 | 21:45 | 2 | 3 | 0 | 0 | 3 |
| 10:00 | 2 | 0 | 0 | 0 | 2 | 22:00 | 0 | 1 | 0 | 0 | 1 |
| 10:15 | 0 | 2 | 0 | 0 | 2 | 22:15 | 1 | 0 | 0 | 0 | 1 |
| 10:30 | 0 | 0 | 0 | 0 | | 22:30 | 0 | 0 | 0 | 0 | 0 |
| 10:45 | 0 | 2 | 0 | 2 | 4 | 22:45 | 1 | 2 | 1 | 2 | 4 |
| 11:00 | 0 | 0 | 0 | 0 | | 23:00 | 1 | 0 | 0 | 0 | 1 |
| 11:15 | 0 | 0 | 0 | 0 | | 23:15 | 0 | 0 | 0 | 0 | 0 |
| 11:30 | 0 | 0 | 0 | 0 | | 23:30 | 0 | 0 | 0 | 0 | 0 |
| 11:45 | 0 | 0 | 0 | 0 | | 23:45 | 0 | 1 | 0 | 0 | 1 |
| TOTALS | 16 | 20 | | | 36 | TOTALS | 42 | 28 | | | 70 |
| SPLIT % | 44.4% | 55.6% | | | 34.0% | SPLIT % | 60.0% | 40.0% | | | 66.0% |

| DAILY TOTALS | | | | | NB | SB | EB | WB | Total |
|-----------------|-------|-------|-------|-------|-----------------|-------|-------|-------|-------|
| | | | | | 58 | 48 | 0 | 0 | 106 |
| AM Peak Hour | 08:45 | 08:45 | | 08:45 | PM Peak Hour | 13:30 | 13:00 | | 13:00 |
| AM Pk Volume | 10 | 8 | | 18 | PM Pk Volume | 7 | 7 | | 13 |
| Pk Hr Factor | 0.625 | 0.667 | | 0.900 | Pk Hr Factor | 0.438 | 0.583 | | 0.464 |
| 7 - 9 Volume | 5 | 8 | 0 | 13 | 4 - 6 Volume | 8 | 9 | 0 | 17 |
| 7 - 9 Peak Hour | 08:00 | 08:00 | | 08:00 | 4 - 6 Peak Hour | 16:45 | 16:00 | | 16:45 |
| 7 - 9 Pk Volume | 4 | 7 | 0 | 11 | 4 - 6 Pk Volume | 5 | 5 | 0 | 9 |
| Pk Hr Factor | 0.500 | 0.438 | 0.000 | 0.550 | Pk Hr Factor | 0.625 | 0.625 | 0.000 | 0.563 |

SPEED

Mulberry Dr E/O Maplethorpe Ln

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_002e

East Bound

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|--------------------|------------|------------|------------|------------|-----------|---------|---------|---------|---------|---------|---------|---------|------|-------------|
| 18:00 | 0 | 3 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| 18:15 | 1 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 18:30 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 18:45 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 19:00 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 19:15 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 19:30 | 1 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 19:45 | 0 | 3 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| 20:00 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 20:15 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 20:30 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 20:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21:00 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 21:15 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 21:30 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 21:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22:00 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 22:15 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 22:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23:00 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 23:15 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 23:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23:45 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Totals | 34 | 107 | 140 | 42 | 5 | | | | | | | | | 328 |
| % of Totals | 10% | 33% | 43% | 13% | 2% | | | | | | | | | 100% |

| | | | | | | | | | | | | | | |
|---------------------|-------|-------|-------|-------|-------|---|---|---|---|---|---|---|---|-------|
| AM Volumes | 13 | 37 | 36 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 91 |
| % AM | 4% | 11% | 11% | 2% | | | | | | | | | | 28% |
| AM Peak Hour | 10:00 | 11:15 | 09:30 | 08:45 | 11:15 | | | | | | | | | 11:15 |
| Volume | 5 | 10 | 12 | 4 | 1 | | | | | | | | | 26 |
| PM Volumes | 21 | 70 | 104 | 37 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 237 |
| % PM | 6% | 21% | 32% | 11% | 2% | | | | | | | | | 72% |
| PM Peak Hour | 12:45 | 16:15 | 16:45 | 15:00 | 16:30 | | | | | | | | | 17:00 |
| Volume | 6 | 14 | 23 | 12 | 2 | | | | | | | | | 45 |

| Directional Peak Periods All Classes | AM 7-9 | | NOON 12-2 | | PM 4-6 | | Off Peak Volumes | |
|---|--------|---|-----------|---|--------|---|------------------|---|
| | Volume | % | Volume | % | Volume | % | Volume | % |

SPEED

Mulberry Dr E/O Maplethorpe Ln

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_002e

East Bound

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|------|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------|
| | | | 23 | ↔ | 7% | 47 | ↔ | 14% | 68 | ↔ | 21% | 190 | ↔ | 58% |

| Street Name | Direction | Percentiles | | | | | |
|-------------|------------|-------------|------|---------|------|------|-----|
| | | 15th | 50th | Average | 85th | 95th | ADT |
| Mulberry Dr | East Bound | 16 | 21 | 20 | 25 | 29 | 328 |
| Mulberry Dr | West Bound | 16 | 22 | 21 | 27 | 29 | 334 |

SPEED

Mulberry Dr E/O Maplethorpe Ln

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_002w

West Bound

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|------|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------|
| | | | 67 | ↔ | 20% | 50 | ↔ | 15% | 33 | ↔ | 10% | 184 | ↔ | 55% |

| Street Name | Direction | Percentiles | | | | | |
|-------------|------------|-------------|------|---------|------|------|-----|
| | | 15th | 50th | Average | 85th | 95th | ADT |
| Mulberry Dr | East Bound | 16 | 21 | 20 | 25 | 29 | 328 |
| Mulberry Dr | West Bound | 16 | 22 | 21 | 27 | 29 | 334 |

SPEED

Mulberry Dr E/O Maplethorpe Ln

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_002

Summary

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|--------------------|------------|------------|------------|------------|-----------|-----------|---------|---------|---------|---------|---------|---------|------|-------------|
| 15:00 | 0 | 2 | 4 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 15:15 | 2 | 1 | 8 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| 15:30 | 6 | 1 | 9 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |
| 15:45 | 0 | 2 | 2 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| 16:00 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| 16:15 | 0 | 6 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| 16:30 | 0 | 2 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 16:45 | 0 | 4 | 6 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| 17:00 | 0 | 5 | 6 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| 17:15 | 2 | 4 | 9 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 |
| 17:30 | 1 | 3 | 8 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| 17:45 | 1 | 5 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| 18:00 | 1 | 4 | 8 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| 18:15 | 1 | 4 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 18:30 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 18:45 | 1 | 1 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 19:00 | 0 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 19:15 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 19:30 | 1 | 3 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 19:45 | 0 | 4 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 20:00 | 0 | 3 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 20:15 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 20:30 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 20:45 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 21:00 | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 21:15 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 21:30 | 1 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 21:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22:00 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 22:15 | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 22:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23:00 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 23:15 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 23:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23:45 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Totals | 71 | 190 | 283 | 104 | 13 | 1 | | | | | | | | 662 |
| % of Totals | 11% | 29% | 43% | 16% | 2% | 0% | | | | | | | | 100% |

| | | | | | | | | | | | | | | |
|---------------------|-------|-------|-------|-------|-------|-------|---|---|---|---|---|---|---|-------|
| AM Volumes | 27 | 73 | 103 | 42 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 249 |
| % AM | 4% | 11% | 16% | 6% | 0% | 0% | | | | | | | | 38% |
| AM Peak Hour | 10:00 | 11:45 | 08:45 | 07:15 | 11:30 | 06:30 | | | | | | | | 07:30 |
| Volume | 12 | 22 | 24 | 14 | 2 | 1 | | | | | | | | 52 |
| PM Volumes | 44 | 117 | 180 | 62 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 413 |
| % PM | 7% | 18% | 27% | 9% | 2% | | | | | | | | | 62% |
| PM Peak Hour | 14:45 | 13:00 | 15:15 | 15:00 | 16:30 | | | | | | | | | 17:15 |
| Volume | 10 | 20 | 30 | 15 | 3 | | | | | | | | | 62 |

| Directional Peak Periods | | AM 7-9 | | NOON 12-2 | | PM 4-6 | | Off Peak Volumes | |
|--------------------------|--------|--------|-----|-----------|---|--------|--------|------------------|-----|
| All Classes | Volume | | % | Volume | | % | Volume | | % |
| | 90 | ↔ | 14% | 97 | ↔ | 15% | 101 | ↔ | 15% |
| | | | | | | | 374 | ↔ | 56% |

| Street Name | Direction | Percentiles | | | | | |
|-------------|-----------|-------------|------|---------|------|------|-----|
| | | 15th | 50th | Average | 85th | 95th | ADT |
| Mulberry Dr | Summary | 16 | 21 | 21 | 26 | 29 | 662 |

SPEED

Mulberry Dr E/O Maplethorpe Ln

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_002

Summary

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|------|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------|
|------|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------|

SPEED

Mulberry Dr E/O Maplethorpe Ln

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_002e

East Bound

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|--------------------|------------|------------|------------|------------|-----------|---------|---------|---------|---------|---------|---------|---------|------|-------------|
| 00:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04:00 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 05:00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 06:00 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 07:00 | 1 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 08:00 | 2 | 7 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 |
| 09:00 | 0 | 8 | 10 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| 10:00 | 5 | 7 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 |
| 11:00 | 5 | 9 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| 12:00 PM | 3 | 4 | 11 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 |
| 13:00 | 4 | 9 | 7 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 14:00 | 1 | 8 | 8 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| 15:00 | 3 | 2 | 10 | 12 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 |
| 16:00 | 0 | 9 | 13 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 |
| 17:00 | 1 | 14 | 22 | 6 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 |
| 18:00 | 2 | 7 | 14 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 19:00 | 1 | 7 | 11 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| 20:00 | 1 | 2 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 21:00 | 2 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 22:00 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 23:00 | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Totals | 34 | 107 | 140 | 42 | 5 | | | | | | | | | 328 |
| % of Totals | 10% | 33% | 43% | 13% | 2% | | | | | | | | | 100% |

| | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|--------|-------|---------------|-------|------------------|---|--------|---------------|----|---|-------------------------|---|--------|-------|----|--|-----|--|-----|--|
| AM Volumes | 13 | 37 | 36 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 91 | | | | | | |
| % AM | 4% | 11% | 11% | 2% | | | | | | | | | | 28% | | | | | | |
| AM Peak Hour | 10:00 | 11:00 | 09:00 | 09:00 | | | | | | | | | | 11:00 | | | | | | |
| Volume | 5 | 9 | 10 | 3 | | | | | | | | | | 22 | | | | | | |
| PM Volumes | 21 | 70 | 104 | 37 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 237 | | | | | | |
| % PM | 6% | 21% | 32% | 11% | 2% | | | | | | | | | 72% | | | | | | |
| PM Peak Hour | 13:00 | 17:00 | 17:00 | 15:00 | 17:00 | | | | | | | | | 17:00 | | | | | | |
| Volume | 4 | 14 | 22 | 12 | 2 | | | | | | | | | 45 | | | | | | |
| Directional Peak Periods | | | AM 7-9 | | NOON 12-2 | | | PM 4-6 | | | Off Peak Volumes | | | | | | | | | |
| All Speeds | Volume | | ←→ | | % | | Volume | | ←→ | | % | | Volume | | ←→ | | % | | | |
| | 23 | | | | 7% | | 47 | | | | 14% | | 68 | | | | 190 | | 58% | |

| Street Name | Direction | Percentiles | | | | | |
|-------------|------------|-------------|------|---------|------|------|-----|
| | | 15th | 50th | Average | 85th | 95th | ADT |
| Mulberry Dr | East Bound | 16 | 21 | 20 | 25 | 29 | 328 |
| Mulberry Dr | West Bound | 16 | 22 | 21 | 27 | 29 | 334 |

SPEED

Mulberry Dr E/O Maplethorpe Ln

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_002w

West Bound

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|--------------------|------------|------------|------------|------------|-----------|-----------|---------|---------|---------|---------|---------|---------|------|-------------|
| 00:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02:00 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 03:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 05:00 | 0 | 1 | 1 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 06:00 | 1 | 1 | 10 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| 07:00 | 3 | 5 | 19 | 7 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 |
| 08:00 | 0 | 10 | 9 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 |
| 09:00 | 1 | 4 | 13 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 |
| 10:00 | 7 | 9 | 5 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 |
| 11:00 | 2 | 6 | 9 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 |
| 12:00 PM | 0 | 11 | 9 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 |
| 13:00 | 3 | 11 | 7 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 14:00 | 5 | 5 | 9 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| 15:00 | 5 | 4 | 13 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |
| 16:00 | 0 | 3 | 10 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 |
| 17:00 | 3 | 3 | 5 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| 18:00 | 1 | 3 | 8 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 |
| 19:00 | 0 | 5 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 20:00 | 0 | 1 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| 21:00 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 22:00 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 23:00 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Totals | 37 | 83 | 143 | 62 | 8 | 1 | | | | | | | | 334 |
| % of Totals | 11% | 25% | 43% | 19% | 2% | 0% | | | | | | | | 100% |

| | | | | | | | | | | | | | | | |
|---------------------------------|---------------|-------|-------|-------|--------|------------------|----|-----|---------------|-----|---|-------------------------|--------|-------|--|
| AM Volumes | 14 | 36 | 67 | 37 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 158 | |
| % AM | 4% | 11% | 20% | 11% | 1% | 0% | | | | | | | | 47% | |
| AM Peak Hour | 10:00 | 08:00 | 07:00 | 08:00 | 05:00 | 07:00 | | | | | | | | 07:00 | |
| Volume | 7 | 10 | 19 | 12 | 1 | 1 | | | | | | | | 36 | |
| PM Volumes | 23 | 47 | 76 | 25 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 176 | |
| % PM | 7% | 14% | 23% | 7% | 1% | | | | | | | | | 53% | |
| PM Peak Hour | 14:00 | 12:00 | 15:00 | 12:00 | 12:00 | | | | | | | | | 12:00 | |
| Volume | 5 | 11 | 13 | 5 | 1 | | | | | | | | | 26 | |
| Directional Peak Periods | AM 7-9 | | | | | NOON 12-2 | | | PM 4-6 | | | Off Peak Volumes | | | |
| All Speeds | Volume | ←→ | | % | Volume | ←→ | | % | Volume | ←→ | | % | Volume | ←→ | |
| | 67 | 20% | | 50 | 15% | | 33 | 10% | 184 | 55% | | | | | |

| Street Name | Direction | Percentiles | | | | | |
|-------------|------------|-------------|------|---------|------|------|-----|
| | | 15th | 50th | Average | 85th | 95th | ADT |
| Mulberry Dr | East Bound | 16 | 21 | 20 | 25 | 29 | 328 |
| Mulberry Dr | West Bound | 16 | 22 | 21 | 27 | 29 | 334 |

SPEED

Mulberry Dr E/O Maplethorpe Ln

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_002

Summary

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|--------------------|------------|------------|------------|------------|-----------|-----------|---------|---------|---------|---------|---------|---------|------|-------------|
| 00:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02:00 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 03:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04:00 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 05:00 | 0 | 2 | 1 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 06:00 | 1 | 4 | 10 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |
| 07:00 | 4 | 7 | 21 | 8 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42 |
| 08:00 | 2 | 17 | 16 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 |
| 09:00 | 1 | 12 | 23 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 44 |
| 10:00 | 12 | 16 | 13 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 43 |
| 11:00 | 7 | 15 | 17 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 |
| 12:00 PM | 3 | 15 | 20 | 9 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 49 |
| 13:00 | 7 | 20 | 14 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 |
| 14:00 | 6 | 13 | 17 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 43 |
| 15:00 | 8 | 6 | 23 | 15 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53 |
| 16:00 | 0 | 12 | 23 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 40 |
| 17:00 | 4 | 17 | 27 | 10 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 61 |
| 18:00 | 3 | 10 | 22 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 41 |
| 19:00 | 1 | 12 | 14 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 |
| 20:00 | 1 | 3 | 13 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |
| 21:00 | 4 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| 22:00 | 3 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 23:00 | 4 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| Totals | 71 | 190 | 283 | 104 | 13 | 1 | | | | | | | | 662 |
| % of Totals | 11% | 29% | 43% | 16% | 2% | 0% | | | | | | | | 100% |

| | | | | | | | | | | | | | | | |
|---------------------------------|---------------|-------|-------|-------|--------|------------------|-----|-----|---------------|-----|---|-------------------------|--------|-------|--|
| AM Volumes | 27 | 73 | 103 | 42 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 249 | |
| % AM | 4% | 11% | 16% | 6% | 0% | 0% | | | | | | | | 38% | |
| AM Peak Hour | 10:00 | 08:00 | 09:00 | 08:00 | 05:00 | 07:00 | | | | | | | | 08:00 | |
| Volume | 12 | 17 | 23 | 13 | 1 | 1 | | | | | | | | 48 | |
| PM Volumes | 44 | 117 | 180 | 62 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 413 | |
| % PM | 7% | 18% | 27% | 9% | 2% | | | | | | | | | 62% | |
| PM Peak Hour | 15:00 | 13:00 | 17:00 | 15:00 | 17:00 | | | | | | | | | 17:00 | |
| Volume | 8 | 20 | 27 | 15 | 3 | | | | | | | | | 61 | |
| Directional Peak Periods | AM 7-9 | | | | | NOON 12-2 | | | PM 4-6 | | | Off Peak Volumes | | | |
| All Speeds | Volume | ←→ | | % | Volume | ←→ | | % | Volume | ←→ | | % | Volume | ←→ | |
| | 90 | 14% | | 97 | 15% | | 101 | 15% | 374 | 56% | | | | | |

| Street Name | Direction | Percentiles | | | | | |
|-------------|-----------|-------------|------|---------|------|------|-----|
| | | 15th | 50th | Average | 85th | 95th | ADT |
| Mulberry Dr | Summary | 16 | 21 | 21 | 26 | 29 | 662 |

VOLUME

Mulberry Dr E/O Maplethorpe Ln

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_002

| DAILY TOTALS | | | | | NB | SB | | | | | Total | | | | |
|----------------|----|----|-------|-------|-------|----|----------------|-----|----|-------|-------|-------|----|----|----|
| | | | | | 0 | 0 | EB | WB | | | 662 | | | | |
| | | | | | | | 328 | 334 | | | | | | | |
| AM Period | NB | SB | EB | WB | TOTAL | | PM Period | NB | SB | EB | WB | TOTAL | | | |
| 00:00 | 0 | 0 | 0 | 0 | | | 12:00 | 0 | 0 | 8 | 5 | 13 | | | |
| 00:15 | 0 | 0 | 0 | 0 | | | 12:15 | 0 | 0 | 4 | 9 | 13 | | | |
| 00:30 | 0 | 0 | 0 | 0 | | | 12:30 | 0 | 0 | 6 | 4 | 10 | | | |
| 00:45 | 0 | 0 | 0 | 0 | | | 12:45 | 0 | 0 | 5 | 23 | 8 | 26 | 13 | 49 |
| 01:00 | 0 | 0 | 0 | 0 | | | 13:00 | 0 | 0 | 4 | 7 | 11 | | | |
| 01:15 | 0 | 0 | 0 | 0 | | | 13:15 | 0 | 0 | 7 | 5 | 12 | | | |
| 01:30 | 0 | 0 | 0 | 0 | | | 13:30 | 0 | 0 | 7 | 3 | 10 | | | |
| 01:45 | 0 | 0 | 0 | 0 | | | 13:45 | 0 | 0 | 6 | 24 | 9 | 24 | 15 | 48 |
| 02:00 | 0 | 0 | 0 | 1 | 1 | | 14:00 | 0 | 0 | 7 | 5 | 12 | | | |
| 02:15 | 0 | 0 | 0 | 0 | | | 14:15 | 0 | 0 | 2 | 5 | 7 | | | |
| 02:30 | 0 | 0 | 0 | 0 | | | 14:30 | 0 | 0 | 8 | 6 | 14 | | | |
| 02:45 | 0 | 0 | 0 | 0 | 1 | 1 | 14:45 | 0 | 0 | 4 | 21 | 6 | 22 | 10 | 43 |
| 03:00 | 0 | 0 | 0 | 0 | | | 15:00 | 0 | 0 | 6 | 6 | 12 | | | |
| 03:15 | 0 | 0 | 0 | 0 | | | 15:15 | 0 | 0 | 10 | 5 | 15 | | | |
| 03:30 | 0 | 0 | 0 | 0 | | | 15:30 | 0 | 0 | 6 | 12 | 18 | | | |
| 03:45 | 0 | 0 | 0 | 0 | | | 15:45 | 0 | 0 | 6 | 28 | 2 | 25 | 8 | 53 |
| 04:00 | 0 | 0 | 0 | 0 | | | 16:00 | 0 | 0 | 6 | 5 | 11 | | | |
| 04:15 | 0 | 0 | 0 | 0 | | | 16:15 | 0 | 0 | 6 | 5 | 11 | | | |
| 04:30 | 0 | 0 | 0 | 0 | | | 16:30 | 0 | 0 | 3 | 2 | 5 | | | |
| 04:45 | 0 | 0 | 1 | 1 | 0 | 1 | 16:45 | 0 | 0 | 8 | 23 | 5 | 17 | 13 | 40 |
| 05:00 | 0 | 0 | 0 | 1 | 1 | | 17:00 | 0 | 0 | 11 | 4 | 15 | | | |
| 05:15 | 0 | 0 | 0 | 1 | 1 | | 17:15 | 0 | 0 | 14 | 3 | 17 | | | |
| 05:30 | 0 | 0 | 0 | 1 | 1 | | 17:30 | 0 | 0 | 11 | 4 | 15 | | | |
| 05:45 | 0 | 0 | 1 | 1 | 3 | 6 | 17:45 | 0 | 0 | 9 | 45 | 5 | 16 | 14 | 61 |
| 06:00 | 0 | 0 | 0 | 8 | 8 | | 18:00 | 0 | 0 | 8 | 8 | 16 | | | |
| 06:15 | 0 | 0 | 3 | 2 | 5 | | 18:15 | 0 | 0 | 7 | 5 | 12 | | | |
| 06:30 | 0 | 0 | 0 | 1 | 1 | | 18:30 | 0 | 0 | 6 | 0 | 6 | | | |
| 06:45 | 0 | 0 | 0 | 3 | 4 | 15 | 18:45 | 0 | 0 | 3 | 24 | 4 | 17 | 7 | 41 |
| 07:00 | 0 | 0 | 1 | 6 | 7 | | 19:00 | 0 | 0 | 5 | 2 | 7 | | | |
| 07:15 | 0 | 0 | 0 | 7 | 7 | | 19:15 | 0 | 0 | 3 | 2 | 5 | | | |
| 07:30 | 0 | 0 | 2 | 13 | 15 | | 19:30 | 0 | 0 | 6 | 3 | 9 | | | |
| 07:45 | 0 | 0 | 3 | 6 | 10 | 36 | 19:45 | 0 | 0 | 8 | 22 | 2 | 9 | 10 | 31 |
| 08:00 | 0 | 0 | 4 | 11 | 15 | | 20:00 | 0 | 0 | 6 | 3 | 9 | | | |
| 08:15 | 0 | 0 | 5 | 4 | 9 | | 20:15 | 0 | 0 | 3 | 2 | 5 | | | |
| 08:30 | 0 | 0 | 3 | 5 | 8 | | 20:30 | 0 | 0 | 1 | 0 | 1 | | | |
| 08:45 | 0 | 0 | 5 | 17 | 11 | 31 | 20:45 | 0 | 0 | 0 | 10 | 3 | 8 | 3 | 18 |
| 09:00 | 0 | 0 | 4 | 7 | 11 | | 21:00 | 0 | 0 | 4 | 1 | 5 | | | |
| 09:15 | 0 | 0 | 3 | 10 | 13 | | 21:15 | 0 | 0 | 2 | 2 | 4 | | | |
| 09:30 | 0 | 0 | 6 | 5 | 11 | | 21:30 | 0 | 0 | 3 | 2 | 5 | | | |
| 09:45 | 0 | 0 | 8 | 21 | 1 | 23 | 21:45 | 0 | 0 | 0 | 9 | 0 | 5 | | 14 |
| 10:00 | 0 | 0 | 5 | 7 | 12 | | 22:00 | 0 | 0 | 2 | 1 | 3 | | | |
| 10:15 | 0 | 0 | 5 | 5 | 10 | | 22:15 | 0 | 0 | 2 | 2 | 4 | | | |
| 10:30 | 0 | 0 | 6 | 4 | 10 | | 22:30 | 0 | 0 | 0 | 0 | | | | |
| 10:45 | 0 | 0 | 4 | 20 | 7 | 23 | 22:45 | 0 | 0 | 0 | 4 | 0 | 3 | | 7 |
| 11:00 | 0 | 0 | 4 | 5 | 9 | | 23:00 | 0 | 0 | 1 | 1 | 2 | | | |
| 11:15 | 0 | 0 | 4 | 11 | 15 | | 23:15 | 0 | 0 | 1 | 3 | 4 | | | |
| 11:30 | 0 | 0 | 6 | 3 | 9 | | 23:30 | 0 | 0 | 0 | 0 | | | | |
| 11:45 | 0 | 0 | 8 | 22 | 4 | 23 | 23:45 | 0 | 0 | 2 | 4 | 0 | 4 | 2 | 8 |
| TOTALS | | | 91 | 158 | 249 | | TOTALS | | | 237 | 176 | 413 | | | |
| SPLIT % | | | 36.5% | 63.5% | 37.6% | | SPLIT % | | | 57.4% | 42.6% | 62.4% | | | |

| DAILY TOTALS | | | | | NB | SB | | | | | Total |
|-----------------|-------|-------|-------|-------|-------|-----------------|-------|-------|-------|-------|-------|
| | | | | | 0 | 0 | EB | WB | | | 662 |
| | | | | | | | 328 | 334 | | | |
| AM Peak Hour | | | 11:15 | 07:15 | 07:30 | PM Peak Hour | | | 17:00 | 14:45 | 17:15 |
| AM Pk Volume | | | 26 | 41 | 52 | PM Pk Volume | | | 45 | 29 | 62 |
| Pk Hr Factor | | | 0.813 | 0.788 | 0.867 | Pk Hr Factor | | | 0.804 | 0.604 | 0.912 |
| 7 - 9 Volume | 0 | 0 | 23 | 67 | 90 | 4 - 6 Volume | 0 | 0 | 68 | 33 | 101 |
| 7 - 9 Peak Hour | | | 08:00 | 07:15 | 07:30 | 4 - 6 Peak Hour | | | 17:00 | 16:00 | 17:00 |
| 7 - 9 Pk Volume | 0 | 0 | 17 | 41 | 52 | 4 - 6 Pk Volume | 0 | 0 | 45 | 17 | 61 |
| Pk Hr Factor | 0.000 | 0.000 | 0.850 | 0.788 | 0.867 | Pk Hr Factor | 0.000 | 0.000 | 0.804 | 0.850 | 0.897 |

SPEED

Colleen Way Bet. Mulberry Dr & Maplethorpe Ln

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_003e

East Bound

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|------|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------|
| | | | 35 | ↔ | 18% | 27 | ↔ | 14% | 19 | ↔ | 10% | 109 | ↔ | 57% |

| Street Name | Direction | Percentiles | | | | | ADT |
|-------------|------------|-------------|------|---------|------|------|-----|
| | | 15th | 50th | Average | 85th | 95th | |
| Colleen Way | East Bound | 11 | 18 | 17 | 22 | 24 | 190 |
| Colleen Way | West Bound | 12 | 18 | 18 | 23 | 25 | 193 |

SPEED

Colleen Way Bet. Mulberry Dr & Maplethorpe Ln

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_003w

West Bound

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|------|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------|
| | | | 15 | ↔ | 8% | 29 | ↔ | 15% | 41 | ↔ | 21% | 108 | ↔ | 56% |

| Street Name | Direction | Percentiles | | | | | ADT |
|-------------|------------|-------------|------|---------|------|------|-----|
| | | 15th | 50th | Average | 85th | 95th | |
| Colleen Way | East Bound | 11 | 18 | 17 | 22 | 24 | 190 |
| Colleen Way | West Bound | 12 | 18 | 18 | 23 | 25 | 193 |

SPEED

Colleen Way Bet. Mulberry Dr & Maplethorpe Ln

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_003

Summary

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|--------------------|------------|------------|------------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------------|
| 15:00 | 2 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 15:15 | 1 | 5 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 15:30 | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 15:45 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 16:00 | 1 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 16:15 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 16:30 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 16:45 | 3 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| 17:00 | 1 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 17:15 | 6 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| 17:30 | 1 | 3 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 17:45 | 1 | 6 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 18:00 | 3 | 3 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 18:15 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 18:30 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 18:45 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 19:00 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 19:15 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 19:30 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 19:45 | 2 | 6 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 20:00 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 20:15 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 20:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20:45 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 21:00 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 21:15 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 21:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22:00 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 22:15 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 22:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23:00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 23:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23:45 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Totals | 87 | 189 | 97 | 10 | | | | | | | | | | 383 |
| % of Totals | 23% | 49% | 25% | 3% | | | | | | | | | | 100% |

| | | | | | | | | | | | | | | | | |
|---------------------------------|---------------|-------|-------|-------|------------------|-----|----|---|---------------|-----|---|-----|-------------------------|-------|---|--|
| AM Volumes | 32 | 77 | 35 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 145 | | |
| % AM | 8% | 20% | 9% | 0% | | | | | | | | | | 38% | | |
| AM Peak Hour | 08:00 | 11:00 | 07:30 | 11:45 | | | | | | | | | | 08:45 | | |
| Volume | 10 | 18 | 10 | 2 | | | | | | | | | | 34 | | |
| PM Volumes | 55 | 112 | 62 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 238 | | |
| % PM | 14% | 29% | 16% | 2% | | | | | | | | | | 62% | | |
| PM Peak Hour | 16:45 | 14:30 | 17:30 | 17:15 | | | | | | | | | | 17:15 | | |
| Volume | 11 | 17 | 17 | 3 | | | | | | | | | | 45 | | |
| Directional Peak Periods | AM 7-9 | | | | NOON 12-2 | | | | PM 4-6 | | | | Off Peak Volumes | | | |
| All Classes | Volume | | % | | Volume | | % | | Volume | | % | | Volume | | % | |
| | 50 | ↔ | 13% | 56 | ↔ | 15% | 60 | ↔ | 16% | 217 | ↔ | 57% | | | | |

| Street Name | Direction | Percentiles | | | | | |
|-------------|-----------|-------------|------|---------|------|------|-----|
| | | 15th | 50th | Average | 85th | 95th | ADT |
| Colleen Way | Summary | 12 | 18 | 17 | 23 | 25 | 383 |

SPEED

Colleen Way Bet. Mulberry Dr & Maplethorpe Ln

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_003

Summary

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|------|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------|
|------|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------|

SPEED

Colleen Way Bet. Mulberry Dr & Maplethorpe Ln

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_003e

East Bound

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|--------------------|------------|------------|------------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------------|
| 00:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 05:00 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 06:00 | 2 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 07:00 | 4 | 8 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 |
| 08:00 | 5 | 9 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |
| 09:00 | 3 | 10 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |
| 10:00 | 3 | 7 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| 11:00 | 2 | 10 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| 12:00 PM | 3 | 10 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| 13:00 | 6 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 14:00 | 2 | 5 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 15:00 | 3 | 6 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| 16:00 | 3 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 17:00 | 3 | 3 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 18:00 | 1 | 6 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 19:00 | 2 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 20:00 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 21:00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 22:00 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 23:00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Totals | 45 | 98 | 42 | 5 | | | | | | | | | | 190 |
| % of Totals | 24% | 52% | 22% | 3% | | | | | | | | | | 100% |

| | | | | | | | | | | | | | | | |
|---------------------------------|---------------|-------|-------|-------|------------------|---|-----|---|---------------|---|-----|---|-------------------------|-------|-----|
| AM Volumes | 20 | 50 | 22 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 93 | |
| % AM | 11% | 26% | 12% | 1% | | | | | | | | | | 49% | |
| AM Peak Hour | 08:00 | 09:00 | 07:00 | 11:00 | | | | | | | | | | 08:00 | |
| Volume | 5 | 10 | 5 | 1 | | | | | | | | | | 18 | |
| PM Volumes | 25 | 48 | 20 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 97 | |
| % PM | 13% | 25% | 11% | 2% | | | | | | | | | | 51% | |
| PM Peak Hour | 13:00 | 12:00 | 14:00 | 12:00 | | | | | | | | | | 12:00 | |
| Volume | 6 | 10 | 4 | 1 | | | | | | | | | | 15 | |
| Directional Peak Periods | AM 7-9 | | | | NOON 12-2 | | | | PM 4-6 | | | | Off Peak Volumes | | |
| All Speeds | Volume | | % | | Volume | | % | | Volume | | % | | Volume | % | |
| | 35 | ↔ | 18% | | 27 | ↔ | 14% | | 19 | ↔ | 10% | | 109 | ↔ | 57% |

| Street Name | Direction | Percentiles | | | | | |
|-------------|------------|-------------|------|---------|------|------|-----|
| | | 15th | 50th | Average | 85th | 95th | ADT |
| Colleen Way | East Bound | 11 | 18 | 17 | 22 | 24 | 190 |
| Colleen Way | West Bound | 12 | 18 | 18 | 23 | 25 | 193 |

SPEED

Colleen Way Bet. Mulberry Dr & Maplethorpe Ln

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_003w

West Bound

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|--------------------|------------|------------|------------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------------|
| 00:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02:00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 03:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04:00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 05:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 06:00 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 07:00 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 08:00 | 5 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 09:00 | 2 | 6 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| 10:00 | 3 | 5 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| 11:00 | 0 | 8 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 12:00 PM | 4 | 4 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| 13:00 | 2 | 9 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| 14:00 | 4 | 6 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| 15:00 | 2 | 6 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| 16:00 | 3 | 6 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| 17:00 | 6 | 13 | 10 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| 18:00 | 3 | 2 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| 19:00 | 3 | 9 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| 20:00 | 1 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 21:00 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 22:00 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 23:00 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Totals | 42 | 91 | 55 | 5 | | | | | | | | | | 193 |
| % of Totals | 22% | 47% | 28% | 3% | | | | | | | | | | 100% |

| | | | | | | | | | | | | | | | |
|---------------------------------|---------------|-------|-------|------------------|--------|---|---------------|-----|--------|-------------------------|---|-----|--------|-------|--|
| AM Volumes | 12 | 27 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 52 | |
| % AM | 6% | 14% | 7% | | | | | | | | | | | 27% | |
| AM Peak Hour | 08:00 | 11:00 | 09:00 | | | | | | | | | | | 09:00 | |
| Volume | 5 | 8 | 5 | | | | | | | | | | | 13 | |
| PM Volumes | 30 | 64 | 42 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 141 | |
| % PM | 16% | 33% | 22% | 3% | | | | | | | | | | 73% | |
| PM Peak Hour | 17:00 | 17:00 | 17:00 | 12:00 | | | | | | | | | | 17:00 | |
| Volume | 6 | 13 | 10 | 1 | | | | | | | | | | 30 | |
| Directional Peak Periods | AM 7-9 | | | NOON 12-2 | | | PM 4-6 | | | Off Peak Volumes | | | | | |
| All Speeds | Volume | ↔ | | % | Volume | ↔ | | % | Volume | ↔ | | % | Volume | ↔ | |
| | 15 | | | 8% | 29 | | | 15% | 41 | | | 21% | 108 | | |

| Street Name | Direction | Percentiles | | | | | ADT |
|-------------|------------|-------------|------|---------|------|------|-----|
| | | 15th | 50th | Average | 85th | 95th | |
| Colleen Way | East Bound | 11 | 18 | 17 | 22 | 24 | 190 |
| Colleen Way | West Bound | 12 | 18 | 18 | 23 | 25 | 193 |

SPEED

Colleen Way Bet. Mulberry Dr & Maplethorpe Ln

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_003

Summary

| Time | < 15 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 - 44 | 45 - 49 | 50 - 54 | 55 - 59 | 60 - 64 | 65 - 69 | 70 + | Total |
|--------------------|------------|------------|------------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|------|-------------|
| 00:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02:00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 03:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04:00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 05:00 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 06:00 | 3 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 07:00 | 5 | 9 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 |
| 08:00 | 10 | 14 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| 09:00 | 5 | 16 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 |
| 10:00 | 6 | 12 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 11:00 | 2 | 18 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |
| 12:00 PM | 7 | 14 | 7 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| 13:00 | 8 | 14 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 |
| 14:00 | 6 | 11 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |
| 15:00 | 5 | 12 | 11 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 |
| 16:00 | 6 | 10 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| 17:00 | 9 | 16 | 12 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 39 |
| 18:00 | 4 | 8 | 10 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 |
| 19:00 | 5 | 12 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| 20:00 | 1 | 8 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| 21:00 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 22:00 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 23:00 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Totals | 87 | 189 | 97 | 10 | | | | | | | | | | 383 |
| % of Totals | 23% | 49% | 25% | 3% | | | | | | | | | | 100% |

| | | | | | | | | | | | | | | | |
|---------------------------------|---------------|-------|-------|-------|------------------|----|----|-----|---------------|-----|---|-----|-------------------------|-------|--|
| AM Volumes | 32 | 77 | 35 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 145 | |
| % AM | 8% | 20% | 9% | 0% | | | | | | | | | | 38% | |
| AM Peak Hour | 08:00 | 11:00 | 09:00 | 11:00 | | | | | | | | | | 09:00 | |
| Volume | 10 | 18 | 10 | 1 | | | | | | | | | | 31 | |
| PM Volumes | 55 | 112 | 62 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 238 | |
| % PM | 14% | 29% | 16% | 2% | | | | | | | | | | 62% | |
| PM Peak Hour | 17:00 | 17:00 | 17:00 | 12:00 | | | | | | | | | | 17:00 | |
| Volume | 9 | 16 | 12 | 2 | | | | | | | | | | 39 | |
| Directional Peak Periods | AM 7-9 | | | | NOON 12-2 | | | | PM 4-6 | | | | Off Peak Volumes | | |
| All Speeds | Volume | ←→ | | % | Volume | ←→ | | % | Volume | ←→ | | % | Volume | ←→ | |
| | 50 | 13% | | 56 | 15% | | 60 | 16% | | 217 | | 57% | | | |

| Street Name | Direction | Percentiles | | | | | |
|-------------|-----------|-------------|------|---------|------|------|-----|
| | | 15th | 50th | Average | 85th | 95th | ADT |
| Colleen Way | Summary | 12 | 18 | 17 | 23 | 25 | 383 |

VOLUME

Colleen Way Bet. Mulberry Dr & Maplethorpe Ln

Day: Thursday
Date: 9/27/2018

City: Santa Cruz
Project #: CA18_8473_003

| DAILY TOTALS | | | | | | NB | SB | EB | WB | Total | |
|----------------|----|----|-------|-------|-------|----------------|----|-----|-------|-------|-------|
| | | | | | | 0 | 0 | 190 | 193 | 383 | |
| AM Period | NB | SB | EB | WB | TOTAL | PM Period | NB | SB | EB | WB | TOTAL |
| 00:00 | 0 | 0 | 0 | 0 | | 12:00 | 0 | 0 | 2 | 5 | 7 |
| 00:15 | 0 | 0 | 0 | 0 | | 12:15 | 0 | 0 | 4 | 3 | 7 |
| 00:30 | 0 | 0 | 0 | 0 | | 12:30 | 0 | 0 | 3 | 5 | 8 |
| 00:45 | 0 | 0 | 0 | 0 | | 12:45 | 0 | 0 | 6 | 15 | 21 |
| 01:00 | 0 | 0 | 0 | 0 | | 13:00 | 0 | 0 | 2 | 1 | 3 |
| 01:15 | 0 | 0 | 0 | 0 | | 13:15 | 0 | 0 | 3 | 4 | 7 |
| 01:30 | 0 | 0 | 0 | 0 | | 13:30 | 0 | 0 | 3 | 6 | 9 |
| 01:45 | 0 | 0 | 0 | 0 | | 13:45 | 0 | 0 | 4 | 12 | 16 |
| 02:00 | 0 | 0 | 0 | 1 | 1 | 14:00 | 0 | 0 | 2 | 3 | 5 |
| 02:15 | 0 | 0 | 0 | 0 | | 14:15 | 0 | 0 | 3 | 1 | 4 |
| 02:30 | 0 | 0 | 0 | 0 | | 14:30 | 0 | 0 | 3 | 8 | 11 |
| 02:45 | 0 | 0 | 0 | 0 | 1 | 14:45 | 0 | 0 | 4 | 12 | 16 |
| 03:00 | 0 | 0 | 0 | 0 | | 15:00 | 0 | 0 | 5 | 4 | 9 |
| 03:15 | 0 | 0 | 0 | 0 | | 15:15 | 0 | 0 | 3 | 6 | 9 |
| 03:30 | 0 | 0 | 0 | 0 | | 15:30 | 0 | 0 | 4 | 1 | 5 |
| 03:45 | 0 | 0 | 0 | 0 | | 15:45 | 0 | 0 | 2 | 14 | 16 |
| 04:00 | 0 | 0 | 0 | 0 | | 16:00 | 0 | 0 | 3 | 3 | 6 |
| 04:15 | 0 | 0 | 0 | 0 | | 16:15 | 0 | 0 | 2 | 3 | 5 |
| 04:30 | 0 | 0 | 0 | 0 | | 16:30 | 0 | 0 | 1 | 1 | 2 |
| 04:45 | 0 | 0 | 0 | 1 | 1 | 16:45 | 0 | 0 | 4 | 10 | 14 |
| 05:00 | 0 | 0 | 1 | 0 | 1 | 17:00 | 0 | 0 | 1 | 5 | 6 |
| 05:15 | 0 | 0 | 1 | 0 | 1 | 17:15 | 0 | 0 | 2 | 9 | 11 |
| 05:30 | 0 | 0 | 0 | 0 | | 17:30 | 0 | 0 | 2 | 10 | 12 |
| 05:45 | 0 | 0 | 1 | 3 | 3 | 17:45 | 0 | 0 | 4 | 9 | 13 |
| 06:00 | 0 | 0 | 6 | 0 | 6 | 18:00 | 0 | 0 | 5 | 7 | 12 |
| 06:15 | 0 | 0 | 0 | 1 | 1 | 18:15 | 0 | 0 | 3 | 2 | 5 |
| 06:30 | 0 | 0 | 1 | 0 | 1 | 18:30 | 0 | 0 | 0 | 2 | 2 |
| 06:45 | 0 | 0 | 2 | 9 | 11 | 18:45 | 0 | 0 | 2 | 10 | 12 |
| 07:00 | 0 | 0 | 2 | 1 | 3 | 19:00 | 0 | 0 | 1 | 2 | 3 |
| 07:15 | 0 | 0 | 4 | 0 | 4 | 19:15 | 0 | 0 | 2 | 2 | 4 |
| 07:30 | 0 | 0 | 5 | 0 | 5 | 19:30 | 0 | 0 | 1 | 4 | 5 |
| 07:45 | 0 | 0 | 6 | 17 | 23 | 19:45 | 0 | 0 | 2 | 6 | 8 |
| 08:00 | 0 | 0 | 8 | 2 | 10 | 20:00 | 0 | 0 | 1 | 5 | 6 |
| 08:15 | 0 | 0 | 2 | 3 | 5 | 20:15 | 0 | 0 | 2 | 2 | 4 |
| 08:30 | 0 | 0 | 3 | 3 | 6 | 20:30 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 0 | 0 | 5 | 18 | 23 | 20:45 | 0 | 0 | 1 | 4 | 5 |
| 09:00 | 0 | 0 | 4 | 2 | 6 | 21:00 | 0 | 0 | 1 | 1 | 2 |
| 09:15 | 0 | 0 | 8 | 2 | 10 | 21:15 | 0 | 0 | 1 | 0 | 1 |
| 09:30 | 0 | 0 | 5 | 4 | 9 | 21:30 | 0 | 0 | 0 | 0 | 0 |
| 09:45 | 0 | 0 | 1 | 18 | 19 | 21:45 | 0 | 0 | 0 | 2 | 2 |
| 10:00 | 0 | 0 | 3 | 3 | 6 | 22:00 | 0 | 0 | 1 | 2 | 3 |
| 10:15 | 0 | 0 | 4 | 3 | 7 | 22:15 | 0 | 0 | 1 | 1 | 2 |
| 10:30 | 0 | 0 | 2 | 3 | 5 | 22:30 | 0 | 0 | 0 | 0 | 0 |
| 10:45 | 0 | 0 | 4 | 13 | 17 | 22:45 | 0 | 0 | 0 | 2 | 2 |
| 11:00 | 0 | 0 | 4 | 2 | 6 | 23:00 | 0 | 0 | 1 | 1 | 2 |
| 11:15 | 0 | 0 | 6 | 3 | 9 | 23:15 | 0 | 0 | 0 | 0 | 0 |
| 11:30 | 0 | 0 | 3 | 1 | 4 | 23:30 | 0 | 0 | 0 | 0 | 0 |
| 11:45 | 0 | 0 | 2 | 15 | 17 | 23:45 | 0 | 0 | 0 | 1 | 1 |
| TOTALS | | | 93 | 52 | 145 | TOTALS | | | 97 | 141 | 238 |
| SPLIT % | | | 64.1% | 35.9% | 37.9% | SPLIT % | | | 40.8% | 59.2% | 62.1% |

| DAILY TOTALS | | | | | | NB | SB | EB | WB | Total | |
|-----------------|-------|-------|-------|-------|-------|-----------------|-------|-------|-------|-------|-------|
| | | | | | | 0 | 0 | 190 | 193 | 383 | |
| AM Peak Hour | | | 07:15 | 11:45 | 08:45 | PM Peak Hour | | | 14:45 | 17:15 | 17:15 |
| AM Pk Volume | | | 23 | 17 | 34 | PM Pk Volume | | | 16 | 32 | 45 |
| Pk Hr Factor | | | 0.719 | 0.850 | 0.850 | Pk Hr Factor | | | 0.800 | 0.800 | 0.938 |
| 7 - 9 Volume | 0 | 0 | 35 | 15 | 50 | 4 - 6 Volume | 0 | 0 | 19 | 41 | 60 |
| 7 - 9 Peak Hour | | | 07:15 | 08:00 | 08:00 | 4 - 6 Peak Hour | | | 16:00 | 17:00 | 17:00 |
| 7 - 9 Pk Volume | 0 | 0 | 23 | 12 | 30 | 4 - 6 Pk Volume | 0 | 0 | 10 | 30 | 39 |
| Pk Hr Factor | 0.000 | 0.000 | 0.719 | 0.750 | 0.750 | Pk Hr Factor | 0.000 | 0.000 | 0.625 | 0.750 | 0.813 |

TURNING VOLUME COUNTS

National Data & Surveying Services

Intersection Turning Movement Count

Location: Maplethorpe Ln & Soquel Dr
City: Soquel
Control: 2-Way Stop(NB/SB)

Project ID: 18-08472-001
Date: 9/25/2018

Total

| NS/EW Streets: | Maplethorpe Ln | | | | Maplethorpe Ln | | | | Soquel Dr | | | | Soquel Dr | | | | |
|-------------------------|---------------------|-------|--------|-------|----------------|-------|--------|-------|-----------|--------|-------|-------|-----------|--------|-------|-------|--------------|
| AM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | TOTAL |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | |
| 7:00 AM | 0 | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 0 | 44 | 0 | 0 | 0 | 138 | 3 | 0 | 191 |
| 7:15 AM | 1 | 0 | 0 | 0 | 6 | 0 | 2 | 0 | 1 | 83 | 0 | 0 | 0 | 181 | 2 | 0 | 276 |
| 7:30 AM | 3 | 0 | 1 | 0 | 12 | 0 | 4 | 0 | 1 | 116 | 1 | 0 | 1 | 213 | 2 | 0 | 354 |
| 7:45 AM | 0 | 0 | 1 | 0 | 6 | 0 | 6 | 0 | 1 | 164 | 2 | 0 | 0 | 318 | 3 | 0 | 501 |
| 8:00 AM | 1 | 0 | 0 | 0 | 7 | 0 | 9 | 0 | 2 | 134 | 0 | 0 | 1 | 368 | 2 | 1 | 525 |
| 8:15 AM | 0 | 0 | 2 | 0 | 0 | 0 | 6 | 0 | 2 | 151 | 0 | 0 | 2 | 329 | 3 | 0 | 495 |
| 8:30 AM | 0 | 0 | 0 | 0 | 5 | 0 | 4 | 0 | 5 | 146 | 0 | 0 | 2 | 282 | 5 | 0 | 449 |
| 8:45 AM | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 116 | 0 | 0 | 0 | 253 | 2 | 1 | 377 |
| TOTAL VOLUMES : | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| | 5 | 0 | 4 | 0 | 41 | 0 | 34 | 0 | 15 | 954 | 3 | 0 | 6 | 2082 | 22 | 2 | 3168 |
| APPROACH %'s : | 55.56% | 0.00% | 44.44% | 0.00% | 54.67% | 0.00% | 45.33% | 0.00% | 1.54% | 98.15% | 0.31% | 0.00% | 0.28% | 98.58% | 1.04% | 0.09% | |
| PEAK HR : | 07:45 AM - 08:45 AM | | | | | | | | | | | | | | | | TOTAL |
| PEAK HR VOL : | 1 | 0 | 3 | 0 | 18 | 0 | 25 | 0 | 10 | 595 | 2 | 0 | 5 | 1297 | 13 | 1 | 1970 |
| PEAK HR FACTOR : | 0.250 | 0.000 | 0.375 | 0.000 | 0.643 | 0.000 | 0.694 | 0.000 | 0.500 | 0.907 | 0.250 | 0.000 | 0.625 | 0.881 | 0.650 | 0.250 | 0.938 |
| | 0.500 | | | | 0.672 | | | | 0.909 | | | | 0.884 | | | | |
| PM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | TOTAL |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | |
| 4:00 PM | 1 | 0 | 1 | 0 | 2 | 0 | 6 | 0 | 9 | 321 | 2 | 0 | 0 | 114 | 2 | 4 | 462 |
| 4:15 PM | 1 | 0 | 6 | 0 | 6 | 0 | 4 | 0 | 5 | 346 | 1 | 0 | 3 | 137 | 6 | 2 | 517 |
| 4:30 PM | 0 | 0 | 1 | 0 | 3 | 0 | 4 | 0 | 4 | 387 | 3 | 0 | 1 | 117 | 3 | 0 | 523 |
| 4:45 PM | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 5 | 363 | 1 | 0 | 1 | 127 | 1 | 2 | 504 |
| 5:00 PM | 2 | 0 | 2 | 0 | 4 | 0 | 4 | 0 | 9 | 327 | 0 | 0 | 1 | 130 | 5 | 2 | 486 |
| 5:15 PM | 0 | 0 | 4 | 0 | 1 | 0 | 6 | 0 | 6 | 333 | 1 | 0 | 1 | 124 | 5 | 1 | 482 |
| 5:30 PM | 0 | 0 | 0 | 0 | 4 | 0 | 3 | 0 | 9 | 353 | 0 | 0 | 0 | 99 | 5 | 0 | 473 |
| 5:45 PM | 0 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 7 | 331 | 1 | 0 | 1 | 111 | 4 | 0 | 463 |
| TOTAL VOLUMES : | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| | 4 | 0 | 16 | 0 | 22 | 0 | 35 | 0 | 54 | 2761 | 9 | 0 | 8 | 959 | 31 | 11 | 3910 |
| APPROACH %'s : | 20.00% | 0.00% | 80.00% | 0.00% | 38.60% | 0.00% | 61.40% | 0.00% | 1.91% | 97.77% | 0.32% | 0.00% | 0.79% | 95.04% | 3.07% | 1.09% | |
| PEAK HR : | 04:15 PM - 05:15 PM | | | | | | | | | | | | | | | | TOTAL |
| PEAK HR VOL : | 3 | 0 | 9 | 0 | 14 | 0 | 15 | 0 | 23 | 1423 | 5 | 0 | 6 | 511 | 15 | 6 | 2030 |
| PEAK HR FACTOR : | 0.375 | 0.000 | 0.375 | 0.000 | 0.583 | 0.000 | 0.938 | 0.000 | 0.639 | 0.919 | 0.417 | 0.000 | 0.500 | 0.932 | 0.625 | 0.750 | 0.970 |
| | 0.429 | | | | 0.725 | | | | 0.921 | | | | 0.909 | | | | |

National Data & Surveying Services

Intersection Turning Movement Count

Location: Maplethorpe Ln & Soquel Dr
City: Soquel
Control: 2-Way Stop(NB/SB)

Project ID: 18-08472-001
Date: 9/25/2018

Cars

| NS/EW Streets: | Maplethorpe Ln | | | | Maplethorpe Ln | | | | Soquel Dr | | | | Soquel Dr | | | | |
|-------------------------|---------------------|-------|--------|-------|----------------|-------|--------|-------|-----------|--------|-------|-------|-----------|--------|-------|-------|--------------|
| AM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | TOTAL |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | |
| 7:00 AM | 0 | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 0 | 42 | 0 | 0 | 0 | 136 | 3 | 0 | 187 |
| 7:15 AM | 1 | 0 | 0 | 0 | 6 | 0 | 2 | 0 | 1 | 83 | 0 | 0 | 0 | 176 | 1 | 0 | 270 |
| 7:30 AM | 3 | 0 | 1 | 0 | 11 | 0 | 4 | 0 | 1 | 113 | 1 | 0 | 1 | 213 | 2 | 0 | 350 |
| 7:45 AM | 0 | 0 | 1 | 0 | 6 | 0 | 6 | 0 | 1 | 158 | 2 | 0 | 0 | 314 | 3 | 0 | 491 |
| 8:00 AM | 1 | 0 | 0 | 0 | 7 | 0 | 9 | 0 | 2 | 132 | 0 | 0 | 1 | 362 | 2 | 1 | 517 |
| 8:15 AM | 0 | 0 | 2 | 0 | 0 | 0 | 6 | 0 | 2 | 146 | 0 | 0 | 2 | 326 | 3 | 0 | 487 |
| 8:30 AM | 0 | 0 | 0 | 0 | 5 | 0 | 4 | 0 | 5 | 144 | 0 | 0 | 2 | 273 | 5 | 0 | 438 |
| 8:45 AM | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 114 | 0 | 0 | 0 | 251 | 2 | 1 | 373 |
| TOTAL VOLUMES : | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| APPROACH %'s : | 5 | 0 | 4 | 0 | 40 | 0 | 34 | 0 | 15 | 932 | 3 | 0 | 6 | 2051 | 21 | 2 | 3113 |
| | 55.56% | 0.00% | 44.44% | 0.00% | 54.05% | 0.00% | 45.95% | 0.00% | 1.58% | 98.11% | 0.32% | 0.00% | 0.29% | 98.61% | 1.01% | 0.10% | |
| PEAK HR : | 07:45 AM - 08:45 AM | | | | | | | | | | | | | | | | TOTAL |
| PEAK HR VOL : | 1 | 0 | 3 | 0 | 18 | 0 | 25 | 0 | 10 | 580 | 2 | 0 | 5 | 1275 | 13 | 1 | 1933 |
| PEAK HR FACTOR : | 0.25 | 0.000 | 0.375 | 0.000 | 0.643 | 0.000 | 0.694 | 0.000 | 0.500 | 0.918 | 0.250 | 0.000 | 0.625 | 0.881 | 0.650 | 0.250 | 0.935 |
| | 0.500 | | | | 0.672 | | | | 0.919 | | | | 0.884 | | | | |
| PM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | TOTAL |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | |
| 4:00 PM | 1 | 0 | 1 | 0 | 2 | 0 | 6 | 0 | 9 | 320 | 2 | 0 | 0 | 112 | 2 | 4 | 459 |
| 4:15 PM | 1 | 0 | 6 | 0 | 6 | 0 | 4 | 0 | 5 | 341 | 1 | 0 | 3 | 135 | 6 | 2 | 510 |
| 4:30 PM | 0 | 0 | 1 | 0 | 3 | 0 | 4 | 0 | 4 | 382 | 3 | 0 | 1 | 115 | 3 | 0 | 516 |
| 4:45 PM | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 5 | 358 | 1 | 0 | 1 | 126 | 1 | 2 | 498 |
| 5:00 PM | 2 | 0 | 2 | 0 | 4 | 0 | 4 | 0 | 9 | 324 | 0 | 0 | 1 | 126 | 5 | 2 | 479 |
| 5:15 PM | 0 | 0 | 3 | 0 | 1 | 0 | 6 | 0 | 6 | 331 | 0 | 0 | 1 | 122 | 5 | 1 | 476 |
| 5:30 PM | 0 | 0 | 0 | 0 | 4 | 0 | 3 | 0 | 9 | 351 | 0 | 0 | 0 | 98 | 5 | 0 | 470 |
| 5:45 PM | 0 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 7 | 330 | 1 | 0 | 1 | 110 | 4 | 0 | 461 |
| TOTAL VOLUMES : | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| APPROACH %'s : | 4 | 0 | 15 | 0 | 22 | 0 | 35 | 0 | 54 | 2737 | 8 | 0 | 8 | 944 | 31 | 11 | 3869 |
| | 21.05% | 0.00% | 78.95% | 0.00% | 38.60% | 0.00% | 61.40% | 0.00% | 1.93% | 97.78% | 0.29% | 0.00% | 0.80% | 94.97% | 3.12% | 1.11% | |
| PEAK HR : | 04:15 PM - 05:15 PM | | | | | | | | | | | | | | | | TOTAL |
| PEAK HR VOL : | 3 | 0 | 9 | 0 | 14 | 0 | 15 | 0 | 23 | 1405 | 5 | 0 | 6 | 502 | 15 | 6 | 2003 |
| PEAK HR FACTOR : | 0.38 | 0.000 | 0.375 | 0.000 | 0.583 | 0.000 | 0.938 | 0.000 | 0.639 | 0.920 | 0.417 | 0.000 | 0.500 | 0.930 | 0.625 | 0.750 | 0.970 |
| | 0.429 | | | | 0.725 | | | | 0.921 | | | | 0.906 | | | | |

National Data & Surveying Services

Intersection Turning Movement Count

Location: Maplethorpe Ln & Soquel Dr
City: Soquel
Control: 2-Way Stop(NB/SB)

Project ID: 18-08472-001
Date: 9/25/2018

HT

| NS/EW Streets: | Maplethorpe Ln | | | | Maplethorpe Ln | | | | Soquel Dr | | | | Soquel Dr | | | | |
|-------------------------|----------------------------|-------|-------|-------|----------------|-------|-------|-------|-----------|---------|-------|-------|-----------|--------|-------|-------|--------------|
| AM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | TOTAL |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 4 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 1 | 0 | 6 |
| 7:30 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 4 | 0 | 0 | 10 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 6 | 0 | 0 | 8 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 3 | 0 | 0 | 8 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 9 | 0 | 0 | 11 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 4 |
| TOTAL VOLUMES : | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| APPROACH %'s : | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 0 | 31 | 1 | 0 | 55 |
| APPROACH %'s : | | | | | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% | 0.00% | 0.00% | 0.00% | 96.88% | 3.13% | 0.00% | |
| PEAK HR : | 07:45 AM - 08:45 AM | | | | | | | | | | | | | | | | TOTAL |
| PEAK HR VOL : | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 22 | 0 | 0 | 37 |
| PEAK HR FACTOR : | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.625 | 0.000 | 0.000 | 0.000 | 0.611 | 0.000 | 0.000 | 0.841 |
| | | | | | | | | | 0.625 | | | | 0.611 | | | | |

| PM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | TOTAL |
|-------------------------|----------------------------|-------|---------|-------|------------|-------|-------|-------|-----------|--------|-------|-------|-----------|---------|-------|-------|--------------|
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 3 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 2 | 0 | 0 | 7 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 2 | 0 | 0 | 7 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 6 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 4 | 0 | 0 | 7 |
| 5:15 PM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 2 | 0 | 0 | 6 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 3 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 2 |
| TOTAL VOLUMES : | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL |
| APPROACH %'s : | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 1 | 0 | 0 | 15 | 0 | 0 | 41 |
| APPROACH %'s : | 0.00% | 0.00% | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 96.00% | 4.00% | 0.00% | 0.00% | 100.00% | 0.00% | 0.00% | |
| PEAK HR : | 04:15 PM - 05:15 PM | | | | | | | | | | | | | | | | TOTAL |
| PEAK HR VOL : | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 0 | 0 | 0 | 9 | 0 | 0 | 27 |
| PEAK HR FACTOR : | 0.00 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.900 | 0.000 | 0.000 | 0.000 | 0.563 | 0.000 | 0.000 | 0.964 |
| | | | | | | | | | 0.900 | | | | 0.563 | | | | |

National Data & Surveying Services

Intersection Turning Movement Count

Location: Maplethorpe Ln & Soquel Dr
City: Soquel
Control: 2-Way Stop(NB/SB)

Project ID: 18-08472-001
Date: 9/25/2018

Bikes

| NS/EW Streets: | Maplethorpe Ln | | | | Maplethorpe Ln | | | | Soquel Dr | | | | Soquel Dr | | | | | |
|-------------------------|---------------------|-------|-------|-------|----------------|-------|---------|-------|-----------|---------|-------|-------|-----------|---------|-------|-------|--------------|----|
| AM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | TOTAL | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 7 | 0 | 0 | 8 |
| 7:15 AM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 4 | 0 | 0 | 7 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 3 | 0 | 0 | 5 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 8 | 0 | 0 | 12 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 3 | 0 | 0 | 11 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 6 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 3 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 6 |
| TOTAL VOLUMES : | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL | |
| APPROACH %'s : | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% | 0.00% | 0.00% | 100.00% | 0.00% | 0.00% | 0.00% | 100.00% | 0.00% | 0.00% | 58 | |
| PEAK HR : | 07:45 AM - 08:45 AM | | | | | | | | | | | | | | | | TOTAL | |
| PEAK HR VOL : | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 18 | 0 | 0 | 0 | 13 | 0 | 0 | 32 | |
| PEAK HR FACTOR : | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.250 | 0.000 | 0.000 | 0.643 | 0.000 | 0.000 | 0.000 | 0.406 | 0.000 | 0.000 | 0.667 | |
| | | | | | 0.250 | | | | 0.643 | | | | 0.406 | | | | | |

| NS/EW Streets: | Maplethorpe Ln | | | | Maplethorpe Ln | | | | Soquel Dr | | | | Soquel Dr | | | | | |
|-------------------------|---------------------|-------|-------|-------|----------------|-------|-------|-------|-----------|--------|-------|-------|-----------|--------|-------|-------|--------------|----|
| PM | NORTHBOUND | | | | SOUTHBOUND | | | | EASTBOUND | | | | WESTBOUND | | | | TOTAL | |
| | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 5 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 4:30 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 6 | 0 | 0 | 10 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 5 | 1 | 0 | 8 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 2 | 2 | 1 | 0 | 8 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 4 | 0 | 0 | 12 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 4 | 0 | 0 | 11 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 4 | 0 | 0 | 8 |
| TOTAL VOLUMES : | NL | NT | NR | NU | SL | ST | SR | SU | EL | ET | ER | EU | WL | WT | WR | WU | TOTAL | |
| APPROACH %'s : | 0 | 0 | 0 | 0 | 100.00% | 0.00% | 0.00% | 0.00% | 3.13% | 96.88% | 0.00% | 0.00% | 6.45% | 87.10% | 6.45% | 0.00% | 64 | |
| PEAK HR : | 04:15 PM - 05:15 PM | | | | | | | | | | | | | | | | TOTAL | |
| PEAK HR VOL : | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 2 | 13 | 2 | 0 | 28 | |
| PEAK HR FACTOR : | 0.00 | 0.000 | 0.000 | 0.000 | 0.250 | 0.000 | 0.000 | 0.000 | 0.000 | 0.833 | 0.000 | 0.000 | 0.250 | 0.542 | 0.500 | 0.000 | 0.700 | |
| | | | | | 0.250 | | | | 0.833 | | | | 0.708 | | | | | |

National Data & Surveying Services

Location: **Maplethorpe Ln & Soquel Dr**
 City: **Soquel**

Project ID: **18-0042-01**
 Date: **9/25/2018**

Intersection Turning Movement Count

Pedestrians (Crosswalks)

| NS/EW Streets: | Maplethorpe Ln | | Maplethorpe Ln | | Soquel Dr | | Soquel Dr | | |
|-------------------------|----------------------------|---------|----------------|--------|-----------|----|-----------|----|-------|
| AM | NORTH LEG | | SOUTH LEG | | EAST LEG | | WEST LEG | | TOTAL |
| | EB | WB | EB | WB | NB | SB | NB | SB | |
| 7:00 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 3 |
| 8:30 AM | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| 8:45 AM | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 5 |
| TOTAL VOLUMES : | 0 | 1 | 7 | 5 | 0 | 0 | 0 | 0 | 13 |
| APPROACH %'s : | 0.00% | 100.00% | 58.33% | 41.67% | | | | | |
| PEAK HR : | 07:45 AM - 08:45 AM | | | | | | | | TOTAL |
| PEAK HR VOL : | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 0 | 7 |
| PEAK HR FACTOR : | | | 0.250 | 0.625 | | | | | 0.583 |

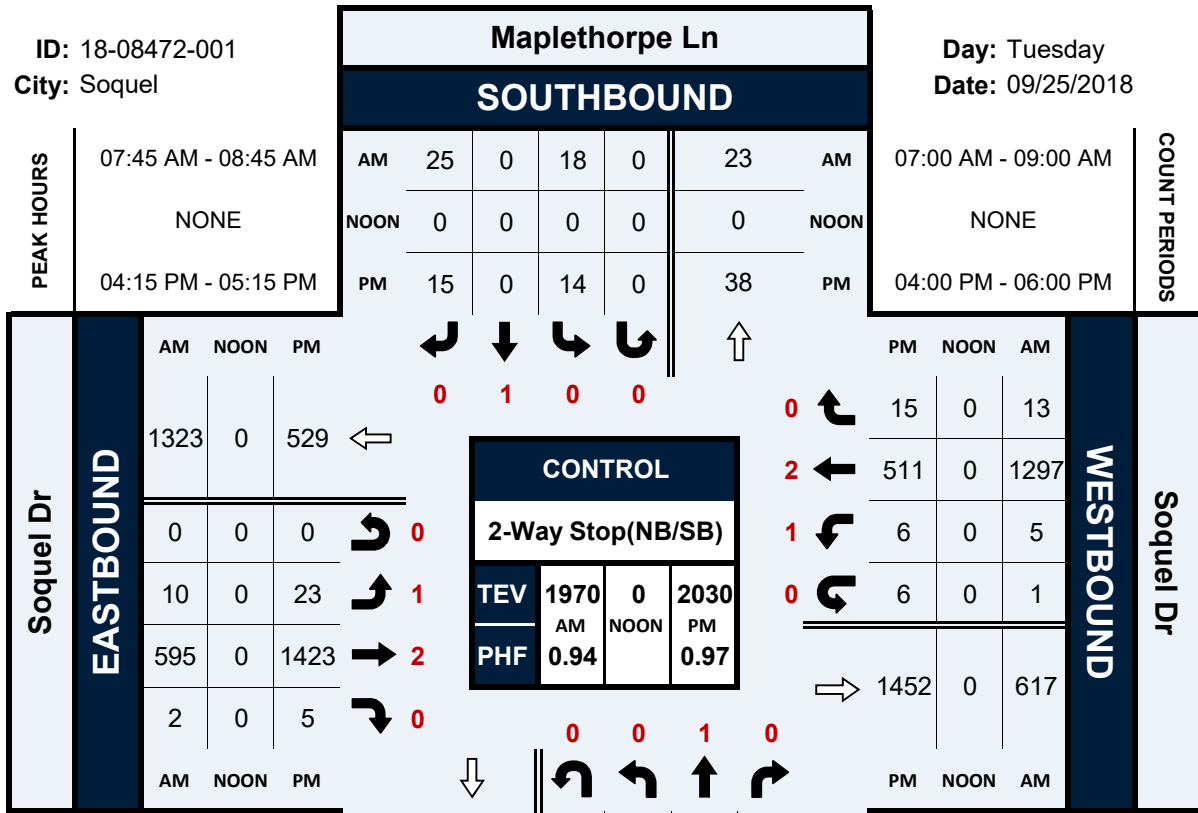
| PM | NORTH LEG | | SOUTH LEG | | EAST LEG | | WEST LEG | | TOTAL |
|-------------------------|----------------------------|--------|-----------|--------|----------|----|----------|----|-------|
| | EB | WB | EB | WB | NB | SB | NB | SB | |
| 4:00 PM | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 |
| 4:15 PM | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 3 |
| 4:30 PM | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| 4:45 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:00 PM | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 5:15 PM | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 4 |
| 5:30 PM | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| 5:45 PM | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 3 |
| TOTAL VOLUMES : | 3 | 3 | 5 | 7 | 0 | 0 | 0 | 0 | 18 |
| APPROACH %'s : | 50.00% | 50.00% | 41.67% | 58.33% | | | | | |
| PEAK HR : | 04:15 PM - 05:15 PM | | | | | | | | TOTAL |
| PEAK HR VOL : | 0 | 2 | 1 | 4 | 0 | 0 | 0 | 0 | 7 |
| PEAK HR FACTOR : | | 0.500 | 0.250 | 0.500 | | | | | 0.583 |

Maplethorpe Ln & Soquel Dr

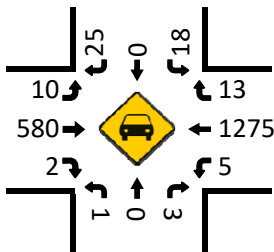
Peak Hour Turning Movement Count

ID: 18-08472-001
City: Soquel

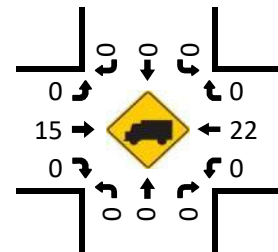
Day: Tuesday
Date: 09/25/2018



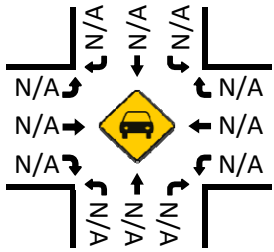
Cars (AM)



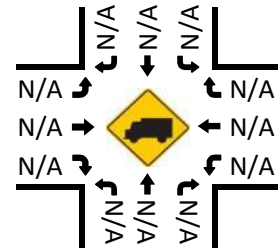
HT (AM)



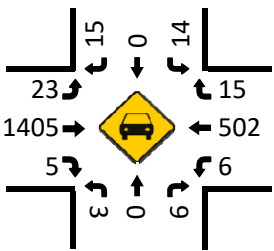
Cars (NOON)



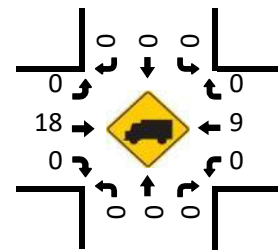
HT (NOON)



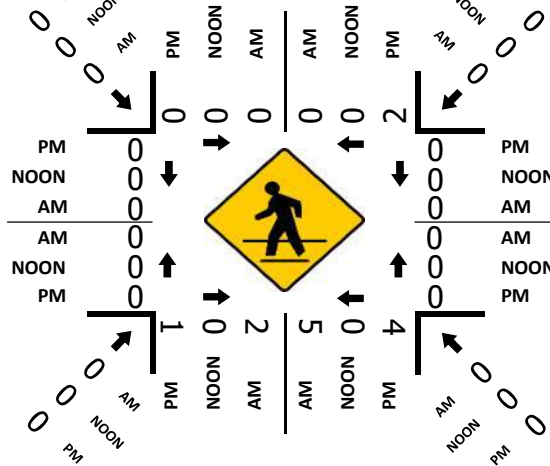
Cars (PM)



HT (PM)



Pedestrians (Crosswalks)



FIELD OBSERVATIONS

| Field Observations: Southbound Left Turn Delay | | |
|--|----------------|-----------|
| # | Time | Delay (s) |
| 1 | 7:28 AM | 10 |
| 2 | 7:29 AM | 6 |
| 3 | 7:30 AM | 2 |
| 4 | 7:31 AM | 10 |
| 5 | 7:34 AM | 6 |
| 6 | 7:35 AM | 8 |
| 7 | 7:36 AM | 2 |
| 8 | 7:37 AM | 4 |
| 9 | 7:38 AM | 4 |
| 10 | 7:39 AM | 2 |
| 11 | 7:40 AM | 4 |
| 12 | 7:41 AM | 8 |
| 13 | 7:44 AM | 8 |
| 14 | 7:44 AM | 18 |
| 15 | 7:44 AM | 5 |
| 16 | 7:45 AM | 22 |
| 17 | 7:46 AM | 4 |
| 18 | 7:47 AM | 27 |
| 19 | 7:48 AM | 56 |
| 20 | 7:53 AM | 14 |
| 21 | 7:57 AM | 4 |
| 22 | 8:03 AM | 50 |
| 23 | 8:04 AM | 22 |

Avg. Delay (s) 13

Avg. Delay during

Peak Hour (s) 25

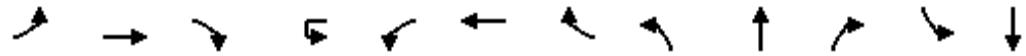
Notes:

Bold denotes peak hour

SYNCHRO OUTPUTS

3300 Maplethorpe Lane
 1: Maplethorpe Ln/Maplethorpe Ln & Soquel Dr

Existing
 Timing Plan: AM



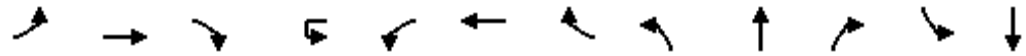
| Movement | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|-----------------------------------|------|------|------|-------|------|------|----------------------|------|------|------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 10 | 595 | 2 | 1 | 5 | 1297 | 13 | 1 | 0 | 3 | 18 | 0 |
| Future Volume (Veh/h) | 10 | 595 | 2 | 1 | 5 | 1297 | 13 | 1 | 0 | 3 | 18 | 0 |
| Sign Control | Free | | | Free | | | Stop | | | Stop | | |
| Grade | 0% | | | 0% | | | 0% | | | 0% | | |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.94 | 0.88 | 0.88 | 0.88 | 0.50 | 0.50 | 0.50 | 0.67 | 0.67 |
| Hourly flow rate (vph) | 11 | 654 | 2 | 0 | 6 | 1474 | 15 | 2 | 0 | 6 | 27 | 0 |
| Pedestrians | | | | | | | | | | 7 | | |
| Lane Width (ft) | | | | | | | | | | 12.0 | | |
| Walking Speed (ft/s) | | | | | | | | | | 3.5 | | |
| Percent Blockage | | | | | | | | | | 1 | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | None | | | | | None | | | | | | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | 731 | | | | | | |
| pX, platoon unblocked | 0.62 | | | 0.00 | | | 0.62 | | | 0.62 | | |
| vC, conflicting volume | 1489 | | | 0 | | | 663 | | | 1452 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 570 | | | 0 | | | 663 | | | 509 | | |
| tC, single (s) | 4.1 | | | 0.0 | | | 4.1 | | | 7.5 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 0.0 | | | 2.2 | | | 3.5 | | |
| p0 queue free % | 98 | | | 0 | | | 99 | | | 99 | | |
| cM capacity (veh/h) | 630 | | | 0 | | | 929 | | | 257 | | |
| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 | | | | |
| Volume Total | 11 | 436 | 220 | 6 | 983 | 506 | 8 | 64 | | | | |
| Volume Left | 11 | 0 | 0 | 6 | 0 | 0 | 2 | 27 | | | | |
| Volume Right | 0 | 0 | 2 | 0 | 0 | 15 | 6 | 37 | | | | |
| cSH | 630 | 1700 | 1700 | 929 | 1700 | 1700 | 475 | 223 | | | | |
| Volume to Capacity | 0.02 | 0.26 | 0.13 | 0.01 | 0.58 | 0.30 | 0.02 | 0.29 | | | | |
| Queue Length 95th (ft) | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 29 | | | | |
| Control Delay (s) | 10.8 | 0.0 | 0.0 | 8.9 | 0.0 | 0.0 | 12.7 | 30.6 | | | | |
| Lane LOS | B | | | A | | | B | | | D | | |
| Approach Delay (s) | 0.2 | | | 0.0 | | | 12.7 | | | 30.6 | | |
| Approach LOS | | | | | | | B | | | D | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | | 1.0 | | | | | | | | |
| Intersection Capacity Utilization | | | | 52.9% | | | ICU Level of Service | | | A | | |
| Analysis Period (min) | | | | 15 | | | | | | | | |



| Movement | SBR |
|------------------------|------|
| Lane Configurations | |
| Traffic Volume (veh/h) | 25 |
| Future Volume (Veh/h) | 25 |
| Sign Control | |
| Grade | |
| Peak Hour Factor | 0.67 |
| Hourly flow rate (vph) | 37 |
| Pedestrians | |
| Lane Width (ft) | |
| Walking Speed (ft/s) | |
| Percent Blockage | |
| Right turn flare (veh) | 3 |
| Median type | |
| Median storage (veh) | |
| Upstream signal (ft) | |
| pX, platoon unblocked | 0.62 |
| vC, conflicting volume | 744 |
| vC1, stage 1 conf vol | |
| vC2, stage 2 conf vol | |
| vCu, unblocked vol | 0 |
| tC, single (s) | 6.9 |
| tC, 2 stage (s) | |
| tF (s) | 3.3 |
| p0 queue free % | 95 |
| cM capacity (veh/h) | 678 |
| Direction, Lane # | |

3300 Maplethorpe Lane
 1: Maplethorpe Ln/Maplethorpe Ln & Soquel Dr

Existing
 Timing Plan: AM



| Movement | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|-----------------------------------|------|-------|------|----------------------|------|------|------|------|------|------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 23 | 1423 | 5 | 6 | 6 | 511 | 15 | 3 | 0 | 9 | 14 | 0 |
| Future Volume (Veh/h) | 23 | 1423 | 5 | 6 | 6 | 511 | 15 | 3 | 0 | 9 | 14 | 0 |
| Sign Control | | Free | | | | Free | | | Stop | | | Stop |
| Grade | | 0% | | | | 0% | | | 0% | | | 0% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.91 | 0.91 | 0.91 | 0.91 | 0.43 | 0.43 | 0.43 | 0.73 | 0.73 |
| Hourly flow rate (vph) | 25 | 1547 | 5 | 0 | 7 | 562 | 16 | 7 | 0 | 21 | 19 | 0 |
| Pedestrians | | | | | | | | | 7 | | | |
| Lane Width (ft) | | | | | | | | | 12.0 | | | |
| Walking Speed (ft/s) | | | | | | | | | 3.5 | | | |
| Percent Blockage | | | | | | | | | 1 | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | | None | | | | | | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | 731 | | | | | | |
| pX, platoon unblocked | 0.89 | | | 0.00 | | | | 0.89 | 0.89 | | 0.89 | 0.89 |
| vC, conflicting volume | 578 | | | 0 | 1559 | | | 1912 | 2198 | 783 | 1428 | 2193 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 275 | | | 0 | 1559 | | | 1776 | 2098 | 783 | 1232 | 2092 |
| tC, single (s) | 4.1 | | | 0.0 | 4.1 | | | 7.5 | 6.5 | 6.9 | 7.5 | 6.5 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 0.0 | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 |
| p0 queue free % | 98 | | | 0 | 98 | | | 84 | 100 | 94 | 83 | 100 |
| cM capacity (veh/h) | 1155 | | | 0 | 427 | | | 45 | 45 | 339 | 109 | 45 |
| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 | | | | |
| Volume Total | 25 | 1031 | 521 | 7 | 375 | 203 | 28 | 40 | | | | |
| Volume Left | 25 | 0 | 0 | 7 | 0 | 0 | 7 | 19 | | | | |
| Volume Right | 0 | 0 | 5 | 0 | 0 | 16 | 21 | 21 | | | | |
| cSH | 1155 | 1700 | 1700 | 427 | 1700 | 1700 | 128 | 230 | | | | |
| Volume to Capacity | 0.02 | 0.61 | 0.31 | 0.02 | 0.22 | 0.12 | 0.22 | 0.17 | | | | |
| Queue Length 95th (ft) | 2 | 0 | 0 | 1 | 0 | 0 | 20 | 15 | | | | |
| Control Delay (s) | 8.2 | 0.0 | 0.0 | 13.6 | 0.0 | 0.0 | 40.9 | 25.9 | | | | |
| Lane LOS | A | | | B | | | E | D | | | | |
| Approach Delay (s) | 0.1 | | | 0.2 | | | 40.9 | 25.9 | | | | |
| Approach LOS | | | | | | | E | D | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 1.1 | | | | | | | | | |
| Intersection Capacity Utilization | | 49.6% | | ICU Level of Service | A | | | | | | | |
| Analysis Period (min) | 15 | | | | | | | | | | | |

3300 Maplethorpe Lane
 1: Maplethorpe Ln/Maplethorpe Ln & Soquel Dr

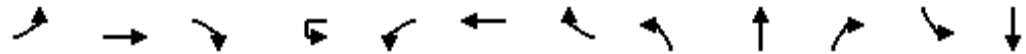
Existing
 Timing Plan: AM



| Movement | SBR |
|------------------------|------|
| Lane Configurations | |
| Traffic Volume (veh/h) | 15 |
| Future Volume (Veh/h) | 15 |
| Sign Control | |
| Grade | |
| Peak Hour Factor | 0.73 |
| Hourly flow rate (vph) | 21 |
| Pedestrians | |
| Lane Width (ft) | |
| Walking Speed (ft/s) | |
| Percent Blockage | |
| Right turn flare (veh) | 3 |
| Median type | |
| Median storage (veh) | |
| Upstream signal (ft) | |
| pX, platoon unblocked | 0.89 |
| vC, conflicting volume | 289 |
| vC1, stage 1 conf vol | |
| vC2, stage 2 conf vol | |
| vCu, unblocked vol | 0 |
| tC, single (s) | 6.9 |
| tC, 2 stage (s) | |
| tF (s) | 3.3 |
| p0 queue free % | 98 |
| cM capacity (veh/h) | 969 |
| Direction, Lane # | |

3300 Maplethorpe Lane
 1: Maplethorpe Ln/Maplethorpe Ln & Soquel Dr

Existing Plus Project
 Timing Plan: AM



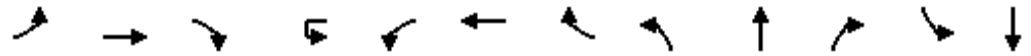
| Movement | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|-----------------------------------|------|------|------|-------|------|------|----------------------|------|------|------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 11 | 595 | 2 | 1 | 5 | 1297 | 14 | 1 | 0 | 3 | 21 | 0 |
| Future Volume (Veh/h) | 11 | 595 | 2 | 1 | 5 | 1297 | 14 | 1 | 0 | 3 | 21 | 0 |
| Sign Control | Free | | | Free | | | Stop | | | Stop | | |
| Grade | 0% | | | 0% | | | 0% | | | 0% | | |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.94 | 0.88 | 0.88 | 0.88 | 0.50 | 0.50 | 0.50 | 0.67 | 0.67 |
| Hourly flow rate (vph) | 12 | 654 | 2 | 0 | 6 | 1474 | 16 | 2 | 0 | 6 | 31 | 0 |
| Pedestrians | | | | | | | | | | 7 | | |
| Lane Width (ft) | | | | | | | | | | 12.0 | | |
| Walking Speed (ft/s) | | | | | | | | | | 3.5 | | |
| Percent Blockage | | | | | | | | | | 1 | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | None | | | | | None | | | | | | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | 731 | | | | | | |
| pX, platoon unblocked | 0.62 | | | 0.00 | | | 0.62 | | | 0.62 | | |
| vC, conflicting volume | 1490 | | | 0 | | | 663 | | | 1456 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 571 | | | 0 | | | 663 | | | 516 | | |
| tC, single (s) | 4.1 | | | 0.0 | | | 4.1 | | | 7.5 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 0.0 | | | 2.2 | | | 3.5 | | |
| p0 queue free % | 98 | | | 0 | | | 99 | | | 99 | | |
| cM capacity (veh/h) | 629 | | | 0 | | | 929 | | | 252 | | |
| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 | | | | |
| Volume Total | 12 | 436 | 220 | 6 | 983 | 507 | 8 | 73 | | | | |
| Volume Left | 12 | 0 | 0 | 6 | 0 | 0 | 2 | 31 | | | | |
| Volume Right | 0 | 0 | 2 | 0 | 0 | 16 | 6 | 42 | | | | |
| cSH | 629 | 1700 | 1700 | 929 | 1700 | 1700 | 471 | 220 | | | | |
| Volume to Capacity | 0.02 | 0.26 | 0.13 | 0.01 | 0.58 | 0.30 | 0.02 | 0.33 | | | | |
| Queue Length 95th (ft) | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 35 | | | | |
| Control Delay (s) | 10.8 | 0.0 | 0.0 | 8.9 | 0.0 | 0.0 | 12.8 | 32.3 | | | | |
| Lane LOS | B | | | A | | | B | | | D | | |
| Approach Delay (s) | 0.2 | | | 0.0 | | | 12.8 | | | 32.3 | | |
| Approach LOS | | | | | | | B | | | D | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | | 1.2 | | | | | | | | |
| Intersection Capacity Utilization | | | | 53.0% | | | ICU Level of Service | | | A | | |
| Analysis Period (min) | | | | 15 | | | | | | | | |



| Movement | SBR |
|------------------------|------|
| Lane Configurations | 7 |
| Traffic Volume (veh/h) | 28 |
| Future Volume (Veh/h) | 28 |
| Sign Control | |
| Grade | |
| Peak Hour Factor | 0.67 |
| Hourly flow rate (vph) | 42 |
| Pedestrians | |
| Lane Width (ft) | |
| Walking Speed (ft/s) | |
| Percent Blockage | |
| Right turn flare (veh) | 3 |
| Median type | |
| Median storage (veh) | |
| Upstream signal (ft) | |
| pX, platoon unblocked | 0.62 |
| vC, conflicting volume | 745 |
| vC1, stage 1 conf vol | |
| vC2, stage 2 conf vol | |
| vCu, unblocked vol | 0 |
| tC, single (s) | 6.9 |
| tC, 2 stage (s) | |
| tF (s) | 3.3 |
| p0 queue free % | 94 |
| cM capacity (veh/h) | 678 |
| Direction, Lane # | |

3300 Maplethorpe Lane
 1: Maplethorpe Ln/Maplethorpe Ln & Soquel Dr

Existing
 Timing Plan: AM



| Movement | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 27 | 1423 | 5 | 6 | 6 | 511 | 18 | 3 | 0 | 9 | 16 | 0 |
| Future Volume (Veh/h) | 27 | 1423 | 5 | 6 | 6 | 511 | 18 | 3 | 0 | 9 | 16 | 0 |
| Sign Control | | Free | | | | Free | | | Stop | | | Stop |
| Grade | | 0% | | | | 0% | | | 0% | | | 0% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.91 | 0.91 | 0.91 | 0.91 | 0.43 | 0.43 | 0.43 | 0.73 | 0.73 |
| Hourly flow rate (vph) | 29 | 1547 | 5 | 0 | 7 | 562 | 20 | 7 | 0 | 21 | 22 | 0 |
| Pedestrians | | | | | | | | | 7 | | | |
| Lane Width (ft) | | | | | | | | | 12.0 | | | |
| Walking Speed (ft/s) | | | | | | | | | 3.5 | | | |
| Percent Blockage | | | | | | | | | 1 | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | | None | | | | | | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | 731 | | | | | | |
| pX, platoon unblocked | 0.89 | | | 0.00 | | | | 0.89 | 0.89 | | 0.89 | 0.89 |
| vC, conflicting volume | 582 | | | 0 | 1559 | | | 1921 | 2210 | 783 | 1438 | 2203 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 275 | | | 0 | 1559 | | | 1784 | 2110 | 783 | 1241 | 2102 |
| tC, single (s) | 4.1 | | | 0.0 | 4.1 | | | 7.5 | 6.5 | 6.9 | 7.5 | 6.5 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 0.0 | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 |
| p0 queue free % | 97 | | | 0 | 98 | | | 84 | 100 | 94 | 79 | 100 |
| cM capacity (veh/h) | 1153 | | | 0 | 427 | | | 44 | 44 | 339 | 107 | 44 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | NB 1 | SB 1 |
|------------------------|------|------|------|------|------|------|------|------|
| Volume Total | 29 | 1031 | 521 | 7 | 375 | 207 | 28 | 45 |
| Volume Left | 29 | 0 | 0 | 7 | 0 | 0 | 7 | 22 |
| Volume Right | 0 | 0 | 5 | 0 | 0 | 20 | 21 | 23 |
| cSH | 1153 | 1700 | 1700 | 427 | 1700 | 1700 | 126 | 219 |
| Volume to Capacity | 0.03 | 0.61 | 0.31 | 0.02 | 0.22 | 0.12 | 0.22 | 0.21 |
| Queue Length 95th (ft) | 2 | 0 | 0 | 1 | 0 | 0 | 20 | 19 |
| Control Delay (s) | 8.2 | 0.0 | 0.0 | 13.6 | 0.0 | 0.0 | 41.6 | 27.5 |
| Lane LOS | A | | | B | | | E | D |
| Approach Delay (s) | 0.2 | | | 0.2 | | | 41.6 | 27.5 |
| Approach LOS | | | | | | | E | D |

Intersection Summary

| | | | |
|-----------------------------------|--|-------|----------------------|
| Average Delay | | 1.2 | |
| Intersection Capacity Utilization | | 49.6% | ICU Level of Service |
| Analysis Period (min) | | 15 | A |

3300 Maplethorpe Lane
 1: Maplethorpe Ln/Maplethorpe Ln & Soquel Dr

Existing
 Timing Plan: AM



| Movement | SBR |
|------------------------|------|
| Lane Configurations | |
| Traffic Volume (veh/h) | 17 |
| Future Volume (Veh/h) | 17 |
| Sign Control | |
| Grade | |
| Peak Hour Factor | 0.73 |
| Hourly flow rate (vph) | 23 |
| Pedestrians | |
| Lane Width (ft) | |
| Walking Speed (ft/s) | |
| Percent Blockage | |
| Right turn flare (veh) | 3 |
| Median type | |
| Median storage (veh) | |
| Upstream signal (ft) | |
| pX, platoon unblocked | 0.89 |
| vC, conflicting volume | 291 |
| vC1, stage 1 conf vol | |
| vC2, stage 2 conf vol | |
| vCu, unblocked vol | 0 |
| tC, single (s) | 6.9 |
| tC, 2 stage (s) | |
| tF (s) | 3.3 |
| p0 queue free % | 98 |
| cM capacity (veh/h) | 968 |
| Direction, Lane # | |

MEMORANDUM

To: John Swift, Swift Consulting Services, Inc.
From: Frederik Venter P.E. and Jacob Mirabella, Kimley-Horn and Associates, Inc.
Date: December 4, 2018
Subject: Addendum to 3300 Maplethorpe Lane Traffic Impact Study and Traffic Calming

The objective of this addendum is to provide an update to the *3300 Maplethorpe Lane Traffic Impact Study and Traffic Calming Memorandum* prepared by Kimley-Horn and dated November 13, 2018. The previous memorandum incorrectly referenced municipal County municipal code 24.12.160-33. The corrected code reference is 13.30.110(e), which states the following:

“13.30.110 PROHIBITED VEGETATION – NUISANCE.

No person shall allow to exist any of the following, on property either owned by that person or property for which the person is responsible, as specified by Chapters 13.30 and 15.20 of this code:

(e) The existence of any branches or foliage which interfere with visibility on, or use of, or access to, any portion of any street improved for vehicular or pedestrian travel;”

**Initial Study
Attachment 4**

3300 MAPLETHORPE LANE, SOQUEL
PROPOSED RESIDENTIAL DEVELOPMENT
APN 037-121-60

BIOTIC REPORT

October 12, 2018



Biotic Resources Group

Biotic Assessments ♦ Resource Management ♦ Permitting

3300 MAPLETHORPE LANE, SOQUEL
PROPOSED RESIDENTIAL DEVELOPMENT
APN 037-121-60

BIOTIC REPORT

Prepared for
John Swift

Prepared by
Biotic Resources Group
Attn: Kathleen Lyons

With

Dana Bland, Wildlife Biologist
Dana Bland & Associates

October 12, 2018

**3300 MAPLETHORPE LANE
PROPOSED RESIDENTIAL DEVELOPMENT
APN 037-121-60**

BIOTIC REPORT
October 12, 2018

1.0 INTRODUCTION

An 11-unit residential development is proposed for a property on Maplethorpe Lane in the Soquel area of Santa Cruz County. The property encompasses approximately 3.5 acres on APN 037-121-60. The property is located along the east side of Maplethorpe Lane, north of Soquel Drive (Figure 1). The property is currently partially developed with greenhouses. The property is irregularly shaped and extends easterly to include a portion of an unnamed creek. The property is located within the County's urban services area.

The proposed project is an 11-unit housing complex, with vehicular entry from Maplethorpe Lane. The configuration of the proposed subdivision is depicted on the *Site Plan* (C2G Civil Consultants Group, Inc., plans dated 9/2718). Project features include a driveway from Maplethorpe Lane, 11 detached buildings, internal driveways and parking spaces, a parklet, and stormwater treatment/infiltration chambers. A new drainage pipe and storm drain inlet is proposed from the infiltration chambers, connecting to an existing storm drain that leads to the creek. Project development will require grading to accommodate the residential development and construction of the stormwater chambers. The project also proposes to sell three areas along the perimeter of the parcel (encompassing 0.32 acre) to adjoining landowners.

At the project site, the creek meets the definition of an arroyo under County Code; therefore, the project is subject to a 50-foot riparian corridor setback and an additional 10-foot construction setback. The residential buildings and parking areas will be located outside this County-designated riparian corridor and setback. The proposed stormwater treatment/infiltrations chambers, storm drain pipe and storm drain inlet are proposed within the 50-foot riparian setback area.

The Biotic Resources Group assessed the biotic resources of the property. The focus of the assessment was to identify sensitive biotic resources within the project area and evaluate the proposed activities relative to such resources.

Specific tasks conducted for this study include:

- Characterize and map the major plant communities on the property;
- Identify sensitive biotic resources, including plant and wildlife species of concern, within areas proposed for development activities,
- Evaluate the potential effects of the proposed project on sensitive biotic resources and recommend measures to avoid or reduce such impacts.

Intended Use of this Report

The findings presented in this biological report are intended for the sole use of the property owner (John Swift), his representatives, and Santa Cruz County in evaluating the proposed residential development project. The findings presented by the Biotic Resources Group in this report are for information purposes only; they are not intended to represent the interpretation of any State, Federal or County law or ordinance pertaining to permitting actions within sensitive habitat or endangered species. The interpretation of such laws and/or ordinances is the responsibility of the applicable governing body.

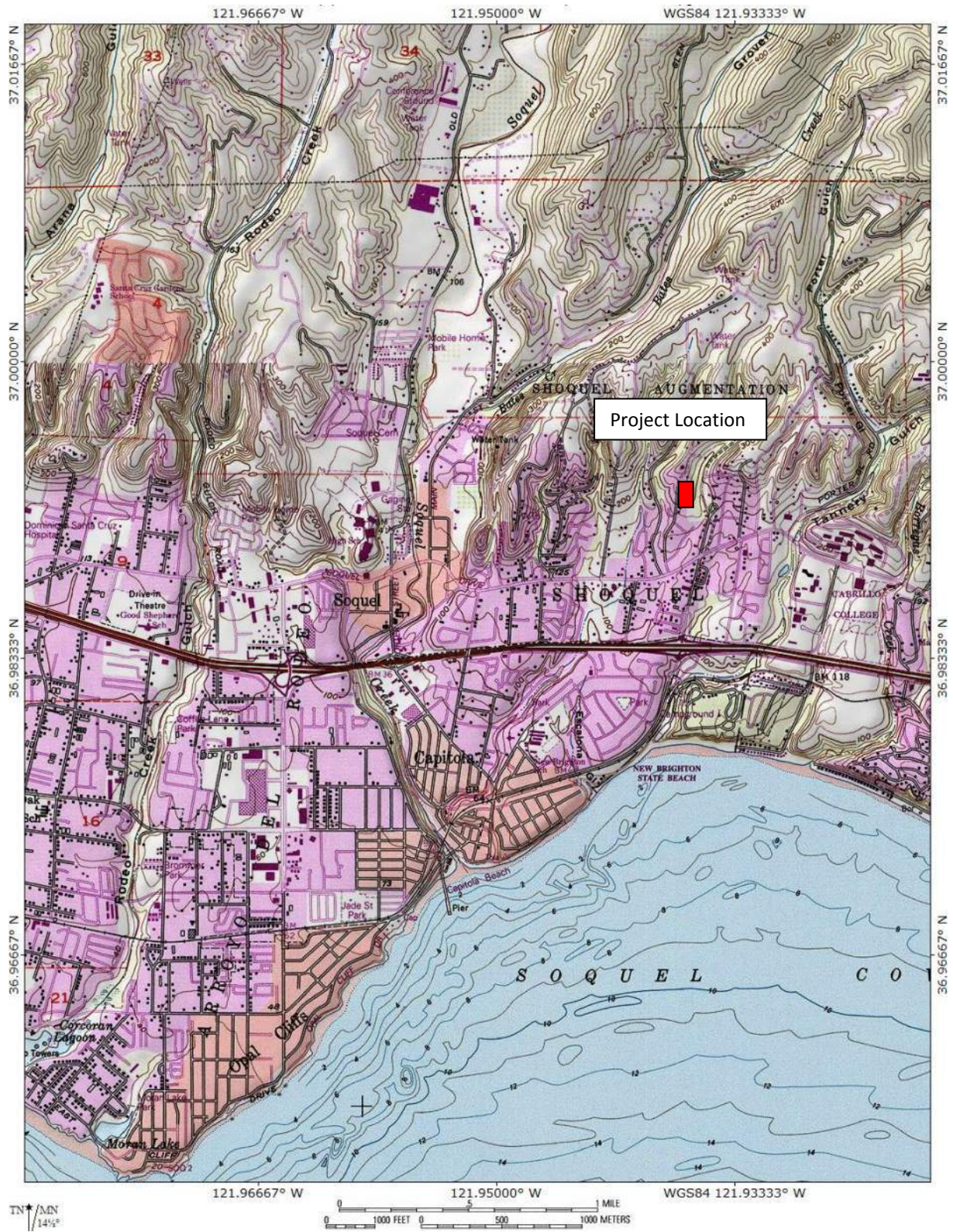


Figure 1. Project Location on USGS Soquel Topographic Map

2.0 METHODOLOGY

A survey to document site conditions and biotic resources on the property was conducted in October 2017 and April 2018 by Kathleen Lyons (plant ecologist) and Dana Bland (wildlife biologist). Study methodology included a field reconnaissance survey, aerial photograph interpretation, and accessing electronic databases. Database searches were conducted; the California Natural Diversity Data Base (CNDDB) “RareFind” (2018) and the California Native Plant Society (CNPS) Rare Plant Electronic Inventory (2018) for the Soquel and surrounding quadrangles were accessed.

Prior to conducting the field surveys, a potential list of special status or sensitive species was reviewed, utilizing species recognized by California Department of Fish and Wildlife (CDFW), US Fish and Wildlife Service (USFWS), and California Native Plant Society (CNPS). The proposed residential development area was walked and the oak and riparian woodlands were traversed. The major plant community types on the property, based on the classification system developed by CNDDB's *California Terrestrial Natural Communities* (CDFG 2010) and *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995) and as amended to reflect site conditions, were mapped during the field survey. Plant community types as recognized by CDFW were used to the greatest extent feasible, however, modifications to the classification system’s nomenclature were made, as necessary, to accurately describe the sites resources, particularly for areas that the CDFG system provides no suitable classification. The plant communities were mapped onto an aerial photo (Figure 2). The *Jepson Manual* (2012) was the principal taxonomic reference used for the botanical work.

3.0 ENVIRONMENTAL SETTING

The Maplethorpe Lane property lies at the mid-portion of the geographic area known as the Central Coast Range and extends eastward to the San Francisco Bay Area Range. The property supports five plant community types: oak woodland, non-native annual grassland, riparian woodland, blackberry scrub, and landscaped areas (non-native trees and groundcovers). Each vegetation type, its California vegetation code, and state ranking (rarity) are listed in Table 1. The location of these communities is depicted on Figure 2. The soils on the property are mapped as Watsonville loam, 2-15 percent slopes (177) and Tierra-Watsonville complex, 30 to 50 percent slopes (175) (NRCS, 2018).

Table 1. Vegetation Types, Maplethorpe Lane Property

| CaCode ¹ | Vegetation Type | Plant Association | State Ranking ² |
|---------------------|------------------------------|--|----------------------------|
| 42.026.22 | Non-native Grassland/Ruderal | Wild Oat/ Ryegrass– Filaree/ Cat’s ear/Iceplant/Bur Clover | None |
| 61.201.00 | Riparian Woodland | Willow/ Coast Live Oak/Big Leaf Maple – California Blackberry/Poison Oak | S4 |
| 71.060.02 | Coast Live Oak Woodland | Coast Live Oak– California Blackberry/Ripgut Brome/Miner’s Lettuce | S4 |
| 63.901.05 | Blackberry Scrub | California Blackberry– Poison Oak | S3 |
| None | Landscaped Areas | Coast Redwood (in containers)/Pittosporum | None |

¹ – California vegetation code as per CDFG (September, 2010); 2- Vegetation types are ranked between S1 and S5. For vegetation types with ranks of S1-S3, all associations within the type are considered to be highly imperiled.

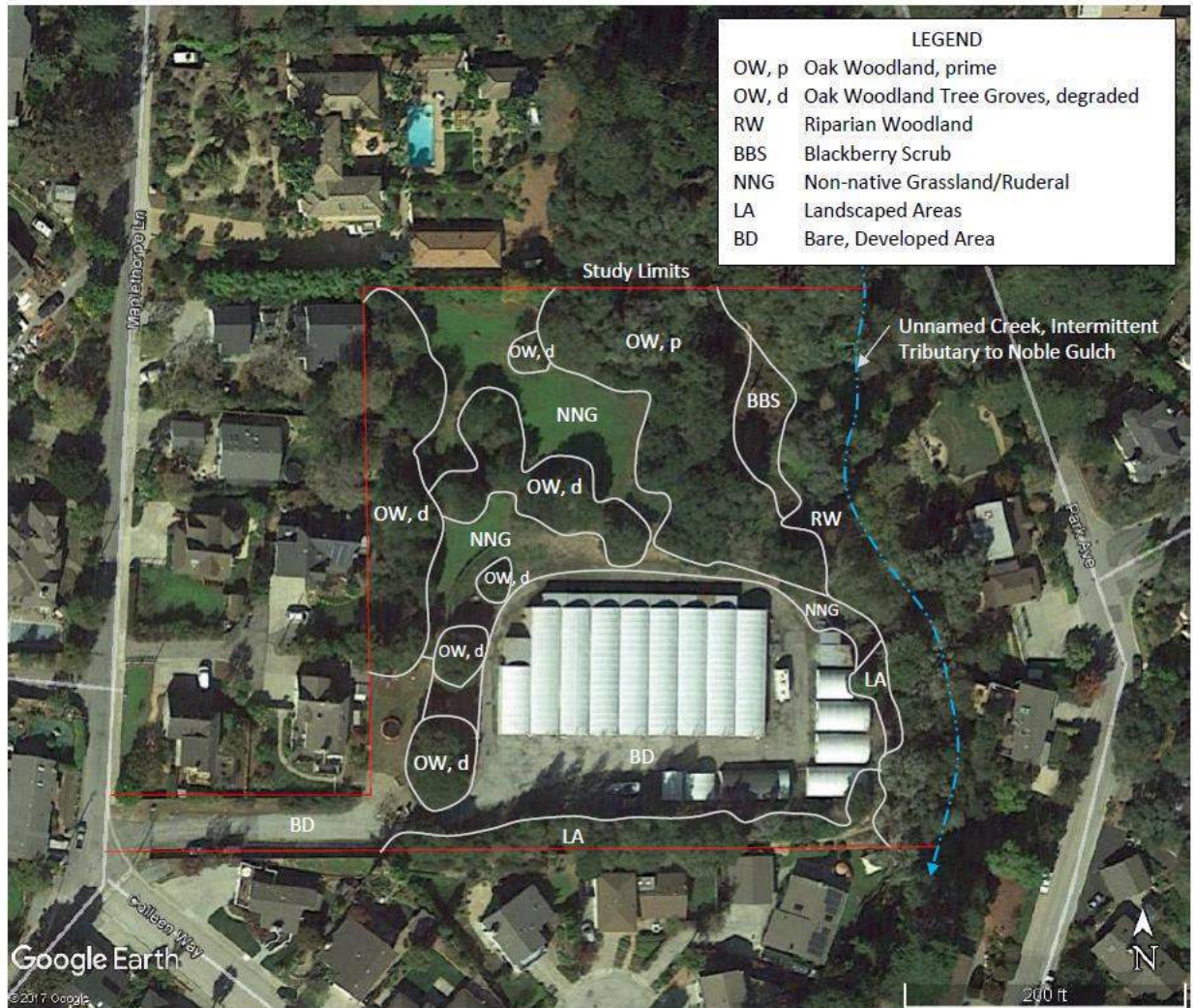


Figure 2. Existing Vegetation Types on Aerial Photo

3.1 Non-native Grassland/Ruderal

The central portion of the property supports non-native grassland and ruderal (weedy areas). The grassland is periodically mowed so it appears to be a non-irrigated lawn. Areas along the slope abutting the greenhouses support weedy plants. This vegetation type was observed to support wild oat (*Avena fatua*), perennial ryegrass (*Lolium perennis*), rattlesnake grass (*Briza maxima*), cat's ear (*Hypochaeris radicata*), geranium (*Geranium dissectum*), scarlet pimpernel (*Anagallis arvensis*), and filaree (*Erodium botrys*). The slope north of the greenhouses was observed to support wild oat, bur clover (*Medicago polymorpha*), rattail fescue (*Festuca myuros*), iceplant (*Carpobrotus edulis*), wild radish (*Raphanus sativa*), scarlet pimpernel, bird of paradise (*Caesalpinia sp.*), jubata grass (*Cortaderia jubata*), vetch (*Vicia sativa*), and rose clover (*Trifolium hirtum*). The character of the grassland is depicted in Figure 3.

Wildlife Resources. The non-native grassland habitat provides little value to native wildlife, due to its fragmented nature at this site, mowing, and the predominance of non-native vegetation. The weedy, grassy areas do provide some forage for wildlife that can tolerate the high human presence in and around the site such as rock dove (*Columba livia*), California towhee (*Pipilo crissalis*), and Botta's pocket gopher (*Thomomys bottae*).



Figure 3. Non-native Grassland in North-Central Portion of Property

3.2 Riparian Woodland

The eastern property line supports a portion of an intermittent creek. This unnamed creek is a tributary to Noble Gulch; Noble Gulch ultimately empties into Soquel Creek in Capitola. The creek supports a band of riparian woodland; this woodland occurs along the bank and extends westward up the slope and top of bank. The canopy of riparian trees extends outward from the top of bank, as depicted on Figures 2 and 4. The vegetation is co-dominated by coast live oak (*Quercus agrifolia*), willow (*Salix spp.*), and big leaf maple (*Acer macrophyllum*). Other tree species include California bay (*Umbellularia californica*) and non-native *Prunus*, *Photinia*, and *Pittosporum*. The riparian woodland understory is dense with California blackberry (*Rubus ursinus*), poison oak (*Toxicodendron diversilobum*), sword fern (*Polystichum munitum*), coffee berry (*Frangula californica*), wood fern (*Dryopteris arguta*), horsetail (*Equisetum arvense*), yerba buena (*Clinopodium douglasii*), and Santa Barbara sedge (*Carex barbarae*). Non-native species are also present, including calla lily (*Zantedeschia sp.*), Bermuda buttercup (*Oxalis pes-caprae*), Italian thistle (*Carduus pycnocephalus*), cape ivy (*Delairea odorata*), and bull thistle (*Cirsium vulgare*).

Wildlife Resources. The riparian habitat on the property provides the cover, forage, nesting opportunities for some birds and mammals, seasonal source of drinking water, and moist microclimate along the creek and embankments in the understory. The value of this riparian is moderated by the proximity to residential uses and high human activity. Common wildlife species expected to occur in riparian habitat on the property include California slender salamander (*Batrachoseps attenuatus*), scrub jay (*Aphelocoma californica*), acorn woodpecker (*Melanerpes formicivorus*), black phoebe (*Sayornis nigricans*), western gray squirrel (*Sciurus griseus*), and raccoon (*Procyon lotor*). This intermittent creek does not support any fish.



Figure 4. Riparian Woodland along Intermittent Creek

3.3 Coast Live Oak Woodland

The property supports oak woodland which is characterized by the presence of coast live oak trees. Dense woodland areas, where there is a closed canopy and relatively undisturbed ground surface, has been identified as prime oak woodland (see Figure 2). This woodland type occurs westward of the riparian woodland and along the western property line. The other oak woodland areas on the property are degraded due to land uses within the understory, such as seasonal mowing, play structures, and former greenhouse activities. In addition to coast live oak, the woodland supports scattered Monterey pine (*Pinus radiata*), willow, California blackberry, ripgut brome (*Bromus diandrus*), Bermuda buttercup, miner's lettuce (*Montia perfoliata*), and bedstraw (*Galium sp.*). The character of the woodland is depicted in Figure 5.

Wildlife Resources. The use of the oak woodland habitat by wildlife is expected to be similar to that described above for the riparian woodland. The value of the oak woodland in the area of proposed Unit #9 lacks any understory vegetation or downed woody debris, and thus has less diversity of niches for wildlife, such as found in the oak woodland areas just to the north of Unit #9 which will not be disturbed by the project. A large San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*) house was observed in the more intact oak woodland and is located approximately 70 feet north of proposed Unit #9.



Figure 5. Oak Woodland, prime

3.4 Blackberry Scrub

A small area of blackberry scrub grows westward of the riparian woodland. This scrub is dominated by California blackberry and poison oak. Figure 6 shows the blackberry scrub.

Wildlife Resources. This habitat type is expected to be similar to that described above for riparian woodland for use by wildlife. The berries provide forage and the thicket provides cover and nesting opportunities for several native wildlife species.



Figure 6. Blackberry Scrub

3.5 Landscaped Areas

The southern edge of the property as well as areas along the east side of the existing greenhouses supports landscaped areas. Several coast redwoods (*Sequoia sempervirens*) grow within concrete containers along the property line. Other landscape trees include *Photinia* and *Pittosporum*.

Wildlife Resources. The landscape tree habitat on the property provide occasional nesting, foraging or roosting habitat primarily for native birds, similar to described above for the oak woodland.

4.0 REGULATED AND SENSITIVE HABITATS

4.1 Regulated Habitats

California Department of Fish and Wildlife (CDFW) is a trustee agency that has jurisdiction under Section 1600 et seq. of the CDFG Code. Under Sections 1600-1603 of the California Fish and Game Code, CDFW regulates all diversions, obstructions, or changes to the natural flow or bed, channel or bank of any river, stream or lake which supports fish or wildlife. Along watercourses, CDFW's jurisdictional limit typically extends to the top of bank or to the edge of riparian habitat if such habitat extends beyond top of bank (outer drip line), whichever is greater. The unnamed creek on the subject property is within the regulatory jurisdiction of CDFW; CDFW jurisdiction extends to the top-of-bank or outer edge of riparian vegetation, whichever is greater. Any activity this area, including vegetation removal, would occur in CDFW's regulatory jurisdiction and may require a permit from CDFW under Code 1600 (Streambed Alteration Agreement) (pending confirmation by this agency). Project actions will occur outside CDFW regulated areas.

Water quality in California is governed by the Porter-Cologne Water Quality Control Act and certification authority under Section 401 of the Clean Water Act, as administered by the Regional Water Quality Control Board (RWQCB). The Section 401 water quality certification program allows the State to ensure that activities requiring a Federal permit or license comply with State water quality standards. Water quality certification must be based on a finding that the proposed discharge will comply with water quality standards which are in the regional board's basin plans. The Porter-Cologne Act requires any person discharging waste or proposing to discharge waste in any region that could affect the quality of the waters of the state to file a report of waste discharge. The RWQCB issues a permit or waiver that includes implementing water quality control plans that consider the beneficial uses to be protected. Waters of the State subject to RWQCB regulation extend to the top of bank, as well as isolated water/wetland features and saline waters. Should there be no Section 404 nexus (i.e., isolated feature not subject to USACE jurisdiction); a report of waste discharge (ROWD) should be filed with the RWQCB. The RWQCB interprets waste to include fill placed into water bodies. The unnamed creek on the subject property is within the regulatory jurisdiction of RWQCB; RWQCB jurisdiction extends to the top-of-bank. Any activity this area, including vegetation removal, would occur in RWQCB's regulatory jurisdiction; this work may require a permit from RWQCB under Section 401 (Water Quality Certification) (pending confirmation by this agency). Project actions will occur outside RWQCB regulated areas.

The US Army Corps of Engineers (USACE) regulates activities within waters of the United States pursuant to congressional acts: Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act (1977, as amended). Section 10 of the Rivers and Harbors Act requires a permit for any work in, over, or under navigable waters of the United States. Navigable waters are defined as those waters subject to the ebb and flow of the tide to the Mean High Water mark (tidal areas) or below the Ordinary High Water mark (freshwater areas). The unnamed creek up to the Ordinary High Water Mark is within the regulatory jurisdiction of USACE. If any fill is placed below the OHWM of the creek, it would be within USACE's regulatory jurisdiction; this work may require a permit from USACE under Section 404 of the Clean Water Act (pending confirmation by this agency). Project actions will occur outside USACE regulated areas.

4.2 Sensitive Habitats

Sensitive habitats are defined by local, State, or Federal agencies as those habitats that support special status species, provide important habitat values for wildlife, represent areas of unusual or regionally restricted habitat types, and/or provide high biological diversity (Santa Cruz County Code and CDFW). The riparian woodland of the subject property is considered sensitive under County Code. At the project site, the creek meets the definition of an arroyo under County Code; therefore, the project is subject to a 50-foot riparian corridor setback. No structures are allowed within the riparian corridor and its setback area unless the County grants a riparian exception. The site plan depicts all roads and residences outside the riparian woodland and the 50-foot riparian setback area. The proposed stormwater infiltration chambers, a drain pipe, and new storm drain inlet are located within the 50-foot riparian setback area. No riparian vegetation will be removed to accommodate the project.

CDFW classifies and ranks the State's natural communities to assist in the determining the level of rarity and imperilment. Vegetation types are ranked between S1 and S5. For vegetation types with ranks of S1-S3, all associations within the type are considered to be highly imperiled. If a vegetation alliance is ranked as S4 or S5, these alliances are generally considered common enough to not be of concern; however, it does not mean that certain associations contained within them are not rare (CDFG, 2007 and 2010). The blackberry scrub on the subject property is ranked as sensitive (i.e., S3) by CDFW.

5.0 SPECIAL STATUS SPECIES

5.1 Special Status Plants

The biotic review focused on special status plant species that are officially listed by the State and/or Federal government and CNPS List 1B. No special status plant species have been recorded for this property as per the CNDDDB. The species evaluated for potential occurrence on the property, as per CNDDDB records, are listed on Table 2.

Of the special status plant species evaluated for their potential to occur on the property (see Table 2), only two species, have been documented in the greater project vicinity. The Santa Cruz tarplant (*Holocarpha macradenia*) is known from the Soquel Hills along Fairway Drive, Anna Jean Cummings Park, and from inland portions of Twin Lakes State Beach. The Fairway Drive population is located approximately 0.5-mile northeast of the subject property. The other two sites are located two-plus miles to the east and southwest of the subject property, respectively, where the species occupies coastal prairie grassland. Although the biotic review was conducted outside the blooming period of this species (typically blooms July-September), the potential presence of this species is considered low due to the compacted condition of the grassland soil and evidence of previous activities on the site (turf-like mowing regime).

The Santa Cruz clover (*Trifolium buckwestiorum*) is known from the SeaCrest Development in Soquel. This occurrence is located approximately two miles to the east of the subject property, where the species occupies mesic areas in coastal prairie grassland. The biotic review was conducted within the blooming period of this species (typically blooms March - April). No individuals were observed during the April site visit and the potential presence of this species is considered low due to the compacted condition of the grassland and lack of mesic microhabitat conditions needed for the species growth.

The site does not support suitable habitat for special status plant species and none were observed, or are predicted to occur, on the property.

Table 2. List of Special Status Plant Species with Potential to Occur at Maplethorpe Lane Property, October 2018

| Scientific Name | Common Name | Lifeform | Rare Plant Rank | CESA | FESA | Potential to Occur on Subject Property |
|--|--------------------------------|------------------------------|-----------------|------|------|--|
| <i>Amsinckia lunaris</i> | bent-flowered fiddleneck | annual herb | 1B.2 | None | None | Low, not observed |
| <i>Arctostaphylos andersonii</i> | Anderson's manzanita | perennial evergreen shrub | 1B.2 | None | None | Low, not observed |
| <i>Arctostaphylos glutinosa</i> | Schreiber's manzanita | perennial evergreen shrub | 1B.2 | None | None | Low, not observed |
| <i>Arctostaphylos ohloneana</i> | Ohlone manzanita | evergreen shrub | 1B.1 | None | None | Low, not observed |
| <i>Arctostaphylos pajaroensis</i> | Pajaro manzanita | perennial evergreen shrub | 1B.1 | None | None | Low, not observed |
| <i>Arctostaphylos silvicola</i> | Bonny Doon manzanita | perennial evergreen shrub | 1B.2 | None | None | Low, not observed |
| <i>Arenaria paludicola</i> | marsh sandwort | perennial stoloniferous herb | 1B.1 | CE | FE | Low, no suitable habitat |
| <i>Calyptidium parryi</i> var. <i>hesseae</i> | Santa Cruz Mountains pussypaws | annual herb | 1B.1 | None | None | Low, no suitable habitat |
| <i>Campanula californica</i> | swamp harebell | perennial rhizomatous herb | 1B.2 | None | None | Low, no suitable habitat |
| <i>Carex saliniformis</i> | deceiving sedge | perennial rhizomatous herb | 1B.2 | None | None | Low, no suitable habitat |
| <i>Chorizanthe pungens</i> var. <i>hartwegiana</i> | Ben Lomond spineflower | annual herb | 1B.1 | None | FE | Low, no suitable habitat |
| <i>Chorizanthe robusta</i> var. <i>hartwegii</i> | Scotts Valley spineflower | annual herb | 1B.1 | None | FE | Low, no suitable habitat |
| <i>Chorizanthe robusta</i> var. <i>robusta</i> | robust spineflower | annual herb | 1B.1 | None | FE | Low, no suitable habitat |
| <i>Collinsia multicolor</i> | San Francisco collinsia | annual herb | 1B.2 | None | None | Low, not observed |
| <i>Dacryophyllum falcifolium</i> | tear drop moss | herb | 1B.3 | None | None | Low, no suitable habitat |
| <i>Eriogonum nudum</i> var. <i>decurrens</i> | Ben Lomond buckwheat | perennial herb | 1B.1 | None | None | Low, no suitable habitat |
| <i>Erysimum teretifolium</i> | Santa Cruz wallflower | perennial herb | 1B.1 | CE | FE | Low, no suitable habitat |
| <i>Fissidens pauperculus</i> | minute pocket moss | moss | 1B.2 | None | None | Low, no suitable habitat |
| <i>Grindelia hirsutula</i> var. <i>maritima</i> | San Francisco gumplant | perennial herb | 3.2 | None | None | Low, not observed |
| <i>Hoita strobilina</i> | Loma Prieta hoita | perennial herb | 1B.1 | None | None | Low, no suitable habitat |

Table 2. List of Special Status Plant Species with Potential to Occur at Maplethorpe Lane Property, October 2018

| Scientific Name | Common Name | Lifeform | Rare Plant Rank | CESA | FESA | Potential to Occur on Subject Property |
|---|----------------------------------|---------------------------|-----------------|------|------|--|
| <i>Holocarpha macradenia</i> | Santa Cruz tarplant | annual herb | 1B.1 | CE | FT | Low |
| <i>Horkelia cuneata ssp. sericea</i> | Kellogg's horkelia | perennial herb | 1B.1 | None | None | Low, not observed |
| <i>Horkelia marinensis</i> | Point Reyes horkelia | perennial herb | 1B.2 | None | None | Low, not observed |
| <i>Lessingia micradenia var. glabrata</i> | smooth lessingia | annual herb | 1B.2 | None | None | Low, no suitable habitat |
| <i>Malacothamnus arcuatus</i> | arcuate bush-mallow | perennial evergreen shrub | 1B.2 | None | None | Low, no suitable habitat |
| <i>Microseris paludosa</i> | marsh microseris | perennial herb | 1B.2 | None | None | Low, no suitable habitat |
| <i>Monolopia gracilens</i> | woodland woollythreads | annual herb | 1B.2 | None | None | Low, no suitable habitat |
| <i>Pedicularis dudleyi</i> | Dudley's lousewort | perennial herb | 1B.2 | CR | None | Low, no suitable habitat |
| <i>Penstemon rattanii var. kleei</i> | Santa Cruz Mountains beardtongue | perennial herb | 1B.2 | None | None | Low, no suitable habitat |
| <i>Pentachaeta bellidiflora</i> | white-rayed pentachaeta | annual herb | 1B.1 | CE | FE | Low |
| <i>Piperia candida</i> | white-flowered rein orchid | perennial herb | 1B.2 | None | None | Low, no suitable habitat |
| <i>Plagiobothrys chorisianus var. chorisianus</i> | Choris' popcorn-flower | annual herb | 1B.2 | None | None | Low, not observed |
| <i>Plagiobothrys diffusus</i> | San Francisco popcorn-flower | annual herb | 1B.1 | CE | None | Low, not observed |
| <i>Polygonum hickmanii</i> | Scotts Valley polygonum | annual herb | 1B.1 | CE | FE | Low, no suitable habitat |
| <i>Rosa pinetorum</i> | pine rose | perennial shrub | 1B.2 | None | None | Low, not observed |
| <i>Silene verecunda ssp. verecunda</i> | San Francisco champion | perennial herb | 1B.2 | None | None | Low, not observed |
| <i>Stebbinsoseris decipiens</i> | Santa Cruz microseris | annual herb | 1B.2 | None | None | Low, no suitable habitat |
| <i>Trifolium buckwestiorum</i> | Santa Cruz clover | annual herb | 1B.1 | None | None | Low, no suitable habitat |

CNPS Status: List 1B: These plants (predominately endemic) are rare through their range and are currently vulnerable or have a high potential for vulnerability due to limited or threatened habitat, few individuals per population, or a limited number of populations. List 1B plants meet the definitions of Section 1901, Chapter 10 of the CDFG Code.

5.2 Special Status Wildlife

Special status wildlife species include those listed, proposed or candidate species by either the Federal or the State resource agencies, as well as those identified as State species of special concern. In addition, all raptor nests are protected by Fish and Game Code, and all migratory bird nests are protected by the Federal Migratory Bird Treaty Act. Special status wildlife species were evaluated for their potential presence in the project area as described in Table 3 below. Only one special status species, the woodrat, was observed on this property. The property does not have suitable habitat for the other special status species known from the greater vicinity of Soquel. However, native birds may nest in the trees.

Table 3. List of Special Status Wildlife Species with Potential to Occur at Maplethorpe Lane, Property, October 2018, Soquel Quadrangle

| SPECIES | STATUS ¹ | HABITAT | POTENTIAL OCCURRENCE ON SITE |
|---|---------------------|---|---|
| Invertebrates | | | |
| Ohlone tiger beetle <i>Cicindela ohlone</i> | FE | Coastal terrace prairie with sparse vegetation and openings, Watsonville loam soils | No suitable habitat |
| Zayante band-winged grasshopper <i>Trimerotropis infantilis</i> | FE | Openings in sand hills parkland habitat with Zayante sandy soils | No suitable habitat |
| Monarch butterfly <i>Danaus plexippus</i> | * | Eucalyptus, acacia and pine trees groves provide winter habitat when they have adequate protection from wind and nearby source of water | None |
| Fishes | | | |
| Steelhead – Central coast DPS <i>Oncorhynchus mykiss</i> | FT | Perennial creeks and rivers with gravels for spawning. | None; creek is intermittent. |
| Tidewater goby <i>Eucyclogobius newberryi</i> | FE, CSC | Coastal lagoons and associated creeks up to 1 mile inland | None |
| Eulachon <i>Thaleichthys pacificus</i> | FT | Anadromous fish that spawns in lower reaches of coastal rivers with pea sized gravel, sand and woody debris | None; creek is intermittent |
| Amphibians | | | |
| Santa Cruz long-toed salamander <i>Ambystoma macrodactylum croceum</i> | FE, SE | Ponds for breeding with water at least into June. Riparian, oak woodland, coastal scrub for upland habitat. | None. Site lacks breeding habitat and is well outside the known range of this species. |
| California giant salamander <i>Dicamptodon ensatus</i> | CSC | Wet coastal forests near streams and seeps; breed in streams | No suitable habitat on site, no perennial waterways; closest known sites are > 5 miles. |
| Foothill yellow-legged frog <i>Rana boylei</i> | CSC | Perennial creeks with cobble substrate for egg attachment. | None; creek is intermittent |
| Reptiles | | | |
| Western pond turtle <i>Emys marmorata</i> | CSC | Creeks and ponds with water of sufficient depth for escape cover, and structure for basking; grasslands or bare areas for | None; creek intermittent |

Table 3. List of Special Status Wildlife Species with Potential to Occur at Maplethorpe Lane, Property, October 2018, Soquel Quadrangle

| SPECIES | STATUS ¹ | HABITAT | POTENTIAL OCCURRENCE ON SITE |
|---|---------------------|--|--|
| | | nesting. | |
| Mammals | | | |
| Pallid bat (<i>Antrozous pallidus</i>) | CSC | Roosts in rock outcroppings, caves, hollow trees, mines, building and bridges; extremely sensitive to human disturbance. | None |
| Townsend's big-eared bat <i>Corynorhinus townsendii</i> | CSC | Roosts in buildings, caves; extremely sensitive to human disturbance | None |
| San Francisco dusky-footed woodrat (<i>Neotoma fuscipes annectens</i>) | CSC | Woodlands including oaks, willow riparian, Eucalyptus | One woodrat house observed in oak woodland |

¹ Key to status

| | | | | | |
|-----|---|---|----|---|--|
| SE | = | State listed as endangered species | FE | = | Federally listed as endangered species |
| ST | = | State listed as threatened species | FT | = | Federally listed as threatened species |
| CSC | = | California species of special concern | | | |
| * | = | Species of local concern under County LCP | | | |

6.0 PROJECT REVIEW AND RECOMMENDATIONS

6.1 Thresholds of Significance

The thresholds of significance presented in the CEQA Guidelines were used to evaluate project impacts and to determine if implementation of the proposed Project would pose significant impacts to botanical resources. For this analysis, significant impacts are those that substantially affect, either directly or through habitat modifications:

- a) A species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW or USFWS or NMFS;
- b) Riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS;
- c) Federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
- f) Conflict with the provisions of an adopted Habitat Conservation plan, Natural Community Conservation plan, or other approved local, regional, or state habitat conservation plan.

6.2 Environmental Impacts, Mitigation Measures and Significance Determination for The Proposed Project

The proposed project (plans by C2G Civil Consultants Group, dated 9/27/18) was evaluated for potential direct and indirect impacts to biotic resources, as per the CEQA criteria presented above. Impacts to sensitive habitats/resources and/or special status species were considered potentially significant. A

discussion of project features and determination of potential impacts, as per CEQA criteria (a) through (f) are presented below.

- a) **Special Status Species.** The San Francisco dusky footed woodrat is a California Special of Special Concern. One woodrat house was observed approximately 70 feet from the edge of the proposed project work area and will not be disturbed by the construction. Visible orange construction fencing is recommended to be placed along the edge of the work area to avoid any inadvertent entry of equipment into the oak woodland area with the woodrat house (see BIO-1, below).
- b) **Riparian Woodland.** The riparian woodland, including the open water and aquatic resources in the intermittent creek, is a sensitive and regulated habitat. Projects within this resource require implementation of avoidance and minimization measures and compensatory mitigation for unavoidable impacts. Residential development (buildings and parking lot) require a setback of at least 50 feet from the County-designated riparian woodland (see Figure 2).

All of the proposed development is located outside the riparian woodland. All structures, except for the stormwater infiltration chambers, a drain line and a new storm drain inlet, will be located outside the 50-foot riparian setback area. Placement of these project features in the setback area may require a riparian exception from the County, pending confirmation by the County. The project will not directly impact the riparian woodland; therefore, no mitigation is identified.

Due to the close proximity of the residential units to the riparian area there may be demand for residents to use the 50-foot wide riparian setback area for recreation. As such, incompatible uses may occur within the setback area and adjacent riparian woodland. The following measure is identified to avoid or reduce potential indirect impacts to the riparian woodland from the residential development.

Recommended Measure BIO-1: The project shall implement standard erosion control BMP's and riparian habitat protection measures prior to, during, and after the construction period to minimize impacts to the intermittent creek, including:

- a. Install plastic mesh fencing at the perimeter of the work area to prevent inadvertent impacts to the adjacent forest vegetation, creek channel, and injury to adjacent native trees. Protective fencing shall be in place prior to ground disturbances and removed once all construction is complete. During construction, no grading, construction or other work shall occur outside the designated limits of work.
 - b. Install perimeter silt fencing and construction area limit-of-work fencing.
 - c. No excess soil, chemicals, debris, equipment or other materials shall be dumped or stored outside the designated limits of work.
 - d. Hand tools shall be used to trim vegetation to the extent necessary to gain access to the work area. All removed material/vegetation shall be removed from the riparian corridor.
 - e. All staging of equipment and materials, and refueling of equipment, shall be located in existing roadways and parking areas. The contractor shall prepare and implement a fuel spill prevention and clean-up plan.
 - f. Implement erosion control on disturbed areas. Utilize a native erosion control seed mix.
- c) **Federally Protected Wetlands.** The creek was found to support federal jurisdictional areas. Federal jurisdiction typically extends to the Ordinary High Water Mark of waterway; however, jurisdiction can also include adjacent wetlands (vegetated areas above OHWM). No activity is proposed to occur in this area as per the current site plan. No impacts are expected.

- d) **Migratory Birds.** Nesting birds may occur in the landscape trees, oak trees, and riparian vegetation to be removed as well as in woodland adjacent to the project site. Removal of trees and other vegetation for construction has the potential to kill or injure nesting birds, if any are present in the construction area. Noise from construction has the potential to cause abandonment by adult birds of chicks or eggs in areas of close proximity to construction. Because most nesting birds are protected by the Migratory Bird Treaty Act, measures are listed in BIO-2 below to avoid potentially significant impacts if any are present during construction.

Recommended Measure BIO-2: To avoid impacting nesting birds, if present, schedule construction to occur between August 1 and March 1 of any given year, which is outside the bird nesting season. Because of the proximity of the trees and other vegetation removal proposed for this project to the riparian corridor, it is not practical to establish a “buffer zone” to protect nesting birds that may be outside the work area, but in close proximity. Therefore, the only practical solution is to implement the tree and vegetation removal outside the nesting season for birds on the Central California Coast.

- e) **Local Policies or Ordinances.** The County has a sensitive habitat ordinance that regulates vegetation removal and other impacts within designated habitats. The riparian woodland and oak woodland are identified as sensitive habitat under County Code. Please refer to item b), above for the riparian woodland.

The site plan depicts residential development within the oak woodland. Residential Units #1, #2 and #9, as well as associated infrastructure for these units, will affect approximately 8,935 square feet of oak woodland area (based on extent of dripline). Vegetation removal will include the removal of 19 mature oak trees (some of these trees have double, triple or quad trunks) and herbaceous understory vegetation. This vegetation removal is a significant impact to biological resources.

Native trees adjacent to construction, but scheduled to be retained, could be inadvertently impacted from construction activities (e.g., limb breakage, damage to tree trunks, etc.). In addition, human uses within and/or in close proximity to the retained habitat areas can adversely affect native wildlife utilization of the habitat.

Recommended Measure BIO-3: Implement compensatory mitigation for impacts to the oak woodland to achieve the following:

- a. Assuming a permanent impact to oak woodland of approximately 8,935 sq. ft. for the residential development, designate a minimum of 17,870 sq. ft. of area to establish native oak woodland to achieve a 2:1 habitat replacement ratio. Mitigation for permanent impacts shall occur in areas not currently supporting oak trees/woodland. A preliminary review of the property found suitable areas between the existing riparian dripline and the proposed residential area and an area north of proposed Unit #9 which would be suitable for the establishment of oak woodland habitat. This area is located outward of the existing riparian woodland. This mitigation will provide adequate compensation for permanent impacts to the oak woodland and provide the following riparian functions: cover and forage for native wildlife and native oak woodland plant diversity at a 2:1 (replacement: impact) ratio.
- b. Rehabilitate all areas temporarily disturbed by construction at a 1:1 ratio.
- c. Install native oak woodland vegetation that can persist in winter-wet and summer-dry site conditions. Provide a minimum oak tree replacement ratio of 2:1. Provide supplemental

irrigation in Years 1-3, or longer if there is an unseasonable drought or other unforeseen circumstance that requires a longer irrigation period.

- d. Utilize plant propagules collected from the greater Soquel Creek watershed and/or Santa Cruz County in the revegetation efforts. Obtain plants from native plant nurseries that employ Best Management Practices (BMP's) that control or eliminate the diseases caused by *Phytophthora ramorum*, as outlined by the California Oak Mortality Task Force.
- e. Maintain 100% survival of installed container stock in Years 1-3, then achieve 80% survival in Years 4-5. Install replacement plants if needed to meet survival rates. If substantial replanting is necessary, the maintenance and monitoring period may need to be extended so that each plant is maintained and monitored for 5 years.
- f. Control cover of target invasive weeds (e.g., thistles, Cape ivy, calla lily, and others) to less than 5% each year.
- g. Maintain and monitor the site annually for 5 years, or longer until success criteria have been met. Submit annual reports to County Planning Department by December 31 of each monitoring year.

Recommended Measure BIO-4: Trees to be retained that are located adjacent to construction shall be protected during construction, as directed by an arborist. If inadvertent damage to trees occurs, a remediation program should be developed by the arborist and implemented; the measures shall be inspected by the County of Santa Cruz Planning Department and arborist to determine the success of the remedial measures.

Recommended Measure BIO-5: To reduce project impacts from the project's encroachment into the County-designated riparian setback area and oak woodland, the applicant shall install a low split-rail type fence or other barrier between the retained woodlands (and oak woodland mitigation areas) and the residential development. The fence or barrier would protect the retained/created woodlands from indirect impacts from facility users (i.e., trampling, deposition of debris, etc.). Allowable uses with the retained/created woodland (including riparian setback area) should be limited to periodic maintenance of the planted trees and shrubs associated with habitat mitigation and periodic control of invasive, non-native plant species. Active recreational activities, such as play structures or other play areas, as well as urban gardening, should not be allowed within the protected areas. The landowner or HOA should be responsible for monitoring and enforcing use restrictions within the protected woodlands and setback area.

- f) **Habitat Conservation Plan.** The project site is not located in an area subject to a Habitat Conservation plan, Natural Community Conservation plan or other approved conservation plan. The project site is not located within any designated critical habitat for any federally-listed species.

7.0 REFERENCES AND LITERATURE CITED

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Jepson Manual 2012. The Jepson Manual – Vascular Plants of California

Initial Study Attachment 5



COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT

701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
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KATHLEEN MOLLOY, PLANNING DIRECTOR

John Swift
500 Chestnut Street
Santa Cruz, CA 95060

February 27, 2019

Subject: 3300 Maplethorpe Lane Biotic Report Review and Conditioned Biotic Approval

APN: 037-121-60

Application #: REV181190, 181586

Dear Mr. Swift,

The Planning Department has received and reviewed the Biotic Report dated October 11, 2018 prepared for APN 037-121-60 by *Biotic Resources Group*. Preparation of a biotic report was required because of the potential for sensitive habitats and protected plant and animal species on the approximately 3.5 acre parcel where a multiple-unit development project is proposed.

The proposed project (Application # 181586) involves construction of an 11-unit housing complex and associated residential improvements where a commercial nursery operation currently exists. Project features include a driveway entrance from Maplethorpe Lane, 11 detached buildings, driveways and parking spaces, stormwater treatment/infiltration chambers, and installation of a new drainage pipe and storm drain inlet. Proposed development activities include demolition of existing structures, removal of fences, grading, removal of mature trees, construction of new structures, residential landscaping, and native plant restoration activities.

The Biotic Report was received by the County Staff Biologist on January 7, 2019. An Arborist Report dated September 28, 2018 prepared by Kurt Fouts, and a draft Landscape Planting Plan were provided by the applicant on February 11, 2019. The Arborist report addresses tree removal on the property, and provides recommendations for tree removal, preservation, and protection measures. The Planting Plan outlines locations and plant pallets for both native plant restoration areas and horticultural landscaping areas. A copy of the Biotic Report, Arborist Report, and Draft Landscape Planting Plan are included as attachments 1-3. The County staff biologist visited the project site on February 11, 2019 with the County's consulting biologist Bill Davilla of Ecosystems West Consulting Group (Ecosystems West).

The Biotic Report identifies 5 habitat types on the project site: non-native annual grassland, landscaped areas, blackberry scrub, oak woodlands, and riparian woodlands. The property also includes a large developed area that is currently paved and occupied by commercial greenhouses. Approximately 1.5 acres of coast live oak woodland occurs on the property interspersed with a mosaic of non-native grassland. This woodland/grassland mosaic has been managed, through regular mowing, into a park-like setting for use by the property owners, tenants, and neighboring residents as a recreational area. Mature riparian woodland habitat, supported by an intermittent unnamed drainage feature, occurs along the entire eastern property line. The boundary of this riparian woodland was mapped and flagged by the biologist and confirmed in the field by Environmental Planning staff. This riparian corridor, 50-foot riparian buffer zone, and additional 10' buffer are mapped on the Project Plans (dated 9/20/18).

The Biotic Report identifies habitat for dusky footed woodrat on the project site. Dusky footed woodrat is a California Species of Special Concern. One dusky footed woodrat house was observed in the oak woodland habitat. In addition, several other prominent woody nests were observed during the February 11 field visit, at least one in close proximity to the ground, that may be used by dusky-footed woodrats. No other habitat for Federal or State listed wildlife species was identified on the project site.

Two special-status plant species were evaluated with potential to occur on the project site. Focused surveys for Santa Cruz clover (*Trifolium buckwestiorum*; CNPS list 1B.1) were conducted during the evident and identifiable period for this species. Santa Cruz clover was not observed during these surveys. In addition it was concluded during field surveys that habitat for Santa Cruz clover does not occur on the project site. Although botanical surveys for Santa Cruz tarplant (*Holocloa macradenia*; CNPS list 1B.1, SE, FT) were not conducted during the evident and identifiable period of this species, field surveys indicated that habitat for Santa Cruz tarplant does not occur on the project site.

The unnamed drainage along the eastern portion of the project site is regulated under the Clean Water Act Section 404 by U. S. Army Corps of Engineers (USACE), and Section 401 by the Regional Water Quality Control Board (RWQCB). The associated riparian habitat is subject to regulation under the Porter-Cologne Water Quality Act as “Waters of the State”, and under California Fish and Game Code Section 1602. In addition, riparian corridors are granted protections under the County’s Sensitive Habitat Protection and Riparian Corridor and Wetlands Protection ordinances. Oak woodlands are protected under the County’s Sensitive Habitat Ordinance.

The Biotic Report and Project Plans (dated 9/20/18), show that the project will avoid encroaching into the boundaries of the Riparian Woodland as delineated by the drip-line of riparian vegetation. No structural additions are proposed within the 50-foot riparian buffer zone, or additional 10’ buffer, protected under the County Riparian Corridor and Wetlands Protection ordinances. However, some development activities are proposed within this area including removal of existing greenhouse structures, grading, and re-habilitation of native habitat. These activities are being considered by Environmental Planning Staff to be habitat restoration measures required as a condition of County approval of a permitted project, and therefore a Riparian Exception would not be required for the project as it is currently designed. The project proposes to tie-in to an old drainage outfall that is located within the Riparian Woodland. The outfall may require improvements as a result of the project. If during development review it is determined that the drainage outfall must be replaced or significantly altered, a Riparian Exception may be required.

According to the Biotic Report, the project will result in approximately 8935 square feet of permanent impacts to oak woodland habitat including removal of 19 mature oak trees. According to the Arborist Report, adjustments were made during preliminary project design to incorporate the arborist’s recommendations to avoid and minimize impacts to oak woodlands.

The project site contains potential habitat for nesting birds. Birds of prey and migratory birds are protected under the California Fish and Game Code, and the Federal Migratory Bird Treaty Act (MBTA). Under the MBTA, it is unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill” a migratory bird unless and except as permitted by regulations.

There are sensitive habitat constraints on the project site associated with special-status species, oak woodlands, riparian habitat, and habitat for nesting birds that must be considered during project implementation. The Biotic Report and Arborist Survey recommend measures to address these constraints. The County Conditions of Approval below incorporate these recommended measures. These Conditions shall be incorporated into any development permits issued for the proposed project.

Project Conditions

In order to develop parcel 037-121-60 under the current proposal (181586) the following conditions shall apply:

1) To minimize impacts to oak woodlands and riparian woodland habitat:

- There are existing greenhouse structures and paving located within the 50-foot riparian buffer zone. These structures shall be removed and the natural soil substrate re-habilitated prior to installing replacement plantings in accordance with the with the Restoration Planting Plan outlined below.
- The Tree Protection Guidelines and Restrictions in Appendix G of the attached Arborist Report shall be adhered to.
- No work shall occur within areas identified as riparian woodland habitat.
- Prior to construction, high visibility construction fencing or flagging shall be installed around the limits of work (limits of grading) to prevent inadvertent grading or other disturbance within the surrounding sensitive habitats. No work-related activity including equipment staging, vehicular access, grading, and vegetation removal shall be allowed outside of the limits of work.
- No excess soil, chemicals, debris, equipment or other materials shall be dumped or stored outside the designated limits of work.
- Upon project completion, areas of exposed soil shall be re-vegetated with locally native erosion control species. Non-native grasses or forbs may not be used for erosion control.
- Tree removal shall be limited to those depicted in the Arborist Report. Trees to be retained that are located adjacent to construction shall be protected in accordance with the Tree Protection Guidelines and Restrictions in Appendix G of the Arborist Report.
- Implementation of standard erosion control best management practices and riparian habitat protection measures shall be adhered to prior, during, and after the construction period to minimize impacts to the intermittent drainage.
- The applicant shall install a low split-rail type fence or other permanent barrier between the retained woodlands (and oak woodland mitigation areas) and the residential development.

2) To compensate for impacts resulting from removal of, or damage to, native trees within oak woodlands:

- All permanently impacted areas of oak woodland habitat shall be compensated for at a 2:1 replacement ratio by creating oak woodland habitat in designated mitigation areas on site.
- All native oak trees removed or damaged during construction shall be replaced in-kind at a minimum 2:1 replacement ratio within designated oak woodland mitigation areas on site.
- Additional restoration plantings shall occur at sizes and ratios determined by the restoration specialist to establish 2:1 replacement of oak woodland habitat while maximizing plant health and survivability of individual trees and shrubs.
- A final Restoration Planting Plan shall be prepared by a certified arborist, or restoration professional and submitted to Environmental Planning staff for approval prior to implementation. The approved Restoration Planting Plan shall be implemented prior to final building inspection and shall include the following minimum elements:
 - Establishment of designated oak woodland mitigation area(s) on site to achieve a 2:1 habitat replacement ratio.
 - Methods for rehabilitating soil substrate in areas identified for oak woodland restoration that were previously covered in asphalt or other development.
 - Species, size and locations of all trees intended for removal.
 - Species, size and locations of all trees and shrubs being planted.
 - Information regarding the methods of irrigation for replacement plantings.
 - 5-year management plan for maintenance and monitoring of restored areas to maintain 100% survival of installed container stock in years 1-3, and at least 80% survival in years

4-5. Replacement plants shall be installed as needed during the monitoring period to meet survival rates. Annual reports shall be submitted to the County Planning Department by December 31 of each monitoring year.

- A management strategy to control cover of target invasive weeds (e.g., thistles, Cape ivy, calla lily, and others) to less than 5% each year.
- Prior to final building inspection approval, planting of oak woodland mitigation area(s) shall be inspected and approved by Environmental Planning staff.

4) To minimize impacts to dusky-footed woodrat:

- At least two weeks prior to commencement of development activities (including tree removal), a qualified biologist shall survey the project disturbance area to confirm wood rat nest locations that may be affected by the proposed development.
- Where dusky-footed woodrat houses are identified, disturbance of the species and their nests shall be avoided by creating a no disturbance buffer around the nests with high visibility fencing.
- If dusky-footed woodrat houses are identified in the project disturbance area, and avoidance is not possible, County Environmental Planning staff shall be notified immediately, and the following conditions shall be adhered to:
 - Prior to nest disturbance, the biologist shall obtain from CDFW a scientific collection permit for the trapping of the dusky-footed wood rats.
 - Nests shall be disturbed/dismantled only during the non-breeding season, between October 1 and December 31.
 - Prior to nest disturbance, wood rats shall be trapped at dusk of the night set for relocation of the nest(s).
 - Any existing nest that may be disturbed by construction activities shall be mostly dismantled and the material spread in the vicinity of identified nest relocation site(s).
 - In order to avoid the potential health effects associated with handling rodents and their milieu, all workers involved in the handling of the wood rats or the nest materials should wear protective gear to prevent inhalation of contaminant particulates, contact with conjunctiva (eyes), and protection against flea bites; a respirator, eye protection and skin protection should all be used.
 - Dismantling shall be done by hand, allowing any animals not trapped to escape either along existing woodrat trails or toward other available habitat.
 - If a litter of young is found or suspected, nest material shall be replaced, and the nest left alone for 2-3 weeks before a recheck to verify that young are capable of independent survival before proceeding with nest dismantling.
 - Woody debris shall be collected from the area and relocated nests shall be partially constructed in an area determined by the qualified biologist to be both suitable for the wood rats and far enough away from the construction activities that they will not be impacted.
 - Rats that were collected at dusk shall be released hours before dawn near the newly constructed nests to allow time for rats to find refuge.

5) To avoid impacts to nesting birds:

- If removal of vegetation, grading activity, or other use of heavy equipment begins outside the February 1 to August 31 breeding season, there will be no need to conduct a preconstruction survey for active nests.
- Trees intended for removal shall be removed during the period of September 1st through January 31st, in order to avoid the nesting season.
- If removal of vegetation, grading activity, or other use of heavy equipment is to commence between February 1st and August 31st, a survey for active bird nests shall be conducted by a qualified biologist within 15 days prior to the start of such activity. The survey area shall include the project area, and a survey radius around the project area of 50 feet for MBTA birds and 250

feet for birds of prey.

- If no active nest of a bird of prey or MBTA bird is found then no further avoidance and minimization measures are necessary.
- If active nest(s) of MBTA birds or birds of prey are found in the survey area, an avoidance buffer of 50 feet for MBTA birds and 250 feet for birds of prey shall be established around the active nest(s). The biologist shall monitor the nest, and advise the applicant when all young have fledged the nest. Removal of vegetation, grading activity, or other use of heavy equipment may begin after fledging is complete.
- If the biologist determines that a smaller avoidance buffer will provide adequate protection for nesting birds, a proposal for alternative avoidance/protective measures, potentially including a smaller avoidance buffer and construction monitoring, may be submitted to Environmental Planning staff for review and approval prior to removal of vegetation, grading activity, or other use of heavy equipment.
- If removal of vegetation, grading activity, or other use of heavy equipment stops for more than two weeks during the nesting season (February 1st - August 31st) a new survey shall be conducted prior to re-commencement of construction.

By incorporating these conditions, the project will result in no significant impacts to sensitive habitat or species, and will improve the habitat features present on this parcel. A copy of this biotic approval has been provided to the Resource Planner and Project Planner for incorporation into your outstanding permit applications.

If you have any questions regarding this letter, please feel free to contact me by email or telephone at Juliette.Robinson@santacruzcounty.us or 831-454-3156.

Sincerely,



Juliette Robinson
Environmental Planner, Biologist

CC: Kathleen Lyons, Biotic Resources Group
Bob Loveland, Area Resource Planner
Randall Adams, Project Planner



February 20, 2019

Juliette Robinson
Environmental Coordinator
Planning Department
County of Santa Cruz
701 Ocean Street
Santa Cruz, CA 95060

Re: Biological Review of the Biotic Report for the 3300 Maplethorpe Lane, Soquel Proposed Residential Development (REV No. 181190)

Dear Juliette:

This letter summarizes my review of the “Biotic Report for 3300 Maplethorpe Lane, Soquel Proposed Residential Development” prepared by Biotic Resources Group dated October 12, 2018. The biotic survey and report findings were prepared to evaluate potential biological impacts and identify mitigations for construction of an eleven-single-family residence subdivision, including internal driveways, parking spaces, a parklet, and storm water treatment/infiltration chambers and drainage pipe. The parcel (APN 037-121-60) is located at 3300 Maplethorpe Lane north of Soquel Drive in the Soquel Planning area of Santa Cruz County. The parcel is characterized by a moderate to gently south-facing slope primarily supporting non-native grassland and oak woodland habitat with a centrally developed greenhouse complex on a flat graded terrace. An unnamed drainage occurs on the east side of the parcel. Ruderal habitat surrounds the greenhouse complex.

Kathleen Lyons, plant ecologist for Biotic Resources Group and Dana Bland, wildlife biologist for Dana Bland & Associates conducted reconnaissance field surveys of the parcel in October 2017 and April 2018. The focus of these surveys was to document habitat conditions to determine the potential for the occurrence of special-status species and habitats with potential to occur on or adjacent to the parcels, map and characterize vegetation communities within the study area, identify and characterize special-status habitats and conduct preliminary determination of stream features found on or adjacent to the parcels.

Bill Davilla of EcoSystems West and Juliette Robinson of the County of Santa Cruz Planning Department along with the applicant, Johnathon Swift conducted a site visit of the subject parcel on February 12, 2019 with a specific focus on those areas designated for development, improvements, and enhancement.

The vegetation habitats on the property are characterized by Ms. Lyon as non-native annual grassland/ruderal, riparian woodland, coast live oak woodland, blackberry scrub, and landscaped areas. Nomenclature for vegetation types does not follow the “Manual of California Vegetation”

(Sawyer, Keeler-Wolf and Evans 2008); however, Table 1 does cross-reference the vegetation types with plant associations from the Manual. During our field visit, we confirmed that the habitat typing, and mapping were consistent with our observations.

No special-status plant species were observed on the parcel and considering the habitats present on the property the potential is considered low (Table 1). Soils are mapped on the parcel as Watsonville loam and Tierra-Watsonville complex. Watsonville loam soil is an indicator for Santa Cruz tarplant habitat. Although surveys were a little too early and a little late phenologically to identify the presence on the parcel. If the plant was present, it should have been remnant individuals present in October. Since the “non-native grassland” has clearly been mowed and maintained it is unlikely that tarplant would be present. Also, this grassland feature appears to be a result of managing the oak woodland understory to favor annual grasses and forbs instead of subshrub and shrub habitat, the site was likely never grazed. One special-status wildlife species was observed during the reconnaissance field surveys, San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*). A den was observed in the prime oak woodland habitat just adjacent to the north-central property line. We observed this ground nest structure during our field visit. One prominent nest woody nest feature was observed during our field visit in a leaning oak near the access driveway to proposed Unit 9. This is likely a squirrel nest but since the nest is close to the ground and the tree provides an easy ramp to the nest structure, it should be confirmed prior to removal of the tree for driveway construction. No other special-status species were observed during their reconnaissance surveys or our site visit.

Mitigation measures proposed for the development include avoidance of the riparian habitat including a survey-level staked delineation of the riparian edge and 50+10-foot buffer from riparian edge. Based on the historical intensive land-use of the parcel, and avoidance measures proposed, I concur with the proposed BMPs and mitigation measures proposed in the report. I suggest a few additional recommendations include placing barrier fencing between the work areas and the woodrat nest to minimize the potential for woodrats being killed during construction. Also, replacement oak plantings should be planted along the entire length of the riparian buffer, rather than concentrated in the northern portion of the parcel.

Should you require further clarification of this review, please don't hesitate to contact me.

Sincerely,



Bill Davilla
Principal

Initial Study Attachment 6

ARBORIST REPORT-

Tree Resource Analysis, Construction Impacts & Protection
Plan for:

3300 Maplethorpe Lane
Soquel, CA
APN:037-121-60
September 28, 2018

Prepared for:

Mr. John Swift
500 Chestnut Street, Suite 100
Santa Cruz, CA 95060

Prepared by:



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Capitola, CA 95010
831-359-3607
kurtfouts1@outlook.com

ISA Certified Arborist WE0681A

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Attachments: Appendix A -H

Appendix A – Tree Assessment Chart

Appendix B – Criteria for Tree Assessment Chart

Appendix C - Tree Protection Plan Sheet

Appendix D – Tree Inventory – Aerial Image

Appendix E – Subject Tree Images

Appendix F – Bibliography

Appendix G - Tree Protection Guidelines & Restrictions

- Protecting Trees During Construction
- Project Arborist Duties & Inspection Schedule
- Tree Protection Fencing
- Tree Protection Signs
- Monitoring
- Root Pruning
- Tree Work Standards & Qualifications
- Development Site Tree Health Care Measures
- County of Santa Cruz - Regulated Tree

Appendix H - Assumptions & Limiting Conditions

SUMMARY

- An eleven-unit, two-phase, residential development is proposed at 3333 Maplethorpe Lane, Soquel.
- The existing commercial greenhouses will be demolished and replaced with new homes.
- Eighty-seven trees within or near the project limits were inventoried.
- Seventy-nine trees are coast live oak species and most are in fair condition.
- Seven of the oaks are in poor condition, are not suitable for preservation, and their removal is recommended.
- Nine oaks will be highly affected by the project and their removal is required.
- Seven coast redwoods are growing in concrete planter boxes, will be highly affected by the project and their removal is required.
- Mitigation measures for retained trees are specified and protection methods detailed.
- When final construction plans are submitted, additional protection specifications may be required.
- If tree removals are permitted by approval authority, replacement trees will be required.

Background

Plans will be submitted to the County of Santa Cruz Planning Department, for a two -phase, multiple-unit development project at 3333 Maplethorpe Lane, Soquel. The project will replace an existing commercial nursery operation. Mr. John Swift has requested my services, to assess the condition of 87 trees, including trees on properties immediately adjacent to the project limits, and the construction impacts that may affect them. Further, to provide a report with my findings and recommendations to meet County of Santa Cruz planning requirements.

The developer of this project enlisted my services at the beginning of the design process in part to reduce the possibility untimely late stage, site design changes based on infrastructure /tree conflicts. In conjunction with of this report, I have been working with the project team, to design the subdivision in a manner that ensures the impact to trees is minimized. Preliminary design efforts were facilitated by translating the information gathered in the resource evaluation/tree assessment spreadsheet, into recommendations about which trees were suitable for preservation and how much undisturbed space was required for them to remain viable. With this information, adjustments have been made by the design team for buildings, street and utility locations based on my recommendations.

Assignment

Provide an arborist report that includes an assessment of the trees within the project area. The assessment is to include the species, size (trunk diameter, height and canopy spread), condition (health and structure), and suitability for preservation ratings.

To complete this assignment, the following services were performed:

- **Tree Resource Evaluation:** Inventory, evaluate and assign suitability for preservation ratings for subject trees. Tag trees with numbered metal tags on north side of trunk.
- **Construction Impact Assessment:** Combine tree resource data with anticipated construction impacts, to provide recommendations for modification of plans to optimize tree retention.
- **Plan Review & Site Design Recommendations:** Reviewed preliminary civil plans by C2G Engineers, *Grading Plan, 3300 Maplethorpe Lane, Soquel*, dated 4/3/2018. Provided recommendations for site plan adjustments to optimize the number of trees preserved.
- **Plan Review:** Reviewed modified Civil Plan Set by C2G Engineers, *Tentative Improvement Plans, 3300 Maplethorpe Lane, Soquel* dated 9/20//2018, to inventory & interpret the number of trees appropriate for removal or retention.
- **Mapping:** Tree canopies were plotted onto: *Utility Plan* by C2G Engineers dated, 9/20/2018.

Limits of the Assignment

The information contained in this report covers only those items that were examined and reflects the condition of those items at the time of inspection on September 12, 2018.

The inspection is limited to visual examination of accessible items without climbing, dissection, excavation, probing, or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the trees in questions may not arise in the future.

Purpose and use of the report

The report is intended to identify all the trees within the plan area that could be affected by a project. The report is to be used by the developer, their agents, and the County of Santa Cruz as a reference for existing tree conditions and to help satisfy the County of Santa Cruz planning requirements.

Resources

All information within this report is based on site plans as of the date of this report.

Resources are as follows:

- Civil Plan Set by C2G Engineers dated, 9/20/2018.
- Site Visit, Tree Inventory & Condition Evaluation at,3333 Maplethorpe Lane, Soquel on 9/12/2018
- County of Santa Cruz Municipal Code – *Significant Tree Protection – Chapter 16.34.* (applicable sections).

OBSERVATIONS

The property is located at 3333 Maplethorpe Lane, Soquel. Much of the project site has been graded and is currently occupied by a series of greenhouses that served a commercial nursery production (Image #1, below). The land surrounding the green houses is ungraded. The terrain ranges from sloping to level and is bordered on the east perimeter by a seasonal creek. This creek and a riparian setback are located outside the project limits.



Image #1 – Approximate property boundaries. Approximate area of riparian setback, (to right of dashed line), is outside project limits.

The project area is comprised of 3 species of native trees, coast live oak, coast redwood and cypress. There are no non-native trees within the project area. Only native trees, 8 inches in diameter or greater (and two 7" trees), were inventoried. The 8-inch threshold was used, since similar development projects within Santa Cruz County have designated 8 inches, as a threshold tree diameter size, for native trees to be inventoried.

The inventoried trees (87 total), primarily consist of mature coast live oak (*Quercus agrifolia*), with 79 total trees. The oaks are spread throughout the project area, with seven located on adjacent properties. Most are in fair condition. There is a long row of oaks beginning near the entrance that continues for the length of the southern perimeter area (Image #2). Within this row is a closely spaced grouping of 28, smaller (2-7" in diameter), oaks.



Image #2 – A long row of oaks (right side of image), along southern perimeter.

There is a very dense grove of coast live oaks on the upper eastern edge of the project limits (Image #3), and many of these trees have unbalanced (one-sided) canopies, due to their closely spaced arrangement.



Image #3 – Grove of coast live oak on north east side of project boundaries.

A similarly crowded grove resulting in trees with unbalanced canopies exists on the mid to upper north western perimeter of the project limits.

There are seven young coast redwoods (*Sequoia sempervirens*), growing in large concrete planter boxes near the south perimeter (Image #4). Finally, one young cypress tree (*Hesperocyparis sp.*) was inventoried.

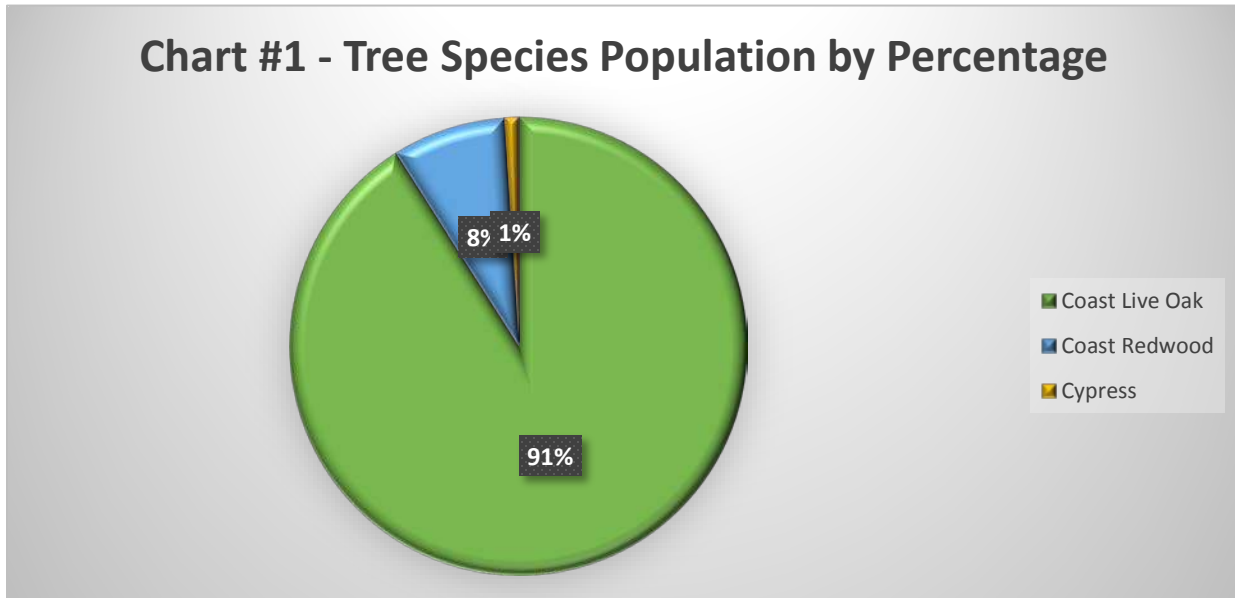


Image #4 – Row of coast redwoods located in planter boxes along southern perimeter. These trees compete for available light and space and suppress the canopy development of the coast live oaks located behind them.

East of the project limits, in the riparian setback area, are approximately 50 native trees with diameters of 8" or greater. Native tree species in the riparian area include, Monterey pine (*Pinus radiata*), big leaf maple (*Acer macrophyllum*), willows (*Salix sp.*), and coast live oak. Additionally, there are 8 non-native trees including, photinia (*Photinia X fraseri*), pittosporum (*Pittosporum undulatum*), maple (*Acer sp.*), and acacia (*Acacia melanoxylon*).

DISCUSSION

Most of the seventy - nine (79) coast live oaks, which make up a majority of the species population, can be retained for the project. Seven oaks in poor condition are recommended for removal and nine oaks will be highly affected by the project and will require removal. Seven coast redwoods growing in concrete planter boxes are located in the footprint of the new proposed street, are incompatible with the new site use, and will require removal.



Species List

TOTAL SUBJECT TREES: 87 Trees

Protected: 45

| | | |
|----|----------------|---------------------------------|
| 38 | Coast Live Oak | (<i>Quercus agrifolia</i>) |
| 7 | Coast Redwood | (<i>Sequoia sempervirens</i>) |

Not Protected: 38

| | | |
|----|----------------|-------------------------------|
| 41 | Coast Live Oak | (<i>Quercus agrifolia</i>) |
| 1 | Cypress | (<i>Hesperocyparis sp.</i>) |

A size criterion of 12 inches in diameter (at 4.5 feet above ground), was used to categorize trees as “protected” or “not protected” as listed above and in the attached, Tree Assessment Chart – Appendix A. Since any tree on a development project can be considered a “protected” tree, this is only a guideline to be used as an aid in decision making and is based on criteria used to categorize “significant” trees as noted in the Santa Cruz County Municipal Code: Significant Tree (A) “any group of 5 or more trees on one parcel, each greater than 12 inches D.B.H”.

Tree Evaluation and Recording Methods

Site evaluations were made on 9/12/2018. *The inventory included all trees within the project limits, and six “protected” trees on adjacent properties with canopies that overhang the project limits.* The health and structural **condition** of each tree was assessed and recorded. Based on the trees health and structural condition, each trees **suitability for preservation** was rated and recorded. **Impact levels** were assessed based on building site plan footprints, related elements such as utilities and the activities required to install those elements such as grading and trenching. The recorded data is included in the *Tree Assessment Chart, Appendix A*, of this report. Tree numbers correlating to the Tree Assessment Chart were plotted on the attached *Tree Protection Plan sheet, Appendix C*. Detailed criteria for each assessment rating category are included in Appendix B – *Criteria for Tree Assessment Chart*.

Condition Rating

A trees condition is determined by an assessing both the **health** and **structure**, then combining the two factors to reach a *condition rating*. Tree condition is rated as poor, fair or good. The quantity of trees assigned for each category (good, fair or poor), is indicated below:

Tree Condition Rating

- Good - 12
- Fair - 63
- Poor - 12

Suitability for Preservation

A trees suitability for preservation is determined based on its health, structure, age, species characteristics and longevity using a scale of good, fair or poor. The quantity of trees assigned to each category (good, fair or poor), is listed below.

Suitability Rating

- Good - 15
- Fair – 58
- Poor - 14

Impact Level

Impact level rates the degree a tree may be impacted by construction activity and is primarily determined by how close the construction procedures occur to the tree. Construction impacts are rated as low, moderate, high. The quantity of trees assigned for each category (low, moderate, high), is indicated below:

Impact Rating

- Low - 41
- Moderate – 21
- High - 20

Tree Protection Zone

The tree protection zone (TPZ), is a defined area within which certain activities are prohibited or restricted to minimize potential injury to designated trees during construction.

The size of the optimal TPZ can be determined by a formula based on: 1) trunk diameter 2) species tolerance to construction impacts, and 3) tree age (Matheny, N. and Clark, J 1998). In some instances, tree drip line is used as the TPZ. Development constraints can also influence the final size of the tree protection zone.

Fencing is installed to delineate the (TPZ), and to protect tree roots, trunk, and scaffold branches from construction equipment. *The fenced protection area may be smaller than the optimal or designated TPZ area in some circumstances.* Tree protection may also involve the armoring of the tree trunk and/or scaffold limbs with barriers to prevent mechanical damage from construction equipment. *See Tree Protection Guidelines & Restrictions – Appendix E.*

Once the TPZ is delineated and fenced (prior to any site work, equipment and materials move in), construction activities are only to be permitted within the TPZ if allowed for and specified by the project arborist.

Where tree protection fencing cannot be used, or as an additional protection from heavy equipment, tree wrap may be used. Wooden slats at least one inch thick are to be bound securely, edge to edge, around the trunk. A single layer or more of orange plastic construction fencing is to be wrapped and secured around the outside of the wooden slats. Major scaffold limbs may require protection as determined by the City arborist or Project arborist. Straw wattle may also be used as a trunk wrap and secured with orange plastic fencing.

Data has been entered in the *Tree Assessment Chart – Appendix A*, which indicates the optimal Tree Protection Zone for each tree.

Additional general tree protection guidelines are included in *Tree Protection Guidelines & Restrictions – Appendix G*.

Critical Root Zone

Critical Root Zone (CRZ) is the area of soil around the trunk of a tree where roots are located that provide critical stability, uptake of water and nutrients required for a tree's survival. The CRZ is the minimum distance from the trunk that trenching that requires root cutting should occur and can be calculated as three to the five times the trunk Diameter at Breast Height (DBH). For example, if a tree is one foot in trunk diameter than the CRZ is three to five feet from the trunk location. We will often average this as four times the trunk diameter or 1ft. DBH = 4ft. CRZ (Smiley, E.T., Fraedrich, B. and Hendrickson, N. 2007).

Construction Impacts to Subject Trees

Demolition Elements Affecting Subject Trees

1. Removal of existing A/C, #3 on demolition plan.
2. Removal of existing drainage pipe, #4 on demolition plan.
3. Removal of existing fencing, #8 on demolition plan.
4. Removal of existing gas line, #11 on demolition plan.

Construction Phases Affecting Subject Trees –

1. Installation of sanitary sewer line.
2. Installation of storm drain lines.
3. Installation of retaining wall adjacent to Lot #1.
4. Installation of roadway, curb and gutter.
5. Installation of parking stalls.
6. Installation of new buildings.

Impacts to Subject Trees by Tree Number –

Demolition:

1. Removal of existing A/C will impact trees T1, T83 & T87.
2. Removal of existing drainage pipe will impact tree T83.
3. Removal of existing fencing will impact trees most of the trees along the south perimeter, and trees T25 & T58.
4. Removal of existing gas line will impact tree T83.

Construction Phases:

1. Installation of sanitary sewer line will impact tree T26.
2. Installation of four storm drain line sections will impact trees in four different areas:
 - Area #1 (206 L.F.), below Units 3, 8 & 11, will affect most of the trees along the south perimeter.
 - Area #2 (50 L.F.), below Unit # 9, will affect trees T61 & 62.
 - Area #3 (73 L.F.), below Unit #2, will affect tree T83.
 - Area #4 (29 L.F.), east of Unit #11, will affect tree T24.
3. Installation of retaining wall adjacent to Lot #1 impact trees T74, 75, 76, & 77.
4. Installation of roadway, curb, gutter and/or sidewalk will impact trees T1 - 6 & T26, T28, T35 & 87 (roots) and T1, T3 – 6, T8, 9, T12-13, T28, T31, T35 & T36 (canopy clearance) .
5. Installation of parking stalls will impact trees T31, T33 & T83 (roots) and T33 & T83 (canopy clearance pruning).
6. Installation of new buildings will impact trees 26, 61, 62, 76 & 77 (canopy clearance pruning).

Mitigation Measures for Retained Trees

The trees retained on this project will require the following methods to protect them from the impacts described above and to minimize root or canopy damage during the demolition and construction phases.

- Tree Protection Fencing (all trees).
- Supervised machine and hand excavation.
- Supervised, selective and non-selective root pruning.
- Supervised, targeted canopy clearance pruning.

Detailed descriptions of the protection requirements (mitigation methods), listed above are specified below. Some of the demolition and construction work will affect the *critical root zones* of selected trees and mitigation methods including project arborist supervision is specified. *The Tree Protection Specifications & Recommended Sequence listed below, are included on the attached Tree Protection Plan sheet T1 and shall become an element of the final plan set.*

When final civil drawings are submitted, additional tree protections may be specified in an addendum or revision to this report and included on the *Tree Protection Plan* sheet T1 or an additional T2 sheet.

Tree Protection Specifications & Recommended Sequence

Demolition:

1. Remove existing cyclone fencing, (#8 on demolition plan). Where trees have grown thru wire mesh, carefully cut wire and remove without injuring tree bark.
2. Canopy Clearance Pruning – Targeted canopy clearance pruning of affected trees shall be supervised by project arborist and shall occur prior to commencement of Construction Phases.
3. Install Tree Protection fencing as indicated on Tree Protection Plan.
4. Remove existing drainage pipe, (#4 on demolition plan). Excavation, if required under canopy of tree T83 shall be accomplished by hand. If excavation is required, within the Tree Protection Zone, of tree T83, the Project Arborist shall be notified, and remaining work to remove pipe shall be supervised by Project Arborist.
5. Removal of existing gas line, (#11 on demolition plan). If excavation is required, within the Tree Protection Zone, of tree T83, the Project Arborist shall be notified, and remaining work shall be supervised by Project Arborist. *Capping and abandoning this line should be considered as an alternative to removal.*
6. Removal of existing A/C (#3 on demolition plan). All A/C/ removal under the canopies of trees T1, T83 & T87 shall be accomplished with a jack hammer and the pieces hand loaded.

Construction Phases:

1. Sanitary Sewer – Trenching for sewer line within 10X the diameter (8 feet), of tree T26 shall be accomplished by hand. If roots are encountered 2” in diameter or greater, they shall be pruned by methods indicated on Tree Protection Plan sheet, Pre-Construction Root Pruning.
2. Storm Drain Lines –
 - **Area #1** (206 L.F.), below Units 3,8 & 11. **The project arborist shall be notified 48 hours prior** to commencement of trenching for storm drain line along south perimeter between trees T6 to T23. Trenching shall be a combination of machine and hand excavation as supervised by project arborist.
 - **Area #2** (50 L.F.), below Unit # 9. Trenching for storm drain line within 10X the diameter (10 feet), of trees T61 & 62 shall be accomplished by hand. If roots are encountered 2” in diameter or greater, they shall be pruned by methods indicated on Tree Protection Plan sheet, Pre-Construction Root Pruning.
 - **Area #3** (73 L.F.), below Unit #2. **The project arborist shall be notified 48 hours prior** to commencement of trenching for storm drain line adjacent to tree T83. Trenching shall be a combination of machine and hand excavation as supervised by project arborist.
 - **Area #4** (29 L.F.), east of Unit #11. **The project arborist shall be notified 48 hours prior** to commencement of trenching for storm drain line adjacent to tree T24. Trenching shall be a combination of machine and hand excavation as supervised by project arborist.
3. Retaining Wall (Unit #1) - **The project arborist shall be notified 48 hours prior** to grading and retaining wall excavation, for Unit #1, that occurs inside the Tree Protection Zone of trees T74,75,76,&77. Excavation shall be a combination of machine and hand excavation as supervised by project arborist.
4. Roadway - **The project arborist shall be notified 48 hours prior** to excavation and grading for roadway. Grade changes around affected trees including T1-6, 25,28,35 &87 shall be accomplished with a combination of machine and hand excavation as supervised by project arborist.
5. Parking Stalls –
 - Below Unit #2: **The project arborist shall be notified 48 hours prior** to grading & excavation for parking stall adjacent to tree T83. Excavation shall be a combination of machine and hand excavation as supervised by project arborist.
 - Below Unit #9: Excavation for stall within 10X the diameter (10 feet), of tree T33 & within 19 feet of T31, shall be accomplished by hand. If roots are encountered 2” in diameter or greater, they shall be pruned by methods indicated on Tree Protection Plan sheet, Pre-Construction Root Pruning.
6. If the project is completed in two phases, the tree work and protection specification’s adjacent to Unit #9 and the related street and utility work, can be deferred until commencement of the second phase. This work includes tree removal, canopy clearance pruning, protection fencing, root pruning and other mitigation methods necessary to ensure long term tree survival.

Replacement Trees

As mitigation for trees removed, replacement trees will be required. The number and species of replacement trees or shrubs shall be specified by the County of Santa Cruz Environmental Planning Department.

Since most of the trees to be removed are native coast live oak, this is the species recommend for replacement. A re-planting design comprised of coast live oak, has been created by the project Landscape Architect based on planting specifications (minimum planting distances to buildings, roads and other trees), for this species, provided by the project arborist. The re-planting design is to be submitted with the civil plan set.

CONCLUSION

- An eleven-unit residential development is proposed at 3333 Maplethorpe Lane, Soquel.
- A portion of the area within the project limits was previously used for the production of ornamental plants and the existing commercial greenhouses will be demolished and replaced with new homes.
- Eighty-seven trees within or near the project limits were inventoried.
- Inventoried trees include those with a diameter of 8 inches or greater.
- Seventy-nine trees are coast live oak species and most are in fair condition.
- Seven of the oaks are in poor condition, are not suitable for preservation, and their removal is recommended.
- Nine oaks will be highly affected by the project and their removal is required.
- Seven coast redwoods are growing in concrete planter boxes, will be highly affected by the project, may have insufficient anchoring roots, are incompatible with new site use, and their removal is required.
- Mitigation measures for retained trees are specified and protection methods detailed.
- The mitigation measures include pre-construction root pruning and targeted canopy clearance pruning.
- If the project is completed in two phases, the tree work and protection specification's adjacent to Unit #9 and the related street and utility work, can be deferred until commencement of the second phase.
- When final construction plans are submitted, additional protection specifications may be required.
- If tree removals are permitted by approval authority, replacement trees will be required.

RECOMMENDATIONS

1. Obtain all necessary permits prior to removing or significantly altering any trees on site.
2. Remove trees in poor condition or if significantly impacted by the project.
3. Clearance prune tree canopies prior to construction phases, as specified in report.
4. Plant replacement trees for trees removed.
5. Ensure that all tree protection requirements for retained trees are executed. More detailed tree protection specifications will be included if necessary, after review of current submittal documents is completed and final construction plans are submitted.
6. This report is based on preliminary plan sets. Alterations to the site plan may change the evaluations and recommendations contained in this report.

Respectfully submitted,

Kurt Fouts

Kurt Fouts ISA Certified Arborist WE0681A



3300 Maplethorpe Lane, Soquel
Tree Assessment Chart - Appendix A

Suitability for Preservation Ratings:

Good: Trees in good health and structural condition with potential for longevity on the site

Fair: Trees in fair health and/or with structural defects that may be reduced with treatment procedures

Poor: Trees in poor health and/or with poor structure that cannot be effectively abated with treatment

Retention or Removal Code:


RT: Retain Tree

RI: Remove Due to Construction Impacts

I.M. Impacts Can Be Mitigated With Pre-Construction Treatments


R.C. Remove Due to Condition

Significant Tree- County of Santa Cruz, Any tree 20 inches or greater in diameter measured at 4.5 feet above grade per Santa Cruz County, Chapter 16:34, also any group of 5 or more trees on one parcel, each greater than 12" DBH

| Tree # | Species | Trunk Diameter @ 54 inches a.g. | Protected Tree | Crown Height & Spread | Health Rating | Structural Rating | Suitability for Preservation (Based Upon Condition) | Tree Protection Zone (in feet) | Construction Impacts (Rating & Description) | Retention or Removal Code | Comments |
|--|---|---------------------------------|----------------|-----------------------|---------------|-------------------|---|--------------------------------|---|---------------------------|---|
| T1 | coast live oak (<i>Quercus agrifolia</i>) | 12" | Yes | 30'X30' | Fair | Fair | Fair | 8' | Moderate- (Root loss- excavation, canopy loss- clearance pruning) | R.T. | 5' from new curb and street. Raise canopy to 14' for fire vehicle clearance. |
| T2 | coast live oak | 9" | No | 30'X20' | Fair | Fair | Fair | 6' | Low (Root loss excavation) | R.T. | |
| T3 | coast live oak | 10" | No | 30'X20' | Fair to Poor | Fair | Fair | 7' | Moderate- (Root loss- excavation, canopy loss- clearance pruning) | R.T. | 3' from new curb and street. Raise canopy to 14' for fire vehicle clearance. Split and missing bark with sap flow, at 1-4' above grade. Monitor for health. |
| T4 | coast live oak | 10" | No | 30'x15' | Fair | Fair | Fair | 7' | Moderate- (Root loss- excavation, canopy loss- clearance pruning) | R.T. | 3' from new curb and street. Raise canopy to 14' for fire vehicle clearance. |
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3300 Maplethorpe Lane, Soquel

Tree Assessment Chart - Appendix A

| Tree # | Species | Trunk Diameter @ 54 inches a.g. | Protected Tree | Crown Height & Spread | Health Rating | Structural Rating | Suitability for Preservation (Based Upon Condition) | Tree Protection Zone (in feet) | Construction Impacts (Rating & Description) | Retention or Removal Code | Comments |
|---|---|---------------------------------|----------------|-----------------------|---------------|-------------------|---|--------------------------------|---|---------------------------|---|
| T5 | coast live oak (<i>Quercus agrifolia</i>) | 6",4" | No | 25'X10' | Fair | Fair | Fair | 5' | Moderate-(Root loss -excavation, canopy loss -clearance pruning) | R.T. | 3' from new curb and street. Raise canopy to 14' for fire vehicle clearance. |
| T6 | coast live oak | 16" | Yes | 35'X30' | Fair | Fair | Fair | 12' | High (Root loss -excavation, canopy loss -clearance pruning) | R.T. | 4' from new catch basin, storm drain, curb and street. Raise canopy to 14' for fire vehicle clearance. |
| T7 | coast live oak | 8" | No | 35'X15' | Fair | Fair | Fair | 6' | Moderate-(Root loss -excavation, canopy loss -clearance pruning) | R.T. | 5' from new storm drain, curb and street. |
| T8 | coast live oak | 8" | No | 38'X20' | Fair | Fair | Fair | 6' | Moderate-(Root loss -excavation, canopy loss -clearance pruning) | R.T. | 1' from new storm drain. 3' from new curb and roadway. Raise canopy to 14' for fire vehicle clearance. |
| T9 (No tag) | coast live oak | 16" (estimated) | Yes | 40'X45' | Fair | Fair | Fair | 12' | Moderate-(Root loss -excavation, canopy loss -clearance pruning) | R.T. | On adjacent property. 7' from new storm drain, curb and street. Trunk is 2' below new street grade. Raise canopy to 14' for fire vehicle clearance. Co-dominant trunks at 4' above grade. |
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3300 Maplethorpe Lane, Soquel
Tree Assessment Chart - Appendix A

| Tree # | Species | Trunk Diameter @ 4.5' | Protected Tree | Crown Height & Spread | Health Rating | Structural Rating | Suitability for Preservation (Based Upon Condition) | Tree Protection Zone (in feet) | Construction Impacts (Rating & Description) | Retention or Removal Code | Comments |
|-----------------|--|------------------------|----------------|-----------------------|---------------|-------------------|---|--------------------------------|--|---------------------------|---|
| T10 (No tag) | coast live oak (<i>Quercus agrifolia</i>) | 13",12" (estimated) | Yes | 40'X45' | Fair | Fair | Fair | 9' | Low (Root loss - excavation) | R.T. | On adjacent property. 8' from new storm drain, curb & street. Trunk is 2' below finish grade of new road. Co-dominant trunks at 2' above grade. |
| T11 (No tag) | coast live oak | 7" | No | 40'X15' | Fair | Fair | Fair | 6' | Moderate (Root loss - excavation, compaction) | R.T. | 2' from new roadway, curb & street. Trunk is 1' below finish grade of new road. |
| T12 (No tag) | coast live oak | 18",18" (estimated) | Yes | 45'X50' | Fair | Fair | Good | 14' | Low (Canopy loss - minor clearance pruning) | R.T. | On adjacent property. 16' from new storm drain, curb and street. Trunk is 4' below finish grade of new street. Co-dominant trunks at 3' above grade. Minor clearance pruning. |
| T13 No tag) | coast live oak | 15",14" (estimated) | Yes | 45'X50' | Fair | Fair | Good | 12' | Moderate- (Root loss -excavation, canopy loss -clearance pruning) | R.T. | Tree location may be on property line. Trunk is 8' from new storm drain line and 2 1/2' below finish grade. Co-dominant trunks at 4' above grade. Minor clearance pruning. |
| T14 | coast redwood (<i>Sequoia sempervirens</i>) | 19" | Yes | 45'X18' | Good | Fair | Poor | N/A | High (Within foot print of new road) | R.I. | Trunk base encased in concrete planter. As tree continues to enlarge, anchoring root development may be insufficient and stability of tree could become compromised. Incompatible with new site use and design. |
| T15 | coast redwood | 22" | Yes | 42'X10' | Fair | Fair | Poor | N/A | High (Within foot print of new road) | R.I. | Same long term stability issue as tree T14. |
| T16 | coast redwood | 14" | Yes | 42'X10' | Fair | Fair | Poor | N/A | High (Within foot print of new road) | R.I. | Same long term stability issue as tree T14. |




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3300 Maplethorpe Lane, Soquel
Tree Assessment Chart - Appendix A

| Tree # | Species | Trunk Diameter @ 4.5' | Protected Tree | Crown Height & Spread | Health Rating | Structural Rating | Suitability for Preservation (Based Upon Condition) | Tree Protection Zone (in feet) | Construction Impacts (Rating & Description) | Retention or Removal Code | Comments |
|--|--|-----------------------|----------------|-----------------------|---------------|-------------------|---|--------------------------------|---|---------------------------|---|
| T17 | coast redwood (<i>Sequoia sempervirens</i>) | 14" | Yes | 37'X10' | Poor | Fair | Poor | N/A | High (Within foot print of new road) | R.I. | Trunk base encased in concrete planter. As tree continues to enlarge, anchoring root development may be insufficient and stability of tree could become compromised. Incompatible with new site use and design. |
| T18 | coast redwood | 14" | Yes | 35'X10' | Poor | Fair | Poor | N/A | High (Within foot print of new road) | R.I. | Same long term stability issue as tree T17. |
| T19 | coast redwood | 14" | Yes | 42'X15' | Fair | Fair | Poor | N/A | High (Within foot print of new road) | R.I. | Same long term stability issue as tree T17. |
| T20 | coast redwood | 24" | Yes | 42'x15' | Good | Fair | Poor | N/A | High (Within foot print of new road) | R.I. | Same long term stability issue as tree T17. |
| T21 | coast live oak (<i>Quercus Agri folia</i>) | 16" | Yes | 42'X25' | Poor | Fair | Poor | 12' | High (Root loss -excavation) | R.C. | 4' from new storm drain line. Moderate decay & missing bark in trunk basal area. Wood decay fungus present. Less than 25% live crown. Co-dominant trunks at 4' above grade. |
| T22 | coast live oak | 8" | No | 15'x15' | Good | Fair | Good | 6' | Moderate (Root loss -excavation) | R.T. | 6' from new storm drain line. Co-dominant trunks at 5' above grade. |
| T23 | coast live oak | 8" | No | 15'X18' | Good | Fair | Good | 6' | Low (Root loss -excavation) | R.T. | 8' from new catch basin. Trunk bows to west at 4' above grade. Raise canopy 2' to 6' above grade. |
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3300 Maplethorpe Lane, Soquel
Tree Assessment Chart - Appendix A

| Tree # | Species | Trunk Diameter @ 4.5' | Protected Tree | Crown Height & Spread | Health Rating | Structural Rating | Suitability for Preservation (Based Upon Condition) | Tree Protection Zone (in feet) | Construction Impacts (Rating & Description) | Retention or Removal Code | Comments |
|--|--|-----------------------|----------------|-----------------------|---------------|-------------------|---|--------------------------------|--|---------------------------|---|
| T24 | coast live oak (<i>Quercus agrifolia</i>) | 15" | Yes | 40'X30' | Fair | Fair | Fair | 11' | Moderate -High (If existing drainage system is replaced) (Root loss-excavation) | R.T. | Tree location may be on property line. Impacted only if existing drainage system is replaced. Trunk straddles existing cyclone fence line, grows into fence at 4' above grade, and is partially girdled. Trunk has 15 degree lean. |
| T25 | coast live oak | 12",12", 11" | Yes | 30'X35' | Good | Fair | Good | 14' | Low - (Canopy loss- clearance pruning) | R.T. | Co-dominant trunks at 1' above grade. Minor basal decay. Sited at top of existing bank. Requires minor clearance pruning from new unit. |
| T26 | coast live oak | 9" | No | 21'X21' | Fair | Fair | Fair | 6' | Moderate (Root loss-excavation) | R.T. | Within 4' of new driveway & 6' from sewer line. Suppressed by tree T27, lack of canopy development on north side. Requires minor clearance pruning from new unit. |
| T27 | coast live oak | 11",10",9" | Yes | 27'X35' | Fair | Fair | Fair | N/A | High (Within foot print of new driveway) | R.I. | Moderate deadwood and decay in 9" co-dominant trunk. Lack of canopy development on north side. Co-dominant trunks at 3' above grade. |
| T28 | coast live oak | 14" | Yes | 30'X20' | Fair | Fair | Fair | 11' | Moderate- (Root loss-excavation, canopy loss- clearance pruning) | R.T. | 9' from new curb and driveway. Requires clearance pruning from new driveway. |
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3300 Maplethorpe Lane, Soquel
Tree Assessment Chart - Appendix A

| Tree # | Species | Trunk Diameter @ 4.5' | Protected Tree | Crown Height & Spread | Health Rating | Structural Rating | Suitability for Preservation (Based Upon Condition) | Tree Protection Zone (in feet) | Construction Impacts (Rating & Description) | Retention or Removal Code | Comments |
|--|---|-----------------------|----------------|-----------------------|---------------|-------------------|---|--------------------------------|---|---------------------------|--|
| T29 | coast live oak (<i>Quercus agrifolia</i>) | 13" | Yes | 37'X20' | Poor | Fair | Poor | 10' | N/A | R.C. | Nearly dead, < 5% live canopy. Significant bark beetle in trunk basal area. Wood decay fungi (<i>Hypoxylon thouarsium</i>), present in significant quantity. |
| T30 | coast live oak | 8" | No | 35'X10' | Poor | Fair | Poor | 6' | N/A | R.C. | Less than 20% live canopy. Suppressed by adjacent trees. |
| T31 | coast live oak | 19" | Yes | 36'X40' | Fair | Fair | Fair | 14' | Moderate- (Root loss-excavation, canopy loss-clearance pruning) | R.T. | 8' from storm drain line. 9' from new parking stall. Unbalanced canopy. Strong weight bias to southwest. Co-dominant trunks at 5' above grade. Requires clearance pruning from new driveway. |
| T32 | coast live oak | 10",8",7" | No | 35'X35' | Fair | Poor | Poor | 11' | N/A | R.C. | One of three trunks is dead. Second trunk nearly horizontal. Very poor structure, trunk leans 30 degrees to southwest. |
| T33 | coast live oak | 10" | No | 35'X20' | Fair | Fair | Fair | 8' | Moderate- (Root loss-excavation, canopy loss-clearance pruning) | R.T. | 7' from parking stall. Requires clearance pruning from parking stall. |
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Tree Assessment Chart - Appendix A

| Tree # | Species | Trunk Diameter @ 4.5' | Protected Tree | Crown Height & Spread | Health Rating | Structural Rating | Suitability for Preservation (Based Upon Condition) | Tree Protection Zone (in feet) | Construction Impacts (Rating & Description) | Retention or Removal Code | Comments |
|--|--|-----------------------|----------------|-----------------------|---------------|-------------------|---|--------------------------------|---|---------------------------|---|
| T34 | coast live oak (<i>Quercus agrifolia</i>) | 10",8",8" | No | 38'X38' | Poor | Fair | Fair | 11' | Low- (Root loss-excavation, canopy loss-clearance pruning) | R.T. | Canopy growth suppressed by adjacent trees. Unbalanced canopy and weight bias to west. Co- dominant trunks at 1' and 3' above grade. Requires clearance pruning form new parking stall. |
| T35 | coast live oak | 11" | No | 20'X25' | Fair | Fair | Fair | 8' | Moderate- (Root loss-excavation, canopy loss-clearance pruning) | R.T. | 5' from new driveway. Unbalanced canopy to south. Requires clearance pruning from driveway. |
| T36 | coast live oak | 9",7" | No | 35'X20' | Fair | Fair | Fair | 8' | Low- (Root loss-excavation, canopy loss-clearance pruning) | R.T. | 11' from new driveway. Requires clearance pruning from driveway. |
| T37 | coast live oak | 12" | Yes | 35'X30' | Fair | Poor | Poor | 9' | N/A | R.C. | Very poor structure, 40% of trunk missing from previous co-dominant trunk failure. Lack of sound wood for tree stability. Moderate risk of failure. |
| T38 | coast live oak | 11" | No | 35'X15' | Fair | Poor | Fair | 9' | Low- (Root loss-excavation) | R.T. | Poor attachment points of co-dominant stems. Co-dominant stems at 6' above grade. Monitor. |
| T39 | coast live oak | 17" | Yes | 30'X35' | Fair to Poor | Fair | Fair | 13' | Low- (Root loss-excavation, canopy loss-clearance pruning) | R.T. | Wood decay fungi (<i>Hypoxylon thousarium</i>) present on dead tree limbs. Unbalanced canopy with weight bias to west. Monitor fungi population & health impact. |
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3300 Maplethorpe Lane, Soquel
Tree Assessment Chart - Appendix A

| Tree # | Species | Trunk Diameter @ 4.5' | Protected Tree | Crown Height & Spread | Health Rating | Structural Rating | Suitability for Preservation (Based Upon Condition) | Tree Protection Zone (in feet) | Construction Impacts (Rating & Description) | Retention or Removal Code | Comments |
|--|--|-----------------------|----------------|-----------------------|---------------|-------------------|---|--------------------------------|---|---------------------------|---|
| T40 | coast live oak (<i>Quercus agrifolia</i>) | 10",9",9", 7" | No | 30'X35' | Fair to Poor | Fair | Fair | 9' | None | R.T. | Very limited live canopy, all growth at outer edge. Co-dominant trunks at 3' above grade. |
| T41 | coast live oak | 11", 10",9" | Yes | 40'X40' | Fair | Fair | Fair | 10' | None | R.T. | |
| T42 | coast live oak | 12" | Yes | 35'X20' | Fair | Fair | Fair | 9' | None | R.T. | |
| T43 | coast live oak | 14" | Yes | 35'X35' | Fair | Fair | Fair | 11' | None | R.T. | Two cavities, decay and deadwood in trunk basal area. Co-dominant at 5' above grade. |
| T44 | coast live oak | 12" | Yes | 35'X20' | Fair | Fair | Fair | 9' | None | R.T. | |
| T45 | coast live oak | 8",8" | No | 20'X15' | Poor | Fair | Poor | 6' | N/A | R.C. | Co-dominant trunk failure, missing bark, deadwood and decay from grade to 8' above grade. Wood decay fungi present. Remaining trunk lacks sound wood for support. |
| T46 | coast live oak | 11" | No | 35'X20' | Fair | Fair | Fair | 8' | None | R.T. | Unbalanced canopy to south. |
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Tree Assessment Chart - Appendix A

| Tree # | Species | Trunk Diameter @ 4.5' | Protected Tree | Crown Height & Spread | Health Rating | Structural Rating | Suitability for Preservation (Based Upon Condition) | Tree Protection Zone (in feet) | Construction Impacts (Rating & Description) | Retention or Removal Code | Comments |
|--|--|-----------------------|----------------|-----------------------|---------------|-------------------|---|--------------------------------|---|---------------------------|---|
| T47 | coast live oak (<i>Quercus agrifolia</i>) | 10" | No | 35'X20' | Fair | Fair | Fair | 8' | None | R.T. | Unbalanced canopy to south. |
| T48 | coast live oak | 8" | No | 35'X10' | Fair | Fair | Fair | 6' | None | R.T. | Unbalanced canopy to south. |
| T49 | cypress (<i>Hesperocyparis sp.</i>) | 7" | No | 50'X20' | Fair | Fair | Fair | 6' | None | R.T. | Crowded. Young tree growing underneath and into canopy of larger mature oak. |
| T50 | coast live oak | 36" (at 3'a.g.) | Yes | 55'X70' | Poor | Fair | Fair | 27' | None | R.T. | Declining. Lack of live canopy relative to tree size. Evidence of bark beetle activity. Moderate decay and wood decay fungi present on dead limbs. Monitor health status. |
| T51 | coast live oak | 18" | Yes | 55'X35' | Fair | Fair | Fair | 14' | None | R.T. | On adjacent property. |
| T52 | coast live oak | 28" | Yes | 45'X55' | Good | Fair | Good | 21' | None | R.T. | On adjacent property. |
| T53 | coast live oak | 16" | Yes | 35'X35' | Good | Fair | Good | 12' | None | R.T. | On adjacent property. Co-dominant at 6' above grade. |
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Tree Assessment Chart - Appendix A

| Tree # | Species | Trunk Diameter @ 4.5' | Protected Tree | Crown Height & Spread | Health Rating | Structural Rating | Suitability for Preservation (Based Upon Condition) | Tree Protection Zone (in feet) | Construction Impacts (Rating & Description) | Retention or Removal Code | Comments |
|--|--|-----------------------|----------------|-----------------------|---------------|-------------------|---|--------------------------------|---|---------------------------|---------------------------------|
| T54 | coast live oak (<i>Quercus agrifolia</i>) | 14" | Yes | 35'X40' | Good | Fair | Fair | 11' | None | R.T. | |
| T55 | coast live oak | 9" | No | 30'X30' | Fair | Fair | Fair | 6' | None | R.T. | |
| T56 | coast live oak | 10" | No | 35'X30' | Fair | Fair | Fair | 8' | None | R.T. | |
| T57 | coast live oak | 18" | Yes | 30'X35' | Good | Fair | Good | 14' | None | R.T. | Minor cavity at 5' above grade. |
| T58 | coast live oak | 10" | No | 20'x20' | Good | Fair | Good | 8' | None | R.T. | |
| T59 | coast live oak | 10",10",9" " | No | 30'X40' | Good | Fair | Good | 9' | None | R.T. | |
| T60 | coast live oak | 10",7",7" | No | 25'X22' | Good | Fair | Good | 9' | None | R.T. | |
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3300 Maplethorpe Lane, Soquel
Tree Assessment Chart - Appendix A

| Tree # | Species | Trunk Diameter @ 4.5' | Protected Tree | Crown Height & Spread | Health Rating | Structural Rating | Suitability for Preservation (Based Upon Condition) | Tree Protection Zone (in feet) | Construction Impacts (Rating & Description) | Retention or Removal Code | Comments |
|--|--|-----------------------|----------------|-----------------------|---------------|-------------------|---|--------------------------------|---|---------------------------|---|
| T61 | coast live oak (<i>Quercus agrifolia</i>) | 11",11", 10",8" | No | 35'X35' | Good | Fair | Good | 10' | Moderate- (Root loss - excavation, canopy loss - clearance pruning) | R.T. | 13' from new storm drain line. Requires minor clearance pruning. |
| T62 | coast live oak | 10",9",9" | No | 30'X35' | Good | Fair | Good | 9' | Moderate- (Root loss - excavation, canopy loss - clearance pruning) | R.T. | 12' from new storm drain line. Requires minor clearance pruning. |
| T63 | coast live oak | 13" | Yes | 25'X35' | Fair | Fair | Fair | 10' | None | R.T. | Minor decay and deadwood. |
| T64 | coast live oak | 16" | Yes | 48'X38' | Good | Fair | Good | 12' | None | R.T. | |
| T65 | coast live oak | 16" | Yes | 35'X40' | Fair to Poor | Fair | Fair | 12' | None | R.T. | < 25% live canopy. Ivy choking lower 2/3 of tree. Remove ivy. Co-dominant trunks at 5' above grade. |
| T66 | coast live oak | 10" | No | 30'X30' | Fair | Fair | Fair | 8' | None | R.T. | Unbalanced canopy to north. Remove ivy. Co-dominant trunks at 5' above grade. |
| T67 | coast live oak | 14" | Yes | 20'X20' | Fair | Fair | Fair | 11' | None | R.T. | Unbalanced canopy to north. Remove ivy. |
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3300 Maplethorpe Lane, Soquel
Tree Assessment Chart - Appendix A

| Tree # | Species | Trunk Diameter @ 4.5' | Protected Tree | Crown Height & Spread | Health Rating | Structural Rating | Suitability for Preservation (Based Upon Condition) | Tree Protection Zone (in feet) | Construction Impacts (Rating & Description) | Retention or Removal Code | Comments |
|--|--|-----------------------|----------------|-----------------------|---------------|-------------------|---|--------------------------------|---|---------------------------|---|
| T68 | coast live oak (<i>Quercus agrifolia</i>) | 28" | Yes | 50'X60' | Fair | Fair | Fair | 21' | None | R.T. | Unbalanced canopy to north. Remove ivy. |
| T69 | coast live oak | 12" | Yes | 30'X30' | Fair | Fair | Fair | 9' | None | R.T. | Very thin canopy. |
| T70 | coast live oak | 10" | No | 20'X20' | Fair | Fair | Fair | 7' | None | R.T. | Very thin canopy. Unbalanced canopy to north. |
| T71 | coast live oak | 13",8" | Yes | 35'X40' | Fair | Fair | Fair | 10' | None | R.T. | Co-dominant trunks at 3' above grade. |
| T72 | coast live oak | 7",6" | No | 30'X15' | Poor | Fair | Poor | 6' | N/A | R.C. | Co-dominant trunks at 1' above grade. One trunk is failed. Missing bark, deadwood and decay on second trunk. Thin and undeveloped canopy. |
| T73 | coast live oak | 8" | No | 30'X15' | Fair | Fair | Fair | 6' | Low- (Root loss-excavation) | R.T. | 18' from new retaining wall. Unbalanced canopy to west. |
| T74 | coast live oak | 10",9",9" | No | 25'X20' | Fair | Fair | Fair | 8' | Moderate- (Root loss-excavation) | R.T. | 8' from new retaining wall. Unbalanced canopy to west. Co-dominant trunks at 2' above grade. Remove ivy. |
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3300 Maplethorpe Lane, Soquel
Tree Assessment Chart - Appendix A

| Tree # | Species | Trunk Diameter @ 4.5' | Protected Tree | Crown Height & Spread | Health Rating | Structural Rating | Suitability for Preservation (Based Upon Condition) | Tree Protection Zone (in feet) | Construction Impacts (Rating & Description) | Retention or Removal Code | Comments |
|--|--|-------------------------|----------------|-----------------------|---------------|-------------------|---|--------------------------------|---|---------------------------|---|
| T75 | coast live oak (<i>Quercus agrifolia</i>) | 8", 7" | No | 35'X20' | Poor | Fair | Fair | 6' | High- (Root loss excavation) | R.T. | 4' from new retaining wall. May require removal depending on site grading and placement of new retaining wall. Co-dominant at 3' above grade. Remove ivy. |
| T76 | coast live oak | 11" | No | 40'X25' | Fair | Fair | Fair | 8' | High- (Root loss excavation) | R.T. | 3.5' from new retaining wall. May require removal depending on site grading and placement of new retaining wall. Requires minor clearance pruning. Remove ivy. |
| T77 | coast live oak | 8", 8", 7" | No | 30'X35' | Fair | Fair | Fair | 8' | Moderate- (Root loss-excitation) | R.T. | 8' from new retaining wall. Unbalanced canopy to east. Requires minor clearance pruning from new building. Co-dominant trunks at grade. Remove ivy. |
| T78 | coast live oak | 10" | No | 35'X20' | Fair | Fair | Fair | 8' | High- (within footprint of new home) | R.I. | Suppressed growth from adjacent tree crowding. Very thin canopy. |
| T79 | coast live oak | 12" | Yes | 35'X20' | Fair | Fair | Fair | 9' | High- (within footprint of new home) | R.I. | |
| T80 | coast live oak | 18" (at 3' above grade) | Yes | 30'X40' | Fair | Fair | Fair | 14' | High- (Root loss excavation, canopy loss-clearance pruning) | R.I. | 5' from new home on one side and 5' from new retaining wall on second side. Canopy cannot be successfully clearance pruned with out significant damage to tree structure. Very thin canopy. |
| T81 | coast live oak | 12" | Yes | 30'X20' | Fair | Fair | Fair | 9' | High- (within footprint of new home) | R.I. | |
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3300 Maplethorpe Lane, Soquel
Tree Assessment Chart - Appendix A

| Tree # | Species | Trunk Diameter @ 4.5' | Protected Tree | Crown Height & Spread | Health Rating | Structural Rating | Suitability for Preservation (Based Upon Condition) | Tree Protection Zone (in feet) | Construction Impacts (Rating & Description) | Retention or Removal Code | Comments | |
|--|--|-----------------------|----------------|-----------------------|---------------|-------------------|---|--------------------------------|---|---------------------------|---|--|
| T82 | coast live oak (<i>Quercus agrifolia</i>) | 28" (at 3.5' a.g.) | Yes | 45'X50' | Fair | Fair | Fair | 21' | High- (within footprint of new home) | R.I. | Co-dominant trunks at 4' above grade. | |
| T83 | coast live oak | 29" (at 3' a.g.) | Yes | 45'X50' | Fair | Fair | Fair | 21' | Moderate- (Root loss -excavation, canopy loss -clearance pruning) | R.T. | 8' from new storm drain line. 9' from new parking stall. Included bark at attachment point of two main stems. Cabling of main stems is recommended. Requires clearance pruning from new home #2. Co-dominant at 4' above grade. | |
| T84 | coast live oak | 12",10",9" " | Yes | 30'X35' | Fair | Fair | Fair | 10' | High- (within 1' of new driveway) | R.I. | Significant grading (cut),to occur within the canopy area. Co-dominant trunks at 4' above grade. | |
| T85 | coast live oak | 13" | Yes | 35'X35' | Fair | Fair | Fair | 10' | High- (within footprint of new driveway) | R.I. | Significant grading (cut),to occur within the canopy area. Co-dominant stems at 5' above grade. | |
| T86 | coast live oak | 9",5" | No | 20'X25' | Fair | Fair | Fair | 7' | High- (within footprint of new driveway) | R.I. | Significant grading (cut),to occur within the canopy area. Co-dominant trunks at 1' above grade. Very thin canopy. | |
| T87 | coast live oak | 9",8",6" | No | 17'x20' | Good | Fair | Good | 7' | Moderate- (Root loss -excavation) | R.T. | 9' from new road. Co-dominant trunk at 3' above grade. | |
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APPENDIX B – CRITERIA FOR TREE ASSESSMENT CHART

Following is an explanation of the data used in the tree evaluations. The data is incorporated in the *Tree Assessment Chart, Appendix A*.

Trunk Diameter and Number of Trunks:

Trunk diameter as measured at 4.5 feet above grade. The number of trunks refers to a single or multiple trunked tree. Multiple trunks are measured at 4.5 feet above grade.

Health Ratings:

Good: A healthy, vigorous tree, reasonably free of signs and symptoms of disease

Fair: Moderate vigor, moderate twig and small branch dieback, crown may be thinning and leaf color may be poor

Poor: Tree in severe decline, dieback of scaffold branches and/or trunk, most of foliage from epicormics

Structure Ratings:

Good: No significant structural defects. Growth habit and form typical of the species

Fair: Moderate structural defects that might be mitigated with regular care

Poor: Extensive structural defects that cannot be abated.

Suitability for Preservation Ratings:

Rating factors:

Tree Health: Healthy vigorous trees are more tolerant of construction impacts such as root loss, grading and soil compaction, then are less vigorous specimens.

Structural integrity: Preserved trees should be structurally sound and absent of defects or have defects that can be effectively reduced, especially near structures or high use areas.

Tree Age: Over mature trees have a reduced ability to tolerate construction impacts, generate new tissue and adjust to an altered environment. Young to maturing specimens are better able to respond to change.

Species response: There is a wide variation in the tolerance of individual tree species to construction impacts.

Rating Scale:

Good: Trees in good health and structural condition with potential for longevity on the site

Fair: Trees in fair health and/or with structural defects that may be reduced with treatment procedures.

Poor: Trees in poor health and/or with poor structure that cannot be effectively abated with treatment. Trees can be expected to decline or fail regardless of construction impacts or management . The species or individual may possess characteristics that are incompatible or undesirable in landscape settings or unsuited for the intended use of the site.

Construction Impacts:

Rating Scale:

High: Development elements proposed that are located within the Tree Protection Zone that would severely impact the health and /or stability of the tree. The tree impacts cannot be mitigated without design changes. The tree may be located within the building footprint.

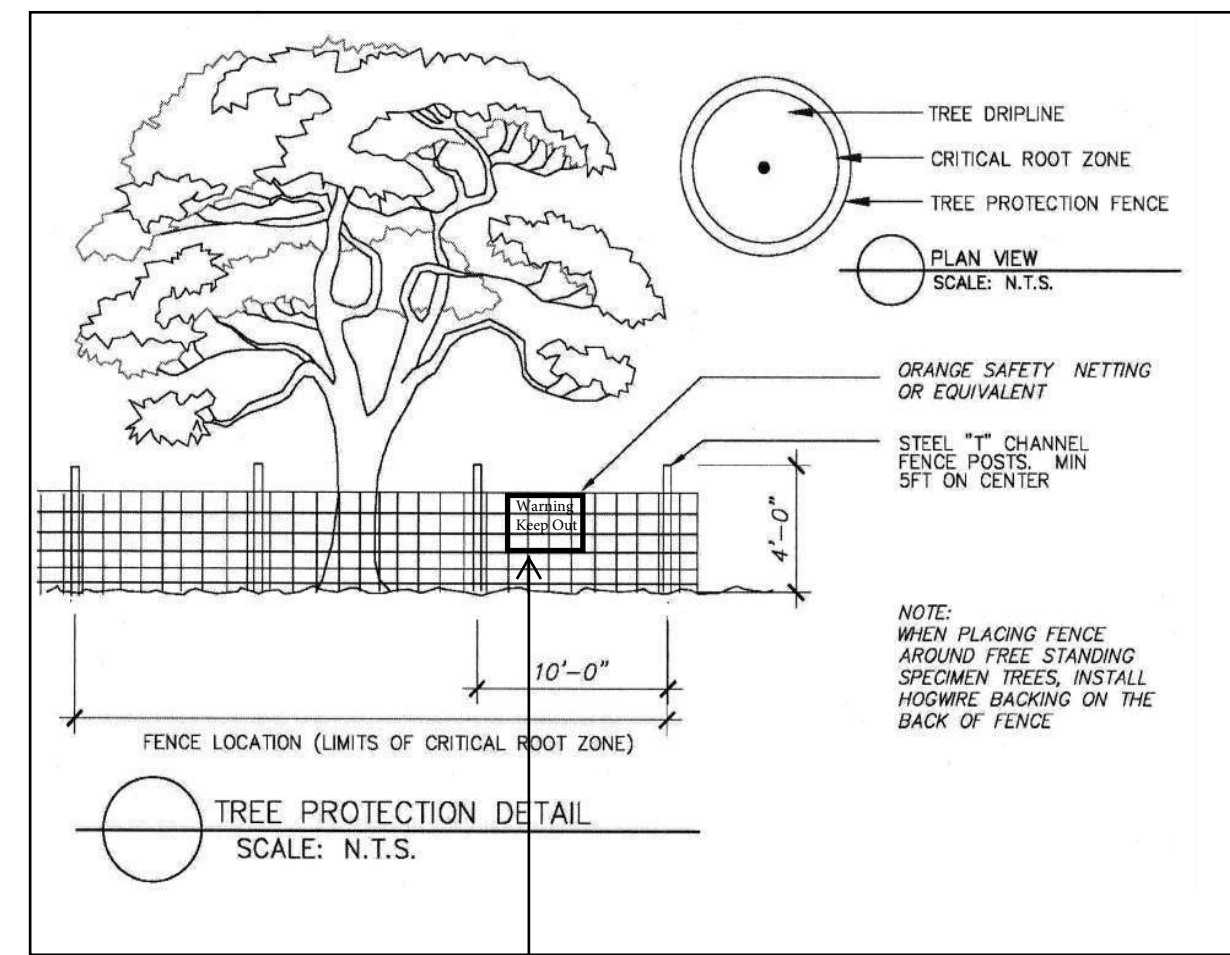
Moderate: Development elements proposed that are located within the Tree Protection Zone that will impact the health and/or stability of the tree and can be mitigated with tree protection treatments.

Low: Development elements proposed that are located within or near the Tree Protection Zone that will have a minor impact on the health of the tree and can be mitigated with tree protection treatments.

None: Development elements will have no impact on the health and stability of the Tree.

Tree Protection Zone (TPZ):

Defined area within which certain activities are prohibited or restricted to prevent or minimize potential injury to designated trees, particularly during construction or development.



Warning
Tree Protection Zone
Keep Out

NOTICE: PROTECTIVE FENCING IS REQUIRED ON THIS JOB SITE. REMOVAL OR DAMAGE OF THIS FENCING MAY RESULT IN A FINE

This sign must be prominently displayed. Fencing may not be moved or removed without permission of the Project Arborist. During demolition and construction, all reasonable steps necessary to prevent damage, or the destruction of protected trees is required. Failure to comply with all precautions may result in a STOP WORK order being issued by the regulating agency.

No Entry without Project Arborist Authorization
 Kurt Fouts - Arborist Consultant- 831-359-3607

Tree Protection Specifications & Recommended Sequence

Demolition:

- Remove existing cyclone fencing, (#8 on demolition plan). Where trees have grown thru wire mesh, carefully cut wire and remove without injuring tree bark.
- Canopy Clearance Pruning - Targeted canopy clearance pruning of affected trees shall be supervised by project arborist and shall occur prior to commencement of Construction Phases.
- Install Tree Protection fencing as indicated on Tree Protection Plan.
- Remove existing drainage pipe, (#4 on demolition plan). Excavation, if required, under canopy of tree T83 shall be accomplished by hand. If excavation is required, within the Tree Protection Zone, of tree T83, the Project Arborist shall be notified, and remaining work to remove pipe shall be supervised by Project Arborist.
- Removal of existing gas line, (#11 on demolition plan). If excavation is required, within the Tree Protection Zone, of tree T83, the Project Arborist shall be notified, and remaining work shall be supervised by Project Arborist. Capping and abandoning this line should be considered as an alternative to removal.
- Removal of existing A/C (#3 on demolition plan). All A/C removal under the canopies of trees T1, T83 & T87 shall be accomplished with a jack hammer and the pieces hand loaded.

Construction Phases:

- Sanitary Sewer - Trenching for sewer line within 10X the diameter (8 feet), of tree T26 shall be accomplished by hand. If roots are encountered 2" in diameter or greater, they shall be pruned by methods indicated on Tree Protection Plan sheet, *Pre-Construction Root Pruning*.
- Storm Drain Lines -
 - Area #1 (206 LF.), below Unit 9, 8 & 11. The project arborist shall be notified 48 hours prior to commencement of trenching for storm drain line along south perimeter between trees T6 to T23. Trenching shall be a combination of machine and hand excavation as supervised by project arborist.
 - Area #2 (50 LF.), below Unit #9. Trenching for storm drain line within 10X the diameter (10 feet), of trees T61 & 62 shall be accomplished by hand. If roots are encountered 2" in diameter or greater, they shall be pruned by methods indicated on Tree Protection Plan sheet, *Pre-Construction Root Pruning*.
 - Area #3 (23 LF.), below Unit #2. The project arborist shall be notified 48 hours prior to commencement of trenching for storm drain line adjacent to tree T83. Trenching shall be a combination of machine and hand excavation as supervised by project arborist.
 - Area #4 (28 LF.), east of Unit #11. The project arborist shall be notified 48 hours prior to commencement of trenching for storm drain line adjacent to tree T24. Trenching shall be a combination of machine and hand excavation as supervised by project arborist.
- Retaining Wall (Unit #1) - The project arborist shall be notified 48 hours prior to grading and retaining wall excavation, for Unit #1, that occurs inside the Tree Protection Zone for trees T74, T75, T6, & 77. Excavation shall be a combination of machine and hand excavation as supervised by project arborist.
- Roadway - The project arborist shall be notified 48 hours prior to excavation and grading for roadway. Grade changes around affected trees T1-6, T26, 28, 35 & 87 shall be accomplished with a combination of machine and hand excavation as supervised by project arborist.
- Parking Stalls -
 - Below Unit #2: The project arborist shall be notified 48 hours prior to grading & excavation for parking stall adjacent to tree T83. Excavation shall be a combination of machine and hand excavation as supervised by project arborist.
 - Below Unit #9: Excavation for stall within 10X the diameter (10 feet), of tree T33 & within 19 feet of T31, shall be accomplished by hand. If roots are encountered 2" in diameter or greater, they shall be pruned by methods indicated on Tree Protection Plan sheet, *Pre-Construction Root Pruning*.

TREE PROTECTION FENCING

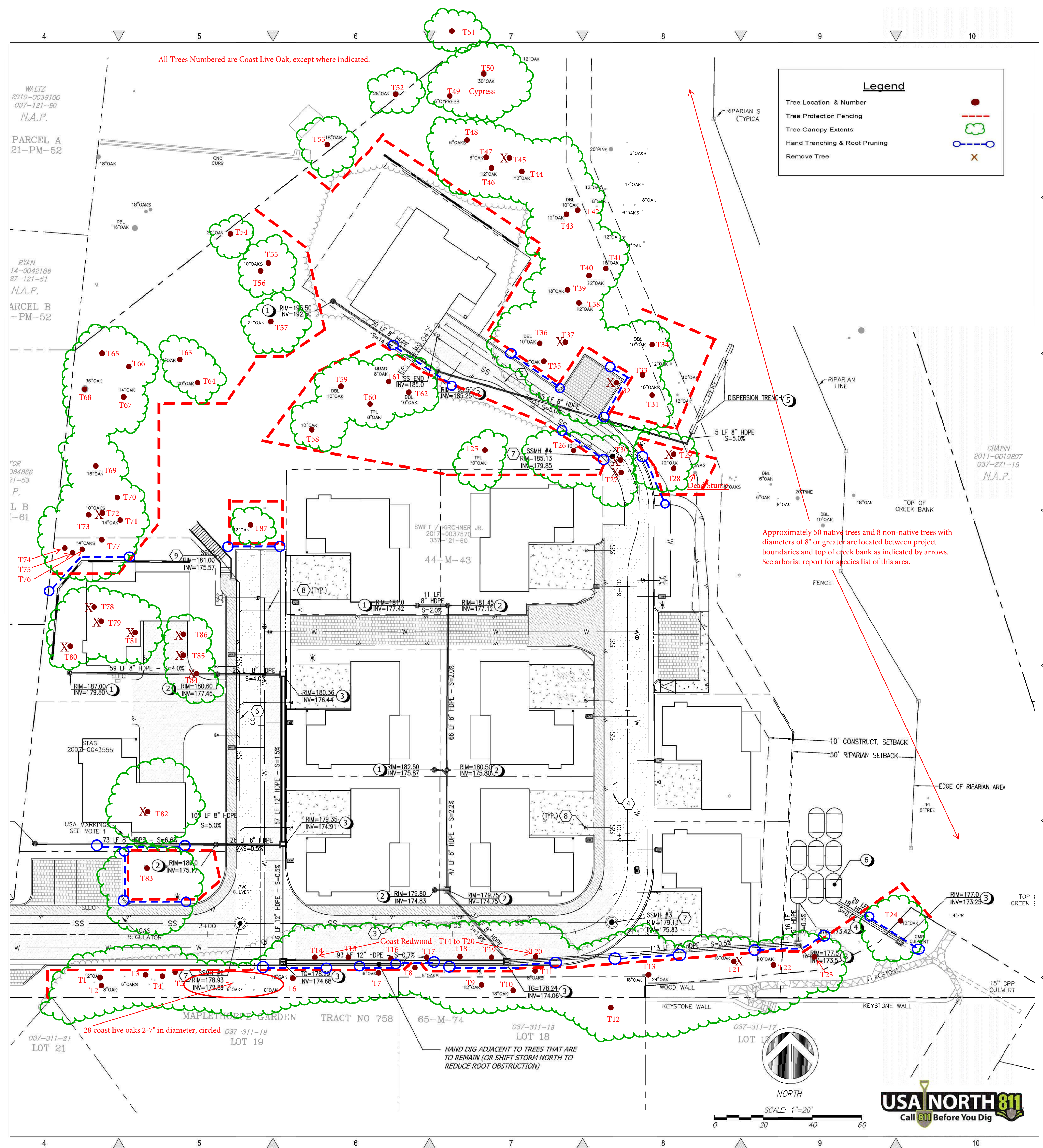
Protection fencing shall be installed in areas defined on the attached Tree Protection Plan. These fences must be installed before any demolition or construction equipment is on site. It must be minimum 4-foot high, orange plastic, welded wire or chain link, secured with a minimum length 6-foot u-channel steel posts, posts driven into the ground on maximum of 6-foot centers. If access into the protected areas becomes necessary, it must be supervised by the Project Arborist. Signage shall be installed on the tree protection fencing. Signage will be installed (8.5 X 11"), on ten-foot centers. An example of the fencing signage is attached to the Tree Protection Plan sheet or arborist report. Once the Tree Protection Zone (TPZ), is delineated and fenced, essentially prior to any site work, equipment and materials move in or landscape construction, activities within the TPZ are only permitted of allowed for and specified by the Project Arborist. The fenced TPZ areas are considered "non - intrusion zones" and should not be altered or breached.

PRE-CONSTRUCTION ROOT PRUNING

Excavation shall only occur within the TPZ (Tree Protection Zone), of retained trees, when designated by the Project Arborist. Excavations within (or outside of the TPZ, as designated), the Tree Protection Zone, will be executed by hand, in order to preserve roots two (2") inches in diameter or greater during the excavation process. All root pruning will be conducted under supervision of the Project Arborist. These activities will be documented, and a monitoring report will be provided to the City Arborist. Under direction of the Project Arborist, it may be necessary to temporarily remove the Tree Protection Fencing to allow access for root pruning activities.

Trenches for root pruning will be hand dug according to locations of the Tree Protection Plan sheet:

- Trenches will be dug one foot behind staking on tree side of stakes.
- The depth of the trench will equal the depth required for installation of the adjacent element.
- Cleanly prune and roots encountered 2 inches in diameter or greater. Use loppers, hand saw or Sawzall. A sharp spade may be used for palm roots. The pruned roots should be covered with burlap layers or carpeting and kept moist until the trench is backfilled.
- Reinstall the Tree Protection Fencing to its original location.



Approximately 50 native trees and 8 non-native trees with diameters of 8" or greater are located between project boundaries and top of creek bank as indicated by arrows. See arborist report for species list of this area.

Tree Inventory

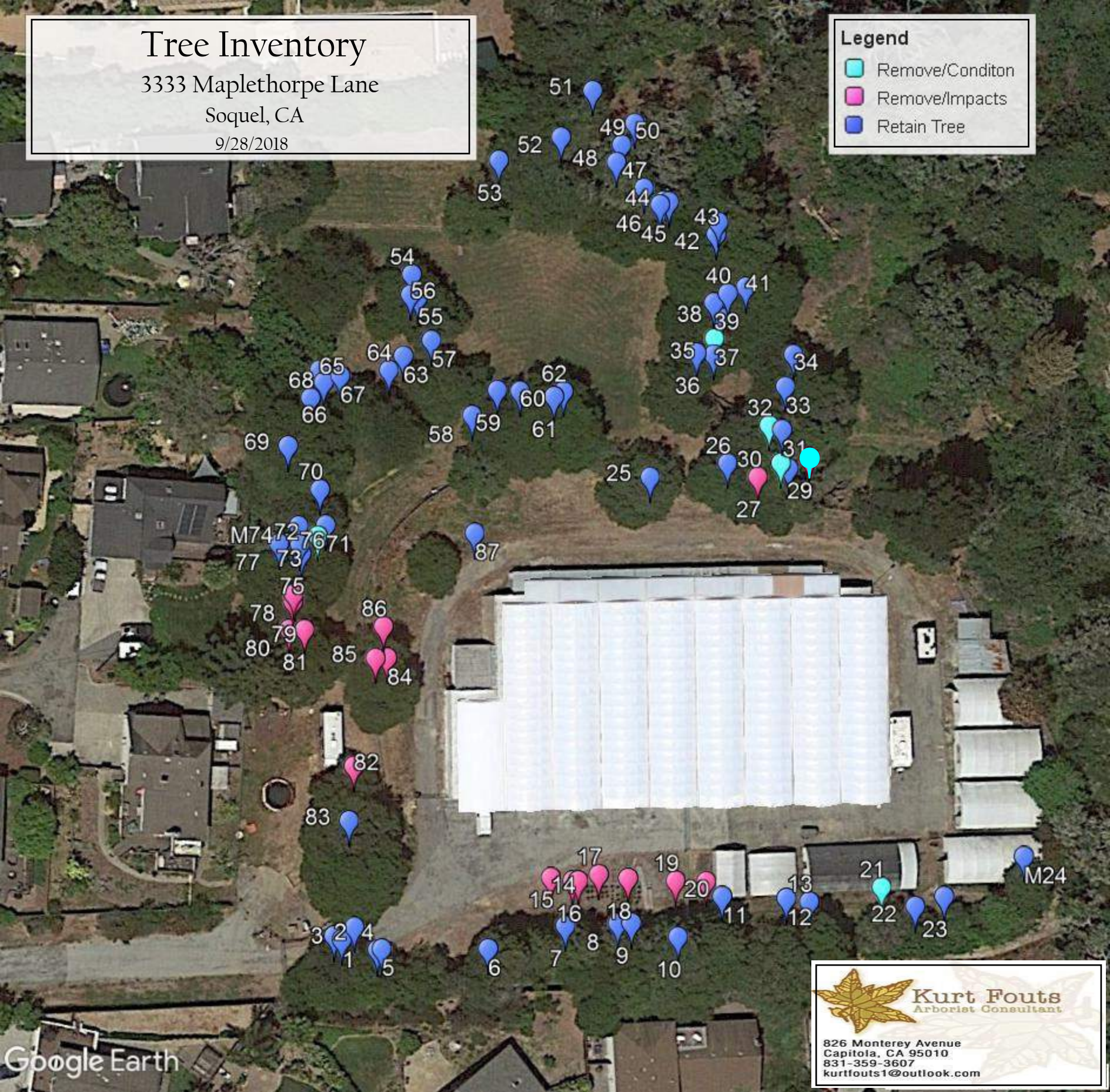
3333 Mapletorpe Lane

Soquel, CA

9/28/2018

Legend

- Remove/Condition
- Remove/Impacts
- Retain Tree



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Image #5 - Entry Area. Trees T1 – T6 on left, canopy of tree T83, on right.



Image #6 – Looking south. Trees T58 -62 & T25, to be retained. Unit #9 proposed for open area (foreground), of trees.



Image #7 - Example of a tree in poor condition. Tree T37 with portion of trunk missing from previous trunk failure.



Image #8 – Looking southwest. Trees T71,73 & 77, upper right, to be retained. Trees T78 – 81 lower left will require removal (in foot print of Unit #1).

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Appendix G - TREE PROTECTION GUIDELINES AND RESTRICTIONS

Protecting Trees During Construction:

- 1) Before the start of site work, equipment or materials move in, clearing, excavation, construction, or other work on the site, every tree to be retained shall be securely fenced- off as delineated in approved plans. Such fences shall remain continuously in place for the duration of the work undertaken in connection with the development.
- 2) If the proposed development, including any site work, will encroach upon the tree protection zone, special measures shall be utilized, as approved by the project arborist, to allow the roots to obtain necessary oxygen, water, and nutrients.
- 3) Underground trenching shall avoid the major support and absorbing tree roots of protected trees. If avoidance is impractical, hand excavation undertaken under the supervision of the project arborist may be required. Trenches shall be consolidated to service as many units as possible. Boring/tunneling under roots should be considered as an alternative to trenching.
- 4) Concrete or asphalt paving shall not be placed over the root zones of protected trees, unless otherwise permitted by the project arborist.
- 5) Artificial irrigation shall not occur within the root zone of native oaks, unless deemed appropriate on a temporary basis by the project arborist to improve tree vigor or mitigate root loss.
- 6) Compaction of the soil within the tree protection zone shall be avoided.
- 7) Any excavation, cutting, or filling of the existing ground surface within the tree protection zone shall be minimized and subject to such conditions as the project arborist may impose. Retaining walls shall likewise be designed, sited, and constructed to minimize their impact on protected trees.
- 8) Burning or use of equipment with an open flame near or within the tree protection zone shall be avoided. All brush, earth, and other debris shall be removed in a manner that prevents injury to the tree.
- 9) Oil, gas, chemicals, paints, cement, stucco or other substances that may be harmful to trees shall not be stored or dumped within the tree protection zone of any protected tree, or at any other location on the site from which such substances might enter the tree protection zone of a protected tree.
- 10) Construction materials shall not be stored within the tree protection zone of a protected tree.

Project Arborist Duties and Inspection Schedule:

The project arborist is the person(s) responsible for carrying out technical tree inspections, assessment of tree health, structure and risk, arborist report preparation, consultation with designers and municipal planners, specifying tree protection measures, monitoring, progress reports and final inspection.

A qualified project arborist (or firm) should be designated and assigned to facilitate and insure tree preservation practices. He/she/they should perform the following inspections:

Inspection of site: Prior to equipment and materials move in, site work, demolition, landscape construction and tree removal: The project arborist will meet with the general contractor, architect / engineer, and owner or their representative to review tree preservation measures, designate tree removals, delineate the location of tree protection fencing, specify equipment access routes and materials storage areas, review the existing condition of trees and provide any necessary recommendations.

Inspection of site: During excavation or any activities that could affect trees: Inspect site during any activity within the Tree Protection Zones of preserved trees and any recommendations implemented. Assess any changes in the health of trees since last inspection.

Final Inspection of Site: Inspection of site following completion of construction. Inspect for tree health and make any necessary recommendations.

Kurt Fouts shall be the Project Arborist for this project. All scheduled inspections shall include a brief Tree Monitoring report, documenting activities and provided to the City Arborist.

Tree Protection Fencing

Tree Protection fencing shall be installed prior to the arrival of construction equipment or materials. Fence shall be comprised of six-foot chain link fence mounted on eight-foot tall, 1 and 7/8-inch diameter galvanized posts, driven 24 inches into the ground and spaced on a minimum of 10-foot centers. Once established, the fence must remain undisturbed and be maintained throughout the construction process until final inspection.

A final inspection by the City Arborist at the end of the project will be required prior to removing any tree protection fencing.

Tree Protection Signs

All sections of fencing should be clearly marked with signs stating that all areas within the fencing are Tree Protection Zones and that disturbance is prohibited.

Monitoring

Any trenching, construction or demolition that is expected to damage or encounter tree roots should be monitored by the project arborist or a qualified ISA Certified Arborist and should be documented.

The site should be evaluated by the project arborist or a qualified ISA Certified Arborist after construction is complete, and any necessary remedial work that needs to be performed should be noted.

Root Pruning

Root pruning shall be supervised by the project arborist. When roots over two inches in diameter are encountered they should be pruned by hand with loppers, handsaw, reciprocating saw, or chain saw rather than left crushed or torn. Roots should be cut beyond sinker roots or outside root branch junctions and be supervised by the project arborist. When completed, exposed roots should be kept moist with burlap or backfilled within one hour.

Tree Work Standards and Qualifications

All tree work, removal, pruning, planting, shall be performed using industry standards of workmanship as established in the Best Management Practices of the International Society of Arboriculture (ISA) and the American National Standards Institute series, *Safety Requirements in Arboriculture Operations* ANSI Z133-2017,

Contractor licensing and insurance coverage shall be verified.

During tree removal and clearance, sections of the Tree Protection Fencing may need to be temporarily dismantled to complete removal and pruning specifications. After each section is completed, the fencing is to be re-installed.

Trees to be removed shall be cut into smaller manageable pieces consistent with safe arboricultural practices, and carefully removed so as not to damage any surrounding trees or structures. The trees shall be cut down as close to grade as possible. Tree removal is to be performed by a qualified contractor with valid City Business/ State Licenses and General Liability and Workman's Compensation insurance.

Development Site Tree Health Care Measures

RECOMMENDED TO PROVIDE OPTIMUM GROWING CONDITIONS, PHYSIOLOGICAL INVIGORATION AND STAMINA, FOR PROTECTION AND RECOVERY FROM CONSTRUCTION IMPACT.

Establish and maintain TPZ fencing, trunk and scaffold limb barriers for protection from mechanical damage, and other tree protection requirements as specified in the arborist report.

Project arborist to specify site-specific soil surface coverings (wood chip mulch or other) for prevention of soil compaction and loss of root aeration capacity.

Soil, water and drainage management is to follow the ISA BMP for "Managing Trees During Construction" and the ANSI Standard A300(Part 2)- 2011 Soil Management (a. Modification, b. Fertilization, c. Drainage.)

Fertilizer / soil amendment product(s) amounts and method of application to be specified by certified arborist.

County of Santa Cruz –Significant Tree

16.34.030 Definitions.

All terms used in this chapter shall be as defined in the General Plan and Local Coastal Program Land Use Plan glossaries and as follows:

“Coastal Zone” means that unincorporated area of the County of Santa Cruz as defined by the California Coastal Act of 1976, Division 20 of the California Public Resources Code. This area is identified on the General Plan and Local Coastal Program Land Use Plan maps.

“Diameter at breast height (d.b.h.)” means the average diameter of a tree outside the bark at a point four and one-half feet above the highest level ground.

“Person” means any individual, group, firm, organization, association, limited liability company, or other business association, corporation, including any utility, partnership, business, trust company, special district or public agency thereof, or other party, or as specified in Section [53090](#) of the California Government Code; or the State or a State agency or city when not engaged in a sovereign activity. Where a coastal development permit is required pursuant to Chapter [13.20](#) SCCC, State and Federal agencies may be required to comply with various provisions of this chapter as a condition of the coastal development permit.

“Planning Director” means the Director of the Planning Department or his or her authorized designee charged with the administration and enforcement of this chapter.

“Significant tree,” for the purposes of this chapter, shall include any tree, sprout clump, or group of trees, as follows:

(A) Within the urban services line or rural services line, any tree which is equal to or greater than 20 inches d.b.h. (approximately five feet in circumference); any sprout clump of five or more stems each of which is greater than 12 inches d.b.h. (approximately three feet in circumference); any group consisting of five or more trees on one parcel, each of which is greater than 12 inches d.b.h. (approximately three feet in circumference)

(B) Outside the urban services line or rural services line, where visible from a scenic road, any beach, or within a designated scenic resource area, any tree which is equal to or greater than 40 inches d.b.h. (approximately 10 feet in circumference); any sprout clump of five or more stems, each of which is greater than 20 inches d.b.h. (approximately five feet in circumference); or, any group consisting of 10 or more trees on one parcel, each greater than 20 inches d.b.h. (approximately five feet in circumference).

(C) Any tree located in a sensitive habitat as defined in Chapter 16.32 SCCC. Also see SCCC16.32.090 (C), exemption of projects with other permits.

“Significant tree removal permit” means a permit issued pursuant to the provisions of this chapter.

“Sprout clump” means individual stems arising from one root collar and sharing a common root system. [Ord. 5182 § 14, 2014; Ord. 4346 §§ 73, 74, 1994; Ord. 3443 § 1, 1983; Ord. 3341 § 1, 1982].

ASSUMPTIONS AND LIMITING CONDITIONS

1. Any legal description provided by the appraiser/consultant is assumed to be correct. No responsibility is assumed for matters legal in character nor is any opinion rendered as the quality of any title.
2. The appraiser/consultant can neither guarantee nor be responsible for accuracy of information provided by others.
3. The appraiser/consultant shall not be required to give testimony or to attend court by reason of this appraisal unless subsequent written arrangements are made, including payment of an additional fee for services.
4. Loss or removal of any part of this report invalidates the entire appraisal/evaluation.
5. Possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the person(s) to whom it is addressed without written consent of this appraiser/consultant.
6. This report and the values expressed herein represent the opinion of the appraiser/consultant, and the appraiser/consultant's fee is in no way contingent upon the reporting of a specified value nor upon any finding to be reported.
7. Sketches. Diagrams. Graphs. Photos. Etc., in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering reports or surveys.
8. This report has been made in conformity with acceptable appraisal/evaluation/diagnostic reporting techniques and procedures, as recommended by the International Society of Arboriculture.
9. When applying any pesticide, fungicide, or herbicide, always follow label instructions.
10. No tree described in this report was climbed, unless otherwise stated. We cannot take responsibility for any defects which could only have been discovered by climbing. A full root collar inspection, consisting of excavating around the tree to uncover the root collar and major buttress roots, was not performed, unless otherwise stated. We cannot take responsibility for any root defects which could only have been discovered by such an inspection.

CONSULTING ARBORIST DISCLOSURE STATEMENT

Arborists are tree specialists who use their education, knowledge, training, and experience to examine trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce risk of living near trees, Clients may choose to accept or disregard the recommendations of the arborist, or to seek additional advice.

Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. Trees are living organisms that fail in ways we do not fully understand. Conditions are often hidden within trees and below ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Likewise, remedial treatments, like medicine, cannot be guaranteed.

Trees can be managed, but they cannot be controlled. To live near trees is to accept some degree of risk. The only way to eliminate all risk associated with trees is to eliminate all trees.



Initial Study Attachment 7

GEOTECHNICAL INVESTIGATION
For
PROPOSED 12-LOT SUBDIVISION
3300 Maplethorpe Lane, Soquel
APN 037-121-60
Santa Cruz County, California

Prepared
For
JOHN SWIFT
Santa Cruz, California

Prepared By
DEES & ASSOCIATES, INC.
Geotechnical Engineers
Project No. SCR-1183
DECEMBER 2017



December 14, 2017

Project No. SCR-1183

JOHN SWIFT
500 Chestnut Street, Suite 100
Santa Cruz, California 95060

Subject: Geotechnical Investigation

Reference: Proposed 12-Lot Subdivision
3300 Maplethorpe Lane, Soquel
APN 037-121-60
Santa Cruz County, California

Dear Mr. Swift:

As requested, we have completed a Geotechnical Investigation for the 12-lot subdivision proposed at the referenced site. The purpose of our investigation was to evaluate the soil conditions at the site and provide geotechnical recommendations for the proposed improvements.

This report presents the results, conclusions and recommendations of our investigation. If you have any questions regarding this report, please call our office.

Very truly yours,

DEES & ASSOCIATES, INC.

Rebecca L. Dees
Geotechnical Engineer
G.E. 2623

Copies: 4 to Addressee



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GEOTECHNICAL INVESTIGATION

Introduction

This report presents the results of our Geotechnical Investigation for the 12-lot subdivision proposed at 3300 Maplethorpe Lane in the Soquel area of Santa Cruz County, California.

Purpose and Scope

The purpose of our investigation was to explore and evaluate surface and near surface soil at the site and provide geotechnical recommendations for design and construction of the proposed improvements.

The specific scope of our services was as follows:

1. Site reconnaissance and review of available data in our files pertinent to the site and vicinity.
2. Exploration of subsurface conditions consisting of logging and sampling of twelve (12) exploratory borings drilled between 4.0 and 31.5 feet below grade.
3. Laboratory testing to evaluate the engineering properties of the subsoils.
4. Engineering analysis and evaluation of the resulting field and laboratory test data. Based on our findings, we have developed geotechnical design criteria for general site grading, foundations, retaining walls, concrete slabs-on-grade, pavements, and general site drainage.
5. Preparation of this report presenting the results of our investigation.

Project Location and Description

The site is located at 3300 Maplethorpe Lane in the Soquel area of Santa Cruz County, California, Figure 1. The 3.5-acre parcel is located in a residential area and is bordered by residential properties on all sides. The natural topography in the area consists of a 10 to 15 percent south facing slope with a drainage ravine along the eastern border. The hillside descending to the drainage ravine is about 15 feet high with 40 to 60 percent slopes.

The site has been graded to create a large level pad. The pad was created by cutting into the slope and placing fill along the downslope sides. The cuts are about 10 feet high and sloped at about a 2:1 (horizontal to vertical) gradient. The fill was spread out along the downslope fringes of the pad and the fill is estimated to be up to about 5 feet deep at its deepest point.

The level pad area of the site is developed with greenhouses and accessory structures with a loop driveway. See Figure 2. The project consists of removing the existing improvements and constructing up to 12 single family residences at the site. Most of the residences will be constructed in the existing level pad area and three residences are



proposed on the gentle slopes above the pad area. A new loop road will be created to access the homesites. The road will enter the property in the same location as the existing driveway then the road will cross the level pad area and loop around on the slope above the existing pad to access the upper homesites.

Field Investigation

Subsurface conditions at the site were explored on 5 October 2017 with nine (9) exploratory borings drilled with 6-inch diameter continuous flight augers advanced with truck mounted drilling equipment and on 30 November 2017 with three (3) exploratory borings drilled with 6-inch diameter continuous flight augers advanced with tractor mounted drilling equipment. Our borings were drilled to depths of 4.0 to 31.5 feet. The approximate locations of our exploratory borings are indicated on Figure 2.

The soils observed in the test borings were logged in the field and described in accordance with the Unified Soil Classification System (D2487 and D2488), Figures 3. The Test Boring Logs denote subsurface conditions at the locations and times observed, and they are not warranted they are representative of subsurface conditions at other locations or times.

Representative soil samples were obtained from the exploratory borings at selected depths, or at major strata changes. These samples were recovered using the 3.0-inch O.D. Modified California Sampler (L) or the Standard Terzaghi Sampler (T). The penetration resistance blow counts for the (L) and (T) noted on the boring logs were obtained as the sampler was dynamically driven into the in situ soil. The process was performed by dropping a 140-pound hammer a 30-inch free fall distance and driving the sampler 6 to 18 inches and recording the number of blows for each 6-inch penetration interval. The blows recorded on the boring logs present the accumulated number of blows that were required to drive the last 12 inches. The blow counts indicated on the logs have been converted to equivalent standard penetration test (SPT) values.

Laboratory Testing

The laboratory testing program was directed toward a determination of the physical and engineering properties of the soils underlying the site. Moisture content and dry densities were performed on representative soil samples to determine the consistency of the soil and the moisture variation throughout the explored soil profile. Grain size analysis and Atterberg Limits were performed on select samples to aid in soil classification and to evaluate the relative shrink/swell potential of the foundation zone soils. Direct shear tests were performed to evaluate the shear strength properties of the foundation zone soil. The results of our field and laboratory testing appear on the "Log of Test Borings", opposite the sample tested.

Subsurface Soil Conditions

The Santa Cruz County Geologic Map indicates the site is underlain by Purisima Formation sandstone and siltstone and Coastal Terrace Deposits. However; our borings indicate the entire site is overlain with Terrace Deposits. Siltstone bedrock was encountered about 15 to 30 feet below existing grades.



Coastal terrace deposits, undifferentiated (Pleistocene), are described as, “Semiconsolidated, moderately well sorted marine sand with thin, discontinuous gravel-rich layers. May be overlain by poorly sorted fluvial and colluvial silt, sand and gravel. Thickness variable; generally less than 20 ft thick. May be relatively well indurated in upper part of weathered zone.”

The subsoils consisted of thin layers of firm to medium dense sandy clay, clay, silty sand and clayey sand. There was very little conformity of the layers between our boring locations. Some areas had thick deposits of clay and some areas had thick deposits of silty sand or clayey sand. Our borings encountered clays and sandy clays in the upper soil horizons over most of the proposed development. The clays were expansive (PI = 33 to 35) along the entrance road and in the southwest corner of the proposed development. The clay had a low to moderate expansion potential elsewhere on the site, although there could be areas with expansive clay present elsewhere. The near surface soils at the north end of the site on the slope above the existing level pad area consisted of silty sand. A detailed description of the subsoils is included on our Logs of Test Borings included in the Appendix.

Soil excavated from the upslope side of the existing level pad area was used as fill along the downslope side of the pad. The fill was 2 to 3.5 feet thick in our borings and is estimated to be up to 5 feet thick in the southeast corner of the site near the southern property line. The fill was loose to medium dense and consisted of clayey sand and sandy clay.

The soils below the site are classified as a Site Class “D” for analysis using the 2016 California Building Code.

Groundwater

A groundwater table was not encountered in our borings. Very moist to wet soils were encountered in Boring 3 about 16 feet below the ground surface. The boring was left open for 4 hours to see if a fully developed groundwater table was present and only a few inches of water developed on top of the sandstone (30 feet below grade) during this time period. No wet soils were encountered in any of our other borings. Boring 12 was drilled 14 feet deep and left open for one week. No groundwater developed in the boring over that time period.

The groundwater levels encountered in our borings denote groundwater conditions at the locations and times observed, and they are not warranted they are representative of groundwater conditions at other locations or times. Groundwater levels may vary with seasonal variations and other factors not evident during our investigation.

Seismicity

The project site is located in a seismically active region and several active and potentially active faults are located in the vicinity of the site. The following is a general discussion of seismicity in the project area. A more detailed discussion of faulting and seismicity is



beyond the scope of our services.

The site is located near the Zayante-Vergeles Fault Zone, the San Andreas Fault Zone, the offshore San Gregorio Fault Zone and the offshore Monterey Bay-Tularcitos Fault Zone. The San Andreas Fault is the largest and most active of the faults in the site vicinity. However, each fault is considered capable of generating moderate to severe ground shaking. It is reasonable to assume that the proposed development will be subject to at least one moderate to severe earthquake from one of the faults during the next fifty years.

| | San Andreas Fault | Zayante-Vergeles Fault | San Gregorio Fault | Monterey Bay-Tularcitos Fault |
|----------------|-------------------|------------------------|--------------------|-------------------------------|
| Distance Miles | 8.2 | 4.6 | 15.6 | 11.4 |
| Direction | NE | NE | SW | SW |

Structures designed according to the 2016 California Building Code may use the following parameters in their analysis. The following ground motion parameters may be used in seismic design and were determined using the USGS Ground Motion Parameter Calculator.

| Ss | S1 | SMs | SM1 | SDs | SD1 |
|---------|---------|---------|---------|---------|---------|
| 1.531 g | 0.606 g | 1.531 g | 0.910 g | 1.020 g | 0.606 g |

| | |
|-------------------------------|--------|
| PGAm | 0.58 g |
| Seismic Design Category (SDC) | D |

Liquefaction

Liquefaction occurs when saturated fine-grained sands, silts and sensitive clays are subject to shaking during an earthquake and the water pressure within the pores builds up leading to loss of strength. There is a low potential for liquefaction to develop below the site due to the lack of a groundwater table.

Landsliding

The site is very gently sloping with the exception of the ravine slope along the eastern edge of the site. The ravine slope is inclined at about a 40 to 60 percent slope and there is a potential for shallow landsliding to occur on the slope.

The proposed homesites will be setback 50 feet from the designated riparian zone along the ravine which sets the residences back a least 50 feet from the top edge of the ravine slope. The ravine slope is about 15 feet high and there is a low potential for landslides to affect improvements located 50 feet behind the top edge of the slope.



DISCUSSIONS AND CONCLUSIONS

Based on the results of our investigation, the subdivision improvements proposed at the site are feasible provided the recommendations presented in this report are incorporated into the design and construction of the project.

Primary geotechnical concerns for the project include setting improvements back from the top of slopes; removing existing fill material below improvements; providing firm, uniform support for foundations, slabs and pavements; mitigating expansive clay soils; controlling site drainage and designing structures to resist strong seismic shaking.

Improvements should be set back from the top of steep slopes. We understand there is a 50 feet wide setback from the riparian zone which puts the improvements at least 50 feet from the top edge of the ravine slope. The 50 feet setback provides more than enough setback from the top of the ravine slope to protect the improvements from landsliding and erosion along the drainage slopes. The existing cutslope at the back of the level pad area is inclined at about a 50 percent slope gradient now and the final slope will be inclined no steeper than 50 percent. Improvements located above cutslope should be setback at least 6 feet from the top edge of slopes or the foundations should be deepened so there is at least 6 feet of soil between the base of the foundation and the adjacent slope face.

There is 2 to 4 feet of existing fill in the homesites at the southeast corner of the site. The fill should be removed and replaced as compacted engineered fill where improvements are planned.

Structures may be supported on shallow spread footing foundations embedded into firm native soil or engineered fill. To provide a firm, uniform base for foundation support the entire foundation should be supported on engineered fill or the footings should penetrate the fill so the entire foundation is embedded into native soil. A map of the existing fill area is included on Figure 2.

There are expansive clays in the southwest area of the site that include the entrance road and about three of the homesites located in the southwest corner. To mitigate heave below foundations, foundations located in areas with expansive clay should be at least 24 inches deep to reduce the overall clay thickness and to provide enough load on the clay to mitigate expansion. The foundation excavations in areas with expansive clay should be kept moist from the time the excavation is made until the time the concrete is placed and the soil should be thoroughly wetted 24 prior to placing concrete.

Concrete slabs-on-grade that are located in areas with expansive soils may move up and down with seasonal moisture variations. To mitigate soil expansion below slabs, the top 12 inches of subgrade below the slab should be replaced with baserock or the top 8 inches of subgrade can be replaced with baserock with 4 inches of drainrock on top of the baserock.



Concentrated surface runoff should be collected and discharged in a controlled manner. The surface soils are generally clayey with poor permeability so concentrated runoff should be discharged into properly designed retention or detention facilities located away from building foundations. Retention facilities should be located at least 10 feet from foundations and at least 30 feet from the top of the ravine slope along the eastern edge of the property. Discharge from detention facilities should be carried to the base of the ravine slope in solid conduit pipe or discharged into off-site drainage facilities.

The upper homesite, located at the north end of the site, is located in an area with permeable soils so roof runoff from the upper homesite may be discharged onto splash blocks as long as the water coming off the splash blocks is directed away from the building foundation.

Structures should be designed to resist strong seismic shaking. Structures designed in accordance with current seismic design requirements should react well to seismic shaking.



RECOMMENDATIONS

The following recommendations should be used as guidelines for preparing project plans and specifications:

Site Grading

1. The soil engineer should be notified at least four (4) working days prior to any site clearing or grading to make arrangements for construction observation and testing services. The recommendations of this report are based on the assumption that the soil engineer will perform the required testing and observation during grading and construction. It is the owner's responsibility to make the necessary arrangements for these required services.
2. Areas to be graded should be cleared of obstructions, organics, existing fill and any other unsuitable material. Voids created during site clearing should be backfilled with engineered fill.
3. Where fill is planned to raise grade, any existing loose soil or fill should be removed and the area to receive engineered fill should be scarified 6 inches, moisture conditioned to 2 to 3 percent over optimum moisture content and compacted to 90 percent relative compaction.
4. For foundations that will be embedded into engineered fill, the fill should extend at least 18 inches below the bases of the foundations and extend at least 3 feet beyond the foundation in all directions.
5. Where referenced in this report, Percent Relative Compaction and Optimum Moisture Content shall be based on ASTM Test Designation D15570.
6. Soils used for engineered fill should be free of organic material, and contain no rocks or clods greater than 6 inches in diameter, with no more than 15 percent larger than 4 inches. Soils with more than 3 percent organic matter by weight should be considered organic and not suitable as engineered fill.
7. We estimate shrinkage factors of about 5 to 10 percent for the on-site materials when used in engineered fills.
8. Engineered fill should be placed in thin lifts not exceeding 8 inches in loose thickness; moisture conditioned to 1 to 3 percent over optimum moisture content and compacted to at least 90 percent relative compaction.
9. The upper 8 inches of subgrade below pavements should be moisture conditioned 2 to 3 percent over optimum moisture content and compacted to at least 94 percent relative compaction. The aggregate base below driveways and pavements should be compacted to at least 95 percent relative compaction.



10. Engineered fill slopes and permanent cutslopes should be inclined less than 2:1 (horizontal to vertical). Fill slopes should be keyed and benched into firm native soil. Keys should be at least 8 feet wide and embedded at least 18 inches into firm, native soil on the downslope side. Benches should be created in the natural hillside as the fill is placed. Benches should be at least 6 feet wide, remove all loose soil and be sloped into the hillside at least 2 percent.

11. Any keys or benches exposing potential seepage zones should be drained. Drains should consist of a minimum 12-inch wide column of Caltrans Class 1, Type A, permeable material that extends to within 12 inches of the final ground surface. A 4-inch perforated rigid pipe should be placed about 4 inches above the base of the gravel with the holes facing down. The pipe should be sloped at least 2 percent towards the discharge end. A solid collector pipe should be connected to the perforated pipe to carry the collected water to a suitable discharge point. The presence of seepage zones and the location and dimensions of the drains should be determined in the field by a representative from our office at the time of grading.

12. The face of cut and fill slopes should be groomed to remove any loose soil, create a fairly uniform slope surface. Cut and fill slopes should be protected from erosion at all times.

13. Engineered fill should be observed and tested by our firm. For planning purposes, in-place density tests should be performed as follows: one test for every 12 vertical inches of material placed for embankments, in trenches or around structures, one test for every 400 square feet for relatively thin fill sections and one test whenever there is a definite suspicion of a change in the quality of moisture control or effectiveness in compaction. The actual testing schedule should be determined by a representative from our firm at the time of grading.

14. After the earthwork operations have been completed and the soil engineer has finished their observation of the work, no further earthwork operations shall be performed except with the approval of and under the observation of the soil engineer.

Conventional Spread Footing Foundations

15. Conventional spread footings may be used to support structures. Foundations should be embedded into firm, native soil or engineered fill.

16. In general, footings should be a minimum of 12 inches deep and 12 inches wide for one story structures and 18 inches deep and 15 inches wide for two story structures.

17. Footings embedded into the expansive clayey soils located in the southwest corner of the site should be a minimum of 24 inches deep and 15 inches wide for both one and two-story structures. The depth of foundations should be measured from the lowest adjacent grade.



18. If footings are embedded into engineered fill, a minimum of 18 inches of engineered fill should be placed below the bases of all load bearing foundation elements.

19. Footings located adjacent to other footings or utility trenches should have their bearing surfaces founded below an imaginary 1.5:1 plane projected upward from the bottom edge of the adjacent footings or utility trenches.

20. Foundations designed in accordance with the above may be designed using the following allowable bearing capacities:

| Soil Condition | | One-Story (Qal) | Two-Story (Qal) |
|-----------------|---------------------|-----------------|-----------------|
| Native Soil | Low Expansion | 2,400 psf | 2,650 psf |
| Native Soil | Expansive Clay | 1,000 psf | 1,000 psf |
| Engineered Fill | Using On-Site Soils | 2,500 psf | 2,800 psf |
| Engineered Fill | Using Select Import | 3,000 psf | 3,400 psf |

The allowable bearing capacities may be increased by 1/3 for short term seismic and wind loads.

21. Total and differential settlements under the proposed light building loads are anticipated to be less than 1 inch and 1/2 inch respectively.

22. Lateral load resistance for structures supported on footings may be developed in friction between the foundation bottom and the supporting subgrade. Frictional resistance may be determined using 130 psf times the contact area of the footing. The frictional resistance may not exceed one-half the dead load.

23. Where footings are poured neat against the adjacent subgrade, the following passive lateral earth pressures may be used:

| Soil Condition | | Passive Pressure (EFW) |
|-----------------|---------------------|------------------------|
| Native Soil | Low Expansion | 300 psf |
| Native Soil | Expansive Clay | 175 psf |
| Engineered Fill | Using On-Site Soils | 300 psf |
| Engineered Fill | Using Select Import | 300 psf |

The top 12 inches of soil should be neglected in passive design.



24. The foundation excavations should be kept moist from the time the excavation is made until the time the concrete is placed to avoid soil shrinkage. The foundation excavations in areas with expansive clay should be thoroughly wetted 24 prior to placing concrete and observed by the soils engineer.

25. Prior to placing concrete, foundation excavations should be cleaned of loose soil and observed by the soils engineer.

Retaining Wall Lateral Pressures

26. Retaining structures should be designed to resist both lateral earth pressures and any additional surcharge loads.

27. If expansive soils exist within a 2:1 (h:v) imaginary line drawn upwards from the base of retaining walls, the expansive soil should be removed.

28. Retaining walls may be designed using the following active pressures:

| Slope | Active Pressure | Restrained Pressure |
|-----------|-----------------|---------------------|
| Level | 45 pcf EFW | 60 pcf EFW |
| 3:1 (h:v) | 50 pcf EFW | 85 pcf EFW |
| 2:1 (h:v) | 80 pcf EFW | 110 pcf EFW |

29. Where footings are poured neat against the adjacent subgrade, the following passive lateral earth pressures may be used:

| Soil Condition | | Passive Pressure (EFW) |
|-----------------|---------------------|------------------------|
| Native Soil | Low Expansion | 300 psf |
| Native Soil | Expansive Clay | 175 psf |
| Engineered Fill | Using On-Site Soils | 300 psf |
| Engineered Fill | Using Select Import | 300 psf |

The top 12 inches of soil should be neglected in passive design.

30. Retaining wall foundations should be at least 12 inches deep in areas where the soils have a low expansion potential and at least 24 inches deep where moderate to expansive soils exist.

31. Retaining wall foundations may be designed using the following allowable bearing capacities:

| Soil Condition | | Qal |
|----------------|---------------|-----------|
| Native Soil | Low Expansion | 2,400 psf |



| | | |
|-----------------|---------------------|-----------|
| Native Soil | Expansive Clay | 1,000 psf |
| Engineered Fill | Using On-Site Soils | 2,500 psf |
| Engineered Fill | Using Select Import | 3,000 psf |

32. Retaining walls should include an added seismic component of 18 pcf, equivalent fluid weight. Dynamic surcharges should be added to the above active lateral earth pressures. The resultant dynamic pressure should be applied at a point 0.6 H above the base of the wall.

33. The above lateral pressures assume that the walls are fully drained to prevent hydrostatic pressure behind the walls. **Drainage materials behind the wall should consist of Class 1, Type A permeable material** (Caltrans Specification 68-1.025) **or an approved equivalent**. The drainage material should be at least 12 inches thick. The drains should extend from the base of the walls to within 12 inches of the top of the backfill. A perforated pipe should be placed (holes down) about 2 inches above the bottom of the wall and be tied to a suitable drain outlet. Wall backdrains should be plugged at the surface with clayey material to prevent infiltration of surface runoff into the backdrains.

Concrete Slabs-on-Grade

34. The upper 8 inches of subgrade below exterior concrete slab-on-grade, walkways and patios should be moisture conditioned to 2 to 3 percent over optimum moisture content and compacted to at least 88 percent relative compaction.

35. Concrete slabs-on-grade that are located in areas with expansive soils may move up and down with seasonal moisture variations and develop cracks and un-even surfaces. To mitigate soil expansion below exterior slabs, the top 12 inches of subgrade below the slab may be replaced with baserock. The soil below the baserock should be wetted prior to placing the baserock.

36. To mitigate soil expansion below interior floor slabs, the top 12 inches of subgrade below the slab should be replaced with baserock or the subgrade should be replaced with 8 inches of baserock with 4 inches of drainrock on top. The soil below the baserock should be wetted prior to placing the baserock.

37. The upper 8 inches of subgrade below concrete pavements should be moisture conditioned to 2 to 3 percent over optimum moisture content and compacted to at least 94 percent relative compaction.

38. All slabs-on-grade can be expected to suffer some cracking and movement. However, thickened exterior edges, a well prepared subgrade including pre-moistening prior to pouring concrete, adequately spaced expansion joints and good workmanship should reduce cracking and movement.



39. Dees & Associates, Inc. are not experts in the field of moisture proofing and vapor barriers. In areas where floor wetness would be undesirable, an expert, experienced with moisture transmission and vapor barriers should be consulted. At a minimum, a blanket of 4 inches of free-draining gravel should be placed beneath the floor slab to act as a capillary break. In order to minimize vapor transmission, an impermeable membrane should be placed over the gravel.

Asphalt Pavements

40. Asphalt pavements should be at least 3 inches thick and be underlain by at least 9 inches of Class 2 Aggregate Base. (Pavement section is based on a TI of 5 and an estimated R-value of 10).

41. Only quality materials of the type and thickness (minimum) specified should be used. Baserock (R=78 minimum) should meet CALTRANS Standard Specifications for Class 2 Untreated Aggregate Base.

42. To have the selected pavement section perform to its greatest efficiency, the grading recommendations provided in this report should be closely followed. Subgrade preparation is very important to the life of pavement.

43. The upper 8 inches of subgrade below asphalt pavements should be moisture conditioned to 2 to 3 percent over optimum moisture content and compacted to at least 93 percent relative compaction.

44. The baserock section should be moisture conditioned to 1 to 2 percent over optimum moisture content and compacted to at least 95 percent relative compaction.

45. Place pavement only during periods of fair weather when the air temperature is within prescribed limits.

Pervious Pavements

46. Pervious pavements may be used at the site to reduce the area of impermeable surfaces.

47. The slope of the soil subgrade below pervious pavement sections should be as flat as possible (less than 2 percent longitudinal slope) to enable even distribution and infiltration of storm water. Infiltration rates should be adjusted where slope gradients steeper than 2 percent are proposed below pavements.

48. The subgrade soils have a low infiltration rate and compaction of the subgrade will reduce the permeability even more. The subgrade surface below pervious pavements should be graded smooth and proof rolled prior to placing the rock sections.

49. Permeable concrete pavements should be underlain by at least 4 inches of Class 3 permeable material over at least 8 inches of Class 4 Aggregate Base, or as specified by your designer.



50. Permeable paver pavements should be underlain by at least 4 inches of ASTM No. 57 permeable material over at least 8 inches of Class 4 Aggregate Base, or as specified by your designer. A 2-inch layer of No. 8 aggregate should be used on top of the No. 57 material and under the pavers.

51. The gravel reservoir below the pavement should be confined along the edges to prevent gravel from coming out from under the pavement.

52. A buried concrete curb should be used between pervious pavements and asphalt or concrete pavements to prevent water in the gravel reservoir from flowing into the subgrade below the non-pervious pavement.

53. If pervious pavements are proposed within 10 feet of structures, an impermeable liner (15 mil minimum) should be used on the subgrade surface to prevent water from saturating the soil and a concrete curb should be used between the pervious pavement and the foundation. The impermeable liner should be extended up the side of the concrete curb to the top of the gravel reservoir. To reduce the potential for water to flow under the membrane, a 4-inch deep trench should be excavated along the other edges of the membrane, the membrane should be turned down into the trench then the trench should be backfilled with native soil tamped in place.

54. Pervious pavements are generally not designed to infiltrate and store all water from all storms and the site soils have a low permeability. Therefore, an outlet or overflow path must be provided to discharge excess water.

55. The property owner should clearly understand the unique maintenance responsibilities inherent with permeable pavements. Pervious pavements require routine and long-term maintenance to maintain the pavement's hydrologic functions. The voids in the pavement need to be kept clear of dirt and debris and activities such as sanding that would clog the pavement should be avoided.

56. If pervious pavement is installed prior to completion of the project, the pavement should be protected from dirt, fine particles, excessive dust or any other activity that could clog or reduce the effectiveness of the pavement during construction operations.

Utility Trenches

57. Utility trenches placed parallel to structures should not extend within an imaginary 1.5:1 (horizontal to vertical) plane projected downward from the bottom edge of the adjacent footing.

58. Trenches should be shored in accordance with appropriate safety codes.

59. Trenches may be backfilled with compacted engineered fill placed in accordance with the grading section of this report. The backfill material should not be jetted in place.



60. The portion of utility trenches that extend under foundations should be sealed with 2-sack sand slurry (or equivalent) to prevent subsurface seepage from flowing under structures.

Site Drainage

61. Controlling surface and subsurface runoff is important to the performance of the project.

62. Surface drainage should include provisions for positive gradients so that surface runoff is not permitted to pond adjacent to foundations or other improvements. Where bare soil or pervious surfaces are located next to the foundation, the ground surface within 10 feet of the structure should be sloped at least 5 percent away from the foundation. Where impervious surfaces are used within 10 feet of the foundation, the impervious surface within 10 feet of the structure should be sloped at least 2 percent away from the foundation. Swales should be used to collect and remove surface runoff where the ground cannot be sloped the full 10 foot width away from the structure. Swales should be sloped at least 2 percent towards the discharge point.

63. Full roof gutters should be placed around the eaves of the structure. Discharge from the roof gutters should be conveyed away from the downspouts and discharged in a controlled manner.

64. Concentrated surface runoff should be collected and discharged in a controlled manner. The surface soils are generally clayey with poor permeability so concentrated runoff should be discharged into properly designed retention or detention facilities located away from building foundations or discharged off-site in accordance with applicable codes and regulations.

65. Retention facilities should be located at least 10 feet from foundations and at least 30 feet from the top of the ravine slope along the eastern edge of the property. Overflow/discharge from retention/detention facilities should be carried to the base of the ravine slope in solid conduit pipe or discharged into off-site drainage facilities.

66. The upper homesite, located at the north end of the site, is located in an area with permeable soils so roof runoff from the upper homesite may be discharged onto splash blocks as long as the water coming off the splash blocks is directed away from the building foundation.

67. The location of all drainage outlets should be reviewed and approved in the field prior to installation.

Plan Review, Construction Observation, and Testing

68. Dees & Associates, Inc. should be provided the opportunity for a general review of the final project plans prior to construction to evaluate if our geotechnical recommendations have been properly interpreted and implemented. If our firm is not accorded the opportunity of making the recommended review, we can assume no



responsibility for misinterpretation of our recommendations. We recommend that our office review the project plans prior to submittal to public agencies, to expedite project review. Dees & Associates, Inc. also requests the opportunity to observe and test grading operations and foundation excavations at the site. Observation of grading and foundation excavations allows anticipated soil conditions to be correlated to those actually encountered in the field during construction.



LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The recommendations of this report are based upon the assumption that the soil conditions do not deviate from those disclosed in the borings. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that planned at the time, our firm should be notified so that supplemental recommendations can be given.
2. This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information and recommendations contained herein are called to the attention of the Architects and Engineers for the project and incorporated into the plans, and that the necessary steps are taken to ensure that the Contractors and Subcontractors carry out such recommendations in the field. The conclusions and recommendations contained herein are professional opinions derived in accordance with current standards of professional practice. No other warranty expressed or implied is made.
3. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they are due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside our control. Therefore, this report should not be relied upon after a period of three years without being reviewed by a soil engineer.

APPENDIX A

Site Vicinity Map

Boring Site Plan

Unified Soil Classification System

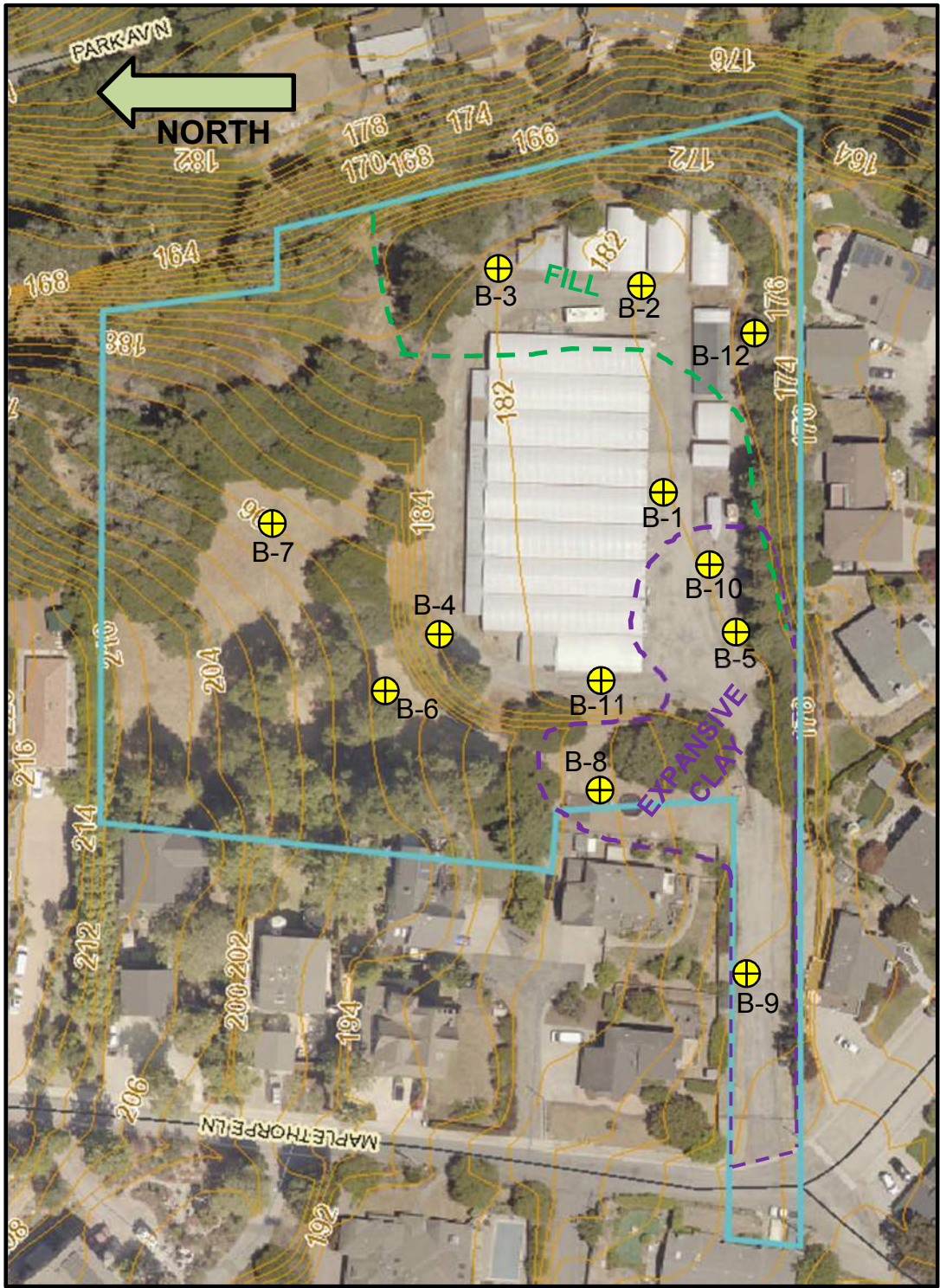
Logs of Test Borings

Laboratory Test Results



Site Location

SITE VICINITY MAP
Figure 1



BORING SITE PLAN
Figure 2

| MAJOR DIVISIONS | | GROUP SYMBOLS | TYPICAL NAMES | CLASSIFICATION CRITERIA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|--|--|--|-------------|------------|------------|-------|-------|--------|--------------|---------|-------|---------|------------|---------|--------------------------------|--|-------------|-------------|-----------|-------|------|-------|------|-------|-------|--------|------------|---------|------|---------|
| COARSE-GRAINED SOILS** MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE (THE NO. 200 SIEVE SIZE IS ABOUT THE SMALLEST PARTICLE VISIBLE TO THE NAKED EYE) | GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE | CLEAN GRAVELS (< 5% FINES) | GW | Well-graded gravels, gravel-sand mixtures, little or no fines | Wide range in grain sizes and substantial amounts of all intermediate particle sizes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | GRAVELS WITH FINES (> 12% FINES) | GP | Poorly graded gravels, gravel-sand mixtures, little or no fines | Predominantly one size or a range of sizes with some intermediate sizes missing Not meeting all gradation requirements for GW | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | GM | Silty gravels, gravel-sand-silt mixtures | Non plastic fines or fines with low plasticity Atterberg limits below "A" line or PI < 4 | Above "A" line with 4 < PI < 7 are borderline cases requiring use of dual symbols | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | GC | Clayey gravels, gravel-sand-clay mixtures | Plastic fines Atterberg limits above "A" line with PI > 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE | CLEAN SANDS (< 5% FINES) | SW | Well-graded sands, gravelly sands, little or no fines | Wide range in grain sizes and substantial amounts of all intermediate sizes missing | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | SANDS WITH FINES (> 12% FINES) | SP | Poorly graded sands, gravelly sands, little or no fines | Predominantly one size or a range of sizes with some intermediate sizes missing Not meeting all gradation requirements for SW | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | SM | Silty sands, sand-silt mixtures | Non plastic fines or fines with low plasticity Atterberg limits below "A" line or PI < 4 | Limits plotting in hatched zone with 4 < PI < 7 are borderline cases requiring use of dual symbols | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | SC | Clayey sands, sand-clay mixtures | Plastic fines Atterberg limits above "A" line with PI > 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | FINE-GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE (THE NO. 200 SIEVE SIZE IS ABOUT THE SMALLEST PARTICLE VISIBLE TO THE NAKED EYE) | SILTS AND CLAYS (LIQUID LIMIT < 50) | ML | Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity | <p>**Gravels and sands with 5% to 12 % fines are borderline cases requiring use of dual symbols.</p> <table border="1"> <thead> <tr> <th colspan="2">RELATIVE DENSITY OF SANDS AND GRAVELS</th> </tr> <tr> <th>DESCRIPTION</th> <th>BLOW / FT*</th> </tr> </thead> <tbody> <tr> <td>VERY LOOSE</td> <td>0 – 4</td> </tr> <tr> <td>LOOSE</td> <td>4 – 10</td> </tr> <tr> <td>MEDIUM DENSE</td> <td>10 – 30</td> </tr> <tr> <td>DENSE</td> <td>30 – 50</td> </tr> <tr> <td>VERY DENSE</td> <td>OVER 50</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">CONSISTENCY OF SILTS AND CLAYS</th> </tr> <tr> <th>DESCRIPTION</th> <th>BLOWS / FT*</th> </tr> </thead> <tbody> <tr> <td>VERY SOFT</td> <td>0 – 2</td> </tr> <tr> <td>SOFT</td> <td>2 – 4</td> </tr> <tr> <td>FIRM</td> <td>4 – 8</td> </tr> <tr> <td>STIFF</td> <td>8 – 16</td> </tr> <tr> <td>VERY STIFF</td> <td>16 – 32</td> </tr> <tr> <td>HARD</td> <td>OVER 32</td> </tr> </tbody> </table> <p>*Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. 12 vertical inches.</p> | RELATIVE DENSITY OF SANDS AND GRAVELS | | DESCRIPTION | BLOW / FT* | VERY LOOSE | 0 – 4 | LOOSE | 4 – 10 | MEDIUM DENSE | 10 – 30 | DENSE | 30 – 50 | VERY DENSE | OVER 50 | CONSISTENCY OF SILTS AND CLAYS | | DESCRIPTION | BLOWS / FT* | VERY SOFT | 0 – 2 | SOFT | 2 – 4 | FIRM | 4 – 8 | STIFF | 8 – 16 | VERY STIFF | 16 – 32 | HARD | OVER 32 |
| | | | RELATIVE DENSITY OF SANDS AND GRAVELS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DESCRIPTION | | | BLOW / FT* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VERY LOOSE | | 0 – 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LOOSE | | 4 – 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MEDIUM DENSE | | 10 – 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DENSE | | 30 – 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VERY DENSE | | OVER 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CONSISTENCY OF SILTS AND CLAYS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DESCRIPTION | BLOWS / FT* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VERY SOFT | 0 – 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SOFT | 2 – 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FIRM | 4 – 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STIFF | 8 – 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VERY STIFF | 16 – 32 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HARD | OVER 32 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CL | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OL | Organic silts and organic silty clays of low plasticity | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SILTS AND CLAYS (LIQUID LIMIT > 50) | MH | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CH | Inorganic clays of medium to high plasticity, organic silts | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | OH | Organic clays of medium to high plasticity, organic silts | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

L M T B
SAMPLE TYPES REFERENCED ON BORING LOGS

TEST BORING LOG

SCR-1183
Maplethorpe

LOGGED BY: CL DATE DRILLED: 10-5-2017 BORING TYPE: 6" SOLID STEM BORING NO: 1

| DEPTH | SAMPLE NO. | SOIL DESCRIPTION | USCS SOIL TYPE | FIELD BLOW COUNT | SPT BLOW COUNT* | DRY DENSITY (PCF) | MOISTURE (%) IN-SITU | MOISTURE (%) SATURATED | COHESION (PSF) | PHI ANGLE | % PASSING 200 SIEVE | PLASTICITY INDEX |
|-------|------------|---|----------------|------------------|-----------------|-------------------|----------------------|------------------------|----------------|-----------|---------------------|------------------|
| 1 | 1-1-1 | 1.5 inches AC over 3 inches AB | | | | | | | | | | |
| 2 | L | Dark yellow brown mottled orange fine Sandy CLAY, moist, hard | CL | 12 | | | | | | | | |
| 3 | 1-2 | Dark yellow brown mottled orange Clayey fine SAND to Sandy CLAY, moist, hard | SC/CL | 25 | 50 | 106.8 | 17.9 | | | | | |
| 4 | T | | | 18 | | | | | | | 36.2 | |
| 5 | 1-3 | Dark yellow brown Sandy CLAY with few rounded fine gravels, moist, very stiff | CL | 26 | | | 15.0 | | | | | |
| 6 | T | | | 9 | | | | | | | | |
| 7 | | | | 11 | | | 19.4 | | | | | |
| 8 | | | | 12 | | | | | | | | |
| 9 | | | | | | | | | | | | |
| 10 | 1-4 | Dark yellow brown Clayey fine SAND, moist, medium dense | SC | 6 | | | | | | | | |
| 11 | T | | | 7 | | | | | | | | |
| 12 | | Gravel lenses | | 14 | | | 20.8 | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |
| 15 | 1-5 | Grayish brown Clayey fine SAND, moist, medium dense | SC | 9 | | | | | | | | |
| 16 | T | | | 11 | | | | | | | | |
| 17 | | Boring terminated at: 16.5 feet | | 17 | | | | | | | | |
| 18 | | No Groundwater Encountered | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | |
| 23 | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | |

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* Blow count converted:
L = Field Blow Count / 2
M = Field Blow Count / 1.5

TEST BORING LOG

SCR-1183
Maplethorpe

| LOGGED BY: CL | DATE DRILLED: 10-5-2017 | BORING TYPE: 6" SOLID STEM | BORING NO: 2 | | | | | | | | |
|---------------|---|----------------------------|------------------|-----------------|-------------------|----------------------|------------------------|----------------|-----------|---------------------|------------------|
| SAMPLE NO. | SOIL DESCRIPTION | USCS SOIL TYPE | FIELD BLOW COUNT | SPT BLOW COUNT* | DRY DENSITY (PCF) | MOISTURE (%) IN-SITU | MOISTURE (%) SATURATED | COHESION (PSF) | PHI ANGLE | % PASSING 200 SIEVE | PLASTICITY INDEX |
| 1 | 2 inches AC over 5.5 inches AB | | | | | | | | | | |
| 2 | FILL, Dark yellow brown fine Clayey fine SAND, moist, medium dense | SC | 6 | | | | | | | | |
| 3 | | | 8 | | | | | | | | |
| 4 | | | 9 | 9 | 105.8 | 19.4 | | | | | |
| 5 | NATIVE, Dark gray Sandy CLAY, moist, stiff (Low Expansion) | CL | 4 | | | | | | | | |
| 6 | Dark gray Sandy CLAY, moist, stiff | CL | 6 | | | | | | | | |
| 7 | | | 7 | | | | | | | | |
| 8 | | | 9 | 8 | 110.0 | 15.4 | 19.2 | 365.5 | 32.9 | | |
| 9 | | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| 11 | Dark brown Clayey to Silty fine SAND, moist, medium dense | SM | 3 | | | | | | | | |
| 12 | | | 4 | | | | | | | | |
| 13 | | | 6 | 10 | | 18.6 | | | | | |
| 14 | | | | | | | | | | | |
| 15 | Dark brown Silty fine to medium SAND, moist, medium dense | SM | 5 | | | | | | | | |
| 16 | | | 6 | | | | | | | | |
| 17 | | | 13 | 10 | 111.1 | 15.7 | | | | | |
| 18 | | | | | | | | | | | |
| 19 | | | | | | | | | | | |
| 20 | Dark yellowish brown Silty fine to medium grained SAND with abundant light yellow brown Siltstone clasts, moist, medium dense | SM | 12 | | | | | | | | |
| 21 | | | 12 | | | | | | | | |
| 22 | | | 14 | 26 | | 19.8 | | | | | |
| 23 | | | | | | | | | | | |
| 24 | | | | | | | | | | | |
| 25 | Dark yellow brown mottled orange Sandy SILT, moist, hard (Purisima?) | ML | 14 | | | | | | | | |
| 26 | | | 14 | | | | | | | | |
| | | | 26 | 40 | | 24.5 | | | | | |
| | Boring terminated at: 26.5 feet No Groundwater Encountered | | | | | | | | | | |

TEST BORING LOG

SCR-1183
Maplethorpe

LOGGED BY: CL DATE DRILLED: 10-5-2017 BORING TYPE: 6" SOLID STEM BORING NO: 3

| SAMPLE NO. | SOIL DESCRIPTION | USCS SOIL TYPE | FIELD BLOW COUNT | SPT BLOW COUNT* | DRY DENSITY (PCF) | MOISTURE (%) IN-SITU | MOISTURE (%) SATURATED | COHESION (PSF) | PHI ANGLE | % PASSING 200 SIEVE | PLASTICITY INDEX |
|------------|---|----------------|------------------|-----------------|-------------------|----------------------|------------------------|----------------|-----------|---------------------|------------------|
| 1 | 3-1-1 L FILL, Mottled brown and yellow fine Sandy CLAY, moist, firm | CL | 4 | | | | | | | | |
| 2 | | | 7 | | | | | | | | |
| 3 | 3-2-1 M NATIVE, Grayish brown fine Sandy CLAY, moist, firm | CL | 10 | 9 | 111.3 | 17.6 | | | | | |
| 4 | | | 3 | | | | | | | | |
| 5 | 3-3 T Dark brown fine Sandy CLAY/Clayey SAND, moist, medium dense | CL/SC | 4 | 5 | | | | | | | |
| 6 | | | 1 | | | | | | | | |
| 7 | 3-4-1 L Dark brown fine Sandy CLAY/Clayey SAND, moist, medium dense | CL/SC | 3 | 6 | | | | | | | |
| 8 | | | 6 | | | | | | | | |
| 9 | Stiffer at 8.5 feet | | | | | | | | | | |
| 10 | 3-5-1 L Dark gray Clayey fine SAND/Sandy CLAY, very moist, firm | CL | 4 | | | | | | | | |
| 11 | | | 5 | | | | | | | | |
| 12 | 3-6 T Dark brown Clayey fine SAND, very moist, medium dense | SC | 9 | 7 | | | | | | | |
| 13 | | | 4 | | | | | | | | |
| 14 | 3-6 T Dark brown Clayey fine SAND, very moist, medium dense | SC | 2 | | | | | | | | |
| 15 | | | 4 | | | | | | | | |
| 16 | Very moist soil at 16.5 feet but no free water | | | | | | | | | | |
| 17 | 3-7 T Dark brown Silty fine SAND, wet, medium dense | SM | 5 | 9 | | 21.9 | | | | | |
| 18 | | | 2 | | | | | | | | |
| 19 | 3-7 T Dark brown Silty fine SAND, wet, medium dense | SM | 4 | | | | | | | | |
| 20 | | | 5 | | | | | | | 28.4 | |
| 21 | 3-8 T Dark gray brown Silty fine SAND with few rounded fine gravels, wet, medium dense | SM | 2 | | | | | | | | |
| 22 | | | 4 | | | | | | | | |
| 23 | 3-8 T Dark gray brown Silty fine SAND with few rounded fine gravels, wet, medium dense | SM | 3 | | | | | | | | |
| 24 | | | 6 | | | | | | | | |
| 25 | 3-8 T Dark gray brown Silty fine SAND with few rounded fine gravels, wet, medium dense | SM | 10 | 16 | | 20.8 | | | | | |
| 26 | | | 3 | | | | | | | 23.5 | |
| | | | | | | | | | | 33.1 | |

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* Blow count converted:
L = Field Blow Count / 2
M = Field Blow Count / 1.5

| TEST BORING LOG | | | | SCR-1183 Maplethorpe | | | | | | | |
|---|---|-------------------------|----------------------------|-------------------------|-------------------|-----------------------|------------------------|----------------|-----------|---------------------|------------------|
| LOGGED BY: CL | | DATE DRILLED: 10-5-2017 | BORING TYPE: 6" SOLID STEM | | | BORING NO: 3 - Con't. | | | | | |
| SAMPLE NO. | SOIL DESCRIPTION | USCS SOIL TYPE | FIELD BLOW COUNT | SPT BLOW COUNT* | DRY DENSITY (PCF) | MOISTURE (%) IN-SITU | MOISTURE (%) SATURATED | COHESION (PSF) | PHI ANGLE | % PASSING 200 SIEVE | PLASTICITY INDEX |
| - 27 - 28 - 29 - 30 - 31 - 32 - | Groundwater perched at 30 feet after 4 hours | | | | | | | | | | |
| 3-9 | Bluish grey moderately cemented SILTSTONE, moist, hard | ML | 50/6" | 50/6" | | | | | | | |
| | Boring Terminated at 31.0 Feet Groundwater developed at 30 feet after 4 hours Soils were very moist to wet at 16.5 feet | | | | | | | | | | |

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* Blow count converted:
 L = Field Blow Count / 2
 M = Field Blow Count / 1.5

| TEST BORING LOG | | | | | | SCR-1183 Maplethorpe | | | | | |
|-----------------|--|-------------------------|------------------|----------------------------|-------------------|-------------------------|------------------------|----------------|-----------|---------------------|------------------|
| LOGGED BY: CL | | DATE DRILLED: 10-5-2017 | | BORING TYPE: 6" SOLID STEM | | BORING NO: 4 | | | | | |
| SAMPLE NO. | SOIL DESCRIPTION | USCS SOIL TYPE | FIELD BLOW COUNT | SPT BLOW COUNT* | DRY DENSITY (PCF) | MOISTURE (%) IN-SITU | MOISTURE (%) SATURATED | COHESION (PSF) | PHI ANGLE | % PASSING 200 SIEVE | PLASTICITY INDEX |
| 1 | 4.5 inches AB | | | | | | | | | | |
| 1-1 | Grayish brown mottled orange fine Sandy CLAY, moist, very stiff | CL | 10 | | | | | | | | |
| 2 | | | 18 | 21 | 102.8 | 16.6 | 25.2 | 239.4 | 28.4 | | 9.6 |
| 3 | | | 24 | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | Dark yellow brown Silty fine to medium SAND, moist, medium dense | SM | 16 | | | | | | | | |
| 5-1 | | | 22 | 25 | 110.4 | 15.4 | | | | | |
| 6 | | | 28 | | | | | | | | |
| 7 | | | | | | | | | | | |
| 8 | | | | | | | | | | | |
| 9 | | | | | | | | | | | |
| 10 | Dark yellow brown Clayey fine SAND, moist, medium dense | SC | 8 | | | | | | | | |
| 10-1 | | | 8 | 22 | | | | | | | |
| 11 | | | 14 | | | | | | | | |
| 12 | | | | | | | | | | | |
| 13 | | | | | | | | | | | |
| 14 | | | | | | | | | | | |
| 15 | Grayish brown mottled orange Clayey fine SAND, moist, medium dense | SC | 12 | | | | | | | | |
| 15-1 | | | 12 | 28 | | 16.2 | | | | | |
| 16 | | | 16 | | | | | | | | |
| 17 | Boring Terminated at 16.5 Feet No Groundwater Encountered | | | | | | | | | | |
| 18 | | | | | | | | | | | |
| 19 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 21 | | | | | | | | | | | |
| 22 | | | | | | | | | | | |
| 23 | | | | | | | | | | | |
| 24 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |

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www.deesgeo.com | (831) 427-1770 | Fax: (831) 427-1794

* Blow count converted:
L = Field Blow Count / 2
M = Field Blow Count / 1.5

| TEST BORING LOG | | | | | SCR-1183 Maplethorpe | | | | | | |
|-----------------|--|---|------------------|----------------------------|-------------------------|----------------------|------------------------|----------------|-----------|---------------------|------------------|
| LOGGED BY: CL | | DATE DRILLED: 10-5-2017 | | BORING TYPE: 6" SOLID STEM | | | BORING NO: 6 | | | | |
| SAMPLE NO. | SOIL DESCRIPTION | USCS SOIL TYPE | FIELD BLOW COUNT | SPT BLOW COUNT* | DRY DENSITY (PCF) | MOISTURE (%) IN-SITU | MOISTURE (%) SATURATED | COHESION (PSF) | PHI ANGLE | % PASSING 200 SIEVE | PLASTICITY INDEX |
| 1 | | | | | | | | | | | |
| 2 | 6-1-1 L | Dark yellow brown mottled gray and black fine Sandy CLAY, damp, very stiff | CL | 12 18 27 | 23 | 95.4 | 10.6 | | | | 18.6 |
| 3 | 6-2 T | Brown fine Sandy CLAY, moist, stiff | | 6 7 8 | 15 | | | | | | |
| 6 | 6-3 T | Dark yellow brown mottled orange fine Sandy CLAY/Clayey SAND, damp, very hard | SC/ CL | 6 18 50/6" | 50/6" | 10.3 | | | | | |
| 11 | 6-4-1 L | Light brown mottled gray fine Sandy CLAY, dry, very hard | CL | 27 50/6" | 50 | 111.8 | 10.8 | | | | |
| 16 | 6-5 T | Yellow brown mottled Gray Sandy CLAY/Clayey SAND, moist, very dense | CL/ SC | 20 24 27 | 51 | 9.6 | | | | | |
| 21 | 6-6 T | Yellow brown Silty fine to coarse SAND, moist, very dense | SM | 17 25 38 | 63 | | | | | | |
| 22 | Boring Terminated at 21.5 Feet No Groundwater Encountered | | | | | | | | | | |
| 23 | | | | | | | | | | | |
| 24 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |

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* Blow count converted:
L = Field Blow Count / 2
M = Field Blow Count / 1.5

| TEST BORING LOG | | | | | | SCR-1183 Maplethorpe | | | | | | | | |
|--|------------------|---|--|----------------------------|----------------|-------------------------|-----------------|-------------------|----------------------|------------------------|----------------|-----------|---------------------|------------------|
| LOGGED BY: CL | | DATE DRILLED: 10-5-2017 | | BORING TYPE: 6" SOLID STEM | | | BORING NO: 7 | | | | | | | |
| SAMPLE NO. | SOIL DESCRIPTION | | | | USCS SOIL TYPE | FIELD BLOW COUNT | SPT BLOW COUNT* | DRY DENSITY (PCF) | MOISTURE (%) IN-SITU | MOISTURE (%) SATURATED | COHESION (PSF) | PHI ANGLE | % PASSING 200 SIEVE | PLASTICITY INDEX |
| 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 - 19 - 20 - 21 - 22 - 23 - 24 - 25 - | 7-1-1 L | Yellow brown mottled orange Silty fine SAND, dry, dense | | | | SM | 23 50/6" | 50 | 107.2 | 11.4 | | | 13.9 | |
| | 7-2-1 M | Dark yellow to Gray brown mottled orange Clayey fine SAND, medium dense | | | | SC | 7 15 17 | 22 | 115.7 | 16.5 | | | | |
| | 7-3 T | Grey brown, orange, gray Silty fine to medium SAND, moist, dense | | | | SM | 14 14 16 | 30 | | | | | | |
| | 7-4 T | Gray brown mottled orange Clayey fine SAND, moist, dense | | | | SC | 14 16 23 | 31 | | 12.2 | | | | |
| | | Boring Terminated at 16.5 Feet No Groundwater Encountered | | | | | | | | | | | | |

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* Blow count converted:
L = Field Blow Count / 2
M = Field Blow Count / 1.5

| TEST BORING LOG | | | | | SCR-1183 Maplethorpe | | | | | | |
|---|------------------|---|------------------|----------------------------|-------------------------|----------------------|------------------------|----------------|-----------|---------------------|------------------|
| LOGGED BY: CL | | DATE DRILLED: 10-5-2017 | | BORING TYPE: 6" SOLID STEM | | | BORING NO: 8 | | | | |
| SAMPLE NO. | SOIL DESCRIPTION | USCS SOIL TYPE | FIELD BLOW COUNT | SPT BLOW COUNT* | DRY DENSITY (PCF) | MOISTURE (%) IN-SITU | MOISTURE (%) SATURATED | COHESION (PSF) | PHI ANGLE | % PASSING 200 SIEVE | PLASTICITY INDEX |
| 1 - - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 - 19 - 20 - 21 - 22 - 23 - 24 - 25 - | 8-1-1 L | Grayish brown fine Sandy CLAY, damp, stiff | CL | 8 12 15 | 14 | | | | | | 34.6 |
| | 8-2 T | Grayish brown fine Sandy CLAY, damp, hard | CL | 16 30 30 | 60 | | 22.8 | | | | |
| | 8-3-1 M | Light grayish brown fine Sandy CLAY, damp, hard | CL | 12 28 50/6" | 50/9" | 127.5 | 13.4 | | | | |
| | 8-4 T | Grayish brown with orange and gray Clayey fine SAND, moist, dense | SC | 12 14 17 | 31 | | 17.6 | | | | |
| | 8-5 T | Grayish brown mottled orange Silty fine SAND, moist, dense | SM | 8 12 17 | 29 | | | | | | |
| | | Boring Terminated at 16.5 Feet No Groundwater Encountered | | | | | | | | | |

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* Blow count converted:
L = Field Blow Count / 2
M = Field Blow Count / 1.5

| TEST BORING LOG | | | | | SCR-1183 Maplethorpe | | | | | | | | |
|-----------------|------------------|---|----------------------------|----------------|-------------------------|-----------------|-------------------|----------------------|------------------------|----------------|-----------|---------------------|------------------|
| LOGGED BY: CL | | DATE DRILLED: 10-5-2017 | BORING TYPE: 6" SOLID STEM | | BORING NO: 9 | | | | | | | | |
| SAMPLE NO. | SOIL DESCRIPTION | | | USCS SOIL TYPE | FIELD BLOW COUNT | SPT BLOW COUNT* | DRY DENSITY (PCF) | MOISTURE (%) IN-SITU | MOISTURE (%) SATURATED | COHESION (PSF) | PHI ANGLE | % PASSING 200 SIEVE | PLASTICITY INDEX |
| 1 | 9-1-1 | 2 inches AC over 3.5 inches AB | | | | | | | | | | | |
| 2 | L | Grayish brown fine Sandy CLAY, moist, stiff | CL | 5 | | | | | | | | | |
| 3 | 9-2 | Grayish brown fine Sandy CLAY, damp, hard | | 7 | 9 | 114.5 | 15.8 | | | | | | |
| 4 | T | | | 10 | | | | | | | | | |
| 5 | | | | 13 | | | | | | | | | |
| 6 | | | | 20 | | 33 | | | | | | | |
| 7 | 9-3 | Dark yellow brown mottled orange Sandy CLAY, moist, hard | CL | 9 | | | | | | | | | |
| 8 | T | | | 10 | | | | | | | | | |
| 9 | | | | 11 | | 21 | | | | | | | |
| 10 | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | |
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| 23 | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| 7 | | Boring Terminated at 6.5 Feet No Groundwater Encountered | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | |
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* Blow count converted:
L = Field Blow Count / 2
M = Field Blow Count / 1.5

| TEST BORING LOG | | | | SCR-1183 Maplethorpe | | | | | | | |
|------------------------|---|--------------------------|----------------------------|-------------------------|-------------------|----------------------|------------------------|----------------|-----------|---------------------|------------------|
| LOGGED BY: BD | | DATE DRILLED: 11-30-2017 | BORING TYPE: 6" SOLID STEM | | BORING NO: 10 | | | | | | |
| SAMPLE NO. | SOIL DESCRIPTION | USCS SOIL TYPE | FIELD BLOW COUNT | SPT BLOW COUNT* | DRY DENSITY (PCF) | MOISTURE (%) IN-SITU | MOISTURE (%) SATURATED | COHESION (PSF) | PHI ANGLE | % PASSING 200 SIEVE | PLASTICITY INDEX |
| 1 | 10-1 | | 5 | | | | | | | | |
| 2 | 10-2 | | 9 | 16 | | | | | | | |
| 3 | | | 7 | | | | | | | | |
| 4 | | | 10 | 17 | | | | | | | |
| 5 | Boring Terminated at 4 Feet No Groundwater Encountered | | | | | | | | | | |
| 6 | | | | | | | | | | | |
| 7 | | | | | | | | | | | |
| 8 | | | | | | | | | | | |
| 9 | | | | | | | | | | | |
| 10 | | | | | | | | | | | |
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| 23 | | | | | | | | | | | |
| 24 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |

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* Blow count converted:
 L = Field Blow Count / 2
 M = Field Blow Count / 1.5

| TEST BORING LOG | | | | SCR-1183 Maplethorpe | | | | | | | | |
|-----------------|------------|--|----------------|----------------------------|-----------------|-------------------|----------------------|------------------------|----------------|-----------|---------------------|------------------|
| LOGGED BY: BD | | DATE DRILLED: 11-30-2017 | | BORING TYPE: 6" SOLID STEM | | BORING NO: 11 | | | | | | |
| | SAMPLE NO. | SOIL DESCRIPTION | USCS SOIL TYPE | FIELD BLOW COUNT | SPT BLOW COUNT* | DRY DENSITY (PCF) | MOISTURE (%) IN-SITU | MOISTURE (%) SATURATED | COHESION (PSF) | PHI ANGLE | % PASSING 200 SIEVE | PLASTICITY INDEX |
| 1 | 11-1 | Mottled gray brown with orange and light gray Sandy CLAY, moist, stiff | | 6 | | | | | | | | |
| 2 | T | | | 7 | 18 | | | | | | | |
| 3 | 11-2 | | | 7 | | | | | | | | |
| 4 | T | | | 9 | 19 | | | | | | | |
| 5 | | Boring Terminated at 4.5 Feet No Groundwater Encountered | | 10 | | | | | | | | |
| 6 | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | |
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| 11 | | | | | | | | | | | | |
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| 14 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | |
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| 21 | | | | | | | | | | | | |
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| 23 | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | |

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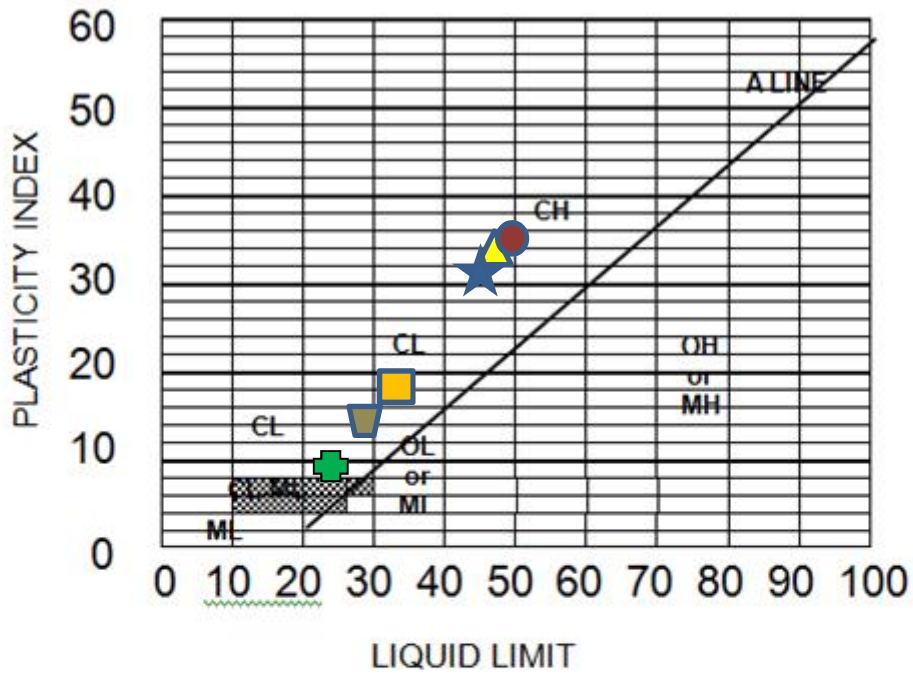
* Blow count converted:
L = Field Blow Count / 2
M = Field Blow Count / 1.5

| TEST BORING LOG | | | | | SCR-1183 Maplethorpe | | | | | | |
|-----------------|--|--------------------------|------------------|----------------------------|-------------------------|----------------------|------------------------|----------------|-----------|---------------------|------------------|
| LOGGED BY: BD | | DATE DRILLED: 11-30-2017 | | BORING TYPE: 6" SOLID STEM | | | BORING NO: 12 | | | | |
| SAMPLE NO. | SOIL DESCRIPTION | USCS SOIL TYPE | FIELD BLOW COUNT | SPT BLOW COUNT* | DRY DENSITY (PCF) | MOISTURE (%) IN-SITU | MOISTURE (%) SATURATED | COHESION (PSF) | PHI ANGLE | % PASSING 200 SIEVE | PLASTICITY INDEX |
| - | | | | | | | | | | | |
| 1 | Old FILL? | | | | | | | | | | |
| - | Dark yellow brown to gray brown Sandy CLAY, soft to firm | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| - | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| - | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| - | | | | | | | | | | | |
| 5 | Dark gray to black CLAY with SAND, wet, firm | | | | | | | | | | |
| - | | | | | | | | | | | |
| 6 | | | | | | | | | | | |
| - | | | | | | | | | | | |
| 7 | | | | | | | | | | | |
| - | | | | | | | | | | | |
| 8 | | | | | | | | | | | |
| - | | | | | | | | | | | |
| 9 | | | | | | | | | | | |
| - | | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| - | | | | | | | | | | | |
| 11 | Increase in density | | | | | | | | | | |
| - | Lighter gray with more sand | | | | | | | | | | |
| 12 | Dark gray Sandy CLAY, wet, firm | | | | | | | | | | |
| - | | | | | | | | | | | |
| 13 | | | | | | | | | | | |
| - | | | | | | | | | | | |
| 14 | | | | | | | | | | | |
| - | | | | | | | | | | | |
| 15 | Boring Terminated at 14'-4" Feet | | | | | | | | | | |
| - | No Groundwater Encountered | | | | | | | | | | |
| 16 | | | | | | | | | | | |
| - | | | | | | | | | | | |
| 17 | | | | | | | | | | | |
| - | | | | | | | | | | | |
| 18 | | | | | | | | | | | |
| - | | | | | | | | | | | |
| 19 | | | | | | | | | | | |
| - | | | | | | | | | | | |
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| - | | | | | | | | | | | |
| 21 | | | | | | | | | | | |
| - | | | | | | | | | | | |
| 22 | | | | | | | | | | | |
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| 23 | | | | | | | | | | | |
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| 24 | | | | | | | | | | | |
| - | | | | | | | | | | | |
| 25 | | | | | | | | | | | |
| - | | | | | | | | | | | |

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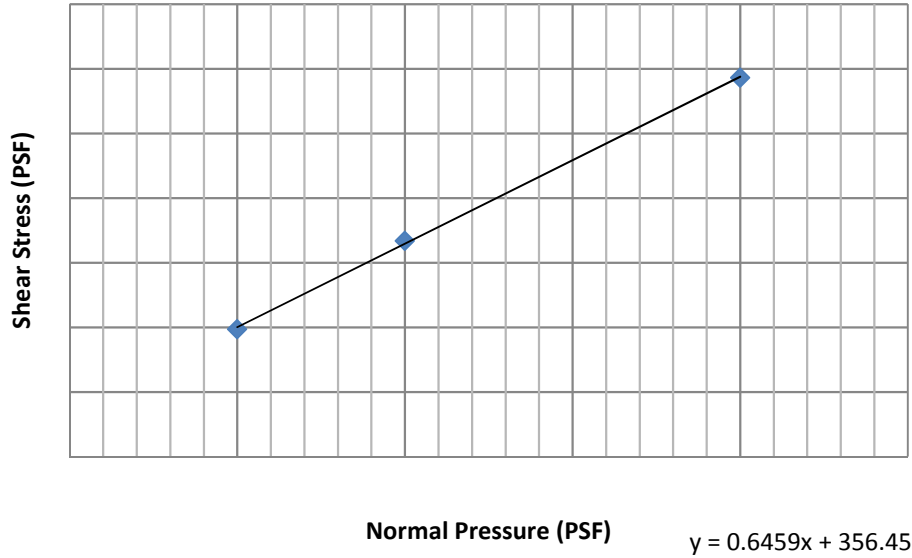
* Blow count converted:
 L = Field Blow Count / 2
 M = Field Blow Count / 1.5



| | | | |
|-----------|---|-----------|--|
| MH | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts | ML | Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity |
| CH | Inorganic clays of medium to high plasticity, organic silts, fat clays | CL | Inorganic clays of low to medium plasticity, gravelly clay sandy clays, silty clays, lean clays |
| OH | Organic clays of medium to high plasticity, organic silts | OL | Organic silts and organic silty clays of low plasticity |
| Pt | Peat and other highly organic soils | | |

| Symbol | Sample No. | Depth Ft. | In-Situ Moisture Content % | Liquid Limit (%) | Plastic Limit (%) | Plasticity Index (%) | Liquidity Index (W-PL)/(LL-PL) | USC Symbol |
|--------|------------|-----------|----------------------------|------------------|-------------------|----------------------|--------------------------------|------------|
| + | 4-1-1 | 2.0 | 16.6 | 23.9 | 14.3 | 9.6 | 0.24 | CL |
| ▲ | 5-1-1 | 2.0 | 14.2 | 45.8 | 12.3 | 33.5 | 0.06 | CL |
| ■ | 6-1-1 | 2.0 | 10.6 | 32.5 | 13.9 | 18.6 | | CL |
| ● | 8-1-1 | 2.0 | 14.1 | 49.6 | 15.0 | 34.6 | | CL |
| ★ | 10-1 | 2.0 | | 45.0 | 13.7 | 31.3 | | CL |
| 🪣 | 11-1 | 2.0 | | 29.0 | 14.2 | 14.6 | | CL |

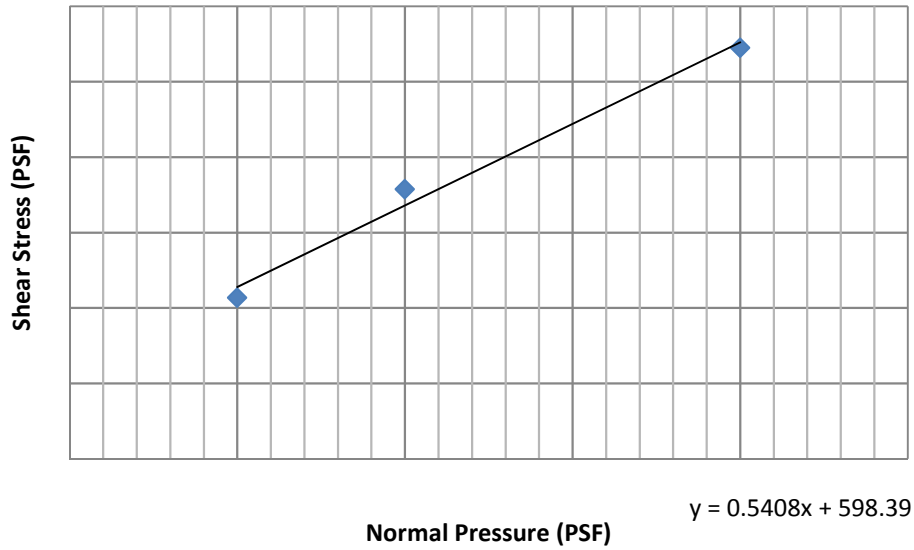
Saturated Direct Shear Results



SAMPLE 2-3-1

Phi = 32.9 degrees
Cohesion = 365.5 psf

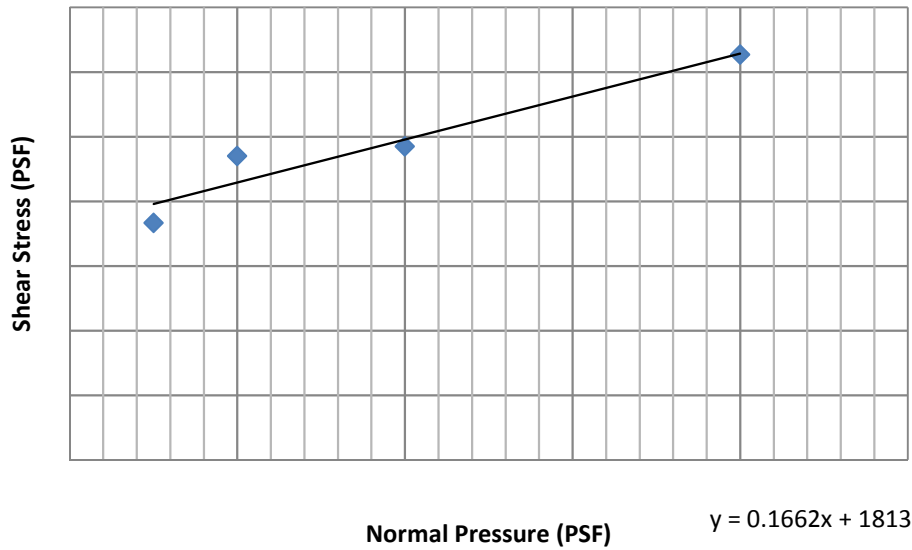
Saturated Direct Shear Results



SAMPLE 4-1-1

Phi = 28.4 degrees
Cohesion = 598.4 psf

Saturated Direct Shear Results



SAMPLE 5-1-1

Phi = 9.4 degrees
Cohesion = 1813.0 psf



Dees & Associates, Inc.
Geotechnical Engineers

501 Mission Street, Suite 8A Santa Cruz, CA 95060

Phone (831) 427-1770 Fax (831) 427-1794

December 13, 2018

Project No. SCR-1183

JOHN SWIFT
500 Chestnut Street, Suite 100
Santa Cruz, California 95060

Subject: Drainage Improvements
Reference: Proposed 12-Lot Subdivision
3300 Maplethorpe Lane, Soquel
APN 037-121-60
Santa Cruz County, California

Dear Mr. Swift:

The proposed drainage system for the new subdivision will include retention/detention chambers with metered outfall into an existing culvert that discharges onto an ephemeral streambed. We understand the detention system is designed to collect runoff from the proposed improvements and discharge the collected water into the stream at pre-development runoff rates. Collected water will be allowed to percolate into the ground as it is being stored. The proposed retention/detention chambers will be located at the southeast corner of the site above the creek bank. See Figure 1, attached. This letter discusses the stability of the slopes below the proposed detention chambers and culvert outfall.

The creek bank is comprised of highly erodible soils. There are numerous slipouts along the creek bank from water eroding the toe of the creek and undermining the slopes above. Based on the existing slope conditions and the composition of the soils, we recommend setting the detention chambers behind a 3:1 line (horizontal to vertical) drawn upwards from the base of the slope. A 3:1 setback line below the proposed detention chambers results in a 45 feet setback from the top of the creek bank. The proposed detention chambers are located about 65 feet from the top edge of the 15 feet high creek bank, which is 20 feet beyond our recommended setback line.

The existing culvert discharges at the base of the creek a couple of feet above the creek bed. There was no erosion noted on the slopes near the culvert outfall. As long as runoff is maintained at existing runoff levels, the creek bed and slopes at the culvert outfall should perform as well as they have in the past.

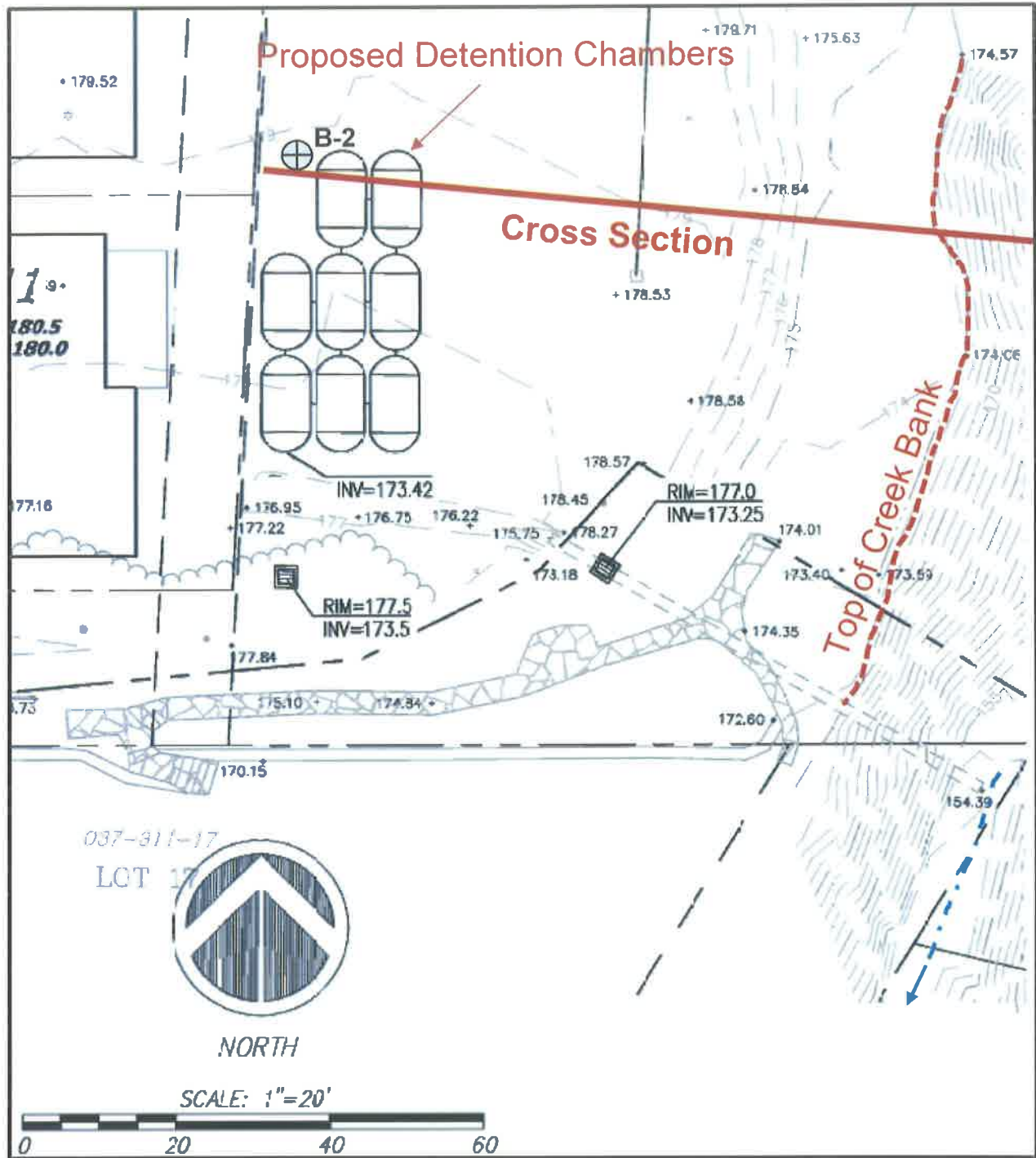
Very truly yours,

DEES & ASSOCIATES, INC.

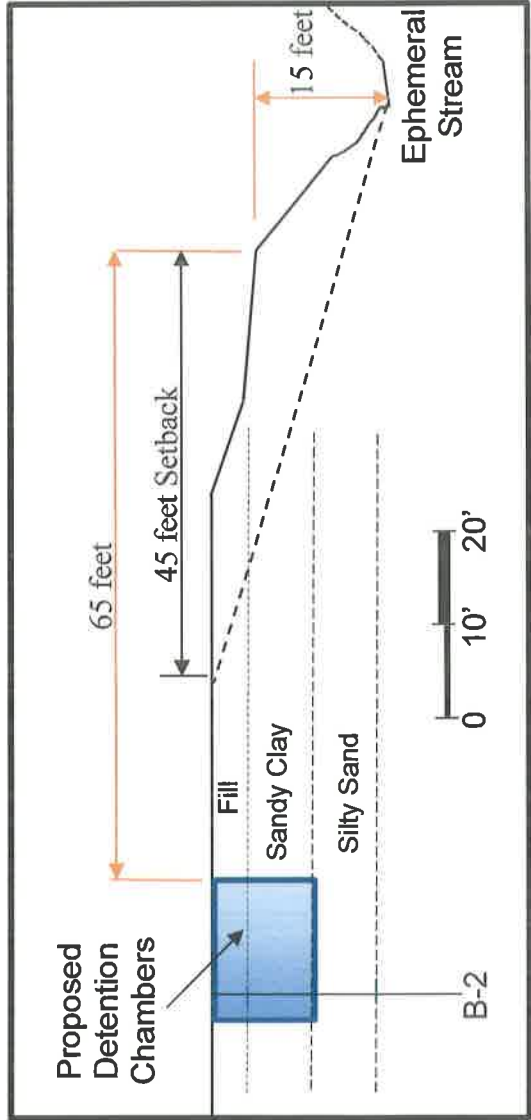

Rebecca L. Dees
Geotechnical Engineer
G.E. 2623



Attachments
Copies: 4 to Addressee



Site Plan
Figure 1



Cross Section
Figure 2



Dees & Associates, Inc.
Geotechnical Engineers

501 Mission Street, Suite 8A Santa Cruz, CA 95060

Phone (831) 427-1770 Fax (831) 427-1794

December 13, 2017
Revised December 11, 2018

Project No. SCR-1183

JOHN SWIFT
500 Chestnut Street, Suite 100
Santa Cruz, California 95060

Subject: Percolation Test Results

Reference: 3300 Maplethorpe Lane, Soquel
APN 037-121-60
Santa Cruz County, California

Dear Mr. Swift:

This report presents a summary of our percolation test results at the referenced site. The purpose of our percolation testing was to determine the soils permeability for use in on-site storm water retention design.

Our scope of work included installation of three (3) percolation test borings drilled 4.5 feet, 9 feet and 15 feet in depth; percolation testing; engineering analysis and preparation of this report. The attached Boring Site Plan, Figure 1, depicts the location of the percolation testing.

The borings were drilled with 6-inch diameter continuous flight auger equipment. Upon removal of the soil from the borings, 2 to 8 inches of pre-washed pea gravel was placed at the bottom. The test holes were fitted with 4-inch diameter, perforated, PVC pipe and the annuli were packed with pre-washed pea gravel. Then the percolation holes were pre-saturated with water twenty-four hours prior to testing.

The percolation tests were performed so that we tested the soil zones between 1 and 4 feet, 6 and 9.5 feet, and 10 to 15 feet. Water was added to the hole at the start of the test then measured at 30 minute time intervals for a period of 4 hours. Water was added after each reading, as needed during the test, to maintain the water level in the zone of interest.

Our test results indicated the soils above 5 feet and between 9 and 15 feet have a percolation rate of zero. The soils between 6 and 9 feet have a percolation rate of 1.75 inches per hour. This value may be multiplied by the wetted surface area of the retention system in design. Our raw field data was adjusted to account for the presence of a gravel and pipe in the hole and the surface area being tested. Our field data and calculations are attached.

DEES & ASSOCIATES, INC.


Rebecca L. Dees
Geotechnical Engineer
G.E. 2623



Attachments

Copies: 4 to Addressee

Initial Study Attachment 8

January 24, 2019

John Swift and Gilbert Kirchner
500 Chestnut St.
Santa Cruz, CA 95060

SUBJECT: Conditional Water Service Application for Subdivision with 11 Tier I Single-Family Dwellings at 3300 Maplethorpe Ln., Soquel, APN 037-121-60

Dear John Swift and Gilbert Kirchner:

In response to the subject application, the Board of Directors of the Soquel Creek Water District (SqCWD) at their regular meeting of January 15, 2019 voted to grant you a Conditional Will Serve Letter for the proposed Subdivision with 11 Tier I (parcels sized less than 10,000 square feet) single-family dwellings to be located at 3300 Maplethorpe Ln, Soquel, so that you may proceed through the appropriate land use planning entity.

This letter is specifically granted for the project as proposed in regard to uses and densities. Changes to the project that result in a change in use or an increase in water demand will require an application for a modification of this Will Serve Letter. Changes in ownership will also require modification of the Will Serve Letter. This conditional approval of water service for your project is valid for two years from the date of this Letter. A 1-year extension of the Conditional Will Serve may be requested using the attached 1-Year Extension Request Form. To be considered for a Conditional Will Serve Extension you must demonstrate that your development permit application with the appropriate land use planning agency is valid. Complete details of the terms and conditions of the Conditional Will Serve can be found in the "Water Demand Offset (WDO) Program Applicant Agreement" that you signed during your application process.

After you have received a tentative map or building permit from the land use planning agency, you will be required to meet all applicable SqCWD requirements defined in the attached Requirements Checklist before your application can be considered for final Board approval. If you meet all the applicable requirements (*including possible future requirements that arise prior to development approval of your project*), and final Board approval is granted, you will be issued an Unconditional Will Serve Letter, which would secure your water service. This present indication to serve is intended to acknowledge that, under existing conditions, water service would be available on the condition that the developer agrees to meet all of the requirements without cost to the District.

The Board of Directors of the SqCWD reserves the right to adopt additional policies to mitigate the impact of new development on the local groundwater basins, which are currently the District's only source of supply. The subject project would be subject to any applicable conditions of service that the District may adopt prior to granting water service.

As new policies and/or requirements are developed, the information will be made available by the SqCWD.

Sincerely,

SOQUEL CREEK WATER DISTRICT



Taj A. Dufour, P.E.

Engineering Manager/Chief Engineer

Attachment: Requirements Checklist for APN 037-121-60

Enclosures :

1. Overview of the SqCWD Water Use Efficiency Requirements for Tier II Single Family Residential, Multi-Family Residential, Commercial, Industrial & Public Development
2. Indoor Water Use Efficiency Checklist
3. Landscape Project Application Submittal Requirements Package
4. 1-Year Extension Request Form

Requirements Checklist for APN {037-121-60}

| | Required | Not Required | Comments |
|--|----------|--------------|---------------------|
| Engineering: | | | |
| Record Water Waiver (required if water pressure is not between 40 psi – 80 psi) with the County Recorder of the County of Santa Cruz to ensure that any future property owners are notified of the conditions set forth herein | x | | |
| Variance request for property not having frontage on a water main | | x | |
| New water main to site (required if existing water main not sized to serve new project) | | x | |
| LAFCO annexation | | x | |
| Off-site water main extension | | x | |
| On-site water system | x | | |
| Backflow prevention | x | | During Construction |
| New water storage tank | | x | |
| Booster pump station | | x | |
| Destroy any wells on the property in accordance with State Bulletin No. 74 | x | | |
| Satisfy all conditions imposed by the District to assure necessary water pressure, flow and quality | x | | |
| Meter all units individually with a minimum size of 5/8-inch by 3/4-inch standard domestic water meter (except as prohibited by law) | x | | |
| Complete fire service requirements form | x | | |
| Sign Service Installation Agreement & pay all fees | x | | |
| Conservation: | | | |
| Complete Indoor Water Use Efficiency Checklist | x | | |
| Complete Outdoor Landscape Plan | x | | |
| Complete Residential Green Credit Application | | x | Optional |
| General: | | | |
| Allow SqCWD Staff to inspect the completed project for compliance with all the applicable project requirements prior to commencing domestic water service | x | | |
| Other requirements that may be added as a result of policy changes. | x | | |

Initial Study Attachment 9



June 7, 2017
(updated November 5, 2017)

(831) 459-9992

john@swiftconsultingservice.com

Swift Consulting Services, Inc.

c/o: Mr. John Swift

500 Chestnut Street, Suite 100
Santa Cruz, California. 95060

Subject: Limited Shallow Soil Screening Program (for Land Use Transition from Agricultural to Residential)

Site: 3300 Maplethorpe Lane, Soquel, California

We conducted a (limited) soil sampling program to evaluate potential historical, commercial land use impacts at 3300 Maplethorpe Lane in Soquel (the "Site"). The 3.4 acre, irregularly shaped property is surrounded by residential neighborhoods and bordered on the east by a drainage (see aerial photo and terrain map clips to the right). The existing greenhouse structures and support sheds were constructed starting in 1970 on the southern half of the property. The northern portion of the property remained undeveloped.

The Site housed a commercial orchid growing operation since the 1970s that has had reduced operations substantially in recent years and a number of greenhouses are vacant. The existing greenhouses and support sheds are located in the southern, developed portion of the property, which is accessed by an asphalt roadway (see areal clip, to the right). It has been reported that Pacific Gas and Electric (PG&E) operated a storage yard on-site, prior the nursery operation, although historical aerials dating from 1943 to the present do not document that land use (historical aerial photos included as Appendix C).

The current soil screening program tested for *Contaminants of Potential Concern (COPC)*, commonly associated with small nursery operations and PG&E-type work yards, specifically for a suite of persistent, chlorinated pesticides and arsenates, polychlorinated biphenyls (PCBs), and creosote. In addition, soils at two, typical storage areas (see photos, Appendix A), were also tested for total petroleum hydrocarbon (TPH) fuel distillates as diesel and motor oil.



The screening for pesticides were completed in general accordance with sampling frequency and testing established by the California-Department of Toxic Substance Control (DTSC) guideline document for sampling agricultural properties transitioning to a sensitive use (i.e., school sites)¹. Additional testing for PCBs, and creosote was conducted on the collected samples to address PG&E storage yard chemicals of potential concern. The sampling and testing was completed to obtain representative samples from worst case locations to evaluate the potential for residual contaminant concentrations in shallow soils at the Site. Sample frequency and locations are designed to confirm soil quality for transition to residential use.

Field Work and Laboratory Analysis: Field sampling was initially conducted on May 23, 2017 to address the nursery land use, and follow-up sample collection and testing was conducted on September 1, 2017 to address potential historical storage yard land use. Sampling was completed in accordance with our *Field Methodology for Shallow Soil Sampling* (field notes, photo sheets and a description of the sampling protocol are included as Appendix A). No soil staining or evidence of contamination was noted aside from some limited surficial oil stains observed in storage areas (i.e., there was no evidence of any significant staining or chemical releases). The field work included the collection of shallow soil from eight (8) locations, specifically

- A Surface Sample: Surface samples (0 to 6 inches) were acquired at each location for persistent pesticide, PCB, and creosote analysis. Any mats of vegetable material, roots, and other extraneous material were removed from the sample to eliminate sample bias.
- A Deeper (backup) Sample: Deeper samples was also collected at each location from a depth of 18-inches and held for potential backup analysis as a contingency, in cast the surfaces contained elevated concentrations of the tested COPC.

Two (2) additional discrete soil samples were also collected from storage/maintenance shed locations and screened for fuel (diesel) and motor oil.

As noted, sample collection and testing were completed in accordance with DTSC-established protocols for screening agricultural land uses. Specifically, discrete and composite testing was completed as follows:

- Composite Sample Analysis for Persistent Pesticides: The eight (8) soil samples were combined into four (4), two-point-composite samples. As shown on the soil sample location map (Figure 1), adjoining soil samples (“SS”) were combined [i.e. **1-SS** (a & b), **2-SS** (a & b), **3-SS** (a & b), and **4-SS** (a & b)]. The four composite samples collected on May 23, 2017 were analyzed for persistent organochlorine pesticides by EPA method 8081a.
- Discrete Sample Analysis for Arsenic: As per the DTSC land-use change protocols, four discrete samples collected from the greenhouses were selected for arsenic analysis by EPA Method 6010b (specifically, for 1-SSA, 2-SSA, 3-SSA, 4-SSA).

Additional Discrete Sample Testing: Two additional samples collected at storage locations where small quantity petroleum products were present and tested for total petroleum hydrocarbons as diesel and motor oil by EPA Method 8015b.

¹: CA-Department of Toxic Substances Control: *Interim Guidance for Sampling Agricultural Properties (Third Revision)*. dated August 7, 2008. < <http://www.dtsc.ca.gov/Schools/upload/Ag-Guidance-Rev-3-August-7-2008-2.pdf> >

- On September 1, 2017, staff remobilized to the field and collected additional samples at the same locations for lab testing for PCBs by EPA method 8082 and creosote by EPA method 8270c. [i.e. **SS-1** (a & b), **SS-2** (a & b), **SS-3** (a & b), and **SS-4** (a & b)].

The State-certified laboratory results are presented in Appendix B and have been tabulated along with risk-based screening thresholds established for residential land². The results are as follows:

- Persistent Pesticides Analysis (by EPA Method 8081a, see Table 1): Samples tested for the organochlorine pesticide suite) contained only trace concentrations of persistent pesticides were detected, all well below regulatory screening values.
- Arsenic (by EPA Method 6010b, see Table 2): Arsenic, a naturally occurring metal, was detected in all soil samples (concentrations ranged between 1.9 to 2.7 mg/kg), which is well within naturally occurring levels. No elevated concentrations were detected.
- Total Petroleum Hydrocarbons as Diesel and Motor Oil (by EPA Method 8015b, see Table 3): Soil samples contained no detectable concentration of these fuels.
- PCB and Creosote (by EPA Methods 8082 & 8270c, see Table 4): Soil samples contained no detectable concentrations of these screened compounds.

Conclusions: The current soil screening program tested shallow soils at the Site for COPCs based on long-term land use as a small nursery (orchid farming) and possible historical use as a storage yard for PG&E. A limited number of samples were obtained from representative, worst case locations to provide due diligence evaluation of *potential* contaminant concentrations in shallow soils at the Site. The sample frequency and locations are designed to provide assurances regarding the shallow soil quality for transition to residential use. **Field observations and State-certified laboratory test results indicate there are no apparent environmental issues of concern associated with shallow soil quality at this vacant, commercial property.**

Any surface oil stains can readily be scrapped up and properly disposed as non-hazardous, oily soils.

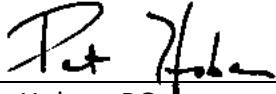
Limitations: Our service consists of professional opinions and recommendations made in accordance with generally accepted geologic and engineering principles and practices. This warranty is in lieu of all others, either express or implied. The analysis and conclusions in this report are based on sampling and testing which are necessarily limited. Additional data from future work may lead to modification of the opinions expressed herein.

²: *Environmental Screening Levels (ESLs):* California Regional Water Quality Control Board - San Francisco Bay Region has established Tier 1, risk-based thresholds for common urban contaminants in an agency published document entitled: *Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater* (interim Final, February 2016). The ESL concentrations provide guidance on whether or not remediation of detected contamination may be warranted. The ESLs also provide threshold values for various media and sensitive receptor scenarios based on land use (i.e., potential impacts to groundwater, ecological or human health).

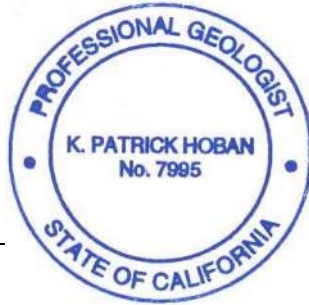
Thank you for the opportunity to participate in the assessment of this site. If you have any questions regarding this report, or any aspect of this project, please contact us at (831) 722-3580.

Sincerely,

Weber, Hayes and Associates

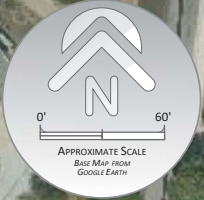


Pat Hoban, PG
Senior Geologist



Attachments: Figure, Tables, Field Notes (photo sheets), *State-Certified Laboratory Report*, and Historical Aerial (1943 to present)

Figures



SUBJECT SITE



EXPLANATION OF SYMBOLS

- ◆ SS-1 Shallow Soil Sample Location (8 total)
- ◆ S-TPH Shallow Soil Total Petroleum Hydrocarbon Sample (2 total)

WEBER-HAYES & ASSOCIATES
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA
831.722.3560 / www.weber-hayes.com

SITE MAP
PROPERTY TRANSACTION SCREENING
SITE: MAPLETHORPE
ADDRESS: 3300 MAPLETHORPE, SOQUEL, CA
DATE: MAY 2017

FIGURE
1
Project
2x716

REVISIONS/NOTES:

Tables

Table 1 - Soil Sample Analytical Results
Persistent Organochlorine Pesticide (OCP)
3300 Maplethorpe, Soquel, CA (Sampled 5-23-17)
Soil results are in parts per million (mg/kg) unless otherwise stated

| Sample Information | | Organochlorine Compounds by EPA #8081A | | | | | | |
|--|---|--|-----------|------------|-----------|----------------|--------------------|--------------------------------------|
| Sample ID | Depth ⁽¹⁾ (feet below ground surface) | Chlordane | 4,4'-DDD | 4,4'-DDE | 4,4'-DDT | Dieldrin | Heptachlor epoxide | All Other OCPs |
| 1-SSA, 1-SSB | 0.5 | < 0.0049 | < 0.00060 | < 0.000057 | < 0.00027 | < 0.0014 | < 0.000049 | All other OCPs = ND |
| 2-SSA, 2-SSB | 0.5 | < 0.0051 | < 0.00063 | < 0.000060 | < 0.00028 | < 0.0024 | < 0.000051 | All other OCPs = ND |
| 3-SSA, 3-SSB | 0.5 | < 0.0049 | < 0.00061 | < 0.000058 | < 0.00027 | < 0.00023 | < 0.000049 | All other OCPs = ND |
| 4-SSA, 4-SSB | 0.5 | < 0.005 | 0.0016 | < 0.000058 | 0.0032 | < 0.00023 | < 0.00005 | All other OCPs = ND |
| Laboratory Practical Quantitation Limit | | 0.00050 | | | | | | |
| Environmental Screening Levels ⁽²⁾ Residential / Commercial-Industrial (Shallow Soils < 10 ft.) | | 0.48 / 2.2 | 2.7 / 12 | 1.9 / 8.5 | 1.9 / 4.3 | 0.038 / 0.17 * | 0.067 / 0.3 * | Endosulfan sulfate = 0.0046 / 0.0046 |
| Regional Screening Levels ⁽²⁾ Residential / Industrial | | 1.7 / 7.5 | 2.3 / 9.6 | 2 / 9.3 | 1.9 / 8.5 | 0.034 / 0.14 | 0.07 / 0.33 | Endosulfan sulfate = 470 / 7,000 |

Notes

- 1 = Soil samples collected from native soil immediately beneath non-native fill material.
- 2 = Environmental Screening Levels (ESLs): California Regional Water Quality Control Board - San Francisco Bay Region has prepared and provided these ESLs in a document entitled: Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater (Interim Final, February 2016). The ESLs are intended to provide guidance on whether or not remediation of detected contamination should be warranted. The ESLs also provide threshold values for various media and sensitive receptor scenarios. The ESLs used for this table were obtained from the above referenced document.

Regional Screening Levels: Are risk-based screening levels created by the EPA for large regional areas. The information from this table is for Region 9, which includes all of California. These numbers were last revised in June 2015.

* = **Leachability threshold is replaced with the direct exposure (Health Based) threshold.** Some screening values are based on leachability, or potential threat to reach groundwater, which tends to be much lower than direct exposure values. For Dieldrin, the leachability threshold is 0.00017 / 0.00017 and for Heptachlor epoxide the leachability threshold is 0.00042 / 0.00042

STLC Extract test determines how much of a particular compound in soil will be able to leach into ground water. For both samples that exceeded leachability thresholds, there was no detectable amount of compound that could be leached from the sample. This supports the decision to use direct exposure thresholds as opposed to leachability thresholds.

<X = Not Detected at or above the laboratory's Method Detection Limit, X. Detection limit may be elevated due to laboratory sample dilution.

ND = Not Detected at or above the laboratory Practical Quantitation Limit (PQL).

BOLD = Analytical results above Residential ESL

BOLD = Analytical results above Commercial-Industrial ESL

Table 2 - Soil Sample Analytical Results
Arsenic
3300 Maplethorpe, Soquel, CA (Sampled 5-23-17)

All soil results are in milligrams per Kilogram (mg/Kg)

| Sample Information | | Metals (TTLIC) <i>by EPA Method 6010B</i> |
|--|--|---|
| Sample ID | Depth <i>(feet below ground surface)</i> | Arsenic |
| 1-SSA | 0.5 | 1.9 |
| 2-SSA | 0.5 | 2.2 |
| 3-SSA | 0.5 | 2.7 |
| 4-SSA | 0.5 | 2.6 |
| Laboratory's Practical Quantitation Limit (PQL) | | 1 |
| Environmental Screening Levels ⁽¹⁾ Residential / Industrial (Shallow Soils = < 10 ft) | | 0.067 / 0.31 |
| Regional Screening Levels ⁽²⁾ Residential / Industrial | | 7.1 / 98 |

Notes

1 = Environmental Screening Levels (ESLs): from *User's Guide: Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater*, set by the San Francisco Bay Regional Water Quality Control Board (Interim Final, February 2016). The ESLs are intended to provide quantitative risk-based guidance on whether further assessment or remediation of contamination is warranted. The ESLs used in this table were obtained from the above referenced document, Table A. Shallow Soils (<3m), Groundwater IS a current or potential Source of Drinking Water.

Regional Screening Levels: Are risk-based screening levels created by the EPA for large regional areas. The information from this table is for Region 9, which includes all of California. These numbers were last revised in June 2015.

BOLD =

Analytical result above Residential RSL.

Analytical result above Commercial RSL.

**Table 3 - Soil Sample Analytical Results
Fuel Fingerprint
3300 Maplethorpe, Soquel, CA (Sampled 5-23-17)**

All soil results are in milligrams per Kilogram (mg/Kg)

| Sample Information | | Laboratory Analytical results |
|--|--|---|
| | | Fuel Fingerprint <i>by EPA Method 6010B</i> |
| Sample ID | Depth <i>(feet below ground surface)</i> | Total Petroleum Hydrocarbons as DIESEL |
| S-TPH-1 | 0.5 | < 1.2 |
| S-TPH-2 | 0.5 | < 1.2 |
| Laboratory's Practical Quantitation Limit (PQL) | | 10 |
| Environmental Screening Levels ⁽¹⁾ Residential / Industrial (Shallow Soils = < 10 ft) | | 230 / 570 |
| Regional Screening Levels ⁽¹⁾ Residential / Industrial | | Not Available |

Notes

1 = Environmental Screening Levels (ESLs): from *User's Guide: Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater*, set by the San Francisco Bay Regional Water Quality Control Board (Interim Final, February 2016). The ESLs are intended to provide quantitative risk-based guidance on whether further assessment or remediation of contamination is warranted. The ESLs used in this table were obtained from the above referenced document, Table A. Shallow Soils (<3m), Groundwater isn't a current or potential Source of Drinking Water.

Regional Screening Levels: Are risk-based screening levels created by the EPA for large regional areas. The information from this table is for Region 9, which includes all of California. These numbers were last revised in June 2015.

BOLD = Analytical result above Residential ESL.

BOLD = Analytical result above Commercial ESL.

**Table 3 - Soil Sample Analytical Results
PCB and Creosote
3300 Maplethorpe, Soquel, CA (Sampled 9-1-2017)**

All soil results are in milligrams per Kilogram (mg/Kg)

| Sample Information | | Laboratory Analytical results | |
|--|--|--------------------------------------|---|
| Sample ID | Depth (feet below ground surface) | PCBs by EPA Method 8082 | Creosote by EPA Method 8270c |
| SS-1 | 0 - 0.5 | < 0.010 | < 2.0 |
| SS-2 | 0 - 0.5 | < 0.010 | < 2.0 |
| SS-3 | 0 - 0.5 | < 0.010 | < 2.0 |
| SS-4 | 0 - 0.5 | < 0.010 | < 2.0 |
| Laboratory's Practical Quantitation Limit (PQL) | | 0.010 | 2.0 |
| Environmental Screening Levels ⁽¹⁾ Residential / Industrial (Shallow Soils = < 10 ft) | | Various | Various |
| Regional Screening Levels ⁽¹⁾ Residential / Industrial | | Various | Various |

Notes

1 = **Environmental Screening Levels (ESLs):** from *User's Guide: Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater*, set by the San Francisco Bay Regional Water Quality Control Board (Interim Final, February 2016). The ESLs are intended to provide quantitative risk-based guidance on whether further assessment or remediation of contamination is warranted. The ESLs used in this table were obtained from the above referenced document, Table A. Shallow Soils (<3m), Groundwater isn't a current or potential Source of Drinking Water.

Regional Screening Levels: Are risk-based screening levels created by the EPA for large regional areas. The information from this table is for Region 9, which includes all of California. These numbers were last revised in June 2015.

BOLD = Analytical result above Residential ESL.

BOLD = Analytical result above Commercial ESL.

APPENDIX A

-

***Field Notes
Photo Sheets, and
Sampling Protocol***



| | |
|--|------------------------------------|
| Client: John Swift | Date: 5/23/17 |
| Site Location: Maplethorpe Nursery | Study #: 2X716 |
| Field Tasks: <input type="checkbox"/> Drilling <input checked="" type="checkbox"/> Sampling <input checked="" type="checkbox"/> Other (see below): | Weather Conditions: Sunny - clouds |
| Personnel / Company On-Site: Harrison Huckes (WHA) | |

TIME:

| | |
|--------|---|
| 4:45 | Arrive On-site with John Swift and tour the property → examine greenhouses, sheds, and back undeveloped area. |
| 10:15 | Set-up decont station and prepare for sampling. See map for locations of samples. |
| 10:20 | Begin sampling - Sampling involves hand augering down to approximately 18 6 inches and collecting a soil sample using an acetate liner in a sample hammer. - Samples are properly containerized after each sample collection and sealed, labeled, and placed in cooler with ice. - Samples at each soil boring are also collected at approximately 18" and labeled with "hd" on the chain of custody. - The sample hammer is decontaminated after every collection event using a bucket of soapy water and a rinse bucket of water. - See photo sheets and attached map for sample point locations. |
| 12:20 | Call Pat Hoban (WHA) and consult on sample point distribution |
| 2 p.m. | Finish sample collection - Decon and mobilize to WHA office to collect additional acetate liners. - Inform Mr. Swift of plans. |
| 3 p.m. | Arrive on-site and collect final composite sample in Eastern greenhouses. Decon - Call Peter Bins (BC laboratories) to coordinate sample pick-up |
| 3:45 | Decon equipment & take photos of field activities & sample locations. |
| 4 p.m. | Demobilize (en route to meet courier) |

- INDICATE ATTACHMENTS THAT APPLY
- Site Map
 - Data Sheets
 - Geologic Logs
 - Photo Sheets
 - COC's
 - Field Tags (sub-contractors)
 - Chargeable Materials

Peter Bins - Courier - BC Labs: 408-341-2942

Signature of Field Personnel & Date

Photo Sheet 1 of 2
(3300 Maplethorpe, Soquel)



Photo Sheet 1 of 2
(Sample locations, typical)



FIGURE 1
Project
2X/16

SITE MAP
PROPERTY TRANSACTION SCREENING

SITE: MAPLETHORPE
ADDRESS: 3300 MAPLETHORPE, SOQUEL, CA

DATE: MAY 2017

REVISIONS/NOTES:



WEBER, HAYES & ASSOCIATES
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA
831.722.3580 / www.weber-hayes.com



SUBJECT SITE

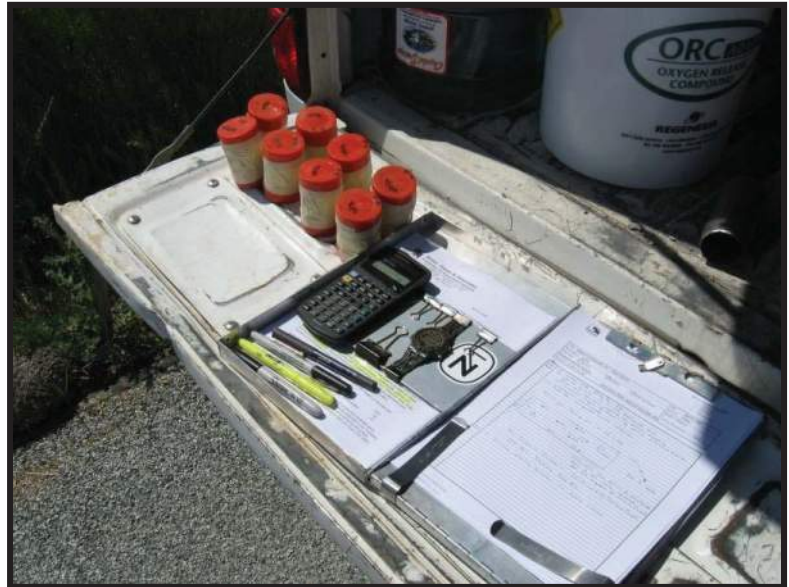
EXPLANATION OF SYMBOLS
 ◆ S-1 Shallow Soil Sample Location (8 total)
 ◆ SEV-8 Shallow Soil Total Petroleum Hydrocarbon Sample (2 total)

Field Methodology for Shallow Soil Sampling

This following provides detailed descriptions of methods used during shallow soil sampling investigations. Included are specifications for shallow soil sampling with a slide hammer, and decontamination procedures.

Shallow Soil Sampling Procedures: A backhoe, two person power auger, or a hand auger is used to get to a point immediately above the sampling depth.

Once at the desired sampling depth, a slide hammer is used to drive a clean stainless steel liner encased in the slide hammer sampling shoe to obtain a relatively undisturbed sample. The slide hammer consists of a metal rod with one end containing a threaded sampling shoe containing a beveled cutting head. A pre-cleaned brass or stainless steel sample liner is installed within the sampling shoe prior to sampling. The slide hammer consists of a weighted sliding handle which slides up and down a connecting rod, and which is used to drive the sampling shoe into undisturbed, native soils. The handle is manually slid up and down the slide rod which in turn forces the sampling shoe (with liner) into native soils.



Materials retrieved from the sampler is be logged on an as-needed basis by the experienced field geologist using the Unified Soil Classification System (USCS), noting in particular, the lithology of the soils, moisture content, and any unusual odor or discoloration. The liner and relatively undisturbed soils is then be removed from the sampling shoe, protected at both ends with Teflon tape, sealed with non-reactive caps, taped, and immediately stored in an insulated container cooled with blue ice at a temperature of 4 degree Celsius or less. Samples targeted for analysis are transported under appropriate chain-of-custody documentation to a State-certified laboratory performing the targeted analysis.

Upon completion of sampling at the designated location, the location will be backfilled and compacted with the materials that were removed prior to sampling, supplemented by clean imported fill as necessary.

Soil samples selected for Volatile Organic Compound (VOC) analysis will follow field preservation protocols according to EPA Method 5035, as described in DTSC's *Guidance Document for the Implementation of United States Environmental Protection Agency Method 5035: Methodologies for Collection, Preservation, Storage, and Preparation of Soils to be Analyzed for Volatile Organic Compounds*, dated November 2004.

Equipment Decontamination and Containerization Procedures: All sampling equipment is cleaned prior to arriving on site to prevent possible transfer of contamination from another site. In areas suspected of having contamination, sampling equipment is thoroughly cleaned between each sampling runs with Alconox[®] solution (or equivalent) followed by a double rinsing with distilled water to prevent the vertical transfer of contamination, and/or contamination from location to location onsite. Accordingly, all sampling equipment will be cleaned following sampling operations to prevent the possible transfer of contamination. All cleaning rinsate, and wash water produced during the shallow soil sampling and decontamination process will be containerized on site in pails or approved DOT drums until profiling determines appropriate disposal options.

APPENDIX B
-
State Certified Laboratory Results



Date of Report: 05/26/2017

Harrison Hucks

Weber, Hayes & Associates

120 Westgate Drive
Watsonville, CA 95076

Client Project: Soquel - Maplethorpe (Swift) 2X716

BCL Project: Misc.

BCL Work Order: 1714097

Invoice ID: B268772

Enclosed are the results of analyses for samples received by the laboratory on 5/24/2017. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Misty Orton
Client Service Rep

Authorized Signature

Certifications: CA ELAP #1186; NV #CA00014; OR ELAP #4032-001; AK UST101

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



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WEBER, HAYES & ASSOCIATES
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, CA 95076
(831) 722-3580 // www.weber-hayes.com

CHAIN-OF-CUSTODY RECORD

PAGE 1 OF X

PROJECT NAME AND JOB #: Soguel-Maplethorpe (WFT) 2x716
SEND CERTIFIED RESULTS TO: Weber, Hayes and Associates - Attention:

LABORATORY: BC Laboratory

ELECTRONIC DELIVERABLE FORMAT: YES NO
Sampler: Harrison Hicks
Date: 5/23/17

TURNAROUND TIME: _____
GLOBAL I.D.: _____

RUSH!

| GeoTracker ¹ Field Point Name | WHA Sample ID | Sample Depth | Date Sampled | Matrix | SAMPLE CONTAINERS | | | | REQUESTED ANALYSIS | | | | |
|---|---------------------|--------------|-----------------|--------|---|--|---|------------------------------|--|--|---------------------|--|--|
| | | | | | 40 mL VOCs | 1 Liter Amber Jars | ___ mL Poly Bottle | Liner Acetate or Brass | Total Petroleum Hydrocarbons | | Additional Analysis | | |
| | | | | | TEPH Screen as Diesel (w/ Silica Gel Cleanup) | Discrete TPH Finger Prints (DIP) | TPH-resoline & MTBE-BTEX by EPA Method 8260 | Total Lead | LUFT 5 Metals plus Arsenic & Hex-Chrome | | | | |
| -1 | S-TPH-1 | 6" | 5/23 | Dr | | | | X | X | | | | |
| -2 | S-TPH-2 | 6" | | | | | | X | X | | | | |
| -3 | S-TPH-1 (18") | 18" | | | | | | hold | hold | | | | |
| -4 | S-TPH-2 (18") | 18" | | | | | | hold | hold | | | | |

CHK BY: [Signature]
DISTRIBUTION: [Signature]
SUB-OUT:

| RELEASED BY: | Date & Time | RECEIVED BY: | Date & Time | SAMPLE CONDITION: (circle 1) | | |
|--------------------------|---------------------|--------------------|----------------------|---------------------------------|---------------------|--------|
| 1) <u>Harrison Hicks</u> | <u>5/23/17</u> | <u>[Signature]</u> | <u>5/23/17 1600</u> | Ambient | <u>Refrigerated</u> | Frozen |
| 2) <u>[Signature]</u> | <u>5/23/17 1701</u> | <u>[Signature]</u> | <u>5/24/17 08:35</u> | Ambient | Refrigerated | Frozen |
| 3) _____ | _____ | _____ | _____ | Ambient | Refrigerated | Frozen |
| 4) _____ | _____ | _____ | _____ | Ambient | Refrigerated | Frozen |
| 5) _____ | _____ | _____ | _____ | Ambient | Refrigerated | Frozen |

NOTES:

1 Please use GeoTracker Field Point Name for EDF.

2 For MTBE-analyzed samples with non-detectable results (ND) but having elevated detection limits, please confirm by EPA Method 8260.

3 Please use MDL (Minimum Detection Limit) for any diluted samples.

Discrete TPH finger print analysis (diesel-motor oil)

Please send certified results to lab@weber-hayes.com

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BC LABORATORIES INC. Submission #: 17-14097 Page 1 of 1

Shipping Information: Fed Ex UPS BC Lab Field Service Hand Delivery Other (Specify) ASD

Shipping Container: Ice Chest None Box Other (Specify) _____

Free Liquid: YES NO W / S _____

Refrigerant: Ice Blue Ice None Other Containers: Intact? Yes No Comments: _____

All samples received? Yes No All samples containers intact? Yes No Description(s) match COC? Yes No Thermometer ID: 208

COC Received: YES NO Emissivity: AT Contained AT Temperature: (A) 0.3 °C / (C) 08.3 °C

| SAMPLE CONTAINERS | SAMPLE NUMBERS | | | | | | | | | |
|---|----------------|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| QT PE UNPRES 4oz / 8oz / 16oz PE UNPRES 2oz Cr ⁶ | | | | | | | | | | |
| QT INORGANIC CHEMICAL METALS | | | | | | | | | | |
| PT INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz | | | | | | | | | | |
| PT CYANIDE | | | | | | | | | | |
| PT NITROGEN FORMS | | | | | | | | | | |
| PT TOTAL SULFIDE | | | | | | | | | | |
| 2oz NITRATE / NITRITE | | | | | | | | | | |
| PT TOTAL ORGANIC CARBON | | | | | | | | | | |
| PT CHEMICAL OXYGEN DEMAND | | | | | | | | | | |
| PTA PHENOLICS | | | | | | | | | | |
| 40ml VOA VIAL TRAVEL BLANK | | | | | | | | | | |
| 40ml VOA VIAL | | | | | | | | | | |
| QT EPA 1664 | | | | | | | | | | |
| PT ODOR | | | | | | | | | | |
| RADIOLOGICAL | | | | | | | | | | |
| BACTERIOLOGICAL | | | | | | | | | | |
| 40 ml VOA VIAL - 504 | | | | | | | | | | |
| QT EPA 508/608/808 | | | | | | | | | | |
| QT EPA 515.1/8150 | | | | | | | | | | |
| QT EPA 525 | | | | | | | | | | |
| QT EPA 525 TRAVEL BLANK | | | | | | | | | | |
| 40ml EPA 547 | | | | | | | | | | |
| 40ml EPA 531.1 | | | | | | | | | | |
| 8oz EPA 548 | | | | | | | | | | |
| QT EPA 549 | | | | | | | | | | |
| QT EPA 8015M | | | | | | | | | | |
| QT EPA 8270 | | | | | | | | | | |
| 8oz / 16oz / 32oz AMBER | | | | | | | | | | |
| 8oz / 16oz / 32oz JAR | | | | | | | | | | |
| SOIL SLEEVE | | | | | | | | | | |
| PCB VIAL | | | | | | | | | | |
| PLASTIC BAG | | | | | | | | | | |
| TEDLAR BAG | | | | | | | | | | |
| FERROUS IRON | | | | | | | | | | |
| ENCORE | | | | | | | | | | |
| SMART KIT | | | | | | | | | | |
| SUMMA CANISTER | | | | | | | | | | |

Comments: No SUMMA cans on the csk

Sample Numbering Completed By: _____

λ = Actual / C = Corrected

Date/Time: 5-24-17 11:36

IS:\WPDoc\Wend\Perfect\LAB_DOCS\FORMS\BAMRECrev 201 Rev 21 08/23/2016



Weber, Hayes & Associates
120 Westgate Drive
Watsonville, CA 95076

Reported: 05/26/2017 14:33
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Laboratory / Client Sample Cross Reference

| Laboratory | Client Sample Information | | | |
|------------|---------------------------|----------------|-----------------------|------------------|
| 1714097-01 | COC Number: | --- | Receive Date: | 05/24/2017 08:35 |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | S-TPH-1 | Lab Matrix: | Solids |
| | Sampled By: | Harrison Hucks | Sample Type: | Soil |
| 1714097-02 | COC Number: | --- | Receive Date: | 05/24/2017 08:35 |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | S-TPH-2 | Lab Matrix: | Solids |
| | Sampled By: | Harrison Hucks | Sample Type: | Soil |
| 1714097-03 | COC Number: | --- | Receive Date: | 05/24/2017 08:35 |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | S-TPH-1 (18") | Lab Matrix: | Solids |
| | Sampled By: | Harrison Hucks | Sample Type: | Soil |
| 1714097-04 | COC Number: | --- | Receive Date: | 05/24/2017 08:35 |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | S-TPH-2 (18") | Lab Matrix: | Solids |
| | Sampled By: | Harrison Hucks | Sample Type: | Soil |

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Weber, Hayes & Associates
120 Westgate Drive
Watsonville, CA 95076

Reported: 05/26/2017 14:33
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Total Petroleum Hydrocarbons

| | |
|----------------------------------|--|
| BCL Sample ID: 1714097-01 | Client Sample Name: S-TPH-1, 5/23/2017 12:00:00AM, Harrison Hucks |
|----------------------------------|--|

| Constituent | Result | Units | PQL | MDL | Method | MB Bias | Lab Quals | Run # |
|-------------------------|--------|-------|----------------------|-----|---------------|---------|-----------|-------|
| TPH - Diesel (FFP) | ND | mg/kg | 10 | 1.2 | EPA-8015B/FFP | ND | | 1 |
| TPH - Motor Oil | ND | mg/kg | 20 | 6.5 | EPA-8015B/FFP | ND | | 1 |
| Tetracosane (Surrogate) | 93.2 | % | 20 - 145 (LCL - UCL) | | EPA-8015B/FFP | | | 1 |

| Run # | Method | Prep Date | Run Date/Time | Analyst | Instrument | Dilution | QC Batch ID |
|-------|---------------|-----------|----------------|---------|------------|----------|-------------|
| 1 | EPA-8015B/FFP | 05/24/17 | 05/26/17 02:07 | AS1 | GC-13 | 1.017 | B[E2753 |

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Weber, Hayes & Associates
120 Westgate Drive
Watsonville, CA 95076

Reported: 05/26/2017 14:33
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Total Petroleum Hydrocarbons

| BCL Sample ID: 1714097-02 | Client Sample Name: S-TPH-2, 5/23/2017 12:00:00AM, Harrison Hucks | | | | | | | |
|----------------------------------|--|-------|----------------------|-----|---------------|---------|-----------|-------|
| Constituent | Result | Units | PQL | MDL | Method | MB Bias | Lab Quals | Run # |
| TPH - Diesel (FFP) | ND | mg/kg | 10 | 1.2 | EPA-8015B/FFP | ND | | 1 |
| TPH - Motor Oil | ND | mg/kg | 20 | 6.5 | EPA-8015B/FFP | ND | | 1 |
| Tetracosane (Surrogate) | 90.0 | % | 20 - 145 (LCL - UCL) | | EPA-8015B/FFP | | | 1 |

| Run # | Method | Prep Date | Run Date/Time | Analyst | Instrument | Dilution | QC Batch ID |
|-------|---------------|-----------|----------------|---------|------------|----------|-------------|
| 1 | EPA-8015B/FFP | 05/24/17 | 05/26/17 02:30 | AS1 | GC-13 | 0.984 | B[E2753 |

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Weber, Hayes & Associates
120 Westgate Drive
Watsonville, CA 95076

Reported: 05/26/2017 14:33
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Total Petroleum Hydrocarbons

Quality Control Report - Method Blank Analysis

| Constituent | QC Sample ID | MB Result | Units | PQL | MDL | Lab Quals |
|--------------------------------|---------------------|-------------|----------|-----------------------------|-----|-----------|
| QC Batch ID: B[E2753] | | | | | | |
| TPH - Diesel (FFP) | B[E2753-BLK1 | ND | mg/kg | 10 | 1.2 | |
| TPH - Motor Oil | B[E2753-BLK1 | ND | mg/kg | 20 | 6.5 | |
| Tetracosane (Surrogate) | B[E2753-BLK1 | 98.2 | % | 20 - 145 (LCL - UCL) | | |

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Weber, Hayes & Associates
120 Westgate Drive
Watsonville, CA 95076

Reported: 05/26/2017 14:33
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Total Petroleum Hydrocarbons

Quality Control Report - Laboratory Control Sample

| Constituent | QC Sample ID | Type | Result | Spike Level | Units | Percent Recovery | RPD | Control Limits | | Lab |
|-----------------------------|--------------|------|--------|-------------|-------|------------------|-----|------------------|-----|-----|
| | | | | | | | | Percent Recovery | RPD | |
| QC Batch ID: B[E2753 | | | | | | | | | | |
| TPH - Diesel (FFP) | B[E2753-BS1 | LCS | 70.885 | 84.459 | mg/kg | 83.9 | | 64 | 124 | |
| Tetracosane (Surrogate) | B[E2753-BS1 | LCS | 3.1843 | 3.3784 | mg/kg | 94.3 | | 20 | 145 | |

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Weber, Hayes & Associates
120 Westgate Drive
Watsonville, CA 95076

Reported: 05/26/2017 14:33
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Total Petroleum Hydrocarbons

Quality Control Report - Precision & Accuracy

| Constituent | Type | Source Sample ID | Source Result | Result | Spike Added | Units | RPD | Control Limits | | Lab Quals |
|-----------------------------|------|--|------------------|--------|----------------|-------|-----|---------------------|-----|--------------|
| | | | | | | | | Percent Recovery | RPD | |
| QC Batch ID: B[E2753 | | Used client sample: Y - Description: S-TPH-1, 05/23/2017 00:00 | | | | | | | | |
| TPH - Diesel (FFP) | MS | 1714097-01 | ND | 71.856 | 83.056 | mg/kg | | 86.5 | | 52 - 131 |
| | MSD | 1714097-01 | ND | 68.944 | 82.508 | mg/kg | 4.1 | 83.6 | 30 | 52 - 131 |
| Tetracosane (Surrogate) | MS | 1714097-01 | ND | 3.2319 | 3.3223 | mg/kg | | 97.3 | | 20 - 145 |
| | MSD | 1714097-01 | ND | 3.1898 | 3.3003 | mg/kg | 1.3 | 96.7 | | 20 - 145 |

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Weber, Hayes & Associates
120 Westgate Drive
Watsonville, CA 95076

Reported: 05/26/2017 14:33
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Notes And Definitions

- MDL Method Detection Limit
- ND Analyte Not Detected
- PQL Practical Quantitation Limit



Date of Report: 06/02/2017

Harrison Hucks

Weber, Hayes & Associates
120 Westgate Drive
Watsonville, CA 95076

Client Project: Soquel - Maplethorpe (Swift) 2X716
BCL Project: Misc.
BCL Work Order: 1714098
Invoice ID: B269330

Enclosed are the results of analyses for samples received by the laboratory on 5/24/2017. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Misty Orton
Client Service Rep

Authorized Signature

Certifications: CA ELAP #1186; NV #CA00014; OR ELAP #4032-001; AK UST101

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17-14098



WEBER, HAYES & ASSOCIATES Hydrogeology and Environmental Engineering 120 Westgate Drive, Watsonville, CA 95076 (831) 722-3580 // www.weber-hayes.com

CHAIN-OF-CUSTODY RECORD

PAGE 1 OF X

PROJECT NAME AND JOB #: Seguel - Maple Harpe (Sluff) 2x716

LABORATORY: B.C. Laboratory

SEND CERTIFIED RESULTS TO: Weber, Hayes and Associates - Attention:

TURNAROUND TIME:

ELECTRONIC DELIVERABLE FORMAT: [X] YES [] NO

RUSH!

Sampler: Harrison Huckes

GLOBAL I.D.:

Date: 5/23/17

Table with columns: GeoTracker Field Point Name, WHA Sample ID, Sample Depth, Date Sampled, Matrix, Sample Containers (40 ml VOAs, 1 Liter Amber Jars, Poly Bottle, Liner), and Requested Analysis (TEPH Screen, TPH-residue & MTBE-ATEX, Arsenic, Total Lead, UFT & Metals, Organic Pesticide Suite).

Table for Sample Condition with columns: Released By, Date & Time, Received By, Date & Time, and Sample Condition (Ambient, Refrigerated, Frozen).

NOTES: 1 Please use GeoTracker Field Point Name for EDF. 2 For MTBE-analyzed samples with non-detectable results (ND) but having elevated detection limits, please confirm by EPA Method 8260. 3 Please use MDL (Minimum Detection Limit) for any diluted samples. - Please send certified results to lab@weber-hayes.com Only analyze SS'a samples and hold 'b' and 18" samples, per Harrison. Memo 5/24/17

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Misty Orton

17-14098

From: Pat Hoban <pat@weber-hayes.com>
Sent: Wednesday, May 24, 2017 11:14 AM
To: Misty Orton
Cc: 'Harrison Hucks'
Subject: RE: Change in Arsenic Analysis for Soil Samples for project 2x716

Misty, yes on all counts.

- So we need to run Ssa's 1-4 for arsenic, - yes.
- run Ssa/SSb comp 1 -4 for pesticides, - yes.
- and hold all 18" samples. - yes.
- We do not need to keep any Ssa sample discrete for additional testing - yes.,
- we are using the remaining Ssa sample to composite with Ssb's? - yes.

Thanks!
Pat

From: Misty Orton [mailto:misty.orton@bclabs.com]
Sent: Wednesday, May 24, 2017 11:09 AM
To: Pat Hoban <pat@weber-hayes.com>
Cc: 'Harrison Hucks' <harrison@weber-hayes.com>
Subject: RE: Change in Arsenic Analysis for Soil Samples for project 2x716

So we need to run Ssa's 1-4 for arsenic, run Ssa/SSb comp 1 -4 for pesticides, and hold all 18" samples. We do not need to keep any Ssa sample discrete for additional testing, we are using the remaining sample to composite with Ssb's?

Thank you,

Misty Orton
Project Manager
BC Laboratories
(661) 327-4911 Office
(661) 852-4281 Direct
(661) 327-1918 Fax

From: Pat Hoban [mailto:pat@weber-hayes.com]
Sent: Wednesday, May 24, 2017 10:48 AM
To: Misty Orton
Cc: 'Harrison Hucks'
Subject: RE: Change in Arsenic Analysis for Soil Samples for project 2x716

G-morning Misty,

This may be obvious, but just to be sure.....

- After BC Labs removes the soil needed for the four *discrete* Arsenic tests, we still want BC to fully homogenize the four, *2-point composites* for persistent pesticide analysis.

Thanks much,
Pat



17-14098

Misty Orton

From: Harrison Hucks <harrison@weber-hayes.com>
Sent: Wednesday, May 24, 2017 10:00 AM
To: Misty Orton
Cc: pat@weber-hayes.com
Subject: Change in Arsenic Analysis for Soil Samples for project 2x716

Misty-

As discussed on the phone here is the change on the chain of custody I would like to make:

Currently: I have four (two-point) composite samples marked for analysis of Arsenic by EPA method 6000/7000 series w/digestion

UPDATE: I would like four discrete samples (Points: 1-SSA, 2-SSA, 3-SSA, 4-SSA) analyzed for Arsenic by EPA method 6000/7000 series w/digestion

Thank you for the help! Let me know if you need more guidance with this change.

-Harrison
831-722-3580

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COOLER RECEIPT FORM

Page 1 of 1

BC LABORATORIES INC. Submission #: 17-14098

Shipping Information: Fed Ex UPS Hand Delivery Ontrac Other (Specify) ASB

Shipping Container: Ice Chest None Box Other (Specify) _____

Free Liquid: YES NO W / S

Refrigerant: Ice Blue Ice None Other Comments: _____

Custody Seals: Ice Chest Containers Intact? Yes No All samples received? Yes No Description(s) match COC? Yes No

COC Received: YES NO Emissivity: AT Containe: ASB Thermometer ID: 208 Date/Time: 8-24-17

Temperature: (A) 0 "C / (C) 0.3 "C Analyst Inlt: AD 08.3

| SAMPLE CONTAINERS | SAMPLE NUMBERS | | | | | | | | | |
|--|----------------|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| QT PE UNPRES 4oz / 8oz / 16oz PE UNPRES | | | | | | | | | | |
| 2oz Cr ⁶ | | | | | | | | | | |
| QT INORGANIC CHEMICAL METALS | | | | | | | | | | |
| INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz | | | | | | | | | | |
| PT CYANIDE | | | | | | | | | | |
| PT NITROGEN FORMS | | | | | | | | | | |
| PT TOTAL SULFIDE | | | | | | | | | | |
| 2% NITRATE / NITRITE | | | | | | | | | | |
| PT TOTAL ORGANIC CARBON | | | | | | | | | | |
| PT CHEMICAL OXYGEN DEMAND | | | | | | | | | | |
| PVA PHENOLICS | | | | | | | | | | |
| 40ml VOA VIAL TRAVEL BLANK | | | | | | | | | | |
| 40ml VOA VIAL | | | | | | | | | | |
| QT EPA 1664 | | | | | | | | | | |
| PT ODOR | | | | | | | | | | |
| RADIOLOGICAL | | | | | | | | | | |
| BACTERIOLOGICAL | | | | | | | | | | |
| 40 ml VOA VIAL- 504 | | | | | | | | | | |
| QT EPA 508/608/8080 | | | | | | | | | | |
| QT EPA 515.1/8150 | | | | | | | | | | |
| QT EPA 525 | | | | | | | | | | |
| QT EPA 525 TRAVEL BLANK | | | | | | | | | | |
| 40ml EPA 547 | | | | | | | | | | |
| 40ml EPA 531.1 | | | | | | | | | | |
| 8oz EPA 548 | | | | | | | | | | |
| 8oz EPA 549 | | | | | | | | | | |
| QT EPA 8015M | | | | | | | | | | |
| QT EPA 8270 | | | | | | | | | | |
| 8oz / 16oz / 32oz AMBER | | | | | | | | | | |
| 8oz / 16oz / 32oz IAR | | | | | | | | | | |
| SOIL SLEEVE | | | | | | | | | | |
| PCB VIAL | | | | | | | | | | |
| PLASTIC BAG | | | | | | | | | | |
| TEDLAR BAG | | | | | | | | | | |
| FERROUS IRON | | | | | | | | | | |
| ENCORE | | | | | | | | | | |
| SMART KIT | | | | | | | | | | |
| SUMMA CANISTER | | | | | | | | | | |

CHK BY: DRS REVISION MA 10/20/17
MA 10/20/17 MA 10/20/17
 SUB OUT

Comments: _____ Date/Time: 5-24-17 Rev. 21 06/23/2016
 Sample Numbering Completed By: AM
 A = Actual / C = Corrected

1127
 (S:\WP\poc\WordPerfect\LAU_DOC\FORMS\SAWREG rev 20)

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Shipping Information:
 Fed Ex
 UPS
 BC Lab Field Service

Shipping Container:
 Ice Chest
 None
 Other (Specify)

Shipping Container:
 Ice Chest
 None
 Other (Specify)

Shipping Information:
 Hand Delivery
 Other (Specify)

Refrigerant:
 Blue Ice
 None
 Other

Custody Seals:
 Ice Chest Intact? Yes
 No
 Containers Intact? Yes
 No

Comments:
 None

Comments:
 None

All samples received? Yes No
 All samples containers intact? Yes No
 Description(s) match COC? Yes No

Emissivity: 0.97
 Thermometer ID: 208
 Date/Time: 5-24-12
 Analyst Init: JDO825

Temperature: (A) 0 °C / (C) 0.2 °C

COC Received
 YES
 NO

| SAMPLE CONTAINERS | SAMPLE NUMBERS | | | | | | | | | |
|--|----------------|----|----|----|----|----|----|----|---|----|
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 9 | 10 |
| QT PE UNPRES 4oz / 8oz / 16oz PE UNPRES | | | | | | | | | | |
| 2oz CH ¹⁶ | | | | | | | | | | |
| QT INORGANIC CHEMICAL METALS | | | | | | | | | | |
| INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz | | | | | | | | | | |
| PT CYANIDE | | | | | | | | | | |
| PT NITROGEN FORMS | | | | | | | | | | |
| PT TOTAL SULFIDE | | | | | | | | | | |
| 2oz NITRATE / NITRITE | | | | | | | | | | |
| PT TOTAL ORGANIC CARBON | | | | | | | | | | |
| PT CHEMICAL OXYGEN DEMAND | | | | | | | | | | |
| P/A PHENOLICS | | | | | | | | | | |
| 40ml VOA VIAL TRAVEL BLANK | | | | | | | | | | |
| 40ml VOA VIAL | | | | | | | | | | |
| QT EPA 1664 | | | | | | | | | | |
| PT ODOR | | | | | | | | | | |
| RADIOLOGICAL | | | | | | | | | | |
| BACTERIOLOGICAL | | | | | | | | | | |
| 40 ml VOA VIAL - 504 | | | | | | | | | | |
| QT EPA 508/608/8080 | | | | | | | | | | |
| QT EPA 515.1/8150 | | | | | | | | | | |
| QT EPA 525 | | | | | | | | | | |
| QT EPA 525 TRAVEL BLANK | | | | | | | | | | |
| 40ml EPA 547 | | | | | | | | | | |
| 40ml EPA 531.1 | | | | | | | | | | |
| 8oz EPA 548 | | | | | | | | | | |
| QT EPA 549 | | | | | | | | | | |
| QT EPA 8015M | | | | | | | | | | |
| QT EPA 8270 | | | | | | | | | | |
| 8oz / 16oz / 32oz AMBER | | | | | | | | | | |
| 8oz / 16oz / 32oz IAR | | | | | | | | | | |
| SOIL SLURRY | | | | | | | | | | |
| PCB VIAL | | | | | | | | | | |
| PLASTIC BAG | | | | | | | | | | |
| TEDLAR BAG | | | | | | | | | | |
| FERROUS IRON | | | | | | | | | | |
| ENCORE | | | | | | | | | | |
| SMART KIT | | | | | | | | | | |
| SUMMA CANISTER | | | | | | | | | | |

Comments:
 Sample Numbering Completed By: mm Date/Time: 5/24/12 11:22 Rev 21 05/23/2016
 A = Actual / C = Corrected (S:\WPDoc\WordPerfect\LAB_DOC\FORM\BIS\AMRRCrv 20)





Weber, Hayes & Associates
120 Westgate Drive
Watsonville, CA 95076

Reported: 06/02/2017 10:17
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Laboratory / Client Sample Cross Reference

| Laboratory | Client Sample Information | | | |
|---------------------------|---------------------------|-----------------------|-----------------------|----------------------|
| 1714098-01 | COC Number: | --- | Receive Date: | 05/24/2017 08:35 |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | 1-SSa | Lab Matrix: | Solids |
| | Sampled By: | Harrison Hucks | Sample Type: | Soil |
| | <hr/> | | | |
| | 1714098-02 | COC Number: | --- | Receive Date: |
| Project Number: | | --- | Sampling Date: | 05/23/2017 00:00 |
| Sampling Location: | | --- | Sample Depth: | --- |
| Sampling Point: | | 2-SSa | Lab Matrix: | Solids |
| Sampled By: | | Harrison Hucks | Sample Type: | Soil |
| <hr/> | | | | |
| 1714098-03 | | COC Number: | --- | Receive Date: |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | 3-SSa | Lab Matrix: | Solids |
| | Sampled By: | Harrison Hucks | Sample Type: | Soil |
| | <hr/> | | | |
| | 1714098-04 | COC Number: | --- | Receive Date: |
| Project Number: | | --- | Sampling Date: | 05/23/2017 00:00 |
| Sampling Location: | | --- | Sample Depth: | --- |
| Sampling Point: | | 4-SSa | Lab Matrix: | Solids |
| Sampled By: | | Harrison Hucks | Sample Type: | Soil |
| <hr/> | | | | |
| 1714098-05 | | COC Number: | --- | Receive Date: |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | Composite of 1-SS a,b | Lab Matrix: | Solids |
| | Sampled By: | Harrison Hucks | Sample Type: | Soil |
| | <hr/> | | | |
| | 1714098-06 | COC Number: | --- | Receive Date: |
| Project Number: | | --- | Sampling Date: | 05/23/2017 00:00 |
| Sampling Location: | | --- | Sample Depth: | --- |
| Sampling Point: | | Composite of 2-SS a,b | Lab Matrix: | Solids |
| Sampled By: | | Harrison Hucks | Sample Type: | Soil |
| <hr/> | | | | |
| 1714098-07 | | COC Number: | --- | Receive Date: |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | Composite of 3-SS a,b | Lab Matrix: | Solids |
| | Sampled By: | Harrison Hucks | Sample Type: | Soil |
| | <hr/> | | | |

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120 Westgate Drive
Watsonville, CA 95076

Reported: 06/02/2017 10:17
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Laboratory / Client Sample Cross Reference

| Laboratory | Client Sample Information | | | |
|------------|---------------------------|-----------------------|-----------------------|------------------|
| 1714098-08 | COC Number: | --- | Receive Date: | 05/24/2017 08:35 |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | Composite of 4-SS a,b | Lab Matrix: | Solids |
| | Sampled By: | Harrison Hucks | Sample Type: | Soil |
| | <hr/> | | | |
| 1714098-09 | COC Number: | --- | Receive Date: | 05/24/2017 08:35 |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | 1-SS b | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | <hr/> | | | |
| 1714098-10 | COC Number: | --- | Receive Date: | 05/24/2017 08:35 |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | 2-SS b | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | <hr/> | | | |
| 1714098-11 | COC Number: | --- | Receive Date: | 05/24/2017 08:35 |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | 3-SS b | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | <hr/> | | | |
| 1714098-12 | COC Number: | --- | Receive Date: | 05/24/2017 08:35 |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | 4-SS b | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | <hr/> | | | |
| 1714098-13 | COC Number: | --- | Receive Date: | 05/24/2017 08:35 |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | 1-SS a (18") | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | <hr/> | | | |
| 1714098-14 | COC Number: | --- | Receive Date: | 05/24/2017 08:35 |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | 1-SS b (18") | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | <hr/> | | | |

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Watsonville, CA 95076

Reported: 06/02/2017 10:17
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Laboratory / Client Sample Cross Reference

| Laboratory | Client Sample Information | | | |
|------------|---------------------------|--------------|-----------------------|------------------|
| 1714098-15 | COC Number: | --- | Receive Date: | 05/24/2017 08:35 |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | 2-SS a (18") | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | <hr/> | | | |
| 1714098-16 | COC Number: | --- | Receive Date: | 05/24/2017 08:35 |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | 2-SS b (18") | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | <hr/> | | | |
| 1714098-17 | COC Number: | --- | Receive Date: | 05/24/2017 08:35 |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | 3-SS a (18") | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | <hr/> | | | |
| 1714098-18 | COC Number: | --- | Receive Date: | 05/24/2017 08:35 |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | 3-SS b (18") | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | <hr/> | | | |
| 1714098-19 | COC Number: | --- | Receive Date: | 05/24/2017 08:35 |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | 4-SS a (18") | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | <hr/> | | | |
| 1714098-20 | COC Number: | --- | Receive Date: | 05/24/2017 08:35 |
| | Project Number: | --- | Sampling Date: | 05/23/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | 4-SS b (18") | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | <hr/> | | | |

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120 Westgate Drive
Watsonville, CA 95076

Reported: 06/02/2017 10:17
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Total Concentrations (TTLC)

| | |
|----------------------------------|--|
| BCL Sample ID: 1714098-01 | Client Sample Name: 1-SSa, 5/23/2017 12:00:00AM, Harrison Hucks |
|----------------------------------|--|

| Constituent | Result | Units | PQL | MDL | Method | MB Bias | Lab Quals | Run # |
|-------------|--------|-------|-----|------|-----------|---------|-----------|-------|
| Arsenic | 1.9 | mg/kg | 1.0 | 0.40 | EPA-6010B | ND | | 1 |

| Run # | Method | Prep Date | Run Date/Time | Analyst | Instrument | Dilution | QC Batch ID |
|-------|-----------|-----------|----------------|---------|------------|----------|-------------|
| 1 | EPA-6010B | 05/30/17 | 05/31/17 15:50 | JCC | PE-OP3 | 0.990 | B[E3027 |

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Reported: 06/02/2017 10:17
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Total Concentrations (TTLC)

| | |
|----------------------------------|--|
| BCL Sample ID: 1714098-02 | Client Sample Name: 2-SSa, 5/23/2017 12:00:00AM, Harrison Hucks |
|----------------------------------|--|

| Constituent | Result | Units | PQL | MDL | Method | MB Bias | Lab Quals | Run # |
|-------------|--------|-------|-----|------|-----------|---------|-----------|-------|
| Arsenic | 2.2 | mg/kg | 1.0 | 0.40 | EPA-6010B | ND | | 1 |

| Run # | Method | Prep Date | Run Date/Time | Analyst | Instrument | Dilution | QC Batch ID |
|-------|-----------|-----------|----------------|---------|------------|----------|-------------|
| 1 | EPA-6010B | 05/30/17 | 05/31/17 15:51 | JCC | PE-OP3 | 0.962 | B[E3027 |

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Reported: 06/02/2017 10:17
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Total Concentrations (TTLC)

| | |
|----------------------------------|--|
| BCL Sample ID: 1714098-03 | Client Sample Name: 3-SSa, 5/23/2017 12:00:00AM, Harrison Hucks |
|----------------------------------|--|

| Constituent | Result | Units | PQL | MDL | Method | MB Bias | Lab Quals | Run # |
|-------------|--------|-------|-----|------|-----------|---------|-----------|-------|
| Arsenic | 2.7 | mg/kg | 1.0 | 0.40 | EPA-6010B | ND | | 1 |

| Run # | Method | Prep Date | Run Date/Time | Analyst | Instrument | Dilution | QC Batch ID |
|-------|-----------|-----------|----------------|---------|------------|----------|-------------|
| 1 | EPA-6010B | 05/30/17 | 05/31/17 15:53 | JCC | PE-OP3 | 0.917 | B[E3027 |

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Reported: 06/02/2017 10:17
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Total Concentrations (TTLC)

| | |
|----------------------------------|--|
| BCL Sample ID: 1714098-04 | Client Sample Name: 4-SSa, 5/23/2017 12:00:00AM, Harrison Hucks |
|----------------------------------|--|

| Constituent | Result | Units | PQL | MDL | Method | MB Bias | Lab Quals | Run # |
|-------------|--------|-------|-----|------|-----------|---------|-----------|-------|
| Arsenic | 2.6 | mg/kg | 1.0 | 0.40 | EPA-6010B | ND | | 1 |

| Run # | Method | Prep Date | Run Date/Time | Analyst | Instrument | Dilution | QC Batch ID |
|-------|-----------|-----------|----------------|---------|------------|----------|-------------|
| 1 | EPA-6010B | 05/31/17 | 06/01/17 11:42 | JCC | PE-OP3 | 0.971 | B[E3110 |

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Reported: 06/02/2017 10:17
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Organochlorine Pesticides (EPA Method 8081A)

| | |
|----------------------------------|--|
| BCL Sample ID: 1714098-05 | Client Sample Name: Composite of 1-SS a,b, 5/23/2017 12:00:00AM, Harrison Hucks |
|----------------------------------|--|

| Constituent | Result | Units | PQL | MDL | Method | MB Bias | Lab Quals | Run # |
|--------------------------------|--------|-------|----------------------|----------|-----------|---------|-----------|-------|
| Aldrin | ND | mg/kg | 0.0014 | 0.000097 | EPA-8081A | ND | | 1 |
| alpha-BHC | ND | mg/kg | 0.0014 | 0.00037 | EPA-8081A | ND | | 1 |
| beta-BHC | ND | mg/kg | 0.0014 | 0.00043 | EPA-8081A | ND | | 1 |
| delta-BHC | ND | mg/kg | 0.0014 | 0.00013 | EPA-8081A | ND | | 1 |
| gamma-BHC (Lindane) | ND | mg/kg | 0.0014 | 0.00023 | EPA-8081A | ND | | 1 |
| Chlordane (Technical) | ND | mg/kg | 0.14 | 0.0049 | EPA-8081A | ND | | 1 |
| 4,4'-DDD | ND | mg/kg | 0.0014 | 0.00060 | EPA-8081A | ND | | 1 |
| 4,4'-DDE | ND | mg/kg | 0.0014 | 0.000057 | EPA-8081A | ND | | 1 |
| 4,4'-DDT | ND | mg/kg | 0.0014 | 0.00027 | EPA-8081A | ND | | 1 |
| Dieldrin | ND | mg/kg | 0.0014 | 0.00023 | EPA-8081A | ND | | 1 |
| Endosulfan I | ND | mg/kg | 0.0014 | 0.000063 | EPA-8081A | ND | | 1 |
| Endosulfan II | ND | mg/kg | 0.0014 | 0.00040 | EPA-8081A | ND | | 1 |
| Endosulfan sulfate | ND | mg/kg | 0.0014 | 0.00097 | EPA-8081A | ND | | 1 |
| Endrin | ND | mg/kg | 0.0014 | 0.00026 | EPA-8081A | ND | | 1 |
| Endrin aldehyde | ND | mg/kg | 0.0014 | 0.00066 | EPA-8081A | ND | | 1 |
| Heptachlor | ND | mg/kg | 0.0014 | 0.00010 | EPA-8081A | ND | | 1 |
| Heptachlor epoxide | ND | mg/kg | 0.0014 | 0.000049 | EPA-8081A | ND | | 1 |
| Methoxychlor | ND | mg/kg | 0.0014 | 0.00060 | EPA-8081A | ND | | 1 |
| Toxaphene | ND | mg/kg | 0.14 | 0.027 | EPA-8081A | ND | | 1 |
| TCMX (Surrogate) | 100 | % | 20 - 130 (LCL - UCL) | | EPA-8081A | | | 1 |
| Decachlorobiphenyl (Surrogate) | 94.5 | % | 40 - 130 (LCL - UCL) | | EPA-8081A | | | 1 |

| Run # | Method | Prep Date | Run Date/Time | Analyst | Instrument | Dilution | QC Batch ID |
|-------|-----------|-----------|----------------|---------|------------|----------|-------------|
| 1 | EPA-8081A | 05/24/17 | 05/26/17 08:26 | HKS | GC-17 | 2.857 | B[E]2697 |

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120 Westgate Drive
Watsonville, CA 95076

Reported: 06/02/2017 10:17
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Organochlorine Pesticides (EPA Method 8081A)

| BCL Sample ID: 1714098-06 | | Client Sample Name: Composite of 2-SS a,b, 5/23/2017 12:00:00AM, Harrison Hucks | | | | | | |
|--------------------------------|--------|---|----------------------|----------|-----------|---------|-----------|-------|
| Constituent | Result | Units | PQL | MDL | Method | MB Bias | Lab Quals | Run # |
| Aldrin | ND | mg/kg | 0.0015 | 0.00010 | EPA-8081A | ND | | 1 |
| alpha-BHC | ND | mg/kg | 0.0015 | 0.00039 | EPA-8081A | ND | | 1 |
| beta-BHC | ND | mg/kg | 0.0015 | 0.00045 | EPA-8081A | ND | | 1 |
| delta-BHC | ND | mg/kg | 0.0015 | 0.00014 | EPA-8081A | ND | | 1 |
| gamma-BHC (Lindane) | ND | mg/kg | 0.0015 | 0.00025 | EPA-8081A | ND | | 1 |
| Chlordane (Technical) | ND | mg/kg | 0.15 | 0.0051 | EPA-8081A | ND | | 1 |
| 4,4'-DDD | ND | mg/kg | 0.0015 | 0.00063 | EPA-8081A | ND | | 1 |
| 4,4'-DDE | ND | mg/kg | 0.0015 | 0.000060 | EPA-8081A | ND | | 1 |
| 4,4'-DDT | ND | mg/kg | 0.0015 | 0.00028 | EPA-8081A | ND | | 1 |
| Dieldrin | ND | mg/kg | 0.0015 | 0.00024 | EPA-8081A | ND | | 1 |
| Endosulfan I | ND | mg/kg | 0.0015 | 0.000066 | EPA-8081A | ND | | 1 |
| Endosulfan II | ND | mg/kg | 0.0015 | 0.00042 | EPA-8081A | ND | | 1 |
| Endosulfan sulfate | ND | mg/kg | 0.0015 | 0.0010 | EPA-8081A | ND | | 1 |
| Endrin | ND | mg/kg | 0.0015 | 0.00027 | EPA-8081A | ND | | 1 |
| Endrin aldehyde | ND | mg/kg | 0.0015 | 0.00069 | EPA-8081A | ND | | 1 |
| Heptachlor | ND | mg/kg | 0.0015 | 0.00011 | EPA-8081A | ND | | 1 |
| Heptachlor epoxide | ND | mg/kg | 0.0015 | 0.000051 | EPA-8081A | ND | | 1 |
| Methoxychlor | ND | mg/kg | 0.0015 | 0.00063 | EPA-8081A | ND | | 1 |
| Toxaphene | ND | mg/kg | 0.15 | 0.028 | EPA-8081A | ND | | 1 |
| TCMX (Surrogate) | 86.2 | % | 20 - 130 (LCL - UCL) | | EPA-8081A | | | 1 |
| Decachlorobiphenyl (Surrogate) | 101 | % | 40 - 130 (LCL - UCL) | | EPA-8081A | | | 1 |

| Run # | Method | Prep Date | Run Date/Time | Analyst | Instrument | Dilution | QC Batch ID |
|-------|-----------|-----------|----------------|---------|------------|----------|-------------|
| 1 | EPA-8081A | 05/24/17 | 05/26/17 08:41 | HKS | GC-17 | 3 | B[E]2697 |

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120 Westgate Drive
Watsonville, CA 95076

Reported: 06/02/2017 10:17
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Organochlorine Pesticides (EPA Method 8081A)

| BCL Sample ID: 1714098-07 | | Client Sample Name: Composite of 3-SS a,b, 5/23/2017 12:00:00AM, Harrison Hucks | | | | | | |
|--------------------------------|--------|---|----------------------|----------|-----------|---------|-----------|-------|
| Constituent | Result | Units | PQL | MDL | Method | MB Bias | Lab Quals | Run # |
| Aldrin | ND | mg/kg | 0.0014 | 0.000098 | EPA-8081A | ND | | 1 |
| alpha-BHC | ND | mg/kg | 0.0014 | 0.00038 | EPA-8081A | ND | | 1 |
| beta-BHC | ND | mg/kg | 0.0014 | 0.00043 | EPA-8081A | ND | | 1 |
| delta-BHC | ND | mg/kg | 0.0014 | 0.00014 | EPA-8081A | ND | | 1 |
| gamma-BHC (Lindane) | ND | mg/kg | 0.0014 | 0.00024 | EPA-8081A | ND | | 1 |
| Chlordane (Technical) | ND | mg/kg | 0.14 | 0.0049 | EPA-8081A | ND | | 1 |
| 4,4'-DDD | ND | mg/kg | 0.0014 | 0.00061 | EPA-8081A | ND | | 1 |
| 4,4'-DDE | ND | mg/kg | 0.0014 | 0.000058 | EPA-8081A | ND | | 1 |
| 4,4'-DDT | ND | mg/kg | 0.0014 | 0.00027 | EPA-8081A | ND | | 1 |
| Dieldrin | ND | mg/kg | 0.0014 | 0.00023 | EPA-8081A | ND | | 1 |
| Endosulfan I | ND | mg/kg | 0.0014 | 0.000063 | EPA-8081A | ND | | 1 |
| Endosulfan II | ND | mg/kg | 0.0014 | 0.00040 | EPA-8081A | ND | | 1 |
| Endosulfan sulfate | ND | mg/kg | 0.0014 | 0.00098 | EPA-8081A | ND | | 1 |
| Endrin | ND | mg/kg | 0.0014 | 0.00026 | EPA-8081A | ND | | 1 |
| Endrin aldehyde | ND | mg/kg | 0.0014 | 0.00066 | EPA-8081A | ND | | 1 |
| Heptachlor | ND | mg/kg | 0.0014 | 0.00010 | EPA-8081A | ND | | 1 |
| Heptachlor epoxide | ND | mg/kg | 0.0014 | 0.000049 | EPA-8081A | ND | | 1 |
| Methoxychlor | ND | mg/kg | 0.0014 | 0.00061 | EPA-8081A | ND | | 1 |
| Toxaphene | ND | mg/kg | 0.14 | 0.027 | EPA-8081A | ND | | 1 |
| TCMX (Surrogate) | 71.9 | % | 20 - 130 (LCL - UCL) | | EPA-8081A | | | 1 |
| Decachlorobiphenyl (Surrogate) | 85.3 | % | 40 - 130 (LCL - UCL) | | EPA-8081A | | | 1 |

| Run # | Method | Prep Date | Run Date/Time | Analyst | Instrument | Dilution | QC Batch ID |
|-------|-----------|-----------|----------------|---------|------------|----------|-------------|
| 1 | EPA-8081A | 05/24/17 | 05/26/17 08:55 | HKS | GC-17 | 2.885 | B[E]2697 |

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Weber, Hayes & Associates
120 Westgate Drive
Watsonville, CA 95076

Reported: 06/02/2017 10:17
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Organochlorine Pesticides (EPA Method 8081A)

| | |
|----------------------------------|--|
| BCL Sample ID: 1714098-08 | Client Sample Name: Composite of 4-SS a,b, 5/23/2017 12:00:00AM, Harrison Hucks |
|----------------------------------|--|

| Constituent | Result | Units | PQL | MDL | Method | MB Bias | Lab Quals | Run # |
|--------------------------------|---------------|--------------|----------------------|----------------|------------------|---------|-----------|-------|
| Aldrin | ND | mg/kg | 0.0015 | 0.000099 | EPA-8081A | ND | | 1 |
| alpha-BHC | ND | mg/kg | 0.0015 | 0.00038 | EPA-8081A | ND | | 1 |
| beta-BHC | ND | mg/kg | 0.0015 | 0.00044 | EPA-8081A | ND | | 1 |
| delta-BHC | ND | mg/kg | 0.0015 | 0.00014 | EPA-8081A | ND | | 1 |
| gamma-BHC (Lindane) | ND | mg/kg | 0.0015 | 0.00024 | EPA-8081A | ND | | 1 |
| Chlordane (Technical) | ND | mg/kg | 0.15 | 0.0050 | EPA-8081A | ND | | 1 |
| 4,4'-DDD | 0.0016 | mg/kg | 0.0015 | 0.00061 | EPA-8081A | ND | | 1 |
| 4,4'-DDE | ND | mg/kg | 0.0015 | 0.000058 | EPA-8081A | ND | | 1 |
| 4,4'-DDT | 0.0032 | mg/kg | 0.0015 | 0.00027 | EPA-8081A | ND | | 1 |
| Dieldrin | ND | mg/kg | 0.0015 | 0.00023 | EPA-8081A | ND | | 1 |
| Endosulfan I | ND | mg/kg | 0.0015 | 0.000064 | EPA-8081A | ND | | 1 |
| Endosulfan II | ND | mg/kg | 0.0015 | 0.00041 | EPA-8081A | ND | | 1 |
| Endosulfan sulfate | ND | mg/kg | 0.0015 | 0.00099 | EPA-8081A | ND | | 1 |
| Endrin | ND | mg/kg | 0.0015 | 0.00027 | EPA-8081A | ND | | 1 |
| Endrin aldehyde | ND | mg/kg | 0.0015 | 0.00067 | EPA-8081A | ND | | 1 |
| Heptachlor | ND | mg/kg | 0.0015 | 0.00010 | EPA-8081A | ND | | 1 |
| Heptachlor epoxide | ND | mg/kg | 0.0015 | 0.000050 | EPA-8081A | ND | | 1 |
| Methoxychlor | ND | mg/kg | 0.0015 | 0.00061 | EPA-8081A | ND | | 1 |
| Toxaphene | ND | mg/kg | 0.15 | 0.027 | EPA-8081A | ND | | 1 |
| TCMX (Surrogate) | 79.0 | % | 20 - 130 (LCL - UCL) | | EPA-8081A | | | 1 |
| Decachlorobiphenyl (Surrogate) | 79.0 | % | 40 - 130 (LCL - UCL) | | EPA-8081A | | | 1 |

| Run # | Method | Prep Date | Run Date/Time | Analyst | Instrument | Dilution | QC Batch ID |
|-------|-----------|-----------|----------------|---------|------------|----------|-------------|
| 1 | EPA-8081A | 05/24/17 | 05/26/17 09:10 | HKS | GC-17 | 2.913 | B[E]2697 |

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Weber, Hayes & Associates
120 Westgate Drive
Watsonville, CA 95076

Reported: 06/02/2017 10:17
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Organochlorine Pesticides (EPA Method 8081A)

Quality Control Report - Method Blank Analysis

| Constituent | QC Sample ID | MB Result | Units | PQL | MDL | Lab Quals |
|---------------------------------------|---------------------|-------------|----------|-----------------------------|----------|-----------|
| QC Batch ID: B[E2697 | | | | | | |
| Aldrin | B[E2697-BLK1 | ND | mg/kg | 0.00050 | 0.000034 | |
| alpha-BHC | B[E2697-BLK1 | ND | mg/kg | 0.00050 | 0.00013 | |
| beta-BHC | B[E2697-BLK1 | ND | mg/kg | 0.00050 | 0.00015 | |
| delta-BHC | B[E2697-BLK1 | ND | mg/kg | 0.00050 | 0.000047 | |
| gamma-BHC (Lindane) | B[E2697-BLK1 | ND | mg/kg | 0.00050 | 0.000082 | |
| Chlordane (Technical) | B[E2697-BLK1 | ND | mg/kg | 0.050 | 0.0017 | |
| 4,4'-DDD | B[E2697-BLK1 | ND | mg/kg | 0.00050 | 0.00021 | |
| 4,4'-DDE | B[E2697-BLK1 | ND | mg/kg | 0.00050 | 0.000020 | |
| 4,4'-DDT | B[E2697-BLK1 | ND | mg/kg | 0.00050 | 0.000093 | |
| Dieldrin | B[E2697-BLK1 | ND | mg/kg | 0.00050 | 0.000079 | |
| Endosulfan I | B[E2697-BLK1 | ND | mg/kg | 0.00050 | 0.000022 | |
| Endosulfan II | B[E2697-BLK1 | ND | mg/kg | 0.00050 | 0.00014 | |
| Endosulfan sulfate | B[E2697-BLK1 | ND | mg/kg | 0.00050 | 0.00034 | |
| Endrin | B[E2697-BLK1 | ND | mg/kg | 0.00050 | 0.000091 | |
| Endrin aldehyde | B[E2697-BLK1 | ND | mg/kg | 0.00050 | 0.00023 | |
| Heptachlor | B[E2697-BLK1 | ND | mg/kg | 0.00050 | 0.000036 | |
| Heptachlor epoxide | B[E2697-BLK1 | ND | mg/kg | 0.00050 | 0.000017 | |
| Methoxychlor | B[E2697-BLK1 | ND | mg/kg | 0.00050 | 0.00021 | |
| Toxaphene | B[E2697-BLK1 | ND | mg/kg | 0.050 | 0.0094 | |
| TCMX (Surrogate) | B[E2697-BLK1 | 56.0 | % | 20 - 130 (LCL - UCL) | | |
| Decachlorobiphenyl (Surrogate) | B[E2697-BLK1 | 60.5 | % | 40 - 130 (LCL - UCL) | | |

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Weber, Hayes & Associates
120 Westgate Drive
Watsonville, CA 95076

Reported: 06/02/2017 10:17
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Organochlorine Pesticides (EPA Method 8081A)

Quality Control Report - Laboratory Control Sample

| Constituent | QC Sample ID | Type | Result | Spike Level | Units | Percent Recovery | RPD | Control Limits | | Lab |
|--------------------------------|--------------|------|-----------|-------------|-------|------------------|-----|------------------|-----|-----|
| | | | | | | | | Percent Recovery | RPD | |
| QC Batch ID: B[E2697 | | | | | | | | | | |
| Aldrin | B[E2697-BS1 | LCS | 0.0056166 | 0.0049669 | mg/kg | 113 | | 70 - 130 | | |
| gamma-BHC (Lindane) | B[E2697-BS1 | LCS | 0.0054318 | 0.0049669 | mg/kg | 109 | | 60 - 140 | | |
| 4,4'-DDT | B[E2697-BS1 | LCS | 0.0056917 | 0.0049669 | mg/kg | 115 | | 60 - 140 | | |
| Dieldrin | B[E2697-BS1 | LCS | 0.0054411 | 0.0049669 | mg/kg | 110 | | 70 - 130 | | |
| Endrin | B[E2697-BS1 | LCS | 0.0055199 | 0.0049669 | mg/kg | 111 | | 60 - 140 | | |
| Heptachlor | B[E2697-BS1 | LCS | 0.0056106 | 0.0049669 | mg/kg | 113 | | 60 - 140 | | |
| TCMX (Surrogate) | B[E2697-BS1 | LCS | 0.010202 | 0.0099338 | mg/kg | 103 | | 20 - 130 | | |
| Decachlorobiphenyl (Surrogate) | B[E2697-BS1 | LCS | 0.020782 | 0.019868 | mg/kg | 105 | | 40 - 130 | | |

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Watsonville, CA 95076

Reported: 06/02/2017 10:17
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Organochlorine Pesticides (EPA Method 8081A)

Quality Control Report - Precision & Accuracy

| Constituent | Type | Source Sample ID | Source Result | Result | Spike Added | Units | RPD | Percent Recovery | | Lab | |
|--------------------------------|------|-----------------------|---------------|-----------|-------------|-------|-----|------------------|------------------|----------|--|
| | | | | | | | | RPD | Percent Recovery | | |
| QC Batch ID: B[E2697 | | Used client sample: N | | | | | | | | | |
| Aldrin | MS | 1705207-61 | ND | 0.0057848 | 0.0050505 | mg/kg | | 115 | | 50 - 140 | |
| | MSD | 1705207-61 | ND | 0.0056533 | 0.0050000 | mg/kg | 2.3 | 113 | 30 | 50 - 140 | |
| gamma-BHC (Lindane) | MS | 1705207-61 | ND | 0.0054303 | 0.0050505 | mg/kg | | 108 | | 50 - 140 | |
| | MSD | 1705207-61 | ND | 0.0056590 | 0.0050000 | mg/kg | 4.1 | 113 | 30 | 50 - 140 | |
| 4,4'-DDT | MS | 1705207-61 | ND | 0.0056788 | 0.0050505 | mg/kg | | 112 | | 50 - 140 | |
| | MSD | 1705207-61 | ND | 0.0054033 | 0.0050000 | mg/kg | 5.0 | 108 | 30 | 50 - 140 | |
| Dieldrin | MS | 1705207-61 | ND | 0.0054983 | 0.0050505 | mg/kg | | 109 | | 40 - 140 | |
| | MSD | 1705207-61 | ND | 0.0054373 | 0.0050000 | mg/kg | 1.1 | 109 | 30 | 40 - 140 | |
| Endrin | MS | 1705207-61 | ND | 0.0057754 | 0.0050505 | mg/kg | | 114 | | 50 - 150 | |
| | MSD | 1705207-61 | ND | 0.0057737 | 0.0050000 | mg/kg | 0.0 | 115 | 30 | 50 - 150 | |
| Heptachlor | MS | 1705207-61 | ND | 0.0053522 | 0.0050505 | mg/kg | | 106 | | 60 - 140 | |
| | MSD | 1705207-61 | ND | 0.0051493 | 0.0050000 | mg/kg | 3.9 | 103 | 30 | 60 - 140 | |
| TCMX (Surrogate) | MS | 1705207-61 | ND | 0.010574 | 0.010101 | mg/kg | | 105 | | 20 - 130 | |
| | MSD | 1705207-61 | ND | 0.010393 | 0.010000 | mg/kg | 1.7 | 104 | | 20 - 130 | |
| Decachlorobiphenyl (Surrogate) | MS | 1705207-61 | ND | 0.022755 | 0.020202 | mg/kg | | 113 | | 40 - 130 | |
| | MSD | 1705207-61 | ND | 0.021351 | 0.020000 | mg/kg | 6.4 | 107 | | 40 - 130 | |

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Weber, Hayes & Associates
120 Westgate Drive
Watsonville, CA 95076

Reported: 06/02/2017 10:17
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Total Concentrations (TTL)

Quality Control Report - Method Blank Analysis

| Constituent | QC Sample ID | MB Result | Units | PQL | MDL | Lab Quals |
|------------------------------|--------------|-----------|-------|-----|------|-----------|
| QC Batch ID: B[E3027] | | | | | | |
| Arsenic | B[E3027-BLK1 | ND | mg/kg | 1.0 | 0.40 | |
| QC Batch ID: B[E3110] | | | | | | |
| Arsenic | B[E3110-BLK1 | ND | mg/kg | 1.0 | 0.40 | |

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120 Westgate Drive
Watsonville, CA 95076

Reported: 06/02/2017 10:17
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Total Concentrations (TTLC)

Quality Control Report - Laboratory Control Sample

| Constituent | QC Sample ID | Type | Result | Spike Level | Units | Percent Recovery | RPD | Control Limits | | Lab |
|-----------------------------|--------------|------|--------|-------------|-------|------------------|-----|------------------|-----|-----|
| | | | | | | | | Percent Recovery | RPD | |
| QC Batch ID: B[E3027 | | | | | | | | | | |
| Arsenic | B[E3027-BS1 | LCS | 10.481 | 10.000 | mg/kg | 105 | | 75 | 125 | |
| QC Batch ID: B[E3110 | | | | | | | | | | |
| Arsenic | B[E3110-BS1 | LCS | 11.043 | 10.000 | mg/kg | 110 | | 75 | 125 | |

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Weber, Hayes & Associates
120 Westgate Drive
Watsonville, CA 95076

Reported: 06/02/2017 10:17
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Total Concentrations (TTLC)

Quality Control Report - Precision & Accuracy

| Constituent | Type | Source Sample ID | Source Result | Result | Spike Added | Units | RPD | Control Limits | | Lab Quals |
|------------------------------|------|-----------------------|------------------|--------|----------------|-------|-----|---------------------|---------------------|--------------|
| | | | | | | | | Percent Recovery | Percent Recovery | |
| QC Batch ID: B[E3027] | | Used client sample: N | | | | | | | | |
| Arsenic | DUP | 1713568-05 | ND | ND | | mg/kg | | | 20 | |
| | MS | 1713568-05 | ND | 10.590 | 10.000 | mg/kg | | 106 | | 75 - 125 |
| | MSD | 1713568-05 | ND | 10.220 | 10.000 | mg/kg | 3.6 | 102 | 20 | 75 - 125 |
| QC Batch ID: B[E3110] | | Used client sample: N | | | | | | | | |
| Arsenic | DUP | 1713800-01 | 7.3609 | 6.9354 | | mg/kg | 6.0 | | 20 | |
| | MS | 1713800-01 | 7.3609 | 19.603 | 10.000 | mg/kg | | 122 | | 75 - 125 |
| | MSD | 1713800-01 | 7.3609 | 18.765 | 10.000 | mg/kg | 4.4 | 114 | 20 | 75 - 125 |

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Weber, Hayes & Associates
120 Westgate Drive
Watsonville, CA 95076

Reported: 06/02/2017 10:17
Project: Misc.
Project Number: Soquel - Maplethorpe (Swift) 2X716
Project Manager: Harrison Hucks

Notes And Definitions

- MDL Method Detection Limit
- ND Analyte Not Detected
- PQL Practical Quantitation Limit



Date of Report: 09/07/2017

Harrison Hucks

Weber, Hayes & Associates
120 Westgate Drive
Watsonville, CA 95076

Client Project: Soquel - Maplethorpe - 2X716
BCL Project: Misc.
BCL Work Order: 1724634
Invoice ID: B278469

Enclosed are the results of analyses for samples received by the laboratory on 9/5/2017. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Misty Orton
Client Service Rep

Stuart Buttram
Technical Director

Certifications: CA ELAP #1186; NV #CA00014; OR ELAP #4032-001; AK UST101

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CHAIN-OF-CUSTODY RECORD



WEBER, HAYES & ASSOCIATES
Hydrology and Environmental Engineering
120 Westgate Drive, Watsonville, CA 95076
(831) 722-5580 // www.weber-hayes.com

RUSH!

PAGE 1 OF 1

LABORATORY: BC Labs
TURNAROUND TIME: 3 day RUSH
SEE BELOW COMMENTS

PROJECT NAME AND JOB #: Seque - Maplethorpe - 2X716

SEND CERTIFIED RESULTS TO: Weber, Hayes and Associates - Attention:

ELECTRONIC DELIVERABLE FORMAT: YES NO

Sampler: Harrison Hucks
Date: 9/1/17

GLOBAL I.D.: _____

| GeoTracker ¹ Field Point Name | WHA Sample ID | Sample Depth | Date Sampled | Matrix | SAMPLE CONTAINERS | | | REQUESTED ANALYSIS | | |
|---|---------------------|--------------|-----------------|--------|-------------------|--------------|-----------------------|---|---|------------------------------|
| | | | | | 40 mL VOAs | 8 oz Jars | 1 L Poly Bottle | TERP_Screen as Diesel (w/ Silica Gel Cleanup) | Total Petroleum Hydrocarbons Thromboline & WITE-ORX by EPA Method 8260 | Additional Analysis |
| -1 | 55-1(a,b) | 0-5' | 9/1 | soil | 2 | 2 | 1 | PLB Analysis +tech-report | LUFF 5 Metals plus Arsenic & Hex-Chrome | Creotech Analysis 8270 |
| -2 | 55-2(a,b) | | | | 2 | 2 | | | | X |
| -3 | 55-3(a,b) | | | | 2 | 2 | | | | X |
| -4 | 55-4(a,b) | | | | 1 | 1 | | | | X |
| | | | | | | | | | | X |

| RELEASED BY: | RECEIVED BY: | DATE & TIME | SAMPLE CONDITION: |
|----------------|--------------|--------------|-------------------|
| Harrison Hucks | [Signature] | 9/1/17 0900 | Ambient |
| [Signature] | [Signature] | 9/1/17 11:00 | Refrigerated |
| | | | Ambient |
| | | | Refrigerated |
| | | | Ambient |
| | | | Refrigerated |
| | | | Ambient |
| | | | Refrigerated |
| | | | Ambient |
| | | | Refrigerated |

PLEASE SEND CERTIFIED RESULTS TO lab@weber-hayes.com

Note: Need sample results by Thursday September 7th

Note: Composite a & b soils (e.g. 55-1 = 55-1a + 55-1b)

- NOTES:
- Please use GeoTracker Field Point Name for EDF.
 - For MTBE-analyzed samples with non-detectable results (ND) but having elevated detection limits, please confirm by EPA Method 8260.
 - Please use MDL (Minimum Detection Limit) for any diluted samples.

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| | | | | | | | | | | | |
|--|--|--|-----|---|-----|-----|------|------|------|---|----|
| BC LABORATORIES INC. | | COOLER RECEIPT FORM | | Page <u>1</u> Of <u>1</u> | | | | | | | |
| Submission #: <u>17-24634</u> | | | | | | | | | | | |
| SHIPPING INFORMATION Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> Ontrac <input checked="" type="checkbox"/> Hand Delivery <input type="checkbox"/> BC Lab Field Service <input type="checkbox"/> Other <input type="checkbox"/> (Specify) _____ | | SHIPPING CONTAINER Ice Chest <input checked="" type="checkbox"/> None <input type="checkbox"/> Box <input type="checkbox"/> Other <input type="checkbox"/> (Specify) _____ | | FREE LIQUID YES <input type="checkbox"/> NO <input type="checkbox"/> W / S | | | | | | | |
| Refrigerant: Ice <input checked="" type="checkbox"/> Blue Ice <input type="checkbox"/> None <input type="checkbox"/> Other <input type="checkbox"/> Comments: | | | | | | | | | | | |
| Custody Seals Ice Chest <input type="checkbox"/> Containers <input type="checkbox"/> None <input checked="" type="checkbox"/> Comments: | | | | | | | | | | | |
| All samples received? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | | All samples containers intact? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | | Description(s) match COC? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | | | | | | | |
| COC Received <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO | | Emissivity: <u>98</u> Container: <u>glass</u> Thermometer ID: <u>208</u> | | Date/Time <u>9-5-17</u> | | | | | | | |
| Temperature: (A) <u>5.8</u> °C / (C) <u>5.7</u> °C | | Analyst Init <u>Jgg 0800</u> | | | | | | | | | |
| SAMPLE CONTAINERS | | SAMPLE NUMBERS | | | | | | | | | |
| | | 5 # | 6 # | 7 # | 8 # | 9 # | 10 # | 11 # | 12 # | 9 | 10 |
| QT PE UNPRES | | | | | | | | | | | |
| 4oz / 8oz / 16oz PE UNPRES | | | | | | | | | | | |
| 2oz Cr ⁶ | | | | | | | | | | | |
| QT INORGANIC CHEMICAL METALS | | | | | | | | | | | |
| INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz | | | | | | | | | | | |
| PT CYANIDE | | | | | | | | | | | |
| PT NITROGEN FORMS | | | | | | | | | | | |
| PT TOTAL SULFIDE | | | | | | | | | | | |
| 2oz. NITRATE / NITRITE | | | | | | | | | | | |
| PT TOTAL ORGANIC CARBON | | | | | | | | | | | |
| PT CHEMICAL OXYGEN DEMAND | | | | | | | | | | | |
| PIA PHENOLICS | | | | | | | | | | | |
| 40ml VOA VIAL TRAVEL BLANK | | | | | | | | | | | |
| 40ml VOA VIAL | | | | | | | | | | | |
| QT EPA 1664 | | | | | | | | | | | |
| PT ODOR | | | | | | | | | | | |
| RADIOLOGICAL | | | | | | | | | | | |
| BACTERIOLOGICAL | | | | | | | | | | | |
| 40 ml VOA VIAL- 504 | | | | | | | | | | | |
| QT EPA 508/608/8080 | | | | | | | | | | | |
| QT EPA 515.1/8150 | | | | | | | | | | | |
| QT EPA 525 | | | | | | | | | | | |
| QT EPA 525 TRAVEL BLANK | | | | | | | | | | | |
| 40ml EPA 547 | | | | | | | | | | | |
| 40ml EPA 531.1 | | | | | | | | | | | |
| 8oz EPA 548 | | | | | | | | | | | |
| QT EPA 549 | | | | | | | | | | | |
| QT EPA 8015M | | | | | | | | | | | |
| QT EPA 8270 | | | | | | | | | | | |
| 1oz / 16oz / 32oz AMBER | | | | | | | | | | | |
| 1oz / 16oz / 32oz JAR | | A | A | A | A | A | A | A | | | |
| FOIL SLEEVE | | | | | | | | | | | |
| CB VIAL | | | | | | | | | A | | |
| LASTIC BAG | | | | | | | | | | | |
| EDLAR BAG | | | | | | | | | | | |
| ERROUS IRON | | | | | | | | | | | |
| NCORE | | | | | | | | | | | |
| MART KIT | | | | | | | | | | | |
| UMMA CANISTER | | | | | | | | | | | |
| Comments: | | | | | | | | | | | |
| Sample Numbering Completed By: <u>Jgg</u> | | Date/Time: <u>9-5-17 0845</u> | | | | | | | | | |
| = Actual / C = Corrected | | Rev 21 05/23/2016 | | | | | | | | | |

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120 Westgate Drive
Watsonville, CA 95076

Reported: 09/07/2017 13:50
Project: Misc.
Project Number: Soquel - Maplethorpe - 2X716
Project Manager: Harrison Hucks

Laboratory / Client Sample Cross Reference

| Laboratory | Client Sample Information | | | |
|------------|---------------------------|----------------|-----------------------|------------------|
| 1724634-01 | COC Number: | --- | Receive Date: | 09/05/2017 08:00 |
| | Project Number: | --- | Sampling Date: | 09/01/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | SS-1 (A, B) | Lab Matrix: | Solids |
| | Sampled By: | Harrison Hucks | Sample Type: | Soil |
| | <hr/> | | | |
| 1724634-02 | COC Number: | --- | Receive Date: | 09/05/2017 08:00 |
| | Project Number: | --- | Sampling Date: | 09/01/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | SS-2 (A, B) | Lab Matrix: | Solids |
| | Sampled By: | Harrison Hucks | Sample Type: | Soil |
| | <hr/> | | | |
| 1724634-03 | COC Number: | --- | Receive Date: | 09/05/2017 08:00 |
| | Project Number: | --- | Sampling Date: | 09/01/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | SS-3 (A, B) | Lab Matrix: | Solids |
| | Sampled By: | Harrison Hucks | Sample Type: | Soil |
| | <hr/> | | | |
| 1724634-04 | COC Number: | --- | Receive Date: | 09/05/2017 08:00 |
| | Project Number: | --- | Sampling Date: | 09/01/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | SS-4 (A, B) | Lab Matrix: | Solids |
| | Sampled By: | Harrison Hucks | Sample Type: | Soil |
| | <hr/> | | | |
| 1724634-05 | COC Number: | --- | Receive Date: | 09/05/2017 08:00 |
| | Project Number: | --- | Sampling Date: | 09/01/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | SS-1 A | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | <hr/> | | | |
| 1724634-06 | COC Number: | --- | Receive Date: | 09/05/2017 08:00 |
| | Project Number: | --- | Sampling Date: | 09/01/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | SS-1 B | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | <hr/> | | | |
| 1724634-07 | COC Number: | --- | Receive Date: | 09/05/2017 08:00 |
| | Project Number: | --- | Sampling Date: | 09/01/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | SS-2 A | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | <hr/> | | | |

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Reported: 09/07/2017 13:50
Project: Misc.
Project Number: Soquel - Maplethorpe - 2X716
Project Manager: Harrison Hucks

Laboratory / Client Sample Cross Reference

| Laboratory | Client Sample Information | | | |
|------------|---------------------------|--------|-----------------------|------------------|
| 1724634-08 | COC Number: | --- | Receive Date: | 09/05/2017 08:00 |
| | Project Number: | --- | Sampling Date: | 09/01/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | SS-2 B | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | | | | |
| 1724634-09 | COC Number: | --- | Receive Date: | 09/05/2017 08:00 |
| | Project Number: | --- | Sampling Date: | 09/01/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | SS-3 A | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | | | | |
| 1724634-10 | COC Number: | --- | Receive Date: | 09/05/2017 08:00 |
| | Project Number: | --- | Sampling Date: | 09/01/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | SS-3 B | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | | | | |
| 1724634-11 | COC Number: | --- | Receive Date: | 09/05/2017 08:00 |
| | Project Number: | --- | Sampling Date: | 09/01/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | SS-4 A | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | | | | |
| 1724634-12 | COC Number: | --- | Receive Date: | 09/05/2017 08:00 |
| | Project Number: | --- | Sampling Date: | 09/01/2017 00:00 |
| | Sampling Location: | --- | Sample Depth: | --- |
| | Sampling Point: | SS-4 B | Lab Matrix: | Solids |
| | Sampled By: | --- | Sample Type: | Soil |
| | | | | |

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Reported: 09/07/2017 13:50
Project: Misc.
Project Number: Soquel - Maplethorpe - 2X716
Project Manager: Harrison Hucks

PCB Analysis (EPA Method 8082)

| BCL Sample ID: 1724634-01 | | Client Sample Name: SS-1 (A, B), 9/1/2017 12:00:00AM, Harrison Hucks | | | | | | | |
|--------------------------------|--------|--|----------------------|--------|----------|---------|-----------|-------|--|
| Constituent | Result | Units | PQL | MDL | Method | MB Bias | Lab Quals | Run # | |
| PCB-1016 | ND | mg/kg | 0.010 | 0.0039 | EPA-8082 | ND | | 1 | |
| PCB-1221 | ND | mg/kg | 0.010 | 0.0072 | EPA-8082 | ND | | 1 | |
| PCB-1232 | ND | mg/kg | 0.010 | 0.0074 | EPA-8082 | ND | | 1 | |
| PCB-1242 | ND | mg/kg | 0.010 | 0.0042 | EPA-8082 | ND | | 1 | |
| PCB-1248 | ND | mg/kg | 0.010 | 0.0070 | EPA-8082 | ND | | 1 | |
| PCB-1254 | ND | mg/kg | 0.010 | 0.0032 | EPA-8082 | ND | | 1 | |
| PCB-1260 | ND | mg/kg | 0.010 | 0.0029 | EPA-8082 | ND | | 1 | |
| Total PCB's (Summation) | ND | mg/kg | 0.010 | 0.0050 | EPA-8082 | ND | | 1 | |
| Decachlorobiphenyl (Surrogate) | 70.0 | % | 40 - 120 (LCL - UCL) | | EPA-8082 | | | 1 | |

| Run # | Method | Prep Date | Run Date/Time | Analyst | Instrument | Dilution | QC Batch ID |
|-------|----------|-----------|----------------|---------|------------|----------|-------------|
| 1 | EPA-8082 | 09/06/17 | 09/07/17 10:45 | HKS | GC-15 | 1.007 | B[10400 |

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120 Westgate Drive
Watsonville, CA 95076

Reported: 09/07/2017 13:50
Project: Misc.
Project Number: Soquel - Maplethorpe - 2X716
Project Manager: Harrison Hucks

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

| | |
|----------------------------------|---|
| BCL Sample ID: 1724634-01 | Client Sample Name: SS-1 (A, B), 9/1/2017 12:00:00AM, Harrison Hucks |
|----------------------------------|---|

| Constituent | Result | Units | PQL | MDL | Method | MB Bias | Lab Quals | Run # |
|----------------------------------|--------|-------|----------------------|-------|-----------|---------|-----------|-------|
| 2-Methylphenol | ND | mg/kg | 1.0 | 0.086 | EPA-8270C | ND | A01 | 1 |
| 3- & 4-Methylphenol | ND | mg/kg | 2.0 | 0.34 | EPA-8270C | ND | A01 | 1 |
| 2-Fluorophenol (Surrogate) | 58.0 | % | 20 - 130 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| Phenol-d5 (Surrogate) | 68.6 | % | 30 - 130 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| Nitrobenzene-d5 (Surrogate) | 60.9 | % | 30 - 130 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| 2-Fluorobiphenyl (Surrogate) | 102 | % | 30 - 140 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| 2,4,6-Tribromophenol (Surrogate) | 34.7 | % | 20 - 150 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| p-Terphenyl-d14 (Surrogate) | 65.5 | % | 30 - 150 (LCL - UCL) | | EPA-8270C | | A01 | 1 |

| Run # | Method | Prep Date | Run | | Instrument | Dilution | QC |
|-------|-----------|-----------|----------------|---------|------------|----------|----------|
| | | | Date/Time | Analyst | | | Batch ID |
| 1 | EPA-8270C | 09/05/17 | 09/06/17 14:33 | MK1 | MS-B2 | 9.604 | B[10309 |

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Reported: 09/07/2017 13:50
Project: Misc.
Project Number: Soquel - Maplethorpe - 2X716
Project Manager: Harrison Hucks

PCB Analysis (EPA Method 8082)

| BCL Sample ID: 1724634-02 | Client Sample Name: SS-2 (A, B), 9/1/2017 12:00:00AM, Harrison Hucks | | | | | | | |
|----------------------------------|---|-------|----------------------|--------|----------|---------|-----------|-------|
| Constituent | Result | Units | PQL | MDL | Method | MB Bias | Lab Quals | Run # |
| PCB-1016 | ND | mg/kg | 0.010 | 0.0039 | EPA-8082 | ND | | 1 |
| PCB-1221 | ND | mg/kg | 0.010 | 0.0072 | EPA-8082 | ND | | 1 |
| PCB-1232 | ND | mg/kg | 0.010 | 0.0074 | EPA-8082 | ND | | 1 |
| PCB-1242 | ND | mg/kg | 0.010 | 0.0042 | EPA-8082 | ND | | 1 |
| PCB-1248 | ND | mg/kg | 0.010 | 0.0070 | EPA-8082 | ND | | 1 |
| PCB-1254 | ND | mg/kg | 0.010 | 0.0032 | EPA-8082 | ND | | 1 |
| PCB-1260 | ND | mg/kg | 0.010 | 0.0029 | EPA-8082 | ND | | 1 |
| Total PCB's (Summation) | ND | mg/kg | 0.010 | 0.0050 | EPA-8082 | ND | | 1 |
| Decachlorobiphenyl (Surrogate) | 66.7 | % | 40 - 120 (LCL - UCL) | | EPA-8082 | | | 1 |

| Run # | Method | Prep Date | Run Date/Time | Analyst | Instrument | Dilution | QC Batch ID |
|-------|----------|-----------|----------------|---------|------------|----------|-------------|
| 1 | EPA-8082 | 09/06/17 | 09/07/17 10:56 | HKS | GC-15 | 1.003 | B[10400 |

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120 Westgate Drive
Watsonville, CA 95076

Reported: 09/07/2017 13:50
Project: Misc.
Project Number: Soquel - Maplethorpe - 2X716
Project Manager: Harrison Hucks

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

| | |
|----------------------------------|---|
| BCL Sample ID: 1724634-02 | Client Sample Name: SS-2 (A, B), 9/1/2017 12:00:00AM, Harrison Hucks |
|----------------------------------|---|

| Constituent | Result | Units | PQL | MDL | Method | MB Bias | Lab Quals | Run # |
|----------------------------------|--------|-------|----------------------|-------|-----------|---------|-----------|-------|
| 2-Methylphenol | ND | mg/kg | 1.0 | 0.086 | EPA-8270C | ND | A01 | 1 |
| 3- & 4-Methylphenol | ND | mg/kg | 2.0 | 0.34 | EPA-8270C | ND | A01 | 1 |
| 2-Fluorophenol (Surrogate) | 48.3 | % | 20 - 130 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| Phenol-d5 (Surrogate) | 50.8 | % | 30 - 130 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| Nitrobenzene-d5 (Surrogate) | 46.0 | % | 30 - 130 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| 2-Fluorobiphenyl (Surrogate) | 71.8 | % | 30 - 140 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| 2,4,6-Tribromophenol (Surrogate) | 23.8 | % | 20 - 150 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| p-Terphenyl-d14 (Surrogate) | 49.5 | % | 30 - 150 (LCL - UCL) | | EPA-8270C | | A01 | 1 |

| Run # | Method | Prep Date | Run | | Instrument | Dilution | QC |
|-------|-----------|-----------|----------------|---------|------------|----------|----------|
| | | | Date/Time | Analyst | | | Batch ID |
| 1 | EPA-8270C | 09/05/17 | 09/06/17 14:58 | MK1 | MS-B2 | 9.901 | B[10309 |

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Watsonville, CA 95076

Reported: 09/07/2017 13:50
Project: Misc.
Project Number: Soquel - Maplethorpe - 2X716
Project Manager: Harrison Hucks

PCB Analysis (EPA Method 8082)

| BCL Sample ID: 1724634-03 | | Client Sample Name: SS-3 (A, B), 9/1/2017 12:00:00AM, Harrison Hucks | | | | | | | |
|--------------------------------|--------|--|----------------------|--------|----------|---------|-----------|-------|--|
| Constituent | Result | Units | PQL | MDL | Method | MB Bias | Lab Quals | Run # | |
| PCB-1016 | ND | mg/kg | 0.010 | 0.0039 | EPA-8082 | ND | | 1 | |
| PCB-1221 | ND | mg/kg | 0.010 | 0.0072 | EPA-8082 | ND | | 1 | |
| PCB-1232 | ND | mg/kg | 0.010 | 0.0074 | EPA-8082 | ND | | 1 | |
| PCB-1242 | ND | mg/kg | 0.010 | 0.0042 | EPA-8082 | ND | | 1 | |
| PCB-1248 | ND | mg/kg | 0.010 | 0.0070 | EPA-8082 | ND | | 1 | |
| PCB-1254 | ND | mg/kg | 0.010 | 0.0032 | EPA-8082 | ND | | 1 | |
| PCB-1260 | ND | mg/kg | 0.010 | 0.0029 | EPA-8082 | ND | | 1 | |
| Total PCB's (Summation) | ND | mg/kg | 0.010 | 0.0050 | EPA-8082 | ND | | 1 | |
| Decachlorobiphenyl (Surrogate) | 88.3 | % | 40 - 120 (LCL - UCL) | | EPA-8082 | | | 1 | |

| Run # | Method | Prep Date | Run Date/Time | Analyst | Instrument | Dilution | QC Batch ID |
|-------|----------|-----------|----------------|---------|------------|----------|-------------|
| 1 | EPA-8082 | 09/06/17 | 09/07/17 11:06 | HKS | GC-15 | 0.984 | B[10400 |

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Reported: 09/07/2017 13:50
Project: Misc.
Project Number: Soquel - Maplethorpe - 2X716
Project Manager: Harrison Hucks

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

| | |
|----------------------------------|---|
| BCL Sample ID: 1724634-03 | Client Sample Name: SS-3 (A, B), 9/1/2017 12:00:00AM, Harrison Hucks |
|----------------------------------|---|

| Constituent | Result | Units | PQL | MDL | Method | MB Bias | Lab Quals | Run # |
|----------------------------------|--------|-------|----------------------|-------|-----------|---------|-----------|-------|
| 2-Methylphenol | ND | mg/kg | 1.0 | 0.086 | EPA-8270C | ND | A01 | 1 |
| 3- & 4-Methylphenol | ND | mg/kg | 2.0 | 0.34 | EPA-8270C | ND | A01 | 1 |
| 2-Fluorophenol (Surrogate) | 50.8 | % | 20 - 130 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| Phenol-d5 (Surrogate) | 52.0 | % | 30 - 130 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| Nitrobenzene-d5 (Surrogate) | 48.9 | % | 30 - 130 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| 2-Fluorobiphenyl (Surrogate) | 81.0 | % | 30 - 140 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| 2,4,6-Tribromophenol (Surrogate) | 36.3 | % | 20 - 150 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| p-Terphenyl-d14 (Surrogate) | 58.9 | % | 30 - 150 (LCL - UCL) | | EPA-8270C | | A01 | 1 |

| Run # | Method | Prep Date | Run Date/Time | Analyst | Instrument | Dilution | QC Batch ID |
|-------|-----------|-----------|----------------|---------|------------|----------|-------------|
| 1 | EPA-8270C | 09/05/17 | 09/06/17 15:24 | MK1 | MS-B2 | 9.437 | B[10309 |

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Reported: 09/07/2017 13:50
Project: Misc.
Project Number: Soquel - Maplethorpe - 2X716
Project Manager: Harrison Hucks

PCB Analysis (EPA Method 8082)

| BCL Sample ID: 1724634-04 | | Client Sample Name: SS-4 (A, B), 9/1/2017 12:00:00AM, Harrison Hucks | | | | | | | |
|--------------------------------|--------|--|----------------------|--------|----------|---------|-----------|-------|--|
| Constituent | Result | Units | PQL | MDL | Method | MB Bias | Lab Quals | Run # | |
| PCB-1016 | ND | mg/kg | 0.010 | 0.0039 | EPA-8082 | ND | | 1 | |
| PCB-1221 | ND | mg/kg | 0.010 | 0.0072 | EPA-8082 | ND | | 1 | |
| PCB-1232 | ND | mg/kg | 0.010 | 0.0074 | EPA-8082 | ND | | 1 | |
| PCB-1242 | ND | mg/kg | 0.010 | 0.0042 | EPA-8082 | ND | | 1 | |
| PCB-1248 | ND | mg/kg | 0.010 | 0.0070 | EPA-8082 | ND | | 1 | |
| PCB-1254 | ND | mg/kg | 0.010 | 0.0032 | EPA-8082 | ND | | 1 | |
| PCB-1260 | ND | mg/kg | 0.010 | 0.0029 | EPA-8082 | ND | | 1 | |
| Total PCB's (Summation) | ND | mg/kg | 0.010 | 0.0050 | EPA-8082 | ND | | 1 | |
| Decachlorobiphenyl (Surrogate) | 70.0 | % | 40 - 120 (LCL - UCL) | | EPA-8082 | | | 1 | |

| Run # | Method | Prep Date | Run Date/Time | Analyst | Instrument | Dilution | QC Batch ID |
|-------|----------|-----------|----------------|---------|------------|----------|-------------|
| 1 | EPA-8082 | 09/06/17 | 09/07/17 11:17 | HKS | GC-15 | 0.990 | B[10400 |

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Reported: 09/07/2017 13:50
Project: Misc.
Project Number: Soquel - Maplethorpe - 2X716
Project Manager: Harrison Hucks

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

| | |
|----------------------------------|---|
| BCL Sample ID: 1724634-04 | Client Sample Name: SS-4 (A, B), 9/1/2017 12:00:00AM, Harrison Hucks |
|----------------------------------|---|

| Constituent | Result | Units | PQL | MDL | Method | MB Bias | Lab Quals | Run # |
|----------------------------------|--------|-------|----------------------|-------|-----------|---------|-----------|-------|
| 2-Methylphenol | ND | mg/kg | 1.0 | 0.086 | EPA-8270C | ND | A01 | 1 |
| 3- & 4-Methylphenol | ND | mg/kg | 2.0 | 0.34 | EPA-8270C | ND | A01 | 1 |
| 2-Fluorophenol (Surrogate) | 43.5 | % | 20 - 130 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| Phenol-d5 (Surrogate) | 44.4 | % | 30 - 130 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| Nitrobenzene-d5 (Surrogate) | 43.5 | % | 30 - 130 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| 2-Fluorobiphenyl (Surrogate) | 72.4 | % | 30 - 140 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| 2,4,6-Tribromophenol (Surrogate) | 21.1 | % | 20 - 150 (LCL - UCL) | | EPA-8270C | | A01 | 1 |
| p-Terphenyl-d14 (Surrogate) | 51.8 | % | 30 - 150 (LCL - UCL) | | EPA-8270C | | A01 | 1 |

| Run # | Method | Prep Date | Run | | Analyst | Instrument | Dilution | QC |
|-------|-----------|-----------|-----------|-------|---------|------------|----------|----------|
| | | | Date/Time | | | | | Batch ID |
| 1 | EPA-8270C | 09/05/17 | 09/06/17 | 15:50 | MK1 | MS-B2 | 9.375 | B[10309 |

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Reported: 09/07/2017 13:50
Project: Misc.
Project Number: Soquel - Maplethorpe - 2X716
Project Manager: Harrison Hucks

PCB Analysis (EPA Method 8082)

Quality Control Report - Method Blank Analysis

| Constituent | QC Sample ID | MB Result | Units | PQL | MDL | Lab Quals |
|---------------------------------------|---------------------|-------------|----------|-------|-----------------------------|-----------|
| QC Batch ID: B[10400 | | | | | | |
| PCB-1016 | B[10400-BLK1 | ND | mg/kg | 0.010 | 0.0039 | |
| PCB-1221 | B[10400-BLK1 | ND | mg/kg | 0.010 | 0.0072 | |
| PCB-1232 | B[10400-BLK1 | ND | mg/kg | 0.010 | 0.0074 | |
| PCB-1242 | B[10400-BLK1 | ND | mg/kg | 0.010 | 0.0042 | |
| PCB-1248 | B[10400-BLK1 | ND | mg/kg | 0.010 | 0.0070 | |
| PCB-1254 | B[10400-BLK1 | ND | mg/kg | 0.010 | 0.0032 | |
| PCB-1260 | B[10400-BLK1 | ND | mg/kg | 0.010 | 0.0029 | |
| Total PCB's (Summation) | B[10400-BLK1 | ND | mg/kg | 0.010 | 0.0050 | |
| Decachlorobiphenyl (Surrogate) | B[10400-BLK1 | 80.0 | % | | 40 - 120 (LCL - UCL) | |

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Weber, Hayes & Associates
120 Westgate Drive
Watsonville, CA 95076

Reported: 09/07/2017 13:50
Project: Misc.
Project Number: Soquel - Maplethorpe - 2X716
Project Manager: Harrison Hucks

PCB Analysis (EPA Method 8082)

Quality Control Report - Laboratory Control Sample

| Constituent | QC Sample ID | Type | Result | Spike Level | Units | Percent Recovery | RPD | Control Limits | | Lab |
|--------------------------------|--------------|------|----------|-------------|-------|------------------|-----|------------------|-----|-----|
| | | | | | | | | Percent Recovery | RPD | |
| QC Batch ID: B[0400 | | | | | | | | | | |
| PCB-1016 | B[0400-BS1 | LCS | 0.062290 | 0.084175 | mg/kg | 74.0 | | 60 - 120 | | |
| PCB-1260 | B[0400-BS1 | LCS | 0.062626 | 0.084175 | mg/kg | 74.4 | | 60 - 120 | | |
| Decachlorobiphenyl (Surrogate) | B[0400-BS1 | LCS | 0.010774 | 0.020202 | mg/kg | 53.3 | | 40 - 120 | | |

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Reported: 09/07/2017 13:50
Project: Misc.
Project Number: Soquel - Maplethorpe - 2X716
Project Manager: Harrison Hucks

PCB Analysis (EPA Method 8082)

Quality Control Report - Precision & Accuracy

| Constituent | Type | Source Sample ID | Source Result | Result | Spike Added | Units | RPD | Percent Recovery | | Lab |
|--------------------------------|------|-----------------------|---------------|----------|-------------|-------|------|------------------|------------------|----------|
| | | | | | | | | RPD | Percent Recovery | |
| QC Batch ID: B[0400 | | Used client sample: N | | | | | | | | |
| PCB-1016 | MS | 1722106-11 | ND | 0.064026 | 0.082508 | mg/kg | | 77.6 | | 60 - 120 |
| | MSD | 1722106-11 | ND | 0.070164 | 0.081967 | mg/kg | 9.1 | 85.6 | 30 | 60 - 120 |
| PCB-1260 | MS | 1722106-11 | ND | 0.064356 | 0.082508 | mg/kg | | 78.0 | | 60 - 120 |
| | MSD | 1722106-11 | ND | 0.071475 | 0.081967 | mg/kg | 10.5 | 87.2 | 30 | 60 - 120 |
| Decachlorobiphenyl (Surrogate) | MS | 1722106-11 | ND | 0.011551 | 0.019802 | mg/kg | | 58.3 | | 40 - 120 |
| | MSD | 1722106-11 | ND | 0.015410 | 0.019672 | mg/kg | 28.6 | 78.3 | | 40 - 120 |

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120 Westgate Drive
Watsonville, CA 95076

Reported: 09/07/2017 13:50
Project: Misc.
Project Number: Soquel - Maplethorpe - 2X716
Project Manager: Harrison Hucks

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

Quality Control Report - Method Blank Analysis

| Constituent | QC Sample ID | MB Result | Units | PQL | MDL | Lab Quals |
|---|---------------------|-------------|----------|-----------------------------|--------|-----------|
| QC Batch ID: B[10309] | | | | | | |
| 2-Methylphenol | B[10309-BLK1 | ND | mg/kg | 0.10 | 0.0086 | |
| 3- & 4-Methylphenol | B[10309-BLK1 | ND | mg/kg | 0.20 | 0.034 | |
| 2-Fluorophenol (Surrogate) | B[10309-BLK1 | 54.4 | % | 20 - 130 (LCL - UCL) | | |
| Phenol-d5 (Surrogate) | B[10309-BLK1 | 61.2 | % | 30 - 130 (LCL - UCL) | | |
| Nitrobenzene-d5 (Surrogate) | B[10309-BLK1 | 56.0 | % | 30 - 130 (LCL - UCL) | | |
| 2-Fluorobiphenyl (Surrogate) | B[10309-BLK1 | 94.1 | % | 30 - 140 (LCL - UCL) | | |
| 2,4,6-Tribromophenol (Surrogate) | B[10309-BLK1 | 51.5 | % | 20 - 150 (LCL - UCL) | | |
| p-Terphenyl-d14 (Surrogate) | B[10309-BLK1 | 60.2 | % | 30 - 150 (LCL - UCL) | | |

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120 Westgate Drive
Watsonville, CA 95076

Reported: 09/07/2017 13:50
Project: Misc.
Project Number: Soquel - Maplethorpe - 2X716
Project Manager: Harrison Hucks

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

Quality Control Report - Laboratory Control Sample

| Constituent | QC Sample ID | Type | Result | Spike Level | Units | Percent Recovery | RPD | Control Limits | | Lab |
|----------------------------------|--------------|------|---------|-------------|-------|------------------|-----|------------------|-----|-----|
| | | | | | | | | Percent Recovery | RPD | |
| QC Batch ID: B[0309 | | | | | | | | | | |
| 2-Methylphenol | B[0309-BS1 | LCS | 1.1608 | 1.6835 | mg/kg | 69.0 | | 50 | 130 | |
| 3- & 4-Methylphenol | B[0309-BS1 | LCS | 2.3824 | 3.3670 | mg/kg | 70.8 | | 50 | 130 | |
| 2-Fluorophenol (Surrogate) | B[0309-BS1 | LCS | 0.68707 | 1.3468 | mg/kg | 51.0 | | 20 | 130 | |
| Phenol-d5 (Surrogate) | B[0309-BS1 | LCS | 0.75200 | 1.3468 | mg/kg | 55.8 | | 30 | 130 | |
| Nitrobenzene-d5 (Surrogate) | B[0309-BS1 | LCS | 0.66084 | 1.3468 | mg/kg | 49.1 | | 30 | 130 | |
| 2-Fluorobiphenyl (Surrogate) | B[0309-BS1 | LCS | 1.0715 | 1.3468 | mg/kg | 79.6 | | 30 | 140 | |
| 2,4,6-Tribromophenol (Surrogate) | B[0309-BS1 | LCS | 0.68803 | 1.3468 | mg/kg | 51.1 | | 20 | 150 | |
| p-Terphenyl-d14 (Surrogate) | B[0309-BS1 | LCS | 0.41710 | 0.67340 | mg/kg | 61.9 | | 30 | 150 | |

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120 Westgate Drive
Watsonville, CA 95076

Reported: 09/07/2017 13:50
Project: Misc.
Project Number: Soquel - Maplethorpe - 2X716
Project Manager: Harrison Hucks

Base Neutral and Acid Extractables Organic Analysis (EPA Method 8270C)

Quality Control Report - Precision & Accuracy

| Constituent | Type | Source Sample ID | Source Result | Result | Spike Added | Units | RPD | Control Limits | | Lab |
|----------------------------------|------|-----------------------|---------------|---------|-------------|-------|-----|------------------|-----|----------|
| | | | | | | | | Percent Recovery | RPD | |
| QC Batch ID: BJI0309 | | Used client sample: N | | | | | | | | |
| 2-Methylphenol | MS | 1722106-96 | ND | 1.2026 | 1.6667 | mg/kg | | 72.2 | | 50 - 130 |
| | MSD | 1722106-96 | ND | 1.2219 | 1.6722 | mg/kg | 1.6 | 73.1 | 30 | 50 - 130 |
| 3- & 4-Methylphenol | MS | 1722106-96 | ND | 2.3920 | 3.3333 | mg/kg | | 71.8 | | 50 - 130 |
| | MSD | 1722106-96 | ND | 2.4107 | 3.3445 | mg/kg | 0.8 | 72.1 | 30 | 50 - 130 |
| 2-Fluorophenol (Surrogate) | MS | 1722106-96 | ND | 0.72192 | 1.3333 | mg/kg | | 54.1 | | 20 - 130 |
| | MSD | 1722106-96 | ND | 0.70993 | 1.3378 | mg/kg | 1.7 | 53.1 | | 20 - 130 |
| Phenol-d5 (Surrogate) | MS | 1722106-96 | ND | 0.80288 | 1.3333 | mg/kg | | 60.2 | | 30 - 130 |
| | MSD | 1722106-96 | ND | 0.77417 | 1.3378 | mg/kg | 3.6 | 57.9 | | 30 - 130 |
| Nitrobenzene-d5 (Surrogate) | MS | 1722106-96 | ND | 0.67488 | 1.3333 | mg/kg | | 50.6 | | 30 - 130 |
| | MSD | 1722106-96 | ND | 0.65978 | 1.3378 | mg/kg | 2.3 | 49.3 | | 30 - 130 |
| 2-Fluorobiphenyl (Surrogate) | MS | 1722106-96 | ND | 1.0902 | 1.3333 | mg/kg | | 81.8 | | 30 - 140 |
| | MSD | 1722106-96 | ND | 1.0711 | 1.3378 | mg/kg | 1.8 | 80.1 | | 30 - 140 |
| 2,4,6-Tribromophenol (Surrogate) | MS | 1722106-96 | ND | 0.73696 | 1.3333 | mg/kg | | 55.3 | | 20 - 150 |
| | MSD | 1722106-96 | ND | 0.69714 | 1.3378 | mg/kg | 5.6 | 52.1 | | 20 - 150 |
| p-Terphenyl-d14 (Surrogate) | MS | 1722106-96 | ND | 0.39584 | 0.66667 | mg/kg | | 59.4 | | 30 - 150 |
| | MSD | 1722106-96 | ND | 0.35922 | 0.66890 | mg/kg | 9.7 | 53.7 | | 30 - 150 |

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Weber, Hayes & Associates
120 Westgate Drive
Watsonville, CA 95076

Reported: 09/07/2017 13:50
Project: Misc.
Project Number: Soquel - Maplethorpe - 2X716
Project Manager: Harrison Hucks

Notes And Definitions

- MDL Method Detection Limit
- ND Analyte Not Detected
- PQL Practical Quantitation Limit
- A01 Detection and quantitation limits are raised due to sample dilution.

APPENDIX C

-

***Historical Aerials
(1943 to present)***



Maplethorpe

3300 Maplethorpe Lane

Soquel, CA 95073

Inquiry Number: 5038281.1

August 31, 2017

The EDR Aerial Photo Decade Package



6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Site Name:

Maplethorpe
 3300 Maplethorpe Lane
 Soquel, CA 95073
 EDR Inquiry # 5038281.1

Client Name:

Weber, Hayes, & Associates
 120 Westgate Drive
 Watsonville, CA 95076
 Contact: Harrison Hucks



Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

| <u>Year</u> | <u>Scale</u> | <u>Details</u> | <u>Source</u> |
|-------------|--------------|---------------------------------|---------------|
| 2012 | 1"=500' | Flight Year: 2012 | USDA/NAIP |
| 2010 | 1"=500' | Flight Year: 2010 | USDA/NAIP |
| 2009 | 1"=500' | Flight Year: 2009 | USDA/NAIP |
| 2005 | 1"=500' | Flight Year: 2005 | USDA/NAIP |
| 1993 | 1"=500' | Acquisition Date: June 14, 1993 | USGS/DOQQ |
| 1982 | 1"=500' | Flight Date: July 05, 1982 | USGS |
| 1974 | 1"=500' | Flight Date: June 07, 1974 | USGS |
| 1968 | 1"=500' | Flight Date: June 14, 1968 | USGS |
| 1956 | 1"=500' | Flight Date: June 02, 1956 | USDA |
| 1948 | 1"=500' | Flight Date: May 14, 1948 | USFS |
| 1943 | 1"=500' | Flight Date: October 05, 1943 | USDA |

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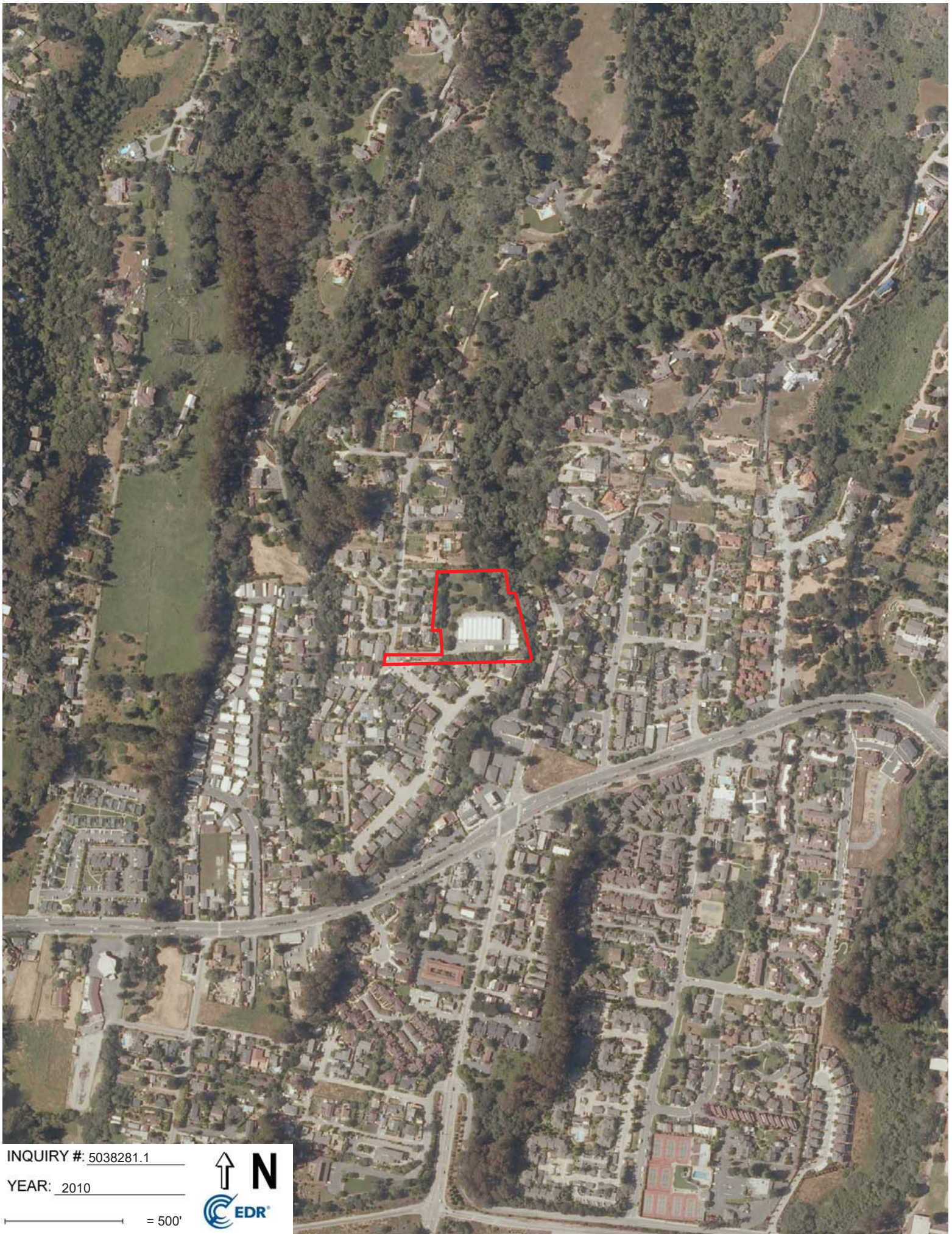


INQUIRY #: 5038281.1

YEAR: 2012

— = 500'





INQUIRY #: 5038281.1

YEAR: 2010

— = 500'





INQUIRY #: 5038281.1

YEAR: 2009

— = 500'





INQUIRY #: 5038281.1

YEAR: 2005

— = 500'





INQUIRY #: 5038281.1

YEAR: 1993

— = 500'





INQUIRY #: 5038281.1

YEAR: 1982

— = 500'





INQUIRY #: 5038281.1

YEAR: 1974

— = 500'





INQUIRY #: 5038281.1

YEAR: 1968

— = 500'





INQUIRY #: 5038281.1

YEAR: 1956

— = 500'





INQUIRY #: 5038281.1

YEAR: 1948

— = 500'





INQUIRY #: 5038281.1

YEAR: 1943

— = 500'



**Initial Study
Attachment 10**

Storm Water Control Plan

***Maplethorpe Subdivision
Application Number 181586
3300 Maplethorpe Lane Soquel, CA
APN 037-121-60***

Client:

John Swift Consulting Services, Inc.
500 Chestnut Street, Suite 100
Santa Cruz, CA 95060

January 25, 2019

By:

C2G / Civil Consultants Group, Inc.
4444 Scotts Valley Drive, Suite 6
Scotts Valley, CA 95066
(831) 438-4420

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LIST OF ATTACHMENTS

Attachment A

- Project Site Soil Map
- Project Site Soil Data Sheets
- Percolation Test Report

Attachment B

- Santa Cruz County Rainfall Intensity – Duration Curve Chart

Attachment C

- Exhibit EXH-1
- Exhibit EXH-2
- C8.3 - Details

Attachment D

- SWM-17 Spreadsheets
- SWM-24 Spreadsheets
- Restrictor Calculation Spreadsheets

Attachment E

- Todd Creamer’s Resume

Attachment F

- Sample Maintenance Checklist

PROJECT SUMMARY

INTRODUCTION

The project is located at 3300 Maplethorpe Lane in Soquel, CA. Proposed improvements include removal of the existing greenhouses with associated structures and hardscape, subdivision of the lot into eleven (11) lots with associated roads and other public areas, and installation of access and drainage improvements.

Various aspects of the site and the proposed development were considered in the design of the Stormwater Best Management Practices (BMPs). The site area is 3.208-ac, and the proposed impervious improvements on this project total 0.844 acres, making the project a Large Project as defined in the Santa Cruz County Design Criteria (Criteria). The following Stormwater Control Plan (SWCP) will address the various aspects of the site and design of the project, as well as runoff mitigation efforts.

The nature of the site and difference between existing and proposed improvements prevent replication of the existing drainage patterns, so a runoff mitigation system has been designed, including pervious pavers, underground storage chambers, runoff rate restriction structures, and connections to existing facilities designed in accordance with the Criteria.

NARRATIVE DESCRIPTION

The proposed development is comprised of removal of the existing improvements, followed by construction of road, water, drainage, and pedestrian walkway improvements intended to provide access and utility service to each of the proposed eleven (11) single family homes. All roofs, asphaltic concrete (AC) and Portland cement concrete (concrete) improvements are considered essentially impervious.

The project is designed to provide capture of the majority of common pollutants by directing runoff from impervious surfaces into the underground chambers or pervious paving section, each of which is designed to provide treatment by infiltration in place. Such pollutants consist of oils from existing and proposed AC as well as any material eroded from roofing treatments or concrete surfaces. Site design measures used to minimize potential for stormwater pollution include minimizing impervious areas, in particular parking areas; clustering structures and pavement, and provision of landscaped areas. The remaining potential sources of pollution include pavement and vehicle parking areas (potential for leaks, cleaning compounds, etc.), offsite run-on areas (misc. pollutants), landscaped areas (potential for fertilizers, pesticides, etc.).

VICINITY MAP

3300 Maplethorpe Lane Soquel, CA; see Figure 1, below.



FIGURE 1: VICINITY MAP

SUMMARY OF PROJECT INFORMATION

| | |
|--|----------------------------------|
| Project Name | Maplethorpe Subdivision |
| Application Number | 181586 |
| Project Location | 3300 Maplethorpe Lane Soquel, CA |
| Address and/or Assessor's Parcel Number(s) | 037-121-60 |
| Name of Applicant | John Swift Consulting, Inc. |
| Project Phase Number | N/A |
| Project Type | Residential Subdivision |

SITE PHYSICAL CHARACTERISTICS

SOIL CLASSIFICATION

The soil at the site consists primarily of Tierra-Watsonville Complex (Soil Type 175), with small areas of Watsonville Loam (Soil Type 177 and 179) per NCS Web Soil Survey Website. These three soil types are poorly drained, with average infiltration rates ranging from 0.00 in/hr to 0.06 in/hr. See the site location on the map shown in Figure 2, below, and NRCS Soils Data in Attachment A.



FIGURE 2: SOILS MAP

Becky Dees of Dees and Associates provided geotechnical analysis of the site. Their investigation found that the soils in the uppermost 5-feet of the soil profile and the range from 9-feet below grade to 15-feet below grade reflect the NRCS data, having an infiltration rate of effectively 0.00 in/hr. The soils between 5-feet below grade and 9-feet below grade, however, were shown to provide an infiltration rate of 1.75 in/hr. The percolation test results are presented in Attachment A. Runoff mitigation features proposed for the site are designed to take advantage of this more receptive soil strata.

RAINFALL INTENSITY

The mean annual precipitation at the site is approximately 32.5 inches. See Figure 3, below.

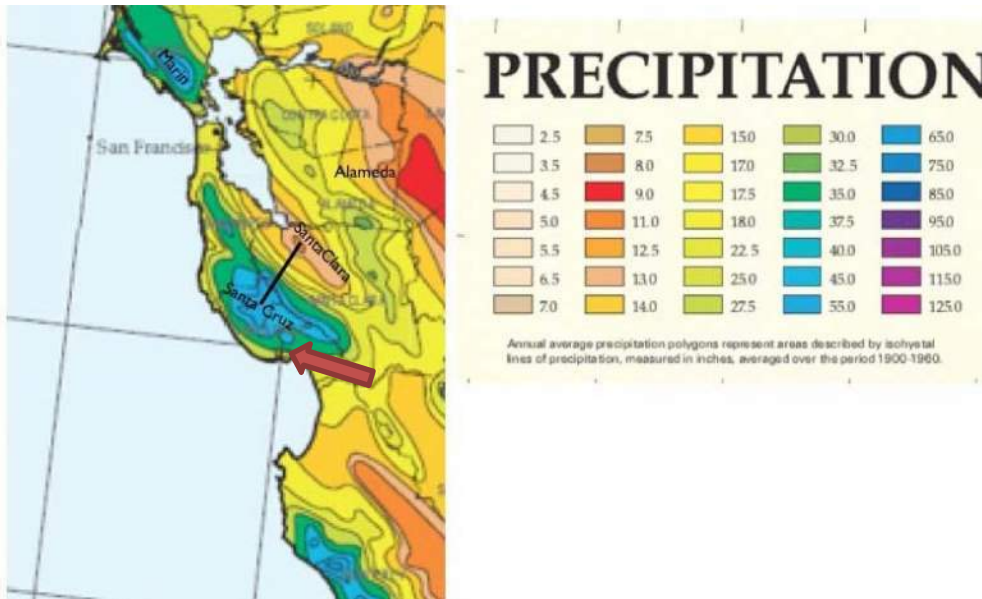


FIGURE 3: MEAN ANNUAL PRECIPITATION MAP

The P60 Isopleth value has been determined to be approximately 1.5 by linear interpolation. See Figure 4, below.

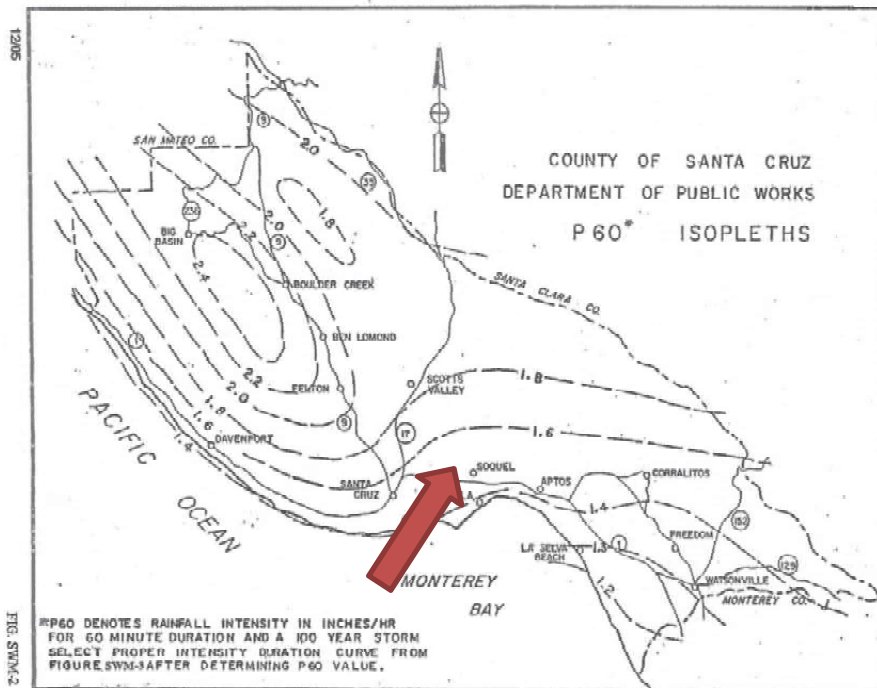


FIGURE 4: SANTA CRUZ COUNTY P-60 ISOPLETH MAP

Applying the P60 Isopleth value, the rainfall intensities have been determined using the Santa Cruz County Rainfall Intensity – Duration Curve Chart (See Attachment B). Refer to the table below for calculated intensities for various return periods:

| | 10 Yr. Return | | Multiplier | | Intensity |
|-------|---------------|---|------------|---|-----------|
| 2-yr | 2.00 | x | 0.64 | = | 1.3 in/hr |
| 5-yr | 2.00 | x | 0.85 | = | 1.7 in/hr |
| 10-yr | 2.00 | x | 1.00 | = | 2.0 in/hr |
| 25-yr | 2.00 | x | 1.20 | = | 2.4 in/hr |

DESIGN INFORMATION

MITIGATION REQUIREMENTS

Based on Part 3, Section C of the Santa Cruz County Design Criteria, this project is considered a “Large Project” because it adds and/or replaces more than 5,000 square feet of impervious area. Incorporation of BMPs has been provided to reduce pollutant and hydraulic impacts. Such measures include Underground Storage & Infiltration, Biofiltration Treatment Systems and Pervious Pavement. This project proposes both Pervious Pavers and Underground Storage & Infiltration.

EXISTING CONDITION DRAINAGE PATTERNS AND TRIBUTARY AREAS

Existing conditions on the site result in runoff following one of two routes. The area drained via each route is considered to be a drainage management area (DMA). These DMAs are depicted on EXH-1, provided in Attachment C.

The majority of the site is identified as DMA/Route 1 and drains to an existing 15-inch corrugated plastic pipe (CPP) culvert located at the southeast corner of the site. This CPP culvert conveys runoff into the adjacent ravine where it is released to join upslope runoff. The runoff enters the Public stormwater control system at this point.

The remainder of the site is identified as DMA/Route 2 and drains into the existing surface drainage system on Maplethorpe Lane and Colleen Way. This system includes curb and gutter and concrete valley gutter facilities. The runoff from this system is released into the Public system where it enters Maplethorpe Lane.

PROPOSED CONDITION DRAINAGE PATTERNS AND TRIBUTARY AREAS

Proposed conditions on the site mimic, to the greatest degree possible, existing conditions as described above. This results in runoff following one of the two routes described above. The area drained via each route varies slightly from existing conditions, and is identified as a DMA. These DMAs are depicted on EXH-2, provided in Attachment C.

Proposed condition DMA/Route 1 collects runoff from impervious surfaces and routes it to an underground storage chamber system sized according to the requirements of SWM 17 and SWM 24 to provide both retention and detention in conformance with the Criteria. The underground storage chamber system is provided with an outlet/restrictor structure and 15-inch High Density Polyethylene (HDPE) pipe which conveys restricted runoff flow into the 15-inch CPP culvert at the southeast corner of the site.

The remainder of the site is identified as DMA/Route 2 and drains to the pervious paver section located along the access road as close to the intersection of Maplethorpe Lane as is feasible and identified as parallel parking. The pervious pavers are provided with storage in the rock section below the pavers as required to meet the storage requirements determined using SWM 17 and SWM 24. The paver system is provided with an outlet/restrictor structure and bubbler to release runoff into the Public system on Maplethorpe Lane.

Analysis of downstream impacts for both routes is presented in the Downstream Impact Analysis, Dated January 25, 2019.

SCM DESCRIPTIONS

DMA/ROUTE 1

The Stormwater Control Measure (SCM) provided for DMA/Route 1 is an underground chamber system consisting of 12 Prinsco HS 180 chambers arranged in 3 rows of 4 chambers each. Each row of chambers is provided with end caps, chambers are separated by 6-inches of $\frac{3}{4}$ " drain rock. The system includes a 12-inch thick blanket of $\frac{3}{4}$ -inch drain rock above the chambers and a 12-inch blanket of $\frac{3}{4}$ -inch drain rock below the chamber invert. These rock blankets provide a pathway for runoff to move between chamber rows, resulting in consistent water levels across the system. The chamber invert is 172.33-feet, and the bottom of the excavation/bottom of rock is 171.33-feet. The system provides approximately 2,784-cubic feet (cf) of storage, exceeding the requirements of 1,357-cf retention volume and 1,418-cf detention volume.

The SCM includes a restrictor/overflow structure contained within a Christy U-43 drop inlet. The restrictor consists of an 8-inch HDPE tee fitted with a cap, an overflow inlet, and an outlet which allows treated and detained runoff to be released through a 15-inch HDPE pipe into the existing CPP culvert at the southeast corner of the site, matching the existing condition for DMA/Route 1. The restrictor itself is a 2.33-inch hole drilled into a 15-inch HDPE end cap installed on the end of the 15-inch HDPE pipe providing an outlet from the U-21 inlet structure. Overflow/bypass is provided by a 15-inch HDPE 90-degree bend leaving the U-21 at an invert elevation of 176.95, which conveys overflow runoff into the 15-inch HDPE pipe downstream of the restrictor orifice. See Detail 3 on sheet C8.3 - Details in Attachment C for a cross sectional view of the restrictor structure.

DMA/ROUTE 2

The Stormwater Control Measure (SCM) provided for DMA/Route 2 consists of 890-square feet (sf) of pervious pavers, placed over a rock storage section and equipped with a restrictor/outlet structure. The rock section consists of 26-inches of permeable material. The section includes the pavers, separated horizontally by #8 aggregate, a 2-inch thick bedding layer composed of #8 aggregate, a base layer composed of 4-inches of #57 stone, and a subbase layer composed of 20-inches of #2 stone. A 4-inch diameter perforated pipe is provided to collect and convey runoff from the rock section to the restrictor/overflow structure. The perforated pipe invert is set at an elevation of 175.83-feet, separating the retention volume below from the detention volume above the invert of the perf pipe.

This rock section provides approximately 450-cf of storage, conforming to the required 119-cf retention and 330-cf detention requirements. The provided volumes are determined based on the volume of the excavation and a rock void ratio of 0.40 for all three aggregate types. Storage volumes were determined using SWM 17 and SWM 24, see Attachment D. See Detail 5 on sheet C8.3 - Details in Attachment C for a cross sectional view of the restrictor structure

The SCM includes a restrictor/overflow structure contained within a Christy U-21 drop inlet. The restrictor consists of an 8-inch HDPE tee fitted with a cap, an overflow inlet, and an outlet which allows treated and detained runoff to be released through an 8-inch HDPE pipe to a Christy V-64 drop inlet which acts as a bubbler to release runoff into the surface drainage system on Maplethorpe Lane, mimicking existing conditions. The restrictor itself is a 1.5-inch hole drilled in to the 6-inch 90-degree bend installed on the horizontal end of the 6-inch outlet pipe inside the structure. The vertical leg of the bend is left open to allow safe overflow/bypass for higher storm events. See Detail 6 on sheet C8.3 - Details in Attachment C for a cross sectional view of the restrictor structure.

Note that pervious pavers are also used elsewhere on the project, specifically in areas designated for perpendicular parking stalls. The section below these additional pavers does not conform to the

specified detail, so these additional pervious pavers are in addition to the treatment and storage facility described above and are not considered in this analysis. See Detail 4 on sheet C8.3 - Details in Attachment C for a cross sectional view of the restrictor structure

SCM SIZING

The hydraulic conductivity range of the soils at the site was identified as being between 0.00 and 0.06 in/hr by NRCS. The geotechnical report and percolation test by Dees and Associates found that the soils underlying the site between 5-feet and 9-feet below grade provide a much higher infiltration rate, found to be 1.75 in/hr. The percolation test report is provided in Attachment A. For spreadsheets SWM-17 and SWM-24, the infiltration rate of 1.75 in/hr determined by site investigation was used. The SWM-17 and SWM-24 spreadsheets are included in Attachment D.

Retention and Detention volumes were calculated for each DMA/Route using spreadsheets SWM-17 and SWM-24 provided by the County of Santa Cruz. The pre-development runoff coefficient (C) used was 0.25, per SWM1. Post-development C=0.90 for all impervious areas. Note that these C values provide a very conservative analysis of the actual change in runoff from the site and storage volumes required to maintain such, as large portions of the site are, pre-project, impervious.

DMA/Route 1 requires 1,357-cf retention volume and 1,418-cf detention volume, a total of 2,775-cf, which is provided by the underground chamber system. The system provides 2,784-cf of storage. The pre-development runoff release rate is 0.081-cfs (SWM 24), requiring a restrictor diameter of 1.25-inches to release post-development runoff at a rate of 0.08-cfs.

DMA/Route 2 requires 119-cf retention volume and 330-cf detention volume, a total of 449-cf, which is provided by the rock section underlying the pervious pavers. The section provides 450-cf of storage. The pre-development runoff release rate is 0.019-cfs (SWM 24), requiring a restrictor diameter of 1.5-inches to release post-development runoff at a rate of 0.06-cfs, less than the existing rate of 0.07-cfs.

DESIGN ENGINEER QUALIFICATIONS

The design of bioretention areas was done under the supervision of Todd Creamer, PE. His qualifications include California Civil Engineer Registration (RCE 64561), California Qualified Storm Water Pollution Prevention Plan (SWPPP) Practitioner/Developer (CA QSP/QSD 00439) and National Certified Erosion and Sediment Control (CESC 2752). See Todd Creamer's resume in Attachment E.

ROUTINE SCM MAINTENANCE AND INSPECTIONS

Monthly inspections for DMA/Route 1 during the rainy season by the maintenance crew will include checking the stormwater intermediaries such as downspouts and drop inlets for damage, debris, obstruction to flow, and sedimentation. The inlet to the underground storage chamber system and the outlet/restrictor structure should be checked for damage, obstructions, debris, or sedimentation. Any discrepancies found should be corrected immediately.

Monthly inspections for DMA/Route 2 during the rainy season by the maintenance crew will include checking the pervious pavers for dislodged or damaged pavers, missing interstitial gravel, and obstructions/debris. All stormwater intermediaries such as downspouts and drop inlets should be checked for damage, debris, obstruction to flow, and sedimentation. Any discrepancies found should be corrected immediately.

The schedule of routine SCM maintenance and inspections shall be bimonthly with additional inspections and/or maintenance as required. Regular maintenance of the underground chamber system is limited to inspection, cleaning, and any necessary repairs to the inlet and outlet structures. Regular maintenance of the pervious pavers in DMA/Route 2 includes clearing of any debris or sediment which may have collected and is obstructing flow, replacement of any damaged pavers, and resetting of any dislodged pavers.

If the results of an inspection show a need for additional maintenance for one or more SCMs, the inspector shall notify the owner and provide a detailed list of the work to be done. See Attachment F for a sample maintenance checklist.

PERIODIC SCM MAINTENANCE AND INSPECTIONS

Each SCM will be inspected twice a year to ensure it is operating to designed specifications and per industry standards for the landscape BMPs. Semi-Annual inspections will conform to the same requirements as the monthly inspections and will be reviewed by a civil engineer registered in the state of California. The inspector or reviewing engineer may direct other inspections and/or maintenance to occur based on the findings. Annual reports will be submitted to the County as required and will include information generated during the Semi-Annual inspections.

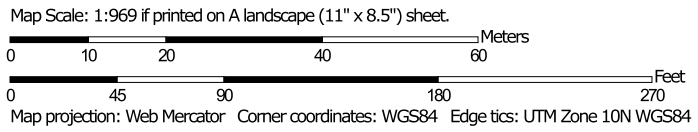
ATTACHMENT "A"

- *Project Site Soil Map*
- *Project Site Soil Data*
- *Percolation Test*

Soil Map—Santa Cruz County, California




Soil Map may not be valid at this scale.





MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Santa Cruz County, California

Survey Area Data: Version 12, Sep 12, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|------------------------------------|---|--------------|----------------|
| 175 | Tierra-Watsonville complex, 30 to 50 percent slopes | 0.1 | 7.2% |
| 177 | Watsonville loam, 2 to 15 percent slopes | 1.7 | 91.1% |
| 179 | Watsonville loam, thick surface, 2 to 15 percent slopes | 0.0 | 1.8% |
| Totals for Area of Interest | | 1.9 | 100.0% |

Santa Cruz County, California

175—Tierra-Watsonville complex, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: h9g3
Elevation: 20 to 1,200 feet
Mean annual precipitation: 14 to 28 inches
Mean annual air temperature: 57 to 59 degrees F
Frost-free period: 245 to 275 days
Farmland classification: Not prime farmland

Map Unit Composition

Tierra and similar soils: 50 percent
Watsonville and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tierra

Setting

Landform: Fan terraces, marine terraces
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 66 inches: clay, clay loam, sandy clay
H2 - 14 to 66 inches:
H2 - 14 to 66 inches:

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: About 14 inches to abrupt textural change
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: CLAYPAN (R015XD115CA)

Hydric soil rating: No

Description of Watsonville

Setting

Landform: Marine terraces, fan terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 18 inches: loam
H2 - 18 to 39 inches: clay, clay loam
H2 - 18 to 39 inches: sandy clay loam, clay loam
H3 - 39 to 63 inches:
H3 - 39 to 63 inches:

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: About 18 inches to abrupt textural change
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: CLAYPAN (R014XD089CA)
Hydric soil rating: Yes

Minor Components

Elkhorn, sandy loam

Percent of map unit: 5 percent
Hydric soil rating: No

Los osos, loam

Percent of map unit: 4 percent
Hydric soil rating: No

Baywood

Percent of map unit: 2 percent
Hydric soil rating: No

Diablo, clay

Percent of map unit: 2 percent

Hydric soil rating: No

Pfeiffer, gravelly sandy loam

Percent of map unit: 1 percent

Hydric soil rating: No

Tierra

Percent of map unit: 1 percent

Hydric soil rating: No

Data Source Information

Soil Survey Area: Santa Cruz County, California

Survey Area Data: Version 12, Sep 12, 2018

Santa Cruz County, California

177—Watsonville loam, 2 to 15 percent slopes

Map Unit Setting

National map unit symbol: h9g5

Elevation: 20 to 1,200 feet

Mean annual precipitation: 28 inches

Mean annual air temperature: 57 degrees F

Frost-free period: 245 to 275 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Watsonville and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Watsonville

Setting

Landform: Marine terraces

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

H1 - 0 to 18 inches: loam

H2 - 18 to 39 inches: clay, clay loam

H2 - 18 to 39 inches: sandy clay loam, clay loam

H3 - 39 to 63 inches:

H3 - 39 to 63 inches:

Properties and qualities

Slope: 2 to 15 percent

Depth to restrictive feature: About 18 inches to abrupt textural change

Natural drainage class: Somewhat poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: D
Ecological site: CLAYPAN (R014XD089CA)
Hydric soil rating: Yes

Minor Components

Elkhorn, sandy loam

Percent of map unit: 5 percent
Hydric soil rating: No

Pinto, loam

Percent of map unit: 4 percent
Hydric soil rating: No

Watsonville, thick surface

Percent of map unit: 3 percent
Landform: Marine terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Hydric soil rating: Yes

Cropley, silty clay

Percent of map unit: 1 percent
Hydric soil rating: No

Danville

Percent of map unit: 1 percent
Hydric soil rating: No

Elder

Percent of map unit: 1 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Santa Cruz County, California
Survey Area Data: Version 12, Sep 12, 2018

Santa Cruz County, California

179—Watsonville loam, thick surface, 2 to 15 percent slopes

Map Unit Setting

National map unit symbol: h9g7

Elevation: 20 to 1,200 feet

Mean annual precipitation: 28 inches

Mean annual air temperature: 57 degrees F

Frost-free period: 245 to 275 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Watsonville and similar soils: 85 percent

Minor components: 13 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Watsonville

Setting

Landform: Marine terraces

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

H1 - 0 to 18 inches: loam

H2 - 18 to 39 inches: clay, clay loam

H2 - 18 to 39 inches: sandy clay loam, clay loam

H3 - 39 to 63 inches:

H3 - 39 to 63 inches:

Properties and qualities

Slope: 2 to 15 percent

Depth to restrictive feature: About 18 inches to abrupt textural change

Natural drainage class: Somewhat poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: D
Hydric soil rating: Yes

Minor Components

Danville, loam

Percent of map unit: 5 percent
Hydric soil rating: No

Elder, sandy loam

Percent of map unit: 4 percent
Hydric soil rating: No

Elkhorn, sandy loam

Percent of map unit: 2 percent
Hydric soil rating: No

Pinto, loam

Percent of map unit: 2 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Santa Cruz County, California
Survey Area Data: Version 12, Sep 12, 2018



Dees & Associates, Inc.
Geotechnical Engineers

501 Mission Street, Suite 8A Santa Cruz, CA 95060

Phone (831) 427-1770 Fax (831) 427-1794

December 13, 2017
Revised December 11, 2018

Project No. SCR-1183

JOHN SWIFT
500 Chestnut Street, Suite 100
Santa Cruz, California 95060

Subject: Percolation Test Results

Reference: 3300 Maplethorpe Lane, Soquel
APN 037-121-60
Santa Cruz County, California

Dear Mr. Swift:

This report presents a summary of our percolation test results at the referenced site. The purpose of our percolation testing was to determine the soils permeability for use in on-site storm water retention design.

Our scope of work included installation of three (3) percolation test borings drilled 4.5 feet, 9 feet and 15 feet in depth; percolation testing; engineering analysis and preparation of this report. The attached Boring Site Plan, Figure 1, depicts the location of the percolation testing.

The borings were drilled with 6-inch diameter continuous flight auger equipment. Upon removal of the soil from the borings, 2 to 8 inches of pre-washed pea gravel was placed at the bottom. The test holes were fitted with 4-inch diameter, perforated, PVC pipe and the annuli were packed with pre-washed pea gravel. Then the percolation holes were pre-saturated with water twenty-four hours prior to testing.

The percolation tests were performed so that we tested the soil zones between 1 and 4 feet, 6 and 9.5 feet, and 10 to 15 feet. Water was added to the hole at the start of the test then measured at 30 minute time intervals for a period of 4 hours. Water was added after each reading, as needed during the test, to maintain the water level in the zone of interest.

Our test results indicated the soils above 5 feet and between 9 and 15 feet have a percolation rate of zero. The soils between 6 and 9 feet have a percolation rate of 1.75 inches per hour. This value may be multiplied by the wetted surface area of the retention system in design. Our raw field data was adjusted to account for the presence of a gravel and pipe in the hole and the surface area being tested. Our field data and calculations are attached.

DEES & ASSOCIATES, INC.


Rebecca L. Dees
Geotechnical Engineer
G.E. 2623

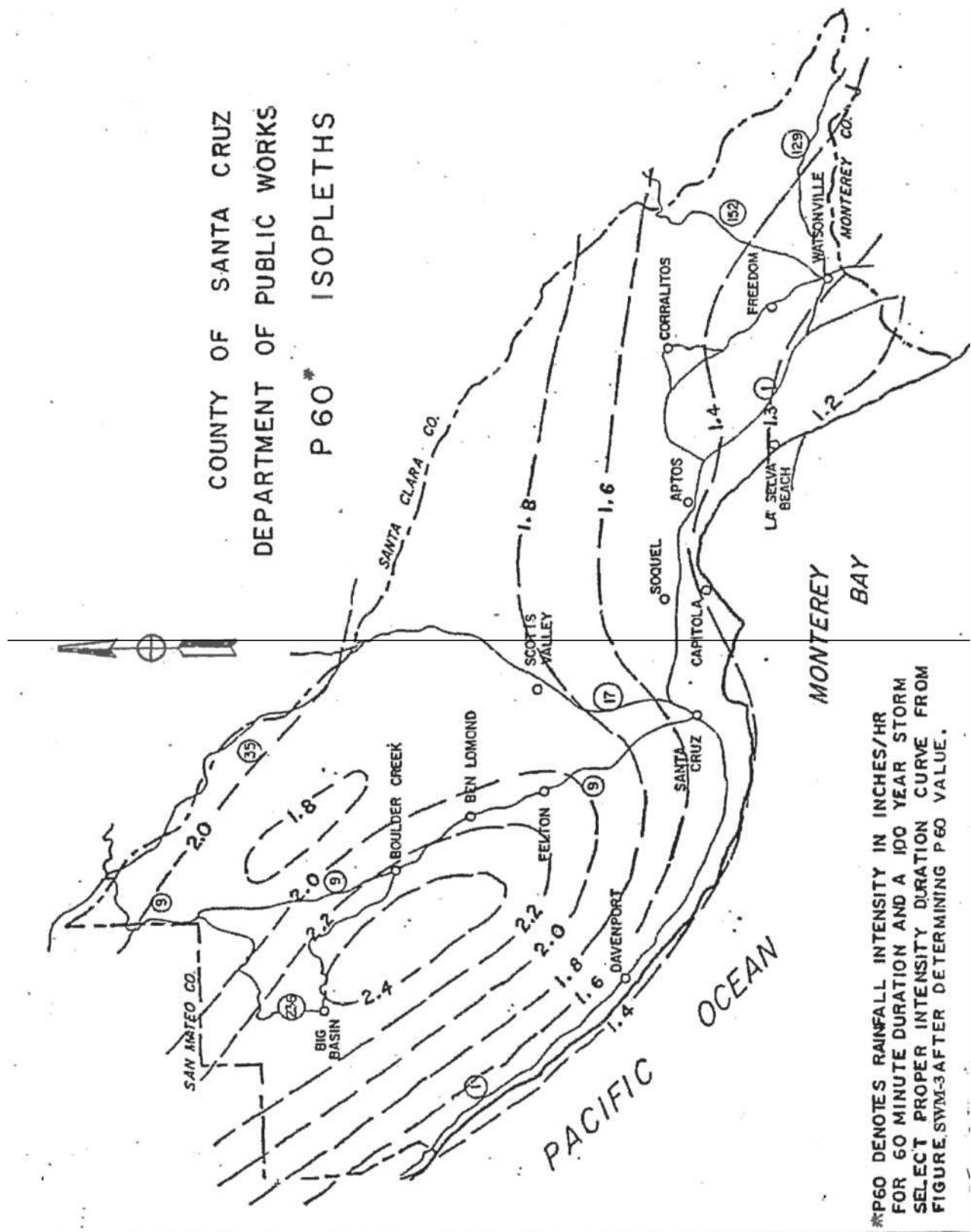


Attachments

Copies: 4 to Addressee

ATTACHMENT "B"
- Rainfall Intensity Chart

Figure SWM-2: Rainfall Intensity IsoPLETHS

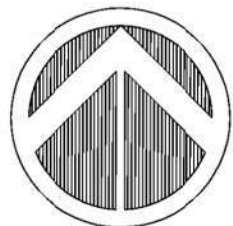


*P60 DENOTES RAINFALL INTENSITY IN INCHES/HR FOR 60 MINUTE DURATION AND A 100 YEAR STORM SELECT PROPER INTENSITY DURATION CURVE FROM FIGURE SWM-3 AFTER DETERMINING P60 VALUE.

ATTACHMENT "C"

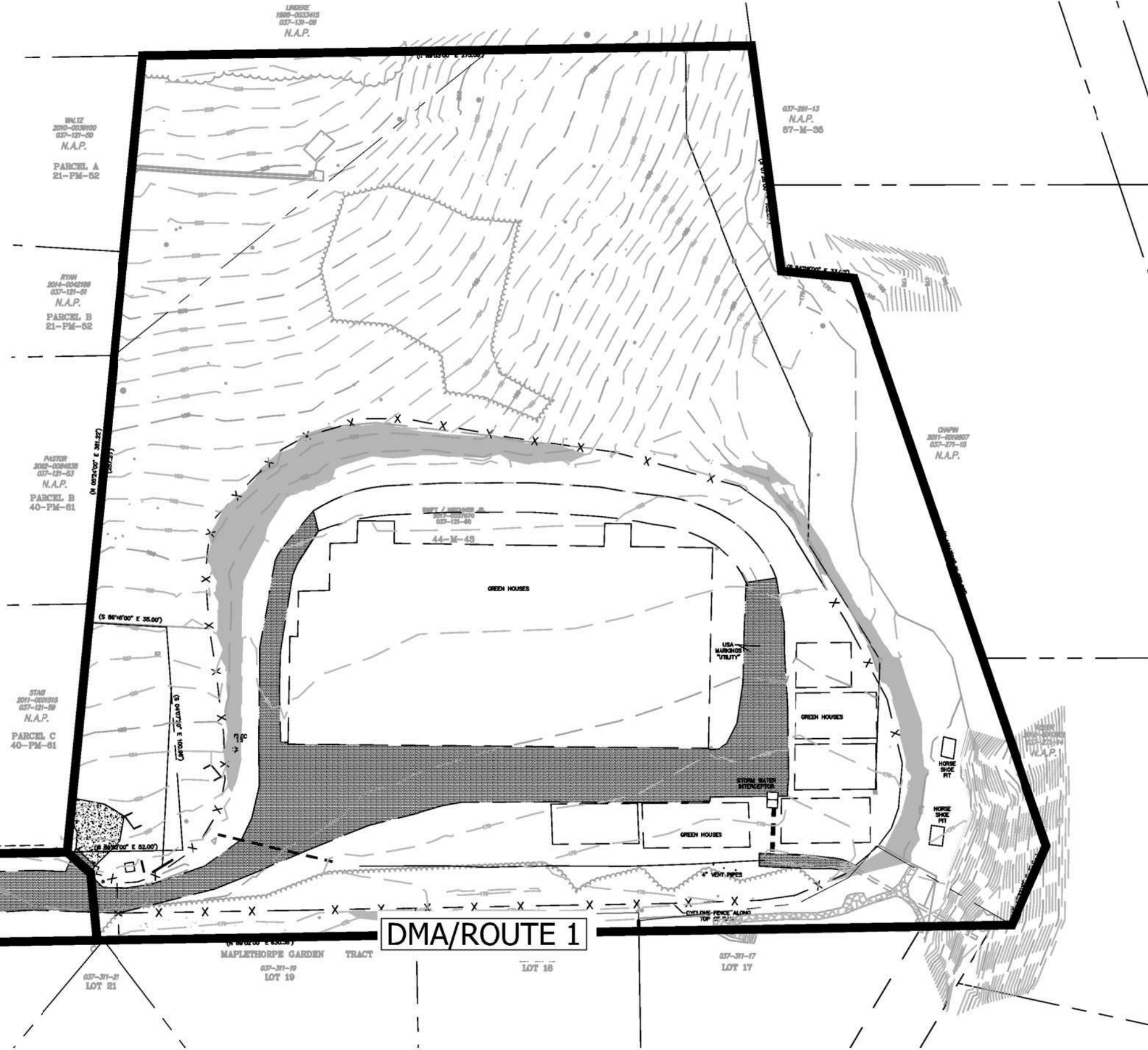
- *Exhibit EXH-1*
- *Exhibit EXH-2*
- *Sheet C8.3 Details*

| EXISTING AREA BREAKDOWN | |
|---------------------------|--------|
| DMA/ROUTE 1 | |
| ROOF | 21600 |
| AC | 10891 |
| CONCRETE | 7720 |
| TOTAL IMPERVIOUS | 40211 |
| LANDSCAPING/NATURAL AREAS | 104909 |
| TOTAL AREA | 145120 |
| DMA/ROUTE 2 | |
| ROOF | 0 |
| AC | 3529 |
| CONCRETE | 0 |
| TOTAL IMPERVIOUS | 3529 |
| LANDSCAPING/NATURAL AREAS | 4961 |
| TOTAL AREA | 8490 |



NORTH

SCALE: 1"=50'



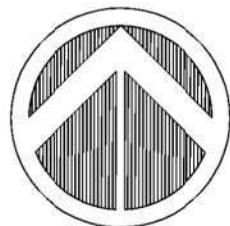
DMA/ROUTE 2

DMA/ROUTE 1

| | |
|--|---------|
| BY | |
| REVISIONS | |
| EXISTING TRIBUTARY AREAS | |
| C2G / CIVIL CONSULTANTS GROUP, INC. Engineers/Planners 4444 Scans Valley Drive / Suite 6 Soquel Valley, CA 95066 T (831) 438-4420 F (831) 438-4420 | |
| 3300 MAPLETHORPE LANE SOQUEL, CA APN: 037-121-60 | |
| Date: | 7/31/18 |
| Scale: | 1"=50' |
| Drawn: | JW |
| Job: | 480-00 |
| Sheet: | EXH-1 |
| Of 3 Sheets | |

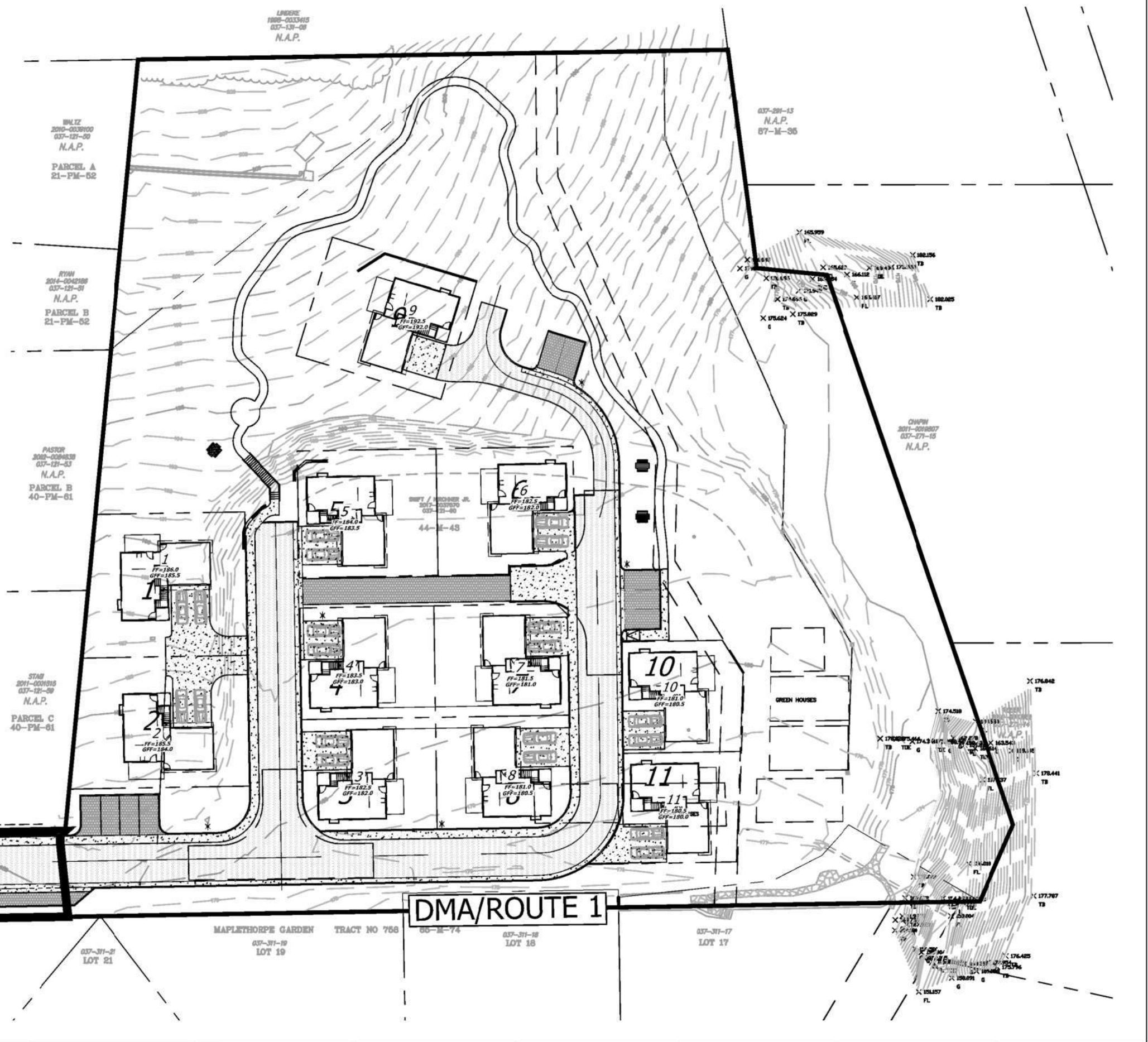
Drawing: W:\480-00 Maplethorpe Ln \Downstream Impact Report\Exhibits\480-00 - EXISTING TRIBUTARY AREAS.dwg
 Layout: Existing DMA
 Last Saved: Tue Jul 31, 2018 - 1:14pm
 Last Plotted: Tue Jul 31, 2018 - 1:37pm
 By:

| PROPOSED AREA BREAKDOWN | |
|---------------------------|--------|
| DMA/ROUTE 1 | |
| ROOF | 10263 |
| AC | 11824 |
| CONCRETE | 7720 |
| TOTAL IMPERVIOUS | 29807 |
| PERVIOUS PAVERS | 1208 |
| LANDSCAPING/NATURAL AREAS | 114600 |
| TOTAL AREA | 145615 |
| DMA/ROUTE 2 | |
| ROOF | 0 |
| AC | 6025 |
| CONCRETE | 920 |
| TOTAL IMPERVIOUS | 6945 |
| PERVIOUS PAVERS | 0 |
| LANDSCAPING/NATURAL AREAS | 1050 |
| TOTAL AREA | 7995 |



NORTH

SCALE: 1"=50'



DMA/ROUTE 2

DMA/ROUTE 1

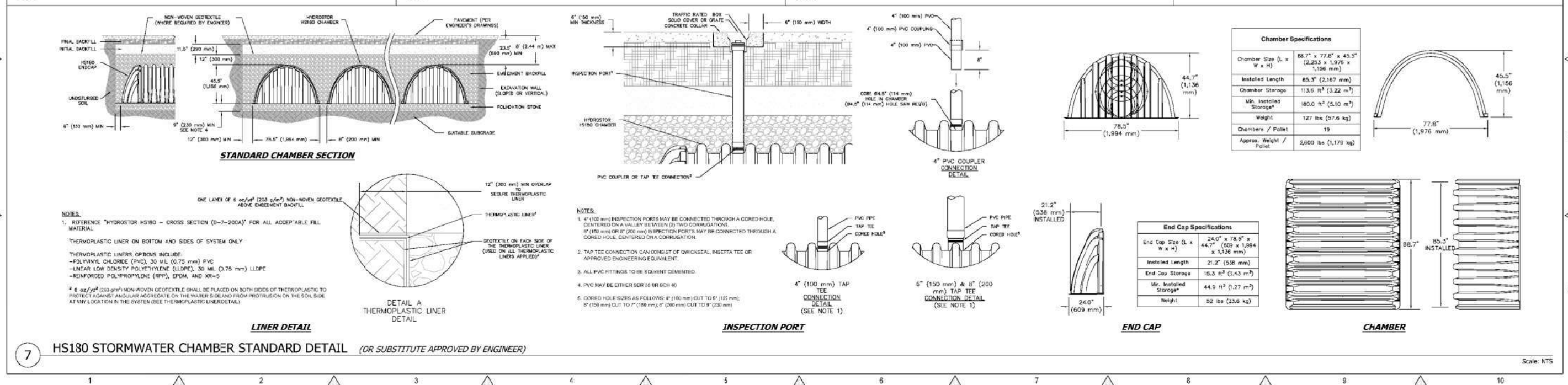
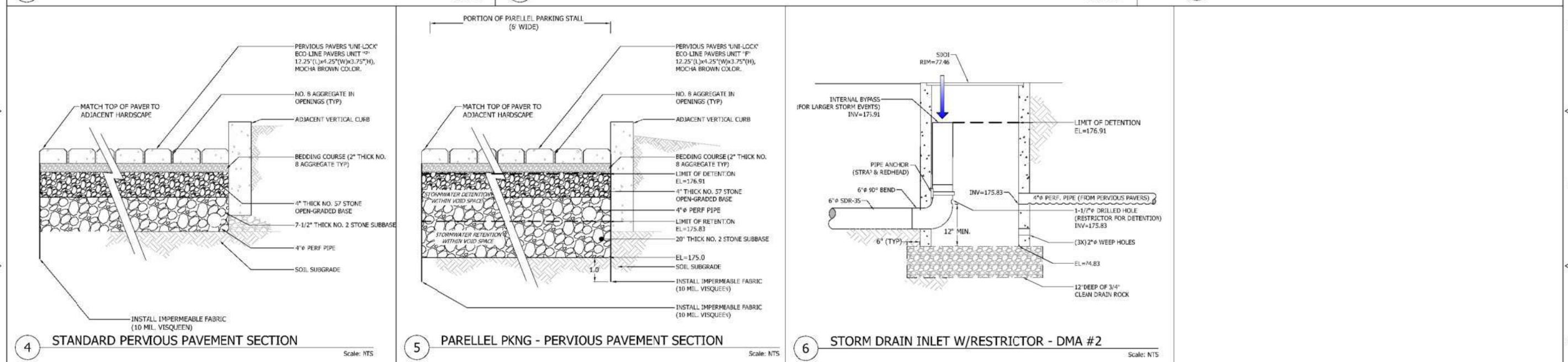
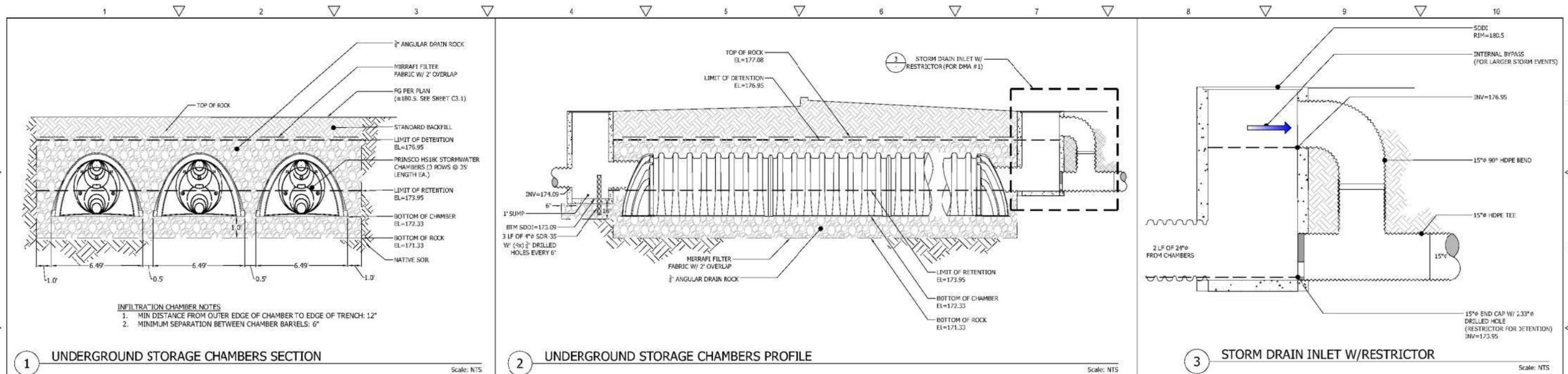
| BY | REVISIONS |
|----|-----------|
| | |
| | |
| | |

PROPOSED TRIBUTARY AREAS

C2G / CIVIL CONSULTANTS GROUP, INC.
 Engineers/Planners
 4444 Scans Valley Drive / Suite 6
 Scans Valley, CA 95066
 T (931) 538-4420
 F (931) 538-4420

3300 MAPLETHORPE LANE
SOQUEL, CA
APN: 037-121-60

Date: 7/31/18
 Scale: 1"=50'
 Drawn: JW
 Job: 480-00
 Sheet:
EXH-2
 Of 3 Sheets



| REVISIONS | BY |
|-----------|----|
| | |
| | |
| | |
| | |

DETAILS

REGISTERED PROFESSIONAL ENGINEER
TROY R. CREMER
No. C 64561
Exp. 6/30/19
CIVIL
STATE OF CALIFORNIA

C2G / CIVIL CONSULTANTS GROUP, INC.
Engineers/Planners
4441 Scotts Valley Drive / Suite 6
Scotts Valley, CA 95066
(925) 435-4420 • (925) 435-4420 • (925) 435-4420

3300 MAPLETHORPE LANE
SOQUEL, CA
APN: 037-121-60

Date: 12.18.18
Scale: AS SHOWN
Drawn: DD/JB
Job: 480-00
Sheet: C8.3
Of 12 Sheets

ATTACHMENT "D"

- *SWM-17 Spreadsheets*
- *SWM-24 Spreadsheets*
- *Restrictor Calculation Spreadsheets*

RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

Data Entry: **PRESS TAB & ENTER DESIGN VALUES** SS Ver: 1.0

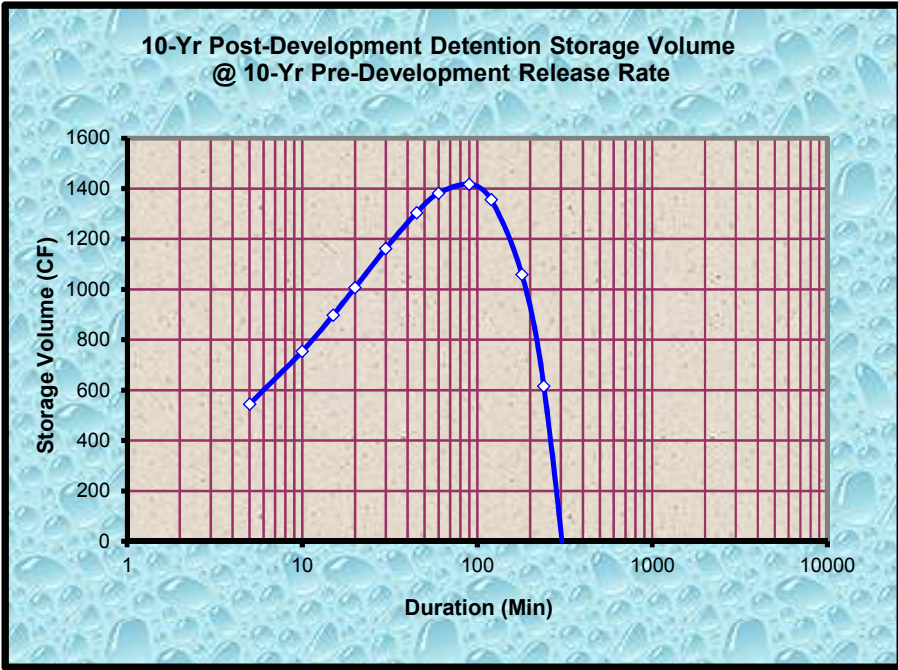
Site Location P60 Isoleth: **1.50** Fig. SWM-2 in County Design Criteria
 Rational Coefficients Cpre: **0.25** See note # 2
 Cpost: **0.90** See note # 2
 Impervious Area: **29807** ft² See note # 2 and # 4

STRUCTURE DIMENSIONS FOR DETENTION

1418 ft³ storage volume calculated
100 % void space assumed
 1418 ft³ excavated volume needed

| Structure Ratios | Length | Width* | Depth* | *For pipe, use the square root of the sectional area |
|--------------------|--------------|-------------|-------------|--|
| | 25.00 | 2.00 | 2.00 | |
| Dimen. (ft) | 60.50 | 4.84 | 4.84 | |

| 10 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|------------------------|-----------------------------|-----------------------------|-----------------------|---------------------------------|-------------------------------|
| Storm Duration (min) | 10 - Year Intensity (in/hr) | 10 - Yr. Release Qpre (cfs) | 10 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.26 | 0.044 | 0.160 | -0.147 | -15908 |
| 1200 | 0.28 | 0.048 | 0.172 | -0.134 | -12103 |
| 960 | 0.31 | 0.053 | 0.189 | -0.117 | -8451 |
| 720 | 0.34 | 0.059 | 0.214 | -0.093 | -5011 |
| 480 | 0.41 | 0.071 | 0.254 | -0.053 | -1895 |
| 360 | 0.46 | 0.080 | 0.287 | -0.020 | -531 |
| 240 | 0.55 | 0.095 | 0.341 | 0.034 | 615 |
| 180 | 0.62 | 0.107 | 0.385 | 0.078 | 1059 |
| 120 | 0.74 | 0.127 | 0.458 | 0.151 | 1356 |
| 90 | 0.83 | 0.144 | 0.517 | 0.210 | 1418 |
| 60 | 0.99 | 0.171 | 0.614 | 0.307 | 1381 |
| 45 | 1.12 | 0.193 | 0.693 | 0.387 | 1305 |
| 30 | 1.33 | 0.229 | 0.823 | 0.517 | 1162 |
| 20 | 1.57 | 0.272 | 0.978 | 0.671 | 1007 |
| 15 | 1.78 | 0.307 | 1.105 | 0.798 | 898 |
| 10 | 2.11 | 0.364 | 1.312 | 1.005 | 754 |
| 5 | 2.83 | 0.489 | 1.760 | 1.453 | 545 |



Notes & Limitations on Use:

- 1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
- 2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
- 3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
- 4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
- 5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
- 6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

PROJECT: **Maplethorpe (DMA 1)**

Calc by: **JW**

Date: **7/17/2018**

RUNOFF RETENTION BY THE STORAGE PERCOLATION METHOD

Data Entry: **PRESS TAB KEY & ENTER DESIGN VALUES**

Notes & Limitations on Use:

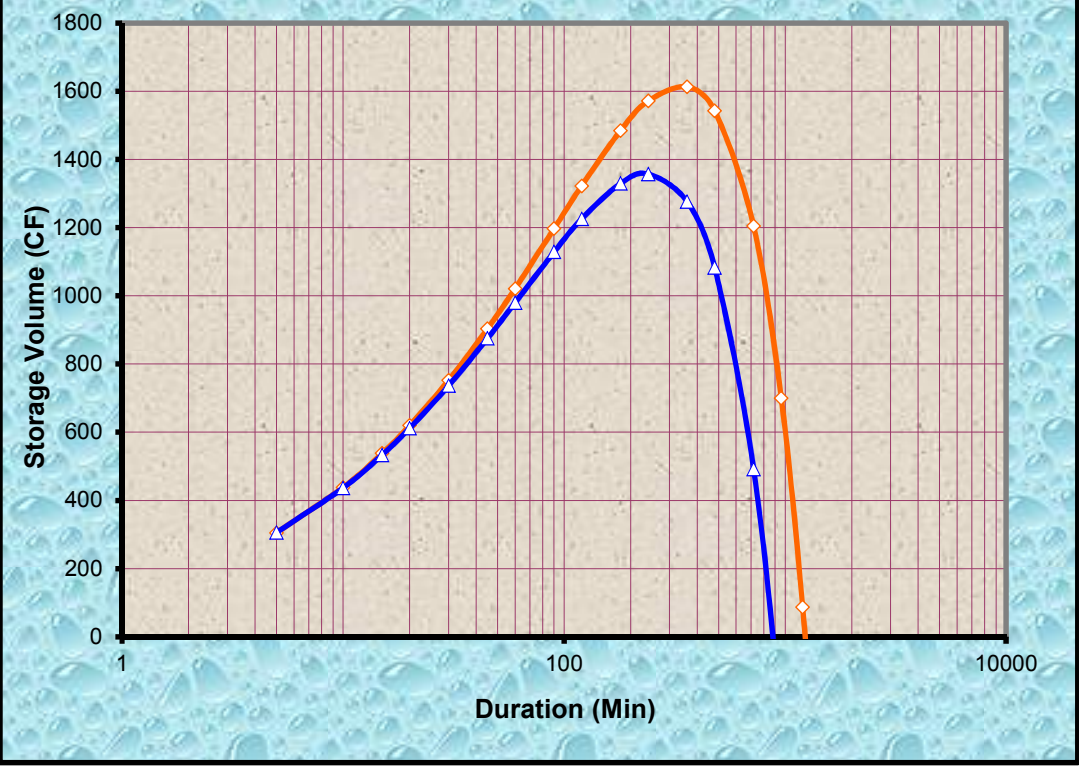
SS Ver:1.0

| | | |
|------------------------------|--------------|-----------------|
| Site Location P60 Isoleth: | 1.50 | Fig. SWM-2 |
| Rational Coefficients Cpre: | 0.25 | |
| Cpost: | 0.90 | |
| Impervious Area: | 29807 | ft ² |
| Saturated Soil Permeability: | 1.75 | in/hr |

Saturated soil permeability values may be used conservatively from the USDA-NRCS soil survey, or use actual test values.
 Site selection and design shall give proper consideration to the path for excess flows downstream of the designated retention area.
 Retention site location on, or immediately above, slopes exceeding 15% will require consulting a geotechnical engineer.
 Gravel packed structures shall use washed, angular, uniformly graded aggregate providing not less than 35% void space.
 Refer to the County of Santa Cruz Design Criteria, Stormwater Management - Section H, for complete method criteria.

| 2 - YEAR DESIGN STORM | | | | RETENTION @ 120 MIN. | | STRUCTURE DIMENSIONS FOR RETENTION | | | | DETENTION @ 60 MIN. | | |
|-----------------------|----------------------------|--------------|--------------|---------------------------------|--------------------------------|--|---|-------------|---------------------|---------------------------------|--------------------------------|--|
| Storm Duration (min) | 2 - Year Intensity (in/hr) | Qpre (cfs) | Qpost (cfs) | Retention Rate To Storage (cfs) | Specified Retained Volume (cf) | 1357 | ft ³ storage volume calculated | | | Detention Rate To Storage (cfs) | Specified Detained Volume (cf) | |
| 1440 | 0.16 | 0.028 | 0.102 | 0.021 | -2089 | 40 | % void space assumed | | | | | |
| 1200 | 0.18 | 0.031 | 0.110 | 0.029 | -1138 | 3393 | ft ³ excavated volume needed | | | | | |
| 960 | 0.20 | 0.034 | 0.121 | 0.040 | -268 | Structure Ratios | Length | Width* | Depth* [#] | | | |
| 720 | 0.22 | 0.038 | 0.137 | 0.056 | 492 | | 25.00 | 2.00 | 2.00 | | | |
| 480 | 0.26 | 0.045 | 0.163 | 0.081 | 1082 | Dimen. (ft) | 80.93 | 6.47 | 6.47 | | | |
| 360 | 0.30 | 0.051 | 0.184 | 0.102 | 1276 | 1656 | ft ² internal surface area | | | | | |
| 240 | 0.35 | 0.061 | 0.218 | 0.137 | 1357 | 1159 | ft ² effective surface area | | | | | |
| 180 | 0.40 | 0.068 | 0.247 | 0.165 | 1329 | 8.0 | hrs estimated structure drainage time | | | | | |
| 120 | 0.47 | 0.081 | 0.293 | 0.211 | 1226 | * For pipe, use the square root of the sectional area. # If cell values displayed are corrupted, enter zero for depth, then re-enter a positive numeric value within allowed range. | | | | | | |
| 90 | 0.53 | 0.092 | 0.331 | 0.249 | 1128 | STRUCTURE DIMENSIONS FOR DETENTION | | | | | | |
| 60 | 0.63 | 0.109 | 0.393 | 0.311 | 980 | 1613 | ft ³ storage volume calculated | | | | | |
| 45 | 0.71 | 0.123 | 0.444 | 0.362 | 875 | 100 | % void space assumed | | | | | |
| 30 | 0.85 | 0.146 | 0.527 | 0.446 | 736 | 1613 | ft ³ excavated volume needed | | | | | |
| 20 | 1.01 | 0.174 | 0.626 | 0.545 | 612 | Structure Ratios | Length | Width* | Depth* | | | |
| 15 | 1.14 | 0.196 | 0.707 | 0.626 | 533 | | 25.00 | 2.00 | 2.00 | | | |
| 10 | 1.35 | 0.233 | 0.840 | 0.758 | 437 | Dimen. (ft) | 63.17 | 5.05 | 5.05 | | | |
| 5 | 1.81 | 0.313 | 1.126 | 1.045 | 306 | | | | | 1.017 | 305 | |

2 - Year Retention or Detention Storage Volume



Restrictor Description: DMA #1
 Project Name: **Maplethorpe**
 Job Number: 480-00
 Date: January 25, 2019

RESTRICTOR SIZE, ORIFICE METHOD (Circular Opening)

| | Value |
|-------------------------------------|--------------|
| 1. HIGHWATER ELEVATION | 180.00 |
| 2. INVERT ELEVATION | 173.95 |
| 3. DIAMETER OF RESTRICTOR IN INCHES | 2.33 |
| 4. CROSS SECTIONAL AREA, SQ. FT. | 0.03 |
| 5. HEAD, FT. | 5.95 |
| 6. DISCHARGE COEFFICIENT | 0.50 |
| <i>SQUARE EDGE 0.79 - 0.82</i> | |
| <i>ROUND EDGE 0.93 - 0.98</i> | |
| <i>SHARP EDGE 0.58 - 0.64</i> | |
| <i>PROJECTING 0.50</i> | |
| 7. DISCHARGE, Q, CFS | 0.290 |
| 8. ALLOWABLE RELEASE RATE, Q, CFS | 0.307 |

RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

Data Entry: **PRESS TAB & ENTER DESIGN VALUES** SS Ver: 1.0

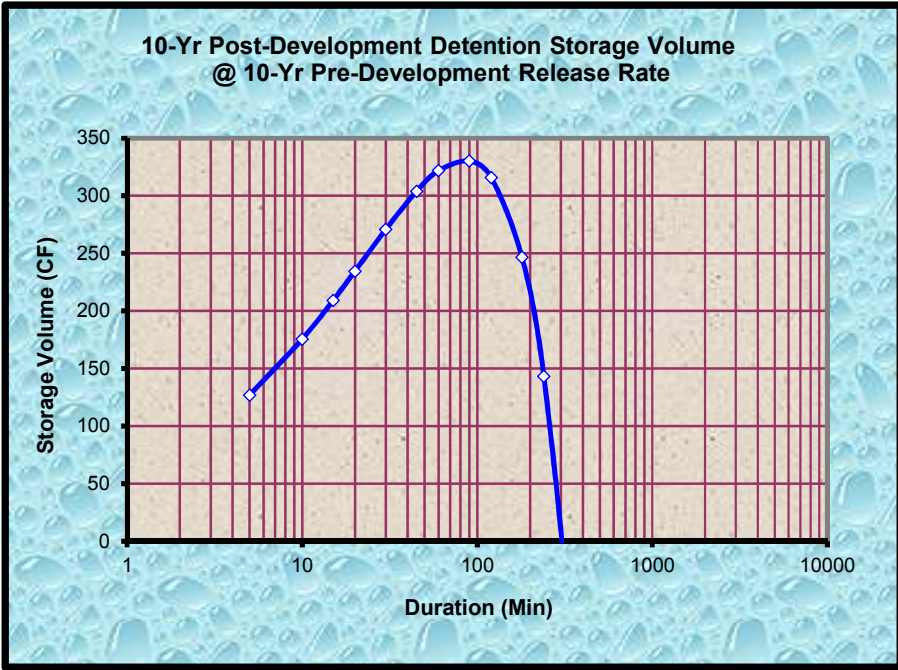
Site Location P60 Isopleth: **1.50** Fig. SWM-2 in County Design Criteria
 Rational Coefficients Cpre: **0.25** See note # 2
 Cpost: **0.90** See note # 2
 Impervious Area: **6945** ft² See note # 2 and # 4

STRUCTURE DIMENSIONS FOR DETENTION

330 ft³ storage volume calculated
 100 % void space assumed
 330 ft³ excavated volume needed

| Structure Ratios | Length | Width* | Depth* | |
|--------------------|--------------|-------------|-------------|--|
| | 25.00 | 2.00 | 2.00 | *For pipe, use the square root of the sectional area |
| Dimen. (ft) | 37.23 | 2.98 | 2.98 | |

| 10 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|------------------------|-----------------------------|-----------------------------|-----------------------|---------------------------------|-------------------------------|
| Storm Duration (min) | 10 - Year Intensity (in/hr) | 10 - Yr. Release Qpre (cfs) | 10 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.26 | 0.010 | 0.037 | -0.034 | -3707 |
| 1200 | 0.28 | 0.011 | 0.040 | -0.031 | -2820 |
| 960 | 0.31 | 0.012 | 0.044 | -0.027 | -1969 |
| 720 | 0.34 | 0.014 | 0.050 | -0.022 | -1168 |
| 480 | 0.41 | 0.016 | 0.059 | -0.012 | -442 |
| 360 | 0.46 | 0.019 | 0.067 | -0.005 | -124 |
| 240 | 0.55 | 0.022 | 0.079 | 0.008 | 143 |
| 180 | 0.62 | 0.025 | 0.090 | 0.018 | 247 |
| 120 | 0.74 | 0.030 | 0.107 | 0.035 | 316 |
| 90 | 0.83 | 0.033 | 0.120 | 0.049 | 330 |
| 60 | 0.99 | 0.040 | 0.143 | 0.072 | 322 |
| 45 | 1.12 | 0.045 | 0.162 | 0.090 | 304 |
| 30 | 1.33 | 0.053 | 0.192 | 0.120 | 271 |
| 20 | 1.57 | 0.063 | 0.228 | 0.156 | 235 |
| 15 | 1.78 | 0.071 | 0.257 | 0.186 | 209 |
| 10 | 2.11 | 0.085 | 0.306 | 0.234 | 176 |
| 5 | 2.83 | 0.114 | 0.410 | 0.339 | 127 |



Notes & Limitations on Use:

- 1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
- 2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
- 3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
- 4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
- 5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
- 6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

PROJECT: **Maplethorpe (DMA 2)**

Calc by: **JW**

Date: **7/17/2018**

RUNOFF RETENTION BY THE STORAGE PERCOLATION METHOD

Data Entry: **PRESS TAB KEY & ENTER DESIGN VALUES**

Notes & Limitations on Use:

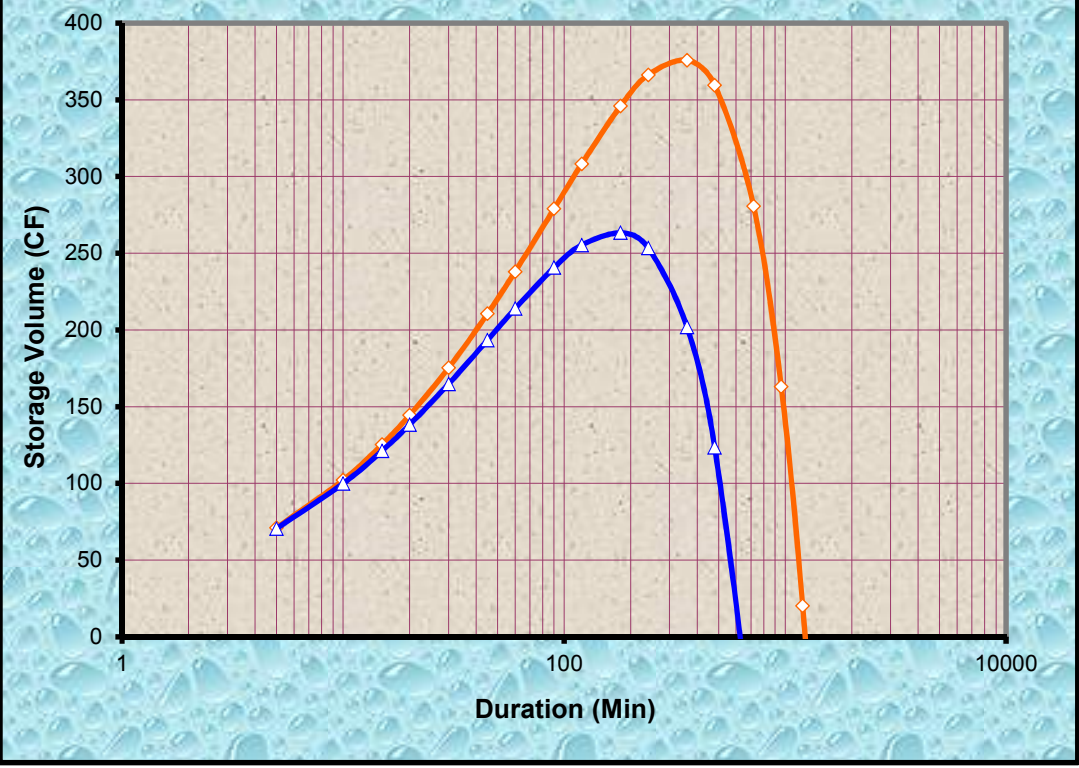
SS Ver:1.0

| | | |
|------------------------------|-------------|-----------------|
| Site Location P60 Isoleth: | 1.50 | Fig. SWM-2 |
| Rational Coefficients Cpre: | 0.25 | |
| Cpost: | 0.90 | |
| Impervious Area: | 6945 | ft ² |
| Saturated Soil Permeability: | 1.75 | in/hr |

Saturated soil permeability values may be used conservatively from the USDA-NRCS soil survey, or use actual test values.
 Site selection and design shall give proper consideration to the path for excess flows downstream of the designated retention area.
 Retention site location on, or immediately above, slopes exceeding 15% will require consulting a geotechnical engineer.
 Gravel packed structures shall use washed, angular, uniformly graded aggregate providing not less than 35% void space.
 Refer to the County of Santa Cruz Design Criteria, Stormwater Management - Section H, for complete method criteria.

| 2 - YEAR DESIGN STORM | | | | RETENTION @ 120 MIN. | | STRUCTURE DIMENSIONS FOR RETENTION | | | | DETENTION @ 60 MIN. | | |
|-----------------------|----------------------------|--------------|--------------|---------------------------------|--------------------------------|--|---|-------------|-------------|---------------------------------|--------------------------------|--|
| Storm Duration (min) | 2 - Year Intensity (in/hr) | Qpre (cfs) | Qpost (cfs) | Retention Rate To Storage (cfs) | Specified Retained Volume (cf) | 263 | ft ³ storage volume calculated | | | Detention Rate To Storage (cfs) | Specified Detained Volume (cf) | |
| 1440 | 0.16 | 0.007 | 0.024 | 0.005 | -883 | 40 | % void space assumed | | | | | |
| 1200 | 0.18 | 0.007 | 0.026 | 0.007 | -595 | 658 | ft ³ excavated volume needed | | | | | |
| 960 | 0.20 | 0.008 | 0.028 | 0.009 | -325 | Structure Ratios | Length | Width* | Depth* # | | | |
| 720 | 0.22 | 0.009 | 0.032 | 0.013 | -81 | | 25.00 | 2.00 | 2.00 | | | |
| 480 | 0.26 | 0.011 | 0.038 | 0.019 | 123 | Dimen. (ft) | 46.85 | 3.75 | 3.75 | | | |
| 360 | 0.30 | 0.012 | 0.043 | 0.024 | 202 | 555 | ft ² internal surface area | | | | | |
| 240 | 0.35 | 0.014 | 0.051 | 0.032 | 253 | 388 | ft ² effective surface area | | | | | |
| 180 | 0.40 | 0.016 | 0.057 | 0.039 | 263 | 4.6 | hrs estimated structure drainage time | | | | | |
| 120 | 0.47 | 0.019 | 0.068 | 0.049 | 255 | * For pipe, use the square root of the sectional area. | | | | | | |
| 90 | 0.53 | 0.021 | 0.077 | 0.058 | 241 | # If cell values displayed are corrupted, enter zero for depth, then re-enter a positive numeric value within allowed range. | | | | | | |
| 60 | 0.63 | 0.025 | 0.092 | 0.073 | 214 | STRUCTURE DIMENSIONS FOR DETENTION | | | | | | |
| 45 | 0.71 | 0.029 | 0.103 | 0.084 | 193 | 376 | ft ³ storage volume calculated | | | | | |
| 30 | 0.85 | 0.034 | 0.123 | 0.104 | 165 | 100 | % void space assumed | | | | | |
| 20 | 1.01 | 0.041 | 0.146 | 0.127 | 138 | 376 | ft ³ excavated volume needed | | | | | |
| 15 | 1.14 | 0.046 | 0.165 | 0.146 | 121 | Structure Ratios | Length | Width* | Depth* | | | |
| 10 | 1.35 | 0.054 | 0.196 | 0.177 | 100 | | 25.00 | 2.00 | 2.00 | | | |
| 5 | 1.81 | 0.073 | 0.262 | 0.243 | 71 | Dimen. (ft) | 38.87 | 3.11 | 3.11 | | | |

2 - Year Retention or Detention Storage Volume



Restrictor Description: DMA #2
 Project Name: **Maplethorpe**
 Job Number: 480-00
 Date: January 24, 2019

RESTRICTOR SIZE, ORIFICE METHOD (Circular Opening)

| | Value |
|-------------------------------------|-------------|
| 1. HIGHWATER ELEVATION | 177.46 |
| 2. INVERT ELEVATION | 175.83 |
| 3. DIAMETER OF RESTRICTOR IN INCHES | 1.50 |
| 4. CROSS SECTIONAL AREA, SQ. FT. | 0.01 |
| 5. HEAD, FT. | 1.57 |
| 6. DISCHARGE COEFFICIENT | 0.50 |
| <i>SQUARE EDGE 0.79 - 0.82</i> | |
| <i>ROUND EDGE 0.93 - 0.98</i> | |
| <i>SHARP EDGE 0.58 - 0.64</i> | |
| <i>PROJECTING 0.50</i> | |
| 7. DISCHARGE, Q, CFS | 0.06 |
| 8. ALLOWABLE RELEASE RATE, Q, CFS | 0.07 |

ATTACHMENT "E"
- *Todd Creamer's Resume*

Todd R. Creamer, PE

Position: Principal Engineer, C2G/Civil Consultants Group, Inc.
Scotts Valley, California

Education: Marquette University, BS/Civil Engineering

Registration: California: RCE 64561
California: QSP/QSD No. 00439
National: CESC No. 2752

Experience: Mr. Creamer serves as President of C2G/Civil Consultants Group, Inc. and as Principal Engineer on assignments for both public and private sector clients. His design experience in California has primarily been located in the South Bay counties of Santa Clara, Santa Cruz and Monterey Counties. Mr. Creamer has also worked in Illinois, Wisconsin and Minnesota.

Recently, Mr. Creamer has been involved with multiple projects associated with school construction within the South Bay area. He has been the project manager for utility infrastructure improvements, road improvements, and offsite improvements for the K-12 schools and community college. Mr. Creamer has also been the civil consultant associated with multiple water distribution system designs throughout the Santa Cruz County area.

Much of Mr. Creamer's professional career has been devoted to site development for public and private sector building complexes, as well as roadway and utility system improvements. His knowledge of municipal and land development engineering is based on consulting work in California, Northern Illinois as well as public works employment with the Cities of Fridley, Minnesota and Franklin, Wisconsin.

Mr. Creamer's breadth of experience in land development has also exposed him to various storm water quality and erosion control requirements throughout the country. This experience has allowed Mr. Creamer to create numerous Storm Water Pollution Prevention Plans (SWPPP's) as well as inspection for erosion and sediment control associated with improvement projects. Mr. Creamer's devotion to storm water quality has resulted in his pursuit of Certification by the Soil and Water Conservation Society and International Erosion Control Association in Erosion and Sediment Control.

Affiliations: American Society of Civil Engineers (ASCE)
Exchange Club of Scotts Valley – President Elect 05-06
President 06-07
Treasurer 07-08

Certifications:
Certified Professional in Erosion and Sediment Control - CESC No. 2752
Certified Master WaterCAD modeler – Haestad Methods

ATTACHMENT "F"

- *Sample Maintenance Checklist*

Exhibit A: Pervious Pavement Inspection and Maintenance Checklist

Property Address: _____

Property Owner: _____

Treatment Measure No.: _____

Date of Inspection: _____

Inspector(s): _____

Type of Inspection: Monthly Pre-Wet Season After heavy runoff (1" or greater)
 End of Wet Season Other: _____

Type of Treatment Measure: Infiltration by use of Pervious Pavement

| Defect | Conditions When Maintenance Is Needed | Maintenance Needed (Y/N) | Comments | Results Expected When Maintenance is Performed |
|--|---|--------------------------|----------|--|
| 1. Trash, Debris, & Weed Accumulation | Trash and debris accumulated in the treatment measure. | | | Treatment measure is free of trash and debris |
| 2. Standing Water | When water stands in the treatment measure between storms and does not drain within 5 days after rainfall. Conditions within treatment measure provide mosquito breeding habitat. | | | No standing water after 5 days of rain event. |
| 3. Stormwater Intermediaries | Downspouts, curb cuts, overflow pipes are damaged and/or debris. Splash blocks or rocks are damaged or missing. | | | All stormwater intermediaries are cleaned and repaired. Treatment measure flows as intended per design specifications. |
| 5. Sediment Accumulation on Vegetation | Sediment accumulation near and/or in inlets is less than 2 inches at any spot, or it covers vegetation. | | | When finished, treatment measure should be level from side to side and drain freely toward outlet. There should be no areas of standing water once inflow has ceased and sediments are disposed of properly. |
| 6. Clogging | Ponding and/or Flooding | | | Treatment measure operates per design specification. |
| 10. Miscellaneous | Any condition not covered above that needs attention in order for the treatment measure to function as designed. | | | Treatment measure operates per the design specification. |

January 25, 2019

Attn: Alyson Tom
Public Works – Drainage
County of Santa Cruz
701 Ocean Street, 4th Floor
Santa Cruz, Ca 95060

Subject: Downstream Impact Analysis
3300 Maplethorpe Lane Soquel, CA
APN: 037-121-60

Background

The proposed 11-lot detached single family home development will increase impervious area on the project site due to new residential structures, access roads and sidewalks. At the request of the County of Santa Cruz Public Works Drainage Department, C2G has performed a downstream impact analysis associated to the project storm water discharge.

The storm water tributary areas of the existing site have been determined based upon the project's topographic survey with supplemented information from the County's GIS website. The project is separated into two (2) offsite drainage patterns (see **Appendix A**):

1. Route 1: This drainage route collects the majority of the project site utilizing on-site catch basins, area drains, subsurface piping, and manholes. This runoff is then routed into an on-site below grade storage facility. The storage facility is comprised of 8 Stormtech MC-3500 underground chambers with end caps and an isolator row, providing treatment, retention, and detention of stormwater collected from on-site areas.

Runoff not infiltrated during storage in the chambers is released at or below pre-development rates via an outlet structure and runoff channel provided with erosion control measures into the ravine to the east of the site, where it is conveyed along an earthen channel to meet Noble Creek.

2. Route 2: Runoff from a small portion of the project is conveyed primarily into an underground storage facility comprised of 2 Stormtech MC-3500 underground chambers with end caps and an isolator row, providing treatment, retention, and detention of stormwater collected from on-site areas. A small portion of this area is not feasible to treat and runs directly into existing curb and gutter along Maplethorpe Lane and Colleen Way. This route accommodates runoff from the entrance road to the project.

Runoff not infiltrated during storage in the chambers is released at or below pre-development rates via an outlet/restrictor structure into the existing curb and gutter along Maplethorpe Drive.

Runoff conveyed by existing curb and gutter along Maplethorpe Lane is collected in a catch basin located immediately south of the intersection of Mulberry Drive, and conveyed via a culvert under Soquel Drive and into an existing earthen channel.



Runoff conveyed by the existing curb and gutter along Colleen Way runs into the curb and gutter along Mulberry drive, and then is collected in a catch basin located at the intersection of Melba Court. The catch basin directs runoff into a culvert and thence into the existing earthen channel. This channel eventually joins the existing earthen channel which conveys runoff from Maplethorpe Lane and is conveyed under Soquel Drive and into the existing earthen channel. This intersection is shown in Figure 1, below, which is taken from the Santa Cruz County GIS website.

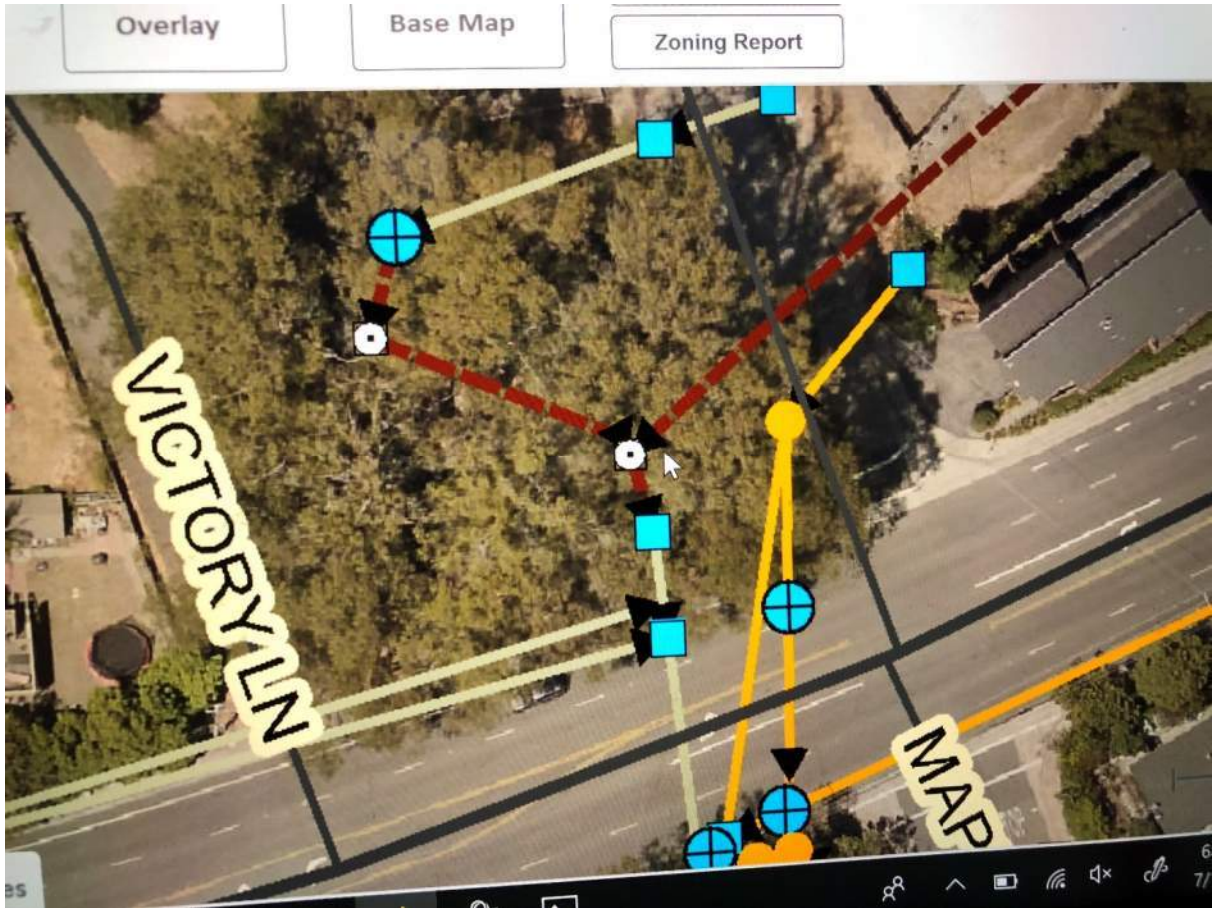


Figure 1- Channel Intersection



Existing Conditions and Runoff Patterns (Route 1)

The ravine running north to south, east of Mulberry Drive, takes in a tributary area of approximately 112 acres (see Figure 2, below). Figure 2 is taken from the Santa Cruz County GIS website. The majority of the site drains directly into the ravine. All runoff from the site is eventually collected in the ravine, prior to being conveyed under Soquel Drive via the existing culvert. Existing conditions of the channel and box culvert which convey the runoff from this tributary area are shown in the photos below (figures 3 and 4)

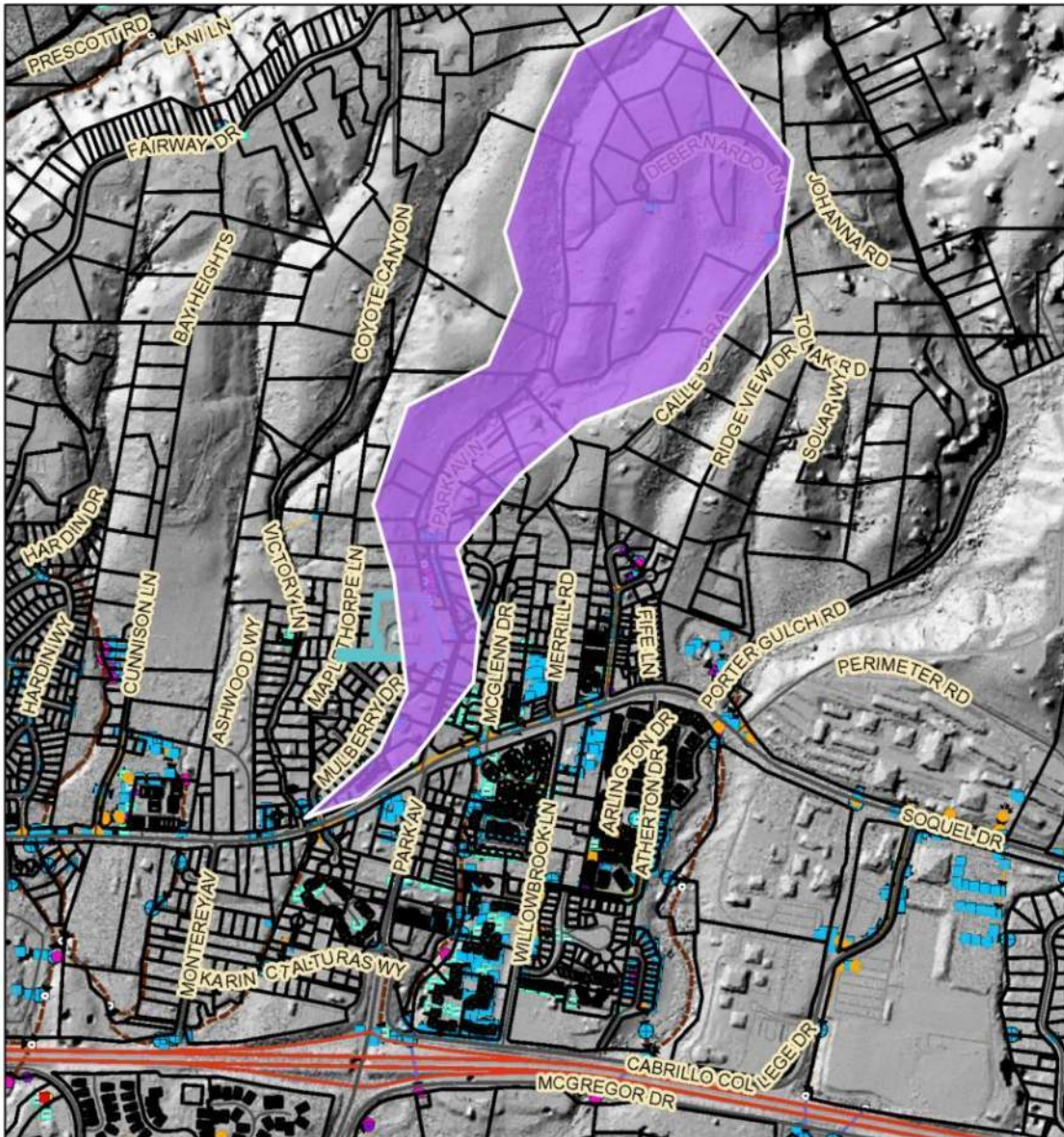


Figure 2- Ravine Tributary Area





Figure 3- Existing Channel





Figure 4- Existing Culvert

This area of the County is subject to a 10 year, 10 minute storm event with an intensity of 2.1 inches per hour (SWM 2 & 3), and has a C value ranging from 0.45 – 0.60 (SWM 1). For this analysis, a C value of 0.45 has been selected to most accurately reflect the large lot sizes found in this area. These values provide a flow rate for the existing earthen channel as follows:

$$Q = CiA$$

$$Q = 0.45 * 2.1 * 112 = 105.84 \text{ cfs}$$

The conversion factors provided (SWM 3), and resulting flowrates for, other storm events of interest are:



2 yr: 0.64, 67.74 cfs
25 yr: 1.2, 127.0 cfs
50 yr: 1.5, 142.88 cfs
100 yr: 1.5, 158.76 cfs

Flowline length of the existing ravine in the area of interest is approximately 135 linear feet, sloped at approximately 6.3%. The bottom of the ravine averages 1.5-feet in width, with side slopes varying from 6:1 to 1:1. The ravine includes one significant point of interest, where a 15-inch corrugated plastic pipe (CPP) culvert discharges into the ravine.

The discharge point (invert) of the CPP culvert is approximately 1.39-feet above the flowline of the ravine. The discharge is protected by a rip-rap energy dissipater (see figure 5, below)



Figure 5- 15" CPP Culvert Discharge Point

The 10-year design storm flow rate of approximately 105.84 cfs results in a flow depth at the CPP discharge point of approximately 1.36-feet, leaving approximately 0.03-feet of freeboard below the CPP culvert invert. As the CPP culvert represents the highest point at which flow from the proposed improvements enters the ravine, flow depth upgradient of this location will remain unchanged by the proposed work. Calculation of flow through the ravine (channel) at the CPP discharge point is shown in Figure 6, below (Note that all channel and culvert flow calculation were performed using AutoDesk's Hydraflow Extension for AutoCAD Civil 3D):



Channel Report

Maplethorpe Channel Flow

Trapezoidal

Bottom Width (ft) = 1.50
 Side Slopes (z:1) = 5.50, 1.75
 Total Depth (ft) = 1.39
 Invert Elev (ft) = 153.00
 Slope (%) = 6.30
 N-Value = 0.025

Highlighted

Depth (ft) = 1.36
 Q (cfs) = 105.84
 Area (sqft) = 8.74
 Velocity (ft/s) = 12.10
 Wetted Perim (ft) = 11.84
 Crit Depth, Yc (ft) = 1.39
 Top Width (ft) = 11.36
 EGL (ft) = 3.64

Calculations

Compute by: Known Q
 Known Q (cfs) = 105.84

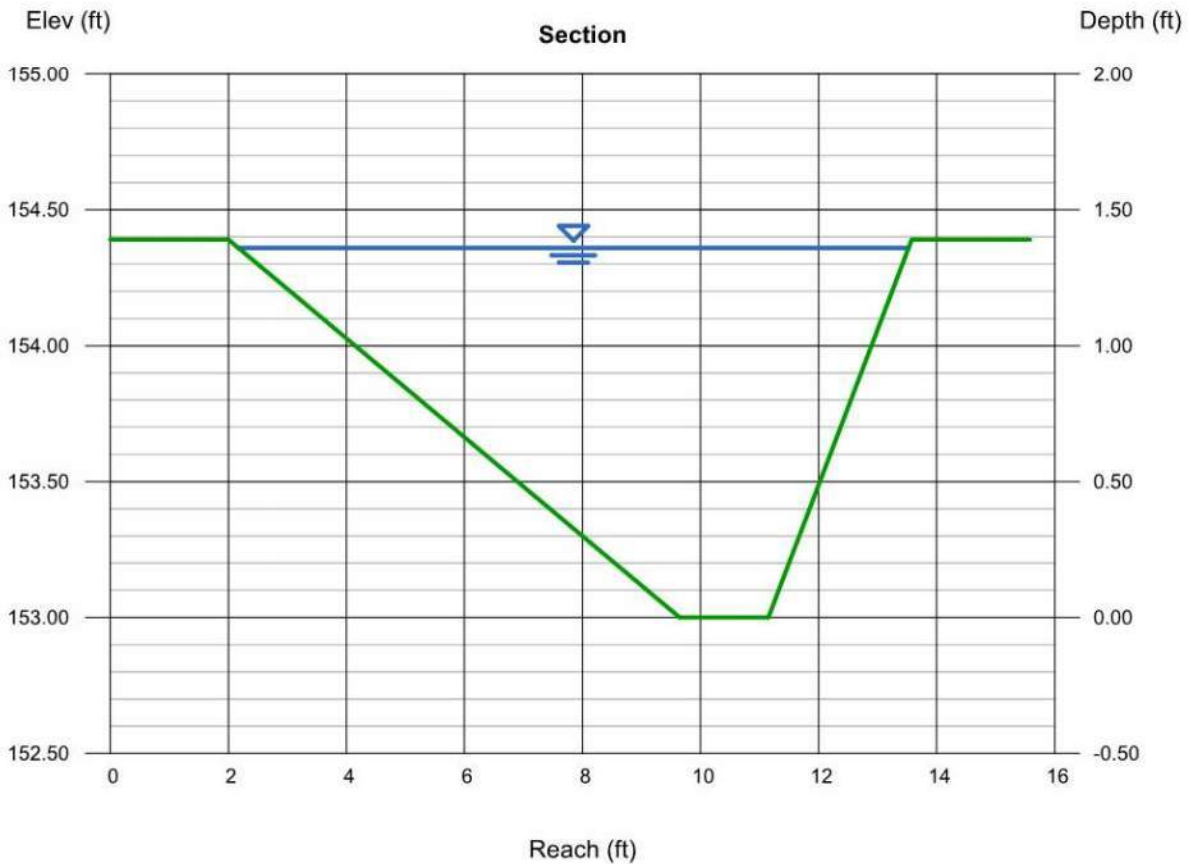


Figure 6- Channel Flow Calculation



The 50-year design storm flow rate of approximately 142.88 cfs results in a flow depth at the CPP discharge point of approximately 1.54-feet. This flow depth results in a water surface elevation at the CPP discharge point approximately 0.15-feet above the CPP culvert invert. This flow depth will be unchanged by the improvements to the site, as the flow rate through the CPP culvert is determined by the restrictor provided for DMA/Route 1 and will be equal to or less than the existing condition. The Channel Report below utilizes a greater total depth than the 10-year Channel Report above. The 50-year Channel Report assumes a total depth of up to the top of the CPP culvert outlet, intended to demonstrate that the 50-year storm does not completely submerge the outlet. The 10-year Report assumes a total depth equal to the depth from outlet invert to flowline of ravine and is intended to demonstrate that a more typical (10-year) storm event will not result in flows through the ravine deep enough to occlude the culvert outlet.



Channel Report

Maplethorpe Channel Flow 50-year Storm

Trapezoidal

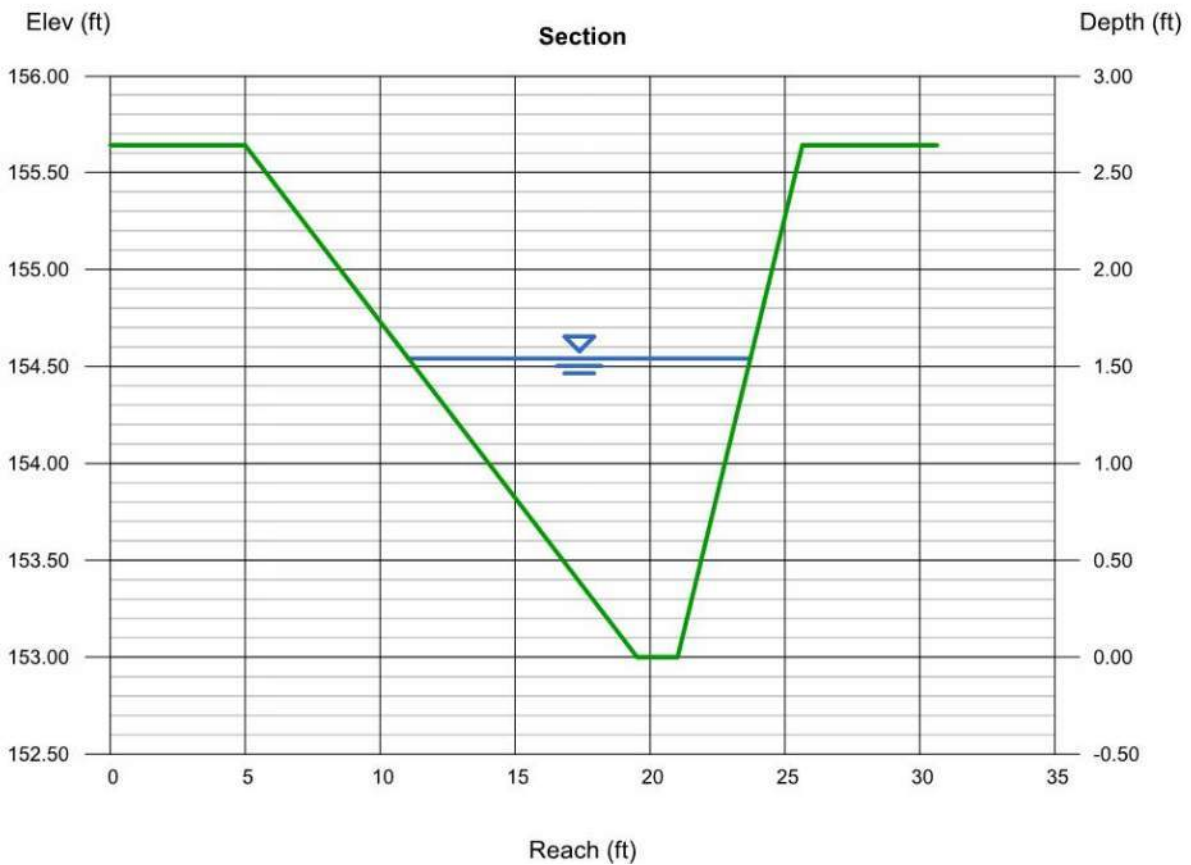
Bottom Width (ft) = 1.50
Side Slopes (z:1) = 5.50, 1.75
Total Depth (ft) = 2.64
Invert Elev (ft) = 153.00
Slope (%) = 6.30
N-Value = 0.025

Highlighted

Depth (ft) = 1.54
Q (cfs) = 142.88
Area (sqft) = 10.91
Velocity (ft/s) = 13.10
Wetted Perim (ft) = 13.21
Crit Depth, Yc (ft) = 2.30
Top Width (ft) = 12.66
EGL (ft) = 4.21

Calculations

Compute by: Known Q
Known Q (cfs) = 142.88



Existing conditions on the project site are best described as industrial, resulting in a C value of 0.80 (SWM 1). Rainfall intensities are as described above, and the portion of the site which drains directly into the ravine is approximately 3.34 acres. Using the equation shown above, these values provide the following flow rates off of the site:

- 2 yr:** 3.59 cfs
- 10 yr:** 5.61cfs
- 25 yr:** 6.73 cfs
- 50 yr:** 7.57 cfs
- 100 yr:** 8.42 cfs

Flow through the existing 15-inch CPP culvert was analyzed using the 10-year design storm flow rate of 5.61-cfs, and is demonstrated in Figure 7, below:

Culvert Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc.

Wednesday, Jul 18 2018

Maplethorpe 15-inch CPP Culvert Existing Flow

| | | | |
|---------------------|----------------------------------|---------------------|-----------------|
| Invert Elev Dn (ft) | = 154.39 | Calculations | |
| Pipe Length (ft) | = 65.00 | Qmin (cfs) | = 0.61 |
| Slope (%) | = 32.86 | Qmax (cfs) | = 5.61 |
| Invert Elev Up (ft) | = 175.75 | Tailwater Elev (ft) | = (dc+D)/2 |
| Rise (in) | = 15.0 | | |
| Shape | = Circular | Highlighted | |
| Span (in) | = 15.0 | Qtotal (cfs) | = 5.61 |
| No. Barrels | = 1 | Qpipe (cfs) | = 5.61 |
| n-Value | = 0.022 | Qovertop (cfs) | = 0.00 |
| Culvert Type | = Circular Corrugate Metal Pipe | Veloc Dn (ft/s) | = 4.89 |
| Culvert Entrance | = Mitered to slope (C) | Veloc Up (ft/s) | = 5.55 |
| Coeff. K,M,c,Y,k | = 0.021, 1.33, 0.0463, 0.75, 0.7 | HGL Dn (ft) | = 155.49 |
| | | HGL Up (ft) | = 176.71 |
| Embankment | | Hw Elev (ft) | = 177.94 |
| Top Elevation (ft) | = 178.27 | Hw/D (ft) | = 1.75 |
| Top Width (ft) | = 60.00 | Flow Regime | = Inlet Control |
| Crest Width (ft) | = 60.00 | | |

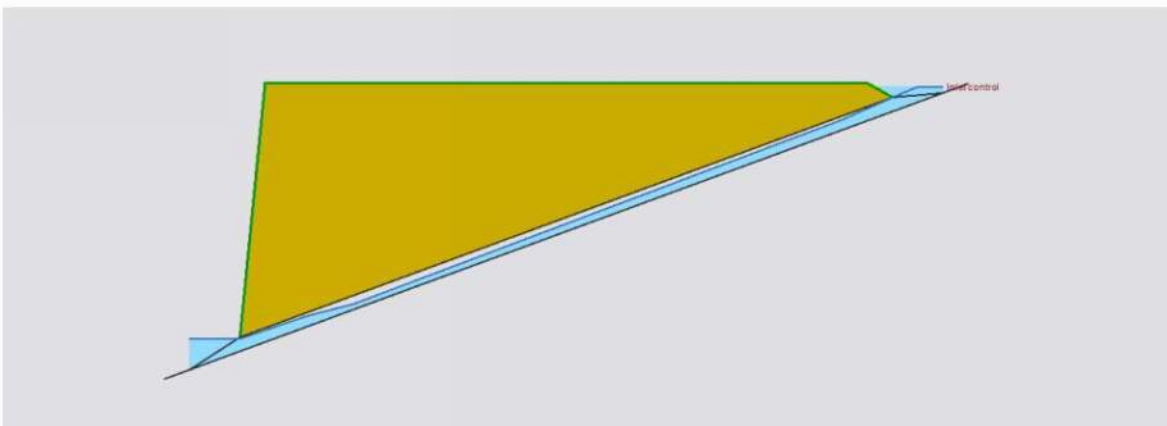


Figure 7- Existing 15" CPP Culvert Existing Flow Rate, 10-year Event



Additionally, flow through the existing 15-inch CPP culvert was analyzed using the 50-year design storm flow rate of 7.57-cfs, and is demonstrated in Figure 8, below:

Culvert Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc.

Friday, Jan 25 2019

Maplethorpe 15-inch CPP Culvert Existing Flow 50-year Event

| | | | |
|---------------------|----------------------------------|---------------------|-----------------|
| Invert Elev Dn (ft) | = 154.39 | Calculations | |
| Pipe Length (ft) | = 65.00 | Qmin (cfs) | = 0.82 |
| Slope (%) | = 32.86 | Qmax (cfs) | = 7.75 |
| Invert Elev Up (ft) | = 175.75 | Tailwater Elev (ft) | = (dc+D)/2 |
| Rise (in) | = 15.0 | | |
| Shape | = Circular | Highlighted | |
| Span (in) | = 15.0 | Qtotal (cfs) | = 6.82 |
| No. Barrels | = 1 | Qpipe (cfs) | = 6.82 |
| n-Value | = 0.022 | Qovertop (cfs) | = 0.00 |
| Culvert Type | = Circular Culvert | Veloc Dn (ft/s) | = 5.78 |
| Culvert Entrance | = Smooth tapered inlet throat | Veloc Up (ft/s) | = 6.21 |
| Coeff. K,M,c,Y,k | = 0.534, 0.555, 0.0196, 0.9, 0.2 | HGL Dn (ft) | = 155.54 |
| | | HGL Up (ft) | = 176.80 |
| Embankment | | Hw Elev (ft) | = 177.38 |
| Top Elevation (ft) | = 178.27 | Hw/D (ft) | = 1.30 |
| Top Width (ft) | = 60.00 | Flow Regime | = Inlet Control |
| Crest Width (ft) | = 60.00 | | |

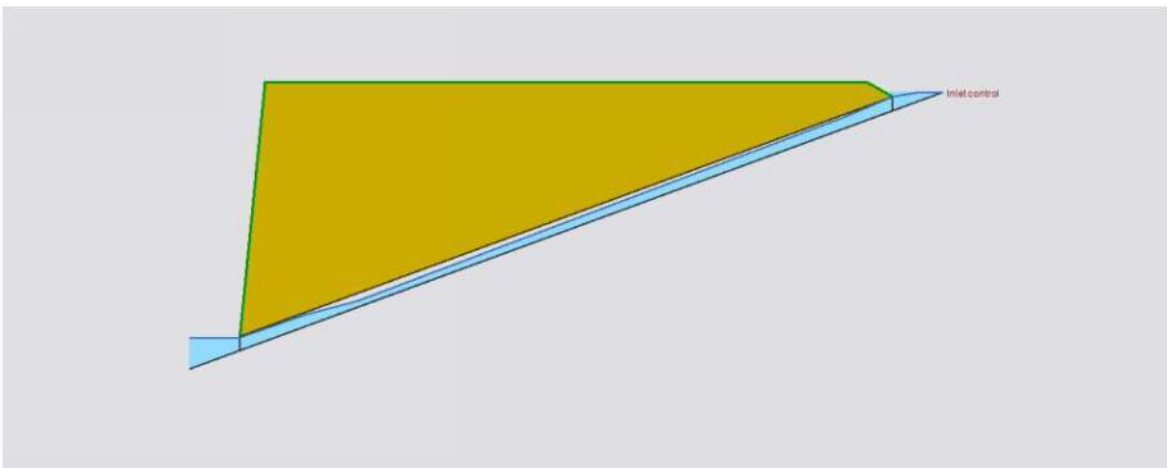


Figure 8 -Existing 15" CPP Culvert Existing Flow Rate, 50-year Event

As shown above, the site contributes approximately 5.3% of the runoff conveyed by the earthen channel.



Existing Conditions and Runoff Patterns (Route 2)

Currently, runoff from the site access road drains into the surface drainage system along Maplethorpe Dr, eventually spreading into the curb and gutter along Colleen Way. Existing conditions are shown in the photo below (figure 9):



Figure 8- Existing Conditions at Site Entrance

The portion of the site which currently drains indirectly into the ravine via curb & gutter along Maplethorpe Lane and/or Colleen Way is approximately 0.19 acres, of which 0.08 ac are impervious. Using the equation shown above and the weighted C shown below (C_{net}), these values provide the following flow rates off of the site:

$$C_{net} = \frac{(C_{imp} * A_{imp} + C_{perv} * A_{perv})}{A_{total}}$$

$$C_{net} = \frac{(0.9 * 0.08 + .30 * 0.11)}{0.19}$$

$$C_{net} = 0.56$$



2 yr: 0.14 cfs
10 yr: 0.22 cfs
25 yr: 0.26 cfs
50 yr: 0.30 cfs
100 yr: 0.33 cfs

Proposed Conditions and Downstream Impacts (ROUTE 1)

The Tributary Area that drains to the east will have a decrease of approximately 10,404 sf in total impervious area. In addition, the proposed conditions include provision of underground storage and infiltration areas. The underground storage area provides an infiltration contact area of approximately 591 sf.

Percolation testing of the site provides an infiltration rate 1.7 in/hr (see **Appendix B**). Use of this infiltration rate results in a volumetric infiltration rate of 0.11 cfs for the storage chamber system. This flow rate reduces the runoff rate from the site into the adjacent ravine.

Proposed conditions for Route 1 include the following areas:

Rooftops: 10,263 sf
 Asphaltic Concrete (AC): 11,824 sf
 Concrete: 7,720 sf
 Total Impervious: 29,807 (approx. 0.68 ac)
 Pervious areas: 115,808 sf (approx. 2.67 ac)
 Net C value is as follows:

$$C_{net} = \frac{(C_{imp} * A_{imp} + C_{perv} * A_{perv})}{A_{total}}$$

$$C_{net} = \frac{(0.9 * 29807 + .30 * 115808)}{145615}$$

$$C_{net} = 0.42$$

10-year storm event runoff from this portion of the site, without inclusion of the underground storage chamber system, is:

$$Q = CiA$$

$$Q = 0.42 * 2.1 * 3.45 = 3.04 \text{ cfs}$$

This Q is reduced by the infiltration in the storage chambers (0.11 cfs) to a net runoff rate for Route 1 of 2.93 cfs, reducing the runoff conveyed by the 15-inch CPP culvert (see Figure 9, below), the earthen channel which runs from north to south to the east of Mulberry Court and eventually reducing the runoff conveyed through the existing culvert under Soquel Drive. As the proposed development will reduce the loading of the existing facilities by 2.68 cfs (channels and culverts), no changes are recommended (see **Appendix C** for further calculations).



Culvert Report

Maplethorpe 15-inch CPP Culvert Proposed Flow

| | | |
|---------------------|---|--------------------------------|
| Invert Elev Dn (ft) | = | 154.39 |
| Pipe Length (ft) | = | 65.00 |
| Slope (%) | = | 32.86 |
| Invert Elev Up (ft) | = | 175.75 |
| Rise (in) | = | 15.0 |
| Shape | = | Circular |
| Span (in) | = | 15.0 |
| No. Barrels | = | 1 |
| n-Value | = | 0.022 |
| Culvert Type | = | Circular Corrugate Metal Pipe |
| Culvert Entrance | = | Mitered to slope (C) |
| Coeff. K,M,c,Y,k | = | 0.021, 1.33, 0.0463, 0.75, 0.7 |

Embankment

| | | |
|--------------------|---|--------|
| Top Elevation (ft) | = | 178.27 |
| Top Width (ft) | = | 60.00 |
| Crest Width (ft) | = | 60.00 |

Calculations

| | | |
|---------------------|---|----------|
| Qmin (cfs) | = | 0.93 |
| Qmax (cfs) | = | 2.93 |
| Tailwater Elev (ft) | = | (dc+D)/2 |

Highlighted

| | | |
|-----------------|---|---------------|
| Qtot (cfs) | = | 2.93 |
| Qpipe (cfs) | = | 2.93 |
| Qovertop (cfs) | = | 0.00 |
| Veloc Dn (ft/s) | = | 2.87 |
| Veloc Up (ft/s) | = | 4.24 |
| HGL Dn (ft) | = | 155.36 |
| HGL Up (ft) | = | 176.44 |
| Hw Elev (ft) | = | 177.08 |
| Hw/D (ft) | = | 1.06 |
| Flow Regime | = | Inlet Control |

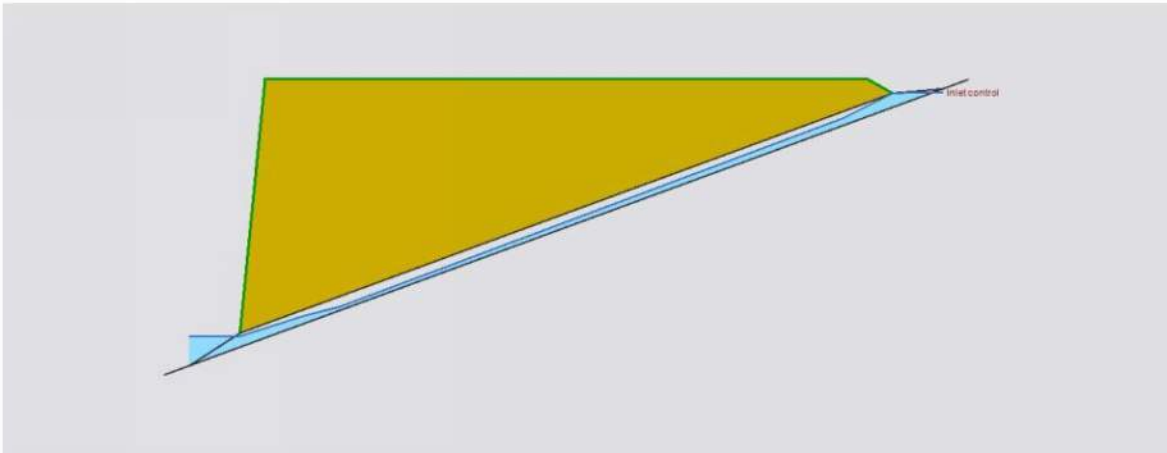


Figure 9- 15" CPP Culvert Proposed Flow Rate

50-year storm event runoff from this portion of the site, without inclusion of the underground storage chamber system, is:

$$Q = CiA$$

$$Q = 0.42 * 2.835 * 3.45 = 4.11 \text{ cfs}$$

This Q is reduced by the infiltration in the storage chambers (0.11 cfs) to a net runoff rate for Route 1 of 4.0 cfs, reducing the runoff conveyed by the 15-inch CPP culvert (see Figure 9, below), the earthen channel



which runs from north to south to the east of Mulberry Court and eventually reducing the runoff conveyed through the existing culvert under Soquel Drive. As the proposed development will reduce the loading of the existing facilities by 2.68 cfs (channels and culverts), no changes are recommended (see **Appendix C** for further calculations).

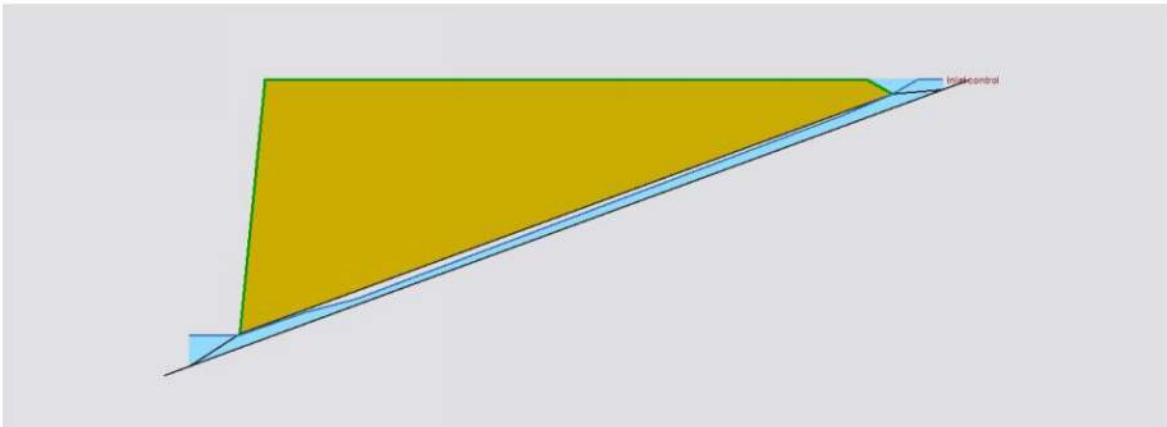
Culvert Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc.

Friday, Jan 25 2019

Maplethorpe 15-inch CPP Culvert Proposed Flow 50-year Event

| | | | |
|---------------------|----------------------------------|---------------------|-----------------|
| Invert Elev Dn (ft) | = 154.39 | Calculations | |
| Pipe Length (ft) | = 65.00 | Qmin (cfs) | = 1.26 |
| Slope (%) | = 32.86 | Qmax (cfs) | = 7.57 |
| Invert Elev Up (ft) | = 175.75 | Tailwater Elev (ft) | = (dc+D)/2 |
| Rise (in) | = 15.0 | | |
| Shape | = Circular | Highlighted | |
| Span (in) | = 15.0 | Qtotal (cfs) | = 7.26 |
| No. Barrels | = 1 | Qpipe (cfs) | = 6.53 |
| n-Value | = 0.022 | Qovertop (cfs) | = 0.73 |
| Culvert Type | = Circular Corrugate Metal Pipe | Veloc Dn (ft/s) | = 5.56 |
| Culvert Entrance | = Mitered to slope (C) | Veloc Up (ft/s) | = 6.05 |
| Coeff. K,M,c,Y,k | = 0.021, 1.33, 0.0463, 0.75, 0.7 | HGL Dn (ft) | = 155.53 |
| | | HGL Up (ft) | = 176.78 |
| Embankment | | Hw Elev (ft) | = 178.29 |
| Top Elevation (ft) | = 178.27 | Hw/D (ft) | = 2.03 |
| Top Width (ft) | = 60.00 | Flow Regime | = Inlet Control |
| Crest Width (ft) | = 60.00 | | |



Recommendations (ROUTE 1)

No changes to downstream drainage facilities are recommended for Route 1. As shown above, the project will reduce loading of the existing drainage facilities.



Proposed Conditions and Downstream Impacts (ROUTE 2)

The Tributary Area that drains to the west will have an increase of approximately 3,416 sf in total impervious area. The increase in impervious area will be accounted for by the provision of pervious pavers and associated underground storage and treatment located adjacent to the new impervious area and providing an infiltration contact area of 890 sf.

Use of the established infiltration rate of 1.7 in/hr results in a volumetric infiltration rate of 0.03 cfs. This flow rate reduces the runoff rate from the site into the curb and gutter along both Maplethorpe Dr and Colleen Way.

Proposed conditions for Route 2 include the following areas:

Asphaltic Concrete (AC): 6,025 sf

Concrete: 920 sf

Total Impervious: 6,945 (approx. 0.16 ac)

Pervious areas: 1,050 sf (approx. 0.02 ac)

Net C value is as follows:

$$C_{net} = \frac{(C_{imp} * A_{imp} + C_{perv} * A_{perv})}{A_{total}}$$

$$C_{net} = \frac{(0.9 * 6945 + .30 * 1050)}{7995}$$

$$C_{net} = 0.82$$

10-year event runoff from this portion of the site, without inclusion of the pervious paver system, is:

$$Q = CiA$$

$$Q = 0.82 * 2.1 * .18 = 0.31 \text{ cfs}$$

This Q is reduced by the infiltration in the pervious paver section (0.03 cfs) to a net runoff rate for Route 2 of 0.28 cfs, which represents an increase in runoff of approximately 0.28 cfs – 0.22 cfs = 0.06 cfs into the curb and gutter along Maplethorpe Lane and Colleen Way. This runoff rate is reduced by the outlet structure to match existing conditions.

The increase in runoff is mitigated by the provision of an outlet structure which conveys runoff not infiltrated in the underground chambers to the curb and gutter along Maplethorpe Dr. Runoff released by this outlet structure flows across the driveway apron and into the gutter. The rim elevation of the outlet structure is such that the entire volume of the chambers is retained, including the required detention volume. Drawdown time for the chamber system from full (449 cf, see **Appendix C**) to empty is approximately 8.9 hours.

The underground storage facility effectively retains and infiltrates the design 10-year storm, reducing runoff from the project to runoff from the small area that is infeasible to treat. This area includes approximately 1,000 sf of impervious area, approximately 2,529 sf less than existing conditions. This reduction in impervious area results in a decrease in runoff from 0.22 cfs to 0.06 cfs.



50-year event runoff from this portion of the site, without inclusion of the pervious paver system, is:

$$Q = CiA$$

$$Q = 0.82 * 2.84 * .18 = 0.42 \text{ cfs}$$

This Q is reduced by the infiltration in the storage chambers (0.03 cfs) to a net runoff rate for Route 2 of 0.39 cfs, which represents an increase in runoff of approximately 0.39 cfs – 0.30 cfs = 0.09 cfs into the curb and gutter along Maplethorpe Lane and Colleen Way during a 50-year event.

Recommendations (ROUTE 2)

Route 2 results in a reduction in runoff being conveyed into the existing storm facilities along either Maplethorpe Lane or Colleen Way during a 10-year event. As such, no recommendations are made for alterations to the existing facilities.

Culvert Condition

The exact condition of the existing culvert is unknown at this time. The culvert will be televised prior to final design work. Once the culvert condition is determined, the project Geotechnical engineer will be consulted to establish any necessary rehabilitation.

Culvert Inspection and Maintenance

The existing culvert extends through a portion of the site which is proposed to be sold. The intention is that the sale will include establishment of an easement on behalf of the Maplethorpe HOA allowing access for inspections and maintenance of the culvert.

ROUTE 1 – TRIBUTARY AREAS & CAPACITY ANALYSIS LOCATIONS

Capacity Analysis was conducted for existing conditions at the 4' x 4' concrete culvert. No analysis of the proposed conditions is provided, as the flow through the culvert will be reduced by the proposed improvements. The Rational method was used to calculate the flow. The tributary area was quantified by using the 'Area Tool' function on the Santa Cruz County GIS Website (see Figure 2, above). The runoff coefficient used was derived from Fig. SWM-1 (in the County Design Criteria, CDC), using the lowest value provided for 'Low residential (Single family dwelling)' which is 0.45. The use of the lowest value provided is based on the large lot sizes and large undeveloped areas included in the tributary area. Rain fall intensities were taken from Fig. SWM-2 & 3, as detailed above.

In evaluating the capacity of the concrete culvert at Maplethorpe Dr. and Soquel Dr., capacity is shown to be adequate for a 10-yr storm event, as shown in Figure 10, below:



Culvert Report

4 x 4 Box Culvert at Maplethorpe and Soquel

| | | |
|---------------------|---|-----------------------------|
| Invert Elev Dn (ft) | = | 115.36 |
| Pipe Length (ft) | = | 55.00 |
| Slope (%) | = | 8.25 |
| Invert Elev Up (ft) | = | 119.90 |
| Rise (in) | = | 48.0 |
| Shape | = | Box |
| Span (in) | = | 48.0 |
| No. Barrels | = | 1 |
| n-Value | = | 0.012 |
| Culvert Type | = | Flared Wingwalls |
| Culvert Entrance | = | 30D to 75D wingwall flares |
| Coeff. K,M,c,Y,k | = | 0.026, 1, 0.0347, 0.81, 0.4 |

| | |
|---------------------|------------|
| Calculations | |
| Qmin (cfs) | = 0.00 |
| Qmax (cfs) | = 105.84 |
| Tailwater Elev (ft) | = (dc+D)/2 |

| | |
|--------------------|----------|
| Embankment | |
| Top Elevation (ft) | = 132.20 |
| Top Width (ft) | = 40.00 |
| Crest Width (ft) | = 0.00 |

| | |
|--------------------|-----------------|
| Highlighted | |
| Qtotal (cfs) | = 105.00 |
| Qpipe (cfs) | = 105.00 |
| Qovertop (cfs) | = 0.00 |
| Veloc Dn (ft/s) | = 7.75 |
| Veloc Up (ft/s) | = 9.46 |
| HGL Dn (ft) | = 118.75 |
| HGL Up (ft) | = 122.67 |
| Hw Elev (ft) | = 124.47 |
| Hw/D (ft) | = 1.14 |
| Flow Regime | = Inlet Control |

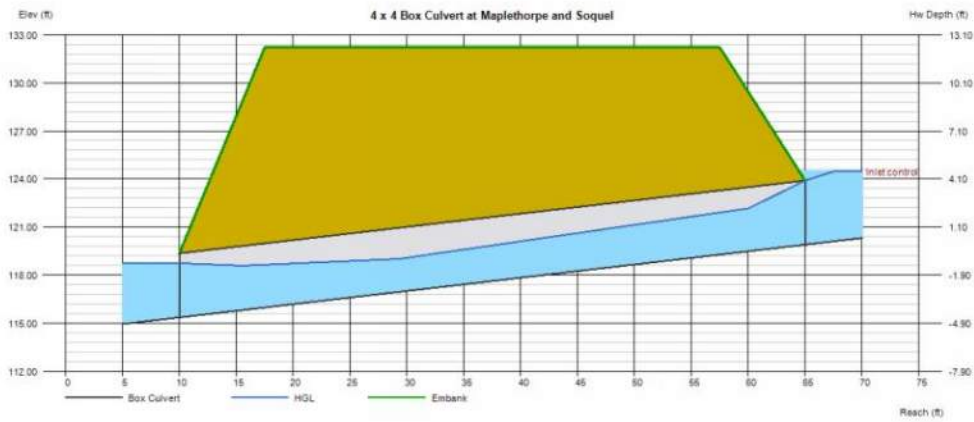


Figure 10- Culvert flow

The capacity of the concrete culvert at Maplethorpe Dr. and Soquel Dr. was evaluated for a 50-year storm event. 50-year flow rate was found to be $105.84 \times 1.35 = 142.88$, capacity is thus shown to be adequate for a 50-yr storm event, as shown in Figure 10, below:



Culvert Report

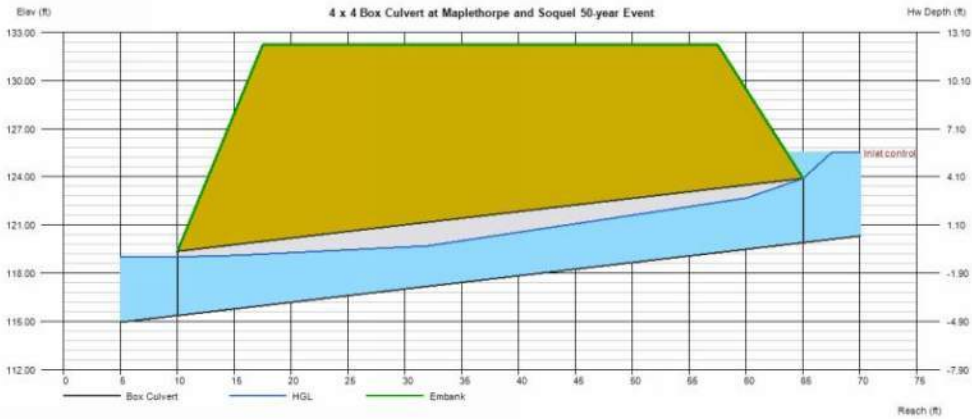
4 x 4 Box Culvert at Maplethorpe and Soquel 50-year Event

Invert Elev Dn (ft) = 115.36
 Pipe Length (ft) = 55.00
 Slope (%) = 8.25
 Invert Elev Up (ft) = 119.90
 Rise (in) = 48.0
 Shape = Box
 Span (in) = 48.0
 No. Barrels = 1
 n-Value = 0.012
 Culvert Type = Flared Wingwalls
 Culvert Entrance = 30D to 75D wingwall flares
 Coeff. K,M,c,Y,k = 0.026, 1, 0.0347, 0.81, 0.4

Calculations
 Qmin (cfs) = 0.00
 Qmax (cfs) = 142.88
 Tailwater Elev (ft) = $(dc+D)/2$

Embankment
 Top Elevation (ft) = 132.20
 Top Width (ft) = 40.00
 Crest Width (ft) = 0.00

Highlighted
 Qtotal (cfs) = 136.50
 Qpipe (cfs) = 136.50
 Qovertop (cfs) = 0.00
 Veloc Dn (ft/s) = 9.34
 Veloc Up (ft/s) = 10.33
 HGL Dn (ft) = 119.01
 HGL Up (ft) = 123.20
 Hw Elev (ft) = 125.50
 Hw/D (ft) = 1.40
 Flow Regime = Inlet Control



Summary: *The capacity analysis of the existing drainage system indicates that it is adequate to handle both the 10-year storm event and the 50-year storm event. In addition, analysis of the proposed conditions demonstrates that loading of the off-site and downstream drainage facilities will be reduced by the proposed improvements.*

If you have any questions with the information provided in this report, please contact our office.

Thank you,

Josh Wolff, P.E.
Associate Engineer

Todd Creamer, PE
Principal Engineer

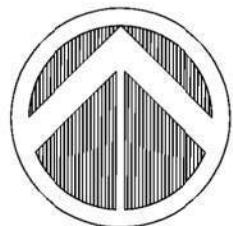


ATTACHMENT "A"

- *Existing Tributary Areas*
- *Proposed Tributary Areas*

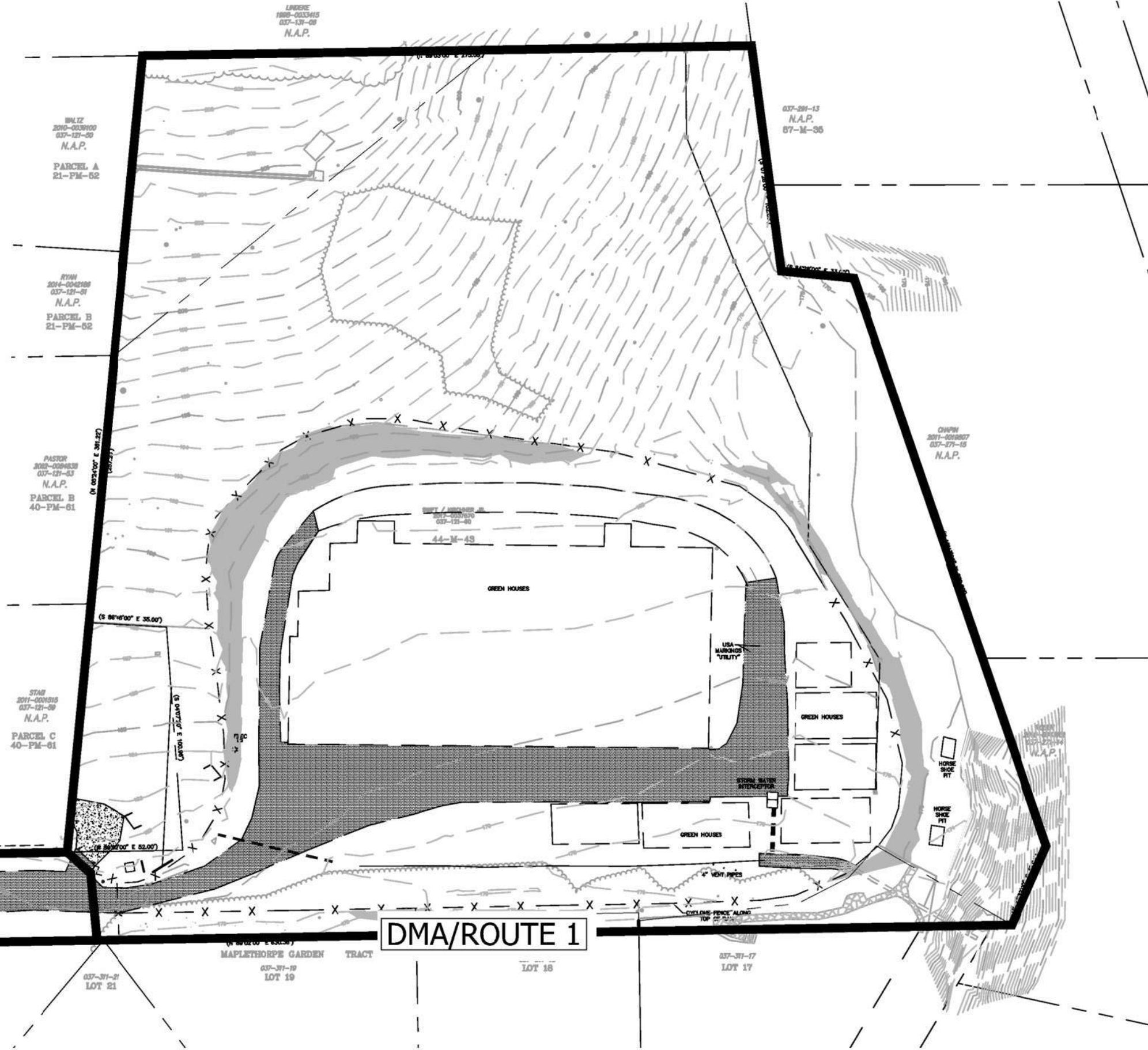


| EXISTING AREA BREAKDOWN | |
|---------------------------|--------|
| DMA/ROUTE 1 | |
| ROOF | 21600 |
| AC | 10891 |
| CONCRETE | 7720 |
| TOTAL IMPERVIOUS | 40211 |
| LANDSCAPING/NATURAL AREAS | 104909 |
| TOTAL AREA | 145120 |
| DMA/ROUTE 2 | |
| ROOF | 0 |
| AC | 3529 |
| CONCRETE | 0 |
| TOTAL IMPERVIOUS | 3529 |
| LANDSCAPING/NATURAL AREAS | 4961 |
| TOTAL AREA | 8490 |



NORTH

SCALE: 1"=50'



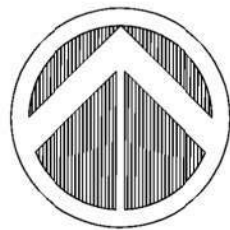
DMA/ROUTE 2

DMA/ROUTE 1

| | |
|--|---------|
| BY | |
| REVISIONS | |
| EXISTING TRIBUTARY AREAS | |
| C2G / CIVIL CONSULTANTS GROUP, INC. Engineers/Planners 4444 Scans Valley Drive / Suite 6 Soquel Valley, CA 95066 T (831) 438-4420 F (831) 438-4420 | |
| 3300 MAPLETHORPE LANE SOQUEL, CA APN: 037-121-60 | |
| Date: | 7/31/18 |
| Scale: | 1"=50' |
| Drawn: | JW |
| Job: | 480-00 |
| Sheet: | EXH-1 |
| Of 3 Sheets | |

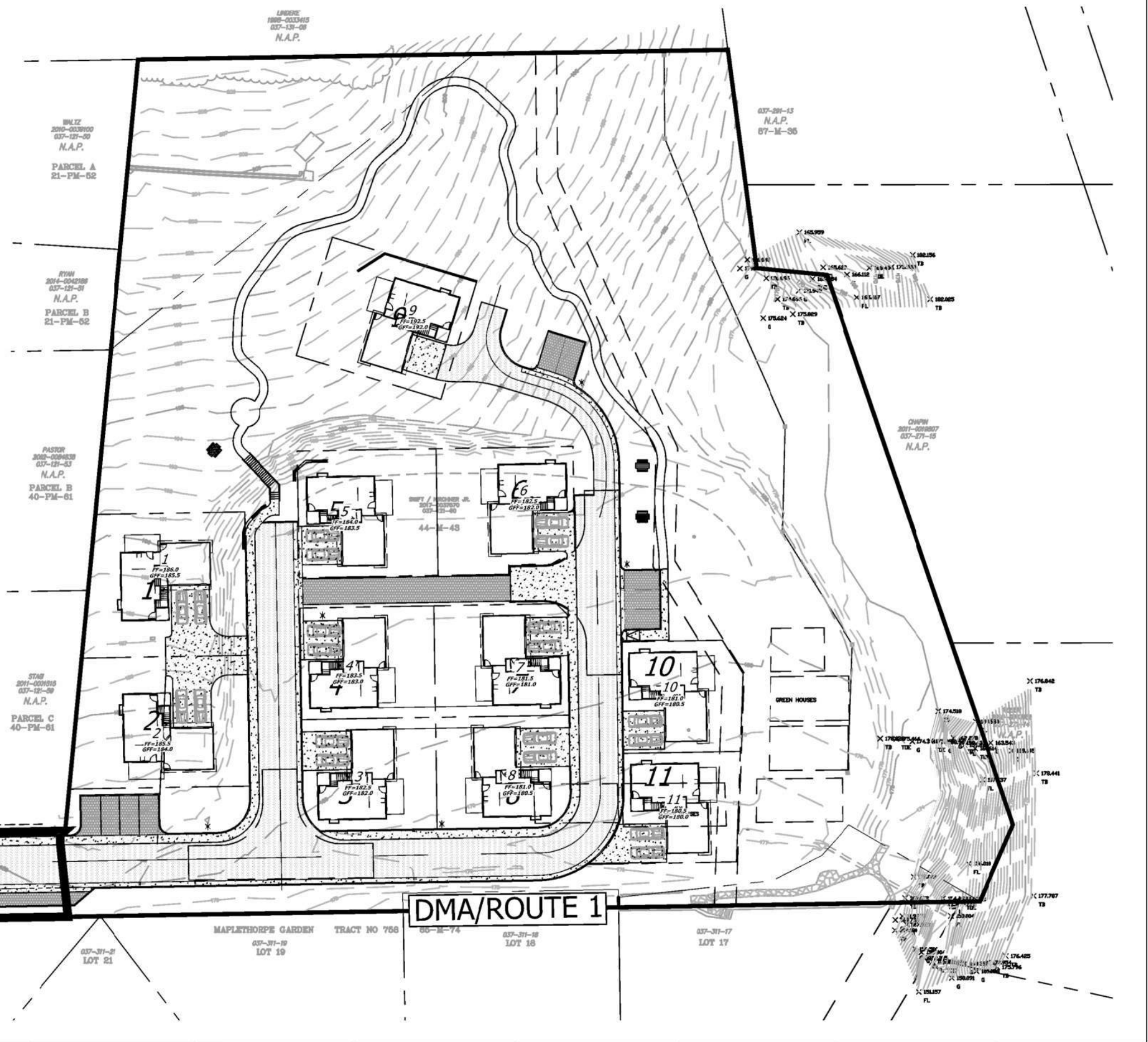
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 Layout: Existing DMA
 Last Saved: Tue Jul 31, 2018 - 1:14pm
 Last Plotted: Tue Jul 31, 2018 - 1:37pm
 By:

| PROPOSED AREA BREAKDOWN | |
|---------------------------|--------|
| DMA/ROUTE 1 | |
| ROOF | 10263 |
| AC | 11824 |
| CONCRETE | 7720 |
| TOTAL IMPERVIOUS | 29807 |
| PERVIOUS PAVERS | 1208 |
| LANDSCAPING/NATURAL AREAS | 114600 |
| TOTAL AREA | 145615 |
| DMA/ROUTE 2 | |
| ROOF | 0 |
| AC | 6025 |
| CONCRETE | 920 |
| TOTAL IMPERVIOUS | 6945 |
| PERVIOUS PAVERS | 0 |
| LANDSCAPING/NATURAL AREAS | 1050 |
| TOTAL AREA | 7995 |



NORTH

SCALE: 1"=50'



DMA/ROUTE 2

DMA/ROUTE 1

| | | | | |
|---|---------|--|--|--|
| BY | | | | |
| REVISIONS | | | | |
| PROPOSED TRIBUTARY AREAS | | | | |
| C2G / CIVIL CONSULTANTS GROUP, INC. Engineers/Planners 4444 Scans Valley Drive / Suite 6 Scans Valley, CA 95066 T (931) 538-4420 F (931) 538-4420 | | | | |
| 3300 MAPLETHORPE LANE SOQUEL, CA APN: 037-121-60 | | | | |
| Date: | 7/31/18 | | | |
| Scale: | 1"=50' | | | |
| Drawn: | JW | | | |
| Job: | 480-00 | | | |
| Sheet: | EXH-2 | | | |
| Of 3 Sheets | | | | |

Drawing: W:\480-00 Maplethorpe Ln \Downstream Impact Report\Exhibits\480-00 - PROPOSED TRIBUTARY AREAS.dwg
 Layout: CG1 - SWMP
 Last Saved: Wed Jul 18, 2018 - 2:57pm
 Last Plotted: Tue Jul 31, 2018 - 1:35pm

ATTACHMENT "B"

- *Site Percolation Report*





Dees & Associates, Inc.
Geotechnical Engineers

501 Mission Street, Suite 8A Santa Cruz, CA 95060

Phone (831) 427-1770 Fax (831) 427-1794

December 13, 2017
Revised December 11, 2018

Project No. SCR-1183

JOHN SWIFT
500 Chestnut Street, Suite 100
Santa Cruz, California 95060

Subject: Percolation Test Results

Reference: 3300 Maplethorpe Lane, Soquel
APN 037-121-60
Santa Cruz County, California

Dear Mr. Swift:

This report presents a summary of our percolation test results at the referenced site. The purpose of our percolation testing was to determine the soils permeability for use in on-site storm water retention design.

Our scope of work included installation of three (3) percolation test borings drilled 4.5 feet, 9 feet and 15 feet in depth; percolation testing; engineering analysis and preparation of this report. The attached Boring Site Plan, Figure 1, depicts the location of the percolation testing.

The borings were drilled with 6-inch diameter continuous flight auger equipment. Upon removal of the soil from the borings, 2 to 8 inches of pre-washed pea gravel was placed at the bottom. The test holes were fitted with 4-inch diameter, perforated, PVC pipe and the annuli were packed with pre-washed pea gravel. Then the percolation holes were pre-saturated with water twenty-four hours prior to testing.

The percolation tests were performed so that we tested the soil zones between 1 and 4 feet, 6 and 9.5 feet, and 10 to 15 feet. Water was added to the hole at the start of the test then measured at 30 minute time intervals for a period of 4 hours. Water was added after each reading, as needed during the test, to maintain the water level in the zone of interest.

Our test results indicated the soils above 5 feet and between 9 and 15 feet have a percolation rate of zero. The soils between 6 and 9 feet have a percolation rate of 1.75 inches per hour. This value may be multiplied by the wetted surface area of the retention system in design. Our raw field data was adjusted to account for the presence of a gravel and pipe in the hole and the surface area being tested. Our field data and calculations are attached.

DEES & ASSOCIATES, INC.


Rebecca L. Dees
Geotechnical Engineer
G.E. 2623



Attachments

Copies: 4 to Addressee

ATTACHMENT "C"

- *Runoff Calculations*



RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

Data Entry: **PRESS TAB & ENTER DESIGN VALUES** SS Ver: 1.0

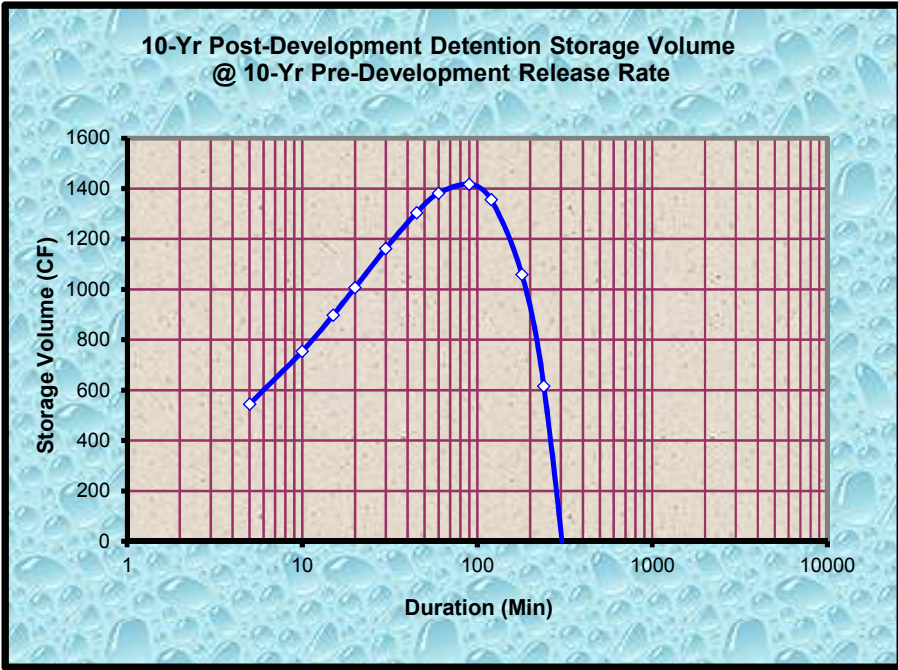
Site Location P60 Isopleth: **1.50** Fig. SWM-2 in County Design Criteria
 Rational Coefficients Cpre: **0.25** See note # 2
 Cpost: **0.90** See note # 2
 Impervious Area: **29807** ft² See note # 2 and # 4

STRUCTURE DIMENSIONS FOR DETENTION

1418 ft³ storage volume calculated
100 % void space assumed
 1418 ft³ excavated volume needed

| Structure Ratios | Length | Width* | Depth* | *For pipe, use the square root of the sectional area |
|--------------------|--------------|-------------|-------------|--|
| | 25.00 | 2.00 | 2.00 | |
| Dimen. (ft) | 60.50 | 4.84 | 4.84 | |

| 10 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|------------------------|-----------------------------|-----------------------------|-----------------------|---------------------------------|-------------------------------|
| Storm Duration (min) | 10 - Year Intensity (in/hr) | 10 - Yr. Release Qpre (cfs) | 10 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.26 | 0.044 | 0.160 | -0.147 | -15908 |
| 1200 | 0.28 | 0.048 | 0.172 | -0.134 | -12103 |
| 960 | 0.31 | 0.053 | 0.189 | -0.117 | -8451 |
| 720 | 0.34 | 0.059 | 0.214 | -0.093 | -5011 |
| 480 | 0.41 | 0.071 | 0.254 | -0.053 | -1895 |
| 360 | 0.46 | 0.080 | 0.287 | -0.020 | -531 |
| 240 | 0.55 | 0.095 | 0.341 | 0.034 | 615 |
| 180 | 0.62 | 0.107 | 0.385 | 0.078 | 1059 |
| 120 | 0.74 | 0.127 | 0.458 | 0.151 | 1356 |
| 90 | 0.83 | 0.144 | 0.517 | 0.210 | 1418 |
| 60 | 0.99 | 0.171 | 0.614 | 0.307 | 1381 |
| 45 | 1.12 | 0.193 | 0.693 | 0.387 | 1305 |
| 30 | 1.33 | 0.229 | 0.823 | 0.517 | 1162 |
| 20 | 1.57 | 0.272 | 0.978 | 0.671 | 1007 |
| 15 | 1.78 | 0.307 | 1.105 | 0.798 | 898 |
| 10 | 2.11 | 0.364 | 1.312 | 1.005 | 754 |
| 5 | 2.83 | 0.489 | 1.760 | 1.453 | 545 |



Notes & Limitations on Use:

- 1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
- 2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
- 3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
- 4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
- 5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
- 6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

PROJECT: **Maplethorpe (DMA 1)**

Calc by: **JW**

Date: **7/17/2018**

RUNOFF RETENTION BY THE STORAGE PERCOLATION METHOD

Data Entry: **PRESS TAB KEY & ENTER DESIGN VALUES**

Notes & Limitations on Use:

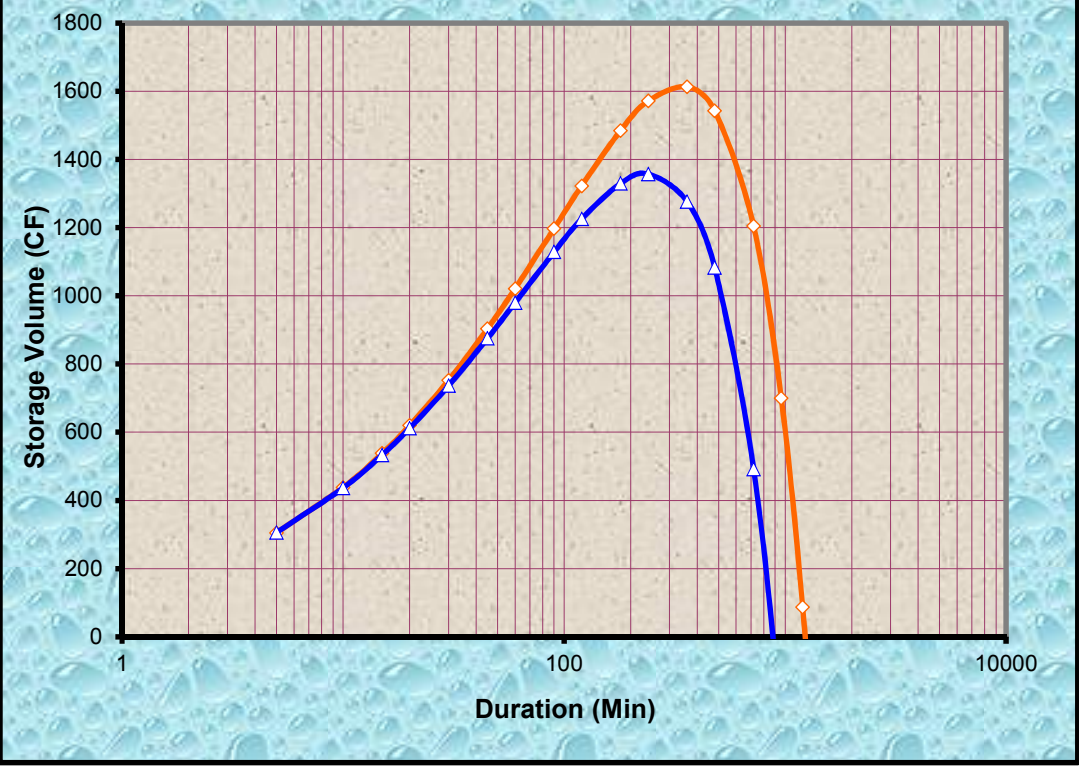
SS Ver:1.0

| | | |
|------------------------------|--------------|-----------------|
| Site Location P60 Isoleth: | 1.50 | Fig. SWM-2 |
| Rational Coefficients Cpre: | 0.25 | |
| Cpost: | 0.90 | |
| Impervious Area: | 29807 | ft ² |
| Saturated Soil Permeability: | 1.75 | in/hr |

Saturated soil permeability values may be used conservatively from the USDA-NRCS soil survey, or use actual test values.
 Site selection and design shall give proper consideration to the path for excess flows downstream of the designated retention area.
 Retention site location on, or immediately above, slopes exceeding 15% will require consulting a geotechnical engineer.
 Gravel packed structures shall use washed, angular, uniformly graded aggregate providing not less than 35% void space.
 Refer to the County of Santa Cruz Design Criteria, Stormwater Management - Section H, for complete method criteria.

| 2 - YEAR DESIGN STORM | | | | RETENTION @ 120 MIN. | | STRUCTURE DIMENSIONS FOR RETENTION | | | | DETENTION @ 60 MIN. | | |
|-----------------------|----------------------------|--------------|--------------|---------------------------------|--------------------------------|--|---|-------------|---------------------|---------------------------------|--------------------------------|--|
| Storm Duration (min) | 2 - Year Intensity (in/hr) | Qpre (cfs) | Qpost (cfs) | Retention Rate To Storage (cfs) | Specified Retained Volume (cf) | 1357 | ft ³ storage volume calculated | | | Detention Rate To Storage (cfs) | Specified Detained Volume (cf) | |
| 1440 | 0.16 | 0.028 | 0.102 | 0.021 | -2089 | 40 | % void space assumed | | | | | |
| 1200 | 0.18 | 0.031 | 0.110 | 0.029 | -1138 | 3393 | ft ³ excavated volume needed | | | | | |
| 960 | 0.20 | 0.034 | 0.121 | 0.040 | -268 | Structure Ratios | Length | Width* | Depth* [#] | | | |
| 720 | 0.22 | 0.038 | 0.137 | 0.056 | 492 | | 25.00 | 2.00 | 2.00 | | | |
| 480 | 0.26 | 0.045 | 0.163 | 0.081 | 1082 | Dimen. (ft) | 80.93 | 6.47 | 6.47 | | | |
| 360 | 0.30 | 0.051 | 0.184 | 0.102 | 1276 | 1656 | ft ² internal surface area | | | | | |
| 240 | 0.35 | 0.061 | 0.218 | 0.137 | 1357 | 1159 | ft ² effective surface area | | | | | |
| 180 | 0.40 | 0.068 | 0.247 | 0.165 | 1329 | 8.0 | hrs estimated structure drainage time | | | | | |
| 120 | 0.47 | 0.081 | 0.293 | 0.211 | 1226 | * For pipe, use the square root of the sectional area. # If cell values displayed are corrupted, enter zero for depth, then re-enter a positive numeric value within allowed range. | | | | | | |
| 90 | 0.53 | 0.092 | 0.331 | 0.249 | 1128 | STRUCTURE DIMENSIONS FOR DETENTION | | | | | | |
| 60 | 0.63 | 0.109 | 0.393 | 0.311 | 980 | 1613 | ft ³ storage volume calculated | | | | | |
| 45 | 0.71 | 0.123 | 0.444 | 0.362 | 875 | 100 | % void space assumed | | | | | |
| 30 | 0.85 | 0.146 | 0.527 | 0.446 | 736 | 1613 | ft ³ excavated volume needed | | | | | |
| 20 | 1.01 | 0.174 | 0.626 | 0.545 | 612 | Structure Ratios | Length | Width* | Depth* | | | |
| 15 | 1.14 | 0.196 | 0.707 | 0.626 | 533 | | 25.00 | 2.00 | 2.00 | | | |
| 10 | 1.35 | 0.233 | 0.840 | 0.758 | 437 | Dimen. (ft) | 63.17 | 5.05 | 5.05 | | | |
| 5 | 1.81 | 0.313 | 1.126 | 1.045 | 306 | | | | | 1.017 | 305 | |

2 - Year Retention or Detention Storage Volume



Chamber Model HS180
 Number of Chambers 12
 Number of Endcaps 6
 Stone Voids (porosity) 40%
 Base of Stone Elevation 171 ft
 Recommended Stone Below Chambers* 12 in.
 Recommended Stone Above Chambers* 12 in.



Include perimeter stone? Yes
 Standard or metric? Standard

Area of System** 841 sq.ft
 **Area must be greater than: 751.09 sq.ft

*The minimum stone below and above the chambers to be determined by the design engineer.

| System Height (Inches) | Incremental Single Chamber Storage (cu.ft) | Incremental Single End Cap Storage (cu.ft) | Incremental Total Chamber Storage (cu.ft) | Incremental Total End Cap Storage (cu.ft) | Incremental Stone Storage (cu.ft) | Incremental Chamber, End Cap, & Stone (cu.ft) | Cumulative Total Storage for System (cu.ft) | Cumulative System Storage (cu.ft) | Elevation (ft) |
|------------------------|--|--|---|---|-----------------------------------|---|---|-----------------------------------|----------------|
| 69 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 2,807.22 | 176.75 |
| 68 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 2,779.19 | 176.67 |
| 67 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 2,751.15 | 176.58 |
| 66 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 2,723.12 | 176.50 |
| 65 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 2,695.09 | 176.42 |
| 64 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 2,667.05 | 176.33 |
| 63 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 2,639.02 | 176.25 |
| 62 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 2,610.99 | 176.17 |
| 61 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 2,582.95 | 176.08 |
| 60 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 2,554.92 | 176.00 |
| 59 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 2,526.89 | 175.92 |
| 58 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 2,498.85 | 175.83 |
| 57 | 0.18 | 0.59 | 2.19 | 3.52 | 25.75 | 31.46 | 31.46 | 2,470.82 | 175.75 |
| 56 | 0.31 | 0.58 | 3.77 | 3.50 | 25.13 | 32.40 | 32.40 | 2,439.36 | 175.67 |
| 55 | 0.44 | 0.58 | 5.31 | 3.48 | 24.52 | 33.31 | 33.31 | 2,406.97 | 175.58 |
| 54 | 0.63 | 0.58 | 7.52 | 3.46 | 23.64 | 34.62 | 34.62 | 2,373.66 | 175.50 |
| 53 | 1.02 | 0.57 | 12.29 | 3.43 | 21.75 | 37.46 | 37.46 | 2,339.04 | 175.42 |
| 52 | 1.27 | 0.56 | 15.26 | 3.39 | 20.57 | 39.22 | 39.22 | 2,301.58 | 175.33 |
| 51 | 1.46 | 0.56 | 17.54 | 3.35 | 19.68 | 40.56 | 40.56 | 2,262.35 | 175.25 |
| 50 | 1.62 | 0.55 | 19.44 | 3.30 | 18.94 | 41.67 | 41.67 | 2,221.79 | 175.17 |
| 49 | 1.76 | 0.54 | 21.08 | 3.24 | 18.30 | 42.63 | 42.63 | 2,180.12 | 175.08 |
| 48 | 1.88 | 0.53 | 22.53 | 3.19 | 17.75 | 43.47 | 43.47 | 2,137.49 | 175.00 |
| 47 | 1.99 | 0.52 | 23.83 | 3.12 | 17.25 | 44.21 | 44.21 | 2,094.02 | 174.92 |
| 46 | 2.08 | 0.51 | 25.01 | 3.06 | 16.81 | 44.87 | 44.87 | 2,049.81 | 174.83 |
| 45 | 2.17 | 0.50 | 26.08 | 2.99 | 16.41 | 45.47 | 45.47 | 2,004.94 | 174.75 |
| 44 | 2.26 | 0.49 | 27.06 | 2.92 | 16.04 | 46.02 | 46.02 | 1,959.47 | 174.67 |
| 43 | 2.33 | 0.47 | 27.99 | 2.85 | 15.70 | 46.54 | 46.54 | 1,913.44 | 174.58 |
| 42 | 2.41 | 0.46 | 28.87 | 2.77 | 15.38 | 47.02 | 47.02 | 1,866.90 | 174.50 |
| 41 | 2.48 | 0.45 | 29.71 | 2.70 | 15.07 | 47.47 | 47.47 | 1,819.88 | 174.42 |
| 40 | 2.54 | 0.44 | 30.50 | 2.62 | 14.79 | 47.90 | 47.90 | 1,772.41 | 174.33 |
| 39 | 2.60 | 0.42 | 31.25 | 2.53 | 14.52 | 48.30 | 48.30 | 1,724.51 | 174.25 |
| 38 | 2.66 | 0.41 | 31.96 | 2.45 | 14.27 | 48.68 | 48.68 | 1,676.20 | 174.17 |
| 37 | 2.72 | 0.39 | 32.64 | 2.37 | 14.03 | 49.04 | 49.04 | 1,627.52 | 174.08 |
| 36 | 2.77 | 0.37 | 33.28 | 2.25 | 13.82 | 49.35 | 49.35 | 1,578.48 | 174.00 |
| 35 | 2.82 | 0.37 | 33.88 | 2.19 | 13.60 | 49.68 | 49.68 | 1,529.14 | 173.92 |
| 34 | 2.87 | 0.35 | 34.46 | 2.10 | 13.41 | 49.97 | 49.97 | 1,479.46 | 173.83 |
| 33 | 2.92 | 0.34 | 35.00 | 2.01 | 13.23 | 50.24 | 50.24 | 1,429.49 | 173.75 |
| 32 | 2.96 | 0.32 | 35.57 | 1.91 | 13.04 | 50.52 | 50.52 | 1,379.25 | 173.67 |
| 31 | 3.00 | 0.30 | 35.98 | 1.80 | 12.92 | 50.70 | 50.70 | 1,328.73 | 173.58 |
| 30 | 3.04 | 0.28 | 36.43 | 1.69 | 12.79 | 50.90 | 50.90 | 1,278.02 | 173.50 |
| 29 | 3.07 | 0.27 | 36.85 | 1.60 | 12.65 | 51.10 | 51.10 | 1,227.12 | 173.42 |
| 28 | 3.11 | 0.25 | 37.26 | 1.50 | 12.53 | 51.29 | 51.29 | 1,176.02 | 173.33 |
| 27 | 3.14 | 0.23 | 37.66 | 1.41 | 12.41 | 51.47 | 51.47 | 1,124.73 | 173.25 |
| 26 | 3.17 | 0.22 | 38.05 | 1.31 | 12.29 | 51.65 | 51.65 | 1,073.25 | 173.17 |
| 25 | 3.20 | 0.20 | 38.42 | 1.22 | 12.18 | 51.82 | 51.82 | 1,021.60 | 173.08 |
| 24 | 3.23 | 0.19 | 38.79 | 1.13 | 12.07 | 51.98 | 51.98 | 969.79 | 173.00 |
| 23 | 3.26 | 0.17 | 39.14 | 1.04 | 11.96 | 52.14 | 52.14 | 917.81 | 172.92 |
| 22 | 3.29 | 0.16 | 39.50 | 0.95 | 11.85 | 52.31 | 52.31 | 865.67 | 172.83 |
| 21 | 3.32 | 0.14 | 39.85 | 0.86 | 11.75 | 52.46 | 52.46 | 813.37 | 172.75 |
| 20 | 3.35 | 0.12 | 40.19 | 0.74 | 11.66 | 52.59 | 52.59 | 760.91 | 172.67 |
| 19 | 3.38 | 0.10 | 40.52 | 0.58 | 11.59 | 52.70 | 52.70 | 708.32 | 172.58 |
| 18 | 3.40 | 0.08 | 40.86 | 0.49 | 11.49 | 52.84 | 52.84 | 655.62 | 172.50 |
| 17 | 3.43 | 0.07 | 41.19 | 0.41 | 11.39 | 53.00 | 53.00 | 602.78 | 172.42 |
| 16 | 3.46 | 0.05 | 41.54 | 0.29 | 11.30 | 53.14 | 53.14 | 549.79 | 172.33 |
| 15 | 3.49 | 0.03 | 41.88 | 0.19 | 11.20 | 53.28 | 53.28 | 496.65 | 172.25 |
| 14 | 3.52 | 0.01 | 42.21 | 0.08 | 11.12 | 53.41 | 53.41 | 443.37 | 172.17 |
| 13 | 3.55 | 0.00 | 42.54 | 0.01 | 11.01 | 53.57 | 53.57 | 389.97 | 172.08 |
| 12 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 336.40 | 172.00 |
| 11 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 308.37 | 171.92 |
| 10 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 280.33 | 171.83 |
| 9 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 252.30 | 171.75 |
| 8 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 224.27 | 171.67 |
| 7 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 196.23 | 171.58 |
| 6 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 168.20 | 171.50 |
| 5 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 140.17 | 171.42 |
| 4 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 112.13 | 171.33 |
| 3 | 0.00 | 0.00 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 84.10 | 171.25 |
| 2 | 0.000 | 0.000 | 0.00 | 0.00 | 28.03 | 28.03 | 28.03 | 56.07 | 171.17 |

Restrictor Description: StormTech MC 3500

Project Name: **Maplethorpe**

Job Number: 480-00

Date: January 25, 2019

RESTRICTOR SIZE, ORIFICE METHOD (Circular Opening)

| | | | | | | Value |
|-------------------------------------|--|--|--|--|--|-------------|
| 1. HIGHWATER ELEVATION | | | | | | 180.00 |
| 2. INVERT ELEVATION | | | | | | 173.95 |
| 3. DIAMETER OF RESTRICTOR IN INCHES | | | | | | 1.25 |
| 4. CROSS SECTIONAL AREA, SQ. FT. | | | | | | 0.01 |
| 5. HEAD, FT. | | | | | | 6.00 |
| 6. DISCHARGE COEFFICIENT | | | | | | 0.50 |
| <i>SQUARE EDGE 0.79 - 0.82</i> | | | | | | |
| <i>ROUND EDGE 0.93 - 0.98</i> | | | | | | |
| <i>SHARP EDGE 0.58 - 0.64</i> | | | | | | |
| <i>PROJECTING 0.50</i> | | | | | | |
| 7. DISCHARGE, Q, CFS | | | | | | 0.08 |
| 8. ALLOWABLE RELEASE RATE, Q, CFS | | | | | | 0.08 |

RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

Data Entry: **PRESS TAB & ENTER DESIGN VALUES** SS Ver: 1.0

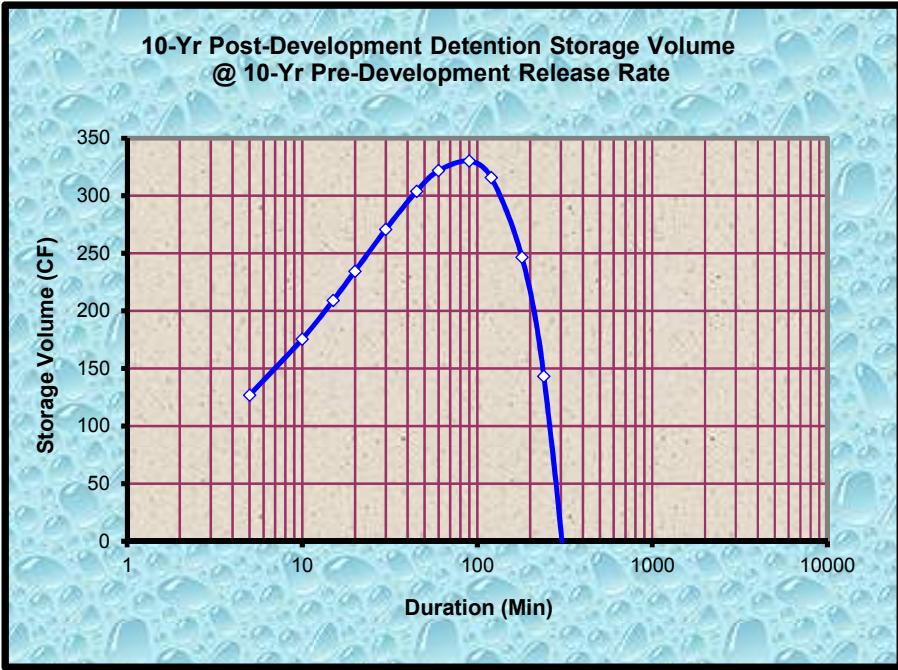
Site Location P60 Isopleth: **1.50** Fig. SWM-2 in County Design Criteria
 Rational Coefficients Cpre: **0.25** See note # 2
 Cpost: **0.90** See note # 2
 Impervious Area: **6945** ft² See note # 2 and # 4

STRUCTURE DIMENSIONS FOR DETENTION

330 ft³ storage volume calculated
 100 % void space assumed
 330 ft³ excavated volume needed

| Structure Ratios | Length | Width* | Depth* | *For pipe, use the square root of the sectional area |
|--------------------|--------------|-------------|-------------|--|
| | 25.00 | 2.00 | 2.00 | |
| Dimen. (ft) | 37.23 | 2.98 | 2.98 | |

| 10 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|------------------------|-----------------------------|-----------------------------|-----------------------|---------------------------------|-------------------------------|
| Storm Duration (min) | 10 - Year Intensity (in/hr) | 10 - Yr. Release Qpre (cfs) | 10 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.26 | 0.010 | 0.037 | -0.034 | -3707 |
| 1200 | 0.28 | 0.011 | 0.040 | -0.031 | -2820 |
| 960 | 0.31 | 0.012 | 0.044 | -0.027 | -1969 |
| 720 | 0.34 | 0.014 | 0.050 | -0.022 | -1168 |
| 480 | 0.41 | 0.016 | 0.059 | -0.012 | -442 |
| 360 | 0.46 | 0.019 | 0.067 | -0.005 | -124 |
| 240 | 0.55 | 0.022 | 0.079 | 0.008 | 143 |
| 180 | 0.62 | 0.025 | 0.090 | 0.018 | 247 |
| 120 | 0.74 | 0.030 | 0.107 | 0.035 | 316 |
| 90 | 0.83 | 0.033 | 0.120 | 0.049 | 330 |
| 60 | 0.99 | 0.040 | 0.143 | 0.072 | 322 |
| 45 | 1.12 | 0.045 | 0.162 | 0.090 | 304 |
| 30 | 1.33 | 0.053 | 0.192 | 0.120 | 271 |
| 20 | 1.57 | 0.063 | 0.228 | 0.156 | 235 |
| 15 | 1.78 | 0.071 | 0.257 | 0.186 | 209 |
| 10 | 2.11 | 0.085 | 0.306 | 0.234 | 176 |
| 5 | 2.83 | 0.114 | 0.410 | 0.339 | 127 |



Notes & Limitations on Use:

- 1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
- 2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
- 3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
- 4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
- 5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
- 6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

PROJECT: **Maplethorpe (DMA 2)**

Calc by: **JW**

Date: **7/17/2018**

RUNOFF RETENTION BY THE STORAGE PERCOLATION METHOD

Data Entry: **PRESS TAB KEY & ENTER DESIGN VALUES**

Notes & Limitations on Use:

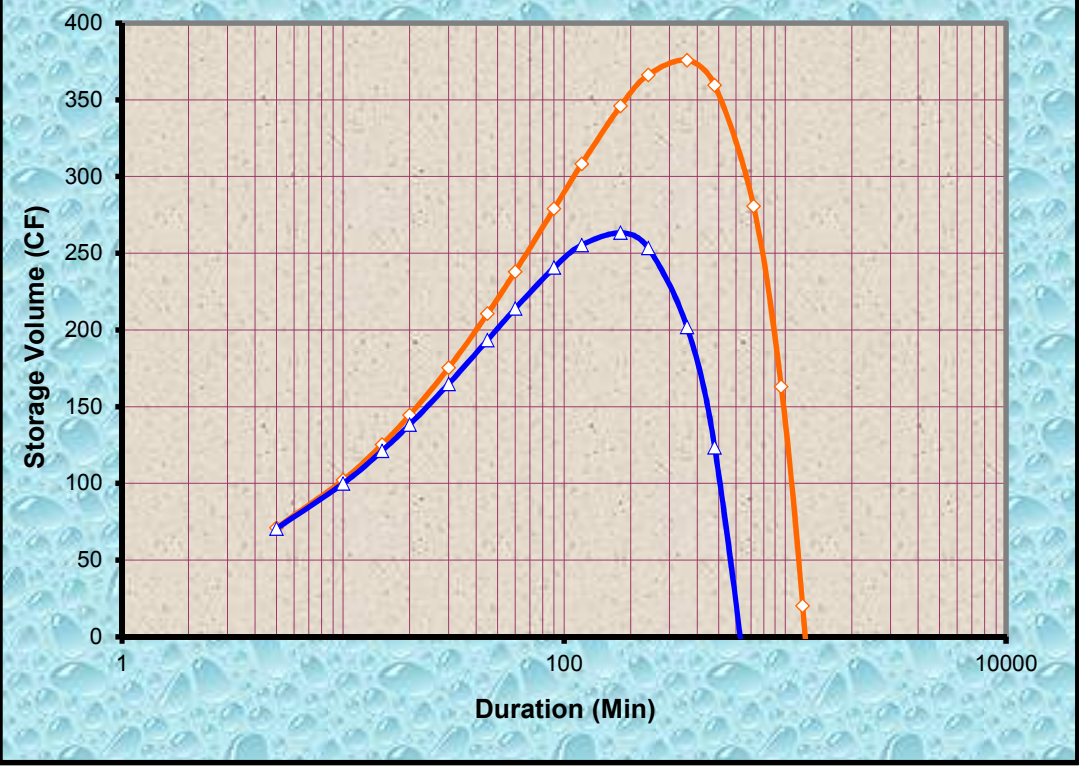
SS Ver:1.0

| | | |
|------------------------------|-------------|-----------------|
| Site Location P60 Isoleth: | 1.50 | Fig. SWM-2 |
| Rational Coefficients Cpre: | 0.25 | |
| Cpost: | 0.90 | |
| Impervious Area: | 6945 | ft ² |
| Saturated Soil Permeability: | 1.75 | in/hr |

Saturated soil permeability values may be used conservatively from the USDA-NRCS soil survey, or use actual test values.
 Site selection and design shall give proper consideration to the path for excess flows downstream of the designated retention area.
 Retention site location on, or immediately above, slopes exceeding 15% will require consulting a geotechnical engineer.
 Gravel packed structures shall use washed, angular, uniformly graded aggregate providing not less than 35% void space.
 Refer to the County of Santa Cruz Design Criteria, Stormwater Management - Section H, for complete method criteria.

| 2 - YEAR DESIGN STORM | | | | RETENTION @ 120 MIN. | | STRUCTURE DIMENSIONS FOR RETENTION | | | | DETENTION @ 60 MIN. | | |
|-----------------------|----------------------------|--------------|--------------|---------------------------------|--------------------------------|--|---|-------------|-------------|---------------------------------|--------------------------------|--|
| Storm Duration (min) | 2 - Year Intensity (in/hr) | Qpre (cfs) | Qpost (cfs) | Retention Rate To Storage (cfs) | Specified Retained Volume (cf) | 263 | ft ³ storage volume calculated | | | Detention Rate To Storage (cfs) | Specified Detained Volume (cf) | |
| 1440 | 0.16 | 0.007 | 0.024 | 0.005 | -883 | 40 | % void space assumed | | | | | |
| 1200 | 0.18 | 0.007 | 0.026 | 0.007 | -595 | 658 | ft ³ excavated volume needed | | | | | |
| 960 | 0.20 | 0.008 | 0.028 | 0.009 | -325 | Structure Ratios | Length | Width* | Depth* # | | | |
| 720 | 0.22 | 0.009 | 0.032 | 0.013 | -81 | | 25.00 | 2.00 | 2.00 | | | |
| 480 | 0.26 | 0.011 | 0.038 | 0.019 | 123 | Dimen. (ft) | 46.85 | 3.75 | 3.75 | | | |
| 360 | 0.30 | 0.012 | 0.043 | 0.024 | 202 | 555 | ft ² internal surface area | | | | | |
| 240 | 0.35 | 0.014 | 0.051 | 0.032 | 253 | 388 | ft ² effective surface area | | | | | |
| 180 | 0.40 | 0.016 | 0.057 | 0.039 | 263 | 4.6 | hrs estimated structure drainage time | | | | | |
| 120 | 0.47 | 0.019 | 0.068 | 0.049 | 255 | * For pipe, use the square root of the sectional area. | | | | | | |
| 90 | 0.53 | 0.021 | 0.077 | 0.058 | 241 | # If cell values displayed are corrupted, enter zero for depth, then re-enter a positive numeric value within allowed range. | | | | | | |
| 60 | 0.63 | 0.025 | 0.092 | 0.073 | 214 | STRUCTURE DIMENSIONS FOR DETENTION | | | | | | |
| 45 | 0.71 | 0.029 | 0.103 | 0.084 | 193 | 376 | ft ³ storage volume calculated | | | | | |
| 30 | 0.85 | 0.034 | 0.123 | 0.104 | 165 | 100 | % void space assumed | | | | | |
| 20 | 1.01 | 0.041 | 0.146 | 0.127 | 138 | 376 | ft ³ excavated volume needed | | | | | |
| 15 | 1.14 | 0.046 | 0.165 | 0.146 | 121 | Structure Ratios | Length | Width* | Depth* | | | |
| 10 | 1.35 | 0.054 | 0.196 | 0.177 | 100 | | 25.00 | 2.00 | 2.00 | | | |
| 5 | 1.81 | 0.073 | 0.262 | 0.243 | 71 | Dimen. (ft) | 38.87 | 3.11 | 3.11 | | | |

2 - Year Retention or Detention Storage Volume



Restrictor Description: DMA #2
 Project Name: **Maplethorpe**
 Job Number: 480-00
 Date: January 24, 2019

RESTRICTOR SIZE, ORIFICE METHOD (Circular Opening)

| | | | | | Value |
|-------------------------------------|--|--|--|--|-------------|
| 1. HIGHWATER ELEVATION | | | | | 177.46 |
| 2. INVERT ELEVATION | | | | | 175.83 |
| 3. DIAMETER OF RESTRICTOR IN INCHES | | | | | 1.50 |
| 4. CROSS SECTIONAL AREA, SQ. FT. | | | | | 0.01 |
| 5. HEAD, FT. | | | | | 1.57 |
| 6. DISCHARGE COEFFICIENT | | | | | 0.50 |
| <i>SQUARE EDGE 0.79 - 0.82</i> | | | | | |
| <i>ROUND EDGE 0.93 - 0.98</i> | | | | | |
| <i>SHARP EDGE 0.58 - 0.64</i> | | | | | |
| <i>PROJECTING 0.50</i> | | | | | |
| 7. DISCHARGE, Q, CFS | | | | | 0.06 |
| 8. ALLOWABLE RELEASE RATE, Q, CFS | | | | | 0.07 |

**Initial Study
Attachment 11**



Santa Cruz County Sanitation District

701 OCEAN STREET, SUITE 410, SANTA CRUZ, CA 95060-4073
(831) 454-2160 FAX (831) 454-2089 TDD/TTY- CALL 711

MATT MACHADO, DISTRICT ENGINEER

NOVEMBER 26, 2018

JOHN SWIFT
500 CHESTNUT ST
SANTA CRUZ, CA 95060

SUBJECT: SEWER AVAILABILITY AND DISTRICT'S CONDITIONS OF
SERVICE FOR THE FOLLOWING PROPOSED DEVELOPMENT
APN: 037-121-60 APPLICATION NO.: N/A
PARCEL ADDRESS: 3300 MAPLETHORPE LANE, SOQUEL
PROJECT DESCRIPTION: 13-15 SINGLE FAMILY HOMES

Dear Mr. Swift:

We've received your inquiry regarding sewer service availability for the subject parcel. Sewer service is available in Colleen Way for the subject development. Records show that this property already has a single lateral connected to the sanitary sewer main. It is likely that it will need to be replaced due to both age and capacity. Rather than 13-15 separate laterals connecting directly to the public sewer main, please plan for the connection to the public main of a single private collector line leading onto the property, serving all units of the development.

No downstream capacity problem or other issue is known at this time. However, downstream sewer requirements will again be studied at time of Planning Permit review, at which time the District reserves the right to add or modify downstream sewer requirements.


This notice is valid for one year from the date of this letter. If, after this time frame, this project has not yet received approval from the Planning Department, then this determination of availability will be considered to have expired and will no longer be valid.

Also, for your reference, we have attached a list of common items required during the review of sanitation projects.

Thank you for your inquiry. If you have any questions, please call Robert Hambelton at (831) 454-2160.

Yours truly,

MATT MACHADO
District Engineer

By: 
Ashleigh Trujillo
Sanitation Engineer

RH:dls/135