



County of Sonoma
Permit & Resource Management Department

Sonoma County Permit and Resource Management Department

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Proposed Mitigated Negative Declaration

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Permit Sonoma File Number:	UPC17-0090
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Pursuant to Section 15071 of the State CEQA Guidelines, this proposed Mitigated Negative Declaration and the attached Expanded Initial Study including the identified mitigation measures and monitoring program, constitute the environmental review conducted by the County of Sonoma as lead agency for the proposed project described below:

Project Name:	UPC17-0090
Project Applicant/Operator:	Luma California, LLC (Alexa Wall)
Project Location/Address:	2275 Roberts Road, Penngrove, CA
APN:	047-122-025
General Plan:	Diverse Agriculture (DA)
Zoning Designation:	DA B6 20/3 RC50/25 SR VOH (Diverse Agriculture with a Density of one dwelling unit per 20 acres and a minimum lot size of 3 acres for the purpose of subdivision); Riparian Corridor Combining Zone 50/25; Scenic Resources Combining District; and Valley Oak Habitat Combining District).
Decision Making Body:	Sonoma County Board of Zoning Adjustments
Appeal Body:	Sonoma County Board of Supervisors
Project Description:	See Item III, below

I. INTRODUCTION

The applicant, Alexa Wall of Luma California, LLC, proposes a commercial medical cannabis and adult use cultivation operation involving a greenhouse and outdoor cultivation areas on the undeveloped portion of a 15-acre parcel located on the north side of Roberts Road, approximately 900 feet east of Petaluma Hill Road, in Penngrove, an unincorporated area in Sonoma County.

This report is the Initial Study required by the California Environmental Quality Act (CEQA). The report was prepared by Richard Larrouy, Land Logistics. Reports, documents, maps, and studies referred to in this document are available for review at the Permit and Resource Management Department (PRMD).

II. EXISTING SETTING

The proposed operation would be located at 2275 Roberts Road, Penngrove. The subject site is zoned DA B6 20/3 RC50/25 SR VOH (Diverse Agriculture with a Density of one dwelling unit per 20 acres and a minimum lot size of 3 acres for the purpose of subdivision); Riparian Corridor Combining Zone 50/25; Scenic Resources Combining District; and Valley Oak Habitat Combining District).

III. PROJECT DESCRIPTION

Luma California, LLC, proposes a commercial medical cannabis and adult use cultivation operation consisting of a 10,000-square foot outdoor cultivation area, a 10,000-square foot mixed light (greenhouse) cultivation area, and a total of 5,000 square feet of indoor cultivation area. The two 10,000-square foot cultivation areas would be located within the southern 5 acres of the undeveloped northern portion of the site (comprising approximately 9.3 acres) and the indoor cultivation area would be located within two buildings: an existing 2,100-square foot shop building on the west side of the property and a new 4,000-square foot building that will replace an existing storage building. The latter will be constructed in the same location as an existing storage building (to be demolished) on the developed central portion of the site. A 3,960-square foot headhouse building would be constructed adjacent to the south side of the greenhouse structure. The existing developed southern portion of the site also contains an approximately 8,000-square foot residence. The remainder of the southern portion of the site consists of lawns and landscaping associated with the existing residence and is not proposed to be utilized as a part of the subject commercial medical cannabis and adult use cultivation operation.

The proposed hours of operation for growing activities are 6:00 a.m. to 9:00 p.m. daily, depending on the season/available hours of sunlight. The proposed hours of operation for processing activities would be from 8:00 a.m. to 5:00 p.m. daily. With respect to staffing, outdoor cultivation is expected to employ two full-time and two part-time employees, greenhouse operations are expected to employ three full-time and two part-time employees, indoor cultivation is expected to employ one full-time employee, and processing/trimming is expected to employ nine part-time employees – for a maximum total of 19 employees (6 full-time and 13 part-time).

Existing Uses: The southern portion of the site is developed with a five-bedroom house and a detached shop building. The detached shop building will be demolished and replaced with a 5,000-square foot building that will be used for indoor cultivation and storage.

Topography: The topography of the project is relatively flat with a gentle rise of 8 feet from the southwest to the northeast portion of the parcel, with elevations ranging from approximately 192 feet above mean sea level (msl) to approximately 200 feet msl. The parcel is located on a broad alluvial fan below the mountain front that forms the eastern edge of the Laguna de Santa Rosa watershed. Interesting the southernmost portion of the parcel drains to Lichau Creek, a tributary of the Petaluma River, and is part of the greater San Francisco Bay watershed. However most of the site is located in most southeasterly corner of the Laguna de Santa Rosa watershed and drains ultimately to the Russian River watershed.

Drainage: The northerly portion of the parcel where the project site is located is lacking in any obvious drainage ways or ditches but appears to generally drain from the east to the west. The project site is near the southern side of Copeland Creek catchment, a tributary of the Laguna de Santa Rosa. The entire project site is underlain by Clear Lake clays, a hydric soil, and was likely part of the complex of wet meadows and vernal pools characteristic of the Santa Rosa Plains before it was drained and farmed sometime in the past. The project's site plan identifies an unnamed, intermittent stream that is located approximately on the very southern edge of the property in the area where the existing residence was developed. The stream flows to Roberts Creek, a tributary of Lichau Creek, then eventually to the Petaluma River. Given the flat topography of the site and the open areas east, west and north of the development area, it will be straightforward for all water on developed road, parking and building surfaces to be contained on site through infiltration on site.

Vegetation: The northern 9.3-acre vacant portion of the subject site is dominated by non-native grassland and given the hydric soils underlying the site can be considered prior converted farmland. Information contained in the project's Biological Resources Assessment indicated that the area was in agricultural (orchard) production from at least 1942 to as recently as 1952. The site currently contains a small number of fruit trees around the site's existing structures and the remaining undeveloped portion of the site appears to be managed for grassland.

Parking: All parking will be done on-site; specifically, in separate areas on the west side of the proposed greenhouse and to the northwest and south of the existing shop building.

Access: All access and egress for vehicles and trucks would be provided by means of a proposed driveway on the west side of the property and an existing concrete driveway on the east side of the property. Both driveways would connect to an existing paved public road on the south side of the property: Roberts Road.

Sewage Disposal: Wastewater that is generated by the site's existing residence is collected and treated by an existing septic system and leach field. Wastewater generated by the proposed cannabis use is required to be treated by a separate septic system. A new septic system will be required to comply with Sonoma County septic and drainage requirements.

Water supply: There is an existing on-site well on the site that is located in a well housed on the east side of the property the southwest of the existing residence. Irrigation of the proposed outdoor, greenhouse, and indoor planting areas will use drip irrigation system, utilizing moisture sensors, irrigation controllers, and backflow prevention devices. The applicant also proposed to utilize a rainwater collection system to supplement well water.

Construction: A detailed construction schedule has not been developed; however, the applicant has indicated that the project will not be developed in phases.

DETAILED PROJECT DESCRIPTION

Cultivation Operation

The proposed project involves the cultivation of cannabis. The proposed cultivation process will take place within a proposed 10,000-square foot greenhouse cultivation canopy area, a proposed 10,000-square foot outdoor cultivation canopy area, and a proposed 5,000-square foot indoor cultivation canopy area. The greenhouse and outdoor growing areas will be contained within an approximate two-acre cultivation area screened by an eight-foot tall security fence that will be constructed using wooden posts at ten feet on enter and metal deer fencing. The fence will be screened and surrounded by native pollinator and fire-resistant plants, in accordance with County water efficient landscape regulations. The indoor cultivation will occur in pre-existing building footprints near the residence. All cultivation areas meet the requirements of county setbacks.

Mixed Light Cultivation

The greenhouse is a total of 25,560 square feet in size and consists of six 30'x120' and one 30'x132' gable-topped greenhouses. The space would be divided into: 1) 30'x132' headhouse for storage, processing, drying, trimming, curing, and office, 2) 180'x12' covered breezeway for walkway and equipment storage, 3) 60'x108' propagation area, and 4) two 60'x108' flowering greenhouse area. The greenhouse span configuration is Headhouse - Veg1 - Veg2 - Flower1 - Flower1 - Flower2 - Flower2. Supplemental lighting, along with natural lighting, would be used to facilitate growth of the cannabis plants. The project is consistent with County Zoning Regulations, which allow a propagation area that is up to 25% of the flowering cultivation canopy. Air temperature and humidity in each of the bays would be closely monitored, and controlled electronically by a system of vents, heaters, and fans. There will also be blackout curtains in the greenhouse and supplemental lights will be used to help aid growing cannabis all year long with zero light leaks.

Outdoor Cultivation

Outdoor cultivation is proposed to take place in a 10,000-square foot area of canopy located on the south side of the greenhouse. The overall area will have approximately 400 plants spaced about 6 feet apart and in rows of 25 making in 20 rows. Plants will be planted above ground in 200-gallon fabric pots using one cubic yard of soil each pot. Each row will be supported using trellis netting to keep plants and canopy in line. Irrigation will be provided by an electronically monitored drip system. Outdoor cultivation would occur from early May to late October, with the harvest conducted once per year, typically in late October.

Indoor Cultivation

Indoor cultivation is proposed to take place within a 5,000-square foot canopy area that will be located in two buildings: 1) an existing 2,100-square foot shop building, and 2) in a 2,900-square foot portion of a new 4,000-square foot building near the site's existing residence and using an existing building footprint. The remaining square footage in the new building will be utilized for walkways and equipment storage.

All growing methods, indoor, outdoor, and greenhouse, will be grown using soil and watered with compost teas, and water. Water flow will be controlled and monitored using advanced drip irrigation systems for water conservation and run-off elimination. In addition, most of the soil after harvest will be re-amended to bring back the nutrients to the soil to be used for the next round of planting. If soil cannot be reused it will be composted for outdoor cultivation the following season. Tanks will be utilized on-site to store composted teas and water for cultivation. Greenhouse and indoor cultivation will occur on rolling benches and all plants will be contained using a trellis system.

Ancillary Processing Activities

Non-cultivation activities related to the processing of cannabis that is harvested on-site would consist of the following activities: drying, storage, trimming, packaging, and curing of harvested material. These activities would take place in the proposed 3,960-square foot headhouse structure that is proposed to be constructed adjacent to the greenhouse structure. The structure would also include offices, an employee break room, restrooms, and other non-specific work and storage areas. Drying will be conducted in foam-insulated rooms outfitted with humidity controls. Trimming, weighing, and packaging will be conducted by trained staff, who will then store the cannabis in a secured room. Any processing that cannot happen on site due to capacity limits would be sent to centralized processing in the county and Santa Rosa.

Parking and Landscaping

The project is proposed to provide approximately 19 vehicle parking spaces in three separate areas for employees working on different parts of the site. The three areas will be located on the west side of the proposed greenhouse and to the north and south of the two buildings (one existing and one proposed) that will be utilized for indoor cultivation. The site also has an existing carport that serves the existing residence that will be occupied by the applicant. Access to the parking areas will be from the site's two existing gated driveways adjacent to Roberts Road: one each on the east and west sides of the property. The driveways will be improved to applicable standards of the Uniform Building Code and applicable provisions of the Sonoma County Development Code.

Project landscaping will consist of plantings to screen the entire proposed security fence around the approximately two-acre outdoor and greenhouse cultivation areas. Detailed landscaping plans have not been submitted to date by the applicant, but must comply with application provisions of the County Zoning Regulations.

IV. SETTING

The subject site is generally located northeast of the intersection of Petaluma Hills and Roberts Roads, in an unincorporated area of Sonoma just east of the current Cotati municipal limits. The site is currently

served by a private septic system and a private well. Parcels on the west and east sides of the property, as well to the south across Roberts Road are as large or larger than the 15-acre subject site and are occupied with single-family residences and limited-intensity agricultural uses. A residential street is located immediately north of the project parcel and a large residential area on unincorporated land between eastern Cotati and Petaluma Hill Road is approximately 1,000 feet west of the project parcel.

V. ISSUES RAISED BY THE PUBLIC OR AGENCIES

A 30-day referral packet was circulated on January 17, 2018, to inform and solicit comments from selected relevant local and state agencies and to special interest groups that were anticipated to take interest in the project. Responses to the project referral were received from: PRMD Natural Resources, Sonoma County Department of Transportation & Public Works, PRMD Grading & Storm Water Section, the California Historical Resources Information System, Sonoma County Public Health Division, PRMD Natural Resources Geologist, and the PRMD Fire and Emergency Services Department. The referral responses included several requests for further information and project use permit conditions of approval. The project planner did not receive referral responses from any state or federal agencies.

Upon permit application, Sonoma County PRMD determined an early neighborhood notification was warranted for this project. Three letters were received with concerns regarding the proposed project.

VI. EVALUATION OF ENVIRONMENTAL IMPACTS

This section analyzes the potential environmental impacts of this project based on the criteria set forth in the State CEQA Guidelines and the County's implementing ordinances and guidelines. For each item, one of four responses is given:

No Impact: The project would not have the impact described. The project may have a beneficial effect, but there is no potential for the project to create or add increment to the impact described.

Less Than Significant Impact: The project would have the impact described, but the impact would not be significant. Mitigation is not required, although the project applicant may choose to modify the project to avoid the impacts.

Potentially Significant Unless Mitigated: The project would have the impact described, and the impact could be significant. One or more mitigation measures have been identified that will reduce the impact to a less than significant level.

Potentially Significant Impact: The project would have the impact described, and the impact could be significant. The impact cannot be reduced to less than significant by incorporating mitigation measures. An environmental impact report must be prepared for this project.

Each question was answered by evaluating the project as proposed, that is, without considering the effect of any added mitigation measures. The Initial Study includes a discussion of the potential impacts and identifies mitigation measures to substantially reduce those impacts to a level of insignificance where feasible. All references and sources used in this Initial Study are listed in the Reference section at the end of this report and are incorporated herein by reference.

The applicant has agreed to accept all mitigation measures listed in the approved Initial Study as conditions of approval for the proposed project, and to obtain all necessary permits.

1. AESTHETICS:

Would the project:

a) Have a substantial adverse effect on a scenic vista?

Comment:

The project site is located in an area designated as visually sensitive by the Sonoma County Zoning Regulations and the Sonoma County General Plan, specifically, by its designation as a Scenic Resources Combining District (“Community Separator” and “Designated Stream”). However, the project would not have a substantial adverse effect on a scenic vista or any designated scenic resources.

As described above (Section III, Project Description), the project site is designated as a Scenic Corridor, specifically as a “Community Separator” for the presence of a “Designated Stream” on the site. The purpose of the Combining District to preserve the visual character and scenic resources of lands in the county and to implement applicable provisions of Sections 2.1, 2.2 and 2.3 of the General Plan Open Space Element. Section 26-240-010 stipulates maximum building heights, minimum lot areas and lot widths, yard requirements, and maximum percentages of lot coverage for parcels with the SR designation. More specifically, as required by Section 26-64-020, structures must be sited below exposed ridgelines, structures must use natural land forms and existing vegetation to screen them from the view of public. The project is consistent with the noted requirements, because there are no exposed ridgelines in the vicinity of the project site and the proposed development is generally screened by existing structures and landscaping on the project site and surrounding parcels; however, the proposed development will be further screened by an eight-foot tall screening fence and extensive landscaping, in the form a formal hedgerow. More specifically, the hedgerow will be an approximately 20-foot wide landscaped area that will surround the approximately two-acre development area. Landscaping will consist of a variety of native evergreen trees and shrubs planted in layers with heights ranging up to 12 feet tall. It will also incorporate perennials and annuals, as well as native wildflowers. The hedgerow will restore native biodiversity to the previously fallow field. The variety of colors and textures presented in the hedgerow will significantly reduce the visibility of project-related improvements. The project is not expected to be visible from Roberts Road, because it will be screened by the existing residence on the site. Likewise, visibility from Petaluma Hill Road will be limited by its approximately 1,200 feet setback from the road and by the intervening improvements (i.e. landscaping structures on adjacent and nearby properties). The project area will also be screened by Code-required screening around the project's security fencing. In addition, the Code states that cuts and fills are discouraged and where practical driveways are screened from public view. The design of the project, therefore, complies with all of the noted standards, with the exception of the one dealing with the screening of driveways. As noted earlier, the site's two driveways are existing and no modifications are anticipated as a part of this project. Because Roberts Road does not experience a significant number of daily trip ends, the redesign and reconstruction of the two driveways is not warranted.

Significance Level: Less Than Significant Impact

b) Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?

Comment:

The project is not located on or visible from a State scenic highway (officially designated state scenic highways in Sonoma County are Highway 12 and Highway 116, as per Caltrans' Scenic Highways Program). As described earlier, the project site is located in the noted Combining District. The purpose of the District, as stated in Section 26-67-005, is to protect and enhance valley oaks and valley oak woodlands and to implement the provisions of Section 5.1 of the General Plan Resource Conservation Element. A Biological Resource Assessment (dated August 2017) was prepared and submitted to PRMD staff along with the Use Permit application to assess the projects potential impacts on biological resources, including protected trees in the County. The study noted that the site contains only one native Valley oak tree that appeared to meet the size criteria for protected status in accordance with the Sonoma County Tree Protection Ordinance. This tree is not proposed for removal by the project. A tree removal permit may be required for the removal of or for work within the protected perimeter (i.e. dropline) of a protected tree. The project, therefore, will not have an adverse impact upon or damage any scenic resources within a state

scenic highway.

Significance Level: No Impact

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

Comment:

The existing visual character of the site and its surroundings are primarily rural to the south and residential to the north. The subject project is consistent with the land use designation for the site, as well as with the SR (Scenic Resources) Combining District and applicable Zoning Regulations. As discussed above, because the project will be adequately screened from the view of both Roberts and Petaluma Hill Roads, no degradation of public view corridors will result from the project. Therefore, the project would not substantially degrade the existing visual character or quality of the site and its surroundings.

Significance Level: Less Than Significant Impact

d) Create a new source of substantial light or glare which would adversely affect day or nighttime view in the area?

Comment:

The project proposes lighting within the proposed greenhouse structure and security lighting. During autumnal months, lights will be utilized in the greenhouses during evening hours to simulate longer day length and thus facilitate the cannabis plant growth cycle. Interior screening material would shield any spillage from light used for cultivation activity and contain it within the greenhouse during evening hours. According to project plans, outdoor security lighting would consist of non-reflective, downward facing lights. As a result, nighttime lighting spillage from security lighting would be minimal. No lighting is required for the outdoor cultivation activities because all outdoor cultivation activities would take place during daylight (between 8:00 AM and 5:00 PM). As noted by the applicant in the project description, exterior lighting will be limited to fixtures that will be provided with screening devices (i.e. hoods, shields) to avoid illuminating adjacent parcels. The project's conditions of approval will also include a requirement to shield lighting to avoid impacts on adjacent parcels or rights-of-way. Overall, lighting provisions incorporated into the project's design will ensure that lighting has a less-than-significant impact on nighttime view in the area.

The project applicant has incorporated the use of polycarbonate plastic for the exterior surfaces of the greenhouse. Polycarbonate is a highly transparent plastic often utilized for greenhouse roofing and walls. The use of polycarbonate for the greenhouse will minimize glare that would otherwise result from sunlight striking the surface of the greenhouse during the daytime.

Therefore, the proposed operation would not create a new source of substantial light or glare that would adversely affect day or nighttime view in the area.

Significance Level: Less Than Significant Impact

2. AGRICULTURE AND FOREST RESOURCES:

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project, and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.

Would the project:

- a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?**

Comment:

The project site is designated by the Sonoma County Permit Sonoma GIS Farmland Map as Farmland of Local Importance and Other Land. The area of the project site that is proposed for development at this time is currently undeveloped. The proposed project would not convert land designated as Prime or Unique Farmland or Farmland of Statewide Importance.

Significance Level: No Impact

- b) Conflict with existing zoning for agricultural use or Williamson Act Contract?**

Comment:

The project site is zoned for Diverse Agriculture land use and is not under a Williamson Act Contract. As noted earlier, the project site is located within the RC, SE, and VOH Combining Districts, none of which prohibit the subject use, subject to compliance with noted development standards. Likewise, the Diverse Agriculture zoning district permits the cultivation of cannabis, subject to securing an approved Use Permit and complying with applicable development standards (see County Zoning Regulations Section 26-88-254).

Significance Level: Less Than Significant Impact

- c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 4526) or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?**

Comment:

The project site is not in a Timberland Production zoning district, nor would it cause a rezoning of forest land.

Significance Level: No Impact

d) Result in the loss of forest land or conversion of forest land to non-forest use?

Comment:

As discussed in Section 2.c, above, the project site would not result in loss of forest land or conversion of forest land to non-forest use.

Significance Level: No Impact

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland, to non-agricultural use or conversion of forest land to non-forest use?

Comment:

The project site is designated Farmland of Local Importance and Other Land, as shown on the Sonoma County Permit Sonoma GIS Farmland Map. The project site is approximately 15 acres in size. The southerly 5.7 acres of the site contains the existing single-family residence and related improvements. Approximately 50% of this portion of the site is developed with improvements related to the residence. The south end of the northerly 9.3 acres of the site is where the applicant has proposed to locate the planned cannabis operation. The proposed project-related improvements encompass approximately 33% of this portion of the site. The proposed project improvements will increase the developed portion of the overall property from approximately 20% to 40%.

Information contained in the project's Biological Resources Assessment indicates that a portion of the project site was in agricultural (orchard) production from at least 1942 to as recently as 1952. The site currently contains a small number of fruit trees around the site's existing structures and the remaining undeveloped portion of the site appears to be managed for grassland. Conversion of approximately 20% of the overall site does not represent a significant conversion of an agricultural use to a non-agricultural use, because the site is not actively farmed at this time. Likewise, development of the proposed cannabis operation does not represent a significant conversion of land that is designated as Farmland of Local Importance, because the site, as currently developed, does not readily lend itself to agricultural use. Conversion of the agricultural resource, however, does not preclude the property owner from developing the remainder of the site – up to as much as 60% of the 15-acre site - with agricultural uses in the future.

Significance Level: Less Than Significant Impact

3. AIR QUALITY:

Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?

Comment:

The project is within the jurisdiction of the Bay Area Air Quality Management District (BAAQMD), which is currently designated as a nonattainment area for State and federal ozone standards, the State PM 10 standard, and the State and federal PM 2.5 standard. The District has adopted an Ozone Attainment Plan and a Clean Air Plan in compliance with Federal and State Clean Air Acts. These plans include measures to achieve compliance with both ozone standards. The plans deal primarily with emissions of ozone precursors (nitrogen oxides (NOx) and volatile organic compounds, also referred to as Reactive Organic Gases (ROG)). The project would not conflict with the BAAQMD air quality plans, because the proposed use is below the emission thresholds for ozone precursors, as discussed in Section 3.b, below.

Significance Level: Less than Significant Impact

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Comment:

State and federal standards have been established for the following "criteria pollutants:" ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and particulates (PM₁₀ and PM_{2.5}). The pollutants NO_x (nitrogen oxides) and reactive organic gases (ROG) form ozone in the atmosphere in the presence of sunlight. The principal source of ozone precursors is vehicle emissions, although stationary internal combustion engines (e.g., from generators) are also a source. The commercial cannabis operations are specifically listed in the BAAQMD Air Quality Guidelines screening criteria; however, a general comparison can be made with the BAAQMD "general light industry" land use. This land use has a screening size of 541,000 square feet (541 ksf) for operational criteria pollutants, and a screening size of 259 ksf for construction-related pollutants. The plans for this project show a total gross square footage of approximately 87,120 square feet, which is approximately 16% of the screening size for operationally generated pollutants, and approximately one-third of the screening size for construction-related pollutants. Because the project did not exceed these screening criteria for ROG and NO_x (BAAQMD Air Quality Guidelines Table 3-1), preparation by the applicant of a detailed air quality not required and emissions of criteria pollutants from the project were assumed to be less than significant.

In addition, a detailed air quality analysis was not required for localized CO concentrations, because traffic generated by the project would not significantly increase traffic volumes at the nearest affected intersection (Petaluma Hill Road and Roberts Road) above the BAAQMD screening criterion (more than 44,000 vehicles per hour). Also, because the project would not cause significant long-term emissions of criteria pollutants, the project would not violate any air quality standard. In addition, the 2016 Sonoma County Medical Cannabis Land Use Ordinance Negative Declaration (2016 ND) states that where new structures would be constructed, construction-related dust could cause temporary, minor increases in PM₁₀ and that construction would be required to obtain building and grading permits and adhere to existing air quality regulations. Individually, the construction of cultivation sites and their ongoing operations would not be expected to result in nonattainment of ambient air quality standards.

Finally, the applicant has estimated that the proposed project would require site grading of approximately 1,000 cubic yards (cy) of cut and 1,000 cy of fill for development of required access roads. A lesser amount cut and/or fill could be reasonably expected for development of the proposed structures. Construction-related grading operations typically involve diesel-powered equipment and generally generate dust in addition to equipment exhaust emissions. For all projects within the air district, BAAQMD recommends implementing eight basic construction best management practices (BMPs) to control fugitive dust from construction activities. BAAQMD established these BMPs to reduce fugitive dust emissions, which would in turn reduce associated air quality impacts to a less than significant level.

Therefore, the following County dust control measures and BAAQMD air quality BMPs are required to be incorporated into the project to reduce construction period air quality impacts to a less-than-significant level.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Mitigation Measure AIR-1:

(a) The following County dust control measures shall be included in the project:

1. Water or alternative dust control method shall be sprayed to control dust on construction areas, soil stockpiles, and staging areas during construction as directed by the County.
2. Trucks hauling soil, sand and other loose materials over public roads will cover the loads, or will keep the loads at least two feet below the level of the sides of the container, or will wet the load sufficiently to prevent dust emissions.

3. Paved roads will be swept as needed to remove soil that has been carried onto them from the project site.

(b) In addition, the above referenced BAAQMD BMPs shall be included in the project:

1. Water all exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) two times per day during construction and adequately wet demolition surfaces to limit visible dust emissions.
2. Cover all haul trucks transporting soil, sand, or other loose materials off the project site.
3. Use wet power vacuum street sweepers at least once per day to remove all visible mud or dirt track-out onto adjacent roads (dry power sweeping is prohibited) during construction of the proposed project.
4. Vehicle speeds on unpaved roads/areas shall not exceed 15 miles per hour.
5. Complete all areas to be paved as soon as possible and lay building pads as soon as possible after grading unless seeding or soil binders are used.
6. Minimize idling time of diesel-powered construction equipment to five minutes and post signs reminding workers of this idling restriction at all access points and equipment staging areas during construction of the proposed project.
7. Maintain and properly tune all construction equipment in accordance with manufacturer's specifications and have a CARB-certified visible emissions evaluator check equipment prior to use at the site.
8. Post a publicly visible sign with the name and telephone number of the construction contractor and County staff person to contact regarding dust complaints. This person shall respond and take corrective action within 48 hours. The publicly visible sign shall also include the contact phone number for the Bay Area Air Quality Management District to ensure compliance with applicable regulations.

Mitigation Monitoring AIR-1:

County staff shall ensure that these construction period air quality measures are listed on all site alteration, grading, building, or improvement plans prior to issuance of grading or building permits.

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Comment:

As discussed in Section 3.b above, the is expected to result in an incremental increase of criteria pollutants given the direct emissions from increased vehicle trips to the parcel as well as indirect emissions from electric power generation sources. However, these incremental emissions are not expected to result in a significant cumulative increase given the small size of the project. Also, as discussed in Section 3.b, above, the project would have no long-term effect on PM_{2.5} and PM₁₀, because all surfaces would be paved, gravel, landscaped, or otherwise treated to stabilize bare soils. Dust emissions from construction operations, while potentially significant, are avoided or minimized by implementing recommended best management practices in Mitigation Measure AIR-1.

Finally, if a back-up diesel-powered generator is installed, Sonoma County Ordinance No. 6189 states that it cannot be used as a primary source of power but only operated for emergency power or for testing and/or maintenance. Emissions from the emergency generator would not be considered significant because of this limited use, however, the generator is subject to BAAQMD rules and regulations, and the operator would need to obtain the appropriate BAAQMD permit for the back-up generator prior to installation and use.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Mitigation Measure AIR-2:

The applicant shall provide County staff with the appropriate BAAQMD permits for operation of an emergency back-up diesel generator.

Mitigation Monitoring AIR-2:

County staff shall verify the BAAQMD permit for operation of the back-up diesel generator prior to issuing grading or building permits.

d) Expose sensitive receptors to substantial pollutant concentrations?

Comment:

Sensitive receptors include hospitals, schools, convalescent facilities, and residential areas. The project site is located to the east and south of residential areas on the eastern side of the greater Cotati urban zone. The main cultivation area in the center of the parcel is more than 300 feet from the nearest residence to the north of the project parcel. Based on the analysis in Sections 3.b and 3.c, above, the project is not expected to result in substantial pollutant exposure due to construction or operations.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Implement Mitigation Measure AIR-1

Mitigation Monitoring:

See Mitigation Monitoring AIR-1

e) Create objectionable odors affecting a substantial number of people?

Comment:

According to the 2016 Sonoma County Medical Cannabis Land Use Ordinance Negative Declaration (2016 ND; page 20), the project is considered an odor-generating use by the County with the potential for "a strong odor...during the final phase of the growing cycle (typically in late summer/early fall)." Although this type of project is not included in the BAAQMD Guidelines (Table 3-3, Odor Screening Distances), BAAQMD recommends a minimum one-mile screening distance for certain project types (i.e., food processing facilities, feed lots and dairies, green water and recycle operations). However, BAAQMD does not intend these distance guidelines "as absolute screening criteria, rather as information to consider along with odor parameters" (BAAQMD Guidelines, p. 3-4). Regardless, the County has determined that because the project is an odor-generating use and within the minimum one-mile screening distance, "a public nuisance may be deemed to exist if the cultivation produces odors which are disturbing to people of normal sensitivity residing or present on adjacent or nearby property or areas open to the public," (2016 ND, p. 20). The project applicant is proposing to use both carbon filters and an odor control system that uses a mixture of natural and biodegradable ingredients injected by high pressure to form atomized droplets that attach to and eliminate noxious odors. The system would be employed in the greenhouse operation to minimize objectionable odors being emitted from the inside of the greenhouses.

With regards to the outdoor cultivation area, the cultivation area is approximately 375 feet from the nearest residence to the north, however, strong northerly evening winds are not uncommon in this area during the summer and early fall. The applicant has proposed that the 375-foot separation, as well as the designation of an "Odor Mitigation Manager" to monitor, log and respond to odor issues or complaints will mitigate potential odor risk from the outdoor growing area. In addition, the applicant has proposed to incorporate two additional mitigation measures to reduce potential project-related odor impacts: Utilization of 1) Commercial Odor Remediation Equipment (C.O.R.E.) and 2) Subtractive Odor Control technology. The former utilizes a process called Molecular Disassociation to destroy the odor-causing molecules using high

powered ultraviolet lamps to create ozone and hydroxyls that destroy Volatile Organic Compounds (VOC) molecules. The latter utilizes selected essential oils, dispersed in vapor form, to neutralize odors.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Mitigation Measure AIR-3: All indoor, greenhouse and mixed light cultivation operations and any drying, aging, trimming and packing facilities shall be equipped with odor control filtration and ventilation system(s) to control odors, humidity, and mold.

Mitigation Measure AIR-4: Conditions will be included in the use permit for the project requiring the following: prior to building permit approval, the owner/operator shall obtain written approval from Permit Sonoma of a Nuisance Odor Contingency Plan to which outlines steps to address odor issues or complaints from the operation including but not limited to the following: 1) ceasing outdoor growing of cannabis, 2) installing a “fog system” around some or all of the perimeter of the outdoor growing area; 3) changing or upgrading the filtration system for the indoor grow areas; and 4) other methods, equipment, or operational changes to address odor generation at the operation.

Mitigation Monitoring:

Mitigation Monitoring AIR-3: County staff shall ensure that the odor control filtration and ventilation system(s) are listed on all site alteration, grading, building, and/or improvement plans, prior to issuance of grading or building permits.

Mitigation Monitoring AIR-4: Permit Sonoma will not issue a building permit for the project until a Nuisance Odor Contingency Plan is approved for the operation.

4. BIOLOGICAL RESOURCES:

Would the project:

- a) **Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?**

Comment:

Regulatory Framework

Four potential biotic resource issues have been identified from the information provided in the Biological Resources Assessment Report (Report) prepared by WRA, Inc. for the project.

1. Wetlands and Hydric Soils. The entire site is underlain by hydric (Clear Lake) soils, however based on a single, mid-dry season site visit in July 2017, the Report concluded that no federal jurisdictional wetlands were present on the site when the U.S. Army Corps of Engineers three-parameter determination standard is applied, i.e., presence of wetland hydrology, presence of hydric soils, a dominance of hydrophytic vegetation. However, the Sonoma County grading ordinance adopts a two-parameter definition of wetlands outside of the coastal zone (Section 11.22.020). Thus, wetlands could be determined to be on-site if soils and hydrology were found to be present. Since wetland hydrology including ponding or saturation of soil within the top 12 inches during the growing season could not be observed, and given the presence of hydric soils at the site, wetlands as defined in the cannabis may occur at the site.

2. California Tiger Salamander Breeding or Aestivation Habitat. The project is located outside of designated critical habitat areas for the California Tiger Salamander (CTS) but the Report identified known occurrences of CTS with 1.2 to 1.6 miles of the project site. Although not identifying breeding pools on the project site during the July 2017 field visit, the Report did not address the use of the site as potential non-breeding aestivation habitat for CTS. It did state the presence of major roads might limit the use of the site by CTS; However, CTS are well-known to cross major roads during their dispersal phase.
3. Congested-headed Tar plant (*Hemizonia congesta* ssp. *congesta*). The Report evaluated over 90 plant species in a five mile vicinity of the project site and based on a comparison of the project site habitat characteristics to the species habitat preferences, concluded that only one species, Congested-headed Tar Plant had moderate potential to occur at the project site (California Native Plant Society (CNPS) Rank 1B). This plant is a small, annual herb in the sunflower family (Asteraceae) that blooms from April to November. It typically grows in grassy areas and fallow fields in coastal scrub and valley and foothill grassland at elevations of 65 to 1840 feet msl. The project site can be characterized as a grassy fallow field located near foothill grasslands just to the east. Based on a single site visit in July 2017, the Report concluded that Congested-headed Tar Plant was unlikely to be present as the plant was not directly observed during the site visit. Similarly, none of the other plant species considered were directly observed during the July 2017 site visit according to the Report.
4. Other Birds and Wildlife. The Report evaluated 50 wildlife (birds, mammals, amphibians) in the 5 mile vicinity of the project site and broadly concluded that there was not a moderate or high potential for any of them to be present at the project site. The Report does note however, that "some suitable habitat may be present (e.g., grassland or trees potentially suitable for nesting) but concludes use of this habitat "may be precluded" due to lack of suitable habitat, high disturbance levels, urbanized areas near the site, or lack of suitable refugia. The project site does include habitat features (e.g., grassland) that are could potentially be used by nesting, foraging or hunting birds and other wildlife (e.g., badgers).

In order to confirm species are either not present and therefore potential impacts are less than significant or to mitigate for potential impacts, the mitigation measures and monitoring below are required.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation Measure:

Mitigation Measure BIO-1:

If ground disturbance or removal of vegetation occurs in the breeding bird season (February 15 through August 15), pre-construction surveys shall be performed by a qualified biologist no more than 14 days prior to commencement of such activities to determine the presence and location of nesting bird species. If active nests are present, establishment of temporary no-work buffers around active nest will prevent adverse impacts to nesting birds. Appropriate buffer distance should be determined by a qualified biologist and is dependent on species, surrounding vegetation, and topography. Once active nests become inactive, such as when young birds fledge the nest or the nest is subject predation, work may continue in the buffer area and no adverse impact birds will result.

Mitigation Measure BIO-2:

The following additional surveys, studies and evaluations are required prior to grading permit issuance:

- a. A wetland determination and if wetlands are determined to be on-site, delineation, performed during the early spring (March-April) specifically determining and mapping areas of surface water ponding or saturation within the top 12 inches of soil at the site and applying the 2-parameter wetland definition used in the County's grading ordinance;
- b. Spring, summer and fall floristic surveys focusing on state or federal listed plant species as well as Congested-headed Tar Plant.
- c. In conjunction with the wetland determination/delineation in BIO-2(a), above, a further evaluation of the project site as potential breeding habitat for CTS. If no wetlands are determined to be present, a further evaluation of the site as potential dispersal or aestivation habitat for CTS including the presence of burrows or other habitat features for CTS dispersal and aestivation.

- d. A further evaluation of the site, performed in conjunction with surveys required by BIO-2(b) of the potential habitat and use of the site as nesting, foraging, hunting, or burrowing habitat for bird and wildlife species that use grassland habitats.

e.

Mitigation Monitoring:

Mitigation Monitoring BIO-1:

Prior to issuance of any grading permit(s), the County shall review and approve the results of all additional surveys, studies, evaluations, and pre-construction surveys and any avoidance measures recommended by the biologist, which shall be noted on the final project plans.

- b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?**

Comment:

Although the project parcel is located on a property zoned RC (Riparian Corridor Combining Zone), and VOH (Valley Oak Habitat Combining District), the project location in the middle of the parcel is not located within any setbacks for riparian corridor and the Valley Oak plant community type is not present on the parcel. Subject to the results of the additional surveys required in BIO-2, above, the project site is not known to contain any riparian habitat, sensitive natural communities, or oak woodlands, and project-related impacts on these resources would be less than significant.

Significance Level: Less than Significant Impact

- c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?**

Comment:

Regulatory Framework

The Army Corps of Engineers (ACOE) regulates both "Waters of the United States", including adjacent wetlands, under Section 404 of the federal Clean Water Act, and "other waters," which are characterized as areas that are inundated for sufficient duration and depth to exclude growth of hydrophytic vegetation. The discharge of dredged or fill material into a Waters of the U.S. (including wetlands) generally requires a permit from the ACOE under Section 404 of the Clean Water Act. "Waters of the State" are also regulated by the Regional Water Quality Control Board (Water Board) under the State Porter-Cologne Water Quality Control Act. Finally, Sonoma County defines what is a "wetland" for the purposes of its own ordinances and specifies various setbacks and restrictions on activities that can occur in or near wetlands.

Based on July 5, 2017, site visit, the Report concluded that no federal jurisdictional wetlands are present on the project parcel. As noted in 4.a above, the mid-dry season site visit may not have been able to detect the presence of wetland hydrology (ponding, soil saturation) in the mapped hydric soils that underlie the project parcel and site which is addressed in Mitigation Measure BIO-2 above.

Significance Level: Less than Significant with Mitigation Incorporated

See Mitigation Measure BIO-2

Mitigation Monitoring:

See Mitigation Monitoring BIO-2

- d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?**

Comment:

As discussed in Section 4.a, above, the grassland habitat and landscape position of the site may provide habitat or movement corridors for bird or wildlife species.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

See Mitigation Measures BIO-1 and BIO-2

Mitigation Monitoring:

See Mitigation Monitoring BIO-1 and BIO-2

e) Conflict with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance?

Comment:

Sonoma County General Plan. The *Sonoma County General Plan 2020* Land Use Element and Open Space & Resource Conservation Element both contain policies to protect natural resource lands including, but not limited to watershed, fish and wildlife habitat, wetlands, threatened or endangered species, biotic areas, and habitat connectivity corridors.

Riparian Corridor Ordinance. The RC combining zone is established to protect biotic resource communities, including critical habitat areas within and along riparian corridors, for their habitat and environmental value, and to implement the provisions of the General Plan Open Space and Resource Conservation and Water Resources Elements. These provisions are intended to protect and enhance riparian corridors, while balancing the need for agricultural production, urban development, timber and mining operations, and other land uses.

Scenic Resources Combining District. As described above (Section III, Project Description), the project site is designated as a Scenic Corridor, specifically as a “Community Separator” for the presence of a “Designated Stream” on the site. The purpose of the Combining District to preserve the visual character and scenic resources of lands in the county and to implement applicable provisions of Sections 2.1, 2.2 and 2.3 of the General Plan Open Space Element. The design of the project complies with all of the noted standards, with the exception of the one dealing with the screening of driveways. As noted earlier, the site’s two driveways are existing and no modifications are anticipated as a part of this project. Because Roberts Road does not experience a significant number of daily trip ends, the redesign and reconstruction of the two driveways is not warranted.

Valley Oak Habitat (VOH) Combining District. The VOH combining district is established to protect and enhance valley oaks and valley oak woodlands and to implement the provisions of *Sonoma County General Plan 2020* Resource Conservation Element Section 5.1. The biological resources assess for the project noted that the site contains only one native Valley oak tree that appeared to meet the size criteria for protected status under the Sonoma County Tree Protection Ordinance. Since the project does not propose to remove this tree, the report concluded that the project will not have an adverse impact on the noted protected tree. If the tree were to be subsequently removed, a tree removal permit may be required for the removal of or for work within the protected perimeter (i.e. dripline) of a protected tree.

Significance Level: Less Than Significant

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state Habitat Conservation Plan?

Comment:

There are no adopted habitat conservation plans or natural community conservation plans covering the project area.

Significance Level: No Impact

5. CULTURAL RESOURCES:

Would the project:

- a) **Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?**

Comments:

In January 2017, Permit Resource Management Department (PRMD) staff referred the project application to Native American Tribes within Sonoma County to request consultation under AB52 (the request for consultation period ended 30 days later in February 2017). One tribe, the Federated Indians of Graton Rancheria, responded with a request for consultation under the provisions of AB52. Staff subsequently consulted with the Tribe and the Tribe provided a written recommendation that project-related activities be monitored by a Tribal Cultural Monitor.

A Cultural Resources Evaluation was conducted and a report prepared for the project by a professional archaeologist (February 16, 2018). The subject site was examined for any indication of the presence of potential significant cultural resources through a surface examination. No indication of Native American use of the property was observed. The cultural resource evaluation resulted in a negative finding. No evidence of cultural deposits from prehistoric or historic areas were observed at any location within the proposed area of disturbance on the project site and there are no documented historical resources on the property. In addition, a Historical Resources Study was conducted and a report was prepared for the project by qualified professionals (April 26, 2018). No historical resources were found within the study area and the study made no specific recommendations regarding development of the project. However, as a precaution, the follow mitigation measure is included in the event of accidental discover of historic or archaeological resources during project development.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Mitigation Measure CUL-1: Any discovered artifact deposit that is over 100 years old is potentially significant and should be evaluated by an archaeologist. If any prehistoric artifactual materials such as modified obsidian flakes or formed tools or concentrations of natural obsidian nodules are observed during any phase or grading or future construction on the property, all work in the vicinity of the find should be stopped until the area of the discovery can be evaluated by an archaeologist. The archaeologist shall prepare a data recovery plan, which makes provisions for adequate recovery of culturally or historically consequential information about the site (or recommends mitigation "in place").

Mitigation Monitoring:

Mitigation Monitoring CUL-1: PRMD staff shall be consulted if a cultural resource is discovered onsite, and shall review and approve archaeologist-recommended measures to recover or preserve any data or cultural resources before ground-disturbing activities may continue.

- b) **Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?**

Comment:

There are no known archaeological resources on the site (See Section 5.1, above), but the project could uncover such resources during construction. In its response to the review of the project, one of the noticed tribal groups, the Federated Indians of Graton Rancheria, requested that monitoring of construction-related activities associated with the project be conducted by a Tribal Cultural Monitor. The following mitigation measure was developed to address the request.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Mitigation Measure CUL-2: A Tribal Cultural Monitor shall be present onsite during all grading and ground disturbance work. Prior to submittal of the application for Grading Permit or any other ground disturbing activity, the applicant shall provide an executed contract with a qualified consultant to monitor ground disturbing activities to Permit Sonoma. All building and/or grading permits shall have the following note printed on grading or earthwork plan sheets:

An Archaeological Monitor is required to be present during all grading or other ground-disturbing work. The Archaeological Monitor must be present on site before the start of any ground-disturbing work, including scraping. In the event that cultural resources are discovered at any time during grading, scraping or excavation within the property, all work should be halted in the vicinity of the find. Artifacts associated with prehistoric sites may include humanly modified stone, shell, bone or other cultural materials such as charcoal, ash and burned rock indicative of food procurement or processing activities. Prehistoric domestic resources include hearths, fire pits, or house floor depressions whereas typical mortuary resources are represented by human skeletal remains. The Archaeological Monitor and Permit Sonoma - Project Review Staff shall be notified. Permit Sonoma Staff should consult with the appropriate tribal representative(s) from the tribes known to Permit Sonoma to have interests in the area to determine if the resources qualify as Tribal Cultural Resources (as defined in Public Resource Code § 21074). If determined to be a Tribal Cultural Resource, Permit Sonoma would further consult with the appropriate tribal representative(s) and project proponents in order to develop and coordinate proper protection/mitigation measures required for the discovery. Permit Sonoma may refer the mitigation/protection plan to designated tribal representatives for review and comment. No work shall commence until a protection/mitigation plan is reviewed and approved by Permit Sonoma - Project Review Staff. Mitigations may include avoidance, removal, preservation and/or recordation in accordance with California law. Evaluation and mitigation shall be at the applicant's sole expense.

If human remains are encountered, all work must stop in the immediate vicinity of the discovered remains and Permit Sonoma Staff and County Coroner must be notified immediately pursuant to State law so that an evaluation can be performed. If the remains are deemed to be Native American, the Native American Heritage Commission must be contacted by the Coroner so that a "Most Likely Descendant" can be designated and the appropriate provisions of the California Government Code and California Public Resources Code would be followed.

Mitigation Monitoring:

Mitigation Monitoring CUL-2: Building and grading permits shall not be approved for issuance by Permit Sonoma - Project Review Staff until the above note is printed on the building, grading and improvement plan(s). The applicant shall provide an executed contract with a qualified consultant to monitor ground disturbing activities to Permit Sonoma.

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Comment:

There are no known unique geologic features on the project site. Paleontological resources include fossil remains, as well as fossil localities and rock or soil formations that have produced fossil material. No surveys for paleontological resources have been conducted for the site. However, implementation of Mitigation Measure CUL-1 would reduce potential impacts on paleontological resources to less-than significant levels in the event that such materials are encountered during development of the project.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Implement Mitigation Measure CUL-1

Mitigation Monitoring:

See Mitigation Monitoring CUL-1.

d) Disturb any human remains, including those interred outside of formal cemeteries?

Comment:

No burial sites are known in the vicinity of the project. The site will be disturbed by grading and construction activities, but it is not likely to be a burial site (see Section 5.a, above). Implementation of Mitigation Measure CUL-1 would reduce potential impacts on human remains to less-than significant levels in the event that such materials are encountered during development of the project.

Significance Level: Less than Significant Impact with Mitigation Incorporated

Mitigation:

Implement Mitigation Measure CUL-1

Mitigation Monitoring:

See Mitigation Monitoring CUL-1

6. GEOLOGY AND SOILS:

Would the project:

- a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving the rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.**

Comment:

The project site is not within a fault hazard zone as indicated on the Sonoma County General Plan 2020, Public Safety Element, Figure PS-1b, Earthquake Fault Hazard Areas Map. The project does not involve constructing residential structures which would be occupied by people.

Significance Level: Less than Significant

i. Strong seismic ground shaking?

Comment:

All of Sonoma County is subject to seismic shaking that would result from earthquakes along the San Andreas, Healdsburg-Rodgers Creek, and other faults. The design and construction of new structures are subject to engineering standards of the California Building Code (CBC), which take into account soil properties, seismic shaking and foundation type. Application of geotechnical evaluation and appropriate engineering practices would reduce risks of potential injury and damage resulting from seismic activity. Project conditions of approval require that building permits be obtained for all construction and that the project meet all standard seismic and soil test/compaction requirements. The project would therefore not expose people to substantial risk of injury from seismic shaking.

Significance Level: Less than Significant Impact with Mitigation Incorporated

Mitigation:

Mitigation Measure GEO-1: All construction-related work, including earthwork, grading, trenching, backfilling and compaction operations, shall be conducted in accordance with the Sonoma County Code Chapter 11. All construction activities shall meet California Building Code regulations for seismic safety. Construction plans shall be subject to review and approval of Permit Sonoma prior to the issuance of a building permit. All work shall be subject to inspection by Permit Sonoma and must conform to all applicable code requirements and approved improvement plans prior to the issuance of a certificate of occupancy.

Mitigation Monitoring

Mitigation Monitoring GEO-1: Building and grading permits for ground disturbing activities shall not be approved for issuance by Project Review staff until the final construction plans, with any applicable building, grading and/or improvement notes, are reviewed. The applicant shall be responsible for notifying construction contractors about California Building Code regulations for seismic safety.

ii. Seismic-related ground failure, including liquefaction?

Comment:

Strong ground shaking can result in liquefaction, the sudden loss of shear strength in saturated fills, sandy materials and other soils prone to liquefaction, resulting in ground failure. Areas of Sonoma County most at risk of liquefaction are along San Pablo Bay and in alluvial valleys. The project site is not located within a liquefaction hazard area according to the Sonoma County General Plan 2020 Public Safety Element.

Significance Level: Less than Significant

iii. Landslides?

Comment:

Steep slopes characterize much of Sonoma County, particularly the northern and eastern portion of the County. Where these areas are underlain by weak or unconsolidated earth materials landslides are a hazard. If the project includes structures located in the footprint of a mapped landslide or within a landslide hazard area building or grading could destabilize slopes resulting in slope failure. The project would be located in a Class IX Landslide Hazard Area according to the General Plan Public Safety Element, Figure PS-1d, which means the area is highly susceptible to landslides. All structures will be required to meet building permit requirements, including seismic safety standards and soil test/compaction requirements.

Pursuant to General Plan Policy PS-1f, prior to project approval, the applicant shall provide the County with a geologic (geotechnical) report that describes the hazards (including from expansive soils) and includes necessary measures to reduce risks to acceptable levels. An engineer's or geologist's certification shall be provided to ensure that risks have been reduced to a level acceptable to the County.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Mitigation Measure GEO-2: Implement Mitigation Measure GEO-1. In addition, the design of all earthwork, cuts and fills, drainage, pavements, utilities, foundations and structural components shall conform with the specifications and criteria contained in the project geotechnical report to be completed and submitted to Permit Sonoma prior to project approval. The geotechnical engineer shall submit an approval letter for the engineered grading plans prior to issuance of the grading permit. Prior to final of the grading permit the geotechnical engineer shall also inspect the construction work and shall certify to Permit Sonoma, prior to the acceptance of the improvements or issuance of a certificate of occupancy that the improvements have been constructed in accordance with the geotechnical specifications.

Mitigation Monitoring:

Mitigation Monitoring GEO-2: Prior to final plan approval, Permit Sonoma Plan Check staff shall review all plans for compliance with geotechnical requirements.

b) Result in substantial soil erosion or the loss of topsoil?

Comment:

The project includes grading, cuts and fills which require the issuance of a grading permit. Improper grading, both during and post construction, has the potential to increase soil erosion from the project site.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Mitigation Measure GEO-3: The project site will be inspected following the first heavy rain, during the middle of the rainy season and at the end of the rainy season following construction. During each visit, areas of significant erosion or erosion control device failure shall be noted and appropriate remedial actions taken.

Mitigation Measure GEO-3: The applicant shall submit an Erosion and Sediment Control Plan prepared by a registered professional engineer as an integral part of the grading plan. The Erosion and Sediment Control Plan shall be subject to review and approval of the Permit Sonoma prior to the issuance of a grading permit. The Plan shall include temporary erosion control measures to be used during construction of cut and fill slopes, excavation for foundations, and other grading operations at the site to prevent discharge of sediment and contaminants from the project site. The Erosion and Sediment Control Plan shall include the following measures as applicable:

- a. During active construction, ground disturbance shall be minimized and existing vegetation shall be retained to the extent possible to reduce soil erosion. All construction and grading activities, including short-term needs (equipment staging areas, storage areas and field office locations) shall minimize the amount of land area disturbed. Whenever possible, existing disturbed areas shall be used for such purposes.
- b. All drainage ways, wetland areas and creek channels shall be protected from silt and sediment in storm runoff through the use of silt fences, diversion berms and check dams. Fill slopes shall be compacted to stabilize. All exposed surface areas shall be mulched and reseeded and all cut and fill slopes shall be protected with hay mulch and /or erosion control blankets as appropriate.
- c. All erosion control measures shall be installed according to the approved plans prior to the onset of the rainy season but no later than October 1st. Erosion control measures shall remain in place until the end of the rainy season, but may not be removed before April 15th. The applicant shall be responsible for notifying construction contractors about erosion control requirement.

Mitigation Monitoring:

Mitigation Monitoring GEO-4: The project site shall be inspected by County staff after storm events that produce 1 inch of rain or greater within 24-hour period in the Santa Rosa area. During every inspection, areas of significant erosion or erosion control device failure shall be noted and appropriate remedial actions

will be taken as soon as practical. If erosion control measures appear to be effective for three consecutive site inspections following 1-inch storm events, then site inspections would only be required following storm events that result in 2 inches of rain, or greater, within a 24-hour period in the Santa Rosa area.

At the end of the rainy season, County staff shall re-inspect the site and evaluate the effectiveness of the erosion control measures that were used. If there were problem areas at the site, recommendations will be made to improve methods used in subsequent projects.

Mitigation Monitoring:

Mitigation Monitoring GEO-4: Building and grading permits for ground disturbing activities shall not be approved for issuance until the above notes are printed on applicable building, grading and improvement plans.

- c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?**

Comment:

The project site is subject to seismic shaking and other geologic hazards as described in section 6.a.ii, iii, and iv

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Implement Mitigation Measures GEO-1, GEO-2, GEO-3, and GEO-4

Mitigation Monitoring:

See Mitigation Monitoring GEO-1, GEO-2, GEO-3, and GEO-4

- d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?**

Comment:

Table 18-1-B of the Uniform Building Code is an index of the relative expansive characteristics of soil as determined through laboratory testing. The project site contains some soils that have moderate to high potential for shrink-swell, which could result in soil expansion. The final geotechnical report required by Mitigation Measure GEO-3 would include an analysis of expansive soil hazards and recommended stabilization measures. With implementation of these measures, combined with conformance with standard CBC and other applicable State and local regulations (all of which shall be required as conditions of approval for the project), potential hazards from expansive soils would be less than significant.

Significance Level: Less than Significant Impact

- e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?**

Comment:

The project site is not in an area served by public sewer. Preliminary documentation provided by the applicant and reviewed by the Permit Sonoma Project Review Health Specialist indicates that the soils on site could support a septic system and the required expansion area.

Significance Level: Less than Significant Impact

7. GREENHOUSE GAS EMISSIONS:

Would the project:

a) Generate greenhouse gas (GHG) emissions, either directly or indirectly, that may have a significant impact on the environment?

Comment:

A Climate Action 2020 Plan was developed by the Sonoma County Regional Climate Plan Authority (RCPA) in 2016 but was unable to be formally adopted due to litigation. The Sonoma County Board of Supervisors adopted a Climate Change Action Resolution on May 8, 2018 which acknowledged the Climate Action 2020 Plan and resolved to "...work towards the RCPA's countywide target to reduce GHG emissions by 40% below 1990 levels by 2030 and 80% below 1990 levels by 2050" as well as adopting twenty goals for reducing GHG emissions including increasing carbon sequestration, increasing renewable energy use, and reducing emissions from the consumption of goods and services. The Bay Area Air Quality Management District (BAAQMD) has published greenhouse gas significance thresholds for use by local governments in the report titled *California Environmental Quality Act Air Quality Guidelines May 2017*. For projects other than stationary sources, the greenhouse gas significance threshold is 1,100 metric tons per year of CO_{2e} or 4.6 metric tons of CO_{2e} per service population (residents and employees) per year. To assess potential greenhouse gas emissions related to the project, a test of air emissions was made, which indicate the emissions from the project would be less than 10% of the threshold developed by the BAAQMD of 1,100 metric tons of CO_{2e} per year.

Significance Level:

Less than Significant Impact

b) Conflict with an applicable goal, objective, plan, policy, or regulation for the purpose of reducing the emissions of greenhouse gases?

Comment:

The County has adopted General Plan Objective OSRC-14.4 which states "Reduce greenhouse gas emissions by 25% below 1990 levels by 2015. In May 2018, the Board of Supervisors adopted a Resolution of Intent to Reduce Greenhouse Gas Emissions that included adoption of the Regional Climate Protection Agency's goal to further reduce greenhouse gas emissions by 40% below 1990 levels by 2030 and by 80% below 1990 levels by 2050. The Resolution of Intent included specific measures that can further reduce greenhouse gas emissions. All new development is required to evaluate all reasonably feasible measures to reduce greenhouse gas emissions and enhance carbon sequestration. The project will not conflict with applicable goals, objectives, plans, policies, or regulations provided mitigation measures specified below are implemented.

Mitigation:

Mitigation Measure AIR-2:

The applicant shall submit a Greenhouse Gas Reduction Plan for PRMD review and approval that defines measures to reduce greenhouse gas emissions in the design, construction, and long-term operations of the project. The Greenhouse Gas Reduction Plan shall include all reasonably feasible measures to reduce greenhouse gas emissions to the maximum extent feasible. Measures that must be evaluated include but are not limited to best available conservation technologies for all energy and water uses, installation of renewable energy facilities to meet demand on-site, provisions of electric vehicle charging stations, bicycle facilities including secure bike parking, and lockers and showers for employees, employing best management practices for carbon sequestration, such as no till soils, reduced use of fertilizers, etc.

Mitigation Monitoring AIR-2:

PRMD staff shall ensure that the methods selected in the Greenhouse Gas Emissions Reduction Plan are

listed on all site alteration, grading, building or improvement plans prior to issuance of grading or building permits. Building/grading permits shall not be approved for issuance by Project Review Staff until the Greenhouse Gas Reduction Plan has been approved and incorporated into the design and construction documents for the project.

Significance Level:

Less than Significant with Mitigation Incorporated

8. HAZARDS AND HAZARDOUS MATERIALS:

Would the project:

- a) **Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?**

Comment:

Construction of the project, as well as ongoing maintenance over time, may involve the intermittent transport, use and disposal of potentially hazardous materials, including fuels and lubricants, paints, solvents, and other materials commonly used in construction and maintenance. During construction activities, any on-site hazardous materials that may be used, stored, or transported are required to follow standard protocols (as determined by the U.S. EPA, California Department of Health and Safety, and Sonoma County) for maintaining health and safety.

Construction of project roads and infrastructure may involve short-term transport, storage, and use of hazardous materials, but the roads and infrastructure do not propose any long-term operations that would require routine or ongoing transport, use, or disposal of hazardous materials beyond periodic maintenance needs. These normal activities would be subject to applicable local, State, and federal regulations.

Project construction may also involve short-term transport, storage, and use of hazardous materials. Future project use of hazardous substances associated with cultivation/processing uses (e.g., fertilizers and herbicides) that may be generated, stored, transported, used, or disposed are subject to applicable local, State, and federal regulations. These future uses would be unlikely to involve routine transport, use, or disposal of hazardous materials, or result in hazardous emissions. With existing General Plan policies and federal, State and local regulation and oversight of hazardous materials, the potential threat to public health and safety or the environment from hazardous materials transport, use or disposal represents a less-than-significant impact.

However, construction would require use of fuels and other hazardous materials. Improper storage or handling of these materials could result in spills. The impact can be reduced to less than significant by requiring standard approved construction methods for handling hazardous materials.

Significance Level: Less than Significant Impact with Mitigation Incorporated

Mitigation:

Mitigation Measure HAZ-1: The construction contract shall require that any storage of flammable liquids be in compliance with the Sonoma County Fire Code and section 7-1.01G of the Caltrans Standard Specification (2006) (or the functional equivalent) for the protection of surface waters. In the event of a spill of hazardous materials the Contractor shall immediately call the emergency number 9-1-1 to report the spill, and shall take appropriate actions to contain the spill to prevent further migration of the hazardous materials to storm water drains or surface waters.

Mitigation Monitoring:

Mitigation Monitoring HAZ-1: The County shall be contacted in the event of an accidental hazardous materials spill, and shall verify that appropriate clean-up procedures have been completed.

- b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?**

Comment:

During construction there could be spills of hazardous materials (see Section 8.a.).

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Implement Mitigation Measure HAZ-1

Mitigation Monitoring:

See Mitigation Monitoring HAZ-1

- c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?**

Comment:

The project site is not located within 0.25 miles of an existing or proposed school.

Significance Level: No Impact

- d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?**

Comment:

There are no known hazardous materials sites within or adjacent to the project limits, based on a review of the following databases.

1. The State Water Resources Control Board Geotracker database,
2. The Department of Toxic Substances Control EnviroStor database (formerly known as Calsites), and
3. The California Integrated Waste Management Board Solid Waste Information System (SWIS).

Significance Level: No Impact

- e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?**

Comment:

The site is not within the Airport Referral Area as designated by the Sonoma County Comprehensive Airport Land Use Plan.

Significance Level: No Impact

- f) For a project located within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?**

Comment:

There are no known private airstrips within the vicinity of the proposed project.

Significance Level: No Impact

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Comment:

The project would not impair implementation of, or physically interfere with the County's adopted emergency operations plan. There is no separate emergency evacuation plan for the County. The project would not result in a significant change in existing circulation patterns, and would have no effect on emergency response routes.

Significance Level: No Impact

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Comment:

According to the Wildland Fire Hazard Areas mapping (Figure PS-1g) of the Sonoma County General Plan 2020, the project is located in a moderate fire hazard zone. The project site is located west of the wildland-urban interface (WUI) area characterized by steep slopes and dense vegetation. The project site itself consists of residential lawn and landscaping and mowed non-native grassland. During a northeasterly or easterly high wind event, structures on the parcel could be subjected to an ember event that deposits flammable embers on the parcel and structures as well as being at risk of a flame front that burns down the mountains into the valley area where the parcel is located. The construction of the greenhouse and processing/office structures in these areas could expose people or structures to increased fire hazards due to project construction activities and conversion of the presently undeveloped area to an area with increased human activity, with increased possibility of starting a fire. As a project condition of approval, construction on the project site must conform to the Fire Safe Standards within the Sonoma County Fire Safety Ordinance No. 6184 (Sonoma County Code Chapter 13), including but not limited to, fire sprinklers, emergency vehicle access, and water supply making the impact from risk of wildland fire less than significant. In addition to the implementation of Mitigation Measure HAZ-2 below, this condition of approval will make impact from risk of wildland fire less-than-significant.

Significance Level: Less than Significant Impact with Mitigation Incorporated

Mitigation:

Mitigation Measure HAZ-2: PRMD staff shall determine that the applicant included required fire provisions in the construction bid documents to minimize the potential for ignition of wildfire as a result of project construction, including notes required by Public Resources Code Section 4442, that internal combustion engines shall be equipped with an operational spark arrester, or the engine must be equipped for the prevention of fire.

Mitigation Monitoring:

Mitigation Monitoring HAZ-2: Prior to approval of final construction plans, the County verify that fire prevention notes are included on the plans.

9. HYDROLOGY AND WATER QUALITY:

Would the project:

a) Violate any water quality standards or waste discharge requirements?

Comment:

As described in the introduction, the project site is located in the middle 5 acres of a 15-acre parcel that has its long axis oriented north-south. The watershed boundary between the Laguna de Santa Rosa/Russian River watershed crosses the southern side of the parcel from approximately ENE to WSW. Thus, the stream channel at the south side of the parcel drains to the Petaluma River and San Francisco Bay. The portion of the parcel where the project site is located ultimately drains north, but there are no existing ditches, swales, sewers or other drainage features in or near the project site. Precipitation falling on the in situ soils infiltrates on project site, is lost to evapotranspiration, or possibly sheet flows in some way to the west and/or north to Copeland Creek. Basically, the project location is landlocked and does not connect to any existing waters of the state or flow conveyances that connect to waters of the state.

As proposed does not include constructing pipelines, ditches or swales from the project site to waters of the state or flow conveyances that connect to waters of the state. Therefore, all storm water generated from impervious surfaces (road and parking lots, building roofs, etc.) constructed on the project site will be contained and managed on the project site. In addition, all process wastewater and domestic wastewater generated by the project will be completely managed on-site by a new septic system dedicated to the commercial cannabis operation. Because storm water and wastewater will be completely managed on-site, no water quality standards will be able to be violated from the operation of the project.

The project has enrolled in the North Coast Regional Water Quality Control Boards' Waiver of Waste Discharge Program as a Tier 2 discharger, which requires preparation of a Water Resource Protection Plan (WRPP) that itemizes actions to be implemented to protect water quality and meet the requirements of the program, and the Sonoma County cannabis ordinance requires that a waste water management plan shall be submitted identifying the amount of waste water, excess irrigation and domestic wastewater anticipated and proper management and disposal. Finally, operators must comply with cannabis cultivation best management practices prescribed by the County Agriculture Commissioner include measures related to pesticide and fertilizer storage, pesticide use, fertilizer use, riparian protection, water use and storage, waste management, erosion control/grading and drainage, and items related to indoor cultivation.

As a construction project disturbing one or more acres of soil, the project would also be required to file a Notice of Intent (NOI) package for coverage under the State Water Resources Control Board (SWRCB) General Permit No. CAS000002 for Discharges of Storm Water Runoff Associated with Construction Activity (General Permit). The General Permit requires development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which in addition to other requirements must list Best Management Practices (BMPs) to be used to protect storm water, and the placement of the BMPs.

The project site is located in an area subject to the North Coast Regional Water Quality Control Board (NCRWQCB) Municipal Separate Storm Sewer Systems (MS4) Permit. The proposed project would involve placement of more than 10,000 square feet of impervious surface area, and would be required to meet Sonoma County Storm Water Quality Ordinance requirements and to incorporate Low Impact Development (LID) Best Management Practices (BMPs) and post-construction treatment and volume BMPs.

Sonoma County also requires the project applicant to prepare a grading and drainage plan (Erosion Prevention and Sediment Control Plan) in conformance with Chapter 11 Grading and Drainage Ordinance) and Chapter 11a (Storm Water Quality Ordinance) of the Sonoma County Code and the Sonoma County Storm Water Low Impact Development Guide, all of which include performance standards and Best Management Practices for pre-construction, construction, and post-construction to prevent and/or minimize the discharge of pollutants, including sediment, from the project site.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Mitigation HYD-1: The following mitigations shall be required as part of the project in order to reduce project effects on water quality and ensure that the project would not violate water quality standards or waste discharge requirements:

Mitigation HYD-1A (Waste Discharge Program): The project shall provide evidence satisfactory to the County of compliance with all NCRWQCB Waiver of Waste Discharge Program requirements.

Mitigation HYD-1B (Construction Permit): The project shall provide evidence satisfactory to the County of compliance with all SWRCB construction permit requirements, including, but not limited to, the SWRCB-required Notice of Intent (NOI), Risk Assessment, Post-Construction Calculations, Site Map, and Stormwater Pollution Prevention Plan (SWPPP).

Mitigation HYD-1C (Additional Preventive Measures): In addition to standard County Low Impact Development BMP requirements, the project shall incorporate the following additional preventive measures into the project:

- Design landscaping to prevent sediment from leaving the project site and to meet vector control requirements (drawdown less than 72 hours).
- Incorporate Integrated Pest Management (IPM) principles and techniques for design and maintenance.
- Contain litter and trash so that it is not dispersed by the wind or runoff during waste removal.
- Maintain stabilized construction entrance to reduce sediment transport off-site.
- Install vehicle washes or conduct regular street sweeping of public roads to avoid sediment tracking off-site.

Mitigation HYD-1D (Grading and Drainage): The project shall submit for County review and approval an Erosion Prevention and Sediment Control Plan which shall describe measures to contain all sediment and storm water completely, on the project site including, but not limited to, the following:

- Maintaining natural and pre-development drainage patterns.
- Post-development runoff shall, at a minimum not exceed pre-development runoff using the calculation methodologies in the Storm Water Low Impact Development Technical Design Manual, or superseding document, or equivalent calculation methodologies.
- Drainage facilities shall be designed and constructed in compliance with the Sonoma County Water Agency Flood Control Design Criteria Manual, or superseding document, for no less than a ten-year design discharge.
- Drainage facilities shall carry storm water to a disposal location(s) on the project site and shall dissipate the energy or diffuse the flow prior to releasing the storm water to the disposal location(s).
- Drainage facilities shall prevent or minimize soil loss through the use of storm drain culverts (pipes), storm drain inlets and outlets, storm drain outfalls, energy dissipators, flow dispersion, check dams, rolling dips, critical dips, proper location and sizing of culverts, revegetation of exposed or disturbed slopes, minimizing cross drains through road outcropping, minimizing the use of artificial slopes, and other best management practices referenced or detailed in the permit authority's best management practices guide.

Mitigation Monitoring:

Mitigation Monitoring HYD-1: Prior to issuance of a grading permit, the County shall verify project compliance with NCRWQCB and SWRCB regulations, and shall also review and approve the project's Erosion Prevention and Sediment Control Plan. The Grading & Storm Water Section of Permit Sonoma shall review and approve all grading or building permits prior to issuance. In addition, construction details for all water quality Best Management Practices shall be submitted for review and approval by the County,

and the County shall verify post-construction storm water Best Management Practices installation and functionality, through inspections, prior to finalizing the permit(s). The owner/operator shall maintain the required post-construction Best Management Practices for the life of the development. The owner/operator shall conduct annual inspections of the post-construction Best Management Practices to ensure proper maintenance and functionality. The annual inspections shall typically be conducted between September 1 and October 1 of each year.

- b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?**

Comment:

The proposed project is located within a Class 1 groundwater area and straddles the medium priority Santa Rosa and Petaluma Basins defined through CA DWR Bulletin 118. Per requirements of the General Plan Policy WR-2E and Sonoma County Code Chapter 26-88-250, a hydrogeologic report is required of the project. PRMD Policy and Procedure # 8-1-14 details minimum requirements for hydrogeologic studies.

Currently there is one well on the project site, which is located in the southwest portion of the project site. A hydrogeologic study was prepared for the project by O'Connor Environmental Inc. (March 21, 2018) and subsequently revised (December 11, 2018) (OEI Report). The revision was requested by the applicant to reflect a change in the project proposal to include 5,000 square feet of indoor cultivation area in addition to the previously analyzed 10,000 square feet of mixed light cultivation area. The change in the project proposal and water use did not change overall findings of the OEI Report.

The OEI Report was reviewed and found to meet the specifications of PRMD Policy # 8-1-14 for hydrogeologic studies. The report finds that groundwater storage (492 to 7,392 acre feet) and average year recharge (455 acre feet/year) are substantially greater than proposed water demands (331 acre feet) of the cumulative impact area. The project parcel has an existing baseline water use of 2.1 acre feet per year. Under proposed conditions, water use is expected to increase to 2.74 acre feet per year. The OEI Report concluded that there is little potential to negatively impact groundwater supply, groundwater levels in neighboring wells, and surface waters.

Among the required conditions of project approval, the County would require (1) groundwater levels and quantities of groundwater extracted for this use to be measured quarterly, (2) water meters to be calibrated, and copies of receipts and correction factors shall be submitted to PRMD Project Review staff at least once every five years and (3) in the event that groundwater use exceeds 2.75 acre feet per year, Permit Sonoma may bring this matter back to the BZA for review of additional measures to reduce groundwater use. Therefore, the proposed project would not result in a net deficit in aquifer volume or a lowering of the local groundwater table.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Mitigation HYD-2: Water wells used for cultivation shall be equipped with a meter and sounding tube or other water level sounding device and marked with a measuring reference point. Water meters shall be calibrated at least once every five years. Static water level and total quantity of water pumped shall be recorded quarterly and reported annually. Static water level is the depth from ground level to the well water level when the pump is not operating after being turned off. Static water level shall be measured by turning the pump off at the end of the working day and recording the water level at the beginning of the following day before turning the pump back on. Groundwater monitoring reports shall be submitted annually to the County by January 31 of each year. The annual report shall show a cumulative hydrograph of static water levels and the total quarterly quantities of water pumped from well(s) used in processing.

Mitigation Monitoring:

Mitigation Monitoring HYD-2: As a condition of project approval, groundwater monitoring reports shall be reviewed and verified annually by County staff.

- c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?**

Comment:

There are no blue line streams on the site. The existing site contains non-native grasses, weeds, low-growing brush and limited number of trees, primarily fruit trees. Drainage onsite occurs as sheet flows from the east that generally travel west, across the property. As noted in Section 4, above, there is an unnamed tributary in the southeast corner of the site.

Project plans indicate that post-construction drainage would generally continue to follow the same route from east to west. See Mitigation Measure HYD-1 for details on project storm water control facilities, which would be incorporated into the project to provide for erosion prevention and sediment control and to ensure that erosion and siltation impacts are less than significant during and after construction.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Implement Mitigation HYD-1

Mitigation Monitoring:

See Mitigation Monitoring HYD-1

- d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?**

Comment:

As discussed in Section 9.c, the existing site contains non-native grasses, weeds, low-growing brush, and a relatively small number of trees. Drainage onsite occurs as sheet flows from the east that generally travel west, across the property. The proposed project would create less than 25,000 square feet of new impervious surface, which could affect the quantity and/or quality of storm water run-off. However, the proposed project has been designed to prevent and/or minimize the discharge of pollutants and waste after the proposed project is constructed (post-construction), using County best management practices, Low Impact Development techniques, and storm water treatment devices based on filtering, settling or removing pollutants.

The type and approximate size of the selected storm water best management practices would need to comply with the adopted Sonoma County Storm Water Low Impact Development Guide, and would be subject to County review and approval. In addition, proper operation and maintenance of post-construction storm water best management practices would be needed to achieve the goal of preventing and/or minimizing the discharge of pollutants.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Implement Mitigation HYD-1

Mitigation Monitoring:

See Mitigation Monitoring HYD-1

e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

Comment:

Storm water treatment Best Management Practices (BMPs) have been incorporated into the project to address potential for water quality impacts and to address water quantity through storm water flow control Best Management Practices. Storm water treatment Best Management Practices have been designed to treat storm events and associated runoff to the 85-percentile storm event in accordance with County Standards.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Mitigation HYD-3: At the time of submitting of a grading, drainage, or building permit application, a final drainage report for the parcel shall be submitted for County review, including appropriate project narrative, on- and off-site hydrology maps, hydrologic calculations, hydraulic calculations, pre- and post-development analysis for all existing and proposed drainage facilities, as specified by the County.

Mitigation Monitoring:

Mitigation Monitoring HYD-3: Prior to issuance of any grading or building permits, the construction plans and final drainage report shall be reviewed and approved by the County. The construction plans and final drainage report shall be prepared by a civil engineer, registered in the State of California, and submitted with the grading or building permit application or improvement plans, as applicable.

f) Otherwise substantially degrade water quality?

Comment:

Any future grading, cuts, and fills would require the issuance of a grading permit (see Section 9.a). The County Grading and Drainage Ordinance and adopted Best Management Practices require installation of adequate erosion prevention and sediment control features. Inspection by County inspectors would ensure that Best Management Practices are specifically designed to maintain potential water quality impacts of project construction at a less than significant level during and post construction.

The County would require any construction to be designed and conducted so as to prevent or minimize the discharge of pollutants or waste from the project site. Best Management Practices to be used to accomplish this goal could include measures such as silt fencing, straw wattles, and soils discharge controls at construction site entrance(s). Storm water Best Management Practices may also include primary and secondary containment for petroleum products, paints, lime and other hazardous materials of concern.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Implement Mitigation HYD-1

Mitigation Monitoring:

See Mitigation Monitoring HYD-1

g) Place housing within a 100-year hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

Comment:

According to Figure 8-5 of the Sonoma County Hazard Mitigation Plan, the project site is outside of the

100-year Flood Hazard Area. The project does not propose housing.

Significance Level: No Impact

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

Comment:

The project site is approximately 195 feet above average mean sea level and the project site is located outside of the 100-year Flood Hazard Area. According to FEMA, the site is located in Zone X - Other Areas, which are defined by FEMA as areas outside the 0.2 percent flood risk area.

Significance Level: No Impact

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Comment:

According to Figure PS-1f of the General Plan, the project site is not located in an area that would be subject to flooding as a result of levee or dam failure.

Significance Level: No Impact

j) Inundation by seiche, tsunami, or mudflow?

Comment:

The project site is not located in an area subject to seiche or tsunami. Seiche is a wave in a lake triggered by an earthquake. Mudflow can be triggered by heavy rainfall, earthquakes or volcanic eruption. See Section 6.a. iv. for discussion of areas with high potential for mudflow (landslide).

Significance Level: Less than Significant Impact

10. LAND USE AND PLANNING:

Would the project:

a) Physically divide an established community?

Comment:

The project would not physically divide a community. It does not involve construction of a physical structure (such as a major transportation facility) or removal of a primary access route (such as a road or bridge) that would impair mobility within an established community or between a community and outlying areas.

Significance Level: Less than Significant Impact

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Comment:

The project would not conflict with any applicable land use plan adopted for the purpose of avoiding or mitigating an environmental effect, including the Sonoma County General Plan and Zoning Ordinance. The proposed use is permitted in the DA (Diverse Agriculture) zoning district, subject to securing an approved Use Permit. In addition, compliance with all applicable development regulations (including setbacks, square footage limitations, mitigation measures and conditions of approval, will allow the project to avoid General Plan and zoning inconsistencies, as well as avoiding significant, adverse environmental impacts.

Significance Level: Less than Significant Impact

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

Comment:

The project site is not located in an area subject to a habitat conservation plan or natural community conservation plan.

Significance Level: No Impact

11. MINERAL RESOURCES:

Would the project:

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

Comment:

The project site is located on a relatively, flat alluvial plain with deep soils and does not contain any known or economically available mineral resources.

Significance Level: No Impact

b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

Comment:

The project site is not located within an area of locally-important mineral resource recovery site and the site is not zoned MR (Mineral Resources) (Sonoma County Aggregate Resources Management Plan, as amended 2010 and Sonoma County Zoning Regulations). No locally-important mineral resources are known to occur at the site.

Significance Level: No Impact

12. NOISE:

Would the project:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Comment:

As discussed in the 2016 Sonoma County Medical Cannabis Land Use Ordinance Negative Declaration (2016 ND; see page 39), cannabis operations can produce potential noise impacts through preparation of land for outdoor cultivation, construction activities for associated structures, noise from onsite power generators, noise from fans and venting equipment in green houses, and road noise from related traffic. Ordinance No. 6198 includes the following standard: "Cultivation operations shall not exceed the General Plan Noise Standards Table NE-2, measured in accordance with the Sonoma County Noise Guidelines." In addition, the Ordinance also includes a provision that "the use of generators as a primary source of power shall be prohibited." The 2016 ND (p. 39) concluded that construction period noise would not exceed existing noise standards. In addition, the 2016 ND (p. 39) concluded that traffic associated with cultivation would be minimal and similar to other very small agricultural and residential uses.

County noise standards (as indicated in Table NE-2 of the General Plan) establish maximum allowable exterior noise exposures of 50 dBA in the daytime (7:00 AM to 10:00 PM) and 45 dBA in the nighttime (10:00 PM to 7:00 AM), as measured using the L50 value (the value exceeded 50 percent of the time, or 30 minutes in any hour--i.e., this is the median noise level).

Table NE- 2 Maximum Allowable Exterior Noise Exposures for Nontransportation Noise Sources

Hourly Noise Metric ¹ , dBA	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
L50 (30 minutes in any hour)	50	45
L25 (15 minutes in any hour)	55	50
L08 (4 minutes 48 seconds in any hour)	60	55
L02 (72 seconds in any hour)	65	60
¹ The sound level exceeded n% of the time in any hour. For example, the L50 is the value exceeded 50% of the time or 30 minutes in any hour; this is the median noise level.		

The applicant has not indicated whether the project will incorporate an emergency generator that will be used in the event of a loss of power at the subject facility. If such a device is utilized on the site, it can be equipped with an acoustical enclosure (available with various levels of sound protection). Use and operation of the generator would include regular testing, which likely would be conducted for ten to 15 minutes anywhere from weekly to monthly, with occasional testing that could run as long as 30 minutes. Because the generator could possibly run for more than 30 minutes in an hour during an emergency, generator operation was considered to fall in the 30 minute per hour daytime category for noise evaluation (i.e., L50). Results of generator testing and operation showed that noise levels at the three nearest residences would exceed the County noise standard for daytime and nighttime, depending on the time and the intensity of generator use.

The noise assessment noted that during a nighttime emergency, even with an acoustical enclosure, emergency generator noise might exceed County noise standards. However, Ordinance 6189 includes operating standard (g)(3), which states that "The use of generators for indoor and mixed light cultivation is prohibited, except for portable temporary use in emergencies only."

A Noise and Vibration Assessment was prepared for the project by Illingworth & Rodkin, Inc. (dated March 298, 2019). Based upon a detailed analysis of the project's potential noise-related impacts, the assessment

concluded that the project was not expected to exceed Sonoma County noise standards at any residential property in the vicinity of the project site and that no specific mitigation measures were warranted, beyond those noted below related to the possible use of an emergency generator. The study noted the need to verify that noise generated by planned ventilation fans in the greenhouse meet applicable County noise standards (see the following Mitigation Measures). The Noise and Vibration Assessment was reviewed by County Health Services Department staff and accepted, subject to the noted Mitigation Measures and specific conditions which have been incorporated into the project's recommended Conditions of Approval.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Mitigation NOISE-1: To reduce emergency generator noise impacts to a less-than-significant level, the following mitigations would need to be incorporated into the project:

Mitigation NOISE-1A: Install the emergency generator in a Level 2 acoustical enclosure. Additional noise attention could be achieved by turning the generator so that the front of the enclosure (where the intake louvers are located) face away from the nearest residences.

Mitigation NOISE-1B: Conduct generator testing only during daytime hours (7:00 AM to 10:00 PM), with a preferred testing schedule between 10:00 AM and 4:00 PM to avoid noise-sensitive nighttime morning and evening hours. Adjacent land owners/residences shall be notified of the testing schedule.

Mitigation Monitoring:

Mitigation Monitoring NOISE-1: Prior to the issuance of building permits, noise mitigations shall be photocopied from the Noise Study and attached to the building plans submitted for plan check. Prior to vesting the Use Permit, noise enclosures shall be installed in accordance with the noise assessment by Illingworth & Rodkin (December 2017; see Item No. 29 in the List of References at the end of this document). Final location of the enclosures must be approved in writing by the noise consultant, and a letter of clearance shall be submitted from the noise consultant to the County. In addition, prior to building permit issuance, a long term, on-going Noise Monitoring Plan shall be submitted to the PRMD Project Review Health Specialist for review and approval. Implementation of an on-going Noise Monitoring Program shall be required upon request of the County.

Mitigation:

Mitigation NOISE-2: Noise Monitoring of Greenhouse Ventilation Fans: Prior to occupancy, the noise resulting from the greenhouse wall-mounted ventilation fans shall be measured by a qualified acoustical consultant acceptable to County staff. The A-weighted sound pressure level will be monitored for five (5) minutes at a distance of 25 feet from the face of each building directly facing the center of the four fans with all four fans in that building operating only. Measurements should be done during the morning between 9:00 a.m. and 12:00 p.m. (noon). The measured sound level shall not exceed 57 dBA L50. The ambient L50 noise level shall be measured for a period of 15 minutes before the first fan noise measurement and after the last fan noise measurement.

Mitigation Monitoring:

See Mitigation Monitoring NOISE-2; Prior to the issuance of building permits, the noise assessment shall be submitted by the noise consultant to the County.

b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?

Comment:

As discussed in the 2016 ND (p. 39), the nature of cannabis cultivation uses does not involve vibration or ground borne noises, except for potential impacts related to construction of related structures. These construction activities may generate minor ground borne vibration and noise, but they would be from conventional construction equipment and would be short-term and temporary, limited to daytime hours.

There are no other activities or uses associated with the project that would expose persons to or generate excessive ground borne vibration or ground borne noise levels.

Significance Level: Less than Significant Impact

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Comment:

As discussed in Section 12.b, construction noise would be considered temporary and short term. In addition, as previously noted, use of electrical generators as the primary source of power is prohibited, although generators may still be used in emergency situations; however, this would not constitute a permanent increase in ambient noise levels. The only permanent operational noise source would be the commercial HVAC unit and fans associated with the greenhouse/indoor climate control system. The calculated noise level of the unit at the nearest property line is expected to be less than 40 decibels, while the estimated noise level at the property line of the nearest residential use would be less than 30 decibels. By comparison, normal conversation is typically measured between 50 and 60 decibels. The low level of operation noise generated by the project would not be expected to result in a substantial permanent increase in the ambient noise level and, therefore, would be a less than significant impact.

Significance Level: Less than Significant Impact

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Comment:

As discussed in Section 12.b, construction noise would be considered temporary and short term. Also, as previously noted, though use of electrical generators could occur that would result in a temporary increase in ambient noise levels, this would be due to an emergency situation. The nearest receptor is located approximately 300 feet from the southeast corner of the project site. Residents could experience temporary noise from construction equipment and transport of construction materials. However, as discussed in Section 12.a, the 2016 ND concluded that construction period noise would not exceed existing noise standards.

Significance Level: Less than Significant Impact

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Comment:

The project site is not within the Airport Referral Area as designated by the Sonoma County Comprehensive Airport Land Use Plan.

Significance Level: No Impact

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

Comment:

There are no known private airstrips within the vicinity of the proposed project.

Significance Level: No Impact

13. POPULATION AND HOUSING:

Would the project:

- a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?**

Comment:

The project does not include plans to construct any new housing, nor will it generate significant new demand for housing in the area (the project proposes a total of 19 employees: 6 full-time and 13 part-time). This small increase in employment opportunities is not anticipated to result in either a direct or indirect increase in population as it is anticipated that employees would be existing residents of the Bay Area. In addition, no new infrastructure is proposed by the project. Therefore, the project would not induce substantial population growth.

Significance Level: No Impact

- b) Displace substantial numbers of existing housing necessitating the construction of replacement housing elsewhere?**

Comment:

No housing will be displaced by the project and no replacement housing is proposed to be constructed.

Significance Level: No Impact

- c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?**

Comment:

No people will be displaced by the project and no replacement housing will be required.

Significance Level: No Impact

14. PUBLIC SERVICES:

Would the project:

- a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:**

Comment:

Construction of the project will not require the provision of new or physically altered public facilities.

Significance Level: No Impact

i. Fire protection?

Comment:

The project site is located in the Rancho Adobe Fire Protection District (FPD) Local Response Area. The project was sent on referral to the Rincon Valley FPD, but Rincon Valley FPD has not, to date, responded to the referral.

Sonoma County Code requires that all new development meet Fire Safe Standards (Chapter 13). The County Fire Marshal reviewed the project description and plans on August 29, 2017 and required that the project comply with Fire Safe Standards, including fire protection methods such as sprinklers in buildings, alarm systems, extinguishers, vegetation management, hazardous materials management and management of flammable or combustible liquids and gases. These are standard conditions of approval required by County Code. Because none of the conditions and/or requirements requires construction of new or expanded fire protection/EMS facilities, project impacts on fire protection/EMS would be considered less-than-significant.

Significance Level: Less than Significant Impact

ii. Police?

Comment:

The Sonoma County Sheriff will continue to serve this area. There is not expected to be an increased need for police protection resulting from the project, due to Security Plan provisions which have been incorporated into the project. The plan includes elements of Crime Prevention Through Environmental Design, the use of identification badges, perimeter security measures, alarms, employee screening and training, and similar measures.

No housing would be created by the project and it would generate 19 jobs. The project would not include construction of a substantial amount of homes, businesses or infrastructure and, therefore, would not induce substantial population growth. Existing police protection facilities would be adequate.

Significance Level: Less than Significant Impact

iii. Schools, parks, or other public facilities?

Comment:

Development fees to offset potential impacts to public services, including school impact mitigation fees, are required by Sonoma County Code and state law for new subdivisions and residential developments. No new schools are reasonably foreseeable as a result of this development.

Significance Level: Less than Significant Impact

iv. Parks?

Comment:

Sonoma County Code, Chapter 23 requires payment of parkland mitigation fees for all new residential development for acquisition and development of added parklands to meeting General Plan Objective OSRC-17.1 to "provide for adequate parkland and trails primarily in locations that are convenient to urban areas to meet the outdoor recreation needs of the population..." Development fees collected by Sonoma County are used to offset potential impacts to public services, including park mitigation fees. The project would not result in the need for any new park facilities, and demand for parks in general is addressed

through fees.

Significance Level: No Impact

v. Other public facilities?

Comment:

The project would not be served by public sewer or water facilities. Expanded facilities are not currently reasonably foreseeable. Expansion or construction of additional types of public facilities is not anticipated as a result of the development of this project.

Significance Level: Less than Significant Impact

15. RECREATION:

Would the project:

- a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?**

Comment:

The proposed project would not involve activities that would cause or accelerate substantial physical deterioration of parks or recreational facilities. The project would have no impact on the use of existing neighborhood and regional parks or other recreational facilities.

Significance Level: Less than Significant Impact

16. TRANSPORTATION / TRAFFIC:

Would the project:

- a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?**

Comment:

As discussed in the 2016 ND (p. 44), increase in traffic generated as a result of cannabis operations were considered to be consistent with the General Plan 2020 and associated EIR and, therefore, Ordinance No. 6198 was determined not to conflict with an applicable transportation/circulation plan. The 2016 ND (p. 44) also noted that while traffic impacts would vary with the type and size of individual cannabis operations (and number of employees), the greatest traffic generation anticipated would be for employee trips during the planting and harvest operations.

The project applicant submitted a "Cannabis Trip Generation" form as requested by the County. The worksheet indicated that the project could be expected to generate an average of 15 trip ends per day from typical operation and 27 trip ends per day from cultivation operations. The Cannabis Trip Generation form estimated average daily trips to total 34 trips during the harvest period, 24 trips per day during the

processing period, and an average of 18 trips per day year-round. It also estimated that the project would generate 96 truck trips end per year.

According to the General Plan 2020, Roberts Road is a rural minor collector and Petaluma Hill Road is a rural minor arterial. Average daily traffic volume measured by the County along Petaluma Hill Road in the vicinity of the project site was 10,588 vehicles, according to the County's Department of Transportation's Traffic Surveys. The proposed project would not alter the roadway configuration, and any permanent increase in traffic (due to employment) on Roberts Road and Petaluma Hill Road would be minor compared to existing average volumes.

There are no marked bicycle facilities in the project vicinity and neither of the two roads (Roberts Road and Petaluma Hill Road) has provisions for pedestrians, although Petaluma Hill Road has paved shoulders. The project does not propose any improvements to bicycle or pedestrian facilities. However, according to the General Plan 2020 (Figure CT-1g), a Class II bicycle lane is proposed for Petaluma Hill Road.

The closest Sonoma County Transit stop is at Snyder Lane and Mountain View Avenue (about one and one-half miles west of the project site).

Significance Level: Less than Significant Impact

b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

Sonoma County does not have a congestion management program but level of service (LOS) standards are established by the Sonoma County General Plan Circulation and Transit Element. See section 16.a for a discussion of traffic resulting from the project.

Significance Level: Less than Significant Impact

c) Result in change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

Comment:

The project would have no effect on air traffic patterns because the nearest airports (public or private) are located over five miles away from the project site.

Significance Level: No Impact

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Comment:

The project would not increase hazards because it would not change the existing alignment of the roadway. However, hazards to drivers, bicyclists, and pedestrians could occur during construction activities. This temporary construction-related impact would cease upon project completion.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Mitigation Measure TRANS-1: The project shall submit a Construction Period Traffic Control Plan to the County for review and approval. The plan shall include traffic safety guidelines compatible with Section 12 of the Caltrans Standard Specifications ("Construction Area Traffic Control Devices") to be followed during construction. The plan shall also specify provision of adequate signing and other precautions for public

safety to be provided during project construction. In particular, the plan shall include a discussion of bicycle and pedestrian safety needs due to project construction and, later, project operation. In addition, the plan shall address emergency vehicle access during construction and provide for passage of emergency vehicles through the project site at all times. The applicant/contractor shall notify local emergency services prior to construction to inform them that traffic delays may occur, and also of the proposed construction schedule.

Mitigation Monitoring:

Mitigation Monitoring TRANS-1: Prior to approval of a grading permit, the County shall review the project Construction Period Traffic Control Plan. During construction, the County shall periodically verify that traffic control plan provisions are being implemented.

e) Result in inadequate emergency access?

Comment:

Development on the site must comply with all emergency access requirements of the Sonoma County Fire Safety Code (Sonoma County Code Chapter 13), including emergency vehicle access requirements. Project development plans would require review by a Department of Fire and Emergency Services Fire Inspector during the building permit process to ensure compliance with emergency access issues. Also, see discussion in section 16.d.

Significance Level: Less than Significant with Mitigation Incorporated

Mitigation:

Implement Mitigation TRANS-1

Mitigation Monitoring:

See Mitigation Monitoring TRANS-1

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Comment:

As discussed in Section 16.a, the project would not create conflicts with County bicycle standards or plans for use of alternative transportation, including provisions for buses. More specifically, the project will not conflict with the County's adopted Bike Plan and would not prohibit or restrict the use by employees of the Bike Plan.

Significance Level: No Impact

g) Result in inadequate parking capacity?

Comment:

Sonoma County Code Section 26-86 includes no specific parking requirements for medical cannabis cultivation land uses; however, the project would not be open to the public, and parking onsite would be designated for employees. The project proposes 14 onsite parking spaces plus 4 additional overflow spaces.

Significance Level: Less than Significant Impact

17. UTILITIES AND SERVICE SYSTEMS:

Would the project:

- a) **Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?**

Comment:

Domestic and possible cultivation processing wastewater disposal would be by septic systems and, therefore, would have no impact upon a wastewater treatment system, or require action by the Regional Water Quality Control Board.

Significance Level: Less than Significant Impact

- b) **Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?**

Comment:

As discussed in following Sections 17.d and e, the project would use groundwater from an existing well on the site for its water use and an existing septic system for wastewater disposal. Both private on-site systems now require County permits and the subject project would also be required to meet County standards for on-site water and wastewater disposal systems. The construction impacts have already been analyzed in this initial study. In addition, the project proposes to utilize rainwater collection to supplement groundwater use.

Significance Level: Less than Significant Impact

- c) **Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?**

Comment:

The project description does not include plans to develop bioretention facilities or other improvements to capture and treat storm water runoff resulting from creation of new impervious surfaces. The design of such project features, if proposed later by the applicant, would only be permitted after County review for compliance with all applicable provisions of County Health Codes and standards.

Significance Level: Less than Significant Impact

- d) **Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?**

Comment:

As discussed in 'section 9.b, the project would use groundwater for its water source and a County-required hydrogeologic report determined that a sufficient water supply is available.

Significance Level: No Impact

- e) **Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?**

Comment:

A new septic system would be constructed for the project. There would be no sewage treatment by an off-site provider.

Significance Level: No Impact

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Comment:

Sonoma County has an existing solid waste management program that provides solid waste collection and disposal services for the entire County. The program can accommodate the permitted collection and disposal of the waste that would result from the proposed project. In addition, Ordinance No. 6198 includes the following standard, which the County would require as a Condition of Approval:

Waste Management. A Waste Management Plan addressing the storing, handling and disposing of all waste by-products of the cultivation and processing activities in compliance with the Best Management Practices issued by the Agricultural Commissioner shall be submitted for review and approval by the agency having jurisdiction. This plan shall characterize the volumes and types of waste generated, and the operational measures that are proposed to manage and dispose, or reuse the wastes in compliance with Best Management Practices and County standards. All garbage and refuse on this site shall be accumulated or stored in non-absorbent, water-tight, vector resistant, durable, easily cleanable, galvanized metal or heavy plastic containers with tight fitting lids. No refuse container shall be filled beyond the capacity to completely close the lid. All garbage and refuse on this site shall not be accumulated or stored for more than seven calendar days, and shall be properly disposed of before the end of the seventh day in a manner prescribed by the Solid Waste Local Enforcement Agency. All waste, including but not limited to refuse, garbage, green waste and recyclables, must be disposed of in accordance with local and state codes, laws and regulations. All waste generated from cannabis operations must be properly stored and secured to prevent access from the public.

Significance Level: Less than Significant Impact

g) Comply with federal, state, and local statutes and regulations related to solid waste?

Comment:

Sonoma County has access to adequate permitted landfill capacity to serve the proposed project.

Significance Level: No Impact

18. MANDATORY FINDINGS OF SIGNIFICANCE

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Comment:

Potential project impacts on special status plant and fish/wildlife species and habitat are addressed in

Section 4 of this Draft Mitigated Negative Declaration. Implementation of the required mitigation measure (Mitigation Measure BIO-1) would reduce these potential impacts to a less-than-significant level. That measure consists of a requirement for a pre-construction surveys by a qualified biologist to identify, then avoid potential adverse impacts on special-status species. Potential adverse project impacts to cultural resources are addressed in Section 5. Implementation of the required mitigation measures (Mitigation Measures CUL-1 and CUL-2,) would reduce these potential impacts to a less-than-significant level. Those measures consist of the implementation of specific protection measures if archaeological items or human remains are found during development of the project and review of construction activities by a tribal cultural monitor.

Significance Level: Less than Significant Impact

- b) Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?**

Comment:

No project impacts have been identified in this Initial Study that are individually limited but cumulatively considerable. The project would contribute to impacts related to air quality, biological resources, greenhouse gases hydrology and water quality, and traffic, which may be cumulative off-site, but mitigations would reduce project impacts to less-than-significant level. As noted in this document, the potentially significant impacts are related to air quality, biological resources, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, noise, and transportation.

Significance Level: Less than Significant Impact

- c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?**

Comment:

1. Cannabis operations have the potential to cause substantial adverse impacts on human beings, both directly and indirectly. However, all potential impact and adverse effects on human beings (resulting from air quality/odors, noise, traffic, etc.) have been analyzed in this document and would be less than significant with the mitigations identified in the Initial Study and mitigation measures incorporated into the project. In addition, potential impacts from cannabis operations were analyzed by the County before adoption of the Medical Cannabis Land Use Ordinance Negative Declaration on October 1, 2016.

Significance Level: Less than Significant Impact

References

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3. General Plan Environmental Impact Report, Sonoma County Permit & Resource Management Department. <http://www.sonoma-county.org/prmd/gp2020/gp2020eir/index.htm>
4. Sonoma County Permit and Resource Management Department and Department of Transportation and Public Works Traffic Guidelines, 2014

5. Sonoma County General Plan 2020 Open Space Map: Santa Rosa and Environs, <https://sonomacounty.ca.gov/PRMD/Long-Range-Plans/General-Plan/Open-Space-Scenic-Santa-Rosa-and-Environs/>
6. Sonoma County Bennett Valley Area Plan revised 2011, <https://sonomacounty.ca.gov/WorkArea/DownloadAsset.aspx?id=2147555115>
7. Sonoma County Zoning Regulations.
8. Caltrans, Scenic Highways, <http://www.dot.ca.gov/design/lap/livability/scenic-highways/>
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12. "Biological Resources Assessment, Petaluma Project, 5406 Petaluma Hill Road, Santa Rosa, Sonoma County, California, APN 045-181-015," prepared by Lucy Macmillan and Roy Buck, June 2018.
13. "A Cultural Resources Evaluation," William Roop, Archaeological Resource Service, February 16, 2018
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17. Sonoma County General Plan 2020, Public Safety Element, Figure PS-1d, Deep-Seated Landslide Hazard Areas, <http://sonomacounty.ca.gov/WorkArea/DownloadAsset.aspx?id=2147542632>
18. Sonoma County General Plan 2020 Public Safety Element, Policy PS-1f, <http://sonomacounty.ca.gov/WorkArea/DownloadAsset.aspx?id=2147542572>
19. State Water Resources Control Board Geotracker Database, <http://geotracker.waterboards.ca.gov/>
20. The Department of Toxic Substances Control EnviroStor Database, <http://www.envirostor.dtsc.ca.gov/public/>
21. The California Integrated Waste Management Board of Solid Waste Information System (SWIS), <http://www.calrecycle.ca.gov/SWFacilities/Directory/Search.aspx>

22. Sonoma County General Plan 2020, Public Safety Element, Wildland Fire Hazard Areas, Figure PS-1g, <https://sonomacounty.ca.gov/PRMD/Long-Range-Plans/General-Plan/Public-Safety-Wildland-Fire-Hazard-Areas/>
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24. Preliminary Standard Urban Storm Water Mitigation Plan, prepared by Adobe Associates, Inc., September 20, 2017.
25. California Regional Water Quality Control Board North Coast Region Order No. 2015-0023 Waiver of Waste Discharge Requirements and General Water Quality Certification for Discharges of Waste Resulting from Cannabis Cultivation and Associated Activities or Operations with Similar Environmental Effects in the North Coast Region. https://www.waterboards.ca.gov/northcoast/board_decisions/adopted_orders/pdf/2015/15_0023_Cannabis_Order.pdf, accessed 5/9/18.
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30. "Focused Traffic Study for the Sonoma Valley Farms Project," W-Trans, October 26, 2017.
31. Sonoma County Department of Transportation & Public Works, Traffic Surveys, <https://www.arcgis.com/apps/webappviewer/index.html?id=5c2f8748449c4dcea7619b723d3463b1>, accessed 5/9/18.
32. UPC17-0006 Permit Application Materials on file at the Sonoma County Permit and Resource Management Department (PRMD). Application materials are made available upon request.

MND Attachments

1. Project Statement
2. Project Plans
3. Groundwater Report
4. Trip Generation Form
5. Greenhouse Plans
6. Well and Septic Report
7. Biological Resources Assessment
8. Odor Study
9. Noise and Vibration Assessment
10. Hedgerow Plan
11. Fire and Safety Plan

Luma California

Sonoma County Conditional Use Permit Application

Name: Luma California, LLC

Address: 2275 Roberts Rd. Penngrove CA 94951

Zoning: Diverse Agriculture

GWA: Zone 1

Lot Size: 15.00 acres

Property Description:

The purpose of this application is for a proposed commercial cannabis cultivation farm by Luma California, LLC to be located at 2275 Roberts Rd, Penngrove, California. This project entails an outdoor cultivation under 10,000sf processing through the Ag Department as a Zoning Permit, 10,000sf of mixed light processing as a Conditional Use Permit, and 500sf of indoor cultivation processing as a Zoning Permit.

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Statement of Operator Qualifications:

Disclosure of Convictions Report

No convictions to disclose.

Employee Management Plan

Local Hiring: Local hiring to Sonoma County residents will be a priority. We want to grow our company with the people of Sonoma County; doing so will make our community stronger. Employees will have to show proof of residency in the county for at least one year at the time of hire.

Occupational Safety: Luma will comply with all occupational safety rules and regulations governing California Agricultural Employers, including CAL/OSHA and California Relations Act. All new employees will go through a 2-week training period upon hire in which they are instructed on Luma's safety and health practices, policies and procedures, and will receive copies of all written materials. This includes but is not limited to an Injury and Illness Prevention Program, Emergency Action & Fire Prevention Plan, Accident Reporting Procedures, Proper Lifting Techniques, and Reporting Unsafe Conditions. Luma will provide workers compensation insurance to all employees.

Employee Drug Policy: Employees may be drug tested upon hire and shall maintain a healthy, drug-free lifestyle. Employees may continue to be tested on a random basis throughout employment.

Staffing Plan: Currently the project is led by Luma California, LLC members and founders Alexa Garcia and Curtis Wall, the only two employees at this time. Eventually we will hire additional staff that will work shifts between the hours of 6am-10pm depending on the season and 8am-5pm for processing. We will conduct a thorough background check on all potential employees for Luma and they must be over the age of 21.

Proposed Staffing: The outdoor cultivation is expected to require 2 full time employees and 2 part time help. The greenhouse is expected to require 3 full time employees and two seasonal or part time employees. The indoor is expected to require 1 full time employee. Trimming is expected to require 9 employees.

Total Employees on Site:

6 Full Time

4 Part Time

9 Trimmers

19 Total Employees

Priority Processing Eligibility

1. Luma has been cultivating cannabis in Sonoma County as a medical collective under the non-profit HRVST, Inc since July 2014.
2. Luma has been operating a delivery service in Sonoma County since September of 2016, which has been suspended during the application process.
3. Luma founders have been residents of Sonoma County since May 2015.
4. Luma has a local preference hiring plan to Sonoma County residents.

Proposal Statement

For this project we are proposing a outdoor cultivation up to 10,000sf, mixed light cultivation of 10,000sf, and indoor cultivation up to 500sf. This application is specifically for the 10,000sf CUP mixed light.

Description of the Existing Use and Property

The southern portion of the property consists of a 5 bedroom residential house including one exterior shop building that is proposed to be renovated and used for cultivation and processing. The northern portion of the parcel includes approximately 8.25 acres of flat, undeveloped land where the outdoor and mixed light cultivation sites are proposed to occur. The residence on the property was completed in 1982. Since 1985, and up until December of 2016, the property was permitted as a residential care facility.

Existing Easements

There are no easements on the property besides for county access to well monitoring.

Existing Agricultural, Commercial, and Residential uses.

The only existing residential use is the house on the property. With approval, eventually this house will likely be demolished due to its current condition and replaced with a new facility; including a small indoor cultivation area for research and development, an infusion kitchen, and a cannabis tasting room. These are long-term goals that will be readdressed at the right time. For now the home will be strictly residential.

The property is currently zoned Diverse Agriculture with an ungrazed pasture land that we are leaving to fallow for next year besides our cultivation area. We are also planning a 500sf vegetable garden and 4'x10' chicken coop and run. However, the property already has 6 mature apple trees, 3 pear trees, 3 citrus, grapes vines, and several prickly pear cacti. This agricultural use will continue and if suffices, then we will not plant the vegetable garden or create a chicken coop.

There is no existing commercial use.

Description of the Proposed Cannabis Use and Operational Plan

Types of Cannabis Use, Sizes, and Locations.

- 1. Mixed-light, 10,000sf, located in the back undeveloped field.**

2. Outdoor, up to 10,000sf, located in the back undeveloped field (currently processing through a Zoning Permit with the Ag Department).
3. Up to 500sf indoor, located in the exterior shop building (processing as a Zoning Permit).



Figure: Undeveloped field in back of the property where cultivation is proposed.

Proposed structures

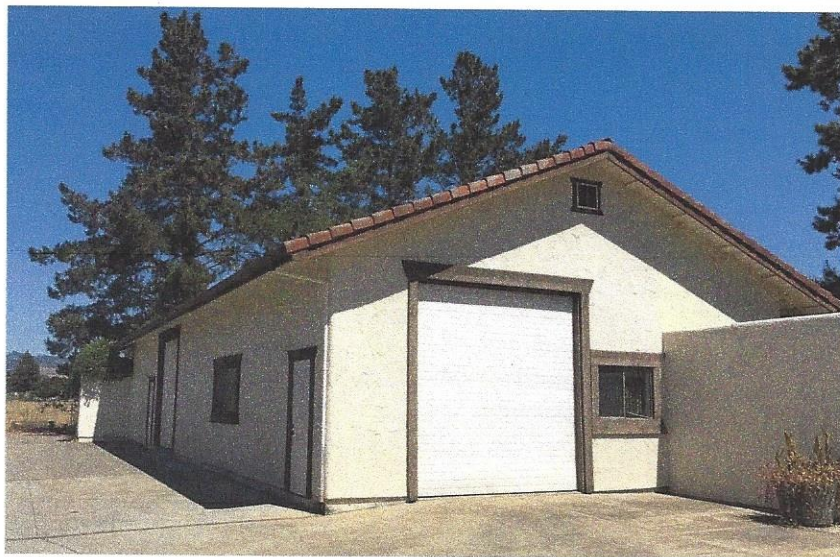
We are proposing to add ADA employee bathrooms to the detached shop building. We will also be adding security fencing and will need to find a location for offices. Currently the existing pool house portion of the residence is proposed for office use, however the cost of bringing this portion of the residence up to code will be weighed against building a new structure, using some sort of small trailer for office use, or building an additional warehouse bay next to the greenhouse. We are leaning towards the latter, with a proposed 4,000sf 'headhouse' next to the greenhouse which would be used for offices and processing such as drying, trimming, and storage.

Additional proposed structures include a trash enclosure, covered composting area, and storage shed.

Processing plan for cannabis

Processing is proposed to occur in the 'headhouse' bay, a greenhouse style wearhouse that would be out in the cultivation field, and the exterior shop building. We will renovate

the shop structure so that it's secure, up to code for cannabis uses, and meets all fire and safety standards. In this shop building we will keep the walk-in freezer for storage of product that would then go directly to the manufactures. The headhouse attached to the cultivation greenhouse would have offices, storage, drying & curing space, and other work space if needed.



Description of how the project will meet the Medical Cannabis Land Use Ordinance Development Criteria (26-88-254(f)).

Number and type of facilities

- (1) Existing residence
- (1) Proposed indoor and processing facility in existing shop building
- (1) ADA bathroom attached to shop building
- (1) Greenhouse for mixed-light
- (1) Proposed office space for employees

Square Footage of Cultivation Area

- Mixed-light cultivation is proposed to be 10,000sf allowed per the land use table.
- Outdoor cultivation is proposed to be 10,000sf and is processing through the Ag Department as a Zoning Permit per the land use table.

- Indoor cultivation is proposed to be under 500sf and is processing as a Zoning Permit.

Setbacks of Cultivation Area to Property Lines

The proposed cannabis operation meets all required setbacks from property lines and occupied residences on adjacent parcels. The nearest occupied residence is over 300' from the proposed outdoor cultivation area.

Separation Distance of Property Boundary to Property Line of Sensitive Uses

The proposed cannabis operation meets all required setbacks from sensitive uses.

Existing Structures and Proposed Uses and Structures

- Residential home of 8,000sf to be lived in by operators.
- Shop building of 2,100sf proposed to be used for indoor cultivation, processing and storage.

Summary of Biotic Assessment

5.0 SUMMARY AND RECOMMENDATIONS

No sensitive biological communities were identified within the Study Area. No special-status plant or wildlife species have been documented to occur within the Study Area, and none have a moderate or high potential to occur.

5.1 Biological Communities

The entirety of the Study Area is comprised of non-native annual grassland and is not considered a sensitive biological community. The Study Area contains no potential wetlands or other waters potentially within the jurisdiction of the Corps under Section 404 of the Clean Water Act and RWQCB under the Porter Cologne Act and Section 401 of the Clean Water Act. No sensitive biological communities exist in the Study Area; therefore, no jurisdictional wetland delineation or other additional surveys or mapping is recommended.

5.2 Special-Status Species

5.2.1 Special-Status Plants

Of the 90 special-status plant species known to occur in the vicinity of the Study Area, none were determined to have a moderate or high potential to occur in the Study Area, and none were observed during the site visit. The grassland in the Study Area is highly disturbed by regular mowing and discing, and overwhelmingly dominated by non-native

species, making it unlikely that special-status grassland species would occur in the Study Area. All listed plant species covered by the Santa Rosa Plain Conservation strategy, Burke's goldfields, Sonoma sunshine, and Sebastopol meadowfoam are unlikely or have no potential to occur within the Study Area due to a lack of vernal pool habitat, lack of suitable hydrology (i.e. extended ponding), prior disturbance (i.e. mowing and discing), and lack of historical occurrences within the vicinity of the Study Area.

5.2.2 Special-Status Wildlife

No special status wildlife species were determined to have a moderate or high potential to occur within the Study Area. The Study Area lacks habitat to support special-status wildlife species such as vernal pools, wetlands, rivers, woodland, riparian, and serpentine habitats. High disturbance levels, urbanized nature of the site and surrounding areas, and/or the lack of suitable refugia reduce the potential for these species to occur and may preclude their presence. There are no further recommendations for special-status wildlife species.

Cultural Resources

The proposed cultivation operation is not located in a cultural or historic district.

Fire Prevention Plan

All employees, supervisors, and managers are expected to follow the procedures outlined in the fire safety plan to ensure that employees and the surrounding community are protected. The written fire prevention and safety plan is to be kept current and available to all employees. Emergency contacts will be posted around the facilities.

All employees upon hiring will be trained on any and all fire hazards, ignition sites, and possible flammable materials on the property. All employees will be made aware of the locations of fire extinguishers. Sprinkler systems and smoke detectors will be installed where necessary. First aid kits will be located on-site.

Emergency vehicles can enter from two locations, both are located at the front of the property. The westernmost entrance, on the left of the property, takes you to the back of the property and the eastern main gate takes you to the front residence. The side driveway is not paved at this time but is flat and takes you to the back cultivation area. There is a turnaround area for this driveway. The front main gate is paved and has a paved turnaround in front of the residence.

Cultivation areas will have proper vegetation management and fire break maintenance around all structures. Fences will be screened with native, fire-resistant vegetation.

The closest fire station is Rancho Adobe Fire District in Pennngrove, located 2.6 miles from the property. Luma will send a copy of the site map and fire plan to the local fire department for their approval and their records. No alcohol or tobacco is allowed on the property at any time.

See attached Site Plan. This document marks the closest public road access, which is Roberts Road, as well as the two front gates and their driveways. It also marks the two turnarounds located in both the front and back of the property. The main gas and electric shut-off is located in the well shed which is marked on the map in the southeastern part of the residence.

Grading and Access

There is an existing concrete driveway with an existing circular turnaround to the front portion of the residence. An existing dirt road provides access to the rear portion of the property. The dirt road is proposed to be graded and gravel paved to provide all weather access and an emergency truck turnaround at the rear of the residence and adjacent to the greenhouse. Emergency access grading is estimated at approximately 1,000 CY of Cut, and 1,000 CY of fill.

Hazardous Materials

Hazardous materials associated with the proposed cultivation activities include: pesticides, agricultural chemicals, and fuels.

The following Best Management Practices shall be employed for the storing hazardous materials:

Storage containers shall be covered at the end of every business day and during rain events.

Hazardous materials shall be located on the site to prevent discharges from chemical storage containers to drainage courses and nearby water bodies.

All chemicals on site shall be kept in watertight containers to prevent spillage or leakage.

Onsite personnel shall be trained to appropriately address hazardous and non-hazardous spills. Properly trained personnel shall be assigned to respond to spills.

In the event of a spill, the following actions shall be immediately taken:

- Spilled or leaking material shall be cleaned up immediately and properly disposed of.
- Personnel trained and assigned to spills shall be immediately notified of the spill to assist in the cleanup.

Agricultural materials, including fertilizers, mulches and topsoil, shall not be allowed to erode and enter any drainage courses or water bodies. Agricultural materials shall be securely protected from wind and rain when not being used.

Agricultural materials shall be applied according to manufacturer recommendations for quantities and application rates to prevent erosion. In the case of a forecasted rain event, Agricultural materials such as pesticides and fertilizers shall not be applied 2 days prior to the event.

Good housekeeping measures on the cultivation site shall be implemented to control the air deposition of hazardous materials from site operations.

Lighting Plan

All lights used around the property will be shielded and downward facing so no light can be directed onto neighboring properties. We will incorporate the use of heat sensors for our motion lights so that lights are triggered for human body heat and not constantly turning on and off due to motion of nature or small wildlife. Light deprivation technique will be used in our mixed-light greenhouse but will be completely sealed from the outside so no light can escape and be visible from neighboring parcels.

Stormwater Management Plan

Stormwater from the proposed onsite development are tributary to Roberts Creek which is Tributary to Lichau Creek and ultimately the Laguna De Santa Rosa.

Grading for proposed structures and the gravel access road shall be designed to maintain pre-development stormwater flow patterns. Stormwater volume leaving the site should be maintained at the pre-development level for the 85th percentile design storm by use of on-site infiltration or rainwater capture. Fiber rolls shall be used on disturbed surfaces to control sediment and erosion. Spacing and installation shall be in compliance with the EPA menu of Best Management Practices.

Should the project disturb one acre or more of soil, compliance with the requirements of the National Pollution Discharge Elimination System (NPDES) General Permit for land disturbing activities will be required.

Security and Fencing Plan

Security is a number one priority for Luma and we will take the necessary steps to protect our employees, assets, and community. Luma has contracted with Operational Security Solutions, a premier security solutions company for the cannabis industry, to design and

implement a security plan for our property and operations. This detailed security plan is located in separate confidential binder.

In general, Luma plans to construct a security fence that does not diminish the visual quality of the site or surrounding areas. The fence will form a perimeter around our entire proposed cultivation area and be secured by locking gates. This fenced area will be screened with native, fire-resistant vegetation. Both of the driveway entrances to the property will receive updated security measures such as new gate and fencing. Cameras will not be visible from other parcels nor will they be pointed at or near any of our neighbors. All security lights will be facing downwards to prevent light pollution onto adjacent properties. Any non-employees will be required to sign into a log during their visit and must be escorted by a Luma employee at all times.

Project Description: Medical Cannabis Land Use Ordinance Operating Standards (26-88-254(g)).

Odor Control Plan

- Greenhouse Odor Controls-
 - Our advanced greenhouses will be equipped with odor mitigation methods. Currently we are exploring these options:
 - Carbon filters
 - A mixture of natural and biodegradable ingredients injected into a high pressure fog system eliminate the molecules that contain odor rather than masking it. A cost effective solution to neutralizing and eliminating odors with no contamination impact.
- Outdoor Odor Controls-
 - The outdoor garden will be situated in the back field in a calculated way as to limit the amount of odor overspill into neighboring parcels.
- Odor Mitigation Manager-
 - Luma will have one full time employee that is designated to be the Odor Mitigation Manager. This employee will check the greenhouse odor controls daily and report any findings in a log. They are responsible for notifying Alexa or Curtis if they find any odor related issues.
- Luma has created a plan for responding to any odor complaints which includes the following...
 - Upon receiving the complaint, the Odor Mitigation Manager (OMM) will check the property logs to see if there are any recorded issues.
 - The OMM will then do a physical walk of the property to check all odor controls and locate the outlier odor.

- If any odor issues are found, the OMM will take the necessary actions to remedy the situation immediately.

Energy Source Use

Luma California will enroll in Sonoma Clean Power's Evergreen Program to use 100% local and renewable energy. We are also exploring solar panels and other energy saving systems, such as Wexus.

- Wexus Energy Management Solutions: remotely connects with our pumps, buildings, utility electric meters & water flow meters via cloud technology to provide information on usage vs energy & money savings.

Hours of Operation

Garden hours will be from 6am-9pm depending on the season and sunlight. Processing will only take place between the hours of 8am-5pm.

Outdoor Cultivation and Distance to Property Lines

All outdoor cultivation will be at least 300 feet from other property lines.

Waste Management Plan

Luma will be sure to follow the Best Management Practices for storing, handling, and disposing of all waste by-products of the cultivation and processing activities. Appropriate clean up materials will be available onsite.

We expect wastes to include the following; trash, recycle, and green waste/compost (cannabis stalks, fan leaves, and soil).

We will have a designated and locking trash area that will contain our trash can, recycle bin, and compost waste. All bins will be covered, locked, and away from weather. All trash products will be kept inside a bin and off of the ground. We will discard waste accordingly and it will be picked up weekly by the appropriate trash service.

All green waste from cannabis activity will either be composted and reused later during the season or recycled using a local composting company. Cannabis by-products we are not using in our compost will be disposed of by grinding down the plant waste and mixing with non-cannabis compost waste (if required), i.e., food waste or yard waste, and then picked up or disposed at a permitted solid waste facility for composting. We will minimize imported soil to only what we need for pots and will reuse as much cultivation

related materials as possible. Used soil will be stored on the property in the proper composting bins which prevent any contaminants from getting into the water supply or any nearby creeks or streams. The compost area will be properly covered and maintained and all setbacks and regulations will be followed.

The excess fan leaves trimmed off in the drying process that are not to be used for further production will be added to the compost waste or disposed of properly. We will keep all trimmings and small buds which will be transported to manufacturing facilities for additional processing after testing.

Water Supply and Management Plan

Water to the property is provided by well water. We also intend to have rainwater collection areas.



Groundwater Monitoring Easement

See submitted easement form for county access to well monitoring. The well is equipped with a Badger Meter Model 55 and Solinst Model 101 sounding meter.



Wastewater Management Plan

Wastewater generated by residential use of indoor fixtures and appliances, such as toilets, sinks, and dishwashers, will use the existing sewer collection system located in the various buildings, and be directed through the existing waste lines to the existing septic system and leach field. The existing septic system has been evaluated by Michael Swicegood, P.E. of Swicegood Civil Engineering, Inc. who has prepared a commercial findings report to propose continued use of the septic system for the commercial cultivation as a Class Three system with a decrease in proposed flow. The residence may be required to modify the existing floor plan to reduce the number of bedrooms in order to qualify for flow reduction requirements.

Irrigation of the outdoor, greenhouse, and indoor plantings will be in accordance with irrigation best management practices – utilizing drip irrigation systems, moisture sensors, irrigation controllers and routine visual inspection. Luma will routinely inspect and repair irrigation systems. Systems will be installed with backflow prevention. Irrigation rates will be managed to match the evapotranspiration needs of the plants and is not expected to generate any excess irrigation or runoff that will require any discharge or management.

Incidental overwatering or overspray from use of hoses as part of periodic activities will either soak into the soil or evaporate (e.g. when rinsing out a bucket). All water storage systems will be properly permitted and checked routinely for leaks.

Luma has submitted a Notice of Intent application to the North Coast Regional Water Quality Control Board for enrollment under the waiver of waste discharge requirements as stipulated in Order #R1-2015-0023. This NOI was submitted on 8/11/17. Additional materials being prepared include a Water Resource Protection Plan which is almost complete. A copy of the payment and enrollment verification is included with this application. Luma has also submitted our 1602 form to CDFW to get a waiver. Once received we will submit to the county.

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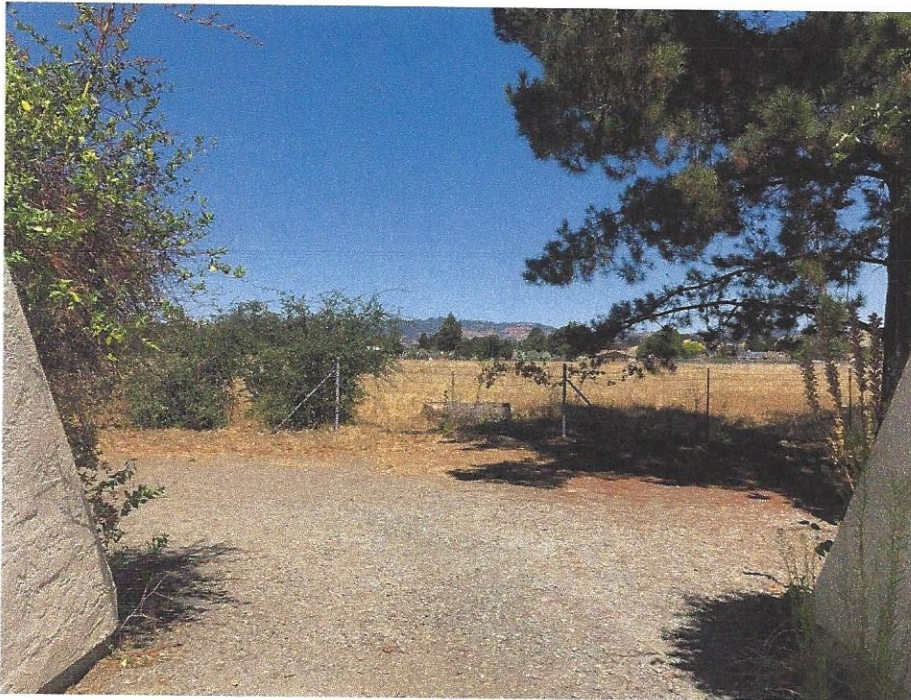
Photographs of the proposed development site.



Above: Front of house and driveway.

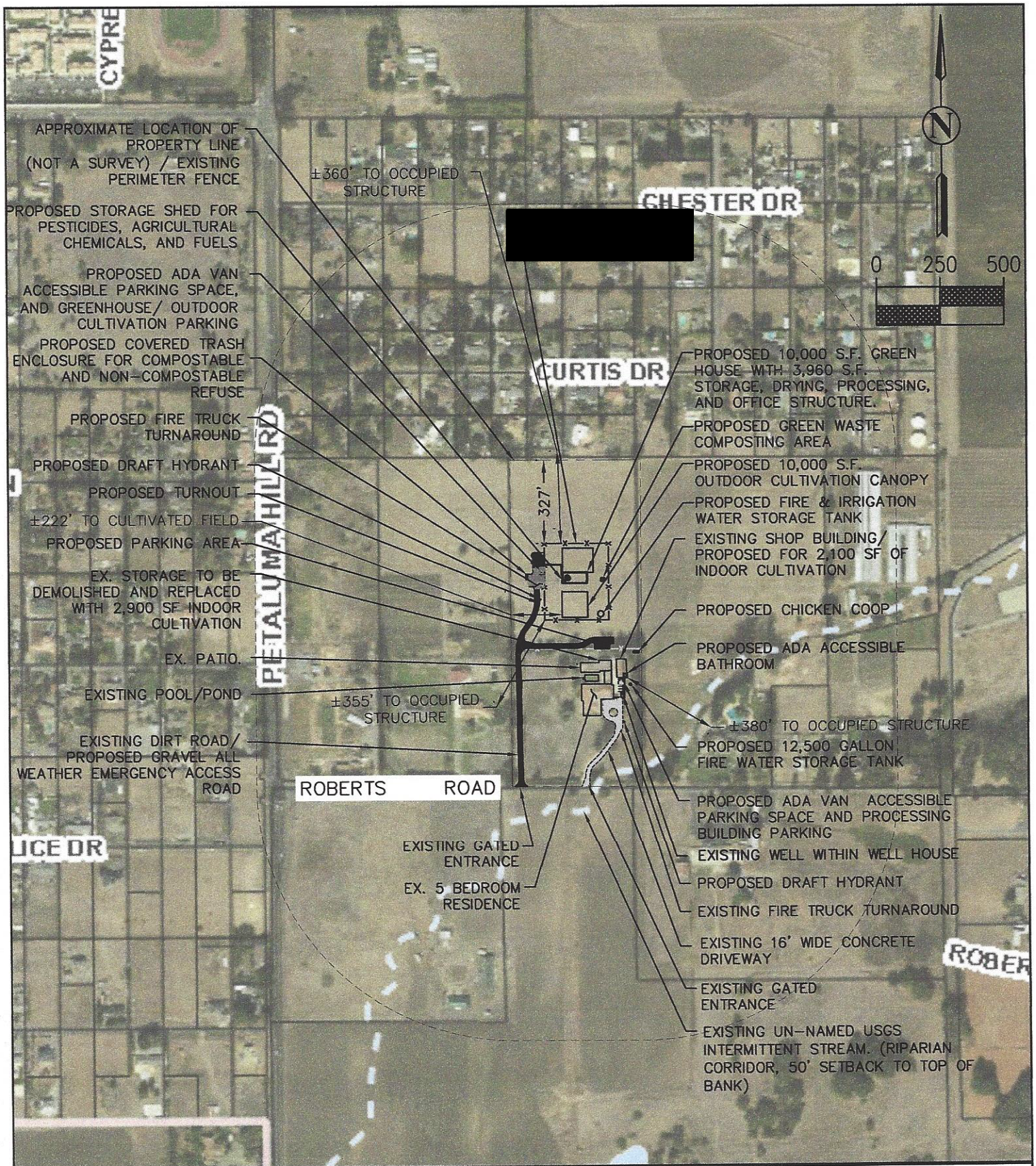
Below: Back of shop / proposed indoor and processing area.





Above: Entrance to back field area.
Below: Proposed for possible offices.





SWICEGOOD
CIVIL ENGINEERING, INC

P.O. Box 924 | Healdsburg CA, 95448

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Phone: (707) 230-6063 | e-mail:ms@swicegood-civil.com

CONTEXT MAP

LUMA CALIFORNIA, LLC

2275 ROBERTS ROAD

PENNGROVE, CA

A.P.N. 047-122-025

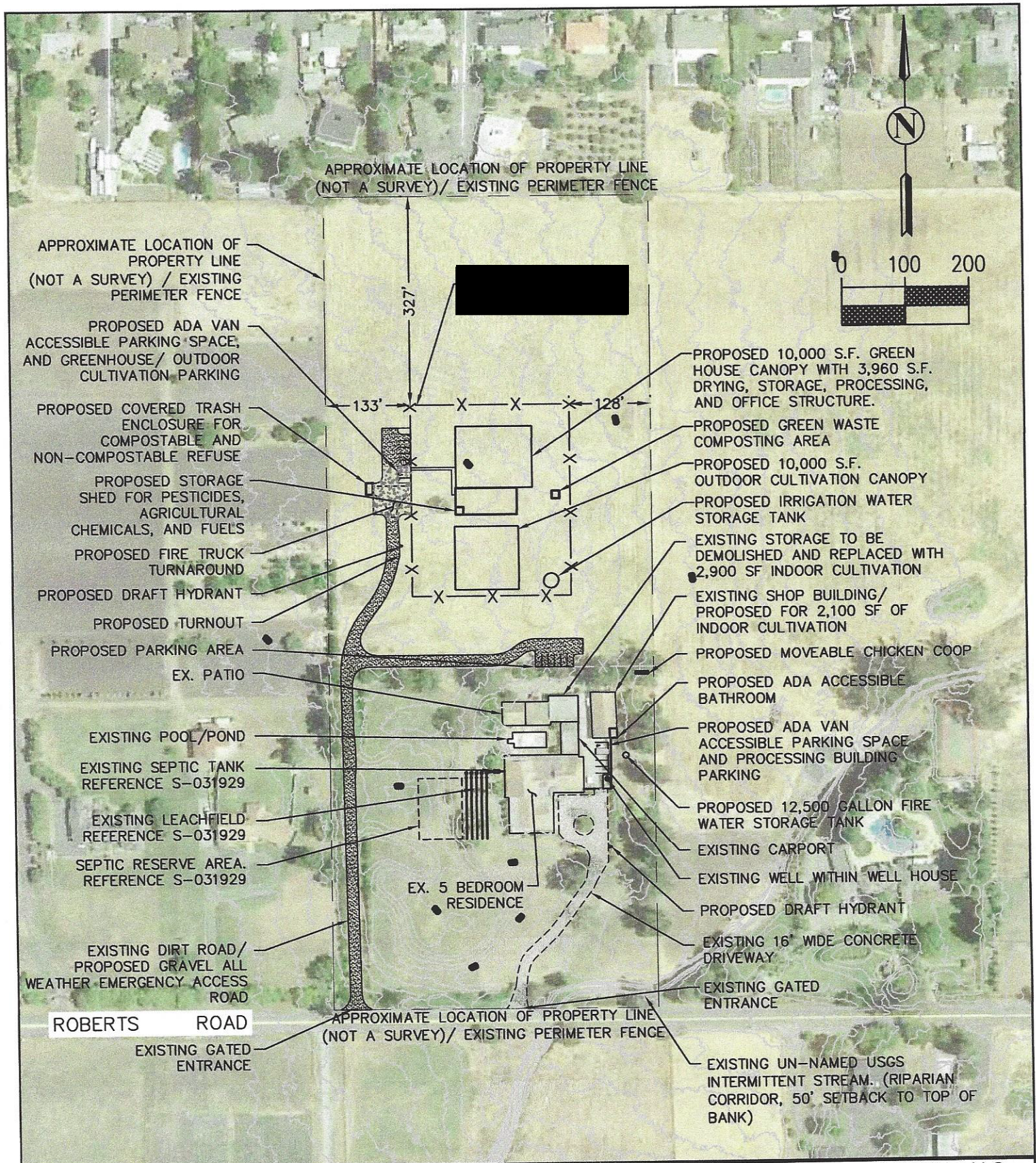
Owner: LUMA CALIFORNIA, LLC

2275 ROBERTS ROAD

PENNGROVE, CA 94951

DECEMBER 11, 2018

Job No. 17-33



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SITE MAP

LUMA CALIFORNIA, LLC

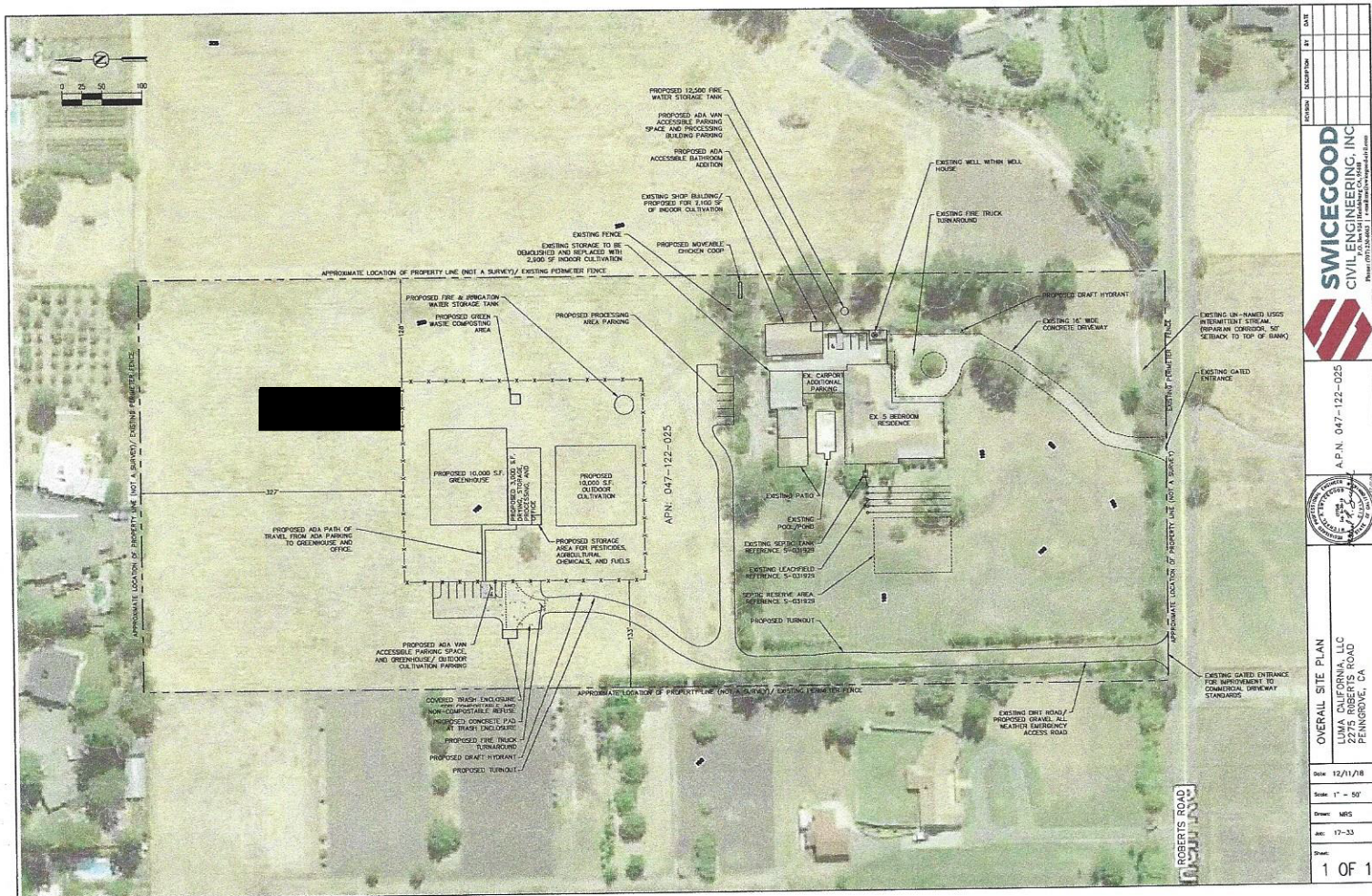
2275 ROBERTS ROAD
PENNGROVE, CA
A.P.N. 047-122-025

Owner: LUMA CALIFORNIA, LLC

**2275 ROBERTS ROAD
PENNGROVE, CA 94951**

DECEMBER 11, 2018

Job No. 17-33



Groundwater Report
Luma California, 2275 Roberts Road
APN 047-122-025

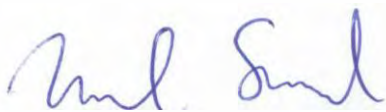
Prepared for:

Alexa Wall
Luma California
2275 Roberts Road
Penngrove, CA 94951

Prepared by:



O'Connor Environmental, Inc.
P.O. Box 794, 447 Hudson Street
Healdsburg, CA 95448
www.oe-i.com



Michael Sherwood, BS, PG #8839 (Exp. 6/30/19)



Matthew O'Connor, PhD, CEG #2449 (Exp. 10/31/19)
President



March 21, 2018
Revised December 11, 2018

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Appendix A- Well Logs

Appendix B- GPM Well test January 2018

Introduction

Luma California is in the process of securing a Sonoma County Cannabis Permit at 2275 Roberts Road (Sonoma County APN 047-122-025) east of Rohnert Park south of Copeland Creek in an unincorporated portion of Sonoma County (Figure 1). This groundwater study was prepared as required by Permit Sonoma (PRMD) pursuant to Policy and Procedure Number 8-1-14 and General Plan Policy WR-2e regarding groundwater resources and section 10d of Exhibit A-2 of County Ordinance No. 6189. Prior to 2017, studies of this type have been required only in groundwater availability Zones 3 and 4. The subject parcel is located in groundwater availability Zone 1, however it also lies within the Santa Rosa Plain and Petaluma Valley Groundwater Basins which is subject to the State's Sustainable Groundwater Management Act (SGMA) and where groundwater studies are now required per recent modifications to PRMD policies (Policy and Procedure Number 8-1-14, dated 2/23/17).

This hydrogeologic report includes the following elements: estimates of existing and proposed water use within the project recharge area, compilation of well completion reports (drillers' logs) from the area and characterization of local hydrogeologic conditions, estimates of annual groundwater recharge and existing and proposed groundwater use, and the potential for well interference between the project well and neighboring wells. This report has been generated as a response to comments provided to Luma California by PRMD regarding the previously submitted "Hydrogeologic Report for Luma California's Phase I Project" by Tully & Young dated December 13, 2017. This new report reflects the most recent plans regarding proposed domestic use, cultivation areas, irrigation rates, number and type of employees submitted by Luma California for permit application UPC17-0090.

On October 15, 2018 amendments to the Sonoma County Cannabis Land use Ordinance including allowing 25% additional space for propagation were approved by the Board of supervisors. In response to this development, the applicant decided to increase the area of the proposed mixed light greenhouse to include an additional 5,000 ft² propagation area. In addition to adding plants into the new propagation area, the proposed indoor operation was expanded and projected irrigation rates were updated. The December 11, 2018 version of this report reflects all updates to the proposed project.

Limitations

Groundwater systems of Sonoma County and the Coast Range are typically complex, and available data rarely allows for more than general assessment of groundwater conditions and delineation of aquifers. Hydrogeologic interpretations are based on the well completion reports made available to us through the California Department of Water Resources, available geologic maps and hydrogeologic studies and professional judgment. This analysis is based on limited available data and relies significantly on interpretation of data from disparate sources of disparate quality.

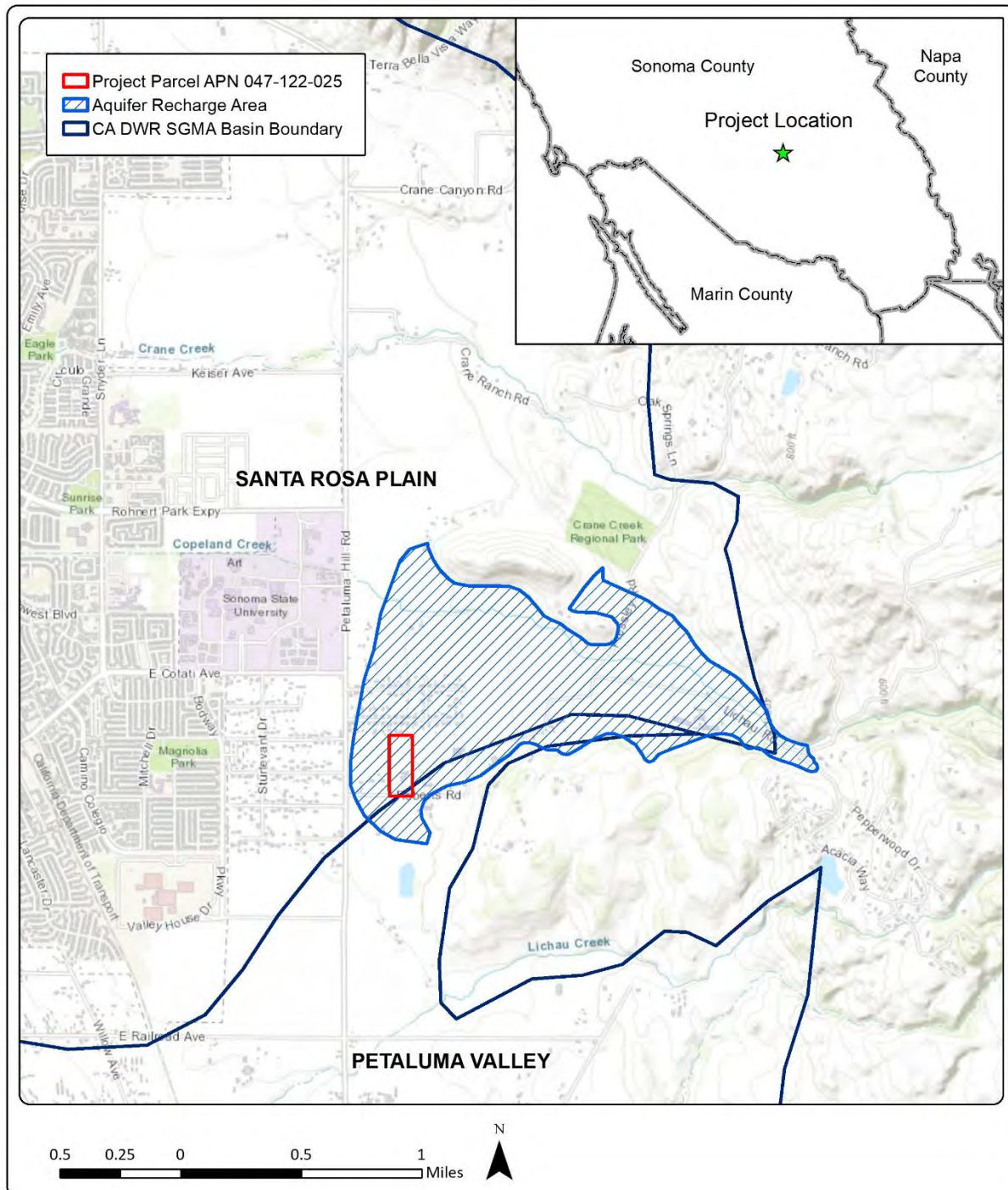


Figure 1: Project Location Map

Hydrogeologic Conditions

The project parcel is located along the eastern edge of the Santa Rosa Plain, approximately 0.5 miles south of Copeland Creek and approximately 1.0 miles east of the Rohnert Park city limits. A tributary to Lichau Creek crosses the southeastern corner of the project parcel. The parcel is underlain by a large area of Quaternary-aged alluvial fan deposits (map unit Qhf, Figure 2) consisting of moderately to poorly bedded sand, silt, and clay deposits (Graymer et al., 2007). Near the project parcel, this geologic map unit extends up to 0.9 miles across a shallow valley bottom and approximately 1.6 miles to the east following Copeland Creek. This map unit also extends 1.5 miles west of the project parcel, transitioning to an area of finer but similarly aged alluvial fan deposits (map unit Qhff). Slightly older (Holocene and late Pliocene) alluvial fan deposits (Qf and Qpf) are mapped to the north of the Qhf along with late and early Pliocene-aged Alluvium Qoa. To the east of the alluvial fan deposits a band of the (early Pliocene and late Miocene-aged sedimentary Petaluma formation is mapped. Quaternary landslide deposits of andesitic composition (Qlsa) make up the eastern boundary of this unit (Figure 2). To the north and the south, the alluvial fan deposits are bounded by andesite and basalt lava flows from the Sonoma Volcanics (map unit Tsa, Figure 2). The Sonoma Volcanics also underlay the alluvial fan deposits at depths varying from several feet along the valley margins to more than 100 feet in the center of the valley. The nearest fault is more than one mile away from the project to the east.

Alluvial fan deposits have a high primary porosity and are highly permeable. They have been assigned a relatively high specific capacity (Sc) of 8 – 17%. Well yields vary from less than 1 gpm to more than 100 gpm depending on the thickness of the deposits (DWR 1982).

The Petaluma Formation contains abundant clay and has been assigned a relatively low specific yield of 3-7% (Weaver, 1949). Despite the high clay content, the formation can yield moderate amounts of water when a well penetrates a significant thickness of sand and gravel (DWR, 1982).

The Tsa unit is part of the lower member of the Sonoma Volcanics which was described by Weaver (1949) as comprised of individual lava flows displaying great variability in thickness and texture over short distances. Given this heterogeneity it can be expected that hydrogeologic conditions exhibit similar spatial variability and yields from wells completed in the Tsa range from minimal to several hundred gpm (LSCE, 2013).

Well Data

Well completion reports were obtained for wells within the project vicinity from the California Department of Water Resources (Table 1). A subset of these logs was compiled (see Appendix A) and georeferenced based on parcel information, location sketches, and landowner communication (Figures 2 and 3). While well completion reports for numerous neighboring wells were obtained, a well completion report was unavailable for the project well (Well 1) however, a water system evaluation was performed by Petersen GPM in January of 2017 that does report

some useful information about the well (Appendix B). Additional details of neighboring wells and properties of the project aquifer were obtained from the Canon Manor West Subdivision Assessment District Groundwater Study prepared by Todd Engineers, Inc. dated March 2004.

The project parcel has one active well (Well 1) located in the center of the southeast quadrant of the property, east of the house (Figure 3). The date and depth of well completion are unknown but the January 2017 report by Petersen GPM reports the deepest water depth measured to be 259.5 feet below ground surface (bgs), the pump is reported to be submersible and did not break suction during the test so we infer that the well is at least 270 feet deep (pumps are normally set at least 10 feet above the bottom of the well so if we assume that the pump was set just below the lowest water elevation measured at 260 feet bgs then ten feet below that would be 270 feet). The Petersen GPM report also states that Well 1 has a 9-inch diameter steel casing. A 1 hour and 35-minute pump test was performed by Petersen GPM on January 9, 2017. The initial static water elevation reported was 210 ft below ground surface (bgs). After ten minutes of pumping at a rate of 42.8 gallons per minute, the rate was reduced to 40 gallons per minute and the dynamic water level stabilized (after a total of 50 minutes of pumping) at 259 ft bgs (49 ft of drawdown) for the remainder of the test (45 minutes). No recovery data was reported.

A well completion report was located for Well 37 which is located on the adjacent parcel (047-122-024) to the west of the Project parcel (Figure 3). The Well 37 is in a small outbuilding approximately 475 feet from the project well (Well 1). Well 37 was drilled in 1973 to a depth of 501 feet with alternating 20-foot sections of screened and blank casing between 61 and 501 feet depth. The driller's log reports a mix of brown clay and soft loose brown rock down to 122 ft bgs where they encountered "hard black rock" for eight feet until 130 bgs, next "brn. Clay/ streaks of sft. Brn. Rock" were encountered down to 150 ft where yellow clay and then alternating layers of "sticky blue clay and small streaks of blue rock" occurred to 435 ft bgs where a layer of "hard blue rock" was encountered down to the final depth of 501 ft. The point in this well log where the anticipated transition from the alluvium into the Sonoma Volcanics is difficult to identify however for the purposes of this analysis we assume the contact to be at 122 ft bgs where the "hard black rock" is encountered. A pump test was performed upon completion of the well, a static water level of 135 feet was recorded at the start of the test and after four hours of pumping the water level had dropped 50 feet to 185 feet. The reported discharge was 35 gallons per minute. The owner of this well was contacted in March of 2018 and confirmed the location of their well and reported a minimum production of 50 gpm. He also stated that in the 20 years that they have lived on the property they had never had any issues with their well.

Well 35 is located on parcel 047-122-026 just east of the project parcel (Figure 3). Well 35 is assumed to be in a small outbuilding identified in aerial photos approximately 640 feet from Well 1 near the southeast corner of the parcel. Well 35 was drilled in 1979 to a depth of 305 feet and screened between 182 and 304 feet bgs. The drillers log reports "soft blue volc.[anic] rock" between a depth of 170 and 185 feet, then "blue clay" from 185 to 203 feet, "soft blue volc.(anic) rock" from 203 to 270 and finally "soft blue volc.(anic) rock/ streaks red rock" from 270 to 305

feet deep. Based on the drillers log the screened section of the well appears to intersect the Tsa unit. A pump test was performed upon completion of the well, a static water level of 160 feet bgs was recorded at the start of the test and after four hours of pumping the water level had dropped 15 feet to 175 feet. The reported discharge was 50 gallons per minute. The owner of this well was also contacted in March of 2018 and reported to never had any water supply issues.

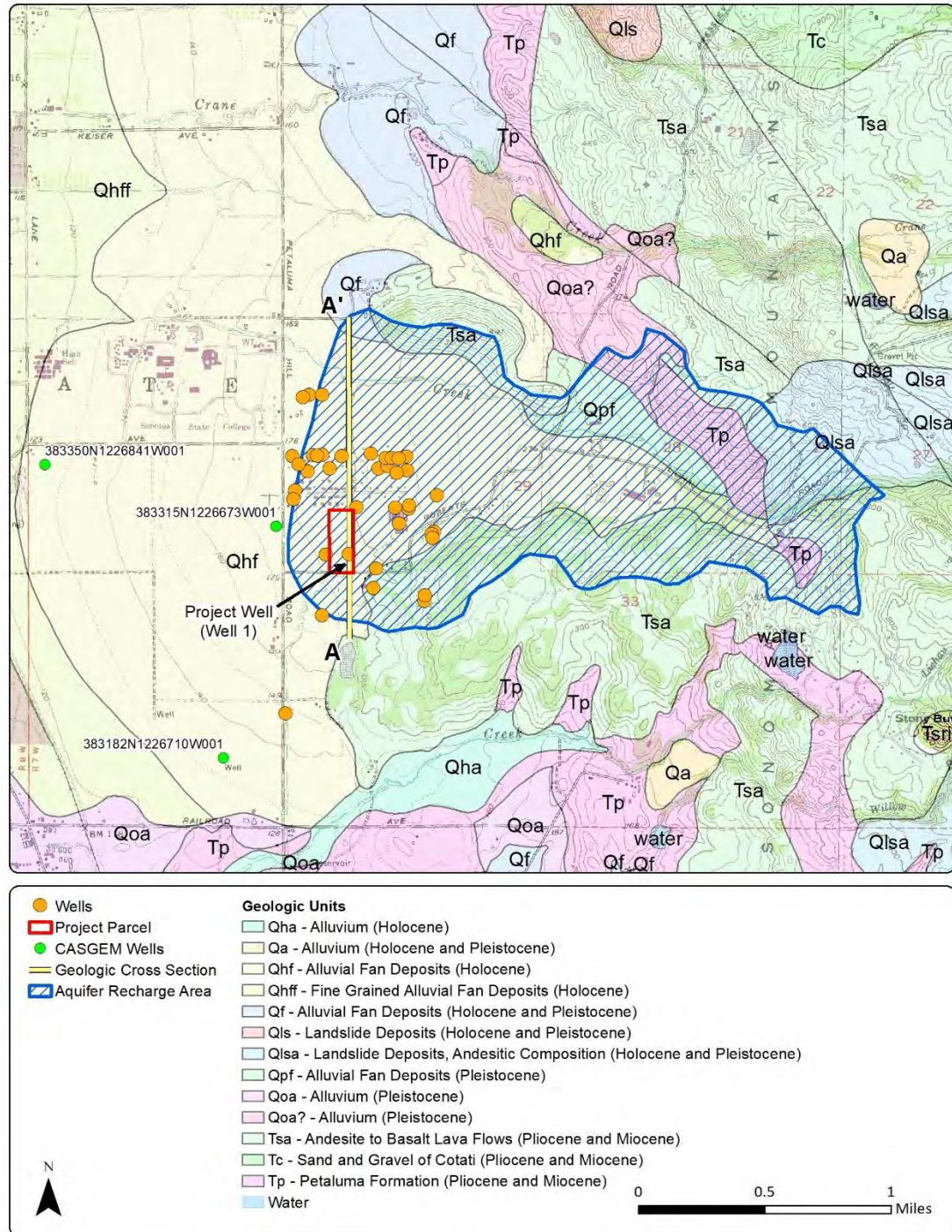


Figure 2: Surficial geology and locations of wells and geologic cross section in the vicinity of the project parcel (Graymer et al., 2007), structural data from McLaughlin et al. (2008).

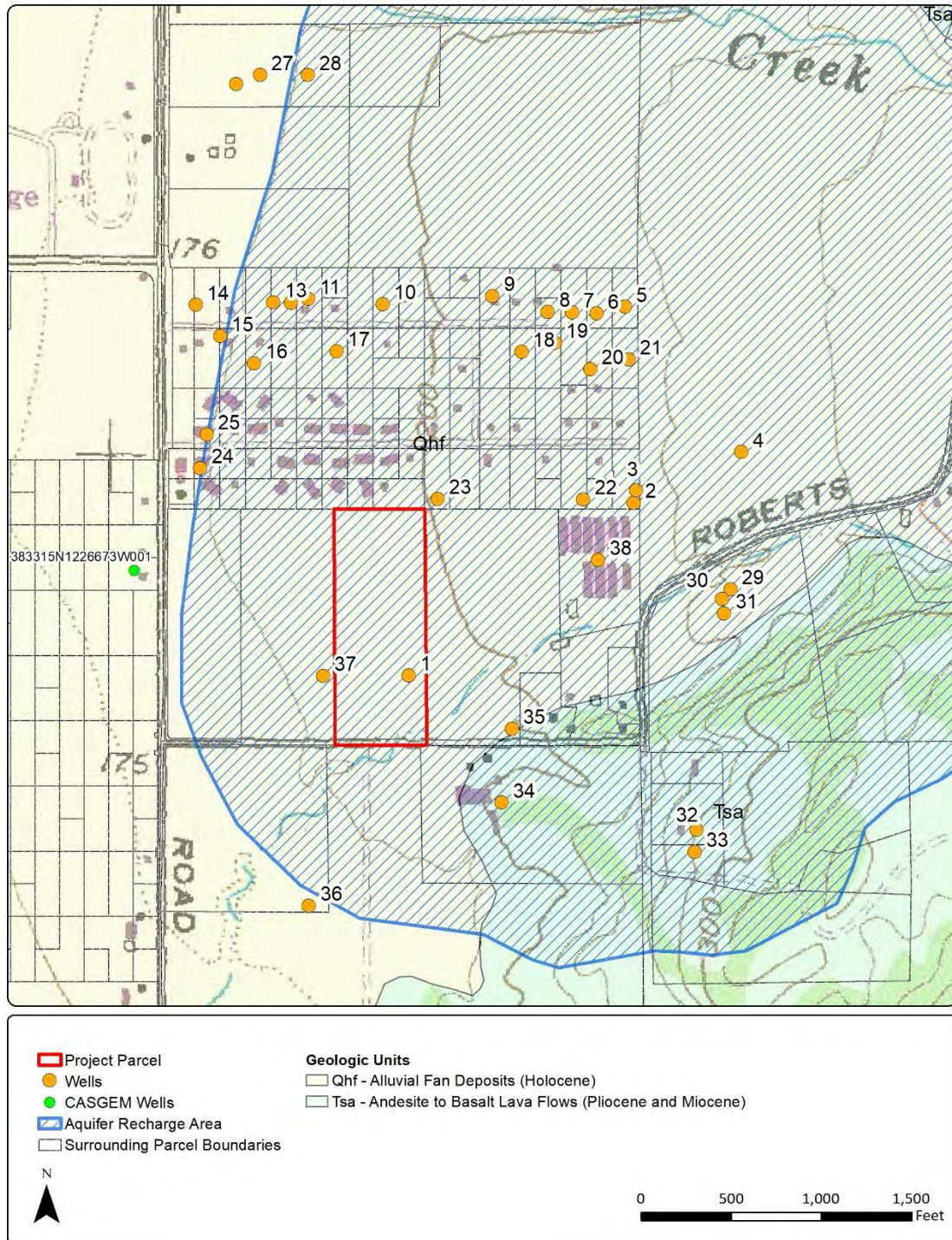


Figure 3: Detailed location of wells within the project vicinity based on available well completion reports

There are three high-capacity wells north and northeast of the project well (Wells 2 – 4). Two of these, also referred to as Canon Manor Wells 1 and 2, are located approximately 1500 feet northeast of the project well. These wells and the parcel they are located on (APN 047-276-011) are owned by the Penngrove-Kenwood Water Company. The third is located approximately 2,200 feet northeast of the project well in a vineyard.

Although a well completion report was not available for Canon Manor Well 1 (Well 2, Figure 3 & Table 1), the Canon Manor West Subdivision Assessment District Groundwater Study (TEI 2004) provides specific design details. This well was completed in 1958 to a depth of 466 feet. At the time of completion, the static water level was approximately 80 feet and the well had an estimated capacity of 1,500 gpm. The screened interval is between 188 and 466 feet, within soft red rock likely derived from the Sonoma Volcanic Formation (Table 1). The well-bore terminates in basalt. A video survey conducted in August 1998 by Weeks Drilling & Pump Company, Inc. showed that the well has been infiltrated with silt to a depth of 380 feet (roughly 86 feet of fill). On February 5, 2004, Todd Engineers, Inc. performed an 8-hour pump test at 375 gpm, the maximum typical operating rate of the well. This test resulted in approximately 18.4 feet of drawdown and a Specific Capacity (S_c) of 20.38 gpm/ft of drawdown. Based on the water surface elevations within Canon Manor Well 1 and a nearby well (Well 5) the underlying aquifer has a transmissivity (T) of approximately 140,000 gpd/ft and an estimated storativity (S) of 0.15. Based on these parameters, the Canon Manor Well 1 is located in a prolific aquifer. Given the proximity to the project well and the similar depths, aquifer properties near the project well are likely comparable.

Well completion reports were available for Canon Manor Well 2 (Well 3) and the irrigation well (Well 4) located in a vineyard to the northeast (APN 047-122-034). These wells were completed to depths of 450 feet and 495 feet respectively. Estimated yields ranged from 50 gpm to 110 gpm and static water elevations ranged from 65 feet to 195 feet. These wells are screened in the Sonoma Volcanics which were encountered at depths of 80 to 133 feet. Based on pump test data, specific capacities were estimated to range from 0.39 to 0.86 gpm/ft of drawdown. It should be noted that while a well completion Report is available for Well 4, the specific location is not reported. The location was estimated based on aerial imagery.

Well completion reports were also available for numerous wells located on rural and semi-rural residential properties (Wells 5 – 38). These wells were typically completed in the late 1970s to late 1990s to depths between 177 and 400 feet. At the time of completion, static water levels ranged from 37 feet to 165 feet and estimated yields varied from 12 to 65 gpm. Estimated specific capacities range from 0.06 to 0.59 gpm/ft of drawdown. Many of these wells are partially screened within the Sonoma Volcanics underlying the Alluvial Fan Deposits. Geologic Logs for these wells indicate highly variable depths of alluvium, ranging from approximately 100 to approximately 400 feet.

Table 1: Well completion details for the project well and wells in the vicinity of the project parcel (see Figure 2 and 3 for locations). Note that not all residential wells are included.

Well ID	1	2	3	4	10	23	28	34	35	36	37
Year Completed	Unk.	1958	2007	1999	1985	1979	2014	1957	1979	1989	79
Depth (ft)	at least 270	466	440	495	247	222	37	214	305	654	501
Static Water Level (ft)	210	80	65	195	110	25	10	0	160	80	135
Top of Screen (ft)	Unk.	188	240	190	147	102	20	144	182	0	61
Bottom of Screen (ft)	Unk.	466	430	495	207	222	35	214	304	654	501
Pumping Rate (gpm)	40	1,500	50	110	65	25	Unk.	120	50	50	35
Drawdown (ft)	49	18.4 ¹	30	285	110	145	na	12	175	320	185
Test Length (hrs)	1.5	8	8	5	4	4	na	1	4	1	4
Specific Capacity (gpm/ft)	0.82	20.38	1.7	0.39	0.59	0.21	Unk.	10	3.3	0.2	0.7
Well Casing Diameter (in)	9	12	12	8	Unk.	6	2	10.25	8	Unk.	6
Geologic Map Unit	Qhf	Qhf	Qhf	Qhf	Qhf	Qhf	Qhf	Qhf	Qhf	Qhf	Qhf
Approx. depth of Alluvium (ft)	Unk.	<271	113	133	125	35	Unk.	208	170	264	122

Groundwater Elevations

The aquifers within the vicinity of the project parcel are relatively well-studied and historical groundwater elevation data was available from a variety of sources. There are three California Statewide Groundwater Elevation Monitoring (CASGEM) wells completed within the alluvial fan in the vicinity of the project well. While these wells are located between 0.5 and 1.4 miles away from the project well, they provide a general characterization of trends in groundwater elevation.

For two of these wells (CASGEM 383315N1226673W001 is nearest to the project site and lies just beyond the west edge of the impact/recharge area and 383182N1226710W001), biennial water surface data is available from 1992 up to the present (2017). Data from these wells shows a relatively consistent increase in groundwater elevation and decrease in depth to groundwater between 1995 and 2017, particularly between 2002 and 2008. Over the period of record, autumn groundwater elevations at these wells increased at a rate of 2.0 ft/yr and 0.5 ft/yr respectively. For the third well (CASGEM Site Code 383350N1226841W001) monthly water surface data is available from late 1991 through the end of 1995. Data from this well also shows a relatively steady increase in autumn ground water elevation on the magnitude of 5 to 10 ft/yr (Figure 4). The variations in autumn groundwater elevations are in part a function of variations in climate and recharge conditions over time. Autumn groundwater elevation observations are less subject to variability of climate (recharge) conditions than Spring groundwater elevations.

This steady increase in groundwater elevation is consistent with the results of the Canon Manor West Subdivision Assessment District Groundwater Study (TEI 2004) which investigated groundwater supplies in the broader Rohnert Park area, including the alluvial fan near Copeland Creek. On a basin-wide scale, this study found significant decreases in groundwater elevation between 1950 and 1990, followed by stabilization of and increases in groundwater elevation in

the late 1990's. On a smaller scale, this study found significant variation including localized decreases in water surface elevations due to specific pumping practices.

The Penngrove-Kenwood Water Company also reports the mean annual depth to groundwater in each of its wells as part of its annual water reports submitted to the California Public Utilities Commission (PUC). These reports include the mean annual depth to groundwater for both Canon Manor Wells (Wells 2 & 3). While the data appears to be provided on a quadrennial interval, the available data shows a steady increase in the depth to groundwater at the Canon Manor Wells. The mean annual depth to groundwater has increased from 188 feet in 2000 – 2003 to 226 feet in 2013 – 2016, the last period for which data is available (Figure 5). While this data does not suggest a regional decrease in groundwater elevation, it does suggest a localized decrease within the vicinity of the Canon Manor Wells.

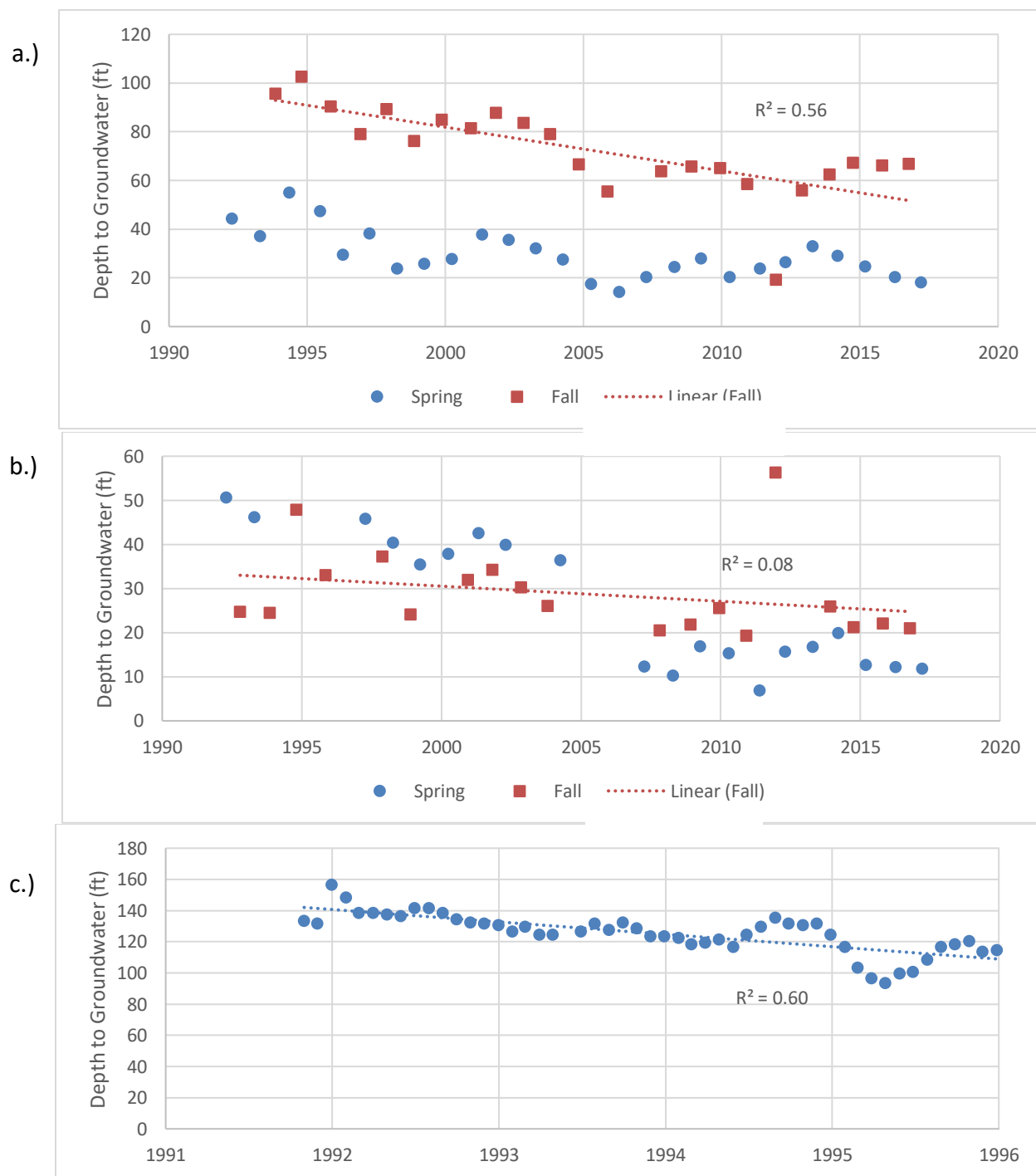
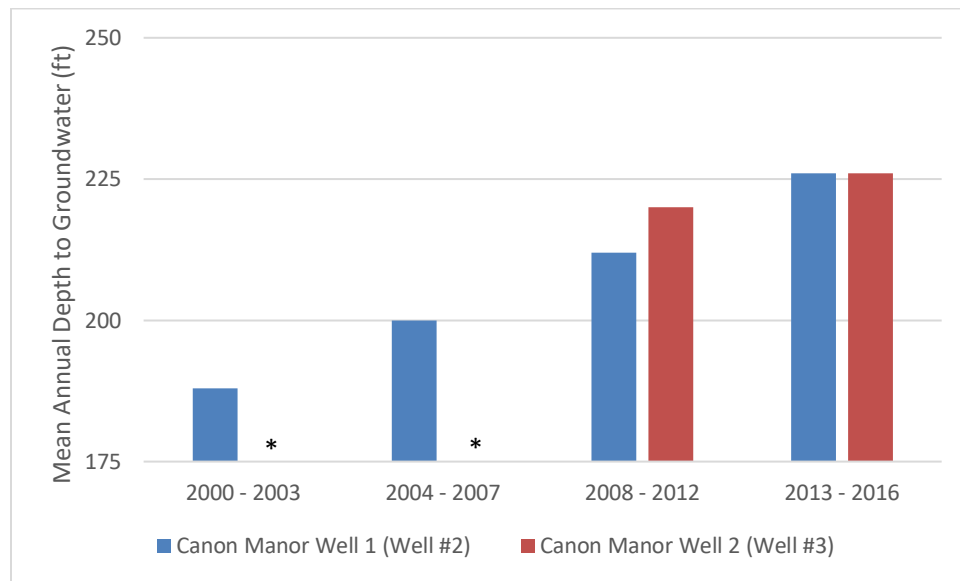


Figure 4: Groundwater elevation hydrograph at a.) CASGEM monitoring well 383315N1226673W001, b.) CASGEM monitoring well 383182N1226710W001, and c.) CASGEM monitoring well 383350N1226841W001. All of these wells show consistent trends of rising groundwater elevation.



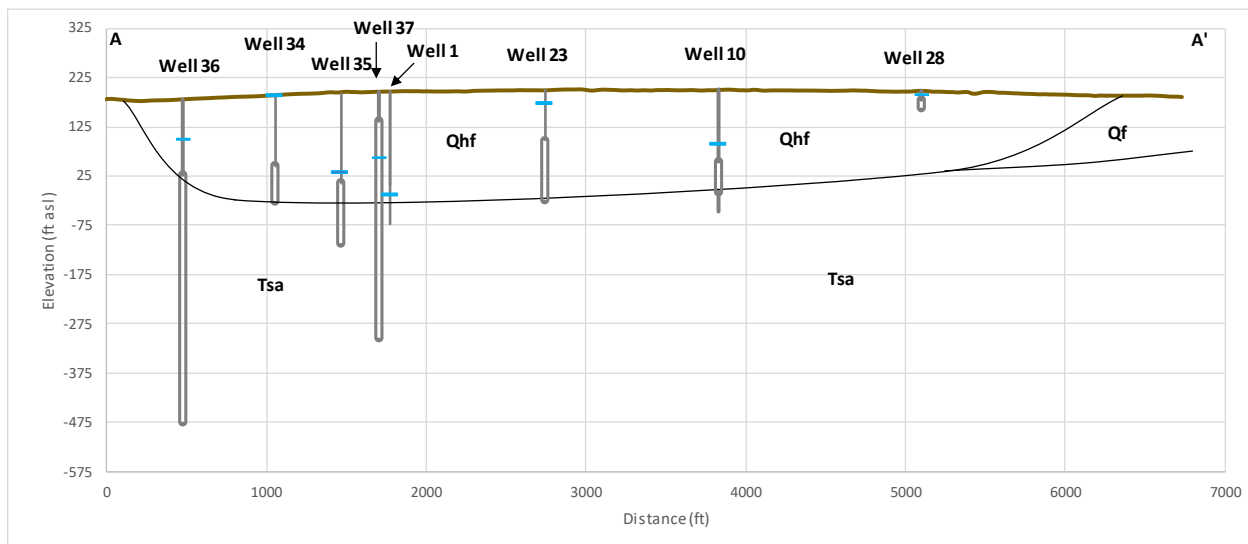
* Well not completed at this time

Figure 5: Depths to groundwater in Cannon Manor Wells 1 and 2 based on Penngrove-Kenwood Water Company annual reports to the California Public Utilities Commission.

Geologic Cross Section

A geologic cross section oriented south to north cuts across a shallow valley (Figure 6, see Figures 2 and 3 for location). The valley bottom consists of alluvial fan deposits (map unit Qhf). Based on available well completion reports and hydrogeology studies (TEI, 2004), the thickness of these deposits is highly variable. Within the vicinity of the project well, the alluvial fan deposits are approximately 150 to 200 feet in thickness. To the west near Wells 7 and 8, the depth of the alluvial fan deposits quickly increases to more than 400 feet in thickness. Andesite and basalt flows from the Sonoma Volcanics (map unit Tsa) underlie the alluvial fan deposits and are exposed along the sides of the valley.

Most of wells for which well details were available are at least partially screened within the Sonoma Volcanics. While the screened interval of the project well is unknown, based on the minimum depth of the project well it is highly likely that it is at least partially screened within the Sonoma Volcanics.



* Groundwater elevation and screening information not available for Well 1.

Contacts: ————— **Geologic Contact (uncertain where queried)**

Well

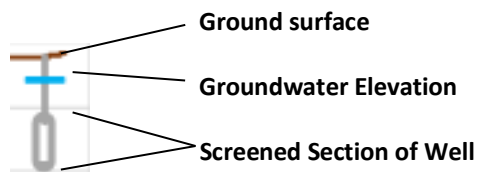


Figure 6: Surficial geology and locations of wells and geologic cross section in the vicinity of the project parcel (Graymer et al., 2007). Note that indicated groundwater elevations indicate static groundwater elevations at the time of well completion or most recent well test.

Project Aquifer

The extent of the project aquifer/recharge area (which also serves as the cumulative impact area) has been defined based on geologic contacts, structures, and surface water drainage patterns. Because the project well is believed to penetrate both the Quaternary-aged Alluvial Fan Deposits (map unit Qhf) and the underlying Sonoma Volcanics, both units are considered to be part of the project aquifer. Therefore, the extent of the project aquifer has been defined as the alluvial deposits occupying the broad valley bottom and adjacent units of the Sonoma Volcanics (map unit Tsa) on hillslopes along the valley margin. These volcanic rocks comprising hillslopes adjacent to the valley floor are exposures of volcanic bedrock aquifer material that can be recharged by rainfall. At the eastern end of the valley, a narrow band of the Petaluma Formation (map unit Pf) and Landslide deposits (Qls) are also included as they both are assumed to lie on top of the Sonoma Volcanics. Volcanic rocks comprising potentially-connected recharge areas for the aquifer could plausibly extend farther to the east.

The northern and southern limits of the project recharge area are defined by ridgelines which have been conceptualized as groundwater divides. The western limit is defined by the western extent of the volcanic outcroppings that would be expected to laterally-confine the alluvial fan deposits. The northeastern limit of the project recharge area is defined by a fault which has been conceptualized as a hydraulic barrier. The southeastern limit is defined primarily by a series of minor ridges. Although this delineation excludes a small drainage with a topographic gradient, and potentially direction of groundwater flow, oriented towards the southeast limit of the recharge area, this drainage is a significant distance away from the valley bottom and the project well. Only the Sonoma Volcanics close to the valley margin are assumed to be connected to the Sonoma Volcanics underlying the alluvial fan deposits in the valley bottom. Therefore this small drainage was not included in the project recharge area.

In total, the project recharge area covers approximately 1,252 acres. Of this, approximately 714 acres or 57% is underlain by Holocene to Pleistocene-aged Alluvial Fan Deposits (map units Qhf and Qpf), approximately 372 acres or 27% is underlain by Pliocene to Miocene aged Andesite to Basalt Lava Flows of the Sonoma Volcanics (map unit Tsa), and approximately 92 acres are underlain by the Pliocene to Miocene aged Petaluma Formation (map unit Pf). The remaining 75 acres is underlain by Holocene to Pleistocene-aged Landslide Deposits at the eastern edge of the project recharge area.

Water Demand

Existing Use

In the existing condition, residences, agricultural operations, and commercial stables use groundwater from the project recharge area. Existing water uses on the project parcel were determined from the existing study performed by Tully and Young (Tully and Young, 2017). Uses on surrounding parcels were determined using satellite imagery and parcel data. Annual rates for the various uses have been estimated primarily based on Napa County's Water Availability Analysis (WAA) Guidance Document, dated May 2016 (Napa County, 2016). When specific water uses on the surrounding parcels were not known precisely, high-end estimates were assumed to be conservative. The existing residential use is estimated to total 168 acre-ft/yr and the existing irrigation use, including water used for vineyards, is estimated to total 160.9 acre-ft/yr. Including an estimated 0.70 acre-ft/yr used for livestock and an estimated 0.72 acre-ft/yr used by agricultural employees, the total estimated existing use is 330.36 acre-ft/yr (Tables 2 through 7).

The project parcel currently contains a single main residence, occupied by four adults with modest landscaping and an unused pond/swimming pool. Existing water use for the project parcel is estimated to be 0.85 acre-ft/yr using Napa County WAA Guidance documents. This rate was calculated by applying the high-end rate for a single-family home with landscaping of 0.75 and adding 0.1 acre-ft/yr for an uncovered pool assuming it will be used in the future. Prior to 2017, when the current owners purchased the property, the project property was used as an

elder care facility. In their report Tully and Young made a detailed estimate of the water use of the facility on Page 7 (Tully and Young, 2017).

“Per communications from the property’s listing agent to Luma representatives, the care facility was home to 11 patients, with 4 or 5 staff on-site during the day and 2 staff overnight. The facility operated on a 24 hour, seven day a week schedule. Because water use data on such facilities is not readily available, the Report assumes the facility mimicked the water demands of a hotel or timeshare facility.¹⁷ A value of 0.13 acre-feet per bed per year is used as a conservative value. For the 11 residents, this would translate to about 1.4 acre-feet per year. The onsite staff represent needs equivalent to a small office facility and are estimated to add approximately 0.1 acre-feet of demand.

The on-site well was used to serve the facility needs as well as landscaping around the property. Based upon visual inspection of aerial images and using Google’s “street view” mapping tool, landscaping was nominally irrigated, but spread all around the main buildings. For purposes of the Report, the annual landscape water needs are estimated at 0.5 acre-feet.”

The per-bed water demand estimates match use numbers similar to what a skilled nursing facility is listed as using (0.12 acre-ft/yr) in Monterey Peninsula Water Management District’s Non-Residential Water use Factors worksheet (MPWMD, 2014). Estimated irrigation of 0.5 acre-ft/yr would be equal to assuming approximately 5,000 square feet of non-xeriscape landscaping under the Napa County WAA guidelines which is a conservative estimate of landscaping areas surrounding the main buildings on the project property. We agree with these two estimates for previous water use on the property but would add an additional demand of 0.1 acre-feet to include the uncovered pool. Taking into account the Tully and Young estimate plus the additional demand of the pool gives a total demand of 2.10 acre-ft/yr. Seeing as the care facility was in operation and impacting the project aquifer for a longer period of time than the current residents we will assume the total existing project parcel water use to be 2.10 acre-ft/yr. The proposed residential water use estimate will use the most recent use estimate of 0.85 acre-ft/yr.

There are eight large agricultural operations located wholly or partially within the project recharge area. The first is an approximately 10.9-acre tree nursery at the northwestern corner of the project recharge area which also contains a 1.9-acre vineyard. The second is an approximately 125-acre vineyard northeast of the project parcel. This vineyard does not include tasting rooms, processing facilities, or other facilities. The third is a commercial stable located southeast of the project parcel. This operation includes a stable with approximately 50 stalls and two primary residences. The fourth is a large farm at the eastern end of the project recharge area. While most of this farm appears to consist of dry-farmed pasture, approximately 2.6 acres are potentially irrigated. This farm also includes two main residences and a secondary residence. The fifth operation is located two parcels to the east of the project parcel where a 3.1-acre farm is located. The sixth operation is located to the south of the project parcel on the other side of

Roberts road on the southern edge of the project recharge area. There appears to be approximately 1.8 acres of row crops in addition to one main residence. The number of employees for each of these operations is unknown. Therefore, a high-range estimate of 10 full-time employees per operation, totaling 60 full-time employees, was used.

The seventh agricultural operation is a large vineyard located at the northern edge of and north of the project recharge area. This vineyard appears to irrigate using surface diversions and water stored in an onstream reservoir, not groundwater. Therefore, irrigation use for this vineyard was not included in the groundwater demand calculations. The eighth agricultural operation is a large vineyard located at the northern edge of and north of the project recharge area. This vineyard appears to irrigate using surface diversions and water stored in an onstream reservoir, not groundwater. Therefore, irrigation use for this vineyard was not included in the groundwater demand calculations.

Three large public supply wells are also located within the project recharge area. Two of these wells, Canon Manor Wells 1 and 2 (Wells 2 and 3), are located at the southeastern corner of the subdivision northeast of the project parcel. These wells are owned by the Penngrove-Kenwood Water Company and supply water to the Canon Manor Subdivision. Annual reports submitted to the California Public Utility Commission (PUC) indicate that between 2009, the first year that Canon Manor Well 2 (Well #3) was in production, and 2016, the latest year for which data is available, the combined extractions from these two wells averaged 54.6 acre-ft/yr (Figure 7). The maximum reported extraction of 60.29 acre-ft, which occurred in 2016, was used in the water use calculations.

There are several parcels within the Canon Manor Subdivision that also have small, privately-owned wells. These parcels are also supplied by the Penngrove-Kenwood Water Company and it is likely that the water used by these parcels is supplied by the Canon Manor Wells. As of 2004, these parcels received an average of 0.53 acre-ft/parcel/year from the Canon Manor Wells (TEI 2004) and contained a single primary residence. This supply rate is consistent with the low end accepted use rated for primary residences (0.50 to 0.75 acre-ft/yr), indicating that the water used by these parcels is supplied by the Canon Manor Wells. While these parcels may supplement water provided by the Penngrove-Kenwood Water Company using water from their small, privately-owned wells, this use is minor in comparison to the total water use within the project recharge area.

Specific annual extraction volumes were unavailable for the well owned by the College Park Mutual Water Company (CPMWC) along Lichau Road. The California State Water Board's (SWB) Safe Drinking Water Information System (SDWIS) indicates that the CPMWC serves 70 residences. The CPMWC does not purchase water from the Sonoma County Water Agency (SCWA), therefore all residences served by the CPMWC were assumed to use groundwater. Using a standard use rate of 0.75 acre-ft/residence/yr, the CPMWC well was estimated to extract 52.5 acre-ft/yr (Table 3).

In addition to agricultural and public water uses, numerous smaller water uses are located throughout the recharge area. A cluster of rural-residential parcels is located east and south of the project parcel.

These include clusters of rural-residential parcels generally located southwest and southeast of the project parcel. In total, these parcels contain two oversized residences, 50 main residences, and 11 secondary residences. These parcels also contain 16 pools, stables for approximately 20 horses, and 100,000 ft² of lawns in excess of the 1,000 ft² assumed per main residence by the Napa County Water Availability Analysis Guidance Document. Approximately 0.5 acres of vineyards and 5.9 acres of irrigated pasture are also located on these parcels.

Table 2: Estimated existing and proposed water uses within the project recharge area.

	Residential Use (acre-ft/yr)	Irrigation Use (acre-ft/yr)	Livestock Uses (acre-ft/yr)	Employee Use (acre-ft/yr)	Total Use (acre-ft/yr)
Existing Use	168.0	160.9	0.70	0.72	330.36
Proposed Use	166.8	162.6	0.70	0.87	331.00

Table 3: Calculation of estimated existing and proposed residential use within the project recharge area.**Existing**

Use Category	# of Units	Use per Unit (ac-ft/yr)	Use per 1,000 square feet	Annual Water Use (ac-ft/yr)
Rural Residential with Private Wells				
Elder Care Facility on Project Parcel	1	2		2.00
Oversized Main Residence	2	1.00		2.00
Main Residence	54	0.75		40.50
Secondary Residences	12	0.35		4.20
Pools	16	0.10		1.60
Lawn	100,000		0.05	4.95
Residential Use Supplied by Canon Manor Well				60.29
Residential Served by College Park Municipal				
Main Residence	70	0.75		52.50
TOTAL				168.0

Proposed

Use Category	# of Units	Use per Unit (ac-ft/yr)	Use per 1,000 square feet	Annual Water Use (ac-ft/yr)
Rural Residential with Private Wells				
Oversized Main Residence	2	1.00		2.00
Main Residence	55	0.75		41.25
Secondary Residences	12	0.35		4.20
Pools	16	0.10		1.60
Lawn	100,000		0.05	4.95
Residential Use Supplied by Canon Manor Well (Penn Grove)				60.29
Residential Served by College Park Municipal				
Main Residence	70	0.75		52.50
TOTAL				166.8

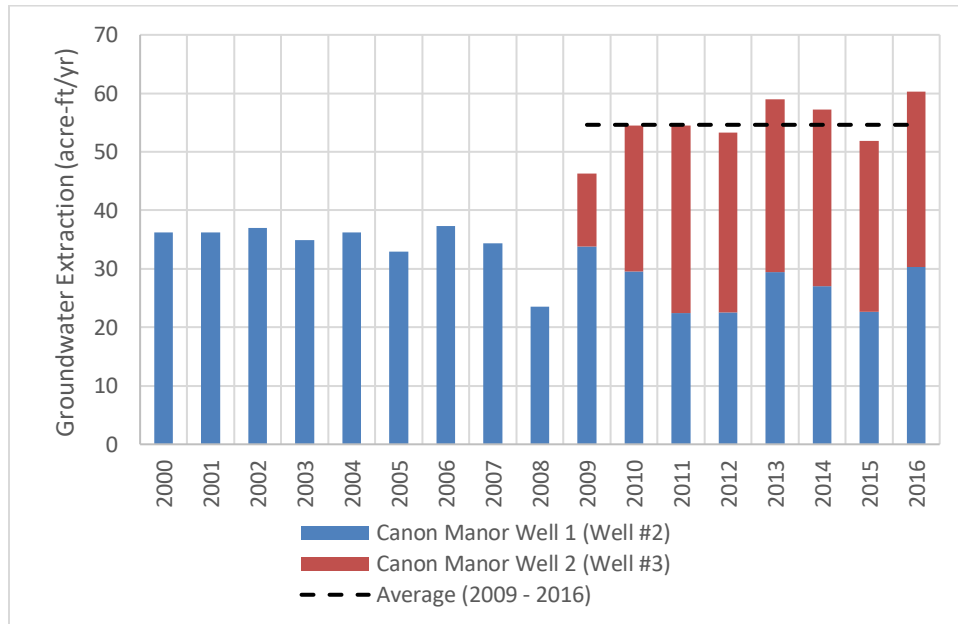


Figure 7: Annual groundwater extractions from Cannon Manor Wells 1 and 2 (Wells #2 and #3) based on annual reports submitted by the Penngrove Kenwood Water Company to the California Public Utilities Commission.

Table 4: Calculation of estimated existing irrigation use within the project recharge area.

Use Category	Number of Acres	Use per Acre (acre-ft/yr)	Annual Water Use (acre-ft/yr)
Vineyard Irrigation	127.4	0.50	63.70
Nursery/Orchard	10.9	4.00	43.60
Irrigated Pasture	8.5	4.00	34.00
Row Crops ¹	4.9	4.00	19.60
TOTAL			160.90

¹Includes flowers, vegetables, and other crops

Table 5: Calculation of estimated existing and proposed livestock uses within the project recharge area.

Use Category	Head	Use per Head (acre-ft/yr)	Annual Water Use (acre-ft/yr)
Stockwater for Horses	70	0.01	0.70
TOTAL			0.70

Table 6: Calculation of estimated existing employee use within the project recharge area.

Work Category	# of Employees	# Work Days per Year	Use per Employee	Annual Water Use (ac-ft/yr)
Full-time	60	260	15	0.72
Part-time	0	130	15	0.00
TOTAL				0.72

Proposed Use

In the proposed condition, a total of 2,100 ft² of cannabis will be cultivated indoors, 10,000 ft² of cannabis will be cultivated in greenhouse mixed light environment with an additional 5,000 ft² for plant propagation and 10,000 ft² will be cultivated outdoors. This operation will have 6 full-time employees, 4 part-time employees with up to nine additional seasonal contract workers. For the purpose of this report the seasonal workers will be considered part-time, bringing the total number of part-time employees to 13.

Based on water use estimates communicated by the project applicant, outdoor plants will require a maximum of 2 gallons per plant per day, flowering plants grown indoors will require 0.5 gal per plant per day while in the greenhouse mixed light environment flowering plants will be more densely planted and require a maximum of 0.2 gallons per plant per day. Immature propagation plants in the greenhouse will require 0.05 gal per plant per day. Both indoor and mixed light cultivation is assumed to occur year round (365 days) while the outdoor cultivation season is assumed be 240 days.

The proposed 2,100 ft² indoor cultivation will have 400 plants which will require 76,650 gallons or 0.24 acre-ft/yr. Although the proposed indoor cultivation is currently 2,100 ft², potential future indoor cultivation could be expanded to 5,000 ft² which is the maximum allowable area on the project parcel. For the purpose of this report we will assume that proposed indoor cultivation will include this potential expansion. Assuming a plant density of 100 plants/ 500 ft² this potential future indoor grow would contain 1,000 plants and require 182,500 gallons or 0.56 acre-ft annually.

The greenhouse mixed light cultivation portion of the project will occupy a total of 12,500 ft². 10,000 ft² will have approximately 4,800 flowering plants in 7-gallon pots (a density of 2 ft² per plant) while the remaining 5,000 ft² will contain 2,000 immature plants in 5-gallon pots (density of 2.5 ft² per plant) in the propagation area of the greenhouse. Water demand for the greenhouse mixed light cultivation is estimated to be 0.2 gallons per plant per day for the flowering plants and 0.05 gallons per plant per day for the immature plants resulting in a demand of 368,650 gallons or 1.19 acre-ft annual demand.

The project applicant plans to use dehumidification systems for their proposed indoor and greenhouse operations. These systems work to regulate temperature and humidity to create an ideal climate for higher yields and lower rates of disease. DryGair Energies¹ specifications report that their Compact Unit has a water condensation rate of 3 gallons per hour (at 64°F and 80% RH). Assuming temperature and relative humidity conditions remain close to the required values this is a projected 0.08 acre-feet of water reclamation per unit annually. The project applicant plans to use five units in their 12,500 ft² greenhouse and two units in the indoor operation and to reuse all reclaimed water for irrigation. This will result in the reuse of a total of 0.56 acre-feet annually (0.40 acre-feet reclaimed in the greenhouse and 0.16 acre-feet reclaimed in the indoor operation). Applying these savings to the use estimates reduces the 5,000 ft² indoor cultivation requirement to 0.40 acre-feet per year while the 12,500 ft² greenhouse cultivation will require 0.73 acre-feet per year (Tables 7 and 8).

The maximum estimated water use for outdoor cultivation at this site is 2 gallons per plant per day over the 240-day growing season. The 10,000 ft² outdoor grow is expected to have 400 plants planted in 20 5ft by 100 ft beds (planting density of approximately 25 ft² per plant) which would require a total of 192,000 gallons or 0.59 acre-ft/yr.

In addition to the water conservation measures planned within the indoor and greenhouse operations, 10,000 gallons (0.03 ac-ft) of rainwater catchment is planned. Rainwater shall be collected from the roof of either the proposed greenhouse (12,500 ft²) or existing main residence (7,000ft²). Assuming the mean annual rainfall of 33 inches, the greenhouse could produce approximately 0.79 ac-ft while the house could produce about 0.44 ac-ft, therefore either could provide more than enough volume to fill the 10,000 gallons of proposed storage.

If we assume maximum potential cultivation area of 5000 ft² for the indoor operation, apply the water reclamation savings from the indoor and greenhouse operations and rainwater catchment and add the proposed outdoor demand, a total of 1.74 acre-ft/yr will be required for cannabis cultivation (Tables 7 and 8).

Based on these uses and the future estimated domestic use on the parcel (0.85 acre-ft/yr), the total proposed water use for the project parcel will be 2.74 acre-ft/year, an increase of 0.64 acre-ft/yr (Table 10). Water use within the project recharge area will also increase by 0.64 acre-ft/yr to 331 acre-ft/yr. Proposed irrigation use will increase from 160.9 to 162.64 acre-ft/yr (Table 7)

¹ DryGair Energies: <https://drygair.com/the-product/>

within the project recharge area. Residential use on the project parcel will decrease from 2.10 to 0.85 acre-ft/yr due to the switch from the elder care facility to a single-family residence (Table 3) reducing the recharge area-wide residential estimate from 168.0 to 166.8 acre-ft/yr. Employee use will increase by 0.15 acre-ft/yr from 0.72 to 0.87 acre-ft/yr throughout the entire recharge area (Table 9). Livestock use is not anticipated to increase as part of this project (Table 5).

Table 7: Calculation of estimated proposed irrigation use within the project recharge area.

Use Category	Number of Acres	Use per Acre (acre-ft/yr)	Annual Water Use (acre-ft/yr)
Vineyard Irrigation	127.40	0.50	63.70
Cannabis Irrigation			1.74
Nursery/Orchards	10.9	4.00	43.60
Irrigated Pasture	8.5	4.00	34.00
Row Crops ¹	4.9	4.00	19.60
TOTAL			162.64

¹Includes flowers, vegetables, and other crops

Table 8: Calculation of estimated proposed water use for cannabis irrigation

Use Category	Area (ft ²)	Plant Count	Max Daily Water Use (gallons / plant /day)	Growing Season (days)	Annual Water Use (gallons)	Annual Water Use (acre-ft)
Cannabis Irrigation						
Indoor	5,000	1000	0.5	365	182,500	0.56
					<i>Reclaimed via Dehumidification</i>	0.16
					<i>From Groundwater</i>	0.40
Mixed Light (flowering)	10,000	4,800	0.20	365	350,400	1.08
Mixed Light Propagation (immature)	5,000	2,000	0.05	365	36,500	0.11
					Subtotal	1.19
					<i>Reclaimed via Dehumidification</i>	0.40
					<i>From Groundwater</i>	0.78
Outdoor	10,000	400	2.00	240	192,000	0.59
					<i>Reclaimed via Rainwater Catchment (10, 000 gallons)</i>	0.03
Total Irrigation						1.74

Table 9: Calculation of estimated existing employee use within the project recharge area.

Work Category	# of Employees	# Work Days per Year	Use per Employee	Annual Water Use (ac-ft/yr)
Full-time	66	260	15	0.79
Part-time	13	130	15	0.08
TOTAL				0.87

	Residential Use (acre-ft/yr)	Irrigation Use (acre-ft/yr)	Livestock Uses (acre-ft/yr)	Employee Use (acre-ft/yr)	Total Use (acre-ft/yr)
Existing Use	2.10	-	-	-	2.10
Proposed Use	0.85	1.74	-	0.15	2.74

Table 10: Estimated existing and proposed water use for project parcel.

Groundwater Storage Calculation

An estimate of the total available groundwater storage within the aquifer recharge area can be obtained as the product of the recharge area (impact area) in units of acres, the saturated aquifer thickness in units of feet, and the aquifer specific yield. While the screened interval of the project well is unknown, given its depth, it is highly likely that the project well is screened within the Sonoma Volcanics. It is unknown if the project well is screened within the alluvial fan deposits as well; therefore, only the Sonoma Volcanics were considered when calculating the available groundwater storage.

Based on well completion data and stratigraphic cross sections (TEI, 2004), within the vicinity of the project well the Sonoma Volcanics are overlain by approximately 150 to 200 feet of alluvial fan deposits. The elevation difference between the bottom of the deepest alluvial fan deposits (200 ft) and the minimum possible depth of the project well (270 feet) yields a minimum estimate of the saturated thickness of the aquifer of 70 feet. The Sonoma Volcanics likely extend to a significantly greater thickness beneath the project area. Water stored in the alluvial fan deposits is also a significant portion of the area aquifer discussed above.

The porosity of fractured bedrock such as the Tsa unit of the Sonoma Volcanics is expected to lie between <1 and 10% (Freeze and Cherry, 1979; Weight and Sonderegger, 2000). To be conservative, we have used low-end estimates of specific yield of 1% for the volcanic rock component of the project aquifer. This results in an estimate of the available groundwater storage of 492 ac-ft. (704 acres x 70 feet x 0.01). It should be noted that pump test data from the older Canon Manor Well suggests significantly higher specific capacity of 15% for the project aquifer (TEI, 2004; aquifer storage would be about 7,392 ac-ft based on the specific capacity determined from an aquifer pump test).

Groundwater Recharge Analysis

Groundwater recharge within the project recharge area was estimated using the Soil Water Balance (SWB) model developed by the USGS. Details and results are discussed below

SWB Model

The Soil Water Balance (SWB) model developed by the U.S. Geological Survey (Westenbroek et al., 2010) was used to produce a spatially distributed estimate of annual recharge in the project recharge area. This model operates on a daily timestep and calculates runoff based on the Natural Resources Conservation Service (NRCS) curve number approach and Actual Evapotranspiration (AET) and recharge based on a modified Thornthwaite-Mather soil-water-balance approach (Westenbroek et al., 2010).

This approach simulates potential recharge from infiltration of precipitation and does not account for the capacity of the project aquifer materials to accept recharge. Significant additional recharge may occur through streambed infiltration, and/or groundwater inflows from outside the defined project recharge area, however quantifying these recharge components is beyond the scope of this analysis.

Model Development

Recharge was also estimated using a Soil Water Balance (SWB) model for the watershed tributary to the project recharge area. This model was developed using a 10-meter resolution rectangular grid and water budget calculations were made on a daily time step. Key spatial inputs included a flow direction map developed from the USGS 10-meter resolution Digital Elevation Model (DEM), a land cover dataset from Sonoma County (Figure 8), a distribution of Hydrologic Soil Groups (A through D classification from lowest to highest runoff potential; Figure 11) and Available Water Capacity (AWC) developed from the NRCS Soil Survey Geographic Database (SSURGO).

A series of model parameters were assigned for each land cover type/soil group combination including a curve number, dormant and growing season interception storage values, and a rooting depth (Table 11). Curve numbers were assigned based on standard NRCS methods. Interception storage values and rooting depths were assigned based on literature values and previous modeling experience. Infiltration rates for hydrologic soil groups A through D were applied based on Cronshey et al. (1986) (Table 12) along with default soil-moisture-retention relationships based on Thornthwaite and Mather (1957) (Figure 10).

Daily precipitation and daily minimum and maximum air temperature data were compiled for the Petaluma Airport Weather Station which is located approximately 5.6 miles south southeast of the project parcel. This station was selected because it represents the best available climate station in proximity to the project site with a long and continuous period of record. Based on the PRISM dataset which describes the spatial variations in long-term precipitation for the

continental U.S., the 1980 to 2010 mean annual precipitation at the Petaluma Airport Weather Station was 27.35 inches versus 33.31 inches for the project recharge area (PRISM, 2010). The precipitation data was scaled by a factor of 1.22 to account for the difference in precipitation between the station location and the project recharge area. Water Year 2010 was selected to represent average water year conditions for the analysis because it represents a recent year with near long-term average precipitation conditions (27.09 inches at the Petaluma Airport station, 32.99 inches estimated at project recharge area). The model was also evaluated for water year 2014 to represent drought conditions. Annual precipitation for water year 2014 at the Petaluma Airport station was approximately 58.4% of the long term average (15.97 inches at the Petaluma Airport station, 19.45 inches estimated at project recharge area)(Figure 11).

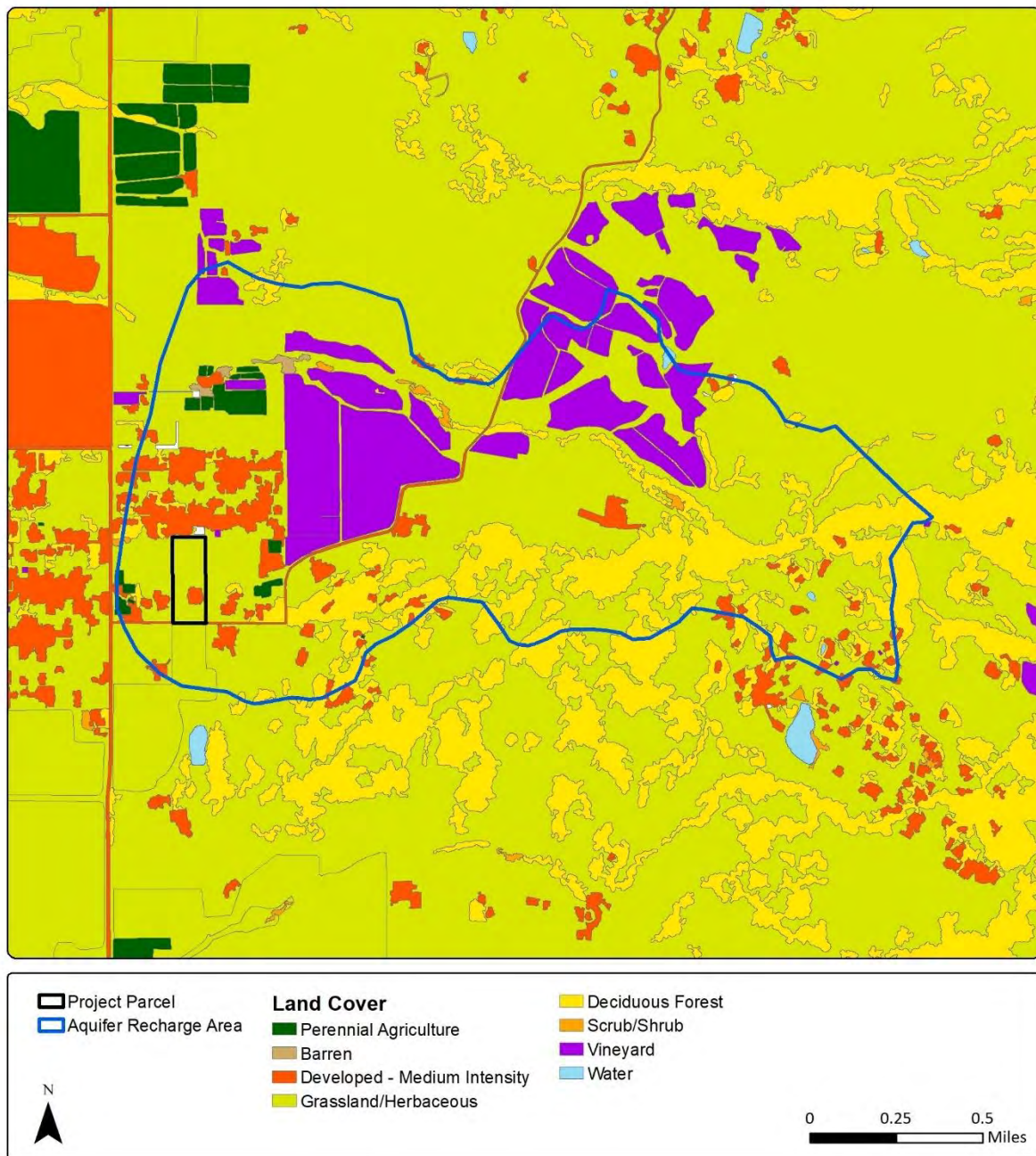


Figure 8: Land cover map used in the SWB model.

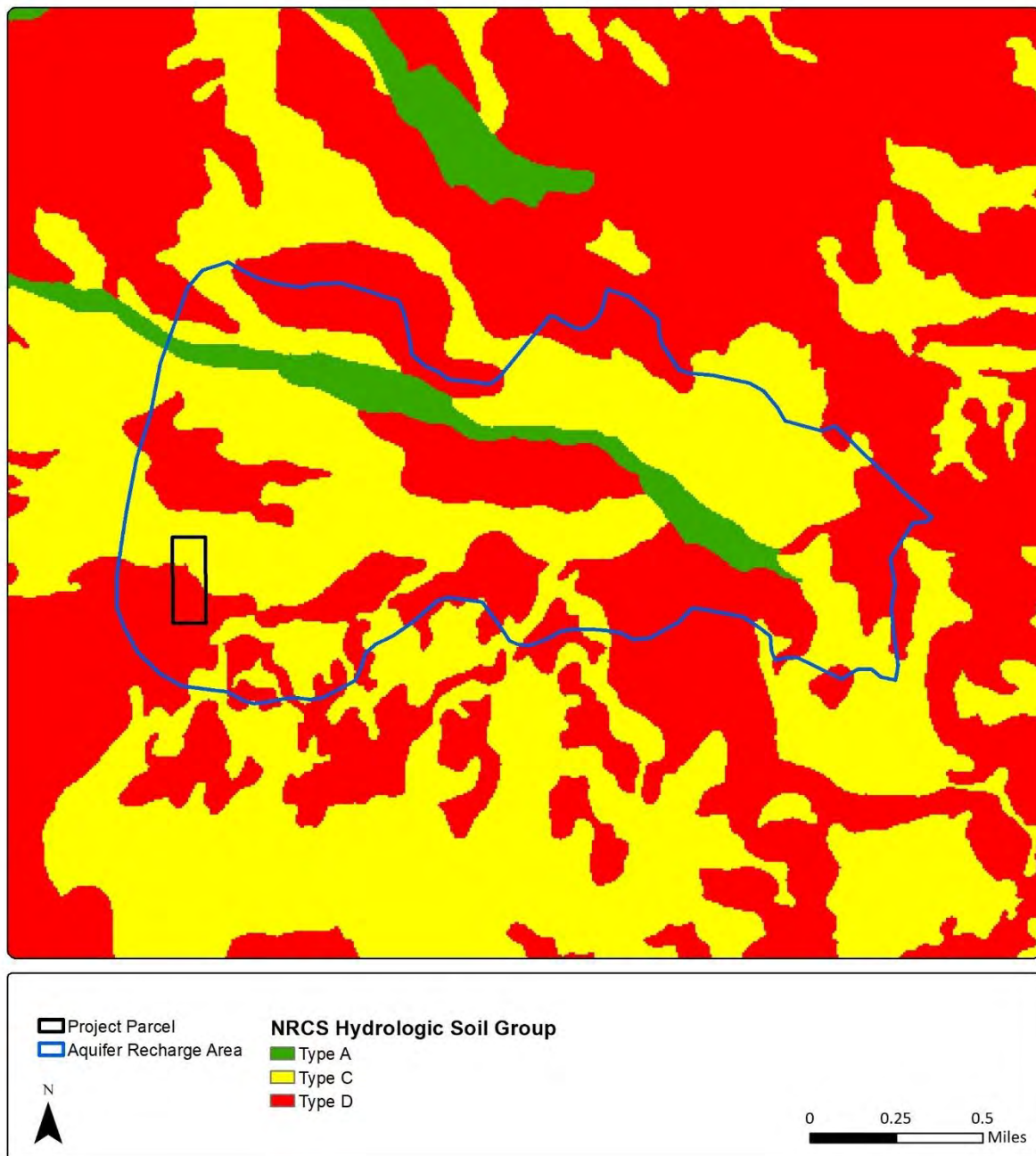


Figure 9: Soil map used in the SWB model.

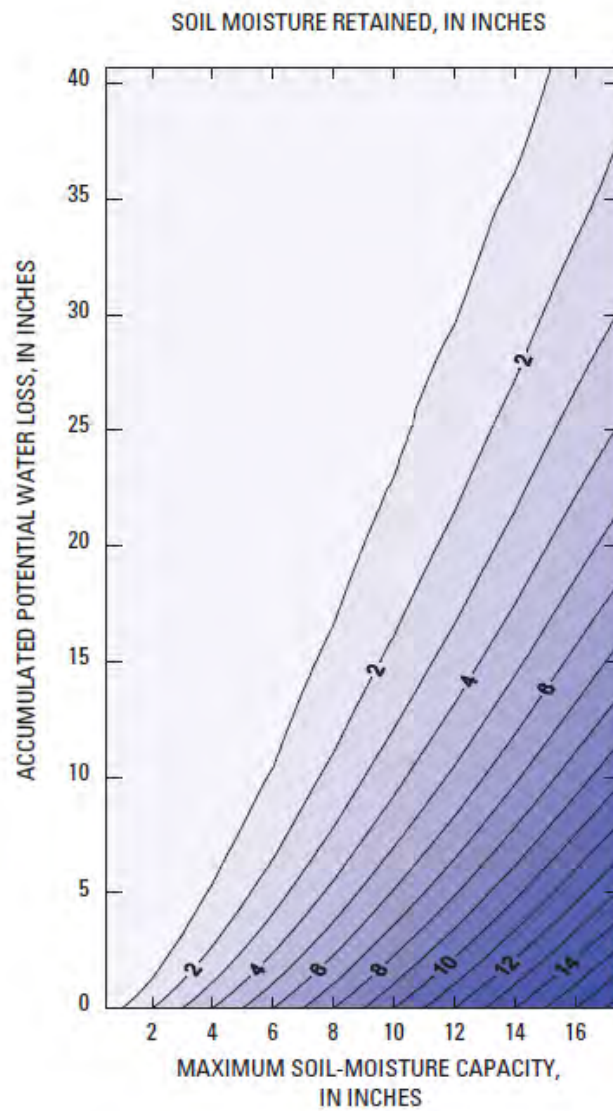


Figure 10: Soil-moisture-retention table (Thorntwaite and Mather, 1957).

Table 11: Soil and land cover properties used in the SWB model.

Land Cover	Interception Storage Values		Curve Number			Rooting Depth (ft)		
	Growing Season	Dormant Season	A Soils	C Soils	D Soils	A Soils	C Soils	D Soils
Perennial Agriculture	0.080	0.040	38	75	81	2.00	1.80	1.70
Barren	0.000	0.000	77	91	94	0.00	0.00	0.00
Developed - Medium Intensity	0.005	0.002	61	83	83	2.30	2.00	1.80
Grassland/Herbaceous	0.005	0.004	30	71	78	1.30	1.00	1.00
Deciduous Forest	0.050	0.020	30	70	77	5.90	4.90	4.70
Scrub/Shrub	0.080	0.015	30	65	73	3.20	2.70	2.60
Vineyard	0.080	0.015	28	75	81	2.20	2.00	1.90
Water	0.000	0.000	100	100	100	0.00	0.00	0.00

Table 12: Infiltration rates for NRCS hydrologic soil groups (Cronshey et al., 1986).

Soil Group	Infiltration Rate (in/hr)
A	> 0.3
B	0.15 - 0.3
C	0.05 - 0.15
D	<0.05

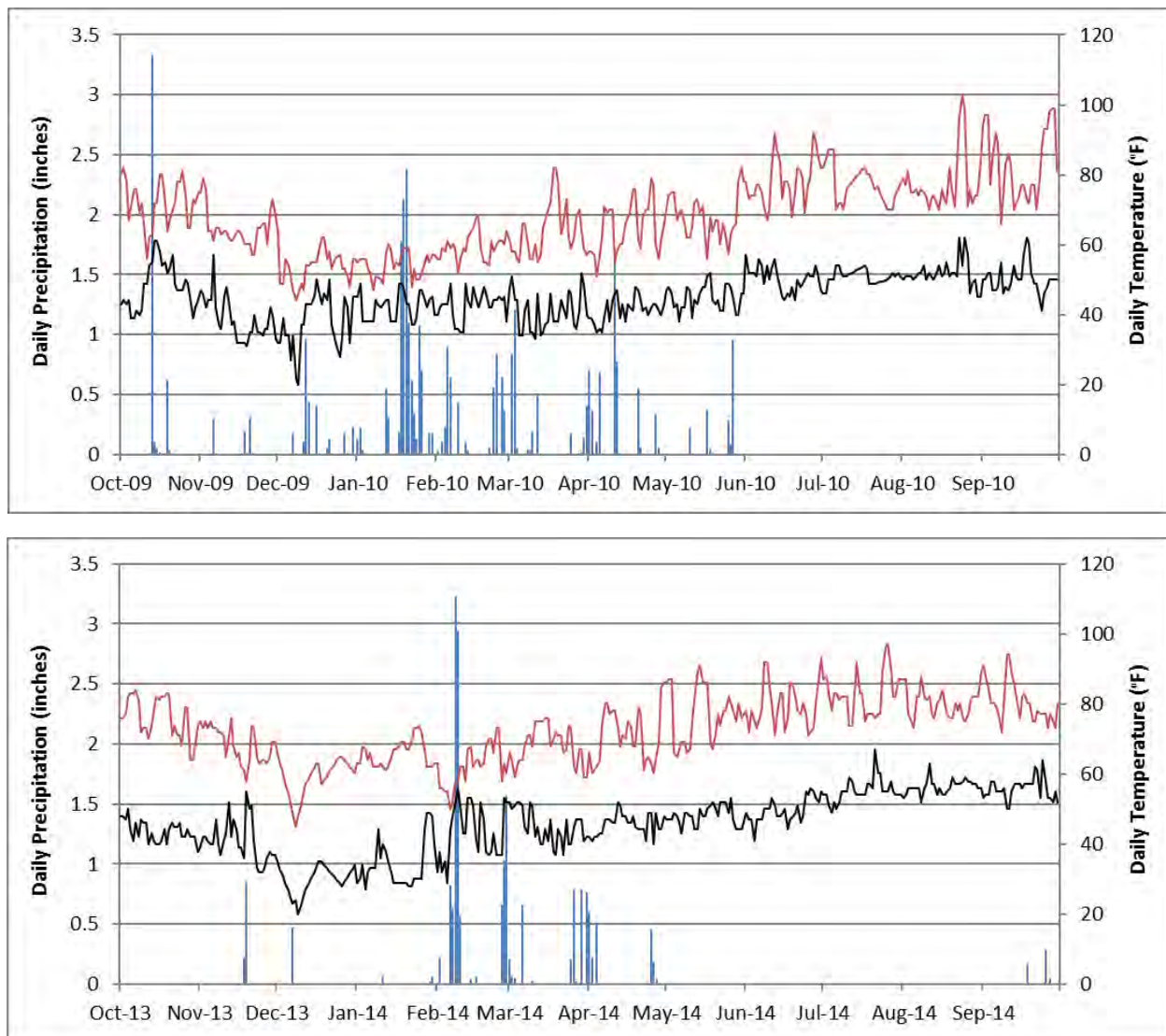


Figure 11: Daily precipitation (blue bars) and minimum (black lines) and maximum (red lines) air temperature used in the SWB model.

Model Results

The simulated Water Year 2010 (average water year) recharge results indicate that recharge varied across the project recharge area from 1.3 to 7.86 inches (Figure 12). Spatially averaged over the project recharge area, the 33.0 inches of precipitation were partitioned as follows: Actual Evapotranspiration (AET) = 19.6 inches, Runoff = 9 inches, and Recharge = 4.4 inches (Table 13). The simulated water year 2014 (dry water year) recharge results indicate that recharge varied across the project recharge area from near zero to 7.76 inches (Figure 13). Spatially averaged over the project recharge area, 3.2 of the 19.5 inches of precipitation were recharged (Table 13).

Recharge as a percentage of annual precipitation ranged from 13.2% in the average water year to 16.2% in the dry water year. Runoff as a percentage of annual precipitation was lower in the dry water year (17.4%) compared to the average water year (27.4%). Groundwater recharge estimates can also be expressed as a total volume by multiplying the calculated recharge by the project aquifer recharge area of 1252 acres. This calculation yields an estimate of total recharge of 329.8 ac-ft during the drought conditions of water year 2014 and of 455.0 ac-ft for the average water year of 2010.

Table 13: Summary of water balance results from the SWB model.

	2010 Normal Year		2014 Dry Year	
	inches	% of precip	inches	% of precip
Precipitation	33.0		19.5	
AET	19.6	59.4%	12.9	66.3%
Runoff	9.0	27.4%	3.4	17.4%
Recharge	4.4	13.2%	3.2	16.2%

Water budget estimates are available for several larger watershed areas nearby including the Santa Rosa Plain, the Green Valley Creek watershed, and the Sonoma Valley. Comparisons to these water budgets are useful for determining the overall reasonableness of the results although one would not expect precise agreement owing to significant variations in climate, land cover, soil types, and underlying hydrogeologic conditions. These regional analyses estimated that mean annual recharge was equivalent to between 7% and 15% of mean annual precipitation (Farrar et. al. 2006; Kobor and O'Connor, 2016; Woolfenden and Hevesi, 2014). The simulated water year 2010 groundwater recharge for the project recharge area represents approximately 13.2% of the precipitation which is within the range of existing regional estimates.

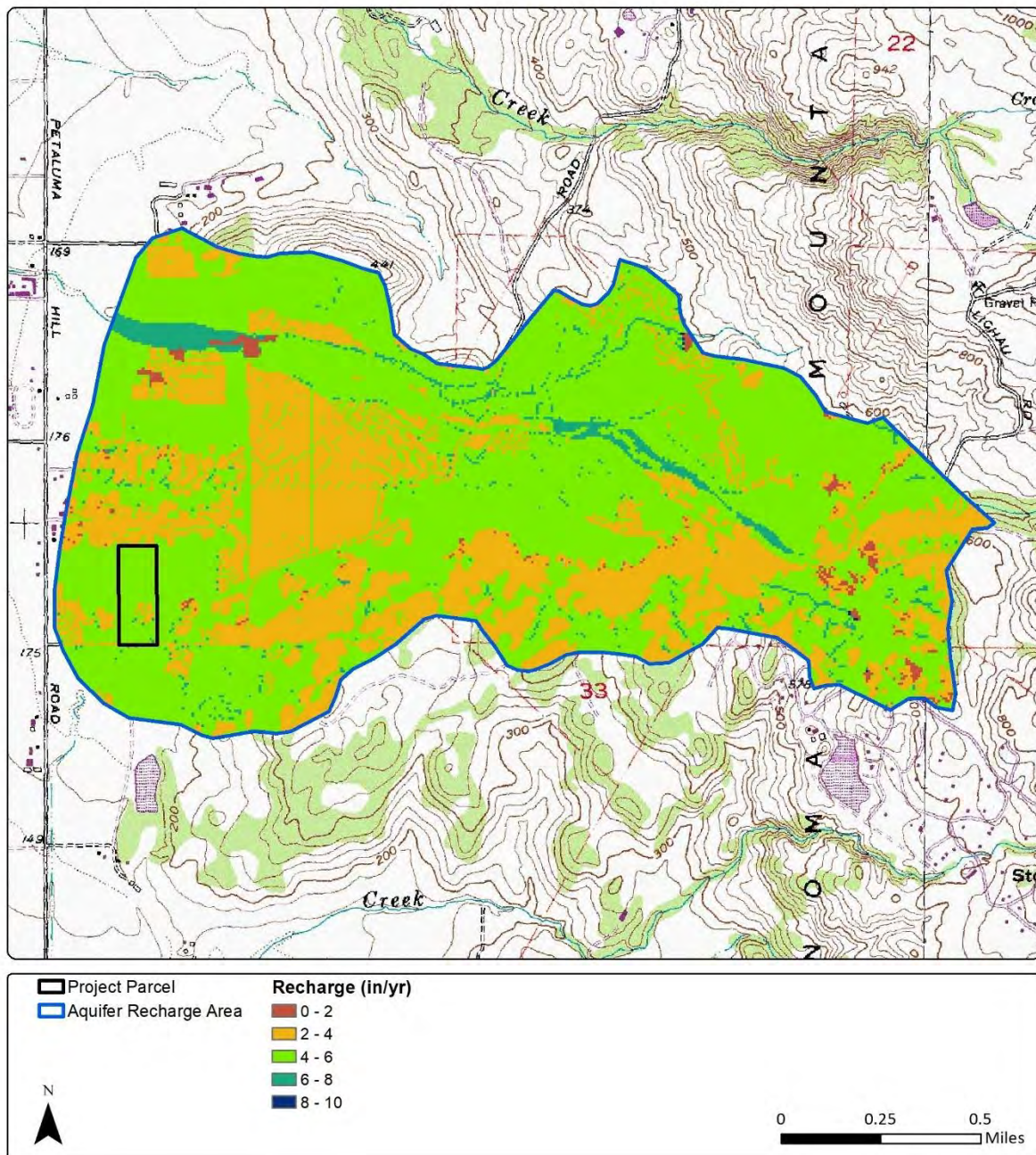


Figure 12: WY 2010 recharge simulated with the SWB model.

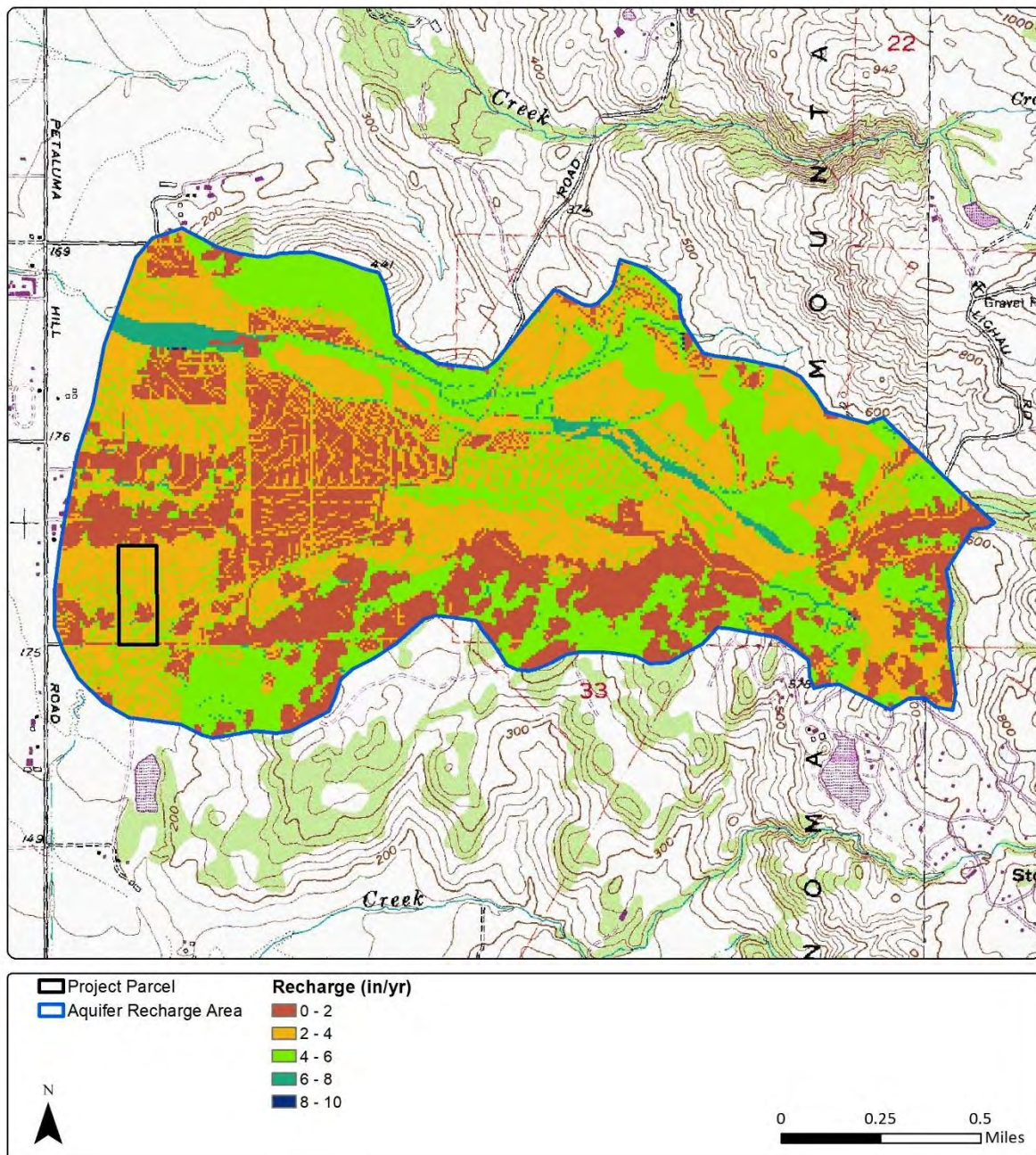


Figure 13: WY 2014 recharge simulated with the SWB model.

Comparison of Water Demand and Groundwater Recharge/Storage

The total proposed water use for the project recharge area is estimated to be 331 acre-ft/yr. Total estimated annual water use in the project impact/recharge area is compared to predicted annual groundwater recharge by SWB in Table 14. The SWB model suggests that annual groundwater demand is less than groundwater recharge for average hydrologic conditions.

Table 14: Total annual Water Use in the project recharge area the project parcel and average and dry year groundwater recharge.

Total Proposed Demand (ac-ft/yr)		Average Conditions (2010)			Dry Water Year (2014)		
		Recharge (ac-ft/yr)	Recharge Surplus (ac-ft/yr)	Demand as % of Recharge	Recharge (ac-ft/yr)	Recharge Surplus (ac-ft/yr)	Demand as % of Recharge
331.0		455.0	124.0	72.7%	329.77	-1.2	100.4%

CASGEM data summarized in Figure 4 indicate a consistent trend of rising water elevation in the area immediately west of the project impact/recharge area (Figure 2). It is not known whether the CASGEM wells intersect the Sonoma Volcanics conceptualized to comprise the project aquifer or alluvium similar to and inter-related with the alluvial fan, or both; however, it is clear that the CASGEM water elevation monitoring data are not indicative of aquifer overdraft. Declining groundwater elevation near the Pengrove-Kenwood Water Company wells is believed likely to be a localized impact associated with operation of public water supply wells and not representative of aquifer conditions in the project impact/recharge area as a whole.

The conceptual model of the project aquifer we used for this analysis assumes recharge via the alluvial fan deposits and a portion of the Sonoma Volcanics connected topographically to the project drainage basin; additional recharge of the Sonoma Volcanics may occur in the uplands further to the east, and we neglected that potential contribution to recharge. In addition, infiltration of surface water through streambeds to the alluvial fan deposits was omitted from the initial conceptual model of the aquifer, as was return flow from on-site sewage disposal systems. The character and quantity of groundwater exchange between the alluvial fan deposits and the underlying Sonoma Volcanics is beyond to scope of this analysis.

The quantity of groundwater used for the project (2.74 ac-ft/yr: 0.85 ac-ft/yr domestic, 1.69 ac-ft/yr irrigation, 0.15 ac-ft/yr for 6 full-time employees and 13 part-time employees) represents about 0.8% of estimated annual use in the project impact/recharge area. The proposed 0.64 acre-ft/yr increase over the existing condition represents less than 0.2% of the estimated annual use in the project impact/recharge area.

Potential Impacts to Streams and Neighboring Wells

The public water supply wells operated by Penngrove-Kenwood Water Company appear to create a local impact on groundwater elevation based on monitoring data submitted to the PUC. The radius of influence of these wells and the lateral extent of the cone of depression associated with these wells has not been analyzed, however, given the high rate of production from these wells, it is evident that any potential drawdown effects of the project well would be negligible in comparison.

Groundwater use for the project is proposed to be 2.74 ac-ft/yr. This is equivalent to a continuous pumping rate of 1.7 gpm from the aquifer. Existing demand is assumed be 2.1 ac-ft/yr and would require a continuous pumping rate of 1.3 gpm. This is an increase in required continuous pumping of only 0.4 gpm. Although there is existing pump test data, due to the short length of the test and lack of water level recovery data, it is not suitable for quantitative analysis of aquifer hydraulic parameters. In addition, the lack of well construction details (in particular well depth and the screened casing interval), makes it difficult to quantitatively estimate potential impacts of pumping of the project well upon neighboring wells. In January of 2017 after pumping at a rate of 40 gpm for 40 minutes, the dynamic water level stabilized for 45 minutes until the end of the test with 49 ft of drawdown. Using the 2.7 ac-ft annual demand an average daily demand would be 2,447 gallons. Pumping at a rate of 40 gpm would produce this average daily demand of water in just over an hour.

The closest neighboring well, Well 37, is 475 ft west of the project well (Figures 2 and 3). The reported water level in Well 37 was 135 ft bgs while the project well's water level was reported to be 210 ft bgs suggesting the presence of confining strata (e.g. clay) potentially separating the portions of the aquifer providing water for each well. Alternatively, the difference in groundwater elevation could result if Well 37 is completed in the alluvial fan deposits while the project well is completed in the alluvial deposits. In either case, there is evidence of vertical separation between these two wells that reduces the likelihood of well interference.

The nearest stream to the project well, an unnamed tributary to Lichau Creek, is located approximately 325-ft to the south. However, this is an ephemeral creek within the alluvial fan and does not appear to contain riparian or other sensitive habitat within the vicinity of the project well. The nearest perennial stream is Copeland Creek which is located approximately 0.7 miles north of the project well. Groundwater elevations in wells at and near the project site are far below the depth of streambeds, indicating either a strong existing hydraulic gradient from the streambed to the aquifer and/or vertical separation (e.g. by clay strata) between water in the stream channels and the wells. These conditions indicate that the potential for significant impacts to streams and aquatic habitat by the small increment of additional groundwater pumping for the project is minimal.

Groundwater Quality

Water samples from the Project Well were collected in January 2017 and results are reported in the GPM well test report (Appendix B). Tests for iron, manganese, Hardness, Alkalinity, pH and TDS indicated concentrations within normal limits. The test also analyzed the samples for Coliform and E. coli Bacteria, Arsenic and Nitrate but no results are presented in the GPM report.

Summary

The project aquifer and impact/recharge area has been conceptualized as Sonoma Volcanics underlying the alluvial fan of Copeland Creek lying to the east of Petaluma Hill Road and Sonoma State University. Recharge of the alluvial fan estimated for an average rainfall year (2010) using the SWB model is slightly greater than estimated annual groundwater use, and nearby CASGEM monitoring wells show steadily increasing groundwater elevation that is inconsistent with aquifer overdraft. The proposed project accounts for 0.8% of estimated groundwater use in the project impact/recharge area, and the proposed increase in use on the project site represents less than 0.2% of groundwater use. The proposed project is not expected to adversely affect groundwater supplies in the project impact/recharge area.

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APPENDIX A
WELL COMPLETION REPORTS

3

ORIGINAL
File with DWR

Page 1 of 1

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. **e054523**

Owner's Well No. **WELL #2**

Date Work Began **3/14/2007**, Ended **4/23/2007**

Local Permit Agency **Sonoma County PRMD**

Permit No. **WEL07-0055**

Permit Date **3/8/2007**

OWNER USE ONLY DO NOT FILL IN
06/10/2007
STATE WELL NO / STATION NO.
LATITUDE
LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ☒ VERTICAL ☐ HORIZONTAL ☐ ANGLE (SPECIFY)

DRILLING METHOD **MUD ROTARY** FLUID **Bentonite**

DEPTH FROM SURFACE	DESCRIPTION
FL. to FL.	Describe material, grain, size, color, etc.
0: 25	Cobbles and hard rock
25: 60	Hard rock
60: 113	Brown clay with embedded gravel
113: 293	Red volcanic rock with streaks of reddish clay
293: 313	Black and red rock
313: 333	Hard gray and black rock
333: 413	Black volcanic rock
413: 450	Black volcanic ash and stiff black clay

TOTAL DEPTH OF BORING **450** (Feet)
TOTAL DEPTH OF COMPLETED WELL **440** (Feet)

WELL OWNER

WELL LOCATION

Address **2496 Curtis Drive**
City **Penn Grove CA**
County **Sonoma**
APN Book **047** Page **276** Parcel **011**
Township _____ Range _____ Section _____
Latitude _____ DEG. MIN. SEC.

LOCATION SKETCH

NORTH

WEST

EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

☒ NEW WELL

MODIFICATION/REPAIR
☐ Deepen
☐ Other (Specify)

DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
☐ Domestic ☒ Public
☐ Irrigation ☐ Industrial

MONITORING ☐
TEST WELL ☐
CATHODIC PROTECTION ☐
HEAT EXCHANGE ☐
DIRECT PUSH ☐
INJECTION ☐
VAPOR EXTRACTION ☐
SPARGING ☐
REMEDIATION ☐
OTHER (SPECIFY) ☐

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER _____ (FL) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL **65** (FL) & DATE MEASURED **4/23/2007**
ESTIMATED YIELD **50** (GPM) & TEST TYPE **BAILED**
TEST LENGTH **8** (hrs.) TOTAL DRAWDOWN **30** (FL.)
May not be representative of a well's long-term yield.

DEPTH FROM SURFACE	BORE-HOLE DIA. (Inches)	CASING (S)							DEPTH FROM SURFACE	ANNULAR MATERIAL				
		TYPE (✓)				MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS		SLOT SIZE IF ANY (Inches)	TYPE			
FL. to FL.		BLANK	SCREEN	CONDUIT	FILL PIPE									FL. to FL.
0: 450	22									0: 100	✓			
+2: 440		✓				STEEL	12	.250		100: 440			✓	1/8 x 1/4 gravel.
240: 430			✓						.050					

ATTACHMENTS (✓)

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analysis
☐ Other _____

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME **Weeks Drilling & Pump**
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
P.O. Box 176
ADDRESS _____
Signed **Michelle R. Lopez**
WELL DRILLER/AUTHORIZED REPRESENTATIVE

Sebastopol CA 95473
CITY STATE ZIP
DATE SIGNED **05/08/07** 177681
C-57 LICENSE NUMBER

STATE OF CALIFORNIA

WELL COMPLETION REPORT

No.

814104

OWNER'S WELL No: 3854

Date Work Began 2/24/99 Ended 3/26/99

Local Permit Agency Sonoma

Permit No. WEL99-0053

Permit Date 2/24/99

GEOLOGIC LOG

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO. STATION NO.

LATITUDE

LONGITUDE

APN/TRS/OTHER

WFI | OWNER

ORIENTATION Vertical

Degree of Angle

DEPTH FROM SURFACE DEPTH TO FIRST WATER (ft.) BELOW SURFACE

Ft. Ft. DESCRIPTION

0	2	Topsoil
2	25	Boulders
25	55	Brown Clay
55	80	Volcanic Ash
80	115	Hard Volcanic Rock
115	128	Volcanic Clay
128	140	Light Brown Volcanic Ash
140	155	Reddish Brown Volcanics
155	280	Red Volcanics
280	520	Very Hard Basalt

WELL LOCATION

Address 3251 Pressley Rd.

City Pennings County Sonoma

Apn Book 047 Page 122 Parcel 034

Township S Range E Section 1/4 1/4

Latitude NORTH Longitude WEST

Please
replace first
well log w/this
updated version.
Thank you

ACTIVITY NEW WELL PLANNED USE(S) Domestic Water

DRILLING METHOD ROTARY MUD FLUID

DEPTH OF STATIC WATER LEVEL 230 (ft.) & DATE MEASURED Mar 26, 1999

ESTIMATED YIELD * 180 (G.P.M.) & TEST TYPE Air Lift

TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN 440 (FT.)

*May not be representative of a well's long-term yield.

TOTAL DEPTH OF BORING 520 (Feet)

TOTAL DEPTH OF COMPLETED WELL 478 (Feet).

DEPTH FROM SURFACE		BORE-HOLE DIA.		CASING					DEPTH FROM SURFACE		ANNULAR MATERIAL	
FL	To FL	FL	DIA.	TYPE	Material / Grade	Dia.	Gauge	Slot size	FL	To FL	Seal Material	Filter Pack (Type / Size)
0	35	20		Blank	F480 PVC	8	200		0	30	Bentonite	
35	140	12.25		Blank	F480 PVC	8	200		30	520		Gravel
140	478	12.25		Screen	F480 PVC	8	200					Fine Pea
478	520	12.25		Blank	Uncased Test Hole							

Attachments

- ☐ no. Geologic Log
- ☐ no. Well Construction Diagram
- ☐ no. Geophysical Logs
- ☐ no. Soil Water Chemical Analyses
- ☐ no. Other

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME Fisch Bros. Drilling, Inc.

(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

5001 Gravenstein Hwy No.

Sebastopol

CA 95472

Signed Ed Fisch

Carol Hughes

3-29-99

WELL DRILLER / AUTHORIZED REPRESENTATIVE

DATE SIGNED

399226

C-57 LICENSE NUMBER

ORIGINAL

File with DWR

STATE OF CALIFORNIA

THE RESOURCES AGENCY

DEPARTMENT OF WATER RESOURCES
WATER WELL DRILLERS REPORT

Do not fill in

No. 151001

State Well No. _____
Other Well No. 06N07W29

#196-85 A.P.#047-273-54

Permit No. or Date _____

(2) LOCATION OF WELL (See instructions):

County Sonoma Owner's Well Number _____Well address if different from above 2207 ChesterTownship _____ Range Penngrove Section _____

Distance from cities, roads, railroads, fences, etc. _____

(12) WELL LOG: Total depth 247 ft. Depth of completed well _____ ft.
from ft. to ft. Formation (Describe by color, character, size or material)

0	-	3	Adobe
3	-	55	gravel, clay, boulders
55	-	125	rock, streaks clay
125	-	233	red volc. and rock
233	-	247	hard red volcanic, brown rock

(3) TYPE OF WORK:

New Well ☒ Deepening ☐Reconstruction ☐Reconditioning ☐Horizontal Well ☐Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:

Domestic ☐Irrigation ☐Industrial ☐Test Well ☐Stock ☐Municipal ☐Other ☐

WELL LOCATION SKETCH

(5) EQUIPMENT:

Rotary ☐Reverse ☐Cable ☐Air ☒Other ☐Bucket ☐

(6) GRAVEL PACK:

Yes ☒No ☐Size 3/8" Pea

Diameter of bore _____

Packed from 212 to 247 ft.

(7) CASING INSTALLED:

Steel ☐Plastic ☒Concrete ☐

(8) PERFORATIONS:

Type of perforation or size of screen _____

From ft.	To ft.	Dia. in.	Cage or Wall	From ft.	To ft.	Slot size
0	247	5 1/2	#200	.032	Sandscreen	
				147	187	
				207	247	

(9) WELL SEAL:

Was surface sanitary seal provided? Yes ☒ No ☐ If yes, to depth 21 ft.Were strata sealed against pollution? Yes ☐ No ☐ Interval _____ ft.Method of sealing ready mix

(10) WATER LEVELS:

Depth of first water, if known _____ ft.

Standing level after well completion 130 ft.

(11) WELL TESTS:

Was well test made? Yes ☒ No ☐ If yes, by whom? _____Type of test Pump ☐ Bailer ☐ Air lift ☒Depth to water at start of test 130 ft. At end of test 240 ft.Discharge 65 gal/min after 4 hours Water temperature _____Chemical analysis made? Yes ☐ No ☐ If yes, by whom? _____Was electric log made? Yes ☐ No ☐ If yes, attach copy to this reportWork started 7/18/85 19 _____ Completed 7/22/85 19 _____

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

SIGNED Wayne Miller

(Well Driller)

NAME LES PETERSEN DRILLING & PUMP, INC.
(Person, firm, or corporation) (Typed or printed)Address 5434 Old Redwood Hwy.City Santa Rosa, Ca. 95401

Zip

License No. 261084Date of this report 7/24/85

DWR 188 (REV. 7-76)

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

15 GPM at 140

23

ORIGINAL

File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
WATER WELL DRILLERS REPORT

No. 084269

Do not fill in

of Intent No. _____
Permit No. or Date 130-79

AP#047-275-16

State Well No. _____
Other Well No. 06N07W29

(2) LOCATION OF WELL (See instructions):

County Sonoma Owner's Well Number 2254
Well address if different from above XXXXX Curtis
Township _____ Range _____ Section _____
Distance from cities, roads, railroads, fences, etc. _____

(12) WELL LOG: Total depth _____ ft. Depth of completed well _____ ft.

from ft.	to ft.	Formation (Describe by color, character, size or material)
0	5	top soil
5	18	bldrs./brn. clay
18	28	brn. clay/rock
28	35	bldrs.
35	90	black rock/streaks clay
90	96	hard bla ck rock
96	110	black rock
110	120	hard black rock
120	130	hard black rock
130	152	brn. clay/rock
152	192	blue clay
192	222	soft blue volc. rock

(3) TYPE OF WORK:

New Well ☒ Deepening ☐
Reconstruction ☐
Reconditioning ☐
Horizontal Well ☐

Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:

Domestic ☒
Irrigation ☐
Industrial ☐
Test Well ☐
Stock ☐
Municipal ☐
Other ☐

WELL LOCATION SKETCH

(5) EQUIPMENT:

Rotary ☒ Reverse ☐
Cable ☐ Air ☐
Other ☐ Bucket ☐

(6) GRAVEL PACK:

Yes ☒ No ☐ Size 3/8
Diameter of bore _____
Packed from 0 to 23

(7) CASING INSTALLED:

Steel ☐ Plastic ☒ Concrete ☐

(8) PERFORATIONS:

Type of perforation or size of screen _____

From ft.	To ft.	Dia. in.	Casing or Wall	From ft.	To ft.	Slot size
0	223	6	PVC	102	122	
				182	222	

(9) WELL SEAL:

Was surface sanitary seal provided? Yes ☒ No ☐ If yes, to depth 23 ft.
Were strata sealed against pollution? Yes ☐ No ☐ Interval _____ ft.
Method of sealing readymix

(10) WATER LEVELS:

Depth of first water, if known _____ ft.
Standing level after well completion 25 ft.

(11) WELL TESTS:

Was well test made? Yes ☒ No ☐ If yes, by whom? _____
Type of test Pump ☐ Bailer ☒ Air lift ☐
Depth to water at start of test 25 ft. At end of test 165 ft.
Flow 25 gal/min after 4 hours Water temperature _____
Local analysis made? Yes ☐ No ☐ If yes, by whom? _____
Was electric log made? Yes ☐ No ☐ If yes, attach copy to this report

Work started 8/30/79 Completed 9/4/79

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

SIGNED John Jepsen

(Well Driller)

NAME LES PETERSEN DRILLING & PUMP, INC.

(Person, firm, or corporation) (Typed or printed)

Address 5434 Old Redwood Highway

City Santa Rosa, Calif. Zip 95401

License No. 261084 Date of this report 9/12/79

28

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

Page 1 of 1

Owner's Well Number A-4

Work Began 05/07/2014

Date Work Ended 5/7/2014

Local Permit Agency Sonoma County Permit and Resource Management Department

Permit Number WEL14-0135

Permit Date 3/17/14

Well Completion Report

Refer to Instruction Pamphlet

No. e0231241

DWR Use Only - Do Not Fill In

State Well Number/Site Number

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ☒ Vertical ☐ Horizontal ☐ Angle Specify
Drilling Method Hollow Stem Auger Drilling Fluid

Depth from Surface Description
Feet to Feet Describe material, grain size, color, etc

0	5	hand augered, material not described
5	7	sandy fat clay with gravel (CH)
10	12	fat clay with minor sand and silt (CH)
15	17	sandy fat clay (CH)
20	22	poorly graded gravel with sand (GW)
25	27	well graded gravel and minor sand (GW)
30	31	well graded gravel and minor sand (GW)
31	32	well graded gravel with sand and silt (GW-GC)
35	37	well graded gravel with sand and silt (GW-GC)

Well Owner

Name

Address

City

Well Location

Address 6626 Petaluma Hill Road

City Rohnert Park

County Sonoma

Latitude 38 20 25 N Longitude 122 39 50 W
Dec. Min. Sec. Dec. Min. Sec.

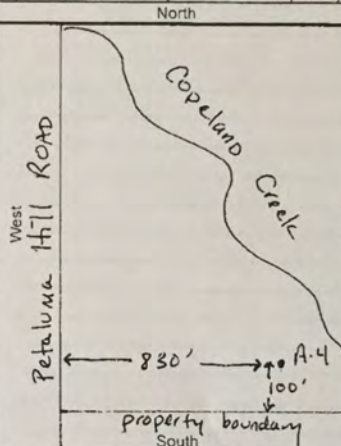
Datum Dec. Lat. Dec. Long.

APN Book 047 Page 132 Parcel 038

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)



Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

- ☒ New Well
☐ Modification/Repair
☐ Deepen
☐ Other
☐ Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

- ☐ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
☐ Cathodic Protection
☐ Dewatering
☐ Heat Exchange
☐ Injection
☒ Monitoring
☐ Remediation
☐ Sparging
☐ Test Well
☐ Vapor Extraction
☐ Other

Water Level and Yield of Completed Well

Depth to first water 7 (Feet below surface)

Depth to Static

Water Level 10 (Feet) Date Measured 05/15/2014

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)
0	20	8	Blank	PVC Sch. 40	2		
20	35	8	Screen	PVC Sch. 40	2	Milled Slots	0.200

Annular Material

Depth from Surface Feet to Feet	Fill	Description
0	17	Cement
17	19	Bentonite time release pellets
19	35	Filter Pack LS 2/16

Attachments

- ☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☐ Other

Attach additional information, if it exists

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name Gregg Drilling & Testing, Inc

Person, Firm or Corporation

950 Howe Rd

Martinez

CA 94553

Signed

Address

City

9/9/2014

State

Zip

C-57 Licensed Water Well Contractor

Date Signed

485165

C-57 License Number

ORIGINAL

File Original, Duplicate and Triplicate with the

REGIONAL WATER POLLUTION

CONTROL BOARD No. _____
(Insert appropriate number)

RECEIVED WATER WELL DRILLERS REPORT

REGIONAL WATER POLLUTION CONTROL BOARD #2

MAR 18 1957

STATE OF CALIFORNIA

Do Not Fill In

No. 2290

State Well No. 64/217-28

Other Well No. 29P8C

(2) LOCATION OF WELL:

County Sonoma

Owner's number, if any—

R. F. D. or Street No.

2300 Roberts Rd.
Penngrove, Calif;

(3) TYPE OF WORK (check):

New well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐

If abandonment, describe material and procedure in Item 11.

(4) PROPOSED USE (check):

Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

(5) EQUIPMENT:

Rotary ☐
Cable ☒
Dug Well ☐

(6) CASING INSTALLED:

SINGLE ☒ DOUBLE ☐From ft. to ft. Diam. Gage or Wall
" 1 " 214 " 10 1/4 "

If gravel packed

Diameter of Bore from ft. to ft.

Type and size of shoe or well ring 10 3/4 x 3/4 x 6Describe joint Welded

Size of gravel:

(7) PERFORATIONS:

Type of perforator used Acetylene BurnSize of perforations 4 in., length, by 5/32 in.

From ft. to ft. Perf. per row Rows per ft.

" 144 " 214 " 6 " " " 1 " " "

(8) CONSTRUCTION:

Was a surface sanitary seal provided? ☐ Yes ☒ No To what depth ft.Were any strata sealed against pollution? ☒ Yes ☐ No If yes, note depth of strata

From 1 ft. to 144 ft.

Method of Sealing Cased

(9) WATER LEVELS:

Depth at which water was first found ft.

Standing level before perforating 0 ft.

Log level after perforating 0 ft.

(10) WELL TESTS:

Was a pump test made? ☐ Yes ☒ No If yes, by whom?

Yield: 120 gal./min. with 12 ft. draw down after 1 hrs.

Temperature of water 75 Was a chemical analysis made? ☐ Yes ☒ NoWas electric log made of well? ☐ Yes ☒ No

(11) WELL LOG:

Total depth 300 ft. Depth of completed well 300

Formation: Describe by color, character, size of material, and structure.

1	ft. to	75	ft.	Yellow Clay & Boulders
75	"	100	"	Yellow Clay
100	"	103	"	Boulders
103	"	135	"	Yellow Clay
135	"	140	"	Boulders
140	"	208	"	Yellow Clay
208	"	212	"	Blue Clay
212	"	216	"	Lava Rock
216	"	300	"	Blue Lava Rock

FOR OFFICIAL USE ONLY

Work started 2/13/57 Completed 3/1/57

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Les Petersen Well Drilling Co.
(Person, firm, or corporation) (Typed or printed)Address 405 Sierra Ave; Cotati, Calif;[SIGNED] Les H. Petersen
Well DrillerLicense No. 106989 Dated 3-13-57

95689 3-54 SON QUIN © SPO

DWR FORM NO. 246 (REV. 3-54)

ORIGINAL

File with DWR

STATE OF CALIFORNIA

THE RESOURCES AGENCY

DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

Do not fill in

No. 084218

State Well No.

Other Well No. 06N07W 32

 of Intent No.
 Permit No. or Date

(2) LOCATION OF WELL (See instructions):

 County Sonoma Owner's Well Number
 Well address if different from above 2373 Roberts Road
 Township Penn Grove Range Calif.
 Distance from cities, roads, railroads, fences, etc.
(12) WELL LOG: Total depth 304 ft. Depth of completed well _____ ft.

from ft.	to	ft.	Formation (Describe by color, character, size or material)
0	-	4	top soil
4	-	8	brn clay
8	-	30	brn clay/boulders
30	-	50	brn. clay/rock
50	-	98	yellow clay
98	-	170	blue clay
170	-	185	soft blue volc. rock
185	-	203	blue clay
203	-	270	soft blue volc. rock
270	-	305	soft blue volc. rock/ streaks red rock.

(3) TYPE OF WORK:

 New Well ☒ Deepening ☐
 Reconstruction ☐
 Reconditioning ☐
 Horizontal Well ☐
 Destruction ☐ (Describe
 destruction materials and
 procedures in Item 12)

(4) PROPOSED USE:

 Domestic ☒
 Irrigation ☐
 Industrial ☐
 Test Well ☐
 Stock ☐
 Municipal ☐
 Other ☐

WELL LOCATION SKETCH

(5) EQUIPMENT:

 Rotary ☒ Reverse ☐
 Cable ☐ Air ☐
 Other ☐ Bucket ☐

(6) GRAVEL PACK:

 Yes ☒ No ☐ Size 3/8
 Diameter of bore _____
 Racked from 0 to 28 ft.

(7) CASING INSTALLED:

 Steel ☒ Plastic ☐ Concrete ☐

(8) PERFORATIONS:

Type of perforation or size of screen

From ft.	To ft.	Dia. in.	Gage or Wall	From ft.	To ft.	Slot size
0	308	8	10	182	304	

(9) WELL SEAL:

 Was surface sanitary seal provided? Yes ☐ No ☒ If yes, to depth 28 ft.
 Were strata sealed against pollution? Yes ☐ No ☐ Interval _____ ft.
 Method of sealing readymix

(10) WATER LEVELS:

 Depth of first water, if known _____ ft.
 Standing level after well completion 160 ft.

(11) WELL TESTS:

 Was well test made? Yes ☒ No ☐ If yes, by whom? _____
 Type of test Pump ☐ Bailor ☒ Air lift ☐
 Depth to water at start of test _____ ft. At end of test 175 ft.
 Discharge 50 gal/min after 4 hours Water temperature _____
 Chemical analysis made? Yes ☐ No ☐ If yes, by whom? _____
 Was electric log made? Yes ☐ No ☐ If yes, attach copy to this report

 Work started 5/17/1979 Completed 5/22/1979

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

SIGNED John Jepsen
 (Well Driller)
 NAME LES PETERSEN DRILLING & PUMP, INC.

(Person, firm, or corporation) (Typed or printed)

Address 5434 Old Redwood HighwayCity Santa Rosa, California Zip 95401License No. 261084 Date of this report 5/23/79

36 (1)

ORIGINAL
File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
WATER WELL DRILLERS REPORT

Page 1
Do not fill in
No. 197993

Noting of Intent No. _____
1 Permit No. or Date 178-89

State Well No. _____
Other Well No. 06N07W29K

(2) LOCATION OF WELL (See instructions):
County Sonoma Owner's Well Number 47-123-09
Well address if different from above Same
Township _____ Range _____ Section _____
Distance from cities, roads, railroads, fences, etc. _____

(12) WELL LOG: Total depth 654 ft. Depth of completed well 654 ft.
from ft. to ft. Formation (Describe by color, character, size or material)

0	-	1	Topsoil & Boulders
1	-	8	Yellow clayee sand
8	-	30	Yellow sandy clay
30	-	38	Brown clay
38	-	47	Blue clay
47	-	50	Brown clay
50	-	71	Hard blue & brown clay
71	-	72	Blue clay with rock
72	-	77	Blue clayee sand
77	-	89	Stiff blue clay
89	-	119	Blue & brown clay
119	-	123	Blue sandy clay
123	-	145	Blue clay
145	-	150	Blue sandy clay
150	-	163	Blue clay
163	-	168	Blue sandy clay with sand and gravel
168	-	177	Blue clay
177	-	179	Blue sandy clay
179	-	193	Blue sandy clay with sand and gravel
193	-	194	Cemented sand and gravel
194	-	205	Blue clay
205	-	208	Sandy clay with sand & gravel
208	-	217	Blue clay
217	-	238	Cemented sand and gravel
238	-	250	Stiff blue clay
250	-	264	Blue clayee sand
264	-	289	Gray clay & hard gray rock
289	-	297	Hard black & gray rock with gray clay
297	-	303	Multi-colored volcanic green clay
303	-	304	Hard volcanic conglomerate
304	-	330	Multi-colored volcanic with green clay

(3) TYPE OF WORK:

New Well ☒ Deepening ☐
Reconstruction ☐
Reconditioning ☐
Horizontal Well ☐
Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:

Domestic ☒
Irrigation ☒
Industrial ☐
Test Well ☐
Stock ☐
Municipal ☐
Other ☐

WELL LOCATION SKETCH

(5) EQUIPMENT:

Rotary ☒ Reverse ☐
Cable ☐ Air ☐
Other ☐ Bucket ☐

(6) GRAVEL PACK:

Yes ☒ No ☐ Size Fine Pea
Character of bore 12 1/2" x 9 7/8"
Packed from 25 to 654 ft

(7) CASING INSTALLED:

Steel ☐ Plastic ☒ Concrete ☐

(8) PERFORATIONS:

Type of perforation or size of screen

From ft.	To ft.	Dia. in.	Cage or Wall	From ft.	To ft.	Slot size
0	654	6 1/2	C1200	154-174	294-374	.032
				394-434	514-534	"
				614-654		"

(9) WELL SEAL:

Was surface sanitary seal provided? Yes ☒ No ☐ If yes, to depth 25 ft.
Were strata sealed against pollution? Yes ☐ No ☐ Interval _____ ft.
Method of sealing Sand-grout-on pack

(10) WATER LEVELS:

Depth of first water, if known _____ ft.
Standing level after well completion 80'2" ft.

(11) WELL TESTS:

Was well test made? Yes ☒ No ☐ If yes, by whom? Weeks
Type of test Pump ☐ Bailer ☐ Air lift ☒
Depth to water at start of test 80' ft. At end of test 300 ft
Discharge 50 gal/min after 1 hours Water temperature Cool
Is chemical analysis made? Yes ☐ No ☒ If yes, by whom?
Was electric log made? Yes ☐ No ☒ If yes, attach copy to this report

Work started 6-5-1989 Completed 6-7-1989

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

SIGNED Ward Thompson

WEEKS DRILLING AND PUMP COMPANY

NAME (Person, firm, or corporation) (Typed or printed)

Address P.O. Box 176

City Sebastopol, CA Zip 95473

License No. C57-177681 Date of this report 6-15-89

ORIGINAL

File with DWR

STATE OF CALIFORNIA

THE RESOURCES AGENCY

DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

Page 2

Do not fill in

No. 1979943

Number of Intest No.

1 Permit No. or Date 178-89

State Well No.

Other Well No.

(2) LOCATION OF WELL (See instructions):

County Sonoma Owner's Well Number 47-123-09Well address if different from above Same

Township _____ Range _____ Section _____

Distance from cities, roads, railroads, fences, etc. _____

(12) WELL LOG: Total depth 654 ft. Depth of completed well 654 ft.
from ft. to ft. Formation (Describe by color, character, size or material)

330	-	336	Sandy blue clay with embedded rock
336	-	345	Multi-colored volcanic with clay and gravel
345	-	351	Sandy blue-gray clay with embedded rock
351	-	369	Multi-colored volcanic with green clay & gravel
369	-	404	Sandy blue clay with green hard crumbly clay
404	-	414	Multi-colored volcanic conglomerate
414	-	426	Stiff blue clay
426	-	430	Multi-colored volcanic conglomerate
430	-	630	Black volcanic rock
630	-	654	Black and red volcanic rock

(3) TYPE OF WORK:

New Well ☒ Deepening ☐Reconstruction ☐Reconditioning ☐Horizontal Well ☐Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:

Domestic ☒Irrigation ☒Industrial ☐Test Well ☐Stock ☐Municipal ☐Other ☐

WELL LOCATION SKETCH

(5) EQUIPMENT:

Rotary ☐Reverse ☐Cable ☐Air ☐Other ☐Bucket ☐

(6) GRAVEL PACK:

Yes ☐ No ☒ Size _____

Diameter of bore _____

Packed from _____ to _____

(7) CASING INSTALLED:

Steel ☐Plastic ☐Concrete ☐

(8) PERFORATIONS:

Type of perforation or size of screen _____

From ft.	To ft.	Dia. in.	Cage or Wall	From ft.	To ft.	Slot size

(9) WELL SEAL:

Was surface sanitary seal provided? Yes ☐ No ☐ If yes, to depth _____ ft.Were strata sealed against pollution? Yes ☐ No ☐ Interval _____ ft.

Method of sealing _____

(10) WATER LEVELS:

Depth of first water, if known _____ ft.

Standing level after well completion _____ ft.

(11) WELL TESTS:

Was well test made? Yes ☐ No ☐ If yes, by whom? _____Type of test Pump ☐ Bailer ☐ Air lift ☐

Depth to water at start of test _____ ft. At end of test _____ ft.

Discharge _____ gal/min after _____ hours Water temperature _____

Is chemical analysis made? Yes ☐ No ☐ If yes, by whom? _____Was electric log made? Yes ☐ No ☐ If yes, attach copy to this reportWork started 6-5-1989 Completed 6-7-1989

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

SIGNED Ward Thompson *Ward Thompson*NAME WEEKS DRILLING AND PUMP COMPANY

(Person, firm, or corporation) (Typed or printed)

Address P.O. Box 176City Sebastopol, CAZip 95473License No. C57-177681Date of this report 6-15-89

ORIGINAL

File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
WATER WELL DRILLERS REPORT

Do not fill in

No. 084262

of Intent No. 434-79 AP#47-122-24
Permit No. or Date

State Well No. _____
Other Well No. 06N07W32

(2) LOCATION OF WELL (See instructions):

County Sonoma Owner's Well Number _____
Well address if different from above 2273 Roberts Rd.
Township Penngrove, California Section _____
Distance from cities, roads, railroads, fences, etc. _____

(3) TYPE OF WORK:

New Well ☒ Deepening ☐
Reconstruction ☐
Reconditioning ☐
Horizontal Well ☐
Destruction ☐ (Describe destruction materials and procedures in Item 12)
(4) PROPOSED USE:
Domestic ☒
Irrigation ☐
Industrial ☐
Test Well ☐
Stock ☐
Municipal ☐
Other ☐

(12) WELL LOG: Total depth 501 ft. Depth of completed well _____ ft.

from ft.	to ft.	Formation (Describe by color, character, size or material)
0	- 4	top soil
4	- 12	brown clay
12	- 55	soft loose brn. rock
55	- 122	brn clay/rock
122	- 130	hard black rock
130	- 150	brn clay/streaks sft. brn. rock.
150	- 165	yellow clay
165	- 190	sticky blue clay
190	- 230	sticky blue clay/small str
230	- 312	blue rock
312	- 314	rock
314	- 385	sticky blue clay
385	- 400	sticky blue clay/small
400	- 435	streaks blue clay
435	- 501	blue clay/streaks blue roc
		hard blue rock

WELL LOCATION SKETCH

(5) EQUIPMENT:

Rotary ☒ Reverse ☐
Cable ☐ Air ☐
Other ☐ Bucket ☐

(6) GRAVEL PACK:

Yes ☒ No ☐ Size 1/8
Diameter of bore _____
Packed from _____ to _____ ft.

(7) CASING INSTALLED:

Steel ☐ Plastic ☒ Concrete ☐

(8) PERFORATIONS:

Type of perforation or size of screen _____

From ft.	To ft.	Dia. in.	Cage or Wall	From ft.	To ft.	Slot size
0	502	6"	#200	61	81	241-261
				101	121	281-301
				141	161	341-361
				181	201	401-501

(9) WELL SEAL:

Was surface sanitary seal provided? Yes ☒ No ☐ If yes, to depth 35' ft.

Were strata sealed against pollution? Yes ☐ No ☐ Interval _____ ft.

Method of sealing readymix'

(10) WATER LEVELS:

Depth of first water, if known _____ ft.

Standing level after well completion 135 ft.

(11) WELL TESTS:

Was well test made? Yes ☒ No ☐ If yes, by whom? _____

Type of test Pump ☐ Bailor ☒ Air lift ☐

Depth to water at start of test 135 ft. At end of test 185 ft.

Flow rate 35 gal/min after 4 hours Water temperature _____

Chemical analysis made? Yes ☐ No ☐ If yes, by whom? _____

Was electric log made? Yes ☐ No ☐ If yes, attach copy to this report

Work started 8/13/79 Completed 8/20/79

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

SIGNED John Jepsen

(Well Driller)

NAME LES PETERSEN DRILLING & PUMP, INC.

(Person, firm, or corporation) (Typed or printed)

Address 5434 Old Redwood Highway

City Santa Rosa, Cl. Zip 95401

License No. 261084 Date of this report 8/21/79

APPENDIX B

GPM WELL TEST JANUARY 2018

Water System Evaluation Report

Site Address: 2275 Roberts Rd	
Date of Inspection: 1-9-17	
Client Information:	
Name: Denise Keeley	Phone Number:
Email Address:	Phone Number:

Agent Information:	
Name: Mark Gold	Phone Number: 707-695-3191
Email Address: markgold@comcast.net	Phone Number:

Well:		
Casing: 9"	Type: Steel	Well Depth: N/A, obstruction in casing
Well Seal: Split, good condition, but needs plug on port hole		
Well Pump System Data		
Pump: Submersible	Horse Power: 5	Volts: 230VAC
Pump Depth: N/A	Phase: Single	
Running Amps: 22.7	Motor Protection: No	
Pressure Tank: (4x) WX302 Charges: 2@20psi, 1@25psi, 1@0psi		
Pump Break Suction: No		
Flow Data		
Water Level at Start (Static Level): 210'	Water Level at end (pumping level): 259'	
Flow rate at start: 42.8	Stabilized Flow Rate: 40	
Well Yield: 40 gallons per minute		

*All water level reading taken from the top of the well casing unless otherwise specified.

Booster Pump System: No booster system	
Booster Pump System Data	
Pump:	Pump Horse Power:
Running Amps:	Voltage:
Motor Protection:	Phase:
Pressure Tank:	
Storage Tank	
Type:	



Site Address: 2275 Roberts Rd	Date of Inspection: 1-9-17
-------------------------------	----------------------------

Filter Equipment: None found	
Equipment	Notes

Water Analysis Report: Water analysis performed by lab.		
Parameter	Date to Lab	Date for final lab
Coliform and E.coli Bacteria	1/10/2017	1/23/2017
Arsenic	1/10/2017	1/23/2017
Nitrate	1/10/2017	1/23/2017

Basic Water Analysis Results; Non Health Related

		Iron	Manganese	Hardness	Alkalinity	pH	TDS	Appearance
Units		mg/L	mg/L	gpg	mg/L	pH Units	mg/l	None
Sample Source	Well	Trace	Trace	9	171	7.3	232	Slight tint
Sample Source								
Sample Source								
Iron: EPA limit is 0.3 mg/L (parts per million)								
Manganese: EPA limit is 0.05 mg/L (parts per million)								
Hardness: <1 gpg = Soft; 1-4 gpg = Slightly Hard; 5-9 gpg = Mod Hard; >10 gpg = Very Hard								
Alkalinity: <100 = Possible Corrosion; >100 = Possible scale								
pH: <7 = Acidic; >7 = Basic; recommended range = 7.0-8.5								
TDS: Recommended Range = <500								

Comments:
Water analysis indicates Moderate hardness, which can be removed with a water softener. Hardness causes a white, crusty calcium/magnesium build up on hot water fixtures, commonly referred to as scale. It also deposits on glassware and can reduce the efficiency of soaps and detergents.



CANNABIS TRIP GENERATION **PJR-126**

Business Name: Luma California, LLC Location: 2275 Roberts Rd. Penngrrove CA

Type of Cannabis Operation and Square Footage:
10,000sf mixed light, 10,000sf outdoor, 500sf indoor

Hours of Operation: Garden hours 6am-9pm depending on season & sun.
Processing hours are 8am-5pm.
Special Hours (harvest, rush processing due to climatic conditions, etc.): outdoor harvest in October.

Please note: ADT means Average Daily Trips. For purposes of this form, provide traffic generation information in one-way trips. This means that a single round trip is counted as two (2) trips (ADT) i.e., a vehicle driving to the property is counted as one trip. The same vehicle leaving the site is counted as a second trip.

Attach pages as necessary to more fully describe any of the items or circumstances found below.

CANNABIS OPERATIONS

Cannabis Operations - Employee traffic using passenger vehicles, in average ADT

Item Description	Existing ADT		Proposed* (year round) ADT		Proposed* (harvest period) ADT		Proposed* (processing period) ADT	
	# of employees	# of trips by employees	# of employees	# of trips by employees	# of employees	# of trips by employees	# of employees	# of trips by employees
Cannabis production (2 employees X 3 = 9 ADT)	0	0	3	9	0	0	0	0
Storage (employees X 3 = ADT)	0	0	0	0	0	0	0	0
Administrative (1 employees X 3 = ADT)	0	0	1	3	0	0	0	0
Sales (employees X 3 = ADT)	0	0	0	0	0	0	0	0
Processing (9 employees X 3 = ADT)	0	0	0	0	0	0	9	27
Other staff (describe):	0	0	0	0	0	0	0	0
Totals	0	0	4	12	0	0	9	27

* "Proposed" shall mean existing traffic + new traffic if expansion is approved

Sonoma County Permit and Resource Management Department
2550 Ventura Avenue Santa Rosa CA 95403-2859 (707) 565-1900

www.PermiTSonoma.org

Date: 08/16/2017



Cannabis Operations - Truck traffic associated with cannabis operations (average ADT)

Item Description	Existing	Proposed*
Cannabis importation Truck loads per year: <u>0</u> Dates of activity: <u>1</u> to <u>1</u> Vehicle type: <u> </u>	0	0
Cannabis disposal Truck loads per year: <u>0</u> Dates of activity: <u>1</u> to <u>1</u> Vehicle type: <u> </u>	0	0
Miscellaneous Deliveries Truck loads per year: <u>17-20</u> Dates of activity: <u>12/18 to 12/18</u> Vehicle type: <u>composting</u> <u>Soil</u>	0	17-20 loads per year
Cannabis transportation to distributor /sales Truck loads per year: <u>24</u> Dates of activity: <u>10/18 to 12/18</u> Vehicle type: <u> </u> , # of Cases: <u> </u> <u>large cargo van /truck</u>	0	24 (2x/mo)
Miscellaneous visitors, UPS, mail, garbage, etc., list items included: <u>trash</u>	0	52/yr trash
Totals	0	96

* "Proposed" shall mean existing traffic + new traffic if expansion is approved

CULTIVATION OPERATIONS

Employee trips associated with cultivation operations (growing of cannabis) in average ADT

Item Description	Existing	Proposed
Cultivation maintenance (year round) (multiply # of employees X 3 for ADT) <u>3</u>	0	9
Cultivation maintenance (part time during peak season), (multiply # of employees X 3 for ADT) Dates of activity: <u>6/18 to 12/18</u> <u>4 part time = 2 fulltime</u>	0	6
Totals	0	15

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Date: 08/16/2017



SUMMARY (During Non-harvest period)

Item Description	Existing	Proposed
Employee traffic associated with cannabis operations	0	54
Truck traffic associated with cannabis operations	0	96
<u>Miscellaneous Other traffic generators</u>		
Totals		150

Variation in ADT during the course of a typical full production year

	6	6	6	6	6	8	8	8	8	19	19	19
Month	Jan	Feb	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Totals	18	18	18	18	18	24	24	24	24	57	57	57

Cannabis Trip Generation
Supplement Information
UPC17-0090

Existing Traffic 1886-2016:

Prior use at 2275 Roberts Rd was a Residential Care Facility since 1986. Per communications from the property's listing agent to Luma representatives, the care facility was home to 11 patients, with 4 to 5 staff on-site during the day time, and 2 staff on-site overnight. The facility operated on a 24 hour, seven day a week schedule. The property also served as a food distribution center for DuMolin Community Living which operates 7 additional care facilities across Sonoma County. There were many employees and truck loads coming in and out of the property until operations ceased in December of 2016.

The property was purchased back in August of 2017 and Luma California will begin operating a cannabis farm as soon as permits are received. So although on this form we list existing ADT as zero since cannabis operations have not begin, the property itself has seen many ADT over time during the care facilities operations.

Employee Living:

Per our submitted CUP application, Luma proposed 6 full time employees, 4 part time, and 9 trimmers. Five of the six Luma full-time employees will be living on site at 2275 Roberts Rd in the residential portion of the property. This will drastically eliminate the employees ADT.

Project Name: Alexa Wall

Estimate Date: 02/05/2019

Project Location: Sonoma County

Estimate Expires: 03/05/2019

Estimate Number: 777

This 25,560 sq. ft Gro-Tech Systems Alpine Series is comprised of a gutter connectable greenhouse made of 4" x 4" square galvanized structural steel columns. Trusses are fabricated with 2" x 2" square galvanized structural steel. Gutters are 12-gauge steel at a 14' gutter height (10' & 12' side wall heights available). This estimate includes 6 - 30' x 120' Alpine Series Greenhouse bays and 3 - 60' x 108' Automated Light Deprivation systems with a 180' x 12' Insect Enclosure. 1 - 30' x 132' Head House

ROOF & WALL COVERINGS

- Roof - 8mm Polygal Polymatte twin wall polycarbonate 77% LT and 100% Diffusion
- Side Walls - 29-gauge metal siding packages
- End Walls - 29-gauge metal siding packages up to 14', and 8mm Polygal Polymatte Twin Wall Polycarbonate 77% LT and 100% Diffusion above 14'
- Separation Walls with Black, White, Black Multiwall Polycarbonate

COVER OPTIONS

	Diffused Twin Wall Polymatte	29 Gauge Metal Siding	Clear Polycarbonate	White/Black/ White Polyblock	Corrugated Polycarbonate
Roof	✓				
Side Wall		✓			
End Wall		✓			
Separation Walls				✓	

DOORS

- 3- 8' x 10' roll up doors - Tracrite 944 Blackout with double brush seals
- 3 - 3' x 6'8" Exterior Man Door with Shims (No handles or locks)

ENVIRONMENTAL CONTROLS

- 3 - iGrow 800 Integrated Greenhouse controller (8 outputs, 9 stages) w/temp probe (50ft cable), USB interface, all ventilation, curtain, cooling, heating, dehumidifiers & light support.
iGrow 100 series S communication module
iGrow 800- 4 output expansion card
Digital integrated sensor module (light, CO2, temp, humidity)

GRO-TECH SYSTEMS AUTOMATED LIGHT DEPRIVATION

- 3 - 60' x 108' GTS Flat Top Premium Automated Light Deprivation System with 3-Layer Bonar EXOVA Blackout Flame Retardant Curtain

GRO-TECH SYSTEMS AUTOMATED SHADE

- Available Upon Request

MECHANICAL VENTILATION

- 6 - QuietAire 30" 1/2 hp 7,800 CFM Galvanized 6-Blade Exhaust Fans for Gable
- 6 - QuietAire 33" Motorized Louvers for Gable Ventilation
- 12 - QuietAire 56" 1.5 hp Galvanized 6-Blade Exhaust Fans w/Light Trap Housings for End Wall
- 12 - GTS 61" x 61" Light Traps for End Wall Fans
- 24 - Vosterman 16" Horizontal Airflow Fans

EVAPORATIVE COOLING SYSTEM

- 3 - QuietAire 52' x 5' x 6" - Aluminum Cooling System with KUUL Pad Cooling Media
- 3 - 52' x 5' Rack & Pinion Pad Vent for Cooling System
- 30 - GTS 62" x 62" Hi-Flo Light Traps & Housings

HEATING SYSTEM

- 6 - 225 xl 225,000 BTU - Industrial Grade Unit Heaters and 6 Thermostats

INSECT ENCLOSURE

- 180' X 12' Insect Enclosure with 50 Mesh Net
- Includes Wiggle Track and Wire and all Hardware

HEAD HOUSE

- 1 - 30' x 132' Head House Gutter Connected to Greenhouse
- Roof and Side Walls - 29-gauge metal siding packages (Upgrade Available Below)
- 1 - 8' x 10' Roll-Up Door
- 2 - 3' x 6'8" Exterior Man Door with Shims (No handles or locks)

SITE SPECIFIC ENGINEERED PLANS

- Greenhouses engineered based on the site
- Engineered to 20lb Snow Load and 110 MPH Wind Load



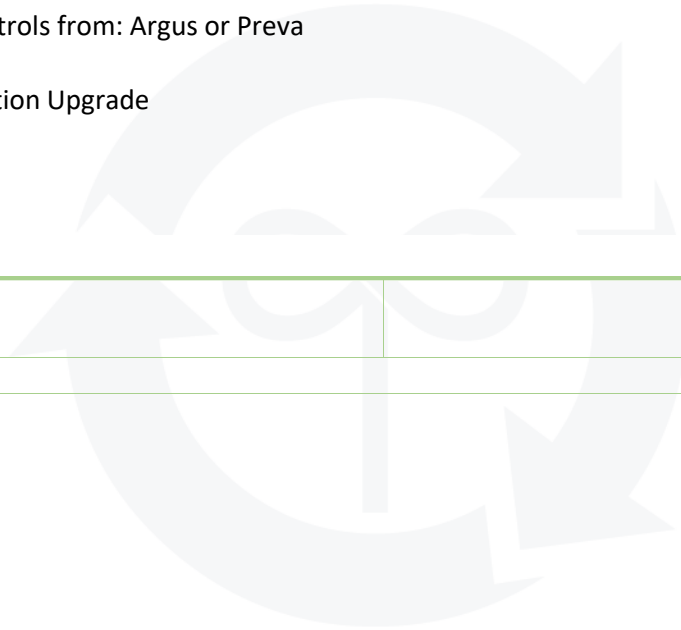


Gro-Tech

SYSTEMS INC.

OTHER OPTIONS AVAILABLE

- 8 MM side walls
- Ground to Ground Automated Light Deprivation systems
- Smell Mitigation
- Rolling Benches
- In-ground or under bench heating
- Lights & Lighting control
- Dehumidifiers
- Environmental controls from: Argus or Preva
- Passive Ventilation
- Head House Insulation Upgrade



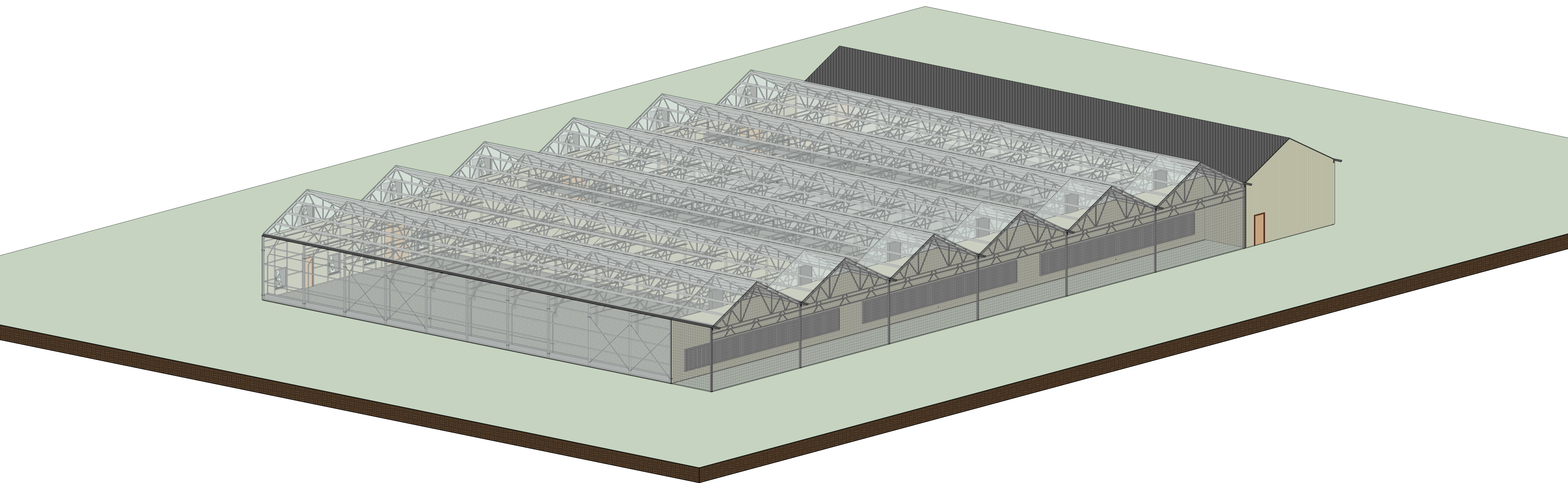
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Rough and Ready, CA 95975

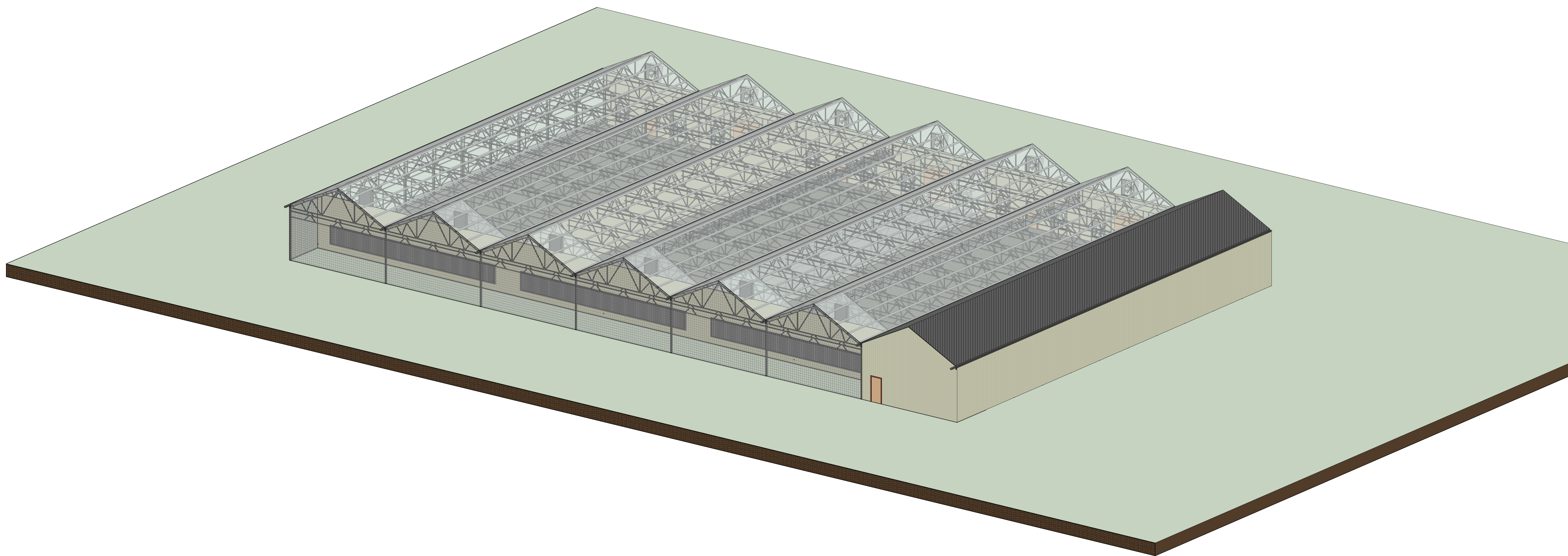


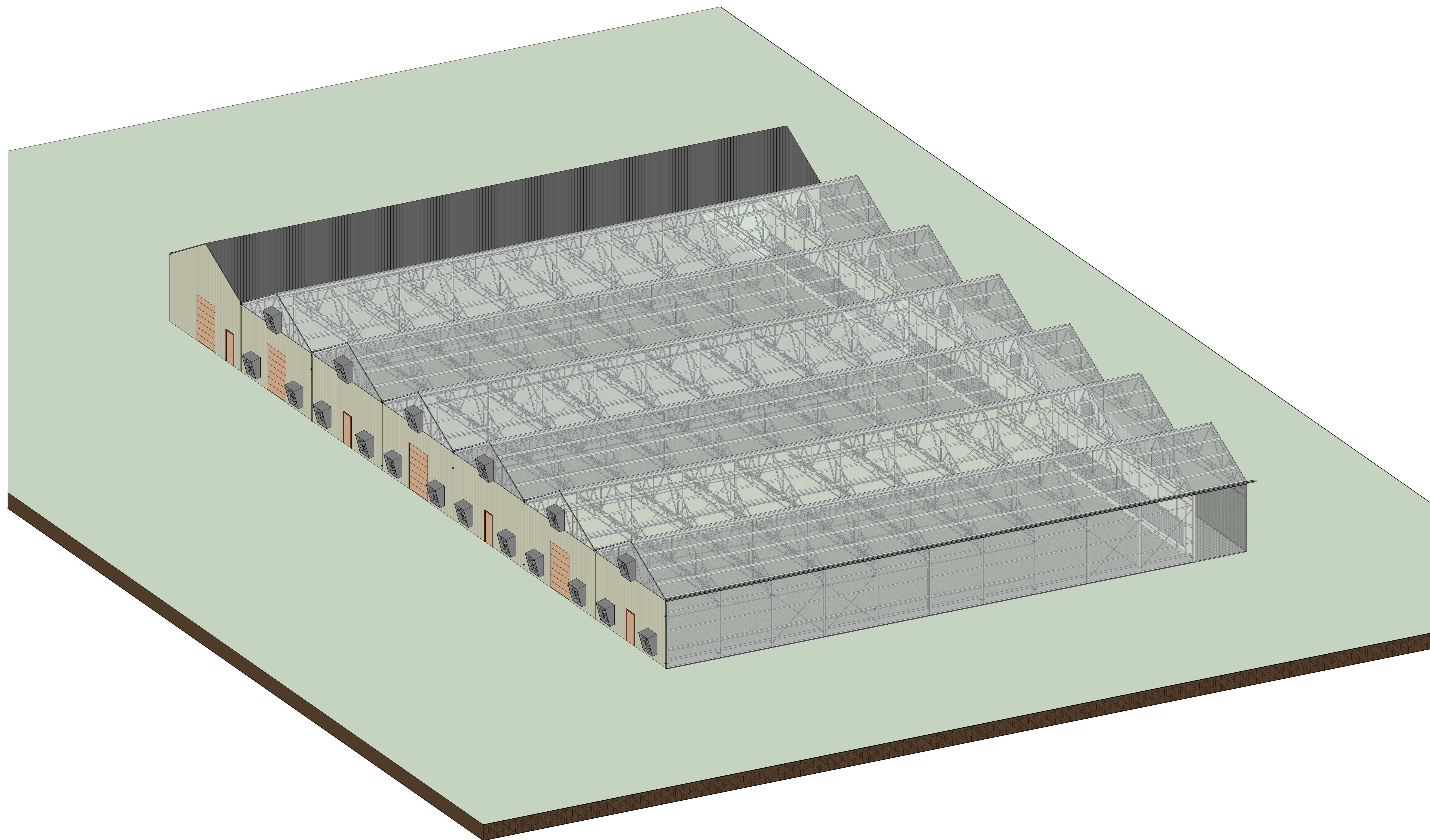
www.gro-techsystems.com
info@gro-techsystems.com

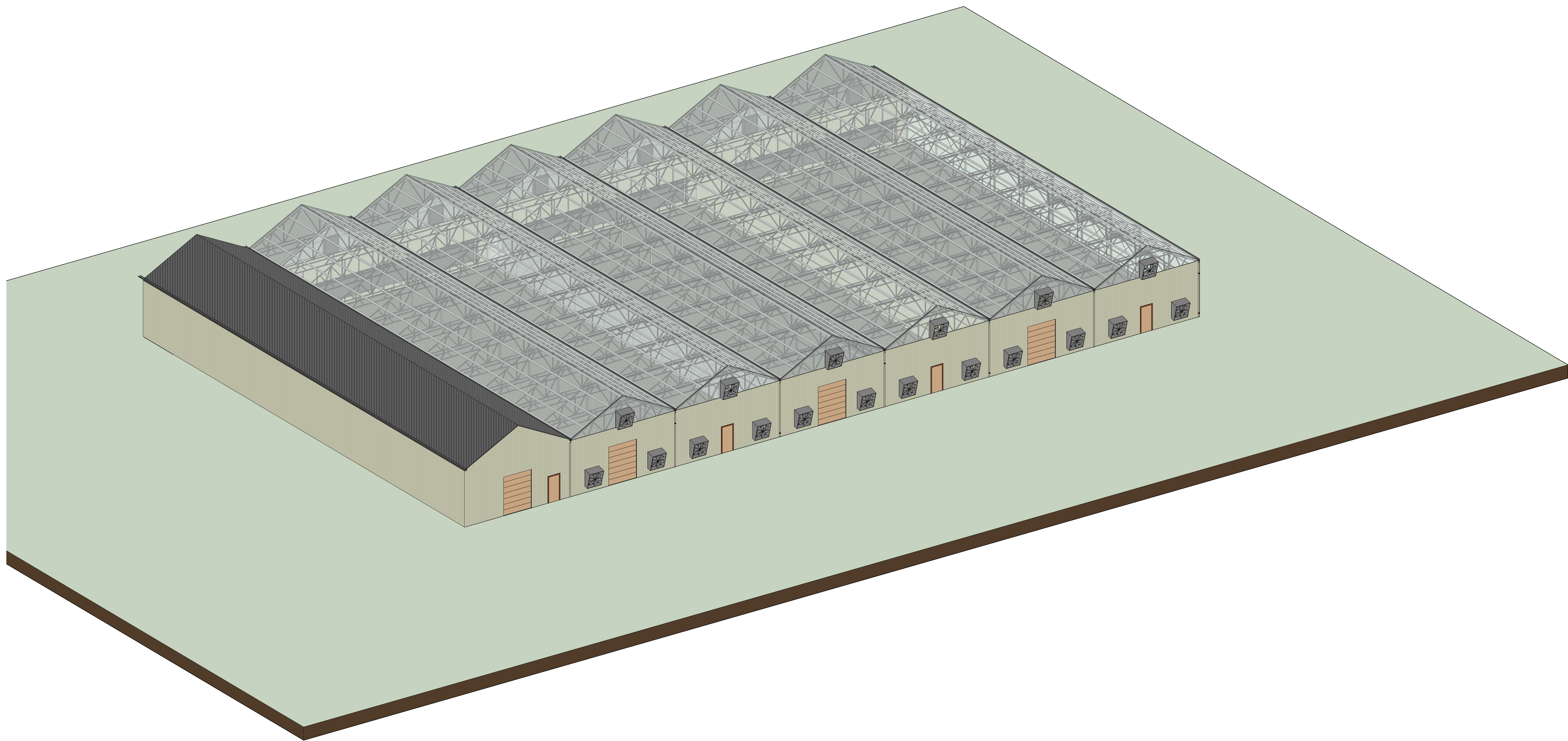


(Toll Free) 866-872-7380
(Local) 530-432-7012









PROJECT SUMMARY

THE PROJECT IS FOR A NEW GRO-TECH GREENHOUSE. GRO-TECH'S PROPRIETARY BUILDING SYSTEM UTILIZES (4) INTERCONNECTED BUILDING MODULES WITH METAL SIDING AND POLYCARBONATE ROOF. EACH BUILDING IS 30x84 FEET, RESULTING IN A TOTAL WIDTH OF 120 FEET. EACH OF THE (4) BUILDINGS HAS ITS OWN INTEGRATED LIGHT DEPRIVATION SYSTEM.

APPLICABLE CODES

2016 CALIFORNIA BUILDING CODE

STEEL CONSTRUCTION MANUAL, 14 ED.

(2016 CBC)

(AISC 14 ED.)

GOVERNING AGENCY

TBD

PROJECT INFORMATION

PROJECT ENGINEER:

MICHAEL J. NICKLIN
LINCHPIN STRUCTURAL ENGINEERING
530.563.6341 EXT. 801

CLIENT:

TBD

CONTRACTOR:

TBD

SHEET INDEX

SHEET NUMBER	SHEET NAME
A-000	COVER PAGE
A-100	FLOOR PLAN
A-200	ELEVATIONS
A-300	SECTIONS
A-400	TYP. & LIGHT DEPRIVATION DETAILS
E-100	ELECTRICAL PLAN
E-101	LIGHT DEPRIVATION PLAN
S-100	FOUNDATION PLAN
S-101	ANCHOR SETTING PLAN & TEMPLATES
S-200	ROOF FRAMING PLAN
S-300	STRUCTURAL ELEVATIONS
S-301	STRUCTURAL ELEVATIONS - CORRIDOR
A-410	FOUNDATION DETAILS
S-420	TRUSS DETAILS
A-421	TRUSS FRAMING FABRICATION
A-430	DETAILS

GENERAL NOTES

1. UNLESS EXPLICITLY STATED IN THESE CONSTRUCTION DOCUMENTS, BY NOTE OR CLARIFICATION LETTER, THE ENTIRE SCOPE OF WORK REPRESENTED BY THESE DOCUMENTS SHALL BE THE SOLE RESPONSIBILITY OF THE GENERAL CONTRACTOR.

2. THESE CONSTRUCTION DOCUMENTS REPRESENT THE DESIGN INTENT OF THE DESIGN TEAM BASED ON DIMENSIONS OF EXISTING SITE AND/OR FIELD CONDITIONS. ACTUAL CONDITIONS MAY REQUIRE MODIFICATIONS OF THE CONSTRUCTION DETAILS TO ACHIEVE THE DESIGN INTENT. CONTRACTOR SHALL NOTIFY DESIGN TEAM IN WRITING OF ANY DISCREPANCIES RELATED TO EXISTING SITE AND/OR FIELD CONDITIONS PRIOR TO CONTINUING ANY WORK.

3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO RECORD ALL OMISSIONS OR CONFLICTS BETWEEN THE VARIOUS ELEMENTS OF THE CONSTRUCTION DOCUMENTS AND TO BRING THEM TO THE ATTENTION OF THE DESIGN TEAM PRIOR TO COMMENCING ANY WORK. ANY DEVIATION FROM THE CONDITIONS SHOWN IN THESE CONSTRUCTION DOCUMENTS SHALL REQUIRE WRITTEN APPROVAL FROM THE DESIGN TEAM.

4. DO NOT SCALE THE DRAWINGS. WRITTEN DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS. ANY DISCREPANCIES BETWEEN THE DRAWINGS AND ACTUAL CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE DESIGN TEAM PRIOR TO COMMENCING ANY WORK.

5. THE CONSTRUCTION DOCUMENTS ARE COMPLEMENTARY. WORK REQUIRED TO BE DONE BY ONE DOCUMENT AND NOT BY OTHERS SHALL BE DONE AS IF REQUIRED BY ALL.

6. THE CONTRACTOR AND SUBCONTRACTOR SHALL MAKE NO STRUCTURAL SUBSTITUTIONS, CHANGES, OR MODIFICATIONS WITHOUT WRITTEN APPROVAL OF THE STRUCTURAL ENGINEER.

7. CONTRACTORS AND SUBCONTRACTORS SHALL ENSURE THAT ALL WORK IS PERFORMED IN A PROFESSIONAL AND WORKMANLIKE MANNER BY SKILLED MECHANICS OF THE TRADE. SUBCONTRACTORS AND SUPPLIERS ARE HEREBY NOTIFIED THAT THEY ARE TO CONFER AND COOPERATE FULLY WITH EACH OTHER DURING THE COURSE OF CONSTRUCTION TO DETERMINE THE EXACT EXTENT AND OVERLAP OF EACH OTHER'S WORK AND TO SUCCESSFULLY COMPLETE THE EXECUTION OF THE WORK IN A TIMELY MANNER.

8. BUILDER'S SET: THIS SET OF DRAWINGS HAS BEEN PREPARED SUFFICIENT TO OBTAIN A BUILDING PERMIT. ALL MATERIALS AND METHODS OF CONSTRUCTION NECESSARY TO COMPLETE THE PROJECT ARE NOT NECESSARILY DESCRIBED IN THIS "BUILDER'S SET". THE IMPLEMENTATION OF THE DRAWINGS REQUIRES THE CONTRACTOR TO BE THOROUGHLY KNOWLEDGEABLE WITH THE APPLICATIONS OF CODES AND THE METHODS OF CONSTRUCTION SPECIFIC TO THIS PROJECT AND TYPE OF CONSTRUCTION.

9. UNLESS SPECIFICALLY SHOWN OR NOTED ON THE DRAWINGS, NO STRUCTURAL MEMBER SHALL BE CUT, NOTCHED, BORED, OR OTHERWISE WEAKENED WITHOUT THE PERMISSION OF THE STRUCTURAL ENGINEER.

10. ALL WATERPROOFING, FLASHING, AND DRAINAGE ARE TO BE DESIGNED AND PROVIDED BY THE BUILDER.

STRUCTURAL ABBREVIATIONS

ABV - ANCHOR BOLT

ABOVE

ADDL - ADDITIONAL

ADJ - ADJACENT

ARCH - ARCHITECTURAL

BLKG - BLOCKING

BLW - BELOW

BN - BOUNDARY NAILS

BETWEEN

BTVM - CALIFORNIA BUILDING CODE

CJ - CONSTRUCTION JOINT

CL - CENTERLINE

COL - COLUMN

CONC - CONCRETE

CONT - CONTINUOUS

DIAM - DIAMETER

DL - DEAD LOAD

DN - DOWN

E - EXISTING

ELECT - ELECTRICAL

ENGR - ENGINEER

ES - EACH SIDE

EW - EACH WAY

FDN - FOUNDATION

FF - FINISH FLOOR

FS - FAR SIDE

G - GAGE

GALV - GALVANIZED

GC - GENERAL CONTRACTOR

HORIZ - HORIZONTAL

HSS - HOLLOW STRUCTURAL SECTION

INTR - INTERMEDIATE

INV - INVERTED

K - KIPS

L - LIVE LOAD

LLV - LONG LEG VERTICAL

LLH - LONG LOG HORIZONTAL

LWT - LIGHTWEIGHT

MAX - MAXIMUM

MECH - MECHANICAL

MFR - MANUFACTURER

MIN - MINIMUM

MISC - MISCELLANEOUS

NS - NEAR SIDE

OC - ON CENTER

OCEW - ON CENTER EACH WAY

OF - OUTER FACE

OH - OPPOSITE HAND

OPNG - OPENING

PL - PLATE

PLF - POUNDS PER LINEAR FOOT

PSF - POUNDS PER SQUARE FOOT

PW - PLYWOOD

REINF - REINFORCEMENT

SCHED - SCHEDULE

SIM - SIMILAR

SMS - SHEET METAL SCREW

SOG - SLAB ON GRADE

STAG - STAGGARED

STD HK - STANDARD HOOK

STLF - STIFFENER

STL - STEEL

SYM - SYMMETRICAL

T&B - TOP & BOTTOM

THRU - THROUGH

TN - TOE NAIL

TS - TUBE STEEL

TYP - TYPICAL

UBC - UNIFORM BUILDING CODE

UNO - UNLESS NOTED OTHERWISE

VERT - VERTICAL

VIF - VERIFY IN FIELD

w - WITH

WWF - WELDED WIRE FABRIC

STRUCTURAL PLANS & DETAILS LEGEND

SHEET NUMBER DESCRIPTION

S-XXX

SHEET SEQUENCE NUMBER

SUB-GROUP OF DESIGNATORS USED WHEN MORE THAN ONE SHEET OF SAME TYPE IS REQUIRED

DETAIL TYPE DESIGNATOR

0 - TYPICAL DETAILS

1 - FOUNDATION DETAILS

2 - FRAMING DETAILS

3 - SHEAR DETAILS

4 - STEEL DETAILS

5 - MASONRY DETAILS

6 - CUSTOM DETAILS

SHEET TYPE DESIGNATOR

0 - SPECIFICATIONS

1 - FOUNDATION PLANS

2 - FRAMING PLANS

3 - SHEAR PLANS

4 - DETAILS

5 - STRUCTURAL ELEVATIONS

6 - SK DETAILS / CONSTRUCTION ADMIN

STRUCTURAL SHEETS

DETAIL CALL OUT DESCRIPTION

DETAIL BUBBLE

LOCATION OF STRUCTURAL DETAIL OR SECTION

DETAIL CUT LINE

DETAIL CUT LOOKING IN THE DIRECTION OF THE SECTION CUT. THE SECTION IS CONTINUOUS UNO.

XXX

S-XXX

DETAIL NUMBER SPECIFIC TO EACH DETAIL.

DETAIL LOCATION NUMBER SHEET LOCATION. SEE SHEET NUMBER DESCRIPTION

CONCRETE

CAST-IN-PLACE CONCRETE

CODES, SPECIFICATIONS, AND STANDARDS: CONCRETE WORK SHALL CONFORM TO THE FOLLOWING CODES, SPECIFICATIONS, AND STANDARDS, AND THE STANDARDS AND SPECIFICATIONS THEY REFERENCE. THE CONTRACTOR SHALL OBTAIN AND HAVE READILY AVAILABLE ON SITE THE LATEST VERSION OF THE "ACI MANUAL OF CONCRETE PRACTICE":

ACI:

1. ACI-116 'CEMENT AND CONCRETE TERMINOLOGY'.

2. ACI-301 'STANDARD SPECIFICATIONS FOR STRUCTURAL CONCRETE'.

3. ACI-302 'GUIDE TO CONCRETE FLOOR AND SLAB CONSTRUCTION'.

4. ACI-304 'GUIDE FOR MEASURING, MIXING, TRANSPORTING, AND PLACING CONCRETE'.

5. ACI-305 'HOT WEATHER CONCRETING'.

6. ACI-306 'COLD WEATHER CONCRETING'.

7. ACI-308 'STANDARD SPECIFICATION FOR CURING CONCRETE'.

8. ACI-309 'STANDARD PRACTICE FOR CONSOLIDATION OF CONCRETE'.

9. ACI-311 'GUIDE FOR CONCRETE INSPECTION'.

10. ACI-315 'DETAILS AND DETAILING OF CONCRETE REINFORCEMENT'.

11. ACI-318 'BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE'.

12. ACI-506R 'GUIDE FOR SHOTCRETING'.

ASTM:

1. ASTM C33 'STANDARD SPECIFICATION FOR CONCRETE AGGREGATES'.

2. ASTM C94 'STANDARD SPECIFICATION FOR READY-MIX CONCRETE'.

3. ASTM C150 'STANDARD SPECIFICATION FOR PORTLAND CEMENT'.

4. ASTM C260 'STANDARD SPECIFICATION FOR AIR-ENTRAINED ADMIXTURES FOR CONCRETE'.

5. ASTM C309 'STANDARD SPECIFICATION FOR LIQUID MEMBRANE-FORMING COMPOUNDS FOR CURING CONCRETE'.

6. ASTM C494 'STANDARD SPECIFICATION FOR CHEMICAL ADMIXTURES FOR CONCRETE'.

7. ASTM C595 'STANDARD SPECIFICATION FOR BLENDED HYDRAULIC CEMENTS'.

8. ASTM C618 'STANDARD SPECIFICATION FOR ... FLY-ASH...', MAXIMUM LOSS ON IGNITION SHALL BE 1.0%.

9. ASTM C1017 'STANDARD SPECIFICATION FOR CHEMICAL ADMIXTURES FOR USE IN PRODUCING FLOWING CONCRETE'.

10. ASTM C-1116 'SYNTHETIC FIBER REINFORCED CONCRETE AND SHOTCRETE'.

11. ASTM C-1218 'STANDARD TEST METHOD FOR WATER-SOLUBLE CHLORIDE IN MORTAR AND CONCRETE'.

MIX DESIGNS: THE CONTRACTOR SHALL DESIGN CONCRETE MIXES THAT MEET OR EXCEED THE REQUIREMENTS OF THE CONCRETE MIX TABLE. THE MIX DESIGNS SHALL FACILITATE ADAPTED PLACEMENT METHODS, WEATHER, REBAR CONCENTRATIONS, ARCHITECTURAL FINISHES, CONSTRUCTION SEQUENCING, STRUCTURAL DETAILS, AND ALL OTHER FACTORS REQUIRED TO PROVIDE A STRUCTURALLY SOUND, AESTHETICALLY ACCEPTABLE FINISHED PRODUCT. WATER-REDUCING ADMIXTURES WILL LIKELY BE REQUIRED TO MEET THESE REQUIREMENTS. CONCRETE MIX DESIGNS SHALL CLEARLY INDICATE THE TARGET SLUMP. SLUMP TOLERANCE SHALL BE ± 1-1/2" INCHES.

AGGREGATE: COARSE AND FINE AGGREGATE SHALL CONFORM TO ASTM C-33

CEMENT: CEMENT SHALL CONFORM TO ASTM-150, TYPE II PORTLAND CEMENT, UNLESS NOTED OTHERWISE.

ALTERNATE MIX DESIGNS: VARIATIONS TO THE MIX DESIGN PROPORTIONS MAY BE ACCEPTED IF SUBSTANTIATED IN ACCORDANCE WITH ACI-318, CHAPTER 5. PROVIDE SUBMITTALS A MINIMUM OF TWO WEEKS PRIOR TO BID FOR DETERMINATION OF ACCEPTABILITY.

ADMIXTURES: ADMIXTURES SHALL BE BY MASTER BUILDERS, W.R. GRACE, OR PRE-APPROVED EQUAL. ALL MANUFACTURER'S RECOMMENDATIONS SHALL BE FOLLOWED.

WATER: SHALL BE CLEAN AND POTABLE.

MAXIMUM CHLORIDE CONTENT: THE MAXIMUM WATER SOLUBLE CHLORIDE CONTENT SHALL NOT EXCEED 0.15% BY WEIGHT OF CEMENTITIOUS MATERIAL UNLESS NOTED OTHERWISE.

CONCRETE EXPOSED TO WEATHER: PROVIDE 5.0% TOTAL AIR CONTENT FOR ALL CONCRETE EXPOSED TO WEATHER. TOTAL AIR CONTENT OF ALL AIR-ENTRAINED AIR PROVIDED BY ADMIXTURES AND NATURALLY OCCURRING ENTRAPPED AIR. AIR CONTENT SHALL BE TESTED PRIOR TO BEING PLACED IN THE PUMP HOPPER OR BUCKET, IT IS NOT REQUIRED TO BE TESTED AT THE DISCHARGE END OF THE PUMP HOSE. THE TOLERANCE ON ENTRAPPED AIR SHALL BE +2.0% AND -1.5% WITH THE AVERAGE OF ALL TESTS NOT LESS THAN THE SPECIFIED AMOUNT.

CONCRETE MIX NOTES:

1. TOTAL CEMENTITIOUS MATERIAL IS THE SUM OF ALL CEMENT PLUS FLYASH.

2. AT THE CONTRACTORS OPTION, FLYASH MAY BE SUBSTITUTED FOR CEMENT BUT SHALL NOT EXCEED 25% BY WEIGHT OF TOTAL CEMENTITIOUS MATERIAL.

3. FIBROUS CONCRETE REINFORCEMENT SHALL BE "FIBERMESH" MANUFACTURED BY SI CONCRETE SYSTEMS OR PRE-APPROVED EQUAL AND SHALL CONFORM TO ASTM C-1116 TYPE III 4.1.3. PERFORMANCE LEVEL 1, AND SHALL BE 100 PERCENT VIRGIN POLYPROPYLENE FIBRILLATED FIBERS CONTAINING NO REPROCESSSED OLEFIN MATERIALS AND SPECIFICALLY MANUFACTURED FOR USE AS CONCRETE SECONDARY REINFORCEMENT. DOSAGE SHALL FOLLOW MANUFACTURER'S RECOMMENDATION BUT NOT BE LESS THAN 1.5 LB/CU. YD.

CONCRETE PLACEMENT

PLACE CONCRETE FOLLOWING ALL APPLICABLE ACI RECOMMENDATIONS. CONCRETE SHALL BE PROPERLY CONSOLIDATED PER ACI 309 USING INTERIOR MECHANICAL VIBRATORS; DO NOT OVER-VIBRATE. CONCRETE SHALL BE POURED MONOLITHICALLY BETWEEN CONSTRUCTION OR EXPANSION JOINTS. IF CONCRETE IS PLACED BY THE PUMP METHOD, HORSES SHALL BE PROVIDED TO SUPPORT THE HOSE. WEATHER FORECASTS SHALL BE MONITORED AND ACI RECOMMENDATIONS FOR HOT AND COLD WEATHER CONCRETING SHALL BE FOLLOWED AS REQUIRED. CONCRETE SHALL NOT FREE FALL MORE THAN 5 FEET DURING PLACEMENT WITHOUT WRITTEN APPROVAL OF ENGINEER.

FORMWORK STRIPPING

1) COLUMNS & WALLS - COLUMNS AND WALLS NOT SUPPORTING FRAMING WEIGHT MAY BE STRIPPED AS SOON AS FORMS CAN BE REMOVED WITHOUT DAMAGING THE CONCRETE AND THE CONCRETE HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 500 PSI.

2) BEAMS & SLABS - BEAMS AND SLABS MAY BE STRIPPED AND BECOME SELF-SUPPORTING AS SOON AS THEIR COMPRESSIVE STRENGTH REACHES 75% OF THE SPECIFIED DESIGN STRENGTH. RESHORING SHALL BE PROVIDED FOR ALL CONSTRUCTION LOADS THEREAFTER PER THE GENERAL CONTRACTOR.

COLD WEATHER PLACEMENT

1) COLD WEATHER IS DEFINED BY ACI 306 AS "A PERIOD WHEN FOR MORE THAN 3 SUCCESSIVE DAILY TEMPERATURE DROPS BELOW 40° F."

2) NO CONCRETE SHALL BE PLACED ON FROZEN OR PARTIALLY FROZEN GROUND. THAWING WITH HEATERS AND SUBSEQUENTLY COMPACTING THE GROUND IS PERMISSIBLE.

3) CONCRETE MIX TEMPERATURES SHALL BE AS SHOWN BELOW. HEATING OF WATER AND/OR AGGREGATES MAY BE REQUIRED TO ATTAIN THESE TEMPERATURES.

4) THE CONCRETE MAY REQUIRE PROTECTION FOR 4-7 DAYS AFTER PLACING. IF TEMPERATURES REMAIN BELOW FREEZING, INSULATING BLANKET COVERAGE IS REQUIRED. IF TEMPERATURES ARE SLIGHTLY BELOW FREEZING (30° F MIN.) AT NIGHT AND ABOVE FREEZING DURING THE DAY, KRAFT PAPER WITH COMPLETE COVERAGE MAY BE USED IN lieu OF INSULATED BLANKETS.

5) NO ADDITIVES CONTAINING CHLORIDES SHALL BE USED. USE "POZZUTEC 20" BY MASTER BUILDERS OR "POLARSETE" BY W.R. GRACE OR PRE-APPROVED EQUAL.

CONTROL AND CONSTRUCTION JOINTS

CONSTRUCTION JOINTS SHALL MEET THE REQUIREMENTS OF ACI 301 SECTIONS 2.2.2.5 AND 5.2.2.6. KEYWAYS PER SECTION 2.2.2.6B ARE NOT REQUIRED UNLESS SPECIFICALLY NOTED ON THE STRUCTURAL DRAWINGS. SPECIAL BONDING METHODS PER SECTION 5.3.2.6 SHALL BE SATISFIED BY ITEM 3 BELOW UNLESS OTHERWISE DETAILED ON THE STRUCTURAL DRAWINGS. WHERE CONSTRUCTION JOINTS ARE NOT SHOWN ON PLAN OR ADDITIONAL CONSTRUCTION JOINTS ARE REQUIRED, SUBMIT PROPOSED JOINTING FOR ENGINEER'S APPROVAL. PROVIDE CONSTRUCTION JOINTS AS INDICATED BELOW UNLESS NOTED OTHERWISE ON THE PLANS.

1. SLABS ON GRADE: PROVIDE CONSTRUCTION AND/OR CONTROL JOINTS AT 13 FEET OC FOR SLABS ON GRADE. PERPENDICULAR SPACING RATIO SHALL NOT EXCEED 1.5.

2. WALLS AND COLUMNS: COORDINATE CONSTRUCTION JOINTS WITH ARCHITECTURAL REVEALS.

3. BONDING AGENT: WHERE BONDING AGENT IS SPECIFICALLY CALLED OUT ON THE STRUCTURAL DRAWINGS, USE "WELD CRETE" BY LARSON PRODUCTS CORPORATION OR PRE-APPROVED EQUAL. FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS.

EMBEDDED ITEMS

EMBEDDED CONDUIT IS NOT PERMITTED IN SLAB EXCEPT WHERE SPECIFICALLY SHOWN. IT SHALL BE PLACED AND REINFORCED PER THE TYPICAL CONCRETE DETAILS. NO ALUMINUM ITEMS SHALL BE EMBEDDED IN ANY CONCRETE. ALL EMBED PLATES SHALL BE SECURELY FASTENED IN PLACE.

CONCRETE CURING AND SEALING

CURING PROCEDURES SHALL COMMOENCE IMMEDIATELY AFTER FINISHING CONCRETE TO MAINTAIN CONCRETE IN A MOIST CONDITION. VERIFY CURING AND/OR SEALING PRODUCTS ARE COMPATIBLE WITH FLOOR COVERINGS SHOWN ON THE ARCHITECTURAL DRAWINGS. FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS.

CONCRETE CURING NOTES:

1. PROVIDE PRE-APPROVED MOIST CURE METHOD FOR A MINIMUM OF 7 DAYS.

2. WHEN THE ESTIMATED EVAPORATION RATE IS GREATER THAN 0.2 PSF/HOUR, PROVIDE A SPRAY APPLIED EVAPORATION RETARDER IMMEDIATELY AFTER CONCRETE PLACEMENT. THE EVAPORATION RATE MAY BE CALCULATED PER ACI 305 FIGURE 2.1.5.

3. APPLY A LIQUID MEMBRANE FORMING CURING COMPOUND PER MANUFACTURER'S RECOMMENDATIONS TO ALL EXPOSED SURFACES IMMEDIATELY AFTER FINAL FINISHING.

4. APPLY A LIQUID MEMBRANE FORMING CURING COMPOUND PER MANUFACTURER'S RECOMMENDATIONS TO ALL FORMED SURFACES IMMEDIATELY AFTER FORM REMOVAL. NOT REQUIRED IF FORMWORK REMAINS IN PLACE FOR MORE THAN 7 DAYS.

5. APPLY A SILANE SEALER WITH A MINIMUM SOLIDS CONTENT OF 40% PER MANUFACTURER'S RECOMMENDATIONS.

GROUT

NON-SHRINK GROUT: MASTER BUILDERS "MASTERFLOW 555" OR PRE-APPROVED EQUAL. GROUT SHALL CONFORM TO CRD-C621 AND ASTM C1107 GRADE B WHEN TESTED AT A FLUID CONSISTENCY PER CRD-C611-86 FOR 30 MINUTES. GROUT MAY BE PLACED FROM A 25 SECOND FLOW TO A STIFF PACKING CONSISTENCY, FILL OR PACK ENTIRE SPACE UNDER PLATES OR FLOW TO A STIFF PACKING CONSISTENCY. FILL OR PACK ENTIRE SPACE UNDER PLATES OR SHAPES. NO GROUTING SHALL BE DONE BELOW 40" F.

EPOXY: USE TWO-PART LOW-SAG EPOXY. GROUT MAY CONTAIN QUARTZ SAND AGGREGATE AS PORPORTIONED BY THE MANUFACTURER. USE EQUIPMENT WHICH WILL ACCURATELY MIX AND DISPENSE THE COMPONENTS. HOLE SHALL BE DRY AND CLEANED WITH WIRE BRUSH AND PRESSURIZED AIR JUST PRIOR TO INSTALLING GROUT. THE REBAR OR ROD SHALL BE CLEAN AND INSTALLED SLOWLY, AND SHALL BE ROTATED AS IT IS PUSHED INTO THE HOLE. COLD WEATHER GROUTING SHALL BE DONE WITH PROPER GROUT FORMULA. FIRST STAGES OF THE GROUTING OPERATION SHALL BE INSPECTED.

REINFORCING STEEL

REINFORCING STEEL SHALL CONFORM TO ASTM A-615, GRADE 60 (GRADE A706 FOR WELDED BARS UNLESS OTHERWISE NOTED, GRADE 40 FOR BEND OUT BARS). DETAIL, FABRICATE AND PLACE PER ACI 318 AND ACI 318. HORIZONTAL BEAM BARS, VERTICAL COLUMN BARS AND VERTICAL SHEAR WALL BARS SHALL MEET THE REQUIREMENTS OF ACI SECTION 21.2.5. REINFORCEMENT SHALL COMPLY WITH ASTM A706 FOR LOW-ALLOY STEEL. BILLET STEEL A615 GRADE 60 REINFORCEMENT MAY BE USED IF THE ACTUAL YIELD STRENGTH BASED ON MILL TESTS DOES NOT EXCEED THE SPECIFIED STRENGTH BY MORE THAN 18,000 PSI AND THE RATIO OF THE ACTUAL ULTIMATE TENSILE STRESS TO THE ACTUAL YIELD STRENGTH IS NOT LESS THAN 1.25.

WELDED WIRE FABRIC REINFORCEMENT SHALL CONFORM TO ASTM A-82 AND A-185. LAP ONE FULL MESH ON SIDES AND ENDS.

GENERAL NOTES

ANY DISCREPANCIES FOUND AMONG THE DRAWINGS, THESE GENERAL NOTES, AND THE SITE CONDITIONS SHALL BE REPORTED TO THE ENGINEER, WHO SHALL CORRECT SUCH DISCREPANCY IN WRITING. ANY WORK DONE BY THE GENERAL CONTRACTOR AFTER DISCOVERY OF SUCH DISCREPANCY SHALL BE DONE AT THE GENERAL CONTRACTOR'S RISK. THE GENERAL CONTRACTOR SHALL VERIFY AND COORDINATE DIMENSIONS AMONG ALL DRAWINGS PRIOR TO PROCEEDING WITH ANY WORK OR FABRICATION. THE STRUCTURE HAS BEEN DESIGNED TO RESIST CODE REQUIRED VERTICAL AND LATERAL FORCES AFTER THE CONSTRUCTION OF ALL STRUCTURAL ELEMENTS HAS BEEN COMPLETED. STABILITY OF THE STRUCTURE PRIOR TO COMPLETION IS THE SOLE RESPONSIBILITY OF THE GENERAL CONTRACTOR. THIS RESPONSIBILITY INCLUDES BUT IS NOT LIMITED TO JOB SITE SAFETY, ERECTION MEANS, METHODS, AND SEQUENCES, TEMPORARY SHORING, FORMWORK, AND BRACING; USE OF EQUIPMENT AND CONSTRUCTION PROCEDURES; PROVIDE ADEQUATE RESISTANCE TO LOADS ON THE STRUCTURES DURING CONSTRUCTION PER SEI/ASCE STANDARD NO. 37-02 "DESIGN LOADS ON STRUCTURES DURING CONSTRUCTION." CONSTRUCTION OBSERVATION BY THE STRUCTURAL ENGINEER IS FOR GENERAL CONFORMANCE WITH DESIGN ASPECTS ONLY AND IS NOT INTENDED IN ANY WAY TO REVIEW THE CONTRACTOR'S CONSTRUCTION PROCEDURES.

STANDARDS

ALL METHODS, MATERIALS, AND WORKMANSHIP SHALL CONFORM TO THE 2013 CALIFORNIA BUILDING CODE (CBC) AS AMENDED AND ADOPTED BY THE LOCAL BUILDING OFFICIAL OR APPLICABLE JURISDICTION.

CONTRACT DRAWINGS / DIMENSIONS

ARCHITECTURAL DRAWINGS ARE THE PRIME CONTRACT DRAWINGS. CONSULTANT DRAWINGS BY OTHER DISCIPLINES ARE SUPPLEMENTARY TO ARCHITECTURAL DRAWINGS. REPORT DIMENSIONAL OMISSIONS OR DISCREPANCIES BETWEEN ARCHITECTURAL DRAWINGS AND STRUCTURAL, MECHANICAL, ELECTRICAL OR CIVIL DRAWINGS TO ARCHITECT PRIOR TO PROCEEDING WITH WORK.

STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH ARCHITECTURAL DRAWINGS. PRIMARY STRUCTURAL ELEMENTS ARE DIMENSIONED ON STRUCTURAL PLANS AND DETAILS AND OVERALL LAYOUT OF STRUCTURAL PORTION OF WORK. SOME SECONDARY ELEMENTS ARE NOT DIMENSIONED SUCH AS: WALL CONFIGURATIONS (INCLUDING EXACT DOOR AND WINDOW LOCATIONS), ALCOYS, SLAB SLOPES AND DEPRESSIONS, CURBS, ETC. VERTICAL DIMENSIONAL CONTROL IS DEFINED BY ARCHITECTURAL WALL SECTIONS AND BUILDING SECTIONS. STRUCTURAL DETAILS SHOW DIMENSIONAL RELATIONSHIPS TO CONTROL DIMENSIONS DEFINED BY ARCHITECTURAL DRAWINGS. DETAILING AND SHOP DRAWING PRODUCTION FOR STRUCTURAL ELEMENTS WILL REQUIRE DIMENSIONAL INFORMATION CONTAINED IN BOTH ARCHITECTURAL AND STRUCTURAL DRAWINGS.

DESIGN CRITERIA

RISK CATEGORY: 1 - TABLE 1604.5

VERTICAL LOADS

AREA	DESIGN DEAD LOAD	LIVE LOAD	CONCENTRATED LOADS
ROOF	15 PSF	20 PSF	--
FLOOR	30 PSF	100 PSF	1000#

SNOW: FOR SITES OVER 25 PSF.

ROOF LIVE LOAD GOVERNS

LATERAL FORCES

WIND:

ALTERNATE HEIGHTS METHOD

EXPOSURE CATEGORY = B

- RISK CATEGORY = I
- BASIC WIND SPEED, V = 110 MPH
- Pnet = .00256V^2KzCnetKzt
- Kz = 0.64
- Pnet = 17 PSF

SEISMIC:

V = CSW

$$Cs = Sds/(R/I); 0.044 Sds \leq Cs < Sd1/((R/I)e^T)$$

- SEISMIC IMPORTANCE FACTOR, Ie = 1
- SPECTRAL RESPONSE ACCELERATION Ss = 1.651, S1 = 0.587
- SITE CLASS PER TABLE 20-3.1 OF ASCE 7-10 = D
- SPECTRAL RESPONSE COEFFICIENTS: Sds = 1.101, Sd1 = 0.587
- SEISMIC DESIGN CATEGORY = D
- ANALYSIS PROCEDURE USED = EQUIVALENT LATERAL FORCE ANALYSIS
- RESPONSE MODIFICATION FACTOR PER TABLE 12.2-1 (ASCE 7-10) R = 1.25
- Cs = 0.881
- DESIGN BASE SHEAR, V = 0.881*W (ULTIMATE)

STRUCTURAL STEEL

DETAILING, FABRICATION AND ERECTION

ALL WORKMANSHIP SHALL CONFORM TO THE CURRENT AISC MANUAL OF STEEL CONSTRUCTION AND AISC 360 CURRENT EDITION.

STEEL MEMBERS ARE EQUALLY SPACED BETWEEN DIMENSION POINTS UNLESS NOTED OTHERWISE.

ALL FABRICATION SHALL BE PERFORMED BY A FABRICATOR CERTIFIED BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ERECTION AIDS AND JOINT PREPARATIONS THAT INCLUDE BUT ARE NOT LIMITED TO, ERECTION ANCHORS, LIFT HOLES, AND OTHER AIDS, WELDING PROCEDURES, REQUIRED ROOT OPENINGS, ROOT FACE DIMENSIONS, GROOVE ANGLES, BACKING BARS, WELD EXTENSION TABS, COPES, SURFACE ROUGHNESS VALUES AND TAPERS OF UNEQUAL PARTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLIANCE WITH ALL CURRENT OSHA REQUIREMENTS.

HOLES, COPES, OR OTHER CUTS OR MODIFICATIONS OF THE STRUCTURAL STEEL MEMBERS SHALL NOT BE MADE IN THE FIELD WITHOUT WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER.

MATERIAL PROPERTIES

WIDE FLANGE SECTIONS: ASTM A992 (Fy = 36 KSI)

OTHER SHAPES AND PLATES: ASTM A36 (Fy = 36 KSI)

STRUCTURAL STEEL PIPES: ASTM A53, GRADE B, TYPE E OR S (Fy = 35 KSI)

STEEL STRUCTURAL TUBING: ASTM A500, GRADE B, (Fy =46 KSI).

MACHINE BOLTS (M.B.): ASTM A307, GRADE A

HIGH-STRENGTH BOLTS A325-ASTM F 1852, A490-ASTM A490

ANCHOR BOLTS (A.B.): ASTM F 1554, GRADE 36, CLASS 2A

WELDING:

STRUCTURAL STEEL: WELD IN ACCORDANCE WITH "STRUCTURAL WELDING CODE" AWS D-1.1. 70 KSI MINIMUM WELD MATERIAL.

CERTIFICATION: ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS. WELDERS SHALL BE PREQUALIFIED FOR EACH POSITION AND WELD TYPE WHICH THE WELDER WILL BE PERFORMING. IF WELDERS ARE NOT CERTIFIED, CONTRACTOR SHALL PAY FOR ANY INSPECTIONS BY TESTING AGENCY THAT WOULD NOT HAVE BEEN REQUIRED IF SHOP WAS CERTIFIED. WITHOUT CERTIFICATION, ALL WELDS SHALL BE CONSIDERED FIELD WELDS.

WELD TABS (ALSO KNOWN AS WELD "EXTENSION" TABS OR "RUN OFF" TABS) SHALL BE USED AFTER THE WELD HAS BEEN COMPLETED. THE WELD TABS SHALL BE REMOVED AND THE WELD END GROUNDED TO A SMOOTH CONTOUR. WELD "DAMS" OR "END DAMS" SHALL NOT BE USED.

THE PROCESS CONSUMABLES FOR ALL WELD FILLER METAL INCLUDING TACK WELDS, ROOT PASSES, AND SUBSEQUENT PASSES DEPOSITED IN A JOINT SHALL BE COMPATIBLE.

ALL WELD FILLER METAL AND WELD PROCESS SHALL PROVIDE CHARPY V-NOTCH TOUGHNESS RATING PER LATEST EDITION OF AISC 341.

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1755

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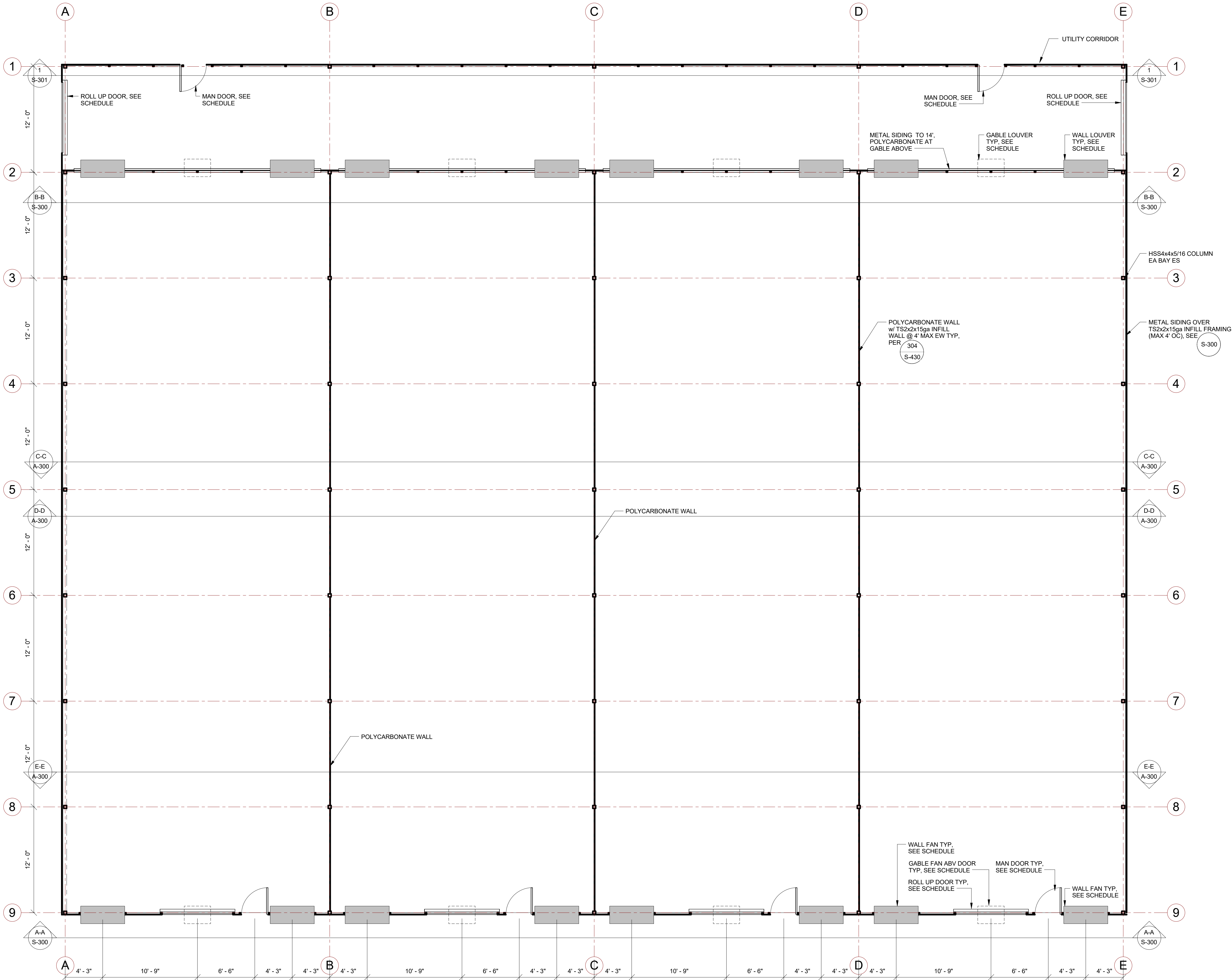
120x96 ALPINE GREENHOUSE

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REGISTERED PROFESSIONAL
MICHAEL JAMES W.
CIVIL
STATE OF CALIFORNIA
SAMPLE PLAN SET

Gro-Tech
SYSTEMS INC.
120x96 ALPINE GREENHOUSE

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COMPONENT SCHEDULE		
ITEM	SIZE	OPENING
GABLE FAN	30"	35-5/8" H x 34-3/4" W
GABLE LOUVER	34"	34-3/4" H x 34-3/4" W
WALL FAN	48"	54-1/4" H x 52-3/4" W
WALL LOUVER	57"	57-3/4" H x 57-3/4" W
MAN-DOOR	36"	84" H x 36" W
ROLL-UP DOOR	8'	10' H x 8' W



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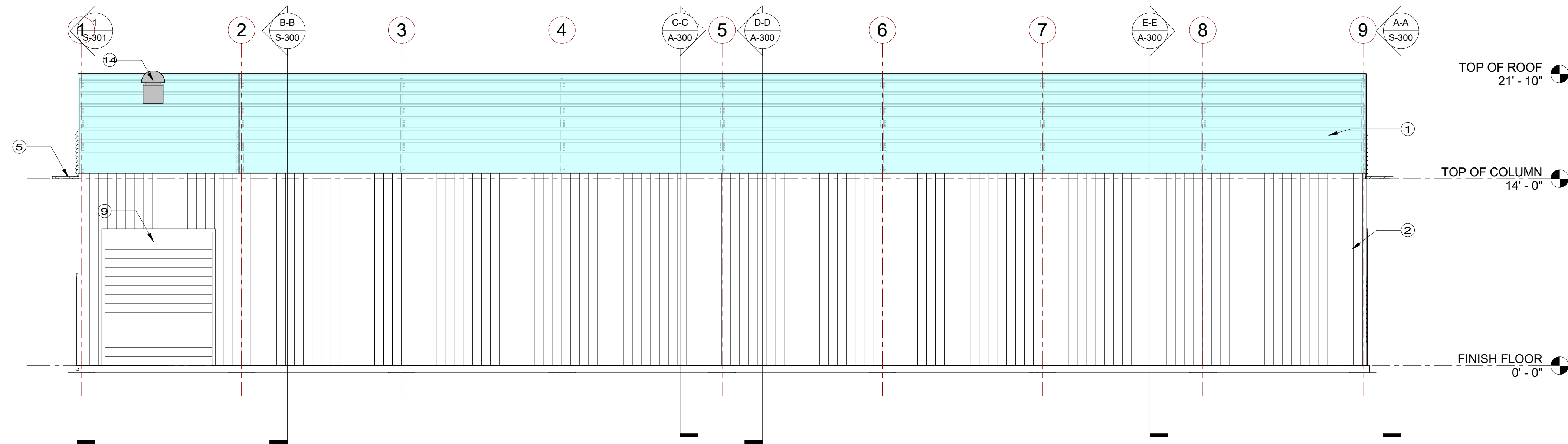
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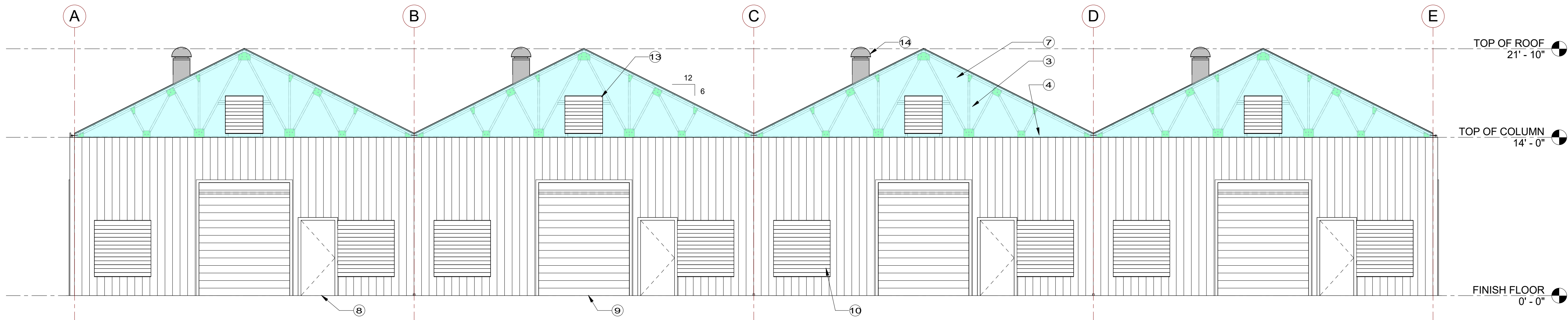
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FLOOR PLAN



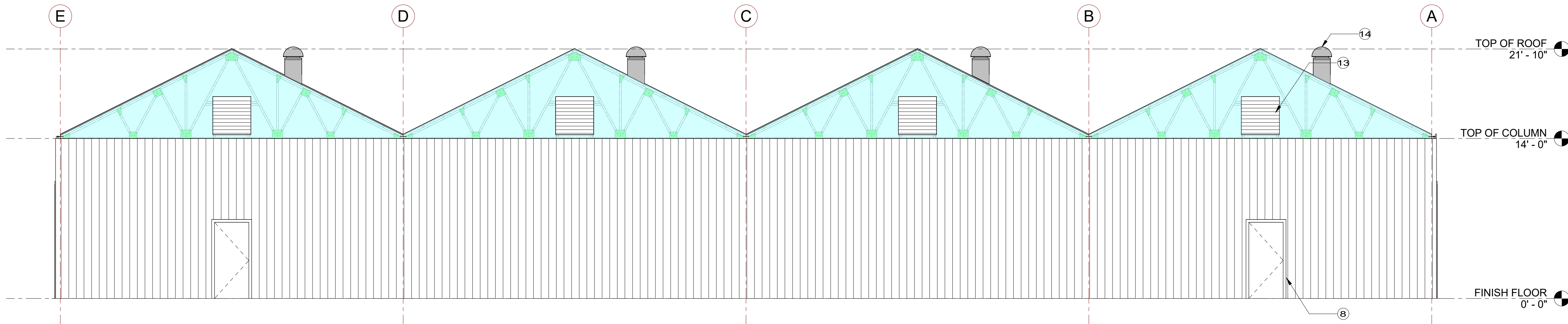
SIDE ELEVATION

3/16" = 1'-0"



FRONT ELEVATION

3/16" = 1'-0"



REAR ELEVATION

3/16" = 1'-0"

ELEVATION LEGEND

- 1 TWIN WALL POLY CARBONATE ROOF - CLEAR
- 2 CORRUGATED METAL SIDING - ASH GREY COLOR
- 3 3/4" Z-BAR FLASHING
- 4 2x2 GSM FLASHING
- 5 GUTTER
- 6 GABLE LOUVER
- 7 TWIN WALL POLY CARBONATE SIDING - CLEAR
- 8 MAN-DOOR
- 9 ROLL-UP DOOR
- 10 WALL FAN
- 11 GUTTER CONNECTION
- 12 WALL LOUVER
- 13 GABLE FAN
- 14 PRESSURE RELIEF DAMPER



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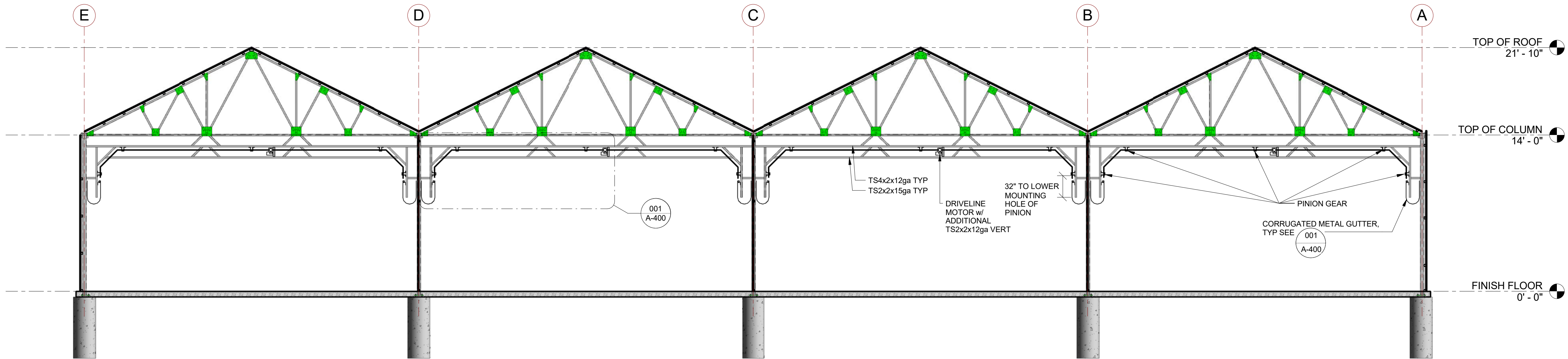
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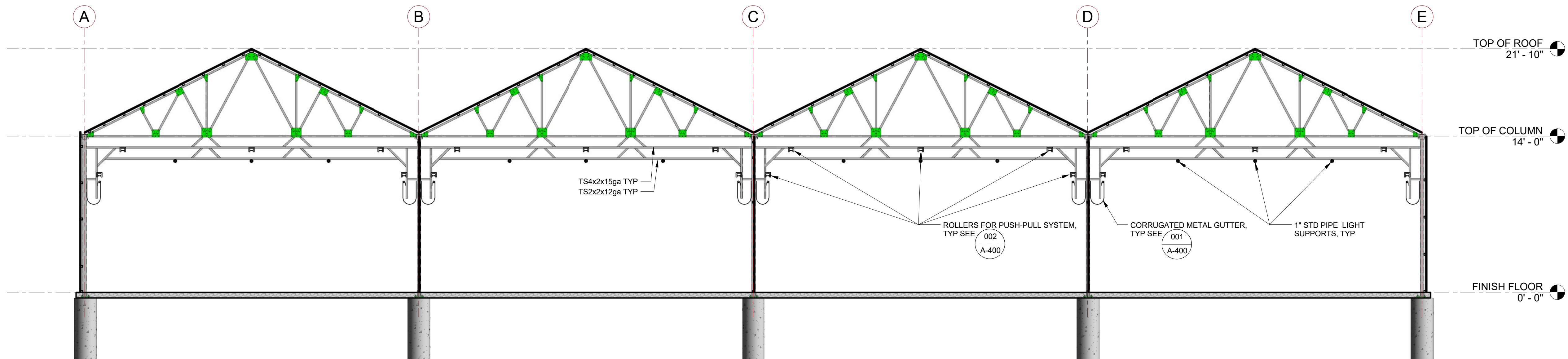
ELEVATIONS

A-200

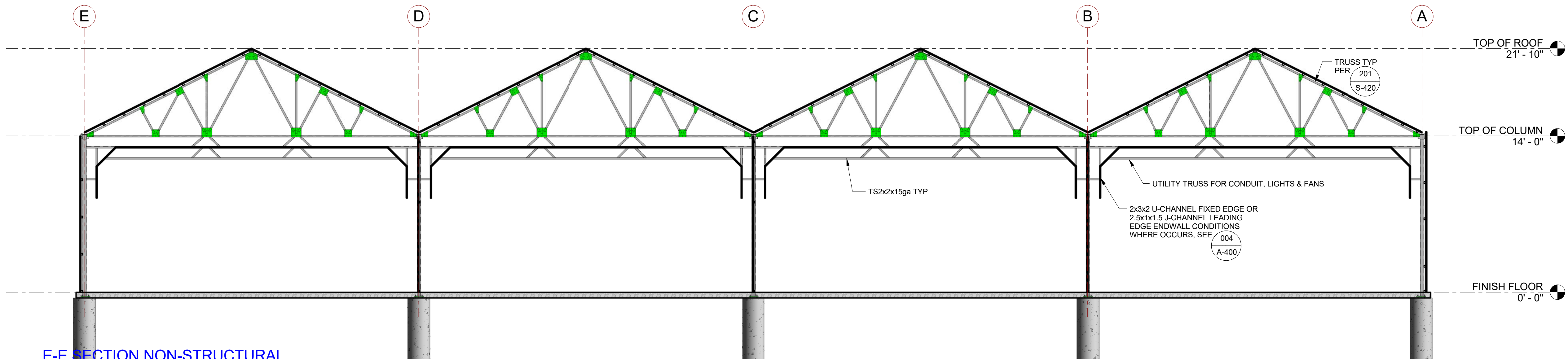
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C-C SECTION DRIVELINE SYSTEM
3/16" = 1'-0"



D-D SECTION PUSH-PULL SYSTEM
3/16" = 1'-0"



E-E SECTION NON-STRUCTURAL ATTACHMENTS
3/16" = 1'-0"

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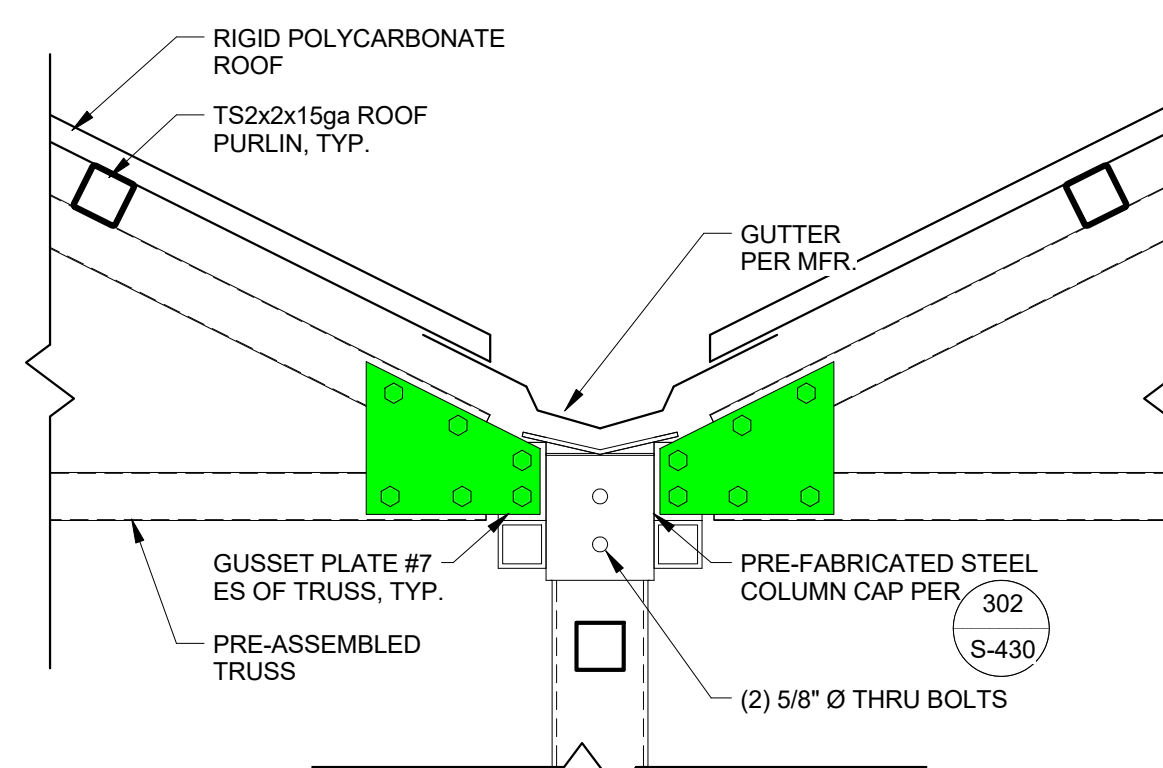
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SECTIONS

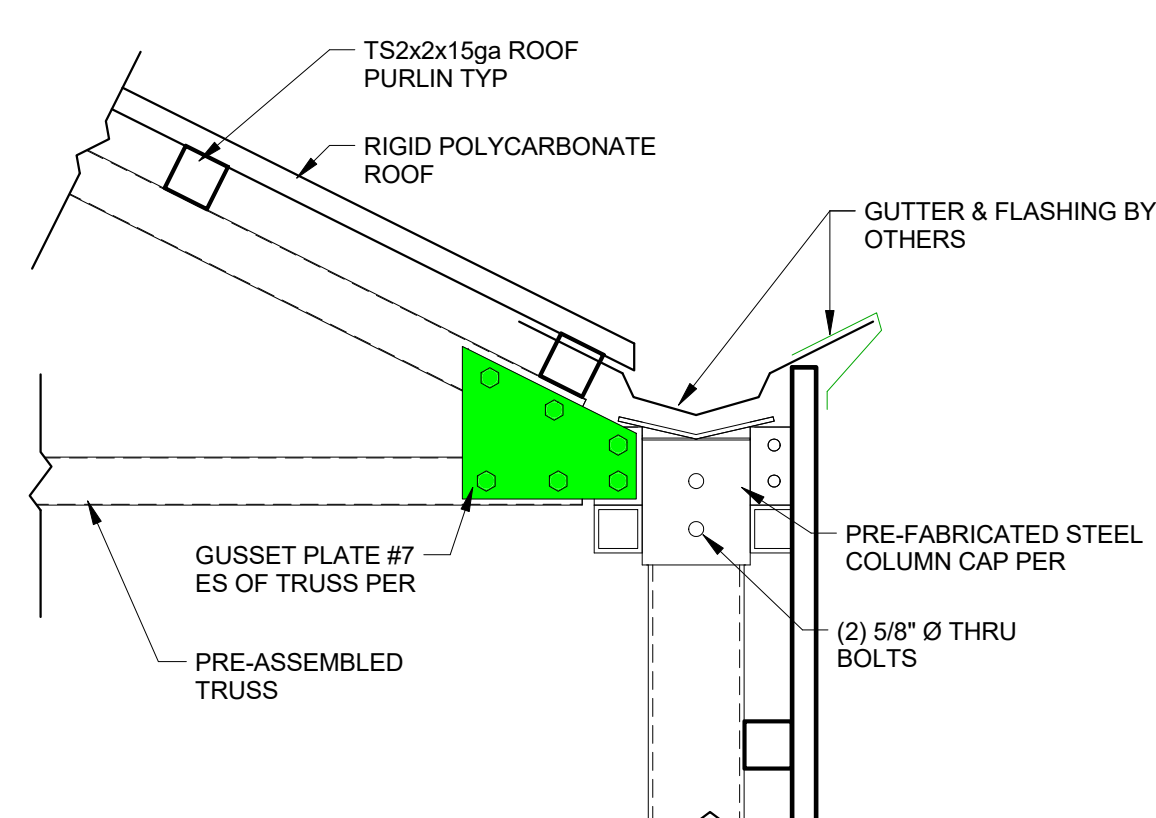
A-300



SCALE: 1 1/2" = 1'-0"

GUTTER CONNECTION

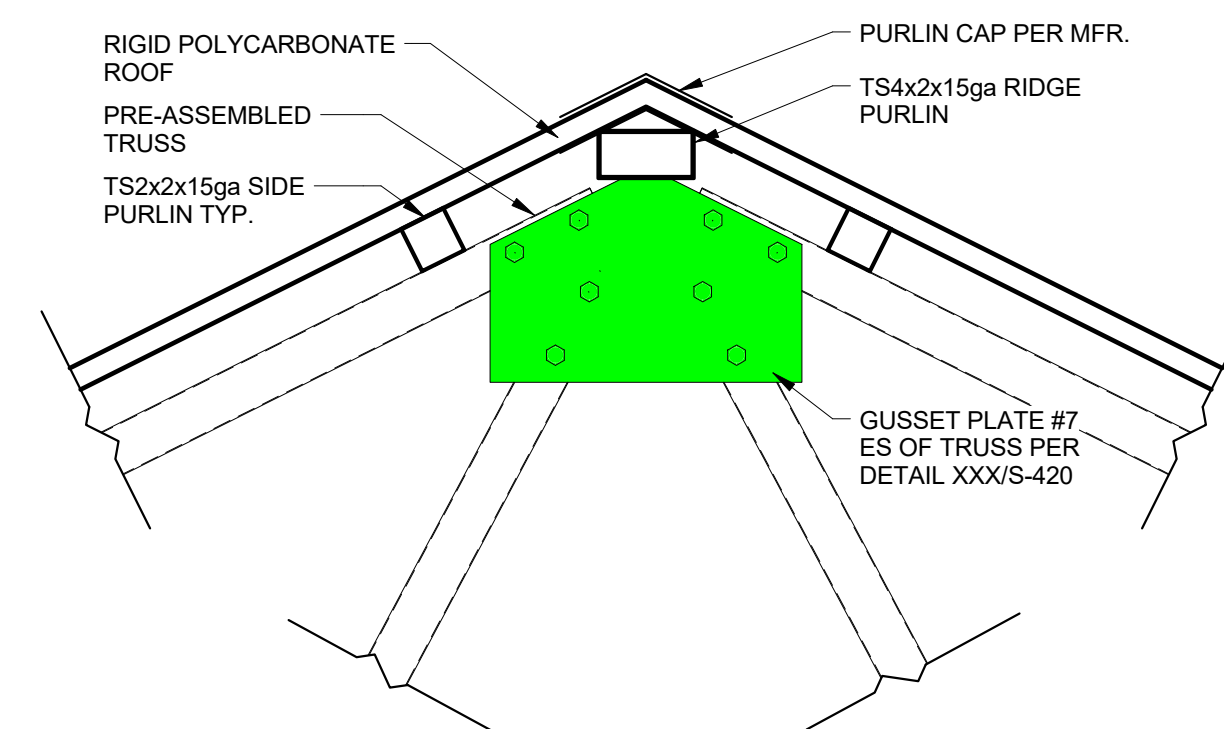
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TRUSS TO COLUMN - SIDE VIEW

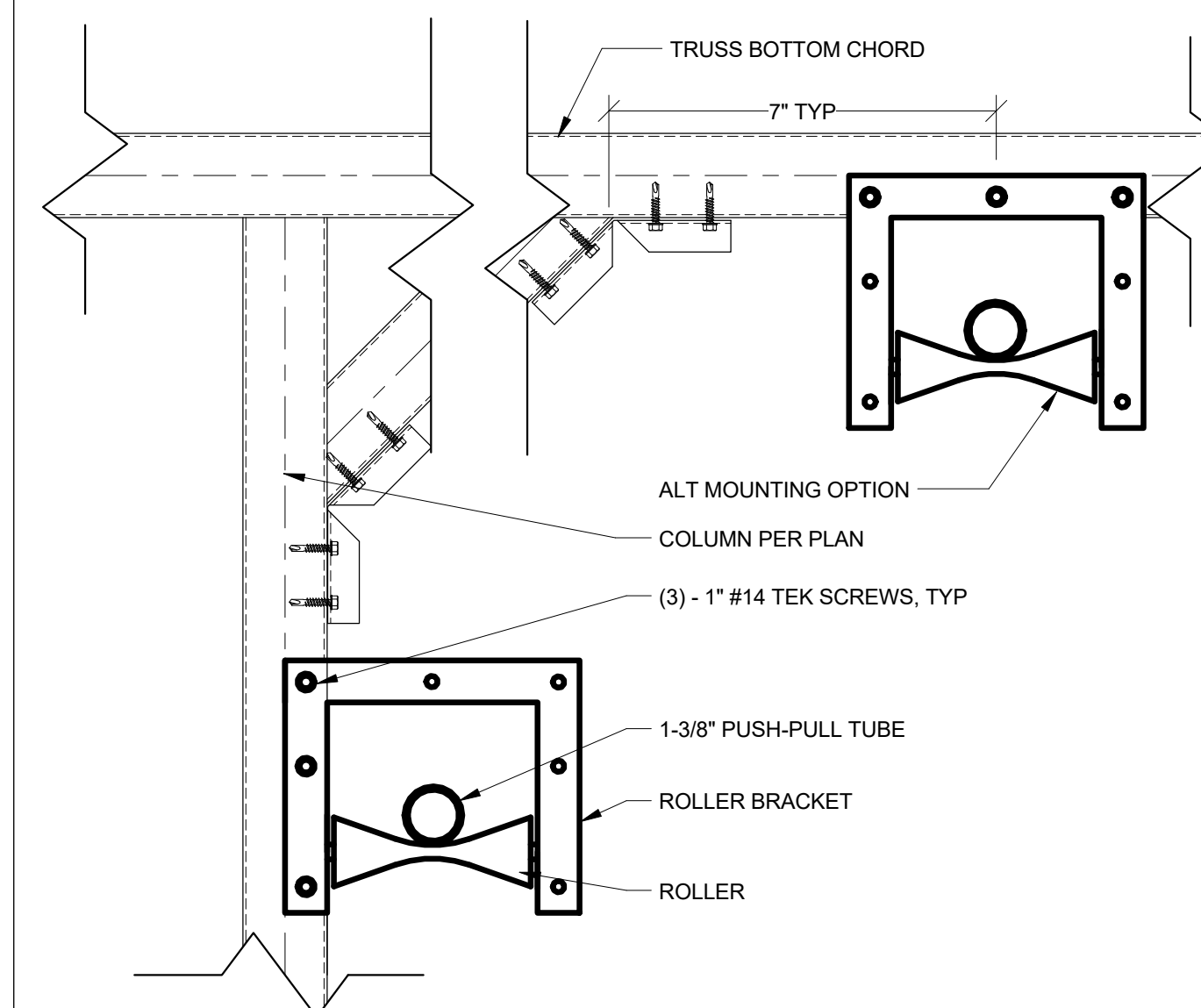
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TRUSS PEAK

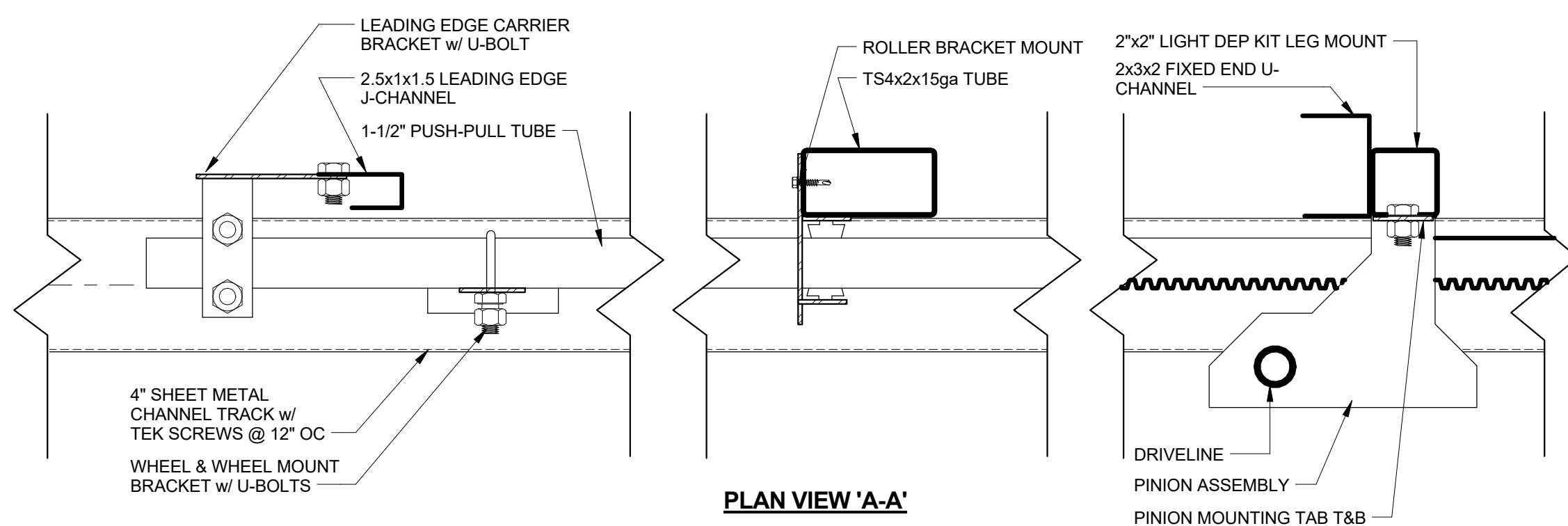
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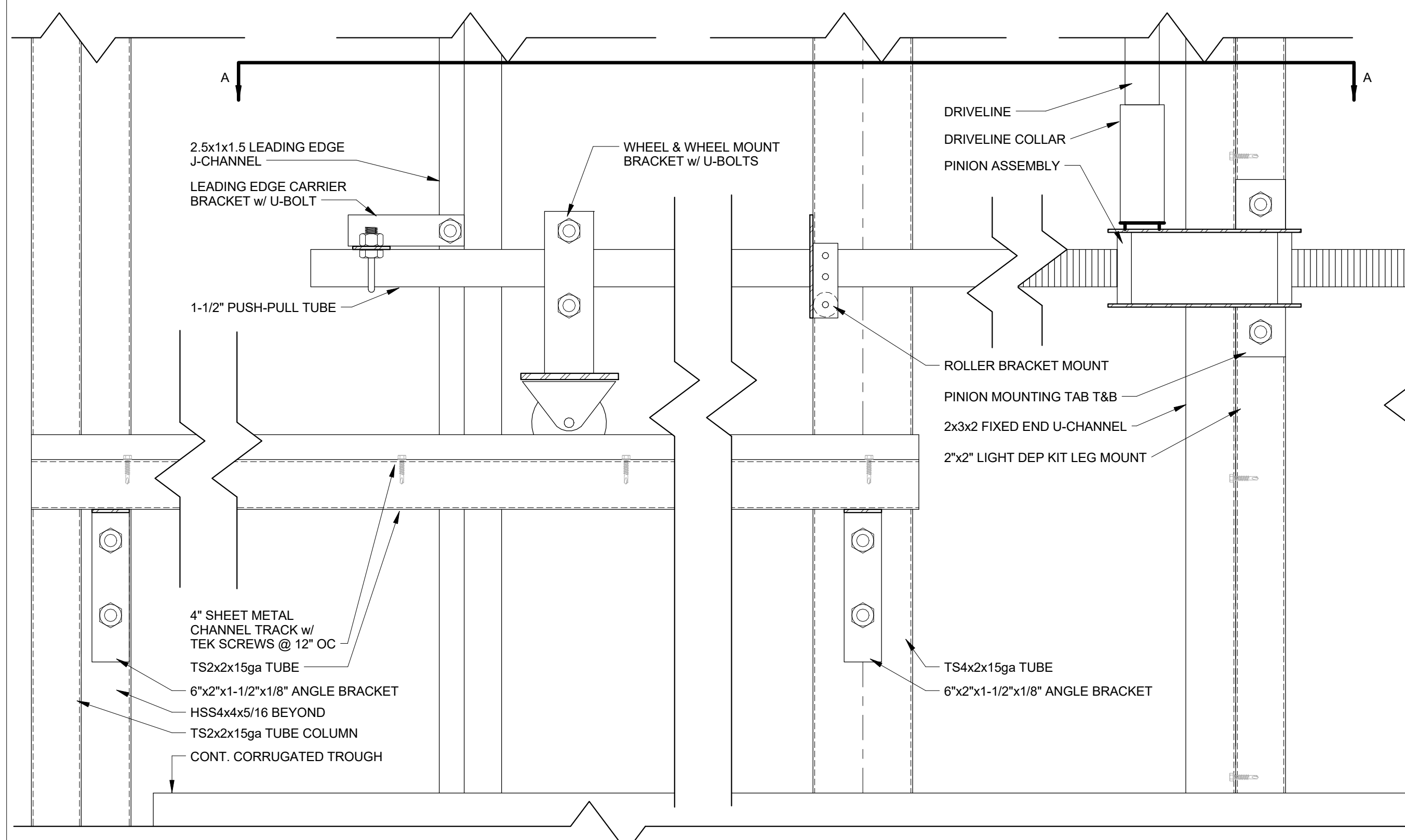
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PUSH-PULL ROLLER BRACKET MOUNTING

002



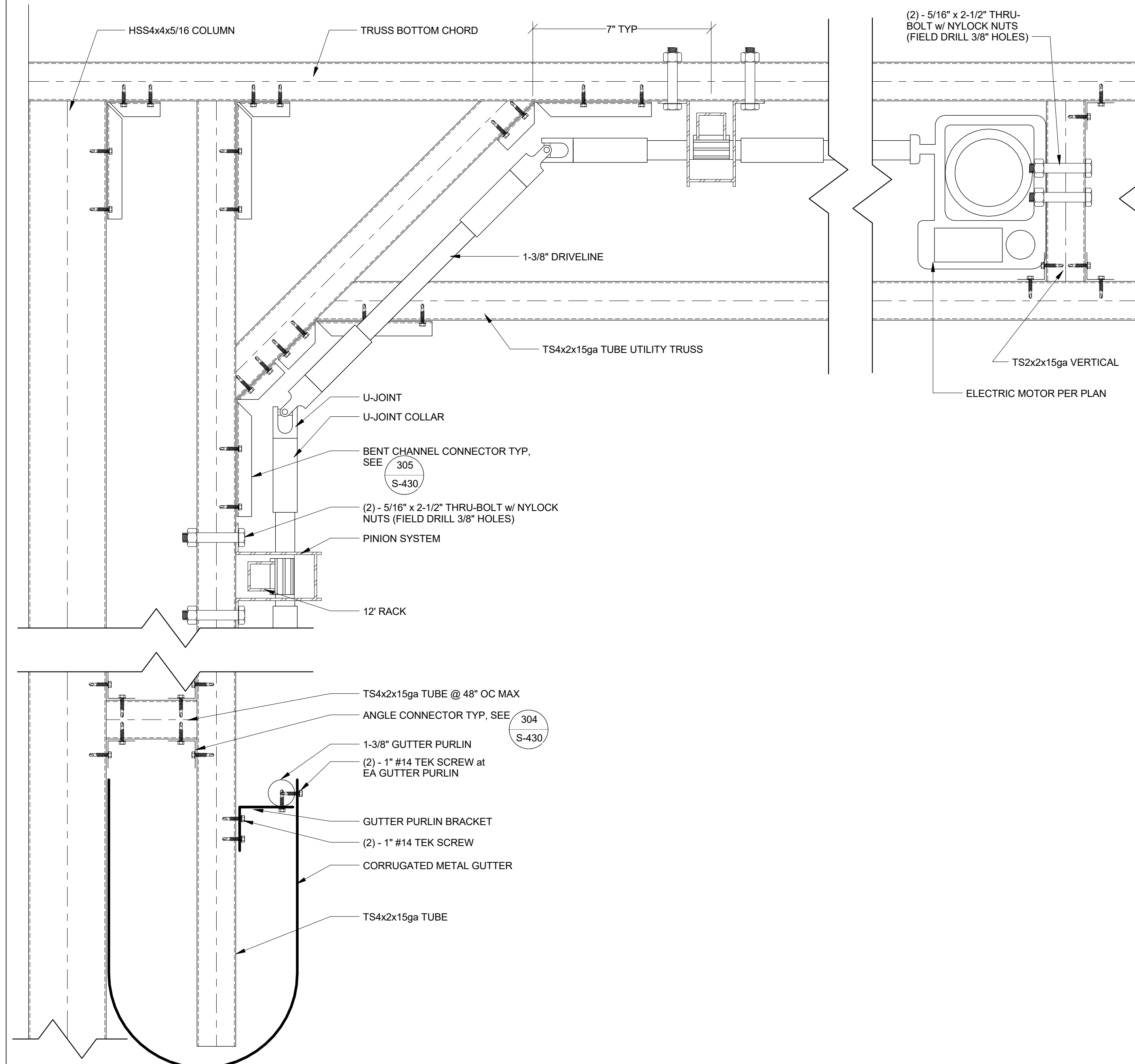
PLAN VIEW 'A-A'



SCALE: 3" = 1'-0"

PUSH-PULL & WHEEL ASSEMBLY

004

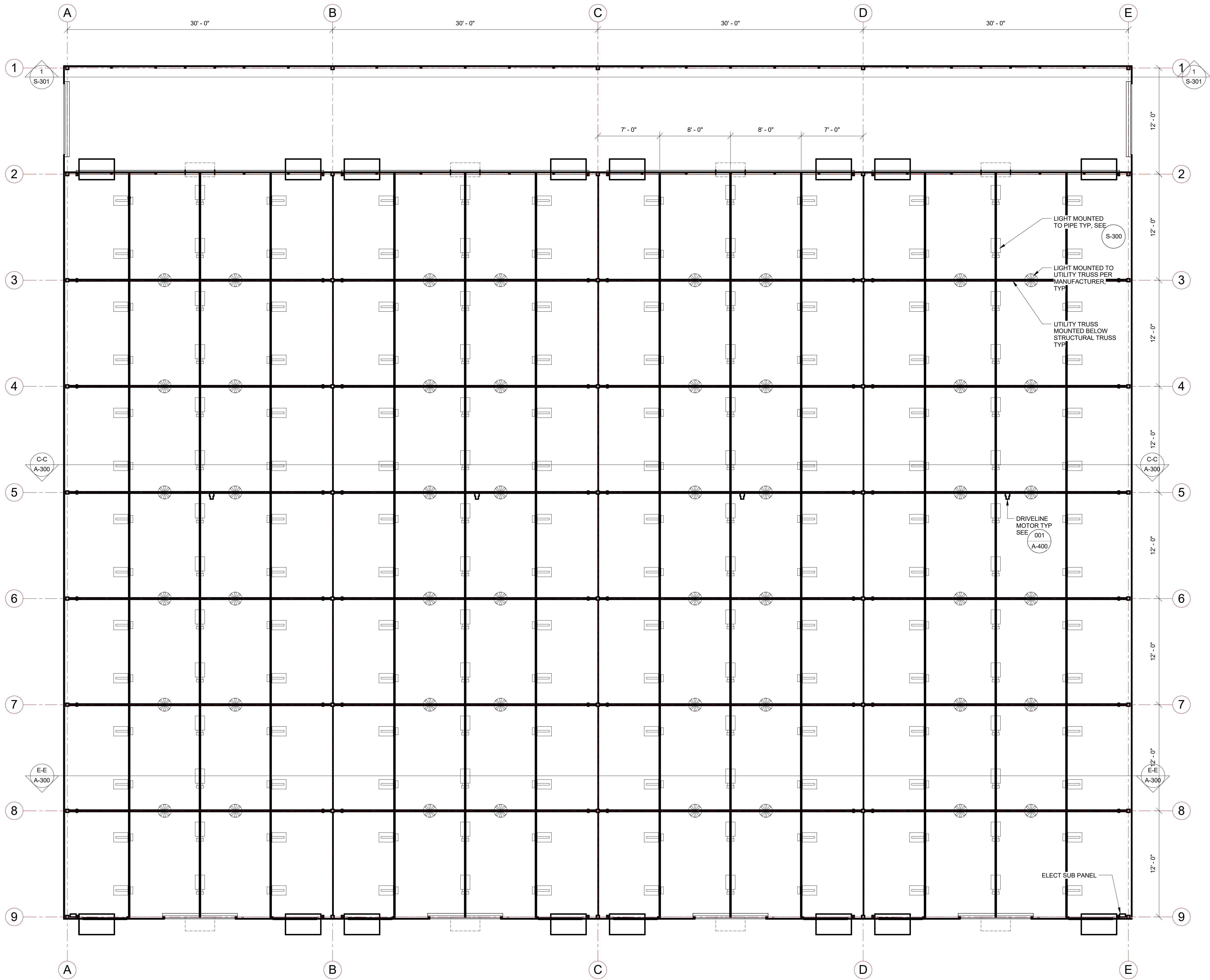


SCALE: 3" = 1'-0"

DRIVELINE SYSTEM

001

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ELECTRICAL PLAN
3/16" = 1'-0"

LEGEND	
SYMBOL	DESCRIPTION
	HAF-18 FAN (10 lbs.)
	LIGHT (13 lbs.)

FOR COMPONENTS NOT LISTED,
SEE FLOOR PLAN & STRUCTURAL

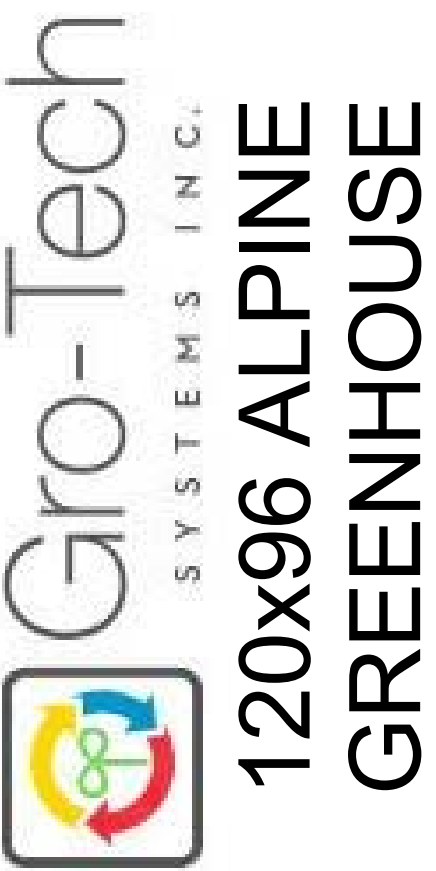


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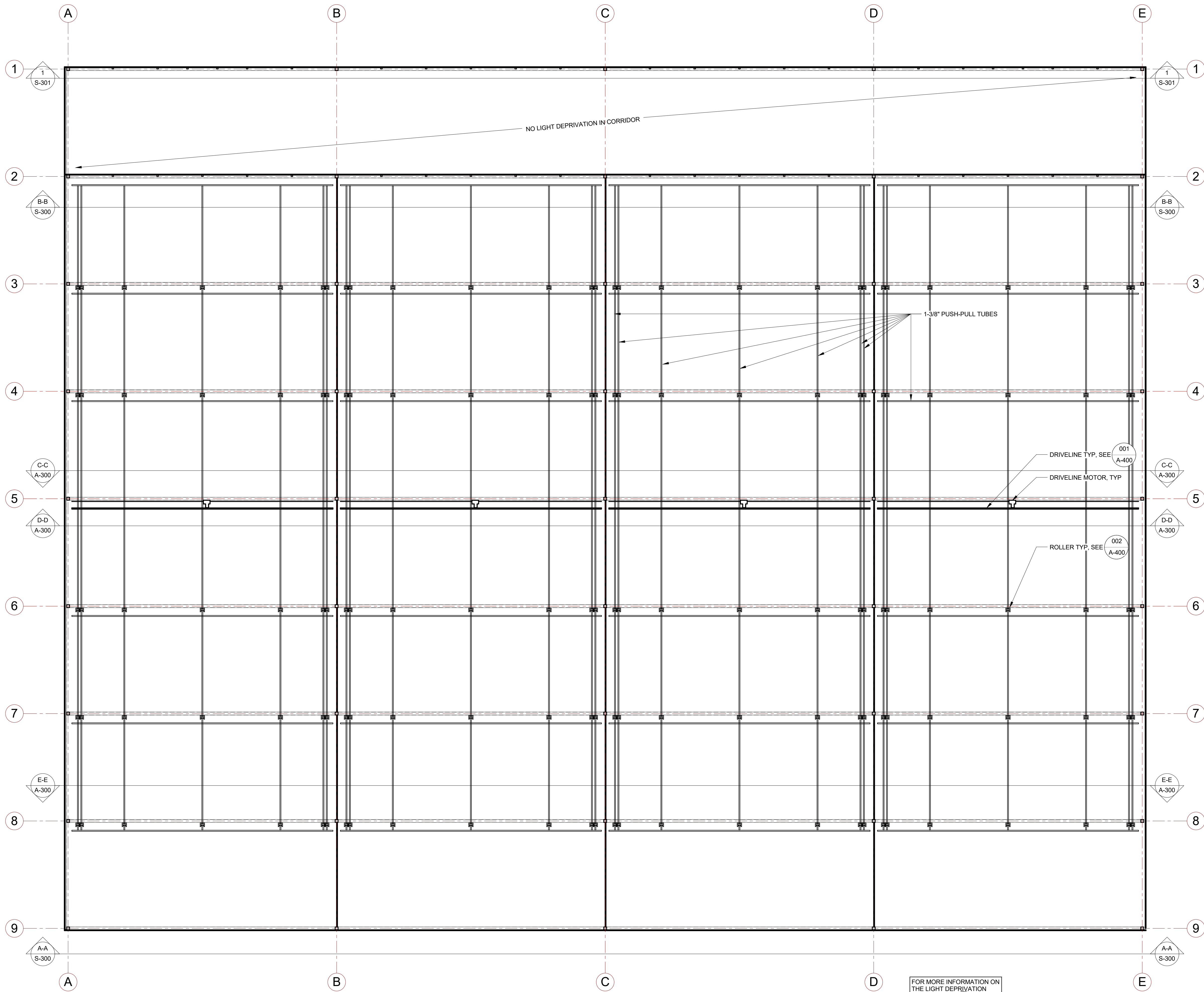
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SCALE 3/16" = 1'-0"

ELECTRICAL
PLAN

E-100

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LIGHT DEPRIVATION PLAN
3/16" = 1'-0"

FOR MORE INFORMATION ON
THE LIGHT DEPRIVATION
SYSTEM, SEE
A-300

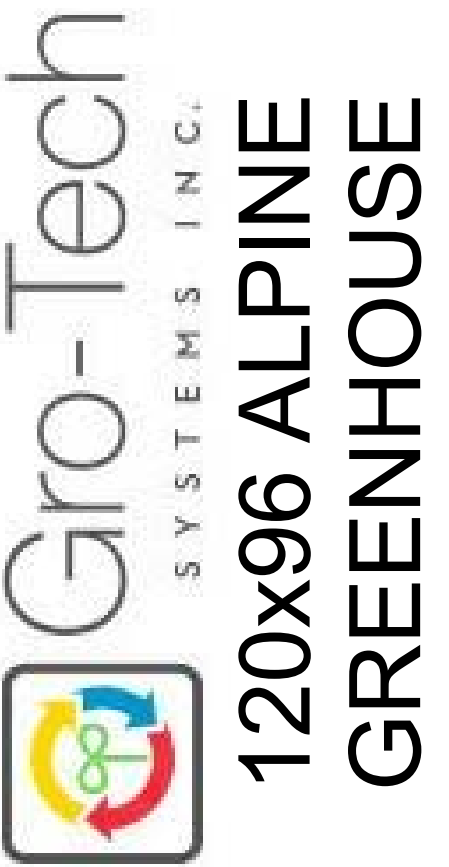


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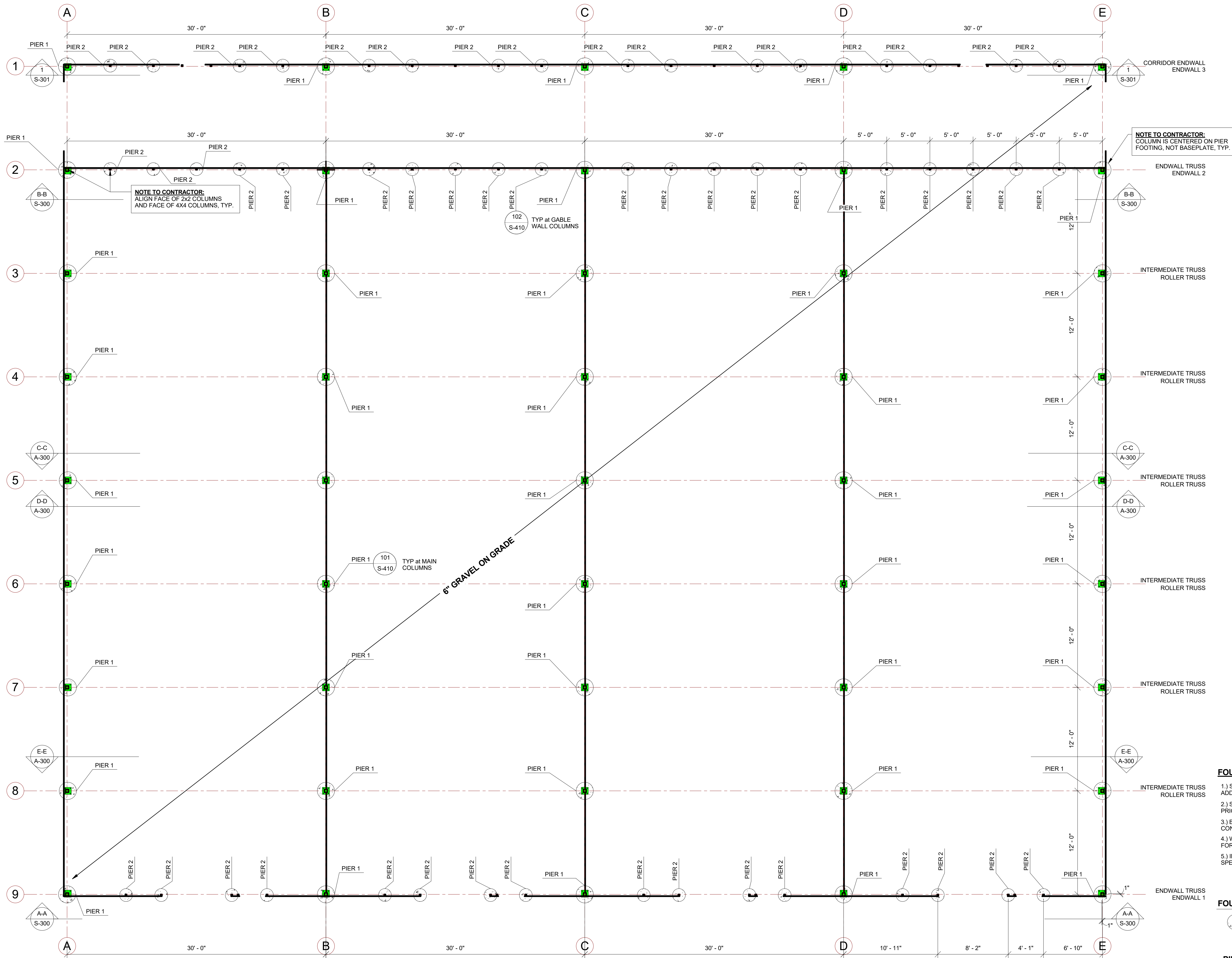
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SCALE 3/16" = 1'-0"

**LIGHT
DEPRIVATION
PLAN**

E-101

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FOUNDATION PLAN
3/16" = 1'-0"

FOUNDATION NOTES

- 1.) SEE TYP NOTES AND DETAILS ON SHEET S-001 FOR ADDITIONAL INFORMATION.
- 2.) SECURE ALL HOLDOWN ANCHORS WITHIN FORMWORK PRIOR TO POUR.
- 3.) BUILDER SHALL CHECK AND VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
- 4.) WIDEN/EXTEND FOOTINGS AS REQUIRED TO PROVIDE SUPPORT FOR ANY VENEER SHOWN ON ARCHITECTURAL DRAWINGS.
- 5.) INSTALL ALL HOLDOWN ANCHORS PER MANUFACTURER SPECS & EDGE DISTANCE REQUIREMENTS.

FOUNDATION LEGEND

 PIER FOOTING

PIER FOOTING SCHEDULE

SYMBOL	FOOTING SIZE	
PIER 1	24" DIA x 6 FT DEEP	DETAIL 101
PIER 2	18" DIA x 2 FT DEEP	DETAIL 102

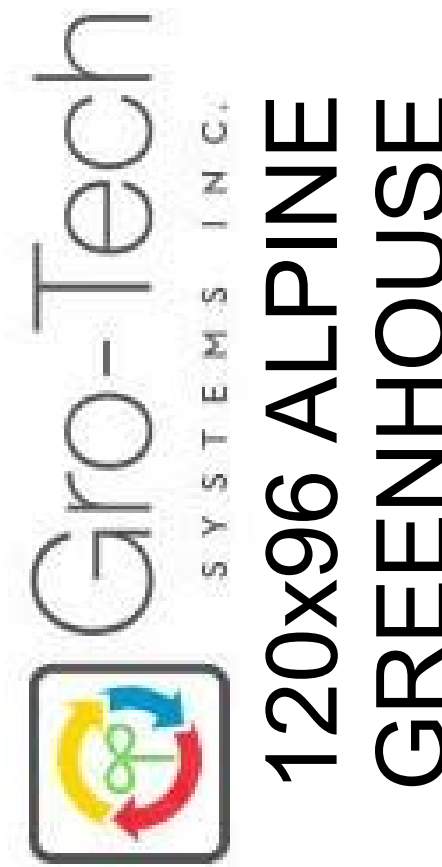


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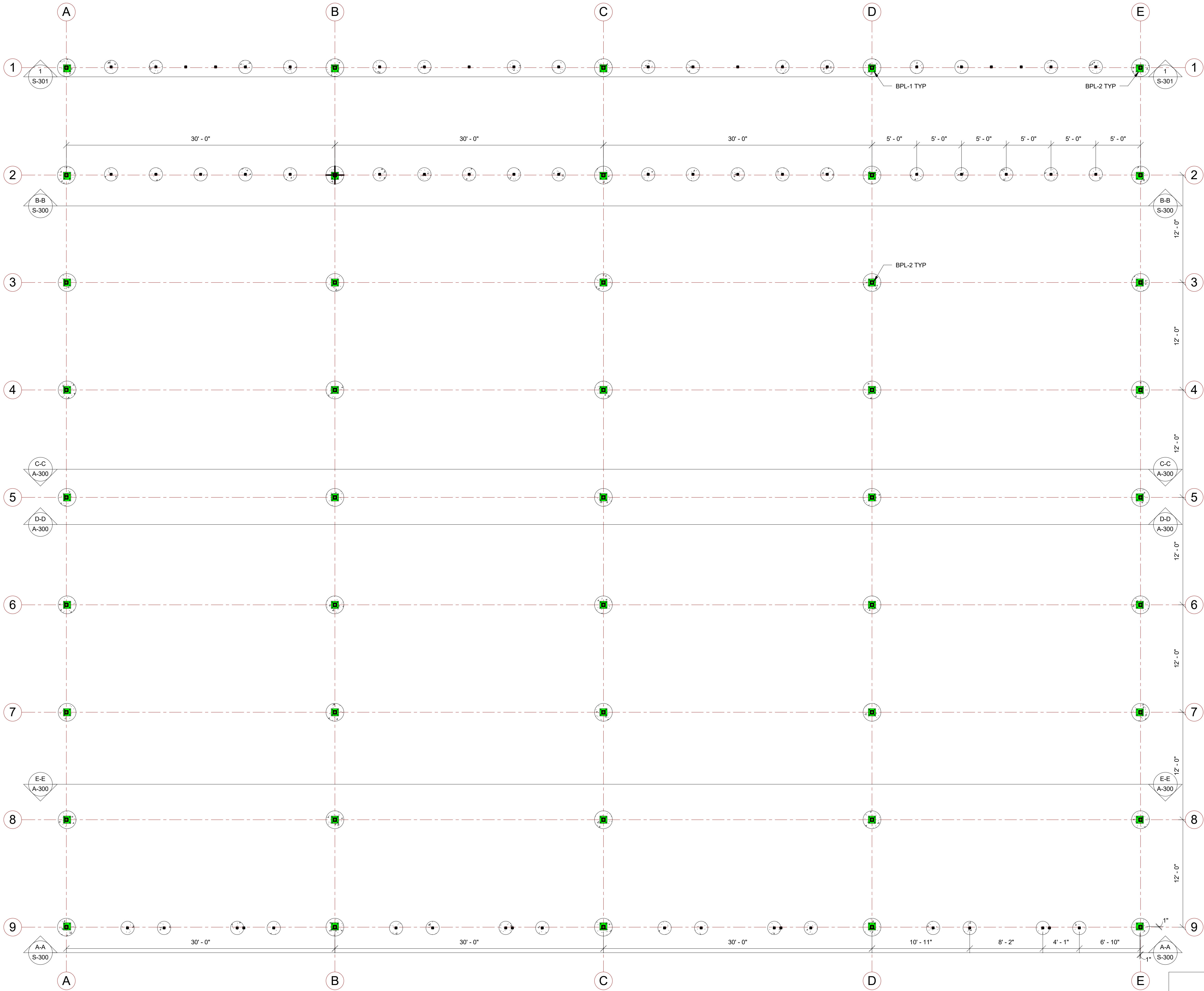
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SCALE As indicated

FOUNDATION PLAN

S-100

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ANCHOR SETTING PLAN
3/16" = 1'-0"

BASE PLATE BILL OF MATERIALS						
Piece Mark	Co unt	Base Plate Thickness	Base Plate Material	Anchor Rod Diameter	Base Plate Anchor Length	Anchor Bolts per Plate
BPL-1	18	5/8"	Steel ASTM A36	3/4"	2' - 0"	4
BPL-2	21	5/8"	Steel ASTM A36	3/4"	2' - 0"	4
BPL-3	6	5/8"	Steel ASTM A36	3/4"	2' - 0"	3



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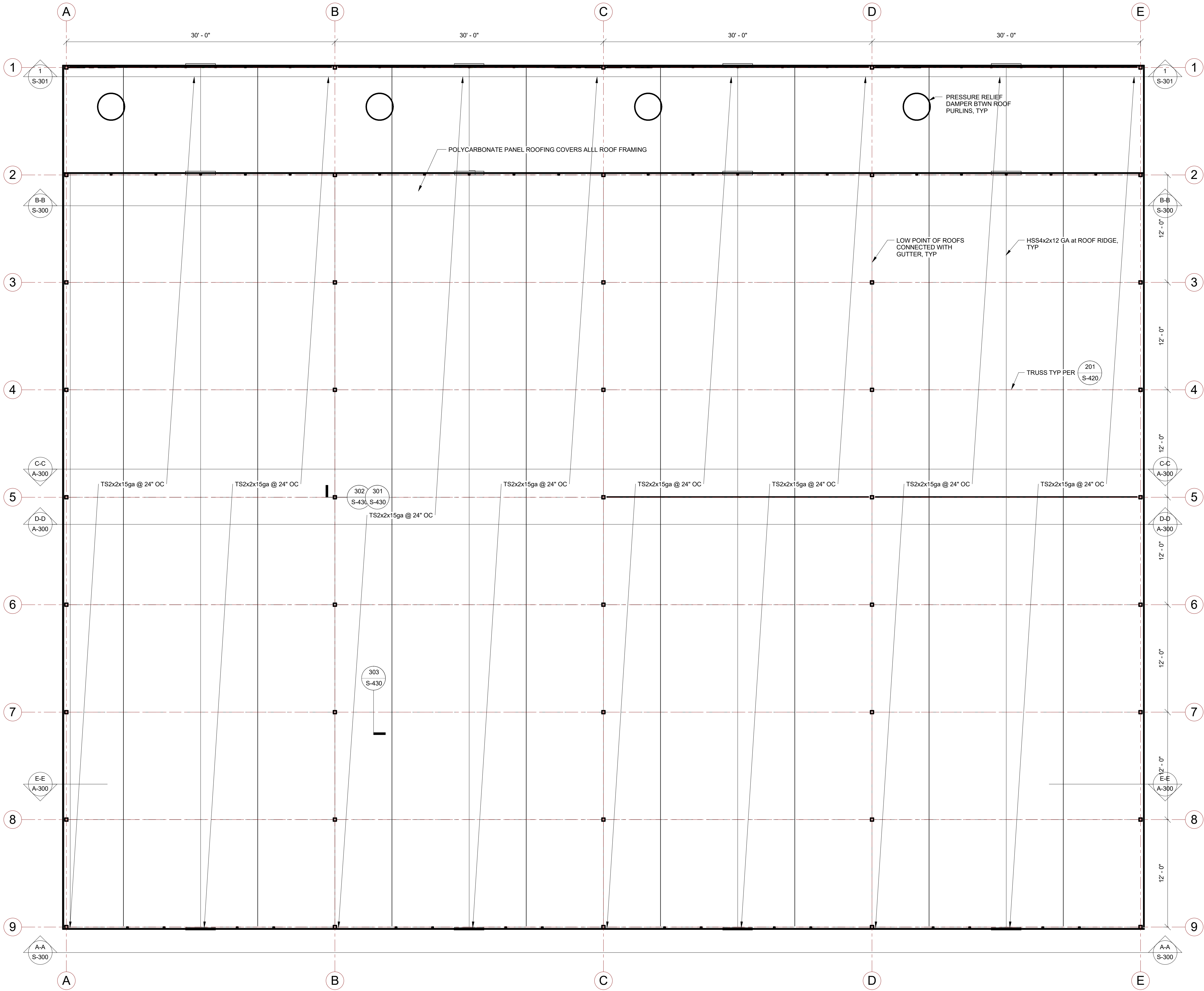
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ANCHOR
SETTING PLAN &
TEMPLATES

S-101

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ROOF FRAMING PLAN
3/16" = 1'-0"

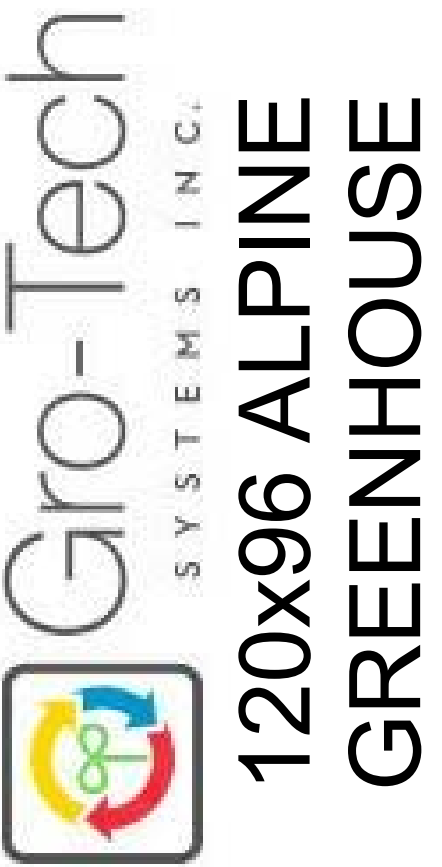


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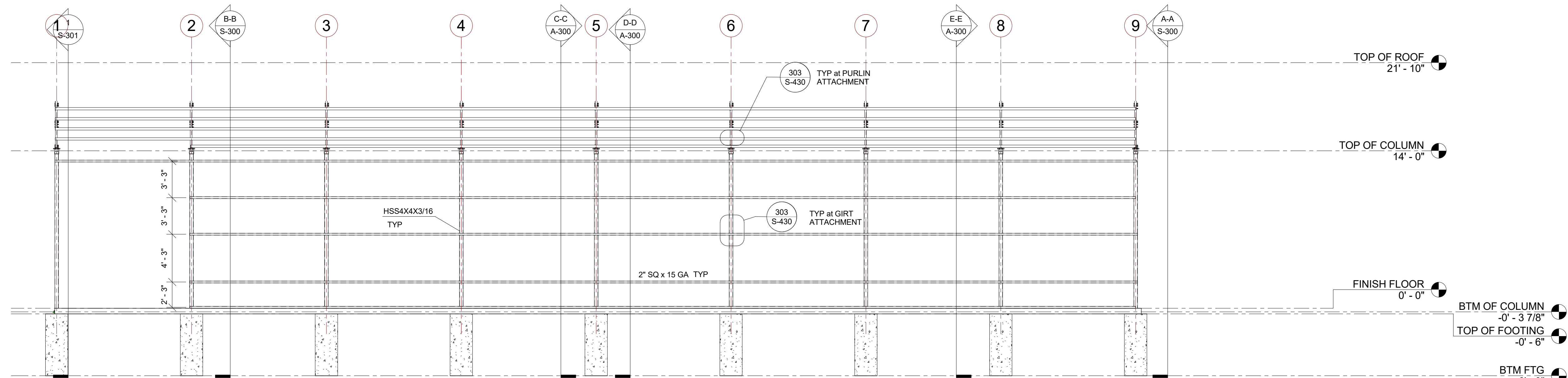
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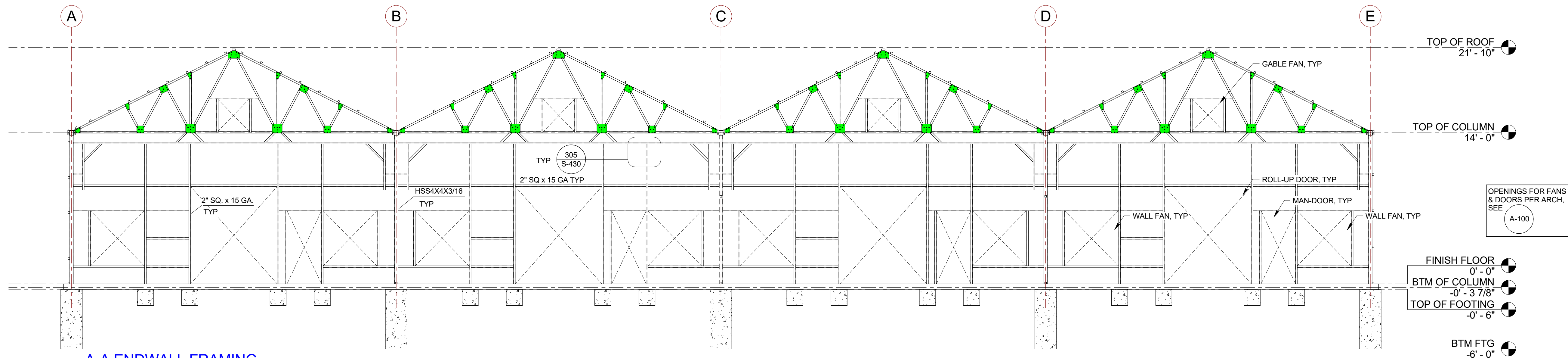
ROOF FRAMING PLAN

S-200

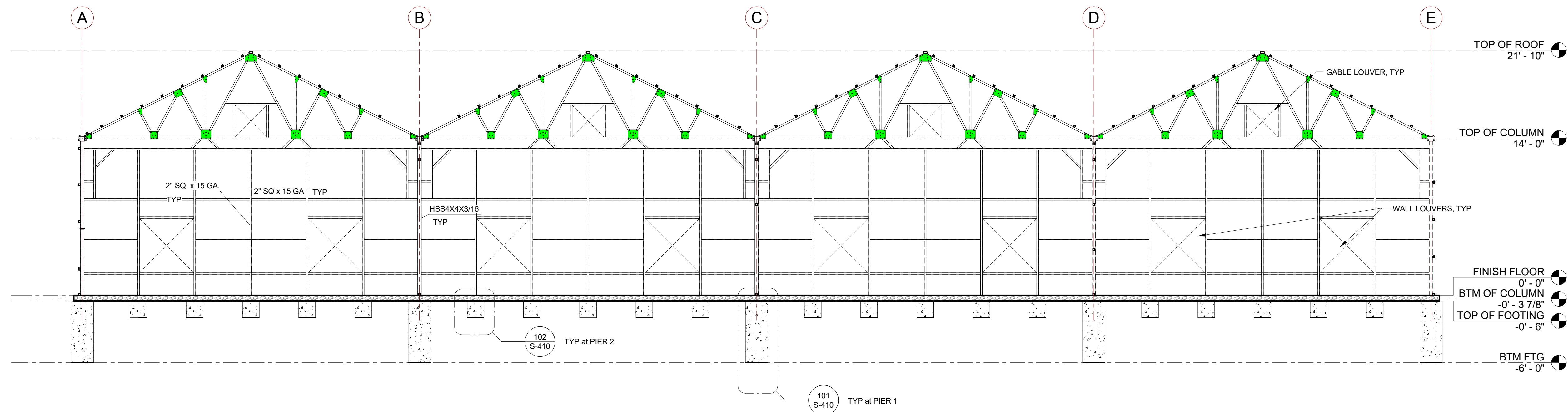
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EAST - WEST ELEVATION FRAMING
3/16" = 1'-0"



A-A ENDWALL FRAMING
3/16" = 1'-0"



B-B ENDWALL FRAMING
3/16" = 1'-0"

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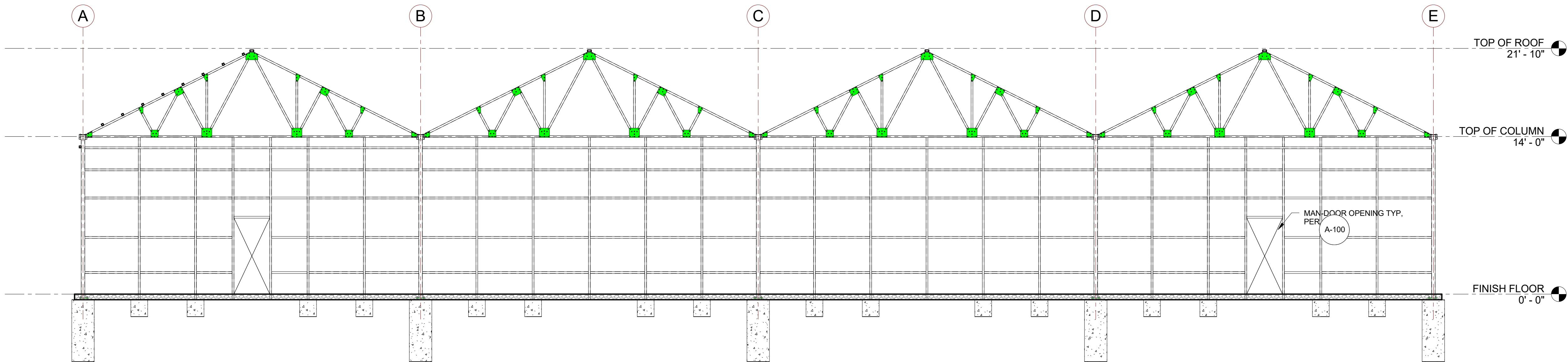
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SCALE 3/16" = 1'-0"

STRUCTURAL
ELEVATIONS

S-300

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D-D SECTION PUSH-PULL SYSTEM1
3/16" = 1'-0"

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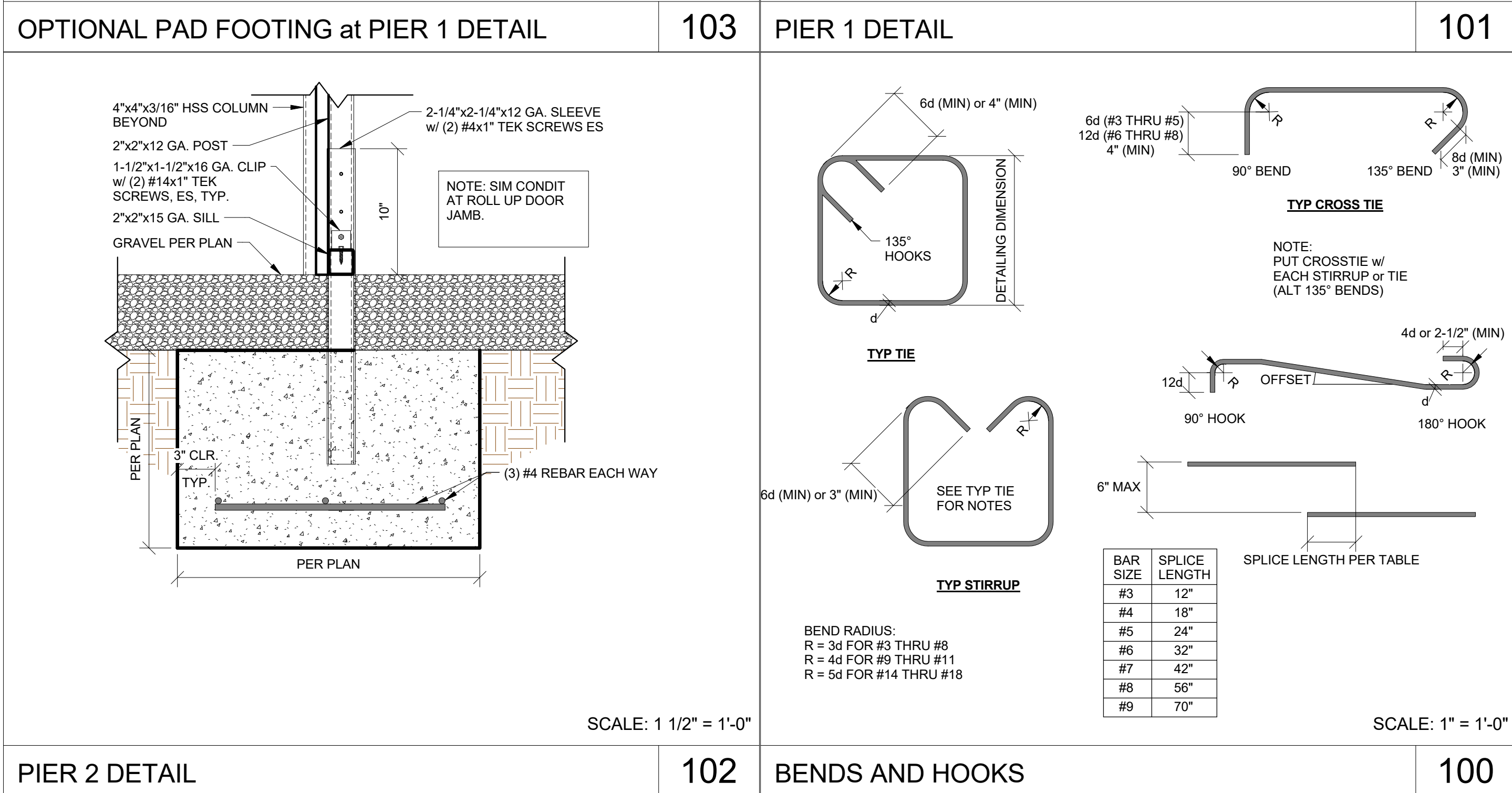
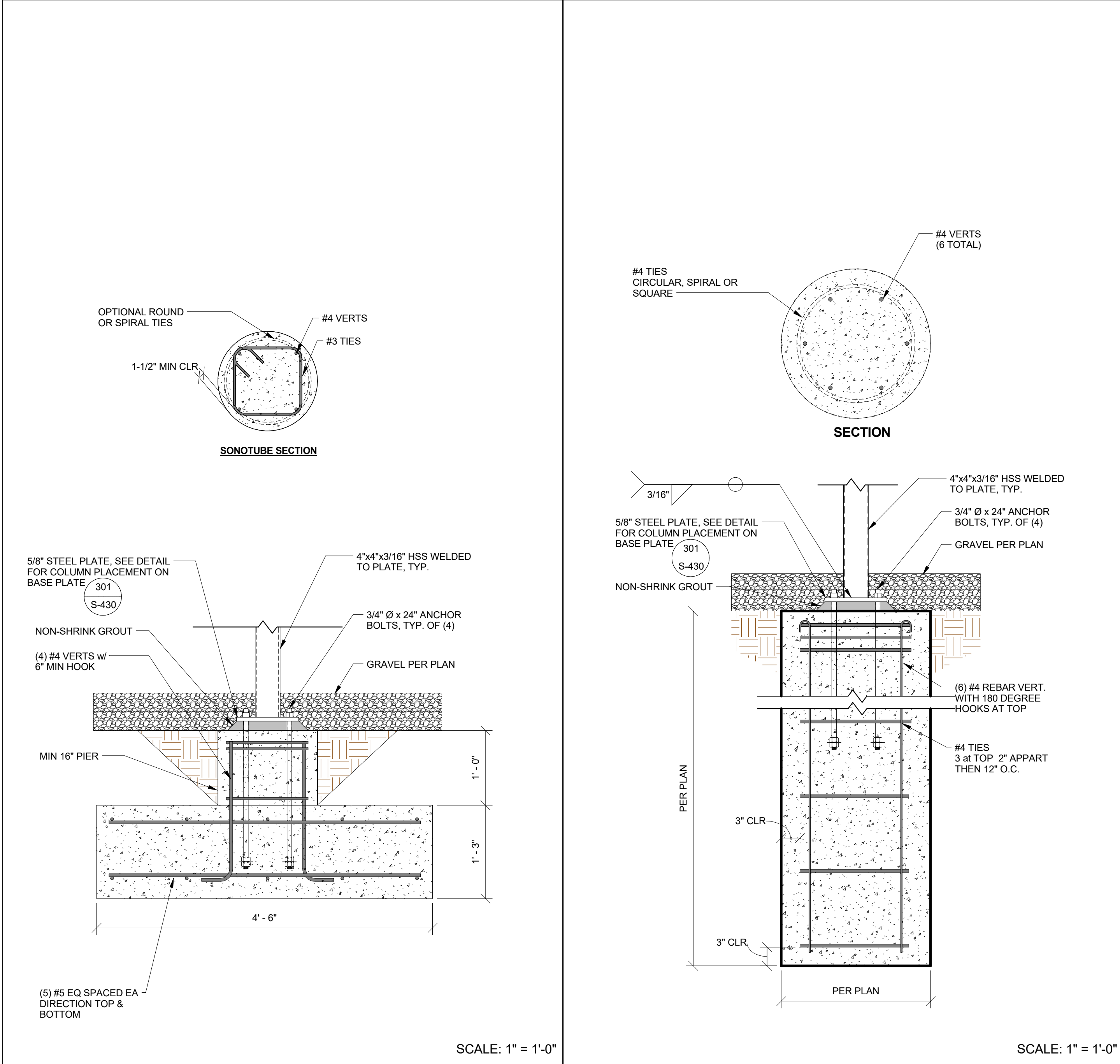
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ISSUE DATE 06/09/17

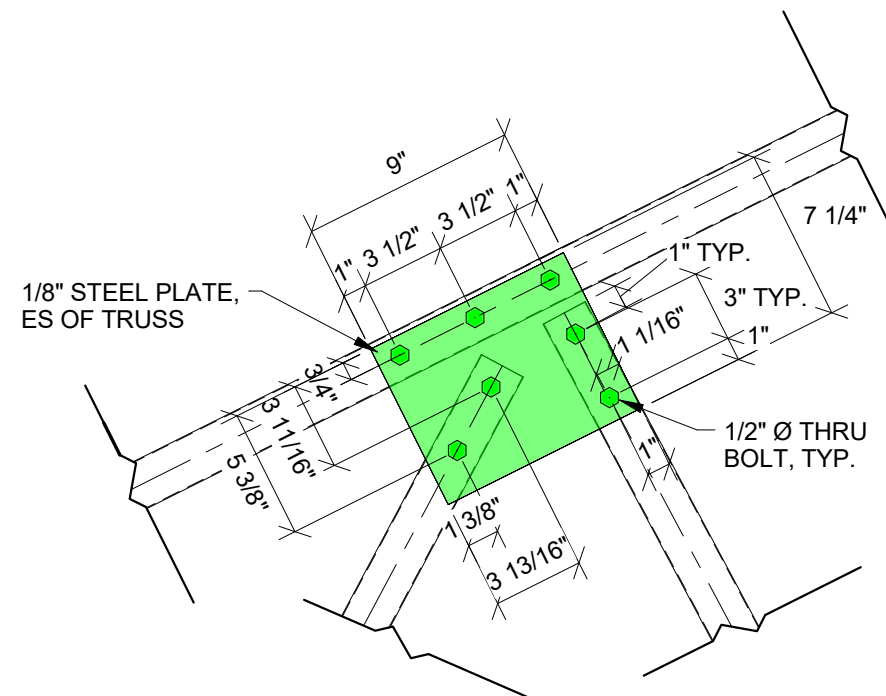
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STRUCTURAL
ELEVATIONS -
CORRIDOR

S-301



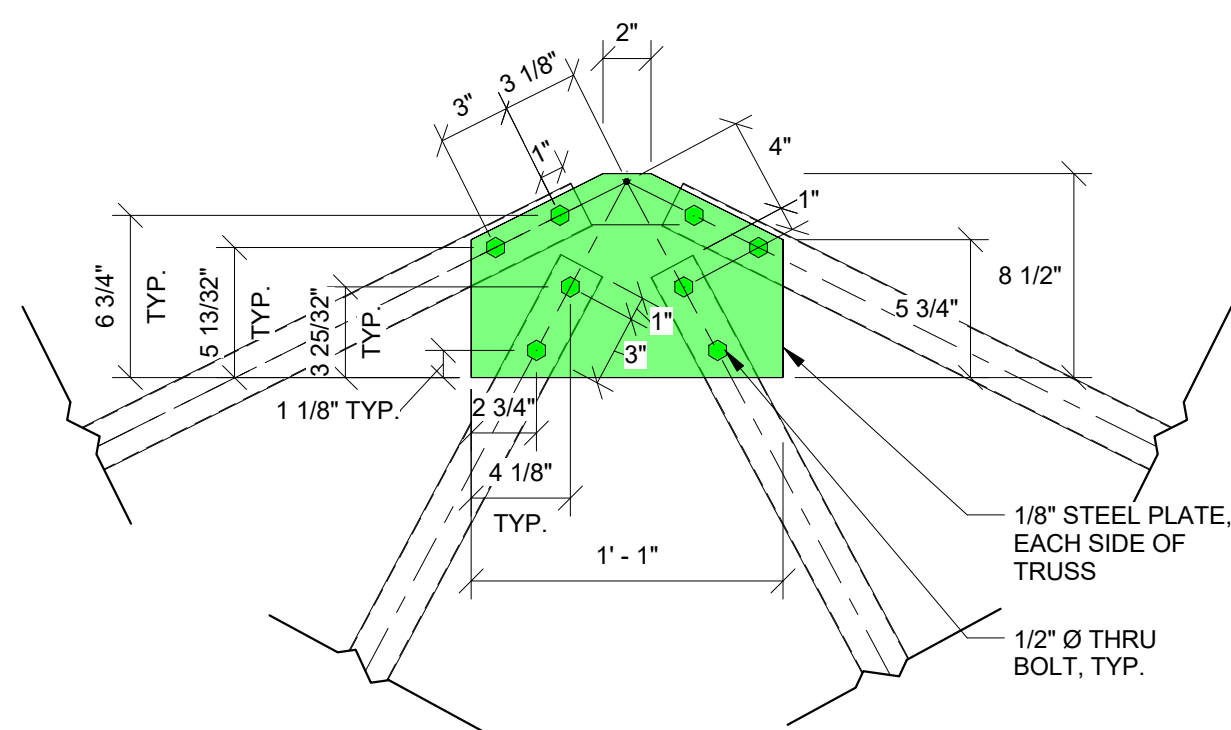
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WEB GUSSET - PLATE 5

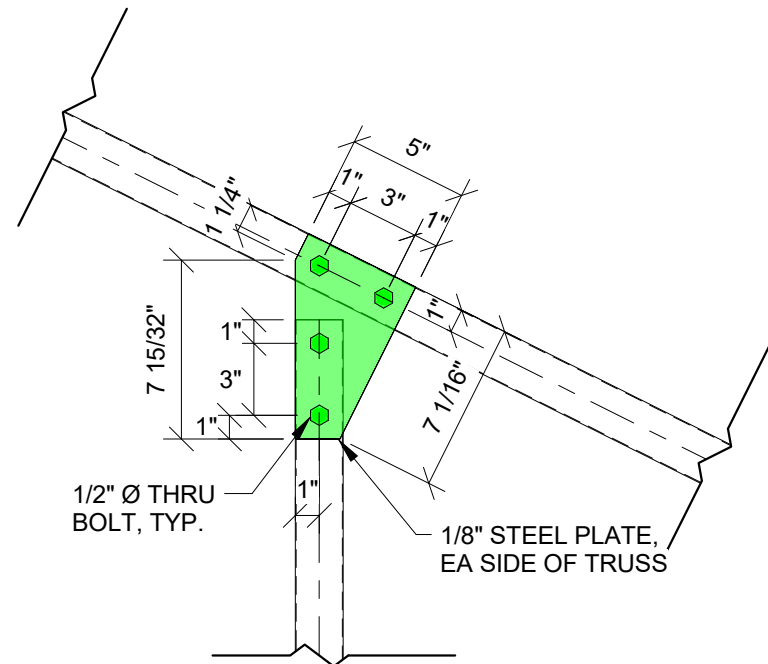
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RIDGE GUSSET - PLATE 6

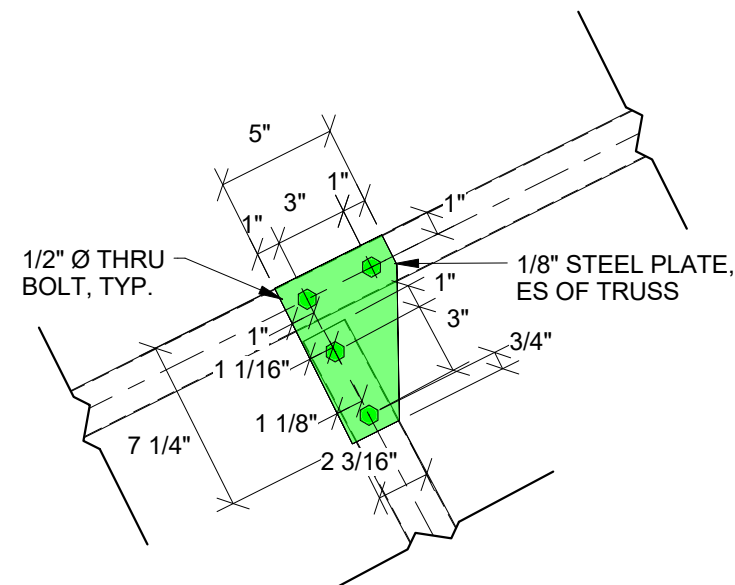
206



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WEB GUSSET - PLATE 4

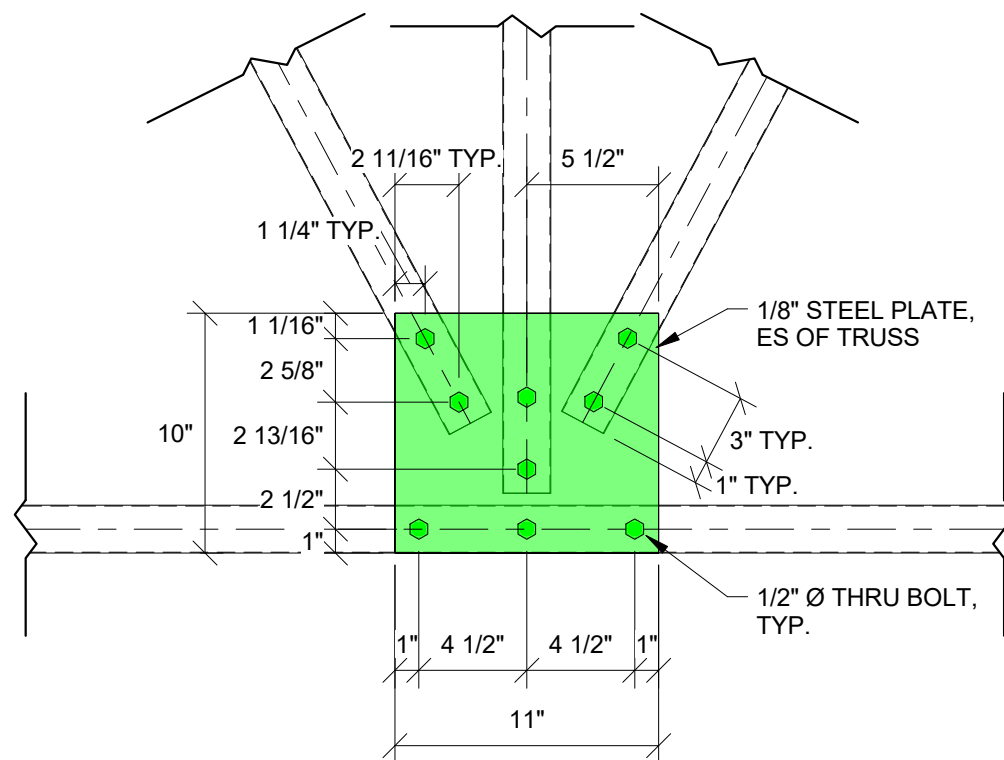
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WEB GUSSET - PLATE 3

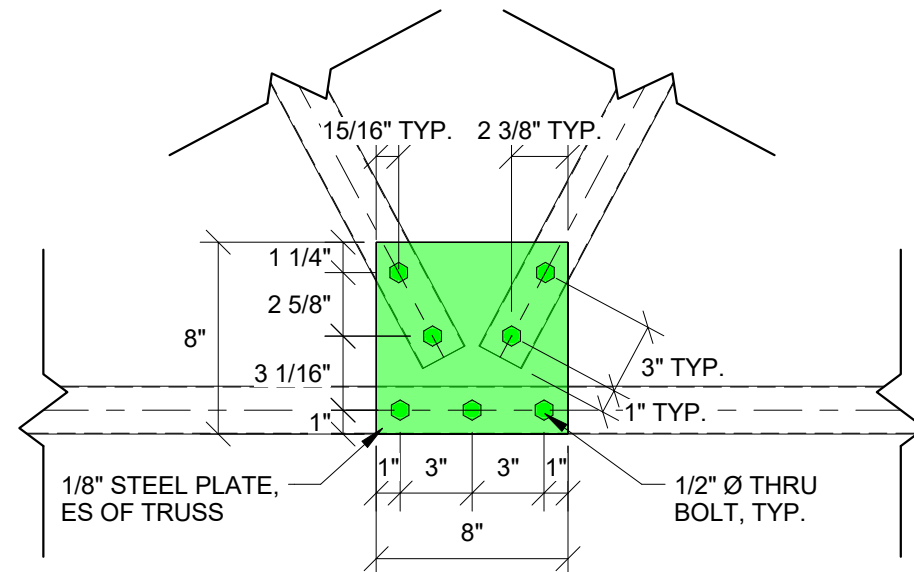
207



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WEB GUSSET - PLATE 1

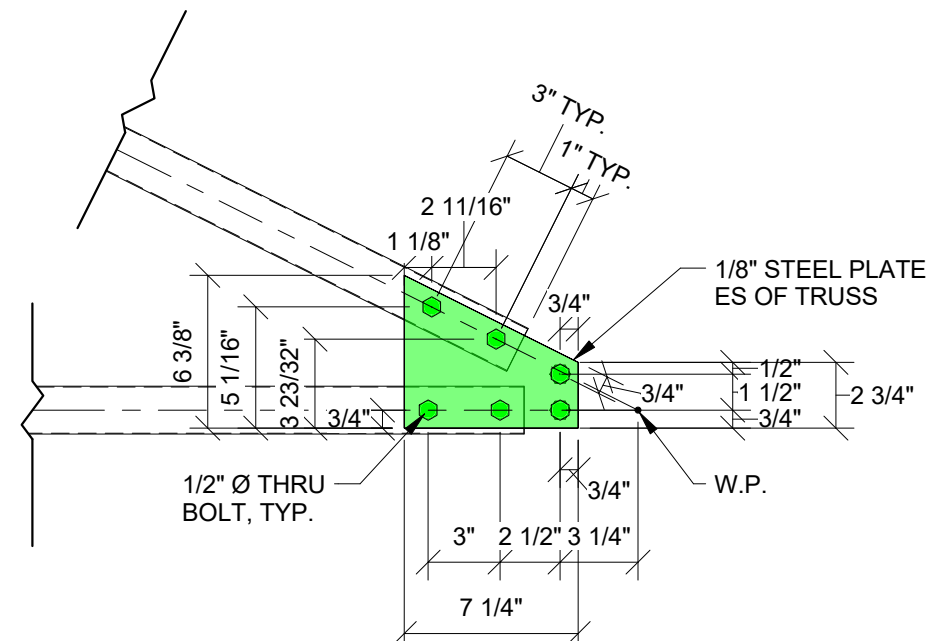
205



SCALE: 1 1/2" = 1'-0"

WEB GUSSET - PLATE 2

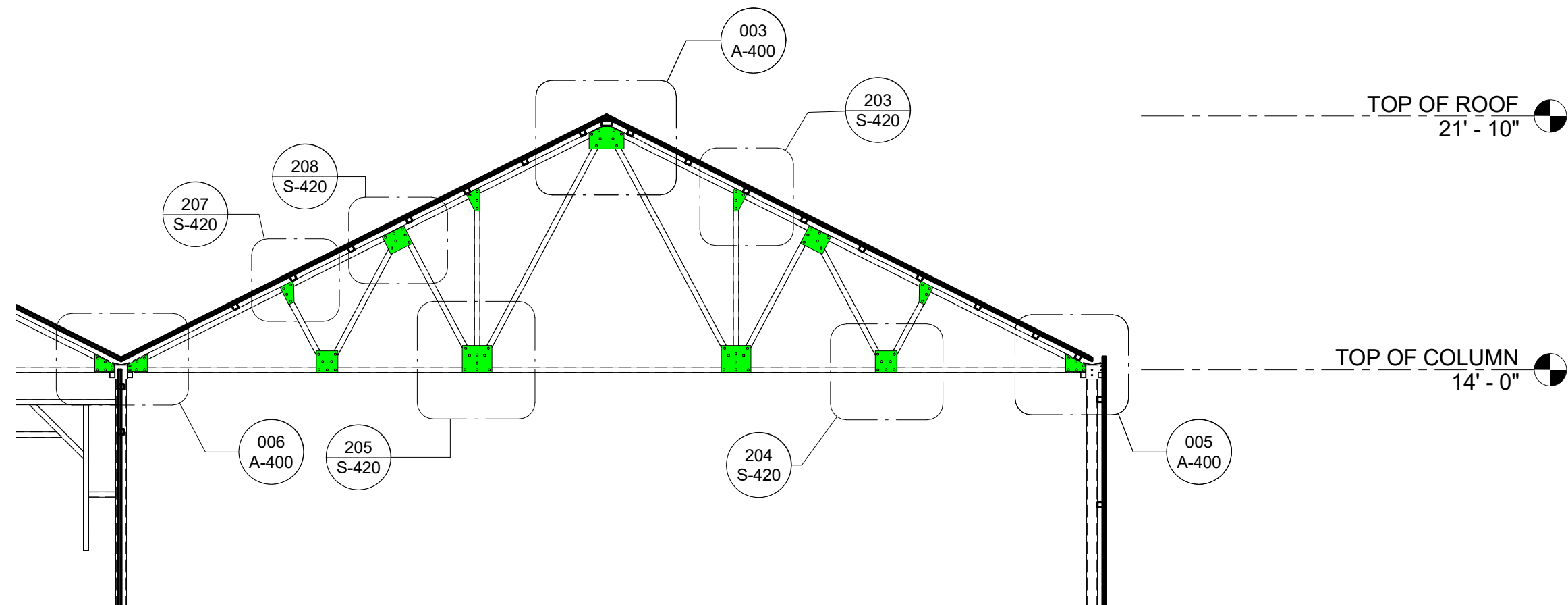
204



SCALE: 1 1/2" = 1'-0"

TRUSS END GUSSET - PLATE 7

202



SCALE: 1/4" = 1'-0"

TRUSS SECTION

201

TRUSS GUSSET PLATE BILL OF MATERIAL					
Piece Mark	Plate Material	Plate Thickness	Bolt Diameter	# Bolts (Per Plate Group)	Count (Number of Plates)
PL-1	Steel ASTM A36	1/8"	1/2"	9	144
PL-2	Steel ASTM A36	1/8"	1/2"	7	144
PL-3	Steel ASTM A36	1/8"	1/2"	4	144
PL-4	Steel ASTM A36	1/8"	1/2"	4	144
PL-5	Steel ASTM A36	1/8"	1/2"	7	144
PL-6	Steel ASTM A36	1/8"	1/2"	8	72
PL-7	Steel ASTM A36	1/8"	1/2"	6	144

ALL 1/8" THICK PLATE HOLES 9/16" DIA.



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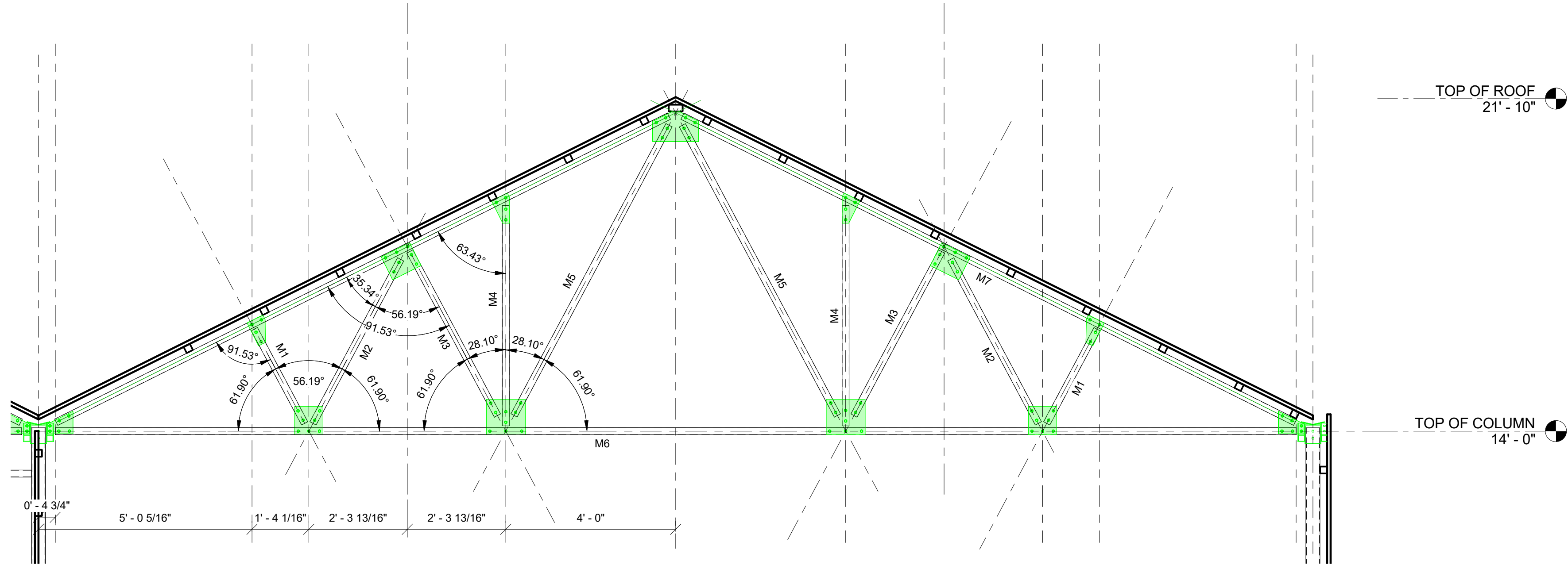
PROJECT# 1755

ISSUE DATE 06/09/17

SCALE As indicated

TRUSS DETAILS

S-420



TRUSS DETAIL

1/2" = 1'-0"

TRUSS MEMBER BILL OF MATERIAL					
Piece Mark	Type	Structural Material	Structural Usage	Cut Length	Count
M1	2" SQ x 15 GA	Steel ASTM A500, Grade B, Rectangular and Square	Web	2' - 6 3/16"	72
M2	2" SQ x 15 GA	Steel ASTM A500, Grade B, Rectangular and Square	Web	4' - 4 9/16"	72
M3	2" SQ x 15 GA	Steel ASTM A500, Grade B, Rectangular and Square	Web	4' - 4 9/16"	72
M4	2" SQ x 15 GA	Steel ASTM A500, Grade B, Rectangular and Square	Web	5' - 2 1/4"	72
M5	2" SQ x 15 GA	Steel ASTM A500, Grade B, Rectangular and Square	Web	7' - 9"	72
M6	2" SQ x 15 GA	Steel ASTM A500, Grade B, Rectangular and Square	Chord	29' - 2 1/2"	36
M7	2" SQ x 15 GA	Steel ASTM A500, Grade B, Rectangular and Square	Chord	16' - 1 1/2"	36

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STRUCTURAL
ENGINEERING

10031 West River Street, Truckee, CA 96161
PO Box 2651, Truckee, CA 96160
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120x96 ALPINE
GREENHOUSE

TBD

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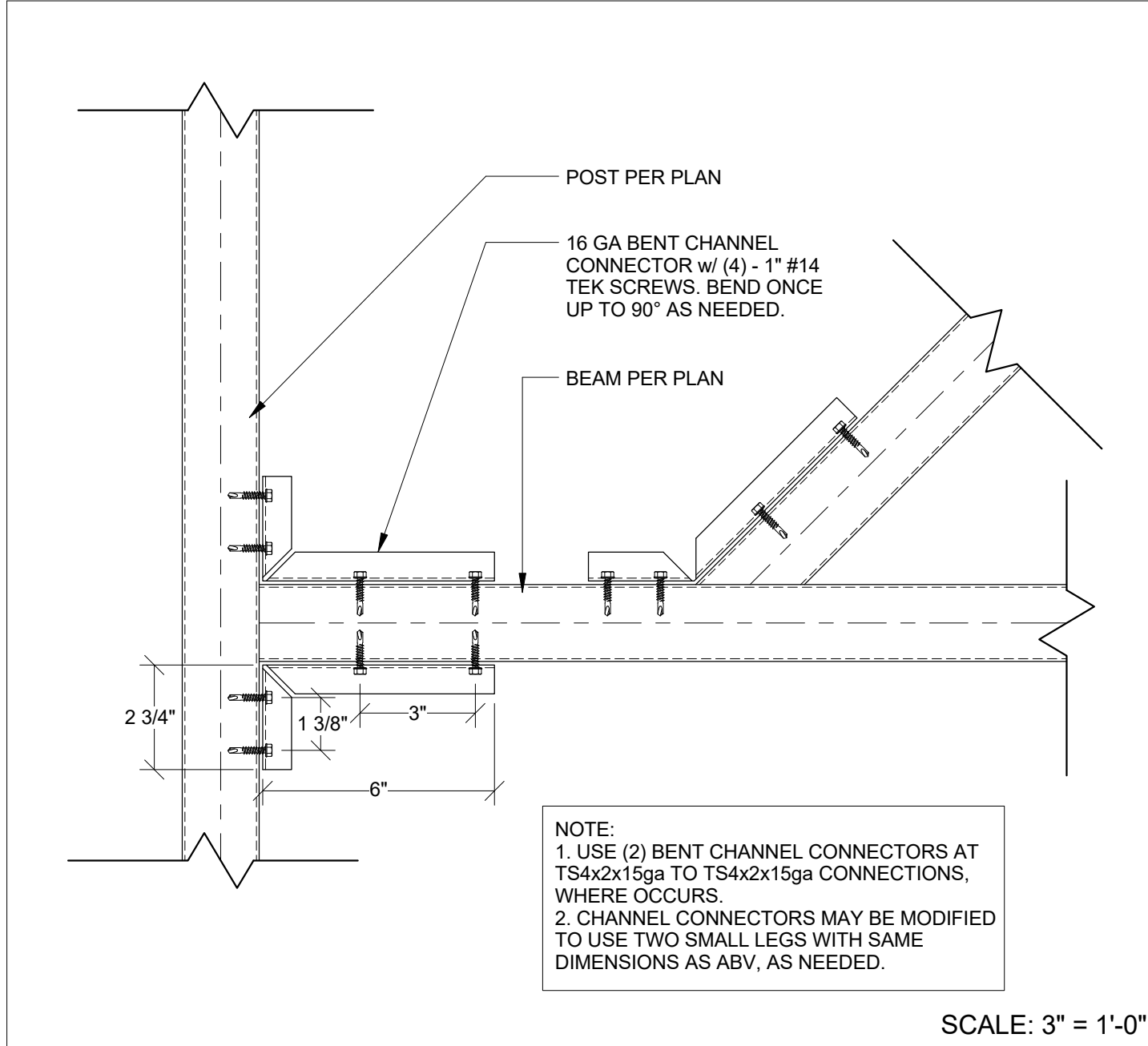
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ISSUE DATE 06/09/17

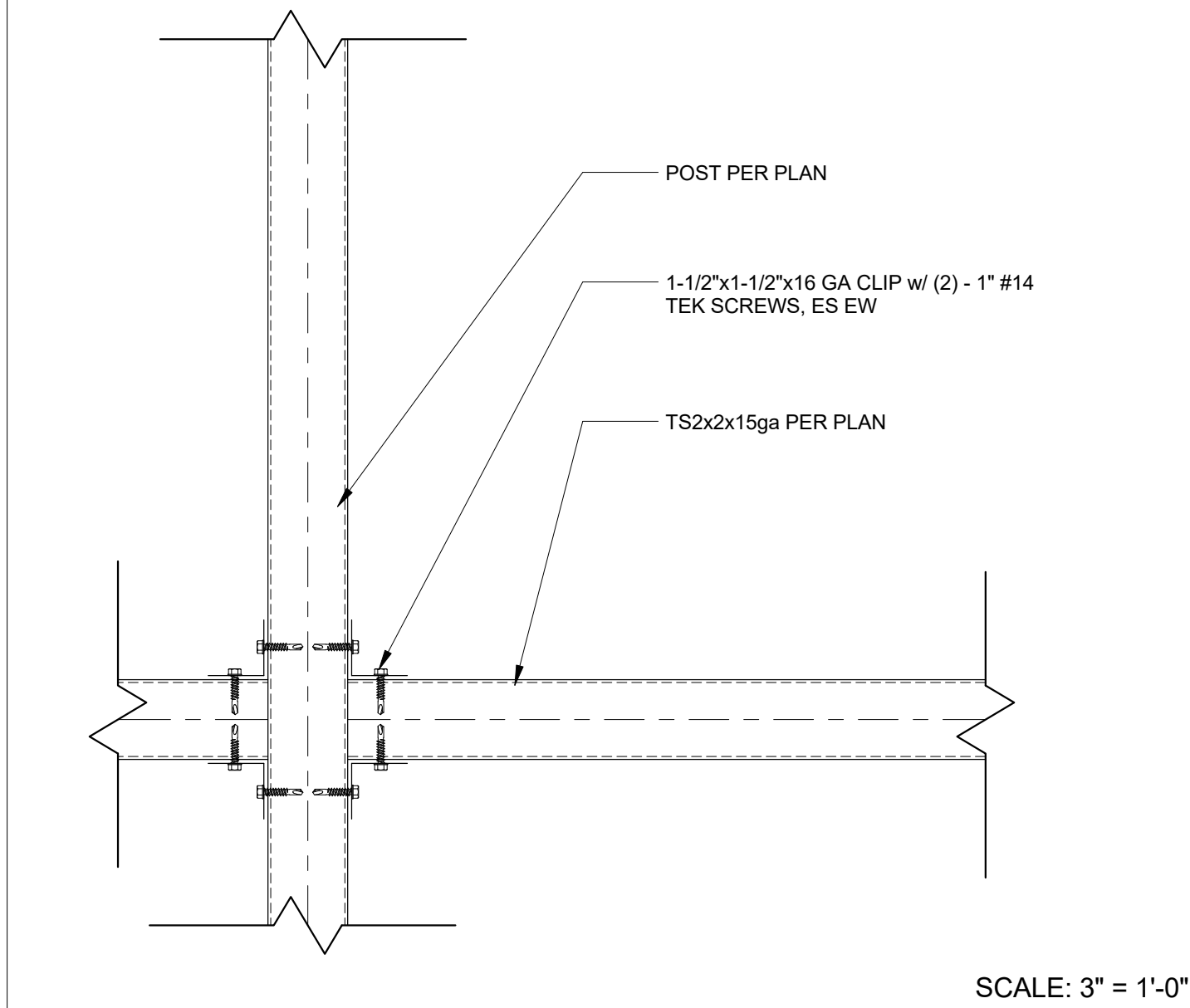
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TRUSS FRAMING
FABRICATION

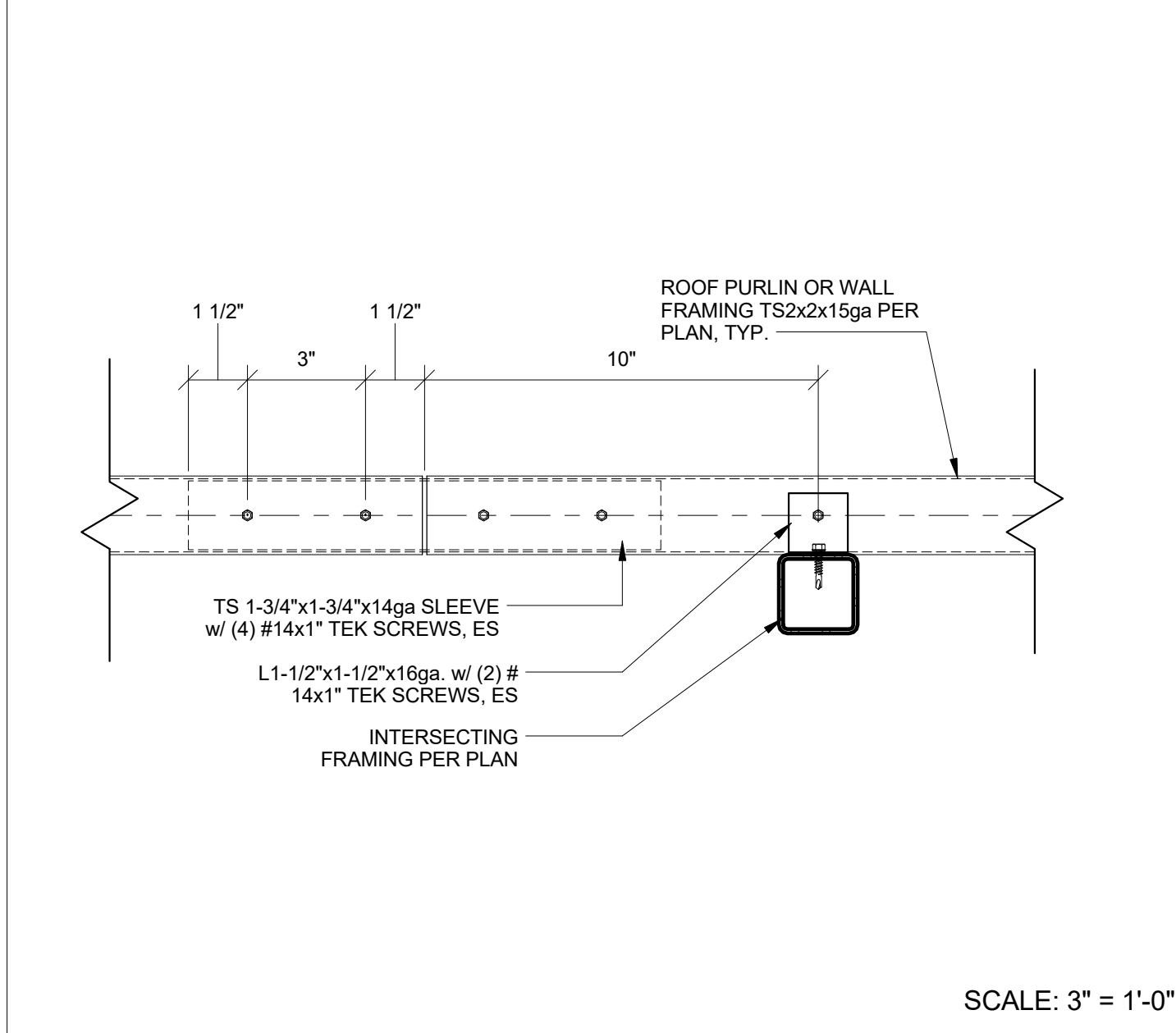
S-421



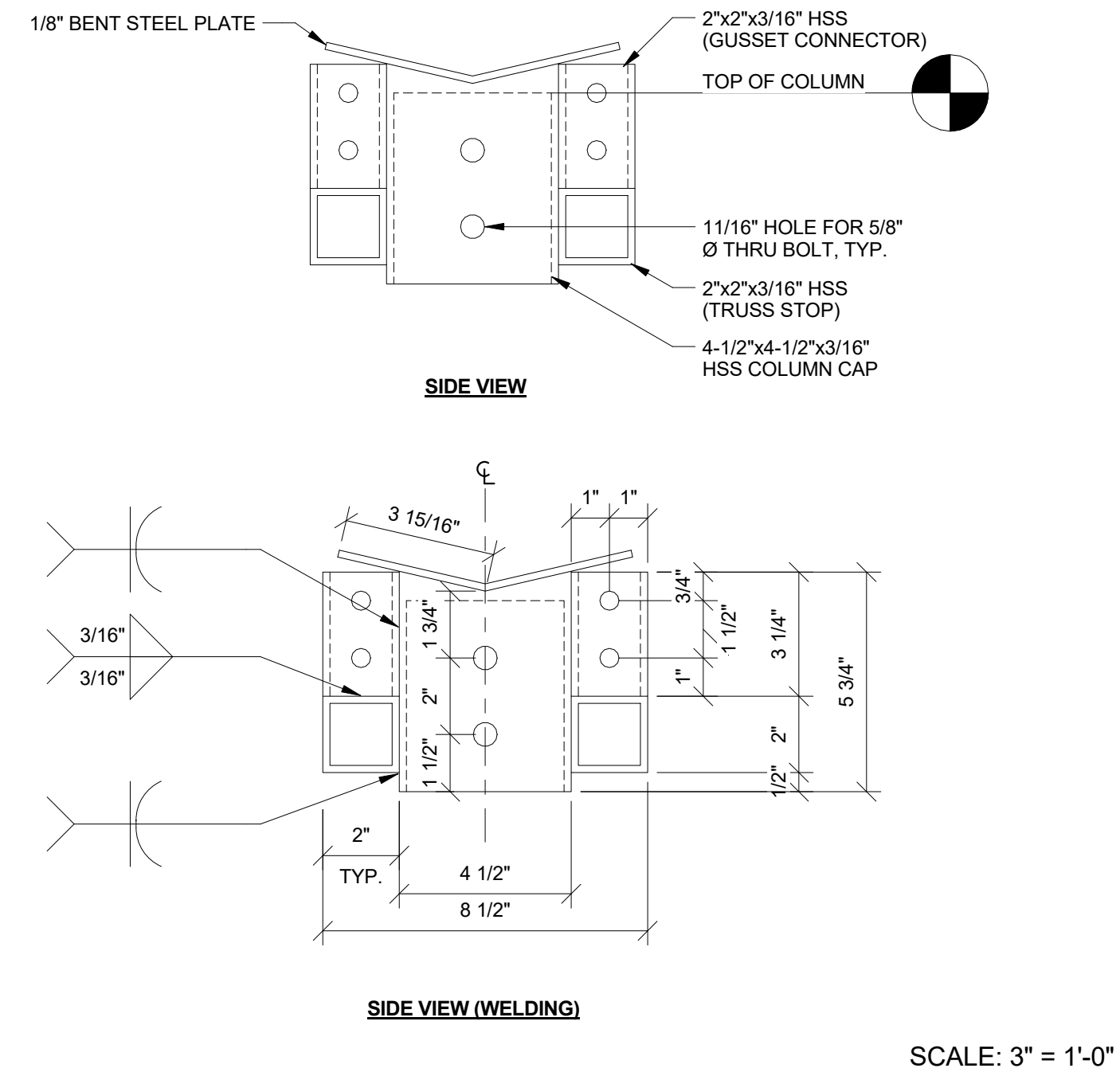
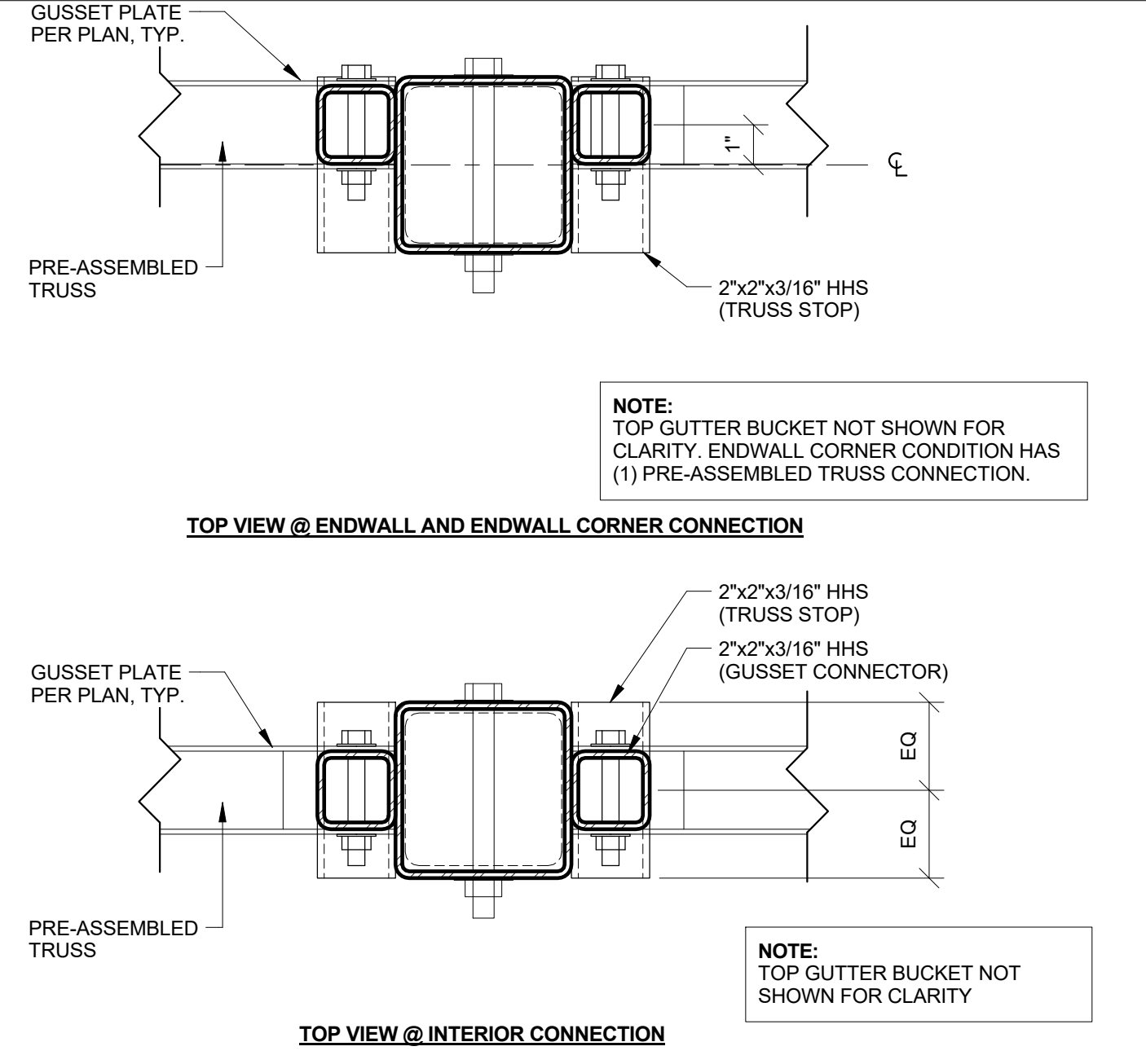
BENT CHANNEL CONNECTOR 305



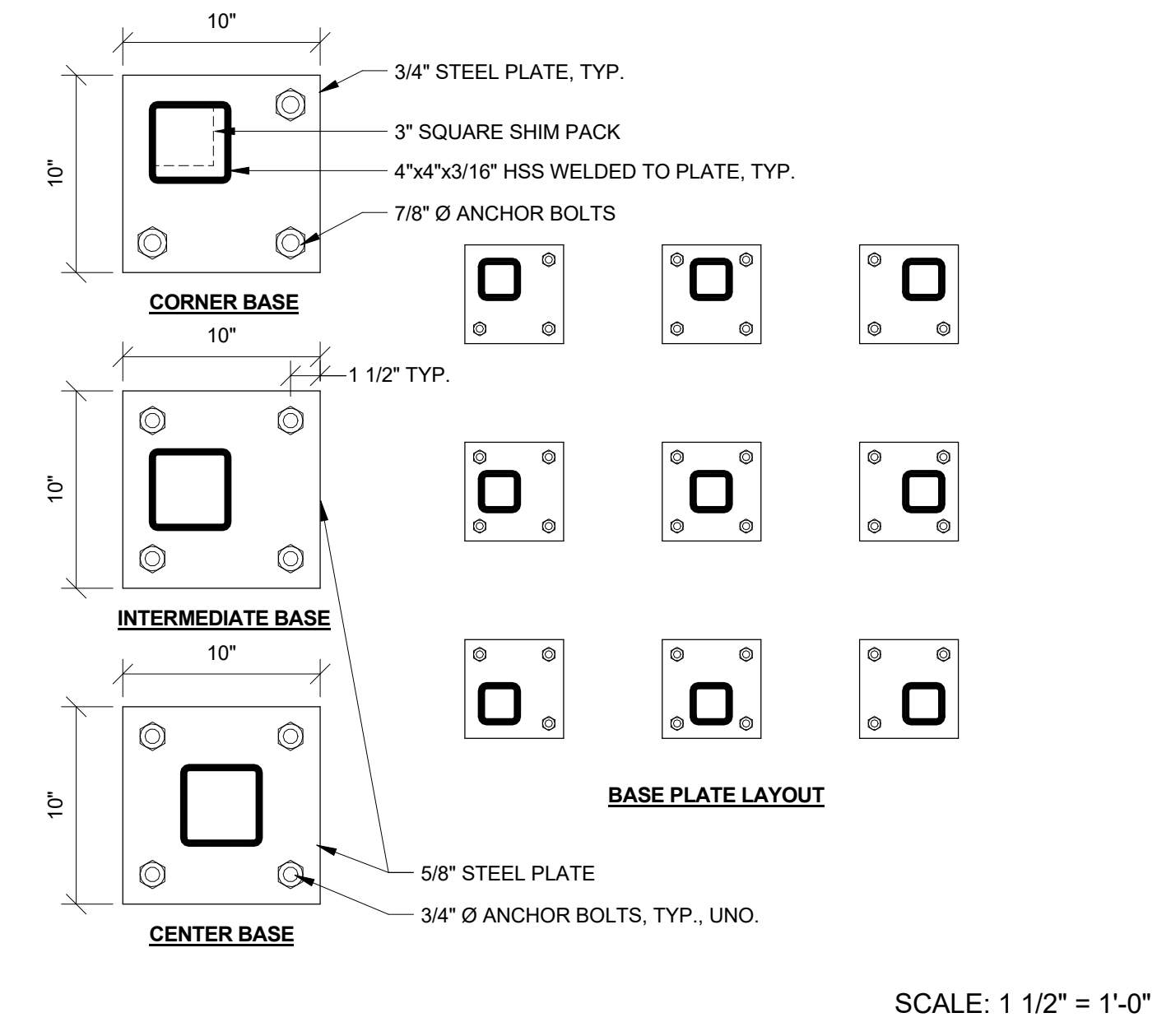
ANGLE CONNECTOR 304



ROOF PURLIN AND SPLICE 303



COLUMN CAP 302



BASE PLATE 301



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PROJECT# 1755

ISSUE DATE 06/09/17

SCALE As indicated

DETAILS

S-430



October 26, 2017
Jn. 17-33

PRMD, Well & Septic Division
2550 Ventura Avenue
Santa Rosa, CA 95403

Re: Commercial Findings Report – 2275 Roberts Road, Penngrove, CA 94951
APN:047-122-025

On 8/21/17 I performed a visual inspection of the existing septic system. The attachments to this letter are listed as follows:

- Copy of the 1979 5 Bedroom Septic Permit
- Site Plan, AP Map, and Vicinity Map.
- Septic design plans on file at PRMD. Reference S-031929.

The solids and liquids side of the septic tank were exposed. Tank findings are as follows:

Tank: The existing septic tank appears to be approximately 1,200 gallon concrete septic tank as indicated on the septic design plans on file at PRMD. (Reference S-031929). The tank appears to be in good condition. The baffle was intact with no visible damage. There was no sanitary tee at the baffle. The tank inlet did not have a sanitary tee installed. The tank outlet was equipped with a sanitary tee. The tank was pumped prior to inspection. A 1 inch PVC pipe is installed terminating above the tank lid at the liquid side of the septic tank. The new owner has no information on the purpose of this line. Because no flow to the septic tank other than the gravity flow from the main residence is permitted, and because this line terminates outside the septic tank, we recommend that this line be exposed to determine its connection point and that it be capped prior to the septic tank, or completely removed.

We recommend that a sanitary tee be installed at the pipe inlet and center baffle.

Leachfield: The leachfield area is located within a grassy field, west of the residence with slopes of 5% or less. There did not appear to be any excess surface moisture within the leachfield area, with no signs of failure. Records indicate that the installed primary system is composed of 2' wide trenches with 12" gravel beneath 4" gravity perf pipe. The trenches have 18" of native soil above them, 6" of which is topsoil fill. A total of 500 L.F. of leachline was installed to serve 5 bedrooms per the septic plans.



Based on the data provided, it appears that the construction of the septic system was completed in October of 1979, therefore the leachfield is about 38 years old.

All five of the distribution boxes were uncovered and inspected. The downslope pipe in all distribution boxes was at a slightly higher elevation to facilitate serial loading of the leachfield.

Each of the distribution boxes was dosed with a garden hose for approximately 20 minutes at approximately 10 gpm. Each leachline handled the surge dose with no backup. The two most downslope leachlines appear to have large trees near the last 25'-40' of the lines. It is unclear if these trees were in place at the time of the leachfield construction, or if they were planted after construction of the leachlines. The surge test did not result in surfacing of effluent in the area of these trees to indicate damage to the leachlines.

Reserve Area: The approved septic plans indicate 200% reserve area, west and downslope of the existing leachfield.

Commercial Use: The existing system serves a property with a Use Permit for a residential care facility housing 14 developmentally disabled clients and 1 full time employee (Reference UP85-11615). It appears that the operator of the care facility illegally built out bedrooms in the garage area for a total of 9 bedrooms. See the attached existing floorplan. According to current standards, the required design flow for a care facility with a total of 15 beds would be (15 beds x 125 gallons per bed) = 1,875 gpd. The existing 5 bedroom design only allows for 750 gpd.

There is currently a cannabis use permit application being processed for the property with a 10,000 sq ft mixed light cannabis cultivation operation. (Reference UPC17-0090). The cannabis cultivation application proposes a total of 20 employees to operate the cultivation. The cultivation operation proposes to remove the bedrooms illegally built within the garage, and to remove walls within the residence to reduce the house to 3 bedrooms. The 3 bedroom residence along with the 20 employees would constitute an equal commercial flow as the previously approved 5 bedroom care facility; however this would be a large reduction in actual historical flow from the actual 9 bedroom, 15 person care facility. Please see calculations below:

Design Commercial Flow:

5 bedrooms x 150 gpd per bedroom = 750 gallons per day

Existing Historic Commercial Flow:

9 bedrooms x 150 gpd per bedroom = 1,350 gallons per day

OR

15 beds x 125 gallons per bed = 1,875 gallons per day



Proposed Commercial Flow:

3 bedrooms x 150 gpd per bedroom = 450 gallons per day
20 employees x 15 gpd per employee = 300 gallons per day
Total Proposed Commercial Flow = 750 gallons per day

Recommendations: There is not sufficient soils and groundwater testing data to suggest that the existing leachfield is installed according to current standards, however the system appears to be adequately meeting present demand and shows no signs of failure, therefore we consider the system to meet class III standards.

We recommend an interior remodel to reduce the residence from 5 bedrooms, and 4 illegal bedrooms down to 3 total bedrooms. The proposed three bedrooms and 20 employees would allow the use of the property for the cannabis operation with no increase in commercial flow from what was originally permitted for the prior residential care facility use permit, however it would be a large reduction in design flow from the historic illegal use of the 9 bedroom residence (1,350 gpd) as well as a significant reduction in flow from current standards for the permitted use as a 14 person care facility with 1 employee (1,875 gpd).

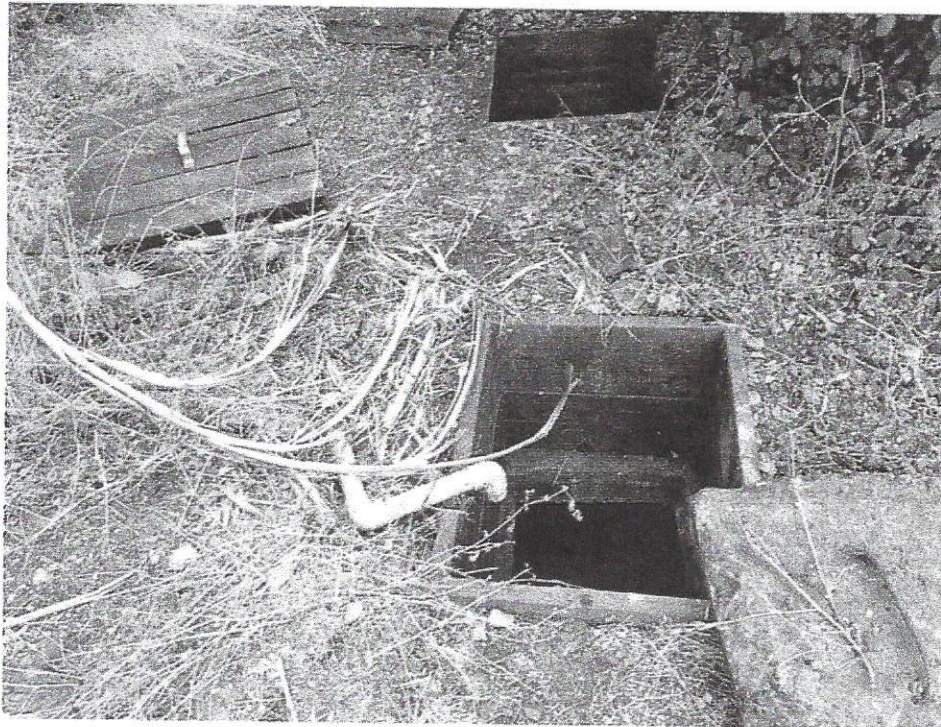
The above is an accurate description of the observations made August 21, 2017. No warranty or guarantee is given or implied regarding the future function of the subject sewage disposal system.

Please contact my office should you have any questions.

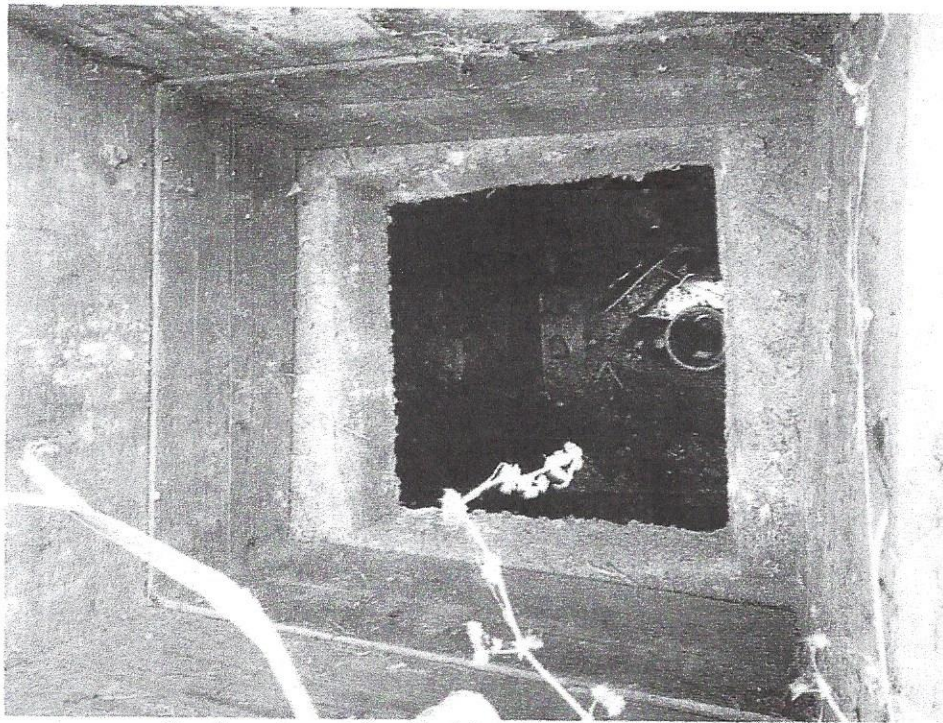
Sincerely,



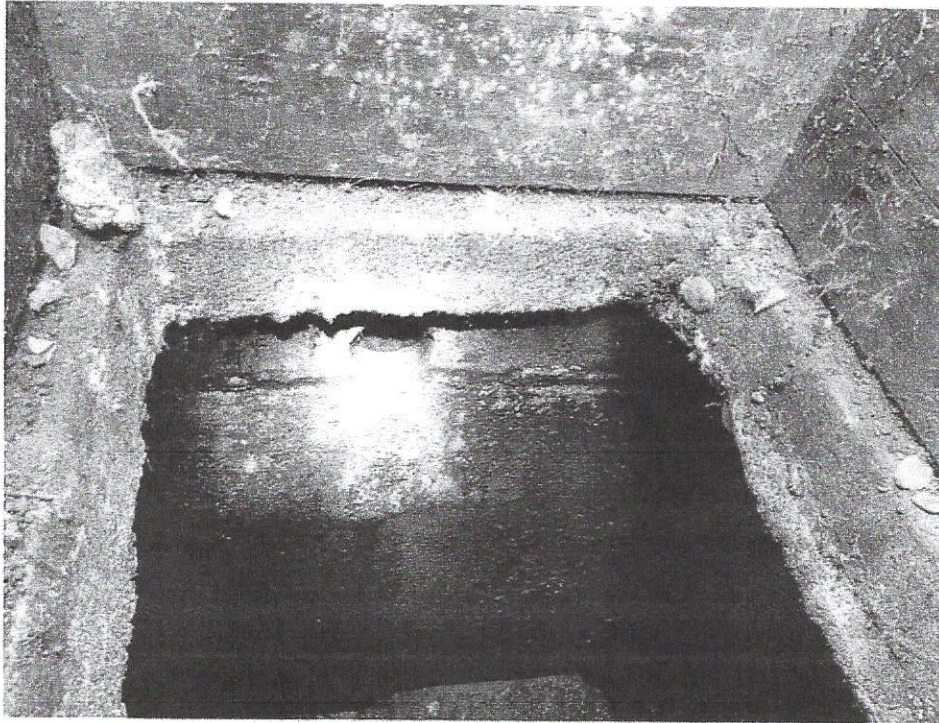
Michael R. Swicegood, RCE



1" PVC Pipe at liquid side of tank



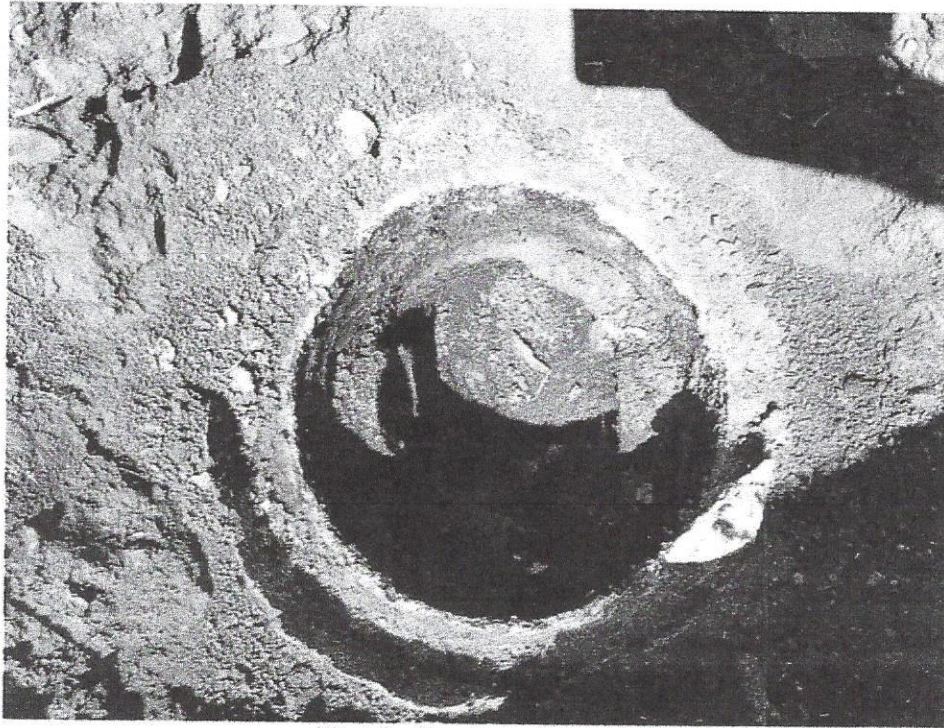
Sanitary tee at liquid side of tank/ Center baffle.



Inlet at solids side of tank



Leachfield, looking west.



Distribution box, Typical

Biological Resources Assessment

ROBERTS ROAD PROJECT PENNGROVE, SONOMA COUNTY, CALIFORNIA

Prepared For:

Alexa Garcia
Luma California, LLC
1415 Fulton Road, Suite 205
Santa Rosa, CA 95403

Prepared By:

WRA, Inc.
2169-G East Francisco Boulevard
San Rafael, California 94901

Contacts: Doug Spicher, Principal
spicher@wra-ca.com

Patricia Valcarcel, Project Manager
valcarcel@wra-ca.com

Date:

August 2017

WRA Project No:

27220

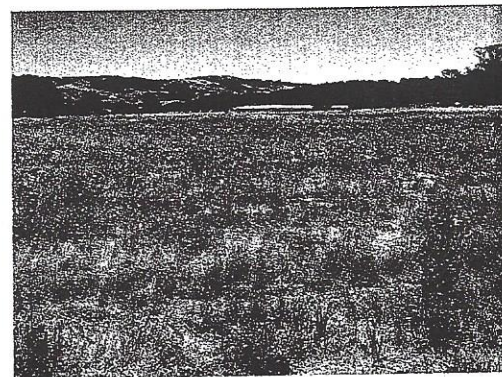


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LIST OF ACRONYMS AND ABBREVIATIONS

BMPs	Best Management Practices
BRA	Biological Resources Assessment
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Corps	U.S. Army Corps of Engineers
CTS	California tiger salamander
ESA	Federal Endangered Species Act
Inventory	CNPS Inventory of Rare and Endangered Plants
MSL	Mean Sea Level
MBTA	Migratory Bird Treaty Act
OWHM	Ordinary High Water Mark
PBO	Programmatic Biological Opinion
Rank	California Rare Plant Rank
RWQCB	Regional Water Quality Control Board
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WBWG	Western Bat Working Group
WRA	WRA, Inc.

1.0 INTRODUCTION

WRA, Inc. (WRA) prepared this biological resources assessment (BRA) report on behalf of Luma California, LLC for the proposed Roberts Road Project (Project). The proposed Project involves medical cannabis outdoor cultivation and installation of a greenhouse for indoor cultivation. The proposed Project is on an approximately 1- to 2-acre portion of an approximately 8.25-acre undeveloped open field located at 2275 Roberts Road (APN 047-122-025), in Penngrove, unincorporated Sonoma County, California (Study Area; Figure 1). The Study Area includes the undeveloped, 8.25-acre northern portion of the 15-acre parcel (Study Area). The southern portion of the parcel, outside of the Study Area, is developed and includes a single-family residence. The purpose of the assessment was to gather information necessary to complete a review of biological resources under the California Environmental Quality Act (CEQA).

This report describes the results of the site visit, which assessed the Study Area for the (1) potential to support special-status species, (2) the potential presence of sensitive biological communities such as wetlands or riparian habitats, and (3) the potential presence of other sensitive biological resources protected by local, state, and federal laws and regulations. Specific findings on the habitat suitability or the presence of special-status species or sensitive habitats may require that protocol-level surveys be conducted.

A BRA provides general information on the potential presence of sensitive species and habitats. The BRA is not an official protocol-level survey for listed species that may be required for project approval by local, state, or federal agencies. This assessment is based on information available at the time of the study and on site conditions that were observed on the date of the site visit(s).

2.0 REGULATORY BACKGROUND

The following sections explain the regulatory context of the BRA, including applicable laws and regulations that were applied to the field investigations and analysis of potential project impacts.

2.1 Sensitive Biological Communities

Sensitive biological communities include habitats that fulfill special functions or have special values, such as wetlands, streams, or riparian habitat. These habitats are protected under federal regulations such as the Clean Water Act; state regulations such as the Porter-Cologne Act, the California Fish and Game Code (CFGF), and CEQA; or local ordinances or policies such as city or county tree ordinances, Special Habitat Management Areas, and General Plan Elements.

Waters of the United States

The U.S. Army Corps of Engineers (Corps) regulates "Waters of the United States" under Section 404 of the Clean Water Act. Waters of the U.S. are defined in the Code of Federal Regulations (CFR) as waters susceptible to use in commerce, including interstate waters and wetlands, all other waters (intrastate waterbodies, including wetlands), and their tributaries (33 CFR 328.3). Potential wetland areas, according to the three criteria used to delineate wetlands as defined in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), are identified by the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Areas that are inundated at a sufficient depth and for a sufficient duration to exclude

growth of hydrophytic vegetation are subject to Section 404 jurisdiction as "other waters" or "non-wetland waters" and are often characterized by an ordinary high water mark (OHWM).

Other waters or non-wetland waters, for example, generally include lakes, rivers, and streams. The placement of fill material into Waters of the U.S generally requires an individual or nationwide permit from the Corps under Section 404 of the Clean Water Act.

Waters of the State

The term "Waters of the State" is defined by the Porter-Cologne Act as "any surface water or groundwater, including saline waters, within the boundaries of the state." The Regional Water Quality Control Board (RWQCB) protects all waters in its regulatory scope and has special responsibility for wetlands, riparian areas, and headwaters. These waterbodies have high resource value, are vulnerable to filling, and are not systematically protected by other programs. RWQCB jurisdiction includes "isolated" wetlands and waters that may not be regulated by the Corps under Section 404. Waters of the State are regulated by the RWQCB under the State Water Quality Certification Program which regulates discharges of fill and dredged material under Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act. Projects that require a Corps permit, or fall under other federal jurisdiction, and have the potential to impact Waters of the State, are required to comply with the terms of the Water Quality Certification determination. If a proposed project does not require a federal permit, but does involve dredge or fill activities that may result in a discharge to Waters of the State, the RWQCB has the option to regulate the dredge and fill activities under its state authority in the form of Waste Discharge Requirements.

Other Sensitive Biological Communities

Other sensitive biological communities not discussed above include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife (CDFW, formerly the California Department of Fish and Game [CDFG]). The CDFW ranks sensitive communities and keeps records of their occurrences in its California Natural Diversity Database (CNDDDB; CDFW 2017). In the CNDDDB, vegetation alliances are ranked 1 through 5 based on NatureServe's (2016) methodology, with those alliances ranked globally (G) or statewide (S) as 1 through 3 considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, or regulations or those identified by the CDFW or U.S. Fish and Wildlife Service (USFWS) must be considered and evaluated under CEQA (California Code of Regulations [CCR] Title 14, Div. 6, Chap. 3, Appendix G). Specific habitats may also be identified as sensitive in city or county general plans or ordinances.

2.2 Special-Status Species

Special-status species include those plants and wildlife species that have been formally listed, are proposed as endangered or threatened, or are candidates for such listing under the Federal Endangered Species Act (ESA) or California Endangered Species Act (CESA). These acts afford protection to both listed species and those that are formal candidates for listing. In addition, CDFW Species of Special Concern, which are species that face extirpation in California if current population and habitat trends continue, CDFW California Fully Protected species, USFWS Birds of Conservation Concern, and CDFW special-status invertebrates, are all considered special-status species. Although these aforementioned species generally have no special legal status, they are given special consideration under CEQA. Bat species are also evaluated for

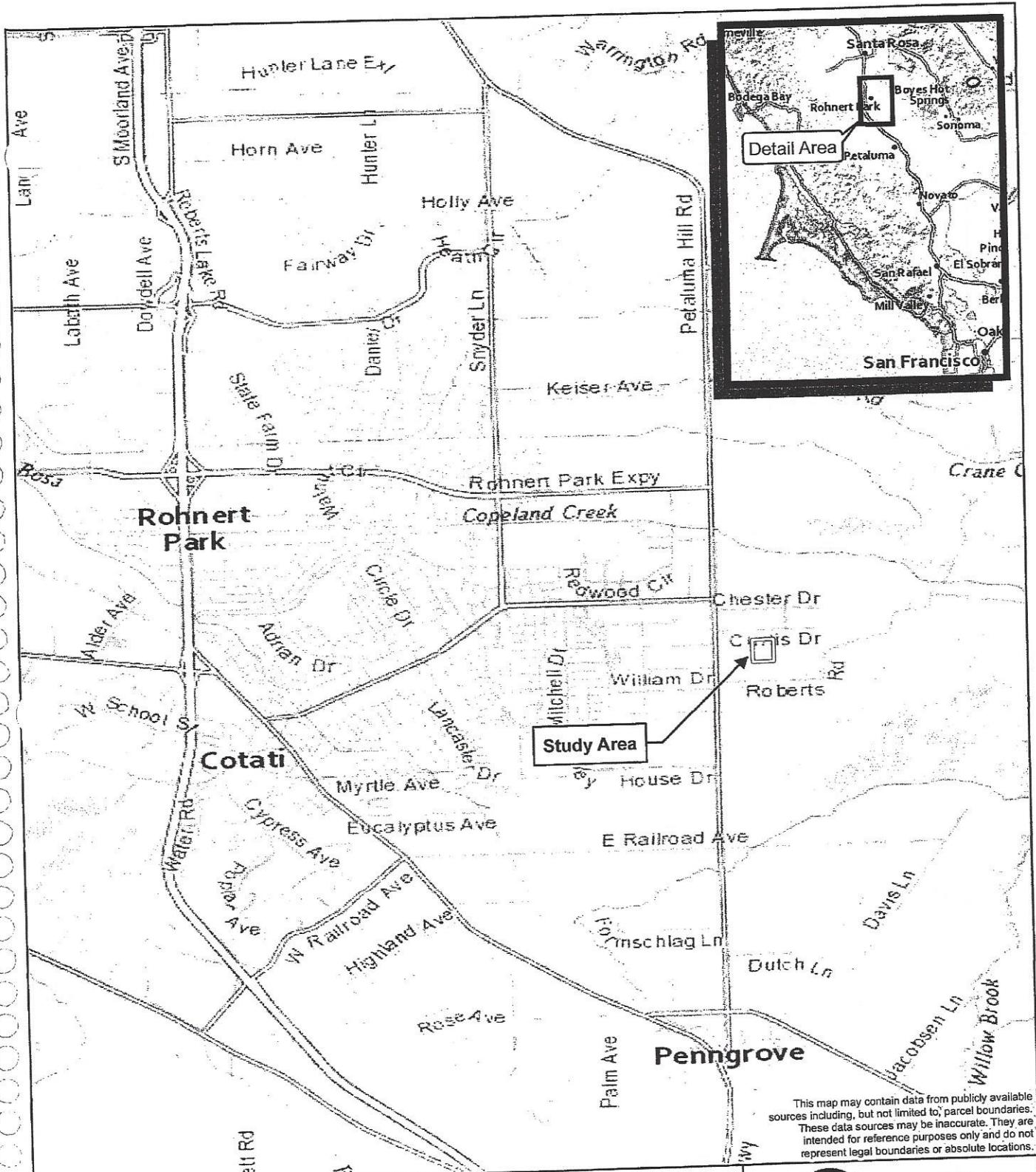


Figure 1. Study Area Location Map

2275 Roberts Road
Penngrove, Sonoma County, California

0 0.25 0.5 1
Miles



ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 7/5/2017
Map Prepared By: smortensen
Base Source: Esri Streaming - National Geographic
Data Source(s): WRA

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conservation status by the Western Bat Working Group (WBWG), a non-governmental entity; bats named as a "High Priority" or "Medium Priority" species for conservation by the WBWG are typically considered special-status and are considered under CEQA. Plant species on the California Native Plant Society (CNPS) Rare and Endangered Plant Inventory (Inventory) with California Rare Plant Ranks (Rank) of 1 through 4 are also considered special-status plant species and must be considered under the CEQA. A description of the CNPS Ranks is provided below in Table 1.

Table 1. Description of CNPS Ranks and Threat Codes

California Rare Plant Ranks (formerly known as CNPS Lists)	
Rank 1A	Presumed extirpated in California and either rare or extinct elsewhere
Rank 1B	Rare, threatened, or endangered in California and elsewhere
Rank 2A	Presumed extirpated in California, but more common elsewhere
Rank 2B	Rare, threatened, or endangered in California, but more common elsewhere
Rank 3	Plants about which more information is needed - A review list
Rank 4	Plants of limited distribution - A watch list
Threat Ranks	
0.1	Seriously threatened in California
0.2	Moderately threatened in California
0.3	Not very threatened in California

Non-Special-Status Species Regulations

In addition to regulations for special-status species, most birds in the United States, including non-special-status native species, are protected by the Migratory Bird Treaty Act of 1918 (MBTA) and the CFGC. Under these laws, destroying active bird nests, eggs, and/or young is illegal.

Santa Rosa Plain Conservation Strategy

The Study Area is located within the Santa Rosa Plain, an ecoregion which supports habitat for many vernal pool-associated special-status species. The USFWS developed the Santa Rosa Plain Conservation Strategy (Conservation Strategy; USFWS et al. 2005) as a conservation plan for these species. The Santa Rosa Plain Conservation Strategy Area is an area established by the USFWS for the protection and continued existence of California tiger salamander (CTS, *Ambystoma californiense*) and three endangered plant species: Burke's goldfields (*Lasthenia burkei*), Sonoma sunshine (*Blennosperma bakeri*), and Sebastopol meadowfoam (*Limnanthes vincularis*). The Conservation Strategy (USFWS 2005) outlines the specific species of concern for this area along with guidance for specific conservation measures. In 2007 the Corps consulted with the USFWS on Section 404 permitting within the Conservation Strategy area which resulted in a Programmatic Biological Opinion (PBO). This 2007 PBO outlines the mitigation requirements resulting from impacts to wetlands and associated impacts to CTS and the three listed plants, and can be appended to permits authorized by the Corps. It is the PBO that dictates the mitigation requirements for CTS and the three listed plant species.

Critical Habitat

Critical habitat is a term defined in the ESA as a specific geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. The ESA requires federal agencies to consult with the USFWS to conserve listed species on their lands and to ensure that any activities or projects they fund, authorize, or carry out will not jeopardize the survival of a threatened or endangered species. In consultation for those species with critical habitat, federal agencies must also ensure that their activities or projects do not adversely modify critical habitat to the point that it will no longer aid in the species' recovery. In many cases, this level of protection is similar to that already provided to species by the ESA jeopardy standard. However, areas that are currently unoccupied by the species but which are needed for the species' recovery are protected by the prohibition against adverse modification of critical habitat.

2.3 Local Policies, Ordinances, and Regulations

Sonoma County General Plan 2020

In conjunction with the CDFW, Sonoma County has identified several habitats as sensitive, natural communities which include coastal salt marsh, brackish water marsh, freshwater marsh, freshwater seeps, native grasslands, several types of forest and woodland (including riparian, valley oak, Oregon white oak, black oak, buckeye, Sargent cypress and pygmy cypress, old growth redwood and Douglas fir forest), mixed serpentine chaparral, and coastal scrub, prairie, bluff, and dunes. Any disturbance to these communities may be subject to additional mitigation measures separate from those required by the federal and state regulatory agencies.

Sonoma County Tree Protection Ordinance

The Sonoma County Tree Protection Ordinance (Tree Ordinance) requires the protection and/or replacement of trees defined as "protected." Protected trees include all native species with a diameter at breast height (DBH) of 9 inches or greater. Exemptions to tree protections include timber harvest plans (THP) filed with the State of California, emergency tree removal in the instance of hazards, lot line adjustments, zoning permits, and agricultural uses. Additionally, Tree Ordinance shall not be applied in the instance of rendering a property undevelopable or to reduce an allowable density lower than that permitted as a result of CEQA. Removal of protected trees requires a permit from the County of Sonoma, and replacement plantings of the same species as the removed trees or an in-lieu fee.

Sonoma County Valley Oak Combining District

Section 26-67, "Valley Oak Habitat Combining District", of the Sonoma County Municipal Code establishes a Valley Oak Habitat (VOH) Combining District, for the purpose of protecting and enhancing valley oaks (*Quercus lobata*) and valley oak woodlands within specific areas of Sonoma County. The ordinance establishes preservation and mitigation guidelines for removal of valley oaks within the VOH district. Required mitigation for removal of any one (1) large valley oak (greater than 20 inches DBH), may include retention of one or more trees having a cumulative DBH equal or greater to the large valley oak being removed; replacement planting of 16:1 valley oaks (trees planted to trees removed); or an in-lieu fee payment. Required mitigation for removal of small valley oak trees (less than 20 inches DBH) totaling a cumulative diameter of greater than 60 inches, may also include retention and/or replacement, or in-lieu fee requirements. The Study Area is located within the VOH Combining District.

3.0 METHODS

On July 5, 2017, the Study Area was traversed on foot to determine (1) plant communities present within the Study Area, (2) whether existing conditions provide suitable habitat for any special-status plant or wildlife species, and (3) whether sensitive habitats are present. All plant and wildlife species encountered were recorded and are summarized in Appendix A. Plant nomenclature follows Baldwin et al. (2012) and subsequent revisions by the Jepson Flora Project (2017), except where noted. For cases in which regulatory agencies, CNPS, or other entities base rarity on older taxonomic treatments, precedence was given to the treatment used by those entities.

Special-status species with a potential for occurrence, determined based on field visits and habitat availability, are discussed within the report. Database records of special-status species documented in the vicinity of the Study Area are provided in Appendix B. Representative photographs of the Study Area taken during field visits are included in Appendix C.

3.1 Biological Communities

Prior to the site visit, the *Soil Survey of Sonoma County, California* [U.S. Department of Agriculture (USDA) 1972] and SoilWeb (USDA 2017) were examined to determine if any unique soil types that could support sensitive plant communities and/or aquatic features were present in the Study Area. In addition, we reviewed the Cotati United States Geological Survey (USGS) 7.5-minute quadrangle topographic map (USGS 1980), the National Wetlands Inventory (NWI) (USFWS 2017a), and aerial photographs of the Study Area (Google Earth 2017) to identify potential sensitive habitats and areas for further investigation during the site visit. Following the site visit, biological communities present in the Study Area were classified based on existing plant community descriptions described in the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986) or *California Vegetation Manual* (Sawyer et. al. 2009, CNPS 2017a). However, in some cases it is necessary to identify variants of community types or to describe non-vegetated areas that are not described in the literature. Biological communities were classified as sensitive or non-sensitive as defined by CEQA and other applicable laws and regulations.

3.1.1 Non-Sensitive Biological Communities

Non-sensitive biological communities are those communities that are not afforded special protection under CEQA, and other state, federal, and local laws, regulations and ordinances. These communities may, however, provide suitable habitat for some special-status plant or wildlife species and are identified or described in Section 4.1.1 below.

3.1.2 Sensitive Biological Communities

Sensitive biological communities are defined as those communities that are given special protection under CEQA and other applicable federal, state, and local laws, regulations and ordinances. Special methods used to identify sensitive biological communities are discussed below.

Wetlands and Non-Wetland Waters

Wetlands and non-wetland waters potentially subject to jurisdiction by the Corps, RWQCB, and/or CDFW were mapped following standard methods from the Corps (Environmental Laboratory

1987, Corps 2008a, b). Identification of wetlands focused on the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) indicators of wetland hydrology. Identification of non-wetland waters focused on the presence of an OHWM.

Other Sensitive Biological Communities

The Study Area was evaluated for the presence of other sensitive biological communities, including riparian areas or other sensitive plant communities recognized by CDFW. Prior to the site visit, aerial photographs, local soil maps, and *A Manual of California Vegetation, Online Edition* (CNPS 2017a) were reviewed to assess the potential for sensitive biological communities to occur in the Study Area. All alliances within the Study Area with a ranking of 1 through 3 were considered sensitive biological communities and mapped. These communities are described in Section 4.1.2 below.

3.2 Special-Status Species

3.2.1 Literature Review

Potential occurrence of special-status species in the Study Area was evaluated by first determining which special-status species occur in the vicinity of the Study Area through a literature and database search. Database searches for known occurrences of special-status species focused on the Cotati 7.5-minute U.S. Geological Survey (USGS) quadrangle and the eight surrounding quadrangles: Sebastopol, Santa Rosa, Kenwood, Glen Ellen, Petaluma River, Petaluma, Point Reyes NE, and Two Rock. The following sources were reviewed to determine which special-status plant and wildlife species have been documented to occur in the vicinity of the Study Area:

- CNDDDB records (CDFW 2017)
- USFWS Information for Planning and Conservation Report (IPaC; USFWS 2017b)
- CNPS Rare and Endangered Plant Inventory (CNPS 2017b)
- CDFG publication "California's Wildlife, Volumes I-III" (Zeiner et al. 1990)
- CDFG publication "California Bird Species of Special Concern" (Shuford and Gardali 2008)
- CDFW and University of California Press publication *California Amphibian and Reptile Species of Special Concern* (Thomson et al. 2016)
- *A Flora of Sonoma County* (Best et al. 1996)
- *A Field Guide to Western Reptiles and Amphibians* (Stebbins 2003)
- *Sonoma County Breeding Bird Atlas* (Madrone Audubon Society 1995)
- Santa Rosa Plain Conservation Strategy (USFWS 2005)
- Santa Rosa Plain Programmatic Biological Opinion (USFWS 2007)
- Final Recovery Plan for the Santa Rosa Plain (USFWS 2016)

3.2.2 Site Assessment

A site visit was made to the Study Area to search for suitable habitats for special-status species. Habitat conditions observed at the Project Site were used to evaluate the potential for presence of special-status species based on these searches and the professional expertise of the investigating biologists. The potential for each special-status species to occur in the Study Area was then evaluated according to the following criteria:

- **No Potential:** Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).
- **Unlikely:** Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.
- **Moderate Potential:** Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.
- **High Potential:** All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.
- **Present:** Species is observed on the site or has been recorded (i.e., CNDDDB, other reports) on the site recently.

The site assessment is intended to identify the presence or absence of suitable habitat for each special-status species known to occur in the vicinity in order to determine its potential to occur in the Study Area. The site visit does not constitute a protocol-level survey and is not intended to determine the actual presence or absence of a species; however, if a special-status species is observed during the site visit, its presence will be recorded and discussed.

In cases where little information is known about species occurrences and habitat requirements, the species evaluation was based on best professional judgment of WRA biologists with experience working with the species and habitats. If necessary, recognized experts in individual species biology were contacted to obtain the most up to date information regarding species biology and ecology.

If a special-status species was observed during the site visit, its presence is recorded and discussed below in Section 4.2. For some species, a site assessment at the level conducted for this report may not be sufficient to determine presence or absence of a species to the specifications of regulatory agencies. In these cases, a species may be assumed to be present or further protocol-level special-status species surveys may be necessary. Special-status species for which further protocol-level surveys may be necessary are described below in Section 5.0.

4.0 RESULTS

A general description of the Study Area and the results of the site assessment are provided in the following sections. A list of plant and wildlife species observed is included as Appendix A. Database records of special-status species documented in the vicinity of the Study Area are provided in Appendix B. Photographs of the Study Area are provided as Appendix C.

Study Area Description

The Study Area consists of approximately 8.25 acres of vacant land dominated by non-native grassland and ruderal areas. The Study Area includes the undeveloped, northern portion of the greater 15-acre parcel. Historical aerial imagery (Sonoma County 2017, NETR 2017) indicates that the Study Area supported agricultural (orchard) production from at least 1942 to as recently as 1952. Recent aerial imagery (Google Earth 2017) indicate that the Study Area contained several portable trailers and a parking area until at least 2010, and the Study Area appears to be

disced or mowed regularly. The Study Area is bordered by single-family and rural residential development to the north, and small-scale agricultural production to the north, south, east and west.

Topography and Soils

The topography in the Study Area is very flat, with elevations ranging from approximately 192 feet above mean sea level (amsl) at the western border of the site, to approximately 200 feet amsl along the eastern border of the site (Figure 2; Sonoma Veg Map 2017). SoilWeb (USDA 2017) indicates that the Study Area contains three native soil mapping units: Clear Lake clay loam, 0 to 2 percent slopes; Clear Lake clay, ponded, 0 to 2 percent slopes; Clear Lake clay, sandy substratum, drained, 0 to 2 percent slopes.

The Clear Lake series consists of very deep clay soils formed in alluvium derived from sedimentary rock, and are located on basin floors of river valleys at elevations ranging from 25 to 2,000 feet. These soils are considered hydric, and are poorly drained, with negligible to high runoff, and slow to very slow permeability. Native and naturalized vegetation is composed of grasses and forbs, and land uses include row cropping, dry farming, irrigated pasture, and dry pasture (USDA 1972).

A representative pedon of this series contains an A-horizon of neutral (pH 7.0) very dark gray (N 3/0), when moist, with few fine faint redoximorphic concentrations from approximately 0 to 13 inches depth. This is underlain by a B-horizon of moderately alkaline (pH 8.0) very dark gray (N 3/0) to light olive brown (2.5Y 5/4), when moist, clay with pronounced and deep soil cracks (slickensides) from approximately 13 to 60 inches depth (USDA 1972). These soils have a high potential to exhibit hydric soil characteristics due to the presence of shrink-swell clays, particularly in depressional areas where surface water can collect.

Climate and Hydrology

Average annual precipitation for nearby Santa Rosa is 25 inches, with the majority falling as rain in the winter months (December through March). The mean daily high temperatures in degrees Fahrenheit range from 56 in December to 81 in September. The mean daily low temperatures in degrees Fahrenheit range from 42 in December to 53 in September (WRCC 2017). Sources of hydrology within the Study Area include direct precipitation and surface runoff from adjacent slopes to the east.

4.1 Biological Communities

Table 2 summarizes the area of each biological community type observed in the Study Area. The Study Area contains one biological community, non-native annual grassland. A description of the biological community observed in the Study Area is contained in the following section and depicted in Figure 3.

Table 2. Summary of Biological Communities in the Study Area

Community Type	Area (acres)
Non-native annual grassland	8.25
Total	8.25

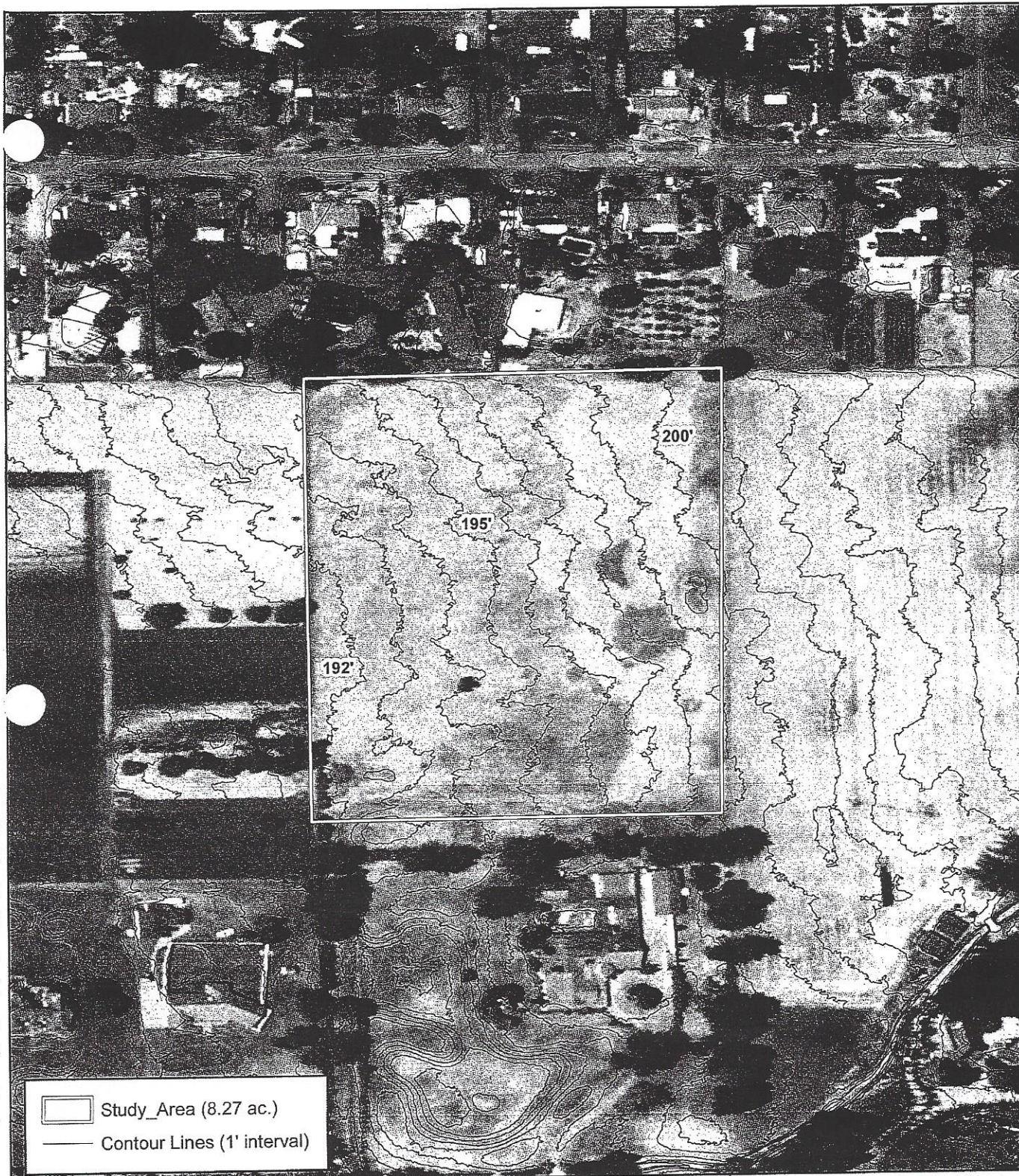


Figure 2. Topography of the Study Area



ENVIRONMENTAL CONSULTANTS

2275 Roberts Road
Penngrove, Sonoma County, California

0 50 100 200
Feet

Map Prepared Date: 7/24/2017
Map Prepared By: smortensen
Base Source: Esri Streaming - NAIP2016
Data Source(s): WRA

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4.1.1 Non-Sensitive Biological Communities

Non-Native Annual Grassland

Approximately 8.25 acres of non-native annual grassland were identified within the Study Area. Holland (1986) describes non-native grassland as a dense to sparse cover of annual grasses, often associated with numerous species of showy-flowered, native and non-native annual forbs. Non-native annual grasslands within the Study Area are dominated by slim oat (*Avena barbata*), with small inclusions of Italian rye grass (*Festuca perennis*). Common forbs in the herbaceous layer included hairy cat's ear (*Hypochaeris radicata*), wild radish (*Raphanus sativus*), field bindweed (*Convolvulus arvensis*), and willow lettuce (*Lactuca saligna*). One individual coyote brush (*Baccharis pilularis* ssp. *consanguinea*) shrub, and one individual valley oak tree (*Quercus lobata*) are located within this community. The valley oak tree within this community is likely large enough to be considered protected Sonoma County Tree Protection Ordinance.

4.1.2 Sensitive Biological Communities

No sensitive biological communities were observed within the Study Area.

4.2 Special-Status Species

4.2.1 Special-Status Plants

Based upon a review of the resources and databases listed in Section 3.2.1 for the Cotati, Sebastopol, Santa Rosa, Kenwood, Glen Ellen, Petaluma River, Petaluma, Point Reyes NE, and Two Rock 7.5-minute USGS quadrangles, it was determined that 90 special-status plant species have been documented from the vicinity of the Study Area; special-status plant species documented from within 5 miles of the site are shown on Figure 4. Of the 90 special-status species known from the region, one species is known in the vicinity, and is discussed below. The remaining species documented to occur in the vicinity of the Study Area are unlikely or have no potential to occur due to one or more of the following factors:

- The species has a very limited range of endemism and has never been observed in the vicinity of the Study Area;
- Vegetation communities commonly associated with the special-status species (e.g. vernal pools, chaparral, marshes and swamps) are absent from the Study Area;
- Specific edaphic characteristics, such as soil derived from serpentine or volcanic, are absent from the Study Area;
- Specific hydrologic characteristics, such as perennial saline, are absent from the Study Area;
- Very unique pH characteristics, such as alkali scalds or acidic bogs and fens, are absent from the Study Area;
- The disturbance regime (i.e. previous and continued mowing or discing) likely precludes the species from persisting in the Study Area.

All listed plant species covered by the Santa Rosa Plain Conservation strategy, Burke's goldfields, Sonoma sunshine, and Sebastopol meadowfoam are unlikely or have no potential to occur within the Study Area due to a lack of vernal pool habitat, lack of suitable hydrology (i.e. extended ponding), prior disturbance (i.e. mowing), and lack of historical occurrences in proximity (within 2 miles) of the Study Area. Moreover, the Study Area is located in an area assessed by the Santa Rosa Plain Programmatic Biological Opinion (USFWS 2007) as "no effect to listed plants".

Congested-headed hayfield tarplant (*Hemizonia congesta* ssp. *congesta*) is a CNPS Rank 1B species, and was determined to not be present. Congested-headed hayfield tarplant is an annual herb in the sunflower family (Asteraceae) that blooms from April to November. It typically occurs in grassy areas and fallow fields in coastal scrub, and valley and foothill grassland at elevations ranging from 65 to 1,840 feet (CDFW 2017, CNPS 2017b). Observed associated species include coast live oak, white hyacinth (*Triteleia hyacinthina*), Italian rye grass, little rattlesnake grass (*Briza minor*), pennyroyal, and spiny buttercup (CDFW 2017).

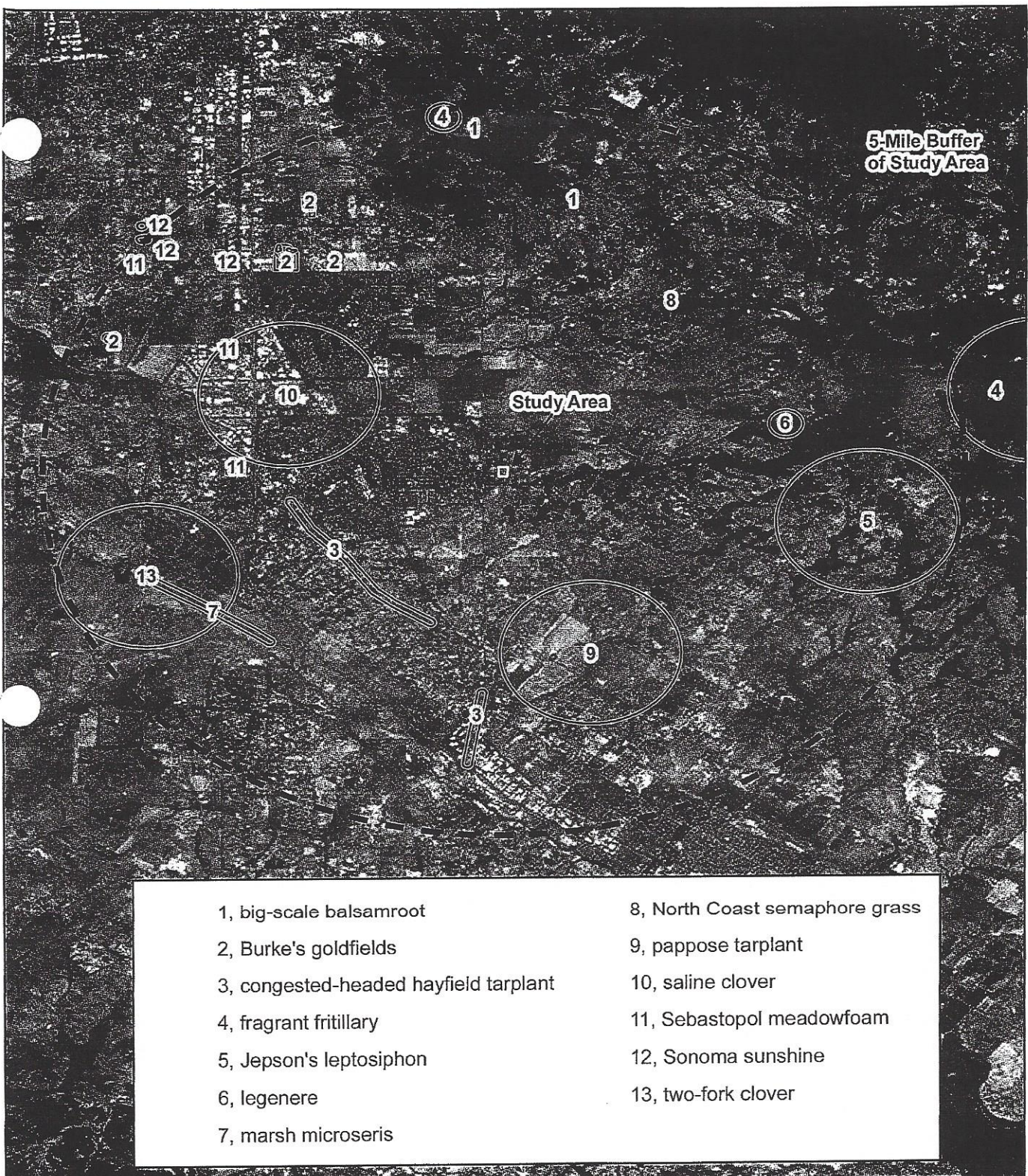
Congested-headed hayfield tarplant is known from 23 USGS 7.5-minute quadrangles in Marin, Mendocino, San Francisco, San Mateo, and Sonoma counties (CNPS 2017b). There are 16 CNDDB (CDFW 2017) records in the greater vicinity of the Study Area, 80 CCH (2017) records from Marin County, and 58 CCH (2017) records from Sonoma County. The nearest documented occurrence is from 1994 and is approximately 4.5 miles west of the Study Area. The most recent documented within the vicinity of the Study Area is occurrence is from 2008, and is approximately 4.7 miles north of the Study Area (CDFW 2017). Congested-headed tarplant was initially assessed to have a moderate potential to occur in the grassland areas of the Study Area due to the presence of associated species, suitable substrate, multiple documented occurrences in relatively close proximity to the Study Area, and relative tolerance of the disturbance regime. However, this species was not observed during the site visit which was conducted during the documented bloom period of the species. This species is unlikely to be present.

4.2.2 Special-Status Wildlife

Based upon a review of the resources and databases listed in Section 3.2.1, it was determined that 50 special-status wildlife species have been documented from within the Cotati, Kenwood, Sebastopol, Calistoga, Glen Ellen, Healdsburg, Mark West Springs, Two Rock, and Santa Rosa USGS 7.5-minute quadrangles. Special-status wildlife species that have been documented in CNDDB within a 5-mile radius of the Study Area are depicted in Figure 5.

No special-status wildlife species were determined to have a moderate or high potential to occur within the Study Area. The species with no potential to occur within the Study Area require habitat elements completely absent from the site, including streams, ponds, vernal pool, rivers, woodland, riparian, and serpentine habitats. Some elements of suitable habitat may be present (e.g., grassland or trees potentially suitable for nesting) for species determined to be unlikely to occur; however, high disturbance levels, urbanized nature of the site and surrounding areas, and/or the lack of suitable refugia reduce the potential for these species to occur and may preclude their presence.

Although the Study Area is within the Santa Rosa Plain, CTS is unlikely to occur within the Study Area based upon a lack of breeding, upland, and dispersal habitat in the Study Area and vicinity. Additionally, the nearest occurrence from 1972 is 1.2 miles south of the Study Area, and has likely been extirpated (CDFW 2017). The nearest documented breeding occurrence is from 2002 and is approximately 1.6 miles southwest of the Study Area (CDFW 2017). However, the Study Area does not contain suitable breeding habitat and is separated from this occurrence by several heavily trafficked roads. No suitable breeding habitat was observed in the vicinity of the Study Area. This region of the Santa Rosa Plain has not been designated as critical habitat for CTS and is not within a CTS core or management area designated in the Santa Rosa Plain Recovery Plan (USFWS 2016). Based on a lack of breeding habitat in the vicinity, distance from documented occurrences, and status of the species in the southeast Santa Rosa Plain, it is unlikely CTS will occur within the Study Area. The Study Area is greater than 1.3 miles from documented breeding occurrences and no habitat mitigation is required per the PBO.



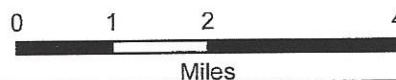
- | | |
|---------------------------------------|--------------------------------|
| 1, big-scale balsamroot | 8, North Coast semaphore grass |
| 2, Burke's goldfields | 9, pappose tarplant |
| 3, congested-headed hayfield tarplant | 10, saline clover |
| 4, fragrant fritillary | 11, Sebastopol meadowfoam |
| 5, Jepson's leptosiphon | 12, Sonoma sunshine |
| 6, legenere | 13, two-fork clover |
| 7, marsh microseris | |

Figure 4. Special-Status Species Plants Within 5 Miles of the Study Area



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2275 Roberts Road
Penngrove, Sonoma County, California



Map Prepared Date: 7/5/2017
Map Prepared By: smortensen
Base Source: Esri Streaming - National Geographic
Data Source(s): WRA

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5-Mile Buffer
of Study Area

Study Area

- | | | |
|--------------------------------|--|----------------------------------|
| 1, American badger | 6, ferruginous hawk | 11, tricolored blackbird |
| 2, burrowing owl | 7, foothill yellow-legged frog | 12, western bumble bee |
| 3, California giant salamander | 8, golden eagle | 13, western pond turtle |
| 4, California red-legged frog | 9, grasshopper sparrow | 14, western yellow-billed cuckoo |
| 5, California tiger salamander | 10, steelhead - central California coast DPS | 15, white-tailed kite |

Figure 5. Special-Status Species Wildlife Within 5 Miles of the Study Area



ENVIRONMENTAL CONSULTANTS

2275 Roberts Road
Penngrove, Sonoma County, California

0 1 2 4
Miles

Map Prepared Date: 7/6/2017
Map Prepared By: smortensen
Base Source: Esri Streaming - NAIP2016
Data Source(s): WRA

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4.3 Sonoma County Protected Trees

The Study Area contains one native valley oak tree which appeared to meet the size criteria for protected status per the Sonoma County Tree Protection Ordinance.

5.0 SUMMARY AND RECOMMENDATIONS

No sensitive biological communities were identified within the Study Area. No special-status plant or wildlife species have been documented to occur within the Study Area, and none have a moderate or high potential to occur. The following sections present recommendations for future studies and/or measures to avoid or reduce impacts to these species and sensitive habitats, if present.

5.1 Biological Communities

The entirety of the Study Area is comprised of non-native annual grassland and is not considered a sensitive biological community. The Study Area contains no potential wetlands or other waters potentially within the jurisdiction of the Corps under Section 404 of the Clean Water Act and RWQCB under the Porter Cologne Act and Section 401 of the Clean Water Act. No sensitive biological communities exist in the Study Area; therefore, no jurisdictional wetland delineation or other additional surveys or mapping is recommended.

5.2 Special-Status Species

5.2.1 Special-Status Plants

Of the 90 special-status plant species known to occur in the vicinity of the Study Area, none were determined to have a moderate or high potential to occur in the Study Area, and none were observed during the site visit. The grassland in the Study Area is highly disturbed by regular mowing and discing, and overwhelmingly dominated by non-native species, making it unlikely that special-status grassland species would occur in the Study Area. All listed plant species covered by the Santa Rosa Plain Conservation strategy, Burke's goldfields, Sonoma sunshine, and Sebastopol meadowfoam are unlikely or have no potential to occur within the Study Area due to a lack of vernal pool habitat, lack of suitable hydrology (i.e. extended ponding), prior disturbance (i.e. mowing and discing), and lack of historical occurrences within the vicinity of the Study Area.

5.2.2 Special-Status Wildlife

No special status wildlife species were determined to have a moderate or high potential to occur within the Study Area. The Study Area lacks habitat to support special-status wildlife species such as vernal pools, wetlands, rivers, woodland, riparian, and serpentine habitats. High disturbance levels, urbanized nature of the site and surrounding areas, and/or the lack of suitable refugia reduce the potential for these species to occur and may preclude their presence. There are no further recommendations for special-status wildlife species.

5.2.3 Non-Special-Status Wildlife

Although no special-status wildlife species have potential to occur, many common bird species protected under MBTA and CFGC have potential to occur within the Study Area. Vegetation removal, construction, or other activities occurring within the nesting season (February 15-August

15) have potential to impact any nesting birds. WRA recommends the following measures be implemented to avoid impacts to nesting birds protected by MBTA and CFGC:

- If ground disturbance or vegetation removal is initiated in the non-breeding season (August 16 through February 14), no pre-construction surveys for nesting birds are required and no adverse impact to birds would result.
- *Pre-construction nesting bird survey:* If ground disturbance or removal of vegetation occurs in the breeding bird season (February 15 through August 15), pre-construction surveys should be performed by a qualified biologist no more than 14 days prior to commencement of such activities to determine the presence and location of nesting bird species. If active nests are present, establishment of temporary no-work buffers around active nests will prevent adverse impacts to nesting birds. Appropriate buffer distance should be determined by a qualified biologist and is dependent on species, surrounding vegetation, and topography. Once active nests become inactive, such as when young fledge the nest or the nest is subject to predation, work may continue in the buffer area and no adverse impact to birds will result.

5.3 Sonoma County Protected Trees

The Study Area contains one native valley oak tree which appeared to meet the size criteria for protected status per the Sonoma County Tree Protection Ordinance. A tree removal permit may be required for the removal or work within the protected perimeter (i.e. dripline) of a protected tree. If tree removal is proposed as part of the Project, an arborist survey is recommended. If a tree removal permit is determined to be required, conditions of approval may include replacement planting or payment of in-lieu fees to the County. However, the Project may qualify for an agricultural exemption from the Tree Protection Ordinance, in which case, no permit or mitigation for tree removal would be required.

5.4 Conclusion

The proposed Project involves medical cannabis outdoor cultivation and installation of a greenhouse for indoor cultivation. The proposed Project is not located within and will not impact sensitive habitats or special-status species.

Greenhouse Odor Mitigation Options

Luma California LLC
2275 Roberts Road
APN: 047-122-025

We are exploring multiple odor mitigation methods including the following systems:

1. C.O.R.E - Commercial Odor Remediation Equipment

In order to mitigate cannabis odors that exhaust from the greenhouse we will be using Innovative Solutions C.O.R.E – Commercial Odor Remediation Equipment technology. The C.O.R.E technology is one of the most powerful odor elimination products on the market today. Utilizing extremely high power ultraviolet lamps to create ozone and hydroxyls, the C.O.R.E breaks down the odor by destroying the (VOC's) Volatile Organic Compound molecules. Unlike many other ineffective products that merely mask odors the C.O.R.E technology is a proven solution that eliminates the odors before leaving the facility.

The C.O.R.E technology uses a process called Molecular Disassociation to destroy the odor causing molecules. The advanced oxidation and ozone produced by the CORE break the bonds which hold the organic molecule together. The molecule “disassociates”, meaning the complex string of atoms, which make up the (VOC's) volatile organic compounds is broken apart and causes the original molecule to no longer exist. It's important to understand molecular disassociation as a cascading process, meaning, as a molecule breaks apart smaller molecules are formed, often times an entirely different VOC as a byproduct. The advanced oxidation products from the C.O.R.E break these byproduct molecules down as well.

How C.O.R.E Works:

The C.O.R.E technology is an air purification unit that is mounted outside of the greenhouse and injects the advanced oxidation and ozone purification into the exhaust vents that will be connected to the exhaust fans at the end of each of the greenhouses. As the advanced oxidation and ozone purification mixes with the odor causing VOCs, the compounds are broken down in seconds by molecular disassociation and the odors will be eliminated before leaving the greenhouse.

The C.O.R.E technology is very effective at eliminating odors from all organic matters as well as from bacteria and contaminants and has been used successfully to eliminate some of the most intense odors from a range of facilities that include: Sewage Lift Stations, Food Processing, Restaurants, Manufacturing, Fish Fertilizer and Cannabis cultivation and extraction facilities.



2. Subtractive Odor Control™

Benzaco Scientific Subtractive Odor Control™ makes additive masking technologies obsolete. By using scientific odor neutralization concepts developed over the last 20 years, Benzaco Scientific is able to dramatically reduce or eliminate malodors completely. Benzaco Scientific uses selected essential oils, intimately dispersed with the malodor in vapor phase delivery and through a combined process of chemical reaction, odor opposites (antagonistic pairs), absorption and adsorption, and pluralistic effects, the odor is neutralized and eliminated.

Benzaco Scientific has many operational sites in the United States using Subtractive Odor Control™ Technology. The results are impressive. Analysis of air samples before and after treatment show reductions in odor intensity of 90% plus. Comparative tests on other vapor phase odor control technologies showed reductions of 40 to 60%.

How Subtractive Odor Control™ Works:

Basically, Benzaco Scientific changes the way one smells the odor. The shape of the odor molecule triggers odor perception. Odor molecules solubilize in mucous in the nasal cavities. The solubilized molecule attaches to a protein in one of millions of olfactory sensory receptors. This combined protein/molecule triggers a signal to the olfactory bulb, which acts like a switching station, sending signals to the brain. These signals are received by various areas of the brain including the temporal lobe, which houses memory. Memory plays a very significant role in odor perception. Smells are remembered, and emotions are triggered by them.

Benzaco Scientific chemists use a number of techniques to modify malodors:

1. Modify the shape (chemical structure) of the odor molecule BEFORE it reaches the nose.
2. Modify the number and intensity of the triggering molecules reaching the nose.
3. Modify the perception of the odor.

Benzaco Science chemists and engineers have combined to make Subtractive Odor Control™ an extremely effective method of odor management for the cannabis-growing industry. The right chemistry and the right engineering make the difference between unsatisfactory odor masking and complete odor reduction. Benzaco Scientific Subtractive Odor Control™ - tested and proven for over 20 years.





Case Study—Colorado Cannabis Grow Facility

COLORADO CANNABIS GROW FACILITY SAVED FROM LICENSE REVOKE BY IMPLEMENTING AN ODOR-ARMOR® 420 ODOR MANAGEMENT PLAN

The Problem

A licensed cannabis grow facility in the mountains of Colorado recently was saved from the imminent inevitability of being shut-down for persistent nuisance odor complaints from the neighbors. Although the owner had previously installed high-pressure fogging nozzles to treat odors from the greenhouse exhaust fans, complaints began to flood in...threatening the continued existence of the business.

The Objective

For the purpose of optimizing the existing odor control system to operate as it completely should, a thorough review of the system was conducted including:

- Nozzle placement
- Cross-wind affects
- Choice of odor counteractant,
- Feed-rate of the counteractant, and
- Contact-time of the counteractant with the cannabis odors.



The Study

It was determined that Odor-Armor® 420 should be used to treat the nuisance odors. Odor-Armor® 420 was specifically formulated to counteract the esters, terpenoids and reduced sulfur compounds found in nuisance marijuana odor. In order to demonstrate the efficacy and performance, an independent, third-party environmental consultant was brought in to conduct a three-day odor survey. The purpose: measure strength and characteristics of nuisance odors at the property line and the surrounding community utilizing Nasal Ranger® technology.

The Nasal Ranger® is a state-of-the-art portable, field olfactometer for confidently measuring and quantifying odor strength in the ambient air. Since the detection of odors are mostly subjective in nature, this device provides odor detecting and measuring values which determines ambient odor "Dilution-to-Threshold" (D/T) values objectively.

Continued on other side



Case Study—Colorado Cannabis Grow Facility (Pg. 2)



The Solution

With a cooperative effort from both Fogco Systems and Benzaco Scientific, engineers designed and constructed diversion hoods over each greenhouse exhaust fan to minimize the affect of the strong cross-winds blowing across the fans. The hoods increased the contact time between the Odor-Armor[®] 420 and the cannabis odor. As a result, the subsequent odor mapping from the Nasal Ranger testing demonstrated “no discernable marijuana odor” at neither the facility property boundary, nor in the surrounding community.

The Results

Despite being initially skeptical, both site personnel and the neighbors were significantly impressed and convinced. Because the growing facility implemented an Odor-Armor[®] 420 odor mitigation program, odor complaints have dropped off from over 30 per month to less than 2 per year. And more importantly, this particular site narrowly escaped being shut-down for odor complaints. Key neighbors who were initially in strong opposition to the cannabis operation had now written and submitted letters of support to the judge, encouraging a permit renewal. The use of Odor-Armor[®] 420, the Nasal Ranger[®] data, and the community letters of support were all enough to convince the hearing judge to rule:



“Permit Granted”

Information concerning human and environmental exposure may be reviewed on the Safety Data Sheet for this product. For additional information regarding incidents involving human and environmental exposure call 888.413.5800 and ask for Health and Environmental Affairs. For more information concerning sales and service contact 888.413.5800 and ask for your local sales representative.

Write Benzaco Scientific Inc., 5024 Garfield St NW, Washington, DC 20016.

www.benzaco.com

***LUMA CALIFORNIA, LLC
NOISE AND VIBRATION ASSESSMENT
APN 047-122-025
UPE17-0090***

***2275 Roberts Road
Sonoma County, California***

March 28, 2019

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Introduction

This report summarizes the evaluation of noise and vibration levels attributable to project construction and operations at nearby residential property lines with respect to the regulatory criteria established by the Sonoma County General Plan and the Sonoma County Guidelines for the Preparation of Noise Analysis. The report first describes the project, and then summarizes the applicable regulatory criteria used in the assessment. Existing noise levels in the project vicinity are described, followed by evaluations of project-generated noise and vibration levels. Standard best management practices are recommended to reduce temporary construction noise levels to less than significant levels. Project operations would not result in significant noise impacts and mitigation measures are not required.

A brief discussion of the fundamentals of environmental noise and groundborne vibration is presented in Appendix A for those unfamiliar with acoustical terms or concepts. Appendix B displays the noise data collected at the project site.

Project Description

The applicant proposes a commercial cannabis cultivation farm at 2275 Roberts Road, Penngrove, in unincorporated Sonoma County, California. The farm would include a 10,000 square-foot (sf) outdoor cultivation canopy, 10,000 sf mixed light cultivation canopy, and 5,000 sf indoor cultivation canopy. The proposed cultivation project is located on the northern portion of the property that is undeveloped, non-native grassland and the previously built shop building and storage area. Processing is proposed to occur in the “headhouse” bay, a greenhouse style warehouse, that would be out in the cultivation field. Processing will include drying, trimming and packaging dry cannabis flowers. Any product that needed to be manufactured or processed further would be transported off site. The proposed project will operate between 6 am – 9 pm, depending on the season and sunlight. Processing will only take place between the hours of 8 am – 5 pm. At peak operations, there would be a maximum of 19 employees, with a combination of part-time, full-time, and seasonal labor. Management will be on-call 24 hours a day, seven days per week, to address any operational or emergency issues. The site will be closed to the public.

Noise Analysis Study Area

The project site is located in an area comprised of rural residential and agricultural land uses. Sonoma State University is located ~1,700 feet northwest of the site opposite Petaluma Hill Road, the primary source of environmental traffic noise in the project vicinity. The nearest noise-sensitive land uses are residences located west of the site along Roberts Road and north of the site along Curtis Drive. Figure 1 is aerial image showing the noise monitoring locations selected during the noise survey and the nearest rural residential receptor locations (R1 and R2) analyzed for potential noise impacts.

FIGURE 1 Aerial Image Showing Noise Monitoring Locations and Nearby Land Uses



Source: Google Earth, March 2019.

Existing Noise Environment

The ambient noise environment in the project vicinity was quantified through a noise monitoring survey made by Illingworth & Rodkin, Inc. (I&R) between Friday, March 1, 2019 and Monday, March 4, 2019, and between March 18, 2019 and March 19, 2019. The noise survey during the first time period consisted of one long-term noise measurement to the west of the site and one short-term noise measurement to the north of the site as indicated on Figure 1. During the second noise monitoring period, a long-term measurement was added to the north of the site. All measurements were made using Larson-Davis Laboratories (LDL) precision Type 1 model sound level meters fitted with ½-inch pre-polarized condenser microphones and windscreens. All meters were calibrated before and after installation with an LDL acoustical calibrator. Weather conditions were good for the purposes of noise monitoring with clear or overcast skies, a slight chance of rain, cooler temperatures, and very little wind.

Long-term noise measurement LT-1 was situated along the west property line of the project site to represent the noise environment at the nearest residence to the west. Appendix B contains graphical summaries of the noise data collected at Site LT-1 between the morning of Friday, March 1, 2019 and the afternoon of Monday, March 4, 2019. A review of these data indicates that daytime and

evening hourly equivalent noise levels (L_{eq}) typically ranged from 44 to 62 dBA L_{eq} and nighttime noise levels typically ranged from 37 dBA to 66 dBA L_{eq} . The data show that noise levels were higher at night. This could be explained by the croaking of frogs, as described by the property owners as a nightly occurrence. The data show that noise levels were lower during the day, with ambient noise levels primarily the result of traffic along Petaluma Hill Road. The calculated day-night average noise level at this location was 59 dBA L_{dn} on Saturday, March 2, 2019 and 54 dBA L_{dn} on Sunday, March 3, 2019.

Long-term noise measurement LT-2 was situated along the northern property line of the project site to represent the noise environment at the nearest residence to the north and to avoid the noise contamination produced by frogs. Appendix B contains graphical summaries of the noise data collected at Site LT-2 between the afternoon of Monday, March 18, 2019 and the afternoon of Tuesday, March 19, 2019. A review of these data indicates that daytime and evening hourly equivalent noise levels (L_{eq}) typically ranged from 41 to 57 dBA L_{eq} and nighttime noise levels typically ranged from 32 dBA to 47 dBA L_{eq} . The calculated day-night average noise level at this location was 47 dBA L_{dn} from 1 pm Monday, March 18, 2019 to 1 pm Tuesday, March 19, 2019.

The measured noise data are also summarized in terms of the metrics appropriate for the Sonoma County noise performance standards and for hourly L_{eq} in Table 1. Ambient noise levels at LT-1 and LT-2 were determined based on the average of the four quietest hours (L_{eq}) during the daytime and at night

TABLE 1 Existing Noise Levels at LT-1 and LT-2

Site	Time Period	Average Hourly Noise Level, dBA				
		L_{02}	L_{08}	L_{25}	L_{50}	L_{eq}
LT-1	Daytime (7 am-10 pm)	51	47	45	43	45
	Nighttime (10 pm-7 am)	49	46	43	40	42
LT-2	Daytime (7 am-10 pm)	47	44	42	40	42
	Nighttime (10 pm-7 am)	39	36	33	32	33

Short-term noise measurement ST-1 was along the northern property line of the project site. This site was selected to represent the noise environment at the nearest residence to the north and to compare with the data collected simultaneously at LT-1. Table 2 summarizes the noise data collected at Site ST-1 between the 9:00 am and 9:20 am Friday, March 1, 2019. A review of these data indicates that hourly equivalent noise levels (L_{eq}) are typically 3 dBA less at ST-1 than at LT-1.

TABLE 2 Comparing Noise Levels at LT-1 and ST-1

Site	Time Period	Average Hourly Noise Level, dBA				
		L ₀₂	L ₀₈	L ₂₅	L ₅₀	L _{eq}
LT-1	9 am-10 am, 3/1/19	59	56	51	47	51
ST-1	9 am-9:20 am 3/1/2019	58	54	45	42	48

Regulatory Criteria

Goals, objectives, and policies designed to protect noise-sensitive uses from exposure to excessive noise are set forth in the Noise Element of the Sonoma County General Plan 2020. The primary goal of the Noise Element is to, “Protect people from the adverse effects of exposure to excessive noise and to achieve an environment in which people and land uses function without impairment from noise.”

Objectives and policies of the Noise Element that are applicable in the assessment of the proposed project are as follows:

Objective NE-1.3: Protect the present noise environment and prevent intrusion of new noise sources which would substantially alter the noise environment.

Objective NE-1.4: Mitigate noise from recreational and visitor serving uses.

Policy NE-1c: Control non-transportation related noise from new projects. The total noise level resulting from new sources shall not exceed the standards in Table NE-2 (Table 3 of this report) of the recommended revised policies as measured at the exterior property line of any adjacent noise sensitive land use. Limit exceptions to the following:

- (1) If the ambient noise level exceeds the standard in Table NE-2, adjust the standard to equal the ambient level, up to a maximum of 5 dBA above the standard, provided that no measurable increase (i.e. +/- 1.5 dBA) shall be allowed.
- (2) Reduce the applicable standards in Table NE-2 by 5 dBA for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises, such as pile drivers and dog barking at kennels.
- (3) Reduce the applicable standards in Table NE-2 by 5 decibels if the proposed use exceeds the ambient level by 10 or more decibels.
- (4) For short-term noise sources, which are permitted to operate no more than six days per year, such as concerts or race events, the allowable noise exposures shown in Table NE-2 may be increased by 5 dB. These events shall be subject to a noise management plan including provisions for maximum noise level limits, noise

monitoring, complaint response and allowable hours of operation. The plan shall address potential cumulative noise impacts from all events in the area.

- (5) Noise levels may be measured at the location of the outdoor activity area of the noise sensitive land use, instead of at the exterior property line of the adjacent noise sensitive use where:
 - (a) The property on which the noise sensitive use is located has already been substantially developed pursuant to its existing zoning, and
 - (b) There is available open land on these noise sensitive lands for noise attenuation. This exception may not be used for vacant properties, which are zoned to allow noise sensitive uses.

#

This exception may not be used on vacant properties which are zoned to allow noise sensitive uses.

TABLE 3 Maximum Allowable Exterior Noise Exposures for Non-Transportation Noise Sources (Table NE-2)

Hourly Noise Metric ¹ , dBA	Daytime 7 am to 10 pm	Nighttime 10 pm to 7 am
L ₅₀ (30 minutes in any hour)	50	45
L ₂₅ (15 minutes in any hour)	55	50
L ₀₈ (5 minutes in any hour)	60	55
L ₀₂ (1 minute in any hour)	65	60
¹ The sound level exceeded n% of the time in any hour. For example, the L ₅₀ is the value exceeded 50% of the time or 30 minutes in any hour; this is the median noise level. The L ₀₂ is the sound level exceeded 1 minute in any hour.		

Noise Impact Analysis

Noise generated by the proposed project was assessed against the Table NE-2 guidelines presented in the County's Noise Element. The guidelines establish daytime and nighttime noise limits for noise events of varying durations. The primary noise sources associated with the project are intermittent vehicle traffic to and from the site and mechanical equipment associated with the proposed greenhouses.

Vehicle Traffic - Additional Vehicle Trips on Roadway Network and Driveway

The project would result in a slight increase in automobile and light vehicle traffic along Roberts Road. There would be a maximum of 19 employees expected between the hours of 6 am – 9 pm.

A significant permanent traffic noise increase would occur if the project would increase noise levels at noise sensitive receptors by 3 dBA L_{dn} or greater. As a credible worst-case estimate, this analysis assumes that up to 19 vehicle trips could be expected during operational hours. FHWA's TNM traffic noise model was used to estimate hourly noise levels due to project trips. Based on the results of the calculations, 19 vehicle trips along Roberts Road, at a speed of 30 mph, would

produce an hourly average noise level of 44 dBA at a distance of 50 feet from the roadway centerline. Such noise levels during the peak traffic hour would fall below ambient conditions produced by local traffic along Roberts Road and distant traffic along Petaluma Hill Road. On a daily average basis, this small additional increment in vehicle traffic would not result in a measurable or detectable increase in daily average noise levels and would not be considered significant.

Once onsite, project related vehicles would utilize the proposed all weather gravel road along the westernmost site boundary to access proposed parking areas. Automobiles and other light vehicles traveling at 15 to 25 mph typically produce sound levels ranging from 51 to 59 dBA at 50 feet. When adjusting for distance to the westernmost property line, autos would typically produce sound levels ranging from 55 to 63 dBA at 30 feet. Truck traffic accessing the project site would occur during the daytime hours on an infrequent basis. The Applicant anticipates soil deliveries 2-4 times per year and quarterly or bi-weekly distribution trucks on site depending on the time of the year. Due to the limited areas for turnaround, heavy duty (semi-tractor trailer type) trucks, are not likely to be used. Trucks entering or exiting the site will thus be limited to medium-duty trucks, such as box trucks, flat beds, and delivery vans. Noise levels generated by truck traffic are dependent on the size and speed of trucks, with typical noise levels generated by medium-duty trucks ranging from 65 to 70 dBA at 50 feet. For the purposes of a worst-case assessment, noise levels are calculated at the property line of the residential property to the west. Medium-duty trucks would typically produce sound levels ranging from 69 to 74 dBA at 30 feet.

Automobile passbys occurring during the daytime would not produce noise levels exceeding 65 dBA because vehicles would pass no closer than 30 feet from a specific receptor along the westernmost property line of the site. In this case, autos would produce sound levels up to 63 dBA at 30 feet. Automobile passbys occurring during the 6 am hour (a nighttime hour) are calculated to produce noise levels that would exceed 60 dBA when the vehicle is located within 45 feet of a specific receptor along the westernmost property line of the site. The total distance where noise levels would exceed 60 dBA would be 90 feet assuming that noise levels would rise during the approach and fall during the departure from a specific receptor point. At a speed of 20 mph, (29.3 ft./sec.) the total duration where noise levels would exceed 60 dBA at a specific receptor would be about 3 seconds. When considering this unlikely scenario where all 19 vehicles would utilize the project driveway during the 6 am hour, nighttime vehicle traffic could theoretically produce noise levels that would exceed 60 dBA for a cumulative time period of 57 seconds per hour. As noted previously, the L_{02} noise level is the noise level exceeded during 2% of the hour. Sounds not lasting more than one minute per hour are not regulated by Table NE-2.

Truck noise levels are calculated to exceed 65 dBA when the truck is located within 90 feet of a specific receptor. The total distance where noise levels would exceed 65 dBA would be 180 feet during approach and departure from a specific receptor. Assuming a passby speed of 20 mph, the total duration where noise levels would exceed 65 dBA would be less than 7 seconds for each truck passby. Therefore, during the worst daytime hour, the cumulative amount of time that noise levels would exceed 65 dBA would be approximately 14 seconds (assuming one truck trip in and one truck trip out during the same daytime hour). Trucks would not be expected at night. Sounds not lasting more than one minute per hour are not regulated by Table NE-2.

Vehicle Traffic – Parking Lot Activities

The project would construct three small surface parking lots (a four-space lot east of the existing residence, a six-space lot north of the existing residence, and a six-space lot west of the proposed greenhouses) that would be used by employees. Vehicle circulation, engine starts, and door slams would be the primary sources of noise associated with the parking lots. These sources typically produce noise levels that range from 50 dBA to 60 dBA L_{max} at 50 feet. The cumulative duration of noise from these intermittent sounds would be more than one minute, but less than 5 minutes in any hour considering the low number of parking spaces proposed. Therefore, the L_{02} would be the applicable regulatory threshold used in the analysis of parking lot activities.

The six-space lots would be of primary concern at receptors R1 and R2 as the four-space lot would be mostly shielded by intervening buildings. The centers of these small parking lots would be approximately 370 to 400 feet from the nearest property line to the west at receptor position R1, and at least 400 feet from the nearest property line to the north at receptor position R2. Regular noise sources occurring within the parking lot during events are calculated to generate L_{02} noise levels ranging from 33 to 43 dBA at the site's western and northern property lines. Parking lot activity noise levels would be 22 dBA or more below the daytime noise level threshold of 65 dBA L_{02} and 17 dBA or more below the nighttime noise level threshold of 60 dBA L_{02} at nearby property lines. Table 4 summarizes the assessment of parking lot noise levels.

TABLE 4 Parking Lot L_{02} Noise Levels

	L_{02}			
	(Noise Level Exceeded 1 Minute per Hour)			
	Daytime		Nighttime	
Receptor	R1	R2	R1	R2
Unadjusted Table NE-2 Limit	65	65	60	60
Ambient Noise Levels	51	47	49	39
Parking Lot Noise Level	33-43	33-43	33-43	33-43
Operations Exceed Ambient by 10 dBA?	No	No	No	No
NE-2 Adjustment	0	0	0	0
Adjusted Table NE-2 Limit	65	65	60	60
Operations Exceed NE-2?	No	No	No	No

Mechanical Equipment

The outdoor and mixed-light cultivation is proposed to be located in the open field to the north of the existing residence and shop buildings. The indoor cultivation is proposed to be located within the existing 2,100 sf shop building and a proposed 2,900 sf cultivation canopy. The Applicant plans to propagate and vegetate plants in the new proposed greenhouses. Processing including drying, trimming, and curing would occur in the proposed headhouse structure adjoining the greenhouses.

Normal daily project operations would not require any heavy equipment or machines. The primary noise sources that would be audible outside on the site would be the fans required for ventilation of the greenhouses. Mechanical and electrical equipment located inside the greenhouses for lighting, internal air circulation, and dehumidification would not contribute to noise outdoors. The

current plans show four wall mounted propeller fans on the gable end of each of the six greenhouses. Manufacturer's noise data provided for the proposed fans indicates that each fan would generate a noise level of 47 dBA at a distance of 25 feet, and with the four fans in a greenhouse operating the noise level would be 53 dBA at a distance of 25 feet. The proposed fans are quieter than manufacturer's data provided to I&R for other similar projects. The difference is likely due to the size, speed, and number of blades in the proposed fans. The fans would be located in the gable end-walls of the buildings. It is also assumed the fans would operate continuously 24-hours per day. The applicable noise metric is therefore the hourly L_{50} during the daytime and the nighttime. The nearest residential properties are located approximately 415 feet to the west and north of the proposed equipment. Utilizing these data and a plan of the layout of the facility provided to us, noise levels were calculated at the project's west and north and south property lines and compared to the ambient noise level and the noise limits set forth in the General Plan. As previously noted, nighttime ambient noise levels at location LT-1 representing the residence to the west (Receptor R1) were affected by frogs. This is likely to be seasonal. The nighttime noise measured at LT-2 (Receptor R2) did not appear to be affected by the frogs and based on our experience in rural settings is believed to represent a reasonable and conservatively low estimate of ambient nighttime noise levels at both LT-1 and LT-2. The cumulative equipment noise levels and existing ambient levels are summarized in Table 5.

The fans proposed for the project would result in noise levels up to 8 dBA lower than the allowable levels shown in Table 5. As noted above, the fan noise data for the selected fans indicate that these fans are "quiet" equipment and were a good selection to minimize fan noise. However, it is critical given the low ambient noise levels in the area that the fans that are purchased and installed operate as expected. The best way to confirm this is to measure the noise from fans prior to occupancy. The following noise performance standard and noise monitoring procedure is recommended as a project condition of approval:

Noise Monitoring of Greenhouse Ventilation Fans: Prior to occupancy the noise resulting from the greenhouse wall mounted ventilation fans shall be measured by a qualified acoustical consultant acceptable to County staff. The A-weighted sound pressure level will be monitored for five minutes at a distance of 25 feet from the face of each building directly facing the center of the four fans with all four fans in that building operating only. Measurements should be done during the morning between 9:00 am and noon. The measured sound level shall not exceed 57 dBA L_{50} . The ambient L_{50} noise level shall be measured for a period of 15 minutes before the first fan noise measurement and after the last fan noise measurement.

The 57 dBA L_{50} noise performance limit for each building allows for a 4 dBA increase above the rated sound level for the specified equipment to account for the effects of actual installation and operating conditions and would still include a substantial 4 dBA factor of safety with respect to the County nighttime noise limit.

TABLE 5 Mechanical Equipment L₅₀ Noise Levels

	L₅₀ (Noise Level Exceeded 30 Minutes per Hour)			
	Daytime		Nighttime	
	R1 W. Pr. Line 415 feet	R2 N. Pr. Line 415 feet	R1 W. Pr. Line 415 feet	R2 N. Pr. Line 415 feet
Receptor and Distance From Noise Sources				
Unadjusted Table NE-2 Limit	50	50	45	45
Ambient Noise Levels	43	40	32	32
Mech. Equipment Noise Level (Proposed)	37	37	37	37
Operations Exceed Ambient by 10 dBA?	No	No	No	No
NE-2 Adjustment	0	0	0	0
Adjusted Table NE-2 Limit	50	50	45	45
Operations Exceed NE-2?	No	No	No	No

Construction Noise

Noise impacts resulting from construction depend on the noise generated by various pieces of construction equipment, the timing and duration of noise-generating activities, the distance between construction noise sources and noise-sensitive receptors, any shielding provided by intervening structures or terrain, and ambient noise levels. Construction noise impacts primarily result when construction activities occur during noise-sensitive times of the day (early morning, evening, or nighttime hours), when construction occurs in areas immediately adjoining noise-sensitive land uses, or when construction durations last over extended periods of time.

Each construction phase would include a different mix of equipment operating. The highest noise levels are typically generated when impact tools are used (e.g., jackhammers, hoe rams). Site grading and excavation activities would also generate high noise levels as these phases often require the simultaneous use of multiple pieces of heavy equipment, such as dozers, excavators, scrapers, and loaders. Lower noise levels result from construction activities when less heavy equipment is required to complete the tasks. Pile driving is not anticipated for project construction.

Typical construction noise levels at a distance of 50 feet are shown in Tables 4 and 5. Table 6 illustrates the average noise level range by typical construction phase type and Table 7 shows the maximum noise level range for different construction equipment.

TABLE 6 Typical Ranges of Noise Levels at 50 Feet from Construction Sites (dBA L_{eq})

	Domestic Housing		Office Building, Hotel, Hospital, School, Public Works		Industrial Parking Garage, Religious Amusement & Recreations, Store, Service Station		Public Works Roads & Highways, Sewers, and Trenches	
	I	II	I	II	I	II	I	II
Ground Clearing	83	83	84	84	84	83	84	84
Excavation	88	75	89	79	89	71	88	78
Foundations	81	81	78	78	77	77	88	88
Erection	81	65	87	75	84	72	79	78
Finishing	88	72	89	75	89	74	84	84

I - All pertinent equipment present at site.

II - Minimum required equipment present at site.

Source: United States Environmental Protection Agency, 1973, Legal Compilation on Noise, Vol. 1, p. 2-104.

TABLE 7 Construction Equipment 50-foot Noise Emission Limits

Equipment Category	L_{max} Level (dBA)1,2	Impact/Continuous
Arc Welder	73	Continuous
Auger Drill Rig	85	Continuous
Backhoe	80	Continuous
Bar Bender	80	Continuous
Boring Jack Power Unit	80	Continuous
Chain Saw	85	Continuous
Compressor ³	70	Continuous
Compressor (other)	80	Continuous
Concrete Mixer	85	Continuous
Concrete Pump	82	Continuous
Concrete Saw	90	Continuous
Concrete Vibrator	80	Continuous
Crane	85	Continuous
Dozer	85	Continuous
Excavator	85	Continuous
Front End Loader	80	Continuous
Generator	82	Continuous
Generator (25 KVA or less)	70	Continuous
Gradall	85	Continuous
Grader	85	Continuous
Grinder Saw	85	Continuous
Horizontal Boring Hydro Jack	80	Continuous
Hydra Break Ram	90	Impact
Impact Pile Driver	105	Impact
Insitu Soil Sampling Rig	84	Continuous
Jackhammer	85	Impact
Mounted Impact Hammer (hoe ram)	90	Impact
Paver	85	Continuous
Pneumatic Tools	85	Continuous

Equipment Category	L _{max} Level (dBA) ^{1,2}	Impact/Continuous
Pumps	77	Continuous
Rock Drill	85	Continuous
Scraper	85	Continuous
Slurry Trenching Machine	82	Continuous
Soil Mix Drill Rig	80	Continuous
Street Sweeper	80	Continuous
Tractor	84	Continuous
Truck (dump, delivery)	84	Continuous
Vacuum Excavator Truck (vac-truck)	85	Continuous
Vibratory Compactor	80	Continuous
Vibratory Pile Driver	95	Continuous
All other equipment with engines larger than 5 HP	85	Continuous

Notes:

¹ Measured at 50 feet from the construction equipment, with a "slow" (1 sec.) time constant.

² Noise limits apply to total noise emitted from equipment and associated components operating at full power while engaged in its intended operation.

³ Portable Air Compressor rated at 75 cfm or greater and that operates at greater than 50 psi.

Source: Mitigation of Nighttime Construction Noise, Vibrations and Other Nuisances, National Cooperative Highway Research Program, 1999.

Construction would be conducted within the allowable hours of 8:00 am and 5:00 pm. Extreme noise generating construction methods, such as impact pile driving, are not proposed.

Construction noise levels would be anticipated to range from 78 to 89 dBA L_{eq} at 50 feet during busy construction periods and would drop off at a rate of about 6 dBA per doubling of distance between the noise source and the receptor. Residential properties are located as close as about 200 feet to the west and 350 feet to the north of areas of the site that would have substantial on-going construction activities. Construction noise levels would range from 66 to 77 dBA L_{eq} at 200 feet and from 61 to 72 dBA L_{eq} at 350 feet.

Implementation of the following standard best management practices would limit construction hours to daytime periods only, reduce construction noise levels emanating from the site, and minimize disruption and annoyance at adjacent noise sensitive uses:

- Limit construction to between the hours of 8:00 am to 5:00 pm.
- Limit work to non-motorized equipment on Sundays and holidays.
- Locate construction staging areas as far as practical from nearby sensitive receptors.
- Locate stationary noise-generating equipment, such as air compressors or portable power generators, as far as practical from nearby sensitive receptors.
- Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment. Air compressors and pneumatic equipment should be equipped with mufflers, and impact tools should be equipped with shrouds or shields.
- Prohibit all unnecessary idling of internal combustion engines.

With the inclusion of the standard best management practices listed above, temporary construction noise would result in a less-than-significant impact.

Cumulative Noise Environment

There are no other known noise-generating projects in the site vicinity. Operational noise levels from other potential projects would not add to noise levels produced by operations at the project site.

CEQA Initial Study Checklist Questions

The California Environmental Quality Act (CEQA) includes qualitative guidelines for determining the significance of environmental noise impacts. The CEQA Initial Study checklist questions are listed below:

- (a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

*The primary noise sources associated with the project are vehicle traffic, parking and on-site vehicle circulation, mechanical equipment associated with the greenhouses. Project operations would comply with the Sonoma County limits assuming adherence to the established noise performance standards established for ventilation equipment that would be recommended as a project condition of approval. **Less-than-Significant Impact.***

*Construction would be conducted within allowable hours and would occur over a period of less than one-year. Pile driving is not anticipated as a method of construction. With implementation of standard best management practices this would be a **Less-than-Significant Impact.***

- (b) Generation of excessive groundborne vibration or groundborne noise levels;

*Construction would occur no closer than 50 feet from the nearest buildings and pile driving is not proposed as a method of construction. At a distance of 50 feet, groundborne vibration from construction is anticipated to generate vibration levels in the range of 0.001 to 0.098 in/sec PPV. These vibration levels would be well below the conservative 0.3 in/sec PPV vibration limit recommended by the California Department of Transportation for buildings that are found to be structurally sound but where structural damage is a major concern. **Less-than-Significant Impact.***

- (c) For a project located within the vicinity of a private airstrip or an airport land use plan or where such a plan has not been adopted within two miles of a public airport or public use airport, if the project would expose people residing or working in the project area to excessive noise levels.

The project is located approximately 5.5 miles northwest of Petaluma Municipal Airport and approximately 14 miles southeast of Charles M. Schulz Sonoma County Airport. The project site is located well outside of each airport's ALUC referral area and 55 dBA CNEL noise

*contour. Excessive aircraft-related noise would not be expected at the project site. **Less-than-Significant Impact.***

SUMMARY/CONCLUSIONS

Based on the above findings, noise associated with project operations is not expected to exceed Sonoma County noise standards at any residential property in the site vicinity and mitigation is not required. Temporary construction noise would be reduced by the implementation of standard best management practices.

Appendix A – Noise and Vibration Fundamentals

Fundamentals of Environmental Noise

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its *loudness*. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (*frequency*) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table A1.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level (dBA)*. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table A2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This *energy-equivalent sound/noise descriptor* is called L_{eq} . The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the *sound level meter*. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level (CNEL)* is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 pm - 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm - 7:00 am) noise levels. The *Day/Night Average Sound Level (L_{dn})* is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

Effects of Noise

Sleep and Speech Interference

The thresholds for speech interference indoors are about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating. Outdoors the thresholds are about 15 dBA higher. Steady noises of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA have been shown to affect sleep. Interior residential standards for multi-family dwellings are set by the State of California at 45 dBA L_{dn} . Typically, the highest steady traffic noise level during the daytime is about equal to the L_{dn} and nighttime levels are 10 dBA lower. The standard is designed for sleep and speech protection and most jurisdictions apply the same criterion for all residential uses. Typical structural attenuation is 12 to 17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for a newer dwelling. Sleep and speech interference is therefore possible when exterior noise levels are about 57 to 62 dBA L_{dn} with open windows and 65 to 70 dBA L_{dn} with standard construction if the windows are closed.

Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that the causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. When measuring the percentage of the population highly annoyed, the threshold for ground vehicle noise is about 50 dBA L_{dn} . At a L_{dn} of about 60 dBA, approximately 12 percent of the population is highly annoyed. When the L_{dn} increases to 70 dBA, the percentage of the population highly annoyed increases to about 25 to 30 percent of the population. There is, therefore, an increase of about 2 percent per dBA between a L_{dn} of 60 to 70 dBA. Between a L_{dn} of 70 to 80 dBA, each decibel increase, increases by about 3 percent, the percentage of the population highly annoyed. People appear to respond more adversely to aircraft noise. When the L_{dn} is 60 dBA, approximately 30 to 35 percent of the population is believed to be highly annoyed.

TABLE A1 Definition of Acoustical Terms Used in this Report

Term	Definition
Decibel, dB	A unit describing, the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro Pascals.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e. g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max} , L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01} , L_{10} , L_{50} , L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurements and Noise Control, Harris, 1998.

TABLE A2 Typical Noise Levels in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110 dBA	Rock band
Jet fly-over at 1,000 feet		
	100 dBA	
Gas lawn mower at 3 feet		
	90 dBA	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80 dBA	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60 dBA	
		Large business office
Quiet urban daytime	50 dBA	Dishwasher in next room
Quiet urban nighttime	40 dBA	Theater, large conference room
Quiet suburban nighttime		
	30 dBA	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20 dBA	
		Broadcast/recording studio
	10 dBA	
	0 dBA	

Source: Technical Noise Supplement (TeNS), California Department of Transportation, September 2013.

Fundamentals of Groundborne Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One method is the Peak Particle Velocity (PPV). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. In this report, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction generated vibration for building damage and human complaints. Table A3 displays the reactions of people and the effects on buildings that continuous vibration levels produce. The guidelines in Table A3 represent syntheses of vibration criteria for human response and potential damage to buildings resulting from construction vibration.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as paint flaking or minimal extension of cracks in building surfaces; minor, including limited surface cracking; or major, that may threaten the structural integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher. The damage criteria presented in Table A3 include several categories for ancient, fragile, and historic structures, the types of structures most at risk to damage. Most buildings are included within the categories ranging from “Historic and some old buildings” to “Modern industrial/commercial buildings”. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

The annoyance levels shown in Table A3 should be interpreted with care since vibration may be found to be annoying at lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage.

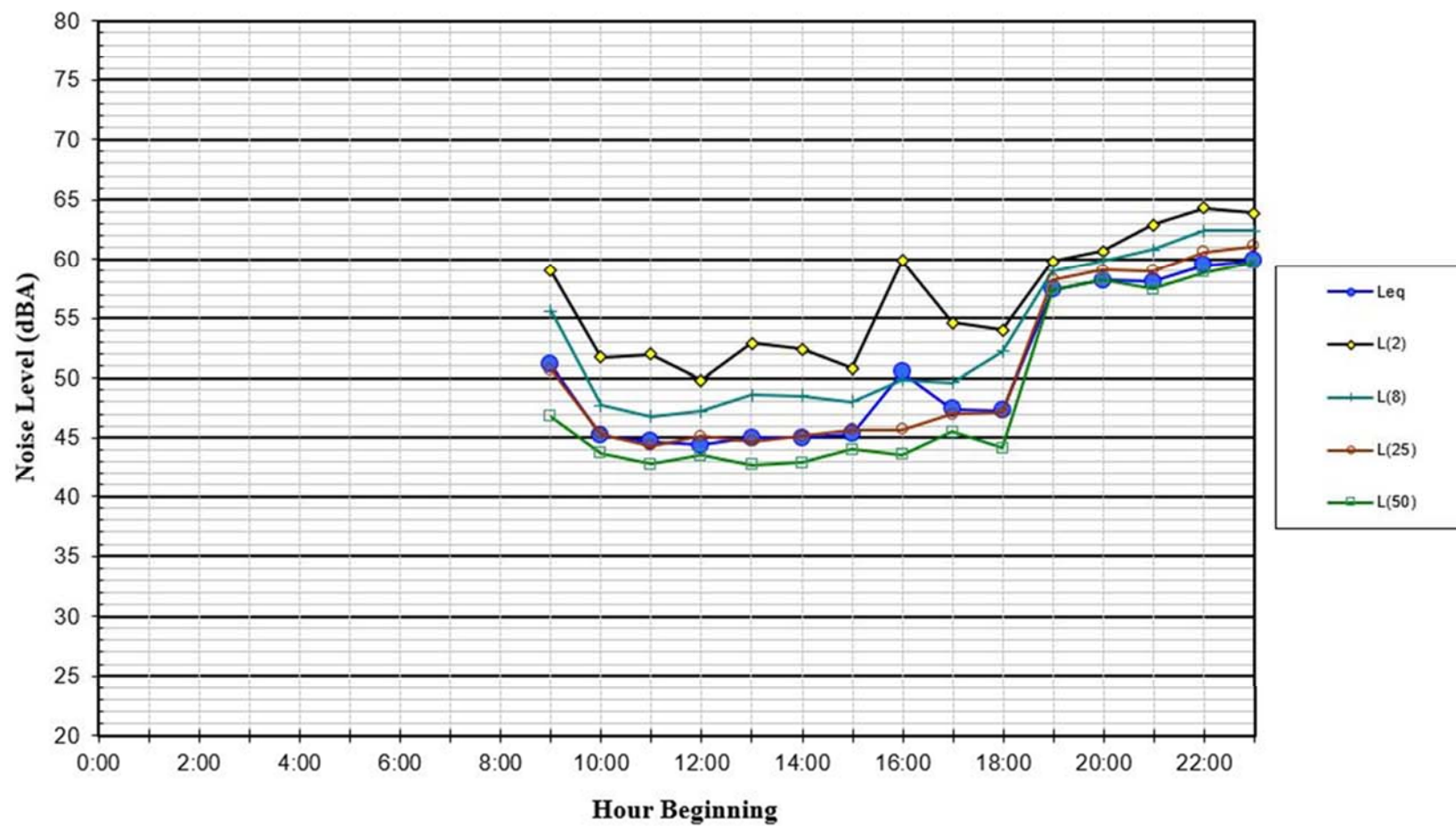
TABLE A3 Reaction of People and Damage to Buildings from Continuous or Frequent Intermittent Vibration Levels

Velocity Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.01	Barely perceptible	No effect
0.04	Distinctly perceptible	Vibration unlikely to cause damage of any type to any structure
0.08	Distinctly perceptible to strongly perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.1	Strongly perceptible	Threshold at which there is a risk of damage to fragile buildings with no risk of damage to most buildings
0.25	Strongly perceptible to severe	Threshold at which there is a risk of damage to historic and some old buildings.
0.3	Strongly perceptible to severe	Threshold at which there is a risk of damage to older residential structures
0.5	Severe - Vibrations considered unpleasant	Threshold at which there is a risk of damage to new residential and modern commercial/industrial structures

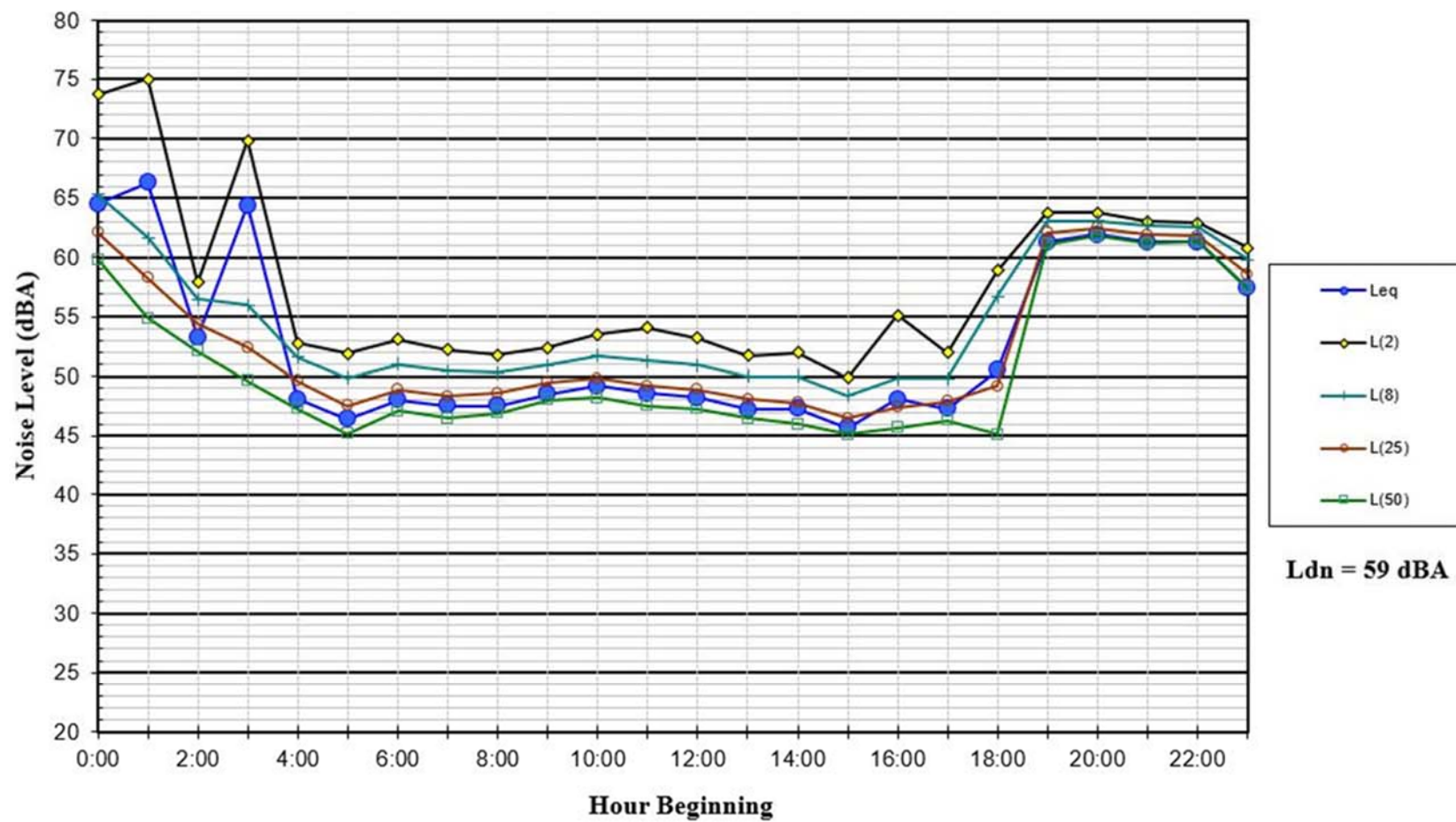
Source: Transportation and Construction Vibration Guidance Manual, California Department of Transportation, September 2013.

Appendix B – Long-Term Noise Data

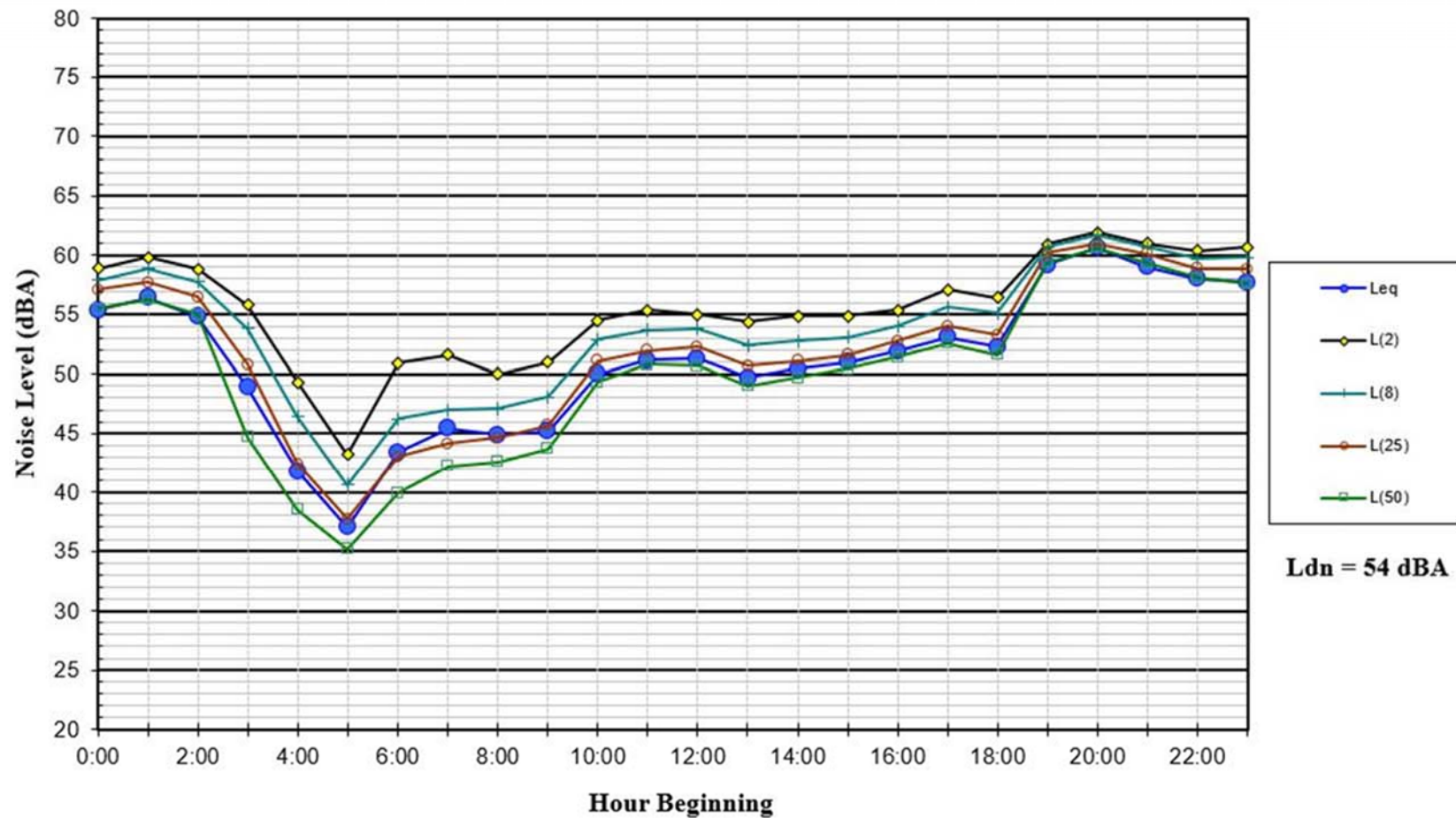
**Noise Levels at Noise Measurement Site LT-1
Western Boundary of Site
Friday, March 1, 2019**



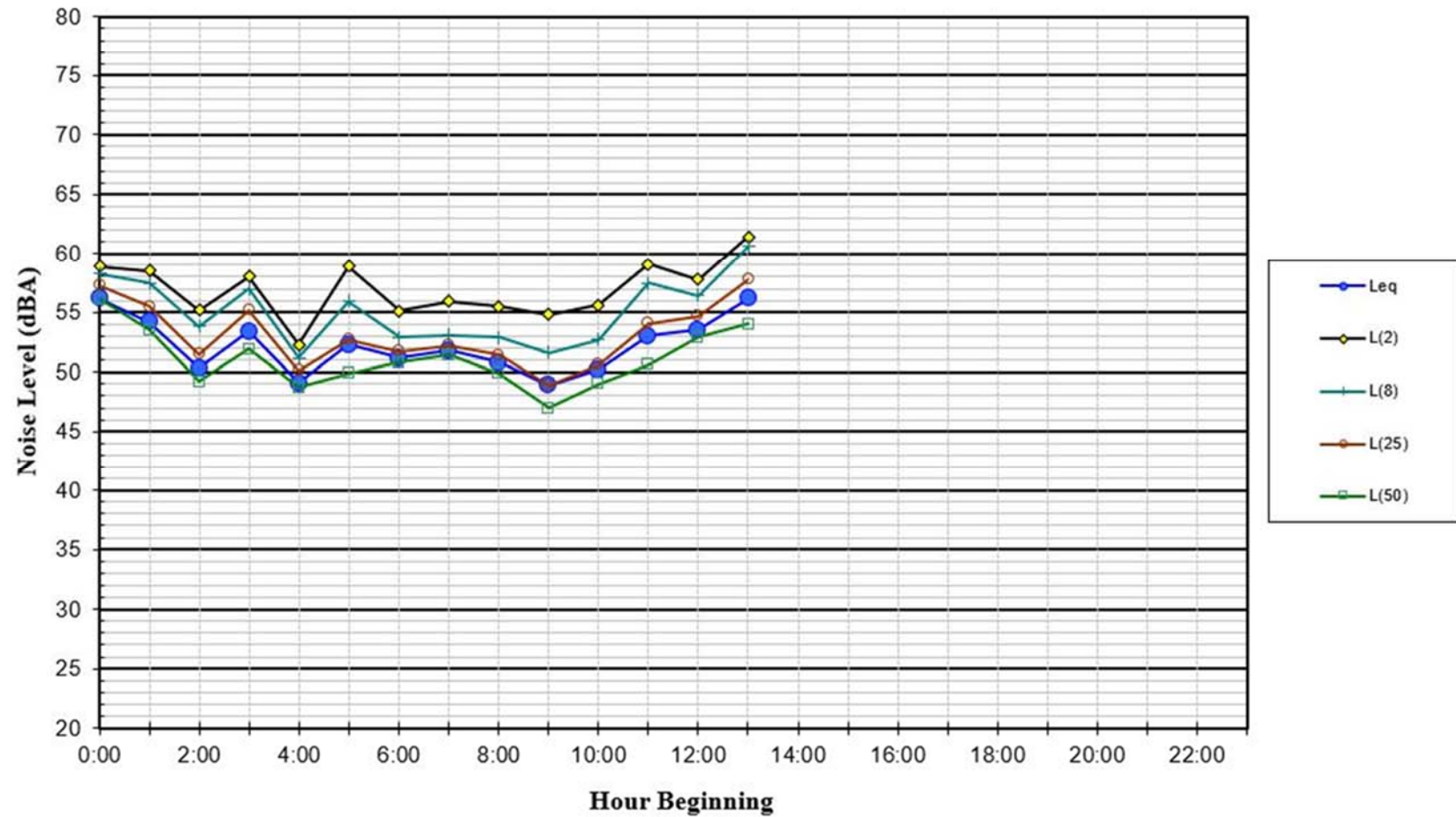
Noise Levels at Noise Measurement Site LT-1
Western Boundary of Site
Saturday, March 2, 2019



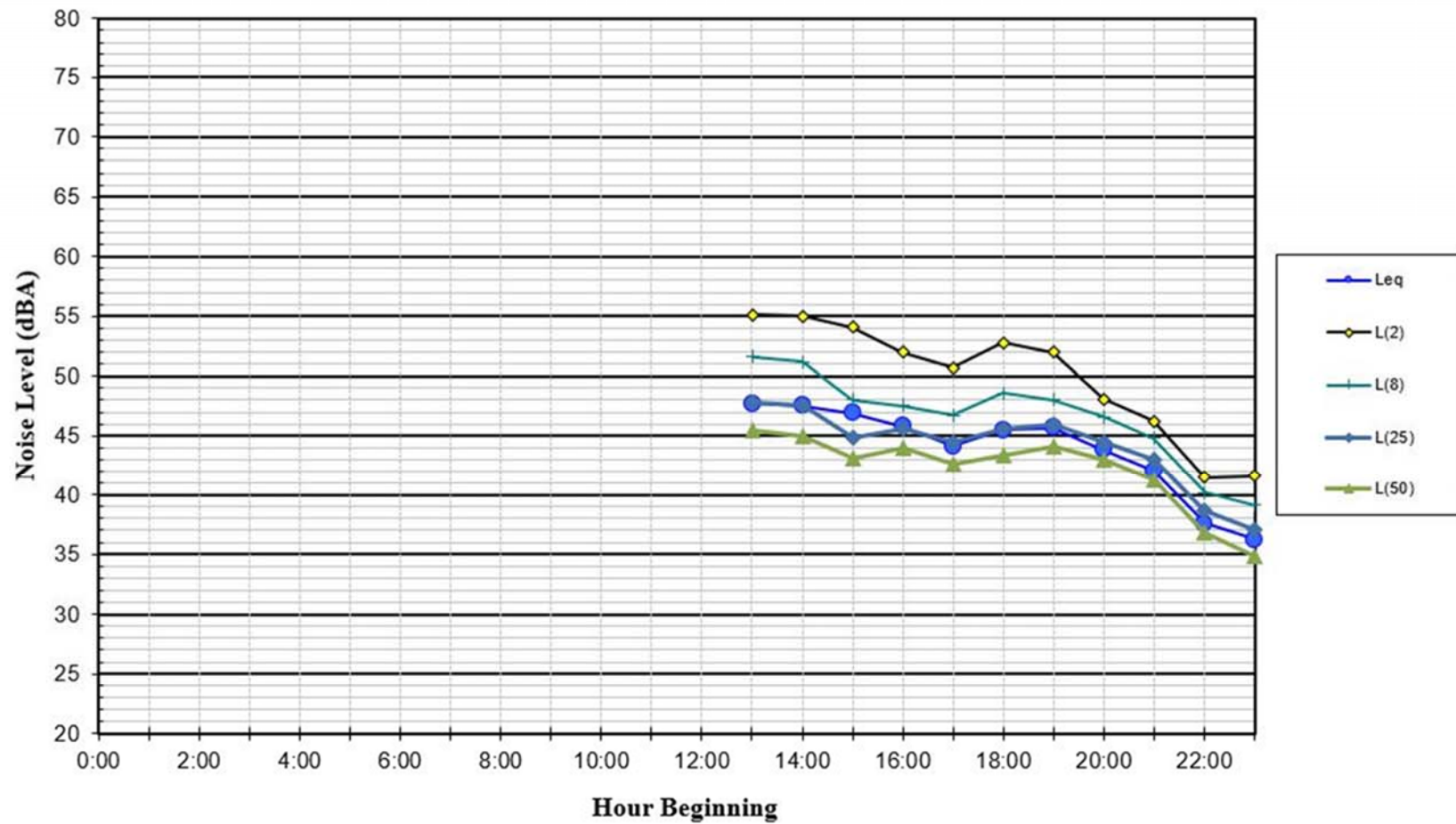
**Noise Levels at Noise Measurement Site LT-1
Western Boundary of Site
Sunday, March 3, 2019**



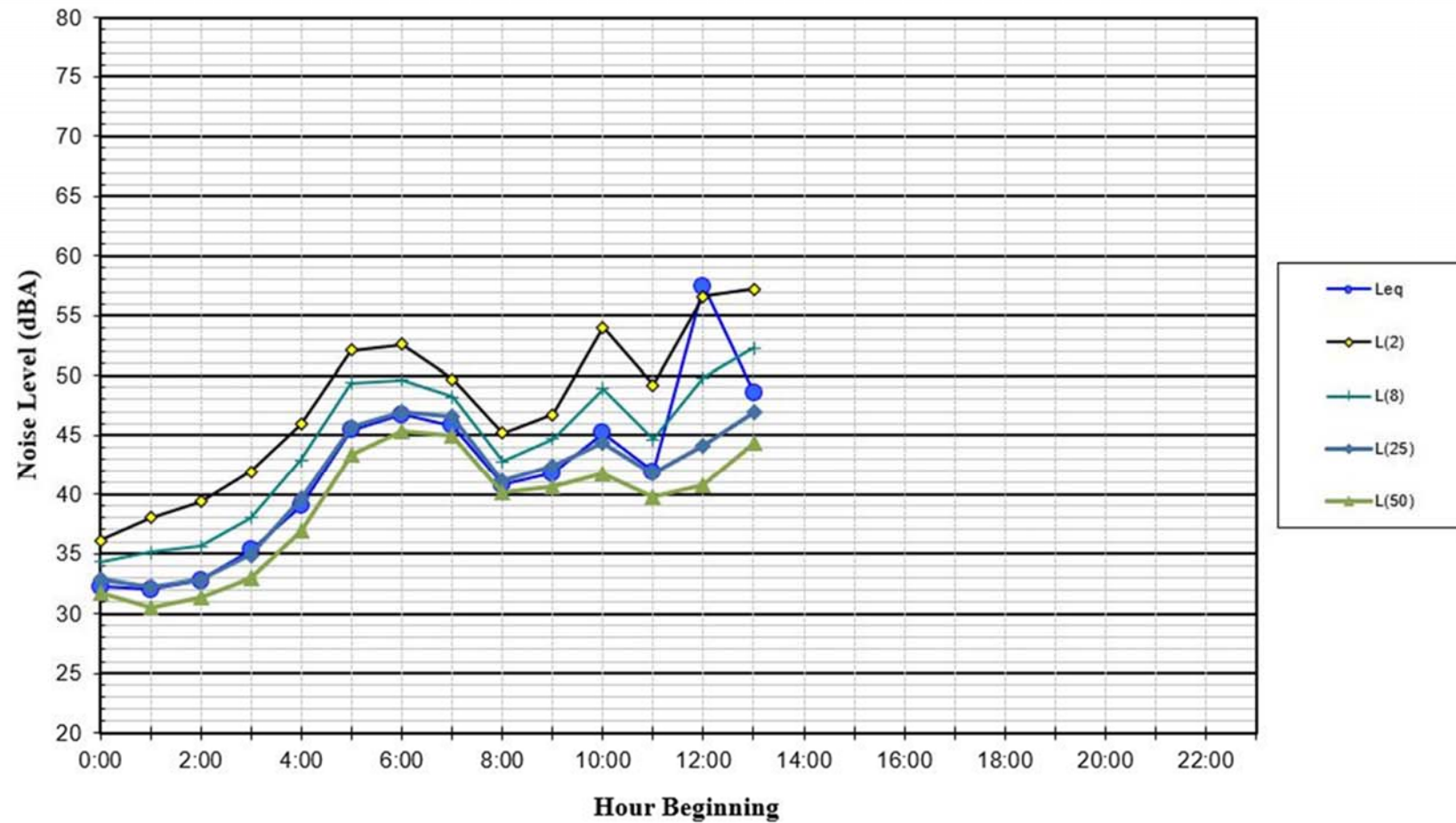
**Noise Levels at Noise Measurement Site LT-1
Western Boundary of Site
Monday, March 4, 2019**



Noise Levels at Noise Measurement Site LT-2
North Boundary of Site
Monday, March 18, 2019



Noise Levels at Noise Measurement Site LT-2
North Boundary of Site
Tuesday, March 19, 2019





LUMA CALIFORNIA

Hedgerow Plan

Attachment 10

Project Plan

This project proposes the creation of a fully fenced and secure area encompassing 2 acres located at 2275 Roberts Rd. in Penngrove California. To provide a visual screen per county requirements we will install hedgerow consisting of native California plants around the perimeter of the fenced “cultivation area”. This hedgerow will include a variety of species which will be aesthetically appealing while providing a source of biomass production for use on the farm in compost creation. The hedgerow will incorporate state listed fire resistant plants planted on the exterior of the fenced zone which will dramatically reduce the ability of the surrounding neighbors and passenger traffic from Petaluma Hill Road to view the fence. The hedgerow will incorporate multiple layers of perennial evergreen shrubs with a foundational height of 8-12 feet tall to obstruct the view of the fence itself. These plantings will be attractive to the eye and beneficial to native wildlife and pollinators, including native bees, birds and butterflies which have been in a precipitous decline to loss of habitat. The hedgerow will promote biodiversity while adding visual interest to the property and the surrounding area.

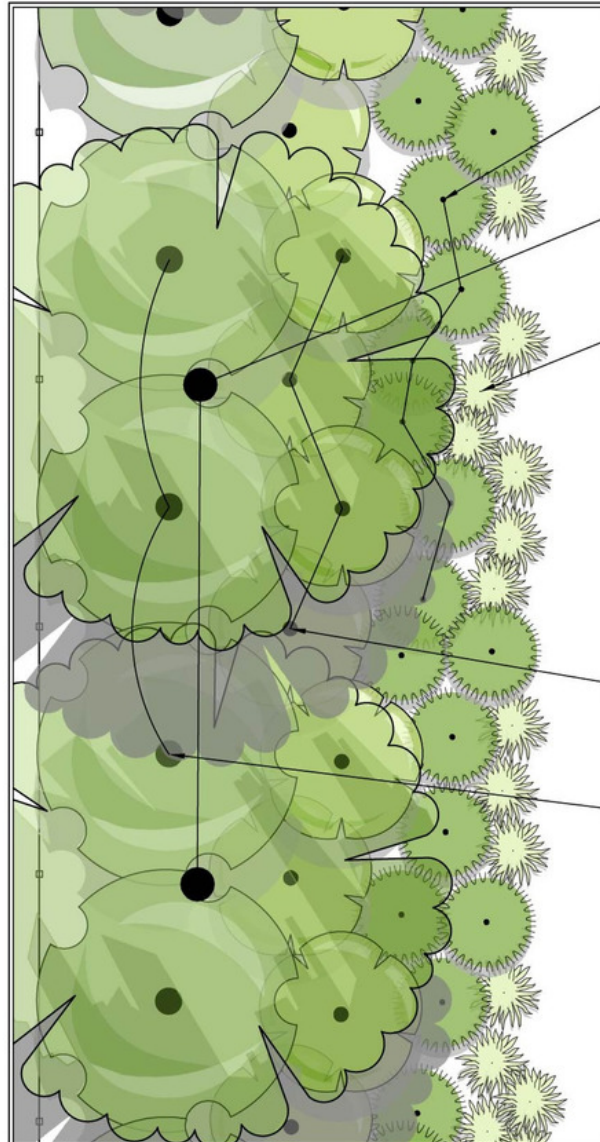
The hedgerow will be professionally installed by a licensed ecological designer and utilize biological amendments including organic compost and compost teas to increase the health and longevity of the hedgerow and surrounding soil biology. This hedgerow will not only provide sufficient screening as required by regulation but also provide an example template for other similar projects to rely on in order to create the best possible result for the county and permit applicants.

The hedgerow will provide ecosystem services including windbreak which will reduce watering needs on the farm, restoration of native biodiversity in what is currently a fallow field and provide habitat for pollinators and a biological control sector for predators of plant pests which will reduce the need for insecticides and such treatments. These plants will provide food/fodder for native insects and animals by utilizing a diverse flowering/bloom period.

The neighboring properties will benefit not only from the beautification of the property but also from the introduction of habitat for native bees, increasing the pollination rates of common garden and agricultural crops such as tomatoes and fruit trees. The plants will consist of a combination of foundational evergreen shrubs and deciduous low growing trees and an herbaceous layer of perennials and annuals including an assortment of native wildflowers. The plants will be properly maintained to remove any dead, diseased or dying vegetation to prevent the spread of wildfire should one occur in the area. In closing the proposed fencing and hedgerow will provide more than adequate coverage to obstruct the view of the Luma Cannabis Farm from the surrounding area.

See examples of intended planting and established California native Hedgerows on the following pages

Example - Planting Plan



PERENNIALS/SUB-SHRUBS

TREES

NATIVE GRASSES

SECONDARY SHRUBS

PRIMARY SCREEN SHRUBS

0 5 10 15 feet
SCALE: 1" = 5'

Hedgerow Plant Examples



TREES

Quercus agrifolia / Coast Live Oak
Salix ssp. / Willow
Sambucus caerulea / Blue Elderberry
Sambucus nigra / Common Elderberry



PRIMARY SCREEN SHRUBS

Ceanothus x 'Ray Hartman' / California Lilac
Cercis occidentalis / Western Redbud Multi-trunk
Fremontodendron californicum / California Flannel Bush
Heteromeles arbutifolia / Toyon
Myrica californica / Pacific Wax Myrtle
Rhamnus californica / California Coffee Berry
Rhus integrifolia / Lemonade Berry



SECONDARY SHRUBS

Amelanchier alnifolia / Serviceberry
Arctostaphylos menziesii / Manzanita
Baccharis pilularis consanguinea / Coyote Brush
Berberis aquifolium / Common Barberry
Calycanthus occidentalis / Spice Bush
Carpenteria californica / Bush Anemone
Corylus cornuta californica / Western Hazelnut
Eriogonum giganteum / St. Catherine's Lace
Lavatera maritima / Tree mallow
Lupinus albus / Bush Lupine
Philadelphus lewisii / Wild Mockorange
Ribes malvaceum / Chaparral Currant



PERENNIALS/SUB-SHRUBS

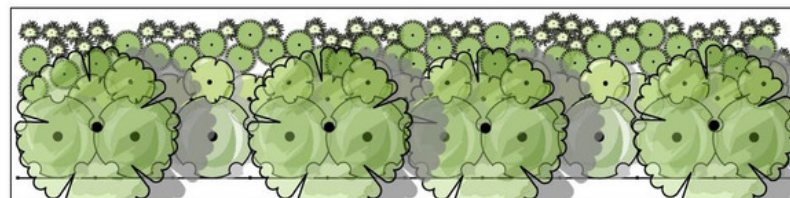
Achillea millefolium / Common Yarrow
Antennaria californica / California Sagebrush
Ceanothus griseus 'Barrico' / Carmel Creeper Cultivar
Epilobium canum / Hummingbird Trumpet
Eriogonum fasciculatum / Common Buckwheat
Eriogonum grande rubescens / Red Buckwheat
Mimulus aurantiacus / Sticky Monkey Flower
Monardella villosa / Coyote Mint
Salvia apiana / White Sage
Salvia clevelandii / Cleveland Sage
Salvia spathacea / Hummingbird Sage
Trichostema lanatum / Woolly Blue Gums



NATIVE GRASSES


Calamagrostis nutkanensis / Reed Grass
Carex ssp. / Sedge
Elymus trachycaulis / Slender Wheatgrass
Leymus condensatus / Giant Wild Rye
Muhlenbergia capillaris / Pink Muhly
Muhlenbergia rigens / Deer Grass
Nassella pulchra / Purple Needle Grass

0 16 32 48 feet
SCALE: 1" = 16'



General Notes

This is an example of several California Native plants that would be suitable in a hedgerow. Depiction of plants sizing and spacing are conceptual, not actual. Actual planting scheme must be based upon site factors including soil type, solar aspect, etc. This list is non-exhaustive, there are many other suitable plants for CA native hedgerows.

No.	Revision/Issue	Date
 PERENNIAL ABUNDANCE conservation design & consultation		
Project Name and Address LUMA		
Project: HEDGEROW		
Date: 3/29/2019		
Size: Multiple		

Example - Hedgerow Views



Hedgerow Perspectives



Hedgerow Elevation



General Notes

Conceptual views of Hedgerow

No.	Revision/Issue	Date

Per Name and Address



Project Name and Address

LUMA

Product
HEDGEROW

Date
3/29/2019

Scale

Sheet

Example Established CA Native Hedgerows

CAFF.org



xerces.org



CA.audubon.org

Fire & Safety Plan- 2275 Roberts Rd.

Property Information

APN: 047- 122-025

County: Sonoma

City: Penngrove

Nearest Fire Station:

Rancho Adobe Fire

District, Penngrove

Distance: 2.6miles

Contact Information

Owner: Zerene Lands,
LLC

Operator: Luma
California, LLC

Alexa Garcia- (512)
826-0462

Curtis Wall- (512)
777-9669

Proposed Cultivation

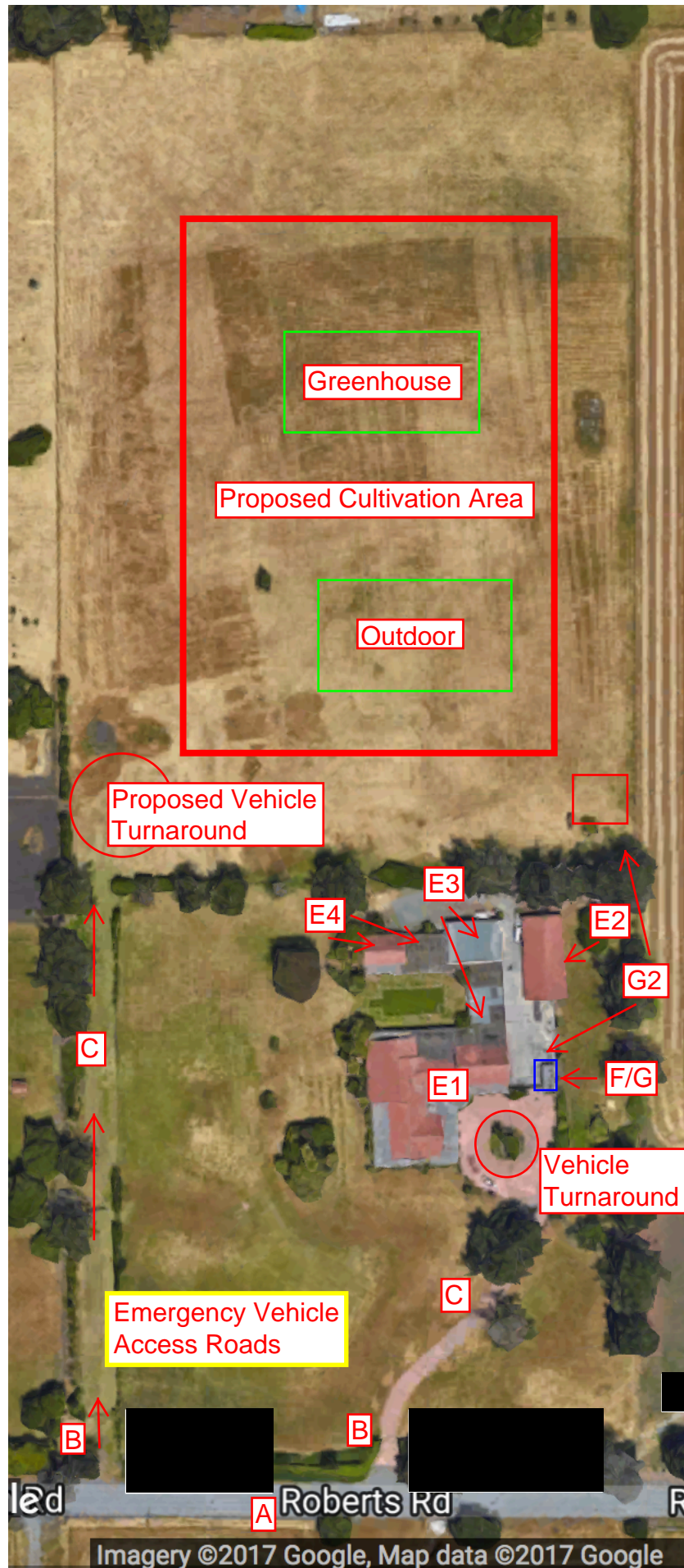
Zoning Permit:

Outdoor- 10,000sf

Use Permit:

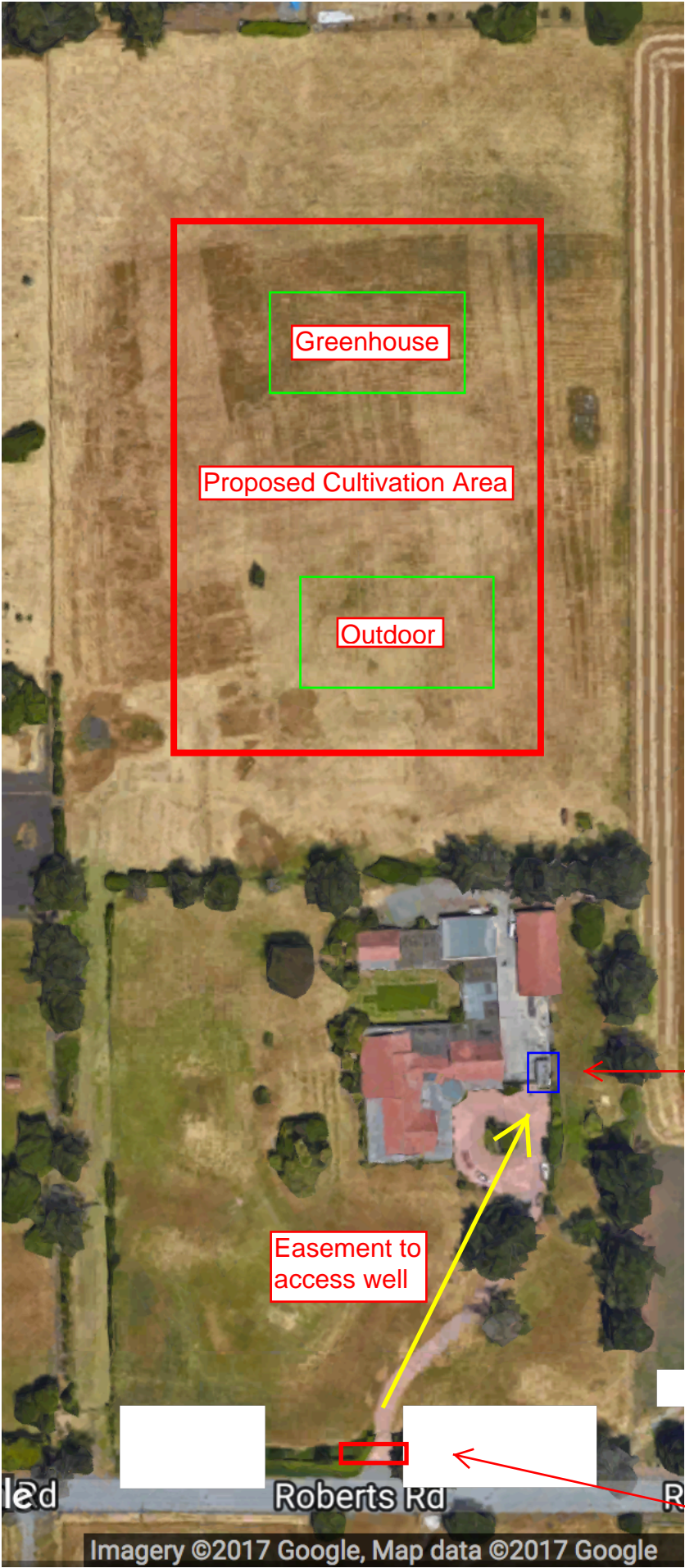
Greenhouse- 10,000sf

Indoor- 2,000-5,000sf



E1- Residential
E2- Proposed for
processing
E3- Proposed for indoor
E4- Storage / office
F/G- Well, electric, & gas
G2- Proposed for water
storage tanks

A- Closest public road
access
B- Private road access to
property
C- Private property
driveway
E- Buildings and use
F- Main gas and electric
shut off
G- Fire protection water
supplies



Greenhouse

Proposed Cultivation Area

Outdoor

Location of
monitored
groundwater
well

Easement to
access well

Roberts Rd

Main entrance