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CIRCULATION, INFRASTRUCTURE AND PUBLIC SERVICES

5.1 Purpose and Intent

The infrastructure, utilities, and public services to be provided as part of the development of The Villages at Almond Grove Specific Plan are summarized in this chapter. For reference, an Infrastructure Master Plan (“IMP”) was prepared in addition to this specific plan and provides a higher level of detail about master plans and design standards for water, wastewater, and storm drainage within the Plan Area.

5.2 Circulation

The circulation plan for The Villages at Almond Grove reinforces the objective of moving vehicles, pedestrians, cyclists, and public transit safely and efficiently through and around the Plan Area. *Exhibit 5.1, Circulation Plan* establishes the hierarchy and general location of roadways within the specific plan area; conceptual sections of these roadways are provided in *Exhibits 5.1a to 5.1e*. Size and location of streets will be further defined during the tentative map process and will not require a Specific Plan Amendment to do so.

The minimum design speeds to be used for center line curve radii, super elevation, corner and approach site distances, vertical and horizontal alignment, and sight distances for the Circulation Plan of streets will comply with City standards.

A traffic study prepared as part of the Specific Plan’s EIR identifies the need for additional rights-of-way at critical intersections to accommodate lanes for left and right turn movement. Phasing and construction of the improvements shall be implemented as required by the City Engineer and pursuant to the mitigation measures identified in the EIR and conditions of approval of tentative maps for the Specific Plan. The locations and construction of bus turnouts may be required within the Plan Area to the satisfaction of the City of Madera and Madera County Transportation Commission (MCTC).

5.2.1) Pedestrian Circulation

A pedestrian circulation system utilizing sidewalks and paseos will be provided. Sidewalks will be provided along all streets in the Plan Area, and will vary between five (5') to twelve (12') feet in width. Sidewalks shall be constructed of concrete as part of the roadway improvements. Paseos are incorporated as part of the open space and lead to a connection throughout the Plan Area.

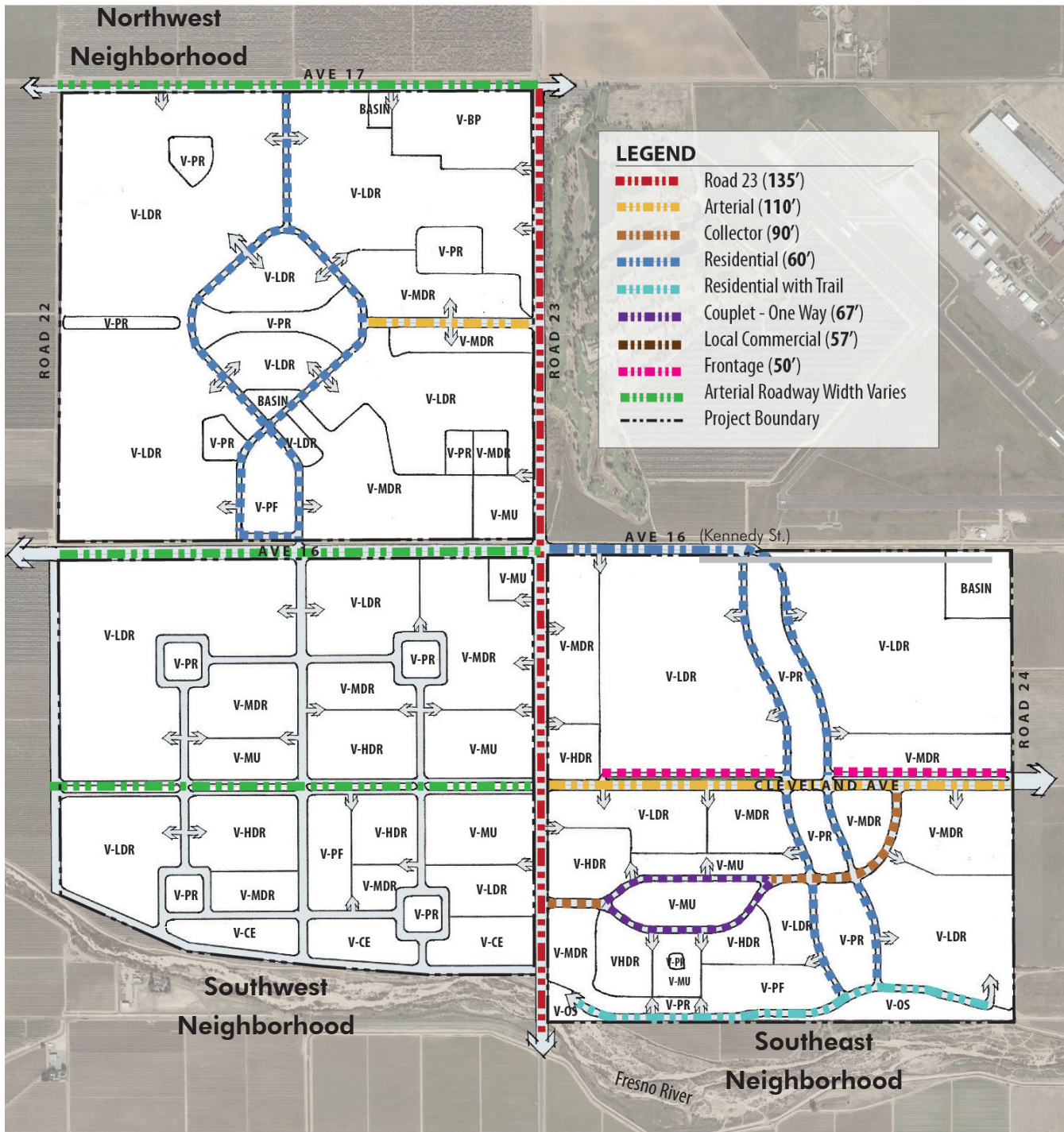
5.2.2) Bicycle Circulation

Bicycle lanes and off-street trails are an integral element in creating accessibility and mobility within the Plan Area. The Plan includes a multi-purpose pedestrian and bicycle trail along the Fresno River. The Plan proposes trail connections to link the multi-purpose trail along the river with the larger on-street bicycle network for the Plan. These bike paths will provide linkages to the City's master planned bike path system. General timing and responsibility will be discussed in the Development Agreement.

5.2.3) Public Transit

Existing public transit in Madera consists of Madera Metro and Dial-A-Ride (DAR). Madera Metro's Route 2 is the closest public transit to the Plan Area. While there is currently no public transit in the Plan Area there is the opportunity to expand as needed as determined by the City.

Exhibit 5.1, Conceptual Circulation Plan

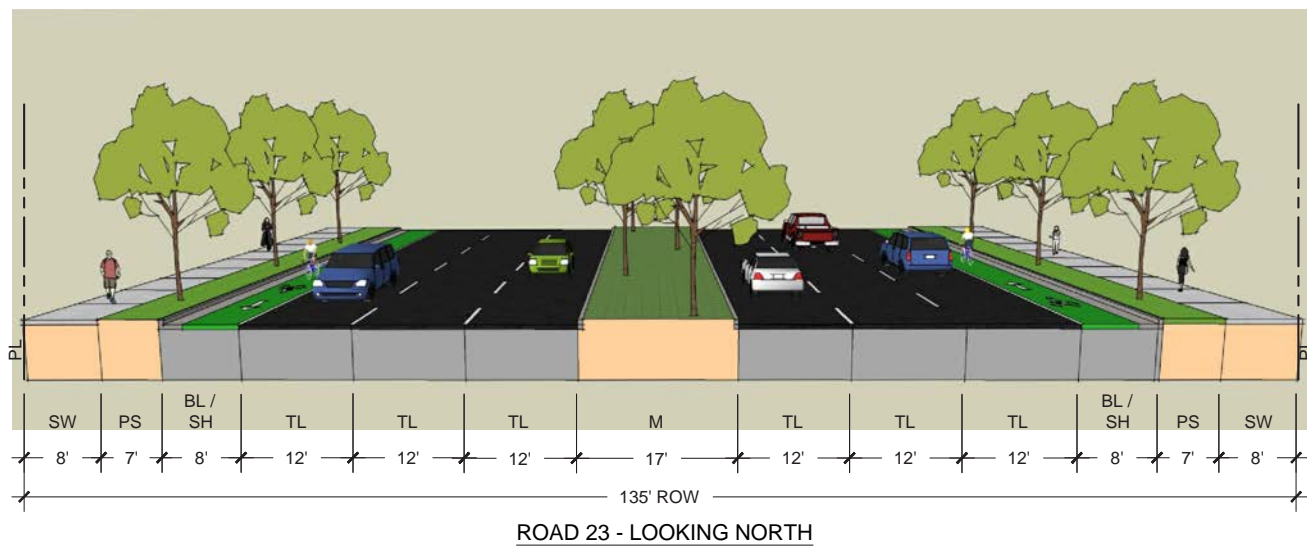


Source: Precision Civil Engineering



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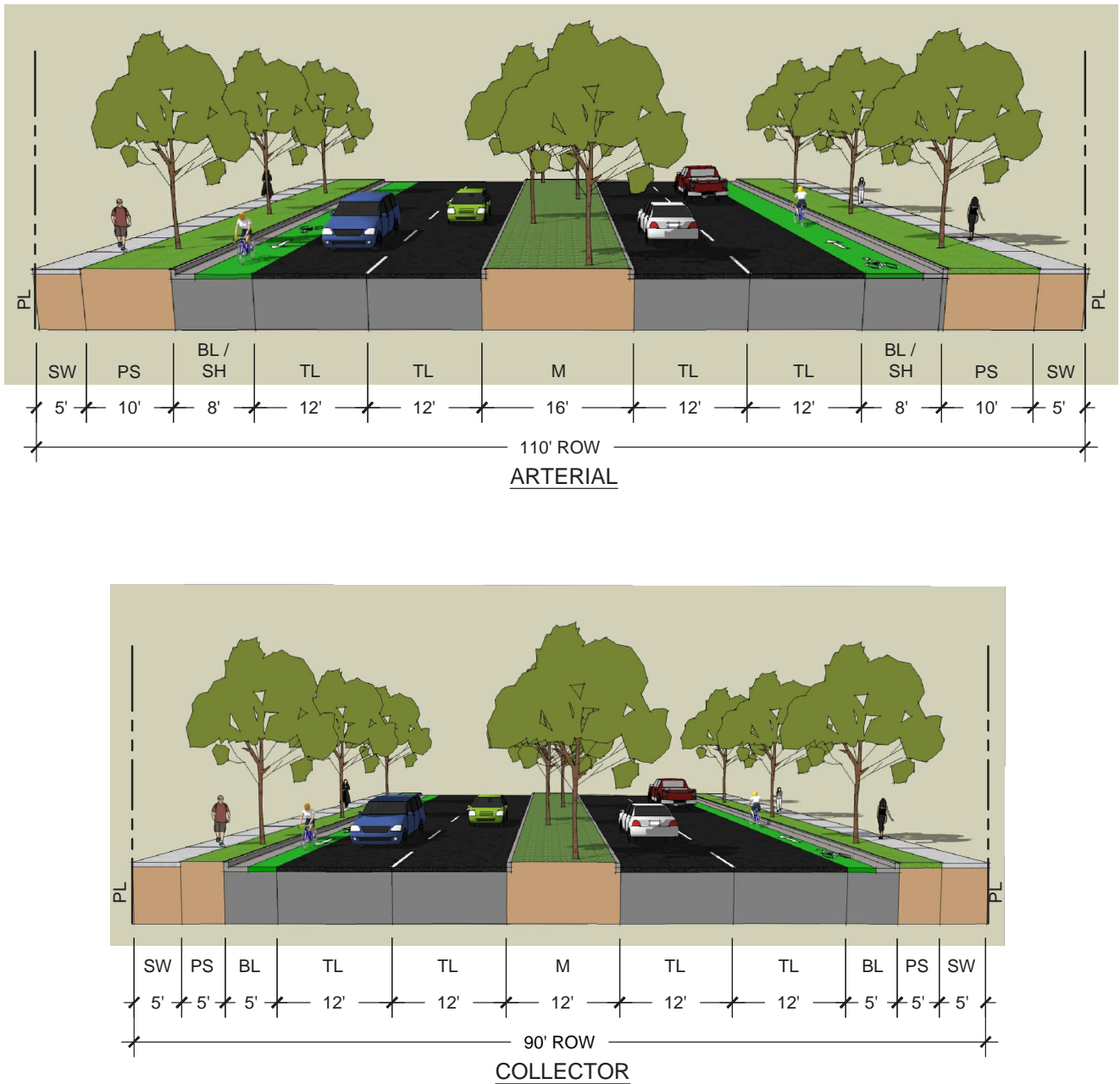
Exhibit 5.1a, Road 23 (135')



Source: Sam Harned Landscape Architecture

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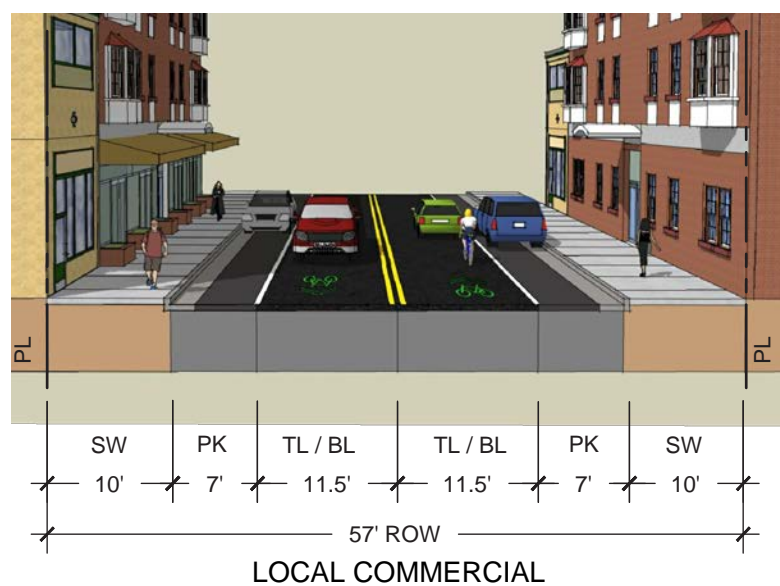
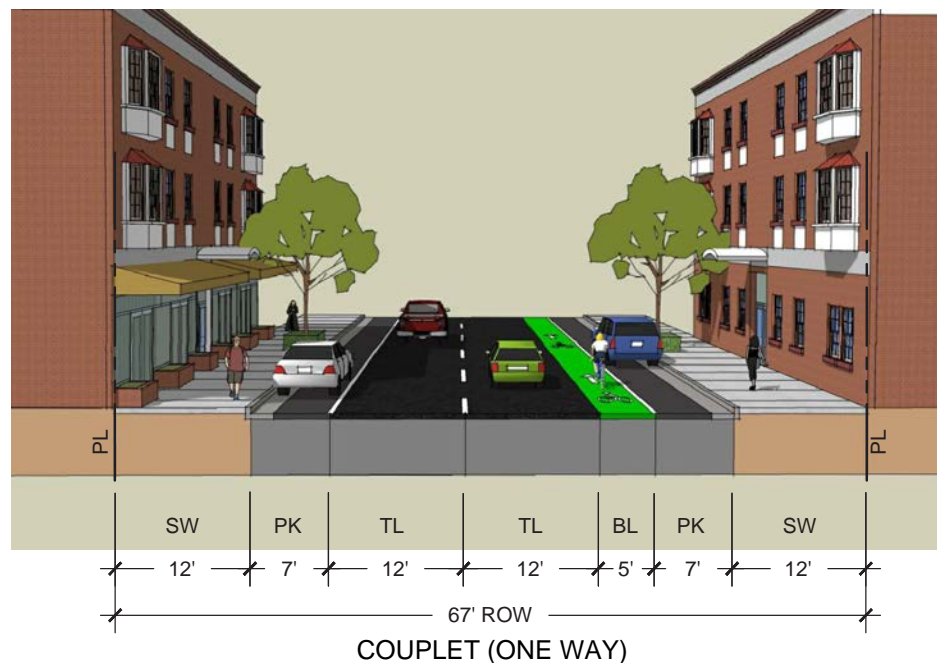
Exhibit 5.1b, Arterial (110') and Collector (90')



Source: Sam Harned Landscape Architecture

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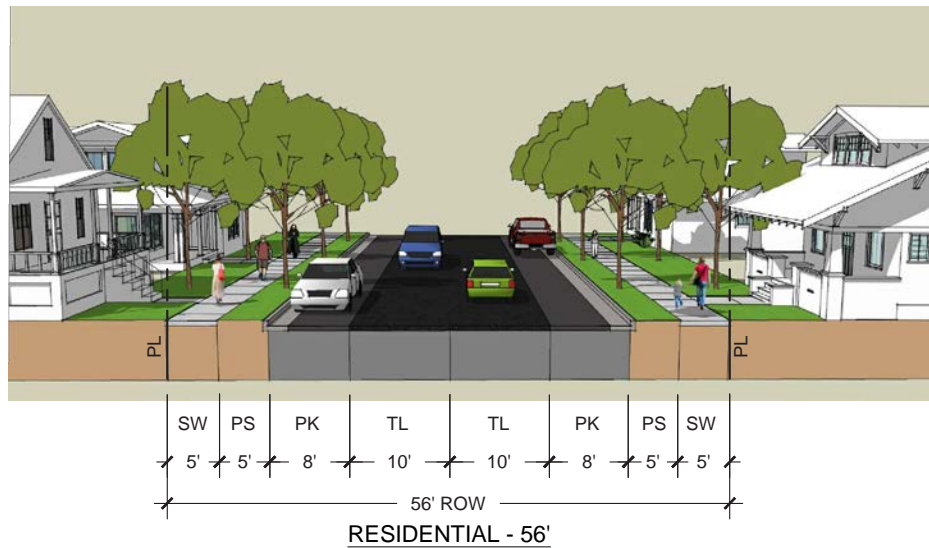
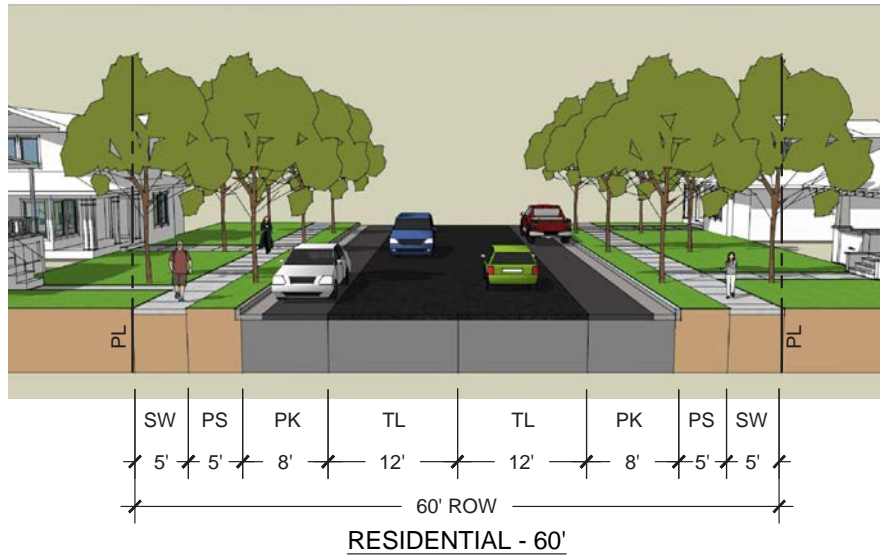
Exhibit 5.1c, Couplet (67') and Local Commercial (57')



Source: Sam Harned Landscape Architecture

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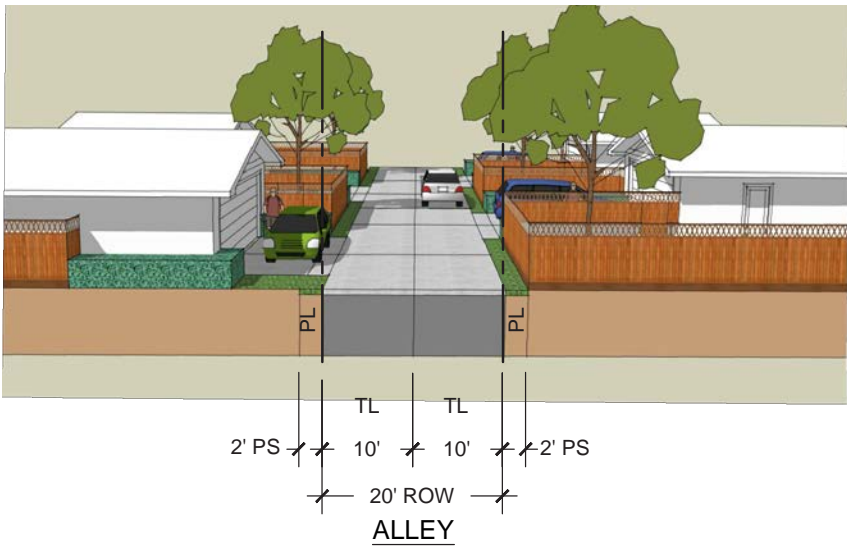
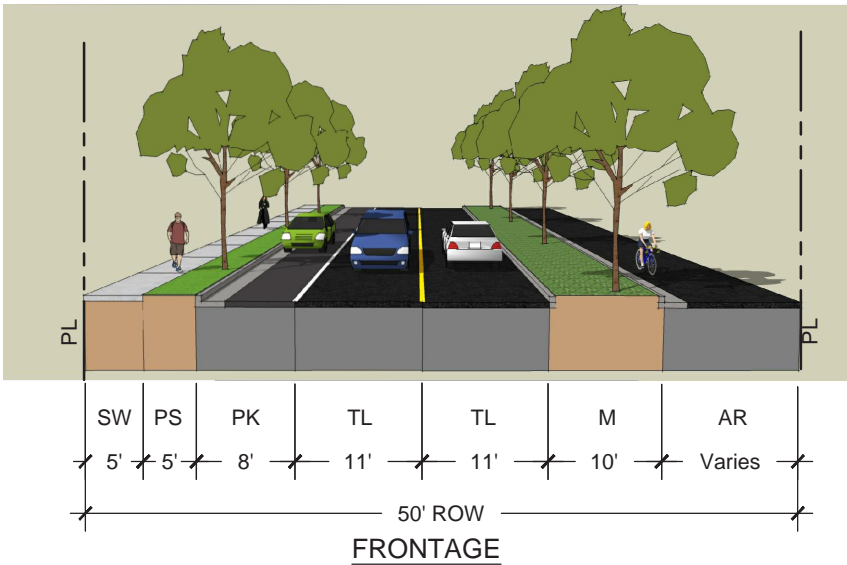
Exhibit 5.1d, Residential (60') and Residential (56')



Source: Sam Harned Landscape Architecture

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Exhibit 5.1e, Frontage (50') and Alley (20')



Source: Sam Harned Landscape Architecture

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5.3 Water Master Plan

This section consists of the major water supply facilities plan and water design standards to provide for a safe and reliable potable water system and fire protection system for the Villages at Almond Grove. The Plan's water demand was calculated based on the assumption that the Plan Area shall comply with the mandated 20 percent reduction of indoor water usage. Reclaimed water will be used for groundwater recharge and irrigation of landscaped areas and open space areas to reduce groundwater demand. The Plan's water system master plan may be subject to modification pending approvals of specific development entitlements over time.

The Plan will comply with the California Green Building Code standards, which requires residential and nonresidential water efficiency and conservation measures for new buildings and structures that will reduce the overall potable water use inside the building by 20 percent. The Development will be required to install ultra-low flow fixtures and appliances.

Development within the Plan Area will be required to install water meters at all service connections. The City will assess service charges based on volumetric rates and/or tiered rates. The rate structure will encourage reasonable water uses.

5.3.1) Fire Protection

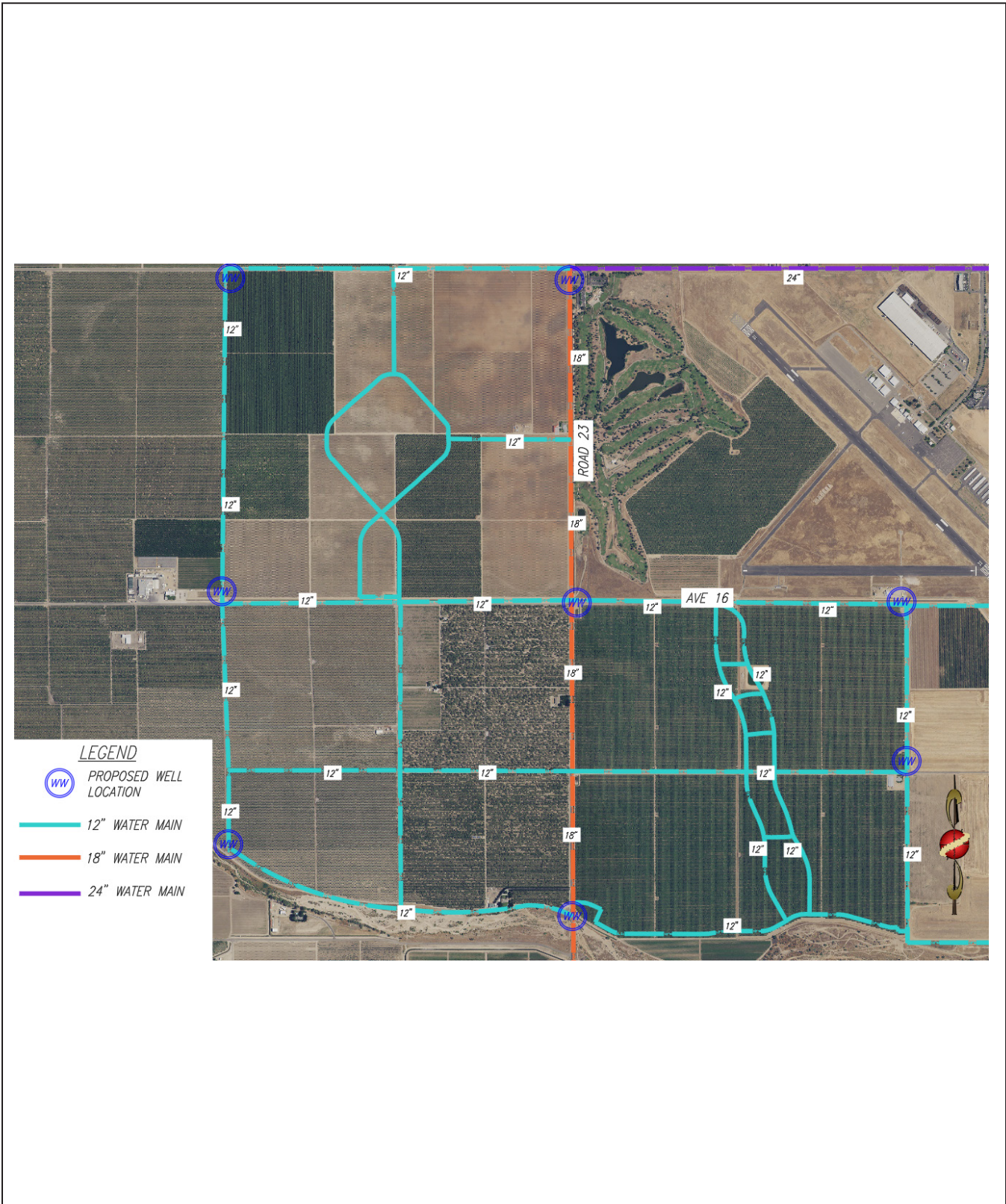
The potable water system shall be designed to supply the required fire flow of 2,000-gpm for a minimum of two hours, while concurrently supplying the Maximum Day Demand, with a minimum pressure of 20 psi. Fire hydrant spacing will be a maximum of 400 feet in residential areas and 300 feet in commercial districts. On-site fire protection must comply with the California Fire Code Appendix C for fire hydrant distribution. Fire hydrants shall be dry-barrel with 4-1/2 inch and 2-1/2 inch outlets per City of Madera Fire standards. All fire hydrants shall be of common manufacture and of a brand acceptable to the City of Madera.

5.3.2) Potable Water System Master Plan

The water system master plan, shown on *Exhibit 5.2, Water Master Plan*, illustrates the proposed system for the Plan Area. The proposed master plan, distribution system, and pipe sizes were developed based on the Land Use Districts Plan (*Exhibit 4.1*) and the City of Madera Water System Master Plan. Any modifications to the Land Uses will require modifications to the water system master plans based on approval of subsequent development entitlements that finalize residential densities, commercial uses, public, industrial, office uses or other development and improvements within the Plan Area.

Potable water for existing developments within the City is currently being supplied by groundwater through eighteen active wells. These wells all pump from the regional groundwater supply from the Madera Sub-basin of the San Joaquin groundwater basin directly into the distribution system to meet the City's demands. The future water needs of the Plan Area shall be met through eight additional wells that are to be constructed around the Plan Area. Well locations are based on the City of Madera Water System Master Plan (*Exhibit 5.2*).

Exhibit 5.2, Water Master Plan



Source: Precision Civil Engineering



While it was preferred to continue constructing groundwater supply wells throughout the City, review of groundwater conditions completed by Kenneth D. Schmidt and Associates, combined with 2014 groundwater test holes, indicate high probability for the presence of poor water quality as well as low well yields in the east and northeast part of the City. Therefore, it was determined by the City that new wells should be constructed in the western side of the City, with the intent of servicing the future developments throughout the Planning Area, including the northeast.

5.3.3) Phasing and Incremental Development

Incremental development of water system infrastructure shall be designed and constructed in accordance with the Plan Area infrastructure master plan as needed for each phase of the Plan.

5.4 Wastewater Master Plan

The City of Madera Sanitary Sewer System Master Plan (SSSMP) identifies the need for an additional sewer trunk line running down Road 23 (Road 23 Trunk) to connect to the existing Wastewater Treatment Plant (WWTP). The Plan's Wastewater System Master Plan may be subject to modification pending approvals of specific developments entitlements over time.

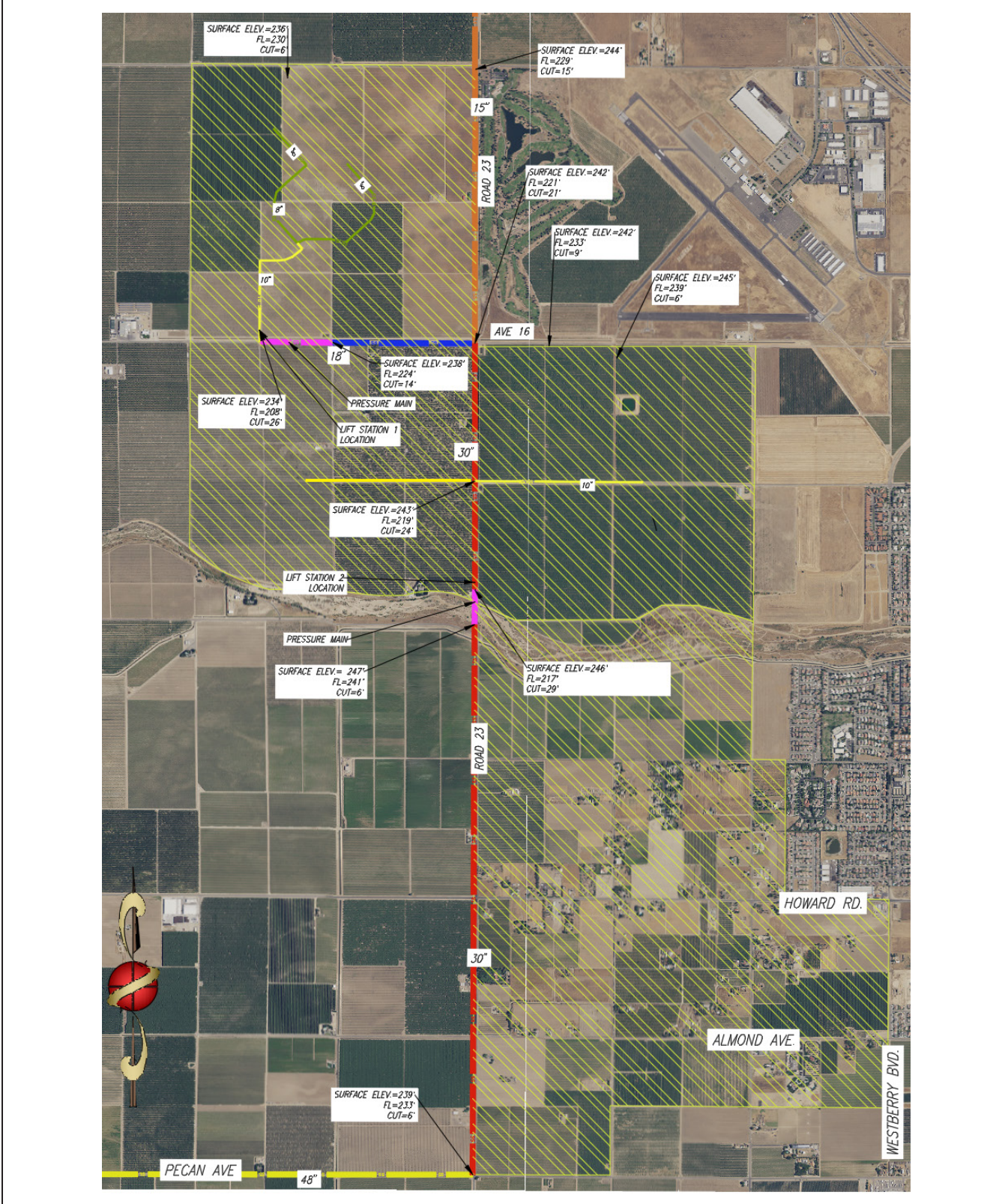
The wastewater system master plan, shown on *Exhibit 5.3, Wastewater Master Plan*, illustrates the wastewater master planned sewer mains and preliminary elevations for Plan Area. The Road 23 Trunk will be a 30" line that connects to a 48" line running parallel to an existing 48" pipe that connects to the existing WWTP. The 30" line will be approximately 15,900 linear feet (lf) and the parallel 48" pipe will be approximately 8,000 lf. A lift station will be needed west of the Ave 16 and Road 23 intersection. A second lift station will be needed before the Fresno River crossing on Road 23 (*Exhibit 5.3*).

The Plan Area's wastewater will be conveyed to the City's existing WWTP located on Road 21 ½ and Avenue 13. Wastewater will be collected in a system of mains using primarily gravity flow. The collection system will generally follow topographical features or roads and require one or more lift stations. In addition, a separate distribution system will be constructed for delivery of treated effluent from the wastewater treatment plant to the Plan Area for irrigation of landscaped areas.

The Madera WWTP will be expanded to treat effluent to be used in the plan to tertiary levels, consistent with Title 22 requirements for landscaping and irrigation uses. Funding for this upgrade as well as the distribution system that will deliver treated effluent will be provided through a Community Facilities District (CFD).

Incremental development of wastewater collection facilities and infrastructure will be designed in accordance with the Plan Area infrastructure master plan as needed for each phase of the Plan. Wastewater collection pipes will be constructed in conformance with the wastewater system master plan.

Exhibit 5.3, Wastewater Master Plan



Source: Precision Civil Engineering



5.5 Reclaimed Water System Master Plan

The Plan Area will utilize reclaimed (non-potable) water supply to irrigate all landscaped areas within the Plan Area. This will allow for efficient disposal of treated water from the City WWTP as well as reduce the Plan Area's potable water demand. The Plan is designed to efficiently use the available water resources and minimize the impacts to the groundwater aquifer. The reclaimed water system master plan may be subject to modification pending approvals of specific development entitlements over time.

Incremental development of non-potable water system infrastructure shall be designed and constructed in accordance with the Plan Area infrastructure master plan as needed for each phase of the Plan.

Per Title 7 of the Division of Drinking Water's Recycled Water-Related Statutes, the waters of the state are of limited supply and are subject to ever-increasing demands. The continuation of California's economic prosperity is dependent on adequate supplies of water being available for future uses. It is in the policy of the state to promote the efficient use of water through the development of water recycling facilities. Landscape design, installation, and maintenance can and should be water efficient. The use of potable domestic water for landscaped areas is considered a waste or unreasonable use of water within the meaning of Section 2 of Article X of the California Constitution if recycled water is available and meets the conditions described in Section 13550 of the Water Code.

5.6 Grading and Drainage

Exhibit 5.4, Existing Plan Area Topography, illustrates the existing topographic drainage in the area. Future grading and drainage in the Plan Area are expected to follow existing drainage patterns; stormwater will be retained on-site. Currently, the Plan Area all ultimately drains into the Fresno River. For stormwater master planned facilities and infrastructure, see the master plan specific to each neighborhood plan area.

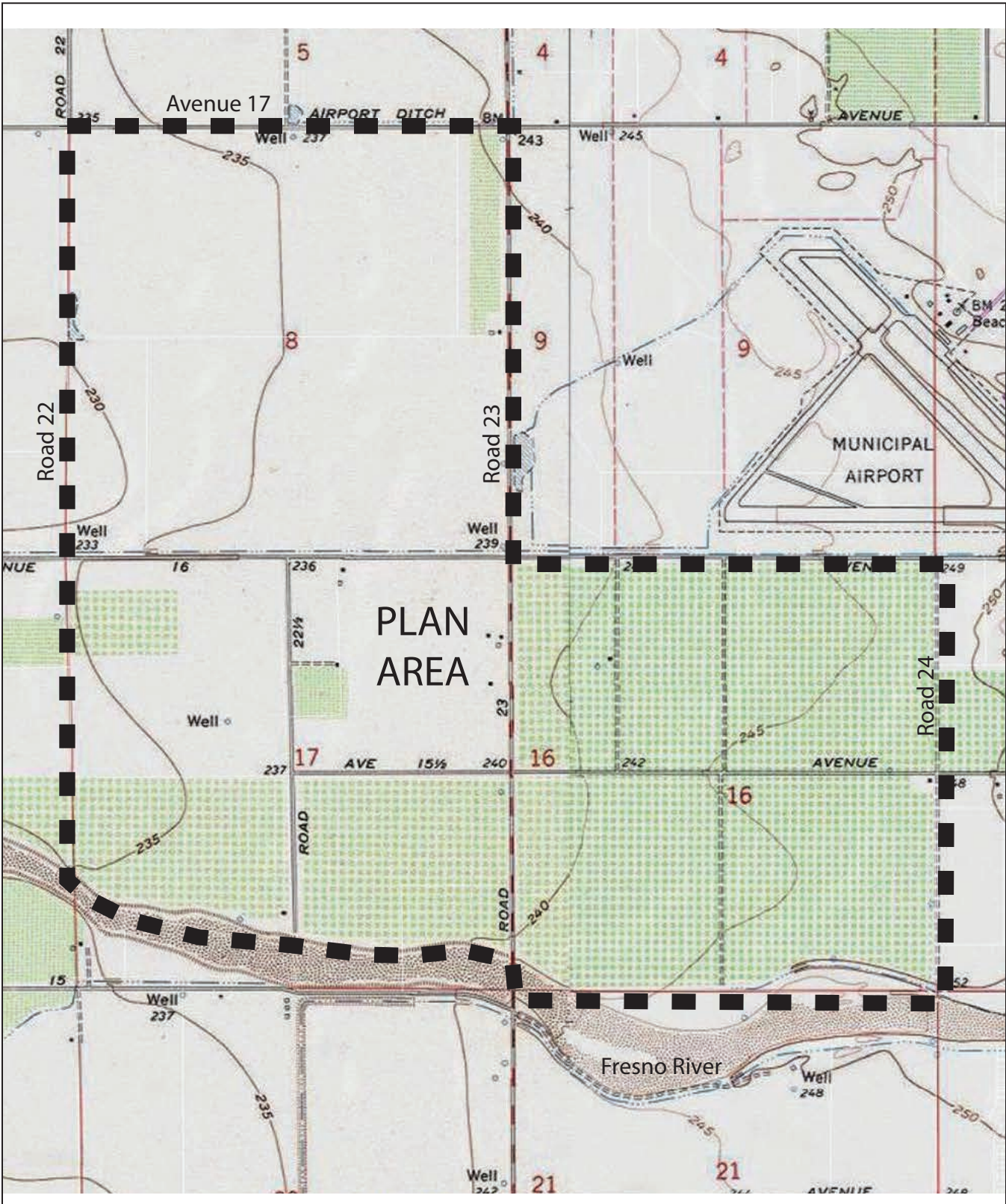
Grading for the Plan Area will be in accordance with the City of Madera Grading Ordinance, the current building code, and the recommendations provided in the infrastructure master plans and their appendices. During Plan design, detailed grading plans will be prepared in conformance with the overall drainage concept and the defined drainage area boundaries. Grading plans must be prepared for and reviewed by the City of Madera Engineering Department.

Currently there is no stormwater flow crossing through this property from any upstream adjacent property. New storm water runoff will be collected and retained on-site. The minimum slope of curb and gutter will be 0.0015. However, to the maximum extent feasible the Plan Area will be designed using the recommended maximum design slope of 0.0017.

5.6.1) Flood Protection and FEMA Flood Hazard

All urban development within the Plan Area must be protected from flooding. The design standards for flood protection are established by the Federal Emergency Management Agency (FEMA). Building pad elevations for the individual subdivisions will be designed to a minimum of one and a half (1.5) feet above the master-planned gutter flowline elevation in the corresponding inlet tributary area. These criteria will

Exhibit 5.4, Existing Plan Area Topography



Source: Madera County GIS (USA Topo Maps)



reduce flood risks to the building structures during an extreme storm event over and above the storm drain pipeline and inlet design criteria.

The grading and drainage plans will be designed so that major storm breakovers and localized street flooding do not exceed a depth of one and a half (1.5) feet. Major storm breakovers will be designed to direct major storm flows to on site retention basins.

According to FEMA, the western portion of the Plan Area is part of Flood Zone AO, refer to *Exhibit 5.5, FEMA Flood Plain Zones*. Zone AO areas are subject to inundation by 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average flood depths derived from detailed hydraulic analyses are shown in this zone. Mandatory flood insurance purchase requirements and floodplain management standards apply.

A Conditional Letter of Map Revision (CLOMR) will need to be processed with FEMA for areas that are part of Zone AO during the Plan Area design phase. A Letter of Map Revision (LOMR) can be processed in order to officially revise the Flood Insurance Rate Map (FIRM) once Base Flood Elevations are set. All requests for changes to effective maps, other than those initiated by FEMA, must be made in writing by the City's Chief Executive Officer (CEO) or his/her designee. Because a LOMR officially revises the effective NFIP map, it is a public record that the community must maintain. Any LOMR will need to be noted on the City's master flood map and filed by panel number in an accessible location.

5.6.2) Phasing and Incremental Development

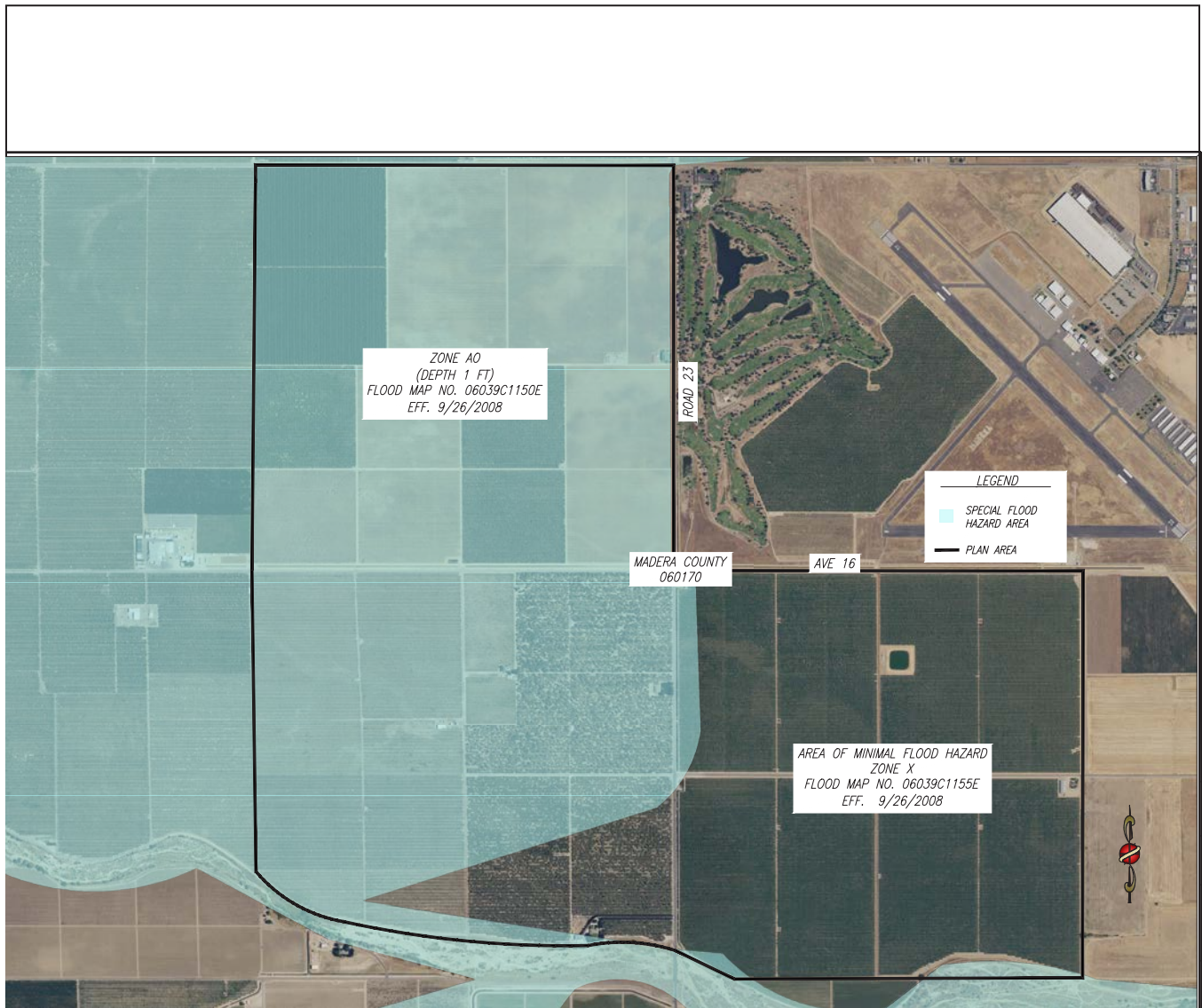
Drainage facilities shall be designed in accordance with the Plan Area infrastructure master plan as needed for each phase of the Plan. The drainage patterns and pipes shall be constructed in conformance with the master storm drainage plan. Use of permanent retention basins shall conform to the infrastructure master plan for each neighborhood plan area.

5.6.3) National Pollution Discharge Elimination System (NPDES) Compliance

National Pollution Discharge Elimination System (NPDES) Compliance Storm water originating from the development of the Plan Area shall be treated utilizing Best Management Practices (BMPs) as permitted by NPDES general permitting process of the Clean Water Act. BMPs for the Villages will be developed during the design phase and may be drawn from local area authorities as appropriate. BMPs may also be drawn from the California Stormwater Quality Association (CASQA) Storm Water Best Management Practice Handbook (Latest Version Adopted at the time of construction). BMPs shall be in accordance with the City's permit requirements and/or ordinance (if ordinance has been implemented at the time of development).

Prior to the start of grading activities for site improvements, the developer shall file a Notice of Intent (NOI) with the Regional Water Quality Control Board (RWQCB), which is a general permit for storm water discharges associated with construction activity. The developer shall also prepare a Storm Water Pollution Prevention Plan (SWPPP) and provide a current copy of the SWPPP to remain on the construction site at all times. The SWPPP shall include construction and post construction BMPs. As the Plan Area develops and becomes more urbanized, it may be identified by the State Water Resources Control Board (SWRCB) or the RWQCB as a small Municipal Separate Storm Sewer System (MS4) operator under the Phase II guidelines of the NPDES general permit.

Exhibit 5.5, FEMA Flood Plain Zones



Source: Precision Civil Engineering

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5.7 Dry Utilities

Utility services provided to the Plan Area consist of natural gas, electrical, and communications systems. Utility lines will be installed underground in accordance with City of Madera guidelines.

5.7.1) Communication Systems

On-site facilities will be placed underground within a duct and structure system to be installed by the developer. Maintenance of the installed system will be the responsibility of the City and/or Special District fiber optic entity. Development of the Plan Area will require the installation, by the developer, of all fiber optic infrastructure necessary to service the Plan Area.

5.7.2) Natural Gas & Electricity

PG&E will provide natural gas and electric to the Specific Plan Area. PG&E will install gas mains to the Specific Plan Area as necessary. All new electric lines and all existing lines within the Specific Plan Area will be installed according to City of Madera requirements.

5.8 Public Facilities and Services

Public services and facilities play an essential role in providing support services to create viable, sustainable, healthy and cohesive communities.

5.8.1) Police

The Madera Police Department will provide law enforcement to The Villages at Almond Grove.

5.8.2) Fire

The Madera Fire Department will provide fire protection, paramedic, and emergency response services to the Plan Area.

5.8.3) Solid Waste Disposal

The City of Madera will provide refuse collection services to the residents and businesses in the Plan Area. The City contracts a vendor for refuse collection and disposal service.

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