Fire Wise Construction

Presented By Robby Schwarz

Thinking ZERO to 360°

BUILDTank inc.

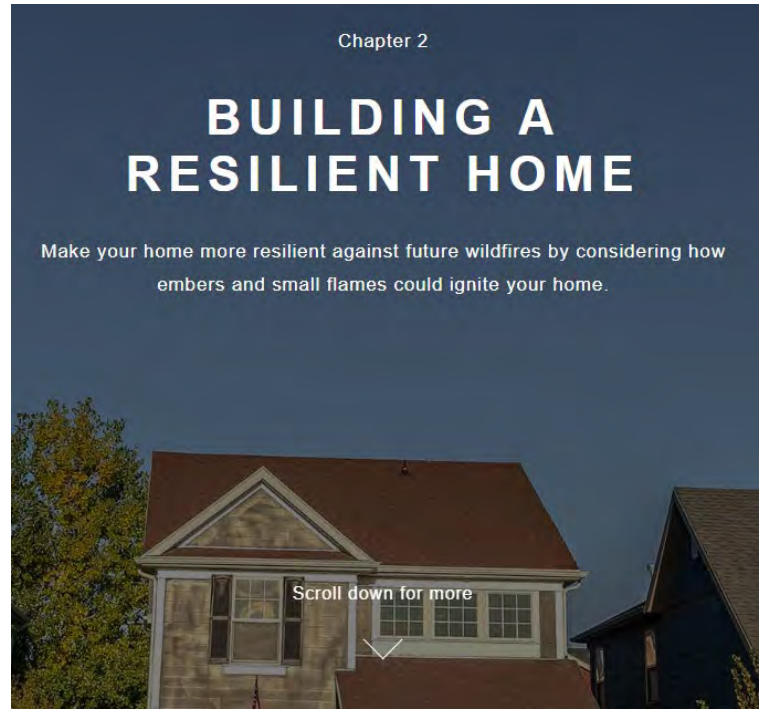
Marshall Fire

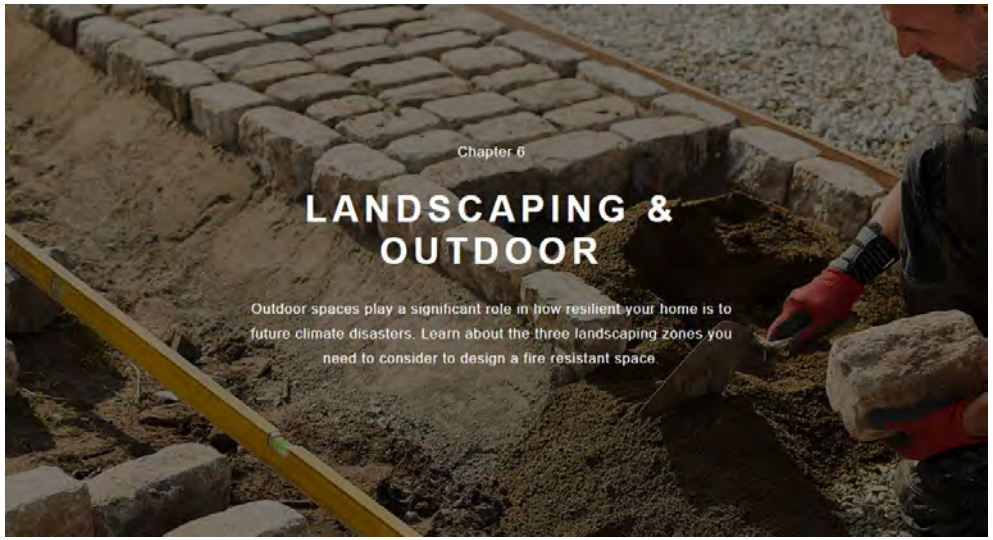
- Wind, Embers, and Smoke

Fire Wise Homes

- https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Preparing-homes-for-wildfire

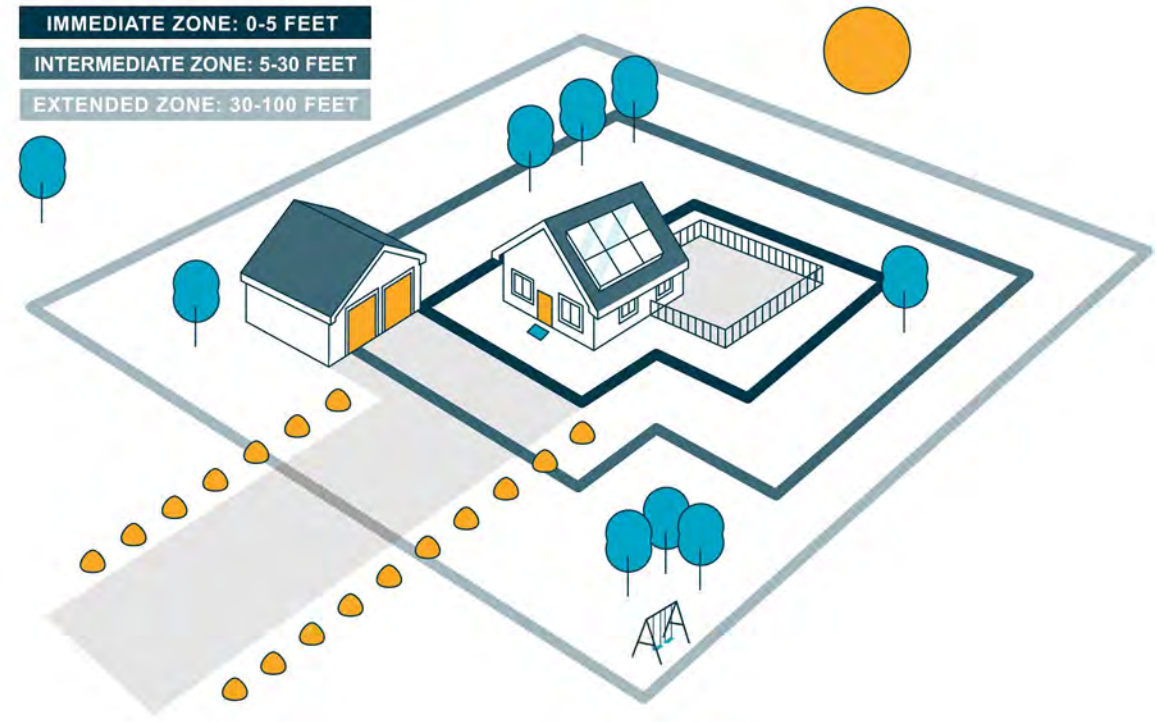
- www.Rebuildingbetter.org
  - Chapter 2 Resilient Homes
  - Chapter 6 Landscaping





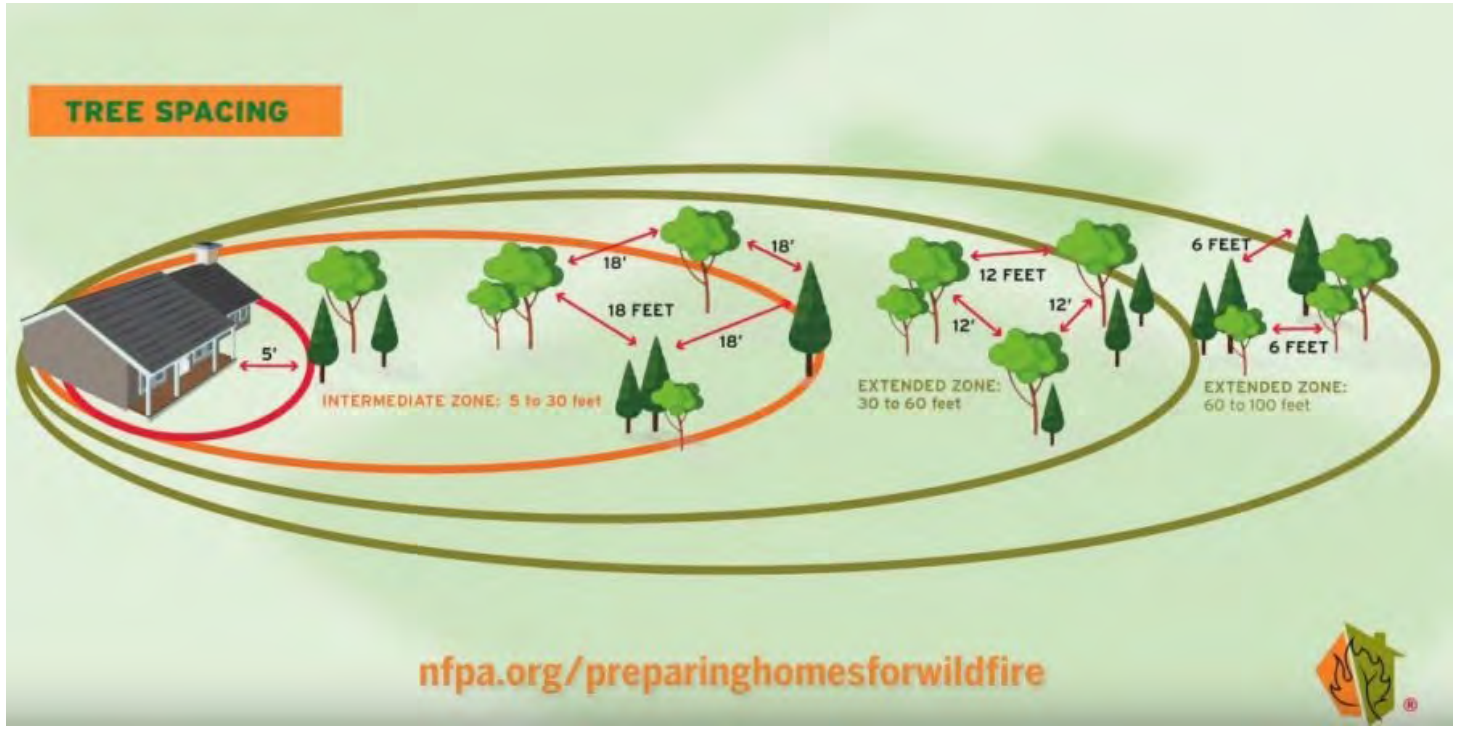
Fire Wise Landscape

- Immediate Zone 0-5’ from house
  - Noncombustible zone
  - i.e.. Gravel no planting
- Intermediate Zone 5-30’ from house
  - Create landscape with less fuel
  - i.e. paver patio, plant choices
- Extended Zone 30-100’ from house
  - Landscape to interrupt fire’s path
  - Space trees father apart the closer to the house



Landscape Maintenance

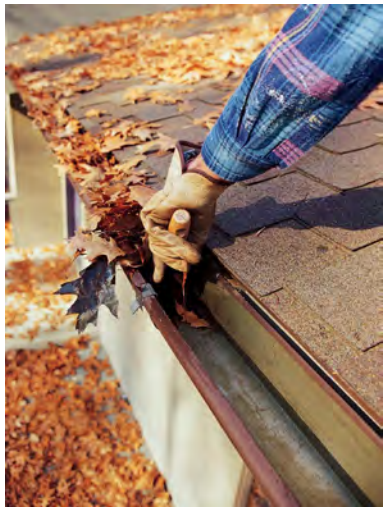
- Lawn Clippings
- Leaves, gutters and gutter guards
- Trees
- Shrubs



https://www.thisoldhouse.com/landscaping/21015539/firesafe-landscaping-defensible-space

Fire Wise House Form

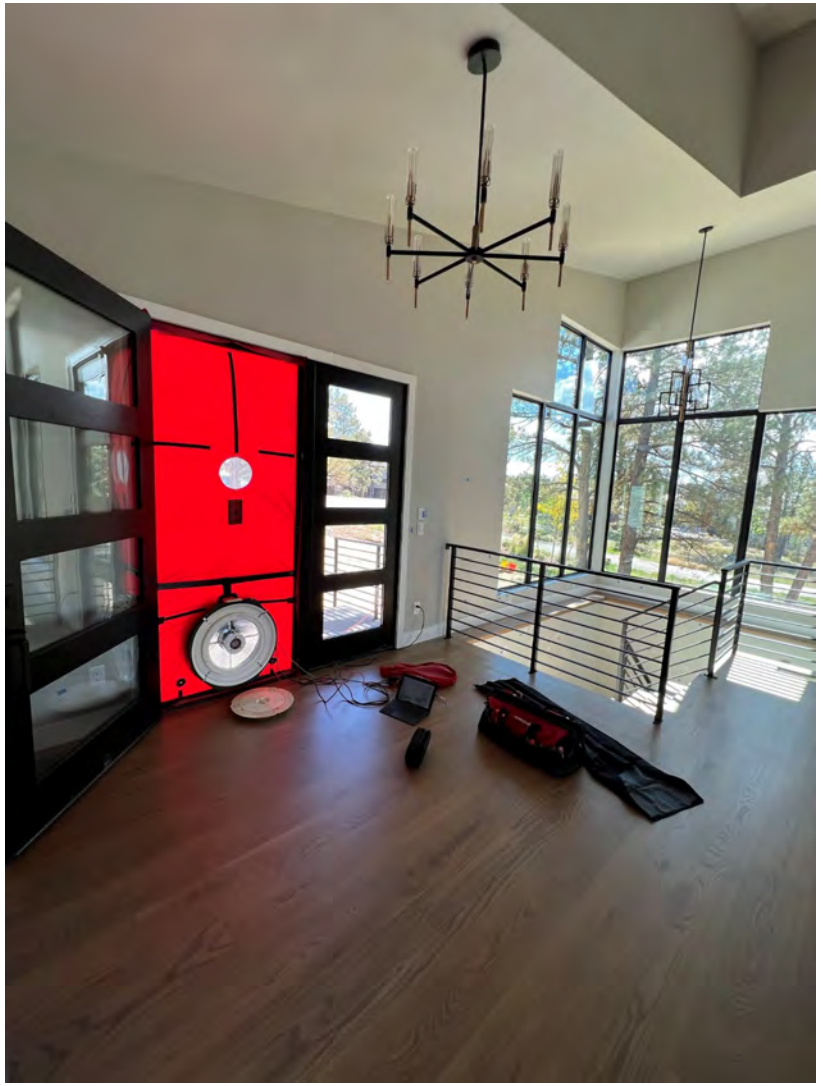
- House form
- Maintenance
- Roof Pitch
- e.g., grass clippings, pine needles, leaf litter and small twigs



Energy and Resiliency

Airtight Homes

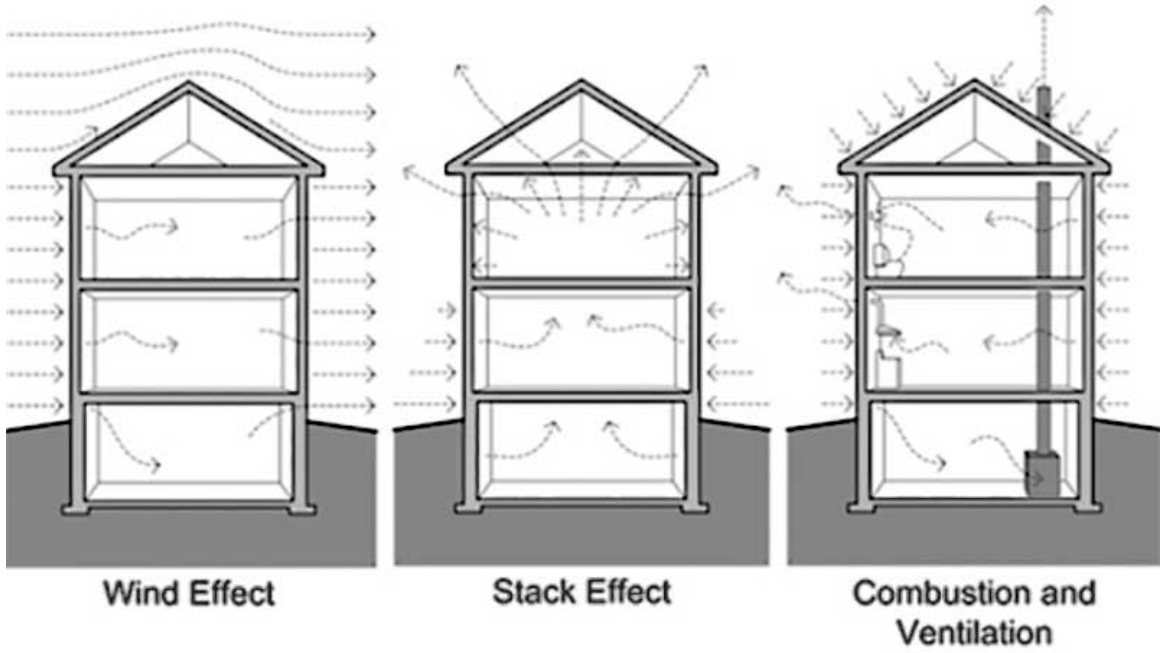
- Wind, Embers, and Smoke
- Energy
  - Conduction
  - Convection
- Moisture
  - Diffusion
  - Air flow
- Building Science
  - Control and predictability



Build Tight / Ventilation Right

Control and predictability

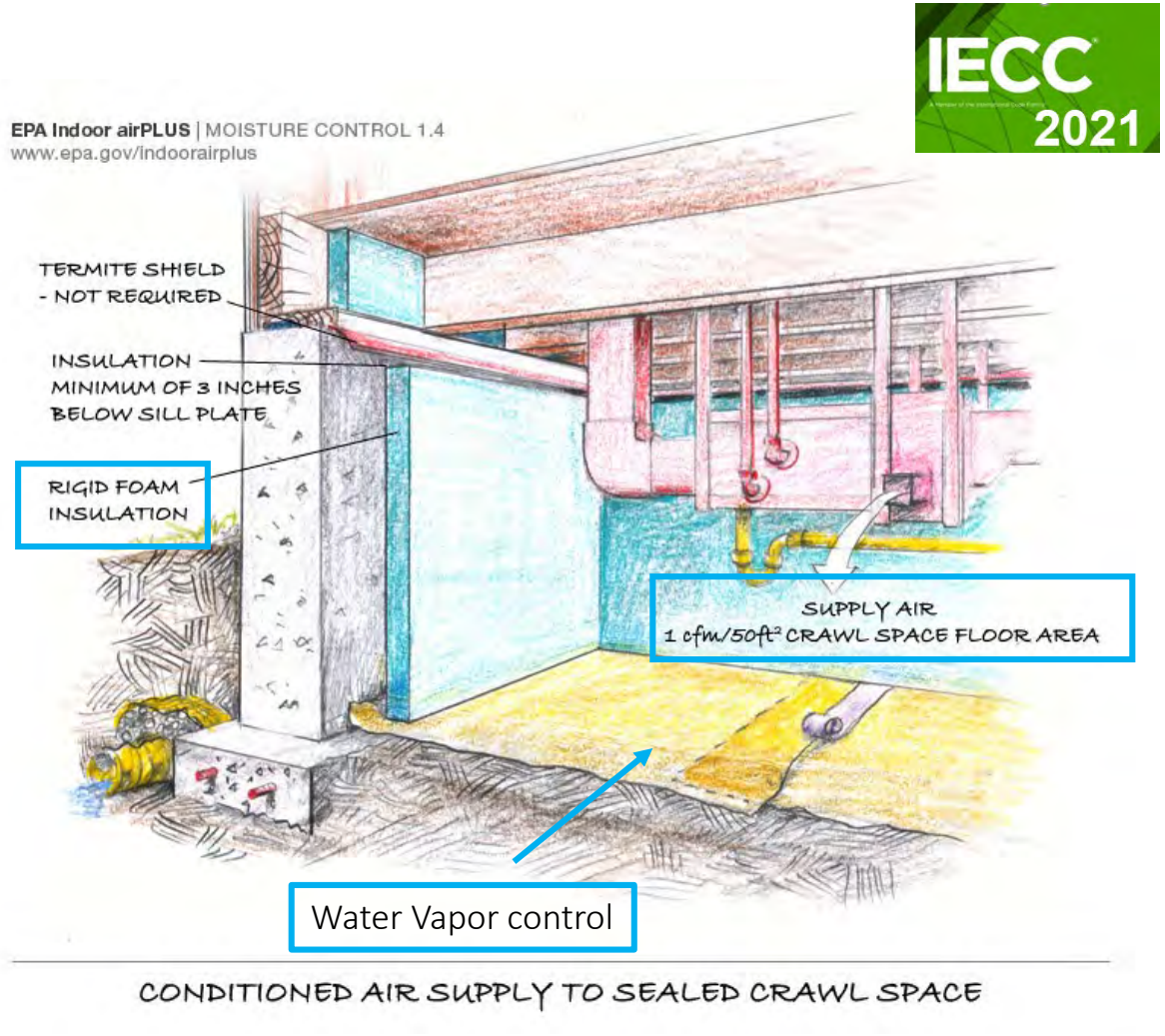
- Conditioned crawl Space
- Conditioned attic
- Unvented roof assembly
- Whole House controlled mechanical ventilation
  - Ventilation for house and occupant
  - Control
- Spot ventilation



https://www.constructioncanada.net/balancing-building-science-and-roof-design/fig-4_wind-stack-mechanical/

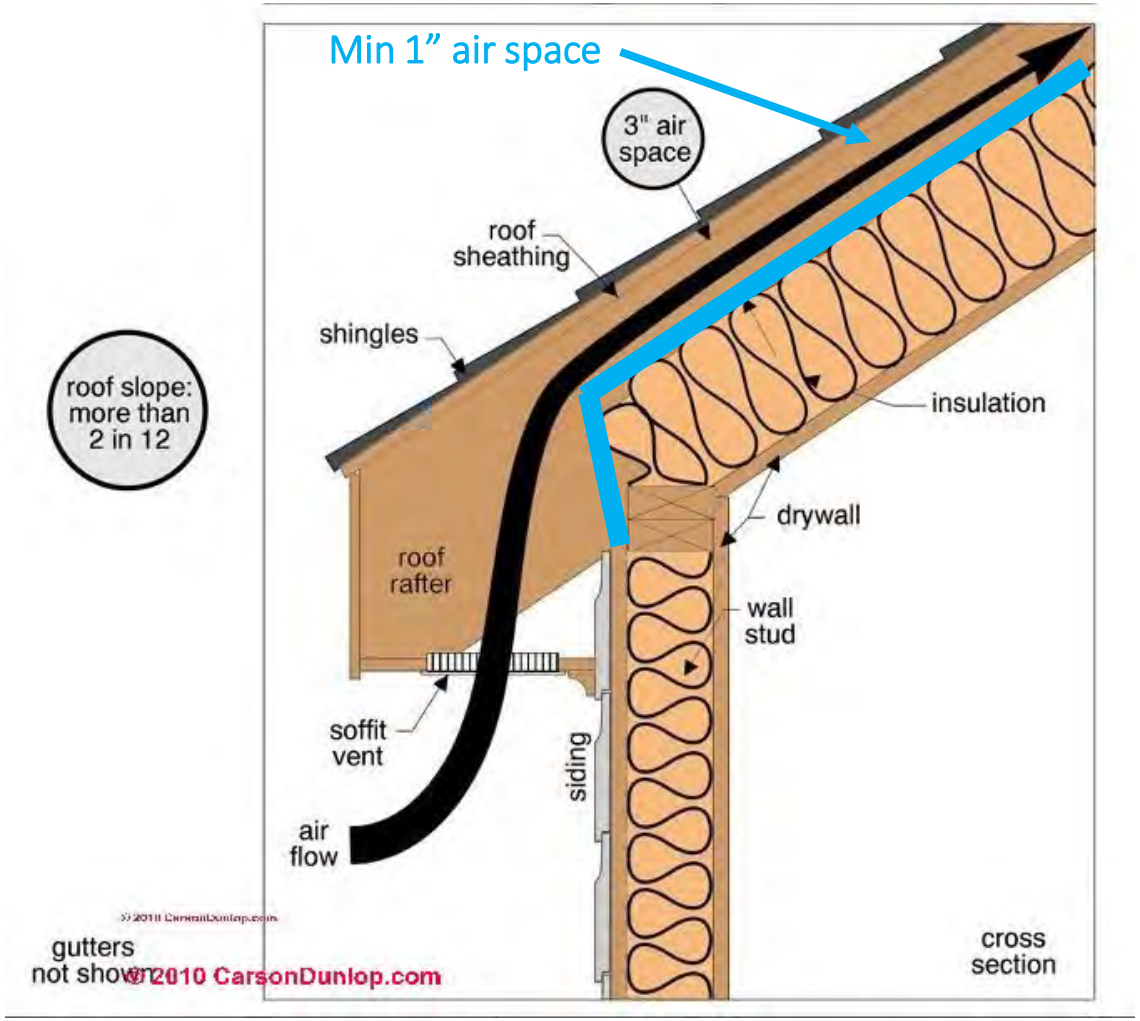
R402.2.10 Unvented Conditioned Crawl Space

- A Building Science solution
  - Moisture controlled at source
    - Vapor barrier overlapped and sealed to itself
  - Thermal envelope redefined
    - Insulation now at foundation wall
  - Air control (stack effect)
    - Unvented space
  - Heated space
  - Think of it as a small basement

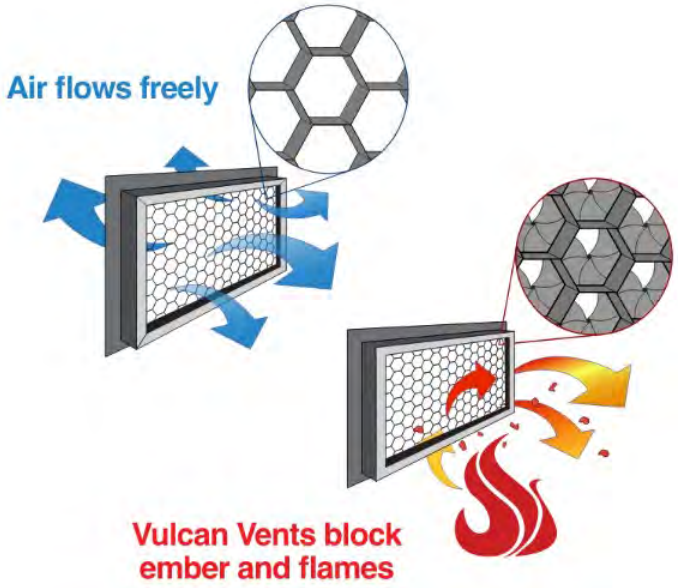


EPA Indoor Air Plus Diagram

Vaulted/Raftered Ceilings

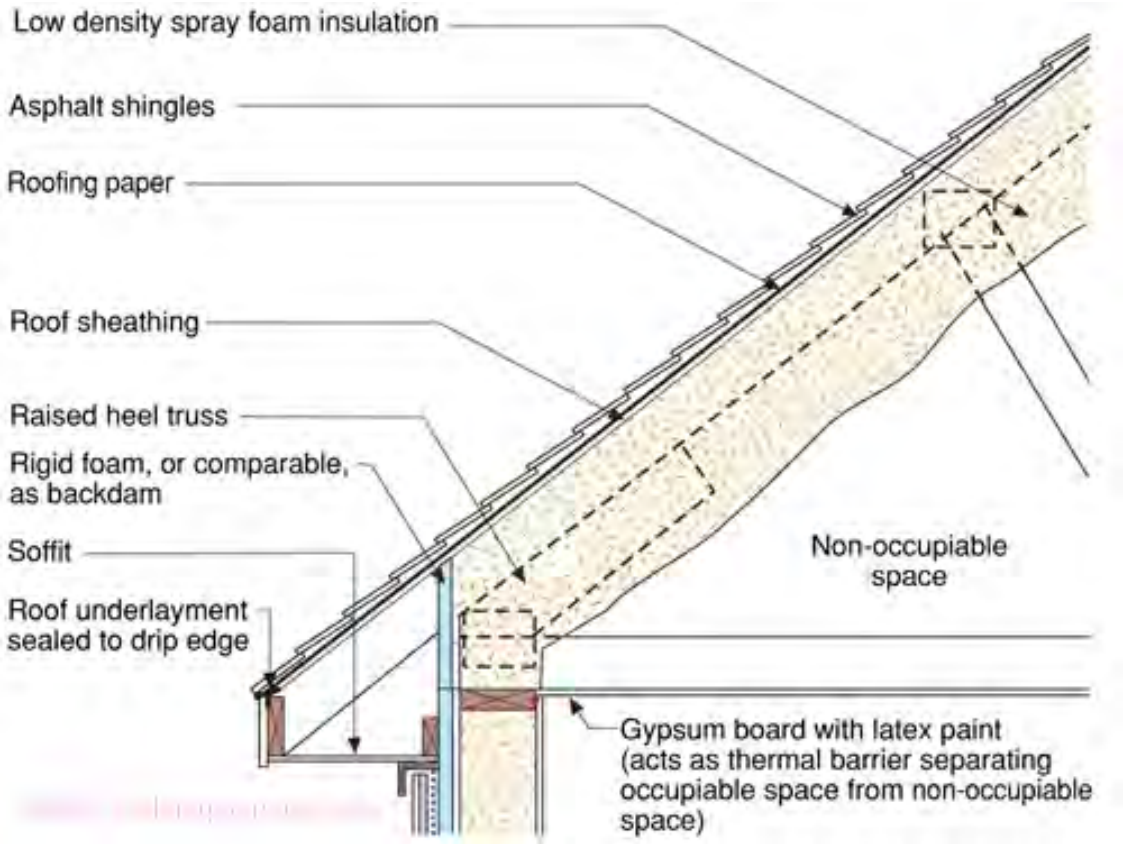


- Continuous baffled air space
- Sealed and separated from the insulation



https://www.vulcanvents.com/

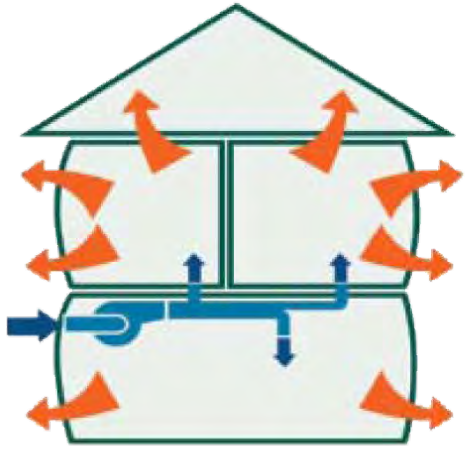
Cathedralized Attic



Bring mechanical equipment and ductwork into conditioned space any way you can!

Whole House Ventilation

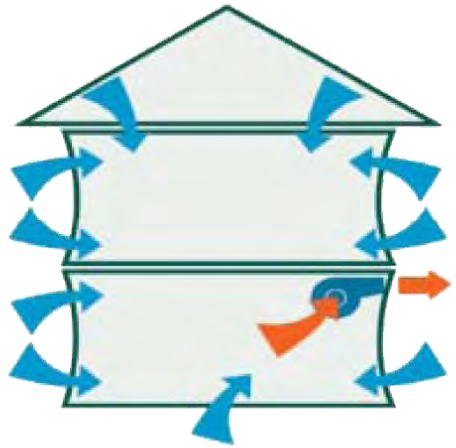
Supply Ventilation



Positive air pressure

- Pushes hot and/or humid air into walls and insulation; condensation can lead to mold, mildew and rot
- Heat loss

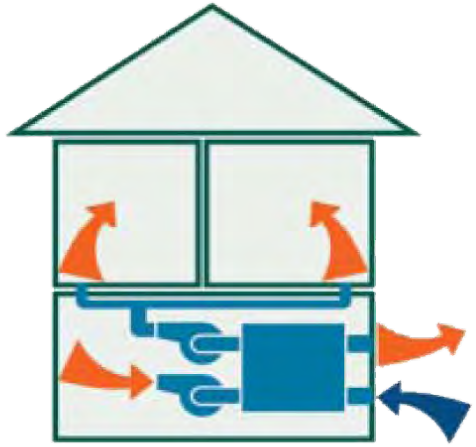
Exhaust Ventilation



Negative air pressure

- Infiltration of unconditioned air increases risks of mold and higher energy costs
- Potential backdraft from combustion appliances

Balanced Ventilation

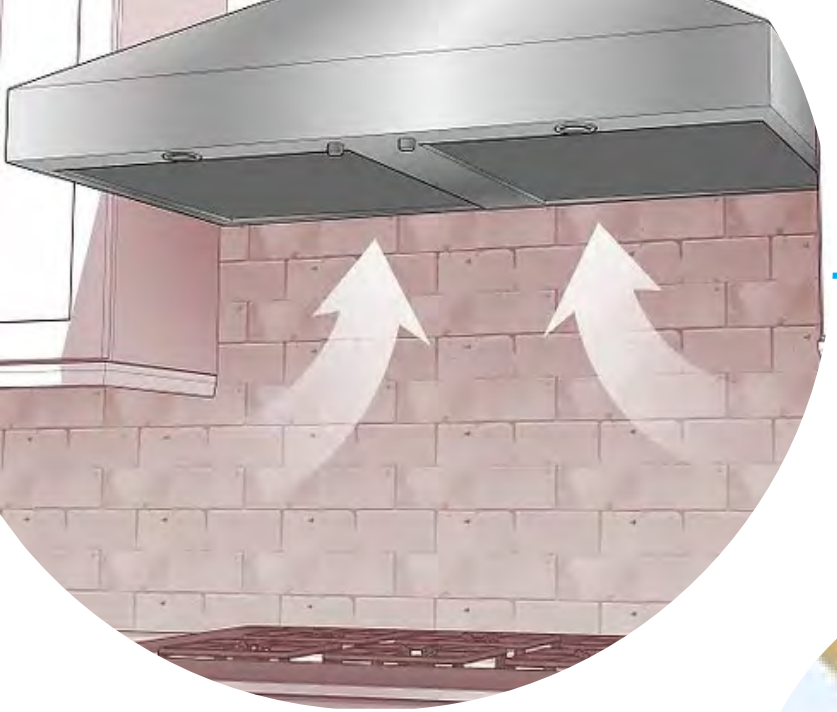


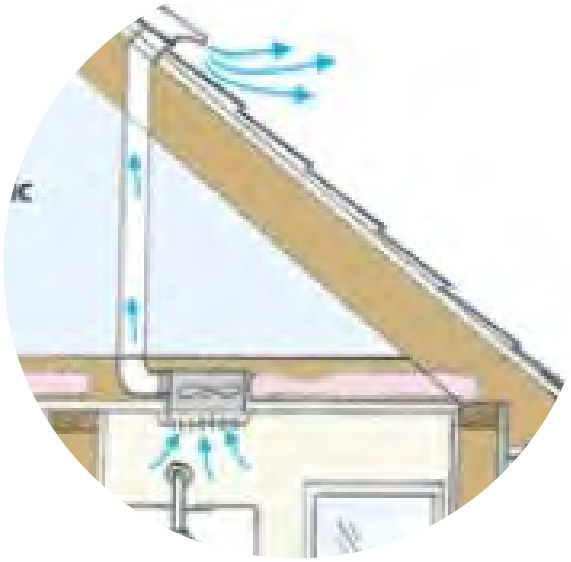
Equal air pressure

- Supply airflow (CFM) is equal to stale air exhaust
- Balancing is required on all units unless specified otherwise

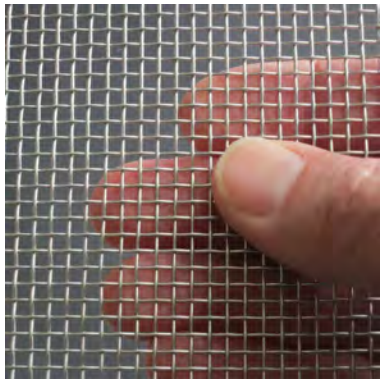
https://www.cleanpng.com/png-furnace-air-filter-ventilation-heat-exchanger-indo-5876223/preview.html

Spot or Local Ventilation





- Kitchens
- Bathrooms
- Laundries
- 1/8” metal screen
- Flap dampers



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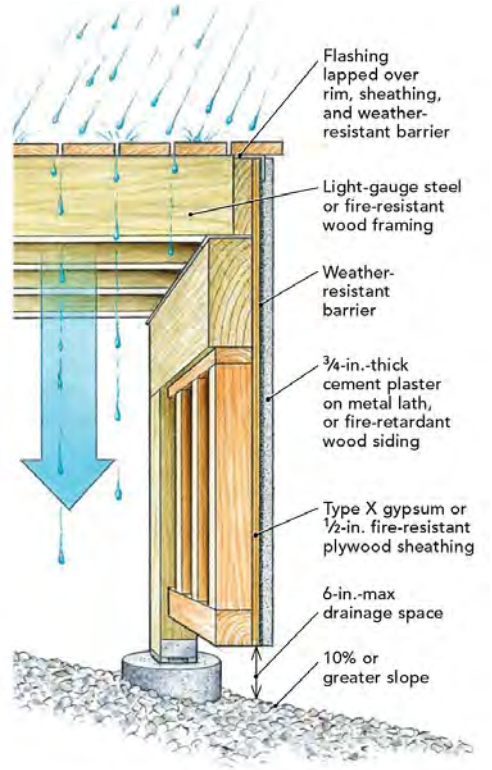
Fencing

- Use a noncombustible fence section when it's attached to a building
- Keep debris away from the base of the fence
  - e.g., grass clippings, pine needles, leaf litter and small twigs
  - Avoid placement of combustible mulch near the fence
- "Privacy fencing is the most vulnerable
- The more air flow through the fence the better
  - Reduce ability for wind-blown embers to accumulate at plank, or lattice panel to horizontal support locations.
- Fence built from lattice that's applied to both sides of the support posts may be desired for privacy but should be avoided in wildfire-prone areas.
- Vinyl fencing is not vulnerable to ember exposures but does burn or deform when subjected to flaming or radiant heat

Decking

- Consider Fire Rated treated decking material
  - California Building Code requirements
- Enclose under decks so embers do not fly under and collect
- Maintenance
  - Clear of debris at base of the deck and under the deck.
  - (e.g., pine needles, leaf litter and small twigs)
- Avoid placement of combustible
  - Mulch
  - Propane



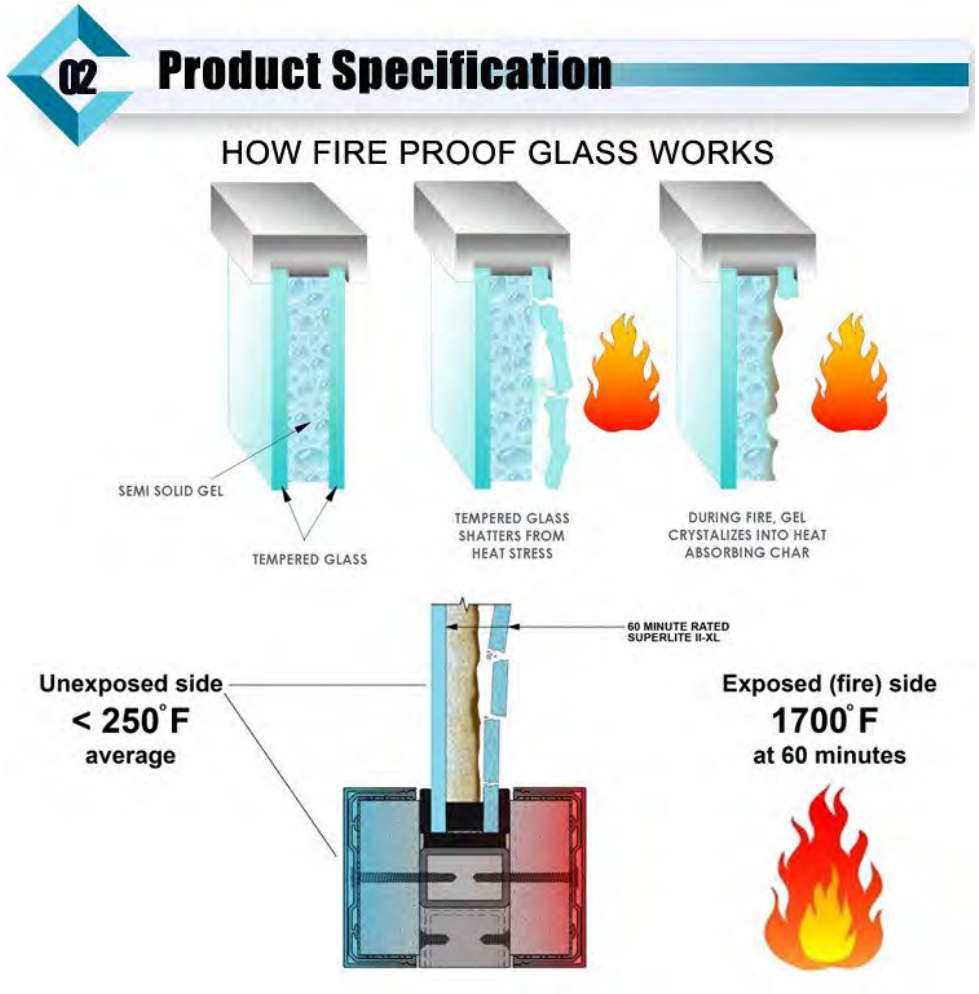
https://www.finehomebuilding.com/project-guides/decks/decks-that-stand-up-to-wildfire

Construction Materials

- Class A Fire-rated roofing
  - Asphalt Composite Shingle
  - Metal
  - Tile
- Siding / Cladding
  - Cementous
  - Brick
  - Stone
- Insulation choices
  - Fiberglass
  - Cellulose
  - Rock Wool

Windows and Doors from a Fire and Energy Perspective

- Reality if the fire is close enough windows are a weak link (radiant heat flow)
  - Windows and glass doors can blow out due to heat
- Limit window openings for fire and energy
  - Inoperable windows vs. operable
  - Double or triple pane windows
  - Tempered glass on the outside surface/resistant to heat
  - Aluminum clad
- Avoid skylights
- Metal insulated doors



https://buildingcci.com/articles/glass-glazings-and-fire-ratings/

Conclusion

- Embers are burning pieces of airborne wood and/or vegetation that can be carried more than a mile by the wind
- Boulder County is in a high wind corridor
- Embers leading cause of ignition
- Build tight
- Choose fire wise materials and building techniques
- Maintenance

https://stock.adobe.com/search?k=conclusion

Thank you!

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Thinking ZERO to 360°

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Northern Water

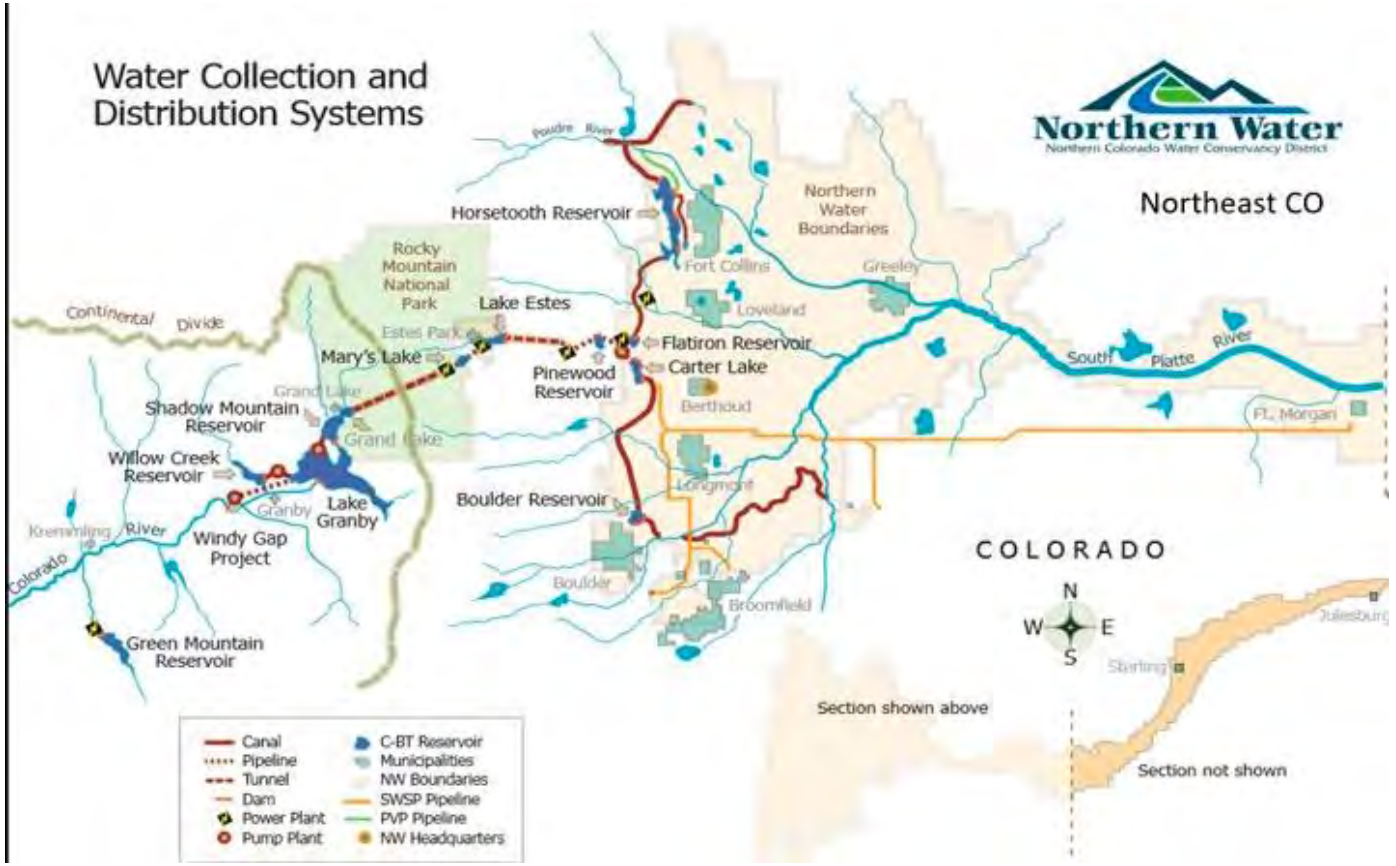
Disaster Education and Outreach Series: Wildfire mitigation – Home Hardening - Sustainable Landscape Templates

Frank Kinder, Water Efficiency and Sustainability Manager

Lindsay Nerad, Water Efficiency Specialist (and Landscape Designer)

Who is Northern Water?

- **Northern Colorado Water Conservancy District**
- **Established in 1930's**
- **Serves 8 Counties**
- **Supplemental Water**
- **US Bureau of Reclamation**
- **Colorado Big Thompson Project**
- **Largest diverter of CO River**



What does Northern Water do?

Collect water in western slope

Moves it to eastern slope

Make Electricity

Serves over 1 million people

1.5 million acres

614,000 acres of irrigated farmland

Support Municipalities

Ag, Commercial and Industrial Users

Sustain the environment

Why is Northern Water assisting?

Colorado River Water

Powell and Mead are in trouble

Sustainability Drought Climate Change

Integrate water efficiency into land use

Agriculture

Recreation

Do more with less

Colorado Water Plan

New Water Ethic

Less turf in our future

New design paradigm

Images courtesy waterwiseyards.org

Project Origins – Emergency Management - Debbie Cave

Timeline:

Fire

After the fire

SMWSP

UBCC -> NW

NW -> SMW

NW consider for 2023

Development

AFTER THE FIRE

RECOVER. REBUILD. REIMAGINE.

Mission: We support communities as they **recover** from fire, **rebuild** their lives, and **reimagine** a more resilient future through prevention, innovation, and facilitation of community-designed recovery.

www.afterthefireUSA.org

Sustainable Landscape Templates

Project Goals –

1. Support the Marshall Fire community recovery from the fire devastation
2. Increase the number of fire, water, and climate-wise, sustainable landscapes in Co
3. Plans and specifications that will minimize landscape construction costs
4. Plans that are attractive, useful, and compelling turf alternatives
5. Plans that offer ecosystem services; habitat, efficiency, conservation
6. Be viable to recovery from disaster, new builds, HOAs managing transitions
7. Incorporate options for green infrastructure; rain gardens, etc.
8. Ensure long-term landscape healthy and viability via a maintenance manual
9. Deploy and hopefully see high adoption rates
10. Help define a new western landscape reflecting our sense of place

Sustainable Landscape Plans

Project Plan

1. Draft SOW, evaluate with Advisory Council, Industry Partners, let RFP
2. Select contract team
3. Conduct charette and outreach meetings with stakeholders
4. Create draft plans and associated documents
5. Incorporate options for green infrastructure, rainwater harvesting, climate resiliency
6. Perform community outreach, incorporate stakeholder input
7. Revise and refine, publish final plans
8. Deploy and hopefully see high adoption rates
9. Measure implementation, revise as needed

Inspiration: Sonoma-Marin Template Overview

Oct 2017 Fire - 5,334 homes destroyed – 3,000 in Santa Rosa
LA firm did design, PM, two community input sessions, 8 templates in 4 styles.
3,000 homes rebuilt – 44% used the templates – 1,320 homes (as of June 2022)
City set up a fast-track process for submitting/processing approval of designs.

Water Smart Landscape Design Templates

The Partnership has developed 8 free, scalable, water-efficient, front-yard landscape design templates. These are permit ready with your site specific modifications and user selectable options. However, there are some criteria that must be met in order for the plans to be applicable to your site:

- The total front yard irrigated landscape area must be less than or equal to 2,500 square feet (SF), excluding hardscaping such as driveways, walkways and other non-irrigated areas. For sites with more than 2,500 SF of irrigated area, contact the permitting agency for guidance

SMWSP Additions since plans publication

A manual for maintenance was necessary to ensure aesthetics and savings

Published Dec' 21

https://www.savingwaterpartnership.org/programs_list/landscape-design-templates/

SNWSP Template Awards

IA SWAT

AWARD for Public Engagement

October 2022 at IA Show

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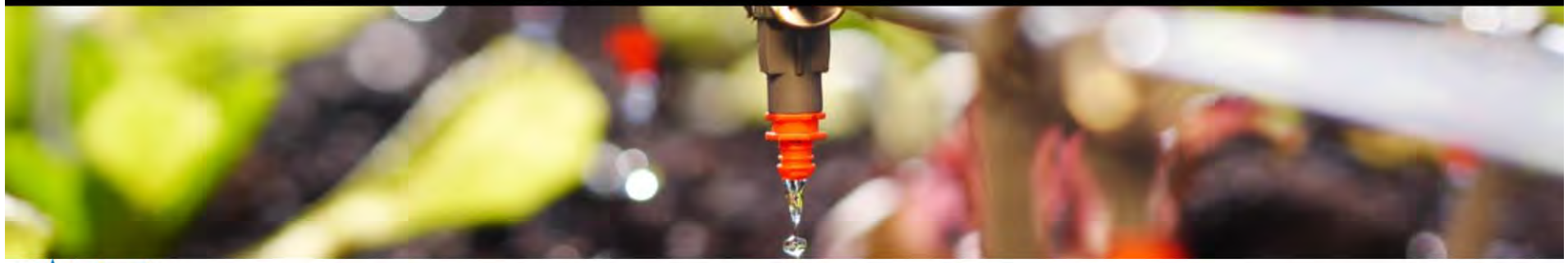
ABOUT MEMBERSHIP EDUCATION CERTIFICATION WORKFORCE DEVELOPMENT ADVOCACY CONFERENCES NEWS RESOURCES



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Editorial Contact | Communications Department | 703.536.7080

Sonoma-Marin Saving Water Partnership named recipient of SWAT Outstanding Public Engagement Award

The Water Smart Landscape Design Template project provided residents with water-efficient, sustainable landscape plans to rebuild following devastating wildfires.

Plan component we will include:

Concept Plan

Plan component we will include:

Architectural Renderings

Architectural Rendering: Eco-Edible - B (without trees f or easier iewing of design)

*House image provided by APM HOMES INC.

Plan component we will include:

Residential

Landscape

Cover
Permit Sheet

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 ("MWELO"). COMPLIANCE WITH MANDATORY ELEMENTS OF MWELO 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 AREA.
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.
B. CONVENTIONAL TURF IS NOT PROVIDED DUE TO HIGH WATER USE.
C. 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.
8. 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

YES	NO	NA	
			PLANTING
☐	☐	☐	1. ALL PLANTS INSTALLED ARE LISTED ON PLANS OR ON APPROVED PLANT SUBSTITUTION LIST
☐	☐	☐	2. 75% OR MORE OF THE PLANTS ARE LOW WATER USE PER WUCOLS REGION 1
☐	☐	☐	3. NO STANDARD HIGH WATER USE TURF HAS BEEN INSTALLED
			SOIL
☐	☐	☐	1. 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
☐	☐	☐	1. NO SPRAY IRRIGATION IS USED
☐	☐	☐	2. STATIC AND DYNAMIC WATER PRESSURE NOTED AT THE POINT OF CONNECTION
☐	☐	☐	3. WEATHER BASED SELF ADJUSTING CONTROLLER WITH NON-VOLATILE MEMORY IS INSTALLED PER MANUFACTURERS SPECIFICATIONS
☐	☐	☐	4. RAINSENSOR AND WEATHER SENSOR (IF REQUIRED FOR WEATHER DATA) INSTALLED PER MANUFACTURERS SPECIFICATION AND IS FUNCTIONING
☐	☐	☐	5. CONTROLLER IS ACURATELY PROGRAMMED
☐	☐	☐	6. CONTROLLER CHART IS PLACED IN CONTROLLER HOUSING OR ADJACENT TO CONTROLLER
☐	☐	☐	7. CONTROLLER CHART CLEARLY INDICATES STATIONS & VALVE ZONES
☐	☐	☐	8. CONTROLLER CHART CLEARLY INDICATES JULY IRRIGATION SCHEDULE FOR EACH ZONE AND INCLUDES PROGRAMS, DAYS PER WEEK, START TIME, AND RUN TIMES
☐	☐	☐	9. 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
☐	☐	☐	1. CHANGES ARE NOTED ON AS-BUILT PLAN AND IS PROVIDED AT TIME OF INSPECTION

SYMBOLS & DEFINITIONS

1. 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.
5. 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.
6. 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)
9. TURF ALTERNATIVE: A LOW WATER USE GRASS OR GROUNDCOVER PLANTING THAT SPREADS TO FORM A LOW COVER THAT CAN BE OCCASIONALLY WALKED UPON.
10. WEATHER SENSOR: SENSOR CONNECTED TO THE IRRIGATION CONTROLLER WHICH DETECTS RAIN, FREEZE, WIND ETC. AND SUSPENDS OR ADJUSTS IRRIGATION OPERATION.

REFERENCE

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

MWELO SECTIONS:

490.1 (c) & D 9 (g): 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

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 APPENDIX D OF MWELO.

STEP 1: PROJECT INFORMATION

TO BE FILLED OUT BY APPLICANT

DATE:

PROJECT APPLICANT (NAME):

PROJECT ADDRESS:

TOTAL PROJECT LANDSCAPE AREA (≤ 2500): _____(SF)

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

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

PROJECT TYPE: NEW RESIDENTIAL

WATER SUPPLY TYPE: _____
(POTABLE/RECYCLED/WELL)

LOCAL WATER PURVEYOR: _____

STEP 2: SIGN PRE-CONSTRUCTION AGREEMENT

TO BY SIGNED BY APPLICANT

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

APPLICANT NAME (PLEASE PRINT)

APPLICANT SIGNATURE DATE

STEP 3: PROVIDE PERMIT AGENCY REQUIRED PLANS

PLANS TO BE PROVIDED BY APPLICANT	OPTIONAL PLANS
L-0.0 PERMIT COVER SHEET	GW-1.0
L-1.0 LANDSCAPE DESIGN PLAN	GW-1.1
L-2.0 IRRIGATION DESIGN PLAN	RW-1.0
L-2.1 IRRIGATION DETAIL SHEET	
L-3.0 PAVING DETAILS	
L-3.1 L.I.D. DETAILS	
L-3.2 PLANTING DETAILS	

STEP 4: SIGN DISCLAIMER

TO BE SIGNED BY APPLICANT

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.

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 NAME (PLEASE PRINT)

APPLICANT SIGNATURE DATE

AGENCY STAMP

ABLA

Daily acts

ForeSite

Equinox

SHERWOOD DESIGN ENGINEERS

P D G

RESIDENTIAL LANDSCAPE DESIGN TEMPLATE
SONOMA-MARIN SAVING WATER PARTNERSHIP
www.savingwaterpartnership.org

NAME:

SITE ADDRESS:

SHEET TITLE:
RESIDENTIAL LANDSCAPE PERMIT COVER SHEET

DATE
PERMIT PLAN
SEPTEMBER 26, 2018

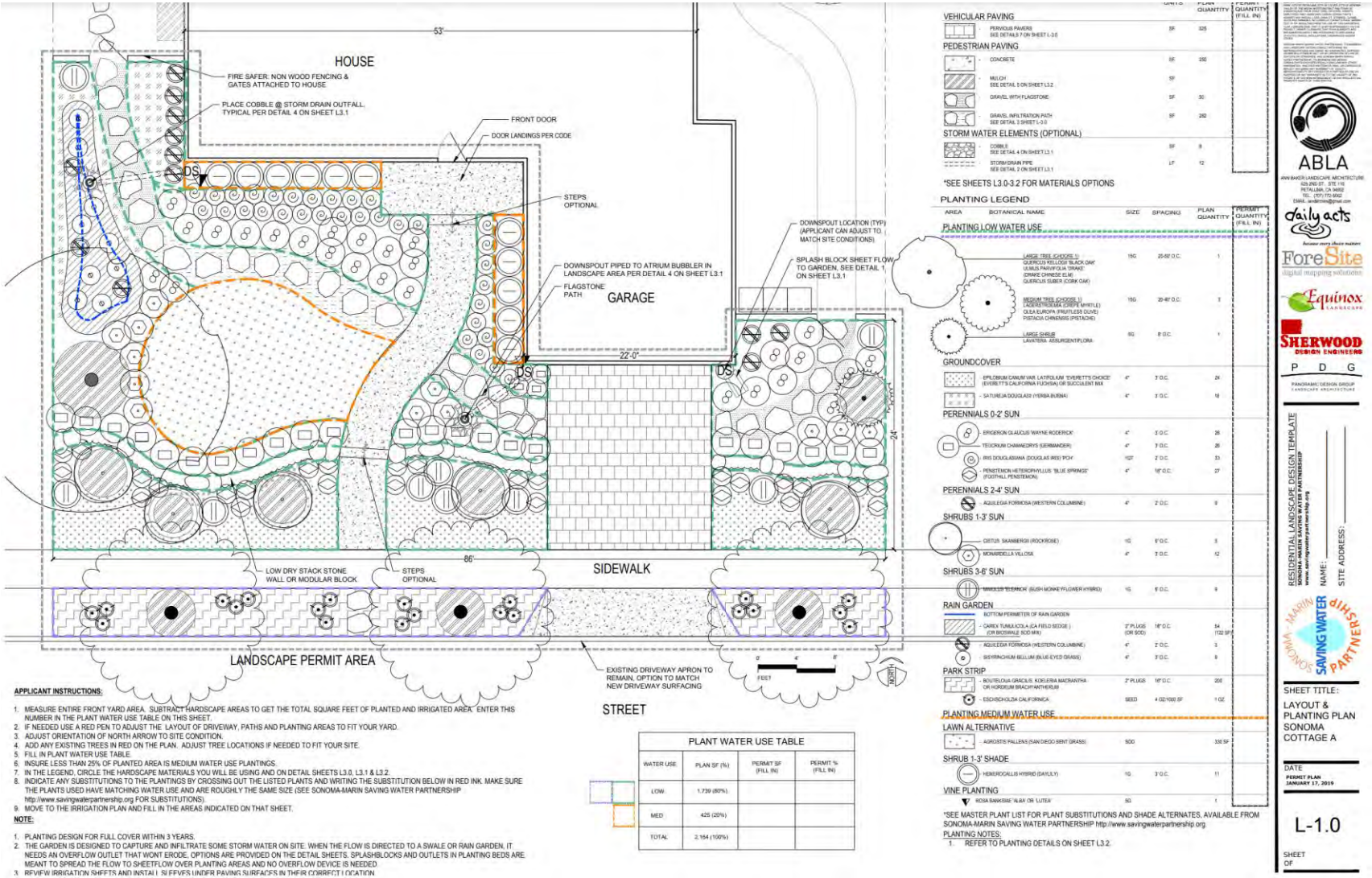
L-0.0

SHEET
OF

Plan component we will include:

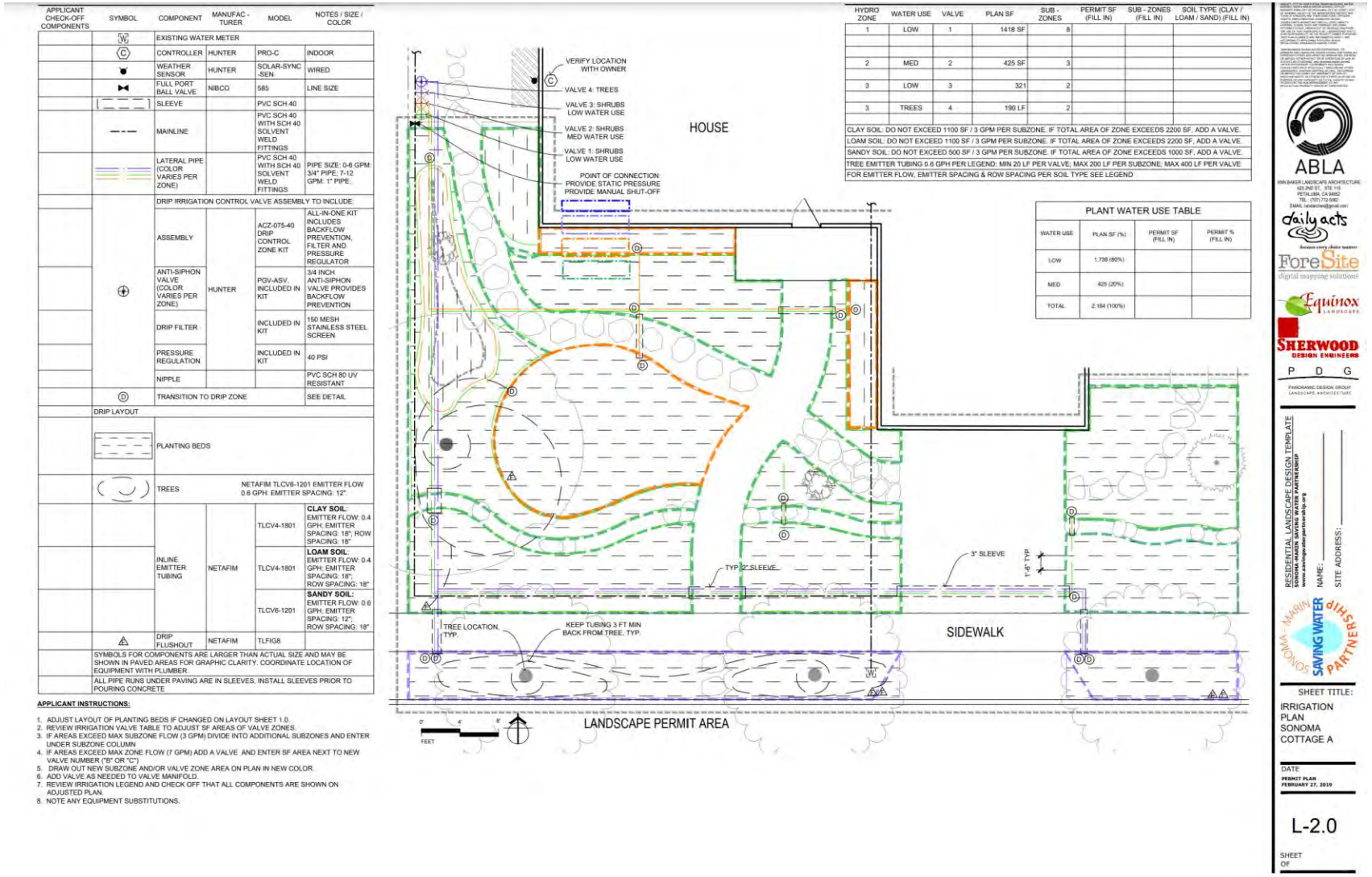
Layout and Planting Plan -

Landscape Plan



Plan component we will include:

Irrigation Plan – Details and Notes



APPLICANT CHECK-OFF COMPONENTS	SYMBOL	COMPONENT	MANUFAC-TURER	MODEL	NOTES / SIZE / COLOR
	W	EXISTING WATER METER			
	C	CONTROLLER	HUNTER	PRO-C	INDOOR
		WEATHER SENSOR	HUNTER	SOLAR-SYNC -SEN	WIRED
		FULL PORT BALL VALVE	NIBCO	585	LINE SIZE
		SLEEVE		PVC SCH 40	
		MAINLINE		PVC SCH 40 WITH SCH 40 SOLVENT WELD FITTINGS	
		LATERAL PIPE (COLOR VARIES PER ZONE)		PVC SCH 40 WITH SCH 40 SOLVENT WELD FITTINGS	PIPE SIZE: 0-6 GPM: 3/4" PIPE; 7-12 GPM: 1" PIPE;
		DRIP IRRIGATION CONTROL VALVE ASSEMBLY TO INCLUDE:			
		ASSEMBLY	HUNTER	ACZ-075-40 DRIP CONTROL ZONE KIT	ALL-IN-ONE KIT INCLUDES BACKFLOW PREVENTION, FILTER AND PRESSURE REGULATOR
		ANTI-SIPHON VALVE (COLOR VARIES PER ZONE)		PGV-ASV, INCLUDED IN KIT	3/4 INCH ANTI-SIPHON VALVE PROVIDES BACKFLOW PREVENTION
		DRIP FILTER		INCLUDED IN KIT	150 MESH STAINLESS STEEL SCREEN
		PRESSURE REGULATION		INCLUDED IN KIT	40 PSI
		NIPPLE			PVC SCH 80 UV RESISTANT
	D	TRANSITION TO DRIP ZONE			SEE DETAIL
	DRIP LAYOUT				
		PLANTING BEDS			
		TREES			NETAFIM TLCV6-1201 EMITTER FLOW 0.6 GPH; EMITTER SPACING: 12"
		INLINE EMITTER TUBING	NETAFIM	TLCV4-1801	**CLAY SOIL:** EMITTER FLOW: 0.4 GPH; EMITTER SPACING: 18"; ROW SPACING: 18"
				TLCV4-1801	**LOAM SOIL:** EMITTER FLOW: 0.4 GPH; EMITTER SPACING: 18"; ROW SPACING: 18"
				TLCV6-1201	**SANDY SOIL:** EMITTER FLOW: 0.6 GPH; EMITTER SPACING: 12"; ROW SPACING: 18"
		DRIP FLUSHOUT	NETAFIM	TLFIG8	
	SYMBOLS FOR COMPONENTS ARE LARGER THAN ACTUAL SIZE AND MAY BE SHOWN IN PAVED AREAS FOR GRAPHIC CLARITY. COORDINATE LOCATION OF EQUIPMENT WITH PLUMBER.				
	ALL PIPE RUNS UNDER PAVING ARE IN SLEEVES, INSTALL SLEEVES PRIOR TO POURING CONCRETE				

APPLICANT INSTRUCTIONS:

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

HYDRO ZONE	WATER USE	VALVE	PLAN SF	SUB-ZONES	PERMIT SF (FILL IN)	SUB-ZONES (FILL IN)	SOIL TYPE (CLAY / LOAM / SAND) (FILL IN)
1	LOW	1	1418 SF	8			
2	MED	2	425 SF	3			
3	LOW	3	321	2			
3	TREES	4	190 LF	2			

CLAY SOIL: DO NOT EXCEED 1100 SF / 3 GPM PER SUBZONE. IF TOTAL AREA OF ZONE EXCEEDS 2200 SF, ADD A VALVE.
LOAM SOIL: DO NOT EXCEED 1100 SF / 3 GPM PER SUBZONE. IF TOTAL AREA OF ZONE EXCEEDS 2200 SF, ADD A VALVE.
SANDY SOIL: DO NOT EXCEED 500 SF / 3 GPM PER SUBZONE. IF TOTAL AREA OF ZONE EXCEEDS 1000 SF, ADD A VALVE.
TREE EMITTER TUBING 0.6 GPH PER LEGEND: MIN 20 LF PER VALVE; MAX 200 LF PER SUBZONE; MAX 400 LF PER VALVE
FOR EMITTER FLOW, EMITTER SPACING & ROW SPACING PER SOIL TYPE SEE LEGEND

PLANT WATER USE TABLE			
WATER USE	PLAN SF (%)	PERMIT SF (FILL IN)	PERMIT % (FILL IN)
LOW	1,739 (80%)		
MED	425 (20%)		
TOTAL	2,164 (100%)		

ABLA
daily acts
ForeSite digital mapping solutions
Equinox LANDSCAPE
SHERWOOD DESIGN ENGINEERS
P D G PANORAMIC DESIGN GROUP LANDSCAPE ARCHITECTURE

RESIDENTIAL LANDSCAPE DESIGN TEMPLATE
SONOMA-MARIN SAVING WATER PARTNERSHIP
NAME:
SITE ADDRESS:

SHEET TITLE:
IRRIGATION PLAN
SONOMA COTTAGE A

DATE
PERMIT PLAN
FEBRUARY 27, 2019

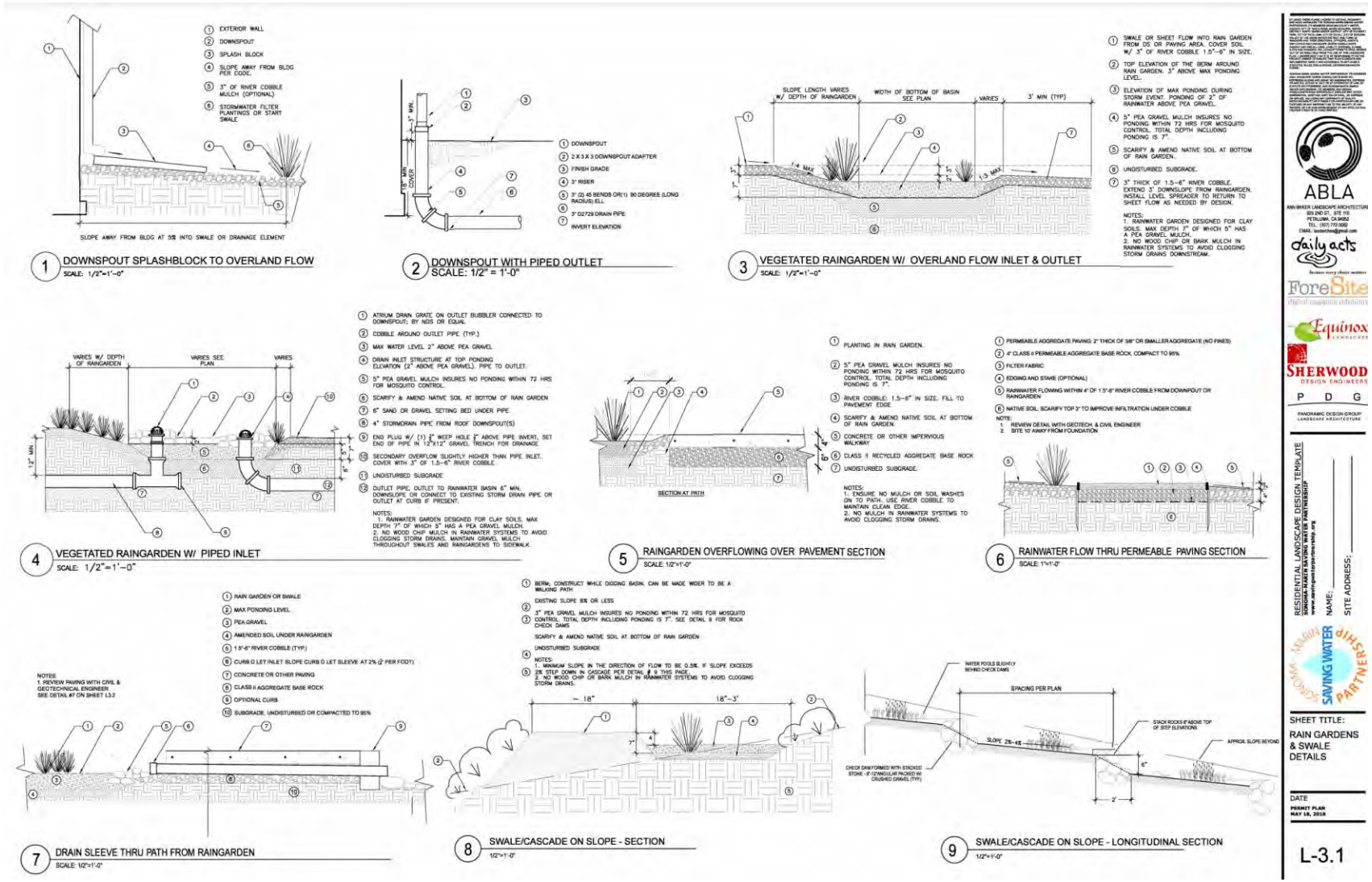
L-2.0

SHEET
OF

Plan component we will include:

Rain Gardens and Swale Details

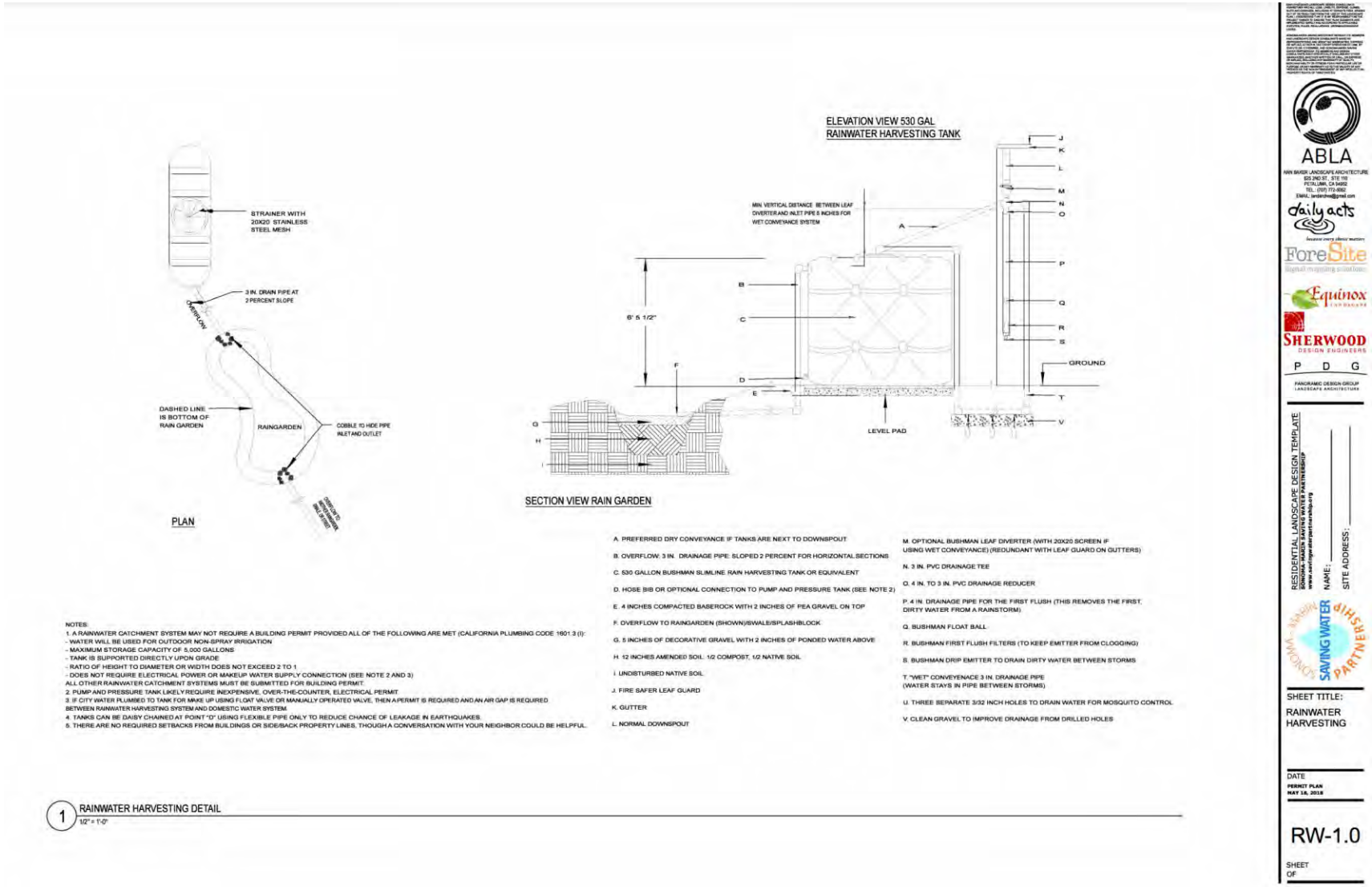
- Optional



Plan component we will include:

Rainwater harvesting/rain barrel details

- Optional



Plan component we will include:

Efficiency Metrics

How much water do they use?

How much will it cost to own them?

Compared to a turf dominant design

Water use and savings estimates compared to traditional turf-dominant formats

Water costs/billings estimates compared to traditional formats

Design Elements we may include:

Cost Opinions

Materials

Not Cost Estimates

Residential Landscape Design Templates
Cost Opinion - Cottage A

Material Costs (Excludes delivery and labor)

Item Descriptions	Quantity	Unit	Unit Price	Item Total
Irrigation: POC (Point Of Connection), Manual Shut off (Ball Valve)	1	LS	$ 40.00	$ 40.00
Hunter Pro C Controller & Solar Sync	1	LS	$ 231.24	$ 231.24
Antisiphon Valve Assembly	4	EA	$ 45.68	$ 182.72
Irrigation Valve Control Wire	100	LF	$ 0.39	$ 39.00
PVC Schedule 40 3/4" Diameter Pipe	440	LF	$ 0.30	$ 132.00
Netafim Techline	1650	LF	$ 0.40	$ 660.00
Misc materials: Glue, primer, teflon tape, etc.	1	EA	$ 100.00	$ 100.00
Arbor Mulch (3" depth)	1824	SF	$ 1.50	$ 2,736.00
Sheet Mulch Cardboard	1824	SF	$ 0.15	$ 273.60
Trees - 15 Gallon	4	EA	$ 60.00	$ 240.00
Shrubs/Vines - 5 Gallon	1	EA	$ 25.00	$ 25.00
Shrubs/Vines/Perennials/Groundcovers - 1 Gallon	112	EA	$ 8.00	$ 896.00
Perennials/Groundcovers/Grasses - Quart/4 Inch/RP	201	EA	$ 5.00	$ 1,005.00
Perennials/Grasses - Stubbie/2.5 Inch	0	EA	$ 4.00	$ -
Grasses - 2 Inch Plugs	120	EA	$ 1.50	$ 180.00
No Mow Sod	330	SF	$ 1.00	$ 330.00
Seed	0.25	QP	$ 10.00	$ 2.50
Total Material Costs				**$ 7,073.06**

Design Elements we may include:

Cost Opinions

Contractor

Not Cost Estimates

General Contractor (Typically included with a home build)

Item Descriptions	Quantity	Unit	Installed Unit Price	Item Total
Rough Grading	2302	SF	$ 0.41	$ 943.82
Soil Preparation (1" compost, 6" incorporate)	2302	SF	$ 1.30	$ 2,992.60
Driveway - Conventional concrete		SF	$ 22.00	$ -
Driveway (Optional Green Design Element)- Add Trench Drain to Driveway concrete		LF	$ 15.00	$ -
Driveway (Optional Green Design Element) - Add Row of Pavers to Driveway concrete		LF	$ 35.00	$ -
Driveway (Optional Green Design Element) - Add Gravel Strip(s) to Driveway concrete		LF	$ 6.70	$ -
Driveway (Alternative Paving Mehtod) - GravelPave		SF	$ 15.00	$ -
Driveway (Alternative Paving Method) - Stabilized Aggregate Paving	325	SF	$ 11.50	$ 3,737.50
Driveway (Alternative Paving Method) - Permeable Unit Pavers		SF	$ 35.00	$ -
Irrigation Sleeves	7	EA	$ 40.00	$ 280.00
Drainage Sleeves - Curb o Let	1	EA	$ 250.00	$ 250.00
Splashblock	1	EA	$ 25.00	$ 25.00

Design Elements we may include:

Cost Opinions

Optional items Contractor

Not Cost Estimates

Optional Elements

Item Descriptions	Quantity	Unit	Installed Unit Price	Item Total
Irrigation Additional Zone		EA	$ 1,130.00	$ -
Additional Lateral Pipe & Control Wires in Trenches		LF	$ 1.55	$ -
Garden Pathway - Conventional Concrete	146	SF	$ 17.00	$ 2,482.00
Garden Pathway - Detail 1 - Permeable Aggregate Paving		SF	$ 7.00	$ -
Garden Pathway - Detail 2 - Permeable Pavers		SF	$ 30.00	$ -
Garden Pathway - Detail 3 - Permeable Infiltration Paving		SF	$ 15.00	$ -
Garden Pathway - Detail 4 - Non Permeable Aggregate Paving	160	SF	$ 8.50	$ 1,360.00
Garden Pathway - Detail 5 - Stabilized Aggregate Paving		SF	$ 13.00	$ -
Rain Garden - Small (40-100 SF) inlet, outlet, gravel & cobble	1	LS	$ 400.00	$ 400.00
Rain Garden - Large (100-200 SF)	1	LS	$ 625.00	$ 625.00
Rain Swale/Cascade 18"-3' grading, gravel, cobble		LF	$ 34.68	$ -
Drainage Pipe w/Atrium Outlet	36	LF	$ 12.00	$ 432.00
Rainwater Tank - 500 gallon		LS	$ 1,400.00	$ -
Rainwater Tank - 2500 gallon		LS	$ 2,200.00	$ -
Add Pump and Pressure Tank for Rainwater Tank		LS	$ 1,500.00	$ -
Greywater - Laundry to Landscape - Contractor Installed		LS	$ 800.00	$ -
Greywater - Laundry to Landscape - DIY		LS	$ 250.00	$ -
Greywater - Branched Drain - Contractor Installed		LS	$ 3,000.00	$ -
Greywater - Branched Drain - DIY except plumbing		LS	$ 1,250.00	$ -

Design Elements we could include:

Is a printing packet helpful?

How many designs should we make:

Considerations:

Cul de sac

Corner lot

Middle block

Slope

Trees

Shade Structure

Fences

Permitting

Aspects we are considering for these layouts

- Budget/minimal
- Slopes- retaining walls/boulders
- Backyards
- One with no turf
- Privacy
- Pollinators
- One without rain garden

Fire Safety and Wildland Urban Interface Requirements

- Fire Safe Sonoma Website
- Fire Safe Sonoma: Living With Fire In Sonoma County Guidebook
- City of Santa Rosa Wildland Urban Interface information
- County of Sonoma Wildland Urban Interface information
- UC Master Gardener Program of Sonoma County Firewise Landscaping

What this could look like:

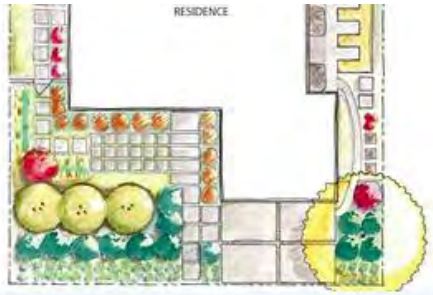
Considerations:

- **Timing**
- **Cost**
- **Complexity**
- **Capacity**
- **Northern Water**
- **Industry**
- **Stakeholders**
- **Public meetings**

Native Adaptive A
1,086 SF

Native Adaptive B (Corner Lot)
2,462 SF

Sonoma Contemporary A
1,266 SF



Sonoma Contemporary B
2,152 SF

Sonoma Cottage A
2,164 SF

Sonoma Cottage B (Cul-de-sac Lot)
2,302 SF

Eco-Edible A

Eco-Edible B

Thank you

- **Cautions but optimistic**
- **Frank Kinder**
- **970-622-2353**
- **fkinder@northernwater.org**

Eco Edible Concept Plan