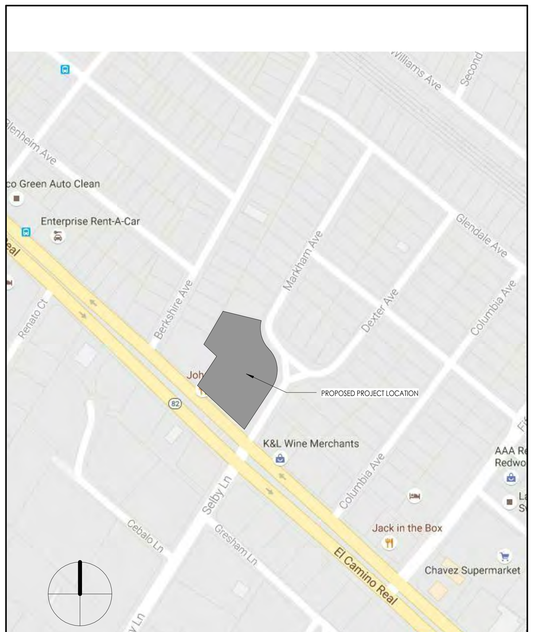
SUNRISE REDWOOD CITY

ASSISTED LIVING FACILITY
REDWOOD CITY, CA

VICINITY MAP NOT TO SCALE



CONTACTS

OWNER
SUNRISE SENIOR LIVING
7900 WESTPARK DRIVE, SUITE T-900
McLEAN, VA 22102
Tel. 703.744.1830
CONTACT: MR. JERRY LIANG

ARCHITECT
HPI ARCHITECTURE
115 22ND ST., NEWPORT BEACH, CA 92663
Tel. 949.675.6442 Fax. 949.675.4543
CONTACT: LEA BROUKHIM, PROJECT MANAGER
JOHN PARIS, PRINCIPAL

LANDSCAPE ARCHITECT
LINDA GATES & ASSOCIATES
2671 CROW CANYON RD
SAN RAMON, CA 94583
Tel. 925.736.8176
CONTACT: LINDA GATES

CIVIL
KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2850 COLLIER CANYON ROAD
LIVERMOORE, CA 94551
Tel. 925.245.8788 Fax. 925.245.8796
CONTACT: EMAD SARIE-DHINE

APPLICABLE CODES

APPLICABLE CODES

PART 1 2016 CALIFORNIA BUILDING STANDARDS ADMINISTRATIVE CODE, TITLE 24 C.C.R.
PART 2 2016 CALIFORNIA BUILDING CODE, TITLE 24 C.C.R.
(2016 INTERNATIONAL BUILDING CODE OF THE INTERNATIONAL CODE COUNCIL, WITH CALIFORNIA AMENDMENTS)
2016 CALIFORNIA ELECTRICAL CODE, TITLE 24 C.C.R.
PART 3 (2011 NATIONAL ELECTRICAL CODE OF THE NATIONAL FIRE PROTECTION ASSOCIATION, NFPA)
2016 CALIFORNIA MECHANICAL CODE, TITLE 24 C.C.R.
PART 4 (2016 UNIFORM MECHANICAL CODE OF THE INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS, IAPMO)
2016 CALIFORNIA PLUMBING CODE, TITLE 24 C.C.R.
PART 5 (2016 UNIFORM PLUMBING CODE OF THE INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS, IAPMO)
2016 CALIFORNIA ENERGY CODE, TITLE 24 C.C.R.
PART 6 *CURRENTLY VACANT*
PART 7 2016 CALIFORNIA HISTORICAL BUILDING CODE, TITLE 24 C.C.R.
PART 8 2016 CALIFORNIA FIRE CODE, TITLE 24 C.C.R.
PART 9 (2016 INTERNATIONAL FIRE CODE OF THE INTERNATIONAL CODE COUNCIL)
2016 CALIFORNIA EXISTING BUILDING CODE, TITLE 24 C.C.R.
PART 10 (2016 INTERNATIONAL EXISTING BUILDING CODE OF THE INTERNATIONAL CODE COUNCIL, WITH CALIFORNIA AMENDMENTS)
2016 CALIFORNIA GREEN BUILDING STANDARDS CODE (CALGREEN CODE), TITLE 24 C.C.R.
PART 11 2016 CALIFORNIA REFERENCED STANDARDS CODE, TITLE 24 C.C.R.
PART 12

PARTIAL LIST OF APPLICABLE STANDARDS

2016 CALIFORNIA BUILDING CODE (FOR SFM) REFERENCED STANDARDS CHAPTER 35

NFPA 13 AUTOMATIC SPRINKLER SYSTEMS (CALIFORNIA AMENDED) 2016 EDITION
NFPA 14 STANDPIPE SYSTEMS (CALIFORNIA AMENDED) 2016 EDITION
NFPA 17 DRY CHEMICAL EXTINGUISHING SYSTEMS 2016 EDITION
NFPA 17A WET CHEMICAL EXTINGUISHING SYSTEMS 2016 EDITION
NFPA 20 STATIONARY PUMPS 2016 EDITION
NFPA 24 PRIVATE FIRE SERVICE MAINS (CALIFORNIA AMENDED) 2016 EDITION
NFPA 72 NATIONAL FIRE ALARM AND SIGNALING CODE (CALIFORNIA AMENDED)
(NOTE: SEE UL STANDARD 1971 FOR "VISUAL DEVICES") 2016 EDITION
NFPA 80 FIRE DOOR AND OTHER OPENING PROTECTIVES 2016 EDITION
NFPA 253 CRITICAL RADIANT FLUX OF FLOOR COVERING SYSTEMS 2016 EDITION
NFPA 2001 CLEAN AGENT FIRE EXTINGUISHING SYSTEMS (CALIFORNIA AMENDED) 2016 EDITION

SITE INFORMATION

ADDRESS:	SUNRISE SENIOR LIVING 2991 EL CAMINO REAL REDWOOD CITY, CA 94063
APN:	254-285-260, 060-271-118, 054-285-210, 060-271-060
PIN:	SEE CIVIL DWGS.
TRACT:	SEE CIVIL DWGS.
LOT #	SEE CIVIL DWGS.
LOT SIZE:	1.42 ACRES (61,725 S.F.)

LEGAL DESCRIPTION: SEE CIVIL DWGS.

PROPOSED DEVELOPMENT

24-HOUR RESIDENTIAL CARE FACILITY FOR THE ELDERLY LICENSED BY THE STATE OF CALIFORNIA
2/3 STORY BUILDING WITH BELOW GRADE PARKING GARAGE
90 UNITS
1.42 ACRES
28,965 S.F. FOOT BUILDING FOOTPRINT
78,026 S.F. BUILDING AREA

SHEET INDEX

NOTE:
- **INSTALL "NO IDLING" SIGN VISIBLE FROM PUBLIC STREETS.**

NOTE:
- **EMERGENCY GENERATOR TO BE TESTED ONCE A MONTH FOR 30 MINUTES.**
- **EMERGENCY GENERATOR TO COMPLY WITH CH 4.88 (NOISE CONTROL) OF THE SAN MATEO COUNTY ORDINANCE UPON SUBMITTAL FOR BUILDING PERMIT.**

SITE DATA:

APN'S: 060-271-060; 060-271-070; 060-271-080; 060-271-090; 060-271-100; 060-271-110

SITE AREA: 61,725 SF

EXISTING LAND USE: C-2, S-1, P, R-2/S-5
PROPOSED LAND USE:C-2, S-1, P, R-2/S-5

PROPOSED DEVELOPMENT

3 STORY - 90 UNITS - ASSISTED LIVING FACILITY
BUILDING AREA: 78,026 SF
FAR: 1.28
BUILDING FOOTPRINT: 28,965 SF
LOT COVERAGE: 46.9%

PARKING REQUIREMENTS:

1 SPACE PER 5 BEDS
100 BEDS - **20** PARKING REQUIRED

56 STANDARD STALLS PROVIDED
(03 ACCESSIBLE STALLS REQUIRED, CBC 118-208.2)
03 ACCESSIBLE STALLS PROVIDED
(04 ELEC. VEHICLE STALLS REQUIRED(GREEN CODE)
03 ELECT. VEHICLE STALLS PROVIDED
01 ACCESSIBLE ELEC. STALL PROVIDED
63 TOTAL SPACES PROVIDED (SUBTERRANEAN PARKING)

BICYCLE PARKING REQUIREMENTS:

25 (PER COUNTY REQUIREMENT)

15 BIKE STALLS PROVIDED ON GARAGE LEVEL**
10 BIKE STALLS PROVIDED ON GROUND LEVEL**
25 BIKE STALLS PROVIDED

*3 BIKE RACKS (6 STALLS) ALSO PROVIDED ALONG EL CAMINO REAL. NOT A PART OF CALCULATION.
** SEE FIRST FLOOR & GARAGE PLANS

UNIT MIX:

STUDIO	350 SF	53
DOUBLE	550 SF	19
SEMI-PRIVATE	470 SF	18
TOTAL UNITS		90

BUILDING CODE ANALYSIS

CODE REFERENCE SECTION - 2016 CBC

TYPE OF CONSTRUCTION: **I-B** **SECTIONS 601, 602.2 & TABLE 601** - FULLY SPRINKLERED PER NFPA13 (SEPARATE PERMIT)

OCCUPANCY GROUP: MIXED USE AND NON-SEPARATED USE **SECTION 508.2.4**
R-2.1 RESIDENTIAL, **SECTION 310.4.1**
S-2 STORAGE, **SECTION 311.3**

HEIGHT: **HEIGHT REQUIREMENT TO BE DETERMINED**

- **ACTUAL BUILDING HEIGHT (FEET):** **46'** (ABOVE GRADE)
- **ACTUAL NUMBERS OF FLOOR:** **2-STORY & 3-STORY** (ABOVE GRADE)

AREA: **CBC** 2016 TABLE 506.2

- **ALLOWABLE AREA:** R-2.1 165,000 SF; S-2 237,000 SF
- **ACTUAL AREA:**

FIRST FLOOR:	28,965 SF
SECOND FLOOR:	33,684 SF
THIRD FLOOR:	15,377 SF
TOTAL BUILDING AREA:	**78,026 SF**
DECKS:	5,456 SF
PARKING STRUCTURE:	38,153 SF

STAFFING REQUIREMENTS: 30 EMPLOYEES PER PEAK SHIFT.

SUSTAINABILITY NOTES

Sunrise is committed to environmental stewardship. The design for the Sunrise of Redwood City is concerned with its impact on the environment as it is constructed, and with a long-range commitment to energy efficiency as it operates.

Exterior Envelope
A robust, continuous thermal envelope with a continuous air infiltration barrier, continuous exterior insulation and a high R value will ensure minimal heat loss/gain and reduce the load on heating systems.

The windows will have a low U value, low E coating and will be argon gas-filled, which also translates to heat/cold resistance and reduces the load on heating and cooling the building. They are also carefully detailed to prevent thermal bridging and avoid air infiltration.

Windows are plentiful and placed to take advantage of daylighting opportunities.

The flat roof portions of the building will be covered in white, light reflecting TPO, which will reduce the heat gain.

The roof will be "solar ready", meaning that both structurally and electrically, if solar panels are added in the future they can be very easily accommodated.

The building will also be computer modeled to show compliance with the new Mass IECC and stretch code requirements.

After construction, the mechanical systems will be commissioned to ensure that they are installed correctly to reach maximum efficiency during operation.

Interior of Building
We will use LED lighting wherever possible and will utilize occupancy sensors and lighting controls.

Exterior lighting is on automatic controls to conserve energy.

The interior environment is planned to enhance the resident's well-being. Fresh ventilation is provided to each room. Low VOC paints will be specified, and low emitting materials will be utilized.

Energy Recovery Units will be provided as part of the mechanical system. They utilize the temperature of exhausting air to temper the incoming ventilation air, thus reducing the energy required to either heat or cool incoming air to the desired temperature.

Units will be equipped with indoor air quality monitoring.

Site
The site design uses permeable paving that allows water to drain through which then recharges the storm water system replenishing the natural water supply.

Plants are specified as drought tolerant, and indigenous to the area.

Irrigation is provided with a "smart" system which gathers local weather data and regulates the amount of water that goes out to the heads. This reduces water use and prevents over-watering and potential damage to the hardscape.

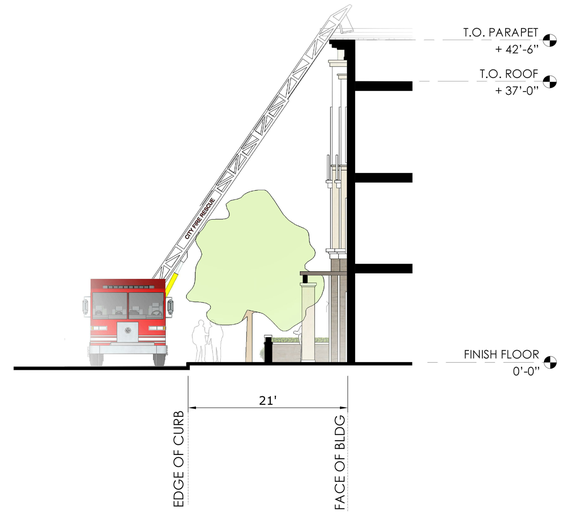
The building is located within walking distance to a public bus stop, and employees are encouraged to car pool and use public transit.

Post Construction
After construction, during normal operation, Sunrise has committed to being certified by the EPA Energy Star Program. The EPA Energy Star Program is a voluntary energy efficiency program. It promotes products and practices that help protect the environment. Sunrise is already committed to the Energy Star Program and enrolls its communities in the program. Since the EPA created "Senior Housing" as a building type for Energy Star Certification, Sunrise Senior Living communities have been certified every year. The water, gas and electric bills for all these communities are monitored monthly and rated against other Energy Star participants. The ENERGY STAR certification signifies that these buildings perform in the top 25 percent of similar buildings nationwide for energy efficiency and meet strict performance levels set by the EPA. These communities use an average of 35 percent less energy and release 35 percent less carbon dioxide than typical communities.

This Sunrise community will have a comprehensive maintenance program in place to maintain equipment and conserve energy costs; they will focus on best practices for efficiency in the areas of kitchen and laundry operations, lighting and HVAC&R (Heating Ventilation Air Conditioning and Refrigeration).

FIRE DEPARTMENT GENERAL NOTES

- All utility's in front of building on El Camino to go underground including around East Selby Lane past Pavilion entrance. Aerial Ladder Access to be established along full length of the building facing El Camino Real. The aerial ladder placement shall meet the prescriptive distance requirements outlined in CFC Appendix D105.
- Fire apparatus roadways, including public and private streets and in some cases driveways used for vehicle access, shall be capable of supporting the imposed weight of a 75,000 pound (34,050 kg) fire apparatus and shall be provided with an all-weather driving surface per CFC 2016, Appendix D.
- Private Roadways shall be all-weather roads with a minimum width of 20 feet and a clear height of 13 feet 6 inches. Roadways shall be designed to accommodate the weight of the fire apparatus and the minimum turning radii of 36 feet for fire apparatus. Dead end roads in excess of 150 feet in length shall be provided with a turn-a-round as specified by CFC Appendix D, Table D103.4. Access roads exceeding 1 mile in length shall be provided with approved turn-a-round areas at ½ Mile Intervals.
- All curbing located within the complex that has not been assigned as onsite parking shall be designated as "No Parking Fire Lane". All fire lanes to comply with MPFPD standard for "Designation and Marking of Fire Lane"; since there are only two points of access to the complex "Entrance Sign B" will be used at each pint of access to complex. Provide a complete no parking-fire lane stripping plan with no parking signage in accordance to MPFPD standard on subsequent submittal:
  1) 20 feet roadway width shall require curb stripping with no parking signage as per MPFPD Standard.
  2) Required no parking signage installed at an approved location at entrances.
- Fire apparatus roadways, including public or private streets or roads used for vehicle access shall be installed and in service prior to construction. Fire protection water serving all hydrants shall be provided as soon as combustible material arrives on the site:
  3) Prior to combustible material arriving on the site, contact the Menlo Park Fire Protection District (MPFPD) to schedule an inspection of roadways and fire hydrants. CFC 2016.
  e. For buildings 30 feet (9144 mm) and over in height above natural grade, the required fire apparatus access roadway shall be a minimum of 26 feet (7925 mm) in width, and shall be positioned parallel to at least one entire side of the building, and the fire lane shall be located within a minimum of 15 feet (4573 mm) and a maximum of 30 feet (9144 mm) from the building. CFC 2016, Appendix D105.
  4) Fire District staging areas to be located and provides details for Aerial Ladder Truck Minimum and Maximum climbing angles, if a climbing angle is less than 50 degrees the roadway shall be adjusted to comply to the charging condition listed above. Note Aerial Ladder requires minimum 4-foot setback on any side to allow for outriggers.



SECTION A-A
AERIAL LADDER ACCESS DIAGRAM


223' - 7"
222' - 7"
DASHED LINE INDICATES WALL ABOVE
19' - 0"
9' - 0"
9' X 19' PARKING STALL, TYP.
25' - 7"
24' - 0"
23' - 1"
20' - 4"
STORAGE
MECH.
EVA
VEST
ELEV.
EQ.
VEST.
STAIR 1
STAIR 2
UP
VAN ACCESSIBLE ELEC. VEHICLE STALL & CHARGING STATION
ELEC. VEHICLE STALLS & CHARGING STATIONS (4 TOTAL)
ELEV. EQ.
MAIN OFFICE
MC OFFICE
21' - 3"
RAMP UP
6%
12.5%
25' - 0"
STRUCTL COL., TYP.
RETAINING WALL, TYP.
BIKE STORAGE
BICYCLE PARKING (15 STALLS)

UNIT MIX (FIRST FLOOR):

SINGLE	14
DOUBLE	04
SEMI-PRIVATE	04
TOTAL	22

NORTH 0 20' 40' 80'

22 UNITS 28,965 S.F.

FIRST FLOOR PLAN A2.1

| JANUARY 22 2018 | REDWOOD CITY ASSISTED LIVING

HPI architecture
planning | interiors |
115 twenty second street, newport beach, california 92663 www.hpiarchitecture.com

SUNRISE SENIOR LIVING

UNIT MIX (SECOND FLOOR):

SINGLE	27
DOUBLE	08
SEMI-PRIVATE	11
TOTAL	46

HPI architecture

planning | interiors |

115 twenty second street, newport beach, california 92663 www.hpiarchitecture.com

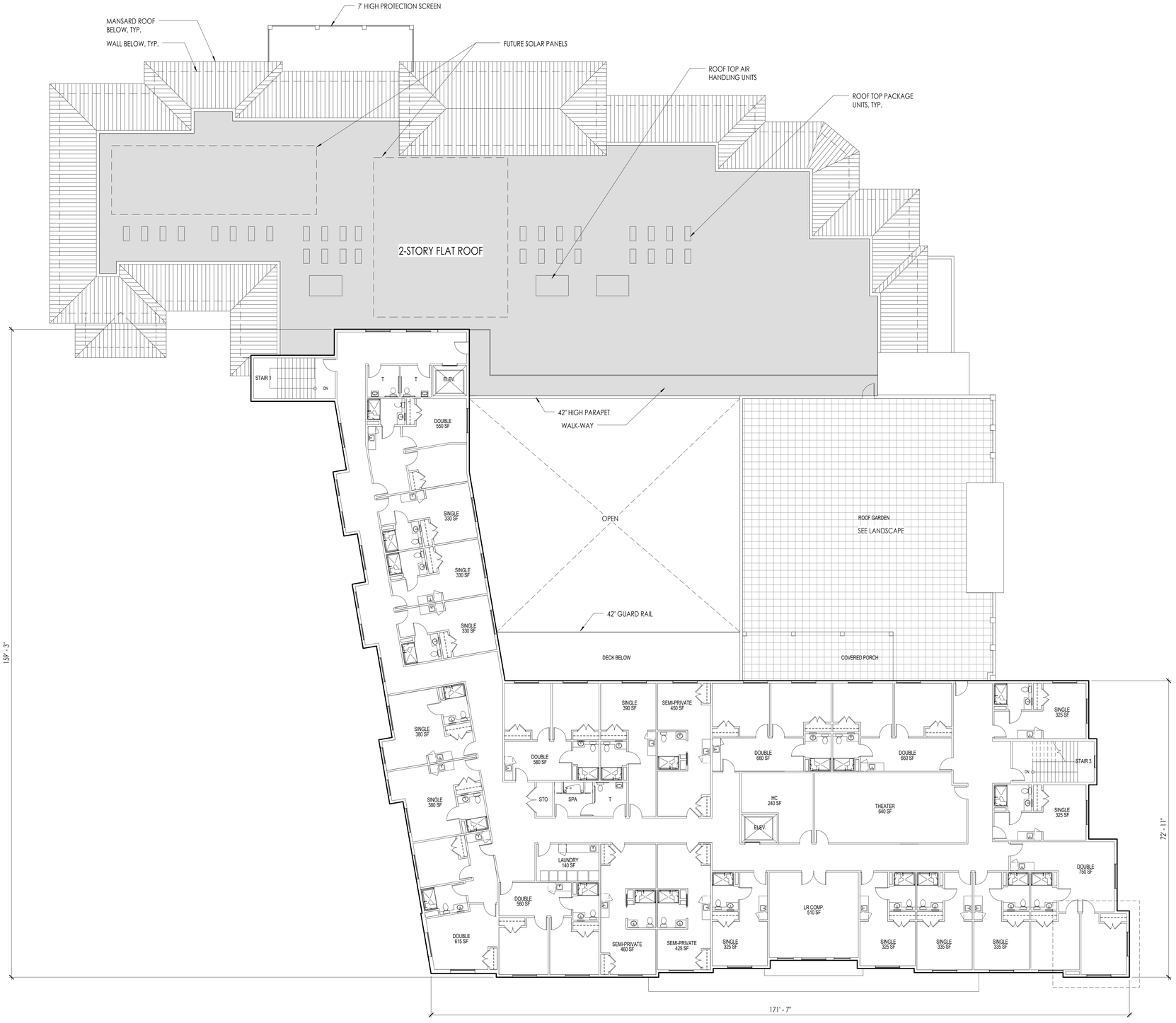
NORTH 0 20' 40' 80'

46 UNITS 33,684 S.F.

SECOND FLOOR PLAN A2.2

| JANUARY 22 2018 | REDWOOD CITY ASSISTED LIVING

SUNRISE SENIOR LIVING



UNIT MIX (THIRD FLOOR):

SINGLE	12
DOUBLE	07
SEMI-PRIVATE	03
TOTAL	22

HPI architecture

planning | interiors |

115 twenty second street, newport beach, california 92663 www.hpiarchitecture.com

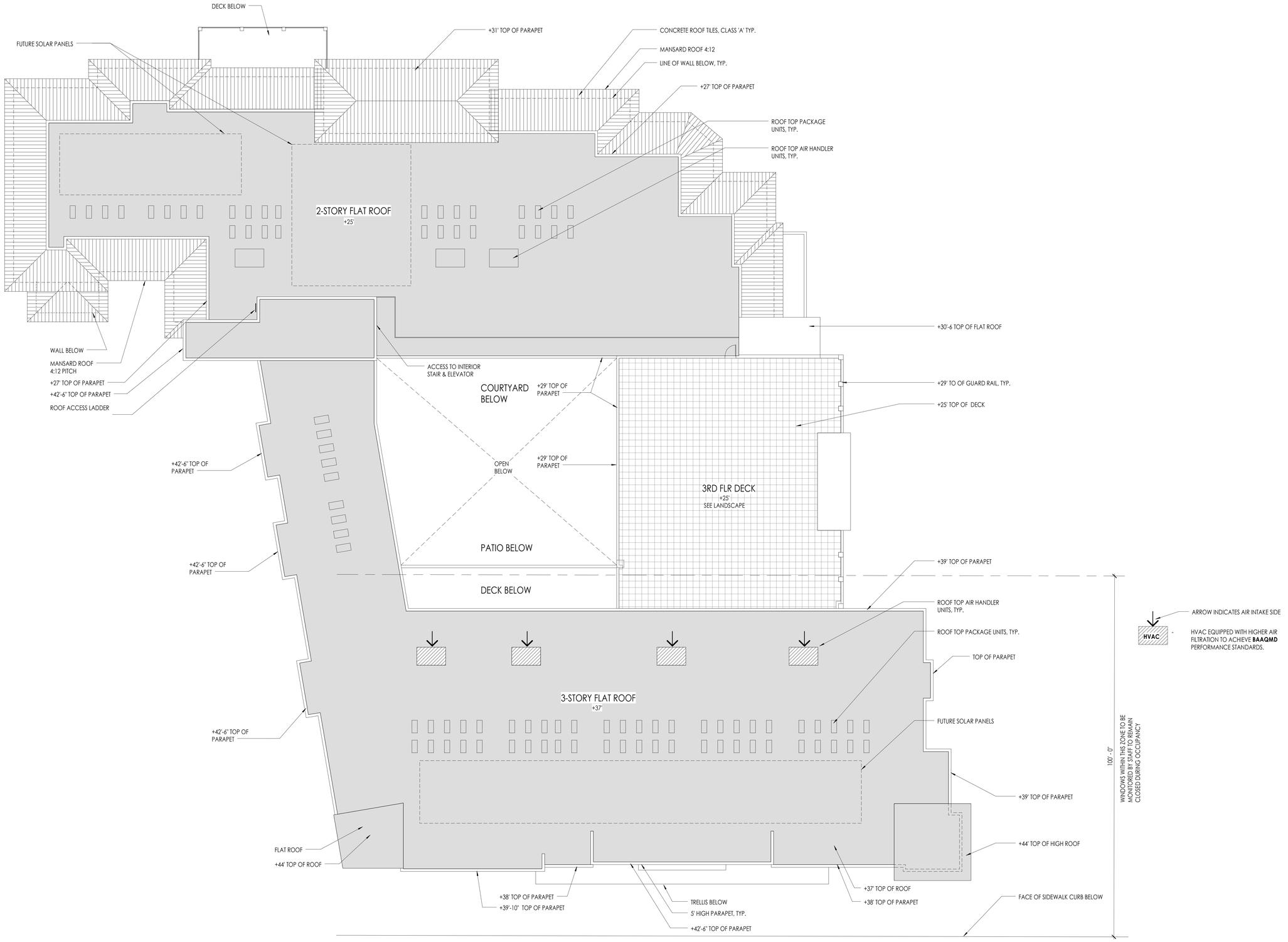
NORTH 0 20' 40' 80'

22 UNITS 15,377 S.F.

THIRD FLOOR PLAN A2.3

| JANUARY 22 2018 | REDWOOD CITY ASSISTED LIVING

SUNRISE SENIOR LIVING



HPI architecture

planning | interiors |

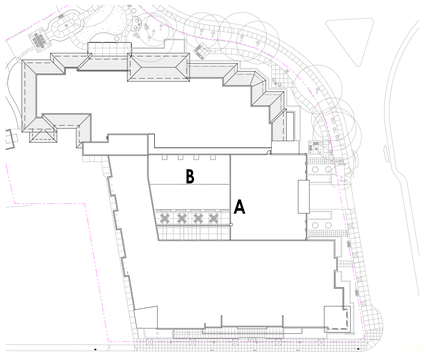
115 twenty second street, newport beach, california 92663 www.hpiarchitecture.com

NORTH 0 20' 40' 80'

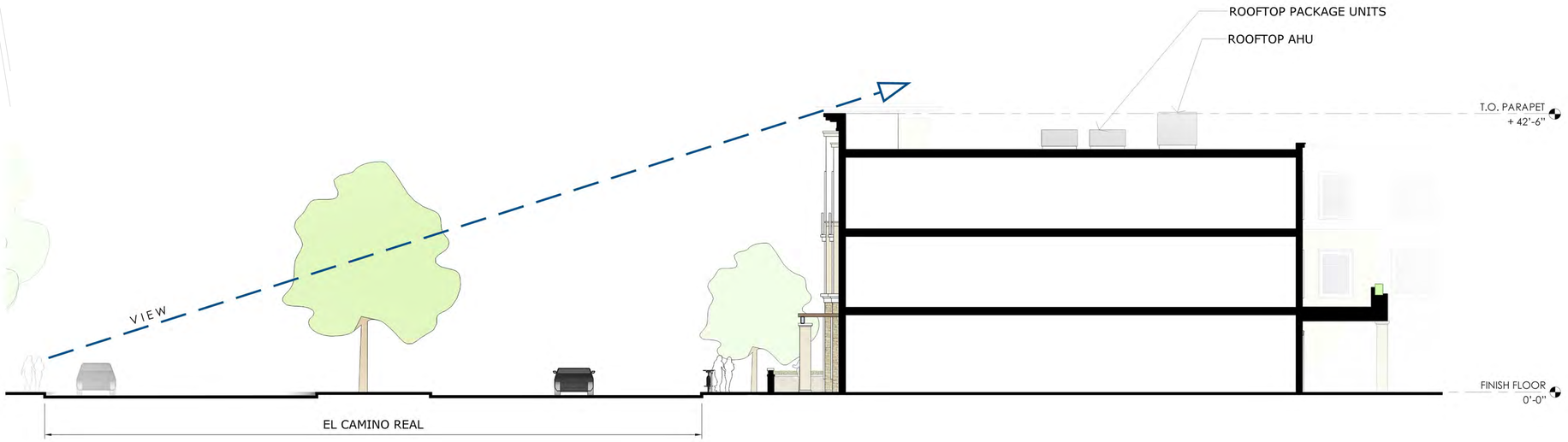
ROOF PLAN A2.4

| JANUARY 22 2018 | REDWOOD CITY ASSISTED LIVING

SUNRISE SENIOR LIVING



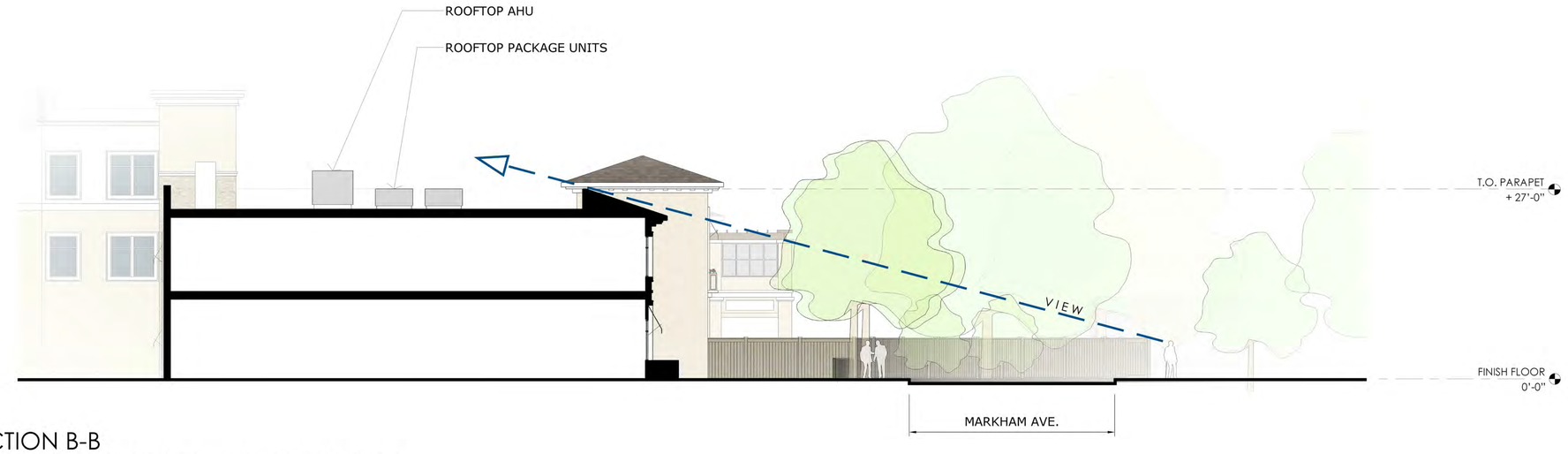
KEYPLAN



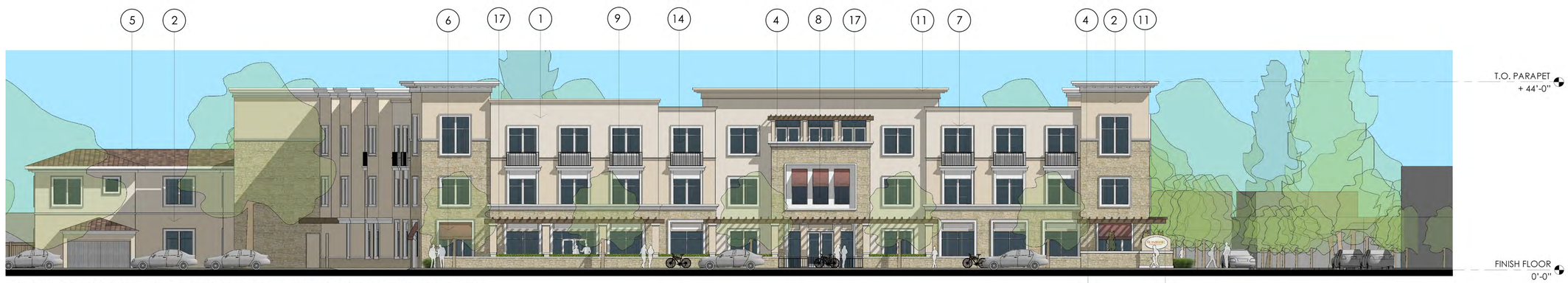
SECTION A-A
MECHANICAL EQUIPMENT SCREENING

NOTE:

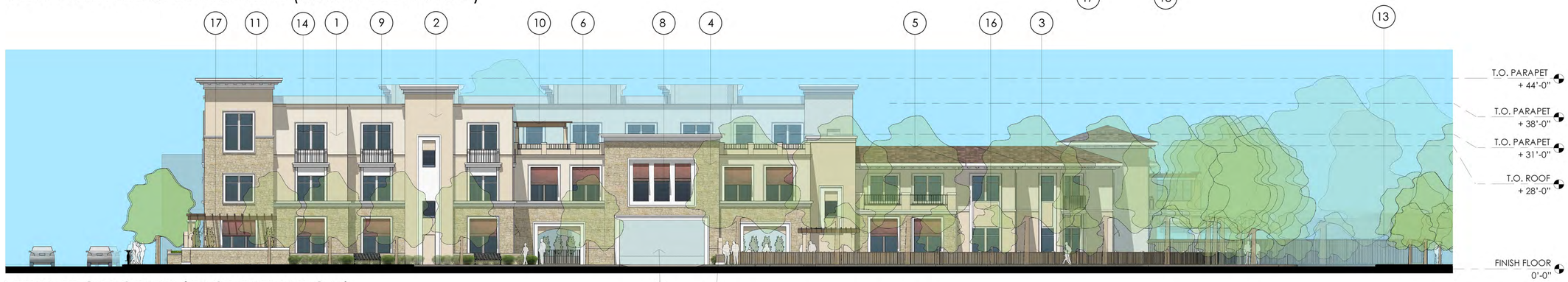
EMERGENCY GENERATOR TO BE TESTED ONCE A MONTH FOR 30 MINUTES.



SECTION B-B
MECHANICAL EQUIPMENT SCREENING

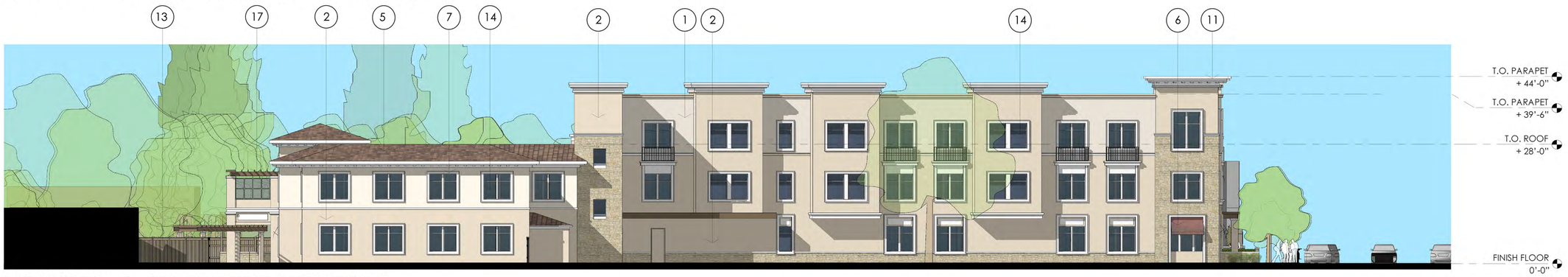


VIEW FROM EL CAMINO REAL (SOUTH ELEVATION)



VIEW FROM SELBY (EAST ELEVATION)

VIEW FROM MARKHAM (NORTH ELEVATION)



VIEW FROM PARKING (WEST ELEVATION)

KEY NOTES

1 STUCCO FINISH (FIELD)*
2 STUCCO FINISH (ACCENT)*
3 3' HIGH WOOD FENCE
4 STONE VENEER*
5 CONCRETE TILE ROOF*
6 AWNING*
7 MOULDINGS @ WINDOWS*
8 PUNCHED WINDOWS
9 DECORATIVE BALCONIES
10 ROOF DECK PATIO TRELLIS
11 STONE MOULDING @ PARAPET*
12 BOX PLANTER
13 6' HIGH WOOD FENCE
14 DOUBLE GLAZED DIVIDED LITE WINDOW
15 OPEN @ ENTRY DRIVE
16 PANEL REVEAL
17 OUTRIGGER TRELLIS*
18 MONUMENT SIGN

* SEE MATERIALS DESCRIPTION BELOW

MATERIALS

ROOFING:
Eagle Roofing
Bel Air Flat Concrete Tile
4645 Sunrise Blend

STONE VENEER:
CORONADO Country Rubble
Antique Cream (Stacked)

PAINT:
STUCCO** FIELD:
Sherwin Williams
SW6140 Moderate White

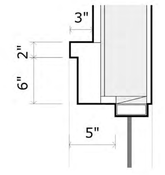
STUCCO** / CORNICE ACCENT:
Sherwin Williams
SW6141 Softer Tan

CORNICE / WINDOW TRIM:
Sherwin Williams
SW7138 Lavender Wisp

TRELLIS / WROUGHT IRON:
Sherwin Williams
SW7040 Smokehouse

AWNINGS:
Hunter Douglas M Screen 6005
Charcoal / Mandarin

** LaHabra stucco: 7/8" 3-coat stucco over approved substrate



WINDOW TRIM PROFILE

0 20' 40' 80'

HPI architecture
planning | interiors |
115 twenty second street, newport beach, california 92663 www.hpiarchitecture.com

EXTERIOR ELEVATIONS A4.0

| JANUARY 22 2018 | REDWOOD CITY ASSISTED LIVING

SUNRISE SENIOR LIVING

1 VIEW FROM CORNER OF EL CAMINO REAL AND E. SELBY LANE

KEY SITE PLAN N

2 VIEW FROM CORNER OF E. SELBY LANE AND MARKHAM AVE.

KEY SITE PLAN

3 VIEW OF MAIN ENTRY FROM E. SELBY LANE

KEY SITE PLAN

4 VIEW FROM MARKHAM AVE.

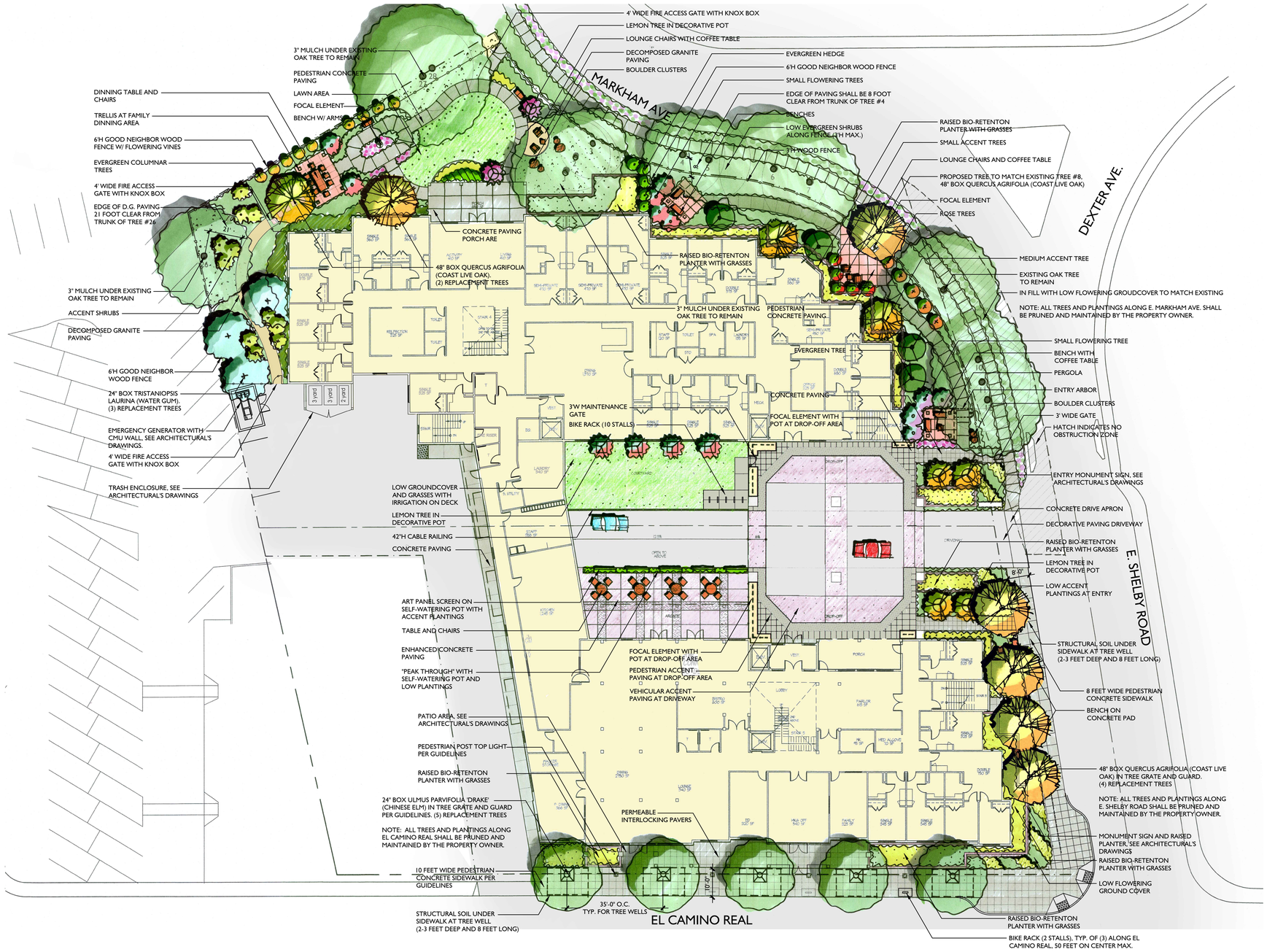
KEY SITE PLAN N

5 VIEW OF MAIN ENTRY FROM E. SELBY LANE

KEY SITE PLAN

AERIAL VIEW FROM NORTH-EAST

AERIAL VIEW FROM SOUTH-EAST



0 8' 16' 32'

L-1

GATES +ASSOCIATES

SUNRISE REDWOOD CITY SAN MATEO COUNTY

LANDSCAPE CONCEPTUAL PLAN (GROUND LEVEL)

MARCH 2, 2018

ASSISTED LIVING COURTYARD


PERGOLA


ENTRY ARBOR


LARGE BENCH W/ ARM


TABLE AND CHAIRS


3' HIGH WOOD FENCE

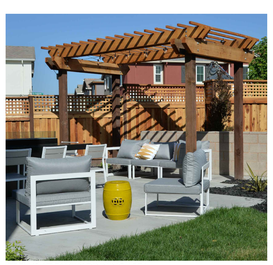

BIRD BATH


BIRD HOUSE


RAISED VEGETABLE PLANTER

MEMORY CARE COURTYARD


6'H GOOD NEIGHBOR WOOD FENCE


TRELLIS AT FAMILY DINNING AREA


DINNING TABLE AND CHAIRS

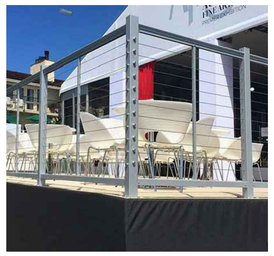

SMALL BENCH W/ ARM


LOUNGE CHAIR AND COFFEE TABLE


BOULDERS

"GREEN" COURTYARD AND DROP-OFF AREA


LEMON TREES IN POT


42"H CABLE RAILING

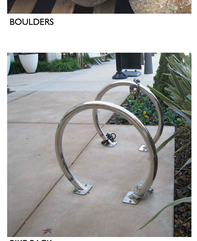

GREEN COURTYARD


FOCAL ELEMENT AT AT DROP-OFF AREA

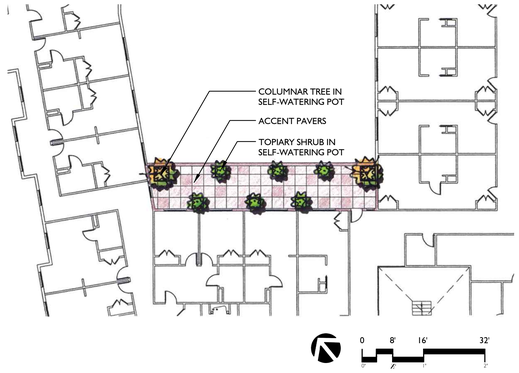
OUTDOOR DINNING

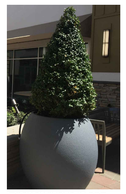

ART PANEL SCREEN ON POTS


TABLE AND CHAIRS


BIKE RACK

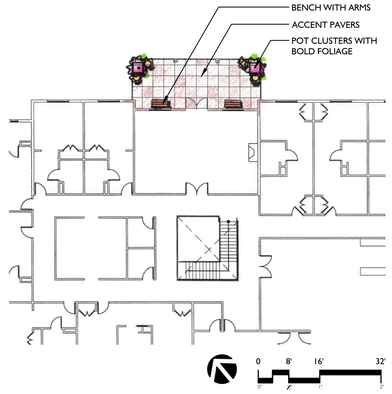
L-2




TOPIARY SHRUB IN POT


ITALIAN CYPRESS IN POT

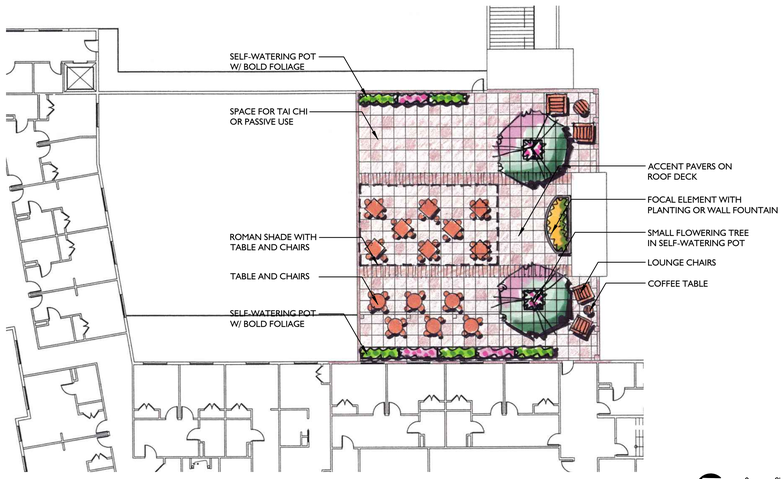
TOPIARY DECK ON SECOND LEVEL




BOLD FOLIAGE ON POT


SMALL BENCH W/ ARM

ACTIVITY DECK ON SECOND LEVEL



ROOF DECK ON THIRD LEVEL


SELF-WATERING TREE POT


SELF-WATERING POT

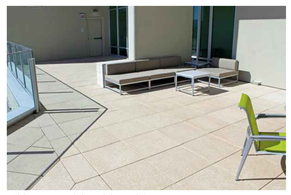

LOUNGE CHAIR AND COFFEE TABLE


TABLE AND CHAIRS


TAI CHI ACTIVITY


WALL WATER FEATURE


ROMAN SHADE STRUCTURE


ACCENT PAVERS ON ROOF DECK

TREES


ACER GRISEUM


CITRUS TREES

CUPRESSUS SEMPERVIRENS


LAGERSTROEMIA 'MUSKOGEE'


QUERCUS AGRIFOLIA


TRISTANIOPSIS LAURINA


ROSA TREE

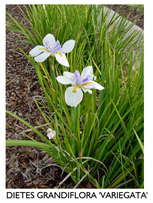

ULMUS PARVIFOLIA 'DRAKE'

SHRUBS/ GROUND COVER/ GRASSES


BUXUS SEMPERVIRENS


CAREX TUMULICOLA


CISTUS 'SUNSET'


DIETES GRANDIFLORA 'VARIEGATA'


ERIGERON KARVINSKIANUS


HEBE 'VERONICA LAKE'

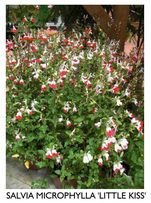

HEMEROCALLIS HYBRID 'SPARKLES'


HELICTOTRICHON SEMPERVIRENS


LAVENDULA INTERMEDIA 'PROVENCE'


LIRIOPE MUSCARI


LOMANDRIA LONGIFOLIA 'BREEZE'


SALVIA MICROPHYLLA 'LITTLE KISS'

RAISED BIO-RETENTION PLANTER


CHONDROPETALUM TECTORUM


JUNCUS PATENS

VINES


HARDENBERGIA VIOLACEA


JASMINUM POLYANTHUM


SOLANUM JASMINOIDES

PLANT LIST

TREES

Symbol	Botanical Name	Common Name	Size	Spacing	Water Needs
AS	Acer griseum	Paperbark Maple	15 Gallon	AS SHOWN	MOD
CT	x Chitalpa tashkentensis	Chitalpa	24" Box	AS SHOWN	LOW
CI	Citrus trees	Lemon	15 Gallon	AS SHOWN	MOD
CS	Cupressus sempervirens	Italian Cypress	15 Gallon	AS SHOWN	LOW
LU	Lagerstroemia 'Muskogee'	Crape Myrtle	24" Box	AS SHOWN	LOW
LT	Lagerstroemia 'Tuscarora'	Crape Myrtle	24" Box	AS SHOWN	LOW
QA	Quercus agrifolia	Coast Live Oak	36" Box	AS SHOWN	VERY LOW
RS	Rosa spp. Standard	Rose Standard	15 Gallon	AS SHOWN	MOD
TL	Tristaniopsis laurina	Water Gum	24" Box	AS SHOWN	MOD
UP	Ulmus parvifolia 'Drake'	Chinese Lacebark Elm	24" Box	AS SHOWN	LOW

SHRUBS

Symbol	Botanical Name	Common Name	Size	Spacing	Water needs
AA	Agapanthus 'Peter Pan'	Peter Pan's Lily of the Nile	1 Gallon	2'-0" O.C.	MOD
AG	Agapanthus 'Elaine'	Elaine's Lily of the Nile	1 Gallon	2'-0" O.C.	MOD
AJ	Aucuba japonica 'Variegata'	Variegated Japanese Aucuba	5 Gallon	3'-0" O.C.	MOD
BD	Buddleja davidii 'Blue Chip'	Blue Chip Butterfly Bush	1 Gallon	3'-0" O.C.	LOW
BS	Buxus sempervirens	Common Boxwood	1 Gallon	3'-0" O.C.	LOW
CA	Camellia x 'Buttermint'	Buttermint Camellia	5 Gallon	4'-0" O.C.	MOD
CS	Cistus 'Sunset'	Sunset Rockrose	1 Gallon	3'-0" O.C.	LOW
CO	Correa pulchella	Australian Fuchsia	1 Gallon	3'-0" O.C.	LOW
DV	Dietes grandiflora 'Variegata'	Striped Fortnight Lily	5 Gallon	3'-0" O.C.	LOW
EC	Escallonia 'Compakta'	Compact Escallonia	5 Gallon	3'-0" O.C.	MOD
GJ	Gardenia jasminoides	Gardenia	1 Gallon	3'-0" O.C.	MOD
HB	Hebe 'Veronica Lake'	Veronica Lake Hebe	5 Gallon	3'-0" O.C.	MOD
HH	Hemerocallis hybrid 'Sparkles'	Evergreen Day Lily	1 Gallon	2'-0" O.C.	MOD
LI	Lavendula intermedia 'Provence'	Provence Lavender	1 Gallon	2'-6" O.C.	LOW
LC	Loropetalum chinensis	Loropetalum	5 Gallon	4'-0" O.C.	LOW
ND	Nadina domestica 'Gulf Stream'	Heavenly Bamboo	5 Gallon	3'-0" O.C.	LOW
RC	Rhaphiolepis indica 'Ballerina'	Ballerina Indian Hawthorn	5 Gallon	4'-0" O.C.	LOW
RJ	Rhaphiolepis indica 'Jack Evans'	Jack Evans Indian Hawthorn	5 Gallon	4'-0" O.C.	LOW
RO	Rhododendron 'Mollis Hybrid	Yellow Rhododendron	5 Gallon	4'-6" O.C.	MOD
SL	Salvia microphylla 'Little Kiss'	Little Kiss Sage	5 Gallon	2'-0" O.C.	MOD
VB	Viburnum xburkwoodii 'Mohawk'	Mohawk Viburnum	5 Gallon	5'-0" O.C.	MOD

GROUND COVERS/GRASSES

Symbol	Botanical Name	Common Name	Size	Spacing	Water needs
CT	Carex tumulicola	Berkeley Sedge	1 Gallon	1'-6" O.C.	MOD
CH	Chondropetalum tectorum	Little Cape Rush	5 Gallon	3'-6" O.C.	MOD
EK	Erigeron karvinskianus	Fleabane	1 Gallon	2'-0" O.C.	LOW
FI	Festuca idahoensis	Idaho Fescue	1 Gallon	1'-0" O.C.	LOW
HS	Helictotrichon sempervirens	Blue Oat Grass	1 Gallon	1'-0" O.C.	LOW
JP	Juncus patens	California Gray Rush	1 Gallon	2'-6" O.C.	MOD
GJ	Geranium 'Johnson's Blue'	Johnson's Blue Geranium	1 Gallon	2'-0" O.C.	MOD
LK	Lantana 'Rainbow'	Rainbow Lantana	1 Gallon	3'-0" O.C.	LOW
LE	Limonium perezii	Sea Lavender	1 Gallon	3'-0" O.C.	LOW
LM	Liriope muscari	Lily Turf	1 Gallon	1'-0" O.C.	MOD
LL	Lomandria longifolia 'Breeze'	Mat Rush	1 Gallon	3'-0" O.C.	LOW
RM	Rosa meidiland - yellow	Yellow Carpet Rose	2 Gallon	4'-0" O.C.	MOD
TJ	Trachelospermum jasminoides	Star Jasmine	1 Gallon	2'-6" O.C.	MOD

VINES

Symbol	Botanical Name	Common Name	Size	Spacing	Water needs
HV	Hardenbergia violacea	Lilac Vine	1 Gallon	AS SHOWN	MOD
JP	Jasminum polyanthum	Jasmine	1 Gallon	AS SHOWN	MOD
SJ	Solanum jasminoides	Potato Vine	1 Gallon	AS SHOWN	MOD

L-4

TREE INVENTORY SPREADSHEET

TREE NO.	COMMON NAME	BOTANICAL NAME	DBH (IN.)	HEIGHT & SPREAD (FT.)	HEIGHT & STRUCTURE RATINGS (0-100% EACH)	REMOVE?	PROTECTED TREE PER COUNTY OF SAN MATEO
1	COAST LIVE OAK	QUERCUS AGRIFOLIA	30.4	30/40	90/65		X
2	COAST LIVE OAK	QUERCUS AGRIFOLIA	18.8	35/25	80/70		X
3	COAST LIVE OAK	QUERCUS AGRIFOLIA	28.2	30/25	75/65		X
4	CALIFORNIA VALLEY OAK	QUERCUS LOBATA	16.5	45/30	86/77		X
5	CALIFORNIA VALLEY OAK	QUERCUS LOBATA	20.4	45/30	85/80		X
6	COAST LIVE OAK	QUERCUS AGRIFOLIA	24	35/45	75/75		X
7	COAST LIVE OAK	QUERCUS AGRIFOLIA	14.3	35/35	80/70		X
8	COAST LIVE OAK	QUERCUS AGRIFOLIA	22	40/30	20/20	X	X
9	TREE OF HEAVEN	AILANTHUS ALTISSIMA	22	45/40	75/75		X
10	COAST LIVE OAK	QUERCUS AGRIFOLIA	18.8	35/35	85/75		X
11	COAST LIVE OAK	QUERCUS AGRIFOLIA	15.8	27/30	90/55		X
12	COAST LIVE OAK	QUERCUS AGRIFOLIA	19.4	35/40	85/80		X
13	COAST LIVE OAK	QUERCUS AGRIFOLIA	13.6	35/25	85/75	X	X
14	COAST LIVE OAK	QUERCUS AGRIFOLIA	12	20/20	75/50	X	X
15	EUROPEAN BIRCH	BETULA PENDULA	27	35/45	65/50	X	X
16	TULIP POPLAR	LIRIODENDRON TULIPIFERA	17.5	25/30	70/45	X	X
17	TULIP POPLAR	LIRIODENDRON TULIPIFERA	17.3	25/30	65/55	X	X
18	TULIP POPLAR	LIRIODENDRON TULIPIFERA	15.6	30/25	65/55	X	X
19	AMERICAN ELM	ULMUS AMERICANA	29.7	35/40	25/25	X	X
20	TREE OF HEAVEN	AILANTHUS ALTISSIMA	28.1	35/30	20/15	X	X
21	AMERICAN ELM	ULMUS AMERICANA	43.5	45/45	40/30	X	X
22	TREE OF HEAVEN	AILANTHUS ALTISSIMA	21	35/30	70/55	X	X
23	COAST LIVE OAK	QUERCUS AGRIFOLIA	35	40/50	90/60	X	X
24	COAST LIVE OAK	QUERCUS AGRIFOLIA	26	35/30	90/60	X	X
25	COAST LIVE OAK	QUERCUS AGRIFOLIA	26	27/30	90/40	X	X
26	CALIFORNIA VALLEY OAK	QUERCUS LOBATA	30	35/35	75/65		X
27	COAST LIVE OAK	QUERCUS AGRIFOLIA	30.5	50/50	90/70		X
28	COAST LIVE OAK	QUERCUS AGRIFOLIA	30.3	30/30	75/60		X

LEGEND:

- EXISTING TREE TO BE REMOVED
- EXISTING TREE TO REMAIN
- TREE PROTECTIVE FENCING

NOTE:
1. INFORMATION PROVIDED ON THIS PLAN IS BASED ON THE MAY 2, 2017 TREE REPORT BY WALTER LEVISON, CONSULTING ARBORIST. AND REVISED REPORT DATED OCTOBER 25, 2017.
2. TREE NUMBERING ARE PER ARBORIST REPORT.
3. SEE SHEET L-6 FOR TREE PROTECTION NOTES AND DETAIL.
4. REPLACEMENT TREES FOR TREES REMOVED SHALL BE 1:1 RATIO.
5. (6) COAST LIVE OAK PROPOSED TO BE REMOVED SHALL BE REPLACED WITH 48" BOX SIZE COAST LIVE OAK TREE.
6. AN ARBORIST'S REPORT IS REQUIRED FOR SIGNIFICANT OR HERITAGE TREES PROPOSED FOR REMOVAL ON THE BASIS OF POOR HEALTH, POTENTIAL HAZARD, OR WHEN A SIGNIFICANT OR HERITAGE TREE(S) IS PROPOSED TO REMAIN, BUT NEW DEVELOPMENT WOULD ENCROACH WITHIN THE DRIP LINE OF THE TREE.
7. THE ARBORIST'S REPORT SHALL ASSESS TREE CONDITION FOR ALL SIGNIFICANT OR HERITAGE TREES, AND ANY MEASURES NECESSARY TO PROTECT TREES ON SITE DURING DEMOLITION OR CONSTRUCTION, INCLUDING ANY REMEDIAL MEASURES NECESSARY TO SUSTAIN IMPACTED TREES. TREE PROTECTION MEASURES SHALL COMPLY WITH SAN MATEO COUNTY'S TREE PROTECTION REQUIREMENTS.
8. FOR DEVELOPMENT WITHIN A TREE DRIPLINE THE REPORT SHALL ASSESS POTENTIAL TREE SURVIVAL AND LONGEVITY, AND SPECIAL MEASURES NEEDED TO PROTECT ANY SUCH TREES OR POST CONSTRUCTION.

0 8' 16' 32'

L-5

GATES +ASSOCIATES

SUNRISE REDWOOD CITY SAN MATEO COUNTY

TREE PROTECTION PLAN

MARCH 2, 2018

TREE PROTECTION NOTES

1. PRIOR TO INITIATING ANY CONSTRUCTION ACTIVITY IN THE AREA, INCLUDING GRADING, TEMPORARY PROTECTIVE FENCING SHALL BE INSTALLED AT EACH SITE TREE. FENCING SHALL BE LOCATED AT OR BEYOND THE CANOPY DRIP LINE SO THAT 100% OF THE DRIP LINE WILL BE PROTECTED BY FENCING. TO REDUCE SOIL COMPACTION FROM EQUIPMENT.

2. THE CONTRACTOR IS REQUIRED TO WATER, FERTILIZE AND ATTEND TO OTHER MAINTENANCE NEEDS OF EXISTING TREES AS NEEDED PER ARBORIST'S RECOMMENDATIONS TO MAINTAIN HEALTHY GROWTH THROUGHOUT THE CONSTRUCTION PERIOD. SIX FEET DIAMETER, MINIMUM, BY SIX INCH TALL EARTH BERMS SHALL BE CONSTRUCTED AT THE BASE OF EACH TREE TO FUNCTION AS TEMPORARY WATERING BASINS DURING THE CONSTRUCTION PERIOD. TREES SHALL BE WATERED ACCORDING TO WEATHER AND TREE REQUIREMENTS. APPROVED MULCH OF 1-2 INCH SIZED WOOD CHIPS SHALL BE PLACED AT A DEPTH OF 4 INCHES WHERE NO EXCAVATION IS TO OCCUR IN THE VICINITY OF THE TREES TO BE PROTECTED.

3. THE TREE PROTECTION FENCE SHALL BE 5' HIGH CHAIN LINK FENCE WITH IMMOVABLE POSTS. THE FENCING SHALL FORM A CONTINUOUS BARRIER WITHOUT ENTRY POINTS AROUND EACH TREE. ANY ENCROACHMENT INTO THE DRIP LINE FOR FENCING OR CONSTRUCTION PURPOSES SHALL NOT BE PERMITTED.

4. LOW HANGING LIMBS OF SAVED TREES SHALL BE PRUNED PRIOR TO GRADING, OR ANY EQUIPMENT MOBILIZATION ON SITE. THE PURPOSE OF THIS REQUIREMENT IS TO AVOID TEARING LIMBS BY HEAVY EQUIPMENT. ALL LIMBS TO BE PRUNED SHALL BE SUPERVISED BY THE ARBORIST OF RECORD FOR THE JOB.

5. THIS FENCING SHALL SERVE AS A BARRIER TO PREVENT DRIP LINE ENCROACHMENT OF ANY TYPE OF CONSTRUCTION ACTIVITIES AND EQUIPMENT. NO OILS,. GAS, CHEMICALS, LIQUID WASTE, SOLID WASTE CONSTRUCTION MACHINERY OR CONSTRUCTION MATERIALS SHALL BE STORED OR ALLOWED TO STAND FOR ANY PERIOD OF TIME WITHIN THE DRIP LINE OF THE TREE. FURTHER, NO ONE SHALL ENTER THE FENCE PERIMETER FOR ANY REASON EXCEPT FOR THE PURPOSE OF MONITORING THE HEALTH OF THE TREE. ACCIDENTAL DAMAGE TO BARK, ROOT CROWN, OR LIMBS MAY INCREASE POTENTIAL FOR FUTURE DECLINE.

6. CONTRACTORS AND SUBCONTRACTORS SHALL DIRECT ALL EQUIPMENT AND PERSONNEL TO REMAIN OUTSIDE THE FENCED AREA AND AT ALL TIMES UNTIL PROJECT IS COMPLETE, AND SHALL INSTRUCT EMPLOYEES AS TO THE PURPOSE AND IMPORTANCE OF FENCING.

7. A 'TREE PROTECTION ZONE' SIGN SHALL BE POSTED AT EACH TREE INDICATING THE PURPOSE OF THE FENCING.

8. THE ARBORIST OF RECORD FOR THE JOB OR THE CITY ARBORIST SHALL BE RESPONSIBLE FOR INSPECTION AND APPROVAL OF THE FENCING PRIOR TO ANY GRADING OPERATIONS.

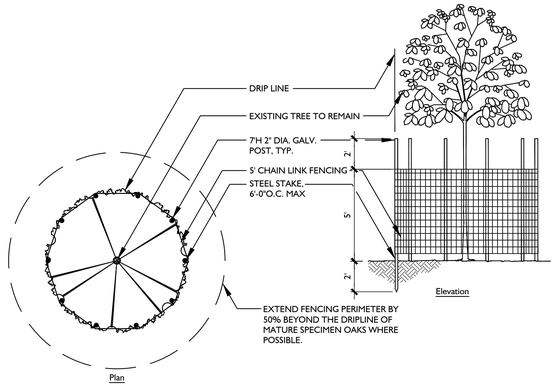
9. FENCING MUST REMAIN IN PLACE AND SHALL NOT BE REMOVED UNTIL ALL CONSTRUCTION ACTIVITIES ARE COMPLETED. THIS SHALL INCLUDE GRADING AND COMPACTION ACTIVITIES, INSTALLATION OF UNDERGROUND, ALL CONSTRUCTION ACTIVITIES AND ANY OTHER CONSTRUCTION OR ACTIVITY WHICH IS SCHEDULED PRIOR OR LANDSCAPE INSTALLATION.

10. ROOTS OF SINGLE STANDING TREES OFTEN EXTEND UP TO THREE TIMES THE DISTANCE OF THE ACTUAL DRIP LINE AND FUNCTION PRIMARILY IN THEY UPTAKE OF NUTRIENTS AND WATER. THE DRIP LINE IS ARBITRARILY ESTABLISHED AS THE MINIMUM ROOT AREA GENERALLY REQUIRED TO PRESERVE TREE HEALTH. AS MUCH AREA AROUND THE CIRCUMFERENCE OF THE TREE SHOULD HAVE MINIMUM INTRUSION TO FURTHER INSURE TREE SURVIVAL AND HEALTH.

11. UNAUTHORIZED TREE REMOVAL IS SUBJECT TO IN-KIND REPLACEMENT EQUAL TO THE VALUE OF THE MATURE RESOURCE LOST, AS DETERMINED BY THE COUNTY OF SAN MATEO.

12. NO MECHANICAL TRENCHING SHALL OCCUR WITHIN THE TREE PROTECTION ZONE. ANY EXCAVATION IF REQUIRED SHALL BE BY HAND, AIR SPADE OR BY VACUUM. CUTTING OF ANY ROOTS OVER 3" DIA SHALL BE REVIEWED BY AN ARBORIST.

13. THE CONTRACTOR SHALL CONTRACT WITH AN ARBORIST AS REQUIRED TO ENSURE PROPER TREE HEALTH IF A PROJECT ARBORIST OR CITY ARBORIST HAS NOT BEEN CONTRACTED.



1 EXISTING TREE PROTECTIVE FENCING

SCALE: 1/4" = 1'-0"

WATER EFFICIENCY LANDSCAPE ORDINANCE (WELO) WORKSHEET

§ 495 BARCLAYS CALIFORNIA CODE OF REGULATIONS Title 23

Appendix B — Sample Water Efficient Landscape Worksheet.

WATER EFFICIENT LANDSCAPE WORKSHEET

This worksheet is filled out by the project applicant and it is a required element of the Landscape Documentation Package.

Reference Evapotranspiration (ETo) 42.8

Hydrozone # /Planting Description[a]	Plant Factor (PF)	Irrigation Method[b]	Irrigation Efficiency (IE)[c]	ETAF (PF/IE)	Landscape Area (sq. ft.)	ETAF x Area	Estimated Total Water Use (ETWU)[d]
Regular Landscape Areas							
Low water use plantings	.2	drip	.81	.25	7,620	1,905	50,551
moderate water use plantings	.5	drip	.81	.62	4,780	2,963	78,626
lawn	.85	spray head	.75	1.13	800	904	23,988
				Totals	13,200	5,772	
Special Landscape Areas							
	[redacted]			1			
				1			
				1			
				Totals			
						ETWU Total	153,165
				Maximum Allowed Water Allowance (MAWA)[e]			192,651

[a] *Hydrozone #/Planting Description*
E.g
1.) front lawn
2.) low water use plantings
3.) medium water use planting

[b] *Irrigation Method*
overhead spray or drip

[c] *Irrigation Efficiency*
0.75 for spray head
0.81 for drip

[d] *ETWU* (Annual Gallons Required) = *Eto x 0.62 x ETAF x Area*
where 0.62 is a conversion factor that converts acre-inches per acre per year to gallons per square foot per year.

[e] *MAWA (Annual Gallons Allowed) = (Eto) (.62) [(ETAF x LA) + ((1-ETAF) x SLA)]*
where 0.62 is a conversion factor that converts acre-inches per acre per year to gallons per square foot per year, LA is the total landscape area in square feet, SLA is the total special landscape area in square feet, and ETAF is .55 for residential areas and 0.45 for non-residential areas.

ETAF Calculations

Regular Landscape Areas

Total ETAF x Area	5,772
Total Area	13,200
Average ETAF	.44

Average ETAF for Regular Landscape Areas must be 0.55 or below for residential areas, and 0.45 or below for non-residential areas.

All Landscape Areas

Total ETAF x Area	5,772
Total Area	13,200
Sitewide ETAF	.44

HISTORY

1. New Appendix B filed 9–10–2009; operative 9–10–2009 pursuant to Government Code section 11343.4 (Register 2009, No. 37).

2. Repealer and new Appendix B filed 9–15–2015; operative 9–15–2015. Exempt from OAL review and submitted to OAL for printing only pursuant to Governor's Executive Order No. B–29–15 (4–1–2015) (Register 2015, No. 38).

Page 38.14(d) Register 2015, No. 38, 9–18–2015

WATER EFFICIENT LANDSCAPE STATEMENT

1. THE IRRIGATION SYSTEM SHALL BE DESIGNED TO MEET CURRENT WATER EFFICIENCY STANDARDS AND STATE MODEL WATER EFFICIENT LANDSCAPE ORDINANCE AB1881 AS REQUIRED BY LOCAL JURISDICTIONS WHILE ACHIEVING THE GOAL OF EFFECTIVELY AND EFFICIENTLY PROVIDING THE LANDSCAPE WITH WATER BY MEANS OF HIGH EFFICIENCY SPRAY IRRIGATION TO THE TURF AND GROUND COVER AREAS AND DRIP IRRIGATION BUBBLERS TO RESTRICTED SHRUB PLANTING AND SHRUB MASS PLANTING AREAS AS APPLICABLE.

2. IRRIGATION SYSTEMS SHALL BE DESIGNED TO ACCOMMODATE RECYCLED WATER WHERE AVAILABLE EITHER CURRENTLY OR IN THE FUTURE AS DIRECTED BY THE LOCAL WATER PURVEYOR. RECYCLED WATER SYSTEMS SHALL BE DESIGNED IN ACCORDANCE WITH LOCAL AND STATE CODES.

3. IRRIGATION SYSTEMS FOR LANDSCAPES GREATER THAT 5,000 SF SHALL HAVE A DEDICATED WATER METER FOR IRRIGATION.

4. A WATER EFFICIENT LANDSCAPE WORKSHEET SHALL BE INCLUDED WITH HYDROZONE INFORMATION TABLE, WATER BUDGET CALCULATIONS AND IRRIGATION OPERATION SCHEDULES.

5. A STATE OF THE ART ET BASED SELF ADJUSTING IRRIGATION CONTROLLER SHALL BE SPECIFIED FOR THIS PROJECT TO AUTOMATICALLY CONTROL THE WATER ALLOCATED TO EACH VALVE GROUPED PER INDIVIDUAL HYDROZONE (BASED ON PLANT TYPE AND EXPOSURE). THIS SHALL INCLUDE RAIN AND FLOW SENSORS AS APPLICABLE FOR A HIGHER LEVEL OF WATER CONSERVATION.

6. TREE BUBBLERS SHALL BE INCLUDED ON SEPARATE CIRCUITS TO ISOLATE THE IRRIGATION TO THE TREES AND PROVIDE DEEP WATERING TO PROMOTE A DEEPER ROOT STRUCTURE.

7. SPRAY IRRIGATION SYSTEMS FOR GROUNDCOVER AREAS GREATER THAN 8' WIDE IN ANY DIRECTION SHALL BE DESIGNED WITH COMMERCIAL SERIES SPRAY HEADS WITH HIGH EFFICIENCY NOZZLES THAT INCLUDE INTERNAL CHECK VALVES AND PRESSURE COMPENSATION DEVICES. THE HEADS SHALL BE DESIGNED IN A HEAD TO HEAD LAYOUT TO ACHIEVE AN EVEN LEVEL OF PRECIPITATION THROUGHOUT THE IRRIGATION SYSTEM. THE NOZZLES DELIVER WATER AT MINIMUM 70% EFFICIENCY WITH A LOW PRECIPITATION RATE THAT MATCHES THE INFILTRATION RATE OF THE SOIL.

8. THE DRIP SYSTEM WILL INCORPORATE PRESSURE COMPENSATING DRIP BUBBLERS WITH 1/4" DRIP TUBES TO EACH PLANT WHICH DELIVERS WATER AT 90% EFFICIENCY AT AN APPLICATION RATE THAT MATCHES THE SOIL TYPE.

L-6

LEGEND

	ASPHALT BERM
	BUILDING LINE
	CENTERLINE
	CONCRETE/BLOCK/RETAINING WALL
	CONCRETE CURB
	CONCRETE CURB & GUTTER
300	CONTOUR LINE
300	OBSCURED CONTOUR LINE
	DRIVEWAY
	EASEMENT LINE
	EDGE OF PAVEMENT
E	ELECTRIC LINE
	FENCE LINE
FO	FIBER OPTICS LINE
FS	FIRE SERVICE & VALVE
G GM	GAS LINE-VALVE & METER
JT	JOINT TRENCH
	LOT LINE
	MONUMENT/MONUMENT LINE
OH	OVERHEAD POWER LINE
	PROPERTY LINE
SS	SANITARY SEWER-MANHOLE & CLEANOUT
	SIDEWALK
+300.00	SPOT ELEVATION
SD	STORM DRAIN-MANHOLE & CATCH BASIN
T	TELEPHONE LINE
TS	TRAFFIC SIGNAL CONDUIT LINE
UKN	UNKNOWN UTILITY LINE
W	WATER LINE & VALVE
	AUTOMATIC SPRINKLER RISER
	BACKFLOW PREVENTION DEVICE
	BLOWOFF VALVE
	ELECTROLIER
	FIRE DEPARTMENT CONNECTION
	FIRE HYDRANT
	FLAG POLE
	GUY ANCHOR
	GAS METER
	HANDICAP SYMBOL
	HOSEBIBB
	MAIL BOX
	UTILITY LINE MARKER
	TELEPHONE BOOTH
	POST INDICATOR VALVE
	POWER POLE/JOINT POLE
	RAILROAD CROSSING
	TRANSFORMER
	TRAFFIC SIGNAL POLE
	TRAFFIC SIGN
12"TR	TREE
	UTILITY BOX
	WATER VALVE
W	WELL
<	ANGLE POINT
AP	ANGLE POINT
BC	BACK OF CURB
BL	BUILDING LINE
BL	BUILDING LINE
BLRD	BOLLARD
BOL	BOLLARD
BS	BOTTOM OF STAIR
BTM	BOTTOM
BW	BACK OF WALK
C	CONCRETE
CATV	CABLE TELEVISION
CL	CENTER LINE
DWY	DRIVEWAY
EB	ELECTRIC BOX
EP	EDGE OF PAVEMENT
EW	EDGE OF WALK
EXC	EXCEPTION
FC	FACE OF CURB
FDC	FIRE DEPARTMENT CONNECTION
FF	FINISH FLOOR
FH	FIRE HYDRANT
FL	FLOWLINE
FNC	FENCE
FOMH	FIBER OPTIC MANHOLE
FW	FACE OF WALL
GA	GUY ANCHOR
GAS	GAS LINE
GB	GRADE BREAK
GM	GAS MARKER/METER
GV	GAS VALVE
HCR	HANDICAP RAMP
HDR	HEADER BOARD
HSB	HOSEBIB
IE	INVERT ELEVATION
JP	JOINT POWER POLE
LIP	LIP OF GUTTER
MH	MANHOLE
N	NORTH
OH	OVERHEAD
P.	PAVEMENT
PIV	POST INDICATOR VALVE
POC	POINT OF CONNECTION
RE	RIM ELEVATION
RET	CURB RETURN
RWL	RAIN WATER LEADER
SL	STREET LIGHT
SL	STREET LIGHT
SS	SANITARY SEWER
SSCO	SANITARY SEWER CLEAN OUT
SSMH	SANITARY SEWER MANHOLE
SWL	SWALE
TB	TELEPHONE BOX
TC	TOP OF CURB
TS	TOP OF STAIR
UB	UNKNOWN UTILITY BOX
USAY	GAS-OIL-STREAM CHEMICAL
TMH	TELEPHONE MANHOLE
WB	WATER BOX
WM	WATER METER
WI	WROUGHT IRON
WD	WOOD
WV	WATER VALVE

NOTES

1. THIS SURVEY WAS PREPARED FROM INFORMATION FURNISHED IN A CONCEPTUAL TITLE REPORT, PREPARED BY FIRST AMERICAN TITLE INSURANCE COMPANY DATED AS OF SEPTEMBER 1, 2016, ORDER NUMBER NCS–817144–DC72, FURNISHED TO KIER & WRIGHT CIVIL ENGINEERS & SURVEYORS, INC BY SUNRISE SENIOR LIVING ON OCTOBER 25, 2016. NO LIABILITY IS ASSUMED FOR MATTERS OF RECORD NOT STATED IN SAID REPORT THAT MAY AFFECT THE TITLE LINES, OR EXCEPTIONS, OR EASEMENTS OF THE PROPERTY.
2. ALL DISTANCES AND ELEVATIONS SHOWN HEREON ARE IN FEET AND DECIMALS THEREOF.
3. THE TYPES, LOCATIONS, SIZES AND/OR DEPTHS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS TOPOGRAPHIC SURVEY WERE OBTAINED FROM SOURCES OF VARYING RELIABILITY. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE TYPES, EXTENT, SIZES, LOCATIONS AND DEPTHS OF SUCH UNDERGROUND UTILITIES. (A REASONABLE EFFORT HAS BEEN MADE TO LOCATE AND DELINEATE ALL KNOWN UNDERGROUND UTILITIES). HOWEVER, THE ENGINEER CAN ASSUME NO RESPONSIBILITY FOR THE COMPLETENESS OR ACCURACY OF ITS DELINEATION OF SUCH UNDERGROUND UTILITIES WHICH MAY BE ENCOUNTERED, BUT WHICH ARE NOT SHOWN ON THESE DRAWINGS.
4. BENCHMARK: CITY OF REDWOOD CITY, BENCHMARK BM38, CARLOS AVE AT CYPRESS ST. – TOP OF DISC ON CURB, ON CARLOS AVE., NORTHEAST OF INTERSECTION ON SOUTHEAST SIDE OF STREET, AT BEGINNING OF CURVE OF CURB RETURN, 2.5' FROM FIRE HYDRANT.

   ELEVATION = 35.40 FEET (NAVD 88)
5. BASIS OF BEARINGS:
   THE BEARING OF SOUTH 32° 32' 00" WEST TAKEN ON THE NORTHWESTERLY RIGHT OF WAY LINE OF MARKHAM AVENUE AS SHOWN ON THAT CERTAIN MAP ENTITLED "DUMBARTON PARK, SAN MATEO COUNTY, CALIF." FILED FOR RECORD ON JANUARY 20, 1926 IN BOOK 13 OF MAPS AT PAGE 29, OFFICIAL RECORDS OF SAN MATEO COUNTY WAS TAKEN AS THE BASIS FOR ALL BEARINGS SHOWN HEREON.

11-23-2016
DATE

PREPARED BY OR UNDER THE SUPERVISION OF
RICHARD JAMES HICKENBOTTOM, P.L.S. 8654
LICENSE EXPIRES: 12-31-17

LICENSED LAND SURVEYOR
RICHARD JAMES HICKENBOTTOM
No. 8654
12/31/17
STATE OF CALIFORNIA

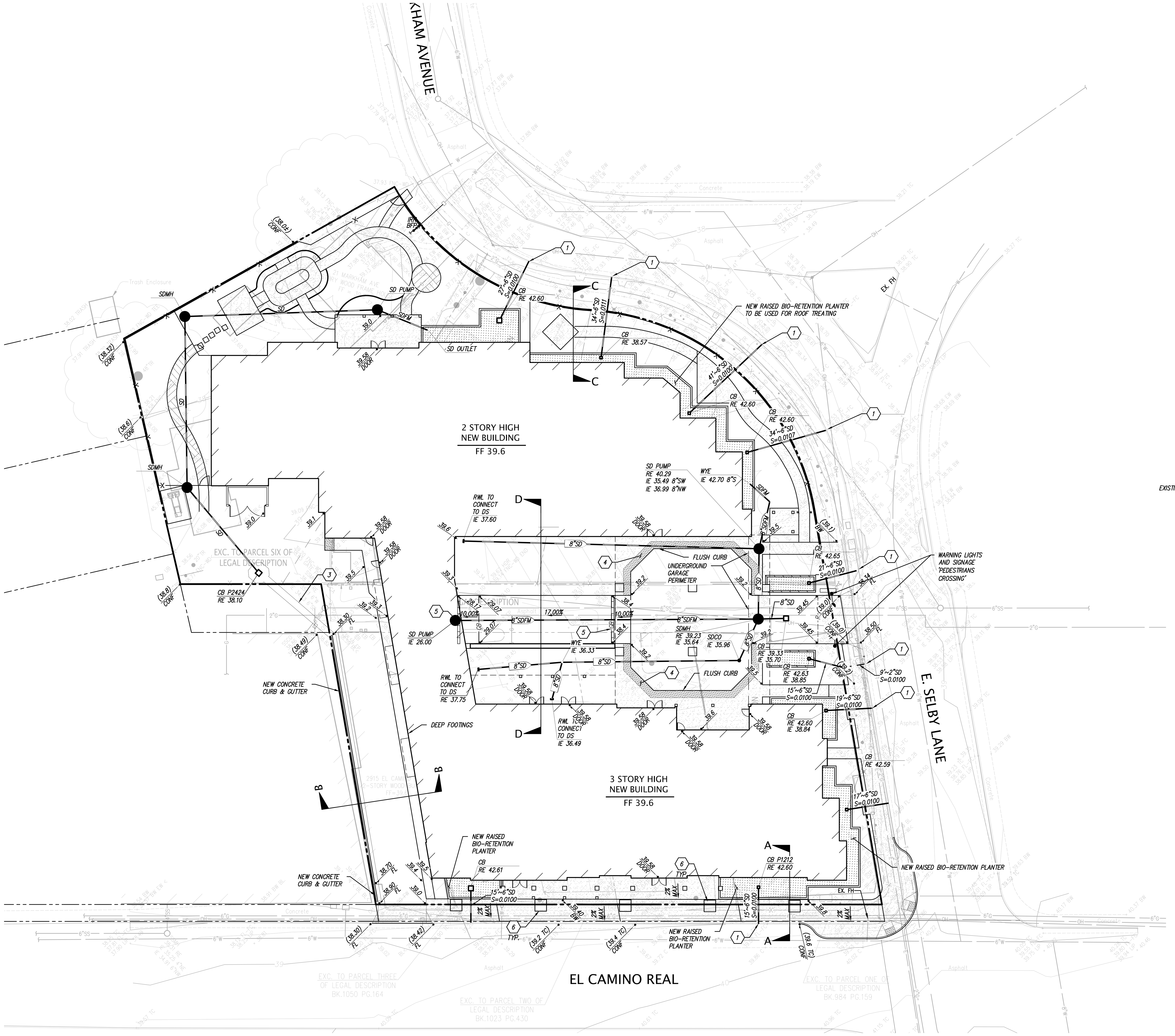
NO.	REVISION	BY
	PLANNING SUBMITTAL 06/05/2017	
	PLANNING SUBMITTAL 09/14/2017	
	PLANNING RESUBMITTAL 10/31/2017	
	PLANNING RESUBMITTAL 1/22/2018	
	PLANNING RESUBMITTAL 3/2/2018	

KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2850 Collier Canyon Road
Livermore, California 94551
Phone (925) 245-8788
Fax (925) 245-8796

TOPOGRAPHIC SURVEY
OF
2915 EL CAMINO REAL
FOR
SUNRISE SENIOR LIVING
REDWOOD CITY, CALIFORNIA

DATE	NOV, 2016
SCALE	1" = 20'
DESIGNER	EYS
JOB NO.	A16704
SHEET	C1
OF	- SHEETS

C:\Users\KWieser\appdata\local\temp\AcPublish_8684\A16704-PG.dwg 3-05-18 11:54:51 AM ejohnson



EARTHWORK SUMMARY

CUT: 11,000± CY

FILL: 0 CY

NOTES:

1. THE EARTHWORK QUANTITIES LISTED ON THESE PLANS ARE STATED ONLY FOR CALCULATION OF GRADING AND BUILDING PERMIT FEES. THESE QUANTITIES DO NOT INCLUDE TRENCH OR FOOTING SPOILS, SHRINK OR SWELL FROM COMPACTING EFFORTS OR OTHER VARIABLES. THE ENGINEER MAKES NO REPRESENTATION THIS SITE WILL BALANCE. THE CONTRACTOR SHALL DETERMINE HIS OWN EARTHWORK QUANTITIES AND BASE HIS BID ACCORDINGLY.

NORTH

0 10 20 40 60

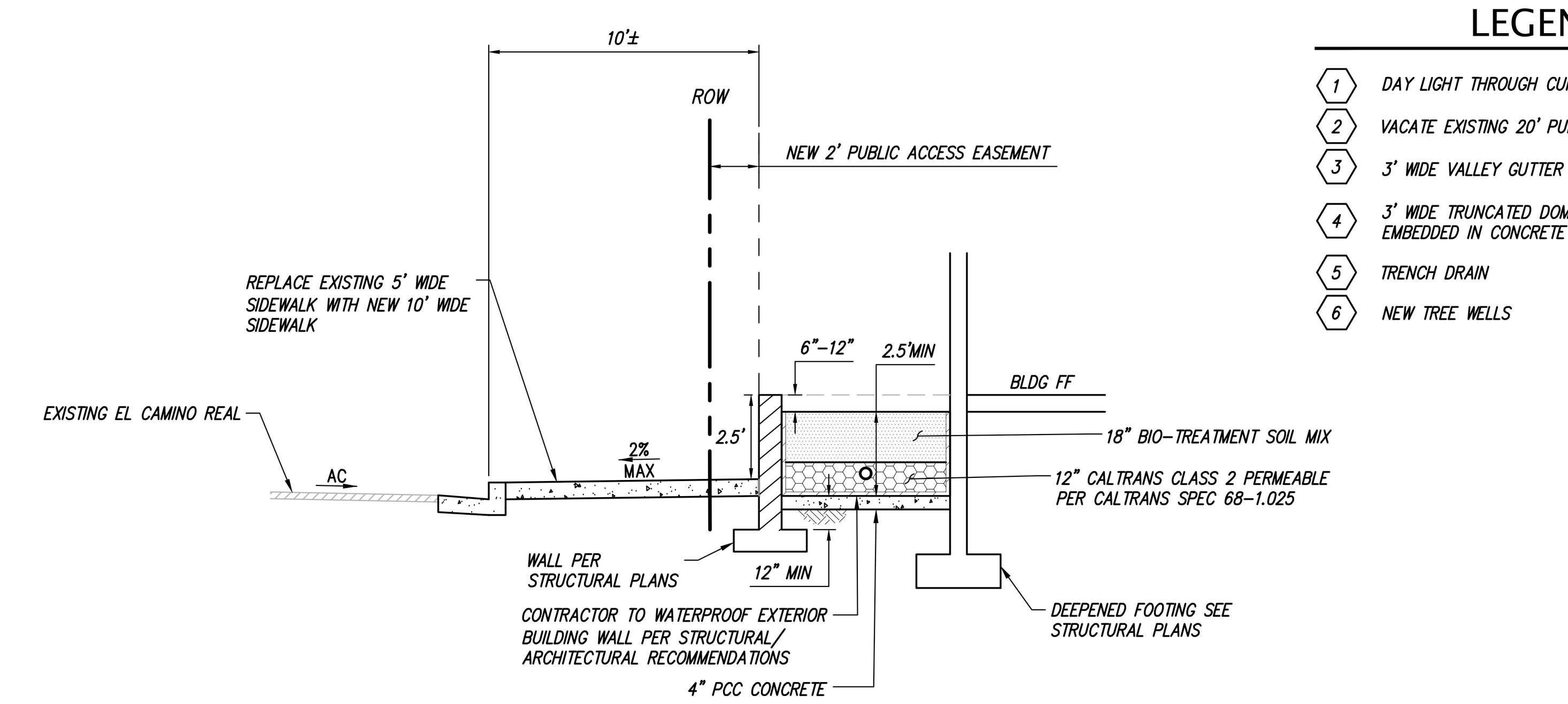
Scale 1" = 20'

LEGEND

Symbol	Description
▲	AREA DRAIN
□	STORM DRAIN CATCH BASIN
■	STORM DRAIN JUNCTION BOX
●	STORM DRAIN MANHOLE
FL	FLOW LINE
FF	FINISH FLOOR
PV	PAVEMENT
RE	RIM ELEVATION
ROW	RIGHT-OF-WAY
23.8	SPOT ELEVATION
X"SD	STORM DRAIN LINE
TC	TOP OF CURB
	BIO-RETENTION PLANTER
	NEW IMPERVIOUS PAVEMENT
	CONCRETE SIDEWALK: 5.5" PCC OVER 6" CLASS II AB
	PERMEABLE PAVERS

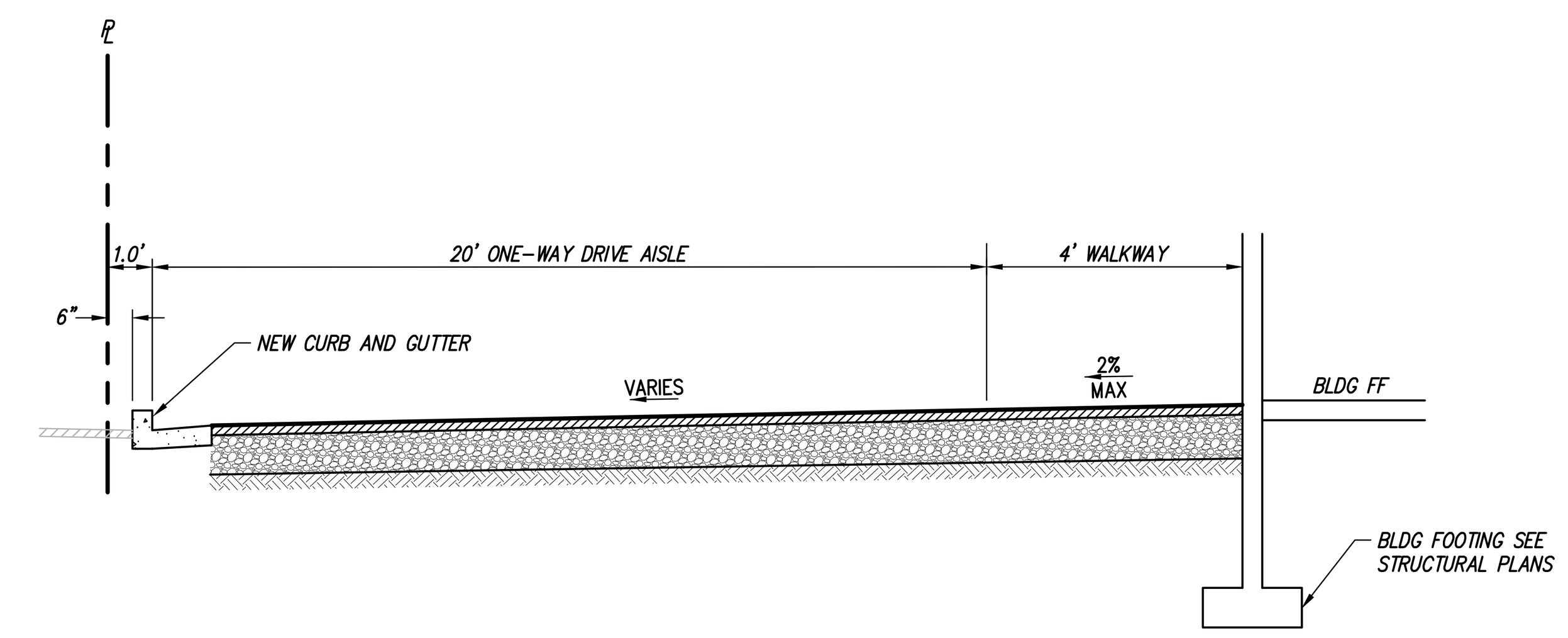
LEGEND

1. DAY LIGHT THROUGH CURB
2. VACATE EXISTING 20' PUBLIC ACCESS ROAD
3. 3' WIDE VALLEY GUTTER
4. 3' WIDE TRUNCATED DOMES TO BE EMBEDDED IN CONCRETE
5. TRENCH DRAIN
6. NEW TREE WELLS



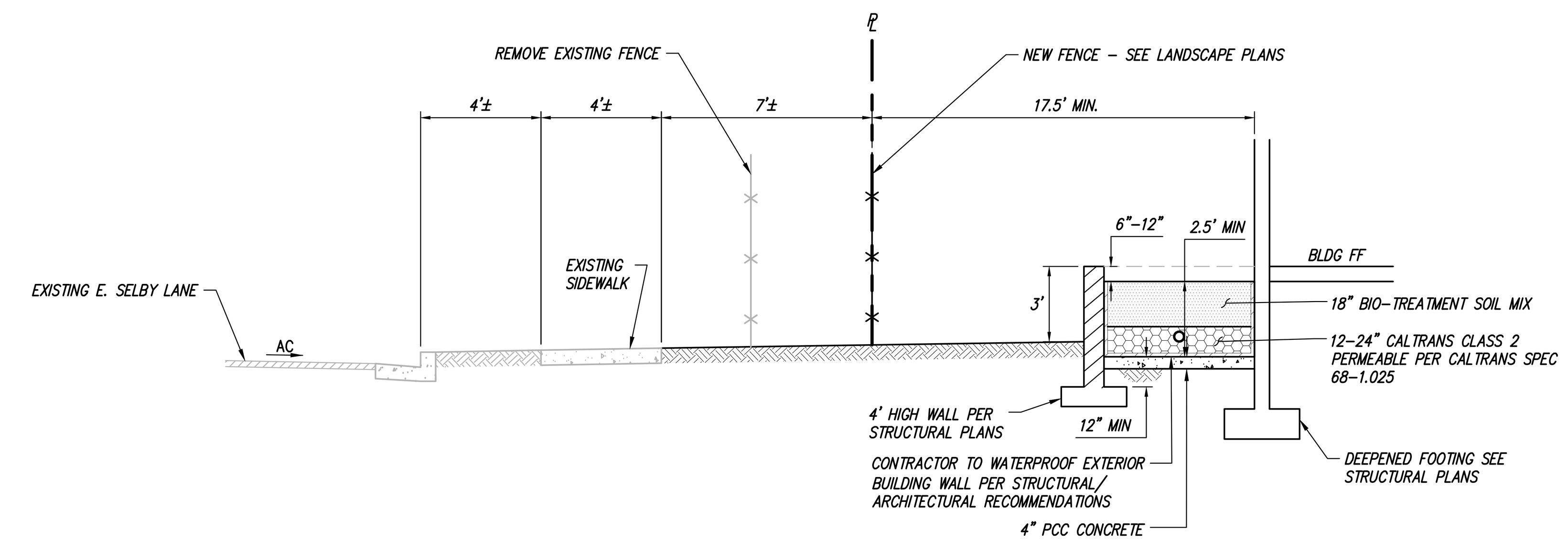
SECTION (A)

NOT TO SCALE



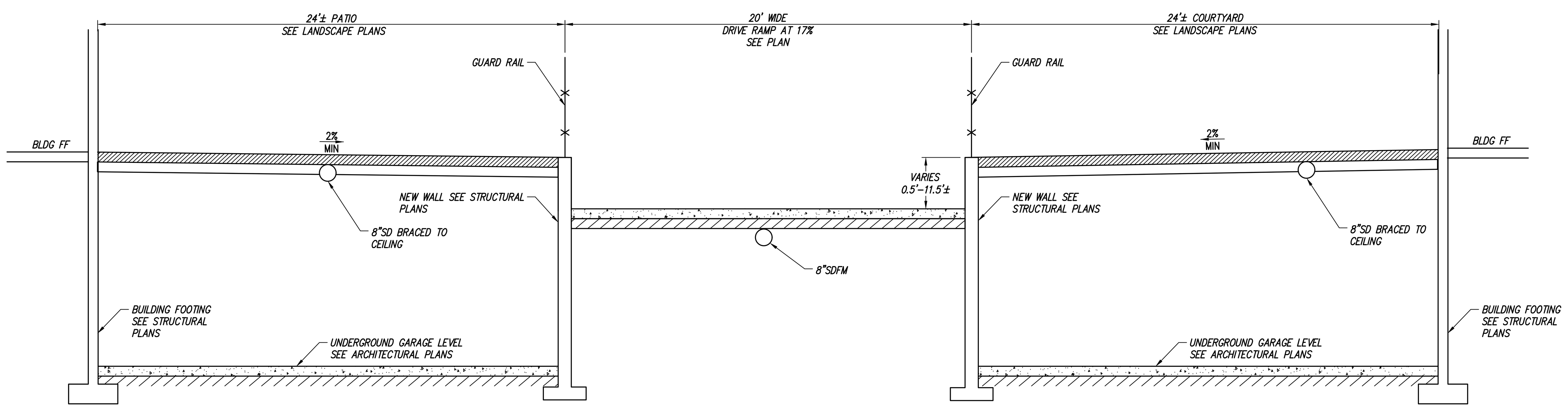
SECTION (B)

NOT TO SCALE



SECTION (C)

NOT TO SCALE



SECTION (D)

NOT TO SCALE

Z:\2016\A16704\A16704-PG.dwg 3-05-18 03:32:42 PM ejohnson

NO.	REVISION	BY
	PLANNING SUBMITTAL 06/05/2017	
	PLANNING SUBMITTAL 09/14/2017	
	PLANNING RESUBMITTAL 10/31/2017	
	PLANNING RESUBMITTAL 1/22/2018	
	PLANNING RESUBMITTAL 3/2/2018	

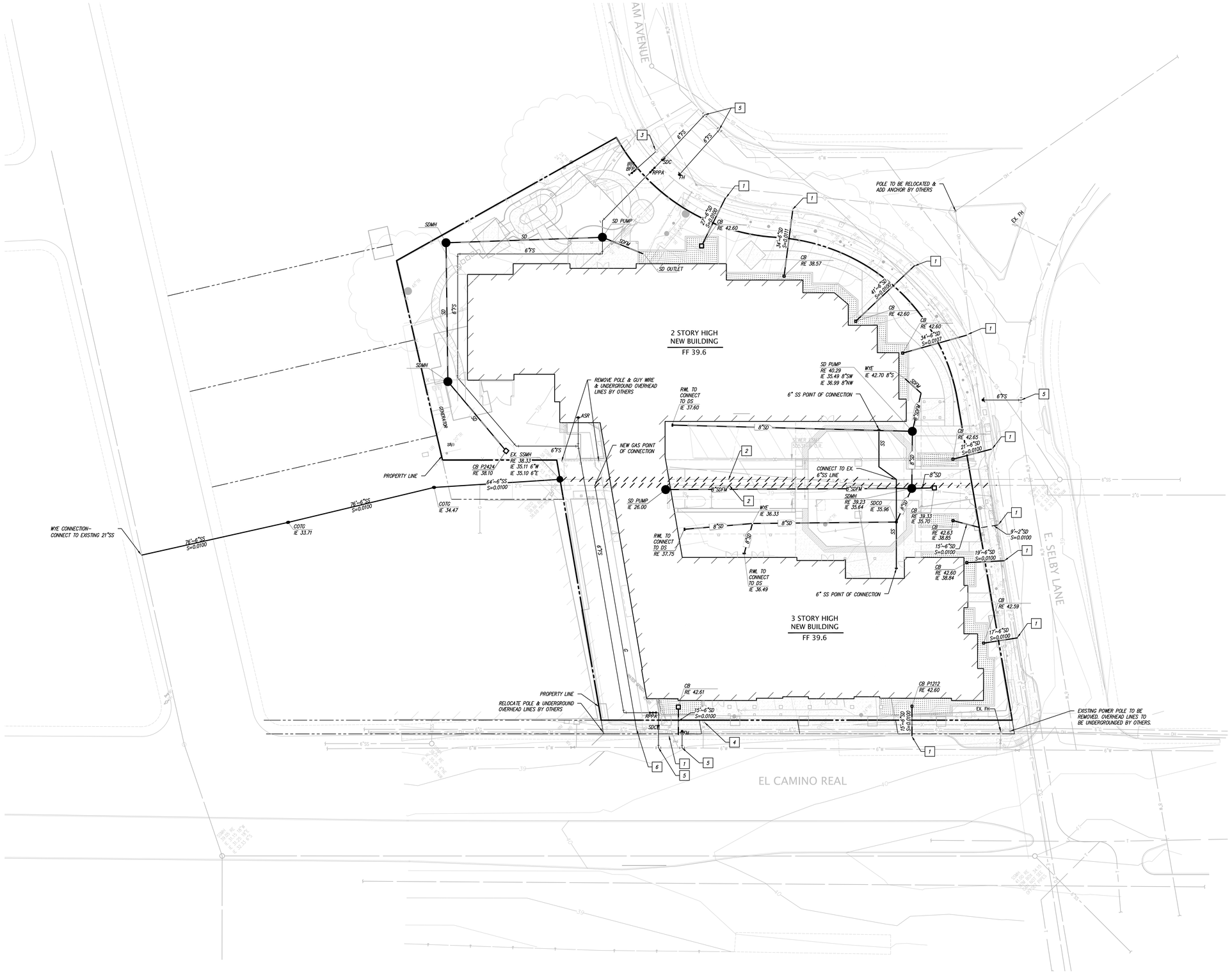
KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2850 Collier Canyon Road
Livermore, California 94551
Phone (925) 245-8788
Fax (925) 245-8796

REGISTERED PROFESSIONAL ENGINEER EMAD Y. SARIEDDINE No. 65112 CIVIL STATE OF CALIFORNIA

CONCEPTUAL GRADING AND DRAINAGE PLAN
OF
2915 EL CAMINO REAL
FOR
SUNRISE SENIOR LIVING

REDWOOD CITY, CALIFORNIA

DATE	NOV, 2016
SCALE	1" = 20'
DESIGNER	EYS
JOB NO.	A16704
SHEET	C2
OF	- SHEETS



NO.	REVISION	BY
	PLANNING SUBMITTAL 06/05/2017	
	PLANNING SUBMITTAL 09/14/2017	
	PLANNING RESUBMITTAL 10/31/2017	
	PLANNING RESUBMITTAL 1/22/2018	
	PLANNING RESUBMITTAL 3/2/2018	

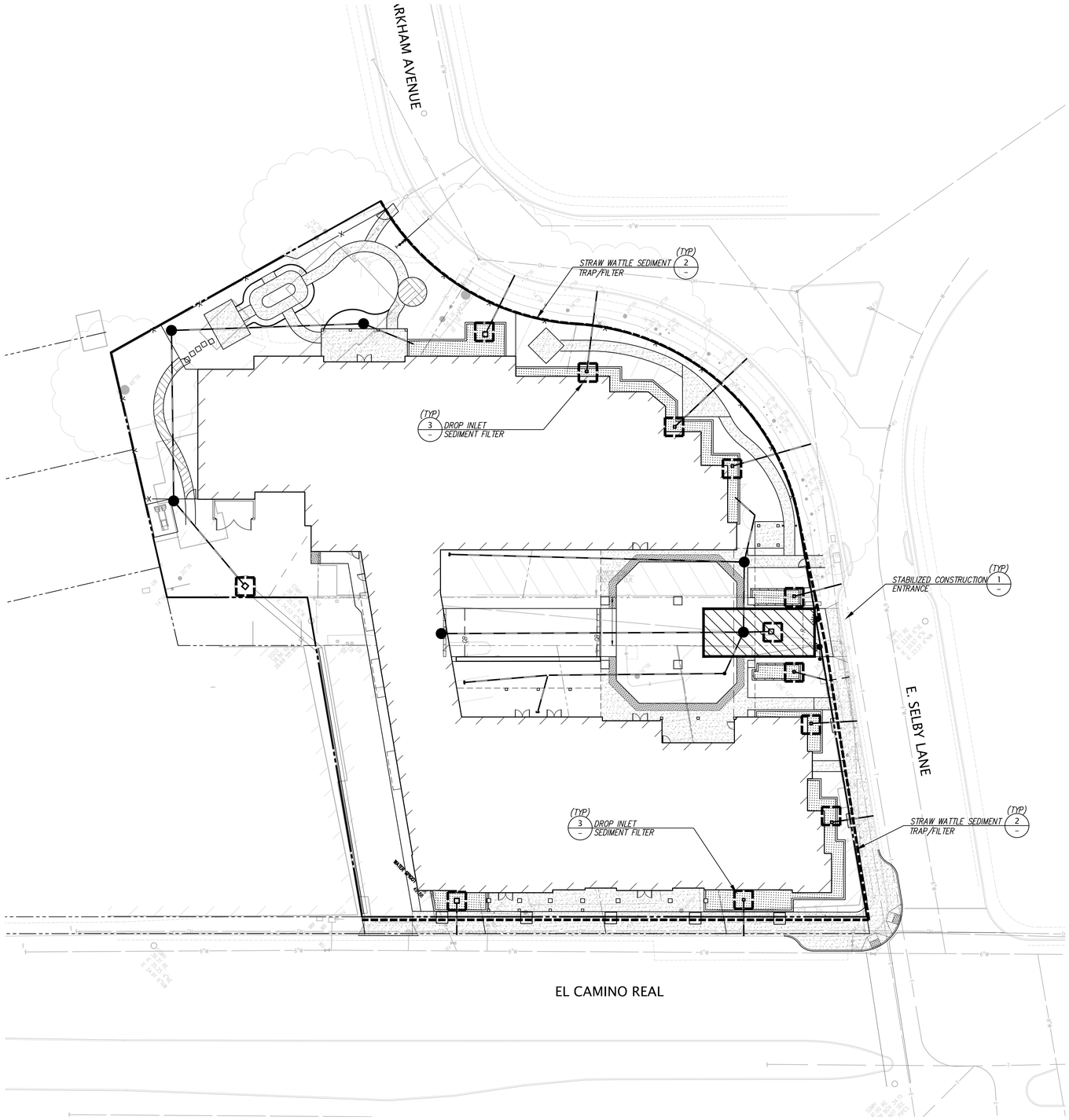
KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2850 Collier Canyon Road Phone (925) 245-8788
Livermore, California 94551 Fax (925) 245-8796

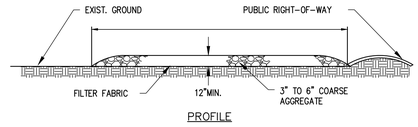
REGISTERED PROFESSIONAL ENGINEER
MARK T. SARTOORTE
No. 75112
CIVIL
STATE OF CALIFORNIA

PRELIMINARY UTILITY PLAN
OF
2915 EL CAMINO REAL
FOR
SUNRISE SENIOR LIVING

REDWOOD CITY, CALIFORNIA

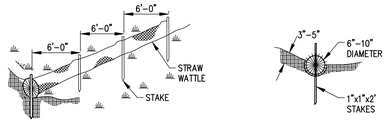
DATE	NOV, 2016
SCALE	1" = 20'
DESIGNER	EYS
JOB NO.	A16704
SHEET	C3
OF	- SHEETS





STABILIZED CONSTRUCTION ENTRANCE 1

NOT TO SCALE

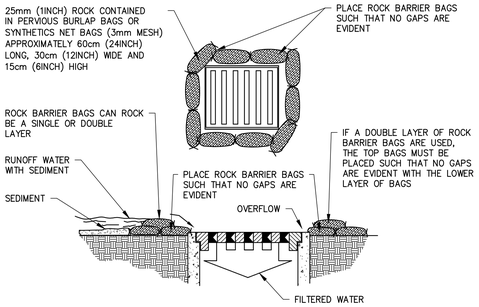


NOTE:

1. STRAW WATTLES ARE TUBES MADE FROM STRAW BOUND W/BIO-DEGRADABLE NETTING. THEY ARE APPROX. 6"-10" DIA AND 20-30 FT LONG.
2. STRAW WATTLES TRAP SEDIMENT AND REDUCE SHEET AND HILL EROSION BY REDUCING SLOPE GRADIENT, INCREASING INFILTRATION RATES AND BY PRODUCING A FAVORABLE ENVIRONMENT FOR PLANT ESTABLISHMENT.
3. STRAW WATTLE INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE WATTLE IN A TRENCH 3"-5" DEEP, DUG ON CONTOUR. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND WATTLE.

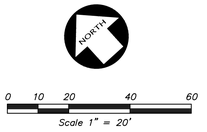
STRAW WATTLE SEDIMENT TRAP/FILTER 2

NOT TO SCALE



DROP INLET SEDIMENT FILTER UTILIZING ROCK BARRIER BAGS 3

NOT TO SCALE



LEGEND

1 – STABILIZED CONSTRUCTION ENTRANCE

2 – STRAW WATTLE SEDIMENT TRAP/FILTER

3 – DROP INLET SEDIMENT FILTER

EROSION & SEDIMENT CONTROL MEASURES

1. *EROSION AND SEDIMENT CONTROL MEASURES SHALL BE EFFECTIVE FOR THE DURATION OF CONSTRUCTION.*
2. *AFTER THE UNDERGROUND STORM DRAIN SYSTEM IS INSTALLED, THE CATCH BASINS WILL BE INSTALLED (AS SOON AS PRACTICAL) AND ROCK BARRIER BAGS WILL BE PLACED AROUND THOSE CATCH BASINS AS SHOWN ON THIS PLAN UNTIL THIS SITE IS PAVED.*
3. *SHOULD THE ON-SITE STORM DRAINS NOT BE INSTALLED COMPLETELY BY OCTOBER 15, THE CONTRACTOR SHALL CONSTRUCT TEMPORARY SEDIMENT BASINS AT THE EXISTING STORM PIPES STUBBED TO THE SITE.*
4. *PERSON RESPONSIBLE FOR IMPLEMENTATION OF EROSION AND SEDIMENTATION PLAN.*

   NAME: TBD
   ADDRESS: TBD
   TELEPHONE: TBD

5. *THE CONTRACTOR SHALL PLACE 3"-6" COARSE AGGREGATE AS A GRAVEL ROADWAY (12" MIN. THICK FOR THE FULL WIDTH AND 50 FEET LONG) AT EACH D/W ENTRANCE TO SITE. ANY MUD THAT IS TRACKED ONTO PUBLIC STREETS SHALL BE REMOVED THAT SAME DAY AND AS REQUIRED BY THE CITY OF REDWOOD CITY.*
6. *ALL EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL DISTURBED AREAS ARE STABILIZED AND CHANGES TO THIS EROSION AND SEDIMENT CONTROL PLAN SHALL BE MADE TO MEET FIELD CONDITIONS ONLY WITH THE APPROVAL OF OR AT THE DIRECTION OF THE CITY ENGINEER.*
7. *ALL PAVED AREAS SHALL BE KEPT CLEAR OF EARTH MATERIAL AND DEBRIS. THE SITE SHALL BE MAINTAINED SO AS TO MINIMIZE SEDIMENT-LADEN RUN-OFF TO ANY STORM DRAINAGE SYSTEM.*
8. *THIS PLAN COVERS ONLY THE FIRST WINTER FOLLOWING GRADING. PLANS ARE TO BE RESUBMITTED FOR CITY APPROVAL PRIOR TO THE SEPTEMBER FIRST OF EACH SUBSEQUENT YEAR UNTIL THE SITE IMPROVEMENTS ARE ACCEPTED BY THE CITY.*
9. *ALL EROSION CONTROL FACILITIES MUST BE INSPECTED AND REPAIRED AT THE END OF EACH WORKING DAY.*
10. *SEDIMENT BASINS SHALL BE CLEANED OUT WHENEVER SEDIMENT REACHES THE SEDIMENT CLEANOUT LEVEL INDICATED ON THE PLANS.*
11. *BORROW AREAS AND TEMPORARY STOCKPILES SHALL BE PROTECTED WITH APPROPRIATE EROSION CONTROL MEASURES TO THE SATISFACTION OF THE CITY ENGINEER.*
12. *ALL CUT AND FILL SLOPES ARE TO BE PROTECTED TO PREVENT OVERBANK FLOW.*
13. *INLETS WHICH ARE NOT USED IN CONJUNCTION WITH ROCK BARRIER BAGS OR SEDIMENT BASINS SHOULD BE COVERED, OR OTHERWISE ADJUSTED TO PREVENT INFLOW, UNLESS THE AREA DRAINED IS UNDISTURBED OR STABILIZED.*
14. *THIS PLAN MAY NOT COVER ALL THE SITUATIONS THAT ARISE DURING CONSTRUCTION DUE TO ANTICIPATED FIELD CONDITIONS. VARIATIONS MAY BE MADE TO THE PLAN IN THE FIELD SUBJECT TO THE APPROVAL OF THE ENGINEER.*
15. *DETAILS FOR THE CONSTRUCTION OF FACILITIES ARE SHOWN ON THESE PLANS.*
16. *THIS PLAN IS INTENDED TO BE USED FOR EROSION CONTROL ONLY. OTHER INFORMATION SHOWN HEREIN MAY NOT BE THE MOST CURRENT. SEE SHEET C2 FOR OTHER INFORMATION.*
17. *EROSION CONTROL POINT OF CONTACT. (PLEASE PROVIDE AN EROSION CONTROL POINT OF CONTACT INCLUDING NAME, TITLE/QUALIFICATION, EMAIL, AND PHONE NUMBER. THE EC POINT OF CONTACT WILL BE THE COUNTY'S MAIN POINT OF CONTACT IF EROSION CONTROL OR TREE PROTECTION CORRECTIONS ARE REQUIRED).*
18. *PERFORM CLEARING AND EARTH-MOVING ACTIVITIES ONLY DURING DRY WEATHER. MEASURES TO ENSURE ADEQUATE EROSION AND SEDIMENT CONTROL SHALL BE INSTALLED PRIOR TO EARTH-MOVING ACTIVITIES AND CONSTRUCTION.*
19. *MEASURES TO ENSURE ADEQUATE EROSION AND SEDIMENT CONTROL ARE REQUIRED YEAR-ROUND. STABILIZE ALL DENUDED AREAS AND MAINTAIN EROSION CONTROL MEASURES CONTINUOUSLY BETWEEN OCTOBER 1 AND APRIL 30.*
20. *STORE, HANDLE, AND DISPOSE OF CONSTRUCTION MATERIALS AND WASTES PROPERTY, SO AS TO PREVENT THEIR CONTACT WITH STORMWATER.*
21. *CONTROL AND PREVENT THE DISCHARGE OF ALL POTENTIAL POLLUTANTS, INCLUDING PAVEMENT CUTTING WASTES, PAINTS, CONCRETE, PETROLEUM PRODUCTS, CHEMICALS, WASH WATER OR SEDIMENTS, AND NON-STORMWATER DISCHARGES TO STORM DRAINS AND WATERCOURSES.*
22. *USE SEDIMENT CONTROLS OR FILTRATION TO REMOVE SEDIMENT WHEN DEWATERING SITE AND OBTAIN REGIONAL WATER QUALITY CONTROL BOARD (RWQCB) PERMIT(S) AS NECESSARY.*
23. *AVOID CLEANING, FUELING, OR MAINTAINING VEHICLES ON-SITE, EXCEPT IN A DESIGNATED AREA WHERE WASH WATER IS CONTAINED AND TREATED.*
24. *LIMIT AND TIME APPLICATIONS OF PESTICIDES AND FERTILIZERS TO PREVENT POLLUTED RUNOFF.*
25. *LIMIT CONSTRUCTION ACCESS ROUTES TO STABILIZED, DESIGNATED ACCESS POINTS.*
26. *AVOID TRACKING DIRT OR OTHER MATERIALS OFF-SITE; CLEAN OFF-SITE PAVED AREAS AND SIDEWALKS USING DRY SWEEPING METHODS.*
27. *TRAIN AND PROVIDE INSTRUCTION TO ALL EMPLOYEES AND SUBCONTRACTORS REGARDING THE WATERSHED PROTECTION MAINTENANCE STANDARDS AND CONSTRUCTION BEST MANAGEMENT PRACTICES.*
28. *PLACEMENT OF EROSION MATERIALS AT THESE LOCATIONS ARE REQUIRED ON WEEKENDS AND DURING RAIN EVENTS: (LIST LOCATIONS)*
29. *THE AREAS DELINEATED ON THE PLANS FOR PARKING, GRUBBING, STORAGE, ECT., SHALL NOT BE ENLARGED OR "RUN OVER."*
30. *CONSTRUCTION SITES ARE REQUIRED TO HAVE EROSION CONTROL MATERIALS ON-SITE DURING THE "OFF-SEASON."*
31. *DUST CONTROL IS REQUIRED YEAR-ROUND.*
32. *EROSION CONTROL MATERIALS SHALL BE STORED ON-SITE.*
33. *USE OF PLASTIC SHEETING BETWEEN OCTOBER 1 AND APRIL 30 IS NOT ACCEPTABLE, UNLESS FOR USE ON STOCKPILES WHERE THE STOCKPILE IS ALSO PROTECTED WITH FIBER ROLLS CONTAINING THE BASE OF THE STOCKPILE.*
34. *TREE PROTECTION SHALL BE IN PLACE BEFORE ANY DEMOLITION, GRADING, EXCAVATING OR GRUBBING IS STARTED.*
35. *LENGTH OF CONSTRUCTION IS APPROXIMATELY 18 MONTHS.*

NO.	BY	REVISION

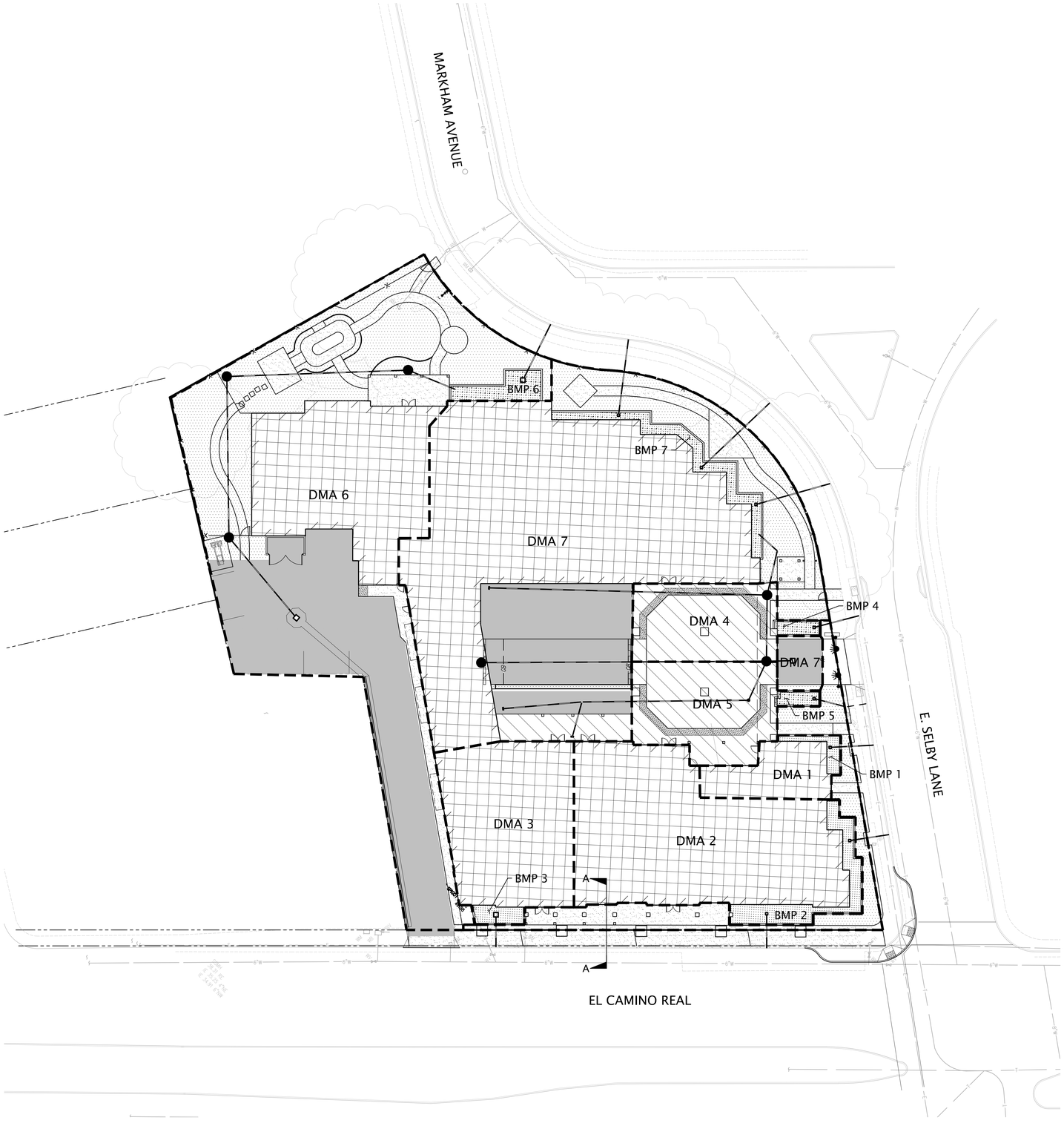
NO.	BY	REVISION	DATE
		PLANNING SUBMITTAL	06/05/2017
		PLANNING SUBMITTAL	09/14/2017
		PLANNING RESUBMITTAL	10/31/2017
		PLANNING RESUBMITTAL	1/22/2018
		PLANNING RESUBMITTAL	3/2/2018

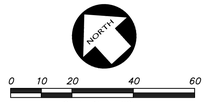
KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2850 Collier Canyon Road
Livermore, California 94551
Phone (925) 245-8788
Fax (925) 245-8796

REGISTERED PROFESSIONAL ENGINEER
RICHARD T. SARTOORTE
No. 35112
CIVIL
STATE OF CALIFORNIA

PRELIMINARY EROSION CONTROL PLAN
OF
2915 EL CAMINO REAL
FOR
SUNRISE SENIOR LIVING
REDWOOD CITY, CALIFORNIA

DATE	NOV. 2016
SCALE	1" = 20'
DESIGNER	EYS
JOB NO.	A16704
SHEET	C4
OF	- SHEETS





LEGEND

- TRIBUTARY AREA LIMITS
- PERVIOUS AREA
- IMPERVIOUS ROOFTOP DRAINING TO FLOW THROUGH PLANTER
- IMPERVIOUS PAVEMENT DRAINING TO FLOW THROUGH PLANTER
- BIO-RETENTION TREATMENT AREA
- CONCRETE AREA
- DECK AREA

BIO-RETENTION SIZING CALCULATIONS

Calculations are based off the San Mateo County C.3 Techincal Guidance, Chapter 5, Section 5.1, Version 4.1 "Combination Flow and Volume Sizing Approach"

Refer to sheet C5.1 for calculation spreadsheets of each DMA.

Drainage Area	Area (SF)	Area (AC)	Pervious (SF)	Pervious (AC)	Impervious (SF)	Impervious (AC)	Total Treatment Area* (SF)	ponding depth (in.)	BMP Required (SF)	BMP Provided (SF)	BMP Dimensions	Sizing Ratio	BMP Provided
1	1,300	0.030	0	0.000	1,174	0.027	1,174	6	37	126	(2'x21')+(6'x14')	10.73%	Flow-through planter
2	7,325	0.168	0	0.000	6,710	0.154	6,710	6	210	615	see plan	9.17%	Flow-through planter
3	4,196	0.096	0	0.000	4,032	0.093	4,032	12	103	164	(10'x8')+(12'x7')	4.07%	Flow-through planter
4	2,320	0.053	0	0.000	2,212	0.051	2,212	12	57	108	18'x6'	4.88%	Flow-through planter
5	2,736	0.063	0	0.000	2,634	0.060	2,634	12	68	102	17'x6'	3.87%	Flow-through planter
6	20,033	0.460	5,997	0.138	13,671	0.314	14,271	12	364	365	see plan	2.56%	Flow-through planter
7	21,052	0.483	2,302	0.053	18,107	0.416	18,337	6	572	643	see plan	3.51%	Flow-through planter
Total:	58,962	1.354											
Self-retaining	2,763	0.063											
TOTAL SITE	**61,725**	**1.417**											

*: Total Treatment Area is equal to Impervious Area + 0.10 * Landscape Area.

SAN MATEO COUNTYWIDE WATER POLLUTION PREVENTION PROGRAM

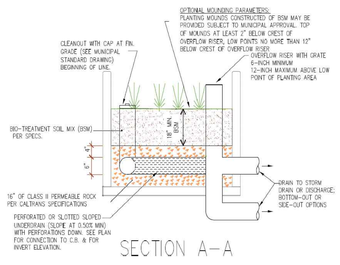


Figure 6-11: Cross section A-A of flow-through planter, shows side view of underdrain (Not to Scale)

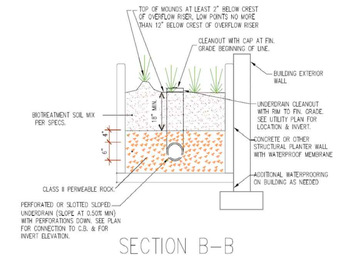


Figure 6-12: Cross section B-B of flow-through planter, shows cross section of underdrain

NO.	BY	REVISION

NO.	BY	REVISION
		PLANNING SUBMITTAL 06/05/2017
		PLANNING SUBMITTAL 09/14/2017
		PLANNING RESUBMITTAL 10/31/2017
		PLANNING RESUBMITTAL 1/22/2018
		PLANNING RESUBMITTAL 3/2/2018

KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2850 Collier Canyon Road
Livermore, California 94551
Phone (925) 245-8788
Fax (925) 245-8796

REGISTERED PROFESSIONAL ENGINEER
BRAD T. SARTOROTTO
No. 75112
CIVIL
STATE OF CALIFORNIA

PRELIMINARY STORM WATER QUALITY CONTROL
OF
2915 EL CAMINO REAL
FOR
SUNRISE SENIOR LIVING
REDWOOD CITY, CALIFORNIA

DATE	NOV, 2016
SCALE	1" = 20'
DESIGNER	EYS
JOB NO.	A16704
SHEET	C5
OF	- SHEETS

Z:\2016\A16704\A16704-PC.dwg 3-06-18 03:11:53 PM ejohnson

Worksheet for Calculating the Combination Flow and Volume Method

Instructions: After completing Section 1, make a copy of this Excel file for each Drainage Management Area within the project. Enter information specific to the project and DMA in the cells shaded in yellow. Cells shaded in light blue contain formulas and values that will be automatically calculated.

1.0 Project Information

1-1 Project Name: **Sunrise Senior Living**
1-2 City application ID:
1-3 Site Address or APN:
1-4 Tract or Parcel Map No:
1-5 Rainfall Region **4**
1-6 Region Mean Annual Precipitation (MAP **14.60**
1-7 Site Mean Annual Precipitation (MAP) **19**

The calculations presented here are based on the **combination flow and volume sizing method** provided in the Countywide Program's C.3 Technical Guidance, Version 4.0. The steps presented below are explained in Section 5.1 of the Guidance, applicable portions of which are included in this file, in the sheet named "Guidance from Chapter 5".

Click here for map

1-8 ***MAP adjustment factor is automatically calculated as:*** **1.30**
(The "Site Mean Annual Precipitation (MAP)" is divided by the MAP for the applicable rain gauge, showin in Table 5-3, below.)
Refer to the map in Appendix C of the C.3 Technical Guidance to identify the Rainfall Region for the site.

2.0 Calculate Percentage of Impervious Surface for Drainage Management Area (DMA)

2-1 Name of DMA: **DMA 1**

For items 2-2 and 2-3, enter the areas in square feet for each type of surface within the DMA.

	Type of Surface	Area of surface type within DMA (Sq. Ft.)	Adjust Pervious Surface	Effective Impervious Area
2-2	Impervious surface	1,174	1.0	1,174
2-3	Pervious surface	126	0.1	13
	Total DMA Area (square feet) =	1,300		

2-4 ***Total Effective Impervious Area (EIA)*** **1,187** **Square feet**

3.0 Calculate Unit Basin Storage Volume in Inches

Table 5-3. Unit Basin Storage Volumes in Inches for 80 Percent Capture Using 48-Hour Drawdowns, based on runoff coefficient

Region	Station, and Mean Annual Precipitation (Inches)	Runoff Coefficient of 1.0
1	Boulder Creek, 55.9"	2.04"
2	La Honda, 24.4"	0.86"
3	Half Moon Bay, 25.92"	0.82"
4	Palo Alto, 14.6"	0.64"
5	San Francisco, 21.0"	0.73"
6	San Francisco airport, 20.1"	0.85"
7	San Francisco Oceanside, 19.3"	0.72"

3-1 ***Unit basin storage volume from Table 5-3:*** **0.64**
(The coefficient for this method is always 1.0, due to the conversion of any landscaping to effective impervious area.)

3-2 ***Adjusted unit basin storage volume:*** **0.83** **Inches**
(The unit basin storage volume [Item 3-1] is adjusted by applying the MAP adjustment factor [Item 1-8].)

3-3 ***Required Capture Volume (in cubic feet):*** **82** **Cubic feet**
(The adjusted unit basin sizing volume [Item 3-2] is multiplied by the DMA EIA [Item 2-4] and converted to cubic feet)

4.0 Calculate the Duration of the Rain Event

4-1 Rainfall intensity **0.2** **Inches per hour**
4-2 Divide Item 3-2 by Item 4-1 **4.16** **Hours of Rain Event Duration**

5.0 Preliminary Estimate of Surface Area of Treatment Measure

5-1 4% of DMA EIA (Item 2-4) **47** **Square feet**
5-2 Area 25% smaller than Item 5-1 (i.e., 3% of DMA EIA) **36** **Square feet**
5-3 Volume of treated runoff for area in Item 5-2 **62** **Cubic feet** (Item 5-2 * 5 inches per hour * 1/12 * Item 4-2)

6.0 Initial Adjustment of Depth of Surface Ponding Area

6-1 Subtract Item 5-3 from Item 3-3 **21** **Cubic feet** (Amount of runoff to be stored in ponding area)
6-2 Divide Item 6-1 by Item 5-2 **0.58** **Feet** (Depth of stored runoff in surface ponding area)
6-3 Convert Item 6-2 from feet to inches **6.94** **Inches** (Depth of stored runoff in surface ponding area)
6-4 If ponding depth in Item 6-3 meets your target depth (recommend 6"), skip to Item 8-1. If not, continue to Step 7-1.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

7.0 Optimize Size of Treatment Measure

7-1 Enter an area larger than Item 5-2 **37** **Sq.ft.** (enter larger area if you need less ponding depth.)
7-2 Volume of treated runoff for area in Item 7-1 **64** **Cubic feet** (Item 7-1 * 5 inches per hour * 1/12 * Item 4-2)
7-3 Subtract Item 7-2 from Item 3-3 **18** **Cubic feet** (Amount of runoff to be stored in ponding area)
7-4 Divide Item 7-3 by Item 7-1 **0.49** **Feet** (Depth of stored runoff in surface ponding area)
7-5 Convert Item 7-4 from ft. to inches **5.89** **Inches** (Depth of stored runoff in surface ponding area)
7-6 If the ponding depth in Item 7-5 meets target, stop here. If not, repeat Steps 7-1 through 7-5 until you obtain target depth.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

8.0 Surface Area of Treatment Measure for DMA

8-1 Final surface area of treatment **37** **Square feet** (Either Item 5-2 or final amount in Item 7-1)

Worksheet for Calculating the Combination Flow and Volume Method

Instructions: After completing Section 1, make a copy of this Excel file for each Drainage Management Area within the project. Enter information specific to the project and DMA in the cells shaded in yellow. Cells shaded in light blue contain formulas and values that will be automatically calculated.

1.0 Project Information

1-1 Project Name: **Sunrise Senior Living**
1-2 City application ID:
1-3 Site Address or APN:
1-4 Tract or Parcel Map No:
1-5 Rainfall Region **4**
1-6 Region Mean Annual Precipitation (MAP **14.60**
1-7 Site Mean Annual Precipitation (MAP) **19**

The calculations presented here are based on the **combination flow and volume sizing method** provided in the Countywide Program's C.3 Technical Guidance, Version 4.0. The steps presented below are explained in Section 5.1 of the Guidance, applicable portions of which are included in this file, in the sheet named "Guidance from Chapter 5".

Click here for map

1-8 ***MAP adjustment factor is automatically calculated as:*** **1.30**
(The "Site Mean Annual Precipitation (MAP)" is divided by the MAP for the applicable rain gauge, showin in Table 5-3, below.)
Refer to the map in Appendix C of the C.3 Technical Guidance to identify the Rainfall Region for the site.

2.0 Calculate Percentage of Impervious Surface for Drainage Management Area (DMA)

2-1 Name of DMA: **DMA 2**

For items 2-2 and 2-3, enter the areas in square feet for each type of surface within the DMA.

	Type of Surface	Area of surface type within DMA (Sq. Ft.)	Adjust Pervious Surface	Effective Impervious Area
2-2	Impervious surface	6,710	1.0	6,710
2-3	Pervious surface	615	0.1	62
	Total DMA Area (square feet) =	7,325		

2-4 ***Total Effective Impervious Area (EIA)*** **6,772** **Square feet**

3.0 Calculate Unit Basin Storage Volume in Inches

Table 5-3. Unit Basin Storage Volumes in Inches for 80 Percent Capture Using 48-Hour Drawdowns, based on runoff coefficient

Region	Station, and Mean Annual Precipitation (Inches)	Runoff Coefficient of 1.0
1	Boulder Creek, 55.9"	2.04"
2	La Honda, 24.4"	0.86"
3	Half Moon Bay, 25.92"	0.82"
4	Palo Alto, 14.6"	0.64"
5	San Francisco, 21.0"	0.73"
6	San Francisco airport, 20.1"	0.85"
7	San Francisco Oceanside, 19.3"	0.72"

3-1 ***Unit basin storage volume from Table 5-3:*** **0.64**
(The coefficient for this method is always 1.0, due to the conversion of any landscaping to effective impervious area.)

3-2 ***Adjusted unit basin storage volume:*** **0.83** **Inches**
(The unit basin storage volume [Item 3-1] is adjusted by applying the MAP adjustment factor [Item 1-8].)

3-3 ***Required Capture Volume (in cubic feet):*** **470** **Cubic feet**
(The adjusted unit basin sizing volume [Item 3-2] is multiplied by the DMA EIA [Item 2-4] and converted to cubic feet)

4.0 Calculate the Duration of the Rain Event

4-1 Rainfall intensity **0.2** **Inches per hour**
4-2 Divide Item 3-2 by Item 4-1 **4.16** **Hours of Rain Event Duration**

5.0 Preliminary Estimate of Surface Area of Treatment Measure

5-1 4% of DMA EIA (Item 2-4) **271** **Square feet**
5-2 Area 25% smaller than Item 5-1 (i.e., 3% of DMA EIA) **203** **Square feet**
5-3 Volume of treated runoff for area in Item 5-2 **352** **Cubic feet** (Item 5-2 * 5 inches per hour * 1/12 * Item 4-2)

6.0 Initial Adjustment of Depth of Surface Ponding Area

6-1 Subtract Item 5-3 from Item 3-3 **117** **Cubic feet** (Amount of runoff to be stored in ponding area)
6-2 Divide Item 6-1 by Item 5-2 **0.58** **Feet** (Depth of stored runoff in surface ponding area)
6-3 Convert Item 6-2 from feet to inches **6.94** **Inches** (Depth of stored runoff in surface ponding area)
6-4 If ponding depth in Item 6-3 meets your target depth (recommend 6"), skip to Item 8-1. If not, continue to Step 7-1.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

7.0 Optimize Size of Treatment Measure

7-1 Enter an area larger than Item 5-2 **210** **Sq.ft.** (enter larger area if you need less ponding depth.)
7-2 Volume of treated runoff for area in Item 7-1 **364** **Cubic feet** (Item 7-1 * 5 inches per hour * 1/12 * Item 4-2)
7-3 Subtract Item 7-2 from Item 3-3 **106** **Cubic feet** (Amount of runoff to be stored in ponding area)
7-4 Divide Item 7-3 by Item 7-1 **0.50** **Feet** (Depth of stored runoff in surface ponding area)
7-5 Convert Item 7-4 from ft. to inches **6.03** **Inches** (Depth of stored runoff in surface ponding area)
7-6 If the ponding depth in Item 7-5 meets target, stop here. If not, repeat Steps 7-1 through 7-5 until you obtain target depth.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

8.0 Surface Area of Treatment Measure for DMA

8-1 Final surface area of treatment **210** **Square feet** (Either Item 5-2 or final amount in Item 7-1)

Worksheet for Calculating the Combination Flow and Volume Method

Instructions: After completing Section 1, make a copy of this Excel file for each Drainage Management Area within the project. Enter information specific to the project and DMA in the cells shaded in yellow. Cells shaded in light blue contain formulas and values that will be automatically calculated.

1.0 Project Information

1-1 Project Name: **Sunrise Senior Living**
1-2 City application ID:
1-3 Site Address or APN:
1-4 Tract or Parcel Map No:
1-5 Rainfall Region **4**
1-6 Region Mean Annual Precipitation (MAP **14.60**
1-7 Site Mean Annual Precipitation (MAP) **19**

The calculations presented here are based on the **combination flow and volume sizing method** provided in the Countywide Program's C.3 Technical Guidance, Version 4.0. The steps presented below are explained in Section 5.1 of the Guidance, applicable portions of which are included in this file, in the sheet named "Guidance from Chapter 5".

Click here for map

1-8 ***MAP adjustment factor is automatically calculated as:*** **1.30**
(The "Site Mean Annual Precipitation (MAP)" is divided by the MAP for the applicable rain gauge, showin in Table 5-3, below.)
Refer to the map in Appendix C of the C.3 Technical Guidance to identify the Rainfall Region for the site.

2.0 Calculate Percentage of Impervious Surface for Drainage Management Area (DMA)

2-1 Name of DMA: **DMA 3**

For items 2-2 and 2-3, enter the areas in square feet for each type of surface within the DMA.

	Type of Surface	Area of surface type within DMA (Sq. Ft.)	Adjust Pervious Surface	Effective Impervious Area
2-2	Impervious surface	4,032	1.0	4,032
2-3	Pervious surface	164	0.1	16
	Total DMA Area (square feet) =	4,196		

2-4 ***Total Effective Impervious Area (EIA)*** **4,048** **Square feet**

3.0 Calculate Unit Basin Storage Volume in Inches

Table 5-3. Unit Basin Storage Volumes in Inches for 80 Percent Capture Using 48-Hour Drawdowns, based on runoff coefficient

Region	Station, and Mean Annual Precipitation (Inches)	Runoff Coefficient of 1.0
1	Boulder Creek, 55.9"	2.04"
2	La Honda, 24.4"	0.86"
3	Half Moon Bay, 25.92"	0.82"
4	Palo Alto, 14.6"	0.64"
5	San Francisco, 21.0"	0.73"
6	San Francisco airport, 20.1"	0.85"
7	San Francisco Oceanside, 19.3"	0.72"

3-1 ***Unit basin storage volume from Table 5-3:*** **0.64**
(The coefficient for this method is always 1.0, due to the conversion of any landscaping to effective impervious area.)

3-2 ***Adjusted unit basin storage volume:*** **0.83** **Inches**
(The unit basin storage volume [Item 3-1] is adjusted by applying the MAP adjustment factor [Item 1-8].)

3-3 ***Required Capture Volume (in cubic feet):*** **281** **Cubic feet**
(The adjusted unit basin sizing volume [Item 3-2] is multiplied by the DMA EIA [Item 2-4] and converted to cubic feet)

4.0 Calculate the Duration of the Rain Event

4-1 Rainfall intensity **0.2** **Inches per hour**
4-2 Divide Item 3-2 by Item 4-1 **4.16** **Hours of Rain Event Duration**

5.0 Preliminary Estimate of Surface Area of Treatment Measure

5-1 4% of DMA EIA (Item 2-4) **162** **Square feet**
5-2 Area 25% smaller than Item 5-1 (i.e., 3% of DMA EIA) **121** **Square feet**
5-3 Volume of treated runoff for area in Item 5-2 **211** **Cubic feet** (Item 5-2 * 5 inches per hour * 1/12 * Item 4-2)

6.0 Initial Adjustment of Depth of Surface Ponding Area

6-1 Subtract Item 5-3 from Item 3-3 **70** **Cubic feet** (Amount of runoff to be stored in ponding area)
6-2 Divide Item 6-1 by Item 5-2 **0.58** **Feet** (Depth of stored runoff in surface ponding area)
6-3 Convert Item 6-2 from feet to inches **6.94** **Inches** (Depth of stored runoff in surface ponding area)
6-4 If ponding depth in Item 6-3 meets your target depth (recommend 6"), skip to Item 8-1. If not, continue to Step 7-1.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

7.0 Optimize Size of Treatment Measure

7-1 Enter an area larger than Item 5-2 **103** **Sq.ft.** (enter larger area if you need less ponding depth.)
7-2 Volume of treated runoff for area in Item 7-1 **179** **Cubic feet** (Item 7-1 * 5 inches per hour * 1/12 * Item 4-2)
7-3 Subtract Item 7-2 from Item 3-3 **102** **Cubic feet** (Amount of runoff to be stored in ponding area)
7-4 Divide Item 7-3 by Item 7-1 **0.99** **Feet** (Depth of stored runoff in surface ponding area)
7-5 Convert Item 7-4 from ft. to inches **11.91** **Inches** (Depth of stored runoff in surface ponding area)
7-6 If the ponding depth in Item 7-5 meets target, stop here. If not, repeat Steps 7-1 through 7-5 until you obtain target depth.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

8.0 Surface Area of Treatment Measure for DMA

8-1 Final surface area of treatment **103** **Square feet** (Either Item 5-2 or final amount in Item 7-1)

Worksheet for Calculating the Combination Flow and Volume Method

Instructions: After completing Section 1, make a copy of this Excel file for each Drainage Management Area within the project. Enter information specific to the project and DMA in the cells shaded in yellow. Cells shaded in light blue contain formulas and values that will be automatically calculated.

1.0 Project Information

1-1 Project Name: **Sunrise Senior Living**
1-2 City application ID:
1-3 Site Address or APN:
1-4 Tract or Parcel Map No:
1-5 Rainfall Region **4**
1-6 Region Mean Annual Precipitation (MAP **14.60**
1-7 Site Mean Annual Precipitation (MAP) **19**

The calculations presented here are based on the **combination flow and volume sizing method** provided in the Countywide Program's C.3 Technical Guidance, Version 4.0. The steps presented below are explained in Section 5.1 of the Guidance, applicable portions of which are included in this file, in the sheet named "Guidance from Chapter 5".

Click here for map

1-8 ***MAP adjustment factor is automatically calculated as:*** **1.30**
(The "Site Mean Annual Precipitation (MAP)" is divided by the MAP for the applicable rain gauge, showin in Table 5-3, below.)
Refer to the map in Appendix C of the C.3 Technical Guidance to identify the Rainfall Region for the site.

2.0 Calculate Percentage of Impervious Surface for Drainage Management Area (DMA)

2-1 Name of DMA: **DMA 4**

For items 2-2 and 2-3, enter the areas in square feet for each type of surface within the DMA.

	Type of Surface	Area of surface type within DMA (Sq. Ft.)	Adjust Pervious Surface	Effective Impervious Area
2-2	Impervious surface	2,212	1.0	2,212
2-3	Pervious surface	108	0.1	11
	Total DMA Area (square feet) =	2,320		

2-4 ***Total Effective Impervious Area (EIA)*** **2,223** **Square feet**

3.0 Calculate Unit Basin Storage Volume in Inches

Table 5-3. Unit Basin Storage Volumes in Inches for 80 Percent Capture Using 48-Hour Drawdowns, based on runoff coefficient

Region	Station, and Mean Annual Precipitation (Inches)	Runoff Coefficient of 1.0
1	Boulder Creek, 55.9"	2.04"
2	La Honda, 24.4"	0.86"
3	Half Moon Bay, 25.92"	0.82"
4	Palo Alto, 14.6"	0.64"
5	San Francisco, 21.0"	0.73"
6	San Francisco airport, 20.1"	0.85"
7	San Francisco Oceanside, 19.3"	0.72"

3-1 ***Unit basin storage volume from Table 5-3:*** **0.64**
(The coefficient for this method is always 1.0, due to the conversion of any landscaping to effective impervious area.)

3-2 ***Adjusted unit basin storage volume:*** **0.83** **Inches**
(The unit basin storage volume [Item 3-1] is adjusted by applying the MAP adjustment factor [Item 1-8].)

3-3 ***Required Capture Volume (in cubic feet):*** **154** **Cubic feet**
(The adjusted unit basin sizing volume [Item 3-2] is multiplied by the DMA EIA [Item 2-4] and converted to cubic feet)

4.0 Calculate the Duration of the Rain Event

4-1 Rainfall intensity **0.2** **Inches per hour**
4-2 Divide Item 3-2 by Item 4-1 **4.16** **Hours of Rain Event Duration**

5.0 Preliminary Estimate of Surface Area of Treatment Measure

5-1 4% of DMA EIA (Item 2-4) **89** **Square feet**
5-2 Area 25% smaller than Item 5-1 (i.e., 3% of DMA EIA) **67** **Square feet**
5-3 Volume of treated runoff for area in Item 5-2 **116** **Cubic feet** (Item 5-2 * 5 inches per hour * 1/12 * Item 4-2)

6.0 Initial Adjustment of Depth of Surface Ponding Area

6-1 Subtract Item 5-3 from Item 3-3 **39** **Cubic feet** (Amount of runoff to be stored in ponding area)
6-2 Divide Item 6-1 by Item 5-2 **0.58** **Feet** (Depth of stored runoff in surface ponding area)
6-3 Convert Item 6-2 from feet to inches **6.94** **Inches** (Depth of stored runoff in surface ponding area)
6-4 If ponding depth in Item 6-3 meets your target depth (recommend 6"), skip to Item 8-1. If not, continue to Step 7-1.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

7.0 Optimize Size of Treatment Measure

7-1 Enter an area larger than Item 5-2 **57** **Sq.ft.** (enter larger area if you need less ponding depth.)
7-2 Volume of treated runoff for area in Item 7-1 **99** **Cubic feet** (Item 7-1 * 5 inches per hour * 1/12 * Item 4-2)
7-3 Subtract Item 7-2 from Item 3-3 **55** **Cubic feet** (Amount of runoff to be stored in ponding area)
7-4 Divide Item 7-3 by Item 7-1 **0.97** **Feet** (Depth of stored runoff in surface ponding area)
7-5 Convert Item 7-4 from ft. to inches **11.66** **Inches** (Depth of stored runoff in surface ponding area)
7-6 If the ponding depth in Item 7-5 meets target, stop here. If not, repeat Steps 7-1 through 7-5 until you obtain target depth.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

8.0 Surface Area of Treatment Measure for DMA

8-1 Final surface area of treatment **57** **Square feet** (Either Item 5-2 or final amount in Item 7-1)

Worksheet for Calculating the Combination Flow and Volume Method

Instructions: After completing Section 1, make a copy of this Excel file for each Drainage Management Area within the project. Enter information specific to the project and DMA in the cells shaded in yellow. Cells shaded in light blue contain formulas and values that will be automatically calculated.

1.0 Project Information

1-1 Project Name: **Sunrise Senior Living**
1-2 City application ID:
1-3 Site Address or APN:
1-4 Tract or Parcel Map No:
1-5 Rainfall Region **4**
1-6 Region Mean Annual Precipitation (MAP **14.60**
1-7 Site Mean Annual Precipitation (MAP) **19**

The calculations presented here are based on the **combination flow and volume sizing method** provided in the Countywide Program's C.3 Technical Guidance, Version 4.0. The steps presented below are explained in Section 5.1 of the Guidance, applicable portions of which are included in this file, in the sheet named "Guidance from Chapter 5".

Click here for map

1-8 ***MAP adjustment factor is automatically calculated as:*** **1.30**
(The "Site Mean Annual Precipitation (MAP)" is divided by the MAP for the applicable rain gauge, showin in Table 5-3, below.)
Refer to the map in Appendix C of the C.3 Technical Guidance to identify the Rainfall Region for the site.

2.0 Calculate Percentage of Impervious Surface for Drainage Management Area (DMA)

2-1 Name of DMA: **DMA 5**

For items 2-2 and 2-3, enter the areas in square feet for each type of surface within the DMA.

	Type of Surface	Area of surface type within DMA (Sq. Ft.)	Adjust Pervious Surface	Effective Impervious Area
2-2	Impervious surface	2,634	1.0	2,634
2-3	Pervious surface	102	0.1	10
	Total DMA Area (square feet) =	2,736		

2-4 ***Total Effective Impervious Area (EIA)*** **2,644** **Square feet**

3.0 Calculate Unit Basin Storage Volume in Inches

Table 5-3. Unit Basin Storage Volumes in Inches for 80 Percent Capture Using 48-Hour Drawdowns, based on runoff coefficient

Region	Station, and Mean Annual Precipitation (Inches)	Runoff Coefficient of 1.0
1	Boulder Creek, 55.9"	2.04"
2	La Honda, 24.4"	0.86"
3	Half Moon Bay, 25.92"	0.82"
4	Palo Alto, 14.6"	0.64"
5	San Francisco, 21.0"	0.73"
6	San Francisco airport, 20.1"	0.85"
7	San Francisco Oceanside, 19.3"	0.72"

3-1 ***Unit basin storage volume from Table 5-3:*** **0.64**
(The coefficient for this method is always 1.0, due to the conversion of any landscaping to effective impervious area.)

3-2 ***Adjusted unit basin storage volume:*** **0.83** **Inches**
(The unit basin storage volume [Item 3-1] is adjusted by applying the MAP adjustment factor [Item 1-8].)

3-3 ***Required Capture Volume (in cubic feet):*** **184** **Cubic feet**
(The adjusted unit basin sizing volume [Item 3-2] is multiplied by the DMA EIA [Item 2-4] and converted to cubic feet)

4.0 Calculate the Duration of the Rain Event

4-1 Rainfall intensity **0.2** **Inches per hour**
4-2 Divide Item 3-2 by Item 4-1 **4.16** **Hours of Rain Event Duration**

5.0 Preliminary Estimate of Surface Area of Treatment Measure

5-1 4% of DMA EIA (Item 2-4) **106** **Square feet**
5-2 Area 25% smaller than Item 5-1 (i.e., 3% of DMA EIA) **79** **Square feet**
5-3 Volume of treated runoff for area in Item 5-2 **138** **Cubic feet** (Item 5-2 * 5 inches per hour * 1/12 * Item 4-2)

6.0 Initial Adjustment of Depth of Surface Ponding Area

6-1 Subtract Item 5-3 from Item 3-3 **46** **Cubic feet** (Amount of runoff to be stored in ponding area)
6-2 Divide Item 6-1 by Item 5-2 **0.58** **Feet** (Depth of stored runoff in surface ponding area)
6-3 Convert Item 6-2 from feet to inches **6.94** **Inches** (Depth of stored runoff in surface ponding area)
6-4 If ponding depth in Item 6-3 meets your target depth (recommend 6"), skip to Item 8-1. If not, continue to Step 7-1.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

7.0 Optimize Size of Treatment Measure

7-1 Enter an area larger than Item 5-2 **68** **Sq.ft.** (enter larger area if you need less ponding depth.)
7-2 Volume of treated runoff for area in Item 7-1 **118** **Cubic feet** (Item 7-1 * 5 inches per hour * 1/12 * Item 4-2)
7-3 Subtract Item 7-2 from Item 3-3 **66** **Cubic feet** (Amount of runoff to be stored in ponding area)
7-4 Divide Item 7-3 by Item 7-1 **0.96** **Feet** (Depth of stored runoff in surface ponding area)
7-5 Convert Item 7-4 from ft. to inches **11.56** **Inches** (Depth of stored runoff in surface ponding area)
7-6 If the ponding depth in Item 7-5 meets target, stop here. If not, repeat Steps 7-1 through 7-5 until you obtain target depth.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

8.0 Surface Area of Treatment Measure for DMA

8-1 Final surface area of treatment **68** **Square feet** (Either Item 5-2 or final amount in Item 7-1)

Worksheet for Calculating the Combination Flow and Volume Method

Instructions: After completing Section 1, make a copy of this Excel file for each Drainage Management Area within the project. Enter information specific to the project and DMA in the cells shaded in yellow. Cells shaded in light blue contain formulas and values that will be automatically calculated.

1.0 Project Information

1-1 Project Name: **Sunrise Senior Living**
1-2 City application ID:
1-3 Site Address or APN:
1-4 Tract or Parcel Map No:
1-5 Rainfall Region **4**
1-6 Region Mean Annual Precipitation (MAP **14.60**
1-7 Site Mean Annual Precipitation (MAP) **19**

The calculations presented here are based on the **combination flow and volume sizing method** provided in the Countywide Program's C.3 Technical Guidance, Version 4.0. The steps presented below are explained in Section 5.1 of the Guidance, applicable portions of which are included in this file, in the sheet named "Guidance from Chapter 5".

Click here for map

1-8 ***MAP adjustment factor is automatically calculated as:*** **1.30**
(The "Site Mean Annual Precipitation (MAP)" is divided by the MAP for the applicable rain gauge, showin in Table 5-3, below.)
Refer to the map in Appendix C of the C.3 Technical Guidance to identify the Rainfall Region for the site.

2.0 Calculate Percentage of Impervious Surface for Drainage Management Area (DMA)

2-1 Name of DMA: **DMA 6**

For items 2-2 and 2-3, enter the areas in square feet for each type of surface within the DMA.

	Type of Surface	Area of surface type within DMA (Sq. Ft.)	Adjust Pervious Surface	Effective Impervious Area
2-2	Impervious surface	13,671	1.0	13,671
2-3	Pervious surface	6,362	0.1	636
	Total DMA Area (square feet) =	20,033		

2-4 ***Total Effective Impervious Area (EIA)*** **14,307** **Square feet**

3.0 Calculate Unit Basin Storage Volume in Inches

Table 5-3. Unit Basin Storage Volumes in Inches for 80 Percent Capture Using 48-Hour Drawdowns, based on runoff coefficient

Region	Station, and Mean Annual Precipitation (Inches)	Runoff Coefficient of 1.0
1	Boulder Creek, 55.9"	2.04"
2	La Honda, 24.4"	0.86"
3	Half Moon Bay, 25.92"	0.82"
4	Palo Alto, 14.6"	0.64"
5	San Francisco, 21.0"	0.73"
6	San Francisco airport, 20.1"	0.85"
7	San Francisco Oceanside, 19.3"	0.72"

3-1 ***Unit basin storage volume from Table 5-3:*** **0.64**
(The coefficient for this method is always 1.0, due to the conversion of any landscaping to effective impervious area.)

3-2 ***Adjusted unit basin storage volume:*** **0.83** **Inches**
(The unit basin storage volume [Item 3-1] is adjusted by applying the MAP adjustment factor [Item 1-8].)

3-3 ***Required Capture Volume (in cubic feet):*** **993** **Cubic feet**
(The adjusted unit basin sizing volume [Item 3-2] is multiplied by the DMA EIA [Item 2-4] and converted to cubic feet)

4.0 Calculate the Duration of the Rain Event

4-1 Rainfall intensity **0.2** **Inches per hour**
4-2 Divide Item 3-2 by Item 4-1 **4.16** **Hours of Rain Event Duration**

5.0 Preliminary Estimate of Surface Area of Treatment Measure

5-1 4% of DMA EIA (Item 2-4) **572** **Square feet**
5-2 Area 25% smaller than Item 5-1 (i.e., 3% of DMA EIA) **429** **Square feet**
5-3 Volume of treated runoff for area in Item 5-2 **745** **Cubic feet** (Item 5-2 * 5 inches per hour * 1/12 * Item 4-2)

6.0 Initial Adjustment of Depth of Surface Ponding Area

6-1 Subtract Item 5-3 from Item 3-3 **248** **Cubic feet** (Amount of runoff to be stored in ponding area)
6-2 Divide Item 6-1 by Item 5-2 **0.58** **Feet** (Depth of stored runoff in surface ponding area)
6-3 Convert Item 6-2 from feet to inches **6.94** **Inches** (Depth of stored runoff in surface ponding area)
6-4 If ponding depth in Item 6-3 meets your target depth (recommend 6"), skip to Item 8-1. If not, continue to Step 7-1.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

7.0 Optimize Size of Treatment Measure

7-1 Enter an area larger than Item 5-2 **364** **Sq.ft.** (enter larger area if you need less ponding depth.)
7-2 Volume of treated runoff for area in Item 7-1 **632** **Cubic feet** (Item 7-1 * 5 inches per hour * 1/12 * Item 4-2)
7-3 Subtract Item 7-2 from Item 3-3 **361** **Cubic feet** (Amount of runoff to be stored in ponding area)
7-4 Divide Item 7-3 by Item 7-1 **0.99** **Feet** (Depth of stored runoff in surface ponding area)
7-5 Convert Item 7-4 from ft. to inches **11.91** **Inches** (Depth of stored runoff in surface ponding area)
7-6 If the ponding depth in Item 7-5 meets target, stop here. If not, repeat Steps 7-1 through 7-5 until you obtain target depth.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

8.0 Surface Area of Treatment Measure for DMA

8-1 Final surface area of treatment **364** **Square feet** (Either Item 5-2 or final amount in Item 7-1)

Worksheet for Calculating the Combination Flow and Volume Method

Instructions: After completing Section 1, make a copy of this Excel file for each Drainage Management Area within the project. Enter information specific to the project and DMA in the cells shaded in yellow. Cells shaded in light blue contain formulas and values that will be automatically calculated.

1.0 Project Information

1-1 Project Name: **Sunrise Senior Living**
1-2 City application ID:
1-3 Site Address or APN:
1-4 Tract or Parcel Map No:
1-5 Rainfall Region **4**
1-6 Region Mean Annual Precipitation (MAP **14.60**
1-7 Site Mean Annual Precipitation (MAP) **19**

The calculations presented here are based on the **combination flow and volume sizing method** provided in the Countywide Program's C.3 Technical Guidance, Version 4.0. The steps presented below are explained in Section 5.1 of the Guidance, applicable portions of which are included in this file, in the sheet named "Guidance from Chapter 5".

Click here for map

1-8 ***MAP adjustment factor is automatically calculated as:*** **1.30**
(The "Site Mean Annual Precipitation (MAP)" is divided by the MAP for the applicable rain gauge, showin in Table 5-3, below.)
Refer to the map in Appendix C of the C.3 Technical Guidance to identify the Rainfall Region for the site.

2.0 Calculate Percentage of Impervious Surface for Drainage Management Area (DMA)

2-1 Name of DMA: **DMA 7**

For items 2-2 and 2-3, enter the areas in square feet for each type of surface within the DMA.

	Type of Surface	Area of surface type within DMA (Sq. Ft.)	Adjust Pervious Surface	Effective Impervious Area
2-2	Impervious surface	18,107	1.0	18,107
2-3	Pervious surface	2,945	0.1	295
	Total DMA Area (square feet) =	21,052		

2-4 ***Total Effective Impervious Area (EIA)*** **18,402** **Square feet**

3.0 Calculate Unit Basin Storage Volume in Inches

Table 5-3. Unit Basin Storage Volumes in Inches for 80 Percent Capture Using 48-Hour Drawdowns, based on runoff coefficient

Region	Station, and Mean Annual Precipitation (Inches)	Runoff Coefficient of 1.0
1	Boulder Creek, 55.9"	2.04"
2	La Honda, 24.4"	0.86"
3	Half Moon Bay, 25.92"	0.82"
4	Palo Alto, 14.6"	0.64"
5	San Francisco, 21.0"	0.73"
6	San Francisco airport, 20.1"	0.85"
7	San Francisco Oceanside, 19.3"	0.72"

3-1 ***Unit basin storage volume from Table 5-3:*** **0.64**
(The coefficient for this method is always 1.0, due to the conversion of any landscaping to effective impervious area.)

3-2 ***Adjusted unit basin storage volume:*** **0.83** **Inches**
(The unit basin storage volume [Item 3-1] is adjusted by applying the MAP adjustment factor [Item 1-8].)

3-3 ***Required Capture Volume (in cubic feet):*** **1,277** **Cubic feet**
(The adjusted unit basin sizing volume [Item 3-2] is multiplied by the DMA EIA [Item 2-4] and converted to cubic feet)

4.0 Calculate the Duration of the Rain Event

4-1 Rainfall intensity **0.2** **Inches per hour**
4-2 Divide Item 3-2 by Item 4-1 **4.16** **Hours of Rain Event Duration**

5.0 Preliminary Estimate of Surface Area of Treatment Measure

5-1 4% of DMA EIA (Item 2-4) **736** **Square feet**
5-2 Area 25% smaller than Item 5-1 (i.e., 3% of DMA EIA) **552** **Square feet**
5-3 Volume of treated runoff for area in Item 5-2 **958** **Cubic feet** (Item 5-2 * 5 inches per hour * 1/12 * Item 4-2)

6.0 Initial Adjustment of Depth of Surface Ponding Area

6-1 Subtract Item 5-3 from Item 3-3 **319** **Cubic feet** (Amount of runoff to be stored in ponding area)
6-2 Divide Item 6-1 by Item 5-2 **0.58** **Feet** (Depth of stored runoff in surface ponding area)
6-3 Convert Item 6-2 from feet to inches **6.94** **Inches** (Depth of stored runoff in surface ponding area)
6-4 If ponding depth in Item 6-3 meets your target depth (recommend 6"), skip to Item 8-1. If not, continue to Step 7-1.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

7.0 Optimize Size of Treatment Measure

7-1 Enter an area larger than Item 5-2 **572** **Sq.ft.** (enter larger area if you need less ponding depth.)
7-2 Volume of treated runoff for area in Item 7-1 **993** **Cubic feet** (Item 7-1 * 5 inches per hour * 1/12 * Item 4-2)
7-3 Subtract Item 7-2 from Item 3-3 **285** **Cubic feet** (Amount of runoff to be stored in ponding area)
7-4 Divide Item 7-3 by Item 7-1 **0.50** **Feet** (Depth of stored runoff in surface ponding area)
7-5 Convert Item 7-4 from ft. to inches **5.97** **Inches** (Depth of stored runoff in surface ponding area)
7-6 If the ponding depth in Item 7-5 meets target, stop here. If not, repeat Steps 7-1 through 7-5 until you obtain target depth.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

8.0 Surface Area of Treatment Measure for DMA

8-1 Final surface area of treatment **572** **Square feet** (Either Item 5-2 or final amount in Item 7-1)

NO.	REVISION	BY
△	PLANNING SUBMITTAL 06/05/2017	
△	PLANNING SUBMITTAL 09/14/2017	
△	PLANNING RESUBMITTAL 10/31/2017	
△	PLANNING RESUBMITTAL 1/22/2018	
△	PLANNING RESUBMITTAL 3/2/2018	

KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2850 Collier Canyon Road
Livermore, California 94551
Phone (925) 245-8788
Fax (925) 245-8796

REGISTERED PROFESSIONAL ENGINEER
EMAD Y. SARIEDDINE
No. 65112
CIVIL
STATE OF CALIFORNIA

PRELIMINARY STORM WATER QUALITY CONTROL
OF
2915 EL CAMINO REAL
FOR
SUNRISE SENIOR LIVING

REDWOOD CITY, CALIFORNIA

DATE	NOV, 2016
SCALE	1" = 20'
DESIGNER	EYS
JOB NO.	A16704
SHEET	C5.1
OF	- SHEETS