DESIGN INTENT

THE LANDSCAPE IS DESIGNED TO COMPLY WITH THE PRESCRIPTIVE COMPLIANCE OPTION OF THE LOCALLY ADOPTED STATE OF CALIFORNIA MODEL WATER EFFICIENT LANDSCAPE ORDINANCE ("WELO"). COMPLIANCE WITH MANDATORY ELEMENTS OF WELO MUST BE DOCUMENTED ON LANDSCAPE PLANS.

THE PLANS ARE DESIGNED TO DEMONSTRATE FIRE SAFER LANDSCAPING APPROACHES WITH LOWER, LESS WOODY PLANTS CLOSE TO BUILDINGS, AND TREES POSITIONED TO ALLOW MAINTENANCE OF BRANCHES 10' AWAY FROM BUILDINGS.

LOW IMPACT DEVELOPMENT ("LID") ELEMENTS SUCH AS PERMEABLE PAVING, AND DOWNSPOUTS DISCONNECTED FROM STORM SEWERS AND DRAINING TO RAINGARDENS OR LANDSCAPE STRIPS, ARE PROVIDED TO INFILTRATE MORE STORMWATER RUN-OFF ON SITE, INCREASE GROUNDWATER RECHARGE AND IMPROVE THE AMOUNT OF SOIL MOISTURE AVAILABLE TO PLANTS THEREBY REDUCING IRRIGATION NEEDS.

LANDSCAPE DESIGN REQUIREMENTS

THE PLANTINGS ARE DESIGNED TO COMPLY WITH THE APPENDIX D "PRESCRIPTIVE COMPLIANCE" OPTION OF WELO:

- 1. MEDIUM WATER USE PLANTINGS DO NOT EXCEED 25 PERCENT OF THE TOTAL PLANTED AND IRRIGATED
- 2. LOW WATER USE OR CLIMATE-ADAPTED SPECIES THAT REQUIRE LITTLE OR NO SUMMER WATER ARE
- SELECTED FOR AT LEAST 75 PERCENT OF THE PLANTED AND IRRIGATED AREA 3. PERMITTED LANDSCAPE AREA MUST BE SMALLER THAN 2500 SF OF PLANTED AND IRRIGATED AREA
- 4. PLANS ARE INTENDED FOR USE ON SITES WITH LESS THAN 8% SLOPES

ADDITIONAL GUIDELINES FOR THE PLANTINGS:

- A. FIRE SAFER PLANTINGS ARE INDICATED ON PLANT LISTS AND USED WITHIN 5' OF HOMES.
- CONVENTIONAL TURF IS NOT PROVIDED DUE TO HIGH WATER USE
- TREES ARE LOCATED FOR SHADE ON GARDEN AREAS AND TO PROVIDE SOLAR ACCESS FOR SOLAR PANELS ON ROOFS. TREES ARE LOCATED AWAY FROM BUILDING STRUCTURES SO THAT BRANCHES CAN BE MAINTAINED 10' FROM ROOFS AND CHIMNEYS
- D. PLANTS ARE PLACED IN APPROPRIATE MICROCLIMATES BY EVALUATING THE DIRECTION THE FRONT YARD IS FACING AND NORTH ARROWS ARE INDICATED ON PLANS.
- E. PLANTS ARE GROUPED IN IRRIGATION ZONES ("HYDROZONES") BASED ON SIMILAR WATER NEEDS AS DEFINED BY THE STATE WATER USE CLASSIFICATIONS OF LANDSCAPE SPECIES IV ("WUCOLS IV") **REGION 1 LIST**
- F. RAINWATER AND STORMWATER ELEMENTS SHOULD BE REVIEWED WITH SITE DESIGN TEAM AND GENERAL CONTRACTOR PRIOR TO SITE GRADING
- G. PERVIOUS PAVING OPTIONS SHOULD BE REVIEWED WITH SITE DESIGN TEAM AND GENERAL CONTRACTOR
- H. SEE SONOMA- MARIN SAVING WATER PARTNERSHIP WEBSITE FOR FURTHER INFORMATION AND FAQ: http://www.savingwaterpartnership.org/landscape-design-templates/

IRRIGATION DESIGN REQUIREMENTS AND GUIDELINES

THE IRRIGATION SYSTEM IS DESIGNED TO COMPLY WITH THE PRESCRIPTIVE COMPLIANCE OPTION OF WELO:

- 1. INSTALL AN AUTOMATIC IRRIGATION CONTROLLER THAT DOES NOT LOSE PROGRAMMING DATA AFTER A POWER FAILURE (NON-VOLATILE MEMORY) AND UTILIZES EVAPOTRANSPIRATION OR SOIL MOISTURE SENSOR DATA.
- 2. INSTALL A RAIN SENSOR.

ADDITIONAL GUIDELINES FOR THE IRRIGATION SYSTEMS:

- 3. SYSTEM IS DESIGNED TO REDUCE WATER USE TO THE MINIMUM AMOUNT TO SUSTAIN HEALTHY PLANT GROWTH AND TO PREVENT RUNOFF.
- 4. A MANUAL SHUT-OFF VALVE IS INSTALLED AS CLOSE AS POSSIBLE TO THE POINT OF CONNECTION. 5. PRESSURE REGULATION IS PROVIDED TO ENSURE THE DYNAMIC PRESSURE OF THE SYSTEM IS WITHIN
- THE MANUFACTURERS RECOMMENDED PRESSURE RANGE FOR THE IRRIGATION COMPONENTS
- 6. ALL IRRIGATION EMISSION DEVICES MUST MEET THE ANSI STANDARD, ASABE/ICC 802-2014 LANDSCAPE IRRIGATION SPRINKLER AND EMITTER STANDARD. SPRINKLER HEADS MUST DOCUMENT A DISTRIBUTION UNIFORMITY LOW QUARTER OF 0.65 OR HIGHER.
- 7. ALL AREAS UTILIZE DRIP IRRIGATION ASSEMBLIES TO ENABLE THE SCALING OF PLANS.
- SPRAY IRRIGATION NOT ALLOWED.

TREE IRRIGATION:

- 9. ALLOW DEEP ROOT WATERING OF THE ENTIRE TREE ROOT SYSTEM WHICH EXTENDS WELL BEYOND THE DRIPLINE OF THE TREE CANOPY.
- 10. ALLOW FOR MOVING THE TREE IRRIGATION DISTRIBUTION LINES AWAY FROM TREE TRUNK AFTER ESTABLISHMENT AND EXPANDING THE LINE OUTWARD WITH ROOT DEVELOPMENT.
- 11. PROVIDE SEPARATE TREE VALVES SO THE TREE VALVE CAN BE LEFT ON DURING PERIODS OF DROUGHT.

SOIL MANAGEMENT REQUIREMENTS

SOIL MANAGEMENT IS DESIGNED TO COMPLY WITH THE PRESCRIPTIVE COMPLIANCE OPTION OF WELO: 1. INCORPORATE COMPOST AT A RATE OF AT LEAST FOUR CUBIC YARDS PER 1,000 SQUARE FEET TO A DEPTH OF SIX INCHES INTO THE LANDSCAPE AREA.

- 2. AFTER PLANTING, A MINIMUM THREE INCH LAYER OF MULCH SHALL BE APPLIED ON ALL EXPOSED SOIL SURFACES OF PLANTING AREAS.
- 3. MULCH CAN BE REDUCED FOR NATIVE GRASS AND/OR WILDFLOWER AREAS.

POST-CONSTRUCTION REQUIREMENTS

STEP 5: POST-CONSTRUCTION CERTIFICATION

TO BE SIGNED BY APPLICANT

I HAVE COMPLIED WITH THE REQUIREMENTS OF THE PRESCRIPTIVE COMPLIANCE OPTION OF THE WATER EFFICIENT LANDSCAPE ORDINANCE

APPLICANT NAME (PLEASE PRINT)

APPLICANT SIGNATURE DATE

STEP 6: WELO FINAL INSPECTION CHECKLIST

PLANTING

YES NO NA

- ALL PLANTS INSTALLED ARE LISTED ON PLANS OR ON APPROVED PLANT SUBSTITUTION LIST
- 75% OR MORE OF THE PLANTS ARE LOW WATER USE PER WUCOLS REGION 1
 - NO STANDARD HIGH WATER USE TURF HAS BEEN INSTALLED

- COMPOST HAS BEEN APPLIED AT A RATE OF AT LEAST FOUR (4) CUBIC YARDS PER ONE THOUSAND (1,000) SQUARE FEET AND HAS BEEN INCORPORATED TO A DEPTH OF SIX (6) INCHES INTO THE LANDSAPE AREA.
- 2. A THREE (3) INCH LAYER OF ORGANIC MULCH HAS BEEN APPLIED OVER ALL SHRUB PLANTING AREAS

IRRIGATION

- NO SPRAY IRRIGATION IS USED STATIC AND DYNAMIC WATER PRESSURE NOTED AT THE POINT OF CONNECTION
- WEATHER BASED SELF ADJUSTING CONTROLLER WITH NON-VOLATILE MEMORY IS INSTALLED PER MANUFACTURERS **SPECIFICATIONS**
- RAINSENSOR AND WEATHER SENSOR (IF REQUIRED FOR WEATHER DATA) INSTALLED PER MANUFACTUERS SPECIFICATION AND IS FUNCTIONING
- CONTROLLER IS ACURATELY PROGRAMMED
- CONTROLLER CHART IS PLACED IN CONTROLLER HOUSING OR ADJACENT TO CONTROLLER
- CONTROLLER CHART CLEARLY INDICATES STATIONS & VALVE ZONES
- CONTROLLER CHART CLEARLY INDICATES JULY IRRIGATION SCHEDULE FOR EACH ZONE AND INCLUDES PROGRAMS, DAYS PER WEEK, START TIME, AND RUN TIMES
- IRRIGATION SYSTEM SHUT OFF VALVE INSTALLED
- 10. IRRIGATION SYSTEM SHUT OFF VALVE LOCATION IS AS SHOWN ON PLAN OR ON AS-BUILT
- 11. DRIP IRRIGATION CONTROL ZONE ASSEMBLIES ARE INSTALLED AND FUNCTIONING
- 12. DRIP IRRIGATION LINES ARE INSTALLED AS SHOWN ON PLAN & DETAILS
- 13. DRIP FLUSHOUTS ARE INSTALLED LOWEST POINT OF EACH ZONE AND ARE FUNCTIONING
- 14. SYSTEM OPERATES WITHOUT LEAKS, BREAKS OR RUNOFF 15. EQUIPMENT INSTALLED IS AS SHOWN ON APPROVED IRRIGATION EQUIPMENT LIST, OR EQUAL

GENERAL

CHANGES ARE NOTED ON AS-BUILT PLAN AND IS PROVIDED AT TIME OF INSPECTION

SYMBOLS & DEFINITIONS

- CLIMATE ADAPTIVE: NON-NATIVE PLANTS WHICH ARE ADAPTED TO LOCAL MICROCLIMATES.
- 2. INVASIVE PLANTS: CALIFORNIA INVASIVE PLANT COUNCIL ("Cal-IPC") DEFINES INVASIVE PLANTS AS: PLANTS THAT ARE NOT NATIVE TO AN ENVIRONMENT, AND ONCE INTRODUCED, THEY ESTABLISH, QUICKLY REPRODUCE AND SPREAD, AND CAUSE HARM TO THE ENVIRONMENT, ECONOMY, OR HUMAN HEALTH.
- 3. HYDROZONE: AN AREA OF THE LANDSCAPE HAVING PLANTS WITH SIMILAR WATER NEEDS AND ROOTING DEPTHS AND THE SAME MICRO-CLIMATE.
- 4. IRRIGATION CONTROLLER: SMART CONTROLLERS ARE REQUIRED. THESE ADJUST AUTOMATICALLY USING WEATHER OR SOIL MOISTURE DATA.
- MICROCLIMATE: THE CLIMATE WITHIN EACH DIFFERENT SUB-AREA OF THE LANDSCAPE WHICH DEPENDS ON ITS SUN AND WIND EXPOSURE, PROXIMITY TO REFLECTIVE SURFACES, PLANT DENSITY AND OTHER FACTORS.
- WELO: THE CALIFORNIA MODEL WATER EFFICIENT LANDSCAPE ORDINANCE THAT REQUIRES WATER CONSERVATION MEASURES TO BE IMPLEMENTED IN LANDSCAPES AND HAS BEEN IN EFFECT SINCE 1990. 7. PLANT WATER USE: AN ESTIMATE OF THE AMOUNT OF WATER NEEDED BY PLANTS TO THRIVE IN WARM/DRY PERIODS. PLANTS ARE
- GROUPED INTO VERY LOW, LOW, MODERATE AND HIGH WATER USE AND ARE ASSIGNED PLANT FACTOR VALUES.
- 8. TURF: A GROUND COVER SURFACE OF MOWED GRASS (CONVENTIONAL LAWN)
- OCCASIONALLY WALKED UPON. 10. WEATHER SENSOR: SENSOR CONNECTED TO THE IRRIGATION CONTROLLER WHICH DETECTS RAIN, FREEZE, WIND ETC. AND SUSPENDS OR ADJUSTS IRRIGATION OPERATION.

9. TURF ALTERNATIVE: A LOW WATER USE GRASS OR GROUNDCOVER PLANTING THAT SPREADS TO FORM A LOW COVER THAT CAN BE

REFERENCE

TITLE 23 CHAPTER 2.7 MWELO: THE MODEL WATER EFFICIENT LANDSCAPE ORDINANCE

MWELO SECTIONS:

490.1 (c) & D 9 (a): APPLICABILITY 491 DEFINITIONS D (b) (A-H): PROJECT INFORMATION D (b) (H): LANDSCAPE DOCUMENTATION PACKAGE D (b) (5): IRRIGATION DESIGN PLAN D (b) (2) & (3) (B): SOIL MANAGEMENT D(c) MWELO FINAL INSPECTION CHECKLIST SECTION 492.7 (a)(1)(B) IRRIGATION CONTROLLER (a)(1)(D) WEATHER SENSOR

PRE CONSTRUCTION - PERMIT APPLICATION BY OWNER - FILL IN **AREAS BELOW**

CONFIRM APPLICABILITY

APPENDIX D OF MWELO.

THIS PLAN SHEET IS FOR USE FOR: 1) FRONT YARD LANDSCAPES UP TO 2,500 SF WHICH THE LOCAL JURISDICTION PERMIT AGENCY ALLOWS TO COMPLY WITH PRESCRIPTIVE COMPLIANCE MEASURES. SEE

STEP 1: PROJECT INFORMATION

TOTAL PROJECT LANDSCAPE AREA (≤ 2500):

MEDIUM WATER USE PLANT MATERIAL AREA (≤ 25%):

TO BE FILLED OUT BY APPLICANT
DATE:
PROJECT APPLICANT (NAME):
PROJECT ADDRESS:

LOW TO VERY LOW NON-TURF PLANT MATERIAL AREA (≥ 75%):

PROJECT TYPE: NEW RESIDENTIAL	
WATER SUPPLY TYPE :	
(POTABLE/RECYCLED/WELL)	

STEP 2: SIGN PRE-CONSTRUCTION AGREEMENT

TO BY SIGNED BY APPLICANT

LOCAL WATER PURVEYOR

I AGREE TO COMPLY WITH THE REQUIREMENTS OF THE PRESCRIPTIVE COMPLIANCE OPTION OF THE WATER EFFICIENT LANDSCAPE ORDINANCE

APPLICANT NAME (PLEASE PRINT)	

APPLICANT SIGNATURE

STEP 3: PROVIDE PERMIT AGENCY REQUIRED PLANS

PLANS TO BE PROVIDED BY APPLICANT: **OPTIONAL PLANS**

- L-0.0 PERMIT COVER SHEET GW-1.0 GW-1.1
- L-1.0 LANDSCAPE DESIGN PLAN L-2.0 IRRIGATION DESIGN PLAN
- L-2.1 IRRIGATION DETAIL SHEET L-3.0 PAVING DETAILS
- · L-3.1 L.I.D. DETAILS

TO BE SIGNED BY APPLICANT

L-3.2 PLANTING DETAILS

STEP 4: SIGN DISCLAIMER

APPLICANT NAME (PLEASE PRINT)

BY USING THESE PLANS, I AGREE TO DEFEND, INDEMNIFY AND HOLD HARMLESS THE SONOMA-MARIN SAVING WATER PARTNERSHIP, ITS MEMBERS (SONOMA COUNTY WATER AGENCY, CITY OF SANTA ROSA, MARIN MUNICIPAL WATER DISTRICT, NORTH MARIN WATER DISTRICT, CITY OF ROHNERT PARK, CITY OF PETALUMA, CITY OF COTATI, CITY OF SONOMA, VALLEY OF THE MOON WATER DISTRICT AND TOWN OF WINDSOR) AND THEIR DIRECTORS, OFFICERS, AGENTS, EMPLOYEES AND LANDSCAPE DESIGN CONSULTANTS AGAINST ANY AND ALL LOSS, LIABILITY, EXPENSE, CLAIMS, SUITS AND DAMAGES, INCLUDING ATTORNEY'S FEES ARISING OUT OF OR RESULTING FROM THE USE OF THIS LANDSCAPE PLAN. I UNDERSTAND THAT IT IS MY RESPONSIBILITY AS THE PROJECT OWNER TO ENSURE THAT PLAN ELEMENTS ARE IMPLEMENTED SAFELY AND ACCORDING TO APPLICABLE STATUTES, RULES, REGULATIONS, ORDINANCES AND/OR CODES.

RW-1.0

SONOMA-MARIN SAVING WATER PARTNERSHIP, ITS MEMBERS AND LANDSCAPE DESIGN CONSULTANTS MAKE NO REPRESENTATIONS AND GRANT NO WARRANTIES, EXPRESS OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, BY STATUTE OR OTHERWISE, AND SONOMA-MARIN SAVING WATER PARTNERSHIP, ITS MEMBERS AND DESIGN CONSULTANTS EACH SPECIFICALLY DISCLAIM ANY OTHER WARRANTIES, WHETHER WRITTEN OR ORAL, OR EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF QUALITY, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE OR ANY WARRANTY AS TO THE VALIDITY OF ANY PATENTS OR THE NON-INFRINGEMENT OF ANY INTELLECTUAL PROPERTY RIGHTS OF THIRD PARTIES.

APPLICANT SIGNATURE	DATE
AGENCY STAMP	



625 2ND ST., STE 110 PETALUMA, CA 94952 TEL.: (707) 772-5062 EMAIL: landarches@gmail.co



PANORAMIC DESIGN GROUP

DESIGN ENGINEERS

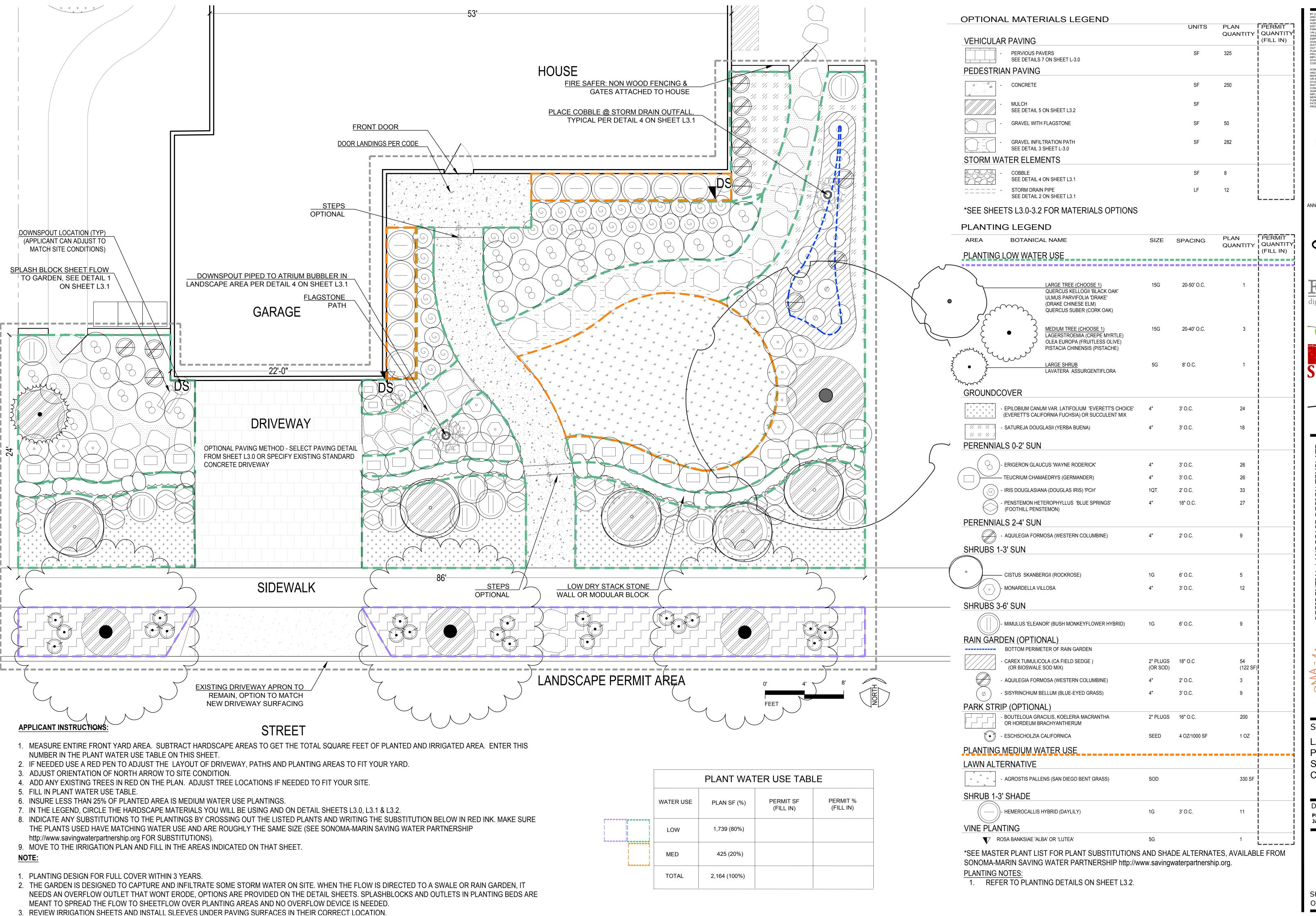
LANDSCAPE ARCHITECTURE

ANDSCAP SAVING W

DATE

SHEET TITLE: RESIDENTIAL LANDSCAPE PERMIT COVER SHEET

DATE PERMIT PLAN **SEPTEMBER 26, 2018**



Y USING THESE PLANS, I AGREE TO DEFEND, INDEMNIFY ND HOLD HARMLESS THE SONOMA MARIN SAVING WATER ARTNERSHIP, ITS MEMBERS (SONOMA COUNTY WATER GENCY, CITY OF SANTA ROSA, MARIN MUNICIPAL WATER ISTRICT, NORTH MARIN WATER DISTRICT, CITY OF ROHNEF ARK, CITY OF PETALUMA, CITY OF COTATI, CITY OF SONOM ALLEY OF THE MOON WATER DISTRICT AND TOWN OF JINDSOR) AND THEIR DIRECTORS, OFFICERS, AGENTS, MPLOYEES AND LANDSCAPE DESIGN CONSULTANTS, GAINST ANY AND ALL LOSS, LIABILITY, EXPENSE, CLAIMS, UITS AND DAMAGES, INCLUDING ATTORNEY'S FEES, ARISIN UIT OF OR RESULTING FROM THE USE OF THIS LANDSCAPE LAN, I UNDERSTAND THAT IT IS MY RESPONSIBILITY AS THE ROLLECT OWNER TO ENSURE THAT PLAN ELEMENTS ARE MPLEMENTED SAFELY AND ACCORDING TO APPLICABLE TATUTES, RULES, REGULATIONS, ORDINANCES AND/OR

NOTES, ROLES, REGULATIONS, ORDINANCES AND/OR DES.

NOMA-MARIN SAVING WATER PARTNERSHIP, ITS MEME DI LANDSCAPE DESIGN CONSULTANTS MAKE NO PRESENTATIONS AND GRANT NO WARRANTIES, EXPREINPLIED, ETHER IN FACT OR BY OPERATION OF LAW, ITUTE OR OTHERWISE, AND SONOMA-MARIN SAVING TER PARTNERSHIP, ITS MEMBERS AND DESIGN SULTANTS EACH SPECIFICALLY DISCLAIM ANY OTHER RRANTIES, WHETHER WRITTEN OR ORAL, OR EXPRESS LIED, INCLUDING ANY WARRANTY OF QUALITY, SCHANTABILITY OR FITNESS FOR A PARTICULAR USE OF A PARTICULAR



ABLA

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LANDSCARE

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DESIGN ENGINEERS

P D G

PANORAMIC DESIGN GROUP
LANDSCAPE ARCHITECTURE

SCAPE DESIGN TEMPLATE
VATER PARTNERSHIP
hip.org

SONOMA-MARIN SAVING WA www.savingwaterpartnership NAME:

SITE ADDRESS:



SHEET TITLE:
LAYOUT &
PLANTING PLAN
SONOMA
COTTAGE A

DATE
PERMIT PLAN
JANUARY 17, 2019

L-1.0

IRRIGATION LEGEND APPLICANT NOTES / SIZE / MANUFAC -CHECK-OFF COMPONENT MODEL SYMBOL TURER COLOR COMPONENTS **EXISTING WATER METER** PRO-C INDOOR | CONTROLLER | HUNTER SOLAR-SYNC WIRED WEATHER HUNTER SENSOR -SEN FULL PORT **NIBCO** LINE SIZE BALL VALVE PVC SCH 40 PVC SCH 40 WITH SCH 40 MAINLINE SOLVENT WELD FITTINGS PVC SCH 40 LATERAL PIPE WITH SCH 40 | PIPE SIZE: 0-6 GPM: (COLOR 3/4" PIPE; 7-12 SOLVENT **VARIES PER** GPM: 1" PIPE; WELD ZONE) **FITTINGS** DRIP IRRIGATION CONTROL VALVE ASSEMBLY TO INCLUDE: ALL-IN-ONE KIT INCLUDES ACZ-075-40 **BACKFLOW ASSEMBLY PREVENTION** CONTROL FILTER AND **ZONE KIT** PRESSURE **REGULATOR** ANTI-SIPHON 3/4 INCH VALVE ANTI-SIPHON PGV-ASV, (COLOR INCLUDED IN VALVE PROVIDES HUNTER **VARIES PER** BACKFLOW ZONE) **PREVENTION** 150 MESH INCLUDED IN STAINLESS STEEL DRIP FILTER SCREEN PRESSURE INCLUDED IN REGULATION PVC SCH 80 UV NIPPLE RESISTANT TRANSITION TO DRIP ZONE SEE DETAIL DRIP LAYOUT - -- -- -- PLANTING BEDS NETAFIM TLCV6-1201 EMITTER FLOW 0.6 GPH: EMITTER SPACING: 12". CLAY SOIL: EMITTER FLOW: 0.4 TLCV4-1801 | GPH; EMITTER SPACING: 18"; ROW SPACING: 18" LOAM SOIL: INLINE EMITTER FLOW: 0.4 EMITTER NETAFIM TLCV4-1801 GPH; EMITTER TUBING SPACING: 18"; **ROW SPACING: 18"** SANDY SOIL: EMITTER FLOW: 0.6 TLCV6-1201 GPH; EMITTER SPACING: 12"; **ROW SPACING: 18"** NETAFIM TLFIG8 FLUSHOUT SYMBOLS FOR COMPONENTS ARE LARGER THAN ACTUAL SIZE AND MAY BE

APPLICANT INSTRUCTIONS:

1. ADJUST LAYOUT OF PLANTING BEDS IF CHANGED ON LAYOUT SHEET 1.0.

EQUIPMENT WITH PLUMBER.

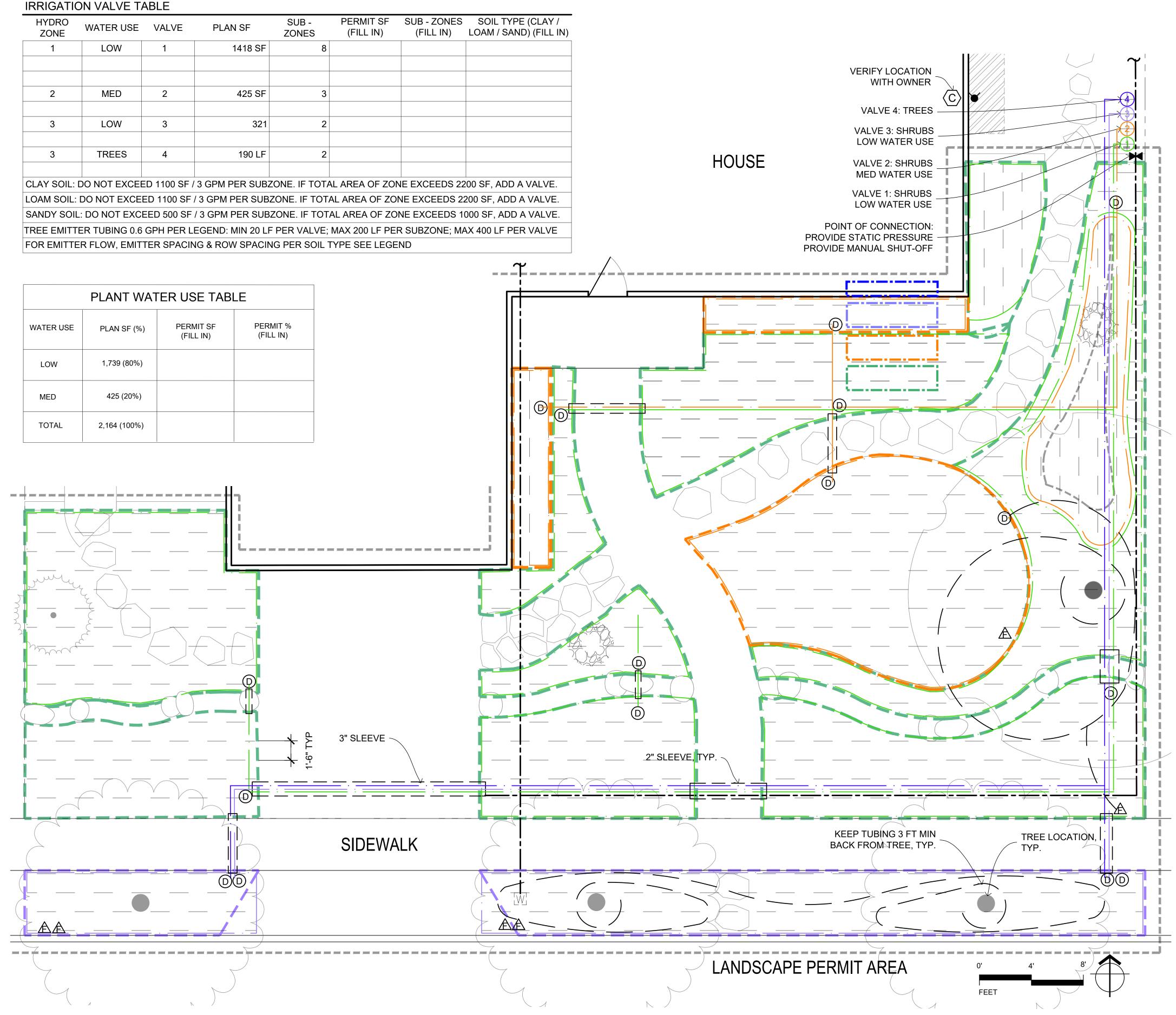
POURING CONCRETE

- 2. REVIEW IRRIGATION VALVE TABLE TO ADJUST SF AREAS OF VALVE ZONES.
- 3. IF AREAS EXCEED MAX SUBZONE FLOW (3 GPM) DIVIDE INTO ADDITIONAL SUBZONES AND ENTER

SHOWN IN PAVED AREAS FOR GRAPHIC CLARITY. COORDINATE LOCATION OF

ALL PIPE RUNS UNDER PAVING ARE IN SLEEVES, INSTALL SLEEVES PRIOR TO

- UNDER SUBZONE COLUMN
- 4. IF AREAS EXCEED MAX ZONE FLOW (7 GPM) ADD A VALVE AND ENTER SF AREA NEXT TO NEW VALVE NUMBER ("B" OR "C")
- 5. DRAW OUT NEW SUBZONE AND/OR VALVE ZONE AREA ON PLAN IN NEW COLOR.
- 6. ADD VALVE AS NEEDED TO VALVE MANIFOLD. 7. REVIEW IRRIGATION LEGEND AND CHECK OFF THAT ALL COMPONENTS ARE SHOWN ON
- ADJUSTED PLAN. 8. NOTE ANY EQUIPMENT SUBSTITUTIONS.





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PANORAMIC DESIGN GROUP LANDSCAPE ARCHITECTURE

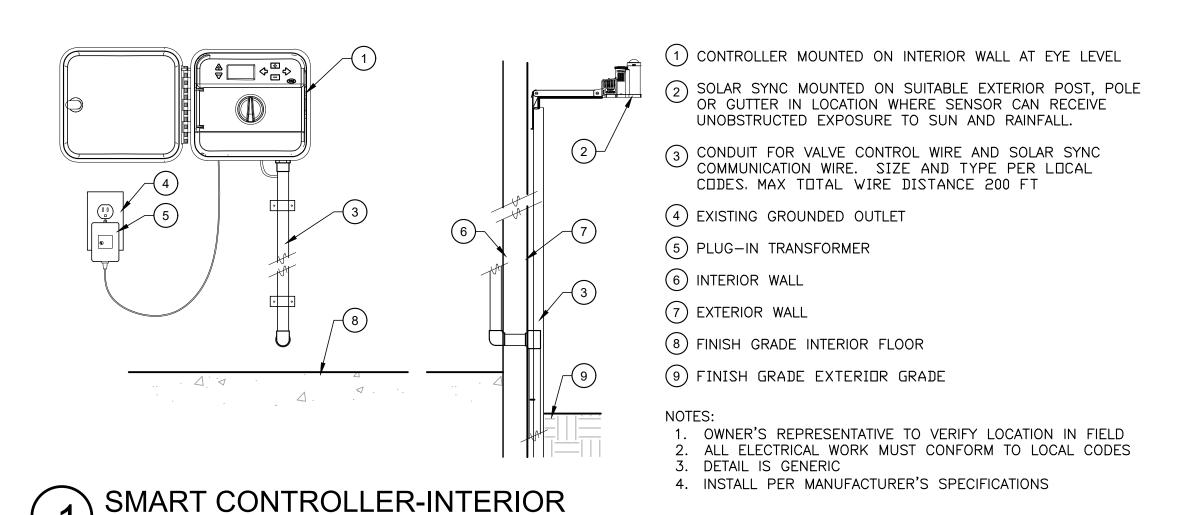


SHEET TITLE:

IRRIGATION PLAN SONOMA COTTAGE A

DATE PERMIT PLAN FEBRUARY 27, 2019

L-2.0



(1) HARDSCAPE SURFACE

PLANTING AREA

(3) AGGREGATE BASE

(4) COMPACTED SUBGRADE

5 SAND ABOVE AND BELOW PIPE

6 IRRIGATION SLEEVE: PVC SCH 40

(8) TO DRIP TRANSITION

PIPES BEING SLEEVED

7) PVC LATERAL OR MAINLINE

SIZE SLEEVE MIN 1.5X SIZE OF

2 FINISH GRADE OF ADJACENT

4 8

(1) FINISH GRADE

MAIN SUPPLY

 $(1)_{7}(2)_{7}(3)_{7}$

ISOLATION VALVE - BALL VALVE

(1) FINISH GRADE

2 MULCH

3 VALVE BOX

(4) MAIN LINE

ROCK

(5) MALE ADAPTERS

6 BRASS BALL VALVE,

7 FILL BOTTOM OF BOX

SIZED TO MATCH PIPE

WITH 3" DEPTH DRAIN

1 FINISH GRADE

(3) 10 INCH ROUND VALVE BOX.

WITHOUT KINKING, TYP.

(5) TEE: PVC TO POLY TUBING

(6) INLINE EMITTER TUBING

(10) PIPE COVER, SEE DETAIL

(11) 3 INCH DEPTH DRAIN ROCK

(8) PVC TEE (SXSXT)

(9) PVC LATERAL

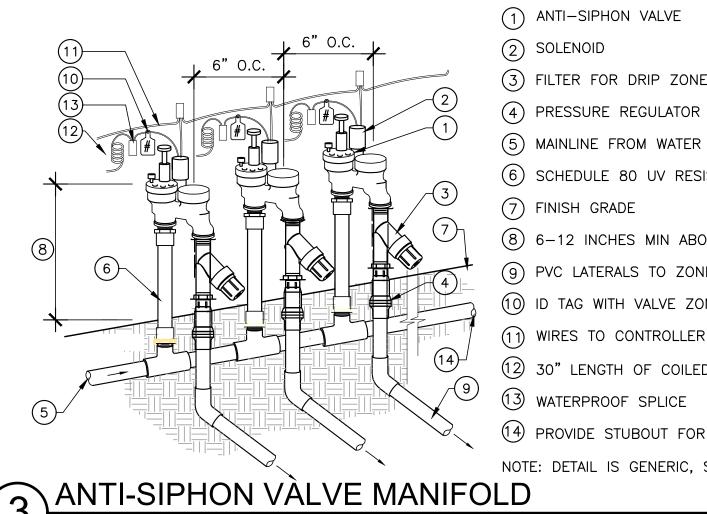
4 CUT HOLES FOR PIPES TO EXIT

(7) NIPPLE: SCH 40 LENGTH AS REQUIRED

2 MULCH

1 2 3

 $(1)_{7}(2)_{7}(3)$



2

1) ANTI-SIPHON VALVE

2 SOLENOID

(3) FILTER FOR DRIP ZONE VALVE

(4) PRESSURE REGULATOR FOR DRIP ZONE VALVES

(5) MAINLINE FROM WATER SUPPLY

(6) SCHEDULE 80 UV RESISTANT PVC NIPPLES

(8) 6-12 INCHES MIN ABOVE HIGHEST POINT OF DISCHARGE

(9) PVC LATERALS TO ZONES

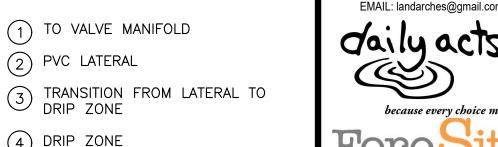
(10) ID TAG WITH VALVE ZONE NUMBER MATCHED TO CONTROLLER STATION

12 30" LENGTH OF COILED WIRE

(13) WATERPROOF SPLICE

(14) PROVIDE STUBOUT FOR FUTURE EXPANSION

NOTE: DETAIL IS GENERIC, SEE LEGEND FOR SPECIFIC EQUIPMENT.



(4) DRIP ZONE 5 IN-LINE DRIP TUBING, INSTALL PERPENDICULAR TO SLOPE

6 BLANK DRIP TUBING, USE TO EXTEND FLUSH-OUT TO ACCESSIBLE LOCATION

(7) STAKE TUBING EVERY 2 FT.

8 TO FLUSHOUT

I. THIS LAYOUT FOR SMALL AREAS & TREE SPIRALS. 4. MAXIMUM LENGTH OF TUBING

200 LF MAXIMUM FLOW PER SUBZONE:

3 GPM 5. DETAIL IS GENERIC, SEE LEGEND FOR SPECIFIC

EQUIPMENT.

6. SEE IRRIGATION VALVE TABLE FOR AREA LIMITATIONS

(2) LATERAL 6 2" SAND SETTING BED ALL 4 SIDES (3) MAINLINE SUPPLY (7) COMPACTED SOIL, TYP. (4) DEPTH OF PIPE COVER TRENCHING & PIPE COVER

<u>LATERAL</u>

(5) WIRING, TYP.

DRIP TRANSITION

DETAIL IS GENERIC, SEE LEGEND FOR SPECIFIC EQUIPMENT. FOR MULCH DEPTH, PIPE COVER & PIPE SIZE SEE NOTES & LEGEND

DRIP SUB-ZONE LAYOUT - SINGLE LINE



IRRIGATION SLEEVING

SCALE: N.T.

SUPPLY HEADER

(4) INDIVIDUAL LENGTHS OF TUBING

(5) SEE LEGEND FOR EMITTER AND ROW SPACING

STAKE TUBING EVERY 2 FT.

AREA PERIMETER, VARIES

8 EXHAUST HEADER

9 FLUSHOUT, SEE DETAIL

1. THIS LAYOUT FOR MEDIUM AND LARGE AREAS. 2. INDIVIDUAL TUBING LENGTHS MAY NOT EXCEED 200 LF EACH

MAXIMUM FLOW PER SUBZONE: 3 GPM DETAIL IS GENERIC, SEE LEGEND FOR SPECIFIC **EQUIPMENT**

SEE IRRIGATION VALVE TABLE FOR AREA LIMITATIONS

DRIP FLUSH VALVE

NOTE: DETAIL IS GENERIC, SEE LEGEND FOR SPECIFIC EQUIPMENT.

(4) BLANK TUBING FED FROM TECHLINE LATERAL COILED

18" TO 24" IN BOX

6 FILL BOTTOM OF BOX WITH

3" DEPTH DRAIN ROCK

5 FIGURE 8 END FITTING,

(1) FINISH GRADE

2 MULCH

3 VALVE BOX



FOR LEGEND SEE IRRIGATION PLAN SHEET L2.0

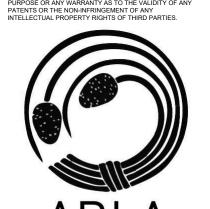
FOR IRRIGATION VALVE TABLE SEE IRRIGATION PLAN SHEET L2.0

IRRIGATION NOTES

- 1. INSTALLATION TO BE BY CONTRACTOR WITH A VALID CURRENT CALIFORNIA C-27 LICENSE OR BY HOMEOWNER WITH RELEVANT KNOWLEDGE, SKILLS & EXPERIENCE.
- 2. THE IRRIGATION PLAN IS DIAGRAMMATIC AND INDICATIVE OF THE WORK TO BE COMPLETED. IRRIGATION EQUIPMENT OR PIPING MAY BE SHOWN IN PAVED AREAS FOR GRAPHIC CLARITY. OBTAIN APPROVAL OF LAYOUT FROM OWNER'S REPRESENTATIVE PRIOR TO FINAL INSTALLATION.
- VERIFY LOCATION OF SUBSURFACE UTILITIES, PIPES AND STRUCTURES. NOTIFY THE OWNER'S REPRESENTATIVE SHOULD UTILITIES OR OTHER WORK NOT SHOWN ON THE PLANS BE FOUND DURING EXCAVATIONS.
- 4. CAREFULLY INVESTIGATE EXISTING FIELD CONDITIONS AND NOTIFY OWNER'S REPRESENTATIVE OF ANY POTENTIAL CONFLICT WITH DESIGN.
- CONFIRM ADEQUATE GPM AT POINT OF CONNECTION PRIOR TO START OF WORK. CONFIRM MINIMUM STATIC PRESSURE AT THE POINT OF CONNECTION PRIOR TO
- START OF WORK. 7. NOTIFY OWNER'S REPRESENTATIVE IF STATIC PRESSURE IS LOWER THAN REQUIRED. IF STATIC PRESSURE IS HIGHER THAN 75 PSI, INSTALL A WILKINS #600 PRESSURE REGULATOR DOWNSTREAM OF BACKFLOW PREVENTER. ADJUST
- **OUTLET PRESSURE TO 55 PSI.** 8. MAKE IRRIGATION POINT OF CONNECTION AS INDICATED ON PLAN AND COORDINATE WITH OTHER WORK AS REQUIRED. EXACT LOCATION OF TO BE APPROVED BY OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.
- 9. INSTALL IRRIGATION CONTROLLER IN LOCATION APPROVED BY OWNER'S REPRESENTATIVE. ENSURE 120 VOLT A.C. ELECTRICAL SUPPLY IS PROVIDED FOR IN IMMEDIATE VICINITY. INSTALL AS DETAILED AND PER MANUFACTURER'S INSTRUCTIONS. GROUND CONTROLLER AND CONFORM TO LOCAL CODES
- 10. MOUNT WEATHER SENSOR ON EXTERIOR WALL OR GUTTER WHERE IT WILL BE EXPOSED TO UNOBSTRUCTED RAINFALL. INSTALL PER MANUFACTURERS INSTRUCTIONS.
- 11. BACKFLOW PREVENTION IS REQUIRED. IF NOT PROVIDED BY ANTI-SIPHON VALVES THEN CODE APPROVED BACKFLOW PREVENTION DEVICE MUST BE
- 12. INSTALL ISOLATION VALVE AT POC UPSTREAM OF BACKFLOW PREVENTION (ANTI-SIPHON VALVES)
- 13. ENSURE THAT ALL COMPONENTS ARE CONNECTED AND OPERATIONAL
- 14. PROVIDE PVC SCH 40 SLEEVES FOR ALL PIPING AND WIRE UNDER PAVING. COORDINATE WITH CONCRETE CONTRACTOR INSTALL SLEEVES PRIOR TO POURING CONCRETE. EXTEND SLEEVE 6 INCHES BEYOND EDGE OF PAVING. ENSURE THAT SLEEVES ARE SIZED ADEQUATELY TO CONTAIN PIPES BEING SLEEVED.
- 15. ENSURE ADEQUATE PIPE SIZE TO PROVIDE REQUIRED FLOW.
- 16. PIPE COVER: SEE DETAIL
- 17. PIPE SIZE: 0-6 GPM: 3/4" PIPE; 7-12 GPM: 1" PIPE;
- 18. INSTALL ALL PLASTIC PIPING IN TRENCHES IN A SERPENTINE MANNER. 19. PROVIDE VALVE BOXES FOR: ISOLATION VALVE, DRIP TRANSITION AND FLUSHOUT VALVE.
- 20. VALVE BOXES: SET PARALLEL TO EACH OTHER AND PERPENDICULAR TO ADJACENT EDGE. SET WITH SUFFICIENT CLEARANCE ABOVE GRADE SO THAT FINAL MULCH GRADE IS FLUSH WITH EDGES OF BOXES. PROVIDE BOLT DOWN

- LIDS FOR EACH BOX.
- 21. INSTALL ALL WIRING IN ACCORDANCE WITH ALL APPLICABLE CODES. 22. USE COPPER WIRE WITH U.L. APPROVAL FOR DIRECT BURIAL IN GROUND. USE WHITE INSULATING JACKET FOR COMMON GROUND WIRE. USE INSULATING JACKET OF COLOR OTHER THAN WHITE FOR CONTROL WIRE. TAPE AND BUNDLE WIRING AT 10 FOOT INTERVALS.
- 23. CHECK VALVES: INSTALL CHECK VALVES ON LATERAL LINES AS REQUIRED TO PREVENT LOW HEAD DRAINAGE. ENSURE THAT IN-LINE DRIP TUBING HAS CHECK VALVES EMBEDDED INTO EMITTERS.
- 24. ENSURE THAT ALL EQUIPMENT IS SIZED CORRECTLY BASED ON EXISTING SITE CONDITIONS AND HYDRAULICS.
- 25. VERIFY SOIL TYPE AND USE APPROPRIATE EMITTER SIZE AND SPACING. 26. INSTALL DRIP TUBING AS SHOWN IN DETAIL AND PER MANUFACTURER'S
- SPECIFICATIONS.
- 27. DO NOT USE SMALL DIAMETER DISTRIBUTION TUBING
- 28. DO NOT INSTALL POST MANUFACTURED BUTTON EMITTERS INTO IN-LINE TUBING.
- 29. REVIEW DRIP LAYOUT WITH OWNER'S REPRESENTATIVE PRIOR TO COVERING WITH MULCH
- 30. STAKE DRIP TUBING IN PLACE @ 2 FT O.C. MAX
- 31. MAINTAIN A 3" MIN. DEPTH OF MULCH COVER OVER DRIP TUBING.
- 32. MAXIMUM LENGTH OF DRIP TUBING IS 200' IN ANY DIRECTION FROM WATER SOURCE.
- 33. OPEN LINE ENDS AND FLUSH THOROUGHLY BEFORE INSTALLATION OF END FLUSH CAPS. 34. FLUSH MAINLINES AFTER INSTALLING RISERS AND PRIOR TO INSTALLING OR
- RECONNECTING TO VALVES. 35. FLUSH LATERALS AFTER INSTALLING RISERS AND PRIOR TO INSTALLING TUBING
- 36. PRESSURE TEST PRIOR TO BACKFILLING, PROVIDE RESULTS TO OWNER'S REP.
- 37. FILL ALL EXCAVATIONS WITH COMPACTED BACKFILL, IN TWO MECHANICALLY
- COMPACTED LIFTS. REPAIR ALL SETTLED TRENCHES. 38. PERFORM COVERAGE TEST. ADJUST SYSTEM AS NEEDED TO PROVIDE FULL
- COVERAGE AND TO AVOID RUNOFF.
- 39. AFTER COMPLETION PROVIDE AS-BUILT PLANS.
- 40. PROVIDE CONTROLLER SCHEDULE.
- 41. SCHEDULE THE TREE ZONE TO RUN AT A LOW FREQUENCY AND LONG DURATION TO PROVIDE DEEP WATERING FOR THE TREES. ADJUST SCHEDULE PER WEATHER AND SEASON.
- 42. SCHEDULE THE SHRUB ZONES TO RUN AT A HIGH FREQUENCY AND SHORT DURATION TO ESTABLISH THE NEW SHRUBS. ADJUST THE SCHEDULE AS THE SHRUBS BECOME ESTABLISHED AND PER WEATHER AND SEASON
- 43. THE DESIGN INTENT IS TO PROVIDE THE MINIMUM AMOUNT OF WATER TO SUSTAIN HEALTHY PLANT GROWTH AND TO AVOID RUN-OFF, LOW HEAD DRAINAGE AND OVERSPRAY.
- 44. ENSURE THAT CONTROLLER SCHEDULE IS ADJUSTED SEASONALLY AT A MINIMUM
- 45. RUN SYSTEM TO CHECK FOR LEAKS AND REPAIR THEM SEASONALLY AT A MINIMUM.

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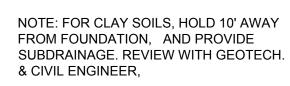


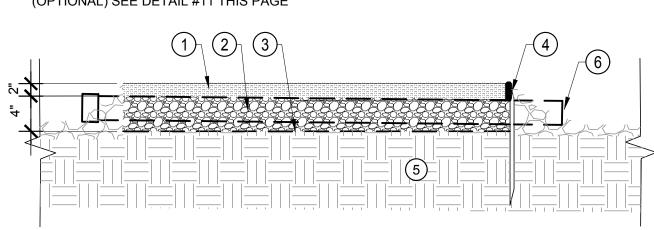
SHEET TITLE: IRRIGATION **DETAILS &** NOTES

DATE **PERMIT PLAN MAY 18, 2018**



- (2) 4" CLASS II PERMEABLE AGGREGATE BASE ROCK, COMPACT
- (3) FILTER FABRIC (OPTIONAL)
- (4) EDGING AND STAKE (OPTIONAL)
- (5) UNDISTURBED SUBGRADE OR COMPACTED TO 90%
- (6) RECTANGULAR DRAINAGE SLEEVE THRU PATHWAY BASE (OPTIONAL) SEE DETAIL #11 THIS PAGE





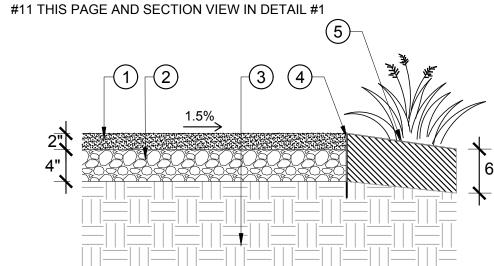
PERMEABLE AGGREGATE PAVING - PATH OR PATIO

SCALE: 1"=1'-0"

PERMEABLE PAVERS - PATH OR PATIO SCALE: 1"=1'-0"

SECTION

- STABILIZED 3/8-" AGGREGATE; TERRAPAVE, ECO-PAVE OR EQUAL STABILIZING PRODUCT APPLIED PER MANUFACTURER SPECIFICATION. SLOPE TO PLANTINGS @ 1.5%.
- (2) CLASS II RECYCLED AGGREGATE BASE, COMPACT TO 95%
- (3) SUBGRADE; UNDISTURBED OR COMPACTED TO 95%
- (4) METAL EDGE, 1/8" X 4", ALUMINUM, STEEL OR ALTERNATE
- (5) AMENDED SOIL OF ADJACENT PLANTING; SLOPE AWAY FROM PATH 2% MIN.
- 1. THIS PAVING IS IMPERVIOUS AND SHOULD HAVE POSITIVE DRAINAGE AWAY FROM BUILDING FOUNDATIONS. 2. FOR DRAINAGE THRU PATH SEE CURB O LET DETAIL



STABILIZED AGGREGATE - PATH OR PATIO

 \bigcirc GRAVEL PAVE XL PAVING SYSTEM. OR APPROVED EQUAL. AGGREGATE FILL SELECTED BY OWNER. $^\prime$ INSTALL PER MANUFACTURER'S INSTRUCTIONS.

(2) PERMEABLE CLASS 2 AGGREGATE BASE ROCK. COMPACT TO 95%

(3) SUBGRADE UNDISTURBED OR COMPACTED TO 90%

(1) CONCRETE OR BRICK PAVERS (L" x W" x THK" VARIES). PAVERS CAN BE PERVIOUS OR PERMEABLE.

(2) 1" SAND SETTING BED PER MANUFACTURER, ASTM #8

(3) JOINT FILL PER MANUFACTURER, ASTM #8

(4) CLASS 2 PERMEABLE AGGREGATE BASE ROCK

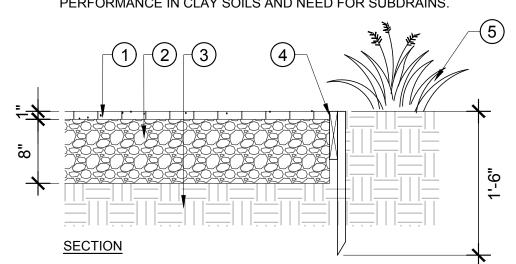
SELECT PAVER PATTERN.

(5) FILTER FABRIC (OPTIONAL)

(6) COMPACTED SUBGRADE, 90%

- (4) 2X6 RDW HEADER, 18" STAKES @ 6' O.C., SCAB AT OVERLAPPING ENDS AND STAKE AT 3' O.C. OPTIONAL CONCRETE CURB.
- (5) ADJACENT PLANTING AREA

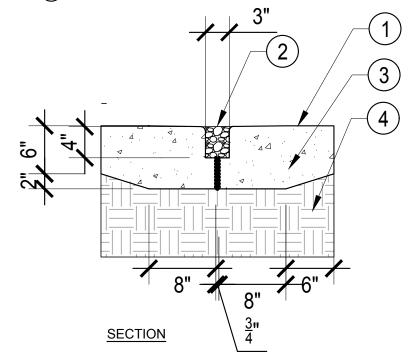
NOTE: CONSULT WITH GEOTECHNICAL & CIVIL ENGINEER FOR AGGREGATE DEPTH, PERFORMANCE IN CLAY SOILS AND NEED FOR SUBDRAINS.

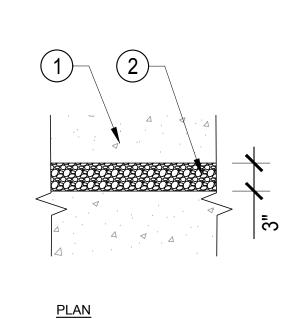


GRAVELPAVE PAVING - VEHICLE

(1) CONCRETE DRIVEWAY - DESIGN BY OTHERS. SEE NOTE 1.

- (2) GRAVEL DRAINAGE SEAM
- (3) EXPANSION JOINT
- (4) COMPACTED SUBGRADE DEPTH DETERMINED BY GEOTECH ENG.





DESIGN FOR LOAD AND SOILS.

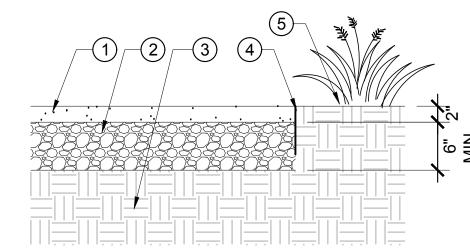
REINFORCEMENT RECOMMENDED.

2. EXPANSION AND CONTRACTION CONTROL JOINTS AND

CONCRETE - VEHICLE - GRAVEL DRAINAGE SEAMS

1. DRIVEWAY ENGINEERING BY OTHERS TO INSURE PROPER (1) STABILIZED 3/8-" AGGREGATE, STABILIZER: ECO-PAVE OR EQUAL. CONTROL RUNNING AND CROSS SLOPES FOR ACCESSIBILITY.

- 2) RECYCLED CLASS II AGGREGATE BASE ROCK, COMPACT TO 95%. CONFIRM AGGREGATE DEPTH W/ GEOTECH. ENG.
- (3) SUBGRADE UNDISTURBED OR COMPACTED TO 95%, CONFIRM SUBGRADE TREATMENT W/ GEOTECH ENG.
- PAVEMENT EDGE, 1/4" X 6" STEEL OR ALUMINUM, OR
- CONCRETE CURB
- (5) ADJACENT PLANTING AREA, SLOPE AWAY FROM PAVING



STABILIZED AGGREGATE - VEHICLE SCALE: 1"=1'-0"

- 1) PERVIOUS PAVER OR PERVIOUS AGGREGATE
- (2) HANDTIGHT JOINTS, SAND SWEPT
- (3) METAL EDGING

1. FOR CLAY SOILS, HOLD 10' AWAY FROM

DETAIL #1

FOUNDATION, AND PROVIDE SUBDRAINAGE

REVIEW WITH GEOTECH. & CIVIL ENGINEER,

2. FOR DRAINAGE THRU PATH SEE CURB O LET

(PATTERN CAN VARY)

DETAIL #11 THIS PAGE AND SECTION VIEW IN

- (4) AMENDED PLANTING BED; FINISH GRADE CAN SLOPE TOWARD PAVING TO INFILTRATE
- (5) 1" SAND SETTING BED
- (6) FILTER FABRIC
- (7) CLASS II PERMEABLE AGGREGATE BASE ROCK,
- 2. FOR DRAINAGE THRU PATH SEE CURB O LET DETAIL #11 THIS PAGE AND SECTION VIEW IN DETAIL #1

1. FOR CLAY SOILS, HOLD 10' AWAY FROM

FOUNDATION, AND PROVIDE SUBDRAINAGE

REVIEW WITH GEOTECH & CIVIL ENGINEER.

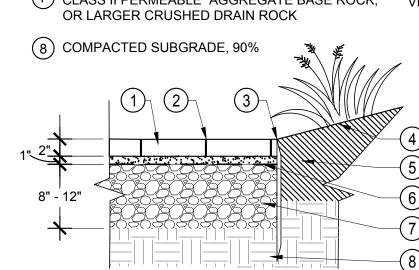
NOTE: CONSULT WITH GEOTECHNICAL & CIVIL

PERFORMANCE IN CLAY SOILS AND NEED FOR

ENGINEER FOR AGGREGATE BASE DEPTH,

SUBDRAINS

PERVIOUS OR PERMEABLE UNIT PAVER - VEHICLE



PERMEABLE INFILTRATION - PEDESTRIAN

(1) CONCRETE UNIT PAVER: SELECT PERVIOUS PAVERS OR PERMEABLE PAVERS

INSTALL PER MANUFACTURER'S INSTRUCTIONS.

5 SAND SETTING BED PER MANUFACTURER'S INSTRUCTIONS

6 PERMEABLE CLASS II AGGREGATE BASE ROCK, COMPACTED TO 95%

(2) JOINTS PER MANUFACTURER'S INSTRUCTIONS

3 METAL EDGING. OPTIONAL CONCRETE CURB.

SCALE: 1"=1'-0"

4 SHOULDER, FINISH GRADE

(8) COMPACTED SUBGRADE TO 90%

(7) FILTER FABRIC

(1) CONCRETE DRIVEWAY - DESIGN BY OTHERS. SEE NOTE 2 AND GENERAL NOTES THIS PAGE.

(2) TRENCH DRAIN, SIZE TBD BY OTHERS, SEE NOTE

(1) 1" OF 3/8" OR SMALLER PATHWAY AGGREGATE

(3) 4" RECYCLED CLASS II AGGREGATE BASE ROCK.

(5) SUBGRADE UNDISTURBED OR COMPACTED TO 90%

COMPACT TO 95%

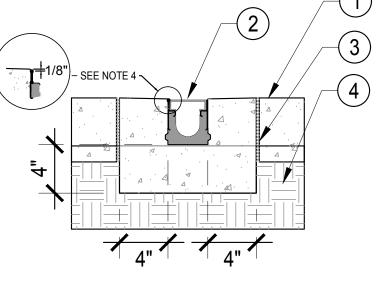
(4) FILTER FABRIC (OPTIONAL)

(6) 1/8" METAL EDGER, BLACK

(7) ADJACENT PLANTING AREA

(2) 1" OF DECOMPOSED GRANITE W/ STABILIZER PRODUCT

- (3) EXPANSION JOINT REQUIRED. SEE NOTE 2.
- (4) COMPACTED SUBGRADE DESIGN BY OTHERS SEE NOTE 2.



1. TRENCH DRAIN: K50 BY ACO POLYMER PRODUCTS, INC, OR EQUAL. REFER TO MANUFACTURER'S LATEST INSTALLATION INSTRUCTIONS FOR DETAILS. 2. DRIVEWAY ENGINEERING BY OTHERS. INSURE PROPER DESIGN FOR LOAD AND SOILS, PLACEMENT OF EXPANSION JOINTS AND REINFORCEMENT.

1. THIS PAVING IS SEMI-PERVIOUS AND

SHOULD HAVE POSITIVE DRAINAGE ON

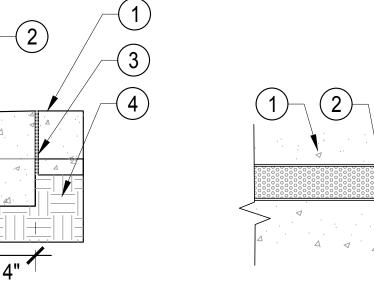
SURFACE OF BASE ROCK AWAY FROM

2. FOR DRAINAGE THRU PATH SEE CURB O

LET DETAIL #11 THIS PAGE AND SECTION

BUILDING FOUNDATIONS.

VIEW IN DETAIL #1



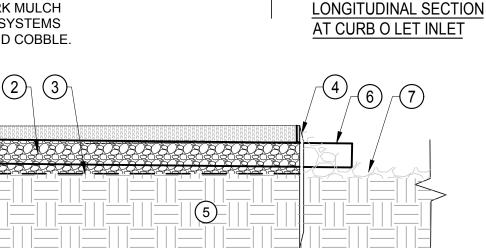
AGGREGATE PAVING - PEDESTRIAN

CONCRETE - VEHICLE - TRENCH DRAIN

1 PATHWAY PAVING MATERIAL, PROVIDE 2" SURFACING MATERIAL OVER CURB O LET SLEEVE.

- 2 AGGREGATE BASE ROCK MATERIAL PROVIDE MIN. .5" UNDER CURB O LET SLEEVE.
- (3) FILTER FABRIC (OPTIONAL)
- (4) EDGING AND STAKE (OPTIONAL)
- (5) UNDISTURBED SUBGRADE OR COMPACTED TO 90%
- (6) CURB O LET RECTANGULAR DRAINAGE SLEEVE THRU PATHWAY BASE OR EQUAL. SLOPE SLEEVE 1-2%.
- (7) PROTECT INLET AND OUTLET OF DRAINAGE SLEEVE WITH 1.5-6" RIVER COBBLE.

NOTE: MAINTAIN CHIP/BARK MULCH AWAY FROM RAINWATER SYSTEMS BY USING PEA GRAVEL AND COBBLE



1 2 3

RECTANGULAR DRAINAGE SLEEVE IN PATHS SCALE: NOT TO SCALE

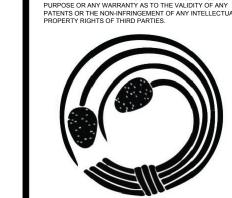
CROSS SECTION OF

GENERAL NOTES

SECTION

- 1. DESIGN STRATEGY: THESE DETAILS ARE PROVIDED TO CREATE OPTIONS FOR PERMEABLE PAVING, AND PAVING STRATEGIES THAT PROMOTE STORMWATER INFILTRATION IN LANDSCAPE SPACES. THESE STRATEGIES HELP CLEAN WATER, INFILTRATE RUN OFF INTO GROUNDWATER, AND PROVIDE MORE SOIL MOISTURE AVAILABILITY FOR LANDSCAPE PLANTINGS.
- 2. THESE DETAILS SHOULD BE EVALUATED BY THE SITE ENGINEER AND ADJUSTED TO SITE CONDITIONS.
- 3. PAVING DEPTH, DEPTH OF BASE GRAVEL, SUB-BASE PREPARATION AND CONCRETE REINFORCEMENT SHOULD ALL BE EVALUATED AND ADJUSTED AS NEEDED BY A GEOTECHNICAL ENGINEER.
- 4. SOIL TYPE AFFECTS THE PERFORMANCE OF THESE DETAILS. CLAY SOILS DO NOT INFILTRATE WELL, SO THERE IS A NEED TO EVALUATE WHETHER THE PERMEABLE/PERVIOUS PAVING DETAILS ARE APPROPRIATE FOR SPECIFIC SITES AND ADJUST THEM AS APPROPRIATE TO PROTECT BUILDINGS AND OTHER IMPROVEMENTS.
- 5. ACCESSIBLE PAVING IS SMOOTH, FIRM, AND HAS A CROSS SLOPE NOT TO EXCEED 2%. RUNNING SLOPE SHOULD BE 5% OR LESS UNLESS PAVING RAMP WITH HANDRAILS. SEE TITLE 24 OF CALIFORNIA CODE FOR ACCESSIBILITY REQUIREMENTS AND STANDARDS

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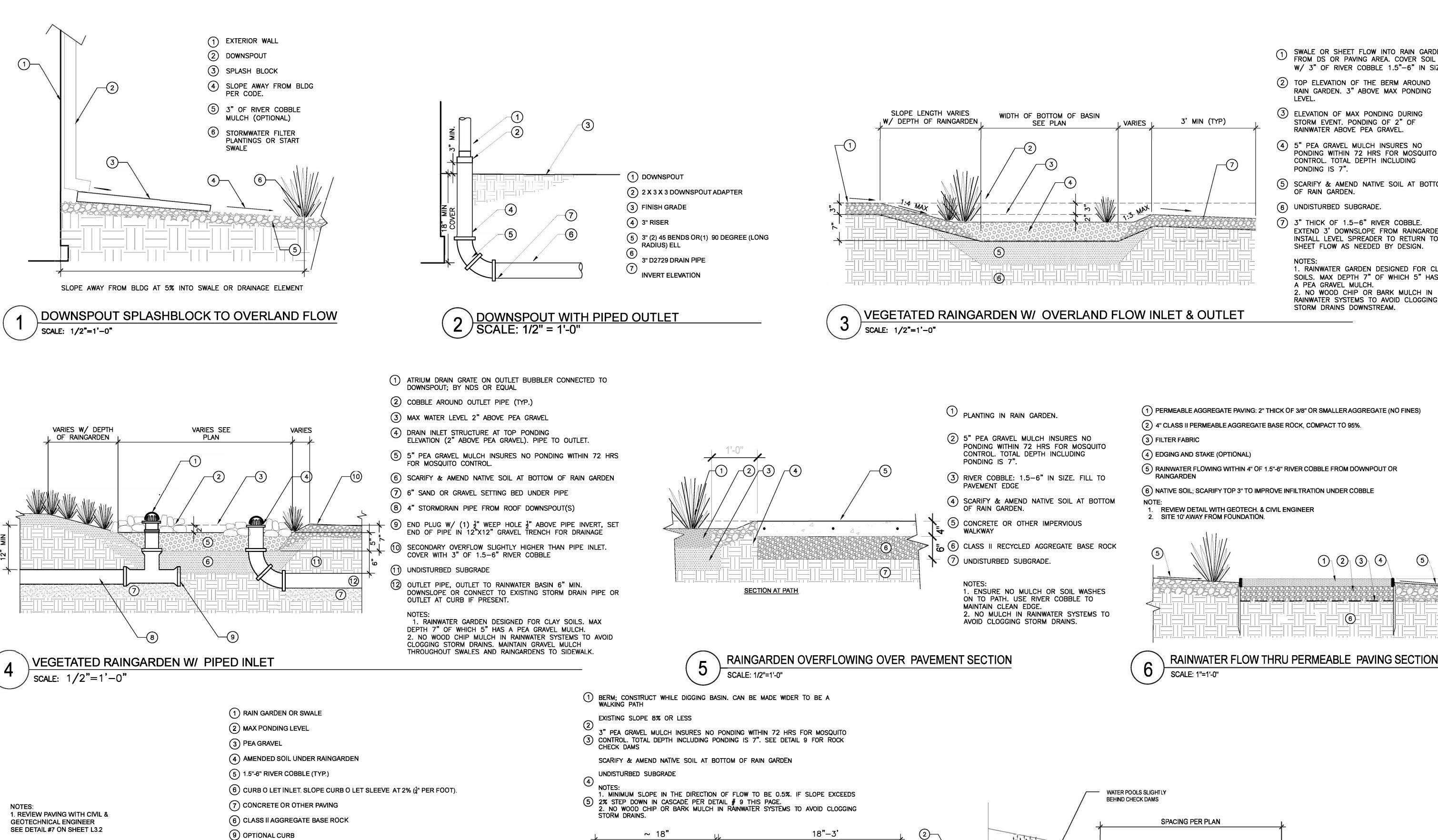
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SHEET TITLE: L.I.D. **PAVING DETAILS**

DATE PERMIT PLAN

MAY 18, 2018

L-3.0



SWALE/CASCADE ON SLOPE - SECTION

10 SUBGRADE, UNDISTURBED OR COMPACTED TO 95%

DRAIN SLEEVE THRU PATH FROM RAINGARDEN

SCALE: 1/2"=1'-0"

(4) 5" PEA GRAVEL MULCH INSURES NO PONDING WITHIN 72 HRS FOR MOSQUITO CONTROL. TOTAL DEPTH INCLUDING PONDING IS 7". (5) SCARIFY & AMEND NATIVE SOIL AT BOTTOM OF RAIN GARDEN. (6) UNDISTURBED SUBGRADE. (7) 3" THICK OF 1.5-6" RIVER COBBLE. EXTEND 3' DOWNSLOPE FROM RAINGARDEN. INSTALL LEVEL SPREADER TO RETURN TO SHEET FLOW AS NEEDED BY DESIGN. 1. RAINWATER GARDEN DESIGNED FOR CLAY SOILS. MAX DEPTH 7" OF WHICH 5" HAS A PEA GRAVEL MULCH. 2. NO WOOD CHIP OR BARK MULCH IN RAINWATER SYSTEMS TO AVOID CLOGGING STORM DRAINS DOWNSTREAM. VEGETATED RAINGARDEN W/ OVERLAND FLOW INLET & OUTLET (1) PERMEABLE AGGREGATE PAVING: 2" THICK OF 3/8" OR SMALLER AGGREGATE (NO FINES) (2) 4" CLASS II PERMEABLE AGGREGATE BASE ROCK, COMPACT TO 95%. (3) FILTER FABRIC (4) EDGING AND STAKE (OPTIONAL) (5) RAINWATER FLOWING WITHIN 4" OF 1.5"-6" RIVER COBBLE FROM DOWNPOUT OR 6 NATIVE SOIL; SCARIFY TOP 3" TO IMPROVE INFILTRATION UNDER COBBLE REVIEW DETAIL WITH GEOTECH. & CIVIL ENGINEER 2. SITE 10' AWAY FROM FOUNDATION. 1,2,3,4

SLOPE 2%-4%

SWALE/CASCADE ON SLOPE - LONGITUDINAL SECTION

CHECK DAM FORMED WITH STACKED STONE - 9"-12"ANGULAR PACKED W/

CRUSHED GRAVEL (TYP.)

SWALE OR SHEET FLOW INTO RAIN GARDEN FROM DS OR PAVING AREA. COVER SOIL

(2) TOP ELEVATION OF THE BERM AROUND

3 ELEVATION OF MAX PONDING DURING

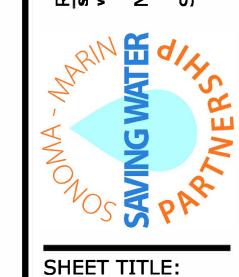
RAINWATER ABOVE PEA GRAVEL.

STORM EVENT. PONDING OF 2" OF

W/ 3" OF RIVER COBBLE 1.5"-6" IN SIZE

RAIN GARDEN. 3" ABOVE MAX PONDING

STACK ROCKS 6" ABOVE TOP OF STEP ELEVATIONS



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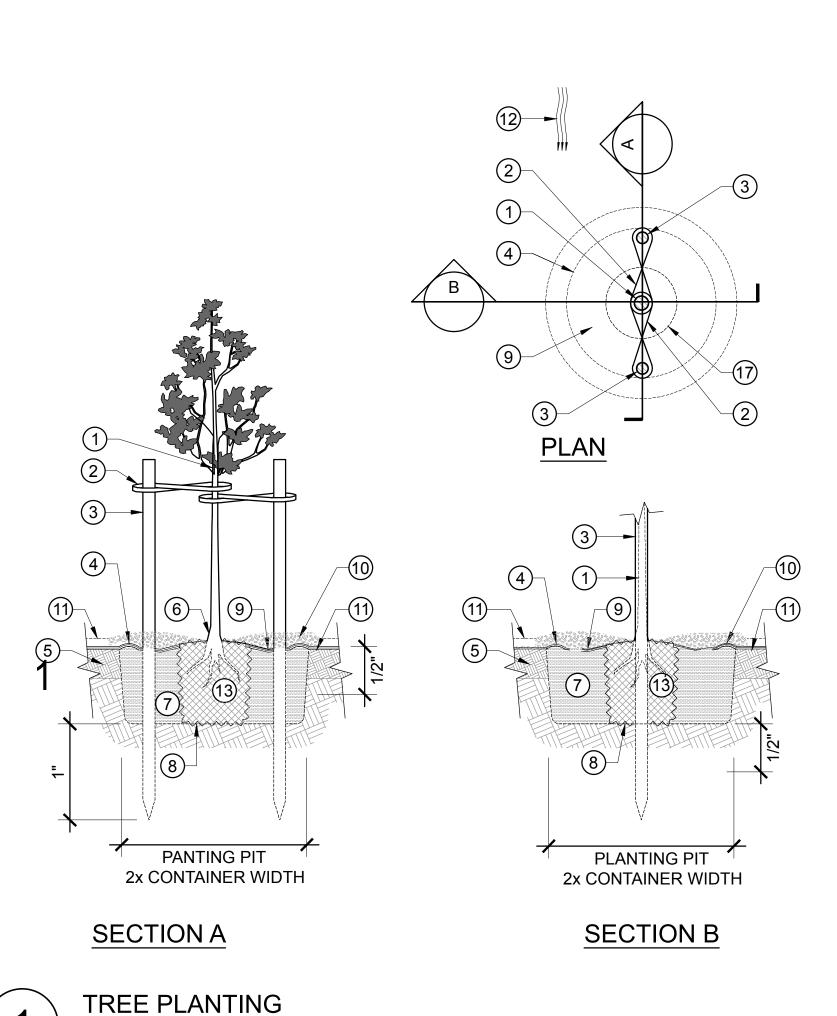
LANDSCAPE ARCHITECTURE

DESIGN ENGINEERS

RAIN GARDENS & SWALE **DETAILS**

DATE PERMIT PLAN MAY 18, 2018

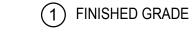
L-3.1



- 1 TREE, CENTRAL LEADER
- SYNTHETIC STRAPPING, LOOP AROUND CENTRAL LEADER BELOW FIRST BRANCH, ONE STRAP PER STAKE, ATTACH TO STAKES W/ SHEET METAL SCREWS
- WOOD STAKES, (2) PER TREE, SET PLUMB, OUTSIDE OF ROOTBALL, ON A LINE PARALLEL TO DIRECTION OF PREVAILING WIND, SET FAR ENOUGH FROM TREE THAT BRANCHES DO NOT TOUCH STAKES; STAKES SHALL BE SPACED AN EQUAL DISTANCE FROM THE CENTRAL LEADER.
- 4) WATERING BERM, 3"H
- 5 TOPSOIL, NATIVE. USE DIGGING FORK TO REMOVE COMPACTION, DO NOT TILL
- (6) CROWN OF ROOTBALL, SET 3" ABOVE FINISH GRADE
- 7 PLANTING PIT BACKFILL, PER SPECS
- 8 PLANTING PIT, SCARIFY EDGES, INSURE ROOT BALL RESTS ON FIRM SOIL AND WILL NOT SINK OVER TIME.
- 9 WATERING BASIN
- (10) MULCH, PER SPECS, 3" LAYER, KEEP 4" AWAY FROM TRUNK
- (11) SHEET MULCH: 2 LAYERS CARDBOARD, OR (5) LAYERS RECYCLED NEWSPAPER. $\frac{1}{2}$ " OF COMPOST UNDER PAPER.
- 12 DIRECTION OF PREVAILING WIND
- (13) ROOTBALL, SCARIFY OUTER 1"

NOTES:

- MAKE STAKES AS SHORT AS POSSIBLE, BUT HIGH ENOUGH TO HOLD THE TREE UPRIGHT UNDER CALM CONDITIONS. THE TREE SHOULD RETURN TO VERTICAL AFTER THE WIND HAS BENT THE
- 2. SUPPORT THE TRUNK AT JUST ONE LEVEL, NEAR THE TOPS OF THE STAKES.
- PROVIDE FLEXIBLE MOVEMENT AT THE POINT WHERE STRAPPING WRAPS LOOSLY AROUND THE CENTRAL LEADER OF
- 4. TAKE CARE NOT TO CAUSE RUBBING OR GIRDLING INJURIES.
- 5. STAKES ARE FOR PROTECTION OF THE TREE FOR A PERIOD AFTER PLANTING. REMOVE STAKES AS SOON AS TREE ESTABLISHES IT ROOT SYSTEM - WITHIN 18 MONTHS MAX.



- 2) 3" THICK MULCH: KEEP 3" AWAY FROM ROOT CROWN
- 3 ROOT CROWN: PLANT CROWN 1" ABOVE FINISHED GRADE
- 4) 3" HIGH BERM OF AMENDED SITE SOIL TO FORM WATERING BASIN
- 5 SHEET MULCH LAYER OF (5) PLY RECYCLED NEWSPAPER OR 1-2 LAYERS OF CARDBOARD.
- 6 1/4" LAYER OF AMENDMENTS UNDER SHEET MULCH.
- 7 AMEND SITE SOIL W/ 4 CUBIC YARDS COMPOST PER 1000 SF.
- 8 NATIVE SOIL: REST PLANT ON FIRM SOIL. SCARIFY EDGES OF HOLE TO PROMOTE ROOT

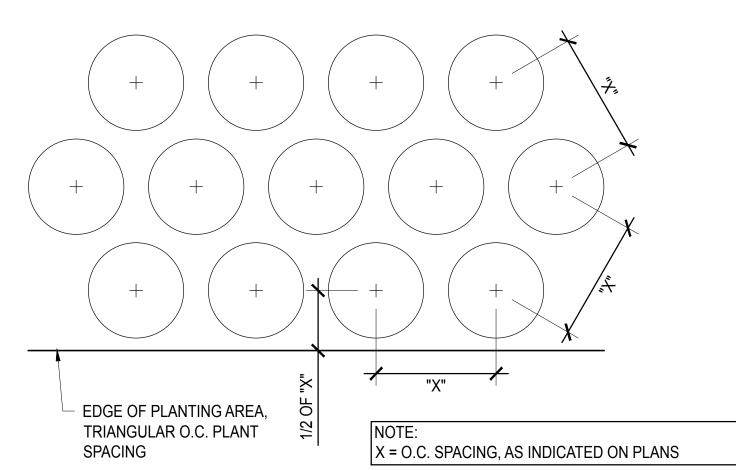


- 1 MULCH: 2" FOR GRASS PLUGS. IF APPLYING WILDFLOWER SEED MULCH WITH RICE STRAW OR 3/4" OF COMPOST.
- 2" PLUG OR STUBBIE. PLANT CROWN 1" ABOVE FINISHED
- 3 6" AMENDED SOIL PER WELO REQUIREMENTS.

PLUG PLANTING NOT TO SCALE

DISTANCE ON CENTER ("O.C")

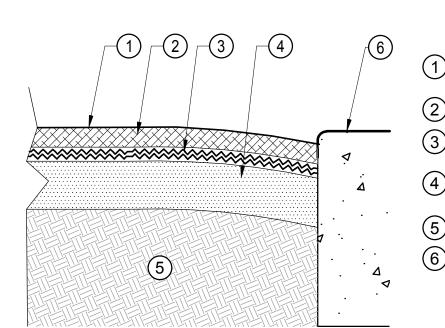
LISTED ON LEGEND



GROUNDCOVER PLANTING - TRI-SPACING

NOT TO SCALE

NOT TO SCALE



FINISH GRADE, HOLD MULCH BELOW PAVING EDGE $\frac{1}{2}$ ". 2 3" THICK MULCH

2 LAYERS OF CORRUGATED CARDBOARD 6" AMENDED SITE SOIL PER WELO REQUIREMENTS

5 UNCOMPACTED SITE SOIL

6 PAVING/EDGE

SHEET MULCH

NOT TO SCALE

PLANT PIT & WATERING BERM TABLE

•	CONTAINER SIZE	PLANT PIT DIAMETER	WATERING BERM HEIGHT	WATERING BERM DIAMETER
	1 GAL CAN	18" MIN	3" MIN	18" MIN
	5 GAL CAN	30" MIN	4" MIN	30" MIN
	15 GAL CAN	3' MIN	5" MIN	3' MIN
	24" BOX	5' MIN	6" MIN	5' MIN

PLANT PIT AND WATERING BERM NOT TO SCALE

WIDTH 2 TIMES

ROOTBALL WIDTH

NOT TO SCALE

PLANTING - SHRUBS, PERENNIALS, GRASSES



4 PLANTING HOLE: USE DIBBLE TO CREATE A HOLE SLIGHTLY LARGER THAN PLUG. PLACE PLUG FIRMLY IN HOLE WITH CROWN AT OR SLIGHTLY ABOVE HEIGHT OF SURROUNDING HOLE. LEAVE NO AIR OR MULCH AROUND ROOTS. BACKFILL HOLE WITH GARDEN SOIL, NOT MULCH.

> 1. PLANT PLUG STRAIGHT UP (PLUMB), NOT AT AN ANGLE TO THE SLOPE. 2. GRASS PLUG PLANTINGS DO BETTER IN CERTIFIED WEED FREE STRAW MULCH OR 1-2" OF LESS WOODY MULCH.

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SHEET TITLE: PLANTING **DETAILS**

DATE

MAY 18, 2018

APPLICANT INFORMATION:

LANDSCAPE TO LAUNDRY SYSTEM OVERVIEW:

A LAUNDRY-TO-LANDSCAPE GRAYWATER SYSTEM CAPTURES LIGHTLY USED WATER FROM THE DISCHARGE HOSE OF YOUR WASHING MACHINE AND PUMPS IT OUT TO THE LANDSCAPE THROUGH 1-INCH TUBING. THE SYSTEM DOES NOT ALTER THE EXISTING PLUMBING AND THEREFORE DOES NOT REQUIRE A PERMIT. A THREE-WAY DIVERTER VALVE IS A NECESSARY COMPONENT, ALLOWING YOU TO SEND DISCHARGE WATER BACK TO THE SEWER SYSTEM WHEN NEEDED OR DURING THE RAINY SEASON.

INSTALLATION & DESIGN CONSIDERATIONS:

LAUNDRY TO LANDSCAPE GRAYWATER SYSTEMS ARE EASY TO INSTALL FOR THE DO-IT-YOURSELFER OR A PROFESSIONAL, ESPECIALLY IF THE WASHING MACHINE IS LOCATED ON AN EXTERNAL WALL AND IS IN CLOSE PROXIMITY TO THE LANDSCAPE AREA BEING IRRIGATED. NOTE, THE WASHING MACHINE PUMP WILL PROVIDE SUFFICIENT PRESSURE THROUGH A 1-INCH IRRIGATION LINE FOR 100-FEET ON FLAT GROUND. IF THE SYSTEM IS DESIGNED TO IRRIGATE UPHILL FROM THE WASHING MACHINE, THE DISTANCE SHOULD BE REDUCED TO 30-50 FEET WITH NO MORE THAN A 5% SLOPE. IF THE SYSTEM IS DESIGNED TO IRRIGATE DOWNHILL FROM THE WASHING MACHINE, THE DISTANCE MAY INCREASE TO 150-FEET DEPENDING ON SLOPE.

GRAYWATER REQUIREMENTS TO COMPLY WITH CALIFORNIA PLUMBING CODE ("CPC") STANDARDS:

- O NOTIFY ENFORCING AGENCY
- O BE ABLE TO REDIRECT TO SEWER
- O NO POTABLE WATER CONNECTION
- O CONTAIN GRAYWATER ON SITE
- O DIRECT AND CONTAIN GRAYWATER WITHIN MULCH BASINS (IRRIGATION OR DISPOSAL FIELD) BELOW THE GROUND SURFACE
- O NO PONDING OR RUNOFF
- O OUTLETS COVERED BY AT LEAST 2-INCHES OF MULCH, ROCK, OR A SHIELD (E.G. VALVE BOX LID)
- O MINIMIZE CONTACT WITH HUMANS AND ANIMALS
- O DIVERT WATER TO THE SEWER IF IT CONTAINS DIAPERS, OIL, OTHER CHEMICALS
- O GRAYWATER DIVERTED TO LANDSCAPE SHALL NOT CONTAIN HAZARDOUS CHEMICALS
- O PERMIT EXEMPTION DOES NOT GRANT INSTALLATION THAT VIOLATES OTHER CODE OR LAWS
- O POST OPERATION AND MAINTENANCE MANUAL

CPC Table 1502.4 -- LOCATION OF GREY WATER SYSTEM

MINIMUM HORIZONTAL DISTANCE IN CLEAR REQUIRED FROM	SUBSURFACE AND SUBSOIL IRRIGATION FIELD AND MULCH BASIN (feet)	
Building structures	2	
Property line adjoining private property	1.5	
Water supply wells	100	
Streams and lakes	100	
Sewage pits or cesspools	5	
Sewage disposal field	4	
Septic tank	5	
On-site domestic water service line	0	
Pressurized public water main	10	

CALCULATIONS SECTION

1. Estimate Daily Graywater Production

Calculation Method (choose one and check box)

*Typical gals/per load: Front loader 15,

☐ Callfornia Plumbing Code Estimate (Assign 2 occupants to master bedroom and 1 occupant to each additional bedroom)

Laundry:	occupants x 15 gallons/day	gai/day
☐ Estimate of graywate	produced from winter (Dec-Feb) water use records (re	ference utility bill)

(gallons/load*) x _____(loads/week) ÷ 7(days/week)

_gal/day

gal/day

Top loader 40

2. Determine Minimum Mulch Basin Size

Minimum Mı	ulch Basin S	Size:
	_(gal/day)	$ft^2 = ft^2$
From 1 above	_15 / //	Maximum Absorption Capacity (from column 3 in table below)

Design of Six Soil Types	Min SQ FT of Irrigation/ Leaching Area Per 100 Gallons of Estimated Graywater Discharge Per Day	Max Absorption Capacity in Gallons Per SQ FT of Irrigation/ Leaching Area for an 24-Hour Period
Coarse sand or gravel	20	5.0
Fine Sand	25	4.0
Sandy Loam	40	2.5
Sandy Clay	60	1.7
Clay with considerable sand or gravel	90	1.1
Clay with small amounts of sand or gravel	120	0.8

3. Determining Weekly Water Needs

Weekly Water needs = (0.62 x Area x Eto x Pf) / 4 weeks = ______ *0.62 = (# of gal in 1" of water covering 1 ft²)

- Area = π r² = 3.14 x (canopy radius of existing plant)² OR = (Length x Width) for number of garden beds
 Evapotranspiration rates (ETo) Choose ETo for hottest month July = 6.51"/month for Santa Rosa
- Plant factor (PF) = 0.3 (Low water use), 0.5 (Moderate water use) *check landscape plan for water use of plants in the hydrozone

ADDITIONAL INFORMATION

GRAYWATER IS RECEIVED BEST BY TREES, BUSHES, SHRUBS, SMALL PERENNIALS AND LARGER ANNUALS, BUT IS PROHIBITED ON LAWN, RAISED BEDS, ROOT AND LEAFY VEGETABLES. MODERATE WATER USERS SUCH AS FRUIT TREES ARE ALSO AN IDEAL APPLICATION. GRAYWATER IS SOMEWHAT ALKALINE (HIGH pH) AND NOT RECOMMENDED FOR PLANTS THAT PREFER ACIDIC SOILS (LOW pH) LIKE BLUEBERRIES AND RHODEDENDRONS SOIL TYPE WILL DETERMINE BOTH HOW QUICKLY GRAYWATER IS ABSORBED IN YOUR LANDSCAPE AND THE SIZE OF THE MULCH BASINS NEEDED TO INFILTRATE THE GRAYWATER..

THE KEY TO PROPER IRRIGATION WITH GRAYWATER IS TO KNOW HOW MUCH THE CHOSEN PLANTS NEED GIVEN EVAPOTRANSPIRATION RATES, PLANT WATERING NEEDS, AND EXISTING CANOPY.

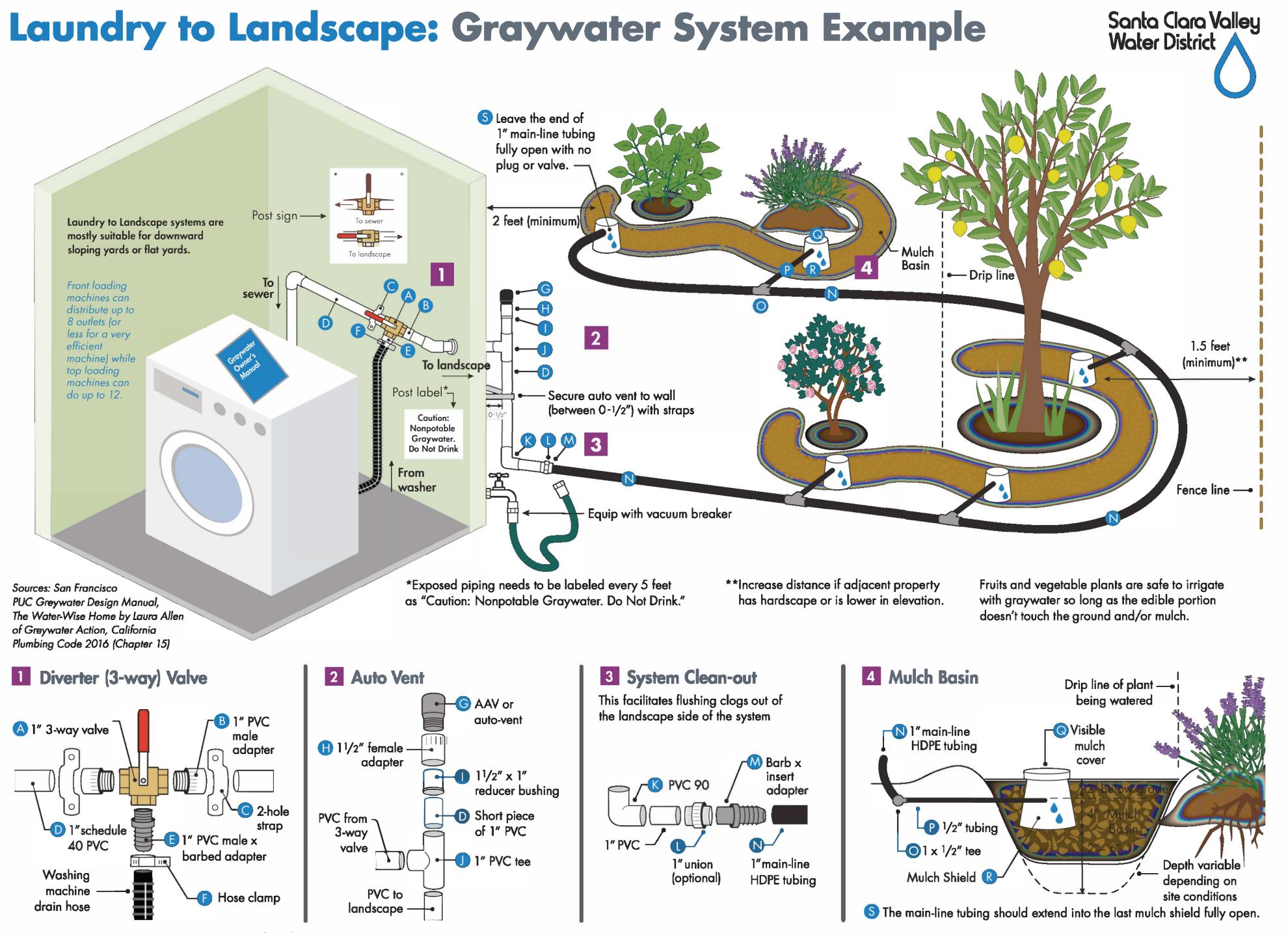
RECOMMENDED DETERGENTS:

TO ENSURE PLANT SURVIVAL AVOID SOAPS AND DETERGENTS THAT CONTAIN BORON, SODIUM AND CHLORINE COMPOUNDS. THE FOLLOWING LIST OF COMMERCIAL DETERGENTS ARE RECOMMENDED FOR USE WITH LAUNDRY TO LANDSCAPE GRAYWATER SYSTEMS.

- OASIS LAUNDRY
- LIQUID ECOS LIQUID DETERGENTLIFE TREE LAUNDRY LIQUID
- BIO PAC LAUNDRY LIQUID
 BIOKLEEN LAUNDRY LIQUID
- MOUNTAIN GREEN LAUNDRY DETERGENT
- ECOVER LAUNDRY WASH (SOME SALT) VASKA HERBATERGENT

APPLICANT INSTRUCTIONS:

- 1. ESTIMATE YOUR GRAYWATER SUPPLY USING THE CALCULATION PROCESS IN CALCULATIONS SECTION BELOW.
- COMPLETE CALCULATIONS TO DETERMINE THE MINIMUM REQUIRED MULCH BASIN SIZE PER YOUR SOIL TYPE.
 MEASURE ACTUAL IRRIGATION FIELD AREA(S) ON SITE AND DEVELOP NUMBER AND SIZE OF MULCH BASINS TO USE THIS VOLUME THAT FIT IN THE LANDSCAPE AREAS.
- 4. REVIEW REQUIRED SETBACKS SHOWN IN CPC TABLE 1502.4 THIS SHEET.
- 5. DEVELOP A SITE PLAN ILLUSTRATING THE FOLLOWING: REQUIRED SETBACKS, PROPOSED MULCH BASINS, VALVE LOCATIONS, PIPING DIAGRAM, AND TREE AND PLANT LOCATIONS TO BENEFIT FROM GRAYWATER.
- 6. IF IN BUILDING DESIGN AND/OR CONSTRUCTION PROCESS REVIEW PLAN WITH ARCHITECT (FOR LOCATION OF LAUNDRY NEAR GRAYWATER SUPPLIED LANDSCAPE AREA), CIVIL ENGINEER (FOR ANY POTENTIAL CONFLICTS WITH STORMWATER DRAINAGE), AND GENERAL & LANDSCAPE CONTRACTORS TO REVIEW THREE WAY VALVE LOCATION AND SUPPLY PIPE LOCATION.



This diagram is not drawn to scale and is provided for <u>reference</u> purposes only. It is your responsibility to properly design, install, maintain, and use your laundry to landscape graywater system (graywater system). If you are unsure of the intricacies of your plumbing system or how to properly design or install a graywater system, please consult with a professional. The District does not accept any liability and responsibility for any direct, special, indirect or consequential loss or damage whatsoever arising out of or in connection with providing you with access to this diagram.



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BY USING THESE PLANS, I.AGREE TO DEFEND, INDEMNIFY AND HOLD HARMLESS THE SONOMA-MARIN SAVING WATER PARTNERSHIP, ITS MEMBERS (SONOMA COUNTY WATER AGENCY, CITY OF SANTA ROSA, MARIN MUNICIPAL WATER DISTRICT, CITY OF TO PINEP PARK, CITY OF PETALUMA, CITY OF COTATI, CITY OF SONOM VALLEY OF THE MOON WATER DISTRICT AND TOWN OF WINDSOR) AND THEIR DIRECTORS, OFFICERS, AGENTS, EMPLOYEES AND LANDSCAPE DESIGN CONSULTANTS AGAINST ANY AND ALL LOSS, LIABILITY EXPENSE, CLAIMS, SUITSAND DAMAGES, INCLUDING ATTORNEY'S FEES, ARISIN OUT OF OR RESULTING FROM THE USE OF THIS LANDSCAPP PLAN. I UNDERSTAND THAT IT IS MY RESPONSIBILITY AS THE PROJECT OWNER TO ENSURE THAT PLAN ELEMENTS ARE IMPLEMENTED SAFELY AND ACCORDING TO APPLICABLE STATUTES, RULES, REGULATIONS, ORDINANCES AND/OR CODES.

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SONOMA-MARIN SAVING WATER PAI

SHEET TITLE:

GREYWATER -

LAUNDRY TO

LANDSCAPE

DATE

SHEET

PERMIT PLAN MAY 18, 2018

GW-1.0

DESIGN ENGINEERS

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APPLICANT INFORMATION:

BRANCHED DRAIN SYSTEM OVERVIEW:

A BRANCHED-DRAIN SYSTEM DISTRIBUTES GRAYWATER FROM SHOWERS AND/OR BATHROOM SINKS THROUGH A SERIES OF BRANCHING 1.5-INCH OR 2-INCH PIPES AND IS DISPERSED INTO THE LANDSCAPE VIA MULCH BASIN OUTLETS. PLUMBING FOR GRAYWATER SOURCES MUST BE SEPARATED FROM BLACK WATER SOURCES (TOILET, KITCHEN SINK). IF POSSIBLE DUE TO CLOSE PROXIMITY, A LAUNDRY MACHINE CAN ALSO BE ADDED INTO THE DISTRIBUTION PIPING. THIS SYSTEM IS DRIVEN BY GRAVITY FLOW AS NO PRESSURE IS PROVIDED BY A WASHING MACHINE PUMP OR ANY OTHER PUMP. AS THIS SYSTEM REQUIRES CUTTING INTO EXISTING SEWER PIPES FROM SHOWER DRAINS OR SINKS, IT DOES REQUIRE A SIMPLE OVER THE COUNTER PLUMBING PERMIT. IF INSTALLING AS PART OF NEW BUILDING CONSTRUCTION OR REMODEL, SHOW SEPERATED PLUMBING IN PLAN SETS AND STUB OUT PIPING FOR EXTERIOR GRAYWATER SYSTEM COMPONENTS DURING BUILDING CONSTRUCTION.

BRANCHED DRAIN GRAYWATER REQUIREMENTS TO COMPLY WITH CALIFORNIA PLUMBING CODE (CPC) STANDARDS:

- O NOTIFY ENFORCING AGENCY AND SECURE PERMIT FOR INTERIOR PLUMBING COMPONENTS
- O BE ABLE TO REDIRECT TO SEWER
- O NO POTABLE WATER CONNECTION
- O CONTAIN GRAYWATER ONSITE
- O DIRECT AND CONTAIN GRAYWATER WITHIN MULCH BASINS (IRRIGATION OR DISPOSAL FIELD)
 BELOW THE GROUND SURFACE
- O NO PONDING OR RUNOFF
- O OUTLETS COVERED BY AT LEAST 2-INCHES OF MULCH, ROCK, OR A SHIELD (E.G. VALVE BOX LID)
- O MINIMIZE CONTACT WITH HUMANS AND ANIMALS
- O DIVERT WATER TO THE SEWER IF IT CONTAINS DIAPERS, OIL, OTHER CHEMICALS
- O GRAYWATER DIVERTED TO LANDSCAPE SHALL NOT CONTAIN HAZARDOUS CHEMICALS
- O FOLLOWALLAPPLICABLE CODE OR LAWS
- O POST OPERATION AND MAINTENANCE MANUAL
- O THE SYSTEM SHALL HAVE A DISCHARGE CAPACITY OF 250 GALLONS PER DAY OR LESS

INSTALLATION & DESIGN CONSIDERATIONS:

WITH A HIGHER POTENTIAL VOLUME OF WATER COMING FROM A SHOWER AND SINK, A BRANCHED DRAIN SYSTEM IS BEST SUITED FOR IRRIGATING TREES, BUSHES, SHRUBS, AND OTHER LARGER PERENNIAL PLANTS. THIS IS A SIMPLE SYSTEM AND DOES NOT REQUIRE ELECTRICITY OR A PUMP. HOWEVER, THE LANDSCAPE AREA MUST BE LOWER IN ELEVATION THAN THE GRAYWATER SOURCE,

CALCULATIONS SECTION

1. Estimate Daily Graywater Production

	g Code Estimate (Assign 2 occupants to master be	edroom and 1 occupar	nt to each additional bedroor
Laundry:	occupants x 15 gallons/day		gals/day
Shower/Sink:	occupants x 25 gallons/day	÷ 7(days/week)	gals/day
		TOTAL	gals/day
stimate of grayw	ater produced from winter (Dec-Feb) water use r	records (attach utility b	oill)
Estimate of grayw Laundry:	ater produced from winter (Dec-Feb) water use r Avg. water use ÷30 days(gals/day)	records (attach utility b	oill) (gals/day)
•	•	,	,
Laundry:	Avg. water use ÷30 days(gals/day)	X .22	(gals/day)

2. Determine Minimum Mulch Basin Size

Minimum Mulch Basin Area

(gal/day)	$\div \qquad \qquad \text{gal/ft}^2/\text{day} = $	
From 1 above	Maximum Absorption Capacity (from column 3 in table b	ielow)

*Dig mulch basin to a depth of 1 ft to ensure sufficient surge capacity for water leaving the laundry machine.

Min SQ FT of Irrigation/ Leaching Area Per 100 Gallons of Estimated Graywater Discharge Per Day	Max Absorption Capacity in Gallons Per SQ FT of Irrigation/ Leaching Area for an 24-Hour Period
20	5.0
25	4.0
40	2.5
60	1.7
90	1.1
120	0.8
	20 25 40 60 90

AND THE ENTIRE SYSTEM MUST HAVE A DOWNWARD SLOPE OF 2 % (1/4 INCH PER FOOT) TO ENSURE EVEN DISTRIBUTION.

INSTALLATION DIFFICULTY DEPENDS ON THE EXISTING HOUSEHOLD PLUMBING, ACCESS TO PIPES AND THE SLOPE OF LANDSCAPE. WHILE OUTDOOR COMPONENTS CAN BE INSTALLED BY A HOMEOWNER, A PROFESSIONAL PLUMBER IS NEEDED FOR INSTALLATION OF 3-WAY DIVERTER VALVE ON THE SEWER LINE. THE HOMEOWNER HAS THE OPTION TO INSTALL AN ACTUATOR, WHICH ALLOWS EASY DIVERSION OF GRAYWATER BETWEEN LANDSCAPE AND THE SEWER LINE.

SYSTEM COSTS & REBATES: THE COSTS CAN RANGE FROM A THOUSAND DOLLARS WHEN PRIMARILY INSTALLED BY A HOMEOWNER TO SEVERAL THOUSAND IF INSTALLED BY A PROFESSIONAL. WHILE MORE COSTLY TO CONSTRUCT THAN A LAUNDRY TO LANDSCAPE SYSTEM, A BRANCHED DRAIN SYSTEM REQUIRES LITTLE MAINTENANCE AND LASTS A LONG TIME, SINCE IT HAS NO MOVING PARTS TO BREAK.

RECOMMENDED SOAPS:

MORE SOAPS ARE COMING OUT ALL THE TIME, BUT IT IS ALWAYS IMPORTANT TO READ THE INGREDIENTS LIST. BELOW ARE SEVERAL THAT ARE KNOWN TO BE GRAYWATER COMPLIANT.

- OASIS ALL-PURPOSE CLEANER FOR HAND-WASHING, BODY & SHAMPOO
- DR. BRONNER'S MAGIC SOAPS (LIQUID)
- AUBREY ORGANICS SHAMPOOS

APPLICANT INSTRUCTIONS:

- . ESTIMATE YOUR GRAYWATER SUPPLY USING THE CALCULATION SECTION THIS SHEET.
- 2. ESTIMATE MULCH BASIN SIZES, AREA AND VOLUME USING TABLE 3.
- 3. DEVELOP A GRAYWATER SITE PLAN SHOWING THE SYSTEM LAYOUT FOR THE PERMIT APPLICATION. SHOW ALL THE PLAN ELEMENTS LISTED IN #4 -GRAYWATER PLAN BELOW. REVIEW THE SAMPLE PLAN SHOWN IN DETAIL #1 THIS SHEET. SHOW TREE AND PLANT LOCATIONS TO BENEFIT FROM GREYWATER.
- 4. SUBMIT FOR BUILDING PERMIT EITHER WITH FULL SITE DRAWINGS OR AS A SEPARATE SUBMITTAL.
- 5. REVIEW PIPE AND VALVE LOCATIONS WITH ARCHITECT, ENGINEER AND CONTRACTOR TO INSURE THERE ARE NO CONFLICTS WITH OTHER SITE ELEMENTS. CONFIRM COMPONENTS TO BE INSTALLED AT TIME OF FOUNDATION SYSTEM CONSTRUCTION, INCLUDING PIPE STUB OUT FOR EXTERIOR GRAYWATER SYSTEM DEVELOPMENT.



Gravity to Mulch Basins (Branched Drain)			
Total mulch basin surge capacity: From Section 1	_gal/day ÷ 7.48 gal/ft ³	÷ 0.80 =	 ft ³

4. Graywater Plan

Using graph paper, or a copy of your site plan, draw a map and legend of graywater system components that shows the pathway of piping from the fixture(s) inside the building to the landscape/irrigation field. If graywater is directed to the front yard, show the street frontage and your driveway. In your drawing, include the location of all:

- Graywater valves Graywater pipes and fittings
- Setback of graywater outlets to property lines and buildings*
 Setback of graywater outlets to onsite
- (indicate material and size)Clean-outsGraywater outlets and mulch basins
- Setback of graywater outlets to onsite
 wastewater treatment system tanks and
 leachfields* (if applicable).
 Setback of greywater outlets to wells and

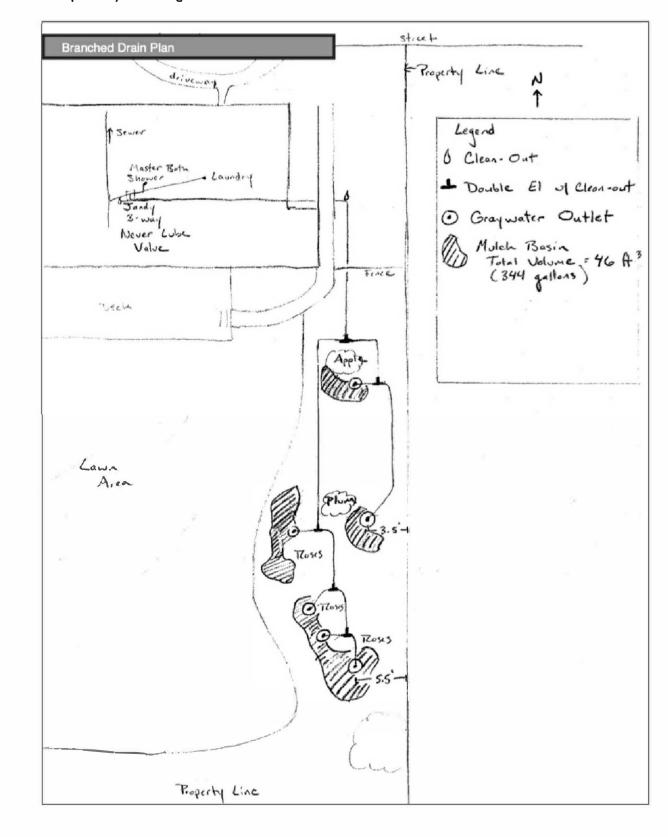
drainages* (if applicable).

*See table below for required setbacks. See the California Plumbing Code for additional notes aboutsetbacks.

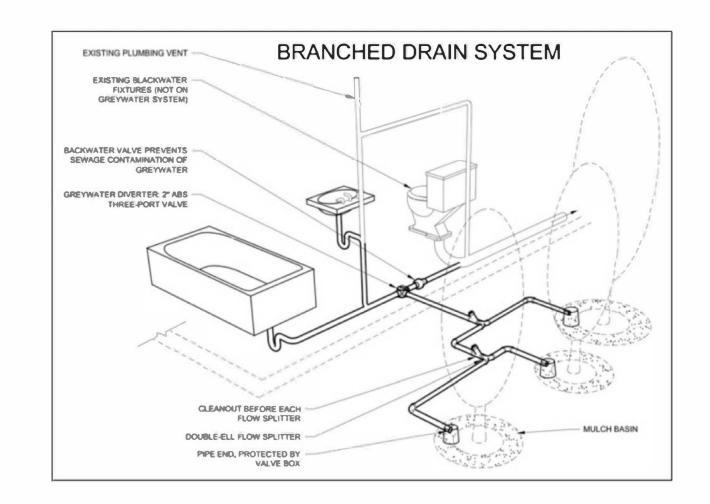
CPC Table 1502.4 --- LOCATION OF GREY WATER SYSTEM

MINIMUM HORIZONTAL DISTANCE IN CLEAR REQUIRED FROM	SUBSURFACE AND SUBSOIL IRRIGATION FIELD AND MULCH BASIN (feet)
Building structures Property line adjoining private property	2 1.5
Water supply wells	100
Streams and lakes	100
Sewage pits or cesspools	5
Sewage disposal field	4
Septic tank	5
On-site domestic water service line	0
Pressurized public water main	10

Example Greywater Irrigation Plan



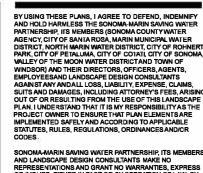






BRANCHED DRAIN SYSTEM DIAGRAM AND INSTALL PHOTO

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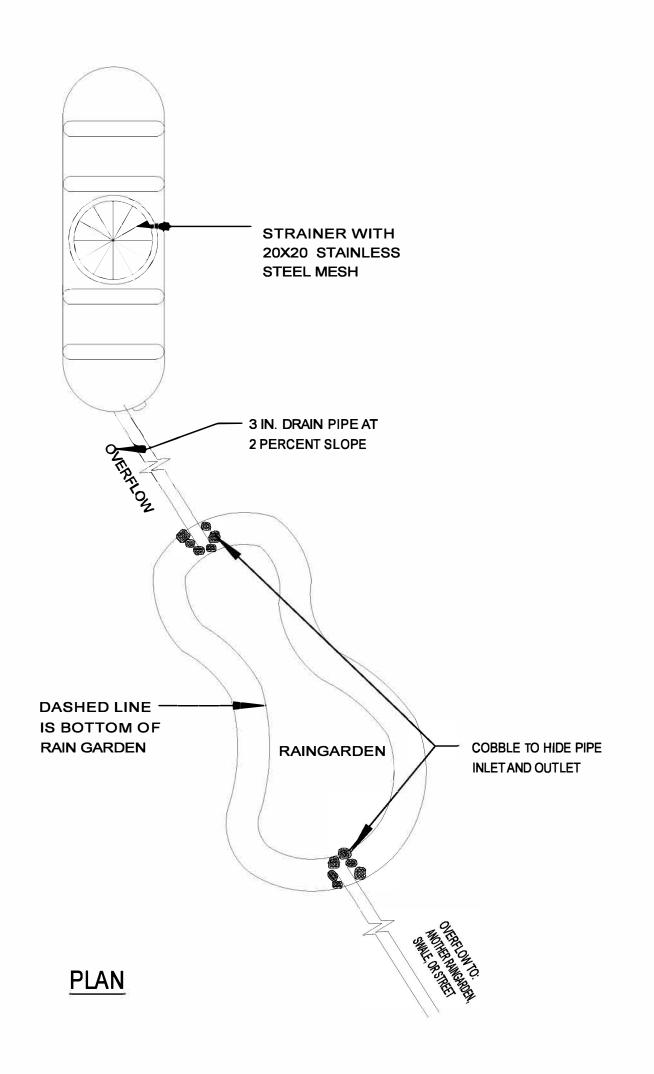
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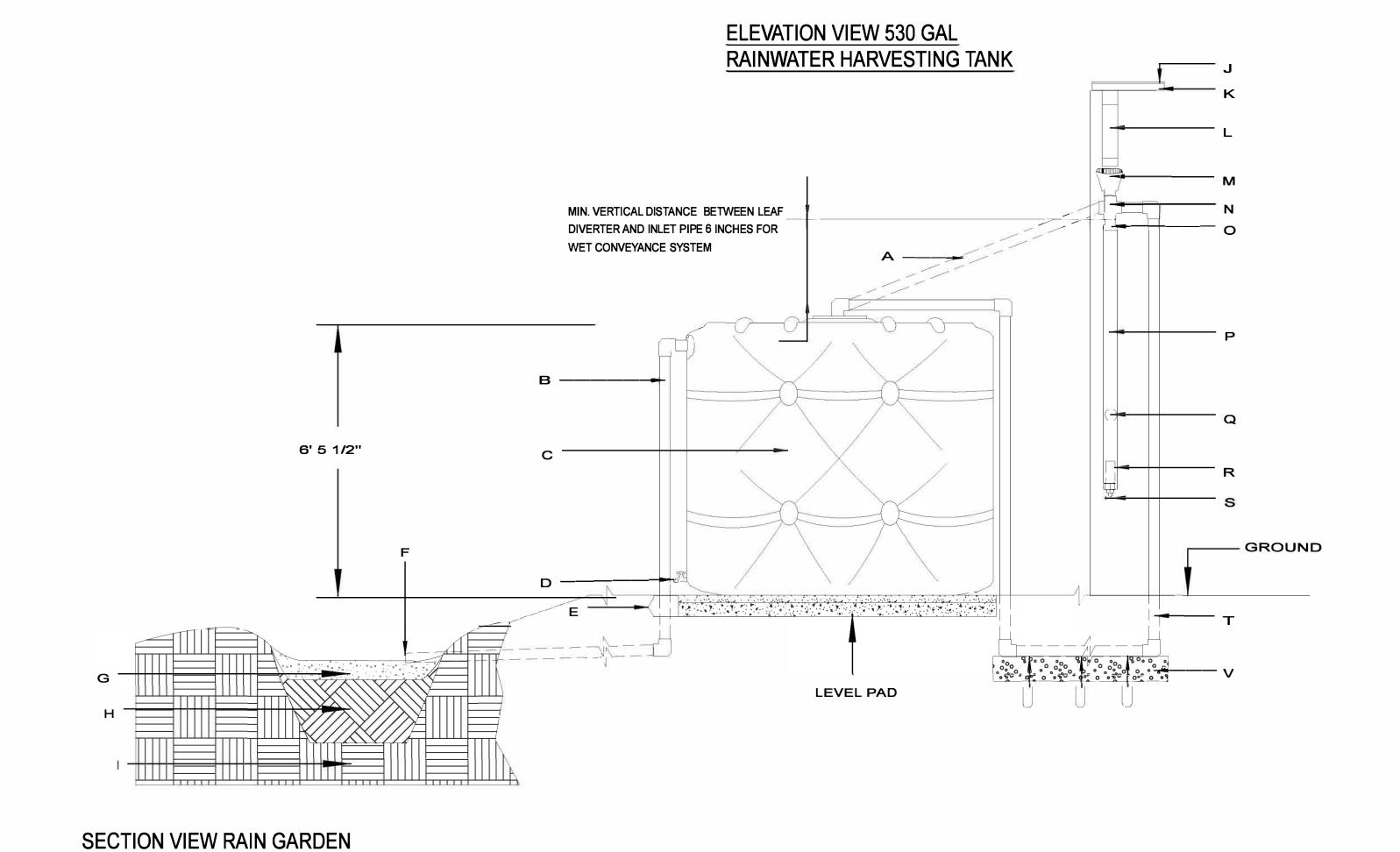
SHEET TITLE:

GREYWATER -BRANCHED DRAIN SYSTEM

DATE
PERMIT PLAN
MAY 18, 2018

GW-1.1





NOTES:

- 1. A RAINWATER CATCHMENT SYSTEM MAY NOT REQUIRE A BUILDING PERMIT PROVIDED ALL OF THE FOLLOWING ARE MET (CALIFORNIA PLUMBING CODE 1601.3 (I):
- WATER WILL BE USED FOR OUTDOOR NON-SPRAY IRRIGATION
- MAXIMUM STORAGE CAPACITY OF 5,000 GALLONS
- TANK IS SUPPORTED DIRECTLY UPON GRADE
 RATIO OF HEIGHT TO DIAMETER OR WIDTH DOES NOT EXCEED 2 TO 1
- DOES NOT REQUIRE ELECTRICAL POWER OR MAKEUP WATER SUPPLY CONNECTION (SEE NOTE 2 AND 3)
- ALL OTHER RAINWATER CATCHMENT SYSTEMS MUST BE SUBMITTED FOR BUILDING PERMIT.
- ALL OTHER RAINWATER CATCHMENT SYSTEMS MUST BE SUBMITTED FOR BUILDING PERMIT.

 2. PUMP AND PRESSURE TANK LIKELY REQUIRE INEXPENSIVE, OVER-THE-COUNTER, ELECTRICAL PERMIT.
- 3. IF CITY WATER PLUMBED TO TANK FOR MAKE UP USING FLOAT VALVE OR MANUALLY OPERATED VALVE, THEN A PERMIT IS REQUIRED AND AN AIR GAP IS REQUIRED
- BETWEEN RAINWATER HARVESTING SYSTEM AND DOMESTIC WATER SYSTEM.
- 4. TANKS CAN BE DAISY CHAINED AT POINT "D" USING FLEXIBLE PIPE ONLY TO REDUCE CHANCE OF LEAKAGE IN EARTHQUAKES.
- 5. THERE ARE NO REQUIRED SETBACKS FROM BUILDINGS OR SIDE/BACK PROPERTY LINES, THOUGH A CONVERSATION WITH YOUR NEIGHBOR COULD BE HELPFUL.

- A. PREFERRED DRY CONVEYANCE IF TANKS ARE NEXT TO DOWNSPOUT
- B. OVERFLOW: 3 IN. DRAINAGE PIPE: SLOPED 2 PERCENT FOR HORIZONTAL SECTIONS
- C. 530 GALLON BUSHMAN SLIMLINE RAIN HARVESTING TANK OR EQUIVALENT
- D. HOSE BIB OR OPTIONAL CONNECTION TO PUMP AND PRESSURE TANK (SEE NOTE 2)
- E. 4 INCHES COMPACTED BASEROCK WITH 2 INCHES OF PEA GRAVEL ON TOP
- F. OVERFLOW TO RAINGARDEN (SHOWN)/SWALE/SPLASHBLOCK
- G. 5 INCHES OF DECORATIVE GRAVEL WITH 2 INCHES OF PONDED WATER ABOVE
- H. 12 INCHES AMENDED SOIL: 1/2 COMPOST, 1/2 NATIVE SOIL
- I. UNDISTURBED NATIVE SOIL
- J. FIRE SAFER LEAF GUARD
- K. GUTTER
- L. NORMAL DOWNSPOUT

- M. OPTIONAL BUSHMAN LEAF DIVERTER (WITH 20X20 SCREEN IF USING WET CONVEYANCE) (REDUNDANT WITH LEAF GUARD ON GUTTERS)
- N. 3 IN. PVC DRAINAGE TEE
- O. 4 IN. TO 3 IN. PVC DRAINAGE REDUCER
- P. 4 IN. DRAINAGE PIPE FOR THE FIRST FLUSH (THIS REMOVES THE FIRST, DIRTY WATER FROM A RAINSTORM)
- Q. BUSHMAN FLOAT BALL
- R. BUSHMAN FIRST FLUSH FILTERS (TO KEEP EMITTER FROM CLOGGING)
- S. BUSHMAN DRIP EMITTER TO DRAIN DIRTY WATER BETWEEN STORMS
- T. "WET" CONVEYENACE 3 IN. DRAINAGE PIPE (WATER STAYS IN PIPE BETWEEN STORMS)
- U. THREE SEPARATE 3/32 INCH HOLES TO DRAIN WATER FOR MOSQUITO CONTROL
- V. CLEAN GRAVEL TO IMPROVE DRAINAGE FROM DRILLED HOLES



HESE PLANS, I AGREE TO DEFEND, INDEMNIF HARMLESS THE SONOMA-MARIN SAVING WATER ITY OF SANTA ROSA, MARIN MUNICIPAL WATER ITY OF SANTA ROSA, MARIN MUNICIPAL WATER IDSTRICT, CITY OF SON OF PETALUMA, CITY OF COTATI, CITY OF SON THE MOON WATER DISTRICT, AND TOWN OF AND THEIR DOING WATER DISTRICT, AND TOWN OF AND THEIR DIRECTORS, OFFICERS, AGENTS, SAND LANDSCAPE DESION CONSULTANTS WAY AND ALL LOSS, LIABILITY, EXPENSE, CLAIM DAMAGES, INCLUDING ATTORNEY'S FEES, ARESULTING FROM THE USE OF THIS LANDSC DERSTAND THAT IT IS MY RESPONSIBILITY AS WINER TO DESIONE CONSULTANTS MAKE NO ENTER SAVING WATER PARTINERSHIP, ITS MEMICAPE DESIGN CONSULTANTS MAKE NO TATIONS AND GRANT NO WARRANTES, EXPR. JETHER IN FACTOR BY OPERATION OF LAW OTHER WATER HIP, ITS MEMBERS AND DESIGN ONTS SAVING THE PROPERTY OF AUXILITY. ABILITY OR FINESS FORA PARTICULAR USES, RAY WARRANTY AS TO THE VALUITY OF ALLITY, ABILITY OF THIRDS FORA PARTICULAR USES RAY WARRANTY AS TO THE VALUITY OF ALLITY, ABILITY OF THIRDS FORA PARTICULAR USE OR ANY WARRANTY AS TO THE VALUITY OF ALLITY, ABILITY OF THIRD PARTIES.

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SHEET TITLE:

RAINWATER

HARVESTING

MAY 18, 2018