TREATMENT RECOMMENDATIONS

VEGETATION FUELS MANAGEMENT STRATEGIES
Strategy: Select fire resistant plants
Actions:
- Remove any and all pyrophytic shrubs within the indicated Defensible Space Zone.
- Select listed fire resistant species, or consult the VMP specialist for other fire resistant landscaping plant recommendations.
- When replanting, select species with low surface to volume ratios (i.e., southern magnolia, tulip tree, rhododendron, Myoporum or English laurel vs trees like acacia, eucalyptus, pine, fir and juniper).
- Select broadleaf vs. needle-leaf species.
- Select clean looking species with stout branches and twigs (non-twiggy).
- Select species listed as pest and disease resistant.
- Select deciduous trees and shrubs with supple, moist foliage.
- Select species without volatile oils in their leaves (use the smell test). Sap is water-like and does not have a strong oil odor.

Strategy: Reduce fuel volumes.
Actions:
- Remove all deadwood from trees and shrubs.
- Thin oaks to reduce production of ground litter and debris.
- Remove shrubs beneath and around existing and emerging trees.
- Use low-growing, non-pyrophytic (fire resistant) shrubs and ground cover as replacement plants.
- Remove/reduce all lofty or loosely compacted litter accumulations, especially large debris such as branches and replace with compact, small particle mulch to prevent invasion of noxious weeds and elevate the live fuel moisture of retained plants.
- Vines, which tend to accumulate dead material, should be removed from trees and the home.

Strategy: Reduce fuel flammability.
Actions:
- Irrigate plants, appropriate to species, to maintain high live fuel moisture content.
- Use fire resistant mulch to increase ground and live fuel moisture.
- Remove dead material and leaf litter from all shrubs.
- Cut all grasses when 50% cured (dried), or no later than June 1.
- Replace annual grasses with plants that do not cure (dry out).
- Remove deadwood in trees and shrubs.
- Remove all dead and downed material each year by June 1, leaving compact leaf litter or mulch to a depth of not more than 2".
- Remove shrubs that have a dead sub-canopy inside the surficial green canopy.
- Remove sick, dying, and dead shrubs and trees.

Strategy: Establish/maintain fuel discontinuity.
Actions:
- Remove/reduce "ladder" fuels (grass, to brush, to trees, low to high branches, lose flammable bark).
- Remove any and all poplar, acacia, eucalyptus, Douglas fir and Monterey pine reproduction.
- Create shrub/grass mosaics from continuous masses by installing hardscape where possible.
- Remove shrubs from beneath and around existing and emerging trees.
- Thin thickets of small trees and tree reproduction from large tree understories.
- Create low fuel zones near structural vulnerabilities such as windows, decks, and large structural overhangs.

Strategy: Reduce the possibility of fire traveling through tree crowns.
Actions:
- Separate overlapping tree and large shrub canopies.
- Thin fire-prone tree canopies (acacia, eucalyptus, Douglas fir and Monterey pine) to open canopy structure. To maintain tree health, remove no more than 30% of foliage per-tree, per-year).
- Ensure that no shrubs or immature trees are allowed to grow beneath mature trees where they would create a fuel ladder.
- Remove all conifer reproduction on property. Retain existing conifers as recommended, with treatment (limb to recommended height and remove all deadwood).
- Prune out low hanging fire-available branches and twigs up to 3 inches in diameter to a minimum of 10 feet above ground under any portion of the canopy or to an elevation 10 feet above the highest ground elevation.
- Where it is not possible to separate crowns by at least 10 feet, prune low hanging fire-available branches and twigs up to 3 inches in diameter to a minimum of 10 feet above ground under any portion of the canopy or to an elevation 10 feet above the highest ground elevation if the height of the tree allows.
- Perform fuel volume reduction actions mentioned above.

FIRE APPARATUS CLEAR ZONE (FACZ)

Management Recommendations:
The FACZ is critical to safe access/egress during a wildfire event.
- All trees within 10' of roadways and driveways should be maintained so that no part of the tree's canopy extends laterally across the roadway or meets an opposing tree's canopy. This provides increased roadway clearance, and decreases the potential for flame impingement on the roadway.
- Tree canopy, where it extends over the roadway, should be raised to a minimum of 15 feet above the paved road surface to provide safe clearance for fire apparatus, and should not meet and opposing canopy.
- Vegetation within 10 feet of roadways should be restricted to fire resistant species (See attached list of fire resistant screen species). Plants should have low surface to volume ratio (Ex: pine is high, and magnolia is low) and should have low concentration of volatile oils, waxes, and fats (pine, fir & bay have high volatile oil content, redwood & oak have low volatile oil content, acacias have high volatility).
- All brush and brambles (blackberries) should be removed within 10 feet of roads to maintain the FACZ.
- Remaining roadside vegetation should be regularly deadwooded and irrigated where the plants are tolerant of summer water (even intolerant plants will tolerate infrequent deep irrigation).
- All dead and down material should be removed.
- Cured grasses and herbs should be cut to less than 4" from June 1 to November 1 or the onset of rain.

DRIVEWAY SIDE FUELS MANAGEMENT ZONE

- Trees adjacent to the driveway should be maintained to meet the same standards as the FACZ roadway, with 15' of vertical clearance from the driveway base, and 5' laterally.
- All down and dead debris should be removed.
- Cured grasses and herbs should be cut to less than 4" from June 1 to November 1 or onset of rains.
- Brush, shrubs, and undergrowth should be removed at least 10' from the sides of the driveway.

LANDSCAPING AND MAINTENANCE

Landscaping:
The final landscape plans, including a detailed species list, shall be provided to the fire prevention consultant for suitability evaluation. Should any additional landscaping be installed in connection with this project or at a later date, all plants installed shall be fire resistant plants either listed in Appendix A (Fire Resistant Plants), or in compliance with fire resistant plant characteristics and approved by the urban forester/fire ecologist. The urban forester/fire ecologist shall consult, review, and approve any future landscape plan and assure its compliance with State and local codes.

- All pyrophytic (fire-prone) shrubs should be removed inside the Defensible Space zone.
- In the defensible space zone, all shrubs will be maintained to a height of less than two feet where they might preheat aerial fuels or form ladder fuels to tree canopies. Shrubs shall be spaced so that no continuity exists between the ground fuels and tree crowns, to reduce the likelihood that a ground fire will extend into the tree canopy. Shrubs or shrub islands (no greater than 15 feet in diameter) shall be spaced a distance apart of two times the actual height of the shrub.
- Native grasses will be maintained, cut to a height of less than 4" from June 1 –October 31. Grasses may need to be cut more than once per season depending on ground moisture and annual growing conditions.
- A compact chipped wood mulch to a depth of 2 inches is recommended and may be applied throughout the landscape to provide water conservation, weed control, healthier and increased moisture content soil environment, increased plant health and higher live vegetation fuel moisture.
- Fire resistant woody plants shall be placed a distance apart at least equal to the mature height of the plants.
- If trees are planted they shall be planted such that when mature, their crowns will be separated by at least 10 feet.
- Only use fire resistant landscaping plants either listed in Appendix A (Fire Resistant Plants), or in compliance with fire resistant plant characteristics, or approved by the urban forester/fire ecologist.

Maintenance:
The vegetation fuels in the Defensible Space Zone, FACZ, and the Driveway Side Fuel Management Zone, shall be maintained as recommended in this report, on an annual basis, prior to June 1 of each year or prior to the beginning of the stated fire season as determined by the Marin County Department Fire Chief. The peak of leaf fall coincides with the peak of the fire season risk. Roofing, including rain gutters and valleys, should be maintained completely free of all leaf litter, needles, and dead vegetation during the fire season.

Irrigation systems should be inspected annually to ensure adequate moisture content is maintained in landscaping plants.

NARRATIVE

- The subject property is located within the "Very High" Fire Hazard Severity Zone. Paved access to the site is limited to one access point from Marinda Dr.
- The average slope on site is approximately 20 degrees.
- The Hazard Assessment Score was assessed at 11, requiring 30'x50'x50'x50' of defensible space around the home.
- Existing vegetation within the defensible space zone consists of predominantly native tree and shrub species and grasses. The predominant tree species on site are valley oak (*Quercus agrifolia*) and Italian stone pine (*Pinus pinea*).
- Landscape/ Irrigation plans have not yet been made available for review. If new plant material is proposed within the defensible space zone, it shall be fire resistant and irrigated. Refer to the Fire Safe Marin fire prone versus fire resistant plant lists website.

HAZARD ASSESSMENT MATRIX-WEST FACING SLOPE

Hazard Points	1	2	3	4	5	6	7	8	Points
Aspect	NE, E	NW, W	SE,	S	SW				3
Slope		0-10		11-20		21-30		31+	4
Fuel 0-30	Specimen Garden	Hardwood	Grass	Mostly Grass	Mostly Brush	Pyrophytic Hardwoods, Chaparral	Conifer	Conifer with Brush understor	3
Fuel 31-100	Grass, Mostly Grass	Mostly Brush		Pyrophytic Hardwoods, Chaparral	Conifer with Brush				1
								Total Hazard Points	11

	Hazard points		
	1 2 3 4 5 6 7	8 9 10 11 12 13 14	17 18 119 20 21 22 23 24 25 >
	30x30x30 ft.	30x30x50 ft.	50x50x100 ft.

Fuel Types:

Specimen Garden:	A well-maintained ornamental garden, usually irrigated. Trees and shrubs are well spaced or clustered, thinned and free of deadwood. The lawn is mowed and clean. No pyrophytic plants within 10 ft. of house.
Hardwood:	Broadleaf(non-pyrophytic)treessuchasoaks,maples,ash,etc.
Grass:	Wild field grass dominates; trees and shrubs occupy less than 1/3 of the
Mostly Grass:	Brush and tree reproduction occupy more than 1/3 and less than 2/3 of
Mostly Brush:	Brush and tree reproduction occupies 2/3 of the area. Includes young chaparral, coastal scrub and broom stands.
Pyrophytic Hardwoods:	Broadleaf trees that is high in volatile oils, which produce heavy debris
Chaparral:	Six foot and taller old, pyrophytic brush with excessive deadwood. Includes mixed chaparral of Manzanita, scrub oak, chaparral pea, tall ceanothus, chamise, etc. Often has some young Douglas fir or pines.
Conifer:	Needleleaf trees typically with heavy litter, low branches and plentiful deadwood. Often mixed with some hardwoods or even pyrophytic hardwoods, but conifers dominated and carry the fire.
Conifer with Brush Understory:	Pine and Douglas Fir with heavy brush and down & dead branches and suppressed trees in the understory.