



Design Templates for Wildfire Mitigation & Landscape Resilience

Vegetation Management Strategies for the Wildland Urban Interface in Coastal Central & Southern California

Agricultural Buffer Zones



Created for the Regional Wildfire Mitigation Program
by SIG-NAL & Watershed Progressive



Agricultural Buffer Zones

How to design and maintain agricultural zones as wildfire buffers

The Regional Wildfire Mitigation Program (RWMP) recognizes the role that working agricultural lands can play in reducing community wildfire hazards in the WUI. Promoting the preservation and expansion of agricultural lands as wildland buffers to mitigate the risk of wildfire spread and intensity is an important land-use strategy.

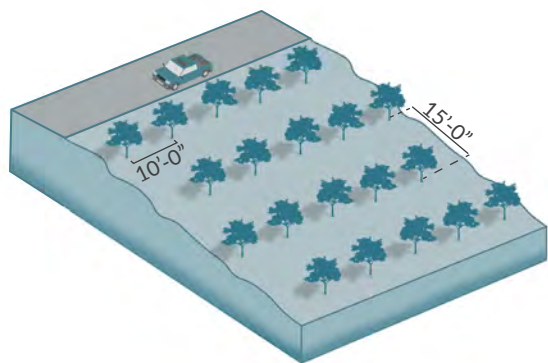


DIAGRAM: Spacing recommendations are dependent on the crop being planted. Top diagram shows basic fruit or deciduous tree spacing, bottom diagram shows spacing for succulents. Maintaining at least 10' between crops and 15' between rows helps reduce fuel loads.

Working agricultural lands can be used as effective wildfire buffers with the proper design and management practices. Here is a guide on how to use farms, orchards, and vineyards as wildfire buffers:

- ✓ DO Select fire-resistant crops: Choosing tree/crop species that are less flammable or carry lower fuel loads can reduce the risk of wildfire spread. This means selecting crops that remain hydrated during wildfire season.
- ✓ DO Plant with the right spacing: Plant trees and crops with adequate spacing between canopies. Always plant with a perimeter road for firefighter access. Consider large alleyways for high density plantings and alternating plant placement in rows to prevent wind tunnels.
- ✓ DO Use mulch strategically: Use a composted wood chip mulch in the interior of orchards and vineyards while maintaining 100 ft buffers along the perimeter with no mulching. Always mulch in the rows only, leaving alleys clear of flammable materials.
- ✓ DO consider offsetting every other row to slow wind and fire intensity when planting trees.
- ✓ DO create defensible space by clearing fuel breaks around your orchard or vineyard. (See Backburner Zone Template)

- ✓ DO maintain an efficient irrigation system capable of evenly delivering water to crops. Dry, non-irrigated crops can be more flammable.
- ✓ DO run irrigation in the case of oncoming fire to elevate live fuel moisture and keep leaf litter and soil hydrated. (Check with your local fire department and don't jeopardize firefighting efforts by compromising existing water availability.)
- ✓ DO Maintain orchard health: Regular pruning and removing dead branches, excessive leaf droppings, and other debris from the orchard or vineyard floor can reduce the amount of flammable material available in the area. This includes maintaining a clear area of 2-3 ft around the tree trunks, free from deadwood, dry grasses, and other debris.
- ✓ DO Consider fire-resistant materials: Using fire-resistant materials for orchard or vineyard infrastructure, such as steel pipes for risers, metal trellis systems, and subsurface plastic drip tubing.

ADDITIONAL CONSIDERATIONS

*Prescribed herbivory or targeted grazing is a wildfire management strategy that involves using livestock to graze on vegetation in targeted areas to reduce fuel loads (1). This strategy can be considered as a site preparation step for targeted fuel reduction.

B

Agricultural Buffer Zones

Prototypical plans, sections and details for implementation

Working agricultural lands can serve as hydrated buffers under specific conditions (2) (3). Crops that require dry season irrigation and display high live fuel moisture content year round are effective hydrated buffers between wildlands and developed areas. This can include crops such as citrus, avocados, pome and stone fruits, vineyards, and alternative crops like agave and cactus.

By irrigating these crops frequently, the vegetation and soil remain moist and less prone to ignition. The moist vegetation can slow or stop the spread of wildfires, providing a barrier between wildlands and developed areas.

The layout of agricultural blocks also contributes to their effectiveness as wildfire buffers. Well-maintained roads, water storage and water delivery infrastructure can make farms, orchards, and vineyards important for fire firefighter operations during wildfire events.

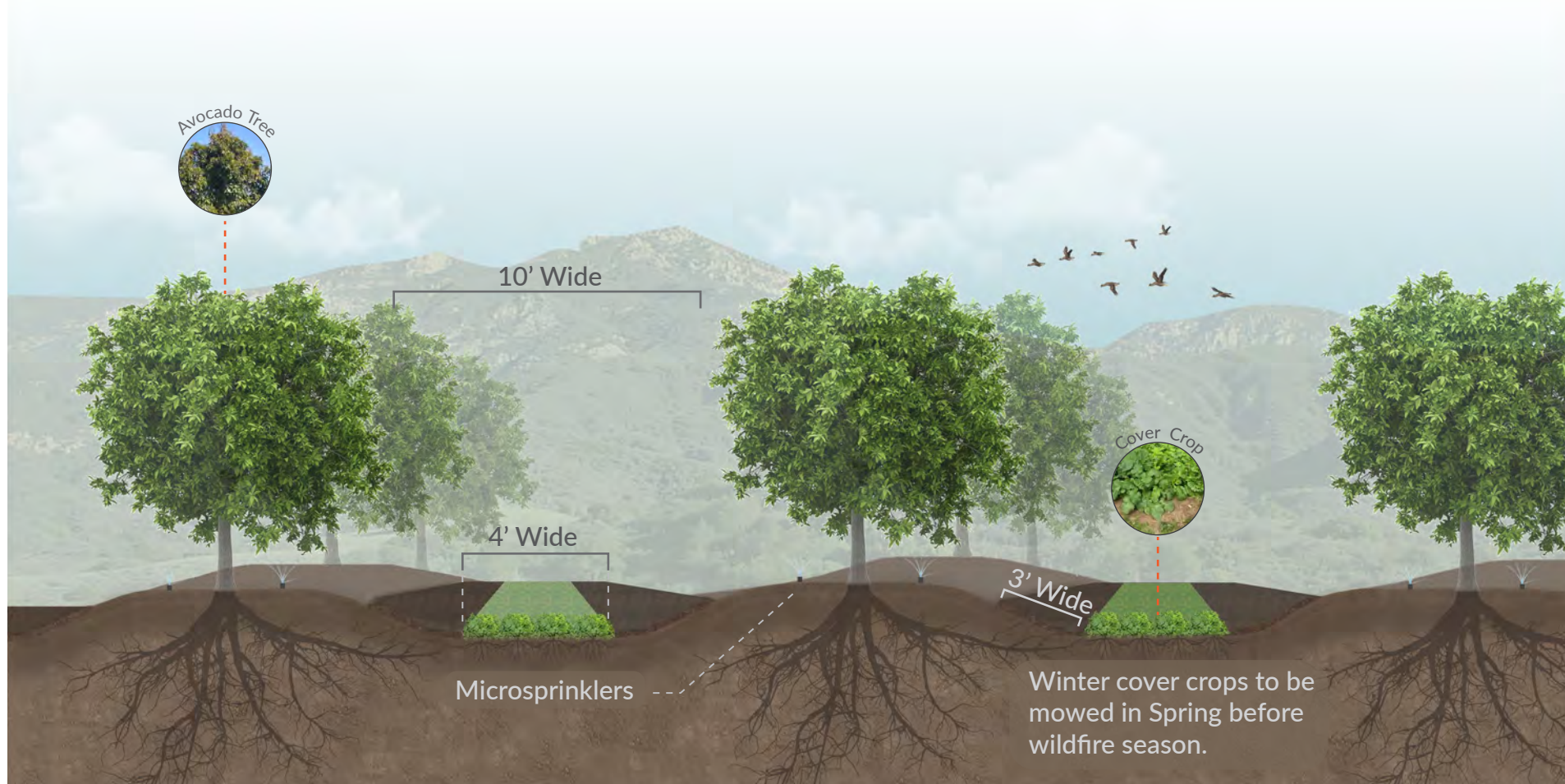


ILLUSTRATION: Basic Guidelines for Planting Crop Fields with Swales Between Rows.


Swales between crop rows help capture stormwater and irrigate the soil. Mulch at the base of each tree protects tree roots from heat and keeps soils cool.



Agricultural Buffer Zones

Plant Palette

TREES



Persea americana
Avocado

☀️
☔️
☔️☔️☔️


TREES



Punica granatum
Pomegranate

☀️
☔️
☔️☔️

TREES



Diospyros kaki
Persimmon

☀️
☀️
☔️
☔️☔️

SUCCULENTS



Agave tequilana (or spp.)
Agave


☀️
☔️
☔️☔️☔️

VINES




Vitis vinifera
Common Wine Grape

☀️
☀️
☔️
☔️



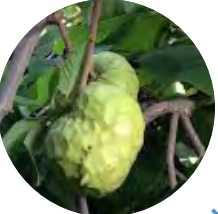
Citrus spp.
Citrus

☀️
☔️
☔️☔️☔️



Ficus carica
Fig

☀️
☔️
☔️☔️




Annona cherimola
Cherimoya

☀️
☀️
☔️
☔️☔️☔️



Opuntia ficus-indica
Prickly Pear

☀️
☔️
☔️☔️☔️



Actinidia deliciosa
Kiwi Fruit

☀️
☔️
☔️☔️☔️




Olea europaea
Olive

☀️
☔️
☔️☔️☔️




Macadamia integrifolia
Macadamia Nut

☀️
☔️
☔️☔️☔️



Morus rubra
Red Mulberry

☀️
☀️
☔️
☔️☔️



Selenicereus undatus
Dragon Fruit (Pitaya)

☀️
☀️
☔️
☔️☔️

*Note: Be careful not to plant White Mulberry trees, which are highly invasive

SOIL DRAINAGE

- ☔️ slow
- ☔️☔️ adaptable
- ☔️☔️☔️ fast

SUN/SHADE

- ☀️ full sun
- ☀️☔️ partial sun / shade
- ☔️ full shade

WATER USAGE

- ☔️ low
- ☔️☔️ moderate
- ☔️☔️☔️ high

OTHER CONSIDERATIONS

- 🌱 erosion control
- ☐ can be irrigated with greywater
- 🔥 fire resistant with maintenance

Agricultural Buffer Zones

Construction Details and Additional Resources

Mulching for Agricultural Zones

Mulching is the use of organic and inorganic material to cover soil surfaces throughout landscapes. Mulching is a valuable tool for wildfire mitigation because it conserves soil moisture, enhances soil quality, regulates soil temperatures for plant roots, and suppresses the growth of invasive weeds.

Mulching in crop fields increases soil moisture, and reduces soil erosion and weed germination, and helps conserve precious water resources. It increases soil water availability “by reducing evaporation, managing soil temperature, or reducing crop irrigation requirements” (4).

However, mulching can also increase combustible surface fuel cover. Where implemented, it needs to be done with careful consideration of hydrological benefits versus flammability tradeoffs (5). Assessing each site’s needs will help you determine best practices for mulching in landscapes within the Wildland-Urban Interface.

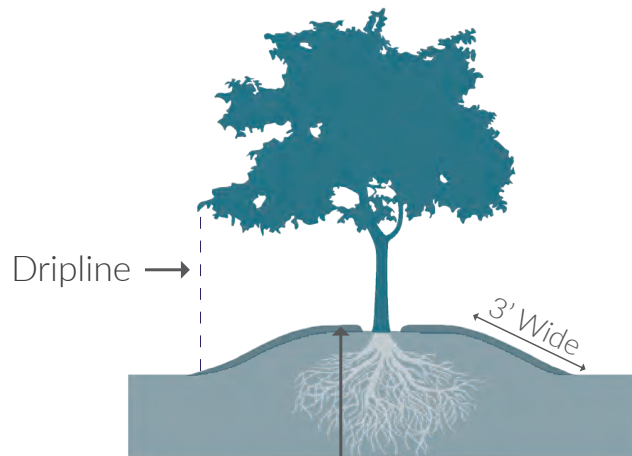
In general, composted wood chips (around 3 inches in size*) have lower burn characteristics than other mulches, and can aid in smoldering fires. You should avoid fibrous mulches, which tend to spread fire.

Wood chip mulches are effective for covering the rootzones of tree and vine crops from 12” from the crown or trunk to just beyond the dripline. It is important not to cover the crown or trunk with wood chip mulches as they can damage the plants.

- ✓ DO Mulch the soil beneath fruit trees with 2”-4” of organic material.
- ✗ DO consider where NOT to mulch. Avoid mulching the first few rows of orchards to eliminate creating embers close to homes and infrastructure.
- ✗ DO NOT Use shredded rubber, pine needles, or shredded cedar bark, as these are highly combustible (6).
- ✗ DO NOT Place mulch directly against tree trunks.
- ✗ DO NOT Use synthetic materials such as rubber pellets, landscape fabric, or anything containing plastic.
- ✗ DO NOT Use gorilla hair or monotone fibrous mulch, which can be a fire hazard, not a fire retardant.

ADDITIONAL CONSIDERATIONS

*There are outstanding questions around mulching to reduce flammability risk. Consult your local fire district for guidance and opinions.



Critical Area
Keep this area dry. Do not irrigate, plant or disturb. Keep mulched.

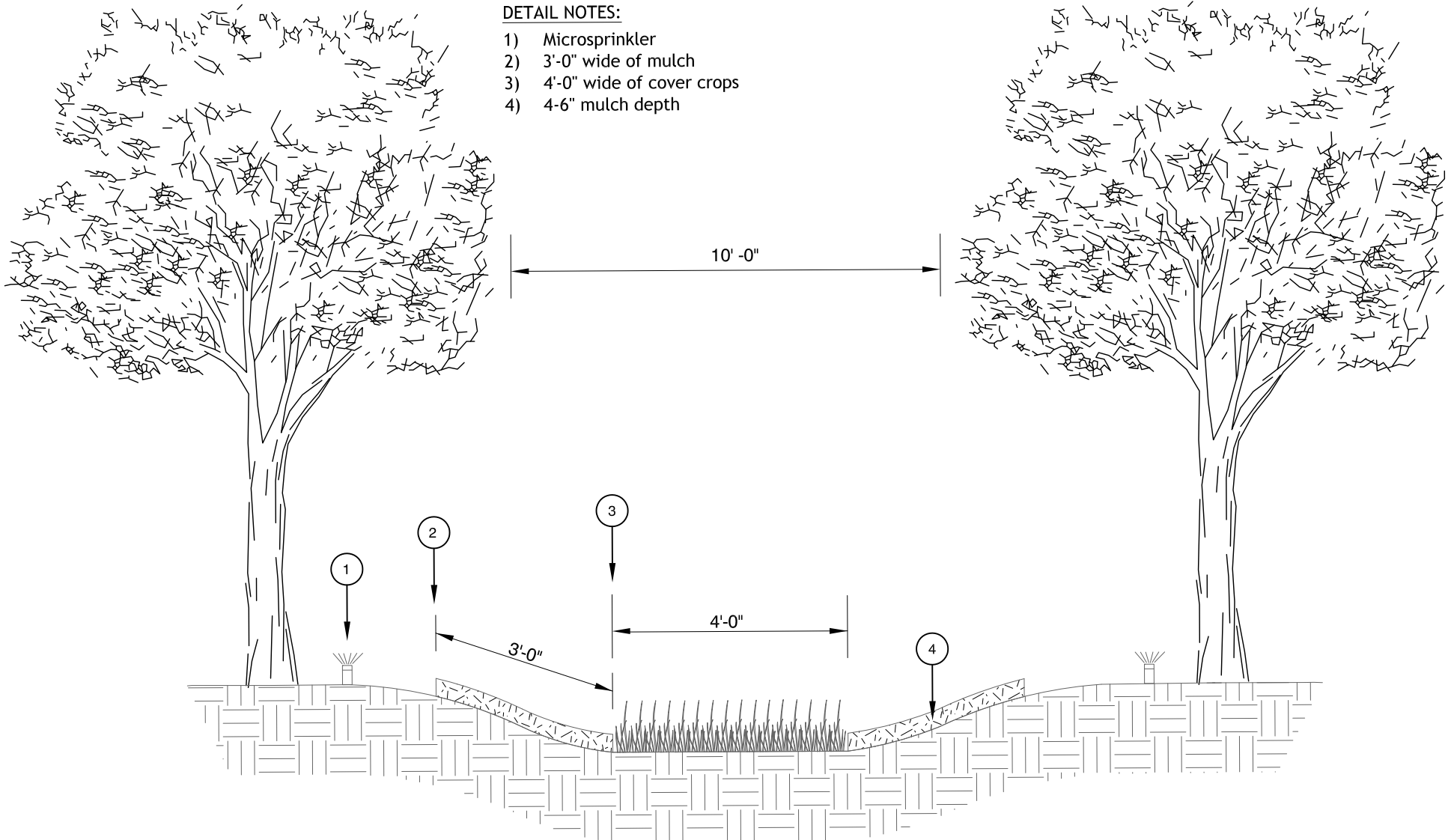
DIAGRAM: Basic Mulching Guidelines for Crop Fields

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Construction Details and Additional Resources

DETAIL NOTES:

- 1) Microsprinkler
- 2) 3'-0" wide of mulch
- 3) 4'-0" wide of cover crops
- 4) 4-6" mulch depth



1

ORCHARD SWALE

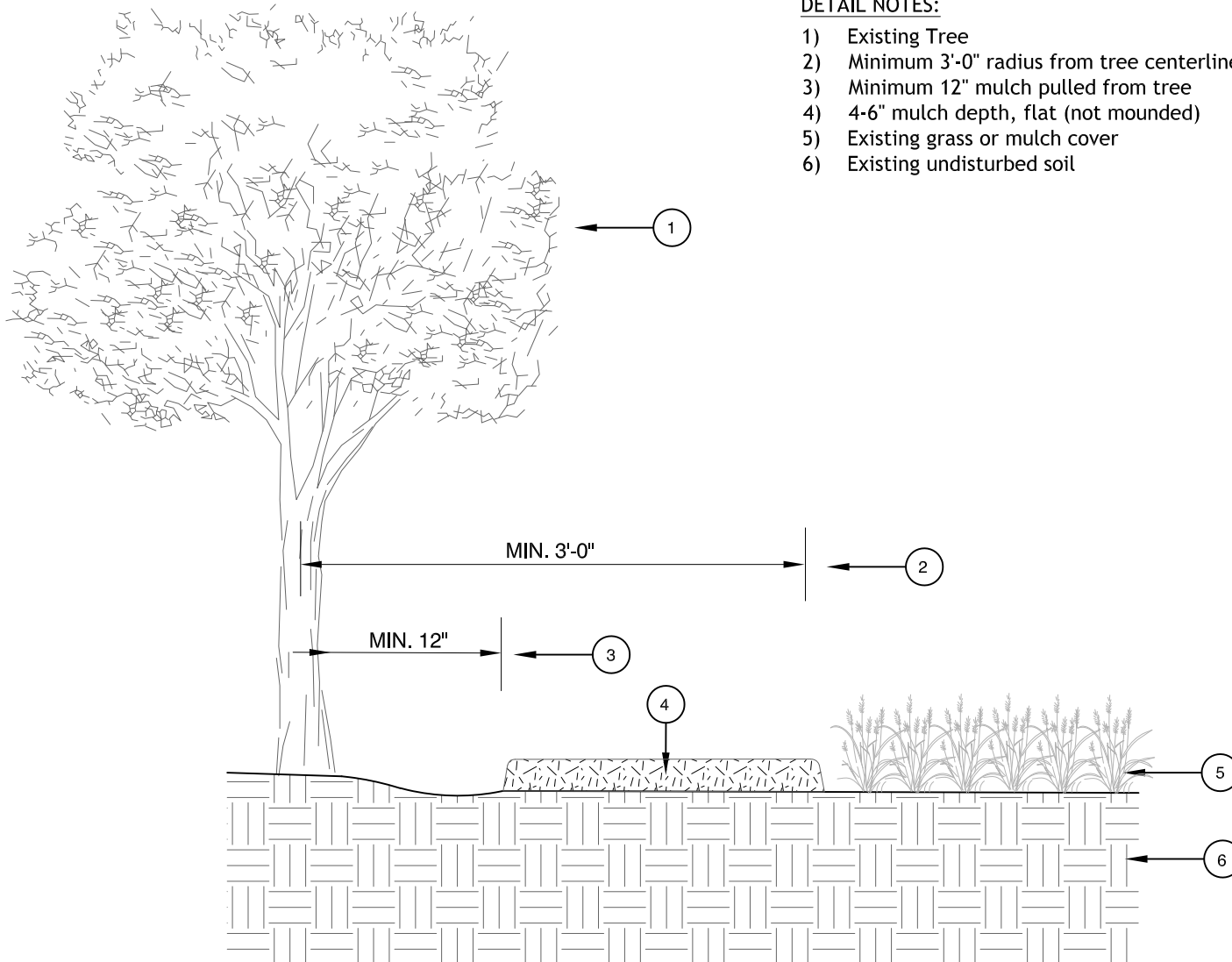
(N.T.S)

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Construction Details and Additional Resources

DETAIL NOTES:

- 1) Existing Tree
- 2) Minimum 3'-0" radius from tree centerline
- 3) Minimum 12" mulch pulled from tree
- 4) 4-6" mulch depth, flat (not mounded)
- 5) Existing grass or mulch cover
- 6) Existing undisturbed soil



2

TREE MULCHING

(N.T.S)



Agricultural Buffer Zones

Construction Details and Additional Resources



Works Cited - Agricultural Buffer Zones

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