



Fire Protection Plan/Fuel Management Plan

For TPM 21144/APN#105-800-63

ER log no 0

Hagerty Project

East Fallbrook/Hamilton Lane

Submitted By

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1.0 Executive Summary

The proposed project is tentative map (APN 105-800-63) that would divide a 2.63 acre lot into 4 parcels with one remaining. The project is located south of the intersection of McDonald Road and E. Fallbrook Street. The project encompasses flat land with non-native grass and urban developed. The majority of this site is urban developed. The surrounding property is urban developed with some Eucalyptus Trees to the South. Removal of the undesirable vegetation for this project in accordance with the landscape plan will be a marked improvement it will substantially reduce the fire hazard in the area. The nearest fire protection for this project is North County Fire Station No. 1 and is 3 minutes away. This project does not require a second access.

2.0 Introduction

This Fire Protection Plan/Fuel Management Plan (FMP) has been prepared for APN 105-800-63, a 4 lot split with a residential development. This plan has been developed to protect the residential structures from potential radiant heat from wildfire hazards to the maximum extent practical. This plan does not guarantee that the structure will not burn, but greatly reduces that possibility. These are not shelter in place residences. A variety of factors have been incorporated into the Fuel Modification Plan including wildfire history, prevailing wind patterns, existing vegetation /fuel loading, terrain, adjacent vegetation/land use.

This project is within the North County Fire Protection District.

The project consists of approximately 2.63 acres.

The APN# is 105-800-63

The number of lots will be 4 plus 1 remaining

The types of occupancies are single-family residences.

2.1 Topography

The project encompasses flat land. On site slopes are approximately <10%. The elevation ranges from 700 feet to 715 feet above sea level.

2.2 Fire Department Location and Response Time

Initial Fire Department response is from North County Fire Station # 1 located at 315 Ivy Street. This station is staffed by 3 firefighters. Apparatus include one type one engine and one-type three engines. The station is located 1.49 mile from the above property and is 3.2 minutes away by using the estimated timetable in NFPA 1142.

2.3 Wildfire History

On February 10, 2002 the Gavilan Wildfire burned over 5,200 acres of natural open space and destroyed 43 structures in the western portion of Fallbrook and the Weapons Annex. Embers from the 50-mile per hour plus Santa Ana Winds caused structures to be destroyed. The Gavilan Fire was driven by Santa Ana Winds fueled by 50-year-old brush and an extended drought.

2.4 Potential for Fire in the Area

The site has the potential to experience a vegetation fire in its current vegetated state. This is based on the type of vegetation and its continuous nature, Santa Ana winds, high temperatures, low humidity and drought conditions. The undeveloped property does pose a hazard from a wildland fire.

3.0 Effect of the Project

The development of this area will reduce the spread of wildfire by reducing the fuel loading, the addition of water supply (additional fire hydrants for fire fighting); improving of roads in the project and the clearing of home sites will provide additional fuel breaks in the area. The development of this site will significantly reduce risk to life and property by removing the vegetation and the threat of wildfire from the property.

3.1 Existing Onsite and Surrounding Area Vegetation

On site consist of non-native vegetation; most of the site is Disturbed Habitat. The surrounding property is urban developed land and is maintained on an annual bases.

3.2 Water Supply

The water supply for this proposed project will come from an existing water main and will be extended into the project (Fallbrook Public Utility District). Domestic and fire flow systems will be designed to San Diego County and North County Fire Prevention requirements. Additional fire hydrants will be added to the new street in locations approved by the North County Fire Protection District and will be located before the curb radius of the turnaround with a fire flow of 1500 GPM @ 20 PSI.

3.3 Landscape Concept

A low fuel, drought tolerant landscape concept has been designed for the proposed slopes. Low fuel, drought tolerant native plant species will be incorporated to the maximum extent possible. A plant species list is included in Appendix A.

The final landscape concept and plant palette shall be reviewed and approved by the San Diego County Department of Planning and Land Use and the North County Fire Protection District. The landscape plan specifically avoids plants on the undesirable plant list. Additionally the plan shall include removal of palm in the drainages. Individual homeowners will be responsible for installing and maintaining their individual front, side and rear yard landscaping. All homeowner installed landscaping must be in accordance with the approved landscape species list.

4.0 BehavePlus Fire Modeling

The BehavePlus Fire Modeling System (Version3.0.2) developed by the U.S. Forest Service/ Rocky Mountain Research Station is the generally accepted software for modeling large-scale wildfire behavior and characteristics. The BehavePlus system was designed to evaluate a variety of wildfire variables for large wildland fires including surface fire spread, safety zones, fire containment, spotting distance crown scorch and probability of ignition. Two aspects of this program (surface fire spread and safety zone) have been utilized to assist in determining acceptable fuel modification requirements. The BehavePlus program coupled with onsite and surrounding area vegetation, access, slope and weather conditions are the basis for the following.

The BehavePlus fire system has been run for the following worst-case scenarios:

60 MPH wind 100-degree ambient air temperature, 2 % dead fuel moisture. 60 % live fuel moisture and 50 % average slope aspect. The model was run for two fuel model scenarios, as the project contains varying types of fuels.

It should be noted that the BehavePlus Model does not and cannot include all variables associated with a specific site and regime, and adjacent mixed land uses can influence the results.

The BehavePlus Model run results are summarized in Table 1.

Table 1

4.1 BehavePlus Fire Model

Fuel Model 1 [short grass (s)]

Wind Speed & Direction	Mid-flame	Rate of spread	Fire Line Intensity	Flame Length
60 mph N, NE, E	24.0 mph	665.6 Ch/h	1415 Btu/ft/s	12.7

Up-slope spotting distance= 1.1 miles

The Behave Plus, coupled with the expected offshore Santa Ana wind direction, anticipated down slope fire line aspect, and relatively low fuel vegetation within the urban wildland interface areas, and existing fuel modified areas, serves as a basis for formulation of the recommended Fuel Modification Zone locations.

5.0 Fuel Modification Zones

A two tiered Fuel Modification Zone system is proposed to create an adequate fire safety buffer along the proposed development areas and access roads, which would be defensible space in case of a wildfire. The Fuel Modification Zone recommendations are based upon a combination of BehavePlus Modeling data, onsite vegetation, access, surrounding area fuel conditions, slope and worst-case weather conditions. The Fuel Modification Zones have been designed to meet the requirements of North County Fire Protection District and San Diego County DPLU.

5.1 Landscape Requirements

All landscaping within the Fuel Modification Zones must be approved by the North County Fire Protection District and shall include low fuel, drought tolerant plant species. (See Appendix A). A landscape plan shall be submitted for approval and shall comply with the Fuel Modification Plan.

6.0 Mitigation for Structures

All new structures shall be equipped with the following interface features:

1. Roofs will be a Class A noncombustible material and shall meet the DPLU standards.
2. Eaves will be of noncombustible material and boxed. (DPLU # 198)
3. Exterior walls will be a noncombustible or ignition_resistive material. (DPLU # 664)
4. All structures will be equipped with automatic fire sprinklers (NFPA 13D). All sprinkler systems shall be approved by the Fire Department prior to installation
5. All future outbuildings must be approved by the North County Fire Protection District prior to installation.
6. Provide the following enhanced fire resistive construction features or meet the County Fire and Building Code requirements for Wildland Urban Interface areas.
 - A. Exterior walls of residence and garage must be non-combustible or ignition resistive material (stucco, masonry or approved cement fiberboard. No wood) and meet (DPLU # 664)
 - B. Any eaves, soffits and facias must comply with ignition resistant construction. (DPLU # 198)
 - C. There shall be no paper faced insulation in the attic or other ventilated spaces.
 - D. There shall be no plastic or vinyl on the exterior.
 - E. Ventilation: No attic ventilation opening or louvers shall be permitted in soffits or overhanging areas. Attic or foundation ventilation openings or types of ventilation

shall be covered with ¼ “ mesh corrosion resistant or other approved equivalent protection. All attic ventilation shall comply with requirements of the building code. Vents shall not face any unmodified fuel that is not cleared 100 feet from the structure. All vents and their locations shall be approved by the Building Official and the Fire Department.

- F. Exterior doors shall be not less than 20 min. fire rating. Minimum 1¾-inch solid core wood door, or approved non-combustible construction.
- G. All projections shall be of non-combustible or ignition resistive construction, to include the following; exterior balconies, carports, decks, gazebos, patios covers, unenclosed roofs, floors and other outbuildings. Vinyl or plastic material is not allowed. All appendages and or projections from the structure shall be of like construction.
- H. Wood or vinyl fencing or other attached items, the first five feet must be of ignition resistive construction or meet the same fire resistive standards as the exterior walls of the structure.
- I. Spark arresters shall be installed on all chimneys and other vents on appliances as required per building and fire codes.
- J. Windows are restricted to tempered glass, or dual-pane glass assemblies, or glass block. Vinyl windows must have welded corners with metal reinforcing to prevent glass from falling out with flame impingement. Vinyl must be labeled showing ANSI/AAMA/NWDA 101/I.S.2-97 structural requirements.

7.0 Fuel Management Zones:

Parcels: 1 to 4

The above mentioned parcels shall have the following zones defined as: 1 and 2 with a combined distance of 100 feet from the structure unless otherwise noted. Zone 1 shall be the distance from the structure out to 50 feet (front, back and side yards) or the property line. Zone 2 shall be the distance from 50 feet to 100 in all directions or the property line. All vegetation in these zones shall be required to be maintained as per the North County Fire Protection District Weed Abatement Ordinance and as described in Management Zones 1 and 2. Note that parcel 4 has a fuel modification zone of 90 feet. The use of a seven foot masonry wall has been approved by County Fire Authority to compensate for the reduce fuel modification zone. The wall is shown on the tentative parcel map and grading plan (labeled “K”) for the project.

Those parcels where zones cross property lines shall be granted an easement to clear on to that property to the required distance.

7.1 Fuel Management Zone 1:

Zone 1 is the first 50 feet from the structure. Native plants shall be removed and replaced with irrigated, drought-tolerant, fire resistive plants (Appendix A).

The purpose of Zone 1 (set back zone) is to provide a defensible space for fire suppression forces to protect structures from radiant and convective heat. The following shall be part of the fuel management of this zone:

1. No combustible construction, groves, firewood, propane tanks, fuel, or combustible native or ornamental vegetation shall be allowed within the 50 foot set back Zone A or within 30 feet of the edge of slopes.
2. Mature trees (>18') to be limbed up or canopied 6' from ground level and spaced on 40' centers.
3. No tree limbs within 10' of chimney outlets or dead limbs overhanging structures.
4. Plant spacing must be as follows:
 - A. Slopes 0-20 % ---2 times the height of the mature plant.
 - B. Slopes 21-40 % --4 times the height of the mature plant.
 - C. Slopes >41 % ----6 times the height of the mature plant.

7.2 Fuel Management Zone 2

This Fuel Management zone consists of irrigated landscaping. Landscape must be submitted to the North County Fire Protection District for approval. The plans must delineate the fuel modification area that will be permanently irrigated. Plant material selection will be from the Appendix A list. Plans shall include methods of erosion control to protect against slope failure. The following shall apply to Zone 2:

1. Clear all existing native combustible vegetation, which may then be irrigated and planted. Refer to Appendix A.
2. Existing groves may exist within this area, but a 50% clearing is required.
3. Trees or new groves are to be maintained as noted for Zone A and spaced as follows:
 - A. Slopes 0-20%-40' on center.
 - B. Slopes 21-40-----60' centers
 - C. Slopes > 40%-----90' center.
4. Tree litter (duff) may remain under groves up to 6'' in depth.
5. Fire resistive plant materials are also required in Zone 2 to control soil erosion and/or to reduce vegetation mass near the wildland interface.
6. Plant spacing will be the same as noted for Zone 1.

8.0 North County Fire Protection District/Fire Prevention Requirements

The proposed project is subject to policies, guidelines and regulations contained in the North County Fire Protection District Ordinance and the San Diego County Consolidated Fire Code, (Appendix II-A) and the Vegetation Abatement in Sensitive Habitats Memorandum of Understanding. Fire Safety and hillside residential design requirements are contained in the Fire Prevention/Plans and Permits section. Specific Fuel Modification Plan and vegetation management criteria are also promulgated in this section.

8.1 Purpose, Policy and Authority

The North County Fire Protection District fuel modification guidelines were created to provide fire protection services and greater public safety in areas prone to wildland brush fires, by establishing additional development standards for those areas. The Fuel Modification Plans are required in designated high fire hazard areas as mapped on the San Diego County General Plan Hazard Map (SANGIS), in conjunction with the California Department of Forestry and the United States Forest Service.

9.0 Fire Safe Community Planning

The proposed project has been designed to be a fire safe community with defensible space. The creation of minimal wildland-urban interface areas, the fire access roads and a comprehensive fuel modification plan. The proposed residential lots are adjacent to native and non-native vegetation with developed property. Onsite and surrounding area native vegetation is not considered high or very high fire hazard. This fuel will be removed where required by the plan and will no longer pose a threat. The existing vegetation will be modified according to the plan and currently does not pose a threat. The onsite grassland associated with this property typically results in a slow burning and intensity (low flame length). High winds coupled with steep slopes and low humidity can increase the risk hazard of the fire. This type of vegetation is rarely associated with major conflagration resulting in property loss. The site is in a not very high fire hazard severity zone according to State of California Calfire mapping dated June 11, 2009. However, the onsite wildfire risk to the proposed dwellings will be mitigated with the implementation of a Fuel Modification Plan and accompanying Landscape Plan.

9.1 Landscape Requirements/Restrictions

The landscaping within the Fuel Modification Zones must be approved by the North County Fire Protection District and shall include low fuel, drought tolerant type vegetation from the list adopted by the County of San Diego (see Appendix A).

10.0 Fire Access Road

The proposed fire access road is designed to allow for egress for the public and fire fighting access for the Fire Department. All of the extension of the road on site shall be a minimum of 24 feet paved on 28 feet graded. The fuel modification on or adjacent to the road adds to the reduction of the spread of the fire and is part of the overall Fuel Modification Plan. All roads shall have a minimum clearance of 20 feet on each side of the road. Turnarounds on all lots shall comply with Appendix B. The proposed access roads shall meet or exceed all San Diego County DPLU and North County Fire Protection District requirements. All roads leading up to the project are paved. The roads McDonald and E. Fallbrook Sreet circulate in two directions onto other roads and meet the requirement for a second access. All lots are one acre plus and access

from McDonald Road. The maximum distance for lots less than 1 acre is 800 feet. All lots meet this requirement no secondary access will be required.

11.0 Fuel Modification Zone Maintenance Requirements

Fuel Modification Zones must be maintained in a manner that will fulfill the intent of the Fuel Modification Plan and meet the requirements of the North County Fire Protection District. Maintenance will include initial planting, weeding, irrigation installation and maintenance, plant pruning, removal of dead/down vegetation, and the replacement of plants as required.

12.0 Water Supply

The project will provide two residential type fire hydrants to NCFPD and FPUD standards, with drip caps and blue dot markers, capable of supplying 1500 GPM, with 2500 GPM available in the main, in the following locations:

- At the intersection of the to be named access road and McDonald Road
- Prior to the radius of the cul-de-sac.

The following will also apply to this project:

1. Each lot owner is personally responsible for all irrigation and landscaping fuel treatment zones within their property boundaries. Where the zone extends onto the adjoining property within the development, the lot owner benefiting from the fuel treatment shall be allowed to perform work on the adjacent property.
2. The North County Fire Protection District will hold each lot owner within this subdivision accountable for enforcement of all wildland fire protection issues discussed in this plan.
3. Each lot owner shall not allow trash dumping or disposal of any yard trimmings in the Fuel Treatment Zones.
4. The North County Fire Protection District or its designated representative shall decide any disputes related to individual lot landscaping or fuel treatment, with respect to interpretation of the Fire Protection Plan. Decisions shall be final and binding on the lot owner.
5. Should modifications to the Tentative Map Plans occur, any and/or all of the Fire Protection Plan may be revised at the discretion of the North County Fire Protection District.
6. All exterior boundaries of Zones 1 and 2 shall be permanently marked on the ground for purposes of guiding annual fuel management maintenance and inspection operations. The most reliable markers are steel fence post with baked on painted finish. The upper half of the above ground portion of the fence post is then painted a bright “day glow” orange to improve visibility. These Fuel Treatment Zone Markers must be spaced so that the markers on each side of an installed marker can be seen from that marker.

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Appendix A

Undesirable Plant List

Acceptable Plants for a Defensible Space In Fire Prone Areas

SUGGESTED PLANT LIST FOR A DEFENSIBLE SPACE

<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>Climate Zone</u>
TREES		
Acer		
platanoides	Norway Maple	M
rubrum	Red Maple	M
saccharinum	Silver Maple	M
saccarum	Sugar Maple	M
macrophyllum	Big Leaf Maple	C/ (R)
Alnus rhombifolia	White Alder	C/I/M (R)
Arbutus		
unedo	Strawberry Tree	All zones
Archontophoenix		
cunninghamiana	King Palm	C
Arctostaphylos spp.**	Manzanita	C/I/D
Brahea		
armata	Blue Hesper Palm	C/D
edulis	Guadalupe Palm	C/D
Ceratonia siliqua	Carob	C/I/D
Cerdidium floridum	Blue Palo Verde	D
Cercis occidentalis**	Western Redbud	C/I/M
Cornus		
nuttallii	Mountain Dogwood	I/M
stolonifera	Redtwig Dogwood	I/M
Eriobotrya		C/I/D
japonica	Loquat	C
Erythrina caffra	Kaffirboom Coral Tree	I/M
Ginkgo biloba "Fairmount"	Fairmount Maidenhair Tree	I/D/M
Gleditsia triacanthos	Honey Locust	
Juglans		I
californica	California Walnut	C/I
hindsii	California Black Walnut	I/D/M
Lagerstroemia indica	Crape Myrtle	I
Ligustrum lucidum	Glossy Privet	C/I/M
Liquidambar styraciflua	Sweet Gum	I
Liriodendron tulipifera	Tulip Tree	
Lyonothamnus floribundus		C
ssp. Asplenifolius	Fernleaf Catalina Ironwood	C/I/D
Melaleuca spp.	Melaleuca	C/I
Parkinsonia aculeate	Mexican Palo Verde	
Pistacia		
chinensis	Chinese Pistache Pistachio Nut	C/I/D

vera	Pistachio Nut	I
Pittosporum		
phillyraeoides	Willow Pittosporum	C/I/D
viridiflorum	Cape Pittosporum	C/I
Platanus		
acerifolia	London Plane Tree	All zones
racemosa**	California Sycamore	C/I/M
Populus		
alba	White Poplar	D/M
fremontii**	Western Cottonwood	I
trichocarpa	Black Cottonwood	I/M
Prunus		
xblireiana	Flowering Plum	M
caroliniana	Carolina Laurel Cherry	C
ilicifolia**	Hollyleaf Cherry	C
lyonii**	Catalina Cherry	C
serrulata 'Kwanzan'	Flowering Cherry	M
yedoensis 'Akebono'	Akebono Flowering Cherry	M
Quercus		
agrifolia**	Coast Live Oak	C/I
engelmannii	Engelmann Oak	I
** suber	Cork Oak	C/I/D
Rhus		
lancea**	African Sumac	C/I/D
Salix spp.**	Willow	All zones (R)
Tristania conferta	Brisbane Box	C/I
Ulmus		
parvifolia	Chinese Elm	I/D
pumila	Siberian Elm	C/M
Umbellularia californica**	California Bay Laurel	C/I

SHRUBS

Agave	Century Plant	D
americana	Century Plant	D
deserti	Shawis Century Plant	D
shawi**		
Amorpha fruticosa**	False Indigobush	I
Arbutus		
menziesii**	Madrone	C/I
Arctostaphylos spp.**	Manzanita	C/I/D
Atriplex**		
canescens	Hoary Saltbush	I
lentiformis	Quail Saltbush	D
Baccharis**		
glutinosa	Mule Fat	C/I
pilularis	Coyote Bush	C/I/D
Carissa grandiflora	Natal Plum	C/I
Ceanothus spp.**	California Lilac	C/I/M
Cistus spp.	Rockrose	C/I/D
Cneoridium dumosum**	Bushrue	C
Comarostaphylis**		
diversifolia	Summer Holly	C
Convolvulus cneorum	Bush Morning Glory	C/I/M
Dalea		
orcuttii	Orcutt's Delea	D
spinosa**	Smoke Tree	I/D
Elaeagnus		
pungens	Silverberry	C/I/M
Encelia**		
californica	Coast Sunflower	C/I
farinose	White Brittlebush	D/I
Eriobotrya		
deflexa	Bronze Loquat	C/I
Eriophyllum		
confertiflorum**	Golden Yarrow	C/I
staechadifolium	Lizard Tail	C
Escallonia spp.	Escallonia	C/I
Feijoa sellowiana	Pineapple Guava	C/I/D
Fouquieria splendens	Ocotillo	D
Fremontodendron**		
californicum	Flannelbush	I/M
mexicanum	Southern Flannelbush	I
Galvezia		
juncea	Baja Bush-Snapdragon	C
speciosa	Island Bush-Snapdragon	C
Garrya		
elliptica	Coast Silktassel	C/I
flavescens**	Ashy Silktassel	I/M

Heteromeles arbutifolia**	Ashy Silktassel	I/M
Lantana spp.	Toyon	C/I/M
Lotus scoparius	Lantana	C/I/D
Mahonia spp.	Deerweed	C/I
	Barberry	C/I/M
Malacothamnus clementinus		
	San Clemente Island Bush Mallow	C
fasciculatus**		
	Mesa Bushmallow	C/I
Melaleuca spp.	Melaleuca	C/I/D
Mimulus spp.**	Monkeyflower	C/I (R)
Nolina		
parryi	Parry's Nolina	I
parryi ssp. wolfii	Wolf's Bear Grass	D
Photinia spp.	Photinia	All Zones
Pittosporum		
crassifolium		C/I
rhombifolium	Queensland Pittosporum	C/I
tobira 'Wheeler'	Wheeler's Dwarf	C/I/D
undulatum	Victorian Box	C/I
viridiflorum	Cape Pittosporum	C/I
Plumbago auriculata	Cape Plumbago	C/I/D
Prunus		
caroliniana	Carolina Laurel Cherry	C
ilicifolia**	Hollyleaf Cherry	C
lyonii**	Catalina Cherry	C
Punica granatum	Pomegranate	C/I/D
Pyracantha spp.	Firethorn	All Zones
Quercus		
dumosa**		
Rhamus	Scrub Oak	C/I
alaternus		
californica**	Italian Blackthorn	C/I
Rhaphiolepis spp.	Coffeeberry	C/I/M
Rhus	Rhaphiolepis	C/I/D
integrifolia**		
laurina	Lemonade Berry	C/I
lentii	Laurel Sumac	C/I
ovata**	Pink-Flowering Sumac	C/D
trilobata**	Sugarbush	I/M
Ribes	squawbush	I
viburnifolium		
speciosum**	Evergreen Currant	C/I
Romneya coulteri	Fuschia-Flowering Gooseberry	C/I/D
Rosa	Matilija Poppy	I
californica**		
minutifolia		

Salvia spp.**	California Wild Rose	C/I
Sambucus spp.**	Baja California Wild Rose	C/I
Symphoricarpos mollis**	Sage	All Zones
Syringa vulgaris	Elderberry	C/I/M
Tecomaria capensis	Creeping Snowberry	C/I
Teucrium fruticans	Lilac	M
Toxicodendron**	Cape Honeysuckle	C/I/D
diversilobum	Bush Germander	C/I
Verbena		
lilacina	Poison Oak	I/M
Xylosma congestum		
Yucca**	Lilac Verbena	C
schidigera	Shiny Xylosma	C/I
whipplei		
	Mojave Yucca	D
	Foothill Yucca	I

GROUNDCOVERS

Achillea**	Yarrow	All Zones
Aptenia cordifolia	Apteria	C
Arctostaphylos spp.**	Manzanita	C/I/D
Baccharis**		
pilularis	Coyote Bush	C/I/D
Ceanothus spp.**	California Lilac	C/I/M
Cerastium tomentosum	Snow-in-Summer	All Zones
Coprosma kirkii	Creeping Coprosma	C/I/D
Cotoneaster spp.	Redberry	All Zones
Drosanthemum hispidum	Rosea Ice Plant	C/I
Dudleya		
brittonii	Brittonis Chalk Dudleya	C
pulverulenta**	Chalk Dudleya	C/I
virens	Island Live Fore-ever	C
Eschscholzia californica**	California Poppy	All Zones
Euonymus fortunei		
'Carrierei'	Glossy Winter Creeper	M
'Coloratus'	Purple-Leaf Winter Creeper	M
Ferocactus viridescens**	Coast Barrel Cactus	C
Gaillardia grandiflora	Blanket Flower	All Zones
Gazania spp.	Gazania	C/I
Helianthemum spp.**	Sunrose	All Zones
Lantana spp.	Lantana	C/I/D
Lasthenia		
californica**	Common Goldfields	I
glabrata	Coastal Goldfields	C
Lupinus spp.**	Lupine	C/I/M
Myoporum spp.	Myoporum	C/I
Pyracantha spp.	Firethorn	All zones
Rosmarinus officinalis	Rosemary	C/I/D
Santolina		
chamaecyparissus	Lavender Cotton	All Zones
virens	Santolina	All Zones
Trifolium frageriferum	O'Connor's Legume	C/I
Verbena		
rigida	Verbena	All Zones
Viguiera laciniata**	San Diego Sunflower	C/I
Vinca		
minor	Dwarf Periwinkle	M

VINES

Antigonon leptopus	San Miguel Coral Vine	C/I
Distictis buccinatoria	Blood-Red Trumpet Vine	C/I/D
Keckiella cordifolia**	Heart-Leaved Penstemon	C/I
Lonicera		
japonica 'Halliana'	Hall's Honeysuckle	All Zones
subspicata**	Chaparral Honeysuckle	C/I
Solanum		
jasminoides	Potato Vine	C/I/D

PERENNIALS

Coreopsis		
gigantea	Giant Coreopsis	C
grandiflora	Coreopsis	All Zones
maritime	Sea Dahlia	C
verticillata	Coreopsis	C/I
Heuchera maxima	Island Coral Bells	C/I
Iris douglasiana**	Douglas Iris	C/M
Iva hayesiana**	Poverty Weed	C/I
Kniphofia uvaria	Red-Hot Poker	C/M
Lavandula spp.	Lavender	All Zones
Limonium californicum		
var. mexicanum	Coastal Statice	C
perezii	Sea Lavender	C/I
Oenothera spp.	Primrose	C/I/M
Penstemon spp.**	Penstemon	C/I/D
Satureja douglasii	Yerba Buena	C/I
Sisyrinchium		
bellum	Blue-Eyed Grass	C/I
californicum	Golden-Eyed Grass	C
Solanum		
xantii	Purple Nightshade	C/I
Zauschneria**		
californica	California Fuschia	C/I
cana	Hoary California Fuschia	C/I
'Catalina'	Catalina Fuschia	C/I

ANNUALS

Lupinus spp.**	Lupine	C/I/M
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UNDESIRABLE PLANT LIST

The following species are highly flammable and should be avoided when planting within the first 50 feet adjacent to a structure. The plants listed below are more susceptible to burning, due to rough or peeling bark, production of large amounts of litter, vegetation that contains oils, resin, wax, or pitch, large amounts of dead material in the plant, or plantings with a high dead to live fuel ratio. Many of these species, if existing on the property and adequately maintained (pruning, thinning, irrigation, litter removal, and weeding), may remain as long as the potential for spreading a fire has been reduced or eliminated.

<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>
<u>Abies species</u>	Fir Trees
<u>Acacia species</u>	Acacia (trees, shrubs, groundcovers)
<u>Adenostoma sparsifolium**</u>	Red Shanks
<u>Adenostoma fasciculatum**</u>	Chamise
<u>Agonis juniperina</u>	Juniper Myrtle
<u>Araucaria species</u>	Monkey Puzzle, Norfolk Island Pine
<u>Artemisia californica**</u>	California Sagebrush
<u>Bambusa species</u>	Bamboo
<u>Cedrus species</u>	Cedar
<u>Chamaecyparis species</u>	False Cypress
<u>Coprosma pumila</u>	Prostrate Coprosma
<u>Cryptomeria japonica</u>	Japanese Cryptomeria
<u>Cupressocyparis leylandii</u>	Leylandii Cypress
<u>Cupressus forbesii**</u>	Tecate Cypress
<u>Cupressus glabra</u>	Arizona Cypress
<u>Cupressus sempervirens</u>	Italian Cypress
<u>Dodonea viscosa</u>	Hopseed Bush
<u>Eriogonum fasciculatum**</u>	Common Buckwheat
<u>Eucalyptus species</u>	Eucalyptus
<u>Heterotheca grandiflora**</u>	Telegraph Plant
<u>Juniperus species</u>	Junipers
<u>Larix species</u>	Larch
<u>Lonicera japonica</u>	Japanese Honeysuckle
<u>Miscanthus species</u>	Eulalia Grass
<u>Muehlenbergia species**</u>	Deer Grass
<u>Palmae species</u>	Palms
<u>Picea species</u>	Spruce Trees
<u>Pickeringia Montana**</u>	Chaparral Pea
<u>Pinus species</u>	Pines
<u>Podocarpus species</u>	Fem Pine
<u>Pseudotsuga menziesii</u>	Douglas Fir
<u>Rosmarinus species</u>	Rosemary
<u>Salvia mellifera**</u>	Black Sage
<u>Taxodium species</u>	Cypress
<u>Taxus species</u>	Yew
<u>Thuja species</u>	Arborvitae
<u>Tsuga species</u>	Hemlock
<u>Urtica urens**</u>	Burning Nettle

** San Diego County native species

References: Gordon, H. White, T.C. 1994. Ecological Guide to Southern California Chaparral Plant Series. Cleveland National Forest.

Willis, E. 1997. San Diego County Fire Chief's Association. Wildland/Urban Interface Development Standards

City of Oceanside, California. 1995. Vegetation Management. Landscape Development Manual. Community Services Department, Engineering Division.

City of Vista, California 1997. Undesirable Plants. Section 18.56.999. Landscaping Design, Development and Maintenance Standards.

www.bewaterwise.com. 2004. Fire-resistant California Friendly Plants.

www.ucfpl.ucop.edu. 2004. University of California, Berkeley, Forest Products Laboratory, College of Natural Resources. Defensible Space Landscaping in the Urban/Wildland Interface. A Compilation of Fire Performance Ratings of Residential Landscape Plants.

County of Los Angeles Fire Department. 1998. Fuel Modification Plan Guidelines. Appendix I, Undesirable Plant List, and Appendix II, Undesirable Plant List.

INVASIVE PLANT LIST

The following species are considered invasive (i.e., those capable of reproducing and spreading into native, non-irrigated areas and displacing those communities). Non-native plant species are prohibited in all areas adjacent to open space lands. Noxious weeds that have been introduced to San Diego County over the years tend to be more widespread and therefore more difficult to contain. The plants listed below have been identified as invasive and/or as noxious weeds and should not be planted or allowed to sprout in any transitional landscapes (landscapes planted with non-native species next to undeveloped areas).

<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>
<u><i>Ailanthus altissima</i></u>	Tree of Heaven
<u><i>Anthemis cotula</i></u> ***	Mayweed, Stinking Chamolile
<u><i>Arctotheca calandola</i></u>	Cape Weed
<u><i>Arundo donax</i></u>	Giant Cane
<u><i>Atriplex semibaccata</i></u>	Australian Saltbush
<u><i>Brassica species</i></u> ***	Mustard
<u><i>Cardaria draba</i></u> ***	Hoary Cress, Perennial Peppergrass
<u><i>Carpobrotus edulis</i></u>	Ice Plant
<u><i>Centaurea solstitialis</i></u>	Yellow Starthistle
<u><i>Cirsium vulgare</i></u> ***	Wild Artichoke
<u><i>Conium maculatum</i></u>	Poison Hemlock
<u><i>Conyza Canadensis</i></u> ***	Horseweed
<u><i>Cortaderia selloana</i></u>	Pampas Grass
<u><i>Cotoneaster lacteus</i></u>	Cotoneaster
<u><i>Cupressus macrocarpa</i></u>	Monterey Cypress
<u><i>Cynara cardunculus</i></u> ***	Artichoke Thistle
<u><i>Cytisus species</i></u>	Scotch Broom, French Broom, etc
<u><i>Elaeagnus angustifolia</i></u>	Russian Olive
<u><i>Eucalyptus globulus</i></u>	Eucalyptus Blue Gum
<u><i>Gensita species</i></u> ***	Broom
<u><i>Hedera helix</i></u>	English Ivy
<u><i>Hypericum perforatum</i></u>	St. John's Wort
<u><i>Ilex aquifolium</i></u>	English Holly
<u><i>Lactuca serriola</i></u> ***	Prickly Lettuce
<u><i>Lepidium latifolium</i></u>	Perennial Pepperweed
<u><i>Myoporum parvifolium</i></u>	Trailing Myoporum
<u><i>Nerium oleander</i></u>	Oleander
<u><i>Nicotiana species</i></u>	Tree Tobacco
<u><i>Olea europaea</i></u>	Olive
<u><i>Pennisetum setaceum</i></u>	Fountain Grass
<u><i>Ricinus communis</i></u>	Castor Bean
<u><i>Robinia pseudoacacia</i></u>	Black Locust
<u><i>Salsola australis</i></u> ***	Russian Thistle, Tumbleweed
<u><i>Schinus molle</i></u>	California Pepper
<u><i>Schinus terebinthifolius</i></u>	Brazilian Pepper
<u><i>Silybum marianum</i></u> ***	Milk Thistle
<u><i>Spartium junceum</i></u>	Spanish Broom

Tamarix species
Ulex europeae***
Vinca major

Tamarisk
Gorse
Periwinkle

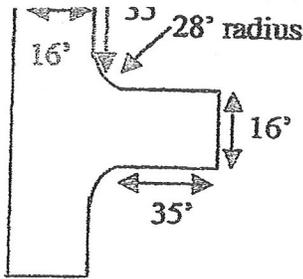
*** Introduced Weeds to San Diego County

References: Bell, Carl, Regional Advisor – Invasive Plants. 2004. University of California Cooperative Extension.

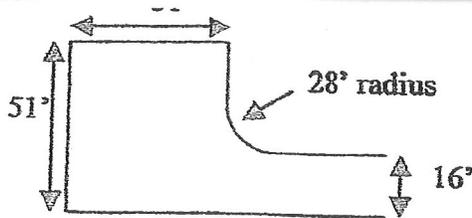
California Exotic Pest Plant Council. October, 1999. Exotic Pest Plants of Greatest Ecological Concern in California. Most Invasive Wildland Pest Plants. www.caleppc.org/info/99lista.html.

Appendix B

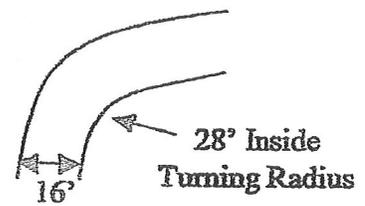
Fire Apparatus Turnaround Configurations



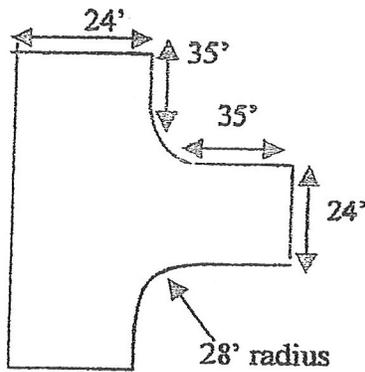
Private Driveway Hammerhead



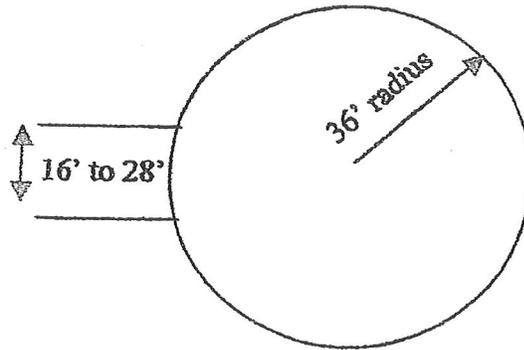
Alternate Private Driveway Hammerhead



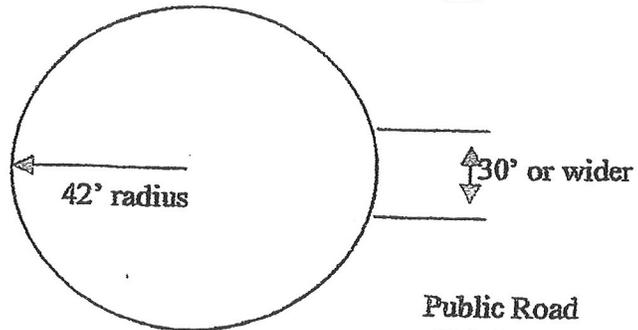
28' Inside Turning Radius



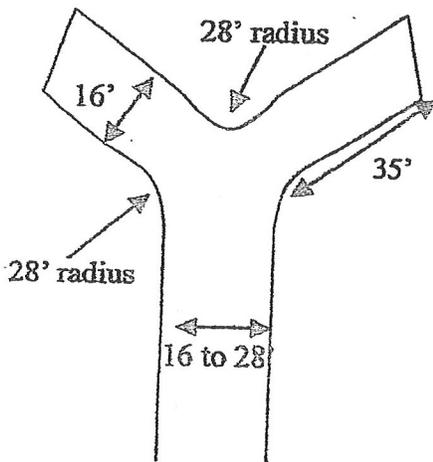
Private Road Hammerhead



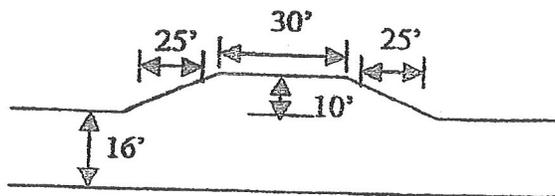
Private Road or Driveway Cul-de-sac



Public Road Cul-de-sac



Hammerhead Incorporating Radius

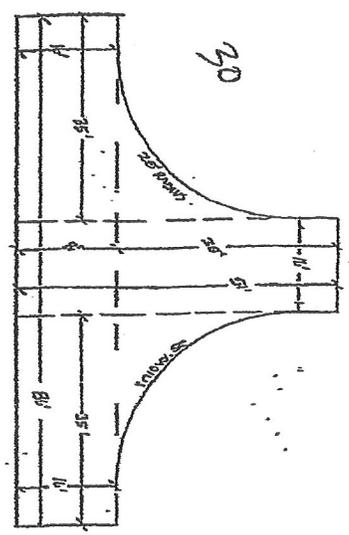
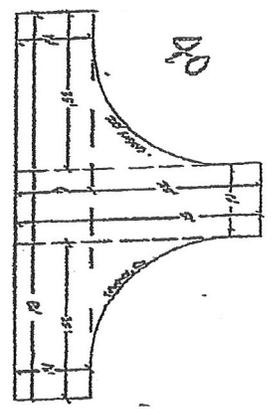
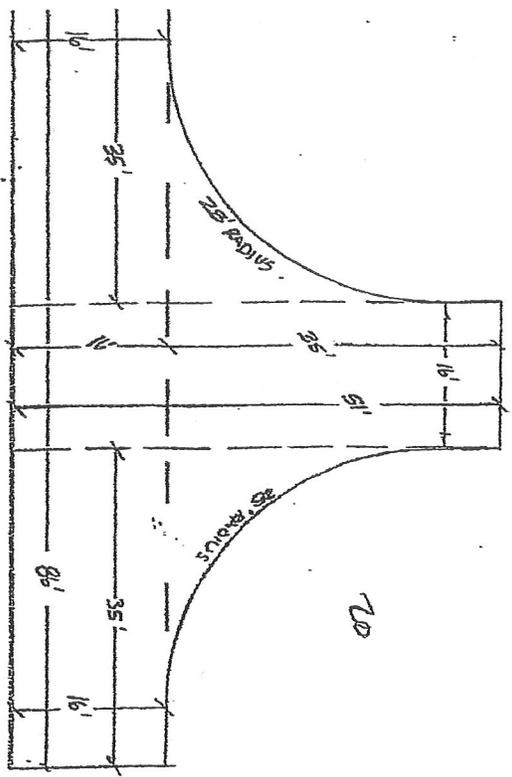
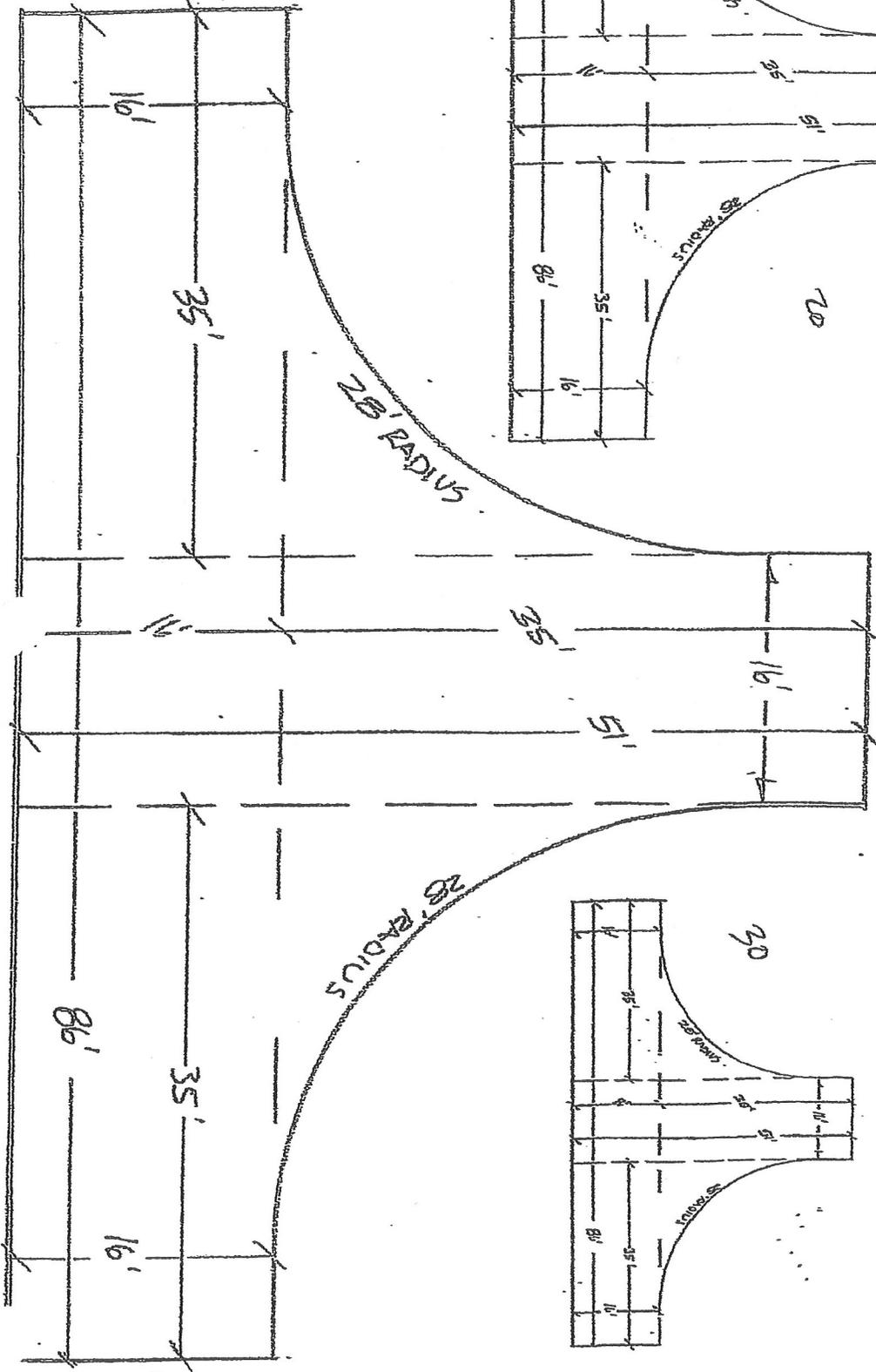


Turnout—Required for driveways In excess of 300-400'

****NOT TO SCALE****

(OVER)

Q1



Q2

Q3

Appendix C

Photos



Looking East from project





South end of project

Looking from East side



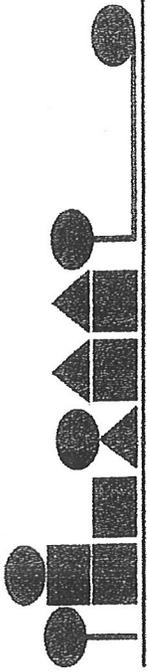
Looking at North end

Appendix D

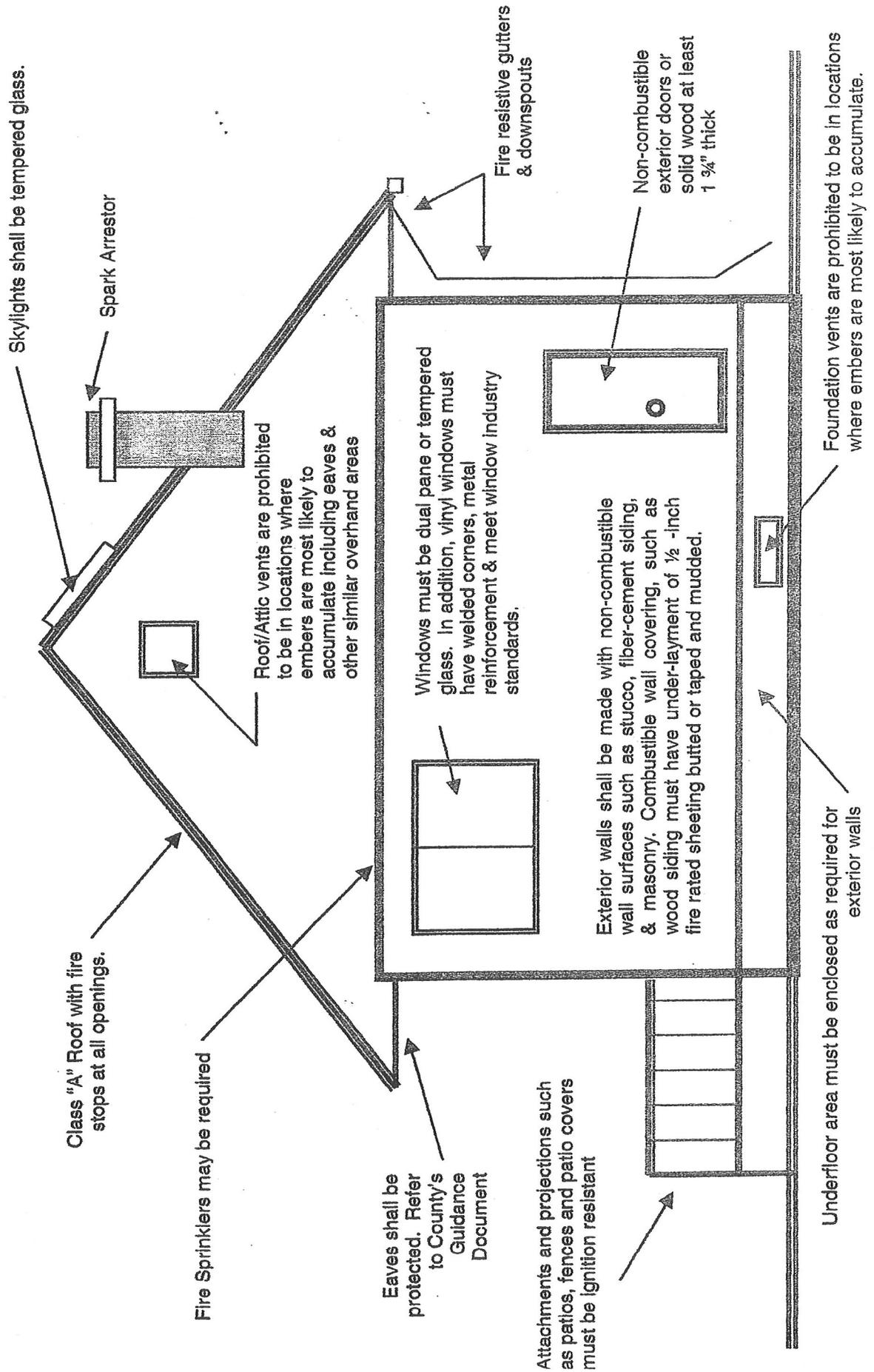
Site Map/Fuel Modification Map

Appendix E

Fire Resistive Construction Requirements



Enhanced Fire Resistive Construction Requirements

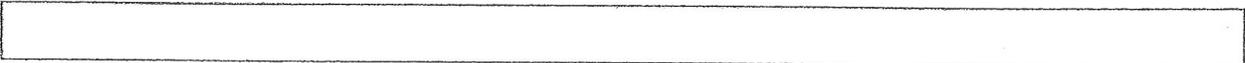


Appendix F

Literature and Codes

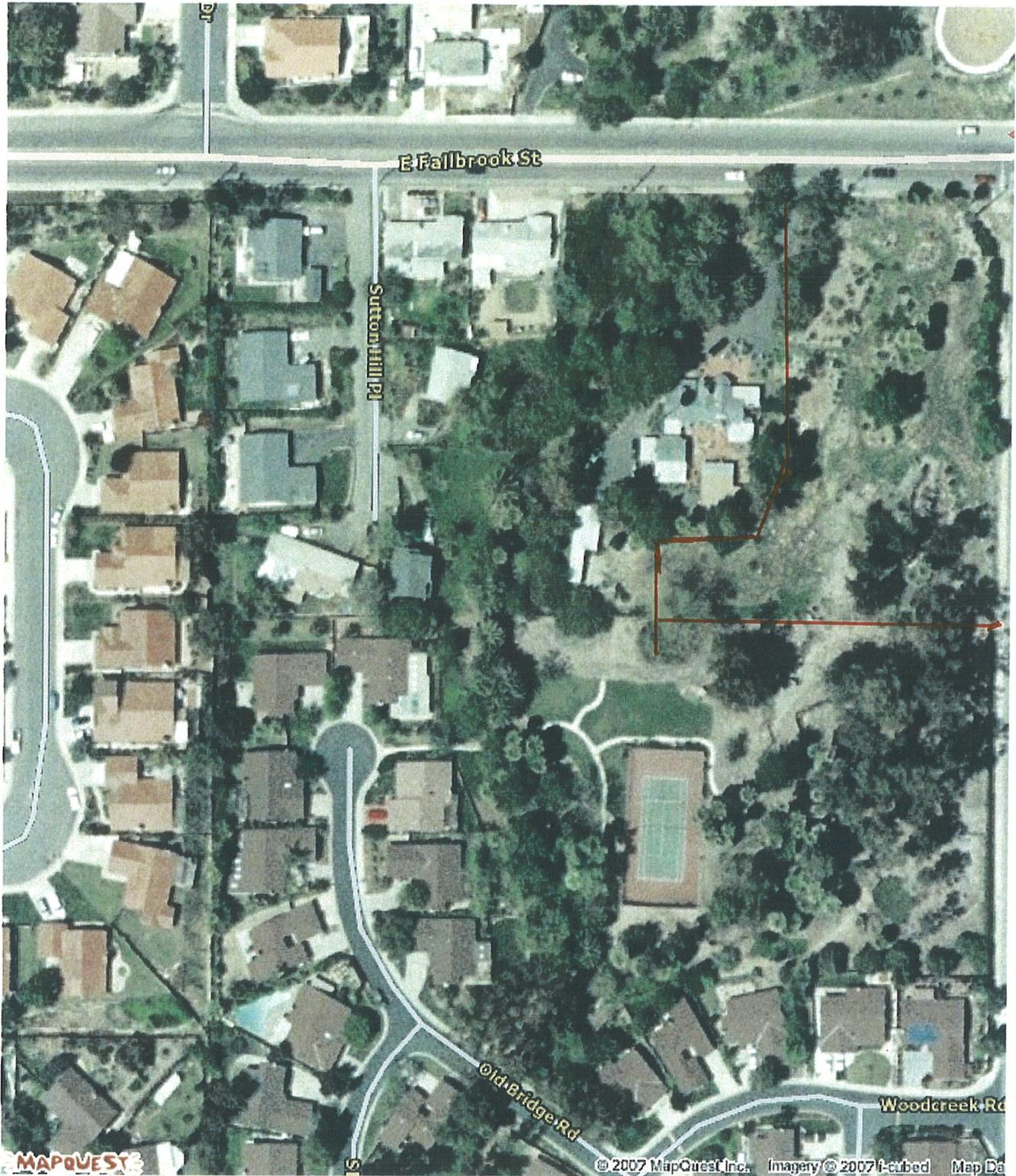
This plan is based on the following Literature and Codes

1. Behave: Fire Behavior Prediction and Fuel Modeling System – BURN Subsystem, Part 1. General Technical Report INT-194. January 1986. Patricia L. Andrews, United States Department of Agriculture – Forest Service, Intermountain Station, Ogden, Utah, 84401.
2. Behave: Fire Behavior Prediction and Fuel Modeling System – BURN Subsystem, Part 2. General Technical Report INT-360. May 1989. Patricia L. Andrews and Carolyn H. Chase, United States Department of Agriculture – Forest Service, Intermountain Station, Ogden, Utah, 84401.
3. BehavePlus Fire Modeling System, Version 2.0 General Technical Report RMRS-GRT-106WWW. June 2003. Patricia L. Andrews, Collin D. Bevins & Robert C. Seli. United States Department of Agriculture - Forest Service, Rocky Mountain Research Station, Missoula, Montana.
4. How to Predict the Spread and Intensity of Forest and Range Fires. General Technical Report INT-1943. May 1989. Richard C. Rothermel, United States Department of Agriculture – Forest Service, Intermountain Station, Ogden, Utah, 84401.
5. 2001 California Fire Code, California Code of Regulations Title 24, Part 9, which is based upon the 2000 Uniform Fire Code, Article 86 – Fire Protection Plan – Wildland Interface (UWI) Areas, Section 8601.
6. California State Senate Bill 1369 – Amends Section 51182 of the Government Code and Section 4291 of the Public Resource Code Relating to Fire Protection.
7. County of San Diego, County Fire Code, Ordinance No. 9669, An Ordinance Repealing And Reenacting The County Fire Code, Adopted July 14, 2004.
8. County of San Diego Ordinance No. 9670 Amending The County Building Code To Adopt The 2001 California Building Code And To Add Certain Fire Resistive Construction Standards, Adopted July 14, 2004
9. National Fire Protection Association - NFPA 1144 *Standard for Protection of Life and Property from Wildfire* (2002).
10. National Fire Protection Association- NFPA 1142 Water Supplies for Suburban and Rural Firefighting 2001 addition



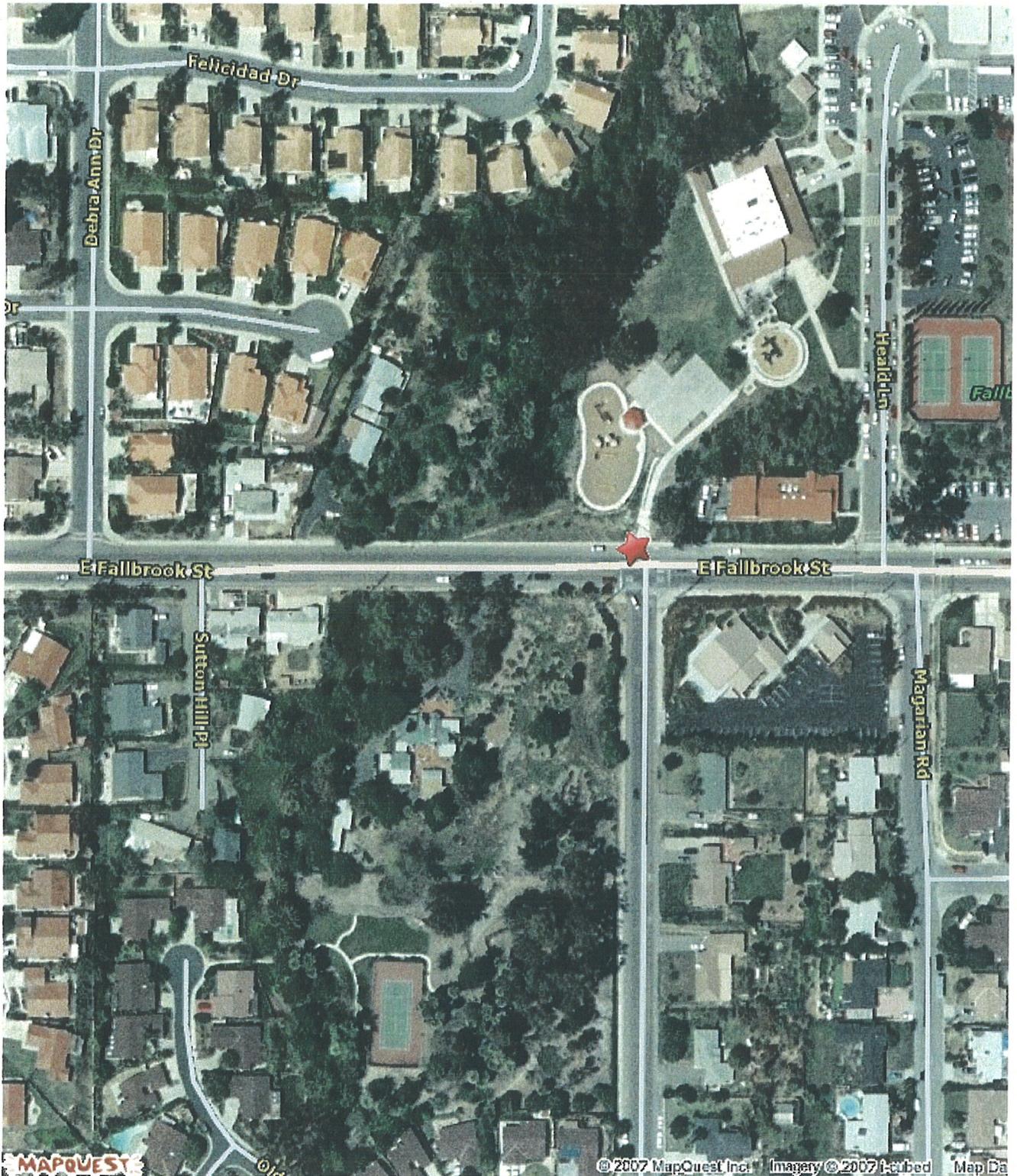
Appendix G

Aerial Photos



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Appendix H

Behaveplus3.02 Fire Model



Modules: SURFACE, SPOT, IGNITE

Description		Hagerty Project
Fuel/Vegetation, Surface/Understory		
Fuel Model		1
Fuel/Vegetation, Overstory		
Canopy Height	ft	0
Fuel Moisture		
1-h Moisture	%	2
10-h Moisture	%	
100-h Moisture	%	
Live Herbaceous Moisture	%	
Live Woody Moisture	%	
Weather		
20-ft Wind Speed (upslope)	mi/h	60
Wind Adjustment Factor		.4
Air Temperature	oF	100
Fuel Shading from the Sun	%	0
Terrain		
Slope Steepness	%	10
Ridge-to-Valley Elevation Difference	ft	15
Ridge-to-Valley Horizontal Distance	mi	.1
Spotting Source Location		VB

Run Option Notes

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind is blowing upslope [SURFACE].

Output Variables

Surface Rate of Spread (maximum) (ch/h) [SURFACE]

Heat per Unit Area (Btu/ft²) [SURFACE]

Fireline Intensity (Btu/ft/s) [SURFACE]

Flame Length (ft) [SURFACE]

Midflame Wind Speed (upslope) (mi/h) [SURFACE]
(continued on next page)

Input Worksheet (continued)

Wind Adjustment Factor [SURFACE]

Effective Wind Speed (mi/h) [SURFACE]

Spot Dist from Wind Driven Surface Fire (mi) [SPOT]

Probability of Ignition from a Firebrand (%) [IGNITE]

Notes



Hagerty Project

Surface Rate of Spread (maximum)	665.6	ch/h
Heat per Unit Area	116	Btu/ft ²
Fireline Intensity	1415	Btu/ft/s
Flame Length	12.7	ft
Midflame Wind Speed (upslope)	24.0	mi/h
Wind Adjustment Factor	0.4	
Effective Wind Speed	10.8	mi/h
Spot Dist from Wind Driven Surface Fire	1.1	mi
Probability of Ignition from a Firebrand	100	%

Discrete Variable Codes Used Hagerty Project

Fuel Model

1 Short grass (S)

Spotting Source Location

VB Valley Bottom