Natural Environment Study

Route 101 Richardson Grove

Operational Improvement Humboldt County

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Summary of Findings and Conclusions

This document is intended to provide information about the natural environment and the species present in the vicinity of Richardson Grove on Route 101 in Humboldt County. The project area will include 1.1 miles of Route 101 between Post Miles 1.1 and 2.2 in and around Richardson Grove State Park (Appendix A). This Natural Environment Study (NES) evaluates potential impacts of the proposed project. The purpose and need of this work is to modify the roadway to accommodate STAA (Surface Transportation Assistance Act of 1982) trucks. STAA trucks are longer than California legal trucks and have a larger turning radius. Consequently, they require more gradual curves to avoid off-tracking. Off-tracking is a result of a turning movement where the rear tires follow a shorter tracking path than the front tires. Off-tracking may cause the vehicle to knock down signs, encroach onto shoulders, or cross into the opposing/adjacent lane of traffic to accommodate to the roadway. The project will involve ground disturbance, slope excavation, a retaining wall, culvert work, temporary stream diversion, disposal/barrow sites, equipment staging areas, permanent right-of-way acquisition, temporary construction easements, as well as vegetation and tree removal.

Avoidance and minimization measures will be employed so the action will have no substantial adverse impact on sensitive biological resources, natural communities of special concern, special status plant species, and special status animal species. Potential impacts to special status species have been analyzed based upon habitat present, record searches, site surveys, and information provided by the U.S. Fish and Wildlife Service, NOAA Fisheries, and the California Department of Fish and Game. Although there is habitat for a number of special status species in the project vicinity, this work will not substantially adversely impact those species or their habitat. For listed fish species, the project is not expected to result in any cumulative adverse impacts to available spawning or rearing habitat, essential fish habitat, and will not result in adverse modification of coho salmon (*Oncorhynchus kisutch*), chinook salmon (*Oncorhynchus tshawytscha*), or steelhead trout (*Oncorhynchus mykiss*) designated critical habitat.

The project site is within the breeding range of the state listed peregrine falcon (*Falco peregrinus*); as well as the federally listed northern spotted owl (*Strix occidentalis caurina*) and marbled murrelet (*Brachyramphus marmoratus*) –also state listed. There is suitable nesting habitat for some of these birds within ¼ mile of the project locations. However, this project will not adversely modify any critical habitat for any of these species. Nor will it impact rearing or foraging habitat except for some marginal northern spotted owl dispersal and foraging habitat. The federal candidate species Pacific fisher (*Martes pennanti*) may also be found near the project area. This work will not have a substantial adverse impact on Pacific

fisher or its habitat. Additional sensitive bird, amphibian, invertebrate, and plant species inhabit the project area. Measures will be included in the design and construction techniques to avoid or minimize direct, indirect, and/or cumulative impacts to these species.

The noise of construction is not expected to substantially exceed ambient traffic noise (Appendix E). Noisy equipment will include jack hammering, concrete sawing, and concrete grinding as well as the back-up warning signal on heavy equipment. To avoid impacting nesting migratory birds, any tree and shrub removal will also take place outside of the bird breeding season. The bird breeding season is March 1 to September 1.

Rare or sensitive plant species may occur close to construction areas in the Environmental Study Limits (ESL) and will be designated as environmentally sensitive areas (ESAs). Temporary fencing will be placed 2 feet from the plant population to protect these resources during construction.

Although there are no three-parameter wetlands in the project area, there are jurisdictional Waters of the U. S. Temporary and minor permanent impacts to jurisdictional watercourses associated with the proposed action will require a Nationwide Permit issued by the U.S. Army Corps of Engineers under Section 404 of the federal Clean Water Act and a Water Quality Certification from the Regional Water Quality Control Board under Section 401 of the Clean Water Act. A Lake and Streambed Alteration Agreement will be required from the Department of Fish and Game.

This NES has been revised from the previous version to include discussion of a new retaining wall alternative.

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List of Abbreviated Terms

BMP	Best Management Practices
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
Corvid	Crow, raven, and jay
DFG	California Department of Fish and Game
DBH	Diameter at Breast Height
NEPA	National Environmental Policy Act
NES	Natural Environment Study
MAMU	Marbled Murrelet
NSO	Northern Spotted Owl
PCE	Primary Constituent Element
PM	Post Mile
SSP	Standard Special Provisions
STAA	Surface Transportation Assistance Act of 1982
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service

Chapter 1. **Introduction**

1.1. Project Purpose and Need

The purpose and need of this work is to widen the roadway to accommodate STAA (Surface Transportation Assistance Act of 1982) trucks. STAA trucks are longer than California legal trucks and have a larger turning radius. The project will involve ground disturbance, slope excavation, construction of a retaining wall, culvert work, potential temporary stream diversion, potential night work, disposal/barrow sites, equipment staging areas, permanent right-of-way acquisition, temporary construction easements, repaving, as well as vegetation and tree removal. Future projects to maintain/rehabilitate the road surfaces or other safety-related projects will continue on a case-by-case basis.

1.2. Project Description -Proposed Build Alternative

Between the circulation of the draft environmental document and approving the final environmental document, the project evolved in response to public comment and as a result of coordination with resource and regulatory agencies. The changes include modifying the retaining wall, modifying some of the culvert improvements, and water quality improvements. The retaining wall modifications include moving the wall from west side of the highway to the east side of the highway, shortening the length by approximately 100 feet, and changing the wall type from an above the road wall to a below the road wall. The culvert modifications include replacing the culvert at PM 1.34 instead of installing a pipe liner and eliminating the pipe liner at the culvert at PM 1.18. The water quality improvement includes removing a restroom no longer in service near the Visitor Center in the park that would decrease the impervious surface in the general project area.

Preferred Alternative

The project has been broken into three segments. The first segment includes PM 1.1 to PM 1.7. In this segment there would be minor realignments of the existing roadway to minimize off-tracking conflicts between large vehicles and fixed objects (trees). Two 12-foot lanes with 2-foot shoulders are proposed where possible. This work would require minor earthwork, sliver widening of the roadway and adjustments to the super-elevation (to “bank the curves”). The maximum lateral change in the alignment would be 17 feet, but the average alignment shift from the existing centerline would be approximately 2 to 6 feet.

The main areas of cut and fill include: PM 1.35 to PM 1.36 cut with approximately 300 cubic yards; PM 1.37 to PM 1.39 fill with approximately 200 cubic yards; and PM 1.56 to PM 1.61 fill with approximately 200 cubic yards. The roadway in this segment would be slightly widened to provide for two foot shoulders where possible. Proposed shoulders would be tapered where existing trees are located adjacent to the edge of pavement.

The 18-inch diameter culverts at PM 1.28 and 1.35 would be replaced with 24-inch diameter culverts. The 18-inch diameter culvert at PM 1.34 would be replaced with an 18-inch diameter culvert. The 18-inch diameter culvert at PM 1.18 would be extended and the existing headwall would be replaced with a drainage inlet. The existing open graded asphalt would be ground off and a new open graded paving would be placed. Finally, pavement striping would be replaced.

The second segment from PM 1.7 to PM 2.04 involves removing and replacing the existing open graded pavement and striping, and extending a berm to divert water into Caltrans plans to realign sections of the Route 101 Roadway in Humboldt County between Post Miles 1.1 and 2.2 in and around Richardson Grove State Park (Appendix A). The project will involve ground disturbance, areas of cut and fill, culvert work, potential temporary watercourse diversion, a seasonal construction window, placement a 200-foot long retaining wall, disposal/barrow sites, equipment staging areas, paving, permanent right-of-way acquisition, temporary construction easements, subsurface drainage easements, as well as vegetation and tree removal (Appendix B).

<u>Cut and Fill</u>

Main Slope Cuts on the western shoulder:
PM 1.35 to PM 1.36- Approx. 300 Cubic Yards (CY), 1500 sq. ft.
PM 2.05 to PM 2.10-Approx. 2200 CY, 4500 sq. ft.

Main Areas of Fill:
PM 1.37 to PM 1.39- Approx 200 CY (eastern shoulder)
PM 1.56 to PM 1.61-Approx 200 CY (western shoulder)

Main Area of Cut and Fill on the eastern shoulder:
PM 1.65 to PM 1.75-Approx 30 CY cut/40 CY fill
PM 2.1 to PM 2.2 – Approx 900 CY fill, 3500 sq. ft. (retaining wall)

<u>Culvert Work</u>

Four 18-inch diameter culverts and one 24-inch diameter culvert will be improved. No tree removal is required for the culvert work. If stream diversion is required, measures will be

employed to minimize sediment discharge. There would be some lengthening at the inlets and the outlets, and inlet structures will be installed. At some of the locations, the culvert will be replaced. These Corrugated Steel Pipe (CSP) culverts will be modified as described below:

- PM 1.18 – This is an 18-inch diameter CSP that crosses Route 101 at a slight skew and passes near the buried base of a 7.5-foot diameter redwood. The down stream invert is perforated causing erosion of the slope below the pipe. The upstream portion will be extended approximately three feet. A new inlet will be installed on the existing culvert.

- PM 1.28 – This is an 18-inch diameter CSP with about 2 feet of existing pipe cover and a corroded invert. The failing culvert will be replaced with a new 24" pipe along the existing alignment. The upstream portion will be extended approximately three feet and new inlet will be installed.

- PM 1.34 – This is an 18-inch CSP with about one foot of existing pipe cover. The invert is corroded and perforated. The culvert will be replaced in kind and the inlet portion will be extended approximately three feet.

- PM 1.35 – This is an 18-inch CSP with 3.5 to 2.5 feet of existing pipe cover. The invert is corroded and perforated. The failing culvert will be replaced with a new 24-inch pipe along the existing pipe alignment and the upstream portion will be extended approximately five feet.

- PM 1.78 –This location has a 48" CSP which was recently slip-lined and had a new down drain with rock energy dissipater installed. The culvert is operating properly and is in good condition. However, roadside runoff is released to the stream by a gap in an earthen berm south of the culvert. The runoff flows over a steep (>1:1) fill slope to the creek. The location was identified by California Department of Fish and Game as a concern for sediment generation potential. To prevent erosion, Caltrans will extend the existing berm across the drainage flow path to divert water to a new 12-inch diameter CSP downdrain located directly above and connected to the existing 48-inch diameter culvert.

- PM 2.10 -- This is a 24-inch diameter CSP with about 3.5 to 5 feet of existing pipe cover. The pipe inlet is about 3 feet from the edge of traveled way. The invert of the culvert is corroded. A 1-1/4inch diameter PVC water line passes through the culvert from the west side of Route 101. At present, vicinity roadway drainage is flowing in an

uncontrolled manner through a gap in an AC dike over a fill slope to an existing swale. The upstream portion will be extended one to three feet and a concrete box inlet will be placed. The existing failing 24" culvert will be abandoned. A new 24" pipe will be installed adjacent to the existing alignment. Conduit will be installed in abandoned culvert to provide a separate accommodation for the private water line. Rock (as an energy dissipater) will be placed on the slope at both the inlet and outlet to prevent erosion. A concrete endwall will be placed at the outlet.

Tree and Shrub Removal.

Up to 54 trees – including about 24 tanoak, 20 Douglas-fir, 6 small redwood, 4 trees of various other species (Appendix C), and a number understory shrubs (mostly huckleberry and sword fern) will be removed from approximately ¼ acre of cuts and fills for this project. This vegetation will be removed between September 30 and March 1 to avoid impacts to federally listed and sensitive species. The majority of the disturbed area will be replanted in kind. The previous alternative with the above-road retaining wall would have required the removal of approximately 90 trees.

Night Work

To minimize traffic delays during peak travel hours there may be some night work as well as day work. For night work, lighting will be directed downward toward the work area to avoid disturbance to special status wildlife species.

Contractor Staging Areas

Contractor stockpiling, equipment storage, and staging areas will be on the paved roadway and gravel shoulders. The contractor may arrange additional staging and storage areas on nearby Caltrans Right of Way (ROW) or private property.

Disposal of Excess Material

Excess material will be transported for off-site disposal. Excess material may be temporarily stockpiled on paved or gravel pull outs near the Project Area. Some of the excess material from the slope cuts may be used for fill material within the Project Area.

Equipment

Loader, excavator, small crane, backhoe, grader, soldier pile auger, light plant, chainsaw, compressor, jackhammer, rock wheel, pavement saw, grinder, paver, cement truck, 10-wheel dump truck, and belly dump would likely be used.

<u>The estimated order of work would be as follows</u>

1. September 30 through March 1 -- Tree and shrub removal.
2. February 1 through July 1 – excavate slope and construct retaining wall
3. February 1 through September – cut and fill other areas
4. June 1 through October 15 – Culvert work
5. September through October -- Paving

Chapter 2. **Study Methods**

2.1. Regulatory Requirements

On September 17, 2007, Ray Bosch and Bill McIver of USFWS visited the site. Later it was determined that formal Section 7 Consultation with USFWS would be initiated for impacts to listed species and critical habitat. There will be no effect to listed fish species. Floristic Surveys were conducted in July 2007, February 2008, and May 2008by the project biologist (Gail Popham) and a Caltrans botanist (Kimberly Hayler). No federally listed plant species were found. One rare plant population was found. Consultation with CFG was initiated for potential impacts to marbled murrelet, however it was determined that the project would not involve take of MAMU, so no 2080.1 Consistency Determination will be required in compliance with CEQA, a consistency determination for impacts to is required under Section 2080.1 of the Fish and Game Code. An EIR (CEQA) and an Environmental Assessment (NEPA) are being prepared for the project.

2.2. Personnel and Survey Dates

Information in this report is based on field observations by a Caltrans Associate Environmental Planners (Natural Science), consultation with the California Department of Fish and Game (DFG), US Fish and Wildlife Service (USFWS), and a review of existing literature. A query of the California Natural Diversity Database (CNDDB) was conducted for the project area and several special status species were reported to have occurred near the project area. The CNDDB does not provide specific locations, but it is assumed that if habitat for the species exists, it will be present. The CNPS Inventory of Rare and Endangered Plants Database 9-Quad search was used to determine rare plants that might be in the project vicinity. Floristic surveys were conducted by a Caltrans biologist, Gail Popham in October and July 2007 and February and May 2008; and by a Caltrans botanist, Kim Hayler in July 2007 (Appendix F) .

2.3. Agency Coordination

On May 8, 2008 DFG Environmental Scientists Michael Van Hattem and Scott Bauer visited the site. It was determined that a 1602 Lake and Streambed Alteration Agreement from the Department of Fish and Game will be required. Section 404 Nationwide Permit from the U.S. Army Corps of Engineers, and a 401 Water Quality Certification from the Regional Water Quality Control Board will also be required. Caltrans is working with California Department

of Parks and Recreation to install corvid-proof refuse and food storage containers in Richardson Grove State Park.

Chapter 3. **Results: Biological Resources Present**

3.1. Description of the Existing Biological and Physical Conditions

The project area is in the Coastal Franciscan Ecological subsection. This subsection is a steep mountainous area of the northern California Coast Ranges south from Humboldt Bay to the Russian River. There is substantial oceanic influence on climate, including summer fog.

Geography. The terrain in the project area consists of mountains with rounded ridges, steep and moderately steep sides, and narrow canyons. There are small areas of alluvium along the South Fork Eel River. Fluvial erosion and mass wasting are the primary geomorphic processes. The elevation of the project area is about 500 feet.

Soils. The soils have high content of plant material in the upper layer with marine sediments below. The soils are leached free of carbonates, and some older soils are strongly acid. Soil moisture regimes in the project area are predominantly xeric (dry) or at least dry during the summer months.

Vegetation. The predominant natural plant communities in the project area are the Redwood series and the Tanoak series (Sawyer & Keeler-Wolf 1995) vegetation communities. The vegetation community within Richardson Grove State Park is predominately Redwood series, dominated by an overstory of large redwood trees (*Sequoia sempervirens*). The project area north of the park is Tanoak series, with a mixture of Douglas-fir (*Pseudotsuga menziesii*), madrone (*Arbutus menziesii*), tan oak (*Lithocarpus densiflorus*), California bay (*Umbellularia californica*), and big leaf maple (*Acer macrophyllum*). Brush/sapling understory includes poison oak (*Toxicodendron diversilobum*), madrone, live oak (*Quercus chrysolepis*), and tan oak. Ground vegetation in this area includes evergreen huckleberry (*Vaccinium ovatum*), sword fern (*Polystichum minitum*), gold-back fern (*Pentagramma triangularis*).

Invasive Plant Species. French broom (*Genista monspessulana*) is an exotic invasive species. It can be found along the highway corridor throughout Richardson Grove. Himalayan blackberry (*Rubus discolor*), Japanese knotweed (*Polygonum cuspidatum*), and yellow star thistle (*Centaurea solstitialis*) are also invasive exotics present within the project limits. A

number of common exotic grass and herb species can also be found along the highway shoulders in Richardson Grove.

Climate. The mean annual precipitation is about 40 to 110 inches. Most is rain at lower elevations and some is snow at higher elevations. Mean annual temperature is about 40° to 53° F. The mean freeze-free period is about 225 to 300 days.

Surface Water. Runoff is rapid and many of the smaller streams are dry by the end of the summer. Natural lakes are absent.

The headwaters of the South Fork Eel River is at Cahto Peak near Laytonville in Mendocino County. From there it flows to its confluence with the mainstem Eel River near Weott in Humboldt County. The river flows mainly from south to north and is approximately 105 miles long. South Fork Eel Basin drains 689 square miles. Elevations within the basin range from 100 feet at the confluence with the Eel River to 4,491 feet at the headwaters at Iron Peak.

The predominant land uses throughout the basin are timber harvest, livestock grazing, and dispersed rural development. Approximately 80% of the basin is privately owned. Highway 101 runs along much of the South Fork Eel River and provides a major thoroughfare for travel.

The South Fork Eel River from its confluence with the mainstem to the Section Four Creek confluence in Mendocino County is designated as a Wild and Scenic River. The section of the river in the section of the river in the project area is designated as "recreational." The basin supports runs of coho salmon *(Oncorhynchus kisutch)* and steelhead trout *(O. mykiss)*, and Chinook salmon *(O. tshawytscha)*.

Three named watercourses cross Route 101 within the project limits. This project will not involve any work in these streams.

PM 1.62, Durphy Creek. This perennial stream supports Coho salmon, Chinook salmon, and Steelhead trout. It flows 2.4 miles from its headwaters northwest of Richardson Grove at an elevation of 1418 feet to its confluence with the South Fork Eel River at an elevation of 594 feet in Richardson Grove. Durphy Creek drains an area of about 2.15 square miles. Durphy Creek flows through a 5 feet-high by 10 feet-wide concrete box culvert under Route 101 in Richardson Grove.

PM 1.78, North Creek. This seasonal stream supports CDFG Species of Concern yellow-legged frog (*Rana boylii*). North Creek flows 0.7 miles from its headwaters west of Richardson Grove at an elevation of about 1278 feet to its confluence with the South Fork Eel River at an

elevation of about 560 feet in Richardson Grove. North Creek drains an area of about 115 acres. This creek flows through a culvert under Route 101.

PM 1.98, Laurel Creek. This seasonal stream is about 3471 feet long as it flows from its headwaters west of Richardson Grove at an elevation of 1260 feet to its confluence with the South Fork Eel River at an elevation of about 457 feet in Richardson Grove. Laurel Creek drains an area of about 127 acres. This creek flows through a culvert under Route 101.

3.2. Special Status Species in Project Area

Rare Plant Species

The project location is in the Garberville USGS 7.5 Minute Quadrangle. The other eight adjacent quadrangles are Piercy, Bear Harbor, Fort Seward, Harris, Noble Butte, Miranda, Ettersburg, and Briceland (9-Quad Area). Although the CNPS Inventory of Rare and Endangered Plants shows a number of rare plants in the 9-Quad Area, floristic surveys conducted on July 26, 2007 found only one rare plant population in the project limits (Appendix G). This population of sticky pea (*Lathyrus glandulosus*) is CNPS List Ranked 4.3 (Limited distribution in CA, watch list; not very endangered in CA); State Rank S3.3 (21-80 occurrences or 3,000-10,000 individuals, or 10,000-50,000 acres); Global Rank G3 (same definition as for State Rank). It is only known to occur in Humboldt & Mendocino Counties and is endemic to California (not found anywhere else in the world). This occurrence is in the middle of the species' range. These plants will be protected by temporary fencing and will not be impacted by project work. No additional rare or listed plant species were found in the project limits. CDFG Biogeographic Data Branch has designated Redwood Forest as a Special Community Type (CDFG 2003). Measures will be included in the design and construction techniques to avoid and minimize direct, indirect, and/or cumulative impacts to Redwood Forest. Consequently, this project will have no substantial adverse impact on this Special Community Type.

Special Status Animal Species

The CNDDB shows a number of special status animal species 9-Quad Area (Appendix F). Richardson Grove contains habitat elements for the species listed below. However, this project activity will have no substantial impact on these species or their habitats.

***Androzous pallidus*, Pallid bat --** The pallid bat is a California Department of Fish and Game Species of Concern. There is a historical record of an individual bat collected in Richardson Grove in 1936 (CNDDB 2007). This species can be found in deserts, grasslands, shrublands,

woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting, the pallid bat is very sensitive to disturbance of roosting sites. Although the large trees in Richardson Grove may provide suitable roosting habitat, these trees will not be impacted by this project. The noise and activity disturbance generated by the construction of this project will not substantially exceed the existing disturbance levels. If night work is required, the lighting will be directed downward toward the roadway and will not substantially exceed the level of disturbance of the existing traffic headlights. Therefore, this project will not adversely impact pallid bats or their habitat.

***Myotis yumanensis*, Yuma myotis and *Myotis californicus*, California Myotis bats** -- These bat species are common and widespread in California. They hibernate in the winter, making short migrations from summer areas to suitable hibernacula. During the warm months, they begin foraging for insects around dusk. Peak feeding activity for this species is 1-2.5 hours after sunset. In Richardson Grove, a 132" DBH, hollow redwood tree about 25 feet from the edge of the roadway near PM 1.49 (STA 79+20) provides a maternity roost for a colony of Yuma myotis. Here, female bats each give birth to a single pup from May to July. The young bats are dependant on their mothers for their first six weeks. If overly disturbed, the mother bats may abandon the roost. The tree's use by bats is public knowledge. It is fenced to discourage close proximity disturbance. To avoid excessive disturbance to this maternity roost during the time when dependent pups are likely to be present, there will be no light plants within 100 feet of the roost tree (PM 1.48-1.52, STA 78+20 to 80+20) during any night construction. Due to high daytime traffic levels, paving may be done at night. However, the additional lighting mounted on the paving equipment will not substantially exceed the level of disturbance of the existing traffic headlights. Excavation and cold planing will be done on the roadway within 25 feet of the roost tree prior to repaving. Excavation, cold planing, paving, and construction equipment activities will take place within 100 feet of the roost tree for no more than 2-3 hours for a period of 3-4 days. Therefore, this project is not likely to adversely impact these bats or their habitat.

***Martes pennanti pacifica*, Pacific fisher** – This species is a federal candidate for listing and a California Department of Fish and Game Species of Concern. The fisher requires intermediate to large-tree stages of coniferous forests & deciduous-riparian areas with high percent canopy closure. They require large areas of mature, dense forest. Although Richardson Grove may provide some suitable elements of Pacific fisher habitat, the noise and activity disturbance generated the current levels of human activity in this area make it low value as fisher habitat. The approximately ¼ acre of tanoak-dominated woodlands that will be cleared for cut-and-fill for this project are suitable as Pacific fisher dispersal and foraging habitat. Most of this area will be replanted in kind, and an additional 1/2 acre of degraded habitat in the park boundary

will be recontoured, planted, and restored. The additional construction disturbance of this project will not substantially exceed the existing disturbance levels. If night work is required, the lighting will be directed downward toward the roadway and will not substantially exceed the level of disturbance of the existing traffic headlights. Therefore, this project will not have a substantial adverse impact on Pacific fishers or their habitat.

***Brachyrampus marmoratus*, Marbled murrelet** – A federally threatened and state endangered species, the marbled murrelet nests in mature Douglas-fir and redwood forest within 35 miles of the ocean. The project area is within Designated Critical Habitat for this species. Although the project will not remove any old growth redwood trees (for the purposes of this document, the definition of old growth redwood would be trees over 30 inches in diameter at breast height (4.5 feet above the ground level)), these mature redwood trees in Richardson Grove are suitable for MAMU nesting. Measures will be implemented to minimize root impacts to old growth redwood trees. The noise and activity disturbance generated by the construction of this project will not substantially exceed the existing disturbance levels. However, the temporary noise, potential night work, and activity associated with project construction, is likely to disturb murrelets that are nesting in the area. The project will not adversely modify MAMU Critical Habitat. USFWS determined that construction activities represent a relatively short term disturbance that is expected to have negligible influence on breeding performance of MAMU. MAMU migrate to and from nest sites at dusk and dawn. To minimize adverse noise impacts to migrating marbled murrelet during the breeding season (between March 24 and September 15) there will be no construction activity in the morning for a three-hour period starting one hour before sunrise until two hours after sunrise, then in the evening no construction activity in the three-hour period starting two hours before sunset until one hour after sunset. Therefore, from March 24 - September 15 there can be night work starting one hour after sunset and ending one hour before sunrise. From September 14 to March 23 there will be no restrictions on night work.

***Haliaetus leucocephalus*, Bald eagle** – Bald eagles are state listed. They nest and roost in large diameter trees or snags near large water bodies where prey is abundant. Although the large trees in Richardson Grove may provide some elements of suitable bald eagle habitat, these trees will not be substantially impacted by this project. The noise and activity disturbance generated by the construction of this project will not substantially exceed the existing disturbance levels. If night work is required, the lighting will be directed downward toward the roadway and will not substantially exceed the level of disturbance of the existing traffic headlights. Therefore, this project will not adversely impact bald eagles or their habitat.

***Pandion haliaetus*, Osprey** -- A California Department of Fish and Game Species of Concern, the osprey can be found near ocean shores, bays, fresh-water lakes, and larger streams. They build large nests built in treetops within 15 miles of good fish-producing bodies of water. There is an active osprey nest in Richardson Grove about 250 feet east of Route 101 at PM 1.9 (east of the state Park Maintenance shop [pers. communication, Tim Wallace, Park Ranger]) This nest is outside the project limits. The noise and activity disturbance generated by the construction of this project will not substantially exceed the existing disturbance levels. If night work is required, the lighting will be directed downward toward the roadway and will not substantially exceed the level of disturbance of the existing traffic headlights. Therefore, this project will not adversely impact ospreys or their habitat.

***Strix occidentalis caurina*, Northern spotted owl** -- Federally listed as threatened, the Northern spotted owl (NSO) inhabits mature forests, with large conifers, and wooded canyons. The project area is not within proposed or designated critical habitat for this species. The project area has some elements of habitat suitable for the NSO. However, the trees that will be impacted by this project are at edges of stands, have less than 60% canopy cover, are adjacent to the highway, and have low value for owl nesting habitat. The approximately ¼ acre of tanoak-dominated woodlands that will be cleared for cut-and-fill for this project are suitable as NSO dispersal and foraging habitat. Their quality, as such, however, is reduced by close proximity to the highway, businesses, residences, and campgrounds. Nonetheless, these areas will be replanted in kind. If night work is required, the lighting will be directed downward toward the roadway and will not substantially exceed the level of disturbance of the existing traffic headlights. Although there are currently no known NSO nest sites within ¼ mile of the project area, there is suitable nesting habitat closer to the project site. If owls were to nest closer, the temporary noise, night work, and activity associated with project construction, may disturb them.

***Actinemys marmorata*, Western Pond Turtle** -- A California Department of Fish and Game Species of Concern, the western pond turtle has been found in the South Fork Eel River and its tributaries in the vicinity of Richardson Grove State Park. These turtles can be found in permanent or semi-permanent freshwater aquatic habitats. During the spring or early summer, female pond turtles lay eggs in depressions they dig in sandy banks or on moist stream banks. Nest sites are typically within about 300 feet of a stream (Nussbaum et al. [1983]).

All of the culvert work in this project involves small, seasonal drainages-- unsuitable habitat for pond turtles. Trenching for culvert replacement will be done from the paved roadway. Any impact to pond turtles will be minor and temporary. The additional noise and activity

associated with this project will not substantially exceed the existing levels. This project will not adversely impact the Western pond turtles or their habitat.

***Rana boylii*, Foothill yellow-legged frog --** A California Department of Fish and Game Species of Concern, the foothill yellow-legged frog can be found in partly shaded, shallow streams & riffles with a rocky substrate in a variety of habitats. These frogs require cobble-sized substrate for egg laying. The CNDDB shows a 2005 observation of foothill yellow-legged frogs in North Creek within Richardson Grove State Park just west Route 101. North Creek flows through a 48" culvert under Route 101 at PM 1.78 within the project limits. Work was recently completed on this culvert. This project is planning no additional work in North Creek. There will be some work on the roadway shoulders adjacent to the culvert to control erosion. This work will not adversely impact the foothill yellow-legged frog or its habitat.

***Rhyacotriton variegatus*, Southern torrent salamander –** Inhabiting coastal redwood, Douglas-fir, mixed conifer, montane riparian, and montane hardwood-conifer habitats, and old growth forest in cold, well-shaded, permanent streams and seepages, the southern torrent salamander is a California Department of Fish and Game Species of Concern. The areas near the inlets/outlets of the four 18-inch diameter culverts that are being lengthened may have habitat suitable for southern torrent salamanders. However, the disturbance at these areas will be less than 500 square feet at each culvert and the outlets will be returned to their original contours. There will be negligible permanent habitat disturbance. The outlet of the culvert at PM 1.18 is perched on a steep slope and allows salamanders to move downstream only. This will not change; it will allow only one-way mobility. The culvert at PM 1.28 will be replaced. It will outlet at grade as it does now, so will not be a barrier to salamander mobility. The third culvert, at PM 1.34 will be replaced; its outlet is (and will remain) perched about one foot making it difficult for salamanders to move upstream. The outlet of the culvert at PM 1.35 will be replaced. It will (and currently does) outlet at grade so it will not be a barrier to salamander mobility. The culvert at 2.10 is ephemeral, flows only during rain storms and is not suitable torrent salamander habitat. Any additional impact to southern torrent salamander will be minor and temporary.

***Oncorhynchus mykiss*, Northern California steelhead**-- Federally listed as threatened and a California Department of Fish and Game Species of Concern, the Northern California steelhead spends its adult life in the Pacific Ocean, but spawns in coastal streams and rivers, over gravel beds. There is suitable habitat present for this species in Durphy Creek, which flows through a concrete box culvert under Route 101 within the project limits. No work will be done within the bed, on the bank or in the channel of Durphy Creek. No riparian vegetation

will be removed. Therefore, this project will not adversely impact northern California steelhead or their habitat.

***Oncorhynchus kisutch*, Coho Salmon**—Federally and state listed as threatened, the Northern California Coho salmon spends its adult life in the Pacific Ocean, but spawns in coastal streams and rivers, over gravel beds. There is suitable habitat present for this species in Durphy Creek, which flows through a concrete box culvert under Route 101 within the project limits. No work will be done within the bed, on the bank or in the channel of Durphy Creek. No riparian vegetation will be removed. Therefore, this project will not adversely impact northern California Coho salmon or their habitat.

***Oncorhynchus tshawytscha*, Chinook Salmon**—Federally listed as threatened the California Coastal Chinook salmon spends its adult life in the Pacific Ocean, but spawns in coastal streams and rivers, over gravel beds. There is suitable habitat present for this species in Durphy Creek, which flows through a concrete box culvert under Route 101 within the project limits. No work will be done within the bed, on the bank or in the channel of Durphy Creek. No riparian vegetation will be removed. Therefore, this project will not adversely impact Chinook salmon or their habitat.

***Acipenser medirostris*, Green Sturgeon**— a Federal Endangered Species Act Species of Concern - the northern DPS of green sturgeon includes coastal spawning populations from the Eel River north, to the Klamath and Rogue Rivers. Green sturgeon are known to occupy the Eel River and its tributaries.

The green sturgeon migrates up rivers to spawn between late February and late July. The spawning period is March-July, with a peak from mid-April to mid-June (Emmett et al. 1991). Juveniles migrate out to sea when they are 1 to 4 years old, although a majority apparently leave as yearlings (USFWS 1982). Green sturgeon are known to forage in estuaries and bays ranging from San Francisco Bay to British Columbia.

The southern distinct population segment (DPS) of green sturgeon is federally threatened; with the only known spawning population in the Sacramento River. On October 10, 2009, NOAA Fisheries designated critical habitat for the threatened Southern DPS of North American green sturgeon pursuant to Section 4 of the Endangered Species Act of 1973. For the Southern DPS, critical habitat encompasses coastal bays and estuaries from Monterey Bay, California in the South to the Strait of Juan de Fuca, Washington in the North.

Although the Northern DPS green sturgeon may be present in the Eel River (and South Fork Eel River). The Eel River and its tributaries are not included as critical habitat. There is

suitable spawning habitat in the South Fork Eel River adjacent to Richardson Grove. No work will be done within the bed, on the bank, or in the channel of South Fork Eel River. No riparian vegetation will be removed. Therefore, this project will not adversely impact green sturgeon or their critical habitat.

Chapter 4. **Project Impacts**

4.1. Construction Noise

The noise of construction is not expected to substantially exceed ambient traffic noise (traffic background noise; Appendix E). Noisy equipment will include jack hammers, concrete saws, and concrete grinders as well as the back-up warning signal on heavy equipment. Because the project area already experiences high noise level from vehicular traffic, the additional noise of construction noise will have no sibstantial impact on breeding birds in the project area.

4.2. Construction Activity

Richardson Grove State Park has year-round campgrounds and foot trails, and is subject to a high level of vehicle and pedestrian traffic in the vicinity of the project area. The construction work for this project will not substantially increase activity in the park. Although potential night work would be a minor source of temporary disturbance, there will be no substantial effect to special status species due to increased human activity levels.

4.3. Tree Removal

Approximately ¼ acre of Tanoak Series (Sawyer & Keeler-Wolf 1995) vegetation community will be cleared for cut-and-fill for this project. These tanoak woodlands are NSO dispersal and foraging habitat and constitute one of the Primary Constituent Elements (PCEs) of MAMU Critical Habitat. Their quality as such, however, is reduced by close proximity to the highway, businesses, residences, and campgrounds. Although much of this area will be replanted in kind, there will be permanent habitat loss from the 200-foot long slope cut at the retaining wall. There will be temporal habitat loss in areas that are replanted since it may take ten years or more for the trees to reach the size of the ones that are going to be removed. Approximately 54 trees will be removed. About half of these are tanoaks, followed in abundance by Douglas-firs with diameter at breast height (diameter measured at 4.5 feet above ground line [DBH]) ranging from 5 inches to 24 inches), redwoods (with DBH's ranging from 4 inches to 16 inches) and two big leaf maples. All trees are listed in Appendix C.

4.4. Root Impacts to Old Growth Redwoods

This work will involve the structural root zones of approximately 66 old growth redwood trees in Richardson Grove State Park ranging in diameter from 3 feet to 18 feet DBH as listed below (rounded to the nearest foot). There will also be work within the structural root zone of three old growth trees (3', 4', and 5" DBH) north of the park at the proposed retaining wall.

3 - 18-15 feet DBH	3 - 11 feet DBH	15 - 8 feet DBH	3 - 5 feet DBH
2- 13 feet DBH	5 - 10 feet DBH	11 - 7 feet DBH	10 - 4 feet DBH
3 - 12 feet DBH	3 - 9 feet DBH	6 - 6 feet DBH	5- 3 feet DBH

Trees are considered old growth if their DBH is 36 inches or greater (California Department of Parks and Recreation 2005). The Structural Root Zone of a tree is the circular area with the tree trunk at the center and a radius equal to 3 times the diameter of the tree trunk measured at breast height (California Department of Parks and Recreation 2005). Additional paving and the placement of shoulder backing could cause soil compaction and disturbance within the structural root zones of old growth redwoods. Studies have shown that compaction of the soils within the root zone can have an adverse effect on these trees (Arnold 1975). Adverse effects to old growth trees may be a significant impact to this unique natural community.

4.5. Culvert Work

The improvement of five culverts (PM 1.18, 1.28, 1.34, 1.35, and 2.10) will involve placement of new inlets, extending or replacing the crossdrains, and/or installing new outlets. This will entail temporary soil and vegetation disturbance in a 20 ft X 20 ft (400 square feet) area at both the inlet and outlet at each culvert. Additional fill will be added to the uplands adjacent to the roadway shoulders perpendicular to the culverts.

4.6. Cumulative Impacts

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this project. An assessment of cumulative effect examines the collective impacts posed by individual projects. Cumulative impacts can result from individually minor, but collectively substantial impacts that take place over time.

Cumulative impacts to natural resources in the general project vicinity may result from projects that degrade habitat and species diversity through displacement, habitat fragmentation disruption of migration corridors, changes habitat quality, and introduction or promotion of predators. CEQA Guidelines, Section 15130, describes when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts, under CEQA, can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts, under NEPA, can be found in 40 CFR, Section 1508.7 of the CEQ Regulations.

Environmental Consequences

The area of cumulative impacts to the natural environment for this project includes the entire Eel River watershed (South, Middle, and North forks of the Eel River). This encompasses portions of Routes 36, 162 and 101 in Humboldt and Mendocino Counties. Impacts to old growth redwood forest and impacts to listed species are the principal environmental effects that require a cumulative impact analysis.

About 1/2 the land in the Eel River watershed basin is primarily held in private ownership. Private timber companies own over 1/3 of the land. Less than 5% of the area is public property. In the proximity of the proposed project, the majority of old growth redwood forest areas are protected and managed by the State Park. Immediately north and south of the proposed project, there is some privately owned mature redwood forest, but the area has low potential for development due to the steep terrain. There are no known large developments being proposed for the area. Although the impacts of ongoing timber harvest and other extractive land use throughout the watershed may be considerable, the additional impact of this project will be negligible, consisting of temporary construction impacts including noise and visual disturbance. Impacts to vegetation from areas of proposed cut and fill will be fully mitigated by the restoration of 0.56 acre of abandoned roadway within the Park.

Confusion Hill

With the exception of the Confusion Hill Realignment project, the projects listed above were improvements to the existing roadway and did not result in redwood tree removal or other substantial adverse impacts to redwoods or listed species. The Confusion Hill project did remove redwood trees. The four largest redwoods removed ranged from 35 inches to 39 inches in diameter. The Confusion Hill project was not within designated marbled murrelet critical habitat. Surveys conducted in 2004 and 2005 did not detect the presence of any marbled murrelet within or immediately adjacent to the project limits. While there were northern spotted owls detected in the survey conducted in 2004 and 2005, the nearest nest was ¼ mile from the project limits. The Confusion Hill project was the only project from the list above that required any mitigation.

The proposed project at Richardson Grove will not result in any removal of old growth redwood trees. Within Richardson Grove State Park 2 redwood trees are proposed for removal ranging in size from 6 to 7 inches. It is expected that the project would result in some impacts to the roots of larger redwood trees within the Park, but these impacts are not anticipated to be substantial adverse impacts with the proposed minimization measures in place.

Chapter 5. Mitigation and Minimization Measures

Equipment staging/storage areas will be on the paved roadway or on existing unvegetated gravel/paved pullouts. There will be no staging in sensitive natural communities. No heavy equipment will be staged or parked within the dripline of mature trees in unpaved areas. Near drainages, measures will be taken to assure that no construction-related material can enter watercourses. Construction techniques will be employed that minimize disturbance to the natural environment. Avoidance and minimization measures will be taken to assure there is no additional direct and indirect impact to the natural environment. During and after construction sediment control measures will be employed to assure that no turbid water is discharged into receiving waters.

5.1. Marbled Murrelet Work Window

To minimize adverse noise impacts to migrating marbled murrelet during the breeding season (between March 24 and September 15) there will be no construction activity in the morning for a three-hour period starting one hour before sunrise until two hours after sunrise, then in the evening no construction activity in the three-hour period starting two hours before sunset until one hour after sunset. Therefore, from July 1 - September 15 there can be night work starting one hour after sunset and ending one hour before sunrise. After September 15 (until March 1) there will be no restrictions on night work.

5.2. Tree and Shrub Removal

To avoid impacts to nesting migratory birds, tree and shrub removal will take place between September 30 and March 1 before construction begins. If this is not feasible, a preconstruction bird survey will be conducted to assure that birds are not nesting in any of the vegetation to be cleared. This survey will be conducted by a qualified biologist not more than 7 days prior to the vegetation removal. If birds are nesting, the nest site and all vegetation within a 2-foot radius of the nest will be designated an Environmentally Sensitive Area and the vegetation cannot be removed until nesting is complete. All work in drainages will take place between June 1 and October 15 to avoid sediment discharge and to control erosion.

5.3. Revegetation

After construction, the 2:1 cut-slope area between PM 1.35 and PM 1.37 will be replanted with the same species of trees, shrubs and ferns that were present in the disturbed area prior to construction. After tree removal, but prior to excavation of the slope-cut areas, the upper 6 to 12 inches of native soil (topsoil) will be set aside and then replaced to provide nutrients and a seed bank for regrowth. All trees and shrubs removed will be put into a chipper and distributed onto the finished cut-slope as mulch. All areas of disturbed soil will be further stabilized with redwood duff mulch after planting if needed. California State Parks and Recreation Commission Statement of Policy (Policy 11.4), Preservation of Vegetative Entities, (Neef 2003) states: "In order to maintain the genetic integrity and diversity of native California plants, all transplant and propagation in the North Coast Redwoods District will be from local populations (preferably from within the same stand). For the purpose of this policy, local is defined as being from the immediate project area (as close as possible, but generally less than one mile)." On the slope cut areas Caltrans will plant the salvaged trees, shrubs, and ferns in a random arrangement on approximately 3 to 10-foot centers. Additional plantings of local native species will be implemented as needed to revegitate all disturbed areas. The planting will take place after November 15 (after the onset of the rainy season) to improve plant survival. After tree removal, but prior to excavation of the slope-cut areas, the upper 6 to 12 inches of native soil (topsoil) will be set aside and then replaced to provide nutrients and a seed bank for regrowth. All larger trees and shrubs removed will be put into a chipper and distributed onto the finished cut-slope as mulch. All areas of disturbed soil will be further stabilized with redwood duff mulch after planting if needed. The plant establishment period will be three years with a 75% survival rate.

A 0.56- acre area of an abandoned segment of Route 101 within the park boundries is still designated as a Caltrans transportation easement. This designation will be relinquished and the area will be turned over to the management of California Department of Parks and Recreation. This area has experinced some recolonization of surrounding vegetation. However, the compacted soil has impeded plant establishment. To offset the loss of vegetated area due to the project's roadway widening, an unvegetated portion of this 0.56-acre area will be de-compacted to prepare the soil for planting. The area will then be planted with locally appropriate native trees and shrubs.

5.4. Rare Plants

Botanical surveys were conducted during different times of year to capture the appropriate season for detecting any rare plants in this area. A preliminary floristic survey was conducted by the Caltrans biologist, Gail Popham, on October 22, 2007. On July 26, 2007 the Caltrans

biologist accompanied by a Caltrans botanist, Kim Hayler, conducted a summer floristic survey. At that time, the Caltrans botanist found only one rare plant population in the project limits. This population of sticky pea (*Lathyrus glandulosus*) is CNPS List Ranked 4.3 (Limited distribution in CA, watch list; not very endangered in CA); State Rank S3.3 (21-80 occurrences or 3,000-10,000 individuals, or 10,000-50,000 acres); Global Rank G3 (same definition as for State Rank). It is only known to occur in Humboldt & Mendocino Counties and is endemic to California (not found anywhere else in the world). This occurrence is in the middle of the species' range. These plants will protected by temporary fencing and will not be impacted by project work (Appendix G). A late-season botanical survey conducted on February 15, 2008 found no additional rare or listed plant species in the project limits.

5.5. Sediment and Erosion Control

To maintain water quality and to minimize the movement of soils and sediment both into and within the project watercourses, effective erosion and pollution control measures will be developed and implemented. It is expected that minor amounts of sediment discharge due to this project are unavoidable. However, Caltrans will ensure that applicable Best Management Practices (BMPs) are used to stabilize all bare soil areas over both the short-term and long-terms and to minimize adverse effects to water quality, aquatic habitat and listed fishes. BMPs include treatment controls, soil stabilization practices, mitigation measures, scheduling, and contract Standard Special Provisions (SSP). Any debris and sediment will be contained within the work site, or diverted into a sedimentation basin before being returned to any receiving waters. When construction is complete, watercourse banks will be returned to natural contours. The upper six inches of duff and excavated material will be side cast and then replaced, and, if necessary, seeded and planted with local native plant species. For all areas disturbed by construction, Caltrans will monitor all revegetation efforts for five years and maintain (watering and weeding) revegetated areas for three years. All other cut-and-fill areas will be replanted in kind. Excess material excavated from the work site will be disposed of off-site at an approved disposal site away from any stream course or reused as fill on-site. Additional BMPs will include:

- Silt fences and fiber rolls will be placed to control sediment discharge; and minimal sediment will be released into receiving waters.
- Measures will be taken to prevent construction equipment effluents from contaminating soil or waters in the construction site;
- Excavated spoils will be controlled to prevent sedimentation to the stream;

- Redwood duff mulch, silt fences, and fiber rolls will be applied to exposed soil areas for over-wintering protection from erosion.
- The contractor will be require to develop and implement site-specific best management practices, a Water Pollution Control Plan, and emergency spill controls.
- No concrete washings or water from concrete will be allowed to flow into waterways. No concrete will be poured within flowing water in the waterways.
- Water that has come into contact with setting concrete will be pumped into a tank and disposed of at an approved disposal site.

5.6. Staging Areas

The primary staging areas will be in pullouts to the immediate north and south of the Project Area along the Route 101 roadway. The contractor may arrange additional staging areas on private property nearby. At the end of each work shift, any vehicles stored within 150 feet of the Ordinary High Water (OHW) level of drainage facilities and watercourses will have containment placed beneath the drip zone when left overnight. Leaks will be immediately controlled with absorbent mats and repaired before the equipment operates again. Clean up of petro-chemical drips will occur as soon as they are observed. All equipment shall be monitored daily for chemical leakage. To offer protection from storm events Caltrans shall require monitoring for storm events and moving equipment accordingly.

5.7. Additional Measures

Due to the uniqueness of this natural community, measures will be taken to avoid and minimize impacts. Daily work windows will be observed. Disturbed areas will be replanted. To mitigate for potential structural root zone impacts to old growth redwoods and potential impacts to elements of marbled murrelet Critical Habitat Caltrans will implement out-of-kind mitigation. In coordination with California Department of Parks and Recreation, Caltrans will fund the replacement and installation of 30 dumpsters, 27 recycle bins, 175 food lockers, 79 drain grates, and 13 trash containers near parking, picnic and camping areas in Richardson Grove State Park with corvid-proofing to enhance habitat for marbled murrelet and other nesting migratory birds in Richardson Grove.

Nest predation by corvids is the primary cause of marbled murrelet nest failure. Common ravens (*Corvus corax*), American crows (*Corvus brachyrhynchos*), and Steller's jays (*Cyanocitta stelleri*) are known to take both eggs and chicks at the nest. Studies have suggested

that corvid density is especially elevated in campgrounds. These species often scavenge human garbage, discarded food, and spilled food around picnic tables and other outdoor locations (Liebezeit and George 2002). Liebezeit and George (2002) found that reduction of food sources adjacent to areas of listed species activity by using corvid-proof garbage cans, can be effective discouraging corvids (examples: http://www.bearsaver.com/CustomPanelDesigns.htm).

Before activities associated with vegetation removal and road construction (including culvert installation and wall construction) begin, a qualified biologist approved by USFWS will conduct a training session for all personnel. At a minimum, the training will include a description of the marbled murrelet and northern spotted owl and their habitats, a description of the format of the USFWS Biological Opinion, the general measures that are being implemented to conserve the marbled murrelet and northern spotted owl as they relate to the project, and the boundaries within which the project may be accomplished. Brochures, books and briefings may be used in the training session, provided that a qualified person is on hand to answer any questions.

Caltrans will designate a person(s) to monitor on-site compliance with all minimization measures, and who will have the authority to halt any action that might result in impacts that exceed the levels anticipated by the Caltrans and the USFWS during review of the proposed action. If work is stopped, the USFWS will be notified immediately by the Caltrans project biologist or on-site monitor. A person designated to monitor on-site compliance with all minimization measures will be present on-site during all project activities.

During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of daily. Following construction, all trash and construction debris will be removed from work areas.

Surveying potential breeding habitat to identify potential nesting areas is identified as a recovery action in the marbled murrelet recovery plan (U.S. Fish and Wildlife Service 1997). Therefore, as a marbled murrelet recovery measure, a qualified biologist will conduct protocol surveys for marbled murrelets in areas that contain potential marbled murrelet nesting habitat within Richardson Grove. After the surveys are completed, the results will be reported to the USFWS. Caltrans will follow the Pacific Seabird Group's Methods for Surveying Marbled Murrelets in Forests: A Revised Protocol for Land Management and Research (Evans Mack et al. 2003).

Design modifications and special construction techniques will be included such the use of an air spade or hand work for excavation within the structural root zone of old growth redwood trees in Richardson Grove state Park. In addition irrigation will be provided during the summer to redwoods with excavation in their (greater than 30" DBH) structural root zone. Other measures

include the removal of invasive alien plant species within Richardson Grove State Park for a four year period.

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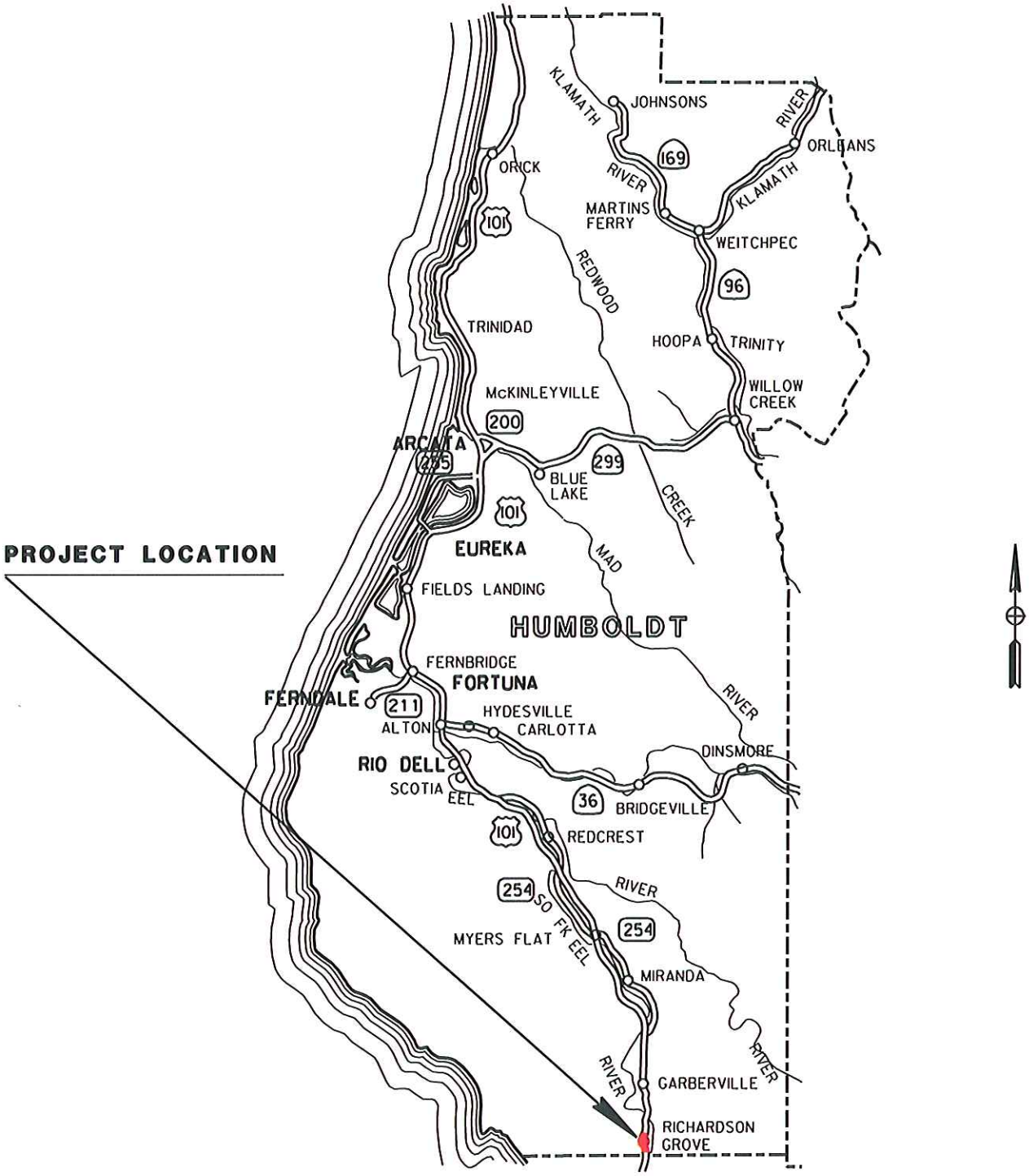
USFWS –U. S. Fish and Wildlife Service. Arcata Fish and Wildlife Office, Species List Search http://www.fws.gov/arcata/specieslist/

Appendices

APPENDIX A. LOCATION MAP (1 of 3).

01-HUM-101-PM 1.1/2.2
EA 01-46480

Richardson Grove
Operational Improvements

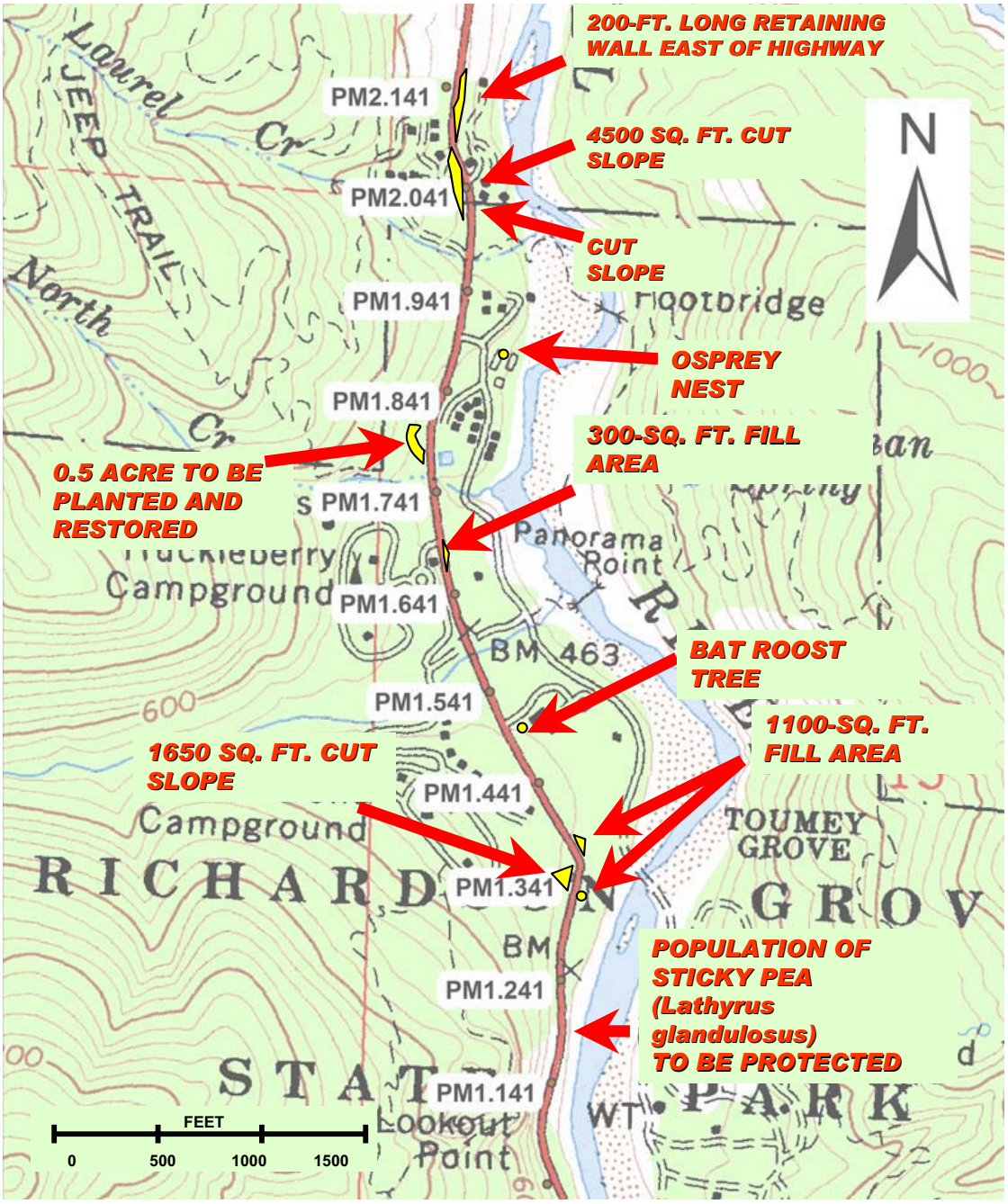


LOCATION MAP

location map.dgn 5/13/2008 2:18:04 PM

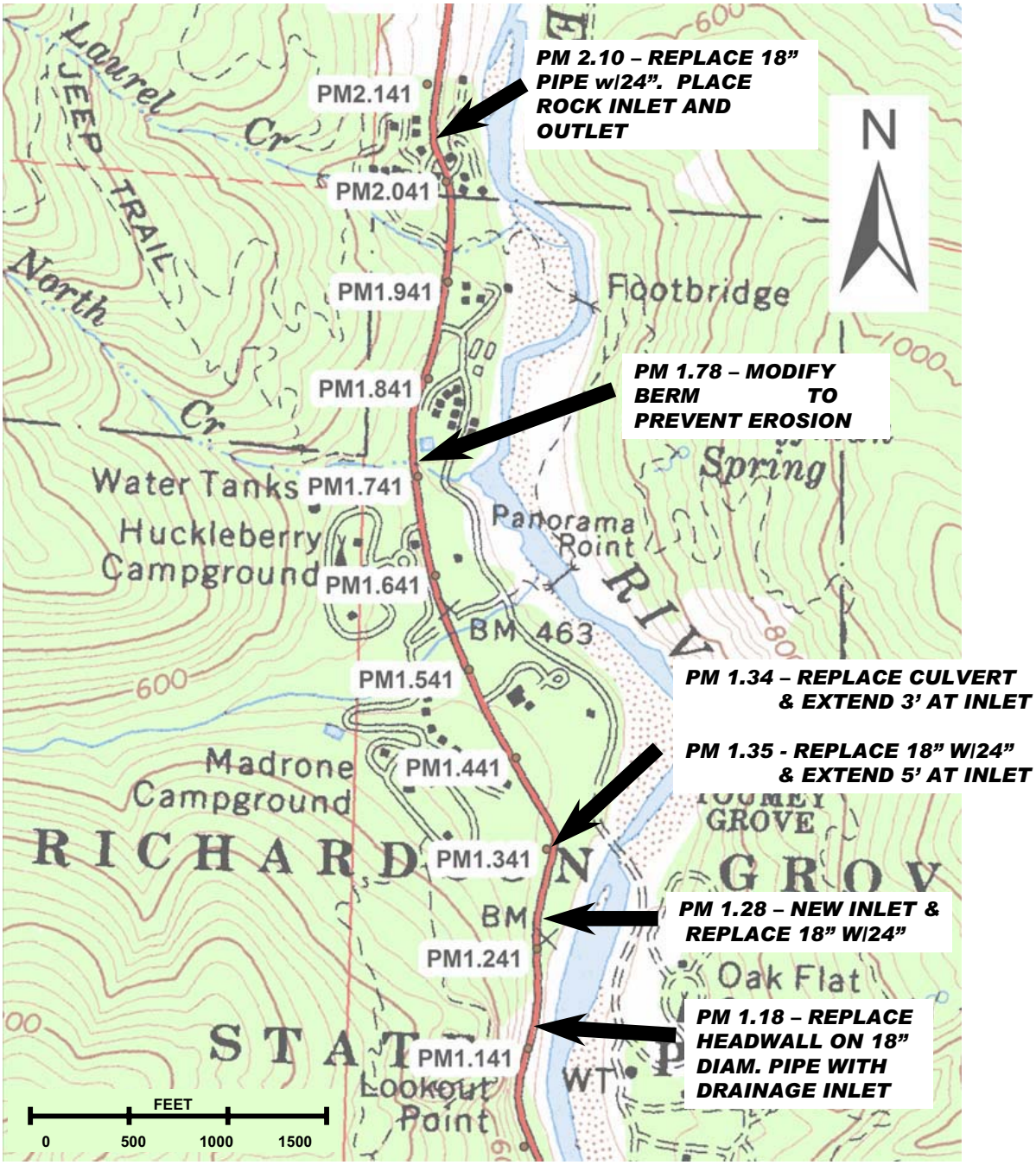
APPENDIX A . Area map with project overview (2 of 3).

Garberville USGS 7.5 Minute Quadrangle
T5S, R3E, S 11 & 12



APPENDIX A. Culvert locations (3 of 3).

Garberville USGS 7.5 Minute Quadrangle
T5S, R3E, S 11 & 12



Appendix B. Project Plans

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.1 - 2.2	1	20

FOR DESIGN STUDY ONLY

REGISTERED CIVIL ENGINEER DATE

FOR DESIGN STUDY ONLY

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Printed: 14-OCT-2008

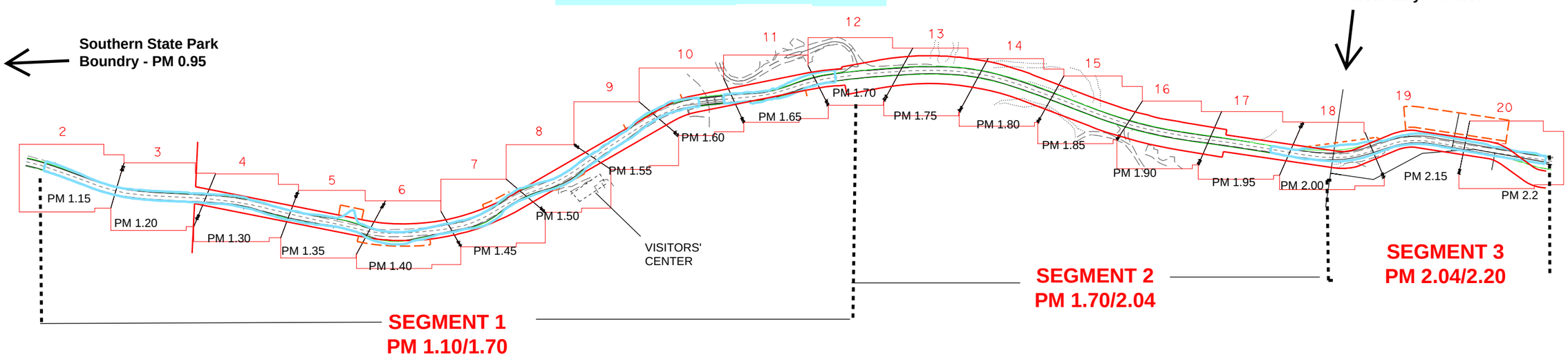
LEGEND:

LINES	DESCRIPTION
	Proposed Edge of Pavement (EP)
	Proposed Edge of Traveled Way (ETW)
	Proposed Centerline (CL)
	Existing EP
	Existing ETW
	Existing CL
	Bridge
	Proposed Right of Way
	Existing R/W
	APN Map Lines
	Existing Hydraulics
	Contours
	CUT and FILL Line
	Tree

ROOT IMPACTS	(87 total)		
72" RW	90" RW	138" RW	36" RW
90" RW	19" ALDER	82" RW	84" RW
17" DF	42" RW	102" RW	72" RW
12" OTHER	19" RW	144" RW	120" RW
96" RW	132" RW	144" RW	60" RW
18" RW	54" RW	84" RW	156" RW
48" RW	120" RW	132" RW	182" RW
84" RW	19" RW	84" RW	216" RW
48" RW	18" RW	96" RW	120" RW
48" RW	108" RW	36" RW	108" RW
12" DF	48" RW	72" RW	48" RW
16" DF	72" RW	96" RW	66" RW
180" RW	96" RW	96" RW	90" RW
96" RW	94" RW	78" RW	48" RW
24" DF	43" RW	96" RW	30" RW
6" OAK	96" RW	48" RW	34" RW
78" RW	108" RW	90" RW	46" RW
24" DF	132" RW	30" RW	48" RW
16" DF	84" RW	36" OTHER	36" DF
115" RW	84" RW	96" RW	36" RW
13" ALDER	74" RW	50" RW	60" RW
86" RW	78" RW	120" RW	

TREES REMOVED		(54 total)
18" ALD	10" TO	8" DF
6" TO	10" TO	10" TO
12" DF	7" TO	16" RW
6" TO	12" DF	16" DF
6" TO	12"TO	6" RW
14" DF	5" TO	4" RW
17" BLM	12" DF	18" DF
22" DF	24" TO	12" DF
22" BLM	18" DF	18" DF
6" RW	7" TO	23" DF
11" DF	10" TO	8" TO
15" DF	12" TO	19" RW
4" TO	8" TO	8" DF
12" DF	4" TO	10" TO
14" DF	10" TO	10" TO
7" RW	10 " TO	18" DF
6" OAK	8" TO	
16" TO	14" DF	
10" TO	4" DF	

TREES
DOUGLAS FIR (DF)
BIG LEAF MAPLE (BLM)
LIVE OAK (OAK)
REDWOOD (RW)
TANOAK (TO)
RED ALDER (AL)
(OTHER)



FOR DESIGN STUDY ONLY

1" = 375'

EA 46480x

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DATE REVISED 14-OCT-2008

LAST REVISION | DATE PLOTTED = 14 OCT 2008

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.1 - 2.2	2	20

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REGISTERED CIVIL ENGINEER DATE

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PLANS APPROVAL DATE

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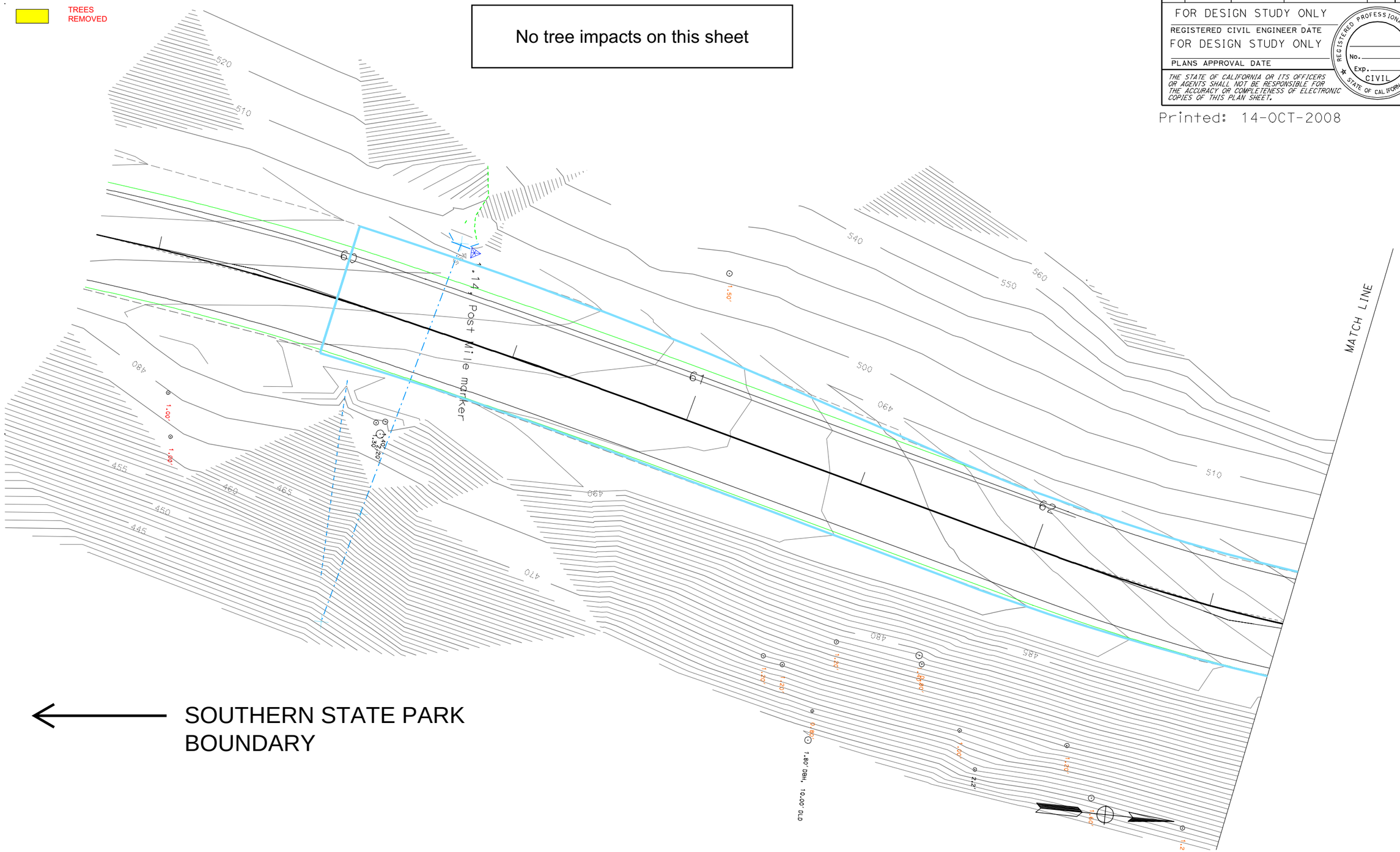
ROOT IMPACTS

TREES REMOVED

No tree impacts on this sheet



SOUTHERN STATE PARK BOUNDARY

FOR DESIGN STUDY ONLY

1" = 25'

EA 46480x

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.1 - 2.2	3	20

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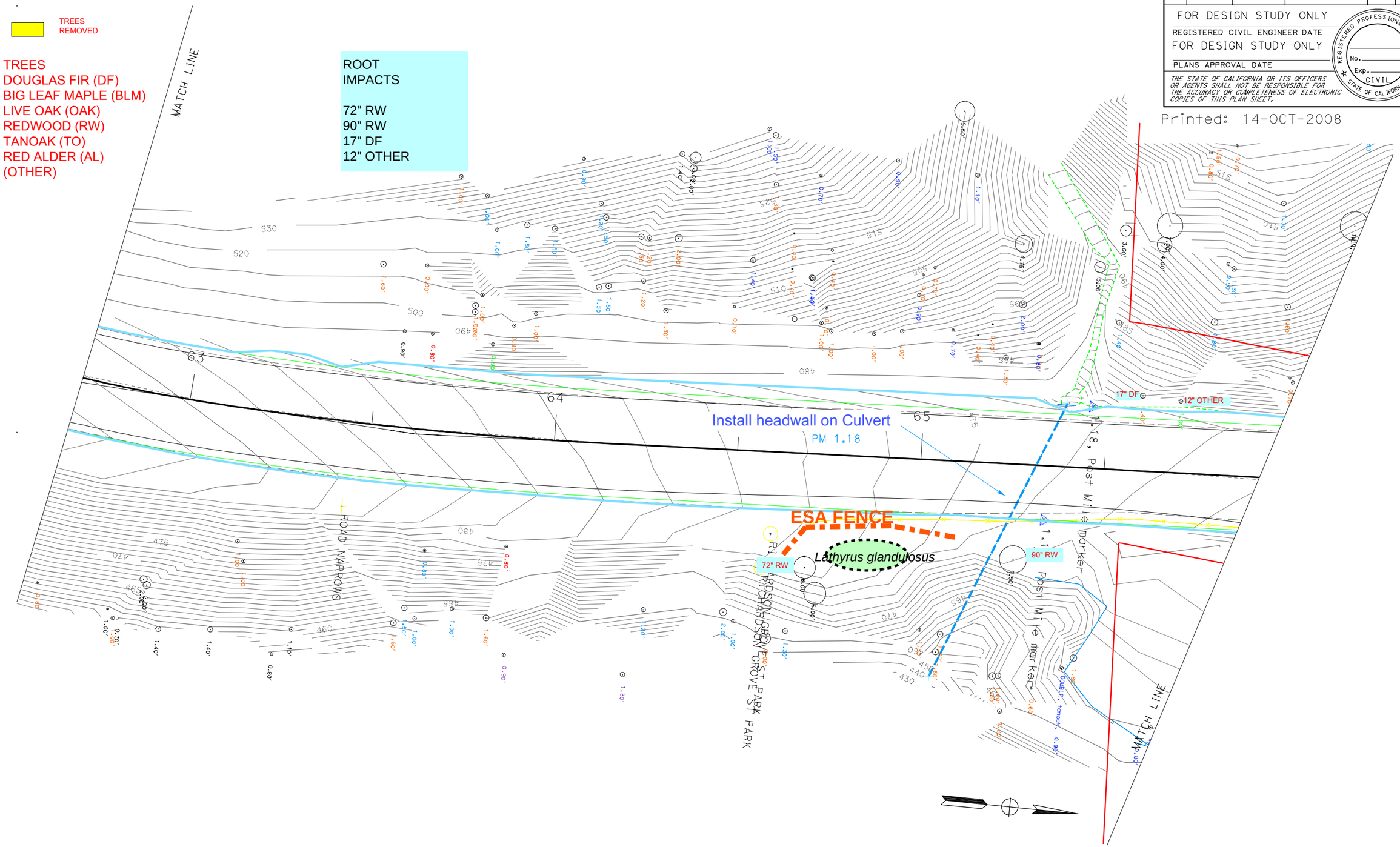
ROOT IMPACTS

TREES REMOVED

TREES
DOUGLAS FIR (DF)
BIG LEAF MAPLE (BLM)
LIVE OAK (OAK)
REDWOOD (RW)
TANOAK (TO)
RED ALDER (AL)
(OTHER)



FOR DESIGN STUDY ONLY

1" = 25'

EA 46480x

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.1 - 2.2	4	20

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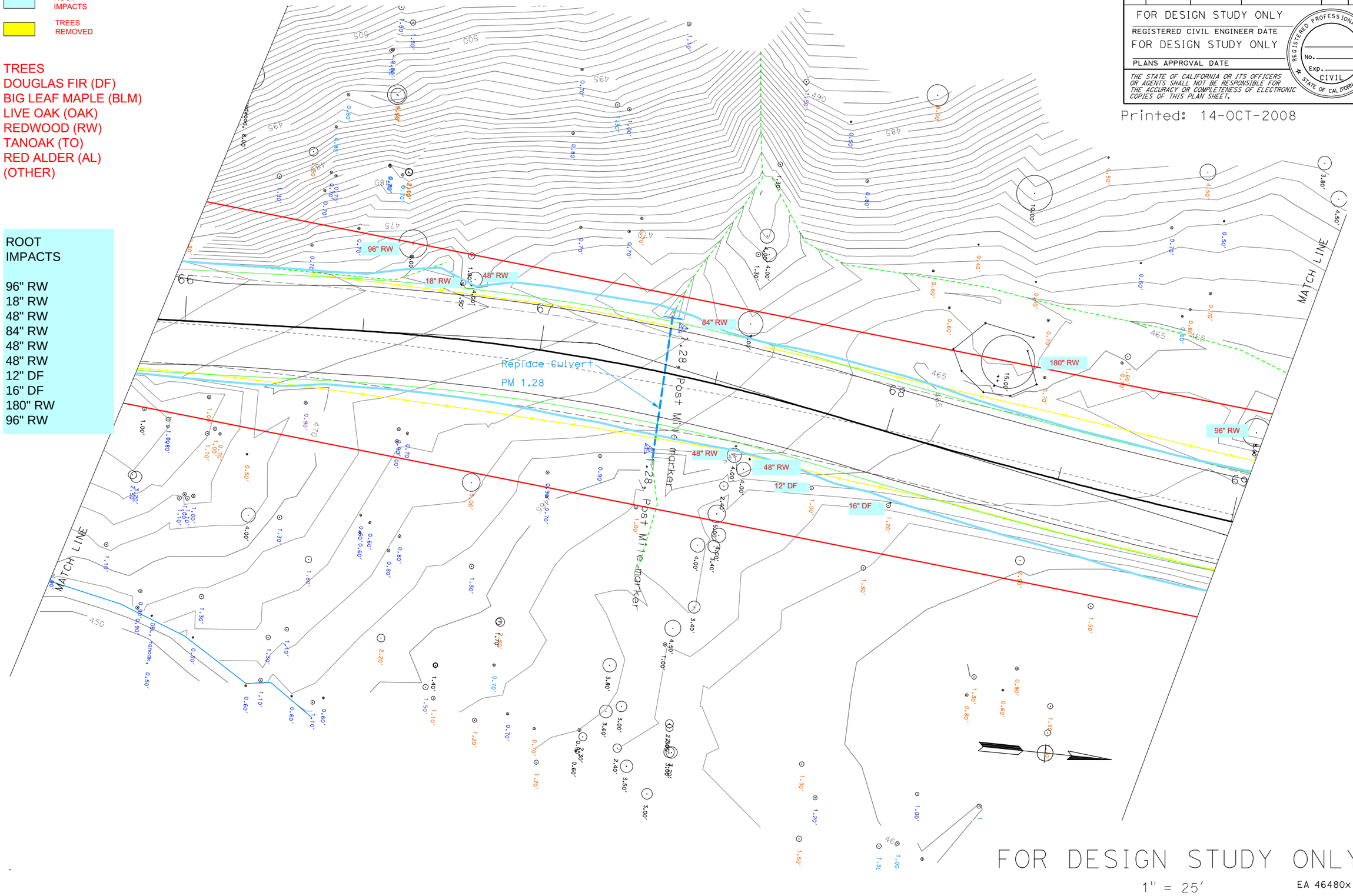
ROOT IMPACTS

TREES REMOVED

TREES
DOUGLAS FIR (DF)
BIG LEAF MAPLE (BLM)
LIVE OAK (OAK)
REDWOOD (RW)
TANOAK (TO)
RED ALDER (AL)
(OTHER)

ROOT IMPACTS

96" RW
18" RW
48" RW
84" RW
48" RW
48" RW
12" DF
16" DF
180" RW
96" RW



FOR DESIGN STUDY ONLY

1" = 25'

EA 46480x

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.1 - 2.2	5	20

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ROOT IMPACTS

TREES REMOVED

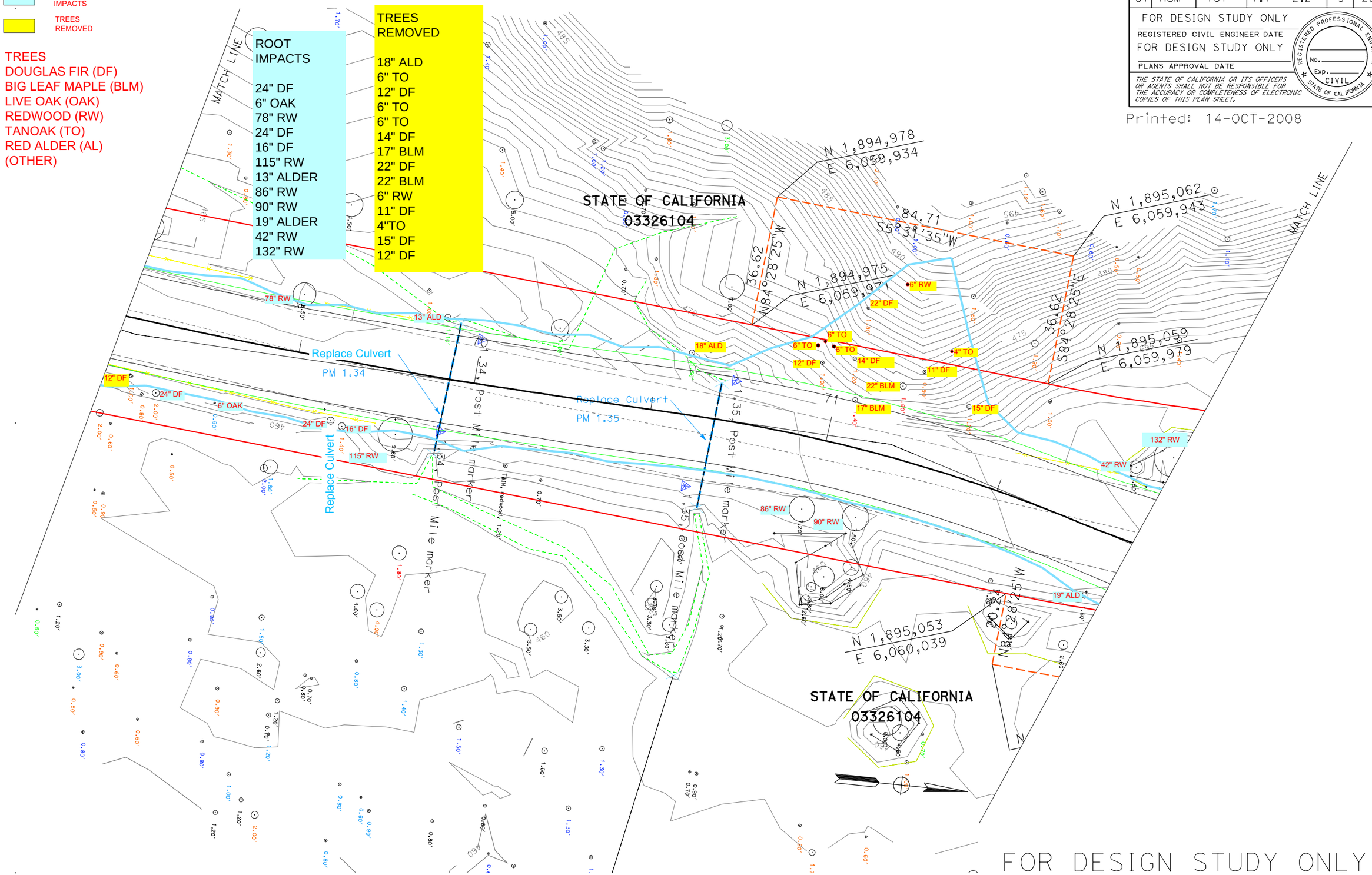
TREES
DOUGLAS FIR (DF)
BIG LEAF MAPLE (BLM)
LIVE OAK (OAK)
REDWOOD (RW)
TANOAK (TO)
RED ALDER (AL)
(OTHER)

ROOT IMPACTS

24" DF
6" OAK
78" RW
24" DF
16" DF
115" RW
13" ALDER
86" RW
90" RW
19" ALDER
42" RW
132" RW

TREES REMOVED

18" ALD
6" TO
12" DF
6" TO
6" TO
14" DF
17" BLM
22" DF
22" BLM
6" RW
11" DF
4"TO
15" DF
12" DF



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EA 46480x

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.1 - 2.2	6	20

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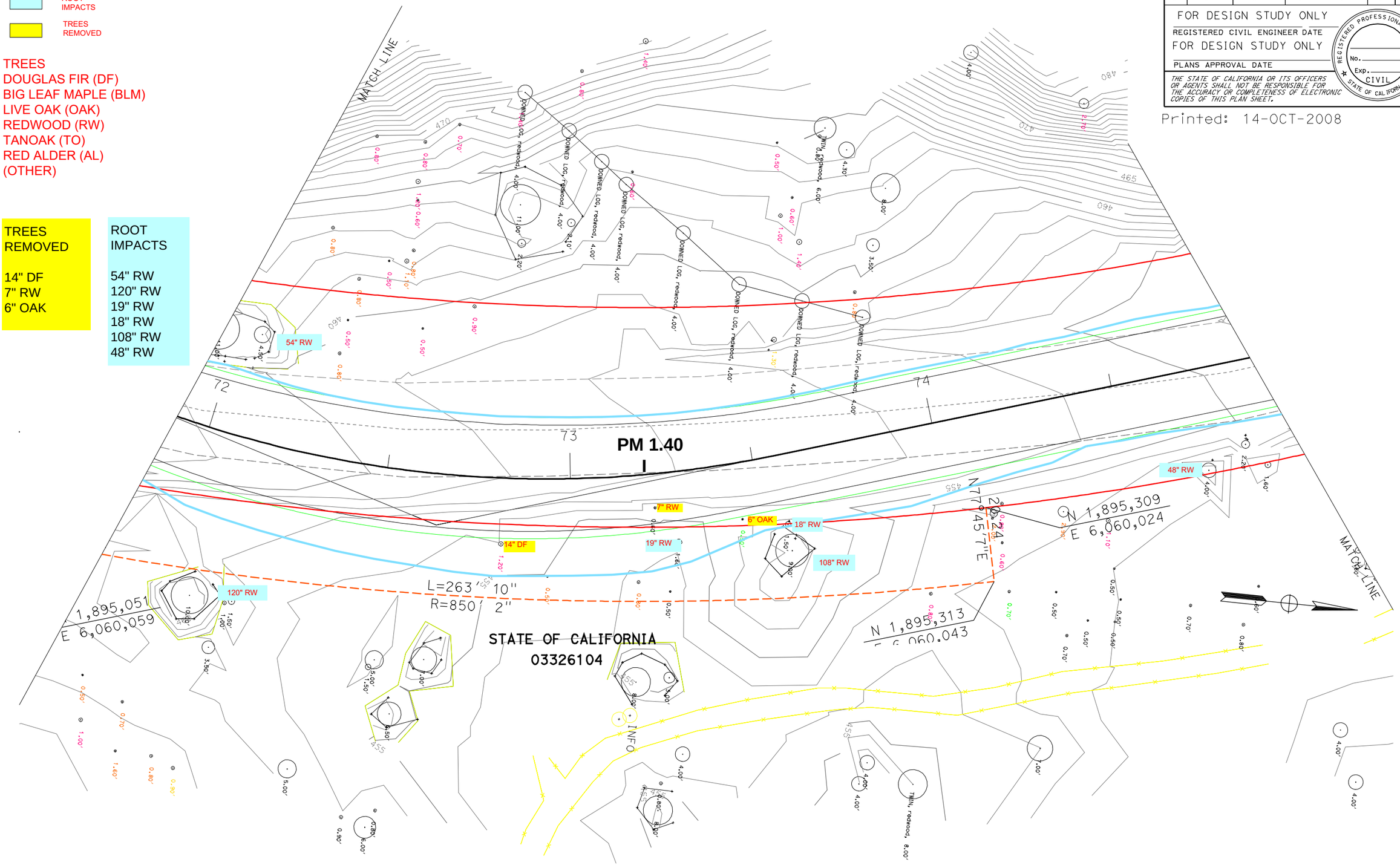
ROOT IMPACTS

TREES REMOVED

TREES
DOUGLAS FIR (DF)
BIG LEAF MAPLE (BLM)
LIVE OAK (OAK)
REDWOOD (RW)
TANOAK (TO)
RED ALDER (AL)
(OTHER)

TREES REMOVED
14" DF
7" RW
6" OAK

ROOT IMPACTS
54" RW
120" RW
19" RW
18" RW
108" RW
48" RW



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1" = 25'

EA 46480x

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01	HUM	101	1.1 - 2.2	7	20

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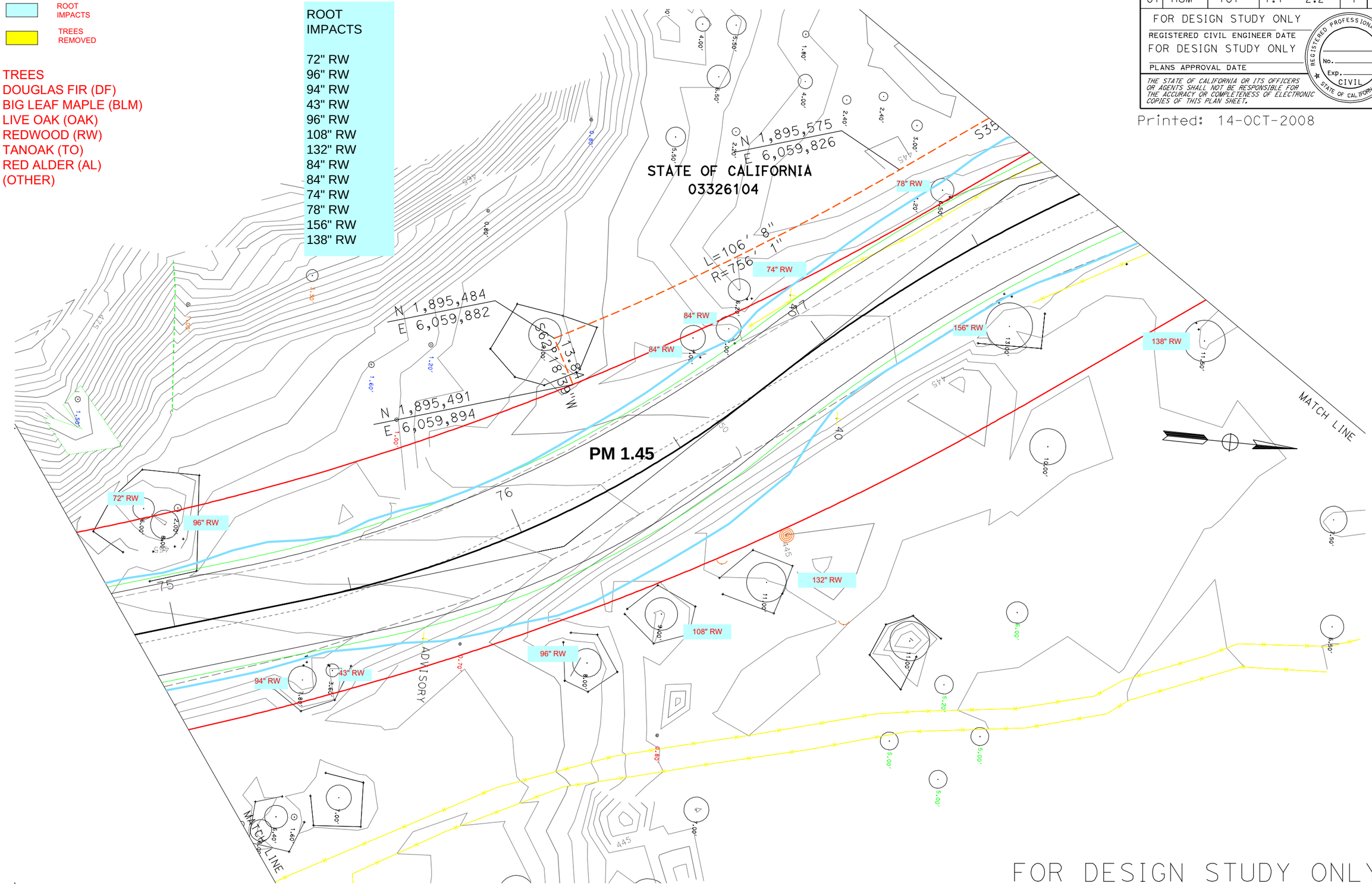
ROOT IMPACTS

TREES REMOVED

TREES
DOUGLAS FIR (DF)
BIG LEAF MAPLE (BLM)
LIVE OAK (OAK)
REDWOOD (RW)
TANOAK (TO)
RED ALDER (AL)
(OTHER)

ROOT IMPACTS

72" RW
96" RW
94" RW
43" RW
96" RW
108" RW
132" RW
84" RW
84" RW
74" RW
78" RW
156" RW
138" RW



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EA 46480x

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.1 - 2.2	8	20

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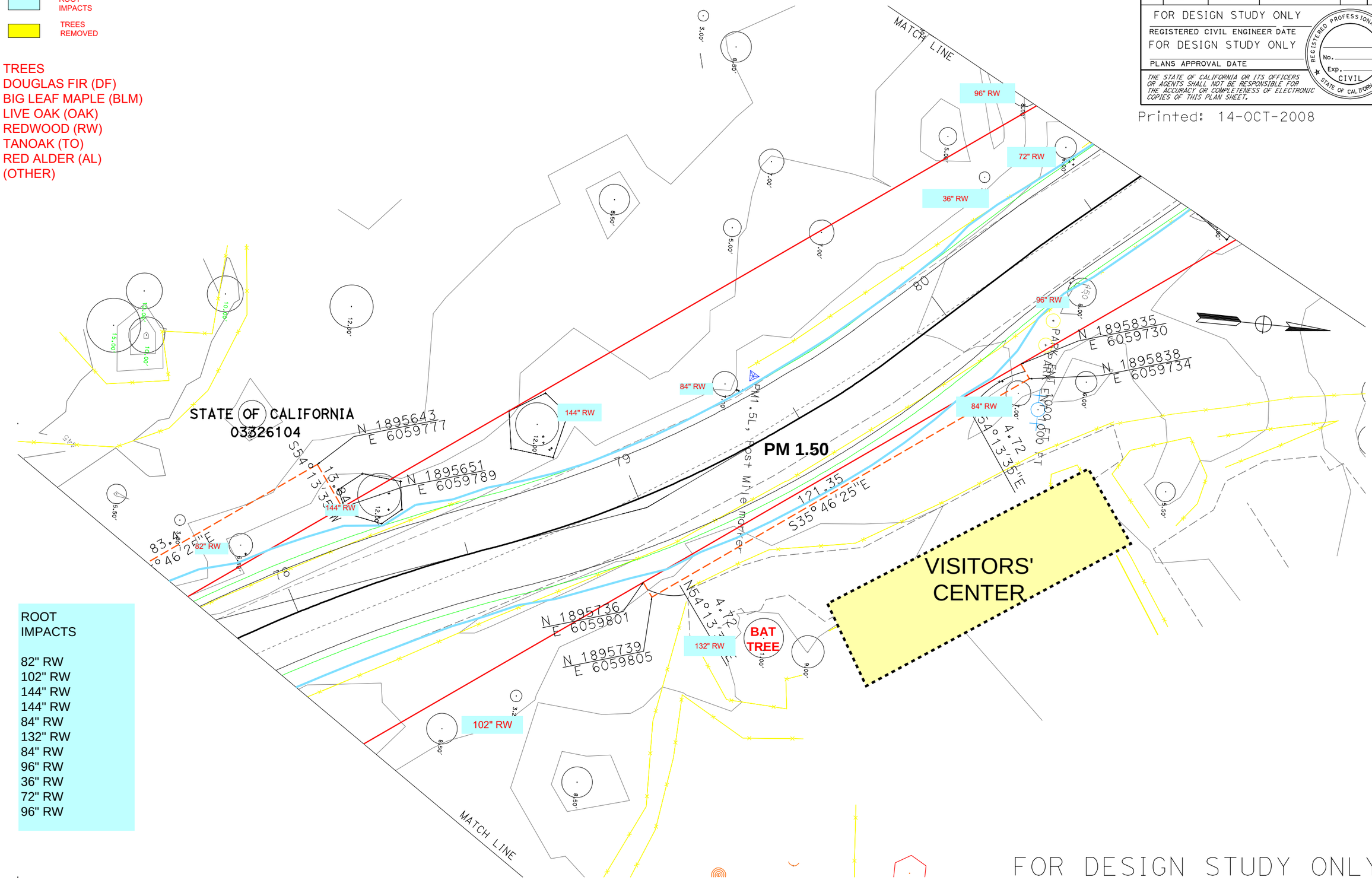
ROOT IMPACTS

TREES REMOVED

TREES
DOUGLAS FIR (DF)
BIG LEAF MAPLE (BLM)
LIVE OAK (OAK)
REDWOOD (RW)
TANOAK (TO)
RED ALDER (AL)
(OTHER)



ROOT IMPACTS

82" RW
102" RW
144" RW
144" RW
84" RW
132" RW
84" RW
96" RW
36" RW
72" RW
96" RW

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.1 - 2.2	9	20

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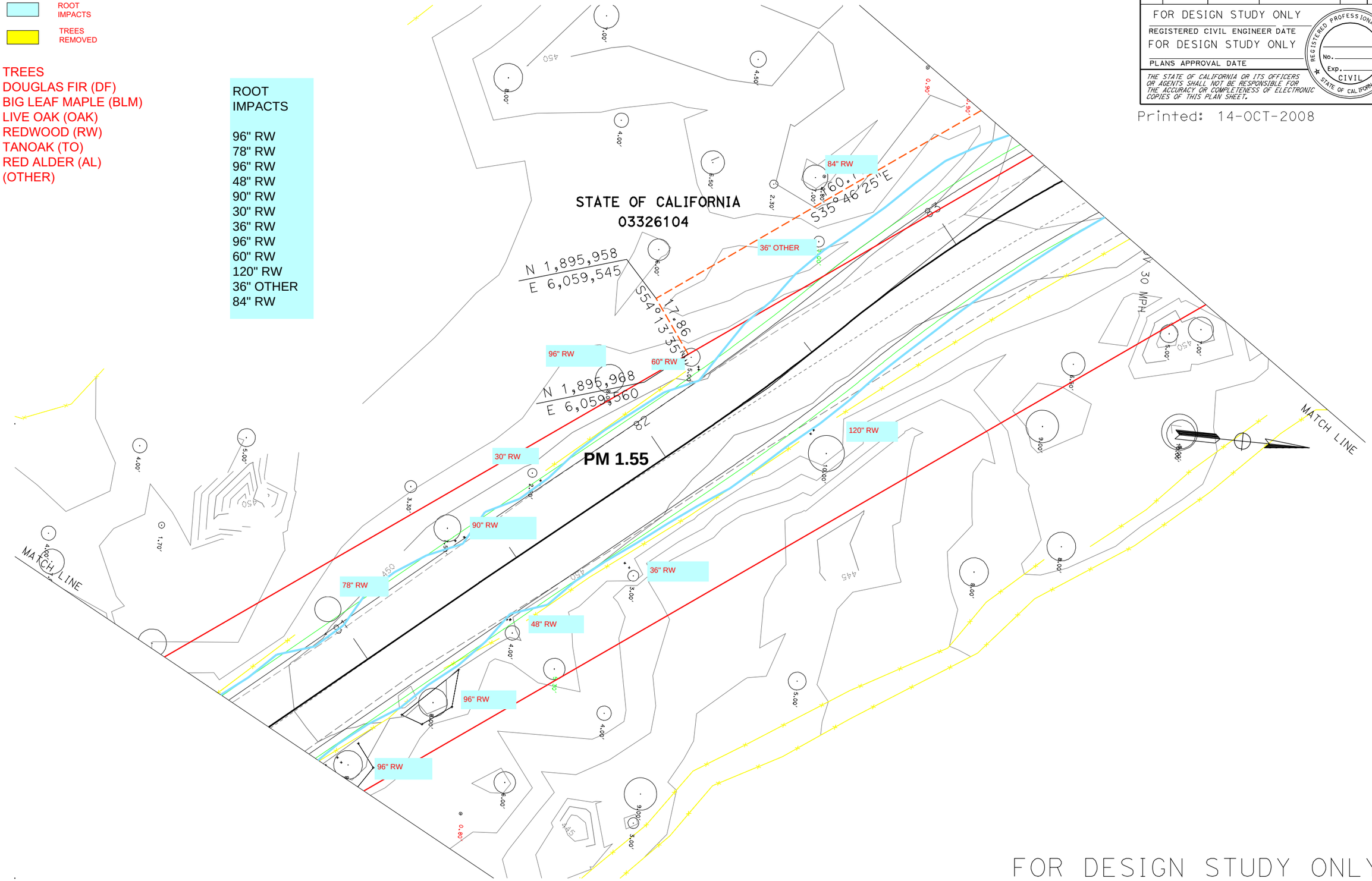
ROOT IMPACTS

TREES REMOVED

TREES
DOUGLAS FIR (DF)
BIG LEAF MAPLE (BLM)
LIVE OAK (OAK)
REDWOOD (RW)
TANOAK (TO)
RED ALDER (AL)
(OTHER)

ROOT IMPACTS

96" RW
78" RW
96" RW
48" RW
90" RW
30" RW
36" RW
96" RW
60" RW
120" RW
36" OTHER
84" RW



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1" = 25'

EA 46480x

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.1 - 2.2	10	20

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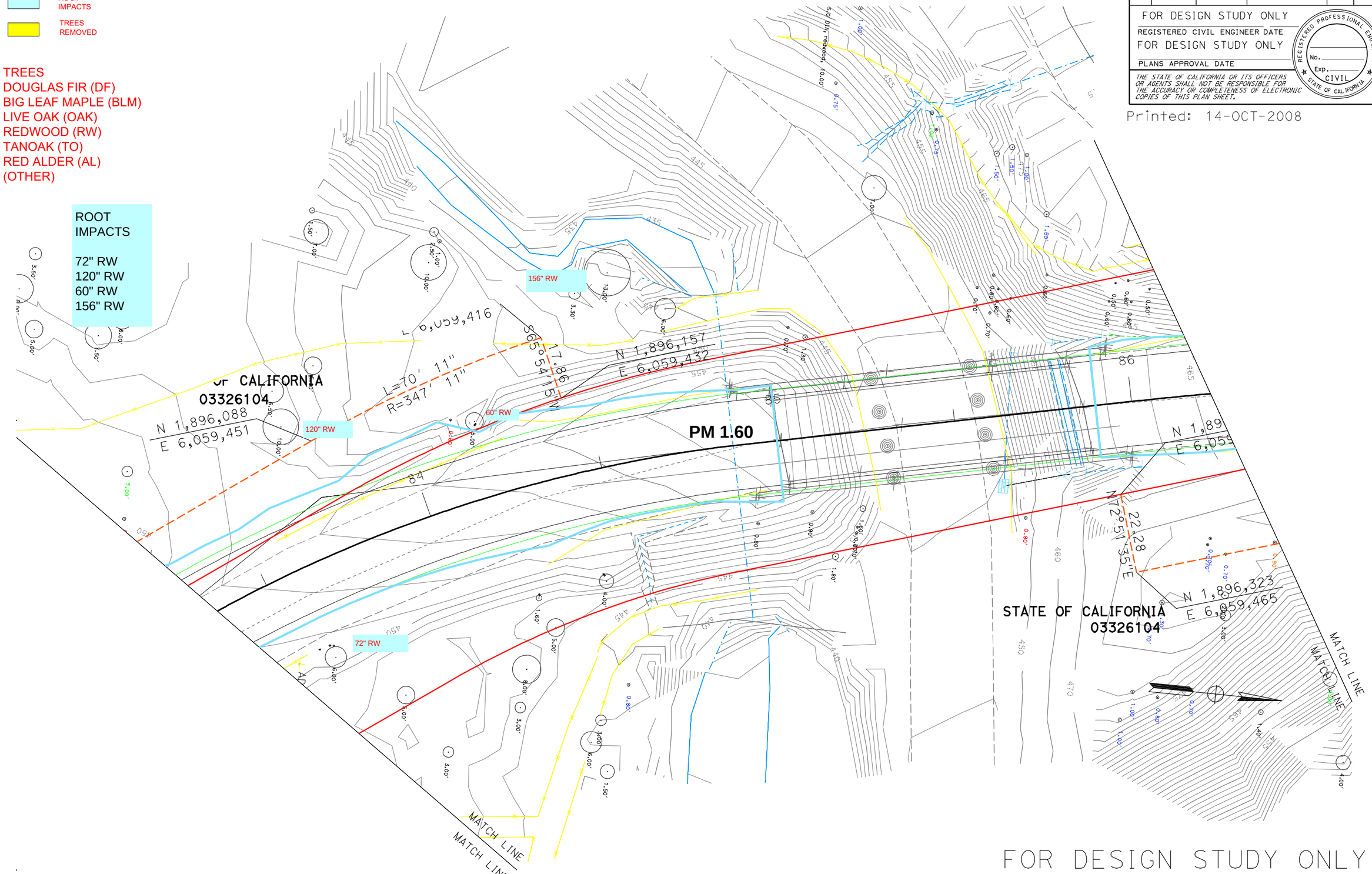
ROOT IMPACTS

TREES REMOVED

TREES
DOUGLAS FIR (DF)
BIG LEAF MAPLE (BLM)
LIVE OAK (OAK)
REDWOOD (RW)
TANOAK (TO)
RED ALDER (AL)
(OTHER)

ROOT IMPACTS

72" RW
120" RW
60" RW
156" RW



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EA 46480x

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01	HUM	101	1.1 - 2.2	11	20

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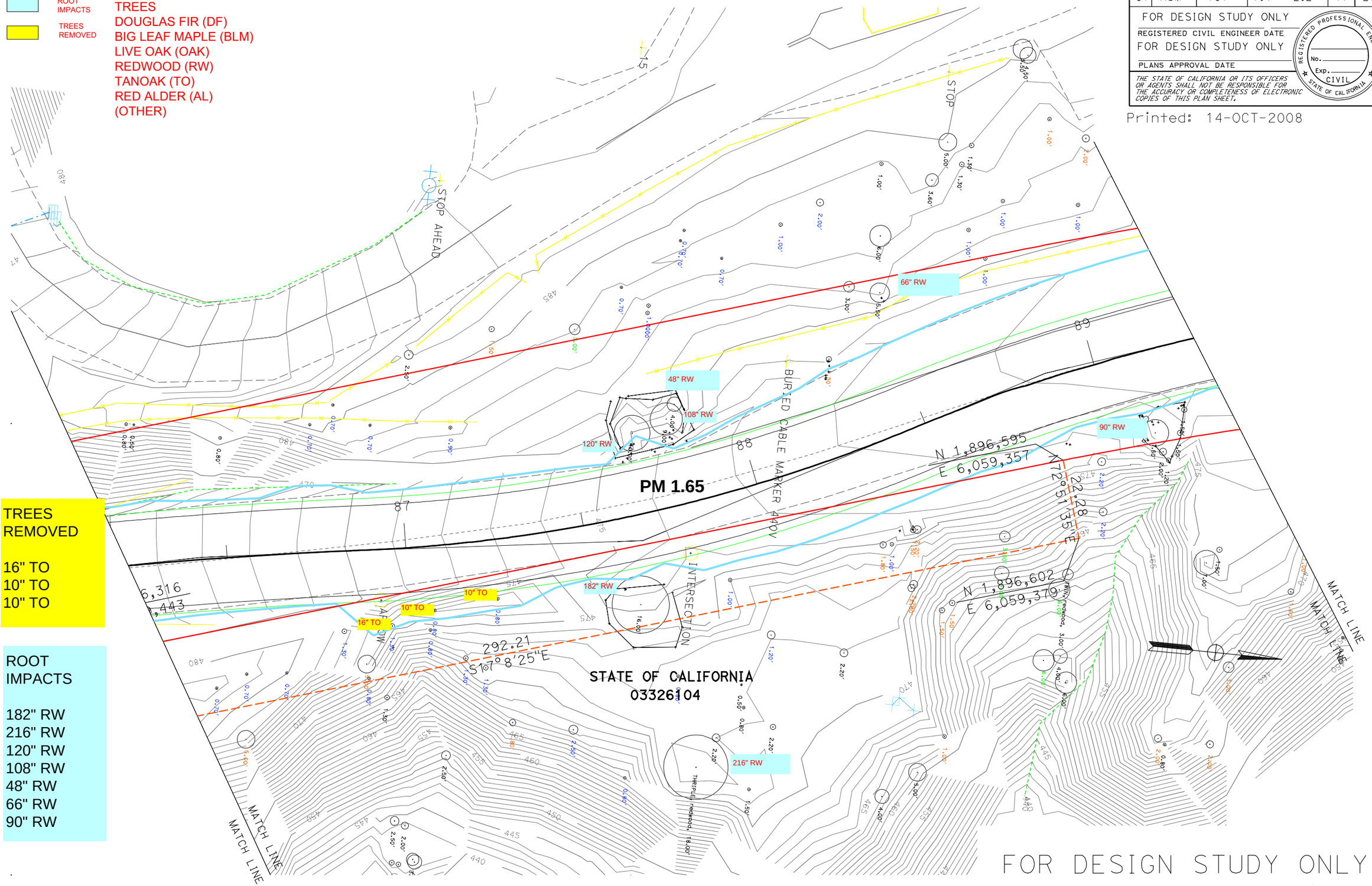
ROOT IMPACTS

TREES REMOVED

TREES
DOUGLAS FIR (DF)
BIG LEAF MAPLE (BLM)
LIVE OAK (OAK)
REDWOOD (RW)
TANOAK (TO)
RED ALDER (AL)
(OTHER)



TREES REMOVED

16" TO
10" TO
10" TO

ROOT IMPACTS

182" RW
216" RW
120" RW
108" RW
48" RW
66" RW
90" RW

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1" = 25'

EA 46480x

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01	HUM	101	1.1 - 2.2	12	20

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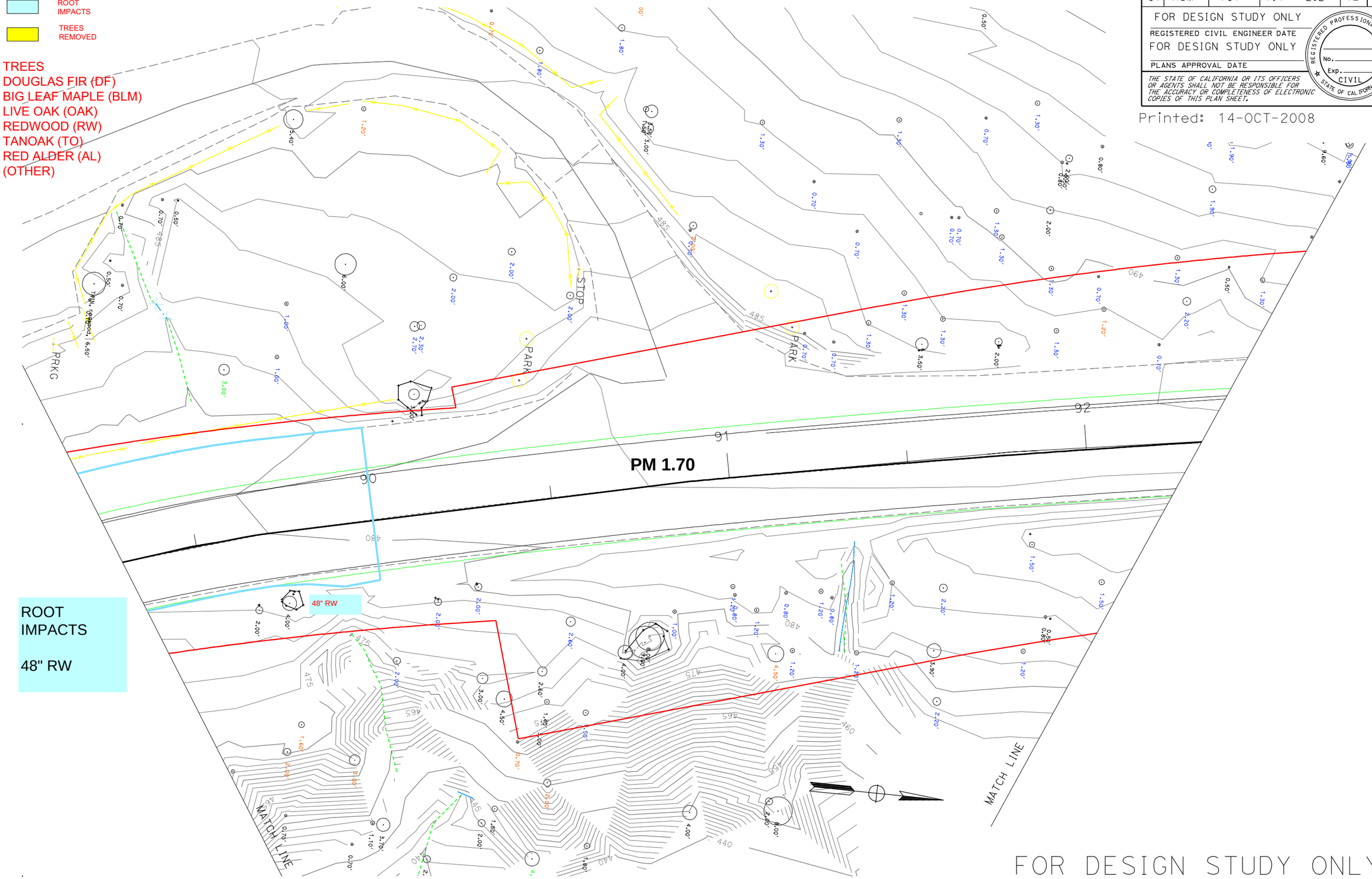

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.1 - 2.2	13	20

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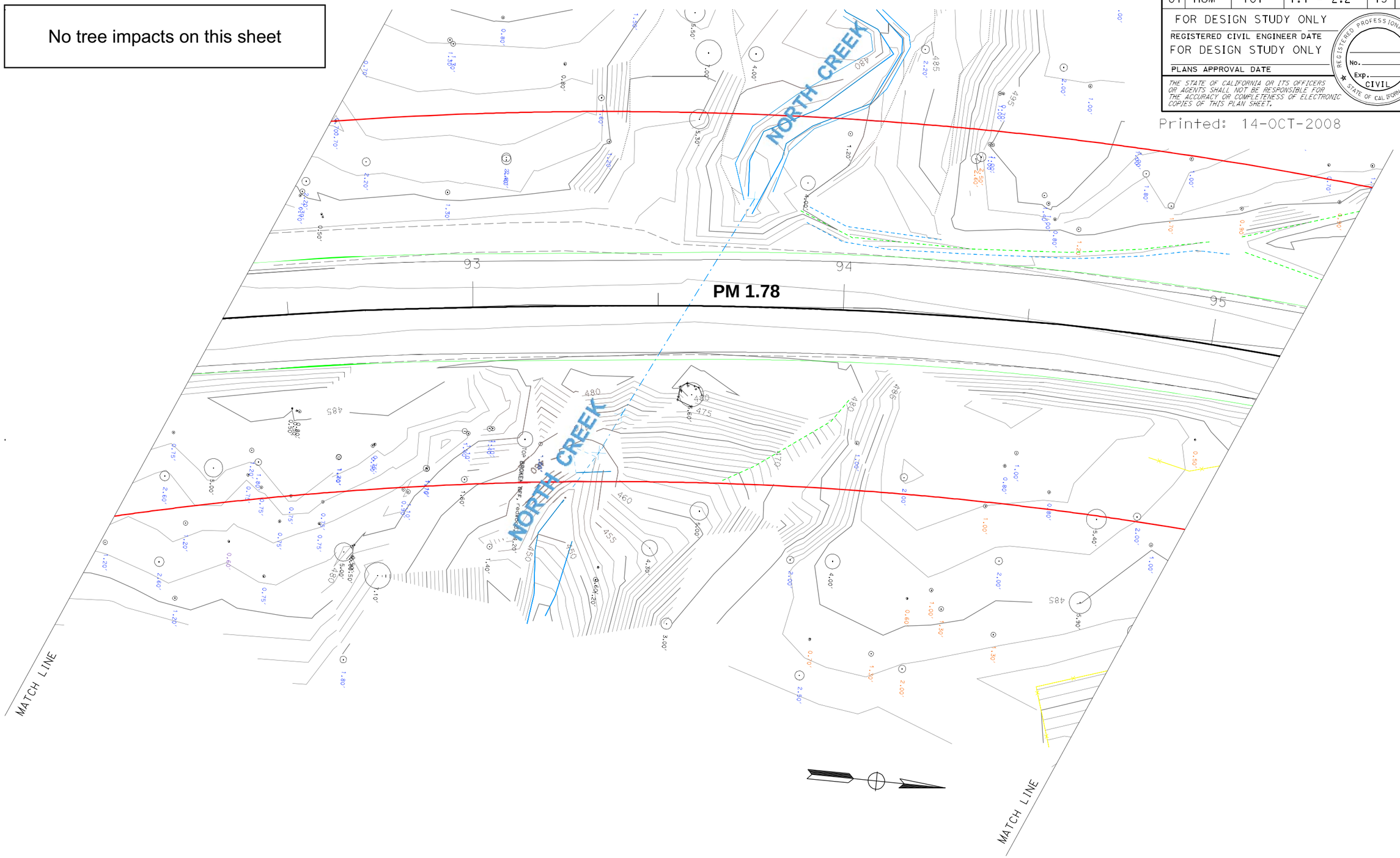

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1" = 25'

EA 46480x

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.1 - 2.2	14	20

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PLANS APPROVAL DATE

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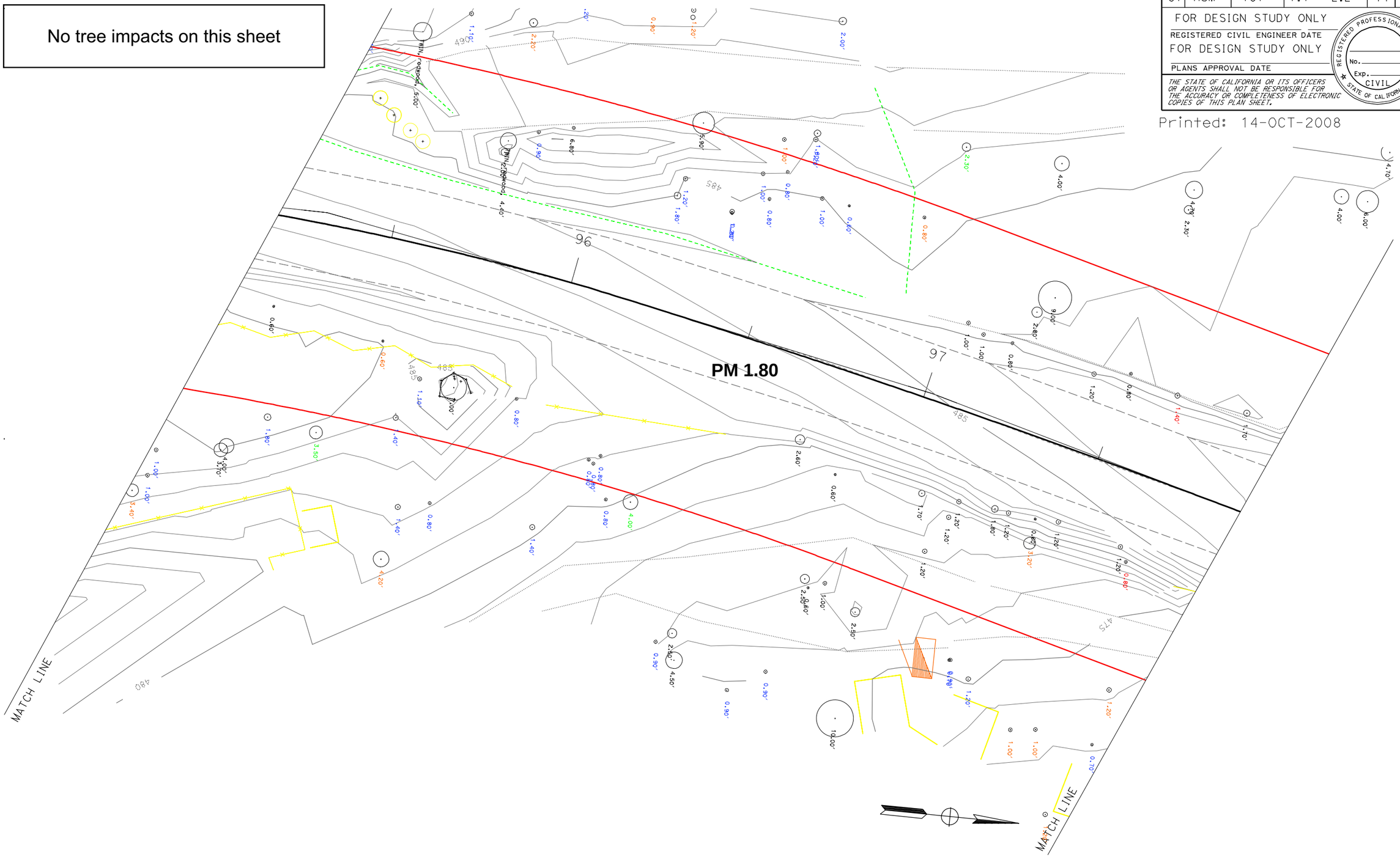
No tree impacts on this sheet



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EA 46480x

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01	HUM	101	1.1 - 2.2	15	20

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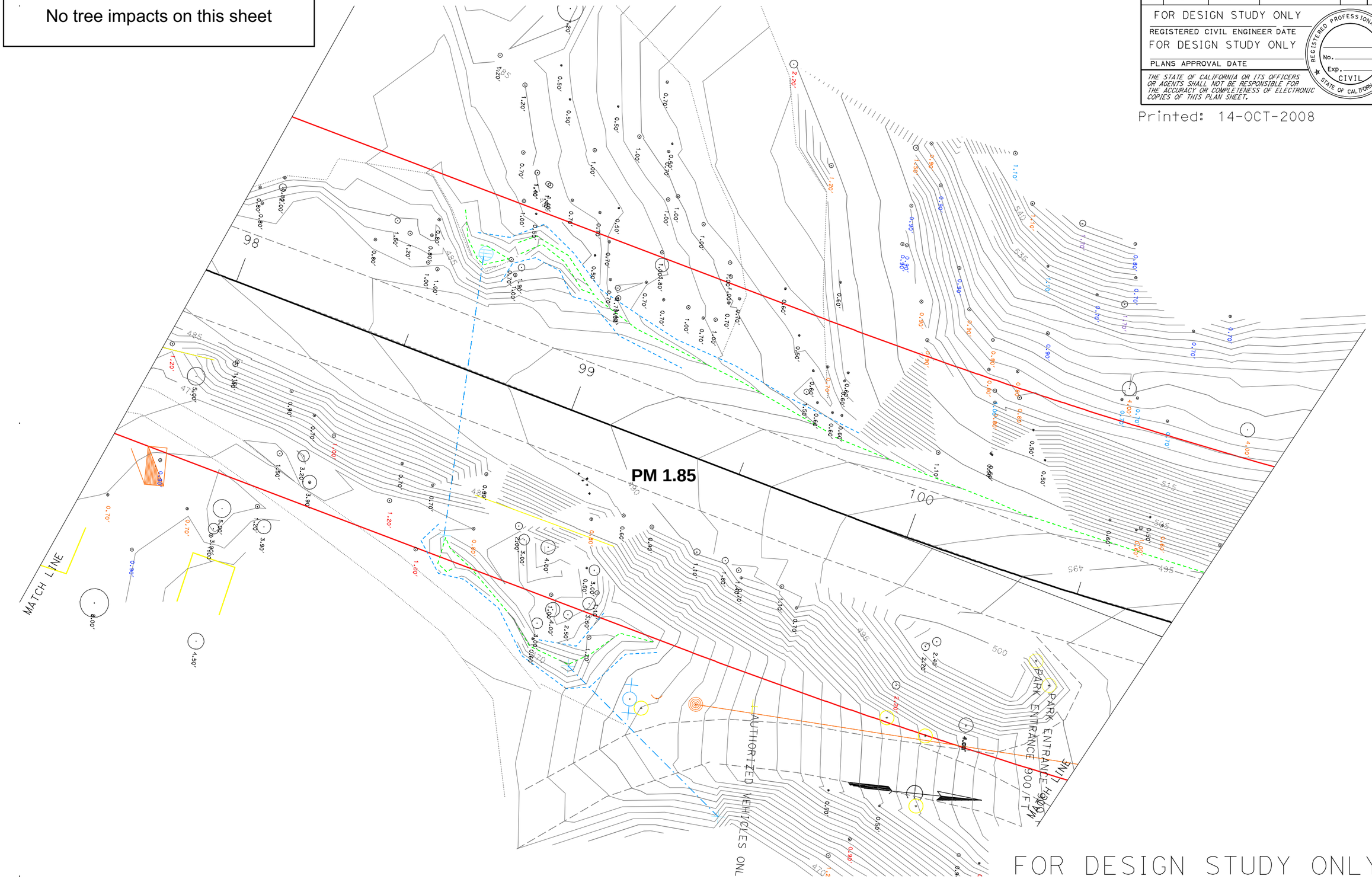
No tree impacts on this sheet



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EA 46480x

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.1 - 2.2	16	20

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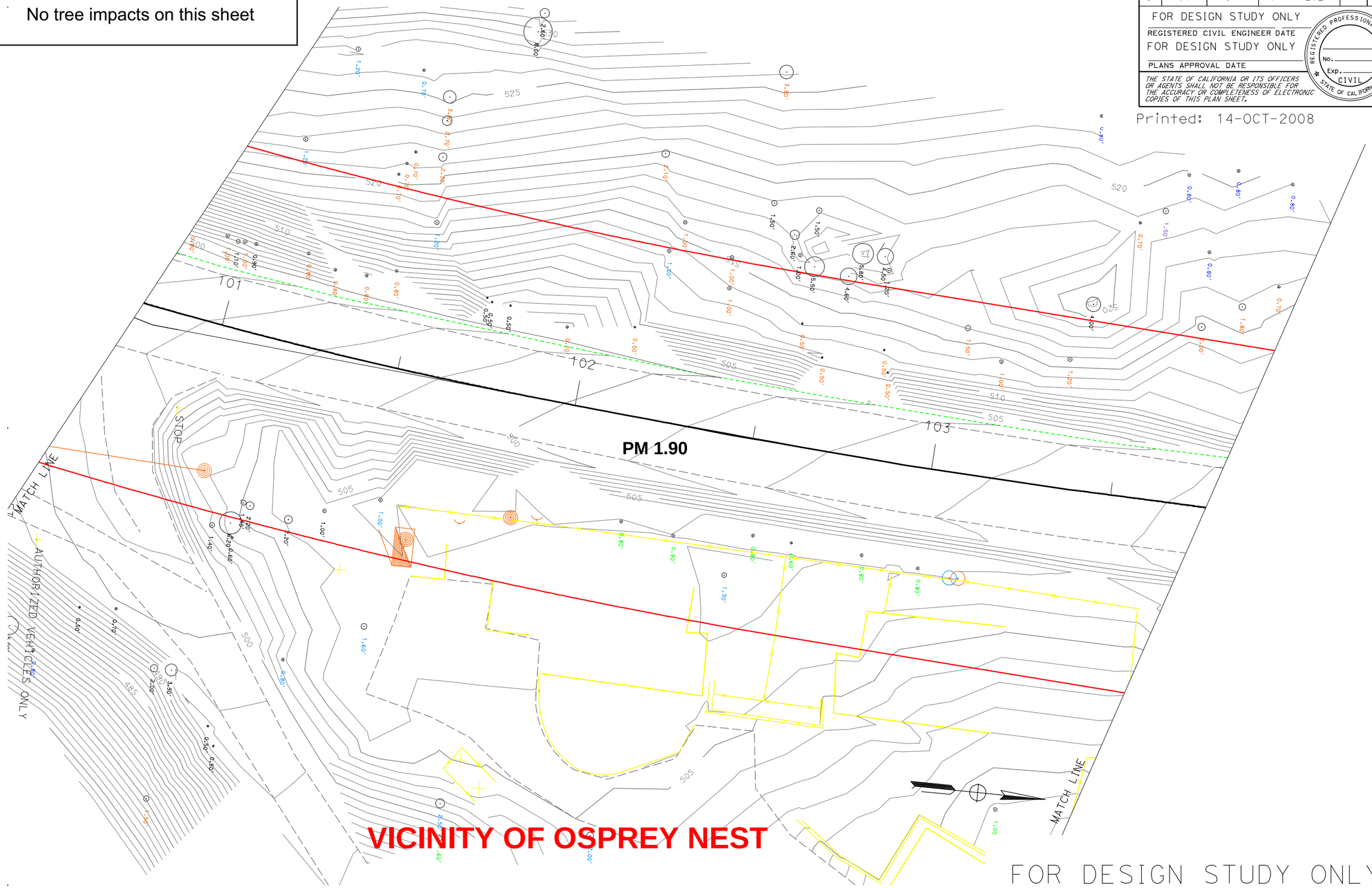

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Caltrans

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DATE REVISED 14-OCT-2008

LAST REVISION | DATE PLOTTED = 14-OCT-2008

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.1 - 2.2	17	20

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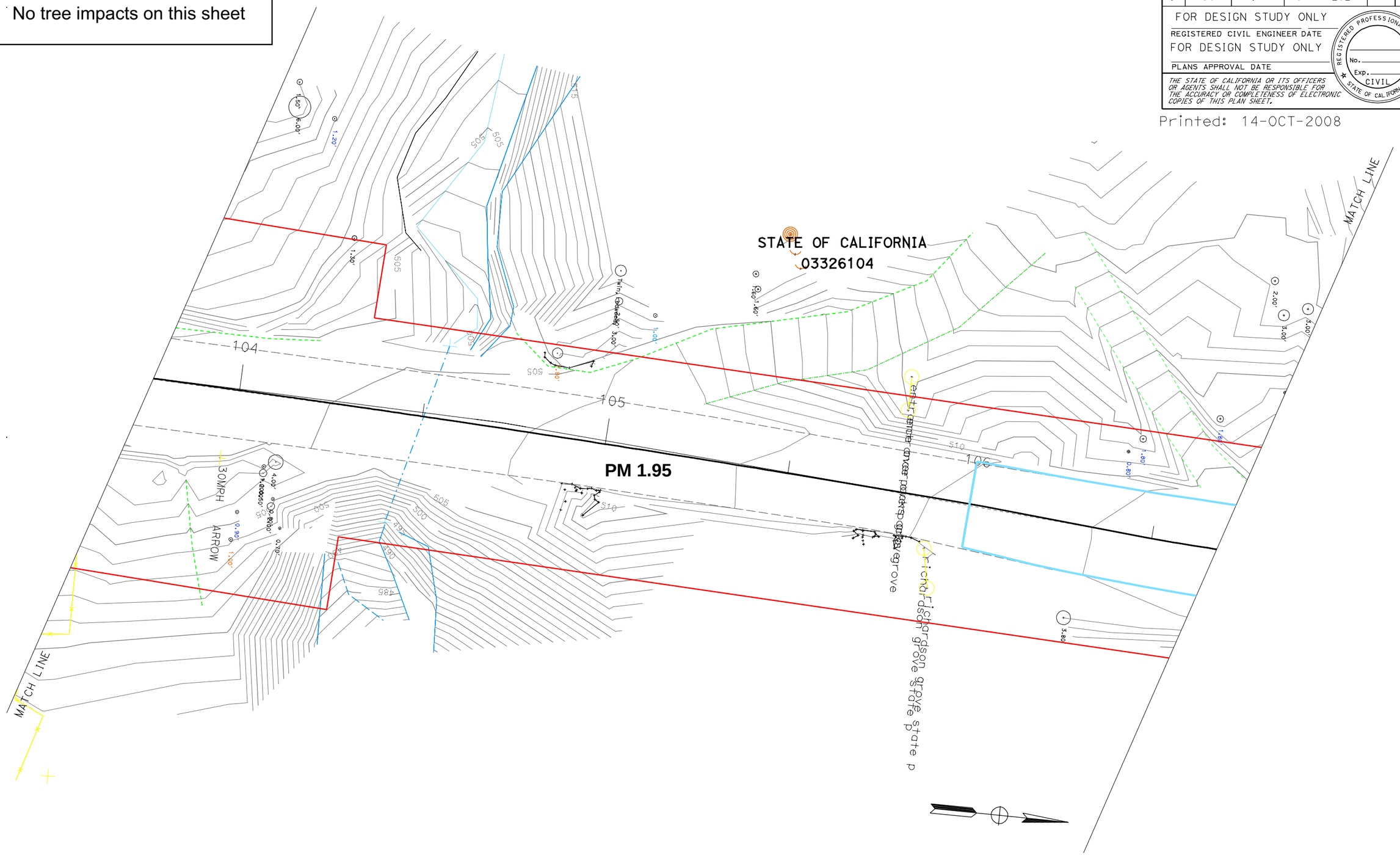

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.1 - 2.2	18	20

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ROOT IMPACTS

TREES REMOVED

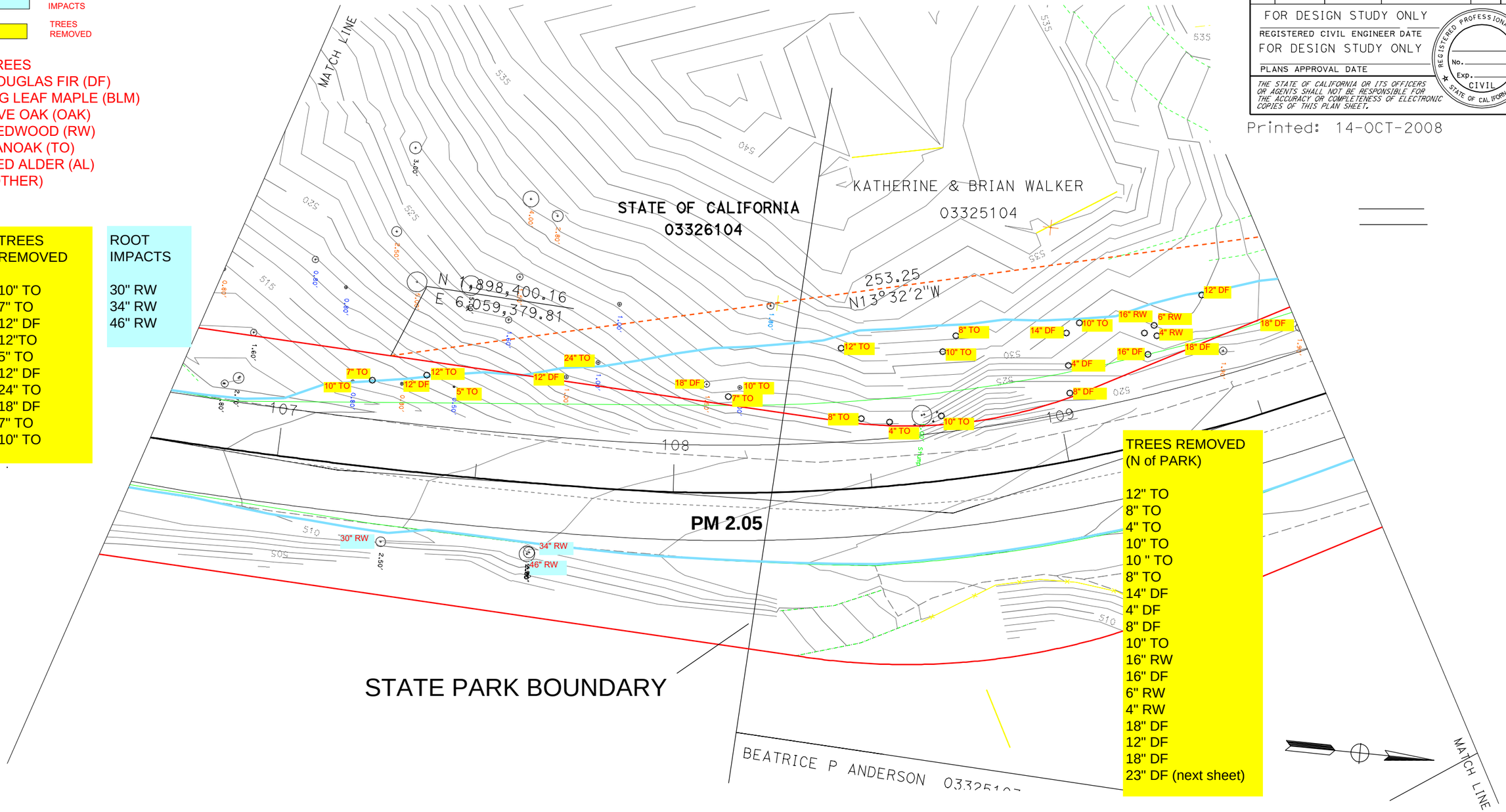
TREES
DOUGLAS FIR (DF)
BIG LEAF MAPLE (BLM)
LIVE OAK (OAK)
REDWOOD (RW)
TANOAK (TO)
RED ALDER (AL)
(OTHER)

TREES REMOVED

10" TO
7" TO
12" DF
12"TO
5" TO
12" DF
24" TO
18" DF
7" TO
10" TO

ROOT IMPACTS

30" RW
34" RW
46" RW



TREES REMOVED
(N of PARK)

12" TO
8" TO
4" TO
10" TO
10 " TO
8" TO
14" DF
4" DF
8" DF
10" TO
16" RW
16" DF
6" RW
4" RW
18" DF
12" DF
18" DF
23" DF (next sheet)

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.1 - 2.2	19	20

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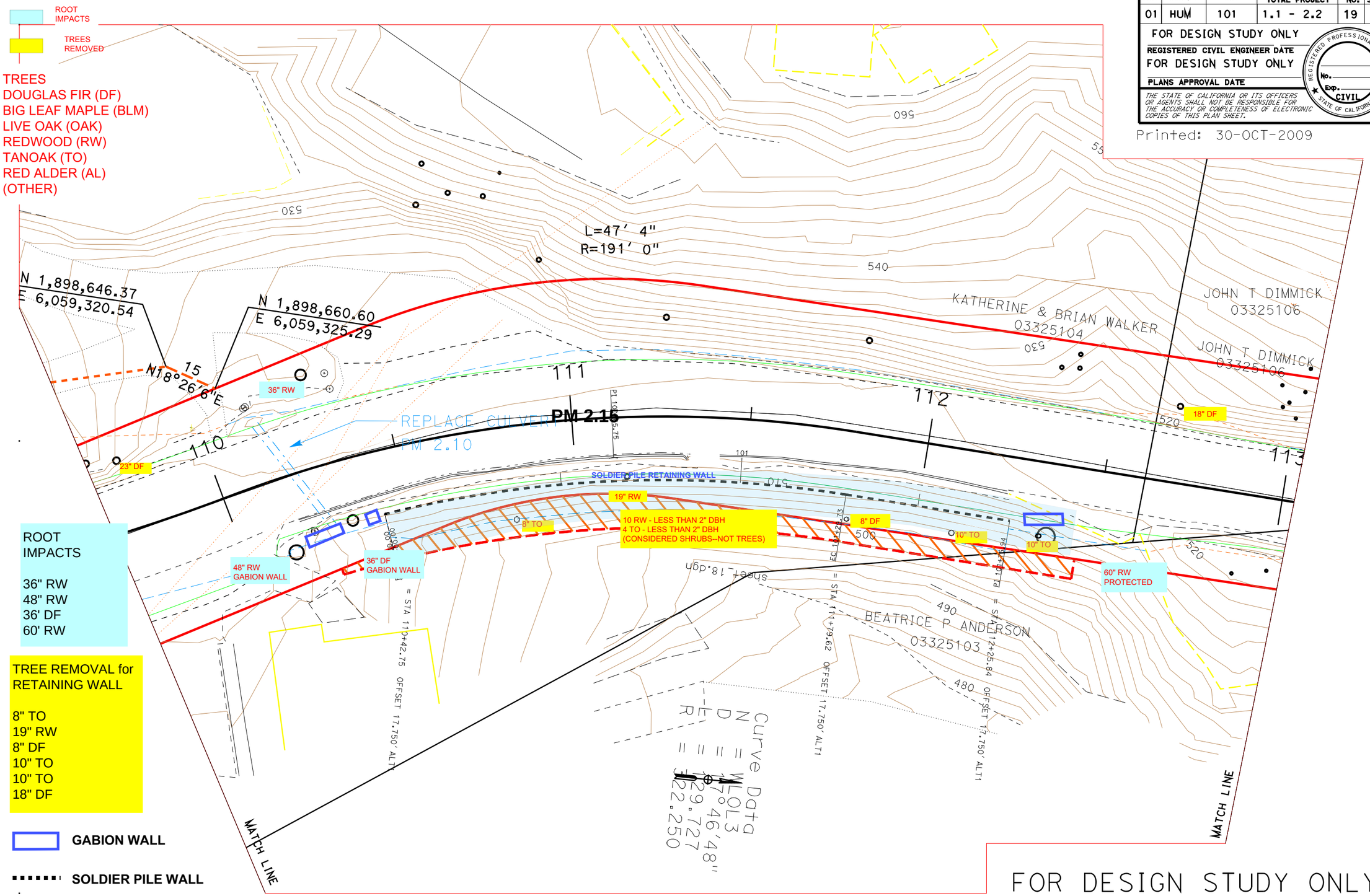

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DATE REVISED

James T. Van Bonn

LAST REVISION 00-00-00

DATE PLOTTED => 30-OCT-2009

TIME PLOTTED => 09:18

BORDER LAST REVISED 3/1/2007

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => temp5

DGN FILE => sheet_18.dgn

CU 00000

EA 000000

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.1 - 2.2	20	20

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REGISTERED CIVIL ENGINEER DATE

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PLANS APPROVAL DATE

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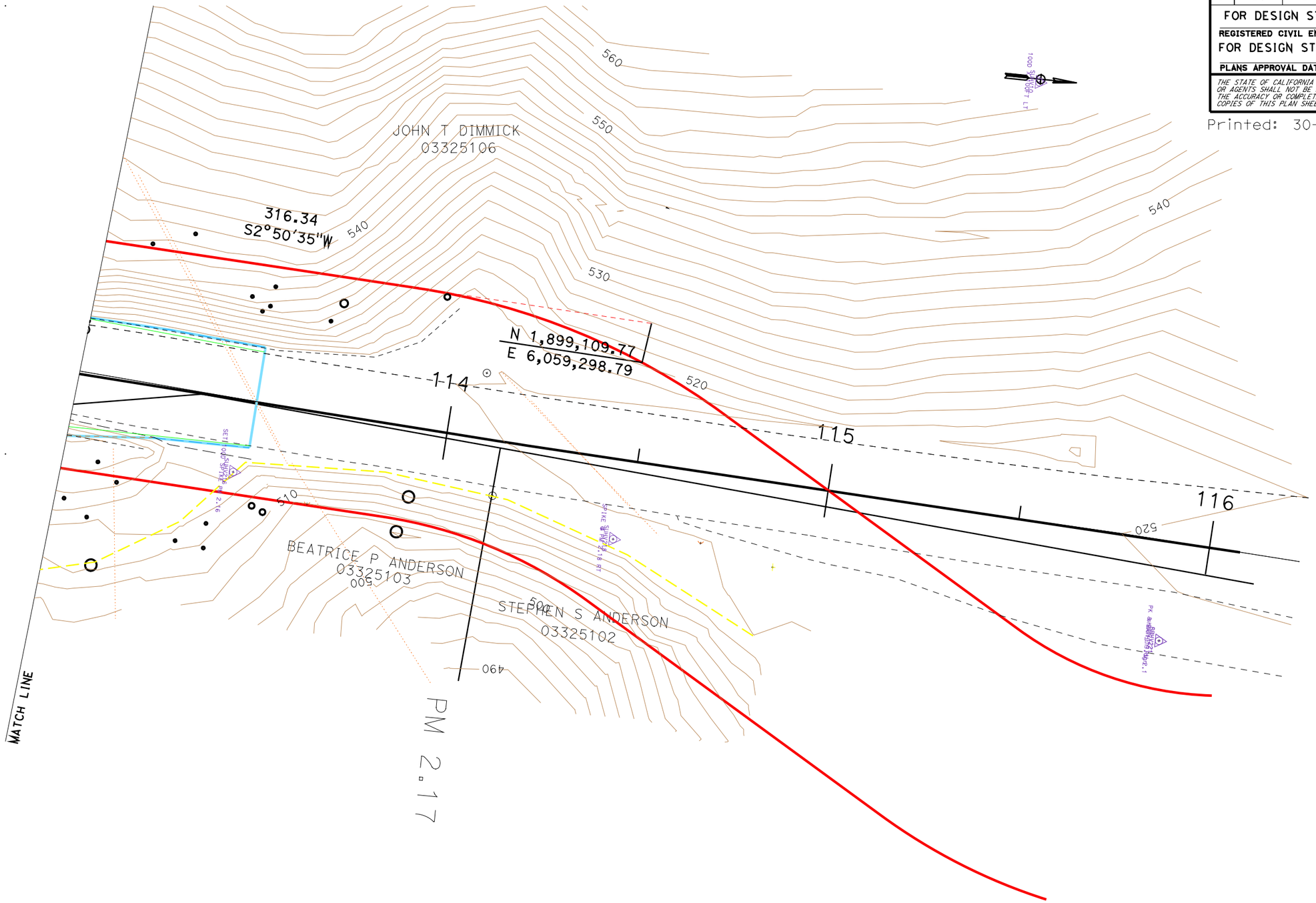

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DATE REVISED

LAST REVISION 00-00-00

DATE PLOTTED => 30-OCT-2009

TIME PLOTTED => 09:18

BORDER LAST REVISED 3/1/2007

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => temp5

DGN FILE => sheet_19.dgn

CU 00000

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Appendix C. Trees to be Removed

Running TOTAL	PM	L/R	Species	DBH-IN.	No. of Trees
Slope Cut West of Road in Park Boundary					
1	1.35	L	alder	18	1
2	1.36	L	tanoak	6	2
3	1.36	L	Douglas-fir	12	3
4	1.36	L	tanoak	6	4
5	1.36	L	tanoak	6	5
6	1.36	L	Douglas-fir	14	6
7	1.36	L	big leaf maple	17	7
8	1.36	L	Douglas-fir	22	8
9	1.36	L	big leaf maple	22	9
10	1.36	L	redwood	6	10
11	1.36	L	Douglas-fir	11	11
12	1.36	L	tanoak	4	12
13	1.37	L	Douglas-fir	15	13
Fill Areas in within Park Boundary					
14	1.31	R	Douglas-fir	12	1
15	1.39	R	Douglas-fir	14	2
16	1.40	R	redwood	7	3
17	1.40	R	oak	6	4
18	1.66	R	tanoak	16	5
19	1.66	R	tanoak	10	6
20	1.66	R	tanoak	10	7
Slope Cut West of Road, Within Park Boundary					
21	2.04	L	tanoak	10	1
22	2.04	L	tanoak	7	2
23	2.04	L	Douglas-fir	12	3
24	2.04	L	tanoak	12	4
25	2.04	L	tanoak	5	5
26	2.04	L	Douglas-fir	12	6
27	2.04	L	tanoak	24	7
27	2.04	L	Douglas-fir	18	8
29	2.04	L	tanoak	7	9
30	2.04	L	tanoak	10	10

Slope Cut West of Road, North of Park					
31	2.06	L	tanoak	12	1
32	2.06	L	tanoak	8	2
33	2.06	L	tanoak	4	3
34	2.06	L	tanoak	10	4
35	2.06	L	tanoak	10	5
36	2.06	L	tanoak	8	6
37	2.06	L	Douglas-fir	14	7
38	2.06	L	Douglas-fir	4	8
39	2.06	L	Douglas-fir	8	9
40	2.06	L	tanoak	10	10
41	2.08	L	redwood	16	11
42	2.08	L	Douglas-fir	16	12
43	2.08	L	redwood	6	13
44	2.08	L	redwood	4	14
45	2.08	L	Douglas-fir	18	15
46	2.08	L	Douglas-fir	12	16
47	2.08	L	Douglas-fir	18	17
48	2.08	L	Douglas-fir	23	18
Slope 200-ft long Retaining Wall East of Road, North of Park*					
49	2.15	R	tanoak	8	1
50	2.15	R	redwood	19	2
51	2.16	R	Douglas-fir	8	3
52	2.17	R	tanoak	10	4
53	2.17	R	tanoak	10	5
54	2.18	L	Douglas-fir	18	6

* Approximately 10 small redwood saplings and 4 small tanoak saplings (less than 2" diameter) will be removed for the retaining wall, but these are too small to be considered as trees for the purpose of the tree impacts.

Appendix D. Potential Tree Root Impacts

	PM	R/L	species	DBH-IN.
1	1.18	R	redwood	72
2	1.18	R	redwood	90
3	1.18	L	Douglas-fir	17
4	1.18	L	other	12
5	1.28	L	redwood	96
6	1.28	L	redwood	18
7	1.28	L	redwood	48
8	1.28	L	redwood	84
9	1.28	R	redwood	48
10	1.28	R	redwood	48
11	1.28	R	Douglas-fir	12
12	1.28	R	Douglas-fir	16
13	1.28	L	redwood	180
14	1.28	L	redwood	96
15	1.34	R	Douglas-fir	24
16	1.34	R	oak	6
17	1.34	L	redwood	78
18	1.34	R	Douglas-fir	24
19	1.34	R	Douglas-fir	16
20	1.34	R	redwood	115
21	1.35	L	alder	13
22	1.35	R	redwood	86
23	1.35	R	redwood	90
24	1.35	R	alder	19
25	1.35	L	redwood	42
26	1.35	L	redwood	132
27	1.40	L	redwood	54
28	1.40	R	redwood	120
29	1.40	R	redwood	19
30	1.40	R	redwood	18
31	1.40	R	redwood	108

	PM	R/L	species	DBH -IN.
32	1.40	R	redwood	48
33	1.41	L	redwood	72
34	1.41	L	redwood	96
35	1.41	R	redwood	94
36	1.41	R	redwood	43
37	1.45	R	redwood	96
38	1.45	R	redwood	108
39	1.45	R	redwood	132
40	1.45	L	redwood	84
41	1.45	L	redwood	84
42	1.45	L	redwood	74
43	1.45	L	redwood	78
44	1.45	R	redwood	156
45	1.45	L	redwood	82
46	1.45	R	redwood	138
47	1.50	R	redwood	102
48	1.50	L	redwood	144
49	1.50	L	redwood	144
50	1.50	R	redwood	132
51	1.50	L	redwood	84
52	1.50	R	redwood	84
53	1.50	R	redwood	96
54	1.50	L	redwood	36
55	1.50	L	redwood	72
56	1.50	L	redwood	96
57	1.55	R	redwood	96
58	1.55	L	redwood	78
59	1.55	R	redwood	96
60	1.55	R	redwood	48
61	1.55	L	redwood	90
62	1.55	L	redwood	30

Appendix D. Potential Tree Root Impacts (cont.)

	PM	R/L	species	DBH
62	1.55	L	redwood	30
63	1.55	R	redwood	36
64	1.55	L	redwood	96
65	1.55	L	redwood	50
66	1.55	R	redwood	120
67	1.55	L	redwood	36
68	1.55	L	redwood	84
69	1.60	R	redwood	72
70	1.60	L	redwood	120
71	1.60	L	redwood	60
72	1.60	L	redwood	156
73	1.65	R	redwood	182
74	1.65	R	redwood	216

	PM	R/L	species	DBH
75	1.65	L	redwood	120
76	1.65	L	redwood	108
77	1.65	L	redwood	48
78	1.65	L	redwood	66
79	1.65	R	redwood	90
80	1.68	R	redwood	48
81	2.05	R	redwood	30
82	2.05	R	redwood	34
83	2.05	R	redwood	46
84	2.15	R	Douglas-fir	36
85	2.15	R	redwood	48
86	2.15	L	redwood	36
87	2.15	R	redwood	60

Appendix E. Project Noise Levels

Traffic Noise Levels

Vehicle	L_{max} @ 50 feet (dBA) (40-50 mph)
Heavy Truck	81-84
Motorcycle	81-84
Medium Truck	76-79
Auto	67-71

Source: Caltrans 1995

Construction Noise Levels

Equipment	L_{max} @ 50 feet (dBA, slow, avg)	Equipment	L_{max} @ 50 feet (dBA, slow, avg)
All Other Equipment > 5 HP	85	Dump Truck	76
Auger Drill Rig	84	Excavator	81
Backhoe	78	Flat Bed Truck	74
Chain Saw	84	Front End Loader	79
Compactor (ground)	83	Generator	81
Compressor (air)	78	Grade-all	83
Concrete Mixer Truck	79	Jackhammer	89
Concrete Pump Truck	81	Pneumatic Tools	85
Concrete Saw	90	Pumps	73
Crane	81	Roller	80
Dozer	82	Warning Horn	83

Source: FHWA Highway Construction Noise Handbook 2006

Appendix F. Results of Floristic Survey (7/26/07)

Scientific name	**Common name**
TREES	
Acer macrophyllum	big leaf maple
Alnus rubra	red alder
Arbutus menziesii	Pacific madrone
Fraxinus latifolia	Oregon ash
Lithocarpus densiflorus	tanoak
Pseudotsuga menziesii var. menziesii	Douglas-fir
Quercus chrysolepis	coast live oak
Quercus garryana	Oregon white oak
Quercus kelloggii	black oak
Rhamnus purshiana	cascara
Sequoia sempervirens	redwood
Umbellularia californica	California bay
SHRUBS	
Aralia californica	elkclover
Baccharis pilularis	coyote brush
Brickellia californica	California brickell bush
Corylus cornuta	hazelnut
Euonymus occidentalis	western burning bush
Fraxinus latifolia	Oregon ash
Fraxinus sp.	ash
Genista monspessulana	French broom
Heteromeles arbutifolia	toyon
Mimulus aurantiacus	bush monkeyflower
Quercus berberidifolia	scrub oak
Rhamnus californica	California coffee berry
Ribes menziesii	gooseberry

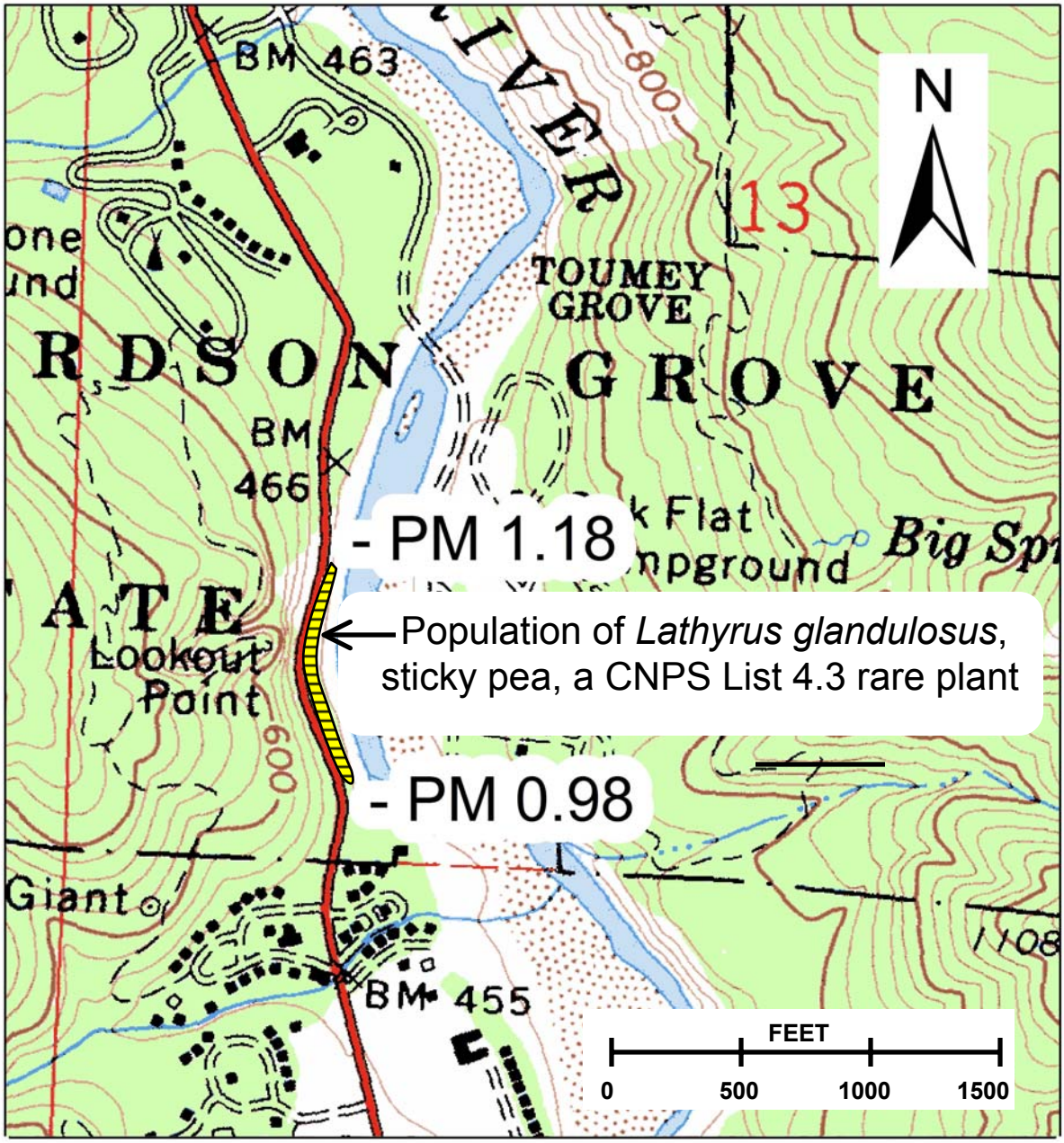
Rosa gymnocarpa	wild rose
Rubus discolor	Himalayan blackberry
Rubus leucodermis	wild raspberry
Rubus ursinus	California blackberry
Sambucus racemosa	red elderberry
Toxicodendron diversilobum	poison oak
Vaccinium ovatum	evergreen huckleberry
FERNS & RELATIVES	
Athyrium felix-femina	maidenhair fern
Equisetum hyemale	giant scouring rush
Equisetum telemetia	common horsetail
Pentagramma triangularis	goldback fern
Polypodium sp.	polypody fern
Polystichum munitum	sword fern
Pteridium aquilinum	bracken fern
Woodwardia fimbriata	giant chain fern
GRASSES & RELATIVES	
Agrostis sp.	bentgrass
Anthoxanthum odoratum	sweet vernal grass
Avena sp.	wild oat
Briza maxima	rattlesnake grass
Bromus vulgaris	common brome
Bromus sp.	brome
Carex deweyana	Dewey’s sedge
Carex globosa	round fruit sedge
Carex harfordii	sedge
Carex obnupta	slough sedge
Cyperus eragrostis	tall flatsedge
Dactylis glomertata	orchard grass
Elymus sp.	wildrye
Festuca arundinacea	tall fescue

Hierchloe occidentalis	California vanillagrass
Holcus lanatus	velvetgrass
Juncus balticus	Baltic rush
Juncus patens	common rush
Phalaris sp.	canarycrass
HERBS	
Adenocaulon bicolor	trail plant
Anaphalis margaritacea	pearly everlasting
Brassica sp.	wild mustard
Calochortus sp. (vegetative)	pussy ears
Campanula prenanthoides	California harebell
Carduus pycnocephalia	Italian thistle
Centaurea solstitialis	yellow star thistle
Centuarium muehlenbergii	centaury
Cerastium sp.	chickweed
Chlorogalum pomeridianum	soaproot
Cichorium sp.	chicory
Cirsium vulgare	bullthistle
Claytonia perfoliata	miner's lettuce
Claytonia siberica	candy flower
Collomia heterophylla	variable leaf collomia
Conyza canadensis	Canadian horseweed
Cynosurus echinatus	dogtail grass
Daucus carota	wild carrot
Digitalis purpurea	foxglove
Disporum hookeri	fairy bells
Epilobium canum sp. latifolium	California fushia
Epilobium sp.	willowherb
Foeniculum vulgare	wild fennel
Fragaria vesca	wild strawberry
Galium sp.	bedstraw

Gnaphalium californicum	everlasting
Gnaphalium luteo-album	everlasting
Gnaphalium sp.	everlasting
Helenium bigelovii	sneezeweed
Heuchera micrantha	alumroot
Hieracium albiflorum	hawkweed
Hypericum perforatum	St. Johnswort
Hypochaeris radicata	catsear
Keckiella corymbosa	redwood keckiella
Lathyrus latifolius	sweet pea
Lathyrus vestitus	pacific pea
Lathyrus glandulosus	**sticky pea (CNPS List 4.3)**
Lonicera hispidula	hairy honeysuckle
Lotus corniculatus	bird's foot trefoil
Lotus sp.	lotus
Lychnis coroneria	rose campion
Madia madioides	tarweed
Madia sativa	coast tarweed
Melilotus alba	white sweetclover
Mentha pulgium	pennyroyal
Mimulus sp.	monkeyflower
Osmorhiza chilensis	sweet cecily
Oxalis oregana	redwood sorrel
Pedicularis densiflora	indian warrior
Petasites frigidus var. palmatus	colts foot
Phacelia sp.	phacelia
Plantago lanceolata	narrow-leaf plantain
Plantago major	plantain
Polygonum cuspidatum	Japanese knotweed
Polygala californica	milkwort
Prunella vulgaris	self-heal

Rorippa nasturtium-aquaticum	nasturtium
Rumex acetosella	sheep sorrel
Rumex crispus	curly dock
Rumex salicifolius	willow dock
Sanicula crassicaulis	sanicle
Satureja douglasii	yerba buena
Sedum spathufolium	yellow stonecrop
Smilacina racemosa	western false Solomon's seal
Sonchus oleraceus	sow thistle
Stachys sp.	hedge nettle
Stellaria media	common chickweed
Torilis arvensis	bur
Trientalis latifolius	star-flower
Trifolium repens	white clover
Trifolium sp.	clover
Trillium ovatum	trillium
Tritelleia laxa	Ithuriel’s spear
Vancouveria sp.	inside-out flower
Vicia sp.	vetch
Vinca major	periwinkle
Viola glabella	stream violet
Viola sempervirens	redwood violet
Whipplea modesta	whipplea

Appendix G.
Location of *Lathyrus glandulosus* (sticky pea) population. USGS 12.5 Minute Garberville Quad. T5S R3E S13, East of Rte. 101 from approx. 40.0129°N, 123.7906°W on the south to 40.0146°N, 123.7914°W on the north.



Appendix H. List of Special Status Species in 9-Quad Area

Garberville, Piercy, Bear Harbor, Fort Seward, Harris, Noble Butte, Miranda, Ettersburg, and Briceland.

Scientific Name	Common Name	Status			General Habitat Description/ Flowering Period	Habitat Present/ Absent	Rationale
		Fed	St	CNPS			
PLANTS							
Arabis macdonaldiana	McDonald's rock-cress	E	E	1B.1	Rocky outcrops, slopes, and open flat benches on serpentine. Blooms May-July.	A	Survey found none
Arctostaphylos canescens ssp. *sonomensis*	Sonoma manzanita	None	None	1B.2	Chaparral, Lower montane coniferous forest sometimes serpentinite. Blooms Jan-Apr (Jun).	A	Survey found none
Arctostaphylos stanfordiana ssp. *raichei*	Raiche's manzanita	None	None	1B.1	Chaparral, Lower montane coniferous forest (openings)/rocky, often serpentinite. blooming period Feb-Apr.	A	Survey found none
Astragalus agnicidus	Humboldt milk-vetch	None	E	1B.1	Broadleafed upland forest, redwood forest, disturbed openings, south aspects. Blooms April - Sept.	HP	Survey found none
Cardamine pachystigma var. *dissectifolia*	dissected-leaved toothwort	None	None	3	Chaparral, Lower montane coniferous forest/usually serpentinite, rocky. blooming period Feb-May.	A	Survey found none
Castilleja affinis ssp. litoralis	Oregon coast Indian paintbrush	None	None	2.2	Coastal bluff scrub, Coastal dunes, Coastal scrub/sandy. Blooming period June.	A	Survey found none
Castilleja mendocinensis	Mendocino coast Indian paintbrush	None	None	1B.2	Coastal bluff scrub, Closed-cone , Coniferous forest, Coastal dunes, Coastal prairie, Coastal scrub, blooms Apr-Aug.	A	Survey found none
Didymodon norrisii	Norris' beard-moss	None	None	2.2	Cismontane woodland, lower montane coniferous forest/intermittently mesic, rock.	A	Survey found none
Erigeron biolettii	streamside daisy	None	None	3	Broadleafed upland forest, Cismontane woodland, North Coast coniferous forest /rocky, mesic, blooming period Jun-Oct.	A	Survey found none
Eriogonum kelloggii	red mountain buckwheat	C	S1.2	1B.2	Lower montane coniferous forest, chaparral, rocky serpentine sites. Blooms May - August.	A	Survey found none
Erythronium revolutum	coast fawn lily	None	None	2.2	Bogs and fens, Broadleafed upland forest, North Coast coniferous forest, /mesic, streambanks. Blooms Mar-Jul (Aug).	A	Survey found none

Appendix H. List of Special Status Species in 9-Quad Area

Garberville, Piercy, Bear Harbor, Fort Seward, Harris, Noble Butte, Miranda, Ettersburg, and Briceland.

Scientific Name	Common Name	Status			General Habitat Description/ Flowering Period	Habitat Present/ Absent	Rationale
		Fed	St	CNPS			
Gentiana setigera	Mendocino gentian	None	None	1B.2	Lower montane coniferous forest, Meadows and seeps/mesic. Blooming period Aug-Sept.	A	Survey found none
Gilia capitata ssp. *pacifica*	Pacific gilia	None	None	1B.2	Coastal bluff scrub, Chaparral (openings), Coastal prairie, Valley and foothill grassland. Blooming period Apr-Aug.	A	Survey found none
Lathyrus glandulosus	**sticky pea**	**None**	**None**	**4.3**	**Cismontane woodland. Blooming period Apr-June.**	**HP**	**Found in Survey**
Monardella villosa ssp. *globosa*	robust monardella	None	None	1B.2	Broadleafed upland forest (openings), Chaparral (openings), Cismontane woodland, Coastal scrub, Valley and foothill grassland. Blooms Jun-Jul (Aug).	HP	Survey found none
Montia howellii	Howell's montia	None	None	2.2	Meadows and seeps, North Coast coniferous forest, Vernal pools /vernally mesic, sometimes roadsides. Blooming period Mar-May.	A	Survey found none
Sedum eastwoodiae	Red mountain stonecrop	C	S1.2	1B.2	Lower montane coniferous forest on serpentine. Blooms May- July.	A	Survey found none
Tracyina rostrata	beaked tracyina	None	None	1B.2	Cismontane woodland, Valley and foothill grassland. Blooming period May-June.	HP	Survey found none
Viburnum ellipticum	oval-leaved viburnum	None	None	2.3	Chaparral, Cismontane woodland, Lower montane coniferous forest. Blooming period May-June.	HP	Survey found none
MAMMALS							
Androzous pallidus	pallid bat	None	SC	N/A	Deserts, grasslands, shrublands, woodlands, and forests. Moat common in open, dry habitats with rocky areas for roosting. Very sensitive to disturbance of roosting sites.	HP	Potential to occur; suitable habitat
Arborimus pomo	Red tree vole	None	CSC	N/A	Live only in coastal coniferous. Usually found in Douglas-fir and grand fir, and western hemlock trees. Live, nest, and feed in forest canopy.	A	No habitat present
Balaenoptera musculus	Blue whale	E	None	N/A	Open waters, occasional inshore waters	A	No habitat present
Balaenoptera physalus	Fin whale	E	None	N/A	Open waters, occasional inshore waters	A	No habitat present

Appendix H. List of Special Status Species in 9-Quad Area

Garberville, Piercy, Bear Harbor, Fort Seward, Harris, Noble Butte, Miranda, Ettersburg, and Briceland.

Scientific Name	Common Name	Status			General Habitat Description/ Flowering Period	Habitat Present/ Absent	Rationale
		Fed	St	CNPS			
Balaenoptera borealis	Sei whale	E	None	N/A	Temperate open sea.	A	No habitat present
Martes pennanti pacifica	Pacific fisher	C	CSC	N/A	Intermediate to large-tree stages of coniferous forests & deciduous-riparian areas w/ high percent canopy closure. Need large areas of mature, dense forest.	P	Potential to occur; suitable habitat present
Physeter macrocephalus	Sperm whale	E	None	N/A	Temperate and tropical oceans, near continental shelf, from Bering Sea to equator	A	No habitat present
Megaptera novaengliae	humpback whale	E	None	N/A	Open waters, occasional inshore waters	A	No habitat present
Eumetopias jubatus	Steller's sea-lion	T	None	N/A	Isolated shoreline and rocky islands.	A	No habitat present
BIRDS							
Accipiter cooperii	Coopers hawk	None	CSC	N/A	Nests in woodland, chiefly of open, interrupted or marginal type. Nest sites mainly in riparian growths of deciduous trees.	A	No habitat present
Aquilia chrysaetos	golden eagle	None			Rolling foothills, mountain areas, sage-juniper flats and desert. Cliff walled canyons provide nesting habitat as well as large trees in open areas.	A	No habitat present
Brachyrampus marmoratus	marbled murrelet	T	E	N/A	Mature Douglas fir and redwood forest within 35 miles of the coast, open ocean. The project area is not within critical habitat for this species.	HP	Potential to occur; suitable habitat present
Coccyzus americanus	western yellow-billed cuckoo	C	None	N/A	Forest to open riparian woodlands	A	No habitat present
Epidonax trailii	willow flycatcher	None	E	N/A	Thickets of low , dense willows on edge of wet meadows, ponds, or backwaters	A	No habitat present
Falco peregrinus anatum	American peregrine falcon	D	E	N/A	Near wetlands, lakes, rivers, or other water; on cliffs/ledges, banks, dunes, mounds; also human-made structures.	A	No habitat present

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Garberville, Piercy, Bear Harbor, Fort Seward, Harris, Noble Butte, Miranda, Ettersburg, and Briceland.

Scientific Name	Common Name	Status			General Habitat Description/ Flowering Period	Habitat Present/ Absent	Rationale
		Fed	St	CNPS			
Haliaetus leucocephalus	Bald eagle	D	E	N/A	Nests and roosts in large diameter trees or snags near large water bodies where prey is abundant	HP	Potential to occur; suitable habitat present
Pandion haliaetus	osprey	None	CSC	N/A	(Nesting) ocean shore, bays, fresh-water lakes, and larger streams. Large nests built in treetops within 15 miles of good fish-producing body of water.	HP	Active nest near PM 1.9
Pelecanus occidentalis californicus	California brown pelican	E	E	N/A	Nest on coastal island lacking ground predators; roost on piers, buoys, and other structures on water bodies near the coast	A	No habitat present
Phoebastris albatrus	Short-tailed albatross	E	None	N/A	Open ocean; nests off the coast of Japan	A	No habitat present
Strix occidentalis caurina	Northern spotted owl	T	None	N/A	Mature old growth forests, conifers, wooded canyons; the project area is not within critical habitat for this species.	HP	Potential to occur; suitable habitat present
Synthliboramphus hypoleucus	Xantus's murrelet	C	T	N/A	Pelagic waters, nest in rocky undisturbed islands, cliffs, sea caves	A	No habitat present
REPTILES / AMPHIBIANS							
Actinemys marmorata	Western Pond Turtle	None	CSC	N/A	Associated with permanent or nearly permanent water in a wide variety of habitat types. Spring / early summer, females move to uplands to lay eggs.	HP	Potential to occur; suitable habitat present
Caretta caretta	Loggerhead turtle	T	None	N/A	Open ocean.	A	No habitat present
Chelonia mydas (incl. Agassizi)	Green turtle	T	None	N/A	Warm-water bays and lagoons.	A	No habitat present
Dermochelys coriacea	Leatherback turtle	E	None	N/A	Open ocean, bays and estuaries.	A	No habitat present
Lepidochelys olivacea	Olive Ridley sea turtle	T	None	N/A	Bay and lagoons.	A	No habitat present

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Scientific Name	Common Name	Status			General Habitat Description/ Flowering Period	Habitat Present/ Absent	Rationale
		Fed	St	CNPS			
Rana boylii	foothill yellow-legged frog	None	CSC	N/A	Partly shaded, shallow streams & riffles with a rocky substrate in a variety of habitats. Need at least some cobble-sized substrate for egg laying.	HP	Potential to occur; suitable habitat present
Rhyacotriton variegatus	southern torrent salamander	None	CSC	N/A	Coastal redwood, Douglas-fir, mixed conifer, montane riparian, and montane hardwood-conifer habitats. Old growth forest. Cold, well-shaded, permanent streams and seepages.	HP	Potential to occur; suitable habitat present
FISH							
Eucyclogobius newberryi	tidewater goby	E	CSC	N/A	Estuaries and lagoons of coastal creeks with low salinity.	A	No habitat present
Oncorhynchus kisutch	central CA, So. OR/No. CA coho salmon	T	T	N/A	Pacific Ocean, nearshore marine zone and riverine and estuarine areas. Critical habitat is present in the BSA.	HP	Possible in Durphy Creek
Oncorhynchus mykiss	northern California steelhead	T	CSC	N/A	Pacific Ocean, spawn in coastal streams and rivers, over gravel beds	HP	Possible in Durphy Creek
Oncorhynchus tshawytscha	CA Coastal chinook salmon;	T	None	N/A	Pacific Ocean, spawn in large, permanent coastal streams and rivers, over gravel beds	HP	Possible in Durphy Creek

KEY:

(CSC) California Species of Concern
(E) Endangered. Listed in the Federal Register as being in danger of extinction
(T) Threatened. Listed as likely to become endangered within the foreseeable future
(C) Candidate. Candidate which may become a proposed species
(D) Delisted
CNPS Listing:
List 1A: Plants Presumed Extinct in California
List 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere
List 2: Plants Rare, Threatened, or Endangered in California, but more common elsewhere
List 3: Plants About Which We Need More Information - A Review List
List 4: Plants of Limited Distribution - A Watch List
Threat Ranks
0.1-Seriously threatened in California (high degree/immediacy of threat)
0.2-Fairly threatened in California (moderate degree/immediacy of threat)
0.3-Not very threatened in California (low degree/immediacy of threats or no current threats known)