Kern County Development Standards

KERN COUNTY
PUBLIC WORKS

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December 19, 2023

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GENERAL INTRODUCTION

Development Standards

These standards are to be used for all developments within Kern County that are outside of incorporated cities. These standards are to establish minimum design & construction requirements that will result in improvements that are economical to maintain and will adequately serve the general public.

The requirements set forth in these standards are considered minimum design standards and will require the approval of the entity that will maintain the facilities to be constructed prior to approval by the County.

Land Division Ordinance

The Kern County Land Division Ordinance and any conditions of approval for a specific development, and/or requirements identified in an adopted General Plan or Specific Plan, are to be used in conjunction with these standards.

Exceptions

Limited exceptions to these standards may be granted by the Director upon receipt of a written request containing sufficient information to warrant the exception. All major exceptions shall be processed in the same manner as required in the Land Division Ordinance for a development variation.

Standard Specifications (State)

When not otherwise stated in the Kern County Land Division Ordinance, these Development Standards, or prescribed by the Board of Supervisors, or the Public Works Department Director, the work shall conform to the Standard Plans and the Standard Specifications published by the California Department of Transportation, current edition.

All definitions and terms in Section 1 of the Standard Specifications shall apply except, whenever the following terms or pronouns are used, the intent and meaning shall be as follows:

a. **CONTRACTOR:** The person or persons, firm, partnership, corporation or combination thereof who have entered into an agreement with the County of Kern for the completion of work or who is prosecuting work under approved land development improvement plans.

b. **DEPARTMENT:** The Public Works Department of the County of Kern, also referred to as Department.

c. **ENGINEER:** The Public Works Department Director of the County of Kern, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties delegated to them.

d. **DIRECTOR:** The Public Works Department Director of the County of Kern, also referred to as the Director.

e. **LABORATORY:** The Laboratory of the Public Works Department or other laboratories authorized by the Public Works Department of the County of Kern.

Notice to Work

The Contractor shall give the Director at least twenty-four (24) hours notice before commencing any part of the improvement work required for the development. If the said improvement work is interrupted for a continuous period in excess of twenty-four (24) hours, exclusive of weekends or holidays, the Contractor shall give an additional twenty-four (24) hours notice to the Director prior to resuming the said improvement work.

Document Priority

State and Federal laws shall govern over the Land Division Ordinance. The Land Division Ordinance shall govern over the Development Standard. Development Standards shall govern over the Improvement Plans. Improvement Plans shall govern over Standard Specifications.

Submittal Standards

The agency with jurisdiction may establish the format for, and minimum required contents of, submittal intended for the review and/or approval of the Director.

All work, unless specifically exempted, covered by the Professional Engineers Act (PE) of the State of California, shall be submitted as if for final submittal. Such submittal shall include, but is not limited to:

1) Be prepared by a California Registered Engineer (Civil Engineer) competent in the necessary engineering discipline(s), in accordance with these standards, plans, profiles and specifications for all proposed improvements.

2) Include all pertinent calculations. All submitted calculations shall be coherent, legible, and in accordance with the latest applicable codes, standards, and sound engineering practices.

3) Include reference to, or the reference itself for all calculations or assumptions.

4) Include all items identified on any Pre-submittal Checklist, where available.

If any of the items listed above are lacking, a finding of "NOT CHECKABLE" will be made by the Director (or his assigned representative) and the project will be returned to the applicant.

GENERAL DEFINITIONS

The following definitions shall be applicable to these standards.

"ARTERIAL": Interchangeable with Major Highway.

"BOARD": The County of Kern, Board of Supervisors, unless otherwise specified.

"CALTRANS": California Department of Transportation.

"COLLECTOR": Interchangeable with Secondary Highway.

"COUNTY": The County of Kern, its officers or agents.

"DEPARTMENT": The Public Works Department.

"DEVELOPER": Includes Subdivider and any person or public agency developing land, seeking to have the County accept or include facilities in its maintained system.

"DEVELOPER'S ENGINEER": Civil Engineer registered in the State of California employed by, acting on behalf of, or as an agent of the developer.

"DEVELOPMENT": The division of a parcel of land into two (2) or more parcels; the construction, reconstruction, conversion, structural alteration, relocation, or enlargement of any structure; any mining, excavation, landfill, or land disturbance; and any use or extension of the use of land.

"DIRECTOR": The Public Works Department Director.

"ENGINEER": The Director of the Public Works Department of the County, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties delegated to them.

"LABORATORY": The Laboratory of the Public Works Department or other laboratories authorized by the Public Works Department Director.

"LIMITED EXCEPTION": Permission to depart from specific requirements of the Development Standards, granted by the Public Works Department Director.

"OBSTRUCTION": Obstruction as used shall mean any potential impediments of whatever kind or nature and shall include, but shall not be limited to, structures, power poles, telephone or telegraph poles and appurtenances, trees, landscaping, fences, pipe lines, conduits and canals.

“OFFICERS”: Whenever in these standards, reference is made to some officer, board or commission, department or office, it shall mean an officer, board, commission, department or office of the County of Kern, unless otherwise specified.

“ROAD COMMISSIONER”: The Public Works Department Director.

“STANDARD DRAWINGS”: Those drawings approved by the Board of Supervisors and adopted by the County as part of these standards.

“STREET”: Includes roads and highways. The terms street, road, and highway are used interchangeably and refer to the rights-of-way used for vehicular traffic, and, except in the case of freeways, for pedestrian traffic.

DIVISION ONE

STANDARDS FOR STREETS

CHAPTER I. INTRODUCTION

Sec. 101-1 Purpose

These standards apply to and regulate all land development improvements and are intended to provide for adequate, coordinated, modern development with the required facilities to serve and protect the potential uses and users of the various areas of the County of Kern.

Sec. 101-2 Plan Review

Plans submitted with road improvements to be included in the County Road Maintenance System shall be reviewed and approved by the Kern County Public Works Department.

CHAPTER II. DEFINITIONS AND GENERAL POLICY

Sec. 102-1 The following definitions shall be applicable to these standards:

102-1.01 **"INTERSECTION":** is the area embraced within the prolongation of the lateral curb lines, or, if none, then the lateral boundary lines of the roadways of two highways which join one another at approximately right angles, or the area within which vehicles traveling upon different highways joining at any other angle may come in conflict.

102-1.02 **"BRIDGES":** Structures of a span of more than 20 feet, measured under the copings along the centerline of the road and multiple span structures where the individual spans are in excess of 10 feet, measured from center to center of supports along the centerline of the road.

Sec. 102-2 Other Documents Referred to in Standards

The following documents referred to in these standards may be applicable and are on file in the Public Works Department. References are to be current editions unless specified otherwise.

102-2.01 **"Planning Manual of Instructions"** published by the California Department of Transportation.

102-2.02 **"California Manual on Uniform Traffic Control Devices (CMUTCD)"** of California Department of Transportation.

102-2.03 **"Standard Specifications for Highway Bridges"**, **"A Policy on Geometric Design of Rural Highways"**, and **"A Policy on Arterial Highways in Urban Areas"** of the American Association of State Highway Officials.

102-2.04 **"AASHTO LRFD Bridge Design Specifications, Eighth Edition with California Amendments (AASHTO-CA BDS-8)"** of the Office of Structures, California Department of Transportation.

102-2.05 **"Highway Design Manual"** of California Department of Transportation (HDM).

102-2.06 **"General and Specific Plans"** of County of Kern.

102-2.07 **"Standard Plans and Specifications"** of California Department of Transportation.

102-2.08 **"Subdivision Map Act"** of the State of California.

102-2.09 **"Land Division Ordinance"** of County of Kern.

102-2.10 **"Hydrology Manual"** of County of Kern.

102-2.11 **"Federal and/or State Regulations pertinent to accessibility guidelines & requirements."**

102-2.12 **"California Fire Safe Regulations, Title 14-California Code of Regulations."**

102-2.13 **"Federal and/or State Regulations pertinent to Wildland fire protection on State Responsibility Areas."**

102-2.14 **"California Department of Forestry and Fire Protection."**

Sec. 102-3 Plans to be Approved by Director

The developer shall cause to be prepared, in accordance with these standards, and submitted to the Director for approval, plans, profiles and specifications for the proposed improvement of all streets, and related improvements. The developer shall obtain the approval of the Director of said plans, profiles and specifications prior to commencing any construction.

Sec. 102-4 Where no Standard Specified: Requirements to be Prescribed by Director

Where the requirements for street improvements are not specified in these standards, or the documents referenced in these standards, the requirements shall be established by the Director. Such requirements shall conform to accepted engineering standards.

Sec. 102-5 Payment for Improvement

102-5.01 All improvements required by these standards shall be constructed and installed by the developer at his expense unless expressly agreed by the Board of Supervisors that the County will bear the expense or any portion of the expense.

102-5.02 Arterial or Collector Streets Alignment in Development:

In case of an arterial or collector street alignment lying within the development, improvement thereof shall be subject to the following provisions:

a. If it appears to the Board that the County may within a reasonable period, not exceeding five (5) years, undertake construction of an arterial or collector street along such alignment, it may make an order requiring the Developer to contribute to and deposit with the County an amount equal to the cost of construction as determined by the Board. Such contribution shall be filed with the County Road Fund through the Director.

b. The Director may require expanded intersections where arterial and/or collector alignments cross in urban areas, see Plate Nos. R-34 thru R-38.

Sec. 102-6 Access

(See Section 18.55.030 A.5 Land Division Ordinance).

Sec. 102-7 Widening and Improvement of Existing Streets

Where land abuts an existing substandard street is to be developed, the developer shall dedicate any necessary additional right-of-way and improve such street, including drainage improvements, modifications to traffic control devices, and all necessary improvements needed to conform to these standards in order to provide adequate traffic capacities.

Sec. 102-8 Design of Street Systems

The design of street systems, including right of way and improvement widths shall provide:

a. Adequate local circulation for the area being developed.

b. Consistency with adopted General Plans, Specific Plans, and other plan routes where appropriate.

c. Expanded intersections as may be required at arterial and collector street intersections as shown on the County General Plan or Specific Plans, or as required by the Director.

d. Bike Lanes shall be designed and constructed in conformance with Caltrans Highway Design Manual, Chapter 1000, Bikeway Planning and Design.

Sec. 102-9 Utilities, Design and Installation

All utilities shall be designed, constructed, and installed by the Developer in accordance with all applicable County requirements and State laws. Underground utilities including services to be located within street right-of-way shall be installed prior to surfacing the streets. Underground utility construction shall be in accordance with the provisions of Public Utility Commission General Order 95. The Director of Kern County Department of Planning & Natural Resources Department may require aboveground cabinets or facilities to be screened in an approved manner. Any aboveground cabinets or facilities located within the road right-of-way shall be permitted only upon approval by the Director. Compliance with this requirement may result in the need to create public utility easements outside of the right-of-way.

CHAPTER III. STREET IMPROVEMENT REQUIREMENTS

Sec. 103-1 Improvement Requirements

Wherever the standards mentioned in the Land Division Ordinance are related to lot area, the reference to the area shall be deemed to be either net area or gross area, depending on whether the minimum lot area for the zoning classification is determined by net area or gross area.

103-1.01 Type "A" Subdivision requirements are as follows:

a. Concrete curb and gutters, sidewalks and drive approaches are required on all streets (Residential, Commercial and Industrial) and highways within the development. For Phased Improvements by parcel or lot size, see Appendix B of the Land Division Ordinance.

b. Surfacing shall be asphalt concrete, except as provided in Section 104-4.

c. Structural section shall be designed in accordance with the current Caltrans Highway Design Manual based on the following criteria:

1. Local streets - TI = 5.0
2. Residential and commercial alley - TI = 3.0
3. Industrial streets and alleys - TI = to be designated by the Director.
4. Arterial and Collector streets - TI to be designated by the Director.

d. The minimum asphalt concrete thickness shall be 0.20 foot.

e. For details, see Plate No. R-32 and Chapter IV.

f. Shoulder and/or median areas shall be paved or otherwise treated as necessary to comply with the Air Pollution Control District PM-10 (fugitive dust) regulations.

103-1.02 Type "B" Subdivision requirements are as follows:

a. Surfacing shall be asphalt concrete, except as provided in Section 104-4.

b. Structural Section shall be designed in accordance with the current Caltrans Highway Design Manual based on the following criteria:

1. Local streets - TI = 4.0
2. Residential and commercial alley - TI = 3.0
3. Industrial streets and alleys - TI = to be designated by the Director.
4. Arterial and collector streets - TI to be designated by the Director.

c. For details see Plate No. R-32 and Chapter IV.

d. The minimum asphalt concrete thickness shall be 0.20 foot.

e. For Phased Improvements by parcel or lot size, see Appendix B of the Land Division Ordinance.

f. Shoulder and/or median areas shall be paved or otherwise treated as necessary to comply with the Air Pollution Control District PM-10 (fugitive dust) regulations.

103-1.03 Type "C" Subdivision requirements are as follows:

a. Roads shall be graded to a minimum width of twenty (20) feet.

b. Maximum grade of roads shall be fifteen percent (15%).

c. Roads shall be traversable by a standard passenger car.

d. Road surfacing is not required except as required by the Air Pollution Control District's regulations.

e. As an alternative, roads may be designed utilizing the requirements of the California Fire Code upon approval of a limited exception by the Fire Chief.

103-1.04 Secondary and emergency access shall be constructed per Plate No. R-29

Sec. 103-2 Limited Exceptions

a. Where multi-family residential, commercial, or industrial development is proposed in conjunction with a subdivision which would otherwise qualify for a type other than Type "A," limited exceptions may be approved by the Director with respect to Type "A" subdivision street improvement requirements, including but not limited to industrial or commercial street cross-section (Plate No. R-13).

b. Where commercial or industrial development is proposed in conjunction with a Type "A" subdivision which also includes residential development, limited exceptions may be approved by the Director with respect to street improvements shown on industrial or commercial street cross-section (Plate No. R-13) and alleys.

Sec. 103-3 Private Streets

The use of private streets within a subdivision requires a Development Variation as specified by the Land Division Ordinance. When private streets are approved for use, an acceptable entity shall be formed for street and drainage maintenance prior to recordation.

The following notes shall be placed on the street improvement plans before the Director signs them:

1. The Subdivider's engineer shall be responsible for inspection of all improvements outside of County road right-of-ways and certify such to the County, with cursory inspections conducted by the County as required by the Director. No changes shall be made to these plans without the approval of the Director.

2. Subdivider shall obtain the necessary building, grading, and encroachment permits prior to starting any work required by these plans.

3. Private streets shall comply with all requirements of the Kern County Fire Department and Land Division Ordinance. Also, private streets

located within the State Responsibility Area (SRA) shall comply with all requirements of the California Department of Forestry and Fire Protection.

Sec. 103-4 Pedestrian Accessibility Guidelines

Federal and state regulations require that each facility or part thereof shall be designed and constructed in such a manner that the facility is readily accessible to and usable by individuals with disabilities.

Every project, including encroachment permit projects, within the R/W that proposes to construct sidewalk/pedestrian walkway must be designed in compliance with the accessibility requirements of ADA, ADAAG, and Title 24 requirements. If it is found that an accessibility design standard can not be fully incorporated in a design, an accessibility design exception will be required, subject to the Director's approval. For an exception to be approved, it will be necessary to document that it is technically infeasible to do so because existing physical structural conditions or because other existing physical or site constraints prohibit modification or when a unique characteristic of terrain prevents the incorporation of the accessibility standard.

CHAPTER IV. DESIGN AND CONSTRUCTION STANDARDS

Sec. 104-1 Alignment Criteria for Streets

104-1.01 Minimum centerline radius of horizontal curvature shall be as follows:

a. Arterial/Collector Streets – 2000 feet.

b. Local or Industrial Streets – 500 feet.

c. Limited exceptions to the above minimums may be approved by the Director when topography or other conditions warrant within the following limits:

1. Arterial and Collector Streets not less than 300 feet.

2. In mountainous areas, minimum local streets radii may be reduced to 100 feet or as approved by the Director. Curve widening to provide adequate sight distance shall be determined by the Director.

104-1.02 Intersections

a. Streets shall intersect at right angles where practicable. When topography or other physical feature makes this requirement impracticable, a Limited Exception may be granted by the Director. In general, the maximum deviation which may be granted shall not exceed 15^{o} skew beginning at the ultimate curb line from a right-angle intersection. A knuckle shall be

considered an intersection for skew angles, along with roundabouts, see Section 104-1.04.

b. Curb return radii shall be:

1. Residential and commercial = 30 feet
2. Industrial = 50 feet

Wheel path plots of the design vehicle shall be provided to verify the curb return radii as required by the Traffic Engineer.

c. Property line cut off at intersections shall be in accordance with Plate No. R-41.

d. Where the angle of intersection is acute, or where a sight distance problem may be anticipated, an increased property line cutoff may be required by the Director.

e. All streets entering upon any given street shall have their center lines directly opposite each other or separated by at least 150 feet, see Plate Nos. R-48 thru R-50.

f. Tangent distance between end of horizontal curve and intersection centerline shall be a minimum of 150 feet.

104-1.03 Dead-end streets in excess of 150 feet in length shall be constructed to permit vehicles to turn around at the end. The Director may increase the length to 200' providing no access is provided by the road. The maximum length of a dead-end street, including all dead-end streets accessed from that dead-end street shall not exceed the following cumulative lengths, regardless of the number of parcels or tracts served:

1.	Zoned for less than one acre	800 feet
2.	Zoned for 1 acre to 4.99 acres	1320 feet
3.	Zoned for 5 acres to 19.99 acres	2640 feet
4.	Zoned for 20 acres or larger	5280 feet

Where a dead-end street serves areas in which several different length limits could apply because of several different parcel sizes, the shortest allowable length shall apply.

Sec. 104-1.04 Roundabouts

Roundabouts generally have the following characteristics:

a. A circular travel lane operating in a counter-clockwise direction for collecting and distributing traffic

b. A raised center island

c. Mountable apron

d. Channelized approaches

e. Yield control at all approaches

f. Tapered approaches to encourage entering vehicles to travel in the correct direction through the circular travel lane

The use of roundabouts is primarily constrained by traffic volumes and by geometrics, therefore roundabout design shall be in accordance with the National Cooperative Research Program (NCHRP) Report 672, current edition and the California Department of Transportation (CALTRANS) Highway Design Manual (HDM), Section 405.10 (ROUNDABOUTS), current edition and Plate R-57. It is understood that roundabouts are not appropriate for all traffic conditions and intersection volumes, therefore requests for roundabouts will be processed through the Traffic Engineer with final approval given by the Director.

When constructed in appropriate locations based on criteria contained herein, roundabouts can provide increased efficiency of operation, enhanced safety, cost savings, enhanced aesthetics, and diminished impacts on surrounding property and the elimination of conflict points.

Sec. 104-2 Gradient

104-2.01 Minimum grade on any street or alley shall be 0.5%. Where concrete curb and gutter or gutter in the case of an alley, is constructed, minimum grade shall be 0.2%.

104-2.02 The maximum grade on any street or alley shall be as follows:

a. Arterial and Collector Streets - 6%.

b. Local Streets and Residential Cul-de-sac Streets (including street turning area) - 8%.

c. All classes of Industrial and Commercial streets - 8%.

d. Alleys - 8%.

Exceptions to the maximum or minimum grades may be granted by the Director as follows:

a. Arterial and Collector Streets - 8% maximum.

b. Local and Cul-de-sac Streets (excluding street turning area) - 15% maximum.

c. All classes of Industrial or Commercial Streets - 8% maximum. (No exceptions allowed).

d. Alleys - 15% maximum.

104-2.03 Superelevation shall be provided for all streets where required by the Director.

104-2.04 Vertical curves shall be as follows:

a. Residential and Industrial streets shall be designed to provide a minimum stopping sight-distance corresponding to a design speed of 25 MPH.

b. Arterial and Collector streets shall be designed to accommodate minimum vehicle speeds of 65 MPH. An exception may be granted by the Director to reduce the vertical curve design speed.

c. Vertical curves shall be used when change in grade exceeds 0.50% and shall have a minimum length of 50 feet.

d. Alleys shall be designed for 20 MPH stopping sight distance.

e. The sight distance to be used for all streets and highways, including vertical curves, shall be in accordance with the current edition of California Department of Transportation Highway Design Manual.

104-2.05 The maximum grade for cul-de-sac street turning area shall be 8%.

104-2.06 The maximum grade through any intersection of two streets shall be 8% within the intersection (P.I. to P.I.).

104-2.07 When any road is extended to a subdivision boundary for the purpose of providing a future connection to adjoining property, the subdivider shall submit an alignment and profile demonstrating the feasibility of such future extension. (Minimum distance beyond tract line shall be 100 feet, 200 feet in mountains).

104-2.08 The minimum grade for any cross gutter shall be 0.35% measured from BCR to ECR.

Sec. 104-3 Grading

104-3.01 Roadways shall be graded by the developer to full width as shown on the standard typical cross-sections.

104-3.02 The maximum grade tolerance in roadway sections for aggregate base, aggregate subbase and original ground shall be 0.05 of a foot high.

104-3.03 Grading beyond the right-of-way may be required by the Director to provide for safe sight-distance, stability and to control drainage.

104-3.04 All grading or excavating in an existing county road, city street, or state highway shall be first authorized by a valid encroachment permit.

104-3.05 Where improvements are required outside of the right-of-way as part of the development improvements, the subdivider shall provide satisfactory easements to allow construction and/or maintenance of the improvements. The easements shall conform to all subdivision requirements including, but not limited to, free and clear dedication, removal of obstructions and guarantee of title.

Sec. 104-4 Pavement, Structural Sections

All streets shall be surfaced by the developer in accordance with the following specifications:

104-4.01 Streets shall be designed in accordance with Chapter III "Street Improvement Requirements" of these standards and the following sections.

104-4.02 Road surfacing on all classes of streets and alleys shall be of asphalt concrete, except as hereinafter provided.

a. Road-Mixed Asphalt Surfacing (RMAS) may be used, in lieu of asphalt concrete, in those areas of the County more than 50 miles along the shortest practical route from a commercial asphalt concrete plant.

1. RMAS shall conform to design mix approved by the Director.

2. Minimum thickness of a road-mixed asphalt surfacing shall be 0.25 foot.

b. Alleys: Surfacing shall be of asphalt concrete or RMAS, whichever is used in the streets of the development.

c. The minimum thickness of aggregate base or aggregate subbase shall be 0.35 foot.

104-4.03 Aggregate Bases - In addition to the specified R-Value for aggregate bases, the R-Value at 150 psi exudation pressure shall be 90% of the R-Value at 300 psi exudation pressure.

Sec. 104-5 Utility Placement Within Streets

Underground utilities including services to be installed in streets shall be installed prior to surfacing of the streets.

The minimum cover of any underground utility within a street right-of-way shall be 30 inches.

Sec. 104-6 Street Lights

All street lights installed shall be light emitting diode (LED).

Unless otherwise approved by the Director, street lighting to be designed in conformance with these specifications, RP-8, "American National Standards Practice for Roadway Lighting, Illuminating Engineering Society of North America, Kern County Zoning Ordinance and/or other approved design guidelines.

All material and work shall conform to the requirements of the California Electrical Code, National Electrical Code, and other pertinent codes and regulations.

104-6.01 Residential Areas - Street lights shall be located at intersections, at midblock with blocks greater than 600 feet between intersections, at ends of cul-de-sacs greater than 150 feet in length, and on curved streets as required by the Director. Street lights on arterial and collector streets or intersections with an arterial street shall be 9,500 lumens. Street lights on local streets shall be 5,800 lumens. Lumen output and light sources may vary depending on new technology. Street lights shall have an acceptable maintenance entity formed and be energized prior to acceptance of the improvements. Street light construction shall be in accordance with Plate No. R-75 unless approved otherwise by the Director.

104-6.02 Commercial and Industrial Areas - Street lights shall be located at intersections and ends of cul-de-sacs greater than 150 feet in length. Luminaires shall be as provided in the above paragraph.

On all streets, the pull box shall be installed, and the light wired from the pull box at the pole per Plate No. R-76. Electrical service shall be provided to the street light from the adjacent parcel (on either side of the street) as it is developed. Electrical service easements shall be granted as required. Street lights shall be installed per Plate No. R-75.

104-6.03 Additional street lights - In commercial, industrial, or residential areas, additional street lights shall be installed as required by the Director.

104-6.04 Street light shall be installed at post office approved community mailboxes.

104-6.05 Street light shall be installed at all passenger bus loading/unloading zones.

104-6.06 All County Service Area maintained street lights shall be Rate Schedule LS2 "PG&E – owned street and Highway Lighting". Rate and Ownership of street lights shall be verified by the Public Works Department. Luminaires shall be full cutoff optics.

104-6.07 Street light location plan and general plan details shall be submitted for review and approval by the engineer. The plans shall show and identify all street lights to be installed, distance between poles, height of poles, wattage of lamps, lumens, type of luminaire, irrigation pedestals and all other pertinent information. Also, all existing street lights within 400 feet of the project shall be clearly identified and shown on the plans.

CHAPTER V. ACCESS

Sec. 105-1 State Highways

Access to state highways, is regulated by Caltrans. Requests for access and changes to existing access shall be coordinated with Caltrans. Encroachment permits for access to state highways shall be obtained from Caltrans.

Sec. 105-2 City Streets

Access to city streets, is regulated by the incorporated city who has jurisdiction. Requests for access and changes to existing access shall be coordinated with the respective incorporated city. Encroachment permits for access to city streets must be obtained from the respective incorporated city.

Sec. 105-3 County Roads – Access Limitations and Intersection Locations

Arterial streets are designed primarily for the movement of through traffic (80% to 90%) with minor usage as access to abutting properties (10% to 20%). Collector streets operate at approximately 40% to 60% either way. Local street's function is to provide nearly 100% access to abutting properties and should be designed to eliminate through traffic.
Driveway access on arterials shall be kept to a minimum as determined by safety, topography, zoning and prior parcelization constraints or other special circumstances. Waivers of access on subdivisions shall be provided along major streets except where driveway access is permitted.

105-3.01 Minimum full access intersection spacing on arterials shall be limited

to one-third mile. Closer spacing may be permitted if a traffic signal synchronization study is approved which demonstrates the location to be feasible for a signal. The signal, if allowed, shall be funded and installed by the developer.

105-3.02 Minimum spacing and type of local street access along arterial and collector streets shall conform to details in Plate Nos. R-49 and R-50.

Access points along arterial streets shall be restricted to right turn in and right turn out movements only. Full access median openings or openings limited to allow left turn in with no left turn out may be permitted where an approved traffic study provides justification for said access. The design of limited access openings shall conform to applicable details in Plate Nos. R-42 through R-57.

105-3.03 Multiple-Family residential projects having more than 100 dwelling units shall be equipped throughout with two (2) separate and approved fire apparatus access roads. (**Exception:** Projects having up to 200 dwelling units shall have not fewer than one (1) approved fire apparatus access road where all buildings, including nonresidential occupancies are equipped throughout with approved automatic sprinkler systems installed in accordance with the California Fire Code.

Multiple-Family residential projects having more than 200 dwelling units shall be provided with two (2) separate and approved fire apparatus access roads regardless of whether they are equipped with an approved automatic sprinkler system.

Developments of one- or two-family dwellings, where the number of dwelling units exceed 30, shall be provided with two (2) separate and approved fire apparatus access roads. (**Exception:** Where there are more than 30 dwelling units accessed from a single public or private fire apparatus access road and all dwelling units are equipped throughout with an approved automatic sprinkler system installed in accordance with the California Fire Code, access from two (2) directions shall not be required. Additional dwelling units shall not be increased along this single access road, unless it will connect with future development as determined by the Public Works Department in consultation with the Kern county fire Department.)

Access points on collectors within 300 feet of the curb return at an arterial intersection shall be limited to right turn in and right turn out movements.

This provision in no way limits more restrictive secondary access requirements, imposed for public safety purposes.

Sec. 105-4 County Roads – Driveway Approaches

All construction to connect driveway approaches to county roads must first be authorized by a valid Encroachment Permit. The design, number and location of driveway approaches must comply with the standards and policies contained herein and must be approved by the County.

105-4.01 Driveway approaches will not be permitted for parking or loading areas which would require backing into county roads with the exception of single family (R-1) residences.

105-4.02 Driveway approaches constructed along arterial streets shall be restricted to right turn in and right turn out movements only. Full access median openings or openings limited to allowing left turn in with no left turn out may be permitted where an approved traffic study provides justification for said access. The design of limited access openings shall conform to applicable details in Plate Nos. R-42 through R-57.

Driveway approaches constructed along collector streets within 300 feet of the curb return at an arterial intersection shall be limited to right turn in and right turn out movements.

105-4.03 Only one driveway approach per property per street is permitted for single family (R-1) lots excepted on local streets. Additional driveway approaches may be permitted where an approved traffic study is provided which demonstrates that more than one access is required to adequately handle driveway volumes and will not adversely affect traffic flow on county roads.

a. Where a property has access to more than one street, at a double frontage location, access will be limited to the lower classification street to minimize the impact upon traffic flow, except as allowed herein. Access to only the higher classification street will be required in the case of incompatible land uses, i.e., the lower classification street serves residential development and the access is to serve commercial or industrial development.

Addition of access to the higher classification street may be allowed provided an approved traffic study provides sufficient justification. Access to the higher classification street may be denied and may also be subject to other constraints contained in these standards and by County regulations.

105-4.04 After all improvements have been accepted by the Public Works Department, the reconstruction, repairs, and maintenance of all driveways, driveway approaches and sidewalk will be the responsibility of the property owner. During construction all such

activities will be the responsibility of the permittee.

105-4.05 Arrangements must be made by the developer or permittee, for the necessary removal or relocation of any public utilities, structures, trees or plants with the person or entity having ownership or control prior to commencing work. Removal or relocations must be accomplished at no cost to the County.

105-4.06 Driveway profiles shall comply with the Kern County Type "A" Street Improvement Details, Plate Nos. R-53 thru R-54.

105-4.07 Private road approach permits are issued only to the property owner as the County assumes no maintenance.

The maximum width of private road approach for residential zoning shall be 20' with three (3) feet radius returns. The maximum width of private road approach for commercial zoning shall be 24' with a 20' radius returns.

No drainage from the private road approach shall enter the County right-of-way. No natural drainage is to be disturbed.

Drainage culvert, if needed, shall be a minimum of 18" in diameter. The drainage culvert shall have a minimum of 12" cover and to be placed approximately three (3) feet from the property line.

During routine road maintenance, the County assumes no liability for damage to the pavement.

Sec. 105-5 <u>County Roads – Turn Lanes</u>

105-5.01 Arterial Streets: Left turn storage lanes are required to all streets and access points where left turn ingress is permitted along arterial streets. Right turn storage lanes are required at all streets and access points where one of the following criteria is met:

a. The 85th percentile speed is less than 45 MPH and the peak hour turning volume is over 200.
b. The 85th percentile speed is 45 MPH or greater, the arterial is shown ultimately having six (6) lanes and the peak hour turning volume is 25.

105-5.02 Collector Streets: Left and right turn storage lanes are required on all collector streets at arterial street intersections. Striping for left turn channelization shall be provided for any access leading to a development, which, at build out, generates more than 50 peak hour trips.

105-5.03 Design of left and right turn storage lanes shall comply with the applicable requirements of details in these standards. Bay tapers for turn lanes shall be 90 feet in length for single turn lanes and 120 feet in length for dual turn lanes. 60' bay tapers will be permitted on streets where the 85th percentile speed is 40 MPH or less, provided the turn lane is accessing either a driveway or a local street.

105-5.04 In the absence of turning volume data showing the need for greater storage, the following minimum lengths shall be used:

Dual left and single right turn storage lanes from arterial street into another arterial street shall be designed for a minimum length of 200 feet (measured from end of taper to limit line). Left and right turn storage into local streets or major private entrances shall be 150 feet minimum. Left and right turn storage into minor private entrances shall be 100 feet minimum on collector streets and 150 feet minimum on arterial streets.

105-5.05 Upon subdivision or other development which accesses onto an arterial or collector street, the following minimum improvements will be required to provide left turn channelization, where insufficient width would otherwise be available due to existing or proposed street improvements.

On and off-site road improvements are required from any collector or arterial street to provide left turn channelization into each street (or access point) within the subdivision (or development). Said channelization shall be developed to provide necessary transitions and turn lanes to meet the current Caltrans standards for the design speed of the roadway in question.

Sec. 105-6 Bus Turnout

Bus turnouts and associated speed change lanes will be required on future and existing bus routes at locations identified by Golden Empire Transit (GET)/Kern Regional Transit (KRT). Design shall be based upon standards contained in Plate Nos. R-66.

CHAPTER VI. SITE ACCESS DESIGN

Sec. 106-1 Introduction

This chapter is intended to serve as a standard for the placement, size and configuration of site access improvements.

Sec. 106-2 Access Widths and Spacing

Access widths and spacing shall be designed per Plate No. R-56.

Sec. 106-3 Alignment

Access drive or road must intersect a public street at 90 degrees or as close as possible to 90 degrees or minus a maximum deviation of 15 degrees on local streets.

Minimum sight distance shall be provided at all access points in accordance with the provisions of this Division and Chapter V of Division Nine.

CHAPTER VII. STREET AND HIGHWAY DRAINAGE

Sec. 107-1 Street and Highway Drainage Easements and Improvements

Any drainage easements and improvements necessary for street and highway drainage shall be provided by the Developer, in accordance with the provisions of this section.

Sec. 107-2 Requirements for Street and Highway Drainage

The following criteria shall be applied to the design and construction of drainage facilities for streets and highways:

107.2.01 Street Drainage

(See Drainage - Division Four, Chapter V.).

107-2.02 Cross Drainage

(See Drainage - Division Four, Chapter VI.).

Sec. 107-3 Design Standards for Culverts and Bridges

Structural Design

a. Bridge and culvert design standards shall conform to "AASHTO LRFD Bridge Design Specifications, Eighth Edition with California Amendments (AASHTO-CA BDS-8)", all bridge design guidelines and “Standard Plans and Specifications" of

the Division of Engineering Services, California Department of Transportation.

b. Design loading shall be H20-S16-44 with alternate.

c. Bridge width shall equal the approach roadway width plus one (1) pedestrian walkway in accordance with the standard typical cross-sections included. Where a designated bike way exists, additional width may be required by the Director.

Sec. 107-4 Miscellaneous Provisions

Street or highway crossings below check dams and/or spillways shall require special investigation and design. Plans for such crossings shall be submitted to the Director for review and approval.

Where special design or variation from standards is necessary for any drainage facility, crossing a street or highway, said design shall be subject to the approval of the Director.

CHAPTER VIII. LANDSCAPING

Sec. 108-1 Landscaping

Landscaping shall comply with Division Five – Landscaping, of these standards. When landscaping within or adjacent to street intersections, the following sight distance and safety criteria shall be provided:

108-1.01 The standards apply only to those intersections which meet at normal skews and where the grade difference between the intersecting streets is not greater than 10 percent.

108-1.02 The clear sight triangle for roadways intersecting arterial and collector streets (55 mph design speed) and stopping sight distance is three hundred (300) feet (near lane approach) and one hundred and fifty-three (153) feet (far lane approach).

108-1.03 The maximum height of shrubs and other obstruction within the above area shall be maintained at a height of thirty (30) inches or less above the sidewalk grade.

108-1.04 For local street intersections; nothing greater than a thirty (30) inch height (above sidewalk grade) within sixty (60) feet of the curb lines extended (normal skew and grades).

108-1.05 See Division Nine, Standards for Traffic Engineering, Plate No. T-7 for illustrations of the above standards.

108-1.06 The maximum trunk diameter for trees located in the road right-of-way of any street shall be four (4) inches or less at 10-year growth.

108-1.07 To maintain appropriate sight distances, no shrubs or trees with a height greater than 30 inches shall be located in a median area within three hundred (300) feet from the centerline of the intersecting cross street, pedestrian walkways, bikeways, or median openings.

108-1.08 All landscaping facilities shall be designed and maintained so as not to present a hazard to the traveling public.

CHAPTER IX. TEMPORARY STREET CLOSURES

Sec. 109-1

Street closures for business purposes require a Special Event Permit approved and issued by the Planning & Natural Resources Department, a Traffic Control Plan and Encroachment Permit approved and issued by the Kern County Public Works Department.

CHAPTER X. SUBDIVISION STREET IMPROVEMENT PLAN NOTES

The following general notes shall be included on Subdivision Street Improvement Plans:

1. All improvements shall be in accordance with Kern County Development Standards and other County adopted policy; street improvements shall be as required for Type _____ Subdivisions.

2. Improvements shall be in accordance with California State Transportation Agency, Department of Transportation (Caltrans) Standard Specifications, current edition, as modified and determined applicable by the Director.

3. All streets have been designed in accordance with the Traffic Index as shown on the typical cross-sections.

4. All streets have been designed using a minimum "R" value as shown on typical cross-sections. Should further testing show a lower "R" value of the actual in-place material, streets shall be redesigned according to the lower "R" value.

5. Any layer of "R" value material specified in the typical cross-section may be increased in depth provided that the material above that layer has no less than the minimum thickness shown.

6. If approved in writing by the Director, an alternate pavement design using Class III Aggregate Base and a thicker A.C. section may be used.

7. Any work which affects any existing County maintained road or the traffic thereon shall be completed within 20 working days from start of work.

8. Elevations and grades shown on the profiles are gutter flowlines (inverts).

9. Maximum plus grade tolerance for A.B., A.S.B/ and O.G. shall be 0.05 of a foot.

10. Concrete for curbs, sidewalks, and their appurtenances, must be minor concrete containing at least 505 pounds of cementitious material per cubic yard. For extruded or slip form curb construction, the maximum aggregate size must be from 3/8 to 1 inch. The cementitious material content must be at least 505 lbs. per cubic yard if a maximum of 3/8-inch aggregate is used. Completely coat the exposed faces of the concrete with curing compound in accordance with Caltrans Standard Specifications, Section 90-1.03B (3).

11. Permanent traffic control signing and other safety devices (not shown on these plans) shall be installed per plans approved by the Engineer.

12. Street lighting shall be installed, and a means provided to contract for public utility services and maintenance.

13. Prior to start of any earthwork, the Subdivider shall obtain a Grading Permit as required by Kern County Code of Building Regulations and Grading Ordinance.

14. Wheelchair ramps shall be constructed at all curb returns per Plate No. R-60 of the Kern County Development Standards and as directed by the engineer. Curb ramps shall have a detectable warning surface in accordance with Plates R-59 through R-61.

15. All existing facilities, including but not limited to structures, poles, pipelines, conduits, canals, and appurtenances, which are considered to be obstructions by the County Engineer, shall be relocated at the expense of the Subdivider.

16. New streets shall be extended at intersections as directed by the County Engineer in order to provide a safe connection to the existing street pavement.

17. Storm drainage sump shall not be allowed to accept water until secured by permanent fencing or in the case of shallow unfenced sumps not until compliance with depth and side slope criteria as set by the Kern County Development Standards, Division Four.

18. Asphalt rejuvenating agent shall be applied to new asphalt concrete pavement, as directed by the Engineer, in accordance with the provisions in Section 37 "Bituminous Seals" of the Standard Specifications and the State Department of Transportation's Standard Special Provisions currently in effect.

19. Pavement grinding in accordance with Section 42 of the Standard Specifications shall be provided as directed by the Engineer where new pavement meets existing pavement.

20. All frames and covers within the roadway shall be raised to finish grade per Plate No. R-69.

21. Underground utilities including services to be located within right-of-way shall be installed prior to surfacing the streets.

22. Utility vaults installed in sidewalk area shall have non-skid surfaces/lids.

23. When bike lanes are required along a street or highway, the curb line shall be extended three (3) feet and the parkway area reduced three (3) feet.

24. Prior to acceptance of improvements, the developer shall submit a letter to the Kern County Public Works Department requesting “No Stopping” along _____ and _____.

25. Street sweeping, walls, drainage, streetlights, etc. shall be maintained by _____.

NOTE: Any additional notes, not required by the Engineer, will be listed under a heading of “The Engineer of Record’s Notes” and will not be considered to be a part of the County approval.

REQUIRED STREET TYPICAL SECTIONS FOR LOT SIZE AND DEVELOPMENT TYPE-LOT SIZE (ACRES)						
PLATE NO.	STANDARD ROAD DETAILS	TRACT MAP		PARCEL MAP		PAGE
R-1	TYPE “A” ARTERIAL STREET		< 5		≤ 3	28
R-2	TYPE “A” ARTERIAL STREET	≥ 5	< 20	> 3	< 20	29
R-3	HALF WIDTH TYPE “A” ARTERIAL STREET		< 5		≤ 3	30
R-4	HALF WIDTH TYPE “A” ARTERIAL STREET	≥ 5	< 20	> 3	< 20	31
R-5	TYPE “A” COLLECTOR STREET		< 5		≤ 3	32
R-6	TYPE “A” COLLECTOR STREET	≥ 5	< 20	> 3	< 20	33
R-7	HALF WIDTH TYPE “A” COLLECTOR STREET		< 5		≤ 3	34
R-8	HALF WIDTH TYPE “A” COLLECTOR STREET	≥ 5	< 20	> 3	< 20	35
R-9	TYPE “A” LOCAL, ZONES “R” & “E”		< 5		≤ 3	36
R-10	TYPE “A” LOCAL, ZONES	≥ 5	< 20	> 3	< 20	37
R-11	PART WIDTH TYPE “A” LOCAL ZONES “A” & “E”		< 5		≤ 3	38
R-12	PART WIDTH TYPE “A” LOCAL	≥ 5	< 20	> 3	< 20	39
R-13	TYPE “A” COMMERCIAL ZONES “C” & “M”					40
R-14	PART WIDTH TYPE “A” COMMERCIAL ZONES “C” & “M”					41
R-15	TYPE “B” ARTERIAL STREET		< 2.5		< 2.5	42
R16	TYPE “B” ARTERIAL STREET	≥ 2.5	< 20	≥ 2.5	< 20	43
R-17	HALF WIDTH TYPE “B” ARTERIAL STREET		< 2.5		< 2.5	44
R-18	HALF WIDTH TYPE “B” ARTERIAL STREET	≥ 2.5	< 20	≥ 2.5	< 20	45
R-19	TYPE “B” COLLECTOR STREET		< 2.5		< 2.5	46
R-20	TYPE “B” COLLECTOR STREET	≥ 2.5	< 20	≥ 2.5	< 20	47
R-21	HALF WIDTH TYPE “B” COLLECTOR STREET		< 2.5		< 2.5	48
R-22	HALF WIDTH TYPE “B” COLLECTOR STREET	≥ 2.5	< 20	≥ 2.5	< 20	49
R-23	TYPE “B” LOCAL ZONES “R” & “E”		< 2.5		< 2.5	50
R-24	TYPE “B” LOCAL	≥ 2.5	< 20	≥ 2.5	< 20	51
R-25	PART WIDTH TYPE “B” LOCAL ZONES “R” & “E”		< 2.5		< 2.5	52
R-26	PART WIDTH TYPE “B” LOCAL	≥ 2.5	< 20	≥ 2.5	< 20	53
R-27	FRONTAGE ROAD					54
R-28	ALLEYS					55
R-29	STANDARD SECONDARY & EMERGENCY ACCESS					56
R-30	PARKWAY AREAS (SHOULDER) TYPE “B”					57
R-31	PARKWAY AREAS TYPE “A”					58

NOTES

1. When bike lanes are required along a highway, the curb line shall be extended three (3) feet and the parkway area reduced three (3) feet.

2. A Special design for wheelchair ramps on arterial and collector highways to allow for the safe movement of pedestrians may be required by the Director.

DWG FILE: K:\BUILDINGDEV\DEVELOPMENT REVIEW\DEV_STD\2023\2023 REVISED DRAWINGS\ROADS\R-1

KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

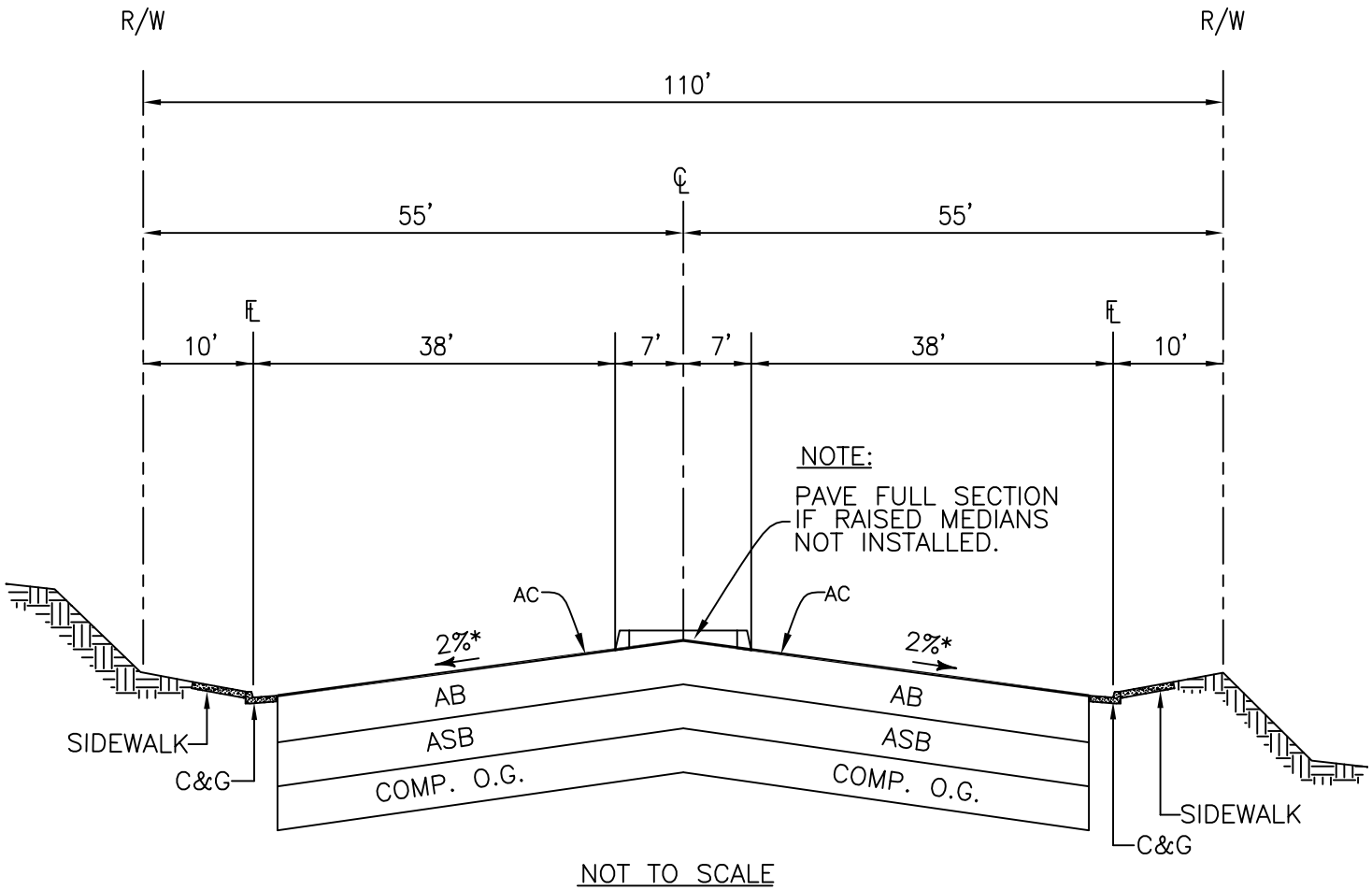
TYPE "A" ARTERIAL STREET
LOT SIZE: < 5 ACRES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

REVISIONS	
DATE	DESC
-	-
-	-
-	-
-	-
-	-

DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-1



NOT TO SCALE

NOTES:

SEE PLATE R-31 FOR PARKWAY AREA (SHOULDER)

MAXIMUM SLOPE TO LOW LOW GUTTER SHALL NOT EXCEED 2.5%.

*GRADE FROM HIGH GUTTER.

TRACT MAPS		PARCEL MAPS
LOT SIZE (ACRES)	NOTE:	LOT SIZE (ACRES)
≥ 2 1/2 < 5	DELETE SIDEWALK AND C & G	> 3 < 5

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

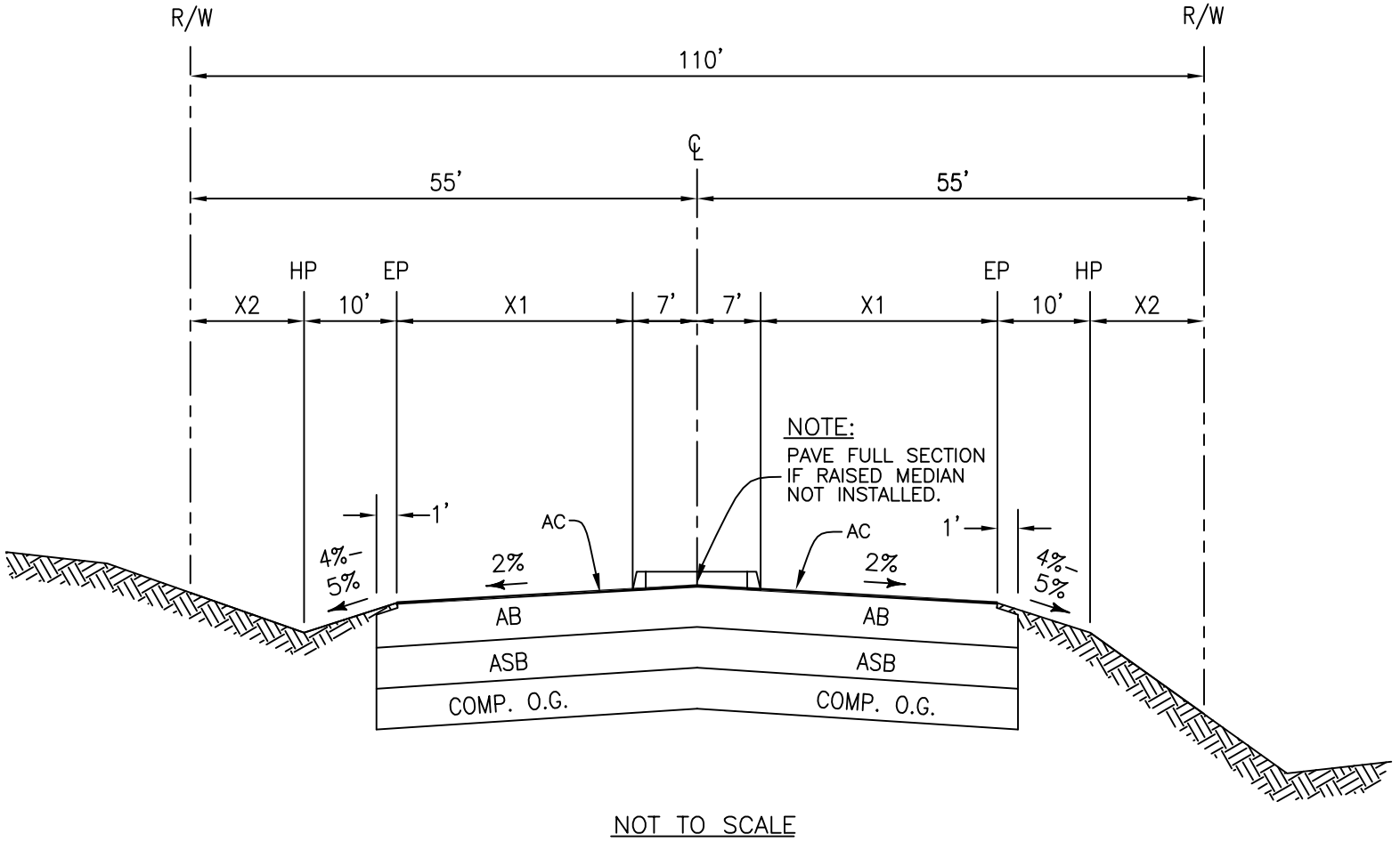
SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

DWG FILE: K:\BUILDINGDEV\DEVELOPMENT REVIEW\DEV_STD\2023\2023 REVISED DRAWINGS\ROADS\R-2

KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

TYPE "A" ARTERIAL STREET
LOT SIZE > 3 < 20 ACRES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD



NOT TO SCALE

TRACT MAPS			PARCEL MAPS
LOT SIZE (ACRES)	X1	X2	LOT SIZE (ACRES)
≥ 5 < 10	28'	10'	
≥ 10 < 20	16'	22'	> 3 < 20

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

NOTES:

SEE PLATE R-31 FOR PARKWAY AREA (SHOULDER)

REVISIONS		
DATE	DESC	
-	-	
-	-	
-	-	
-	-	
-	-	

DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-2

DWG FILE: K:\BUILDINGDEV\DEVELOPMENT REVIEW\DEV_STD\2023\2023 REVISED DRAWINGS\ROADS\R-3

KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

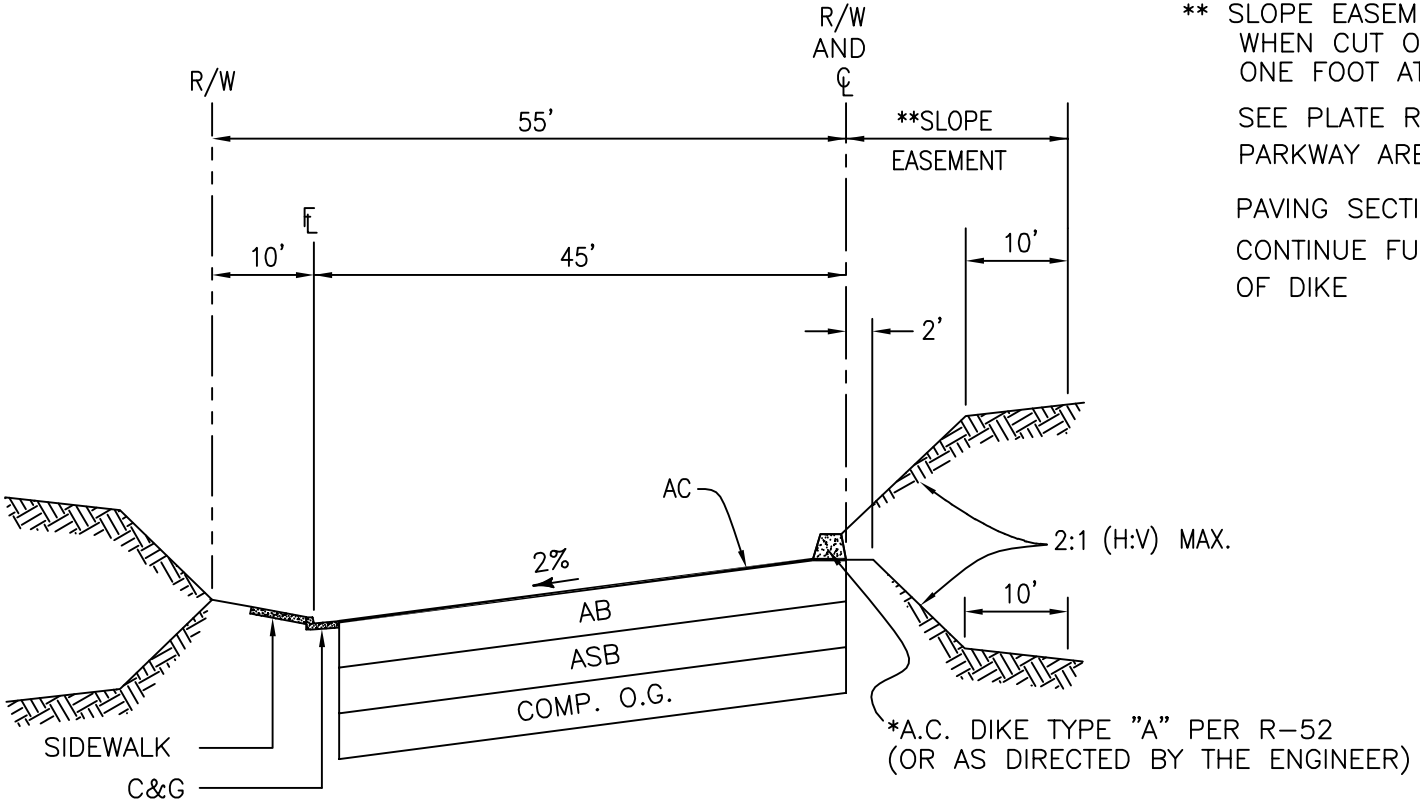
HALF WIDTH TYPE "A" ARTERIAL
STREET LOT: < 5 ACRES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

REVISIONS	
DATE	DESC
-	-
-	-
-	-
-	-
-	-

DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-3



NOTES:

* NO DIKE NEEDED IF SIDE SLOPE IS 4:1 OR FLATTER

** SLOPE EASEMENT REQUIRED WHEN CUT OR FILL EXCEEDS ONE FOOT AT R/W.

SEE PLATE R-31 FOR PARKWAY AREA (SHOULDER).

PAVING SECTION SHALL CONTINUE FULL WIDTH OF DIKE

NOT TO SCALE

TRACT MAPS		PARCEL MAPS
LOT SIZE (ACRES)	NOTES:	LOT SIZE (ACRES)
≥ 2 1/2 < 5	DELETE SIDEWALK AND C & G	> 3

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

DWG FILE: K:\BUILDINGDEV\DEVELOPMENT REVIEW\DEV_STD\2023\2023 REVISED DRAWINGS\ROADS\R-4

KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

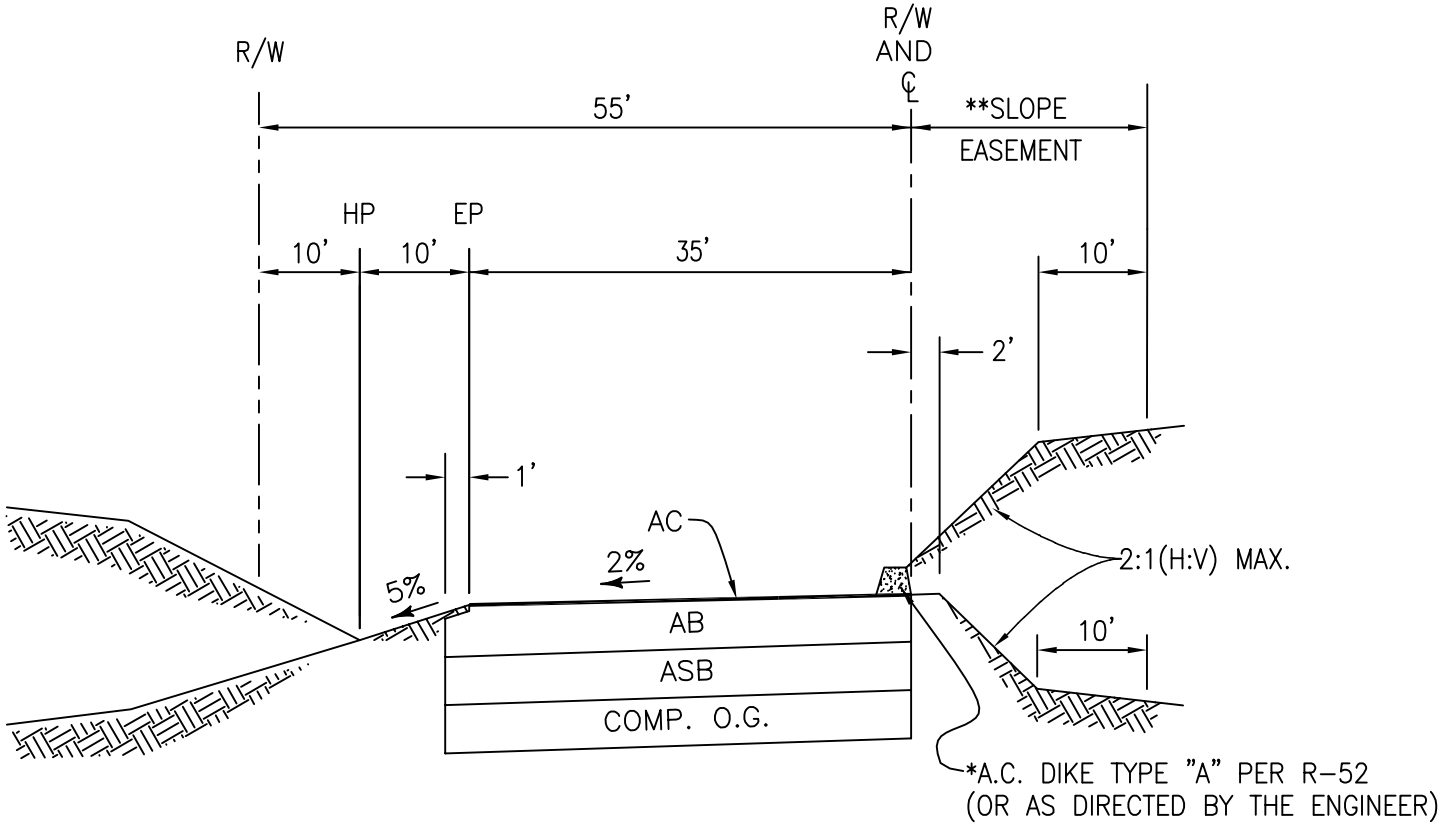
HALF WIDTH TYPE "A" ARTERIAL
STREET LOT SIZE: > 3 < 20 ACRES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

REVISIONS DATE	DESC
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-4



NOT TO SCALE

NOTES:

TRACT MAPS: LOTS ≥ 5 < 20 ACRES
PARCEL MAPS: LOTS > 3 < 20 ACRES

* NO DIKE NEEDED IF SIDE SLOPE IS 4:1(H:V) OR FLATTER.

** SLOPE EASEMENT REQUIRED WHEN CUT OR FILL EXCEEDS ONE FOOT AT R/W.

SEE PLATE R-31 FOR PARKWAY AREA (SHOULDER).

PAVING SECTION SHALL CONTINUE FULL WIDTH OF DIKE

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

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KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

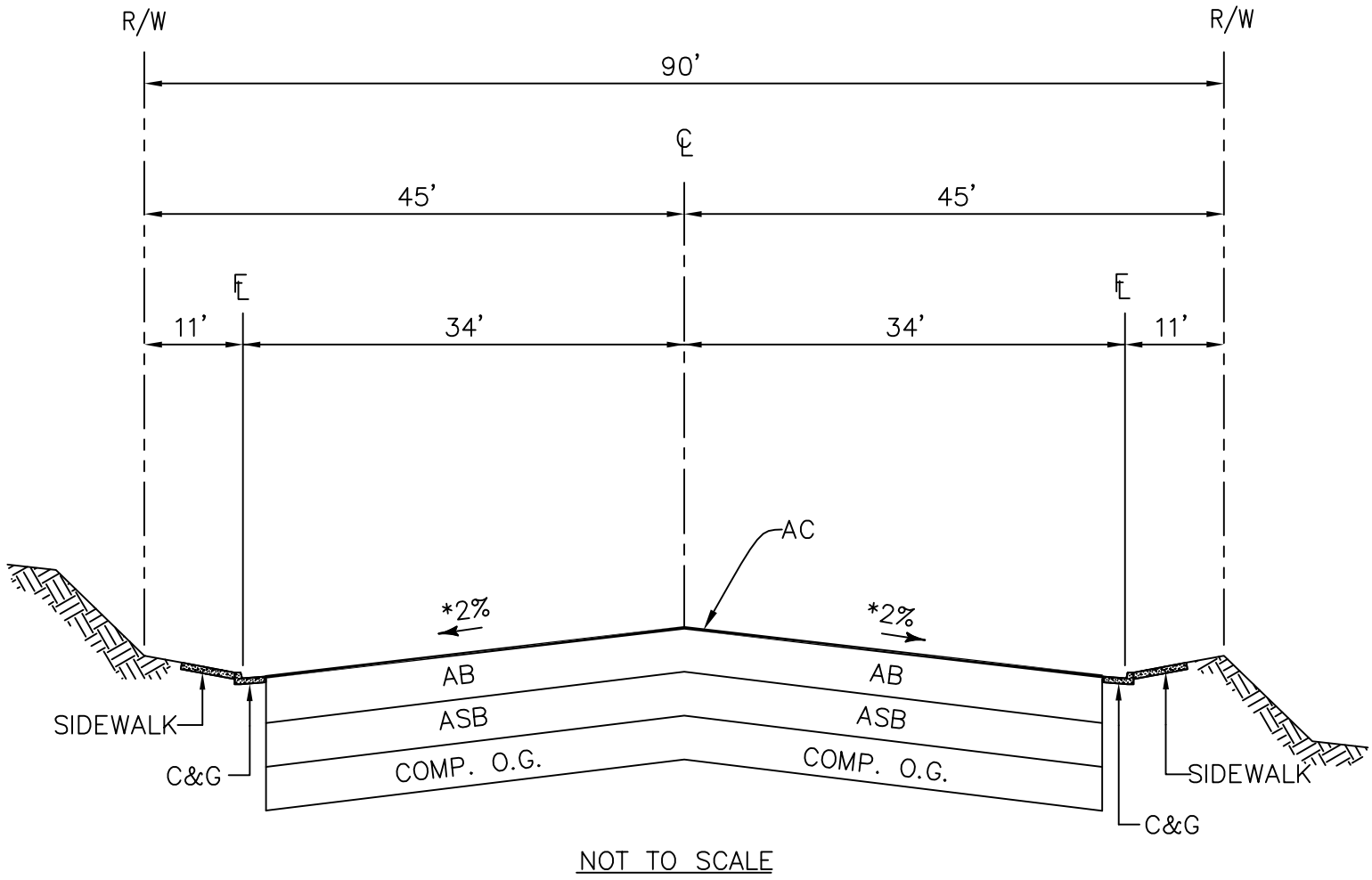
TYPE "A" COLLECTOR STREET
LOT SIZE < 5 ACRES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-5



NOT TO SCALE

NOTE:

* SLOPE FROM HIGH GUTTER. MAXIMUM SLOPE SHALL NOT EXCEED 2.5% TO LOW GUTTER.

SEE PLATE R-31 FOR PARKWAY AREA (SHOULDER).

TRACT MAPS		PARCEL MAPS
LOT SIZE (ACRES)	NOTES:	LOT SIZE (ACRES)
≥ 2 1/2 < 5	DELETE SIDEWALK AND C & G	> 3

TI=	R-Value O.G.=
MATERIAL	Thickness
AC	
AB	
ASB	
COMP. O.G.	

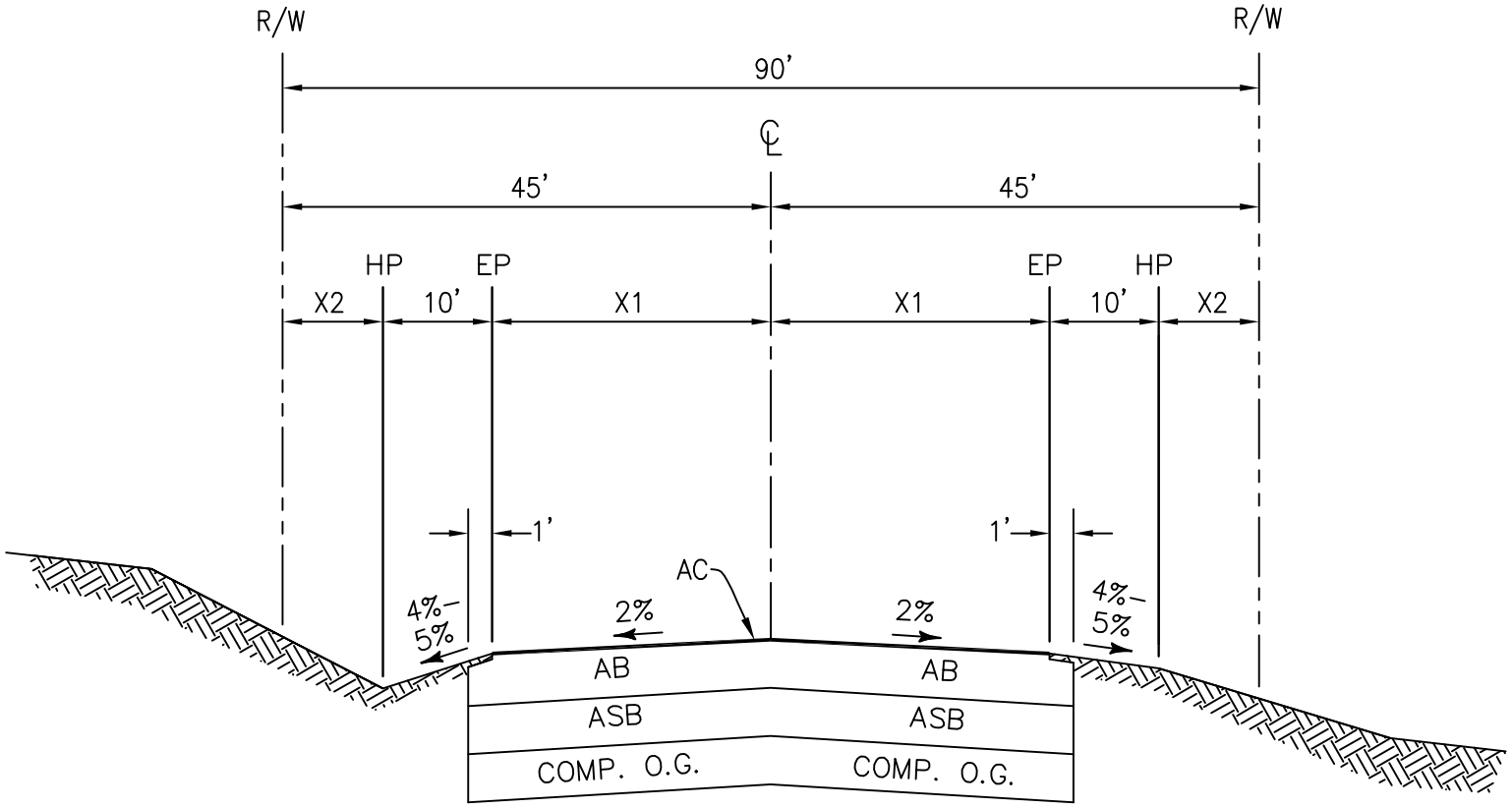
SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

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KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

TYPE "A" COLLECTOR STREET
LOT SIZE: > 5 < 20 ACRES

COUNTY OF KERN
STATE OF CALIFORNIA
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NOT TO SCALE

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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-6

NOTE:

SEE PLATE R-31 FOR PARKWAY AREA (SHOULDER).

TRACT MAPS			PARCEL MAPS
LOT SIZE (ACRES)	X1	X2	LOT SIZE (ACRES)
≥ 5 < 10	24'	11'	
≥ 10 < 20	12'	23'	> 3 < 20

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

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KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

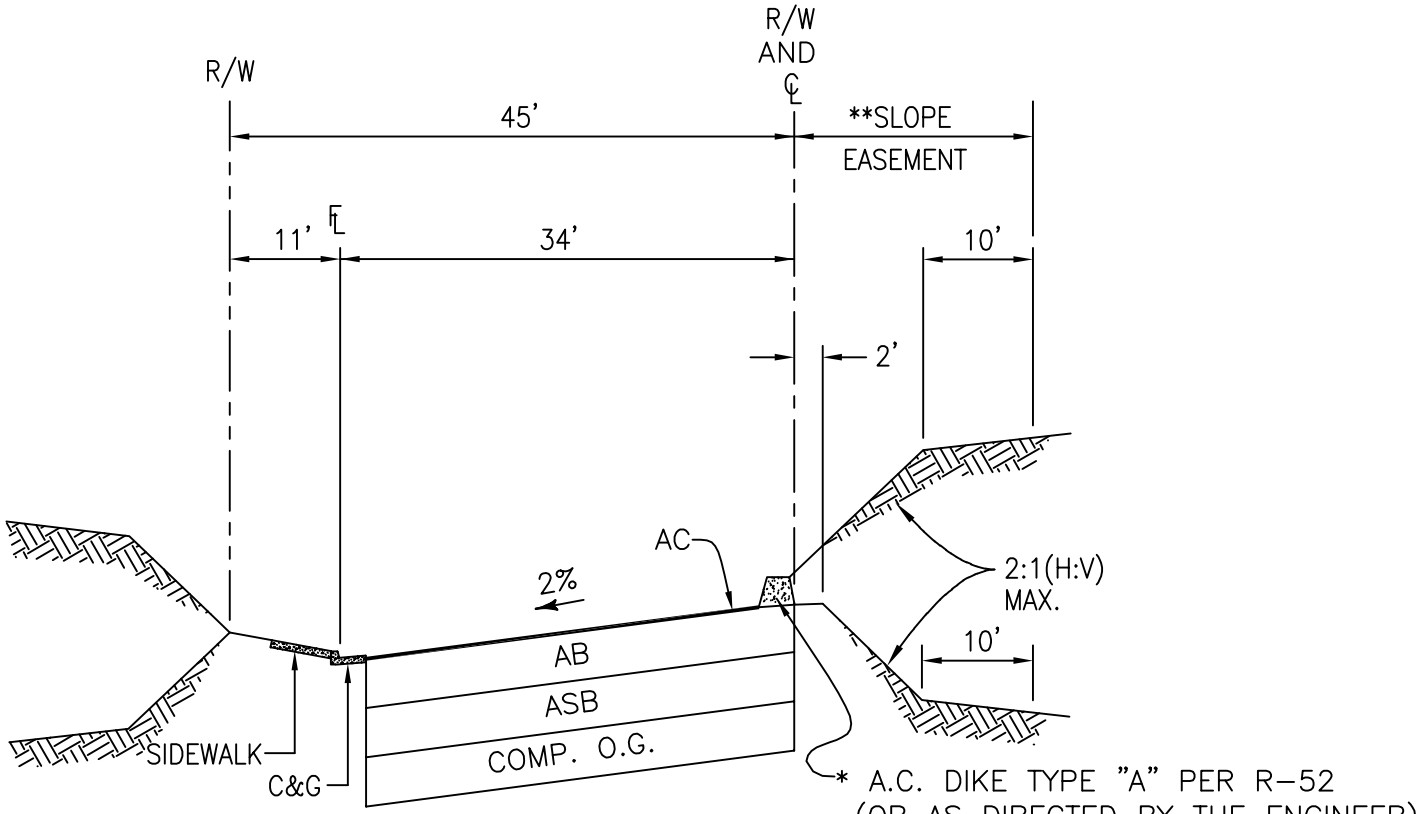
HALF WIDTH TYPE "A" COLLECTOR
STREET LOT SIZE: < 5 ACRES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

REVISIONS	
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DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-7



NOT TO SCALE

NOTES:

* NO DIKE NEEDED IF SIDE SLOPE IS 4:1 OR FLATTER

** SLOPE EASEMENT REQUIRED WHEN CUT OR FILL EXCEEDS ONE FOOT AT R/W. PAVING SECTION SHALL CONTINUE FULL WIDTH OF DIKE

SEE PLATE R-31 FOR PARKWAY AREA (SHOULDER).

TRACT MAPS		PARCEL MAPS
LOT SIZE (ACRES)	NOTES:	LOT SIZE (ACRES)
≥ 2 1/2 < 5	DELETE SIDEWALK AND C & G	

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

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KERN COUNTY PUBLIC WORKS
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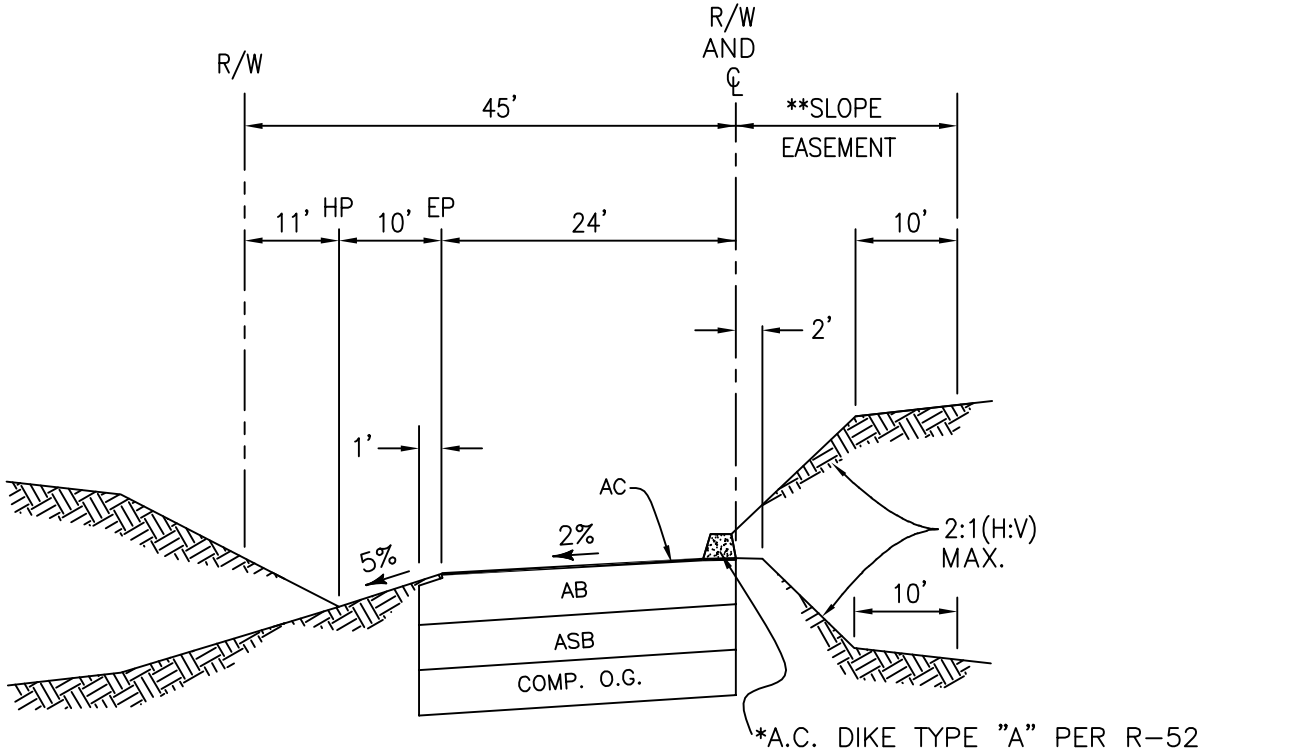
HALF WIDTH TYPE "A" COLLECTOR
STREET LOT SIZE: > 3 < 20 ACRES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-8



NOT TO SCALE

NOTES:

TRACT MAPS: LOTS ≥ 5 < 20 ACRES
PARCEL MAPS: LOTS > 3 < 20 ACRES

* NO DIKE NEEDED IF SIDE SLOPE IS 4:1(H:V) OR FLATTER.

** SLOPE EASEMENT REQUIRED WHEN CUT OR FILL EXCEEDS ONE FOOT AT R/W.

SEE PLATE R-31 FOR PARKWAY AREA (SHOULDER).

PAVING SECTION SHALL CONTINUE FULL WIDTH OF DIKE

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	
SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.	

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KERN COUNTY PUBLIC WORKS
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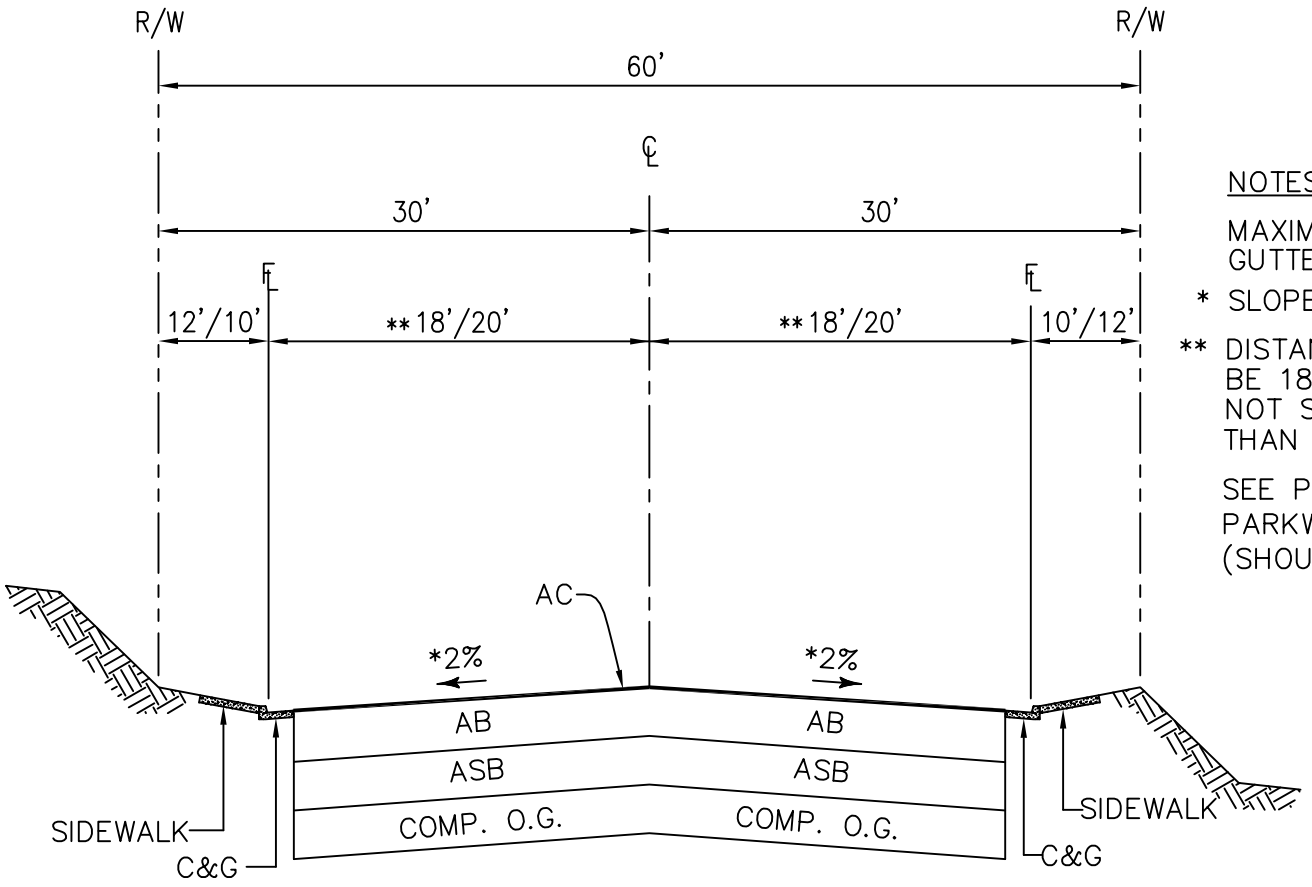
TYPE "A" LOCAL STREET ZONE "R" AND ZONE "E" LOT SIZE: < 5 ACRES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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APPROVED BY: J.R.C.

PLATE NO. R-9



NOT TO SCALE

NOTES:

MAXIMUM CROSS FALL LOW GUTTER SHALL BE 0.5'.

* SLOPE FROM HIGH GUTTER.

** DISTANCE FROM ℄ TO ℄ MAY BE 18' WHERE STREET WILL NOT SERVE MORE THAN 30 THAN 30 SINGLE-FAMILY LOTS.

SEE PLATE R-31 FOR PARKWAY AREA (SHOULDER).

TRACT MAPS		PARCEL MAPS
LOT SIZE (ACRES)	NOTES:	LOT SIZE (ACRES)
≥ 2 1/2 < 5	DELETE SIDEWALK AND C & G	> 3

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

NOT TO SCALE

NOTES:
TRACT MAPS: LOTS ≥ 5 < 20 ACRES
PARCEL MAPS: LOTS > 3 < 20 ACRES

SEE PLATE R-31 FOR PARKWAY AREA (SHOULDER).

KERN COUNTY PUBLIC WORKS
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TYPE "A" LOCAL STREET
LOT SIZE: > 3 < 20 ACRES

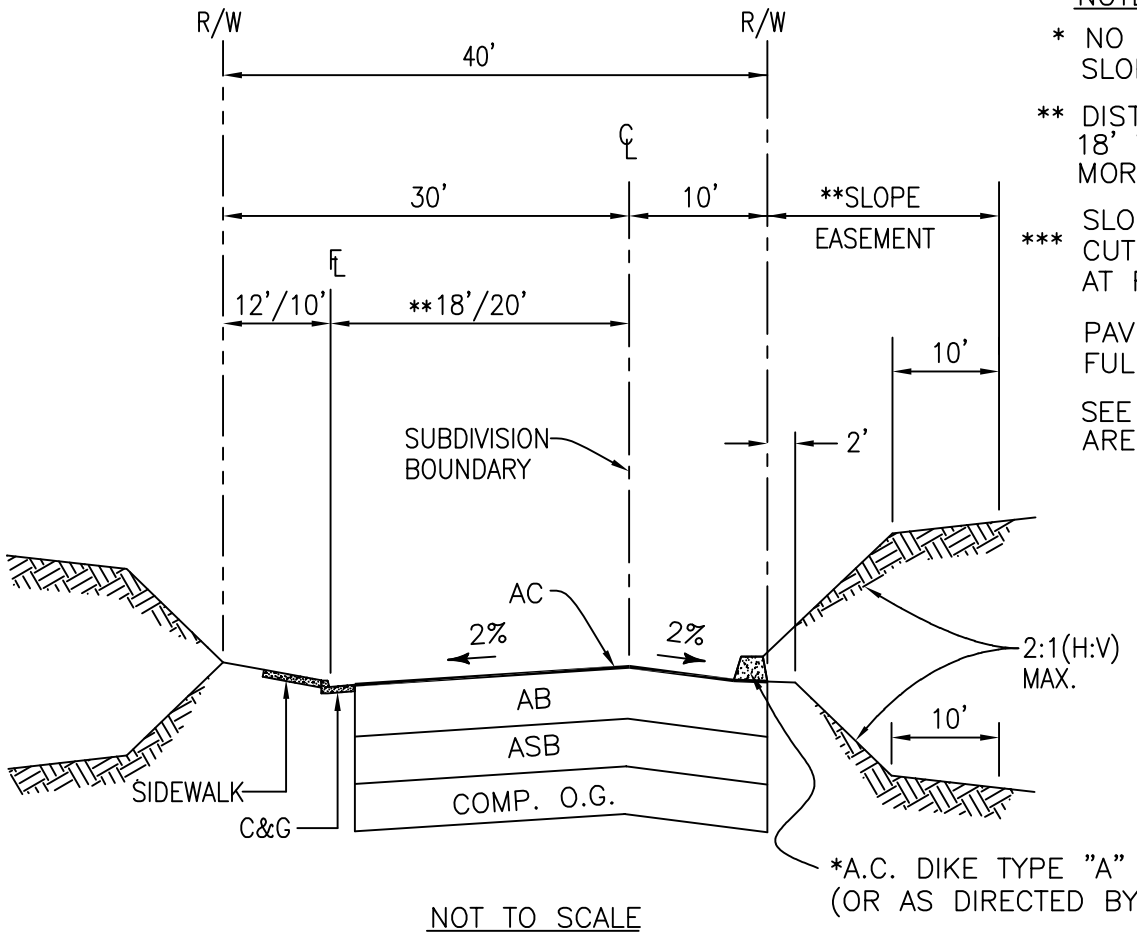
COUNTY OF KERN
STATE OF CALIFORNIA
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PLATE NO.
R-10

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NOT TO SCALE

NOTES:

* NO DIKE NEEDED IF SIDE SLOPE IS 4:1(H:V) OR FLATTER

** DISTANCE FROM ℄ TO ℄ MAY BE 18' WHERE STREET WILL NOT SERVE MORE THAN 30 SINGLE-FAMILY LOTS.

*** SLOPE EASEMENT REQUIRED WHEN CUT OR FILL EXCEEDS ONE FOOT AT R/W.

PAVING SECTION SHALL CONTINUE FULL WIDTH OF DIKE

SEE PLATE R-31 FOR PARKWAY AREA (SHOULDER).

TRACT MAPS		PARCEL MAPS
LOT SIZE (ACRES)	NOTES:	LOT SIZE (ACRES)
≥ 2 1/2 < 5	DELETE SIDEWALK AND C & G	> 3

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

KERN COUNTY PUBLIC WORKS
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PART WIDTH TYPE "A"
LOCAL STREET ZONE "R" AND ZONE "E"
LOT SIZE: < 5 ACRES

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PLATE NO. R-11

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KERN COUNTY PUBLIC WORKS
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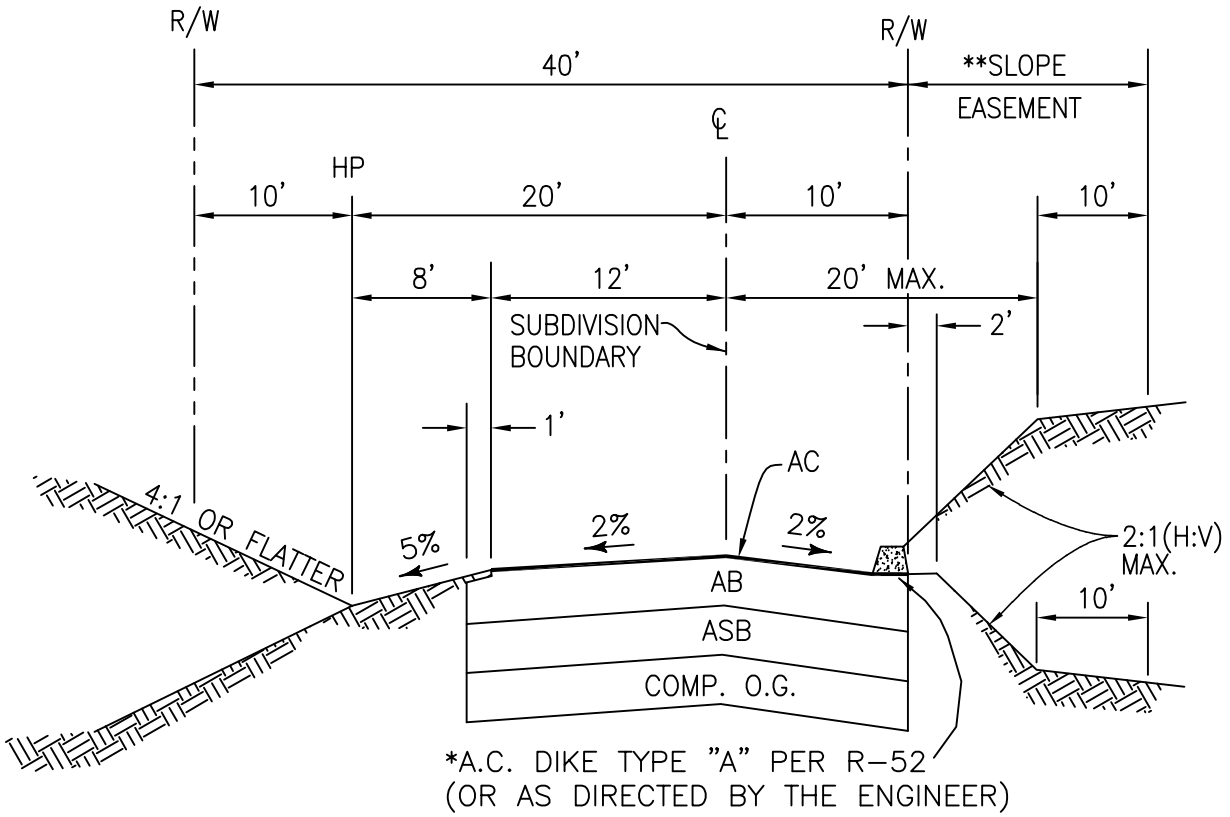
PART WIDTH TYPE "A" LOCAL STREET
LOT SIZE: > 3 < 20 ACRES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-12



NOTES:

TRACT MAPS: LOTS ≥ 5 < 20 ACRES

PARCEL MAPS: LOTS > 3 < 20 ACRES

* NO DIKE NEEDED IF SIDE SLOPE IS 4:1(H:V) OR FLATTER

** SLOPE EASEMENT REQUIRED WHEN CUT OR FILL EXCEEDS ONE FOOT AT R/W.

SEE PLATE R-31 FOR PARKWAY AREA (SHOULDER).

PAVING SECTION SHALL CONTINUE FULL WIDTH OF DIKE

NOT TO SCALE

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

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KERN COUNTY PUBLIC WORKS
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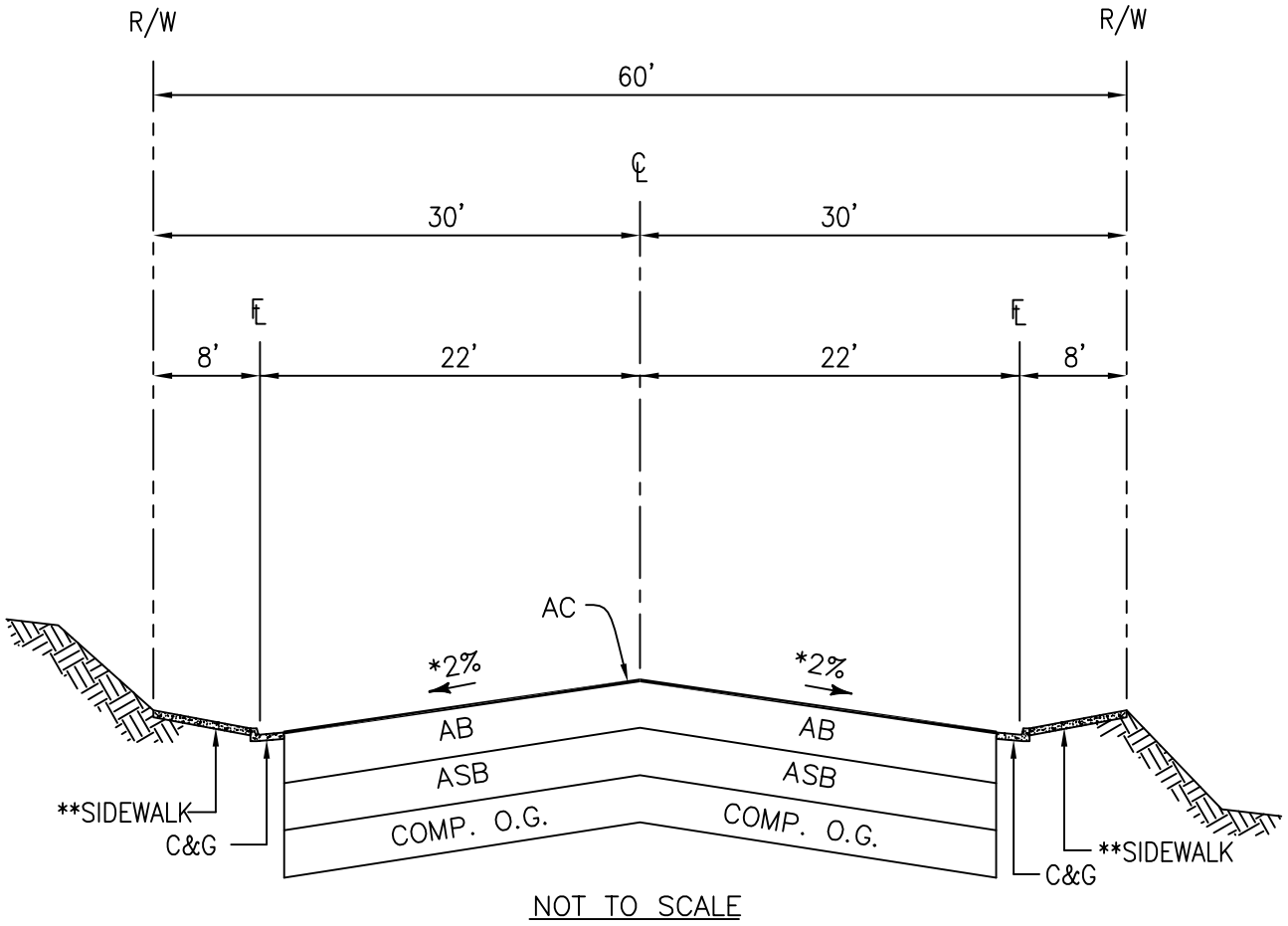
TYPE "A" COMMERCIAL STREET ZONE "C" AND ZONE "M"

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-13



NOT TO SCALE

NOTES:

* SLOPE FROM HIGH GUTTER. MAXIMUM SLOPE SHALL NOT EXCEED 2.5% TO LOW GUTTER.

** SIDEWALK SHALL BE FULL WIDTH TO R/W ON COMMERCIAL DEVELOPMENTS. IT MAY BE REDUCED TO A MINIMUM OF 5' WIDE, IF LANDSCAPING IS CONTIGUOUS AND MAINTAINED BY OTHERS, SUBJECT TO THE DIRECTOR'S APPROVAL.

NOTES: (CONT.)

22' STREET WIDTH SATISFACTORY ONLY WHERE STREETS ARE CONTINUOUS AND ADEQUATE OFF-STREET PARKING IS PROVIDED. ALTERNATE WOULD BE TYPE "A" COLLECTOR.

SEE PLATE R-31 FOR PARKWAY AREA (SHOULDER).

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

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KERN COUNTY PUBLIC WORKS
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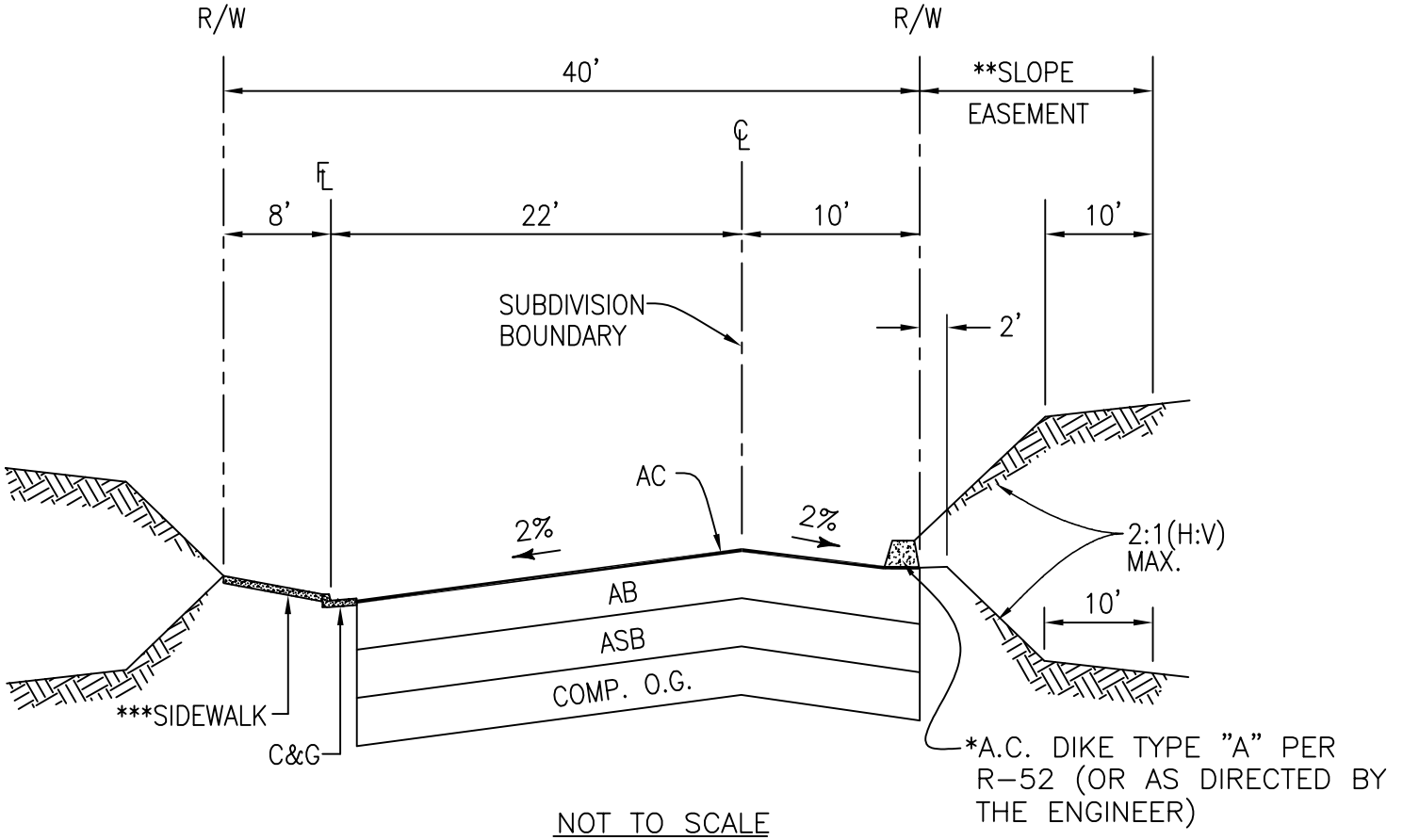
PART WIDTH TYPE "A" COMMERCIAL STREET ZONE "C" AND ZONE "M"

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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APPROVED BY: J.R.C.

PLATE NO. R-14



NOT TO SCALE

NOTES:

* NO DIKE NEEDED IF SIDE SLOPE IS 4:1(H:V) OR FLATTER.

** SLOPE EASEMENT REQUIRED WHEN CUT OR FILL EXCEEDS ONE FOOT AT R/W.

*** SIDEWALK SHALL BE FULL WIDTH TO R/W ON COMMERCIAL DEVELOPMENTS. IT MAY BE REDUCED TO A MINIMUM OF 5' WIDE, IF LANDSCAPING IS CONTIGUOUS AND MAINTAINED BY OTHERS, SUBJECT TO THE DIRECTOR'S APPROVAL.

SEE PLATE R-31 FOR PARKWAY AREA (SHOULDER).

PAVING SECTION SHALL CONTINUE FULL WIDTH OF DIKE.

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

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KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

TYPE "B" ARTERIAL STREET

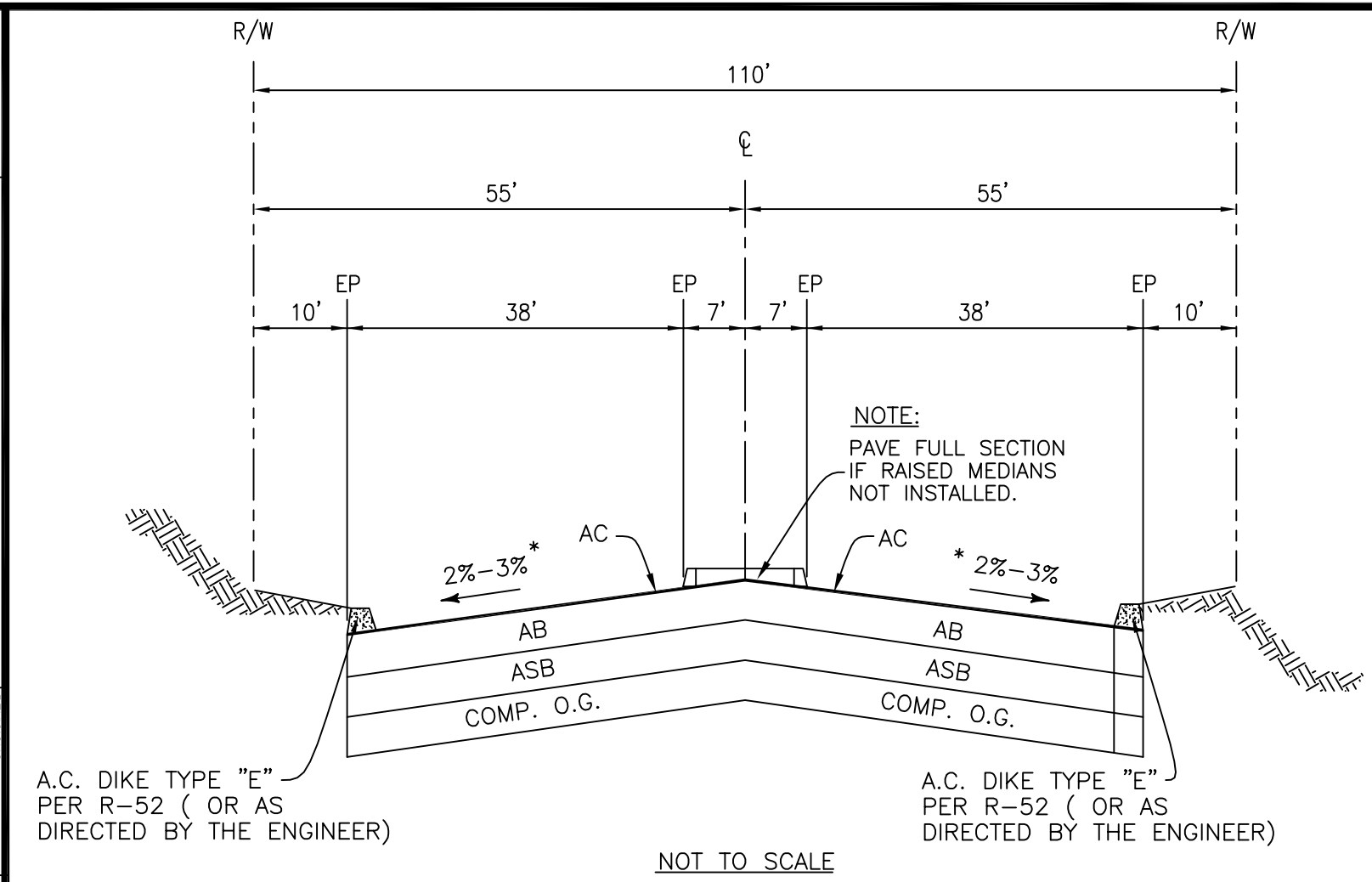
LOT SIZE: < 2 1/2 ACRES

COUNTY OF KERN
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-15



NOT TO SCALE

NOTES:

SEE PLATE R–30 FOR PARKWAY AREA (SHOULDER).

* GRADE FROM HIGH GUTTER.

PAVING SECTION SHALL CONTINUE FULL WIDTH OF DIKE

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

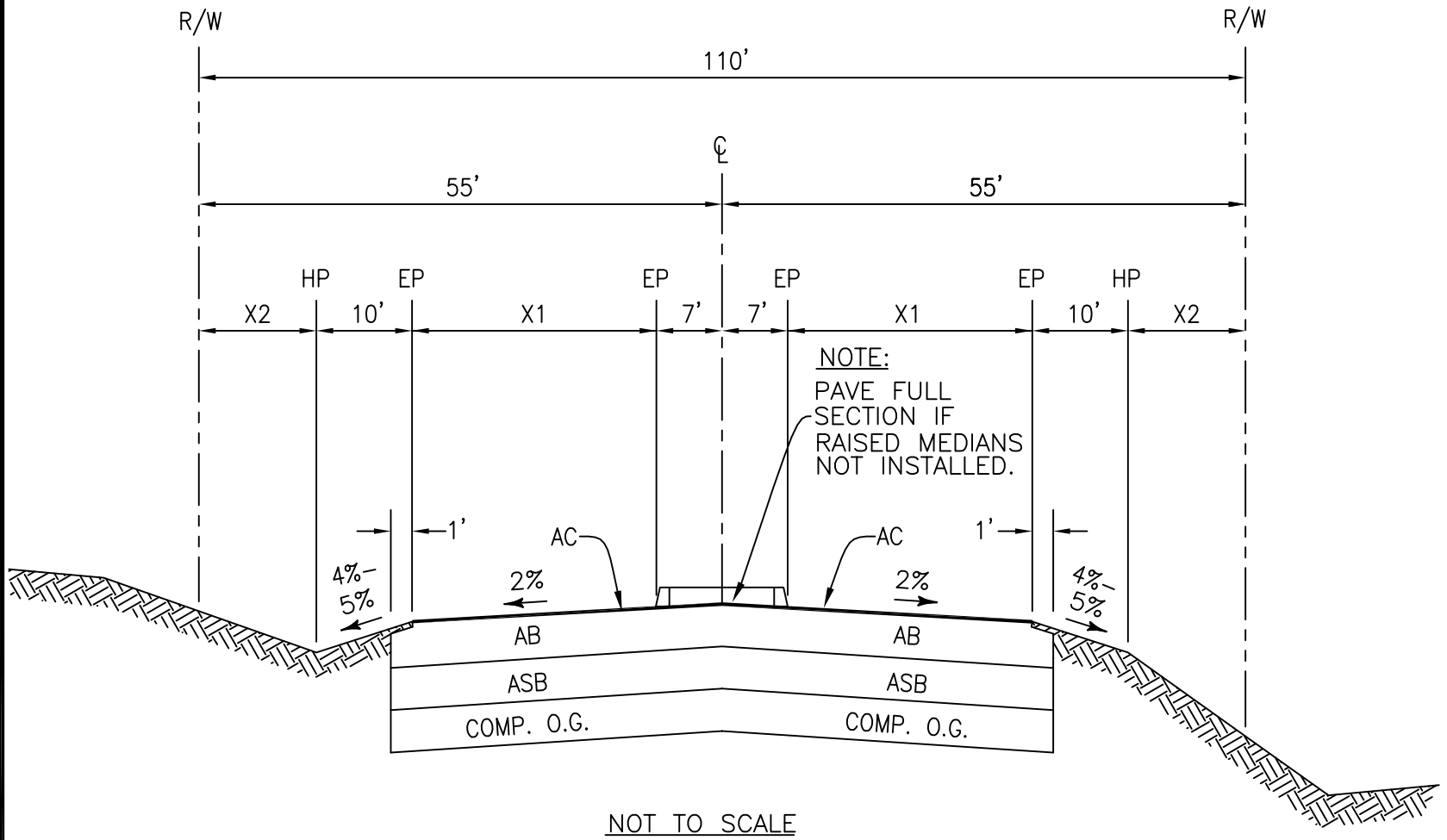
SEE PLATE R–32 FOR LIMITS OF COMPACTION OF O.G.

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KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

TYPE "B" ARTERIAL STREET
LOT SIZE: ≥ 2 1/2 < 20 ACRES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD



NOT TO SCALE

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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-16

NOTES:

SEE PLATE R-30 FOR PARKWAY AREA (SHOULDER).

TRACT MAPS AND PARCEL MAPS		
LOT SIZE (ACRES)	X1	X2
≥ 2 1/2 < 10	28'	10'
≥ 10 < 20	18'	20'

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

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KERN COUNTY PUBLIC WORKS
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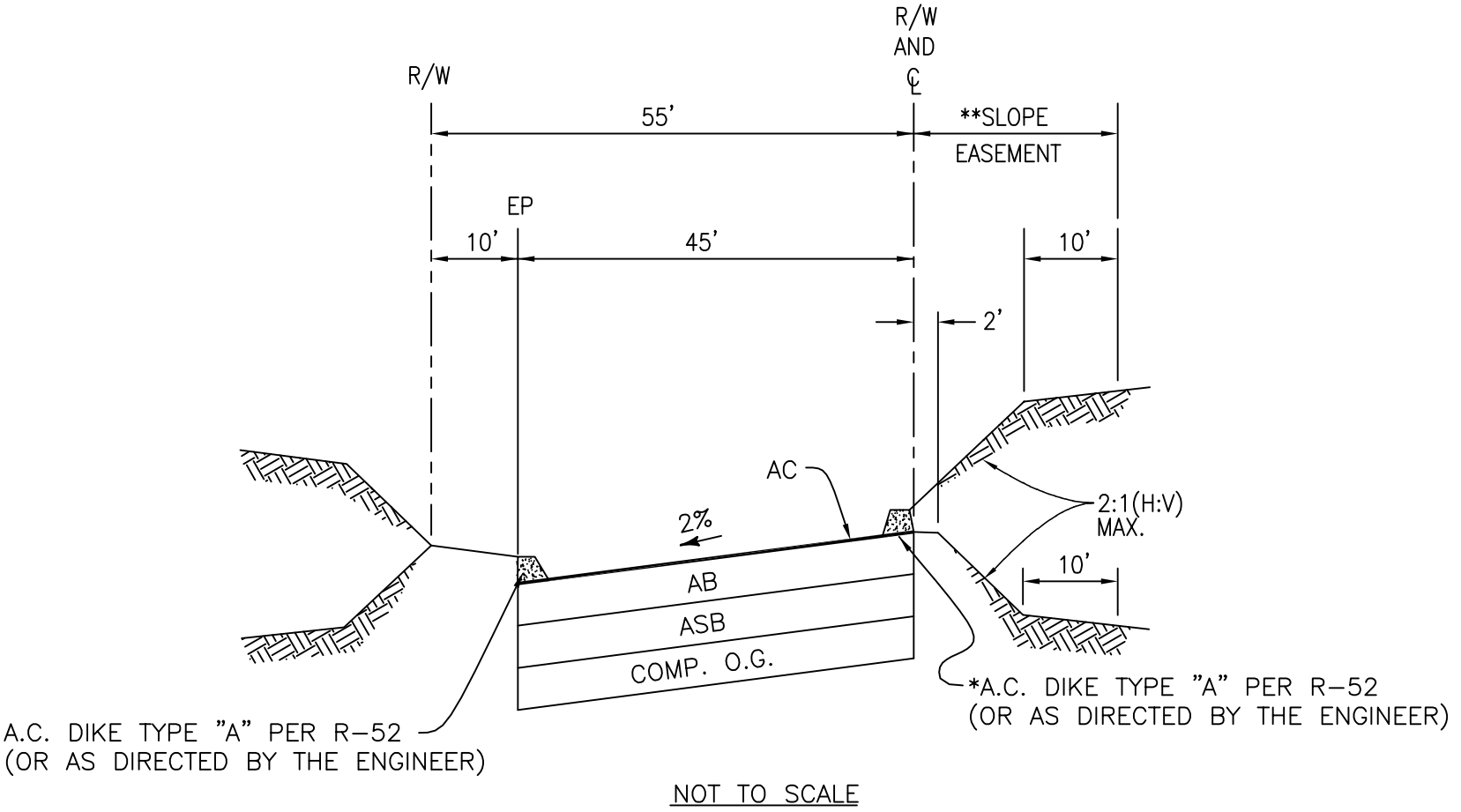
HALF WIDTH TYPE "B" ARTERIAL
STREET LOT SIZE : < 2 ½ ACRES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DATE DRAFTED: 09/30/23
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PLATE NO. R-17



NOT TO SCALE

NOTES:

SEE PLATE R-30 FOR PARKWAY AREA (SHOULDER).

** SLOPE EASEMENT REQUIRED WHEN CUT OR FILL EXCEEDS ONE FOOT AT R/W.

* NO DIKE NEEDED IF SIDE SLOPE IS 4:1(H:V) OR FLATTER

PAVING SECTION SHALL CONTINUE FULL WIDTH OF DIKE

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

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KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

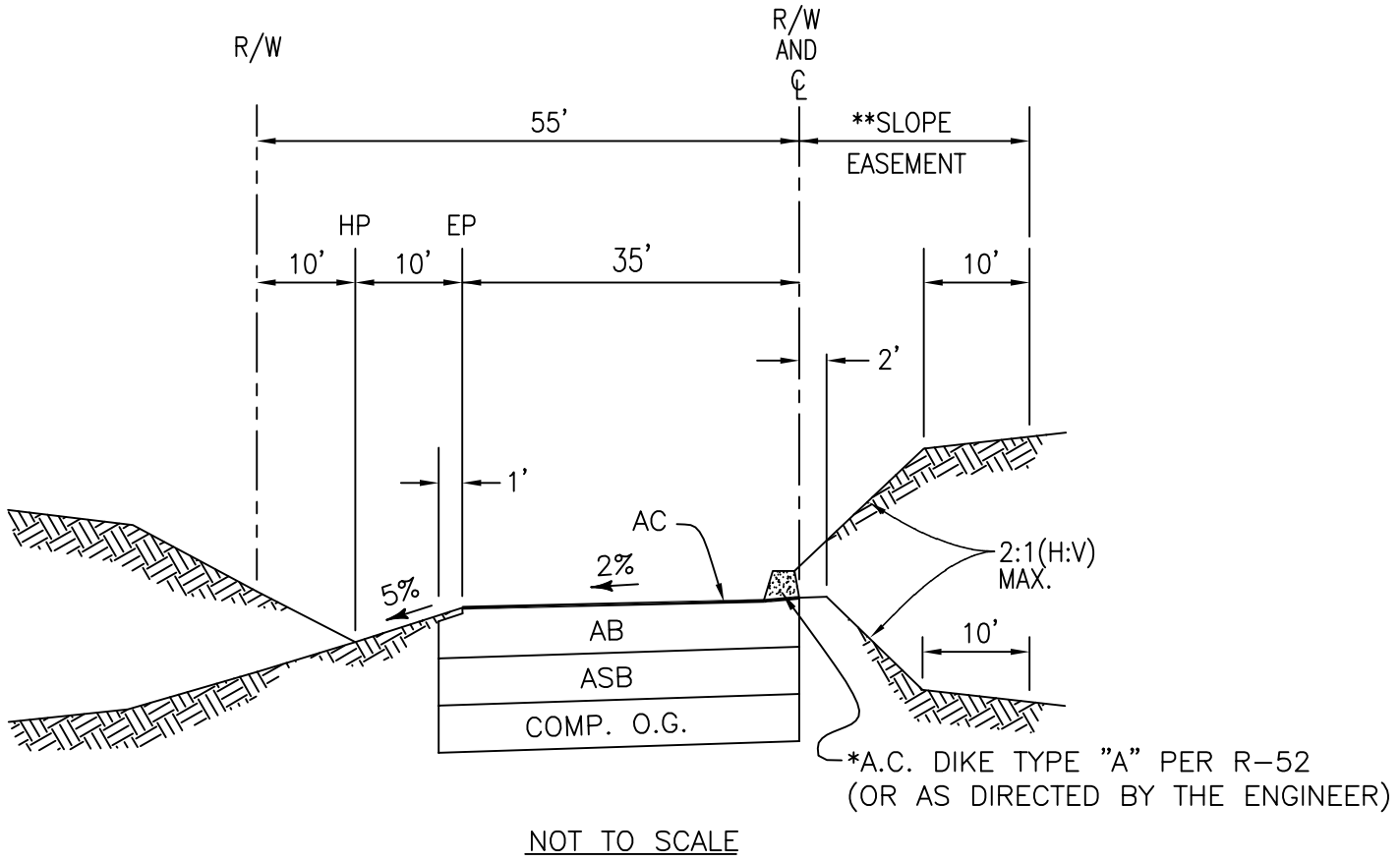
HALF WIDTH TYPE "B" ARTERIAL
STREET LOT SIZE: ≥ 2 1/2 < 20 ACRES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

REVISIONS		
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APPROVED BY: J.R.C.

PLATE NO. R-18



NOT TO SCALE

NOTES:

SEE PLATE R-30 FOR PARKWAY AREA (SHOULDER)

* NO DIKE NEEDED IF SIDE SLOPE IS 4:1(H:V) OR FLATTER

** SLOPE EASEMENT REQUIRED WHEN CUT OR FILL EXCEEDS ONE FOOT AT R/W.

PAVING SECTION SHALL CONTINUE FULL WIDTH OF DIKE

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

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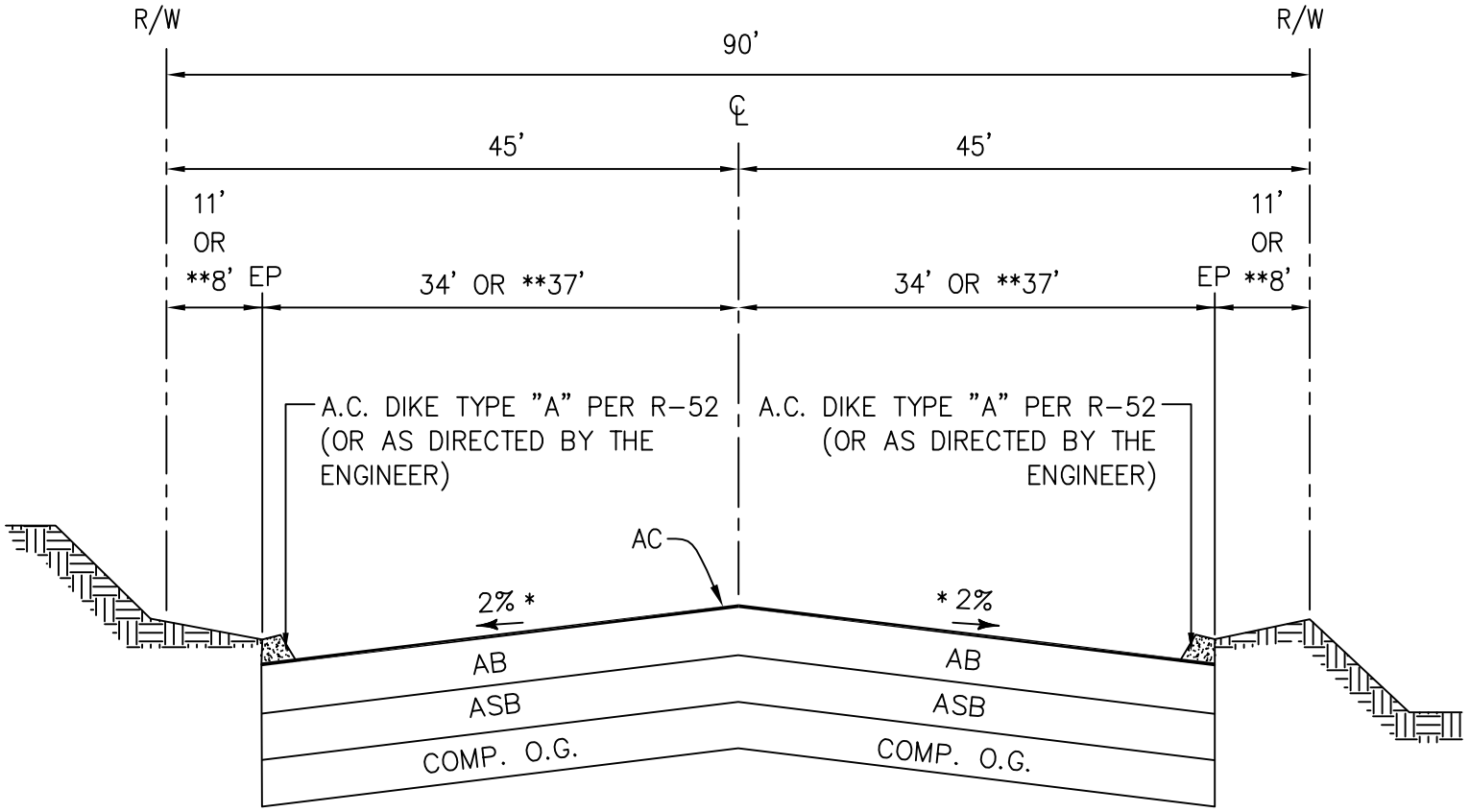
KERN COUNTY PUBLIC WORKS
GROUNDED. BOUNDLESS

TYPE "B" COLLECTOR STREET

LOT SIZE: < 2 ½ ACRES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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NOT TO SCALE

NOTES:

* SLOPE FROM HIGH GUTTER. MAXIMUM SLOPE SHALL NOT EXCEED 2.5% TO LOW GUTTER.

** USE WITH BIKE LANES.
OR FILL EXCEEDS ONE FOOT AT R/W.

PAVING SECTION SHALL CONTINUE FULL WIDTH OF DIKE

SEE PLATE R-30 FOR PARKWAY AREA (SHOULDER)

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

DRAFTED BY:	R.R.P.
DESIGNED BY:	J.R.C.
DATE DRAFTED:	09/30/23
APPROVED BY:	J.R.C.

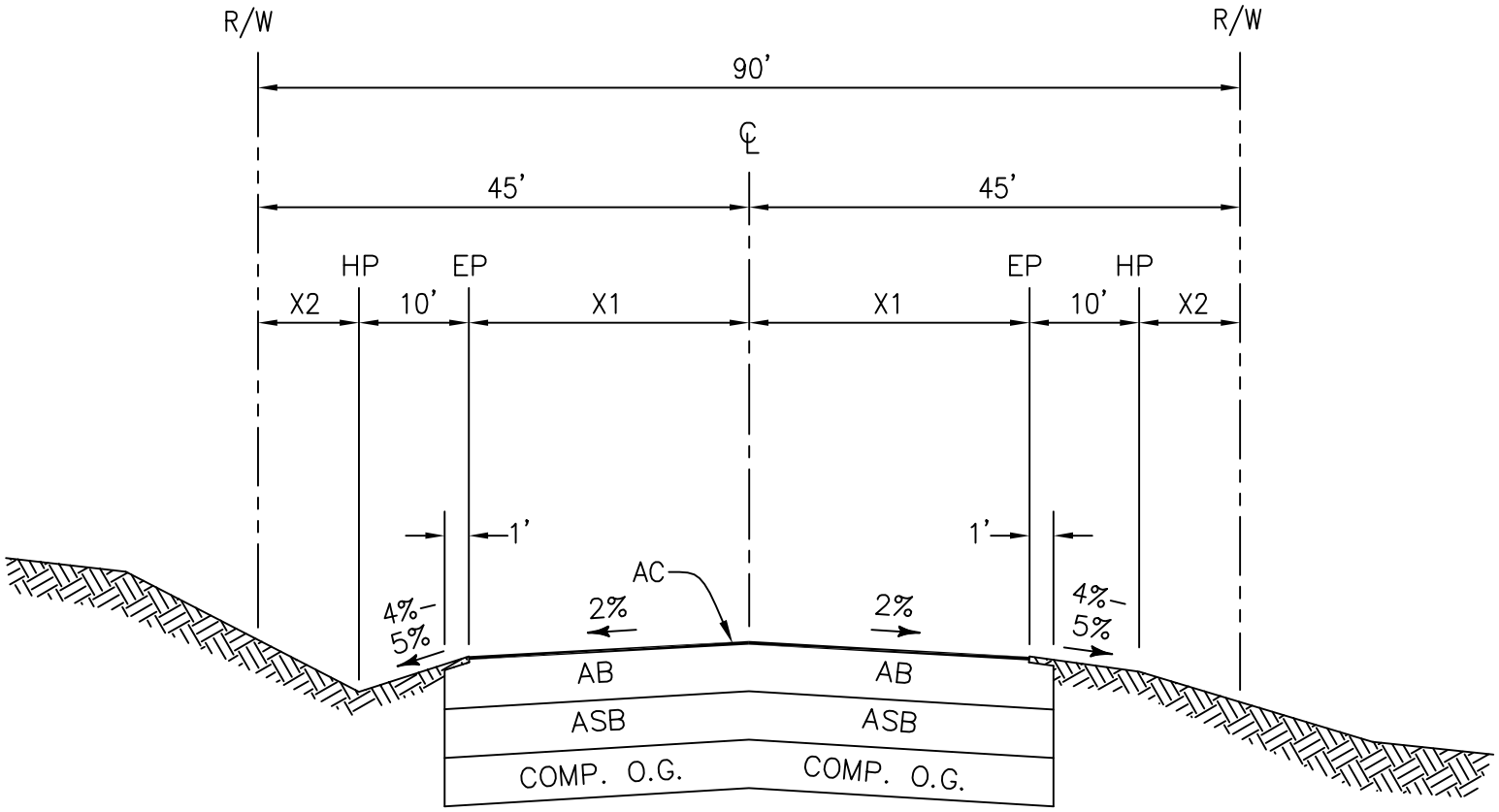
PLATE NO. R-19

DWG FILE: K:\BUILDINGDEV\DEVELOPMENT REVIEW\DEV_STD\2023\2023 REVISED DRAWINGS\ROADS\R-20

KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

TYPE "B" COLLECTOR STREET
LOT SIZE: > 2 1/2 < 20 ACRES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD



NOT TO SCALE

NOTES:
WHERE 4:1(H:V) OR FLATTER FILL SLOPES ARE USED, THE MINIMUM FILL AT THE HINGE POINT SHALL AVERAGE 0.5 FEET.

SEE PLATE R–30 FOR PARKWAY AREA (SHOULDER)

TRACT MAPS AND PARCEL MAPS		
LOT SIZE (ACRES)	X1	X2
≥ 2 1/2 < 10	24'	11'
≥ 10 < 20	12'	23'

TI=	R–Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R–32 FOR LIMITS OF COMPACTION OF O.G.

REVISIONS		
DATE	DESC	
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DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R–20

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KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

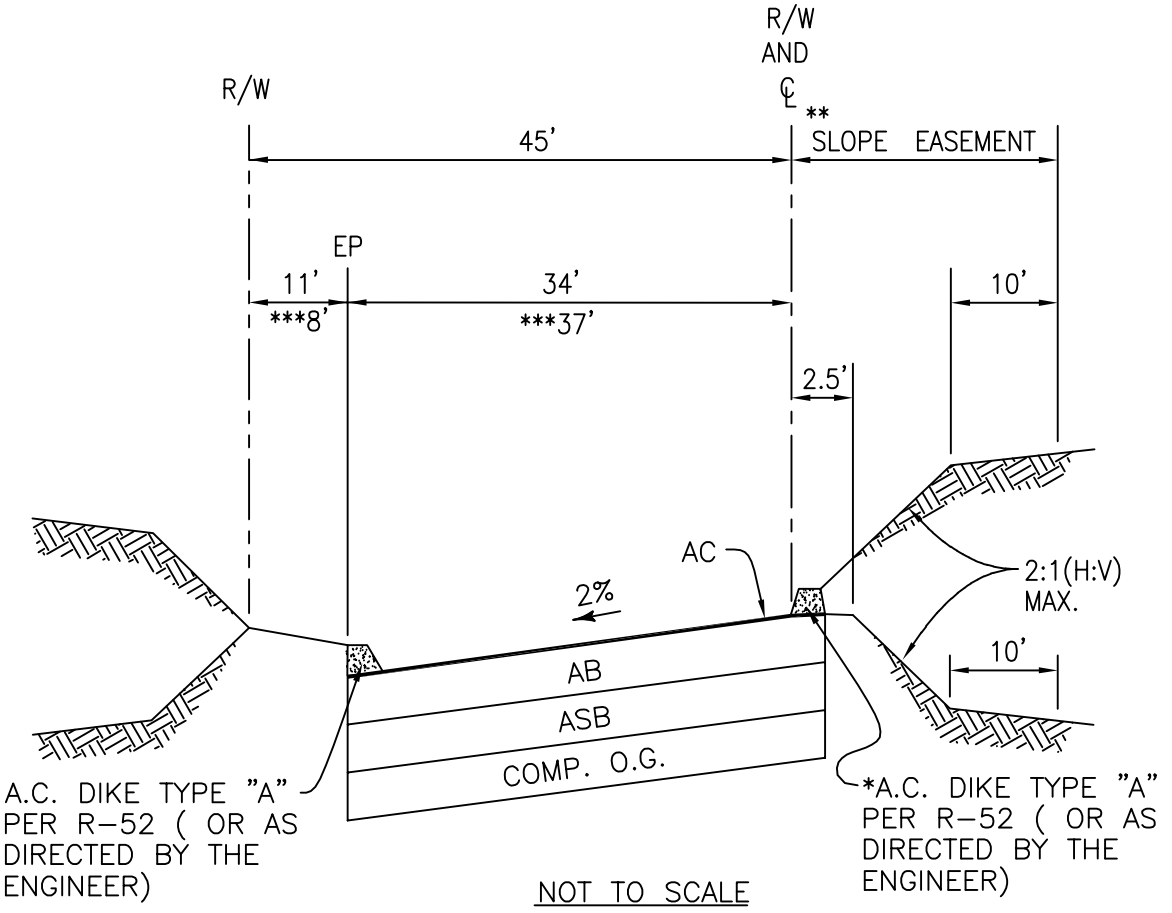
HALF WIDTH TYPE "B" COLLECTOR
STREET LOT SIZE: < 2 1/2 ACRES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

REVISIONS	
DATE	DESC
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-21



NOT TO SCALE

NOTES:

SEE PLATE R-30 FOR PARKWAY AREA (SHOULDER)

* NO DIKE NEEDED IF SIDE SLOPE IS 4:1(H:V) OR FLATTER

** SLOPE EASEMENT REQUIRED WHEN CUT OR FILL EXCEEDS ONE FOOT AT R/W.

PAVING SECTION SHALL CONTINUE FULL WIDTH OF DIKE

*** USE WITH BIKE LANES

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

Tl=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

NOTES:

SEE PLATE R-30 FOR PARKWAY AREA (SHOULDER)

* NO DIKE NEEDED IF SIDE SLOPE IS 4:1(H:V) OR FLATTER

** SLOPE EASEMENT REQUIRED WHEN CUT OR FILL EXCEEDS ONE FOOT AT R/W.

PAVING SECTION SHALL CONTINUE FULL WIDTH OF DIKE

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

HALF WIDTH TYPE "B" COLLECTOR
STREET LOT SIZE: > 2 $\frac{1}{2}$ < 20 ACRES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

REVISIONS DATE	DESC

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PLATE NO.
R-22

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KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

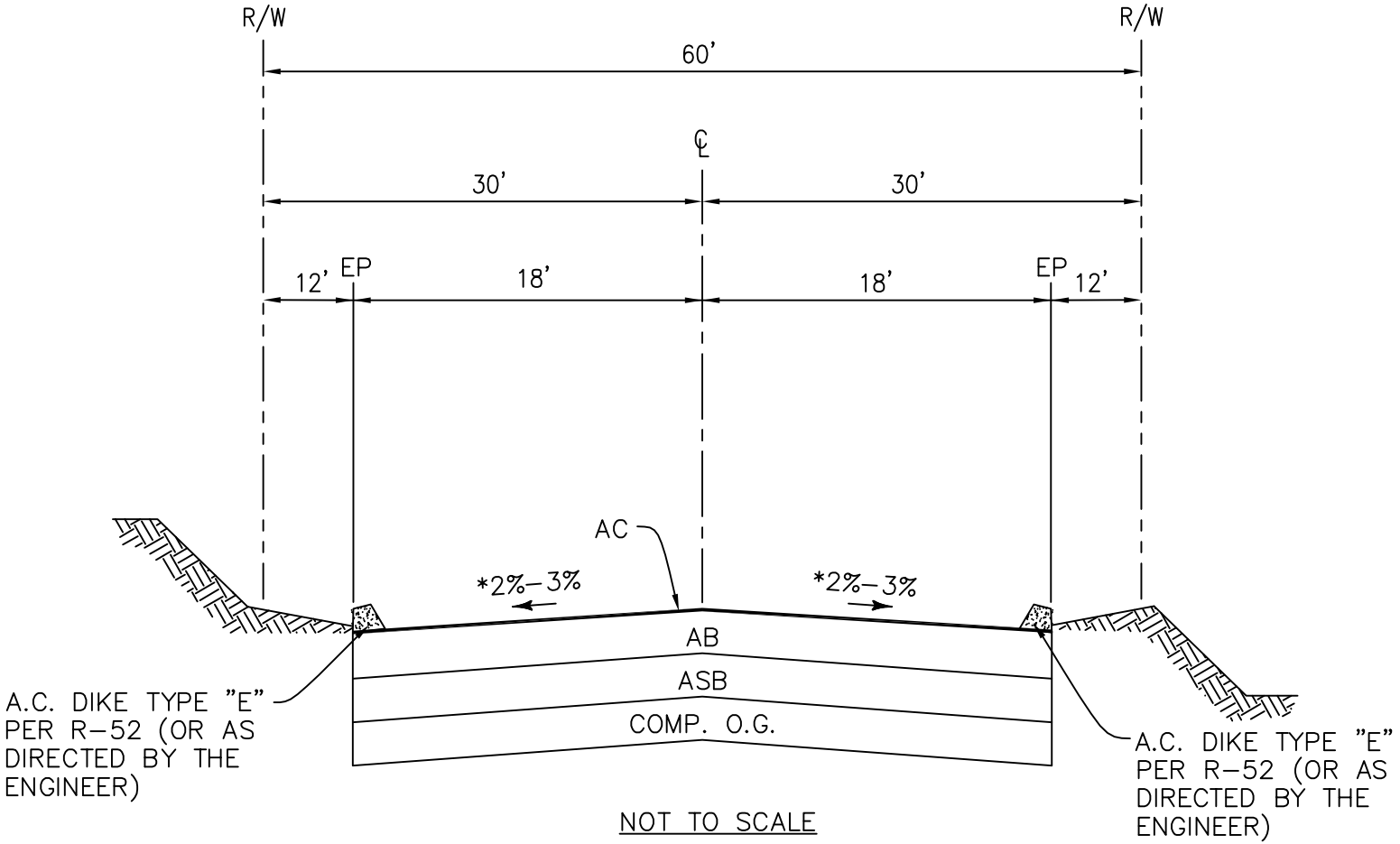
TYPE "B" LOCAL STREET ZONE "R" AND ZONE "E" LOT SIZE: < 2 1/2 ACRES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

REVISIONS	
DATE	DESC
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-23



NOT TO SCALE

NOTES:

SEE PLATE R–30 FOR PARKWAY AREA (SHOULDER)

MAXIMUM CROSS FALL TO LOW GUTTER SHALL BE 0.5'.

* SLOPE FROM HIGH GUTTER.

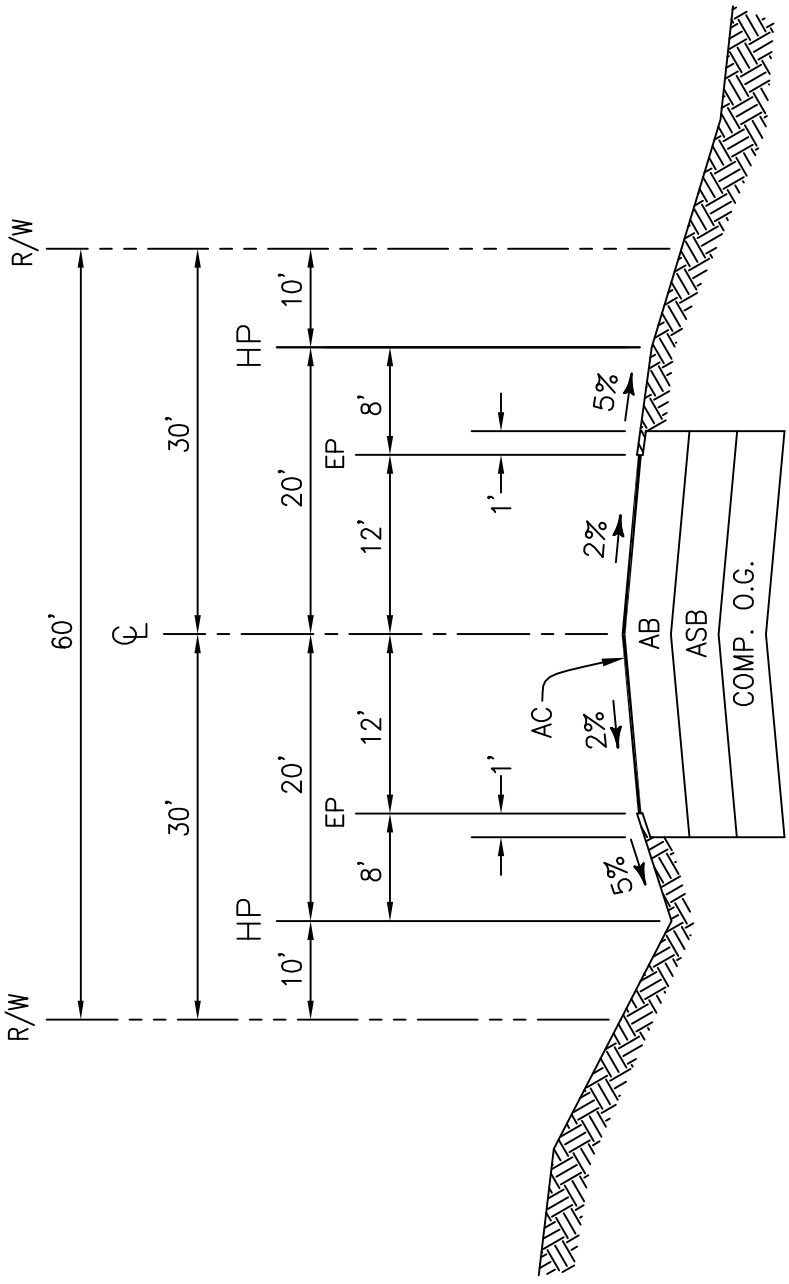
PAVING SECTION SHALL CONTINUE FULL WIDTH OF DIKE

TI=	R–Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R–32 FOR LIMITS OF COMPACTION OF O.G.

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.



NOT TO SCALE

NOTE: SEE PLATE R-30 FOR PARKWAY AREA (SHOULDER)

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

TYPE "B" LOCAL STREET
LOT SIZE: ≥ 2 1/2 < 20 ACRES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

REVISIONS DATE	DESC
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DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO.
R-24

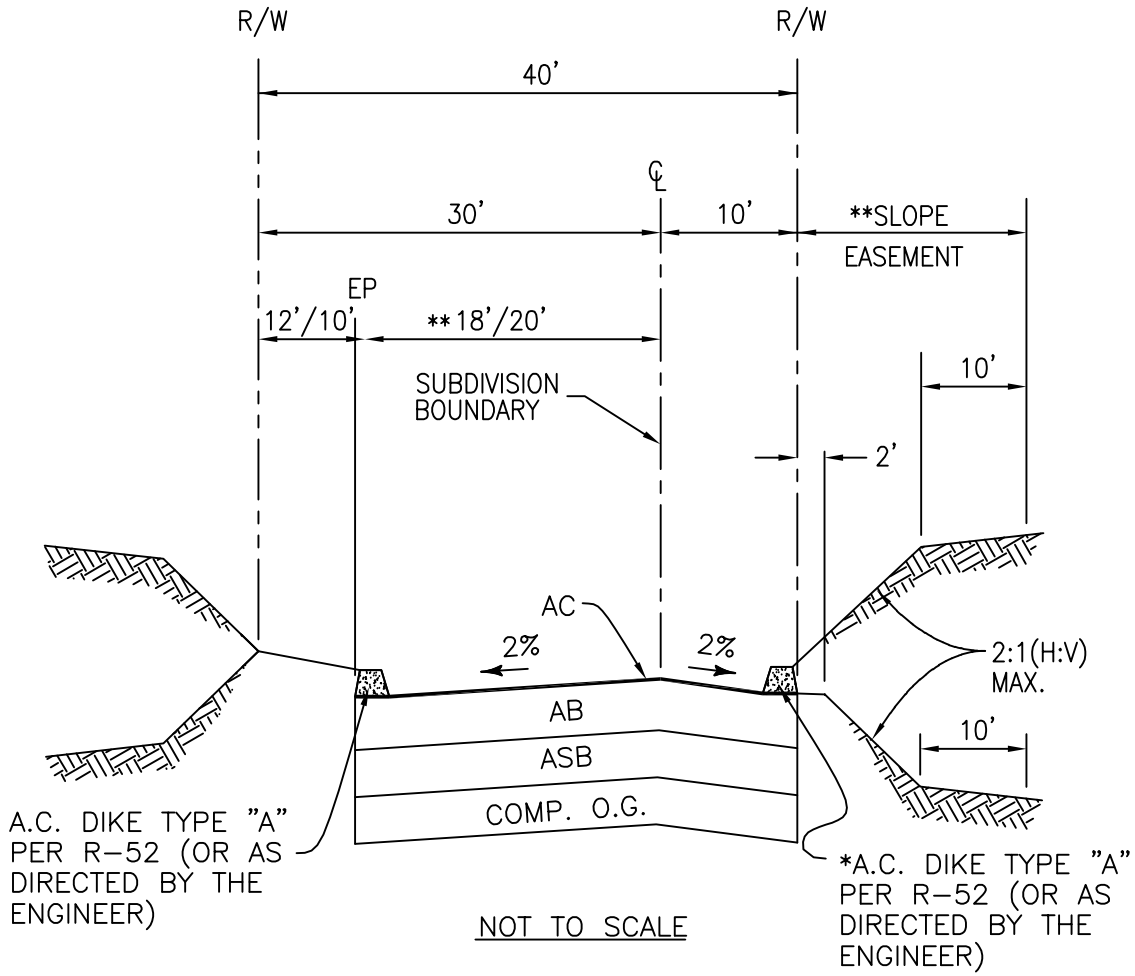
DWG FILE: K:\BUILDINGDEV\DEVELOPMENT REVIEW\DEV_STD\2023\2023 REVISED DRAWINGS\ROADS\R-24

DWG FILE: K:\BUILDINGDEV\DEVELOPMENT REVIEW\DEV_STD\2023\2023 REVISED DRAWINGS\ROADS\R-25

KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

PART WIDTH TYPE "B" LOCAL STREET ZONE "R" AND ZONE "E" LOT SIZE: < 2½ ACRES



NOT TO SCALE

NOTES:

SEE PLATE R-30 FOR PARKWAY AREA (SHOULDER)

* NO DIKE NEEDED IF SIDE SLOPE IS 4:1(H:V) OR FLATTER

** DISTANCE FROM ℄ TO ℄ MAY BE 18' WHERE STREET WILL NOT SERVE MORE THAN 30 SINGLE-FAMILY LOTS.

*** SLOPE EASEMENT REQUIRED WHEN CUT OR FILL EXCEEDS ONE FOOT AT R/W. PAVING SECTION SHALL CONTINUE FULL WIDTH OF DIKE

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

REVISIONS		
DATE	DESC	
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-25

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KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

PART WIDTH TYPE "B" LOCAL STREET

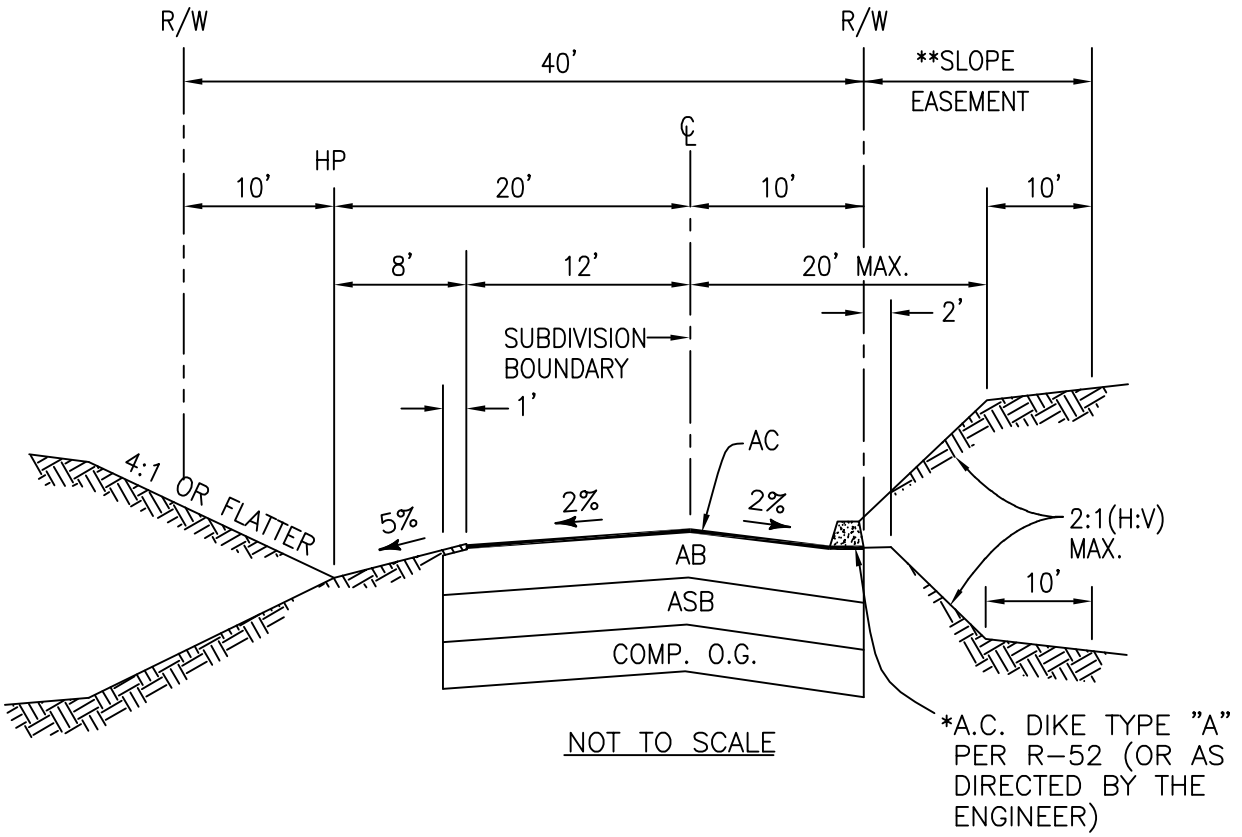
LOT SIZE: ≥ 2 1/2 < 20 acres

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

REVISIONS DATE	DESC
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-26



NOTES:

SEE PLATE R-30 FOR PARKWAY AREA (SHOULDER)

* NO DIKE NEEDED IF SIDE SLOPE IS 4:1(H:V) OR FLATTER

** SLOPE EASEMENT REQUIRED WHEN CUT OR FILL EXCEEDS ONE FOOT AT R/W.

PAVING SECTION SHALL CONTINUE FULL WIDTH OF DIKE

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

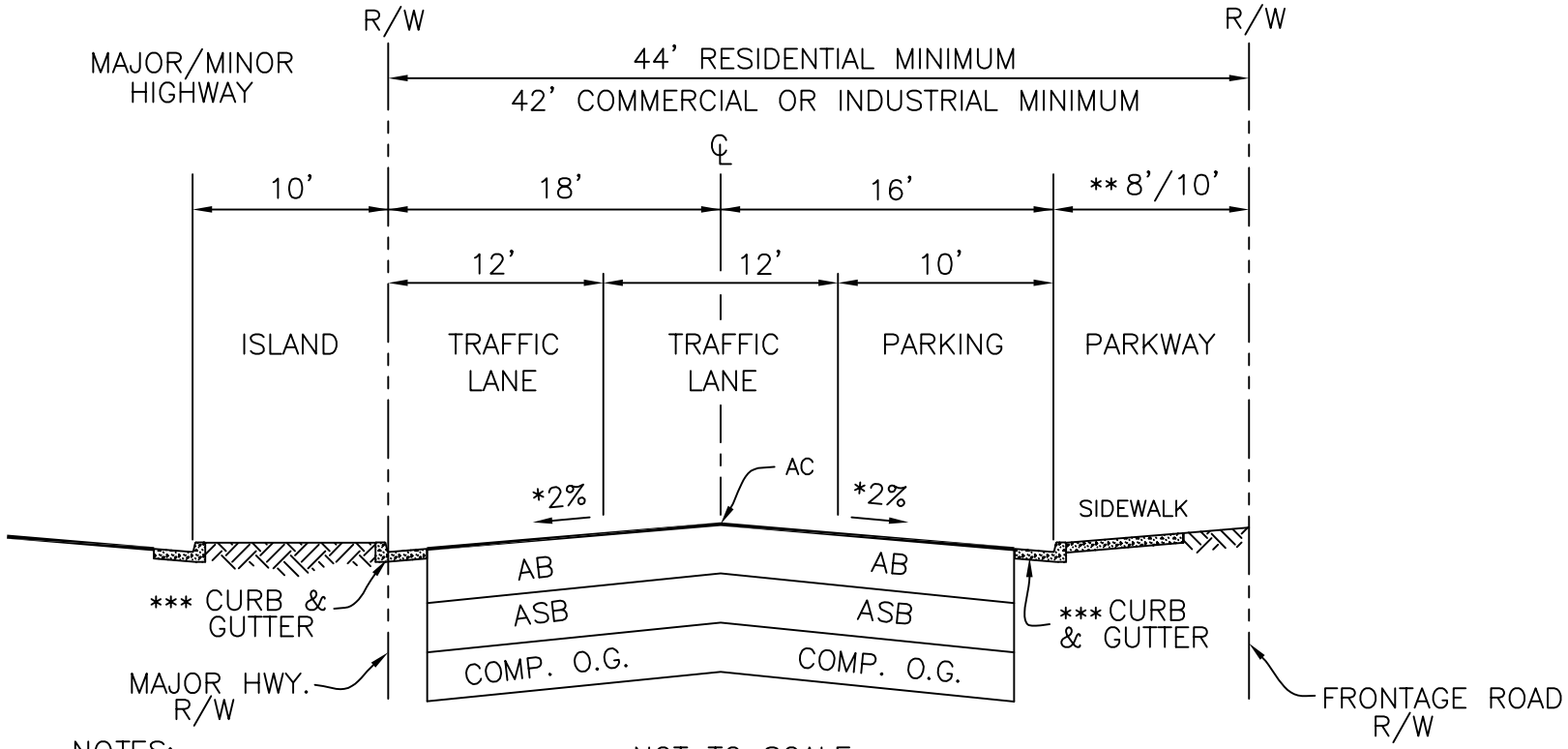
SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

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KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

FRONTAGE ROAD

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD



NOT TO SCALE

NOTES:

* GRADE FROM HIGH GUTTER. MAXIMUM SLOPE TO LOW GUTTER SHALL NOT EXCEED 2.5%.

** 10' RESIDENTIAL, 8' COMMERCIAL OR INDUSTRIAL.

*** AC DIKE FOR TYPE 'B' RESIDENTIAL.

SEE PHASED DEVELOPEMENT APPENDIX "B", KERN COUNTY LAND DIVISION ORDINANCE.

SPECIAL PAVEMENT DESIGN WILL BE REQUIRED IN ZONE "C" & ZONE "M"

SEE PLATE R-30/R-31 FOR PARKWAY AREA (SHOULDER).

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

REVISIONS DATE	DESC
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DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-27

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KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

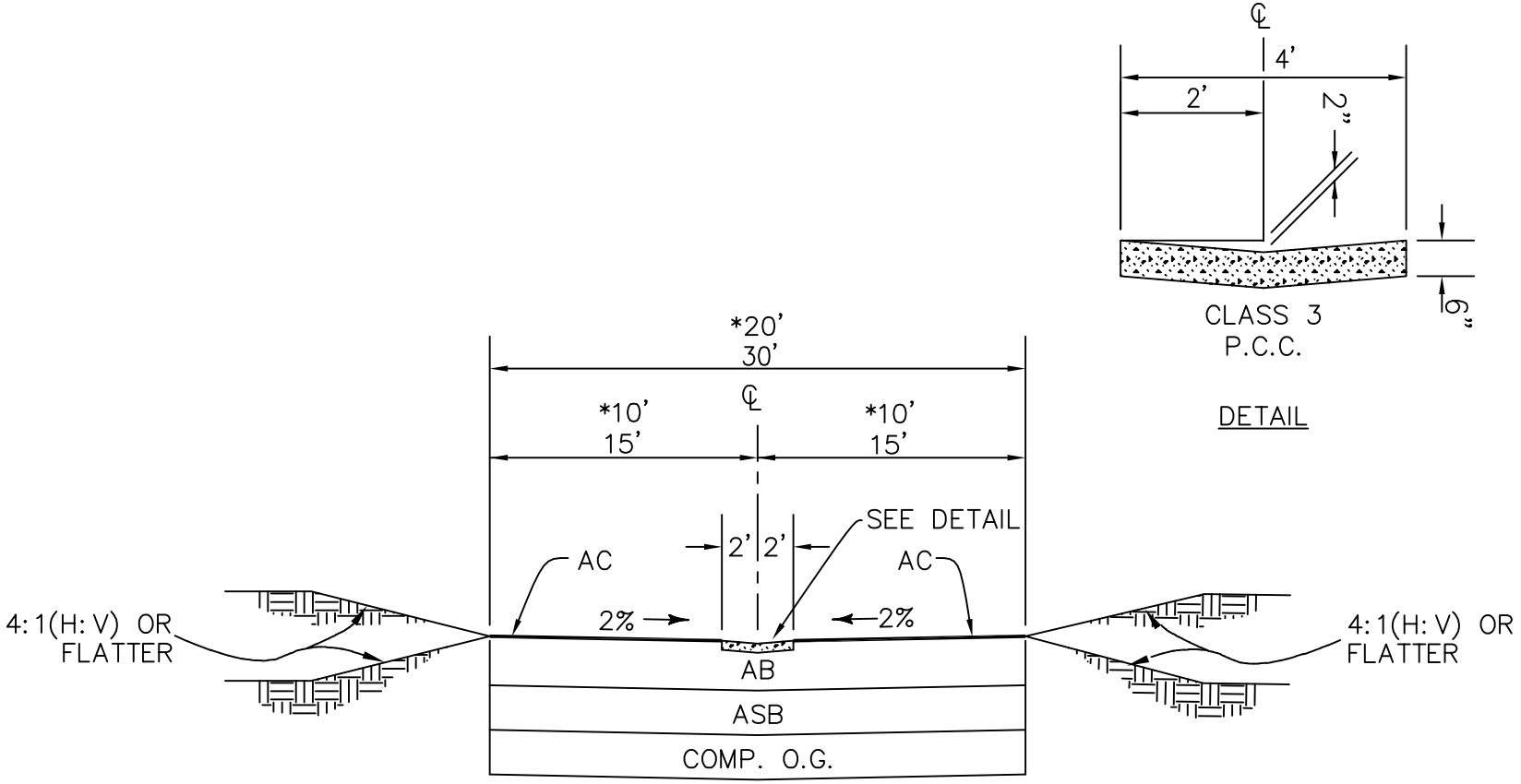
ALLEYS

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

REVISIONS		
DATE	DESC	
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DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-28



INDUSTRIAL, COMMERCIAL, AND MULTIPLE RESIDENTIAL ZONES OR INTENDED USES

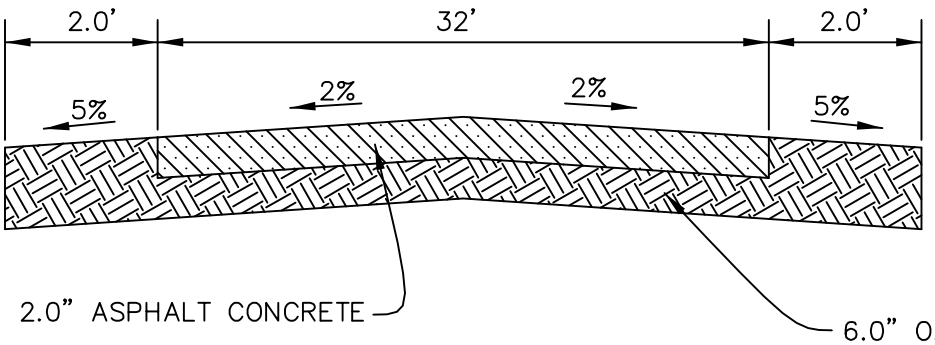
NOT TO SCALE

TI=	R-Value O.G.=
MATERIAL	THICKNESS
AC	
AB	
ASB	
COMP. O.G.	

SEE PLATE R-32 FOR LIMITS OF COMPACTION OF O.G.

NOTE:

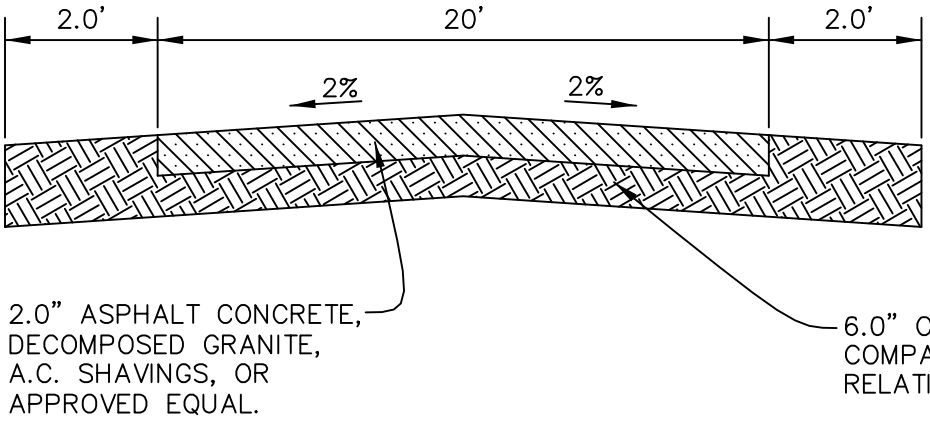
* USE FOR R-1 RESIDENTIAL DEVELOPMENTS.



SECONDARY ACCESS
NOT TO SCALE

NOTES:

1. AS REQUIRED BY THE ENGINEER FOR CIRCULATION.
2. PAVEMENT SECTION MAY BE REQUIRED TO BE A FULL DEPTH DESIGNED SECTION IF IN ALIGNMENT WITH A FUTURE STREET.
3. A SECONDARY ACCESS EASEMENT OR STREET RIGHT-OF-WAY DEDICATION IS REQUIRED.



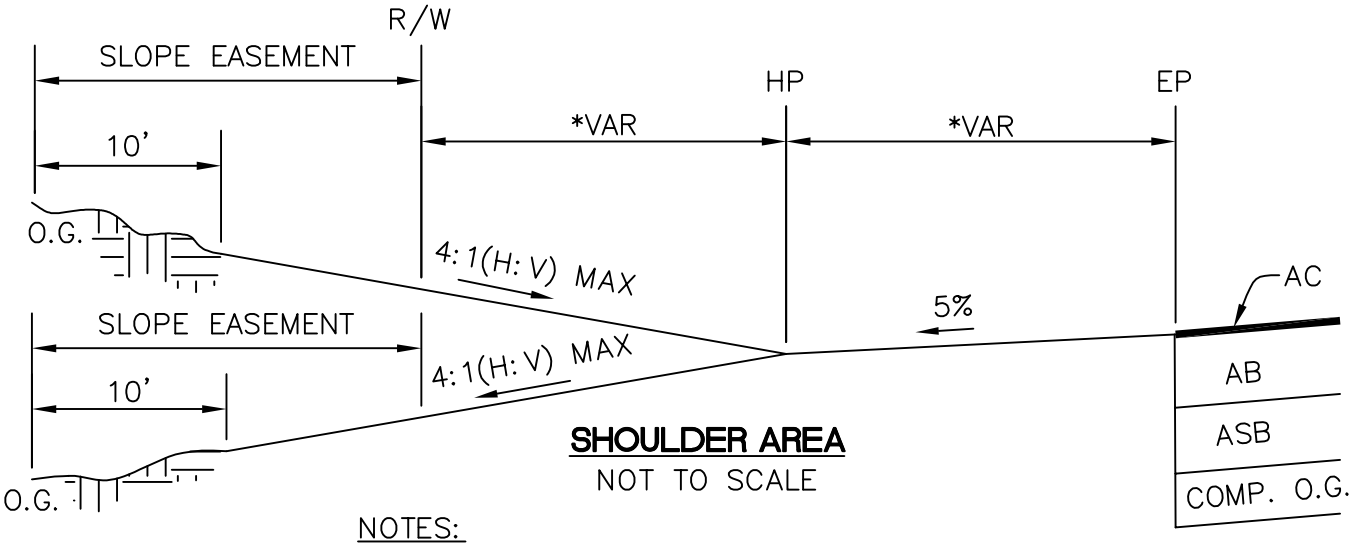
EMERGENCY ACCESS
NOT TO SCALE

NOTES:

1. AS REQUIRED BY THE FIRE DEPARTMENT FOR ALL SECONDARY ACCESSES.
2. FOR EMERGENCY ACCESS, BARRICADES MAY BE REQUIRED TO RESTRICT ACCESS.
3. AN EMERGENCY ACCESS EASEMENT IS REQUIRED FOR ALL EMERGENCY ACCESSES.

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS	STANDARD SECONDARY AND EMERGENCY ACCESS	REVISIONS DATE – DESC –	DRAFTED BY: R.R.P.
			DESIGNED BY: J.R.C.
	COUNTY OF KERN STATE OF CALIFORNIA DEVELOPMENT STANDARD		DATE DRAFTED: 09/30/23
			APPROVED BY: J.R.C.
			PLATE NO. R-29

DWG FILE: K:\BUILDINGDEV\DEVELOPMENT REVIEW\DEV_STD\2023\2023 REVISED DRAWINGS\ROADS\R-29



SHOULDER AREA

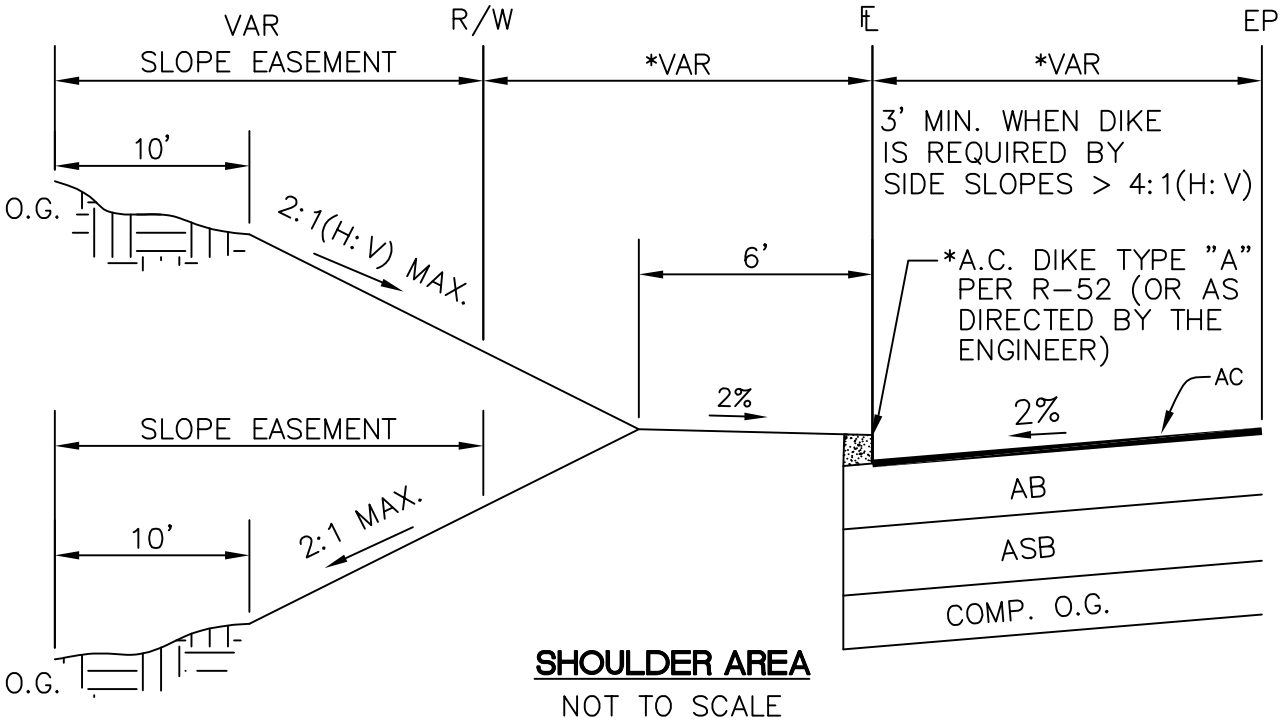
NOT TO SCALE

NOTES:

*FOR PHASE CONSTRUCTION, THE AREA BETWEEN HP AND R/W WILL VARY IN ACCORDANCE TO IMPROVEMENTS REQUIRED.

CUT/FILL SLOPES 4:1(H:V) OR FLATTER

(SEE TYPICAL SECTION)



SHOULDER AREA

NOT TO SCALE

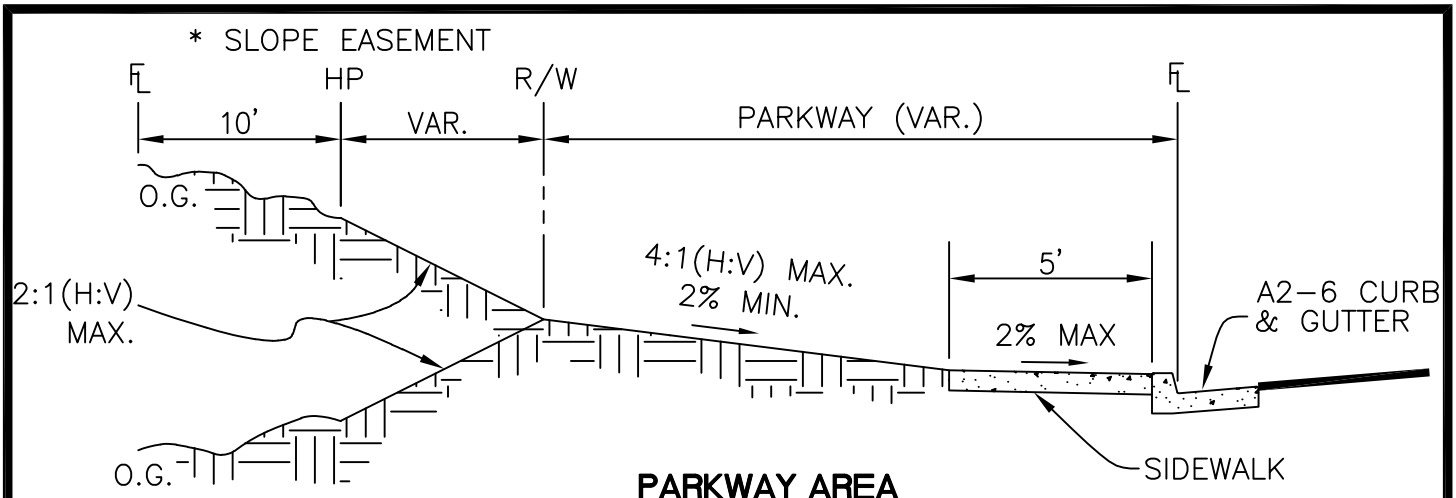
NOTES:

WHEN CUT/FILL EXCEEDS 1 FOOT AT R/W LINE, SLOPE EASEMENT IS REQUIRED.

CUT/FILL SLOPES EXCEED 4:1(H:V)

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS	PARKWAY AREAS (SHOULDER) TYPE "B"	REVISIONS DATE – DESC –	DRAFTED BY: R.R.P.	PLATE NO. R-30
	COUNTY OF KERN STATE OF CALIFORNIA DEVELOPMENT STANDARD		DESIGNED BY: J.R.C.	
			DATE DRAFTED: 09/30/23	
			APPROVED BY: J.R.C.	

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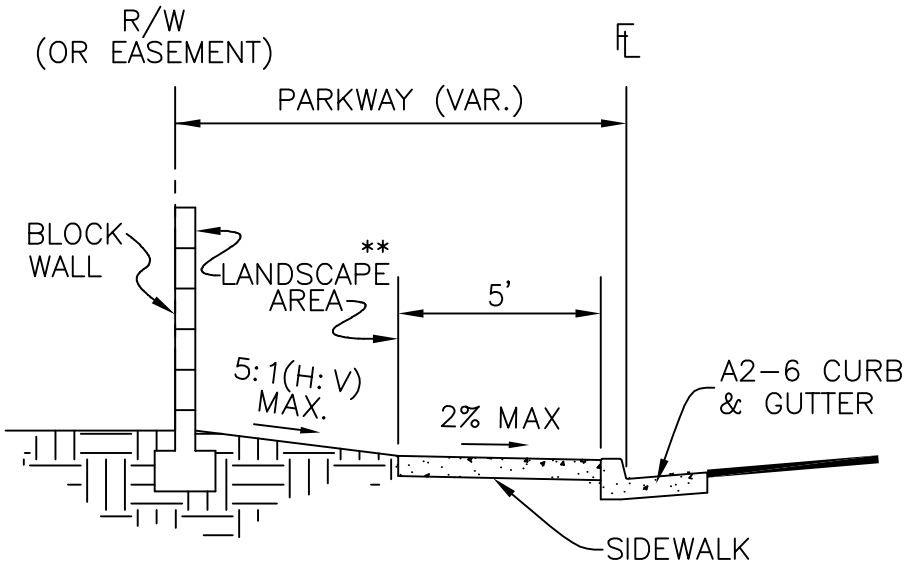


PARKWAY AREA

NO ACCESS CONTROL
NOT TO SCALE

NOTE:

* SLOPE EASEMENT MAY BE DELETED WHEN GRADING PERMIT IS PROVIDED OR CUT/FILL IS LESS THAN ONE FOOT AT R/W LINE.
FOR PHASE CONSTRUCTION USE TYPE "3" SHOULDER STANDARD.



PARKWAY AREA

WITH ACCESS CONTROL WALL
NOT TO SCALE

NOTES:

** MAY INCLUDE LANDSCAPE EASEMENT.
IF NOT LANDSCAPED, SIDEWALK SHALL EXTEND TO ACCESS-CONTROL WALL AT 2%

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS	PARKWAY AREAS TYPE "A" (SHOULDERS)	REVISIONS DATE – DESC –	DRAFTED BY: R.R.P.	PLATE NO. R-31
	COUNTY OF KERN STATE OF CALIFORNIA DEVELOPMENT STANDARD		DESIGNED BY: J.R.C. DATE DRAFTED: 09/30/23 APPROVED BY: J.R.C.	

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T.I.-LIMITS OF COMPACTION OF O.G.

T.I.	COMPACTION DEPTH
0–5	ONE FOOT
5.5–6.5	1.5 FEET
7–8	2.0 FEET
8.5+	2.5 FEET

COMPACT O.G. IS MEASURED FROM TOP OF AC TO BOTTOM OF COMPACT O.G. MINIMUM COMPACTION OF O.G. SHALL BE 95 % FOR 0.5 FEET.

R-VALUE TESTS

THE DEVELOPER IS REQUIRED TO HAVE R–VALUE TESTS PERFORMED FOR DEVELOPMENTS IN KERN COUNTY. TESTS SHALL BE PROVIDED BY REGISTERED GEOTECHNICAL ENGINEER/CIVIL ENGINEER.

THE MINIMUM NUMBER OF TESTS IS BASED ON CENTERLINE DISTANCE OF STREETS TO BE CONSTRUCTED. SEE CHART BELOW.

STREET C/L DISTANCE	NO. OF R–VALUE TESTS
0–1500'	2
1501'–3000'	3
3001'–4500'	4
4501'–6000'	5
ETC.	.

CLASS 3 AGGREGATE BASE AND AGGREGATE SUBBASES

REQUIREMENTS FOR CLASS 3 AB AND ALL ASB'S SHALL BE SET FORTH ON THE PLANS FOR THE DEVELOPMENT. SPECIFICATIONS SHALL BE APPROVED BY THE DIRECTOR.

LEGEND

AC– ASPHALT CONCRETE
AB– AGGREGATE BASE
ASB– AGGREGATE SUB–BASE
OG– ORIGINAL GROUND
COMP..– COMPACT
T.I.– TRAFFIC INDEX
HP– HINGE POINT
EP– EDGE OF PAVEMENT

KERN COUNTY PUBLIC WORKS GROUNDED : BOUNDLESS

T.I. LIMITS OF COMPACTION OF O.G. AND R-VALUE TESTS

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

REVISIONS DATE	DESC
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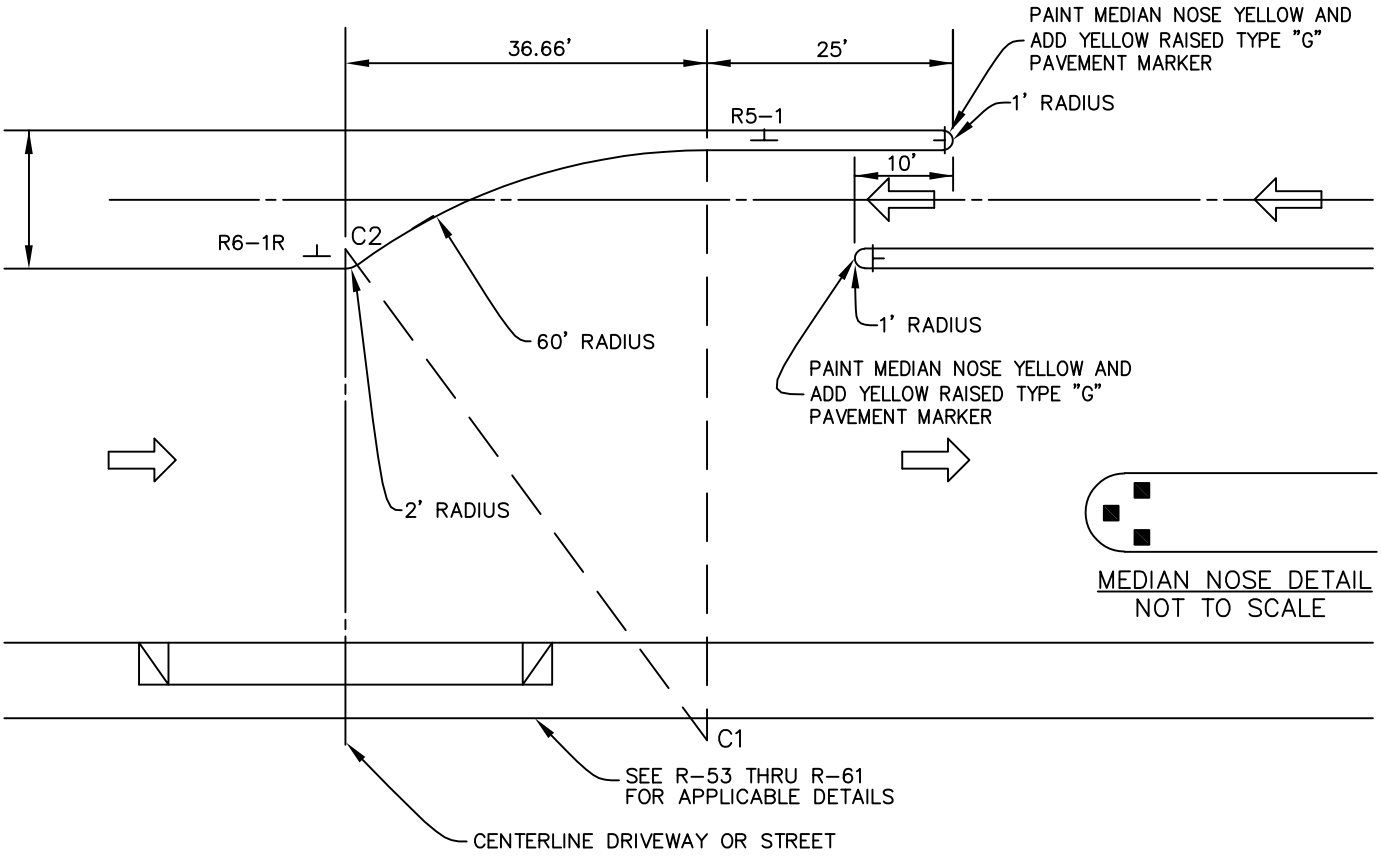
DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R–32

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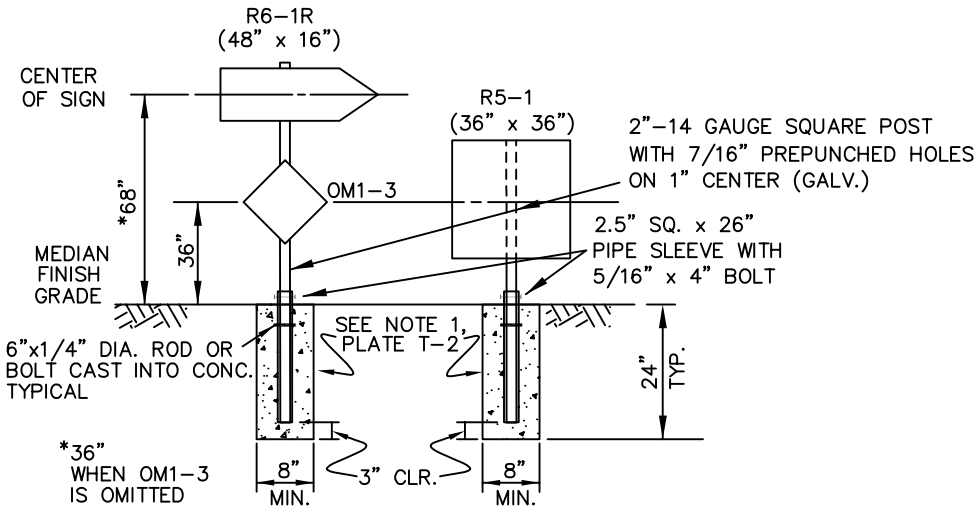
CURVE DATA

C1	C2
D = 36°14'58"	D = 36°14'58"
R = 60.00'	R = 2.00'
L = 37.96'	L = 1.27'
T = 19.64'	T = 0.65'



MEDIAN NOSE DETAIL
NOT TO SCALE

NOT TO SCALE



NOTES:

TYPE OM1-3 MARKERS ARE USED ONLY AT STREET INTERSECTIONS

SIGN PANELS SHALL BE ALUMINUM, .080" IN THICKNESS

R6-1R – DENOTES "ONE WAY" SIGN PER CA MUTCD

R5-1 – DENOTES "DO NOT ENTER" SIGN PER CA MUTCD

TYPE OMI-3 MARKER-ALL-YELLOW RETRO REFLECTIVE DIAMOND PANEL

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD ONE-WAY MEDIAN OPENING WITH 14' WIDE MEDIAN

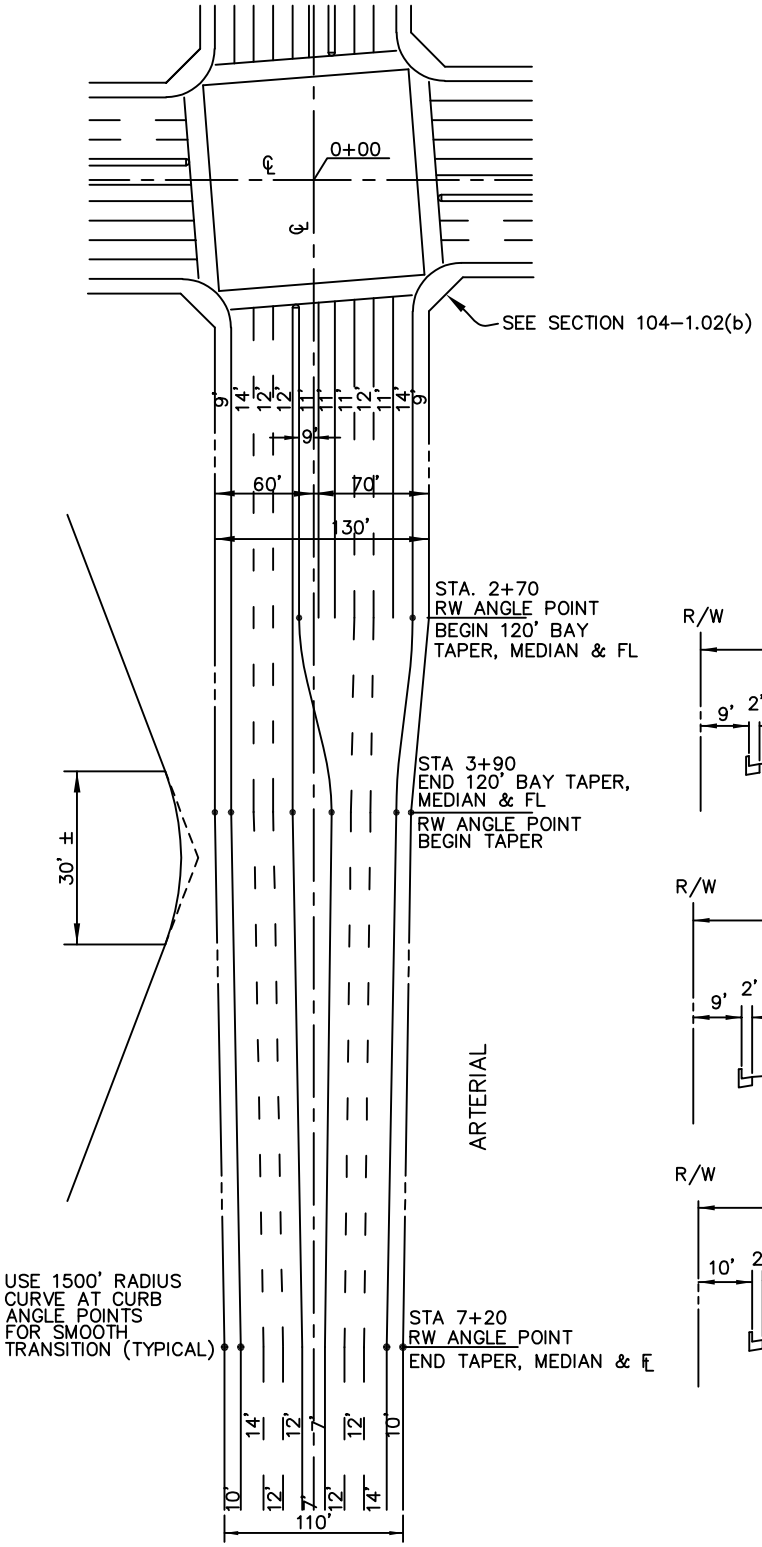
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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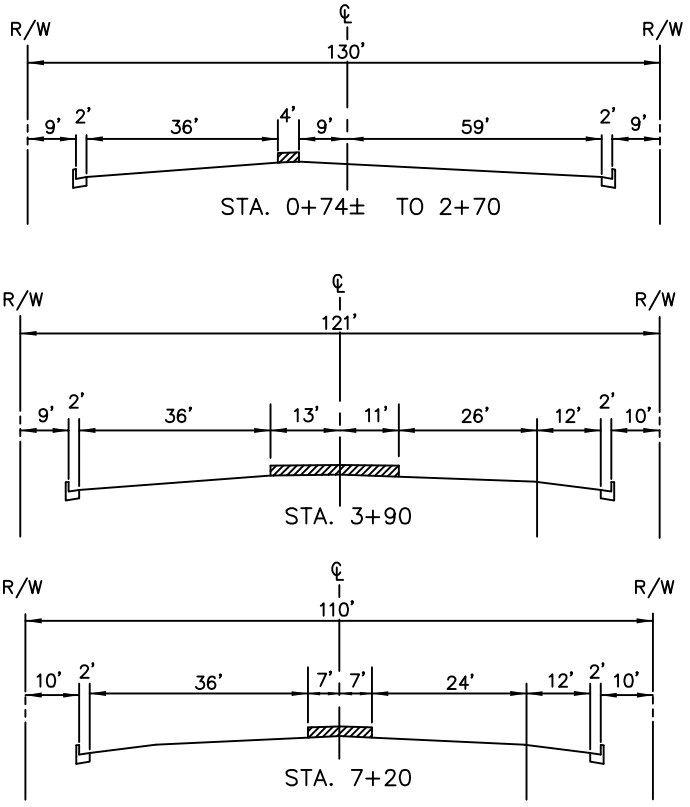
DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO.
R-33

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TRANSITION TAPER DATA		
STA.	OFFSET FROM ℄ CONSTRUCTION	
	MEDIAN CURB E	CURB & GUTTER F
2+70	9.00' RT.	61.00' LT.
2+80	8.69' RT.	60.84' LT.
2+90	7.75' RT.	60.37' LT.
3+00	6.19' RT.	59.59' LT.
3+10	4.00' RT.	58.50' LT.
3+20	1.50' RT.	57.25' LT.
3+30	1.00' LT.	56.00' LT.
3+40	3.50' LT.	54.75' LT.
3+50	6.00' LT.	53.50' LT.
3+60	8.19' LT.	52.41' LT.
3+70	9.75' LT.	51.62' LT.
3+80	10.69' LT.	51.16' LT.
3+90	11.00' LT.	51.00' LT.



SELECTED CROSS SECTIONS

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD ARTERIAL TRANSITION AT INTERSECTION WITH ARTERIAL OR COLLECTOR

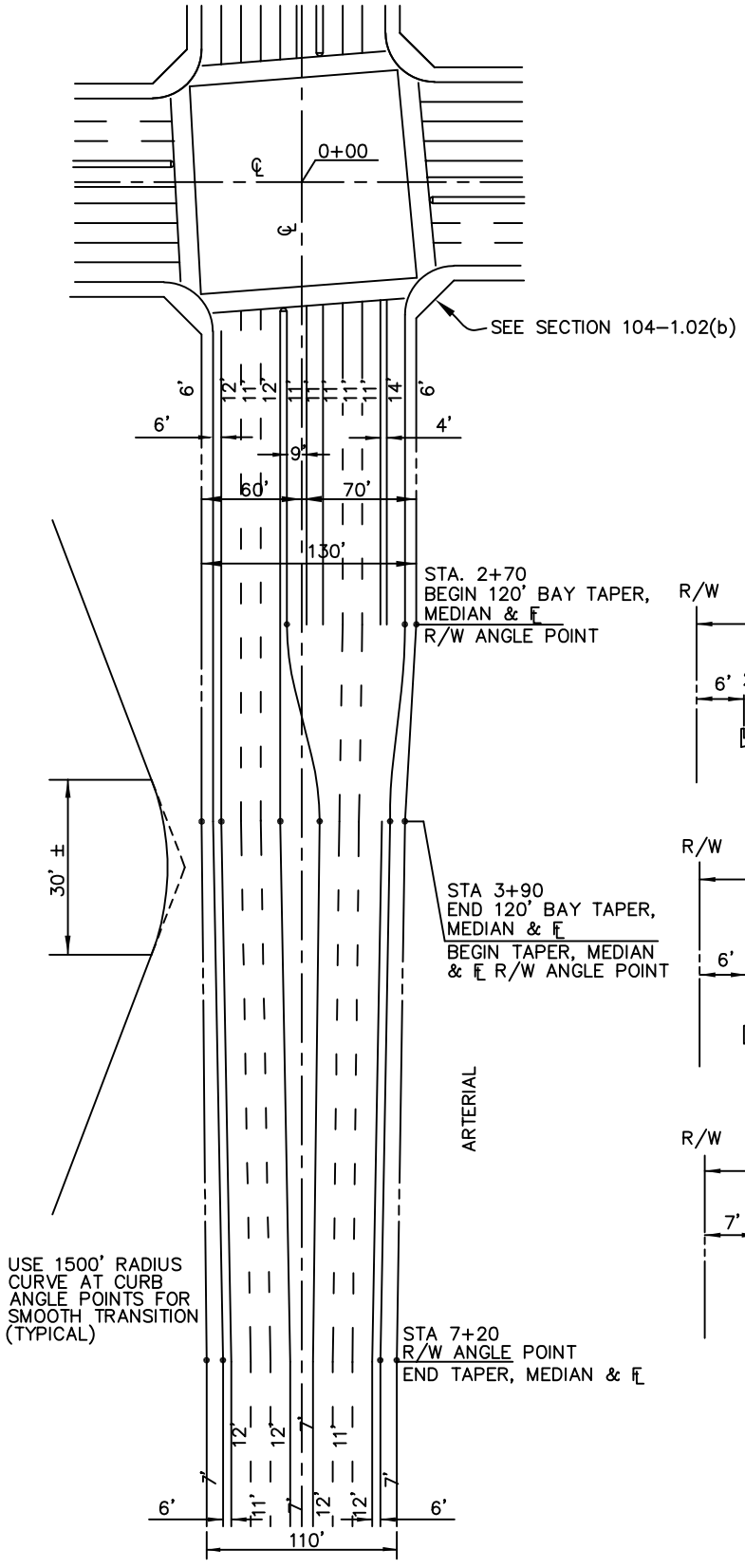
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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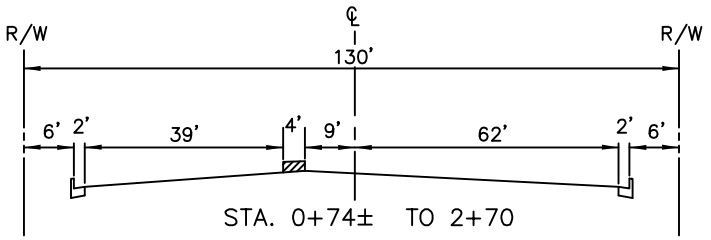
DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

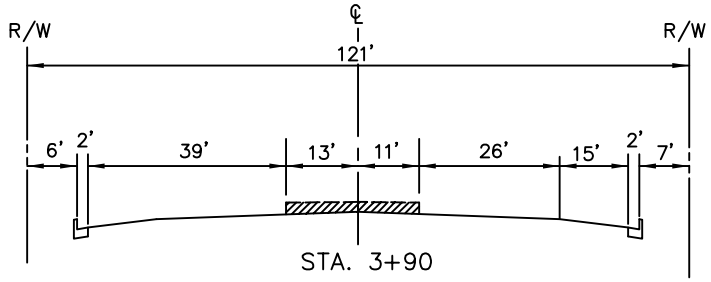
PLATE NO. R-34

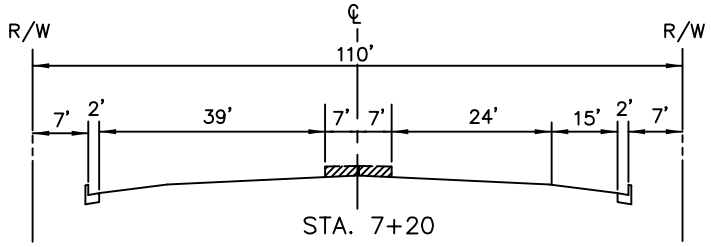
DWG FILE: K:\BUILDINGDEV\DEVELOPMENT REVIEW\DEV_STD\2023\2023 REVISED DRAWINGS\ROADS\R-34



TRANSITION TAPER DATA		
STA.	OFFSET FROM ℄ CONSTRUCTION	
	MEDIAN CURB ℄	CURB & GUTTER ℄
2+70	9.00' RT.	64.00' LT.
2+80	8.69' RT.	63.84' LT.
2+90	7.75' RT.	63.37' LT.
3+00	6.19' RT.	62.59' LT.
3+10	4.00' RT.	61.50' LT.
3+20	1.50' RT.	60.25' LT.
3+30	1.00' LT.	59.00' LT.
3+40	3.50' LT.	57.75' LT.
3+50	6.00' LT.	56.50' LT.
3+60	8.19' LT.	55.41' LT.
3+70	9.75' LT.	54.63' LT.
3+80	10.69' LT.	54.16' LT.
3+90	11.00' LT.	54.00' LT.







SELECTED CROSS SECTIONS

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD ARTERIAL TRANSITION WITH BIKE LANES AT INTERSECTION WITH ARTERIAL OR COLLECTOR

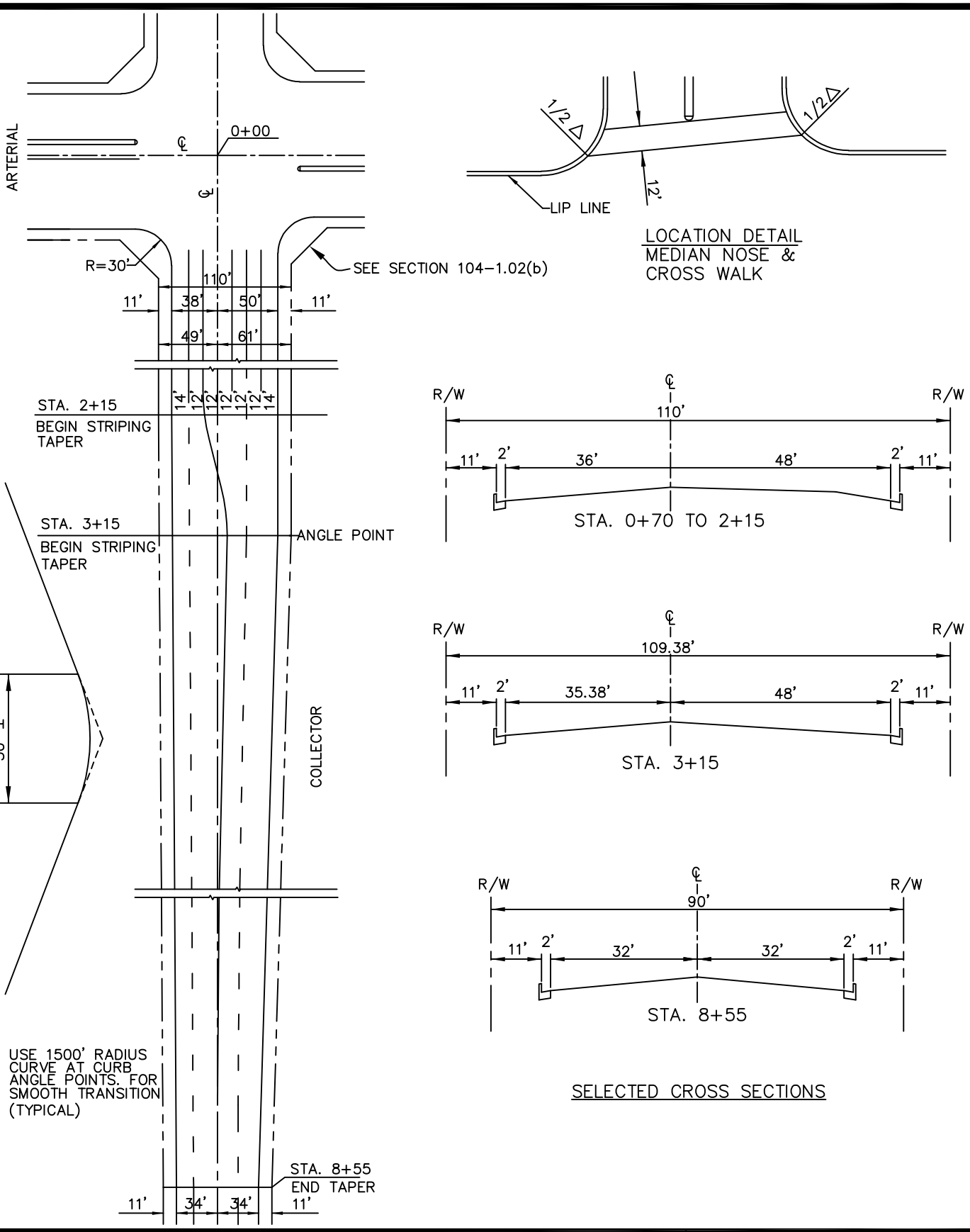
COUNTY OF KERN
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DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-35

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STANDARD COLLECTOR AT INTERSECTION WITH ARTERIAL

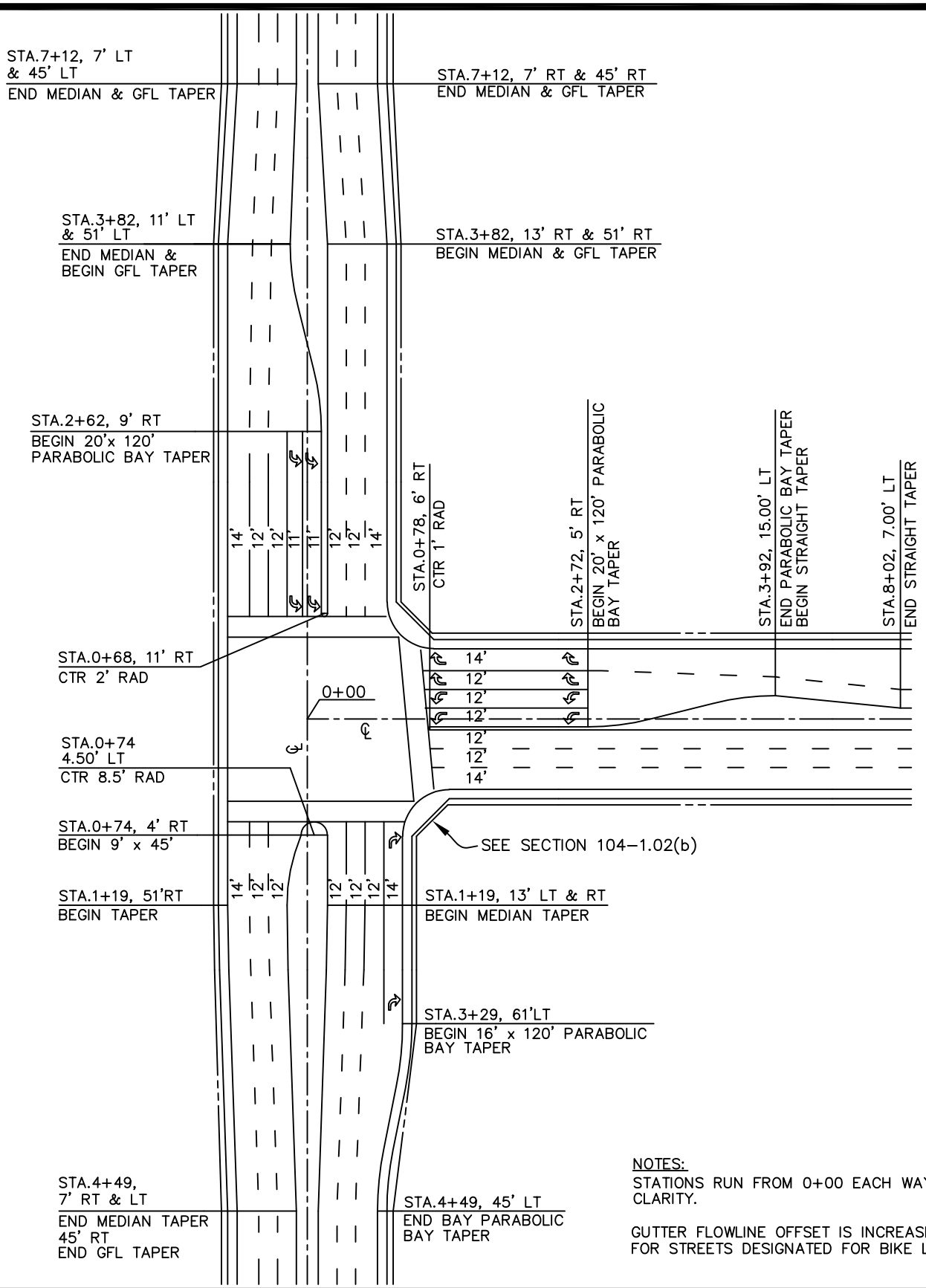
COUNTY OF KERN
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-36

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NOTES:

STATIONS RUN FROM 0+00 EACH WAY FOR CLARITY.

GUTTER FLOWLINE OFFSET IS INCREASED 3' FOR STREETS DESIGNATED FOR BIKE LANES.

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD "T" INTERSECTION EXPANDED ARTERIAL / ARTERIAL CONFIGURATION

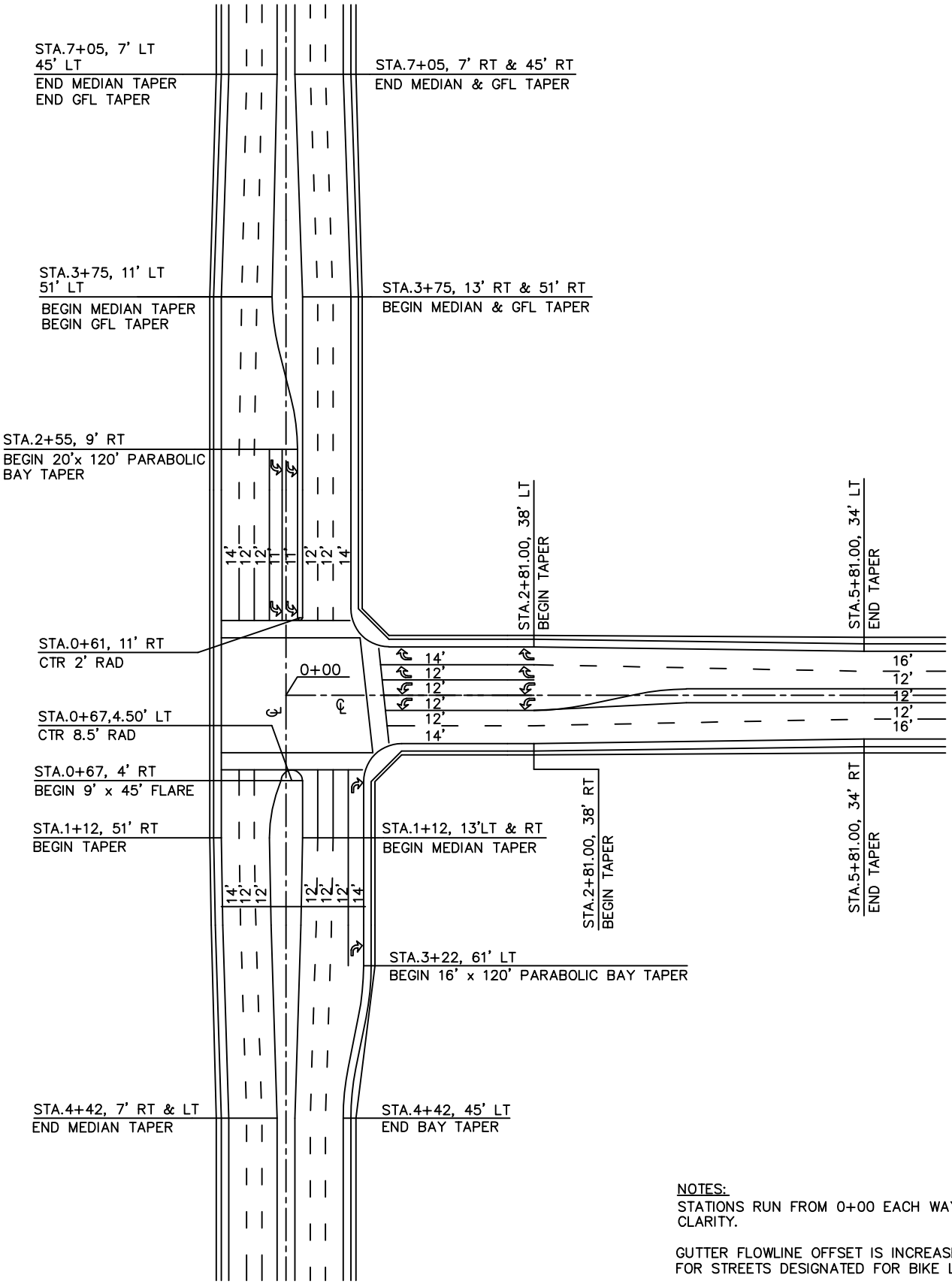
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO.
R-37

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NOTES:
STATIONS RUN FROM 0+00 EACH WAY FOR CLARITY.

GUTTER FLOWLINE OFFSET IS INCREASED 3' FOR STREETS DESIGNATED FOR BIKE LANES.

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD "T" INTERSECTION EXPANDED ARTERIAL / COLLECTOR STD CONFIGURATOIN

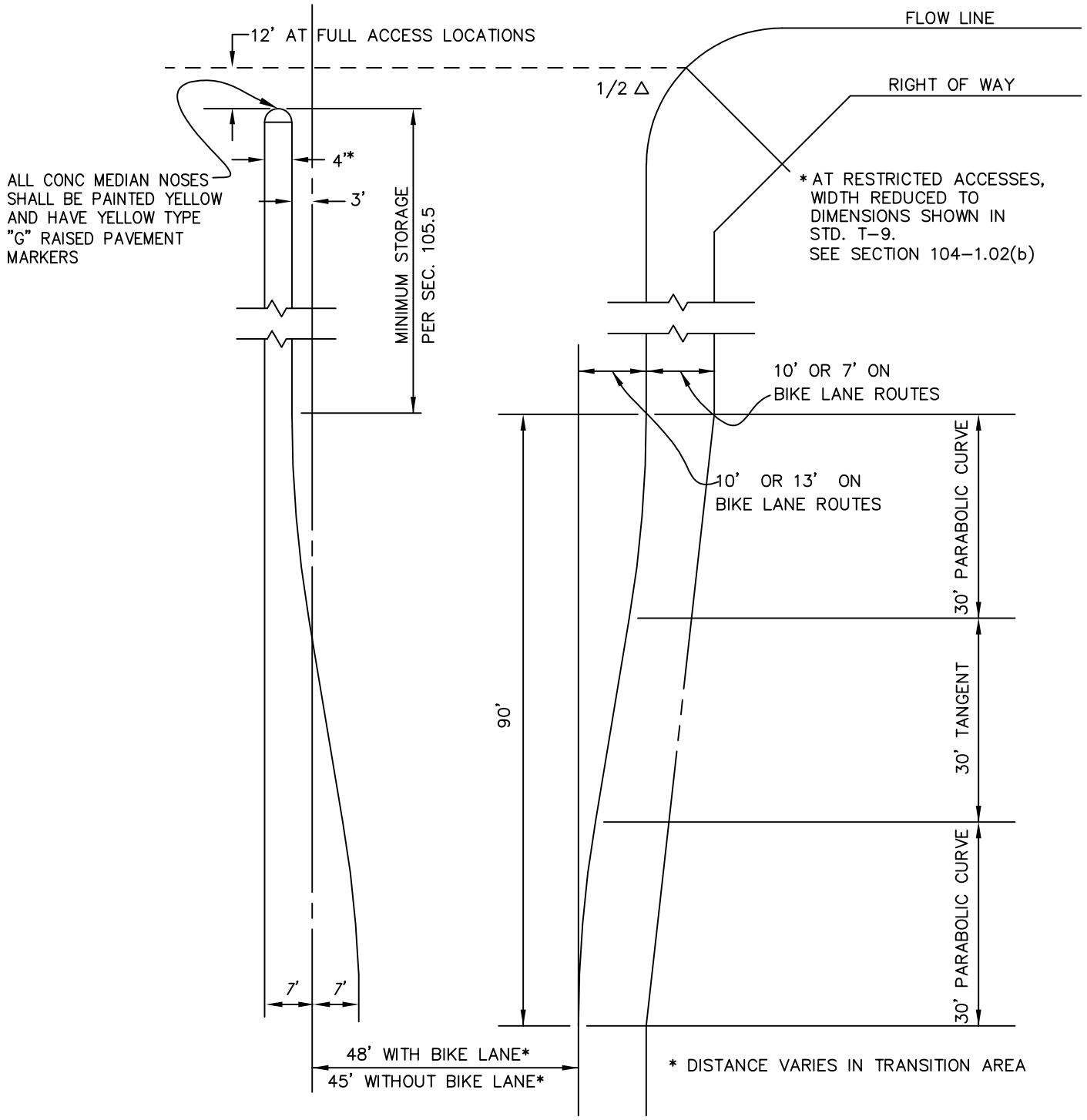
COUNTY OF KERN
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DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

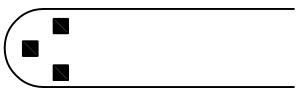
PLATE NO.
R–38

DWG FILE: K:\BUILDINGDEV\DEVELOPMENT REVIEW\DEV_STD\2023\2023 REVISED DRAWINGS\ROADS\R-38



NOTE

DETAIL TO BE USED WHERE FULL EXPANSION OF INTERSECTION AS SHOWN IN DETAILS R-34 THRU R-38 ARE NOT POSSIBLE DUE TO PRIOR DEVELOPMENT OR PARCELIZATION. ALSO AT DRIVEWAYS AND OTHER PUBLIC ACCESSES WHERE TURN LANES ARE REQUIRED OR PERMITTED.



MEDIAN NOSE DETAIL
NOT TO SCALE

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD LEFT AND RIGHT TURN LANES ARTERIAL / COLLECTOR

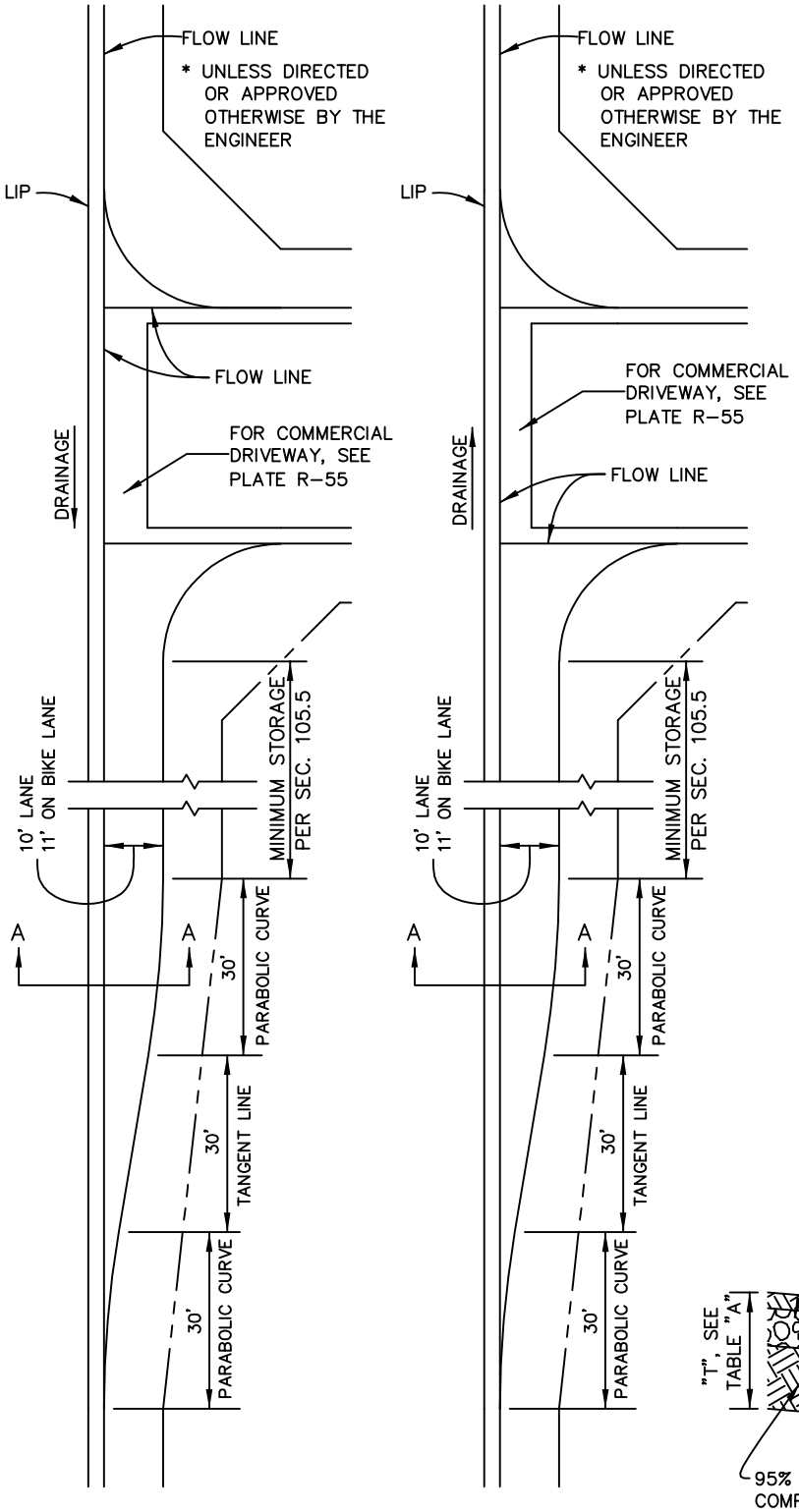
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-39

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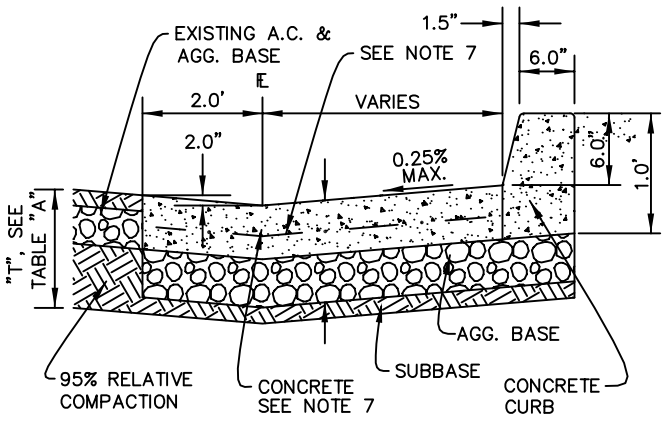
NOT TO SCALE

NOTES:

1. THIS DETAIL MAY BE USED WHEN SLOPE CONSTRAINTS EXIST. DETAIL R-39 MAY BE USED UNDER OTHER CONDITIONS.
2. SEE COUNTY OF KERN STANDARD R-52, TYPE "B" CURB AND GUTTER, FOR ALL APPLICABLE DIMENSIONS AND NOTES.
3. CONCRETE TO HAVE 0.125" WIDE BY 2.0" DEEP WEAKENED PLANE JOINT AT 15' O.C. AND 0.5" EXPANSION JOINTS AT 90' O.C.
4. SAWCUT EXISTING EDGE OF PAVEMENT AS DIRECTED BY THE ENGINEER.
5. REMOVE, REPLACE, OR RELOCATE ANY NECESSARY SIGNS PER COUNTY REQUIREMENTS OR AS DIRECTED BY THE ENGINEER.
6. ANY DESIGN DEVIATIONS FROM THIS STANDARD MUST BE APPROVED IN WRITING BY THE ENGINEER.
7. CONCRETE FOR TURN LANE AND CURB SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR MINOR CONCRETE (MIN. CEMENT CONTENT 590LB/CY). CONCRETE SHALL CONTAIN NO ADDITIVES WITHOUT PRIOR APPROVAL OF THE COUNTY ENGINEER.
8. THIS DETAIL MAY BE USED WHEN SLOPE CONSTRAINTS EXIST. REBAR: #4 AT 24" O.C. BOTH WAYS, THE ENTIRE LENGTH OF THE TURN LANE WITH 2" CLEARANCE FROM THE BOTTOM OF THE CONCRETE.

TABLE "A"

THE FOLLOWING SHALL APPLY FOR CONCRETE STRUCTURAL THICKNESSES:			
T.I.	CONCRETE DEPTH	AB DEPTH	SUBBASE (AS) DEPTH
6.0 – 7.0	0.5'	1.00'	0.50'
7.5 – 8.0	0.6'	1.00'	0.50'
8.5 – 10.0	0.7'	1.00'	0.50'
10.5 – 12.0	0.8'	1.00'	0.50'
12.5 +	0.9'	1.00'	0.50'



SECTION A-A

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD RIGHT TURN LANE INTO COMMERCIAL OR PRIVATE DEVELOPMENT

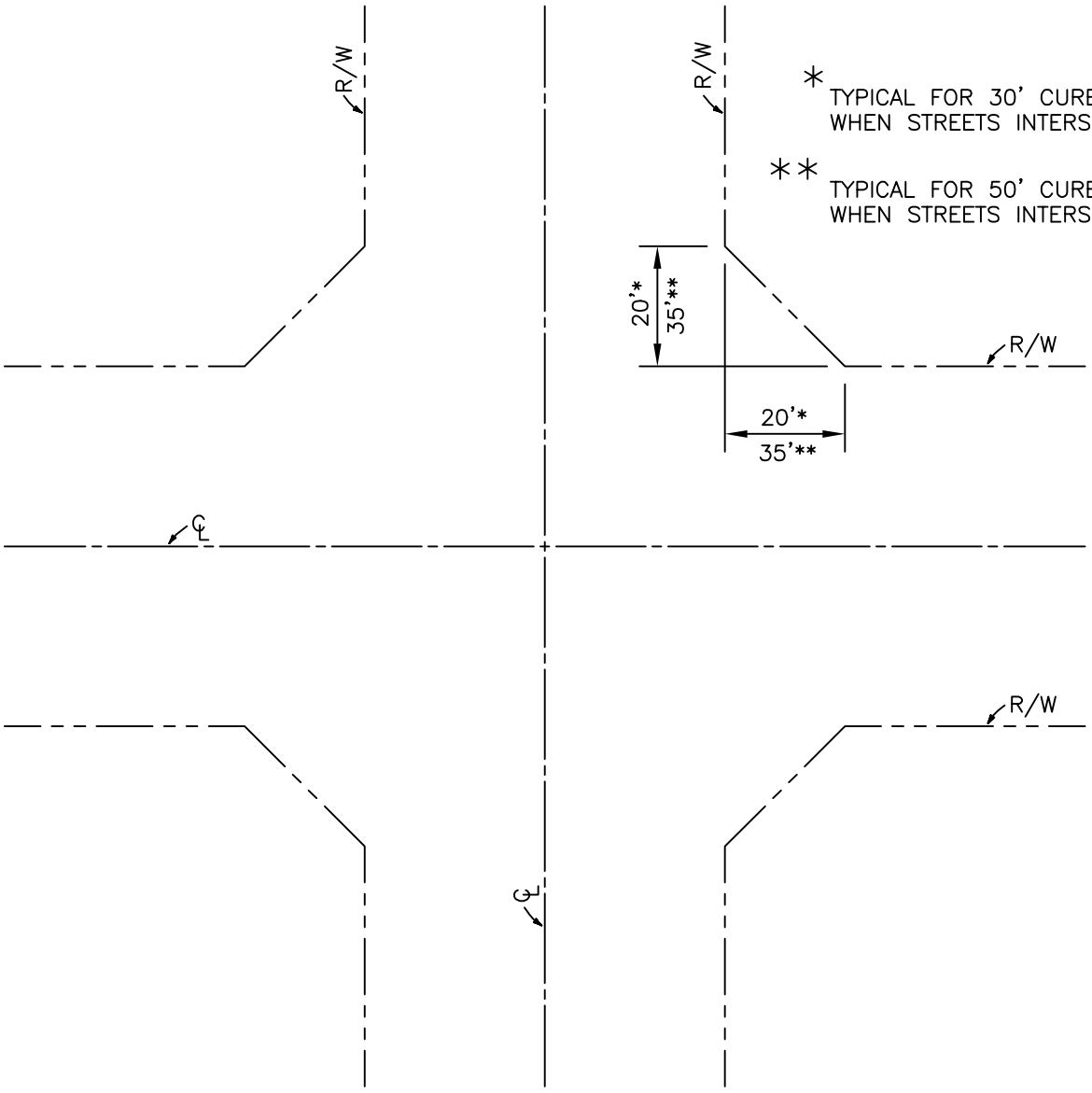
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-40

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NOT TO SCALE

NOTE:
PROPERTY LINE DETAIL TO BE USED AT INTERSECTIONS OF ALL STREETS ADJACENT TO OR WITHIN NEW DEVELOPMENTS.

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

PROPERTY LINE CORNER CUTOFF DETAIL

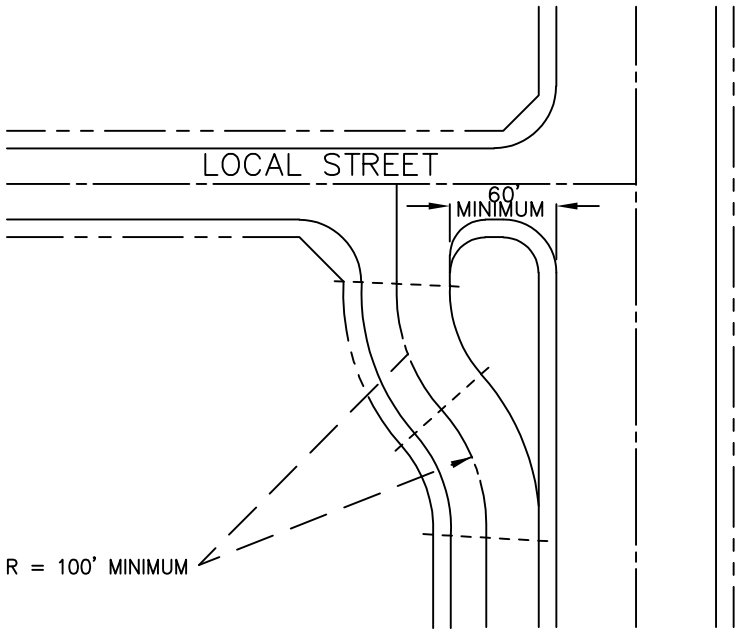
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

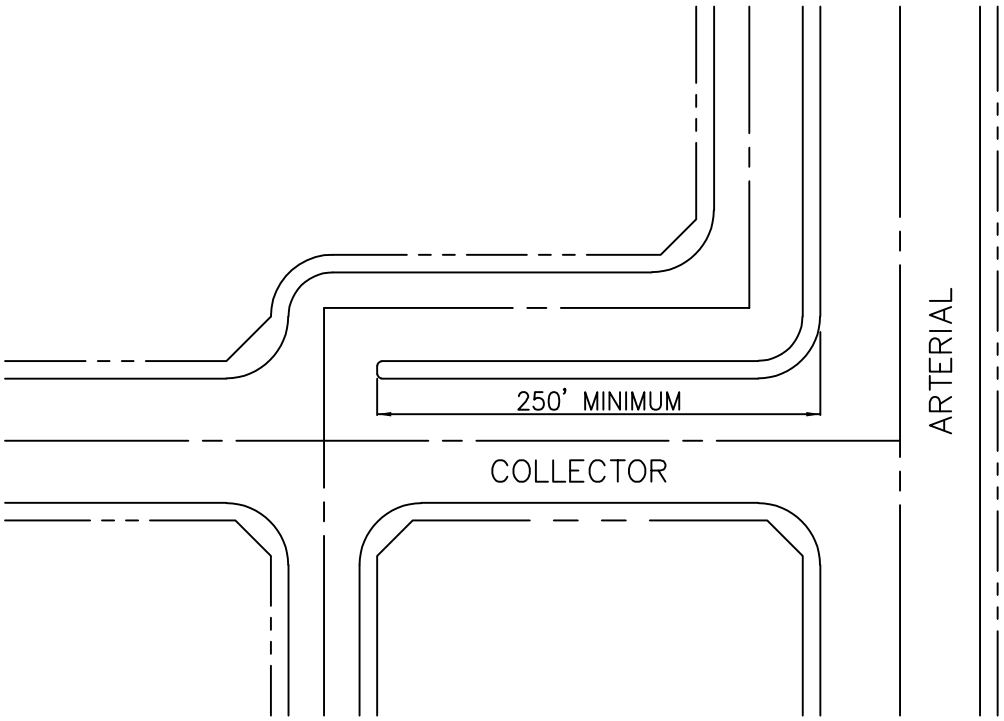
PLATE NO.
R–41

DWG FILE: K:\BUILDINGDEV\DEVELOPMENT REVIEW\DEV_STD\2023\2023 REVISED DRAWINGS\ROADS\R-41



NOT TO SCALE

NOTE
FOR CURB RETURN RADII
SEE SECTION 104–1.02(b)



NOT TO SCALE

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

FRONTAGE ROADS

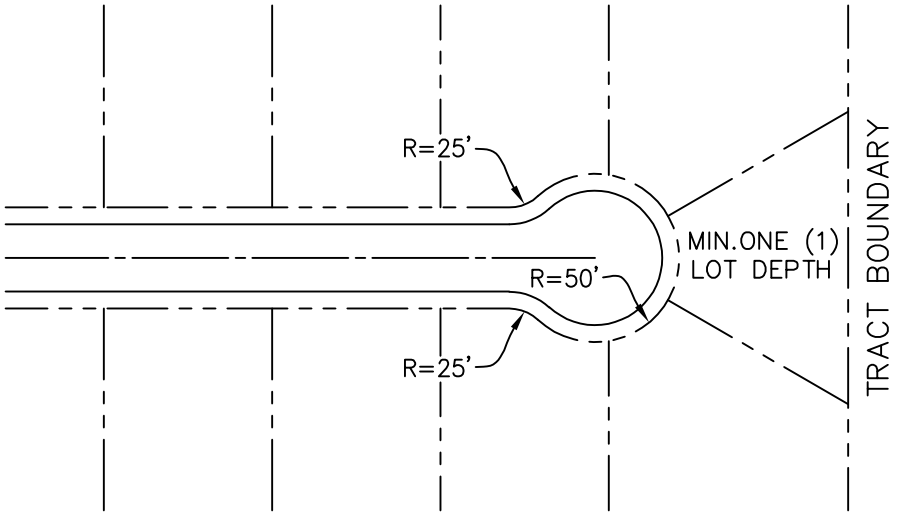
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

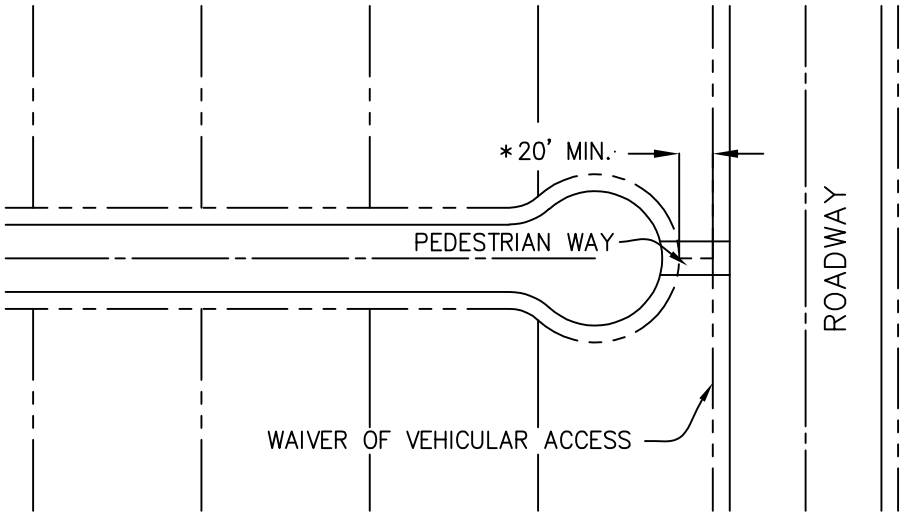
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

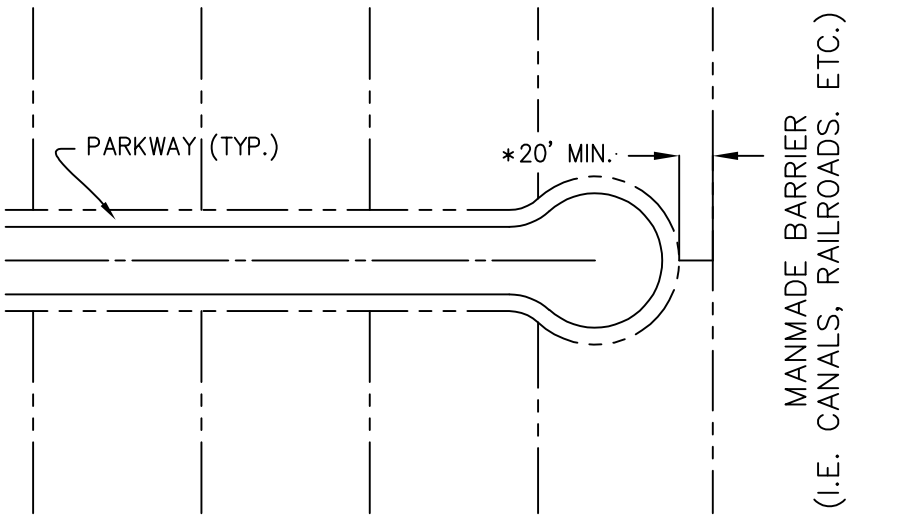
PLATE NO.
R–42

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* MAY BE REDUCED TO "0" BY DIRECTOR.



NOT TO SCALE

NOTE: PARKWAY WIDTH TO BE MAINTAINED AT A UNIFORM WIDTH AROUND CUL-DE-SAC

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

TYPICAL CUL-DE-SAC LOCATIONS

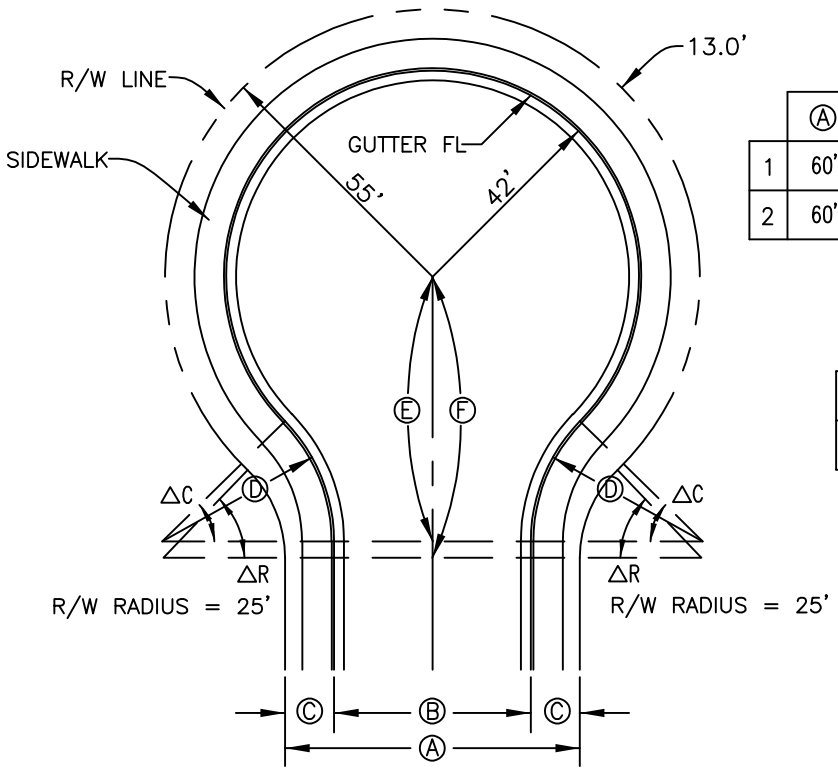
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-43

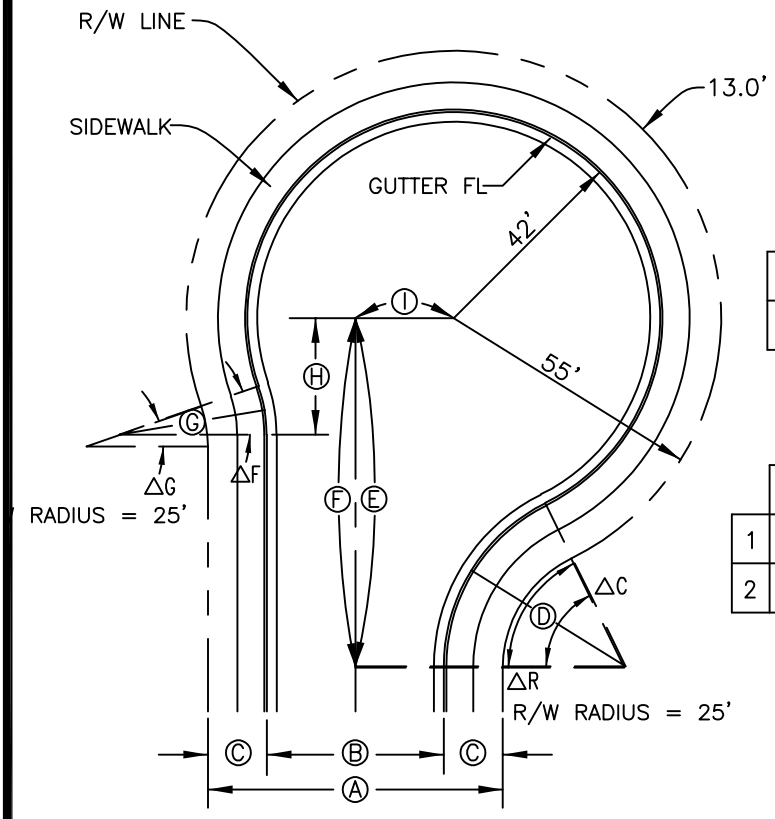
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	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ
1	60'	36'	12'	37'	56.71'	58.10'
2	60'	40'	10'	35'	53.89'	58.10'

	ΔR R/W	ΔC CURB
1	46° 34' 03"	45° 52' 37"
2	46° 34' 03"	44° 24' 35"

SYMMETRICAL CUL-DE-SAC



	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓗ
1	60'	36'	12'	37'	70.82'	71.89'	28.72'
2	60'	40'	10'	35'	65.56'	71.89'	28.72'

	ΔG R/W	ΔR R/W	ΔC CURB	ΔF CURB	Ⓖ	Ⓘ
1	19° 45' 00"	64° 03' 20"	63° 42' 08"	19° 11' 17"	30'	20'
2	19° 45' 00"	64° 03' 20"	62° 57' 52"	13° 32' 10"	30'	20'

NOT TO SCALE

OFFSET CUL-DE-SAC

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

TYPICAL CUL-DE-SAC STANDARDS

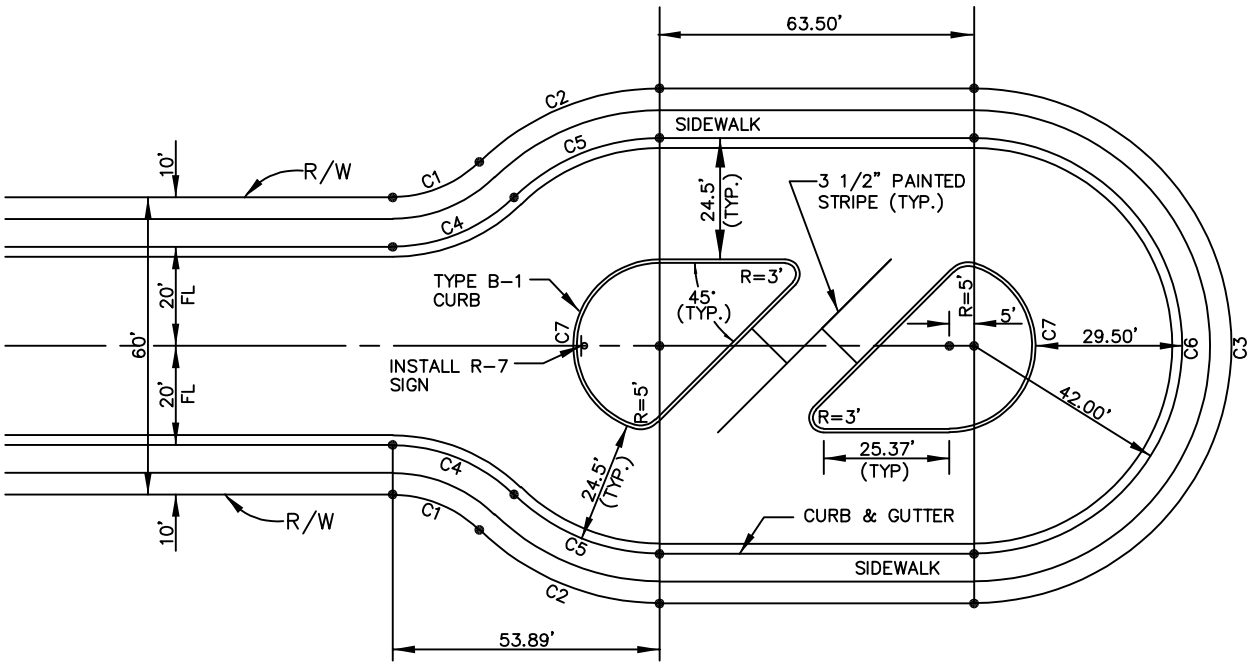
COUNTY OF KERN
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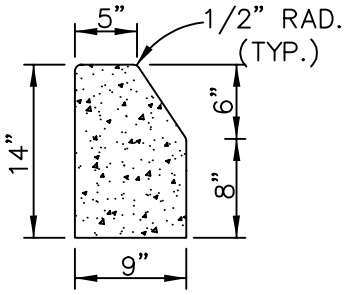
DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO.
R-44

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NOT TO SCALE



TYPE B-1 CURB
(SEE K.C.D.S. PLATE R-52)
N.T.S.

NOTE:
PARKWAY WIDTH TO BE MAINTAINED AT A UNIFORM WIDTH AROUND (PADDLE) CUL-DE-SAC.

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C1	25.00'	19.38'	10.21'	44°24'55"
C2	52.00'	40.31'	21.23'	44°24'55"
C3	52.00'	163.36'	——	180°00'00"
C4	35.00'	27.13'	14.29'	44°24'55"
C5	42.00'	32.56'	17.15'	44°24'55"
C6	42.00'	131.95'	——	180°00'00"
C7	17.50'	49.50'	110.80'	162°02'56"

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

(PADDLE) CUL-DE-SAC CONSTRUCTION STANDARDS

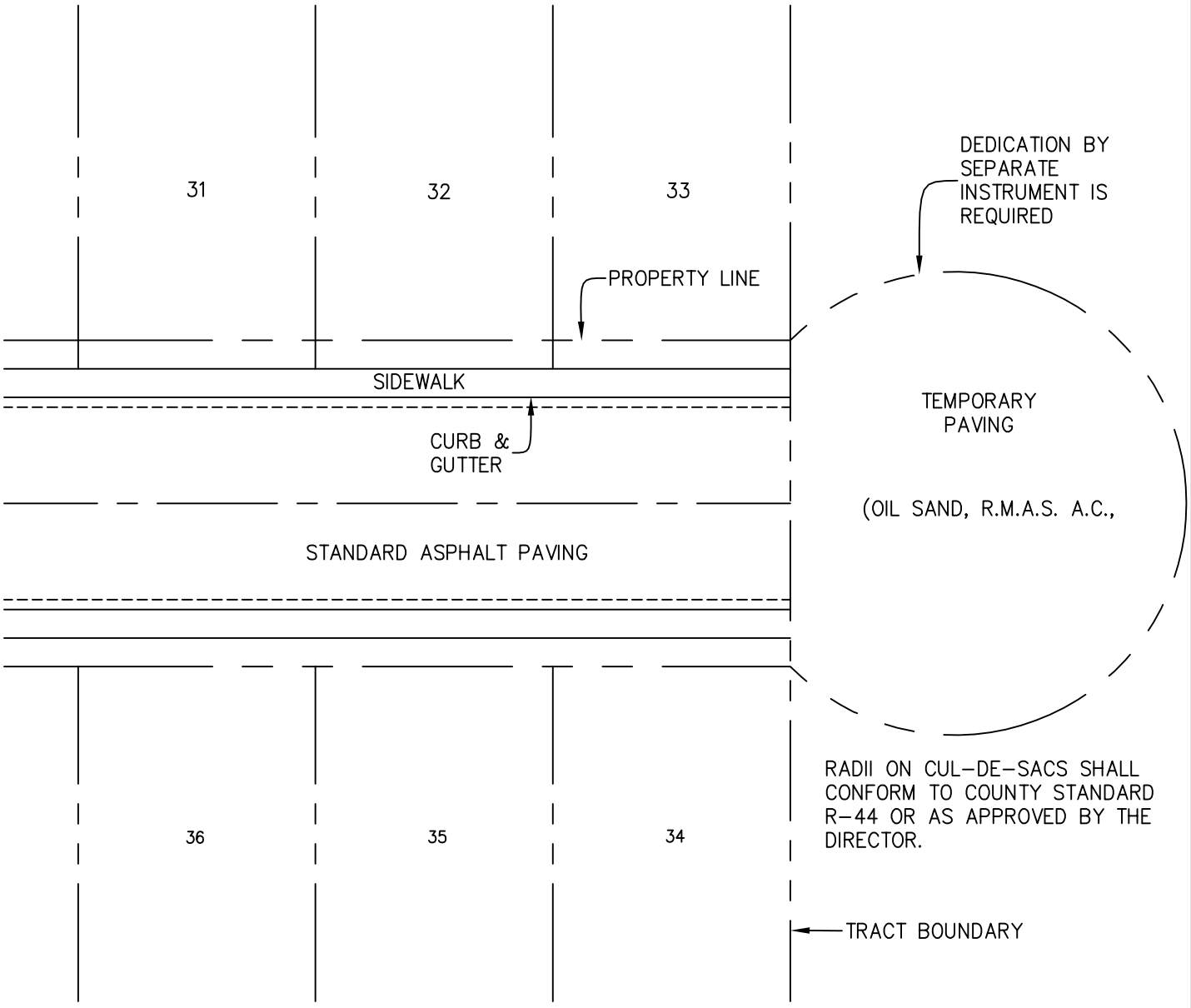
COUNTY OF KERN
STATE OF CALIFORNIA
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-45

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NOT TO SCALE

OFF-SITE TURNAROUND

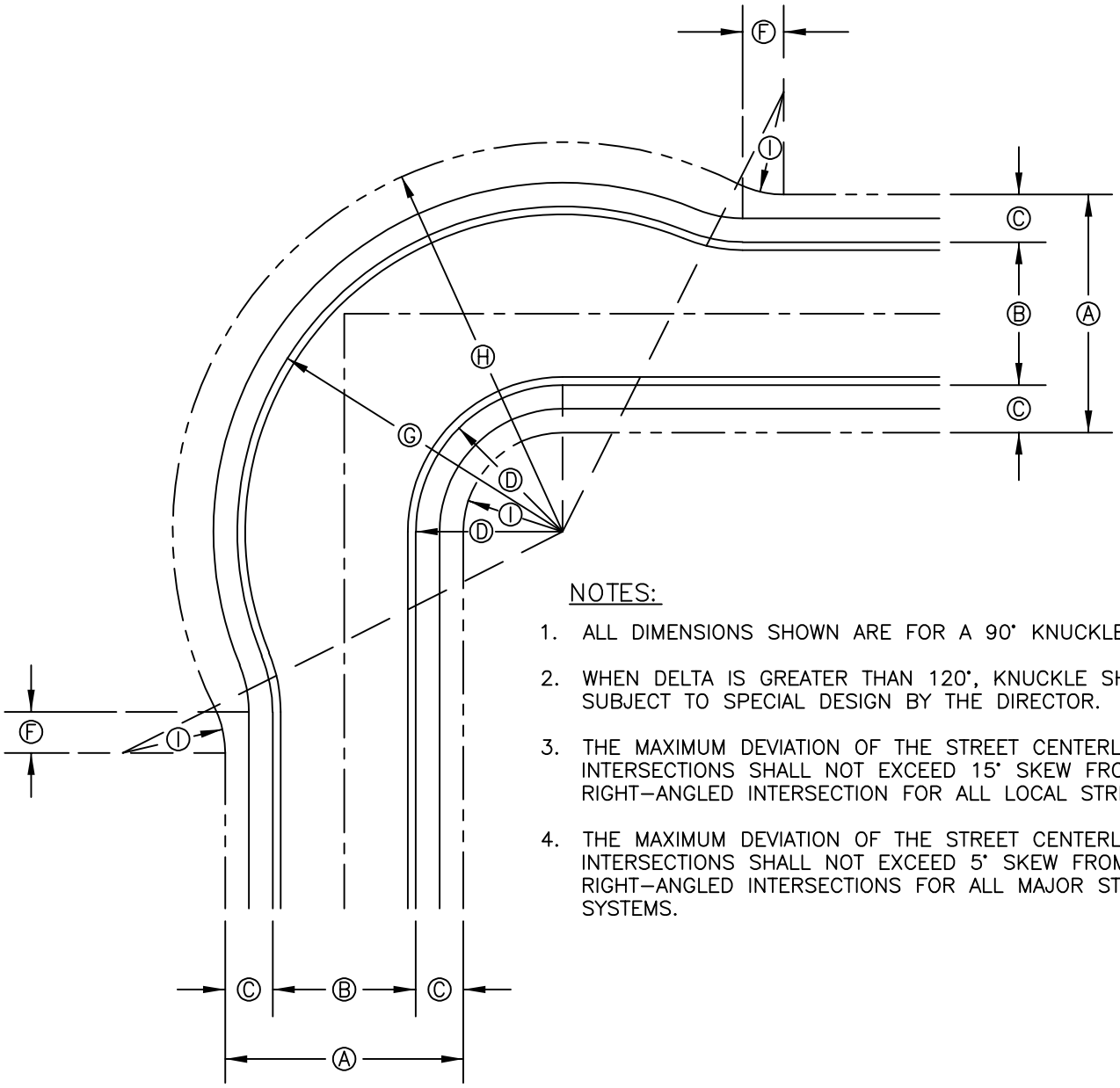
(REQUIRED WHEN THE TRACT AND OFF-SITE HAVE THE SAME OWNER)

NOTE:

TEMPORARY PAVING SHALL BE 2" THICK, MINIMUM OVER 6" COMPACTED SUBGRADE COMPACTED TO 95% RELATIVE DENSITY. PAVING SHALL INCLUDE TYPE "A" AC DIKE. PER K.C.D.S. PLATE R-52. AROUND THE CUL-DE-SAC OR OTHER APPROVED METHODS FOR DRAINAGE AS DIRECTED BY THE ENGINEER.

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS	STANDARD TEMPORARY TURNAROUND COUNTY OF KERN STATE OF CALIFORNIA DEVELOPMENT STANDARD	REVISIONS DATE – DESC –	DRAFTED BY: R.R.P. DESIGNED BY: J.R.C. DATE DRAFTED: 09/30/23 APPROVED BY: J.R.C.	PLATE NO. R-46

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NOTES:

1. ALL DIMENSIONS SHOWN ARE FOR A 90° KNUCKLE ONLY.
2. WHEN DELTA IS GREATER THAN 120°, KNUCKLE SHALL BE SUBJECT TO SPECIAL DESIGN BY THE DIRECTOR.
3. THE MAXIMUM DEVIATION OF THE STREET CENTERLINES AT INTERSECTIONS SHALL NOT EXCEED 15° SKEW FROM A RIGHT–ANGLED INTERSECTION FOR ALL LOCAL STREETS.
4. THE MAXIMUM DEVIATION OF THE STREET CENTERLINES AT INTERSECTIONS SHALL NOT EXCEED 5° SKEW FROM A RIGHT–ANGLED INTERSECTIONS FOR ALL MAJOR STREET SYSTEMS.

NOT TO SCALE

	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓕ	Ⓖ	Ⓗ	Ⓘ
1	60'	36'	12'	37'	5.05'	82'	95'	25'
2	60'	40'	10'	35'	4.59'	84'	95'	25'
3	60'	44'	8.0'	33'	4.13'	86'	95'	25'

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD KNUCKLE TREATMENT LOCAL STREETS

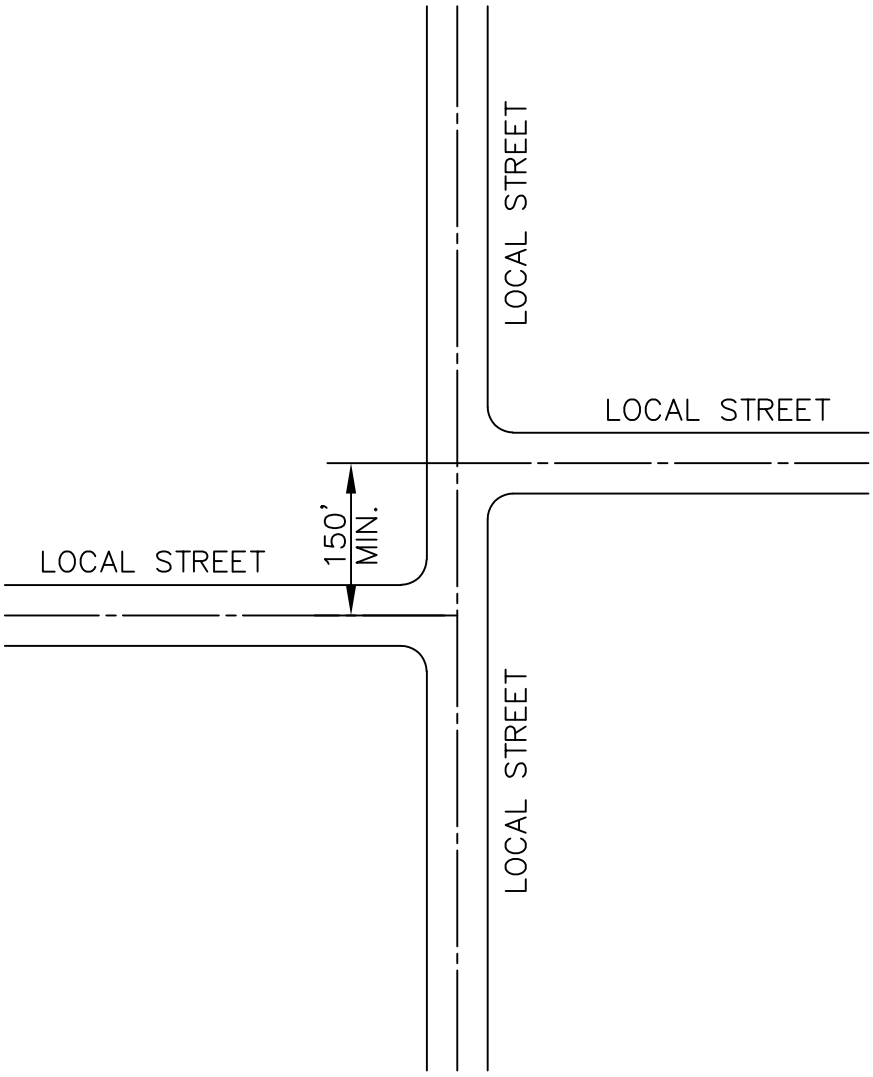
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
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PLATE NO.
R–47

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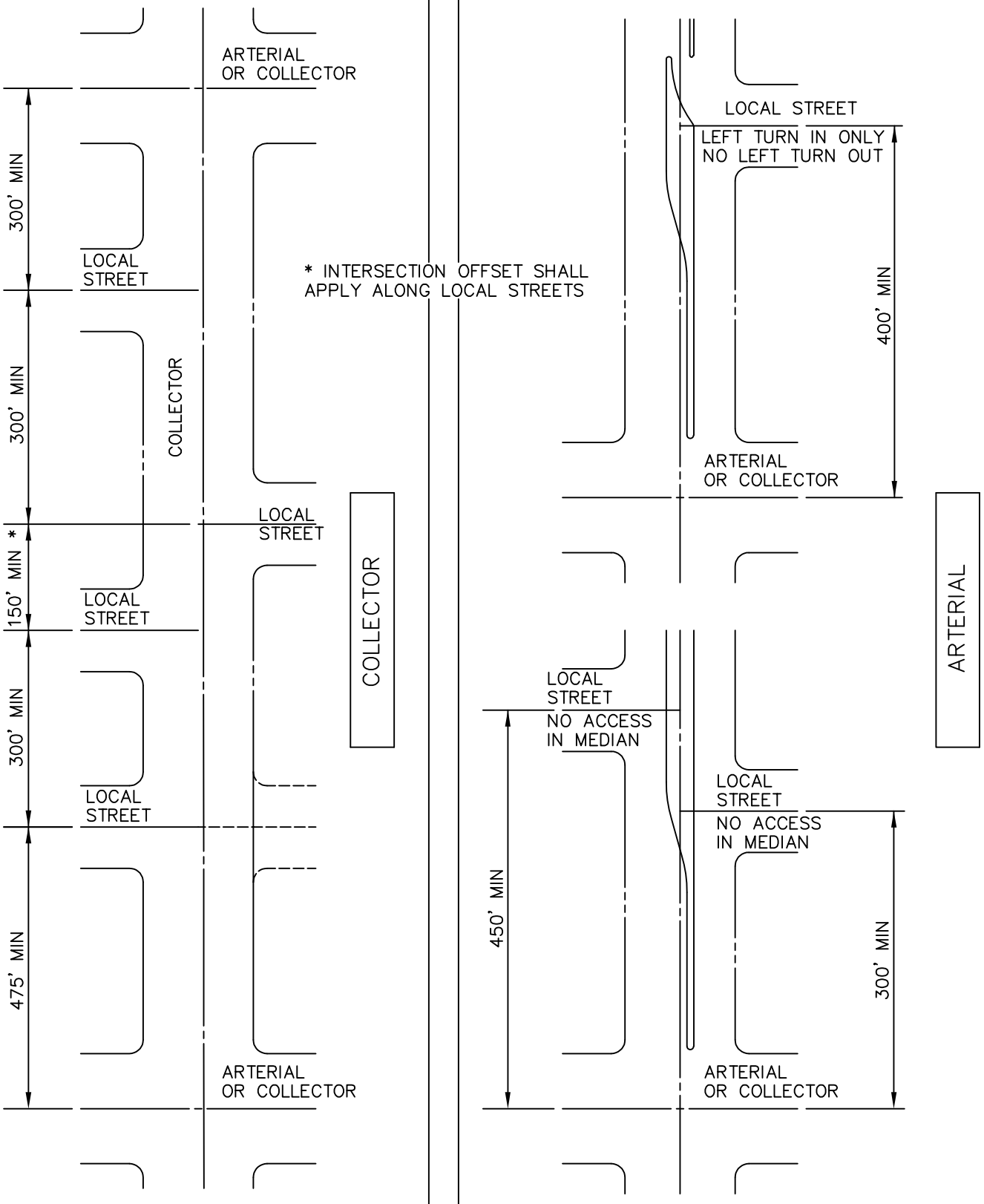
LOCAL INTERSECTION OFFSETS

NOT TO SCALE

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS	LOCAL INTERSECTION OFFSETS COUNTY OF KERN STATE OF CALIFORNIA DEVELOPMENT STANDARD	REVISIONS DATE – DESC –	DRAFTED BY: R.R.P. DESIGNED BY: J.R.C. DATE DRAFTED: 09/30/23 APPROVED BY: J.R.C.

PLATE NO. R-48

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KERN COUNTY PUBLIC WORKS
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STANDARD MINIMUM STREET ACCESS SPACING ON ARTERIALS AND COLLECTORS

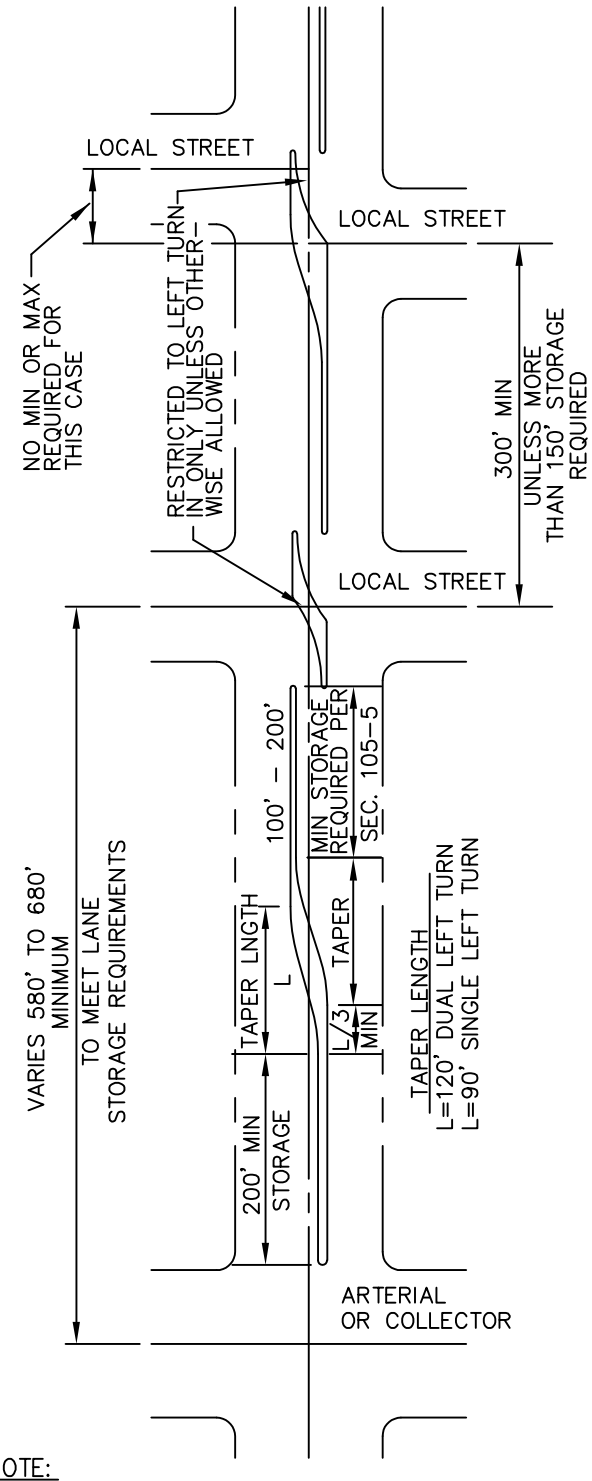
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

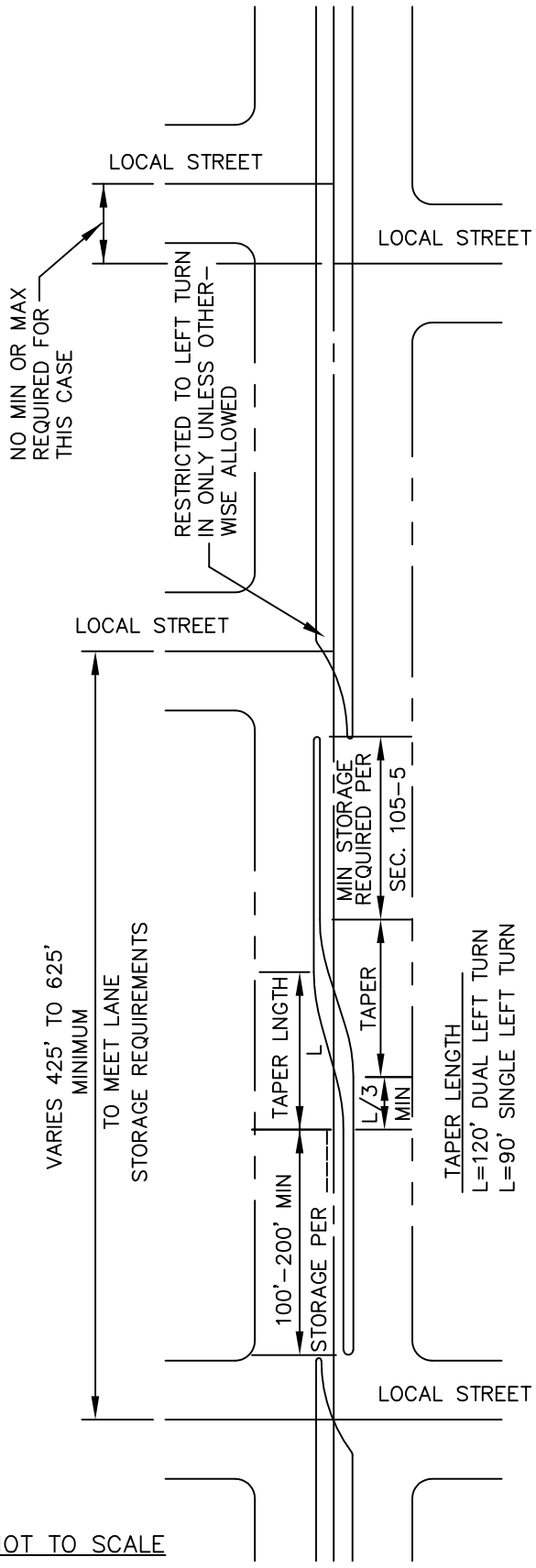
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DATE DRAFTED: 09/30/23
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PLATE NO.
R–49

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NOTE:
NUMBER OF ACCESS POINTS SHOWN TO ARTERIAL STREETS IS FOR ILLUSTRATIVE PURPOSES ONLY TO COVER TYPICAL ACCESS CONFIGURATIONS. ARTERIALS ARE PRIMARILY DESIGNED FOR MOVEMENT OF THROUGH TRAFFIC AS INDICATED SEC. 105.3 ACCESS POINTS TO ARTERIAL STREETS SHALL BE MINIMIZED TO THE GREATEST EXTENT POSSIBLE.

NOT TO SCALE

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD MINIMUM STREET ACCESS SPACING ON ARTERIALS

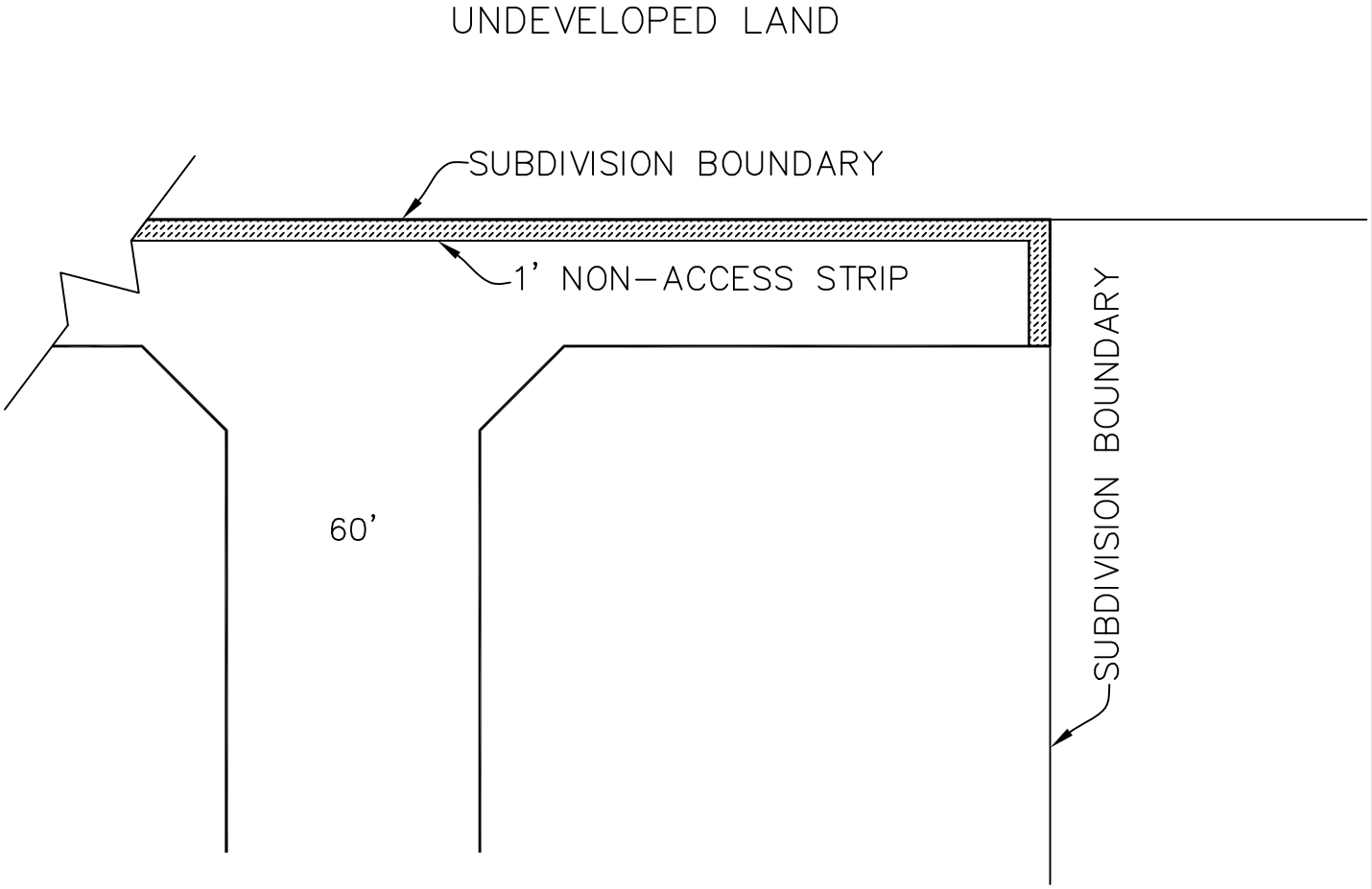
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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PLATE NO. R-50

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NOT TO SCALE

KERN COUNTY PUBLIC WORKS
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LOCATION OF 1' NON-ACCESS STRIPS

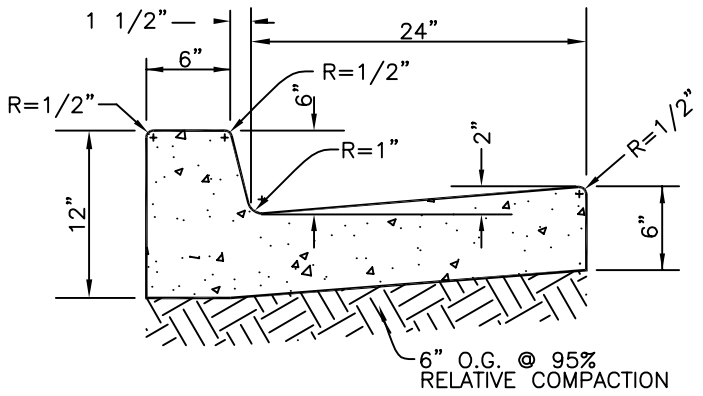
COUNTY OF KERN
STATE OF CALIFORNIA
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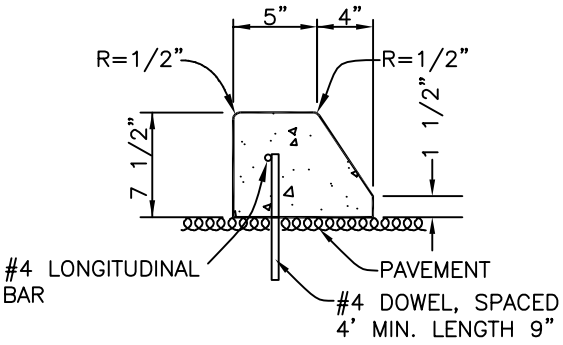
DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO.
R–51

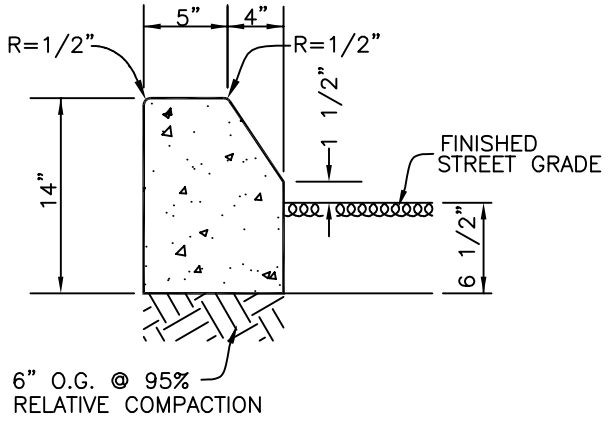
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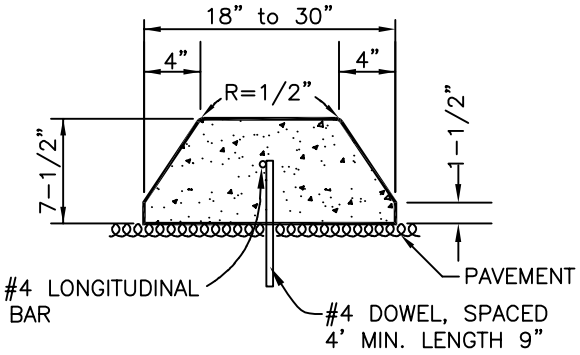
TYPE A2–6 CURB AND GUTTER



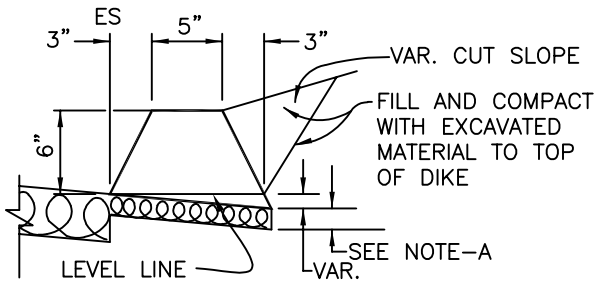
TYPE B5 CURB



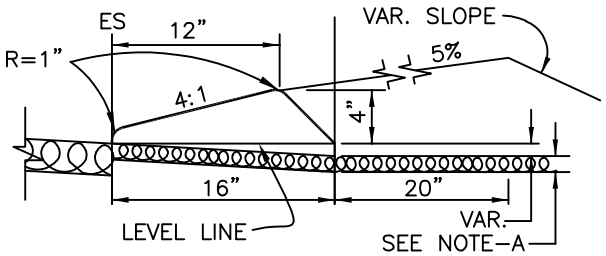
TYPE B1 CURB



TYPE B6 CURB



TYPE "A"–ASPHALT CONCRETE
HIGH DIKE



TYPE "E"–ASPHALT CONCRETE
MOUNTABLE DIKE

NOT TO SCALE

NOTE:
1. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR MINOR CONCRETE (MIN. CEMENT CONTENT 505 LB/CU.YD.) CONCRETE SHALL CONTAIN NO ADDITIVES UNLESS APPROVED PRIOR APPROVAL IS OBTAINED FROM THE COUNTY ENGINEER.

2. NO COLORING SHALL BE ADDED.

3. FOR EPOXY GLUE ON CURB, ELIMINATE THE REBAR AND SEE CALTRANS STANDARD SPECIFICATIONS FOR EPOXY INSTALLATION.

NOTE–A:
1. EXTEND TOP LAYER OF AC PLACED ON THE SHOULDER UNDER DIKE WITH NO JOINT AT THE ES.

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD CURBS

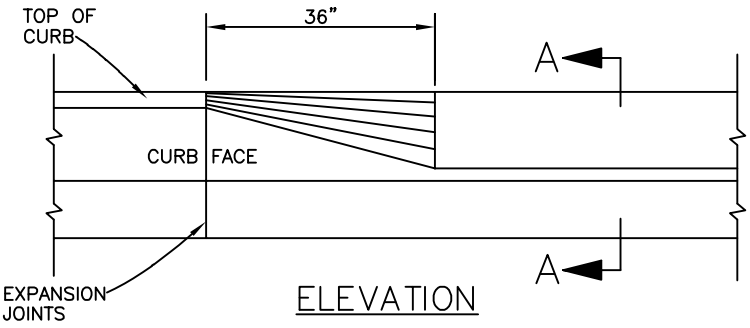
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STATE OF CALIFORNIA
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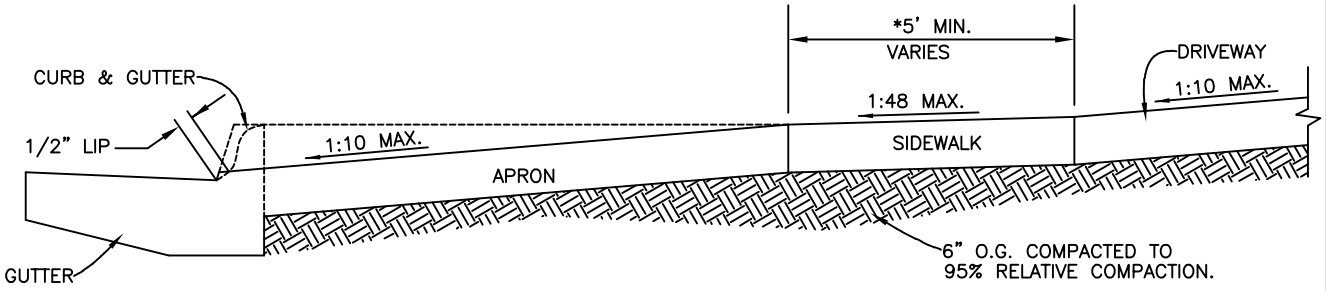
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R–52

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ELEVATION



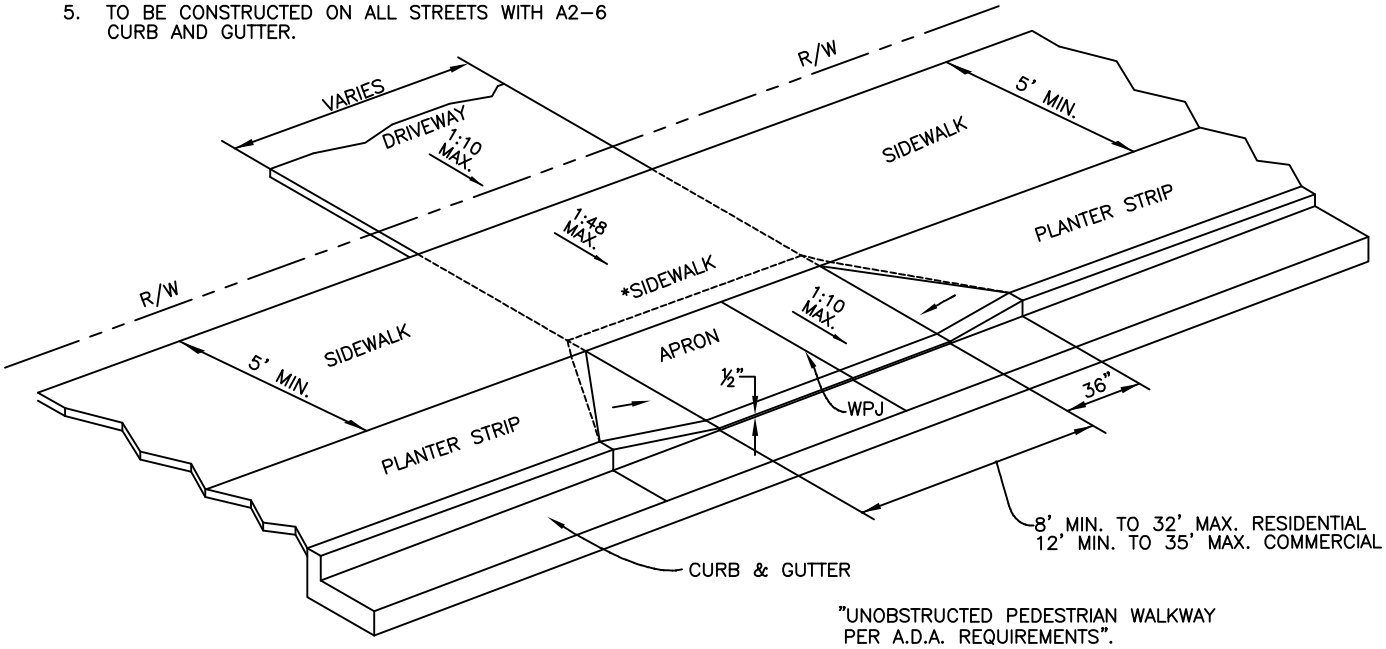
SECTION A–A WITH VERTICAL CURB

NOTES:

1. EXPANSION JOINTS SHALL BE EITHER (A) 1/4" TO 1/2" PREMOLDED EXPANSION JOINT FILLER PER THE STANDARD SPECIFICATIONS, SEC. 51–1–12 OR (B) 2" DEEP SCORED JOINT.
2. WEAKENED PLANE JOINTS (WPJ) REQUIRED ON CENTERLINE FOR DRIVEWAYS 10' TO 20' WIDE. DRIVEWAYS 22' TO 35' WIDE SHALL HAVE TWO WPJ EVENLY SPACED AT 1/3 AND 2/3 POINTS.
3. ALL CONSTRUCTION AND MATERIALS SHALL BE IN CONFORMANCE WITH STANDARD SPECIFICATIONS.
4. THICKNESS OF APRONS AND SIDEWALK BETWEEN APRON & DRIVEWAY SHALL BE 6" OF CONCRETE.
5. TO BE CONSTRUCTED ON ALL STREETS WITH A2–6 CURB AND GUTTER.
6. LANDSCAPE PLANTER STRIP AS PER 503–14.02.
7. CONCRETE SHALL BE MINOR CONCRETE.
8. NO COLORING SHALL BE ADDED.

* PROVIDE REQUIRED PEDESTRIAN EASEMENT IF OUTSIDE R/W. SIDEWALK MAY BE REDUCED TO 4'–2" WIDE BETWEEN APRON AND DRIVEWAY.

** IF CURB AND GUTTER ARE POURED SEPARATE OF APRON THEN DOWELS ARE REQUIRED AT BACK OF CURB. 3" IN CURB AND 9" IN CENTER OF APRON.



"UNOBSTRUCTED PEDESTRIAN WALKWAY PER A.D.A. REQUIREMENTS".

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

SIDEWALK & PLANTER STRIP DRIVEWAY
DETAIL TYPE "A" RESIDENTIAL/COMMERCIAL

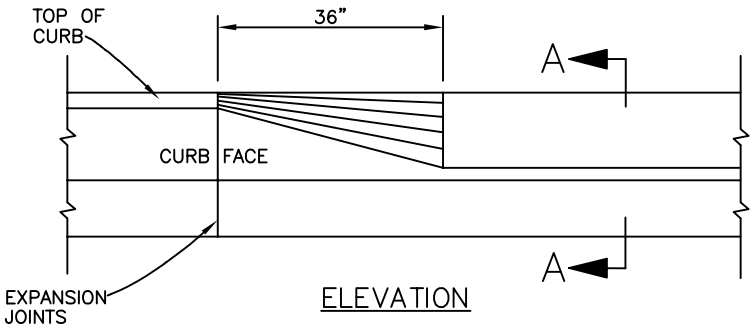
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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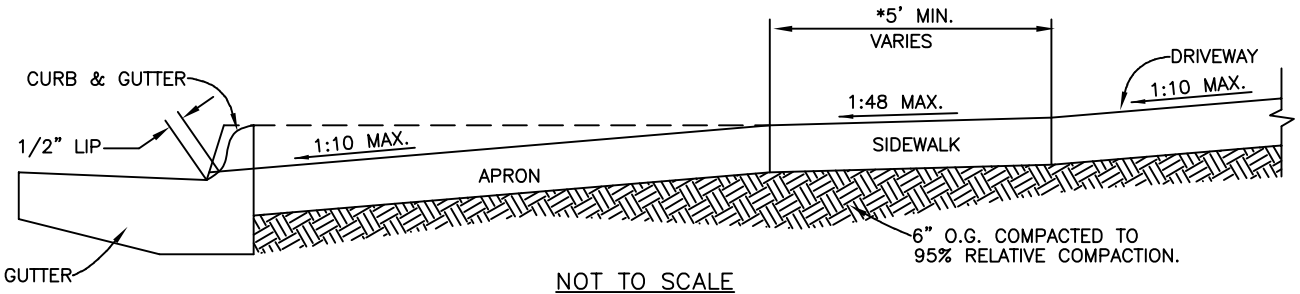
DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO.
R–53

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ELEVATION



NOT TO SCALE

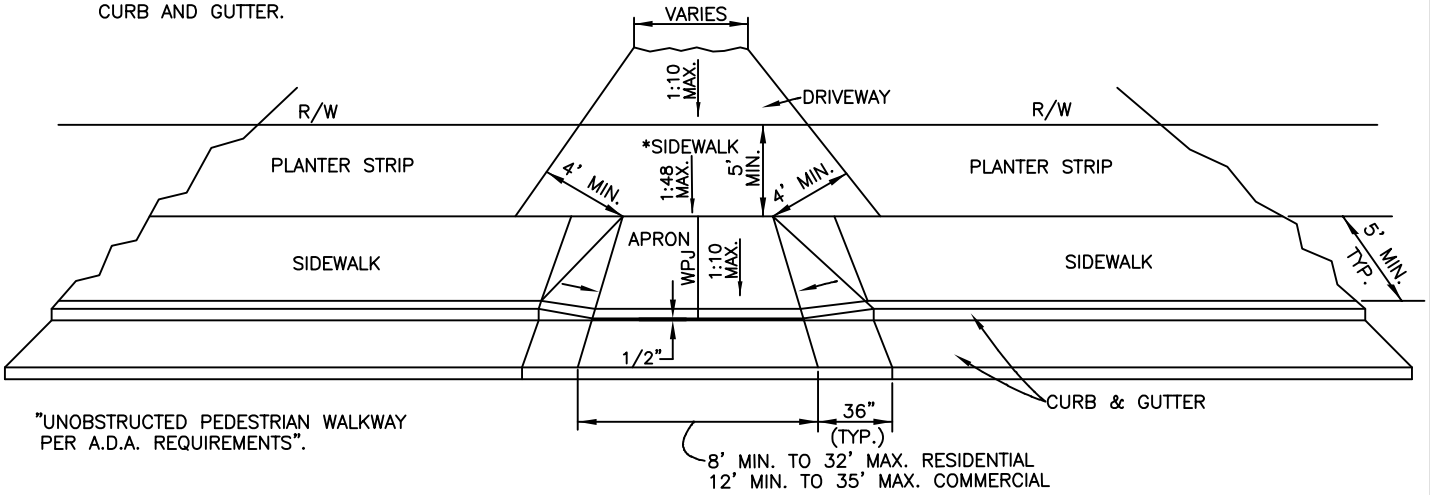
SECTION A–A WITH VERTICAL CURB

NOTES

1. EXPANSION JOINTS SHALL BE EITHER (A) 1/4" TO 1/2" PREMOLDED EXPANSION JOINT FILLER PER THE STANDARD SPECIFICATIONS, SEC. 51–1–12 OR (B) 2" DEEP SCORED JOINT.
2. WEAKENED PLANE JOINTS (WPJ) REQUIRED ON CENTERLINE FOR DRIVEWAYS 10' TO 20' WIDE. DRIVEWAYS 22' TO 35' WIDE SHALL HAVE TWO WPJ EVENLY SPACED AT 1/3 AND 2/3 POINTS.
3. ALL CONSTRUCTION AND MATERIALS SHALL BE IN CONFORMANCE WITH STANDARD SPECIFICATIONS.
4. THICKNESS OF APRONS AND SIDEWALK BETWEEN APRON & DRIVEWAY SHALL BE 6" OF CONCRETE.
5. TO BE CONSTRUCTED ON ALL STREETS WITH A2–6 CURB AND GUTTER.
6. LANDSCAPE PLANTER STRIP AS PER 503–14.02.
7. CONCRETE SHALL BE MINOR CONCRETE.
8. NO COLORING SHALL BE ADDED.

* PROVIDE REQUIRED PEDESTRIAN EASEMENT IF OUTSIDE R/W. SIDEWALK MAY BE REDUCED TO 4'–2" WIDE BETWEEN APRON AND DRIVEWAY.

** IF CURB AND GUTTER ARE POURED SEPARATE OF APRON THEN DOWELS ARE REQUIRED AT BACK OF CURB. 3" IN CURB AND 9" IN CENTER OF APRON.



NOT TO SCALE

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

SIDEWALK DRIVEWAY DETAIL TYPE "B" RESIDENTIAL/COMMERCIAL

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R–54

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KERN COUNTY PUBLIC WORKS
GROUNDED. BOUNDLESS.

STANDARD DRIVEWAY APPROACH
TYPE "C" COMMERCIAL

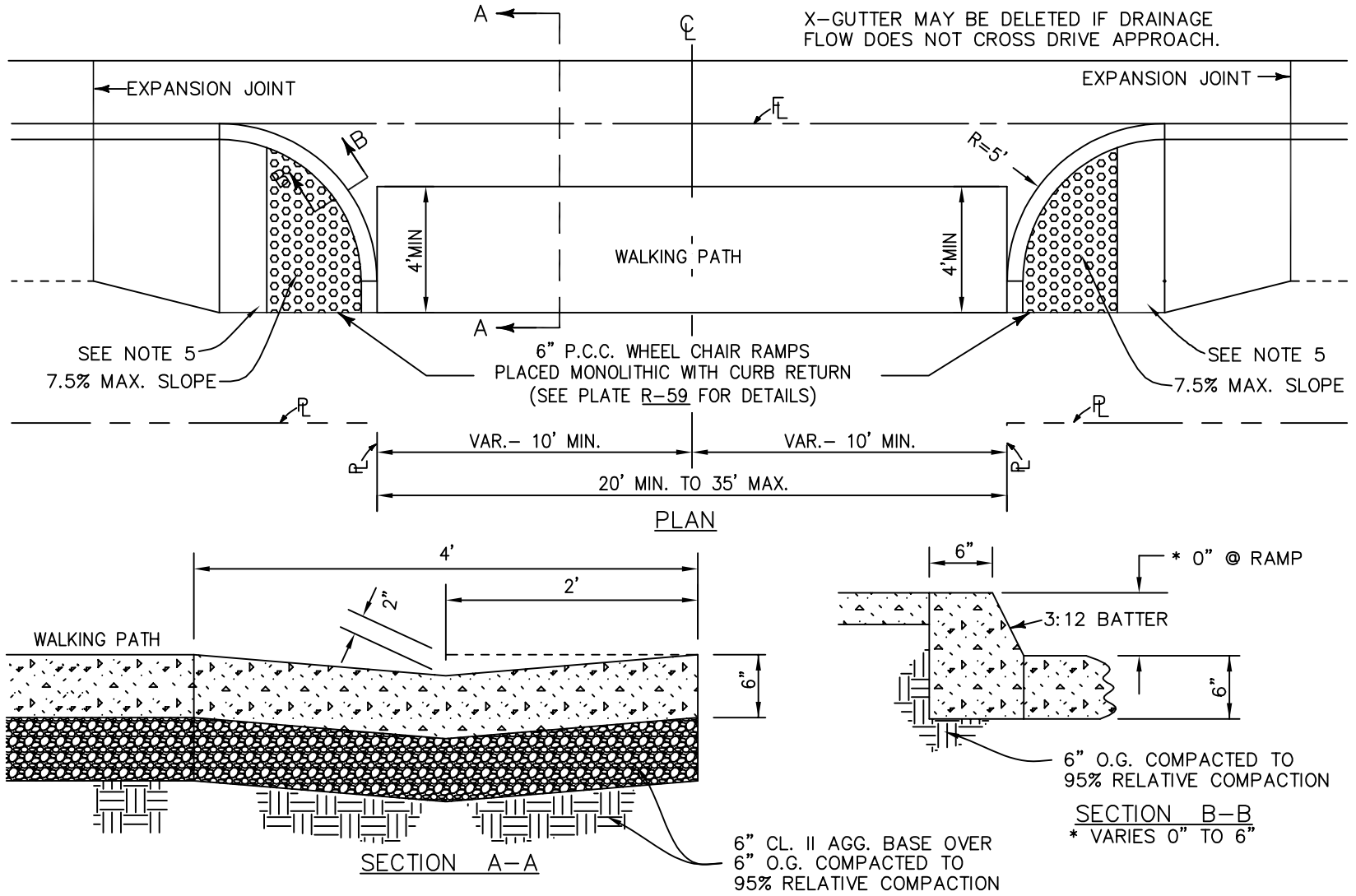
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STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

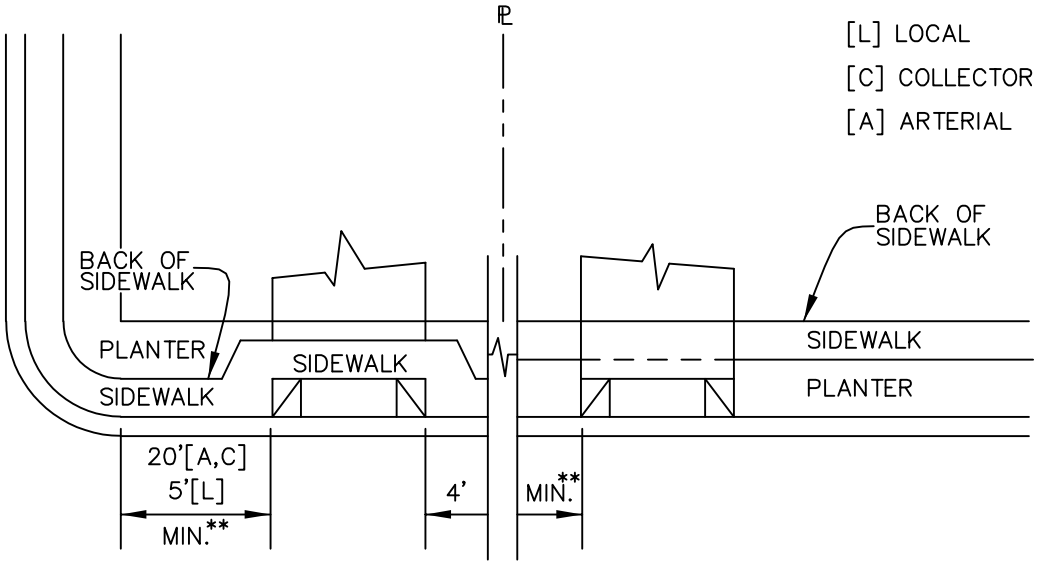
PLATE NO. R-55

NOT TO SCALE



NOTES:

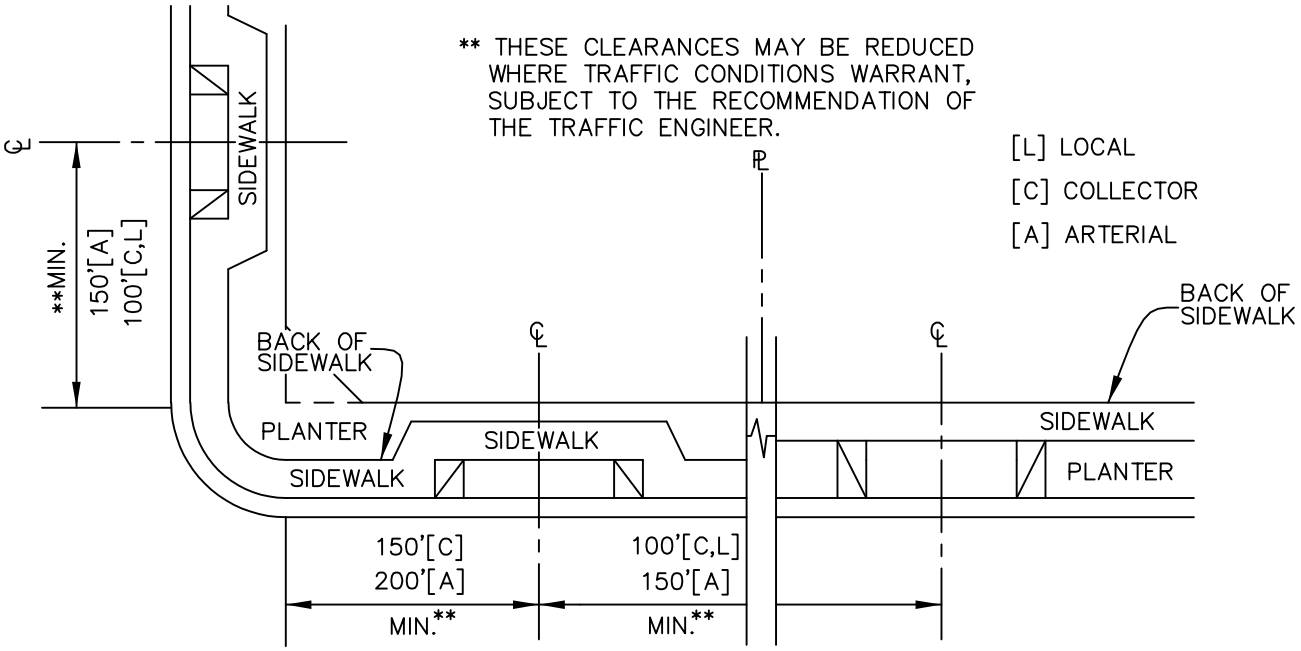
1. CONCRETE SHALL BE MINOR CONCRETE. NO COLORING SHALL BE ADDED.
2. TO INCREASE THE RADIUS IN COMMERCIAL DEVELOPMENTS, LIMITED EXCEPTIONS MAY BE GRANTED BY THE DIRECTOR.
3. EXPANSION JOINTS SHALL BE EITHER (A) 1/4" TO 1/2" PREMOLDED EXPANSION JOINT FILLER PER SEC. 51–1.12 OF THE STANDARD SPECIFICATIONS, OR (B) 2" DEEP SCORED JOINT (WEAKENED PLANE, EXTRUSION MACHINE ONLY).
4. ADDITIONAL EXPANSION JOINT REQUIRED AT CENTERLINE WHEN APPROACH IS GREATER THAN 20'.
5. CURB RAMPS SHALL HAVE A DETECTABLE WARNING SURFACE THAT EXTENDS THE FULL WIDTH AT THE BOTTOM AND 3'–0" IN DEPTH OF THE RAMP, EXCLUDING THE FLARED SIDES.



NOT TO SCALE

R1, R2

THIS STANDARD APPLIES TO RESIDENTIAL ACCESS ON LOCAL STREETS. FOR ARTERIALS AND COLLECTORS OR WHERE THE SIDE STREET IS AN ARTERIAL OR COLLECTOR, THE DIMENSION FROM THE CORNER WILL BE 20'.



NOT TO SCALE

NON R1, R2

THIS STANDARD APPLIES TO ALL TYPES OF ACCESSES, EXCEPT R1,R2 FOR ALL STREETS. THE 200' & 150' DIMENSION FROM THE CORNER MAY REQUIRE ADDITIONAL CLEARANCE FOR LEFT & RIGHT TURN STORAGE. ACCESSES WILL NOT BE ALLOWED WITHIN TURN LANE TRANSITIONS.

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS

STANDARD MINIMUM ACCESS DESIGN

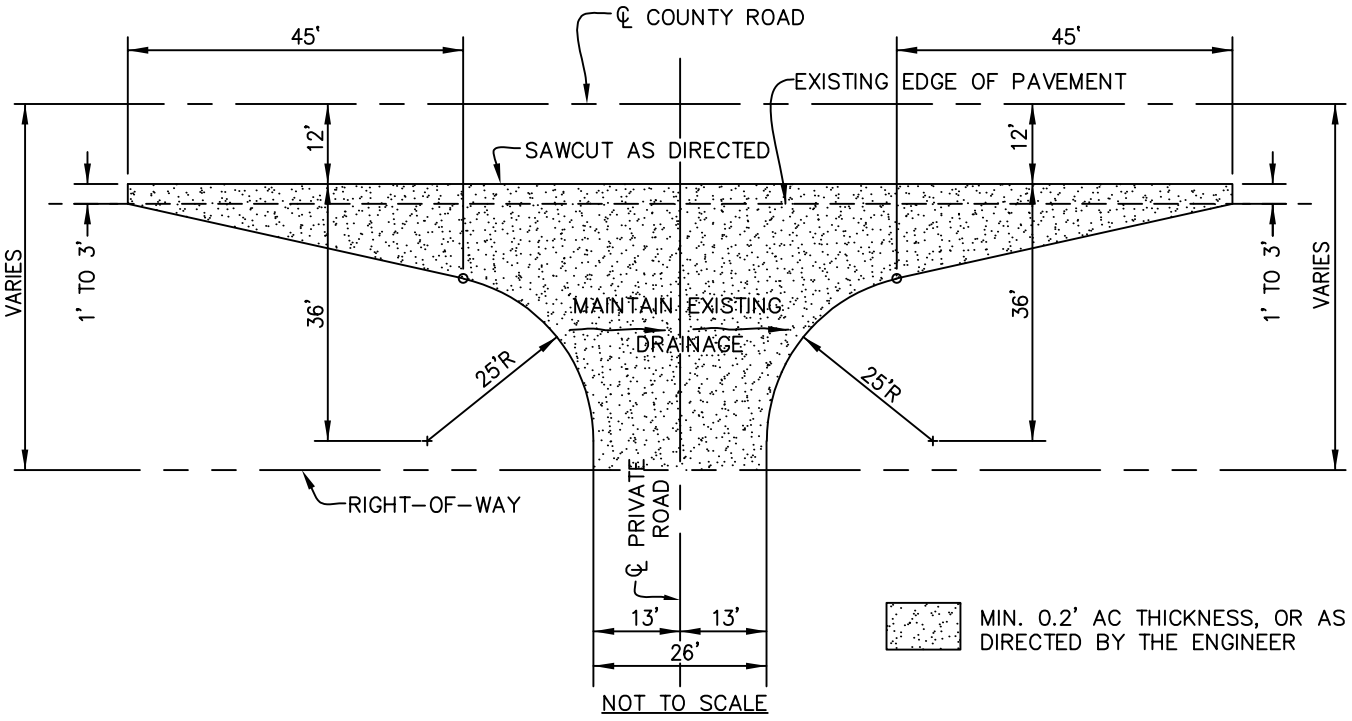
COUNTY OF KERN
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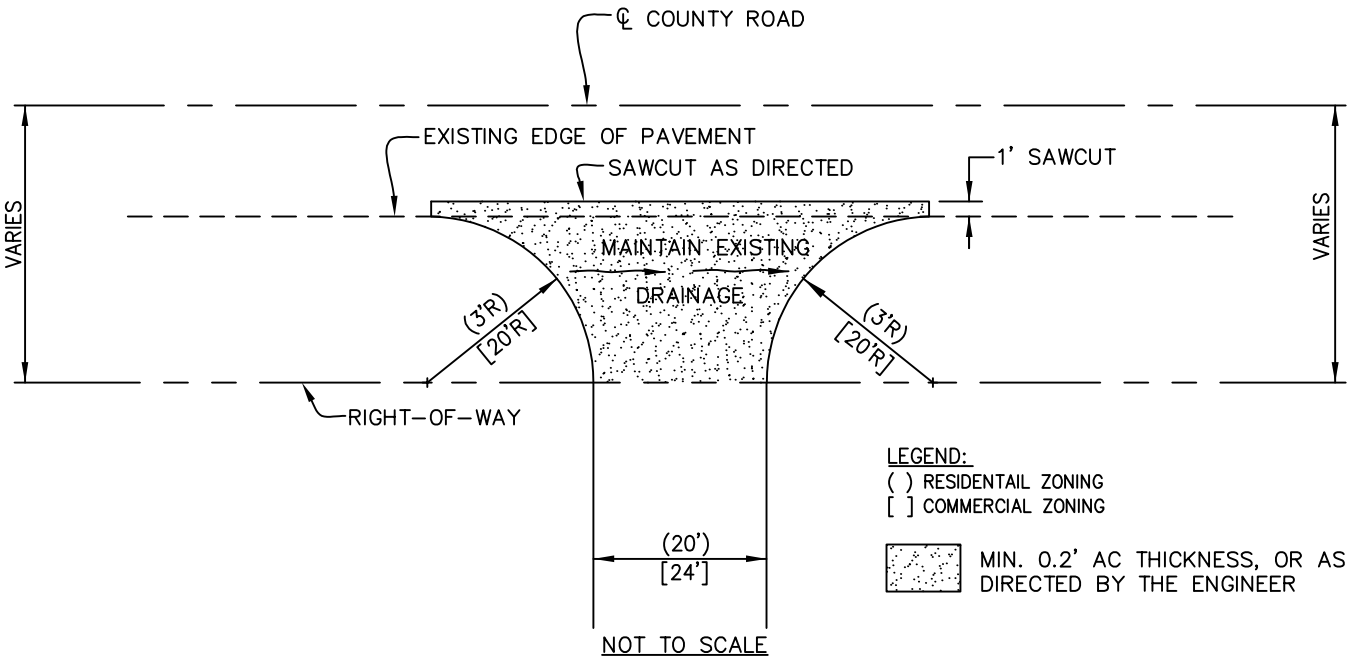
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-56

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AGRICULTURAL AND INDUSTRIAL COMMERCIAL ZONING



COMMERCIAL AND RESIDENTIAL ZONING

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

PRIVATE ROAD APPROACH

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-57

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KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

MODIFIED TYPE "C" APPROACH HEAVY TRUCK USAGE AREAS

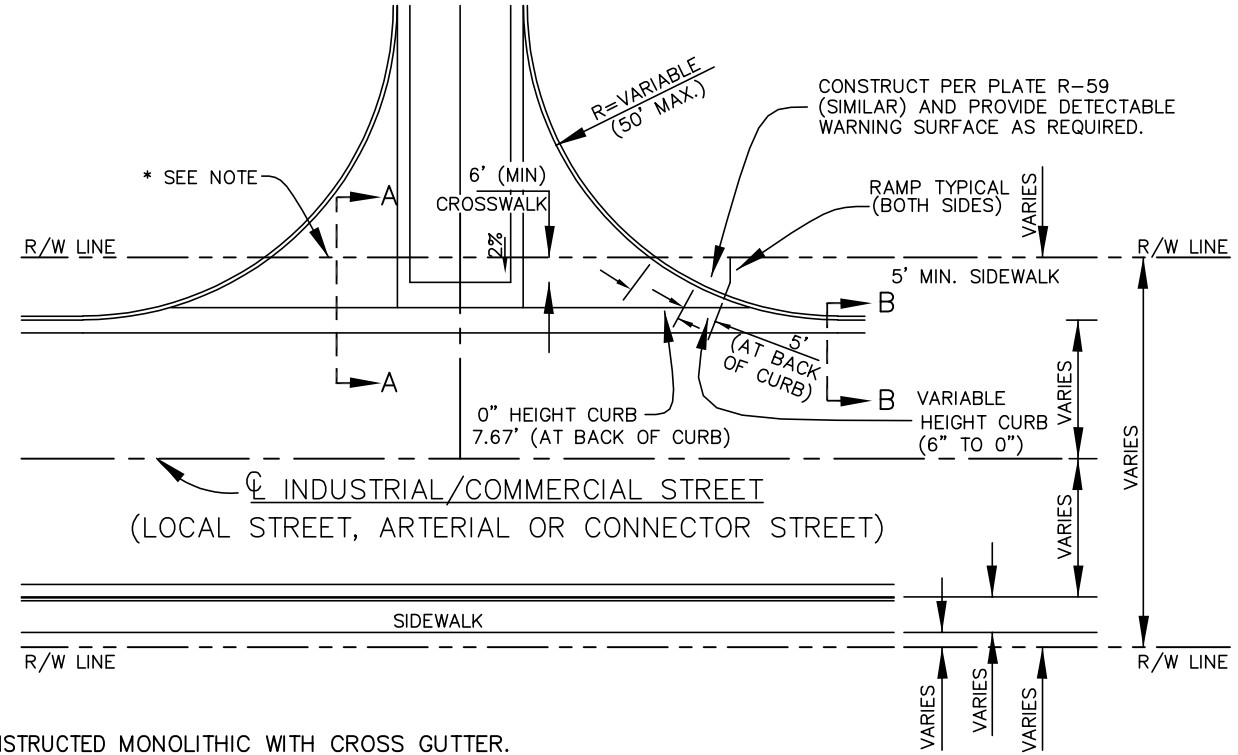
COUNTY OF KERN
STATE OF CALIFORNIA
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-58

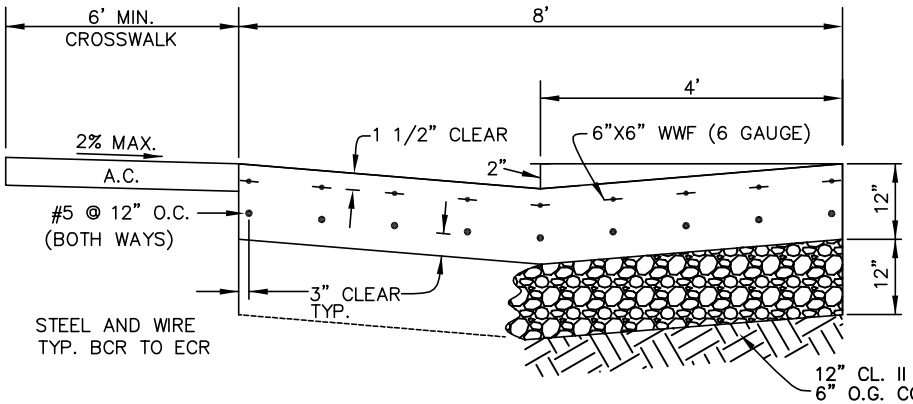
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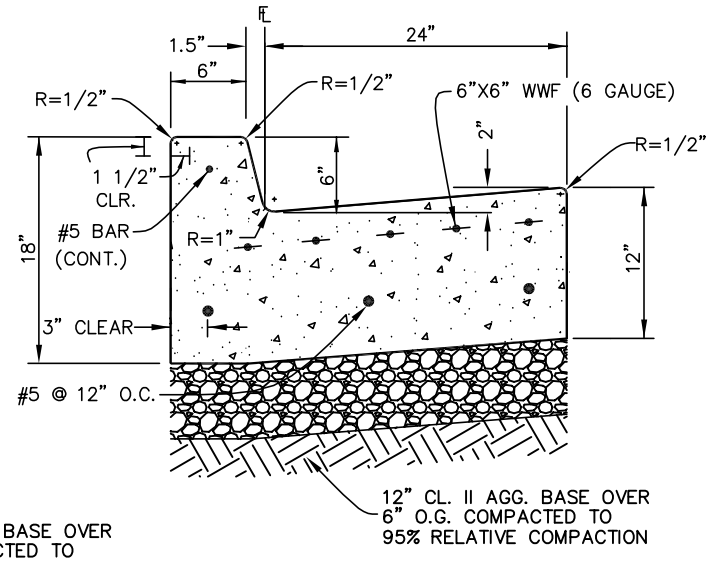
NOTES:

1. CURBS TO BE CONSTRUCTED MONOLITHIC WITH CROSS GUTTER.
2. CONCRETE SHALL BE MINOR CONCRETE. NO COLORING SHALL BE ADDED.
3. SCORING AS DIRECTED BY ENGINEER.

* ADDITIONAL RIGHT OF WAY MAY BE REQUIRED FOR PEDESTRIAN WALKWAY.



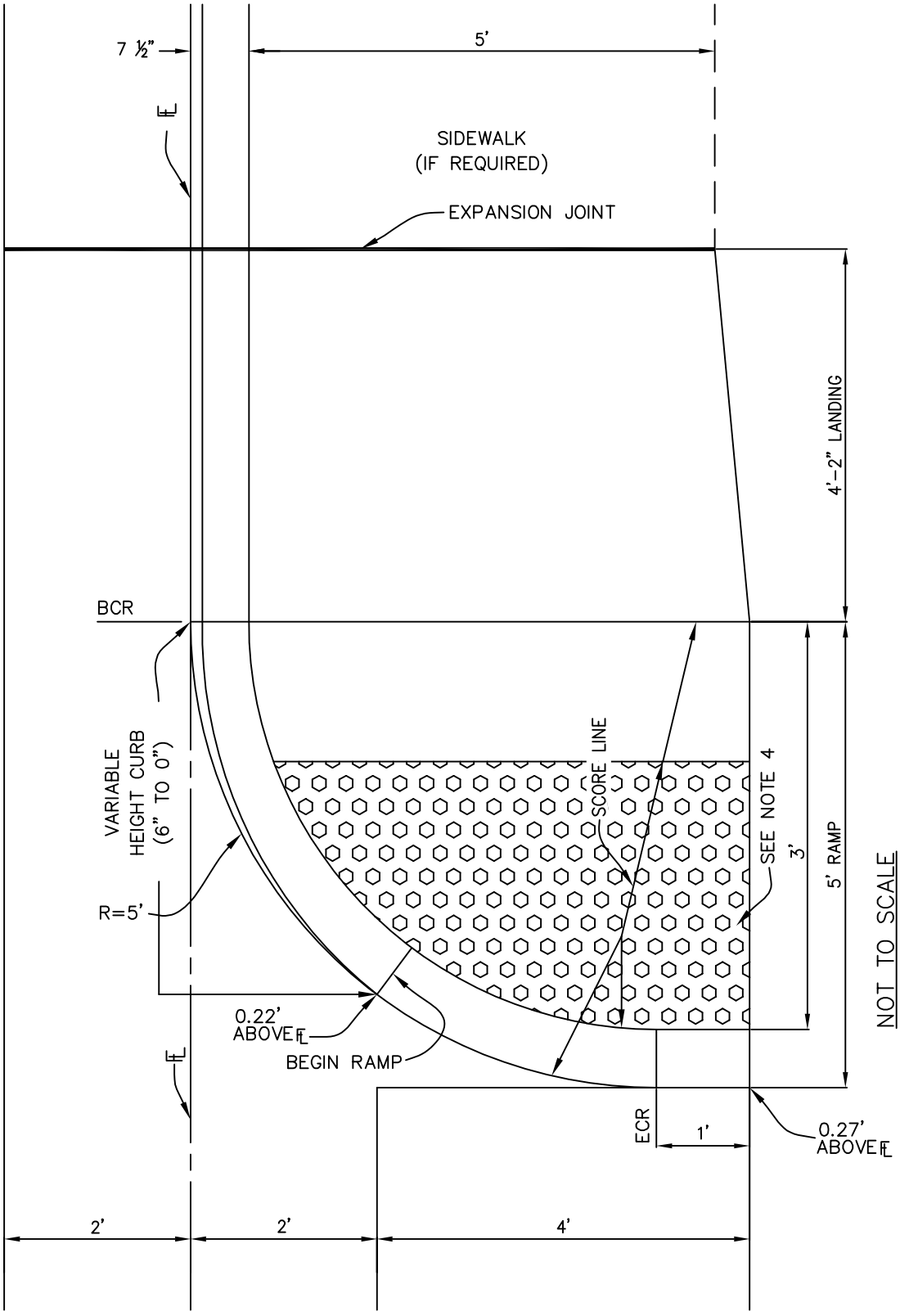
SECTION A–A
TYPICAL



SECTION B–B

NOTES:

1. CONCRETE SHALL BE MINOR CONCRETE. NO COLORING SHALL BE ADDED.
2. EXPANSION JOINTS SHALL BE EITHER (A) 1/4" TO 1/2" PREMOLDED EXPANSION JOINT FILLER PER SEC. 51-1.12 OF THE STANDARD SPECIFICATIONS OR (B) 2" DEEP SCORED JOINT (WEAKENED PLANE, EXTRUSION MACHINE ONLY).
3. CONCRETE 0.5' THICK (MONOLITHIC WITH CURB RETURN).
4. CURB RAMPS SHALL HAVE A DETECTABLE WARNING SURFACE THAT EXTENDS THE FULL WIDTH AND 3'-0" IN DEPTH OF THE RAMP, EXCLUDING THE FLARED SIDES. DETECTABLE WARNING PRODUCTS SHALL BE DSA-AC APPROVED.
5. TRANSITION GUTTER PAN SLOPE FROM 1" OF DEPTH FOR EACH 2'-0" OF WIDTH TO MATCH TYPICAL GUTTER PAN SLOPE.



KERN COUNTY PUBLIC WORKS
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WHEELCHAIR RAMP DETAIL TYPE "C"
DRIVE APPROACH

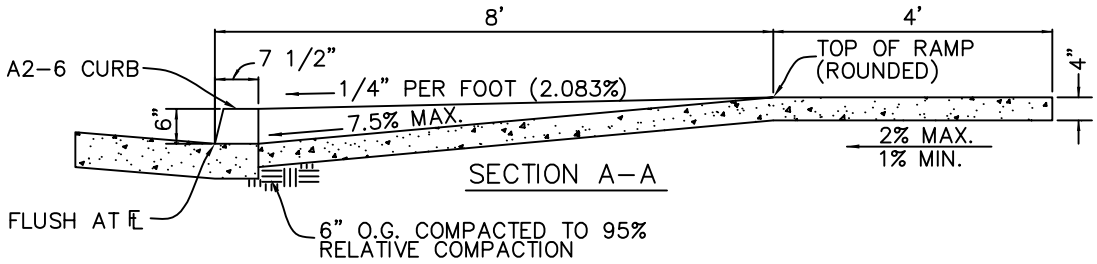
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

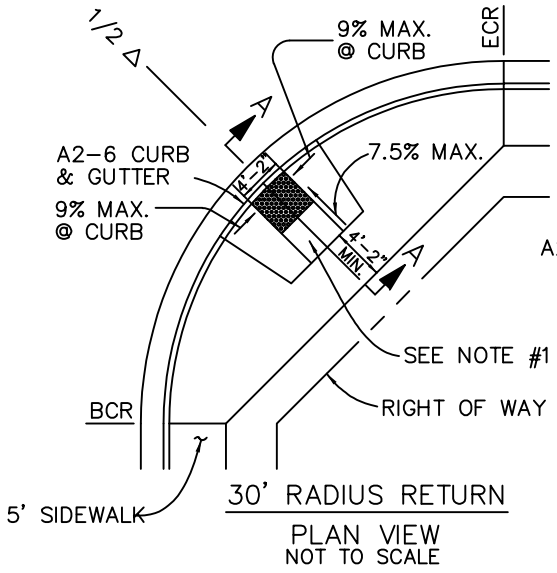
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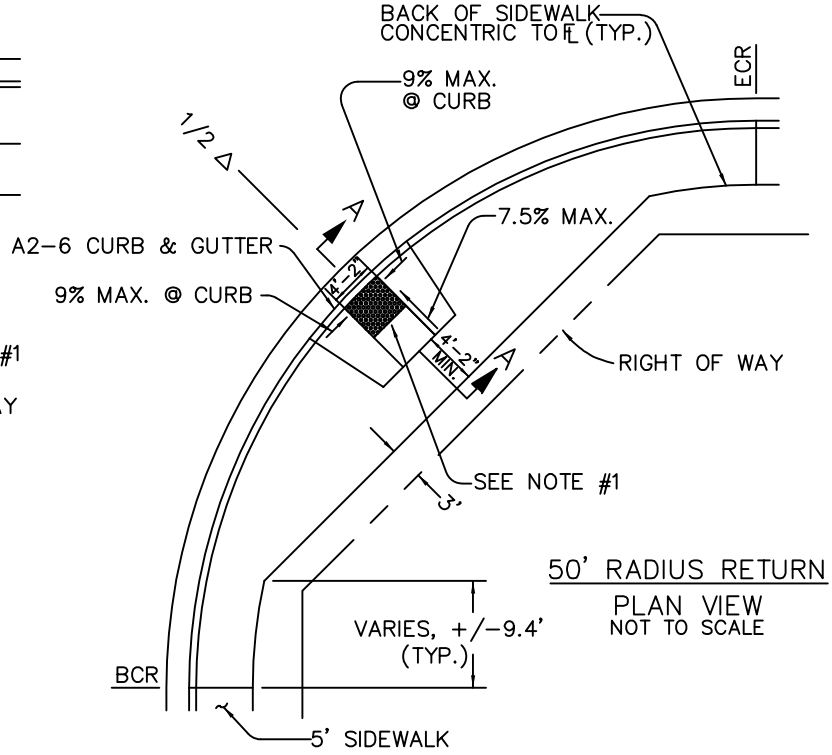
DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
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PLATE NO.
R-59

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NOTES:

1. CURB RAMPS SHALL HAVE A DETECTABLE WARNING SURFACE THAT EXTENDS THE FULL WIDTH AND 3'-0" IN DEPTH OF THE RAMP, EXCLUDING THE FLARED SIDES. DETECTABLE WARNING PRODUCTS SHALL BE DSA-AC APPROVED.
2. CONCRETE SHALL BE MINOR CONCRETE. NO COLORING SHALL BE ADDED.
3. CONSTRUCT WHEELCHAIR RAMP AT ALL RETURNS.
4. ARTERIAL AND COLLECTOR INTERSECTIONS MAY REQUIRE DUAL WHEELCHAIR RAMPS.
5. TRANSITION GUTTER PAN SLOPE FROM 1" OF DEPTH FOR EACH 2'-0" OF WIDTH TO MATCH TYPICAL GUTTER PAN SLOPE.

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

WHEELCHAIR RAMP CURB SIDE SIDEWALK

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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PLATE NO.
R-60

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KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

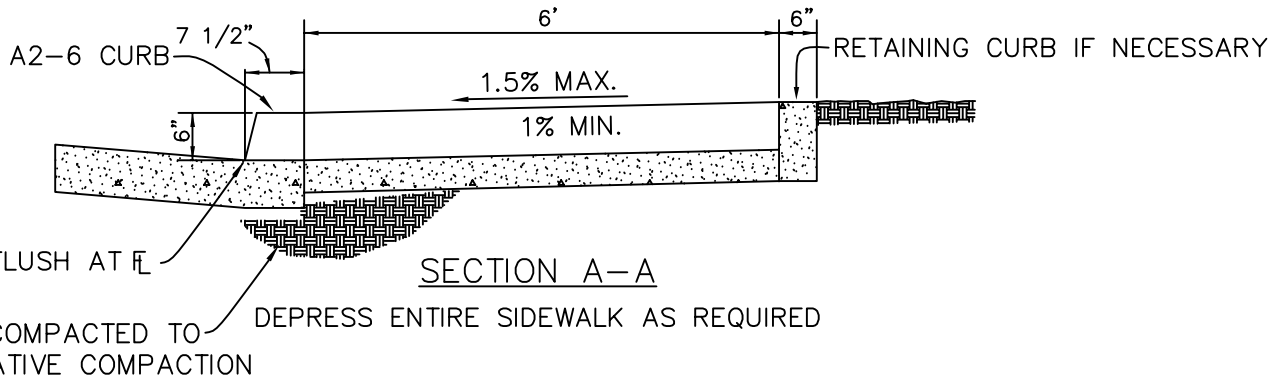
WHEELCHAIR RAMP PROPERTY LINE SIDEWALK

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

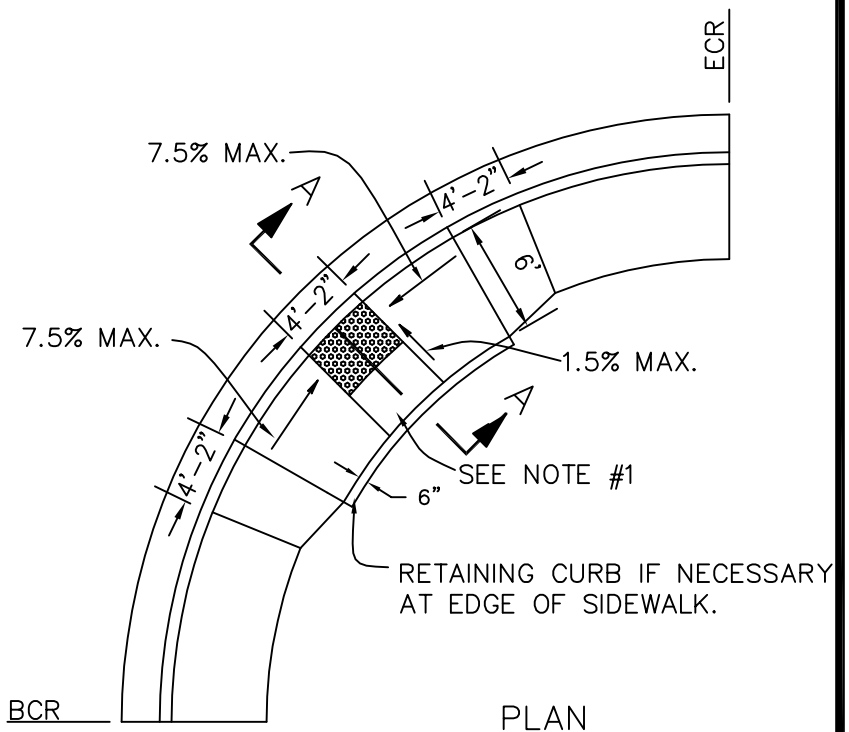
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-61



SECTION A–A



PLAN

NOT TO SCALE

NOTES:

1. CURB RAMPS SHALL HAVE A DETECTABLE WARNING SURFACE THAT EXTENDS THE FULL WIDTH AND 3'–0" IN DEPTH OF THE RAMP, EXCLUDING THE FLARED SIDES. DETECTABLE WARNING PRODUCTS SHALL BE DSA–AC APPROVED.
2. CONCRETE SHALL BE MINOR CONCRETE. NO COLORING SHALL BE ADDED.
3. CONSTRUCT WHEELCHAIR RAMP AT ALL RETURNS.
4. ARTERIAL AND COLLECTOR INTERSECTIONS MAY REQUIRE DUAL WHEELCHAIR RAMPS.
5. TRANSITION GUTTER PAN SLOPE FROM 1" OF DEPTH FOR EACH 2'–0" OF WIDTH TO MATCH TYPICAL GUTTER PAN SLOPE.
6. ONLY TO BE USED WHERE ADEQUATE R/W IS NOT AVAILABLE.

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KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

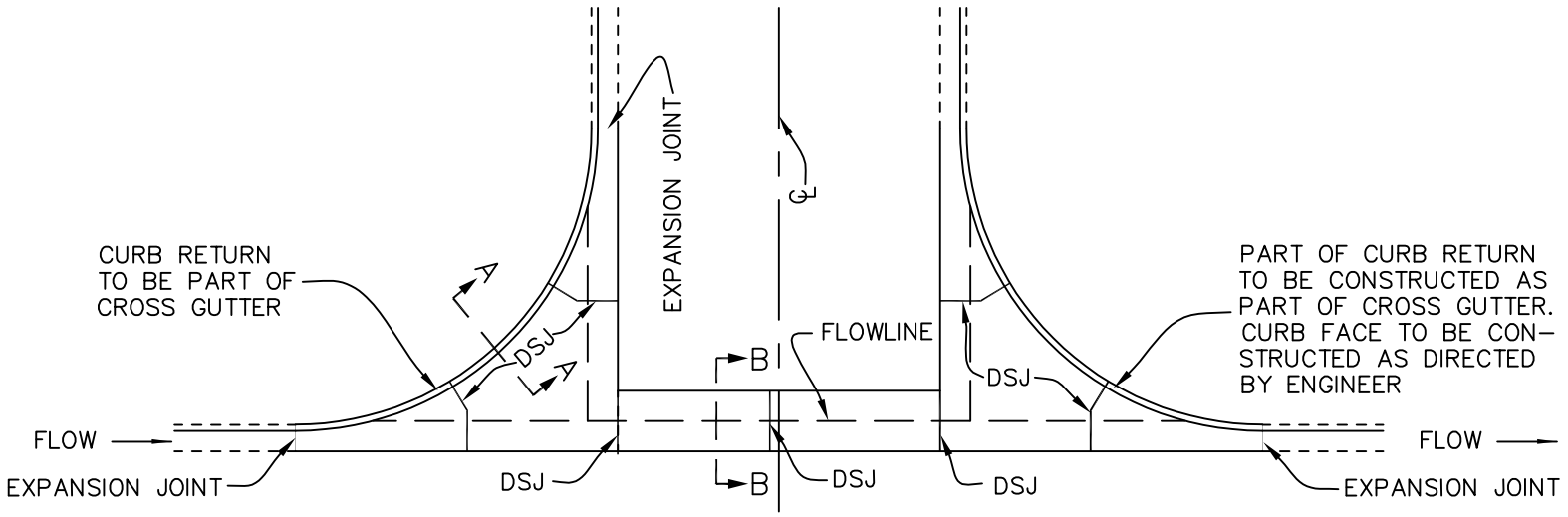
STANDARD CONCRETE CROSS DRAIN TYPICAL

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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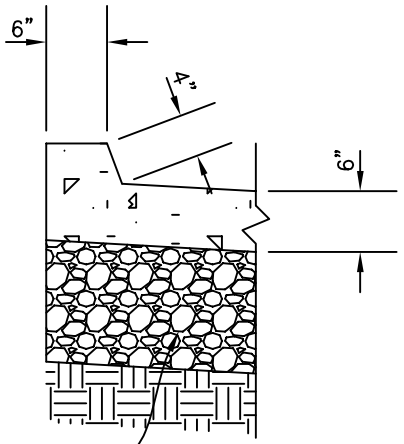
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PLATE NO. R-62

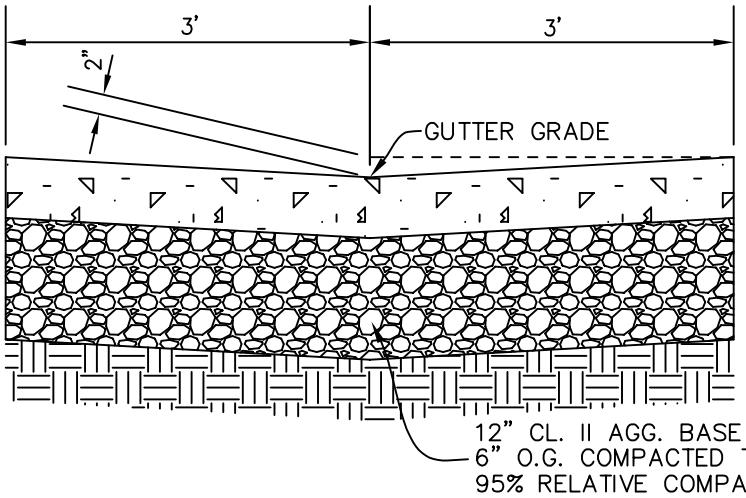


PLAN

NOT TO SCALE



SECTION A–A



SECTION B–B

NOTE:

1. JOINT EXPANSION JOINTS SHALL BE EITHER (A) 1/4" PREMOLDED EXPANSION FILLER PER SEC. 51–1.12 OF THE STANDARD SPECIFICATIONS, OR (B) 2" DEEP SCORED JOINT (WEAKENED PLANE, EXTRUSION MACHINE ONLY).

2. DEEP SCORED JOINTS (DSJ) TO BE CONSTRUCTED AT LOCATIONS APPROVED BY THE ENGINEER.

NOTE:

1. JOINT EXPANSION JOINTS SHALL BE EITHER (A) 1/4" PREMOLDED EXPANSION FILLER PER SEC. 51-1.12 OF THE STANDARD SPECIFICATIONS, OR (B) 2" DEEP SCORED JOINT (WEAKENED PLANE, EXTRUSION MACHINE ONLY).
2. DEEP SCORED JOINTS (DSJ) TO BE CONSTRUCTED AT LOCATIONS APPROVED BY THE ENGINEER.

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

WIDE CONCRETE CROSS DRAIN TYPICAL

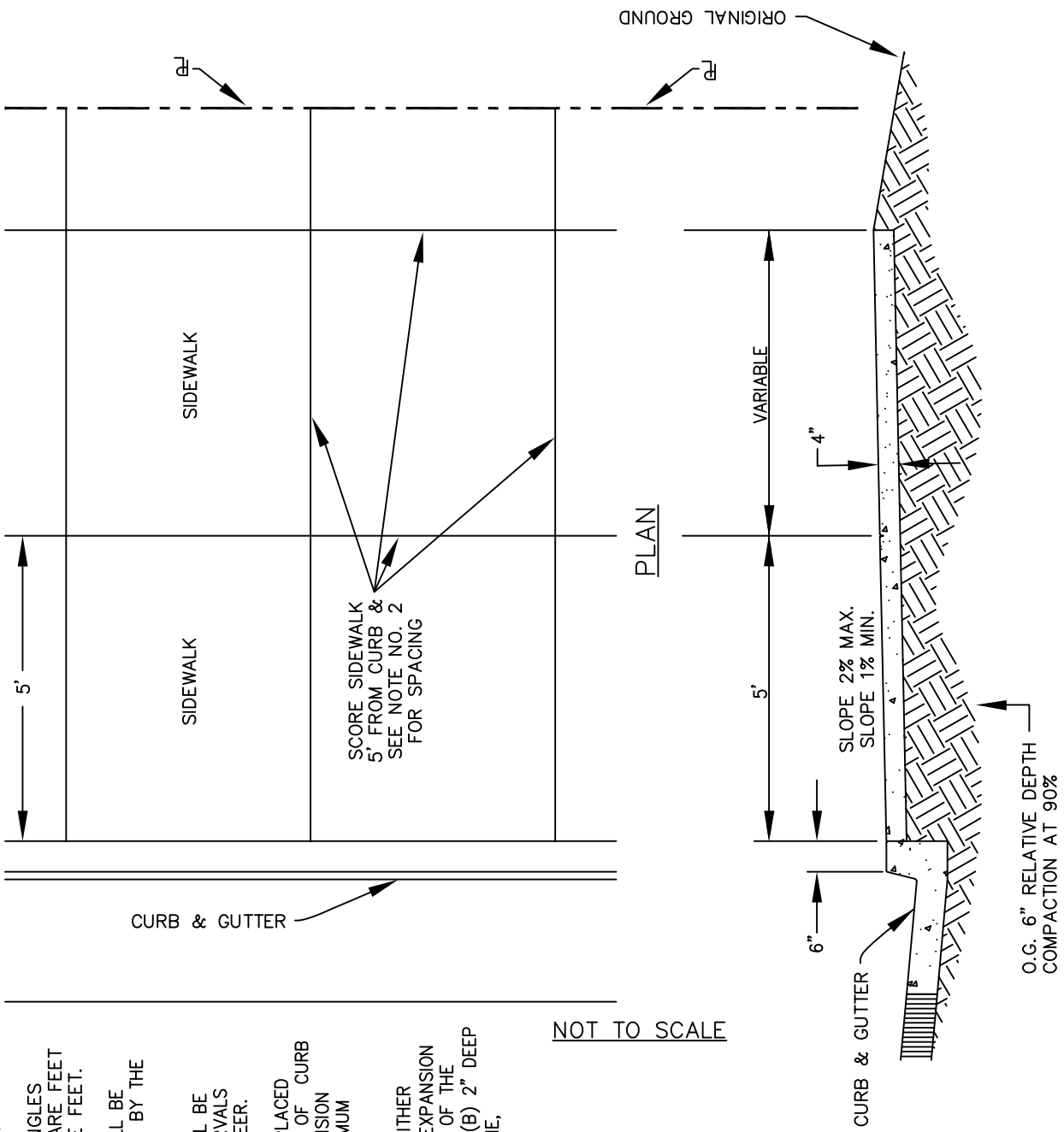
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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PLATE NO.
R–63

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NOT TO SCALE

NOTES:

1. SLOPE IS PLUS 2% MAX FROM TOP OF CURB TO PROPERTY LINE.
2. SCORE SIDEWALK IN RECTANGLES OF NOT LESS THAN 12 SQUARE FEET NOR MORE THAN 20 SQUARE FEET.
3. CONCRETE FOR SIDEWALK SHALL BE MINOR CONCRETE AS APPROVED BY THE "COUNTY OF KERN".
4. WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED AT 8 FOOT INTERVALS OR AS DIRECTED BY THE ENGINEER.
5. EXPANSION JOINTS SHALL BE PLACED AT SIDES OF STRUCTURES, END OF CURB RETURNS, AND OPPOSITE EXPANSION JOINTS IN EXISTING CURB. MAXIMUM SPACING – 60 FT.
6. EXPANSION JOINTS SHALL BE EITHER (A) 1/4" TO 1/2" PREMOLDED EXPANSION JOINT FILLER PER SEC. 51-1.12 OF THE STANDARD SPECIFICATIONS, OR (B) 2" DEEP SCORED JOINT (WEAKENED PLANE, EXTRUSION MACHINE ONLY).

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD SIDEWALK DETAIL TYPE 1

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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APPROVED BY: J.R.C.

PLATE NO.
R-64

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NOTES:

1. SLOPE IS PLUS 2% MAX FROM TOP OF CURB TO PROPERTY LINE.
2. SCORE SIDEWALK IN RECTANGLES OF NOT LESS THAN 12 SQUARE FEET NOR MORE THAN 20 SQUARE FEET.
3. CONCRETE FOR SIDEWALK SHALL BE MINOR CONCRETE AS APPROVED BY THE "COUNTY OF KERN".
4. WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED AT 8 FOOT INTERVALS OR AS DIRECTED BY THE ENGINEER.
5. EXPANSION JOINTS SHALL BE PLACED AT SIDES OF STRUCTURES, END OF CURB RETURNS, AND OPPOSITE EXPANSION JOINTS IN EXISTING CURB. MAXIMUM SPACING – 60 FT.
6. EXPANSION JOINTS SHALL BE EITHER (A) 1/4" TO 1/2" PREMOLDED EXPANSION JOINT FILLER PER SEC. 51-1.12 OF THE STANDARD SPECIFICATIONS, OR (B) 2" DEEP SCORED JOINT (WEAKENED PLANE, EXTRUSION MACHINE ONLY).

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD SIDEWALK DETAIL TYPE 2

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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PLATE NO. R-65

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KERN COUNTY PUBLIC WORKS
GROUNDED. BOUNDLESS.

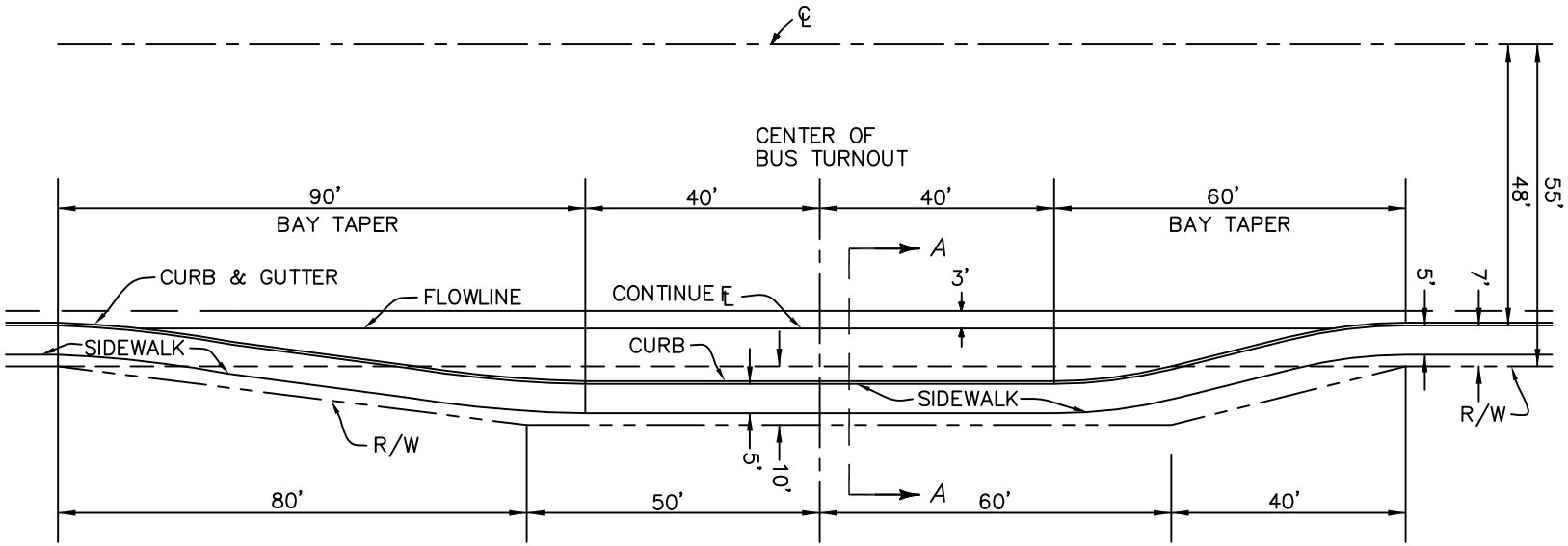
BUS TURNOUT ON ARTERIAL AND COLLECTOR WITH BIKE LANE

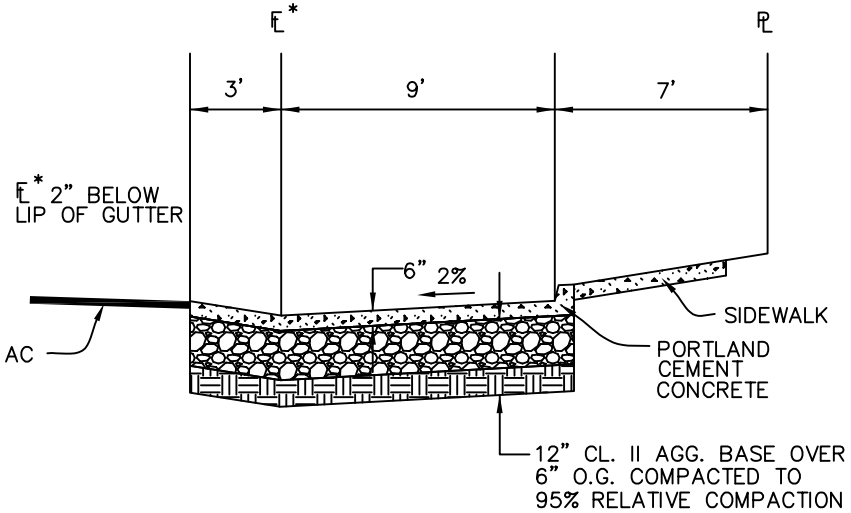
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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APPROVED BY: J.R.C.

PLATE NO. R-66



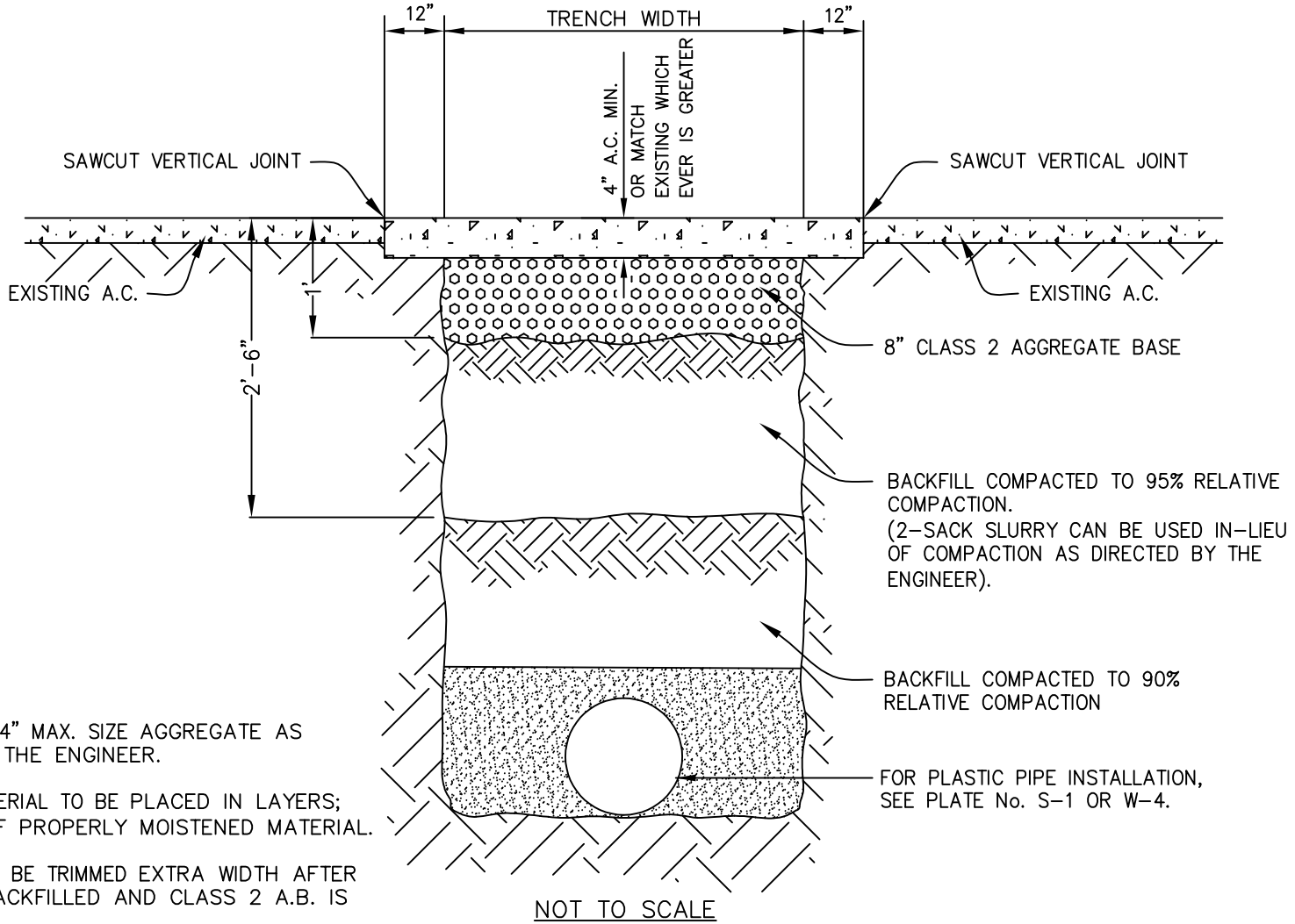


SECTION A–A

NOTE:

1. WITHOUT BIKE LANE, CURB LINE IS 45', WITH 10' TO PROPERTY LINE. ADDITIONAL RIGHT–OF–WAY IS REDUCED FROM 10' TO 7'.
2. FLOWLINE TO EXTEND THROUGH TURNOUT.
3. COMPACT 18 INCHES OF O.G. TO 95% UNDER CONCRETE FOR TURNOUT.
4. CONCRETE FOR TURNOUT TO BE SAME AS FOR C & G.
5. PROVIDE NECESSARY PASSENGER WAITING PAD AND/OR SHELTER AS REQUIRED BY GOLDEN EMPIRE TRANSIT (GET) OR KERN REGIONAL TRANSIT (KRT).

NOT TO SCALE



NOT TO SCALE

NOTES:

1. A.C. TO BE 3/4" MAX. SIZE AGGREGATE AS DIRECTED BY THE ENGINEER.
2. BACKFILL MATERIAL TO BE PLACED IN LAYERS; 8" LAYERS OF PROPERLY MOISTENED MATERIAL.
3. SURFACING TO BE TRIMMED EXTRA WIDTH AFTER TRENCH IS BACKFILLED AND CLASS 2 A.B. IS IN PLACE.
4. ALL WORK TO CONFORM TO CALIF. DEPT. OF TRANS. STANDARD SPECIFICATIONS, CURRENT EDITION, AND AS SHOWN ON THIS SHEET.
5. SAWCUTS SHALL BE MADE PARALLEL OR AT RIGHT ANGLES TO THE CENTERLINE OF THE ROAD.
6. PATCHES LESS THAN 2' FROM EXISTING PATCHES, EDGES OF PAVEMENT, CENTERLINE, LANE LINE, OR GUTTER SHALL BE EXTENDED TO INCLUDE THE INTERMEDIATE ISOLATED STRIP OF EXISTING PAVEMENT.

NOTES: (CONT.)

7. MINIMUM PATCH WIDTH SHALL BE 2' AT ITS SMALLEST DIMENSION UNLESS OTHERWISE APPROVED BY THE ENGINEER.
8. WHEN A POTHOLE OCCURS WITHIN AN EXISTING PATCH, ENTIRE PATCH SHALL BE REPLACED.

KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

BACKFILL REQUIREMENTS ON A/C STREETS

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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PLATE NO. R-67A

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KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

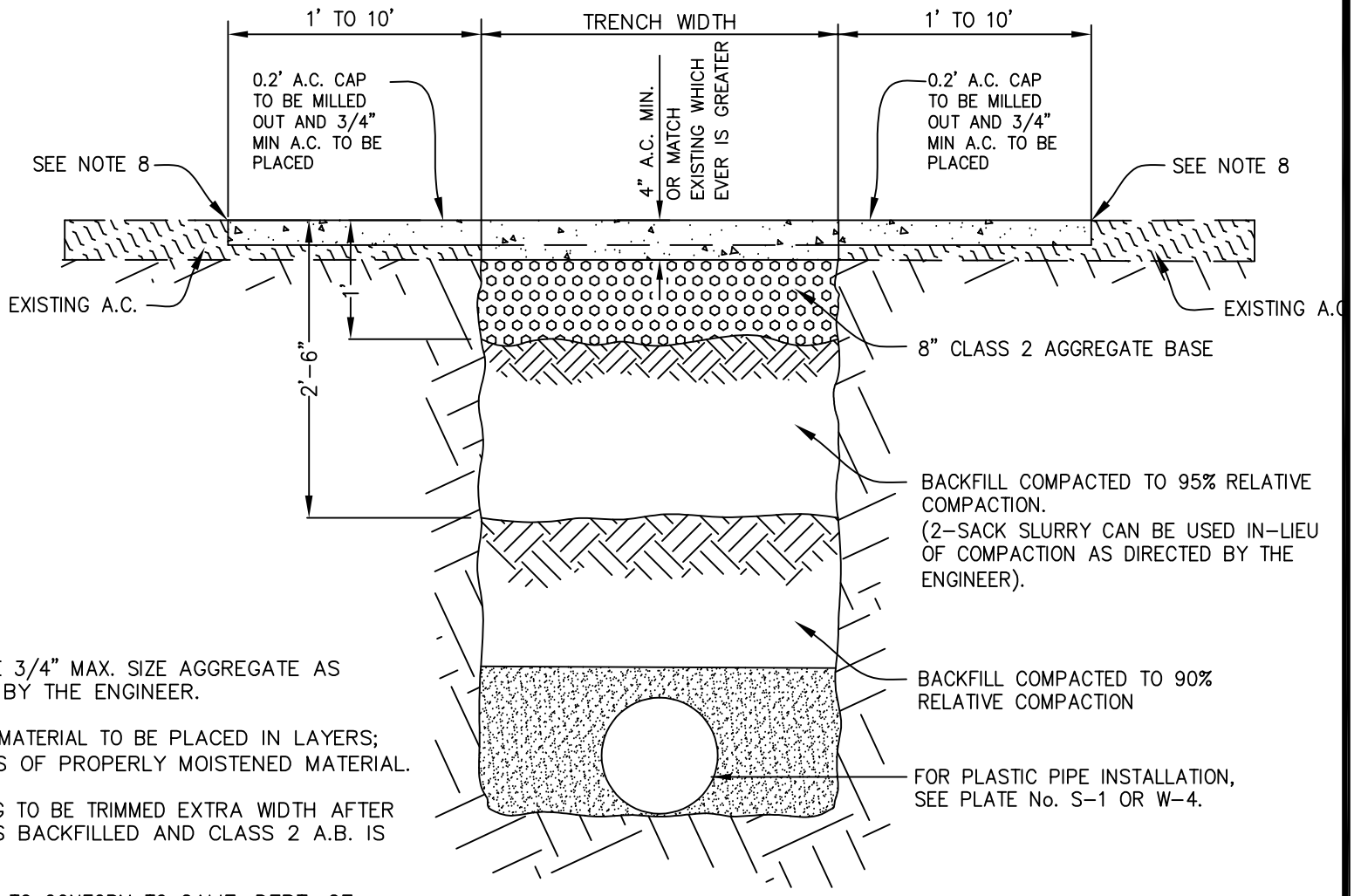
BACKFILL REQUIREMENTS ON A/C STREETS

COUNTY OF KERN
STATE OF CALIFORNIA
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PLATE NO. R-67B



NOT TO SCALE

NOTES:

1. A.C. TO BE 3/4" MAX. SIZE AGGREGATE AS DIRECTED BY THE ENGINEER.
2. BACKFILL MATERIAL TO BE PLACED IN LAYERS; 8" LAYERS OF PROPERLY MOISTENED MATERIAL.
3. SURFACING TO BE TRIMMED EXTRA WIDTH AFTER TRENCH IS BACKFILLED AND CLASS 2 A.B. IS IN PLACE.
4. ALL WORK TO CONFORM TO CALIF. DEPT. OF TRANS. STANDARD SPECIFICATIONS, CURRENT EDITION, AND AS SHOWN ON THIS SHEET.
5. SAWCUTS SHALL BE MADE PARALLEL OR AT RIGHT ANGLES TO THE CENTERLINE OF THE ROAD.
6. PATCHES LESS THAN 2' FROM EXISTING PATCHES, EDGES OF PAVEMENT, CENTERLINE, LANE LINE, OR GUTTER SHALL BE EXTENDED TO INCLUDE THE INTERMEDIATE ISOLATED STRIP OF EXISTING PAVEMENT.

NOTES: (CONT.)

7. MINIMUM PATCH WIDTH SHALL BE 2' AT ITS SMALLEST DIMENSION UNLESS OTHERWISE APPROVED BY THE ENGINEER.
8. WHEN A POTHOLE OCCURS WITHIN AN EXISTING PATCH, ENTIRE PATCH SHALL BE REPLACED.

NOTES:

1. SAWCUTS SHALL BE MADE PARALLEL OR AT RIGHT ANGLES TO THE CENTERLINE OF THE ROAD.
2. PATCHES LESS THAN 2' FROM EXISTING PATCHES, EDGES OF PAVEMENT, OR GUTTER SHALL BE EXTENDED TO INCLUDE THE INTERMEDIATE ISOLATED STRIP OF EXISTING PAVEMENT.
3. MINIMUM PATCH WIDTH SHALL BE 2' AT ITS SMALLEST DIMENSION UNLESS OTHERWISE APPROVED BY THE ENGINEER.
4. WHEN A POTHOLE OCCURS WITHIN AN EXISTING PATCH, ENTIRE PATCH SHALL BE REPLACED.

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

BACKFILL REQUIREMENTS ON R.M.A.S STREETS

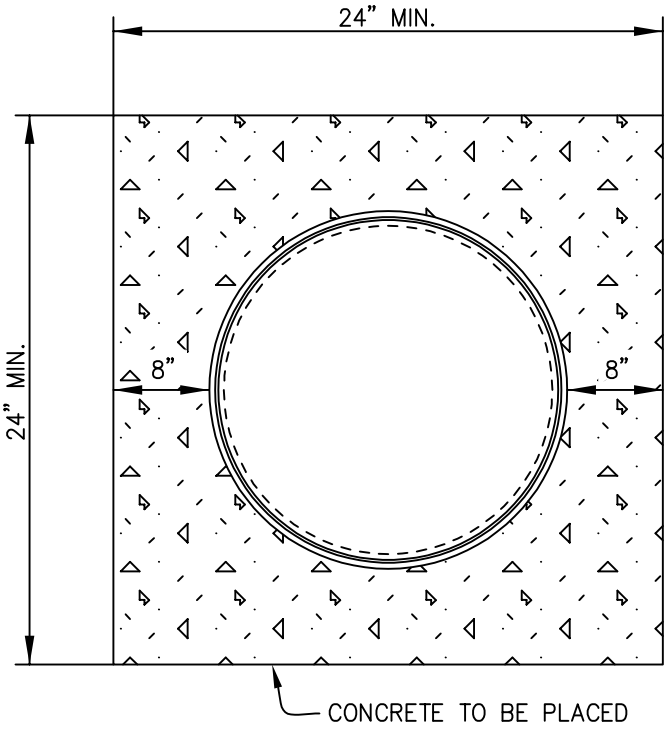
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PLATE NO.
R-68

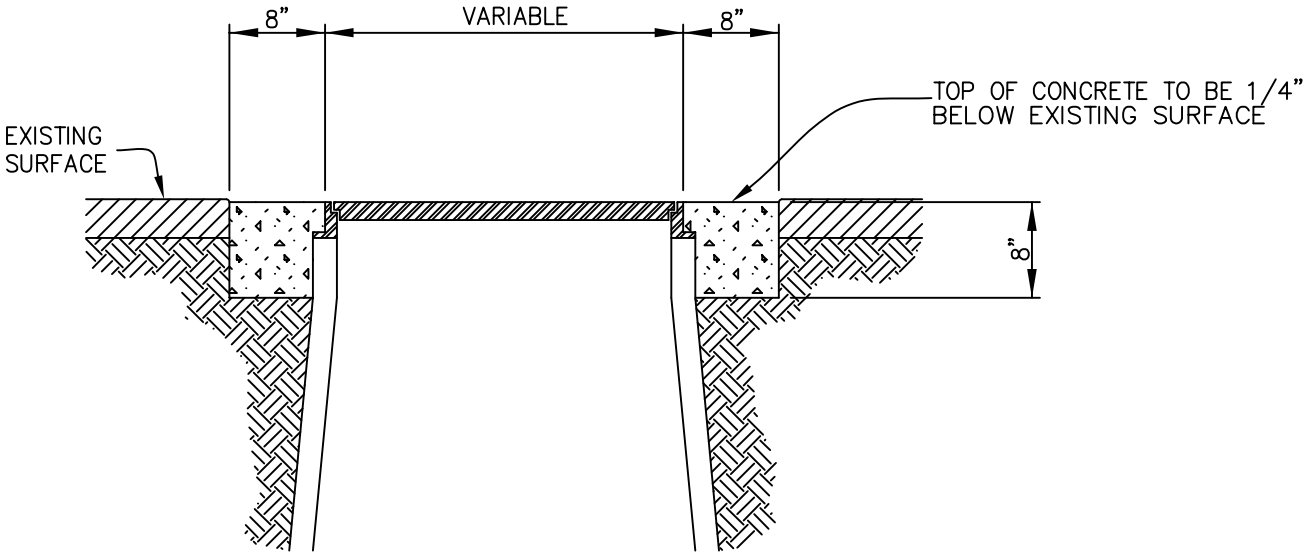
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PLAN

NOTE:

1. CONCRETE SHALL BE EITHER:
   (A) MINOR CONCRETE (MIN. CEMENT CONTENT 505 LB/CU.YD.), WHERE STREET IS NOT COUNTY MAINTAINED OR OPEN TO TRAFFIC FOR 2 WEEKS AFTER PLACING.
   (B) MINOR CONCRETE (MIN. CEMENT CONTENT 590 LB/CU.YD.)WHERE IN EXISTING STREET OR STREET BEING USED BY PUBLIC TRAFFIC.
2. WHEN OUTSIDE OF PAVED SURFACE, TOP OF CONCRETE SHALL BE FLUSH WITH EXISTING SURFACE AS APPROVED BY THE ENGINEER.
3. CONCRETE MAY BE DELETED ON ROAD MIX STREETS UPON APPROVAL OF COUNTY ENGINEER.
4. DIMENSIONS SHOWN TO BE THE SAME FOR ALL SIZES OR TYPES OF OPENINGS ON COUNTY ROADS OR AS MODIFIED TO FIT FIELD CONDITIONS BY ENGINEER.



SECTION

NOT TO SCALE

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

ADJUST COVERS TO GRADE

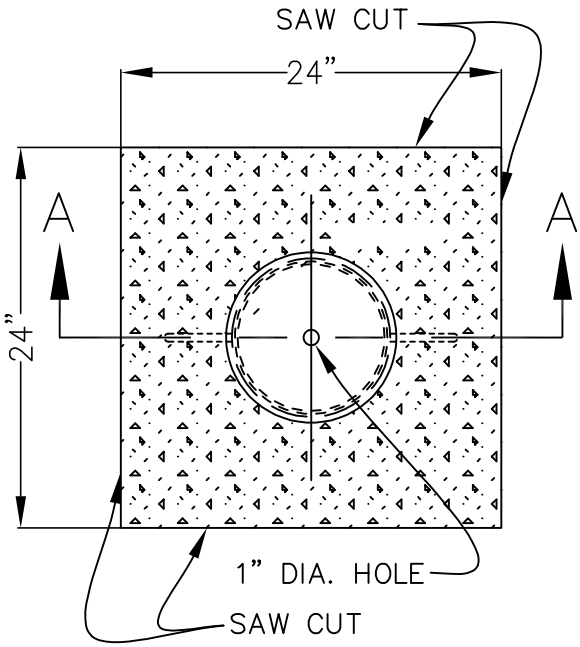
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PLATE NO. R-69

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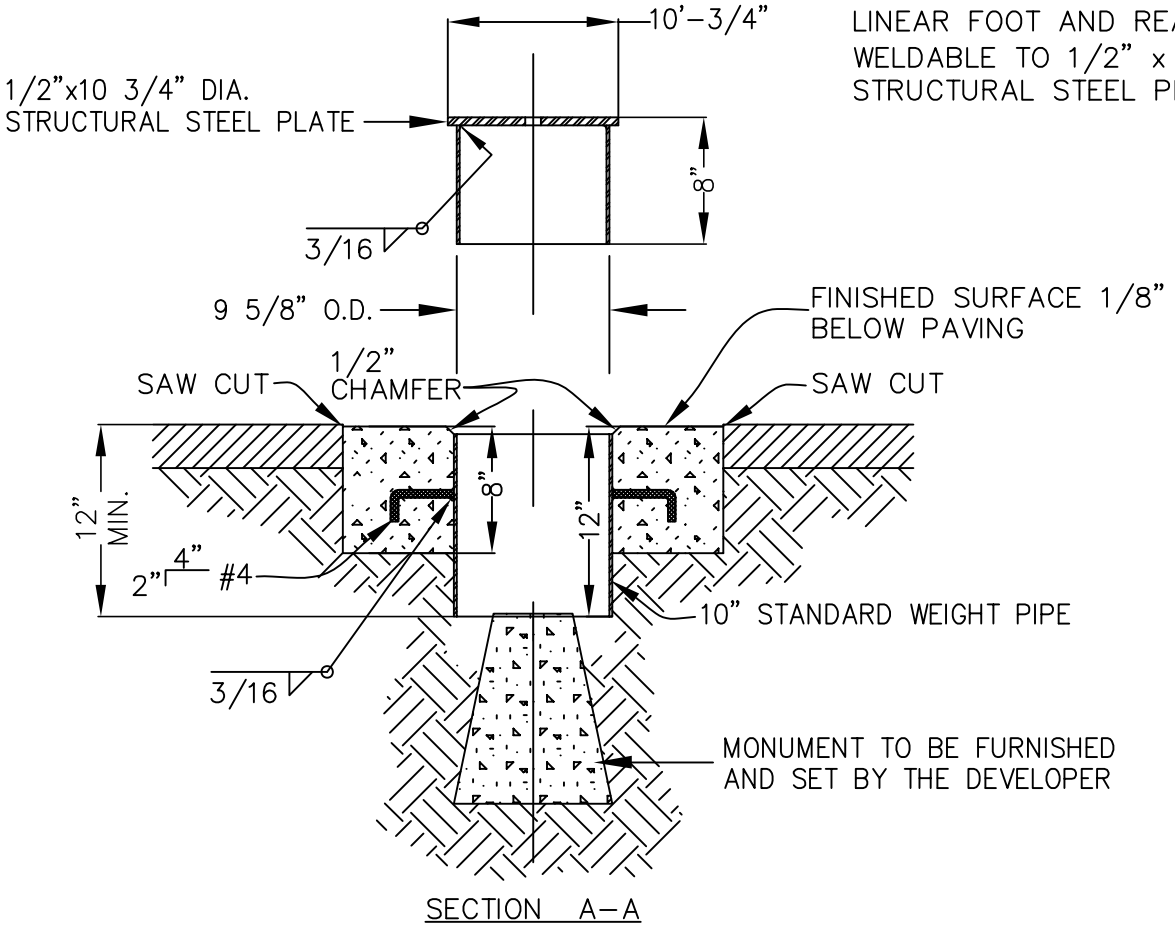


NOTE:

1. CONCRETE SHALL BE EITHER:
   (A) MINOR CONCRETE (MIN. CEMENT CONTENT 505 LB/CU.YD.), WHERE STREET IS NOT COUNTY MAINTAINED OR OPEN TO TRAFFIC FOR 2 WEEKS AFTER PLACING.
   (B) MINOR CONCRETE (MIN. CEMENT CONTENT 590 LB/CU.YD.) WHERE IN EXISTING STREET OR STREET BEING USED BY PUBLIC TRAFFIC.

2. FABRICATE IN ACCORDANCE WITH SECTION 55-1.02E "FABRICATION", OF THE CALIFORNIA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.

3. COVER TO BE 9 5/8" O.D. CASING PIPE WEIGHING AT LEAST 32 LBS. PER LINEAR FOOT AND READILY WELDABLE TO 1/2" x 10 3/4" DIA. STRUCTURAL STEEL PLATE.

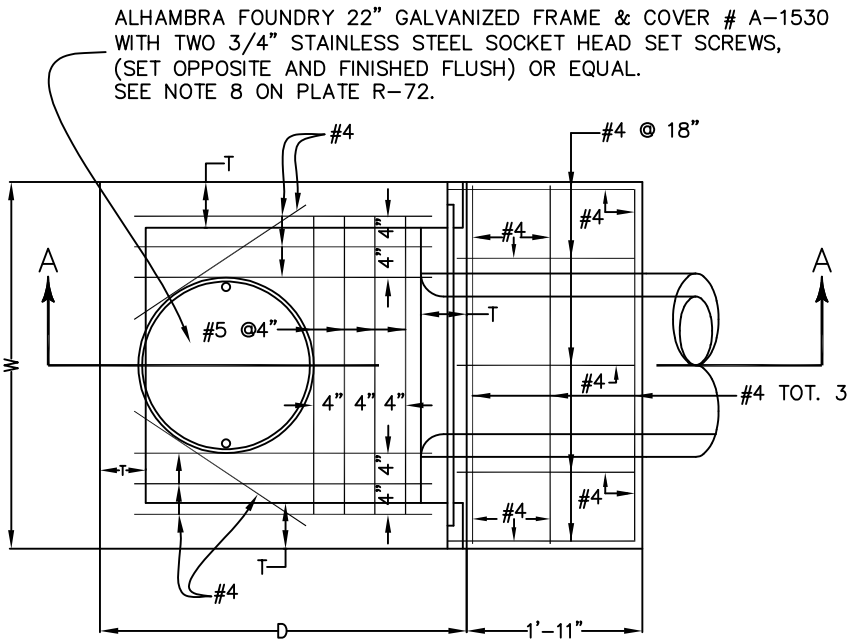


SECTION A-A

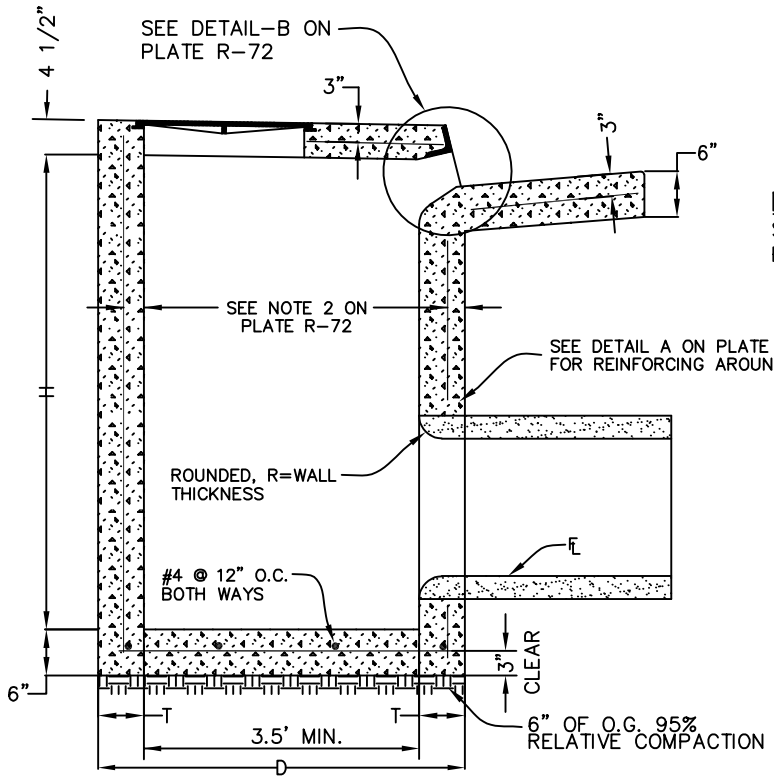
NOT TO SCALE

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS	STANDARD SURVEY MONUMENT ENCASEMENT COUNTY OF KERN STATE OF CALIFORNIA DEVELOPMENT STANDARD	REVISIONS DATE / DESC	DRAFTED BY: R.R.P. DESIGNED BY: J.R.C. DATE DRAFTED: 09/30/23 APPROVED BY: J.R.C.	PLATE NO. R-70

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PLAN



SECTION A-A

NOTE:
SEE PLATE R-72 FOR NOTES PERTAINING TO THIS PLATE.

NOT TO SCALE

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

TYPE "A" MINOR STRUCTURE

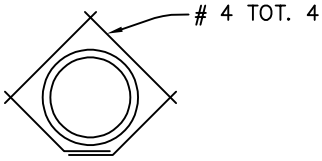
COUNTY OF KERN
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PLATE NO.
R-71

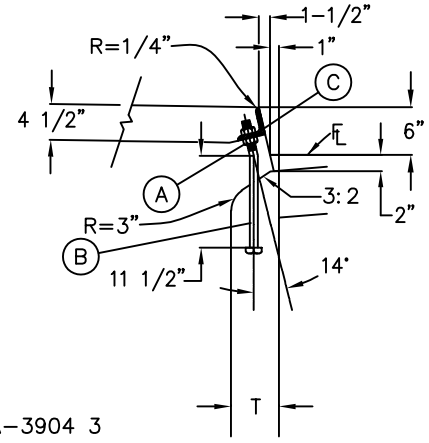
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DETAIL A

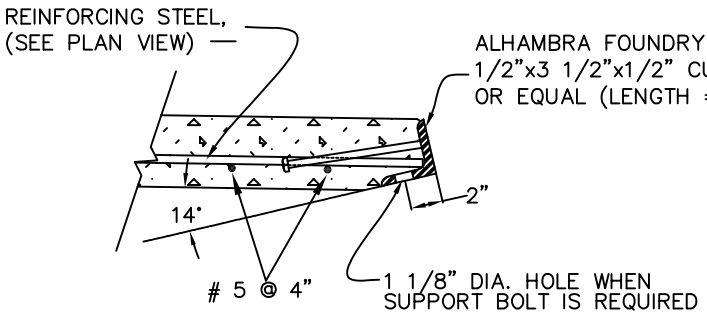
SEE PLATE R-71 FOR PLAN AND SECTIONAL VIEWS

INLET



DETAIL B

SEE PLATE R-71 FOR PLAN AND SECTIONAL VIEWS



CURB ANGLE DETAIL

NOT TO SCALE

A. ADJUSTING NUTS TO BE TIGHTENED AND SECURED IN PLACE WHEN ANGLE IS IN PROPER POSITION.

B. 1"x16" SUPPORT BOLT WITH HEX NUTS. (SEE NOTE 5 & 6)

C. CURB ANGLE, SEE DETAIL THIS SHEET.

NOTES (FOR PLATES R-71 & R-72):

NOTES:

1. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR MINOR CONCRETE (MIN. CEMENT CONTENT 590 LB/CU.YD.) CONCRETE SHALL CONTAIN NO ADDITIVES UNLESS APPROVED PRIOR APPROVAL IS OBTAINED FROM THE COUNTY ENGINEER.

2. WALL REINFORCING NOT REQUIRED WHEN H=8' OR LESS OR THE UNSUPPORTED WIDTH OR LENGTH = 7' OR LESS. WALLS EXCEEDING THESE LIMITS SHALL BE REINFORCED WITH NO. 4 BARS AT 18" CENTERS PLACED 1 1/2" CLEAR TO INSIDE OF BOX UNLESS OTHERWISE SHOWN.

3. ALL EXPOSED METAL PARTS SHALL BE GALVANIZED AFTER FABRICATION.

4. SUPPORT BOLTS SHALL BE INSTALLED WHEN LENGTH OF OPENING EXCEEDS 7'-0" AND SHALL BE SPACED NOT MORE THAN 7'-0" O.C. AND NOT LESS THAN 5'-0" O.C.

5. WHEN STRUCTURE IS LOCATED WITHIN CURB RETURN, THE CURB ANGLE SHALL BE FABRICATED IN CHORD SECTIONS OF EQUAL LENGTH NOT TO EXCEED 4 FEET WITH ONE SUPPORT BOLT AT EACH ANGLE POINT. WHEN "W"=5' THE CURB ANGLE MAY BE FABRICATED STRAIGHT.

NOTES: (CONT.)

6. WALL THICKNESS, T=6" EXCEPT: H > 8', T=8" W > 8', T=8"(FRONT & BACK WALLS ONLY) D > 8', T=8"(SIDE WALLS ONLY)

7. LOCATION OF FRAME AND COVER TO BE DETERMINED BY THE ENGINEER.

8. CAST-IN-PLACE OR PRECAST ALTERNATIVE IS OPTIONAL WITH CONTRACTOR, SEE SECTION 51-7 OF STANDARD SPECIFICATIONS.

9. THE MINIMUM OPENING SHALL BE 3.5 FEET.

10. THE DEPRESSED FLOWLINE SHALL BE TRANSITIONED IN 6 FEET ON UPSTREAM SIDE, AND 3 FEET ON DOWNSTREAM SIDE OF THE INLET.

11. WHEN CURB OPENING EXCEEDS 4 1/2", A PLAIN ROUND STEEL PROTECTION BAR 1" IN DIAMETER SHALL BE INSTALLED. BAR SHALL BE IMBEDDED 5" AT EACH END.

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS

TYPE "A" MINOR STRUCTURE DETAILS

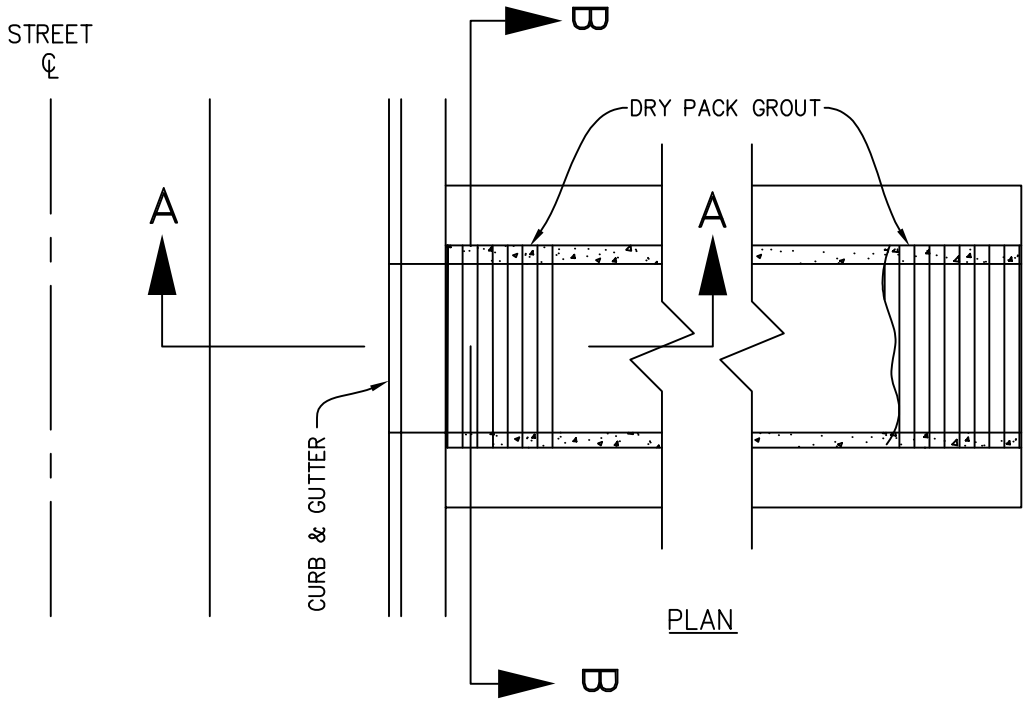
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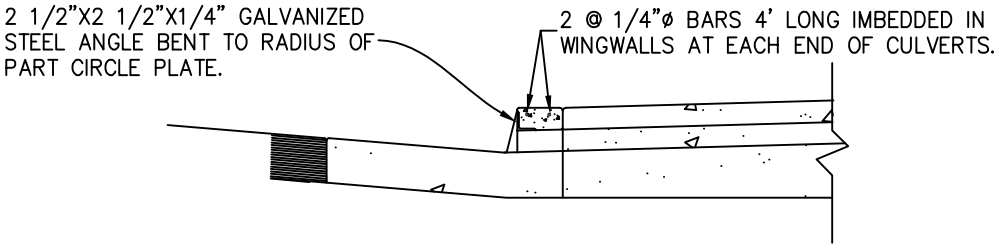
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-72

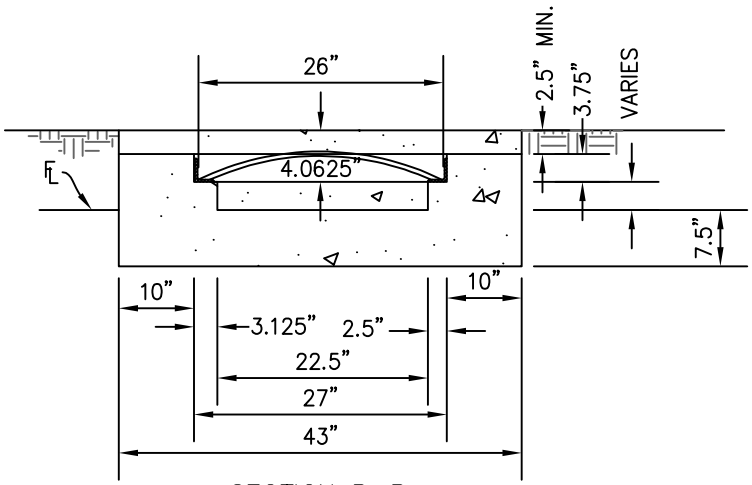
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PLAN



SECTION A–A



SECTION B–B

NOTE:

1. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR MINOR CONCRETE (MIN. CEMENT CONTENT 505 LB/CU.YD.) CONCRETE SHALL CONTAIN NO ADDITIVES UNLESS APPROVED PRIOR APPROVAL IS OBTAINED FROM THE COUNTY ENGINEER.
2. PART CIRCLE CULVERT SHALL BE FABRICATED OF 8 GAUGE CORRUGATED METAL.
3. FOR RUNS LONGER THAN 20', INSTALL AN ALHAMBRA FOUNDARY A–1530 FRAME AND COVER WITH SET SCREWS IN THE MIDDLE OF RUN.
4. PART CIRCLE CULVERT SHALL EXTEND AT LEAST TO THE RIGHT–OF–WAY LINE.

NOT TO SCALE

KERN COUNTY PUBLIC WORKS
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STANDARD 26 INCH PART CIRCLE CULVERT

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DATE DRAFTED: 09/30/23
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PLATE NO. R–73

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KERN COUNTY PUBLIC WORKS
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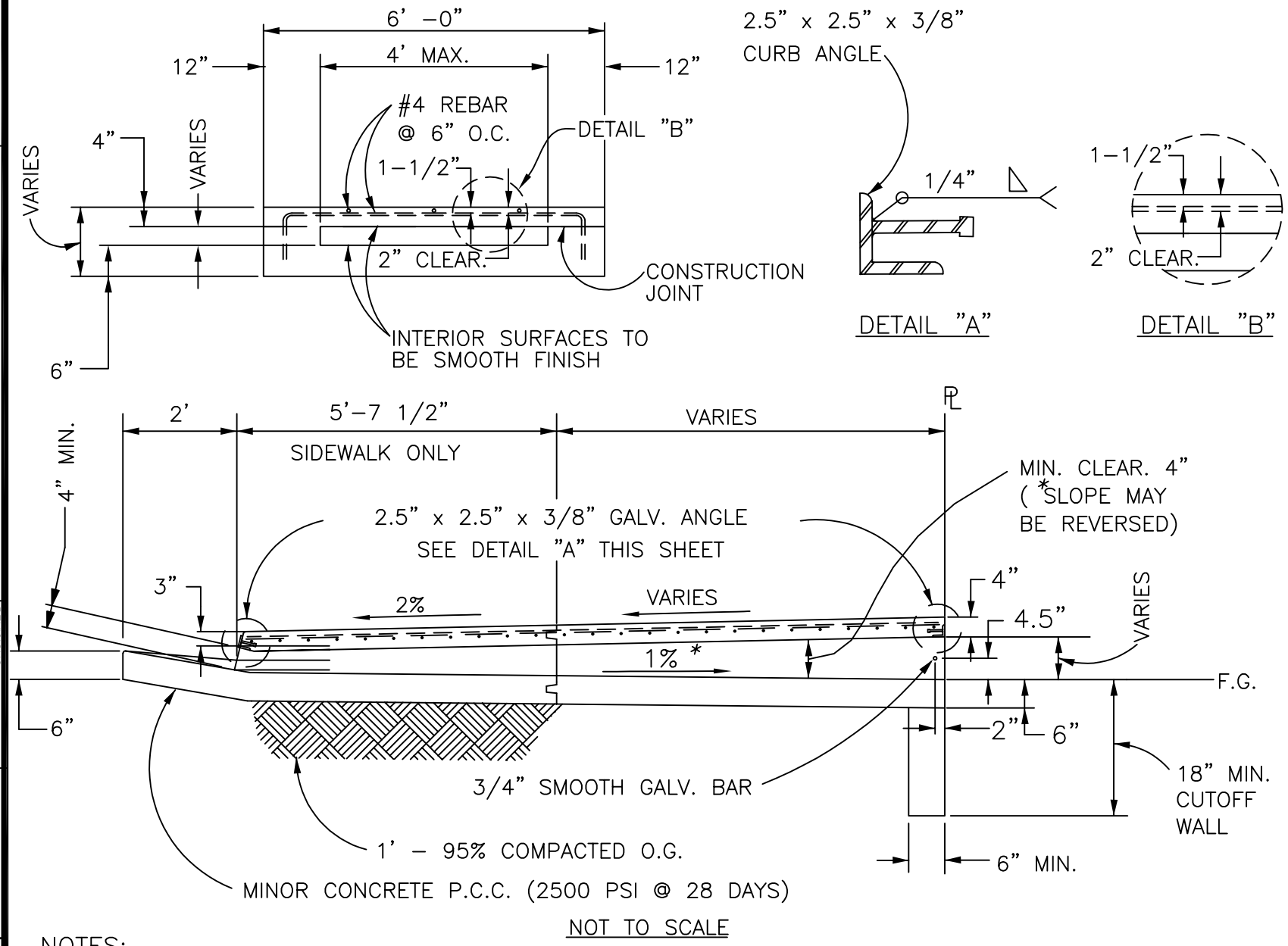
UNDERSIDEWALK DRAIN

COUNTY OF KERN
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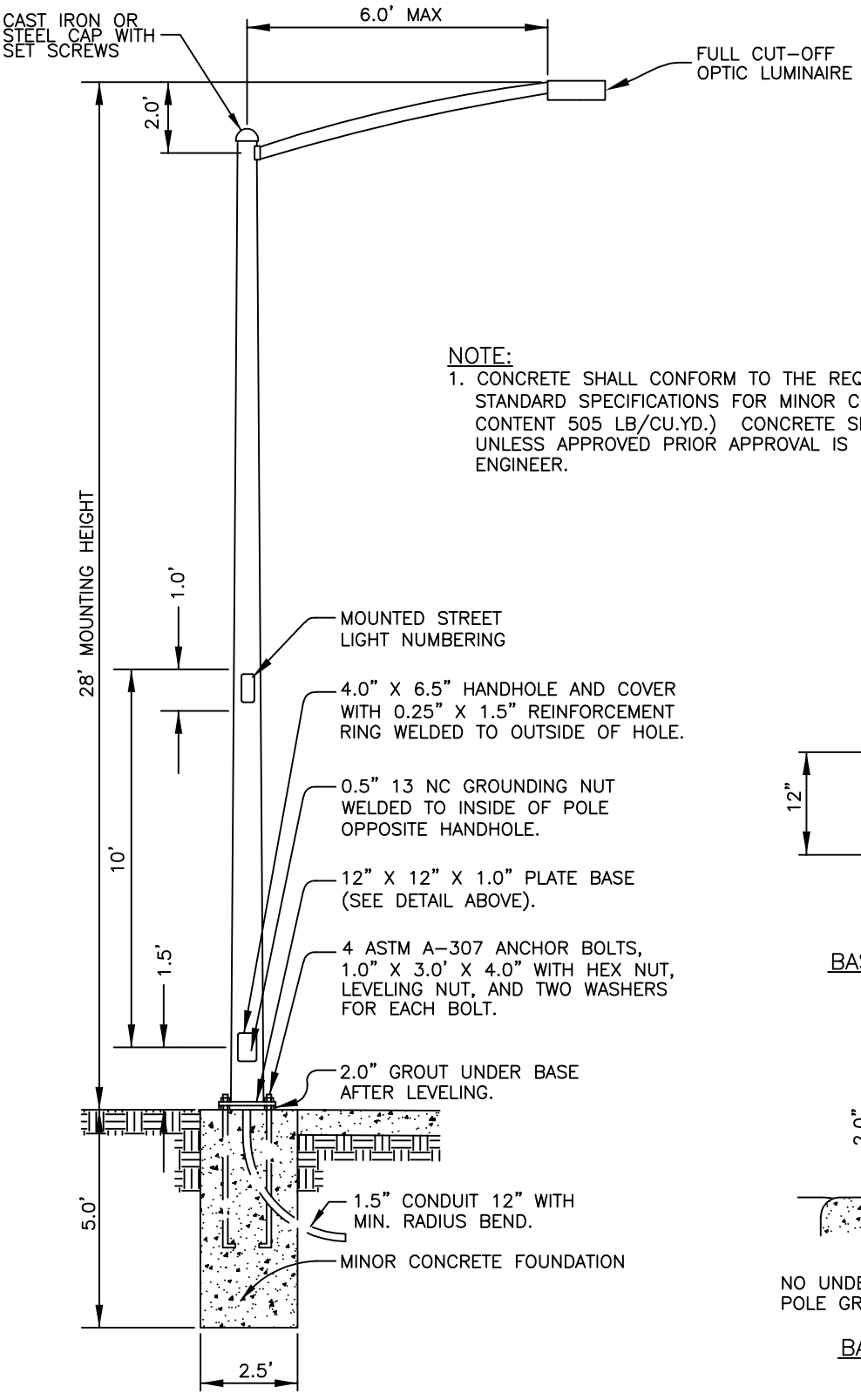
PLATE NO. R-74



NOT TO SCALE

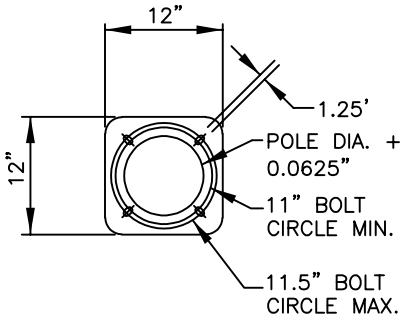
NOTES:

1. UNDERSIDEWALK DRAIN TO EXTEND TO PROPERTY LINE. IF LENGTH IS GREATER THAN 20', INSTALL AN ALHAMBRA FOUNDRY FRAME AND COVER A-1530 WITH TWO 3/4" STAINLESS STEEL SOCKET HEAD SCREWS (SET OPPOSITE AND FINISHED FLUSH) OR EQUAL.
2. CURB ANGLE TO BE GALVANIZED AFTER FABRICATION.

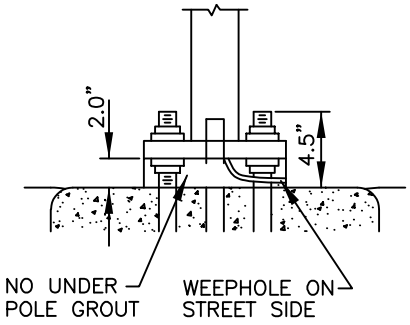


NOTE:

1. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR MINOR CONCRETE (MIN. CEMENT CONTENT 505 LB/CU.YD.) CONCRETE SHALL CONTAIN NO ADDITIVES UNLESS APPROVED PRIOR APPROVAL IS OBTAINED FROM THE COUNTY ENGINEER.



BASE PLATE-PLAN



BASE PLATE-PROFILE

NOT TO SCALE

KERN COUNTY PUBLIC WORKS
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STANDARD STREET LIGHT MAST ARM DETAIL

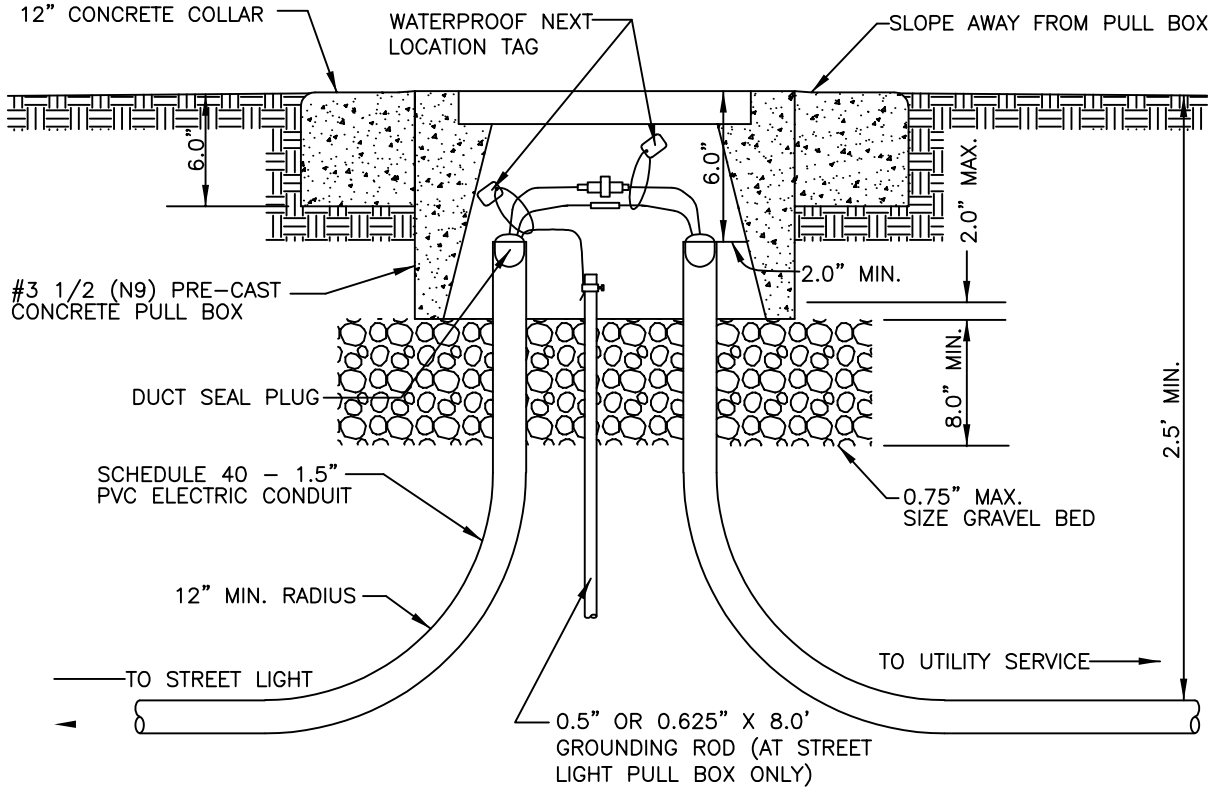
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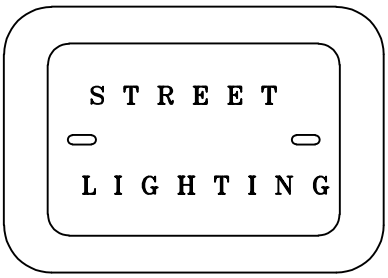
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DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R-75

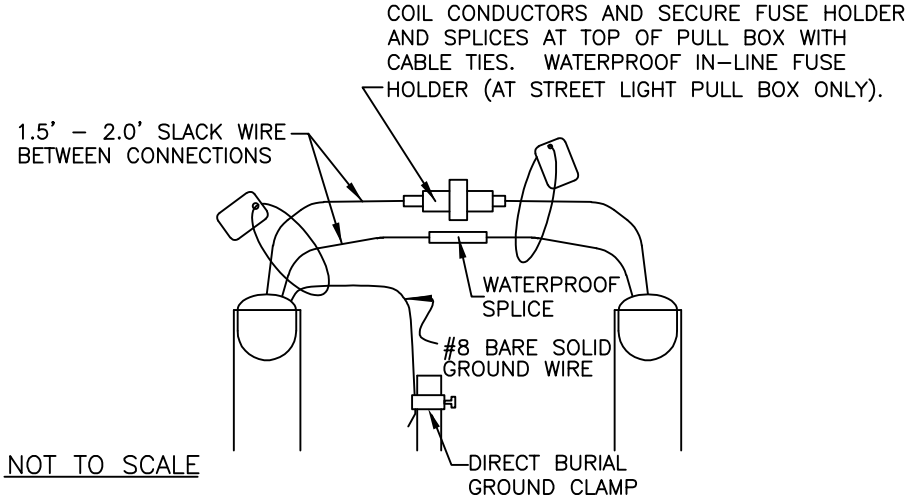
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PULL BOX DETAIL



COVER DETAIL



NOT TO SCALE

INNER BOX DETAIL

NOTES:

1. REMOVE COVER BEFORE PLACING CONCRETE. KEEP INSIDE OF BOX FREE OF OVERSPILL.
2. PULL BOX SHALL BE SIZE 3 1/2 AND SHALL BE LOCATED WITHIN 5.0' OF THE STREET LIGHT AND INSTALLED FLUSH WITH THE SIDEWALK. GRAVEL (0.75" MAX.) SHALL BE PLACED UNDER THE PULL BOX FOR DRAINAGE. PULL BOX COVER SHALL BE MARKED TO IDENTIFY IT AS STREET LIGHTING. PULL BOX SHALL BE PRE CAST CONCRETE.
3. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR MINOR CONCRETE (MIN. CEMENT CONTENT 505 LB/CU.YD.) CONCRETE SHALL CONTAIN NO ADDITIVES UNLESS APPROVED PRIOR APPROVAL IS OBTAINED FROM THE COUNTY ENGINEER.

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS

STREET LIGHT PULL BOX DETAILS

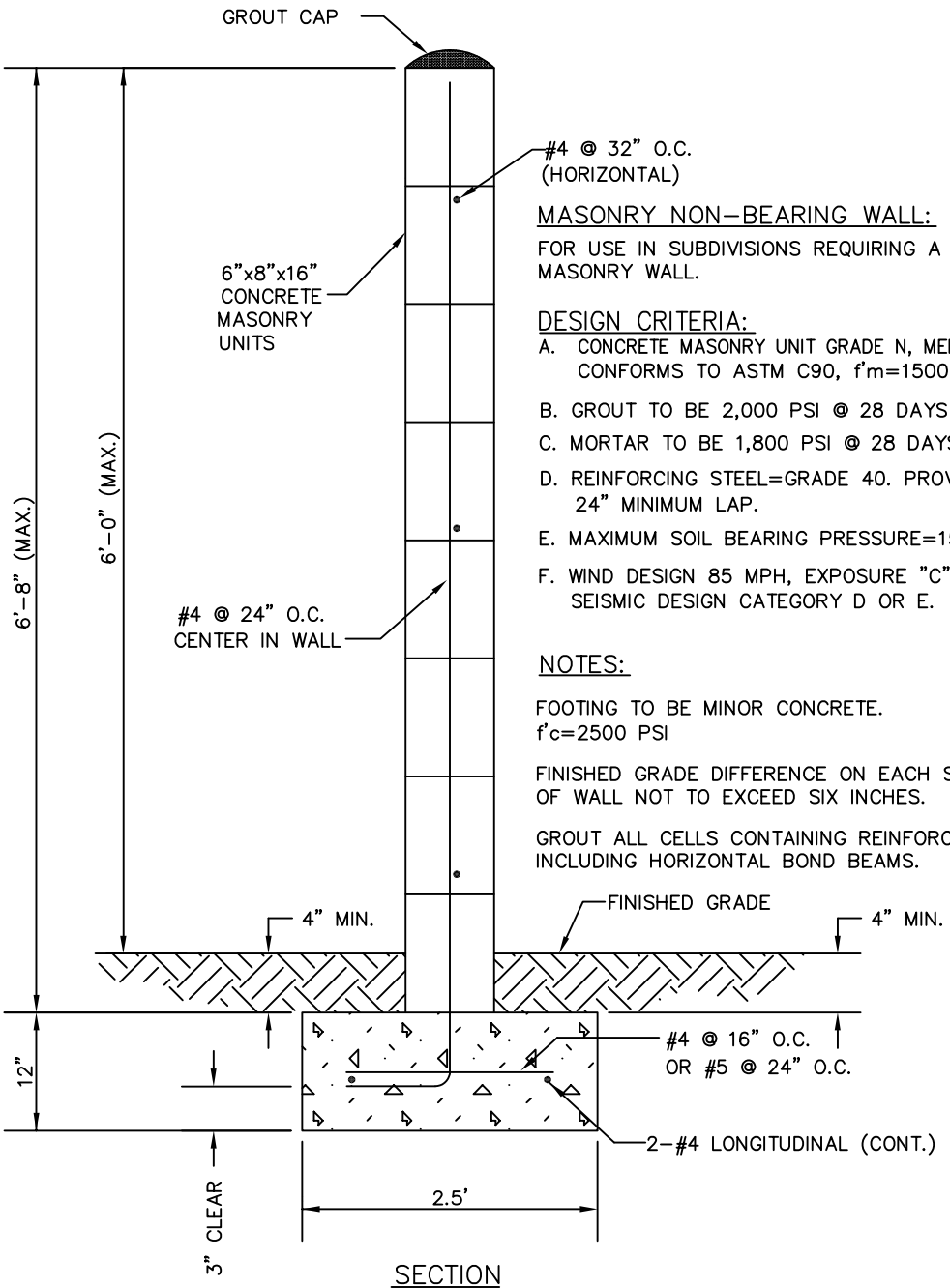
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APPROVED BY: J.R.C.

PLATE NO. R-76

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SECTION

NOT TO SCALE

MASONRY NON-BEARING WALL:

FOR USE IN SUBDIVISIONS REQUIRING A SIX FOOT MASONRY WALL.

DESIGN CRITERIA:

A. CONCRETE MASONRY UNIT GRADE N, MEDIUM WEIGHT CONFORMS TO ASTM C90, f'm=1500 PSI

B. GROUT TO BE 2,000 PSI @ 28 DAYS

C. MORTAR TO BE 1,800 PSI @ 28 DAYS

D. REINFORCING STEEL=GRADE 40. PROVIDE 24" MINIMUM LAP.

E. MAXIMUM SOIL BEARING PRESSURE=1500 PSF.

F. WIND DESIGN 85 MPH, EXPOSURE "C" AND SEISMIC DESIGN CATEGORY D OR E.

NOTES:

FOOTING TO BE MINOR CONCRETE.
f'c=2500 PSI

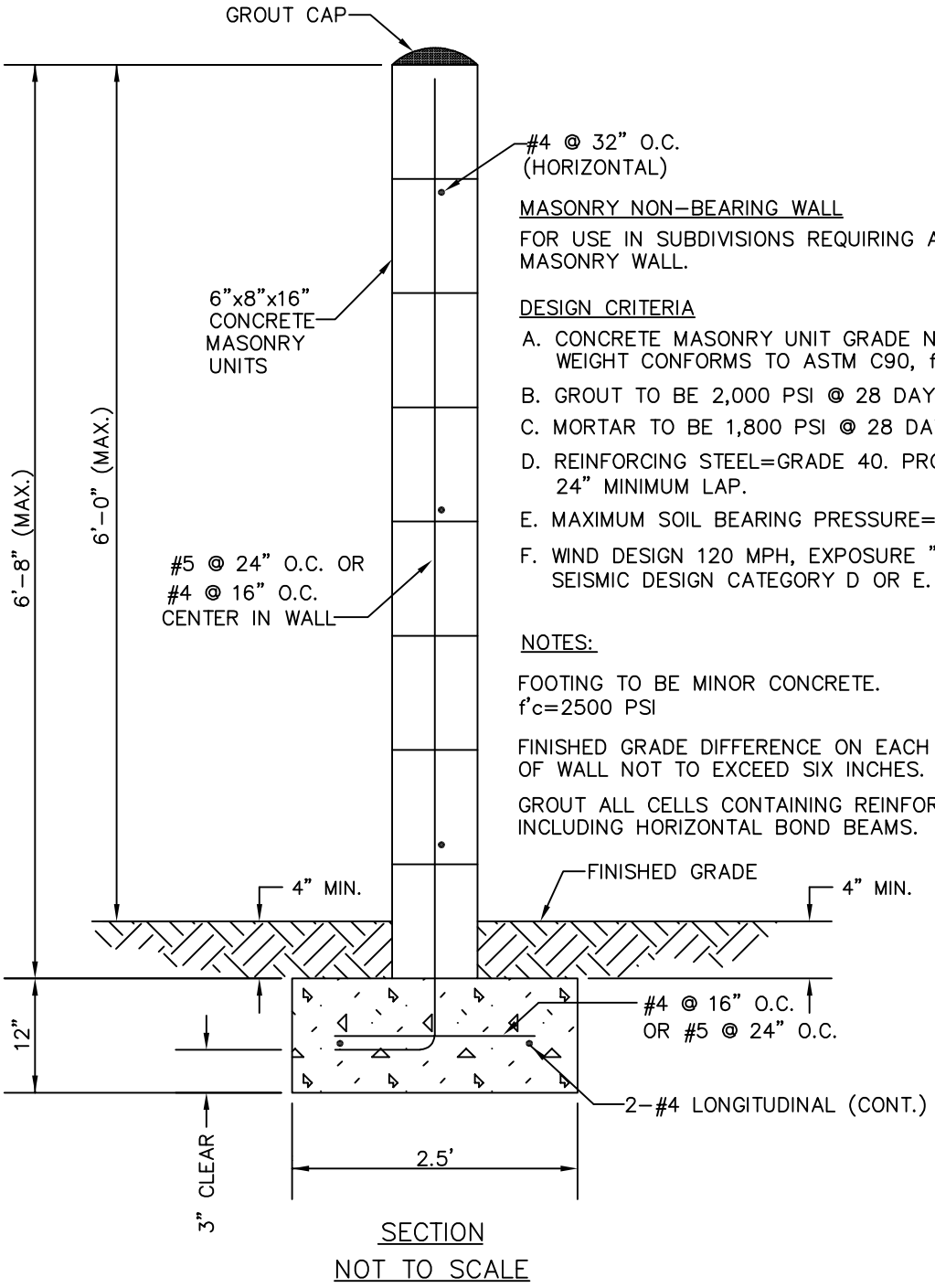
FINISHED GRADE DIFFERENCE ON EACH SIDE OF WALL NOT TO EXCEED SIX INCHES.

GROUT ALL CELLS CONTAINING REINFORCEMENT, INCLUDING HORIZONTAL BOND BEAMS.

95 MPH WIND SPEED
EXPOSURE C
(3-SECOND GUST)
FLAT TERRAIN

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS	MASONRY NON-BEARING WALL	REVISIONS DATE – DESC –	DRAFTED BY: R.R.P.
			DESIGNED BY: J.R.C.
	COUNTY OF KERN STATE OF CALIFORNIA DEVELOPMENT STANDARD		DATE DRAFTED: 09/30/23
			APPROVED BY: J.R.C.
			PLATE NO. R-77

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SECTION

NOT TO SCALE

MASONRY NON-BEARING WALL

FOR USE IN SUBDIVISIONS REQUIRING A SIX FOOT MASONRY WALL.

DESIGN CRITERIA

A. CONCRETE MASONRY UNIT GRADE N, MEDIUM WEIGHT CONFORMS TO ASTM C90, f'm=1500 PSI

B. GROUT TO BE 2,000 PSI @ 28 DAYS

C. MORTAR TO BE 1,800 PSI @ 28 DAYS

D. REINFORCING STEEL=GRADE 40. PROVIDE 24" MINIMUM LAP.

E. MAXIMUM SOIL BEARING PRESSURE=1500 PSF.

F. WIND DESIGN 120 MPH, EXPOSURE "C" AND SEISMIC DESIGN CATEGORY D OR E.

NOTES:

FOOTING TO BE MINOR CONCRETE.
f'c=2500 PSI

FINISHED GRADE DIFFERENCE ON EACH SIDE OF WALL NOT TO EXCEED SIX INCHES.

GROUT ALL CELLS CONTAINING REINFORCEMENT INCLUDING HORIZONTAL BOND BEAMS.

120 MPH WIND SPEED
EXPOSURE C
(3-SECOND GUST)
FLAT TERRAIN

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

MASONRY NON-BEARING WALL

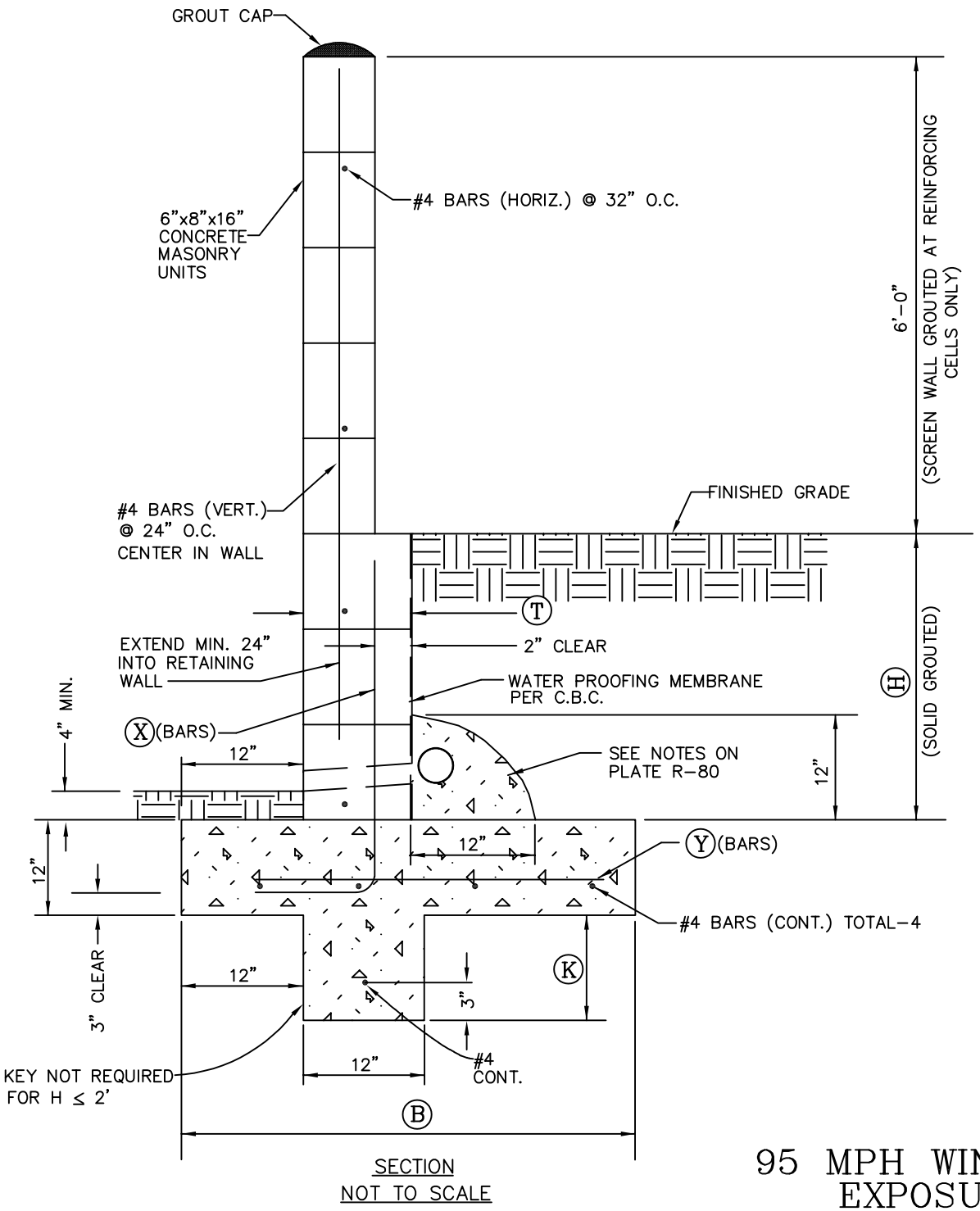
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DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO.
R-78

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SECTION
NOT TO SCALE

95 MPH WIND SPEED
EXPOSURE C
(3-SECOND GUST)
FLAT TERRAIN

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

MASONRY SCREEN / RETAINING WALL COMBINATION 1 OF 2

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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PLATE NO.
R-79

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MASONRY NON-BEARING WALL:
FOR USE IN SUBDIVISIONS REQUIRING A SIX FOOT MASONRY WALL.

95 MPH WIND SPEED EXPOSURE C (3-SECOND GUST) FLAT TERRAIN

DESIGN CRITERIA:

A. SOIL EQUIVALENT FLUID PRESSURE = 45 PCF. ALLOWABLE SOIL BEARING PRESSURE = 1500 PSF.

B. CONCRETE MASONRY UNIT GRADE N, MEDIUM WEIGHT, CONFORMS TO ASTM C90, f'm=1500 PSI.

C. GROUT TO BE 2000 PSI @ 28 DAYS.

D. MORTAR TO BE 1800 PSI @ 28 DAYS.

E. FOOTING TO BE MINOR CONCRETE. f'c=2500 PSI @ 28 DAYS.

F. REINFORCING STEEL TO BE GRADE 40.

G. MAXIMUM SLOPE OF RETAINED AREA SHALL NOT EXCEED 2%.

H. IF RETAINING HEIGHT EXCEEDS 2', PROVIDE 4" PERFORATED PVC DRAIN LINE WITH A MINIMUM OF 1 CUBIC FOOT PER FOOT COMPACTED 1/2" GRAVEL BETWEEN WALL. PROVIDE 1 1/2" WEEP HOLE AT 100' O.C. MAXIMUM OR AT EACH PROPERTY LINE, WHICH EVER IS CLOSER OR OMIT HEAD JOINT IN 1ST COURSE @ 32" O.C. MAXIMUM FOR WEEP HOLE.

I. MINIMUM SET BACK FOR STRUCTURES FROM WALL (RETAINED SIDE) IS "H" PLUS 2'.

NOTE:
CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR MINOR CONCRETE (MIN. CEMENT CONTENT 505 LB/CU.YD.) CONCRETE SHALL CONTAIN NO ADDITIVES UNLESS APPROVED PRIOR APPROVAL IS OBTAINED FROM THE COUNTY ENGINEER.

RETAINING HEIGHT (H)	WALL THICKNESS (T)	KEY DEPTH (K)	FOOTING WIDTH (B)	(X)(BARS)	(Y)(BARS)
0.5' – 2'	8"	–	2'-6"	#4 @ 24" O.C.	#4 @ 16" O.C. OR #5 @ 24" O.C.
2' – 4'	8"	12"	3'-3"	#4 @ 8" O.C. OR #5 @ 16" O.C.	#4 @ 16" O.C. OR #5 @ 24" O.C.
4' – 6'	12"	16"	5'-3"	#4 @ 8" O.C. OR #5 @ 16" O.C.	#4 @ 12" O.C. OR #5 @ 24" O.C.

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

MASONRY SCREEN / RETAINING WALL COMBINATION 2 OF 2

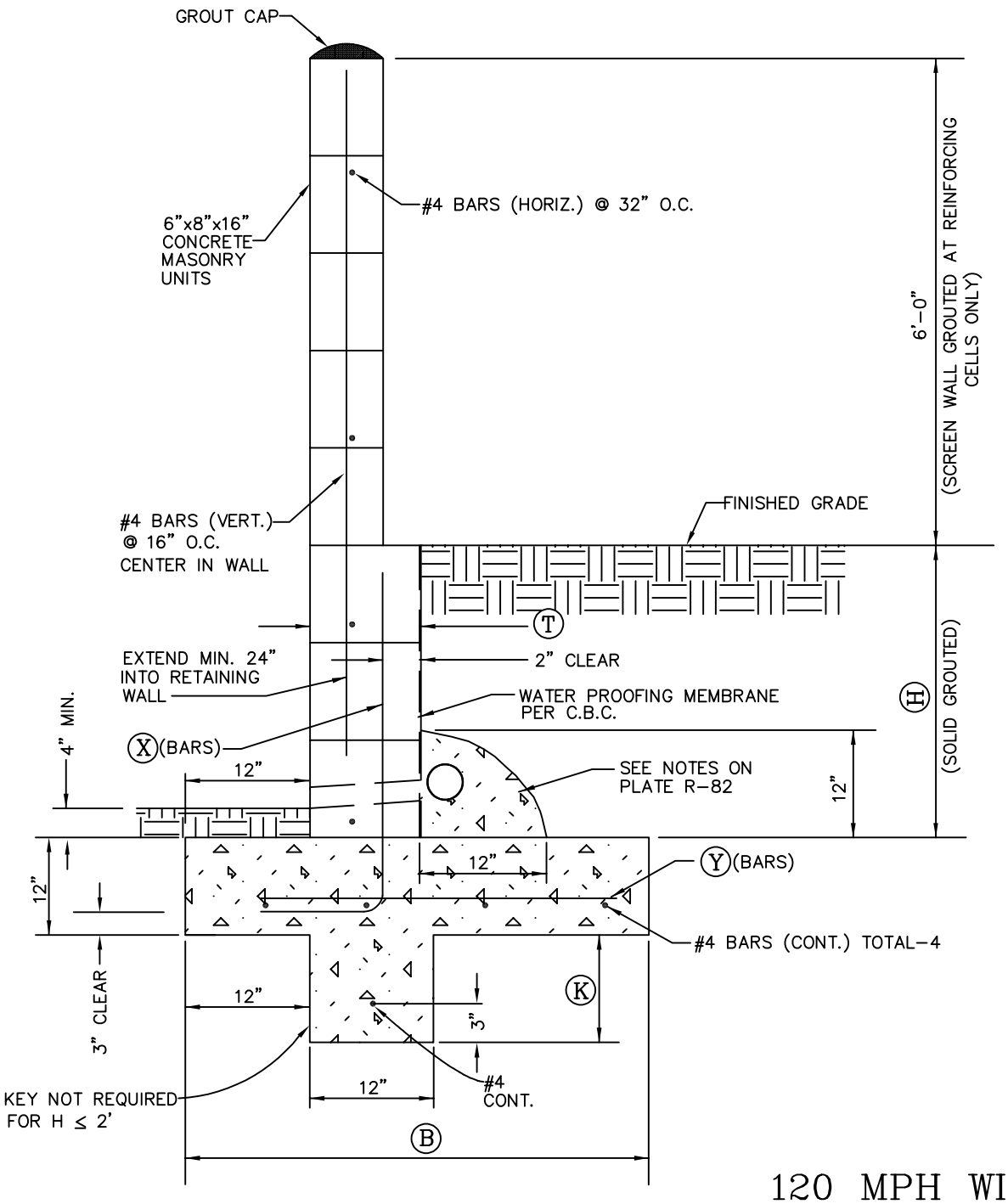
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DESIGNED BY: J.R.C.
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PLATE NO. R-80

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SECTION
NOT TO SCALE

120 MPH WIND SPEED
EXPOSURE C
(3-SECOND GUST)
FLAT TERRAIN

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

MASONRY SCREEN / RETAINING WALL COMBINATION 1 OF 2

COUNTY OF KERN
STATE OF CALIFORNIA
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PLATE NO.
R-81

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120 MPH WIND SPEED
EXPOSURE C
(3-SECOND GUST)
FLAT TERRAIN

MASONRY NON-BEARING WALL:
FOR USE IN SUBDIVISIONS REQUIRING A SIX FOOT MASONRY WALL.

DESIGN CRITERIA:

A. SOIL EQUIVALENT FLUID PRESSURE = 45 PCF. ALLOWABLE SOIL BEARING PRESSURE = 1500 PSF.

B. CONCRETE MASONRY UNIT GRADE N, MEDIUM WEIGHT, CONFORMS TO ASTM C90, f'm=1500 PSI.

C. GROUT TO BE 2000 PSI @ 28 DAYS.

D. MORTAR TO BE 1800 PSI @ 28 DAYS.

E. FOOTING TO BE MINOR CONCRETE. f'c=2500 PSI @ 28 DAYS.

F. REINFORCING STEEL TO BE GRADE 40.

G. MAXIMUM SLOPE OF RETAINED AREA SHALL NOT EXCEED 2%.

H. IF RETAINING HEIGHT EXCEEDS 2', PROVIDE 4" PERFORATED PVC DRAIN LINE WITH A MINIMUM OF 1 CUBIC FOOT PER FOOT COMPACTED 1/2" GRAVEL BETWEEN WALL. PROVIDE 1 1/2" WEEP HOLE AT 100' O.C. MAXIMUM OR AT EACH PROPERTY LINE, WHICH EVER IS CLOSER OR OMIT HEAD JOINT IN 1ST COURSE @ 32" O.C. MAXIMUM FOR WEEP HOLE.

I. MINIMUM SET BACK FOR STRUCTURES FROM WALL (RETAINED SIDE) IS "H" PLUS 2'.

NOTE:
CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR MINOR CONCRETE (MIN. CEMENT CONTENT 505 LB/CU.YD.) CONCRETE SHALL CONTAIN NO ADDITIVES UNLESS APPROVED PRIOR APPROVAL IS OBTAINED FROM THE COUNTY ENGINEER.

RETAINING HEIGHT (H)	WALL THICKNESS (T)	KEY DEPTH (K)	FOOTING WIDTH (B)	(X)(BARS)	(Y)(BARS)
0.5' – 2'	8"	–	3'-0"	#4 @ 16" O.C.	#4 @ 16" O.C. OR #5 @ 24" O.C.
2' – 4'	8"	12"	3'-6"	#4 @ 8" O.C. OR #5 @ 16" O.C.	#4 @ 16" O.C. OR #5 @ 24" O.C.
4' – 6'	12"	16"	5'-6"	#4 @ 8" O.C. OR #5 @ 16" O.C.	#4 @ 12" O.C. OR #5 @ 24" O.C.

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

MASONRY SCREEN / RETAINING WALL COMBINATION 2 OF 2

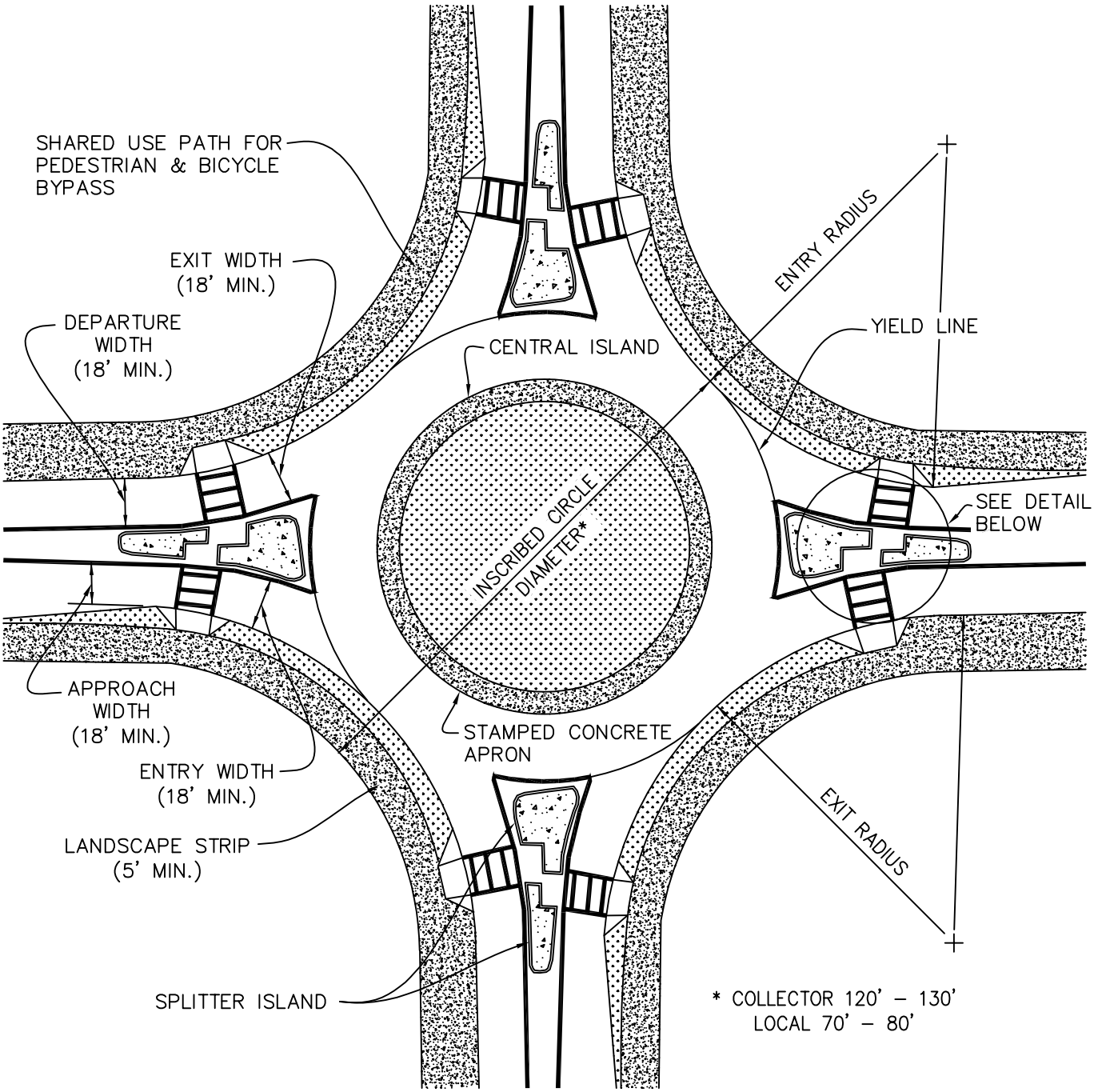
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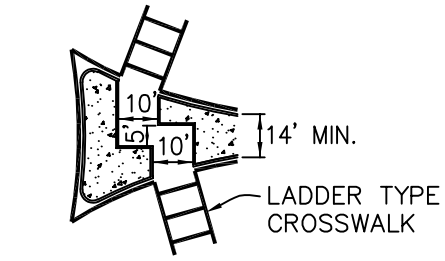
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NOT TO SCALE



CROSSWALK SPLITTER ISLAND DETAIL

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

TYPICAL ROUNDABOUT STANDARDS

COUNTY OF KERN
STATE OF CALIFORNIA
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. R–83A

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NOTES:

1. PROPOSED USE OF ROUNDABOUT INTERSECTIONS IS SUBJECT TO APPROVAL OF THE PUBLIC WORKS DIRECT.

2. EACH PROPOSAL SHALL BE DEVELOPED IN ACCORDANCE WITH THE NATIONAL COOPERATIVE RESEARCH PROGRAM (NCHRP) REPORT 672 (REPORT), CURRENT EDITION AND THE CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS) HIGHWAY DESIGN MANUAL (HDM), SECTION 405.10 (ROUNDABOUTS), CURRENT EDITION AND THESE STANDARDS.

3. THE REPORT WILL GOVERN WHERE THERE ARE DIFFERENCES WITH THE HDM. THESE STANDARDS WILL GOVERN OVER BOTH HDM AND REPORT.

4. ONLY SINGLE LANE ROUNDABOUTS WILL BE ALLOWED AND PERMITTED UNDER THE FOLLOWING CONDITIONS:
   A. COLLECTOR–COLLECTOR INTERSECTIONS WHERE NEITHER STREETS BUILD–OUT VOLUME EXCEEDS 10,000 VEHICLES PER DAY.
   B. LOCAL STREET INTERSECTION ON LOCAL COLLECTOR STREETS, AT A SPACING OF NO CLOSER THAN EVERY OTHER INTERSECTION.
   C. PEAK HOUR APPROACH VOLUMES WILL NOT EXCEED 80% OF APPROACH CAPACITY.
   D. PEAK HOUR EXIT VOLUMES WILL NOT EXCEED 80% OF EXIT CAPACITY.

5. GEOMETRIC DESIGN FOR ROUNDABOUTS SHALL BE DESIGNED TO INCLUDE THE FOLLOWING PARAMETERS:
   A. DESIGN SHALL ACCOMMODATE THE MORE RESTRICTIVE OF EITHER THE LARGEST COUNTY FIRE TRUCK CURRENTLY IN USE OR THE WB–50 DESIGN VEHICLE. WHEEL PATH PLOTS SHALL BE PROVIDED.
   B. TYPICALLY CROSS SECTIONS AND TRAVERSABLE CONCRETE TRUCK APRONS SHALL BE IN ACCORDANCE WITH EXHIBITS 6–76 THROUGH 6–78 OF THE REPORT.
   C. MAXIMUM DESIGN SPEED SHALL BE IN ACCORDANCE WITH THE REPORT. (EXCEPTION: COLLECTORS SHALL BE 20 MPH AND ON LOCAL STREETS SHALL BE 5 MPH).
   D. STOPPING SIGHT DISTANCE SHALL BE IN ACCORDANCE WITH THE REPORT AND THE COUNTY STANDARDS. PLOTS OF SIGHT LINE VIEW SHEDS SHALL BE PROVIDED.
   E. BICYCLE ENTRY RAMP AND SHARED USE PATH SHALL BE PROVIDED ON COLLECTOR STREETS IN ACCORDANCE WITH THE REPORT TO PROVIDE FOR CYCLISTS WHO PREFER NOT USE THE CIRCULATORY ROADWAY. IN ALL CASES, ENTRY, EXIT, AND CIRCULATORY, ROADWAY WIDTH SHALL BE SHARABLE AND SUFFICIENT TO ACCOMMODATE CYCLISTS.
   F. TRANSITIONS FROM STANDARD STREET WIDTHS TO AND FROM THE APPROACHES SHALL BE IN ACCORDANCE THE COUNTY AND THE HDM GEOMETRIC DESIGN STANDARDS.

6. SIGINING, STRIPING, AND MARKING SHALL BE IN ACCORDANCE WITH THE CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CAMUTCD).

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TYPICAL ROUNDABOUT STANDARDS

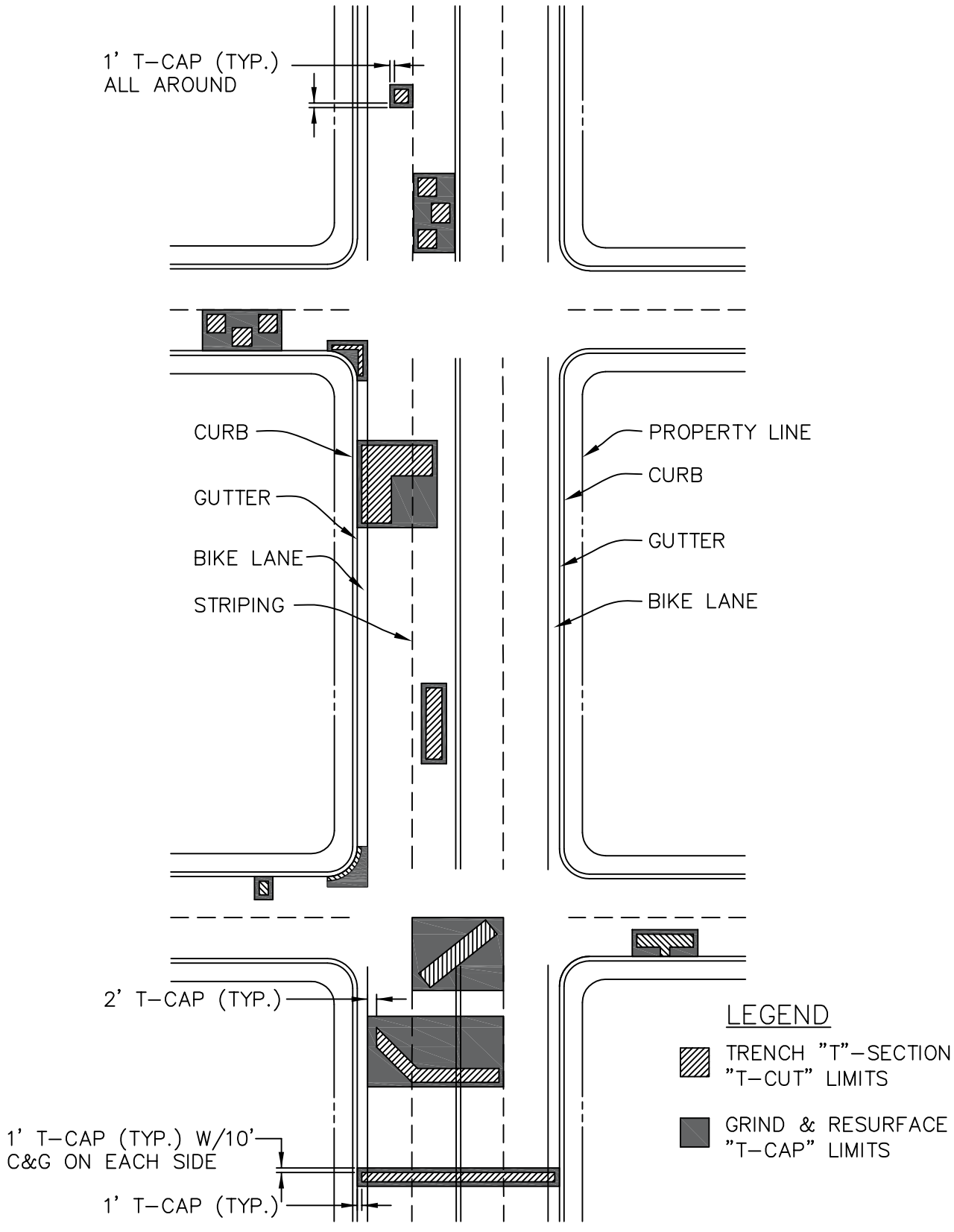
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DATE DRAFTED: 09/30/23
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GRIND AND RESURFACE "T-CAP" LIMITS

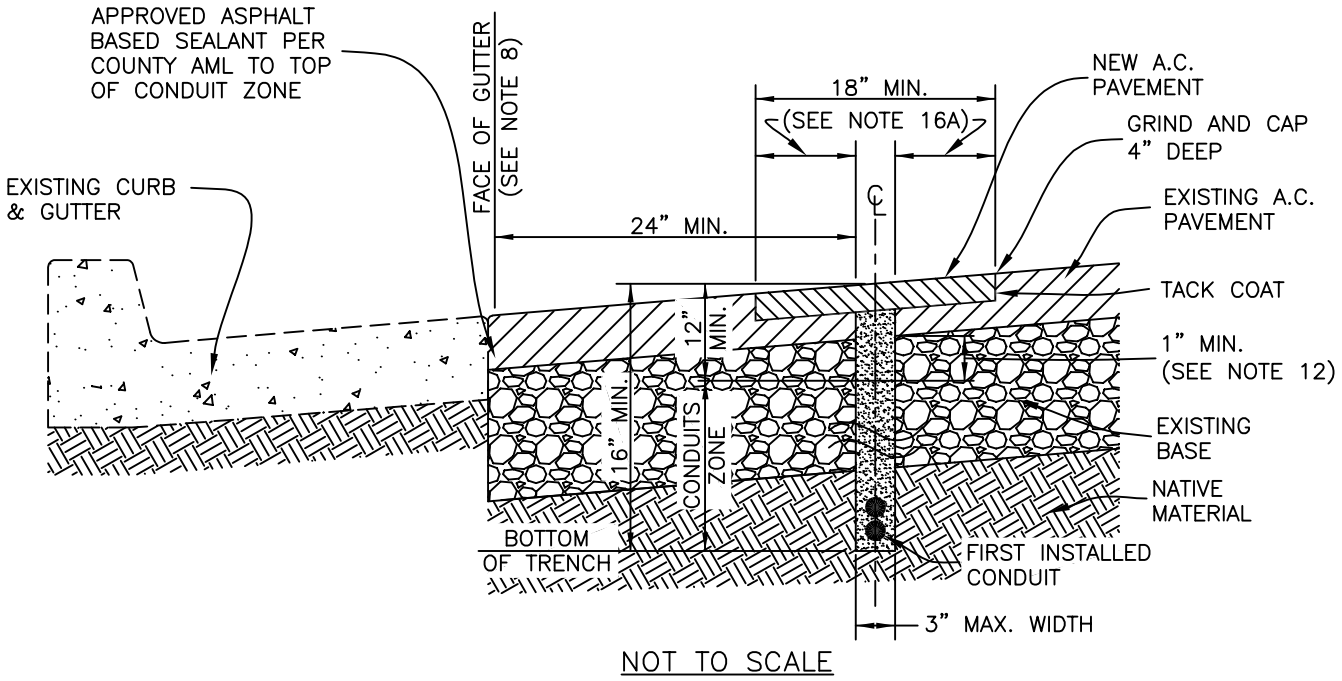
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DATE DRAFTED: 09/30/23
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NOTES:

1. MICRO–TRENCHING SHALL ONLY BE USED TO INSTALL TELECOMMUNICATION CONDUITS.
2. MICRO–TRENCHING SHALL NOT BE ALLOWED IN CONCRETE PAVED STREETS, NOR SIDEWALKS, PARKWAYS, CURBS, AND GUTTERS.
3. THE CONTRACTOR SHALL IDENTIFY ALL EXISTING UTILITIES, INCLUDING SERVICE CONNECTIONS IN THE FIELD. THE CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT (U.S.A.) AT LEAST 48 HOURS PRIOR TO START OF WORK AT 8–1–1, OR TOLL–FREE AT 1–800–422–4133. THE CONTRACTOR SHALL FURTHER SUPPLEMENT THE FINDINGS OF U.S.A. TO DETERMINE THE EXACT LOCATIONS AND DEPTHS OF ALL UTILITIES BY USING A MOBILE GROUND PENETRATING RADAR SYSTEM. THE CONTRACTOR SHALL POTHOLE ALL CROSSING UTILITIES AND PARALLEL UTILITIES WITHIN 18–INCHES OF THE PROPOSED ALIGNMENT TO A DEPTH OF 6–INCHES BELOW THE BOTTOM OF THE MICRO–TRENCH, TO DETERMINE THE EXISTING UTILITY ALIGNMENT AND ELEVATION. POTHOLES SHALL BE IMMEDIATELY BACKFILLED AND COMPACTED IN ACCORDANCE WITH THE SPECIFICATIONS OR RESTORED AS DIRECTED BY THE ENGINEER.
4. IF EXISTING UTILITIES ARE DAMAGED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE INSPECTOR, ENGINEER AND UTILITY OWNER TO PERFORM THE REPAIRS PROMPTLY ACCORDING TO THEIR REQUIREMENTS AND PER ASSOCIATED CITY PERMITS.
5. THE FOLLOWING ITEMS SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER FOR APPROVAL:

   A. PROVIDE A DETAILED SITE PLAN PER THE LATEST EXCAVATION "U" PERMIT CHECKLIST FOUND IN THE DEVELOPMENT SERVICES PROCEDURES MANUAL.

   B. A STREET CROSS–SECTION THAT INCLUDES THE FOLLOWING INFORMATION:

      (1) THE CURB AND GUTTER, ASPHALT CONCRETE (A.C.) ROADWAY APPROXIMATE THICKNESS, BASE, DEPTH AND WIDTH OF MICRO–TRENCH, DEPTH OF TOPMOST CONDUIT, DISTANCES OF MICRO–TRENCH TO FACE OF GUTTER, CURB, CONCRETE PAVEMENT OR STRUCTURE AS APPLICABLE, AND BACKFILL MATERIAL.

      (2) A.C. REINSTATEMENT INCLUDING WIDTH AND DEPTH OF GRIND AND CAP, STARTING FROM GUTTER FACE, CURB, SLAB OR STRUCTURE AS APPLICABLE.

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MICRO-TRENCH BACKFILL FOR DRY UTILITIES

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DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

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NOTES (CONT.):

C. DETAIL SHOWING CONDUIT FROM MAIN MICRO–TRENCH ALIGNMENT TO LATERAL SURFACE CONNECTIONS INCLUDING TO ANY JUNCTION/PULL BOX. INCLUDE SPECIFIC INFORMATION OF DEPTH, SIZE, AND METHOD OF EXCAVATION BELOW EXISTING CURB AND GUTTER.

D. CUT SHEETS OF THE PROPOSED EQUIPMENT PARTICULARLY SUITABLE FOR MICRO–TRENCHING, INCLUDING:

(1) MICRO–TRENCHER CAPABLE OF MEETING TARGET DEPTH AND WIDTH IN A SINGLE PASS WITH AN INTEGRAL HOOD AND ASSOCIATED VACUUM SYSTEM. SELECTION OF CUTTING WHEEL SHALL BE SUCH THAT IT MINIMIZES DAMAGE TO THE ADJACENT A.C. SURFACE.

(2) MOBILE CONCRETE/SLURRY PLACEMENT WITH AN ON–BOARD VIBRATOR AND NARROW TROUGH TO MATCH MICRO–TRENCH WIDTH.

(3) MOBILE GROUND PENETRATING RADAR SYSTEM THAT IS CAPABLE OF LOCATING BOTH METALLIC AND NON–METALLIC PIPES AND CABLES TO A DEPTH OF 24–INCHES.

E. OTHER SITE SPECIFIC ITEMS AS REQUIRED BY THE ENGINEER.

LIMITS OF REMOVALS, TRENCH WIDTH, AND LOCATION

6. THE MICRO–TRENCH SHALL BE CONSTRUCTED WITH CONTINUOUS UNIFORM STRAIGHT AND NEAT EDGES.
7. MICRO–TRENCH ALIGNMENTS SHALL CONSIST OF RUNS PARALLEL TO THE CENTERLINE OF THE STREET. STREET CROSSING MAY BE DONE PROVIDED THE ALIGNMENT IS PERPENDICULAR TO THE STREET CENTERLINE TO THE EXTENT POSSIBLE.
8. THE EDGE OF THE MICRO–TRENCH SHALL BE A MINIMUM OF 24–INCHES FROM THE EXISTING FACE OF THE GUTTER, EXISTING CONCRETE STRUCTURE, OR CURB IF GUTTER IS NOT PRESENT.
9. THE MICRO–TRENCH WIDTH SHALL BE A MINIMUM OF 1–INCH AND A MAXIMUM OF 2–INCHES.
10. MICRO–TRENCHING MAY BE PERMITTED UPON THE ENGINEER'S DISCRETION ON SPECIAL PAVEMENTS SUCH AS DECORATIVE ASPHALT PAVING, AND THROUGH EXISTING IMPROVEMENTS SUCH AS PERPENDICULAR TO SPEED BUMPS. SPECIAL PAVEMENTS AND EXISTING IMPROVEMENTS SHALL BE RESTORED IN KIND AS APPROVED BY THE ENGINEER. HOWEVER, MICRO–TRENCHING THROUGH EXISTING CURB, GUTTER, CROSS GUTTER, BUS PAD, SIDEWALK, FLOATING CURB EXTENSION, BUS BULB, TRUCK PILLOW, RAISED CROSSWALK, ISLAND, MINI–ROUNDABOUT, OR SIMILAR ELEMENTS IS NOT PERMITTED.
11. UP TO TWO (2) VERTICALLY STACKED CONDUITS CAN BE PLACED WITHIN A MICRO–TRENCH.
12. THE CONDUIT SHALL BE INSTALLED AT A MINIMUM DEPTH OF 12–INCHES BELOW THE EXISTING A.C. PAVEMENT SURFACE, AT LEAST 1–INCH BELOW THE BOTTOM OF THE A.C. PAVEMENT, AND THE BOTTOM OF THE MICRO–TRENCH SHALL BE AT A MINIMUM DEPTH OF 16–INCHES BELOW THE EXISTING A.C. PAVEMENT SURFACE.
13. ANCHORS/SPACERS SHALL BE PLACED AT A MAXIMUM OF 10–FEET APART ALONG THE ALIGNMENT TO ENSURE THE CONDUIT DOES NOT RISE FROM THE BOTTOM OF THE MICRO–TRENCH AND DOES NOT TOUCH THE WALLS OF THE MICRO–TRENCH DURING INSTALLATION.

BACKFILL

14. ALL MICRO–TRENCHES SHALL BE COMPLETELY BACKFILLED WITH A CEMENT SAND SLURRY 2500 PSI TO FINISH GRADE BY THE END OF THE WORK DAY.

GRIND AND RESURFACE SECTION

15. COMMENCEMENT OF SURFACE PREPARATION SUCH AS GRINDING/CHIPPING FOR ASPHALT CONCRETE PAVING REPLACEMENT WILL OCCUR NO SOONER THAN 48 HOURS AFTER SLURRY BACKFILL OF TRENCH. FIELD CONDITIONS OR MATERIAL USED MAY NECESSITATE A LONGER WAIT AS DETERMINED BY THE INSPECTOR.
16. AS SOON AS BACKFILL HAS CURED, NOT TO EXCEED 30 CALENDAR DAYS, ASPHALT CONCRETE SHALL BE GROUND AND CAPPED AS FOLLOWS:
    A. EXISTING A.C. AND SLURRY BACKFILL SHALL BE GROUND DOWN 4–INCHES, FOR A WIDTH OF 18–INCHES BUT NO LESS THAN 6–INCHES FROM BOTH EDGES OF THE MICRO–TRENCH AND RESURFACED WITH CLASS C2 ASPHALT AND BINDER GRADE PER BROWNBOOK TABLE 302–5.1 (A).
    B. TACK COAT ALL EDGES WITH EITHER SS–1H EMULSIFIED ASPHALT OR PG 64–10 PAVING ASPHALT IMMEDIATELY BEFORE THE ADJOINING ASPHALT CONCRETE IS PLACED.

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MICRO-TRENCH BACKFILL FOR DRY UTILITIES

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NOTES (CONT.):

C. WHERE ANGULAR CROSSING OR ANY LENGTH–WISE CUTS OF A BIKE LANE OCCUR BY MICRO–TRENCHING, THE CAPPING LIMITS SHALL EXTEND THE FULL WIDTH OF THE BIKE LANE. PERPENDICULAR CROSSINGS MAY RECEIVE TYPICAL CAPPING WIDTH PER NOTE 16.A. ABOVE. PAVEMENT MARKINGS SHALL BE RESTORED IN KIND. WHERE NO BIKE LANE MARKINGS EXIST, CONTRACTOR SHALL CONSULT WITH THE KERN COUNTY PUBLIC WORKS DEPARTMENT – TRAFFIC DIVISION TO DETERMINE LOCATION OF ANY PLANNED BIKE LANES SO THAT IMPACT OF PAVEMENT SURFACE MAY BE AVOIDED.

D. PAVEMENT SHALL BE LEVEL WITH ADJACENT ROADWAY ELEVATIONS AND SHALL PROVIDE A SMOOTH SURFACE PER GREENBOOK SECTION 302–5 AS AMENDED BY THE BROWNBOOK AND SUBJECT TO ACCEPTANCE BY THE INSPECTOR.

VAULTS AND SERVICE CONNECTIONS

17. CONNECTION TO SERVICE LATERALS, JUNCTION BOXES, ETC., SHALL BE DONE SUCH THAT CURB AND GUTTER IS NOT DISTURBED, SETTLED OR DAMAGED. REMOVAL LIMITS OF SIDEWALK SHALL FOLLOW APPLICABLE STANDARDS AND REQUIREMENTS AS APPROVED BY THE ENGINEER.

18. THE USE OF HYDRO–JETTING IS NOT PERMITTED. TRENCHLESS METHODS SHALL NOT CREATE A VOID TWO TIMES GREATER THAN CONDUIT. VOID SHALL BE COMPACTED AND BACKFILLED WITH APPROVED CONTROLLED LOW–STRENGTH MATERIAL (CLSM).

IDENTIFICATION

19. EACH MICRO–TRENCH SHALL BE IDENTIFIED WITH A METAL IDENTIFICATION TAG LISTING THE OWNER, YEAR OF CONSTRUCTION, AND INCLUDE THE WORDS "NOT A SURVEY POINT". IF THE WORK IS MORE THAN 50 FEET IN LENGTH, PLACE THE TAG NEAR EACH END OF THE MICRO–TRENCH AND AT INTERVALS NOT TO EXCEED 50 FEET.

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MICRO-TRENCH BACKFILL FOR DRY UTILITIES

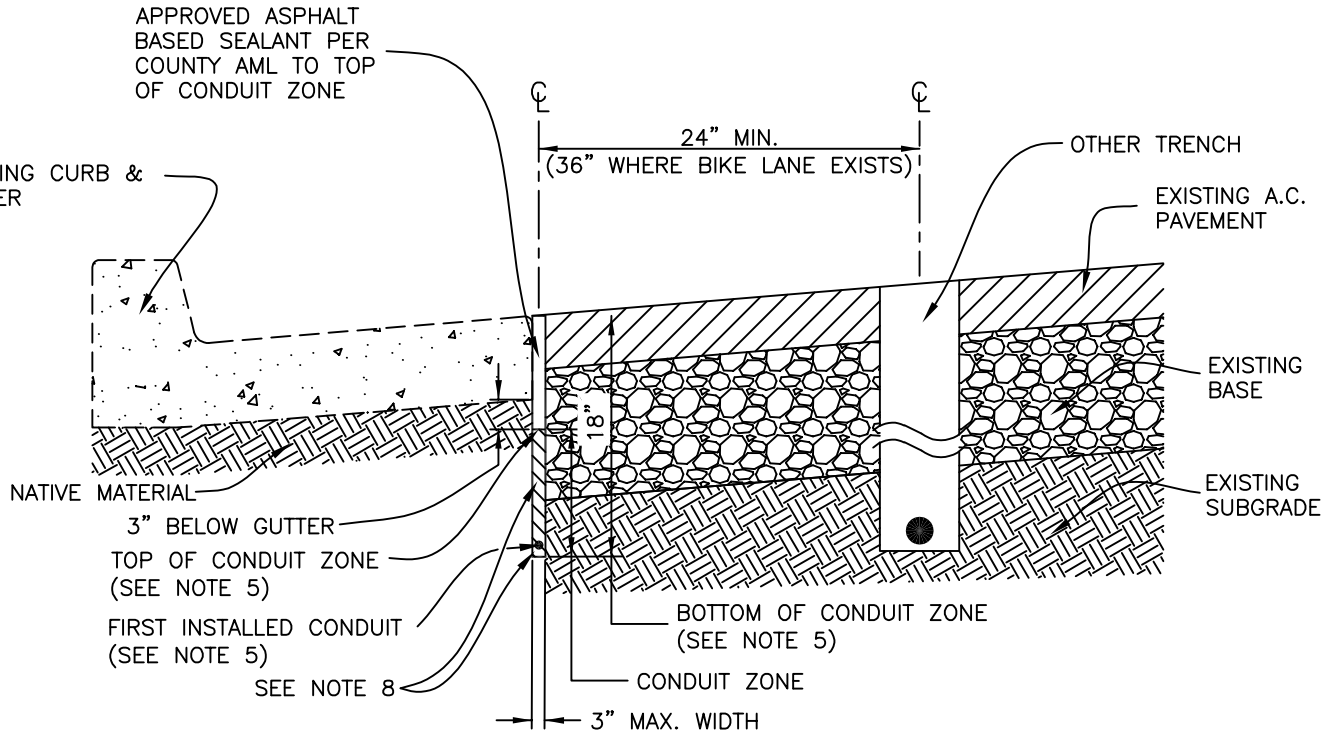
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LEGEND:

—MTC— MICRO-TRENCH CONDUIT (MTC)

NOTES:

1. PAVEMENT CUTS SHALL BE STRAIGHT AND CLEAN. SPALLS AND POTHOLES WITHIN 12-INCHES OF MICRO-TRENCH SHALL BE REPAIRED PRIOR TO TRENCHING TO FACILITATE STRAIGHT PAVEMENT CUTS.

2. INSTALL 1-INCH WIDE (FOLDED) WARNING/INDENTIFICATION TAPE PER SDM-105.

3. TRENCH LOCATION SHALL BE AT EDGE OF CURB AND GUTTER. NO MICRO-TRENCHES ALONG MEDIAN CURBS SHALL BE ALLOWED. THE LOCATION OF MICRO-TRENCH IN RELATION TO THE CURB SHALL NOT DEVIATE ALONG ITS ALIGNMENT UNLESS OTHERWISE APPROVED BY THE COUNTY.

4. WHERE THERE IS NO ECPOSED OR VISIBLE CONCRETE GUTTER, THE CONDUIT SHALL BE INSTALLED IN A NARROW TRENCH PER SDG-117.

5. FIRST INSTALLED CONDUIT SHALL BE PLACED AT A DEPTH OF 18-INCHES WITHIN THE CONDUIT ZONE. THE CONDUIT ZONE SHALL BE 3-INCHES FROM BOTTOM OF GUTTER THROUGH 18-INCHES FROM LIP OF GUTTER. ADDITIONAL CONDUIT(S) SHALL BE INSTALLED WITHIN CONDUIT ZONE, UNLESS OTHERWISE APPROVED BY THE COUNTY.

6. ONLY ONE MICRO-TRENCH PER SIDE OF THE STREET IS ALLOWED. IF A MICRO-TRENCH EXISTS AND NO ADDITIONAL CONDUIT CAN BE INSTALLED IN THE SAME TRENCH, THE NEW CONDUIT SHALL BE INSTALLED IN NARROW TRENCH PER SDG-117.

7. AT STREET INTERSECTIONS, CONDUIT SHALL BE INSTALLED IN NARROW TRENCH PER SDG-117 WITH PAVEMENT RESURFACING AND ANY OTHER REQUIREMENTS PER COUNTY REGULATIONS, OR USE TUNNELING PER COUNTY STANDARDS.

8. BACKFLOW/BEDDING BELOW ASPHALT BASED SEALANT SHALL BE DRY SAND (SE 50 OR BETTER). ONCE PLACED, SAND SHALL BE THROUGHLY CONSOLIDATED BY FLOODING.

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MICRO-TRENCH BACKFILL FOR DRY UTILITIES

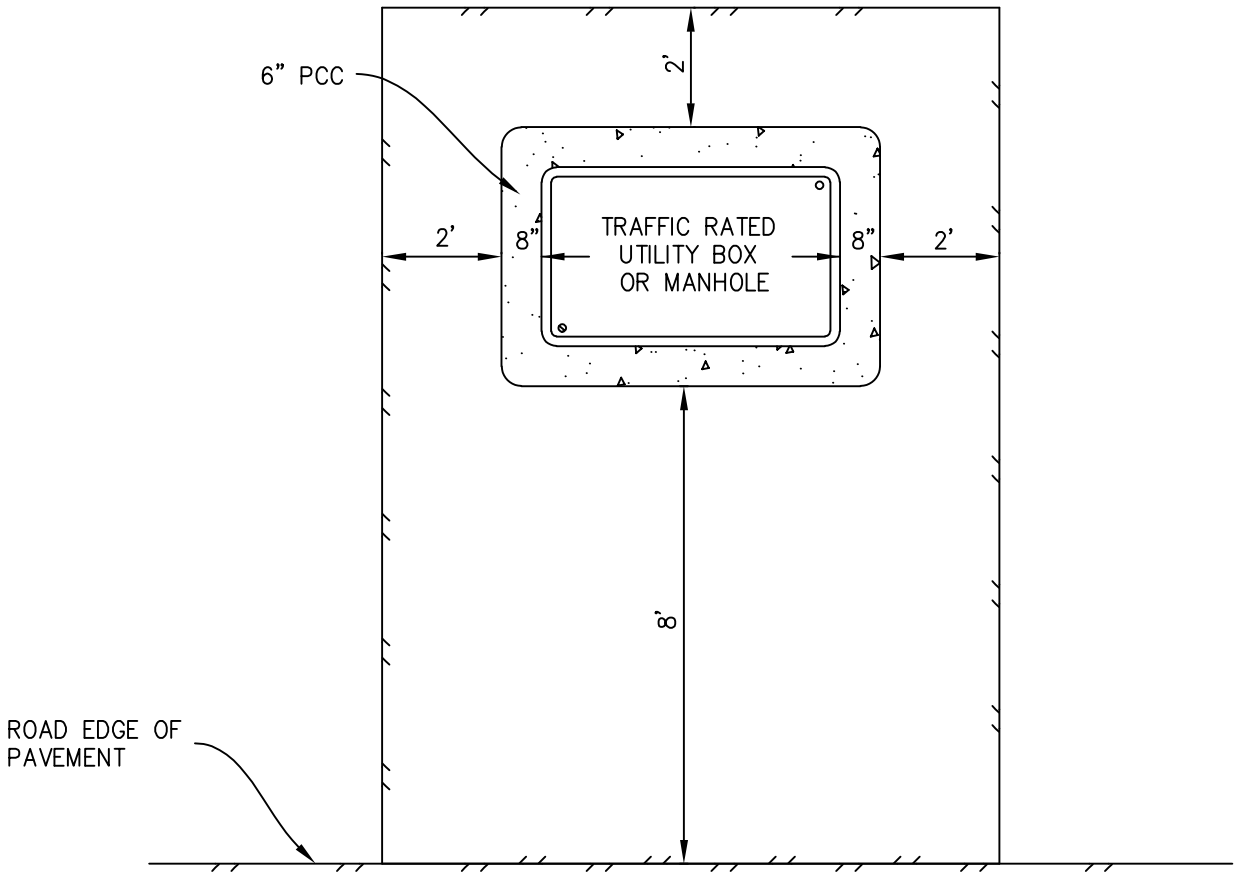
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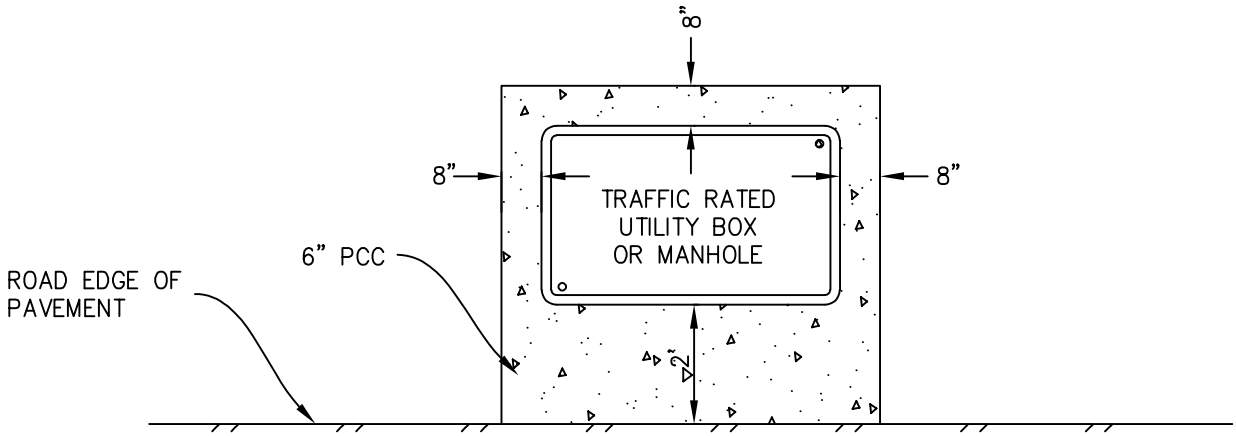
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INSTALLED IN ASPHALT CONCRETE WITH CONCRETE COLLAR



INSTALLED IN PORTLAND CEMENT CONCRETE

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DIVISION TWO

STANDARDS FOR WATER SYSTEMS

CHAPTER I. GENERAL

Sec. 201-1 Scope

This division establishes the minimum acceptable standards of performance and materials and methods used in the construction of water mains and water systems for developments in the County of Kern. Water purveyors may have more restrictive requirements.

Sec. 201-2 General

201-2.01 The provisions of this manual are not intended to prevent the use of any material or method of construction not specifically prescribed by this manual if such alternate has been submitted to and has been approved by the Director and the Purveyor's Engineer.

201-2.02 The Director may approve such alternate if such alternate is found to be for the purpose intended and at least the equivalent of that prescribed in this manual in quality, strength, sanitation, durability, safety, and effectiveness.

201-2.03 The Director may require the person seeking approval of such alternate to submit to him a sample of such alternate material or method, together with two copies of a technical report, including design data, report of material and chemical analysis, and details of laboratory tests which have been performed, plus copies of all tests and approvals, if any, under "AWWA", "ASA", State Department of Health Services, or other approved testing laboratories.

201-2.04 In no event will the use of other than new and unused materials be permitted unless specifically approved by the Environmental Health Services Department and the Director.

201-2.05 The Land Division Ordinance requires that construction plans for the water supply and distribution system be reviewed and approved by the Fire Department, the Environmental Health Services Department, and the Public Works Department.

201-2.06 The requirement for review by and approval of the Director for water plans may be waived when all of the following conditions exist:

a. The facilities are to be accepted and maintained by an established public district or company.

b. The company or district has adopted standards which are equivalent to, or more restrictive than, the County's adopted Development Standards.

c. The plans are prepared by the developer's engineer and approved by the company's or district's engineer or prepared by the company's or district's engineer and approved by the developer's engineer.

d. The company's or district's engineer is independent of the developer and the developer's engineer.

e. The company's or district's engineer by certificate shall state on the plans that the plans meet or exceed the minimum County Development Standards.

f. The district or company has received written approval of the Director for waiver of the requirement of his review and approval of the plans.

201-2.07 See Section 305 of Division III, Standards for Sanitary Sewers, for clearance between water and sewer lines.

Sec. 201-3 Enforcement

Provisions of these standards for water systems shall be enforced by the Director, the Director of Environmental Health Services, and the Fire Chief.

Sec. 201-4 Definitions, Terms, and Abbreviations

Whenever any of the following words, expressions or pronouns are used in these minimum standards, they shall be understood to have the meanings given below:

201-4.01 **PURVEYOR'S ENGINEER**: Civil Engineer registered in State of California employed or contracted by the Water Purveyor.

201-4.02 **WATER PURVEYORS**: The water system shall be owned and operated by a public utility, a mutual water company, or a governmental body. The entity serving water must hold a valid permit to purvey water from the State Department of Health Services or County Environmental Health Services Department. In the case of a public utility, it must also hold a valid "Certificate of Convenience and Necessity" from the California Public Utility Commission.

201-4.03 **TRADE NAMES**: Where trade names are used in these minimum standards, it shall be understood that other materials may be substituted provided they are equal in quality and meet with the approval of the Engineer and the Purveyor's Engineer.

201-4.04 **REFERENCE TO STANDARDS AND PUBLICATIONS**: Any reference made in these minimum standards to any specifications, standard methods or publications of any scientific or technical society or other organization shall be understood to refer to the specification, standard, method or publication, in effect as of the date the work is approved.

201-4.05 **SPECIFICATION REFERENCES**: The following standards of materials and construction for installation of water mains and water systems in the County are included by reference:

a. Specifications of the "American Water Works Association" (AWWA).

b. Specifications of "The American Society for Testing Materials" (ASTM).

c. Specifications of the "American Petroleum Institute" (API).

d. Specifications of the "American Society of Mechanical Engineers" (ASME).

e. Specifications of the "American National Standards Institute" (ANSI).

201-4.06 **CERTIFICATE:** The supplier shall furnish a certificate if requested by the Engineer, stating that all pipe, valves, fittings, protective coatings and all other materials comply with the specifications in these standards.

CHAPTER II. WATER SUPPLY REQUIREMENTS

Sec. 202-1 General

The developer shall form a service entity or furnish a certificate from the water purveyor stating that they can and will perform the function of providing and maintaining the water supply, mains, valves, hydrants, and fire flows.

All facilities of the water system shall be designed and constructed to provide adequate size and capacity from the source facilities and storage to meet the flow requirements. All distribution systems shall be designed to permit circulation of water flows throughout, except where impractical because of cul-de-sac and like conditions.

Sec. 202-2 Number of Customers

The total number of customers shall be determined in accordance with this section. Number of Customers (See Water Supply Requirement Chart, Plate No. W-5)

202-2.01 Residential Areas: Each single-family home or lot will be counted as one (1) customer. Each dwelling unit of an apartment, duplex, or triplex building will be counted as one-half (½) customer.

202-2.02 Commercial and Industrial Areas: Each acre (including storage and parking area) will be counted as a minimum five (5) customers.

202-2.03 Parks and Landscaped Areas: Each acre of land will be counted as two (2) customers, except where specific design indicates otherwise.

202-2.04 Mobile Home Parks: Each mobile home or mobile home space will be counted a one-half (½) customer.

Sec. 202-3 Required Residential Supply - General

All water systems shall be designed with minimum source and storage capacities as required in this section and as may be required by the California Building Standards Code.

202-3.01 Plate No. W-5 "Water Supply Requirements Chart," shall be used in computing the peak hourly residential flow. The top of the appropriate band shall be used in computing the peak hourly residential.

202-3.02 The peak hourly residential flow or the sum of the required fire flow plus one-half (½) of the peak hourly residential flow, whichever is greater, shall be maintained for the period of time shown in Section 205-3. With the most critical well or pump inoperative, a minimum of 2/3 of the above flow shall be maintained for the time specified. This requirement may be met by drawing from both well pumping and storage.

202-3.03 The maximum daily residential flow shall be equal to one-half (½) of the peak hourly residential flow and shall be maintained for a period of three days. This requirement may be met from a combined source of wells and storage.

202-3.04 The average daily residential flow for the maximum month shall be equal to one-third (1/3) of the peak hourly residential flow and shall be maintained continuously from the well pumping only.

CHAPTER III. WATER PIPE

Sec. 203-1 Pipe Pressure

Water distribution systems shall be designed to maintain normal operating pressures of not less than 25 PSIG at the service connection, except that during periods of fire flow plus one-half (½) of the peak hourly residential flow as defined in Section 202-3.02, the pressure may be reduced to not less than 20 PSIG. During periods of hourly minimum demand or no flow, the water system pressure may not be more than 150 PSIG. Variations in pressures under normal operations shall not exceed 50% of the average operating pressure. Computations shall be submitted to demonstrate that these maximum and minimum pressures will be met. Class 150 pipe shall be the minimum pressure pipe used.

Sec. 203-2 Pipe Diameter

All diameters shall be full nominal inside diameters; the actual diameters may not be less than the nominal by more than 5.0% when measured approximately three (3) inches from the ends of the pipe. Water main minimum nominal diameter shall be six (6) inches. A variance may be granted by the Director to allow a reduction to four (4) inches minimum nominal diameter for water mains.

Sec. 203-3 Poly Vinyl Chloride Pipe (PVC)

203-3.01 General

All pipe and fittings shall conform to the following:

a. Pipe and fittings shall conform to AWWA-C-900 Class 150, DR 18, and ASTM D3139.

b. Pipe fittings and couplings made from PVC shall have a minimum cell classification of 12454B or 12454C as defined by ASTM D1784.

c. Each length of pipe shall be marked with the applicable ASTM, DR, cell classification, nominal pipe size and manufacturer's name or trademark.

d. A certificate of compliance from the pipe manufacturer shall be provided for each type of material used.

e. PVC pipe shall not deviate-from straight by more than 1/16th inch per foot (camber) when the maximum offset is measured from the concave side of the pipe.

f. Double strap saddles shall be used for service taps.

g. PVC pipe shall be of the bell and spigot type. Bells shall be factory attached to the pipe. Couplings may be used as allowed by the Engineer.

203-3.02 Storage and Handling of PVC Pipe

PVC pipe shall be stored on a smooth bed. The pipe shall not be dropped or dragged. Stored pipe shall be covered to protect it from ultraviolet light (sun's rays). PVC pipe with noticeable color changes resulting from exposure to ultraviolet light shall be rejected by the Engineer.

203-3.03 Bedding

Embedment materials (Class I, II, and III) shall conform to Section 5 of ASTM D2321, which includes the following:

Class I - Angular, 1/4 to 1-1/2 inch graded stone, including a number of fill materials that have regional significance such as coral, slag, cinders, crushed stone, crushed gravel, and crushed shells.

Class II - Coarse sands and gravels with maximum particle size of 1-1/2 inch, including variously graded sands and gravels containing small percentages of fines, generally granular and non-cohesive, either wet or dry. Soil Types GW, GP, SW. and SP are included in this class.

Class III - Fine sand and clayey gravels, including fine sands, sand-clay mixtures, and gravel-clay mixtures. Soil Types GM, GC, SM, and SC are included in this class.

Soil classification is in conformance with Unified Soil Classification System ASTM Designation D2487 and D2488. Native soils meeting the requirements for Class II and Class III materials may be accepted by the Engineer.

Bedding procedure shall conform to Section 7 ASTM D2321, and the following:

a. Bedding shall be placed and compacted for all main lines as shown on Plate No. W-4.

b. After placement and compaction of bedding and prior to installation of water main and laterals, the Engineer shall inspect the bedding placement and compaction.

203-3.04 Installation of Pipe, Fittings, and Haunching

PVC pipe exposed to the sun during summer months shall be allowed to cool prior to connection to manholes or placement of haunching. Allowance shall be made for the movement of pipe along the main line and at the laterals. Fittings shall be sized to receive type of pipe used. Installation of fittings shall be in accordance with manufacturers instruction manuals.

Pipe installation and haunching shall conform to ASTM D2321, AWWA Standards, and the following:

a. After cooling of the PVC pipe, haunching shall be placed and compacted for all main lines as shown on Plate No. W-4.

b. Materials used for haunching shall be the same class as that used for bedding.

c. Prior to placement and compaction of initial backfill, the Engineer shall inspect the placement of the water main and laterals, haunching and compaction.

d. Care shall be exercised in placing haunching material to prevent damage to or displacement of, the water pipe.

e. Initial backfill shall be placed as required to secure the pipe prior to testing in conformance with Section 203-3.07.

203-3.05 Cleaning

The completed water main shall be flushed and chlorinated in conformance with Section 208-7.

203-3.06 Testing

The completed water main and laterals shall be hydrostatically tested, after pipeline cleaning, but prior to completion of initial backfill and compaction in conformance with Section 208-6.

203-3.07 Initial Backfill

Initial backfill shall conform to ASTM D2321, and the following:

a. After testing of the PVC pipe and placement and inspection of haunching, initial backfill placement shall be completed and compacted for all main lines as shown on Plate No. W-4.

b. Materials used for initial backfill shall be the same class as that used for haunching.

c. Prior to placement and compaction of backfill, the Engineer shall inspect the initial backfill and compaction.

d. Care shall be exercised in placing initial backfill material to prevent damage to or displacement of, the water pipe.

203-3.08 Backfill

The remainder of the trench backfill shall conform with Section 19-3 of the Standard Specifications and as follows:

a. Section 19-3.02E and 19-303F, "Slurry Cement Backfill", of the Standard Specifications is deleted. Sand slurry may be used in lieu of aggregate base per the approval of the Engineer.

b. Backfill material shall be free of all rock or lumps, exceeding six (6) inches maximum dimension.

c. Compacting of backfill material shall be required for all main lines and laterals as shown on the attached Plate.

CHAPTER IV. VALVES AND OTHER APPURTENANCES

Sec. 204-1 General

All main line gate valves on transmission and/or distribution mains shall be double disc gate valves or butterfly valves and shall conform to the following standards:

204-1.01 Double Disc Gate Valves shall be cast-iron body, all bronze mounted interior, non-rising stem, or for cold water service of 175 PSI working water pressure and shall be in accordance with "AWWA C500", as last revised.

204-1.02 Hub End Gate Valves provided with rubber rings shall be in accordance with "AWWA C500" or C509.

204-1.03 Bronze for interior of Gate Valves shall be Grade 1 and shall conform to current ASTM and State Standards.

204-1.04 Butterfly Valves shall be rubber seated and shall comply with "AWWA C504", class 125-16 gear operated unless otherwise authorized. Disc shall be of ni-resist alloy cast-iron and shall rotate 90 degrees

between the fully open and fully closed positions. Rubber seats shall be securely held in place by nickel cast-iron or type 316 stainless steel retaining segments and shall not require bonding or cementing to the body.

204-1.05 The butterfly valve standard is not intended to cover valves for installation where service conditions exceed the shutoff pressures and line velocities stated in Table 1 of "AWWA C504" or on lines supplying fire hydrants.

Sec. 204-2 Valve Boxes and Vaults

204-2.01 A valve box or vault or capped standpipe shall be provided for every valve installed below the grade. The cover for all valve boxes and vaults placed in the street pavement or any location where there is vehicular traffic shall be traffic rated, metallic or of reinforced concrete.

204-2.02 All valve box caps shall be marked with the word "water", or a "W", or a suitable identification of the water utility.

Sec. 204-3 Air and Vacuum Release Valves

Air and vacuum release valves shall be installed in the water system at all points where it is indicated that air pockets may form. The design shall be such as to ensure the release of air automatically from the water main. These valves may also ensure the entrance of air into the water main when the pressure inside the line is below atmospheric pressure. All valves shall be designed for a minimum of 150 PSI operating pressure. The inlet to each valve shall be provided with a gate valve or corporation stop to provide a positive closure between the main pipeline and the air and vacuum release valve. Vent outlets shall be installed above ground in such manner as to preclude back-flow.

Sec. 204-4 Check Valves

All check valves shall seat readily and completely to assure water tightness. The face of the closure element and valve seat shall be bronze, composition, or other non-corrodible material which will seat tightly under all prevailing conditions of field use. All check valves four (4) inch and larger in size, for use on distribution mains, shall be designed for a minimum of 175 PSI cold water working pressure.

Sec. 204-5 Flushouts (Blowoffs)

All flushouts (blowoffs) shall be a minimum outlet size of 2" and shall be designed for a minimum operating pressure of 150 PSI. A flushout or fire hydrant shall be installed at the terminus of all dead-end water mains or non-circulating flow water mains.

CHAPTER V. FIRE PROTECTION REQUIREMENTS

Sec. 205-1 Fire Hydrants

Fire hydrants shall conform with AWWA Specification NO. C-502 or C-503 2-1/2" and 4" national standard threaded connections as required. Hydrant shall be painted rust inhibiting aluminum silver. For details see Fire Hydrant Detail Standard Drawing, Plate No. W-1.

Sec. 205-2 Bury

Bury for hydrants shall conform to AWWA standard specifications C-502 or C-503, height to be sufficient to ensure 30" minimum cover. Bury to be coated with coal tar enamel or coal tar epoxy.

Sec. 205-3 Water Supplies for Fire Protection

205-3.01 The fire flow requirements shall be determined by the Fire Chief and shall be computed on the basis of a minimum 20 PSIG residual operating pressure at the point of lowest pressure of the street main from which the flow is measured. In setting the requirements for fire flow, the Fire Chief may be guided by the minimum requirements set forth in Table 1-W but may require higher standards on the basis of local conditions, exposure, congestion, other regulations, or construction of the buildings. The required fire flows are to be provided in addition to the residential requirements required in Section 202-3.

TABLE NO. 1-W - FIRE FLOW REQUIREMENTS

DISTRICT CLASSIFICATION	MINIMUM FIRE FLOW (in gpm)	MINIMUM DURATION (in hours)	MAXIMUM HYDRANT SPACING
Residential Includes: 1 and 2 family dwellings	500	1	660'
Commercial Includes: all commercial uses, hotels, apartments, multiple residence buildings, schools, and colleges	1,500	2	330'
Industrial	1,500	4	330'

205-3.02 The water distribution system shall be provided with valves and other facilities, such as tanks, so that no point on any lot at the street right-of-way shall be more than one and one-half (1-1/2) times the maximum hydrant spacing from a working hydrant as a result of any single break or shutdown for repairs, except where impractical.

205-3.03 All water mains serving hydrants shall have a minimum nominal diameter of six (6) inches. Stub lines over 800 feet in length or supporting more than one hydrant shall have a minimum nominal diameter of eight (8) inches.

205-3.04 The location, number and type of fire hydrants connected to a water supply capable of delivering the required fire flow shall be as required and approved by the Fire Chief.

205-3.05 Fire Hydrants shall be installed with a maximum spacing between hydrants as indicated in Table No. 1-W. A hydrant shall be placed at each intersection except where this would provide excessive hydrant coverage.

Exception: The spacing of hydrants shall have an individual tolerance of 10 percent. However, the average spacing between any three (3) adjacent hydrants shall not exceed the required spacing.

205-3.06 Fire hydrant spacing shall be computed separately for each side of major highways, divided roadways, canals, or railways.

205-3.07 The last hydrant on a cul-de-sac or stub street shall not be more than one-half the maximum spacing from the end of the street.

205-3.08 Whenever any hydrant or other valve, which is intended for use by the Fire Chief for fire suppression purposes, is installed or replaced, the same shall be installed or replaced in accordance with Plate No. W-1, "Fire Hydrant Detail."

205-3.09 "Dry Barrel" type fire hydrants shall be provided at all elevations above 2,500 feet, or where freezing conditions occur.

Sec. 205-4 Fire Checks

Any connection between a building's fire sprinkler system and the water purveyor's main line shall be protected from backflow in accordance with the Fire Department, Environmental Health Services Department Standards and the water purveyor’s requirements.

Sec. 205-5 Fire Hydrant Barricades

Barricades shall be installed where considered necessary by the Fire Chief to protect fire hydrants.

Sec. 205-6 Location Markers for Fire Hydrants

Blue raised retroreflective pavement markers shall be placed on a highway, street, or road to mark fire hydrant locations. They shall not be used for any other purpose.

In general, the blue raised retroreflective pavement markers:

a. Should be placed one-half (1/2) foot from the centerline stripe, or approximate center of the pavement where there is no centerline stripe, on the side nearest the fire hydrant.

b. When placed on expressways, freeways and freeway ramps, they should be placed on the shoulder, one (1) foot to the right of the edge line, opposite the fire hydrant. Typical marker locations are shown on Figure 3B-102((CA) CMUTCD).

c. In areas at elevations above 2,500 feet and where snowplows are used shall be recessed, as shown in the Caltrans Department of Transportation's Standard Plan A20-D.

Because fire hydrants adjacent to freeways may be out of the right-of-way and, in many locations, out of view from the freeway, the Fire Department may require installation of small supplemental signs (S9(CA) and S10(CA) CMUTCD) or markings to indentify the hydrant number or distance to the hydrant. These installations are optional and at the discretion of the Fire Department and Caltrans.

CHAPTER VI. PIPE FITTINGS

Sec. 206-1 Cast-Iron Fittings

206-1.01 Bell and Spigot Fittings: All cast-iron bell and spigot fittings shall conform with either "AWWA C110" (Standard, Class D, 173 PSI) or "AWWA C110" (shortbody, 3 inch to 12 inch, 250 PSI) or the long radius type, in class D, 173 PSI water working pressure.

206-1.02 Flange Fitting: All cast-iron flanged fittings shall conform to "AWWA C110."

CHAPTER VII. WATER SERVICE CONNECTIONS

Sec. 207-1 Threads

All threads for underground service line fittings and materials for these fittings, corporation and meter stops, shall comply with "AWWA C800".

Sec. 207-2 Service Pipe Size

207-2.01 Water service connections shall be adequately sized to provide 25 psi at the customer connection during peak hourly residential flow. Water service connections shall not be less than ¾-inch nominal size.

207-2.02 In the event of double service connections for two 3/4" services, the service pipe from the main to the service connection tee shall be 1" nominal size.

207-2.03 The water service connection shall be equipped with a service valve or curb stop located two feet outside of the property, or next to the sidewalk where sidewalk is placed.

207-2.04 Where property will be served by two or more water service connections from different street water mains or supplies, each service connection shall be equipped with a single check valve to prevent cross connection flow.

Sec. 207-3 Water Service Pipe and Tubing

All the following materials shall conform either to IAPMO IS 3 "Installation Standard for Copper Plumbing Tube, Pipe and Fittings" or IAPMO 7 "Installation Standard for Polyethylene (PE) Cold Water Building Supply and Yard Piping" in the current adopted edition of the California Plumbing Code.

207-3.01 All 3/4 inch and larger water service connections may be seamless copper water tubing (ASTM B88) or polyethylene plastic tubing (ASTM D2239, PE 3408).

207-3.02 All 1-1/2 inch and larger water service connections may also use seamless red brass pipe conforming to (ASTM B43), or copper pipe conforming to (ASTM B42).

207-3.03 Water services for either 1-1/2 inch or 2 inch may also use annealed coiled copper tubing.

Sec. 207-4 Corporation Stops

All corporation stops, if used, shall be bronze or brass, round, with inlet for either corporation stop (C.S.) thread or iron pipe standard (I.P.S.) thread, and outlet for the type of service pipe used in accordance with AWWA C800.

Sec. 207-5 Meter Stops

All 3/4 inch and 1-inch (curb) meter stops shall be bronze or brass, with inlet for the type of service pipe used, and outlet for the type or service pipe or meter coupling used.

For 1-1/2 inch and 2-inch service, bronze or brass curb stop valve, straight ground key curb stop, or bronze gate valve (Minimum of 200 PSI rated working pressure) may be used. Inlet and outlet shall be appropriate for the type of service pipe or meter flange used. All valves shall be factory hydro-tested to 300 PSI or air-tested to 100 PSI under water.

Sec. 207-6 Bronze Gate Valves

All 1-1/2 inch through 3-inch gate valves shall be all bronze and comply with "AWWA C500" and ASTM standards.

Sec. 207-7 Standard Service Clamps

All Service clamps and straps shall be in accordance with AWWA Standards and the pipe manufacturer's recommendations.

Sec. 207-8 Repair Service Clamp

Where no service clamp is required, and the corporation stop does not seal properly, a repair service clamp shall be used.

Sec. 207-9 Solder Joints and Fittings

The use of solder containing more than two-tenths of one percent of lead in making joints and fittings in any potable water system is prohibited.

CHAPTER VIII. WATER PIPE INSTALLATION

Sec. 208-1 Trench Excavation and Backfilling for Dedicated Streets

All pipeline trenches in streets dedicated or offered for dedication shall be excavated, backfilled, and compacted in accordance with this Division and Division I Standards for Streets, see Plate Nos. W-4, R-67A, R-67B, and R-68.

Sec. 208-2 Trench Excavation and Backfilling Outside of Dedicated Streets

The engineer in charge of the design and construction of the water system shall specify compaction requirements for the backfill of all waterline trenches not located in streets

dedicated or offered for dedication. Prior to acceptance of the water system the developer's engineer shall certify by letter that all trenches have been backfilled in accordance with the specifications.

Sec. 208-3 Pipe Depth

All water mains shall be installed so that the top of the pipe and fittings are not less than 30 inches below finished paving of the street for water mains less than 12 inches in diameter or a minimum cover or 36 inches for mains 12 inches and larger in diameter, unless a greater depth is specified in the excavation and/or encroachment permit. All water service connections shall be installed with a minimum of 30-inch cover within the right of way.

Sec. 208-4 Material Handling

All pipe material shall be handled, laid, blocked and joined in accordance with the manufacturer's recommendations.

All open ends of all water mains being installed shall be properly covered at the end of each day's work to prevent entry of foreign matter, animals, debris, or children.

Sec. 208-5 Thrust Devices

All tees, plugs, caps, bends of more than 5 degrees, hydrant branches or pipe reducers shall be restrained against movement by use of thrust devices.

All reaction or thrust backing devices shall be designed for a minimum static pressure of 200 PSIG. All thrust devices shall be installed in accordance with design data and plans submitted to the engineer. For normal situations, installation shall be in accordance with Plate W-3, "Typical Thrust Block Details." The size and shape of the thrust device shall be designed to prevent movement of the water mains when subjected to the maximum hydrostatic test pressure. Thrust devices shall be cast-in-place concrete, metal harness, or other suitable devices. If the thrust exceeds the bearing value of the surrounding soil, the soil shall be precompacted before placing concrete. To ensure against lateral movement of the water main, valve or fitting where a change in direction of the water main is made by the use of such fittings, a metal harness of tie rods and pipe clamps may be used, except for pipe having rubber-ring type joints. Steel tie rods and pipe clamps shall be galvanized or otherwise rust proofed or painted. All concrete used for thrust blocks shall conform to the requirements of the Standard Specifications for minor concrete (minimum cement content 295 lb./cu/ yd.). Concrete shall contain no additives unless prior approval is obtained from the County Engineer.

Sec. 208-6 Testing

208-6.01 Distribution mains shall be tested to a minimum hydrostatic pressure of design pressure or pipe class. Class 150 pipe shall be tested to a minimum of 150 PSIG. The minimum duration of the test shall be two hours. Before applying the hydrostatic pressure, all entrapped air shall be thoroughly bled off. For all types of water mains, there shall

be no visible leakage at any joint or section of pipe and the allowable leakage for the total lengths of all water mains under test shall not exceed that amount specified in "AWWA C600" or “AWWA M23" as appropriate.

208-6.02 All tests shall be made in the presence of the Engineer. Backfill over joints, valves or fittings shall not exceed the initial backfill until they have been inspected, tested, and approved by the Engineer.

208-6.03 When it is necessary to cover the ditch as soon as the water main is laid, the authorized representative of the Engineer may permit the backfilling to be completed prior to testing and disinfecting. If the pipe then tested exceeds the allowable leakage, the pipe must be uncovered, repaired, and tested until it meets the allowable leakage.

Sec. 208-7 Disinfecting

All new or repaired water mains, pumps, tanks, wells, and other facilities before being placed in service, shall be completely disinfected in accordance with "Procedures for Disinfecting Water Mains, AWWA C601" and any additional requirements, as required by the State Department of Health Services or the Kern County Environmental Health Services Department. Water used for testing shall be potable and contain a minimum residual chlorine content of 50 ppm after a time period of 24 hours, after which the water mains and/or waterworks shall be thoroughly drained and flushed. Before being placed in service, a bacteriological test of the system shall be performed in compliance with the requirements of the appropriate health agency.

CHAPTER IX. STORAGE FACILITIES

Sec. 209-1 Design

All steel tanks, standpipes, reservoirs and elevated tanks for water storage shall comply with "AWWA D100 Standard for Welded Steel Tanks for Water Storage" or "AWWA D103 Standard for Factory Coated Bolted Steel Tanks for Water Storage," and also meet all foundation and seismic requirements of the Building Code.

All pressure (hydromatic) tanks containing more than 1000 U.S. gallons shall conform to the ASME Code for pressure storage and vessels.

Sec. 209-2 Repairing and Painting

All inspection, repairing, painting and repainting of steel tanks, standpipes, reservoirs, and elevated tanks for water storage shall comply with "AWWA D102."

CHAPTER X. VERTICAL TURBINE PUMPS

Sec. 210-1 General

All vertical turbine pumps shall comply with "AWWA E101".

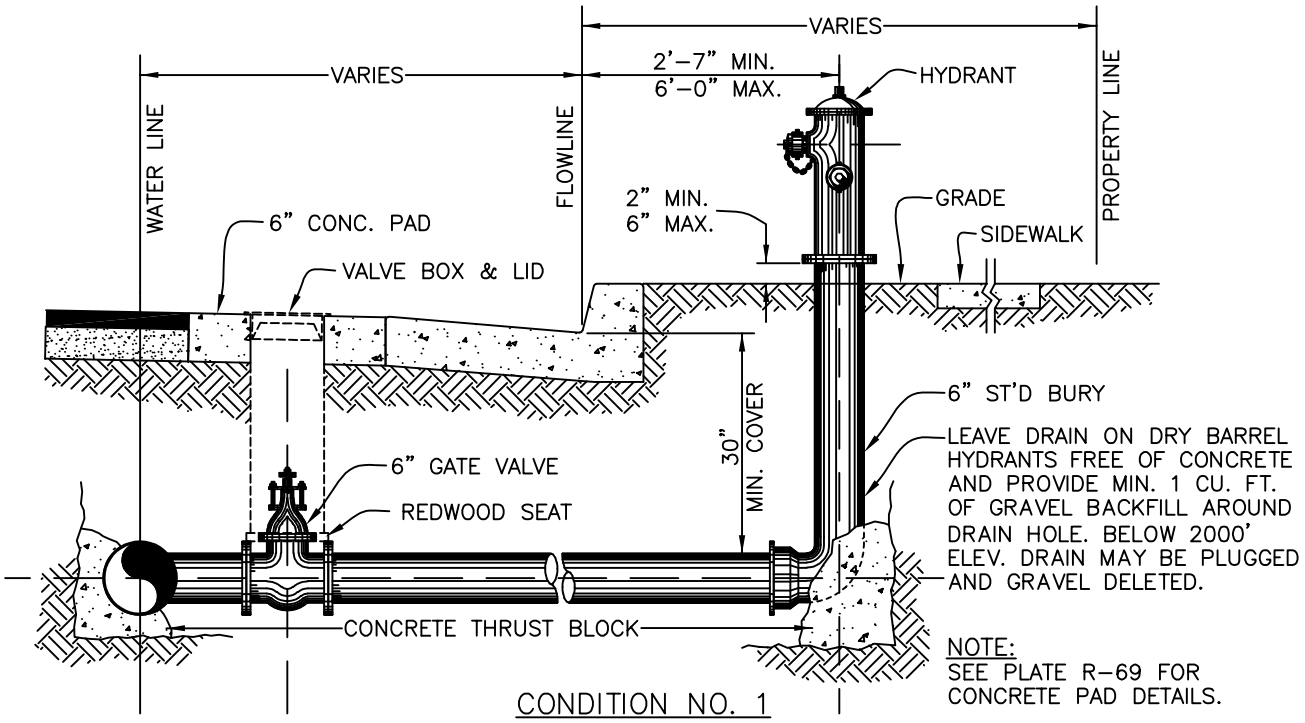
CHAPTER XI. TESTS

Sec. 211-1 General

211-1.01 All tests to determine compliance with any of these specifications shall be made within the Continental United States.

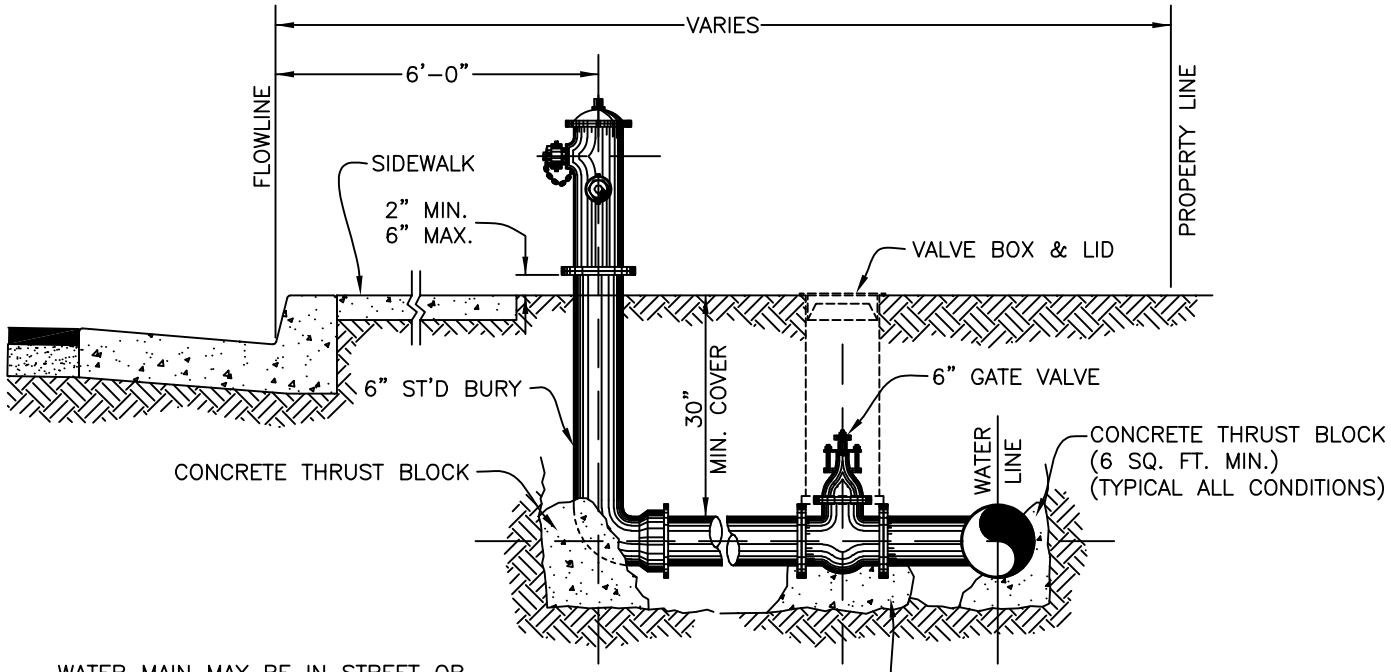
211-1.02 If requested by the Engineer, the test results shall be certified by an established and reputable materials testing firm and a copy forwarded to the Engineer.

211.1.03 Any materials delivered to the job site and suspected of damage due to shipping or handling, if requested by the Engineer, shall be tested again and the test results certified by an approved materials testing firm.



CONDITION NO. 1

WHEN SIDEWALK IS AWAY FROM CURB OR SIDEWALK OCCUPIES ALL OF PARKWAY



WATER MAIN MAY BE IN STREET OR PARKWAY FOR EITHER CONDITION.

CONDITION NO. 2

SIDEWALK NEXT TO CURB OR FUTURE SIDEWALK

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FIRE HYDRANT DETAIL

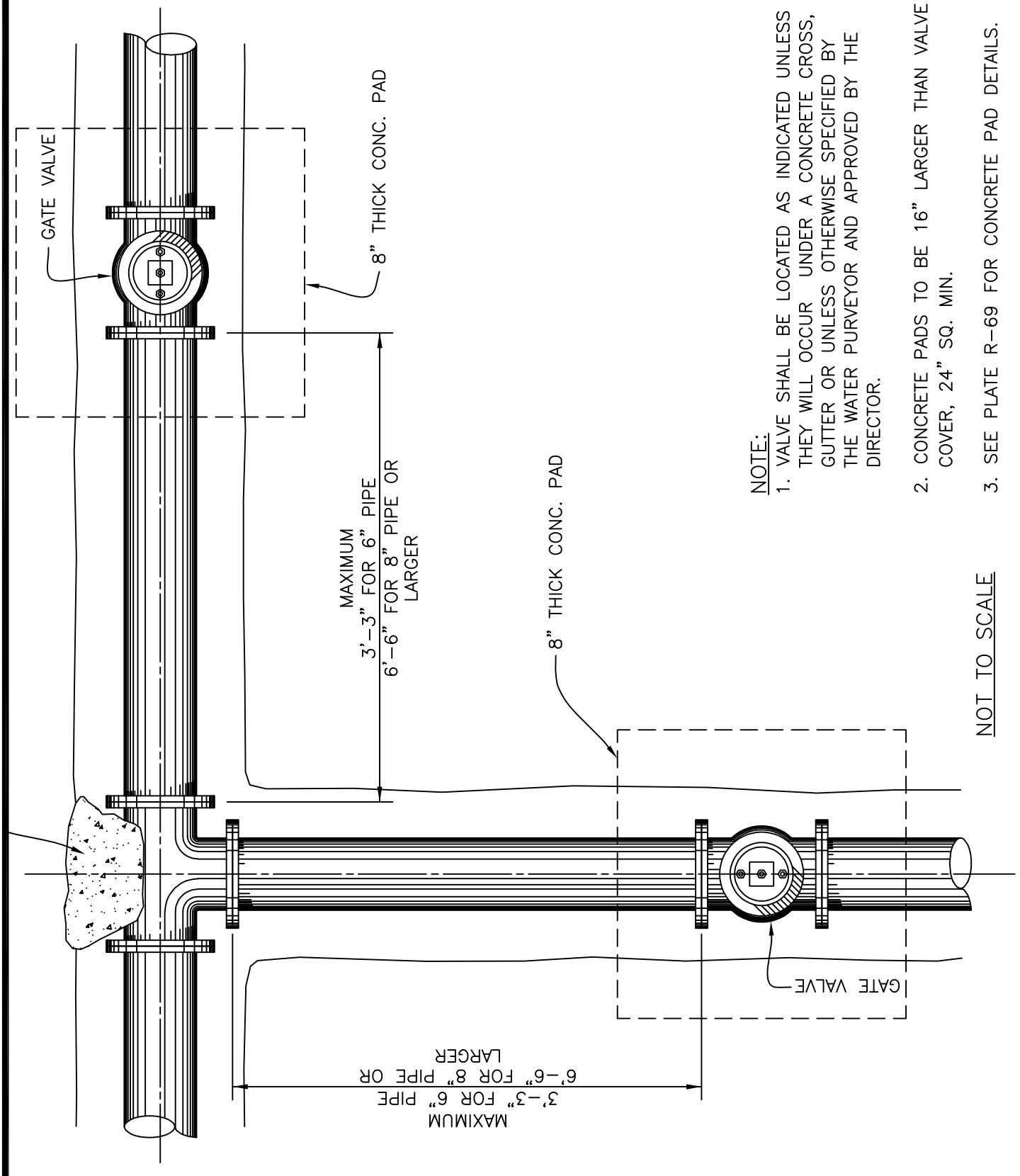
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DEVELOPMENT STANDARD

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DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. W-1

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NOTE:
1. VALVE SHALL BE LOCATED AS INDICATED UNLESS THEY WILL OCCUR UNDER A CONCRETE CROSS, GUTTER OR UNLESS OTHERWISE SPECIFIED BY THE WATER PURVEYOR AND APPROVED BY THE DIRECTOR.
2. CONCRETE PADS TO BE 16" LARGER THAN VALVE COVER, 24" SQ. MIN.
3. SEE PLATE R-69 FOR CONCRETE PAD DETAILS.

NOT TO SCALE

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VALVE INSTALLATION

COUNTY OF KERN
STATE OF CALIFORNIA
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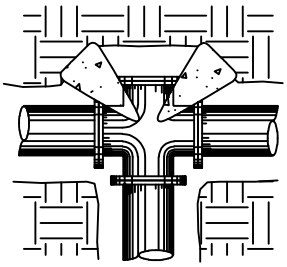
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APPROVED BY: J.R.C.

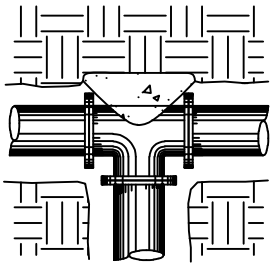
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W-2

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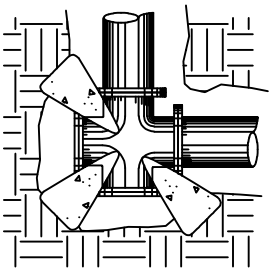
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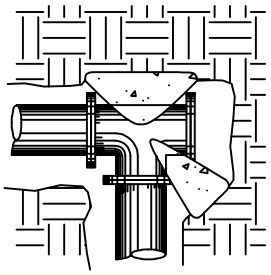
TEE



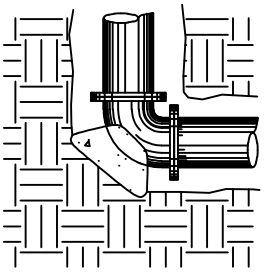
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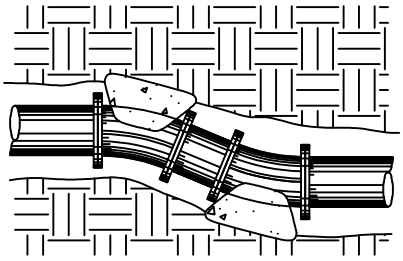
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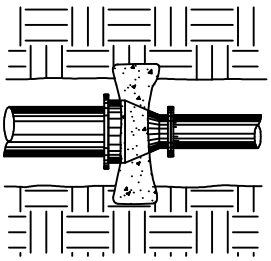
90° ELL



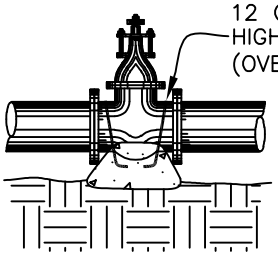
22–1/2° ELL



REDUCER



VALVE ANCHOR



THRUST BLOCK SCHEDULE				
PIPE SIZE	BEARING AREA IN SQ. FT.			
	TEE OR PLUG	90° ELL OR HYDRANT	45° ELL	22–1/2° ELL
4"	2	2	2	1
6"	3	4	2	2
8"	5	7	4	2
10"	8	11	6	3
12"	11	16	8	4

NOTES:

1. ALL THRUST BLOCKS TO BE POURED AGAINST UNDISTURBED SOIL, CONCRETE SHALL BE PLACED BEHIND BELLS OF FITTINGS.
2. BEARING AREAS SHOWN IN TABLE ARE BASED ON ALLOWABLE SOIL PRESSURE OF 1500 P.S.I.
3. KEEP CONCRETE AWAY FROM BELLS.
4. CONCRETE SHALL CONFORM TO SECTION 208–5.

KERN COUNTY PUBLIC WORKS
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TYPICAL THRUST BLOCK DETAILS

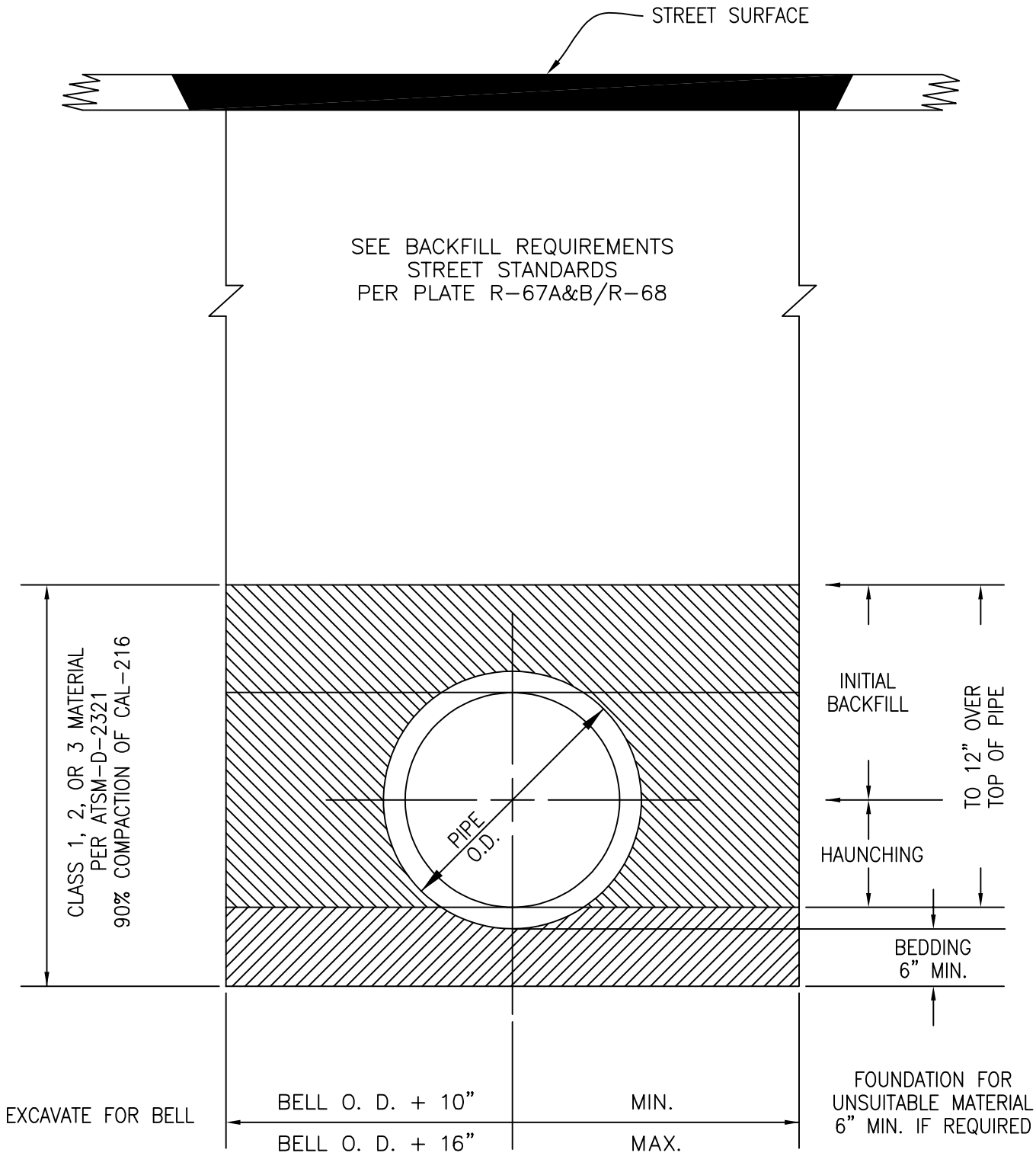
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DEVELOPMENT STANDARD

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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. W–3

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KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

PVC PIPE TRENCH SECTION IN PAVED AREAS

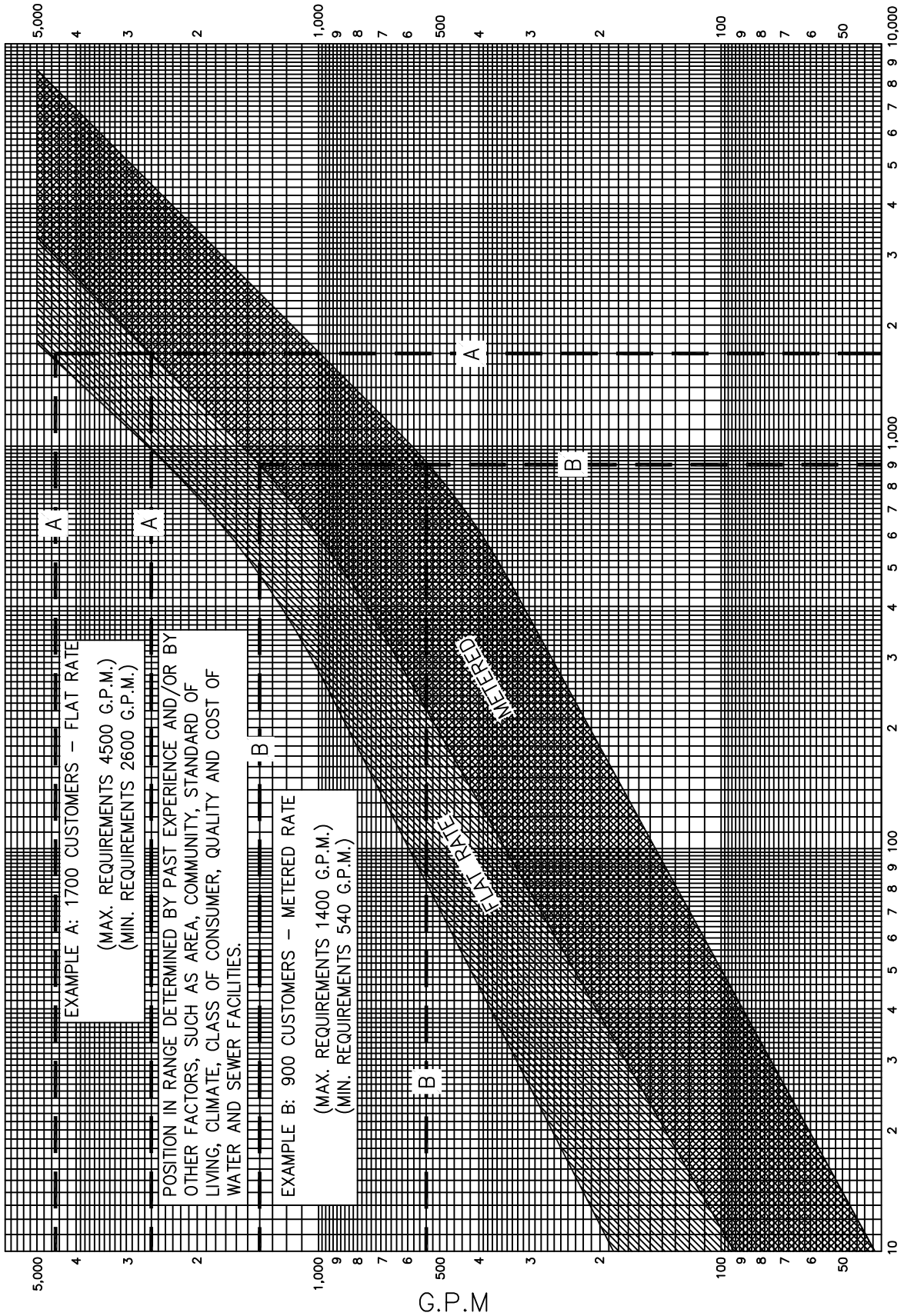
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO.
W-4

DWG FILE: K:\BUILDINGDEV\DEVELOPMENT REVIEW\DEV_STD\2023\2023 REVISED DRAWINGS\WATER SYSTEMS\W-4



KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

WATER SUPPLY REQUIREMENTS CHART

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO.
W–5

DWG FILE: K:\BUILDINGDEV\DEVELOPMENT REVIEW\DEV_STD\2023\2023 REVISED DRAWINGS\WATER SYSTEMS\W-5

DIVISION THREE

STANDARDS FOR SANITARY SEWERS

CHAPTER I. GENERAL

Sec. 301-1 Scope

This division establishes the minimum acceptable standards of design, materials and methods to be used in providing sanitary sewer systems for developments in the County of Kern. Where the sewer system being designed is to be installed within a district which has adopted standards for sewers, the more restrictive of that district's standards and the standards contained herein shall apply. Minor deviations from these standards may be permitted where warranted in the opinion of the Director, with the concurrence of the district Engineer for the district or entity.

Sec. 301-2 General

301-2.01 The design data and calculations, and the construction plans for proposed development sewers are to be submitted by the developer's engineer to the Director, for review and approval prior to construction. This is in addition to the approval of any applicable district.

301-2.02 The requirement for review by, and approval of, the Director for sewer plans may be waived when all of the following conditions exist:

a. The facilities are to be accepted and maintained by an established Public Utility District, Mutual Water Company, Home-Owner Association or other approved entity.

b. The company or district has adopted standards which the Director has found to be equivalent to, or more restrictive than, the County’s adopted Development Standards.

c. The plans are prepared by the developer's engineer and approved by the company's or district's engineer or prepared by the company's or district's engineer and approved by the developer's engineer.

d. The company's or district's engineer is independent of the developer and the developer's engineer.

e. The company's or district's engineer, by certificate, shall state that the plans meet or exceed the minimum Kern County Development Standards.

f. The district or company has received written approval from the Director for waiver of the requirement of County review and approval of the plans.

CHAPTER II. DESIGN STANDARDS

Sec. 302-1 Sanitary Sewers Design Criteria

The following guidelines shall be used to compute contributing sewage:

302-1.01 The average family unit shall be two and eight tenths (2.8) persons per residential dwelling unit or its equivalent, and two and twenty-four hundredths (2.24) persons per multi-family residential unit.

302-1.02 The average discharge of domestic sewage shall be one hundred (100) gallons per day per person. In the absence of any specific information to the contrary, the design peak discharge shall be estimated as follows:

Peak Factor = 1.8 x (Average Discharge)

302-1.03 Infiltration allowances will be in addition to the above.

302-1.04 In the absence of any specific information to the contrary, the peak design discharge for commercial and industrial sewage shall be:

Land Use	Peak Discharge Rate		Peak Factor
Commercial	0.010 CFS/GA	(6,460 GPD/GA)	1.8
Industrial	0.015 CFS/GA	(9,695 GPD/GA)	2.0

Flow rates may be obtained from approved references or other acceptable source.

302-1.05 Depth of flow in main and trunk sewers: Main sewers up to fifteen (15) inches inside diameter shall be designed to flow not more than seven-tenths (0.7) full; Trunk or main sewers over fifteen (15) inches inside diameter may be designed to flow full.

Note: Under no condition is a gravity sewer ever to be designed to flow under a head.

Sec. 302-2 Sewer Velocity and Quantities

302-2.01 Minimum design velocity for any sanitary sewer shall be two (2) feet per second, for pipes flowing full or half full, or with the approval of the Director, one and six tenths (1.6) feet per second. Acceptable criteria

for allowing 1.6 feet per second would be as follows: Pipes designed for 1.6 feet per second velocity at peak shall flow at least 40% full for computed average flows. Without considering the above, the following pipe slopes may be used:

Pipe Diameter	Minimum Slope - (ft/100 ft)	
	n=0.011	n=0.013
4” Laterals	1.00	1.00
6"	0.38	0.50
8"	0.25	0.35
10"	0.20	0.25
12"	0.15	0.20
15”	0.13	
18”	0.11	
21”	0.09	
24” greater	0.08	

302-2.02 Unless special provisions approved by the Director have been provided, design velocities for sanitary sewers shall not exceed 10 feet per second. Velocities are to be computed using Manning's formula with a constant "n" value for pipes half full or full as follows:

PVC Pipe	“n” = 0.011
Other Pipe	“n” = 0.013

Sec. 302-3 Maximum Discharge

The maximum design discharge shall not exceed the flow at critical slope and velocity. Sanitary sewers shall not be designed for flow conditions at critical slope and velocity.

Sec. 302-4 Manholes

302-4.01 Manholes shall be placed at the intersections of all six (6) inch and larger sewer lines.

302-4.02 Manholes shall be placed at all changes of alignment, either vertical or horizontal.

302-4.03 The maximum distance between manholes shall be 400 feet, except for mains 15 inches in diameter or larger, the maximum distance may be increased to 600 feet. Minor exceptions may be approved by the Director. In areas where the slope of the sewer line exceeds 1%, the maximum distance between manholes shall be reduced to 350 feet.

302-4.04 A one tenth (0.1) foot energy drop shall be allowed for flow through manholes with a deflection of 45° or more.

302-4.05 Invert elevations of varying size pipes leading into and out of manholes shall be set by matching elevations of the pipe soffits.

302-4.06 Building drains or house laterals which terminate in a manhole shall be elevated a minimum of six (6) inches and a maximum of 12 inches above the flowline of the manhole.

302-4.07 Manholes shall be placed only in locations that provide ready access to the sewer for maintenance and emergency service.

302-4.08 All manholes shall be as shown on standard drawing STANDARD PRECAST MANHOLE, Plate S-5. Manholes shall be constructed to grade. Precast reinforced concrete manhole risers and tops shall conform to ASTM Designations C478 with openings over outgoing sewer. Precast tops shall be eccentric cone type. All cement used in the construction of concrete manholes shall be minor concrete and conform to ASTM Designation C150. All manholes shall have a concrete pad, unless an exception is given by the sewer service agency. Manholes outside of paved areas shall be constructed to prevent drainage water from entering manhole. Approved water stops are required for all PVC sewer lines entering and exiting any manholes.

302-4.09 Frame and cover shall be as shown on standard drawing CAST IRON MANHOLE FRAME AND COVER, Plate S-6. They shall be interchangeable with Alhambra Foundry Model A-1270 and conform to ASTM A48-83 Class 35B gray cast iron with minimum strength 35,000 psi for H20-44 highway loading.

302-4.10 Manholes in open fields shall conform to Plate No. R-89.

Sec. 302-5 Joints

All joints in the precast concrete sections, except adjusting rings, shall be set in an elastomeric sealant.

Sec. 302-6 Drop Manholes

Whenever the vertical distance between the inverts of sewer line connection and a manhole exceeds 18 inches, a Standard Drop Manhole, Plate Nos. S-3 or S-4 shall be constructed. Drop Manholes shall be permitted only for compelling reasons.

Sec. 302-7 Rodding and Flushing Inlets

Standard rodding and flushing inlets, also known as cleanouts, may be allowed at the terminal end of sewer segments constructed for later extension, such as at the edge of a subdivision, except where the sewer segment exceeds 200 feet in length, in which case a standard manhole shall be constructed. See Plate Nos. S-7 and S-8.

Sec. 302-8 Polypropylene Coated Manhole Steps

Manhole Steps shall be constructed with grade 60 steel reinforcement and in accordance with ASTM C478. Manhole step shall be of the type with a No-Slip tread surface on one side of step. Manhole step shall be installed into the full depth of tapered preformed holes of at least 3 inches minimum depth.

Sec. 302-9 Sewer Main Location, Alignment, Cover and Size

302-9.01 Location

All sanitary sewers and appurtenant structures shall be a minimum of five (5) feet from the roadway center line. In no case shall a sanitary sewer line be located closer than five (5) feet from an existing or proposed gutter lip. Sanitary sewers shall be centered on travel lanes to the greatest extent possible. In unstable soil, the minimum distances may be increased by the Engineer. Minor exceptions may be approved by the Director.

The entire sanitary system shall be located as mentioned above and shall be designed to clear all other existing or proposed utilities by a minimum of six (6) inches. Clearances with water lines shall conform to Chapter V of this Division.

Location of sewer mains in easements shall be subject to the approval of the Director. Sewer mains in easements shall be kept to a minimum.

Where sewer mains are located within easements, the easements shall be:

a. Granted with final map, or

b. Be granted to the entity accepting and maintaining the sewers, or

c. Be dedicated to and accepted by Kern County.

d. The minimum width of any easement for sanitary sewer purpose shall be ten (10) feet. In special cases of terrain, depth of sewer line, access, etc. the required easement width shall be increased based on 1:1 cut slope plus three (3) feet for pipe zone. Width of easement to be approved by Director.

e. All easements shall include right of ingress and egress over adjoining property for maintenance, replacement and operation. No permanent structures shall be constructed in such easements, except fences, and except utilities which are the subject of an overlapping easement. Vehicular access shall be provided to all manholes except as specifically exempted by the Director.

f. Length of curved sewer lines shall not exceed three hundred (300) feet, unless approved by the Director.

302-9.02 Alignment

Whenever possible, sewer lines shall be laid out in a straight line between structures. Curved sewer lines will be allowed under the following conditions:

a. All curve data shall be shown on the plans.

b. Minimum radius of curvature and joint deflections shall be as recommended by the pipe manufacturer and approved by the Director. Alignment shall be concentric to street or easement centerline.

c. All deflections shall be at the pipe joints or by specially mitered pipe sections. Actual bending of the pipe itself will not be allowed.

d. Manholes shall be constructed at the B.C. and E.C. of all curves.

e. Any non-metallic sewer line constructed on a horizontal curve shall have a No. 10 bare soft copper detector wire placed over the pipeline prior to backfilling. The detector wire shall be brought up to the manhole frames at each end of the curved pipeline.

f. Identification tape, designed for use on sewers, shall be placed one foot above on top of the sewer main along its entire length. Identification tape shall also be placed on the top of sewer laterals extending from one (1) foot above the sewer main to the right of way line.

302-9.03 Cover

Minimum cover for any sewer main shall be four (4) feet within the street section, and three (3) feet in sewer easements, and over sewer laterals within the street section. Any deviation from this cover shall require special design and approval by the Director.

302-9.04 Size

Minimum line size for any sewer main shall be eight (8) inches in diameter. For sewer mains of 150 feet or less which cannot be extended, (e.g. cul-de-sacs) sewers shall not be less than eight (8) inches in diameter or as approved by Director.

Sec. 302-10 Building Sewers

302-10.01 Minimum size of any sanitary building sewer within road right of way and/or dedicated easement to serve individual residences, commercial structures, etc. shall be four (4) inches. Actual size of building sewers larger than four (4) inches shall be determined by fixture unit requirements as per the current edition of the California Plumbing Code.

302-10.02 Quantity: A separate building sewer lateral shall be provided to each lot, parcel or building. Subdivision of land into large parcels subject to potential future re-subdivision or multiple building sites may require additional laterals or increased lateral size.

Sec. 302-11 Special Equipment and Structures

302-11.01 All special equipment such as package treatment plants, their appurtenances, and their effluent disposal areas and methods shall be designed, located, and constructed so as to preclude contamination, pollution, nuisance, and structural and mechanical instability. Proposals and plans for package treatment systems and disposal facilities shall be subject to the review and approval of: (1) the Regional Water Quality Control Board (RWQCB) for design, contamination elements of pollution and nuisance aspects. Upon approval, waste discharge requirements will be issued by said RWQCB, (2) the Public Works Department for structural and mechanical integrity. Special structures, such as pump stations,

pressure lines and sags, etc. shall be subject to the approval of the Public Works Department and the maintaining District.

302-11.02 Plans for individual septic tank systems shall be subject to the review and approval of the County Environmental Health Services Department and by the County Building Inspection Division. Reclaimed water usage shall be subject to the review and approval of the State Department of Health Services.

302-11.03 Sewer Pumping Stations: Sewer lift stations shall be designed to lift the design peak flow as determined using the criteria in Section 302-1 of this manual. The lift station shall be equipped with two pumps, each capable of discharging the peak flow. Multiple pump stations may be considered where dual pump stations are infeasible, subject to the approval of the Director and/or the maintaining District. Said facilities shall be capable of passing the peak flow with any one pump out of service. Final design is subject to the approval of the Director and/or maintaining District.

CHAPTER III. FINAL ACCEPTANCE

Sec. 303-1 Cleaning

Prior to the acceptance of any sewer line by the County, the contractor shall clean all lines with a Wayne-type sewer cleaning ball under hydrostatic pressure. Any stoppage, dirt or foreign matter shall be removed from the lines and not be washed into the public sewer system. All cleaning and testing of sewer lines shall take place after all construction work is completed, up to, but not including, the final paving. The system will be inspected after final paving is completed and any damage to the system during final paving and cleanup will be corrected before approval.

Sec. 303-2 Air Testing

Prior to final approval, all sewer lines shall be tested for leakage by low pressure air test. The method of test shall follow the procedures and methods as recommended by Uni-bell PVC Pipe Association's publication UNI-B-06, "Recommended Practice for Low Pressure Air Testing of Installed Sewer Pipe." Building drains which are not within the right of way shall be tested in accordance with the low-pressure air testing procedures specified within the California Plumbing Code.

Sec. 303-3 Mandrell Testing PVC, ABS, and PVC Truss

The sewer mains shall be mandrelled to test for excessive deflection.

Deflections in the installed sewer pipe shall not reduce the base inside diameter, as listed by the manufacturer, by more than 5% no less than thirty (30) days after back-fill and

compaction. After the time period, the Contractor, at his expense, shall hand-pull a mandrell, approved by the Engineer, through the installed pipe to demonstrate that deflections have not reduced the inside diameter below tolerance. If the mandrell fails to pass freely, the pipe shall be deemed to be over-deflected. Over-deflected pipe shall be uncovered, any damaged pipe shall be replaced, and the pipe again backfilled, compacted and tested at the Contractor's expense.

The Engineer may waive the thirty (30) daytime period if the initial deflection, after back-fill and compaction, reduces the manufacturer's listed base inside diameter less than 3.5%. Testing procedures for this requirement are the same as previously described. In the case of a non-passing test the Contractor, at his option, may replace over-deflected pipe as described in this section or revert to the requirements previously described for maximum 5% deflection.

The mandrell used to test for excessive defection shall be rigid and non-adjustable, have an odd number of vanes (nine minimum) and have an effective length of not less than its nominal diameter. Before use, the mandrell shall be passed through a go/nogo ring provided by the Contractor and approved for use by the Engineer. At the option of the County, the Engineer may choose to provide the mandrell and go/nogo ring for use by the Contractor.

CHAPTER IV. MATERIALS AND INSTALLATION

Sec. 304-1 General

All material that is to become a permanent part of any sanitary sewer or appurtenant structure, shall conform to the requirements for the particular material as set forth in these specifications. The contractor shall supply any and all certificates of compliance, certified tests results or shall perform tests as required to assure the Engineer that the material being incorporated into the work has met the requirements as specified. Requests to use materials not listed in these standards shall require special consideration and approval of the Director.

Sec. 304-2 Pipe and Conduits

All pipe or conduits shall be of the size, material and strength as shown on the plans. All pipe and fittings shall be marked or stamped with the trade brand name of the manufacturer, and strength or class of pipe. All pipe shall be designed to withstand all internal or external loads applied. Supporting strength of conduits as installed to safely carry imposed gravity loads and superimposed loads (including a suitable factor of safety) shall be determined by use of Marston formula as per Chapter 9 (Structural Requirements) ASCE Manual of Engineering Practices No. 60 (Copy on file with Director). All pipe or conduits shall be of the same material between structures.

Sec. 304-3 Vitrified Clay Pipe (VCP)

Vitrified Clay Pipe (VCP) and fittings shall be new, first quality pipe and shall comply with the specifications for Extra Strength Unglazed Clay Pipe ASTM Designation C700. Joints for bell and spigot VCP shall conform to ASTM Designation C425. Installation of VCP shall comply with ATSM Designation C12. The only allowable variations from the above recommended practices will be as definitely specified in other sections of these standards.

a. Materials: The pipe and fittings shall be extra strength vitrified clay conforming to current ASTM designation C700 and shall be installed in conformance with the provisions of section 71 of the standard specifications of the State of California, Department of Transportation, current edition and the current ASTM designation C12.

b. Joints:

(1) Joints for bell and spigot VCP shall conform to ASTM Designation C425. The pipe and fittings shall have a socket end and a spigot end with compression joints conforming with the current ASTM designation C425.
(2) The pipe and fitting for 6", 8", 10" and 12" sanitary sewer mains may be plain-end with compression couplings conforming with the current ASTM designation C425, excepting that a stainless steel shear ring as manufactured by Mission Clay Products Corporation for their "Mainline" band seal compression coupling, or approved equal, shall be required.
(3) The pipe and fittings for private sanitary house sewer or building laterals may be plain end with compression or coupling conforming with the current ASTM designation C425, (stainless steel shear rings are not required.

The only allowable variations from the above recommended practices will be as definitely specified in other sections of these standards.

The use of VCP shall be at the discretion of the District.

Sec. 304-4 Intentionally left blank

Sec. 304-5 PVC, ABS, and PVC Truss Pipes

P.W. Pipe Twin Seal or J-M Ring Tite PVC or Armco ABS or PVC Truss pipe sewer installations. Except for procedures involving the use of the above pipes as detailed herein, the requirements of Section 71 of the Standard Specifications and the required Mandrell Test and Air Pressure Test upon completion of compaction of the trench backfill and subgrade grading plane are applicable. ASTM specifications referred to herein shall be the latest edition thereof.

304-5.01 P.V.C. Sewer Pipe shall conform to the following:

a. Pipe shall conform to ASTM D3034 in accordance with SDR-35 (1.4.2.3 D2680 and D2751) requirements.

1. Pipe and fittings shall be homogeneous throughout and free from cracks, holes, foreign inclusions or other defects. Fitting shall be injection molded and shall be installed in line on new pipelines; cut-in fittings are not permitted.

2. Joints: Use only elastomeric gasket joints. The assembly of joints shall be in accordance with the manufacturer's recommendation. Where PVC pipe connects to VCP, use couplings approved by the County and District.

3. Joints: Use only solvent welded joints. The assembly of Joints shall be in accordance with the manufacturer's recommendations. Where ABS pipe connects to VCP, use couplings approved by the County and District.

b. Pipe and fittings shall be made from PVC having a minimum cell classification of 12454-B, 12454-C or 13364-B, as defined by ASTM D1784.

c. Pipe stiffness shall be 46 psi minimum when measured in accordance with ASTM D2412.

d. P.V.C. compound used shall not contain filler material in excess of 10 pph.

304-5.02 Parallel Rib Sewer Pipe shall conform to the following:
(Only approved for use by limited districts in the County)

a. Pipe shall conform to ASTM-F-949 for 4", 6", or 8" diameter pipe.

b. Pipe and fittings shall be made from PVC having a minimum-cell classifications of 12454B or 12454C as defined by ASTM D1784.

c. Pipe stiffness shall be 50 psi minimum when measured in accordance with ASTM D2412.

d. The PVC compound used for ASTM F949 pipe manufacture shall not contain filler material in excess of 5 pph.

304-5.03 ABS or PVC Truss Pipe shall conform to the following:
(Only approved for use by limited districts in the County)

a. Pipe shall conform to ASTM D2680 in accordance with SDR-23.5 requirements.

b. Pipe shall be made from ABS or PVC having a minimum cell classification of 12454-B or 12454-C, as defined by ASTM D1784 or classification of 2-2-3 as defined by ASTM D1788.

c. Pipe, glue and fittings shall conform to ASTM designations D1084, D1788, D2234, D3189, and F402.

d. Fittings shall be made from PVC having a minimum cell classification of 12454B, 12454C or 13343C as defined by ASTM D1784.

e. Each length of pipe shall be marked with the applicable ASTM, SDR (if applicable), cell classification, nominal pipe size and manufacturers name or trademark.

f. A certificate of compliance from the pipe manufacturer shall be provided for each type of material used.

304-5.04 PVC Pipe and Fittings

All PVC pipe and fittings shall conform to the following:

a. Each length of pipe shall be marked with the applicable ASTM, SDR (if applicable), cell classification, nominal pipe size and manufacturers name or trademark.

b. A certificate of compliance from the pipe manufacturer shall be provided for each type of material used.

c. PVC pipe shall not deviate from straight by more than 1/16th inch per foot (camber) when the maximum offset is measured from the concave side of the pipe. ABS or PVC pipe shall be of the bell and spigot type. Bells shall be factory attached to the pipe. Wyes or tees for house service connections shall be complete fittings. Saddle type fittings shall not be allowed. Field solvent welded joints shall not be allowed.

304-5.05 Storage and Handling of PVC, ABS, and PVC Truss Pipes.
Pipes shall be stored on a smooth bed. The pipe shall not be dropped or dragged. Stored pipe shall be covered to protect it from ultraviolet light (sun's rays). Pipe with noticeable color changes resulting from exposure to ultraviolet light shall be rejected by the Engineer.

304-5.06 Bedding for PVC ABS, and PVC Truss Pipes

Embedment materials (Class I, II and III) shall conform to Section 5 of ASTM D2321, and the following:

a. Class I - Angular, 1/4 to 1-1/2 in. graded stone, including a number of fill materials that have regional significance such as coral, slag, cinders, crushed stone, crushed gravel, and crushed shells.

b. Class II - Coarse sands and gravels with maximum particle size of 1-1/2 in., including variously graded sands and gravels containing small percentages of fines, generally granular and non-cohesive, either wet or dry. Soil types GW, GP, SW, and SP are included in this class.

c. Class III - Fine sand and clayey gravels, including fine sands, sand-clay mixtures, and gravel-clay mixtures. Soil types GM, GC, SM and SC are included in this class.

d. Soil classification is in conformance with Unified Soil Classification System ASTM Designation D2487 and D2488. Native soils meeting the requirements for Class II and Class III materials may be accepted by the Engineer.

e. Bedding procedure shall conform to Section 7 of ASTM D2321 and the following:

1. Bedding shall be placed and compacted for all main lines and building sewer laterals as shown on plate S-1.

2. After placement and compaction of bedding and prior to installation of sewer main and laterals the Engineer shall inspect the bedding placement and compaction.

3. Flooding or jetting of bedding will not be allowed.

304-5.07 Installation of Pipe, Fittings and Haunching PVC, ABS, and PVC Truss Pipes

a. Pipe exposed to the sun during summer months shall be allowed to cool prior to connection to manholes or placement of haunching. Allowance shall be made for the movement of pipe along the main line and at the building sewer laterals. Fittings shall be sized to receive type of pipe used. Installation of fittings shall be in accordance with manufacturer's instruction manuals. Plugs shall be placed at the termination of the building sewer laterals and main line (if required).

b. A flexible coupling or a flexible joint, shall be installed within three feet of each sewer manhole. Where bands are tied to secure flexible couplings, the bands, housing, and screw shall be stainless steel. Flexible couplings shall comply with ASTM C1173 and ASTM D5926.

c. Pipe installation and haunching shall conform to ASTM D2321 and the following:

1. The pipe shall be laid true to grade with 0.03' maximum tolerance, per joint.

2. After cooling of the pipe, haunching shall be placed and compacted for all main lines and building sewer laterals as shown on Plate S-1.

3. Materials used for haunching shall be the same class as that used for bedding.

4. Prior to placement and compaction of initial backfill, the Engineer shall inspect the placement of sewer main and house building sewers, haunching and compaction.

5. Care shall be exercised in placing haunching material to prevent damage to or displacement of the sewer pipe.

6. Flooding or jetting the haunching will not be allowed.

304-5.08 Initial Backfill PVC, ABS and PVC Truss Pipes

Initial backfill shall conform to ASTM D2321 and the following:

a. After cooling of the pipe and placement and inspection of haunching, initial backfill shall be placed and compacted for all main lines and building sewer laterals as shown on Plate S-1.

b. Materials used for initial backfill shall be the same class as that used for haunching.

c. Prior to placement and compaction of backfill, the Engineer shall inspect the initial backfill and compaction.

d. Care shall be exercised in placing initial backfill material to prevent damage to or displacement of the sewer pipe.

e. Flooding or jetting the initial backfill will not be allowed.

304-5.09 Backfill PVC, ABS and PVC Truss Pipes

PIPE ZONE MATERIAL

Rigid Pipe	**All material passing 1" sieve**
Flexible Pipe	ASTM D2321 Class I, II or III (Classes I and II allow up to 1-½" rock)
Compaction	90% (ASTM D2321 only requires 85% for Class II material

TRENCH WIDTH

Pipe Size (in.)	O.D. (in.)*	Min. (O.D.+10")	Max. (O.D.+16")
4	4.215	14.2	20.2
6	6.275	16.3	22.3
8	8.400	18.4	24.4
10	10.500	20.5	26.5
12	12.500	22.5	28.5
15	15.300	25.3	31.3
18	18.701	28.7	34.7
21	22.047	32.0	38.0
24	24.800	34.8	40.8
27	27.950	38.0	44.0

* O.D. may vary from type and/or manufacturer of pipe.

The remainder of the trench backfill shall conform with Section 19-3 of the Standard Specifications and as follows:

a. Section 19-3.03F, "Slurry Cement Backfill", of the Standard Specifications is deleted.

b. Backfill material shall be free of all rock or lumps, exceeding six (6) inches maximum dimension.

c. Compaction of backfill material shall be required for all main lines and building sewer laterals as shown on the attached Plate S-1.

d. Flooding or jetting of the backfill will not be allowed.

304-5.10 Sewer Pipes

After pipeline cleaning, backfill and compaction of trench and subgrade grading plane compaction, the completed sewer main shall be air tested in conformance with Section 303-2 of the Kern County Development Standards.

a. Lateral and Stubs

1. All laterals shall extend to the property line and shall be 4” in diameter except as noted on plans. Surface markers for sewer laterals shall be installed at property line.

2. Wye fittings shall be in-line type and shall be used for all lateral connections and shall be rotated a minimum of 23 degrees above the horizontal plane running through the centerline of the main.

3. All sewer stubs shall be closed with a standard plastic plug solvent welded.

b. Existing Facilities: All existing improvements, (curbs, gutter, sidewalk, cross gutter, fencing, etc.), that are removed, damaged or undercut shall be repaired or replaced as directed by the County.

CHAPTER V. STANDARDS FOR SEPARATION OF WATER AND SEWER LINES

Sec. 305-1 General

This document sets forth the construction criteria for the installation of water mains and sewer lines to prevent contamination of the public water supplies from nearby sanitary sewers.

305-1.01 The "California Waterworks Standards" sets forth the minimum separation requirements for water mains and sewer lines. These Standards, contained in Section 64572, Title 22, California Administrative Code, specify:

(a) Parallel Construction: The horizontal distance between pressure water mains and sewer lines shall be at least 10 feet.

(b) Perpendicular Construction (Crossing): Pressure water mains shall be at least one foot above sanitary sewer lines where these lines must cross.

(c) Separation distances specified in (a) above shall be measured from the nearest edges of the facilities.

(d) Common Trench: Water mains and sewer lines must not be installed in the same trench.

(e) Where steel casings or tunnels are used for the passage of water and sewer lines under railroad tracks, highways or other structures, the same shall be specially designed to eliminate any hazard of contamination to the water system.

Sec. 305-2 Exceptions to Basic Separation Standards

Local conditions, such as available space, limited slope, existing structures, etc., may create a situation where there is NO ALTERNATIVE but to install water mains or sewer lines at a distance less than that required by the Basic Separation Standards. In such cases, alternative construction criteria as specified in Section 305-4 should be followed, subject to the special provisions in Section 305-3.

Water mains and sewers of 24 inches in diameter or greater may create special hazards because of the large volumes of flow. Therefore, installations of water mains and sewer lines 24 inches in diameter or larger should be reviewed and approved by the health agency prior to construction.

Sec. 305-3 Special Provisions

305-3.01 The Basic Separation Standards are applicable under normal conditions for sewage collection lines and water distribution mains. More stringent requirements may be necessary if conditions, such as, high groundwater exist.

305-3.02 Sewer lines shall not be installed within 25 feet horizontally of a low head (5 psi or less pressure) water main.

305-3.03 New water mains and sewers shall be pressure tested where the conduits are located ten feet apart or less.

305-3.04 In the installation of water mains or sewer lines, measures should be taken to prevent or minimize disturbances of the existing line. Disturbance of the supporting base of this line could eventually result in failure of this existing pipeline.

305-3.05 Special consideration shall be given to the selection of pipe materials if corrosive conditions are likely to exist. These conditions may be due to soil type and/or the nature of the fluid conveyed in the conduit, such as a septic sewage which produces corrosive hydrogen sulfide.

305-3.06 Sewer Force Mains

a. Sewer force mains shall not be installed within ten feet (horizontally) of a water main.

b. When a sewer force main must cross a water line, the crossing should be as close as practical to the perpendicular. The sewer force main should be at least one (1) foot below the water line.

c. When a new sewer force main crosses under an existing water main, all portions of the sewer force main within ten feet (horizontally) of the water main shall be enclosed in a continuous sleeve.

d. When a new water main crosses over an existing sewer force main, the water main shall be constructed of pipe materials with a minimum rated working pressure of 200 psi or equivalent pressure rating.

e. Force mains greater than 1000 feet shall have pressure clean-outs every 600 feet.

Sec. 305-4 Alternate Criteria for Construction

The construction criteria for sewer lines or water mains where the Basic Separation Standards cannot be attained are shown on Plate Nos. S-9 and S-10. There are two situations encountered:

Case 1: New sewer line -- new or existing water main.
Case 2: New water main -- existing sewer line.

For Case 1, the alternate construction criteria apply to the sewer line.

For Case 2, the alternate construction criteria may apply to either or both the water main and sewer line.

The construction criteria should apply to the house laterals that cross ABOVE a pressure water main but not to those house laterals that cross BELOW a pressure water main.

305-4.01 Case 1: New Sewer Being Installed (Plate Nos. S-9 and S-10)

Special Construction Required for Sewer

Zone A. Sewer lines parallel to water mains shall not be permitted in this zone without approval from the responsible health agency and water supplier.

Zone B. A sewer line placed parallel to a water line shall be constructed of:

1. Extra strength vitrified clay pipe with compression joints.

2. Plastic sewer pipe with rubber ring joints (per ASTM D3034) or equivalent.

3. Cast or ductile iron pipe with compression joints.

Zone C. A sewer line crossing a water main shall be constructed of:

1. Ductile iron pipe with hot dip bituminous coating and mechanical joints.

2. A continuous section of Class 200 (DR 14 per AWWA C900) plastic pipe or equivalent, centered over the pipe being crossed.

3. Any sewer pipe within a continuous sleeve.

Zone D. A sewer line crossing a water main shall be constructed of:

1. A continuous section of ductile iron pipe with hot dip bituminous coating.

2. A continuous section of Class 200 (DR 14 PER AWWA C900) plastic pipe or equivalent centered on the pipe being crossed.

3. Any sewer pipe within a continuous sleeve.

4. Any sewer pipe separated by a ten-foot by ten-foot, four (4) inch-thick reinforced concrete slab.

305-4.02 Case 2: New Water Mains Being Installed (Plate Nos. S-9 and S-10)

Zone A. No water mains parallel to sewers shall be constructed without approval from the health agency.

Zone B. If the sewer paralleling the water main does not meet the Case 1, Zone B, requirements, the water main shall be constructed of:

1. Ductile iron pipe with hot dip bituminous coating.

2. Dipped and wrapped one-fourth (1/4) inch thick welded steel pipe.

3. Class 200 pressure rated plastic water pipe (DR 14 per AWWA C900) or equivalent.

4. Reinforced concrete pressure pipe, steel cylinder type, per AWWA (C300 or C301 or C303).

Zone C. If the sewer crossing the water main does not meet the Case 1, Zone C, requirements, the water main shall have no joints in Zone C and be constructed of:

1. Ductile iron pipe with hot dip bituminous coating.

2. Dipped and wrapped one-fourth (1/4) inch thick welded steel pipe.

3. Class 200 pressure rated plastic water pipe (DR 14 per AWWA C900) or equivalent.

4. Reinforced concrete pressure pipe, steel cylinder type, per AWWA (C300 or C301 or C303).

Zone D. If the sewer crossing the water main does not meet the requirements for Zone D, Case 1, the water main shall have no joints within four (4) feet from either side of the sewer and shall be constructed of:

1. Ductile iron pipe with hot dip bituminous coating.

2. Dipped and wrapped one-fourth (1/4) inch thick welded steel pipe.

3. Class 200 pressure rated plastic water pipe (Dr 14 per AWWA C900) or equivalent.

4. Reinforced concrete pressure pipe, steel cylinder type, per AWWA (C300 or C301 or C303).

Sec. 305-5 Notes and Definitions

305-5.01 **HEALTH AGENCY** - The Department of Health Services. For those water systems supplying fewer than 15 service connections, the local health officer may act for the Department of Health Services.

305-5.02 **WATER SUPPLIER** - "Person operating a public water system" or "supplier of water" means any person who owns or operates a public water system

305-5.03 **LOW HEAD WATER MAIN** - Any water main which has a pressure of five (5) psi or less at any time at any point in the main.

305-5.04 **DIMENSIONS** are from outside of water maim to outside of sewer line or manhole.

305-5.05 **COMPRESSION JOINT** - A push-on joint that seals by means of the compression of a rubber ring or gasket between the pipe and a bell or coupling.

305-5.06 **MECHANICAL JOINTS** - Bolted joints.

305-5.07 **RATED WORKING WATER PRESSURE OR PRESSURE CLASS** - A pipe classification system based upon internal working pressure of the fluid in the pipe, type of pipe material, and the thickness of the pipe wall.

305-5.08 **FUSED JOINT** - The jointing of sections of pipe using thermal or chemical bonding processes.

305-5.09 **SLEEVE** - A protective type of steel with a wall thickness of not less than one-fourth inch into which a pipe is inserted.

305-5.10 **GROUNDWATER** - Subsurface water found in the saturation zone.

305-5.11 **HOUSE LATERAL** - A sewer connecting the building drain and the main sewer line.

CHAPTER VI STANDARDS FOR SEWER LIFT STATION

Sec. 306-1 General

Sewer Lift stations shall conform to the following minimum features and specifications:

306-1.01 Pumps shall be installed in a single wet well and shall be submersible as approved by the manufacture.

306-1.02 Pumps shall be removable from ground level through use of a guide rail and cable system attached to the wet well.

306-1.03 Sewer lift stations shall be located outside street right of way in an easement dedicated for a lift station.

306-1.04 Site shall be enclosed by fence and interior surface shall be graveled with three-tenths (0.30) foot of three-fourths (¾) inch gravel. Site shall have approved access.

306-1.05 Wet well shall be equipped with access frame and cover which will allow removal of pump and motor assembly.

306-1.06 Wet well shall be mechanically vented to prevent odors from reaching adjacent properties.

306-1.07 Minimum pump horsepower shall be five (5) hp.

306-1.08 Wet well surfaces shall be treated with a protective lining, acceptable to County, and shall be integral to all interior surfaces.

306-1.09 A portable supply shall be provided for wash down.

306-1.10 Bottom of wet well shall be sloped toward pumps to direct sludge. Pumps shall be supported on smooth and level bottom area.

306-1.11 All pipes shall be neoprene sealed at walls of wet well.

306-1.12 A wash down assembly to facilitate break-up of scum layer shall be connected to each discharge as near the top as possible. It shall consist of a one (1) inch NPT Bronze strap service saddle with stainless steel nuts and bolts, a one (1) inch NPT cast iron threaded nipple eight (8) inch long, and a one (1) inch cast iron threaded 90° ell.

306-1.13 Discharge shall feed into a valve box equipped with check and gate valves for each discharge line. The box shall have a three-fourths (¾) inch gravel bedding with a two (2) inch bleed off pipe connected to the wet well. (see Plate No. S-13)

306-1.14 The pump number shall be painted contrasting colors on each discharge pipe in a manner clearly visible from above.

306-1.15 The motor control center shall be pedestal mounted on a concrete base in a metal or fiberglass weatherproof, rainproof and lockable enclosure.

Sec. 306-2 Lift Station Specifications

306-2.01 General

All work involved in constructing sewer pump stations shall conform to the applicable provisions of the California Department of Transportation Standard Specifications, current edition, hereinafter referred to as Standard Specifications, County Standards, the improvement plans and these specifications.

The following specifications represent the minimum specification allowable for a duplex sewer pump station. Additional features or specifications may be needed as required by the engineer.

306-2.02 Concrete

The work included herein shall conform to Section 51 "Concrete Structures" and Section 90 "Portland Cement Concrete" of the Standard Specifications. This work shall consist of furnishing all labor, tools, equipment and materials necessary for the installation of all structural concrete, minor concrete and mortar as shown on the plans

and specified herein.

Structural Concrete:

Strength:
The minimum ultimate (28 days) compressive strength of all structural concrete shall be 3250 psi.

Concrete Mix:
Structural concrete must contain at least 675 pounds of cementitious material per cubic yard of concrete. The maximum size of aggregate shall be one and one-half (1 ½) inches.

Slump:
The amount of water used for mixing (including free moisture carried by the aggregate) shall not exceed the maximum necessary to produce a four (4) inch slump as determined by ASTM test method C143.

Placing:
Concrete shall be placed in accordance with Section 51-1.03C(2)(c)(ii): Placing Concrete" of the Standard Specifications.

Forms:
All form work shall conform to Section 51-1.03C(2) "Forms" of the Standard Specifications.

Defective Concrete:
Concrete not meeting the minimum strength requirement, not formed as indicated, not true to intended alignment, which has large voids or rock pockets, which has wood or other debris embedded which has a surface deviation greater than one-eighth (1/8) inch in 10'-0", or does not fully conform to the specifications shall be deemed defective, and if so directed by the Engineer, shall be removed and replaced with concrete complying with the drawings and specifications.

Minor Concrete:

Concrete Mix:
Minor concrete must contain at least 505 pounds of cementitious material per cubic yard of concrete. The maximum size of aggregate shall be one (1) inch.

Form work:
Earthen forms for exterior concrete surfaces shall be allowed only upon approval by the Engineer. The acceptability of the earthen forms shall be solely decided upon by the Engineer.

Mortar:
All mortar shall conform for Section 51-1.02F "Mortar" of the Standard Specifications.

Non-Shrink Grout and Dry-pack:
Non-shrink grout shall conform to Section 50-1.03B(2)(d), "Bonding and Grouting" of the Standard Specifications with a required admixture using the following proportions:
Portland Cement. .... 1 Part by Wt.
Sand (100% Passing #8 Sieve) .... I Part by Wt.
Water.. .. .. 4 ½ -5 ½ gal./sack cement
Sika "intraplast" N Admixture .... 1 % by Wt. Of cement
Dry-pack shall be composed as for grout except that only enough water shall be added to wet the mixture (no free water and no slump). Dry-pack shall be tamped into place and cured as specified for concrete in this section. Contractor shall not use non-shrink grout or dry-pack that has been mixed longer than 30 minutes. No re-tamping shall be allowed.

Finishes on Walking Surfaces:
The contractor shall give a monolithic finish to the walking surfaces at all concrete floors and slabs within and adjacent to the structures. All concrete surfaces to be so finished shall be thoroughly worked, brought to a uniform smooth finish and given a final brush finish.

Curing:
All newly placed concrete shall be kept moist for the first seven (7) days after the concrete has been placed. This shall be achieved by one of the following methods:

1. Ponding
2. Cotton mats rugs or carpets kept continuously wet.
3. Kraft paper or plastic film with joints sealed or tapered. The perimeter of the paper shall be sprinkled once daily.
4. Curing compound method: All exposed cast in place concrete shall be cured with curing compound in accordance with Section 90-1.03B "Curing Concrete", of the Standard Specifications.

Forms may be used to cure formed portions in accordance with Section 90-1.03B(5) "Forms In-Place Methods" of the Standard Specifications. If the forms are removed prior to seven (7) days after the pour, the newly exposed areas shall be cured for the remainder of the seven (7) days by one of the above methods.

306-2.03 Metal Work

The work included herein shall conform to Sections 52- "Reinforcement", 55- "Steel Structures" and 75 -" Miscellaneous Metal" of the Standard Specifications. This work shall consist of furnishing all labor, tools, equipment, and materials necessary for the installation of all reinforcing steel, structural steel and miscellaneous metal as shown on the plans and specified herein and as directed by the Engineer.

Reinforcing Steel:

Materials:

1. Bars shall be deformed bars conforming to ASTM A615, as follows: Bar Size Grade #4 and smaller Grade 40, #5 and larger Grade 60

2. All reinforcing steel shall be new, clean, free from oil, dirt, loose mill scale, excessive rust, mortar, or other coatings that would destroy or reduce the bond.

Placing Reinforcement:

The bending and placing of all reinforcement shall conform to the "Manual of Standard Practice" of the American Concrete Institute. Bends shall be made around a pin having a diameter of not less than four (4) times the bar diameter for stirrups and ties, six (6) times the bar diameter for other bars except for bars larger than 1" which shall be eight (8) times the bar diameter. Bars shall be bent cold. Reinforcing shall be accurately placed in accordance with the drawings and shall be securely tied in position with at least No. 16 gauge annealed wire at all bar intersections. Metal chairs and bolsters shall be used to hold all steel above the form bottoms at the proper distance. Metal spacers shall be used to secure the proper spacing of the steel. Pre-cast concrete blocks shall be used to support reinforcing steel off the ground in footings and off the soffit of concrete exposed to weather. The clear distance between parallel bars shall not be less than one and one-half (1 ½) times the bar diameter, but in no case less that one and one-half (1 ½) inches nor less than one and one-third (1 1/3) times the maximum size of coarse aggregate.

Splices shall be made with a lap of at least 30 bar diameters unless noted otherwise. The bars shall be placed in contact and wired together in such a manner as to maintain a clearance of not less than the minimum clear distance to the other bars and to the surface of the concrete. Minimum clear distance to all concrete surfaces shall be two (2) inches unless otherwise noted on the plans.

Pump Access Covers:
The wet well shall be equipped with a pump access cover for each pump as shown on the plans. Access covers shall be stainless steel-fitted aluminum construction, designed for access to submersible pumps. Covers shall be equipped with a guide bar bracket, safety chain hook, electric cable support, and a hasp for a padlock. Covers shall be of a size compatible with the pumps.

Valve Box Access Cover:
Cover shall be double leaf, channel frame aluminum construction with stainless steel hardware and a hasp for a padlock. Cover shall be of a size compatible with valve box opening, minimum size shall be five (5) feet x six (6) feet with each leaf being three (3) feet x five (5) feet. The cover shall withstand a live-load of at least 300 pounds per square foot and be equipped with spring door operators and automatic hold-open arms. The cover construction shall have a mill finish with Bituminous Coating applied to exterior of the frame.

Anchor Bolts and Concrete Anchors:
Concrete anchorage devices shall be installed in the concrete as shown on the plans so that the attached equipment will bear firmly against the concrete. The concrete anchors for the pump discharge mount shall be wedge anchors and must be Type 316 stainless steel, three-fourths (3/4) inch Diameter, or approved equal.

Bolted Connections:
All bolts, nuts and washers within the wet well shall be 316 stainless steel.

306-2.04 Painting

Furnish and apply to the satisfaction of the Engineer, protective paint in colors as approved by the engineer. All exposed interior and exterior metal surfaces, except aluminum, galvanized steel, stainless steel and chrome plated metal, shall be coated. All paint shall be delivered in original containers and shall be applied in strict accordance with the recommendations of the manufacturer.

Preparation of surfaces:

Concrete Surfaces:
Before painting, all concrete surfaces to be painted shall be thoroughly cleaned. Surfaces to be painted shall be completely wire brushed to remove any loose concrete or paint, and cracks shall be patched. Concrete surfaces to be painted shall have all air pockets or other imperfections filled, so that a smooth surface results. All surfaces shall be completely dry prior to painting. Concrete surfaces

which shall be coated with a protective coating for the purpose of protecting the concrete surface, shall have all air pockets or other imperfections in the concrete filled, so that a smooth concrete surface results, after the surface has been opened, it shall be sacked to fill the voids with mortar. Sacking shall be accomplished soon after the removal of the forms to promote adequate adhesion. Covering over the surface with a thin layer of mortar shall not be acceptable.

Metal Surfaces:
All metal work to be painted shall be absolutely clean and free of all rust and grease. All exposed cast iron or steel piping to be painted, which has a previously applied coal tar derivative, shall be primed, prior to finish coating, with two (2) coats of a heavy duty, coal tar based epoxy or approved equal.

Completion of Surface Preparation:
After completion of preparing all surfaces to be painted, the surfaces shall be inspected and approved by the County prior to the application of any protective coatings.

Materials:
Under these specifications, all paint products to be furnished for application as specified in this section.
Coating System:

A. One (1) coat of a self-priming, coal-tar, with a continuous dry temperature resistance of at least 325 degrees F. The completed surfaces shall have a dry thickness of at least 16 mil.

B. Two (2) coats of a coal-tar epoxy polyamide with a solids content by volume of at least 72% and has a continuous dry temperature resistance of at least 325 degrees F, the first (1^{st}) coat to be red, second (2^{nd}) coat to be black application of second (2^{nd}) coat to be applied within 24 hours of the first. The completed surfaces shall have a dry thickness of at least 16 mil.

C. One (1) coat of a polymeric epoxy amine that is a universal primer and tie-coat, self-priming, with a dry temperature resistance of at least 175 degrees F, followed by two (2) coats of a medium oil/alkyd all-purpose enamel, color: OSHA Safety Blue.

The completed surfaces shall have a dry thickness of at least three (3) mil.

Exterior Concrete Painting:
Coating System A shall be used to paint the wet well and valve box exterior surfaces in contact with the soil.

Interior Concrete Painting:
After surface preparation, the Contractor shall paint all submerged concrete surfaces, surfaces exposed to sewage fumes, all valve box interior, with coating System B.

Wet Well Metalwork Painting:
All exposed metalwork surfaces which are submerged or subjected to sewage fumes shall be painted with coating System B. Metal located within water containing compartments shall be considered submerged. The pumps, pump discharge, pump power cables and lifting cables are not to be coated. Also, the access covers are not to be coated.

Valve Box Metalwork Painting:
All exposed metalwork surfaces in the valve box shall be painted with coating System C. The access cover is not to be coated.

306-2.05 Pipe work

All labor and materials shall be furnished for the complete installation and testing of all pipe work and appurtenances related to lift stations. Shop drawings are required to be submitted by the Contractor/Developer to the Engineer for all fabricated pipe work, valves and special fittings for approval prior to construction.

Materials:

PVC Gravity Sewer Pipe:
PVC sewer pipe shall conform to these standards and the requirements of ASTM D3034. SDR 35 and shall have gasketed joints.

PVC Force Main:
PVC force main shall conform to AWWA C900 and shall be Class 150.

Ductile Iron Pipe (D.I.):
Ductile iron pipe and fittings shall be cement mortar lined. Pipe joints shall be flanged or as shown on the plans. Applicable sections of the following standards apply.

Standard	Item
AWWA C151	Ductile Iron Pipe
AWWA CI04	Cement Mortar Lining

AWWA CllO	Fittings
AWWA Clll	Rubber Gasket Joints

Cast Iron Fittings (C.I.):
Cast iron fittings shall be in accordance with the American Water Works Association Standard A21.10 (C110), "Gray Iron and Ductile Iron fittings, three (3) inch through 48-inch, for Water and Other Liquids."

Couplings and Flanges:
In the locations shown on the plans, flanged coupling adaptors shall have a body and end rings composed of ductile iron in accordance with ASTM A536, cross bolts, T-Bolts and nuts of High Strength Low Alloy Steel per AWWA C111 or ductile iron in accordance with ASTM A536 with an SBR coupling gasket per ASTM D2000, nitrile butadiene rubber (NBR) / Buna-N flange O-rings, flange drilled in accordance with ANSI/AWWA C110/A21.10, AWWA C207 and shop coat finish. Flexible couplings shall be comprised of a ductile iron center sleeve and end rings in accordance with ASTM A536, Grade 65-42-12, gaskets comprised of SBR rubber in accordance with ASTM D2000, bolts and heavy hex nuts comprised of high strength low allow in accordance with ASTM A242 and AWWA C111 and a shop coat finish. End rings shall be color coded for easy identification. Gaskets shall have size and end ring color code embossed. NBR or Buna-N gaskets may be permitted upon approval of Engineer. Flanges shall be of a size and pattern to fit valves and other piping to which they are to be connected.

Small Piping and Fittings:
These specifications shall apply to all metal pipe four (4) inches in diameter and smaller, other than cast iron piping, and shall also apply to all valves and cocks, unions, fittings, and connecting devices, and to pipe lines furnished as a part of the several piping and equipment items within the pump station. Small pipe shall include all nuts, bolts, gaskets, hangers, supports, the drilling of holes and flanges, and all materials and labor that may be necessary to the best installation of this class of work.

Fittings:
All screwed fittings shall be "American Standard Malleable Iron Screwed Fittings", 300 lb. W.O.G. of standard form and dimensions. Malleable iron shall conform to current standard specifications for malleable iron. Castings, as adopted by the "American Society for Testing Materials." All fittings shall be galvanized to correspond with pipe on which they are installed. All fittings necessary for the satisfactory alignment and arrangement of piping and all necessary

unions and clean-outs shall be furnished by the Contractor.

Gate Valve:
All gate valves shall have standard flanged ends. Each valve shall have a two (2) inch square operating nut. Valves shall correspond in size with the run of pipe on which it is installed, except as otherwise noted. Gate valves shall be four (4) inch resilient wedge gate valves with flanged ends in accordance with AWWA C515 or approved equal.

Swing Check Valve:
Check valves shall be flanged, iron body, bronze-mounted check valves. Hinge pins shall be stainless steel or other noncorrodible metal, and the stuffing box assembly shall be made of bronze, securely screwed to the valve body. Swing check valves shall have a spring type lever and check valve with a rubber disc facing in accordance with AWWA C508. Check valve shall have flanged ends in accordance with ANSI B16.1, class 125 and be epoxy coated on exterior and interior. Check valve shall have 200 PSI maximum working pressure and 400 PSI test pressure. Spring shall have option to be installed on either side of valve.

Pipe work in Concrete:
Where formed holes are left in the concrete, the Contractor shall be responsible for the accuracy of their location and for sealing around pipes to produce water tightness where necessary. All necessary pipeline openings through the concrete which may have been omitted shall also be provided.

Christy Box and Force Main Access:
For lift stations without a back-up generator, a Camlock wye connection to the force main shall be installed and placed in a utility box of at least 24 inches by 24 inches, comprised of concrete, to allow portable surface pump access to the force main in the event of a sewer lift station electrical failure, if required by the District. Lid of box shall be comprised of concrete or polymer that can withstand at least 22,500 pounds of force.

Domestic Water Service:
The Contractor shall provide and install all items as shown on the plans and as needed to supply one (1) inch water service to the valve box. The Contractor shall also coordinate installation of the service meter with the utility company providing water service to the site.

Meter and Valve Box:
The meter and valve box shall be a utility box with a minimum size of 15 inches by 22 inches and 12 inches deep. Box performance shall be in accordance with ASTM C857 with a cover that shall be comprised

of concrete or polymer that can withstand at least 22,500 pounds of force.

Reduced Pressure Back-flow Preventer:
The backflow preventer shall be a reduced pressure principle type and shall be suitable for supply pressure up to 175 psi. The backflow preventer shall be designated for inline servicing. The device shall be rated for 175 PSI working pressure and temperature range of at least 32 - 140 degrees F. The reduced pressure zone assembly shall consist of two independently operating, spring loaded, “Y” pattern check valves and one hydraulically dependent differential relief valve. Mainline valve body and caps including relief valve body and cover shall be lead free cast copper silicon alloy. Diaphragm to seat area ratio shall be 10:1 minimum. Relief valve shall have a removable seat ring. Check valve and relief valve components shall be constructed to allow service without removing the valve body from the line. All seat discs shall be reversible. The assembly shall be in accordance with AWWA C511 for a one (1) inch service or approved equal.

Domestic Water Spigots:
Contractor shall supply one (1) spigot as shown on the plans.

Wet Well Water Stops:
All cored openings in the wet well wall shall be sealed with water stops secured by stainless steel bands and non-shrink grout as specified in Section 306-2.02. Water stops shall be comprised of elastomeric PVC and in accordance with ASTM C923.

Discharge Wash-Down Assembly:
Wash-down assemblies as shown on the plans shall use eight (8) inched x one (1) inch bronze saddles with a brass body, rolled strap threads, O-ring sealed outlet and in accordance with AWWA C800.

Wet Well construction:
Wet well shall be constructed using 96-inch diameter minor concrete reinforced concrete pipe sections manufactured to meet ASTM Standards C76, C443, and C655. The wet well shall be constructed with no more than three pipe sections. The lower wet well section shall be a minimum of six (6) feet in length. Interior surfaces shall be painted prior to the installation of pumps. The discharge connection mating surface shall be kept clean and free of all paint.

Sewer Manholes:
The Contractor shall construct the sewer manholes as shown on the plans per these Standards (Plate Nos. S-5 and S-6).

306-2.06 MECHANICAL EQUIPMENT

The Contractor shall provide and install all necessary items and appurtenances required for the proper placement and functioning of the project components as intended, whether such items and appurtenances are directly specified or not. All equipment shall be designed, manufactured and assembled in such a manner so as to perform satisfactorily within housings, enclosures and the environment into which it is to be installed and operated. All items shall be tested in place. Required supervision for installing, testing and starting shall be furnished by factory-trained personnel at no charge. The Contractor shall verify all actual dimensions of existing and new construction equipment areas, bases and mountings; and he shall be responsible for ensuring proper fit of the equipment selected for installation. The Contractor shall be fully responsible for the compatibility of furnished mechanical, electrical, pipework and structural items and appurtenances.

Pump Warranty:
The pump manufacturer shall warrant the pumps and motors being supplied to the owner against defects in workmanship and materials for a period of one (1) year under normal use, operation and service. The warranty shall be in printed form and shall apply to all similar units.

Submersible Pumps, Motor and Slide-Away Coupling:
The Contractor shall furnish and install a totally submersible pumps as shown on the plans and as described hereinafter. The pumping unit shall conform to the following: Under this section the Contractor shall furnish and install all mechanical equipment and appurtenances for this project as shown on the plans and hereinafter specified. All such equipment shall be placed by the Contractor in satisfactory operating condition as an integral part of the construction of the project.

Characteristics:
Two (2) (brand) size (size) Model Torque-flow vortex submersible pumps with HP, phase, volt, hertz.

Submersible motors and slide-away casings:
Pump casing shall be constructed of ASTM A48 Class 30 gray iron and shall be completely open from suction to discharge with no wearing rings or impeller faceplates required. All internal case clearances shall be equal to the discharge diameter so that all material which will pass through the discharge can pass through the pump. The impeller shall be of the recessed design, constructed of ASTM A48 Class 30 gray iron and shall be mounted completely out of the flow path between the pump inlet and discharge connection, so

that the solids pumped are not required to flow through the impeller. The impeller shall be keyed to the motor shaft and secured by an impeller bolt.

The motor shall be provided with thrust and radial bearings to carry the entire load which may be imposed upon it under all operating conditions. Motor shall be approved by Underwriters Laboratory for operation in a Class I, Group D, Division I, hazardous location.

The motor shall have two (2) mechanical seals, the lower one (1) outside the motor and protecting the upper one (1) which is an oil-filled chamber. Moisture detector probes in the oil-filled seal chamber shall be connected to a customer-supplied alarm to indicate the presence of moisture in the seal chamber. Thermal overload protectors shall be imbedded in the motor windings and connected to the starter to disconnect the motor in the event of overload. The slide-away coupling shall consist of a foot-mounted discharge elbow and adaptor steel baseplate, upper and lower rail supports, lifting yoke and cable. All metal-to-metal interfaces where movement might occur shall be non-sparking. The foot-mounted discharge elbow and adaptor shall conform to ASTM A48 Class 30 grey iron. Lifting cable and hardware shall be stainless steel. Cable shall have a minimum working load of 2,400 lbs. and shall be supplied by the pump manufacturer.

Performance:
The developer's engineer shall provide and complete the following performance date on sewer plans. Each pump shall be capable of operating at the following conditions:
First design point GPM @ _____ ' TDH.
Second design point = GPM @ ____' TDH.
(Minimum) (Maximum) shut off=_____ feet.

Impeller selected shall be capable of operating at all three (3) design points without exceeding BHP.
Minimum clearance through case = ____"

Pump Test:
The pump manufacturer shall perform the following inspections and tests on each pump before shipment from factory:

1. Impeller, motor rating and electrical connections shall first be checked for compliance to the customer's purchase order.
2. A motor and cable insulation test for moisture content or insulation defects.
3. Prior to submergence, the pump shall be run dry to establish correct rotation and mechanical integrity.
4. The pump shall be run for 30 minutes submerged, a minimum of six (6) feet under the water.

5. After operational test No.4, the insulation test (No.2) is to be performed again.

A written report stating the foregoing have been done shall be supplied with each pump at the time of shipment. The pump cable end will then be fitted with a shrink fit rubber boot to protect it prior to electrical installation.

Documentation:
Standard drawings supplied shall include pump outlines, controls, access frames and typical installation guides. Electrical control wiring diagrams shall be supplied. Instruction and maintenance manuals and pump parts lists for the pumps installed shall also be supplied.

Acceptance Tests:
After installation, each pumping unit shall be given a running test, during which it shall demonstrate its ability to operate without vibration, overheating or excessive current draw, and to pump the capacity and head specified. These tests are to be conducted by the Contractor in the presence of the Engineer. The Engineer shall be given at least 24 hours notice in advance of each test.

During the tests, observations shall be made of motor input, vibration, noise and overheating to detect any defects in the equipment. Written results of each test shall be submitted by the Contractor to the Engineer prior to approval of the tested pumps. The Contractor shall provide at his expense the necessary water, gauges, meters, piping and labor necessary for conducting the tests. All adjustments needed to place the equipment in satisfactory working order shall be made at the time of the tests. All defects or defective equipment revealed by or noted during a test shall be corrected or replaced promptly at the expense of the Contractor, and if necessary, tests shall be repeated until satisfactory results are obtained. In case the Contractor is unable to demonstrate to the satisfaction of the Engineer that the units will satisfactorily perform the service required, and that they will operate free from vibration and over heating, the units may be rejected. The Contractor shall then remove and replace the equipment at his own expense.

306-2.07 ELECTRICAL WORK

The Contractor shall provide all the required labor, project equipment and materials, tools, construction equipment, safety equipment, transportation, test equipment, and satisfactorily complete all the electrical work shown on the drawings and included in these specifications. The electrical work for this project includes providing all electrical materials and equipment required for a complete and full

operating facility. The Contractor shall provide temporary power for system testing. Included in this work is the providing of all required conduits, conductors, and cables including those specified; shown on the drawing; and neither specified nor shown on the drawings but nonetheless required for satisfactory interconnection and operations of all electrical, mechanical and instrumentation equipment either shown on the respective drawings, specified in the respective portions of the specifications, or otherwise required.

Codes:

All the electrical equipment and materials, including their installations, shall conform to the following applicable codes:

1. National Electrical Code, Latest Edition
2. State Electrical Code, Latest Edition, Title 24 Part 3
3. Occupational Safety and Health Act Standards
4. County of Kern Codes and Ordinances

Variances:

In instances where two (2) codes are at variance, the more restrictive requirements shall apply.

Standards:

Equipment shall conform to the applicable EIA, IEEE, and NEMA Standards

Drawings:

The electrical drawings shall govern the general layout of the completed construction. Except where special details are used to illustrate the method of installation of a particular piece or type of equipment or materials, the requirements or descriptions in these specifications shall take precedence in the event of conflict.

Securing Equipment:

1. Locations of equipment, inserts, anchors, motors panels, conduits, stub-ups, fittings, power and convenience outlets and ground wells are approximate unless dimensioned, and the Contractor shall be responsible for field verifications of scaled dimensions on drawings.

2. The contractor shall review the drawings and specifications of other trades and shall perform the electrical work that will be required for the installations.

3. Should there be a need to deviate from the electrical drawings and specifications, the Contractors shall submit written details and reasons for all changes to the Engineer for approval.

The Contractor shall provide the required inserts, bolts and anchors, and shall securely attach all equipment and materials to their supports.

Cutting, Drilling and Welding:
The Contractor shall provide the required cutting, drilling and welding that is necessary for the electrical construction work. Cutting and drilling structural members shall not be permitted, except when approved by the Engineer. A core drill shall be used wherever it is necessary to drill through concrete. The Contractor shall provide the required welding for equipment supports. Patchwork shall be completed with the same materials and finished to match the surrounding area.

Condit:
All electrical conduits shall be PVC Schedule 80 unless otherwise specified.

Ground Rods:
Ground rods shall be Copper weld, not less than one-half (1/2) inch x eight (8) feet.

Control Panel:
Contractor shall furnish and install one duplex air bubbler control panel (conforming to NEMA 3R and 12 standard) with a hinged inner door (dead front) fabricated from 5052- H32 0.080 thick marine alloy aluminum. The inner door shall be held closed by two (2) hand operated, one-fourth (1/4) turn fasteners and shall contain the control instruments and indicators. The tamperproof outer door shall be lockable using a hasp. Ventilation shall be provided by louvers on one (1) side of the enclosure. Enclosure shall be double compartment _ size __ and contain space for service entrance equipment of the left side. The entire control panel shall be UNDERWRITERS LABORATORY LISTED and furnished with a UL LABEL, or listed by one of the other Nationally Recognized Testing Laboratory Program (NRTLP) participants and furnished with an appropriate label certifying their acceptance or the item meeting stated requirements. Each component shall be factory mounted, wired, inspected and tested. A wiring diagram and heater chart shall be enclosed in the panel. A red "High Voltage Inside" nameplate shall be fastened to door covering the high voltage compartment. All components including indicating lights, switches, buttons, relays, accessories, and permanently identified as to their function with the components. The identifications shall be in the form of photo etching, silk screening or engraving. All terminal blocks shall be identified by both number and graphic symbols which clearly indicate the purpose of each terminal block. All control wiring shall be numbered at each termination. The panel

enclosure shall be free standing and mounted on a reinforced concrete pad. The lower compartment shall have a lockable access door and be flush with the concrete pad. The enclosure shall be constructed of 14-gauge steel. The entire unit shall be degreased, cleaned and treated with a phosphatizing process, then primed and painted inside and out with corrosion-resistant, industrial-grade baked enamel. The finish coat shall be ASA-61 Gray.

Control System Operation:
The control system shall provide total automatic control for two (2) motor driven pumps operating on 480 volts, 3 phase service. The wet well level shall be monitored and controlled as follows:

Level 5- High Level
Level 4- Start Lag Pump
Level 3- Start Lead Pump
Level 2- Stop Lag Pump
Level 1- Stop Lead Pump

Contingent upon the wet well level, the bubbler system shall cause the liquid level indicator/controller to energize the appropriate control contacts. Upon wet well level rise, the lead pump start contact (Level 3) shall be energized causing a relay in the pup logic controller to start the lead pump. If the level continues to rise to the lag pump start control. (Level 4), the controller shall energize a relay to start the lag pump, and both pumps shall run simultaneously. The liquid level shall be lowered until the lag pump stop contact (Level 2) is reaches, stopping the lag pump. The lead pump shall continue to run lowering the wet well level until the lead pump stop contact (Level 1) is reached. Upon the next wet well level rise, the lead pump selection shall be alternated. If the wet well level rises to high level contact (Level 5), it shall energize a relay in the pump logic controller to operate the alarm system and indicate a high-water condition. The control system shall be built in such a manner that the owner will have the ability to select high level alarm activation at a separate specific level or have it activated when start lag pump level is reached. The owner shall have the ability to select independent start and stop for the lead and lag pumps, or a common stop for both pumps.

Liquid Level Indicator/Controller:
The wet well level shall be monitored and maintained by a well-type manometer with mercury media that makes and breaks a series of electrical contacts as the mercury rises and falls in direct proportion to the change of the liquid level in the wet well. Digital read out or horizontal needle deflection instruments are not acceptable. The manometer shall have one common 24 V AC electrical contact and a vertical row of contact points, which when coming in contact with the

column of mercury shall signal a relay in the pump logic control to perform the pump operation and alarm functions. The liquid level indicator/controller shall have a viewing window which shall display the mercury column and be calibrated in both feet and inches of water indicating the liquid level in the wet well. The unit shall be mounted on the dead front door. The unit shall be an electro-mechanical device with no moving parts. The unit shall be factory calibrated and not require field calibration. Accuracy shall be plus minus ½ percent of full scale with 100 percent repeat accuracy and zero dead band when making and breaking electrical contacts. Indicated full scale range shall be zero to ten feet with front scale graduated in feet (0 to 10 feet) and inches (0 to 120 inches) the vertical, linear, mercury column shall have a total of 40 control points providing as electrical output for every three inches of water pressure, and shall be individually labeled as to the level at which they are activated. The liquid level indicator/controller shall be manufactured from corrosion resistant material. The liquid level indicator/controller shall be equipped with manual testing capability located on the inner door. The testing system shall consist of a two-position normal test/blowdown manually operated toggle valve and test-port. Test position shall seal off and prevent liquid from rising in the submersed bubbler tube. Simultaneously, it shall divert the bubbler air output to the test port and relieve any air pressure on the indicator/controller. The operator shall be able to simulate rising and falling liquid level by restricting the air flow exiting the test port. The control panel shall be equipped with *W'* NPT female bulkhead fitting located on the inner door for the purpose of applying high pressure air to purge any obstruction in the bubbler tube should it become clogged. Protection shall be provided to prevent high pressure air for blowdown from damaging the liquid level indicator/controller. Blowdown must be possible without having to disconnect any tubing or fittings. All fittings shall be brass or stainless steel and assembled with an adhesive that has a range of application between 40 - 140 degrees F. Adhesive shall be intended for use on both porous and non-porous materials. Cured adhesive shall meet ASTM D 3498 requirements. All tubing fittings shall be barbed with a minimum of three barbs. Tubing shall be clear urethane. The control system shall be equipped with an external ¼" NPT female bulkhead fitting for connection to the bubbler tube in the wet well. The air bubbler tubing from the panel to the wet well shall be size 3/8 polyethylene. The tubing shall be fastened to the wet well wall using stainless steel rubber backed brackets and stainless-steel fasteners. The tubing shall terminate into an air cell constructed of size 1" PVC pipe with brass adapter. The standard air supply for the bubbler system shall be two continuous running, oil-less, diaphragm-type air pumps. The air pumps shall each deliver .6 SCFH@ 5.5 PSIG. A fixed orifice shall be installed in line with the air pumps output to insure a ripple free air flow. The air pump designated as "lead" shall provide

the air flow to operate the bubbler systems. The designated "lag" air pump shall be automatically energized if the "lead" air pump fails. Indication of failure shall be monitored by measuring the AIR FLOW RATE of the lead air pump. The air flow controlled automatic transfer/alarm chassis shall consist of an automatic electro-mechanical circuit which transfers to the lag air pump whenever air flow from the lead air pump drops to less that 0.15 SCFH for a period of 15 seconds. If the lag air pump fails to produce flow for a period of 120 seconds, an isolated contact shall close relaying a signal, which will activate the high-water alarm. A push button shall be provided to manually reset the circuit to the "lead" air pump. Components to make-up this circuit shall include a flow meter, four (4) LED status indicators and a reset push button; plus a push button flow switch with hermetically sealed contacts, a duplex receptacle for the air pumps, transfer relay, transfer timer and alarm timer all mounted on a single chassis.

Logic Controls:

The duplex logic control system shall consist of the logic chassis mounted on the subpanel and the logic panel mounted on the dead front door. The logic chassis shall be a pre-wired assembly constructed of anodized aluminum containing logic and alarm circuits. The logic chassis shall interface with the wet well level liquid indicator/controller. The logic chassis shall contain a three point terminal block for 120 V AC supply power, a power on-off switch for 120 V AC power, a 15 amp circuit breaker to protect 120 VAC power; a 120/24 V AC control transformer, a 3 position lead pump selector switch that can operate in either "automatic alternation"; "lead pump #1- Lag pump #2; or "lead pump #2- lag pump #1" positions Relays shall be square base, plug-in type, 3 pole double throw rated at 10 amp, 240 V AC with epoxy encapsulated coil and clear dust cover and shall be directly interchangeable. Five LED status indicator lights shall be mounted adjacent to the relay sockets and wired in parallel with the relay coils to indicate that the power is applied to the coils. All relays shall have mechanical hold-down bales. All terminals on the logic chassis shall be of the barrier clamp plate type rated at 15 amp at 300 V AC and accept two (2) AWG#14 wires. Terminal blocks shall be provided for interfacing output from the liquid level indicator/controller to the logic chassis via a multi-conductor cable shall be identified with yellow heat shrink tubing with black nomenclature. Labels shall read as follows: High level alarm, start lag pump, start lead pump, stop lag pump, stop lead pump, and common. The logic panel shall be constructed of corrosion resistant anodized aluminum and connected to the logic chassis via a multi-conductor cable. The logic panel shall be mounted on the inner door. The logic panel shall have the following components: Two (2) "hand-off automatic" selector switches for pumps, two (2) "pump run" green LED Indicators, one (1) 24 V AC

"power on" yellow LED indicator, one (1) "start lag pump" yellow LED indicator, (1) one red pushbutton for audible alarm silence, one (1) "high level alarm" red LED indicator and one (1) red pushbutton for visible alarm reset. Provide two (2) six (6) -digit non-resettable, dust tight, oil tight and moisture resistant running time meters.

Power Handling:

Main lugs of the appropriate size shall be furnished for connecting the incoming supply power. The lugs shall be suitable for use with aluminum or copper conductors. Ground lugs of appropriate size shall be bolted to the subpanel. Motor circuit protection shall be either thermal magnetic circuit breakers or magnetic motor circuit protectors. Either type shall contain a self test "Trip Selector" permitting a mechanical simulation of the over current tripping device. The protector operating mechanisms shall be quick-mate, quick-break and trip-free type. Thermal magnetic breakers shall comply with Federal SPB.W-C 357a as Class Two breakers. Symmetrical amperes interrupting ratings shall be 10,000 amps minimum for 250 volt rated breakers and 15,000 amps minimum for 480 volt rated breakers. Magnetic motor circuit protectors shall provide instantaneous clearing of faults to a minimum of 10,000 amperes. RMS, symmetrical and shall have an adjustable instantaneous trip setting. Q-Frame type circuit breakers are not acceptable. Circuit breaker toggles shall be operable through external extension handles that will interlock with the dead front door. Each motor starter shall be NEMA rated, FVNR, with three (3) overload relays and reset button. The contractor shall feature double break, silver cadmium oxide contacts, pressure type terminals, and barriers, free floating armature-magnet frame, molded continuous duty coils and stainless-steel springs sized for the specific pumps supplied under this contract. Definite purpose contractors, horsepower rated motor starters, and fractional NEMA sizes are not acceptable. Motor starter overload reset operators shall be installed on the dead front door allowing motor starter overload relays to be reset without opening the dead front door. A 100-watt strip heater and separate thermostat set at the appropriate temperature to prevent corrosion-causing condensation and freezing shall be supplied. A control transformer, adequately sized for the connected load shall be provided on 3 phase, 3 wire systems. The transformer shall be protected by fuses or circuit breaker. The control transformer may be eliminated on 4-wire and single-phase systems providing that the control voltage is protected by a circuit breaker and is wired per N.B. C. Standards. The unit shall be equipped with the capability to connect a portable generator which will be activated by 60A, 6000V, 3 phase transfer-switch.

For CSA maintained facility, the Development shall install back-up generator which complies with the appropriate Air Pollution Control District requirements. The back-up generator shall have a minimum of 2-day fuel capacity and adequate power generation to operate all pumps.

Optional Equipment: (As required)

1. Provide a NEMA 4X, red lexan, break resistant globe and 75-watt lamp which shall be mounted on top of the enclosure. The globe shall be mounted with stainless steel screws and closed cell neoprene gasket to insure water-tight integrity.

2. Provide a flasher which shall be installed and connected to the logic chassis to provide a flashing alarm light.

3. Provide dim glow terminals on the logic chassis so that the alarm light glows dim during normal condition to verify circuit integrity. When alarm condition occurs, the alarm light shall be switched to full brilliance.

4. Provide a NEMA 4 X encapsulated high intensity electronic horn mounted on the side of the enclosure. Audible rating of the horn shall be a minimum of 85 decibels at 10 feet.

5. A power monitor relay system shall be installed and connected to the logic chassis. When the power monitor relay is activated, it shall disconnect control power from the motor starters and illuminate red LED indicator on the logic chassis. The control power shall automatically reset if the fault conditions correct itself. The power monitor relay shall be activated in the event that any of the following conditions occur:

    a. Phase loss (single phasing) when anyone of the three-line voltages drop to 83 percent or less or nominal.
    b. Phase reversal (sequence) when improper phase sequence is applied to equipment.
    c. Low voltage (brown out) when all three-line voltages drop to 90 percent or less of nominal.

6. Moisture sensing relays for each motor shall be installed and connected to the logic chassis. In the event that moisture enters the motor housing, the relay shall illuminate the red LED indicator on the logic chassis. Provide a back up control consisting of two mercury tilt switches with intrinsically safe relay circuits. The tilt switches shall be UL approved. The upper tilt switch shall engage both pumps and activate the high-water alarm circuit. The lower switch shall disengage both pumps and

de-activate the alarm circuit.

7. Provide a 750-watt duplex convenience receptacle with ground fault interrupter installed on the dead front door.

8. Wiring from the thermal sensor located in the pump motor shall be connected to the pump monitor provision on the logic chassis. In the event the sensor is activated, it shall disconnect control power from the appropriate pump motor starter and illuminate the red LED Indicator on the logic chassis. The circuit shall automatically reset on reclosure of the temperature sensor.

9. Provide an automatic two (2) channel telephone dialer. The Dialer shall upon alarm condition call up to five (5) predetermined numbers and deliver a voice message.

   The message shall identify the location of the alarm, and the required action to be taken, and instructions for acknowledging the Dialer. The Dialer must be capable of calling at least five (5) different telephone numbers for each channel. If the called telephone number is busy, or does not answer, or answers but is not acknowledged the Telephone Dialer proceeds to call the same number and/or proceeds to call different "backup" numbers. Each called party has the option to cancel all remaining calls or to allow the Dialer to continue the dialing sequence. The Dialer shall retain the programmed telephone numbers should there be a loss of power.

   The called party shall be able to communicate with the Telephone Dialer by means of a tone signal. The signal is generated through a touch tone telephone set. To prevent nuisance alarms the Phone Dialer shall have a time delay adjustment which will delay the starting of the calling cycle from 10 to 90 seconds. If during this delay time, or at any time that the Dialer is placing calls, the activating contact is restored to normal, the Telephone dialer automatically hangs up and resets itself to the beginning number of the dialing sequence. The tripping circuits shall be desensitized with filters so that the time response shall be the same as a telephone type relay (approximately 10 milliseconds). Input pulses of less than ten milliseconds shall be filtered out to eliminate false tripping due to lightning or voltage surges.

   When any channel is tripped the Dialer shall continue the calling cycle until acknowledged, or the alarm condition in corrected. Independent memory circuits shall be provided for each channel. The system shall have an indicator light defining which channel

is tripped. When the condition corrects itself, or it is reset, this light shall automatically reset.

The Telephone Dialer shall utilize a regular private line telephone circuit provided by the owner. Connection into the telephone circuit shall be through an industry standard eight (8) pin modular jack. The Phone Dialer shall have the proper cable for connecting into the telephone system modular terminal XRJ-31-X. The Phone Dialer shall provide all the necessary power and control switching for the built-in coupler with no auxiliary equipment, coupler, or power source required. All dial pulses and voice message inputs to the telephone system shall meet the requirements as published by the telephone companies and shall be FCC approved for use on the telephone network.

A low voltage recharging circuit shall be provided to maintain the lead acid batteries in peak condition. An externally mounted pilot light shall indicate when the charging circuit is operational. The stand-by capacity of the Dialer shall be sufficient to sustain one (1) hour of continuous calling or up to eight (8) hours with the system in standby after complete power failure.

The Dialer shall have a built-in AC line monitor. This will allow the Dialer to monitor AC power or another function if desired. The Dialer shall have the option of being called from any of the programmed telephone numbers and being remotely tested. This test shall confirm proper operations of the Dialer and the telephone network. An off/on/abort switch must be accessible to facility testing and installation.

The Dialer shall be provided with one (1) year warranty after acceptance by the Engineer, or a minimum of up to two (2) years after shipment date. The representative shall supply installation and operation data to the Engineer and shall furnish factory authorized start up service and training at no additional cost to the County.

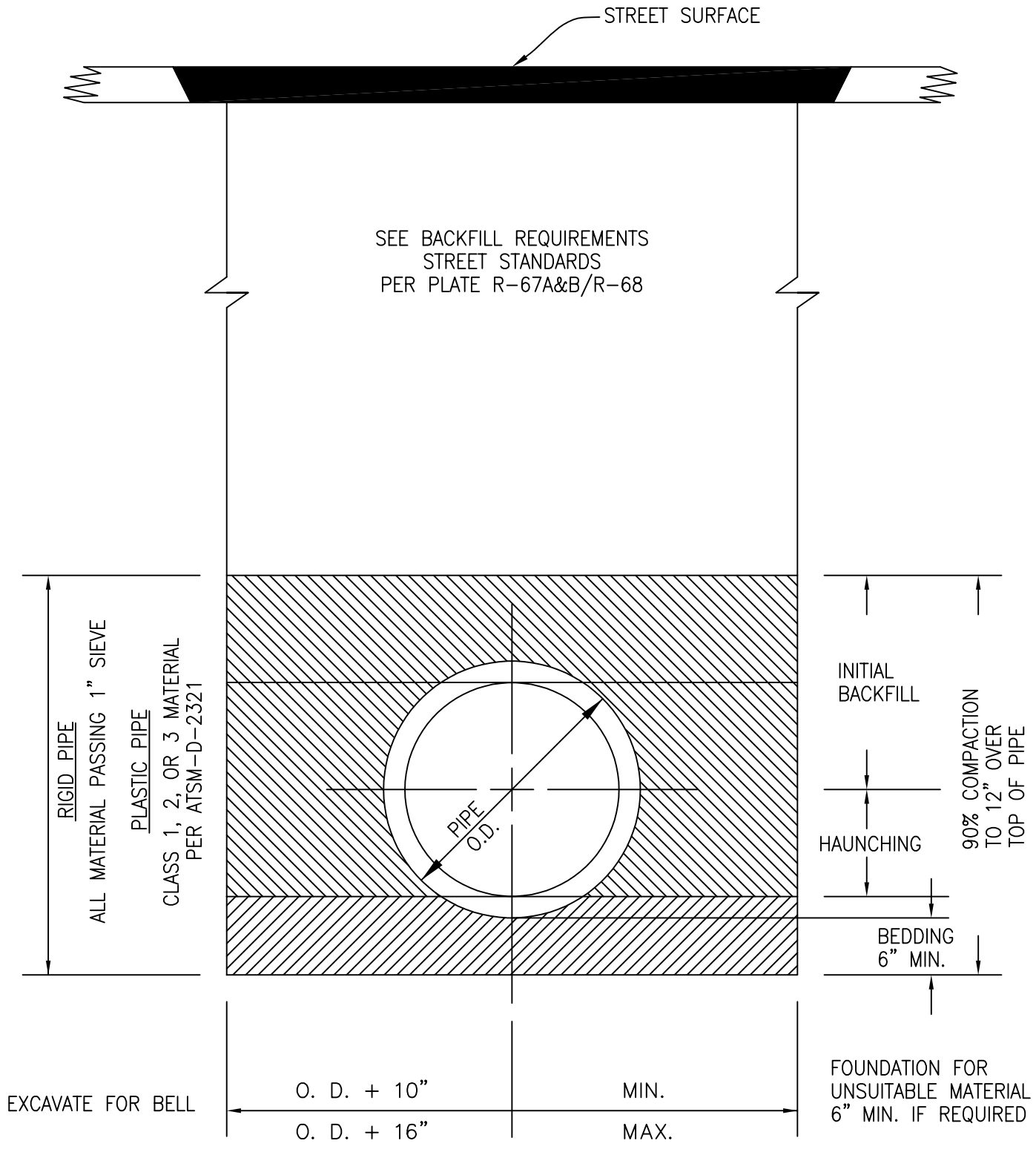
10. Provide a spray system for breaking up the wet well floating scum blanket. Pump system shall recirculate a portion of the pumpage in the form of a spray.

Submittals:
Shop Drawings:
Shop drawings shall be submitted for approval prior to start of construction and shall include the following:
A wiring diagram and an elementary control diagram for each unit
An overall connection diagram for each control panel
A dimensioned outline drawing to scale showing space for conduits, etc.
A complete identification of all electrical components in each control panel and their interconnections within the control panel
All connections to external equipment and control
Wire marking scheme.

Spare Parts List:
A spare parts list shall be included showing recommended parts and quantities, as well as complete ordering information for replacement components. Instruction books shall be provided for special control devices and special equipment installed in the control panels. These shall be submitted to the Engineer prior to installation of the equipment.

Manuals:
The Contractor shall obtain manuals from the manufacturer of the installed control panels and shall submit same to the Engineer as specified under "Submittals" of this specification section.

The complete system shall be the product of one (1) manufacturer who shall have maintenance personnel that are factory trained to service and repair all components supplied. The guarantee period shall be for two (2) years from the date of successful start-up. Guarantee shall include on-the-job repair and maintenance that cannot be performed by plant personnel.



KERN COUNTY PUBLIC WORKS
GROUNDED | BOUNDLESS

TYPICAL TRENCH SECTION IN PAVED AREAS

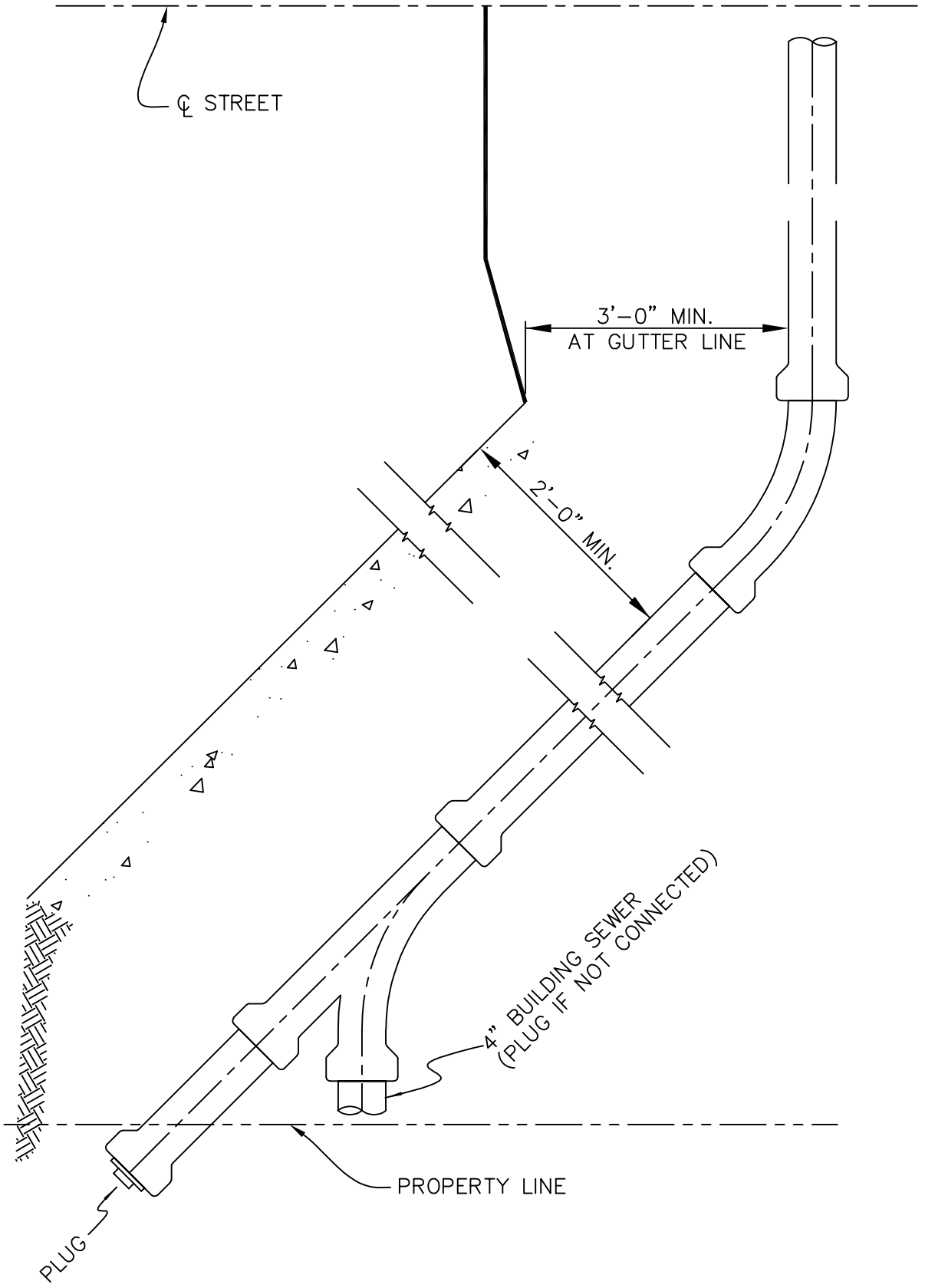
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STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. S-1

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KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

TYPICAL BUILDING SEWER INSTALLATION IN CUT AREA

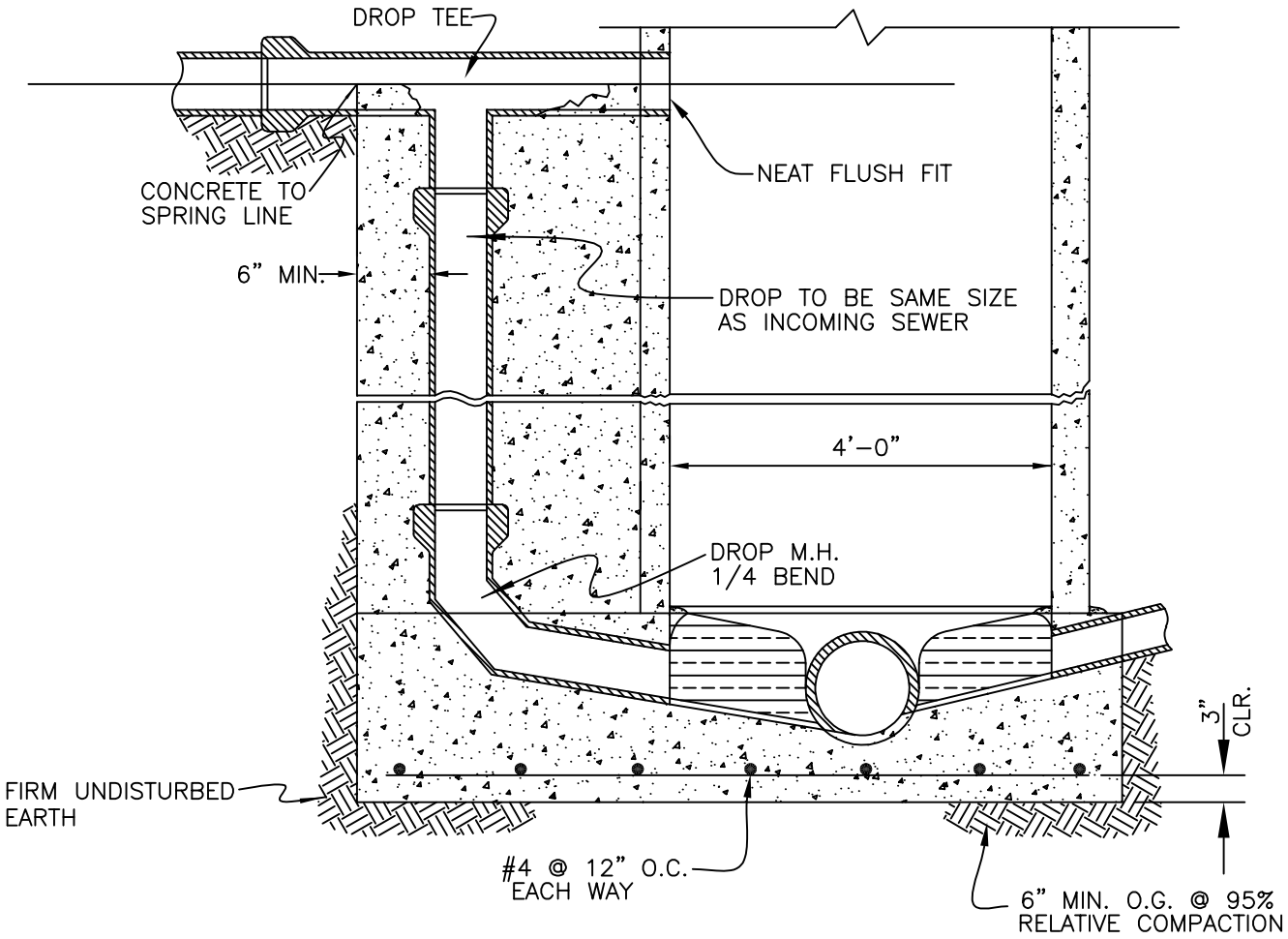
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DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO.
S–2

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GENERAL NOTES:

1. STOP ALL PIPES INSIDE WALL.
2. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR MINOR CONCRETE (MIN. CEMENT CONTENT 505 LB/CU.YD.) CONCRETE SHALL CONTAIN NO ADDITIVES UNLESS APPROVED PRIOR APPROVAL IS OBTAINED FROM THE COUNTY ENGINEER.
3. DROP TYPE CONNECTION SHALL BE USED IF DIFFERENCE IN ELEVATION BETWEEN THE MAIN & INTERSECTING PIPES IS GREATER THAN 1.5 FT.
4. THE DROP TYPE MANHOLE IS THE SAME AS THE STANDARD MANHOLE EXCEPT FOR DROP TYPE CONNECTION.
5. THE DROP SECTION OF THE PIPE MAY BE INSTALLED INSIDE THE MANHOLE WHERE PERMITTED BY THE DISTRICT OR THE COUNTY.

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS

STANDARD OUTSIDE DROP TYPE MANHOLE

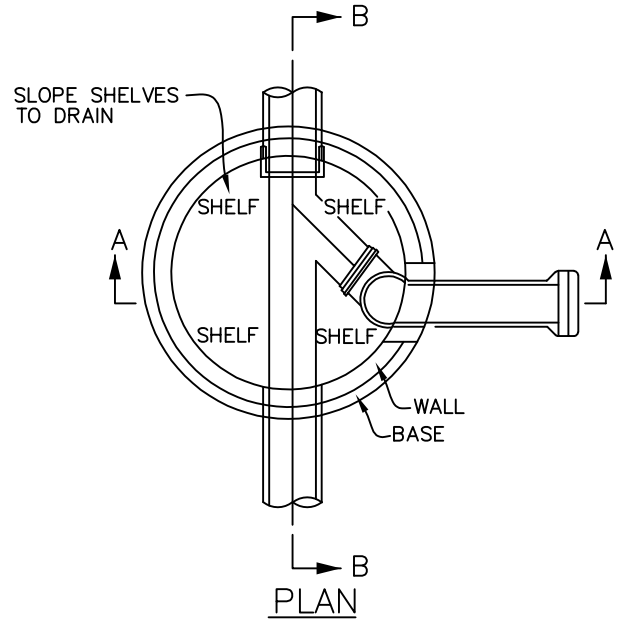
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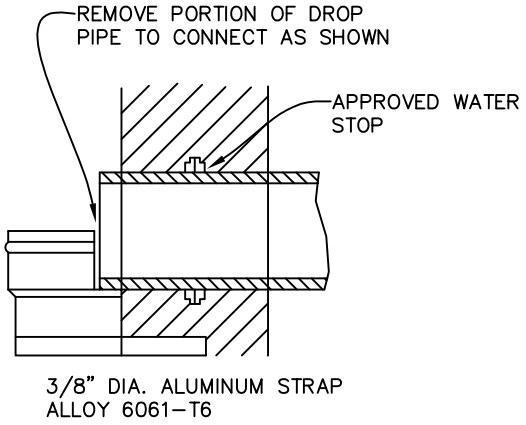
DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. S-3

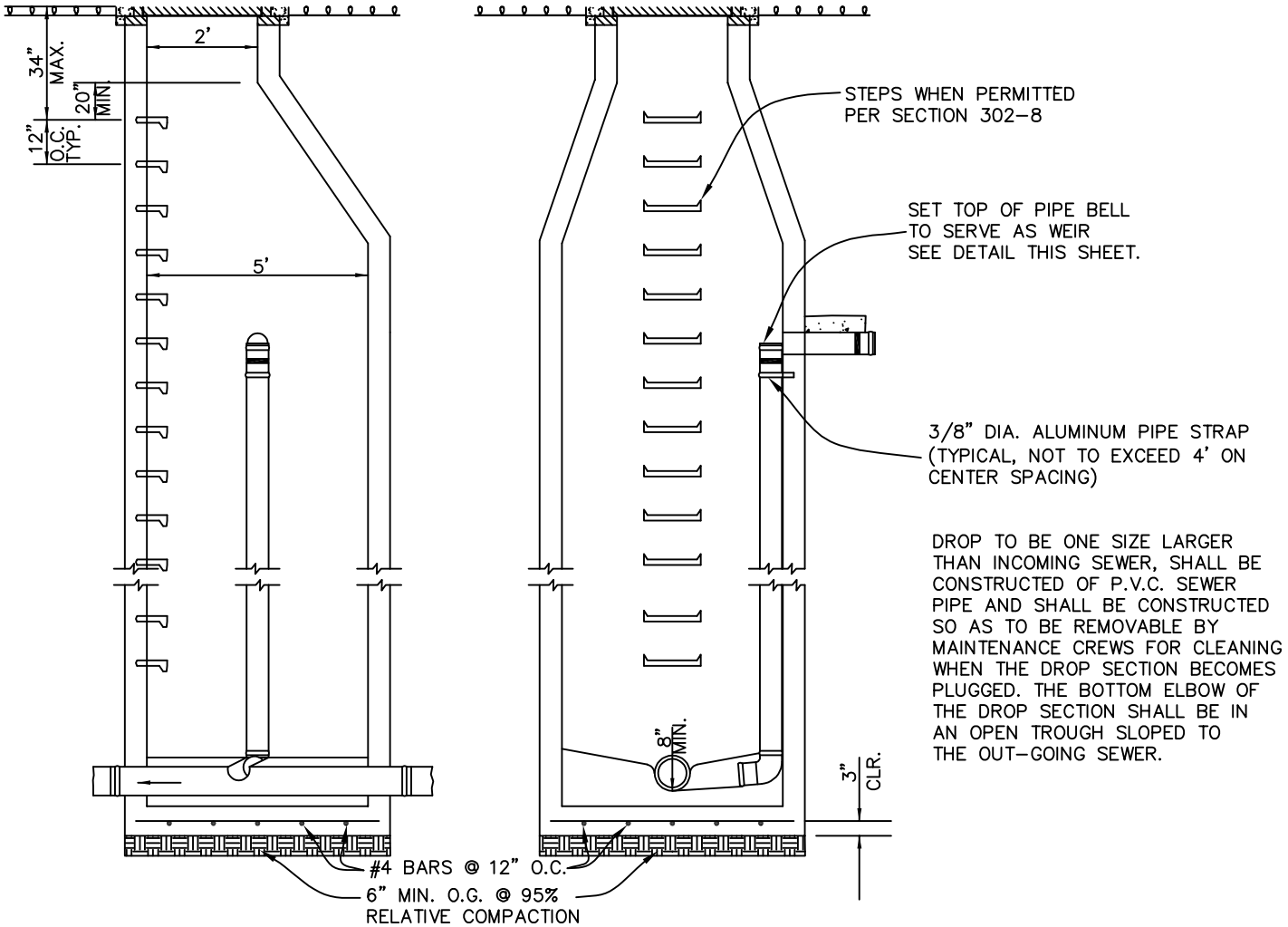
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PLAN



WEIR DETAIL



SECTION B–B

SECTION A–A

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD INSIDE DROP MANHOLE

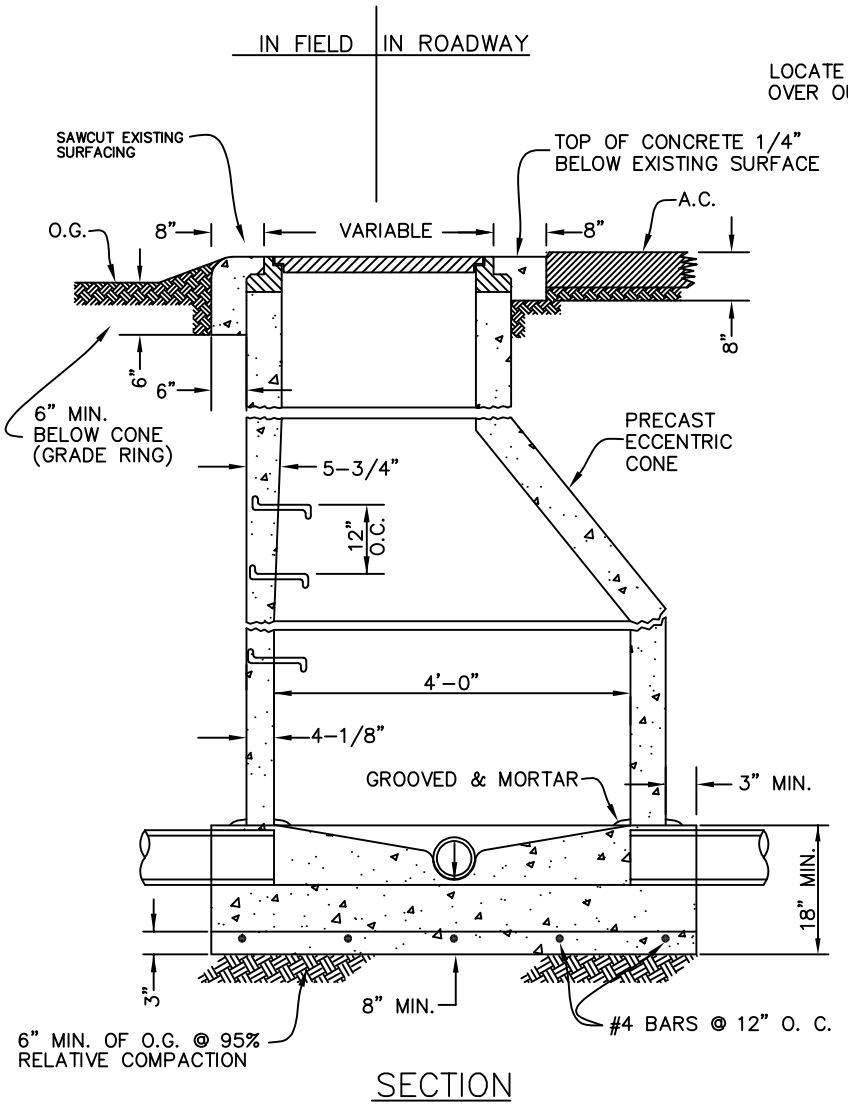
COUNTY OF KERN
STATE OF CALIFORNIA
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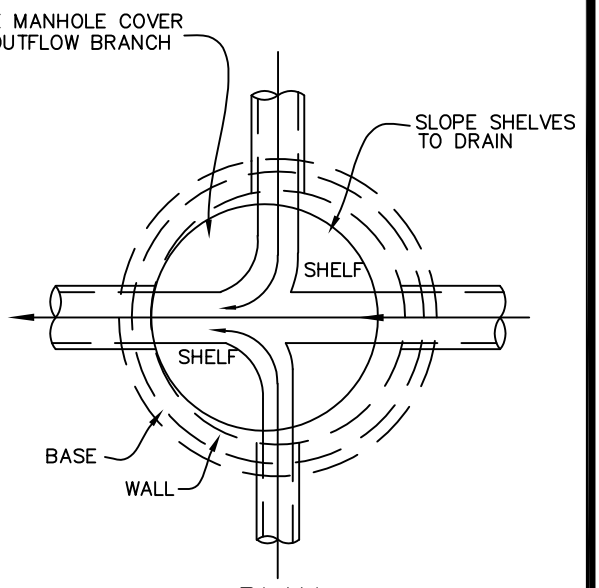
DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. S–4

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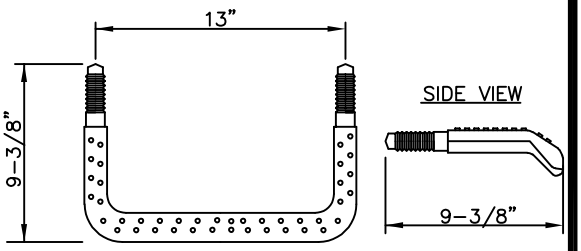


SECTION



PLAN

WEIR DETAIL



TOP VIEW

(POLYPROPYLENE STEP WITH 1/2" INTERNAL STEEL BAR)

MANHOLE STEP DETAIL

GENERAL NOTES:

1. MANHOLE STEPS WHEN REQUIRED PER SECTION 302-8 SHALL BE STANDARD POLYPROPYLENE STEPS. THE TOP STEP SHALL BE NO MORE THAN 34" BELOW FINISH STREET GRADE AND NO LESS THAN 20" BELOW THE TOP OF THE ECCENTRIC MANHOLE CONE. THE BOTTOM STEP SHALL BE 10" TO 20" ABOVE THE MANHOLE FLOOR. STEPS SHALL BE 12" ON CENTER AND SHALL BE IN VERTICAL ALIGNMENT OVER OUTGOING SEWER.
2. STRUCTURAL BACKFILL IMPERVIOUS MATERIAL @ 95% RELATIVE COMPACTION. LIMITS ARE AS DIRECTED BY THE ENGINEER.
3. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR MINOR CONCRETE (MIN. CEMENT CONTENT 590 LB/CU.YD.) CONCRETE SHALL CONTAIN NO ADDITIVES UNLESS APPROVED PRIOR APPROVAL IS OBTAINED FROM THE COUNTY ENGINEER.
4. MANHOLE HEIGHT SHALL BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
5. JOINTS SHALL BE SET IN AN ELASTOMETRIC SEALANT PER SECTION 302-5.

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS

STANDARD PRECAST MANHOLE

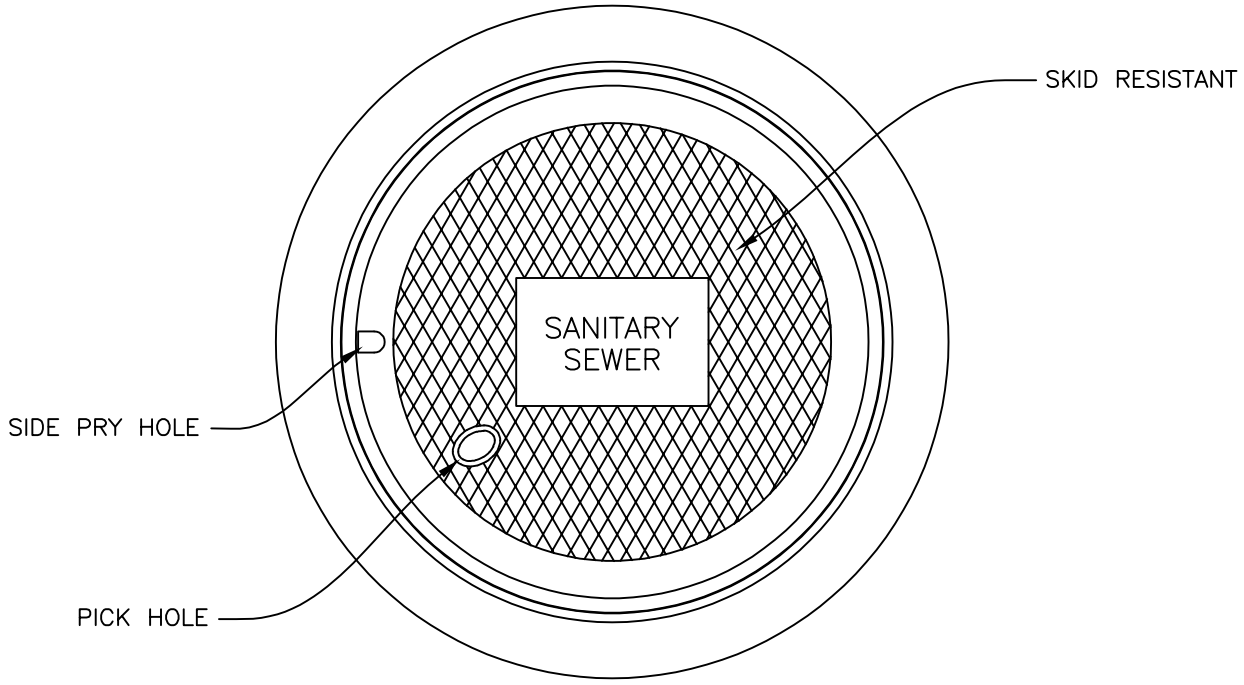
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

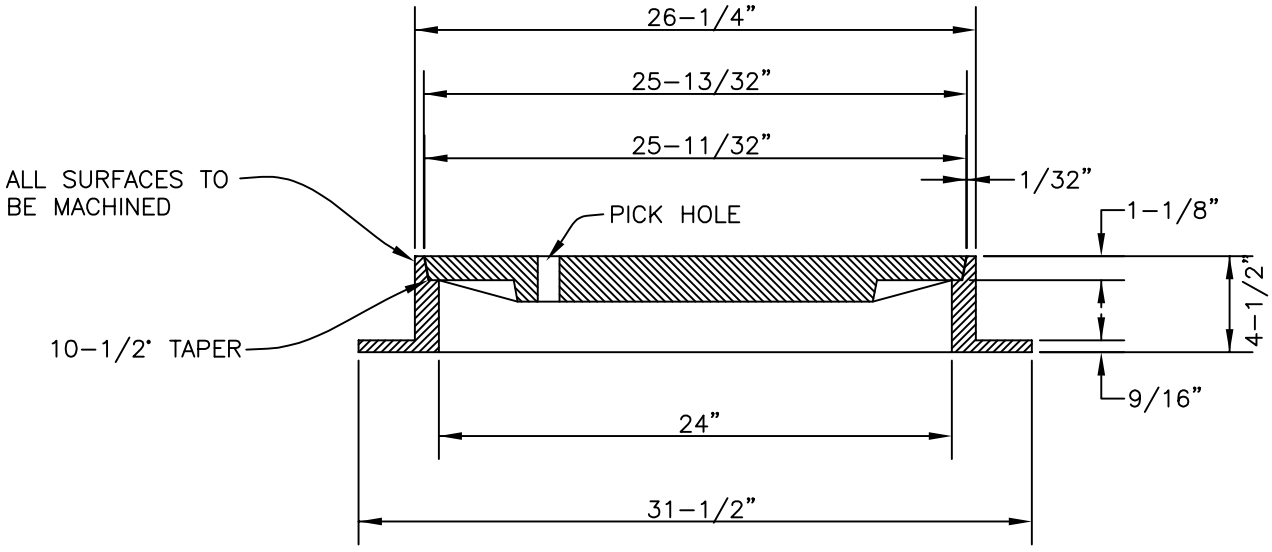
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. S-5

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KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

CAST IRON MANHOLE FRAME AND COVER

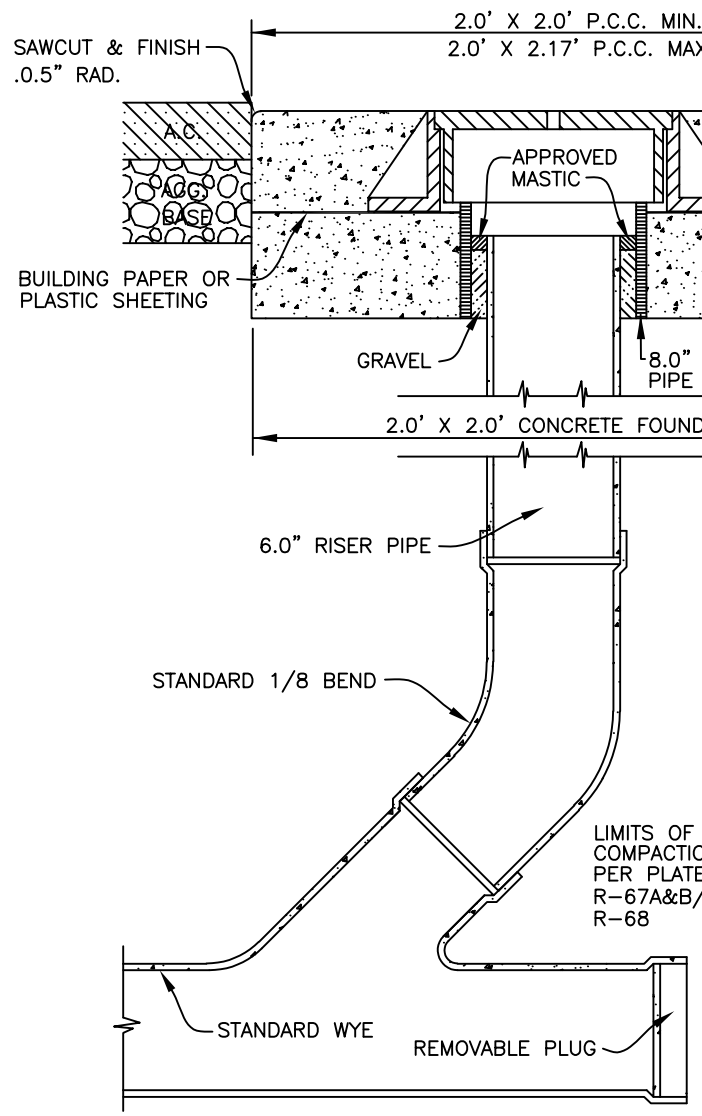
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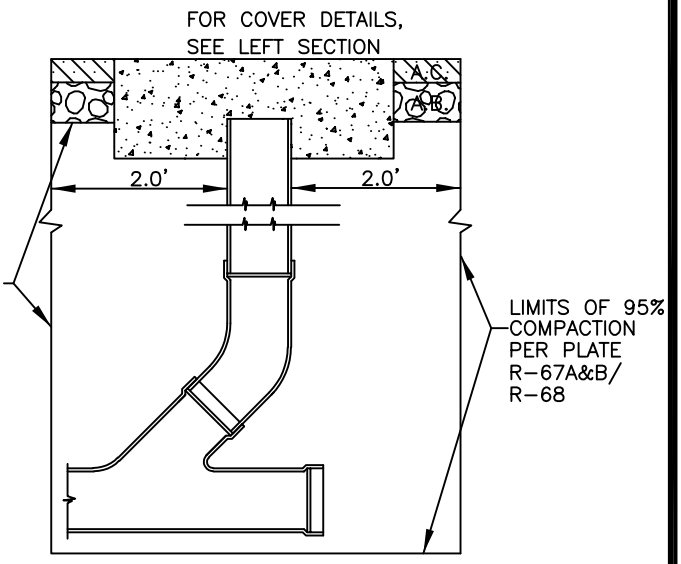
DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO.
S–6

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CLEANOUT SECTION



COMPACTION DETAIL

NOTES:

1. ALL WORK SHALL CONFORM TO THE APPLICABLE SECTIONS OF THE SPECIFICATIONS ENTITLED "STANDARD SPECIFICATIONS, STATE OF CALIFORNIA, BUSINESS AND TRANSPORTATION AGENCY, DEPARTMENT OF TRANSPORTATION", APPROVED CURRENT EDITION.
2. PIPE MATERIAL SHALL MEET 302-7.
3. ALL CONCRETE SHALL BE MINOR CONCRETE WITH 590 LBS/CY OF CEMENT CONTENT.
4. CLEANOUT FRAME AND COVER SHALL CONFORM TO THE KERN COUNTY DEVELOPMENT STANDARDS PLATE NO. S-8.
5. CONCRETE SHALL HAVE NO ADDITIVES UNLESS PRIOR WRITTEN APPROVAL IS OBTAINED FROM THE DIRECTOR.
6. CONCRETE SHALL BE CURED WITH CURING COMPOUND PER SEC. 90-1.03B OF THE STANDARD SPECS.
7. TOP OF SLAB SHALL BE TROWELED SMOOTH AND GIVEN A LIGHT BROOM FINISH.
8. 95% RELATIVE COMPACTION IS REQUIRED PER KERN COUNTY DEVELOPMENT STANDARDS PLATE NOS. R67A, R67B, AND R68.
9. BUILDING PAPER OR PLASTIC SHALL BE PLACED BETWEEN THE 0.5' CONCRETE FOUNDATION AND 4.5" SLAB.
10. FILL CAVITY BETWEEN PIPE AND COLLAR WITH GRAVEL TO WITHIN 0.5" OF TOP OF PIPE. CAULK REMAINING 0.5" WITH APPROVED MASTIC TO TOP OF PIPE FOR WATER TIGHT SEAL.
11. COLLAR SHALL BE VCP, ABS, OR PVC PIPE.
12. FINISHED PCC SLAB TO BE 0.125' MIN. AND 0.25" MAX. BELOW FINISHED PAVING SURFACE.

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD EIGHT INCH CLEANOUT

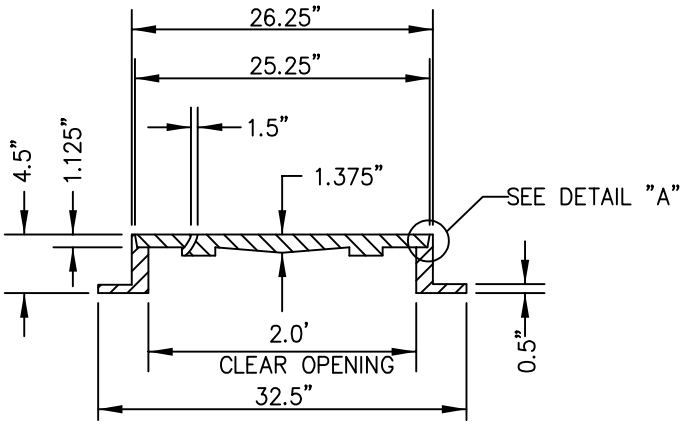
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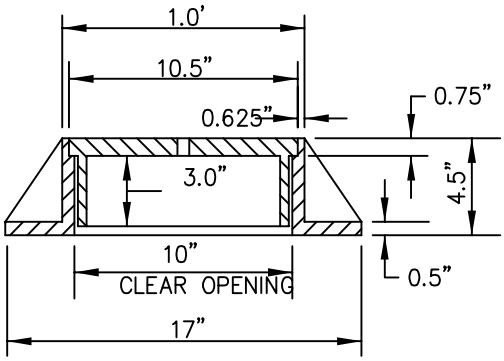
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO.
S-7

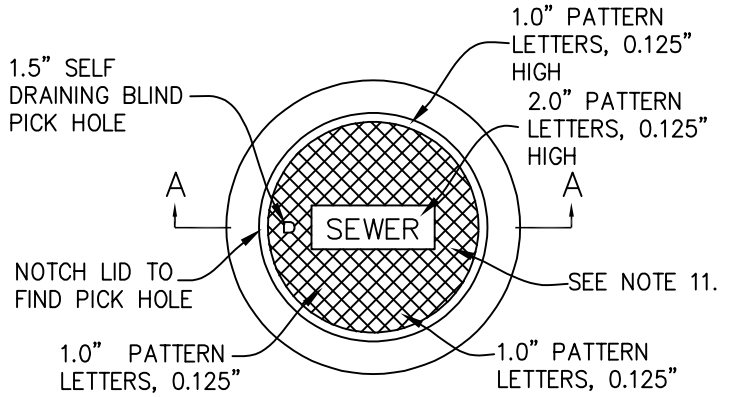
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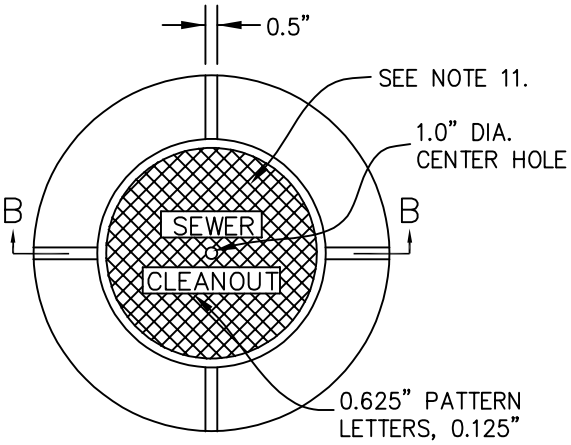
SECTION A–A



SECTION B–B



MANHOLE



CLEANOUT

NOTES:

1. ALL FRAMES AND COVERS SHALL BE TESTED FOR ACCURACY OF FIT AND SHALL BE MARKED IN SETS PRIOR TO DELIVERY.

2. THE SEATS OF FRAMES AND BEARING FACES OF THE COVERS SHALL BE MACHINED FOR A SMOOTH NON–ROCKING FIT BETWEEN THE TWO CASTINGS.

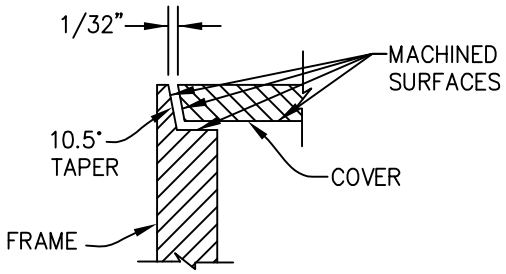
3. CASTINGS SHALL BE THOROUGHLY CLEANED AND DIPPED TWICE IN A QUICK–DRYING, JET–BLACK ASPHALTIC COMPOUND TO PROVIDE A PROTECTIVE COATING.

4. ALL FRAMES AND COVERS SHALL BE GRAY CAST IRON, FREE FROM WARPS, CRACKS, HOLES, SWELLS AND COLD–SHOT, AND SHALL HAVE A WORKMANLIKE FINISH.

5. CASTING SHALL CONFORM TO THE PROVISIONS OF THE SPECIFICATIONS FOR GRAY–IRON CASTINGS, SERIAL DESIGNATION ASTM: A–48 (LATEST REVISION), CLASS NO. 30B.

6. THE NAME OF THE MANUFACTURING COMPANY SHALL BE ON THE UNDERSIDE OF THE COVER.

7. MANHOLE FRAME SHALL WEIGH NOT LESS THAN 120 LBS. NOR MORE THAN 250 LBS. THE COVER SHALL WEIGH NOT LESS THAN 120 LBS. NOR MORE THAN 200 LBS.



DETAIL "A"

8. MANHOLE COVERS SHALL HAVE A SELF DRAINING BLIND PICK HOLE UNLESS OTHERWISE APPROVED BY THE DIRECTOR.

9. THE 2.0" PATTERN LETTERS ON THE MANHOLE COVERS SHALL HAVE ONE OF THE FOLLOWING DESIGNATIONS: DRAIN OR SEWER

10. ASSEMBLY SHALL BE DESIGNED FOR HIGHWAY LOADING OF HS 20–44.

11. 2.0" X 1.0" DIAMOND MAT 0.125" DEEP.

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD FRAMES AND COVERS FOR MANHOLES & CLEANOUTS

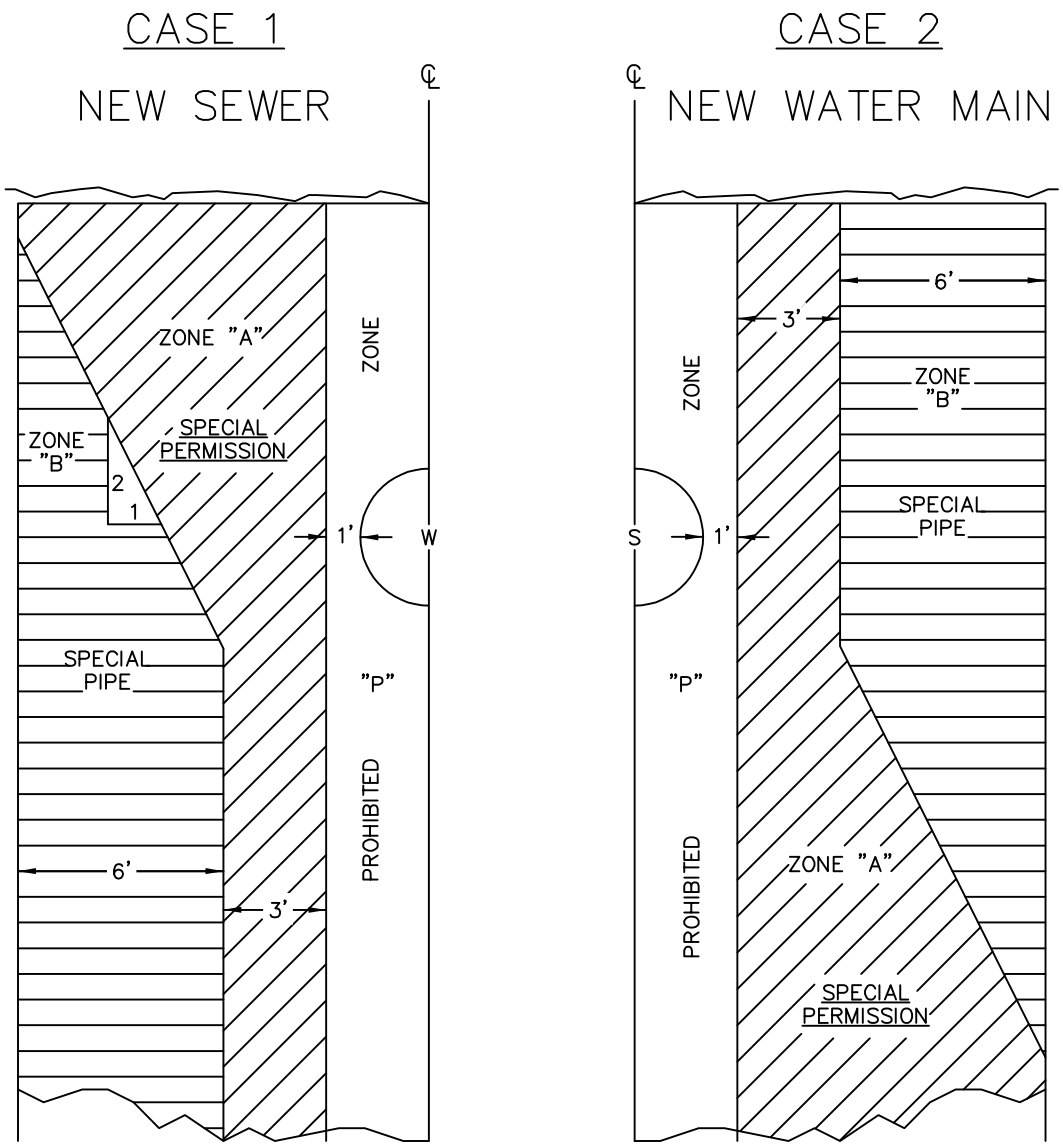
COUNTY OF KERN
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PLATE NO. S–8

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PARALLEL CONSTRUCTION

NOT TO SCALE

NOTE:

ZONES IDENTICAL ON EITHER SIDE OF CENTER LINES.
ZONE "P" IS A PROHIBITED ZONE, SECTION 64572 (E) (2) CALIFORNIA ADMINISTRATIVE CODE, TITLE 22.

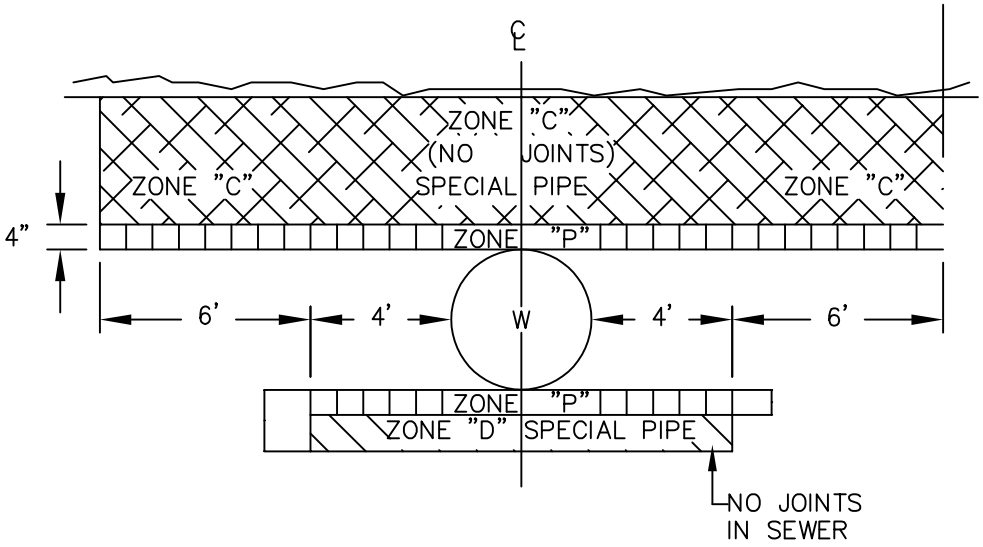
KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS	STANDARD FOR SEPARATION OF WATER AND SEWER LINES COUNTY OF KERN STATE OF CALIFORNIA DEVELOPMENT STANDARD	REVISIONS DATE – DESC –	DRAFTED BY: R.R.P. DESIGNED BY: J.R.C. DATE DRAFTED: 09/30/23 APPROVED BY: J.R.C.	PLATE NO. S–9

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CASE 1

NEW SEWER

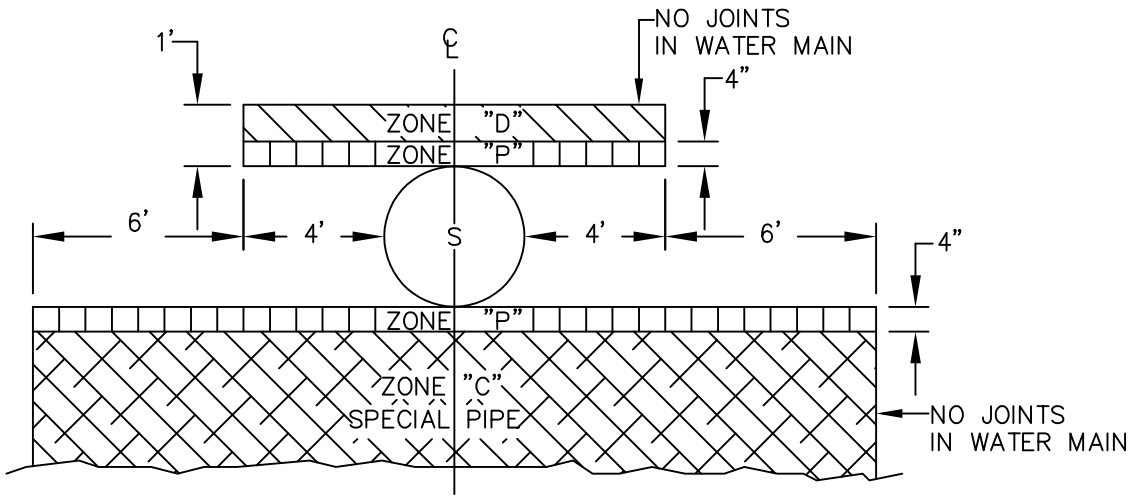
APRONS ARE NOT PROPORTIONAL WITH DIMENSIONS.



CASE 2

NEW WATER MAIN

APRONS ARE NOT PROPORTIONAL WITH DIMENSIONS.



CROSSINGS

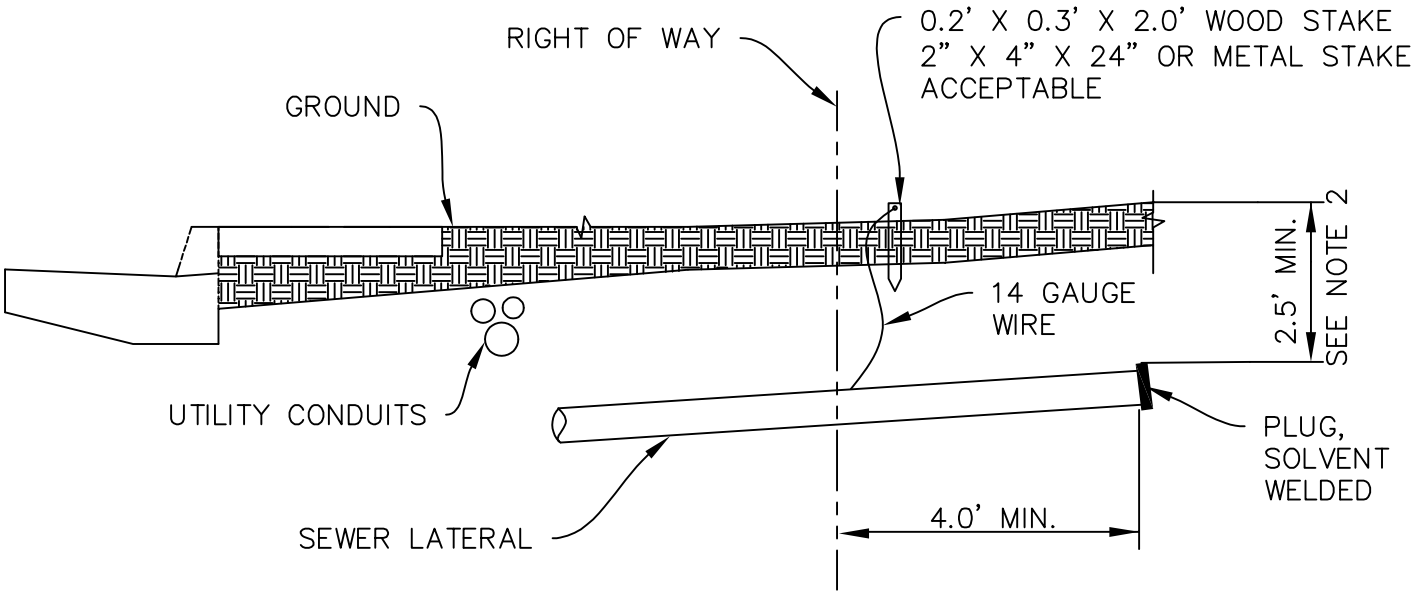
NOT TO SCALE

NOTE:

"P" IS A PROHIBITED CONSTRUCTION ZONE.

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS	STANDARD FOR SEPARATION OF WATER AND SEWER LINES	REVISIONS DATE – DESC –	DRAFTED BY: R.R.P.
			DESIGNED BY: J.R.C.
	COUNTY OF KERN STATE OF CALIFORNIA DEVELOPMENT STANDARD		DATE DRAFTED: 09/30/23
			APPROVED BY: J.R.C.
			PLATE NO. S–10

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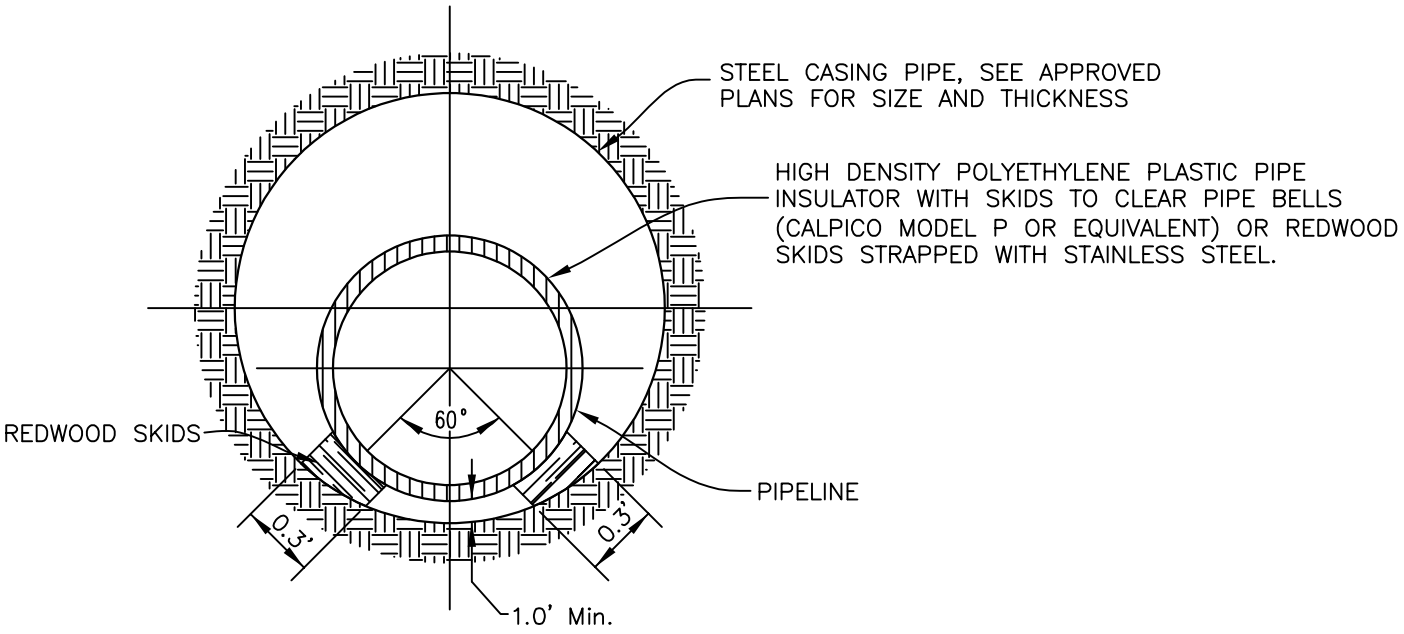
NOT TO SCALE

NOTES:

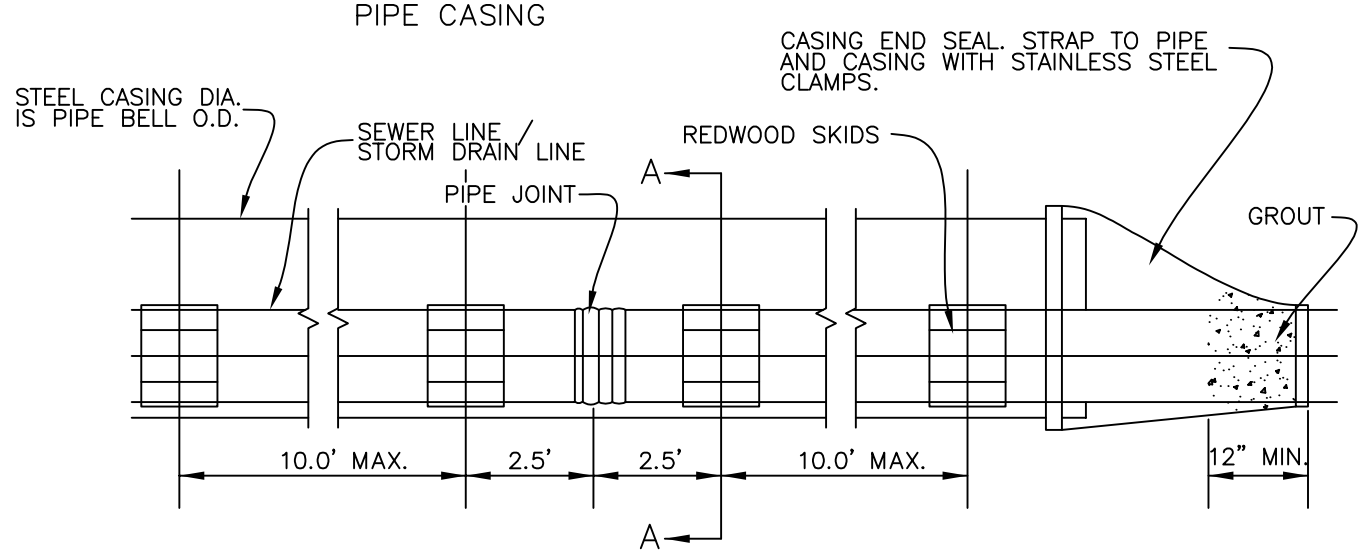
1. STAMP "S" INTO CURB FACE OVER SEWER LATERAL.
2. MINIMUM COVER WITHIN RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH SECTION 302-9.03.
3. LATERALS LOCATED SO NOT TO CONFLICT WITH UTILITIES.
4. SEE SECTION 304-5.10 FOR MORE DETAILS.

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS	STANDARD SEWER LATERAL MAKER	REVISIONS DATE – DESC –	DRAFTED BY: R.R.P.	PLATE NO. S-11
			DESIGNED BY: J.R.C.	
	COUNTY OF KERN STATE OF CALIFORNIA DEVELOPMENT STANDARD		DATE DRAFTED: 09/30/23	
			APPROVED BY: J.R.C.	

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SECTION A–A
PIPE CASING



SECTION DETAIL
PIPE BORING

NOTES:

1. CASING SHALL BE INSTALLED BY THE BORE, JACK, AND/OR TUNNEL METHOD.
2. INSTALLATION SHALL BE AS RECOMMENDED BY THE PIPE MANUFACTURER.
3. ALL CASING SECTIONS SHALL BE JOINED BY CONTINUOUS PROCESS.
4. FILL VOID BETWEEN CARRIER PIPE AND CASING WITH SAND SLURRY. IF SAND IS USED, COMPACT BY USE OF AIR BLOWING SAND EQUIPMENT OR AS DIRECTED BY THE DIRECTOR.
5. REDWOOD SKIDS SHALL BE CONSTRUCTION GRADE.
6. REDWOOD SKIDS SHALL BE VEED TO FIT CONTOUR OF PIPE.
7. REDWOOD SKIDS SHALL BE STRAPPED TO THE PIPE WITH STRAPPING OR APPROVED WIRE BANDS.

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD SEWER LINE IN PIPE CASING

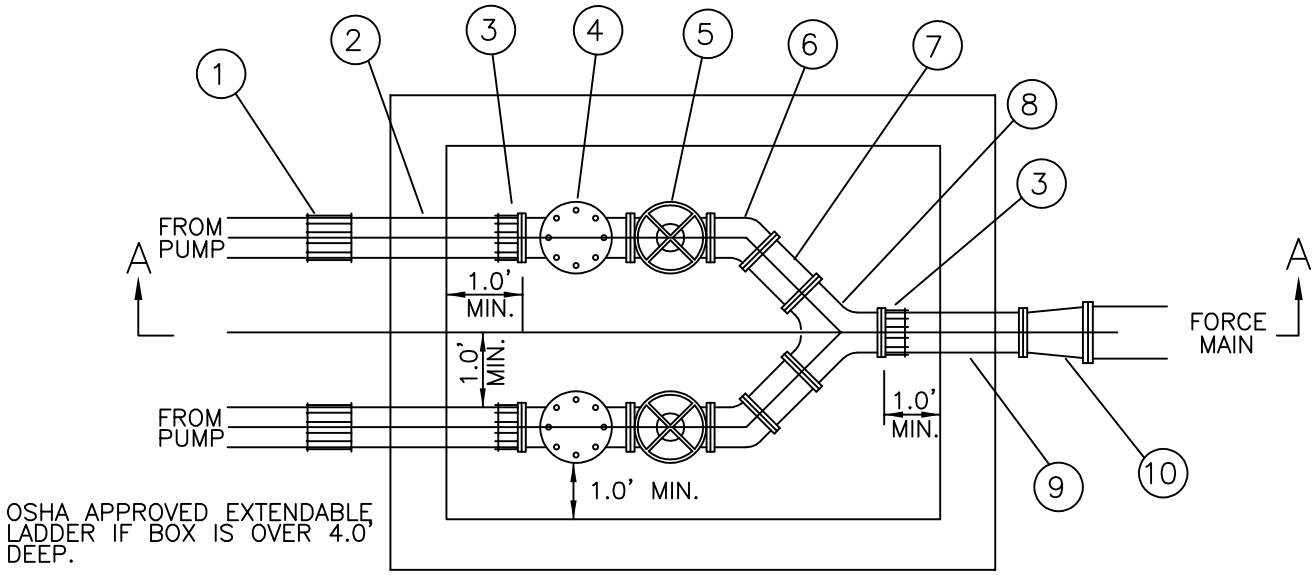
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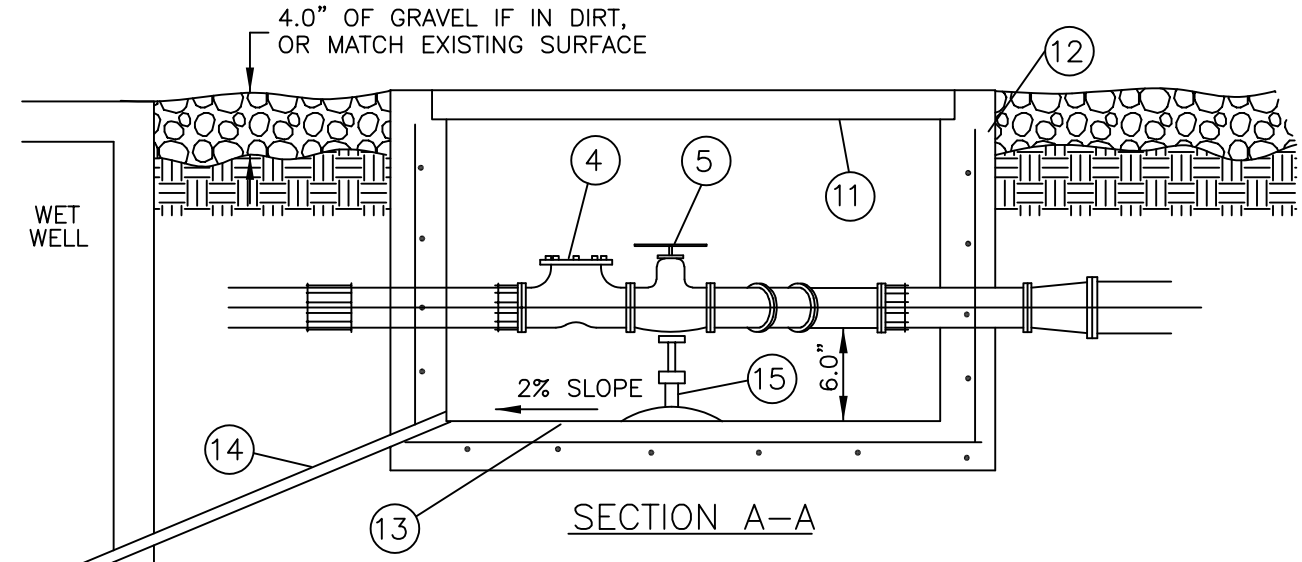
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PLATE NO. S–12

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PLAN VIEW



SECTION A–A

KEY TO CIRCLED REFERENCES

1. FLEXIBLE COUPLING ADAPTOR
2. DUCTILE IRON PIPE WITH EPOXY COATING – PLAIN ENDS
3. FLANGED COUPLING ADAPTOR
4. SWING CHECK VALVE, FLANGED ENDS
5. PLUG VALVE, FLANGED ENDS
6. 45° ELBOW, FLANGED ENDS
7. PIPE – FLANGED ENDS
8. FLANGED WYE
9. PIPE – FLANGED END & PLAIN END
10. CONCENTRIC REDUCER
11. ACCESS COVER WITH FRAME & HINGES. SEE APPROVED SPECIFICATIONS.
12. REINFORCED CONCRETE VALVE BOX, PRE–CAST OR CAST–IN–PLACE. DESIGN TO BE APPROVED BY THE DIRECTOR.
13. 2 COATS PER SECTION 306–2.04 OF THE KERN COUNTY DEVELOPMENT STANDARDS. SEE APPROVED SPECIFICATIONS.
14. 2.0" SCHEDULE 80 PVC DRAIN PIPE EXTENDED TO BOTTOM OF WET WELL.
15. ADJUSTABLE PIPE SUPPORT STAND.

SEE STANDARD SPECIAL PROVISIONS FOR SPECIFICATIONS.

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD TYPICAL SEWER PUMPING STATION VALVE BOX

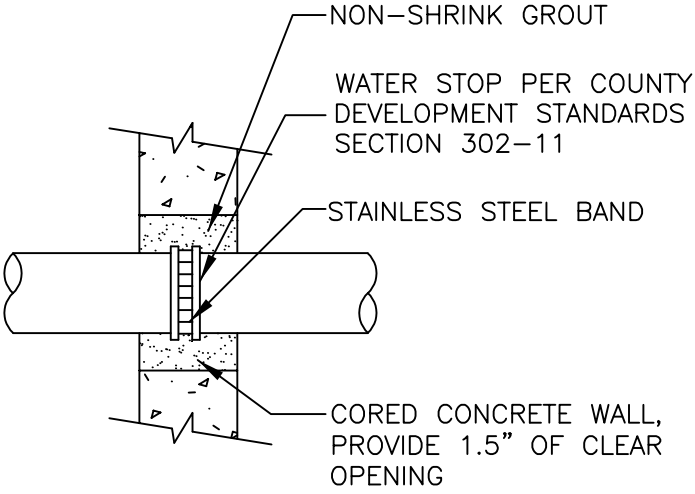
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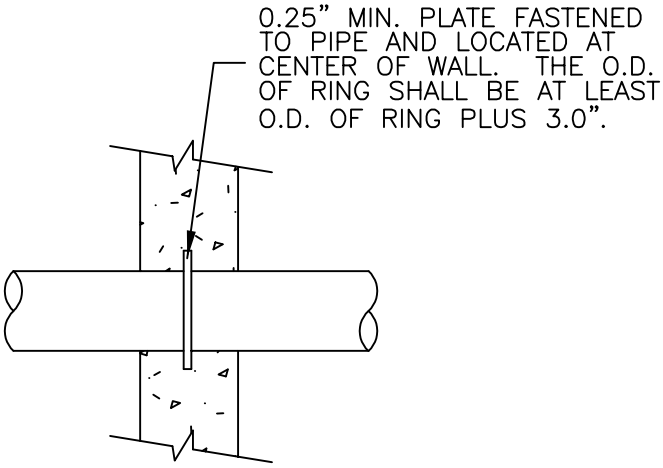
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO
S–13

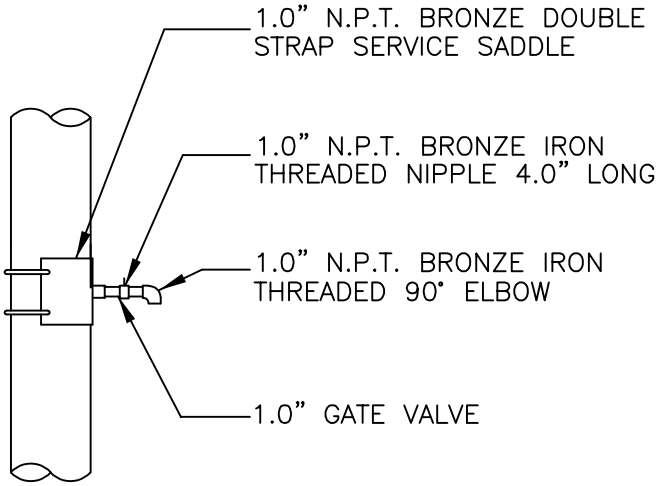
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Ⓐ WATER STOP DETAIL



Ⓑ CUT-OFF RING DETAIL



Ⓒ WASH DOWN DETAIL

NOT TO SCALE

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD MISCELLANEOUS PUMPING STATION DETAIL

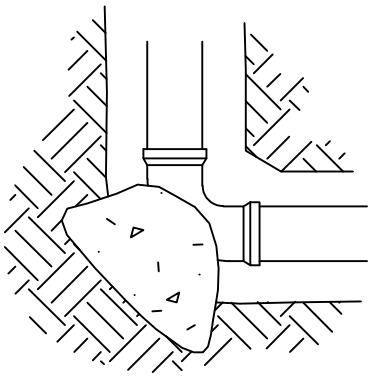
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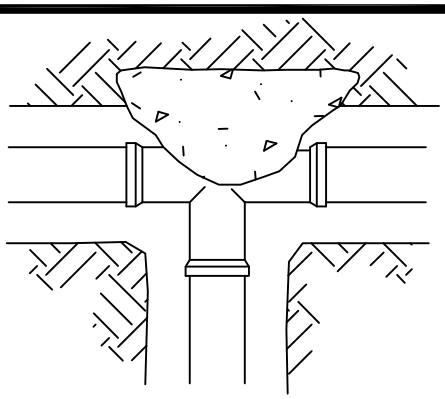
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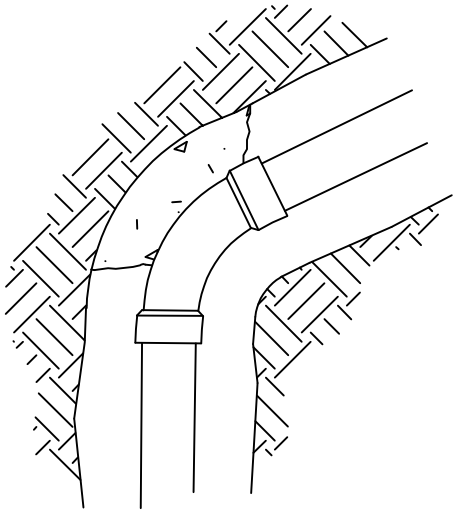
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90° ELL



TEE



45° ELL

THRUST BLOCK DETAILS

NOT TO SCALE

NOTES:

1. ALL VALVES, FITTINGS, AND DIRECTIONAL CHANGES ARE TO BE HELD IN PLACE BY CONCRETE THRUST BLOCKS.
2. BEARING AREAS INDICATED ARE BASED ON ALLOWABLE SOIL PRESSURE OF 1500 PSF.
3. CONCRETE IS NOT TO BEAR AGAINST PIPE. THRUST BLOCK TO ONLY BE IN CONTACT WITH THE FITTING.

* 1 S.F. (SQUARE FOOT)

THRUST BLOCK SCHEDULE				
BEARING AREA IN SQUARE FEET*				
PIPE SIZE	TEE OR PLUG	90° ELL	45° ELL	22.5° ELL
4.0"	2	2	2	1
6.0"	3	4	2	2
8.0"	5	7	4	2
10"	8	11	6	3
12"	11	16	8	4
16"	14	20	10	5

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD PUMPING STATION
THRUST BLOCK

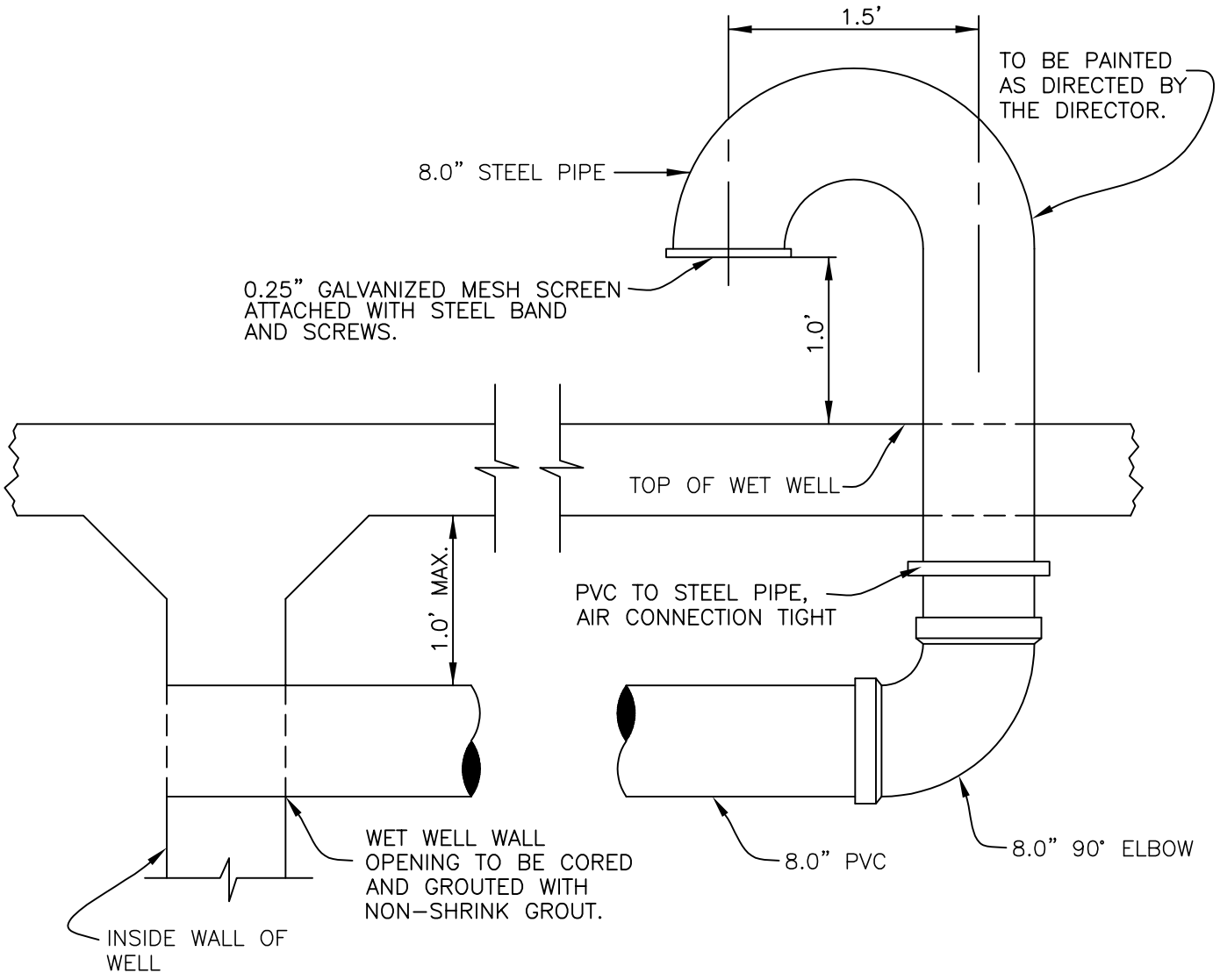
COUNTY OF KERN
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PLATE NO.
S–15

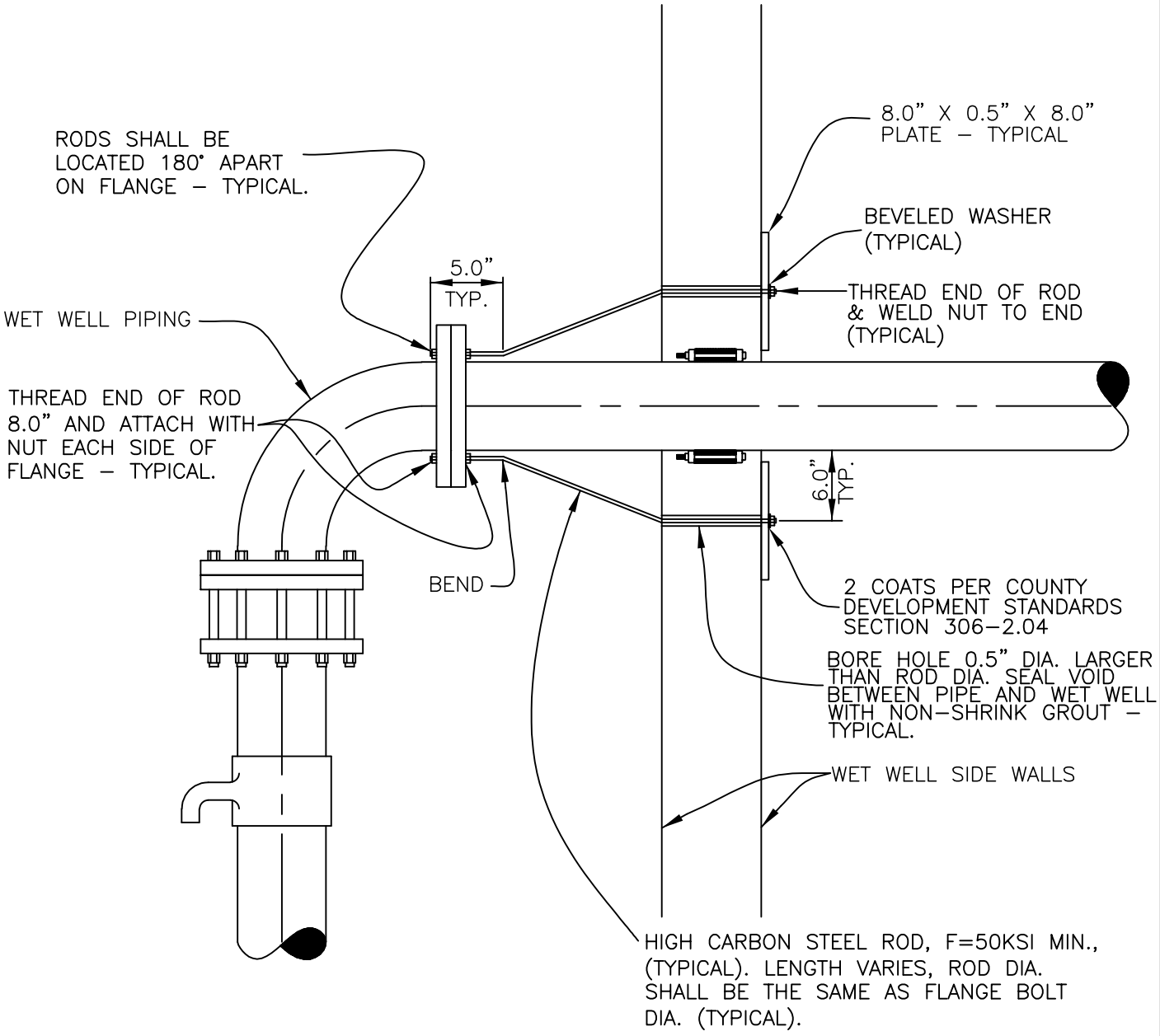
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NOT TO SCALE

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	COUNTY OF KERN STATE OF CALIFORNIA DEVELOPMENT STANDARD		DESIGNED BY: J.R.C.	
			DATE DRAFTED: 09/30/23	
			APPROVED BY: J.R.C.	

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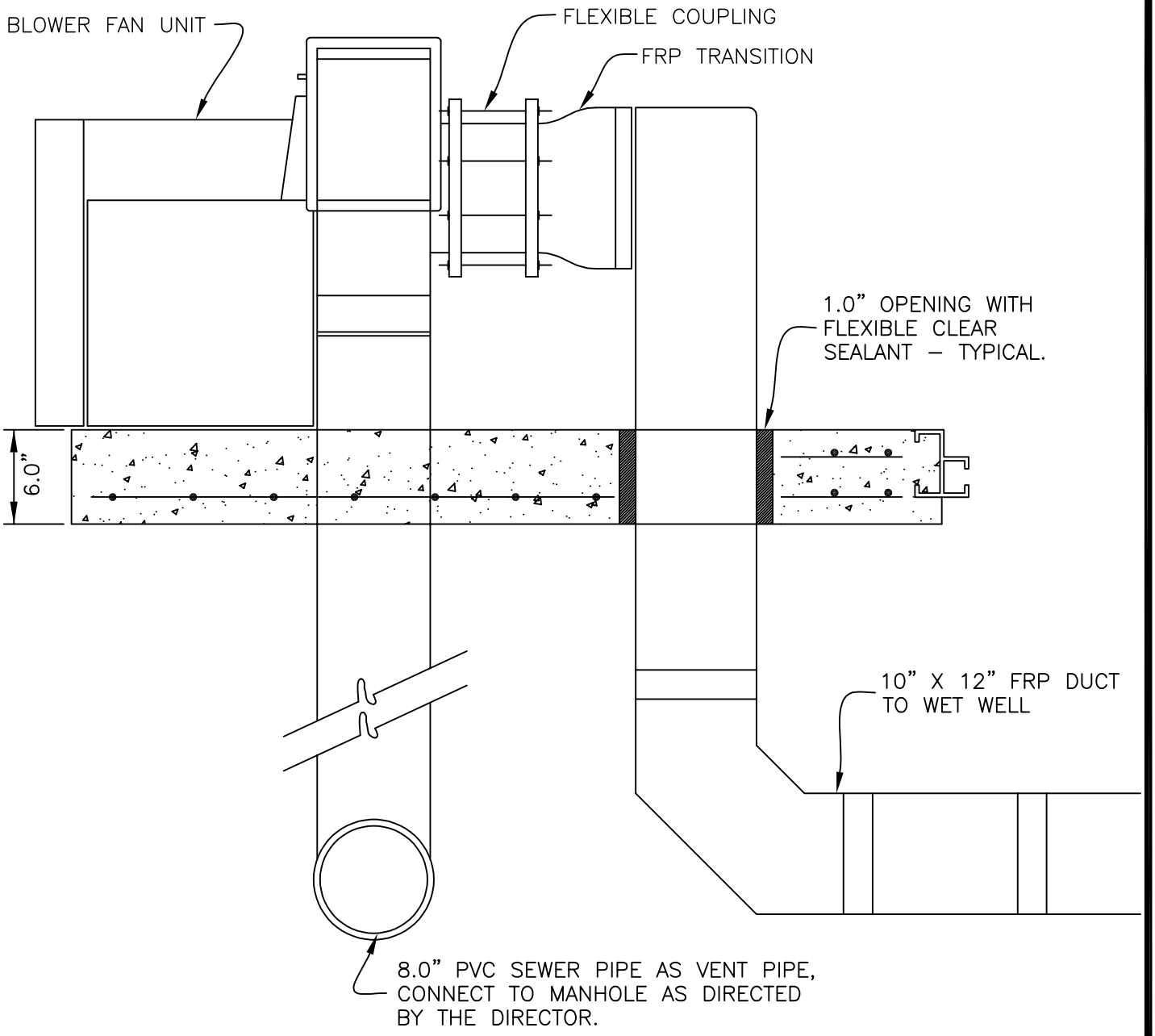
NOTES

1. EXCEPT FOR PIPING, ALL METAL WORK WITHIN THE WET WELL SHALL BE STAINLESS STEEL.

NOT TO SCALE

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS	STANDARD PUMPING STATION PIPE RESTRAINT ASSEMBLY	REVISIONS DATE – DESC –	DRAFTED BY: R.R.P.	PLATE NO. S–17
	COUNTY OF KERN STATE OF CALIFORNIA DEVELOPMENT STANDARD		DESIGNED BY: J.R.C.	
			DATE DRAFTED: 09/30/23	
			APPROVED BY: J.R.C.	

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NOTES

1. EXCEPT FOR PIPING, ALL METAL WORK WITHIN THE WET WELL SHALL BE STAINLESS STEEL.

NOT TO SCALE

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD PUMPING STATION BLOWER FAN

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DRAFTED BY: R.R.P.
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PLATE NO. S–18

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DIVISION FOUR

STANDARDS FOR DRAINAGE

CHAPTER I. GENERAL

Sec. 401-1 General Purpose

401-1.01 It is the general purpose of these standards that waters generated by storms, springs, or other sources be mitigated so as to provide reasonable levels of protection for life and property, and the maintenance of necessary access to property or passage of the traveling public on the public highways.

401-1.02 To meet this general purpose, it is necessary that these standards reasonably protect life from the direct effects of flood waters, the indirect health effects associated with stagnating water, and the attractive nuisance provided by standing waters. It is necessary to reasonably protect property from the damaging effects of flood waters. Property access for the ingress and egress of emergency vehicles, or the general public should be reasonably provided. The passage of public vehicles on the public highways should also be reasonably ensured.

401-1.03 In general, the mitigation measures for the protection of life and property, and the maintenance of emergency vehicle access are based upon the Capital Storm Design Discharge (CSDD). The issues related to property access (by the public) and passage on public highways, and local drainage facility design are based upon the Intermediate Storm Design Discharge (ISDD).

401-1.04 The design standards in this section are to be deemed to be minimal and shall not limit the design engineer from using higher standards based upon the engineer's assessment of the protection needs of the development. Alternatives are permissible which are determined by the Director to be of equal or higher quality.

401-1.05 The Director may allow such exceptions as he may find to be reasonably required by the specific circumstances, to be in the public interest and in conformity with the general objectives of these standards.

401-1.06 Special circumstances may exist that require additional mitigation above and beyond these standards as determined by the Director.

Sec. 401-2 Maintenance

401-2.01 All facilities intended for public maintenance shall be designed and constructed subject to the approval of the Director and the maintenance entity, or these standards, whichever is more conservative.

401-2.02 All drainage facilities intended for private maintenance shall provide a maintenance plan, subject to the approval of the Director. All such facility maintenance plans shall include, but not be limited to: (a) schedule of cleaning (or clearing), (b) mosquito and vector abatement measures (if applicable), (c) pump maintenance schedule (if applicable), (d) notarized statement by the owner(s) acknowledging his/her/their responsibility and intent to maintain the proposed facility in accordance with the approved maintenance schedule.

401-2.03 Subdivisions with privately maintained streets shall have the drainage facilities maintained by a home-owners association or other entity which has the ability to assess fees for maintenance.

CHAPTER II. DEFINITIONS

Sec. 402-1 Definitions:

402-1.01 **AGENCY**: refers to the Department of the County of Kern with jurisdiction.

402.1.02 **ALLUVIAL FAN**: is a landform originating at an apex and characterized by high-velocity flows; active processes of erosion, sediment transport, and deposition; and unpredictable flow paths.

402-1.03 **APEX**: means a point on an alluvial fan or similar landform below which the flow path of the major stream that formed the fan becomes unpredictable and alluvial fan flooding can occur.

402-1.04 **CAPITAL STORM DESIGN DISCHARGE (CSDD)**: is that flow determined based upon a precipitation event having a one percent probability of being equaled or exceeded in any given year, commonly referred to as the 100-year storm.

402-1.05 **CLOSED CONDUIT**: is any system of underground drainage facilities, other than culverts.

402-1.06 **COMPREHENSIVE DRAINAGE PLAN**: refers to a storm water runoff mitigation plan for multi-phase developments. Such a plan need not be adopted by the County but will be kept on file by the Director.

402-1.07 **CONSTRUCTED CHANNEL**: refers to the physical modification of natural channels or the construction of channels.

402-1.08 **CONTROL FACILITY**: are those hydraulic structures which mitigate the effects of surface runoff resulting from development, flow pattern modification, or flood flows.

402-1.09 **CULVERT**: is a hydraulically short conduit which conveys storm runoff flows through a roadway embankment or past some other type of flow obstruction.

402-1.10 **DESIGN PONDING DEPTH**: is the depth to which the design volume will pond in a storm water basin.

402-1.11 **DETENTION BASIN**: is a storm water facility designed to affect flood hydrograph peak attenuation.

402-1.12 **EMBANKMENT AREA**: is an area of compacted fill material.

402-1.13 **ENCROACHMENT:** refers to any change in land use that materially alters the lands flow conveyance potential.

402-1.14 **FLOOD CONTROL PLAN**: is a plan for the mitigation of flood flows originating from off-site watersheds or resulting from on-site development.

402-1.15 **FLOOD FLOW**: shall be considered to be the CSDD for reference in these standards.

402-1.16 **FLOW PATTERN**: refers to any physical tracing resultant from the historic or existing runoff of water.

402-1.17 **INTERMEDIATE STORM DESIGN DISCHARGE (ISDD**): is that flow determined based upon a precipitation event having a ten percent probability of being equaled or exceeded in any given year, commonly referred to as the ten-year storm.

402-1.18 **LEVEE**: is an embankment whose primary purpose is to furnish drainage or flood protection from storm water run-off and which is, therefore, subject to water loading for periods of only a few days or weeks a year.

402-1.19 **MASTER DRAINAGE PLAN**: refers to a comprehensive drainage plan or flood control plan adopted by the County which includes adopted funding mechanisms.

402-1.20 **NATURAL CHANNEL**: is a flow pattern characterized by incised flow channelization with well defined banks and including the overbank flow areas.

402-1.21 **NUISANCE FLOW**: shall be considered as those waters originating from within, or adjacent to, the development not resulting from storm runoff.

402-1.22 **ONE PERCENT RISK FLOW**: is the flow on an alluvial fan based upon the joint probability of the flow distribution at the fan apex and the probability of occurring at the development site.

402-1.23 **REASONABLE:** in the context of this section refers to the balancing of the utility of the facilities or circumstances described against the gravity of the potential for harm.

402-1.24 **RETENTION BASIN**: is a terminal storm water facility for the storage of runoff. Commonly referred to as a sump.

402-1.25 **RETARDATION BASIN**: Synonymous with Detention Basin.

402-1.26 **SLOPE EASEMENT**: shall include the horizontal dimension from the top to toe of slope plus the setback requirements specified by the Grading Ordinance.

402-1.27 **SOILS ENGINEER (GEOTECHNICAL ENGINEER):** shall mean an engineer experienced and knowledgeable in the practice of soils engineering (geotechnical engineering).

402-1.28 **SOILS ENGINEERING (GEOTECHNICAL ENGINEERING):** shall mean the application of the principles of soil mechanics in the investigation, evaluation and design of civil works involving the use of earth materials and the inspection and/or testing of the construction thereof.

402-1.29 **STRESS AREA**: refers to those locations where the erosion potential is greater than a straight, uniform channel reach, and includes junctions, transitions, and curves.

402-1-30 **WATERWAY**: refers to any natural channel, artificial channel or closed conduit, which provides a course for drainage water to flow.

Sec. 402-2 Off-Site Capital Storm Design Discharge (CSDD) Mitigation

The CSDD flow determined from the off-site watershed shall consider the total area of the off-site watershed. The watershed development condition may be considered in its existing condition at the time of the proposed development if no control facilities mitigating surface runoff exist, and as undeveloped if adequate control facilities mitigating surface runoff exist.

The design of all structures within the development shall be protected to a minimum of one (1) foot above the water surface associated with the CSDD.

The CSDD flow shall be received into the development without diversion onto adjacent property or causing more than one-foot rise in pre-development water surface and shall be discharged in a manner as similar as possible to the existing condition downstream of the development.

Sec. 402-3 Off-Site Intermediate Storm Design Discharge (ISDD) Mitigation

The ISDD flow shall be based upon the uncontrolled developed watershed proximate to the development when no defined flow pattern exists. When a flow pattern is defined, the ISDD flow determination shall include the total watershed contributing to the flow pattern.

The off-site ISDD shall be mitigated in conjunction with requirements for on-site ISDD flows.

Sec. 402-4 Hydrologic Flow Determinations

The CSDD and ISDD flows shall be calculated in accordance with the current Kern County Hydrology Manual.

CHAPTER III. DRAINAGE PLANS

Sec. 403-1 Authority

403-1.01 County Master Drainage Plans

The County administers master drainage plans (MDP) over some portions of the County. In these MDP areas, the design hydrology is governed by the assumption made and methodology used, in the development of the MDP or its most recent revision. Modifications to the MDP's assumed land uses may result in the requirement of additional permanent facilities being constructed to mitigate unanticipated runoff.

If MDP planned facilities have not been constructed at the time of site development, then temporary facilities will be required to be constructed by the Developer. Such facilities may be abandoned upon completion of the MDP facilities intended to serve the site.

403-1.02 Special Districts

Special Districts, such as Community Service Districts, may prepare comprehensive drainage and/or flood control plans for areas under their jurisdiction. Such plans are subject to the review and approval of the County.

If the Special Districts planned facilities have not been constructed at the time of site development, then temporary facilities will be required to be constructed. Such facilities may be abandoned upon completion of the planned facilities intended to serve the site.

County Service Areas are typically required to be formed for the maintenance of drainage facilities in the absence of another maintenance entity.

403-1.03 Subdivisions

These standards shall apply to the drainage/floodplain management requirements specified for subdivisions improvements in the County's Land Division Ordinance.

If the subdivisions storm runoff mitigation measures are to be constructed as part of a comprehensive drainage plan, then each phase of the development shall be designed to function independently or in conjunction with completed development phases.

403-1.04 Mobile Home/Recreational Vehicle Parks

These standards shall apply to the drainage/floodplain management review of Mobile Home/Recreational Vehicle Parks specified in the County's Zoning Ordinance.

403-1.05 Site Development

These standards shall apply to the drainage/floodplain management requirements specified for site development in the County's Building Code, Grading Code, Floodplain Management Ordinance, and all other pertinent County Ordinances.

CHAPTER IV. ALLUVIAL FAN DEVELOPMENT

Sec. 404-1 Development Policy

Development upon an alluvial fan shall mitigate the effects of the flow at the site of development, which has a one-percent risk of being equaled or exceeded in any given year. Such mitigation shall ensure that the one-percent risk flow will be received into the development site, without causing more than one (1) foot of water surface rise resulting from encroachment at the development site, and discharge the one-percent risk flow in a manner, as close as possible, to the flow pattern existing prior to development of the site.

Sec. 404-2 Flood Control Facility Requirements

The design of structural flood control measures on alluvial fans shall demonstrate that the measures will effectively eliminate alluvial fan flood hazards from the area protected by such measures. The provided analyses must include, but are not limited to, the following:

404-2.01 Engineering analyses that quantify the discharges and volumes of water, debris, and sediment movement associated with the flood that has a one percent probability of being exceeded in any year at the apex under current watershed conditions and under potential adverse conditions (e.g., deforestation of the watershed by fire). The potential for debris flow and sediment movement must be assessed using an engineering method acceptable to the Director and Federal Emergency Management Agency (FEMA). The assessment should consider the characteristics and availability of sediment in the drainage basin above the apex and on the alluvial fan.

404-2.02 Engineering analyses showing that the measures will accommodate the estimated peak discharges and volumes of water, debris, and sediment, as determined in accordance with Section 404-2.01, and will withstand the associated hydrodynamic and hydrostatic forces.

404-2.03 Engineering analyses showing that the measures have been designed to withstand the potential erosion and scour associated with estimated discharges.

404-2.04 Engineering analyses or evidence showing that the measures will provide protection from hazards associated with the possible relocation of flow paths from other parts of the fan.

404-2.05 Engineering analyses that assess the effect of the project on flood hazards, including depth and velocity of floodwaters and scour and sediment deposition, on other areas of the fan.

404-2.06 Engineering analyses demonstrating that flooding from sources other than the fan apex, including local runoff, is either insignificant or has been accounted for in the design.

CHAPTER V. STREET DRAINAGE

Sec. 405-1 Design Flow

405-1.01 The ISDD shall include the evaluation of both on-site and off-site watersheds when applicable.

405-1.02 Street Conveyance

1. For Type "A" subdivisions, the ISDD may exceed the top of a six (6) inch curb by 0.10 feet.

2. For Type "B" subdivisions, the depth of flow contained within the road right of way shall not exceed 0.60 feet for the ISDD.

3. The depth of flow for the CSDD on an Arterial and Collector shall be maintained as not to prohibit reasonable access.

4. For mobile home/recreational vehicle parks, the depth of flow for the ISDD shall not exceed the carrying capacity of the travel way.

5. Where the discharge exceeds the above-mentioned limits, a storm drain or other facilities shall be provided to convey the excess flows.

6. The drainage system shall be free flowing and shall not allow the retention of more than one (1) foot of water measured at the flowline after the flows have subsided.

405-1.03 Sedimentation

In areas suspected of significant sediment yield from an ISDD, the following shall apply:

1. The developer’s engineer shall quantify any sediment yield from on-site or off-site properties based upon the ISDD.

2. Sediment yield shall be independent of the runoff event and is to be mitigated separate from the design discharge.

3. Sediment shall not be deposited on the roadway.

4. Higher levels of mitigation may be required in mudslide-mudflow areas.

405-1.04 Erosion

1. Erosion protection measures based on the ISDD shall be established upstream, downstream and through the project by the developer's engineer subject to approval by the Director.

CHAPTER VI. CULVERTS, BRIDGES AND AT-GRADE-CROSSINGS

Sec. 406-1 General

406-1.01 All publicly maintained crossings of natural channels shall be bridged or culverted. The minimum length of any culvert shall be from toe-of-slope to toe-of-slope. Additional right-of-way may be required for maintenance of these facilities.

406-1.02 Roadways shall be required to bridge a floodway where encroachment of the floodway is prohibited.

406-1.03 Energy losses for bridge piers, interior walls for multiple box culverts, or other obstructions within the channel shall be predicated upon the obstruction width plus two (2) feet of debris allowance for each obstruction.

Sec. 406-2 Culverts

406-2.01 The ISDD for the total upstream watershed under existing conditions shall not exceed soffit of culvert.

406-2.02 The CSDD for the total upstream watershed under existing conditions will be allowed to overtop the roadway until two (2) feet of specific energy is obtained, at which point additional culverts will be required to meet these minimum requirements.

406-2.03 The two (2) feet of specific energy shall be calculated at the crown or high point of the traveled roadway.

406-2.04 The minimum size of any culvert under a publicly maintained roadway shall be 18 inches. For private roads or public access, which are privately maintained, this requirement may be waived.

406-2.05 Culverts shall be designed to have a minimum useful life of 50 years.

Sec. 406-3 Bridges

406-3.01 The lowest portion of the bridge span shall be one (1) foot or 0.2 times the specific energy (whichever is greater) above the water surface elevation when the normal depth of flow for the CSDD is subcritical.

406-3.02 The lowest portion of the bridge span shall be one (1) foot or 0.2 times the specific energy (whichever is greater) above the sequent flow depth when the normal depth of flow for the CSDD is supercritical.

406-3.03 When levee conditions exist, the lowest portion of the bridge span shall also meet the minimum freeboard requirements of the levee.

Sec. 406-4 At-Grade-Crossings

406-4.01 At-grade-crossings shall not be permitted on a publicly maintained roadway and shall not encroach upon a floodway.

CHAPTER VII. CLOSED CONDUIT SYSTEMS, CATCH BASINS

Sec. 407-1 Design

407-1.01 Closed conduit system shall be designed for the total ISDD flow less allowable street flow. (see Chapter V Street Drainage)

407-1.02 A closed conduit system intended to serve on-site lot development shall be designed for the total ISDD originating on-site.

407-1.03 Closed conduit system shall be designed to have a minimum useful life of 50 years.

407-1.04 The minimum size of a closed conduit system within the street right-of-way or intended for public maintenance shall be 18 inches.

407-1.05 The minimum size of a closed conduit system outside of the street right-of-way and intended to be privately maintained shall be eight (8) inches.

407-1.06 The minimum cover over any closed conduit system shall be 24 inches. The minimum cover required within the street right-of-way shall be 30 inches.

407-1.07 Closed conduit system shall be free flowing with no continuous standing water within the pipe.

407-1.08 The designed pipe size shall not be allowed to decrease as the system progresses downstream.

407-1.09 The minimum slope of any closed conduit system shall be .001(.10 percent) unless otherwise approved by the Director.

407-1.10 The hydrologic tie-in design criteria for the closed conduit system shall be based on equal recurrence.

407-1.11 Closed conduit system within the street right-of-way or intended for public maintenance shall be Class III reinforced concrete pipe with rubber gasket joints, or cast-in-place concrete pipe unless otherwise approved or required by the Director.

407-1.12 The developer's engineer shall plot the hydraulic grade line and the energy grade line profiles for the closed conduit system either on a set of, or on the original, street improvement plans. All calculations and related data for these profiles shall be included with the street improvement plans when submitted.

Sec. 407-2 Location

407-2.01 A publicly maintained closed conduit system shall be placed within the road right-of-way or easement unless otherwise approved by the Director.

407-2.02 The alignment of a publicly maintained closed conduit system shall be parallel or perpendicular with the centerline of the road unless otherwise approved by the Director.

Sec. 407-3 Freeboard

Within the closed conduit system, the hydraulic grade line shall be at least 0.5 feet below all inlet flowline elevations, and 0.5 feet below the top of non-pressure manholes.

Sec. 407-4 Manholes

407-4.01 Within the closed conduit system, manholes shall be provided at all junctions, bends, and at intervals prescribed below:

a. Manholes shall be provided at intervals no greater than 300 feet where the conduit diameter is less than or equal to 30 inches.

b. Manholes shall be provided at intervals no greater than 400 feet where the conduit diameter is larger than 30 inches, but smaller than 48 inches.

c. Manholes shall be provided at intervals no greater than 500 feet where the conduit diameter is 48 inches or larger.

407-4.02 A pressure manhole shaft and a pressure cover shall be installed in a closed conduit system whenever the energy grade line is less than 0.50 foot below the top of the manhole.

Sec. 407-5 Losses

In addition to normal friction losses, energy losses due to entrance and exit conditions, bends, junctions, and transitions shall be computed. The engineer shall supply all data and reference material for calculated losses subject to review and approval by the Director.

Sec. 407-6 Erosion

407-6.01 Velocities within the closed conduit system should not exceed 20 feet per second with standard wall RCP, or 10 feet per second for plastic pipe. Where velocities exceed 20 feet per second for RCP, or 10 feet per second for plastic pipe, a special pipe shall be installed as approved by the Director.

407-6.02 Erosion protection against scour velocities shall be provided at the inlet and outlet of the closed conduit system. The engineer shall supply all data and reference material supporting his/her design, subject to approval by the Director.

Sec. 407-7 Catch Basins

407-7.01 The inlet design at closed conduit systems (i.e., location, depression, capacity, structural, etc.) shall be subject to review and approval by the Director.

407-7.02 Grate type inlets to the closed conduit system within the street right-of-way shall be allowed only in conjunction with side curb openings and shall be bicycle safe.

407-7.03 The minimum width of opening for any catch basin intended to be publicly maintained shall be three (3) feet and six (6) inches (3.5').

Sec. 407-8 Rights-of-Way/Easements

407-8.01 A right-of-way sufficient to contain the closed conduit and appurtenances plus a minimum of five feet on each side, measured from the edge of the conduit or drainage structure, shall be provided but in no case shall the right-of-way be less than 15-feet in width. Whenever possible, rights-of-way for conduits shall be adjacent to property lines and outside areas where structures are planned. Under no circumstances shall closed conduits and appurtenances be constructed less than 10-feet from any planned or existing structure.

407-8.02 Easements will be required on all closed conduit systems outside of the street right-of-way, which are intended for public maintenance.

407-8.03 Land rights shall be conveyed to the County in one of the following forms, whichever is appropriate:

1. Separate parcel easement dedicated on a subdivision map.
2. Easement dedicated on a subdivision map as part of adjacent lots.
3. Fee simple or easement offered or granted by separate documents.

CHAPTER VIII. RETENTION BASIN DESIGN

Sec. 408-1 Design Volume

The design volume of storm water retention basins shall be based upon the runoff from the ISDD five-day storm event and a volume of nuisance water determined by the engineer. No runoff generated on site from the design storm or from nuisance flows will be allowed to leave the site unless downstream drainage disposal facilities exist to handle the flow. The retention of upstream off-site flows shall not be considered to reduce the size of the required on-site retention facilities or mitigate the runoff from the proposed development. An evaluation of the runoff volumes associated with the site in its existing condition shall not reduce the size of the required drainage facilities. The runoff volume from the ISDD five-day storm shall be calculated using the formula:

Runoff Volume (cu.ft.) = $[(D_{10yr\text{-}5day})/12)]$ (a_i) (Area) where;

$D_{10yr\text{-}5day}$ = depth of rainfall (in.) obtained from NOAA Atlas 14, Vol. 6, Ver. 2.0 (Use procedure outlined in Kern County Engineering Bulletin 11-02

a_i = average percentage of impervious area; The 'Actual Impervious Cover for Developed Areas' (Figure C-3---Kern County Hydrology Manual) are based on average conditions which may not

apply to a particular study. The a_i may vary greatly even on comparable study sized lots due to differences in dwelling size, improvements, etc. Landscape practices should also be considered as it is common in some areas to use ornamental gravels underlain by impervious plastic materials in place of lawns and shrubs. A field investigation of a study area shall always be made, and a review of aerial photos, where available, may assist in estimating the percentage of impervious cover in developed areas.

Area = Drainage area of total development (sq.ft.)

Sec. 408-2 Hydraulic Design

In the absence of a hydrologic volume routing analysis, the storm drain hydraulic grade line calculations shall assume that 50% of the design storm volume and 100% of the nuisance volume is in the basin when the peak flow rates occur.

Sec. 408-3 Freeboard

Freeboard shall be required for all retention basins having a design water depth exceeding 18 inches. Six (6) inches of freeboard will be required when the design ponding depth within the basin is four (4) feet or less. For basins with a design ponding depth greater than four (4) feet the amount of freeboard required shall be one (1) foot. Freeboard shall be measured from the lowest gutter inlet or top of bank, whichever is lower.

Sec. 408-4 Fencing

Retention basins shall be fenced and provided with gated access when the design ponding depth exceeds 18 inches. All retention basins, regardless of ponding depth, that are maintained by the County or an entity administered by the County shall be enclosed by a six (6) foot high masonry block wall. Exceptions may be made, subject to the Director's approval, for certain master planned facilities intended for multi-purpose use.

408-4.01 The fence shall consist of a six (6) foot high chain link fence of 9 gage fabric with redwood slats or a six (6) foot masonry block wall or approved equal. Fence post footings shall have a minimum diameter of 12 inches and a minimum depth of 30 inches. Masonry block walls shall be designed in accordance with accepted engineering practices. Retaining walls used for basin fencing requirements shall have their design approved by the Director. See Plate Nos. R-77 thru R-82.

408-4.02 Fence setbacks measured from the top of slope shall provide a reasonable maintenance way for the equipment outlined in the

maintenance plan. The following minimum setbacks shall apply:

Design ponding depth	Setback
≤ 18 inches	2 feet
> 18 inches but ≤ 4 feet	5 feet
> 18 inches but ≤ 4 feet and Total basin depth >= 5 feet	12 feet
> 4 feet	12 feet
> 8 feet	12 feet (or in accordance with an approved maint-enance plan).

408-4.03 The basin access gate may be chain link, wrought iron, or other as approved by the Director. The double gate is not to be attached directly to the masonry wall. The opening must be sufficient for the 14-foot double gate and anchor posts. If wrought iron is used, a metal mesh privacy screen is to be securely attached to the double gate by rivets or equivalent as approved by the Director. Wrought iron double gates will also require a commercial grade latch or equivalent that can be locked with a County padlock (3/8" shackle diameter). See Plate No. D-11 for specific sizing and material requirements.

Sec. 408-5 Access

An equipment access ramp to the bottom of the retention basin shall be provided when the design depth exceeds 18 inches or when the facility is intended for County maintenance.

408-5.01 The ramp shall be a minimum of 12 feet wide with a maximum slope of 15%. The gate to the access ramp shall be 14 feet wide.

Exception - When the design ponding depth is ≤ 4 feet, the maximum slope on the ramp may be increased to 20%.

408-5.02 Ramps shall not be designed to convey drainage water into the sump.

408-5.03 The ramp alignment shall be no more than 45 degrees from the center of the access gate to facilitate maintenance equipment ingress and egress. Other proposed alignments shall have their design approved by the Director.

Sec. 408-6 Curbing and Rodent Barriers

408-6.01 In conjunction with fencing, a six (6) inch wide, eighteen (18) inch deep continuous concrete curb shall be provided around the top of the sump. The top of the curb shall be 0.5 feet above the highest adjacent grade. When the sump is fronting on a street, the top of the

curbing shall be a minimum of one (1) foot above the top of the street curb. Ramped access across the curb shall be provided at all gated access points to the sump.

408-6.02 Rodent barriers will be required on the sides of the sump in proximity to open space, agricultural areas or lots one (1) acre or larger. The bottom of the rodent barrier shall be a minimum of 42 inches below finish grade.

Exception - Rodent barriers may be omitted when the design water depth is four (4) feet or less.

Sec. 408-7 General Construction Requirements

408-7.01 General construction requirements for retention facilities shall be in accordance with Plate Nos. D-1, D-2, and D-3.

408-7.02 Retention facilities shall have the design volume contained entirely in cut.

408-7.03 Slopes shall be designed no steeper than is safe and no steeper than two (2) horizontal to one (1) vertical. A slope stability analysis will be required when the design water depth exceeds eight (8) feet and side slopes are steeper than 3:1.

408-7.04 The minimum bottom dimension for retention basins with a design depth greater than four (4) feet shall be 20 feet. For design water depths 4 feet or less, the minimum bottom width shall be no less than that required for maintenance equipment specified in the maintenance plan.

408-7.05 The maintenance way shall be sloped away from the top of bank at a minimum 2%.

408-7.06 Drainage basins intended for County maintenance shall be located on a lot dedicated exclusively for drainage/recreational purposes.

Sec. 408-8 Testing

408-8.01 Retention basins shall not be permitted unless it can be demonstrated, to the satisfaction of the Director, that the basin will completely drain the design volume within seven (7) days.

408-8.02 Testing of the proposed retention basin shall be provided by a Soils Engineer and shall include, but need not be limited to, an analysis of the soils boring logs and the establishment of the drainage rates of the

soils encountered. A minimum of one (1) boring shall be logged within the proposed sump location. This boring shall be advanced below the invert of the basin to a depth equivalent to at least three (3) times the design ponding depth. Testing methods used to establish soil drainage rates shall be approved by the Director.

CHAPTER IX. DETENTION BASIN DESIGN

Sec. 409-1 Design Flow

The design flow into the basin shall be the ISDD five-day runoff hydrograph. Hydrograph design and mass ratios shall be in accordance with the Kern County Hydrology Manual. The outflow hydrograph shall not extend beyond five days from the end of the inflow hydrograph. Infiltration effects from the detention facility shall not be included in the calculation of the outflow hydrograph.

Sec. 409-2 Facility Design

Sizing and placement of detention facilities shall not aggravate the potential for downstream flooding.

Requirements for fencing, curbing, setbacks, access, and freeboard shall be in accordance with retention basin design.

409-2.01 Detention basins shall be provided with a concreted low flow bypass, or approved equivalent, for the conveyance of nuisance flows to the outlet.

409-2.02 An emergency spillway will be incorporated in the design of all detention basins.

Sec. 409-3 Sedimentation

Sediment yield shall be determined and mitigation provided by the developer's engineer.

Sec. 409-4 Duplex Pump Station (Wet Well) Design Specifications

Pumps used in conjunction with detention facilities shall have their design approved by the Director. Specific design criteria shall include the use of an automated duplex pump, and an alarm system. The pump system shall be designed to pass a minimum two (2) inch sphere and for reliability and low maintenance. Pump maintenance shall be included in the facility maintenance plan.

409-4.01 Pump station shall be designed to drain the sump in five (5) to seven (7) days with one (1) pump running. However, the minimum flow rate shall be 100 gpm.

409-4.02 Pump station shall be a duplex system which automatically alternates between pumps at the end of each cycle.

409-4.03 The pump station shall either include a lag pump design or automatic controls, which will start the second pump if the first fails to pump.

409-4.04 Pumps shall be minimum one (1) HP.

409-4.05 Pump station shall be designed to allow easy removal of pumps for maintenance, without requiring personnel to enter into a wet well or similar enclosed structure. A “cage” style pump system, where the pump is located in a cage structure at the bottom of the basin, will not be allowed.

409-4.06 Pumps and pump station inlet structure shall be screened to prohibit plugging by debris.

409-4.07 The pump station (including the electrical/control panel) shall be located next to the entrance of the basin outside of the maintenance way.

409-4.08 The receiver wet well shall consist of one 60” diameter concrete precast manhole sections with single offset R-3 rubber gasket joints per ASTM C478, latest edition or approved equal. Duplex pump system shall be equipped with two (2) one (1) HP (minimum), 115V, non-clog, explosion proof, sump pumps with alarm and alarm switch, check valves, ball valves, discharge line, pump lift out assembly, and electrical junction box. Include a traffic-rated 30” x 42” hatch with lockable, steel hinged access with safety grate.

409-4.09 The lifting assembly shall be best suited for the pump arrangement. All cables, etc. are to be stainless steel nylon coated. All slide metal surfaces must be considered non-sparking, by URL, to prevent spark ignition in wet well.

409-4.10 The valve vault shall consist of one 42” diameter concrete precast manhole section (conforming to ASTM C478 with single offset R-3 gasket joints) with gate valves, swing check valves, and adjustable pipe supports or equivalent. Include a 24” x 24” hatch with lockable, hinged steel access door with safety grate.

409-4.11 Sump pump wiring shall be connected to a waterproof electrical control panel in a NEMA (3R) enclosure or equivalent. The splicing of pump leads to the Junction Box and from the Junction Box to the control panel is not allowed.

409-4.12 A four (4) inch thick reinforced concrete pad (minimum cementitious material of 590 lb./cu. yd.) will be required to encompass the precast top slabs, manholes and control panel.

409-4.13 All electrical conduits and connectors shall be sealed water-tight and gas-tight using bitumastic paint.

409-4.14 All pipe or conduit wall penetrations shall be sealed with a neoprene seal.

409-4.15 All exposed steel (pipe, valves, flanges, elbows, and control box exterior) shall be primed with zinc-chromate primer and painted with an epoxy enamel finish. Color to be grey unless otherwise approved.

409-4.16 A water level staff shall be placed in the sump. The staff may be either anchored to the sideslope of the sump or be attached to the outlet structure, as approved by the Director. The bottom portion of the staff shall be painted black and white, alternating at one-foot increments, to an elevation equivalent to the half full-depth of the sump. The top portion of the staff shall be painted red and white, alternating at one-foot increments, to one (1) foot above design water surface.

409-4.17 All controls shall be mounted in a NEMA (3R) metal enclosure or equivalent. The control panel and all electrical components shall bear the Underwriter's Laboratory (UL) Label. All circuit breakers shall have operators extending through the control panel door. All motor starter overload resets, selector switches, push buttons and pilot lights shall be mounted on the control panel door. The control panel shall be enclosed in a vandal resistant enclosure with provisions for locking with a County's lock three-eighths (3/8) inch shank pad lock or approved equal.

409-4.18 The control for each pump shall include a thermal magnetic circuit breaker, rotary hand-off-automatic switch, and magnetic motor starter with ambient compensated overload relays and quicktrip heaters. The pump control circuit shall include a door interlock switch to de-energize the control circuit when the control panel door is open, a control mounted transformer with fused 115 volt secondary, and a door mounted control circuit disconnect switch.

409-4.19 Pump operation shall be controlled by three (3) bulb type liquid level sensors. An intrinsically safe pilot circuit shall be provided for each level sensor to reduce the power to the sensor to a level incapable of

releasing sufficient electrical or thermal energy to ignite explosive gases.

409-4.20 A fourth level sensor, with intrinsically safe circuit, shall be furnished for indication of high-water alarm condition. High water alarm shall be indicated by a panel-mounted pilot light and external audible alarm with silence button.

409-4.21 The controls shall provide for lead/lag sequencing of the pumps, an automatic alternator shall alternate the lead/lag duty on each succeeding pump cycle. An outer pump seal leakage detection system shall be included in the control enclosure. When the motor probes sense the presence of moisture in the oil seal chamber, a relay coil will illuminate a panel mounted indicating alarm lamp to indicate possible outer motor seal failure and the alarm light.

409-4.22 The pump station shall have a Hand-Off-Auto switch and an automatic low water shut-off and have green (run) and red (alarm) indicator lights visible from the road/street.

409-4.23 Control panel shall contain an “hour meter” for each pump.

409-4.24 Control panel shall contain a switched GFI 115-volt duplex electrical outlet.

409-4.25 Control panel shall include an emergency generator hook-up connection.

409-4.26 The discharge piping from the gate valve assembly shall be pressure rated and conform to AWWA C900 and Class 165. The discharge piping shall be pressure tested per ASTM standards, or approved equal. The installation of the discharge piping shall incorporate thrust blocks per Kern County Development Standards Plate Nos. L-7 and S-15.

409-4.27 System Testing—Installed pumps, controls and pipes shall be tested in accordance with recommendations of the manufacturer prior to acceptance by the Kern County Public Works Department.

409-4.28 Prior to acceptance, two (2) complete operation and maintenance manuals, with wiring and interconnect diagrams for all equipment and controls (including power pedestal), model and serial numbers of the sump pumps in binders, one (1) digital copy, one (1) set of as-built drawings on mylar, and one (1) digital copy shall be furnished to the County. The as-built drawings shall show the location of the electrical conduit from the power pedestal to the control panel.

CHAPTER X. CONSTRUCTED CHANNEL DESIGN CRITERIA

Sec. 410-1 Design Flow

Constructed channels shall be designed to carry the CSDD plus freeboard.

Sec. 410-2 Freeboard

410-2.01 The minimum freeboard between the design water surface, and the top of bank of the channel shall be five-tenths (0.50) feet or two-tenths (0.20) of the specific energy, whichever is greater.

410-2.02 If the designed water surface is within the embankment area, the design and construction of the channel shall be in accordance with the levee design criteria, including freeboard requirements.

410-2.03 The minimum freeboard requirements for bridges, culverts, and utility crossings which span open channels and which are existing, planned or projected at the time of channel design shall be in accordance with the requirements specified in Sections 406-2 and 406-3.

410-2.04 Superelevation resultant from directional modification shall be considered prior to computing the required freeboard.

Sec. 410-3 Hydraulic Design

410-3.01 Channels shall be designed with proper allowance for hydraulic losses for all planned and projected future crossings or other obstructions to maintain clearance and freeboard as required.

410-3.02 The water surface and the energy grade line profile shall be computed and plotted for all constructed channels and at locations where natural channels modifications are proposed.

410-3.03 Constructed channels shall not be designed with a slope in the range of ± 20% of critical slope unless freeboard equal to the height for instability waves is added.

410-3.04 A minimum velocity of two (2) feet per second shall be maintained for lined channels to prevent sedimentation.

Sec. 410-4 Structural Design

410-4.01 The minimum bottom width of constructed channels shall be ten (10) feet. A triangular channel may be permitted when the channel side slopes are four (4) to one (1) or flatter.

410-4.02 The minimum centerline radii for curves in constructed channels shall be three (3) times the top width of the design water surface.

410-4.03 Design of slopes shall be predicated upon results of an investigation by a Soil Engineer, subject to the approval of the Director.

410-4.04 Adequate bank protection and drop structures shall be provided where the slopes in the channel are steep and high velocities are present.

410-4.05 Bank protection shall be provided based on the design engineer's recommendations, subject to the approval of the Director. Stress area protection shall extend downstream from the end of the stress area a distance equal to ten (10) times the design water depth, unless the engineer can show that the erosion potential is not excessive.

410-4.06 At drop structures or in other locations where a hydraulic jump may occur, bank protection shall be provided through the hydraulic jump for a minimum distance of six (6) times the sum of the sequent depth and the depth of freeboard. This protection shall cover the invert and extend to the height of the sequent depth plus the height of the freeboard. The protection material may be either concrete, concreted-rock slope protection, sacked concrete, air-blown mortar or other approved alternative.

410-4.07 All channel lining materials and methods shall be specified by the engineer and approved by the Director.

410-4.08 All appurtenant drainage facilities shall be constructed and areas adjacent to channels graded so that erosion will be prevented within the channel right-of-way.

410-4.09 Waterways shall enter the main channel at an angle not exceeding 25 degrees.

Sec. 410-5 Erosion

The engineer shall provide recommendations on all necessary mitigation measures for erosion including bank protection and bottom stabilization of the channel, subject to the approval of the Director.

Sec. 410-6 Fencing

410-6.01 Constructed channels with slopes steeper than four (4) to one (1) with specific energy, at any point, greater than 1.5 feet shall be fenced in its entirety.

410-6.02 A six (6) foot high nine (9) gage chain link fence fabric with tension wire shall be installed on each side of the right-of-way.

410-6.03 At all road intersections, fencing shall be installed to prevent public access to constructed channels.

410-6.04 A 14-foot wide chain link drive gate shall be provided at all points of vehicular access.

Sec. 410-7 Easements/Right-of Ways and Maintenance Ways

410-7.01 Right-of-ways for constructed channels with side slopes steeper than four (4) to one (1) shall be provided as follows:

a. The right-of-way for channels with top widths greater than 50 feet, as measured to the top of freeboard, shall include the top width of the channel, two maintenance ways (one on each side of the channel), slope easements (when applicable), and interceptor ditch area (when applicable). The maintenance ways shall be a minimum of 15 feet wide. Runoff from the maintenance ways shall be mitigated.

b. The right-of-way for channels with top widths of 50 feet or less, as measured to the top of freeboard, shall include the top width of the channel, one maintenance way on either side of the channel, slope easements (when applicable), and interceptor ditch area (when applicable). The maintenance way shall be a minimum of 15 feet wide. Runoff from the maintenance way shall be mitigated.

410-7.02 The right-of-way for constructed channels with side slopes four (4) to one (1) or flatter shall be sufficient to contain the top width of the channel (measured from top of freeboard) plus slope easements as needed. A minimum of five (5) feet on either side of the channel shall be provided for maintenance purposes.

410-7.03 Right-of-way for turn-around: Turn-around distance and radii:

At the terminus and at intervals not to exceed one channel mile, turn around areas shall be provided. The minimum inside radii for maintenance roads shall be 40 feet.

410-7.04 Tributary waterways shall be conveyed under maintenance roads in closed conduits or culverts as applicable. Where open channel tributaries cross a maintenance road, a convenient turn-around area shall be provided for maintenance vehicles. The minimum diameter of a turn-around shall be 40 feet.

410-7.05 Right-of-Way for Channels Intersecting Public Roads:

At intersections of the channel with public roads, sufficient right-of-way shall be provided to permit access from the public road to the maintenance road as approved by the Director.

In the event that the channel right-of-way does not intersect a public road, a turn-around or a 15-foot wide access right-of-way shall be provided from a public road to the channel right-of-way at intervals not to exceed one (1) channel mile.

Sec. 410-8 Sedimentation

The determination of sediment yield and proposed mitigation measures of such shall be prepared and recommended by a qualified registered civil engineer, subject to the approval of the Director.

CHAPTER XI. LEVEE DESIGN

Sec. 411-1 Design Flow

Levees shall be designed to accommodate for the CSDD plus freeboard.

Sec. 411-2 Freeboard

411-2.01 The minimum freeboard between the designed CSDD water surface and the levee's top of bank shall be three (3) feet or two-tenths (0.20) times the specific energy plus one (1) foot, whichever is greater.

411-2.02 An additional one (1) foot, above this minimum of freeboard, shall be required within 100 feet of either side of structures within the levee or whenever the flow is constricted, such as at bridges. An additional five-tenths (0.50) foot above the minimum is also required at the upstream end, tapering to the minimum at the downstream end of the levee.

Sec. 411-3 Hydraulic Design

See Section 410-3 Hydraulic Design for details.

Sec. 411-4 Structural Design

Levees shall be designed in accordance with the latest revision of the Corps of Engineers Design and Construction of Levees, Engineer Manual, EM1110-2-1913.

Sec. 411-5 Erosion

Mitigation measure for erosion protection shall be prepared and recommended by a registered civil engineer, subject to the approval of the Director.

Sec. 411-6 Fencing

Fencing requirements for levees shall be in accordance with the criteria contained in the constructed channel design, Section 410-6.

Sec. 411-7 Easements/Right-Of-Way

Access, easements and right-of-way shall be in accordance with the requirements set forth in Section 410-7. (Constructed Channels).

Sec. 411-8 Sedimentation

Mitigation measures shall be prepared and recommended by a qualified, registered engineer, subject to the approval of the Director.

Sec. 411-9 Maintenance

The County, including a County Service Area (CSA), will not assume the responsibility for a levee. Control and maintenance of a levee shall be provided by an entity with the authority to impose taxes, and/or special assessments for levee matters. To ensure proper compliance, a control and maintenance plan shall be established and said plan shall be subject to the approval of the Director.

CHAPTER XII. NATURAL CHANNELS

Sec. 412-1 Delineation

All natural channels shall be identified and clearly delineated on the plans with the appropriate floodplain designation.

For defined natural channels, the Floodplain and Floodway Boundaries shall be delineated, subject to the approval of the Director.

Sec. 412-2 Setback

The minimum setback from the top of bank of a natural channel with side slopes steeper than two (2) horizontal to one (1) vertical, shall be a two (2) to one (1) slope plus a 10-foot wide buffer strip. The setback shall be measured from the toe of the slope. Where the slopes are flatter than two (2) to one (1), the required setback shall be a minimum of 10 feet from the Floodway limit.

Sec. 412-3 Tie-Ins

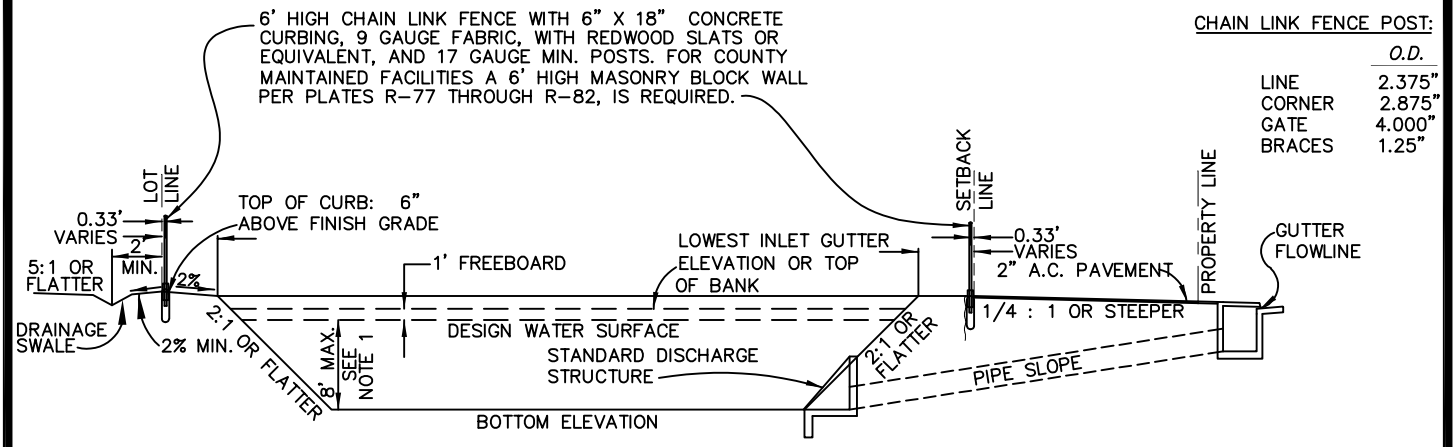
Where natural channels merge into constructed channels, the tie-ins shall be designed in a manner to dissipate energy and protect against erosion. The design for such tie-ins shall be in accordance with acceptable engineering practices and approved by the Director.

Sec. 412-4 Relocation

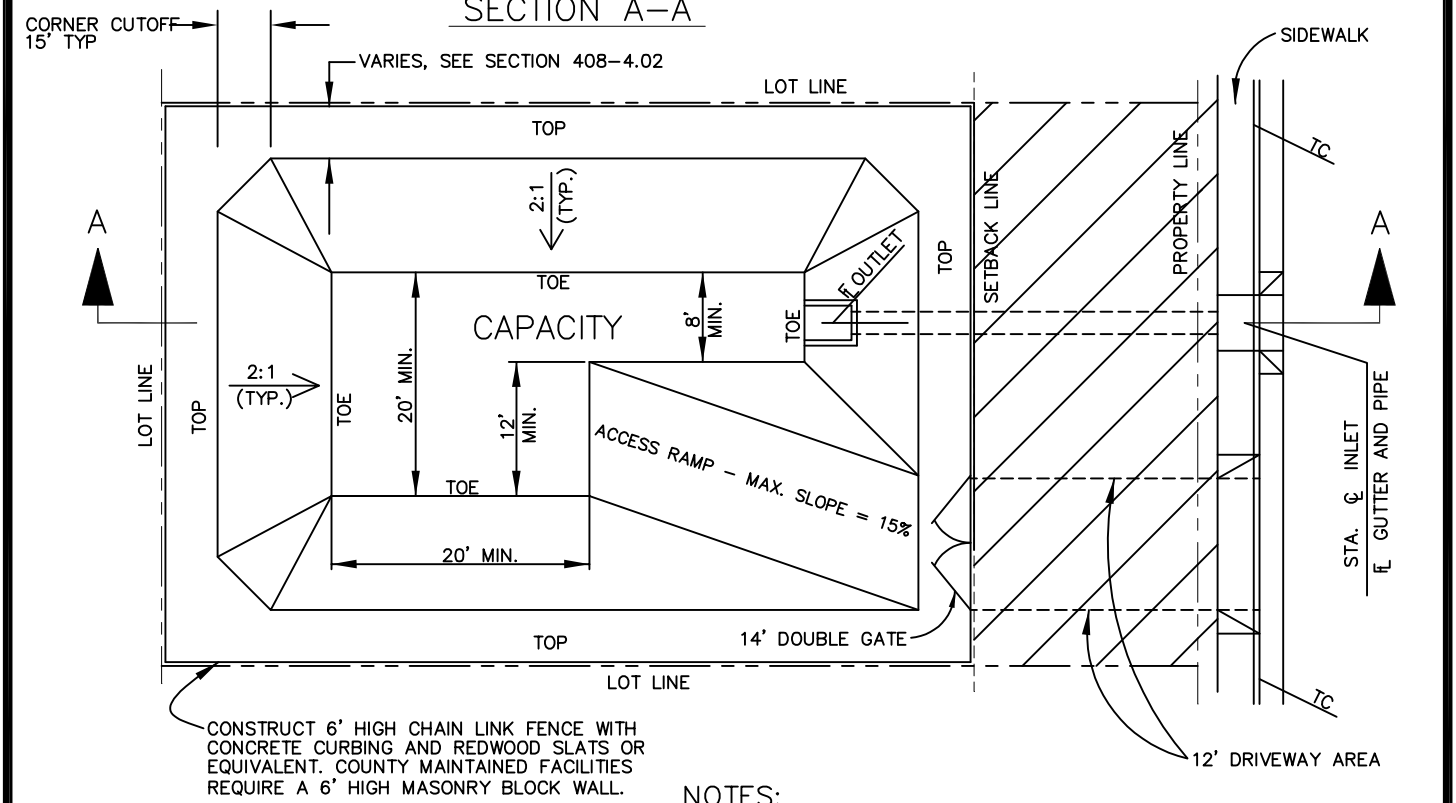
Should an existing natural channel be relocated, the channel shall be designed in accordance with the criteria specified herein for constructed channels.

Sec. 412-5 Use of Natural Facilities

All applicable Federal and State permits and requirements shall be required for any operation that would discharge dredged or fill material in any waters of the United States (normally channels identified with blue lines on the U.S.G.S. maps).



SECTION A–A



SUMP PLAN

LEGEND

TOP – TOP OF CURB
FG – FINISH GRADE
OG – ORIGINAL GROUND

INDICATES 2" A.C. OVER NATIVE SOIL WHICH HAS BEEN TREATED WITH A PERMANENT SOIL STERILANT SUBJECT TO THE APPROVAL OF THE DIRECTOR.

NOTES:

1. MAY EXCEED 8' IF SIDE SLOPES ARE 3:1 OR FLATTER; OR A SLOPE STABILITY ANALYSIS IS PROVIDED.
2. VARIATIONS TO THE DIMENSION MAY BE APPROVED BY THE DIRECTOR.
3. ADDITIONAL REQUIREMENTS MAY BE IMPOSED AS PART OF THE CONDITIONS ISSUED.
4. COMPACT O.G. TO 95% FOR MINIMUM OF SIX (6) INCHES UNDER 2" A.C.
5. WHEN FENCE IS SET ON FRONT R/W LINE SIDEWALK SHALL BE FULL WIDTH.
6. TACK WELD FABRIC AND HARDWARE TO POSTS.
7. TREAT BLOCK WALL WITH ANTI-GRAFFITI PRODUCT SUBJECT TO APPROVAL OF THE DIRECTOR.
8. CONSTRUCT 6" X 18" CONCRETE CURB UNDER GATE W/ TWO (2) #4 REBAR TOP AND BOTTOM.

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS

SUMP DETAILS

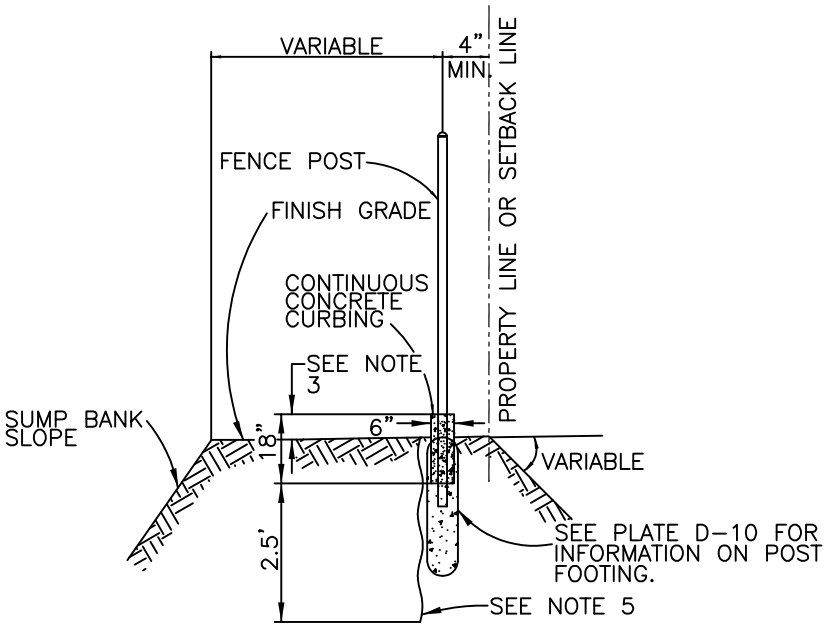
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. D–1

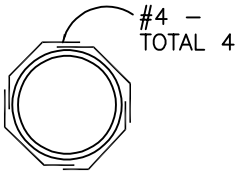
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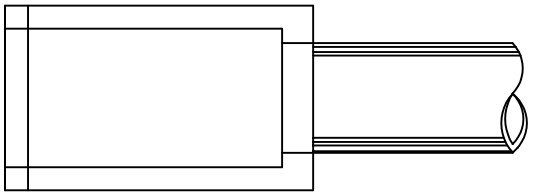
NOTES:

1. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR MINOR CONCRETE (MIN. CEMENT CONTENT 505 LB/CU.YD.) CONCRETE SHALL CONTAIN NO ADDITIVES UNLESS APPROVED PRIOR APPROVAL IS OBTAINED FROM THE COUNTY ENGINEER.
2. CONCRETE SHALL BE TROWELED SMOOTH AND BRUSH FINISHED.
3. VARIES FROM 3" TO 6" ABOVE FINISH GRADE.
4. SUBGRADE PREP. SHALL BE CONSTRUCTED TRUE TO GRADE AND CROSS SECTION WITH COMPACTION AT 90% TO DEPTH OF 6".
5. RODENT BARRIER – 26 GAUGE CORRUGATED GALVANIZED IRON SHEETING, 3' HIGH, WITH 6" MIN. OVERLAP ON ENDS. CONCRETE SHALL BE USED IN LIEU OF RODENT BARRIER AS APPROVED BY THE ENGINEER.

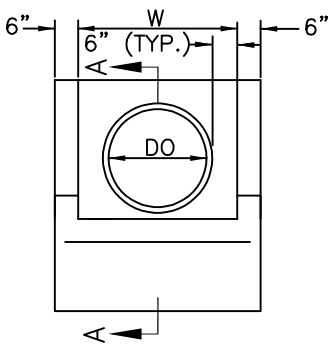
CURBING AND RODENT BARRIER DETAILS



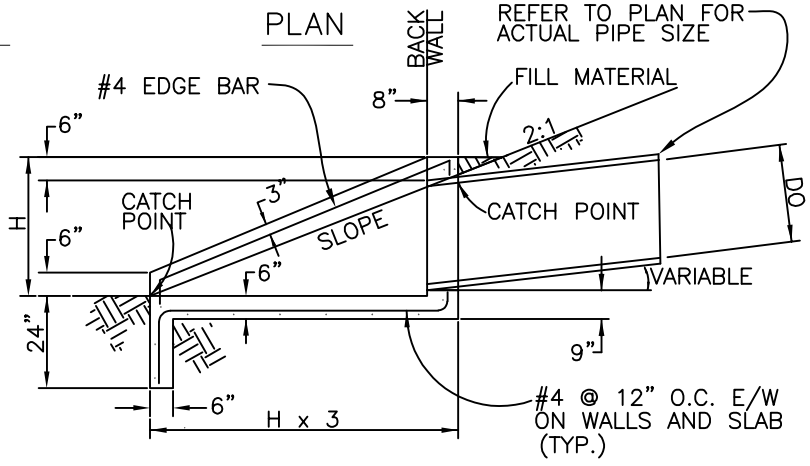
DETAIL "A"



PLAN



FRONT

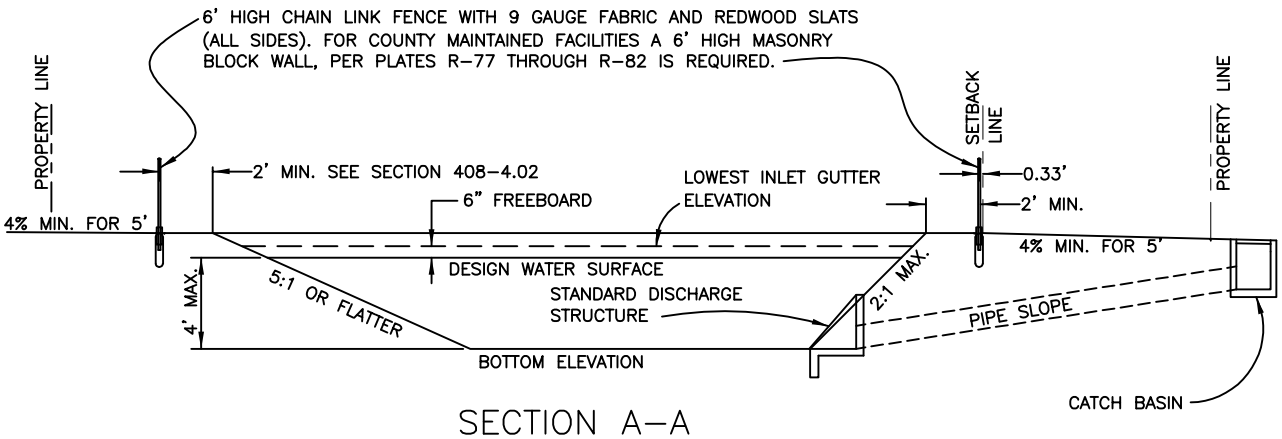


SECTION A–A

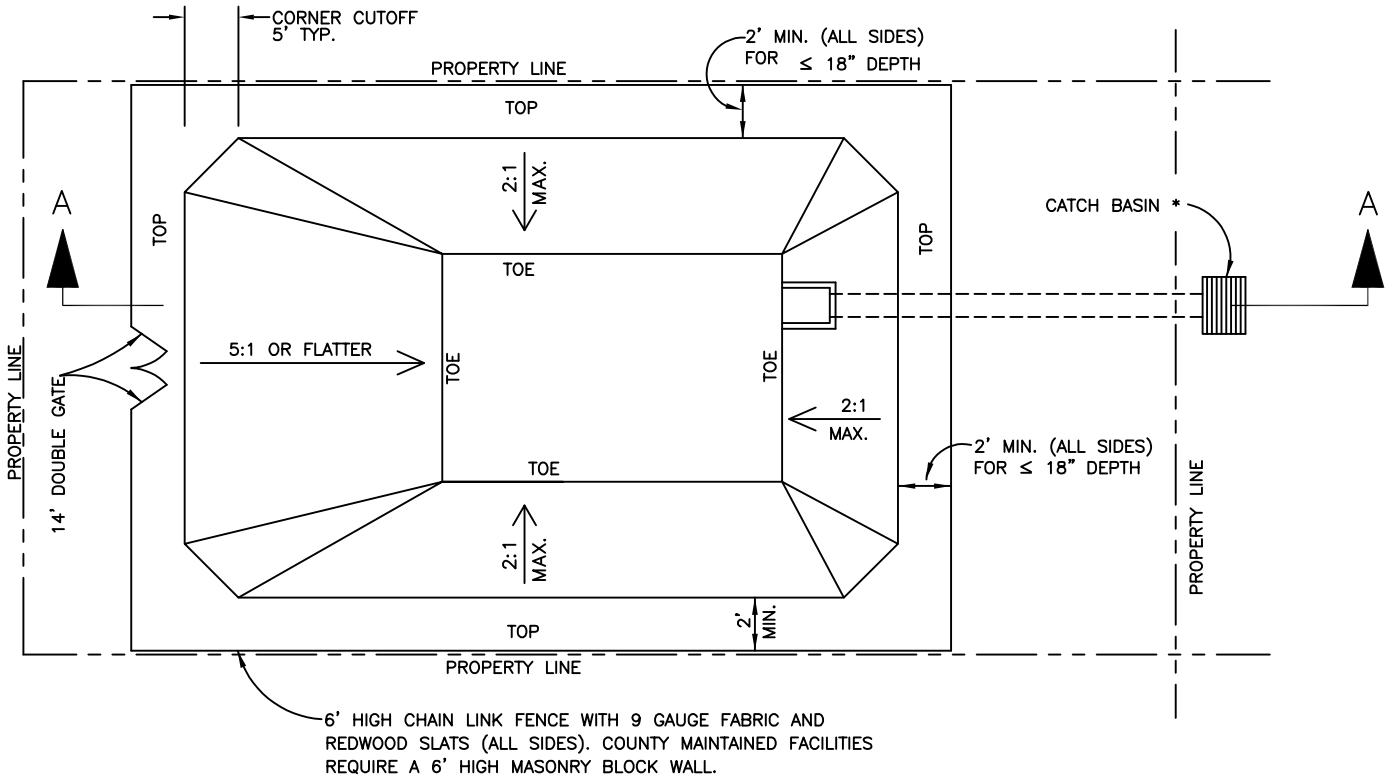
DISCHARGE STRUCTURE

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS	CURBING, RODENT BARRIER, AND DISCHARGE STRUCTURE DETAILS	REVISIONS DATE – DESC	DRAFTED BY: R.R.P.	PLATE NO. D–2
	COUNTY OF KERN STATE OF CALIFORNIA DEVELOPMENT STANDARD		DESIGNED BY: J.R.C.	
			DATE DRAFTED: 09/30/23	
			APPROVED BY: J.R.C.	

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SECTION A-A



SUMP PLAN

* NO CURB AND GUTTER SHOWN

NOTE:

SEE ADDITIONAL NOTES AND REQUIREMENTS FOR CHAIN-LINK FENCES AND MASONRY WALLS ON PLATE D-1

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

SHALLOW SUMP DETAILS

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. D-3

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KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

TYPE "B" MINOR STRUCTURE - JUNCTION BOX

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

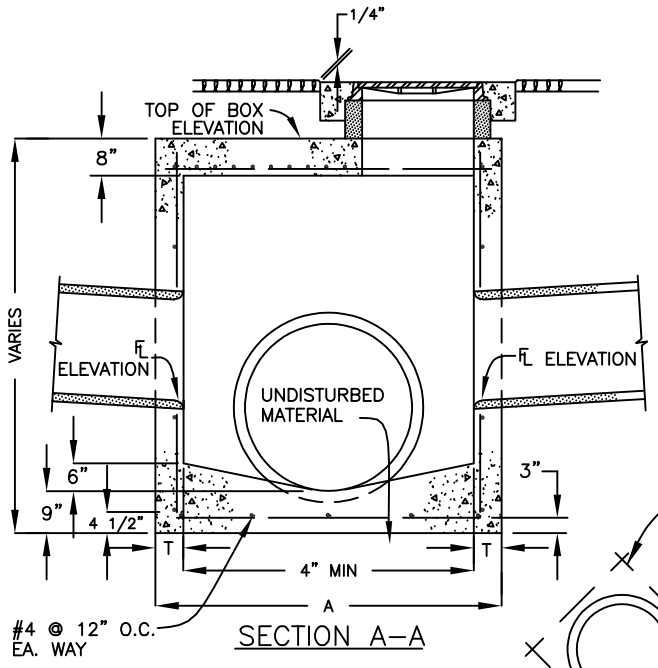
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DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. D-4

NOTES:

1. CONCRETE SHALL CONFORM TO REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR MINOR CONCRETE (MIN. CEMENT CONTENT 590 LB/CU.YD.) CONCRETE SHALL CONTAIN NO ADDITIVES UNLESS APPROVED PRIOR APPROVAL IS OBTAINED FROM THE COUNTY ENGINEER.
2. WALL REINFORCING NOT REQUIRED WHEN H = 8' OR LESS AND THE UNSUPPORTED LENGTH OF ALL WALLS = 7' OR LESS. WALLS EXCEEDING EITHER LIMIT SHALL BE REINFORCED WITH #4 BARS AT 18" CENTERS PLACED 1 1/2" CLEAR TO INSIDE OF BOX UNLESS OTHERWISE SHOWN.
3. GALAVANIZING – SEE STANDARD SPECIFICATIONS OR SPECIAL PROVISIONS.
4. T = 6" WHEN H = 8' OR LESS AND THE UNSUPPORTED LENGTH OF ALL WALLS = 7' OR LESS. WALLS EXCEEDING EITHER LIMIT SHALL HAVE T = 8".
5. LOCATION OF FRAME AND COVER TO BE DETERMINED BY THE ENGINEER.
6. PRECAST ALTERNATIVE IS OPTIONAL. SEE SECTION 51–1.02 OF STANDARD SPECIFICATIONS.

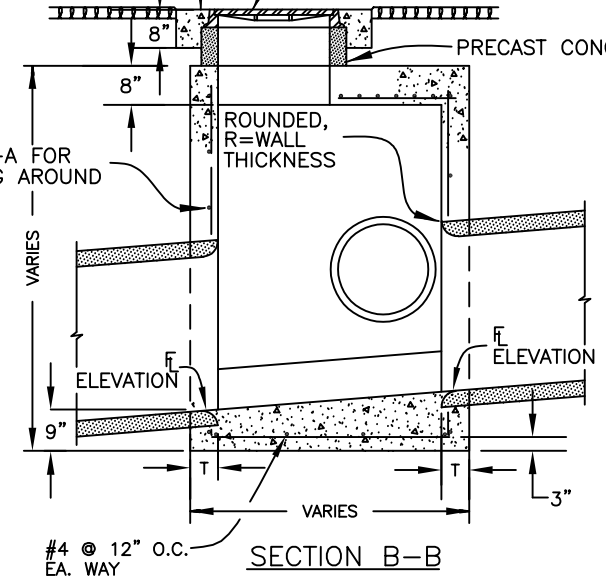


SECTION A–A

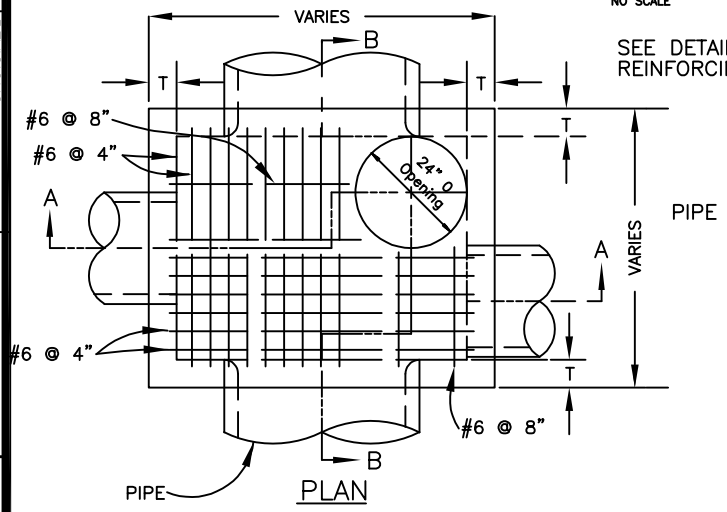
DETAIL A
NO SCALE

TRAFFIC

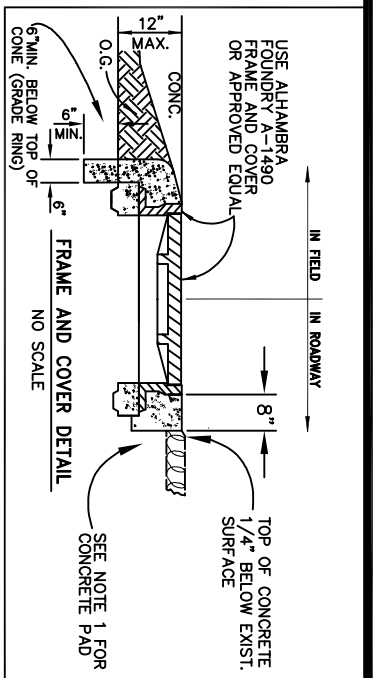
TRAFFIC FRAME AND COVER SET TO GRADE AS DIRECTED BY THE ENGINEER. COVER AND FRAME MACHINED TO FIT. COVER TO HAVE RADIAL BLOCK TREAD, FRAME TO HAVE FLANGE DOWN, APPROXIMATE WEIGHT–315 POUNDS. SEE NOTE #5



SECTION B–B



PLAN



FRAME AND COVER DETAIL
NO SCALE

TYPE "B" MINOR STRUCTURE

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KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

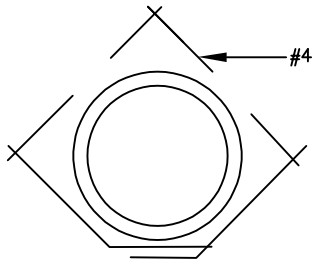
TYPE "C" MINOR STRUCTURE MANHOLE

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

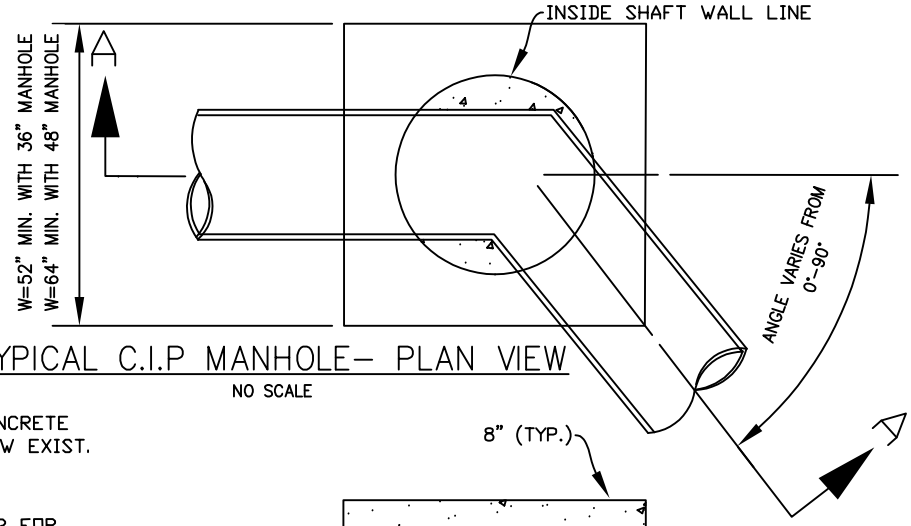
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DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

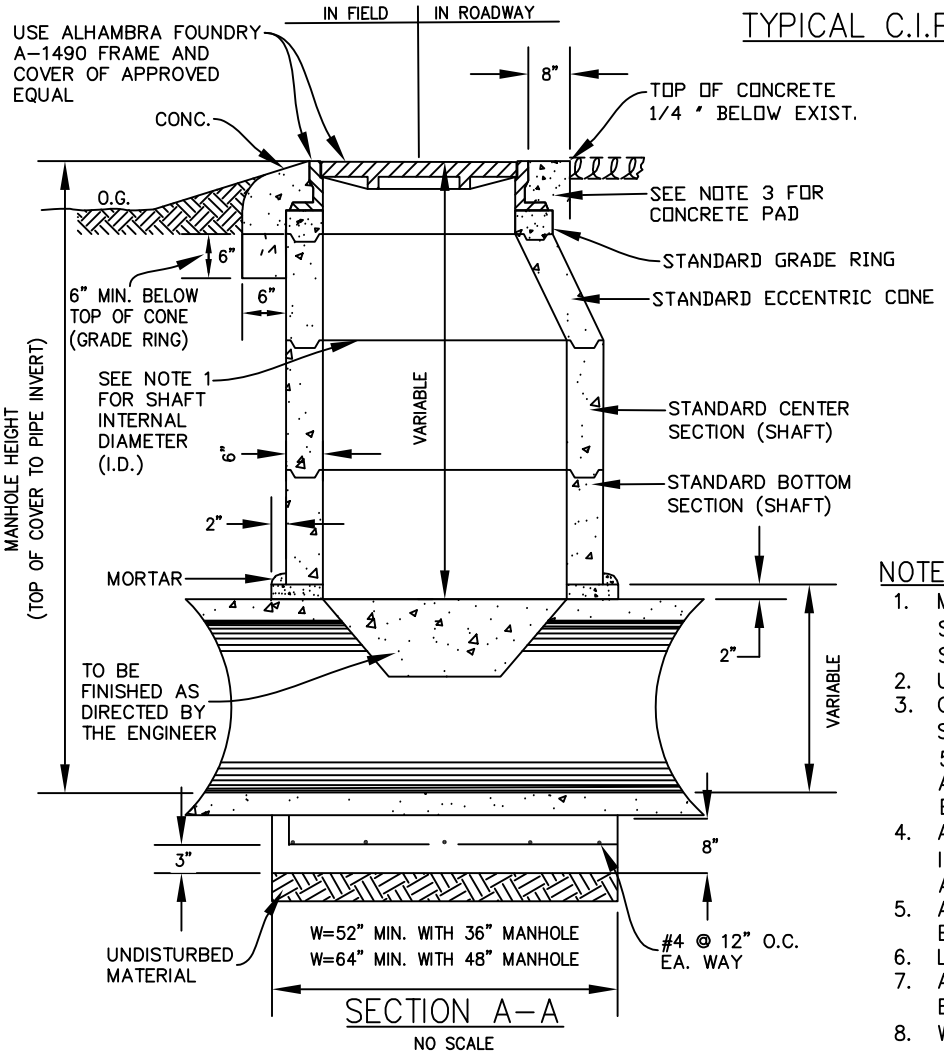
PLATE NO. D-5



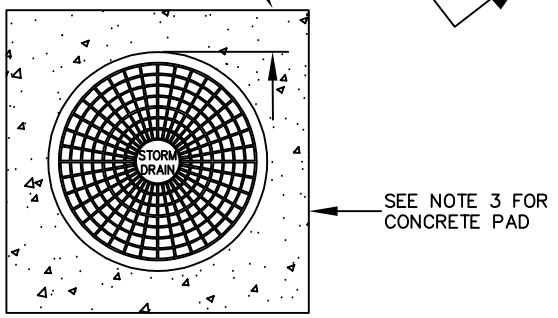
DETAIL A
NO SCALE



TYPICAL C.I.P MANHOLE– PLAN VIEW
NO SCALE



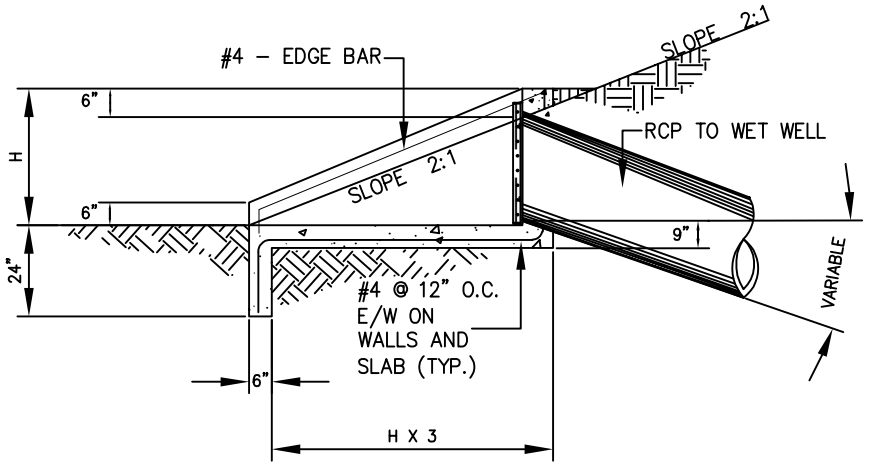
SECTION A–A
NO SCALE



MANHOLE COVER AND CONCRETE PAD
NO SCALE

NOTES:

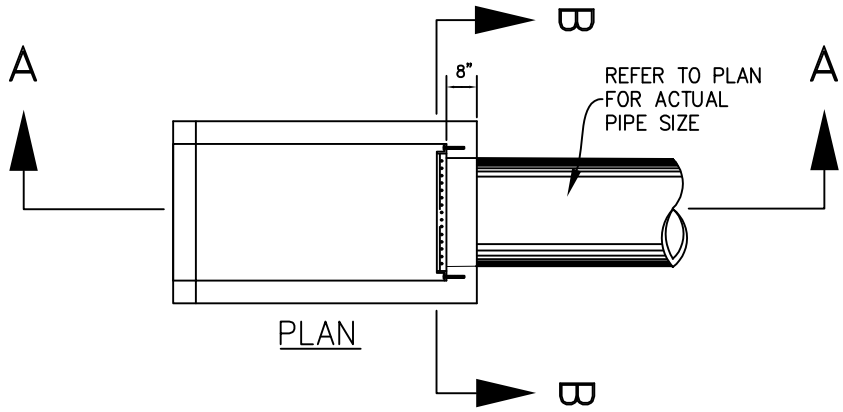
1. MANHOLE CONSTRUCTED ON CONCRETE PIPE OF 36" I.D. OR GREATER SHALL USE 48" SHAFT; CONCRETE PIPE WITH LESS THAN 36" I.D. SHALL USE 36" SHAFT.
2. USE COMBINATION OF CONE AND SHAFT AS DIRECTED BY THE ENGINEER.
3. CONCRETE SHALL CONFORM TO REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR MINOR CONCRETE (MIN. CEMENT CONTENT 590 LB/CU.YD.) CONCRETE SHALL CONTAIN NO ADDITIVES UNLESS APPROVED PRIOR APPROVAL IS OBTAINED FROM THE COUNTY ENGINEER.
4. ALL REINFORCING TO BE NO.4 BARS AT 12" O.C., 1 1/2" CLEAR OF INSIDE FACE UNLESS OTHERWISE NOTED. SEE DETAIL "A" FOR REINFORCING AROUND PIPE.
5. ALL EXPOSED METAL PARTS SHALL BE GALVANIZED AFTER FABRICATION EXCEPT FRAME AND COVER.
6. LOCATION OF FRAME AND COVER TO BE DETERMINED BY T THE ENGINEER.
7. ALL REINFORCEMENT FOR SURFACES IN CONTACT WITH THE GROUND SHALL BE PROTECTED WITH NOT LESS THAN 2" OF CONCRETE.
8. WORDING ON MANHOLE TO READ "STORM DRAIN".



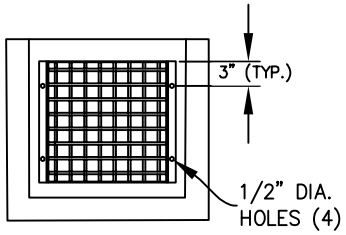
SECTION A–A

NOTE:

1. PIPE DETAIL REFER TO PLATE D–2.



PLAN



SECTION B–B

GRATE NOTES:

1. GRATE FABRICATED OR EQUIVALENT SHELF ITEM–ALL PARTS & PRODUCTS GALVANIZED.
2. FRAME CONSTRUCTED W/ 1/4" X 3/4" X 2" X LENGTH (VARIES TO PIPE SIZE) ANGLE IRON.
3. MIN. FOUR – 3/8" X 3" S.S. RED HEAD ANCHOR BOLTS FLAT LOCK WASHER, 2 EA PER VERTICAL ANGLE 3" FROM TOP & BOTTOM OF FRAME.
4. FOUR – 1/2" DIA. HOLES IN FRAME.
5. GRATE OPENING 1–3/16" X 2" O.C.
6. 1/4" DIA. ROD WELDED TO FRAME ON ALL SIDES.

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PUMP STATION
INLET STRUCTURE

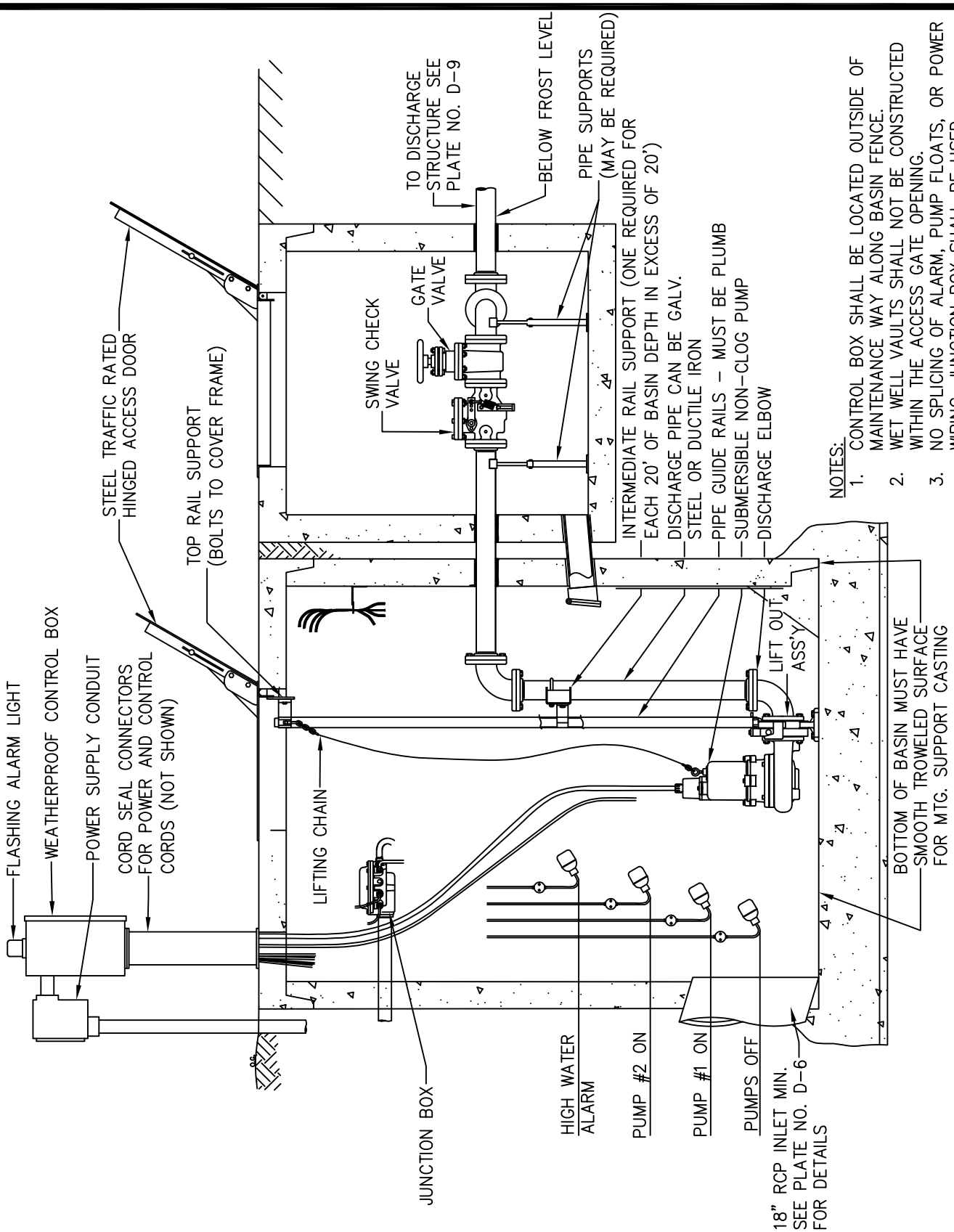
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PLATE NO.
D–6

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DUPLEX PUMP STATION

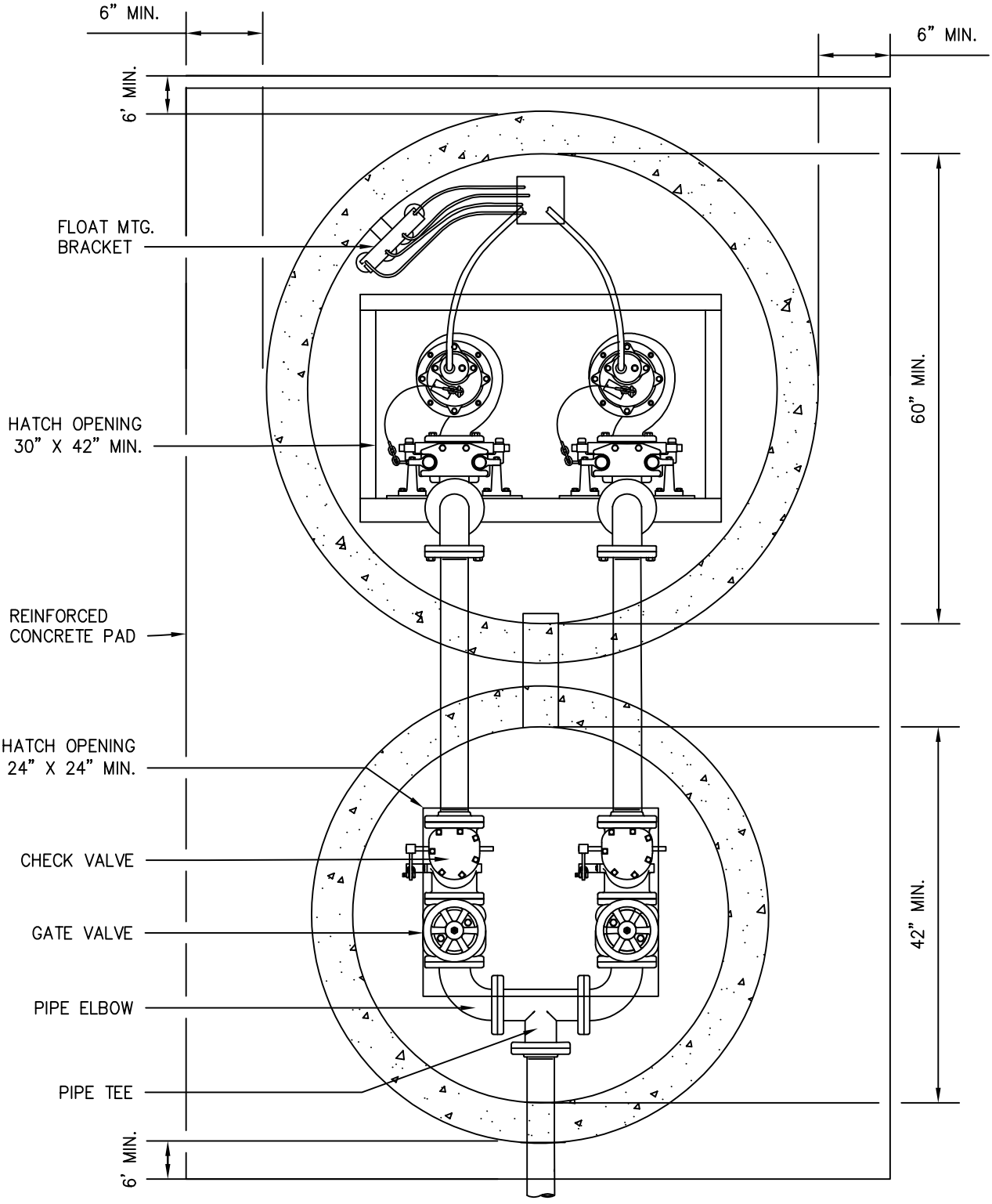
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PLATE NO.
D-7

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*MODIFIED FROM FEMYERS.COM NON-CLOG, 3" DISCHARGE, DUPLEX PUMP INSTALLATION DRAWING ESS-2228B

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PLAN VIEW
DUPLEX PUMPS

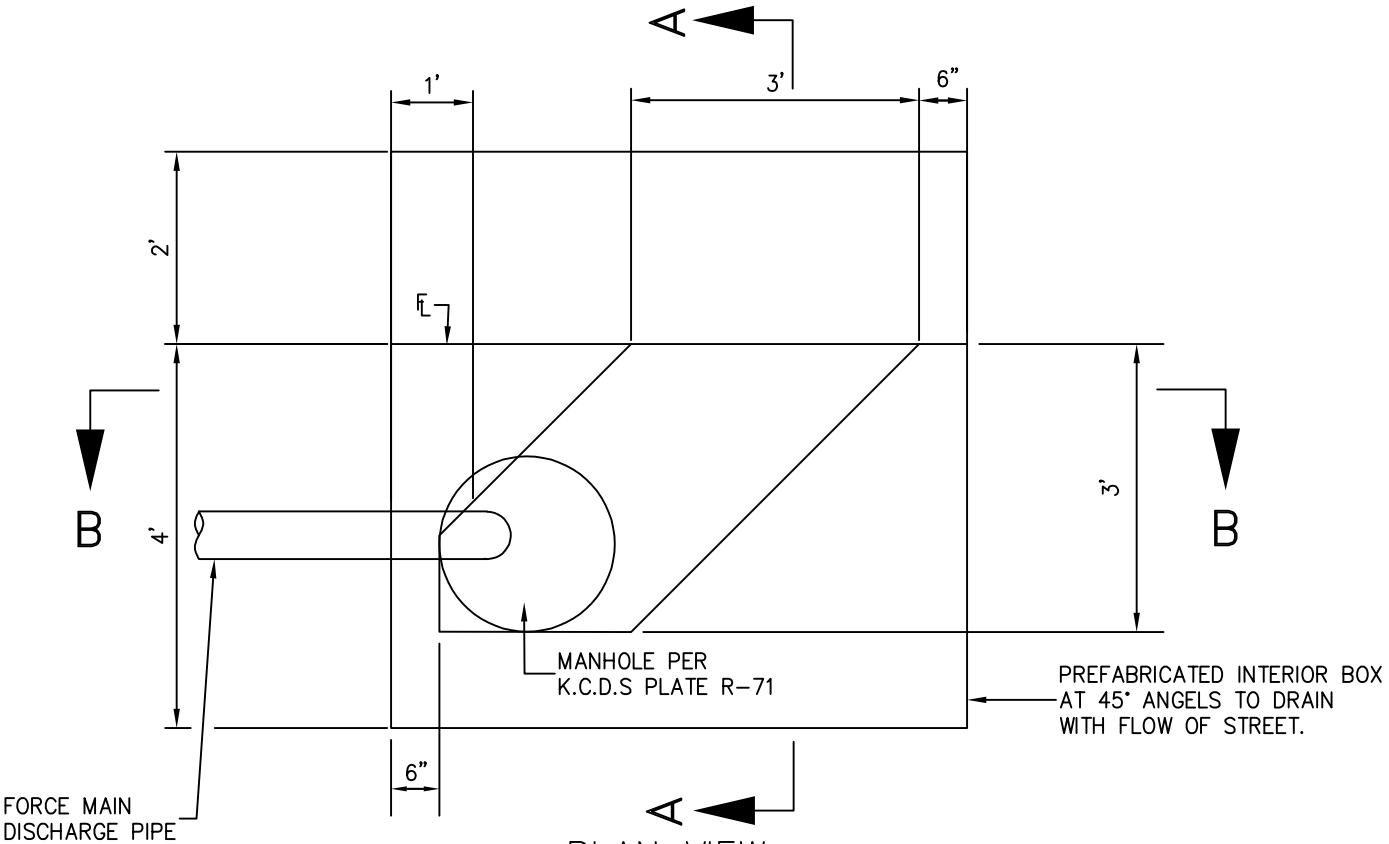
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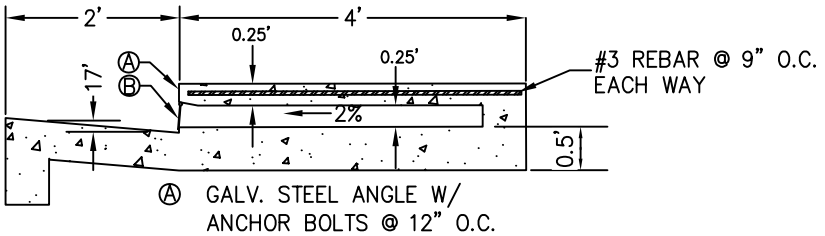
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APPROVED BY: J.R.C.

PLATE NO.
D-8

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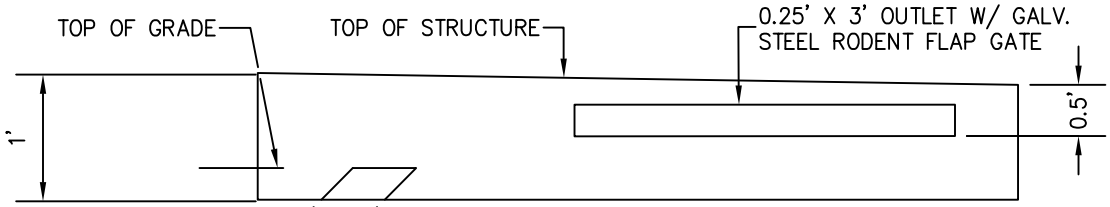
PLAN VIEW



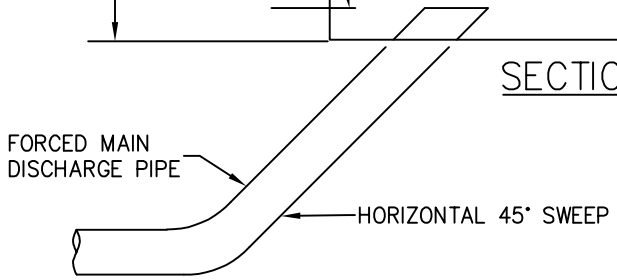
Ⓐ GALV. STEEL ANGLE W/
ANCHOR BOLTS @ 12" O.C.

Ⓑ GALV. STEEL RODENT FLAP
W/ MIN OF 2 HINGES.

SECTION A-A



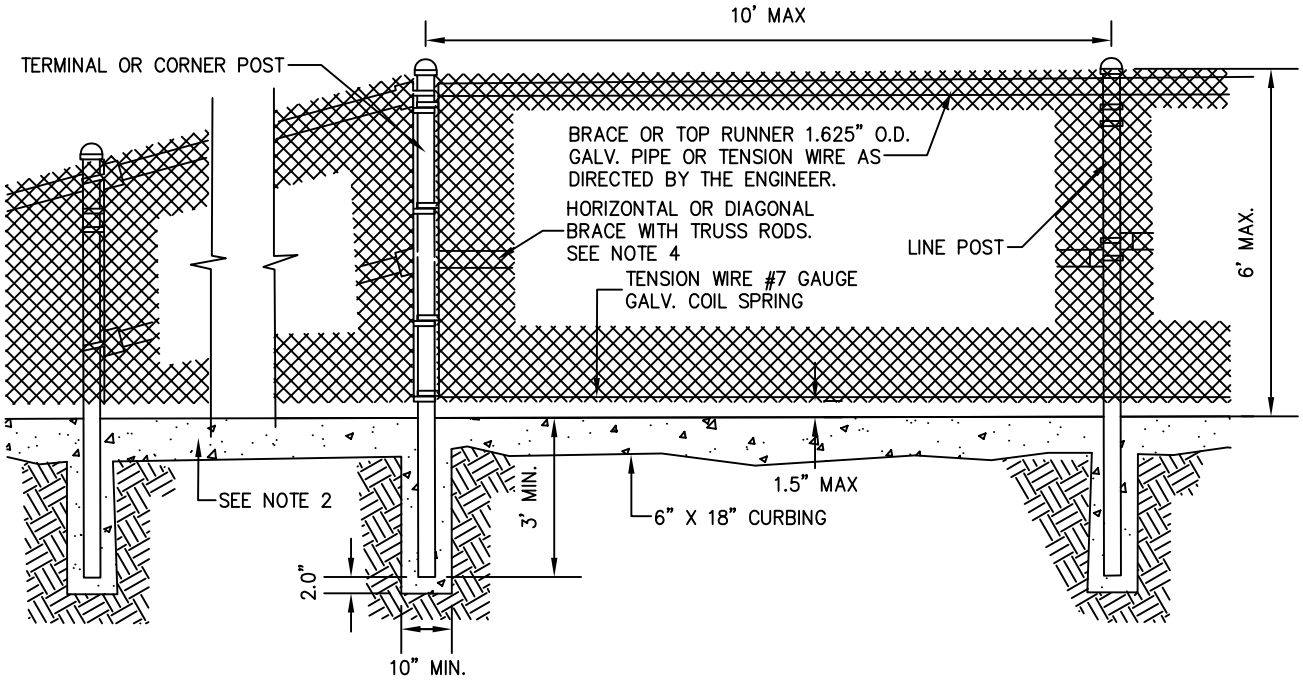
SECTION B-B



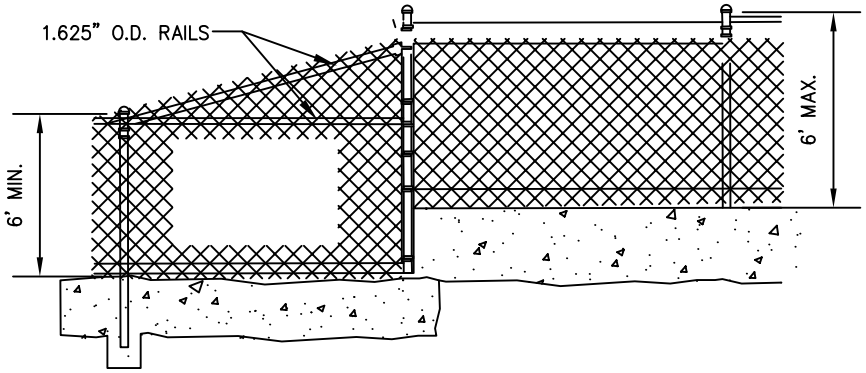
NOTE:
FORCE MAIN DISCHARGE PIPE MUST BE
AWWA C-900 CLASS 165 OR EQUIVALENT

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			APPROVED BY: J.R.C.
			PLATE NO. D-9

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TYPICAL CHAIN LINK FENCE DETAIL



TYPICAL DETAIL AT
CULVERT ENDWALLS

FENCING SPECIFICATIONS:

1. FENCING FABRIC SHALL BE 9 GUAGE, 2" MESH, AFTER WEAVING, KNUCKLED TOP AND BOTTOM. 6" HIGH GALV.
2. CORNER POSTS SHALL BE 2-7/8" O.D. GALV. PIPE.
3. LINE POST 2-3/8" O.D. GALV. PIPE.
4. PRIVACY SLATS SHALL BE 2-3/16" X 1/4".

NOTES:

1. INSTALLATION OF FENCING AND GATES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF "STANDARD SPECIFICATION, STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION," APPROVED CURRENT EDITION.
2. CONCRETE CURBING SHALL BE CONSTRUCTED UNDER ALL FENCES. CURBING SHALL BE 6" X 18", MINOR CONCRETE. CONCRETE SHALL CONFORM TO REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR MINOR CONCRETE (MIN. CEMENT CONTENT 505 LB/CU.YD.) CONCRETE SHALL CONTAIN NO ADDITIVES UNLESS APPROVED PRIOR APPROVAL IS OBTAINED FROM THE COUNTY ENGINEER.
3. CORNER POST SHALL BE INSTALLED AT ALL ANGLES IN FENCE LINE IN EXCESS OF 10".
4. END, CORNER, AND GATE POSTS SHALL BE BRACED TO THE NEAREST LINE POST WITH GALV. DIAGONAL OR HORIZONTAL BRACES USED AS COMPRESSION MEMBERS AND GALV. 0.375" STEEL TRUSS RODS WITH TURNBUCKLES OR TRUSS TIGHTERNER USED AS TENSION MEMBERS.
5. FABRIC SHALL BE FASTENED TO GATE POST, TERMINAL POST, OR CORNER POST WITH 3" X 3/4" STRETCHER BAR BONDS AT 8" ON CENTER.
6. FABRIC SHALL BE FASTENED TO LINE POST, LAST RUNNER, AND BOTTOM TENSION WIRES WITH FABRIC BONDS SPACED APPROX. 14" APART.
7. FABRIC SHALL CONFORM TO ASTM A-392, CLASS 1.
8. SUBGRADE PREPARATION SHALL BE CONSTRUCTED TRUE TO GRADE AND CROSS SECTION WITH COMPACTION OF 85% TO A DEPTH OF 0.5".
9. WHEN REDWOOD SUBURBAN SCREEN, OR EQUIVALENT IS REQUIRED IT SHALL BE CONSTRUCTED SO THAT THE SLATS ARE LOCKED INTO POSITION AND CAN ONLY BE REMOVED WITH TOOLS.
10. FENCE FABRIC IS TO BE TACK WELDED TO POSTS IN THREE PLACES (TOP, CENTER, AND BOTTOM). FENCE HARDWARE IS TO BE TACK WELDED AND GROUND SMOOTH. ALL EXPOSED METAL PARTS ARE TO BE GALV. PRIOR TO INSTALLATION.

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CHAIN LINK FENCING SPECIFICATIONS

COUNTY OF KERN
STATE OF CALIFORNIA
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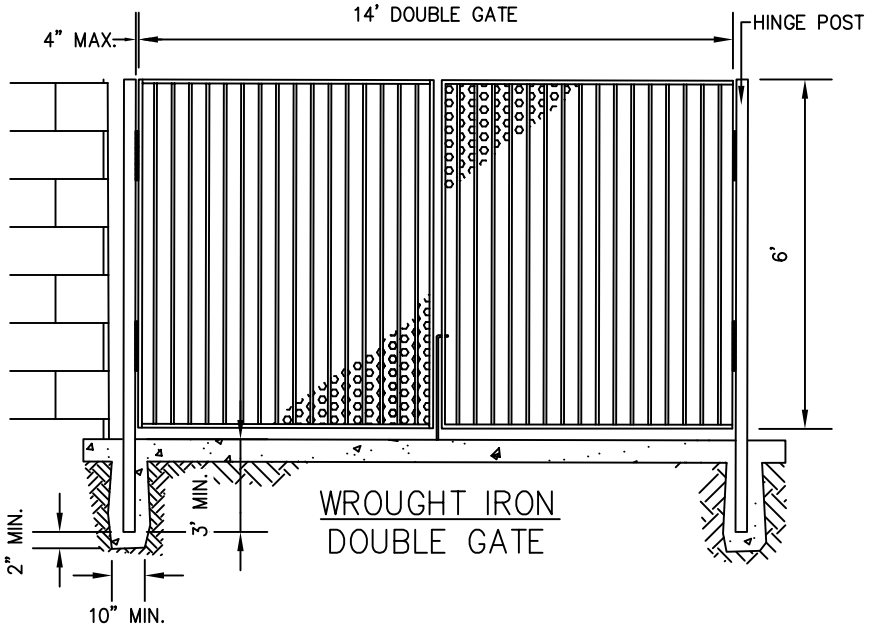
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO.
D-10

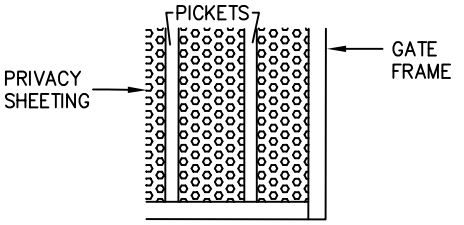
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WROUGHT IRON GATE SPECS:

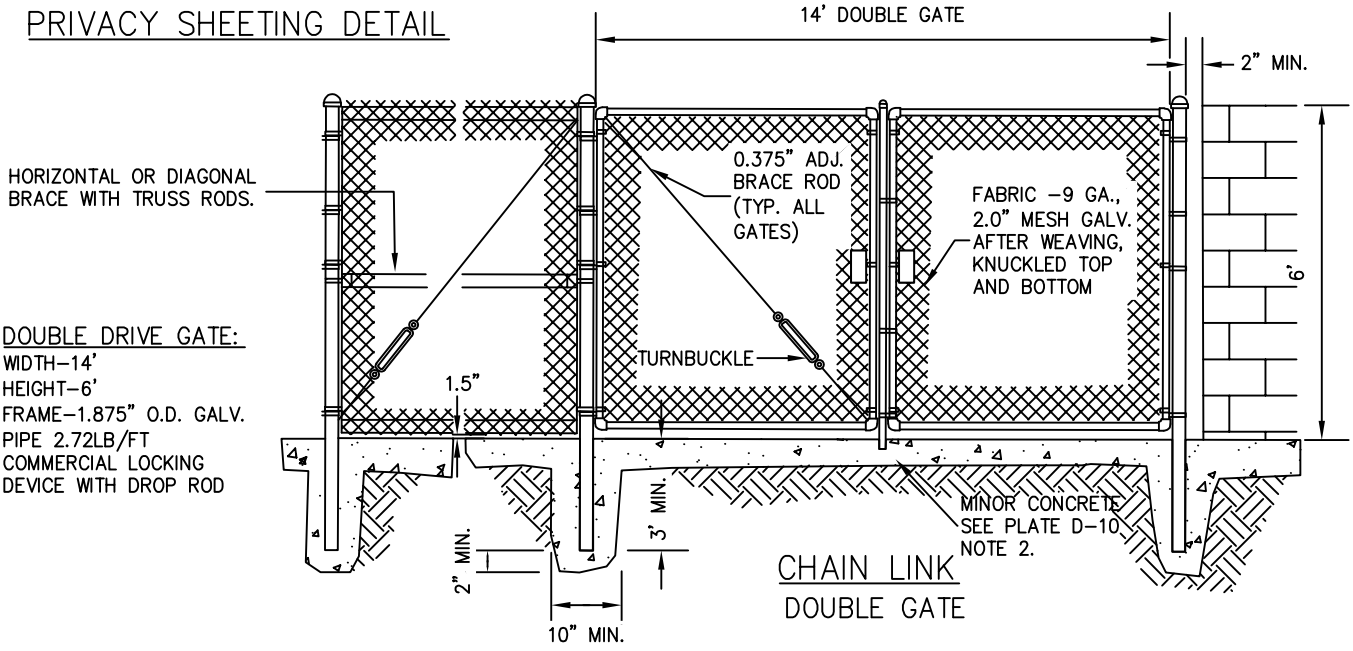
1. HINGE POST SHALL BE A MIN. OF 4X4X3/16" SQ TUBING.
2. GATE FRAME SHALL BE A MIN. 1–1/2" SQ. TUBING.
3. PICKETS SHALL BE A MIN. 3/4" SQ. TUBING WITH 4" MAX. CLEAR DIMENSION.
4. PRIVACY SHEETING SHALL BE PERFORATED SHEET METAL, 24 GAUGE, 1/16" DIM HOLE, 1/8" STAGGERED CENTER.
5. GATE SHALL BE A 14' DOUBLE GATE.
6. GATE LATCH SHALL HAVE COMMERCIAL GRADE LOCKING DEVICE WITH 3/8" PADLOCK SHANK OR A LOCKING DEVICE THAT CAN BE KEYED TO THE STANDARD PUBLIC WORKS KEY–CORE.
7. HINGES SHALL BE COMMERCIAL GRADE AND SIZED APPROPRIATELY FOR THE WEIGHT OF THE GATE AND PRIVACY SHEETING.



WROUGHT IRON
DOUBLE GATE



PRIVACY SHEETING DETAIL



DOUBLE DRIVE GATE:
WIDTH–14'
HEIGHT–6'
FRAME–1.875" O.D. GALV. PIPE 2.72LB/FT
COMMERCIAL LOCKING DEVICE WITH DROP ROD

CHAIN LINK
DOUBLE GATE

NOTES:

1. CURBING AS SPECIFIED BY COUNTY OF KERN DEVELOPMENT STANDARDS, PLATES D–2 AND D–10.
2. END, CORNER, AND GATE POSTS SHALL BE BRACED TO THE NEAREST LINE POST WITH GALV. DIAGONAL OR HORIZONTAL BRACES USED AS COMPRESSION MEMBERS AND GALV. 0.375" STEEL TRUSS RODS WITH TURNBUCKLES OR TRUSS TIGHTENERS USED AS TENSION MEMBERS.
3. WHEN REDWOOD SUBURBAN SCREEN, OR EQUIVALENT, IS REQUIRED IT SHALL BE CONSTRUCTED SO THAT THE SLATS ARE LOCKED INTO POSITION AND CAN ONLY BE REMOVED WITH TOOLS.
4. FRAMES SHALL BE MADE WITH FITTINGS OR WELDS GROUND SMOOTH, AND GALVANIZED.
5. CHAIN LINK FENCE FABRIC SHALL CONFORM TO ASTM: A–392, CLASS 1, AND BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 80–4 OF THE "STANDARD SPECIFICATIONS, STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION," APPROVED CURRENT EDITION.
6. NO THUMB LATCHES.
7. THE POST AND HINGE GAUGE MUST BE APPROPRIATE FOR THE WEIGHT OF THE GATES AND PRIVACY SHEETING.

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DOUBLE GATE SPECIFICATIONS

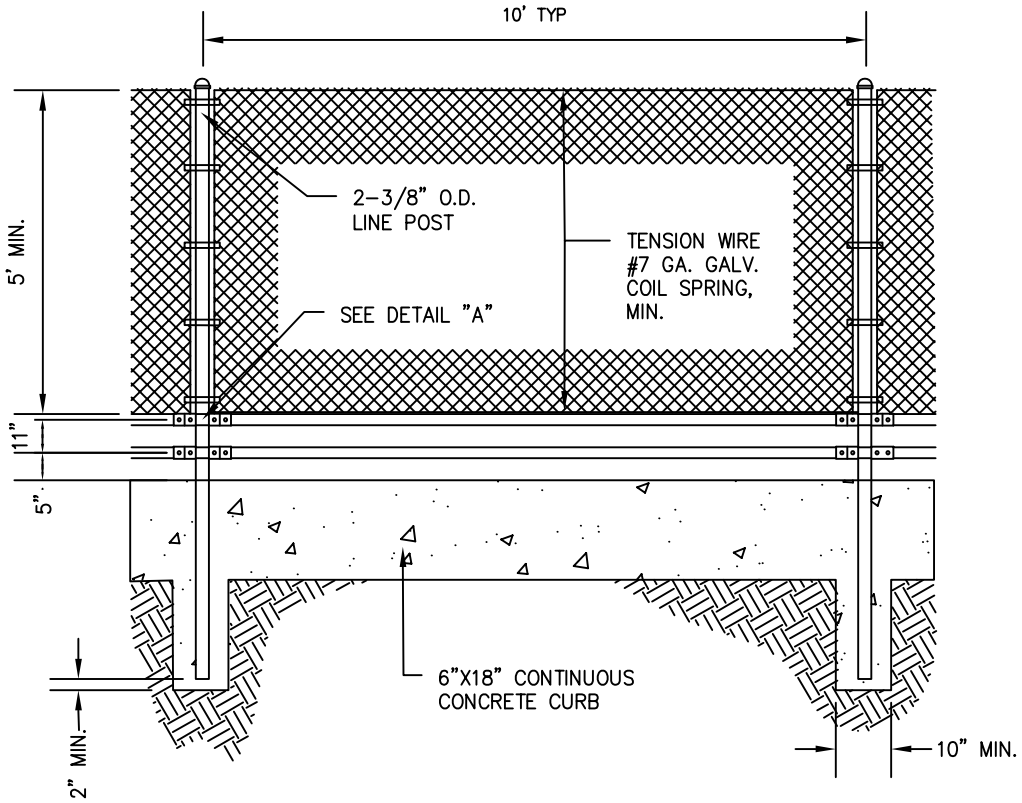
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DEVELOPMENT STANDARD

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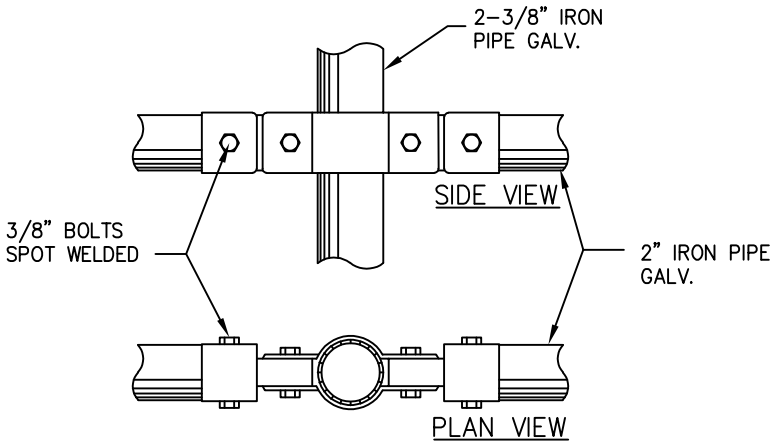
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DATE DRAFTED: 09/30/23
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PLATE NO.
D–11

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TRANSVERSE PROTECTION BAR



DETAIL "A"

NOTES:

1. CONCRETE SHALL CONFORM TO REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR MINOR CONCRETE (MIN. CEMENT CONTENT 505 LB/CU.YD.) CONCRETE SHALL CONTAIN NO ADDITIVES UNLESS APPROVED PRIOR APPROVAL IS OBTAINED FROM THE COUNTY ENGINEER.
2. SEE PLATE D-10 FOR ADDITIONAL FENCE DETAILS.
3. ALL EXPOSED METAL PARTS ARE TO BE GALVANIZED PRIOR TO INSTALLATION.
4. HARDWARE IS TO BE TACK WELDED AND GROUND SMOOTH AND GALVANIZED. SEE PLATE D-2 FOR RODENT BARRIER DETAILS.

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FLOOD ZONE FENCING SPECIFICATIONS

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PLATE NO.
D-12

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DIVISION FIVE

STANDARDS FOR LANDSCAPING

CHAPTER I. GENERAL

Sec. 501-1 Purpose and Scope

This division establishes the minimum standards of design, materials, plants, and methods to be used in providing landscaping for developments in Kern County. Landscaping required by development or within a County right-of-way shall be maintained by an entity approved by the Director. A County Service Area (CSA) or Park District are examples of acceptable maintenance entities. All landscaping installed in County right-of-way shall require an encroachment permit from the Public Works Department.

Sec. 501-2 Procedures

The following procedures shall be used when landscaping is to be provided:

501-2.01 Maintenance entity/CSA shall be formed prior to approval of landscape plans.

501-2.02 Landscape plans shall be submitted to the Public Works Department for review and final approval. All Landscape plans and specifications shall be designed in compliance with Assembly Bill No. 1881 (Government Code Section 6551), The California Code of Regulations – Title 23 Waters – Division 2 – Department of Water Resources – Chapter 2.7 – Model Water Efficient Landscape Ordinance (MWELO) and State and/or local regulations and ordinances relating to water conservation. Landscape plans shall be approved by the Director of Public Works and the maintenance entity.

501-2.03

a. Landscape Plans shall identify and label all hydrozones, recreational areas, pervious & non-pervious hardscapes, permanent best management practices, graywater discharge systems and any areas irrigated with recycled water. Landscape Plans must include a Water Efficient Landscape Worksheet which contains two sections (see sample worksheet in Appendix ‘B’):
    1. A Hydrozone Information Table (see Appendix ‘B’, Section ‘A’) for the landscape project; and

    2. A Water Budget Calculation (see Appendix ‘B’, Section ‘B’) for the landscape project. For the calculation of the Maximum Applied Water Allowance and Estimated Total Water Use, a project

applicant shall use the ETO values from the Reference Evapotranspiration Table in Appendix 'A' for geographic areas not covered in Appendix 'A', use data from other cities located nearby in the same reference evapotranspiration zone, as found in the CIMIS Reference Evapotranspiration Zones Map, Department of Water Resources, 1999.

b. Water budget calculation shall adhere to the following requirements:

1. The plant factor used shall be from the "Water Use Classification of Landscape Species' website (WUCOLS). The plant factor ranges from 0 to 0.1 for very low water use plants, 0.2 to 0.3 for low water use plants, from 0.4 to 0.6 for moderate water use plants and from 0.7 to 1.0 for high water use plants.

2. All water features shall be included in the high-water use hydrozone and temporarily irrigated areas shall be included in the low water use hydrozone.

3. All Special Landscape Areas shall be identified and their water use calculated as described below.

4. Evapotranspiration Adjustment Factor (ETAF) is based on the plant factors and irrigation methods selected. ETAF shall not exceed 0.45 exclusive of Special Landscape Areas. ETAF for Special Landscape Areas shall not exceed 1.0.

5. Estimated Total Water Use (ETWU) is calculated based on the plants used, irrigation method selected, Conversion Factor and Eto. The total ETWU must be less than the calculated total MAWA.

c. Maximum Applied Water Allowance (MAWA);

The Maximum Applied Water Allowance shall be calculate using the equation:

$$MAWA = (ETo)(0.62)[(0.45 \times LA) + (0.55 \times SLA)]$$

Where:
MAWA – Maximum Applied Water Allowance (gallons per year)
ETo = Reference Evapotranspiration (inches per year)
0.62 – Conversion Factor (to gallons)
0.45 – ETAF Adjustment Factor (to gallons)
LA – Landscape Area (square feet)
0.55 – Additional Water Allowance for SLA (1-ETAF)
SLA – Special Landscape Area (square feet)

501-2.04 Provisions from Division One, Standards for Streets, Chapter VI shall be met.

501-2.05 The plans shall clearly show the location of all valves, meters, backflow preventers, controllers, sprinkler heads, points of connection to the water system and other such equipment. These exact locations shall be indicated on the "As-Built Record Drawings" to allow easy location. The As-Built Record Drawings shall be prepared by the Landscape engineer/architect.

The plans shall clearly show existing and proposed streetlights, utility poles, utility vaults and fire hydrants.

501-2.06 The plans shall be prepared on mylar or similar material on sheets sized to 24 inches X 36 inches.

Title sheet shall identify the development, contain a vicinity map, a key map (scale 1 inch = 200 feet), signature blocks for the Landscape Architect and the Kern County Public Works Director.

The balance of the drawings shall be drawn at a scale not less than 1 inch = 20 feet.

Where shrubs or trees are to be planted, the sight distance lines,per Plate No. T-7 shall be overlaid on the plans to show that the plants and other improvements do not interfere with clear zones. See Division One, Chapter VIII, Section 108-1 Landscaping, for sight distance requirements.

CHAPTER II. IRRIGATION SYSTEM

Sec. 502-1 General Design Notes

502-1.01 All electrical wiring, controls, and devices shall be U.L. listed, and so labeled. Other approval organizations will be subject to review and approval prior to installation.

502-1.02 The landscape system shall be designed to properly function from service pressure without the use of pumps.

502-1.03 Sprinkler heads shall be selected to limit the amount of overspray on walls, sidewalks, or pavement.

502-1.04 All sprinklers and quick coupling valves shall be installed using double swing joints.

502.105 A master irrigation plan shall be submitted for phased development.

502.106 Irrigation system shall be designed to minimize the number of meters and backflow devices.

Sec. 502-2 As-Built Drawings

502-2.01 Provide a complete "As-Built" record set of prints which shall be corrected daily and show every change from the original drawings and the exact "As-Built" locations, sizes, and kinds of equipment. The "As-Built" prints shall be a set of cronar or similar mylar material. All work shall be in waterproof, red ink and applied to the mylar by a technical pen made expressly for use on mylar material in a neat and complete legible manner.

502-2.02 The As-Builts shall be dimensioned from two permanent points of reference, i.e., building corners, sidewalks, or road intersections, etc., and accurately show the location of the following items:

a. Connection to existing water lines.

b. Connection to existing electrical power and irrigation controller.

c. Gate valves, remote control valves, quick couplings and related equipment.

d. Routing and/or directional turns of sprinkler pressure lines and control wiring (dimension max. 100 feet along routing).

Sec. 502-3 Controller Charts

Provide three controller charts for each controller supplied, one is to be attached in the controller and the other turned over to the County in the Operation and Maintenance Manuals. Chart attached to controller shall be laminated to prevent weather damage.

The chart shall indicate the area controlled by the automatic controller and shall be the maximum size which the controller door will allow.

Sec. 502-4 Operation and Maintenance Manuals

Prepare and deliver prior to completion of construction, two (2) hard cover three (3) ring binders containing the following information:

502-4.01 Index sheet stating landscape Contractor's address and telephone number, list of equipment with contacts for manufacturer's representative.

502-4.02 Catalog and part sheets on all material and equipment installed.

502-4.03 Complete operating and maintenance instructions on all major equipment.

CHAPTER III. MATERIALS

Sec. 503-1 PVC Pipe and Fittings

503-1.01 Pressure Main Line Piping and Fittings: Sizes two and one half (2-1/2) inches or larger shall be P.V.C. Class 200 Ring Tite or approved equal.

503-1.02 Pressure Main Line Piping and Fittings: Sizes two (2) inches and smaller shall be Schedule 40 P.V.C.

503-1.03 Non-pressure laterals shall be minimum thickness Schedule 40 P.V.C.

503-1.04 P.V.C. nipples shall be Schedule 80 with molded threads.

503-1.05 All pipe and fittings shall conform to specific requirements as follows:

a. P.V.C. Pipe: Manufactured from virgin polyvinyl chloride compound in accordance with ASTM D1784 or ASTM D2241, Cell classification 12454B.

b. P.V.C. Fittings (solvent weld or thread): Standard weight, schedule 40, side gated, injection molded P.V.C. complying with ASTM D1784, cell classification 13454B, including threads when required.

Sec. 503-2 Electrical (Low Voltage)

503-2.01 Wiring sizing shall be a minimum of #14 direct burial AWG-UF, 600-volt wire, insulation thickness 3/64 inch, utilizing low density high molecular weight polyethylene insulation. Wiring shall be color coded with the common wire to be white and all others in different colors. An extra wire for every six (6) stations shall be looped in each valve box and housed in a box.

503-2.02 Splices, where necessary or permitted, shall be waterproofed using connectors which are UL 486D compliant.

503-2.03 All wiring placed under concrete or pavement shall be placed in a sleeve with pull boxes at each end.

Sec. 503-3 Gate Valves

503-3.01 Gate valves three (3) inches and smaller: ASTM B62 brass body, 150-pound saturated steam rated; with screwed joints; non-rising stem; screwed bonnet, solid disc. Provide with handwheel.

503-3.02 All gate valves shall be installed with schedule 80 unions to allow easy removal and placed in an approved valve box.

Sec. 503-4 Backflow Prevention Units

503-4.01 Backflow preventer shall be designed to operate on a "reduced pressure" principle; equipped with gate valves, “Wye” strainers of 125# class brass with 40 mesh monel screen and field test cocks acceptable to the water purveyor and the Environmental Health Services Department.

503-4.02 Prior to acceptance, the backflow prevention unit must be tested, and the test results submitted to, and approved by, the Environmental Health Services Department.

The backflow preventer shall be protected by a water protection unit mounted to the concrete slab and shall have adequate insulation blanket attached to the unit.

Sec. 503-5 Automatic Controller

Automatic controllers shall be the fully automatic operation type capable of independently operating the number of stations indicated.

503-5.01 Wall mount type in a housing with locking hinged cover.

503-5.02 Fuse and chassis ground all controller components.

503-5.03 The controller shall be mounted inside a stainless steel, vandal-resistant and weather-resistant enclosure. The enclosure shall include a predrilled backboard with 117-volt duplex outlet. Metal conduit shall run from the 117-volt supply to the controller housing. All power within the housing shall be properly phased.

503-5.04 Controller must be UL approved. Each valve shall be controlled by a separate station.

503-5.05 The electric meter may be installed in the above cabinet or a separate, approved vandal-resistant enclosure.

Sec. 503-6 Remote Control Valves

503-6.01 Valve type shall be spring-loaded, packless diaphragm activated, normally closed type with plastic body, equipped with adjustable flow control.

503-6.02 Valve solenoid shall be 24-volt A.C. 45-watt maximum, 500 milli-amp maximum surge, corrosion-proof, stainless steel construction, epoxy encapsulated to form a single integral unit.

503-6.03 Provide bleeder valve to permit operation in the field without power at the controller.

503-6.04 All valves shall be installed with Schedule 80 unions to provide for easy maintenance.

503-6.05 Identification tags shall be attached to each remote-control valve, showing the number that corresponds with the controller sequence. Tags shall have the station number displayed with one-half (1/2) inch letters.

Sec. 503-7 Small Lawn Sprinkler Heads

Heads shall have screw adjustments.

Nozzles shall rise a minimum of six (6) inches.

Sec. 503-8 Rotary Sprinkler Heads

Rotary sprinkler heads shall be gear driven with minimum six (6) inch pop-up sprinkler heads.

Part circle heads shall have variable arc setting capability.

Sec. 503-9 Quick Coupling Valves

503-9.01 Type: Heavy-duty, brass construction, with stainless steel internal valve spring, using a three-fourths (3/4) inch valve key, and shall have a locking rubber cover.

503-9.02 Quick Coupling Valves shall be spaced no more than 100 feet apart or 50 feet from either end of landscape sections.

503-9.03 All Quick Coupling Valves shall be installed in approved round valve boxes.

Sec. 503-10 Small Shrubbery Sprinkler Heads

12-inch minimum pop-up type body shall be used. Heads shall be fully adjustable.

Sec. 503-11 Valve Boxes

503-11.01 Valve boxes shall be fabricated from a durable plastic material with UV inhibitors, resistant to weather, sunlight and chemical action of soils.

503-11.02 Gate valve boxes shall be round plastic boxes with an overlapping, lockable lid.

503-11.03 Remote control valve boxes shall be rectangular plastic boxes with an overlapping, lockable lid.

Sec. 503-12 Installation - General

503-12.01 All plastic pipe and fittings shall be installed in accordance with manufacturer's instructions for same.

503-12.02 Line Clearance: All lines shall have a minimum clearance of six (6) inches from each other and from lines of other trades. Parallel lines shall not be installed directly over one another.

503-12.03 Pressure lines shall have a metallic detector tape placed above them in accordance with manufacturer's recommendation.

503-12.04 Provide minimum coverage as follows:

Pressure supply lines (two and one half - (2-1/2) inches and smaller): 18 inches

Pressure supply lines (three (3) inches and larger): 30 inches

Non-pressure lines: 12 inches

Control wire: 18 inches

All wire and pipes under concrete or paving shall be at least 30 inches deep and sleeved.

503-12.05 All lines placed under paving or concrete shall be contained in a Schedule 40 P.V.C. sleeve. The size of the sleeve shall be the minimum size which will allow the interior pipe or control wire to be freely removed and replaced.

Sec. 503-13 Field Quality Control - Adjustment of the System

503-13.01 The Contractor shall adjust all sprinkler heads and valves for optimum performance and to prevent as much as possible any overspray onto walks and roadways.

503-13.02 Testing of Irrigation System

Test all pressure lines under hydrostatic pressure of 150 pounds per square inch and prove watertight. Testing of pressure main lines shall occur prior to installation of electric control valves, quick couplers or any other equipment that might prevent a proper test from being performed. All piping under paved areas shall be tested under a hydrostatic pressure of 150 pounds per square inch, and proved water-tight, prior to paving. Pressure in lines shall be sustained for not less than two (2) hours. If leaks develop, replace joints and repeat test until entire system is proven watertight.

Sec. 503-14 Plant Material

503-14.01 Soil

Engineer shall submit to the County for approval a soil nutrient report; this requirement may be waived if the County has on file acceptable information to indicate that it is not warranted. The report shall contain recommendations of soil amendments, fertilizers, as well as an indication of the soil's suitability for the purpose intended.

503-14.02 Plants

Turf will only be allowed under certain circumstances and if in compliance with MWELO, this must be approved by the Director of Public Works. Trees shall not be a type which have a lot of surface roots or drop fruit or are a maintenance problem. Trees when planted near concrete or paving shall be planted with root guards. All plants/trees must be chosen from WUCOLS Database (Water Use Classification of Landscape Species). Trees which exceed a four (4) inch diameter trunk at 10 years growth shall not be placed in the right-of-way without specific approval from the Director of Public Works or his representative. No trees shall be planted within 20 feet of a streetlight pole base.

Sec. 503-15.01 Multi-Use Trail Fence

Trail fence shall be heavy duty two rail white vinyl fence designed for agricultural uses, or an alternative approved by the Engineer. Fence rails shall be nominal two (2) inches x six (6) inches x 16 feet ribbed type, with minimum 0.11-inch wall thickness, installed with a minimum

24” bury at eight (8) feet on center. Use aluminum inserts at all end, corner and gate posts (both latch and hinge sides) or fill with concrete. See Plate No. L-15 for details.

Sec. 503-16.01 Stamped Concrete

Stamped or imprinted concrete shall require proposed design provided and approved with Landscape Plans. Design mix shall include design of stamp or imprinting, color and other relevant specifications. If vapor retarding membrane is not used, the based shall be moistened. Concrete shall be constructed with the use of forms in accordance with ACI 347. Concrete shall be placed in accordance with ACI 301, 302 and 304. If using non-integral color, apply color hardener prior to application of pattern. Apply hardener at rate by that recommended by the manufacturer, evenly to the surface of the fresh concrete by the dry-shake method. If applied in two or more shakes, float after each shake and trowel concrete only after final floating. While concrete is still in its plastic state, apply the tool/texture pattern to the surface of the concrete. Property tamp tools into the surface to achieve the required texture, with uniformity of pattern and depth of stamping. Release materials shall be applied to the troweled surface prior to stamping/imprinting. Place curing compound on exposed concrete surfaces immediately after finishing in accordance with the manufacturer's instructions. If required per design, apply secondary stain treatment and apply finish sealer per approved design. Immediately after placement, protect concrete from premature drying, excessive temperatures and mechanical damage.

CHAPTER IV. MAINTENANCE

Sec. 504-1 Maintenance

Maintenance of the system is the responsibility of the Developer until such time as the maintenance entity/CSA has collected sufficient funds to operate and maintain the system. Prior to the entity/CSA beginning to maintain the system, the Developer shall replace all plants which are not in healthy condition, readjust all sprinklers and make all repairs to the system.

A one (1) year’s maintenance bond is required prior to acceptance of the landscaping by the maintenance entity.

A PLANT MATERIAL LEGEND

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	QUANTITY	REMARKS/COMMENTS

B IRRIGATION LEGEND

SYMBOL	QUANTITY	MANUFACTURE	MODEL	HEAD TYPE	NOZ.	PATTERN	P.S.I.	G.P.M.	RAD/DIA	REMARKS

C IRRIGATION EQUIPMENT LEGEND

SYMBOL	MANUFACTURE	MODEL	DESCRIPTION	SIZE	QUANTITY

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STANDARD LANDSCAPE AND IRRIGATION LEGENDS

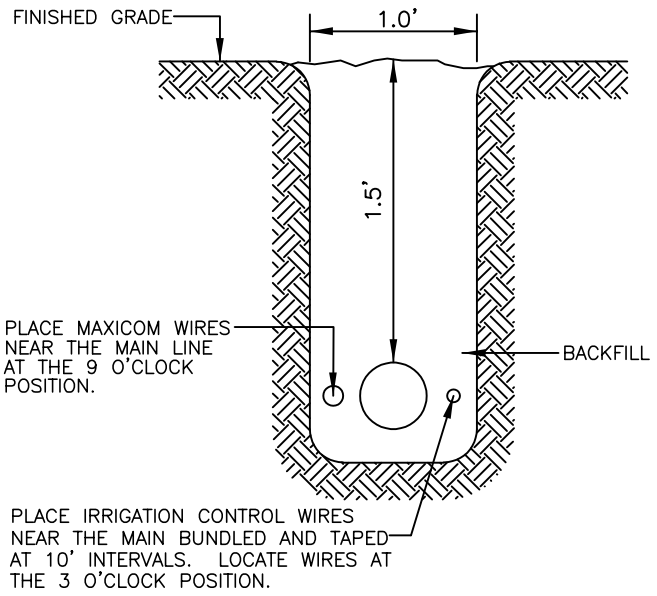
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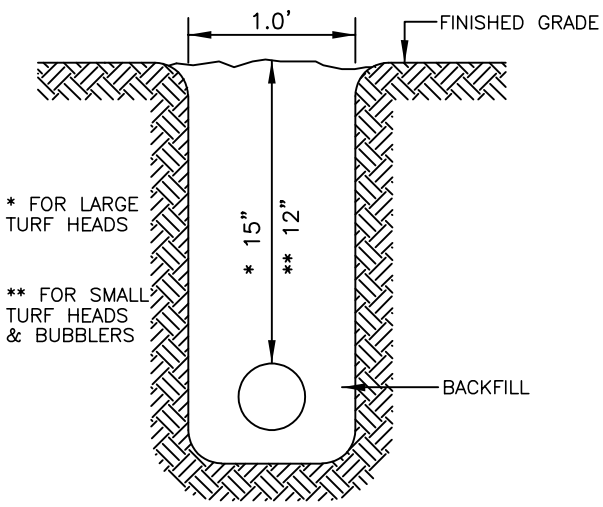
DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO.
L–1

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(D) MAIN LINE



(E) LATERAL LINE

NOTES:

1. ALL ELECTRICAL WIRING AND WATER LINES SHALL BE INSTALLED 2.5' DEEP IN A SCHEDULE 40 PVC CONDUIT WHEN CROSSING ROADWAYS OR UNDER ANY HARD SURFACES. PULL BOXES SHALL BE PLACED AT EACH END FOR ELECTRICAL WIRE RUNS.
2. IF MORE THAN ONE LINE IS INSTALLED PER TRENCH, PROVIDE 0.5' HORIZONTAL AND VERTICAL SEPARATION.
3. ALL PVC SOLVENT (GLUE) SHALL BE #711 (PRIMER IS REQUIRED ON MAIN LINE ONLY).
4. LANDSCAPE AND IRRIGATION IMPROVEMENTS WITHIN THE DEDICATED STREET RIGHT-OF-WAY MAY REQUIRE AN OPEN STREET PERMIT. CHECK WITH THE KERN COUNTY PUBLIC WORKS DEPARTMENT FOR REQUIREMENTS.
5. WHERE OPEN STREET CUTS ARE REQUIRED TO INSTALL VARIOUS IRRIGATION LINES AND/OR WIRES, ALL STREET PATCHING WITHIN THE COUNTY RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH COUNTY STANDARD R-67, A & B/ R-68 OR AS DIRECTED BE THE ENGINEER.
6. WHEN THERE IS A CHANGE IN FITTED DIRECTION, ALL IRRIGATION MAIN LINES LARGER THAN 2.0" IN DIAMETER PRESSURE LINES SHALL BE SECURED WITH CONCRETE THRUST BLOCKS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION AND AS DIRECTED BY THE ENGINEER. SEE COUNTY STANDARD PLATE L-7 FOR THRUST BLOCK DETAIL.
7. ALL IRRIGATION LATERAL LINES SHALL BE CLASS 200 LINE PVC AND SIZED AS SHOW ON THE PLANS. IF A LATERAL IS LOCATED UNDER A HARD SURFACE, SCHEDULE 40 PVC IS REQUIRED.
8. ALL IRRIGATION MAINLINES 2.0" IN DIAMETER AND LESS SHALL BE SCHEDULE 40 PVC. IRRIGATION MAINLINES GREATER THAN 2.0" IN DIAMETER SHALL BE CLASS 200 RING TITE PVC SCHEDULE 40 OR APPROVED EQUAL BE THE ENGINEER.
9. ANY AND ALL CHANGES SHALL BE APPROVED BY THE ENGINEER, PRIOR TO IMPLEMENTATION.
10. ALL IRRIGATION INSTALLATION SHALL BE IN ACCORDANCE WITH COUNTY STANDARDS, THE LATEST APPROVED EDITION OF THE CALIFORNIA PLUMBING CODE, MANUFACTURER'S RECOMMENDATIONS, SECTION 20 OF THE STANDARD SPECIFICATIONS, AND AS DIRECTED BY THE ENGINEER.
11. ALL MATERIAL USED SHALL BE NEW AND FREE FROM IMPERFECTIONS.
12. SEE APPROVED LANDSCAPE AND IRRIGATION PLANS AND LEGENDS FOR SPECIFIC MODEL NUMBER, SIZE, QUANTITY, MANUFACTURER, AND PERFORMANCE REQUIREMENTS.

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS

STANDARD DETAILS FOR PIPING, TRENCHING, AND BACKFILL

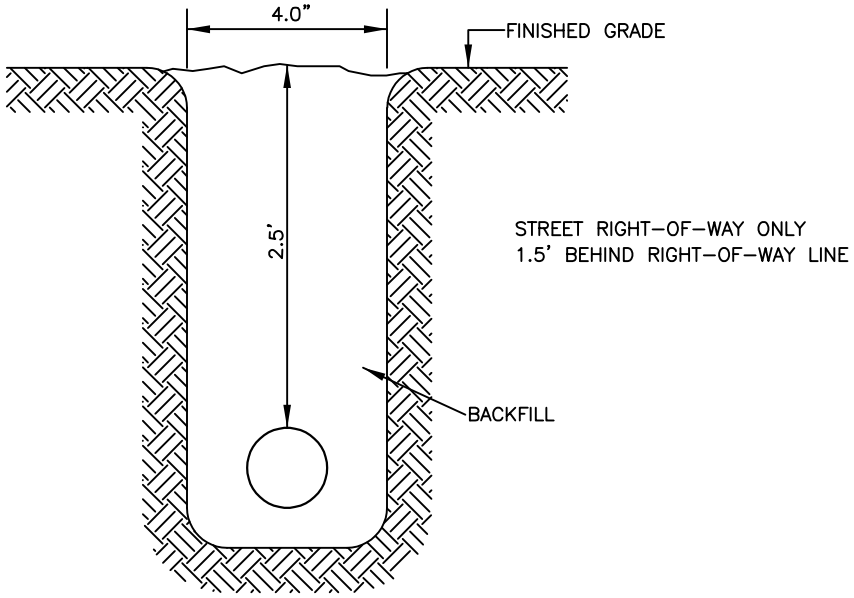
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. L-2

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(F) ELECTRICAL CONDUIT

NOTES:

1. ALL ELECTRICAL WIRING AND WATER LINES SHALL BE INSTALLED 2.5' DEEP IN A SCHEDULE 40 PVC CONDUIT WHEN CROSSING ROADWAYS OR UNDER ANY HARD SURFACES. PULL BOXES SHALL BE PLACED AT EACH END FOR ELECTRICAL WIRE RUNS.
2. IF MORE THAN ONE LINE IS INSTALLED PER TRENCH, PROVIDE 0.5' HORIZONTAL AND VERTICAL SEPARATION.
3. ALL PVC SOLVENT (GLUE) SHALL BE #711 (PRIMER IS REQUIRED ON MAIN LINE ONLY).
4. LANDSCAPE AND IRRIGATION IMPROVEMENTS WITHIN THE DEDICATED STREET RIGHT-OF-WAY MAY REQUIRE AN OPEN STREET PERMIT. CHECK WITH THE KERN COUNTY PUBLIC WORKS DEPARTMENT FOR REQUIREMENTS.
5. WHERE OPEN STREET CUTS ARE REQUIRED TO INSTALL VARIOUS IRRIGATION LINES AND/OR WIRES, ALL STREET PATCHING WITHIN THE COUNTY RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH COUNTY STANDARD R-67, A & B/ R-68 OR AS DIRECTED BE THE ENGINEER.
6. WHEN THERE IS A CHANGE IN FITTED DIRECTION, ALL IRRIGATION MAIN LINES LARGER THAN 2.0" IN DIAMETER PRESSURE LINES SHALL BE SECURED WITH CONCRETE THRUST BLOCKS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION AND AS DIRECTED BY THE ENGINEER. SEE COUNTY STANDARD PLATE L-7 FOR THRUST BLOCK DETAIL.
7. ALL IRRIGATION LATERAL LINES SHALL BE CLASS 200 LINE PVC AND SIZED AS SHOW ON THE PLANS. IF A LATERAL IS LOCATED UNDER A HARD SURFACE, SCHEDULE 40 PVC IS REQUIRED.
8. ALL IRRIGATION MAINLINES 2.0" IN DIAMETER AND LESS SHALL BE SCHEDULE 40 PVC. IRRIGATION MAINLINES GREATER THAN 2.0" IN DIAMETER SHALL BE CLASS 200 RING TITE PVC SCHEDULE 40 OR APPROVED EQUAL BE THE ENGINEER.
9. ANY AND ALL CHANGES SHALL BE APPROVED BY THE ENGINEER, PRIOR TO IMPLEMENTATION.
10. ALL IRRIGATION INSTALLATION SHALL BE IN ACCORDANCE WITH COUNTY STANDARDS, THE LATEST APPROVED EDITION OF THE CALIFORNIA PLUMBING CODE, MANUFACTURER'S RECOMMENDATIONS, SECTION 20 OF THE STANDARD SPECIFICATIONS, AND AS DIRECTED BY THE ENGINEER.
11. ALL MATERIAL USED SHALL BE NEW AND FREE FROM IMPERFECTIONS.
12. SEE APPROVED LANDSCAPE AND IRRIGATION PLANS AND LEGENDS FOR SPECIFIC MODEL NUMBER, SIZE, QUANTITY, MANUFACTURER, AND PERFORMANCE REQUIREMENTS.

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STANDARD DETAILS FOR ELECTRICAL CONDUIT TRENCHING AND BACKFILL

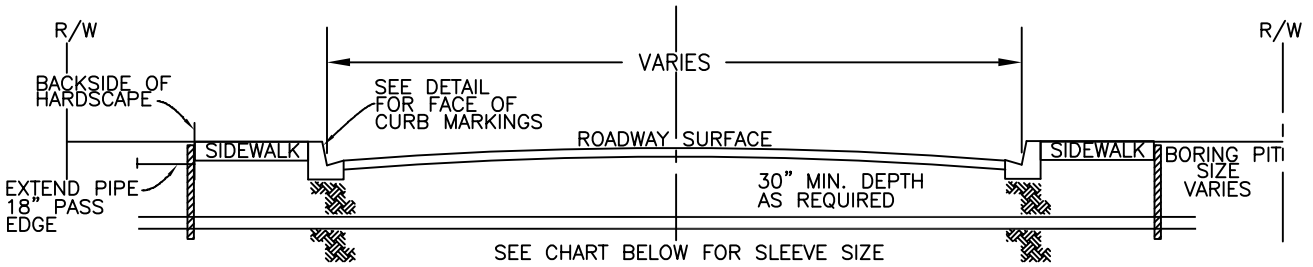
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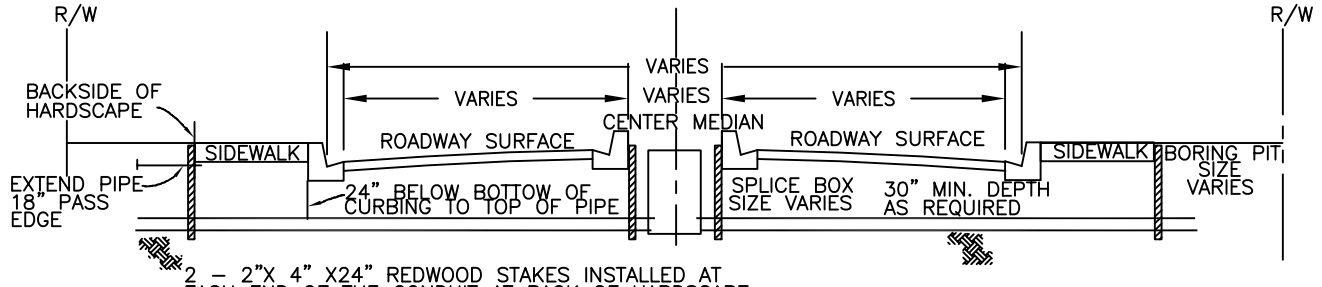
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CONTRACTOR SHALL CONTACT UTILITY COMPANIES PRIOR TO BORING.

(H) IRRIGATION CROSSOVER (NO CENTER MEDIAN)



2 – 2"X 4" X24" REDWOOD STAKES INSTALLED AT EACH END OF THE CONDUIT AT BACK OF HARDSCAPE TOP OF REDWOOD STAKE 1" BELOW TOP OF HARDSCAPE.

SEE CHART BELOW FOR SLEEVE SIZE

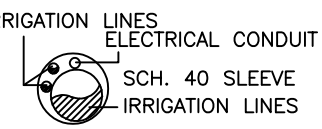
(I) IRRIGATION CROSSOVER (WITH CENTER MEDIAN)

(J) IRRIGATION SLEEVE CHART

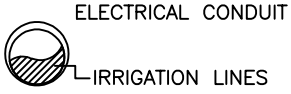
SLEEVE CHART INCREASE SLEEVE SIZE AS REQUIRED PER THIS CHART FOR MORE THAN ONE PIPE PER SLEEVE			
P.V.C. PIPE SIZE	SLEEVE SIZE		
	UNDER 18'	OVER 18' UNDER 18'	OVER 28'
1/2"	1"	1–1/4"	1–1/2"
3/4"	1–1/4"	1–1/2"	2"
1"	1–1/2"	2"	2"
1–1/4"	2"	2–1/2"	2–1/2"
1–1/2"	2–1/2"	2–1/2"	3"
2"	3"	3"	3"
2–1/2"	3"	3"	4"
3"	4"	5"	5"
3–1/2"	5"	5"	6"
4"	5"	6"	6"
5"	6"	8"	8"
6"	8"	8"	8"

GENERAL NOTES:

1. ALL PIPING AND FITTINGS SHALL BE SCH. 40 P.V.C. UNLESS APPROVED EQUAL BY THE ENGINEER.
2. WHERE CONDUIT(SLEEVE ONLY) IS INSTALLED, ONE PULL WIRE OR ROPE SHALL BE INSTALLED. THE LENGTH OF WIRE OR ROPE SHALL EXTEND 6' BEYOND EACH END OF THE CONDUIT. EACH CONDUIT (SLEEVE) SHALL BE CAPPED AT EACH END.
3. ALL MATERIAL USED SHALL BE NEW AND FREE FROM IMPERFECTIONS.
4. SEE APPROVED LANDSCAPE/IRRIGATION PLANS AND LEGENDS FOR SPECIFIC MODEL NUMBER, SIZE, MANUFACTURER AND PERFORMANCE REQUIREMENTS.
5. ALL TRANSITIONS FROM GALVANIZED PIPE TO PVC PIPE SHALL BE CONSTRUCTED WITH SCH. 40 FEMALE ADAPTER OR APPROVED EQUAL BY THE ENGINEER.
6. ALL IRRIGATION INSTALLATION SHALL BE IN ACCORDANCE WITH COUNTY STANDARDS, THE LATEST EDITION OF THE CALIFORNIA PLUMBING CODE, MANUFACTURER'S RECOMMENDATION, SECTION 20 OF THE STANDARD SPECIFICATIONS, AND AS DIRECTED BY THE ENGINEER.
7. ANY AND ALL CHANGES SHALL BE APPROVED BY THE ENGINEER PRIOR TO IMPLEMENTATION.
8. THE METHOD USED FOR BORING SHALL BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO START OF OPERATION.
9. VERIFY ALL MEASUREMENTS IN THE FIELD.
10. VERIFY SPECIFIC SITE CONDITIONS IN THE FIELD.



MORE THAN ONE PIPE PER SLEEVE



ONE PIPE PER SLEEVE

ROUTE PIPE AS REQUIRED PER THE APPROVED LANDSCAPE/IRRIGATION PLANS

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STANDARD DETAILS FOR IRRIGATION SLEEVE(S)

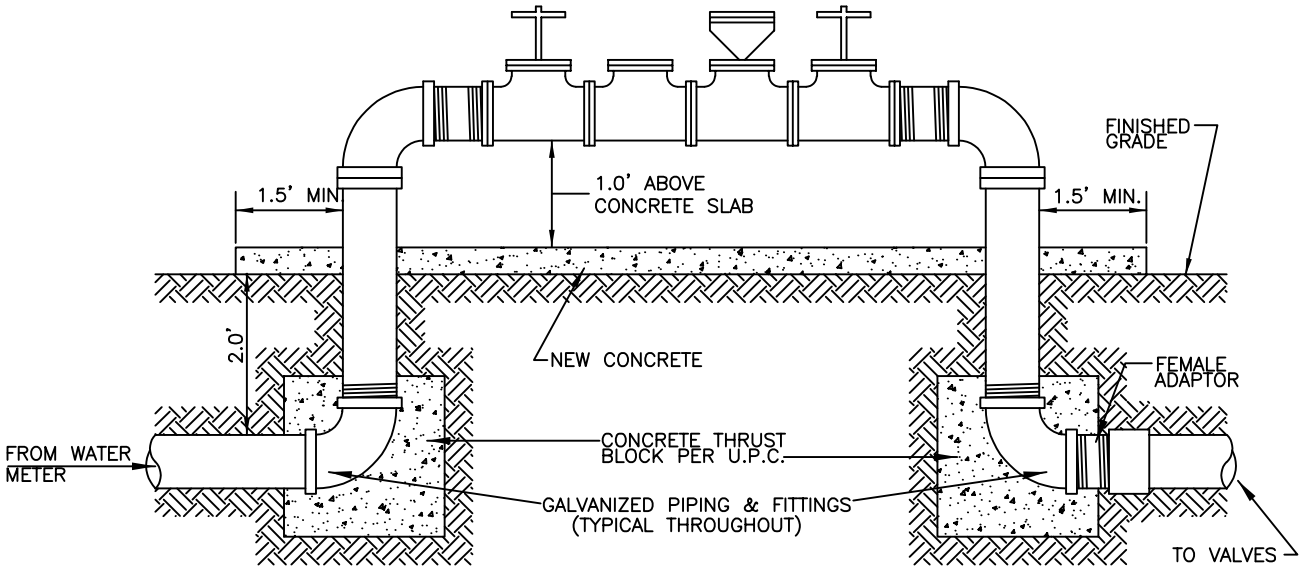
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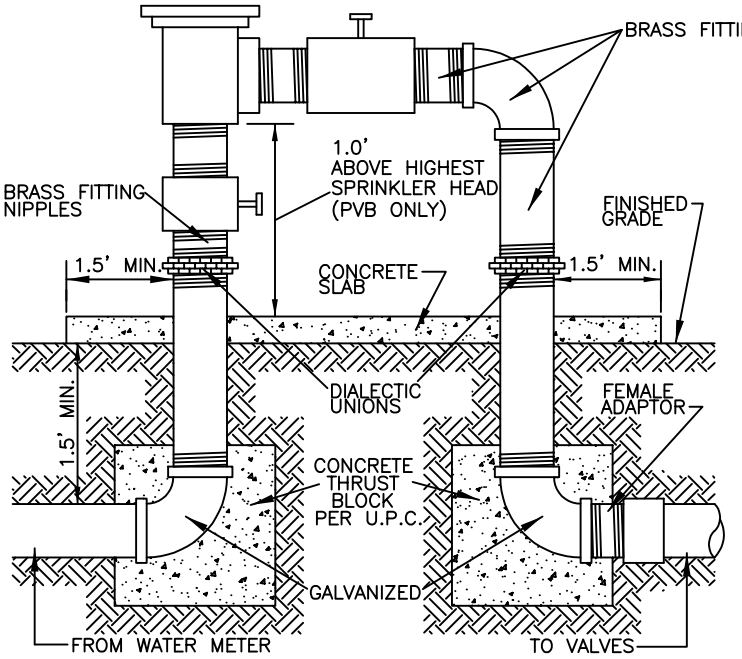
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. L–4

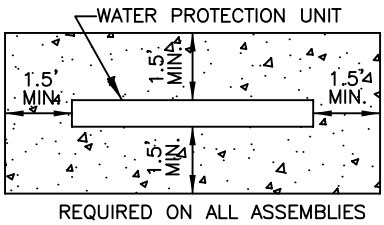
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G DOUBLE CHECK OR REDUCED PRESURE BACKFLOW PREVENTER (GREATER THAN 2.0" DIA.)



H BACKFLOW PREVENTER (2.0" AND LESS)



REQUIRED ON ALL ASSEMBLIES

I CONCRETE SLAB PLAN

NOTES:

1. EXCEPT AS NOTED, ALL PIPING AND FITTINGS SHALL BE GALVANIZED UNLESS APPROVED BY THE ENGINEER.
2. USE TEFLON PIPE TAPE ON ALL THREADED JOINTS OR APPROVED EQUAL BY THE ENGINEER.
3. ALL MATERIALS SHALL BE NEW AND FREE FROM IMPERFECTIONS.
4. SEE APPROVED LANDSCAPE AND IRRIGATION PLANS AND LEGENDS FOR SPECIFIC MODEL NUMBERS, SIZE, QUANTITY, MANUFACTURERS, AND PERFORMANCE REQUIREMENTS.
5. ALL TRANSITIONS FROM GALVANIZED PIPE TO PVC PIPE SHALL BE CONSTRUCTED WITH SCHEDULE 40 FEMALE ADAPTER OR APPROVED EQUAL BY THE ENGINEER.
6. A 6.0" THICK REINFORCED CONCRETE SLAB IS REQUIRED FOR ALL WATER PROTECTION DEVICES. MINIMUM CLEARANCE SHALL BE 1.5' ON ALL SIDES OF THE DEVICE AND AS DIRECTED BY THE ENGINEER (SEE STANDARD L-5 DETAIL I).
7. ALL IRRIGATION INSTALLATION SHALL BE IN ACCORDANCE WITH COUNTY STANDARDS, THE LATEST ACCEPTED EDITION OF THE CALIFORNIA PLUMBING CODE, MANUFACTURER'S RECOMMENDATION, SECTION 20 OF THE STANDARD SPECIFICATIONS, AND AS DIRECTED BY THE ENGINEER.
8. ANY AND ALL CHANGES SHALL BE APPROVED BY THE ENGINEER BEFORE IMPLEMENTATION.

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STANDARD DETAIL FOR POTABLE WATER PROTECTION

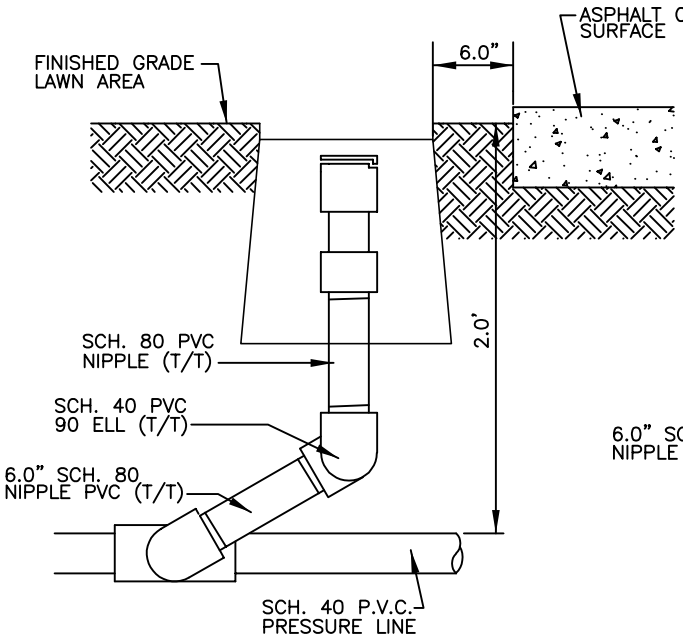
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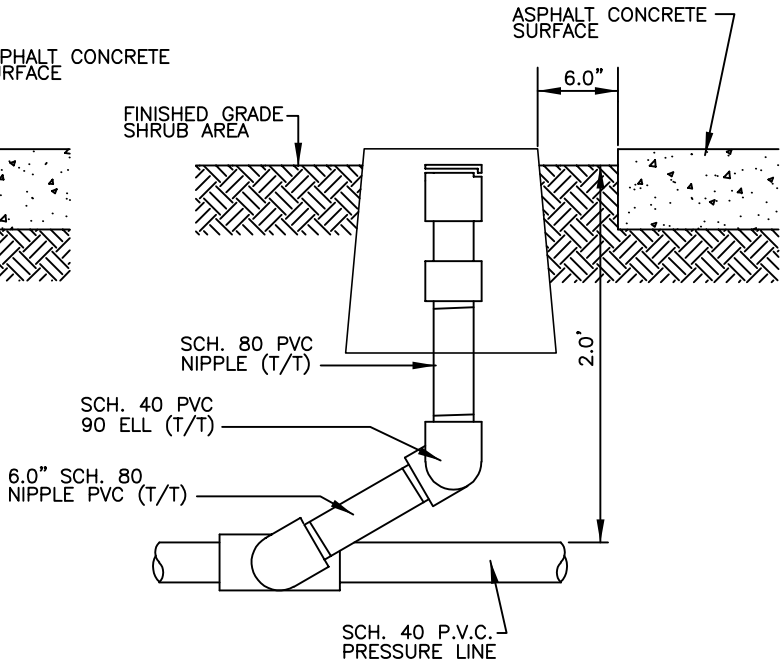
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

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Ⓦ QUICK COUPLER VALVE
TURF AREA



Ⓧ QUICK COUPLER VALVE
SHRUB AREA

NOTES:

1. USE TEFLON ON ALL THREADED JOINTS.
2. ALL NIPPLES SHALL BE SCHEDULE 80 PVC. ALL FITTINGS SHALL BE SCHEDULE 40 PVC.
3. ALL IRRIGATION CONTROL VALVES SHALL BE PLACED IN A PLASTIC IRRIGATION CONTROL VALVE BOX WITH TOP OF VALVE BOX 2.0" BELOW FINISHED GRADE IN TURF AND 2.0" ABOVE FINISHED GRADE IN PLANTER AREA.
4. INSTALLATION OF EXTRA IRRIGATION CONTROL WIRE FROM IRRIGATION CONTROL CLOCK TO REMOTE CONTROL VALVE IS REQUIRED FOR EACH MANIFOLD (BUNDLE OF VALVES). EXTRA WIRE SHALL BE A DIFFERENT COLOR THAN THE ONE USED TO OPERATE VALVES.
5. ALL IRRIGATION CONTROL WIRES (CONTROL AND COMMON) SHALL BE 14 GAUGE U.L. SINGLE STRAND COPPER WIRE, TAPED AND BUNDLED AT 10' INTERVALS AND PLACED NEAR THE IRRIGATION MAINLINE AT THE 3 O'CLOCK POSITION.
6. ALL WIRE CONNECTIONS SHALL BE WATERPROOF.
7. ALL IRRIGATION INSTALLATIONS SHALL BE IN ACCORDANCE WITH STANDARDS, THE LATEST APPROVED EDITION OF THE CALIFORNIA PLUMBING CODE, MANUFACTURER'S RECOMMENDATIONS, SECTION 20 OF THE STANDARD SPECIFICATIONS, AND AS DIRECTED BY THE ENGINEER.
8. ALL MATERIALS USED SHALL BE NEW AND FREE FROM IMPERFECTIONS.
9. ANY AND ALL CHANGES SHALL BE APPROVED BY THE ENGINEER PRIOR TO IMPLEMENTATION.
10. SEE APPROVED LANDSCAPE AND IRRIGATION PLANS AND LEGENDS FOR SPECIFIC MODEL NUMBERS, SIZE, QUANTITY, MANUFACTURERS AND PERFORMANCE REQUIREMENTS.

KERN COUNTY PUBLIC WORKS
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STANDARD QUICK COUPLER VALVE DETAIL

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

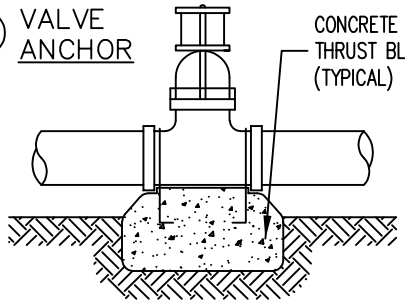
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DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

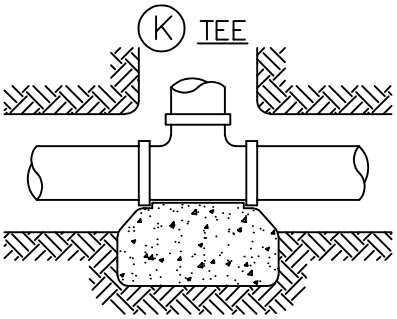
PLATE NO.
L–6

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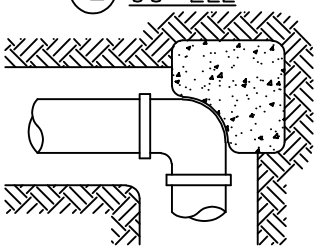
(J) VALVE ANCHOR



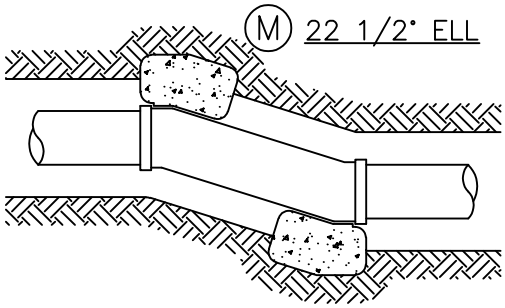
(K) TEE



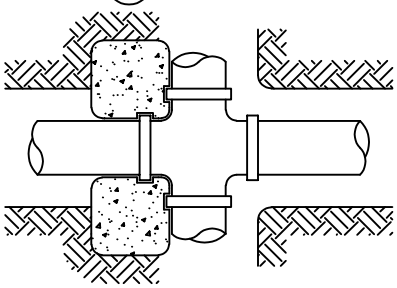
(L) 90° ELL



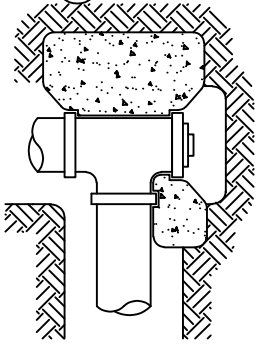
(M) 22 1/2° ELL



(N) CROSS



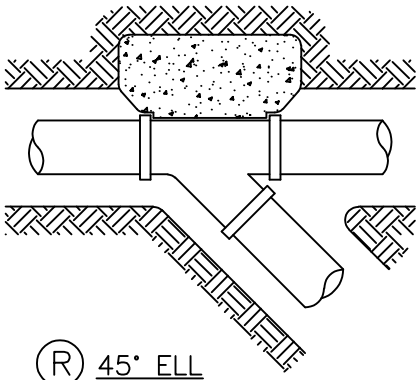
(O) PLUG



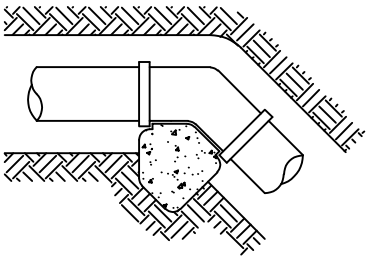
NOTES:

1. ALL MAINLINES INSTALLED SHALL BE TESTED AS PER MANUFACTURES SPECIFICATIONS AND SHALL BE A PART OF THE INSTALLATION SPECIFICATIONS.
2. ALL TRENCHING DEPTHS SHALL BE PER COUNTY STANDARD PLATE L–2 DETAIL D & E, L–3 DETAIL F.
3. PORTLAND CEMENT CONCRETE USED FOR THRUST BLOCKS CONCRETE SHALL CONFORM TO REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR MINOR CONCRETE (MIN. CEMENT CONTENT 505 LB/CU.YD.) CONCRETE SHALL CONTAIN NO ADDITIVES UNLESS APPROVED PRIOR APPROVAL IS OBTAINED FROM THE COUNTY ENGINEER.
4. THRUST BLOCKS SHALL BE USED AT CHANGES OF DIRECTION (BENDS, TEES), CHANGES OF VELOCITY (REDUCERS, VALVES), AND PIPE DEAD ENDS.
5. WHEN THRUST BLOCKS ARE USED, THE SIZE AND TYPE OF THE BLOCKING MUST BE BASED ON THE MAXIMUM THRUST FORCE EXPECTED AND THE LOAD–BEARING CAPACITY OF THE SOIL.
6. ALL ANCHOR RODS SHALL BE REINFORCED STEEL AND A MINIMUM OF 0.5" IN DIAMETER.
7. ALL CONCRETE THRUST BLOCKS SHALL BE IN ACCORDANCE WITH THE LATEST APPROVED EDITION OF THE CALIFORNIA PLUMBING CODE.
8. ALL THRUST BLOCKS TO BE POURED AGAINST UNDISTURBED SOIL, CONCRETE SHALL BE PLACED BEHIND BELLS OF FITTINGS.
9. BEARING AREAS SHOWN IN TABLE ARE BASED ON ALLOWABLE SOIL PRESSURE OF 1500 P.S.F.
10. KEEP CONCRETE AWAY FROM BELLS.

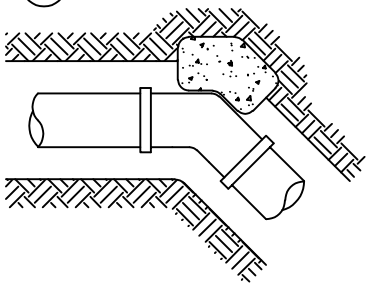
(P) 45° TEE



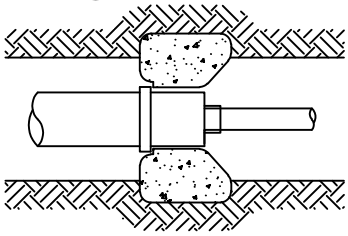
(Q) 45° TEE ELEVATION



(R) 45° ELL



(S) REDUCER



THRUST BLOCK SCHEDULE				
PIPE SIZE	BEARING AREA IN SQ. FT.			
	TEE OR PLUG	90° ELL OR HYDRANT	45° ELL	22-1/2" ELL
4"	2	2	2	1
6"	3	4	2	2
8"	5	7	4	2
10"	8	11	6	3
12"	11	16	8	4

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STANDARD DETAIL FOR THRUST BLOCK

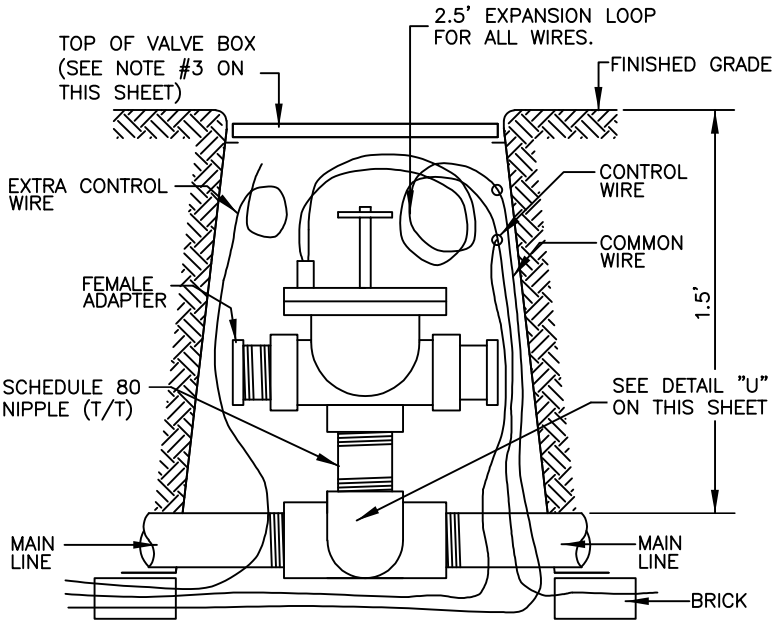
COUNTY OF KERN
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DEVELOPMENT STANDARD

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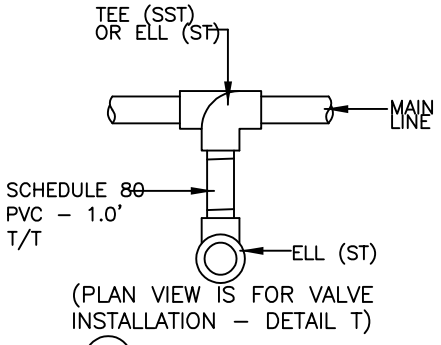
DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. L–7

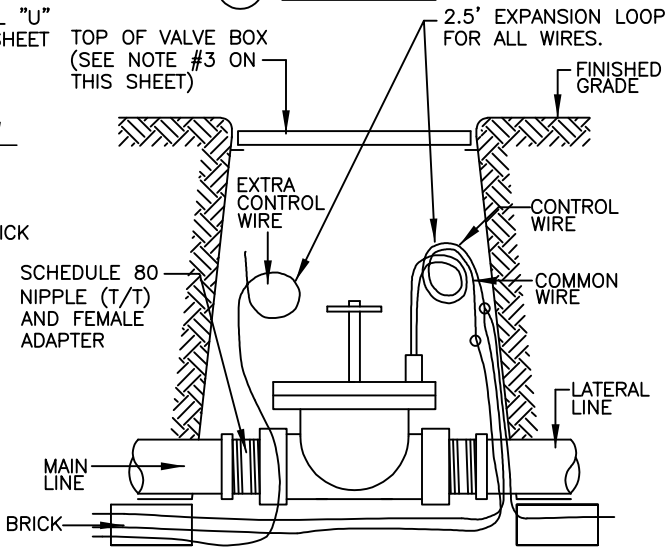
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T REMOTE CONTROL VALVE



U PLAN VIEW



V REMOTE CONTROL VALVE

NOTES:

1. USE TEFLON ON ALL THREADED JOINTS.
2. ALL NIPPLES SHALL BE SCHEDULE 80 PVC. ALL FITTINGS SHALL BE SCHEDULE 40 PVC.
3. ALL IRRIGATION CONTROL VALVES SHALL BE PLACED IN A PLASTIC IRRIGATION CONTROL VALVE BOX WITH TOP OF VALVE BOX 2.0" BELOW FINISHED GRADE IN TURF AND 2.0" ABOVE FINISHED GRADE IN PLANTER AREA.
4. INSTALLATION OF EXTRA IRRIGATION CONTROL WIRE FROM IRRIGATION CONTROL CLOCK TO REMOTE CONTROL VALVE IS REQUIRED FOR EACH MANIFOLD (BUNDLE OF VALVES). EXTRA WIRE SHALL BE A DIFFERENT COLOR THAN THE ONES USED TO OPERATE VALVES.
5. ALL IRRIGATION CONTROL WIRES (CONTROL AND COMMON) SHALL BE 14 GAUGE U.L. SINGLE STRAND COPPER WIRE, TAPED AND
6. ALL WIRE CONNECTIONS SHALL BE WATERPROOF AND APPROVED BY THE ENGINEER. SPLICES WILL NOT BE ALLOWED UNLESS APPROVED BY ENGINEER.
7. MAINTAIN 2.0' SEPARATION BETWEEN REMOTE CONTROL VALVE (CENTERLINE TO CENTERLINE) WHEN MORE THAN ONE VALVE IS INSTALLED IN THE SAME LOCATION.
8. WHERE POSSIBLE, LOCATE VALVES IN THE PLANTER AREAS. BUNDLED AT 10' INTERVALS AND PLACED NEAR THE IRRIGATION MAINLINE AT THE 3 O'CLOCK POSITION.
9. ALL IRRIGATION INSTALLATIONS SHALL BE IN ACCORDANCE WITH COUNTY STANDARDS, THE LATEST APPROVED EDITION OF THE CALIFORNIA PLUMBING CODE, MANUFACTURER'S RECOMMENDATIONS, SECTION 20 OF THE STANDARD SPECIFICATIONS, AND AS DIRECTED BY THE ENGINEER.
10. ALL MATERIALS USED SHALL BE NEW AND FREE FROM IMPERFECTIONS.
11. ANY AND ALL CHANGES SHALL BE APPROVED BY THE ENGINEER PRIOR TO IMPLEMENTATION.
12. SEE APPROVED LANDSCAPE AND IRRIGATION PLANS AND LEGENDS FOR SPECIFIC MODEL NUMBERS, SIZE, QUANTITY, MANUFACTURERS AND PERFORMANCE REQUIREMENTS.

KERN COUNTY PUBLIC WORKS
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STANDARD DETAIL FOR REMOTE CONTROL VALVES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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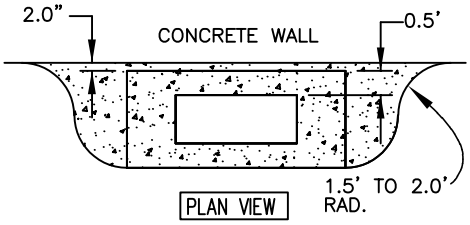
DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

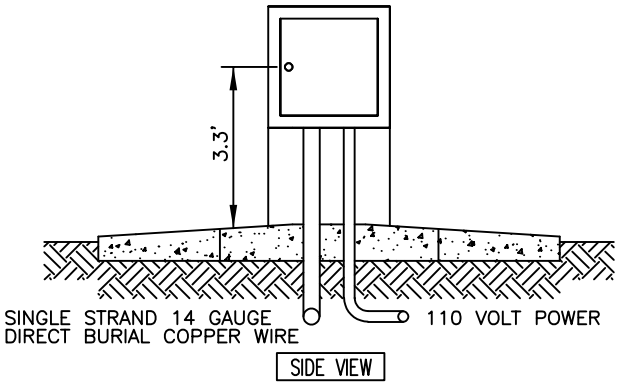
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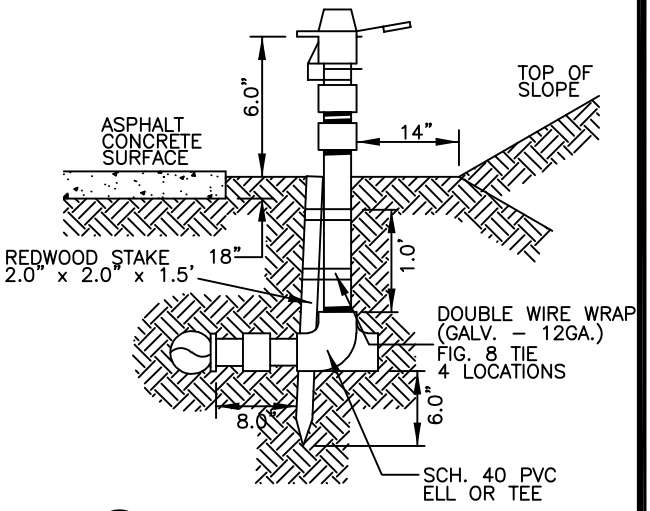
NOTES:

1. USE TEFLON TAPE ON ALL THREADED JOINTS
2. ALL RISERS AND NIPPLES SHALL BE SCHEDULE 80 PVC SIZED AS REQUIRED BY THE ENGINEER.
3. ALL FITTINGS SHALL BE SCHEDULE 40 PVC SIZED AS REQUIRED.
4. WHERE IRRIGATION HEADS ARE INSTALLED WITHIN EMBANKMENTS, A DRAIN VALVE OR CHECK VALVE IS REQUIRED TO PREVENT EROSION. CHECK VALVES AND DRAIN VALVES SHALL BE INSTALLED AT LOCATIONS AS PRESCRIBED BY THE SPECIFIC FIELD CONDITIONS AND SHALL BE APPROVED BY THE ENGINEER PRIOR TO USE AND PLACEMENT.
5. USE SCHEDULE 80 PVC CONDUIT WITH AN ENCLOSED PEDESTAL, SLOPE CONDUIT TO DRAIN 1/8" PER 1.0'.
6. CONSTRUCT 0.5' MINOR CONCRETE (MIN. CEMENT CONTENT 505 LB/CU.YD.) CONCRETE SHALL CONTAIN NO ADDITIVES UNLESS APPROVED PRIOR APPROVAL IS OBTAINED FROM THE COUNTY ENGINEER. SLAB AS REQUIRED TO RECEIVE THE PEDESTAL MOUNTED IRRIGATION CONTROL CLOCK. COMPACT 0.5' BASE TO 90% RELATIVE DENSITY PRIOR TO PLACEMENT OF THE CONCRETE SLAB.
7. WHERE PART CIRCLE IRRIGATION HEADS ADJACENT TO A BUILDING WALL, LOCATE IRRIGATION HEAD 4.0" FROM FACE OF BUILDING WALL TO BACK OF IRRIGATION HEAD.
8. ALL IRRIGATION HEADS SHALL PROVIDE 100% COVERAGE WITH NO OVER SPRAY ONTO SIDEWALKS, STREETS, WALLS, AND BUILDINGS. ADDITION OF HEADS MAY BE REQUIRED AT ANY TIME IN ORDER TO ACHIEVE 100% COVERAGE.
9. ALL IRRIGATION INSTALLATION SHALL BE IN ACCORDANCE WITH COUNTY STANDARDS, THE LATEST EDITION OF THE CALIFORNIA PLUMBING CODE, AND MANUFACTURER'S RECOMMENDATION, SECTION 20 OF THE STANDARD SPECIFICATIONS, AND AS DIRECTED BY THE ENGINEER.
10. ALL MATERIALS SHALL BE NEW AND FREE FROM DEFECTS.
11. SEE APPROVED LANDSCAPE AND IRRIGATION PLANS AND LEGENDS FOR SPECIFIC MODEL NUMBERS, SIZE, QUANTITIES, MANUFACTURES AND PERFORMANCE REQUIREMENTS.
12. ANY AND ALL CHANGES FROM THIS STANDARD SHALL BE APPROVED BY THE ENGINEER PRIOR TO ANY TYPE OF CONSTRUCTION.

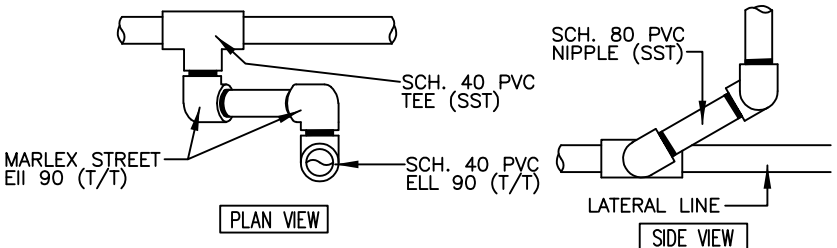




(X) VANDAL RESISTANT ENCLOSURE FOR ELECTRIC METER AND/OR IRRIGATION CONTROL CLOCK



(Y) OSCILLATING HEAD DETAIL



(Z) TRIPLE SWING JOINT DETAIL

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STANDARD DETAIL FOR CONTROL CLOCK, OSCILLATING HEAD AND TRIPLE SWING JOINT

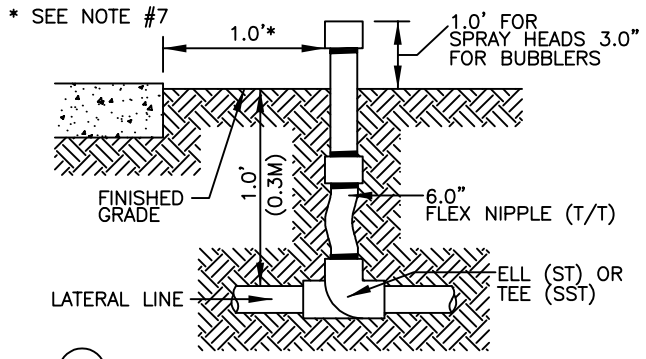
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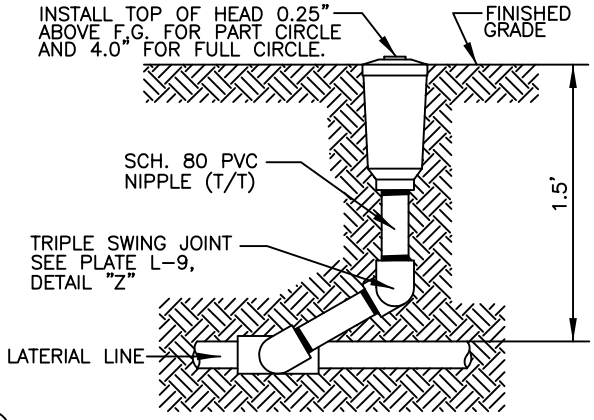
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. L–9

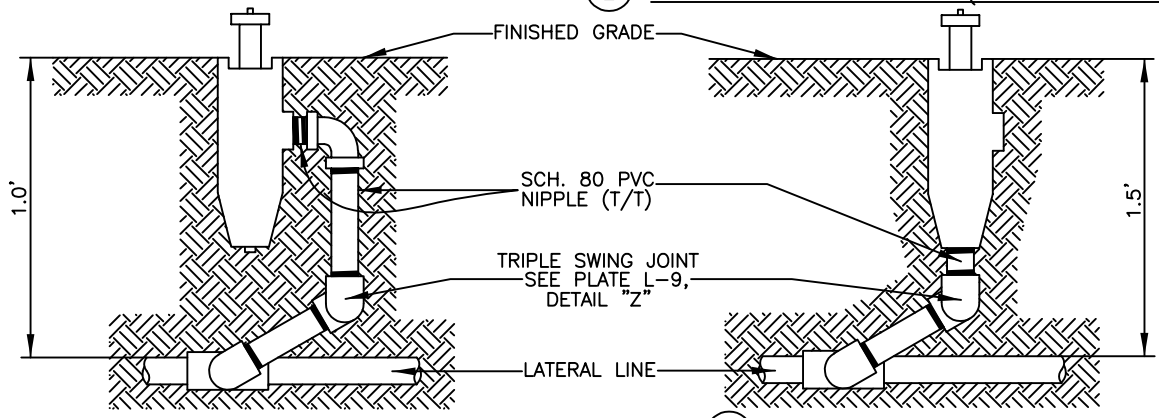
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(A) BUBBLER/SHRUB SPRAY HEAD

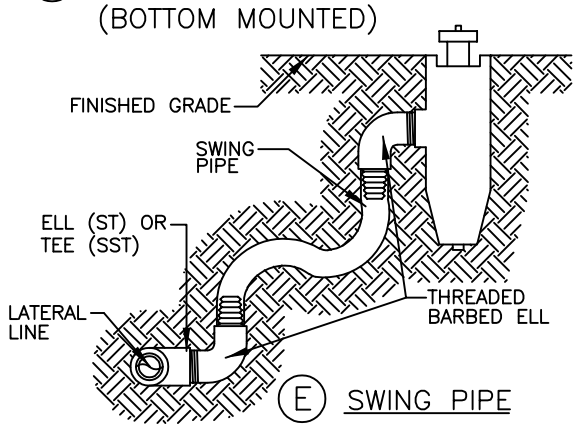


(B) LARGE RADIUS HEAD (BOTTOM MOUNTED)



(C) POP UP SPRAY HEAD (SIDE MOUNTED)

(D) POP UP SPRAY HEAD (BOTTOM MOUNTED)



(E) SWING PIPE

NOTES:

1. USE TEFLON PIPE ON ALL TREADED JOINTS
2. ALL RISERS AND NIPPLES SHALL BE SCH. 80 PVC. ALL FITTINGS SHALL BE SCH. 40 PVC.
3. ALL LATERALS SHALL BE CLASS 200 PVC OR AS REQUIRED ON PLANS.
4. WHEN IRRIGATION HEADS ARE INSTALLED WITHIN EMBANKMENTS, A DRAIN VALVE OR CHECK VALVE IS REQUIRED TO PREVENT EROSION. CHECK VALVES AND DRAIN VALVES SHALL BE INSTALLED AT LOCATIONS AS PRESCRIBED BY THE SPECIFIED CONDITIONS AND SHALL BE APPROVED BY THE ENGINEER PRIOR TO PLACEMENT AND USE.
5. ALL POP UP HEADS SHALL BE 1.0" FROM CONCRETE AND ASPHALT AREAS. ALL LARGE RADIUS IRRIGATION HEADS (PART CIRCLE) SHALL BE 4.0" FROM CONCRETE AND ASPHALT AREAS. HEIGHT OF POP UP HEADS SHALL BE AS FOLLOWS:
   4.0" FOR LAWN AREAS
   1.0' FOR SHRUBS
   1.0' FOR GROUND COVERS
6. WHERE PART CIRCLE IRRIGATION HEADS ARE ADJACENT TO A BUILDING WALL, LOCATE HEADS 1.0' FROM FACE OF BUILDING WALL TO BACK OF IRRIGATION HEAD.
7. WHERE TRIPLE SWING JOINT IS REQUIRED, SEE COUNTY PLATE L-9, DETAIL "Z". SWING JOINTS SHALL BE ALLOWED ON ALL IRRIGATION HEADS EVEN WHERE NOT REQUIRED.

NOTES: (CONT.)

8. ANY AND ALL CHANGES FROM THIS STANDARD DETAIL SHEET SHALL BY APPROVED BY THE ENGINEER.
9. SEE APPROVED LANDSCAPE AND IRRIGATION PLANS AND LEGENDS FOR SPECIFIC MODEL NUMBERS, SIZE, QUANTITY, MANUFACTURER'S, AND PERFORMANCE REQUIREMENTS.
10. ALL IRRIGATION INSTALLATIONS SHALL BE IN ACCORDANCE WITH COUNTY STANDARDS, THE LATEST EDITION OF THE CALIFORNIA PLUMBING CODE, MANUFACTURER'S RECOMMEN-DATION SECTION 20 OF THE STANDARD SPECIFICATIONS, AND AS DIRECTED BY THE ENGINEER.
11. ALL MATERIALS USED SHALL BE NEW AND FREE FROM IMPERFECTIONS.

KERN COUNTY PUBLIC WORKS
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STANDARD DETAIL FOR VARIOUS IRRIGATION HEADS

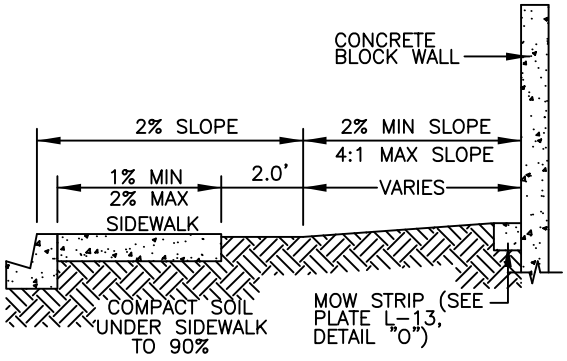
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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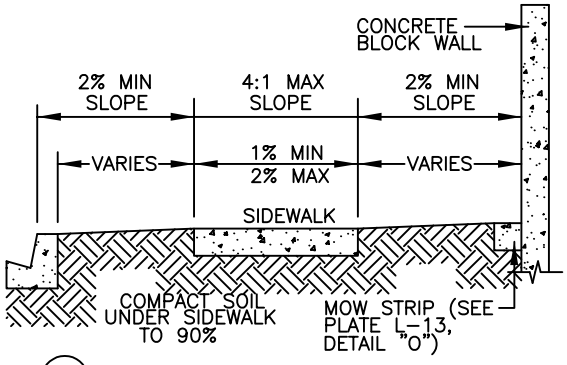
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. L-10

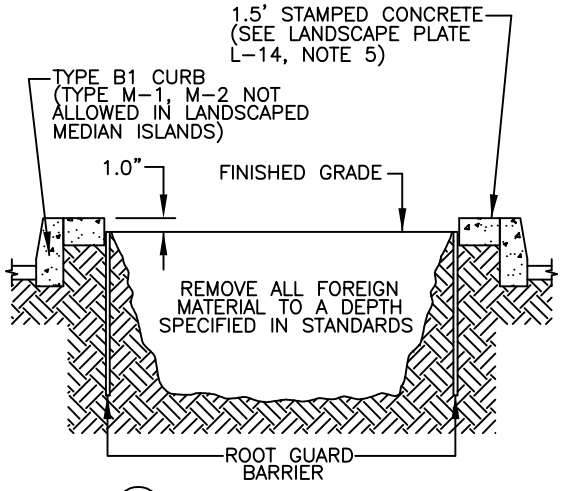
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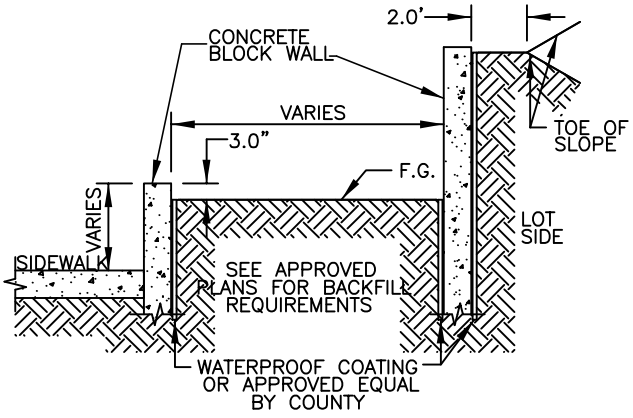
(F) PARKWAY SECTION
(COMBINATION TYPE SIDEWALK)



(G) PARKWAY SECTION
(STANDARD TYPE SIDEWALK)



(H) MEDIAN SECTION



(I) WATER PROOFING
(PLANTERS AND RETAINING WALLS)

NOTES:

1. PROVIDE POSITIVE DRAINAGE (2% MINIMUM TO 4:1 MAX.) IN ALL LANDFILL AREAS.
2. 9.0" CONCRETE MOW STRIP IS REQUIRED FOR ALL LAWN AREAS ADJACENT TO PROPOSED OR EXISTING WALL PER COUNTY PLATE L-13, DETAIL "O".
3. WHERE LOT GRADES ARE HIGHER THAN STREET GRADES, SIDE OF WALL WATER PROOFING IS REQUIRED PER COUNTY PLATE L-11, DETAIL "I".
4. ANY AND ALL CHANGES SHALL BE APPROVED BY THE ENGINEER PRIOR TO IMPLEMENTATION.
5. ALL IRRIGATION INSTALLATION SHALL BE IN ACCORDANCE WITH COUNTY STANDARDS, THE LATEST EDITION OF THE CALIFORNIA PLUMBING CODE, MANUFACTURER'S RECOMMENDATIONS, SECTION 20 OF THE STANDARD SPECIFICATIONS, AND AS DIRECTED BY THE ENGINEER.
6. ALL MATERIALS USED SHALL BE NEW AND FREE FROM IMPERFECTIONS.

NOTES: (CONT.)

7. SEE APPROVED LANDSCAPE AND IRRIGATION PLANS AND LEGENDS FOR SPECIFIC MODEL NUMBERS, SIZE, QUANTITY, MANUFACTURES, AND PERFORMANCE REQUIREMENTS.
8. IF CURBING AND OR CURB/GUTTER FOR LANDSCAPE CENTER MEDIANS ARE NOT EXISTING, SEE APPROVED CIVIL ENGINEERING DRAWINGS.
9. MEANDERING SIDEWALK MAY BE APPROVED BY THE DIRECTOR WITHIN THE PARKWAY AREA WHERE LANDSCAPING IS PROVIDED.

KERN COUNTY PUBLIC WORKS
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STANDARD VARIOUS PARKWAY AND MEDIAN SECTION MISCELLANEOUS DETAIL

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

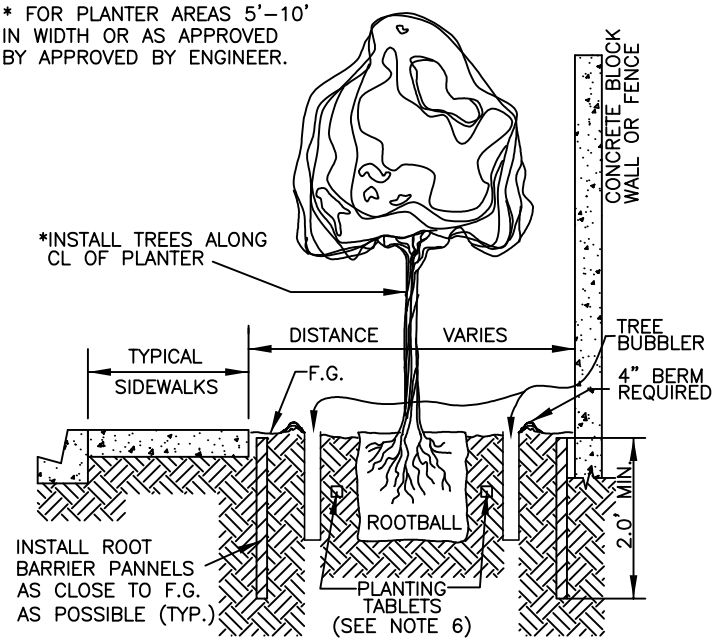
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/01/23
APPROVED BY: J.R.C.

PLATE NO. L-11

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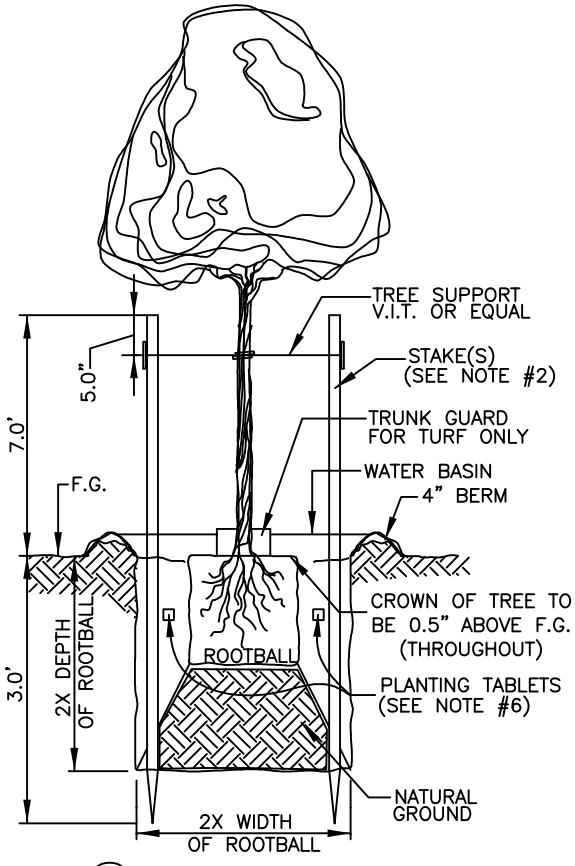
* FOR PLANTER AREAS 5'–10' IN WIDTH OR AS APPROVED BY APPROVED BY ENGINEER.



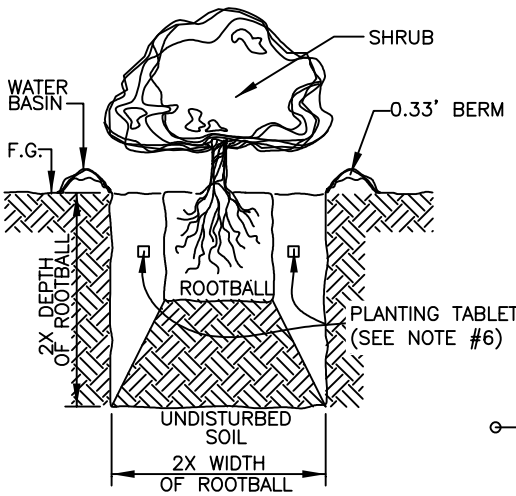
(J) TREE PLANTING WITH ROOTGUARD

NOTES:

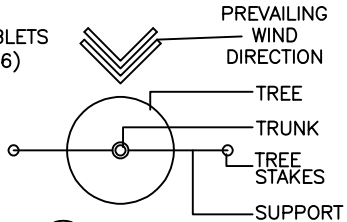
1. APPLY SOIL AMENDMENT AS PER SOIL TEST.
2. ALL TREES SHALL BE STAKED WITH NEW 2.0" DIA. (PRESSURE TREATED) LODGE POLE PINE. REMOVE ORIGINAL TREE STAKES FROM ALL PLANT MATERIAL DELIVERED TO THE PROJECT SITE AND INSTALL NEW TREE STAKES.
3. CONSTRUCT MOUND AS REQUIRED TO SECURE PLANTS STABILITY DURING CONSTRUCTION INSTALLATION.
4. ARBOR TREE GUARD OR APPROVED EQUAL IS REQUIRED AROUND ALL TREES PLANTED IN LAWN AREAS. TREE BUBBLER SHALL BE INSTALLED.
5. ROOT GUARD BARRIER IS REQUIRED ON ALL HARD SURFACES WHEN THE TREE TRUNK IS 5.0' OR LESS FROM ANY HARD SURFACE. PLACE BARRIER PARALLEL ALONG THE EDGE OF HARD SURFACE.
6. PLANTING TABLET SHALL BE PLACED 2.0" BELOW FINISHED GRADE NEAR ROOT FOUNDATION AS FOLLOWS:
   1 –TABLET PER 1 GAL.
   3 – TABLETS PER 5 GAL.
   6 –TABLETS PER 15 GAL.
   9 – TABLETS PER 2.0' BOX
7. ANY AND ALL DEVIATIONS FROM THIS STANDARD SHALL BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.
8. ALL LANDSCAPE INSTALLATION SHALL BE IN ACCORDANCE WITH COUNTY STANDARDS, MANUFACTURER'S RECOMMENDATION, AND SECTION 20 OF THE STANDARD SPECIFICATIONS, AND AS DIRECTED BY THE ENGINEER.
9. ALL MATERIAL USED SHALL BE NEW AND FREE FROM IMPERFECTIONS.
10. SEE APPROVED LANDSCAPE AND IRRIGATION PLANS FOR SPECIFIC MODEL NUMBERS, SIZE, MANUFACTURER, AND PERFORMANCE REQUIREMENTS.



(K) STAKING DETAIL



(L) TYPICAL SHRUB PLANTING DETAIL



(M) STAKE LOCATION

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD LANDSCAPE AND IRRIGATION FOR VARIOUS PLANTINGS

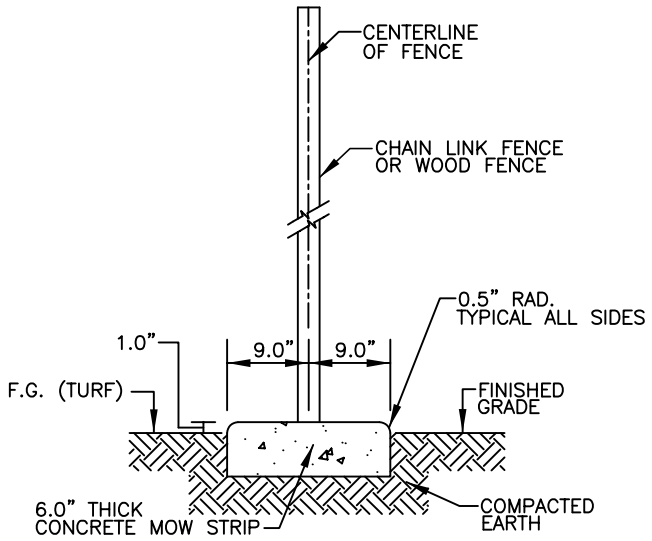
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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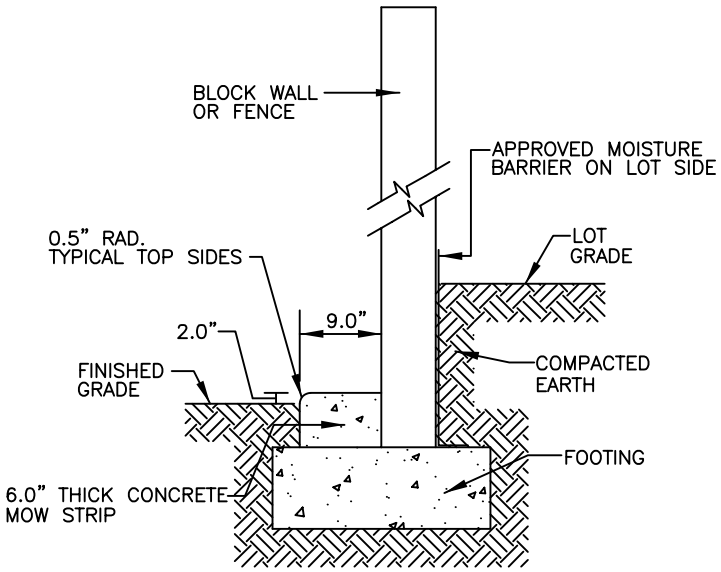
DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. L–12

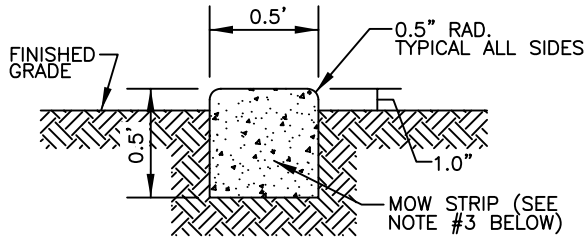
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Ⓝ MOW STRIP AT CHAIN LINK FENCE AND WOOD FENCE



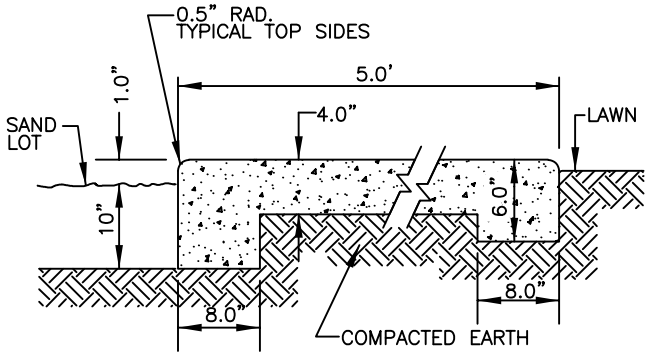
Ⓞ MOW STRIP AT WALL AND FENCE



Ⓟ CONCRETE MOW STRIP

NOTES:

1. CONSTRUCT A DEEP SCORE EXPANSION JOINT AT EVERY FENCE POST AND EVERY 15' ON ALL OTHER CONCRETE SURFACES.
2. ALL AREAS TO RECEIVE CONCRETE SHALL BE COMPACTED TO 90% RELATIVE DENSITY FOR A DEPTH OF 0.5' OR AS APPROVED BY THE ENGINEER.
3. TOP OF MOW STRIP SHALL BE 1.0" ABOVE FINISHED GRADE WHEN ADJACENT TO TURF AND 2.0" ABOVE FINISHED GRADE WHEN ADJACENT TO PLANTER.
4. WHERE THE GRADE ON THE LOT SIDE OF THE WALL IS HIGHER THAN THE GRADE ON THE STREET SIDE OF THE WALL, WATER PROOFING IS REQUIRED. SEE COUNTY PLATE L–11, DETAIL "I" FOR WATER PROOFING REQUIREMENTS.
5. A 9.0" CONCRETE MOW STRIP IS REQUIRED FOR ALL LAWN AREAS ADJACENT TO AN EXISTING OR PROPOSED FENCE PER COUNTY PLATE L–13, DETAILS "N" & "O".
6. ANY AND ALL CHANGES FROM THIS STANDARD DETAIL SHEET SHALL BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.
7. ALL CONCRETE SHALL BE MINOR CONCRETE (SEE PLATE L–7, NOTE 2) IN ACCORDANCE WITH COUNTY STANDARDS, THE LATEST EDITION OF SECTION 73 OF THE STANDARD SPECIFICATION, AND AS APPROVED BY THE ENGINEER.



Ⓠ PLAYGROUND SIDEWALK

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD CONCRETE MOW STRIPS AND PLAYGROUND SIDEWALK

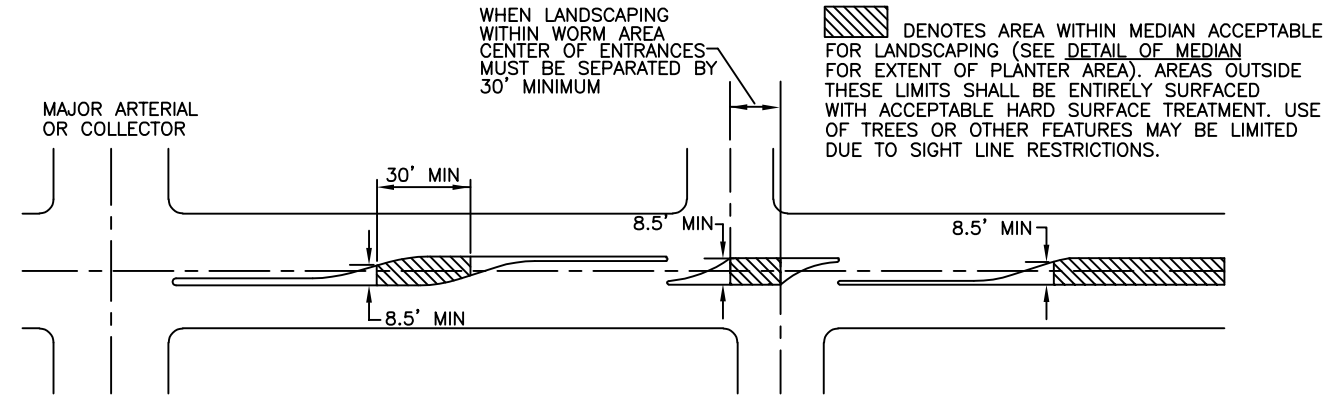
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

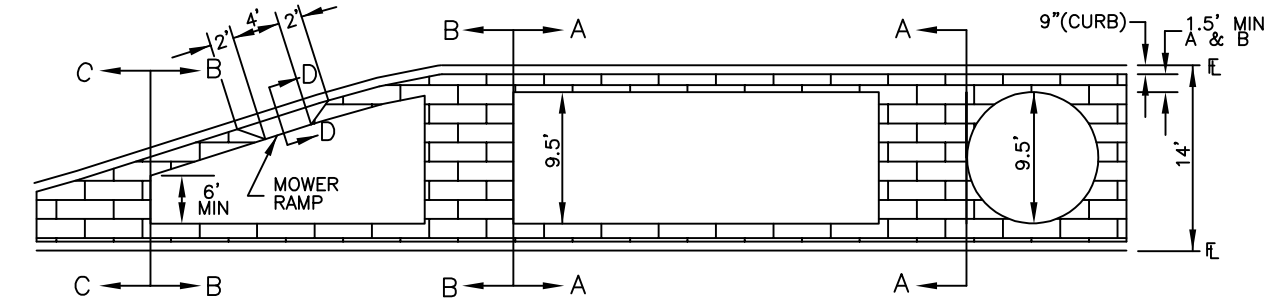
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DESIGNED BY: J.R.C.
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APPROVED BY: J.R.C.

PLATE NO. L–13

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HARD SURFACE TREATMENT

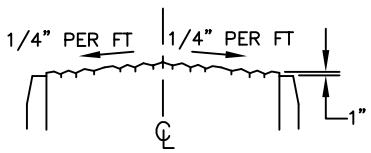
50% MIN. PLANTER AREA
75% MAX. PLANTER AREA

50% MIN. PLANTER AREA
75% MAX. PLANTER AREA

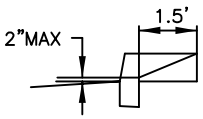
DENOTES ACCEPTABLE HARD SURFACE TREATMENT AS APPROVED BY ENGINEER

DETAIL OF MEDIAN

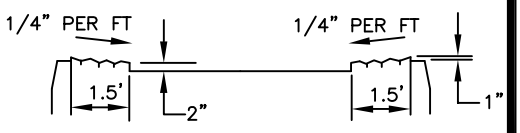
1. A 1.5' MIN. BORDER OF HARD SURFACE TREATMENT IS REQUIRED ADJACENT TO THE BACK OF CURB THROUGHOUT SECTIONS A & B.
2. WHERE WIDTH IS LESS THAN 8.5' MEASURED FROM ℄ TO ℄ (6' PLANTER WIDTH) HARD SURFACE TREATMENT ONLY REQUIRED.
3. HARD SURFACE TREATMENT ONLY MUST BE INSTALLED WHEN THE MINIMUM WIDTH DOES NOT OCCUR FOR 30 CONSECUTIVE FEET.
4. NO TURF WILL BE ALLOWED IN PLANTER AREA WITHOUT PRIOR APPROVAL OF THE DIRECTOR.
5. STAMPED CONCRETE INSTALLATION SHALL BE IN ACCORDANCE WITH SECTION 503-16.01.
6. "SPRAY HEAD" TYPE IRRIGATION REQUIRES THE 1.5' HARD SURFACE TREATMENT ALONG THE PERIMETER OF THE PLANTER TO BE SLOPED INWARD TOWARD THE PLANTER AT 2%.
7. "BUBBLER HEAD" TYPE IRRIGATION IS ENCOURAGED HOWEVER WHERE STREET ℄ GRADES EXCEED 2% FALL, "SPRAY HEAD" TYPE IRRIGATION IS REQUIRED.
8. COLOR OF CONCRETE OR OTHER HARD SURFACE TREATMENT SHALL BE DETERMINED IN CONSULTATION WITH THE DIRECTOR.
9. ALLOWABLE SHAPE OF LANDSCAPED PLANTER AREAS CAN BE FREE FORM AND IS NOT LIMITED TO RECTANGULAR OR CIRCULAR CONFIGURATIONS.
10. INSTALL MOWER RAMP AT ALL MEDIAN BREAKS. (PERFERABLY AT LEFT TURN POCKETS ADJACENT TO LAWN AREAS).



X-SECTION WHERE NO PLANTER EXISTS



SECTION D-D



X-SECTION ADJACENT TO PLANTER AREAS

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD LANDSCAPING UNITS WITHIN MEDIANS

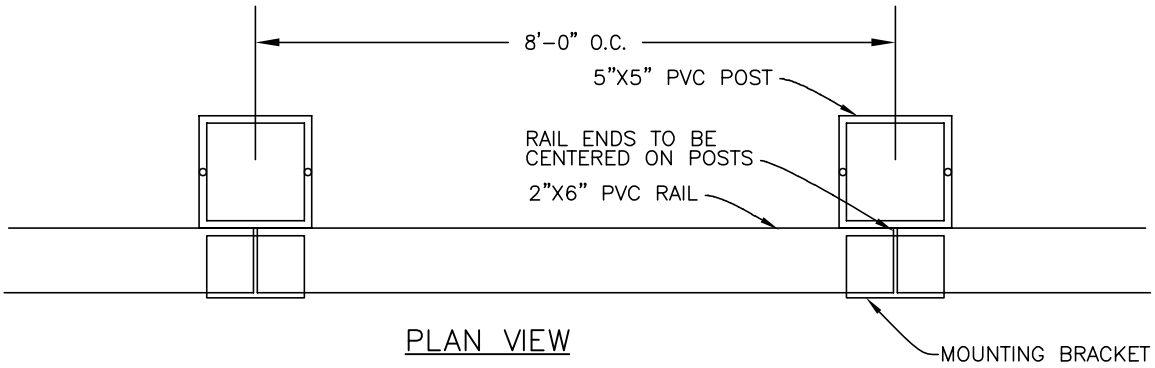
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STATE OF CALIFORNIA
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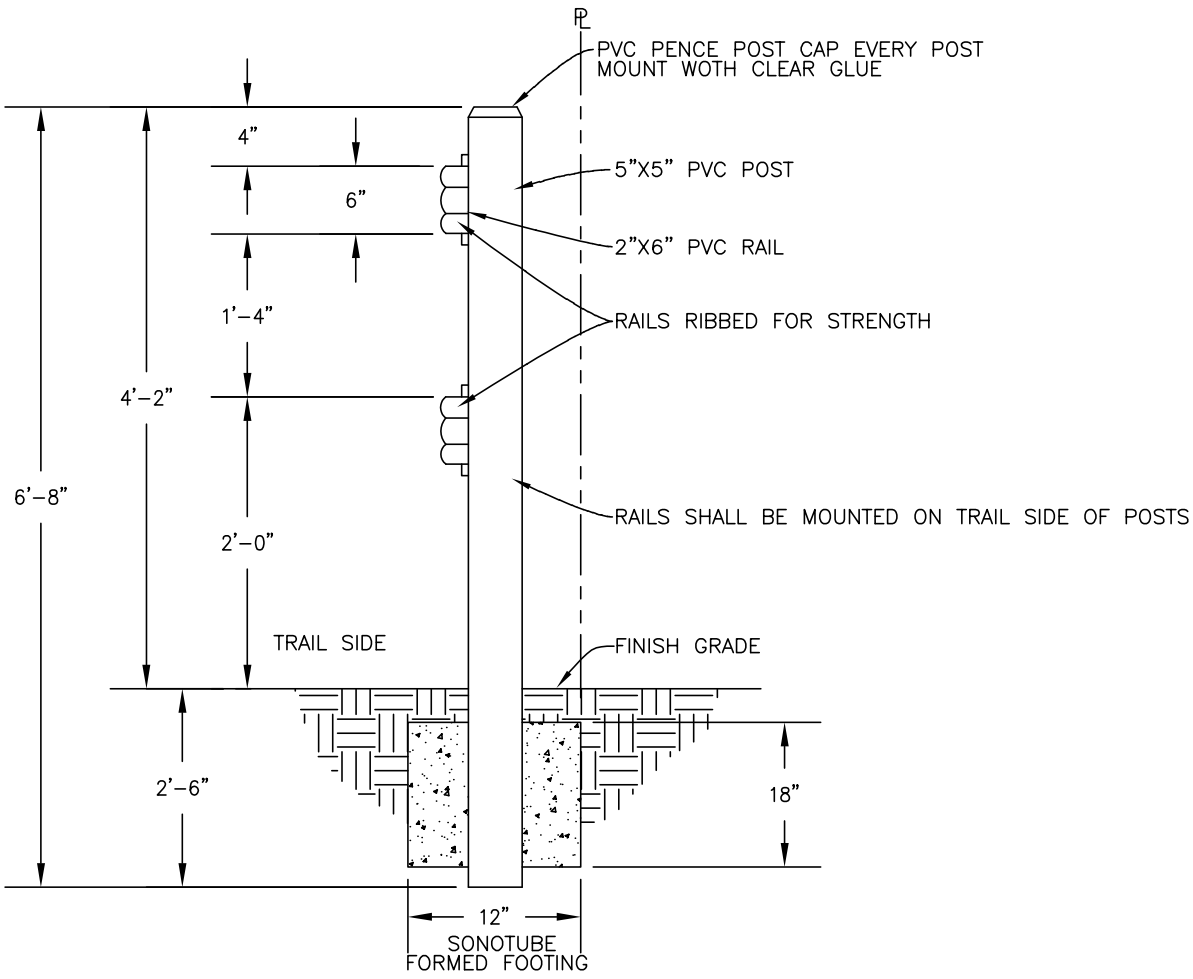
DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. L-14

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PLAN VIEW



SIDE VIEW

NOTES:

1. RAILS SHALL MEASURE EXACTLY 2"X6".
2. POST SHALL MEASURE EXACTLY 5"X5".
3. ALL FENCE MATERIAL SHALL CONSIST OF 100% MONO-EXTRUDED VIRGIN PVC WITH A MIN. OF 8% T102 THROUGHOUT THE PRODUCT OR ALTERNATIVE APPROVED BY THE DIRECTOR.
4. FENCE MATERIAL SHALL BE UV RESISTANT.
5. CAP ALL POSTS AND ENDS OF EXPOSED RAILS.

NOTES: (CONT.)

6. EVERY THIRD PVC POST AND ALL PVC POSTS LOCATED AT CHANGES OF DIRECTION OR END POSTS ARE REQUIRED TO BE FILLED WITH CONCRETE.
7. STAINLESS STEEL SCREWS SHALL BE USED FOR FENCE CONSTRUCTION.
8. RAILS SHALL HAVE TWO RIBS ALONG THE ENTIRE LENGTH OF THE PRODUCT FOR ADDED STRENGTH.
9. TRAILS ON CURVES REQUIRE SPECIAL DESIGN.

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

DETAIL FOR MULTI-USE TRAIL FENCE

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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APPROVED BY: J.R.C.

PLATE NO. L-15

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DIVISION SIX

STANDARDS FOR SEWAGE DISPOSAL, WATER SUPPLY, AND PRESERVATION OF ENVIRONMENTAL HEALTH

CHAPTER I. DEFINITIONS

Sec. 601-1 **The definitions set forth in the following section shall apply throughout these standards.**

601-1.01 **"Alluvium":** Sediment deposited by a river.

601-1.02 **"Disposal field":** The required absorption area on square feet per one hundred (100) gallons of septic tank liquid capacity.

601-1.03 **"Domestic Water":** Water plumbed to a dwelling or structure which is intended to be used for, but not limited to, drinking, food preparation, dish washing, and bathing. Domestic water must also be potable.

601-1.04 **"Easement":** A grant of one (1) or more of the property rights by the owner to or for the use by the public, a corporation, or another person or entity.

601-1.05 **"Effluent":** The liquid outflow of any facility designed to treat, convey, or retain wastewater.

601-1.06 **"Expansion Area":** Additional seepage pits or subsurface drain fields, equivalent to at least one hundred (100) percent of the required original system that may be installed if the original system cannot absorb all the sewage.

601-1.07 **"Floodplain":** A land area adjoining a river, stream, watercourse, or lake which is likely to be flooded, including alluvial cones, wherein streams may change their course. "Primary" floodplain refers to the channel and adjacent areas where the bulk of the flood flow occurs, also commonly known as the "floodway". "Secondary" floodplain refers to areas outside the primary floodplain that are subject to inundation, but where there is no significant flood flow or current.

601-1.08 **"Groundwater":** Water stored underground in the spaces between rocks or sediments.

601-1.09 **"Leach bed ":** The joining of leach line trenches into one large square area.

601-1.10 **"Leach line":** A series of horizontal trenches that hold a level perforated pipe that is used to distribute the wastewater throughout a rock absorption system where it eventually soaks into the soil particles.

601-1.11 **"Percolation Test":** A method of testing water absorption of the soil. The test is conducted with clean water and test results can be used to establish the dispersal system design. The test must be accomplished by registered civil engineers, certified engineering geologists, or approved Registered Environmental Health Specialist.

601-1.12 **"Potable Water":** Water safe for drinking, culinary and domestic purposes, and meets all requirements of the health officer.

601-1.13 **"Public Entity":** A local agency which is empowered to plan, design, finance, construct, operate, maintain, and to abandon, if necessary, any sewerage system, the expansion of any sewerage system and the sewage treatment facilities serving a land development.

In addition, the entity may, per Health and Safety Code (Sections 6950-6982), be empowered to provide permits and to have supervision over the location, design, construction, operation, maintenance, abandonment of individual OWTS, and to conduct any monitoring or surveillance programs required for water quality control purposes.

601-1.14 **"Seepage Pit":** A covered pit with an open-jointed or perforated lining through which wastewater effluent seeps into the surrounding soil, sometimes called a leaching pit or leaching pool.

601-1.15 **"Septic Tank":** A watertight, covered receptacle designed and constructed to receive the discharge of sewage from a building sewer, to separate solids from the liquid, to digest organic matter, to store digested solids through a period of detention, and to allow the clarified anaerobic liquids to discharge for final disposal or additional (supplemental) treatment.

601-1.16 **"Setback":** The required minimum distance between a proposed OWTS and various building, landscape, and water features as specified under Siting Criteria in the Kern County Onsite Systems Manual, Part 1.

601-1.17 **"Sewage":** Any combination of water-carried waste, discharged from buildings.

601-1.18 **"Sewage system":** A network of wastewater collection, conveyance, treatment, and disposal facilities interconnected by sewers.

Private system: a private sewerage disposal system or any part thereof, or the building sewer to the point of connection to a public sewer main which typically parallels the center line of the roadway. A private system is sometimes referred to as private disposal system.

Public system: a common sewerage system or any part thereof which is operated by the county, or by a county service area, or by any political subdivision or public entity.

601-1.19 **"Streams":** Surface: a continual or seasonal flow of water in channel having a definite bed and banks.

Non-classified: a flow of water within a well-defined course only during a period of storm runoff.

CHAPTER II. GENERAL

Sec. 602-1

The Kern County Public Health Services Department, Environmental Health Division (EHD) "Standards for Land Developments" include the aspects of sewage disposal, water supply, and preservation of environmental health. The standards, which are intended to safeguard the public health, are enforced by EHD. They are primarily intended to apply to residential units. The applicant may request a variance from the requirements of these Standards. Exceptions may be granted by the Director of the Public Health Services Department. The Director of the Public Health Services Department is authorized to approve a variance if it is determined that the granting of such variance will not result in any nuisance or menace to the public health, and may conditionally approve a variance if it is determined to be necessary to meet the goals and objectives of these "Standards".

Sec. 602-2

It is the responsibility of the land developer and his technical consultants to provide to the EHD any and all data needed to satisfy the content and the intent of these Standards.

Sec. 602-3

Regulations of the State of California or other governmental agencies that are more restrictive in nature, have precedence over these Standards.

Sec. 602-4

All references herein to the California Plumbing Code (CPC) relate to the current edition as adopted by the County of Kern.

CHAPTER III SEWAGE DISPOSAL BY INDIVIDUAL ONSITE WASTEWATER TREATMENT SYSTEMS

Sec. 603-1

Consideration should be given to the construction of a community sewerage system and treatment plant if connection to a public sewer is not possible. Where sewage disposal by individual onsite wastewater treatment systems (OWTS) such as septic tanks with disposal fields or seepage pits is proposed, the following standards shall apply:

1. A soils report regarding the feasibility of using individual OWTS in accordance with the standards of good public health and engineering practice is required. Three copies of the report must be submitted. The report must be prepared by a registered civil engineer, qualified in the field of soils engineering, or by some other specialist acceptable to the EHD. The report is subject to the review and approval of the Division.

2. The report must include the results of soil percolation tests. Percolation tests shall be made in accordance with the U.S. Public Health Service test procedure (Manual of Septic Tank Practice, Part I). Any departure from that procedure must first be approved by the EHD. The submittal of soil test hole logs is also required, with soils classified in accordance with the Kern County Onsite Systems Manual and by either the U.S.D.A. Soil Classification System or Unified Soil Classification System.

   Where soil and bedrock conditions permit, the test pits or borings shall extend to minimum depths of seven (7) feet below the bottoms of proposed disposal trenches or twelve (12) feet below the bottoms of pits. The Engineer must specify whether disposal trenches and/or pits are to be used. The number of test holes and percolation tests is ordinarily at the discretion of the engineer, but they are required to state whether or not the soil in each lot in a development is capable of satisfactorily absorbing sewage effluent.

Soil and percolation test hole locations must be accurately plotted on the map which accompanies the report. If the soil types vary within the development, the map shall indicate limits of the different types, and a lot-by-lot list of soil types shall be submitted.

3. For purposes of standardization, Appendix Tables 1 and 2 shall be used to correlate percolation rates with soil types.

Sec. 603-2

Individual OWTS may be used only where sufficient area for them is provided and where the density of such systems and of the resulting sewage effluent will not have an adverse effect upon water quality or public health.

1. The minimum allowable lot size where individual OWTS are used is considered to be a function of soil properties, climate, geology, and topography. The required minimum lot size where individual OWTS are used is 10,000 square feet net, except as follows:
    a. In desert, valley, or foothill areas, lots may be less than 10,000 square feet net but no less than 7,200 square feet net, where individual systems are used, provided that the following criteria, over and above those contained elsewhere in these Standards, are satisfied:
        i. A functioning public entity providing potable water exists or is provided.
        ii. The site is shown on the Geologic Map of California as “Recent Alluvium”, as published by the California Division of Mines and Geology.
        iii. The soils for septic tank purposes are Type 2 (Fine sand) per Appendix Table 2.
        iv. The natural slope of the surface of the ground throughout the site does not exceed ten (10%) percent.
        v. Other pertinent environmental quality control factors, in the discretion of the Director of the Public Health Services Department, allow the smaller lot size.

2. In all areas, each lot shall be provided with an adequate site for subsurface disposal of sewage effluent within the boundaries of the lot. The site must have a natural slope of thirty (30%) percent or less; it must be located to allow disposal by gravity flow, and its size for single family residential use, whether leaching trenches or disposal pits are used, shall be in accordance with Appendix Table 3.

3. The required minimum size of the effluent disposal field area for multiple dwelling lots, in which leaching trenches or seepage pits are used, shall be determined by the following information:

    a. The required area in square feet and the required septic tank capacity in gallons, in accordance with requirements in the Kern County Onsite Systems Manual (Part 1).

    b. The proposed number of dwelling units, the number of bedrooms in each unit, and the soil type in the future effluent disposal area must be known in order to derive the required area.

    c. Also, the use of dual disposal systems, which entails alternate, periodic use and resting of trenches or pits, is required on multiple dwelling lots.

Sec. 603-2.02

In designing lots and sewage disposal sites prior to the filing of a tentative map, the following factors shall be considered:

1. Space shall be allowed on the lot for expansion of the original disposal field. The square footages given in Appendix Table 3 are intended to satisfy initial expansion area requirements for disposal fields. The use of dual disposal systems, which entails alternate, periodic use and resting of trenches and pits, may be required at the reasonable discretion of the Director of the Public Health Services Department. Where dual disposal systems are to be used, each one-half of the system shall have an absorption area equal to at least two-thirds of that required by the current Kern County OWTS design standards, per Onsite Systems Manual, Part 1, an expansion area capable of accommodating at least 50% of the original installation is required in Types 1, 2, and 3 soils; at least 87% in Type 4 soil; and 125% in Type 5 soil.

2. The design of the lot should be easily accessible for future maintenance, repair, reconstruction, or connection to future public sewers.

3. The installation of sewage disposal systems within easements is not permitted without prior approval of the easement holder. Slope easements are included in this prohibition.

4. The disposal system must be located so that sewage effluent will not percolate out through the surface of the embankment. As a guideline, disposal systems should be set back at a ratio of 4 to 1 from embankments; for example, for each vertical foot of embankment height, the disposal system should be located four feet horizontally from the top of the embankment. Setbacks should be adjusted to suit local geologic conditions. The following minimum setbacks from water wells are required:

System	All Water Wells	Public Water Supply Wells
Sewer or water-tight septic tank	100 feet	150 feet
Leaching Field	100 feet	150 feet*
Seepage Pit	150 feet	150 feet*

*200 feet for any trench or seepage pit >10' deep; 2-yr microbial travel study required for seepage >20' deep within 600 feet of public water supply well.

5. These setback distances may be increased where deemed necessary by the Director of the Public Health Services Department.

6. Disposal systems should not have to be installed underneath pavement or other impervious ground surface coverings. If it is necessary to install disposal fields beneath impervious surface coverings, the disposal system and required areas shall: (1) be increased by 25%; and (2) be installed using traffic-rated chambers in place of standard pipe and drain rock, with no reduction credit for chambers.

7. The use of aerobic or other supplemental treatment equipment in place of or in addition to conventional septic tanks is not acceptable as a basis for reduction of the subsurface disposal area. The installation of electro-mechanical sewage disposal devices must have a provision for periodic professional maintenance, and is subject to approval by the EHD as an "alternative OWTS" in accordance with provisions of Kern County OWTS Ordinance Article 3.

8. A lot is not suitable for residential use if the sewage disposal system cannot be installed within its boundaries.

9. Bedrock, other impervious formations, and the maximum seasonal elevation of the ground water level shall be at least seven (7) feet below the bottoms of disposal trenches or twelve (12) feet below the bottoms of seepage pits.

   In very pervious soils, for example, Types 1 and 2, the required separation between ground water level and the bottoms of disposal trenches or pits may be increased at the discretion of the Director of the Public Health Services Department.

10. The installation of sewage disposal systems in areas underlain by carbonate rocks or by fractured bedrock is not permitted unless evidence indicates that solution cavities or open fractures will not serve as conduits for the passage of improperly filtered sewage effluent into ground waters, springs, or surface streams.

    Professional findings or opinions in this regard shall be submitted where applicable.

11. No sewage or sewage effluent may be discharged within 100 feet (horizontally) of any water source or the high water mark of a river, stream, canal, lake, or other surface body of water.

    Sewage disposal systems shall be located as far as possible from a non-classified stream or its established easement and in no case closer than 25 feet thereto unless certified by a qualified engineer that is safe to do so without creating a nuisance or endangering the watershed.

Sec. 603-3

The engineer is required to submit a statement that all lots have been designed in compliance with these standards. For “alternative OWTS” and other specially engineered systems, the engineer shall certify that the system(s) have been installed according to the approved plans when required by the EHD.

Sec. 603-4

One copy of a topographical analysis map on the tentative map base (or on a larger scale map) may be required at the Director of the Public Health Services Department discretion. Slope percentage categories shall be depicted in accordance with the following color code:

Slope Range	Color
0 to 30%	Uncolored
Greater than 30%	Colored

Additionally, the map shall show all easements and locations of rock out-crops, high ground water, and spring discharge. The portions of lots allocated for the subsurface disposal of sewage effluent shall be delineated, and their approximate areas in square feet indicated. The approximate size of irregularly shaped lots must also be shown.

Sec. 603-5

Where watercourses, significant drainage channels, or bodies of water traverse or adjoin a lot, a predevelopment plan, showing how OWTS can be installed and still remain at least the necessary distance from the high-water mark, may be required. Lines depicting the required setbacks from such watercourses, drainage channels, or bodies of water shall be indicated on a copy of the tentative map.

Sec. 603-6

The use of disposal fields, wherever conditions permit, is preferred to that of pits. Seepage pits are prohibited where percolation rates for them exceed 25 minutes per inch (U.S. Public Health Service test procedure). In lieu of seepage pits, the engineer may consider the use of “alternative OWTS” or “specially designed”, deeper disposal trenches in accordance with applicable provisions and requirements of Kern County OWTS Ordinance, Article 3 and Onsite Systems Manual.

Sec. 603-7

If the engineer determines that the building of fill pads for the installation of disposal fields is necessary, he/she must submit design criteria for such pads and fields. Where any fill pad is to be built in sloping terrain, EHD shall require the subdivider to furnish findings of an engineer or engineering geologist qualified in such matters regarding the possibility of soil slippage or landslide of the pad area, along with recommended design measures to mitigate such hazards. The Engineer shall certify that the fills are constructed in accordance with the design.

Sec. 603-8

If lot-grading adversely changes the engineer's initial report on percolation characteristics of the soil in a proposed sewage disposal area, the system installed therein shall be designed in accordance with specific recommendations of a soils engineer or other specialist acceptable to EHD .

Sec. 603-9

If underground irrigation lines or other pipelines, either abandoned or proposed for abandonment, exist within a proposed land development, their locations must be shown on the tentative map, and they must be removed or destroyed as part of the subdivision improvements.

Sec. 603-10

When a geologic hazards report for land development is prepared (either at the developer's will or as a requirement of any governmental agency), it shall include findings and recommendations concerning probable adverse effects of such hazards on the integrity of water supply and sewage disposal facilities. A copy of the report shall be furnished to EHD.

Sec. 603-11

When a flood hazard is found to exist, the engineer shall define it and shall submit their recommendations for protecting the integrity of water wells, water quality, and OWTS. Where applicable, the limits of the 100-year flood line shall be indicated on the tentative map.

The installation of public or private sewage disposal systems in a primary floodplain is prohibited. In a secondary floodplain, individual sewage disposal systems are not permitted unless protected by flood control devices approved by the Kern County Public Works Department and constructed in accordance with the requirements of the EHD so as to minimize infiltration of floodwaters into the systems and discharges from the systems into the floodwater.

Sec. 603-12

EHD acceptance of proposed water supply and sewage disposal methods is contingent upon clearance of those proposals through the State Regional Water Quality Control Board or State Water Resources Control Board.

Sec. 603-13

If a private domestic water well and individual OWTS are to be constructed on a lot, the minimum lot size shall be 2 ½ acres gross. In order to preclude interference with neighboring installations, water wells shall be located with consideration of required setback distances from existing or future neighboring OWTS. Where demonstrated by a qualified civil engineer or geologist to be practical from the public health and engineering viewpoints, an exception may be granted to allow lot design of one (1) acre net minimum size where the construction of a private water well and individual OWTS is proposed. This will normally entail completion of a cumulative impact assessment per Kern County OWTS Ordinance, Article 3 and applicable guidelines contained in the Onsite Systems Manual, Part 1.

Sec. 603-14

In accordance with the California Plumbing Code and County ordinance, all individual OWTS must be installed under permit with the Building Inspection Division of the Kern County Public Works Department.

Sec. 603-15

In areas which are determined by EHD to be unsafe for installation of individual sewage disposal systems, and where it is considered likely that a nuisance or health hazard might be created, said areas shall be served by an approved public or community sanitary sewer system.

Sec. 603-16

If a "package treatment plant" is proposed as a means of community sewage disposal, the engineer must submit design criteria for the plant to EHD and receive approval from the appropriate Regional Water Quality Control Board.

Sec. 603-17

In larger land developments, consideration should be given to setting aside easements and areas for possible future use for sewage collector lines and treatment plant sites. In some cases, EHD may require such provisions.

Sec. 603-18

If a proposed land development is to be served by a public or community sewerage system, a letter from the appropriate agency or company signifying its capability and its intention to furnish its sewerage facilities to the property must be submitted to EHD. If construction has not begun within one year of the date the "will serve" letter is issued, an updated letter will be required.

Sec. 603-19

The sewerage statement on the tentative map for a land development for which individual sewage disposal systems are proposed should be worded: "Sewerage: Individual septic tank systems to be furnished by each subsequent lot owner", or similar.

Sec. 603-20

The findings and comments of EHD regarding a proposed land development are ordinarily based upon the most recent of available tentative maps. If the design is later changed significantly, a reappraisal of the development by the Division may be necessary.

CHAPTER IV. WATER SUPPLY

Sec. 604-1

There must be an adequate supply of potable domestic water for the needs of the development.

Sec. 604-2

The quality of the domestic water supply shall meet the current U.S. Environmental Protection Agency Drinking Water Standards. Should those standards be replaced by those of some Federal or State agency, the newer standards shall apply.

Sec. 604-3

Where domestic water supply by private wells is proposed, a report prepared by a qualified engineer or geologist outlining findings and opinions concerning the adequacy of the quantity and quality of ground water is required. The report shall include but shall not be limited to data on the chemical and bacteriological qualities of the ground water (chemical and bacteriological analyses must be made by a State approved laboratory).

Sec. 604-4

Tank-truck hauling of domestic water for land developments or lots within new land developments is not permitted.

Sec. 604-5

Domestic water supply wells shall be drilled and constructed in accordance with the Kern County Ordinance Code. The installation of private water wells within easements or in building setback areas is not permitted.

Sec. 604-6

All domestic water supply systems must be under EHD or State Water Resource Control Board. A permit to construct a new water system for a subdivision must be obtained prior to recordation of the final map. If an existing system is to be expanded, its permit must be updated prior to recordation of the final map.

Construction of any water supply facilities shall be in compliance with the Kern County Zoning Ordinance, and any Variance, Conditional Use Permit, Modification, or other requirement shall be obtained prior to recordation of the final map.

Sec. 604-7

Existing water wells which have been or are proposed to be abandoned shall be destroyed in accordance with the Kern County Ordinance Code prior to recordation of the final map

Sec. 604-8

If the proposed land development is to be served by a public domestic water supply, a letter from the appropriate agency or company signifying its capability and its intention to furnish domestic water to the property must be submitted to EHD . If construction has not begun within one (1) year of the date the "will serve" letter is issued, an updated letter will be required.

Sec. 604-9

Sources of domestic water supply are not permitted in floodplains unless protected by flood control devices approved by the Water Agency or the Kern County Public Works Department and constructed in accordance with the requirements of EHD so as to minimize infiltration of floodwaters thereinto.

CHAPTER V.

PRESERVATION OF ENVIRONMENTAL HEALTH

Sec. 605-1

Any aspect of the design of a proposed development which in the opinion of the Director of the Public Health Services Department is likely or highly possible to cause serious public health problems; or likely to cause degradation of environmental quality by pollution or contamination shall be cause for a recommendation from the EHD for disapproval of the development.

EHD activities in this regard will be coordinated with the appropriate State agencies.

Sec. 605-2

Violations of health and safety laws within a proposed land development must be abated prior to EHD acceptance of the development.

Uncovered or abandoned shafts, pits, and wells, and any other possible hazards, shall be properly destroyed, filled, or otherwise corrected.

Sec. 605-3

Land developments are subject to review and regulation with regard to all aspects pertinent to EHD.

Appendix

Table 1. Percolation rates correlated with soil types.

Percolation Rate Minutes/Inch	Soil Type
Less than one	1
1 to 3	2
3+ to 10	3
10+ to 25	4
25+ to 60	5
Greater than 60	Unacceptable

Table 2. Design criteria of five typical soils.

	Type of Soil	Required sq. ft. Of leaching area/ 100 gal. (m^2/L)		Maximum absorption capacity in gals./sq. ft. of leaching area for a 24 hr. period (L/m^2)	
1	Coarse sand or gravel	20	(0.005)	5.0	(203.7)
2	Fine Sand	25	(0.006)	4.0	(162.9)
3	Sandy loam or sandy clay	40	(0.010)	2.5	(101.8)
4	Clay with considerable sand or gravel	90	(0.022)	1.1	(44.8)
5	Clay with small amount of sand or gravel	120	(0.030)	0.8	(32.6)

Table 3. Minimum size of disposal site (square feet) required according to soil type in disposal area.

Soil Type in Disposal Area	Required minimum size of disposal site (square feet) *
1	2,000
2	2,500
3	4,500
4	13,000
5	21,000

* Exclusive of any areas occupied by structures, setbacks, and easements on the lot and in accordance with the requirements of the Kern County Onsite Systems Manual and these standards.

The minimum disposal area required by the table above (which includes expansion area) is for standard leaching trenches which provide three (3) square feet of leaching area per lineal foot, or special leaching trenches which provide seven (7) square feet of leaching area per lineal foot.

DIVISION SEVEN

CONSTRUCTION SECURITY

CHAPTER I. GENERAL

Sec. 701-1 Purpose and Scope

The following unit prices are to be used when security is required for developments within the unincorporated area of Kern County. The unit prices may be revised when construction costs differ significantly from current amounts. Revisions will be made by the Director with consultation of private engineers.

Sec. 701-2 Preparation and Approval of Engineer's Estimate

Estimates shall be prepared by a registered engineer for the developer and approved by the Director. Small projects/estimates shall be adjusted to the approval of the Director.

Sec. 701-3 Reduction in Estimates

When a portion of the work required is completed prior to posting security, the security may be reduced based on work completed. The security amount shall be as follows:

1. Total estimate
2. Minus estimated work completed
3. Plus 20% of (1-2) (See Section 702-9)
4. Plus 10% of work completed.

The estimate of work completed shall be approved by the Director.

CHAPTER II. UNIT PRICES

Sec. 702-1 **Unit Prices for Preparing Improvement Security Estimates for Kern County Developments**

Sec. 702-2 **Road Construction Items**

ITEM	DESCRIPTION	UNITS	MINIMUM UNIT PRICES
Excavation (Roadway)	Over 50,000 20,000 to 50,000 20,000 to 10,000 10,000 to 5,000 Under 5,000 Compacted Imported Borrow	Cu. Yd. Cu. Yd. Cu. Yd. Cu. Yd. Cu. Yd. Cu. Yd.	$ 36.00 48.00 72.00 100.00 150.00 200.00
Curb and Gutter	PCC A2-6 (6" High Curb) Under 1,000 L.F. Over 1,000 L.F. A.C. Dike (6" High)	 L.F. L.F. L.F.	 65.00 40.00 35.00
Concrete Sidewalk, Driveways	4" Thick 6" Thick	Sq. Ft. Sq. Ft.	6.00 9.00
Concrete Cross Gutter	6' Wide X 6" Thick (Std.)	Ea. Sq. Ft.	5,500.00 9.00
Wheelchair/Curb Ramps	ADA,Title 24 and Caltrans compliant. With detectable warning.	Ea.	3,000.00
Concrete-Structural	Retaining Walls, etc. Class A	 Cu. Yd.	 1,000.00
Aggregate Base	Class 2	Cu. Yd.	120.00
Street Surfacing Paving	Asphalt Concrete - For Streets and Alley Only Misc. Asphalt Concrete - Includes all areas outside of street & Alley Gutterlines	<1000 1000-5000 >5000 Tons Tons	150.00 100.00 75.00 120.00
Construction Seal	Asphalt Rejuvenating Agent	SY	0.25
Saw Cutting		L.F.	5.00

Sec. 702-3 Drainage Items

ITEM	DESCRIPTION	UNITS	MINIMUM UNIT PRICES
Structures	Manholes	Ea.	$5,200.00
	Junction Boxes	Ea.	6,500.00
	Standard Outlet Structure	Ea.	5,200.00
	Catch Basin Up to 5' Opening Width	Ea.	6,500.00
	Per Additional Foot of Opening Beyond 5'	Ft.	1,300.00
Note: The estimated actual structure cubic yardage may be used in lieu of the above each and per foot, using $2500 per cubic yard.			
	Other Structures and headwalls (Includes Forming & Reinforcement	Cu. Yd.	3,800.00
Under-Sidewalk Drain		Ea.	4,600.00
Gunite - (Includes Reinforcement - 3" Thick)		Sq. Ft.	20.00
Rip Rap		Cu. Yd.	165.00

Pipe Installed as Storm Drains - (In-Place per L.F.)

CONCRETE (Plain)		R.C.P (Rubber Gasket)		For Runs over 200 Ft.	C.M.P. (Galvanized)	
Size	**Cost**	**Size**	**Cost**	**Cost**	**Gauge**	**Cost**
18"	$ 130	18"	$ 160	$ 125	16	$125
21"	150	--	165	130	--	--
24"	160	24"	170	140	14	160
27"	--	--	180	145	--	--
30"	--	30"	190	150	14	225
36"	--	36"	210	170	14	260
42"	--	42"	225	180	14	300
48"	--	48"	290	230	14	350
54"	--	54"	340	275	12	390
60"		60"	390	315	12	445
72"	--	72"	910	730	10	590
84"	--	--	2,000	1,560	--	--

DOWNS DRAINS	UNITS	MINIMUM UNIT PRICES
12" Pipe	L.F.	$195.00
Entrance Taper	Ea.	880.00
Exit Treatment W/Anchors	Ea.	520.00

C.M.P. Standard End Sections - (Installed)

Size	Units	Minimum Unit Prices	Size	Units	Minimum Unit Prices
18"	Ea.	$ 250	54"	Ea.	$2,965.00
21"	Ea.	280	60"	Ea.	3,720.00
24"	Ea.	325	66"	Ea.	4,110.00
30"	Ea.	600	72"	Ea.	4,485.00
36"	Ea.	890	78"	Ea.	4,810.00
42"	Ea.	1,550	84"	Ea.	5,235.00
48"	Ea.	2,225			

Sec. 702-4 Sanitary Sewer

ITEM	DESCRIPTION	UNITS	MINIMUM UNIT PRICES PVC	VCP
Pipe 3' Minimum Cover- Includes trenching, backfill and fittings.	4" 6" 8" 10" 12"	L.F. L.F. L.F. L.F. L.F.	$40.00 60.00 70.00 85.00 90.00	$45.00 70.00 75.00 85.00 90.00
Manholes	Standard - 6' to 8' Deep - 9' to 12' Deep - 13' to 16' Deep Single Drop Multiple Drop	Ea. Ea. Ea. Ea. Ea.	3,400.00 3,900.00 4,700.00 4,200.00 4,400.00	
Tie-In	Connect to existing	Ea.	6500.00	
Clean Outs (To Grade)	4" 6" 8"	Ea. Ea. Ea.	685.00 845.00 910.00	

Sec. 702-5 Domestic Water Items

ITEM	DESCRIPTION	UNITS	MINIMUM UNIT PRICES
Pipe (Includes trenching, backfill and fittings - No Valves			
	4" PVC Class 150	L.F.	$ 34.00
	6" PVC Class 150	L.F.	40.00
	8" PVC Class 150	L.F.	46.00
	10" PVC Class 150	L.F.	55.00
	12" PVC Class 150	L.F.	63.00
	14" PVC Class 150	L.F.	78.00
	4" DIP Class 50	L.F.	47.00
	6" DIP Class 50	L.F.	53.00
	8" DIP Class 50	L.F.	59.00
	10" DIP Class 50	L.F.	65.00
	12" DIP Class 50	L.F.	78.00
	14" DIP Class 50	L.F.	94.00
	16" DIP Class 50	L.F.	101.00
Road Bore	12"	L.F.	260.00
Valves (Mechanical Joints - Includes Installation			
	2" Gate	Ea.	520.00
	4" Gate	Ea.	925.00
	6" Gate	Ea.	1,110.00
	8" Gate	Ea.	1,365.00
	10" Gate	Ea.	2,350.00
	12" Gate	Ea.	2,730.00
Valves (Flanged Joints - Includes Installation)			
	4" Gate	Ea.	1,250.00
	6" Gate	Ea.	1,950.00
	8" Gate	Ea.	3,400.00
	10" Gate	Ea.	3,650.00
	12" Gate	Ea.	4,030.00
Valve Boxes		Ea.	665.00
Meter Boxes-Concrete		Ea.	140.00
Blow-offs	2" (with box & valve; add $35 per linear foot of pipe length from main to blowoff in excess of 15')	Ea.	1560.00
	4" (with hydrant outlet; add $30 per linear foot of pipe length from main to blowoff in excess of 15')	Ea.	2,600.00

ITEM	DESCRIPTION	UNITS	MINIMUM UNIT PRICES
Services	3/4" single-long & short 1" single-long & short 1" double-long & short 2" single (add $24 per linear foot of pipe length from main to R/W in excess of 15')	Ea. Ea. Ea. Ea.	$1,200.00 1,450.00 1,700.00 1,500.00
Fire Hydrant (Including gate valve)		Ea.	5,200.00
Tie-in		Ea.	1,450.00
Plug & Block		Ea.	260.00

Sec. 702-6 Miscellaneous Items

ITEM	DESCRIPTION	UNITS	MINIMUM UNIT PRICES
Chain Link Fencing	4' High Chainlink Fence 6' High Chainlink Fence Gates-14' Opening w/post lock 6' Chainlink Fence (with redwood slats & 6"x18" concrete footing (including gates)	L.F. L.F. Per Pair L.F.	$ 75.00 75.00 3,600.00 95.00
CMU Screen Wall	5' High 6' High	L.F. L.F.	115.00 130.00
Electric Gates - Double		Ea.	26,000.00
Electric Gates - Single		Ea.	19,500.00
Landscaping		S.F	10.00
Liquid Asphalt (R.M.S.)		Ton	800.00
Survey Monuments		Ea.	205.00
Survey Monument Encasements		Ea.	800.00
Lot Corners		Ea.	65.00

ITEM	DESCRIPTION	UNITS	MINIMUM UNIT PRICES
Street Signs		Ea.	300.00
Barricades		Ea.	600.00
Street Lights		Ea.	10,000.00
Pump Station		Ea.	Per Engineer

Sec. 702-7 Utilities

The cost of all utility relocations shall be based upon estimates submitted by utility companies.

Sec. 702-8 Items not listed

When the project requires construction or installation of items not listed in the previous tables, the engineer shall provide an estimate of the item(s), to be approved by the director.

Sec. 702-9 Inflations-Contingency Factor

A contingency factor of 20% shall be added to the unit prices to compensate for the effect of inflation and any changes in construction during the life of the project.

DIVISION EIGHT

SURVEY MONUMENTS

CHAPTER I. GENERAL

Sec. 801-1 Purpose and Scope

Survey monuments shall be set in accordance with the Kern Land Division Ordinance, California Subdivision Map Act, California Professional Land Surveyor's Act and California Government Code Section 27580-27581, by a surveyor registered in the State of California, or an appropriately licensed civil engineer, for all land developments. All monuments shall be properly identified by the surveyor or engineer setting the monuments.

CHAPTER II. MONUMENTS

Sec. 802-1 Permanent Monuments (Streets)

Monuments for street locations shall be precast concrete blocks in the shape of a frustum of a cone with a base diameter of ten (10) inches, a top diameter of six (6) inches and a height of ten (10) inches with the top of the monument containing a brass disk bearing the surveyor's license number. These monuments shall be set at all points of intersection of street centerline, all angle points of street centerline and all beginning and ending of curvature along street centerlines in a Standard Survey Monument Encasement in accordance with Plate No. R-70.

Sec. 802-2 Permanent Monuments (Boundaries)

The surveyor may use either the street monument specified in Sec. 802-1, or a two (2) inch iron pipe a minimum of 18 inches in length, for boundary monuments. Iron pipes shall be filled with concrete or have a two x two (2 x 2) redwood stake driven in the top of the pipe with a penny tag or a suitable metal cap driven into or permanently fixed to the pipe bearing the surveyor's license number. Boundary monuments shall be set along the exterior boundary of the development at all angle points, curve points and points of intersection.

Sec. 802-3 Monuments (Lot Corners)

Monuments shall be set for all lot corners in a development by a surveyor. Monuments for lot corners shall be a one (1) inch iron pipe a minimum of 12 inches in length, or a one-half (1/2) inch rebar or a five-eighths (5/8) inch rebar a minimum of 18 inches in length with a plastic or aluminum cap. Where concrete curb and gutter exists, the surveyor may set brass tags in the curb along the offset of the lot line. Tag and nail shall be set in wet concrete or in a drilled hole filled with approved epoxy. Brass tags shall be set where extended lot lines intersect the concrete curb.

Sec. 802-4 Monuments General

1. The County Surveyor shall determine the number, type, and location for all survey monuments, which may include section corners, quarter corners, center of section, or any other PLSS corner deemed necessary within the project area. Variance to the above requirements may be granted or required by the County Surveyor.

2. The consulting engineer shall show the location and character of all known survey monuments within the construction area, and place a note on all construction plans stating the following:

   "The contractor is responsible for the protection of all existing monuments and other survey markers in accordance with Section 8771 of the Professional Land Surveyor's Act".

DIVISION NINE

STANDARDS FOR TRAFFIC ENGINEERING

CHAPTER I. INTRODUCTION

Sec. 901-1 Purpose and Scope

This division establishes the minimum acceptable standards for the application of traffic engineering and traffic planning principals in the design of the transportation system to promote the safe, efficient and orderly movement of goods and people.

CHAPTER II. TRAFFIC STUDIES

Sec. 902-1 Responsibility for Traffic Studies

Traffic studies may be required by the County in order to adequately assess the impacts of a development proposal on the existing and/or planned major street system. These impacts would typically be addressed in the "Traffic Circulation" section of an Environmental Impact Report (EIR). If a full EIR is not required, a Negative Declaration, or an expanded initial study addressing traffic impacts, may be required. The primary responsibility for assessing the traffic impacts associated with a proposed development shall be the developer's, with the County serving in a review capacity.

The following development proposals will require regional traffic studies prepared, in a format acceptable to the Kern County Public Works Department, unless the study is waived.

902-1.01 Any Project proposed within the Kern County General Plan, where a Transportation Impact Fee Program has not been implemented and the increase in project trip generation during any peak hour is expected to exceed 50 vehicles.

902-1.02 Any Project proposed within the Rosamond-Willow Springs Specific Plan where the increase in project trip generation during any peak hour is expected to exceed 50 vehicles.

902-1.03 Any General/Specific Plan Amendment application, which is expected to intensify land use over that previously allowed in the General/Specific Plan whereby the increase in trip generation during any peak hour is expected to exceed 50 vehicles.

Where proposed projects, as noted above, are not expected to result in an increase in trip generation, it is exempt from a regional traffic impact study. To be eligible, a traffic analysis shall be submitted and approved which computes

trip generation with proposed land uses. Said analysis shall show that increase in peak hour trip generation does not exceed 50 trips.

902-1.04 Special traffic studies may be required where special circumstances dictate the need for a traffic study (such as issues of safe access concerns, significant public opposition, request for deviation from standards, large commercial/ industrial centers, etc.).

902-1.05 Where access points are not defined at the time the traffic study is prepared, additional traffic work may be required when the access points are determined.

902-1.06 Transportation consultants are required to discuss projects with the Development Review Division prior to starting the study.

902-1.07 The traffic study shall be prepared, stamped and signed by a licensed Traffic Engineer or Civil Engineer experienced in preparing traffic studies.

Sec. 902-2 Traffic Study Format

In order to provide consistency and to facilitate staff review of traffic studies, the Caltrans “Guide for The Preparation of Traffic Impact Studies” shall be followed in the preparation of traffic studies.

(http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/reports/tisguide.pdf) VERIFY REFERENCE AND THE METRIC TO BE USED

Facilities to be studied shall be any City, State or County facility (mainline, interchange, structure, intersection or any project on the Transportation Impact Fee (TIF) list) when the peak hour trip generation onto said facility exceeds 50 trips. For those facilities currently experiencing level-of-service (LOS) "C" or less, the following "sliding scale" of "added peak project trips" shall be applied as the procedure to determine whether the facility should be included:

EXISTING LOS	ADDED PEAK PROJECT TRIPS
"C"	50
"D"	40
"E"	20
"F"	10

902-2.01 Project Trip Generation and Design Hour Volumes must be calculated using the data contained within the Institute of Transportation Engineer's (ITE) Trip Generation Manual, latest edition, or more appropriate local data as approved by the Traffic Engineer. (Formula Averaging is NOT acceptable for the

calculation of Peak Hour trip generation rates as published in the ITE Trip Generation Manual, latest edition.)

902-2.02 Capacity Analysis must be determined by the methods contained within the Highway Capacity Manual (HCM), latest edition.

902-2.03 Traffic Signal requirements will be determined by the warrants contained in the California Manual on Uniform Traffic Control Devices (California MUTCD), latest edition.

902-2.04 Proportionate Shares along State highways and County Roads shall be calculated using the Caltrans formula.

CHAPTER III. TENTATIVE SUBDIVISION REVIEW

Sec. 903-1 Introduction

This chapter is intended as a standard for design and review of the traffic aspects of tentative subdivision maps.

Sec. 903-2 Street Name Signs

Street name signs shall be paid for and installed by the developer and placed in accordance with the requirements of County Standards Plate Nos. T-1 and T-2. These shall also be placed at the corner of knuckled streets.

Sec. 903-3 Regulatory/Warning Signs

Developer will be required to pay for and install regulatory and warning signs in accordance with these standards. Traffic signs shall be installed in conformance with the standards in the latest California MUTCD. In the event of a conflict between these standards and the California MUTCD, the California MUTCD shall take precedence.

CHAPTER IV. TRAFFIC SIGNAL IMPROVEMENTS

Sec. 904-1 Introduction

This chapter is intended as a standard for design and installation of traffic signal improvements.

Sec. 904-2 Traffic Signal & Lighting System Design

Traffic signals and lighting systems shall be designed to meet all County and State standards. These standards are defined in detail by the Kern County Public Works Department, Traffic Engineering Division.

Sec. 904-3 Traffic Signal Interconnect

Traffic signal interconnect conduit shall be installed along all collector and arterial streets or as directed by the Traffic Engineer as part of the standard street improvements. Placement of conduit shall be on the side of the street first developed unless otherwise directed due to prior development or conduit placement.

Interconnect conduit shall accommodate future Fiber-Optic Cable Systems, and be two (2) inches minimum with pull rope or pull wire and shall conform to CalTrans Standard Specifications, latest edition. Interconnect conductor shall be installed where a complete segment of conduit is being placed between signalized or future signalized intersections. The standard location for conduit shall be under sidewalk and shall be constructed with No. 5 pull boxes per Plate No. T-16 spaced at a maximum of 200 feet. Alternate design locations may be allowed as approved by the Traffic Engineer.

Sec. 904-4 Future Signal Conduit

Future signal conduit shall be installed at all major intersections or intersections planned for future signals per Plate No. T-15. Additional right of way shall be provided for location of controller as shown in the detail.

CHAPTER V. LINE OF SIGHT REVIEW

Sec. 905-1 Introduction

This chapter is intended as a standard for the construction and restriction of improvements in the line of sight for vehicles entering and exiting county roads as required.

Sec. 905-2 Uncontrolled Intersections

At all corners located on uncontrolled intersections no obstruction to the driver's view in excess of three (3) feet above the adjacent gutter flowline shall be placed in a triangular area formed by the intersecting street curblines and a line connecting them at points 60 feet from the intersection point per Plate No. T-7.

Sec. 905-3 Alleys and Minor Driveways

No obstruction to sight view will be allowed within a triangular area formed by the alley or driveway edge and the interior sidewalk edge (the street right-of-way line if no sidewalk exists) and a line connecting them at points 10 feet from the intersection point.

Sec. 905-4 Controlled Intersections

905-4.01 Sight distance at controlled intersections shall be based upon a sight distance equal to design speed (S) in miles per hour multiplied by a factor of 10 (See Plate No. T-7). Design speeds for various street classifications are as follows:

Classification	Speed (S)
Local Street	25 MPH
Collector	65 MPH
Arterial	65 MPH

905-4.02 Corner sight distance is measured from a point on the minor road fifteen feet from the curb line of the major road, and three feet right of the left edge of the viewing lane under consideration. Said point is viewed from a height of three and one-half (3.5) feet on the minor road to an oncoming vehicle height of four and one-quarter (4.25) feet on the major road.

905-4.03 When viewing left, the location of the oncoming vehicle is considered to be twelve feet from the nearest curb line of the major street (six (6) feet with parking prohibited). Parking is assumed to be prohibited on arterial and collector streets.

905-4.04 When viewing right, the location of the oncoming vehicle is considered to be three (3) feet right of the left edge of the left most lane for the oncoming vehicle on the major street.

Sec. 905-5 T-Intersections

At uncontrolled T-intersections, the requirements of both Sections 905-2 and 905-4 shall be met.

Sec. 905-6 Landscaping

905-6.01 Landscaping over thirty (30) inches in height above top of curb shall not be placed within the lines of sight defined in the preceding sections. All landscaping must be maintained at a height of thirty (30) inches or less with the exception of trees as provided for in Section 905-6.02 (See Plate No. T-8)

905-6.02 Trees are permitted in the line of sight for controlled intersections provided that the skirt height (bottom of foliage) is maintained seven (7) feet above the adjacent top of curb height. In the event more than one (1) tree is placed in the sight line area they must be placed on a radial from the viewpoint. (See Plate No. T-8)

CHAPTER VI. SIGNING, STRIPING AND MARKING

Sec. 906-1 Introduction

The County shall provide all new and revised signing, striping, marking and other channelization necessary except as noted in Chapter III of this Division. However, design of all new and revised signing, striping, marking and other channelization shall be provided by the project's Engineer and comply with the standards established in the State of California and detailed in the California MUTCD.

These requirements are intended to supplement and clarify the requirements contained in the California MUTCD and the CalTrans Standard Plans and Specifications, latest edition.

The associated details, special provisions and these requirements are to be used as a general standard for developing signing & striping plans. Specific situations may require special consideration.

Sec. 906-2 Design Requirements

906-2.01 Signing & striping plans shall show the proposed signing, striping and markings within the limits of the project. It shall also show existing signing and striping in and beyond the project limits as needed to determine proper transition.

909-2.02 Depending upon the location involved, various methods for dividing traffic may be available or appropriate. These include: a yellow skip stripe, double yellow stripe, double-double yellow stripe (painted median), two-way turn lane stripe and where there is a minimum specified ADT, reflective raised pavement markers will be required. The Traffic Engineer shall have final determination as to which method is used.

909-2.03 Paint shall conform to Section 84 of the Caltrans Standard Specifications, unless another treatment is allowed.

906-2.04 Existing stripes shall be removed, where necessary. Removal shall be in accordance to Section 15 of the Caltrans Standard Specifications.

906-2.05 Provisions shall be included to have the Inspector review the "Rabbit Tracked" layout in the field prior to final striping. Field adjustments may be needed.

906-2.06 It is the responsibility of the project's Engineer to review the road work to be done with relationship to maintaining existing traffic. If the project's Engineer determines a detour is needed, then a detour plan shall also be included. If no detour plan is provided but the Inspector finds that one is necessary during construction, then the project's Engineer shall provide such a plan at that time and no work shall progress until such plan is approved.

906-2.07 Plate Nos. T-12 and T-13 detail typical striping plans, which cover most of the common striping situations encountered. Striping plans shall be designed to provide the total number of lanes for ultimate full width improvements whenever possible. Specific projects may require special treatment to match existing conditions. (e.g. - dropping a lane or forcing the outside lane to turn at an intersection, providing only 2-lanes each way on a 6-lane arterial, moving lanes over due to 1/2 width improvements, etc.)

CHAPTER VII. STREET SIGN SPECIFICATIONS

907-1 Design

Street signs shall consist of two (2) double faced signs, mounted at right angles. (or 45 degree if angle of intersection warrants)

907-2 Bracket Assembly

Post cap shall fit a two (2) inch I.D. Round Pipe or two (2) inch Square Tubing, complete with minimum of three (3) Allenhead setscrews to secure to pipe. Crosspiece shall secure the name plates at 90-degree (or 45-degree) with a minimum of two (2) five-sixteenths (5/16) inch Allen head setscrews in each plate (setscrews shall be electro-plated zinc-coated.0003-.0005”). Casting shall be die-cast aluminum. Standard weight.

907-3 Plate Size

Length shall be either 30” or 36”. Width shall be nine (9) inches. Radius of corners shall be one-half (½) inch. Plates shall be 0.125” ga. aluminum, 6061T6 Alloy with Alodine 1200 surface treatment.

907-4 Finish

Signs shall be baked enamel finished in accordance with the current State of California Specifications of Interstate Green.

907-5 Lettering

The letters shall be the rounded type style conforming to the standard alphabet for highway signs designed by the “Standard Highway Signs and Markings” of the Federal Highways Administration (FHWA). Street names shall be Series B, C, D, or E, six (6) inch high. Abbreviations (St., Dr., Ln., Ave., Ct., Way, etc.) shall be series C, two (2) inch high. Street names and abbreviations shall be White Reflective Sheeting Material, as manufactured by the 3M Company, or equal. Each name shall be individually laid out and spaced to fit either the 30” or 36” plates. Application of Reflective sheeting shall be applied in accordance with the manufacturer’s specifications.

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD STREET SIGNS AND LOCATIONS

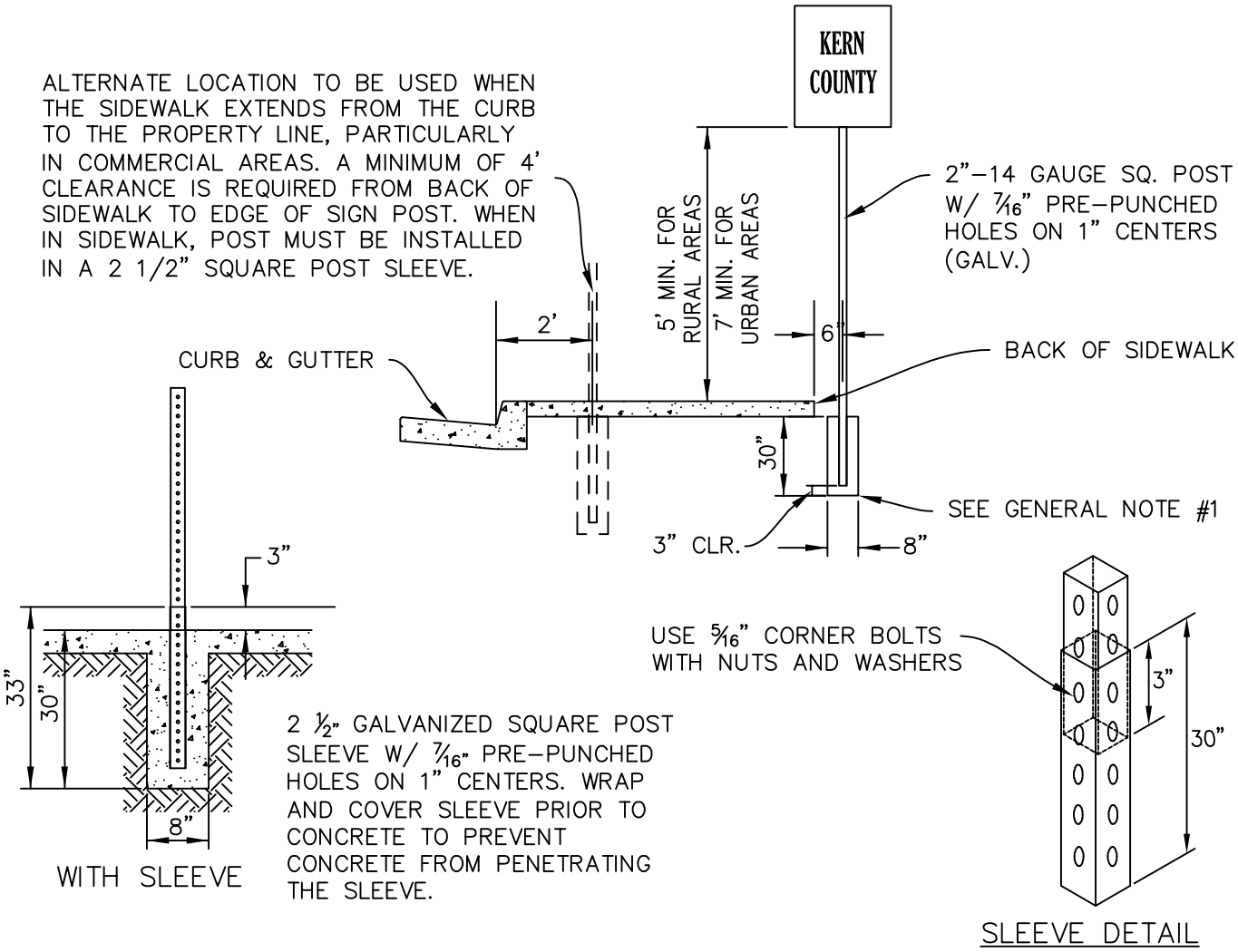
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

REVISIONS DATE	DESC

DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. T-1

DWG FILE: K:\BUILDINGDEV\DEVELOPMENT REVIEW\DEV_STD\2023\2023 REVISED DRAWINGS\TRAFFIC\T-1



GENERAL NOTE:

1. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR MINOR CONCRETE (MIN. CEMENT CONTENT 505 LB/CU.YD.). CONCRETE SHALL CONTAIN NO ADDITIVES UNLESS PRIOR APPROVAL IS OBTAINED FROM THE COUNTY ENGINEER.

MOUNTING REQUIREMENTS:

1. SIGN PANELS SHALL BE MOUNTED WITH HAWKINS M2G SERIES BOLT AND VANDAL PROOF NUT ASSEMBLY OR APPROVED EQUAL. SIGNS MOUNTED ON SIGNAL OR OTHER POLES SHALL BE ATTACHED WITH STAINLESS STEEL STRAPS AND HAWKINS M2G SERIES BOLT AND VANDAL PROOF NUT ASSEMBLY OR APPROVED EQUAL. TOP OF POST IS TO BE BELOW THE TOP OF SIGN PANEL BY NO MORE THAN 1.5".

2. SIZE OF SIGN PANELS SHALL BE ASSUMED AS STANDARD DENOTED IN THE CALIFORNIA MUTCD, UNLESS OTHER SIZE IS SPECIFIED ELSEWHERE.

3. SIGN PANEL SHALL BE MOUNTED WITH 3/8" ALL ALUMINUM DRIVE RIVET WITH WASHERS. SIGNS MOUNTED ON SIGNAL OR OTHER POLES SHALL BE ATTACHED WITH STAINLESS STEEL STRAPS WITH 5/16" THREADED STAINLESS STEEL STRAPPING FLARED LEG BRACKETS. DRILLED HOLES SHALL NOT EXCEED DIAMETER OF BOLT MORE THAN 1/16". TOP OF POST IS TO BE BELOW THE TOP OF THE SIGN PANEL BY NO MORE THAN 1.5"

KERN COUNTY PUBLIC WORKS
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STANDARD MISCELLANEOUS SIGN DETAILS

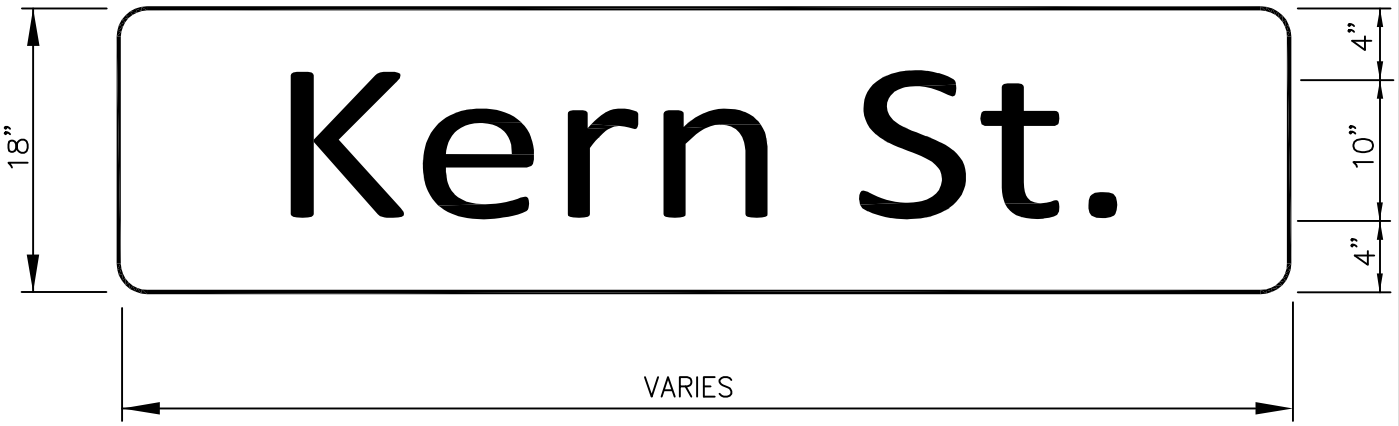
COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. T–2

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SPECIFICATIONS:

THE SIGN PLATE SHALL BE ALUMINUM, 0.125" THICK.

THE BACKGROUND SHALL BE REFLECTIVE SHEETING, HIGH INTENSITY GRADE, GREEN.

THE STREET NAME LETTERING SHALL BE 10 INCH REFLECTIVE SHEETING, DIAMOND GRADE, WHITE.

BACKGROUND AND LETTERING SHALL BE INSTALLED ON BOTH SIDES.

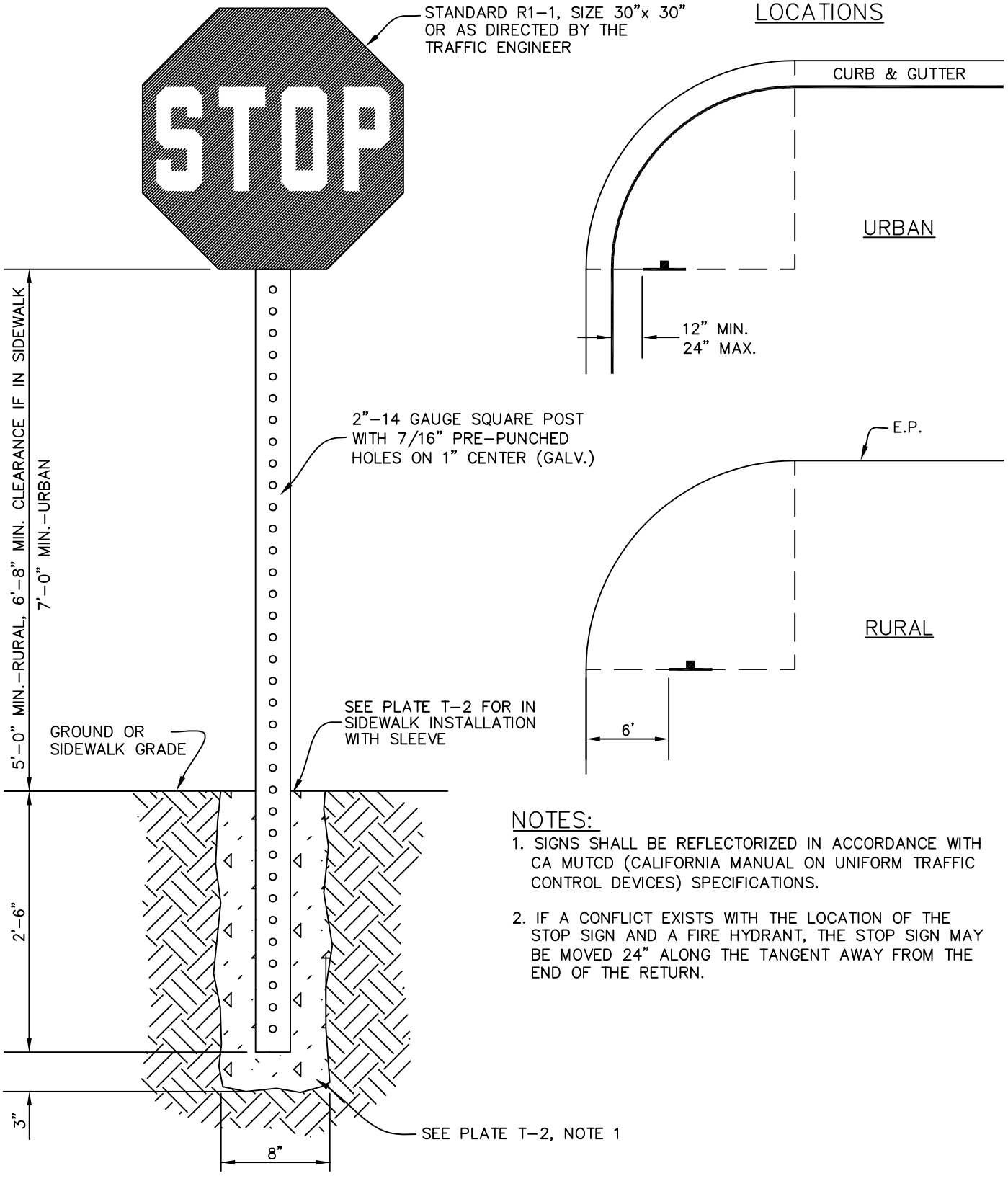
INSTALL USING MAST-ARM HANGER METHODS SUCH AS HAWKINS M10J SERIES SWINGING SIGN BRACKET, WITH RETURN SPRING REMOVED, OR APPROVED EQUAL.

OTHER DETAILS SHALL BE PER THE CURRENT STANDARD SPECIFICATIONS, STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, SECTION 56, "SIGNS".

KERN COUNTY PUBLIC WORKS
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STANDARD SIGN PLATE MAST ARM MOUNT	REVISIONS DATE	DESC	DRAFTED BY: R.R.P.	PLATE NO.
	–	–	DESIGNED BY: J.R.C.	T-3
COUNTY OF KERN STATE OF CALIFORNIA DEVELOPMENT STANDARD	–	–	DATE DRAFTED: 09/30/23	
	–	–	APPROVED BY: J.R.C.	

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NOTES:

1. SIGNS SHALL BE REFLECTORIZED IN ACCORDANCE WITH CA MUTCD (CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES) SPECIFICATIONS.
2. IF A CONFLICT EXISTS WITH THE LOCATION OF THE STOP SIGN AND A FIRE HYDRANT, THE STOP SIGN MAY BE MOVED 24" ALONG THE TANGENT AWAY FROM THE END OF THE RETURN.

NOT TO SCALE

KERN COUNTY PUBLIC WORKS
GROUNDED · BOUNDLESS

STANDARD STOP SIGN

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO.
T-4

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NOT TO SCALE

NOTES:

1. MARKINGS FOR BARRICADE RAILS SHALL BE ORANGE AND WHITE STRIPES (SLOPING AT AN ANGLE OF 45 DEGREES)

2. THE ENTIRE AREA OF THE ORANGE AND WHITE RAIL SHALL BE REFLECTORIZED AND SHALL MEET THE FOLLOWING MINIMUM DRY REFLECTIVE VALUES AT 0.2 AND 0.5 DEGREE DIVERGENCE, EXPRESSED IN UNITS OF CANDLEPOWER PER FOOT CANDLE PER SQUARE FOOT, AS MEASURED AT A DISTANCE OF 50 FEET FROM THE LIGHT SOURCE. THE WET REFLECTIVE VALUES SHALL BE A MINIMUM OF 90 PERCENT OF THE DRY VALUES. THE PREDOMINATE COLOR FOR OTHER BARRICADE COMPONENTS SHALL BE WHITE.

INCLUDED ANGLE	WHITE		ORANGE	
	0.2	0.5	0.2	0.5
-4	45.0	20.0	13.0	6.5
+30	20.0	11.0	6.5	2.9

3. SECTION 57, "TIMBER STRUCTURES" OF THE STANDARD SPECIFICATIONS, CURRENT EDITION, SHALL APPLY. ALL TIMBER TO BE DOUGLAS FIR CONSTRUCTION GRADE S4S.

4. RAILS SHALL BE NOMINAL 2" x 8" OF 2" x 10"

*5. WIDTHS OF BARRICADE AND PLACEMENT OF TRAFFIC STANDARD SIGNS SHALL BE DETERMINED/APPROVED BY THE DIRECTOR

KERN COUNTY PUBLIC WORKS
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STANDARD BARRCODE
END - OF - STREET

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

REVISIONS DATE	DESC

DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO.
T-5

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STANDARD
END- OF - STREET SIGN

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

REVISIONS DATE	DESC

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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO.
T-6

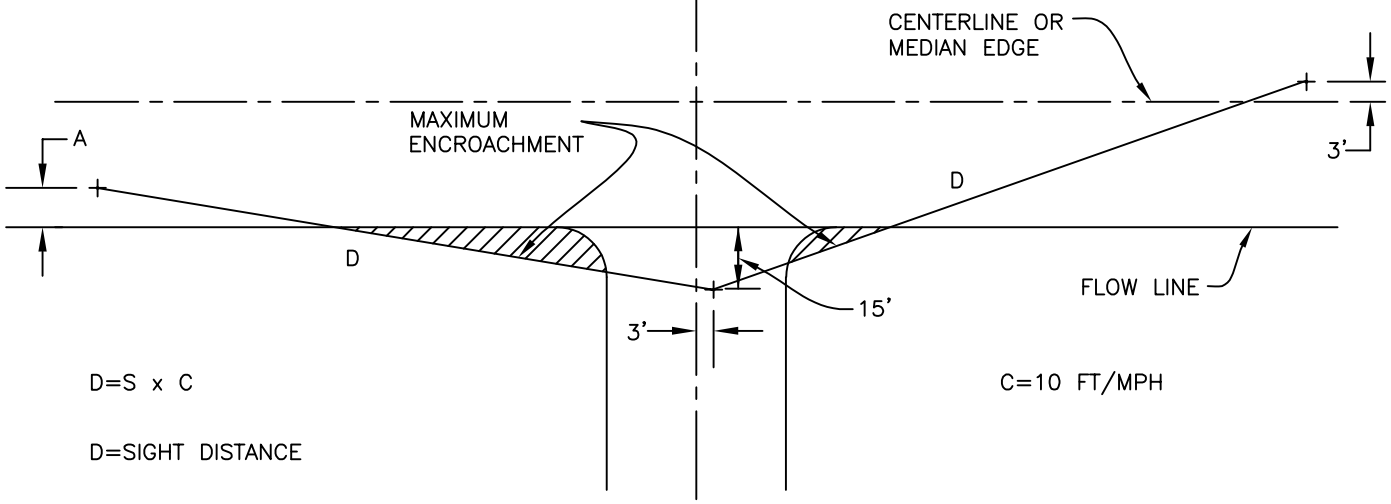
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A=6' WITHOUT PARKING
(ALWAYS USED ON ARTERIALS
AND COLLECTORS)

A=12' WITH PARKING

DESIGN SPEEDS

60' R/W	25 MPH
76' R/W	55 MPH
90' R/W	65 MPH
110' R/W	65 MPH



D=S x C

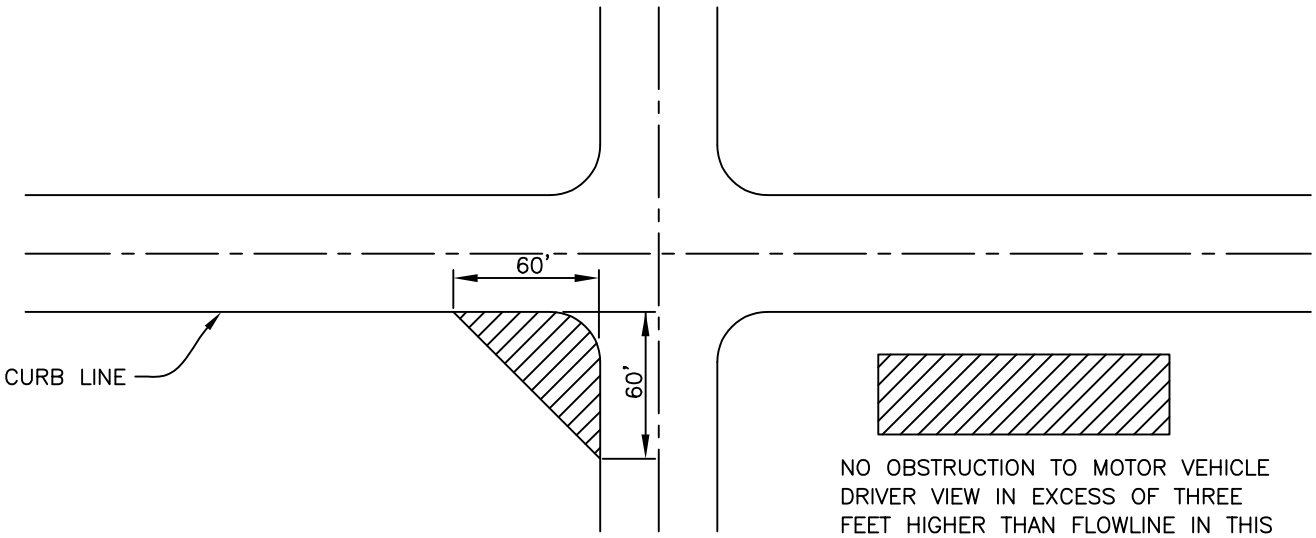
C=10 FT/MPH

D=SIGHT DISTANCE

S=CRITICAL SPEED (85th PERCENTILE) OR,
IF NOT KNOWN, DESIGN SPEED ON THRU STREET.

(SIGHT LINE ASSUMES AN EYE AT 3.5' HEIGHT
LOOKING AT AN OBJECT AT 4.25' HEIGHT)

CONTROLLED INTERSECTION
NOT TO SCALE



NO OBSTRUCTION TO MOTOR VEHICLE DRIVER VIEW IN EXCESS OF THREE FEET HIGHER THAN FLOWLINE IN THIS AREA.

UNCONTROLLED INTERSECTION
NOT TO SCALE

KERN COUNTY PUBLIC WORKS
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STANDARD SIGHT DISTANCE REQUIREMENTS FOR INTERSECTIONS

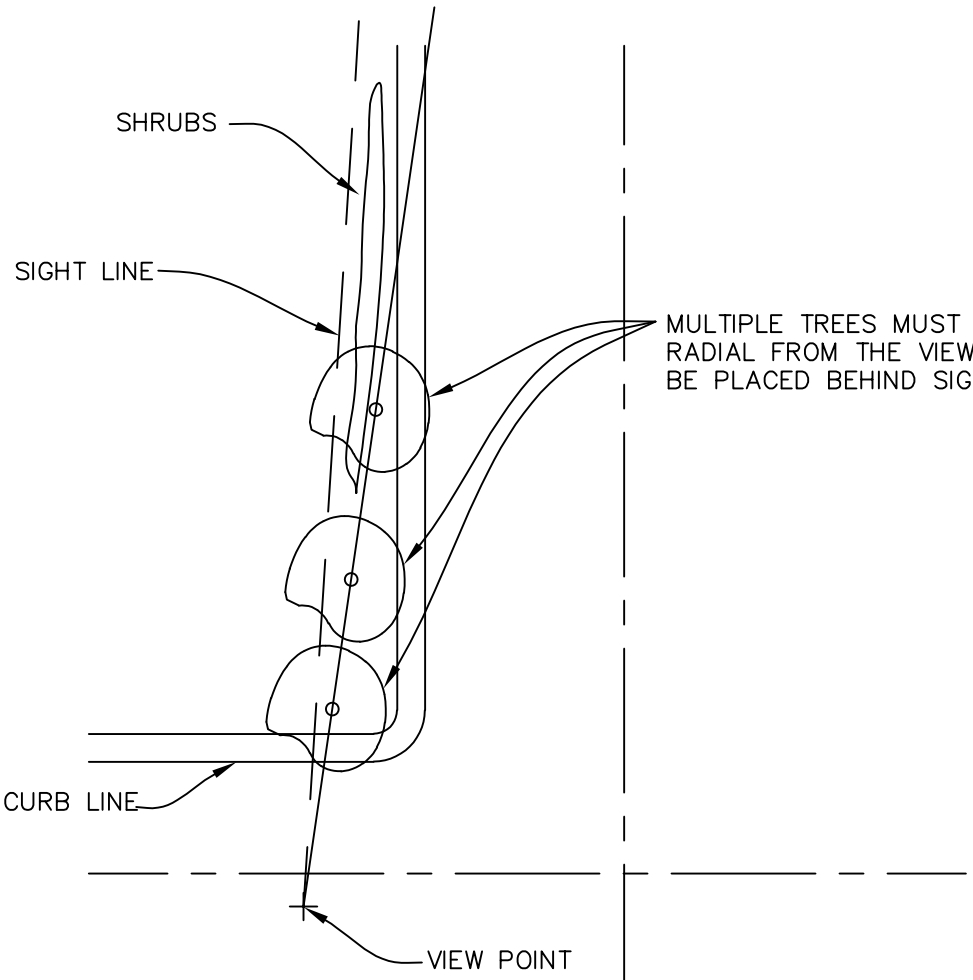
COUNTY OF KERN
STATE OF CALIFORNIA
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APPROVED BY: J.R.C.

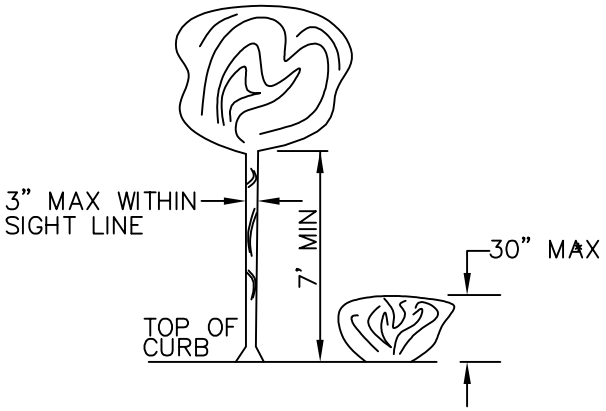
PLATE NO.
T–7

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TREES IN MEDIANS WITHIN SIGHT LINE VIEWING AREA SHALL BE SPACED AT OR GREATER THAN 50'. OTHER PLANT MATERIALS SHALL BE RESTRICTED TO LOW GROWTH SHRUBS, GROUND COVER OR TURF.

NOT TO SCALE



TREES AND SHRUBS WITHIN SIGHT LINE AND TREES OVER SIDEWALKS SHALL CONFORM TO THE DETAIL BELOW.

TREES AND SHRUBS WITHIN SIGHT LINE AND TREES OVER SIDEWALKS SHALL CONFORM TO THE DETAIL BELOW.

* MEASURE FROM TOP OF CURB FOR SOLID OBJECTS, I.E. FENCES, WALLS, ETC.

KERN COUNTY PUBLIC WORKS
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STANDARD TYPICAL SIGHT LINE REQUIREMENTS FOR LANDSCAPING

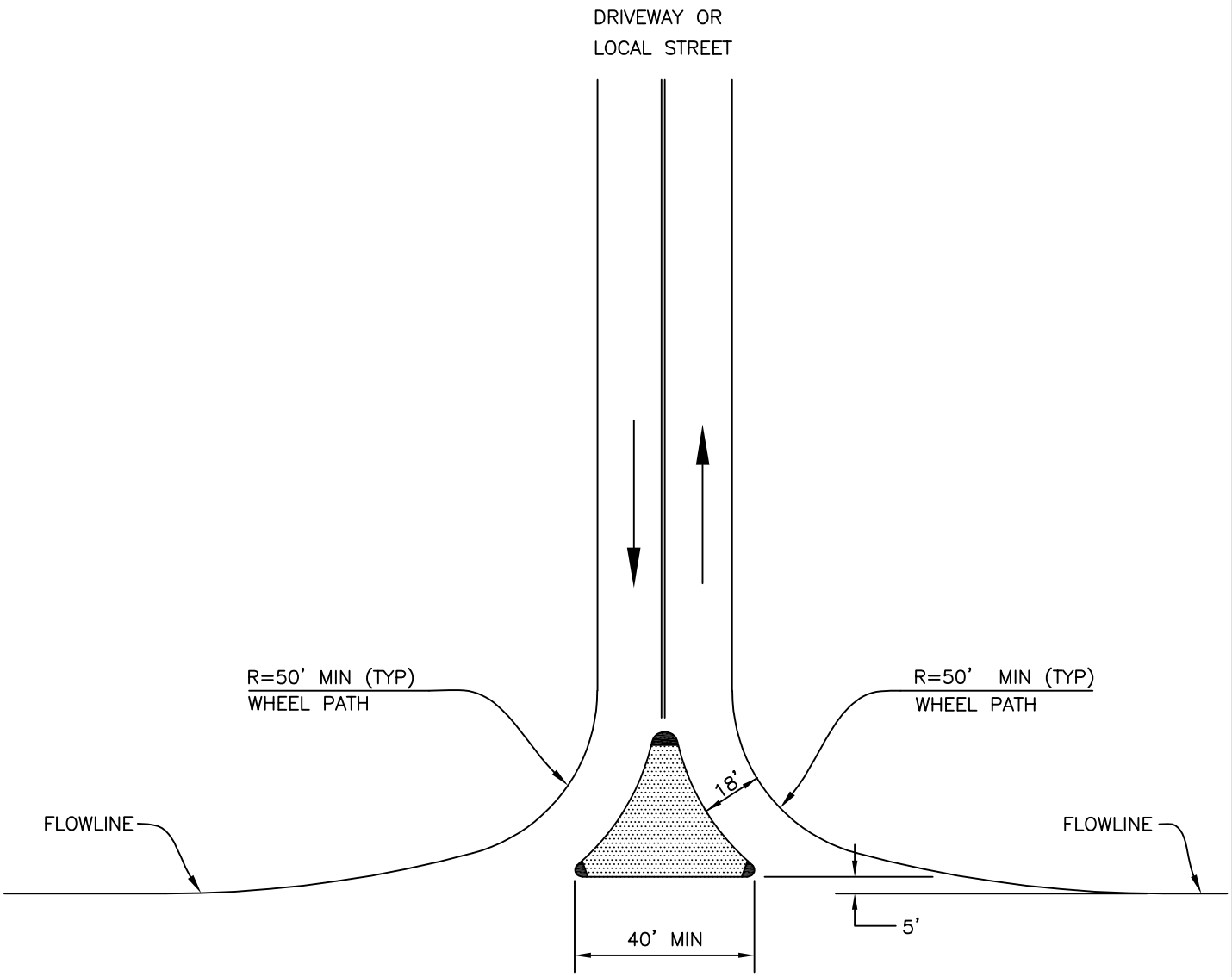
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PLATE NO. T–8

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NOT TO SCALE

NOTES:

1. ALL CONCRETE MEDIAN NOSES SHALL BE PAINTED YELLOW AND HAVE TYPE "G" RAISED PAVEMENT MARKERS.

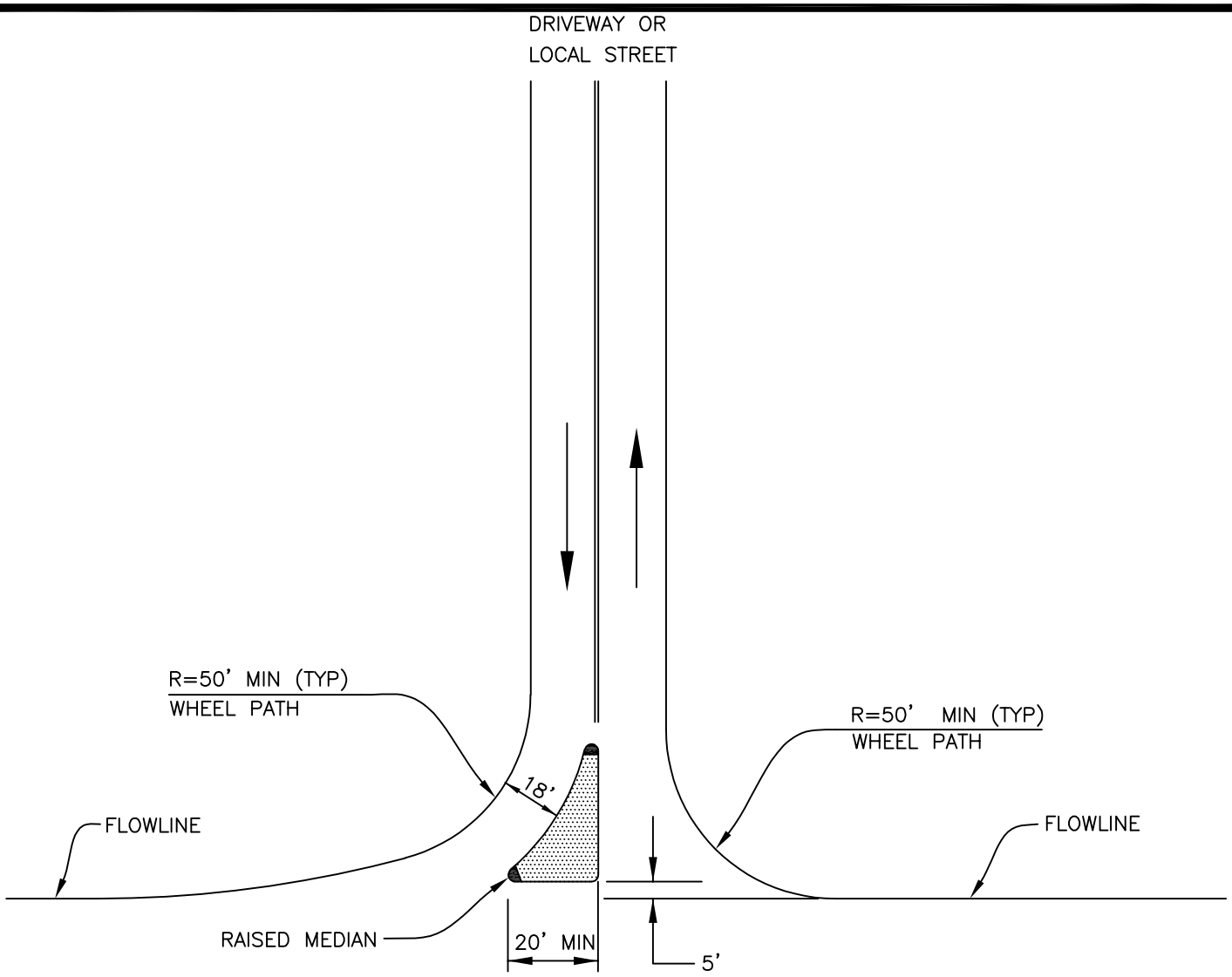
2. TO BE USED WHERE RESTRICTED TURNING MOVEMENTS ARE REQUIRED AND MEDIAN NOT BEING CONSTRUCTED ON MAIN STREET AT TIME OF DRIVEWAY OR LOCAL STREET CONSTRUCTION.

3. ALTERNATIVE DESIGN DIMENSIONS MAY BE ACCEPTED, PROVIDING MOVEMENTS ARE SATISFACTORILY RESTRICTED, PEDESTRIAN AND DISABLED ACCESS IS PROVIDED FOR, AND DESIGN TURNING RADIUS IS ACCOMMODATED.

"THIS PLAN IS CONCEPTUAL ONLY AND IS NOT TO BE CONSIDERED A CONSTRUCTION DRAWING."

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS	STANDARD RESTRICTED ACCESS STANDARD RIGHT-IN, RIGHT-OUT ONLY	REVISIONS DATE – DESC –	DRAFTED BY: R.R.P.	PLATE NO.
			DESIGNED BY: J.R.C.	
	COUNTY OF KERN STATE OF CALIFORNIA DEVELOPMENT STANDARD		DATE DRAFTED: 09/30/23	T–9
			APPROVED BY: J.R.C.	

DWG FILE: K:\BUILDINGDEV\DEVELOPMENT REVIEW\DEV_STD\2023\2023 REVISED DRAWINGS\TRAFFIC\T-9



NOT TO SCALE

NOTES:

1. ALL CONCRETE MEDIAN NOSES SHALL BE PAINTED YELLOW AND HAVE TYPE "G" RAISED PAVEMENT MARKERS.
2. TO BE USED WHERE RESTRICTED TURNING MOVEMENTS ARE REQUIRED AND MEDIAN NOT BEING CONSTRUCTED ON MAIN STREET AT TIME OF DRIVEWAY OR LOCAL STREET CONSTRUCTION.

"THIS PLAN IS CONCEPTUAL ONLY AND IS NOT TO BE CONSIDERED A CONSTRUCTION DRAWING."

KERN COUNTY PUBLIC WORKS
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STANDARD RESTRICTED ACCESS RIGHT-IN, RIGHT-OUT, LEFT-IN ONLY

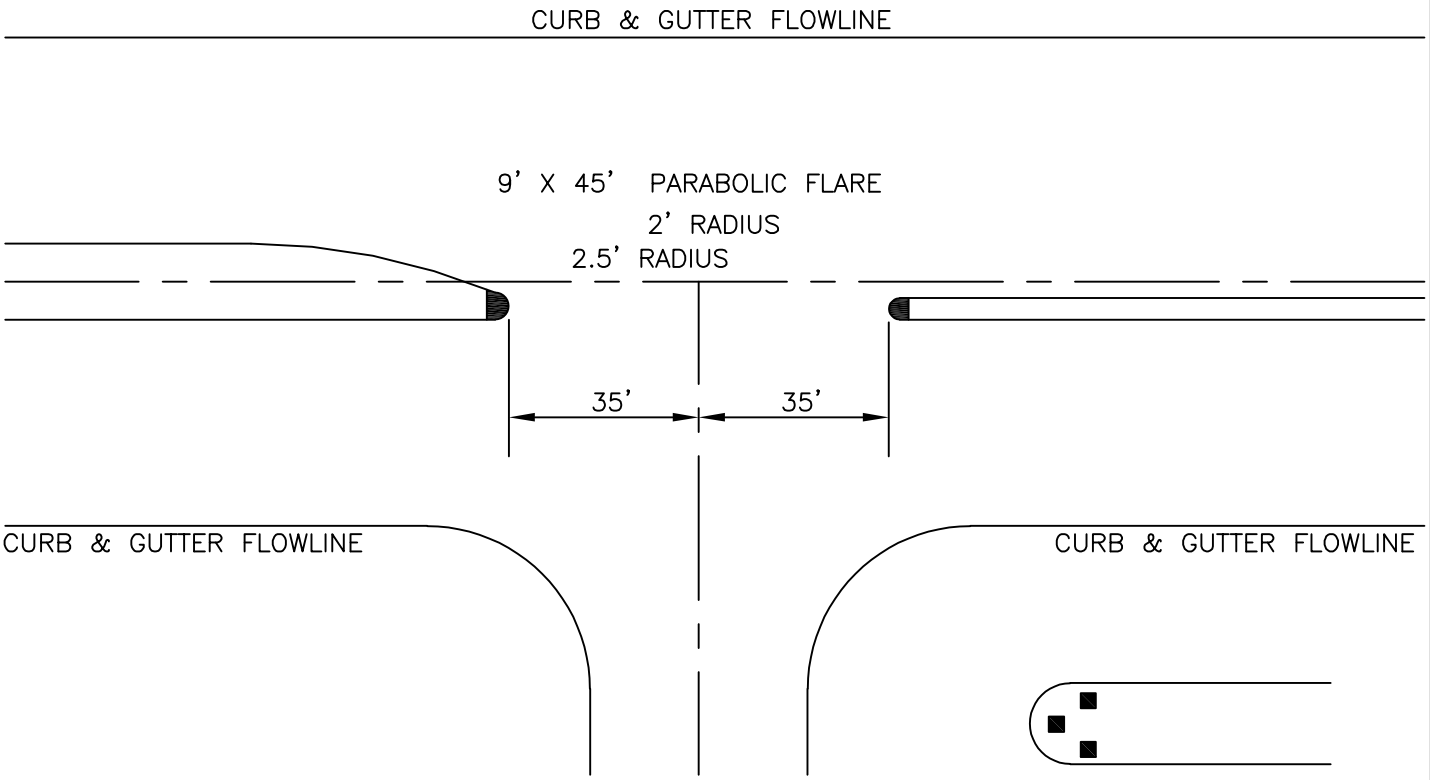
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DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. T–10

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TYPICAL MEDIAN END DETAIL FOR
T – INTERSECTION OF LOCAL STREET WITH ARTERIAL STREET
HAVING FULL ACCESS IN ALL DIRECTIONS

NOTES:

1. ALL CONCRETE MEDIAN NOSES SHALL BE PAINTED YELLOW AND HAVE TYPE "G" RAISED PAVEMENT MARKERS.

"THIS PLAN IS CONCEPTUAL ONLY AND IS NOT TO BE CONSIDERED A CONSTRUCTION DRAWING."

KERN COUNTY PUBLIC WORKS GROUNDED · BOUNDLESS	STANDARD TYPICAL MEDIAN END DETAILS AT INTERSECTIONS WITH T-LOCAL STREETS	REVISIONS DATE – DESC –	DRAFTED BY: R.R.P.	PLATE NO. T–11
	COUNTY OF KERN STATE OF CALIFORNIA DEVELOPMENT STANDARD		DESIGNED BY: J.R.C. DATE DRAFTED: 09/30/23 APPROVED BY: J.R.C.	

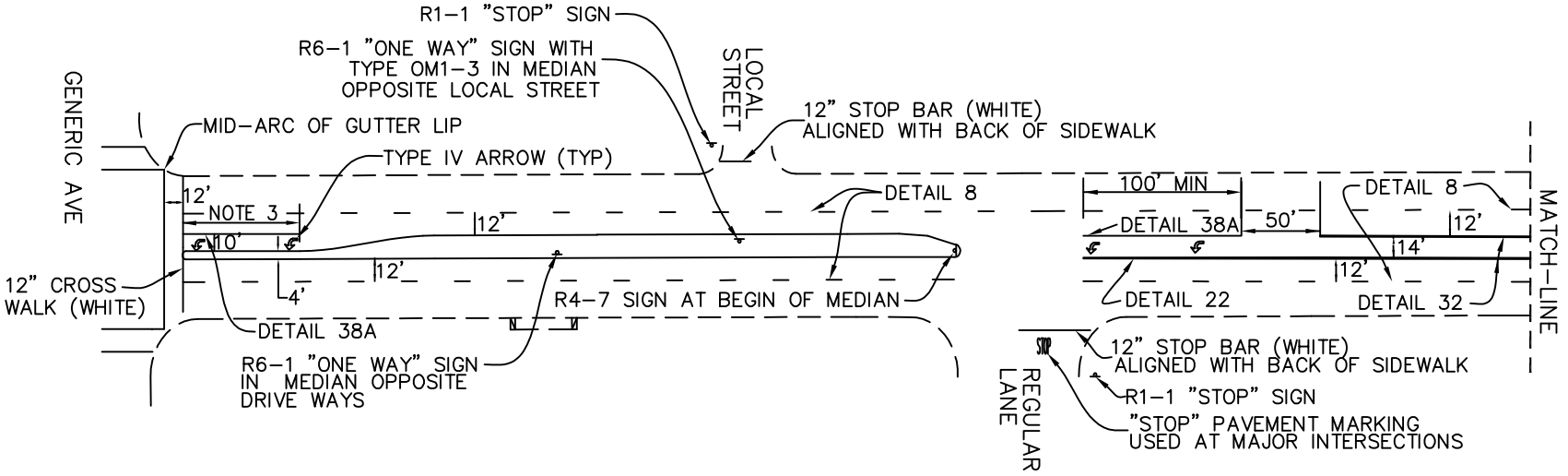
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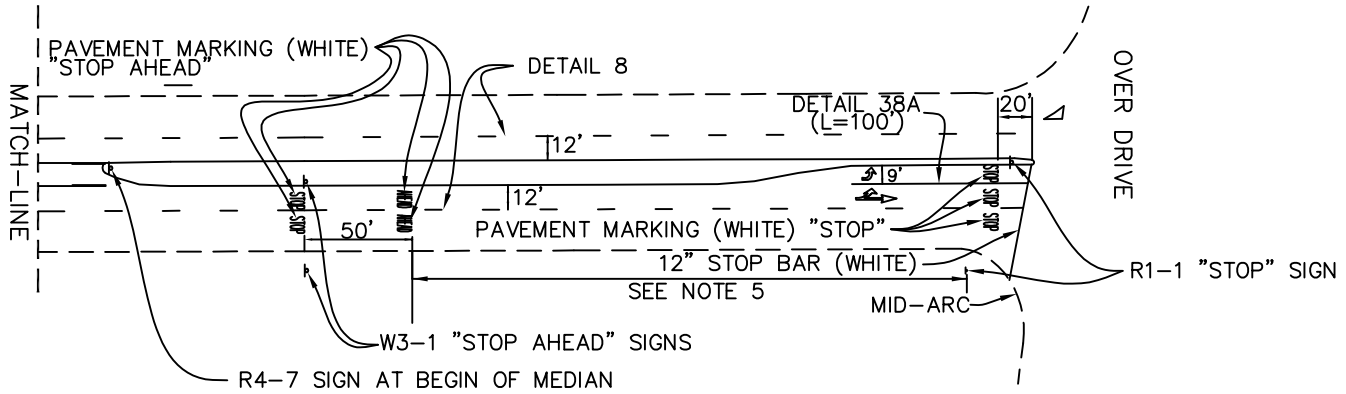
KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

STANDARD TYPICAL STRIPING PLAN

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD



CROSS WALKS NORMALLY USED AT SIGNALIZED OR ARTERIAL-ARTERIAL INTERSECTIONS



GENERAL NOTES:

1. THE CA MUTCD (CALIFORNIA MANUAL ON UNIFORM TRAFFIC DEVICES) SHALL USED AS A DESIGN GUIDE FOR STRIPING, SIGNING, & MARKING PLANS.
2. STRIPING DETAILS AND PAVEMENT MARKINGS SHALL CONFORM TO CURRENT CALTRANS STANDARD PLANS A20A THROUGH A24C.
3. STORAGE LENGTH FOR LEFT AND RIGHT TURN LANES VARY, BASED ON NEED DUE TO DECELARATION AND ANTICIPATED VOLUMES. THE LENGTH SHALL MATCH LENGTH TO BEGINNING OF TURN BAY TAPERS WHERE EXISTING IN MEDIAN OR IN CURB AND GUTTER.
4. SIGNS SHALL BE PLACED IN ACCORDANCE WITH PLATE T-1 & T-2.
5. PLACEMENT OF WARNING SIGNS SHALL BE BASED ON SEC. 2C.05 OF THE CA MUTCD (CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES).
6. TRANSITION TAPERS SHALL BE ADJUSTED IN THE FIELD TO PROVIDE SMOOTH TRANSITION OF TRAFFIC.

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DRAFTED BY: R.R.P.
DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. T-12

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KERN COUNTY PUBLIC WORKS
GROUNDED: BOUNDLESS

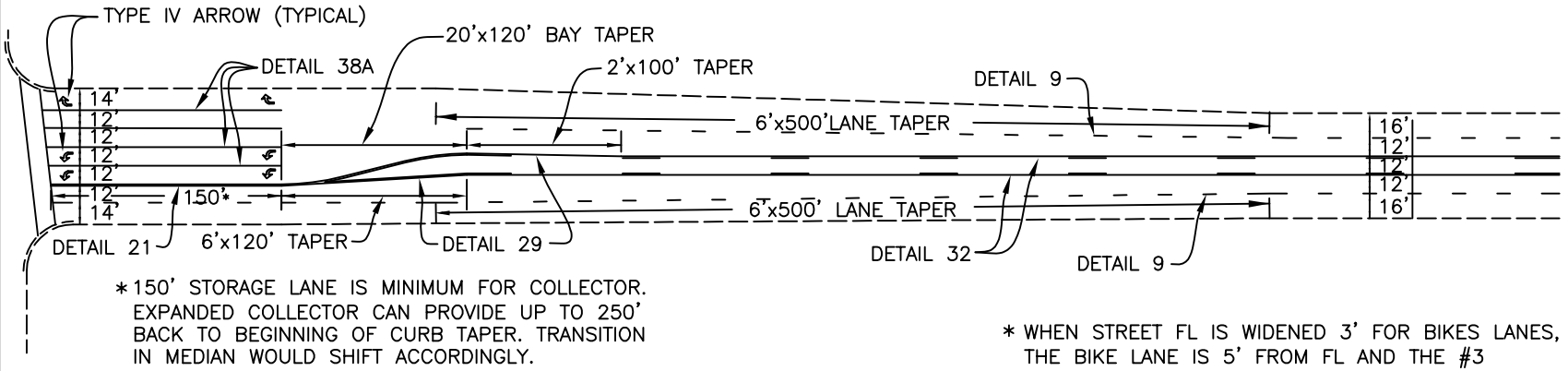
STANDARD TYPICAL STRIPING PLAN FOR ARTERIAL AND COLLECTOR APPROACHES

COUNTY OF KERN
STATE OF CALIFORNIA
DEVELOPMENT STANDARD

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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

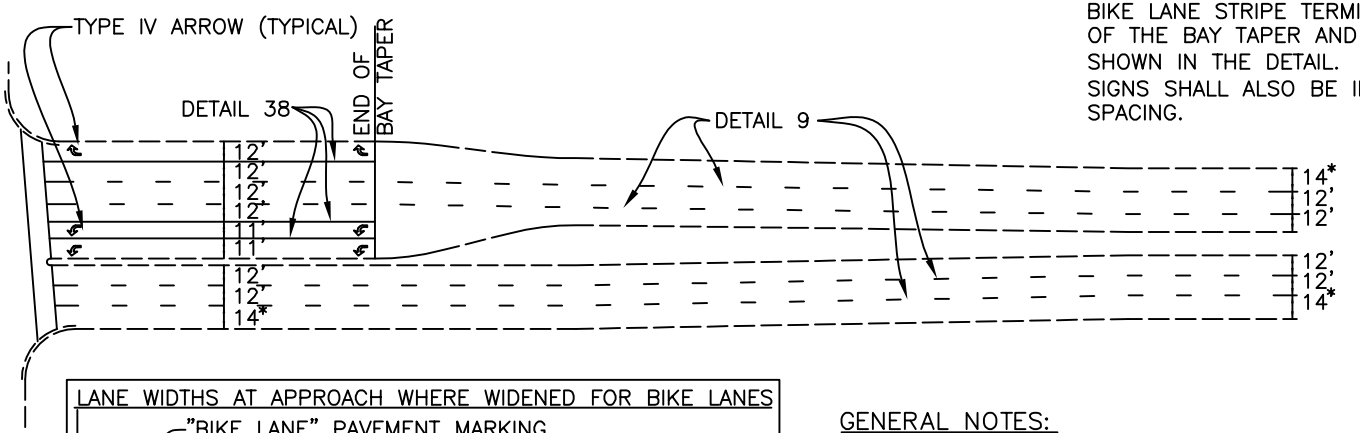
PLATE NO. T-13

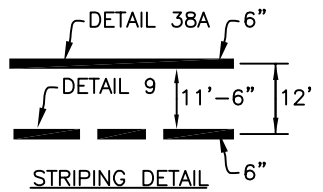


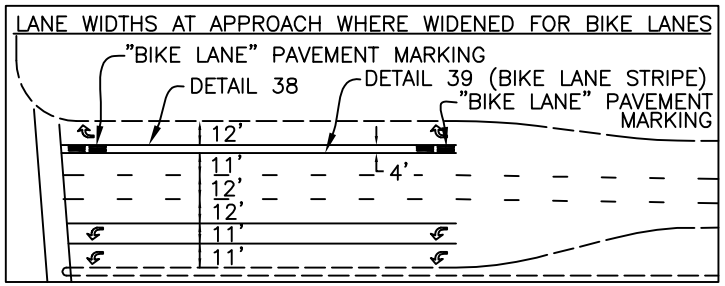
*150' STORAGE LANE IS MINIMUM FOR COLLECTOR. EXPANDED COLLECTOR CAN PROVIDE UP TO 250' BACK TO BEGINNING OF CURB TAPER. TRANSITION IN MEDIAN WOULD SHIFT ACCORDINGLY.

TYPICAL EXPANDED COLLECTOR APPROACH

* WHEN STREET FL IS WIDENED 3' FOR BIKES LANES, THE BIKE LANE IS 5' FROM FL AND THE #3 OUTSIDE LANEIS 12'. THE BIKE LANE STRIPE IS DETAIL 39. APPROACHING THE INTERSECTION THE BIKE LANE STRIPE TERMINATES AT THE BEGINNING OF THE BAY TAPER AND THEN CONTINUES AS SHOWN IN THE DETAIL. R-81 (CA), BIKE LANE SIGNS SHALL ALSO BE INSTALLED AT 600' MAXIMUM SPACING.







TYPICAL EXPANDED ARTERIAL APPROACH

GENERAL NOTES:

1. FIGURES 6-13 THROUGH 6-55 OF THE CALTRANS TRAFFIC MANUAL SHALL BE USED AS A DESIGN GUIDE FOR STRIPING, SIGNING, & MARKING PLANS.
2. STRIPING DETAILS AND PAVEMENT MARKINGS SHALL CONFORM TO CURRENT CALTRANS STANDARD PLANS A20A THROUGH A24C.
3. STORAGE LENGTH FOR LEFT AND RIGHT TURN LANES VARY, BASED ON NEED DUE TO DECELARATION AND ANTICIPATED VOLUMES. THE LENGTH SHALL MATCH LENGTH TO BEGINNING OF TURN BAY TAPERS WHERE EXISTING IN MEDIAN OR IN CURB AND GUTTER.
4. SIGNS SHALL BE PLACED IN ACCORDANCE WITH PLATE T-1 & T-2.
5. PLACEMENT OF WARNING SIGNS SHALL BE BASED ON SEC. 2C.05 OF THE CA MUTCD (CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES).
6. TRANSITION TAPERS SHALL BE ADJUSTED IN THE FIELD TO PROVIDE SMOOTH TRANSITION OF TRAFFIC.

L1	L2
< $\frac{1}{4}$ MILE	NO TRANSITION NECESSARY TYPE F CLASS 1 OBJECT MARKERS ONLY WITH OM1-3 MARKER
$\frac{1}{4}$ MILE TO $\frac{1}{2}$ MILE	200'
OVER $\frac{1}{2}$ MILE	500' MIN OR MORE. FOR ACTUAL MOVE OVER USE DESIGN SPEED

REFERENCE: 1. SEC. 6-06 OF THE CALTRANS TRAFFIC MANUAL FOR USE OF CHANNELIZERS

2. CALTRANS STD PLAN A73C FOR DETAILS

KERN COUNTY PUBLIC WORKS
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STANDARD TRANSITIONS AT ROAD NARROWINGS

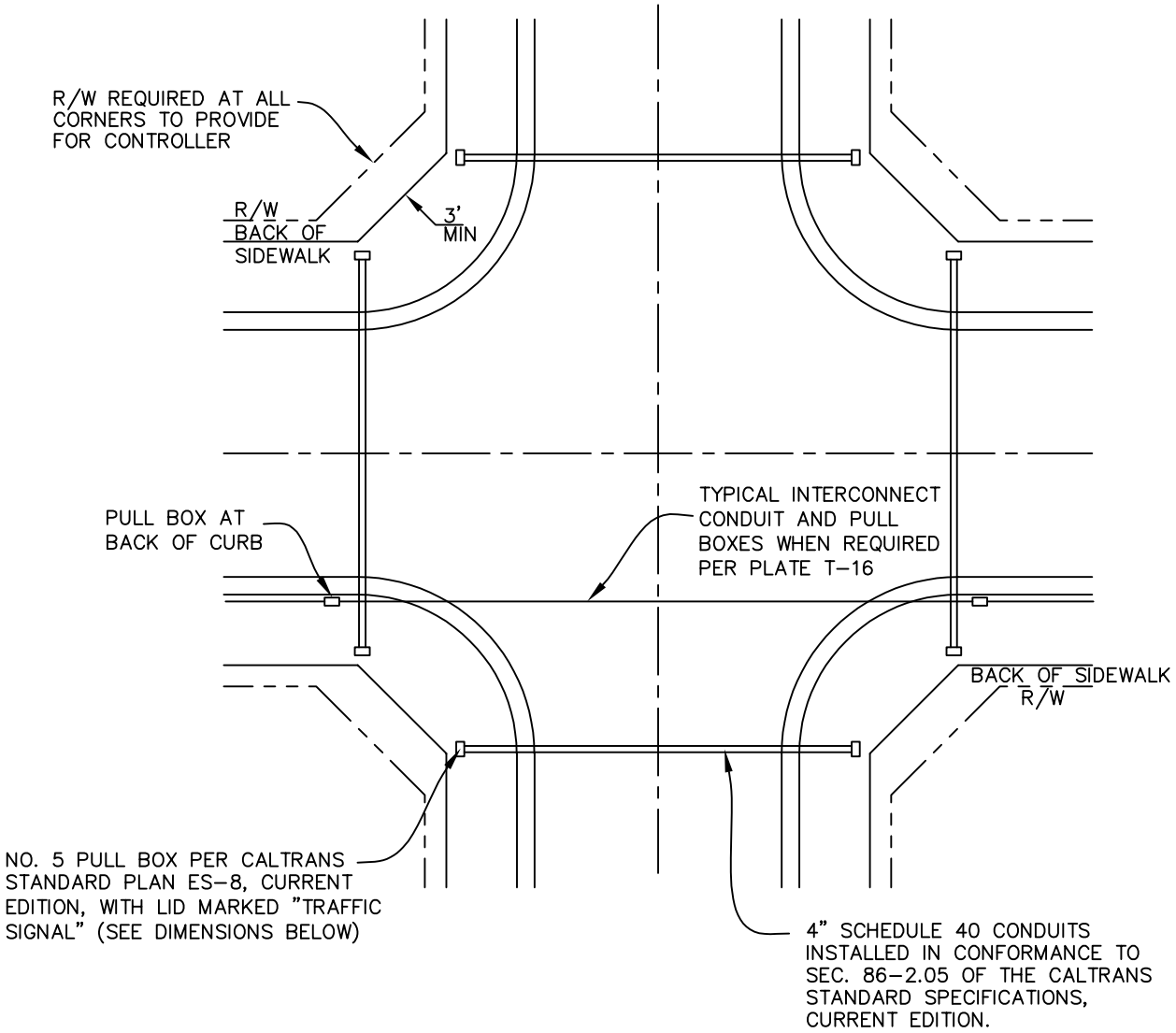
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STATE OF CALIFORNIA
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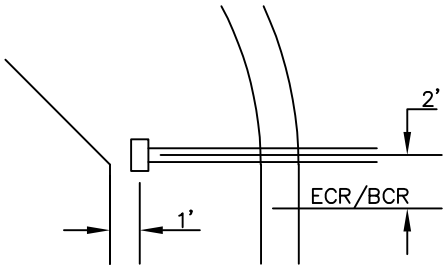
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PLATE NO.
T-14

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PULL BOXES ARE REQUIRED AT BOTH ENDS OF CONDUIT. WHERE PAVING IS EXISTNG, CONDUIT SHALL EXTEND ACROSS ENTIRE PAVED WIDTH AND SHALL BE INSTALLED BY BORING EXISTING PAVEMENT, UNLESS OTHER METHOD IS ALLOWED.



SEPARATE CONDUIT AND PULL BOXES MAY BE REQUIRED ON CERTAIN CROSSINGS WHERE INTERCONNECT IS REQUIRED ALONG SAID STREET. (SEE PLATE T-16)

THIS STANDARD APPLIES AT ALL INTERSECTIONS OF 2 MAJOR STREETS OR ANY INTERSECTION DESIGNATED FOR FUTURE SIGNAL INSTALLATION

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STANDARD CONDUIT & R/W REQUIREMENTS FOR FUTURE SIGNAL LOCATIONS

COUNTY OF KERN
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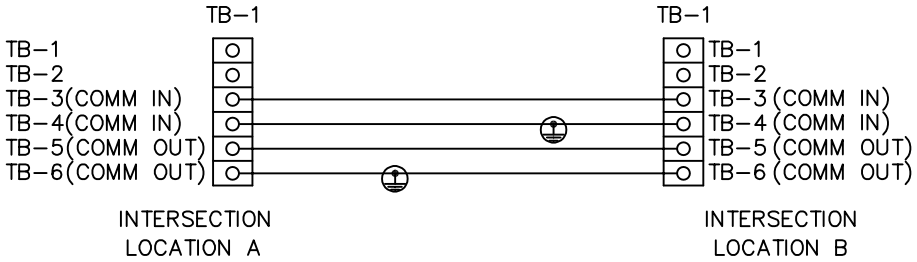
PLATE NO. T-15

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C2P MODEM INTERCONNECT/TERMINAL BLOCK TB-1

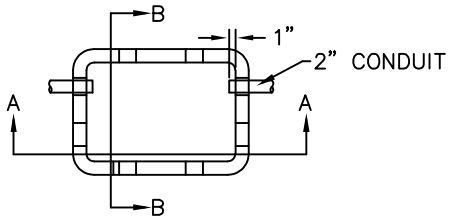
INPUT PANEL #4
WIRE COLOR ASSIGNMENTS

PIN	FUNCTION	WIRE COLOR MODEM HARNESS	TB-1	WIRE COLOR INTERCONNECT CABLE
A	AUDIO IN	WHITE	TB1-3	WHITE
B	AUDIO IN	BLACK	TB1-4	BLACK
C	AUDIO OUT	RED	TB1-5	BLACK
E	AUDIO OUT	GREEN	TB1-6	GREEN

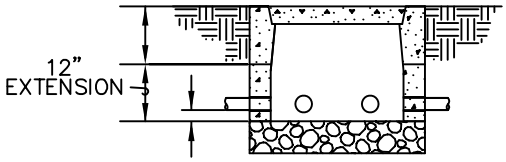


INTERCONNECT DETAIL
NTS

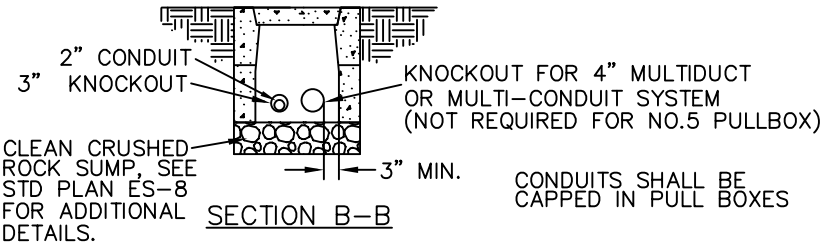
NOTE:
COPPER WIRE NO LONGER USED. REPLACE CABLE WITH A PULL ROPE FOR FUTURE USE WITH FIBER.



TOP VIEW

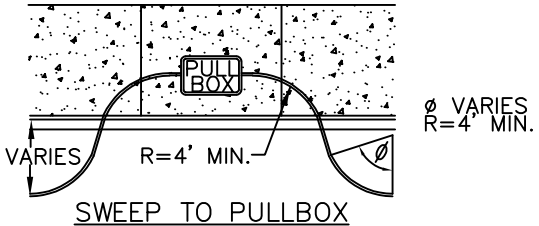


SECTION A-A



SECTION B-B

NO.5 PULLBOX WITH EXTENSION
(NO.6 PULLBOX WITH EXTENSION SIMILAR)
NTS



SWEEP TO PULLBOX
NTS

MULTI-DUCT:

TRAFFIC SIGNAL INTERCONNECT SHALL BE INSTALLED ALONG ALL ARTERIAL AND COLLECTOR STREETS OR AS DIRECTED AS PART OF THE STANDARD STREET IMPROVEMENT. OMISSION OF INTERCONNECT CONDUIT ALONG ARTERIAL OR COLLECTOR STREETS MAY BE ALLOWED WHERE ACCEPTABLE ALTERNATE MEANS OF COMMUNICATION IS APPROVED BY THE COUNTY TRAFFIC ENGINEER.

ALL OTHER ROUTES:

INSTALL 2" SCHEDULE 40 CONDUIT UNDER SIDEWALK WITH PULL BOXES AT 200' (60m) MAXIMUM INTERVAL. PULL BOXES SHALL BE NO. 5 WITH EXTENSIONS AND KNOCKOUTS. CONDUIT SHALL BE BROUGHT INTO PULL BOXES PARALLEL TO THE EXISTING SURFACE (HORIZONTAL). THE TOTAL ANGULAR BEND OF CONDUIT BETWEEN PULL BOXES SHALL NOT EXCEED 180 DEGREES. A PULL ROPE CONFORMING TO SECTION 86-2.05C "INSTALLATION" OF THE STANDARD SPECIFICATION SHALL BE INCLUDED IN ALL INTERCONNECT CONDUIT FOR INSTALLATION OF FUTURE CONDUCTORS.

NOTE:
TO BE USED ONLY WHEN CONDUIT IS ALLOWED TO BE PLACED AT GUTTER LIP LINE. IN ALL OTHER CASES, CONDUIT IS TO BE LOCATED UNDER SIDEWALK AREA.

LIDS SHALL READ "TRAFFIC SIGNAL"

KERN COUNTY PUBLIC WORKS
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STANDARD TRAFFIC SIGNAL
INTERCONNECT-WIRING AND PULL BOXES

COUNTY OF KERN
STATE OF CALIFORNIA
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PLATE NO.
T-16

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DIVISION TEN

BEST MANAGEMENT STANDARDS (BMPs)

CHAPTER I. GENERAL

Sec. 1001-1 General Purpose

1001-1.01 Best Management Practices (BMP's) contained herein reflect the minimum requirements. Alternate methods providing equal or greater protection may be utilized. For in depth information on BMP's refer to the California Storm Water BMP Handbooks, available at www.cabmphandbooks.com, California Department of Transportation Construction Site BMP Fact Sheets at www.dot.ca.gov/hq/construc/stormwater/factsheets.htm, and/or USEPA BMP Fact sheet @ http://cfpub.epa.gov/npdes/stormwater.

1001-1.02 All construction activity shall be performed in accordance with a Stormwater Pollution Prevention Plan (SWPPP) developed and implemented in compliance with the requirements of the National Pollutant Discharge Elimination System (NPDES) Construction General Permit Order No. 2009-009-DWQ and as amended by Order No. 2010-0014-DWQ.

1001-1.03 The SWPPP shall:

a. Identify potential pollutant sources and include the design and placement of BMPs to effectively prohibit the entry of pollutants from the construction site onto the street and/or into a storm drain system during construction.

b. Be kept on site and amended to reflect changing conditions throughout the course of construction.

c. Be kept up to date. Any additional updates requested by agency representative are to be made immediately.

1001-1.04 Non-Stormwater discharges are prohibited from entering any storm drain system and/or street.

1001-1.05 Discharges of pumped ground water require a discharge permit from the State of California Regional Water Quality Control Board (RWQCB).

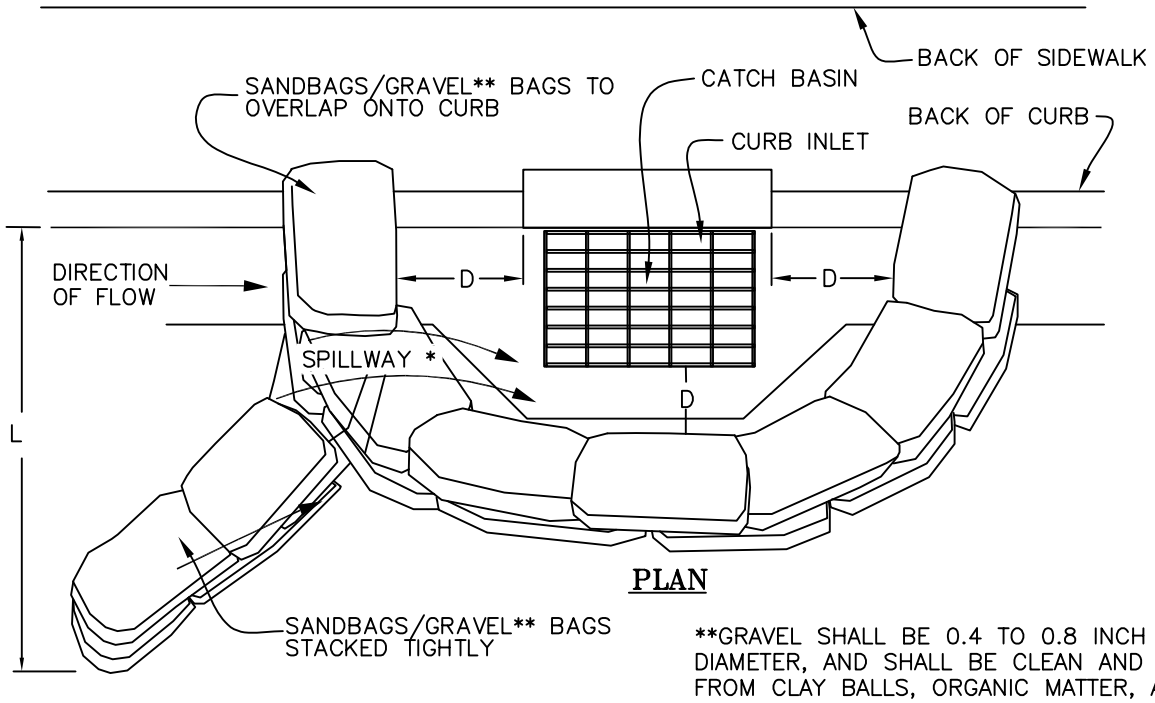
1001-1.06 Pollutants shall be removed from stormwater discharges to the Maximum Extent Practicable (MEP) through design & implementation of the SWPPP.

1001-1.07 A standby crew for emergency work, shall be available at all times during the wet weather season, which is typically Oct 1 through May 30. Necessary materials shall be available on site and stockpiled at convenient locations to facilitate rapid construction of emergency devices when rain is imminent.

1001-1.08 Portable sanitary facilities shall be located on relatively level ground away from traffic areas, drainage courses, and storm drain inlets.

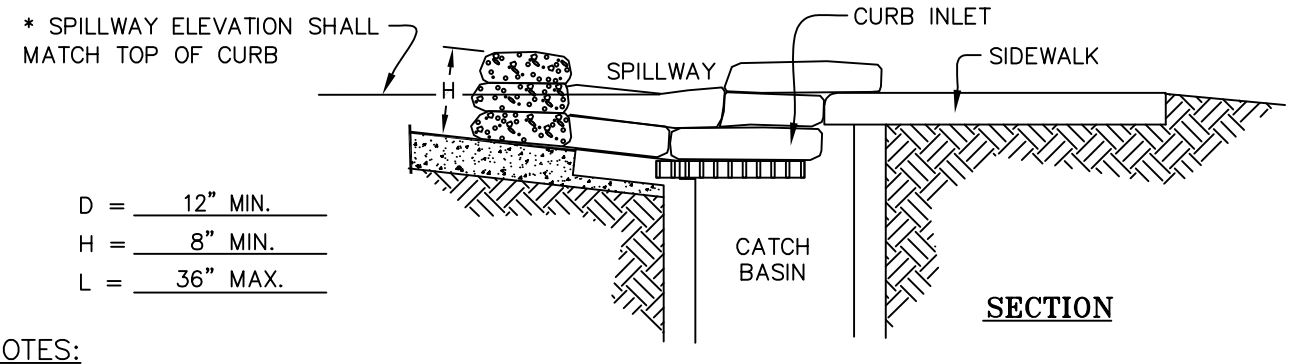
1001-1.09 Employees, subcontractors and suppliers shall be educated on all BMP's including concrete waste storage and disposal procedures.

1001-1.10 Sediment control practices shall effectively prevent a net increase of sediment load in stormwater discharge.



PLAN

**GRAVEL SHALL BE 0.4 TO 0.8 INCH IN DIAMETER, AND SHALL BE CLEAN AND FREE FROM CLAY BALLS, ORGANIC MATTER, AND OTHER DELETERIOUS MATERIALS.



D = 12" MIN.
H = 8" MIN.
L = 36" MAX.

SECTION

NOTES:

1. CATCH BASIN/INLET PROTECTION SHALL BE INSTALLED WHEREVER THERE IS A POTENTIAL OF STORMWATER OR NON-STORMWATER BEING DISCHARGED INTO IT.
2. INLET PROTECTION IS REQUIRED ALONG WITH OTHER POLLUTION PREVENTION MEASURES SUCH AS; EROSION CONTROL, SOIL STABILIZATION, AND MEASURES TO PREVENT TRACKING ONTO PAVED SURFACES.
3. MODIFY INLET PROTECTION AS NEEDED TO AVOID CREATING TRAFFIC HAZARDS.
4. INCLUDE INLET PROTECTION MEASURES AT HILLSIDE V-DITCHES AND MISC. DRAINAGE SWALES.
5. INLET PROTECTION SHALL BE INSPECTED AND ACCUMULATED SEDIMENTS REMOVED. SEDIMENT SHALL BE DISPOSED OF PROPERLY AND IN A MANNER THAT ASSURES THAT THE SEDIMENT DOES NOT ENTER THE STORM DRAIN SYSTEM.
6. DAMAGED BAGS SHALL BE REPLACED IMMEDIATELY.
7. ADDITIONAL SANDBAG SEDIMENT TRAPS SHALL BE PLACED AT INTERVALS AS INDICATED ON SITE PLAN.

CATCH BASIN/INLET PROTECTION

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NPDES BMP SEDIMENT AND EROSION CONTROL

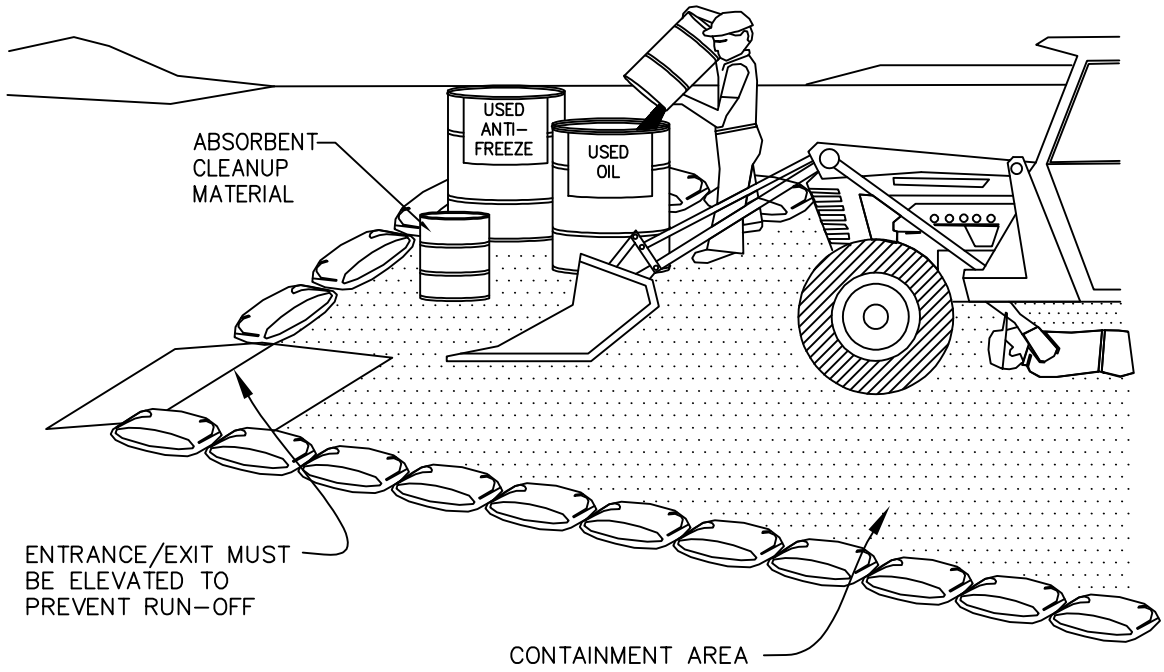
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PLATE NO. BMP-1

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NOTES:

1. LEAKING VEHICLES AND EQUIPMENT SHALL NOT BE ALLOWED ONSITE. EQUIPMENT AND VEHICLES SHALL BE INSPECTED FREQUENTLY FOR LEAKS AND SHALL BE REPAIRED IMMEDIATELY. CLEAN UP SPILLS AND LEAKS PROMPTLY WITH ABSORBENT MATERIALS; DO NOT FLUSH WITH WATER.
2. VEHICLES AND EQUIPMENT SHALL BE MAINTAINED, AND REPAIRED ONSITE ONLY IN DESIGNATED AREAS. PREVENT RUN–ON AND RUN–OFF FROM DESIGNATED AREAS. CONTAINMENT DEVICES SHALL BE PROVIDED AND AREAS SHALL BE COVERED IF NECESSARY.
3. DESIGNATE ONSITE VEHICLE AND EQUIPMENT MAINTENANCE AREAS, AWAY FROM STORM DRAIN INLETS AND WATERCOURSES.
4. ALWAYS USE SECONDARY CONTAINMENT, SUCH AS A DRAIN PAN OR DROP CLOTH, TO CATCH SPILLS AND LEAKS WHEN REMOVING OR CHANGING FLUIDS.
5. LEGALLY DISPOSE OF USED OILS, FLUIDS, LUBRICANTS, AND BATTERIES.
6. PROVIDE SPILL CONTAINMENT DIKES OR SECONDARY CONTAINMENT AROUND STORED OIL, FUEL, AND CHEMICAL DRUMS.
7. MAINTAIN AN ADEQUATE SUPPLY OF ABSORBENT SPILL CLEANUP MATERIALS IN DESIGNATED AREA.
8. IT IS THE CONTRACTORS RESPONSIBILITY TO REGULARLY INSPECT THE VEHICLE AND EQUIPMENT MAINTENANCE AREA(S).

EQUIPMENT MAINTENANCE AREAS

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NPDES BMP SEDIMENT AND EROSION CONTROL

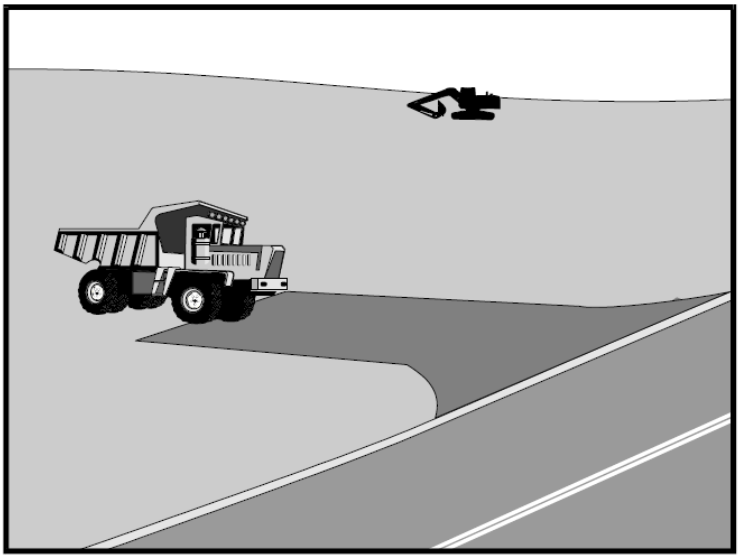
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PLATE NO.
BMP–2

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NOTES:

1. SEDIMENTS AND OTHER MATERIALS SHALL NOT BE TRACKED FROM THE SITE BY VEHICLE TRAFFIC. THE CONSTRUCTION ENTRANCE ROADWAYS SHALL BE STABILIZED SO AS TO PREVENT SEDIMENTS FROM BEING DEPOSITED INTO THE PUBLIC ROADS. SEDIMENT DEPOSITED ON THE ROADWAY MUST BE SWEPT UP IMMEDIATELY AND MAY NOT BE WASHED DOWN BY RAIN OR OTHER MEANS INTO THE STORM DRAIN SYSTEM. SEE TYPE 1 AND TYPE 2 DETAILS.

2. STABILIZED CONSTRUCTION ENTRANCE SHALL BE:
   A. LOCATED AT ANY POINT WHERE TRAFFIC WILL BE ENTERING OR LEAVING A CONSTRUCTION SITE TO OR FROM A PUBLIC RIGHT OF WAY, STREET, ALLEY, AND SIDEWALK OR PARKING AREA.

   B. A SERIES OF STEEL PLATES WITH "RUMBLE STRIPS", AND/OR MIN >3" TO <6" CRUSHED AGGREGATE WITH LENGTH, WIDTH & THICKNESS AS NEEDED TO ADEQUATELY PREVENT ANY TRACKING ONTO PAVED SURFACES. ALL STEEL PLATES WITH "RUMBLE STRIPS" SHALL BE PLACED OUTSIDE THE PUBLIC RIGHT-OF-WAY.

3. ADDING A WASH RACK WITH A SEDIMENT TRAP LARGE ENOUGH TO COLLECT ALL WASH WATER CAN GREATLY IMPROVE EFFICIENCY.

4. ALL VEHICLES ACCESSING THE CONSTRUCTION SITE SHALL UTILIZE THE STABILIZED CONSTRUCTION ENTRANCE SITES.

   A. REMOVE ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS IMMEDIATELY.
   B. SWEEP PAVED AREAS THAT RECEIVE CONSTRUCTION TRAFFIC WHENEVER SEDIMENT BECOMES VISIBLE.
   C. PAVEMENT WASHING WITH WATER IS PROHIBITED IF IT RESULTS IN A DISCHARGE TO THE STORM DRAIN SYSTEM.

STABILIZED CONSTRUCTION ENTRANCE/EXIT

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NPDES BMP SEDIMENT AND EROSION CONTROL

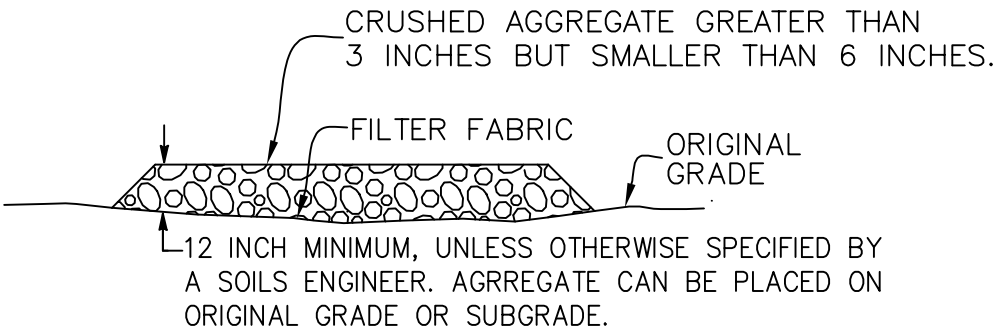
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PLATE NO. BMP-3

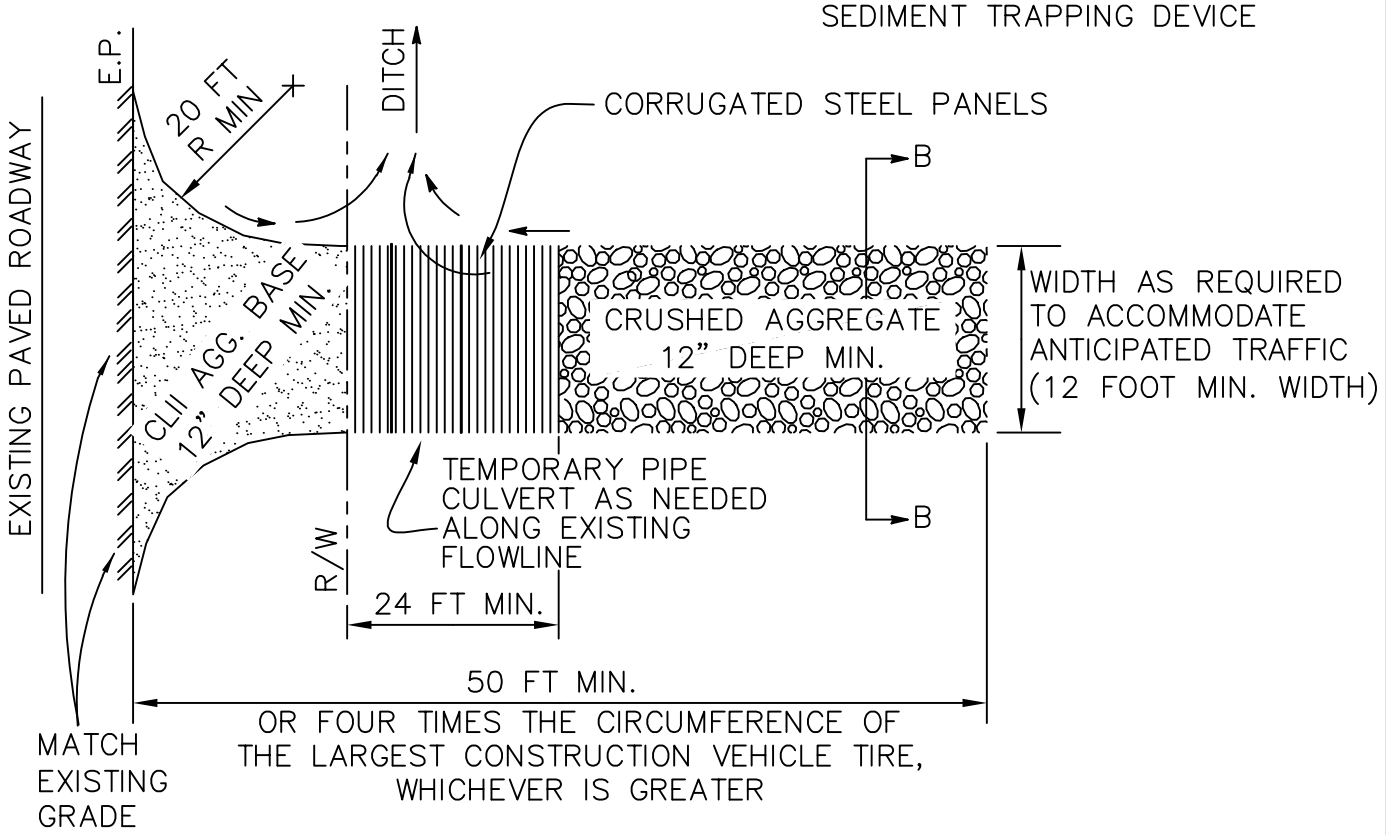
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SECTION B–B
NOT TO SCALE

SEDIMENT TRAPPING DEVICE

NOTE:
CONSTRUCT SEDIMENT BARRIER AND CHANNELIZE RUNOFF TO SEDIMENT TRAPPING DEVICE



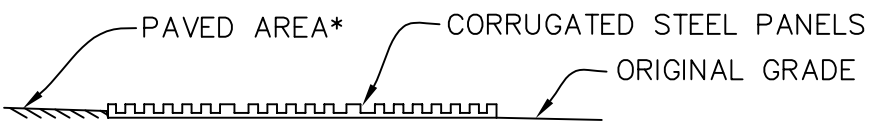
PLAN
NOT T SCALE

TYPE 1 GRAVEL ENTRANCE/EXIT

STABILIZED CONSTRUCTION ENTRANCE/EXIT

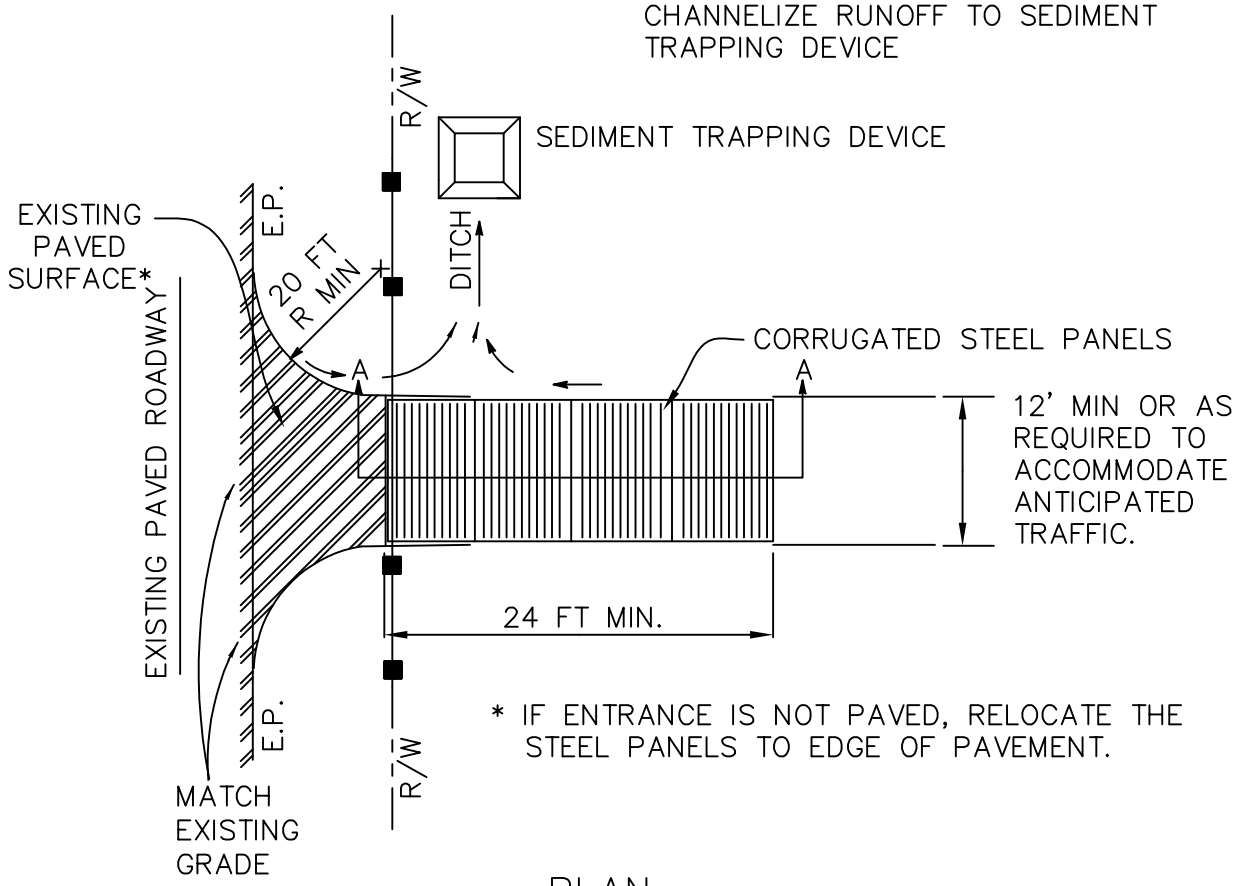
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			PLATE NO. BMP–4

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SECTION A–A
NOT TO SCALE

NOTE:
CONSTRUCT SEDIMENT BARRIER AND CHANNELIZE RUNOFF TO SEDIMENT TRAPPING DEVICE



* IF ENTRANCE IS NOT PAVED, RELOCATE THE STEEL PANELS TO EDGE OF PAVEMENT.

PLAN
NOT TO SCALE

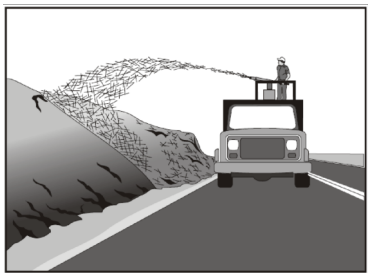
TYPE 2 ALTERNATIVE ENTRANCE/EXIT

USE OF CORRUGATED STEEL PLATES, SHAKER PLATES, RUMBLE PLATES, ETC.

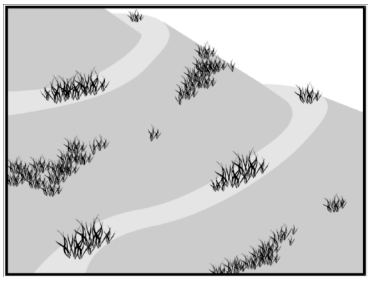
STABILIZED CONSTRUCTION ENTRANCE/EXIT

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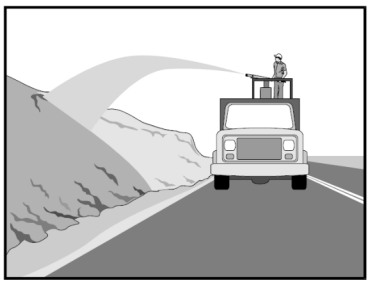
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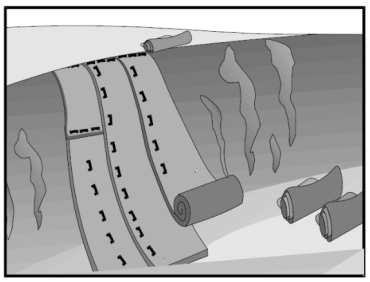
STRAW MULCH



HYDROSEEDING



HYDRAULIC MULCH



GEOTEXTILES, MATS, PLASTIC COVERS AND EROSION CONTROL BLANKETS

NOTES:

1. SOIL/SLOPE STABILIZATION PRACTICES SHALL BE DESIGNED TO PRESERVE EXISTING VEGETATION WHERE FEASIBLE AND TO REVEGETATE OPEN AREAS AS SOON AS FEASIBLE AFTER GRADING. THESE CONTROL PRACTICES SHALL INCLUDE TEMPORARY SEEDING, PERMANENT SEEDING, MULCHING, SOD STABILIZATION, VEGETATIVE BUFFER STRIPS, PROTECTION OF TREES, OR OTHER SOIL STABILIZATION PRACTICES.
2. SOIL STABILIZATION SHALL BE IMPLEMENTED ON ALL INACTIVE DISTURBED AREAS FROM OCTOBER 1 THRU MAY 30 AND ON ALL DISTURBED AREAS DURING A RAIN EVENT OR POTENTIAL RAIN.
3. STABILIZATION PRACTICES SHALL CONTROL/PREVENT EROSION FROM THE FORCES OF WIND AND WATER.
4. STABILIZATION PRACTICES SHALL BE IMPLEMENTED IN CONJUNCTION WITH SEDIMENT TRAPPING/FILTERING PRACTICES AND PRACTICES TO REDUCE THE TRACKING OF SEDIMENT ONTO PAVED ROADS.
5. WHEN USING STRAW MULCHING, THE MINIMUM APPLICATION SHALL BE 2 TONS/ACRE. MULCH MUST BE ANCHORED IMMEDIATELY TO MINIMIZE LOSS BY WIND OR WATER.
6. WHEN USING HYDROSEEDING/MULCHING, THE MINIMUM, APPLICATION OF WOOD FIBER SHALL BE 1,500 LBS/ACRE, THAT DOES NOT CONTAIN MORE THAN 50 PERCENT NEWSPRINT.
7. FOR SEEDING RECOMMENDATIONS, CONTACT: USDA, NATURAL RESOURCES CONSERVATION SERVICE AT 5000 CALIFORNIA AVENUE, BAKERSFIELD, CA 93309–0725. PHONE: (661) 336–0967.
8. WHEN USING HYDRAULIC MULCH, THE APPLICATION SHALL BE BETWEEN 1 TO 2 TONS PER ACRE.
9. GEOTEXTILES, MATS, PLASTIC COVERS AND EROSION CONTROL BLANKETS SHOULD BE CONSIDERED WHEN DISTURBED SOILS MAY BE PARTICULARLY DIFFICULT TO STABILIZE.
10. FOR GEOTEXTILES, MATS, AND EROSION CONTROL BLANKETS, INSTALLATION SHOULD BE IN ACCORDANCE WITH MANUFACTURES RECOMMENDATIONS. TYPICALLY OVERLAP OF GEOTEXTILES/MATS EDGES IS 2 TO 3 IN. AND STAPLED EVERY 6 IN. WHEN BLANKETS ARE TO BE SPLICED, PLACE BLANKETS END–OVER–END (SHINGLE STYLE) WITH 6 IN. OVERLAP AND STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12 IN. APART.

EROSION CONTROL

KERN COUNTY PUBLIC WORKS
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NPDES BMP SEDIMENT AND EROSION CONTROL

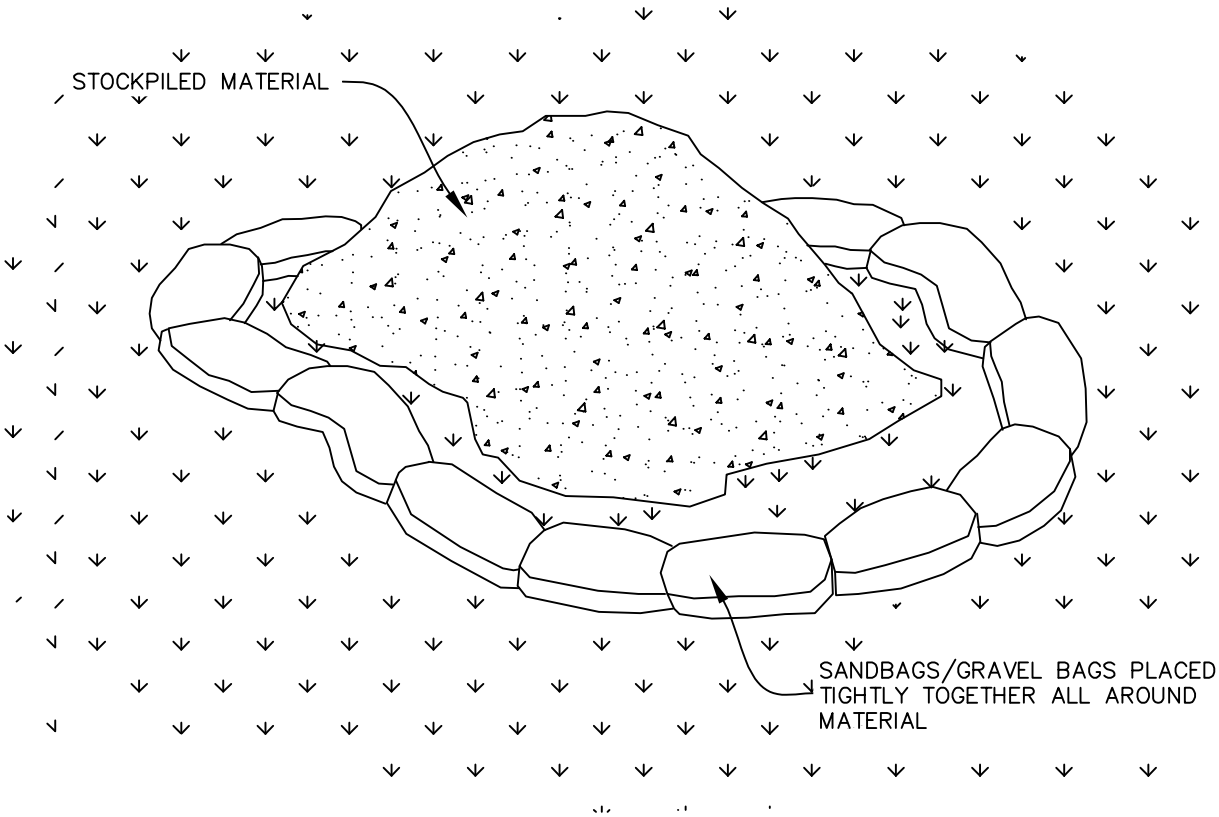
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DEVELOPMENT STANDARD

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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO. BMP–6

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NOTES:

STOCKPILE MANAGEMENT PROCEDURES AND PRACTICES ARE DESIGNED TO REDUCE OR ELIMINATE AIR AND STORM WATER POLLUTION FROM STOCKPILES OF SOIL, AND PAVING MATERIALS SUCH AS PORTLAND CEMENT CONCRETE (PCC) RUBBLE, ASPHALT CONCRETE (AC), ASPHALT CONCRETE RUBBLE, AGGREGATE BASE, AGGREGATE SUBBASE OR PRE-MIXED AGGREGATE, ASPHALT BINDER (I.E. COLD MIX) AND PRESSURE TREATED WOOD.

1. PROTECTION OF STOCKPILES IS A YEAR-ROUND REQUIREMENT.
2. LOCATE STOCKPILES A MINIMUM OF 50 FEET AWAY FROM CONCENTRATED FLOWS OF STORM WATER, DRAINAGE COURSES, AND DRAIN INLETS.
3. IMPLEMENT WIND EROSION/TRANSPORT CONTROL PRACTICES AS APPROPRIATE.
4. ALL STOCKPILES SHALL BE COVERED, STABILIZED, OR PROTECTED WITH A TEMPORARY LINEAR BARRIER (I.E. SANDBAGS, ETC.) PRIOR TO THE ONSET OF PRECIPITATION.

MATERIAL STORAGE

KERN COUNTY PUBLIC WORKS
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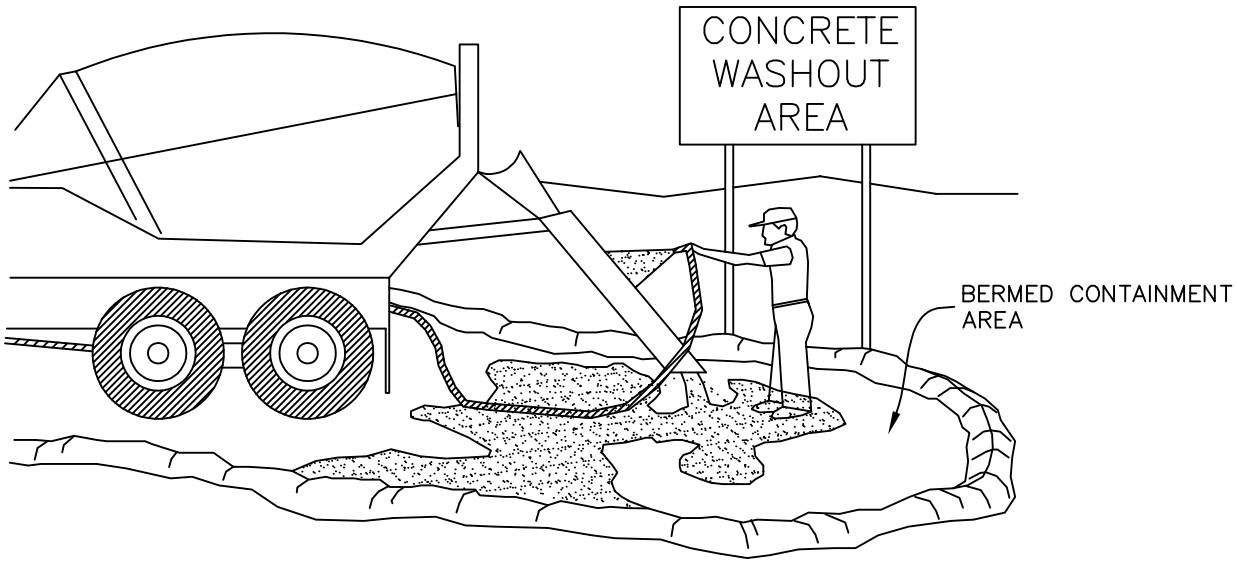
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PLATE NO. BMP-7

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NOTES:

1. EXCESS AND WASTE CONCRETE SHALL NOT BE WASHED INTO THE STREET OR INTO A DRAINAGE SYSTEM.
2. FOR WASHOUT OF CONCRETE AND MORTAR PRODUCTS, A DESIGNATED CONTAINMENT FACILITY OF SUFFICIENT CAPACITY TO RETAIN LIQUID AND SOLID WASTE SHALL BE PROVIDED ON SITE AND DISPOSED OF PROPERLY OFF SITE.
3. SLURRY FROM CONCRETE AND ASPHALT SAW CUTTING SHALL BE VACUUMED OR CONTAINED, DRIED, PICKED UP AND DISPOSED OF PROPERLY.

CONCRETE WASTE MANAGEMENT

KERN COUNTY PUBLIC WORKS
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NPDES BMP SEDIMENT AND EROSION CONTROL

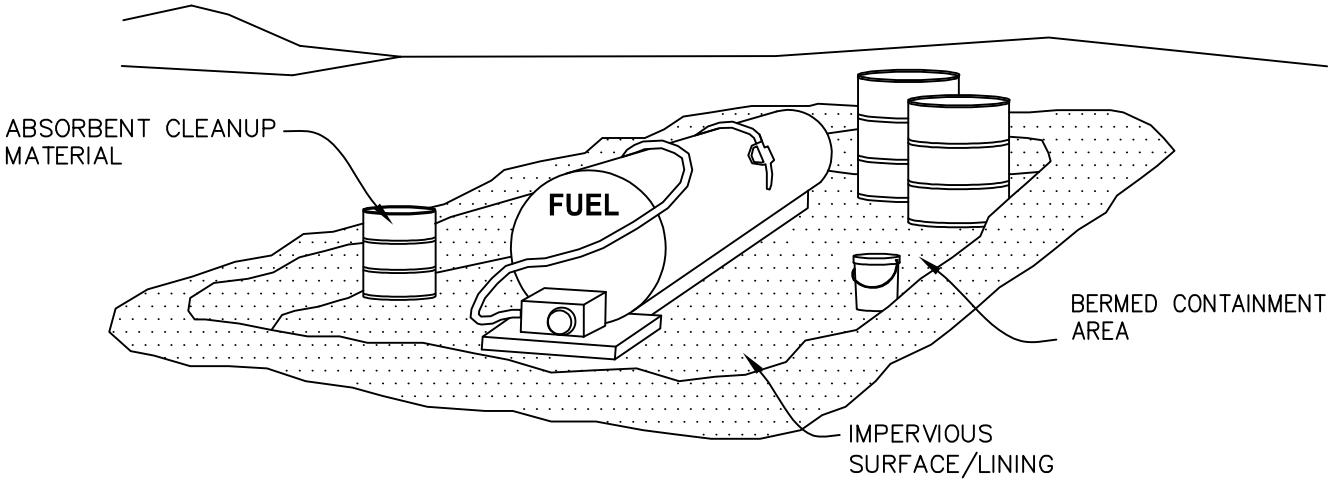
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PLATE NO.
BMP–8

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NOTES:

1. FUELING SHALL BE PERFORMED IN A DESIGNATED AREA, AWAY FROM DRAINAGE COURSES.
2. ABSORBENT CLEANUP MATERIAL SHALL BE ON SITE AND USED IMMEDIATELY IN THE EVENT OF A SPILL.
3. DRIP PANS OR ABSORBENT PADS SHALL BE USED DURING VEHICLE AND EQUIPMENT FUELING, UNLESS THE FUELING IS PERFORMED OVER AN IMPERMEABLE SURFACE IN A DEDICATED FUELING AREA.
4. DEDICATED FUELING AREAS SHALL BE PROTECTED FROM STORM WATER RUN–ON AND RUNOFF, AND SHALL BE LOCATED AT LEAST 50 FEET FROM DOWNSTREAM DRAINAGE FACILITIES AND WATERCOURSES. FUELING MUST BE PERFORMED ON LEVEL–GRADE AREAS.
5. PROTECT FUELING AREAS WITH BERMS AND/OR DIKES TO PREVENT RUN–ON, RUNOFF, AND TO CONTAIN SPILLS.

VEHICLE/ EQUIPMENT FUELING

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NPDES BMP SEDIMENT AND EROSION CONTROL

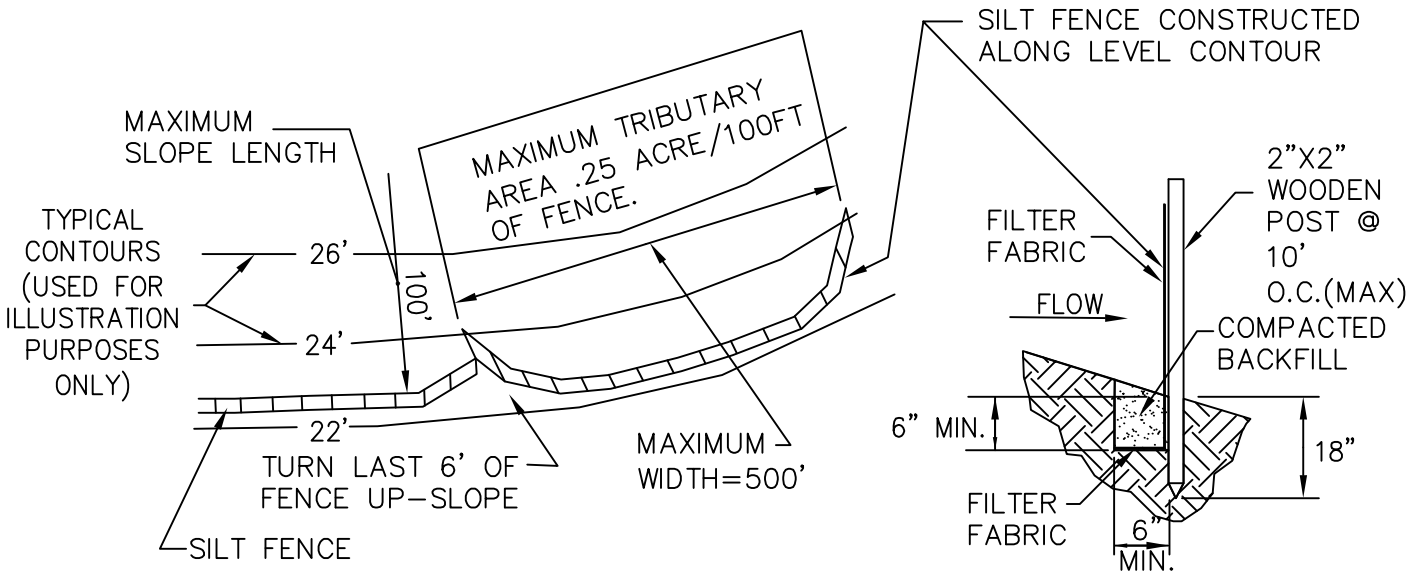
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PLATE NO. BMP–9

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NOTES:

1. CONSTRUCT THE SILT FENCE ALONG A LEVEL CONTOUR.
2. SILT FENCES SHALL REMAIN IN PLACE UNTIL THE DISTURBED AREA IS PERMANENTLY STABILIZED.
3. PROVIDE SUFFICIENT ROOM FOR RUNOFF TO POND BEHIND THE FENCE AND ALLOW SEDIMENT REMOVAL EQUIPMENT TO PASS BETWEEN THE SILT FENCE AND TOE OF SLOPE OR OTHER OBSTRUCTIONS. ABOUT 1200 SQ. FT. OF PONDING AREA SHALL BE PROVIDED FOR EVERY ACRE DRAINING TO THE FENCE.
4. TURN THE ENDS OF THE FILTER FENCE UPHILL TO PREVENT STORMWATER FROM FLOWING AROUND THE FENCE.
5. LEAVE AN UNDISTURBED OR STABILIZED AREA IMMEDIATELY DOWNSLOPE FROM THE FENCE.
6. DO NOT PLACE IN LIVE STREAM OR INTERMITTENTLY FLOWING CHANNELS.
7. WHEN STANDARD FILTER FABRIC IS USED, A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY-DUTY (0.6 INCH) WIRE STAPLES AT LEAST 1.75 INCHES LONG, TIE WIRES OR HOG RINGS.
8. FILTER FABRIC SHALL BE WOVEN POLYPROPYLENE GEOTEXTILE WITH A MINIMUM WIDTH OF 36 INCHES AND A MINIMUM TENSILE STRENGTH OF 100 LB FORCE.
9. WOOD STAKES SHALL BE COMMERCIAL QUALITY LUMBER NO LESS THAN 2 INCH BY 2 INCH. WOOD STAKES SHALL BE DRIVEN TO A DEPTH OF NO LESS THAN 18 INCHES FROM SURFACE.

SILT FENCE

KERN COUNTY PUBLIC WORKS
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NPDES BMP SEDIMENT AND EROSION CONTROL

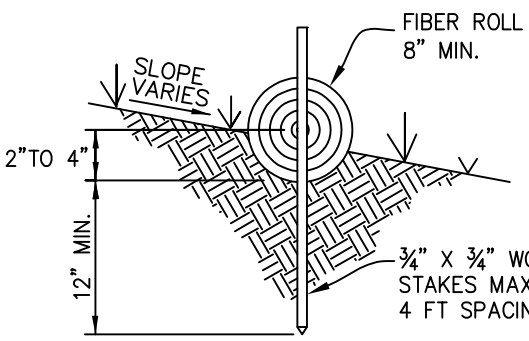
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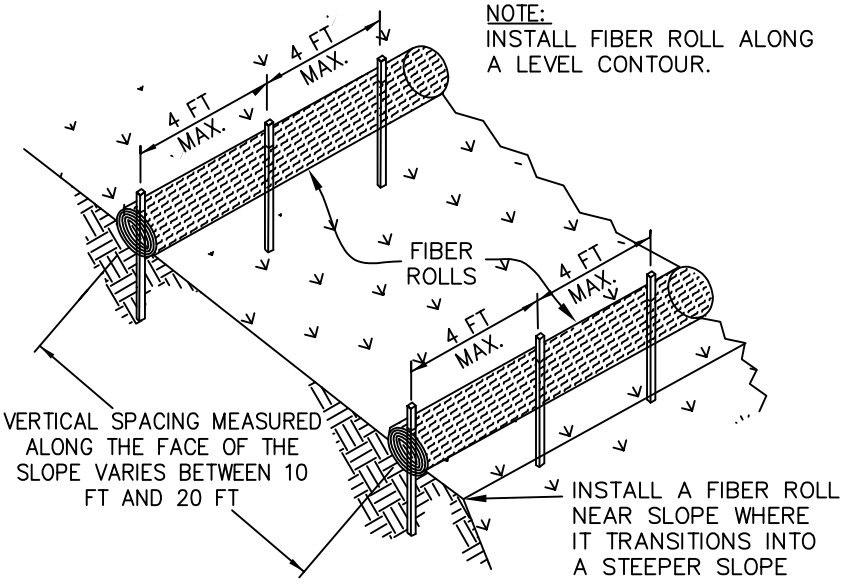
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PLATE NO. BMP-10

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ENTRENCHMENT DETAIL
NOT TO SCALE



TYPICAL FIBER ROLL INSTALLATION
NOT TO SCALE

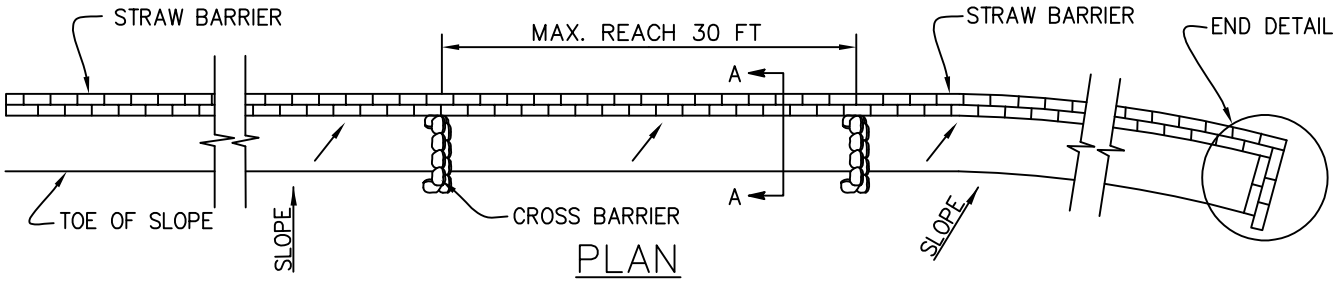
NOTES:

1. PLACE ALONG THE TOE, TOP, FACE, AND AT GRADE BREAKS OF EXPOSED AND ERODIBLE SLOPES.
2. PLACE ON THE DOWN–SLOPE OF EXPOSED SOIL AREAS.
3. PLACE AROUND TEMPORARY STOCKPILES.
4. PLACE ALONG THE PERIMETER OF A PROJECT.
5. SLOPES GREATER THAN 1:5 MAY REQUIRE THE USE OF 20 INCH DIAMETER FIBER ROLLS AT THE TOP OF SLOPES.
6. FIBER ROLLS SHALL BE EITHER PREFABRICATED OR ROLLED TUBES OF EROSION CONTROL BLANKETS WITH A MINIMUM 8 INCH DIAMETER.
7. SLOPES 1:4 OR FLATTER REQUIRE FIBER ROLLS TO BE PLACED NO MORE THAN 20 FEET APART.
8. SLOPES 1:4 TO 1:2 REQUIRE FIBER ROLLS TO BE PLACED NO MORE THAN 15 FEET APART.
9. SLOPES 1:2 OR GREATER REQUIRE FIBER ROLLS TO BE PLACED NO MORE THAN 10 FEET APART.
10. FIBER ROLLS SHALL BE PLACED IN A 2 TO 4 INCH DEEP TRENCH.
11. WOODEN COMMERCIAL GRADE STAKES, ¾" X ¾", SHALL BE USED TO SECURE THE FIBER ROLL TO THE GROUND SURFACE. STAKES SHALL BE A MINIMUM LENGTH OF 24 INCHES AND DRIVEN A MINIMUM OF 12 INCHES.
12. A SINGLE–STAKE INSTALLATION REQUIRES THE STAKES TO BE PLACED NO MORE THAN 2 FEET APART.
13. IF MORE THAN ONE FIBER ROLL IS PLACED IN A ROW, THE ROLLS SHALL BE OVERLAPPED, NOT ABUTTED, A MINIMUM OF 1 FOOT.

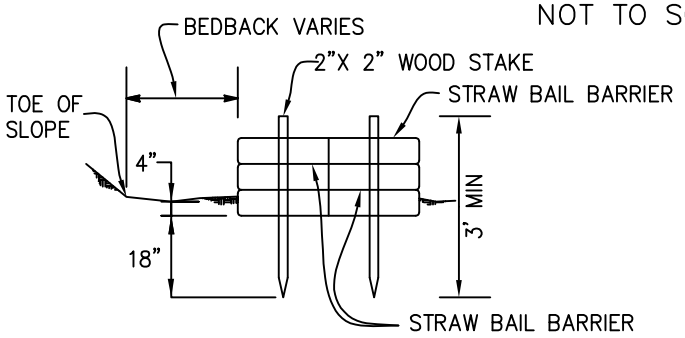
FIBER ROLL

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			DESIGNED BY: J.R.C.	BMP–11
	COUNTY OF KERN STATE OF CALIFORNIA DEVELOPMENT STANDARD		DATE DRAFTED: 09/30/23	
			APPROVED BY: J.R.C.	

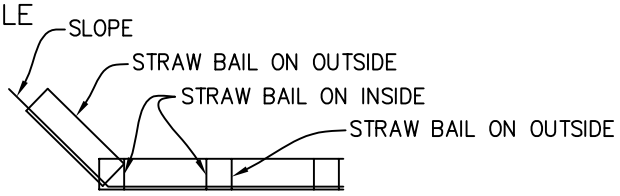
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PLAN
NOT TO SCALE



A–A
NOT TO SCALE



END DETAIL
NOT TO SCALE

A STRAW BALE BARRIER IS A TEMPORARY LINEAR SEDIMENT BARRIER CONSISTING OF STRAW BALES, DESIGNED TO INTERCEPT AND SLOW SEDIMENT LADEN SHEET FLOW RUNOFF. STRAW BALE BARRIERS ALLOW SEDIMENT TO SETTLE FROM RUNOFF BEFORE WATER LEAVES THE CONSTRUCTION SITE.

NOTES:

1. PLACE ALONG THE PERIMETER OF A SITE, STREAMS AND CHANNELS, AND/OR AROUND STOCKPILES.
2. PLACE BELOW THE TOE OF EXPOSED AND ERODIBLE SLOPES.
3. PLACE DOWN SLOPE OF EXPOSED SOIL AREAS.
4. PLACE PARALLEL TO ROADWAY TO KEEP SEDIMENT OFF PAVED AREAS.
5. DO NOT USE FOR DRAIN INLET PROTECTION OR IN AREAS OF CONCENTRATED FLOWS.
6. STRAW BALE TO BE A MINIMUM OF 14 INCHES WIDE, 18 INCHES IN HEIGHT AND 36 INCHES IN LENGTH.
7. SHALL BE COMPOSED ENTIRELY OF VEGETATIVE MATERIAL, EXCEPT FOR THE BINDING MATERIAL.
8. BALE BINDINGS SHALL BE EITHER STEEL WIRE, NYLON OR POLYPROPYLENE STRING PLACED HORIZONTALLY.
9. COMMERCIAL QUALITY LUMBER SHALL BE USED FOR 2 INCH BY 2 INCH WOOD STAKES OF ADEQUATE LENGTH.
10. LIMIT THE DRAINAGE AREA UPSTREAM OF THE BARRIER TO 0.25AC/100 FT.
11. LIMIT THE SLOPE LENGTH DRAINING TO THE STRAW BALE BARRIER TO 100FT.
12. SLOPES OF 2% OR FLATTER ARE PREFERRED.
13. IF SLOPE EXCEEDS 10%, THE LENGTH OF THE SLOPE UPSTREAM OF THE BARRIER MUST BE LESS THAN 50 FT.
14. INSTALL STRAW BARRIER ALONG A LEVEL CONTOUR, IN A TRENCH AND TIGHTLY ABUT ADJACENT BALES.
15. LAST STRAW BALE ON END NEEDS TO BE TURNED UP SLOPE.
16. INSPECT STRAW BALE BARRIERS BEFORE AND AFTER EACH RAIN EVENT.
17. INSPECT STRAW BALE BARRIERS FOR SEDIMENT ACCUMULATIONS AND REMOVE SEDIMENT WHEN DEPTH REACHES ONE THIRD OF THE BARRIER HEIGHT.
18. REPLACE OR REPAIR DAMAGED BALES AS NEEDED.

STRAW BALE BARRIER

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NPDES BMP SEDIMENT AND EROSION CONTROL

COUNTY OF KERN
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DESIGNED BY: J.R.C.
DATE DRAFTED: 09/30/23
APPROVED BY: J.R.C.

PLATE NO.
BMP–12

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BEST MANAGEMENT PRACTICES (BMP's)

GENERAL NOTES

1. BEST MANAGEMENT PRACTICES (BMP'S) CONTAINED HEREIN REFLECT THE MINIMUM REQUIREMENTS. ALTERNATE METHODS PROVIDING EQUAL OR GREATER PROTECTION MAY BE UTILIZED. FOR IN DEPTH INFORMATION ON BMP'S REFER TO THE CALIFORNIA STORM WATER BMP HANDBOOKS, AVAILABLE AT WWW.CABMPHANDBOOKS.COM, CALIFORNIA DEPARTMENT OF TRANSPORTATION CONSTRUCTION SITE BMP FACT SHEETS AT WWW.DOT.CA.GOV/HQ/CONSTRUC/STORMWATER/FACTSHEETS.HTM, AND/OR USEPA BMP FACT SHEET @ HTTP://CFPUB.EPA.GOV/NPDES/STORMWATER.

2. ALL CONSTRUCTION ACTIVITY SHALL BE PERFORMED IN ACCORDANCE WITH A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) DEVELOPED AND IMPLEMENTED IN COMPLIANCE WITH THE REQUIREMENTS OF THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) CONSTRUCTION GENERAL PERMIT ORDER NO. 2009-009-DWQ AND AS AMENDED BY ORDER NO. 2010-0014-DWQ.

3. THE SWPPP SHALL:

   A. IDENTIFY POTENTIAL POLLUTANT SOURCES AND INCLUDE THE DESIGN AND PLACEMENT OF BMP'S TO EFFECTIVELY PROHIBIT THE ENTRY OF POLLUTANTS FROM THE CONSTRUCTION SITE ONTO THE STREET AND/OR INTO A STORM DRAIN SYSTEM DURING CONSTRUCTION.

   B. BE KEPT ON SITE AND AMENDED TO REFLECT CHANGING CONDITIONS THROUGHOUT THE COURSE OF CONSTRUCTION.

   C. BE KEPT UP TO DATE. ANY ADDITIONAL UPDATES REQUESTED BY AGENCY REPRESENTATIVE ARE TO BE MADE IMMEDIATELY.

4. NON-STORMWATER DISCHARGES ARE PROHIBITED FROM ENTERING ANY STORM DRAIN SYSTEM AND/OR STREET.

5. DISCHARGES OF PUMPED GROUND WATER REQUIRE A DISCHARGE PERMIT FROM THE STATE OF CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD (RWQCB).

6. POLLUTANTS SHALL BE REMOVED FROM STORMWATER DISCHARGES TO THE MAXIMUM EXTENT PRACTICABLE (MEP) THROUGH DESIGN & IMPLEMENTATION OF THE SWPPP.

7. A STANDBY CREW FOR EMERGENCY WORK SHALL BE AVAILABLE AT ALL TIMES DURING THE WET WEATHER SEASON, WHICH IS TYPICALLY OCT 1 THROUGH MAY 30. NECESSARY MATERIALS SHALL BE AVAILABLE ON SITE AND STOCKPILED AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF EMERGENCY DEVICES WHEN RAIN IS IMMINENT.

8. PORTABLE SANITARY FACILITIES SHALL BE LOCATED ON RELATIVELY LEVEL GROUND AWAY FROM TRAFFIC AREAS, DRAINAGE COURSES, AND STORM DRAIN INLETS.

9. EMPLOYEES, SUBCONTRACTORS AND SUPPLIERS SHALL BE EDUCATED ON ALL BMP'S INCLUDING CONCRETE WASTE STORAGE AND DISPOSAL PROCEDURES.

10. SEDIMENT CONTROL PRACTICES SHALL EFFECTIVELY PREVENT A NET INCREASE OF SEDIMENT LOAD IN STORMWATER DISCHARGE.

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			DESIGNED BY: J.R.C.	
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			APPROVED BY: J.R.C.	

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