THE CITY OF PLEASANTON

STANDARD SPECIFICATIONS AND DETAILS

JULY 2024

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CITY ENGINEER

THE CITY OF PLEASANTON

2024 Edition of the Standard Specifications and Details

Adopted by City Council on July 16, 2024

Updating the City of Pleasanton Standard Specifications and Details was completed by hard work and dedication of several City employees. Special thanks and appreciation are given to the following individuals:

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SECTION 1. GENERAL

1-01 Scope and Purpose

The scope and purpose of these City Standard Specifications are to provide minimum standards for materials used and methods of construction for the City's public infrastructure including streets, water, sanitary sewer, and storm drainage facilities. The City Standard Specifications are to be used in conjunction with the City Standard Details. These minimum standards shall apply to City capital improvement and private development projects. All references to industry standards shall mean "to the latest version of the standard at the time of the bid."

1-02 Definition and Terms

As used in these City Standard Specifications unless the context otherwise requires, the following terms have the meanings indicated:

Addenda: Written or graphic instruments, clarifications, or corrections issued prior to the execution of the contract, that modify or interpret the Contract Documents.

Bidder: Any individual, partnership, or corporation submitting a Bid Proposal for the work described in the Contract Documents.

Bidding Documents: Includes the Notice to Bidders, the Bid Proposal, Bid Bond, Contractor's Information Forms – including the Contractor's experience, financial responsibility, and Subcontractors – and Instructions to Bidders.

City: The City of Pleasanton.

City Project: A public improvement project contracted by the City of Pleasanton.

City Standard Specifications and Details: The latest edition of the City's Standard Specifications and Standard Details.

Contractor: Any individual, partnership, or corporation that has entered a Contract with the City to perform the work described in the Contract Documents for Capital Improvement projects or with the Developer for private development improvements.

Contract Documents: Includes the Bidding Documents, the Award and Execution of Contract Requirements, the Contract, the Labor and Material Bond, the Performance Bond, the Maintenance Bond, the City General Provisions, the Special Provisions, Project Plans, the city of Pleasanton Standard Specifications and Details, the State Standard Specifications and Standard Plans, all Addenda issued by the City, and all Change Orders executed by the City.

Developer: A person, firm, or corporation with whom the City has executed a written improvement agreement.

Engineer: The City Engineer of the City of Pleasanton, acting either directly or through properly authorized agents, such agents acting within the scope of the duties entrusted to them.

General Provisions: Those Specifications that apply to all projects unless specifically modified by Special Provisions.

Private Development Project: A commercial or residential improvement contracted by a private developer.

Project Plans: Drawings specifically prepared for a particular project.

Public Right-of-Way: Any real property within a street or public utility easements dedicated to the City.

Public Works Inspector: A representative of the City Engineer assigned to inspect Public Improvements to ascertain that the material and workmanship are in accordance with the requirements of these City Standard Specifications, the Special Provisions, and the Project Plans.

Special Provisions: Specifications specifically prepared for a particular project.

State Standard Specifications and Standard Plans: Except where specified, the current edition, including all updates at the time and date of the bid opening, of the Standard Specifications and Standard Plans of the State of California, Department of Transportation. Any reference therein to the State of California or a State agency, office, or officer shall be interpreted to refer to the City or its corresponding agency, office, or officer acting under the contract.

Subcontractor: Any individual, partnership, or corporation that has contracted with the Contractor to provide labor, equipment, and/or materials described in the Contract Documents, which is an amount more than 0.5% of the prime Contractor's total bid or ten thousand dollars ($10,000), whichever is greater.

Work: Material, equipment, tools, and labor to be provided by Contractor as defined by the Contract Documents.

1-03 Abbreviations

The City Standard Specifications refer to standards materials and specifications of other published data of various national, regional, or local organizations in the form of abbreviations. In the City Standard specifications, the following abbreviations have the following corresponding meaning:

AASHTO	American Association of State Highway and Transportation Officials
ABAG	Association of Bay Area Governments
ACP	Asbestos Cement Pipe
ANSI	American National Standards Institute
ASA	American Standards Association
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
BASMAA	Bay Area Stormwater Management Agencies Association
BMP	Best Management Practices
CSA	Canadian Standards Association
C	Celsius (temperature)
CALTRANS	Department of Transportation-State of California
CPM	Critical Path Method
CTS	Copper Tube Size
DIP	Ductile Iron Pipe
DOHS	Department of Health Services
DSRSD	Dublin San Ramon Services District
F	Fahrenheit (temperature)
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineers Society
ISA	International Society of Arboriculture
MSDS	Material Safety Data Sheets
MUTCD	Manual on Uniform Traffic Control Devices
NEC	National Electric Code
NEMA	National Electrical Manufacturer's Association
OSHA	Occupational Safety and Health Administration
PE	Polyethylene
PG&E	Pacific Gas & Electric
PGS	Pleasanton Garbage Service
PSI	Pounds per Square Inch
PVC	Polyvinyl Chloride
RCP	Reinforced Concrete Pipe
RWQCB	Regional Water Quality Control Board-State of California
SDR	Standard Dimension Ratio
SWPPP	Stormwater Pollution Prevention Plan
TCP	Traffic Control Plan
UL	Underwriters Laboratories
USA	Underground Service Alert
USCC	United States Composting Council
USCFCCCHR	University of Southern California Foundation for Cross Connection Control and Hydraulic Research
VCP	Vitrified Clay Pipe
WELO	Water Efficient Landscape Ordinance
Zone 7	Alameda County Flood Control and Water Conservation District, Drainage Area 7-1

1-04 Order of Precedence of Specifications and Reference to Other Specifications

The Work presented in the Contract Documents shall be done in accordance with the following documents: (1) Project Plans and the Special Provisions, (2) the City Standard Specifications and Details, (3) the State Standard Specifications and Standard Plans including all updates at time of bid, and (4) City-approved shop drawings. In case of conflicting portions, the above order of precedence shall prevail. In case of conflict between the specifications and drawings, the specifications shall prevail.

1--05 Operation of Existing Facilities

Existing water, sanitary sewer, storm drainage, traffic signals, street lighting, irrigation system facilities, and other utilities must be kept in continuous operation throughout the construction period. Existing City-owned water valves shall be operated only by City personnel. If interruption of City-owned facilities is required, the Contractor shall give the Engineer a minimum of two (2) working days' notice. Only interruption which does not adversely affect the degree of service provided will be permitted and is subject to permission obtained from the Engineer in advance.

The Contractor shall provide temporary facilities and make temporary modifications as necessary to keep the existing facilities in operation during the construction period.

All fire hydrants and water control valves shall be always kept free from obstruction and available for use.

The Contractor shall notify affected residents in writing forty-eight (48) hours before any possible service interruptions. Door hangers are available from the City. No interruption on Friday unless approved otherwise.

1-06 Protection of Existing Utilities and Property

Contractor shall comply with Section 5-1.36, "Property and Facilities Preservation," and Sections 7-1.05, "Indemnification," and 7-1.06 "Insurance," of the State Standard Specifications.

Contractor shall be held responsible for any damage to existing utilities and property, both public and private, due to Contractor's work. Contractor shall repair or replace any such damaged utilities and property according to the requirements of the Engineer at no additional cost to the City.

Contractor shall protect, shore, brace, support, and maintain all underground pipes, conduits, drains, and other underground construction uncovered or otherwise affected by construction operations.

The Contractor shall be responsible for the removal of all Underground Service Alert markings and other reference marks at the completion of the project as directed by the Construction Services Inspector. For City Projects, all costs associated with this marking removal work shall be included in the prices paid for the items of work involved and no additional compensation shall be made.

In the event that private water services or sewer laterals are damaged, the Contractor shall immediately, at the Contractor's own expense, repair such damage in a manner satisfactory to the Engineer so that service will not be interrupted for a period greater than one (1) hour. If such interruption is sustained, it shall be the Contractor's responsibility to notify the occupants of the premises to which said services were connected and make necessary arrangements so that no damage will occur on said premises.

Whenever damage is done by the Contractor to public water, sewer, storm drainage facilities, traffic signals, streetlights, irrigation systems, or other utilities, the Contractor shall immediately notify the Engineer. Repair of public sewer and storm drainage facilities shall be made directly by the Contractor under the supervision of City personnel. Repair to existing public water facilities, including main and water service to the meter, shall be performed only by City personnel, but at the Contractor's expense. The Contractor shall provide access to existing City water facilities to City personnel for repair purposes. Trenching and backfill activities for water service repair shall be performed by the Contractor. The water service line damage between the meter and house shall be repaired by the Contractor shall restore all pavement, striping, surfacing, driveways, curbs, walks, buildings, utility poles, guy wires, fences, landscaping, and other surface structures to their original condition. All repairs and replacements shall be made with new materials.

No trees shall be removed except were authorized by the Engineer. Contractor shall follow the requirements of Section 3-03F, "Protection of Trees," of these City Standard Specifications.

Contractor shall comply with Section 15, “Existing Facilities,” of the State Standard Specifications.

1-07 Location of Existing Utilities

The Project Plans show underground utilities in locations as they are known from record plans and reasonable inference from physical conditions. The Contractor shall be required to contact Underground Services Alert (USA) at 1-800-227-2600 to request marking of all underground facilities known to be in the area of construction a minimum of forty-eight (48)hours in advance of any excavation. For City projects, the Contractor shall also notify City’s Parks Division, Traffic Division and IT Department. It shall be the responsibility of

the Contractor to pothole all potential underground conflicts before start of trenching operations. All potholes are to be repaired at the direction of the Engineer.

1-08 Site Protection

The Contractor shall be responsible for leaving the site in a safe condition each day before leaving the site. This shall include any temporary flagging, fencing, and street sweeping necessary for site safety. Toilet and material testing sites shall be screened. For City Projects, all costs associated with this Work shall be included in the prices paid for the items of Work involved, and no additional compensation will be made.

1-09 Dust Control

Dust control shall be in accordance with these City Standard Specifications and Section 13, "Water Pollution Control," of the State Standard Specifications and Construction General Permit.

The Contractor shall provide an acceptable plan for preventing the generation of dust due to their operations in the construction zones, along the haul routes, or equipment parking areas, including having a water truck on the site seven (7) days a week during grading operations. The plan shall consist of water sprinkling or an equivalent service every day, including days that work is not conducted on the project, to maintain adequate dust control during construction. Other measures of dust control may be required as directed by the Engineer. For City Projects, no separate payment will be made for dust control, and all costs in connection therewith shall be included in the payment items to which the work is incidental.

City water shall be furnished by the City at points designated by the City's Water Department. A refundable deposit will be charged by the City's Water Department for the fire hydrant meter and backflow device. Information regarding required deposits and meter and backflow devices can be obtained from the City's Utility Billing Division at 925-931-5565. For City Projects, the Contractor will not be charged for water needed and used in association with the project. For Private Development Projects, the Contractor will be charged for water used according to the City's latest fee schedule. Alternatively, the City may require use of reclaimed water on any project at its sole discretion. If required, payment terms for City projects will be included in the project Special Provisions.

During filling operations, tanker trucks must either use a hydrometer backflow prevention device approved by the Engineer or have a visible air gap mounted on the outside of the water tank approved by the Engineer. For overhead or "Tower Tanks," water fills to the tank shall be accomplished by either an air gap or a City-approved backflow prevention device.

In the event the dust control is not satisfactory to the Engineer, the Engineer shall take such measures as may be necessary to ensure satisfactory dust control and, for City Projects, deduct the cost of such measures from any payments due the Contractor. For Private Development Projects, the cost of such measures shall be deducted from the hazard bond, and no work shall continue until the hazard bond is replenished.

1-10 Noise Control

The Contractor shall abide by the City of Pleasanton Municipal Code, Chapter 9.04, which specifies that *between the hours of 8:00 a.m. and 8:00 p.m. daily, except Sundays and holidays, when the exemption shall apply between 10:00 a.m. and 6:00 p.m., construction, alteration, or repair activities which are authorized by a valid City permit shall be allowed if they meet at least one of the following noise limitations:*

A. No individual piece of equipment shall produce a noise level exceeding 83 dBA at a distance of 25 feet. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to 25 feet from the equipment as possible; or

B. The noise level at any point outside of the property plane of the project shall not exceed 86 dBA.

For additional information and for exceptions to this restriction, the Contractor is referred to Chapter 9.04 of the City of Pleasanton Municipal Code.

1-11 Security

The Contractor shall be responsible for the protection against vandalism of the construction site, including all work performed, materials, equipment, tools, and existing facilities related to the Work. Access to all existing City facilities shall be maintained throughout the duration of the project, regardless of whether the site is secured during non-working hours. The Contractor shall use due diligence in protecting the work from vandalism. The Contractor is responsible for all costs for the repair or replacement of work due to vandalism until the project is accepted by the City.

1-12 Storage

Contractors shall store materials in accordance with Section 6, "Control of Materials," of the State Standard Specifications and Section 1-25B, "Materials Storage," of these City Standard Specifications. Unless specifically designated on the Project Plans, the Contractor's storage site shall be approved by the Engineer.

The Contractor shall not be allowed to stockpile any waste materials and/or construction debris on the project site beyond the day on which the waste was generated Materials need to be hauled off daily or covered in an approved dumpster.

1-13 Quality Control

Contractor shall comply with Section 6, "Control of Materials," of the State Standard Specifications and the following requirements: Material and equipment to be incorporated into the Work shall be new and unused unless otherwise approved and shall bear the

manufacturer's stamp or marking. In case a reference is not clear as to which of several available grades is desired, the highest quality material shall be used.

Where articles or materials are specified by brand or trade name, alternate materials or articles equal to those specified may be approved provided the request for approval is in writing, accompanied by supporting data, in ample time as determined by the Engineer, to permit investigations without delaying the work. Unless substitutions are approved, no deviation from the standards will be allowed.

All Work shall be done by persons experienced in the specific work, under competent supervision, and in a manner to the Engineer's complete satisfaction as specified in Section 5-1.16, "Representative," and Section 5-1.17, "Character of Workman," of the State Standard Specifications.

Materials not conforming to the requirements of these specifications shall be considered defective and all such materials, whether in place or not, shall be rejected and shall be removed from the site of the Work unless otherwise permitted by the Engineer. If the deficiencies of a rejected material are subsequently corrected, the material shall not be used until it has been inspected and approved by the Engineer.

1-14 Shop Drawings and Product Data Submittals

The Contractor shall submit shop drawings and product data to meet the quality control requirements of Section 1-13, "Quality Control," of these City Standard Specifications. These submittals shall contain sufficient detail to show the type, dimensions, and installation of all materials and equipment.

All submittals shall include a letter of transmittal and shall identify by reference, the sheet and detail numbers on the Project Plans and City Standard Details and sections of the Special Provisions and these City Standard Specifications. The Contractor's transmittal represents that the Contractor accepts full responsibility for determining and verifying field measurements and installation requirements. The Contractor shall confirm that the quality and quantity of all materials and equipment have been reviewed and are in compliance with the Contract Documents.

The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Engineer's review of shop drawings and product data submittals unless the Contractor has specifically informed the Engineer in writing of such deviation with the submittal and has received written approval by the Engineer of the specific deviation. The Engineer's review of shops drawings and product data submittals will cover only general conformity to the Contract Documents. The Engineer's review of submittals shall not relieve the Contractor from responsibility for errors, omissions, or deviation in compliance with the Contract Documents.

Contractor shall submit seven (7) hardcopy sets of shop drawings and product data submittals along with one (1) electronic copy of all sheets (PDF format) required for distribution. Two

(2) sets will be retained by the Engineer. Submittals shall be consecutively numbered, followed by a letter to indicate sequence of resubmittals. Resubmittal resulting from non-compliance will not be cause for contract time extension. Contractor shall verify that all exceptions previously noted by the Engineer have been corrected in the resubmittal. Unless modified by the Special Provisions, the Engineer shall return the submittal with disposition to the Contractor within ten (10) working days of receipt.

The Contractor shall, at any time, when requested, submit to the Engineer proper authenticated documents or other satisfactory proofs of compliance with the requirements of these specifications. This shall include certified copies of factory or laboratory test reports showing the strength characteristics of any materials used in the Work.

Suppliers of material, upon request, shall furnish a certified statement signed by an authorized representative of the manufacturer that materials furnished under these specifications comply in all respects. All physical and chemical tests must be performed within the United States.

1-15 Easements, Rights of Way, and Right of Entry

Easements and rights of way are shown on the Project Plans. The Contractor shall confine the Work within the limits of those easements and rights-of-way except for Work on private property, which is specifically called for on the Project Plans and for which the City has obtained a right of entry.

1-16 Lines and Grades and Construction Staking

All Work shall be done in accordance with the lines, grades, and elevations shown on the Project Plans by a licensed surveyor. Staking and marking shall be provided in accordance with Section 5-1.24, "Construction Surveys," of the State Standard Specifications. Stakes and marks shall be carefully preserved by the Contractor. In case such stakes and marks are destroyed or damaged on City projects, they will be replaced by the Engineer at the expense of the Contractor. In the case of City projects, the Contractor will provide the staking and marking. For private development projects, sufficient staking and markings shall be provided to allow for required inspection as determined by the Engineer.

1-17 Cleanup

The Contractor shall keep the premises free at all times from accumulations of waste materials and rubbish. Debris piles must be removed from the project site on a daily basis. Contractor shall provide adequate trash receptacles about the site and shall promptly empty the containers when filled. When required by plans and/or special provisions or conditions of approval for private development projects, debris shall be separated in bins and containers for collection as recyclable waste.

Construction materials, such as concrete forms and scaffolding, shall be neatly stacked by the Contractor when not in use. The Contractor shall promptly remove splattered concrete,

asphalt, oil, paint, corrosive liquids, and cleaning solutions from surfaces to prevent marring or other damage.

Volatile waste shall be properly stored in covered metal containers and removed daily.

Waste shall not be buried or burned on the site or disposed of into storm drains, sanitary sewers, streams, or waterways. All waste shall be removed from the site and disposed of in a manner complying with antipollution laws and Section 1-25B, "Materials Storage," of these City Standard Specifications.

Construction dumpsters shall be provided by the Contractor in conformance with the City's existing Waste Collection Franchise Agreement. The Contractor shall contact the City's current waste collection company regarding policies for the storage, disposal, and recycling of materials.

The Contractor shall remove all USA markings, submit waste/recycled ticket at the end of the project And clean up the SWPPP prior to final inspection.

1-18 Working Hours

The Contractor shall restrict working time to Monday through Friday, 8:00 a.m. to 5:00 p.m., unless otherwise specified by the Engineer. Specific working hours may be set by the Engineer in the project's Special Provisions or in the Conditions of Approval for Private Development Projects. There shall be no work allowed on weekends or city holidays unless approved by the Engineer.

Water shutdown is only allowed at night for commercial property and during the day for residential areas as approved by the Engineer.

1-19 Mobilization

Mobilization shall consist of preparatory work and operations, including, but not limited to , those necessary for the movement of personnel, equipment, supplies and incidentals to the project site; for the establishment of all offices, building and other facilities necessary for work on the project; and for all other work and operations which must be performed or costs incurred prior to beginning work on the various contract items on the project site. Full compensation for any necessary mobilization required shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore unless a specific bid item is shown on the bid form. Mobilization will not be approved until BMP/SWPPP has been approved by the City.

1-20 Permits and Licenses

The Contractor shall be responsible for obtaining and paying for all necessary permits, including all required City permits. The Contractor shall also be required to obtain a City of Pleasanton Business License. The Contractor shall submit copies of all permits to the

Engineer prior to the start of work. For City projects, an encroachment permit is required and issued by the Engineering Division. A separate Building Permit is also required and issued by the Building Department if the work is for a building project.

1-21 Progress Schedule

A progress schedule shall be submitted to the Engineer in accordance with Section 8-1.02, "Schedule," of the State Standard Specifications. The schedule shall be prepared using the critical path method (CPM) format or Excel format. The schedule should include three (3) weeks ahead of the project.

1-22 Inspection

Contractor's requirements with respect to “Inspection of Work” shall be in accordance with Section 5, "Control of Work," of the State Standard Specifications.

The Engineer shall, always, have safe access to the work during its construction, and shall be furnished with every reasonable facility for ascertaining that the materials and the workmanship are in accordance with the requirements and intentions of these specifications, the special provisions and the plans. All work done and all materials furnished shall be subject to the Engineer’s inspection.

The inspection of the work or materials shall not relieve the Contractor of any of the Contractor's obligations to fulfill the contract as prescribed. Work and materials not meeting the requirements shall be made good, and unsuitable work or materials may be rejected, notwithstanding that the work or materials have been previously inspected by the Engineer or that payment, therefore, has been included in a progress estimate.

Projects financed in whole or in part with Federal funds shall always be subject to inspection by the Federal agency involved.

1-23 Modifications

Any modifications to the Contract Documents shall be made in accordance with Section 4-1.05, "Changes and Extra Work," of the State Standard Specifications.

1-24 Requirements of Other Agencies

Contractor shall be aware of and follow all applicable requirements of other agencies before proceeding with the Work.

1-25 Stormwater Management and Discharge Control

1.25A General

The Contractor shall abide by the latest version of the "National Pollutant Discharge Elimination system general permit for stormwater discharges associated with construction and land disturbance activities" for Alameda County. The intent of these requirements is to enforce Federal, State, and other local agencies regulations that prohibit stormwater pollution at construction sites. Storm drains discharge directly to creeks and the Bay without treatment, and, therefore, discharge of pollutants (i.e., any substance, material, or waste other than uncontaminated stormwater) into the storm drain system is strictly prohibited.

In this section, the term "storm drain system" shall include stormwater conduits, storm drain inlets, and other storm drain structures, street gutters, channels, watercourses, and creeks.

For the purpose of eliminating stormwater pollution, the Contractor shall implement effective control measures at construction sites. There are several publications which provide guidance on selecting and implementing effective control measures known as Best Management Practices (BMPs). BMPs include schedules of activities, prohibition of practices, general good housekeeping practices, operational practices, pollution prevention practices, maintenance procedures, and other management procedures to prevent the discharge of pollutants directly or indirectly to the storm drain system. BMPs also include the construction of some facilities, which may be required to prevent, control, and abate stormwater pollution.

California Stormwater Best Management Practice Handbook - Industrial/Commercial

The reference publications are as follows:

California Stormwater Best Management Practice Handbook - Construction Activity

These handbooks may be purchased from the California Stormwater Quality Association (CASQA). Their website address is: https://www.casqa.org/resources/bmp-handbooks

The following flyers are available, free of charge, at the City of Pleasanton's Engineering Division at 200 Old Bernal Avenue, Pleasanton, CA 94566, as well as on the City's website, http://www.cityofpleasantonca.gov.

1. General Construction and Site Supervision.

2. Fresh Concrete and Mortar Application.

3. Paint and Application of Solvents and Adhesives.

4. Heavy Equipment Operation.

5. Roadwork and Paving Activities Guidelines.

6. Building Maintenance and Remodeling Best Management Practices.

7. The Pour Right (Guidelines for Small, "Weekend" Concrete Jobs), Best Management Practices.

8. Bay Area Stormwater Management Agencies Association (BASMAA)/Alameda Countywide Clean Water Program Blueprint for a Clean Bay.

The Contractor shall comply with all stormwater management and discharge control provisions contained in Chapter 9.14 of the City of Pleasanton Municipal Code.

The Contractor shall comply with SWPPP when applicable to the project as defined in the latest version of NPDES general permit.

1-25B Material Storage

Storage and exposure of raw materials, by-products, finished products, and containers shall be controlled as described in the following paragraphs.

All construction materials shall be stored at least ten feet away from inlets, catch basins, and curb returns. The Contractor shall not allow any material to enter the storm drain system. At the end of each working day, the Contractor shall collect and dispose of all scrap, debris, and waste material.

During wet weather or when rain is forecast, the Contractor shall shelter materials that can contaminate rainwater or be transported by stormwater or other runoff to the storm drain system. Shelter shall be provided by either storing potentially contaminating material inside a building or covering them with a tarp or other waterproof material secured with weighted tires or sandbags to prevent contact with rain.

At the end of each working day or as directed by the Engineer, the Contractor shall clean and sweep roadways and on-site paved areas of all materials attributed to or involved in the Work. The Contractor shall not use water to flush down streets in place of street sweeping unless an approved storm drain protection system is in place.

At the end of each working day, the Contractor shall collect all scrap, debris, and waste material and dispose of such materials properly.

The Contractor is reminded that storage and disposal of all hazardous materials, such as paints, thinners, solvents, and fuels, and all hazardous wastes, such as waste oil, must meet all Federal, State and local laws, standards and requirements.

The Contractor shall store all hazardous materials and all hazardous wastes in accordance with secondary containment regulations; it is recommended that these materials and wastes be covered, as needed, to avoid potential management of collected rainwater as a hazardous waste.

The Contractor shall keep an accurate, up-to-date inventory, including Material Safety Data Sheets (MSDS), of hazardous materials and hazardous wastes stored on-site to assist emergency response personnel in the event of a hazardous materials incident.

1-25C De-watering Operations

All groundwater removed from the trench must be desilted prior to discharging it into the storm drain system through filtering materials and methods meeting the Association of Bay Area Governments (ABAG) Standards for Erosion & Sediment Control Measures and/or through methods and procedures described in the California Stormwater Best Management Practice Handbook - Construction Activity (latest edition), or as defined in approved SWPPP.

The Contractor shall reuse the water for other needs, such as dust control and irrigation, to the maximum extent practicable.

1-25D Pavement Saw Cutting Operations

The Contractor shall be knowledgeable of and apply the most recent BMPs for pavement saw cutting operations. This shall include the installation and monitoring of water pollution control measures, cleanup, and disposal.

Prior to beginning a saw cutting operation, the Contractor shall locate all storm drain inlets, culverts, and catch basins through which sediment discharges may flow to a waterway. The Contractor shall contain discharges from saw cutting to the immediate work area and minimize runoff of the resulting slurry to the maximum extent practicable.

When slurry from a saw cutting operation is within access of a storm drain inlet, the Contractor shall use water pollution control measures that will effectively eliminate sediment discharges into the storm drain inlet. Such acceptable water pollution control measures shall include one or more of the following:

1. Sand/Gravel Bags

   Bags shall be made of burlap or woven polyester filled with sand and gravel.

   To ensure adequate filtering, the bags shall be filled with five parts sand and one part pea gravel. Other mixtures of materials may be used providing comparable or superior filtering is demonstrated.

   Sand/gravel bags shall be arranged in such a manner to surround the storm drain inlet and provide an adequate barrier in preventing any saw cutting slurry runoff from entering the inlet.

   Sand/gravel bags shall be stacked with overlap and tightly butted together.

Sand/gravel bags shall be stacked to the height of the closest adjacent curb or a minimum height of six (6) inches.

2. Inlet Filters

   Inlet filters shall completely cover the opening of the inlet and be properly installed according to the manufacturer's recommendations.

3. Drain Plugs or Covers

   Inlet devices shall be properly installed according to the manufacturer's recommendations.

4. Vacuum Cleaning Equipment

   Equipment shall be properly operated according to the manufacturer's recommendations.

   Sandbags shall be placed at appropriate locations to catch any residual sediment from escaping during the vacuum cleaning process and proceeding to downstream storm drain inlets.

   The Contractor shall monitor and ensure the effectiveness of the water pollution control measures for the duration of the saw cutting operation.

   Upon completion of the saw cutting operation, the Contractor shall remove all sediment and residue resulting from the saw cutting operation. Areas of cleanup and sediment removal include, but are not limited to, roadways, walkways, parking areas, and storm drain inlets and catch basins. The Contractor shall be responsible for transporting and disposing of the slurry runoff at a properly classified waste disposal site.

1-25E Pavement Operations

The Contractor shall prevent the discharge of pollutants from paving operations by using measures to prevent run-on and run-off pollution, properly disposing of wastes, and implementing the following BMPs:

1. No paving during wet weather.

2. Store materials as required under Section 1-25B of these City Standard Specifications.

3. Cover inlets and manholes when applying asphalt, seal coat, tack coat, slurry seal, fog seal, etc.

4. Place drip pans or absorbent materials under paving equipment when not in use. During wet weather, store contaminated paving equipment indoors or cover with tarp or other waterproof covering.

5. Sweep site daily to prevent sand, gravel, or excess asphalt from entering or being transported by rain into the storm drain system.

6. Keep ample supplies of drip pans or absorbent materials on-site.

7. If paving involves Portland Cement Concrete, refer to Section 1-25F of these City Standard Specifications.

1-25F Concrete Operations

The Contractor shall prevent the discharge of pollutants from concrete operations by using measures to prevent run-on and run-off pollution, properly disposing of waste, and implementing the following BMPs:

1. Store all materials in waterproof containers or under cover away from drain inlets or drainage areas.

2. Avoid mixing excess amounts of Portland cement materials.

3. Do not wash out concrete trucks into storm drains, open ditches, streets, streams, planting areas, etc. Whenever possible, perform washout of concrete trucks off-site where discharge is controlled and not permitted to discharge to the storm drain system. For on-site washout:

    - Locate washout area at least fifty feet (50') from storm drains, open ditches, or other water bodies, preferably in a dirt area. Do not allow runoff from this area by constructing a temporary pit or bermed area large enough for the liquid and solid waste.

    - Wash out concrete waste into a temporary lined pit where the concrete can set, be broken up, and then disposed of properly. If the volume of water is greater than what will allow concrete to set, allow the wash water to evaporate, if possible. Remove or vacuum the remaining silt and debris from the ponding or bermed area and dispose of it properly.

4. Collect and return sweepings from exposed aggregate concrete to a stockpile or dispose of the waste in trash container.

1-25G Grading and Excavation Operations

The Contractor shall implement erosion and sedimentation control measures to prevent sediments or excavated material from entering the storm drain system. Refer to Section 5, "Erosion and Sediment Control," of these City Standard Specifications for related specific requirements.

1-25H Spill Prevention and Control

The Contractor shall take all precautions to prevent accidental spills during the work under this contract. However, in the event of a spill:

1. The Contractor shall immediately contain and prevent leaks and spills from entering the storm drain system and properly clean up and dispose of the waste and clean up materials. If waste is hazardous, the Contractor shall comply with all Federal, State, and local hazardous waste requirements.

2. The Contractor shall not wash any spilled material into the streets, gutters, storm drains, or creeks.

3. The Contractor shall report any hazardous materials spill immediately to the Livermore-Pleasanton Fire Department, the Alameda County Hazardous Materials Division, and other State and local agencies as required by state and local regulations.

1-25I Vehicle/Equipment Cleaning, Fueling and Maintenance

The Contractor shall not perform vehicle or equipment cleaning on-site or in the street using soaps, solvents, degreasers, steam cleaning equipment, or equivalent methods. The Contractor shall perform vehicle or equipment cleaning with water only in a designated, bermed area that will not allow rinse water to run off-site or into the storm drain system.

The Contractor shall dispose of wash water from the cleaning of water-based paint equipment and tools to the sanitary sewer.

If using oil-based paint, to the maximum extent practicable, the Contractor shall filter the paint thinner and solvents for reuse and dispose of the waste thinner and solvent, and sludge from cleaning of equipment and tools as hazardous waste.

1-25J Contractor Training and Awareness

The Contractor shall train all employees on the water pollution prevention requirements contained in these Specifications. The Contractor shall inform all Subcontractors of the water pollution prevention contract requirements and include appropriate subcontract provisions to ensure that these requirements are met.

1-25K Good Housekeeping Practices

The Contractor shall implement the following applicable good housekeeping practices:

1. Use tarps on the ground to collect fallen debris or splatters that could contribute to stormwater pollution.

2. Secure opened bags of cement and of other light or powdered materials which can be transported by wind.

3. Pick up litter, construction debris, and other waste daily from outside areas, including the sidewalk area, gutter, street pavement, and storm drains impacted by the project. All waste shall be stored in covered containers or disposed of or recycled immediately.

4. Inspect vehicles and equipment arriving on-site for leaking fluids and promptly repair leaking vehicles and equipment. Use drip pans to catch leaks until repairs are made.

5. Avoid spills by handling materials carefully. Keep a stockpile of spill materials, such as rags and adsorbents, readily accessible on-site. Clean up all spills immediately to prevent any material from being discharged to the storm drain system. Refer to Section 1-25H of these City Standard Specifications.

6. Maintain and replace all sediment and water pollution control devices as necessary to ensure that said controls are working effectively (i.e., inspect all sediment ponds or sandbag sedimentation/filtering systems after each rain; remove accumulated sediment, and debris and replace or repair damaged sandbags immediately).

1-25L Payment

Unless a separate pay item is provided in the bid schedule, the Contractor shall include in all bid items all costs incurred from these specified water pollution control requirements.

1-25M Enforcement

The City has the authority, through various sections of the Pleasanton Municipal Code, to enforce any portion of this section. City enforcement may include, but is not limited to citations, orders to abate, bills for City cleanup costs and administration, civil suits, and criminal charges. Enforcement action by the City does not void or suspend any enforcement actions by other agencies. As a minimum, the Contractor shall implement the Urban Runoff Clean Water Program BMPs listed in Section 1-25A of these City Standard Specifications or implement equally effective alternatives approved by the Engineer on all projects within the City of Pleasanton.

1-26 Soils and Material Testing

In the case of City Projects, soil and material testing shall be performed by the Engineer. In the event of a failed test, to meet contract compliance, the Contractor shall pay for additional testing.

Native soils and imported material (i.e., aggregate base) compaction tests shall be performed based on the ASTM D-1557 Modified Proctor Test.

1-27 Alameda County Fair (Fair & Rodeo Events) and School Zones

The City restricts construction activity during the Alameda County Fair or any other major events within certain areas surrounding the fairground facilities. Prior to construction, the Contractor must contact the City as well as the Alameda County Fairgrounds to confirm schedule of events that may affect the project. The Contractor shall contact the Engineer to determine if work will be affected by this restriction.

The Contractor shall notify the school's principal if work is within 250 feet of a school zone.

1--28 Record Drawings

Prior to the acceptance of Work and creation of the punch list, the Contractor shall provide the Engineer one (1) set of neatly and legibly marked Project Plans and one (1) copy of each of the electronic files of marked plans showing changes in the final location and depth of all underground utilities, subsurface drains, cross sectional street sections, and location of aboveground utility appurtenances. In addition, changes in the extent of asphalt paving, areas of lime treatment of subgrade, changes in concrete work, and street grade elevations and slopes shall be indicated. The marking of the drawings shall be kept current and made available to the Engineer upon request and at the time of the monthly pay estimate. Payment shall be withheld if the Record Drawings do not represent the current condition of the Work. Electronic files shall be submitted only in PDF or JPG format with a minimum 300 DPI resolution, on a portable thumb drive or uploaded to an FTP site where the files can be downloaded.

1--29 Overtime

The regular working hours and days of the week of City Inspectors are 8:00 a.m. to 4:30 p.m., Monday through Friday excluding City holidays. If the Contractor needs to perform the Work outside of this time frame, then the Contractor shall submit a written request for scheduled overtime forty-eight (48) hours in advance. The Engineer's approval shall be required before overtime work begins. The Contractor and/or Developer may be held responsible for overtime cost incurred by the City of Pleasanton for after-hours operations.

1-30 Bonds

The Contractor shall submit to the City within ten (10) working days after notice of award the following contract bonds:

1. Faithful Performance Bond for one hundred percent (100%) of contract price

2. Labor and Material Bond for one hundred percent (100%) of contract price

3. Maintenance Bond for ten percent (10%) of contract price

4. Tree Bond

For Private Development Projects:

The project applicant/developer shall submit a refundable cash bond or surety bond for hazard and erosion control prior to approval of the final map or issuance of an Engineering permit, whichever occurs first. The amount of this bond will be determined by the Engineer. The cash bond will be retained by the City until all the permanent landscaping is installed for the development, including individual lots, unless otherwise approved by the Engineer.

1-31 Pre-construction Meeting

For City Projects, following award of contract, submittal of executed contract, and approval of certificates of insurance and bonds, but before start of the Work, a pre-construction meeting shall be held at a mutually agreed time and place. For Private Development Projects, the pre-construction meeting shall be held following receipt of approved plans by Public Works Inspection. The Contractor shall contact public works inspection to setup a pre-construction meeting and shall allow a minimum of ten (10) days to coordinate the meeting.

The conference shall be arranged by the City and attended by City representatives, including the Inspector, the Contractor, Contractor's superintendent, and major Subcontractors. The Contractor shall present at the conference the progress and submittal schedules, progress payment format, emergency phone numbers, and a trench shoring plan designed and signed by a registered Civil Engineer for trenches over five feet (5') in depth.

The purpose of the conference is to designate responsible personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established.

1-32 Project Identification Signs (PIS)

A minimum of one Project Identification Sign (PIS) per City Standard Detail No. 603 shall be installed on every Capital Improvement Project. Location of PIS will be marked by the City. For projects with several locations with less than 5 working days at each location Contractor shall place sign on movable supports and relocate signs to active working areas on a weekly basis. Projects in duration less than nineteen (19) working days are exempt from PIS sign requirement unless noted otherwise. PIS shall be removed by Contractor within thirty (30) days after construction completion and turned over to the City. Contractor shall fill-in all project information required on PIS and submit it to City for approval prior to fabrication.

1-33 Measurement and Payment

Measurement and payment for bid items are described in each respective section of these City Standard Specifications. Full compensation for Work not appearing as a specific bid item but required by the contract documents shall be considered as included in the contract unit price paid for the various items of work and no additional compensation will be allowed, therefore.

The following language shall apply for each respective section of these City Standard Specifications:

Payment for Work shall be made based on unit price bid according to the units of measure described in Subsection 4 of each section of these City Standard Specifications. Payment shall include full compensation for furnishing all materials, equipment, tools, and labor to complete the Work as required by the Contract Documents.

1-34 Enforcement

The City has the authority, pursuant to the terms of the Contract, through various provisions of the Pleasanton Municipal Code, as well as in law and in equity, to enforce any portion of these Standards. City enforcement may include, but not be limited to a civil suit, administrative citation, order to stop work, and criminal charges. City enforcement actions are distinct and cumulative to any other right or remedy afforded by law or equity and may be exercised concurrently, independently, or successively. Any forbearance by the City in exercising any right or remedy will not be a waiver of the exercise of any such right or remedy.

SECTION 2. TRAFFIC CONTROL

2-01 General

This section covers traffic control for City and private development projects, including public convenience and safety, construction area traffic control devices, haul routes, traffic control plans, traffic control restrictions, and temporary pavement delineation.

2-01A Public Convenience and Safety

The Contractor shall comply with Sections 7-1.03, "Public Convenience," and Section 7-1.04, "Public Safety," of the State Standard Specifications.

Upon completion of each day's work, the Contractor shall be responsible for leaving the work area free of hazards and shall provide all necessary temporary signs, warning devices and barricades at no additional cost to the City. Access is to be provided for all adjacent residences and businesses during non-construction hours.

2-01B Construction Area Traffic Control Devices

The Contractor shall comply with flagging and traffic handling equipment and device requirements of Section 12, "Temporary Traffic Control," of the State Standard Specifications except for Section 12-1.04 "Payment."

The Contractor shall furnish and plan all barricades, arrow boards, lights, construction signs, no parking signs, and flagmen as necessary. The Contractor shall furnish to the Engineer for review and comment a construction signing plan, five (5) working days before construction begins.

"No Parking" signs shall be furnished and installed by the Contractor a minimum of seventy-two (72) hours in advance of any work that requires parking to be temporary removed. The "No Parking" signs shall include the time and the day the work is to be performed. It shall indicate that any vehicles in violation of the "No Parking" signs will be towed in accordance with the California Vehicle Code, and shall be posted conspicuously in adequate quantities to sufficiently notify the public. The Contractor shall post "No Parking" signs no later than noon the Thursday prior to a Monday "No Parking" request.

If identified on plans or special conditions, the Contractor shall supply Changeable Message Sign/s (CMS). The CMS shall be delivered and be in operation at least seven (7) days for residential and collector streets and fourteen (14) days for arterial streets in advance of the start of work and shall be maintained in continuous operation until completion of the project. The Contractor shall modify the message on the CMS devices to convey accurate messages. The City reserves the right to direct the Contractor to relocate locations of CMS devices at no additional cost to the City. Non-functioning CMS signs shall be replaced within twenty-four (24) hours of notification. CMS signs shall be removed within forty-eight (48) hours after notification of removal.

Contractor shall be responsible for notifying each resident and business in writing, seventy-two (72) hours and seven (7) days in advance of any street closure, including notification of any resident/business on adjacent streets directly affected by the closure of the main street.

Contractors shall not be permitted to work on any roadways that have not been adequately posted seventy-two (72) hours prior to the beginning of work. As an example, if the Contractor skips a roadway that was previously signed and scheduled for slurry seal, the Contractor shall reschedule the missed roadway in such a manner that a new seventy-two (72) hour advance notification is achieved prior to the beginning of the work.

Traffic control devices that are necessary for overnight lane restrictions shall meet the latest requirements of the MUTCD and shall, at a minimum, have a lighted barricade at the beginning of the closure/work zone.

The Contractor shall be responsible for maintenance of all traffic control devices that are required by the Traffic Control Plan. The Contractor shall ensure that all devices are always maintained in the proper location including holidays, overnight, and on weekends.

Should it become necessary to use City forces to maintain the traffic control devices, the Contractor will be billed at the overtime rate for two (2) technicians and a vehicle, with a minimum of two (2) hours per incident/call.

2-01C Haul Route

The haul route shall be determined for each project by the Engineer and shown on the Project plans or in the conditions of approval. For private development projects, the Contractor shall submit a haul-route plan for approval by the Engineer prior to obtaining an encroachment permit. The plan shall include routing, the daily number and size of trucks, and the duration of trucking. The plan shall address the stacking/temporary parking of trucks. A separate oversized load permit shall be obtained from the City, if applicable.

2-01D Traffic Control Plan

The Contractor shall provide the Engineer with a traffic control plan (TCP) with a schedule for each phase of the Work in accordance with the latest edition of California Manual on Uniform Traffic Control Devices and Caltrans Standard Plans. The Contractor shall not start the Work until the TCP has been reviewed and commented on by the City Traffic Engineer. The Contractor shall allow for at least five (5) working days for the Engineer to review and comment on the TCP. If, after the Engineer's review and comment on the TCP, the Engineer finds no reason to object to the TCP, the Contractor shall proceed with the Work in accordance with the TCP. Plans shall be prepared by qualified professional (Traffic Engineers or by Traffic Control Specialists).

Any revisions required shall be resubmitted prior to commencing work. The Contractor shall allow five (5) working days for the Engineer to review any resubmittals. The Contractor will

not be entitled to claim any delays in the project schedule or be entitled to any additional days to the duration of the contract due to the review and resubmittal process.

Contractor to provide pedestrian/ADA access plan (including bike lanes) for various construction phases. No demolition work for pedestrian access is to be initiated until a pedestrian plan is approved and all detour measures are in place and operational.

2-01E Traffic Control Restrictions

The following traffic control restrictions listed are a minimum requirement and may be modified by the Engineer or the conditions of approval on a project-by-project basis.

No work shall be allowed in signalized intersections between the hours of 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. unless specifically approved by the Engineer.

Additional conditions may be placed on working hours in certain locations, dependent upon specific activities in the area (e.g., downtown, school areas, events at the County Fairgrounds, etc.) at the discretion of the Engineer. These conditions shall be included in the project Special Provisions.

Work within five hundred (500) feet of schools when school is in session that requires the closure of lane(s) shall be completed between school bell schedules. Contractor shall check the Pleasanton Unified School District website for the applicable bell schedule.

The Contractor shall give the Engineer at least forty-eight (48) hours' notice for requests to alter timing of signalized intersections.

The full width of the travel way shall be open for use by the public on Saturdays, Sundays, and legal holidays and when construction operations are not actively in progress.

At least one lane of through traffic for each direction shall be always provided unless otherwise approved in the project's Special Provisions. Access to bicycle and pedestrian facilities shall be always provided unless otherwise approved in the Special Provisions.

The Contractor shall cooperate with local authorities relative to handling traffic through the working area and shall make arrangements relative to keeping the working area clear of parked vehicles.

The Contractor shall be responsible for notifying business establishments, each resident, Livermore Amador Valley Transit Authority (LAVTA), Pleasanton Garbage Service, the Pleasanton Post Office, the Pleasanton Unified School District, and any other agencies identified by the City of Pleasanton forty-eight (48) hours prior to the commencement of work.

Prior to commencing work, the Contractor shall submit a proposed schedule of work for approval by the Engineer.

2-01F Temporary Pavement Delineation

Whenever the work causes obliteration of pavement delineation, temporary pavement delineation shall be in place prior to opening the traveled way to public traffic. Lane line, centerline, and limit line (i.e., stop bars and crosswalks) pavement delineation shall be always provided for traveled ways open to public traffic.

All Work necessary, including any required lines or marks, to establish the alignment of temporary pavement delineation shall be performed by the Contractor. Surfaces to receive temporary pavement delineation shall be dry and free of dirt and loose material. Temporary pavement delineation shall not be applied over existing pavement delineation or other temporary pavement delineation. Temporary pavement delineation shall be maintained until superseded or replaced with a new pattern of temporary pavement delineation or permanent pavement delineation.

Temporary pavement markers and removable traffic type tape which conflicts with a new traffic pattern, or which is applied to the final layer of surfacing or existing pavement to remain in place, shall be removed when no longer required for the direction of public traffic, as determined by the Engineer.

Whenever lane lines and centerlines are obliterated, the minimum lane line and centerline delineation to be provided shall be temporary reflective raised pavement markers placed at longitudinal intervals of not more than twenty-four feet (24’). The temporary reflective raised pavement markers shall be the same color as the lane line or centerline the markers replaced. Temporary reflective raised pavement markers shall be placed in accordance with the manufacturer's instructions and shall be cemented to the surfacing with the adhesive recommended by the manufacturer, except epoxy adhesive shall not be used to place pavement markers in areas where removal of the markers will be required.

Temporary lane line or centerline delineation consisting entirely of temporary reflective raised pavement markers placed on longitudinal intervals of not more than twenty-four feet (24’) shall be used on lanes opened to public traffic for a maximum of fourteen (14) days. Prior to the end of the fourteen (14) days, permanent pavement delineation shall be placed. If the permanent pavement delineation is not placed within fourteen (14) days, the Contractor shall provide, at the Contractor's expense, additional temporary pavement delineation. The Contractor will be required to refresh the temporary pavement delineation when directed by the Engineer due to inclement weather or traffic volume conditions, if less than the already required fourteen-day (14) period. The additional temporary pavement delineation to be provided shall be equivalent to the pattern specified for the permanent pavement delineation for the area, as determined by the Engineer.

Pedestrian crosswalks and stop bars shall be installed in four-inch (4”) temporary white paint or removable traffic tape upon approval of Engineer, at all arterial streets and near all high traffic areas such as schools, elderly care facilities, business, hospitals, etc.

2-02 Materials

Temporary reflective raised pavement markers shall be the following or equal:

- FOL Tape, LLC, Flex-O-Line Pavement Marking Tape – Metallic Backing
- Bunzl Extrusion Tacoma, Inc., T.O.M., Type W-1 or W-2 or Type Y-1 or Y-2, or Grade WZ
- Temporary 4" removable traffic striping (Upon Engineer Approval)
- FOL Tape, LLC, Flex-O-Line Pavement Marking Tape – Metallic Backing

2-03 Construction - Not Included

2-04 Measurement

Traffic control shall be measured on a lump sum basis if included on the bid form.
CMS signs shall be measured on each basis if included on the bid form.

2-05 Payment

The contract price for traffic control shall include full compensation for doing all the Work involved in designing, furnishing, placing, removing, storing, maintaining, temporarily relocating, replacing and disposing of the components of the traffic control system. The Contractor shall bear all costs in compliance with the approved traffic control plan, including costs for flagging operations.

The contract price for CMS signs shall include full compensation for doing all the Work involved in the placement, maintaining, relocating, and removal of the CMS sign.

SECTION 3. CLEARING AND GRUBBING

3-01 General

Clearing and grubbing shall consist of removing vegetation growth and deleterious materials, such as designated trees, stumps, roots of down trees, brush, grass, weeds, rocks, concrete, curb, gutter, sidewalk and driveway, and asphalt concrete pavement and all other objectionable material (material that interferes with or impedes construction) to a depth of eighteen inches (18") defined herein and from within the limits of the project as defined in the Project Plans and Special Provisions. All clearing and grubbing shall conform to the applicable requirements of Section 17, “Clearing and Grubbing”, of State Standard Specifications.

The Contractor shall protect from damage all improvements and facilities which are to remain. Any such improvements which are damaged as a result of the Contractor's operations shall be replaced as directed by the Engineer at the Contractor's expense.

3-02 Materials

Reference City Standard Details for specified materials.

3-03 Construction

3-03A Burning and Blasting

No burning or blasting of material by the Contractor shall be allowed.

3-03B Extent of Work

Objectionable material as defined in Section 3-01 General, considered greater than six inches (6”) in length or diameter shall be removed to a minimum depth of eighteen inches (18") below subgrade within the entire street, easement right of way area and from within the limits of the project. All concrete and asphalt shall be sawcut at conform lines.

3-03C Temporary Relocation of Signs and Street Furniture

Existing warning, regulatory and guide signs, mailboxes, and street furniture shall be temporarily relocated if necessary. All signs and sign poles removed by the Contractor shall be stored in a location designated by the Engineer. If necessary for public safety or directed by the Engineer, removed signs shall be temporarily installed until a permanent location and installation is determined. All mailboxes shall be installed temporarily and coordinated with the Postmaster prior to the relocation to ensure continued mail service.

3-03D Wells, Tanks, and Basements

All wells shown on the Project Plans shall be abandoned or sealed according to Zone 7, Water Agency requirements prior to the start of grading. All tanks and basements encountered shall be removed in their entirety to native soil. All rubble from tank and basement removal shall be properly disposed at a designed landfill site.

3-03E Demolition Permit

A demolition permit shall be acquired by the Contractor from the City's Building and Safety Division prior to demolition of any building structures on the project site. A SWPPP shall be provided as part of obtaining a demolition permit on a project disturbing one acre or more. All concrete and/or asphalt in excessive of five (5) cubic yards or more shall be recycled.

3-03F Protection of Existing Trees

Only those trees that are specifically designated on the Project Plans for removal shall be removed. All other remaining trees shall be protected by the Contractor against injury from construction activities. Prior to the commencement of construction, the Contractor shall install a sturdy fence at the dripline of any tree which will be affected by the construction and prohibit scarification of the ground surface or any storage of construction materials or other materials inside the fence. The dripline shall not be altered in any way to increase the encroachment of the construction. The Contractor shall be responsible for providing temporary irrigation to the protected trees. Pruning shall only be performed by a certified arborist at the Contractor's expense to the minimum extent necessary as directed by the Engineer and agreed to by the project's Arborist.

All cuts shall be made using a sharp blade with cuts perpendicular to the root or branch using ISA approved methods. Tools shall be disinfected between cuts.

Refer to the Pleasanton Municipal Code Chapter 17.16, Tree Preservation, for tree protection requirements.

The following protection measures shall be practiced during the course of construction. These measures may be modified or eliminated by the Engineer if it is determined that they do not apply to the specific situation or are contrary to the design intent of the project. Exemption of any one or part of the listed measures shall be confirmed in writing and in any event shall not release the Contractor of the obligation to take whatever measures are necessary to protect those trees not designated to be removed.

1. Prior to the commencement of construction, install a sturdy fence at the dripline of any tree which will be affected by the construction and prohibit any storage of construction materials or other materials inside the fence. The dripline shall not be altered in any way to increase the encroachment of the construction.

2. Excavation, grading, drainage and leveling within the dripline of the tree in prohibited unless approved by the Engineer.

3. Disposal or depositing of oil, gasoline, chemicals or other harmful materials within the dripline or in drainage channels, swales or areas that may lead to the dripline is prohibited.

4. The attachment of wires, signs and ropes to any tree that shall remain is prohibited.

5. Design utility services and irrigation lines to be located outside of the dripline when feasible.

6. Retain the services of a certified consulting arborist for periodic monitoring of the project site and the health of those trees to be preserved. The certified consulting arborist shall be present whenever activities occur which pose a potential threat to the health of the trees to be preserved (for example, when work occurs within the dripline of trees to be preserved).

7. The Engineer shall be notified of any damage that occurs to a tree during construction so that proper treatment may be administered.

3-03G Spoil Area and Off-Haul

The spoil areas shall only be used for the purpose of temporarily stockpiling objectionable material on site before transfer to a permanent disposal site. All materials removed from the project site shall be properly disposed of in accordance with Section 17-2.03D, "Disposal of Materials" of the State Standard Specifications. All materials from within the City's right of way or property shall have the stockpile tested for hazardous materials prior to removal from site. A minimum of one test for every five hundred (500) cubic yards.

3-03H Utility Abandonment

Utility pipes less than or equal to six inches (6") in diameter to be abandoned shall be sealed with concrete for a length no less than two feet (2') unless otherwise shown on the Project Plans. Abandoned irrigation pipes six inches (6") in diameter and smaller are not required to be sealed with concrete. (See Sections 14-03I and 13-03M for Water and Sewer Abandonment provisions). Abandoned utility pipes greater than six inches (6") in diameter shall be grout-injected for entire volume and valves removed unless otherwise shown on the Project Plans. Abandoned irrigation pipes greater than six inches (6") in diameter shall be grout injected for a length not less than two feet (2') unless otherwise shown on the Project Plans.

3-03I Archaeological Finds

For City Projects:

If, during work, archaeological artifacts are encountered, all work in the immediate area of the find shall be discontinued. The City shall acquire the services of an archaeologist to determine the nature of the find. Only after a preservation plan has been initiated shall the Contractor proceed with the Work.

For Private Development Projects:

If an archaeological deposit is encountered, all soils disturbing activities in the vicinity of the deposit shall cease and the City shall be immediately notified. The Project Developer shall retain the services of a qualified archaeological consultant having expertise in California prehistoric archaeology. The archaeological consultant shall determine if the planned development could potentially impact important archaeological resources and shall then design an appropriate archaeological monitoring program. Upon completing the archaeological monitoring program, the archaeological consultant shall submit a written report of findings to the Engineer. At a minimum, the archaeological monitoring program shall include the following:

1. An archaeological monitor shall be on site during any further soils disturbing activities.

2. The archaeological consultant shall advise all project Contractors to be on the alert for evidence of expected resources, of how to identify the evidence of the expected resources, and of the appropriate protocol in the event of discovering an archaeological resource.

3. The archaeological monitor shall be present on site until the City Engineer, in consultation with the archaeological consultant, determines that project construction activities could have no effects on significant archaeological resources.

4. The archaeological monitor shall record and be authorized to collect soil samples and artifactual/ecofactual material as warranted for analysis.

5. The Project Developer shall empower the archaeological monitor to temporarily redirect demolition/excavation/construction crews and heavy equipment until the resource is evaluated. The archaeological consultant shall immediately notify the City Engineer of the encountered resources.

6. The Project Developer shall consult with City and tribal representatives to determine the appropriate disposition of findings. Mitigation measures shall include one of the three alternatives below:

    - In-Situ Preservation: The Project Developer shall preserve artifacts and resources as found and shall apply suitable open space, capping, or monumentation to the site. The Project Developer shall alter development plans to accommodate this alternative, as necessary.

    - Excavation/Recovery: The archaeological consultant shall excavate the site, evaluate the site for historical references, recover artifacts as appropriate, and cover the site to preserve remaining artifacts. The Project Developer shall

maintain sufficient buffering between development subsurface construction and the location of resources.

- Excavation/Removal: The archaeological consultant shall excavate and recover the cultural resources as described above and remove artifacts as necessary.

The archaeological consultant shall prepare an Archaeological Data Recovery Plan that shall be submitted to the Engineer for review and approval.

If human remains are discovered, the Project Developer shall contact the County Coroner immediately. If the coroner determines that the human remains are Native American remains, the Project Developer shall notify the California State Native American Heritage Commission.

The archaeological consultant shall prepare a Final Archaeological Resources Report, meeting City and state standards, evaluating the historical importance of the archaeological resource, and describing the archaeological and historical research methods employed in the testing, monitoring, and data recovery programs. The City Engineer shall review and approve this document. The Project Developer shall file the report with appropriate state offices.

3-04 Measurement

Clearing and grubbing shall be measured on a lump sum basis.

Trees less than six inches (6”) in diameter as measured four and half feet (4.5’) from the ground that shall be removed, including stump grinding to one foot (1’) below grade shall be included in the clearing and grubbing bid item. All stump grindings shall be legally disposed of off-site, and the holes filled with native soil or approved import topsoil.

Tree Protection shall be measured on a lump sum basis.

Tree removal shall be measured by each location and includes stump and root removal.

3-05 Payment

The lump sum price paid for clearing and grubbing shall include full compensation for excavation, removal, disposal, saw cutting, protection of existing improvements to remain, and obtaining all applicable permits and associated costs, including City of Pleasanton permits.

The lump sum price paid for Tree Protection shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in tree protection, complete in place.

The contract price paid for Tree Removal shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in tree removal, complete in place.

SECTION 4. ROADWORK EXCAVATION AND GRADING

4-01 General

Roadwork excavation and grading shall consist of performing all operations necessary to excavate all materials, regardless of character and subsurface conditions, from the roadway prism or adjacent thereto including grading of sidewalk, driveway and conform areas, and other work items as described in Section 19-1, "General," and Section 19-2, "Roadway Excavation," of the State Standard Specifications. Contractor shall comply with Section 19, "Earthwork," of the State Standard Specifications except as modified by the Special Provisions and Project Plans and these City Standard Specifications. For cases when required by the Engineer, this section also covers lime stabilization of subbase/basement material within the roadway prism.

4-02 Materials

4-02A Subbase/Basement Material

Subbase/basement material is defined as that material in excavation or embankment under the lowest layer to be placed. The subbase/basement material shall meet all the conditions of acceptability as specified in Section 19-1.03B, "Unsuitable Material," of the State Standard Specifications.

4-02B Borrow-Import

Borrow-import shall be defined as materials which are obtained from sources outside the project site. Such materials shall comply with Section 19-7.02C, "Imported Borrow," of the State Standard Specifications and shall be subject to approval by Engineer before use. Only in the case when all selected materials have been depleted from the project site shall borrow-import be used for roadway fill.

Testing Requirements:
Borrow-Import material shall be tested every five thousand (5,000) cyds or change of material type subject to City Engineer review. Material shall be tested for soil classification, corrosivity, contaminants and plasticity index.

Borrow-Import fill shall be tested per ASTM D2487 for soil classification.

Contaminants shall be per California DTSC recommendations, (Reference: “Information Advisory Clean Imported Fill Material per State of California, California EPA, Department of Toxic Substances Control”) and screened per Tier 1 ESLs for soil. (Reference latest “SF Bay Regional Water Quality Control Board, Tier 1 ESLs”)

Borrow-Import fill shall have Plasticity Index of 15 or less (per ASTM D4318), or Expansion Index of less than 20 (per ASTM D4829).

Borrow-Import fill shall not have higher corrosivity than onsite material.

4-02C Selected Materials

Selected materials shall be defined as materials which are excavated from the project site and which are satisfactory for use in fills, embankments, backfill or other uses as directed. Such material shall be suitable for compaction, have no cemented lumps or rock larger than three inches (3") measured in any direction, shall be free of topsoil, organic, and other deleterious materials and shall be approved by the Engineer. Selected material shall be used as specified in Section 19-2.03D, "Selected Material," of the State Standard Specifications.

On-site select materials utilized on City property shall be tested per section 4-02B.

4-02D Lime

Lime used for subbase/basement material stabilization shall conform to the requirements of Section 24-1.02 "Materials," of the State Standard Specifications. Lime may only be used upon approval of City Engineer.

4-02E Concrete

Concrete used for subbase/basement material stabilization shall conform to the requirements of Section 90-1.02B of the State Standard Specifications.

4-02F Stabilization Fabric

A woven geotextile composed of polypropylene fibers, which are woven into a stable network such that the fibers retain their relative position. Shall be inert to biological degradation and resist naturally encountered chemicals, alkalis, and acids. Meet AASHTO M288 Strength Class 3 for Elongation < 50%.

4-03 Construction

4-03A Roadway Excavation and Grading Procedures

Roadway excavation shall conform to the provisions of Section 19-2, "Roadway Excavation," of the State Standard Specifications. Roadway excavation shall consist of all excavation involved in grading and construction of the roadway, including grading of sidewalk, driveway, and conform areas.

When directed by the Engineer, the Contractor shall excavate unsuitable subbase/basement material. The resulting voids shall be filled with either select materials or aggregate base material as specified in the Special Provisions. The use of fabric for basement stabilization shall only be considered after all other alternatives have been implemented and upon approval of the Engineer.

All material removed and surplus excavated material shall become the property of the Contractor.

All select materials or aggregate base used to replace subbase/basement material shall be compacted to a minimum of ninety-five percent (95%) at a moisture content of within ± two percent (±2%) to within six inches (6") directly below the grading plane for the full width of the roadbed between and including curbs. The minimum compaction requirement under sidewalks shall be ninety two percent (92%). No material shall be placed above any layer of prepared subbase/basement material that does not meet the relative compaction requirements, is firm and un-yielding as checked with a full water truck in presence of Engineer and until the subbase/basement material has been approved by the Engineer.

Immediately prior to placing subsequent layers of materials thereon, the grading plane shall conform to Section 19-1.03C, "Grade Tolerance," of the State Standard Specifications.

4-03B Ditch Excavation

Ditch excavation shall be in conformance with Section 19-2.03H "Ditch Excavation," of the State Standard Specifications. An excavation with a bottom width of less than twelve feet (12') shall be classified as ditch excavation.

4-03C Embankment

Embankment construction shall be in conformance with Section 19-6, "Embankment Construction," of the State Standard Specifications. Embankment construction shall include the construction of roadway embankments, including preparation of the areas upon which they are to be placed; the construction of any temporary surcharge embankment above the grading plane; the construction of dikes within or outside of the right of way; the placing and compacting of approved material within roadway areas where unsuitable material has been removed; and the placing and compacting of embankment material in holes, pits, and other depressions within the roadway area.

4-03D Utility Protection

The Contractor shall be responsible for the protection of all existing pipelines, manholes, catch basins, valve boxes, and other utility structures that are to remain within the excavation work area.

Any such utility facilities that are damaged from roadway excavation work performed by the Contractor shall be either repaired or replaced to the satisfaction of the Engineer at no cost to the City in accordance with Section 1-06, "Protection of Existing Utilities and Property," of these City Standard Specifications.

4-03E Finishing Roadway

Finishing roadway work shall conform to the provisions of Section 22, "Finishing Roadway," of the State Standard Specifications.

4-03F Watering

Watering shall be in conformance with Section 10-6, "Watering," of the State Standard Specifications and Section 1-09, "Dust Control," of these City Standard Specifications.

4-03G Lime Stabilization

Lime stabilization of subbase/basement material shall conform to Section 24-2, "Lime Stabilized Soil," of the State Standard Specifications.

4-03H Concrete Stabilization

Concrete stabilization of subbase/basement material shall conform to Section 24-3, "Concrete Stabilized Soil," of the State Standard Specifications.

4-04 Measurement

Roadway excavation and grading, excluding lime/concrete stabilization, shall be measured on a lump sum basis. Lime/concrete stabilization of subbase/basement material, if required by the Special Provisions and Project Plans, shall be measured by the square foot. Removal of unsuitable materials as directed by the Engineer shall be measured on a per cubic yard basis and include over-excavation, haul away of spoil materials, and compaction of selected materials filling the voids.

4-05 Payment

The contract price for roadway excavation and grading shall include full compensation for excavation, removal and disposal of unsuitable and or surplus subbase/basement material, and placement of select material in resulting voids; testing of materials; grading of the roadway prism; watering; compaction of subbase/basement material; grading conform cut; and finishing roadway work and testing. The contract price for lime/concrete stabilization of subbase/basement material shall include full compensation for preparing material and spreading and mixing lime/concrete. Payment for compacting lime-stabilized subbase/basement material shall be included in the contract price for roadway excavation and grading. Over -excavation of unsuitable material and replacement with suitable material shall be on a per -cubic -yard basis and include removal and disposal of unsuitable material and the replacement and compaction of suitable material as directed by the Engineer.

SECTION 5. EROSION AND SEDIMENTATION CONTROL

5-01 General

The Contractor shall implement erosion and sedimentation control measures to prevent sediments or excavated material from entering the storm drain system and/or leaving the site. A SWPPP shall be implemented for all sites that disturb one (1) acre or more in conformance with the latest NPDES regional permit.

The erosion and sedimentation control materials and methods shall be in accordance with the "Erosion and Sediment Control Field Manual," by the California Regional Water Quality Control (latest edition), and the "Manual of Standards for Erosion & Sediment Control Measures," by ABAG (latest edition). In case of conflicting information or requirements between these two manuals, the California Regional Water Quality Control Manual shall prevail.

A specific erosion and sedimentation control plan shall be developed for every project. Work shall not proceed until the Engineer has approved the project-specific erosion and sedimentation control plan. Types of erosion and sedimentation control measures that may be required include but are not limited to: preservation of existing vegetation; temporary seeding and planting; permanent seeding and mulching; mulching; soil stabilizers; geotextiles, mats/plastic covers, and erosion control blankets; temporary stream crossings; stabilized construction entrances; entrance/outlet tire washes; check dams; slope roughening/terracing/rounding; silt fences; straw bale barriers; sandbag barriers; straw wattles; brush or rock filters; storm drain inlet protection; sediment basins; and sediment traps.

At a minimum, the Contractor shall install filter materials (such as sandbags, filter fabric, etc.) at the storm drain inlets located in and downstream of the project site between October 15 through April 15 and/or, when rain is forecast, within twenty-four (24) hours. The Contractor shall install filter materials or seal all surface inlet openings during the dry season if there is potential for sediment or excavated material to be discharged to the storm drain system during the construction operation (e.g., sediments and debris tracked by construction vehicles, windblown, or transported by other runoff). The storm drain inlets shall be sealed in such a manner that they can be opened in an emergency and unblocked at the end of each working day so that no property is damaged as a result of accidents or other overflows.

Contractors shall always prevent erosion of materials by wind. Sedimentation and erosion control/filter materials shall be placed in a manner that will retain any debris or sediment from flowing into the storm drain system and/or off site. Such materials or control devices shall also be maintained and/or replaced as necessary to ensure effective sediment control and to prevent flooding.

The Contractor shall be responsible for monitoring and update erosion control plans to accommodate phased construction and as necessary, modify plans to fit existing conditions.

Changes in plans will require City review and approval.

5-02 Not Included

5-03 Not Included

5-04 Measurement

Erosion and sedimentation control shall not be a measured item unless specified in the Special Provisions.

5-05 Payment

Full compensation for erosion and sedimentation control shall be considered as included in the contract unit price paid for the various items of work and no additional compensation will, therefore, be allowed.

SECTION 6. AGGREGATE SUBBASE

6-01- General

Aggregate subbase shall conform to the provisions of Section 25, "Aggregate Subbases," of the State Standard Specifications, and to these City Standard Specifications.

6-02 - Materials
6-02A - Aggregate Subbase

Aggregate subbase shall be Class 2 and shall conform to the grading and quality requirements as specified in Section 25-1.02, "Materials," of the State Standard Specifications. Aggregate subbase exceeding workable moisture content will be rejected by the Engineer and shall be immediately removed from the project site by the Contractor.

6-03 - Construction
6-03A - Spreading and Compaction

Aggregate subbase shall be spread in accordance with the provisions of Section 25-1.03D, "Spreading," and Section 25-1.03E, "Compacting," of the State Standard Specifications. Spreading and compacting shall be performed by methods that will produce a uniform subbase, firmly compacted and free from pockets of coarse or fine material. No spreading operation shall begin until the physical characteristics of aggregate subbase and subgrade have been approved by the Engineer.

Aggregate subbase under a roadway shall be compacted to a minimum ninety-five percent (95%) relative compaction.

Select materials shall not be considered acceptable for the placement of AC pavement or sidewalk pavement until base materials, meeting the compaction requirements above, are determined to be firm and stable. When required by the Engineer, the Contractor shall demonstrate the base course's stability by "proof rolling" the prepared surface with equipment approved by the Engineer.

6-04 - Measurement

Quantity of aggregate subbase used under roadway, including aggregate subbase used to fill voids from removal of unsuitable basement material, shall be measured by the ton. The weight of water in the aggregate will not be determined and no deduction will be made from the weight of material delivered to the site of work.

6-05 - Payment

The contract price for aggregate subbase shall include full compensation for supplying, spreading and compacting aggregate subbase material.

SECTION 7. AGGREGATE BASE

7-01 - General

Aggregate base shall conform to the provisions of Section 26, "Aggregate Bases," of the State Standard Specifications, and to these City Standard Specifications. Cement treatment of aggregate base shall be in accordance with Section 27, "Cement Treated Bases," of the State Standard Specifications.

7-02 - Materials

7-02A - Aggregate Base

Aggregate base shall be Class 2 and shall conform to the grading and quality requirements for three-quarter inches (3/4") maximum as specified in Section 26-1.02B, "Class 2 Aggregate Base," of the State Standard Specifications. Aggregate base exceeding workable moisture content will be rejected by the Engineer and shall be immediately removed from the project site by the Contractor.

Recycled Class 2 aggregate base shall be allowed from Caltrans-approved suppliers.

7-03 - Construction

7-03A - Spreading and Compaction

Aggregate base shall be spread in accordance with the provisions of Section 26-1.03D, "Spreading," and Section 26-1.03E, "Compaction," of the State Standard Specifications. Spreading and compacting shall be performed by methods that will produce a uniform base, firmly compacted and free from pockets of course or fine material. No spreading operation shall begin until the physical characteristics of aggregate base have been approved by the Engineer.

Aggregate base under roadway from back of curb to back of curb and under driveways shall be compacted to a minimum ninety-five percent (95%) relative compaction. Aggregate base under sidewalk shall be compacted to a minimum ninety-two percent (92%) relative compaction.

7-04 - Measurement

The quantity of aggregate base used under roadway, including aggregate base used to fill voids from removal of unsuitable basement material, shall be measured by the ton. The weight of water in the aggregate will not be determined and no deduction will be made from the weight of material delivered to the site of work. Aggregate base used under curb and gutter, sidewalks, ADA access ramps, driveways, driveway conforms, and valley gutters shall be measured on the basis as specified in Section 15 Concrete Improvements of these City Standard Specifications.

7-05 - Payment

The contract price for aggregate base shall include full compensation for supplying, spreading, and compacting aggregate base material.

SECTION 8. HOT MIX ASPHALT, LIQUID ASPHALT, AND ASPHALTIC EMULSION

8-01 General

This section covers requirements for hot mix asphalt, liquid asphalt, and asphaltic emulsion. For requirements relating to hot mix asphalt paving excluding hot mix asphalt, liquid asphalt, and asphaltic emulsion, refer to Section 9, "Hot Mix Asphalt Paving," of these City Standard Specifications.

8-02 Materials

8-02A Hot Mix Asphalt

Hot Mix Asphalt (HMA), previously known as asphalt concrete to be used for HMA paving shall conform to the provisions of Section 39 "Hot Mix Asphalt," of the State Standard Specifications and to these City Standard Specifications.

Hot mix asphalt shall be produced from commercial quality asphalt and aggregates and shall be produced at a central mixing plant. A Certificate of Compliance shall be furnished to the Engineer for all asphalt concrete.

Recycled asphalt concrete up to twenty percent (25%) shall be allowed. Only material from Caltrans approved plants shall be deemed acceptable to use on City projects.

8-02A.1 Type

HMA shall be Type A or Rubberized as provided in the project Special Provisions.

8-02A.2 Aggregate Grading

Aggregate grading for Type A HMA shall conform to the requirements of one-half inch (1/2") maximum, medium gradation for surface course and three-quarters inch (3/4") maximum, medium gradation, for base course.

8-02A.3 Hot Mix Asphalt Mix Design

The following shall be added to Section 39 “Hot Mix Asphalt” of the State Standard Specifications:

The City will accept a previously Caltrans approved mix design and shall not require job start up verification. The mix shall have been validated by Caltrans within the last 24 months. Contractor shall submit Job Mix Formula (JMF), Job Mix Formula Verification, Contractor Hot Mix Asphalt Design Data, Suppliers Quality Control Plan, density core results from previous job, briquettes test data from previous job.

The City will not provide verification of JMF. JMF must be previously approved by Caltrans within the last 24 months and provided to the Engineer prior to the start of HMA production.

The City reserves the right upon request by the Engineer for contractor to assist the City's third-party inspector to perform density cores in accordance with section 39-2.01A(4)(h)(viii), Density Cores. Contractors are not required to have density cores taken by an independent party. This does not relieve the supplier from performing testing as identified in their Quality Control Plan. Contractor shall submit test results from previous job with same JMF.

The City reserves the right upon request by the Engineer for contractor to assist the City's 3rd party inspector to sample the mix to make and tests briquettes in accordance with section 39-2.01A(4)(h)(i) Contractor is not required to have briquettes made and tested by an independent party. This does not relieve the supplier from performing testing as identified in their Quality Control Plan. Contractor shall submit test results from previous job with same JMF.

The City reserves the right to use Contractor's/Supplier's Quality Control data for acceptance. Contractor to submit Suppliers quality control data from testing identified in Supplier's Quality Control Plan.

The City reserves the right to perform production start-up evaluation by third party if deemed necessary by Engineer upon review of submittals and previous test data.

8-02A.3 Asphalt Binder

Asphalt binder to be mixed with the aggregate shall be paving asphalt PG 64-10 or PG 58-22 in conformance with Section 92, "Asphalts Binders" of the State Standard Specifications, unless otherwise directed by the Engineer.

8-02B Liquid Asphalt

Liquid asphalt to be used as a prime coat on compacted base material shall be SC-70 in conformance with Section 93, " Liquid Asphalt," of the State Standard Specifications, unless otherwise directed by the Engineer. Liquid asphalt shall be used on all aggregate bases under pavement unless otherwise approved by the Engineer. Contractors shall take measures to prevent track out of equipment driving on treated base.

8-02C Asphaltic Emulsion

Asphaltic emulsion to be used as a tack coat on existing asphalt concrete surfaces shall be SS1 in conformance with Section 94, "Asphaltic Emulsions," of the State Standard Specifications, unless otherwise directed by the Engineer.

8-03 Construction

8-03A Hot Mix Asphalt

8-03A.1 Spreading and Compacting

Spreading and compacting shall be performed by methods that will produce an asphalt concrete surface of uniform smoothness, texture and density. The Contractor shall comply with provisions of Section 39-2.01C (2), "Spreading and Compacting Equipment," of the State Standard Specifications.

The completed surfacing shall be thoroughly compacted, smooth and free from ruts, humps, depressions or irregularities. Any ridges, indentations or other objectionable marks left on the surface of the asphalt concrete by blading or other equipment shall be eliminated by rolling or other means. The use of any equipment that leaves ridges, indentations or other objectionable marks in the asphalt concrete shall be discontinued, and acceptable equipment shall be furnished by the Contractor.

When a straightedge twelve feet (12') long is laid on the finished surface and parallel with the center line, the surface shall not vary more than 0.01-foot from the lower edge of the straightedge. The transverse slope of the finished surface shall be uniform to a degree such that no depressions greater than 0.02-foot are present when tested with a straightedge twelve feet (12') long laid in a direction transverse to the center line and extending from edge to edge of a twelve-foot (12') traffic lane.

Pavement within fifty feet (50') of a structure or approach slab shall conform to the smoothness tolerances specified in Section 51-1.01 D(3)(b)(ii) "Surfaces Smoothness," of the State Standard Specifications.

The Contractor shall comply with smoothness per Section 39-2.01A94) (i)(iii) "Pavement Smoothness" of the State Standard Specifications. The profile graph is only required by request of the Engineer. The Contractor shall be required to use a "ski" at the time of spreading of HMA pavement to level irregularities.

The Contractor shall furnish and operate a self-loading motor sweeper with spray nozzles before and after paving operations, where feasible. All other areas will require hand-sweeping. All sidewalks, driveways and ADA ramps shall be swept clean by the end of each day when paving operations occur.

The procedure whereby material is deposited in a wind row, then picked up and placed in the asphalt paver with loading equipment, will not be permitted unless otherwise authorized by the Engineer.

Rolling shall be performed in such a manner that cracking, shoving, or displacement will be avoided. Any displacement occurring as a result of reversing the direction of the roller or from any other cause shall at once be corrected using rakes and fresh asphalt mixture, where required.

Not less than one breakdown roller and two finish rollers shall be used with each paving operation and shall meet minimum equipment requirements as specified in Section 39 "Hot Mix Asphalt," of the State Standard Specifications, in accordance with applicable pavement and design method.

Areas inaccessible to the rollers shall be compacted by use of a power compactor of the high-impact vibra-plate type, capable of attaining the same compaction as the rolled areas.

Segregation shall be avoided, and the surface shall be free from pockets of coarse or fine material. Asphalt concrete or asphalt concrete base containing hardened lumps shall not be used.

Type A HMA for base and surface courses shall not be applied when the ambient air temperature is below fifty-five (55°) Fahrenheit and is falling, but it may be applied when the air temperature is above fifty degrees (50°) Fahrenheit and is rising. Air temperature shall be taken in the shade and away from artificial heat. Asphaltic material shall not be placed when general weather conditions, in the opinion of the Engineer, are not suitable.

8-03A.2 Thickness at Lip of Gutter

Hot Mix Asphalt placed adjacent to any gutter designed to carry water shall be one-fourth inches (1/4") maximum above the gutter lip after final compaction. At ADA ramps, the asphalt concrete shall be flushed with the lip of gutter.

8-03A.3 Paving Joint

No excessive build-up or unsightly appearance shall be permitted on longitudinal or transverse joints. Paving joints shall be constructed in accordance with Section 39-2.01C (2), "Spreading, and Compacting Equipment," of the State Standard Specifications. Lap joints shall be constructed in accordance with the City Standard Details. Longitudinal joints in top layers must match specified lane markings unless approved otherwise by the Engineer.

The paving joint between longitudinal paving seams shall be reviewed and approved by the Engineer. The Contractor shall schedule the work accordingly so that the entire roadway width to be completely paved between these roadway sections daily/nightly. There are striping reconfigurations, and the existing striping may not reflect the proposed striping. The Contractor shall layout paving plan, so the longitudinal paving seam meets the proposed striping.

In event that a street requires cold joint paving (as approved by Engineer), the longitudinal joints shall be trimmed to a vertical face and to a neat line if the edges of the previous paved surface are, in the opinion of the Engineer, rolled and deformed in such condition that the quality of the completed joint (paving seam) will be affected.

8-03A.4 Weight Certificates

The Contractor shall furnish two licensed weighmaster's certificates (the original and duplicate copy) showing the actual net weight of material and the date and time of weighing. The weight certificates shall be given to the Engineer on the job as soon as the truck arrives at the work site. All trucks used for hauling asphalt concrete shall be weighed empty daily and at such times as directed by the Engineer.

8-03B Liquid Asphalt

Liquid asphalt shall be applied at a rate 0.2 to 0.5 gal/SY as a prime coat to compacted aggregate base surfaces prior to HMA paving or as directed by the Engineer.

8-03C Asphaltic Emulsion

Asphaltic emulsion shall be applied as a tack coat to existing asphalt concrete surfaces prior to asphalt concrete paving in accordance with Section 39-2.01C(3)(f), "Tack Coat," of the State Standard Specifications.

8-04 Measurement

HMA shall be measured by the ton in accordance with Section 39-2.01D., "Payment," of the State Standard Specifications. Asphalt binder, liquid asphalt, and asphaltic emulsion shall not be measured items.

8-05 Payment

The contract price paid for Hot Mix Asphalt shall include full compensation for supplying, spreading and compacting asphalt concrete; supplying and applying liquid asphalt and asphaltic emulsion; and supplying and mixing asphalt binder with HMA.

No adjustments of the unit price shall be made for any increase or decrease in the quantity of Hot Mix Asphalt required by these Special Provisions and Project Plans regardless of the reason for such increase or decrease. The Provision in Section 4-1.05, “Changes and Extra Work,” of the State Standard Specifications shall not apply to these mentioned items

SECTION 9. HOT MIX ASPHALT PAVING

9-01 General

This section covers all requirements relating to hot mix asphalt paving of existing and new streets excluding hot mix asphalt, liquid asphalt, and asphaltic emulsion. Refer to Section 8, "Hot Mix Asphalt, Liquid Asphalt, and Asphaltic Emulsion," of these City Standard Specifications for material and installation requirements for hot mix asphalt, liquid asphalt, and asphaltic emulsion. The types of asphalt concrete paving projects presented in this section include:

1. New Street: Application of hot mix asphalt over a new base.

2. Existing Street: Application of asphalt concrete over existing, recycled and new bases; and existing asphalt pavement surfaces.

3. Rip-Off: Removal of existing asphalt concrete but reuse of existing base.

4. Total Recycle: Reuse of existing asphalt concrete and base with or without stabilizing agent mixture.

5. Total Reconstruction: Removal of existing asphalt concrete and aggregate base and installation of new aggregate base.

6. Isolated Pavement Repair/Base repair: Same as a rip-off or total reconstruction but only performed for relatively small and defined pavement failures.

7. Overlay: Preparation of existing asphalt concrete surface and placement of a new asphalt concrete pavement surface layer.

9-02 Materials

Material requirements for aggregate base, liquid asphalt, and hot mix asphalt used for new and existing streets shall conform to the following sections of these City Standard Specifications.

- Aggregate base: Section 7-02A, "Aggregate Base"

- Liquid asphalt: Section 8-02B, “Liquid Asphalt"

- Asphalt concrete: Section 8-02A, "Hot Mix Asphalt"

9-02A New Streets

Refer to Section 9-02, "Materials," of these City Standard Specifications.

9-02B Existing Streets

Refer to Section 9-02, "Materials," of these City Standard Specifications.

9-02B.1 Rip-Off

(No additional materials specific to rip-off included in this section.)

9-02B.2 Total Recycle

9-02B.2.1 Base Stabilizing Agents

Base stabilizing agents used for existing recycled base and asphalt concrete composite mixtures before overlay of new asphalt concrete surface shall be either Portland cement, Lime, Fly ash, or bituminous stabilizing agents depending on existing and site condition (structure and type of subgrade soil) as specified on Project Plans & Specifications. The Contractor shall perform sampling and pre-testing of the site and determine the appropriate type of stabilizing agent to be used based on results obtained on soil classification type, percent of material passing (No. 200 sieve), plasticity index, and liquid limit, if it not specified on the Project Plans & Specifications.

9-02B.3 Total Reconstruction

(No additional materials specific to total reconstruction included in this section.)

9-02B.4 Isolated Pavement Repair

(No additional materials specific to isolated pavement repair included in this section.)

9-02B.5 Overlay

9-02B.5.1 Asphaltic Emulsion

Material requirements for asphaltic emulsion used for existing street overlays shall conform to Section 8-02C, "Asphaltic Emulsion," of these City Standard Specifications.

9-02B.5.2 - Paving Mat

Paving mat material used on existing asphalt concrete surfaces must be nonwoven fiberglass and polyester material and shall conform to the provisions of Section 96-1.02K, of the State Standard Specifications and these City Standard Specifications.

The paving mat shall be accompanied with a Certificate of Compliance conforming to the provisions in Section 6-2.03C, "Certificates of Compliance," of the State Standard Specifications.

Paving mat shall be protected from exposure to ultraviolet rays until placed.

Asphalt binder for pavement fabric shall conform to the provisions of Section 92, "Asphalt Binders," of the State Standard Specifications and shall be Grade PG 64-10 or pre-approved by the Engineer.

Paving mat shall consists of either Trupave paving mat manufactured by Owens Corning or GlasPave25 paving mat manufactured by Saint-Gobain Technical Fabric/Tensar International Corporation, or approved equal. The material shall be a "single layer non-woven paving mat" in accordance with ASTM D7239 Type 1 Classification and shall meet the following physical properties table when tested in conformance with the listed Test Method designation.

PHYSICAL PROPERTIES OF HYBRID/FIBERGLASS POLYESTER PAVING MAT			
Property	**Test Method**	**Units**	**Value**
Mass per unit area	ASTM D5261	g/m2	125
Tensile strength, MD	ASTM D5035	N/50mm (lb/2 in)	200 (45)
Tensile Strength, CD	ASTM D5035	N/50mm (lb/2 in)	200 (45)
Ultimate Elongation	ASTM D5035	percent	<5
Melting point	ASTM D276	C (F)	>205 (>400)

Material submitted as "or equal" shall provide project lists showing placement of the "or equal" material on at least 5 years of projects in California prior to the current year. The material shall have a proven record that it can be recycled and milled via written documentation from milling contractors and recycle facilities. Refer to manufacture's recommendations for proper asphalt binder application rates.

9-02B.6 Stress Absorbing Membrane Interlayer (SAMI)

Refer to Section 10-02, "Materials" of these Project Special Provisions.

9-03 Construction

For both hot mix asphalt paving of new and existing streets, the Contractor shall raise structures to grade after all paving operations are complete. On streets where full width milling is to take place, the Contractor shall lower all structures prior to the full mill grind.

Adjustments of frames and covers for manholes, water valves, monuments, detection handholes, and cleanouts shall be in accordance with the applicable City Standard Details. All utility covers shall be marked and referenced prior to paving. This shall be accomplished by removing the existing concrete collar around the frame, installing concrete adjusting rings, raising the frame and cover, constructing concrete collar and placing two inches (2") of asphaltic concrete. No metal riser adjustment rings will be allowed. When raising structures to grade, the contractor shall use Caltrans Minor concrete batched from a certified batch plant along with a weight tag from a certified weigh master unless otherwise approved by the City Engineer. All existing water valve and monument boxes shall be removed and replaced with new boxes at the time of construction. Water valves shall be accessible immediately after paving and water valve covers must be raised within 48 hours after paving. All structures raised to grade shall be paved within 48 hours or the Contractor shall be required to furnish temporary paving. The City shall have the right to assess a penalty of two-hundred-fifty ($250.00) per day for each street where the water valve boxes have not been raised after forty-eight (48) hours. All manholes, lamp holes, and water valve risers shall be covered and protected to avoid any debris or foreign materials entering these systems. Installation of temporary false bottom in manhole is required to collect debris.

Sequence of Work:

The contractor shall perform all work in the following sequence (if required):

- Full width milling/cold plane Full Depth HMA Repair
- Crack seal
- Grinding or wedge cutting at gutter lip/end conform
- HMA leveling
- Traffic detector loop installation
- Paving mat installation
- Hot mix asphalt placement
- Raising of irons
- Striping and signing

Crack sealing shall be completed a minimum of 21 twenty-one (21) days prior to resurfacing.

Hot mix asphalt overlay shall be placed within ten (10) calendar days, from the day lip of gutter or end conform grinding/wedge cutting started, or seven (7) calendar days from the day rubberized chip seal work begins on each individual street. A penalty of seven hundred ($700) per calendar day shall be assessed against the Contractor for each individual street after the above-mentioned ten (10) and seven (7) calendar day period, whichever is more restrictive. The contractor shall schedule their work accordingly.

The contractor shall complete all traffic striping operations on major arterial and collector streets within seven (7) calendar days of the final HMA placement. A penalty of one thousand ($1,000) per calendar day shall be assessed against the Contractor for each individual street after the above mentioned seven-day (7) period. The contractor shall schedule their work accordingly.

The contractor shall sweep and/or broom sidewalks, driveways, median islands, etc., of all aggregate that is generated daily, prior to each of their sweeping operations and shall review after sweeping operations all debris has been removed, at no additional cost to the satisfaction of the Engineer.

The contractor shall remove any oil marks/tracking from driveways, sidewalks, median islands, striping, etc., within 48 hours of occurring, at no additional cost, to the satisfaction of the Engineer.

Contractors shall take measures to reduce project track out on adjacent streets. No staging of trucks on side streets that are not scheduled for surface treatment except for haul route streets. The contractor shall protect existing striping, concrete, pavers, etc. from track out oils. The contractor shall replace all damaged surfaces/stripping from track out markings at no cost to the owner.

The contractor shall remove no parking barricades/signage no later than the day of paving and within 24 hours after expiration of the signage. Barricades shall not be placed on private property, sidewalks or driveways blocking pedestrian and vehicular traffic unless approved by the Engineer.

The contractor shall remove all temporary stripping including 3M tape and 3M tabs immediately after permanent striping/marker has been placed.

9-03A New Streets

Aggregate base shall be applied to the newly graded basement material of new streets in accordance with Section 7, "Aggregate Base," of the City Standard Specifications.

9-03B Existing Streets

Aggregate base shall be placed on basement material for the total reconstruction of existing streets and used as make-up base material for rip-off, total recycle, and isolated pavement repair projects for existing streets in accordance with Section 7, "Aggregate Base," of these City Standard Specifications.

For rip-off, total recycle, total reconstruction, and isolated pavement repair projects, prime coat shall be applied to the compacted aggregate base surface prior to application of asphalt concrete. Refer to Section 8, "Hot Mix Asphalt, Liquid Asphalt, and Asphaltic Emulsion," of these City Standard Specifications for prime coat requirements.

9-03B.1 Rip-Off

The Contractor shall remove existing asphalt concrete and scarify, grade, and compact to ninety-five percent (95%) minimum, the top six inches (6") of base material for the full width of the street between gutter lips. The Contractor shall provide import base material needed to meet the desired grade or to replace soft spots. Contractor is required to proof roll the compacted grade.

9-03B.2 Total Recycle

9-03B.2.1 Preparation

Total recycle process includes the in-place pulverization/grinding and uniform blending of existing asphalt concrete roadway and predetermined thickness of underlying material, creating a homogeneous mixture of recycle base material. The process also consists of shaping, finishing, fine grading, and compacting recycled base material to the depth and grade shown on the Project Plans.

Any ground particles larger than two-and-a-half inches (2½") in diameter shall be removed. Existing asphalt concrete and base materials shall be ground and mixed to a minimum distance of fifteen inches (15") from the edge of all utility structures and the remaining sections removed by hand or suitable equipment.

The Contractor shall cut and/or fill the existing ground asphalt concrete and base materials to meet the desired grades shown on the Project Plans. The minimum relative compaction requirement shall be ninety-five percent (95%). Grading and compaction shall be performed for the full width of the street between gutter lips. After compaction and trimming, the recycled composite mixture shall be firm and unyielding. The Contractor is required to proof-roll the compacted material. The Contractor shall haul away and properly dispose of all excess materials. All manholes and valve covers shall be protected with metal-plate lids during grading and compaction.

9-03B.2.2 Stabilization

Base stabilizing agent, as specified in Section 9-02D, "Base Stabilizing Agents," of these City Standard Specifications shall be added to: (1) the composite mixture specified in Section 9-03B.2.1 of these City Standard Specifications, (2) remaining existing base materials, and (3) basement material to the depth and at a rate as described in the Special Provisions or as shown on the Project Plans. Base stabilization shall conform to Section 24, "Stabilized Soils," of the State Standard Specifications, except as modified in these City Standard Specifications. All base stabilization work shall be performed by a specialty soil stabilization contractor. After application of curing seal, stabilized recycled base shall be ready for cross traffic within twenty-four (24) hours. The Contractor shall stabilize the materials described herein surrounding the existing utility structures to fifteen inches (15") from the edge of those existing structures.

The recycled composite mixture should be allowed to cure for the specified time as approved in the mix design or in the Project Plans & Specifications. Curing is the Contractor responsibility, who should consider all factors, including but not limit to, limitation and restrictions to weather and work zone traffic.

Quality Assurance:

The approved mix design shall conform to the following strength parameters and test procedures based on the stabilizing agent used:

- For Portland cement, Lime, Fly ash stabilizing agent: Use Unconfined Compressive Strength Test parameters in conformance with ASTM D1633 Method A. Minimum strength shall be 350 psi (2413 kPa) but less than 800 psi (516 kPa).

- For Bituminous Stabilizing Agent (s): Use Modified Proctor Density, ASTM D1557 and/or Marshall Method, ASTM D6927.

On the first day of production, the Contractor will take the appropriate QC samples of reclaimed mix in accordance with the appropriate test method mentioned above. Two additional samples will also be tested by the Contractor's laboratory for aggregate gradation and percent stabilizer content. Test results will be submitted to the Engineer before the end of the next working day.

For each subsequent day of production, a minimum of one sample of the reclaimed mix will be taken from each street or from each three thousand (3,000) center-line feet of production. These samples will be tested as noted for the first day of production. Test results will be delivered to the Engineer within two (2) working days.

9-03B.3 Total Reconstruction

The Contractor shall remove existing asphalt concrete and base material and prepare existing basement material in accordance with Section 4, "Roadway Excavation and Grading," of these City Standard Specifications prior to application of new aggregate base in accordance with Section 7, "Aggregate Base," of these City Standard Specifications.

9-03B.4 Full Depth HMA Repair

The Contractor shall perform isolated pavement repairs for various types of projects as required by the Special Provisions and the Project Plans. The construction requirements in the following paragraph shall apply to isolated pavement repair.

The Contractor shall remove existing asphalt concrete pavement by cold plane grinding, blade cutting, or jack hammering areas shown on the Project Plans and marked in the field. The edge of the outside perimeter cut of the base repair shall be straight and firm, with no up-heaving, and free of loose material. The Contractor shall scarify, grade, and compact the top six inches (6") of base materials. Any import base materials needed to meet the

requirement for this work shall be provided by the Contractor. The minimum relative compaction for this work shall be ninety-five percent (95%). The Contractor shall replace asphalt concrete with materials meeting the requirements of these City Standard Specifications. The thickness of this asphalt concrete shall be a minimum of four inches (4") or equal to the depth of the existing asphalt concrete, whichever is greater

9-03B.5 Overlay

9-03B.5.1 Cleaning

Prior to commencing paving, existing pavement shall be cleaned of all loose material by a self-loading motor sweeper to the satisfaction of the Engineer. The Contractor shall also be responsible for removing all painted or thermoplastic striping, markings, and buttons.

9-03B.5.2 Grinding and Milling of HMA Pavement

The grinding and milling/cold plane of HMA pavement shall be performed in advance of the resurfacing operation and in accordance with the requirements of these City Standard Specifications and as shown on the Project Plans. The grinding machine cutter head shall be at least six feet (6') wide.

All loose material removed shall become the property of the Contractor and be disposed of outside of the street right-of-way. The Contractor shall make his own arrangements for a disposal site and shall be responsible for all costs involved.

The Contractor shall furnish and operate a self-loading motor sweeper with spray nozzles for final cleanup work and shall keep the ground area clean and always maintained until the street has been resurfaced.

The cold planing machine shall be capable of planing the pavement without requiring the use of a heating device to soften the pavement during or prior to the planing operation.

Pavement planing shall consist of cold planing a continuous width of asphalt concrete pavement, to the limit shown or specified in the Contract. The depth of planing below gutter lips shall be equal to the specified thickness of hot mix asphalt overlay less 1/4 inch and shall slope smoothly at the specified cross slope to the street centerline or identified crown. The final cut shall result in a uniform surface conforming to the depth, width, shape and cross slope as shown on the Project Plans. The outside lines of the planed area shall be neat and uniform.

The cold-plane depth shown on the Project Plans are approximate and varies. The cold-plane depth is to be adjusted as necessary to provide a uniform surface and to provide a best fit to field conditions as directed by the Engineer. The Contractor shall be responsible for providing grade checking during the cold-plane operation.

At the end of each working day, there shall not be any elevation difference between the planed and un-planed pavement in the travel vehicle lanes. Any elevation differences that parallel the centerline of the street shall be sloped by either temporary asphalt concrete tapers or additional planing to produce a bevel within the planed pavement. The slope of either temporary asphalt concrete tapers or the bevel shall not be greater than one inch vertically and twelve inches horizontally. Elevation differences between the planed pavement and lips of gutters are not required to be sloped except at driveways or walkways.

Elevation differences perpendicular to the centerline of the street or between the planed street and cross streets shall be lessened with a temporary asphalt concrete taper.

When temporary asphalt concrete tapers are used, the asphalt concrete taper shall be commercial quality and can be spread and compacted by any method that produces a smooth riding surface. Warning signage shall be installed. Temporary asphalt concrete tapers and all loose material shall be completely removed before overlay operation.

Intermediate longitudinal joints shall have no larger differential than 1.75 inches before opening to traffic. Joints taller than 1.75 inches shall be ramped. All intersections and ADA ramps shall have temporary joints ramped to remove any differential

Contractor shall provide a means for temporary lane delineation, including centerline (yellow) and lane line (white), between the planing operations and roadway paving, as specified in Section 2-01A Public Convenience and Safety of these Specifications.

The Contractor shall remove and dispose of all existing paving fabric if encountered within the cold plane section and as directed by the Engineer at no additional cost to the City.

The depth of wedge-cut shall be as shown on the Project Plans along the edge of pavement or gutter lip and tapered out to zero over a six -foot (6') minimum width or as directed by the Engineer. The final cut shall result in a uniform surface conforming to the cross-section of each street. The adjacent concrete shall have all asphalt concrete removed where required. The outside lines of the ground area shall be neat and uniform. The street surface to remain in place and the existing concrete curb and gutter shall not be damaged in any way.

Grinding widths of pavement shall be continuous and 15 feet (15') wide along conform lines, as directed by the Engineer. All loose material ground from the street surface, including material deposited in the existing gutter or on the adjacent traveled way, shall be immediately removed from the work site. The removal operation shall follow within fifty feet (50') of the grinder, unless otherwise directed by the Engineer. Cutback shall be placed in all fifteen-foot (15') wide conform line immediately after grinding operation is completed for a minimum width of five feet (5'). The Contractor shall also be responsible for placing cutback around any protruding structures in the grind area.

Asphalt concrete shall be removed from driveways and gutters and around all structures in the ground area as directed by the Engineer as part of the grinding asphalt concrete pavement work and no additional compensation will be made, therefore.

On streets where full milling is to take place, the Contractor shall lower all structures prior to performing the full mill grind.

9-03B.5.3 Hot Mix Asphalt Leveling Course

If an HMA leveling course is required by the Special Provisions and Project Plans, then all leveling courses shall be placed with one-half-inch (½") HMA Type A.

The Contractor shall apply an SS-1 tack coat to all surfaces receiving the leveling course prior to spreading the leveling course.

The Contractor shall spread and compact the leveling course at all dip areas, depressions and voids greater than one-half-inch (½") thickness.

Spreading and compacting shall be performed by methods that will produce a surface of uniform smoothness, texture, and density to allow subsequent layers to be of uniform thickness.

9-03B.5.4 Paving Mat

The surface on which the engineered paving mat is to be placed shall be reasonably free of dirt, water, vegetation or other debris. The engineered paving mat shall be placed on a drainable surface, and any rutting or low spots in the pavement shall be removed by milling or using a leveling course as shown on the plans or directed by the Engineer in the field. Cracks exceeding one-quarter inch (1/4”) in width shall be filled with suitable crack filler. Potholes shall be properly repaired as directed by the engineer. Fillers shall be allowed to cure prior to placement of the engineered paving mat.

Neither the asphalt binder nor the engineered paving mat shall be placed when weather conditions, in the judgment of the engineer, are not suitable. Air and pavement temperatures shall be sufficient to allow the tack coat to hold the engineered paving mat in place. The air temperature shall be fifty degrees (50º) Fahrenheit and rising for placement of the asphalt tack coat.

The application rate of tack coat shall be .20 gal/SY +/- .03 gal/SY. This application rate is necessary for an effective moisture barrier. Tack coat application rate shall be sufficient to satisfy the asphalt retention properties of the engineered paving mat and to bond the engineered paving mat and HMA overlay to the existing pavement.

Application of the tack coat shall be by a calibrated distributor truck spray bar. Hand spraying, squeegee and brush application will only be allowed where the distributor truck does not have room to operate and shall be kept to a minimum. The temperature of the tack coat shall be at least three-hundred-fifty degrees (350º) Fahrenheit.

The target width of the tack coat application shall be the width of the engineered paving mat material plus four inches (4”). The tack coat application shall be wide enough to cover the

entire width of engineered paving mat material overlaps. The tack coat shall be applied only as far in advance of the engineered paving mat material installation as is appropriate to ensure a tacky surface at the time of the engineered paving mat material placement. Traffic shall not be allowed on the tack coat.

The engineered paving mat shall be placed onto the tack coat with minimum folds or wrinkles and before the tack coat has cooled and lost tackiness. As directed by the engineer, wrinkles or folds in excess of one inch (1") shall be slit and laid flat or pulled out and replaced. In these repaired areas, additional tack coat shall be applied as needed to achieve a sound bond to the substrate. The damaged paving mat shall be removed and replaced, per the manufacturer's recommendations, at the contractor's expense with the same type of material.

Overlap of engineered paving mat joints shall be lapped two to four inches (2 – 4") to ensure full closure of the joint. Transverse joints shall be lapped in the direction of paving to prevent edge pickup by the paver. A second application of tack coat shall be placed beneath the overlapping engineered paving mat to ensure proper bonding of the double material layer.

Brooming, squeegee or pneumatic rolling shall be used to remove any air bubbles and to maximize engineered paving mat contact with the pavement surface and shall be done in accordance with the manufacturer's specifications and to the satisfaction of the engineer.

Excess tack coat that bleeds through the engineered paving mat under normal construction traffic shall be countered by broadcasting clean sand or hot mix to create a bond break between the excess tack and the construction equipment tires. If sand is applied, any excess sand shall be removed from the interlayer prior to placing the HMA overlay. No other material, such as asphalt release agents or diesel, shall be used for this purpose.

No traffic, except necessary construction traffic or emergency vehicles, shall be driven on the engineered paving mat, unless approved by the engineer. If traffic on the interlayer is approved by the engineer, clean sand shall be lightly broadcasted over the engineered paving mat interlayer, and any loose sand shall be removed prior to paving.

Placement of the first lift of the HMA overlay shall closely follow placement of the engineered paving mat. All areas in which the engineered paving mat has been placed shall be paved during the same day, unless approved otherwise by the engineer. In the event of rainfall on the engineered paving mat prior to the placement of the first HMA overlay lift, the engineered paving mat shall be allowed to dry before the HMA is placed. The compacted thickness of the first lift of the HMA overlay on the engineered paving mat shall not be less than one-and-one-half inches (1.5"), and the temperature of the mix at placement shall not exceed the engineered paving mat melting point temperature. Where the total HMA overlay thickness is less than one-and-one-half inches (1.5"), engineered paving mat shall not be placed.

At locations where the contractor is overlaying the gutter pan with asphalt concrete, and at the direction of the city engineer, the contractor shall zero grind or knock off the existing asphalt concrete at the lip of gutter without damaging the existing concrete gutter in order for

the new asphalt concrete to be placed properly. This is not a measured item of work, and no additional payment shall be allowed, therefore.

A manufacturer's representative shall be present, at minimum, for the first two days of installation of the engineered paving mat and available thereafter upon request by the engineer. This shall be arranged by the contractor with the manufacturer. This is not a measured item of work and no separate payment to the contractor shall be allowed for full compliance to this provision.

9-03B.7 Stress Absorbing Membrane Interlayer (SAMI)

Stress Absorbing Membrane Interlayer construction consisting of existing surface preparation, Asphalt Rubber Binder Seal Coat (rubberized chip seal) application and overlay with hot mix asphalt.

1. Existing surface preparation: The existing street surface shall be prepared in accordance with Section 9-03B.4, "Full Depth HMA Repair", Section 9-03B.5.2, "Grinding and Milling of Hot Mix asphalt Pavement", and Section 9-03B.5.3, "Hot Mix Asphalt Leveling Course" of these City Standard Specifications.

2. Rubberized chip seal application: Rubberized chip seal shall be placed in accordance with Section 37-2.04, "Asphalt Rubber Binder Chip Seals," of the State Standard Specifications, except a flush coat is not required and to City Standard Specifications. Prior to commencing chip seal, existing pavement shall be cleaned of all loose material to the satisfaction of the Engineer.

3. Overlay: The Contractor shall overlay the street with hot mix asphalt as required by the Special Provision and Project Plans. Hot mix asphalt overlay shall be in accordance with Section 8-03, "Construction" of these City Standard Specifications.

9-04 Measurement

Measurement of asphalt concrete used for paving and leveling course shall be in accordance with Section 8-04, "Measurement," of these City Standard Specifications. The basis of measurement for asphalt concrete paving shall be as follows.

Square Yard:	Remixing
	Paving mat
Square Foot:	Preparation of recycled base and hot mix asphalt material
	Base stabilization

Total Reconstruction

Full depth HMA/Isolated pavement repair

Milling/cold plane

Linear Foot:	Grinding along the gutter lip or at conform line and removal of grindings. (Each linear foot of grinding shall have a required width and an average depth of cut as shown on the Project Plans at the gutter lip or conform.)
Per Each:	Irons Adjustment

9-05 Payment

The contract unit price paid for all hot mix asphalt paving measured items, identified in Section 9-04, "Measurement," of these City Standard Specifications, shall be considered full compensation for completing all works associated with that item.

Payment of hot mix asphalt used for paving and leveling course shall be in accordance with Section 8-05, "Payment," of these City Standard Specifications.

The contract price paid for paving mat shall include full compensation for furnishing and applying paving mat and asphalt binder including lapping, complete in place.

The contract price paid for preparation of recycled existing base and asphalt concrete material shall include full compensation for grinding, mixing, grading, and compacting recycled existing base and asphalt concrete material to the depth shown on the Project Plans; hauling and disposal of all excess materials; and protection of all utility covers.

The contract price paid for base stabilization shall include full compensation for supplying, adding, and mixing base stabilizing agent to the mixture of recycled existing base and asphalt concrete material; existing base; and basement material. The contract price paid shall also include full compensation for the application of a curing seal.

The contract unit price for isolated pavement/base repairs shall include full compensation for the removal and disposal of existing pavement including pavement fabric, if any; the scarification, grading, and compaction of base materials; and the replacement and compaction of asphalt concrete.

The contract price paid for milling/cold plane includes full compensation for grinding existing asphalt concrete to the depth specified on the Project Plans; removal and disposal of all loose material; and final cleanup until the street has been resurfaced.

The contract price paid for grinding shall include full compensation for grinding existing asphalt concrete along gutter and conform lines; removal of all loose material; and final cleanup until the street has been resurfaced.

The contract price paid for raising structures (irons) to grade shall include full compensation for removal of frame collars, installation of concrete adjustment rings, raising of frame and cover, constructing a concrete collar and replacing surrounding asphalt concrete; removal and replacement of new water valve and monument boxes; protection of raisers from foreign materials; and installation of temporary false bottoms in manholes.

No adjustments of the unit price shall be made for any increase or decrease in the quantity of preparation of recycle base and asphalt concrete material, base stabilization, total construction, rubberized chip seal, Isolated pavement repair, HMA leveling course, pavement grinding and milling/cold-plane required by these Special Provisions and Project Plans regardless of the reason for such increase or decrease. The Provision in Section 4-1.05, "Changes and Extra Work," of the State Standard Specifications shall not apply to these mentioned items.

SECTION 10. BITUMINOUS SEALS

10-01 - General

Bituminous seals including fog seal, slurry seals and rubberized chip seals (asphalt rubber binder chip seal), and crack seal shall conform to the provisions of Section 37, "Seal Coat," of the State Standard Specifications and to these City Standard Specifications.

Prior to commencing work, the Contractor shall submit a proposed schedule of work for approval by the Engineer. This schedule shall list the dates on which individual streets are to be closed to traffic for surfacing. Work on each street shall be completed in one working day.

The Contractor shall be responsible for notifying business establishments, each resident, Livermore Amador Valley Transit Authority (LAVTA), Pleasanton Garbage Service, Pleasanton Post Office, Pleasanton Unified School District, and any other agencies identified by the City of Pleasanton 48 hours prior to the commencement of work. The Contractor shall be responsible for notifying each of the above with regard to changes in schedule should they occur.

The Contractor shall coordinate with Pleasanton Garbage Service to ensure trash pickup will not occur within 48 hours after the placement of the slurry seal. Contractors shall include in their schedule the date of the next trash pick-up for each street.
Fifteen (15) working days prior to commencing slurry seal and rubberized chip seal work, the Contractor shall submit a detailed proposed schedule of work for approval by the Engineer. Each proposed schedule of work submitted for review shall include a map clearly showing details of pulls and specific lanes for each street by color coding so that limits of work on a daily basis are clearly delineated. For any subsequent changes in the approved schedule of work, the Contractor shall provide a new proposed schedule of work with a color-coded map for review and approval by the Engineer at least five (5) working days prior to the start of the work. The Contractor shall schedule the work so the walking distance from each individual street that is closed for resurfacing shall be no further than one thousand (1,000) feet to the nearest street suitable for on-street parking. Map shall include the trash pick-up dates

Requirements for using City water for bituminous seal projects shall be in accordance with Section 1-09, "Dust Control," of these City Standard Specifications.

10-02 - Materials

10-02A - FOG Seal Coat

Fog seal coat material shall conform to the provisions of Section 37-4.02B, "Materials," of the State Standard Specifications.

10-02B - Slurry Seal

10-02B1 - Aggregate

Aggregate shall be (Type II) one hundred percent (100%) crushed with no rounded particles, volcanic in origin, and black in color, as supplied by George Reed, Table Mountain Plant, Sonora, CA, or equal. The use of gray or light-colored aggregate will not be allowed as a substitute for black aggregate. The material shall be free from vegetable matter and other deleterious substances. The percentage composition by weight of the aggregate shall conform to the following grading:

	Percentage Passing	
Sieve Sizes	Type II	Stockpile Tolerance *(*)*
3/8"	100	-5%
No. 4	90-100	± 5%
No. 8	65-90	±/- 5%
No. 16	40-70	± 5%
No. 30	25-50	± 5%
No. 200	5-15	± 2%

(*) The job mix (target) gradation shall be within the gradation band. After target gradation has been submitted, the percentage passing each sieve shall not vary by more than the stockpile tolerance and still remain within the gradation band.

The aggregate shall also conform to the following quality requirements:

Test	Test Method	Requirement
Sand equivalent (min)	California Test 217	65
Durability Index (min)	California Test 229	65

10-02B.2 Polymer Modified Asphaltic Emulsion

Polymer modified asphaltic emulsion must consist of polymer mixed with bituminous material uniformly emulsified with water and an emulsified or stabilizing agent.

Polymer modified asphaltic emulsion shall be Grade PMCQS-1h and must comply with the following requirements:

Test	Test Method	Requirement
Test on Emulsion:		
Saybolt Furol viscosity @25ºC (Saybolt Furol seconds)	AASHTO T59	15-90
Sieve test (%)	AASHTO T59	0 – 0.3
Storage stability after 1 day (%)	AASHTO T59	0-1
Residue by evaporation (min, %)	California Test 331	64

Test	Test Method	Requirement
Particle Charge	AASHTO T59	Positive
Tests on residue:		
Penetration at 25ºC	AASHTO T49	40-90
Ductility at 25ºC (min, %)	AASHTO T51	400
Softening Point (min, ºF)	ASTM D36	142
Torsion Recovery (min, %) or Polymer content (min,%)	California Test 332 California Test 401	20 4

10-02B.3 - Mineral Filler

Mineral filler may be used to improve mixture consistency and to adjust mixture breaking and curing properties. The mineral filler shall be either Portland Cement or other approved mineral fillers meeting the ASTM D242 if required by mix design. Portland Cement, if used, shall be commercially available Type I-II and shall be free of lumps and clods.

10-02B.4 - Water

Water shall be free of harmful, soluble salts and shall be of such quality that the asphalt shall not separate from the emulsion before the emulsion mix is in place in the work.

10-02B.5 - Additive

Aluminum sulfate or mineral filler additive may be used to retard the set rate or accelerate the break rate of the slurry seal, respectively. Appropriate additives and their applicable use range shall be clearly identified in the mix design.

10-02B.6 - Polymer

Styrene Butadiene Rubber latex shall be added to the water/soap phase by injection prior to the mill manufacture of the emulsified asphalt by the emulsion producer. The latex shall be BASF NX 1118 or approved equal. The amount of latex shall be a minimum of four percent (4%) of the asphalt residual content and shall be **certified by the emulsion producer on each load of emulsion delivered to the job site**. Failure to have the latex percentage listed on the delivery ticket with the certification will cause the load to be rejected. No post or field addition of Polymer Latex will be allowed.

Test	Requirement
Total solids, min, %	60
Bound styrene %	24 - 26
PH at 25° Celsius	4.2 - 5.2
Brookfield viscosity RVT	1000 - 4000
Residual Monomer %	0.08 max

10-02C - Rubberized Chip Seal

Rubberized chip seal shall conform to the provisions of Section 37-2.04, "Asphalt Rubber Binder Chip Seals" of the State Standard Specifications.

10-02-D Pavement Crack Seal
Crack seal shall be joined seal and Crafco Polyflex Type 3 or approved equal.

10-03 Construction

10-03A Fog Seal Coat

The preparation, application, and finishing of fog seal coat surface shall be in accordance with Sections 37-4- "Fog Seals and Flush Coats" of the State Standard Specifications.

10-03B Slurry Seal

10-03B.1 Mix Design

The slurry seal must have the material proportion limits as follows:

Material	Proportion Limits
Residual asphalt	7.5 - 13.5% by dry weight aggregate
Mineral filler	0 - 3% by dry weight of aggregate
Polymer content	Minimum of 4% by weight of emulsion's residual asphalt
Additive	As needed
Water	As required to produce proper mix consistency

Contractor shall submit complete laboratory report tests and proposed mix design covering the specific materials to be used on the project to the Engineer for approval ten (10) days before placement of the slurry seal. The mix design and laboratory testing shall be performed by a laboratory that has experience in designing slurry seals and dated within thirty (30) days prior to the application of the slurry seals. Compatibility of the aggregate, emulsion, mineral filler, polymer, water, and other additives shall be verified by the mix design. The percentage of each individual material required shall be shown in the signed laboratory report. The report shall also include quantitative moisture effects on the aggregate's unit weight determined under ASTM C29.

The testing and mix design shall be performed by a laboratory capable of performing the applicable International Slurry Seal Association (ISSA) Technical Bulletin (TB) tests. The proposed slurry seal shall conform to the requirements specified when tested in accordance with the following tests:

Test	Test Method	Requirement
Mix time @77º F (25ºC)	TB 113	Controllable to 180 seconds minimum
Slurry seal consistency (cm)	TB 106	2 - 3

Wet cohesion @30 minute (set) (min, kg-cm) @60 minute (traffic) (min, kg-cm)	TB 139	 12 20
Wet stripping (min., %)	TB114	Pass (90)
Wet track abrasion loss One hour soak (max, g/m2)	TB100	810
Excess asphalt by LWT (max, g/m2)	TB109	540

10-03B.2 Proportioning

Polymer-modified asphaltic emulsion shall be added at a rate within the range of twelve percent (12%) to eighteen percent (18%) by weight of the dry aggregate. The Engineer will determine the exact rate based on the design asphalt binder content and the asphalt solid content of the asphaltic emulsion furnished.

A job mix design mix submitted by the Contractor for approval by the Engineer shall conform to the specification limits and shall be suitable for the traffic, climate conditions, curing conditions, and final use. This will include the recommended application rate of slurry to suit the job conditions. During construction, if the mix design needs to be modified due to field conditions, it shall be submitted and approved by the Engineer prior to the placement of the material.

Slurry seal shall be proportioned by the operation of a single start/stop switch or lever which automatically sequences the introduction of aggregate, polymer modified asphalt emulsion, additives, and water to the pugmill.

Calibrated sight flowmeters shall be provided to measure both the addition of water liquid and mixtures to the pugmill.

Contractor may add water and/or additives per approved mix design allowances during construction to ensure proper workability and permit uncontrolled traffic on the slurry seal no more than three (3) hours after placement.

The slurry seal must not show bleeding, raveling, separation, or other distress within fifteen (15) days after placing the slurry seal.

10-03B.3 Mixing and Spreading Equipment

Slurry seal shall be mixed in a self-propelled mixing machine equipped with a continuous flow pugmill, capable of accurately delivering and automatically proportioning the aggregate, polymer-modified asphaltic emulsion, mineral filler, water, and admixtures to a double-shafted, multi-blade pugmill mixer capable of minimum speeds of two hundred (200) revolutions per minute. Polymer-modified asphaltic emulsion retention time in the pugmill shall be less than three (3) seconds. The mixing machine shall have sufficient storage capacity of aggregate, polymer modified asphaltic emulsion, mineral filler, and water to maintain an adequate supply to the proportioning controls. A minimum of two operational mixing machines

of twelve (12) cubic yards capacity or larger shall be maintained on the project site and operating in the same general vicinity (i.e., not across town).

The mixing machine shall be equipped with hydraulic controls for proportioning the material by volume to the mix. Each mixing unit shall be calibrated in the presence of the Engineer prior to the start of the project. Previous calibration documentation covering the exact material to be used may be acceptable, provided that no more than sixty (60) days have lapsed.

The mixing machine shall be equipped with a water pressure system and nozzle-type spray bars to provide water spray immediately ahead of the spreader box.

The mixing machine shall be equipped with an approved fines feeder that provides a uniform, positive, accurately metered, pre-determined amount of the mineral filler at the same time and location that the aggregate is fed.

The slurry mixture shall be uniformly spread by means of a controlled spreader box conforming to the following requirements:

1. The spreader shall be capable of spreading a layer of slurry mixture the full width of the travel lane.
2. The spreader shall have strips of flexible belting or similar material on each side of the spreader box that is in contact with the pavement to prevent loss of slurry from the box.
3. The spreader box shall have baffles or other suitable devices to ensure uniform application on elevated sections and shoulder slopes.
4. The spreader box shall be maintained in such a manner as to prevent chatter, wash boarding, or other surface defects that will affect the aesthetic value of the finished mat.
5. The rear flexible strike-off blade shall maintain close contact with the pavement and shall be adjustable to the various crown shapes so as to apply a uniform slurry seal.
6. The spreader box must be equipped with flexible drag attached to the rear and changed if longitudinal scouring occurs.
7. The spreader box shall be clean and free of slurry seal or emulsion at the start of each work shift.

Slurry seal to be spread in areas inaccessible to a controlled spreader box may be spread by hand squeegees and other methods approved by the Engineer to provide complete and uniform coverage. Handwork shall exhibit the same finish as that applied by the spreader box.

10-03B.4 Placing

Prior to commencing the slurry seal operations all vegetation growing in the roadway shall be removed. The surface shall be cleaned, and debris in gutters removed.

Immediately before commencing the slurry seal operation, all utilities within the slurry seal area shall be protected thoroughly by applying an appropriate cover/protection or by other methods acceptable to the Engineer. These cover/protection(s) shall be removed, and the utility

covers cleaned of any slurry material by the end of the same workday for each and every roadway.

The Contractor shall protect existing striping from track out and being damaged to the satisfaction of the Engineer. Any areas impacted by track out shall be cleaned within forty-eight (48) hours. If the existing striping cannot be cleaned to the satisfaction of the Engineer, the striping shall be replaced at no cost to the City.

Slurry seal shall be placed at the target rate of dry aggregate stone weight of fifteen (15) pounds per square yard with the acceptable tolerance of ± two (2) pounds per square yard. The target rate may adjust in the field by the Engineer within the range between fourteen (14) and sixteen (16) pounds per square yard based upon the unit weight of the aggregate, the gradation of the aggregate, and the demand of the street surface.

Through traffic lanes shall be spread in full lane widths only. The Contractor shall be responsible for making sure that all longitudinal joints for the slurry sealing work correspond only with the edges of the new proposed through traffic lanes. Longitudinal joints that are common to two (2) traffic lanes shall be butt joints with an overlap not to exceed three inches unless approved otherwise by the Engineer. Ridges or bumps in the finished surface will not be permitted and shall be rejected.

Slurry seal for multilane roadways shall begin on the inside lane(s), allowing traffic to use the outside lanes for through movements and then switching traffic to the inside lane for the final outside lane pull. Left turn movements will be prohibited as needed and appropriate detour signs, “Fresh Oil” signs, “No U-Turn” signs and all necessary lane coning shall be shown on a submitted and reviewed traffic control plan.

A minimum of two complete coverages with pneumatic tired rollers shall be made on the slurry seal coat within twenty-four (24) hours after the placement of the slurry seal. Pneumatic tired rollers shall conform to the equipment specified in Section 37-2.01C (2), “Equipment”, of the State Standard Specifications.

Sanding for cross traffic is strictly limited and only allowed upon the approval by the Engineer. Only screened aggregate (no dust) shall be used for cross traffic sanding.

Pneumatic tire rolling is required for all roadways. Pneumatic-tired rollers shall be the oscillating type having a width of not less than four (4) feet with pneumatic tires of equal size and diameter and having treads satisfactory to the Engineer. Wobble-wheel rollers will not be permitted. The tires shall be spaced so that the gaps between adjacent tires will be covered by the following tires. The tires shall be inflated to ninety (90) psi, or a lower pressure as designated by the Engineer, and maintained so that the air pressure will not vary more than five (5) psi from the designated pressure. Pneumatic-tired rollers shall be constructed so that the total weight of the roller can be varied to produce an operating weight per tire of not less than two thousand (2,000) pounds. Pneumatic tire rolling with equipment ID shall be submitted as part of the submittal.

Special pavement sections with decorative pavers, colored concrete and/or concrete bands, and bus turnouts exist within the project limits. It is understood that these special pavement/concrete sections are not to be slurry sealed and shall be protected to prevent tracking of slurry sealing material, including up to the next intersection. The Contractor is held fully responsible for ensuring that these special pavement/concrete sections are kept clean and free from traces of slurry sealing materials. Cleaning of any slurry sealing material that is outside the limit of work shall be the full responsibility of the Contractor. This is not a measured item of work.

Slurry seal shall not be placed when weather conditions prolong opening to traffic beyond a reasonable time and under the following conditions:

- The atmospheric temperature is below fifty degrees (50°) Fahrenheit and falling but may be applied when both the air and pavement temperature is forty-five degrees (45°) Fahrenheit or above and rising.

- The atmospheric temperature is above one hundred degrees (100°) Fahrenheit.

- The expected high atmospheric temperature within twenty-four (24) hours after placement is below sixty degrees (60º) Fahrenheit.

- The expected high atmospheric temperature within twenty-four (24) hours after placement is above one hundred degrees (100º) Fahrenheit.

- Rain is forecasted to occur prior to the ability of slurry to cure.

The surface shall be pre-wetted by fogging with a water mist directly preceding the spreader box as needed for field performance. The rate of application of the fog shall be adjusted during the day to suit temperatures, surface texture, humidity, and the dryness of the pavement with no apparent flowing water from the slurry distributor. The pre-wet fog shall not exceed the allowable pre-wet limit indicated in the approved mix design.

Immediately prior to slurry seal placement, the surface shall be thoroughly cleaned of all vegetation, including but not limited to the weeds/growth between the asphalt concrete joint and the concrete gutter lip, loose materials, dirt, mud, and all other deleterious materials. All utility covers, monument boxes, valve covers, and miscellaneous irons shall be neatly covered along the edge and protected in a manner that can be uncovered and cleaned to the satisfaction of the Engineer.

The slurry seal shall be a consistent mixture upon leaving the mixer. A sufficient amount of material shall be carried in all parts of the spreader at all times so that complete coverage is obtained. No lumping, balling, or unmixed aggregate shall be permitted. No streaks, such as those caused by oversized aggregate, shall be left on the finished surface. If streaking occurs, the slurry seal placement shall be stopped until the cause of the problem has been corrected.

Driveway aprons and returns shall be done concurrently with the street preparation. The joint between the edge of the pavement and the concrete gutter shall be slurry sealed and overlap the lip of the gutter by a minimum of three-quarter inches (3/4") and a maximum of one inch (1"). The Contractor shall complete all uncovering and clean-up operations of each street on the same day after applying the slurry seal on said street. All debris and slurry seal on concrete curb/gutter, driveway, and sidewalk shall be removed.

Construction joints shall be neat in appearance and shall be tapered or feathered to conform to the existing surfacing. All excess material shall be removed from surfaces upon completion of each run. The maximum difference between the pavement surface and the bottom edge of twelve (12) -foot straightedge placed perpendicular to the joint must be four-hundredths foot (0.04') for longitudinal joints and three-hundredths foot (0.03') for transverse joints.

The Contractor shall protect the newly placed slurry seal from damage until it has cured and will not adhere or be picked up by vehicle tires.

Finished slurry seal surface must be free of irregularities such as scratches or tear marks. Do not leave any marks that are over one (1) inch wide or six (6) inches long.

Early distress after placing the slurry seal, such as bleeding, raveling, delaminating, rutting, surface scuffing, or washboarding, shall be repaired. The defective area of less than one hundred (100) square feet may be repaired by hand. All other areas shall be repaired with spreader box. Other repair methods are subjected to review and approval by the Engineer. Repairs shall be performed in sufficient quality to provide a uniform and consistent appearance free from patch-like patterns.

10-03B.5 Quality Control

Quality Control shall be in accordance with Section 1-13, "Quality Control," of these City Standard Specifications and as follows.

Traffic control shall be in accordance with Section 37-2, "Seal Coats," of the State Standard Specifications and Section 2, "Traffic Control," of these City Standard Specifications.

The Contractor shall provide the Engineer with the following materials. Each sample shall be clearly labeled as to its contents.

1. One (1) quart of asphalt emulsion from each delivered tanker

2. Five (5) -gallon bucket of aggregate per stockpile

These samples will be randomly tested by an independent testing laboratory at the City's expense. Any additional testing the Contractor deems necessary shall be done at the Contractor's sole expense.

A representative sample of the slurry seal may be taken directly from the slurry seal unit(s) for Consistency (ISSA TB 106) and residual asphalt content (ASTM D2172). These tests will be performed immediately after the sample is taken and at the City's expense.

The residual asphalt content of the slurry seal shall be within the acceptable tolerance of minus six-tenths percent (-0.6%) to plus two percent (+2%) from the Engineer-approved mix design, residual asphalt content.

When the test indicates that the residual asphalt content of the slurry mix is below the acceptable tolerance, the entire area shall receive an additional slurry seal at the Contractor's expense.

When the test indicates that the residual asphalt content of the slurry mix is above the acceptable tolerance, a deduction of thirty percent (30%) shall be made from the bid amount paid per square foot for that area.

When the test indicates that the percentage of aggregate passing each sieve is outside the stockpile tolerance specified, the slurry seal represented by such test shall be removed and replaced at the Contractor's expense.

The rate of slurry seal application shall be within acceptable tolerance of two pounds ($\pm$2 lbs) per square yard from the Engineer approved target rate specified in Section 10-03B.4, "Placing," of these City Standard Specifications.

When the test for an area indicates that the rate of slurry seal application is less than the acceptable tolerance, the entire area shall receive an additional slurry seal at the Contractor's expense.

The Contractor shall check the stockpile moisture content and set the machine accordingly. Moisture content shall be checked a minimum of twice daily and shall be recorded/identified on the Contractor's daily report

At the end of each day's production, the Contractor shall send to the Engineer a report containing the following information:

1. Tons of dry aggregate consumed for each street.

2. Tons of asphalt emulsion consumed for each street, including emulsion set rate.

3. Surface area covered that day including slurry seal application rate and additive used by each street.

4. Weigh Tags of each asphalt emulsion delivered to site including certificate of compliance.

5. Moisture content reading from aggregate stockpile.

This report shall be submitted no later than 10 a.m. the following workday.

10-03B.6 Submittal

Prior to the start of work, the Contractor shall submit to the Engineer for review and approval the following submittals:

- Slurry seal mix design
- Traffic Control Plans
- Schedule and color code map
- Good Neighbor Letter
- Equipment Certification/Verification
- Certificate of Compliance of all materials utilized under mix design, including aggregate, polymer-modified asphaltic emulsion, micro-surfacing emulsion, mineral filler, and polymer latex.
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10-03B.7 Sweeping

The first sweeping shall be performed when the slurry seal has cured, and the sweeping operation does not damage the slurry seal surface. Additional street sweeping shall be scheduled by the Contractor at the end of the first and third week, from the completion of each run. The contractor shall also sweep/clean median islands, sidewalks, and driveways from aggregates that are generated from the slurry sealing work to the satisfaction of the Engineer. Sweeping shall be curb to curb, and a blower may be used to remove build-up under parked vehicles.

It shall be the responsibility of the Contractor to notify the residents of each street sweeping operation by installing barricades at each intersection and at two hundred fifty-foot (250') intervals with signage that lists the date and time window of the upcoming sweeping schedule. Signs shall be placed seventy-two (72) hours in advance of the sweeping operation. If the Contractor utilizes "No-Parking" for sweeping operations, the Contractor shall submit a map of the streets to ensure on-street public parking is available within one thousand feet (1,000').

The Contractor shall utilize street sweeping machines capable of picking up loose aggregates. At a minimum, the sweeping machine shall utilize the true regenerative air system with steel bristles. Street sweeping machines shall be submitted as part of submittal for approval by the Engineer prior to the actual sweeping operation.

The City reserves the right to halt the sweeping operation and direct the Contractor to redo the sweeping at no additional cost to the City if the sweeping operations are not to the satisfaction of the Engineer.

10-03C Rubberized Chip Seal

10-03C.1 Certificate of Compliance

A certificate of compliance shall be furnished to the Engineer in accordance with Section 6-2.03C, "Certificates of Compliance", of the Standard Specifications for each material conforms to the requirements of these special provisions. When requested by the Engineer, the Contractor shall also submit samples with certificates of compliance. The Contractor shall provide the Engineer with a Material Safety Data Sheet (MSDS) for each of the constituent components of the asphalt-rubber binder and for the completed mixture of the rubberized asphalt binder.

Certified volume or weight slips shall be delivered to the Engineer for all materials supplied.

10-03C.2 Equipment:

The contractor shall utilize the following equipment for asphalt rubber seal coat operations:

1. Self-propelled power brooms capable of cleaning the existing pavement and removing loose screenings without dislodging screenings set in the asphalt rubber binder. Gutter brooms or steel-tinned brooms shall not be used. Pneumatic tired rollers conforming to the requirements specified in Section 39-2.01C (2), "Spreading and Compacting Equipment", of the State Standard Specifications, except that the rollers shall have an air pressure of one hundred pounds (100 lb.) per square inch and maintained so that the air pressure will not vary more than +/- 5 psi in each tire. A sufficient number of rollers shall be used so that one complete coverage will be provided in one pass.

2. A self-propelled, computerized screenings spreader, equipped with a screenings hopper in the rear, belt conveyors to carry the screenings to the front of the spreader hopper. The screenings spreader shall be capable of providing a uniform spread rate over the entire width of the traffic lane in one application.

3. An asphalt-heating tank equipped to heat and maintain the blended paving asphalt and asphalt modifier mixture at the necessary temperature before blending with crumb rubber modifier (CRM). This unit shall be equipped with a thermostatic heat control device and a temperature reading device, which shall be accurate within five degrees (5º) Fahrenheit and shall be of the recording type.

4. A mechanical mixer for the complete, homogeneous blending of paving asphalt, asphalt modifier, and CRM. Paving asphalt and asphalt modifier shall be introduced into the mixer. The blending system shall be capable of varying rate of delivery of paving asphalt and asphalt modifier proportionate with the delivery of CRM. During the proportioning and blending of the liquid ingredients, the temperature of paving asphalt and the asphalt modifier shall not vary more than +/- twenty-five degrees (25º) Fahrenheit. The paving asphalt feed, the asphalt modifier feed, and CRM feed shall be equipped with devices by which the rate of feed can be determined during the proportioning operation. The liquid and dry ingredients shall be fed directly into the mixer at a uniform rate. The rate of feed to the mixer shall

not exceed that which will permit the complete mixing of all the materials. Dead areas in the mixer in which the material does not move or is not sufficiently agitated shall be corrected by a reduction in the volume of material or by other adjustments. Mixing shall continue until a homogeneous mixture of uniformly distributed and properly blended asphalt rubber binder of unchanging appearance and consistency is produced. The Contractor shall provide a safe sampling device capable of delivering a representative sample of the completed asphalt rubber binder of sufficient size to permit required tests.

5. An asphalt rubber binder storage tank equipped with a heating system to maintain the proper temperature of the asphalt rubber binder and an internal mixing unit capable of maintaining a homogeneous mixture of blended paving asphalt, asphalt modifier, and CRM.

6. A self-propelled truck or trailer-mounted distributor equipped with an internal mixing unit capable of maintaining a homogeneous mixture of blended paving asphalt, asphalt modifier, and CRM. The distributor shall have a pump or pumps capable of spraying asphalt rubber binder with +/- five hundredths (0.05) gallons per square yard of the specified rate. The distributor shall have a fully circulating spray bar capable of applying the asphalt rubber without a streaked or otherwise irregular pattern. The distributor shall be equipped with a tachometer, pressure gauge, volume measuring devices, and a thermometer. The distributor shall have a platform on the rear of the vehicle and an observer shall accompany the distributor. The observer shall ride in such a position that all spray nozzles are in full view and readily accessible for unplugging any plugged nozzles, should they occur.

7. Tailgate discharge trucks for hauling screenings shall be equipped with a device to lock on to the hitch at the rear of the screenings spreader. Haul trucks shall be compatible with the screening spreader so that the dump bed will not push down on the spreader when fully raised or have too short of a bed, which results in spilling while dumping into the receiving hopper.

All equipment shall be approved by the Engineer prior to use.

10-03C.3 Applying Rubberized Asphalt Binder

Rubberized asphalt binder shall be applied in accordance with the requirements specified for applying asphaltic emulsion in these special provisions and in Section 37-2-.05B (3), "Construction", of the State Standard Specifications.

Rubberized asphalt binder shall be applied where shown on the plans at a rate of fifty-five hundredths (0.55) to seven-tenths (0.70) gallons per yard. The Engineer will determine the exact rate.

Rubberized asphalt binder shall be placed upon a clean, dry surface. The pavement surface temperature shall be a minimum of fifty-five degrees (55º) Fahrenheit where rubberized asphalt

binder is to be applied. The atmospheric temperature shall be a minimum of sixty degrees (60º) Fahrenheit and a maximum of one hundred-five degrees (105º) Fahrenheit.

Distributor bar height, distribution speed, and shielding materials shall be utilized to reduce the effects of wind upon spray distribution as directed by the Engineer. The Engineer shall delay or reschedule work when high-gusting or dirty winds prevent or adversely affect binder or screening application operations. All necessary equipment shall be in position and ready to commence operations before starting.

The Contractor shall comply with all Federal, State, and local environmental laws, rules, regulations, and ordinances, including but not limited to air quality requirements.

The binder application shall not spread in excess of that which can be covered with screening within two (2) minutes. The crumb rubber asphalt rubber binder shall be applied to the roadway immediately following mixing and reacting and shall be applied at a temperature of not less than three hundred eighty-five degrees (385º) Fahrenheit nor more than four hundred fifteen degrees (415º) Fahrenheit.

When placing rubberized asphalt binder seal coat at intersections, turn pockets, gore points, and other irregular areas, the amount of asphalt rubber applied shall not exceed that which can be covered with screenings within fifteen (15) minutes.

When joining edges against areas with screenings, the joint shall be swept clean of excess screenings prior to the adjacent application of rubberized asphalt binder. Transverse joints of this type shall be constructed by placing roofing paper across and over the edge of the previous asphalt rubber seal coat application. Once the spraying has progressed beyond the paper, the paper shall be removed immediately.

The longitudinal joint between adjacent applications of screenings shall coincide with the line between designated traffic lanes. At longitudinal joints with screenings, the edge shall be broomed back and blended to eliminate any difference in elevation. They shall be free from ridges and depressions and have a uniform appearance consistent with the adjacent sealed surface. All defects shall be corrected at the Contractor’s expense.

Joints between areas of rubberized asphalt binder without screenings shall be made by overlapping rubberized asphalt binder distributions. The excess material shall be properly dispersed by spreading with a squeegee or rake over a larger area of freshly applied rubberized asphalt binder.

The application of rubberized asphalt binder to areas not accessible with the distributor bar on the distributor truck shall be accomplished by using pressurized hand wands or other means approved by the Engineer.

Immediately prior to placing rubberized asphalt binder, the surface shall be thoroughly cleaned of all vegetation, loose materials, dirt, mud, and all other extraneous materials by the use of a power sweeper with a vacuum. All utilities covers shall be neatly covered along the edge of

each individual cover and protected in a manner that can be uncovered and cleaned to the satisfaction of the Engineer.

Existing raised pavement markers and reflectors, when no longer required for traffic lane delineation as directed by the Engineer, shall be removed and disposed of.

All regular and thermoplastic traffic striping, pavement legends, and markers shall be scarified prior to placing rubberized asphalt binder. Scarification shall be performed by grinding or sandblasting such that approximately twenty percent (20%) of the underlying pavement is exposed.

10-03C.4 Spreading Screening:

Screenings for rubberized chip seals shall be spread in accordance with the requirements specified for spreading screenings on asphaltic emulsion in these special provisions.

Following the application of the rubberized asphalt binder, screenings shall be placed on all areas receiving rubberized asphalt binder.

Screenings for rubberized chip seals shall be applied at a temperature of not less than two hundred twenty-five degrees (225º) Fahrenheit after applying the rubberized asphalt binder.

The Contractor shall prevent any vehicle, including construction equipment, from driving on the rubberized asphalt binder prior to the application of screenings.

Screenings shall be applied at a rate of twenty-eight (28) to forty (40) pounds per square yard or at a rate shown on the Project Plans. The exact rate will be determined by the Engineer. The completed spread rate shall be within ten percent (10%) of the rate determined by the Engineer. The completed surface shall be free of gaps, ridges, depressions, or other irregularities caused by the application of the rubberized asphalt binder.

The screening spreader shall not be more than fifty (50) feet behind the binder distribution truck or more than two hundred (200) feet ahead of the completed initial rolling unless otherwise ordered by the Engineer. Trucks hauling screening shall be kept clear of the freshly placed screenings until ready to dump screenings in the spreader equipment, except on staggered trucks, which will be allowed to follow the binder seal coat operations.

10-03C.5 Finishing:

Rubberized chip seals shall be finished in accordance with the requirements for finishing screenings spread on the asphaltic emulsion in these special provisions and in Section 37-2.04C(5), “Rolling and Sweeping,” of the State Standard Specifications. Initial rolling of the rubberized asphalt seal coat shall consist of a minimum of one complete coverage with one or more pneumatic tired rollers and shall begin within ninety (90) seconds after the placement of screenings.

The distance between the rollers and the screening spreader shall not exceed two hundred (200) feet at any time during the screening spreading operation.

A minimum of three (3) complete coverages with pneumatic tired rollers, after the initial coverage, shall be made on the asphalt rubber seal coat. At the Contractor's option, if approved by the Engineer, the final roller coverage may be made with a steel-wheeled roller weighing between eight (8) to ten (10) tons. It shall be operated in static mode only.

Sweeping shall be a multi-step operation following the final rolling of the screenings. Loose screenings shall be removed from the roadway surface and abutting adjacent areas. Loose screenings shall be disposed of at least one hundred fifty feet (150') from the nearest waterway, and areas shall be provided and identified for this purpose.

Initial sweeping shall be completed before controlled traffic is permitted on the rubberized asphalt seal coat. Removal of excess screening shall be completed before uncontrolled traffic is permitted on the completed rubberized chip seal. Sweeping shall also be done at forty-eight (48) hour intervals on each street until the street is overlayed. Final sweeping shall be done, and all loose screenings shall be removed without dislodging the screenings set in the rubberized asphalt binder prior to overlay. Prior to final sweeping, all sidewalks, ramps, and driveways shall be cleaned by sweeping or other methods to ensure all loose stone is removed.

10-03.D Pavement Crack Seal

The Contractor shall seal all pavement cracks on streets that are scheduled for preventative maintenance and overlay treatment as directed by the Engineer. Cracks shall be free of dirt, vegetation, debris, and loose sealant. Cleaning shall be done by air blasting. Old sealant that protrudes above the asphalt concrete surfacing shall be completely removed prior to receiving a sealant treatment. Crack sealants shall be smoothed until sealant is flush with the existing asphalt concrete surfacing. Crack sealing shall generally be performed after full-depth HMA repair. Therefore, the existing pavement condition during the bidding period may not necessarily reflect the actual condition of the pavement prior to crack sealing. Work shall be performed in conformance with Section 37-6.03 of the State Standard Specifications.

The conform joint construction between the new HMA overlay and all concrete approach slabs, as shown on the Project Plans, shall be completed by providing a straight-line pavement cut directly along the joint after the overlay is completed and filling the space flush to the pavement surface with crack seal material. The pavement cutting shall be one-half-inch (1/2") wide by two inches (2") deep. Measurement and payment to complete this work shall be measured in pounds of crack seal material used and paid for under the unit bid price for crack seal material. Pavement cutting and all other associated miscellaneous work to conform to this provision shall not be a measured item of work and shall be considered included in the price paid for under crack seal material and no separate payment shall be allowed therefor.

10-04 Measurement

Fog seal coat and slurry seals shall be measured by the square foot for the actual surface area covered.

Rubberized Chip Seal shall be measured by the square yard of the actual surface area covered.

Pneumatic-tired rolling, as required for slurry seal, will be measured as a lump sum. Street sweeping is not a measured item of work.

The basis of measurement for crack sealant shall be by actual weight in pounds of applied crack sealant regardless of the width of the cracks.

Slurry seal shall be measured by the square foot for the actual surface area covered.

10-05 Payment

The contract price for fog seals shall include full compensation for furnishing all labor, material, tools, equipment, incidentals, and for all work involved in fog sealing, as specified in these Special Provisions and as directed by the Engineer.

The contract price for slurry seal shall include full compensation for furnishing all labor, material, tools, equipment, incidentals, and for all work involved in slurry sealing, as specified in these Special Provisions and as directed by the Engineer.

The contract price for rubberized chip seal shall include full compensation for completing all the work involved in the furnishing and placing of rubberized asphalt binder and screenings for seal coats complete in place, including the removal of all traffic striping, pavement markers, and legends, protecting existing utility covers, cleaning the surface, and sweeping/removal of excess screening.

The contract unit price for crack sealing shall include full compensation for providing all labor, materials, tools, equipment and incidentals, and for doing all of the work involved in crack sealing, complete and in place, and shall include furnishing, storing, providing traffic control, cleaning cracks, applying crack sealant, etc. and no separate payment, therefore, shall be allowed

No adjustments of the unit price shall be made for any increase or decrease in the quantity of fog seal, slurry seal, rubberized chip seal, and crack seal required by these Special Provisions and Project Plans, regardless of the reason for such increase or decrease. The Provision in Section 4-1.05, "Change and Extra Work," of the State Standard Specifications shall not apply to these mentioned items.

Oil price adjustment shall be made for any increases or decreases in state-wide crude oil price index pricing over or under five percent (5%) in accordance with Section 9-1.07' "Payment Adjustments for Price Index Fluctuations" of the State Standard Specifications

SECTION 11. TRENCH EXCAVATION AND BACKFILL

11-01 - General

Trench excavation and backfill shall consist of all work involving the excavation of pavement, rock, and dirt necessary to prepare a trench bedding to install water, sanitary sewer, storm drain pipelines, and electric, gas, telephone, and cable utilities and the backfilling with required materials and repaving the surface.

Trench backfill includes multiple backfill zones as shown in Detail No. 113, "Trench Backfill for Streets," and Detail No. 114, "Trench Backfill for Undeveloped Areas," of the City Standard Details. The lowest backfill zone surrounding the pipe is referred to in these City Standard Specifications as pipe embedment. The remaining zone is referred to in these City Standard Specifications as the upper trench backfill zone from the top of the pipe embedment zone to the bottom of the street base course or to the native cap in the case of undeveloped areas.

11-02 - Materials

11-02A - Pipe Embedment Material for Water, Sanitary Sewer, and Storm Drain Pipelines

Pipe embedment material for all water, sanitary sewer, and storm drain pipelines shall be "Pleasanton Fine Fill," meeting the following requirements:

Sieve Size	Percentage Passing
3/4"	100
3/8"	85-100
No. 4	55-80
No. 30	5-10
No. 200	2-5

A minimum of one gradation report shall be submitted per day for material delivered to the site or as directed by the Engineer.

11-02B - Pipe Embedment Material for Electric, Gas, Telephone, and Cable Utilities

Pipe embedment material for electric, gas, telephone, and cable utilities shall meet the following requirements; PG&E conduits shall meet the requirements in the PG&E Greenbook:

Sieve Size	Percentage Passing
3/8"	100
No. 4	95-100
No. 8	90-100
No. 16	80-100
No. 30	65-100
No. 50	40-70
No. 100	0-10
No. 200	0-5

A minimum of one gradation report shall be submitted per day for material delivered to the site or as directed by the Engineer.

11-02C - Upper Trench Backfill Material

Upper trench backfill material for water, sanitary sewer, and storm drain pipelines in existing streets shall be Class 2 aggregate base as specified in Section 7, "Aggregate Base," of these City Standard Specifications. Upper trench backfill for electric, gas, telephone, and cable utilities in existing streets and undeveloped areas shall be pipe embedment material as specified in Section 11-02B, "Pipe Embedment Material for Electric, Gas, Telephone, and Cable Utilities," of these City Standard Specifications and locations with upper backfill zones greater than two feet (2') in depth native material shall be used. For the case of sloping trench walls and in undeveloped areas, native material may be used.

11-02D - Drain Rock

Drain rock, when required by the Engineer for unusual trench conditions, shall be granular material consisting of clean crushed rock or gravel with 100 percent (100%) passing a three-fourths-inch (3/4") sieve and conforming to Section 68-2.02F, "Permeable Material," of the State Standard Specifications, Class 1, Type A. Drain rock shall be hard and durable and shall not flake or disintegrate in water. Drain rock shall be burrito-wrapped by a non-woven geotextile filter fabric.

11-02E - Tracer/Warning Tape

All trenches shall receive underground marking tape, six-inch (6″) width, detectable marking tape, with a minimum 5.0 mil overall thickness. Tape shall be manufactured using a 0.8 mil clear virgin polypropylene film, reverse printed and laminated to a 0.35 mil solid aluminum

foil core, and then laminated to a 3.75 mil clear virgin polyethylene film. The tape shall be printed following the APWA Color-Code standard for identification of buried utilities.

11-03 - Construction

11-03A - Excavation

Unless otherwise indicated, the excavation shall be by an open cut method except where the jack and bore are indicated on the Project Plans.

Coupling holes and depressions for bells or couplings shall be excavated after the trench bottom has been graded and pipe embedment material placed and shall be only of such length, depth, and width as required for properly making the particular type of joint. Over -excavations shall be backfilled with the same material as the pipe embedment.

The trench bottom shall be of even grade such that it will provide uniform bearing and support for each section of pipe and shall be free of clods, rocks, and excess spoil material.

11-03A.1 - Shoring and Safety

The Contractor shall furnish, put in place, and maintain appropriate ground support or shoring, both in open cut and tunneling, as may be required to support the sides of the excavation and prevent any movements that could in any way injure persons or structure.

All excavations shall be supported in a manner to comply with the Division of Industrial Safety (OSHA) standards. The Contractor shall be responsible for preparing an excavation safety plan as specified in Section 7-1.02K(6)(b), "Excavation Safety," of the State Standard Specifications.

11-03A.2 - Trench Length, Width, and Depth

Within the City of Pleasanton right of way, the maximum length of open trench, including trenching, pipe laying, and backfilling, shall not exceed three hundred feet (300') or what can be completed within one day unless approved by the Engineer.

Trenches shall be of sufficient width to provide free working space on either side of the pipe. The minimum width of the vertical trench for water, sanitary sewer, and storm drainpipe shall, in no event, be less than the outside diameter of the pipe plus twelve inches (+12"). The maximum width of the vertical trench for water, sanitary sewer, and storm drainpipe shall be the outside diameter of the pipe plus two feet (+2'). If shoring or sheeting is used, the above widths shall apply to the inside faces of the shoring or sheeting. Upon approval of the Engineer, the Contractor may excavate the trench with sloping walls starting at a point eighteen inches (18") above the outside top of the pipe. Whenever the maximum allowable trench width is exceeded, the Contractor shall, at the Contractor's expense, embed or cradle the pipe in concrete in a manner satisfactory to the Engineer.

The trench shall be excavated to a depth to allow a minimum cover of forty-two inches (42") over storm drain lines and water mains and sixty inches (60") over sanitary sewer lines relative to the finished grade. The minimum cover for all lines relative to the subgrade shall be eighteen inches (18"). A pipe cover less than the minimum shall only be allowed if approved by the Engineer. The trench bottom shall be on a uniform grade and within three-hundredths feet (0.03') of the specified grade for gravity lines at a grade of two percent (2%) or less and within one-tenth of a foot (0.1') for all pressure lines and gravity lines or at a grade steeper than two percent (2%). When unstable material is encountered at the specified depth, the trench shall be over-excavated an additional one foot (1') and backfilled with pipe embedment material or drain rock as determined by the Engineer. Unstable material shall be soil containing excessive amounts of water or organic matter in the opinion of the Engineer. When rock is encountered, the Contractor shall over-excavate an additional six inches (6") and backfill with pipe embedment material.

11-03A.3 - Removal of Existing Pavement

Prior to trenching, the Contractor shall remove the existing pavement as follows:

1. Portland Cement Concrete Pavement: The pavement to be removed prior to trenching shall be cut with a concrete saw along the limits of the trench to a depth of at least four inches (4") or fifty percent (50%) of the existing thickness, whichever is greater; and then shall be broken up and removed from the job site. If a construction or control joint is located three feet (3') or less from the limit of the trench, the Contractor shall remove all pavement between the limit of the trench and the joint.

2. Asphalt Concrete Pavement: The pavement to be removed prior to trenching shall be cut six inches (6") away from and parallel to the limits of the trench with equipment that produces a straight line cut.

3. Damage to Pavement Outside of Trench Limits: If damage such as spalling or cracking occurs to the pavement outside the trench limits as a result of the Contractor's operations, the Contractor shall remove the damaged pavement as directed and replace it as a part of its final paving operations.

11-03A.4 - Dewatering

The trench shall be maintained in a dry condition until backfilling is completed. The Contractor shall furnish, install, and operate such equipment as may be necessary to maintain the trench in a dry condition. Water shall be disposed of in such a manner as not to cause damage to property or present a danger to traffic. The Contractor shall comply with the applicable provisions of Section 1-25, "Stormwater Management and Discharge Control," of these City Standard Specifications when conducting dewatering operations.

11-03B - Backfill

11-03B.1 - Placement and Compaction of Pipe Embedment

Before placement of embedment material, the trench shall be cleared of all timber and debris, such as wood blocks, grade stakes, paper, rope, rags, broken pavement, and other such materials. Embedment material shall be placed and compacted in the trench to the full width, as shown in the City Standard Details. Embedment material above the pipe bottom shall only be placed after the pipe has been properly laid, inspected, and found satisfactory. Embedment material shall be hand -shoveled and uniformly distributed on both sides of the pipe. Embedment material shall not be dropped directly upon the pipe in such a manner or above a certain height which would cause damage to the pipe. Sufficient material shall be hand -shoveled to securely anchor the pipe so that no change in alignment or grade will occur when the next section of pipe is installed.

The Contractor shall obtain a relative compaction of ninety percent (90%) in the pipe embedment zone. Jetting or flooding shall not be allowed. The compaction device may either be manually, mechanically, or pneumatically driven; however, the compaction device used shall in no manner cause displacement, instability, or damage to the pipe. In the event that damage occurs to the pipe, the Contractor shall be responsible for total repair.

Compaction lifts within the embedment zone shall be of appropriate depth to achieve the required compaction and protect the pipe. All compaction lifts shall be compacted as required before the next lift is deposited.

The embedment material shall be uniformly compacted throughout the entire pipe embedment zone- so no voids exist. If testing performed by the City indicates that the required compaction has not been achieved, the trench shall be re-compacted and retested. Re-compaction and retesting shall be paid for by the Contractor.

During the process of backfilling embedment material, any timbering, sheeting, shoring, and sheet piling used to shore the excavation shall be carefully removed by the Contractor in such a manner as will result in a minimum of caving, lateral movement, or flowing of the soil.

Every two hundred fifty feet (250’), a three-foot (3’) long check dam of native soil shall be installed within the pipe embedment zone. Check dam shall be placed at the center of a full length of pipe.

11-03B.2 - Placement and Compaction of Upper Trench Backfill

The Contractor shall obtain relative compaction of ninety-five percent (95%) in the upper trench backfill zone. The maximum depth of each lift shall be six inches (6") prior to compaction. No material shall be deposited in depths greater than that which will allow the minimum percent relative compaction to be achieved in any portion of that lift. No subsequent lifts shall be placed until the previously compacted lift has been approved. No mechanical tamping will be allowed over the pipe without sufficient cover to avoid damage.

Tracer/Warning Tape shall be placed at the top of the Upper Trench backfill but no deeper than twenty-four inches (24”).

11-03C - Pavement Replacement

In existing streets, trenches shall be paved with temporary or permanent paving on the same working day after backfilling has been completed. Temporary paving shall be maintained in first-class condition until permanent paving is placed. Material for temporary paving shall consist of not less than one-and-one-half inches (1.5") of premixed bituminous treated aggregate (cut-back). Permanent paving shall match the adjacent existing pavement except that in no event shall the section be less than three inches (3") of asphalt concrete and eight inches (8") of aggregate base. Prior to placing permanent paving, the area shall be thoroughly cleaned, the opening shaped, and the sides trimmed vertically. The subbase and base courses shall be thoroughly compacted, and the base and edges shall be primed with an asphaltic emulsion prior to placing the asphalt surface. Permanent paving shall be completed within fourteen (14) calendar days unless approved by the Engineer.

Under certain conditions for existing streets, including the absence of a certified soils engineer, the Engineer shall require use of cement treated base. If required by the Engineer, trenches in major thoroughfares shall have a minimum fifteen inches (15") of cement-treated base placed directly beneath a minimum of three inches (3") of asphalt concrete. If required by the Engineer, minor streets shall have a minimum of ten inches (10") of cement-treated base beneath a minimum of three inches (3") of asphalt concrete. Cement -treated base shall be Class 1 as defined in Section 27-1.02, “Materials,” of the State Standard Specifications and shall contain one sack of Type II Modified Portland cement per ton of aggregate used. Cement -treated base may be road -mixed or plant -mixed at the Contractor’s option as defined in Section 27-1.03C (3), “Mixing,” of the State Standard Specifications. Regardless of the method the Contractor elects to use, all requirements of Section 27 will apply. Alternate mixing methods must be approved by the Engineer.

11-03D - Horizontal Directional Drilling (Bore and Jack)

When approved by the Engineer, conduit may be placed under existing pavement using the Horizontal Directional Drilling (Directional Bore) method. Pavement shall not be disturbed without permission from the Engineer. Adherence to the specifications contained herein, or the Engineer’s approval of any aspect of any directional bore operation covered by this specification, shall in no way relieve the Contractor of their ultimate responsibility for the satisfactory completion of the work authorized under the Contract.

In the event obstructions are encountered, small potholes may be cut in the pavement to locate or remove obstructions, upon approval of the Engineer. All potholes shall be repaired per these specifications. Boring pits shall be kept two feet (2’) clear of the edge of any type of pavement wherever possible. In addition, boring pits shall be kept two feet (2’) clear of any pedestrian or bicycle facilities. Unless directed by the Engineer, pedestrian and bicycle facilities shall remain open at all times. At the end of each workday, all boring pits shall be

covered, and work areas properly coned off to warn and prohibit potential pedestrian and/or vehicular traffic to the satisfaction of the Engineer.

Excessive use of water, such that pavement might be undermined, or subgrade softened, is not permitted.

Conduit to be placed as part of the completed work shall not be used for drilling or jacking. Type 2 and Type 3 conduits may be installed under existing pavement if a hole larger than the conduit is pre-drilled and the conduit installed by hand.

Conduit to be placed beneath railroad tracks shall comply with the following: The conduit shall be either Type 1 or 2-, one- and one-half inch (1.5") minimum diameter and shall be placed to a minimum depth of three feet (3') below the bottom of the tie. The near side of each conduit jacking pit shall be constructed not less than thirteen feet (13') from the centerline of the track. When the jacking pit is to be left overnight, the pit shall be covered with substantial planking.

Prior to beginning work, the Contractor must submit to the Engineer a general work plan outlining the procedure and schedule to be used to execute the project. The Plan shall document the thoughtful planning required to successfully complete the project.

The Contractor shall submit specifications on directional boring equipment to be used to ensure that the equipment will be adequate to complete the project.

Specifications on the material to be used shall be submitted to the Engineer. Material shall include the pipe, fittings, and any other item to be installed as a component of the project.

Documentation of training and relevant experience of personnel shall be submitted prior to any work taking place.

The Engineer must be notified forty-eight (48) hours in advance of starting work. The Directional Bore shall not begin until the Engineer is present at the job site and agrees that proper preparations for the operation have been made. The Engineer's approval for beginning the installation shall in no way relieve the Contractor of the ultimate responsibility for the satisfactory completion of the work as authorized under the Contract.

All personnel shall be fully trained in their respective duties as part of the directional boring crew and in safety. Training shall be provided specific to the project if any potential hazards may be encountered that have not already been included in the personnel's training.

Upon request from the Engineer, the Contractor shall photograph or videotape the entire work area, including entry and exit points, prior to the beginning of work and after work is completed.

The work site, as indicated on the drawings, within the right-of-way, shall be graded or filled, if needed, to provide a level working area. No alterations beyond what is required for

operations are to be made. The Contractor shall confine all activities to designated work areas.

The entire drill path shall be accurately surveyed with entry and exit stakes placed in the appropriate locations within the areas indicated on drawings. If the Contractor is using a magnetic guidance system, the drill path shall be surveyed for any surface geomagnetic variations or anomalies.

The Contractor shall place silt fence between all boring operations and any drainage, wetland, waterway, or other area designated for such protection by contract documents and State, Federal, and local regulations. Additional environmental protection necessary to contain any hydraulic or boring fluid spills shall be put in place, including berms, liners, turbidity curtains, and other measures. The Contractor shall adhere to all applicable environmental regulations. Fuel or oil may not be stored in bulk containers within two hundred feet (200') of any waterbody or wetland.

The Contactor shall notify all companies with underground utilities in the work area using the Underground Service Alert (USA) hotline/Digalert.org at 811 to obtain utility locations. Once utilities have been located, the Contractor shall physically identify the exact location of the utilities by potholing to determine the actual location and path of any underground utilities which might be within five feet (5') of the bore path. The Contractor shall not commence boring operations until the location of all underground utilities within the work area have been verified.

The Contractor shall adhere to all applicable State, Federal, and local safety regulations, and all operations shall be conducted in a safe manner. Safety meetings shall be conducted at least weekly with a written record of attendance and topic submitted to the Engineer.

Pipe shall be connected together in one length prior to pull-back operations, if space permits. Steel pipe welds will be X-rayed prior to being placed in bore hole. Pipe will be placed on pipe rollers before pulling into bore hole with rollers spaced close enough to prevent excessive sagging of pipe.

The pilot hole shall be drilled on the bore path with no deviations greater than five percent (5%) of depth over a length of one hundred feet (100'). In the event that the pilot hole does deviate from the bore path more than five percent (5%) of depth in one hundred feet (100'), the Contractor shall notify the Engineer immediately. The Engineer may require the Contractor to pull back and re-drill from the location along the bore path before the deviation.

In the event that a boring fluid fracture, inadvertent returns, or returns loss occur during pilot hole boring operations, the Contractor shall cease boring, wait at least thirty (30) minutes, then inject a quantity of boring fluid with viscosity exceeding one hundred twenty (120) seconds as measured by a Marsh Funnel (quart) and wait another thirty (30) minutes. If mud fracture or returns loss continues, the Contractor will cease operations immediately and

notify the Engineer. The Engineer and the Contractor will discuss additional options, and work will then proceed accordingly.

Upon successful completion of the pilot hole, the Contractor shall ream bore the hole to a minimum of twenty-five percent (25%) greater than the outside diameter of the pipe using the appropriate tools. The Contractor will not attempt to ream at one time more than the boring equipment and mud system are designed to safely handle.

After successfully reaming the borehole to the required diameter, the Contractor will pull the pipe through the borehole. In front of the pipe will be a swivel. Once pull-back operations have commenced, operations must continue without interruption until the pipe is completely pulled into the borehole. During pull-back operations, the Contractor shall not apply more than the maximum, safe pipe pull pressure at any time.

In the event that the pipe becomes stuck, the Contractor shall cease pulling operations to allow any potential hydro-lock to subside and then shall commence pulling operations. If the pipe remains stuck, the Contractor shall notify the Engineer. The Engineer and the Contractor will discuss options, and then work will proceed accordingly.

If required by the Engineer, the Contractor shall hydro-test the pipe using potable water for a period of two (2) hours at a pressure of one hundred fifty (150) psi. A calibrated pressure recorder shall be used to record the pressure during the test period. This record shall be presented to the Engineer. After successful completion of the hydro-test, the pipe shall be pigged dry.

Following boring operations, the Contractor shall demobilize the equipment and restore the site to its original condition. All excavations shall be backfilled and compacted to ninety-five percent (95%) of the original density. Landscaping shall be restored to its original condition.

The Contractor shall maintain a daily project log of boring operations and a guidance system log with a copy given to the Engineer at the completion of the project. As-built drawings shall be certified as to accuracy by the Contractor and submitted to the Engineer.

11-03E - Plating of Trenches

In no case shall the plating of trenches overnight be greater than forty feet (40') in length unless prior written approval is obtained from the Engineer. Plating shall be of a non-skid surface and be secured in such a manner to eliminate plate movement; this may include welding or pinning of the plate(s). Cutback shall be placed in such a manner as to provide a smooth transition for vehicles and to reduce noise. Plating that is left in place for longer than fourteen (14) calendar days shall require key cutting and set flush with pavement.

11-04 - Measurement

Trench excavation and backfill are not measured in quantity.

11-05 - Payment

Full compensation for trench excavation and backfill shall be included within the unit price of pipe, service, or lateral installed; and shall include removal of existing surfacing; excavation and hauling; disposing or storing of material; sheeting; shoring; dewatering; placing and compacting of pipe embedment and trench backfill; tracer/warning tape and installation of new street surface pavement on existing streets. Where cement treated base is required, payment shall be by change order negotiated between the Engineer and Contractor.

SECTION 12. STORM DRAIN

12-01 - General

This section covers all storm drain-related facilities, including pipes, concrete structures, and appurtenances. Unless otherwise approved by the Engineer, all storm drainpipes shall be reinforced concrete.

12-01A - C-3 Planters & Green Infrastructure

C-3 Planters and Green Infrastructure shall be designed and constructed in accordance with the latest version of the Clean Water Program C.3 Stormwater Technical Guidance. (www.cleanwaterprogram.org). No porous asphalt shall be placed within the public right of way unless approved by the City. No proprietary soils shall be used for public structures within the public right of way. Structures and deepened curbs adjacent to roadways shall be designed to support HS-20 live load loading. Devices dependent upon infiltration shall submit a site-specific infiltration test demonstrating the site's capacity to meet the design infiltration rates.

12-02 - Materials

12-02A - Reinforced Concrete Pipe

Reinforced concrete pipe materials shall conform to the provisions of Section 65-2.01D (3), "Circular Reinforced Concrete Pipe, Described or Chosen by Class," of the State Standard Specifications; the specifications of AASHTO Designation, M 170; or ASTM Designation, C76; and these City Standard Specifications. All reinforced pipe shall be Class III, unless otherwise shown on the Project Plans.

Reinforced concrete pipe joints shall be bell and spigot having "O" ring rubber gaskets retained in a groove on the spigot end in accordance with Section 65-2.02F, "Joints," of the State Standard Specifications.

Pipe shall be marked in accordance with AASHTO M170. All pipes shall be rejected if there is any indication of poor-quality control or improper handling of product. Pipe rejection criteria shall be in accordance with ASTM C76.

12-02B - Not Included

12-02C - Subsurface Drains

Subsurface drain piping shall be perforated smooth-wall SDR 35 polyvinyl chloride plastic pipe in accordance with Section 68-2.02D, "Perforated Plastic Pipe," of the State Standard Specifications, AASHTO M278, and ASTM F758. Material for backfilling subsurface drain trenches shall be Class 2 permeable, in accordance with Section 68-2.02F, "Permeable Material," of the State Standard Specifications. Filter fabric for subsurface drains shall be in

accordance with Section 68-2.02G, "Filter Fabric," of the State Standard Specifications. Subsurface drains shall terminate flush with the face of the sidewalls of the structure or vaults.

12-02D - Curb Through Drains

Curb through drains shall be three-inch (3") in diameter schedule 40 PVC and shall terminate flush with the curb face and only installed upon City Engineer approval. Downspouts and drains are to be directed to vegetated areas.

12-02E - Concrete Structures

Concrete structures, including storm drain manholes, junction boxes, headwalls, inlets, and outfalls, shall conform to the City Standard Details, the applicable provisions of Section 51, "Concrete Structures," of the State Standard Specifications, and the modifications and additions of these City Standard Specifications.

12-02E.1 - Cast-In-Place Concrete Structures

All concrete structures shall be constructed of minor concrete with three-quarter inch (3/4") maximum aggregate in accordance with Section 90-2, "Minor Concrete," of the State Standard Specifications. Admixtures may be used only when approved by the Engineer. All manhole bases and inlets shall be constructed of cast-in-place concrete with #4 Grade 60 rebar twelve inches (12”) on center each way minimum.

12-02E.2 - Precast Concrete Structures

All manhole barrel, tapered cones, and adjustment rings shall be concentric precast reinforced concrete sections conforming to ASTM C 478 and the size, shape, and details shown on the City Standard Details. Eccentric rings shall only be used upon approval of the Engineer. Precast manhole bases and catch basins shall not be allowed within the public right-of-way.

12-02E.3 - Mortar

Mortar shall conform to the applicable provisions of Section 65-2.02F, "Joints," of the State Standard Specifications.

12-02E.4 - Precast Joint Filler

Precast joint filler shall be Ramneck with primer or approved equal.

12-02E.5 - Reinforcement

Reinforcement materials shall conform to the applicable provisions of Section 52-1.02, "Materials," of the State Standard Specifications with the following modifications:

1. Reinforcing steel shall be intermediate-grade Billet-Steel Bars only.

2. All bends in reinforcing steel shall be cold bends.

3. Where concrete is deposited directly against earth the minimum clear distance between the reinforcing steel and the earth shall be three (3) inches.

12-02E.6 - Manhole Frames and Covers

Manhole frames and covers shall be gray iron castings conforming to the requirements of ASTM Designation A 48, Class 30B and accurately to the form and dimensions shown in the City Standard Details. The surface of the casting shall be reasonably smooth and free from defects. Frames and covers shall be non-rocking and shall be the heavy-duty traffic type designed for HS-20 traffic loading. All castings shall be thoroughly cleaned and subject to a hammer inspection, after which they shall be twice dipped with asphalt or coal tar coating applied at a temperature of not less than two hundred ninety degrees (290°) Fahrenheit or more than three hundred ten degrees (310°) Fahrenheit. Frame and cover shall match to an exact fit. The cover shall be clearly embossed with the label “Storm-drain” on the manhole cover.

12-02E.7 - Inlet Frames and Grates

Inlet frames and grates shall be fabricated of structural steel conforming to the requirements of ASTM Designation, A36, and accurately to the form and dimensions shown in the City Standard Details. Frame and grate shall be of the same manufacturer as the pre-cast inlet and shall be hot dipped galvanized after fabrication. Frames and grates shall be assembled and made to fit before delivery to the job site. After erection all abraded surfaces shall be cleaned free of rust and oil and painted with two (2) applications of un-thinned zinc-rich primer (organic vehicle type) conforming to section 91 “Paint,” of the State Standard Specifications. The grate and frame details are shown in Detail Nos. 201A through 201E, "Type I Storm Drainage Curb Inlet," of the City Standard Details. All grates shall satisfy the requirements of the Bicycle Proof Grate Details contained in the State Standard Plans.

12-02E.8 - Trash Capture Screening

Trash capture screening for new development shall be installed per the California Clean Water Program C.3 Stormwater Technical Guidance Manual Section 7.3 or as approved by the Engineer.

12-02E.9 - Bioretention Soils

Bioretention soils shall be compliant with Appendix K of the California Clean Water Program C.3 Stormwater Technical Guidance Manual and Section 20 Plants and Planting.

12-03 - Construction

12-03A - Reinforced Concrete Pipe

Trench excavation and backfill shall be in accordance with Section 11 of these City Standard Specifications.

Reinforced concrete pipe shall be laid and joined in conformance with Section 65-2.03C, "Laying Pipe," of the State Standard Specifications. Installation of reinforced concrete pipe in prepared trenches shall start at the lowest point with the spigot ends pointing in the direction of flow. Bell holes shall be excavated at each joint to provide full length barrel support of the pipe and to prevent point loading at the bells.

The rubber gasket joint shall be made by properly lubricating the rubber gasket with a suitable vegetable compound soap before being placed in the groove at the spigot end. The gasket shall be stretched over the spigot end of the pipe and seated in the groove with care taken to equalize the stress in the gasket around the circumference of the joint. The gasket shall not be twisted, rolled, cut, crimped, or forced out of position during the closure of the joint. A feeler gauge shall be used to check the position of the rubber gasket after the joint has been assembled.

12-03B - Cast-In-Place Concrete Pipe

Upon approval by City Engineer

12-03C - Subsurface Drains

Installation of perforated plastic pipe, permeable material and filter fabric shall be in accordance with Section 68-2, "Underdrains," of the State Standard Specifications. Subsurface drains shall terminate flush with the face of the structure or vault.

12-03D - Manholes

Manholes shall be located as shown on the Project Plans and constructed in accordance with the requirements of the City Standard Details.

The concrete for the manhole base shall be placed by a continuous pour. It shall be poured only on dry, firm, undisturbed earth. The concrete shall be consolidated manually or mechanically to eliminate all voids and secure a dense watertight mass. An approved form ring shall be on the job site so that a level keyed slot may be formed in the fresh concrete. The finish work of all concrete and mortar is to be absent of any voids.

All precast manhole sections shall be set plumb on joints using Ramneck with primer or an approved equal. Excess filler shall be trimmed away from all joints.

After the manhole frame is set to grade a concrete collar shall be poured around the manhole as shown in the City Standard Details. All manholes shall be raised to grade after the street paving is complete. All voids between precast adjustment rings and shims shall be filled with mortar. The distance between the final or highest precast adjustment ring and the manhole frame where shims are used shall not exceed three inches (3"). The area shall be filled with mortar and troweled to a smooth finish. There shall not be any space between the manhole cone sections and precast adjustment rings or space between stacked precast adjustment rings. The entire manhole riser area shall be coated with mortar and troweled to a smooth finish. The distance between the riser rings shall not exceed three inches (3"). The cumulative height of the precast adjustment rings and frame shall not exceed eighteen inches (18").

12-03E - Inlets

Inlets within the City's right-of-way shall be located as shown on the Project Plans and constructed according to the requirements of the City Standard Details. Inlets shall be Type I. Type II shall only be allowed if approved by the Engineer. All inlets shall have the wording "NO DUMPING! DRAINS TO BAY" installed as a thermoplastic legend on the curb above the inlet according to the City Standard Details.

12-03F - Outfalls

Outfalls shall be constructed in accordance with the Standard Details of Zone 7 - Alameda County Flood Control and Water Conservation District. Rip rap used at outfalls shall be natural rock approved by the Engineer. Product data submittal for natural rock shall be in accordance with Section 1-14, "Shop Drawings and Product Data Submittal," of these City Standard Specifications.

12-03G - Lug Connections

Lug connections shall not be allowed.

12-03H - Television Inspection of New Storm Drains

The Contractor shall arrange with the Engineer for a television inspection of one hundred percent (100%) of the network by the Contractor prior to paving in accordance with the following procedures. Work rejected by the Engineer shall be corrected by the Contractor to the satisfaction of the Engineer and re-inspected.

The Contractor shall provide digital database TV inspection reports, printed TV inspection reports and MPEG-4 format color video of all work completed. Inspection data needs to be geo-coded and referenced so we can tie back to the city’s GIS system, the city will provide the system mapping data. The Contractor shall use TV inspection software and data storage system, which is directly compatible with WinCan Database System, version 8 or, latest version or, equivalent. Additionally, the image capture system will include provisions for capturing both motion video and audio. In other words, the complete interface system will

allow the operator to record and store short video movies of the sewer defects and include verbal audio when necessary. The operator(s) shall be Pipeline Assessment Certification Program (PACP/MACP) certified. NASSCO PACP/MACP format shall be used to assess the pipeline conditions. The inspections shall document the following conditions and any other pertinent observations:

a. Cracks - radial and longitudinal, hairline or open.
b. Laterals (identify active or inactive, if possible) - quadrant location, protruding, cracks, roots.
c. Corrosion - iron stains, roughened aggregate, exposed aggregate, exposed rebar, or exposed soil.
d. Offsets/sags - 1-inch, 2-inch, 4-inch, etc.
e. Roots - light, moderate, heavy, or matted roots.
f. Grease - light, moderate, or heavy.
g. Infiltration - water stains, dripping water, or stream of water.
h. Other - holes in pipe, missing tile.

PACP/MACP pipe ratings shall be included for each pipe segment inspected. All videos shall be of good quality MPEG-4 format and shall clearly show the above-stated conditions. The date, identification of sewer section by upstream and downstream manhole locations, and footage shall always be displayed on the video data view.

MPEG-4 videos, pictures and databases must be submitted on an external portable external hard drive. If a video and/or the capture images in the database do not clearly show the pipe conditions due to an inadequate amount of light or are of such poor quality that the City is unable to evaluate the condition of the sewer or locate sewer service connections, the Contractor shall re-televise that section of the pipe at Contractor's expense.

Television inspection shall not be performed until all of the following conditions are met:

1. All storm drain pipelines have been installed, backfilled, and compacted.

2. All storm drain structures are in place, and pipelines are accessible from these structures.

3. All other underground facilities, utility piping, and conduits have been installed.

4. Final street grading has been completed, and 80 percent (80%) of the aggregate base has been installed.

5. Pipelines to be inspected have been cleaned and flushed.

After the above work is complete, the Contractor shall request the Engineer to witness the inspection. The Contractor shall submit a plan for correcting defects to the Engineer. The plan shall be approved by the Engineer prior to starting corrective work. The City reserves the right to require retesting as defined in Section 13-03I, "Testing," of these City Standard Specifications following the completion of any repair.

1. Those portions of the pipeline system that have been corrected shall be re-televised.

2. The procedure outlined in Conditions 1 through 5 above will be repeated until all deficiencies observed by television inspection have been corrected to the complete satisfaction of the City.

3. All storm stubs will be televised.

4. The following observations from television inspections will be considered defects in the construction of storm drain and will require correction prior to paving:

   Television inspection of new work and the correction of observed defects will not relieve the Contractor of responsibility for the one-year guarantee period. The City may televise new work at any time during the one-year guarantee period. The contractor shall repair any defective new work discovered during the one-year guarantee period within five (5) working days from notice. Repair work determined by the City as an emergency in nature shall be performed within 48 hours of notification.

   - Any storm drain pipeline that has low spots more than that shown in the table below shall be removed and laid to the required grade:

PIPE DIAMETER	MINIMUM DEVIATION OF PIPE GRADE / 4 FEET OF RUN OR GREATER (DEPTH OF STANDING WATER)
12"	2"
15"	2.4"
18"	2.8"
21"	3.7"
24"	3.8"
27" OR GREATER	4" MAXIMUM

   - No pipe offsets shall be accepted; the pipe shall be removed and replaced.

   - Any pipe that is not round and shows diameter distortion shall be replaced.

12-04 - Measurement

Storm drainpipe shall be measured on a horizontal linear foot basis for the various strengths and sizes along the centerline of the pipe less the distance between the ends of the pipe in manholes and inlets through which the pipe does not continuously pass. Subsurface drains and curb through drains shall be measured on a linear foot basis. Concrete storm drain structures, including manholes and inlets, shall be measured by the number of items. Connection of new pipe to existing structures shall not be measured.

12-05 - Payment

The contract price for storm drain facilities, including pipe, pipe appurtenances, and structures, shall include full compensation for all materials and labor, including excavation, installation, backfill, compaction, and resurfacing. The contract price for storm drainpipe shall include full compensation for connections to storm drain structures. The contract price for inlets shall include the material cost and installation of thermoplastic legends.

SECTION 13. SANITARY SEWER

13-01 General

This section covers requirements for materials and methods of installation for sanitary sewer mains (up to and including fifteen inches (15") in diameter), laterals, manholes, and appurtenances within the City's sanitary sewer system. All sanitary sewer system improvements shown on Project Plans and City Standard Details shall conform to the following specifications.

13-02 Materials

Approved pipe materials for City sanitary sewer mains and laterals shall be polyvinyl chloride (PVC, SDR 26 OR SDR 35), epoxy-lined ductile iron pipe (DIP), vitrified clay pipe (VCP) and HDPE for four inches (4") and six inches (6") only. Asbestos cement pipe (ACP) shall not be permitted. Unless a pipe material is specifically referenced in the bid form or on the construction plans, the following criteria for pipe material selection shall apply:

1. Sanitary sewer mains installed with less than sixty inches (60") of cover relative to finished grade shall be epoxy-lined ductile iron pipe.

2. Sanitary sewer mains installed with equal to or greater than sixty inches (60") but less than 20 feet (20') of cover shall be PVC, epoxy-lined DIP or VCP.

3. Sanitary sewer mains installed with equal to or greater than twenty feet (20') of cover shall require the Engineer to approve the pipe material selection.

4. The minimum cover for all lines relative to subgrade shall be eighteen inches (18").

5. PVC gravity lines shall be ASTM D3034 SDR 26 (see table in Section). PVC force mains shall be AWWA C-900.

6. For sanitary sewer mains within twelve inches (12") above other pipeline utilities, pipe main material shall be either AWWA C-900 or epoxy-lined DIP as shown on Detail No. 403, "New Pipe Installation Under Existing Pipe," or Detail No. 404, "Sanitary Sewer and Water Main Separation," of the City Standard Details.

Material requirements of manholes and other appurtenances are included in this section.

13-02A PVC Pipe and Fittings

PVC pipe and fittings for gravity sewer lines of diameters from four inches (4") up to and including fifteen inches (15") shall conform to the requirements of ASTM D3034, Cell Classification 12454-B or 12454-C, with a minimum thickness of SDR 26 and minimum pipe stiffness of forty-six (46) psi, according to ASTM Test D2412. Material for PVC pipe shall conform to the requirements of ASTM D1784.

PVC pipe for force mains shall conform to the requirements specified in AWWA C-900 and the material requirements specified in Section 14-02A, "Polyvinyl Chloride Pipe," of these City Standard Specifications.

13-02A.1 Joints

Joints for PVC pipe and fittings shall be bell and spigot type and conform to the requirements of ASTM D3212 with integral bell push-on type elastomeric gasket joints. Gaskets shall be factory installed and meet the requirements of ASTM F477.

13-02B Epoxy-lined Ductile Iron Pipe and Fittings

Ductile iron pipe and fittings shall conform to the requirements of ANSI Standards A21.51 (AWWA C151) and shall be epoxy-lined. All pipe shall have the minimum pressure rating as indicated below, or higher ratings as indicated in the contract documents:

Pipe Sizes Inches	**Pressure Class (psi)**
4 -12	350
14 - 20	250
24	200
30 - 64	150

A higher thickness class may be required to meet certain design conditions, as determined by the Engineer and as shown on the Project Plans.

The exterior of DIP and fittings shall be coated with a bituminous coating one (1) mil thick in accordance with ANSI A21.51(AWWA C151).

Cement-lined ductile iron pipe shall not be used for gravity sanitary sewer use.

13-02C Vitrified Clay Pipe and Fittings

Vitrified clay pipe and fittings shall be extra strength, unglazed and conform to the requirements of ASTM C700 except for the minimum test loads which shall conform to the requirements listed in the "Standard Specifications for Public Works Construction." Crushing strength shall be determined by the three-edge bearing method designated in ASTM C301. Both pipe and fittings shall be supplied by the same manufacturer. Each section of pipe shall be clearly stamped with either the words "Extra Strength" or the symbol "ES" designating the strength class.

13-02C.1 Joints

Joints for vitrified clay pipe and fittings shall be bell and spigot type with compression gaskets conforming to the requirements of ASTM C425. Preformed rubber gaskets and sleeves shall only be used for tie-ins and repairs.

13-02D Manholes

Sanitary sewer manholes shall conform to the requirements of Section 12-02E, "Storm Drain Concrete Structures," of these City Standard Specifications.

13-02E Lateral Cleanouts

All four-inch (4") and six-inch (6") cleanouts shall be AB & I two-way wye branch fittings of the same diameter as the lateral sewer with an internal baffle.

Four-inch (4") diameter cleanouts shall be cast iron Anaco or approved equal.

Six-inch (6") cleanouts shall be cast iron.

Cleanout boxes shall be Christy F8 box with Christy V1-71C Grate marked "S" or “sewer.”

13-02F Flexible Couplings

Flexible couplings shall either be considered banded rubber couplings with adjustable stainless-steel shear rings, or bell or mechanical joint.

13-02G Polyethylene Encasement

Material requirements for polyethylene encasement used with DIP shall be in accordance with ANSI 21.5 (AWWA C105).

13-02H Taps

Taps shall be Tap-Tite or approved equal. All taps shall be installed to achieve a maximum angle of forty-five degrees (45°) in the direction of flow.

13-03 Construction

The general pipe and fittings installation requirements for water systems specified in Section 14-03 of these City Standard Specifications shall also apply to sanitary sewer systems with the exceptions that: (1) sanitary sewer pipe laying shall proceed upgrade with the spigot ends of bell and spigot pipe pointing in the direction of flow, (2) disinfection procedures are not applicable and (3) grade tolerance differs between gravity and pressure pipelines as according to Section 11-03A.2, "Trench Length, Width, and Depth," of these City Standard Specifications.

Horizontal and vertical curves shall be achieved in accordance with manufacturer recommendations.

13-03A PVC Pipe

Installation of PVC gravity pipe shall meet the requirements of ASTM D2321. All field-cut PVC pipe shall be beveled and lubricated before joining.

At manhole connections, Contractor shall use flexible water stops, resilient connectors, or other flexible systems recommended by the pipe manufacturer and approved by the Engineer to make watertight connections to manholes and other structures.

Empty pipelines shall be prevented from floating due to flooding of the trench by ground water, rainwater or backfill consolidation. Should any pipe sections float in the trench, the affected reach of pipeline will be removed, the trench dewatered and re-excavated, and pipe reinstalled at the Contractor's expense.

Installation of AWWA C900 PVC force main pipe shall be in accordance with AWWA Manual No. 23, "PVC Pipe - Design and Installation," with exception to references specific to water main installations. Twelve (12) gauge insulated copper tracer wire shall be installed on the top of all PVC force main pipe and made accessible at each manhole.

13-03B Ductile Iron Pipe (DIP)
Installation of epoxy-lined DIP shall be in accordance with AWWA C600 with exception to references specific to water main installations.

For corrosion protection purposes, ductile iron pipe and fittings shall be wrapped in polyethylene encasement, eight (8) mil thick minimum in accordance with the requirements of ANSI A21.5 (AWWA C105). Contractor shall use two-inch (2") wide ten (10) mil tape to secure the ends of the polyethylene encasement.

Soil shall be checked every five hundred (500) lineal feet of trench line for corrosivity, and if soil is determined to be moderate-to-hot, cathodic protection shall be installed.

13-03C Vitrified Clay Pipe (VCP)

Installation of vitrified clay pipe shall be in accordance with ASTM C12.

13-03D Manholes

Sanitary sewer manholes shall be installed in accordance with the requirements of Section 12-03D, "Storm Drain Manhole Construction," of these City Standard Specifications and shall be labeled “Sanitary Sewer.”

Drop type manholes shall not be allowed, unless approved by the Engineer.

13-03E Lateral Cleanouts

Unless indicated differently on the Project Plans, two-way cleanouts shall be installed on the sewer lateral within the public right-of-way or public service easement, according to Detail No. 409, "Cleanout," of the City Standard Details.

13-03F Sewer Laterals

Sewer laterals shall be installed in accordance with Detail No. 408, "Standard Sewer Lateral," of the City Standard Details and at the stations indicated on the Project Plans. Sewer lateral connections shall be made at the main using a wye branch fitting or in the case of a cul-de-sac on the upstream side of a manhole. Wye branch fittings shall be constructed of the same material and installed at the same time as the sanitary sewer main. Tee connections shall not be allowed.

For sewer laterals in vacant lots or where no concrete curbs exist, the Contractor shall furnish and install a two -inch x two -inch x four -foot (2" x 2" x 4') minimum wood post five feet (5') beyond the two -way clean out directly above the end of the sewer lateral with the letter "S" and the depth to the sewer lateral marked with paint on the hub.

For existing sewer replacement, trenchless replacement is acceptable upon video review of existing conditions; offsets greater than half the pipe diameter or impacted by tree roots causing movement, and all sags over three-quarter inches (3/4") deep shall be excavated and repaired prior to trenchless replacement. Existing laterals not meeting the minimum slope per building code are not candidates for trenchless. Two-way cleanouts shall be installed at the back of the sidewalk/curb.

13-03G Connections to Existing Sanitary Sewer Facilities

When connections to existing sanitary sewer facilities disrupt sewer flows, the Contractor shall provide necessary bypassing in accordance with Section 13-03N, "Sewer Bypassing," of these City Standard Specifications.

Connection of new sanitary sewers to existing mains shall be made at existing manholes or by constructing a new manhole over the point of connection.

When connection of new sewer mains to existing facilities is at existing manholes, the Contractor shall make the connection by breaking through the manhole base, cutting a rough channel through the manhole shelf to the existing channel, installing the new pipe with a water stop if PVC sewer, finishing a new channel within the manhole and repairing any damage to the structure. Connection to the existing manhole shall not be made until immediately before the cleaning and flushing operation commences.

Contractor shall install a flexible coupling within twelve inches to eighteen inches (12"–18") of a manhole base where pipe enters or exits a manhole.

Approved mechanical expanding type temporary plugs shall be installed as necessary to separate new and existing sanitary sewer facilities during construction. Removal of this plug will not be allowed until the new work has been cleaned and tested and specific approval has been given by the Engineer. The Contractor may be required to ball, flush and televise all affected existing downstream sanitary sewer facilities should the Contractor remove this plug and connect new work to the existing sanitary sewer system without specific approval of the Engineer. Such an incident may also result in the Contractor being required to pay for any additional costs or damages incurred at either the City's pump stations or the Dublin San Ramon Sanitation District (DSRSD) wastewater treatment facilities as a result of sediment, rocks, or other debris.

Where wyes have been previously installed in the existing sanitary sewer main, the new sewer lateral shall be directly connected to the wye. Tapping shall only be allowed for connecting the new sewer lateral to the existing sewer main when an existing wye is not in place and the new sewer lateral is no more than fifty percent (50%) of the existing main size. A wye shall be installed in the existing main when an existing wye is not in place, and the new sewer lateral is more than fifty percent (50%) of the existing main size.

Taps shall only be performed in the presence of the Engineer.

13-03H Pipe Crossings

Sanitary sewer and water pipeline crossings shall be in accordance with the requirements of Detail Nos. 403 and 405, "Sanitary Sewer and Water Main Separation," of the City Standard Details.

13-03I Testing

All completed sanitary sewer mains, force mains, and laterals shall be tested by the Contractor in the Engineer's presence prior to acceptance of the work and prior to connection to the residential service. All testing shall be performed using the air testing procedure between each adjacent pair of manholes. The conditions under which testing shall be performed shall be as follows.

1. After all proposed work, including mains, manholes, laterals, and connections, has been completed.

2. After the installation of all other underground utilities.

3. After all sanitary sewer facilities are adequately protected from destructive loadings, and the surface is no longer subjected to continuous abnormal construction traffic. Testing shall be conducted after eighty percent (80%) of the street base material has been placed and compacted. In unimproved areas, the backfill shall be satisfactorily compacted.

13-03I.1 Air Test

Air testing of PVC pipe shall be performed in accordance with the latest edition of Uni-Bell PVC Pipe Association publication, UNI-B-6, "Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe," except as modified in this section. Air testing of DIP and VCP shall be performed in accordance with the latest edition of ASTM C828, except as modified in this section.

After plugging all openings and providing thrust blocking as necessary, air shall be admitted into the section under test at an inlet pressure not exceeding five (5) psi from a source regulated by an adjustable pressure control valve and measured by a sensitive pressure gage calibrated from zero to no more than ten (10) psi. When the internal gage pressure has reached three-point five (3.5) psi for PVC pipe and four (4) psi for ductile iron and vitrified clay pipe under stabilized temperature conditions, the air supply to the test section shall be cut off. The Engineer shall then observe the time interval during which the internal pressure drops zero-point five (0.5) psi for PVC pipe and one (1) psi for ductile iron and vitrified clay pipe from at least three-point five (3.5) psi.

For PVC, DIP, and VCP, the length of time for such loss shall not be less than that shown in the following tables for the main sewer size and length being tested.

PVC PIPE - TIME REQUIRED FOR 0.5 PSI PRESSURE DROP FOR SIZE AND LENGTH OF PIPE INDICATED

Pipe Diameter, Inches	Min Time, Minute: Seconds	Length for Min Time, Feet	Time for Longer Length, Seconds	Specification Time (Minutes: Seconds) for Length, L (Feet) Shown							
				100	150	200	250	300	350	400	450
4	1:53	597	0.190L	1:53	1:53	1:53	1:53	1:53	1:53	1:53	1:53
6	2:50	398	0.427L	2:50	2:50	2:50	2:50	2:50	2:50	2:51	3:12
8	3:47	298	0.760L	3:47	3:47	3:47	3:47	3:48	4:26	5:04	5:42
10	4:43	239	1.187L	4:43	4:43	4:43	4:57	5:56	6:55	7:54	8:54
12	5:40	199	1.709L	5:40	5:40	5:42	7:08	8:33	9:58	11:24	12:50
15	7:05	159	2.671L	7:05	7:05	8:54	11:08	13:21	15:35	17:48	20:02

DUCTILE IRON PIPE AND VITRIFIED CLAY PIPE - TIME REQUIRED FOR 1.0 PSI PRESSURE DROP FOR SIZE AND LENGTH OF PIPE INDICATED

Pipe Diameter, Inches	Specification Time (Minutes: Seconds) for Length, L (Feet) Shown							
	100	150	200	250	300	350	400	450
4	0:18	0:27	0:36	0:45	0:54	1:03	1:12	1:21
6	0:42	1:03	1:24	1:45	2:06	2:27	2:48	3:09
8	1:12	1:48	2:24	3:00	3:36	4:12	4:48	5:24
10	1:30	2:15	3:00	3:45	4:30	5:15	6:00	6:45
12	1:48	2:42	3:36	4:30	5:24	6:18	7:12	8:06
15	2:06	3:09	4:12	5:15	6:18	7:21	8:24	9:27

Test plugs for air tests shall not be removed until the pressure is no longer measurable. Air shall be released slowly through a valve. If the pipe to be tested is submerged in groundwater, Contractor shall determine the back pressure due to groundwater submergence and increase all gage pressures in the test by that amount. If the calculated test pressure is greater than eight (8) psi results, then air testing shall not be used, and an exfiltration test will be required.

During air testing, the Contractor shall be responsible for providing uninterrupted sewer service to all services affected by the Contractor's Work.

13-03I.1.1 Air Test Failure

If the air test indicates leakage greater than the specified limits, the Contractor shall locate the defects by inspection and shall make such repairs and replacements as are necessary and approved by the Engineer. All defective portions shall be exposed and repaired or replaced including defective bedding to the satisfaction of the Engineer. The air test shall be repeated until it passes, at the sole expense of the Contractor.

13-03I.2 Water Exfiltration Test

A water exfiltration test will not substitute for a required air test but when calculated air test pressures are greater than eight (8) psi due to high groundwater conditions, then a water exfiltration test shall be required. Water exfiltration test procedures are as described below.

Sanitary sewer mains shall be tested between successive manholes by plugging the inlets of the lower and upper manholes. The pipe and manhole shall be filled with water to a point four feet (4') above the invert of the center of the upper manhole or in the presence of groundwater, four feet (4') above the average adjacent groundwater level.

The allowable leak shall be computed as follows over a period of at least a one-hour test:

$E = 0.00002(LD)(H)^{1/2}$

L = Length of line being tested including laterals in feet

D = Internal diameter of pipe in inches

E = Allowable leakage in gallons per minute (gpm)

H = Elevation between the upper manhole water surface and invert of the pipe at lower manhole (or if groundwater present, upper manhole water surface and groundwater at the lower manhole)

13-03I.3 Testing Deflection of PVC Sewer Pipe

The inside diameter of an installed section of PVC sewer pipe shall not be allowed to deflect more than five percent (5%). All PVC pipe main sewers shall be checked by means of a pipe deflection gauge. The pipe deflection shall be checked in the presence of the Engineer after placement of all trench backfill and pipe cleaning but prior to surface restoration.

The pipe deflection gauge shall be fabricated to permit passage through installed sections of the pipeline within the specified maximum five percent (5%) deflection of the base inside diameter of the PVC pipe. Any section or sections of plastic pipe that do not permit deflection gauge passage will not be accepted, and said section or sections shall be properly repaired or replaced and rechecked as directed by the Engineer. The gauge shall pass through the pipe without the use of mechanical force.

Re-rounding through the use of a vibratory machine will not be permitted.

13-03J Cleaning

Upon satisfactory completion of the testing and after all necessary repairs and adjustments have been made, including setting manhole frames to final elevations after paving, the entire new system of sewers and manholes shall be cleaned. Before beginning the cleaning operation, a standard sand trap shall be placed in the manhole at which the new work connects to the City's existing sanitary sewer system, and it will remain in place until all solid matter has been removed. Under no conditions shall material other than clear flushing water be discharged into the City's existing sanitary sewer system before final acceptance of the work. Splattered mortar and all irregularities shall be removed from the flow channels to leave a smooth, uniform surface.

A hydraulically propelled ball shall be used to thoroughly clean the interior of all new sanitary sewer mains. The ball shall be inflated to fit snugly into the sewer main to be cleaned. The rate at which the ball is allowed to pass through the sewer pipe shall be controlled by a rope attached to the ball at all times. Care shall be taken not to release the ball too rapidly, as the sediment and debris flushed out ahead of the ball must be removed at each downstream manhole. Those sections of the main that cannot be visually inspected by mirroring between manholes will be cleaned only in the presence of the Engineer. Prior to the beginning of this cleaning operation, excessive amounts of debris shall be directly removed by the Contractor.

Solid materials washed into the lowest manhole or manholes shall be removed from the system. The sand trap between the new work and existing system shall be removed only after all phases of work have been approved after final inspection. The Contractor shall prevent wash water from entering the existing sanitary sewer system and sediment and debris from entering the new sanitary sewer mains after cleaning. Should any of these events occur, the Contractor shall be responsible for cleaning the City's affected sanitary sewer system from the point of connection through the City's pumping stations to the DSRSD treatment plant at no cost to the City. Unauthorized connection to the existing sanitary sewer system or failure to properly plug lines as required will be considered satisfactory evidence that sediment or debris has entered the system, and cleaning as specified above will be required.

13-03L Television Inspection of New Sanitary Sewer Mains

The Contractor shall arrange with the Engineer for television inspection one hundred percent (100%) of the network by the City prior to paving in accordance with the following procedures:

1. The Contractor shall not be charged for the initial television inspection.

2. Work rejected by the Engineer shall be corrected by the Contractor to the satisfaction of the Engineer, and the television inspection shall be repeated by the City. The Contractor shall be charged for all television inspections after the initial television inspection in accordance with the City's latest fee schedule.

3. The complete job is ready for television inspection when the following work has been completed:

    - All sewer pipelines are installed, backfilled, and compacted.

    - All plugs and pull ropes are removed, and manholes are accessible and free of construction debris.

    - All structures are in place, and pipelines are accessible from structures.

    - All other underground facilities, utility piping, and conduits are installed.

    - Final street grading is complete, and 80 percent (80%) of the aggregate base has been installed.

    - Final air test has been completed.

    - Pipelines to be inspected have been cleaned and flushed.

    - Deflection test has been completed.

4. After the above work is complete, the Contractor shall request the Engineer to have the City schedule the television inspection. A minimum of forty-eight (48) hours' advance notice is required.

5. The Contractor will be notified by the Engineer of the scheduled date of the television inspection.

6. If the job site is not ready or accessible for the television inspection on the scheduled date, the Contractor shall notify the City of the necessary cancellation at least twenty-four (24) hours in advance of the scheduled inspection.

a. If the City's television crew arrives at the job site and the work is not ready or accessible, the Contractor will be billed a cancellation fee according to the City's latest fee schedule prior to the date of rescheduled television inspection.

b. The Contractor shall reschedule the inspection as outlined above.

7. The work will be initially televised by the City.

    - If no deficiencies are observed, the work will be considered satisfactory.

    - If deficiencies are observed, a videotape will be made, and the City will determine whether the defects are serious enough to require correction.

8. The Engineer shall notify the Contractor of any deficiencies revealed by the television inspection that will require repair. If corrective work is indicated and viewing of the videotapes is desired, the Contractor shall be contacted to schedule a time to review the tapes with the Engineer.

9. The Contractor shall submit a plan for correcting defects to the Engineer, who must approve the plan prior to the Contractor starting corrective work. The City reserves the right to require retesting as defined in Section 13-03I, "Testing," of these City Standard Specifications following completion of any repair.

10. Those portions of the pipeline system that have been corrected shall be re-televised by the City at a cost to the Contractor as according to the City's latest fee schedule.

11. The procedure outlined in Conditions 1 through 10 above will be repeated until all deficiencies observed by television inspection have been corrected to the complete satisfaction of the City.

12. All sewer main stubs will be television inspected.

13. The following observations from television inspections will be considered defects in the construction of sewer pipelines and will require correction prior to paving:

    - Low spot (0.0625 x diameter of pipe or greater - mainlines only)

    - Joint separations (one-half inch (1/2”) inch or greater opening between pipe sections)

    - Cocked joints present in straight runs or on the wrong side of pipe curves

    - Chips in pipe ends

    - Cracked or damaged pipe

- Dropped joints
- Infiltration
- Debris or other foreign objects
- Other obvious deficiencies
- Irregular condition without logical explanation

The Contractor shall provide digital database TV inspection reports before and after all work is completed. For video requirements, see Section 12-03H of Storm Drain.

Television inspection of new work and the correction of observed defects will not relieve the Contractor of responsibility for the one-year guarantee period. The City may televise new work at any time during the one-year guarantee period. Contractor shall repair any defective new work discovered during the one-year guarantee period within five (5) working days from notice. Repair work determined by the City as emergency in nature shall be performed within forty eight (48) hours.

13-03M Abandonment of Sewer Lines and Structures

Sewer pipes less than twelve inches (12”) in diameter shall be grout-injected with two (2) sack slurry for entire volume between manholes unless otherwise shown on the Project Plans.

Sewer lines more than or equal to twelve inches (12”) in diameter to be abandoned shall be securely closed at all pipe ends by an approved cap or, at manhole entries, by a watertight plug of concrete or brick and cement mortar not less than two feet (2’) thick. When lateral sewers are abandoned, they will be capped with an approved fitting at locations determined by the Engineer.

Structures to be abandoned shall have all openings, inlets, and outlets sealed off as set forth for sewer lines. The structure shall be removed to a point three feet (3’) below the proposed street grade and filled with backfill material, as specified in Section 11-02A, "Pipe Embedment Material," of these City Standard Specifications.

Salvaged metal castings, such as frames, covers, and other metal appurtenances, unless otherwise specified, shall be delivered to the City of Pleasanton's Operations Service Center.

13-03N Sewer Bypassing

Sewer bypassing shall be accomplished by pumping or diverting the upstream flow around the Contractor's work. The Contractor shall submit a sewer bypassing plan, which shall be reviewed and approved by the Engineer.

The Contractor shall provide temporary pumps, conduits, and other equipment to bypass the sewer flow. The Contractor shall furnish the necessary labor and supervision to set up and operate the pumping and bypass system. Engines shall be equipped with mufflers and/or enclosed to keep the noise level within local ordinance requirements. Pumps and bypass lines shall be of adequate capacity and size to handle the flows. All bypassed flow shall be discharged to the nearest downstream sanitary sewer manhole.

Unless otherwise specified, the Contractor shall bypass flow around the Work whenever the depth of flow, as measured at the inlet pipe to the upstream manhole adjacent to the Contractor's work, exceeds the crown elevation of the pipe or whenever the Contractor's equipment operating in the sewer provides an obstruction that restricts flow and causes the depth of flow to exceed the crown elevation.

No sanitary sewer flow shall be allowed in the new sewer main line trench.

The contractor shall maintain, on-site, sufficient equipment and materials to ensure continuous and successful operation of the bypass and dewatering systems. Standby pumps shall be fueled and operational at all times. The Contractor shall maintain, on-site, a sufficient number of valves, tees, elbows, connections, tools, sewer plugs, piping, and other parts or system hardware to ensure immediate repair of modification of any part of the system as necessary.

13-04 Measurement

Sewer laterals with cleanouts and sanitary sewer structures, such as manholes, shall be measured by the number of items. New sanitary sewer main and casing pipe shall be measured on the basis of linear feet of pipe from the center of the manhole to the center of the manhole.

13-05 Payment

The contract price of new sanitary sewer main pipe installed in trenches shall include full compensation for all Work described in Section 11, "Trench Excavation and Backfill," of these City Standard Specifications; abandonment of existing mains; pipe material and installation; connections to manhole structures; bypassing; cleaning; testing; and restoration of all asphaltic and concrete surfaces affected by trenching operations.

The contract price of new sanitary sewer laterals shall include full compensation for all Work described in Section 11, "Trench Excavation and Backfill," of these City Standard Specifications; abandonment of existing laterals; new materials including lateral pipe, wyes, and cleanouts; connections to the sanitary sewer main and private sanitary sewer lateral; installation of all sanitary sewer materials; and restoration of all asphaltic and concrete surfaces.

The contract price of new manholes shall include full compensation for all associated materials and installation of base, manhole sections, frame and cover, concrete collar, and adjustment to grade.

SECTION 14. WATER

14-01 - General

This section covers requirements for materials and methods of installation for the water mains, fittings, and appurtenances within the City water distribution system. All water distribution system improvements shown on Project Plans and City Standard Details shall conform to the following specifications.

14-02 - Materials

Approved pipe materials for the City water distribution mains shall be polyvinyl chloride (PVC) and ductile iron (DIP).

Service lines shall be copper for one inch (1") and smaller and one and a half inches (1.5") or larger be polyethylene (PE).

Material requirements of valves, meters, hydrants, and other appurtenances are included in this section.

All materials shall be manufactured and approved for potable water systems and must be in compliance with State of California AB 1953 and contain less than twenty-five hundredths of a percent (0.25%) Lead by average weight.

All bolts shall be stainless steel bolts; anchor bolts, nuts, and washers shall be Type 316 stainless steel in accordance with ASTM A193, Class 2, Grade 8 or ASTM F593, Condition SH. Threads on stainless steel bolts shall be protected with antiseize lubricant suitable for submerged stainless-steel bolts, to meet government specification MIL-A-07E. Buried bolts shall be coated if specified for Cathodic Protection measures.

1. Anti-seize lubricant shall be classified as acceptable for potable water use by the NSF.
2. Anti-seize lubricant shall be "Pure White" by Anti-Seize Technology, Franklin Park, IL; or equal.

14-02A - Polyvinyl Chloride Pipe

Polyvinyl chloride (PVC) pipe shall conform to the requirements as specified in AWWA C-900/905 and shall have a minimum pressure rating of Class 235 (SDR18). A higher class may be required to meet certain design conditions as determined by the Engineer, and as indicated on the Project Plans.

14-02A.1 - Joints

Joints of PVC pipe shall be with elastomeric-gasket bell ends or couplings.

The bell ends shall be an integral thickened bell end (IB) or an integral sleeve-reinforced bell end. The bell end joints shall have a minimum wall thickness of the bell or sleeve-reinforced bell equal, at all points, to the standard dimension ratio requirements for the pipe. The minimum wall thickness in the ring groove and bell-entry sections shall equal or exceed the minimum wall thickness of the pipe barrel.

All PVC couplings shall be manufactured of the same material as the pipe and shall be furnished with two (2) rubber rings. The couplings shall be designed to ensure a water-tight joint with the pipe. The couplings body and sockets shall have a wall thickness equal to the pipe barrel thickness with which the coupling is to be used.

All rubber rings shall be furnished by the pipe manufacturer. These rubber rings (Elastomeric Gaskets) shall be manufactured to conform to the requirements of ASTM F-477.

14-02A.2 - Fittings

All fittings for use with PVC pipe shall be mechanical joint ductile iron, with the exception of fittings with valves which shall be flanged joint ductile iron. Tapered ends on PVC pipe shall be removed prior to installation into a mechanical joint fitting to allow for full insertion. Mechanical joint ductile iron fittings shall be in accordance with AWWA C-153. Flanged ductile iron fittings shall be in accordance with AWWA C-110. All fittings for use with PVC pipe shall be cement mortar lined in accordance with AWWA C-104 and shall have the manufacturer's standard bituminous or asphaltic coating.

14-02B - Ductile Iron Pipe

Ductile iron pipe (DIP) shall conform to the requirements as specified in AWWA C-150 and C-151. All pipe six inches (6") and greater in diameter shall have a minimum thickness class of fifty (50). A higher thickness class may be required to meet certain design conditions as determined by the Engineer and as shown on the Project Plans.

The pipe and fittings shall be cement mortar lined in accordance with AWWA C-104 and shall have the manufacturer's standard bituminous or asphaltic coating.

Soil corrosivity shall be tested every five hundred (500) lineal feet minimum. If results identify moderate or greater, a cathodic protection system shall be designed.

14-02B.1 - Joints

Joints for DIP shall either be push-on, mechanical, or flanged, as selected to suit installation conditions as determined by the Engineer. Acceptable joint gaskets include neoprene or synthetic rubber. Natural rubber gaskets will not be accepted. Push-on and mechanical joints shall be in accordance with AWWA C-111. Flanged joints shall be in accordance with AWWA C-115. The minimum pressure rating of all joints shall be two hundred-fifty (250) psi.

Restrained mechanical joints are to be used only if specified in the project plans and special provisions or approved by Engineer. The use of restraint mechanical joints does not negate the need for concrete kickers.

14-02B.2 - Fittings

Fittings used for DIP shall be in accordance with Section 14-02A.2 of these City Standard Specifications.

14-02C - Services and Related Appurtenances

14-02C.1 - Service Line

Unless otherwise required by the Engineer, all water service lines shall be no less than one inch (1") in size.

14-02C.1.1 - Copper

Copper tubing service lines shall only be used for certain site conditions upon approval of the Engineer. Copper tubing shall be Type K soft copper conforming to the requirements of AWWA C-800.

14-02C.1.2 - Plastic

For pipe sizes greater than one inch (1”), use polyethylene. For one inch (1”) pipe sizes, use Service Guard© from Underground Solutions.

Polyethylene tubing shall be copper tube size conforming to the requirements of ASTM D 2737 and AWWA C-901 with a required pressure rating of two hundred (200) psi (SDR 9) and minimum size of one inch (1"). The material designation code of polyethylene tubing shall be PE 3408 with classification 334434C. All polyethylene tubing used for water service lines shall meet the requirements of Standard No. 14 as published by the National Sanitation Foundation.

14-02C.2 - Corporation Stops

Unless otherwise approved by the Engineer, single residence water service taps at the main shall be one inch (1") in diameter with corporation stop connection. Corporation stops shall be ball valves Ford Company FB-1100 series, copper tube size (CTS), or approved equal with packed joint outlet. All Corporation Stops must be in compliance with State of California AB 1953 and contain less than twenty-five hundredths of a percent (0.25%) Lead by average weight.

14-02C.3 - Saddles

Saddles shall be suitable for the diameter and pipe material of the pipe to be tapped. Saddles shall be shaped to accurately fit the contour of the main and shall have double straps. Straps shall have a flattened design to provide large bearing surfaces for a secure installation. All saddles shall have a neoprene gasket wedged in place at the tapping box to provide a tight seal at the main. Saddles shall have no bushings to accommodate corporation stops.

Saddles for use with C900/905 PVC pipe shall be constructed of bronze, two-piece, two-bolt, single-strap, and shall be Ford model S912 or approved equal.

Saddles for use with AC pipe shall be constructed of bronze top with single wide stainless-steel strap four bolts and shall be Ford model 202BS or approved equal.

Saddles for use with DIP/Cast shall be constructed of the following materials: CASTING- The saddle body is cast from ductile (nodular) iron, meeting or exceeding ASTM A 536, Grade 65-45-12. GASKET- Gasket is made from Nitrile Butadiene Rubber (NBR) compounded for water and sewer service and a tolerance of petroleum products in accordance with ASTM D 2000 MBC 610 and NSF 61 Certified. Other compounds are available for special applications. COATING- Casting is coated with fusion bonded black nylon, ten to fourteen (10-14) mils thick, with a dielectric strength of one thousand (1,000) v/mil and NSF 61 Certified. Romac 202 NSSU or approved equal. Cast top with two stainless steel straps and shall be Ford model FSD202 or approved equal.

The taps shall all be iron pipe size.

14-02C.4 - Angle Meter Valves

All angle meter valves shall have padlock wirings and packed joint inlets. Angle meter valves for meter sizes greater than one inch (1") shall have flanged outlets. Angle meter valves shall be Ford Company models, BA or BFA 43 Series or approved equal as detailed by meter size in Detail No. 301, "Standard Water Service for Residential," of the City Standard Details. All Angle Meter Valves must be in compliance with State of California AB 1953 and contain less than twenty-five hundreths percent (0.25%) Lead by average weight.

14-02C.5 - Meters

In the case of new water service installations, new water meters shall be provided and installed by the City. In the case of replacement of existing water services, Contractor shall reinstall existing meters.

Water meters and boxes shall be placed in public service easements.

14-02C.6 - Meter Boxes

Meter boxes shall be Christy models or approved equal as detailed by service size in Detail Drawing No. 301, "Standard Water Service for Residential," of the City Standard Details. For meter sizes of one inch (1") and less, meter boxes shall be covered with one-piece

concrete lids. For meter sizes greater than one inch (1"), meter box concrete lids shall be two-piece. For meter boxes in traveled areas, the box and cover shall be traffic bearing.

14-02D - Valves

All mainline valves shall be resilient wedge-type gate valves rated for a minimum working pressure of two hundred (200) psi. Valves connecting directly to tees or crosses shall be flanged directly to the tee or cross. All valves connecting to PVC pipe shall be mechanical joint. Butterfly valves shall only be used with the approval of the Engineer. Valves at all tie-ins or isolating from existing system need to be pressure tested prior to installation and witnessed by an inspector.

14-02D.1 – Gate Valves

Gate valves shall be resilient wedge-type valves conforming to AWWA C-509 with “O” ring seals, non-rising bronze stem, counterclockwise opening, and a two inch (2”) operating square wrench nut. All gate valves shall have stainless steel or fusion epoxy-coated hardware on the bonnets.

14-02D.2 – Butterfly Valves

Butterfly valves shall be tight-closing, rubber-seated with rubber seats securely fastened to the valve body, counterclockwise opening with a two inch (2”) operating square nut conforming to AWWA C-504. Gear operators designed for buried service shall be provided with each butterfly valve.

14-02D.3 – Air and Vacuum Air Release Valves and Enclosure

Air and vacuum air release valves shall be the combination type, CLA_VAL 36 series for one inch (1”) tubing and two inch (2”) tubing, or approved equals. The combination air valve shall be designed for an operating working pressure of two hundred (200) psi and shall have a stainless steel float. All other working parts shall be brass, stainless steel, or other non-corroding materials. The minimum inlet/outlet size shall be one inch (1") for pipe sizes up to ten inches (10"). The maximum inlet/outlet size shall be two inches (2") for pipe sizes twelve inches (12") and larger. Air and vacuum air release valves shall be installed above grade in a dual swing sixteen-inch (16”) diameter by twenty-four-inch (24”) high pipeline product model V-VCDD-1624E or approved equal. See “Combination Air-Vacuum Release” City Standard Detail 312.

14-02D.4 - Valve Boxes, Covers and Risers

Valve boxes and covers shall be Christy model G5 or approved equal with "Water" marked on the cover. Valve risers shall be eight inch (8") SDR 35 PVC.

Valve boxes and covers for recycled water shall be Christy Model G4 with “recycled water” marked per Detail 316. Risers for potable water shall be blue; risers for recycled shall be purple.

14-02E - Fire Hydrants

Fire hydrants for potable water shall be the wet barrel type with cast iron body conforming to the requirements of AWWA C503. All fire hydrants shall have two (2) two-and-one half-inch (2½") outlets and one (1) four-and-one-half-inch (4½") outlet and shall have a minimum weight of one hundred ninety pounds (190 lb.). Fire hydrants shall be Clow model F-960, Long Beach Iron Works model Anacapa 615, or equal. Fire hydrants shall be fusion epoxy lined having a total minimum thickness of six (6) mils. Hydrant buries and break-off spools shall be either factory cement mortar lined, or fusion epoxy lined, having a total minimum thickness of six (6) mils. A break-off spool with two (2) cast score marks or one (1) machined score mark shall be provided between the hydrant head and the hydrant bury. The top score mark shall be located within three inches (3") of the flange that connects to the hydrant head. Fire hydrant bolts shall be a breakaway type. City-owned and maintained fire hydrants shall be painted Kelly Moore Yellow Rust Inhibitor Safety Yellow #1700-63 or approved equal. Privately owned fire hydrants shall be painted Kelly Moore Kel Guard Rust Inhibitive Siren Red #1700-62 or approved equal.

Fire hydrants for recycled water shall be CLOW F900 series wet barrel hydrants with hydra-shield hydrant security cap.

14-02F - Blowoffs

Blowoff shall be constructed of the materials and to the sizes indicated in City Standard Details 310 & 309, "Blowoff at Dead End," and “Midline Blow Off,” of these City Standard Details.

14-02G - Solid Mechanical Sleeve and Flexible Coupling

Solid sleeves used for pipe closure shall be AWWA C153 mechanical joint ductile iron fittings. Flexible couplings shall be fusion epoxy coated, shall only be used upon approval by the Engineer, and shall be Power Seal–Power Max Coupling Model 3506LB with 304 Stainless Steel Bolts or JCM Coupling Model 242 with 304 Stainless Steel Bolts or approved equal.

14-02H - Thrust Blocks

Thrust blocks shall be constructed of minor concrete in conformance with Section 90-2, "Minor Concrete," of the State Standard Specifications. Minimum dimensions of thrust blocks shall be in accordance with "Typical Thrust Blocks," of the City Standard Details. Contractor shall be responsible for the adequate sizing of thrust blocks.

14-02I - Tapping Sleeve Tees and Tapping Valve

Tapping sleeves for wet tapping of asbestos cement shall be Ford Meter Box “Fast Stainless Steel Tapping Sleeve with three hundred-sixty degrees (360º) Gasket” or approved equal.

Tapping sleeves for wet tapping twelve-inch (12”) or smaller PVC, cast iron, or ductile iron shall be Ford Meter Box “FTSS Stainless Steel Tapping Sleeve with Removable Bolts and three hundred-sixty degrees (360º) Gasket” or approved equal.

Tapping sleeves for wet tapping sixteen-inch (16”) or larger of PVC, asbestos cement, cast iron, or ductile iron pipe shall be mechanical joint cast iron tapping sleeve assembly complete with gaskets and bolts. The tapping valve shall be a resilient wedge gate valve equal in size to the branch of the tapping sleeve. The tapping sleeve and valve shall have a minimum rating of two hundred pounds (200 lb.) per square inch working pressure. The tapping valve shall have a two inch (2”) square nut for operation. Tapping sleeves for PVC, cast iron, and ductile iron pipe shall be Mueller H-615 or approved equal. Tapping sleeves for asbestos cement pipe shall be Mueller H-619 or approved equal. Tapping valves shall be Mueller A-2360 or approved equal.

Tapping sleeves tap shall be limited to fifty percent (50%) of mainline pipe size, rounded down.

14-02J - Backflow Prevention and Fire Services

Backflow prevention and fire service facilities shall be constructed in accordance with the drawings presented in the City Standard Details and the latest edition of approved devices from University of Southern California Foundation for Cross Connection Control and Hydraulic Research (USCFCCCHR).

14-02K - Warning Tape and Tracer Wire

Warning tape for potable water shall be two inches (2") wide, blue, and carry the inscription: "Caution Buried Water Line Below.” Warning tape shall be manufactured by Calpico or approved equal, and installed within five hundred feet (500’) max.

Tracer wire shall be continuous 12 A.W.G. gauge, insulated, solid-core copper wire, and installed for all underground piping.

14-03 - Construction

All pipe, fittings, and appurtenances shall be handled with care and protected from damage during loading and unloading operations, while in storage, and during installation, according to the manufacturers’ recommendations.

Prior to installation of pipe, roadway subgrade shall be within one tenth feet (0.1') of finished subgrade. All pipe shall be laid with full uniform support on compacted pipe embedment material and maintained at the required grade and alignment shown on the project plans. No mounding shall be allowed. Adjustments to avoid obstructions and major relocations to avoid unforeseen obstructions shall only be allowed if approved by the Engineer. Backfill operations shall only proceed once the pipe has been inspected and is continuously supported in its final grade and alignment position.

Prior to connecting pipe joints, all surfaces of the portion of the pipe to be jointed shall be cleaned, dried, and prepared as recommended by the manufacturer. Pipe joints shall only be connected with the couplings and rubber rings furnished with the pipe and in accordance with the manufacturer's recommendations. Disruption of the pipe joint after the connection has been made will not be permitted.

Pipe shall be laid with the bell end facing in the direction the work is proceeding. The interior of the pipe shall be kept clean and free from dirt and foreign matter at all times. Whenever the work ceases, the end of the pipe shall be securely closed with a tight-fitting plug or cover. If, in the opinion of the Engineer, the interior of the pipe is not kept clean or if the pipe was found to be open-ended at any time, the Contractor shall be required to thoroughly and completely swab and flush the end pipe section and all connecting pipe sections as necessary to the satisfaction of the Engineer.

Damage to lining or coating shall be repaired to the satisfaction of the Engineer before the pipe or fitting is installed.

Pipe shall not be laid when, in the opinion of the Engineer, the condition of the trench is unsuitable.

A maximum of one-half-inch (½") spacing shall be allowed between pipes joined by solid mechanical sleeve.

14-03A - PVC Pipe

In addition to general pipe installation procedures, installation requirements particular to PVC pipe shall be followed in accordance with AWWA Manual No. 23, "PVC Pipe - Design and Installation."

PVC pipe shall be deflected in accordance with the manufacturers' recommendations. The Contractor shall not install PVC pipe at less than the manufacturer's required minimum radius of curvature. Significant alignment changes shall only be achieved through the use of angular fittings.

Tracer wire shall be required for all PVC mains. Tracer wire shall be taped on top of the PVC main and be made accessible at each valve box according to the City Standard Details.

14-03B - Ductile Iron Pipe (DIP)

In addition to general pipe installation procedure, installation requirements particular to DIP shall be followed in accordance with AWWA C-600, "Installation of Ductile Iron Water Mains and their Appurtenances."

Curved alignments shall be obtained through deflection of joints in accordance with manufacturers' recommendations.

All DIP and fittings shall be encased in polyethylene tubing, eight (8) mil thick minimum, for external corrosion protection. Installation of polyethylene encasement shall be in accordance with the requirements of AWWA C105. Contractor shall use two inch (2") wide ten (10) mil tape to secure the ends of the polyethylene tubing.

14-03C - Services

Service lines shall be installed in accordance with the City Standard Details and shall rest on compacted bedding material placed above an undisturbed earth trench bottom. All service line connections to mains regardless of main pipeline material shall be made using a saddle. Polyethylene lines shall be installed from the corporation stop horizontal at the main to the angle meter stop in accordance with manufacturer recommendations. Warning tape and tracer wire shall be required for all services. The minimum distance between service taps shall be twenty five inches (25").

14-03D - Valves

All valves shall be set plumb and properly fitted to the adjacent sections of main. A valve box shall be installed over each valve. The valve box must not bear on the valve or pipe so that traffic loads are not transferred to the water pipe. The top of the valve box shall be placed flush with finished grade unless otherwise directed. Valves shall be fitted with suitable extension stems when the valve operating nut is greater than sixty inches (60") in depth. The extension stem shall to bring the valve operating nut to within thirty six inches (36") of the finished grade.

The location and type of all valves shall be permanently marked, either on the curb face or on four-inch by four-inch (4" x 4") posts where there is no curb. There shall be two (2) triangulation ties to each valve box labeled with the corresponding distance in feet from the post or curb to the valve box.

14-03E - Connection to Existing Lines

14-03E.1 - Type and Conditions

All connections to the City's existing water system shall be the cut-in, dry connection type. Wet taps shall only be considered on a case-by-case basis and shall only be performed if

approved by the Engineer. If a wet tap is approved by the Engineer, then the tapping sleeve branch shall not exceed fifty percent (50%) of the diameter of the existing main.

Before proceeding with a connection to the City's existing water system, the following conditions shall be met:

1. The Engineer has approved the connection and is on the job site.

2. The new water main has passed both the pressure and bacteriological tests.

3. Proper notifications have been made for interruption of service.

4. City personnel are available to operate the existing water system. {See 14-03E.3}

5. Materials have been on-site twenty-four (24) hours prior to the start of trenching and have been inspected and approved by the Engineer.

14-03E.2 - Interruption of Services

The Contractor shall notify the City no less than seventy-two (72) hours prior to the start of any scheduled shut-down so that advance notice can be given to the Fire Department by City personnel. The Contractor shall notify affected residences and businesses forty-eight (48) hours in advance of possible service interruptions. The Contractor shall specify the expected length and time of day of the shut-down in the notification. The Contractor shall take into account high-demand periods and shall complete the connection to existing lines in such a manner as to minimize the inconvenience to water users. Shut-down is only allowed from Monday through Thursday unless approved by the Engineer.

14-03E.3 - Valve Operation

Only City Utilities Department personnel shall operate all potable water system valves.

14-03F - Pipe Crossings

The Contractor shall comply with the requirements of the State Department of Health Services regarding separation distances and pipe material specifications at water main-sanitary sewer crossings as shown in Detail Nos. 405 and 406, "Sanitary Sewer and Water Main Separation," of the City Standard Details.

All pipe crossings and siphons shall be constructed with TR Flex type Ductile Iron Pipe.

14-03G - Pressure and Leakage Testing

14-03G.1 - General

All water lines shall be pressure and leakage tested in the presence of the Engineer. Pressure and leakage testing shall be done only after the following items are completed:

1. The new pipe segment has been flushed.

2. The trench has been satisfactorily backfilled and compacted.

3. All other underground utilities have been installed.

4. All water facilities are adequately protected from destructive loadings and the surface is no longer subjected to continuous abnormal construction traffic. Testing shall be conducted after eighty percent (80%) of the street base material has been placed and compacted.

5. The use of jumpers with a certified backflow device is required for the disinfection of all new mains prior to final tie-ins being completed. The only exception would be if placement of the device causes a safety hazard. The Engineer must approve all exceptions.

Make-up water pumped into the new pipe segment for both the pressure and leakage tests shall be adequately chlorinated to prevent contamination.

14-03G.2 - Pressure Test

After the Contractor has met all of the required preconditions in Section 14-03G.1, "General," of these City Standard Specifications, the Contractor shall conduct a pressure test of restricted segment lengths at a required pressure not less than two hundred (200) pounds per square inch for two (2) hours and sustained during this period within a tolerance of ± ten (10) pounds per square inch. For hillside areas, the length of the pipe segment tested shall be determined to allow a maximum test pressure of not less than two hundred (200) psi on the low end and a minimum test pressure of not less than one hundred seventy-five (175) psi on the high end. In no case shall the tested pipe segment length exceed one thousand feet (1,000'). The maximum rated pressure of pipe, pipe appurtenances, valves, or hydrants at low points in the system shall not be exceeded.

All valves used for isolation shall be pressure tested above grade prior to installation.

14-03G.3 - Leakage Test

Following the pressure test, a leakage test shall be conducted at a pressure not less than one hundred fifty (150) pounds per square inch for four (4) hours and sustained during this period within a tolerance of ± ten (10) pounds per square inch. The allowable leakage shall be dependent upon the type of pipe material as specified in the following sections of these City Standard Specifications.

14-03G.4 - Polyvinyl Chloride Pipe Leakage Test

The rate of leakage of polyvinyl chloride pipe during the four (4) hour test time period shall be accurately measured and not exceed the following:

Nominal Pipe Size, Inches	Allowable Leakage-150 psi, Gallons/Hr/1000 Ft
4	0.33
6	0.50
8	0.66
10	0.83
12	0.99

14-03G.5 Ductile Iron Pipe Pressure Test

The rate of leakage of ductile iron pipe during the four (4) hour test time period shall be accurately measured and not exceed the following:

Nominal Pipe Size, Inches	Allowable Leakage-150 psi, Gallons/Hr/1000 Ft
4	0.37
6	0.55
8	0.74
10	0.92
12	1.10
14	1.29
16	1.47
18	1.66
20	1.84
24	2.21

14-03H Disinfection

14-03H.1 General

Bacteriological samples are not to be taken until the proposed lines have passed hydrostatic and leakage tests. Loading, chlorinating, flushing, and bacteriological testing of all new water facilities shall be conducted in the presence of the Engineer in accordance with the latest version of AWWA C-651, “Disinfecting Water Mains,” and as modified in these standard specifications. Water samples from the disinfected potable water system shall be collected by the City of Pleasanton Utilities Department.

Responsibilities of the Contractor, the City of Pleasanton Construction Services Division, and the City of Pleasanton Utilities Division shall be as stated in the following paragraphs. Generally, the City Utilities Division will operate all existing facilities, collect water samples, monitor chlorine residuals, and conduct bacteriological tests, and the Contractor

shall be responsible for all other areas of work, including assisting City Utilities Division personnel as necessary and operation of new water facilities before passing of bacteriological tests.

Contractor Responsibilities:

1. Provide Construction Services Inspector a minimum of twenty-four (24) hours' notice though three (3) working days is preferred) advanced notification to schedule the chlorination.

2. Ensure that all mainline and hydrant valves are raised, accessible, and in an open position.

3. Ensure that all blow-offs have a riser pipe above-grade that includes a sampling hose bib and a separate outlet with an independent shut-off valve to attach a fire hose to for flushing.

4. Ensure that all pre-arranged sampling locations have a hose bib above grade prior to starting the disinfection process.

5. Monitor the injection of the chlorine and related injection equipment.

6. Provide personnel to assist the City Utilities Division staff with expelling air and achieving a chlorine residual of not less than fifty (50) mg/L at all blow-offs, fire hydrants and water services.

7. Bag hydrants and secure water services after chlorination until results from the bacteria testing is obtained to ensure that no water is discharged from the new system. Failure to secure the new system will result in an automatic failure and require the disinfection process to start over. Services are to be secured at the curb stops through the use of heavy-duty zip ties padlocks by the Contractor.

8. Provide personnel and all required equipment necessary for the flushing of the chlorine.

9. Dispose of the chlorinated water in accordance with all applicable Federal, State, and local agency regulatory requirements. Refer to AWWA Standard C651-92, Section 6.2, "Disposing of Heavily Chlorinated Water," for procedures.

10. Meet with the Inspector and Utilities Division staff to review plans and establish bacteriological sampling locations at the time of scheduling the chlorination. The distance between sample locations shall not exceed five hundred feet (500'). Sampling shall not be allowed through fire hydrants.

11. Schedule all new main chlorination for Monday or Tuesday only.

Construction Services Responsibilities:

1. Provide the Utilities Division a minimum of twenty-four (24) hours' notice (though three (3) working days is preferred) advanced notification to schedule the chlorination.

2. Meet with Utilities Division staff and the Contractor to review plans and establish bacteriological sampling locations at the time of scheduling the chlorination. The distance between sample locations shall not exceed five hundred feet (500'). Sampling shall not be allowed through fire hydrants.

3. Schedule new main chlorination to begin on Monday or Tuesday. If the Utilities Division and Laboratory staff are willing and available to work overtime, coordinate those efforts and ensure that the Contractor understands that they are responsible for reimbursing the City for all overtime costs incurred from the new main chlorination that does not begin on Monday or Tuesday.

4. Review the New Main Disinfection Procedures and Contractor Responsibilities with the Contractor.

Utilities Division Responsibilities:

1. Operate all existing City-owned valves and facilities.

2. Monitor chlorine residuals during the disinfection and flushing of all new water mains.

3. Monitor Turbidity at the time the new main is flushed.

4. Collect all bacteriological samples.

5. Process and analyze all bacteriological samples (laboratory technician).

6. Notify PWI of bacteriological testing results immediately upon availability.

14-03H.2 Pipe Loading and Chlorination

Pipe sections to be bacteriologically tested shall be slowly filled with water by City Utilities Division personnel, and all air shall be expelled by the Contractor from the pipe. Air shall be released through opening hydrants, service line curb stops at high points in the system and blowoffs at all dead ends. Water for pipe loading shall be supplied directly from the closest existing mainline valve operated only by City Utilities Division personnel. After the system has been filled with water, chlorinated, and all air has been expelled, all valves controlling the section to be tested shall be closed and the system isolated. The line will then be allowed to sit for a period of at least twenty-four (24) hours, and not more than thirty-six (36) hours, to permit the pipe to absorb water and allow the escape of trapped air.

Disinfection shall be accomplished through chlorination with the initial introduction of water into the system. The method of disinfection shall be the continuous feed method. The tablet or slug method shall not be allowed. Chlorine shall be introduced into the pipe section to be tested no greater than fifty feet (50') from the existing line valve being used for loading. During the twenty-four (24) -hour disinfection period, the free chlorine residual shall not be less than fifty (50) mg/1.

Acceptable chemicals for disinfection shall comply with AWWA standards listed below:

1. Hypochlorite, AWWA B300
2. Liquid Chlorine, AWWA B301
3. Ammonia Sulfate, AWWA B302
4. Sodium Chlorite, AWWA B303

Disinfection of repaired sections of pipe shall be done by swabbing with sodium hypochlorite solution. Special procedures for disinfecting tapping sleeves as described in AWWA C 651 86, shall be followed.

The interior of the tapping sleeve and the exterior surfaces of the main to be enclosed by the taping sleeve are to be disinfected by swabbing the assembly with chlorine prior to tapping.

Following a tie-in, the area affected by the tie-in shall be thoroughly flushed and bacteriological samples taken to verify compliance.

14-03H.3 Flushing and Bacteriological Testing

Following the twenty-four (24) hour disinfection period, chlorinated water shall be flushed from the main until the turbidity is five (5.0) NTU or less, and chlorine measurements show that the concentration in the water leaving the main is no higher than that generally prevailing in the system or that which is acceptable for domestic use. As during the loading operation, the existing mainline valve used for flushing shall only be operated by the City Utilities Division personnel. Chlorinated water shall be disposed of by the Contractor in a manner consistent with all applicable Federal, State, and local agency regulatory requirements.

After flushing the line and prior to connection for final service, the City Utilities Division personnel will check for chlorine residual, and samples will be drawn after a twenty-four (24) hour minimum incubation period by the City for bacteriological analysis to verify compliance with primary drinking water regulations.

14-03I Abandonment of Water Facilities

Existing water mains shall be abandoned as according to Section 3-03H, "Utility Abandonment," of these City Standard Specifications. For one inch (1") through two inch (2") water services that are connected to a water main to remain in service, the water service

shall be abandoned by closing the corporation valve, removing the service, and installing a Ford Brass Corp Cap (see manufacturers cut sheet for model #'s). For four inch (4") and larger water services which are connected to a water main to remain in service, the water service shall be abandoned by closing the valve, severing the service within two feet (2') of the valve, plugging the service with concrete, blind flanging the valve, removing the valve pot, backfilling the hole left after removing the valve pot, and repairing the surface. The valve pot shall be returned to the City Operations Services Center. For the case of when both the water service and water main are to be abandoned, the water service shall be turned off at the angle meter stop water meter and the water meter box removed and delivered to the City Operations Services Center.

14-03J Warning Tape and Tracer Wire Installation

Warning tape shall be installed approximately one foot (1') above the centerline of all mains and services, as shown in the City Standard Details.

14-04 Measurement

Installation of new water services, fire hydrants, fire services, meter boxes, and blowoffs shall be measured by the number of items. New water main pipe installed shall be measured on the basis of linear feet of pipe. New water main tie-ins to existing water mains shall be measured on a lump sum basis per tie-in.

14-05 Payment

The contract price of new water main pipe installed in trenches shall include full compensation for: all Work described in Section 11, "Trench Excavation and Backfill," of these City Standard Specifications; abandonment of existing mains; new pipe, mainline valve, warning tape and tracer wire, appurtenance and fitting materials; installation of new pipe, mainline valve, warning tape and tracer wire, appurtenances and fittings; disinfection; pressure and leakage testing; and restoration of all asphaltic and concrete surfaces affected by the trenching operation.

The contract price of new water services shall include full compensation for: all Work described in Section 11, "Trench Excavation and Backfill," of these City Standard Specifications; the abandonment of existing services; new materials including service line, fittings, warning tape, and tracer wire, appurtenances and meter box (excludes new meter to be provided by City as necessary); connections to the water main and private water service; installation of all water service materials; and restoration of all asphaltic and concrete surfaces.

The price of new water main tie-ins to existing water mains shall include new closure pipe, fittings and valve materials, and installation including trenching, backfill and pavement restoration per Section 11, "Trench Excavation and Backfill," of these City Standard Specifications and as defined in the details of the Project Plans.

The contract price of new fire hydrant installations shall include full compensation for: the fire hydrant, breakaway spool, bury elbow, piping, and valve materials, installation of materials, connection to the main, and restoration of all asphaltic and concrete surfaces.

SECTION 15. CONCRETE IMPROVEMENTS

15-01 - General

The Contractor shall provide all materials, equipment, and labor to furnish and install all concrete improvements, including concrete curbs, gutters, valley gutters, sidewalks, ADA access ramps, ADA detectable warning surfaces, bus turnouts, driveways, median nose surfacing, pads, miscellaneous concrete footings, and all appurtenant work, complete in place, as specified in these City Standards.

15-02 - Materials

15-02A - Portland Cement Concrete

Portland cement concrete for all concrete surface improvements shall be minor concrete in conformance with Section 90, "Concrete," of the State Standard Specifications and shall have a maximum slump of three inches (3"). Portland cement concrete shall be composed of Portland cement, fine aggregate, coarse aggregate, admixtures if approved by the Engineer, and water, proportioned and mixed as specified in these City Standard Specifications.

The maximum water-to-cement ratio shall be 0.50. Minimum twenty-eight (28) day compressive strength shall be three thousand (3,000) psi. The air content shall be zero to 3 percent (0-3%). Maximum concrete temperature shall not exceed eighty-five degrees (85º) Fahrenheit or per ACI 305. Minimum concrete temperature shall not drop below fifty-five degrees (55º) Fahrenheit or per ACI 305. Maximum Time of batch one and one half (1.5) hours or per ACI 305/306. Maximum number of revolutions: two hundred-fifty (250).

15-02B - Lampblack and Other Admixtures

Lampblack shall be of an approved quality, mixed at the rate of one (1) pint per cubic yard of minor concrete mix, and shall be used in Hardscape concrete applications only.

Use of concrete admixtures shall be in conformance with Section 90-1.02E, "Admixtures," of the State Standard Specifications and only upon the approval of the Engineer.

15-02C - Curing Compounds

Materials for curing concrete shall be in conformance with Section 90-1.03B (3), "Curing Compound Method," of the State Standard Specifications. All curing compounds shall be of the non-pigmented type with fugitive dye in conformance with ASTM C 309, Type 1-D, Class A.

15-02D - Base Material

Granular material used as a base cushion shall be Class 2, three-fourths inch (3/4") maximum size aggregate in conformance with Section 26, "Aggregate Bases," of the State Standard Specifications.

15-02E - Reinforcement and Dowels

Steel bar for concrete reinforcement and dowels shall be deformed billet-steel bars of the size or sizes as specified on the Project Plans and shall conform to the requirements of ASTM A 615 for Grade 40 or Grade 60 bars.

Sidewalk, driveways, and curb and gutter shall have a minimum of #3 bar spaced at sixteen inches (16”) on center.

15-02F - Fiber Reinforcement

Fibrous Reinforcement shall be used for all curbs and gutters, sidewalks and driveways.

Fibrous Reinforcement shall be delivered in bagged reinforcing fibers in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name, manufacturer, and weight of fibers. Store reinforcing fibers in dry area in accordance with manufacturer's instructions. Keep bags sealed until ready for use. Protect reinforcing fibers during handling to prevent contamination.

Add reinforcing fibers into concrete mixture in accordance with manufacturer's instructions and ASTM C 94. Mix synthetic fiber reinforcement in concrete mixer in accordance with mixing time and speed of ASTM C 94 to ensure uniform distribution and random orientation of fibers throughout concrete. Allow a minimum of four (4) minutes at mixing speed.

Fibrous Reinforcing shall be a micro-synthetic fibrillated fiber, ASTM C1116/C1116M, Type III Fiber reinforcement, Sika Fibermesh 300, or approved equal. Shall be added at a one point 5 to three pound per cubic yard (1.5 to 3 lb/cu yd).

15-02G - Surface Applied Detectable/Tactile Warning Surfaces

This Section specifies furnishing and installing Surface Applied Detectable/Tactile Warning Surface Tiles where indicated. Not recommended for asphalt applications.

15-02G.01 - Submittals

Submit manufacturer’s literature describing products, installation procedures, and routine maintenance.

15-02G.02 - Quality Assurance

Surface-Applied Detectable/Tactile Warning Surface Tiles shall be from California Department of Transportation Authorized Material List and shall be held to the latest standard approved by the California State Architect.

Americans with Disabilities Act (ADA): Provide Surface Applied Detectable/Tactile Warning Surface Tiles that comply with the detectable warnings on walking surfaces section of the Americans with Disabilities Act (Title III Regulations, 28 CFR Part 36 ADA STANDARDS FOR ACCESSIBLE DESIGN, Appendix A, Section 4.29.2 DETECTABLE WARNINGS ON WALKING SURFACES).

California Code of Regulations (CCR): Provide only approved DSAAC detectable warning products as provided in the California Code of Regulations (CCR) Title 24, Part 2, Section 202 definition of" Detectable Warning." Section 1116A.5 and 11B-406.5.12 for" Curb Ramps", 11B-406.6 at "Islands" and Section 11B-705 for "Detectable Warnings and detectable directional texture."

Vitrified Polymer Composite (VPC) Surface Applied Detectable/Tactile Warning Surface Tiles shall be an epoxy polymer composition with an ultraviolet stabilized coating employing aluminum oxide particles in the truncated domes. The tile shall incorporate an in-line pattern of truncated domes measuring nominal two-tenths inch (0.2") height, nine-tenths inch (0.9") base diameter, and forty-five hundredths-inch (0.45") top diameter, spaced center-to-center two and thirty five hundredths inches (2.35") as measured on a diagonal and one and sixty seven hundredths inches (1.67") as measured side by side. For wheelchair safety, the field area shall consist of a non-slip surface with a minimum of 40 - 90° raised points forty-five thousandths inch (0.045") high per square inch;" Armor-Tile" as manufactured by Engineered Plastics Inc., Tel: 800-682-2525, or approved equal.

15-02G.03 - Manufacturers

The Vitrified Polymer Composite (VPC) Surface Applied Detectable/Tactile Warning Surface Tile specified is based on Armor-Tile manufactured by Engineered Plastics Inc. (800-682-2525). Existing engineered and field-tested products, which have been in successful service for a period of three (3) years, are subject to compliance with requirements, may be incorporated in the work, and shall meet or exceed the specified test criteria and characteristics.

Color: Yellow conforming to Federal Color No. 33538 unless noted otherwise and shall be homogeneous throughout the tile

Fasteners: Color-matched, corrosion-resistant, flat head drive anchor: one-quarter inches (¼") diameter by one- and one-half inches (1 ½") long as supplied by Engineered Plastics Inc.

Adhesive: Armor-Bond as supplied by Engineered Plastics Inc.

Sealant: Armor-Seal as supplied by Engineered Plastics Inc.

15-02G.04 - Installation

During all surface preparation and Surface Applied Detectable/Tactile Warning Surface Tile installation procedures, ensure adequate safety guidelines are in place and that they are in accordance with the applicable industry and government standards.

The installation of all tiles, adhesives, mechanical fasteners, and caulking shall be in strict accordance with the guidelines set by the manufacturers.

15.03 - Construction

Concrete improvements shall be constructed in accordance with the Special Provisions and Project Plans, City Standard Specifications, all applicable City Standard Details, and Section 73, "Concrete Curbs and Sidewalks," of the State Standard Specifications.

When the Project Plans require monolithic curb, gutter, and sidewalk, the Contractor shall place concrete for the curb, gutter, and sidewalk as one (1) continuous pour.

Where new concrete is placed against existing concrete, the existing concrete shall be drilled and dowelled with steel dowels or reinforcing steel. The dowels or reinforcing steel shall be set into the existing concrete with adhesive. Dowel or reinforcing steel size and spacing shall be according to the following schedule (HIT-HY10 or approved equal):

Application	Bar Size	Length, Inches	Dowel Spacing, Inches
Sidewalk	4	12	18
Sidewalk to curb	4	12	18
Curb and gutter	4	12	3 per curb

Batch weight tickets to be included with delivery ticket. Batch weight tickets shall include weights/volumes of all materials included in the mix including admixtures and time of batch. Delivery and batch weight tickets shall have approved mix design number, date, and any additional water added after batching written on the sheets.

Concrete shall be placed per ACI 306 “Cold Weather Concreting” if applicable per the discretion of the City. ACI 306 may apply if the average daily air temperature is less than forty degrees (40^{o}) Fahrenheit and the air temperature is not greater than fifty degrees (50^{o}) Fahrenheit for more than one-half (1/2) of any twenty-four (24) hour period.

Concrete shall be placed per ACI 305 “Hot Weather Concreting” if applicable per the discretion of the City. ACI 305 may apply if any combination of the following conditions occurs that tends to impair the quality of the freshly mixed or hardened concrete:

- High ambient temperature, temperature above ninety degrees (90º) Fahrenheit
- High concrete temperature, temperature above eighty-five degrees (85º) Fahrenheit
- Low relative humidity, humidity less than thirty percent (30%)
- Wind speed greater than ten (10) mpg
- Solar radiation (Poured in direct sunlight between 10:00 a.m. and 4:00 p.m.)

15-03A - Subgrade and Base Preparation

Subgrade and base preparation shall be constructed in accordance with Section 4, "Roadway Excavation and Grading," and Section 7, "Aggregate Base," of the City Standard Specifications.

15-03B - Saw cutting Existing Concrete Improvements

Where a portion of existing concrete surface improvements is to be removed and replaced, the section to be removed shall be sawcut with an approved concrete saw to a minimum depth of one- and one-half inches (1½"). For sidewalks, ADA access ramps, and driveways, the limit of the saw cut shall be, at a minimum, the first score line beyond the limits of the area to be replaced or as directed by the Engineer. For curb and gutter, the limit of the sawcut shall be the nearest deep joint or as directed by the Engineer.

15-03C – Forms

No forms shall be placed prior to approval of the subgrade and aggregate base by the Engineer.

Timber forms shall be surfaced on the side placed next to the concrete and shall have a true surfaced upper edge and shall not be less than one- and one-half inches (1½”) thick after being surfaced except on curb returns, horizontal curves, and vertical curves where laminated timber forms, bender boards, or thin plank forms may be used.

The depth of forms for the toe and back of curbs shall be equal to the full depth of the curb. The depth of the face forms for concrete curbs shall be equal to the full-face height of the curb.

Forms shall be carefully set to alignment and grade and shall conform to the required dimensions. Forms shall be held rigidly in place by stakes. Clamps, spreaders, and braces shall be used where required to ensure rigidity in the forms.

15-03D - Portland Cement Concrete

No concrete shall be placed until the subgrade, aggregate base, forms, reinforcement, and curb-through drains have been approved by the Engineer.

Concrete improvements shall not exceed the tolerances established in Section 73, "Concrete Curbs and Sidewalks," of the State Standard Specifications.

15-03E - Deep Joints and Score Lines

Deep joints and score lines shall be placed at the interval spacing according to the City Standard Details. Deep joints shall be a maximum of one- and one-half inches (1½") in depth. Score lines shall be maximum one-quarter inch (1/4") in depth. Expansion joints shall not be allowed.

15-03F - Water Test

All curb and gutter work shall be water-tested before the final finish.

15-03G - Sidewalk Slope

Sidewalk shall drain toward the street, with a maximum slope of one-quarter inch (1/4") per foot.

15-03H - Extruded Curb

Extruded curbs shall only be allowed upon approval of the Engineer. Extruded curb construction shall conform to Section 73-2.03C, "Extruded or Slip Formed Methods," of the State Standard Specifications.

15-03I - Finishes

All concrete surface improvements, except miscellaneous concrete footings, shall receive a soft broom finish. The sidewalk shall be broomed transverse to the curb, and the curb and gutter shall be broomed longitudinally.

15-03J - Curing

All exposed surfaces of Portland cement concrete shall be cured in conformance with Section 90-1.03BC, "Curing Compound Method," of the State Standard Specifications.

15-04 - Measurement

Concrete sidewalk, driveways, bus turnouts, median nose surfacing, and sidewalk and driveway conforms shall be measured on the basis of square footage. Concrete curb and gutter and valley gutters shall be measured on the basis of linear feet including driveways. ADA access ramp shall be measured and counted as a complete unit in place and shall include the fronting curb and gutter, the truncated domes, the retaining curb(s) at the back or at the sides, and the potential enlargement of the side areas up to the nearest expansion joints.

Surface applied detectable warning surface tile shall be measured by the number completed in place. In the event that an existing ramp used more than one regular sheet of surface-applied detectable/tactile warning surface to complete the installation per plan, the Contractor understands that this shall be measured as one complete installation.

15-05 - Payment

The contract price for concrete surface improvements, including concrete curbs; gutters; valley gutters; sidewalks; ADA access ramps; bus turnouts; driveways; median nose surfacing; and walk and driveway conforms shall include full compensation for concrete saw cutting; aggregate base; forms; reinforcement; adhesive; dowels; Portland cement concrete; scoring; water-testing; final finish work; and curing of concrete surface improvements complete in place.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in the installation of detectable warning surface to existing access ramps (surface-applied) shall be considered included in the unit price bid for Install Detectable Warning Surface to Existing Access Ramp (Surface-Applied) and no additional compensation shall be, therefore, allowed.

SECTION 16. STREET NAME AND TRAFFIC SIGNS

16-01 - General

This section covers requirements for materials and methods of installation of street name signs and traffic signs.

Street name signs shall be in accordance with these City Standard Specifications and Detail Nos. 116 through 122 of the City Standard Details.

Traffic signs shall be in accordance with these City Standard Specifications; Detail No. 120, "Traffic Sign," of the City Standard Details; Section 82, “Signs and Markers” in the State Standard Specifications and shall conform to the requirements of the latest edition of the California Manual on Uniform Traffic Control Devices (CA MUTCD). The CA MUTCD is available on the State Department of Transportation website via the following link: https://dot.ca.gov/programs/safety-programs/camutcd. Unless otherwise noted, all signs shall be of "Standard" size.

16-02 - Materials

Fabrication of all metal parts shall be accomplished in a uniform and workmanlike manner. The tolerance of the panels shall be plus or minus one thirty-second of an inch (1/32”). Panels shall be cut to size and shape and shall be free of buckles, warp, dents, cockles, burrs, and any other defects resulting from fabrication. The surface of all sign panels shall be flat.

All sign plates shall be eight hundredths inches (0.080”) of aluminum alloy.

The cantilever bracket supports for all signs installed on round street light standards shall conform to the requirements of SIGNFIX Cantilever Sign System or equal. For sign blanks up to twenty inches (20") in length, with a maximum area of two square feet, use SIGNFIX Stainless Steel Mini Cantilever Brackets, with five-eighths inch (5/8’) stainless steel band and buckle BAND-IT or equal. For sign blanks up to forty-two inches (42") in length, with a maximum area of six square feet, use SIGNFIX V-Back Aluminum Cantilever Brackets with five-eighths inch (5/8”) stainless steel band and buckle BAND-IT or equal.

All signs are to be of Diamond grade reflectivity. HIP reflective is not allowed.

16-02A - Signs

Street name signs shall be nine inches (9") wide by 24 inches (24") minimum length and may be up to 36 inches (36") long when necessary to accommodate the sign legend, and lettering shall be six inches (6") in height. The sign shall include the abbreviated street category and block number, each three inches (3") in height. Street name and category letters and block numbers shall be orientated as shown in Detail Nos. 117, "Street Name Sign," and 119, “Arch Street Name Sign,” of the City Standard Details. The sign background shall be green with reflective white lettering. All plates shall have a one-half-inch (½") radius on the

corners. All signs shall be sheeted with 3M's DG3 and 3M's EC film in appropriate colors. All Arch Street Name signs shall be purchased from the City of Pleasanton Sign Shop. Standard Street Name signs may also be purchased from the City of Pleasanton Sign Shop. Contact the Street Maintenance Division at (925) 931-5551 to place orders or obtain pricing.

Traffic sign materials shall conform to Section 82-2, "Sign Panels" of the State Standard Specifications.

Sign is not allowed to be installed on PG&E poles or in biofilter system area.

R4-7 and Keep Right sign shall be mounted six inches (6") above finished grade on median island nose.

16-02B - Posts and Mounting Hardware

Posts shall be two inch (2") standard-weight galvanized iron pipe with a thickness dimension of one hundred fifty-four thousandths inches (0.154"). Mounting hardware for street name signs shall be Hawkins Heavy Duty Aluminum "Slotted Lock," (HD)SL or approved equal.

Posts for signs located in the clear zone shall be square formed steel tube, telescoping metal breakaway type, Unistrut Sign Support System or equal. Tubing shall be twelve (12) gauge strip steel, structural quality, conforming to ASTM A-570 Grade 33. Galvanized tubing shall be twelve (12) gauge strip steel, structural quality, conforming to ASTM A 446 Grade A; hot-dipped galvanized with a one and twenty-five hundredths (1.25) ounce zinc coat, interior and exterior, conforming to ASTM C 653 coating designation G90; and the corner welds shall be zinc coated after scarifying operations.

Hardware for formed steel tube posts shall conform to the requirements of Unistrut Telespar Sign Support System or equal. Drive rivets shall be Unistrut TL 3806 or equal.

Posts for traffic signs in all other areas shall be two inch (2") standard-weight galvanized iron pipe with thickness dimension of one hundred fifty-four thousandths inches (0.154") as shown on Detail No. 117, "Street Sign Post," of the City Standard Details. Under certain conditions as determined and approved by the Engineer, posts may also be four-inch by four-inch (4" x 4") redwood construction heart S4S, per the CA MUTCD.

Hardware for galvanized iron pipe posts shall be Hawkins sign bracket #M2-C2B with vandal proof bolt M2G-BTP or equal.

Surface mount is allowed only upon approval. See City Standard Detail for surface mount requirements.

16.03 – Construction

All sign locations shall be inspected and approved by the Engineer prior to installation. The Contractor shall notify the Engineer no later than forty-eight (48) hours prior to the start of the scheduled sign installation. The Contractor shall contact Underground Services Alert (USA)/ usanorth811.org at 811 to request marking of all underground facilities known to be in the area of construction. All reference markings made by the Contractor shall be done with spray chalk and shall be removed by the Contractor after the installation of the signs.

Pipe posts shall be set at least two feet (2') into the ground and shall be encased in Caltrans minor concrete poured against undisturbed earth, with a minimum thickness of six inches (6") of concrete outside the pipe at any point.

For posts installed in existing sidewalks, a six inch (6") core shall be drilled, the anchor installed, the core filled with Caltrans minor Portland cement concrete. Existing surface other than Portland cement concrete shall be replaced in kind, with the replacement matching the existing product, depth and pattern, to the satisfaction of the Engineer. The sleeve shall be protected such that concrete will not enter the inside of the square post.

Signs on street light standards shall be installed using cantilever support brackets in accordance with the manufacturer's recommendations. Cantilever bracket system shall be installed on both the top and bottom of each sign.

16-03A - Street Name Signs

Street name signs shall consist of an assembly of one, two, or three street name plates, as appropriate. There shall be at least one (1) street name sign assembly installed at each undivided street intersection and at least two (2) street name sign assemblies installed at each divided street intersection. The street name signs shall be installed at the locations shown on the Project Plans. If specific locations are not indicated on the Project Plans, then the street name signs shall be installed in the quadrant of the intersection at the lower end of the block represented by the particular block number.

Signs shall be mounted one over the other on the top of a two-inch (2") (inside diameter) standard weight galvanized iron pipe post.

16-03B - Traffic Signs

Traffic sign types, locations, and offsets shall be in accordance with the Project Plans.

Traffic signs supported by pipe posts shall be installed in accordance with Detail No. 117, "Street Sign Post," of the City Standard Details and Sections 82-2.03, "Construction," of the State Standard Specifications. Traffic signs supported by wood posts shall also be installed in accordance with Sections 82-2.03, "Construction," of the State Standard Specifications.

Traffic signs supported by formed steel tubes shall be installed in accordance with the requirements of Unistrut Telespar Sign Support System or equal.

16-04 - Measurement

Street name and traffic signs shall each be measured by the number of items.

16-05 - Payment

The contract price for street name and traffic signs shall include full compensation for street name and traffic sign plates, reflective sheeting, lettering, posts and mounting complete in place.

SECTION 17. TRAFFIC STRIPES AND PAVEMENT MARKINGS

17-01 - General

Traffic stripes shall be either thermoplastic or raised pavement markers as shown on the Project Plans. Thermoplastic traffic stripes shall be in accordance with Section 84-2, "Traffic Stripes and Pavement Markings," of the State Standard Specifications. Raised pavement markers shall be in accordance with Section 81-3, "Pavement Markers" of the State Standard Specifications. All legends, crosswalks, arrows, and other pavement markings shall be thermoplastic in accordance with Section 84-2, "Traffic Stripes and Pavement Markings," of the State Standard Specifications. Details for traffic stripes and pavement markings shall be in conformance with A20A through A24F of the State Standard Plans.

17-02 - Materials

17-02A - Thermoplastic

Thermoplastic material shall conform to the requirements of Section 84 of the State Standard Specifications.

17-02B - Paint

Paint shall only be used for traffic stripes and pavement markings when shown on the Project Plans and approved by the Engineer. All concrete surfaces shall be done in paint. Paint for traffic stripes and pavement markings shall conform to Section 84, "Materials," of the State Standard Specifications.

17-02C - Pavement Markers

Pavement marker materials shall conform to Sections 81-3, “Pavement Markers” of the State Standard Specifications. Non-reflective pavement markers shall be ceramic. The adhesive used for pavement markers shall be the rapid-set type conforming to Section 95, "Epoxy," of the State Standard Specifications or hot melt bituminous adhesive conforming to Section 81-3.02D, “Hot Melt Bituminous Adhesives,” of the State Standard Specifications.

17-02D - Color Cycle Lanes

Color Cycle Lane (green bike lane pavement marking) shall be StreetBondCL Celtic Green or approved equals

17-02 - Bike Bollards

Bicycle Bollards shall be US Reflector K71 Traffic Post Bright Green with high intensity white reflective film and bright green caps. Bicycle Bollards shall be mounted using manufacturer supplied metal anchor sleeves. Metal anchor sleeves shall be epoxied in place using a two-part epoxy as approved by the Engineer.

17-03 – Construction

Approximate locations of all traffic stripes and pavement markings are shown on the Project Plans. Exact locations shall be approved by the Engineer before placement.

Traffic stripes and pavement markers shall be placed in accordance with the control lines established by the plans Project Plans, or as directed by the Engineer.

Temporary striping and markings shall conform to Section 2-01F, "Temporary Pavement Delineation," of these City Standard specifications. Temporary striping on milled surface shall be painted.

All layouts shall be inspected and approved by the Engineer prior to the permanent placement of the traffic stripes and pavement markings. The Contractor shall notify the Engineer no later than two (2) working days prior to the start of the scheduled traffic stripes and pavement marking installation.

On arterial streets all permanent lane lines and stop bars shall be installed within 10 calendar days of new pavement surfaces.

Any overlap, dripping, or tracking of fresh thermoplastic or paint onto unmarked surfacing shall be removed to the satisfaction of the Engineer.

Any layout markings or cat-tracking remaining after installation of the permanent marking shall be removed or painted over at the direction of the Engineer.

Thermoplastic and paint shall be placed as close as possible to existing utility structures and monument frames and covers without covering them.

The Contractor shall protect all fresh thermoplastic and paint after installation. All damage to traffic stripes and/or pavement markings caused by the Contractor's failure to do so shall be repaired or replaced at the Contractor's own expense.

Centerline striping shall be six inches (6”) wide.

Color cycle lane coating application shall be done per the manufacturer’s guidelines and recommendations. Two (2) coats are required at minimum.

Color cycle pavement boxes adjacent to the Detail 39A striping should be in line with each Detail 39A dash. i.e., each box shall be four feet (4’) long, spaced eight feet (8’) apart, and as wide as the bike lane.

Color cycle lanes shall not be placed on the existing concrete gutter.

All median curb faces (nose) shall be painted with reflective paint. Median noises shall be yellow and pork chop islands shall be white. It shall include the full radius of the median returning two feet after the radius.

17-03A - Removal

All removed traffic stripes and pavement markings and excess material shall become the property of the Contractor and shall be removed and disposed of in a legal and proper manner in accordance with Section 15, "Existing Facilities," of the State Standard Specifications.

The Contractor shall not damage existing pavement and public improvements to remain. Any resultant damage shall be repaired by the Contractor at the Contractor's expense. Damage to the pavement resulting from removal of pavement markers shall be considered as any depression more than one-quarter inch (1/4”) in depth. Such damage shall be repaired by the Contractor by filling the depression with hot bituminous adhesive to the satisfaction of the Engineer.

Where sand blasting is used for removal of traffic stripes and pavement markings or objectionable material, the sand residue including dust shall be removed immediately after contact between the sand and the surface being treated. Such removal shall be by a vacuum attachment operating concurrently with the blast cleaning operation. Where removal of traffic stripes and pavement markings is done by grinding or sandblasting methods, the affected pavement surface shall be completely covered by applying asphaltic emulsion conforming to Section 94, "Asphaltic Emulsions," of the State Standard Specifications.

All temporary traffic stripes and pavement markings shall be removed by the Contractor after placement of permanent striping and markings on the same day.

17-03A.1 - Hazardous Materials

The existing yellow thermoplastic/paint striping is understood and assumed to contain lead. Any work that disturbs the existing paint system will expose workers to health hazards and will (1) produce debris containing heavy metal in amounts that exceed the thresholds established in Titles 8 and 22 of the California Code of Regulations or (2) produce toxic fumes when heated. All debris produced when the existing paint system is disturbed shall be contained.

Debris Containment and Collection Program

Prior to starting work, the Contractor shall submit a debris containment and collection program prepared by a CIH (Certified Industrial Hygienist) to the Engineer in conformance with the provisions in Section 5-1.02, “Contract Components,” of the State Standard Specifications, for debris produced when the existing yellow thermoplastic/paint striping is disturbed. The program shall identify materials, equipment, and methods to be used when the existing yellow thermoplastic/paint

striping is disturbed and shall include removal and collection methodologies, work area monitoring, and worker safety considerations.

At the option of the Contractor, the removal shall consist of either: (1) scraping with mechanical equipment with vacuum recovery and wet wiping if necessary, (2) high-pressure water removal with full vacuum recovery, or (3) an equivalent method approved by the CIH and the City. The containment system shall contain all water, resulting debris, and visible dust produced when the existing yellow thermoplastic/paint striping is disturbed.

If the measures being taken by the Contractor are inadequate to provide for the containment and collection of debris produced when the existing yellow thermoplastic/paint is disturbed, the Engineer will direct the Contractor to revise the operations and the debris containment and collection program. The directions will be in writing and will specify the items of work for which the Contractor's debris containment and collection program is inadequate. No further work shall be performed on the items until the debris containment and collection program is adequate and, if required, a revised program has been approved for the containment and collection of debris produced when the existing yellow thermoplastic/paint striping is disturbed.

The Engineer will notify the Contractor of the approval or rejection of the debris containment and collection program or revised program within two (2) weeks of its receipt.

The City will not be liable to the Contractor for failure to approve all or any portion of an originally submitted or revised debris containment and collection program, nor for delays to the work due to the Contractor's failure to submit an acceptable program.

Full compensation for the debris containment and collection program shall be considered as included in the contract prices paid for various items of work causing the existing yellow thermoplastic/paint striping to be disturbed, and no additional compensation shall be allowed, therefore.

Safety and Health Provisions

Attention is directed to Section 7-1.02K, "Occupational Safety & Health Standards," of the Standard Specifications. Work practices and worker health and safety shall conform to the California Code of Regulations, Title 8, Construction Safety Orders, including Section 1532.1 "Lead."

The Contractor shall furnish the Engineer with a written Code of Safe Practices and shall implement an Injury and Illness Prevention Program and a Hazard Communication Program in conformance with the requirements of Construction Safety Orders, Section 1509 and 1510.

Prior to starting work that disturbs the existing yellow thermoplastic/paint striping, and when revisions to the program are required by Section 1532.1, "Lead," the Contractor shall submit the compliance programs required in subsection (e) (2), "Compliance Program," of Section 1532.1, "Lead," of the Construction Safety Orders to the Engineer in conformance with the provisions in Section 5-1.02, "Contract Components," of the Standard Specifications. The compliance program shall include the data specified in subsections (e) (2) (B) and (e) (2) (C) of Section 1532.1, "Lead." Approval of the compliance programs by the Engineer will not be required. The compliance programs shall be reviewed and signed by a Certified Industrial Hygienist (CIH) who is certified in comprehensive practice by the American Board of Industrial Hygiene (ABIH). Copies of all air monitoring or job site inspection reports made by or under the direction of the CIH in conformance with Section 1532.1, "Lead," shall be furnished to the Engineer within twenty-four (24) hours after monitoring or inspection.

Full compensation for furnishing the Engineer with the submittals and for implementing the programs required by this safety health section shall be considered as included in the contract prices paid for items of work causing the existing yellow thermoplastic/paint striping to be disturbed, and no additional compensation shall be allowed, therefore.

Debris Handling

Debris produced when the yellow thermoplastic/paint striping is disturbed shall not be temporarily stored on the ground. Debris accumulated inside the containment system shall be removed before the end of each work shift. Debris shall be stored in approved, leakproof containers and shall be handled in such a manner that no spillage shall occur.

Disposal of debris produced when the existing paint system is disturbed shall be performed in conformance with all applicable Federal, State and local hazardous waste laws. Laws that govern this work include:

- Health and Safety Code, Division 20, Chapter 6.5 (California Hazardous Waste Control Act.)
- Title 22; California Code of Regulations, Division 4.5, (Environmental Health Standards for the Management of Hazardous Waste).
- Title 8, California Code of Regulations.

Except as otherwise provided herein, debris produced when the existing yellow thermoplastic/paint striping is disturbed shall be disposed of by the Contractor at an approved Class 1 disposal facility in conformance with the requirements of the disposal facility operator. The debris shall be hauled by a transporter currently registered with the California Department of Toxic Substances Control using correct manifesting procedures and, in a vehicle, displaying current certification of

compliance. The Contractor shall make all arrangements with the operator of the disposal facility and perform any testing of the debris required by the operator.

At the option of the Contractor, the debris produced when the existing yellow thermoplastic/paint is disturbed may be disposed of by the Contractor at a facility equipped to recycle the debris, subject to the following requirements:

- The debris produced when the existing yellow thermoplastic/paint striping is disturbed shall be tested by the Contractor to confirm that the solubility of the heavy metals is below regulatory limits, and that the debris may be transported to the recycling facility as a non-hazardous waste.

- The Contractor shall make all arrangements with the operator of the recycling facility and perform any testing of the debris produced when the existing yellow thermoplastic/paint striping is disturbed that is required by the operator.

- Full compensation for debris handling and disposal shall be considered as included in the contract prices paid for items of work causing the existing yellow thermoplastic/paint striping to be disturbed, and no additional compensation shall be allowed, therefore.

Work Area Monitoring

The Contractor shall perform work area monitoring of the ambient air and ground surfaces in and around the work area to verify the effectiveness of the containment system. The work area monitoring shall consist of collecting, analyzing, and reporting air and sample testing results and recommending the required corrective action when specified exposure levels are exceeded. The work area monitoring shall be carried out under the direction of a CIH hired and compensated for by the Contractor. The samples shall be collected at locations designated by the Engineer.

Air samples shall be collected and analyzed in conformance with National Institute for Occupational Safety and Health (NIOSH) methods. Air samples for lead detection shall be collected and analyzed in conformance with NIOSH Method 7082, with a limit of detection of at least five tenths (0.5) microgram per cubic meter. Air samples for detection of other metals shall be collected and analyzed in conformance with NIOSH Method 7300, with a limit of detection of at least one percent (1%) of the appropriate Permissible Exposure Limits (PELs) specified by the California Occupational Safety and Health Administration (Cal/OSHA). Alternative methods of sample collection and analysis, with equivalent limits of detection, may be used at the option of the Contractor, if approved by the Engineer.

The airborne metals exposure, outside either the containment system or work areas, shall not exceed the lower of either: (1) ten percent (10%) of the Action Level specified for lead by Section 1532.1, “Lead,” of the Construction Safety Orders, or

(2) ten percent (10%) of the appropriate Permissible Exposure Levels (PELs) specified for other metals by Cal/OSHA.

The air samples shall be collected at least once per each location during progress of work that disturbs the existing yellow thermoplastic striping. All air samples shall be analyzed within twenty-four (24) hours at a facility accredited by the Environmental Lead Laboratory Accreditation Program of the American Industrial Hygiene Association (AIHA). The Contractor shall obtain procedure compliance from the CIH by performing on-site operation before proceeding to other locations in the City. When corrective action is recommended by the CIH, Contractor shall revise all procedure and testing at Contractor's expense.

Air sample laboratory analysis results, including result of additional samples taken after corrective action as recommended by the CIH, shall be submitted to the Engineer. The results shall be submitted both verbally within twenty-four (24) hours after sampling and in writing with a copy to the Contractor, within two (2) days after sampling. Sample analysis reports shall be prepared by the CIH as follows:

- For the sample laboratory analysis results, the date and location of sample collection, sample number, contract number, street location, and section and sheet number on plan will be required.

- For air sample laboratory analysis, the following will be required:

    1. List of emission control measures in place when air samples were taken.
    2. Air sample results shall be compared to the appropriate PELs.
    3. Chain of custody forms.
    4. Corrective action recommended by the CIH to ensure airborne metals exposure outside either the containment system or work areas is within specified limits.

17-03B - Thermoplastic

Thermoplastic traffic stripes and pavement markings shall be installed in accordance with Section 84-2.03, "Construction," of the State Standard Specifications with the exception that only the extrusion application method shall be allowed. Thermoplastic material for traffic stripes and pavement markings shall be applied at a minimum thickness of 0.100 inch.

17-03C - Painted Stripes

Painted traffic stripes and pavement markings shall be installed in accordance with Section 84-2.03C(3), "Painted Traffic Stripes and Pavement Markings," of the State Standard Specifications.

17-03D - Pavement Markers

Pavement markers shall be installed in accordance with Section 81-3 "Pavement Markers," of the State Standard Specifications. The adhesive used for pavement markers shall be the rapid-set type conforming to Section 95, "Epoxy," of the State Standard Specifications, or hot melt bituminous adhesive conforming to Section 81-3.02D, “Hot Melt Bituminous Adhesives,” of the State Standard Specifications.

Raised pavement markers shall be installed on the 14th calendar day after asphalt concrete is placed.

Blue raised pavement markers shall be installed opposite fire hydrants, according to the City Standard Details.

17-04 - Measurement

Traffic stripes shall be measured by the linear foot. Thermoplastic legends shall be measured by the square foot, as provided for in the State Standard Plans. Hydrant markers shall be measured by the number of markers.

17-05 - Payment

The contract price for traffic stripes and pavement markings shall include full compensation for: removing existing traffic striping and pavement markings; establishing alignment and layout work; application of thermoplastic complete in place; placing reflective pavement markers including adhesives complete in place; and cleanup including removal and disposal of residue from grindings or recess construction, including monitoring by a Certified Industrial Hygienist (CIH).

SECTION 18. STREET LIGHTING

18-01 - General

The Contractor shall furnish and install standard streetlights per the Project Plans, Special Provisions, these City Standard Specifications, the City Standard Details, and the provisions in Section 86, "Electrical Work," of the current edition of State Standard Spe.

The locations of PG&E service drops are shown on the Project Plans.

All poles, mast arms, pole foundations, conduits, pull lines, wiring, luminaires, and pull boxes shall be supplied and installed by the Contractor and shall meet the requirements of the Project Plans, Special Provisions, these City Standard Specifications, the City Standard Details and the provisions in Section 86, "Electrical Work," of the current edition of State Standard Specifications.

All poles, mast arms, pole foundations, conduits, pull lines, wiring, luminaires, and pull boxes shall be subject to inspection by the City.

18-01A - Scope

The Contractor shall install streetlights and underground service to the PG&E service point and terminate conduit and wiring in boxes as shown on the Project Plans.

All work and materials shall be in full accordance with the latest rules and regulations of the State Fire Marshall; all applicable City, County, State, and Federal Regulations; the latest standards of IEEE, ASA, NEC, and OSHA where applicable; in Section 86, "Electrical Work," of the current edition of State Standard Specifications; and as modified in these City Standard Specifications.

In addition to complying with all applicable codes and regulations as noted above, the Contractor shall comply with all local utility company regulations.

18-02 - Materials

A certificate of compliance shall be required for all material prior to delivery to the project site.

Conduit, which is installed underground, shall be rigid, nonmetallic type, one-and-one-half inches (1½"), Schedule forty (40) minimum. Conduit shall enter all pull boxes with a ninety degree (90°) degree elbow, unless otherwise permitted by the Engineer.

All street light wiring shall be Type THW No. 8 copper wire rated to operate at six hundred (600) volts. All fixture wiring within the pole shall be Type THW No. 10 copper wire rated to operate at six hundred (600) volts. All wire sizes are those that are minimally acceptable. Any substitution shall be approved by the Engineer prior to installation.

All street light standards shall have a No. 3.5 Pull Box adjacent to the foundation facing away from traffic unless otherwise noted.

All streetlights shall be fused with a waterproof disconnect splice connector with a five (5) Amp. Buss "TRON" fuse enclosure (or approved equal) located in a pull box next to each standard.

All street light fixtures shall have a Type IV photoelectric control mounted on top of each luminaire or the top of each pole, which plugs into an EEI-NEMA twist lock receptacle.

Brushing on PVC rigid non-metallic conduit is required per Section 347-12 of the NEC.

The Contractor shall be responsible for attaching a reflective identification number to each pole.

18-02A - LED Luminaire

This specification is for the purchase of light emitting diode (LED) roadway lighting luminaires (herein referred to as luminaires) mast-arm applications.

All devices must meet the general specifications of the Transportation Electrical Equipment Specifications (TEES), in Section 86, "Electrical Work," of the current edition of State Standard Specifications as well as the following specification. In case of conflict, this specification shall govern over the TEES, Chapter 1.

For additional luminaire specifications, please refer to the Caltrans LED Roadway specifications.

Glossary

Wherever the following terms or abbreviations are used, the intent and meaning shall be interpreted as follows:

CALiPER: Commercially Available LED Product Evaluation and Reporting A US DOE program for the testing and monitoring of commercially available LED luminaires and lights.

CCT: correlated color temperature. A visible light characteristic of comparing a light source to a theoretical, heated black body radiator. Measured in Kelvin.

Cd: Candela. Unit of measurement of light intensity.

Chromaticity: The property of color of light

fc: foot-candle. Unit of illuminance

IP: International Protection rating, sometimes referred to as ingress protection, that delineates the level at which foreign objects and water can intrude inside a device.

LED: Light Emitting Diode.

METS: Material Engineering and Testing Services of the Translab.

NEMA: National Electrical Manufacturers Association

NVLAP: National Voluntary Laboratory Accreditation Program A program under the USDOE to accredit independent testing laboratories to qualify

Power factor: The ratio of the real power component to the total (complex) power component

Rated power: The power consumption that the luminaire was designed and tested for at ambient temperature of seventy degrees (70°) Fahrenheit or twenty-one degrees (21°) Celsius)

SPD: Surge Protection Device. A subsystem or component(s) that can protect the unit against short duration voltage and current surges

TEES: Transportation Electrical Equipment Specifications. A package of standard specifications for transportation related electrical equipment to be used on State Highways. This document is compiled by Caltrans Traffic Operations Program.

THD: Total Harmonic Distortion. The amount of higher frequency power on the power line

General Requirements

Each luminaire shall consist of an assembly that utilizes LEDs as the light source. In addition, a complete luminaire shall consist of a housing, LED array, and electronic driver (power supply).

Luminaires shall be listed on the "PG&E Pre-Qualified LED Street Lighting for Rebate & Incentive Programs" list (see www.pge.com\led) unless otherwise approved by the engineer. These fixtures have been approved by the PG&E LED Street Light Program and may be eligible for rebates and incentives. Luminaires shall be the GE ERSI series unless otherwise directed by the engineer.

The LED lamps utilized in the luminaire shall be individually capable of producing white light and shall be the ultra-bright or hi-flux/hi-power type rated to produce a minimum of 70 percent (70 %) of initial intensity at fifty thousand (50,000) hours of life.

Each luminaire shall be rated for a minimum operational life of seventy-four thousand (74,000) hours of operations at an average operating time of eleven and one-half (11.5) hours per night based on their LM-80 test. Each luminaire shall be designed to operate at an average temperature of seventy (70°) Fahrenheit. The operating temperature range shall be negative forty degrees (-40°) Fahrenheit to one hundred thirty degrees (+130°) Fahrenheit.

Each luminaire shall meet all parameters of this specification throughout the minimum operational life when operated at the average nighttime temperature. The individual LEDs shall be connected such that a catastrophic loss or the failure of one LED will not result in the loss of the entire luminaire. Each luminaire shall be listed with Underwriters Laboratory, Inc. under UL 1598 for luminaires or an equivalent standard from a recognized testing laboratory.

Technical Requirements

Power Consumption
Luminaires shall not exceed the following wattages identified to replace traditional High-Pressure Sodium (HPS), Metal Halide (MH), or Mercury Vapor (MV) applications unless otherwise approved by the Engineer. Alternate applications and LED equivalents shall be approved by the Engineer.

Traditional Application Wattage	Maximum LED Luminaire Wattage
70W MV	37W
70W HPS / 100W MH	51W
100W HPS	73W
150W HPS, 175W MH	105W
200W HPS, 250W MH	147W
250W HPS, 400W MH	204W
310W HPS	204W

Operation Voltage

The luminaire shall operate from a 60 HZ ±3 HZ AC line over a voltage ranging from 95 VAC to 285 VAC. The fluctuations of line voltage shall have no visible effect on the luminous output.

The standard operating voltages are 120 VAC, 207 VAC, 240 VAC, and 277 VAC.

Power Factor

The luminaire shall have a power factor of nine-tenths (0.90) or greater.

THD

Total harmonic distortion (current and voltage) induced into an AC power line by a luminaire shall not exceed 20 percent (20%).

Surge Suppression

The luminaire on-board circuitry shall include surge protection devices (SPD) to withstand high repetition noise transients as a result of utility line switching, nearby lightning strikes, and other interference.

- The SPD shall protect the luminaire from damage and failure for transient peak voltages up to 10 kV (minimum) and transient peak currents up to 5 kA (minimum).

- SPD shall conform to UL 1449, or UL 1283, depending on the components used in the design.

- SPD performance shall be tested per the procedures in ANSI/IEEE C62.41-1992 (or current edition).

Operational Performance

The LED circuitry shall prevent perceptible flicker to the unaided eye over the voltage range specified above.

Compatibility

The luminaire shall be operationally compatible with currently used lighting control systems and photoelectric controls as detailed in 2006 Caltrans Standard Specification 86-6.07.

RF Interference

The luminaires and associated on-board circuitry must meet Class A emission limits referred in Federal Communications Commission (FCC) Title 47, Subpart B, Section 15 regulations concerning the emission of electronic noise.

Photometric Requirements

Illuminance
The use of the Illuminating Engineering Society of North America's (IESNA) publication RP-8 entitled "American National Standard Practice for Roadway Lighting" provides recommended guidelines for the design, operation and maintenance of roadway lighting systems. These guidelines are neither intended as, nor does it establish, a legal standard for roadway lighting systems.

Light Color/Quality

The City requires that LED luminaires shall have a correlated color temperature (CCT) range of 3,500K to 4,500K. Luminaires with CCT's above 4500k will not be accepted.

The color rendition index (CRI) shall be fifty (50) or greater.

Cut-Off Distribution

The luminaire shall conform to the IESNA definition of "full cutoff"

- The luminaire shall not allow more than ten percent (10%) of the rated lumens to project above eighty degrees (80°) from vertical.

- The luminaire shall not allow any of the rated lumens to project above ninety degrees (90°) from vertical.

- The luminaire IES Backlight, Uplight, Glare ("BUG") Rating shall be 1,1,1, or better.

LED luminaires on most local residential streets and two (2) lane collector streets shall produce a Type II light distribution. LED luminaires on most multilane arterial roadways and at signalized intersections shall produce a Type III light distribution. Photometric performance of the LED fixture shall be evaluated per LM-79 by a qualified independent photometric testing laboratory, and the manufacturer shall be required to submit the resulting data in "I.E.S." format and the associated photometric test report. Additionally, a photometric layout demonstrating performance to the stated parameters of this specification shall be submitted by the manufacturer.

Thermal Management

The thermal management (of the heat generated by the LEDs) shall be of sufficient capacity to assure proper operation of the luminaire over the expected useful life. The designed maximum junction temperature shall not exceed one hundred-five degrees (105°) Celsius. Thermal management shall be passive by design. The use of fans or other mechanical devices shall not be allowed. On request the manufacturer shall provide thermal tests showing that the junction temperature will not exceed one hundred-five degrees (105°) Celsius in one hundred plus degrees (100°+) Fahrenheit temperatures.

Physical and Mechanical Requirements

The luminaire shall be a single, self-contained device, not requiring on-site assembly for installation. The power supply for the luminaire shall be integral to the unit. The maximum weight of the luminaire shall be thirty-five pounds (35 lbs). The maximum effective projected area (when viewed from either side or either end) shall be one and four-tenths (1.4) square feet. The housing shall be a light or medium gray color with a flat or semi-gloss sheen.

Each housing shall be provided with a slipfitter- capable of mounting on a two inch (2") pipe tenon. The housing shall include a four (4) bolt attachment to the two inch (2") pipe tenon.

- This slip-fitter shall fit on mast-arms from 1-5/8 to 2-3/8 in (O.D.)

- The slip-fitter shall be capable of being adjusted to a minimum of plus or minus five degrees (±5°) from the axis of the tenon in a minimum of five steps (+5, +2.5, 0, -2.5, -5).

- The clamping brackets of the slip-fitter shall not bottom out on the housing bosses when adjusted within the designed angular range.

- No part of the slip-fitter mounting brackets on the luminaires shall develop a permanent set in excess of 1/32 in. when the two or four 3/8 in. diameter cap screws used for mounting are tightened to ten (10) ft-lb.

The assembly and manufacturing process for the LED luminaire shall be designed to assure all internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources. Luminaires to be mounted on horizontal mast arms, when tested in conformance with California Test 611, shall be capable of withstanding cyclic loading. The housing shall be designed to prevent the buildup of water on the top of the housing. Exposed heat sink fins shall be oriented so that water can freely run off the luminaire and carry dust and other accumulated debris away from the unit. The optical assembly of the luminaire shall be protected against dust and moisture intrusion per the requirements of IP-66 (minimum) to protect all internal components. Optical assembly, specifically the area around the LED itself, shall not have any gel or other liquids to assist in its thermal management or optics. The electronics/power supply enclosure shall be sealed and protected per the requirements of IP-54 (minimum). The receptacle shall conform to requirements of current edition of State Standard Specification 86-1.02M “Photoelectric Controls”.

Each mounted luminaire may be furnished with or without a photoelectric unit receptacle.

- If a photoelectric unit receptacle is included, a rain-tight shorting cap shall be provided and installed. The receptacle shall conform to requirements of current edition of State Standard Specification 86-1.02M “Photoelectric Controls”.

- If the luminaire housing is provided with a hole for the receptacle, the hole shall be closed, covered and sealed with weatherproof material, in a permanent manner.

When the components are mounted on a down-opening door, the door shall be hinged and secured to the luminaire housing separately from the refractor or flat lens frame. The door shall be secured to the housing in a manner to prevent its accidental opening.

Field wires connected to the luminaire shall terminate on a barrier-type terminal block secured to the housing. The terminal screws shall be captive and equipped with wire grips for conductors up to No. 6. Each terminal position shall be clearly identified.

The circuit board and power supply shall be contained inside the luminaire. Circuit boards shall conform to Chapter 1, Section 6 of the "Transportation Electrical Equipment Specifications."

- Electrolytic capacitors used in the power supplies shall be rated for negative forty degrees (-40°) Fahrenheit to two hundred twenty degrees (220°) Fahrenheit or negative forty degrees (-40°) Celsius to one hundred five degrees (+105°) Celsius), long life

greater than five thousand (> 5000 hours), and operated at no more than seventy percent (70%) of their rated voltage, and seventy percent 70% of rated current.

Materials

Housings shall be fabricated from materials that are designed to withstand a three thousand (3000) hour salt spray test as specified in ASTM Designation: B117.

Each refractor or lens shall be made from UV-inhibited high-impact plastic such as acrylic or polycarbonate and be resistant to scratching.

Polymeric materials (if used) of enclosures containing either the power supply or electronic components of the luminaire shall be made of UL94VO flame retardant materials. The lens of the luminaire is excluded from this requirement.

Paint or powder coating of the housing shall conform to the requirement of the Caltrans Standard Specifications and the Caltrans Standard Special Provisions.

Luminaire Identification

Each luminaire shall have the manufacturer's name, trademark, model number, serial number, date of manufacture (month-year), and lot number as identification permanently marked inside each unit and the outside of each packaging box.

The following operating characteristics shall be permanently marked inside each unit: rated voltage and rated power in Watts and Volt-Ampere.

Quality Assurance

The luminaires shall be manufactured in accordance with a manufacturer quality assurance (QA) program. The QA program shall include two types of quality assurance: (1) design quality assurance and (2) production quality assurance. The production quality assurance shall include statistically controlled routine tests to ensure minimum performance levels of the modules built to meet this specification and a documented process of how problems are to be resolved.

QA process and test results documentation shall be kept on file for a minimum period of seven years. LED luminaire designs not satisfying design qualification testing, and the production quality assurance testing performance requirements described below shall not be labeled, advertised, or sold as conforming to this specification. The manufacturer of the LED Street light shall be certified to ISO 9001 by a qualified accrediting body. Documentation of current ISO certification status shall be provided by the manufacturer.

Warranty

In addition to meeting the performance requirements for the minimum period of seventy-two (72) months, the manufacturer shall provide a written warranty against defects in materials and workmanship for the luminaires for a period of seventy-two (72) months after acceptance of the luminaires. Replacement luminaires shall be provided promptly after receipt of luminaires that have failed at no cost to the City.

18-03 - Construction

Trench backfill shall be imported as specified in Section 11-02B, "Pipe Embedment Material for Electric, Gas, Telephone, and Cable Utilities," of these City Standard Specifications and as shown in Detail Nos. 113, "Trench Backfill for Streets," and 506, "Street Light Standard Trench Detail & System Connection Diagrams" of the City Standard Details.

It is the Contractor's responsibility to have all installations inspected and approved prior to any backfilling.

Grounding and bonding shall properly interconnect all metal parts of the system. All connections shall be secured with lock nuts and insulated bushings.

No splices shall be permitted between pull boxes. All splices within boxes shall be watertight, Type "C" per CALTRANS Standard Plan ES-13, insulated by Method "B" or by heat-shrink tubing.

Foundation mounted street light standard shall be plumbed by adjusting the nuts on the anchor bolts before the foundation cap is placed. Shims or other similar devices for plumbing or raking will not be permitted. After plumbing the standard, anchor bolts shall be cut off one quarter inch (1/4") above nuts and the exposed surfaces shall be repaired as necessary.

All conduits shall enter or exit perpendicular to pull box walls and have no more than two hundred seventy degrees (270) in total bends between pull boxes.

It shall be the Contractor's responsibility to coordinate construction with PG&E, giving forty-eight (48) hours notice prior to the need for PG&E connection. After the connection is made, the Contractor shall initiate a five (5) day burn test.

18-04 - Measurement

Streetlights and pull boxes shall be measured by the number of items. Conduits and conductors shall be measured by the linear foot.

18-05 - Payment

The contract price for streetlights shall include full compensation for the supply and installation of the pole, mast arm, pole foundation, internal wiring, and luminaire. The contract price for conduits and conductors shall include full compensation for the supply and installation of conduits and conductors and pull lines, including trenching, backfill, surface

restoration, and termination at pull boxes. The contract price for pull boxes shall include full compensation for the supply and installation of pull boxes, including excavation, placement, backfill, and surface restoration.

SECTION 19. IRRIGATION

19-01 - General

19-01A Scope of Work

This section covers the furnishing and installation of complete irrigation systems as shown on the Project Plans and specified in the Special Provisions; connection to existing water supply lines in street, related trenching and backfilling; electrical connections to automatic irrigation controller and the guarantee.

19-01B - Purpose of Specifications

The purpose of this section of the City Standard Specifications is to accomplish the Work of installing an irrigation system which will operate in an efficient and satisfactory manner. Notwithstanding the fact that these City Standard Specifications may be deficient in setting forth a complete, detailed description, it is the responsibility of the Contractor to install the irrigation system in such a manner that it shall operate efficiently.

19-01C - Project Plans

The irrigation Project Plan is diagrammatic and is not intended to show exact locations of piping and valves. The Contractor shall locate these items as closely as possible to related curbs and edges of paving. Pipelines shown parallel in the Project Plans may be installed in one trench.

Sprinkler heads are shown accurately and shall be installed as indicated by the center of the symbol. Discrepancies in dimensions or sizes of areas to be irrigated shall be brought to the attention of the Engineer prior to trenching.

Locations of bubblers, backflow preventers, valves and other equipment are shown in the approximate locations intended and shall be installed as indicated in the detail drawings. Discrepancies in dimensions or sizes of areas to be irrigated shall be brought to the attention of the Engineer prior to installation.

19-01D - Damage to Property

Prior to the start of construction, the City and Contractor shall perform an irrigation test to determine that all existing equipment is working properly. All deficiencies shall be repaired by the City and shall be noted by both the City and Contractor. At the end of the job, a final check shall be performed. The Contractor shall be responsible to repair any deficiencies that did not exist prior to the start of construction.

Any property including existing buildings, equipment, piping, pipe covering, sewers, sidewalks, landscaping, etc., damaged by the Contractor during the course of its work shall

be replaced or repaired by the Contractor in a manner satisfactory to the Engineer and at the Contractor's sole expense and before final payment will be made.

19-01E - Damage by Leaks

The Contractor shall be responsible for damages to the ground, walks, roads, buildings, piping systems, plant material, and electrical systems and their equipment and contents caused by leaks in the piping systems being installed or having been installed by them. The Contractor shall repair at its own expense, all damage so caused to the satisfaction of the Engineer.

19-01F - Inspections

The Contractor shall notify the Engineer at least twenty-four (24) hours in advance of the time inspection and/or direction is required.

19-01G - Verification of Dimensions

Before proceeding with any work, the Contractor shall carefully check and verify all dimensions and report any discrepancy to the Engineer.

19-01H - Project Plans and Records

The Contractor shall provide and keep up to date a complete set of Record Drawings, corrected daily and showing all changes from the original Project Plans and Special Provisions with the exact locations, sizes, and kinds of equipment. Prints for this purpose may be obtained from the Engineer. This set of Project Plans shall be kept on the site and shall be used only as a record set.

Record Drawings shall serve as work progress sheets, and the Contractor shall make neat and legible annotations daily as the work proceeds, showing the work as actually installed. These Record Drawings shall always be available for inspection and shall be kept on the job.

The Contractor shall dimension from two (2) permanent points of reference, such as building corners, sidewalk, or road intersections, etc., the location of the following items:

- Connection to existing water lines
- Connection to existing electrical power/Controller Shut-off
- Gate/Ball valves
- Routing of sprinkler pressure lines (dimension max. one hundred feet (100') along routing)
- Irrigation control and master valves

- Routing of control wiring & location of extra wires
- Quick coupling valves
- Flow Sensors
- Other related equipment as directed by the Engineer

On or before the date of the final inspection, the Contractor shall deliver the corrected and completed reproducible Record Drawings to the Engineer. Delivery of reproducible shall not relieve the Contractor of responsibility for furnishing required information that may be omitted from the "as-builts." The deliverables shall include a digital copy of all items.

19-01I - Controller Charts

As-built Project Plans shall be approved by the Engineer before controller charts are prepared.

The Contractor shall provide two (2) controller charts for each controller supplied.

The controller chart shall show the area controlled by the automatic controller and shall be the maximum size which the controller door will allow.

The controller chart shall be a reduced drawing of the actual as-built system. However, in the event the controller sequence is not legible when the drawing is reduced, it shall be enlarged to a size that will be readable when reduced.

The chart shall be provided as a PDF document and as a laminated hard copy with a different color used to indicate the area of coverage for each station.

When completed and approved, the chart shall be hermetically sealed between two pieces of plastic, each piece being a minimum of ten (10) mils.

All controller charts shall be completed and approved prior to final inspection of the irrigation system.

19-02 - Materials

Wherever a material is specified by name and number, such specification is to facilitate a description and establish quality. Unless two or more brand names are listed, it shall be construed that the words "or approved equal" shall follow the name. No substitution will be permitted which has not been submitted for approval to the Engineer within ten (10) days after the contract has been awarded. Electronic copies of descriptive literature must be furnished for any materials submitted for consideration as equal substitutes.

19-02A - Plastic Pipe

1. Pressure Lines: Pipe sizes of one-and-one-half inch (1½") or smaller shall be Schedule 40 PVC 1120 Polyvinyl-Chloride Solvent Weld Pipe, ; pipe sizes of two inches (2") or larger shall be Schedule 80 PVC 1120 o1220., Polyvinyl Chloride Solvent Weld Pipe, Simpson, Pacific Western, JM Eagle, or ASC.

2. Lateral Lines: Shall be Schedule 40 PVC, 1120 PSI, Polyvinyl-Chloride Solvent Weld Pipe, Simpson, Pacific Western, JM Eagle, or ASC.

3. Slip Fittings: PVC, Schedule 40/80 matching pipe rating Same material type as pipe, solvent cement-welded slip socket, unless otherwise indicated shall be GSR or LASCO.

4. Threaded Fittings: Schedule 80 PVC, all fittings same IPS as head. Threaded fittings by LASCO or Spears.

5. Plastic Pipe Primer and Glue: Type and make as recommended by the pipe manufacturer and appropriate to the pipe type. Clean all PVC joints with cleaner than prime with "IPS Weld-On P-70" as recommended by the manufacturer. Use IPS Weld-On 711 heavy bodied gray glue.

6. Plastic Flexible Pipe Glue: Type and make as recommended by the pipe manufacturer and appropriate to the pipe type. Clean all joints then glue with IPS Weld-On 795 clear glue.

7. Plastic Pipe Marking: All pipe shall be continuously and permanently marked with the following information: Manufacturer's name, pipe size, IPS size (Schedule No.), type of material and code number.

8. Drip Irrigation: Dripline shall be Rainbird XFCV or approved equal. Fittings and installation shall be per manufacturer's recommendation and as shown on Project Plans.

19-02B - Distribution Piping

All pipe shall be guaranteed by the manufacturer to be free of manufacturing defects in material or workmanship. A manufacturer's liability may be limited to replacement or credit for defective pipe if the use has been within the limits of pressure and temperatures recommended. The manufacturer must guarantee that all pipe has passed, or will pass, the Anhydrous Acetone Immersion Test.

19-02C - Risers

1. Plastic: Schedule 80 PVC or as shown on Project Plans

2. Metal: Schedule 40 steel or as shown on Project Plans

19-02D - Quick Coupling Valves

On swing joint riser, as noted on Project Plans.

19-02E - Utility Boxes

All boxes located in turf areas shall be made of concrete with cast iron locking lids. All boxes located in mulch areas may be green fiberglass or plastic with locking lids. Boxes shall be sized to accommodate the valve or appurtenance and related fittings, as shown on the detail drawing. Lids shall be labeled per the content of the box: Remote Control Valve, Gate Valve, Quick Coupling Valve, Flow Sensor, Electrical, etc. Remote control valve boxes shall have the control valve number welded or burned to the top in one inch (1") lettering upon final completion of the system.

Boxes used in recycled water systems are to have purple lids.

19-02F - Sprinkler Heads

As indicated on Irrigation Plan Legend.

19-02G - Automatic-Irrigation Controllers

As described on Project Plans or approved equal, UL rated. The controller shall be electrically operated at 24-volt A.C. output. Each station shall be independently variable from zero to 60 minutes without affecting the setting of other stations. Changes made in individual settings shall not affect other time settings. The controller shall operate automatically, semi-automatically, or manually. All controllers for City-maintained landscapes shall conform to the current requirements of the City of Pleasanton's central irrigation system. For current requirements, contact the City's Landscape Architecture Division. Prior to project acceptance, the contractor is required to provide the City written certification from the manufacturer's representative, that the irrigation controller was installed properly. New irrigation systems to be powered from a City metered service, if none are available provide a 100amp service.

19-02H - Remote Control Valves

Globe pattern as noted on Project Plans. Diaphragm type actuated by means of a 24-volt solenoid valve attached directly to the sprinkler valve body. Solenoid coils shall be molded waterproof construction and capable of normal operation in any position. Valves shall be equipped with positive shut-off which also permits flow regulating. The valve shall be normally closed until energized, and shall automatically close if electric power fails. Valves shall be capable of manual operation without control wires of controller being installed. Irrigation power shall include independent electric meter unless otherwise approved by the City.

19-02I - Control Wiring

Shall be single conductor, solid copper type UF-AWG, 600-volt rated, permanently marked as to manufacturer, size and type:

1. Pilot or Control Wire: AWG 14-1; Black - install a minimum of one extra control wire for each of the six (6) stations; loop into valve boxes and label as "spare."

2. Common Wire: AWG 12-1; Separate solid color (other than black) for each controller.

3. Spare Wires: One spare common wire shall follow the entire main line and shall be looped into each remote-control valve box. There shall be spare control wires installed at a ratio of one wire per six valves. Spare wires shall be looped into each remote-control valve box.

4. Connectors: Scotch DBY or approved equal.

5. Markers: Panduit No. Insta-Code PCM Series or approved equal.

19-02J - Isolation Valves

As noted in plan legend.

19-02K - Check Valves

PVC swing check as manufactured by King Bros. or Valcon.

19-02L - Ball Valves

Model #B11 Series as manufactured by Ford or approved equal.

19-02M - Backflow Units

As noted, in plan legend. Install it on a concrete pad with locking enclosure.

19-02N - Backflow Enclosures

Shall be Strongbox as manufactured by V.I.T. Products, Inc. or approved equal. Brushed aluminum; one piece enclosure on concrete pad per manufacturer's detail drawings. Device shall be covered by insulated bag inside the Strongbox.

19-02O - Water Meter Sizing

The water meter shall be sized with a velocity not to exceed 5 fps (feet per second) based on the peak water demand of the valve(s) programmed to operate simultaneously within the

watering window allowed by the municipal code and as shown on the Project Plans. Refer to Section 14 of these Standard Specifications for material and installation.

19-03 Construction

19-03A Excavation and Backfill

The Contractor shall do all necessary excavation for the installation of all work included in the contract. After the work has been installed, inspected and approved, all excavations shall be backfilled with approved backfill material – defined as native or approved import soil with no rocks, clods, deleterious materials, or other sharp-edged objects greater than two inches (2”) in diameter – to four inches (4") above crown at pipe and tamp. Then fill with native or approved import topsoil and tamp to eighty-five percent (85%) relative compaction in planting areas. All trenches shall be left flush with adjoining grade in a firm unyielding condition. The Contractor shall correct any subsequent trench settlement.

Mechanical trench diggers used on the site shall be of an approved type with straight sides. Trenches shall be no wider at any point than is necessary to lay the pipe and to obtain proper compaction.

19-03B General Requirements for Piping

Pipelines shall be installed in the locations and shall be of the sizes shown on the Project Plans and these City Standard Specifications. All materials and workmanship shall conform to the Project Plans and these City Standard Specifications.

All mainlines that does not have a wire bundle shall have warning tape and tracer wire installed per section 14-02K labeled “Irrigation” in English and Spanish.

All pipe shall be assembled free from dirt and scale and shall be reamed, and burrs removed. All pipe shall be laid with markings up and include irrigation tape per the irrigation trenching detail.

The main line with control valves in place and before lateral pipes is connected shall be flushed out and tested for leaks before backfilling. Flush out each section of lateral pipe before sprinkler heads are attached.

All new pipe installations and wiring under paving shall be placed in sleeves. The wiring shall be in a separate sleeve with sleeves offset by one foot (1’). Sleeves shall be schedule 40 PVC or approved equal, shall not be bent or jointed, and shall be no less than twice the diameter of the piping or wiring to be sleeved. Minimum sleeve size shall be three inches (3”). Sleeves shall extend a minimum of six inches (6") beyond paving into planting areas in order to facilitate their location at some future date.

19-03C Piping Depth

1. Main: Twenty-four inches (24”) of cover.

2. Laterals: Eighteen inches (18”) of cover.

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No line shall be installed directly over another line in the same trench.

Piping under existing pavement shall be done by jacking, boring, or hydraulic driving, but where any cutting or breaking of pavement is necessary; it shall be done and replaced by this Contractor as part of the contract cost. Permission to cut or break pavement must be obtained from the Engineer. No hydraulic driving will be permitted under asphaltic concrete paving.

19-03D Plastic Pipe and Fittings

Install main line and lateral line in locations shown on Project Plans. Discrepancies shall be brought to the attention of the Engineer prior to trenching.

1. Handling: Exercise care in handling loading, unloading, and storing plastic pipe and fittings. Store pipe and fittings under cover before using and transport on a vehicle with a bed long enough to allow the pipe to lay flat to avoid undue bending or concentrated external load. Repair dented or damaged pipe by cutting out the dent or damaged section and rejoin with a coupling.

2. Jointing: Apply "IPS WELD-ON P70" primer prior to applying solvent cement. Use WELD-ON 711 Grey Glue on all PVC fittings. Use only the solvent recommended by the manufacturer to make plastic pipe joints. Solvent welded joints should be given at least fifteen (15) minutes set-up curing time before moving or handling and twenty-four (24) hours curing time before water is placed in PVC Pipe. Center-load pipe with small amount of backfill to prevent arching and slipping under pressure. Plastic to steel connections, work the steel connection first. Use a non-hardening pipe dope on all threaded plastic to steel joints. A light wrench pressure is all that is necessary for these joints.

3. Thrust Blocks: As per Detail No. 311, "Typical Thrust Blocks," of the City Standard Specifications. Installation shall be approved before backfilling.

19-03E Ball Valves

Shall be installed at all remote-control valves as shown on detail.

19-03F Remote Control Valves

As detailed on the Project Plans. Connect to automatic controllers in the operating sequence indicated on the Project Plans by numbers. Provide and install one control valve box for each electric control valve.

19-03G Quick Coupling Valve

The top shall be one inch (1") below the inside of the ten-inch (10") diameter round box. Box shall be installed so as to be flush with finish grade.

19-03H Master Valve

As detailed on the Project Plans. Provide and install one valve box for each valve.

19-03I Flow Sensor

As detailed on the Project Plans. Provide and install one valve box for each sensor.

19-03J Sub-meter

As detailed on the Project Plans. Provide and install one valve box for each valve.

19-03H Sprinkler Heads

Install as noted on Project Plans. The final location shall be flush with grade and two inches (2") clear of walkways, curbs, or headers to facilitate edging. All sprinkler heads of the same type shall be of the same manufacturer.

19-03I Electric Services

As per Project Plans and the Special Provisions. Refer to section 19.02G for service requirements.

19-03J Controller and Control Wiring

Refer to the Special Provisions for related work items.

Securely mount controller as specified by the manufacturer and install as directed. Complete all electrical connections to controller.

Lay control wiring at bottom of trenches with main lines and tape wires every ten feet (10') into a common bundle. Wires shall not be taped to main lines.

At valves, both wires shall be brought into the valve box and shall have an excess loop of twenty-four inches (24") before being spliced to the solenoid pig tails.

Place labels on control wiring at all terminus points indicating controller and valve number, and station.

19-03K Testing Live Water Lines

After valves have been installed, test all live water lines for leaks at full pressure of one-hundred fifty (150) psi for a period of six (6) hours with couplings exposed and pipe sections center-loaded. Before testing, fill the line with water for at least twenty-four (24) hours. Provisions shall be made for thoroughly bleeding the line of air and debris. Correct all leaks and retest until acceptance by the Engineer.

19-03L Testing Lateral Lines

After pipe and risers have been installed, and prior to heads being installed, test all lateral lines for leaks for thirty (30) minutes at line pressure. Repair all leaks and retreat until acceptance by Engineer.

19-03M Closing in Uninspected Work

The Contractor shall not allow nor cause any of his work to be covered or enclosed until it has been inspected, tested, and approved by the Engineer.

19-03N Final Inspection

The contractor shall clean and adjust all systems and present at the time of final inspection a thoroughly workable, clean, balanced system. The system shall be checked for proper coverage and adjusted as necessary. Contractor shall operate system in its entirety in the presence of the Engineer. As-builts shall be confirmed for accuracy during the final inspection and uploaded as necessary prior to final approval.

All heads shall be adjusted for radius and arc of coverage. Contractor shall attach the approved controller charts inside controller door.

19-03O Guarantee

The entire irrigation system, including all work done under this contract, shall be guaranteed against all defects and faults of material and workmanship for one year from date of acceptance by City Council without expense to the City. All material used shall carry a manufacturer's guarantee for a minimum of one year.

Any settling of backfill trenches which may occur during a one-year period after final acceptance shall be repaired to the Engineer's satisfaction by the Contractor without expense to the City including the complete restoration of all damaged planted areas, plants, paving or other improvements of any kind.

The guarantee for the irrigation system shall be made in accordance with the attached form. The general conditions and supplementary conditions of these City Standard Specifications shall be filed with the Owner or his representative prior to acceptance of the irrigation system.

A copy of the guarantee form shall be included in the operations and maintenance manual.

The guarantee form shall be retyped onto the Contractor's letterhead and contain the following information:

GUARANTEE FOR IRRIGATION SYSTEM

We hereby guarantee that the irrigation system we have furnished and installed is free from defects in materials and workmanship, and that work has been completed in accordance with the Drawings and Specifications, ordinary wear and tear, and unusual abuse or neglect excepted. We agree to repair or replace any defects in material or workmanship which may develop during the period of one year from date of acceptance by City Council and also to repair or replace any damage resulting from the repairing or replacing of such defects at no additional cost to the City. We shall make such repairs or replacements within 48 hours, after receipt of written notice. In the event of our failure to make such repairs or replacements within 48 hours after receipt of written notice from the City, we authorize the City to proceed to have said repairs or replacements made at our expense and we will pay the costs and charges therefore upon demand.

PROJECT: _____

LOCATION: _____

_____

SIGNED: _____

ADDRESS: _____

_____

PHONE: _____

DATE OF ACCEPTANCE: _____

19-03P Certification

All controllers associated with the City's central irrigation system shall be certified by the manufacturers' representative. This certification shall be provided to the City in writing before the start of the maintenance period.

19-04 Measurement

Irrigation shall be measured as lump sum.

19-05 Payment

The lump sum price paid for irrigation shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in irrigation, complete in place.

SECTION 20. PLANTS AND PLANTINGS

20-01 - General

20-01A - Scope of Work

The Work includes all labor, materials, tools, equipment, transportation, incidentals, and services necessary for the completion of planting. In general, work includes:

1. Finish Grading
2. Soil Testing, Preparation, Furnishing and Incorporation of Fertilizer
3. Furnishing All Plant Materials
4. Planting and Fertilizing All Plant Materials
5. Tree Staking
6. Clean-up and Site Restoration
7. Maintenance
8. Guarantee

20-01B - Protection

The Contractor shall provide necessary safeguards and exercise caution against injury or defacement of any existing site improvements and plantings including avoiding soil compaction. The Contractor shall be responsible for any damage at his expense. No trucks or vehicles of any kind shall be allowed to pass over curbs, unless adequate protection is provided.

Use all means necessary to protect planting materials before, during and after installation and to protect the installed work and materials of other trades. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer at no additional cost to the City.

The Contractor shall replace all plant material damaged due to inadequate care and inappropriate storage during all phases of construction, e.g., trees, shrubs, and groundcover areas during installation, etc.

Plant health and vigor shall not decline after plants arrive at the job site.

20-01C - Grading

Refer to Section 4, "Roadwork Excavation and Grading," of these City Standard Specifications.

20-01D - Job Conditions

Perform actual planting only when weather and soil conditions are suitable in accordance with locally accepted practice.

Scheduling: Install trees, shrubs and liner stock plant material before hydraulic seeding is commenced.

Samples and Tests: Contractor shall take soil samples at his expense from no less than three (3) locations as directed by Engineer. These samples shall be taken after rough grading operations are complete and shall be taken by the Contractor for testing at: Waypoint Analytical, www.waypointanalytical.com, (714) 282-8777, or approved equal. Soil shall be analyzed for nutrients, pH balance, composition, texture and structure. A copy of the results of these tests shall be delivered to the Engineer.

20-02 - Material

The Engineer reserves the right to take and analyze samples of imported materials for conformity to the Special Provisions and these City Standard Specifications at any time. Contractor shall furnish samples upon request by the Engineer. Rejected materials shall be immediately removed from the site at the Contractor’s expense. Cost of testing of materials not meeting the Special Provisions and these City Standard Specifications shall be paid by Contractor. Contractor shall amend soils as recommended in the soils analysis.

20-02A - Import Soil

All material shall be made from clean materials, free from rocks, rubble, clods, plants, weeds, roots and toxic matter.

Prepare and submit Soil Analysis report to Engineer for review and approval prior to importing soil.

The following organic soil amendments and fertilizer are to be used for bid price basis only. Specific amendments and fertilizer specification will be made after rough grading operations are complete and soil samples are tested by Contractor.

All materials shall be standard, approved and of first-grade quality and shall be in prime condition when installed and accepted. Any commercially processed or packaged material shall be delivered to the site in the original unopened container bearing the manufacturer's guaranteed analysis. Contractor shall supply Engineer with sample of all supplied materials accompanied by analytical data from an approved laboratory source illustrating compliance or bearing the manufacturer's guaranteed analysis.

20-02A.1 - Organic Amendment

Per the Project plans and specifications, compost shall be a well decomposed, stable, weed-free organic matter source. The product shall be certified through the United States Composting Council (USCC) Seal of Testing Assurance Program (STA). It shall be derived from agricultural, food waste or green waste sources. The compost shall be free of glass, plastic, and other inorganic matter and shall meet the requirements of SB 1383. The product shall contain no substances toxic to plants, will possess no objectionable odors and shall not resemble the feedstock (the original materials from which it was derived).

Before delivery of the compost, the supplier must submit a copy of lab analysis performed by a laboratory that is enrolled in the USCC's Common Agricultural Policy (CAP) and must use approved Test Methods for Evaluating of Composting and Compost (TMECC). The lab report shall verify the following:

1. Feedstock Materials shall be specified
2. Organic Matter content: fifty percent – sixty percent (50% - 60%)
3. Carbon to Nitrogen Ratios: C – less than 25:1
4. Maturity/Stability: Shall have a dark brown color and earthy odor
5. Non-toxicity
6. Nutrient Content:
    - N-P-K
    - Ca
    - Na
    - Mg
    - S
    - B
7. pH
8. Particle Size
9. Bulk Density
10. Inerts (glass, plastic, etc.)
11. Weed seeds
12. Select pathogens, including Salmonella and fecal coliform Bacteria
13. Trace metals

20-02A.2 – Soil Amendment

1. Soil Sulfur: Agricultural grade sulfur containing a minimum of ninety nine percent (99%) sulfur (expressed as elemental)

2. Calcium Carbonate: Ninety five percent (95%) lime as derived from shells

3. Gypsum: Agricultural grade product containing ninety eight percent (98%) minimum calcium sulphate

20-02A.3 - Fertilizer

1. Planting fertilizer: Pellet or granular form shall consist of the following percents by weight and shall be mixed by commercial fertilizer supplier:

    a. Six percent (6%) nitrogen

    b. Twenty percent (20%) phosphoric acid

    c. Twenty percent (20%) potash

2. Gro-Power planting fertilizer: Shall be Gro-Power Plus (bacteria included) with soil penetrant or approved equal and shall consist of the following percents by weight:

    a. Five percent (5%) nitrogen

    b. Three percent (3%) phosphoric acid

    c. One percent (1%) potash

    d. Fifty percent (50%) humus

    e. Fifteen percent (15%) humic acid

3. Planting Tablets

    1) Shall be slow-release type with potential acidity of not more than 5 percent (5%) by weight containing the following percentages of nutrients by weight:
        - Twenty percent (20%) nitrogen
        - Ten percent (10%) phosphoric acid
        - Five percent (5%) potash
        - Two-point six percent (2.6%) combined sulfur
        - Thirty five percent (35%) iron (elemental) from ferrous sulfate

    2) Shall be 21-gram tablets as manufactured by Agriform or approved equal, applied per manufacturer's instructions.

20-02B - Plant Material

Plants shall be in accordance with the California State Department of Agriculture's regulation for nursery inspections, rules and rating. All plants shall have a normal habit of growth and

shall be sound, healthy, vigorous, and free of insect infestations, plant diseases, sunscalds, fresh abrasions of the bark, excessive abrasions, or other objectionable disfigurements.

Tree trunks shall be sturdy and have well "hardened" systems and vigorous and fibrous root systems which are not root or pot bound. Trees shall have a strong, central leader.

In the event of disagreement as to condition of root system, the root conditions of the plants furnished by the Contractor in containers will be determined by removal of earth from the roots of not less than two (2) plants or more than two percent (2%) of the total number of plants of each species or variety.

If container-grown plants are obtained from several sources, the roots of not less than two (2) plants of each species or variety from each source will be inspected. In case the sample plants inspected are found to be defective, the Engineer reserves the right to reject the entire lot or lots of plants represented by the defective samples. The Engineer is the sole judge as to acceptability. Any plants rendered unsuitable for planting because of this inspection will be considered as samples and will be provided at the expense of the Contractor.

The size of the plants will correspond with that normally expected for species and variety of commercially available nursery stock or as specified on the Project Plans. The minimum acceptable size of all plants measured before pruning with the branches in normal position, shall conform to the measurements, if any, specified on the Project Plans in the list of plants. Plants larger in size than that specified may be used with the approval of the Engineer, but the use of larger plants will not constitute a change in the Contract price. If the use of larger plants is approved, the ball of earth or spread of roots for each plant will be increased proportionately.

All plants not conforming to the requirements herein specified shall be considered defective; and such plants, whether in place or not, shall be marked as rejected and immediately removed from site of the work and replaced with new plants at the Contractor's expense. The plants shall be of the species, variety, size, and conditions specified herein or as shown on the Project Plans. Under no conditions will there be any substitutions of plants or sizes listed on the accompanying Plans, except with the written consent of the Engineer.

Plant material shall be true to botanical and common name and variety as specified in the updated version of "Annotated Checklist of Woody Ornamental Plants in California, Oregon and Washington," published by the University of California School of Agriculture (1979).

Pruning: At no time shall trees or plant material be pruned, trimmed or topped prior to delivery and any alteration of their shape be conducted only with approval and when in the presence of the Engineer.

20-02B.1 - Nursery Grown and Collected Stock

1. Grown under climatic conditions similar to those in locality of project.

2. Container-grown stock in vigorous, healthy condition, not root-bound or with root system hardened off.

3. Use only liner stock plant material which is well established in removable containers or formed homogenous soil sections.

4. Substitute plant material will not be permitted unless specifically approved in writing by the Engineer.

20-02B.2 - Seed

1. All seed used shall be labeled and shall be furnished in sealed standard containers with signed copies of a statement from the vendor certifying that each container of seed delivered is fully labeled in accordance with the California Seed Agricultural Code and is equal to or better than the requirements of these Specifications.

2. Seed which has become wet, moldy or otherwise damaged in transit or storage will not be accepted.

3. Lawn Seed Mix: Seed mix shall be 90/10 Mix, available from Pacific Coast Seed, Tracy, CA, or approved equal.

20-02B.3 - Hydro-Mulch

The Hydro-Mulch shall be composed of wood cellulose fiber and contain no germination or growth-inhibiting factors. It shall have a consistent texture which disburses evenly and remains suspended in agitated water. It shall have a temporary green dye and the following property analysis:

1.	Moisture content	9.0% $\pm$ 3% O.D.Basis
2.	Organic Matter	99.2% $\pm$ 0.8%
3.	Ash content	0.8% $\pm$ 0.2%
4.	pH	4.8% $\pm$ 0.5%
5.	Water Holding Capacity	1150 minimum (grams of H_20 per 100 grams of fiber)

20-02B.4 - Hydroseeding Additive (Binder)

Ecology Control-M-Binder's organic seeding additive.

20-02C - Guying and Staking Materials

20-02C.1 - Wood Tree Stakes

As per City Standard Detail No. 806, "Tree Planting Detail," : three inches (3") (min. nominal size) diameter x ten feet (10') long for fifteen- (15) gallon and for twenty-four (24)-inch-box size trees. Trees shall be double staked.

20-02C.2 - Ties

As per City Standard Detail 806, four ties minimum per tree.

20-02C.3 - Root Control Barriers

Root control barriers shall be of the "panel type," as manufactured by the Deep Root Corp; Model No. UB 24-2(or approved equal). Refer to detail drawings to determine the quantity and location of panels for each particular planting situation. Root barriers shall be installed at the back of pavement anywhere pavement is within eight feet (8') of newly planted trees.

20-02D - Water

Shall be furnished by the City; the Contractor shall be responsible for any type of transportation, if required.

20-02E - Mulch

Mulch shall be wood chip mulch made from live tree branches or trunk wood. Mulch must be aged such that a minimum of eighty percent (80%) of the green, organic matter has decomposed.

The Contractor must submit a one- (1) gallon bag sized sample of any proposed mulch for approval.

The mulch shall generally consist of fibrous, woody mixture of varied particle size which conforms to the following:

Percent Passing	Sieve Size
90 - 100	25.4 mm (3/4")
80 - 100	12.7 mm (1/2")
20 - 60	6.35 mm (3/8")

20-02F - Wood Header boards

As per Project Plans and City Standard Details.

20-02G - Sand

For play areas and volleyball courts: Lone Star Lapis B-16 or approved equal.

20-02H - Sod

Sod shall be species as noted on the Project Plans with three-quarter inch (3/4') thick pads, free of weeds. Sod shall be purchased from a commercial grower. Care shall be taken to prevent drying during shipping and handling.

20-02I - Inspection

City certification that final grade, plus or minus one-tenth of a foot (0.10 feet) has been established must be obtained prior to commencing planting operations. Provide for inclusion of all amendments, settling, etc. The Contractor shall be responsible for shaping all planting areas as indicated on Project Plans or as directed by Engineer.

Inspect trees, shrubs and liner stock plant material for injury and insect infestation, and trees and shrubs for improper pruning, vigor and potting.

All plant material shall be labeled and inspected by the Engineer prior to any planting.

No installation of plant material may begin until deficiencies are corrected, or plant material has been replaced.

Rejected plant material shall be removed from site immediately.

20-02J - Soil Preparation

After - finished grades have been established, soil shall be conditioned and fertilized in the following manner: Amendments shall be uniformly spread and cultivated thoroughly by means of mechanical tiller into the top six inches (6") of soil.

The following organic soil amendments, fertilizer rates, and quantities are to be used for bid basis only. Specific planting requirements will be made after rough grading operations are complete and soil samples are tested by the Contractor.

Application Rates: To be used for bid price basis only. Specific amendments will be made following soil tests.

Per 1,000 sf:
1. Organic amendment – 6 cu yds.
2. Planting fertilizer – 15 lbs.
3. Agricultural gypsum – 25 lbs.
4. Soil Sulphur – 20 lbs

At time of planting, the top two inches (2") of all areas to be planted shall be free of stones, stumps, or other deleterious matter one inch (1") in diameter or larger, and shall be free from all wire, plaster, or similar objects that would be a hindrance to planting or maintenance.

All material shall be delivered directly to the project site. All transportation receipts shall be made available to the Engineer upon request. The contractor shall notify the Engineer upon delivery and prior to spreading and incorporating all amendments and fertilizers to confirm quantities and materials.

20-02K - Final Grades

1. Minor modifications to grade may be required to establish the final grade.

2. Finish grading shall insure proper drainage of the site as determined by the Engineer.

3. All areas shall be graded so that the final grades will be 1 inch below adjacent paved areas, sidewalks, valve boxes, clean-outs, drains, manholes, etc., as indicated on the Project Plans.

4. Surface drainage shall be away from all fences, and walls. See grading and drainage Project Plans.

5. Eliminate all erosion scars prior to commencing the maintenance period.

20-02L - Disposal of Excess Soil

Dispose of any unacceptable or excess soil at a legal offsite location.

20-03 - Planting Installation

20-03A - General

Actual planting shall be performed during those periods when weather and soil conditions are suitable and in accordance with locally accepted practice, as approved by the Engineer.

All plants shall be planted within seventy-two (72) hours of their arrival at the project site, unless a written exception is provided by the Engineer.

Only as many plants as can be planted and watered on that same day shall be distributed in a planting area.

Containers shall be opened, and plants shall be removed in such a manner that the ball or earth surrounding the roots remains intact and they shall be planted and watered as herein specified immediately after removal from the containers. Containers shall not be opened prior to placing the plants in the planting area.

20-03B – Pre-Plant Weed Control

If live perennial weeds exist on-site at the beginning of work, spray with a non-selective systemic contact herbicide, as recommended and applied by an approved licensed landscape pest control advisor and applicator. Leave sprayed plants intact for at least fifteen (15) days to allow systemic kill.

Clear and remove these existing weeds by mowing or grubbing off all plant parts at least three inches (3") below the surface of the soil over the entire area to be planted.

Maintain site weed-free until final acceptance by the Engineer, utilizing mechanical and chemical treatment.

See Hydroseeding.

20-03C - Lay-Out of Major Plantings

Locations for plants and outlines of areas to be planted shall be marked on the ground by the Contractor before any plant pits are dug. All such locations shall be approved by the Engineer. If underground construction or utility line is encountered in the excavation of planting areas, other locations for planting may be selected by the Engineer. The layout shall be accomplished with flagged grade stakes indicating plant names and specified container size on each stake. It shall be the Contractor's responsibility to confirm with the Engineer and governing agencies the location and depth of all underground utilities, and obstructions.

20-03D - Planting of Trees, Shrubs, and Vines

Excavation for planting shall include the stripping and stacking of all acceptable topsoil encountered within the areas to be excavated from trenches, tree holes, plant pits, and planting beds.

Excess soil generated from the planting holes and not used as backfill or in establishing the final grades shall be removed from the site.

Protect all areas from excessive compaction when trucking plants or other material to the planting site.

Center plant in pit or trench.

Face plants with fullest growth into prevailing wind.

Set plant plumb and hold rigidly in position until soil has been tamped firmly around ball or roots.

Plant pit to be as per City Standard Details.

All excavated holes shall have vertical sides with roughened surfaces and shall be of a size that is twice the diameter and one and one-half (1½) times the depth of the root ball for all trees and shrubs.

For bidding purposes only, container plants shall be backfilled with:

- 7 parts by volume on-site soil
- 3 parts by volume organic amendment
- 1 lb. 6-20-20 fertilizer mix per cubic yard of mix

The bottom of the planting pit shall be compacted before planting.

All plants which settle deeper than the surrounding grade shall be raised to the correct level. After the plant has been placed, additional unamended backfill shall be added to the hole to cover approximately one-third of the height of the root ball. At this stage, water shall be added to the top of the partly filled hole to thoroughly saturate the root ball and adjacent soil.

Container Removal:

- If metal, cut container on two sides with an acceptable cutter. If plastic, gently loosen the root ball from the sides of the container.
- Do not injure the root ball.
- Do not cut containers with spade or ax.
- Recycle containers appropriately.

Box Removal:

- Remove the bottom of plant boxes before planting.
- Remove sides of box without damage to root ball after positioning plant and partially backfilling.

Plant Tablets:

After the water has completely drained, planting tablets shall be placed as indicated below:

- One tablet per 4 inches container
- One (1) tablet per one- (1) gallon container

- Two (2) tablets per five- (5) gallon container
- Eight (8) tablets per fifteen- (15) gallon container
- Sixteen (16) tablets per twenty-four-inch (24") box
- Twenty-four (24) tablets per thirty-six-inch (36") box

Planting tablets shall be set with each plant on the top of the root ball while the plants are still in their containers so the required number of tablets to be used in each hole can be easily verified by the Engineer.

Backfill:

The remainder of the hole shall then be backfilled with amended backfill and tamped firm.

Pruning:

Approval must be obtained from the Engineer prior to any pruning being performed.

Pruning shall be limited to the minimum necessary to remove injured twigs and branches. Pruning may not be done prior to delivery of plants.

Staking:

Staking of all trees shall be completed immediately after planting. All stakes shall be installed plumb and as shown on Project Plans.

Root Control Barrier:

Install per Project Plans and City Standard Details.

20-03E - Planting of Groundcovers

Groundcover plants shall be grown in flats, liners, or one- (1) gallon containers as indicated on the Project Plans. Plants shall remain in their containers until transplanting. The container's soil shall contain sufficient moisture so that it will not fall apart when lifting the plants.

Groundcover shall be planted in straight rows and evenly spaced, unless otherwise noted, and at intervals called out in the Project Plans. Triangular spacing shall be used unless otherwise noted on the Project Plans.

Each rooted plant shall be planted with its proportionate amount of soil. Plantings shall be immediately irrigated after planting until the entire area is soaked to the full depth of each hole.

Care shall be exercised at all times to protect the plants after planting. Any damage to plants by trampling or other operations of this Contract shall be repaired immediately to the satisfaction of the Engineer.

20-03F - Mulch

Approved mulch shall be placed in planting areas to a minimum depth of three inches (3") unless otherwise specified on the project plans. Prior to the placement of mulch, pre-emergent herbicide shall be applied to all shrub and groundcover areas. The pre-emergent herbicide shall be Ronstar granular, or approved equal, and shall be applied per the manufacturer's specifications. Engineer shall verify the application of the pre-emergent prior to the placement of mulch.

20-03G - Planting of Sod

For bidding purposes only, the sod bed shall be tilled and amended with the following materials to a minimum depth of six inches (6"):

- 6 cubic yards organic matter per 1,000 SF
- 15 pounds planting fertilizer per 1,000 SF
- 25 pounds agricultural gypsum per 1,000 SF
- 20 pounds soil Sulphur per 1,000 SF

Roll and rake to a smooth, even and compact grade which is free of ridges and depressions and drains properly. The finished soil surface should be approximately one inch (1") below adjacent pavement grades in order to accommodate sod pad thickness. Finish sod grade shall be flush to one-half inch (½") maximum below adjacent paving.

Sod rolls are to be laid tightly in a straight line, with tightly butted staggered joints. There are to be no open or overlapping joints. A sharp edge knife shall be used to cut sod to fit around sprinklers, tree roots, paved edges, etc.

Sod shall be lightly watered within one (1) hour of the time it is laid. Sod shall then be rolled smoothly to eliminate any surface irregularities and insure complete soil contact. After rolling, water thoroughly penetrates subsoil to a depth of at least eight inches (8"). Repeat watering at regular intervals to keep sod moist until firmly rooted.

Protect turf areas with temporary fencing if necessary. Maintain protective barriers in an orderly condition and repair any damage to turf until planting work has been accepted by the Engineer.

20-03H - Hydroseeding Preparation and Operation

The ensuing process shall be followed in order listed:

1. See Pre-Plant Weed Control, Section 20-03B, "Pre-Plant Weed Control," of these City Standard Specifications.

2. Install trees if they occur in hydroseeded area. Operation contained elsewhere in these City Standard Specifications.

3. Hydroseeding Operation:

    - Mix shall be that which is specified or approved by the City Engineer.

    - All hydroseeded areas are to be applied by an approved hydro mulch company.

    - The hydro mulch shall be applied in the form of a slurry consisting of cellulose fiber, seed, chemical additives, M-binder, commercial fertilizer, and water. When hydraulically sprayed on the soil surface, the hydro mulching shall form a blotter-like groundcover impregnated uniformly with seed and fertilizer and shall allow the absorption of moisture and rainfall to percolate to the underlying soil.

    - Preparation: The slurry preparation shall take place at the site of work and shall begin by adding water to the tank when the engine is at half throttle. When the water level has reached the height of the agitator shaft, full recirculation shall be established; and at this time the seed shall be added. Fertilizer shall then be added, followed by mulch. The mulch shall only be added to the mixture after the seed and the tank is at least one-third filled with water. All the mulch shall be added by the time the tank is two-thirds to three-fourths full. Spraying shall commence immediately when the tank is full.

    - Application: The operator shall spray with a uniform visible coat by using the green color of the mulch as a guide. The slurry shall be applied in a sweeping motion, in an arched stream so as to fall like rain allowing the wood fibers to build on each other until a good coat is achieved and the material is spread at the required rate per acre.

    - Application Rates: The seed mix shall be applied at the rate specified in the project documents. The fiber shall be applied at a rate of 1,800 lbs. per acre. The hydroseeding fertilizer shall be applied at a rate of 200 lbs. (16-20-0) per acre and

150 lbs. urea formaldehyde (38-0-0) per acre. The M-binder shall be applied at a rate of 60 lbs. per acre.

- Time Limit: All slurry mixture which has not been applied within two (2) hours after mixing will be rejected and removed from the project and disposed at the Contractor's expense.

- Daily work sheets must be filled out by nozzlemen. One copy shall be sent to the Engineer. The following information shall be recorded:

    - Seed - type, amount
    - Fertilizer - analysis, amount
    - Mulch - type, amount
    - Seeding Additive - type, amount
    - Number of Loads - amount of water
    - Area covered in acres
    - Equipment used - capacity, license number if applicable

- Protection: Special care should be exercised by the Contractor in preventing any of the slurry being sprayed inside any reservoir basin or into drainage ditches and channels which may impede the free flow of rain or irrigation water. Any slurry spilled into restricted areas shall be cleaned up at the Contractor's expense to the satisfaction of the Engineer.

- Immediately following application of hydro mulch, the Contractor shall wash excess material from previously planted materials and architectural features. Care shall be exercised to avoid washing or eroding mulch materials from the area.

- Equipment: Hydraulic equipment used for the application of the fertilizer, seed and slurry or prepared wood pulp shall have a built-in agitation system and operating capacity sufficient to agitate, suspend, and homogeneously mix slurry containing not less than 40 lbs. of fiber mulch plus a combined total of 7 lbs. fertilizer solids for each 100 gallons of water.

- The slurry distribution lines shall be large enough to prevent stoppage and shall be equipped with a set of hydraulic spray nozzles which will provide a continuous no-fluctuating discharge. The slurry tank shall have a minimum capacity of 1,500 gallons and shall be mounted on a traveling unit, either self-propelled or drawn by a separate unit which will place the slurry tank and spray nozzles within sufficient proximity to the areas to be seeded.

- The hydraulic equipment for herbicide applications shall consist of a clean 150-gallon minimum capacity fiberglass tank with complete mechanical agitation. The pump volume shall be 10 gallons per minute while operating at a pressure of 100 pounds per square inch. Distribution lines shall be large enough to carry the volume of water necessary for even chemical distribution. The spray nozzle must cover a 15 -foot swath, with a minimum output of 5 gpm at 80 psi.

20-03I - Clean-Up and Site Restoration

After all planting operations have been completed; remove all trash, excess soil, empty plant containers, and rubbish from the property. All scars, ruts, compaction, or other marks in the ground caused by this work shall be repaired and the ground left in a neat, uncompacted, and orderly condition throughout the site. The top six inches (6") of soil shall not exceed eighty five percent (85%) relative compaction. The contractor shall pick up all trash resulting from this work no less frequently than each Friday before leaving the site, once a week, and/or the last working day of each week. All trash shall be removed completely from the site.

The Contractor shall leave the site area broom-clean and shall wash down all paved areas within the Contract area, leaving the premises in a clean condition. All utility markings shall be removed.

All cleaning and restoration activities shall conform to the provisions of Section 5 of the City Standard Specifications, “Erosion and Sedimentation Control.”

20-03J - Observation Schedule

The Contractor shall be responsible for notifying the Engineer in advance for the following site visits, according to that indicated below:

- Pre-Job Conference - 7 days
- Final grade review - 48 hours
- Plant material review - 48 hours
- Plant layout review - 48 hours
- Soil preparation and planting operations – 48 hours
- One tree of each type or with specified staking shall be approved prior to planting of trees - 48 hours
- Pre-Maintenance - 7 days
- Final walk-through - 10 days

When observations are conducted by someone other than the Engineer, the Contractor shall show evidence in writing of when and with whom these inspections were made.

No site visits shall commence without all items noted in previous Observation Reports either completed or remedied unless such compliance has been waived by the Engineer. Failure to accomplish punch list tasks or prepare adequately for desired inspections shall make the Contractor responsible for reimbursing the Engineer at his current billing rates per hour (plus transportation costs). No further inspections shall be scheduled until this charge has been paid and received.

20-03K - Planting Maintenance

20-03K.1 - General Requirements

The time duration of the maintenance period shall be ninety (90) calendar days.

The maintenance period shall commence following the second mowing of turf and upon written approval of Engineer and substantial completion of the project. On projects where turf is not called for, the maintenance period shall commence immediately following all planting improvements upon written approval of the Engineer and substantial completion of the project. Maintenance shall continue per these specifications for a minimum period of ninety (90) days, or longer, where necessary, to establish acceptable stands of thriving plants or to complete punch list items when determined to be necessary. Extensions in the length of the maintenance period will be made at no additional costs to the City.

- Protect all areas against damage, including erosion, animals, and trespassing, and provide proper safeguards. Maintain and keep in good repair all temporary barriers erected to prevent trespass.

- Keep all walks and paved areas clean. Keep the site free from debris resulting from landscape work or maintenance.

- Repair all damaged planted areas and replace plants immediately upon discovery of damage or loss.

- Check sprinkler systems at each watering; adjust coverage and clean heads as necessary. Adjust the timing of sprinkler controller to prevent flooding. Repair all damages immediately.

- Maintain adequate moisture depth in soil to ensure vigorous growth. The contractor is required to deep water all trees to ensure adequate moisture level around said trees.

- Keep contract areas free of weeds by cultivating, or hand pulling. Use of chemical weed killers will not relieve the Contractor of the responsibility of always keeping areas free of weeds over one inch high.

- Control gopher, ground squirrel, vole, or other animal damage continuously throughout the maintenance period.

20-03K.2 - Tree and Shrub Maintenance

Maintain during entire maintenance period by regular watering, cultivating, weeding, repair stakes and ties and control of insect pests, rodents, and animals. Prune only when requested by the Engineer.

Keep water basins in good condition and always weed free.

All damaged, unhealthy or dead trees, shrubs, and vines shall be replaced with new stock immediately without cost to the City, size as indicated on the Project Plans. Any new stock planted within ten (10) days of the end of the maintenance period shall include an additional ten (10) day maintenance period.

20-03K.3 - Turf Maintenance

Maintain during entire maintenance period. Cut as frequently as growth of grass requires. Cut to a height of three (3") inches unless otherwise directed by the Engineer.

Maintain constant adequate moisture.

Trim edges of turf at paving and header boards at time of second cutting and at each cutting thereafter.

Trim around trees in the turf areas. After thirty (30) days, provide an area three feet (3') in diameter under trees free of turf and watering basins at all times.

Keep turf areas free of undesirable weeds and grasses by the application of suitable selective weed killers as approved by Engineer or by hand pulling.

Sod or reseed all areas which fail to adequately germinate as soon as evident, or as directed by the Engineer.

Remove all rocks over one inch which emerge on the surface.

Repair any hollow, settled or eroded areas by filling, rolling, top dressing and reseeding, or as directed.

Fertilize all planting areas with a commercial fertilizer based on recommended application rates from the soils report. If there is no recommended application rate, a 4-1-2 for turf and a 5-1-2 or 5-1-3 for all other plantings is acceptable at the rate of 6 lbs. per 1,000 square feet prior to the end of the first thirty (30) days after planting and at 30-day intervals thereafter. Water thoroughly after applying fertilizer.

20-03L - Final Planting Inspection and Acceptance

Final inspection for project acceptance shall be made at the conclusion of the specified maintenance period provided that on such date all project improvements and all corrective work has been completed. If all project improvements and corrective work are not completed, the maintenance period shall continue at no additional cost to the City until the work has been completed and has been determined to be satisfactory by the Engineer. The project will then be placed on the City Council's agenda for acceptance. The Contractor shall continue to maintain the project per these specifications until the City Council has accepted project.

Written notice requesting inspection shall be submitted by the Contractor to the Engineer at least ten (10) days before the completion of the maintenance period.

Prior to being considered ready for inspection, the Contractor shall have done a final weeding and clean-up of all planting areas. Plant basins shall be repaired or removed if directed, all tree stakes replumbed, , and the entire job cleared of all debris and presented in a neat, orderly fashion.

20-03M - Guarantee and Replacement

Guarantee all plants and planting to be in a healthy, thriving condition until the end of the maintenance period or beyond that time until active growth is evident. Guarantee all trees for a minimum of one (1) year from date of acceptance by City Council.

20-04 - Measurement

Plants and plantings, excluding mulching and the maintenance period, shall be measured by the number of items. Mulching and the maintenance period shall each be measured as lump sum items.

20-05 - Payment

The contract price for plants and plantings shall include full compensation for the plant pit, root barrier, plant, backfill mix, fertilizer, and staking.

The contract price for mulching shall include full compensation for pre-emergent herbicide and mulch complete and in place.

The contract price for the maintenance period shall include full compensation for fulfilling all requirements of Section 20-03K, "Planting Maintenance," of these City Standard Specifications.

SECTION 21. RECYCLED WATER

21-01 - GENERAL

This section covers recycled water system construction specifications. All recycled water design and construction work shall conform to Sections 14 of the City Standard Specifications as amended, unless otherwise noted. In addition, all recycled water pipes and fittings shall be purple or wrapped in purple polyethylene sleeve conforming to AWWA C105 specifications. Piping or piping wrap shall be permanently labeled "Caution: Recycled Water – Do Not Drink" or similar as approved by the City Engineer.

21-02 - MATERIALS OF CONSTRUCTION

This section covers materials for recycled water pipes, fittings, and appurtenances for City recycled water facilities.

21-02A - Pipes and Fittings

21-02A.1 - Polyvinyl Chloride (PVC) Pipe and Fittings

PVC pipe and fittings for City facilities shall conform to City Standard Specification Section 14 for potable water.

21-02A.2 - Ductile Iron Pipe Materials

Ductile iron pipe and fittings shall conform to City Standard Specifications for potable water, Sections 14-02B and 14-03B.

21-02A.3 - Pipe Identification

All recycled water piping shall be clearly marked as recycled water pipe by the use of purple-colored and stenciled pipe, permanent recycled water warning tape continuously applied to the pipe, or marked plastic encasement. All marking and coloring shall be durable enough to be easily recognizable and legible for the design life of the piping. PVC pipe material shall be purple infused color at time of extrusion.

Plastic pipe, permanent warning tape, or encasement shall be purple in color with the words "CAUTION: RECYCLED WATER – DO NOT DRINK," or similar, printed on it as approved by the City Engineer or Inspector. The lettering shall be repeated continuously on two (2) sides of the pipe, warning tape, or encasement for the full length of the pipe, warning tape, or encasement. If purple pipe is used, it shall be PW PurplePlus, or JM Purple Save, or approved equal. If encasement or warning tape is used, it shall be Pantone 512 or equivalent in color with one inch (1") minimum black or white lettering. Encasement or warning tape shall be T.Christy Enterprises, Rencor, or equivalent.

All piping shall be continuously and permanently marked with the manufacturer's name or trademark, nominal size, and schedule or class indicating the pressure rating.

All riser pipes for valves and blowoffs on recycled water lines shall be purple piping.

Recycled water service lines shall conform to City Standard Details as referenced in the Drawings. The line shall be purple or purple wrapped.

21-02A.4 - Cathodic Protection of Buried Metallic Recycled Water System Components

Ductile iron pipe and fittings shall be encased in eight (8) mil polyethylene sheeting in conformance with AWWA C105. The polyethylene sheeting shall be purple.

See Section 22, "Cathodic Protection" of the City Standards and 1100 of the City Plans.

21-02B - Appurtenances

21-02B.1 - General

Unless otherwise specified below, appurtenances for City recycled water facilities shall conform to City specifications for potable water, Section 14-02C.

21-02B.2 - Above-Ground Equipment

Exposed or above-ground equipment, such as blowoffs, valves, pumps, and water meters, shall be labeled with recycled water tags. Tags shall be provided by City and fastened as specified in Section 22-01B.7 of this document.

21-02B.4 - Valve and Meter Boxes

All recycled water valve boxes shall be Christy G-4, or approved equal with a cast iron triangular, purple powder-coated cover for heavy traffic areas. All valve covers shall have a recognizable "RW" inscription cast or otherwise permanently marked on the top surface.

All meter boxes and customer facility valve boxes shall be purple in color and have a warning label permanently molded into or affixed onto the lid with rivets, bolts, etc. Warning labels shall be constructed of a purple weatherproof material with the warning "RECYCLED WATER" permanently stamped or molded into the label, T.Christy Enterprises 3800, or equivalent.

Valve stem riser pipe shall be purple PVC pipe.

21-02B.5 - Pressure Reducing Valves

Pressure reducing valves (PRV) for customer services shall be Wilkins Model 500XL with HLR (10 psi to 125 psi spring range, factory set at 50 psi) and SC (sealed cage bell housing

and stainless steel adjustment screw) options or approved equal for irrigation systems serviced by three-quarter-inch (¾")to three-inch (3") water meters. City Engineer shall review proposed PRV installations for larger sizes on an individual basis. All pressure reducing valves shall be factory union inlet, red brass nipple and brass union connection to allow for easy removal of the valve. The valve shall have a minimum of six inches (6") of clearance all the way around the valve.

21-02B.7 - Identification Tags

All meters, valves, blowoffs, and controllers shall be identified using recycled water identification tags, T.Christy Enterprises 3150, or equivalent. Tags shall be weatherproof plastic, 3-inch by 4-inch, purple in color with the words "WARNING – RECYCLED WATER – DO NOT DRINK," or similar imprinted on one side, and "AVISO – AGUA IMPURA – NO TOMAR" on the other side, or similar as approved by the City Engineer. Imprinting shall be permanent and black in color. One tag shall be attached to each valve as follows:

- Attach to valve stem directly or with plastic tie wrap; or
- Attach to solenoid wire directly or with plastic tie wrap; or
- Attach to valve cover with existing valve cover bolt.

Weatherproof stickers of equivalent color and lettering may be used as an alternative for controller units.

21-02B.9 - Tracer Wire and Warning Tape

Underground tracer wire shall be insulated #10 AWG THWN copper wire. The Contractor shall demonstrate the continuity of the buried tracer wire to the City between each valve box or locator station box. Locator stations to be spaced no further than five hundred feet (500').

21-02C - Thrust Blocks

Thrust blocks for recycled water systems shall conform to City specifications for potable water, Section 14-02H. Where allowed, thrust blocks to resist static thrust loads caused by pipeline system pressure are allowed on pipe up to twelve-inch (12") diameter. For larger pipe, thrust restraint shall be accomplished using restrained joints and over the restrained joint lengths shown on the Drawings, unless otherwise noted. All pipe restrained utilizing cross trench kicker thrust blocks shall be ductile iron.

All new additions to the existing recycled water system shall have concrete thrust block restraint at the point of connections to the existing system.

21-02E - Joint Restraints

Mechanically restrained joints shall be suitable to the application and pressure rated equal to the pressure rating of the adjoining pipe in accordance with the manufacturer's specifications. Mechanical restraints shall be the following or approved equal:

1. Restraining gland for plain end PVC pipe spigot to ductile iron mechanical joint fittings: Uni-Flange Series 1500 (Ford Meter Box Company); Megalug 2000PV (EBAA Iron); Sigma One-Lok Series SLCE or approved equal.
2. Restraining gland for plain end DI pipe spigot to ductile iron mechanical joint at fittings and valves shall be Uni-Flange Series 1400 (Ford Meter Box Company); Megalug Series 1100 (EBAA Iron); One-Lok SLDE (Sigma); or approved equal.
3. Ductile Iron Pipe Restrained Joints to Utility Undercrossing: Push-on type restrained joints shall be of the locking segment, boltless type, TR FLEX (US Pipe Company); Snap Lok (Griffin Pipe Company); Flex Ring (American Cast Iron Pipe Company); or approved equal. Joint restraint systems shall be rated to at least 250 psi working pressure.
4. PVC Pipe Restrained Joints: The restraints can be via fusing joints, installing bell restraints, or use internal restraining gasket systems. Internal restraining gaskets are allowed on twelve-inch (12") diameter and smaller pipes and shall be Bulldog Integral Joint Restraint System, JM EAGLE LOC 900 or approved equal. Restraining harness for PVC pipe bell and spigot push on joints sized larger than twelve-inch (12") diameter: Ford Meter Box Co. Uni-Flange Series 1350, EBAA Iron Series 2800, Sigma PV-Lok PWP or equal.

21-02E - Service Taps on Recycled Water Mains

Recycled water services shall be installed in conformance with Section 14-02C of the City Standard Specifications, the same as for the construction of potable water services.

21-02F - Nuts and Bolts for Buried Pipelines

Nuts and bolts for buried pipelines shall be stainless steel per Section 14-02. Nuts and bolts shall be bitmastic protective coated.

21-03 - INSTALLATION OF RECYCLED WATER PIPE AND APPURTENANCES

Recycled water pipe and appurtenances shall be installed in conformance with Section 14-03 of City Standard Specifications, the same as for the construction of potable water pipe and appurtenances, with the following exceptions:

1. At the point where a service line crosses beneath a curb, the point shall be permanently marked with an "RW" to signify recycled water, rather than a "W," which is used for potable water.
2. Plastic warning tape specified in Section 14-02K used for recycled water lines shall be purple in color, a minimum of three inches (3") wide and printed continuously with the works "CAUTION: RECYCLED WATER LINE BELOW," or similar as

approved by the City Engineer. Plastic warning tape shall be installed at twelve inches (12") above all recycled water mains.

3. During construction, above ground risers for recycled water pipe and appurtenances shall be purple in color.
4. All metallic pipe, fittings, couplings and appurtenances shall be cathodically protected as specified in Attachment A, Section 16640 – Cathodic Protection and as shown in the Drawings.

21-04 - INSPECTION AND TESTING

Recycled water piping shall be tested using recycled water. If the Contractor demonstrates a need to use potable water for testing and with the approval of the City, the recycled water piping may be tested using potable water with an approved backflow prevention device. The testing shall be performed in accordance with City Standard Specifications, Section 14-03G.2 to Section 14-03G.5. The minimum flushing velocity is 3feet per second for a minimum of 10 exchanges of water and until a NTU 2 + source water. Disinfection is not required on recycled water mains.

After completion of testing, the Contractor shall thoroughly flush all recycled water from the line with recycled water from the existing system to remove debris from the pipeline. The Contractor is responsible for proper disposal of the flush water in a manner that will not cause damage and/or nuisance to the environment and in compliance with state and local regulations.

21-04B - Cross-Connection Inspection and Coverage Test

The Contractor shall be advised that the City will be conducting customer side retrofit work to allow for conversion to recycled water for irrigation purposes. The City will be performing mandated cross connection inspections and tests, irrigation system coverage tests and removing of potable water cross connections within the customer side irrigation system. Successful completion of cross connection test is required prior to meter set. The Contractor shall cooperate and support the City in these testing activities by preparing work areas under its responsibility to allow testing and inspection on the customer side of the irrigation meter.

SECTION 22. CATHODIC PROTECTION

22-01 - General

This section covers requirements for materials and methods of installation for cathodic protection on the recycled water system with PVC piping and Ductile Iron Fittings. All other pipe combinations shall not be applicable. All new main line piping that is to be installed shall have the soil tested for corrosively and if any of the prescribed tests are deemed "mild corrosively" or higher per general corrosion engineering standards cathodic protection is required for new pipeline installations. Soil samples shall be taken at a minimum of five hundred feet (500') or soil characteristics change whichever is shorter.

See 1100's details of the City Standard Plans for additional details.

The Contractor shall furnish all materials, install all equipment and provide all labor necessary to complete the work shown on the Drawings and or/listed below and all other work and miscellaneous items not specifically mentioned but reasonably inferred, including all accessories and appurtenances required for a complete system. The intent of this specification is to provide for a complete, functional cathodic protection system and or corrosion protection system for the Pleasanton Recycled Water Infrastructure.

Work included in this section consists of all components of the cathodic protection system; including anodes, cables, and any other work necessary to complete the installation. Work on this project includes a combination of the following items, depending on the pipe material selected for the Project:

- Cathodic protection of pipeline, pipe segments and/ or metallic fittings.
    - Polyethylene encased ductile iron pipe segments
    - Polyethylene encased ductile iron fittings.
- Bonding of flanges, flexible couplings and other non-welded fittings.
- Joint bonding of ductile iron pipe & fittings
- Coating of buried harness sets
- Installation of magnesium anodes, cables, insulating blankets, insulating joints, coatings for buried insulating joints, and test stations, where required.
- Backfill and compaction of backfill.
- Provide shop Drawings, reports, permits, and obtain City's approval where required.
- Correction of all deficiencies.
- The work shall include the provision of all materials, equipment, and apparatus not specifically mentioned herein or noted on the plans, but which are obviously necessary to complete the work specified.

Reference Specifications

This section contains references to the following documents. They are a part of this section as specified and modified. In case of a conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

- American Society of Testing and Materials (ASTM)
- National Electrical Manufacturers Association (NEMA)
- American Water Works Association (AWWA)
- National Association of Corrosion Engineers (NACE)
- American National Standards Institute (ANSI)

Codes And Regulations

All materials, workmanship, and installation shall conform to all requirements of the legally constituted authority having jurisdiction. These authorities include, but are not limited to, the latest revision of the State of California, Department of Industrial Relations, Division of Industrial Safety Orders of the Industrial Accident Commission, and all other applicable State, County, or City codes and regulations. Nothing in the Drawings or specifications is to be construed to permit work not conforming to these regulations and codes. Where larger size or better grade materials than required by these regulations and codes are specified, the specifications and Drawings shall have precedence.

22-0A - Minimum Testing Requirements

Soil samples shall be taken at a minimum of five hundred feet (500') or where soil characteristics change whichever is shorter.

The following minimum tests shall be conducted, and results turned over to the City for evaluation: Redox (mV) shall be tested in conformance with ASTM D1498, pH per ASTM 4972, Conductivity (ohms/cm) per ASTM D1125M, Resistivity (100% saturation, ohms-cm) ASTM G57, Sulfide (mg/kg) ASTM D4658M, Chloride (mg/kg) per ASTM D4327, Sulfate (mg/kg) per ASTM D4327

22-02 - Materials

22-02A - General

All materials shall conform to the requirements set forth herein or as designated on the Drawings, unless otherwise specified. All materials must be new, free from defects, and shall be of the best commercial quality for the purpose specified. The Contractor shall furnish all necessary items and accessories not shown on the Drawings or specified herein, but which are required to fully carry out the specified intent of the work, without additional cost to the City.

22-02B - Magnesium Galvanic Anodes

Magnesium anodes shall be of the H-1 alloy with composition as indicated below. Each anode shall be cast with a steel core and the core shall protrude from one end and shall be of sufficient length to permit attachment of a lead wire. Each anode shall conform to the following chemical composition and dimensions:

1. Chemical Composition

Element	Range
Aluminum	5.0 – 7.0%
Zinc	2.0 – 4.0%
Manganese	0.15% Min.
Copper	0.10% Max.
Nickel	0.003% Max.
Iron	0.003% Max.
Other Impurities	0.05% each or 0.3% Max Total.
Magnesium	Balance

2. Bare Anode Dimensions:

Nominal Wt. Bare (lbs.)	Height (in.)	Width (in.)	Length (in.)
5	3	3	7.5
9	3	3	13.5
17	4	4	17
32	5	5	21
50	8	-	15

Anode Core Strap: Galvanized steel, with one end of anode recessed to provide access to the rod for connection of the lead wire

Lead Wire: No. 10 AWG, Type THHN (Black) silver brazed to the rod, making a mechanically secure connection

Soldered Connection and Core: Seal entirely with electrical potting compound

Magnesium Anode Packaging: Prepackaged in a cloth bag containing low resistivity backfill consisting of 75% hydrated gypsum, 20% bentonite, and 5% sodium sulfate.

Manufacturers, or equal

- Farwest Corrosion.
- Corrpro Companies.

22-02C - Cables

All underground cables utilized for drain and bonding cables shall be single conductor, stranded copper, Type CP, insulated for 600 volts with High Molecular Weight Polyethylene (HMWPE) in accordance with the requirements of ASTM D1248, Type 1, Class C, Category 5, Grades E-4 and E-5.

All cables for galvanic anodes and test stations shall be Type THHN, solid, copper, sized as shown on the plans, and shall conform to Federal Specifications JC-30B

Test Leads and Anode Leads: Extend eighteen inches (18”) minimum above grade after connection to test station panel board.

22-02D - Cable-To-Pipe Connections

The cable connections to the steel pipelines shall be accomplished utilizing an exothermic welding process as shown on the Drawings. Each cable shall be fitted with a copper sleeve for accomplishing the weld and cartridge, sleeves and molds for each weld shall be furnished by the same manufacturer. All materials for welding shall be sized and in accordance with recommendations in manufacturers' literature.

Manufacturers, or equal

1. “Cadweld" by Erico Products, Inc.
2. "Thermoweld" by Continental Industries, Inc.

22-02E - Cable-To-Pipe Connections (Pin Brazing)

Pin brazing equipment based upon Electric-arc silver soldering using a specially designed portable Pin Brazing unit, a hollow brazing pin containing silver solder and flux shall be utilized for cable-to-stainless steel pipe connections. The unit may be battery powered or powered with a welding generator. Battery pack, pins with fuse wire, ceramic ferrules and cable lugs shall be in accordance with the manufacturer's recommendations for each wire size and pipe or fitting size and material. Brazing materials and equipment shall be the product of a single manufacturer. All material and equipment utilized for brazing shall be from one manufacturer.

Subject to Compliance with the Contract Documents the following Manufacturers are acceptable:

- BAC - GMC Electrical, Ontario, CA
- Safetrack Baavhammar AB
- Farwest Corrosion Control
- Or equal.

22-02F - Cable-To-Pipe Coating Material

Corrosion protection for exothermic cable-to-pipe connections shall utilize two-part epoxy resin.

Manufacturers, or equal

- Durcon-164, by Duriron Company
- Scotchcast Resin No. 4, by 3M Company
- CC-1 Potting Compound, by PSI Products
- Propoxy 20 epoxy putty by the Hercules Chemical Company

23-02G - Test Station Metering Shunts (N/A)

Anode metering shunts shall be 0.01 ohm, 6-amp capacity, with 1% accuracy.

Provide only where shown on the Drawings.

Manufacturers, or equal

- Tinker & Rasor

22-02H - Flush Grade Test Station

Flush grade test stations shall be traffic boxes with cast iron cover as shown on the Drawings. Terminal boxes shall be locking type, constructed of high-impact, molded Lexan plastic. The test box shall be provided with sufficient hardware and binding post terminals for each cable as shown on the Drawings. All test station hardware, including nuts, bolts and shorting straps shall be nickel plated brass.

Provide only where shown on the Drawings.

Manufacturers, or equal

- Christy G5 traffic box with a cast iron lid as shown on the Drawing. The cover shall be manufactured with "CP-TEST" markings for easy identification.
- Terminal Boxes shall be Model "T-3" by Tinker & Rasor

22-02I - Cable Warning Tape

All buried test station cables shall have plastic warning tape installed a minimum of twelve inches (12”) above the top of the cables for the entire buried length of the cables. The warning tape shall be four inches (4”) wide and shall be yellow with black lettering with the legend "CAUTION, CATHODIC PROTECTION CABLES BURIED BELOW" in three-inch (3”) high lettering printed at a minimum of seven-foot (7’) intervals along the entire buried length of the cable.

22-02J - Cable Splices

All cable splices shall be accomplished utilizing a steel split bolt connector or crimp-type connector. The connector was appropriately sized for the #10 AWG anode lead cable and the #8 AWG anode header cable. The connector shall be installed and wrapped with two layers of half-lapped rubber tape, followed with two layers of half-lapped PVC tape.

22-02K - Cable Identification Tag

All cables in the terminal boxes shall be identified. The identification tags shall be white plastic “zip-tie” type straps with a plastic tab of sufficient size to allow the pipeline station to be written on the tab with a permanent felt tip marker.

22-02 L - Insulating Joints

Insulating Flange

- Each insulating flange set shall consist of a full-face central gasket, a full-length sleeve for each flange bolt, and two insulating washers with two steel washers for each bolt. The ring-type central gasket shall be one-eighth inch (1/8”) thick sheet packing, having a dielectric constant of 300 volts per mil, minimum. Bolt sleeves shall be fabric reinforced phenolic resin or mylar, and insulating washers shall be constructed of fabric reinforced phenolic resin. The complete assembly shall have an ANSI pressure rating equal to that of the flanges between which it is installed.

Insulating Flanged Coupling Adapters

- Insulating elements shall be installed to electrically isolate the water pipeline from existing pipelines. The insulating elements shall consist of a full-face

central gasket, two sleeves for each end of the flange bolt, and two insulating washers with two steel washers for each bolt. The ring-type central gasket shall be one-eighth inch (1/8") thick sheet packing, having a dielectric constant of 300 volts per mil, minimum. Bolt sleeves shall be fabric reinforced phenolic resin or mylar, and insulating washers shall be constructed of fabric reinforced phenolic resin. The complete assembly shall have an ANSI pressure rating equal to that of the flanges between which it is installed.

Insulating Flexible Coupling

- A double boot assembly shall be installed on the flexible coupling to electrically isolate the water pipeline from existing pipelines.

22-02M - Rigid PVC Conduit And Fittings

Rigid polyvinylchloride (PVC) conduit and fittings shall be Schedule 40, manufactured to NEMA TC-2 and WC-1094 specifications and shall be U.L. approved.

22-02N - Buried Insulating Joint & Harness Set Coating Material

Viscous Elastic Coatings and Sealants (VEC) or a three-part wax tape coating system shall be used for coating all buried insulating flange as well as insulating flanges inside of Vaults.

- Viscous Elastic Coatings & Sealants (VEC)

  Manufacturers, or equal

  - Viscotaq Coatings
  - Stopaq Coatings

- Three-part wax tape coating system

  Coatings for buried insulating flanges and insulating couplings shall consist of a non-conductive, petrolatum-based coating system, such as Trenton Wax Tape #1 by The Trenton Corporation or approved equal. The coating system shall consist of a prime coat as an initial surface preparation to displace moisture on the surface and to improve adhesion of the wax tape. A wrap material shall be used to provide a smooth contour on the surface of the joint as well as for protection of the substrate. An over wrap shall be used as a final coating to provide increased mechanical strength of the coating. The prime coat shall be a petrolatum material with corrosion inhibitors and plasticizers. The wrap coat shall be a synthetic fabric saturated with a blend of petroleum wax, plasticizers

and corrosion inhibitors. The over wrap shall be plasticized, self-adhesive PVC tape.

22-02O - Bitumastic

Coating for all buried bolts, nuts and metallic washers of the ductile iron pipe and the copper insulating corporation stops shall be Bitumastic 300M coal tar mastic coating, as manufactured by Carboline or approved equal.

23-02P - Polyethylene Sheets for Pipe Encasement

The polyethylene sheets used for encasement of the ductile iron pipe and fittings shall be a minimum of 8-mils thick in accordance with AWWA C-105. The polyethylene sleeves used for encasement of the copper pipe shall be a minimum of 6-mils thick and shall be of sufficient diameter to slip over the pipe without getting damaged.

22-03 - Construction

22-03A - Material Delivery, Storage And Protection

All materials and equipment to be used in construction shall be stored in such a manner to be protected from detrimental effects from the elements. If warehouse storage cannot be provided, materials and equipment shall be stacked well above ground level and protected from the elements with plastic sheeting or other method as appropriate.

22-03B - General

All materials, workmanship and installation shall conform to all requirements of the legally constituted authority having jurisdiction. These authorities include, but are not limited to, the latest revision of the State of California, Department of Industrial Relations, Division of Industrial Safety, Electrical Orders; The National Electric Code, General Construction Safety Orders of the Industrial Accident Commission; and all other applicable State, County, or City codes and regulations. Nothing in the Drawings or specifications is to be construed to permit work not conforming to these regulations and codes. Where larger size or better grade materials than required by these regulations and codes are specified, the Specifications and Drawings shall have precedence.

22-03C - Galvanic Anodes

Galvanic anodes shall be installed in the trench horizontally in native soil, after excavation to proper depth, equal to the bottom of the pipeline, a minimum of three feet (3') from fittings and a minimum of five feet (5') from the pipelines. Spacing between anodes shall be a minimum of ten feet (10'), if multiple anodes are installed at a single test station location. Prior to placing anodes in the trench or hole, paper or plastic bags shall be removed, but the

cloth bag shall remain around the anode. Care shall be exercised during installation to prevent damage to the cloth bag and loss of backfill material. After placing anodes in the trench, native soil, free of rocks and other foreign objects shall be placed around the anode to a minimum cover of one foot above the anode. Flood the anode hole with five (5) gallons of fresh water when the backfill reaches one foot above the anode. The remainder of the trench shall then be backfilled with native soil. During installation, anodes shall not be supported or handled by use of attached wires.

The number of anodes to be installed at each test station is designated on the City Standard Drawings or as specified by Engineer.

22-03D - Cables

Cables buried in the ground shall be direct buried and shall be laid straight, without kinks. The cable shall have a minimum cover of thirty inches (30”). Each cable run shall be continuous in length and free of joints or splices. Care shall be exercised during installation to avoid punctures, cuts, and similar damage to insulation. Any damage to insulation will require replacement of the entire cable length. The backfill surrounding the cables shall be native soil free of foreign materials. Cable warning tape shall be installed twelve inches (12”) above the entire buried length of the cable.

22-03E - Cable-To-Pipe Connections

Cable-to-pipe connections shall be installed in the manner and at the locations shown on the Drawings. Coating materials shall be removed from the pipe surface over an area just sufficient to make the connections. The surface shall be cleaned to white metal by grinding or filing prior to welding the conductor. Grinding with resin impregnated wheels shall not be allowed. The conductor shall be welded to the pipe by the exothermic process with a copper sleeve fitted over the conductor, and only sufficient insulation shall be removed from the conductor to allow placing in welding mold. After the weld has cooled, all slag shall be removed, and the weld shall be tested with a sharp blow from a twenty-two ounce (22 oz.) hammer to assure proper metallurgical bond. All defective welds shall be removed and replaced. All exposed surfaces of copper and steel shall be covered with a minimum thickness of one-quarter inch (¼”) of insulating materials as shown on the Drawings.

22-03F - Mortar Coated Pipe Connection Coating

The exposed metal and surrounding surface shall be cleaned of contaminants and coated with ¼ inch thick application of epoxy. After the epoxy has dried, restore the coating by using a non-shrink mortar.

22-03G - Cable-To-Pipe Connections (Pin Brazing)

Cable-to-pipe connections for stainless steel pipe shall be installed in the manner shown on the Drawings utilizing a pin-brazing technique. Cut wire with a wire cutter to prevent deforming the wire ends. Do not deform the wire. Remove only enough insulation from the wire to allow the brazed connection to be made. The surface of the stainless-steel structure shall be ground or filed to a bright, shiny, clean and dry surface before brazing the wire connection. The wire is to be held at a ninety degree (90°) angle to the surface when brazing. Only one wire is to be attached with each braze. All wire to structure braze shall be a minimum of six inches (6") apart. As soon as the braze has cooled, the brazed connection shall be tested for strength by striking a sharp blow with a two-pound (2 lb.) hammer while pulling firmly on the wire. All unsound brazed connections are to be redone and retested. Assure that the area to be coated is thoroughly cleaned by wire brushing. All exposed surfaces of copper, steel and surrounding surface shall be cleaned of contaminants and covered with a minimum thickness of one-quarter inch (1/4") of epoxy as shown on the Drawings.

22-03H - Test Stations

Test stations shall be installed at locations designated on the Drawings anode installation locations. The test station shall be located directly above the pipe or fitting. Exact locations of test stations shall be determined by the City in the field. The terminal end of each cable shall be identified with the structure identification using the permanent cable identification tags.

The test station leads shall be tested by the Contractor and results approved by the City prior to backfill.

22-03I - Joint Bonding

All non-welded rubber gasket joints, mechanical joints, flange joints and threaded joints shall be bonded with an insulated copper cable, sized as shown on the Drawings. The overall length of the conductor shall permit maximum movement of the pipe joint without transferring any tensile stress to the cable, per pipe manufacturer's recommendations.

22-03J - Insulating Flanged Joints (N/A)

All insulating components of the insulating flanged gasket set shall be cleaned of all dirt, grease, oil and other foreign materials immediately prior to assembly. Bolt holes in mating flanges shall be properly aligned at the time bolts and insulating sleeves are inserted to prevent damage to the insulation. After flanged bolts have been tightened, each insulating washer shall be inspected for cracks or other damage. All damaged washers shall be replaced. After assembly, resistance between each bolt and flange shall be measured with an approved

ohmmeter, and the minimum resistance shall be 50,000 ohms. Where the insulating joint is assembled in the shop and shipped as a unit, resistance shall be measured in the shop between the flanges and between each bolt and flange and shall meet the above requirements. All insulating flanged joints shall be coated as shown on the Drawings and specified below.

The completed assembly shall be tested with a flange insulation tester such as Gas Electronics Model 601, or equal for the integrity of the insulation. This testing shall be conducted in the presence of the City and approved prior to backfill.

22-03K - Coating Buried Insulating Flanged Joints and Harness Sets

Viscous Elastic Coatings & Sealants (VEC) Option

- Use wire brush, power brush or an abrasive cleaning pad to remove all loose material, dirt and grime from substrate to a minimum cleanliness of SSPC SP2. Clean pipe/substrate with denatured alcohol. Apply VEC coating and overlap ten percent (10%) or one-half inch (1/2") minimum to substrate. For uneven areas, around bolts and in voids apply Viscous Elastic Paste materials. Paste should be packed into these areas leaving as few air pockets as possible. Once the substrate is coated using the VEC an outer wrap shall be applied for mechanical protection.

Three Part Wax Tape Coating System Option

- Surfaces shall be cleaned of all dirt, grease, oil and other foreign materials immediately prior to coating. Remove loose rust, paint and other foreign matter in accordance with SSPC SP2 or SP3. A prime coating shall be applied in a uniform coating over the entire surface to be wrapped. A liberal coating shall be applied to threads, cavities, shoulders, pits and other irregularities. A fill coating shall be molded and packed onto irregular surfaces such as flanges, valves or flexible couplings to create a smooth profile prior to wrapping. A wrap coating shall be spirally wrapped using a minimum of fifty-five percent (55%) overlap to ensure a double thickness of material. At the completion of each roll the overlaps shall be smoothed by hand in the direction of the spiral to ensure sealing of the overlap. A two-inch (2") overlap shall be maintained when overlapping one roll with the end of a new roll. Overlap shall occur on the top half of the pipeline. A guard coating shall be spirally over-wrapped using a fifty-five percent (55%) overlap to ensure a double coating.

22-03L - Field Coating of Buried Flange Hardware

All buried nuts and bolts shall be coated with bitumastic prior to polyethylene encasement. After flange hardware is installed use wire brush, power brush or an abrasive cleaning pad to remove all loose material, dirt and grime from substrate to a minimum cleanliness of SSPC

SP2. Apply Bitumastic coating liberally with a medium bristle brush to the extent that all surfaces are completely covered with no bare spots visually evident. The coat exposed surfaces of bolts, washers and nuts, giving special attention to the bottom-side surfaces. Follow the manufacturer's recommendations for drying times required before polyethylene encasement and backfill.

22-03M - Polyethylene Encasement of Pipe and Fittings

Encase the buried ductile iron pipes and fittings in minimum 8-mil polyethylene in accordance with AWWA C-105. Encase copper pipe in polyethylene sleeves a minimum 6-mils thick.

22-03N - System Commissioning

After installation of the cathodic protection facilities, the system shall be tested, and adjusted by the Project's corrosion engineer, to assure conformance with the Specifications. Testing shall include a determination of proper installation of each component, adequacy of test stations and insulating joints, anodes, dielectric insulation and electrical continuity of bonded pipe fittings. Upon completion of tests, a detailed report will be submitted describing any deficiencies detected. Any and all deficiencies shall be corrected by the Contractor and site conditions restored prior to final acceptance. All retesting shall be at the Contractor's expense.

After the final acceptance, if at the Insulating Joint Test Stations both the project pipe and the existing pipe show adequate levels of cathodic protection, then the Project's corrosion engineer shall bond across the insulating joints to make the new and existing pipe electrically continuous. If the existing pipelines do not show adequate cathodic protection, the insulating joint shall not be bonded across.

The Contractor shall notify the City 48 hours prior to installation of any cathodic protection components so that inspections can be scheduled. Phone messages left with others will not be considered adequate notification. The Contractor shall not backfill any cathodic protection components prior to inspection and approval by the City.

22-03O - Quality Assurance

All work shall be performed to the satisfaction of the City.

The Contractor shall not substitute for the specified materials unless approved by the City.

Compaction of backfill and trenches shall match the existing conditions and shall be approved by the City.

22-03P - Interference and Exact Locations

The Contractor shall coordinate and properly relate this work to the site and to the work of all trades. The general locations of the facilities are shown on the Drawings. However, the Contractor shall visit the premises and thoroughly familiarize himself with all details of the work and working conditions, verify existing conditions in the field, determine the exact locations of existing pipelines and structures and advise the City of any discrepancy that may prevent or hinder the specified work from being completed. The Contractor shall be solely responsible for location and marking underground structures so as to avoid damage during construction.

22-03Q - Pre-Construction Cathodic Protection Coordination Meeting

Prior to the start of pipe installation conduct a field meeting with all installation crew foremen to go over cathodic protection installation requirements and field testing.

22-04 - Measurements

Measurement of Cathodic Protection shall be lump sum.

22-05 - Payment

The contract price for Cathodic Protection shall include full compensation for complete cathodic protection system including but not limited: soil testing, polyethylene encasement, bonding, jointing of pipe, coating of buried hardware, installation of magnesium anodes, cables, insulting blankets, insulating joints, coatings for buried insulating joints, test stations, backfill and compaction, over excavation of trench line for bury of anodes, shop drawings, reports, testing and any apparatus not specifically mentioned herein or noted on the plans, but which are obviously necessary to complete the work specified.

SECTION 23. SIGNALS AND LIGHTING

23-01 - Reference Specifications and Standards

A. Federal Specifications and Standards:
595a - Federal Standard.
NEC - National Electric Code.
NEMA - National Electric Manufacturers Association.
B. State of California (Caltrans) Standards:
1. Current version of the Standard Specifications
2. Current version of the Standard Plans
3. Current version of the California Manual of Uniform Traffic Control Devices
C. City of Pleasanton Standard Plans and Specifications
D. Commercial Standards:
UL - Underwriters Laboratories, Inc.

23-02 - Equipment List and Drawings

The controller cabinet schematic wiring diagram and intersection sketch shall be combined into one drawing, so that, when the cabinet door is fully open, the drawing is oriented with the intersection.

The Contractor shall furnish a maintenance manual for all controller units, auxiliary equipment, and vehicle detector sensor units, control units and amplifiers. The maintenance manual and operation manual may be combined into one manual. The maintenance manual or combined maintenance and operation manual shall be submitted at the time the controllers are delivered for testing or, if ordered by the Engineer, previous to purchase. The maintenance manual shall include, but need not be limited to, the following items:

(a) Specifications
(b) Design characteristics
(c) General operation theory
(d) Function of all controls
(e) Trouble shooting procedure (diagnostic routine)
(f) Block circuit diagram
(g) Geographical layout of components
(h) Schematic diagrams
(i) List of replaceable component parts with stock numbers

The CONTRACTOR shall submit to the ENGINEER a list of equipment and materials proposed for to be used in accordance with Section 86-1.01, "Equipment List and Drawings," of the Caltrans Standard Specifications.

The controller cabinet and its components shall be tested and certified by the cabinet manufacturer prior to delivery to the CITY for testing.

23-03 - Warranties, Guarantees, and Instruction Sheets

Warranties, guarantees, and instruction sheets shall conform to Section 5, "Control of Work" of the Standard Specifications and these special provisions.

The traffic signal and highway lighting system installed under these special provisions, including all equipment, workmanship, and appurtenances furnished or performed in connection therewith, shall be guaranteed by the CONTRACTOR for a period of not less than one (1) year following the date of acceptance thereof. If any part is found to be defective in materials or workmanship within the one-year period and the said part cannot be repaired satisfactorily on the site, the CONTRACTOR shall immediately provide a replacement part of equal kind and/or type during the repair period. The CONTRACTOR shall be responsible for the removal, handling, repair or replacement, and reinstallation of the part until such time as the traffic signal system is functioning as specified and intended herein. The one-year guarantee on the repaired or replaced parts shall again commence with the date of reassemble of the system.

The CONTRACTOR shall deliver, handle, and store products in accordance with manufacturer's written recommendations and by methods and means which will prevent damage, deterioration, and loss including theft. Delivery schedules shall be controlled to minimize long-term storage of products at site and overcrowding of construction spaces. In particular, the CONTRACTOR shall provide delivery and installation coordination to ensure minimum holding or storage times for products recognized to be flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other sources of loss.

Poles shall be handled in a manner that will preserve the overall appearance and prevent damage to the coating. The use of chains or cables for loading, unloading, shipping or installing is prohibited. Only non-abrasive rope or equivalent nylon belting shall be used. Adequate hold-downs and appropriate blocking shall be utilized for shipping to prevent load movement and damage to the outer coating in transit. No handling shall be allowed until "dry through" condition has been achieved with the coating. Any damage to the poles as a result of mishandling shall be repaired at the CONTRACTOR’S expense.

Products shall be transported by methods to avoid product damage and shall be delivered in undamaged condition in manufacturer's dry, unopened containers or packaging.

Products shall be stored in accordance with manufacturer's written instructions, with seals and labels intact and legible. Environmentally sensitive products shall be stored in weather-tight enclosures, and temperature and humidity levels shall be maintained consistent with the manufacturer's written instructions.

Fabricated products stored outside shall be placed on sloped supports above ground. Products subject to deterioration shall be covered with impervious sheet covering; adequate ventilation shall be provided to avoid condensation.

Loose granular materials shall be stored on solid surfaces in a self-drained area and shall be prevented from mixing with foreign matter.

Stored products shall be subject to periodic inspection on a scheduled basis.

23-04 - Order of Work

Order of work shall conform to the provisions in these Special Provisions.

The first order of work shall be to place the order for the traffic signal equipment. **The CONTRACTOR shall furnish the Engineer with a statement from the vendor that the order for said equipment has been received and accepted by said vendor together with a guaranteed delivery date. This documentation may be used by the Engineer in the event of a time extension request by the Contractor.**

The CONTRACTOR shall arrange to have a signal technician, qualified to work on the controller cabinet and controller and employed by the cabinet and controller manufacturer(s) or their representative, present at the time the traffic signal is turned on, when signal interconnect cable is terminated, when emergency vehicle preemption system is activated, when a new signal phase is activated, or when any modifications are required to the controller cabinet, except for the termination of the field wires.

When microwave detection is used, the CONTRACTOR shall arrange to have a signal technician, qualified to work on the microwave detection and employed by the microwave detection manufacturer or their representative, present at the time the traffic signal is turned on, or when any video detection is activated on an existing signal.

23-05 - Control of Work

The CONTRACTOR shall be responsible for locating the corners of each new detector loop. The CONTRACTOR shall mark the detector loops and the Engineer thereof shall approve the locations before pavement is cut. The pavement shall be cut with an abrasive type of saw. The saw cut depth shall be of uniform depth throughout.

The CONTRACTOR shall be responsible for locating and marking the positions of all new signal standards and pull boxes. The Engineer may assist the CONTRACTOR in locating the above items. The ENGINEER shall approve the locations before any work on the foundations is performed. The CONTRACTOR shall give the ENGINEER a minimum of two (2) working days' notice to verify locations.

23-06 - Foundations

Portland cement shall conform to Section 90-1, "Class 1," of the latest Caltrans Standard Specifications.

23-07 - Standards, Steel Pedestals and Posts

The sign-mounting hardware, as shown on Detail U of Standard Plan ES-7N, shall be installed at the locations shown on the plans.

All Traffic Signal standards and posts shall be galvanized steel unless otherwise noted on the project plans. Locations of Traffic Signal and street lighting standards and posts shall be marked in the field with marking chalk for review by the ENGINEER before beginning any installation.

23-08 - Conduit

Conduit that is installed underground shall be rigid, nonmetallic type, Schedule 40 or HDPE schedule 80. All conduit bends greater than forty-four degrees (44°) shall be factory bends and shall have a minimum radius of eighteen inches (18”). Where factory bends are not used conduit shall be bent without crimping or flattening using the longest radius possible. Bending of non-metallic conduit shall be by methods recommended by the conduit manufacturer and with equipment approved for that purpose.

Conduit and fittings to be installed underground shall be rigid non-metallic type. Conduits designated for signal interconnect shall be installed satisfying the requirements for both twisted pair and fiber optic cables use (e.g., sweeps/bends for fiber optic should be used).

Conduit installed in concrete base shall be the same type size and quality used for the underground conduit runs.

The size of conduit used shall be as shown on the Drawings, but in no case shall conduit be less than two inches (2”) in diameter. In addition, the CONTRACTOR may, at his option and expense, use conduit of larger size than that shown or specified, provided the larger size is used for the entire length of the run from pull box to pull box. Reducing couplings will not be allowed.

When a standard coupling cannot be used for coupling metal type conduit, a UL-listed threaded union coupling, concrete-tight split coupling, or concrete-tight set screw coupling shall be used.

All fiber optic and signal interconnect pull boxes shall employ a maximum of thirty-degree- (30°) conduit sweeps. Conduit shall be rigid, nonmetallic type, schedule 40 or HDPE schedule 80. All new fiber optic or signal interconnect conduit shall be a minimum of three inches (3”) unless otherwise noted in the project plans. Conduit shall be installed so that a straight cable pulling path may be maintained.

All conduits shall enter the controller cabinet at the front and less than twenty inches (20”) from the cabinet door opening.

The first paragraph in Section 87-1.03B, "Conduit Installation," of the Standard Specifications is amended to read:

> Conduit to be installed on the surface of poles or structures or other exposed locations shall be the rigid metal type. Exposed conduit installed on a painted structure shall be painted the same color as the structure.

Insulated bonding bushings will be required on metal conduit.

When rigid, nonmetallic conduit is placed in a trench, the trench shall be back filled with minor concrete to not less than 376 pounds of cement per cubic yard, and to not less than 4 inches above the conduit before additional back fill material is placed.

Conduit shall be laid to a depth of not less than eighteen inches (18”/ (460mm) below grade in Portland cement concrete sidewalk areas and curbed paved median areas, and not less than thirty inches (30”/750mm) below finished grade in all other areas. Conduit may lie on top of the pavement within new curbed medians being constructed on top of the existing pavement.

Conduit runs shown on the plans to be located behind curbs may be installed in the street, within three feet of and parallel to the curb, by trenching, as provided below, on approval of the City Engineer. All pull boxes shall be located behind the curb or at the locations shown on the plans.

After conductors have been installed, the ends of conduits terminating in pull boxes and controller cabinets shall be sealed with an approved type of sealing compound.

Asphalt concrete shall be type "B", in accordance with City Standard Specifications.

Damage to Pavement Outside of Trench Limits
If damage such as spilling or cracking occurs to pavement outside trench limits as a result of the CONTRACTOR’S operations, the CONTRACTOR shall remove the damaged pavement as directed and replace as a part of final paving operations at the CONTRACTORS expense.

DIRECTIONAL BORING
When approved by the City Engineer, conduit may be placed under existing pavement by horizontal directional drilling (Directional Bore) method. Pavement shall not be disturbed without permission from the Engineer. Adherence to the specifications contained herein, or the Engineer’s approval of any aspect of any directional bore operation covered by this specification, shall in no way relieve the Contractor of their ultimate responsibility for the satisfactory completion of the work authorized under the Contract.

In the event obstructions are encountered, upon approval of the Engineer, small potholes may be cut in the pavement to locate or remove obstructions. All potholes shall be repaired per these specifications. Boring pits shall be kept two feet (2’) clear of the edge of any type of pavement wherever possible. In addition, boring pits shall be kept two feet (2’) clear of any pedestrian or bicycle facilities. Unless directed by the Engineer, pedestrian and bicycle facilities shall remain open at all times. All boring pits, upon end of work day, shall be covered and work areas properly coned off to warn and prohibit potential pedestrian and/or vehicular traffic to the satisfaction of the Engineer.

Excessive use of water, such that pavement might be undermined, or subgrade softened, will not be permitted.

Conduit to be placed as part of the completed work shall not be used for drilling or jacking. Type 2 and Type 3 conduit may be installed under existing pavement if a hole larger than the conduit is pre-drilled and the conduit installed by hand.

Conduit to be placed beneath railroad tracks shall comply with the following: The conduit shall be either Type 1 or 2, one-and-one-half inch (1.5") minimum and shall be placed to a minimum depth of three feet (3') below bottom of tie. The near side of each conduit jacking pit shall be constructed not less than thirteen feet (13') from the centerline of track. When the jacking pit is to be left overnight, the pit shall be covered with substantial planking.

WORK PLAN
Prior to beginning work, the Contractor must submit to the Engineer a general work plan outlining the procedure and schedule to be used to execute the project. Plan should document the thoughtful planning required to successfully complete the project.

EQUIPMENT
The contractor will submit specifications on directional boring equipment to be used to ensure that the equipment will be adequate to complete the project.

MATERIAL
Specifications on material to be used shall be submitted to the Engineer. Material shall include the pipe, fittings and any other item which is to be an installed component of the project.

PERSONNEL
Documentation of training and relevant experience of personnel shall be submitted.

The Engineer must be notified forty-eight (48) hours in advance of starting work. The Directional Bore shall not begin until the Engineer is present at the job site and agrees that proper preparations for the operation have been made. The Engineer approval for beginning the installation shall in no way relieve the Contractor of the ultimate responsibility for the satisfactory completion of the work as authorized under the Contract.

All personnel shall be fully trained in their respective duties as part of the directional boring crew and in safety. Training shall be provided specific to the project if any potential hazards may be encountered which have not already been included in personnel's training.

Upon request from the Engineer, the contractor shall photograph or video tape entire work area, including entry and exit points, prior to the beginning of work and after work is completed.

Work sites as indicated on drawings, within right-of-way, shall be graded or filled if needed to provide a level working area. No alterations beyond what is required for operations are to be made. The contractor shall confine all activities to designated work areas.

The Entire drill path shall be accurately surveyed with entry and exit stakes placed in the appropriate locations within the areas indicated on drawings. If contractor is using a magnetic guidance system, drill path will be surveyed for any surface geo-magnetic variations or anomalies.

Contractors shall place silt fence between all boring operations and any drainage, wetland, waterway or other area designated for such protection by contract documents, state, federal and local regulations. Additional environmental protection necessary to contain any hydraulic or boring fluid spills shall be put in place, including berms, liners, turbidity curtains and other

measures. The contractor shall adhere to all applicable environmental regulations. Fuel or oil may not be stored in bulk containers within two hundred feet (200') of any water-body or wetland.

Contactor shall notify all companies with underground utilities in the work area using the Underground Service Alert (USA) hotline at 811 to obtain utility locations. Once utilities have been located Contractor shall physically identify the exact location of the utilities by potholing to determine the actual location and path of any underground utilities which might be within 5 feet of the bore path. The contractor shall not commence boring operations until the location of all underground utilities within the work area has been verified.

The contractor shall adhere to all applicable state, federal and local safety regulations and all operations shall be conducted in a safe manner. Safety meetings shall be conducted at least weekly with a written record of attendance and topic submitted to the Engineer.

Pipe shall be connected together in one length prior to pull-back operations, if space permits. Steel pipe welds will be X-rayed prior to being placed in bore hole. Pipe will be placed on pipe rollers before pulling into bore hole with rollers spaced close enough to prevent excessive sagging of pipe.

Pilot hole shall be drilled on bore path with no deviations greater than five percent (5%) of depth over a length of one hundred feet (100'). In the event that pilot does deviate from bore path more than five percent (5%) of depth in one hundred feet (100'), contractor will notify Engineer and Engineer may require contractor to pull-back and re-drill from the location along bore path before the deviation.

In the event that a boring fluid fracture, inadvertent returns or returns loss occurs during pilot hole boring operations, contractor shall cease boring, wait at least thirty (30) minutes, inject a quantity of boring fluid with a viscosity exceeding one-hundred-twenty (120) seconds as measured by a March funnel and then wait another thirty (30) minutes. If mud fracture or returns loss continues, contractor will cease operations and notify Engineer. Engineer and contractor will discuss additional options and work will then proceed accordingly.

Upon successful completion of pilot hole, contractor will ream bore hole to a minimum of twenty-five percent (25%) greater than outside diameter of pipe using the appropriate tools. Contractor will not attempt to ream at one time more than the boring equipment and mud system are designed to safely handle.

After successfully reaming the bore hole to the required diameter, contractor will pull the pipe through the bore hole. In front of the pipe will be a swivel. Once pull-back operations have commenced, operations must continue without interruption until pipe is completely pulled into bore hole. During pull-back operations the contractor will not apply more than the maximum safe pipe pull pressure at any time.
In the event that pipe becomes stuck, contractor will cease pulling operations to allow any potential hydro-lock to subside and will commence pulling operations. If the pipe remains stuck, contractor will notify Engineer. Engineers and contractors will discuss options and then work will proceed accordingly.

Following boring operations, contractor will de-mobilize equipment and restore the worksite to original condition. All excavations will be backfilled and compacted to ninety-five percent (95%) of original density. Landscaping will be restored to its original.

Contractor shall maintain a daily project log of boring operations and a guidance system log with a copy given to Engineer at completion of project. As-built drawings shall be certified as accuracy by contractor.

23-09 – Pull Boxes

Grout in bottom of pull boxes will not be required; however, the depth of the crushed rock sump shall be increased to a minimum depth of twelve inches (12”).

Pull boxes shall conform to the provisions in Section 86-1.02C, "Pull Boxes," of the Caltrans Standard Specifications and this Section.

Pull box size shall be No. 5 for traffic signals, No. 3-1/2 for streetlights, No. 6 for homeruns, No. 6E for fiber optic and signal interconnect cable, and thirty inches by forty-eight inches by twenty inches (30”x48”x20”) “double lid” for fiber optic splice enclosures unless otherwise shown on the Drawings. The cover shall be polymer concrete. Where pull boxes are to be placed in areas subject to traffic loads, a steel or cast-iron cover shall be used in lieu of the concrete cover.

Maximum pull box spacing shall be one-hundred feet (100') for traffic signals, two-hundred feet (200') for streetlights and hardwire signal interconnect, and eight-hundred feet (800’) for fiber optic communications unless otherwise noted on the plans.

Interconnect pull boxes shall have lids embossed with “INTERCONNECT,” streetlight pull box lids with “STREET LIGHTING,” and traffic signal pull boxes with “TRAFFIC SIGNAL.” All thirty inch by forty-eight inch (30”x48”) double lid pull boxes shall read “CITY OF PLEASANTON FIBER OPTIC”.

All 6E pull boxes shall employ a ten-inch (10”) extension. A minimum of eighteen inches (18”) of space shall be maintained between the lid of the 6E pull box and material at the bottom of the box.

Recesses for suspension of ballast will not be required.

All conduits shall enter the pull box from the bottom. Side access will not be permitted unless otherwise directed by the ENGINEER.

Where the sump of an existing pull box is disturbed by the CONTRACTOR’S operations, the sump shall be reconstructed and, if the sump was grouted, the old grout shall be removed and new grout placed at the CONTRACTOR’S expense.

23-10 - Conductors and Wiring

At least ten feet (10’) of slack shall be provided in the interconnect pull boxes and the pull box nearest each signal standard, for those conductors terminating in that standard; and five feet (5’)

of slack shall be provided in each conductor in all other pull boxes. The wire bundle entering the controller cabinet shall be neatly coiled in the bottom of the cabinet in order to obtain as much slack as possible. All No. 14 conductors shall be SOLID copper wire.

Splices shall be insulated by "Method B."

Multiple-circuit conductors shall conform to the provisions in Section 86-1.02F, "Multiple Lighting Conductors," of the Standard Specifications.

Traffic signal light conductor splicing, where permitted by subparagraph 5 of the first paragraph of Section 87-1.03H, "Conductor and Cables Splices," of the Standard Specifications, shall be spliced using a Type "C" splice.

Conductors shall not be pulled into conduits until the pull boxes have been set to grade, crushed rock sumps have been installed, and conduits have been bonded and grounded. All pull boxes shall be inspected and approved prior to pulling any conductors. Conductors shall not be pulled into conduits unless the Engineer is present to observe the operation. The ends of all unused cables shall be sealed. The ends of all cables shall be sealed prior to being installed into the conduits.

All phase conductors and detector cables, including existing phase detectors and conductor labels, shall be identified with the new phase numbers, as shown on the plans. Identification bands shall be T & B Ty-Rap Cable Ties; No. TY 553 M. The flags on the bands shall be marked with a Ty-Rap marking pen; No. WT 163 M-1 (Black), or approved equal. No other method of labeling will be acceptable. All phase conductors and detector cables shall be labeled by phase designations in the pull box nearest their termination, and in the controller cabinet. Phase conductors shall be labeled with phase designation. Detector cables shall be labeled with phase and loop number. Lighting conductors (street or sign) shall be labeled as appropriate. Spare conductors need not be labeled. A one-quarter inch (1/4”) pull rope shall be installed into all new conduits.

INTERCONNECT CABLE

Splicing of the interconnect cable shall be done only within controller cabinets on terminal blocks furnished and installed by the controller cabinet supplier. Terminal blocks shall be per City standard. The contractor shall be responsible for terminating interconnect cable in the cabinet per direction of the engineering. All the splices shall be done in accordance with the recommendation of the controller supplier and to the satisfaction of the Pleasanton Traffic Engineering.

Temporary interconnect splicing shall be allowed during construction for a maximum period of sixty (60) days. Temporary splices of interconnect shall be insulated with heat-shrink tubing of the appropriate size and shall overlap the conductor insulation at least one-half inches (0.5”). The overall cable splice shall be covered with heat-shrink tubing, with at least one-and-one-half inch (1.5”) of overlap of the cable jacket. Any alternate temporary splice method shall be approved by the Project Engineer.

Cable six (6) pairs shall be installed between signal control cabinet telemetry panel and splice cabinet terminal block, as directed by Pleasanton Traffic Engineering.

The Contractor shall provide and install, as per plans, No. 18 or 19 gauge twisted, single-pair conductors, shielded, IPCEA, Type A, or equal, suitable for telemetry's, communicators, or control usage with 300 volt minimum rating within conduit runs which interconnect the traffic signal controllers. Conductor color code shall conform to the following:

White/Blue, White/Orange, White/Green, White/Brown, White/Gray, and Red/Blue, etc.

Contractor may **NOT** use the Signal Interconnect Cable that is called out in Section 86-1.02F(3)(d)(v) of the State of California Standard Specifications for this cable.

The Contractor shall be responsible for maintaining the existing interconnect during construction. Any interruption of interconnectivity during the construction process due to contractor activity shall be resolved by the contractor immediately and at the contractor's expense.

INTERCONNECT FIBER

Fiber Cable shall be all dielectric, loose tube with twelve (12) single strand fibers per loose tube. No ribbon fiber shall be utilized. Fiber optic cable shall be single mode. Where available, within contract, water protection tape rather than gel filling shall be utilized. Fiber and fiber cable construction shall adhere to RUS PE-90 and Bellcore GR-20. Cable shall adhere to standard industry fiber and loose tube color coding, as defined by RUS PE-90 and Bellcore GR-20. The Cable shall be constructed to provide a minimum of 30 years useful life when installed in conduit. Fiber shall be 8.3 microns (normal) diameter with mode field diameters for depressed cladding being 8.8 microns ± 0.5 microns at 1310 nm and 10.0 ±1.0 microns at 1550 nm; for matched cladding mode field shall be 9.3 microns ± 0.5 microns and 10.5 ± 1.0 microns for respective wave lengths. (Cladding types shall not be mixed during fiber deployment). The fiber shall be protected with a cladding with diameter of 125.0 ±1.0 microns.

The fiber within the cable shall have an attenuation of no greater than 0.35 dB/Km (0.56 dB/Mile) at 1310 nm and 0.25 dB/Km (0.40 dB/Mile) at 1550 nm. Water peak attenuation 1385 nm (±3 nm) shall not exceed 2.5 dB/Km (4.02 dB/Mile). The attenuation of the fiber shall be distributed uniformly throughout its length such that there are no localized discontinuities in excess of 0.1dB at either 1310 nm or 1550 nm as determined by TIA 455-59 Fiber Optic Test Procedures (FOTP).

The Fibers shall have a maximum dispersion of 2.8 picoseconds/nanometer – km (ps/nm-km) over an optical wavelength range of 1290 to 1330 nm and a maximum value of zero dispersion slope of 0.093 ps/(km-nm2). Dispersion tests are in accordance with TIA 455-17S FOTP. The manufacturers shall have tested for dispersion as required by Bellcore GR – 20 or RUS PE-90. New factory tests are required only if the fiber has not been pre-tested and qualified to standards.

The Construction of the cable shall follow referenced standards for construction of dielectric, loose tube fiber cable with the exception that water-blocking tape is acceptable and preferred. The dielectric strength member shall support a tensile force of 2700 Newtons during cable installation and shall protect fiber attenuation change during installation allowing no greater than 0.31 dB/Km (0.50 dB/Mile) increase over manufacturer's specified fiber attenuation.

The cable shall include a ripcord under the sheath to support easy removal of the sheaths. The sheaths shall be marked in accordance with National Electric Safety Code 350 G. The Cable Sheath

shall also be permanently marked with the manufacturer's name, type cable and "Fiber Optic Cable." There shall also be sequential length markers that are accurate within 1%. Marking size shall be such as to the easily read by a technician. The Contractor shall submit cut sheets for cable approval to the Construction Manager identifying the marking size, repetition and symbol per National Electrical Safety Code (i.e., Telephone Symbol).

Cable diameter for up to 72 fibers should be approximately 13mm. Cable shall be rated for an operating temperature of -400C to +750C. The cable shall contain no metal and shall conform to the National Electric Code's definition of fiber.

Tracer Wires shall be included with all fiber optic cable installation projects. The tracer wires shall be installed in such a way so that underground fiber optic utilities can be identified and located in the future by maintenance staff.

Cable shall be shipped from the factory with protective wrapping and with sealed ends. The cable shall include a waterproof tag with the results of factory OTDR attenuation test as well as:

- Contract Number/Identification
- Manufacturer's Name/Address
- Manufacturer's Part Number
- Type of Cable
- Number of Loose Tubes and Fiber
- Beginning and Ending Length Marks
- Reel Number
- Ship Date
- Weight of Cable and Reel

Cable shall be of a continuous length on the reels. The Cable runs are as shown on plans. Slack cable requirements shall be considered by the Contractor, based on normal industry installation practices, in computing required cable length.

All traffic signal controller cabinets shall employ a fiber termination panel or tray for fiber optic termination with SC (female) connectors. Each jumper cable shall be 900 microns and terminated with an SC (male) connector having integral strain relief.

The fiber optic patch cable shall comply with the fiber cable special provisions of this document. The length of the patch cable shall be two (2) meters (minimum). The patch cable shall have employ SC (male) connectors, simplex and single mode. The jumper cable will interface with the SC (female) connectors on the optical transceivers installed in field equipment cabinets.

The Contractor is responsible for interfacing the SC (Male) connectors to test optical-to-electrical communications performance between the patch cables, other installation locations, and the Traffic Operations Center (if applicable). The Contractor is responsible for correct splicing of the drop cable onto the backbone cable in accordance with splice tables provided by the City. Only fusion splicing method shall be accepted. The contractor is responsible for point-to-point continuity in accordance with splice tables and assuring point-to-point optical path loss (attenuation) is within specifications. Fiber drop cables and patch cables shall be marked R-1, R-2, T-1, T-2 or SPARE.

The Contractor shall prepare and submit Record Drawings of each fiber color, splices, and unconnected fibers. Record drawings shall be labeled to indicate the splice closure location.

All fiber optic splices shall be completed using the fusion splice method. All splices shall be tested, and the results of those tests shall be provided to the CITY by the CONTRACTOR.

23-11 - Functional Testing

The functional test for each system shall consist of not less than fourteen (14) days. If unsatisfactory performance of the system develops, the conditions shall be corrected, and the test shall be repeated until the fourteen (14) days of continuous, satisfactory operation is obtained.

The traffic signal controller shall be delivered to the City's Traffic Engineering Department by no less than twenty-one (21) calendar days before the traffic signal is activated. Traffic engineering will prepare preliminary signal timing and test the traffic signal controller prior to releasing the controller to the CONTRACTOR. Once the controller is released to the CONTRACTOR the CONTRACTOR assumes ownership of the controller. Any lost, stolen, misplaced traffic signal controller shall be replaced by the CONTRACTOR at their expense.

The City shall have the right to request a sample of any materials used for the construction of the traffic signal, including, but not limited to: controller and components, signal heads, poles, conductor wire, or any other item deemed necessary to be tested or inspected for compliance to the specifications. CONTRACTOR shall deliver those materials requested within twenty-one (21) calendar days of request. If the City does not receive the requested materials within the time specified, those materials requested shall be deemed to be unsatisfactory, and rejected.

If the CONTRACTOR is notified of the need for repair of equipment being tested, the required repairs shall commence within five (5) working days of the time of notification by the ENGINEER. The CONTRACTOR shall be responsible for all the costs involved in the repair of the equipment, including re-testing if necessary.

If any of the equipment is rejected for failure to comply with the requirements of these Specifications, the CONTRACTOR shall be responsible for all the costs involved in re-testing the equipment after it has been rejected. Deductions to cover the cost of such re-testing will be made from any monies due or which may become due the CONTRACTOR.

If control equipment fails during the time period between turn on and final acceptance and the CONTRACTOR is unavailable to immediately respond to repair or replace the failed equipment, the ENGINEER may call in City contract maintenance forces and bill the CONTRACTOR reasonable costs to restore the intersection to designed operation.

The manufacturer's warranty period for furnished equipment shall not commence until the equipment has been installed at the project sites and has been placed in operation by a factory representative, and the project accepted.

In order to properly conduct functional testing of the controller assembly, schematic drawings specific for the cabinet to be used in this specific project shall be submitted with the cabinet. Traffic

signal construction plan shall also be submitted. Drawings shall indicate the intersection name and phasing. Absence of the required drawings could result in the rejection of the entire controller assembly. Cabinet testing will not proceed until the required drawings are submitted. The functional test for each signal system shall consist of not less than fourteen (14) days. If unsatisfactory performance of the system develops, the conditions shall be corrected, and the test shall be repeated until the fourteen (14) days of continuous satisfactory operations is obtained.

Before scheduling the traffic signal "Turn On," the CONTRACTOR is required to coordinate a pre-testing to be conducted by the City or their designee. Seventy-two (72) hours minimum advance notice is required to schedule this pre-test. During the pre-test, the City's traffic signal maintenance staff will determine if all components of the traffic signal system are operational as designed. If deficiencies are found, the CONTRACTOR shall make the necessary corrections and schedule a follow up pre-testing. Only after all the deficiencies found are corrected can the CONTRACTOR schedule the signal "Turn On." The CONTRACTOR shall provide a minimum of forty-eight (48)-hour advance notice to schedule the "Turn On".

All vehicle signal and pedestrian signal heads shall be bagged in their entirety with a burlap sack once the signal heads are installed prior to turn-on. Alternate methods of signal head bagging must be approved by the ENGINEER. The CONTRACTOR shall remove the burlap sacks on the day of turn-on. At that time the CONTRACTOR shall place temporary "STOP" signs in all directions of travel per direction of the ENGINEER. The signs may be removed once the signal is placed in "flashing red" operation. The signs shall remain on site until the signal has been activated and deemed functional by the ENGINEER.

The CONTRACTOR shall require the following product vendors and/or contractors to attend the traffic signal turn on date:

- Traffic Signal Controller Cabinet
- Traffic Signal Controller
- Vehicle Video Detection System
- The City's Designated Traffic Signal Maintenance contractor

The CONTRACTOR shall not be required to pay for the City's Maintenance contractor time on-site.

The ENGINEER may waive a vendor's attendance requirement prior to turn on ONLY through written notice. Electronic notice (email) shall be an acceptable method of notice.

The CONTRACTOR shall schedule a time to activate the traffic signal. Traffic signal turn-on may be scheduled on a non-holiday week Tuesday, Wednesday, or Thursday before 1PM. For the purposes of these specifications "TURN ON" denotes that the signal is physically ready for activation. The ENGINEER shall perform a final pre- turn on system check immediately prior to If the signal is not ready for activation on the appointed time the ENGINEER, at their discretion, may cancel the turn on. The CONTRACTOR shall be responsible for rescheduling the turn-on and is responsible for any additional costs resulting from the rescheduled turn-on.

23-12 - Service and UPS System

The traffic signal service equipment cabinet shall be a Millbank (CP3A C-Size BBU) Type III with Alpha FXM1100-HP 120/240-volt/Battery backup combo and shall be powder coated to match the controller cabinet color #14109 Federal Standard 595B Colors unless otherwise noted on plans. Service shall conform to the provisions in Section 86-2.11, "Service," of the Caltrans Standard Specifications and this Section except that the CONTRACTOR shall pay all costs and fees required by the utility company for the connection of both temporary and permanent service.

At the time of bidding only a preliminary PG&E electrical service point has been established. For bidding purposes, the CONTRACTOR shall assume a three-hundred-foot (300') conduit run between the service cabinet and secondary service pull boxes. Once the final PG&E service location is established the CONTRACTOR shall be compensated on a cost per liner foot basis from the service cabinet to the secondary service pull box.

Battery backup systems (BBS) shall be required on all new traffic signal service equipment installations. The service cabinet shall house both PG&E equipment and BBS equipment, including batteries. The base for a Type III Service/BBS enclosure shall meet Caltrans Standard Plans ES-2D. The BBS design shall be installed so that the unit may be replaced with standard Type III-AF service cabinet in the event of an emergency.

The traffic signal service enclosure shall meet the requirements of PG&E, and shall conform to Section 86-1.02, "Regulations and Code," of the Caltrans Standard Specifications. The enclosure shall be factory pre-wired and tested to meet NEMA 3R standards. A copy of the wiring diagram for the integrated system shall be enclosed in plastic and mounted inside the enclosure. Name plates shall be provided for each control component. The name plates shall be phenolic, black background with white lettering except the main breaker, which shall be red with white lettering. All name plates shall be fastened in the enclosure by screws. I.D. numerals shall be used to show the address for the meter below the meter window or the front of the enclosure.

The traffic signal service enclosure shall have a separate disconnect for the traffic signal, safety lighting, and sign lighting circuits. Separate disconnects shall be provided for any other separate circuit, such as street lighting or irrigation systems, when shown on the plans. The top half of the service cabinet shall be equipped with nineteen-inch (19") rack mountable rails.

A traffic signal equipped with fully functional BBS shall be wired to operate for a period of at least two hours and run an additional two (2) hours (minimum) on Red Flash only. The UPS/BBS shall have a minimum Power Rating of 1.1 KVA (1100 Watts).

GENERAL SPECIFICATIONS

Input / Output Voltage (VAC) nominal	120
Input / Output Frequency (Hz) nominal	l60
Input Current (A)	12.0
Input voltage Variation	-23% to +17%
Output Power (VA)	1100
Active Output Power (watts)	1100
Voltage Waveform	sine

Battery Run Time

Power required 1000 watts for 3 hours

Transfer time (ms)	2 - 4
Operating Temperature	-35C to +55 C

Lightning / Surge Protection:

Passes ANSI/IEEE C.62.41/C.62.45 Cat A & B

STANDARD FEATURES

Generator Hookup to service cabinet
Transient voltage protection from damaging line spikes
Low harmonic AC sine wave output
Intelligent Boost Operation for brownout protection available
Noise suppression, FCC Class A
Multiple mounting configurations
UL / CSA listed

POWER CONDITIONING

Intelligent Boost Operation (optional) increases output voltage 12% if input voltage falls between 17% to -23% of nominal.

COMMUNICATION & ALARMS

Form C dry relay contacts close on low battery
RS-232 status port
LED indicator for online, on battery, low battery, overload & fault
Ethernet Port

23-13 - Traffic Signal Controller

The CONTRACTOR shall furnish a new signal controller assembly as shown on the plans, and delivery of the controller shall be to the City's Traffic Engineering Division for testing. The controller shall be a Trafficware Shelf Mount Commander ATC NT2 controller with the latest version of the SCOUT ATC software and capable of providing the phasing shown on the plans. It shall be possible to interconnect and fully interface the controller to the City's Central Traffic Signal Master Computer. The hardware necessary to provide communication with the Central Traffic Signal Master Computer shall be an integral part of the control cabinet assembly.

All delivered material and equipment shall be in accordance with Section 86 of the State of California Department of Transportation Standard specifications and these special provisions.

The controller assembly will be connected to the Central Traffic Signal Master Computer and tested for a minimum of 10 working days. Equipment that fails this test operation shall be immediately repaired or replaced by the Contractor. After completion of tests, the CONTRACTOR shall install the controller cabinet as shown on the plans.

23-14 - Controller Assembly

This specification sets forth the minimum requirements for a TS-2 Type 1/Type 2 controller assemblies with a 16-position load bay, wired for eight phases and fully operational with all the components and plug-ins, malfunction management unit, bus interface unit, cabinet power supply, load switches, flashers and detectors including the controller unit. The controller assembly shall meet all applicable sections of the NEMA TS-2 1998 Standards and Caltrans Standard Specifications and Standard Plans.

23-15 - Controller Cabinet

New controller cabinets shall conform to Section 86-3, "Controller Cabinet," of the State Standard Specifications and these Special Provisions.

Controller cabinet foundations shall extend four inches (4") above grade. The cabinet size will be called out in the project plans and will be a Type "Stretch P" cabinet and fabricated from aluminum sheet. The interior of the cabinet shall be painted powder coat white. The cabinet door shall be fitted with a No. 2 Corbin lock number 1548-1 or exact equivalent, and stainless-steel handle with a 16mm (minimum) diameter shaft and three-point latch. The lock and latch design shall not allow the handle to open the cabinet unless the lock is engaged. A locking auxiliary police door shall be included to allow limited controller function access to switch the traffic controller between normal and flash operation. The police door-in-door shall be provided with a treasury type lock Corbin No. R357SGS or exact equivalent. The cabinet shall be "plug and play" ready with a Trafficware Shelf Mount Commander ATC NT2 controller with the latest version of the SCOUT ATC software. The cabinet layout shall be configured to provide adequate shelf space for all shelf-mounted required equipment (e.g., EVP rack, power supply, detector racks, BIU, video detection equipment, MMU, Modem/Switch, and Controller). At least seventy-two (72) hours before the scheduled "signal turn-on", the controller assemblies including video detection system, shall be fully wired, programmed, tested, and organized with no unnecessary

loose cables or conductors. The wiring in the cabinet shall be tie-wrapped in a neat/orderly fashion to the satisfaction of the City of Pleasanton.

The main door hinge shall be a one-piece, continuous piano hinge with a stainless-steel pin running the entire length of the door. The hinge is attached in such a manner that no rivets or bolts are exposed.

The main door and police door-in-door shall close against a weatherproof and dust-proof, closed-cell neoprene gasket seal. The gasket material for the main door shall be a minimum of twenty-five hundredths inches (0.250") thick by one inch (1.00") wide. The gasket material for the police door shall be a minimum of twenty-five hundredths inches (0.250") inches thick by five hundredths inches (0.500") wide. The gaskets shall be permanently bonded to the cabinet.

The cabinet flange for securing the anchor bolts will not protrude outward from the bottom of the cabinet.

The cabinet and doors shall be powder coated to match the service cabinet color #14109 Federal Standard 595B Colors unless otherwise noted on plans. The cabinet shall be constructed and wired to provide full TS-2 NEMA capability with both a Type 1 and Type 2 controller, 16 phase, 64 detector channel operation programmable through the controller, and shall include load switches and other equipment necessary to provide this phasing.

Facing the Cabinet door the cabinet shall open on the right-hand side. The power distribution panel shall be mounted on the inside right-hand side. On the left hand side of the cabinet, 48 channels of loop detection will be landed. Interconnect terminal blocks shall be a minimum of 2 each 12 positions light duty terminal blocks rate for 5 amp and shall be provided with No. 6 x 3-mm {1/8 inches} binder head screws.

The Cabinet shall be wired for two 762 Opticom Discriminators (or approved equal) to operate in the first detector rack. The cabinet shall be "plug and play" ready for a Trafficware Shelf Mount Commander ATC NT2 controller.

The cabinet shall be tested by the cabinet manufacturer prior to delivery on site. Any cabinet deficiencies identified by the ENGINEER shall be resolved by the CONTRACTOR at their expense prior to turn-on.

The "on-off" switch for the cabinet lighting fixtures shall be both a toggle switch mounted on the inside control panel, and a door-activated switch that turns the light on when the door is open and off when the door is closed. Cabinet shall be wired for manual control operation.

23-16 - Auxiliary Equipment

Auxiliary equipment shall conform to Section 86 of the State Standard Specifications and these Special Provisions.
The load-switching device shall have indicator lamps for both the inputs and outputs of the device.

The MMU (Malfunction Management Unit) monitoring device shall be installed external to and electrically independent of each controller unit. MMU shall meet or exceed all NEMA TS2 specifications along with the following:

- NEMA TS1 compatible (Type 12 operation), Advanced diagnostic features isolate problems,
  Data logging capability allows viewing and recording of improper voltages; Event logging provides a detailed, time-stamped record of time change, MMU reset, MMU configuration changes, prior failures, AC line voltages, and signal sequence characteristics; Front panel shall have 24-mounted DIP switches allow for easy configuration of Field Check/Dual Enables and selection of options; 77 front paneled mounted LED's provide a clear, concise, real-time indication of the status of all channel inputs and fault conditions,
- Front panel mounted RJ-45 Ethernet Port facilitates computer interface; Also extended NEMA TS2 features including Advanced Hardware Architecture, Dual Indication Monitoring, GY-Dual Indication Monitoring, Field Check Monitoring, External Watchdog Monitoring, Program Card Absent Monitoring, Display LED Test, 12 Volt DC Monitoring, Modified CVM Latch.

ETHERNET OVER FIBER SWITCH
When Ethernet over fiber optic communication is being used a RuggedCom RS900 managed Ethernet switch shall be required unless otherwise noted on the plans. Model to be approved by Traffic Engineering.

ETHERNET OVER COPPER SWITCH
When Ethernet over Signal Interconnect Cable is used for communications an Actelis MetaLight Ethernet over Copper Bridge shall be required unless otherwise noted on the plans. Model to be approved by Traffic Engineering.

CLOSED CIRCUIT TELEVISION CAMERA WITH PAN/TILT/ZOOM CONTROL
The pan-tilt-zoom cameras shall be the Axis Q-series network camera manufactured by Axis Communications. Model to be approved by Traffic Engineering.

CAMERA MOUNTS (DOME CAMERAS)
The outdoor mount assembly shall include the AXIS T91L61 Pole Mount (Part # 5801-721). The housing assembly and mounting hardware shall be provided with mounting bolts, banding straps and clips and a banding tool for the installation of the pole mount.

GENERAL
The dome camera shall be based around a solid-state microprocessor, operating on a non-Windows based platform and include a built-in web server providing the user with full remote control of the camera's pan, tilt and zoom functionality.

It shall include a built-in motorized zoom lens of at least 30x optical zoom and 12x digital zoom. The dome camera shall provide continuous 360º pan support and provide user with at least 20 presets.

FUNCTIONALITY

The operator shall be able to remotely control the built-in variable speed pan/tilt functionality as well as the zoom lens, which shall incorporate at least 30x optical + 12x digital zoom.

The dome camera shall allow the transmission of images at up to 30 frames per second, using ISMA-compliant H.264, and with no modification or alteration of the images.

HARDWARE
The dome camera shall be connected to a network using 10baseT Ethernet/100baseTX POE via a standard RJ-45 socket and shall support autosensing of speed.

Power shall be provided by a High Power over Ethernet (High PoE), maximum 60 W.

SOFTWARE
The dome camera shall incorporate support for Shell scripting to allow customer specific functions to be created.

The dome camera shall support full functionality when operating in the following environment.

Operating Systems: Windows 10 or Higher
Browsers: MS Edge or Chrome

A fully open and published API (Application Programmers Interface) shall support the dome camera, providing all necessary information needed to integrate functionality into third party applications.

ENVIRONMENTAL
The dome camera shall operate successfully in a temperature range from -50° to 50° C. (-58° to 122° F.), and in a humidity range of 10 – 100% RH.

The unit shall carry the following approvals:

EMC:

- CE Compliant according to: EN55024:1998 + A1 +A2, EN55022:1998 + A1 Class B, EN61000-3 2:2000, EN61000-3-3:1995 + A1
- FCC Part 15 subpart B Class B, by compliance with EN55022:1998 Class B
- VCCI:2003 Class B ITE
- C-tick AS/NZS 3548
- Canadian ICES-003 B, by compliance with EN55022:1998 Class B

Power over Ethernet:

- IEEE 802.3af - Class 2

23-17 - Vehicle Signal Faces and Signal Heads

Vehicle signal faces and signal heads shall be in conformance with Section 86-1.02R, "Signal Heads" of the Caltrans Standard Specifications and as shown on the Drawings.

Signal section housing shall be metal type and shall have twelve-inch (12") sections. Signal housings and mounting hardware shall be painted black and electrically powder coated. The backplates for mast arm mounted heads shall be ventilated. All backplates shall be such that they can be removed and reinstalled without requiring the removal of the traffic signals.

The second sentence in the third paragraph in Section 86-1.02R(3), "Backplates," of the Caltrans Standard Specifications is amended to read:

> Sections shall be joined using 1) aluminum rivets and washers painted or permanently colored to match the backplate, or 2) No. 10 machine screws with washer, lock washer and nut, painted to match the backplate.

All vehicle signals shall be Dialight ITE Compliant "X" and "XL" 12-inch LED indications or approved equal and furnished by the CONTRACTOR. This specification LED modules to be used in place of the incandescent lamp, reflector, socket, gasket, and lens assembly of the vehicle signal sections. Vehicle type LED modules shall fit in all standard, incandescent vehicle traffic signal housings. Each module shall also incorporate a printed circuit board inclusive of all of the LEDs and required circuit components, 36 inch 16 AWG wire leads with strain relief and spade terminals, a rigid housing for protection in shipping, handling and installation, and a one piece neoprene gasket. Screw-in type products are not allowed for vehicle signals.

All LED shall meet the latest ITE specifications and current Caltrans standards and measurement criteria for LED traffic signal modules, and shall conform to the following specifications:

Ball type signals shall utilize the LumiLeds (1) light engine as their source of illumination.

Lenses for ball type modules shall be made of ultraviolet stabilized polycarbonate and incorporate facets that serve to enhance the optical efficiency of the LED traffic signal module. Individual lens-lets are specifically not allowed. The ball type signals shall incorporate an inner lens that is sealed to the lamp housing, and serves to collimate the light emitted by the LumiLeds (1) light engine. An outer lens shall also be incorporated, that serves to focus the collimated light, so as to meet ITE intensity and distribution standards. Additionally, the LED shall almost perfectly, approximate to the motorist, the appearance of an incandescent traffic signal. This means that the face of the ball LED lamp shall appear to the motorist as nearly totally uniform in illumination, and have a wide viewing angle that makes it suitable for installation on wide boulevards or single-tethered span wire. This also means that it shall not be apparent that LEDs are used as the light source for the traffic signal ball. The external lens surface for all vehicle signals shall be smooth, with no raised features, so as to minimize the collection of dirt, diesel smoke, and other particulate contaminates, and to facilitate periodic cleaning. External lens facets are not allowed. The lens shall be keyed to the housing of the LED signal module to ensure the proper orientation and to avoid possible rotation during any handling. External lenses shall be hard coated in compliance with Caltrans specifications.

The LEDs shall be mounted and soldered to a printed circuit board. The LED signal module shall be watertight when properly installed in a traffic signal housing. The LED signal module shall utilize the same mounting hardware used to secure the incandescent lens and gasket assembly and shall only require a screwdriver or standard installation tool to complete the mounting. The LED signal module assembly shall weigh less than 5 pounds. For vehicle signals, the incandescent lamp

sockets and reflectors shall be removed from the signal head housings. So as to minimize possible maintenance problems, the LED lamp module may not protrude into the signal visor area more than three-quarters of an inch in depth.

The housing of the LED signal module shall be marked 'TOP' to designate the proper orientation of the LED signal module in the traffic signal housing. The housing of red LED ball type traffic signal modules shall utilize a partial, embedded and integral metal layer, in its design and construction. Manufacturers part number, date code, and electrical characteristics of the LED signal module shall be visible on the rear of the assembly. A label shall be affixed to back of the all ball type modules, that certifies their complete compliance with the latest ITE VTCSH, Part II specification for LED traffic signal modules.

The LED traffic signal manufacturer shall be ISO 9001 certified.

The light intensity and distribution from red LED signal modules shall as a minimum, meet the July 1998 ITE VTCSH Part II, and current CALTRANS standards and measurement criteria for LED traffic signal modules. Test data to verify the performance for red and green ball signals as meeting the July 1998 ITE VTCSH, Part II intensity requirements at 74° Centigrade, shall be supplied from either:

Lighting Sciences	ETL Testing Laboratories
7630 East Evans Road	3933 US Route 11
Scottsdale, AZ 85260	Cortland, NY 13045-0950

or, other certified independent test lab. The light output of all LED vehicle signal modules shall meet ITE specifications for chromaticity.

The LEDs shall be connected in series parallel strings. No more than one percent (1%) of the total luminosity of the entire signal module may be lost in the event of a single string failure. For red LED ball type signals, the failure of a single LED shall cause loss of light from only that LED. No loss of light output from the complete module assembly shall occur as a result of a single LED failure in a red LED ball lamp.

The control circuitry shall prevent the current flow through the LEDs in the off state to avoid any false indication as may be perceived by the human eye, during daylight and evening hours. The LED traffic signal module shall be operationally compatible with NEMA TS-1 and NEMA TS-2 conflict monitoring parameters. The intensity of the LED signal module shall not vary by more than ten percent (10%) over the allowable voltage range as specified in the electrical section below.

Red balls shall maintain required intensity, as defined by the July 1998 ITE VTCSH, Part II intensity standards for LED traffic signal modules, over the temperature range of -40° Centigrade to +74° Centigrade, at 120 volts A.C., when new, and after 3 years.

Power factor shall be ninety percent (90%) or greater, at nominal rated voltage, at 25C, after 60 minutes of operation. Total harmonic distortion (THD) shall be less than twenty percent (20%) at rated voltage, at 25°C.

All LED traffic signal modules shall be in compliance with FCC noise regulations.

All green LEDs shall have a clear lens. No green tint lens allowed.

The red LEDs shall utilize exclusively AlInGaP technology, either AS (Absorbing Substrate) or TS (Transparent Substrate) and shall not exhibit degradation of more than thirty percent (30%) of their initial light intensity following accelerated life testing (operating at 85° C. and eighty-five percent (85%) humidity, for 1,000 hours). AlGaAs technology is not acceptable.

The LED signal modules shall be connected directly to line voltage, 120 Volts AC nominal, and shall be able to operate over the voltage range of 80 VAC to 135 VAC.

The twelve inches (12") red ball units shall consume no more than a nominal 10.5 watts respectively, at 120 VAC, at 25° Centigrade. Maximum power consumption shall not exceed 12 watts respectively, at 120 VAC, at 25° Centigrade.

Red arrow type LED traffic signal modules shall be temperature-compensated so as to maintain intensity at elevated temperatures. Red arrow type LED traffic signal shall be tested and documented by CALTRANS as being in compliance with CALTRANS intensity standards for red arrows at elevated temperatures.

All LED traffic signal modules supplied shall be warranted for five (5) years against manufacturing defects.

Red ball and red arrow traffic signal modules shall be performance warranted to be in compliance with July 1998 ITE VTCSH, Part II, and CALTRANS minimum intensity standards for LED traffic signal modules, at 74 degrees centigrade, for a period of three (3) years.

23-18.1 - Pedestrian Signals

Pedestrian signals shall be in conformance with Section 86-1.02S(3) "Pedestrian Signal Faces" of Caltrans Standard Specifications.

Pedestrian LED shall be sixteen inches by eighteen inches (16" x 18") Full Hand/Full Man. The Countdown Module shall be standard for pedestrian LED signals. Alternate pedestrian LED signals shall be approved by the ENGINEER. The displayed messages shall be "UPRAISED HAND" and "WALKING PERSON" symbols. The unit "counts down", or exhibits to the pedestrian a digital numerical display, as well as the Caltrans international graphic display, to communicate how much time remains to clear the intersection. The units shall have two optional operational modes; total countdown and clearance count down. The units shall be set to clearance countdown unless otherwise directed by the ENGINEER. The units shall be capable of "learning" automatically the walk time interval and the pedestrian clearance intervals whenever pedestrian timing changes are made. The housing shall be die cast from a one-piece corrosion-resistant aluminum alloy. Additionally, the LED display shall almost perfectly, approximate to the pedestrian, the appearance of an incandescent pedestrian signal, or the UPRAISED HAND and WALKING PERSON symbols shall be LED filled. The outline of the symbols shall not be acceptable. The count-down display shall utilize Double LED rows.

The housing shall be die cast from a one-piece corrosion-resistant aluminum alloy. The housing door frame shall be hinged to the housing by stainless steel pins and hinge lugs integrally cast in the housing and door frame. Pedestrian signal housings and mounting hardware shall be painted gloss black and electrically powder coated.

23-18.2 - Pedestrian Pushbuttons

The pushbutton shall be a Polara BullDog III Series Model BDL3-B Round Style.

Pedestrian and bike push buttons shall conform to the provisions in Section 86-1.02U, "Pedestrian Push Button Assemblies," of the Caltrans Standard Specifications and this Section.

Pedestrian and bike push button frames shall be Type B with appropriate signs. Pedestrian push button frames and switch housing shall be painted gloss black and electrically powder coated.

The pedestrian and bike push buttons shall comply with the Americans with Disabilities Act (ADA). In the event that a conflict exists between the ADA guidelines and City Specifications, the ADA guidelines shall take precedent.

23-18.3 - Accessible Pedestrian Signals (APS)

The APS shall be a Polara iNS 2-wire system with shelf-mount Central Control Unit (iCCU-S2), Interconnect Board (iN2-ICB), SDLCCP (SDLC Cabinet Cable Package for ICCU-S2), and custom message option.

The buttons shall be black with a five inch by seven inch (5” x 7”) informational faceplate. The pushbuttons shall have a directional arrow pointing in the direction to cross. Model to be approved by Traffic Engineering.

23-19.1 - Loop Detection System

When applicable all loop detectors shall be rack mounted meeting or exceeding NEMA TS2 specification.

Sensor units shall be EDI Oracle 4E

Detector sensor units furnished shall function without "locking up." If the detector sensor units furnished for the contract continually lock up when tuned for a motorcycle, as described herein, all furnished sensor units shall be replaced with another brand of detector at the CONTRACTORS expense.

23-19.2 - Video Detection System

Shall be the AutoScope Vision Video Detection System by Econolite. The Video detection systems shall provide a minimum of 20 detection zones per camera, placed anywhere in the camera’s field of view. System hardware and software shall provide presence detection, bicycle discrimination, incident monitoring, high definition video, and traffic data collection. Available traffic data include

statistics on volume, turning movements, occupancy, speed, density, headway, and vehicle classification in user selectable time periods of 10, 20, 30 seconds or 1, 5, 10, 15, 30, or 60 minutes.

The system shall include connectivity for IP-addressable broadband communications that supports digital H.264 video compression for streaming output.

The system shall use a single Interface Panel that connects at a minimum 4 video sensors. The Panel shall be mountable to the sides of the traffic cabinet.

The camera shall require only a single 3-conductor cable to operate. This set-up will provide power and data communications back to the traffic signal cabinet up to 1,000 feet away. The camera shall have HD resolution of at least 720p (1280x720 pixels). The camera shall be equipped with an integrated zoom lens that can be adjusted using configuration computer software. The Zoom lens shall have a 10X optical zoom and the field of view shall be adjustable over the range of 7 to 73 degrees horizontal and 5 to 58 degrees vertical. The camera assembly shall be housed in a sealed IP-67 enclosure. In addition, the enclosure shall have a heater for the lens, a desiccant packet to absorb moisture, and a sunshield. The power and communications requirements of the video detection system shall be fully compatible with a standard TS2 cabinet configuration.

23-19.3 - Microwave Detection System

Shall be the MS Sedco Intersector Microwave Motion and Presence Sensor. Model to be approved by Traffic Engineering.

The microwave detection systems shall provide a minimum of 8 detection zones and 4 channels per Sensor unit. System hardware and software shall provide presence detection, bicycle discrimination, incident monitoring, and traffic data collection.

The Intersector Unit shall be mounted at a height of fourteen to nineteen feet (14’ to 19’) on a corner signal pole using stainless steel banding or bolts. A single outdoor rated Cat5e cable is used for power and communications using T-568B Wiring Standard.

23-20 - Loop Installation Details

When applicable loop detector lead-in cable shall be Type B. Conductor for inductive detector loop shall be Type 2. All six foot by six-foot (6' x 6') loop shall consist of four (4) turns per loop. No more than four (4) six foot by six foot (6’ x 6’) loops shall be connected to each sensor unit. Type E loop detectors six foot (6’) in diameter may be installed in lieu of Type A loops. All front loop detectors shall be Type D. When front loop detectors are used to supplement video detection, Type D loops shall be used. No splices are permitted in detector lead-in cables.

Residue resulting from slot cutting operations shall not be permitted to flow across shoulders or lanes occupied by public traffic and shall be removed from the pavement surface.

The sealant for filling slots cut in pavement shall conform to the State Specification 86-5.01A(5) for Hot-Melt Rubberized Asphalt Sealant. Conductors to be buried in the pavement shall be installed only in the presence of the Engineer.

Where detector lead-in cables are connected to the terminal strips in the controller cabinet, the pressure terminal connectors shall be soldered to the detector lead in cables.

The CONTRACTOR shall identify loop wires by lane number, loop number, and start/finish using tie raps and permanent marker.

23-21 - LED Luminaries

Luminaires shall be GE Evolve LED roadway lights. Model ERL2-0-16-D3-30-A-Gray-L or model approved by Traffic Engineering.

23-22 - Edge-Lit Street Name Signs

Edge-Lit LED street name signs (SNS) shall be the Temple Razor Edge-Lit LED SNS.

Edge-Lit LED SNS installed on signal mast arms shall be the LED type per the Project Plans and these Specifications. Edge-Lit LED SNS shall operate maintenance-free for over 60,000 hours, with no bulbs or ballasts to replace. The technology consists of LEDs mounted along the top and bottom edge of the sign, concealed in the frame. The Edge-Lit sign shall use high-flux LEDs. Edge-Lit Light shall be emitted vertically from the top and bottom through a clear acrylic sheet and refracted outwards horizontally through the sign legend.

Edge-Lit technology shall allow for an ultra-slim, unobtrusive frame that can be mounted in any arrangement. Edge-Lit SNS mounted shall be mounted on the Signal Mast Arm unless otherwise noted. Edge-Lit SNS signs shall be double sided signs installed using an underhung mounting per the manufacturer's specifications. Edge-Lit LED SNS shall be White on a standard MUTCD Color 1177 (Green) background. All SNS lettering shall be the Series E standard lettering eight-inch (8") Uppercase and six-inch (6") Lowercase.

The CONTRACTOR and ENGINEER shall verify the wording and spelling to be used on the signs prior to ordering equipment.

Sign brackets shall be the swivel type allowing movement in all directions.

23-23 - Photoelectric Control

Photoelectric control shall be Type V for traffic signals and Type IV for standard streetlights. Photoelectric units shall be installed inside the service cabinet.

23-24 - Modulated Signal Detection System

The modulated signal detection system shall be able to interface with the CITY'S "Opticom" detection system as manufactured by 3M or approved equal. The controllers shall be equipped with internal circuitry to provide programmable channels of emergency vehicle preemption. The detector shall have a minimum range of 2,500 feet.

The modulated signal detection system shall consist of a phase selector; detector for 1-channel or 2-channel detection; and interface cable.

The controller cabinets shall be wired with a "D" connector or special function cable to provide all necessary controller connections for emergency vehicle preemption. The phase selectors or discriminators shall be wired to provide emergency vehicle preemption for the emergency vehicle phases as shown on the Drawings.

Necessary communications cables shall be installed to allow modulated signal detector communications with the Trafficware Shelf Mount Commander ATC NT2 controller and the Traffic Operations Center, if applicable.

23-25 - Intelligent Transportation Systems (ITS) Integration

Not used

23-26 - Removing, Reinstalling or Salvaging Electrical Equipment

Salvaged traffic signal equipment identified in the project plans shall be delivered to City of Pleasanton, Public Works Department, 3333 Busch Road unless otherwise noted on the project plans. The Contractor shall provide equipment, as necessary, to safely unload the equipment.

Full compensation for hauling and stockpiling salvaged electrical materials shall be considered as included in the contract lump sum price paid for "Signal Installation", and no additional compensation will be allowed.

23-27 - BLANK

Not used

23 - 28 - Payment

The lump sum price bid for "Signal Installation" shall include new controller assemblies, connection of the controller to the Traffic Signal Central Master Computer, interconnect cable splices within the controller cabinet, or at the City traffic computer, interconnect conduit, and all other parts and labor required for successful operation of the controller by the Traffic Signal Central Master Computer.

It shall also include a system detector controller, where required, system detection equipment, loops, etc., and any additional labor or equipment associated with each intersection, as shown on the plans.

Mobilization: Ten percent (10%) of the total contract price will be paid upon completion of mobilization.

Payment for Materials on Site: Fifty percent (50%) of invoice cost for all signal poles, mast arms, cabinet, controller and hardware properly tested, stored and documented per all of the applicable provisions of these specifications.

Progress payments will be processed by the City according to the following schedule unless otherwise approved by the Engineer:

	Percent of Lump Sum Itemized Bid	Signal Work Completed
(1)	20%	All conduit in place.
(2)	10%	All foundations dug, and concrete poured.
(3)	15%	All loops cut with wires and sealant in place and/or all video detection equipment installed and operational.
(4)	5%	All wire pulled in all conduits.
(5)	20%	All signal standards and poles erected.
(6)	10%	Handicap Ramps installed.
(7)	5%	All new signing and striping completed.
(8)	10%	Controller and cabinet installed and operational.
(9)	5%	Miscellaneous work completed.
TOTAL	100%	

Said price shall include the controller testing by Signal Maintenance, Inc., including pick-up and deliveries, and providing a signal technician at the time the equipment is turned on, and no additional payment will be allowed, therefore.

A complete operating system is to be provided.

SECTION 24. MISCELLANEOUS

24-01A Monuments

Monument materials and construction shall conform to Detail No. 128, "Monument," of the City Standard Details. Monuments shall not be installed until the asphalt concrete pavement has been completed. Monuments shall be installed at the locations shown on the Project Plans.

Monuments shall be measured by the number of items.

The contract price for monuments shall include full compensation for the monument complete in place according to Detail No. 128, "Monument," of the City Standard Details.

24-01B Street Barricades

Street barricade materials and construction shall conform to Detail No. 116, "Street Barricade," of the City Standard Details. Street barricades shall be installed at the locations shown on the Project Plans.

Street barricades shall be measured by the linear foot.

The contract price for street barricades shall include full compensation for the street barricade complete in place according to Detail No. 116, "Street Barricade," of the City Standard Details.

24-01C header boards

header boards shall be installed at locations shown on the Project Plans. header boards and stakes shall be construction-grade, pressure-treated, Douglas fir S4S, graded in accordance with Section 57-2.01B(2), "Structural Timber and Lumber," of the State Standard Specifications. Nails shall be hot-dipped galvanized.

When header boards are installed along unprotected edges of pavement, the top edges of the header board shall conform to the line and grade of pavement.

header boards shall be two inches (2") by six inches (6"), unless otherwise noted, and shall be held in place with two inches by three-inch (2" x 3") stakes of lengths necessary to extend twelve (12) inches into solid ground.

Stakes shall be of sound material, neatly pointed, driven vertically, located at butt joints and elsewhere, spaced not over four feet (4') on center, and securely nailed to the headboard. Header boards shall have a continuous bearing on undisturbed earth or compacted earth or base rock.

Header boards shall be measured by the lineal foot.

The contract price for header boards shall include full compensation for the header board complete in place as specified in these City Standard Specifications and shown on the Project Plans.

24-01D Bollards

Bollard materials and construction shall conform to Detail No. 126, "Removal Pathway Bollard," and 117A, "Pathway Bollard," of the City Standard Specifications. Bollards shall be installed at the locations shown on the Project Plans.

Bollards shall be measured by the number of items.

The contract price for bollards shall include full compensation for the bollard complete in place as according to Detail No. 126, " Removal Pathway Bollard," and Detail No. 127 "Pathway Bollard" of the City Standard Specifications.

24-01E Not used

24-01F Main Street/Downtown Furniture

The following paragraphs provide a summary of the existing furniture, fixtures, and materials currently in use for Main Street in Downtown Pleasanton. The list is provided to assist in the replacement of existing fixtures and to maintain the continuity established for the area. Note the numbers listed are for convenience only and are not intended as an endorsement for any particular vendor.

1. **Trash Receptacles**

   Manufacturer: Urban Accessories, Model No. ST-55

   Corresponding Lid: Model No. ST-55

   Color: Cardinal Industrial Coatings, High Solids Polyurethane, City of Pleasanton Light Pole Green, 6403-EO 423 4-U

   Anchor bolt attachment to sidewalk

   32-gallon high density plastic liner

   Contact: Stephanie or Tom at David F. O'Keefe Company (925-837-4440) which represents Urban Accessories (206-487-0488)

2. **Tree Grates**

   Ironsmith 48"-M4814 and 60"-M6018

Contact: Ironsmith (800) 338-4766

3. Utility Box Lids

Shall match existing color and texture of surrounding paving, whether stamped concrete or cobblestone.

Contacts: Central Wholesale, Pleasanton (925) 417-6900
Westco, Livermore (925) 449-2550
Platt Electric, Livermore (925) 449-6774

4. Bicycle Rack

Custom per attached Detail #828.

Color: Cardinal Industrial Coatings, High Solids Polyurethane, City of Pleasanton Light Pole Green, 6403-EO 423 4-U

Original Contact: David O'Keefe Company (925- 837-4440) representing P-W Athletic Co. (408-988-3066) model # 1609-01

5. Pavers

CalPave "Classico" Tan/brown – two sizes (7" x 4" x 2.5" and 4" x 4" x 2.5")

Random pattern with seams perpendicular to Main Street

6. Newspaper Rack

Manufacturer: Quick Crete Model #Q-NR with green "PLEASANTON" inset and painted on top arch

(23 ¾" D x 110" W x 56 1/8"H; 67 ½" to top of arch)

Color: Quick Crete Latte, smooth texture

Anti-graffiti

Original Contact: Quick Crete (925) 256-1265

7. Planter & Planter Stands

Stanford Series Planter, Quick Crete Model #QRST3622P w/interior water sealant

Planter stand –40" dia. X 22" ht. custom precast

Gloss sealer (anti-graffiti) with 1 ½" dia., centered drain hole

Color of planters not on a stand - Scofield beige cream, T3-Santa Fe Sandblast

Color of planters on a stand - Scofield Westwood brown

Color of all planter stands - Scofield beige cream

Original Contact: Quick Crete – Greg Caron (925) 256-1265

8. Benches

8'L x 2'9"W custom precast concrete curved bench slab

Color – Scofield beige cream, brush blast texture

Std. gloss sealer, anti-graffiti

Original Contact: Quick Crete – Greg Caron (925) 256-1265

Metal supports per City Std Detail 827 & 827A

Color: Cardinal Industrial Coatings, High Solids Polyurethane, City of Pleasanton Light Pole Green,

Original Contact: F and F Steel and Stairway, (408) 279-6558

9. Concrete Curbs, Band Between Stamped Concrete and Pavers and in Front of Buildings

Lamp black pigment

10. Telephone Boxes

Telephone enclosures are "Traditional Enclosures" by Philip Brooks, Inc.

Telephone: (404) 887-9901

11. Streetlights

Mc-Graw Edison Fixtures: Morton Powder Paint #VMS3174 or LED per City Standard Detail 509

Poles are manufactured by Ameron Pole division
Pole Color: Cardinal Industrial Coatings, High Solids Polyurethane, City of Pleasanton Light Pole Green, 6403-EO 423 4-U

12. Stamped Concrete

Color: Weathered Pleasanton Buff
Stamped Concrete Supply
Telephone: 1-800-427-8781

Stamp pattern: 30" x 30"

13. Street Curb

Curb width - 12 inches

24-01G Trail Construction – Earthen Areas

The specific design elements of the trail should follow the specifications and details from the U.S. Forest Service's "National Trails Drawings and Specifications (EM-7720-103), September 1996," available at www.fs.fed.us/.ftproot/pub/acad/dev/trails/trails.htm.

In addition, the trail is to be designed and constructed within the following parameters:

- The average downward slope of the trail shall not exceed eight percent (8%). Any individual section shall not exceed ten percent (10%) for more than 50 feet. The maximum slope shall not exceed 15 percent (15%).

- The grade of any portion of the trail shall not exceed half the grade of the hillside or side slope that the trail traverses (Half Rule).

- Trail corridors shall be cleared of overhead obstructions to eight feet (8') for pedestrians and bicyclists and 12 feet (12') for equestrians. Brush shall be cleared five feet (5') from the edge of the trail tread.

- On contouring trails, trail tread shall consist of a full bench cut. Dirt spoils shall be spread evenly on the down slope side.

- On bench-cut trails, the uphill back slope shall be shaped to more closely match the original slope grade.

- Except as approved by City Staff, all trail beds shall have an outward angled slope of five percent (5%) to eight percent (8%).

- Trail tread shall be compacted to eighty percent (80%).

- Any sections of trail with a downward slope shall have a design element to dewater the trail every fifty feet (50'), preferably a rolling dip/grade reversal type.

- When contour trails require directional changes, climbing turns shall be used for slope grades of seven percent (7%) or less. Switchbacks shall be used for trail slopes greater than seven percent (7%). The upper and lower approaches for both climbing turns and switchbacks shall be immediately preceded by grade reversals to divert water.

- In areas where natural terrain features concentrate water runoff or runoff is accelerated by degree of slope, design elements shall be included to manage water, erosion and chronically muddy conditions.

- Two weeks prior to beginning trail construction, the City Parks Division shall approve the final layout of the trail in the field.

23-01I Commercial and Multifamily Trash Enclosure Design

This section covers the design guidelines for commercial and multifamily trash enclosures. Trash enclosures shall conform to City Standard.

24-01I.01 Department Approvals

The City of Pleasanton requires approvals and permits for the construction of trash enclosures by the following divisions and outside agencies:

Planning Division - Design Review (925) 931-5600
Engineering Division - Storm Water Pollution Control (925) 931-5650
Building Division - Construction (925) 931-5300
Livermore/Pleasanton Fire Department – Fire Sprinklers (925) 454-2361
Alameda County Health Department (510) 567-6700
Pleasanton Garbage Service (925) 846-2042

24-01I.02 Minimum Requirements

The minimum requirements for the design of trash enclosures include:

1. Trash enclosure location on site.
2. Size of enclosure based on the required number of trash bins, trash containers for recyclables and organic waste. Contact the Pleasanton Garbage Service for bin/trash container sizes.
3. Trash enclosures are required to have an automatic fire sprinkler protection system.

Exception: A fire extinguishing system may not be installed when **all** of the following conditions are met.

- The enclosure, including the door(s) and roof shall be constructed of non-combustible materials.
- If the enclosure is a stand-alone structure, it shall be a minimum of 20 feet away from adjacent buildings and 10 feet from property line(s).
- The maximum size of the enclosure shall be 180 square feet.
- The trash enclosure shall be used exclusively for waste garbage contained within approved trash bins/containers.

4. For restaurants, cafeterias and similar uses having food, grease and oil waste, the trash enclosure floor shall be designed to slope to an interior trapped area floor drain and connected to a grease interceptor before entering the sanitary sewer system. The designed floor shall contain all interior run off and not allow outside run off entering the enclosure. Cold running water shall be required at the enclosure for wash down purposes. Hot running water shall be required by the Alameda County Health Dept. for food establishments and similar uses. Retail, office and like uses may design the trash enclosure floors without the drain and grease interceptor requirement.
5. Trash enclosures shall have a roof to prevent the entrance of rainwater.
6. Provide an accessible path to the trash enclosure.
7. A posted sign prohibiting the dumping of hazardous materials into the sanitary sewer system.
8. All trash enclosure plans shall be designed by a licensed architect and a licensed structural engineer.

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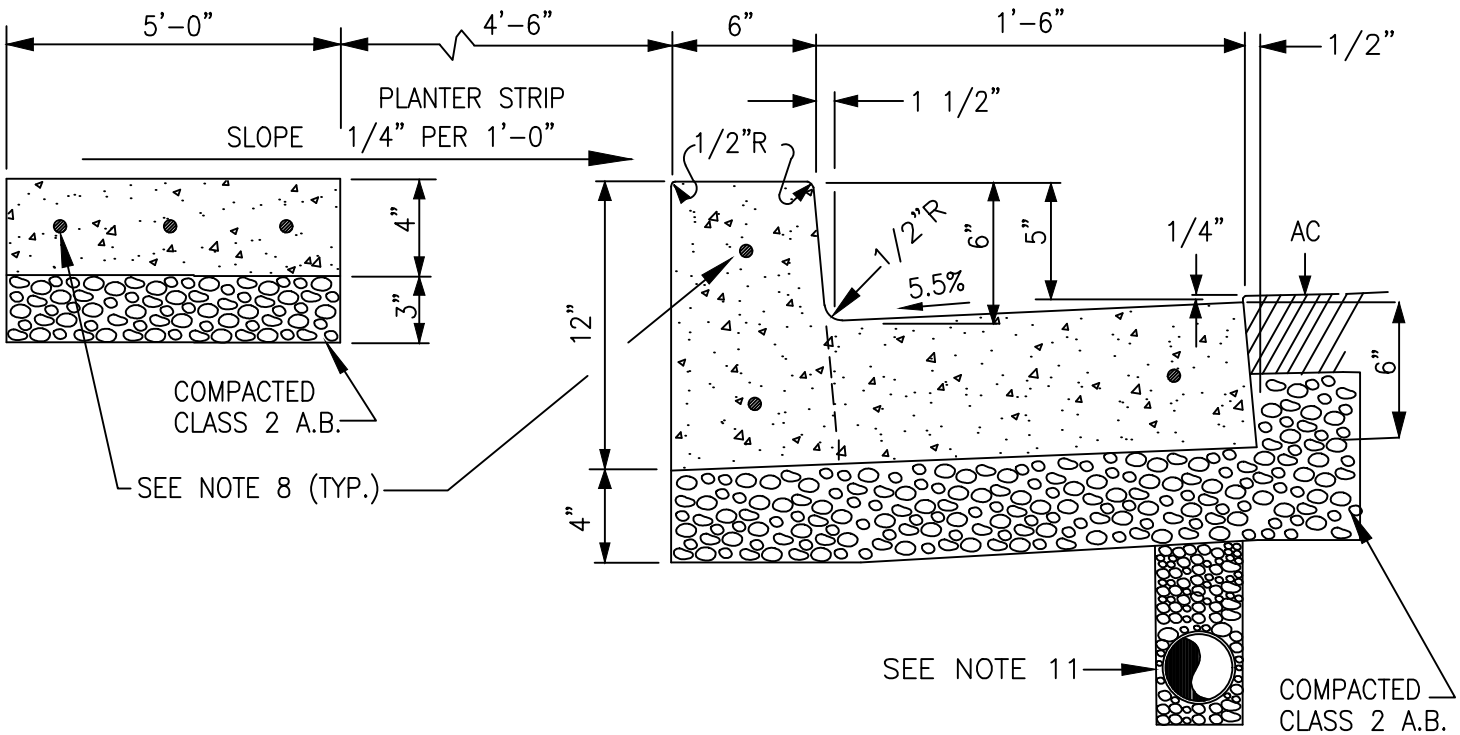
910B	TYPICAL CURB, GUTTER AND SIDEWALK PLAN
911	TREE WELL WITHIN PAVERS AND SIDEWALK
	RECYCLED WATER
1001	RECYCLED WATER SERVICE
1003	RECYCLED WATER COMMERCIAL AND INDUSTRIAL WATER SERVICE
1004	RECYCLED WATER SIGN POST
1005	RECYCLED WATER ALUMINUM SIGN
1006	RECYCLED WATER ALUMINUM SMALL SIGN
1007	RECYCLED WATER IRRIGATION DECAL SIGNS
1008	RECYCLED WATER DECAL SIGN
1009	RECYCLED WATER TAG
1010	RECYCLED WATER FLUSHING HYDRANT CONNECTION
1011	RECYCLED WATER FLUSHING CONNECTION
1012	RECYCLED WATER METER BOX REPLACEMENT
1013	RECYCLED WATER MINIMUM RESTRAINED JOINT LENGTHS
	CATHODIC PROTECTION SYSTEM
1101	CATHODIC PROTECTION SYSTEM – DETAILS 1
1102	CATHODIC PROTECTION SYSTEM – DETAILS 2
1103	CATHODIC PROTECTION SYSTEM – DETAILS 3
1104	CATHODIC PROTECTION SYSTEM – DETAILS 4
1105	CATHODIC PROTECTION SYSTEM – DETAILS 5
1106	CATHODIC PROTECTION SYSTEM – DETAILS 6
1107	CATHODIC PROTECTION SYSTEM – DETAILS 7
1108	CATHODIC PROTECTION SYSTEM – DETAILS 8
1109	CATHODIC PROTECTION SYSTEM – DETAILS 9
1110	CATHODIC PROTECTION SYSTEM – DETAILS 10
1111	CATHODIC PROTECTION SYSTEM – DETAILS 11
1112	CATHODIC PROTECTION SYSTEM – DETAILS 12
1113	CATHODIC PROTECTION SYSTEM – DETAILS 13



GENERAL NOTES FOR CURB, GUTTER & SIDEWALK:

1.) LANDSCAPE TREATMENT OF PLANTER STRIP SUBJECT TO CITY APPROVAL.

2.) SEE DETAIL NO. 102 FOR SIMILAR SCORING DETAILS.

3.) ROOT BARRIERS ARE REQUIRED ON BOTH SIDES WHEN TREES ARE PLANTED WITHIN PLANTER STRIP.

4.) WHEN REPLACING EXISTING CURB & GUTTER, THE EXISTING ASPHALT SHALL BE SAW CUT 12" FROM GUTTER LIP AND REPLACED WITH FULL DEPTH ASPHALT AFTER NEW CURB & GUTTER IS PLACED.

5.) VAPOR BARRIER SHALL BE INSTALLED AT THE BACK OF CURB/SIDEWALK WHERE THERE IS EXPANSIVE SOIL AS DETERMINED BY CITY ENGINEER.

6.) SEE CITY STANDARD DETAIL NO. 208 FOR DRAIN THROUGH CURB DETAILS.

7.) ASPHALT SHOULD BE PAVED 1/4" ABOVE GUTTER LIP.

8.) WHEN TYING INTO EXISTING CONCRETE CURB, GUTTER OR SIDEWALK, THE EXISTING CONCRETE SHALL BE DOWELED WITH #4 X 18" BARS AT 18" O.C. IN SIDEWALK AND THREE EACH IN CURB. SEE DETAIL NO. 109, SECTION A-A, B-B, C-C AND D-D.

9.) FOR COMPACTION REQUIREMENTS REFER TO STANDARD SPECIFICATIONS, SECTION 7-03A.

10.) SEE DETAIL NO. 824 FOR CUTTING OR GRINDING TREE ROOTS OR RETROFITS.

11.) INSTALL A SUBDRAIN IN ACCORDANCE WITH DETAIL 209 AS DETERMINED BY THE CITY ENGINEER.

12.) CURB HEIGHTS IN COMMERCIAL AREAS MAY BE 8" HIGH. MATCH EXISTING CURB HEIGHTS.

13.) IN HACIENDA BUSINESS PARK SEE HBP STANDARD PLANS FOR ADDITIONAL DETAILS.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

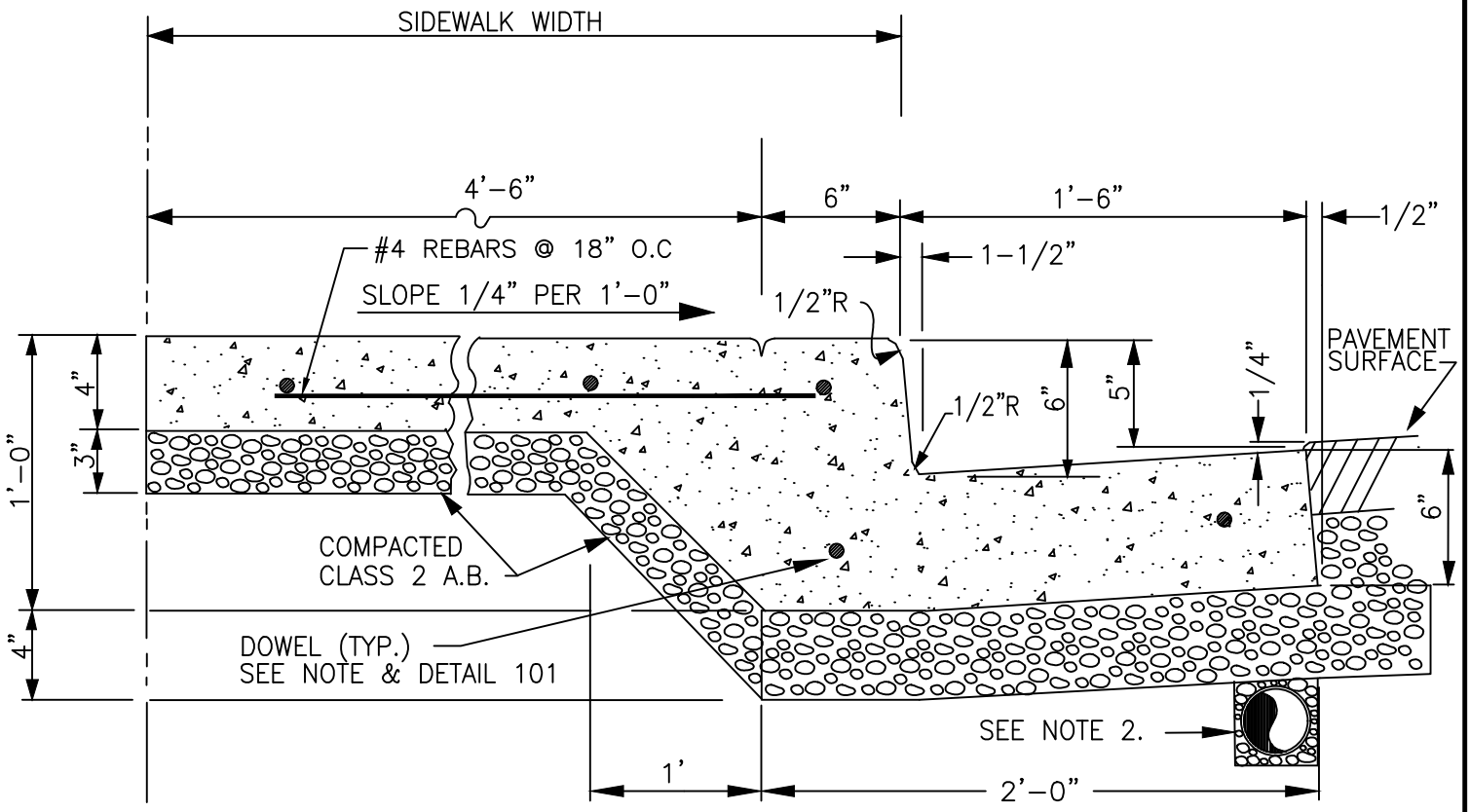
CITY OF PLEASANTON

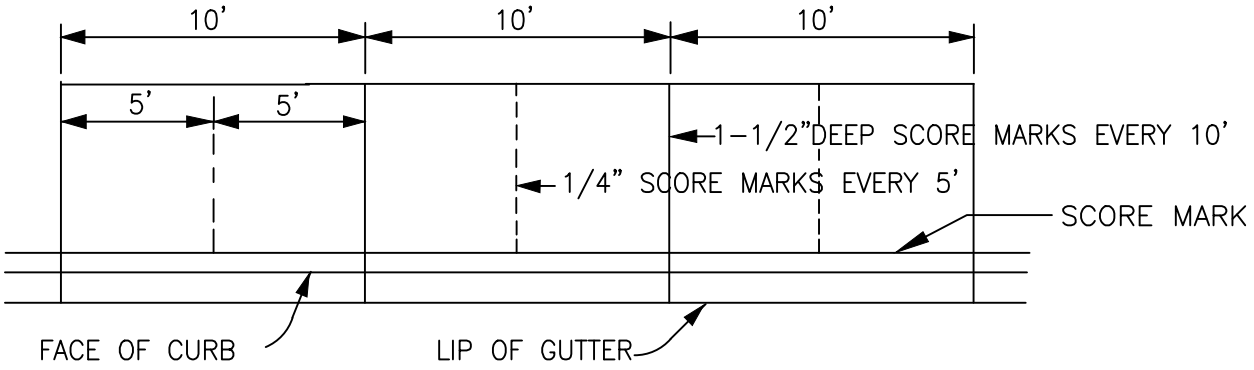
STANDARD DETAILS

TYPE "A" CURB, GUTTER AND SIDEWALK

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24	DWG NO. 101





TYPICAL SCORE MARKING DETAIL FOR 5' WIDE SIDEWALK OR LESS

NOTES:

1. SEE DETAIL 101 FOR GENERAL CURB, GUTTER & SIDEWALK NOTES.
2. INSTALL A SUBDRAIN IN ACCORDANCE WITH DETAIL 209 AS DETERMINED BY THE CITY ENGINEER.

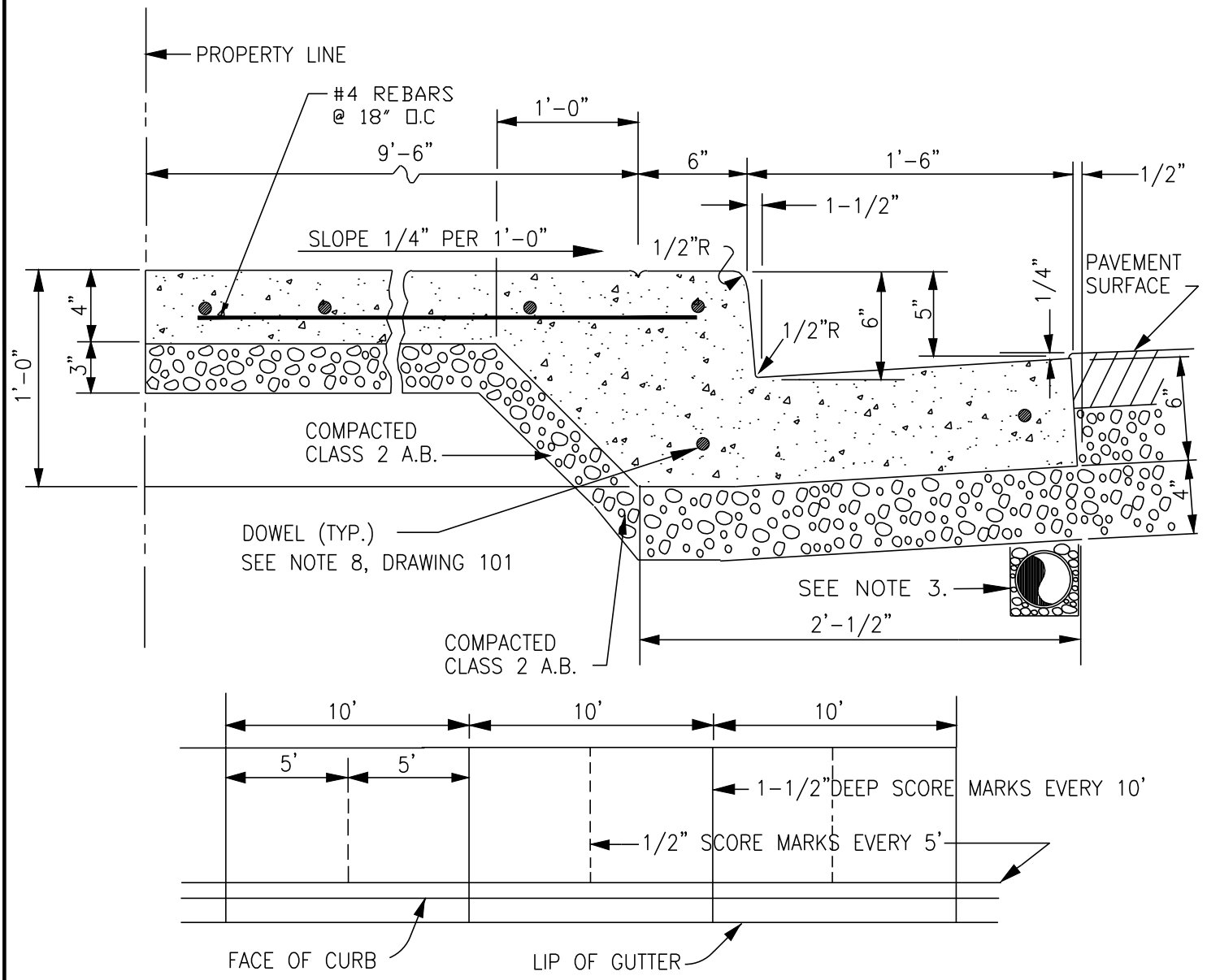
DRAWN BY:	STAFF
CHECKED BY:	AN
SCALE:	N.T.S.

CITY OF PLEASANTON
STANDARD DETAILS

TYPE "B" MONOLITHIC CURB, GUTTER AND SIDEWALK

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO.102



TYPICAL SCORE MARKING DETAIL FOR 10' WIDE SIDEWALK

NOTES:

1. PLANTER POCKETS SHALL BE PROVIDED AS REQUIRED BY THE CITY OF PLEASANTON.
2. SEE DETAIL 101 FOR GENERAL CURB, GUTTER & SIDEWALK NOTES.
3. INSTALL A SUBDRAIN IN ACCORDANCE WITH DETAIL 209 AS DETERMINED BY THE CITY ENGINEER.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

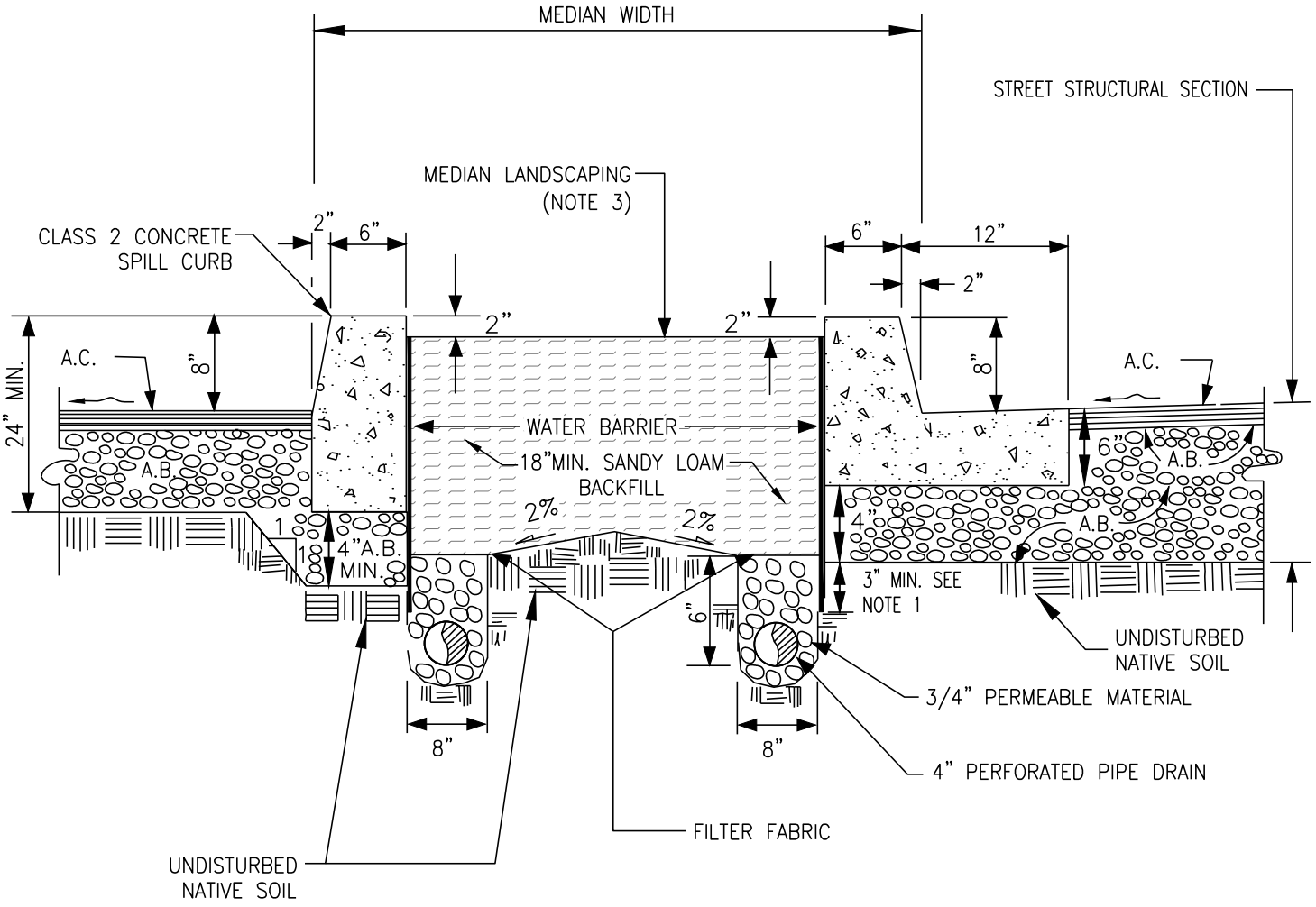
CITY OF PLEASANTON

STANDARD DETAILS

TYPE "C" MONOLITHIC CURB, GUTTER AND SIDEWALK

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NEIKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 103



NOTES:

1. IMPERMEABLE WATER BARRIER SHALL BE 30" MIN. DEPTH OR SHALL EXTEND 3" INTO NATIVE SOIL, WHICH EVER IS GREATER.
2. MEDIAN ISLANDS LESS THAN 10' WIDE MAY HAVE ONE SUBDRAIN LOCATED IN THE CENTER OF THE MEDIAN.
3. NOT APPLICABLE FOR STORM WATER TREATMENT.
4. INSTALL A SUBDRAIN IN ACCORDANCE WITH DETAIL 209 AS DETERMINED BY THE CITY ENGINEER.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

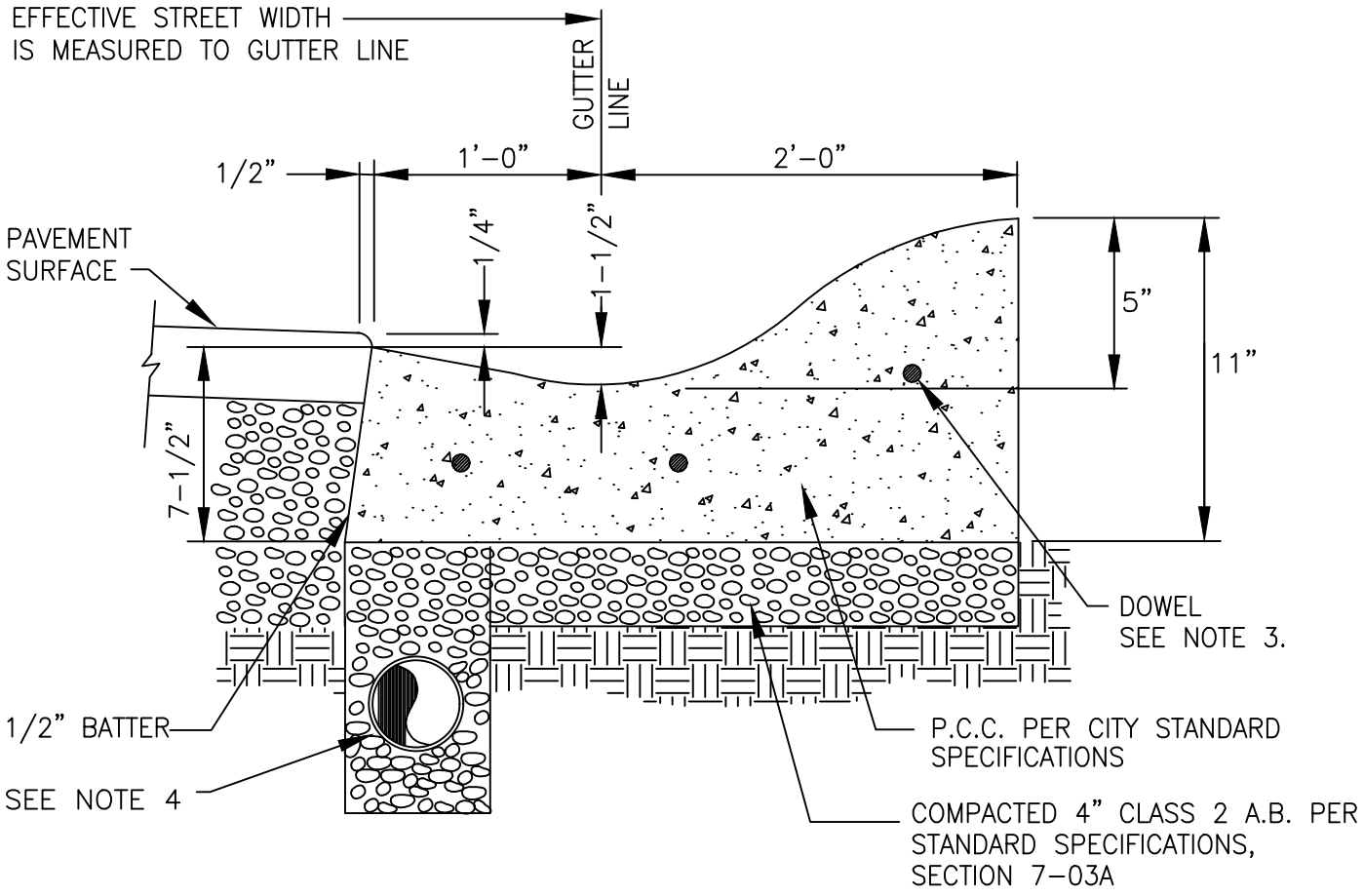
CITY OF PLEASANTON

STANDARD DETAILS

MEDIAN ISLAND CURB WITH LANDSCAPING

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NEUKIRK
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 104



DEEP SCORE MARKS ON 10 FOOT CENTERS

NOTES:

1. USE OF ROLLED CURB SUBJECT TO APPROVAL BY THE CITY ENGINEER
2. WHERE SIDEWALK IS ADJACENT TO CURB, THE CURB AND SIDEWALK SHALL BE POURED MONOLITHIC AND SCORED ACCORDING TO DETAIL NO. 102.
3. SEE DETAIL 101 FOR DOWELS (TYP.) AND GENERAL CURB NOTES.
4. INSTALL A SUBDRAIN IN ACCORDANCE WITH DETAIL 209 AS DETERMINED BY THE CITY ENGINEER.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

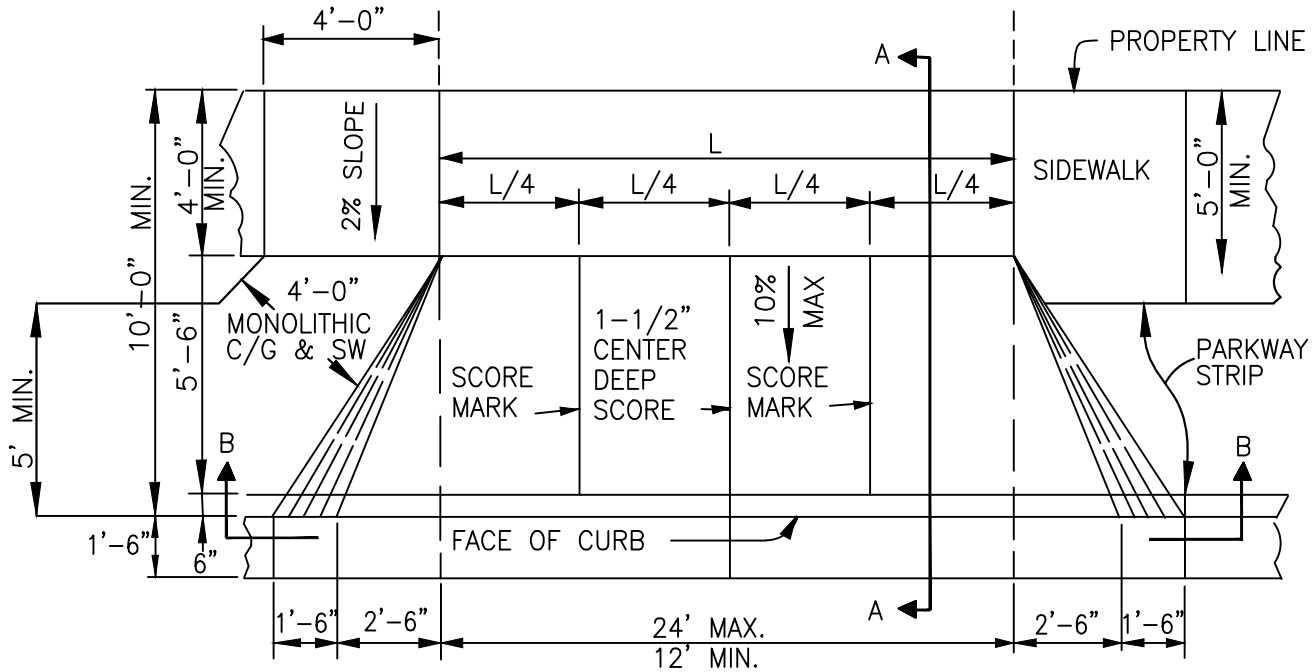
CITY OF PLEASANTON

STANDARD DETAILS

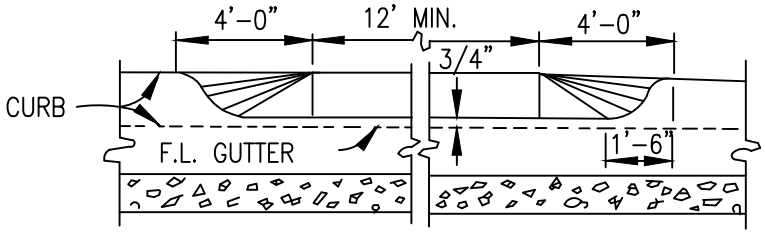
ROLLED CURB

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO.105

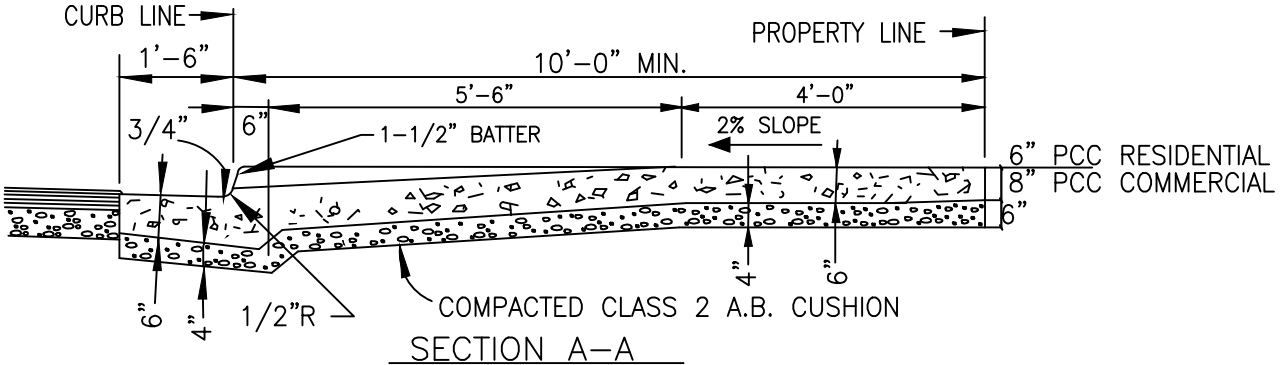


PLAN



SECTION B–B

SMOOTH REVERSE CURVE TRANSITION



SECTION A–A

NOTES:

1. SEE DETAIL 101 FOR GENERAL NOTES.
2. SEE DETAIL 139 FOR REBAR REQUIREMENTS.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

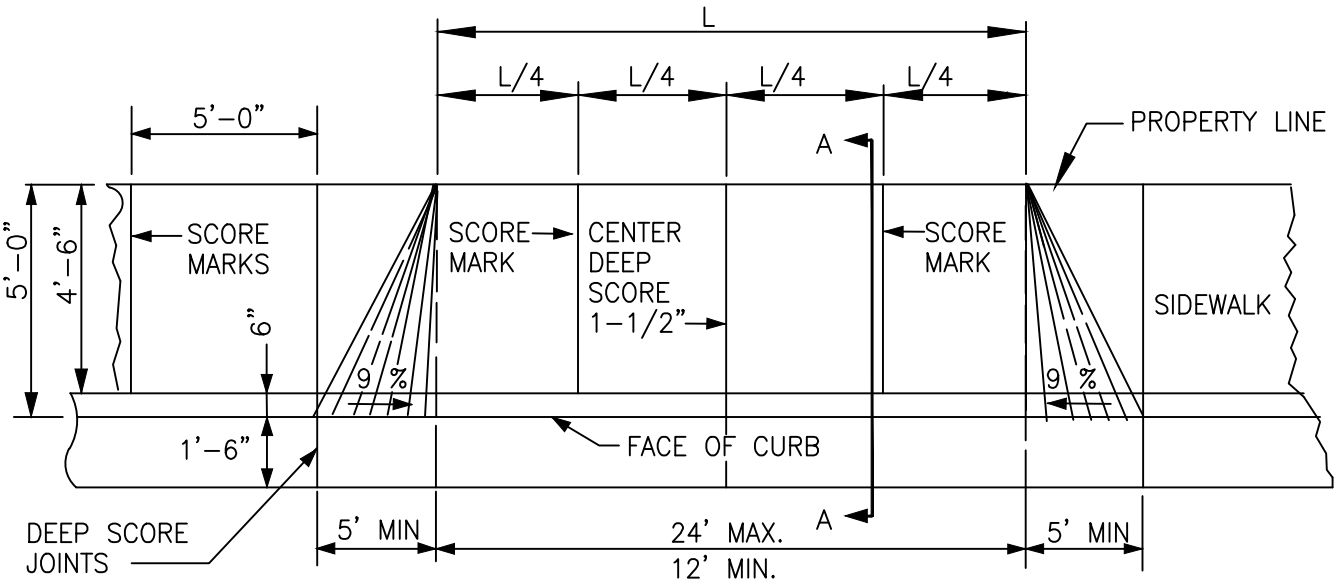
CITY OF PLEASANTON

STANDARD DETAILS

TYPE "A" DRIVEWAY APPROACH

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24	DWG NO. 106



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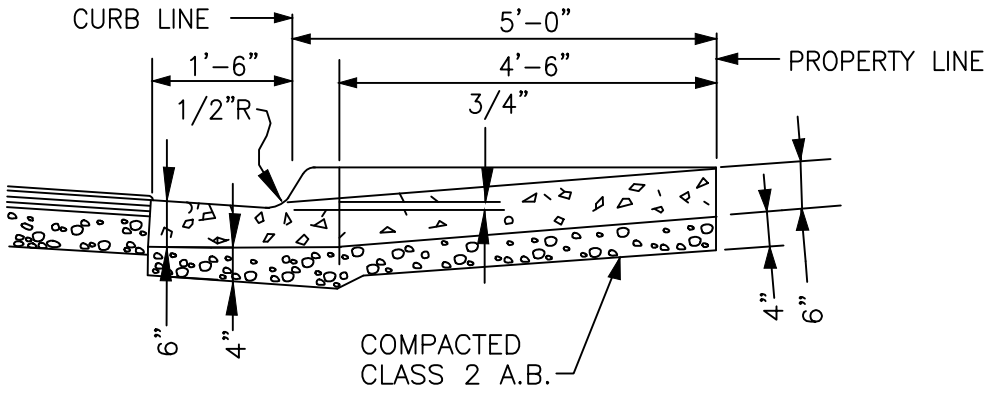


SECTION A-A

NOTES:

1.) NOT TO BE USED UNLESS APPROVED BY CITY ENGINEER TO REPAIR/REPLACE EXISTING DRIVEWAYS AND SIDEWALKS MONOLITHIC TO CURB AND GUTTER.
2.) NOT TO BE USED WITH 8 INCH HIGH CURB OR COMMERCIAL DRIVEWAY.
3.) SEE DETAIL 101 FOR GENERAL NOTES.
4.) SEE DETAIL 139 FOR REBAR REQUIREMENTS.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

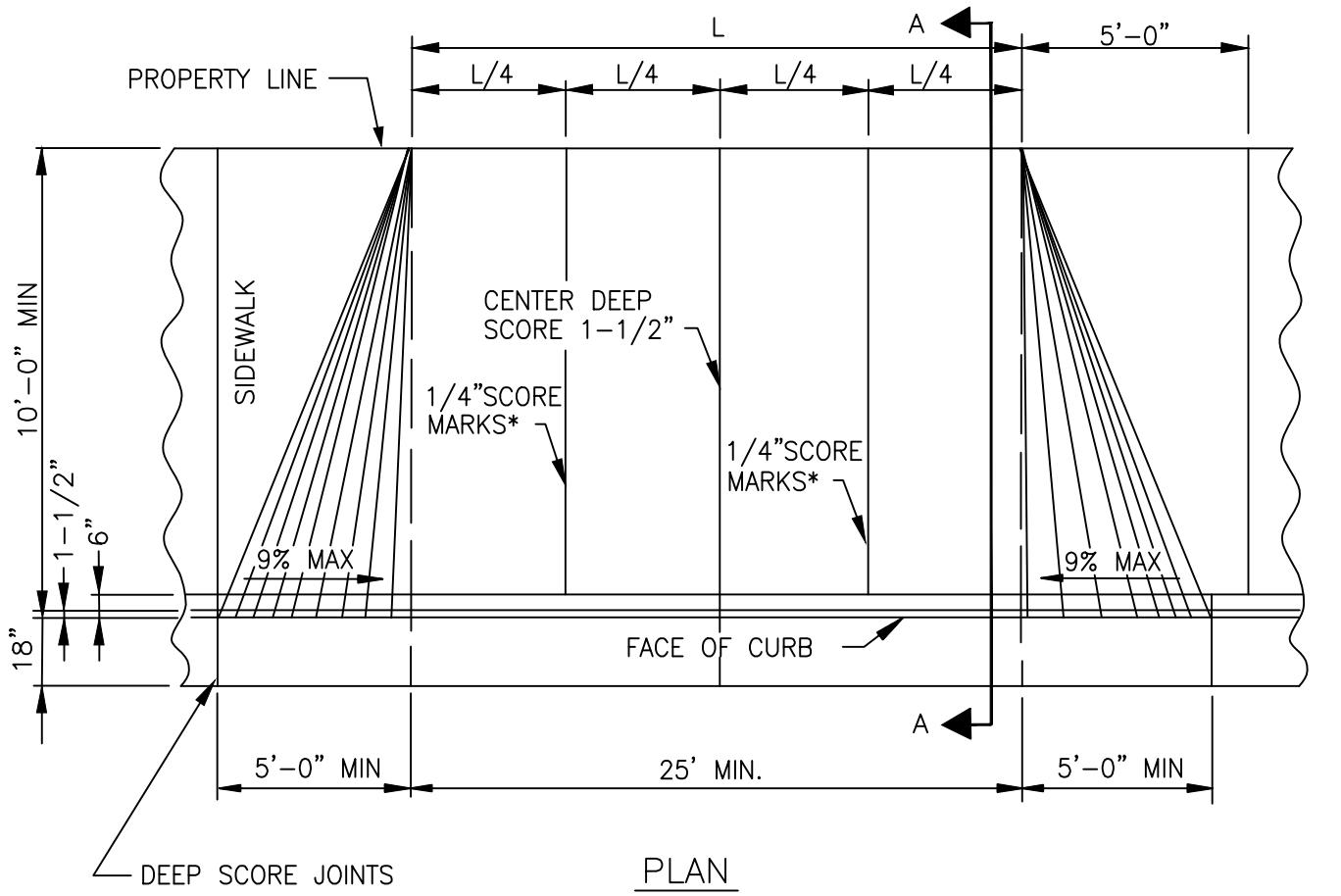
CITY OF PLEASANTON

STANDARD DETAILS

TYPE "B" DRIVEWAY APPROACH

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW WELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 107



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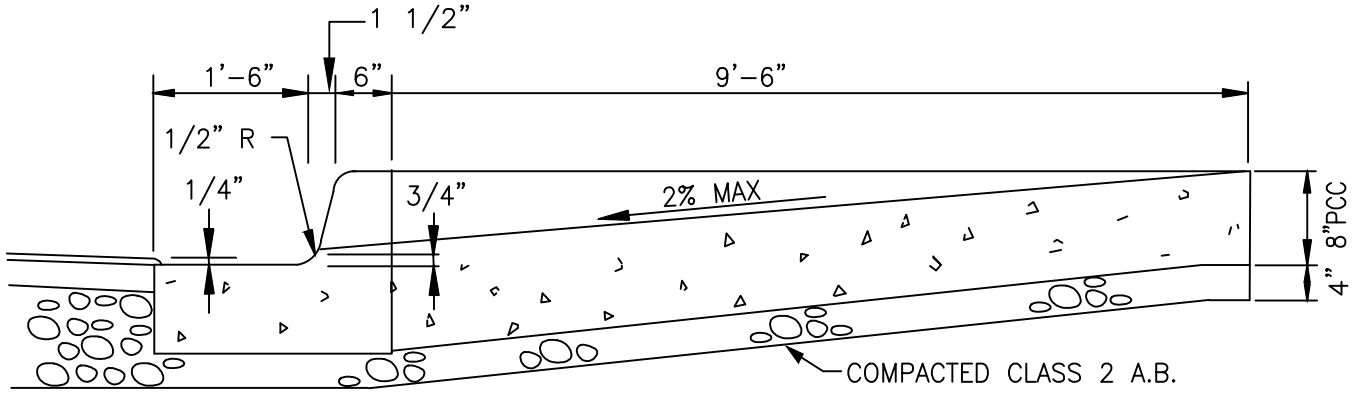


SECTION A-A

NOTES:

1. NOT TO BE USED UNLESS APPROVED BY CITY ENGINEER TO REPLACE EXISTING DRIVEWAYS THAT DO NOT HAVE SUFFICIENT RIGHT OF WAY AND MONOLITHIC SIDEWALK WITH CURB & GUTTER
2. * MAX. 10' ON CENTER/EQUALLY SPACED
3. SEE DETAIL 101 FOR GENERAL NOTES AND DETAIL 139 FOR REBAR REQUIREMENTS.
4. FOR EXISTING CONDITIONS ONLY.

REVISION:		
DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

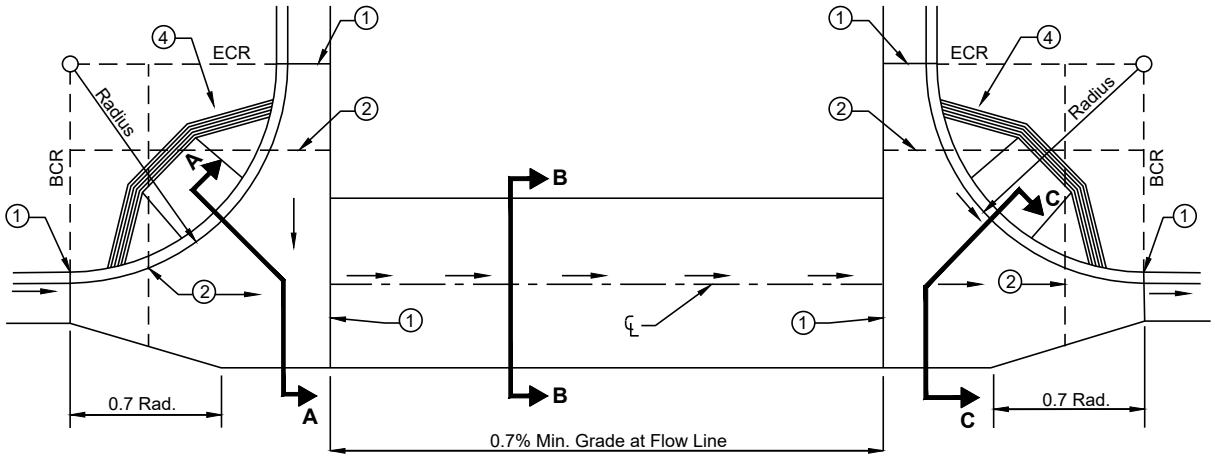
CITY OF PLEASANTON

STANDARD DETAILS

TYPE "C" COMMERCIAL DRIVEWAY APPROACH

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 108



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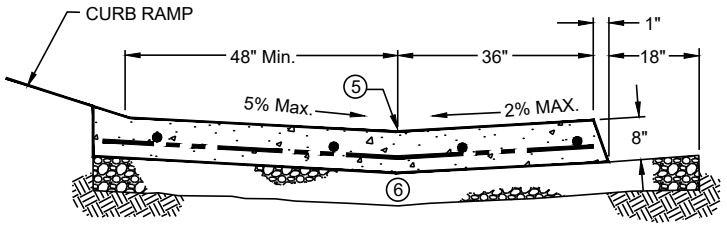
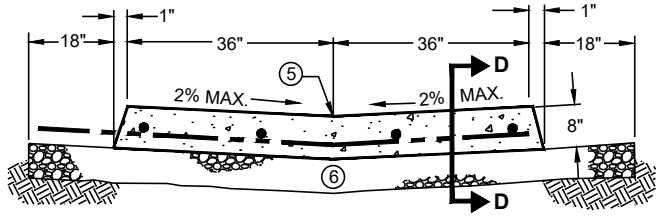
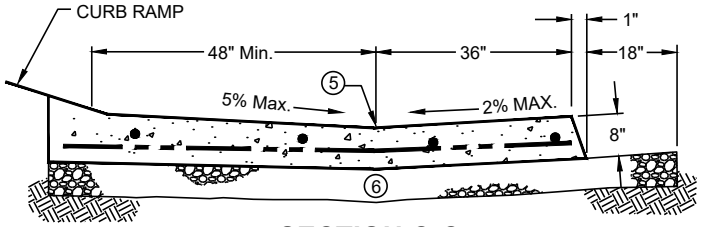


SECTION A-A
(UPHILL SIDE)



SECTION B-B



SECTION C-C
(DOWNHILL SIDE)

1. Use Of Concrete Valley Gutter Subject To Approval By Engineer.
2. The Design Engineer Shall Specify The F/l Elev. As Noted In Addition To The Standard Curb Return Elev.
3. See Detail 101 For General Notes. 4. Dashed Lines With Arrows Indicate Flow Lines.

INSTALLATION NOTES:

(1) Standard expansion joint, see Note (3)

(2) If curb return radius is 20' or larger, spandrels shall have extra expansion joints at locations to be determined by the City Engineer. Rebar shall be cut and dowels installed per Note (3)

(3) All expansion joints shall have 1/2"x18" smooth dowels @ 22" O.C., wrapped or greased.

(4) See City Standards for note regarding required curb ramps.

(5) All flowlines shall have an 8" wide steel-trowel finish.

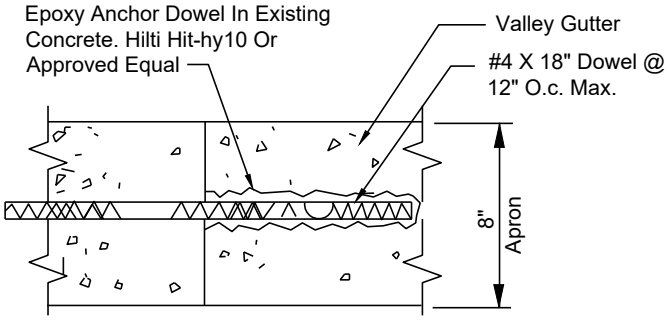
(6) 6" Class 2 aggregate base.

GENERAL NOTES:

A. All PCC shall be Class 2, including curb.

B. See City Standard 101 for notes regarding required pavement removal and repair.

C. Curb ramps shall be install with cross gutter for monolithic pour, no joints will be allowed.



SECTION D-D

CITY OF PLEASANTON

STANDARD DETAILS

CONCRETE VALLEY GUTTER AND APRON

DRAWN BY: STAFF

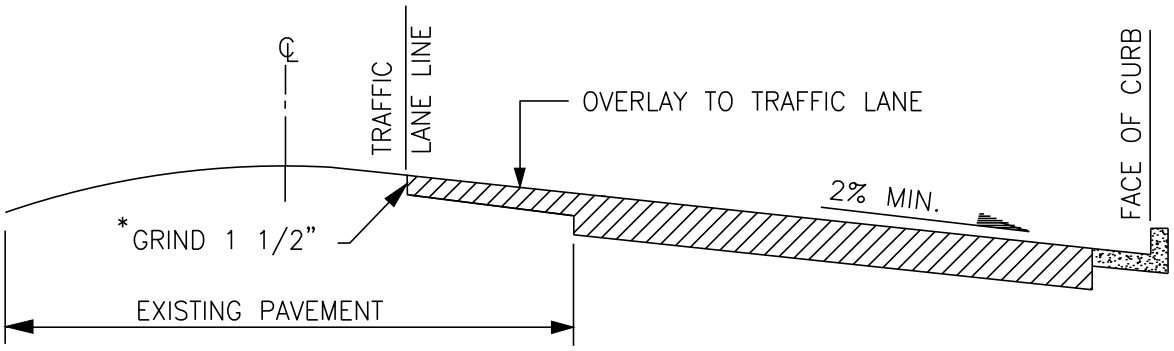
CHECKED BY: AN

SCALE: N.T.S.

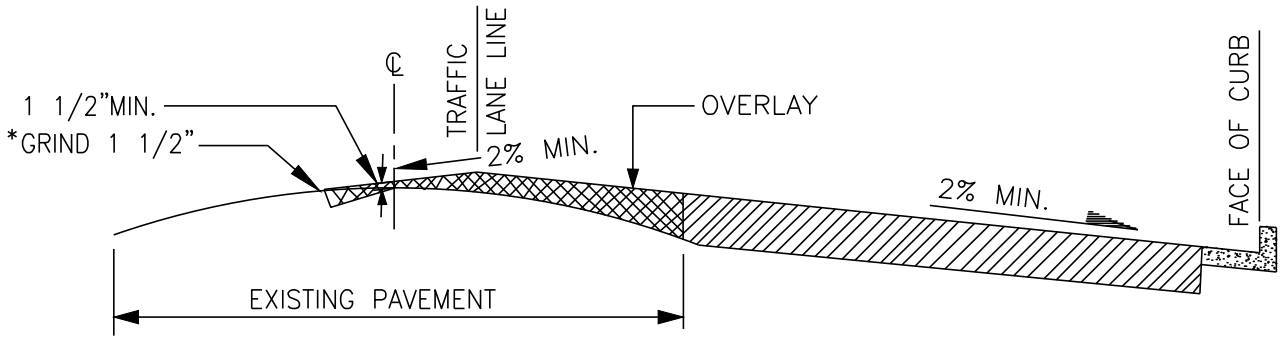
REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NEUKIRK
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24

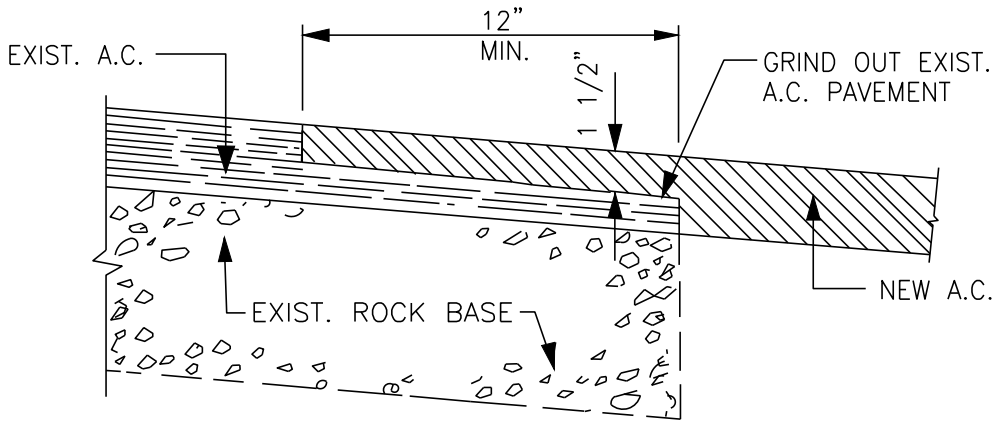
DWG NO. 109



CASE I – CONFORM TO CROWN OF PAVEMENT(STREET WIDENING)



CASE II – CROWN OF PAVEMENT LOW WIDTH OF GRIND TO BE FIELD VERIFIED



A.C. LAP JOINT DETAIL

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

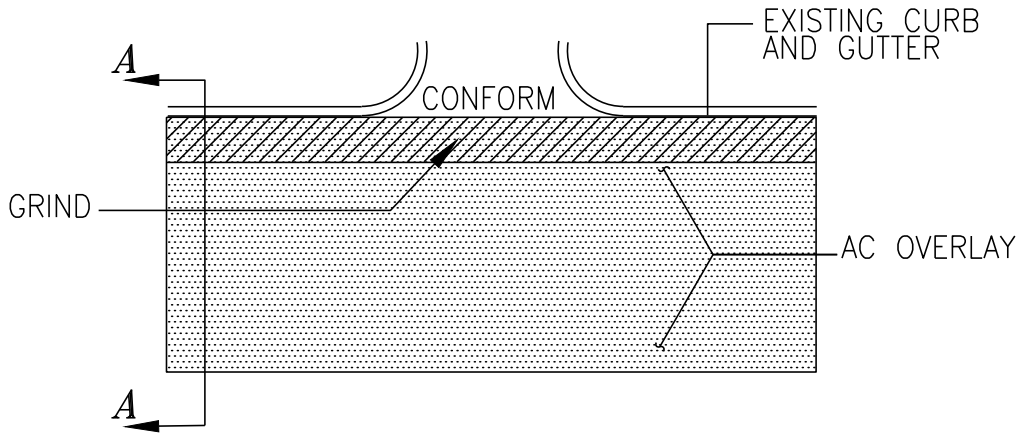
CITY OF PLEASANTON

STANDARD DETAILS

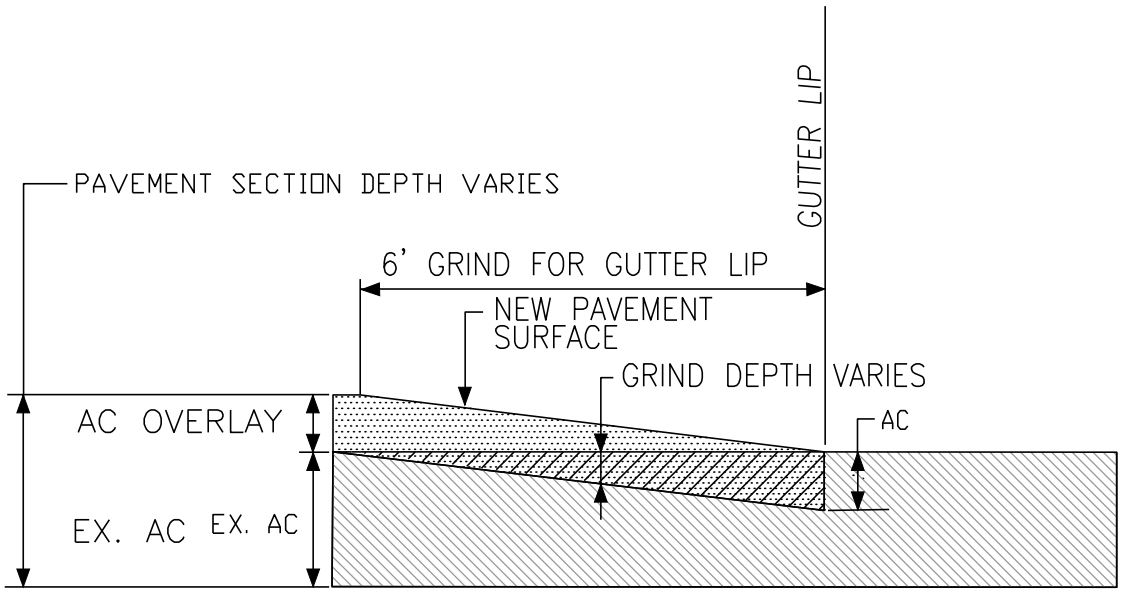
CONFORM TO PAVEMENT

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 110



PLAN



SECTION A–A

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

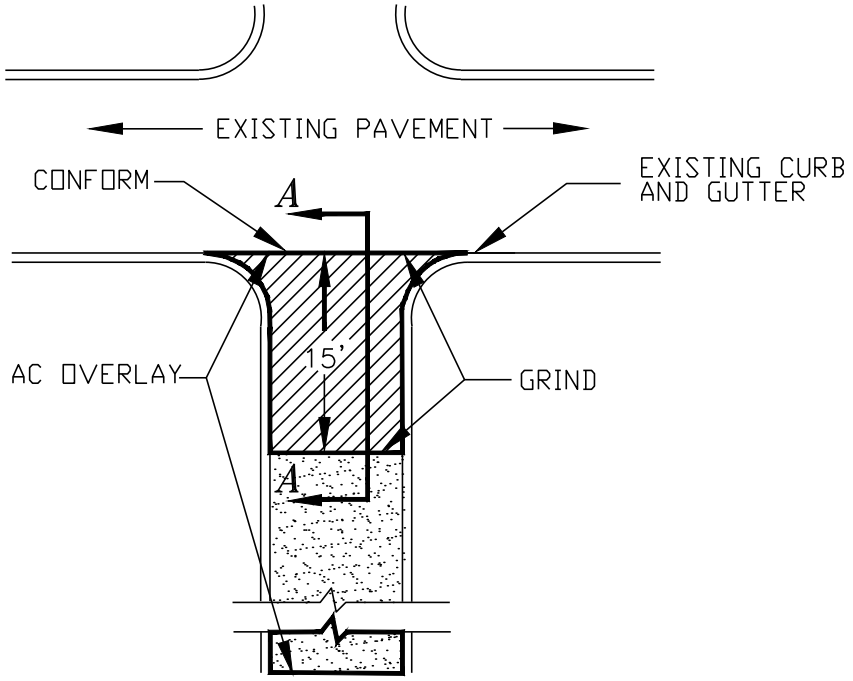
CITY OF PLEASANTON

STANDARD DETAILS

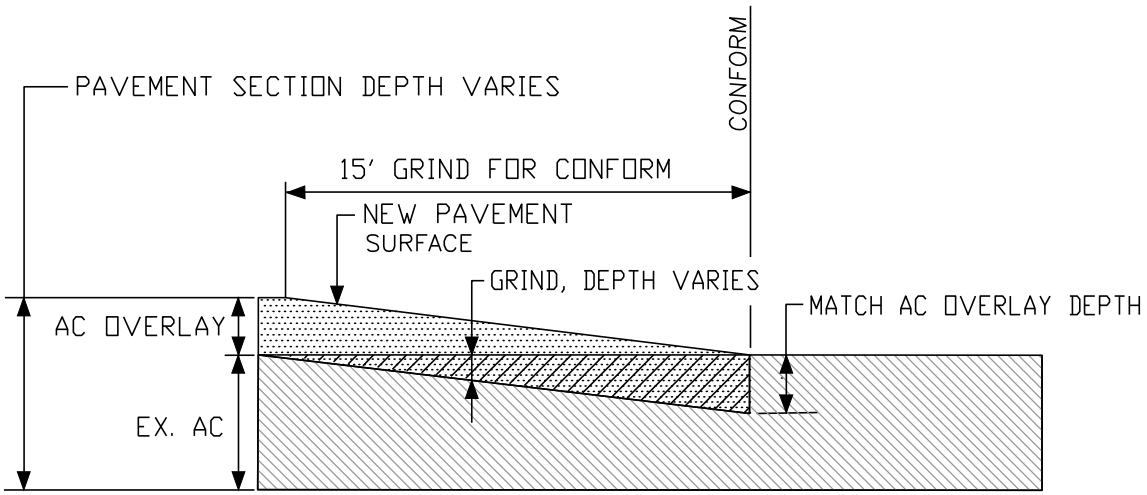
CONFORM PAVEMENT TO GUTTER

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24	DWG NO. 111



PLAN



SECTION A–A

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

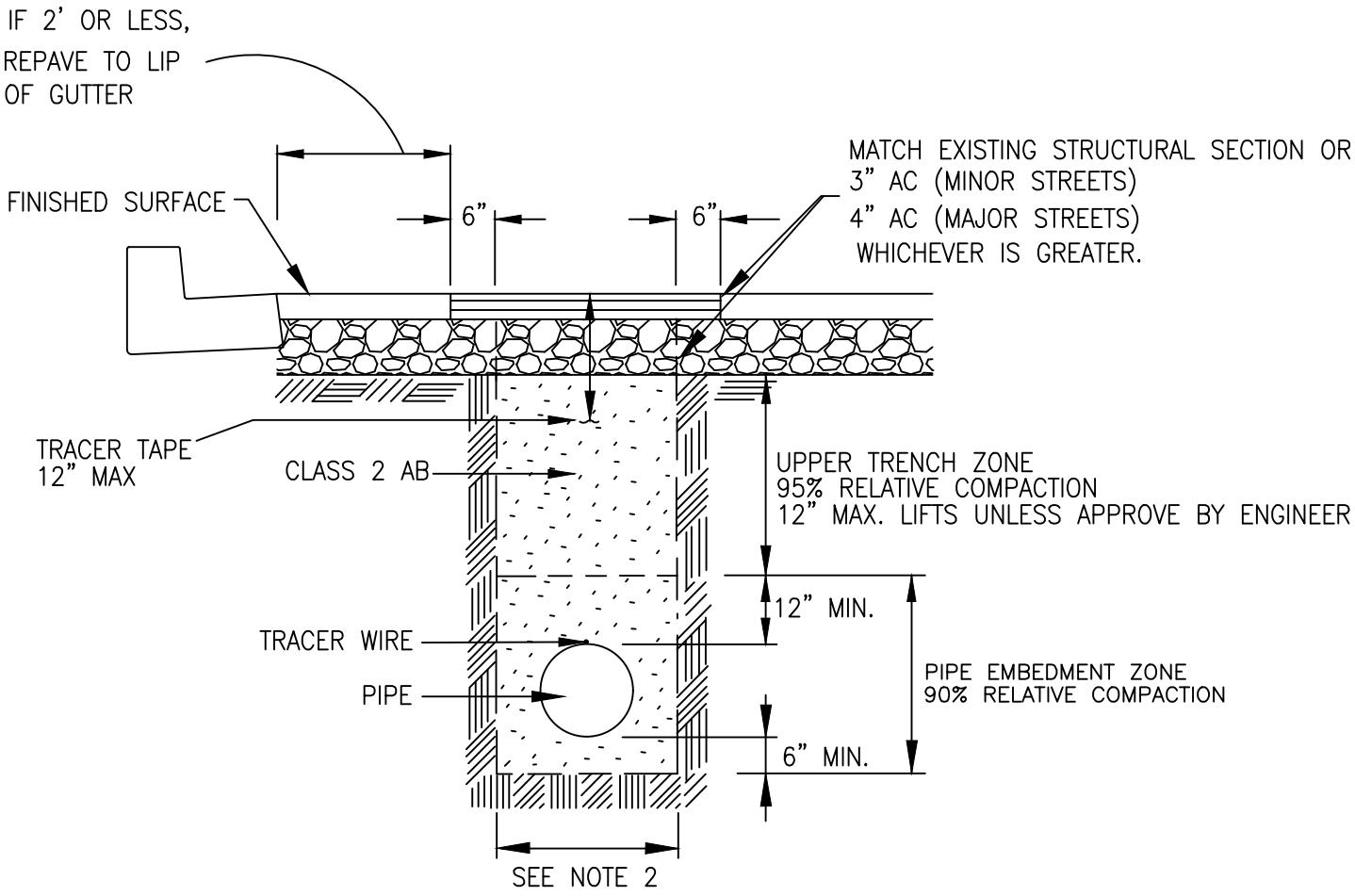
CITY OF PLEASANTON

STANDARD DETAILS

CONFORM NEW PAVEMENT TO EXISTING PAVEMENT

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NEIKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24	DWG NO. 112



NOTES:

1. BACKFILL COMPACTION SHALL BE CERTIFIED BY THE SOILS ENGINEER.
2. SEE SPECIFICATIONS FOR TRENCH WIDTH REQUIREMENTS.
3. CEMENT TREATED BASE MAY BE REQUIRED INSTEAD OF AB WHEN SPECIFIED BY THE ENGINEER.
4. TRENCH WIDTH OF 4" OR LESS SHALL BE BACKFILLED WITH 2 SACK CONCRETE SLURRY UPON APPROVAL OF THE CITY ENGINEER.
5. CLASS II AB PER CITY STANDARD SPECIFICATIONS, SECTION 7.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

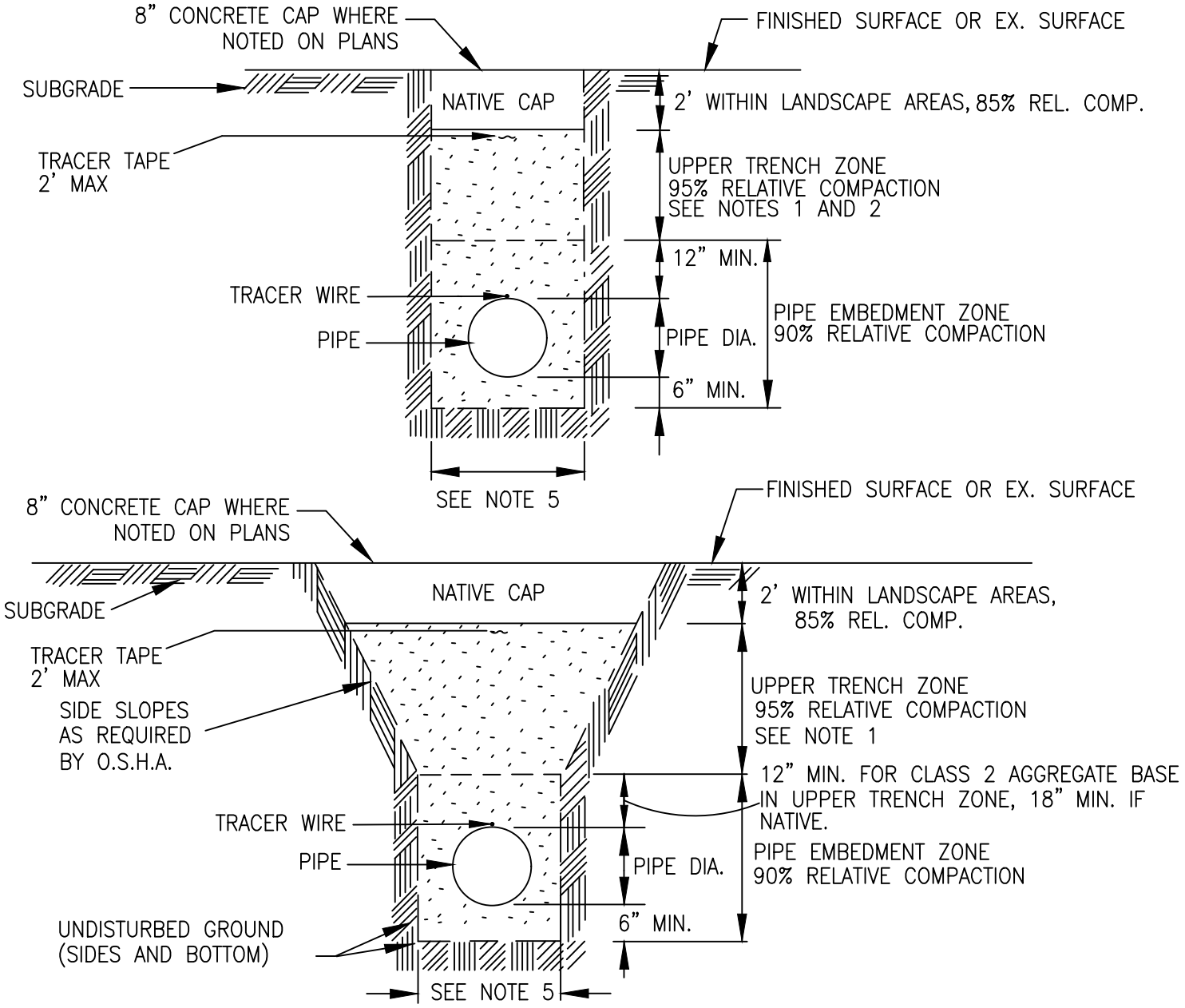
CITY OF PLEASANTON

STANDARD DETAILS

TRENCH BACKFILL FOR STREETS

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24	DWG NO. 113



NOTES:

1. NATIVE MATERIAL MAY BE USED WHEN SPECIFICALLY APPROVED BY ENGINEER.
2. THIS DETAIL DOES NOT APPLY TO EXISTING PAVED STREETS.
3. BACK FILL COMPACTION SHALL BE CERTIFIED BY SOILS ENGINEER.
4. 100% IMPORT IN ALL VERTICAL TRENCHES.
5. SEE SPECIFICATIONS FOR TRENCH WIDTH REQUIREMENTS.

DRAWN BY:	STAFF
CHECKED BY:	AN
SCALE:	N.T.S.

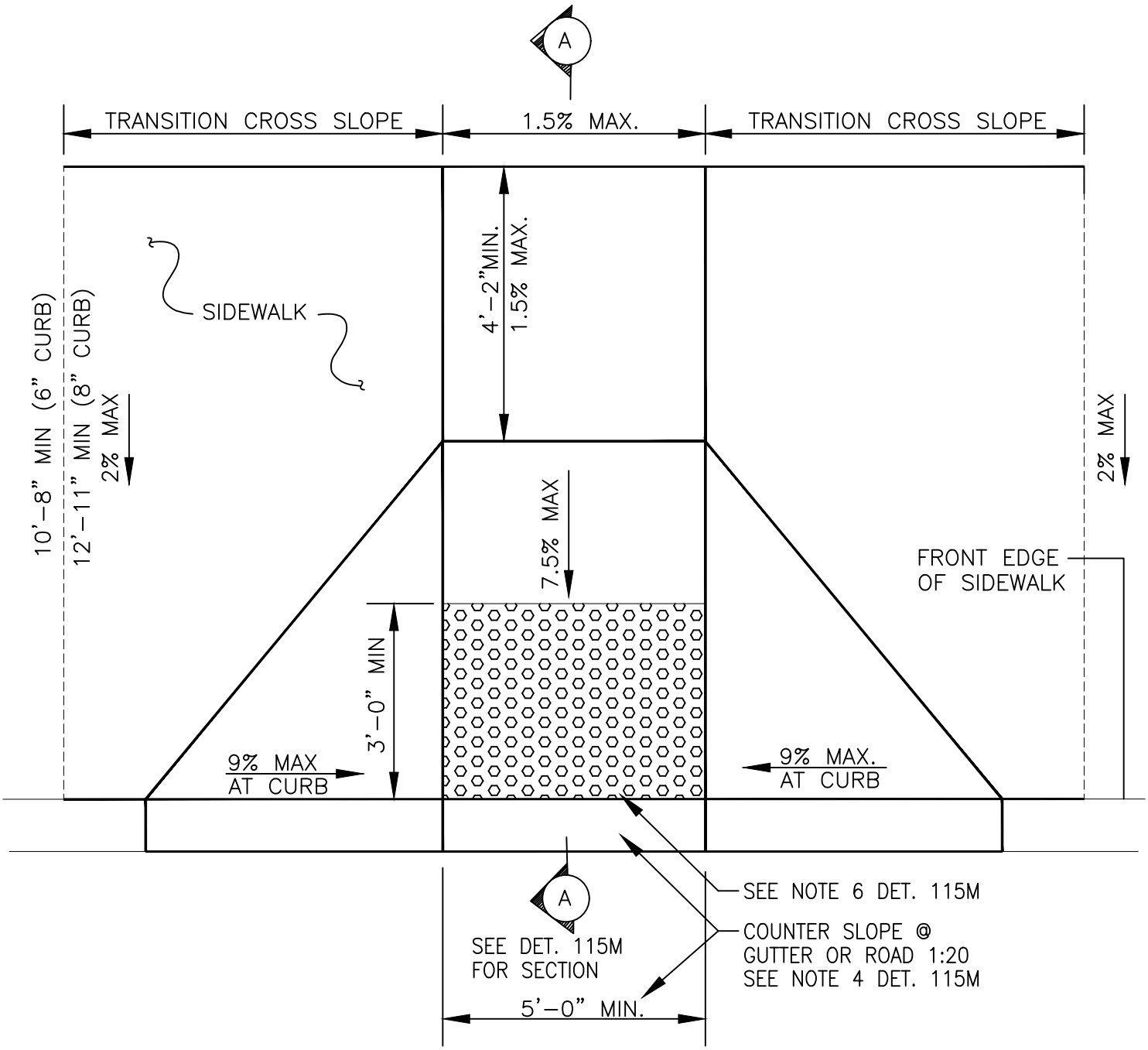
CITY OF PLEASANTON

STANDARD DETAILS

TRENCH BACKFILL FOR UNDEVELOPED AREAS

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO.114



CASE A

NOTE:

1. SEE DETAIL 101 AND 115M FOR ADDITIONAL GENERAL CONSTRUCTION NOTES.

REVISED 8/15		
DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

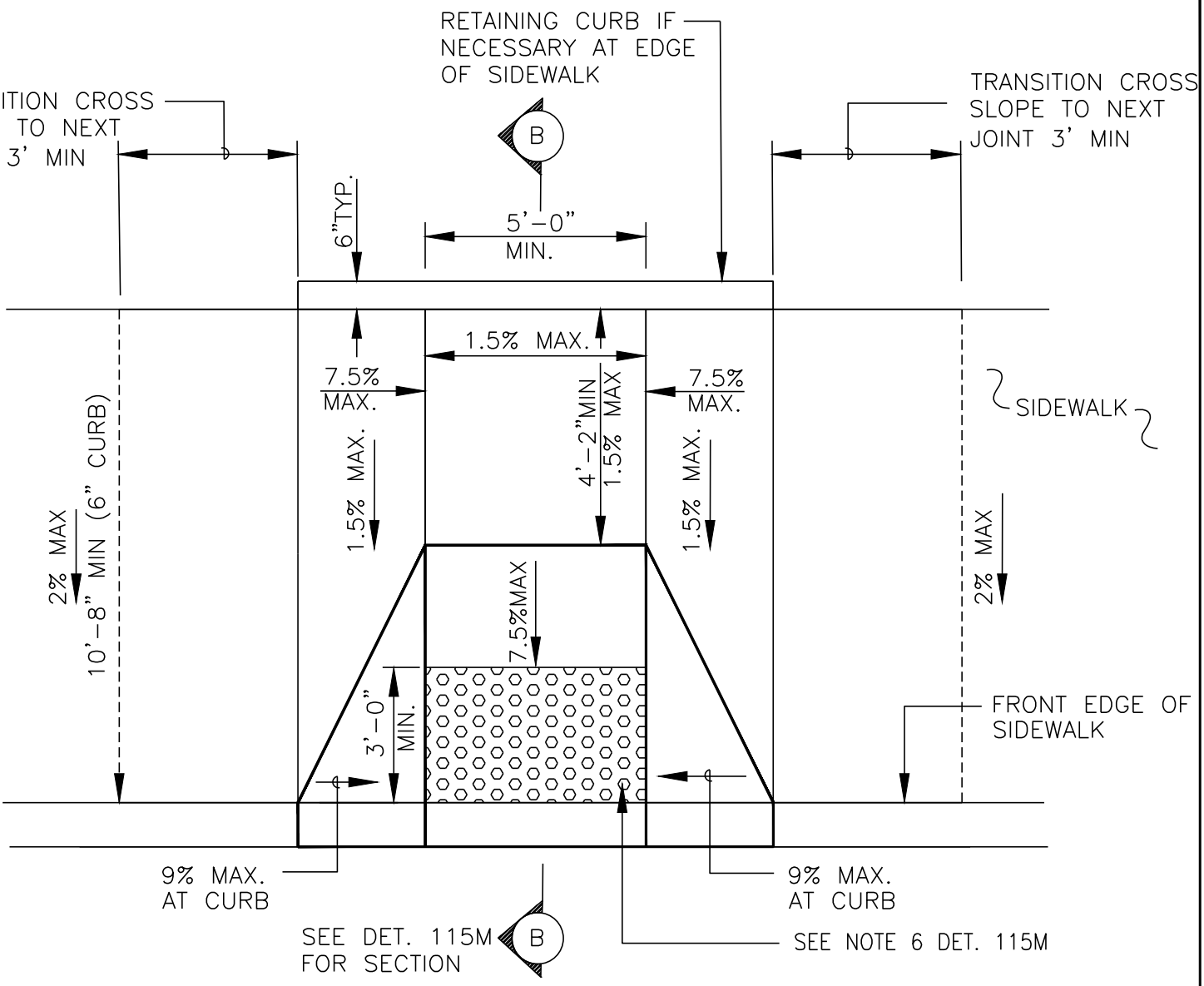
CITY OF PLEASANTON

STANDARD DETAILS

ADA RAMP

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 115A



CASE B

NOTE:

1. SEE DETAIL 101 AND 115M FOR ADDITIONAL GENERAL CONSTRUCTION NOTES.

REVISED 8/15		
DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

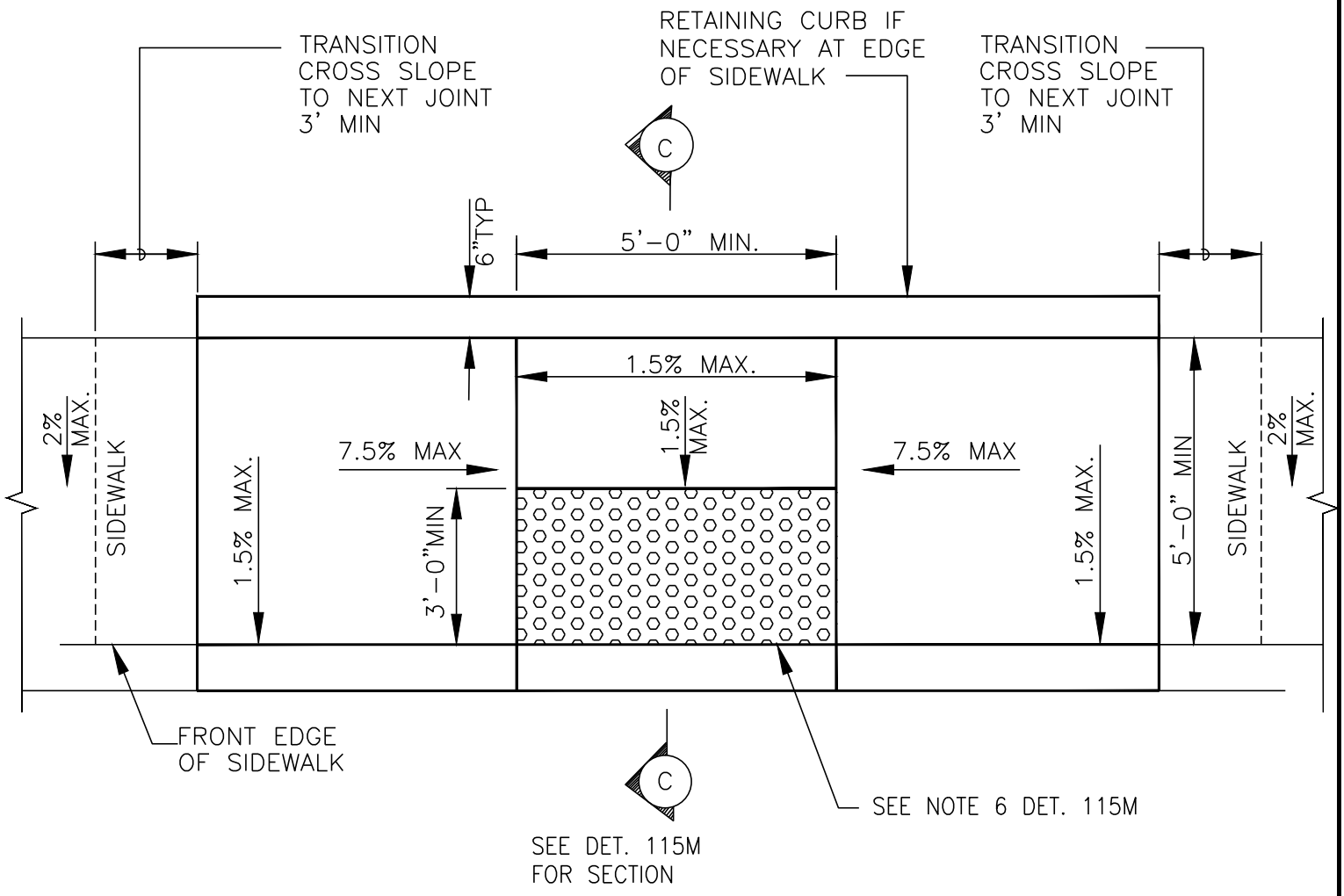
CITY OF PLEASANTON

STANDARD DETAILS

ADA RAMP

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

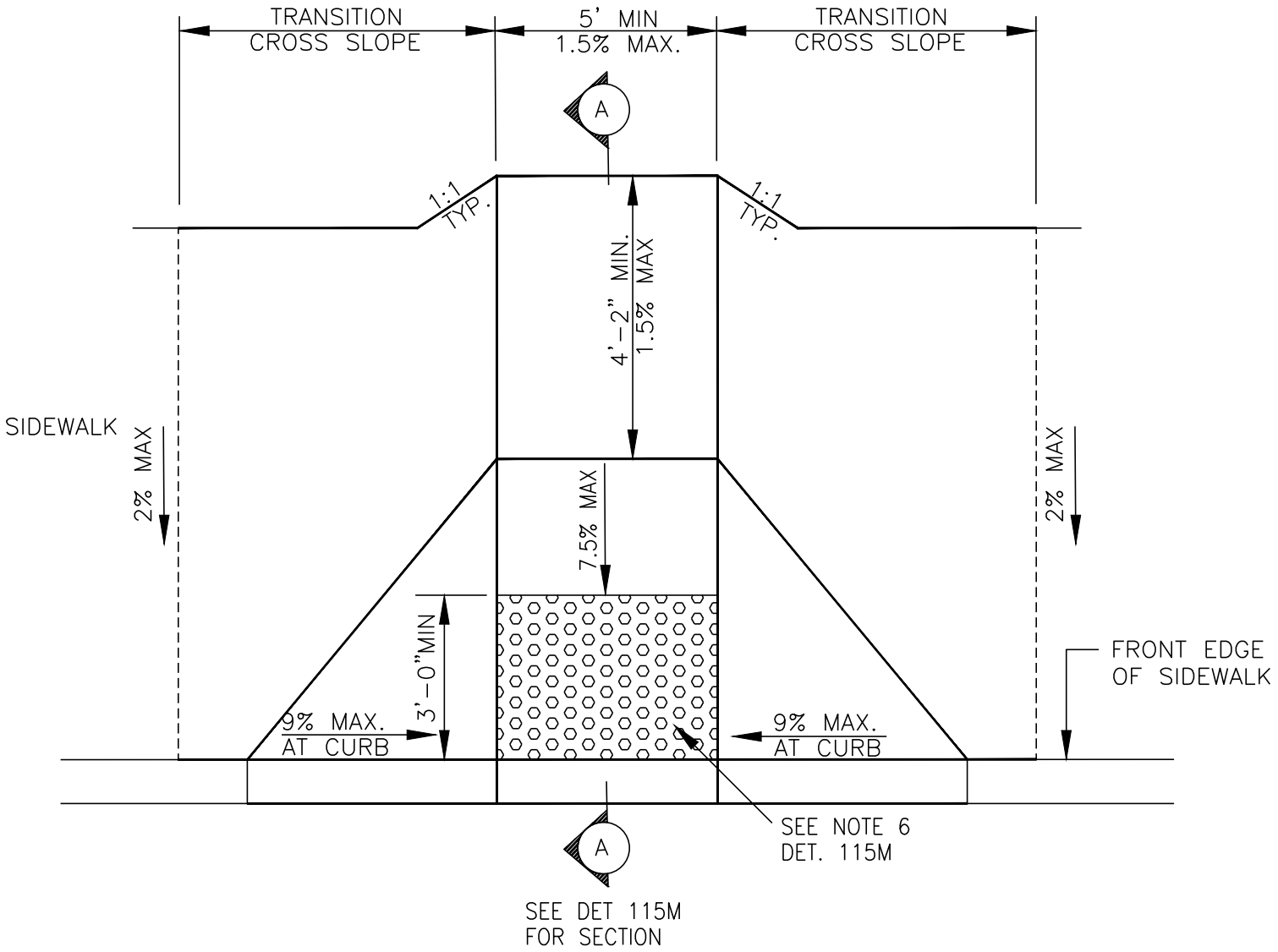
DATE: 7/24 | DWG NO. 115C



CASE C

NOTE:
1. SEE DETAIL 101 AND 115M FOR ADDITIONAL GENERAL CONSTRUCTION NOTES.

REVISED 8/15	CITY OF PLEASANTON	REGISTERED PROFESSIONAL ENGINEER ADAM MATTHEW NELKIE No. 78830 Exp. 9/30/2025 CIVIL STATE OF CALIFORNIA
DRAWN BY: STAFF	STANDARD DETAILS	
CHECKED BY: AN	ADA RAMP	
SCALE: N.T.S.		DATE: 7/24 DWG NO. 115D



CASE D

NOTE:

1. SEE DETAIL 101 AND 115M FOR ADDITIONAL GENERAL CONSTRUCTION NOTES.

REVISED 8/15		
DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

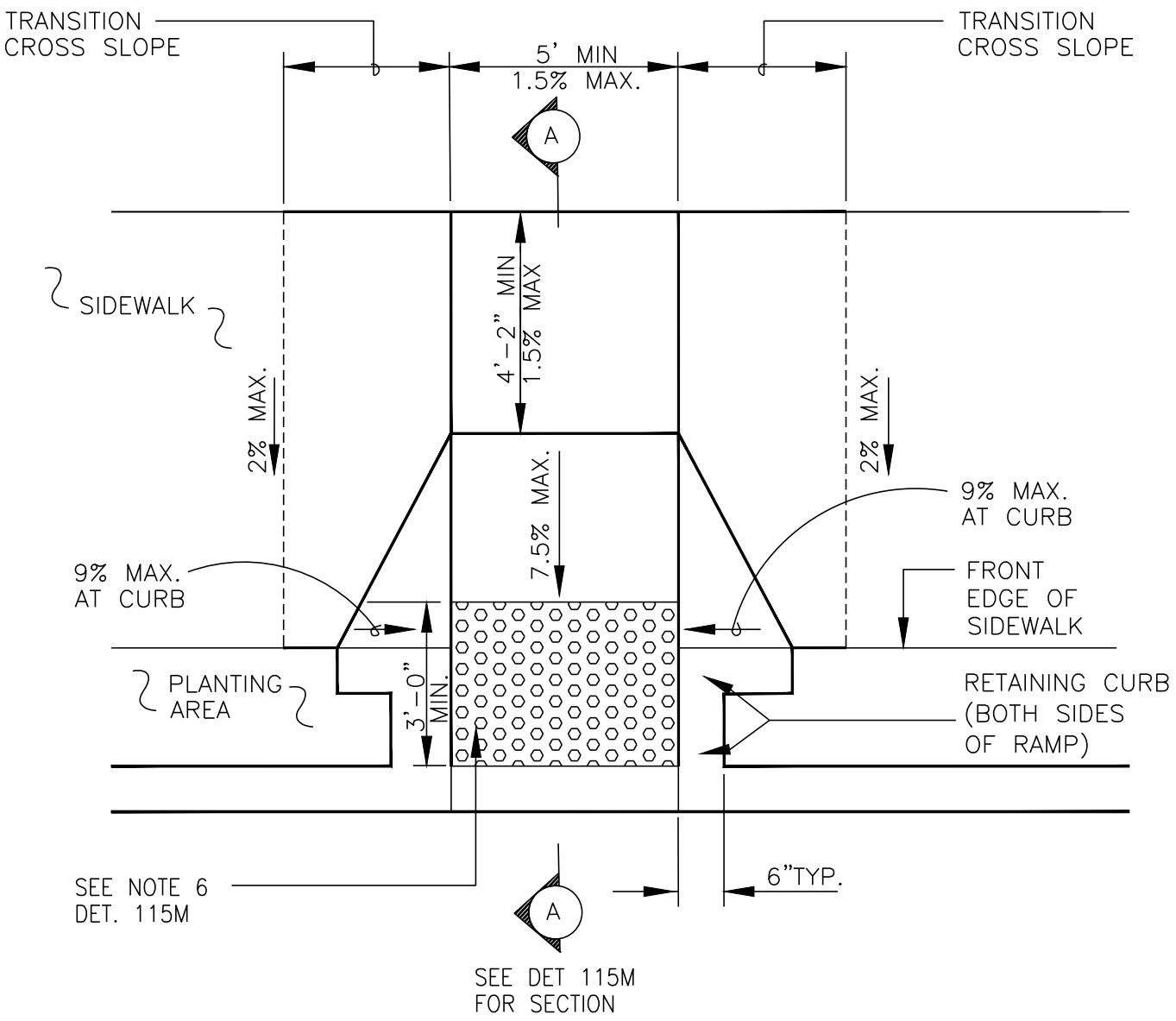
CITY OF PLEASANTON

STANDARD DETAILS

ADA RAMP

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NEEKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 115G

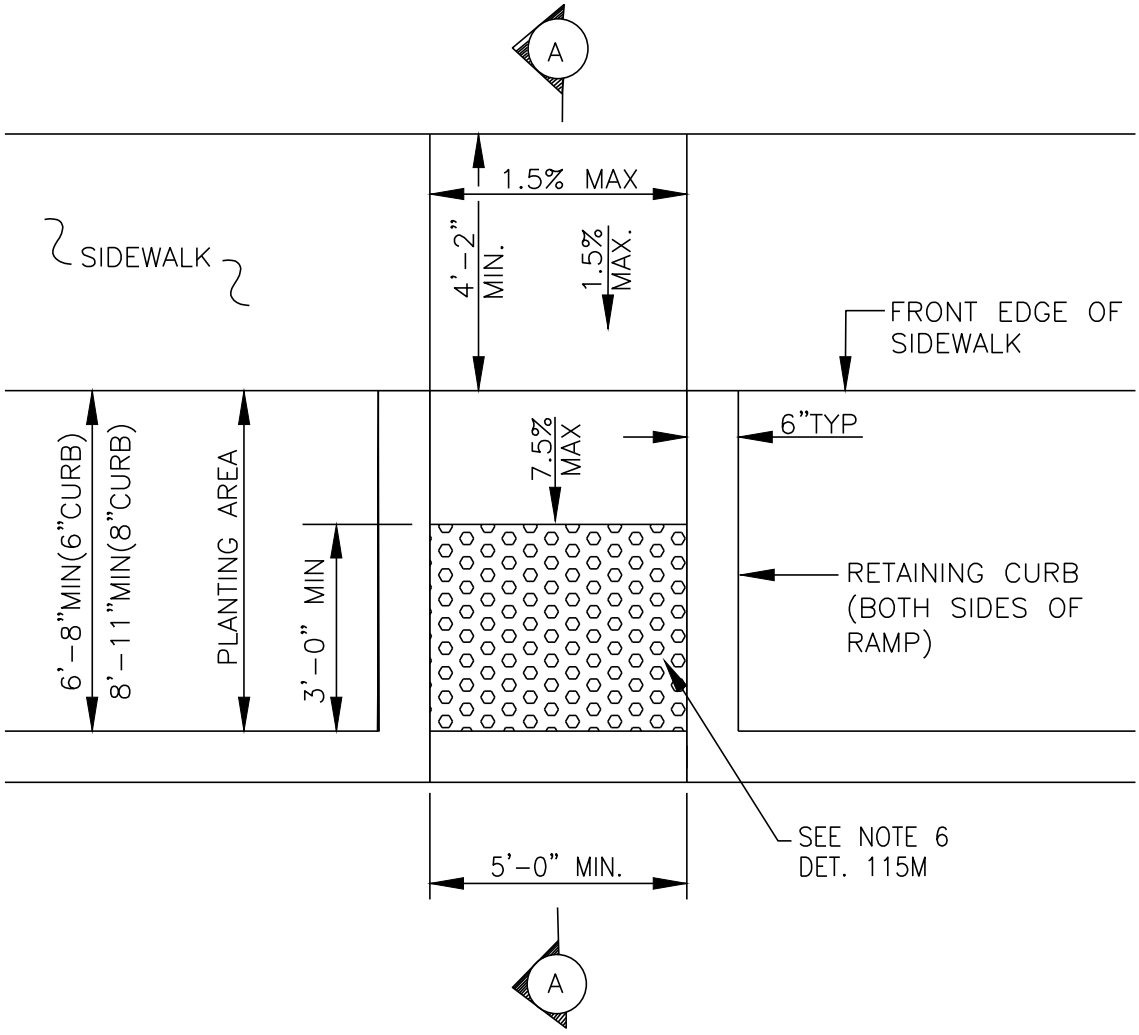


CASE E

NOTE:

1. SEE DETAIL 101 AND 115M FOR ADDITIONAL GENERAL CONSTRUCTION NOTES.

REVISED 8/15	CITY OF PLEASANTON	REGISTERED PROFESSIONAL ENGINEER ADAM MATTHEW NELSEN No. 78830 Exp. 9/30/2025 CIVIL STATE OF CALIFORNIA
DRAWN BY: STAFF	STANDARD DETAILS	
CHECKED BY: AN	ADA RAMP	
SCALE: N.T.S.		DATE: 7/24 | DWG NO. 115H



CASE F

NOTE:

1. SEE DETAIL 101 AND 115M FOR ADDITIONAL GENERAL CONSTRUCTION NOTES.
2. SEE DETAIL 115M FOR SECTION A-A

REVISED 8/15		
DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

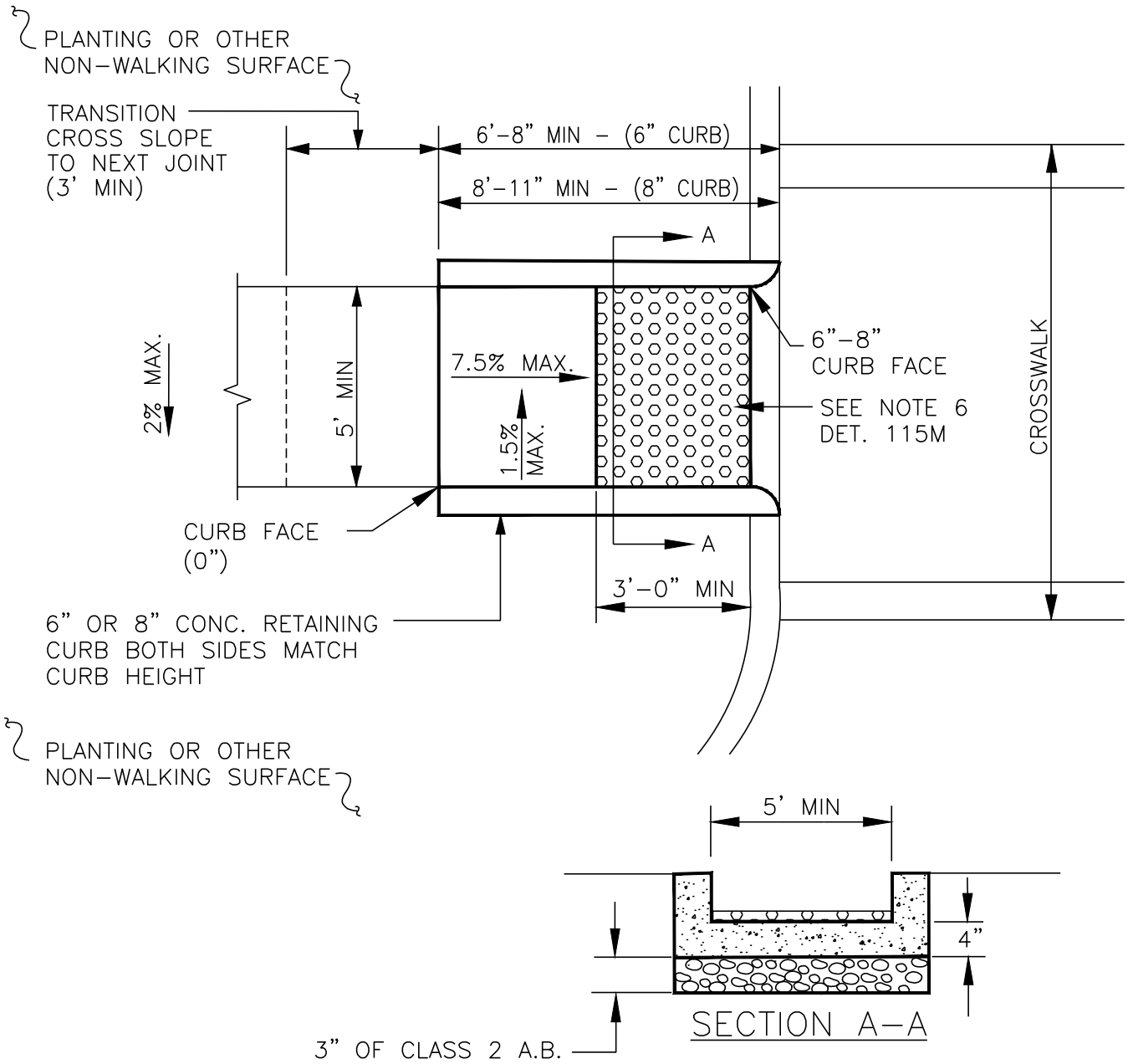
CITY OF PLEASANTON

STANDARD DETAILS

ADA RAMP

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 1151



CASE F1

NOTE:

1. SEE DETAIL 101 AND 115M FOR ADDITIONAL GENERAL NOTES.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

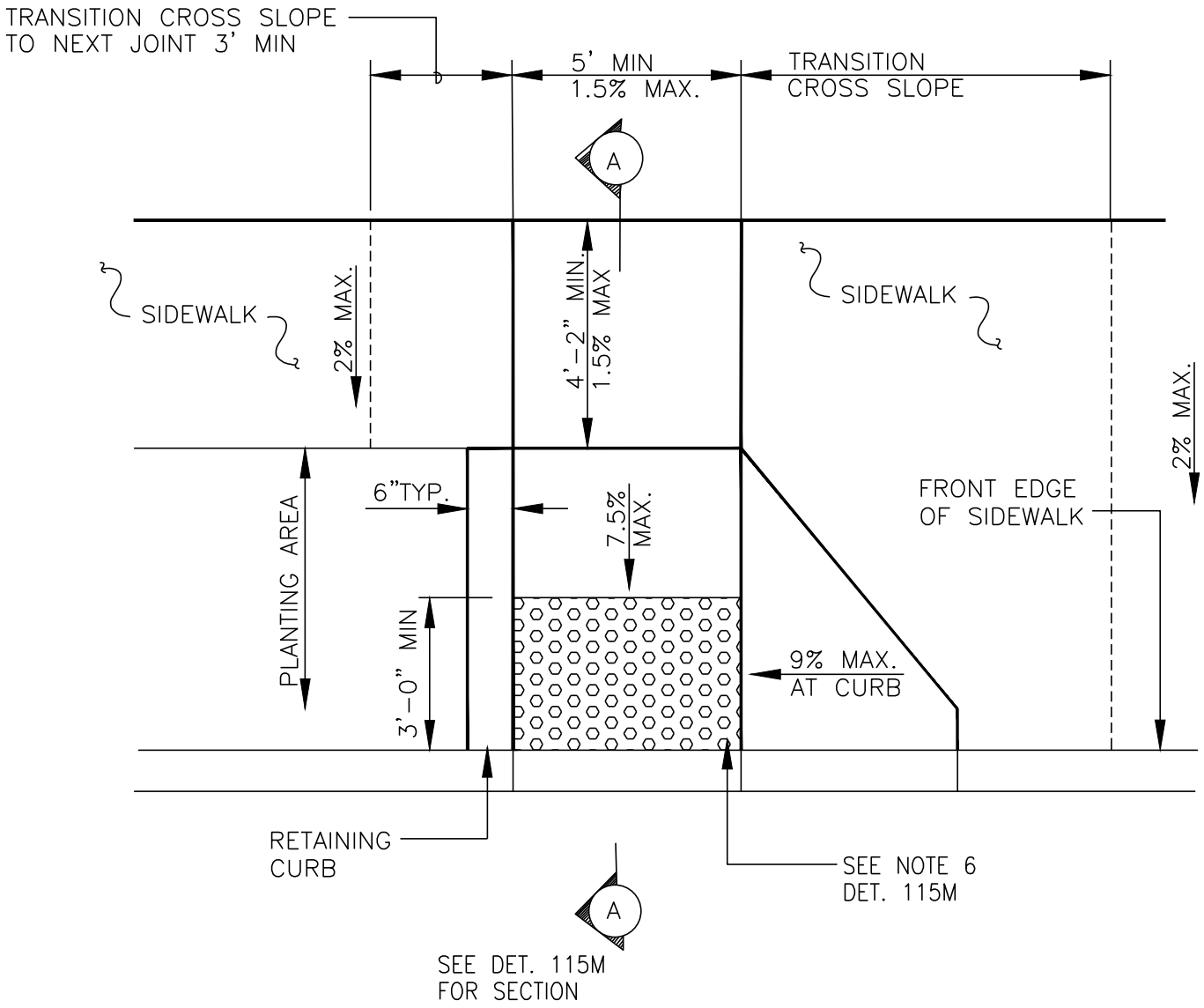
STANDARD DETAILS

ADA RAMP

W/TWO RETAINING CURBS

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 115J



CASE G

NOTE:

1. SEE DETAIL 101 AND 115M FOR ADDITIONAL GENERAL CONSTRUCTION NOTES.

REVISED 8/15		
DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

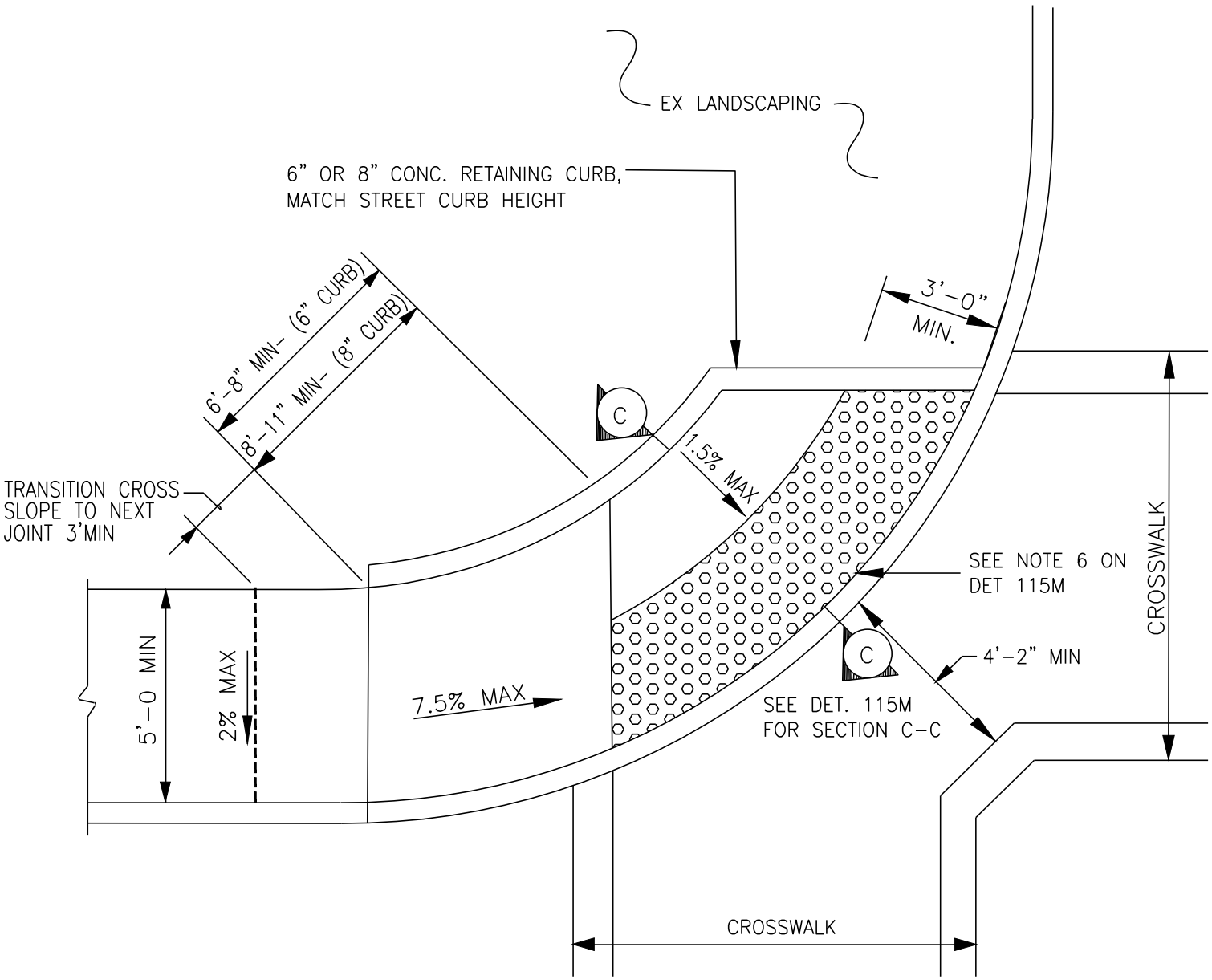
CITY OF PLEASANTON

STANDARD DETAILS

ADA RAMP

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 115K



CASE G1

NOTES:

1. SEE DETAIL 101 AND 115M FOR ADDITIONAL GENERAL NOTES.

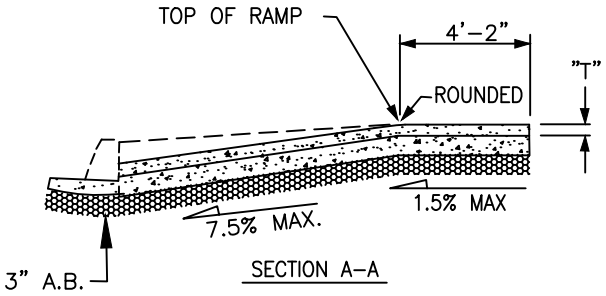
REVISED 11/19		
DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON
STANDARD DETAILS

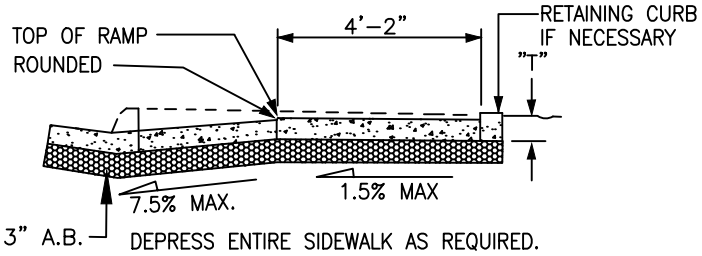
ADA RAMP
END OF SIDEWALK

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELSON
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 115L

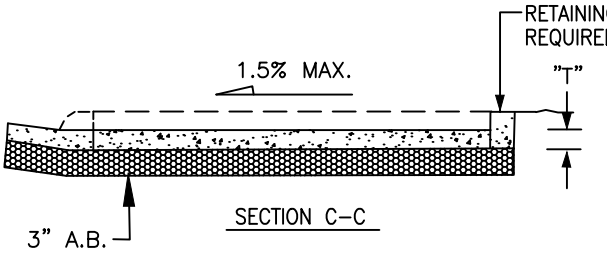


SECTION A-A



DEPRESS ENTIRE SIDEWALK AS REQUIRED.

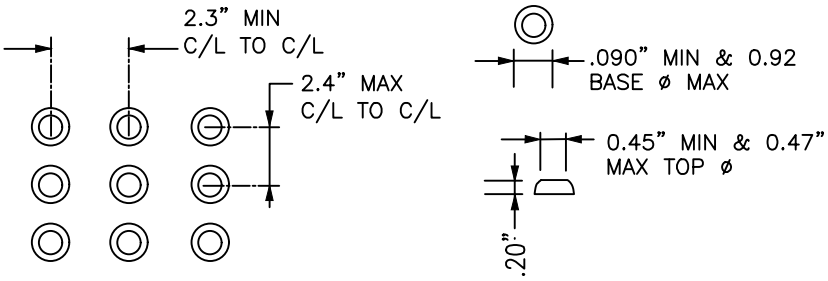
SECTION B-B



SECTION C-C

NOTES:

1. UTILITY PULL BOXES, MANHOLES, VAULTS AND ALL OTHER UTILITY FACILITIES, WITHIN THE BOUNDARIES OF THE CURB RAMP, WILL BE RELOCATED BY THE OWNER PRIOR TO, OR IN CONJUNCTION WITH, CURB RAMP CONSTRUCTION.
2. WHEN RAMP IS LOCATED IN CENTER OF CURB RETURN, CROSSWALK CONFIGURATION MUST BE SIMILAR TO THAT SHOWN IN CASE G1 AND BLENDED TRANSITION RAMPS.
3. IF LOCATED ON A CURVE, THE SIDES OF THE RAMP NEED NOT BE PARALLEL, BUT THE MINIMUM WIDTH OF THE RAMP SHALL BE 4'.
4. TRANSITIONS FROM RAMPS TO WALKS, GUTTERS OR STREETS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES. MAX 1:20
5. SIDEWALK AND RAMP THICKNESS, "T", SHALL BE 4" CONCRETE WITH 3" CLASS II A.B.
6. CURB RAMPS SHALL HAVE A DETECTABLE WARNING SURFACE THAT EXTENDS THE FULL WIDTH OF THE RAMP. THE TYPE OF DETECTABLE WARNING SURFACES, AT THE OPTION OF THE CONTRACTOR SHALL BE CONSTRUCTED EITHER BY CAST IN PLACE OR STAMPED METHOD, OR CONSIST OF PREFABRICATED SURFACE. THE PREFABRICATED SURFACE SHALL CONFORM TO THE REQUIREMENTS IN THE SPECIAL PROVISIONS. THE COLOR SHALL BE APPROVED BY THE ENGINEER (YELLOW).
7. RAMP SIDE SLOPE VARIES UNIFORMLY FROM A MAXIMUM OF 9% AT CURB TO CONFORM WITH LONGITUDINAL SIDEWALK SLOPE ADJACENT TO THE TOP OF THE RAMP, EXCEPT IN CASE C AND F.
8. MAXIMUM SLOPES OF ADJOINING GUTTERS, THE ROAD SURFACE IMMEDIATELY ADJACENT TO THE CURB RAMP AND CONTINUOUS PASSAGE TO THE CURB RAMP SHALL NOT EXCEED 5% WITHIN 4' OF THE TOP OR BOTTOM OF THE CURB RAMP.
9. (FOR HACIENDA BUSINESS PARK ONLY) CONCRETE CURB W/# 4 REINFORCING BAR. TOP OF CURB TO BE FLUSH W/ SIDEWALK @ EACH END OF CURB.
10. THE EDGE OF THE DETECTABLE WARNING SURFACE NEAREST THE STREET SHALL BE BETWEEN 6" & 8" FROM GUTTER FLOW LINE.



RAISED TRUNCATED DOME

REVISED 8/15		
DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

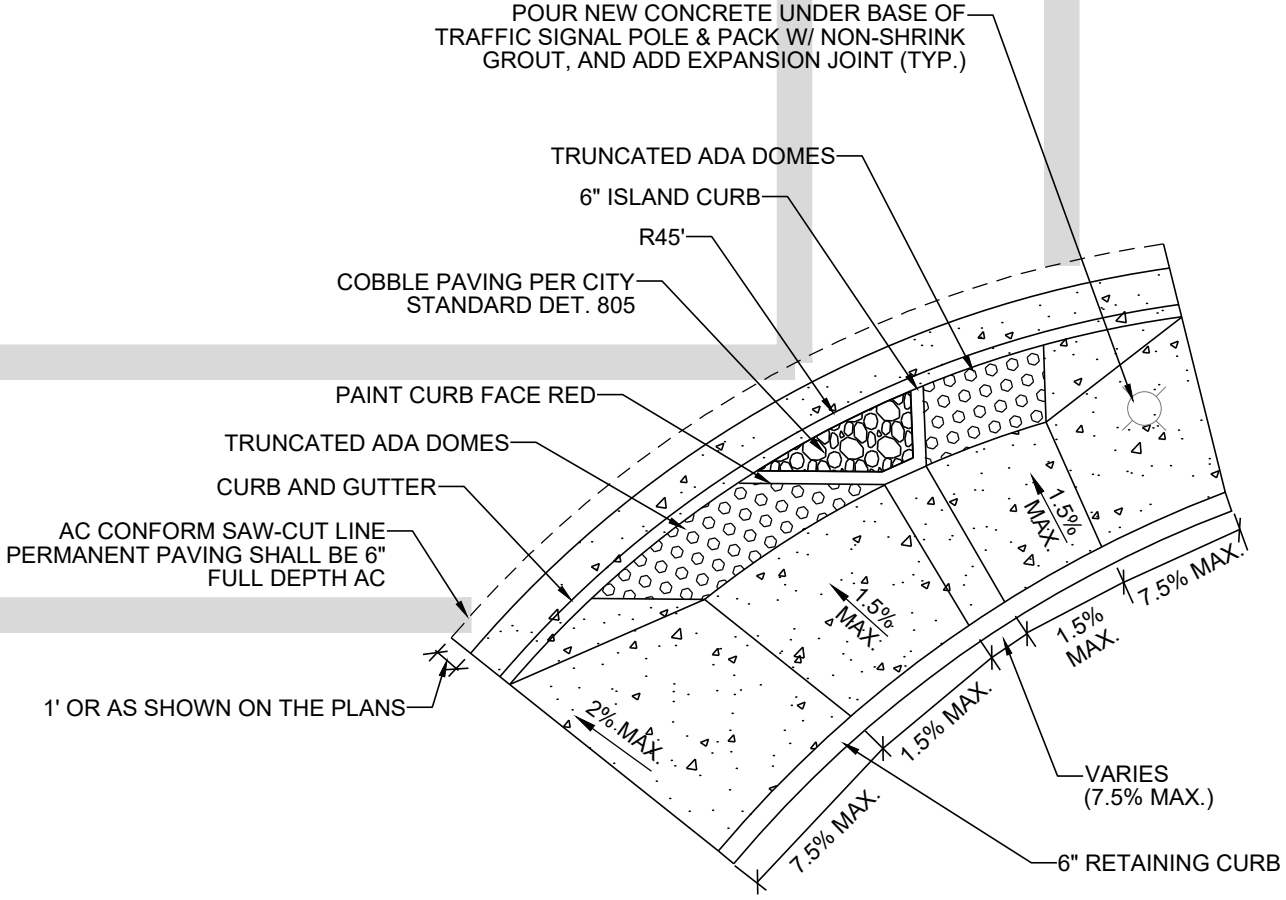
CITY OF PLEASANTON

STANDARD DETAILS

ADA RAMP (NOTES AND DETAILS)

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 115M



BLENDED TRANSITION RAMP WITH ISLAND

NTS

NOTE:

1. SEE DETAIL 101 AND 115M FOR ADDITIONAL GENERAL CONSTRUCTION NOTES.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

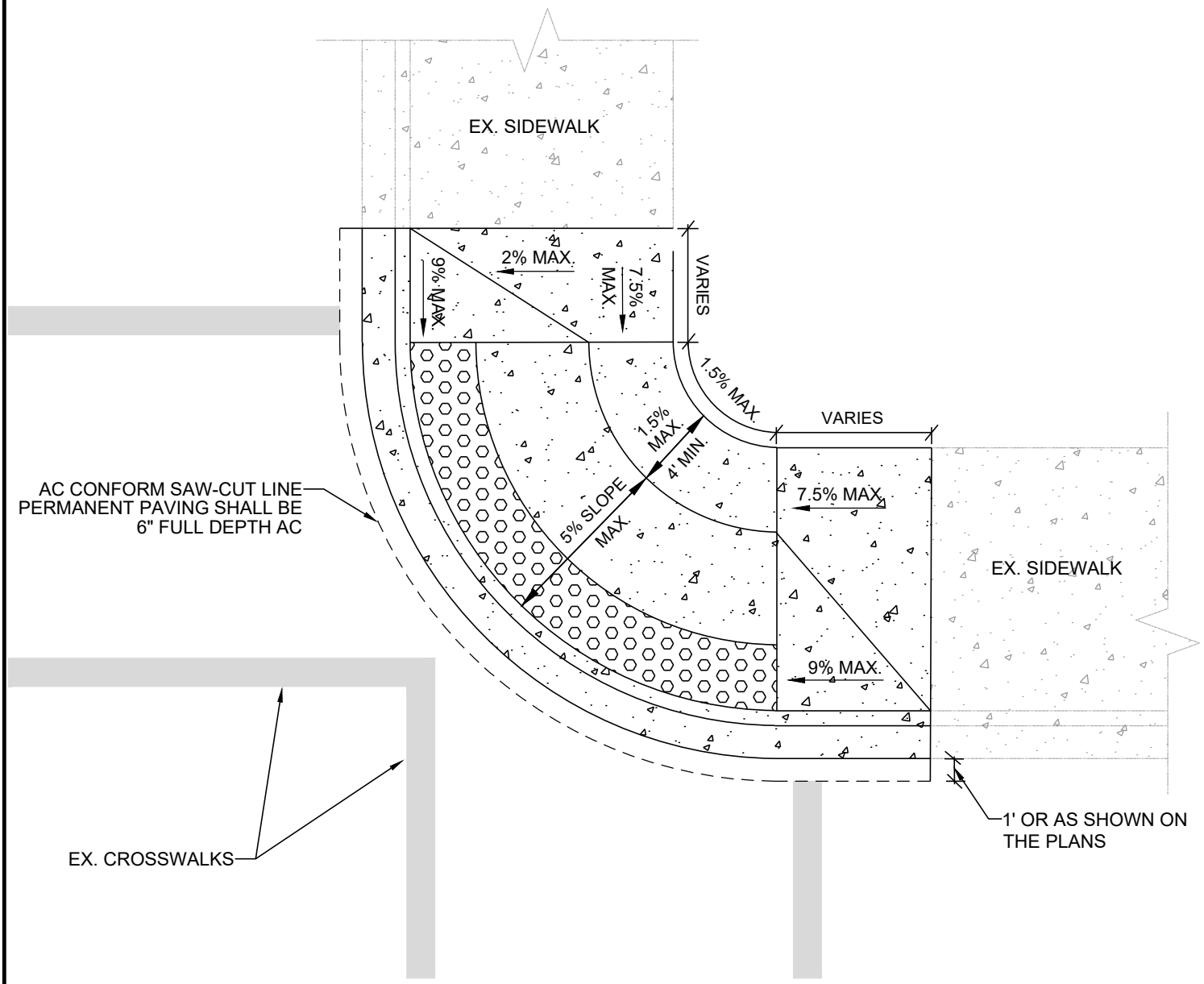
CITY OF PLEASANTON

STANDARD DETAILS

ADA RAMP

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 115N



BLENDED TRANSITION RAMP

NOTE:

1. SEE DETAIL 101 AND 115M FOR ADDITIONAL GENERAL CONSTRUCTION NOTES.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

STANDARD DETAILS

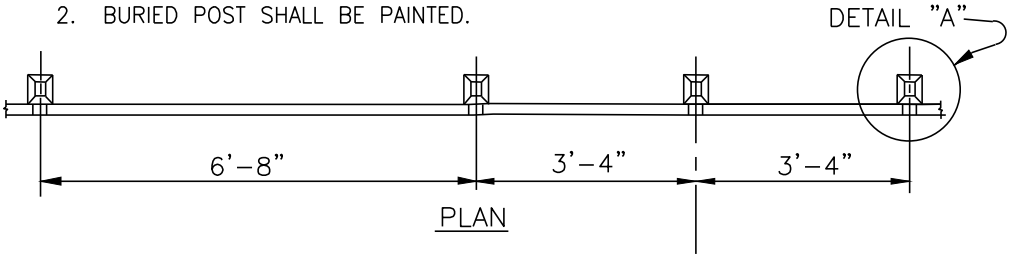
ADA RAMP

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

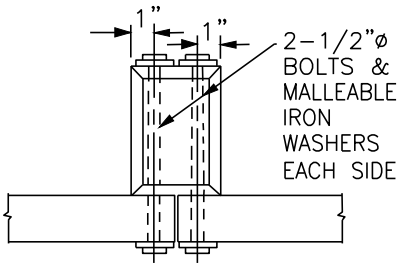
DATE: 7/24

DWG NO. 1150

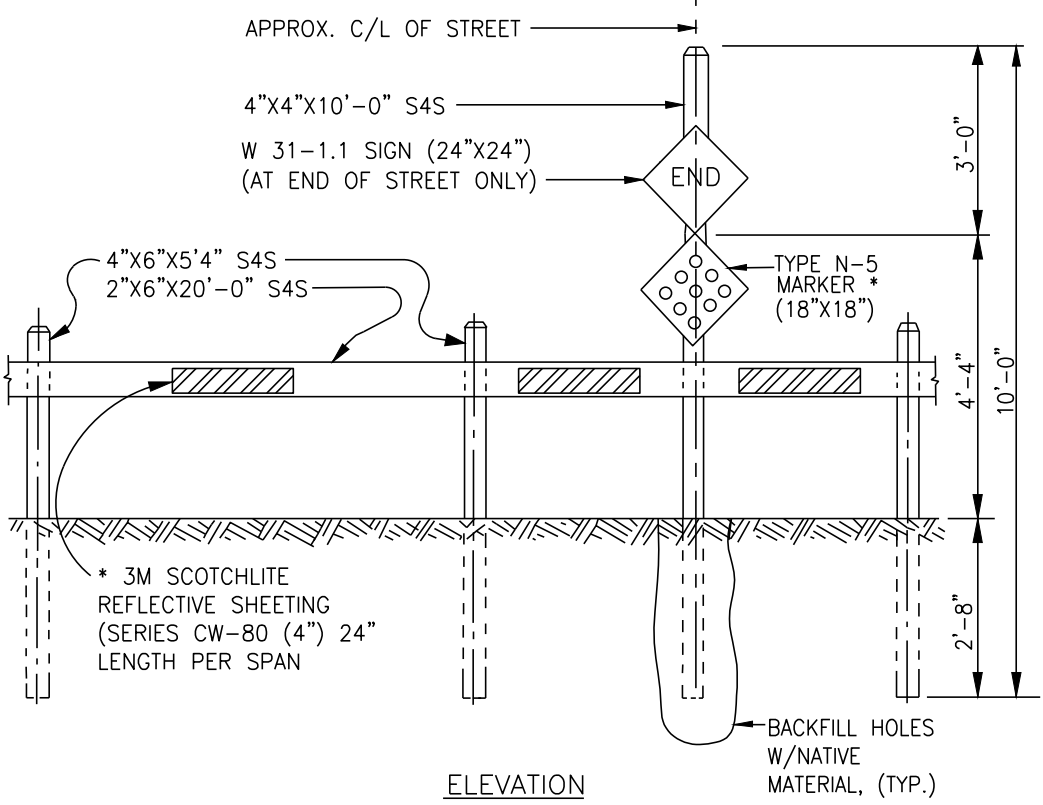
NOTES:
1. BARRICADE SHALL EXTEND ACROSS SIDEWALK AREA WHERE INDICATED ON IMPROVEMENT PLANS.
2. BURIED POST SHALL BE PAINTED.



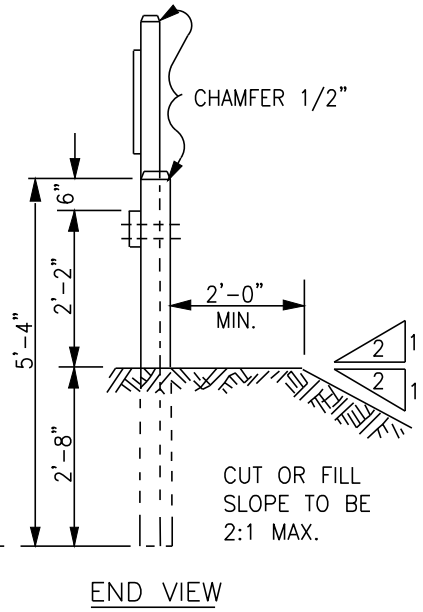
PLAN



DETAIL "A"



ELEVATION



END VIEW

MATERIALS

RAILS: DOUGLAS FIR, DENSE NO. 1 STRESS GRADE OR BETTER.
POSTS: TREATED DOUGLAS FIR, DENSE NO. 1, STRESS GRADE OR BETTER, OR DENSE STRUCTURAL GRADE REDWOOD.

PVMT WIDTH	NO. OF SPANS
32'	5
36'	6
40'	6

PAINTING

ONE COAT OF WOODPRIMER, STATE SPECIFICATION 78-4.02.
TWO COATS OF FAST DRYING FINISH PAINT FOR WOOD, STATE SPECIFICATION 78-4.02. (COLOR: WHITE)

* RED AT END OF STREET, ALL OTHER LOCATIONS YELLOW.

DRAWN BY: STAFF
CHECKED BY: AN
SCALE: AS SHOWN

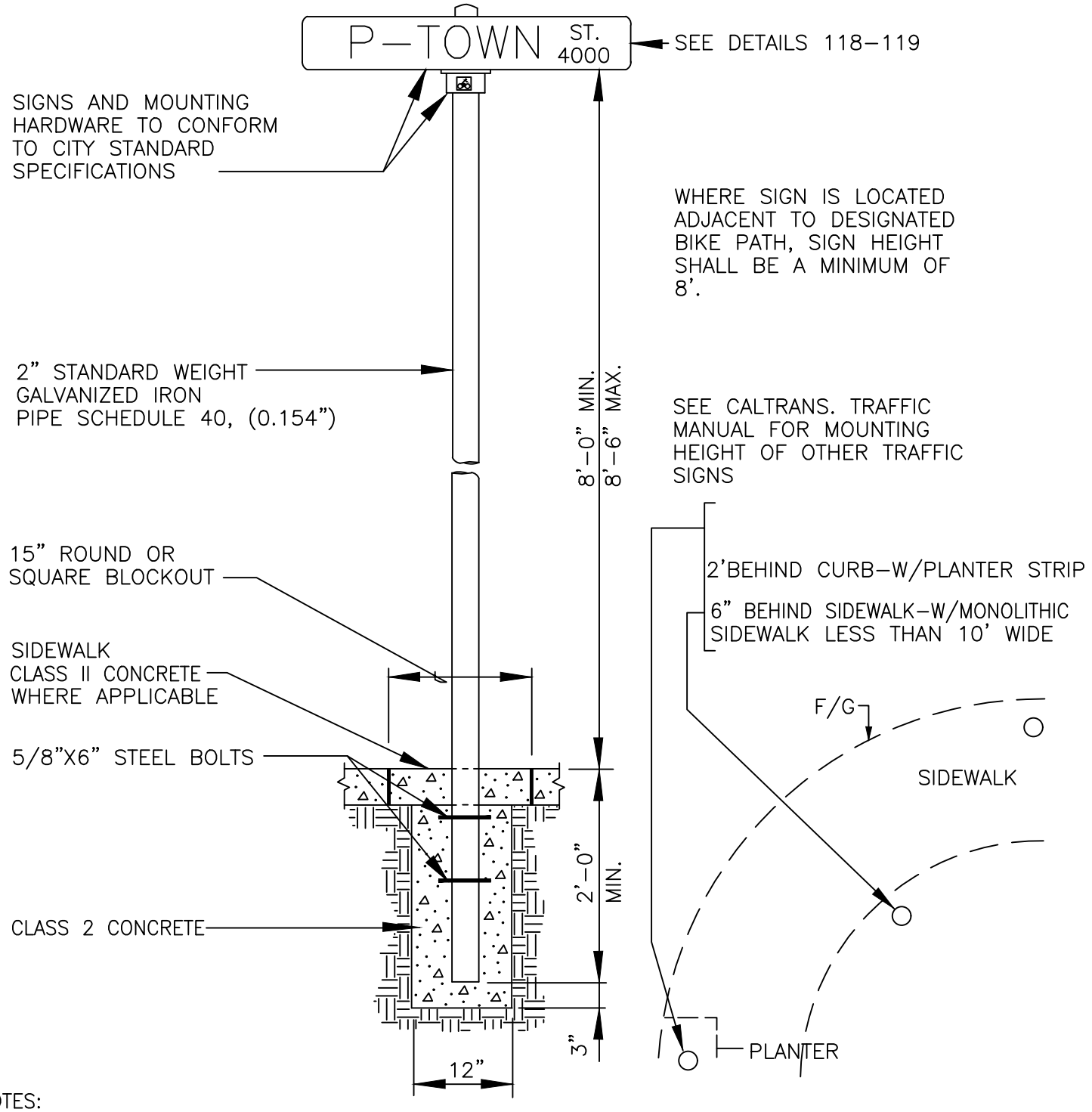
CITY OF PLEASANTON

STANDARD DETAILS

STREET BARRICADE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 116



NOTES:

1. FOR SIGNAGE IN HACIENNDA BUSINESS PARK, PLEASE CONTACT HACIENDA BUSINESS PARK ASSOCIATION CONTACT: JAMES PAXON (925) 463-9040 WWW.HACIENDA.ORG
2. SEE DWG NO 123 FOR BUSINESS PARK LIMITS.

REVISION:		
DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

STANDARD DETAILS

STREET NAME SIGN POST

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 117

Notes:
All blanks to be .080 Aluminum 9" in height
24" Blank for Seven (7) letters (14" or less)
30" Blank for Nine (9) letters (20" or less)
36" Blank for greater than nine (9) letters (26" or less)
G or Y to be 7.3" high total

Lettering to be Highway Gothic C -A.K. Revision C

MUTCD Section 2A.08 & 2D.38 Compliant

FOR 40 MPH OR MULTILANE ROAD, 8" TEXT HEIGHT IS REQUIRED.
CONTACT THE CITY OF PLEASANTON SIGN SHOP AT (925) 931-5500 FOR TEMPLATE.

CITY OF PLEASANTON

STANDARD DETAILS

STREET NAME SIGN

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DRAWN BY: STAFF
CHECKED BY: AN
SCALE: N.T.S.

DATE : 7/24 | DWG NO. 118

CITY OF PLEASANTON

STANDARD DETAILS

ARC STREET NAME SIGN

DRAWN BY: STAFF

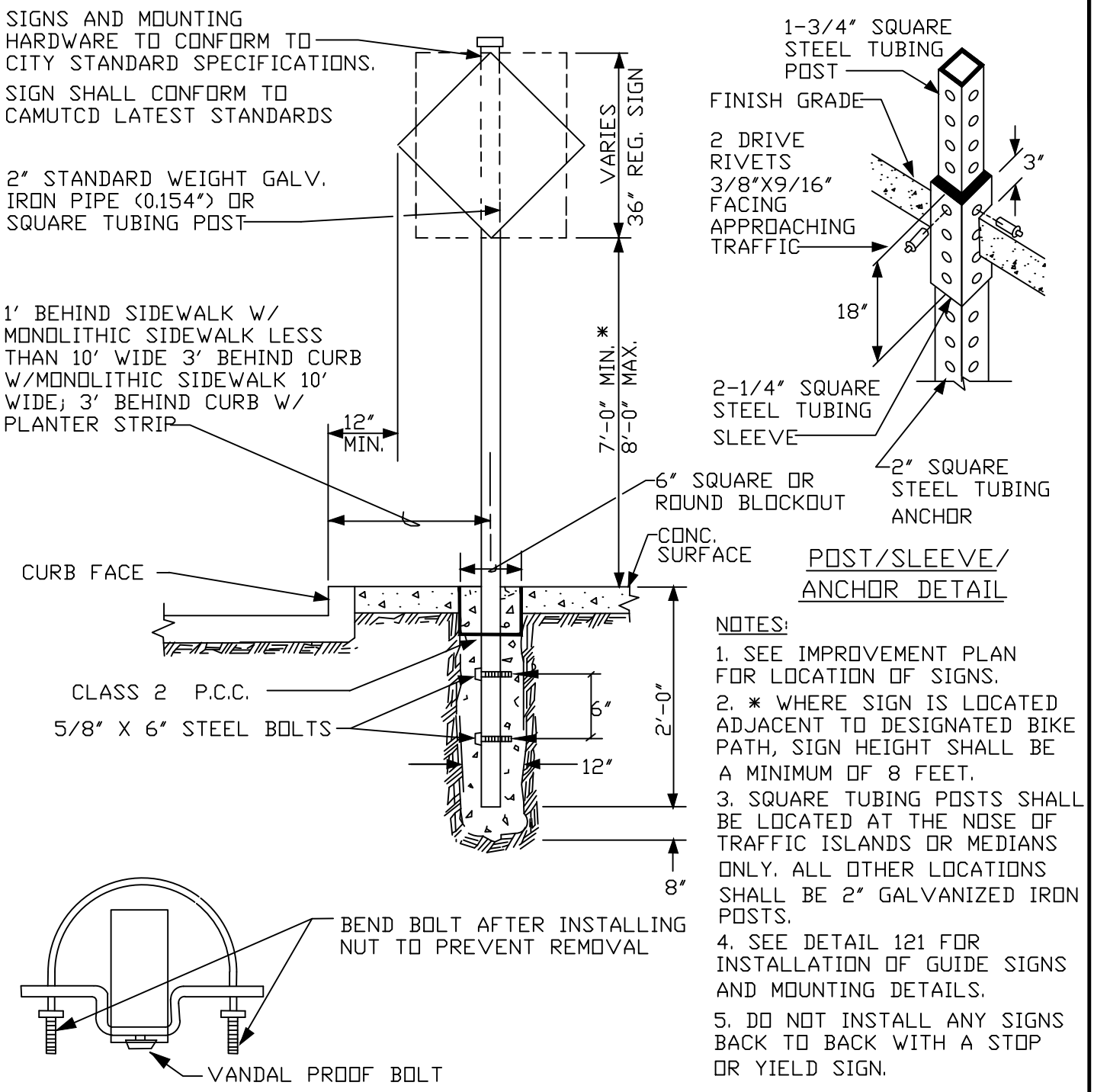
CHECKED BY: AN

SCALE: N.T.S.

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24

DWG NO. 119



POST/SLEEVE/ANCHOR DETAIL

SIGN BRACKET DETAIL

NOTES:

1. SEE IMPROVEMENT PLAN FOR LOCATION OF SIGNS.
2. * WHERE SIGN IS LOCATED ADJACENT TO DESIGNATED BIKE PATH, SIGN HEIGHT SHALL BE A MINIMUM OF 8 FEET.
3. SQUARE TUBING POSTS SHALL BE LOCATED AT THE NOSE OF TRAFFIC ISLANDS OR MEDIANS ONLY. ALL OTHER LOCATIONS SHALL BE 2" GALVANIZED IRON POSTS.
4. SEE DETAIL 121 FOR INSTALLATION OF GUIDE SIGNS AND MOUNTING DETAILS.
5. DO NOT INSTALL ANY SIGNS BACK TO BACK WITH A STOP OR YIELD SIGN.

DRAWN BY:	STAFF
CHECKED BY:	AN
SCALE:	N.T.S.

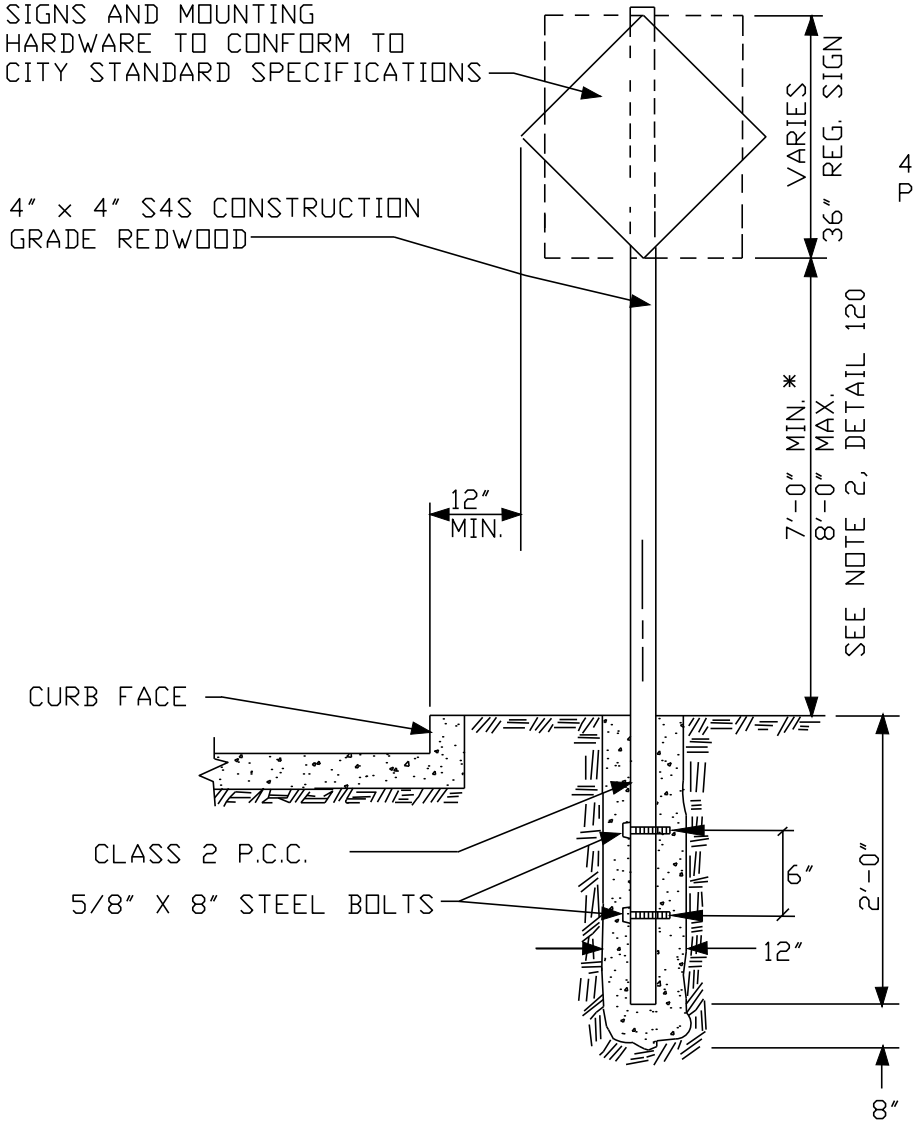
CITY OF PLEASANTON

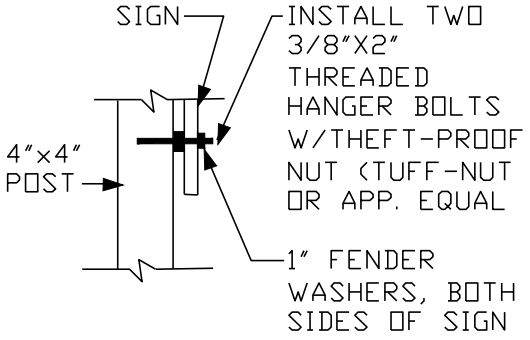
STANDARD DETAILS

TRAFFIC SIGN

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 120





SIGN CONNECTION TO POST

NOTES:

1. SEE IMPROVEMENT PLAN FOR LOCATIONS OF SIGNS.
2. ONLY AS APPROVED BY THE ENGINEER.
3. NO SIGN ON BIO FILTER SYSTEM.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

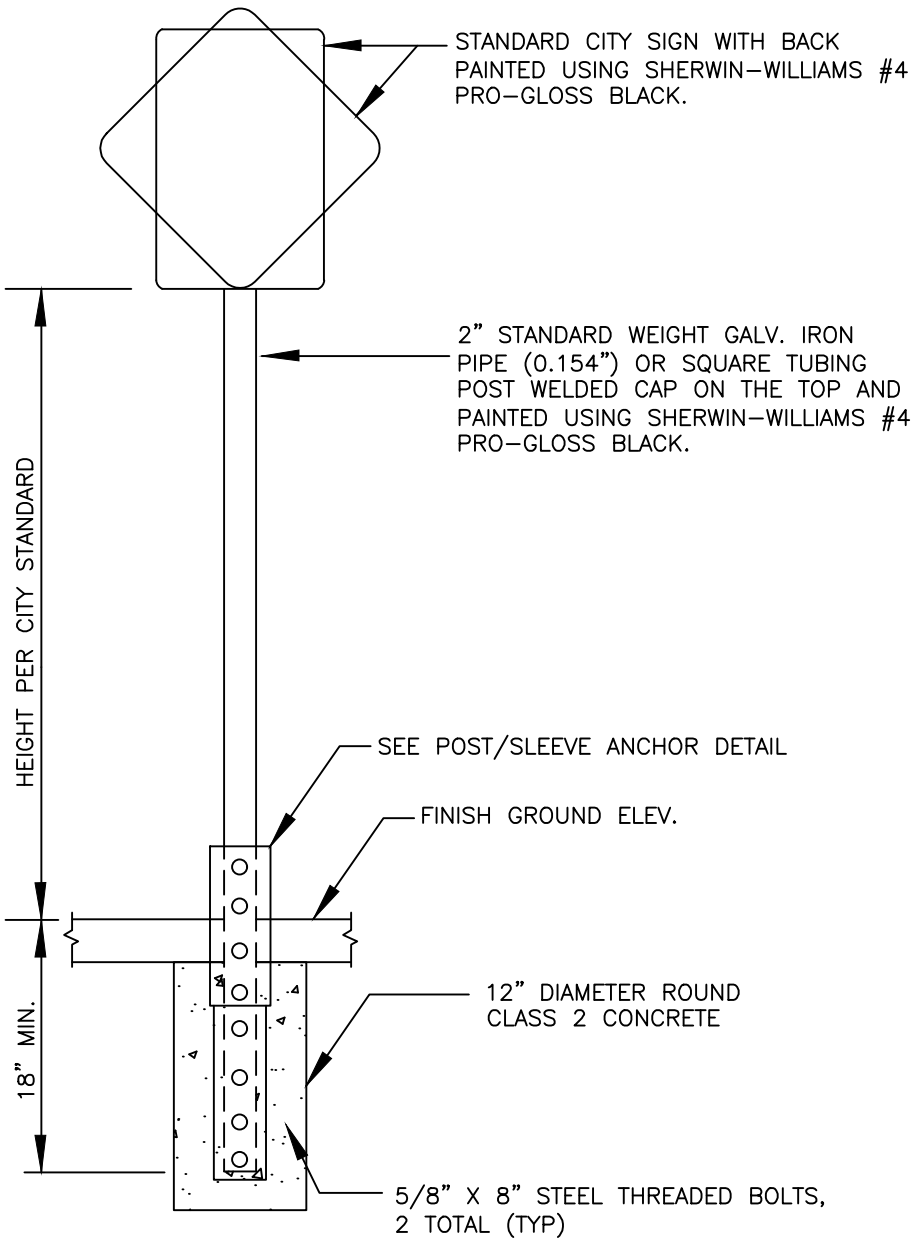
CITY OF PLEASANTON

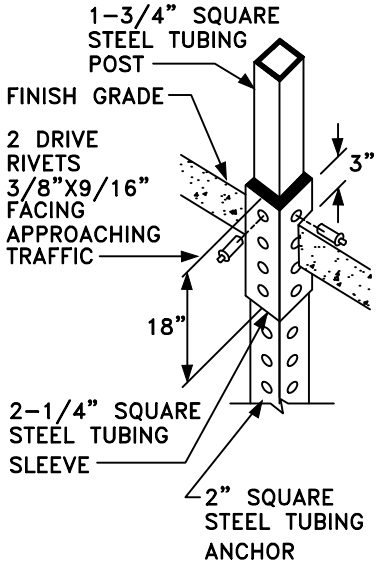
STANDARD DETAILS

TEMPORTARY TRAFFIC SIGN WOOD POST

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 121





POST/SLEEVE/ ANCHOR DETAIL

TRAFFIC CONTROL SIGNS HACIENDA BUSINESS PARK

DRAWN BY:	STAFF
CHECKED BY:	AN
SCALE:	N.T.S.

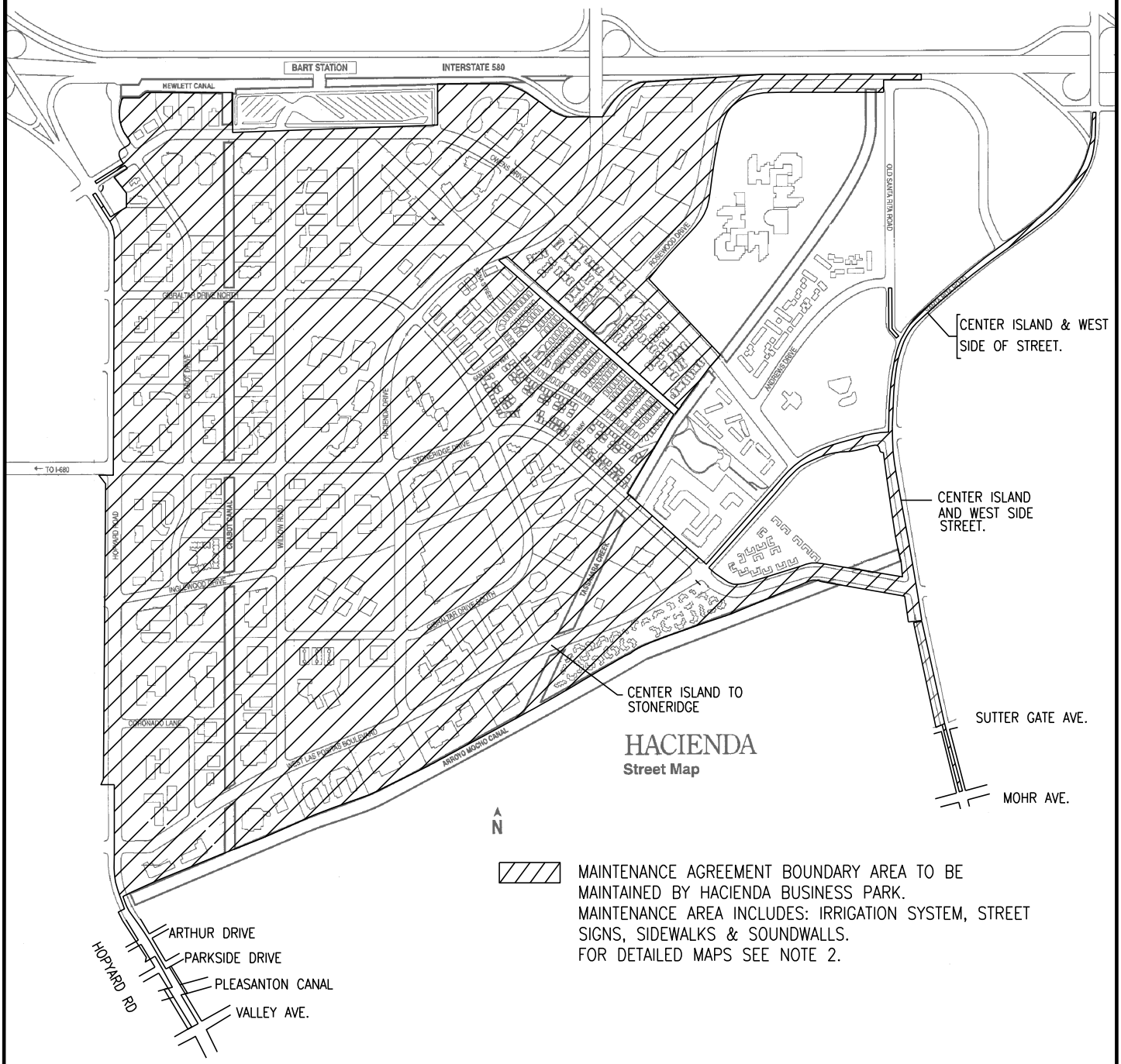
CITY OF PLEASANTON

STANDARD DETAILS

HACIENDA BUSINESS PARK SIGN DETAIL

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 122



NOTES:

1.) WORK WITHIN THIS AREA SUBJECT TO HACIENDA BUSINESS PARK APPROVAL.

2.) https://www.hacienda.org/featuremap/?fl_lbl_point=true&fl_lbl_icon=true&fl_lbl_type=false&fl_lbl_item_type=false&fl_lbl_code=true&fl_t_sign=true

REVISION:		
DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

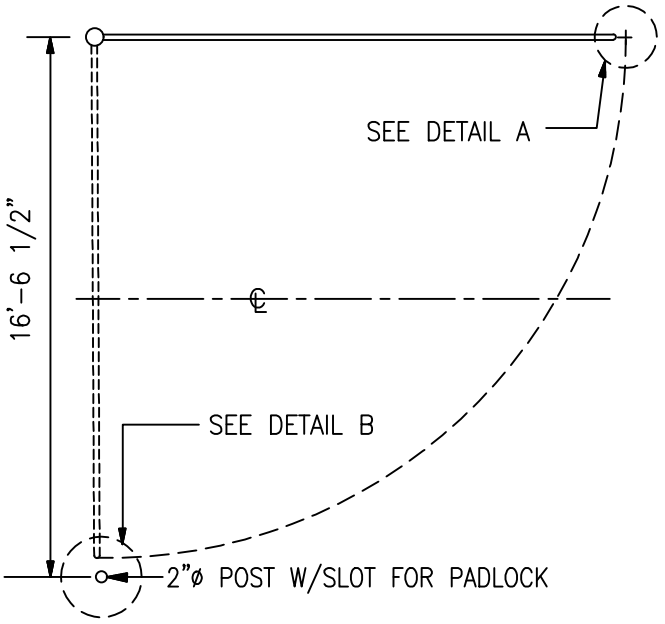
CITY OF PLEASANTON

STANDARD DETAILS

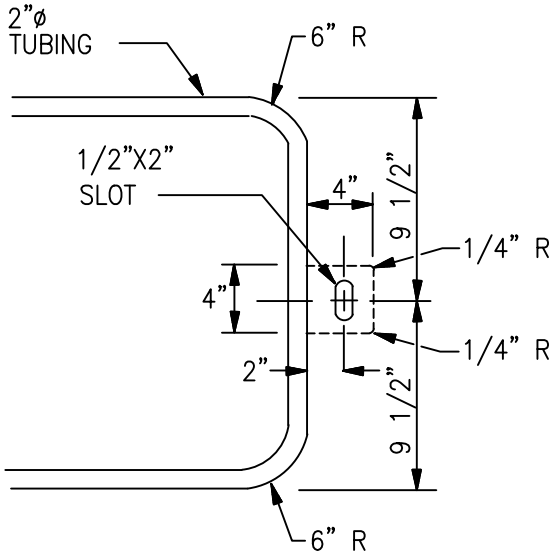
HACIENDA BUSINESS PARK LANDSCAPE AND MAINTENANCE BOUNDARY

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

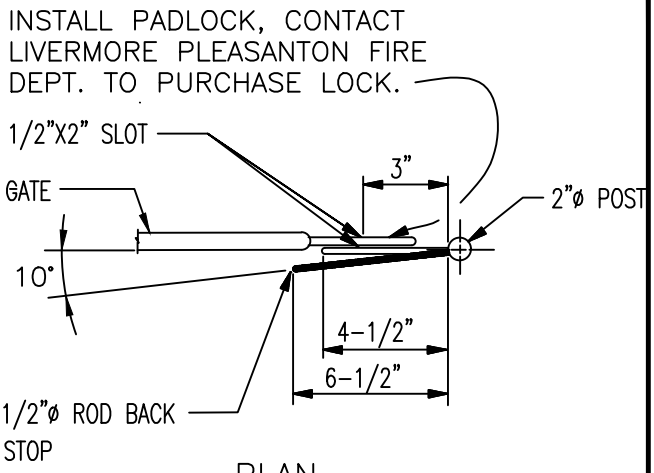
DATE : 7/24 | DWG NO. 123



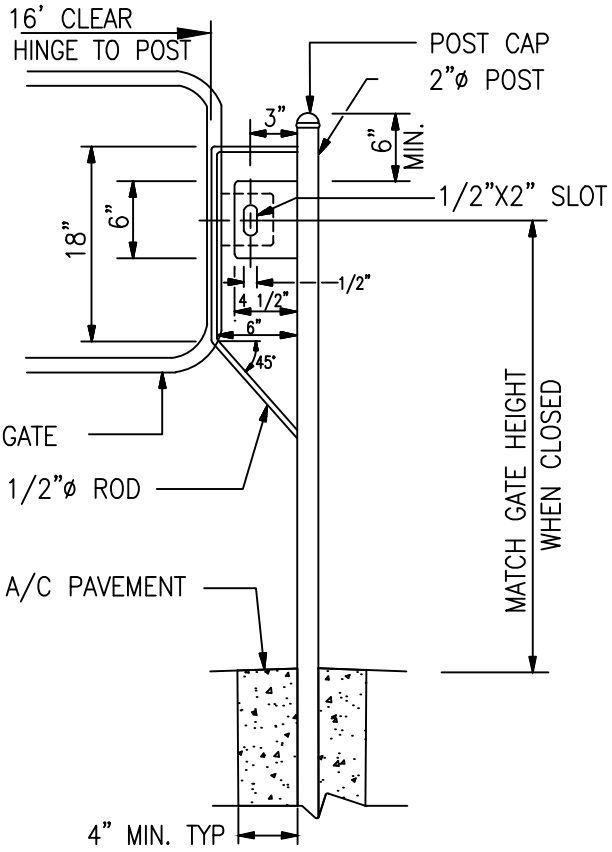
PLAN VIEW



DETAIL A



PLAN



DETAIL B

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

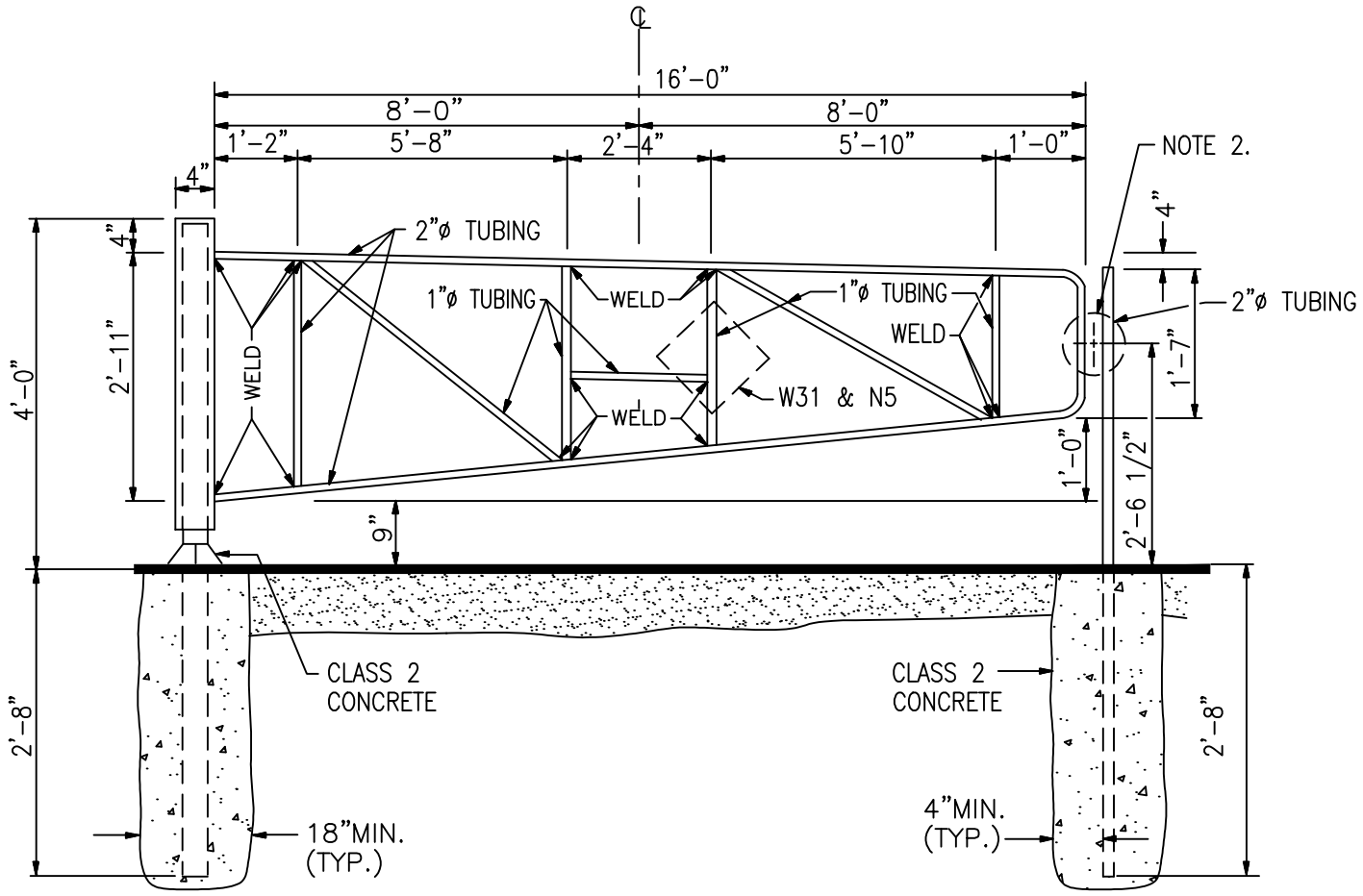
CITY OF PLEASANTON

STANDARD DETAILS

EMERGENCY VEHICLE ACCESS GATE

REGISTERED PROFESSIONAL ENGINEER
ANN MATTHEW NGUYEN
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 124



NOTES:

1. TUBING MATERIAL–ALUMINUM ALLOY PIPE SHALL CONFORM TO THE REQUIREMENTS FOR ALLOY 6063, TEMPER 76, OF ASTM DESIGNATION B429.
2. SEE DET. 124 FOR DETAILS A & B.

DRAWN BY: STAFF	
CHECKED BY: AN	
SCALE: N.T.S.	

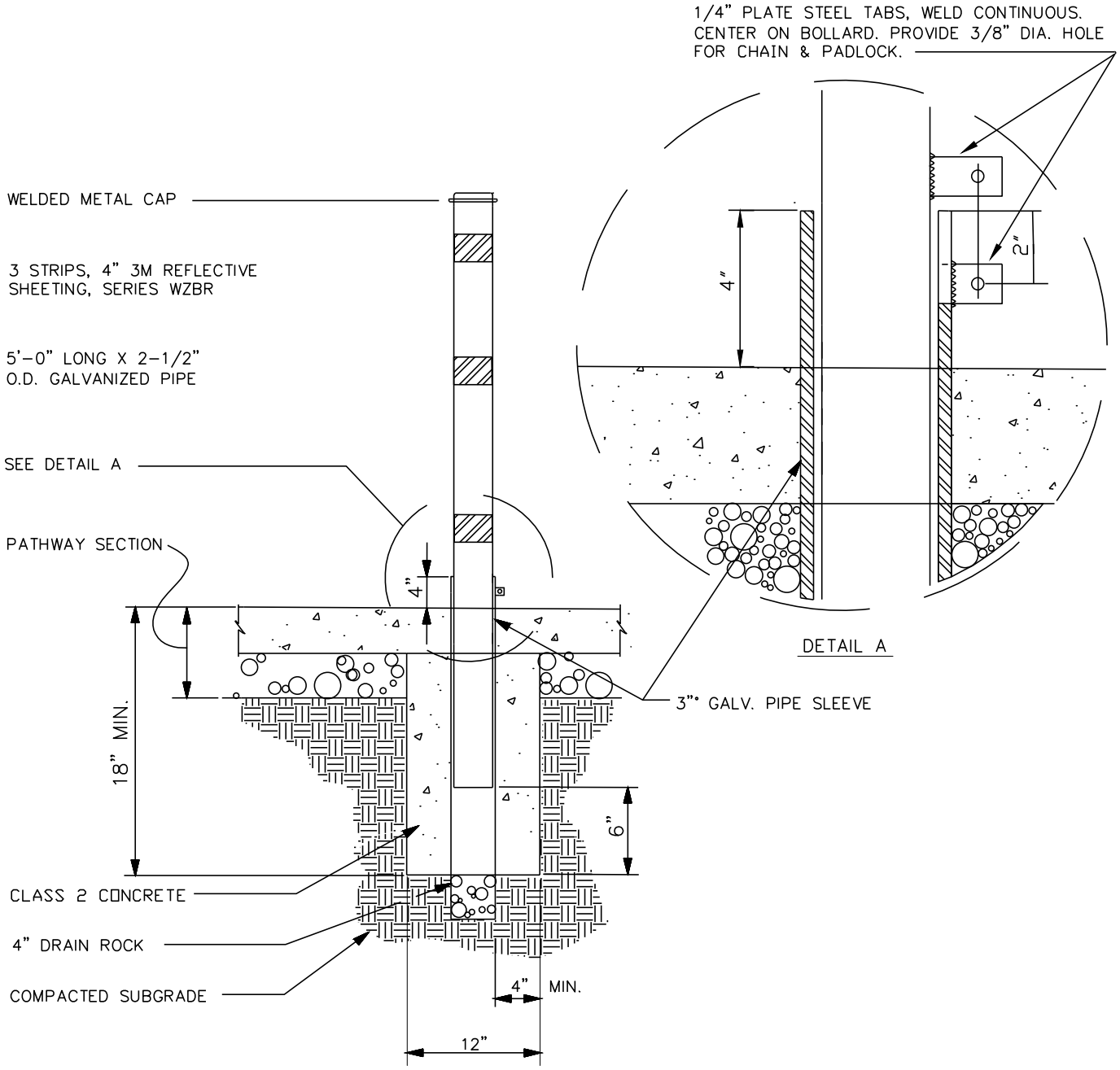
CITY OF PLEASANTON

STANDARD DETAILS

EMERGENCY VEHICLE ACCESS GATE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 125



NOTES:

1. BOLLARD FINISH TO BE POWDER COAT, COLOR GREEN IN PARK AREAS TO MATCH PLAY EQUIPMENT POST.
2. ALL OTHER AREAS TO BE FOREST GREEN SUBMIT SAMPLE OF COLOR TO ENGINEER FOR APPROVAL.
3. LABEL OLD REMOVED BOLLARD "NOT FOR DRIVEWAY USE".

DRAWN BY:	STAFF
CHECKED BY:	AN
SCALE:	N.T.S.

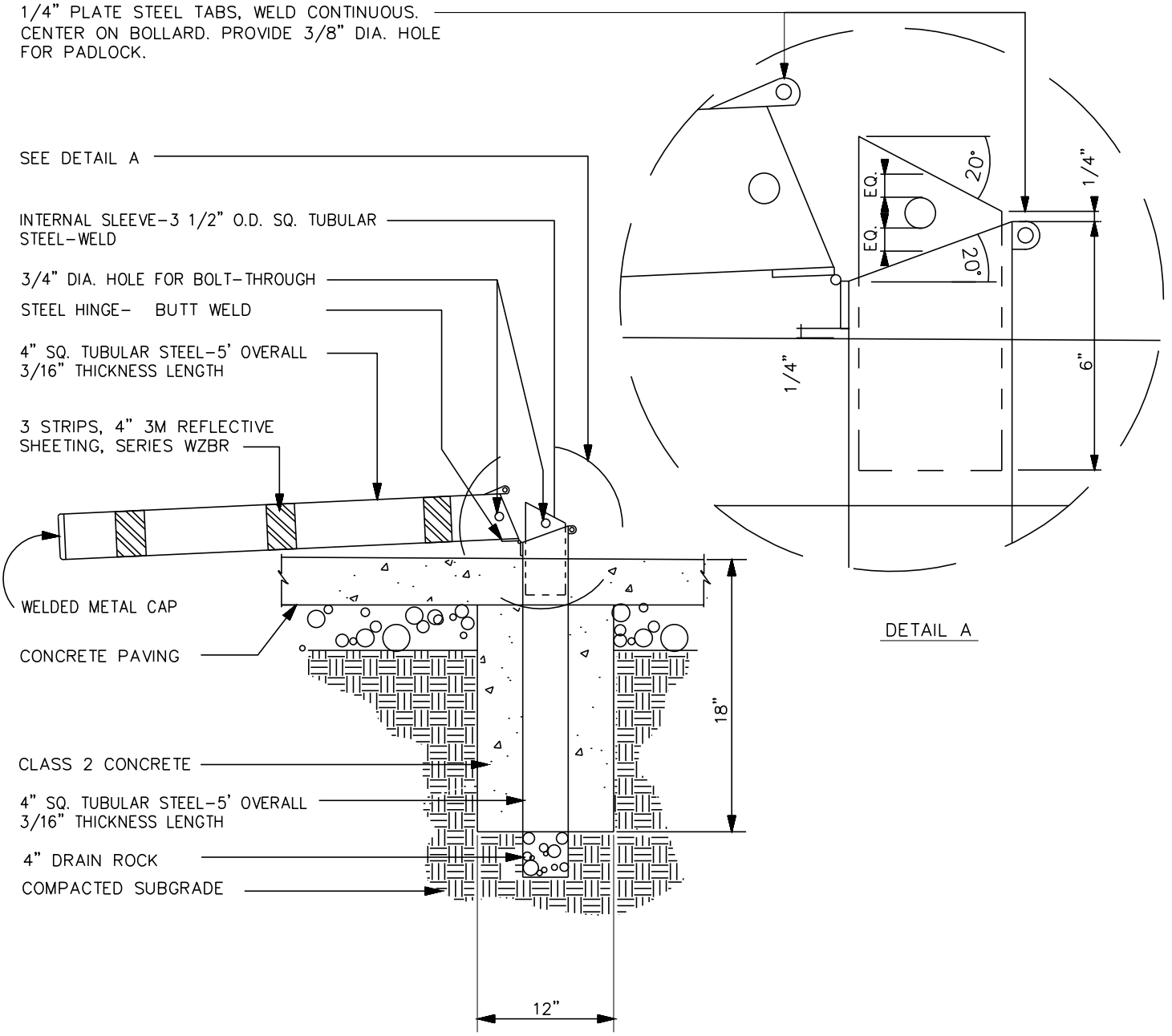
CITY OF PLEASANTON

STANDARD DETAILS

REMOVABLE PATHWAY BOLLARD

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NEERE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 126



NOTES:

1. BOLLARD FINISH TO BE POWDER COAT, COLOR GREEN IN PARK AREAS TO MATCH PLAY EQUIPMENT POSTS.
2. ALL OTHER AREAS TO BE FOREST GREEN, SUBMIT SAMPLE OF COLOR TO ENGINEER FOR APPROVAL.
3. LABEL OLD BOLLARD "NOT FOR DRIVEWAY USE".

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

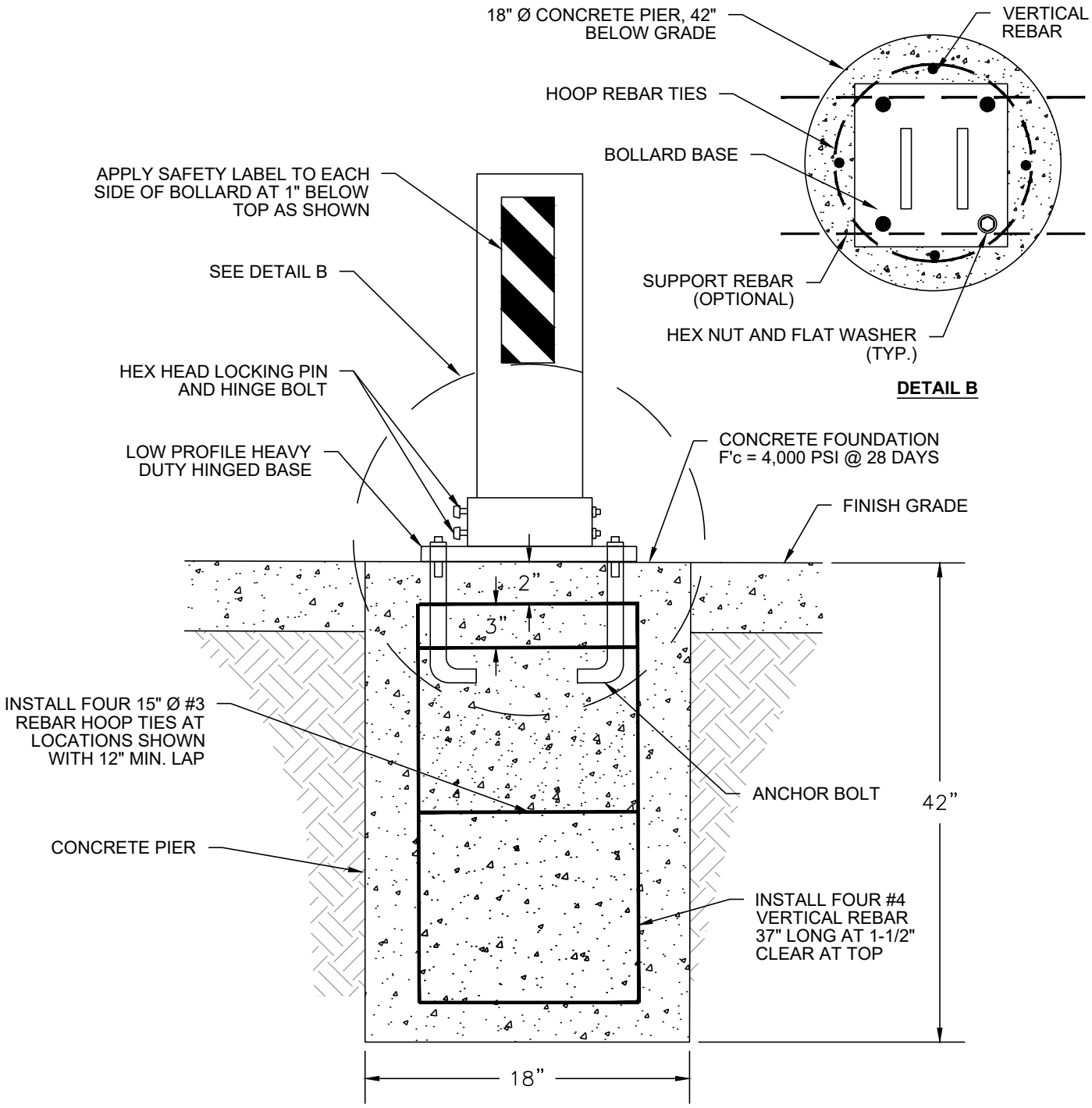
CITY OF PLEASANTON

STANDARD DETAILS

PATHWAY BOLLARD

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 127



NOTES:

1. POST TO BE LOW PROFILE HEAVY DUTY HINGED BOLLARD FROM TRAFFIC GUARD, INC.
2. BASE TO BE FROM TRAFFIC GUARD, INC.
3. COLLAPSIBLE POST ANCHOR SYSTEM ASSEMBLY (CPAS12) SHALL BE FROM TRAFFIC GUARD, INC.
4. INSTALLATION OF BOLLARD AND ANCHOR SYSTEM SHALL BE PER MANUFACTURE'S GUIDELINES.

CITY OF PLEASANTON

STANDARD DETAILS

SURFACE MOUNT BOLLARD

DRAWN BY: STAFF

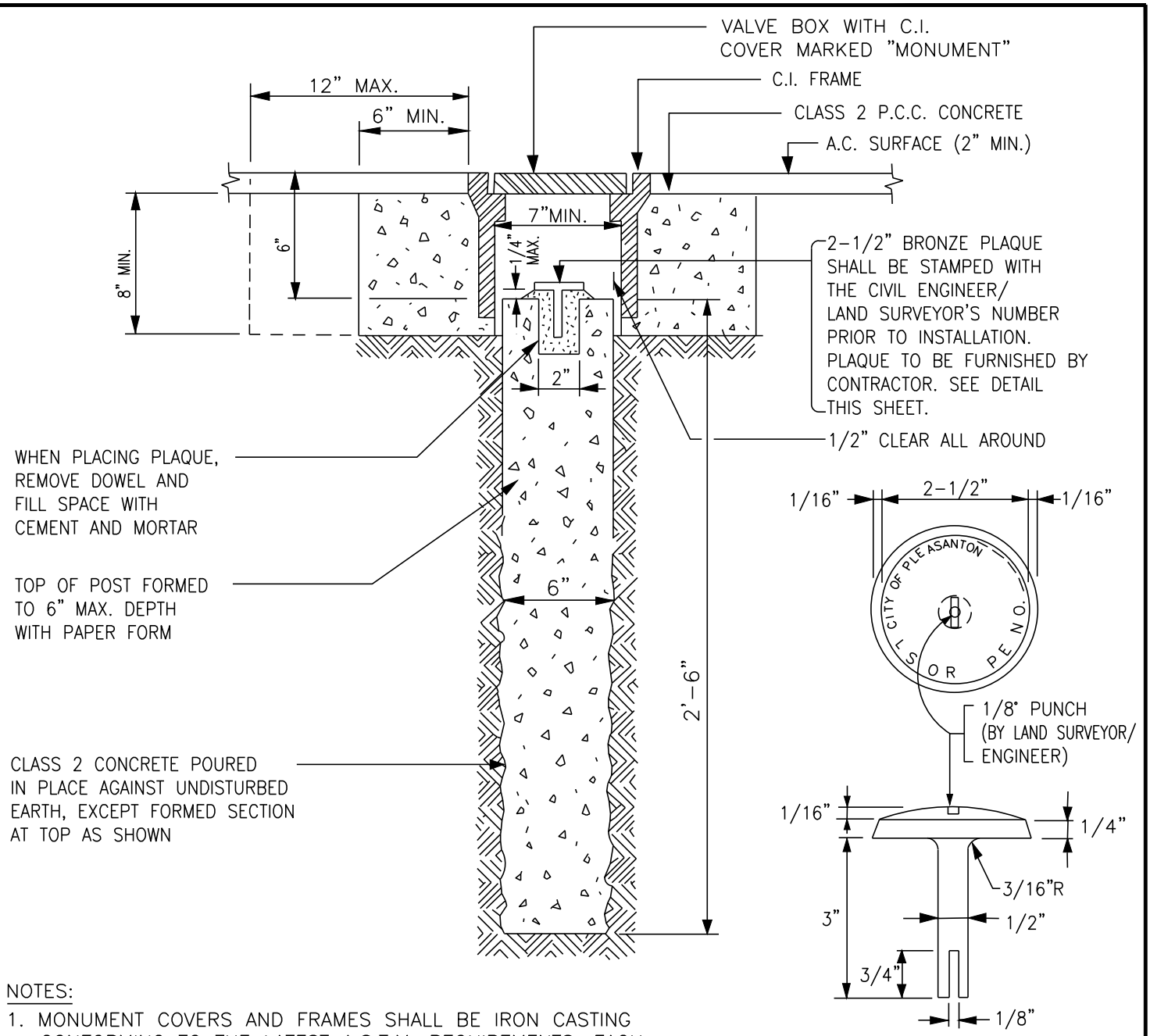
CHECKED BY: AN

SCALE: N.T.S.

REGISTERED PROFESSIONAL ENGINEER
ADAM NATHEN NELKE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24

DWG NO.127A



DETAIL BRONZE PLAQUE

NOTES:

1. MONUMENT COVERS AND FRAMES SHALL BE IRON CASTING CONFORMING TO THE LATEST A.S.T.M. REQUIREMENTS. EACH COVER SHALL BE GROUND OR OTHERWISE FINISHED SO THAT IT WILL FIT ITS FRAME WITHOUT ROCKING. BRONZE PLAQUE NOT TO EXTEND MORE THAN 1/4" ABOVE CONCRETE BASE.
2. VALVE BOX SHALL BE SET TO GRADE AFTER STREET PAVING.
3. LS OR PE RESPONSIBLE PARTY FOR SETTING MONUMENTS.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

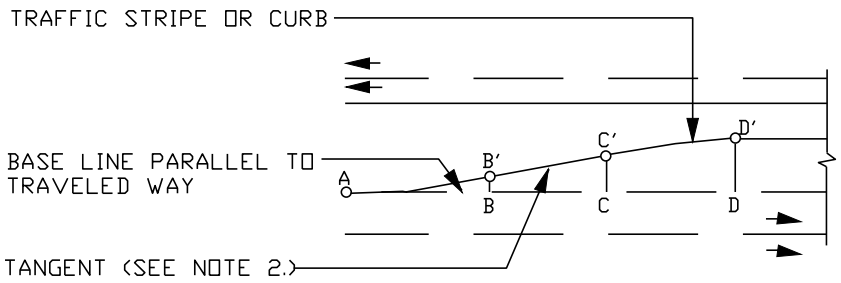
CITY OF PLEASANTON

STANDARD DETAILS

MONUMENT

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO.128



AD = LENGTH OF TAPER
AB = BC = CD = 1/3 AD
AB' & C'D' ARE PARABOLIC CURVES

	LENGTH OF TAPER-FEET			OFFSET DISTANCE			
	60	90	120	DD'= 10'	DD'= 11'	DD'= 12'	
	DISTANCE FROM POINT A						
	–	–	–	0	0	0	
	5	7.5	10	0.16	0.17	0.19	
	10	15	20	0.62	0.69	0.75	
	15	22.5	30	1.41	1.55	1.69	
B'	20	30	40	2.50	2.75	3.00	B'
	30	45	60	5.00	5.50	6.00	
C'	40	60	80	7.50	8.25	9.00	C'
	45	67.5	90	8.59	9.45	10.31	
	50	75	100	9.38	10.31	11.25	
	55	82.5	110	10.0	10.83	11.81	
	60	90	120	10.0	11.0	12.0	

NOTES:

1. THE TABLE GIVES OFFSETS FROM A BASE LINE PARALLEL TO THE EDGE OF TRAVELED WAY AT INTERVALS MEASURED FROM POINT "A".
2. WHERE EDGE OF TRAVELED WAY IS A CURVE, NEITHER BASE LINE NOR TAPER BETWEEN B & C WILL BE A TANGENT. USE PROPORTIONAL OFFSETS FROM B TO C.
3. TAPER LENGTHS

DRAWN BY: STAFF
CHECKED BY: AN
SCALE: N.T.S.

CITY OF PLEASANTON

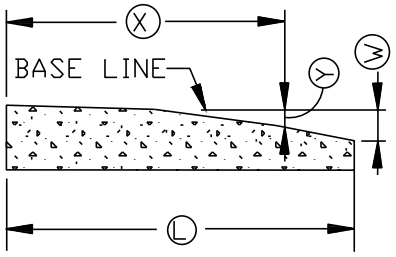
STANDARD DETAILS

LEFT TURN LANE TRANSITION

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 129

$$Y = \frac{WX^2}{L^2}$$



(L) = LENGTH OF FLARE IN FEET
(W) = MAXIMUM OFFSET IN FEET
(X) = DISTANCE ALONG BASE LINE IN FEET
(Y) = OFFSET FROM BASE LINE IN FEET

(W) IS SHOWN IN TABLE SHOWN AS

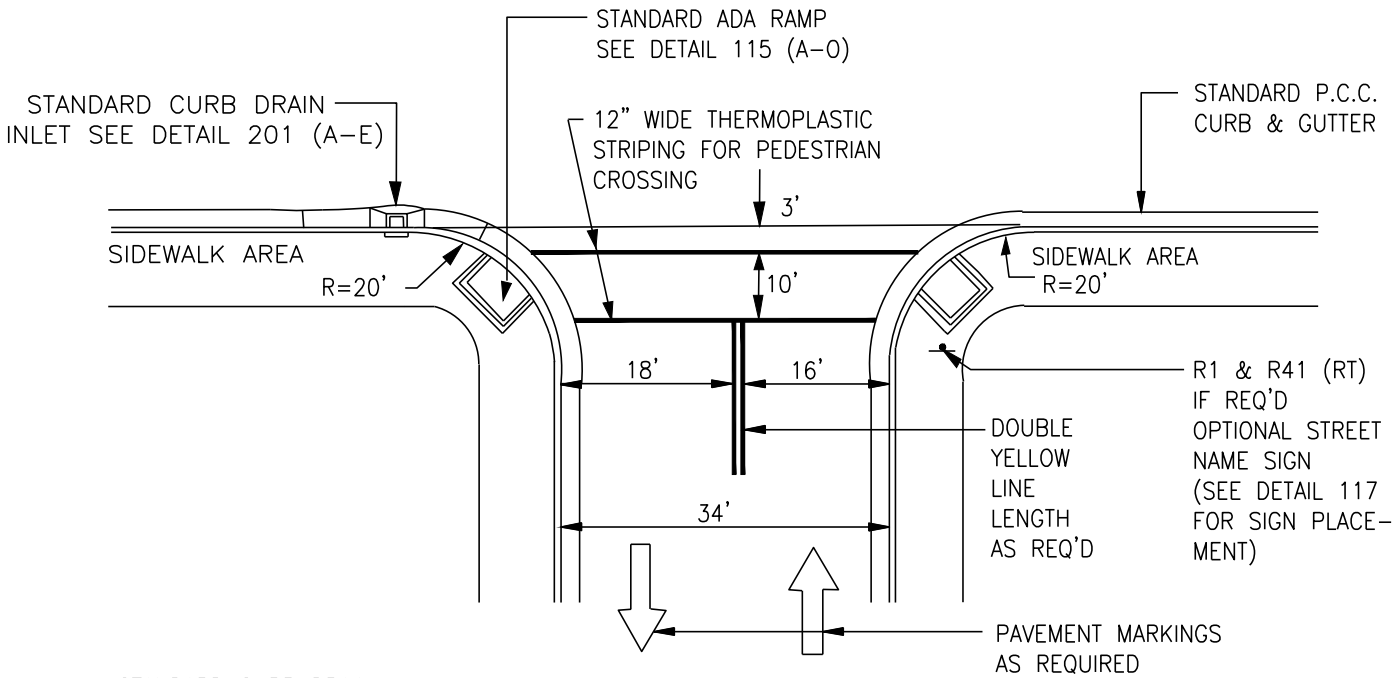
OFFSET IN FEET FOR GIVEN "X" DISTANCE																
(L) LENGTH OF FLARE \ (X) DISTANCE	10	15	20	25	30	40	45	50	60	70	75	80	90	100	110	120
1:5 FLARES																
25	0.80	1.80	3.20	5.00												
50	0.40		1.60		3.60	6.40		10.0								
1:10 FLARES																
50	0.20		0.80		1.80	3.20		5.00								
100	0.10		0.40		0.90	1.60		2.50	3.60	4.90		6.40	8.10	10.0		
1:15 FLARES																
45	0.15		0.59		1.33	2.37	3.00									
75	0.09		0.36		0.80	1.42		2.22	3.20	4.36	5.00					
90	0.07		0.30		0.67	1.19		1.85	2.67	3.63		4.74	6.00			
120	0.06		0.22		0.50	0.89		1.39	2.00	2.72		3.56	4.50	5.56	6.72	8.00

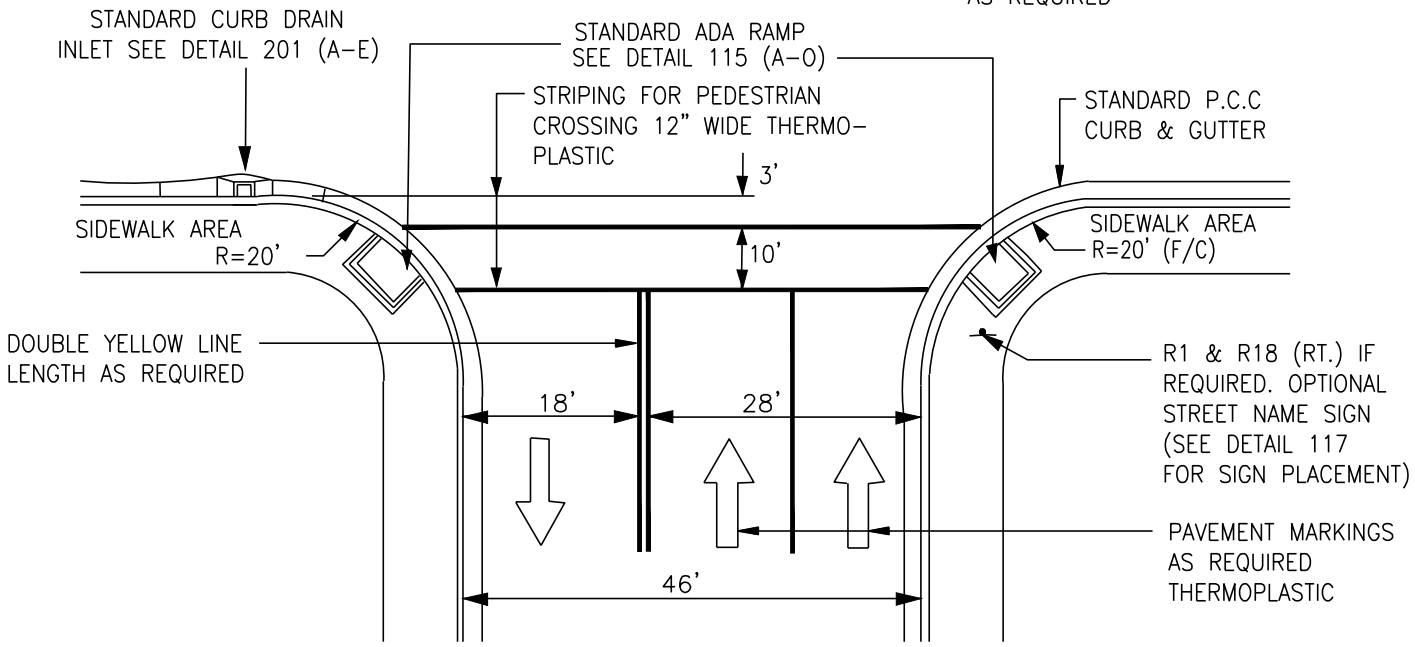
DRAWN BY: STAFF
CHECKED BY: AN
SCALE: N.T.S.

CITY OF PLEASANTON
STANDARD DETAILS
MEDIAN FLARES

REGISTERED PROFESSIONAL ENGINEER
JOHN MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 130





NOTES:

1.TIE-IN CURB DRAIN INLET TO UNDERGROUND DRAINAGE SYSTEM.
2.WHEN SEMITRAILER TRUCK TRAFFIC IS EXPECTED, DIMENSIONS MAY REQUIRE MODIFICATION.

DRAWN BY: STAFF	
CHECKED BY: AN	
SCALE: N.T.S.	

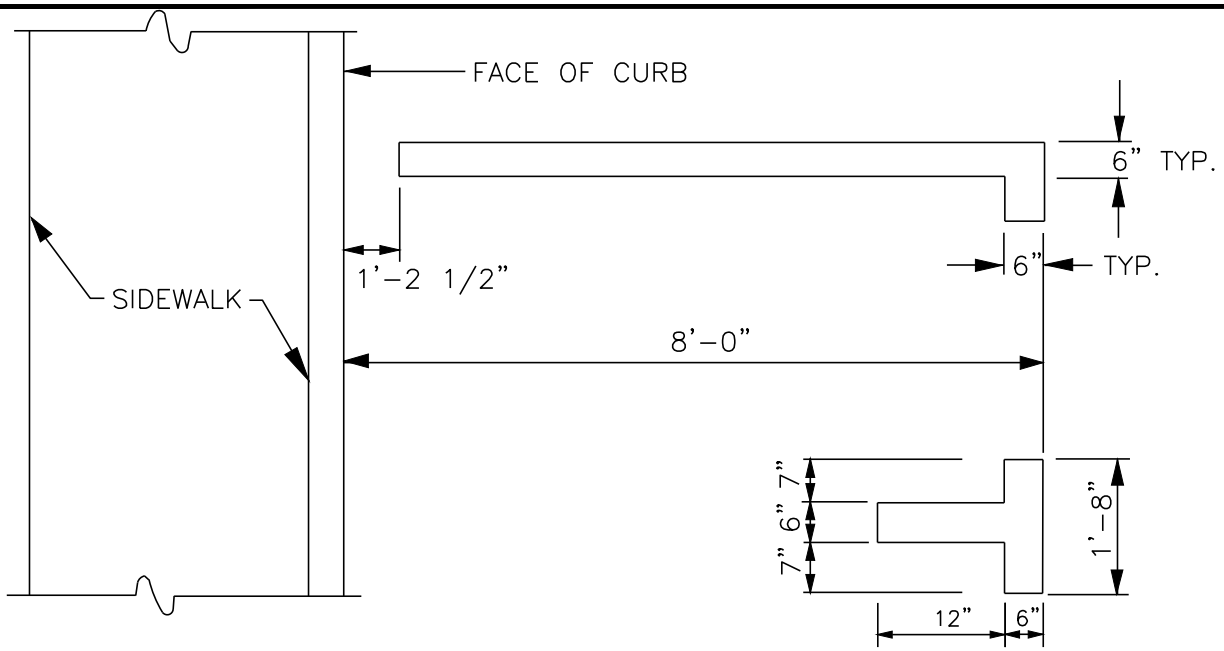
CITY OF PLEASANTON

STANDARD DETAILS

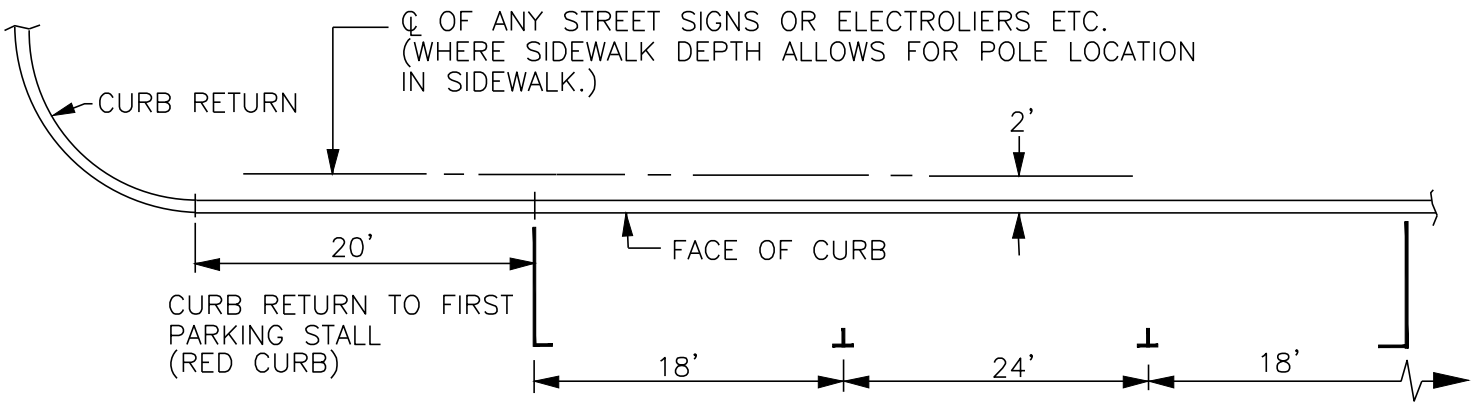
ACCESS TO OFF-STREET PARKING FACILITIES

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NEIKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 131



STRIPING DETAIL



PARKING STALL

NOTES:

1. ALL EXISTING STRIPING SHALL BE REMOVED BY GRINDING BEFORE NEW THERMOPLASTIC STRIPING IS APPLIED.
2. THE WHITE THERMOPLASTIC SHALL CONTAIN THE REFLECTIVE GLASS BEADS, (PER STATE STANDARD SPECIFICATIONS).
3. ALL DIMENSIONS PARALLEL TO CURB IN PARKING STALL DETAIL ARE CENTERLINE TO CENTERLINE.
4. LOW VOLUME RESIDENTIAL WIDTHS WITH PARKING: MINIMUM 28' WIDE FOR PARKING ON ONE SIDE AND 32' WIDE FOR PARKING ON BOTH SIDES.
5. STANDARD RESIDENTIAL ROADWAY WIDTHS WITH PARKING: 36' WIDE FOR PARKING ON BOTH SIDES.

DRAWN BY: STAFF	
CHECKED BY: AN	
SCALE: N.T.S.	

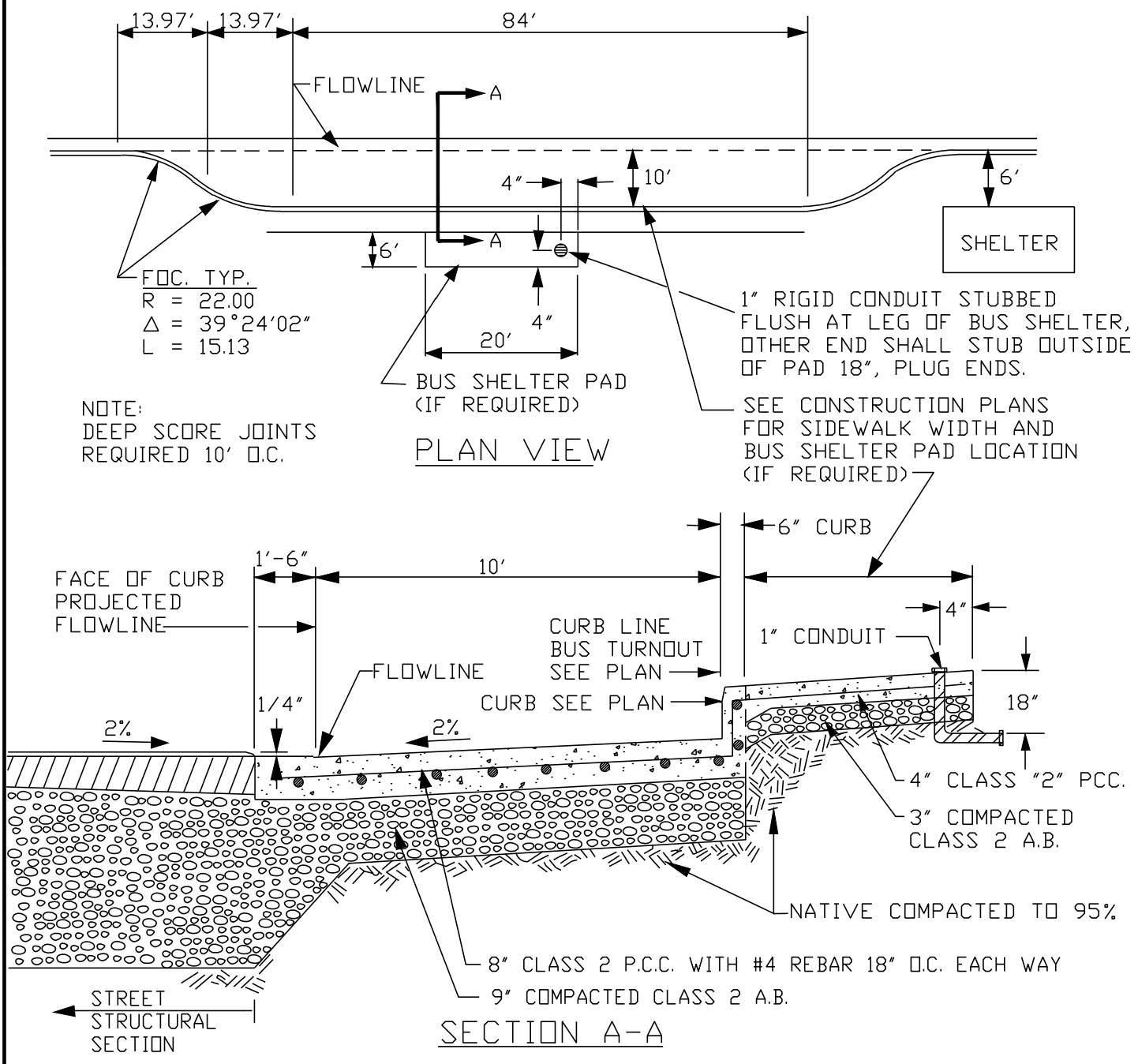
CITY OF PLEASANTON

STANDARD DETAILS

STRIPING AND PARKING STALL DETAIL

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 132



DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

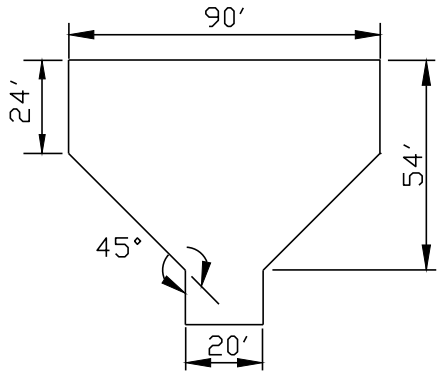
CITY OF PLEASANTON

STANDARD DETAILS

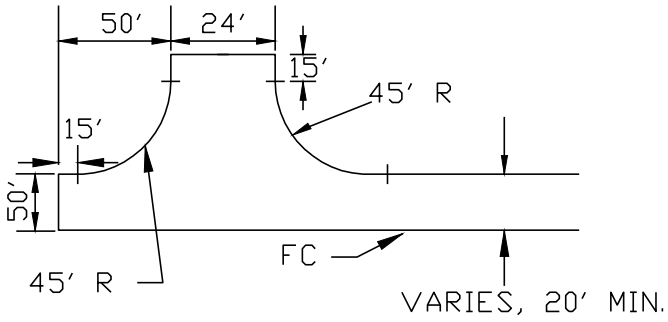
BUS STOP DETAIL

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

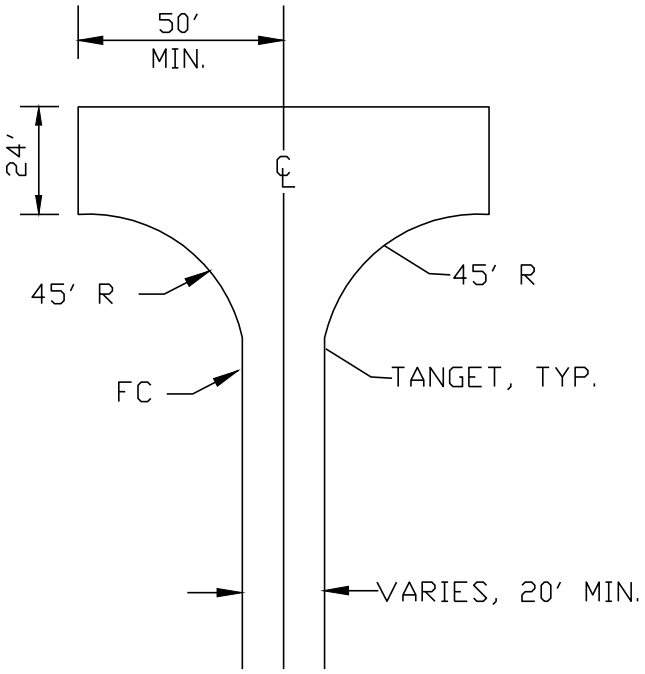
DATE : 7/24 | DWG NO. 133



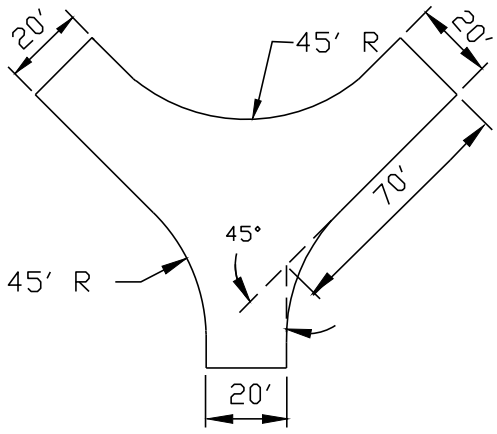
"T" HAMMERHEAD
(CHAMFER ALTERNATIVE)



DOG LEG HAMMERHEAD



"T" HAMMERHEAD



70' "Y"

NOTES:

1. NOT FOR USE IN PUBLIC STREETS.
2. MARK AS FIRE LANE AND SIGN OR PAINT CURB RED.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

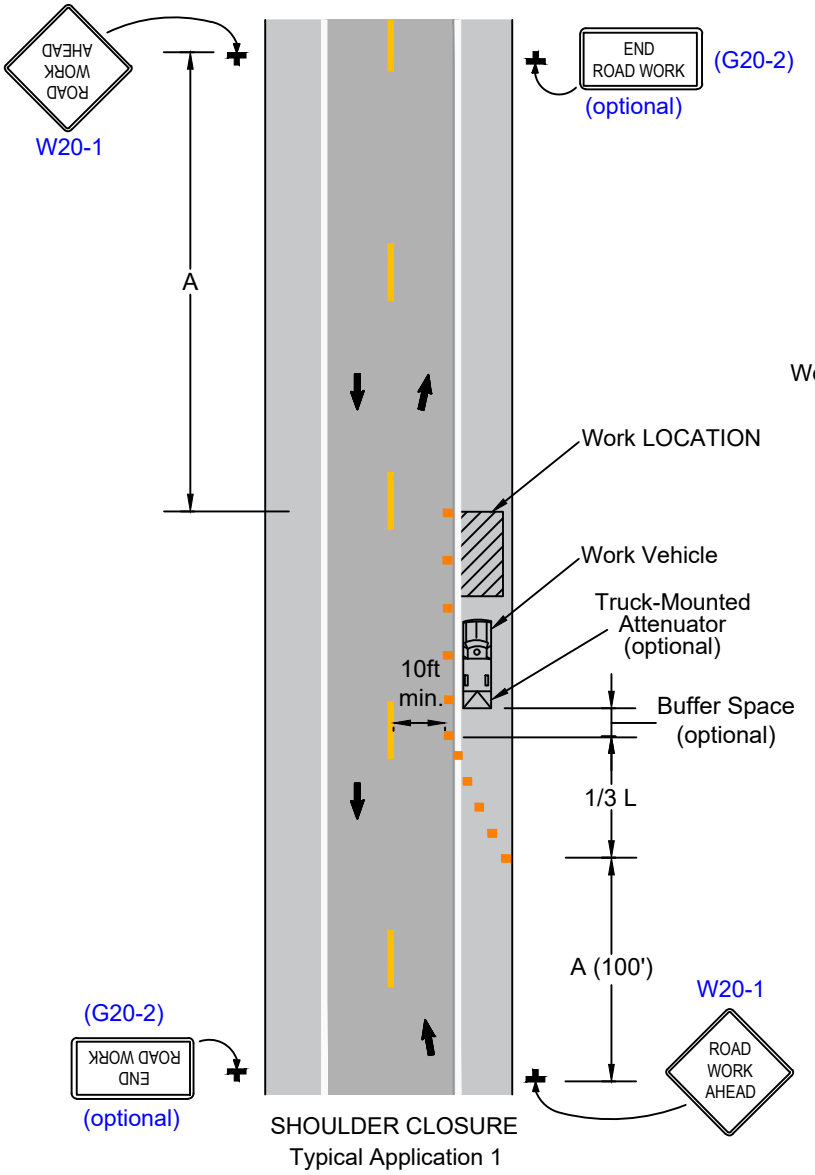
CITY OF PLEASANTON

STANDARD DETAILS

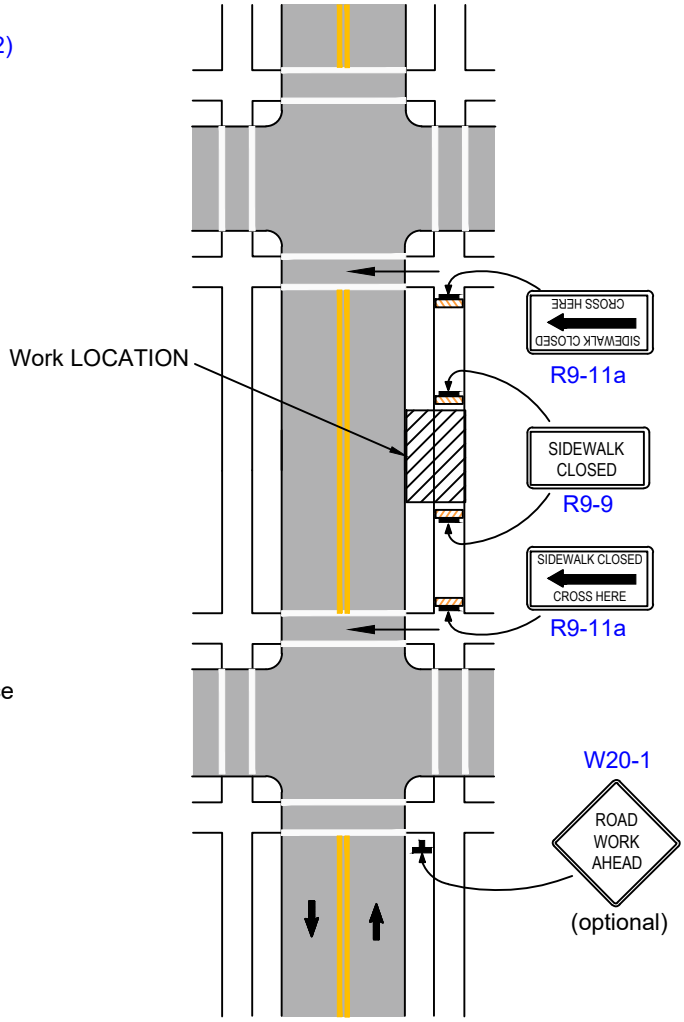
FIRE APPARATUS TURN AROUND

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 134



SHOULDER CLOSURE
Typical Application 1



SIDEWALK DETOUR
Typical Application 2

Speed MPH	Minimum Taper Length: Merging L	Shifting L/2	Shoulder L/3	Down Stream	Advance Warning Signs (ft)
20	80	40	27	50	100
25	125	63	42	50	250
30	180	90	60	50	250
35	245	123	82	50	250
40	320	160	107	50	250
45	540	270	180	50	350

NOTES:

1. TEMPORARY TRAFFIC CONTROL SHALL ADHERE TO CALIFORNIA LATEST MUTCD EDITION.
2. LATEST EDITION CAN BE VIEWED HERE: HTTPS://DOT.CA.GOV/PROGRAMS/SAFETY-PROGRAMS/CAMUTCD/CAMUTCD-FILES
3. FOR MAJOR STREET, SUBMIT SITE SPECIFIC TRAFFIC CONTROL.
4. TEMPORARY TRAFFIC CONTROL IS ALLOWED FROM DUST TO DAWN ONLY.

DRAWN BY: STAFF

CHECKED BY: AN

SCALE: N.T.S.

CITY OF PLEASANTON

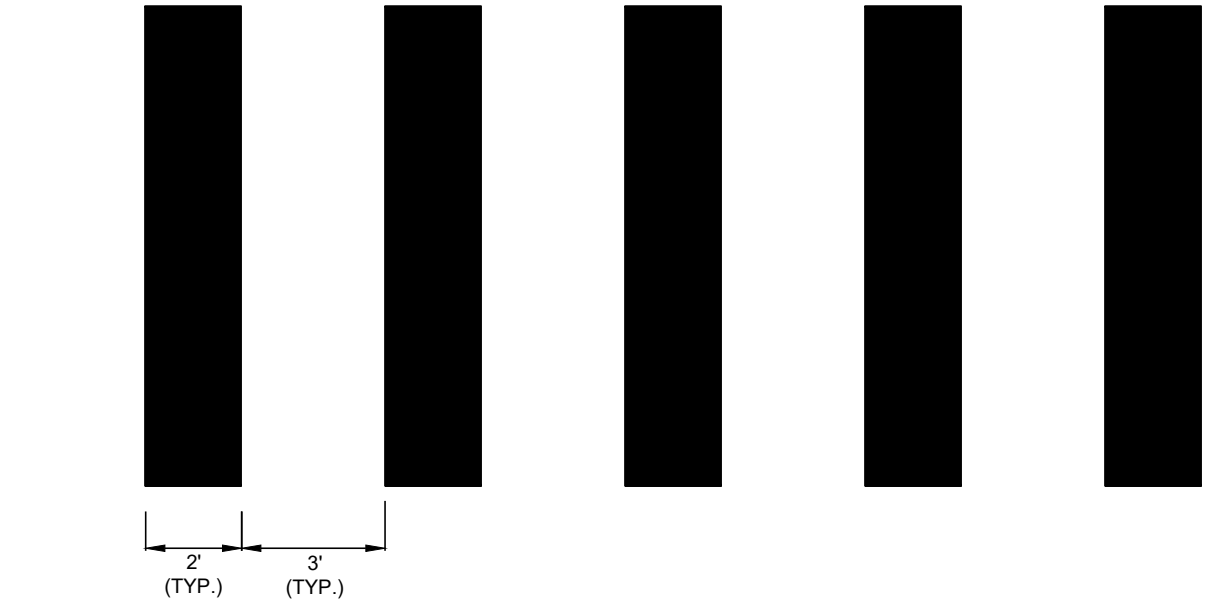
STANDARD DETAILS

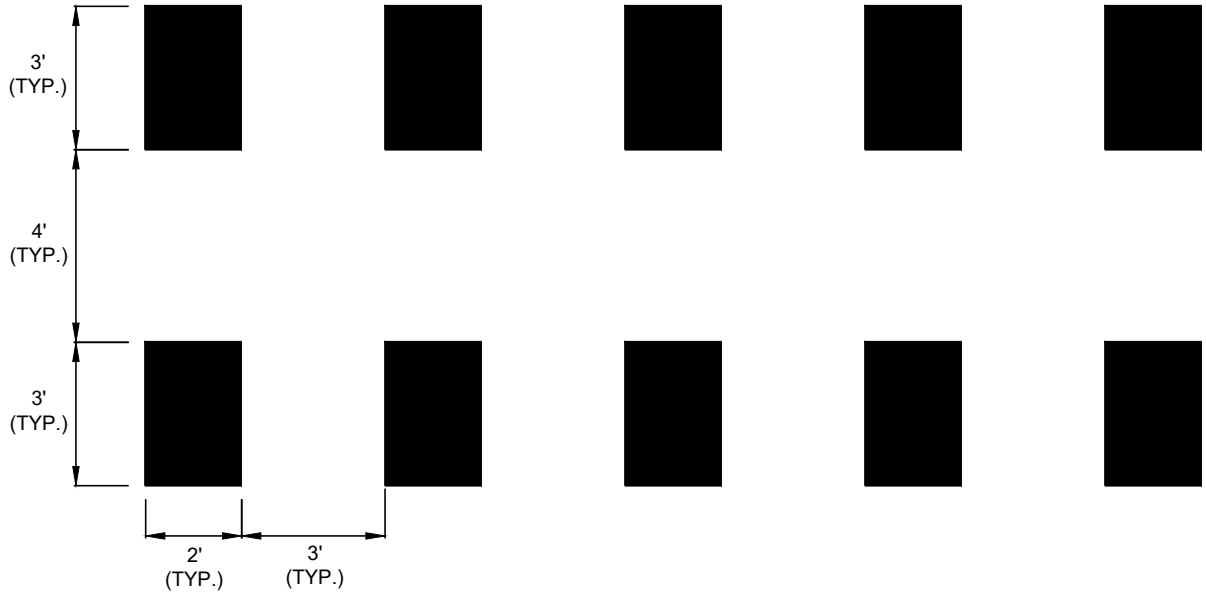
TEMPORARY TRAFFIC CONTROL FOR SHOULDER AND SIDEWALK CLOSURE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24

DWG NO. 135





CITY OF PLEASANTON

STANDARD DETAILS

CONTINENTAL CROSSWALKS

DRAWN BY: STAFF

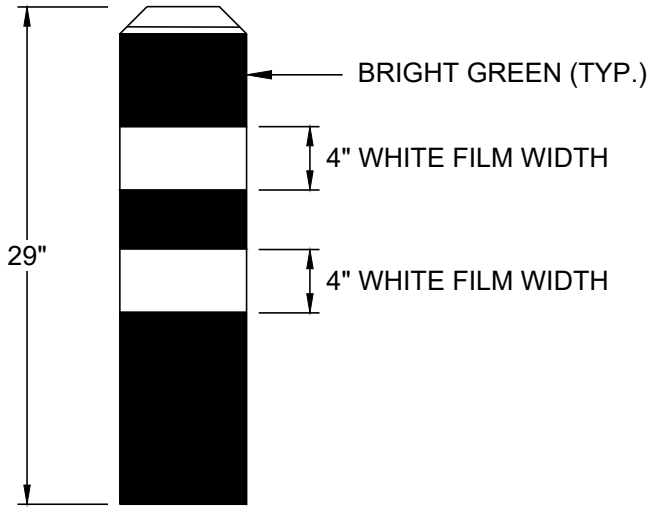
CHECKED BY: AN

SCALE: N.T.S.

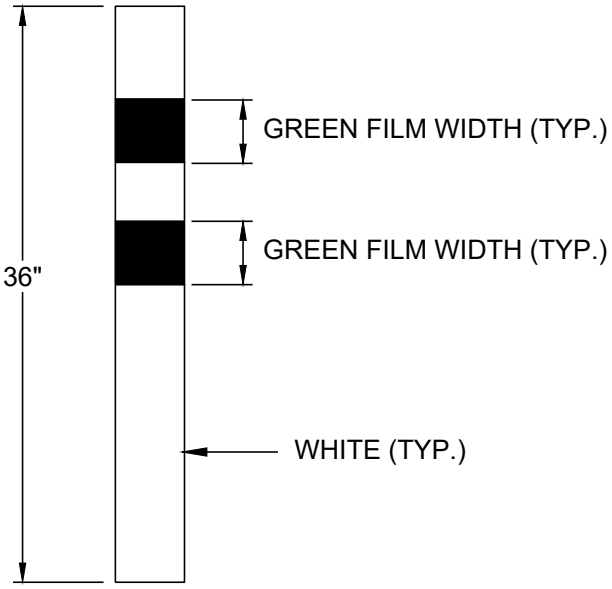
REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24

DWG NO. 136



TYPE K-71
NTS



TYPE
NTS

NOTES:

1. INSTALLATION SHALL FOLLOW MANUFACTURER INSTALLATION INSTRUCTIONS.
2. GLUE DOWN IS ONLY ALLOWED UPON APPROVAL BY THE CITY.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

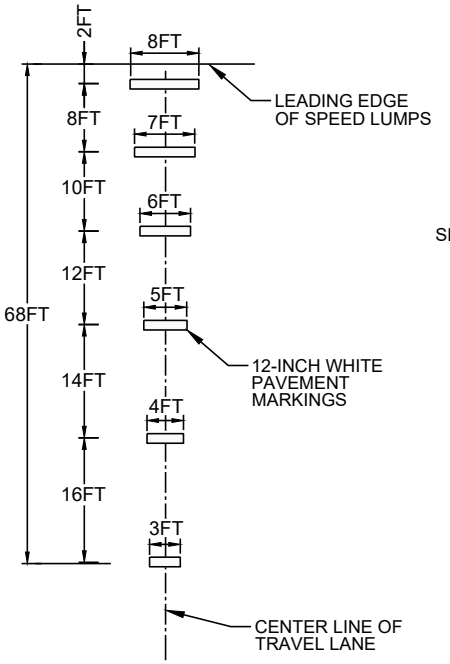
CITY OF PLEASANTON

STANDARD DETAILS

TRAFFIC CHANNELIZER

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 137



SPEED LUMP ADVANCE WARNING MARKINGS

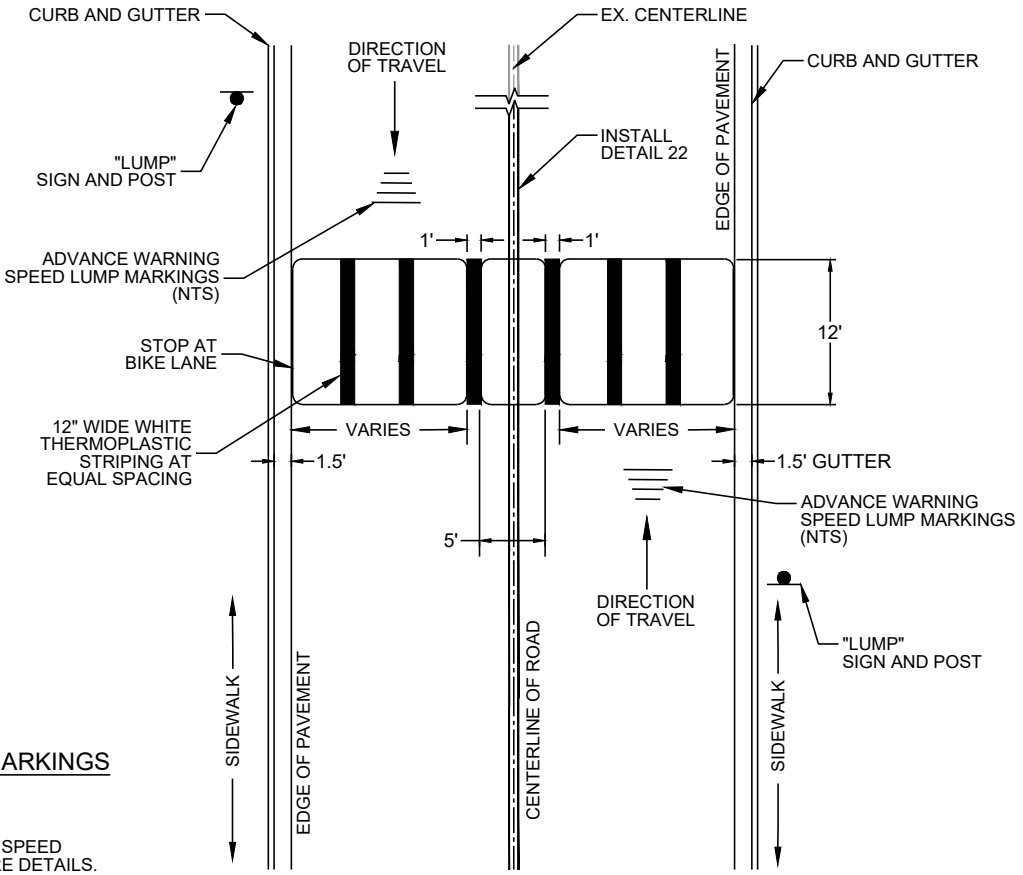
NTS

NOTES:

1. 1-INCH GRIND REQUIRED BEFORE INSTALLING SPEED LUMPS. SEE TYPICAL PROFILE VIEW FOR MORE DETAILS.
2. "SPEED LUMP" SIGN AND POST SHALL BE INSTALLED AT OR NEAR TO THE SPEED LUMP. LOCATION TO BE MARKED IN THE FIELD.

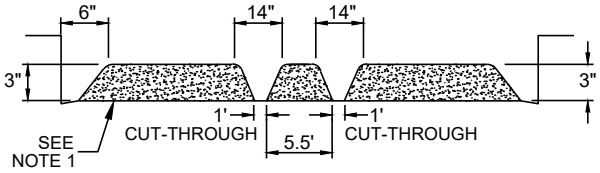
USER NOTE:

THESE DETAILS SHALL BE USED IN CONJUNCTION WITH ALL THE CITY STANDARD DETAILS AND SPECIFICATIONS. REFER TO THE CITY STANDARD SPECIFICATIONS FOR THE MATERIALS, INSTALLATION, TESTING, PROTECTIVE COATINGS, AND OTHER REQUIREMENTS.



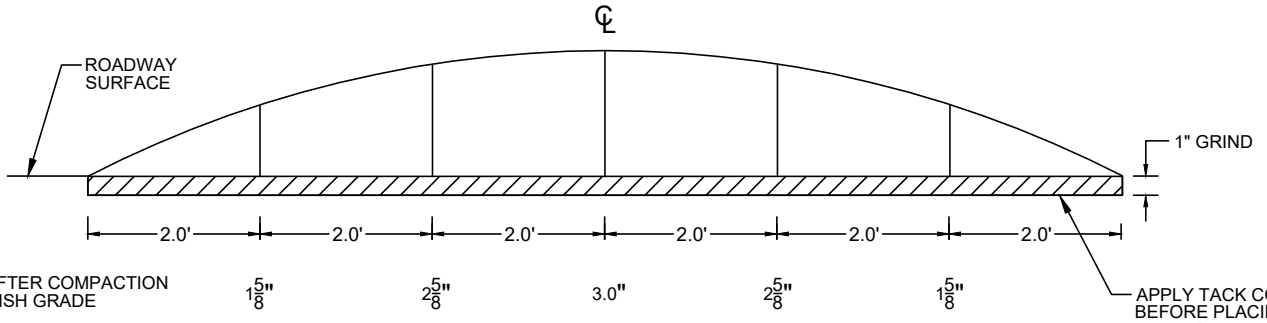
PLAN VIEW

NTS



CROSS SECTION VIEW

NTS



3" - HIGH SPEED LUMP - TYPICAL PROFILE VIEW

NTS

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

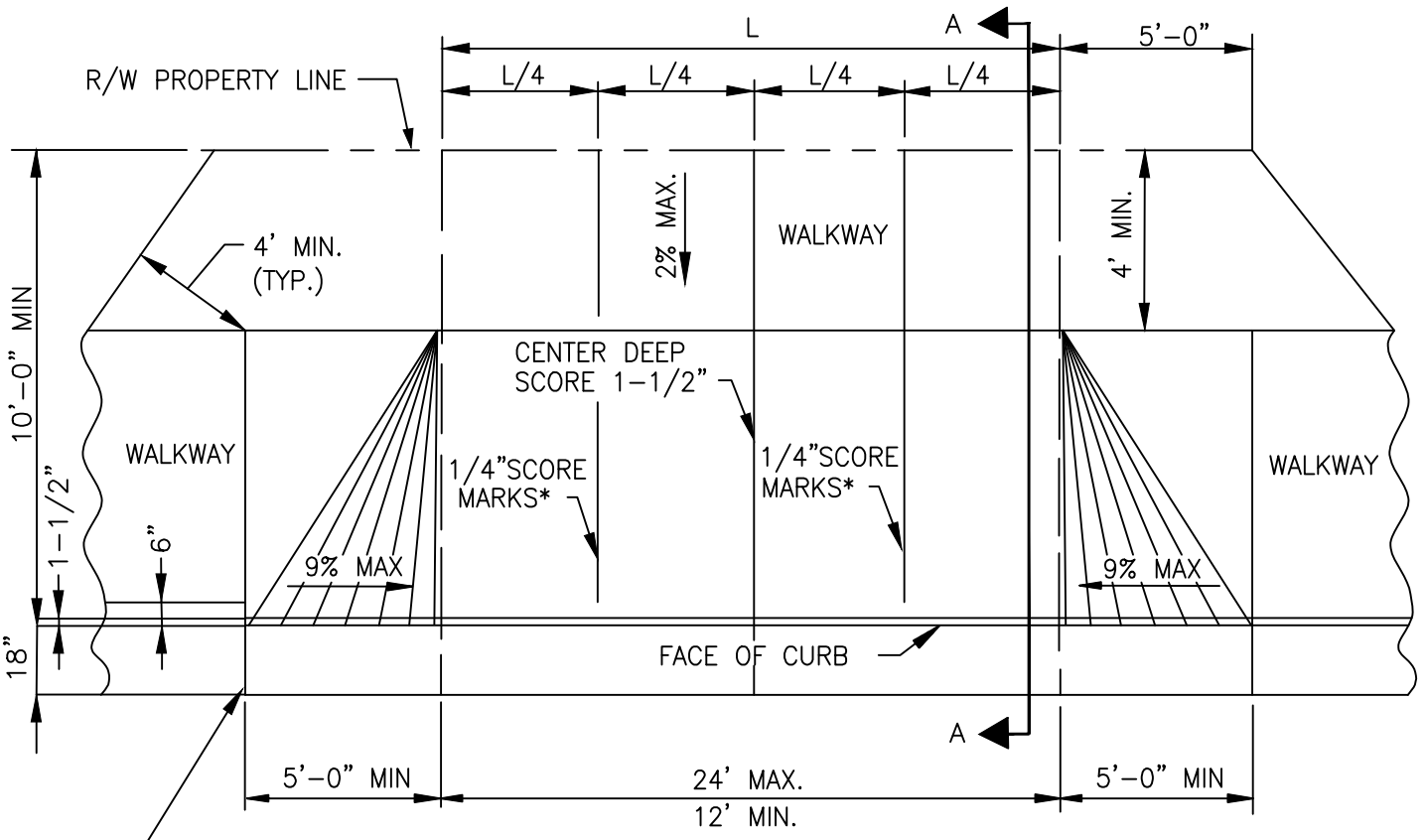
STANDARD DETAILS

SPEED LUMP AND ADVANCE WARNING MARKINGS

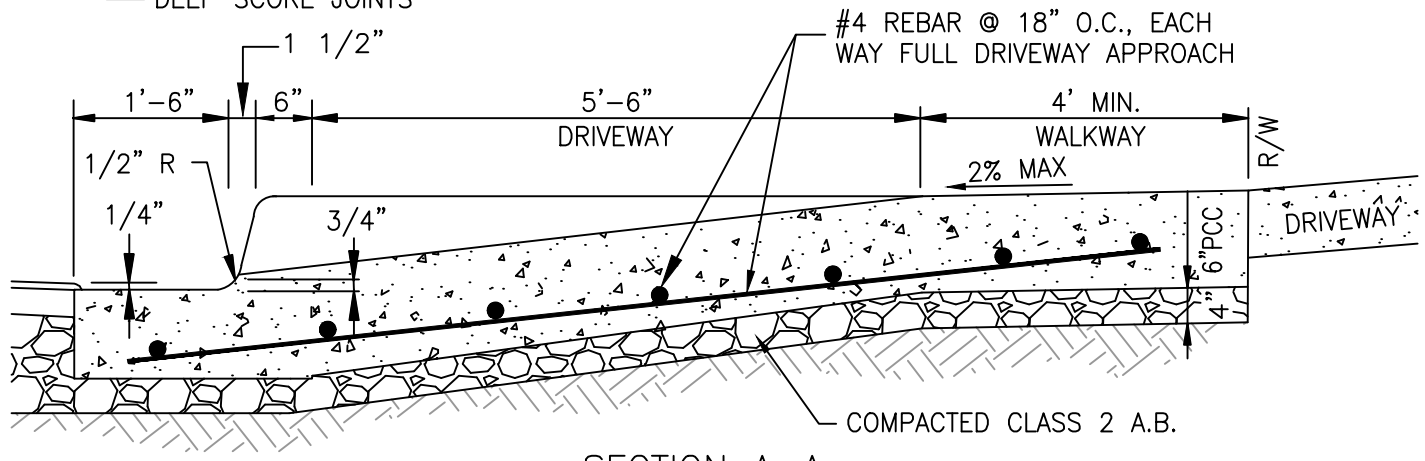
REGISTERED PROFESSIONAL ENGINEER
ANN MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24

DWG NO. 138



PLAN



SECTION A-A

NOTES:

1. * MAX. 10' ON CENTER/EQUALLY SPACED
2. SEE DETAIL 101 FOR GENERAL NOTES.

REVISION:		
DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

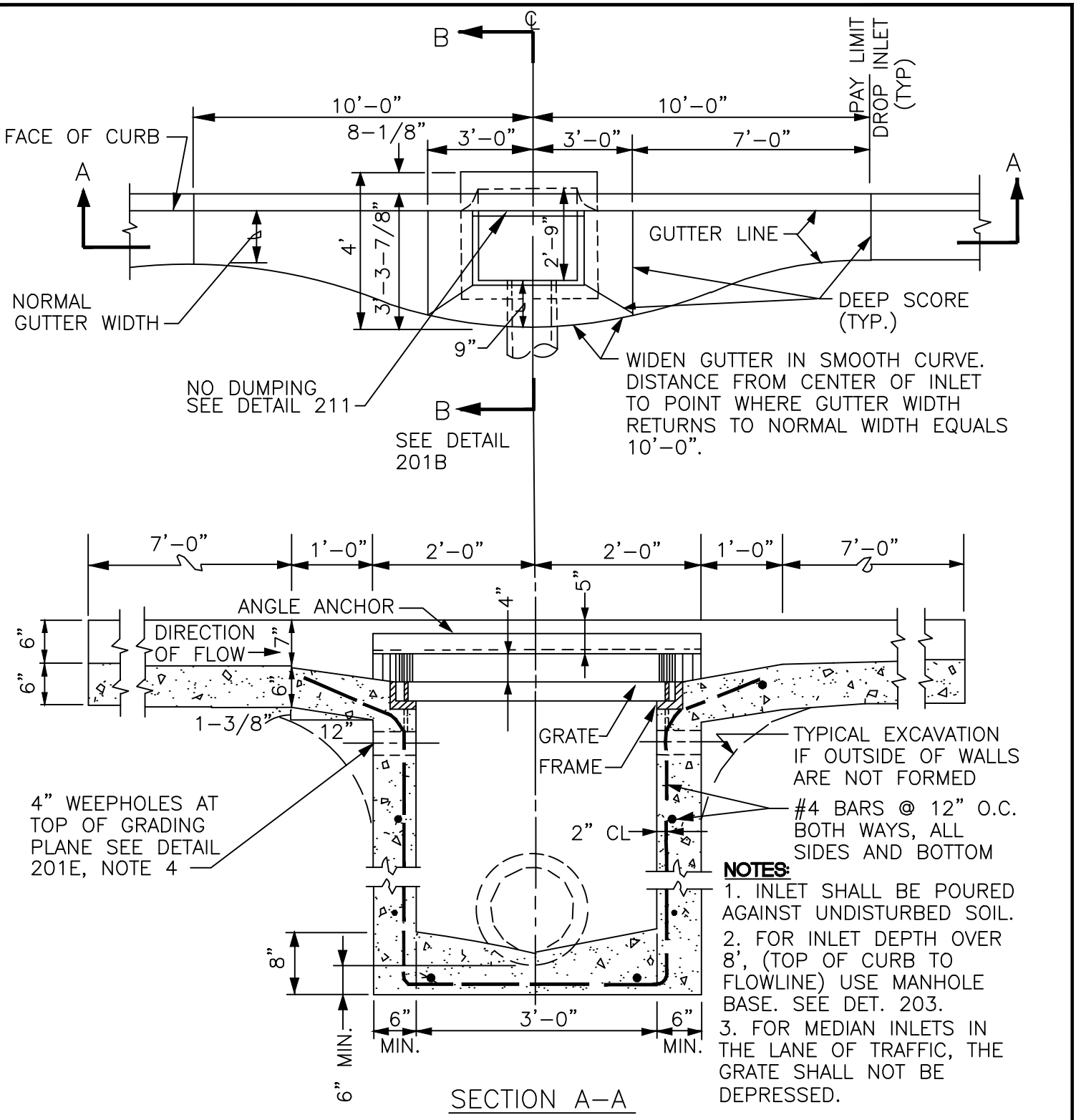
CITY OF PLEASANTON

STANDARD DETAILS

DRIVEWAY APPROACH FOR NEW DEVELOPMENT

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 139



SECTION A–A

NOTES:

1. INLET SHALL BE POURED AGAINST UNDISTURBED SOIL.
2. FOR INLET DEPTH OVER 8', (TOP OF CURB TO FLOWLINE) USE MANHOLE BASE. SEE DET. 203.
3. FOR MEDIAN INLETS IN THE LANE OF TRAFFIC, THE GRATE SHALL NOT BE DEPRESSED.

CITY OF PLEASANTON

STANDARD DETAILS

TYPE – I STORM DRAINAGE CURB INLET

SHEET 1 OF 5 SHEETS

DRAWN BY: STAFF

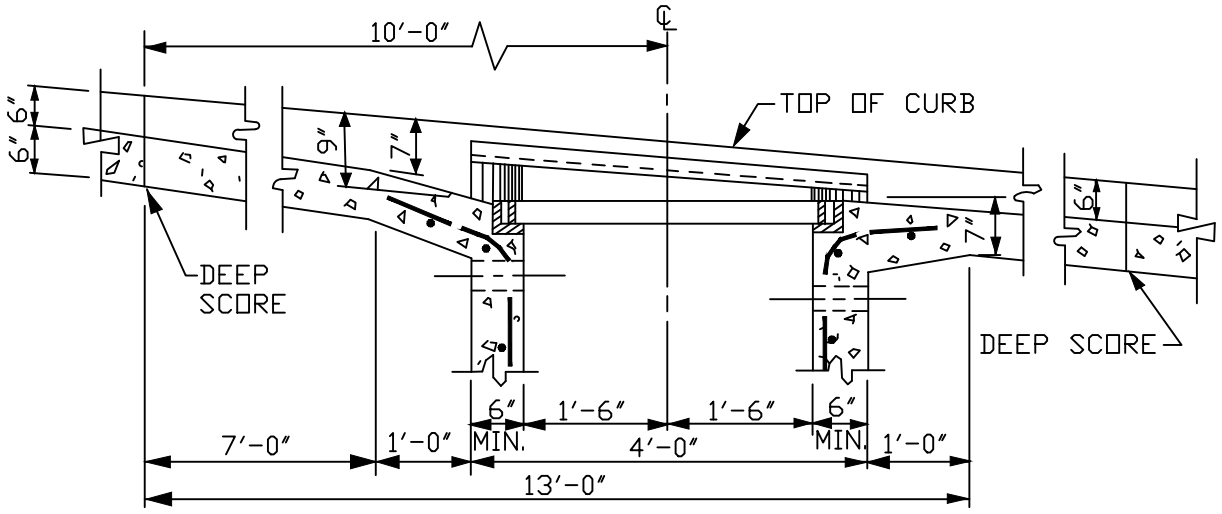
CHECKED BY: AN

SCALE: N.T.S.

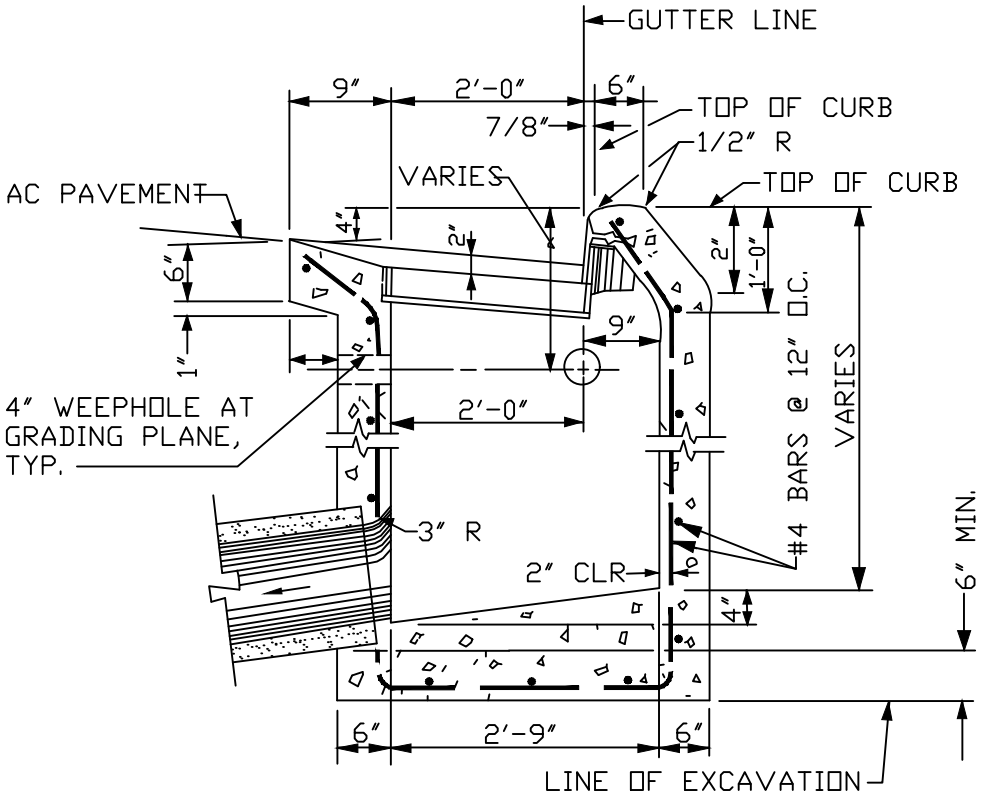
REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24

DWG NO. 201A



POSITION OF FRAME AND GRATE
FOR CURB GRADES 5% OR STEEPER



SECTION B - B

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

STANDARD DETAILS

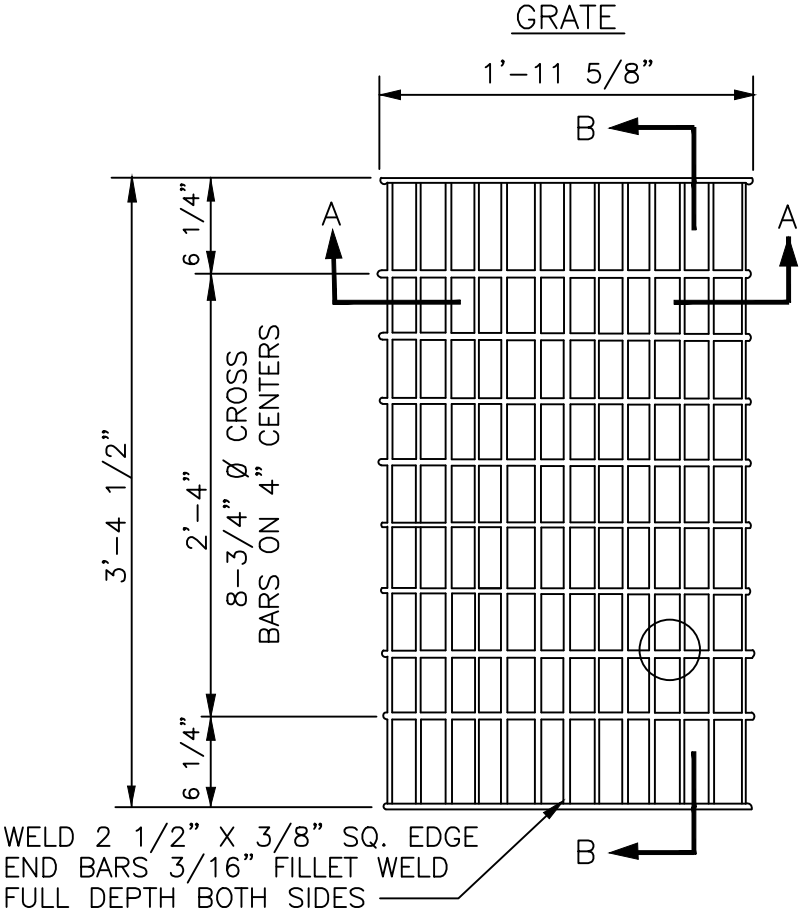
CURB INLET

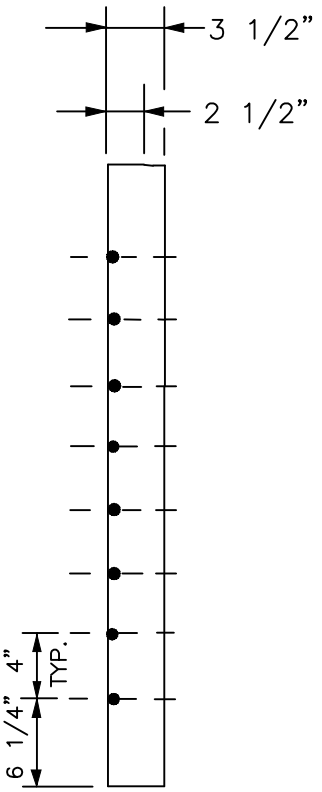
SHEET 2 OF 5 SHEETS

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

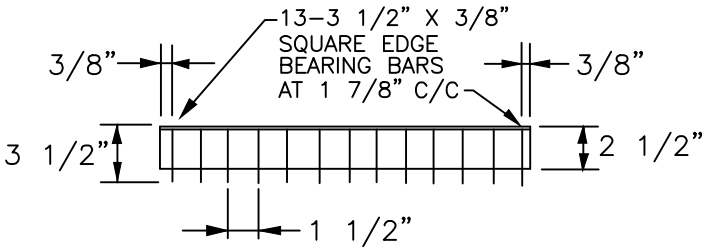
DATE : 7/24 | DWG NO. 201B

GRATE

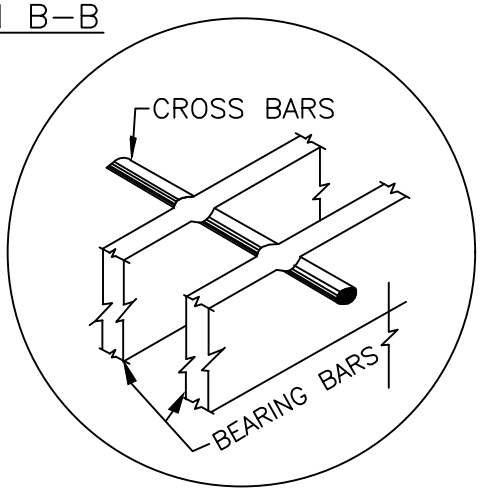




SECTION B–B



SECTION A – A



DETAIL

NOTE:

1. ALL BEARING BARS AND CROSS BARS SHALL BE ELECTROFORGED INTO A ONE PIECE CONSTRUCTION.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

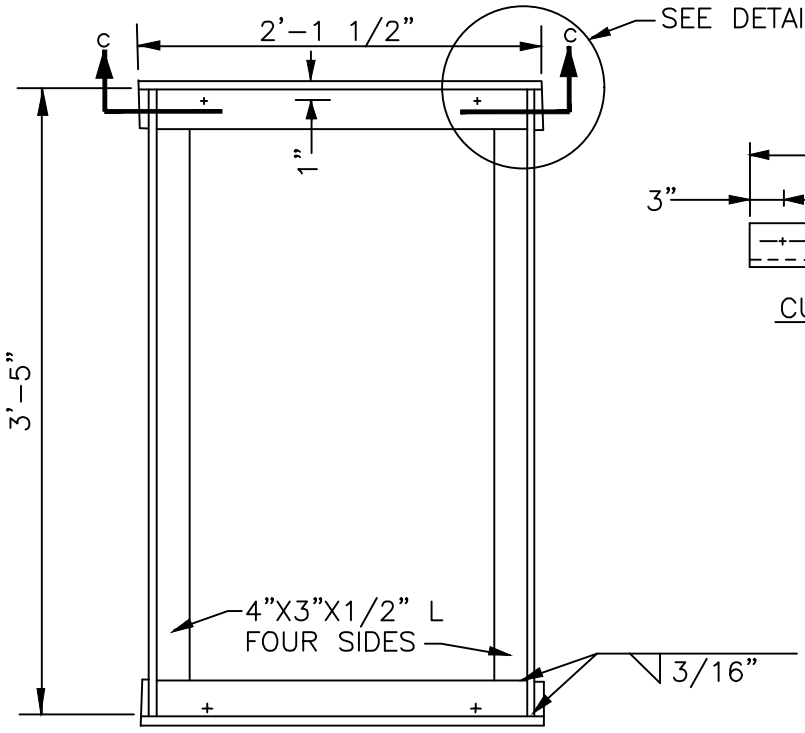
STANDARD DETAILS

CURB INLET

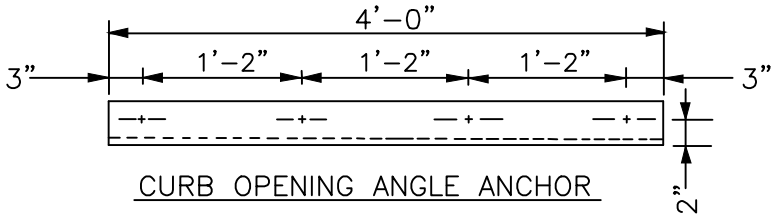
SHEET 3 OF 5 SHEETS

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

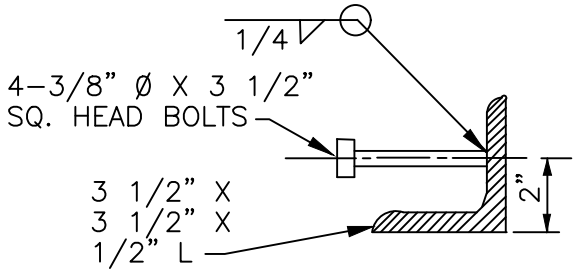
DATE: 7/24 | DWG NO. 201C



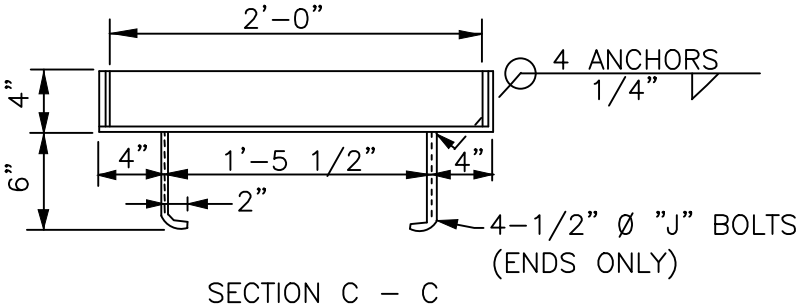
GRATE FRAME



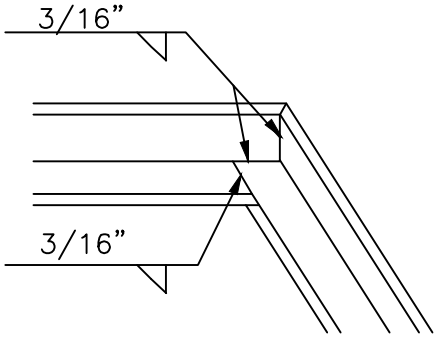
CURB OPENING ANGLE ANCHOR



ANGLE ANCHOR



SECTION C – C



DETAIL A

CITY OF PLEASANTON

STANDARD DETAILS

CURB INLET

SHEET 4 OF 5 SHEETS

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DRAWN BY: STAFF	
CHECKED BY: AN	
SCALE: N.T.S.	DATE: 7/24
	DWG NO. 201D

CURB INLET NOTES

1. ALL MATERIAL SHALL BE STRUCTURAL GRADE STEEL OR BETTER.
2. GRATING AND FRAMES ARE TO BE ASSEMBLED AND MADE TO FIT BEFORE DELIVERY TO JOB SITE.
3. ALL CONCRETE TO BE CLASS 2. ONE PINT OF LAMP BLACK PER CU YD.
4. 4" WEEP HOLES TO BE PLACED AT BOTTOM OF PERVIOUS BASE OR SUBBASE AS DIRECTED BY THE ENGINEER. PLACE DRAIN ROCK IN SACK AROUND EACH HOLE.
5. POSITION OF CONDUIT LEAVING INLET TO BE AS INDICATED ON IMPROVEMENT PLANS. INLET FLOOR TO SLOPE TO OUTLET CONDUIT. CONDUITS SHALL NOT ENTER THE INLET AT THE CORNERS.
6. MINIMUM CLEAR SPACING BETWEEN SURFACES OF THE CONCRETE AND REINFORCING STEEL TO BE 2". WHERE THE CONCRETE IS POURED AGAINST UNDISTURBED SOIL AND WALL THICKNESS EXCEEDS 7", CLEARANCE MAY BE 3".
7. NO CONSTRUCTION JOINTS TO BE PLACED OTHER THAN WHERE SHOWN ON THE PLANS, EXCEPT WITH THE APPROVAL OF THE ENGINEER.
8. ALL EXPOSED STEEL COMPONENTS TO BE GALVANIZED AFTER FABRICATION.
9. MINIMUM COVER FOR CONDUITS TO BE DETERMINED BY FIELD CONDITIONS BY THE ENGINEER.
10. INSTALL THERMOPLASTIC CURB MARKINGS AT ALL STORM WATER INLET LOCATIONS: "NO DUMPING – DRAINS TO BAY" (SEE DETAIL 211).

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

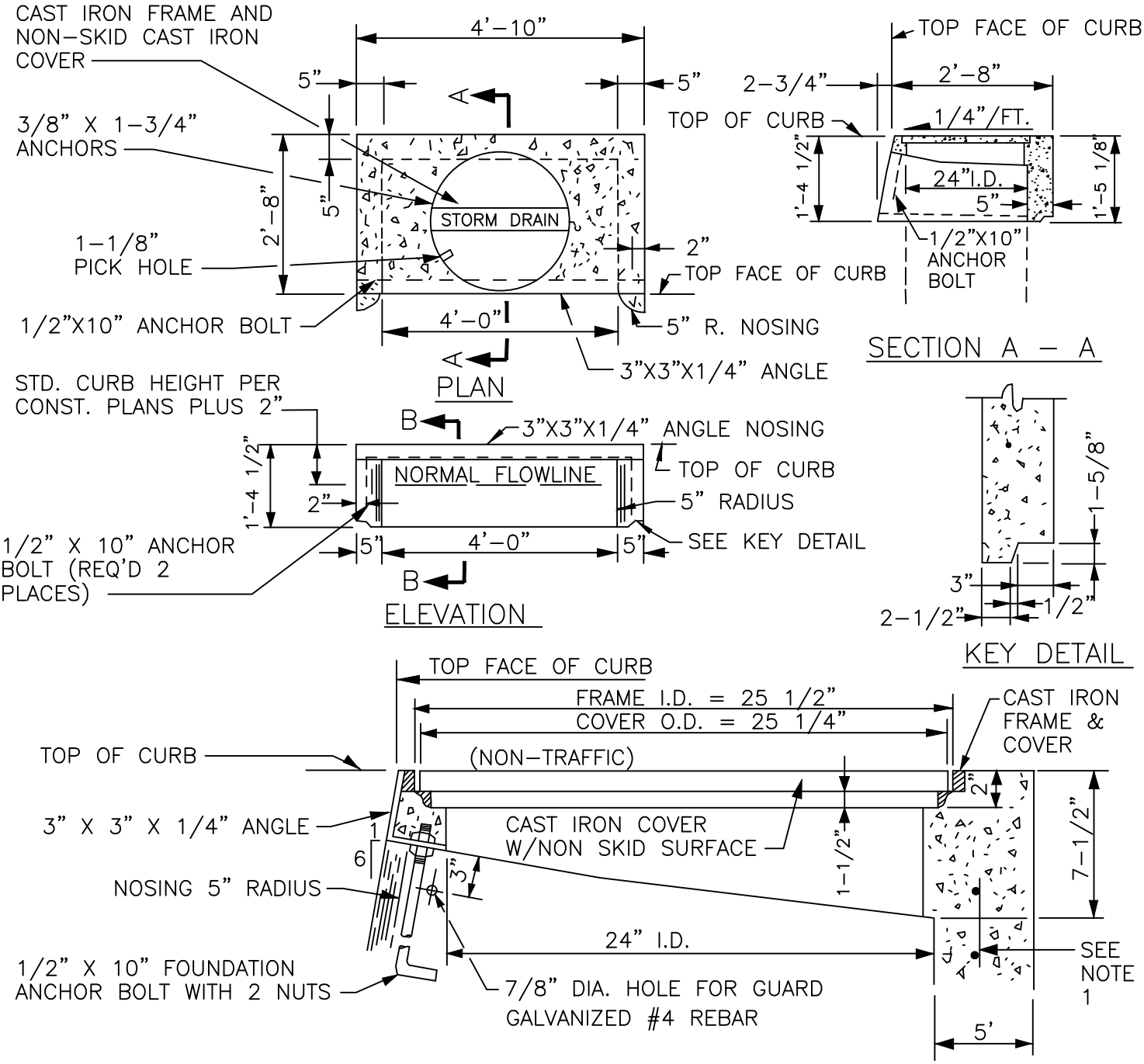
STANDARD DETAILS

CURB INLET

SHEET 5 OF 5 SHEETS

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 201E



NOTES:

1. ALL REINFORCING IN CONCRETE TO BE 4" X 4" X #6 MESH.
2. TOP OF COVER TO HAVE NON-SKID SURFACE.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

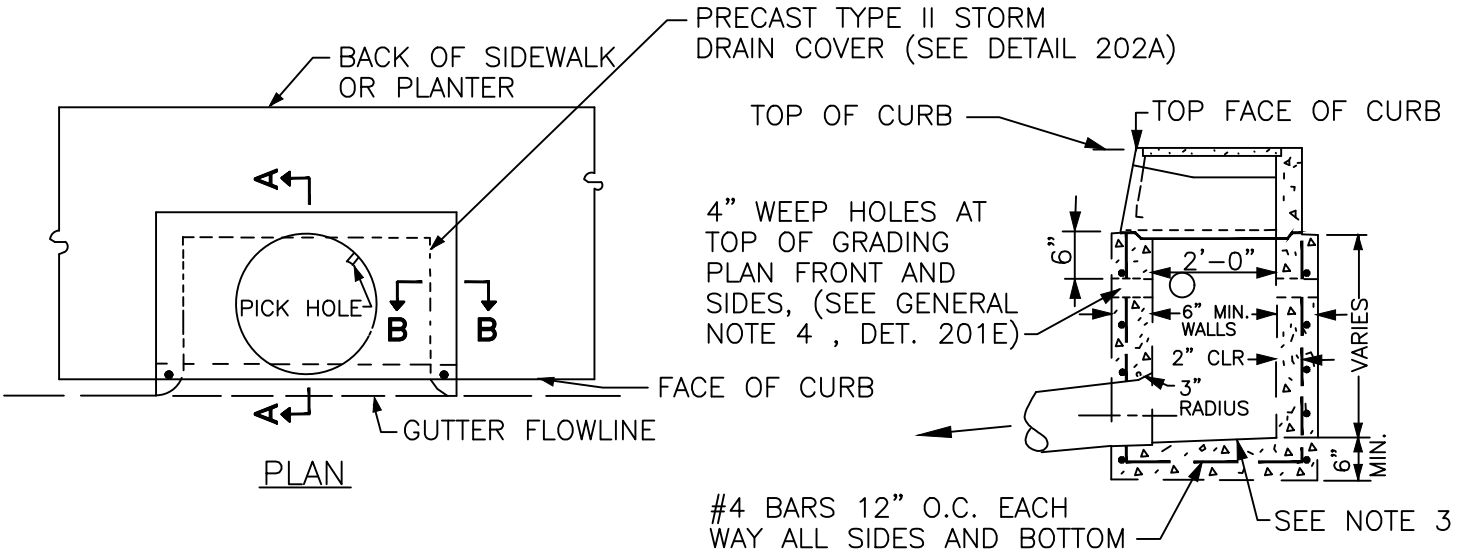
STANDARD DETAILS

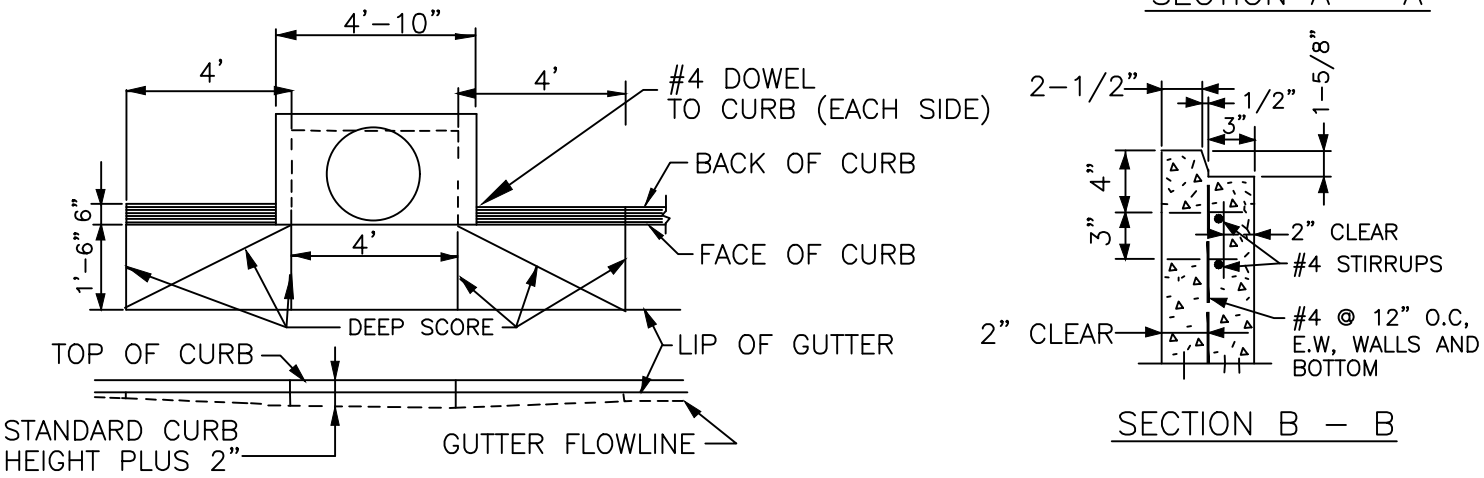
TYPE II STORM DRAIN CURB INLET PRECAST COVER

TO BE USED ONLY UPON APPROVAL OF THE ENGINEER

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 202A





NOTES:

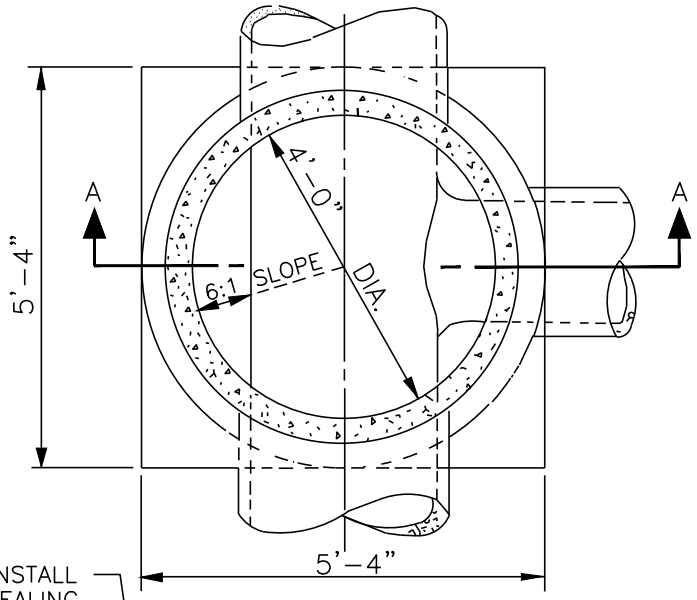
1. MAXIMUM SIZE PIPE ENTERING OR EXITING CATCH BASIN SHALL BE 18".
2. A MAXIMUM OF 2 PIPES SHALL CONNECT TO THE CATCH BASIN.
3. SLOPE BOTTOM OF CATCH BASIN TO DRAIN.
4. CURB INLET TO BE CAST IN PLACE UNLESS SPECIFICALLY APPROVED BY THE ENGINEER.
5. SEE DET. 201E FOR GENERAL NOTES.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON
STANDARD DETAILS
TYPE II STORM DRAIN
2' X 4' CURB INLET
TO BE USED ONLY UPON APPROVAL OF THE ENGINEER

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 202B

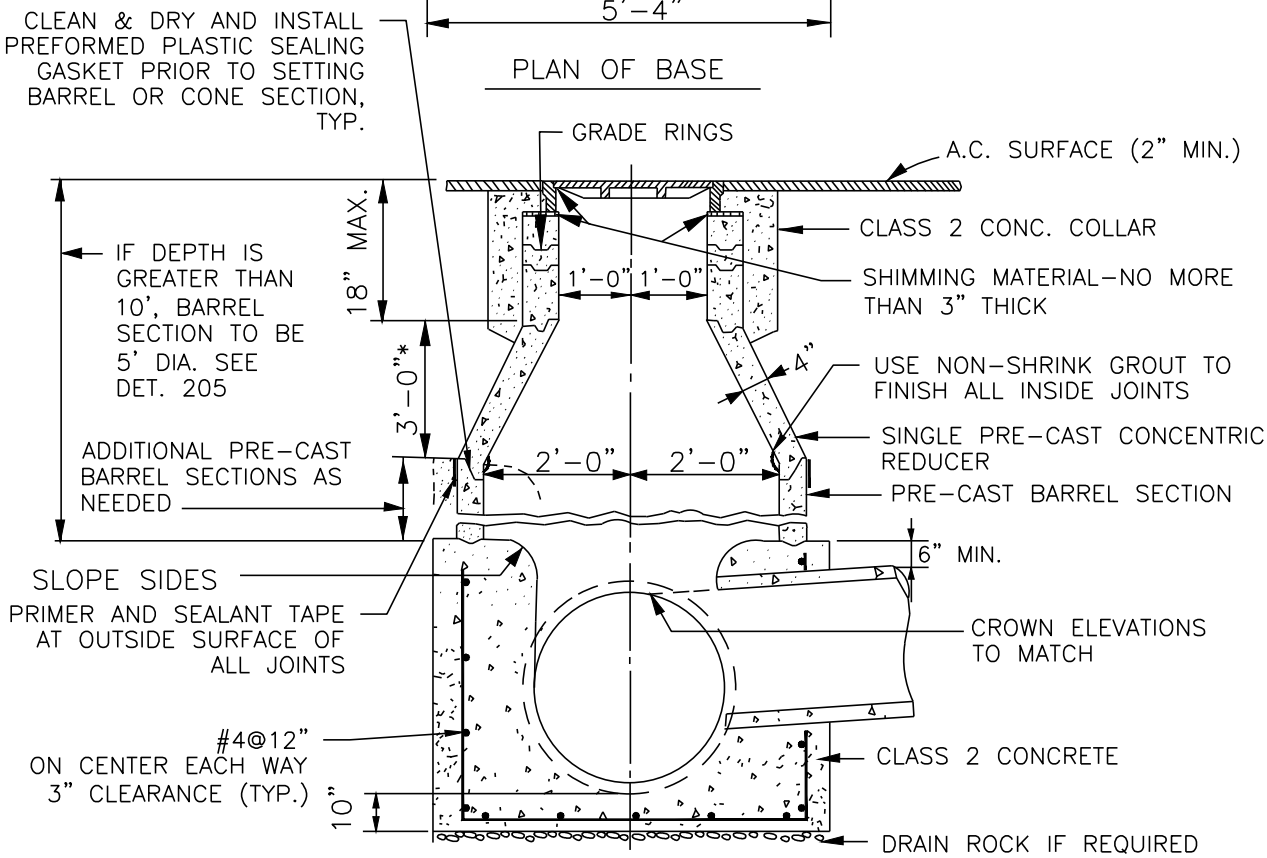


PLAN OF BASE

NOTES:

1. FOR PIPE SIZES LARGER THAN 36", SEE TYPE III STORM DRAIN MANHOLE, DET. 205.
2. USE RAMNECK OR APPROVED EQUAL BETWEEN JOINTS.
3. TRIM ALL JOINTS AFTER COMPLETION.
4. MANHOLES SHALL HAVE NO STEPS.

* UNLESS APPROVED BY THE ENGINEER.



SECTION A – A

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

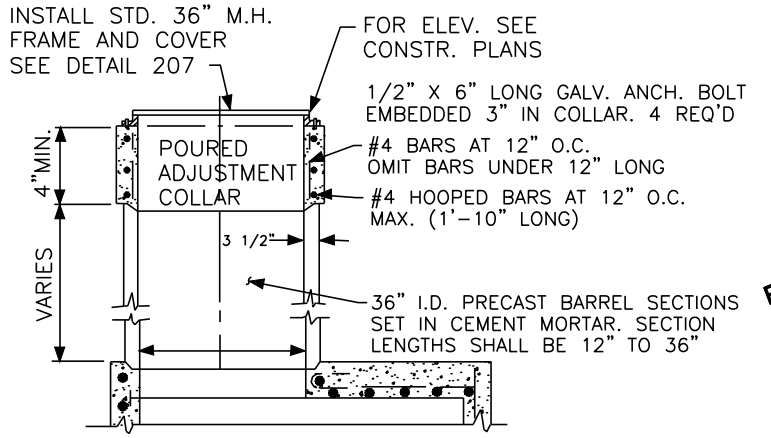
CITY OF PLEASANTON

STANDARD DETAILS

TYPE I STORM DRAIN MANHOLE PIPE SIZES 12" – 36"

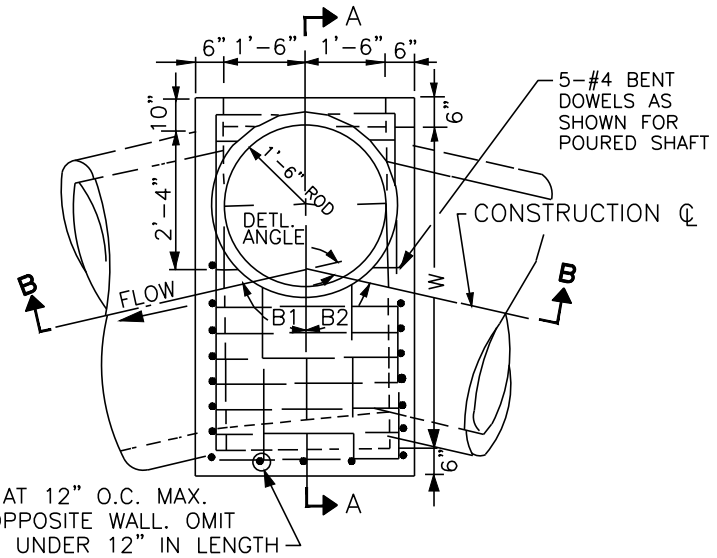
REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 203

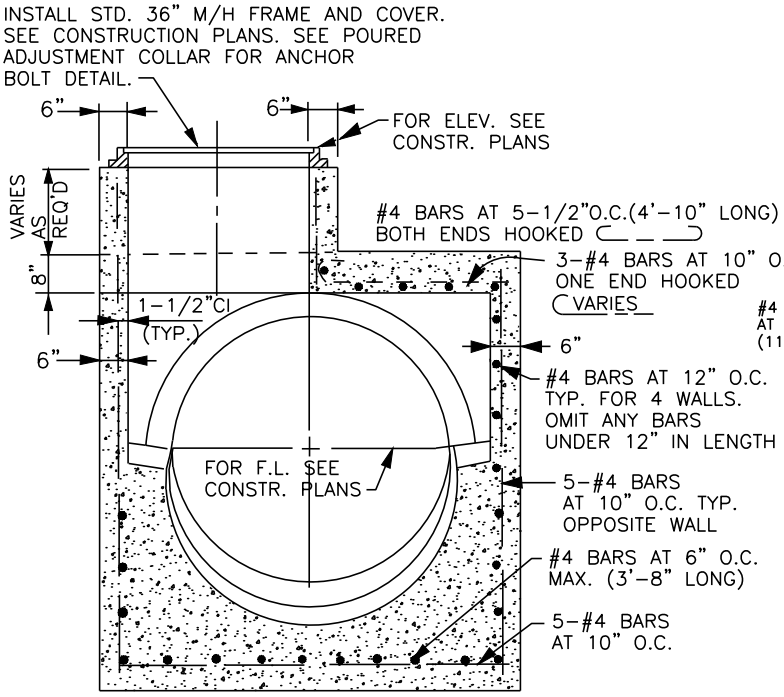


SECTION A-A

(M.H. WITH PRECAST BARREL SECTIONS AND POURED ADJUSTMENT COLLAR)

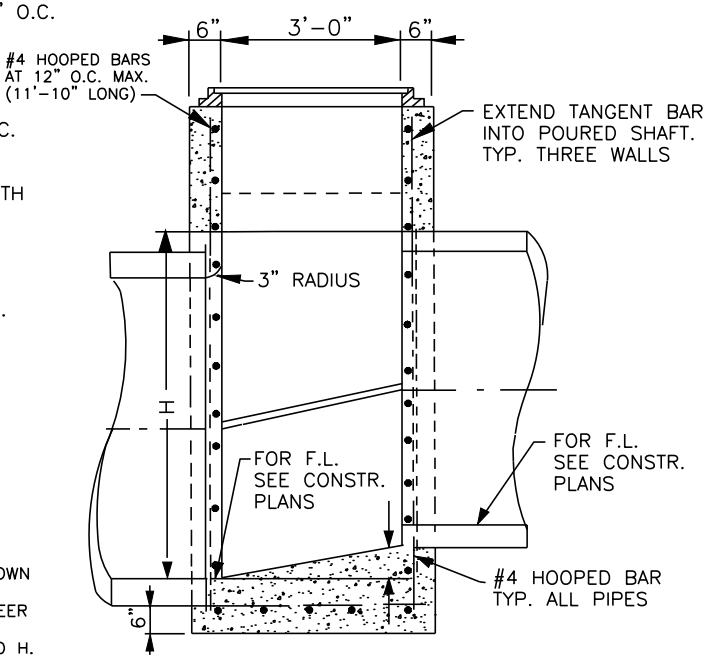


PLAN OF MANHOLE BASE WITH TOP SLAB REINFORCEMENT (SHAFT REMOVED)



SECTION A-A

(M.H. WITH POURED SHAFT)



SECTION B-B

(M.H. WITH POURED SHAFT)

NOTES:

1. LOCATION AND DIRECTION OF CONDUITS ENTERING AND EXITING MANHOLE ARE SHOWN ON THE CONSTRUCTION PLANS.
2. REINFORCING STEEL MAY BE BENT, CUT, OR SPREAD AS DIRECTED BY THE ENGINEER TO PERMIT CONNECTION OF LATERAL PIPE.
3. SEE CONSTRUCTION PLANS FOR INFORMATION ON SHAFT LOCATION B_1, B_2, W AND H.
4. SEE STANDARD DETAIL 203 FOR PLASTIC SEALING GASKET, NON SHRINK GROUT, PRIMER AND SEALING TAPE ON JOINTS.

DRAWN BY: STAFF

CHECKED BY: AN

SCALE: N.T.S.

CITY OF PLEASANTON

STANDARD DETAILS

TYPE II STORM DRAIN MANHOLE FOR PIPE SIZE 54"-84"

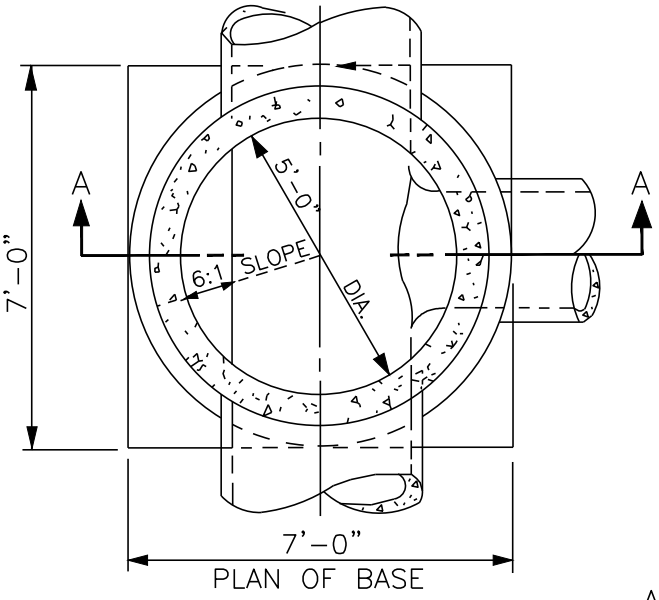
REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24

DWG NO. 204

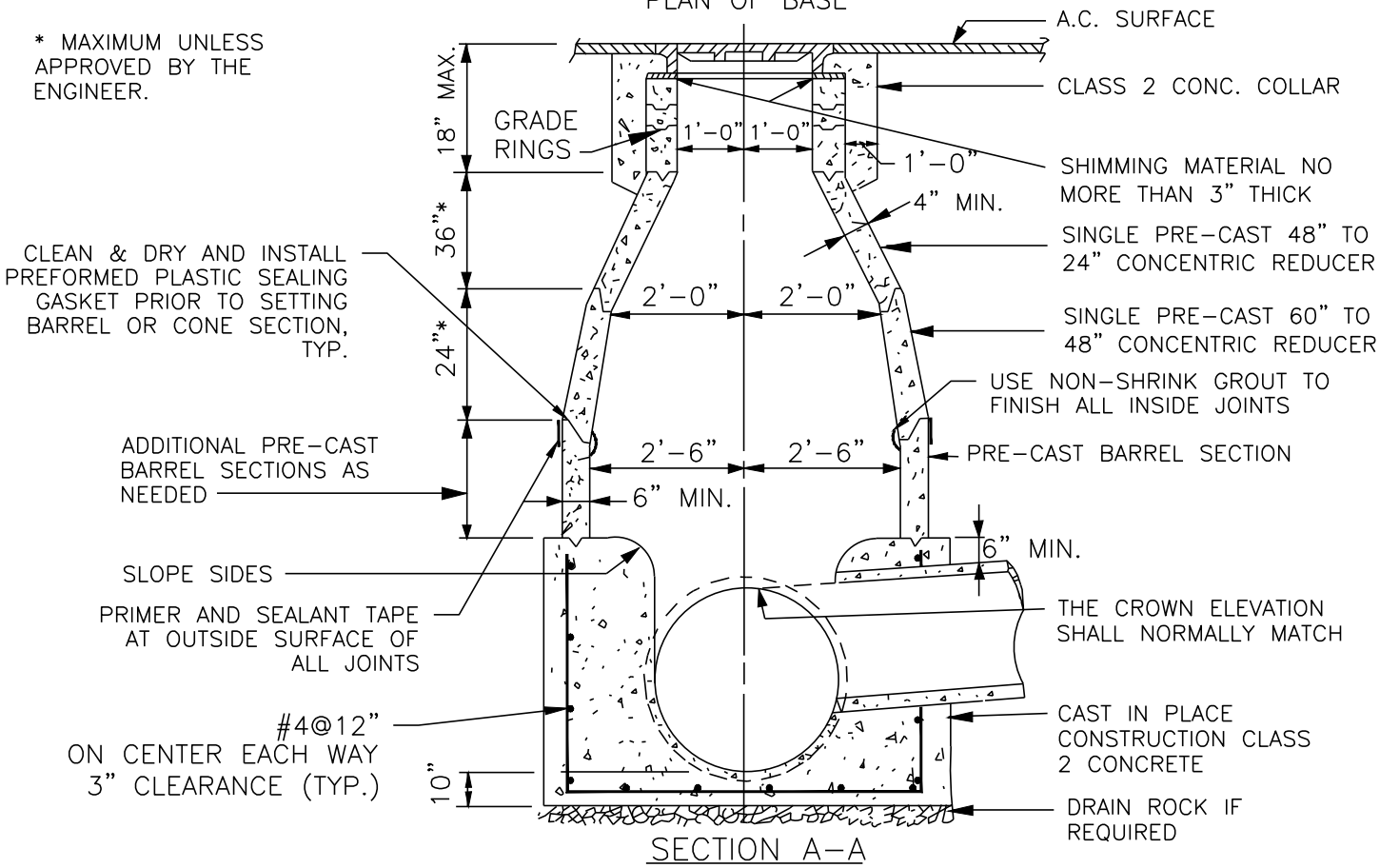
NOTES:

1. FOR PIPE SIZES LARGER THAN 48" SEE TYPE II STORM DRAIN MANHOLE DETAIL 204.
2. USE RAMNECK OR APPROVED EQUAL BETWEEN JOINTS AFTER COMPLETION.
3. MANHOLES SHALL HAVE NO STEPS.



PLAN OF BASE

* MAXIMUM UNLESS APPROVED BY THE ENGINEER.



SECTION A-A

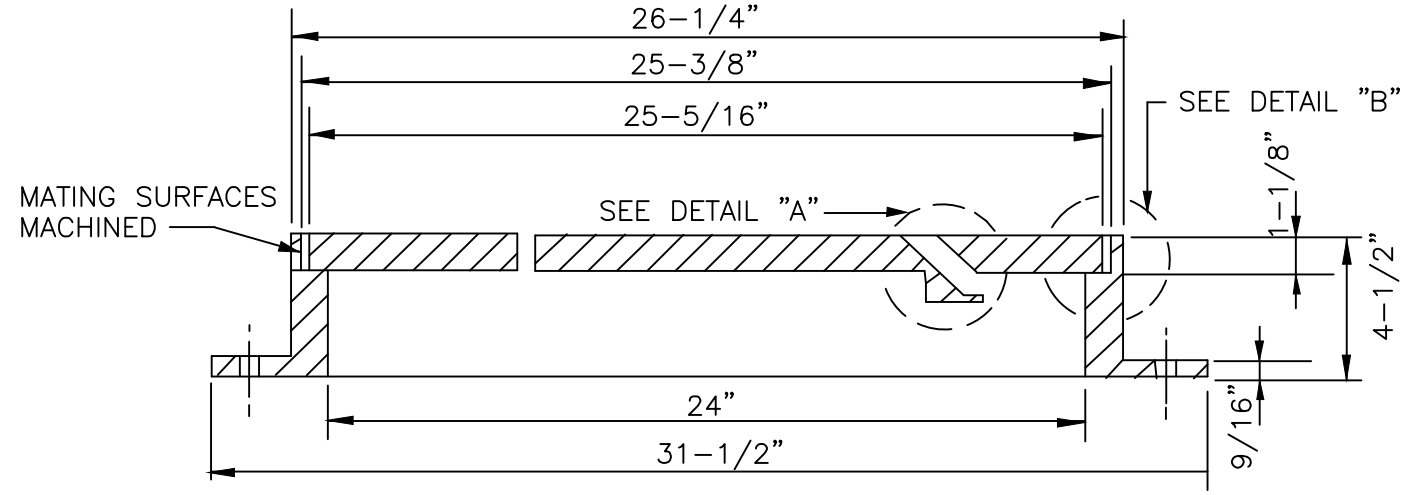
DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

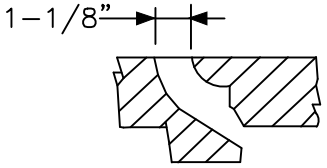
CITY OF PLEASANTON

STANDARD DETAILS
TYPE III STORM DRAIN MANHOLE
FOR PIPE SIZES 42" & 48"

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 205

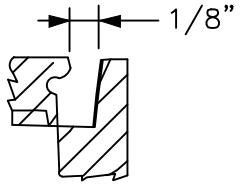




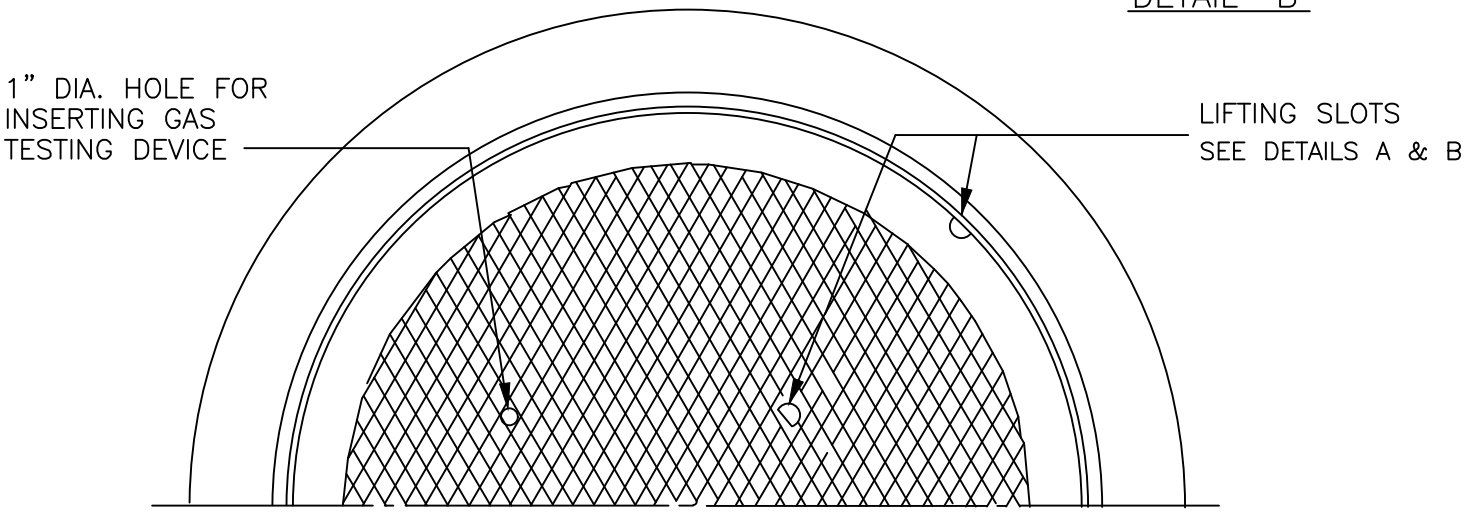
DETAIL "A"

MANHOLE FRAME & COVER SECTION

N.T.S.



DETAIL "B"



HALF PLAN OF TOP

N.T.S.

NOTES:

1. COVERS SHALL BE SET FLUSH AND NOT ROCK.
2. SANITARY SEWER AND STORM DRAIN MANHOLE FRAME AND COVERS SHALL BE IDENTICAL EXCEPT FOR THE WORDS "SANITARY SEWER" OR "STORM DRAIN" EMBOSSED ON THE COVERS OR OTHER ACCEPTABLE IDENTIFICATION.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

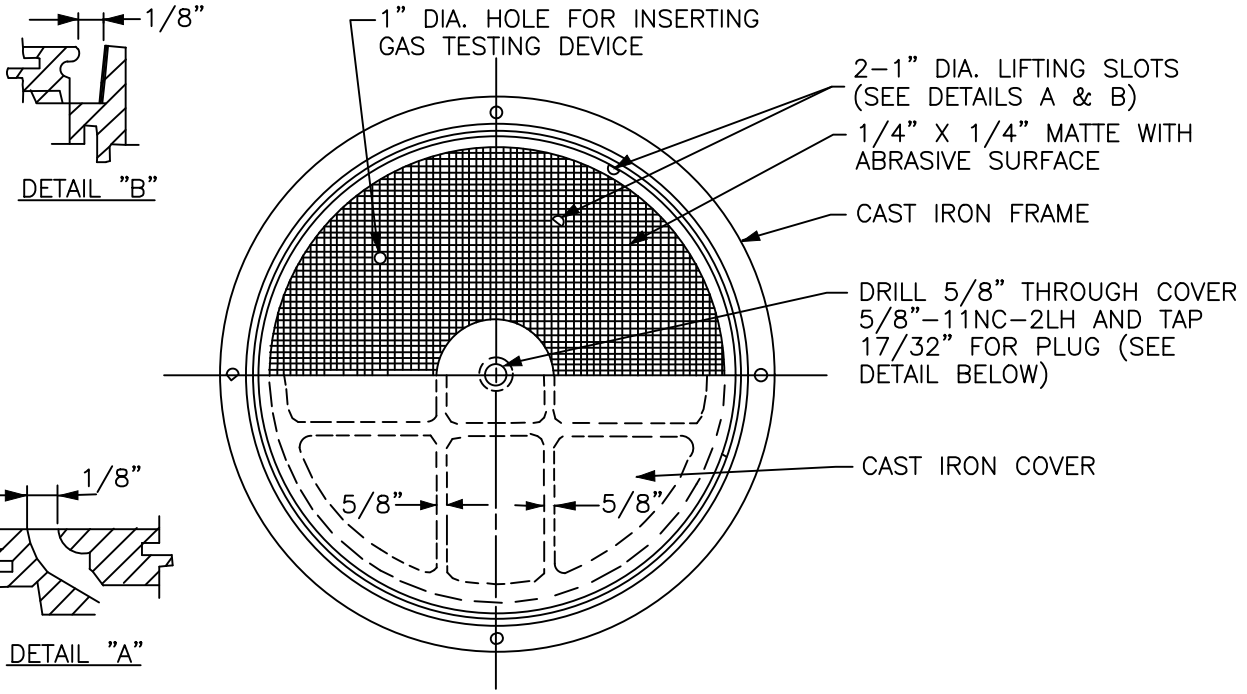
CITY OF PLEASANTON

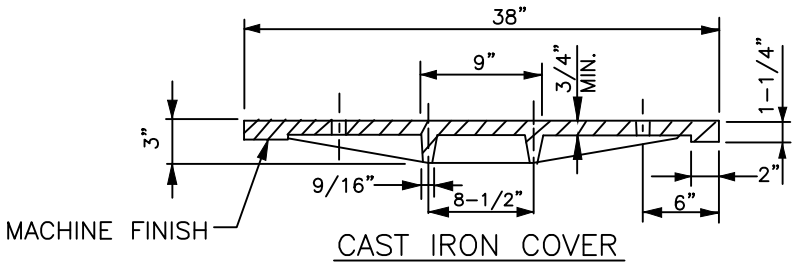
STANDARD DETAILS

MANHOLE FRAME & COVER

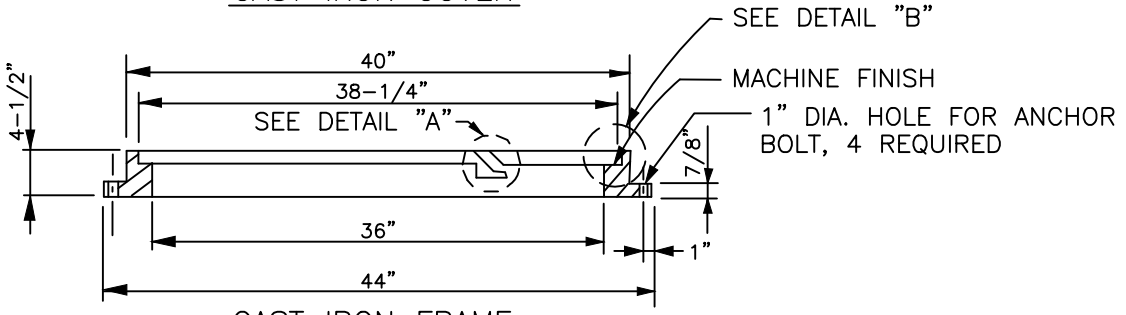
REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 206





CAST IRON COVER



CAST IRON FRAME

NOTES:

1. ALL CONTACT AND BEARING SURFACES OF BOTH FRAME AND COVER SHALL BE MACHINED TO FIT ACCURATELY SO THAT THE COVER WILL NOT ROCK AND SHALL BE MATCHED AND MARKED IN PAIRS BEFORE DELIVERY.
2. SANITARY SEWER AND STORM DRAIN MANHOLE FRAME AND COVERS SHALL BE IDENTICAL, EXCEPT FOR THE WORDS "SANITARY SEWER" OR "STORM DRAIN" EMBOSSED ON THE COVERS, OR OTHER ACCEPTABLE IDENTIFICATION.
3. FRAME AND COVER SHALL EXCEED H–20 WHEEL LOADING.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

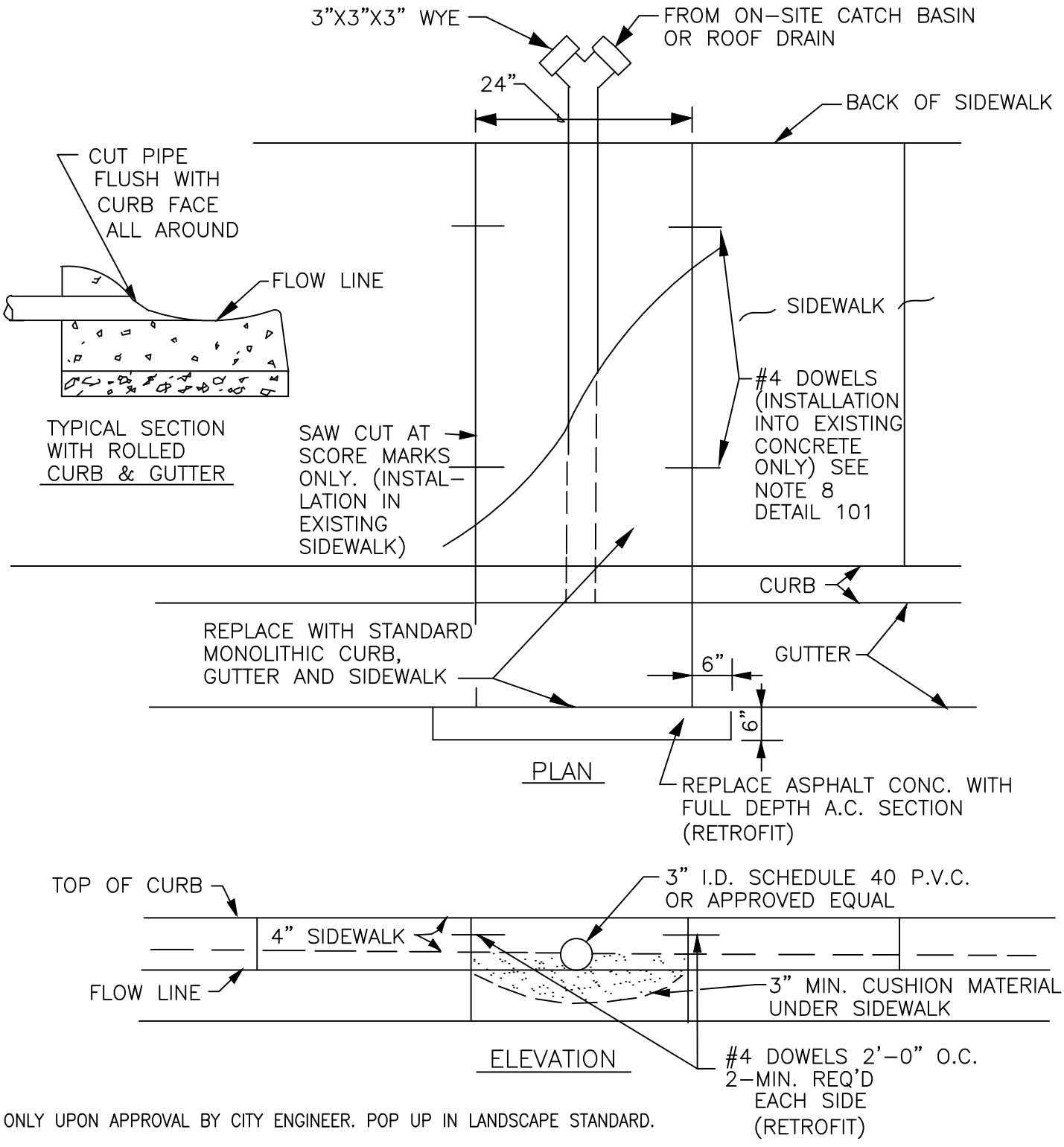
CITY OF PLEASANTON

STANDARD DETAILS

36" MANHOLE FRAME AND COVER

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 207



1. ONLY UPON APPROVAL BY CITY ENGINEER. POP UP IN LANDSCAPE STANDARD.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

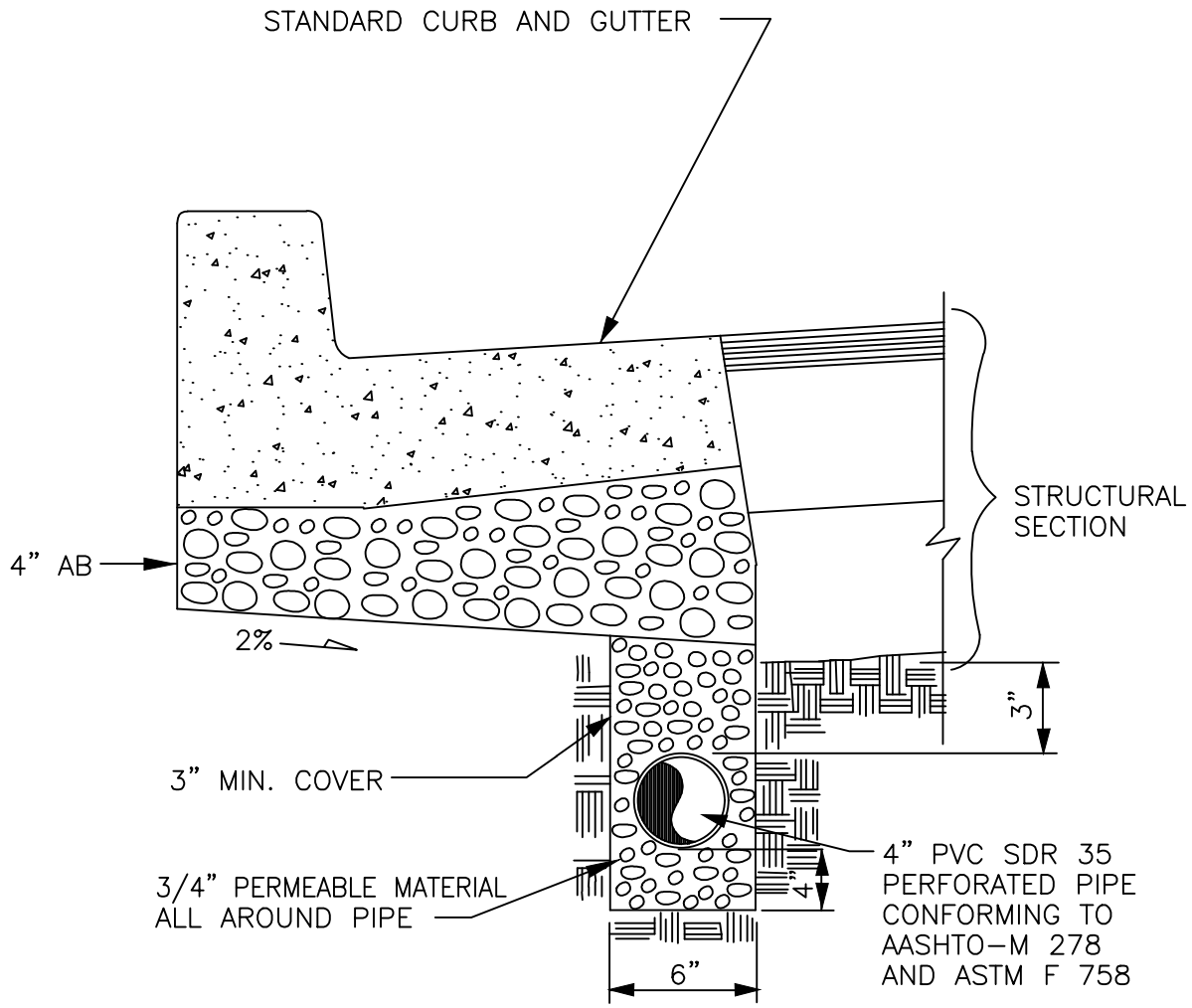
CITY OF PLEASANTON

STANDARD DETAILS

OFF-SITE DRAIN THROUGH CURB

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 208



NOTE:

1. 4" PERFORATED PIPE TO BE LAYED PARALLEL WITH THE PROPOSED GUTTER.
2. CONNECT TO EXISTING CURB INLET STRUCTURE.
3. PROVIDE 0.10 % SLOPE MINIMUM.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

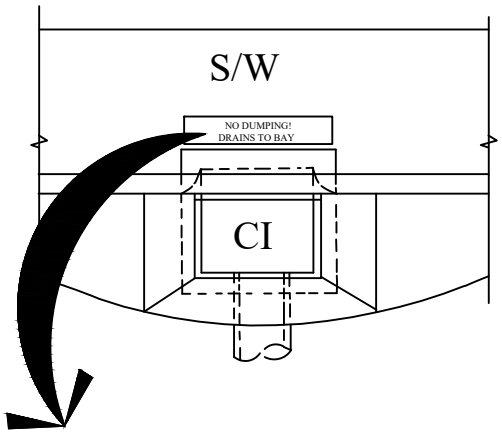
STANDARD DETAILS

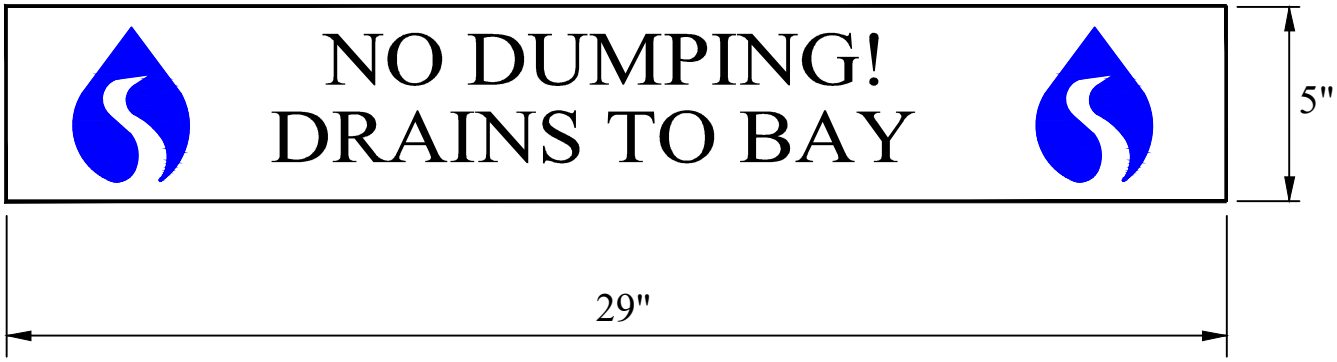
SUBDRAIN DETAIL

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 209

WHITE BLUE

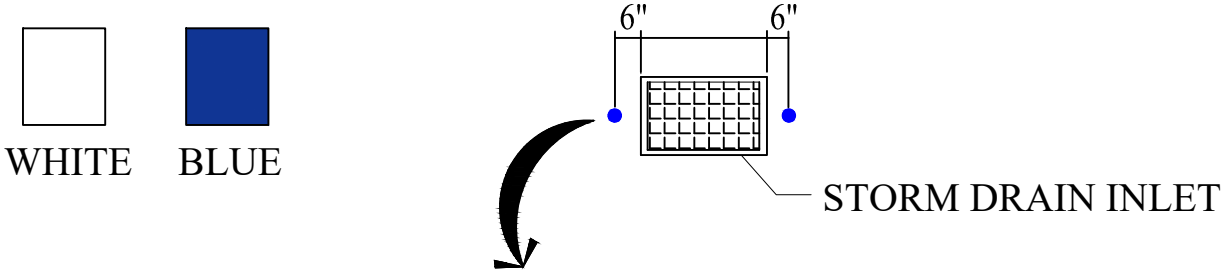




NOTES:

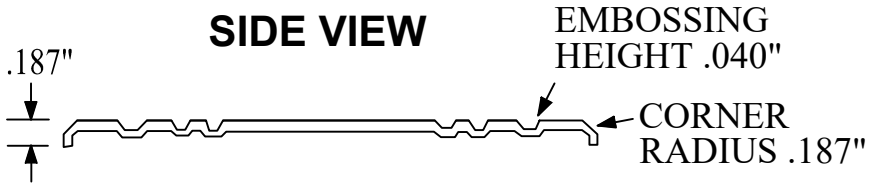
1. NEW CONCRETE SURFACES MUST BE SANDBLASTED TO ENTIRELY REMOVE THE CURING COMPOUND.
2. THE RETROREFLECTIVE THERMOPLASTIC PREFORMED PAVEMENT MARKING SHALL BE APPLIED TO CONCRETE OR ASPHALT BY MEANS OF HEAT FUSION IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. THE MARKING MAY BE OBTAINED FROM ENNIS–FLINT (336) 475–6600
3. THE THERMOPLASTIC SHALL BE A TWO PART APPLICATION: PART ONE SHALL BE BLUE AND PART TWO SHALL BE WHITE.

DRAWN BY: STAFF	CITY OF PLEASANTON STANDARD DETAILS "NO DUMPING" CURB & GUTTER	REGISTERED PROFESSIONAL ENGINEER ADAM MATTHEW NELKIE No. 78830 Exp. 9/30/2025 CIVIL STATE OF CALIFORNIA
CHECKED BY: AN		
SCALE: N.T.S.		DATE: 7/24 DWG NO. 210



TOP VIEW

SIDE VIEW



NOTES:

1. TWO STAINLESS STEEL DISK SHALL BE INSTALLED ON THE SIDES OF STORM DRAIN INLET.
2. THE RETROREFLECTIVE DISK SHALL BE INSTALLED AS PER MANUFACTURE RECOMMENDATIONS. THE DISK MAY BE OBTAINED FROM ALMETEK, 1-800-248-2080 OR AT HTTPS://WWW.ALMETEK.COM, PRODUCT # SDS4R0231BLNAX.

DRAWN BY:	STAFF
CHECKED BY:	AN
SCALE:	N.T.S.

CITY OF PLEASANTON

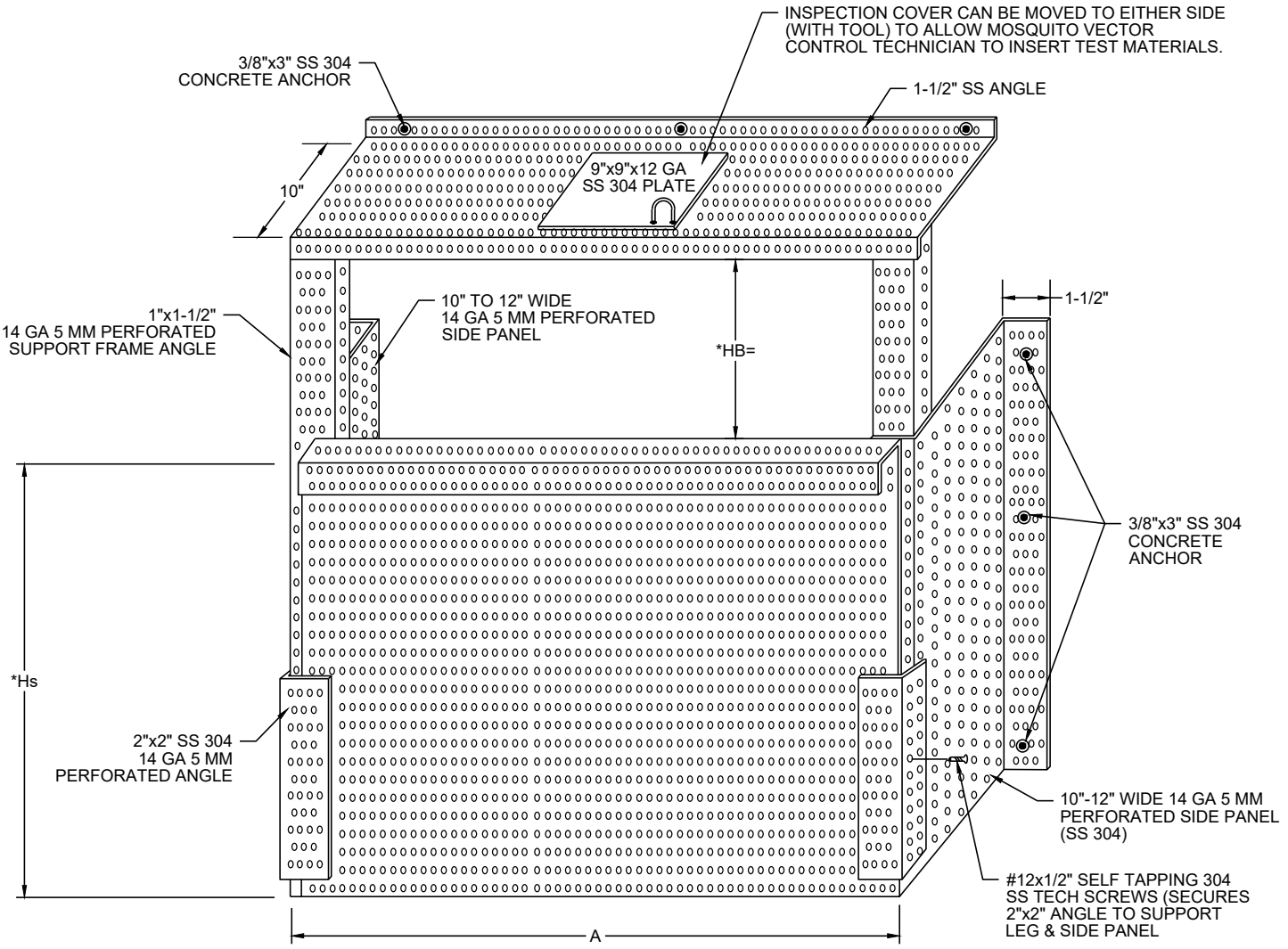
STANDARD DETAILS

"NO DUMPING"

INLET MARKING

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 211



NOTES:

1. USE IN CATCH BASINS THAT HAVE CLEARANCE FROM GRATE BOTTOM TO DEFLECTOR TOP, 9-1/2" OR LESS. ALLOWS MOSQUITO ABATEMENT TESTING INSIDE THE CPS OUTLET AREA.
2. FOR SHALLOW BASINS THAT HAVE 10" OR LESS DISTANCE FROM BOTTOM OF GRATE TO TOP OF DEFLECTOR.
3. * SEE CPS CONFIGURATION AND SIZING TABLES STANDARD DETAILS.
4. #12x1/2" SS 304 TECH SCREWS SECURE ALL PIECES TO FRAME.

DRAWN BY: STAFF	
CHECKED BY: AN	
SCALE: N.T.S.	

CITY OF PLEASANTON

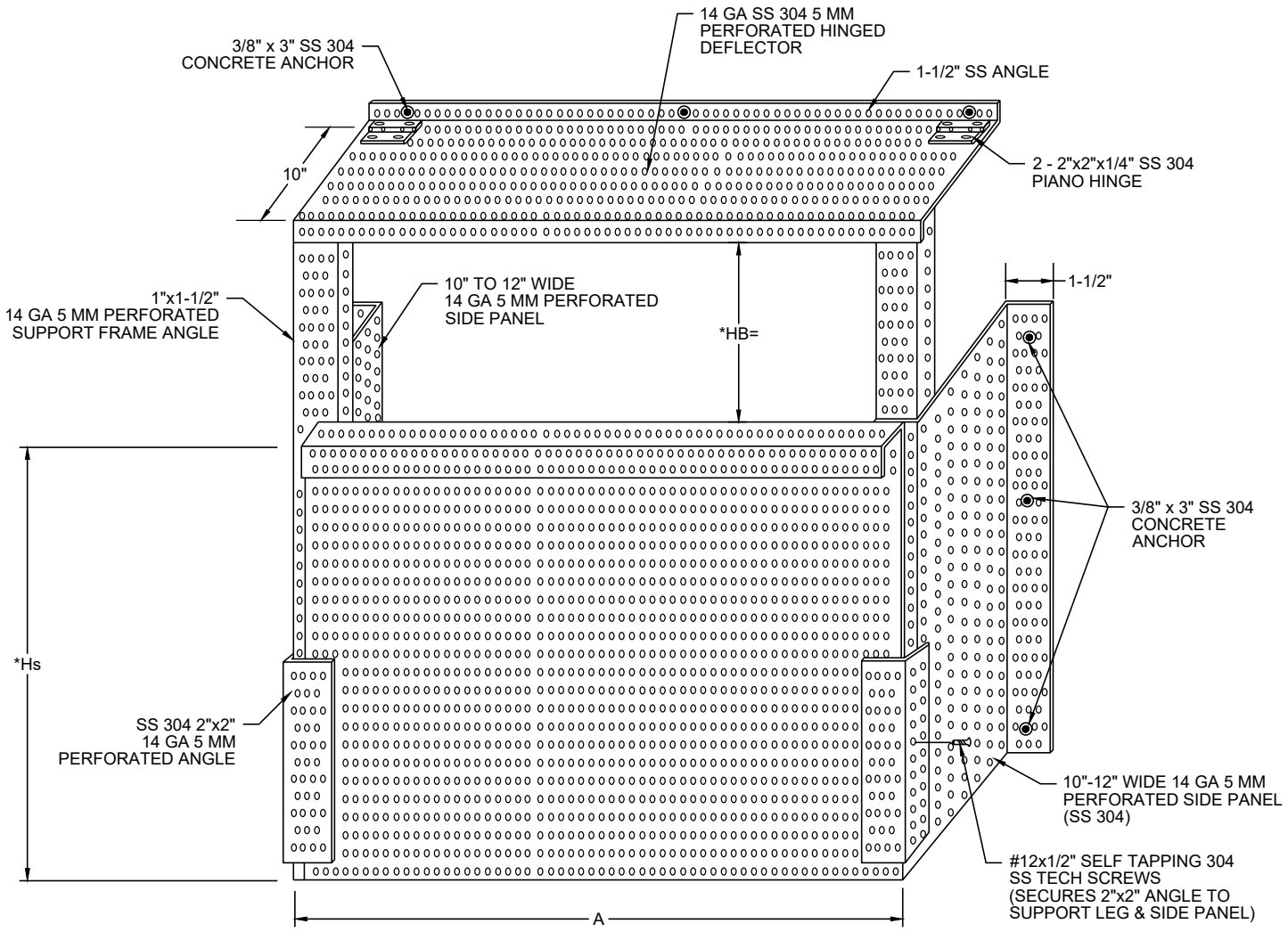
STANDARD DETAILS

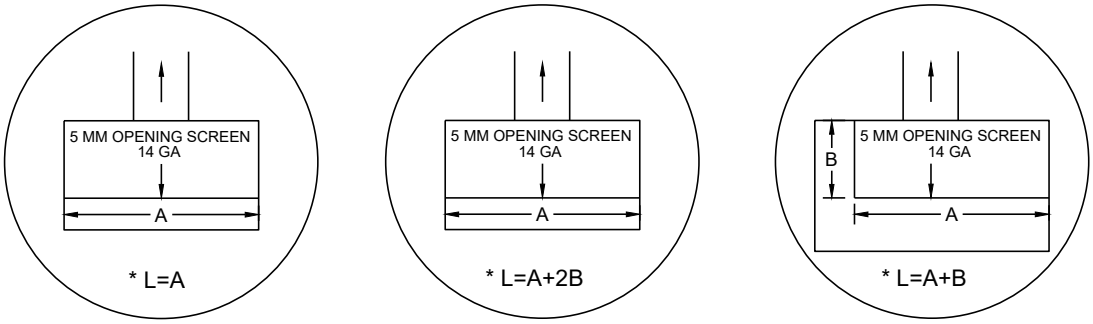
ASSEMBLED REMOVABLE FRONT AND HINGED TOP SCREEN CPS

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24

DWG NO. 212





NOTES:

1. USE CATCH BASINS WHERE THERE IS 10" OR MORE CLEARANCE FROM GRATE BOTTOM TO DEFLECTOR TOP FOR MOSQUITO ABATEMENT TESTING.
2. FOR BASINS THAT ARE 11" OR GREATER FROM BOTTOM OF GRATE TO DEFLECTOR.
3. * SEE CPS CONFIGURATION AND SIZING TABLES STANDARD DETAILS.
4. #12x1/2" SS 304 TECH SCREWS SECURE ALL PIECES TO FRAME.

CITY OF PLEASANTON

STANDARD DETAILS

ASSEMBLED REMOVABLE FRONT AND TOP SCREEN CPS

DRAWN BY: STAFF

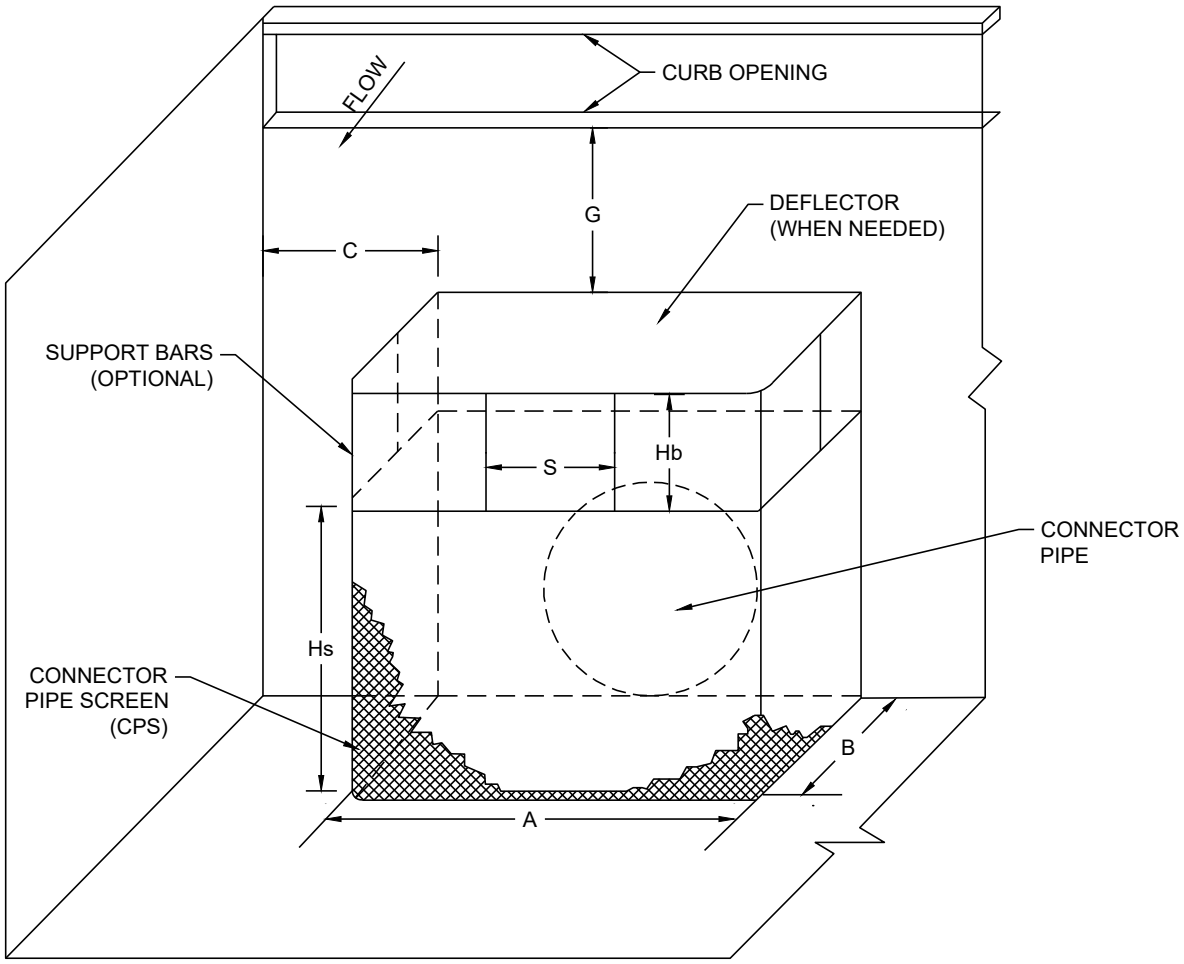
CHECKED BY: AN

SCALE: N.T.S.

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24

DWG NO. 213



CATCH BASIN INTERIOR VIEW

NOT TO SCALE

NOTES:

1. THE CPS SHOWN ABOVE IS FOR ILLUSTRATIVE PURPOSES ONLY. THE CATCH BASIN CONNECTOR PIPE LOCATION AND THE SHAPE AND DESIGN OF THE CPS MAY SIGNIFICANTLY DEVIATE FROM THE ABOVE EXAMPLE.
2. FOR THE GRATED CATCH BASINS, "G" SHALL BE MEASURED FROM THE TOP OF GRATE TO THE TOP OF THE CPS DEFLECTOR PLATE.

CPS LENGTH	L = A+2B
CPS HEIGHT AT PROJECTED SLOPE	Hs
BYPASS HEIGHT	Hb
MINIMUM WALL CLEARANCE	C > = 4"
MINIMUM BAR SPACING	S > = 6"
MINIMUM INTERIOR SPACING	B > = 10"
MINIMUM DISTANCE FROM FLOW LINE	G > = 4"

DRAWN BY: STAFF

CHECKED BY: AN

SCALE: N.T.S.

CITY OF PLEASANTON

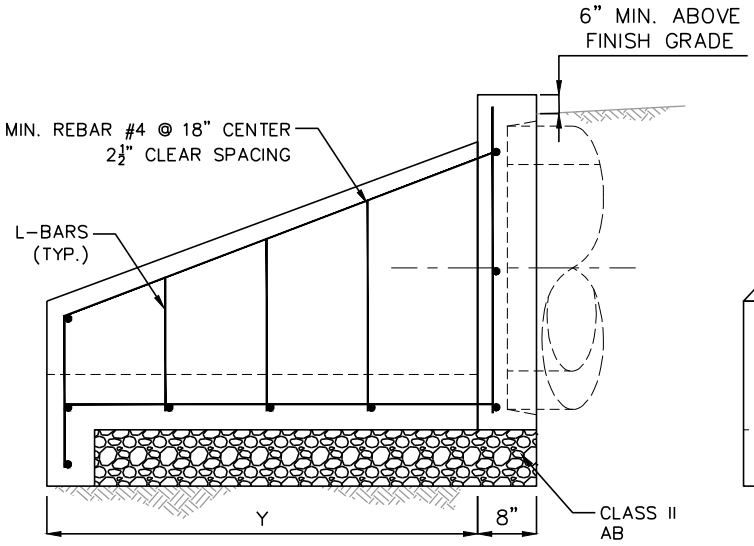
STANDARD DETAILS

CONNECTOR PIPE SCREEN CONFIGURATION

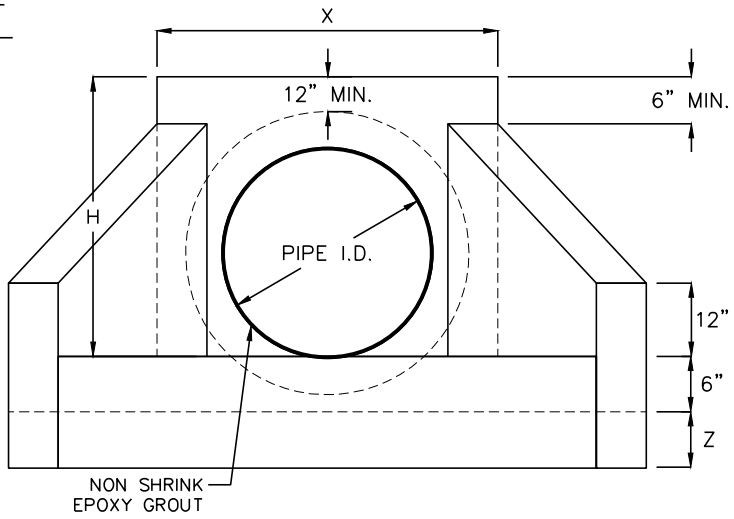
REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24

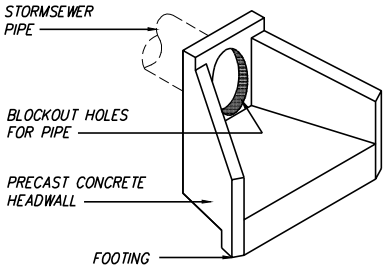
DWG NO. 214

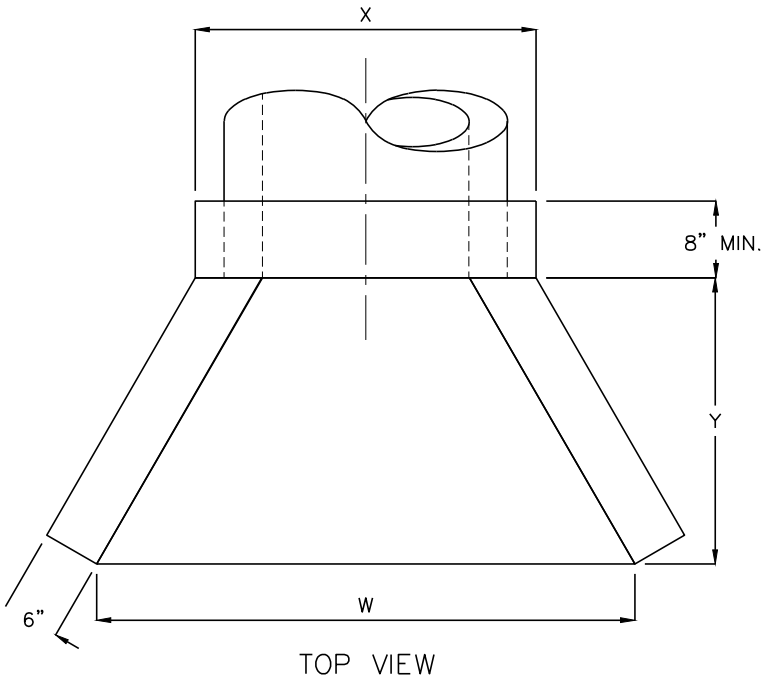


SIDE VIEW



FRONT VIEW





TOP VIEW

PIPE DIA	DIMENSIONS				
	H	W	X	Y	Z
12"	2'-6"	4'-3"	3'-0"	2'-0"	6"
15"	2'-6"	4'-3"	3'-0"	2'-0"	6"
18"	2'-6"	4'-3"	3'-0"	2'-0"	6"
21"	3'-0"	5'-10"	3'-2"	3'-0"	6"
24"	3'-0"	5'-10"	3'-2"	3'-0"	6"

NOTES:

1. CLEAR DISTANCES TO STEEL SHALL BE TWO AND HALF INCHES.
2. THE MAXIMUM SIZE PIPE CULVERTS TO BE USED SHALL BE 24 INCH DIAMETER. SPECIAL DETAILS REQUIRED FOR LARGER SIZES OF PIPE.
3. STEEL SPACING SHOWN IS MAXIMUM ALLOWABLE.
4. CLASS II CONCRETE WITH DESIGN STRENGTH 3,000 PSI AT 28 DAYS.

DRAWN BY: STAFF

CHECKED BY: AN

SCALE: N.T.S.

CITY OF PLEASANTON

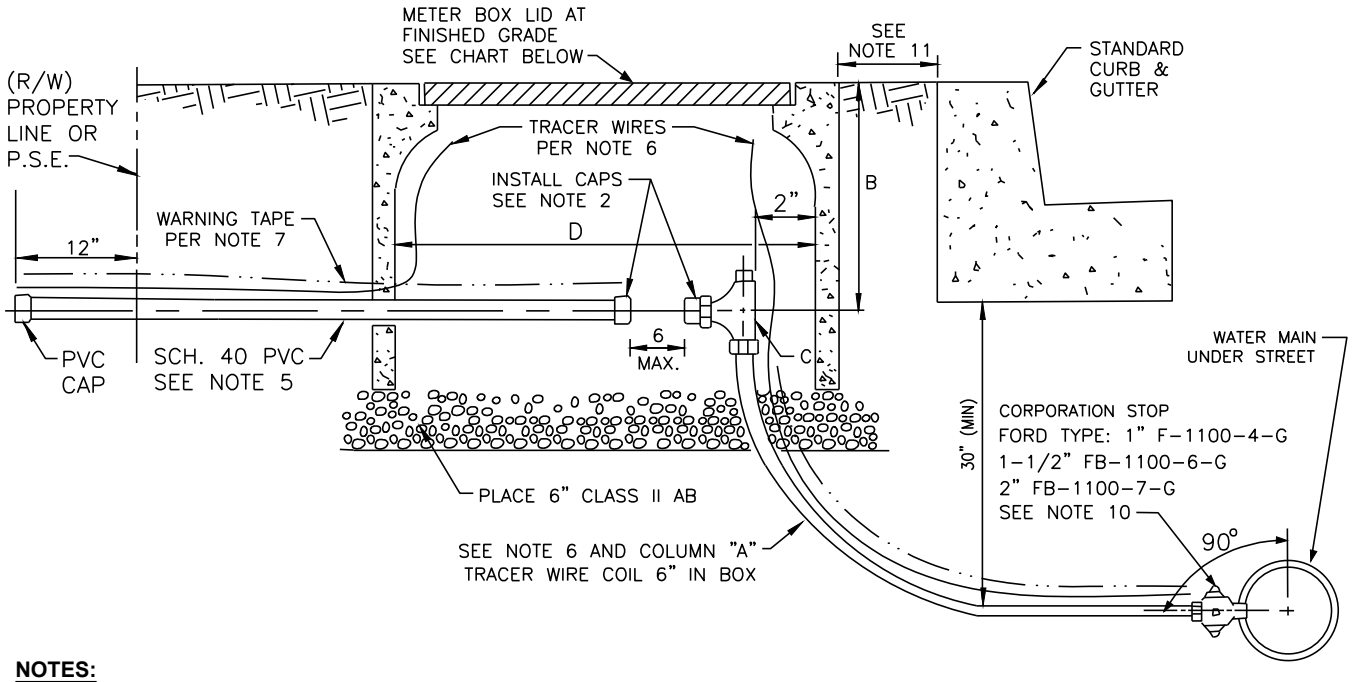
STANDARD DETAILS

HEADWALL FOR STORMWATER PIPING

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24

DWG NO. 215



NOTES:

1. WATER METERS SHALL BE PURCHASED FROM AND SET BY THE CITY OF PLEASANTON UTILITY DEPT.
2. NO CONNECTION TO THE CITY WATER SYSTEM SHALL BE MADE WITHOUT A WATER METER AND ACTIVE ACCOUNT.
3. 5/8" BRASS BOLTS SHALL BE INSTALLED AT METER OR ADAPTER.
4. SERVICE LINE SHALL BE INSTALLED IN A STRAIGHT LINE PERPENDICULAR FROM MAIN TO PROPERTY LINE.
5. 3/4" SCH. 40 PVC FOR 5/8" AND 3/4" METERS. 1" PVC FOR 1" METER. 1-1/2" PVC FOR 1-1/2" METER. 2" PVC FOR 2" METER.
6. FOR 1" SERVICE LINES, ONE CONTINUOUS PIECE OF TYPE "K" COPPER TUBING SHALL BE PLASTIC COATED SHALL BE USED. ALL FITTINGS SHALL BE COMPRESSED TYPE. FOR 1-1/2" AND 2" LINES, USE CLASS 200 POLYETHYLENE. TUBING SHALL CONFORMS TO ASTM D-2737 AND AWWA C-901 WITH A PRESSURE RATING OF 200 PSI AND SHALL BE "INTERSTATE POLY TUBING" OR APPROVED EQUAL. 1 1/2" AND 2" SERVICE LINES REQUIRE TRACER WIRE TO BE INSTALLED WITH THE SERVICE.
7. WARNING TAPE MARKED "CAUTION" WATER LINE BURIED BELOW ''SHALL BE INSTALLED 1' ABOVE THE WATER SERVICE. SEE SPEC. 14-03J.
8. IF METER AND SERVICE SIZE ARE OTHER THAN THOSE LISTED BELOW, PROVIDE A DETAIL DRAWING.
9. TAPS ABOVE 1''REQUIRES A SADDLE (1-1/2" AND 2")
   1. ACP - FORD MODEL S912
   2. C.I.P./D.I.P. - FORD MODEL FSD202
   3. P.V.C.- FORD MODEL S912
10. STUB PVC LINE:
    1. 12" OUTSIDE OF METER BOX OR 12" BEHIND PROPERTY LINE.
    2. 4" BEHIND CURB, WHERE PLANTER AREA EXIST BETWEEN CURB AND SIDEWALK.
    3. 4" BEHIND SIDEWALK, WHERE SIDEWALK IS MONOLITHIC TO CURB.
11. JOINT TRENCH DEPTH SHALL BE DETERMINED BEFORE WATER SERVICE IS INSTALLED.

						* OR APPROVED EQUAL
METER SIZE	A	B	C*	D*	INSIDE DIMENSIONS	ARMORCAST LID
3/4"	1"	8"	FORD BA—43—442W—G	CHRISTY B12	12"X20"	A6000484T-PLEASANTON
1"	1"	8"	FORD BA-43-444W-G	CHRISTY B12	12"X20"	A6000484T-PLEASANTON
1"	1 1/2"	8"	FORD BFA— 43 — 666W —G	CHRISTY B30	13— 1/4"X24"	A6001969-PLEASANTON
1 1/2"	1 1/2"	8"	FORD BFA— 43 — 666W —G	CHRISTY B36	13— 1/4"X24"	A6001947 T-PLEASANTON
2"	2"	8"	FORD BFA— 43 — 777W —G	CHRISTY B36	17— 1/4"X30"	A6001947 T-PLEASANTON

DRAWN BY: STAFF

CHECKED BY: AN

SCALE: N.T.S.

CITY OF PLEASANTON

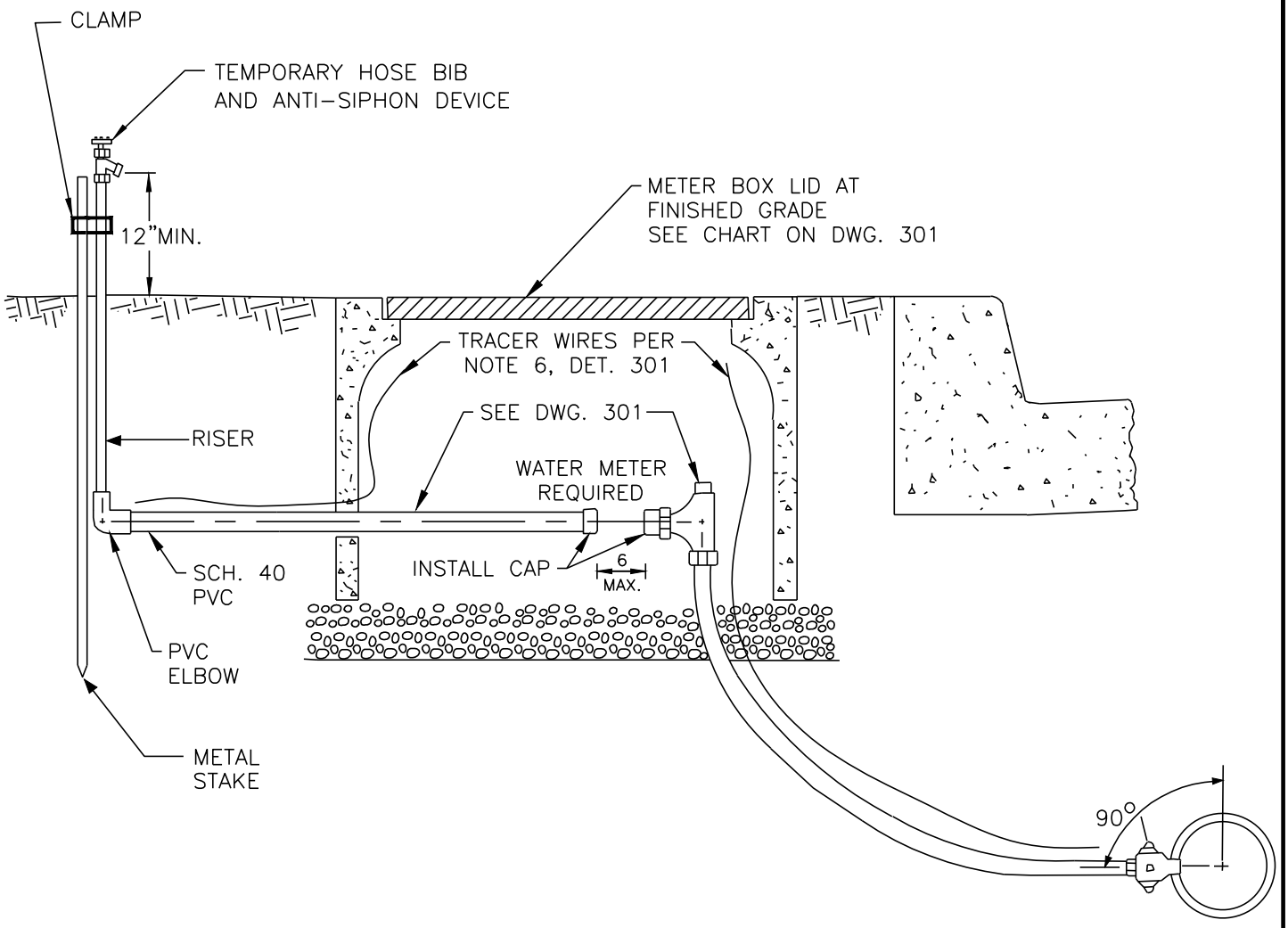
STANDARD DETAILS

STANDARD WATER SERVICE FOR RESIDENTIAL

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24

DWG NO. 301



NOTES:

1. WATER METERS SHALL BE PURCHASED FROM AND SET BY THE CITY OF PLEASANTON UTILITY DEPARTMENT.
2. NO CONNECTION TO THE CITY WATER SYSTEM SHALL BE MADE WITHOUT A WATER METER AND ACTIVE ACCOUNT.
3. SEE DETAIL 301 FOR WATER CONNECTION SPECIFICATIONS.
4. THIS DETAIL IS FOR TEMPORARY CONSTRUCTION WATER ONLY.

NO.	REVISION	BY

DRAWN BY: STAFF

CHECKED BY: AN

SCALE: N.T.S.

CITY OF PLEASANTON

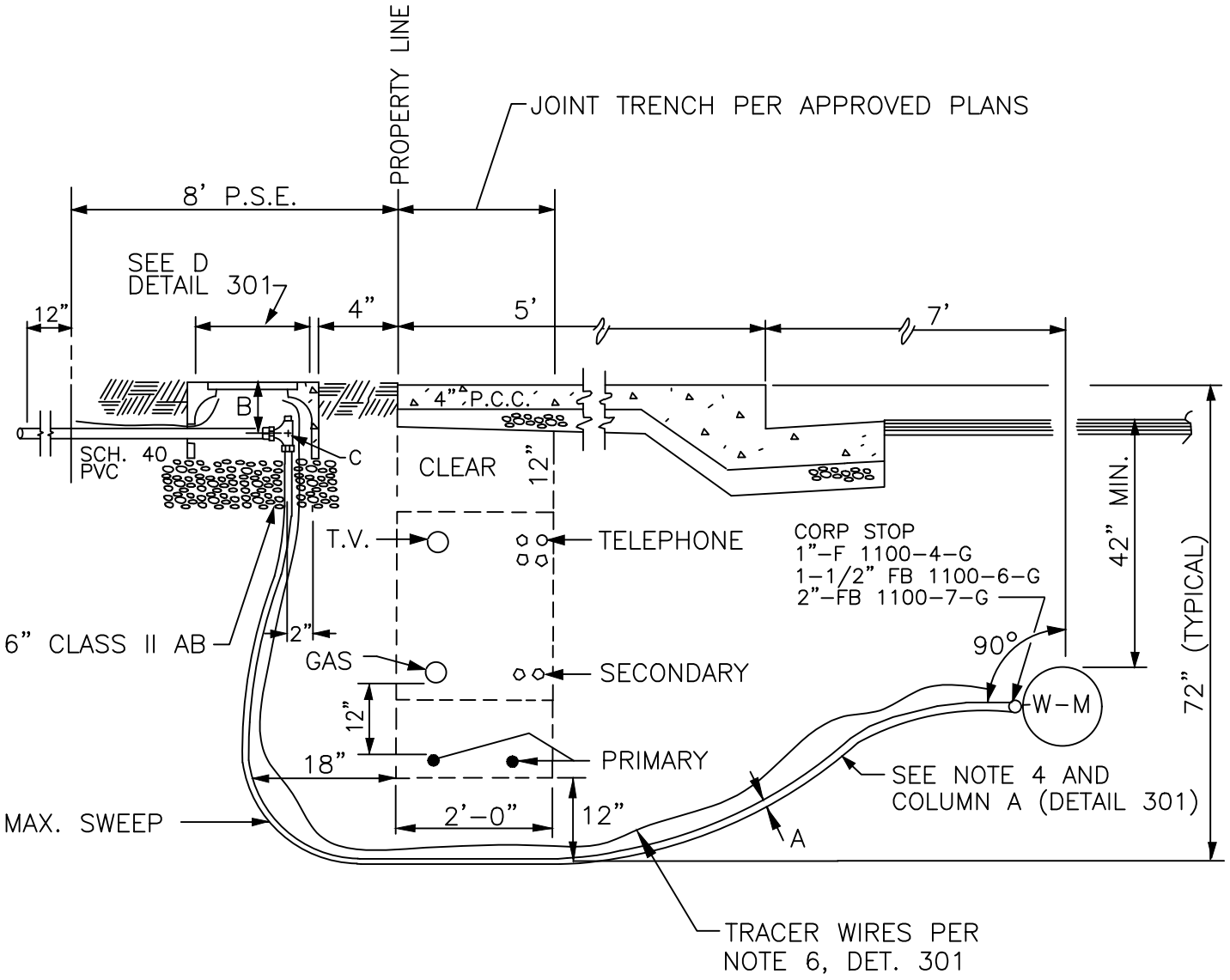
STANDARD DETAILS

TEMPORARY WATER SERVICE FOR RESIDENTIAL DURING CONSTRUCTION ONLY

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NEUKIRK
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24

DWG NO. 302



NOTES:

1. JOINT TRENCH DEPTH SHALL BE DETERMINED BEFORE WATER SERVICE IS INSTALLED.

2. FOR ADDITIONAL NOTES SEE DETAIL 301.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

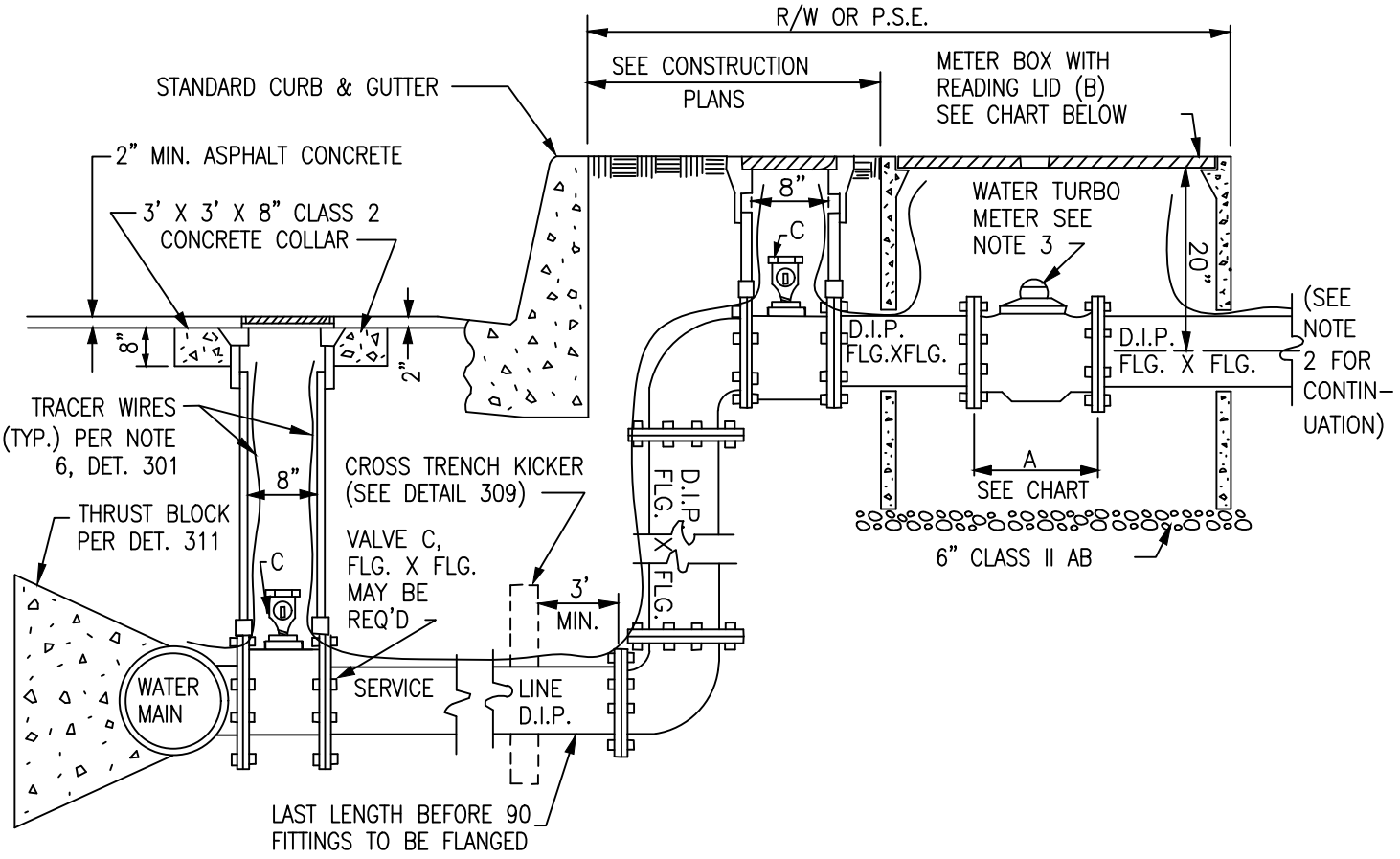
CITY OF PLEASANTON

STANDARD DETAILS

STANDARD WATER SERVICE (MONOLITHIC SIDEWALK) ON SIDE OF STREET W/JOINT TRENCH

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 303



METER SIZE	A	B*	C
3	SPACER PROVIDED BY CITY UTILITY DEPARTMENT	BROOKS #67-S CHRISTY B-36-M-75	GATE VALVE
4		BROOKS #67-S CHRISTY B-36-M-75	GATE VALVE
6		BROOKS #68-2PC CHRISTY B-40-M-75	GATE VALVE
		* OR APPROVED EQUAL	

NOTES:

1. ADDITIONAL VALVES SHALL BE REQUIRED TO ISOLATE ADDITIONAL METERS OR WATER SERVICES.
2. SEE BACK FLOW REQUIREMENTS 700 DETAILS.
3. WATER METER SHALL BE PURCHASED FROM AND SET BY THE CITY OF PLEASANTON UTILITIES DEPARTMENT.
4. ALL THRUST BLOCKS TO BE POURED AGAINST UNDISTURBED SOIL PER DET. 311.
5. METERS AND BACKFLOW PREVENTORS TO BE LOCATED BEHIND LANDSCAPE BERM WITHIN PSE.

DRAWN BY: STAFF	
CHECKED BY: AN	
SCALE: N.T.S.	

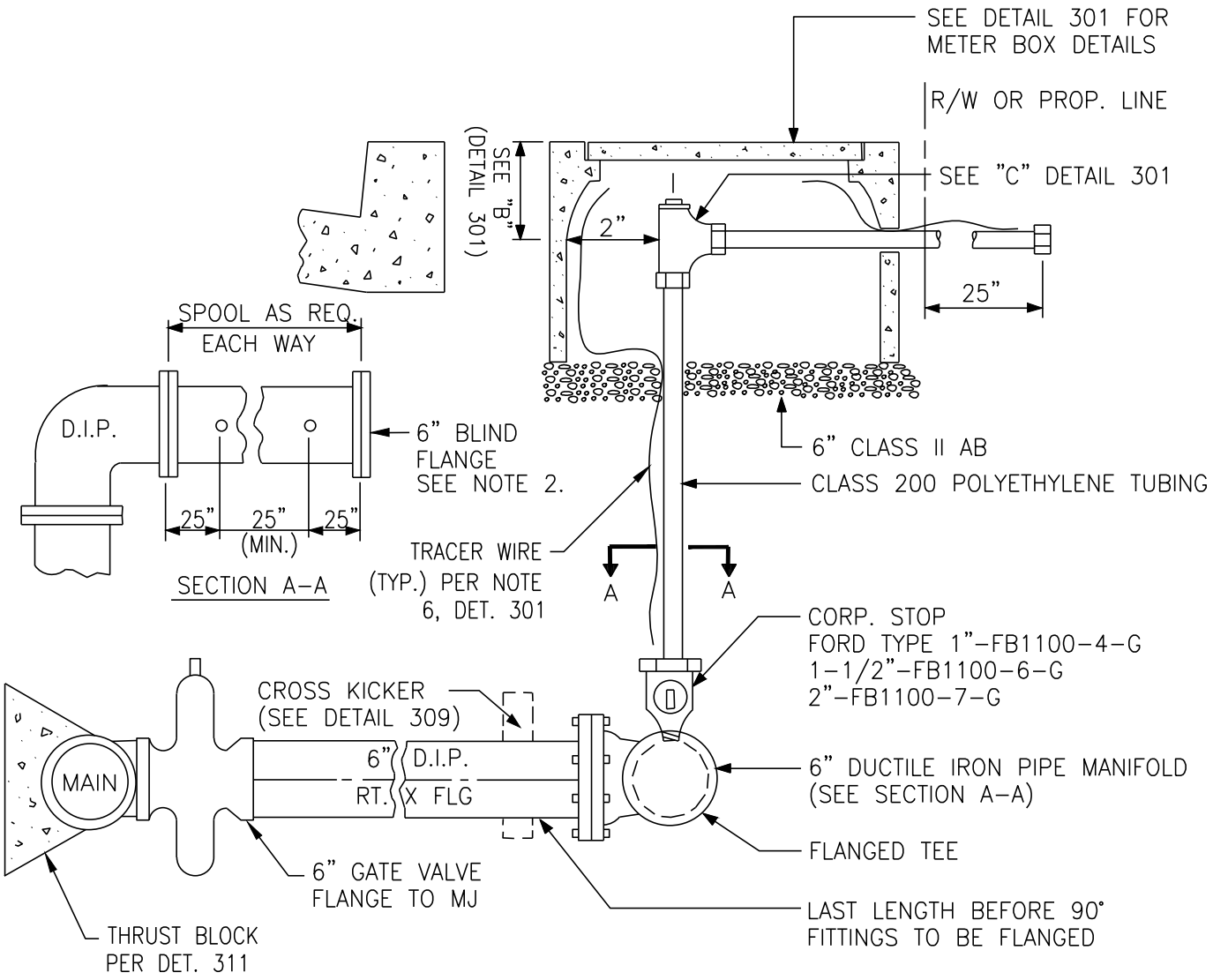
CITY OF PLEASANTON

STANDARD DETAILS

COMMERCIAL AND INDUSTRIAL WATER SERVICE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

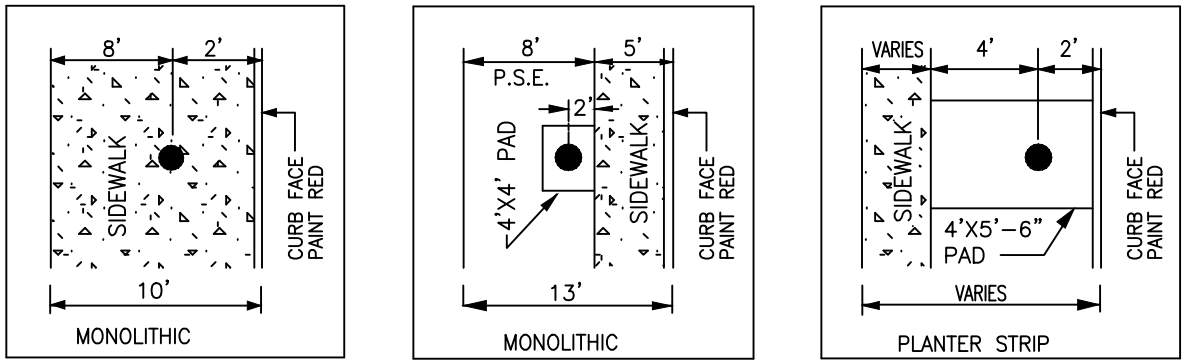
DATE : 7/24 | DWG NO. 304

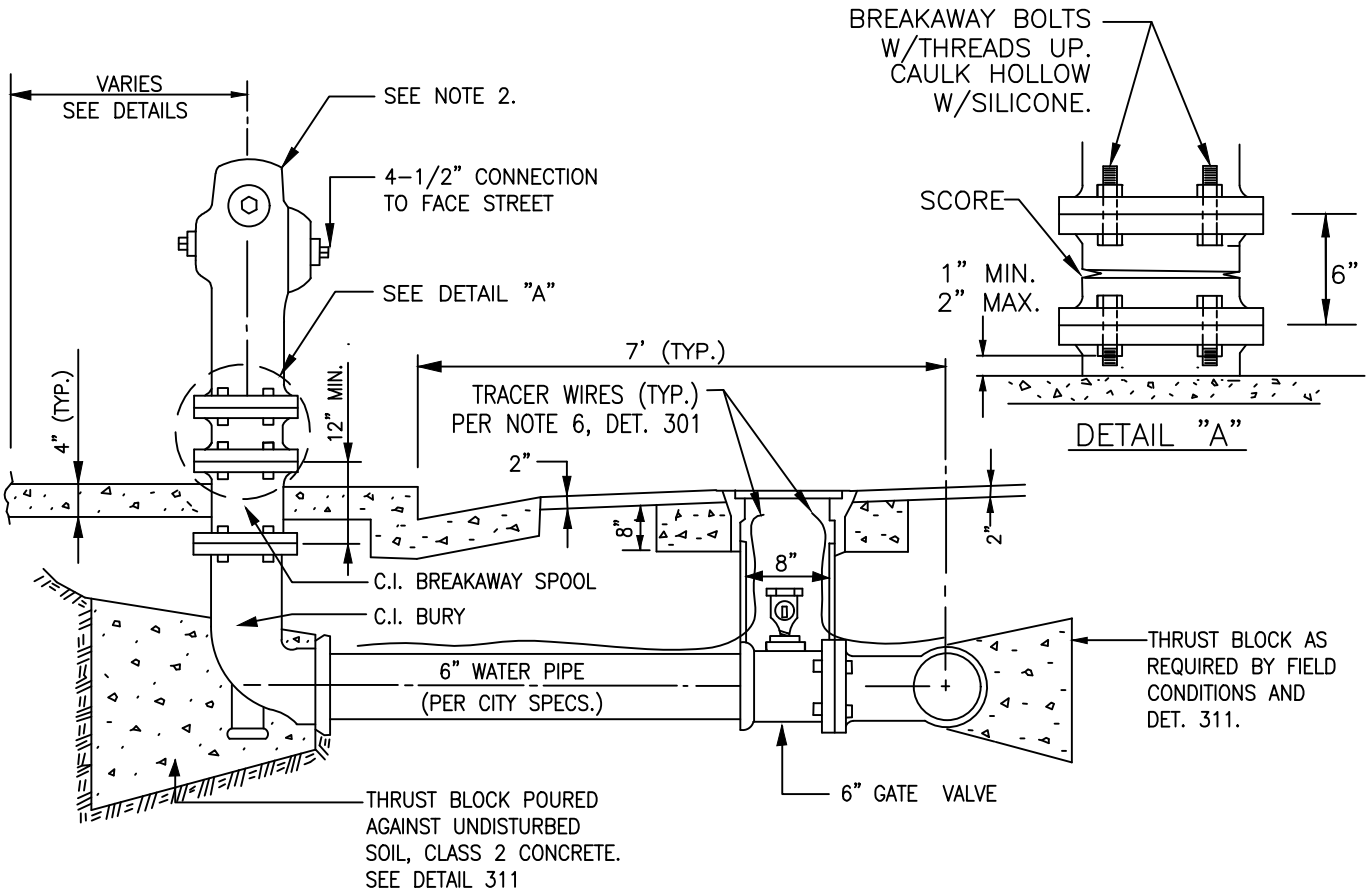


NOTES:

1. FOR NOTES SEE DETAIL 301.
2. LAST WATER SERVICE LATERAL TO BE TAPED ON END OF BLIND FLANGE.
3. ALL DUCTILE IRON PIPE SHALL BE ENCAPSULATED WITHIN 8 MIL POLYETHYLENE ENCASEMENT PER CITY STANDARD SPECIFICATIONS.
4. WATER METERS CLUSTERED AT A SINGLE MANIFOLD SHALL HAVE THE CORRESPONDING HOUSE NUMBERS ENGRAVED OR STAMPED ON A METAL TAG AND BE ATTACHED WITH A METAL RING TO THE PIPE.

DRAWN BY: STAFF	CITY OF PLEASANTON STANDARD DETAILS MANIFOLD WATER SERVICE	REGISTERED PROFESSIONAL ENGINEER ADAM MATTHEW NELKIE No. 78830 Exp. 9/30/2025 CIVIL STATE OF CALIFORNIA
CHECKED BY: AN		
SCALE: N.T.S.		DATE : 7/24 | DWG NO. 305





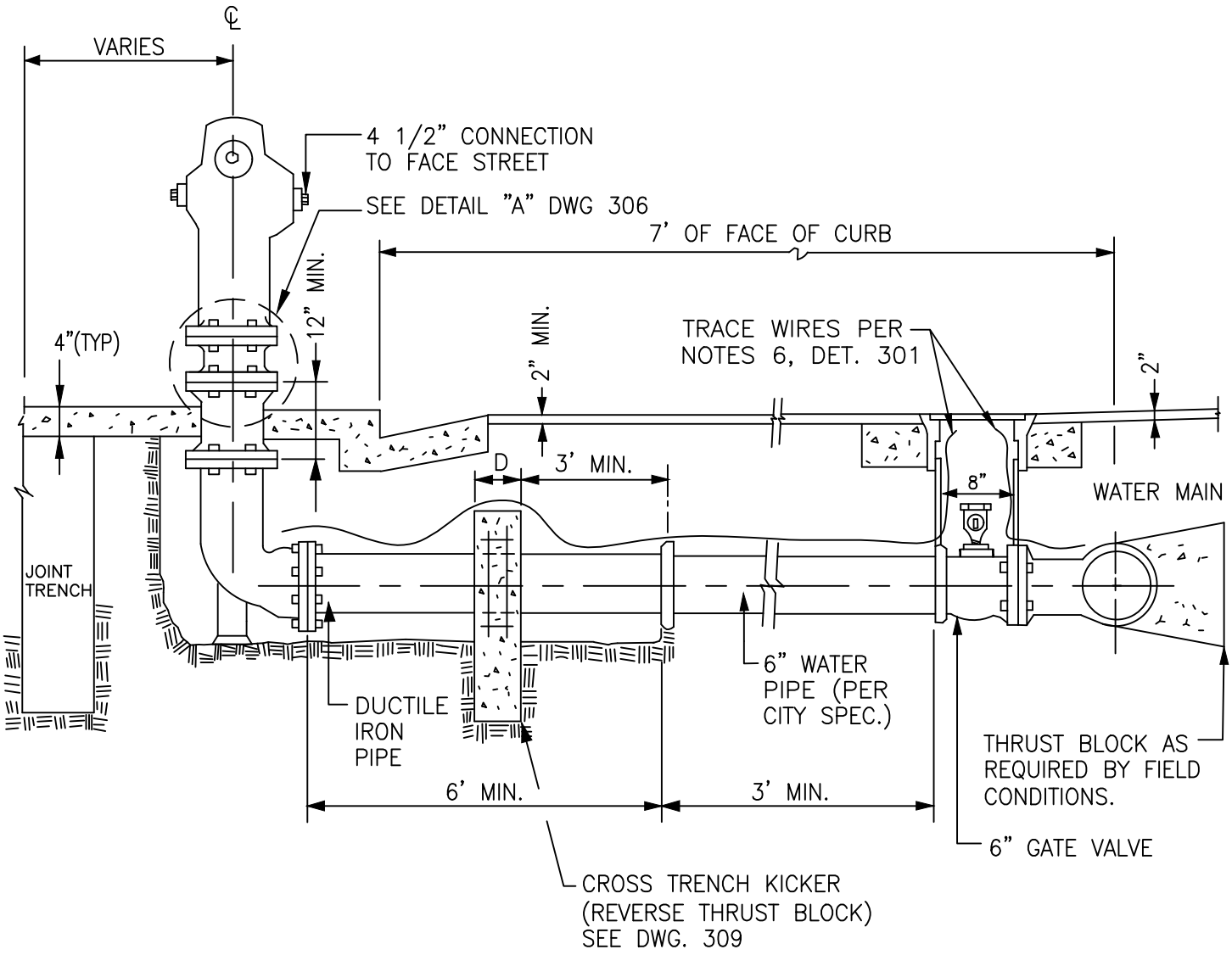
NOTES:

1. WHEN THE HYDRANT IS ON THE SAME SIDE OF THE STREET AS THE JOINT TRENCH, SEE DETAIL 307.
2. FOR HYDRANT TYPES SEE SECTION 14-02 E, CITY STANDARD SPECIFICATIONS.
3. ALL FITTINGS SHALL BE FACTORY CEMENT LINED OR FUSION EPOXY COATED.
4. THE FACE AND TOP OF CURB SHALL BE PAINTED RED FOR 4.5' ON BOTH SIDES OF THE HYDRANT, UNLESS OTHERWISE APPROVED BY THE ENGINEER.

DRAWN BY: STAFF	CITY OF PLEASANTON
CHECKED BY: AN	STANDARD DETAILS
SCALE: N.T.S.	FIRE HYDRANT CONNECTION

REGISTERED PROFESSIONAL ENGINEER
ANN MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 306



NOTES:

1. SEE DETAIL 306 FOR GENERAL FIRE HYDRANT NOTES AND DETAILS.
2. AT THE CONTRACTORS OPTION THE CROSS KICKER MAY BE ELIMINATED IF THE PIPE IS FLANGED FROM THE MAIN TO THE HYDRANT.
3. DUCTILE IRON PIPE SHALL ALSO BE USED IF THE JOINT TRENCH IS IN FRONT OF THE HYDRANT.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

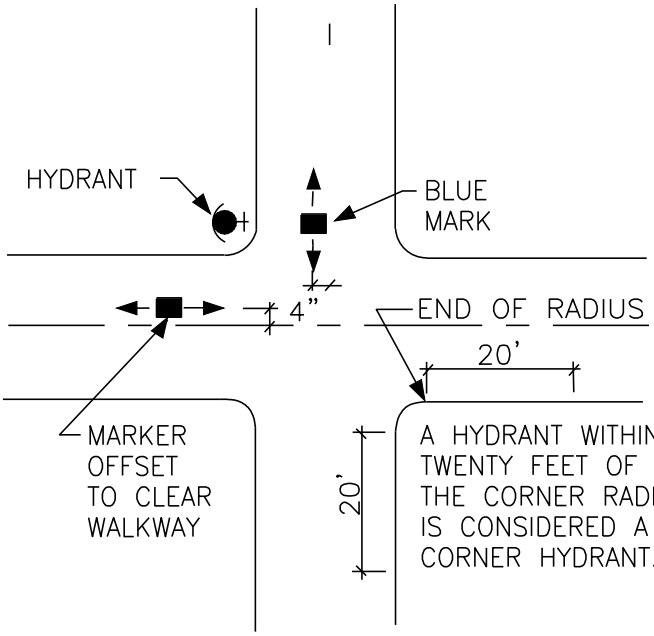
STANDARD DETAILS

FIRE HYDRANT CONNECTION (WITH HYDRANT ON SAME SIDE OF STREET AS JOINT TRENCH)

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

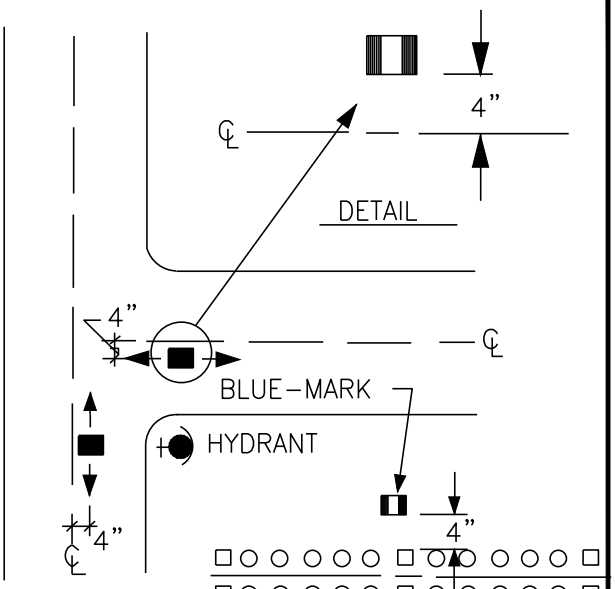
DATE : 7/24 | DWG NO. 307

CORNER HYDRANTS



CASE "A"

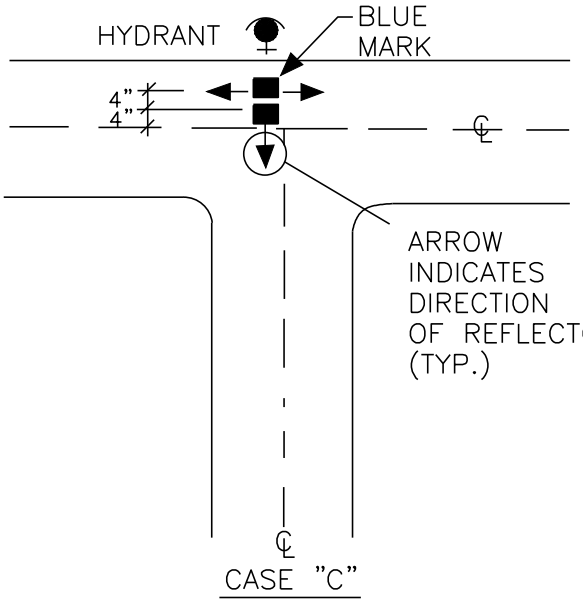
CORNER HYDRANT TEE INTERSECTION



W/CENTER LINE PAVEMENT MARKERS

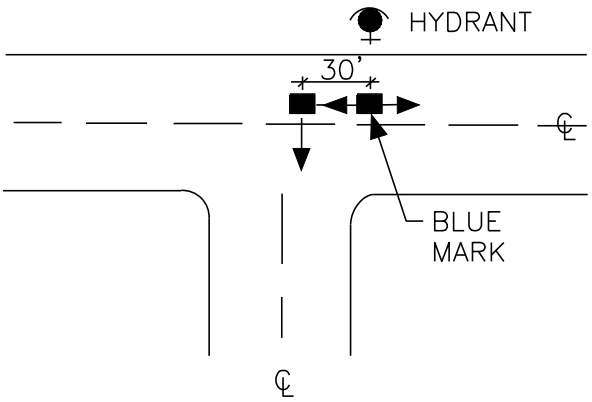
CASE "B" DETAIL

TEE INTERSECTION WITH HYDRANT IN THE CENTER



CASE "C"

TEE INTERSECTION WITH HYDRANT OFFSET 30' MAX.



CASE "D"

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

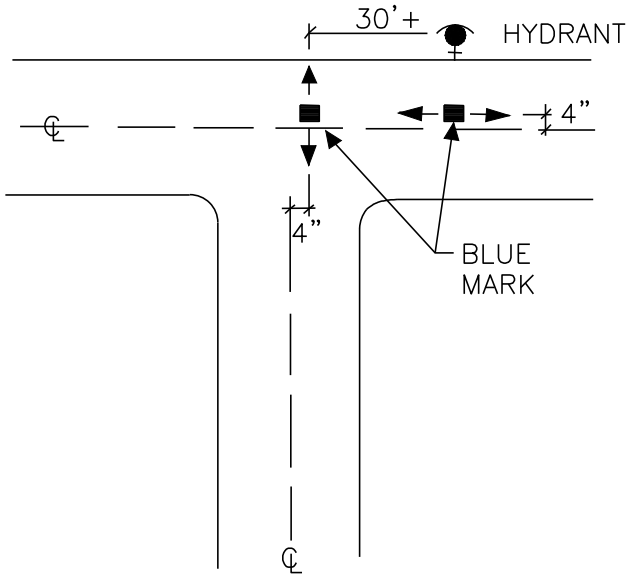
STANDARD DETAILS

LOCATING HYDRANT MARKERS

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

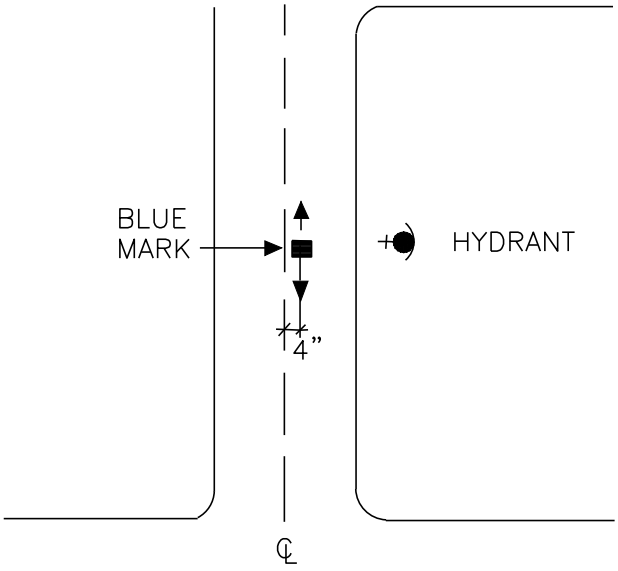
DATE : 7/24 | DWG NO. 308A

TEE INTERSECTION WITH
HYDRANT OFFSET OVER 30'



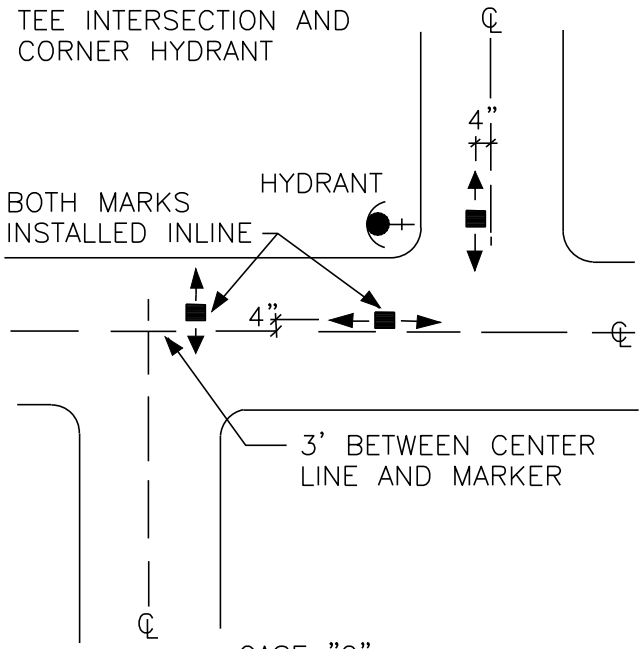
CASE "E"

CENTER OF
BLOCK HYDRANT



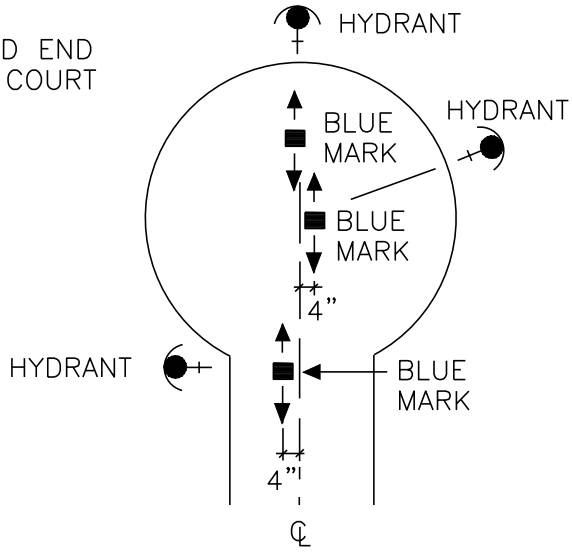
CASE "F"

TEE INTERSECTION AND
CORNER HYDRANT



CASE "G"

DEAD END
OR COURT



CASE "H"

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

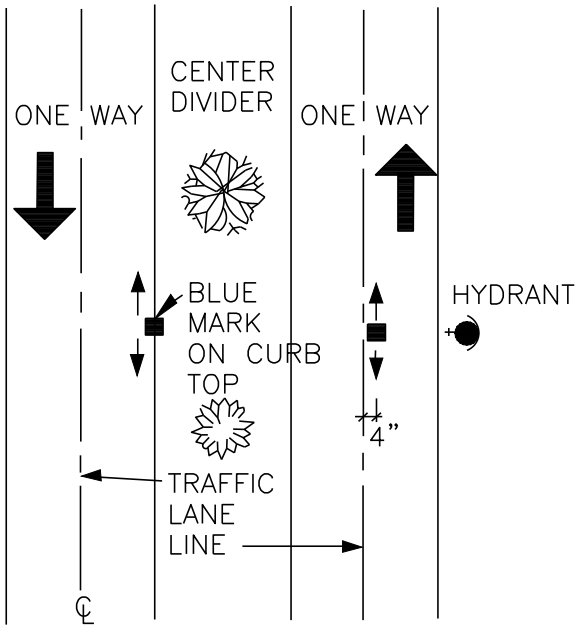
STANDARD DETAILS

LOCATING HYDRANT MARKERS

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NECKAI
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

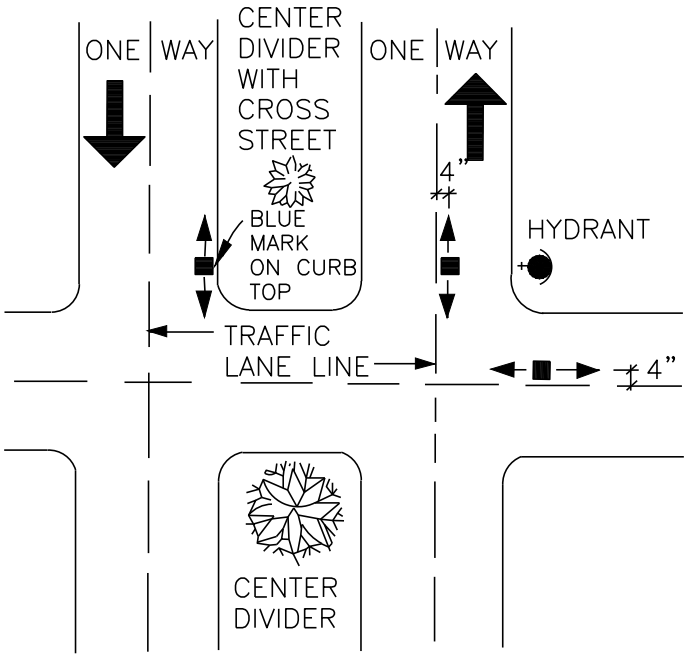
DATE : 7/24 | DWG NO. 308B

CENTER OF BLOCK HYDRANT



CASE "I"

CORNER HYDRANT



CASE "J"

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

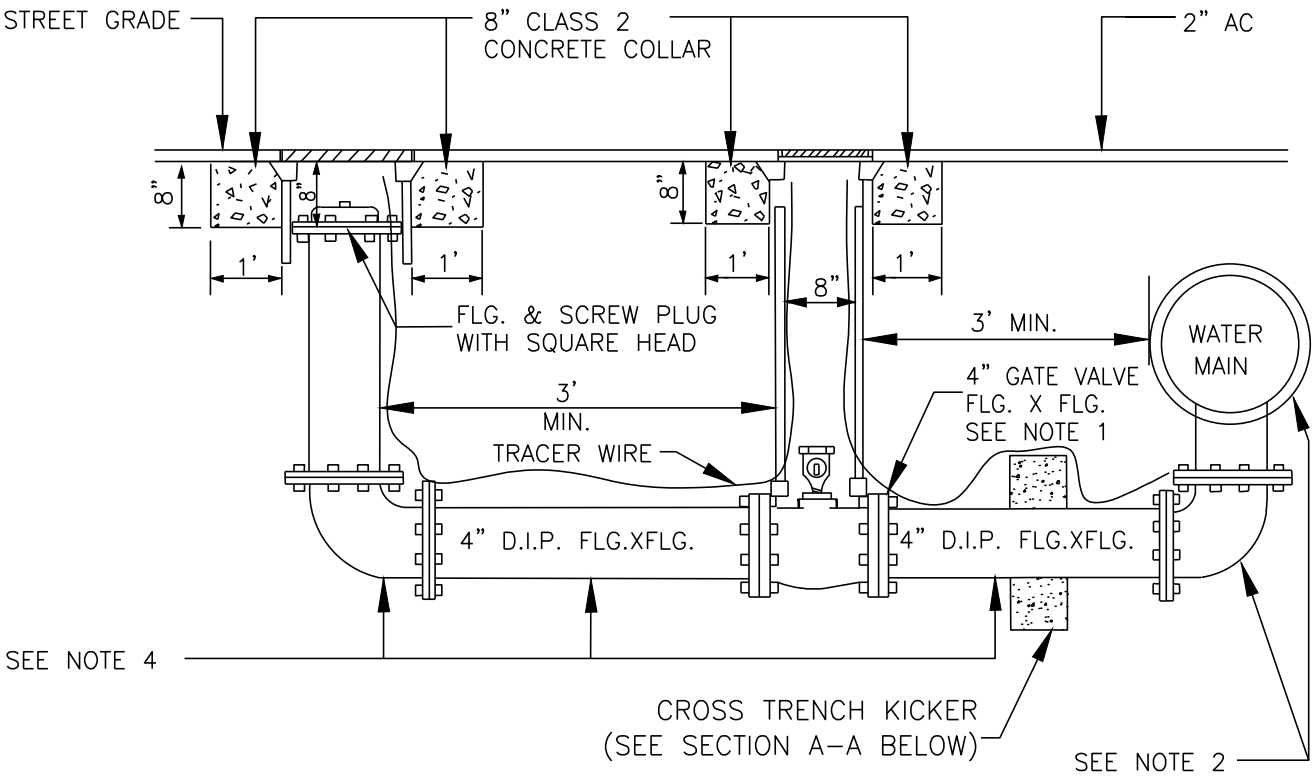
CITY OF PLEASANTON

STANDARD DETAILS

LOCATING HYDRANT MARKERS

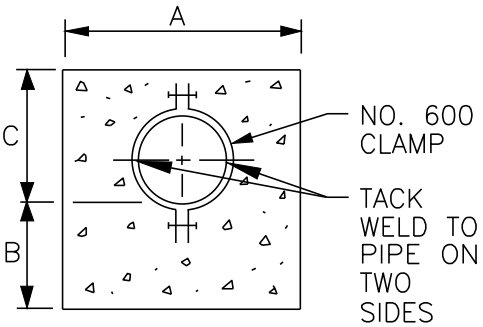
REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 308C



TYPICAL CROSS TRENCH KICKER DIMENSIONS
ADJUST SIZE FOR SOIL CONDITIONS

PIPE-SIZE	A	B	C	DIA.	CU.YDS.
6"	18"	12"	12"	6"	0.1
8"	24"	16"	14"	8"	0.1
10"	30"	21"	18"	10"	0.2
12"	36"	24"	20"	12"	0.4



SECTION A-A

NOTES:

1. EXTENSION REQUIRED FOR GATE VALVE IF DEPTH IS OVER 60".
2. TEE WITH 4" OR 6" FLANGED OUTLET. ELBOW, FLANGED, STD. 4" OR 6" X 4" REDUCING.
3. TERMINATE BLOWOFF WITH 4" W/SQ. HEAD, SCREWED PLUG.
4. 4" DUCTILE IRON PIPE FLANGED X FLANGED.
5. A MINIMUM OF 24 HOURS CURING TIME REQUIRED BEFORE WATER INTRODUCED INTO LINE.
6. A MINIMUM OF 7 DAYS CURING TIME REQUIRED BEFORE PRESSURE TEST.
7. BACK AND BOTTOM OF THRUST BLOCKS TO BE POURED AGAINST UNDISTURBED EARTH.
8. KEEP BOLT UP AREAS FREE OF CONCRETE FOR EASE OF ACCESS.
9. CONTRACTOR IS RESPONSIBLE FOR ALL CROSS TRENCH KICKER LOCATIONS.

DRAWN BY: STAFF
CHECKED BY: AR
SCALE: N.T.S.

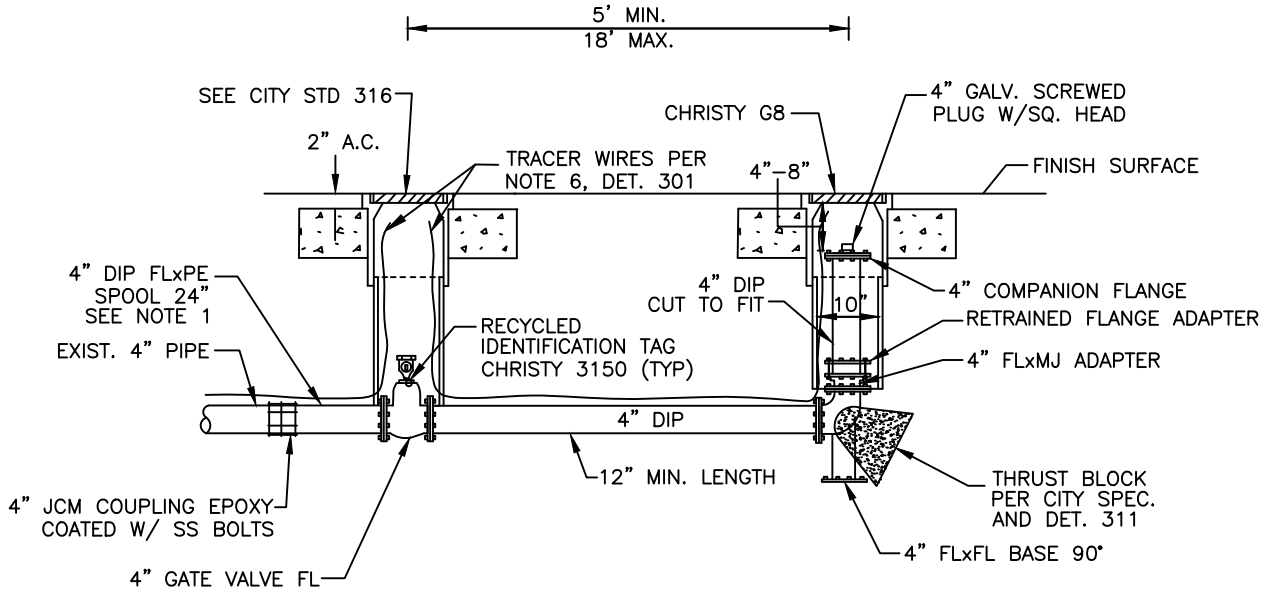
CITY OF PLEASANTON

STANDARD DETAILS

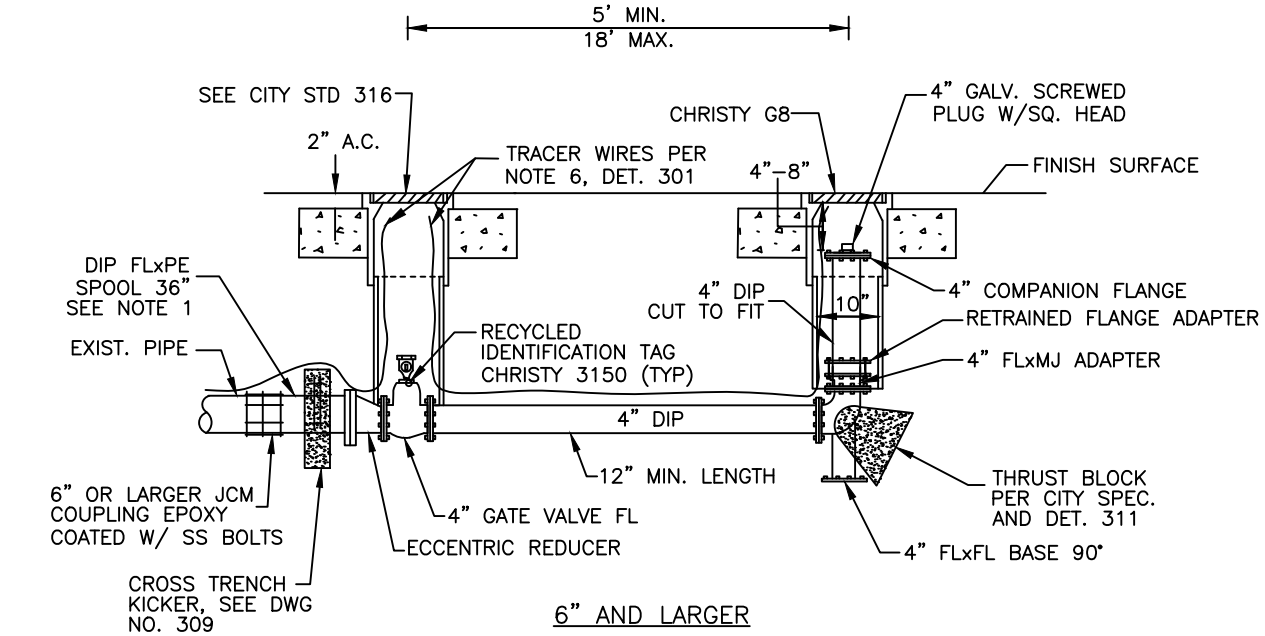
MID LINE BLOW OFF

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 309



EXISTING 4" MIN. SIZE TO MAIN LINE



6" AND LARGER

NOTES:

1. IF EXISTING PIPE IS LARGER THAN 4", JCM COUPLING FOR ACP SOLID SLEEVE FOR PVC/DIP AND 36" MIN. DIP SPOOL SHALL BE SAME DIAMETER AS EXISTING PIPE AND AN ADDITIONAL FLxFL REDUCER SHALL BE INSTALLED BETWEEN 36" SPOOL AND 4" GATE VALVE. INSTALL CROSS TRENCH KICKER ON SPOOL.
2. RECYCLE WATER SHALL FOLLOW RECYCLED WATER STDS AND INCLUDE TAGS, PURPLE RISERS, PURPLE LIDS, ETC.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

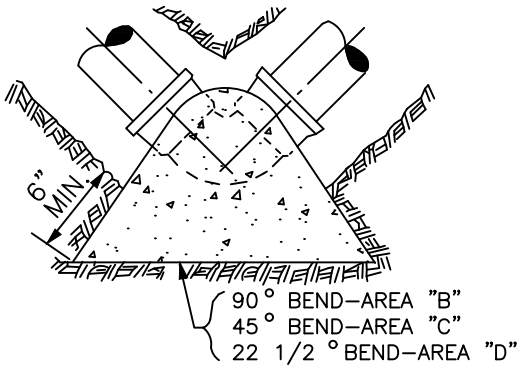
CITY OF PLEASANTON

STANDARD DETAILS

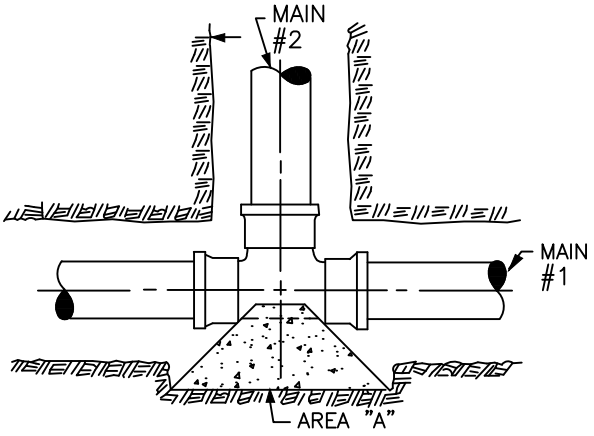
BLOWOFF AT DEAD END NEW CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

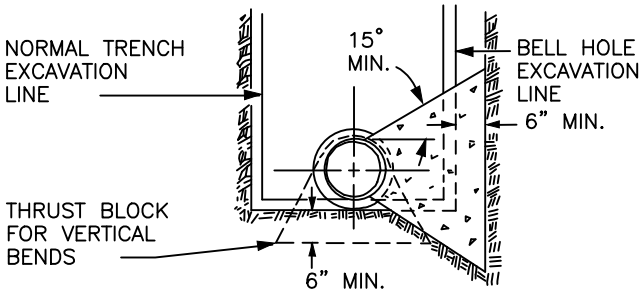
DATE : 7/24 | DWG NO. 310



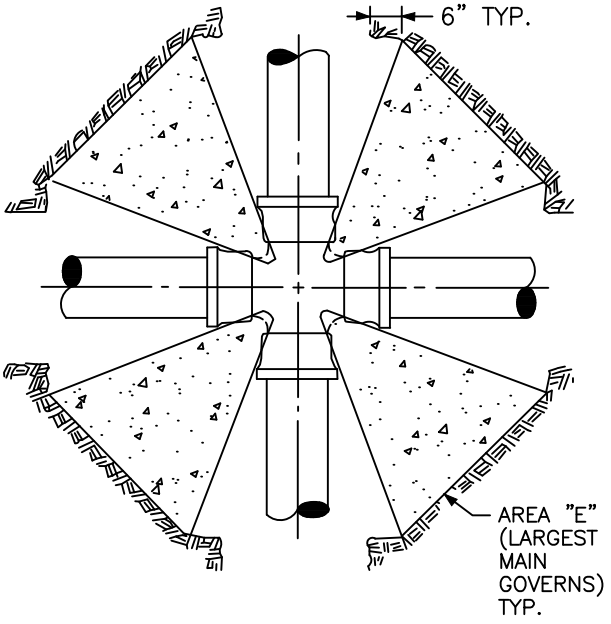
HORIZONTAL AND VERTICAL DOWNTHRUST BENDS



TEE



TYPICAL SECTION



CROSS

MINIMUM THRUST BLOCK BEARING AREAS IN SQUARE FEET					
PIPE SIZE	AREA				
	A	B	C	D	E
6"	4	6	3	2	3
8"	7	10	5	3	5
10"	11	15	8	4	8
12"	15	22	12	6	11
14"	21	29	16	8	15
16"	27	38	21	12	19
NOTE: VALUES SHOWN ARE BASED ON 1500 PSF SOIL BEARING PRESSURE AND 200 PSI TEST PRESSURE. AREAS MAY BE INCREASED BY THE ENGINEER IF FIELD CONDITIONS WARRANT.					

NOTES:

1. THRUST BLOCK SHALL BE CLASS 2 P.C.C.
2. CONCRETE SHALL NOT EXTEND BEYOND FACE OF BELL FOR SLIP–ON JOINTS NOR INTERFERE WITH FLANGES, NUTS OR BOLTS ON FLANGED JOINTS.
3. A MINIMUM OF 24 HOURS CURING TIME REQUIRED BEFORE WATER INTRODUCED INTO LINE.
4. A MINIMUM OF 7 DAYS CURING TIME REQUIRED BEFORE PRESSURE TEST.
5. BACK AND BOTTOM OF THRUST BLOCKS TO BE POURED AGAINST UNDISTURBED EARTH.
6. KEEP BOLT UP AREAS FREE OF CONCRETE FOR EASE OF ACCESS.
7. CONTRACTOR IS RESPONSIBLE FOR ALL THRUST BLOCK LOCATIONS.
8. THIS DETAIL IS TO BE USED AS A DESIGN GUIDE ONLY. ACTUAL SIZE OF THRUST BLOCK TO BE DETERMINED BY THE ENGINEER.
9. SEE DETAIL 309 FOR CROSS TRENCH KICKER DIMENSIONS.

DRAWN BY: STAFF

CHECKED BY: AN

SCALE: N.T.S.

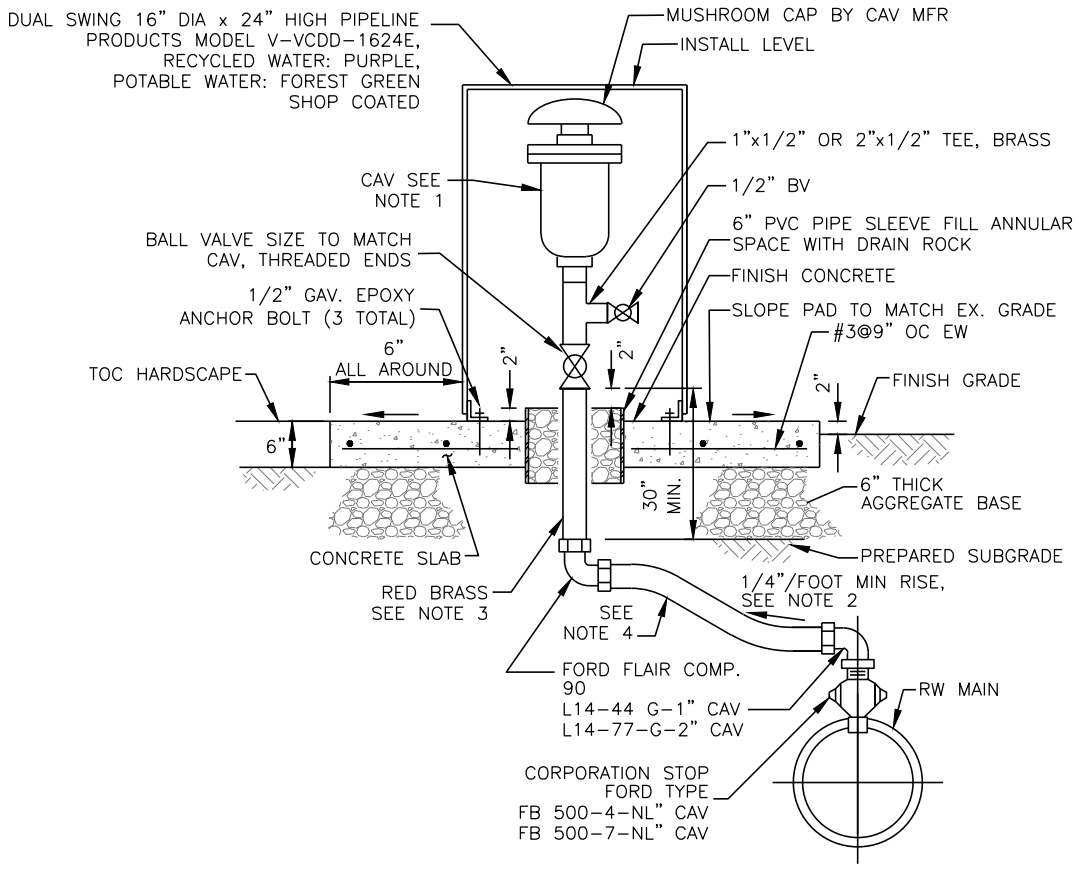
CITY OF PLEASANTON

STANDARD DETAILS

TYPICAL THRUST BLOCKS

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 311



SECTION (ABOVE GROUND CAV)

COMBINATION AIR VALVE (CAV)

NTS

NOTES:

1. CAV SHALL BE APCO 143C FOR 1"TUBING AND APCO 145C FOR 2" TUBING, OR APPROVED EQUAL.
2. SERVICE LINE SHALL BE RUN IN A STRAIGHT LINE PERPENDICULAR TO PROPERTY LINE FROM MAIN TO PROPERTY LINE AND HAVE POSITIVE SLOPE.
3. 1" RED BRASS FOR 1" CAV. 2" RED BRASS FOR 2" CAV.
4. POLYETHYLENE TUBING SHALL CONFORM TO A.S.T.M. D-2737 & AWWAC-901 WITH A PRESSURE RATING OF 200 PSI AND SHALL BE "INTERSTATE POLY TUBING" OR APPROVED EQUAL. PURPLE TUBING FOR RECYCLE WATER.
5. WARNING TAPE MARKED "CAUTION RECYCLED WATER LINE BURIED BELOW" OR "POTABLE WATER" SHALL BE INSTALLED 12" ABOVE THE WATER SERVICE.
6. TAPS FOR 2" REQUIRE A SADDLE.
7. 4" BEHIND CURB - WHERE PLANTER AREA EXISTS BETWEEN CURB AND SIDEWALK, 4" BEHIND SIDEWALK - WHERE SIDEWALK IS MONOLITHIC TO CURB.
8. FIELD COAT CAV AND ENCLOSURE W/12 MILS DFT AMINE CURED EPOXY, AMERCOAT 395 OR EQUAL. RECYCLED WATER COLOR: PURPLE PANTONE 512. POTABLE WATER COLOR: FOREST GREEN.
9. SEE PLANS FOR GENERAL PLACEMENT LOCATIONS.

REVISED 1/24		
DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

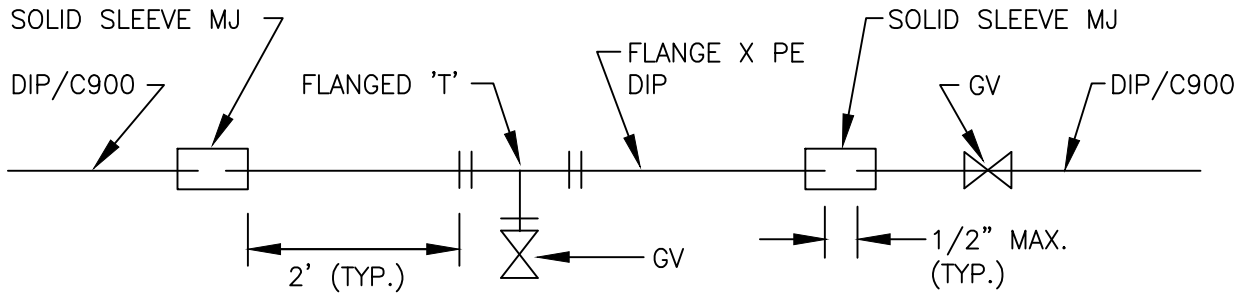
CITY OF PLEASANTON

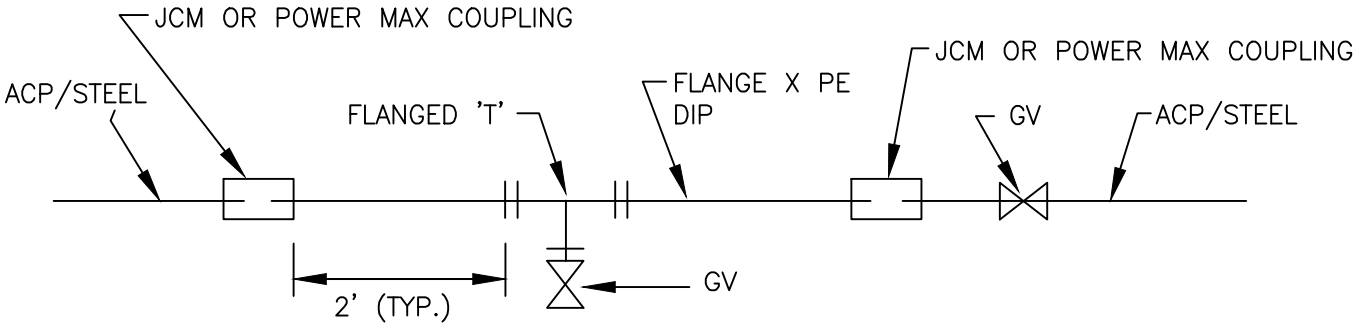
STANDARD DETAIL

COMBINATION AIR - VACUUM RELEASE VALVE ASSEMBLY

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 312





NOTE:

CONTRACTOR TO FOLLOW AWWA GUIDELINES FOR CONNECTION TO ACP.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

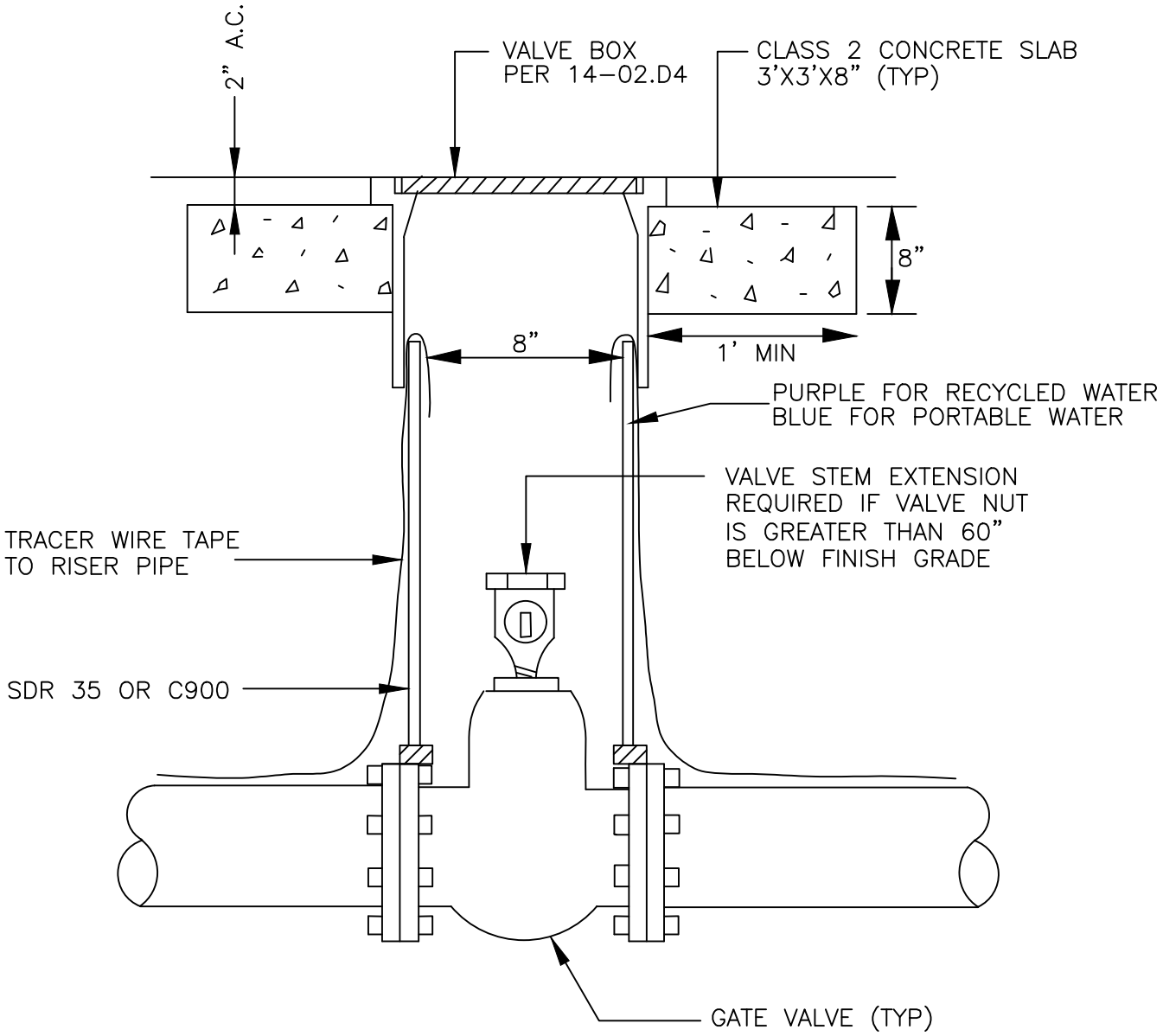
CITY OF PLEASANTON

STANDARD DETAILS

TEE INSTALLATION ON EXISTING PIPE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 313



NOTES:

1. ON MAINS WHERE VALVES ARE TO BE INSTALLED ADJACENT TO TEES OR CROSSES, THE VALVES SHALL BE FLG X FLG WITH FLANGED END BOLTED DIRECTLY TO THE TEE OR CROSS.
2. IN-LINE VALVES MAY BE FLG X FLG WITH ADAPTERS OR MJ X MJ ENDS.
3. PROVIDE RECYCLED WATER I.D. TAG IF NON-POTABLE WATER.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

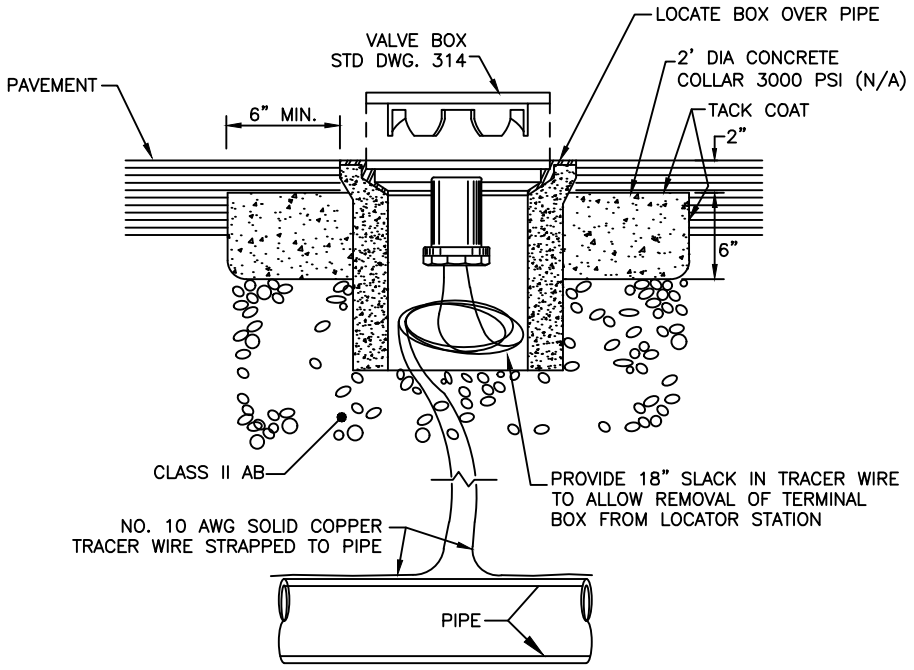
CITY OF PLEASANTON

STANDARD DETAILS

GATE VALVE INSTALLATION

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELATE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 314



NOTES:

1. ALL NON FERRIOUS PIPE SHALL HAVE TRACER WIRE AND LOCATOR BOXES INSTALLED.
2. FLUSH MOUNTED LOCATOR STATION SHALL BE AT 500' MAXIMUM INTERVALS.
3. MINIMUM OF TWO (BEGIN & END) LOCATOR STATIONS INSTALLED TRACER WIRE.
4. VALVE BOXES MAY BE USED AS LOCATOR STATION BOX.

FLUSH MOUNTED LOCATOR STATION CONCRETE BOX

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

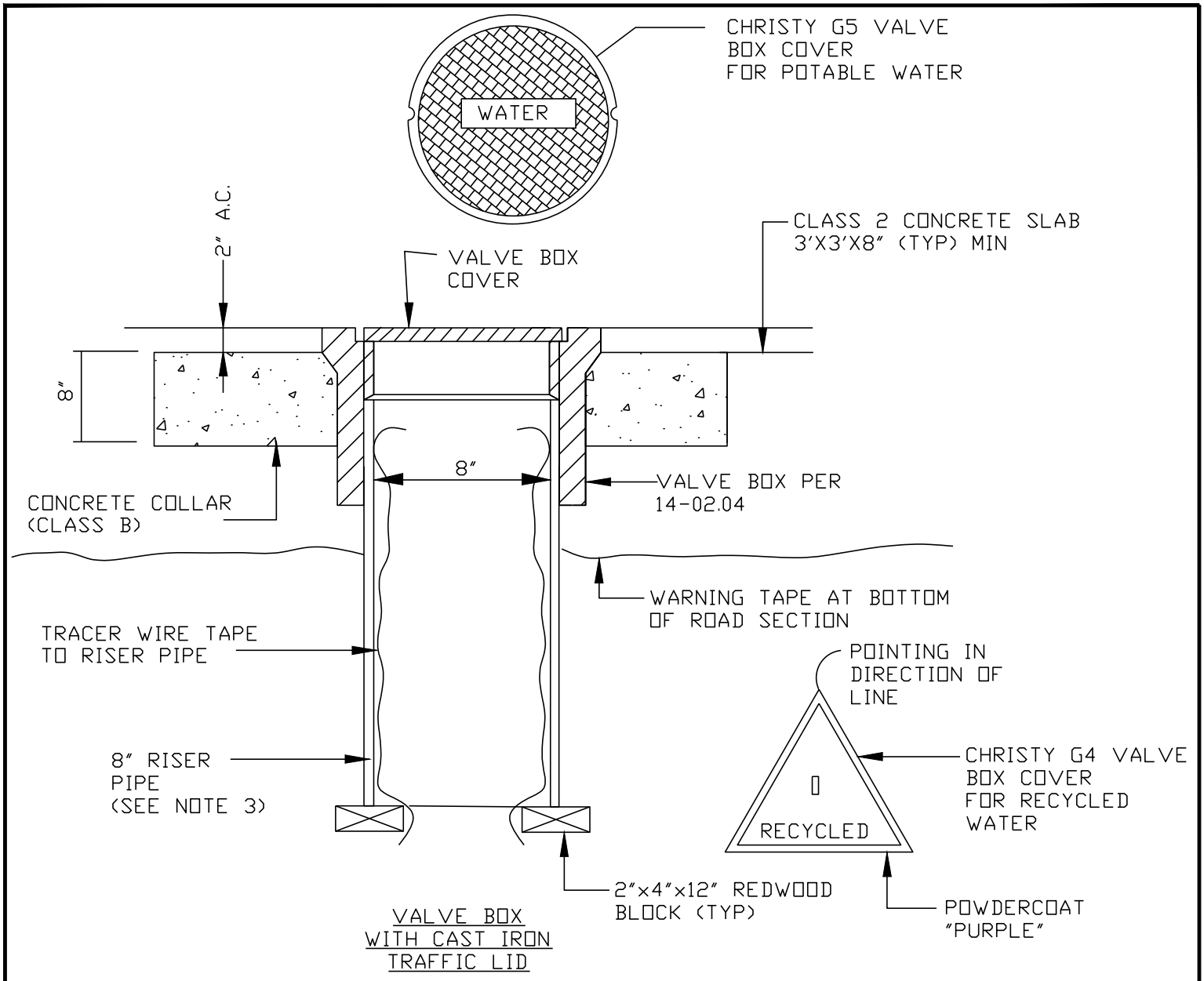
CITY OF PLEASANTON

STANDARD DETAILS

LOCATOR STATION

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 315



NOTES:

1. A.C. PAVEMENT TO COMPLY WITH STREET PAVEMENT REQUIREMENTS.
2. FOR VALVE BOXES INSTALLED IN NON-TRAFFIC AREAS, CONCRETE COLLAR SHALL BE EXTENDED TO FINISH GRADE. SLOPE COLLAR TO DRAIN AWAY FROM LID.
3. RISER PIPE TO BE ONE CONTINUOUS PIECE, SDR35 OR C900 FOR RECYCLED WATER RISER PIPE SHALL BE PURPLE
4. VALVE BOX COVERS FOR RECYCLED WATER MAINS SHALL BE TRIANGULAR WITH "RECYCLED" INSCRIPTION CAST ON THE TOP SURFACE AND POWDER COATED PURPLE 3 MIL W/EDGES MASKED. COLOR TO BE MAAS BROTHERS RAL 4006 TRAFFIC PURPLE.

DRAWN BY: STAFF	
CHECKED BY: AN	
SCALE: N.T.S.	

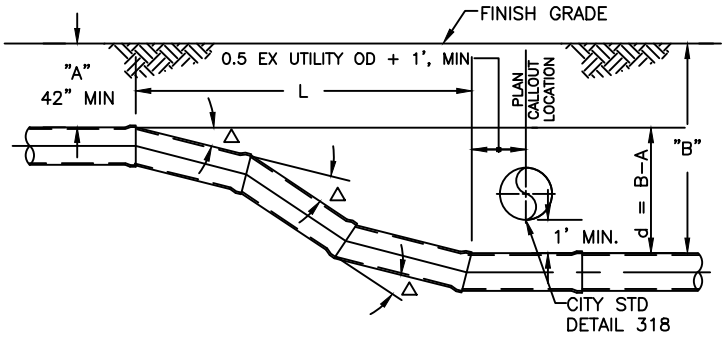
CITY OF PLEASANTON

STANDARD DETAILS

VALVE BOX INSTALLATION

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NICKITE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 316



NOTES:

1. CONTRACTOR SHALL MEET ALL PIPE SEPARATION, UTILITY CROSSING CLEARANCE AND MINIMUM COVER REQUIREMENTS INDICATED.
2. PULLED JOINTS SHALL BE LIMITED TO 75% OF PIPE MANUFACTURER'S RECOMMENDED ALLOWABLE JOINT DEFLECTION.
3. ASSUMES MAXIMUM JOINT DEFLECTION SHOWN. VERIFY WITH PIPE MANUFACTURER.
4. ASSUMES FULL 20 FT PVC OR DIP PIPE SECTION LENGTHS.

UTILITY UNDERCROSSING DETAIL 1

Ductile Iron

Pipe Size (inches)	Maximum Allowable Deflection Angle, Δ (degrees)	Vertical Offset, *d* (ft)	Minimum Allowable Transition Length, *L* (ft)
6	3.75	1	20
		2	40
		3	60
		4	60
		5	80
8	3.75	1	20
		2	40
		3	60
		4	60
		5	80
12	3.75	1	20
		2	40
		3	60
		4	60
		5	80
>12	3.75	1	20
		2	40
		3	60
		4	60
		5	80

TR Flex

Pipe Size (inches)	Maximum Allowable Deflection Angle, Δ (degrees)	Vertical Offset, *d* (ft)	Minimum Allowable Transition Length, *L* (ft)
6	3.75	1	20
		2	40
		3	60
		4	60
		5	80
8	3.75	1	20
		2	40
		3	60
		4	60
		5	80
12	3.75	1	20
		2	40
		3	60
		4	60
		5	80
16	2.4	1	40
		2	60
		3	80
		4	100
		5	120

PVC

Pipe Size (inches)	Maximum Allowable Deflection Angle, Δ (degrees)	Vertical Offset, *d* (ft)	Minimum Allowable Transition Length, *L* (ft)
6	1.0	1	60
		2	80
		3	100
		4	120
		5	140
8	1.0	1	60
		2	80
		3	100
		4	120
		5	140
12	1.0	1	60
		2	80
		3	100
		4	120
		5	140
16	1.5	1	40
		2	80
		3	120
		4	160
		5	200
20	1.5	1	40
		2	80
		3	120
		4	160
		5	200

Notes:

1. Assumes maximum allowable joint deflection shown. Verify with pipe manufacturer
2. Assumes full 20 ft PVC or DIP pipe section lengths

DRAWN BY: STAFF
CHECKED BY: AN
SCALE: N.T.S.

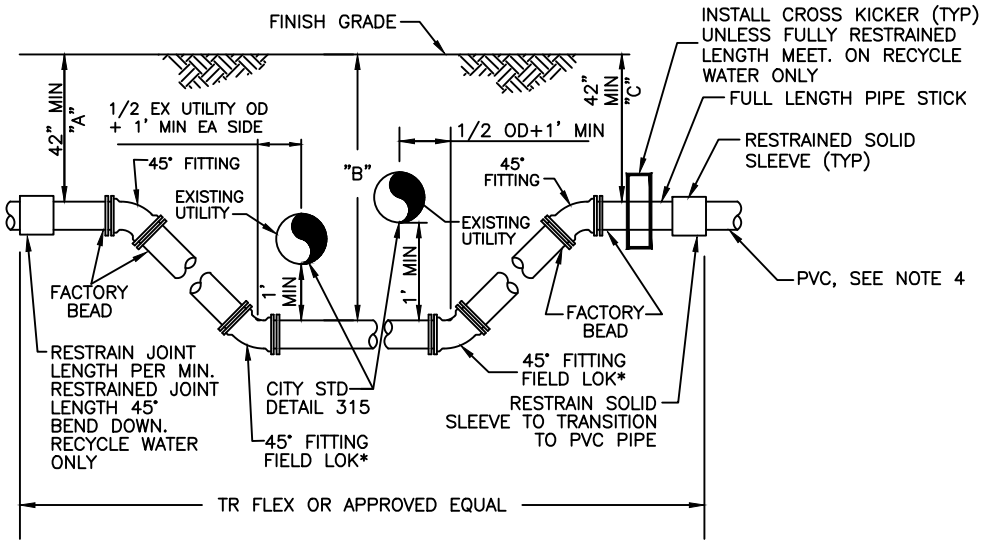
CITY OF PLEASANTON

STANDARD DETAILS

UTILITY UNDERCROSSING DETAIL 1

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 317



NOTES:

1. CONTRACTOR MAY SUBSTITUTE DIFFERENT FITTING DEFLECTION ANGLES, OFFSET FITTINGS OR MAY PULL JOINTS TO ACHIEVE THE CONFIGURATION. PULLED JOINTS SHALL BE LIMITED TO 75% OF PIPE MANUFACTURER'S RECOMMENDED ALLOWABLE JOINT DEFLECTION.
2. CONTRACTOR SHALL MEET ALL PIPE SEPARATION, UTILITY CROSSING CLEARANCE AND MINIMUM COVER REQUIREMENTS INDICATED.
3. RESTRAIN PER RESTRAINT JOINT LENGTH TABLE VERTICAL DOWN BEND, OR INSTALL CROSS TRENCH KICKER PER DETAIL 309.
4. SEE DETAIL 317, NOTE 4.
5. * OR APPROVE EQUAL.

UTILITY UNDERCROSSING DETAIL 2

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

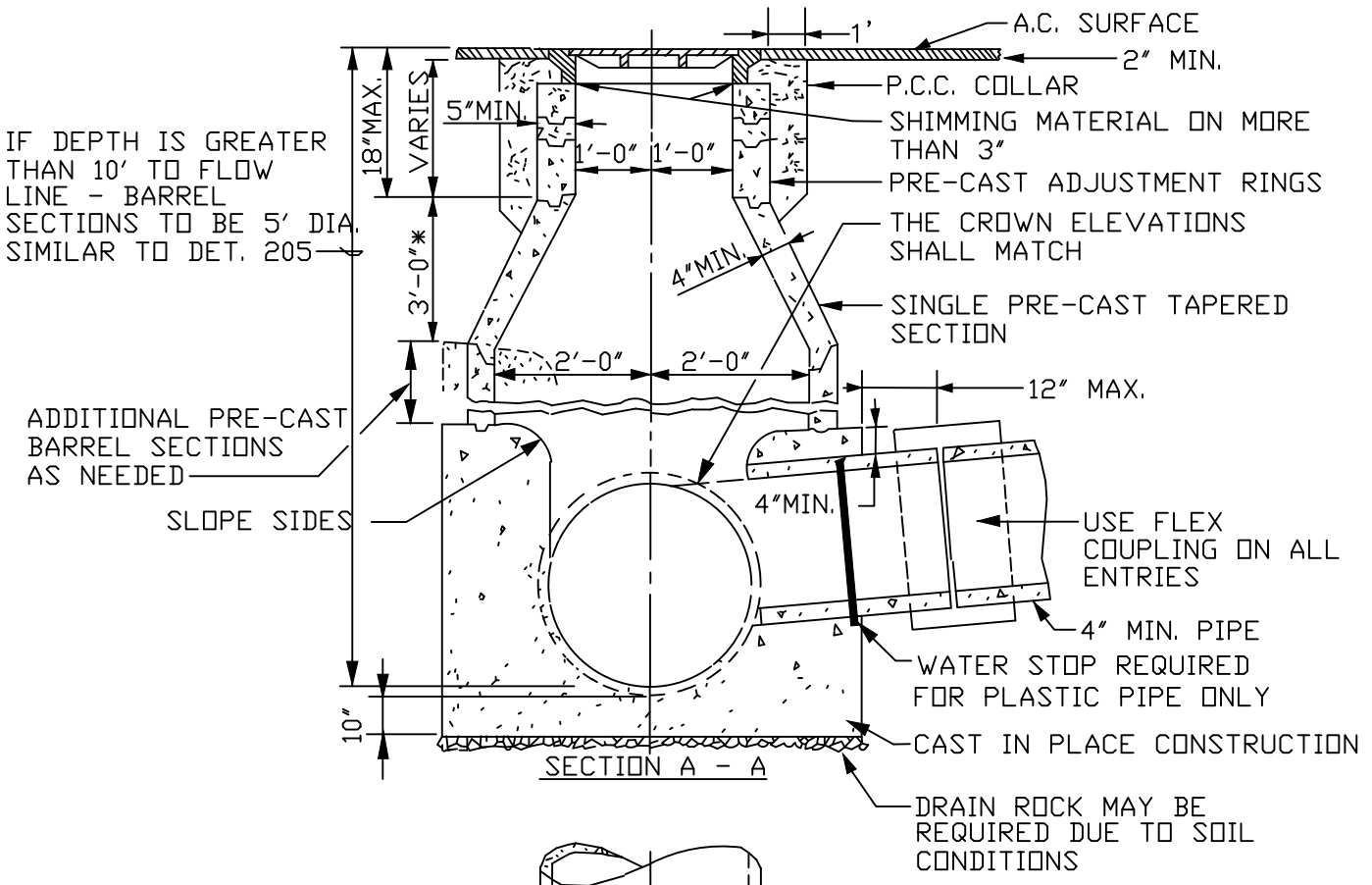
CITY OF PLEASANTON

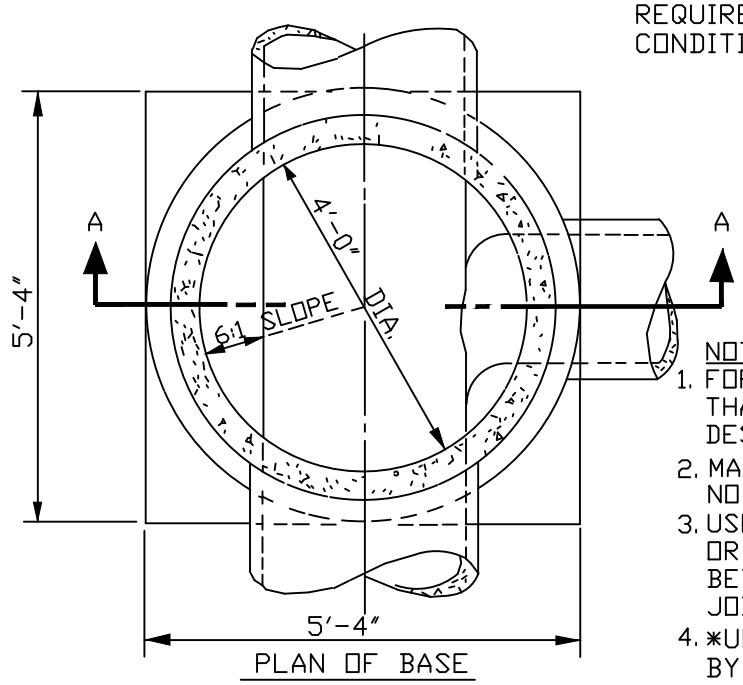
STANDARD DETAILS

UTILITY UNDERCROSSING DETAIL 2

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 318





NOTE:

1. FOR PIPE SIZES LARGER THAN 36" PROVIDE A DESIGNED STRUCTURE.
2. MANHOLES SHALL HAVE NO STEPS.
3. USE RAMNECK W/PRIMER OR APPROVED EQUAL BETWEEN JOINTS. TRIM ALL JOINTS AFTER COMPLETION.
4. *UNLESS APPROVED BY THE ENGINEER

DRAWN BY:	STAFF
CHECKED BY:	AN
SCALE:	N.T.S.

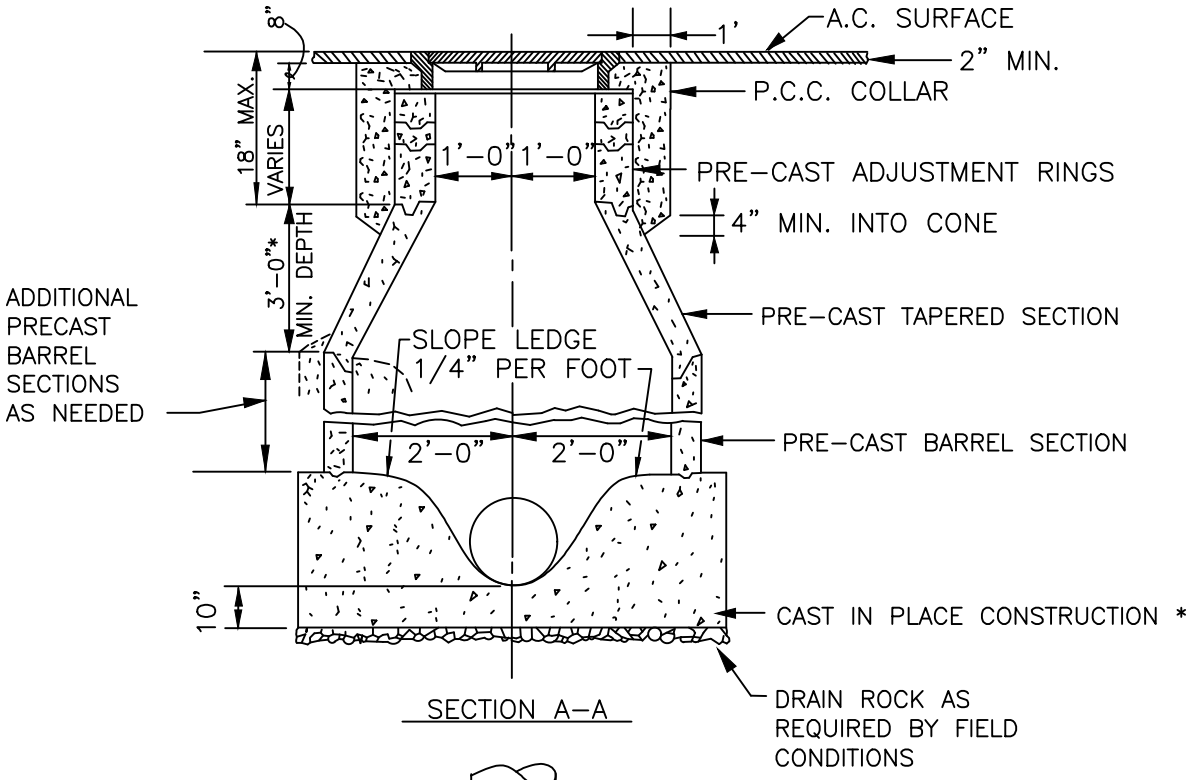
CITY OF PLEASANTON

STANDARD DETAILS

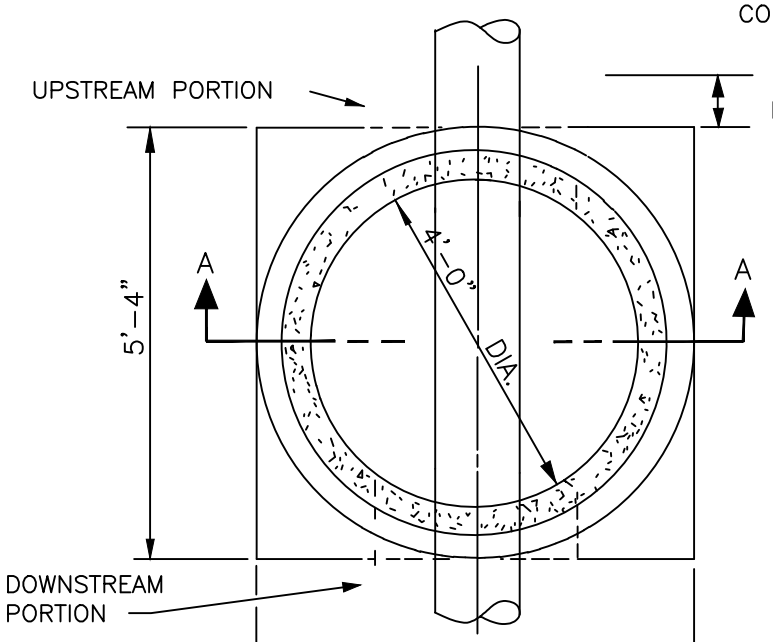
SANITARY SEWER MANHOLE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 401



SECTION A-A



PLAN OF BASE

NOTES:

1. MAINTENANCE HOLES SHALL HAVE NO STEPS.
2. * UNLESS APPROVED BY THE ENGINEER.
3. USE RAMNECK OR APPROVED EQUAL BETWEEN JOINTS. TRIM ALL JOINTS AFTER COMPLETION.
4. WATER STOPS SHALL BE REQUIRED WHEN P.V.C. PIPE IS USED.
5. THERE SHALL BE NO ANGLES IN MANHOLE. IT SHALL ONLY BE A STRAIGHT THRU FLOWLINE.
6. FOR FLEX JOINTS SEE DETAIL 401.

* CAST IN PLACE PER ENGINEER APPROVAL.

DRAWN BY:	STAFF
CHECKED BY:	AN
SCALE:	N.T.S.

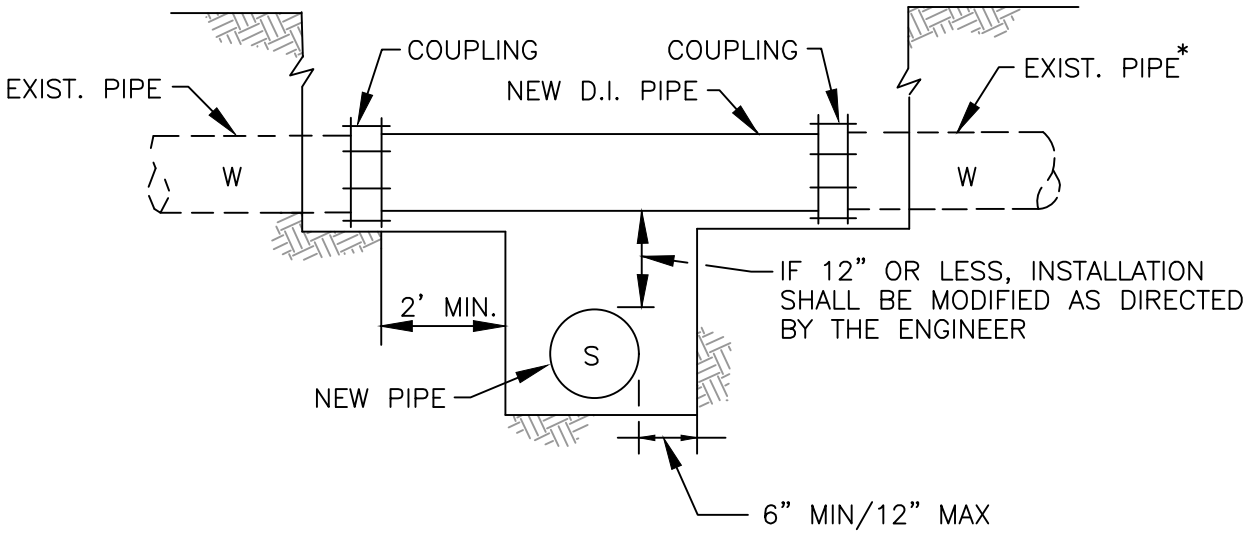
CITY OF PLEASANTON

STANDARD DETAILS

SAMPLING MANHOLE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 402



NEW PIPE UNDER EXISTING

NOTES:

1. THIS STANDARD APPLIES TO PIPES UP TO AND INCLUDING 16" DIAMETER. ALL CROSSINGS INVOLVING PIPES OF LARGER DIAMETER SHALL BE AS APPROVED BY THE ENGINEER.
2. WHEN NEW PIPES ARE TO BE INSTALLED WITHIN THE LIMITS SHOWN, DUCTILE IRON PIPE SECTIONS SHALL BE INSTALLED IN THE NEW AND OR EXISTING PIPES AS SHOWN ON THE DETAILS, EXCEPT WHEN THE NEW OR EXISTING PIPE IS STEEL OR CAST IRON.
3. FUSION EPOXY COATED DUCTILE IRON PIPE SHALL BE CLASS 50 MINIMUM.
4. COUPLINGS TO BE APPROVED BY THE ENGINEER.
5. * CAN REMAIN IN PLACE IF APPROVED BY THE ENGINEER, DEPENDENT ON EXISTING CONDITIONS.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

STANDARD DETAILS

NEW PIPE INSTALLATION UNDER EXISTING PIPE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 403

SANITARY SEWER AND WATER CROSSING DETAIL

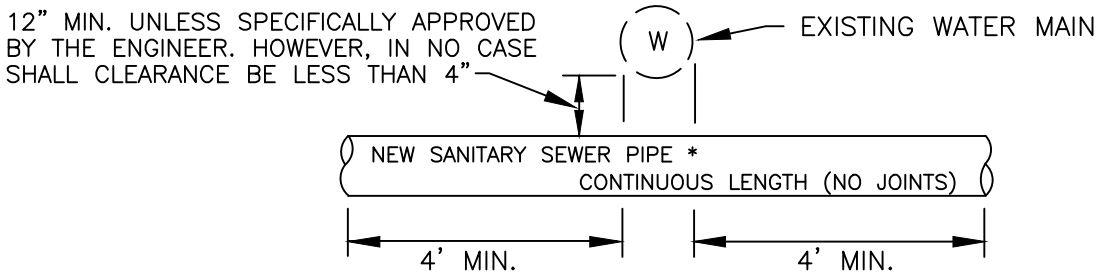
A NEW WATER MAIN CROSSING AN EXISTING SEWER LINE SHALL BE CONSTRUCTED OF:

1. DUCTILE IRON PIPE, CLASS 50, INSTALLED WITH POLYWRAP.
2. DIPPED AND WRAPPED ONE FOURTH INCH THICK WELDED STEEL PIPE.
3. MORTAR LINED INSIDE AND OUTSIDE SCHEDULE 40 STEEL PIPE AND ALL JOINTS MORTAR COATED.
4. CLASS 235, PRESSURE RATED PVC PLASTIC WATER PIPE (DR 18 PER AWWA C900) OR EQUIVALENT.

A NEW SEWER LINE CROSSING AN EXISTING WATER MAIN SHALL BE CONSTRUCTED OF:

1. FUSION EPOXY–COATED DIP (SEE SPECIFICATIONS) AND MECHANICAL JOINTS.
2. A CONTINUOUS SECTION OF SDR–35 PVC PLASTIC PIPE OR EQUIVALENT, CENTERED OVER/UNDER THE PIPE BEING CROSSED. (WHERE P.V.C. LINES ARE PERMITTED BY CITY SPECIFICATIONS).
3. A CONTINUOUS SECTION OF CLASS 235 PVC (AWWA C905) WATER PIPE CENTERED OVER/UNDER THE PIPE BEING CROSSED.
4. ANY SEWER PIPE WITHIN A CONTINUOUS SLEEVE.

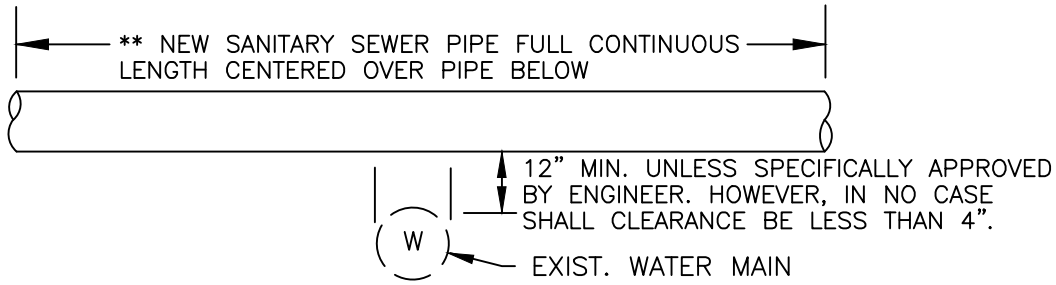
IF THE EXISTING WATER LINE IS OTHER THAN CLASS 50 DUCTILE IRON WELDED STEEL PIPE OR C900 P.V.C., THE WATER LINE SHALL BE REPLACED IN ACCORDANCE WITH DETAIL 403.



*SEE GENERAL NOTES ABOVE FOR ACCEPTABLE TYPES OF PIPES.

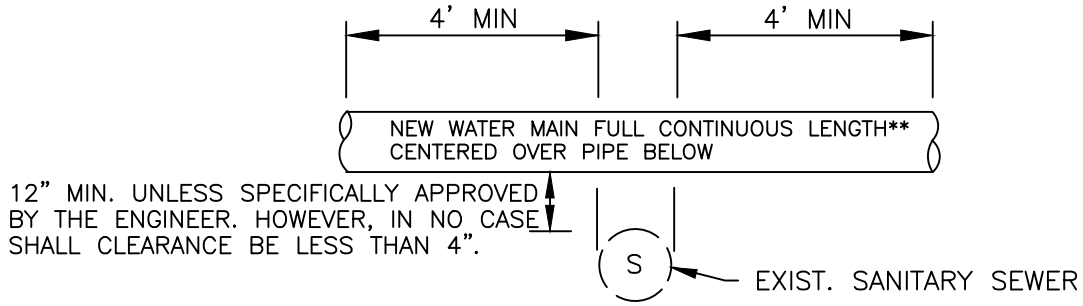
NEW SANITARY SEWER CROSSING DETAIL UNDER EXISTING WATER MAIN

DRAWN BY: STAFF	CITY OF PLEASANTON STANDARD DETAILS SANITARY SEWER AND WATER MAIN SEPARATION	REGISTERED PROFESSIONAL ENGINEER ADAM MATTHEW NELKIE No. 78830 Exp. 9/30/2025 CIVIL STATE OF CALIFORNIA
CHECKED BY: AN		
SCALE: N.T.S.		DATE : 7/24 DWG NO. 404



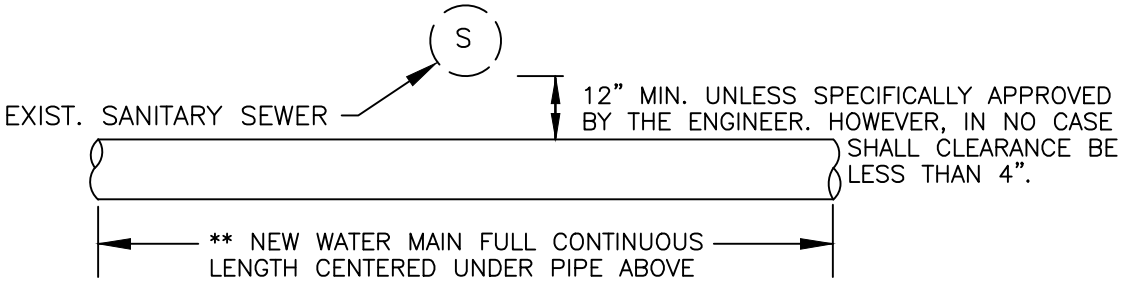
NEW SANITARY SEWER CROSSING OVER EXISTING WATER MAIN

(TO BE USED ONLY WITH SPECIAL PERMISSION FROM THE ENGINEER)



NEW WATER MAIN CROSSING OVER EXISTING SANITARY SEWER

THE EXIST. SANITARY SEWER SHALL BE REPLACED IN ACCORDANCE WITH DETAIL 403.



NEW WATER MAIN CROSSING UNDER EXISTING SANITARY SEWER

(TO BE USED ONLY WITH SPECIAL PERMISSION FROM THE ENGINEER.)

**SEE NOTES ON DETAIL 404 FOR ACCEPTABLE TYPES OF PIPES.

DRAWN BY:	STAFF
CHECKED BY:	AN
SCALE:	N.T.S.

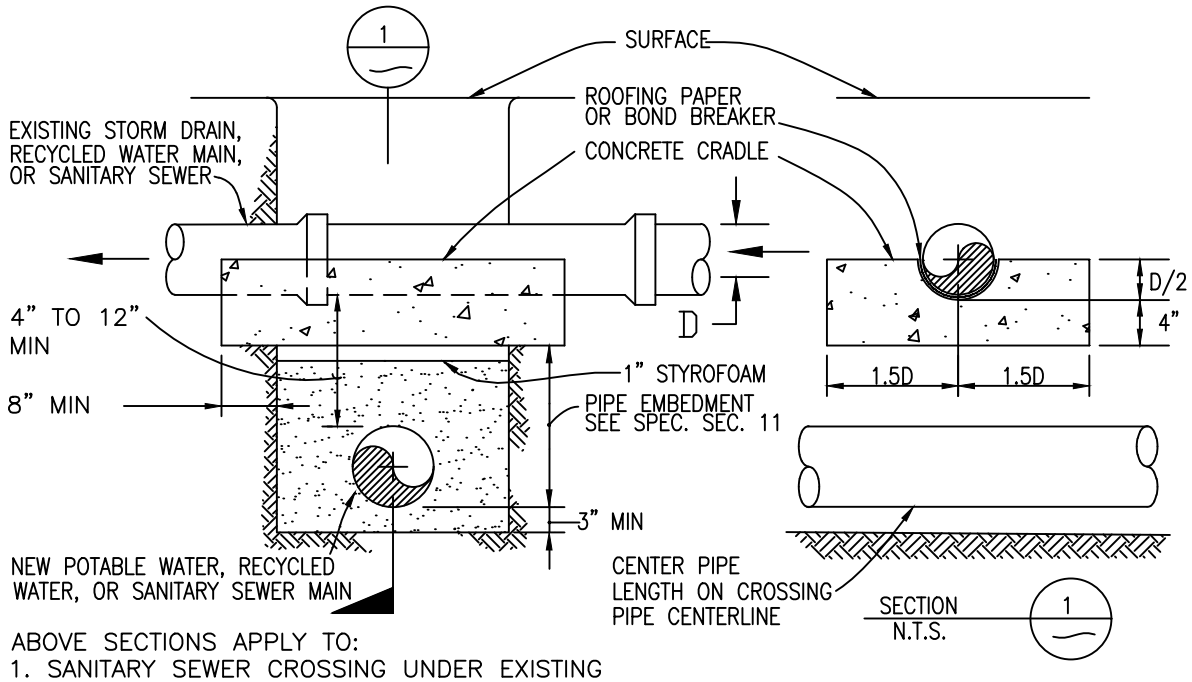
CITY OF PLEASANTON

STANDARD DETAILS

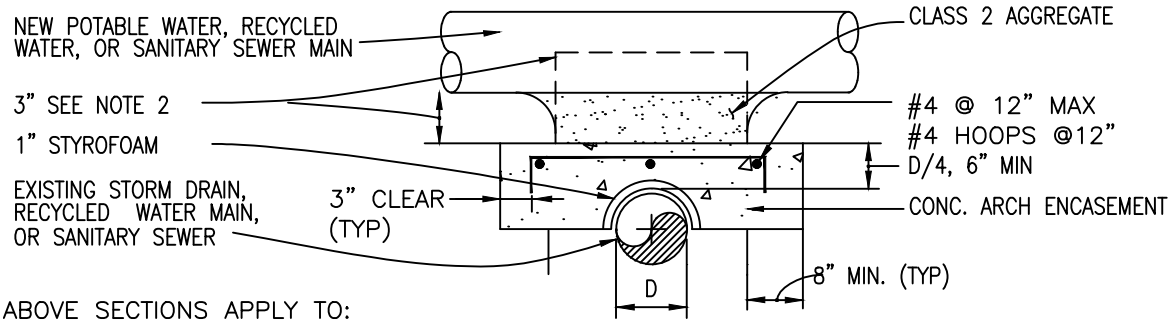
SANITARY SEWER AND WATER MAIN SEPARATION

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 405



ABOVE SECTIONS APPLY TO:
1. SANITARY SEWER CROSSING UNDER EXISTING STORM DRAIN OR SANITARY SEWER.
2. RECYCLED WATER CROSSING UNDER EXISTING STORM DRAIN OR RECYCLED WATER
3. POTABLE WATER CROSSING UNDER EXISTING STORM DRAIN
4. ONLY USED IF APPROVED BY CITY ENGINEER.



ABOVE SECTIONS APPLY TO:
1. SANITARY SEWER CROSSING OVER EXISTING STORM DRAIN OR SANITARY SEWER
2. RECYCLED WATER CROSSING OVER EXISTING STORM DRAIN OR RECYCLED WATER
3. POTABLE WATER CROSSING OVER EXISTING STORM DRAIN
4. ONLY USED IF APPROVED BY CITY ENGINEER.

NOTES:
1. CROSSING OF POTABLE WATER MAINS, RECYCLED WATER MAINS, AND SANITARY SEWERS: SEPARATION, CONSTRUCTION, AND PIPE CRITERIA SHALL BE AS REQUIRED BY SECTION I–C5 AND THE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH.
2. IF CLASS 2 AGGREGATE BASE MATERIAL CANNOT BE ATTAINED, THEN RAISE PIPE CRADLE TO CONTACT LOWER HALF OF NEW PIPE. PROVIDE ROOFING PAPER OR BOND BREAKER BETWEEN NEW PIPE AND CONCRETE AS SHOWN IN SECTION 1 ABOVE.
3. APPROVAL OF THE CITY ENGINEER REQUIRED TO USE ABOVE DETAILS.

DRAWN BY: STAFF
CHECKED BY: AN
SCALE: N.T.S.

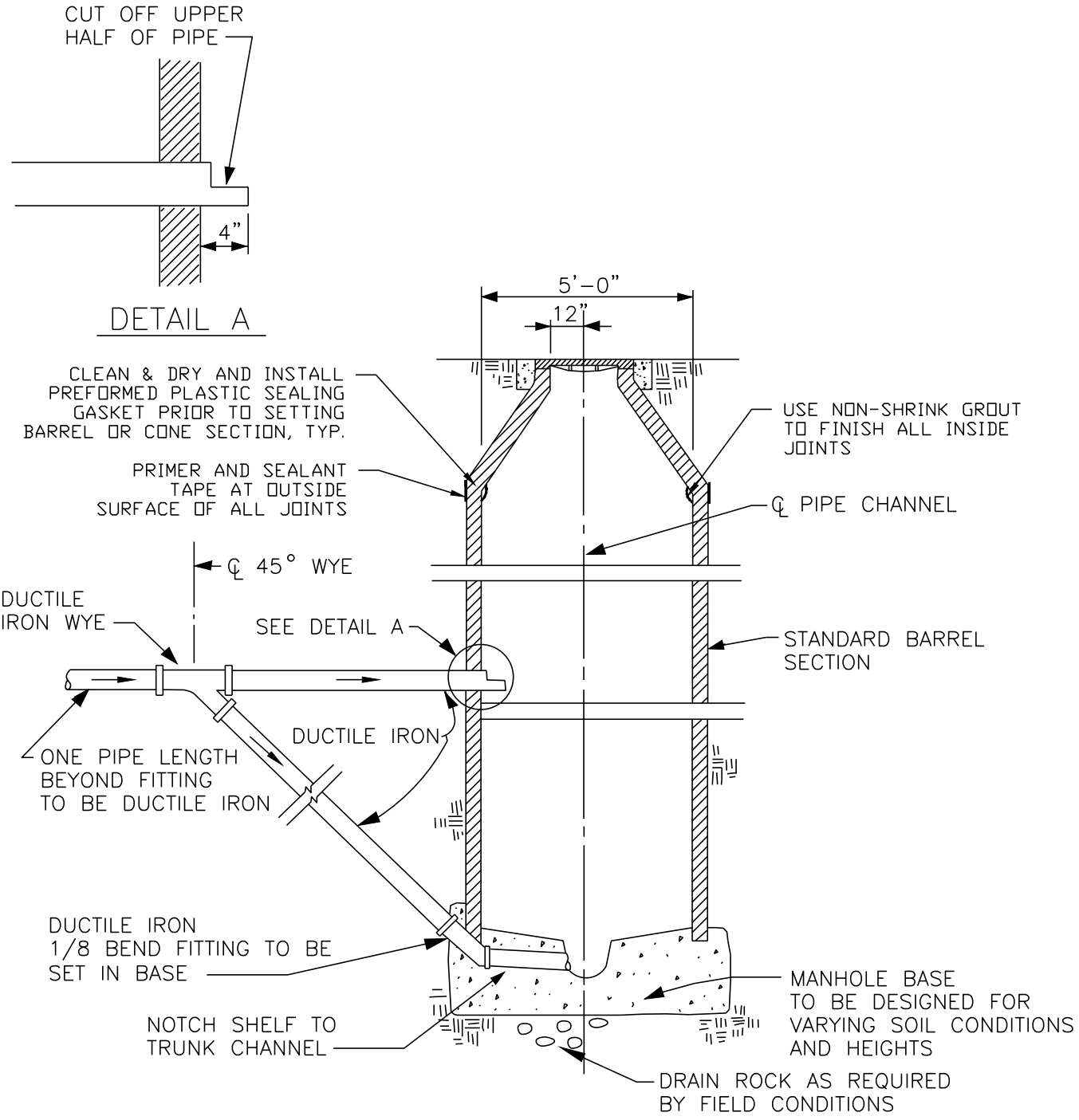
CITY OF PLEASANTON

STANDARD DETAILS

CLOSE CROSSING DETAIL

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 406



NOTES:

1. DROP MANHOLES ARE ONLY TO BE USED WITH THE APPROVAL OF THE ENGINEER.
2. SEE DETAIL 401 FOR GENERAL DESIGN AND SPECS.
3. FOR SPECIFICATIONS ON DUCTILE IRON PIPE SEE SECTION 13-02-B.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

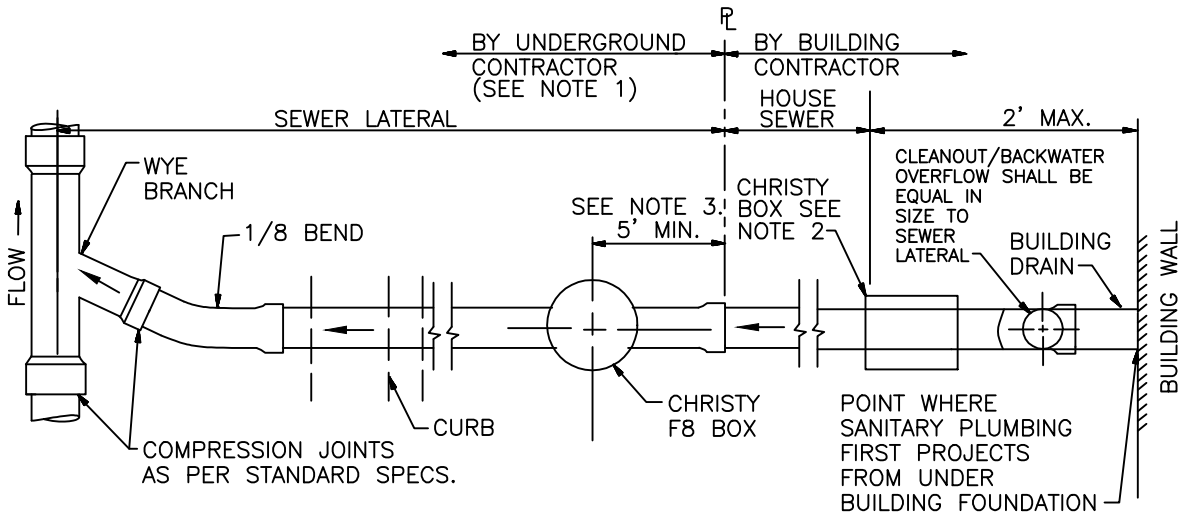
CITY OF PLEASANTON

STANDARD DETAILS

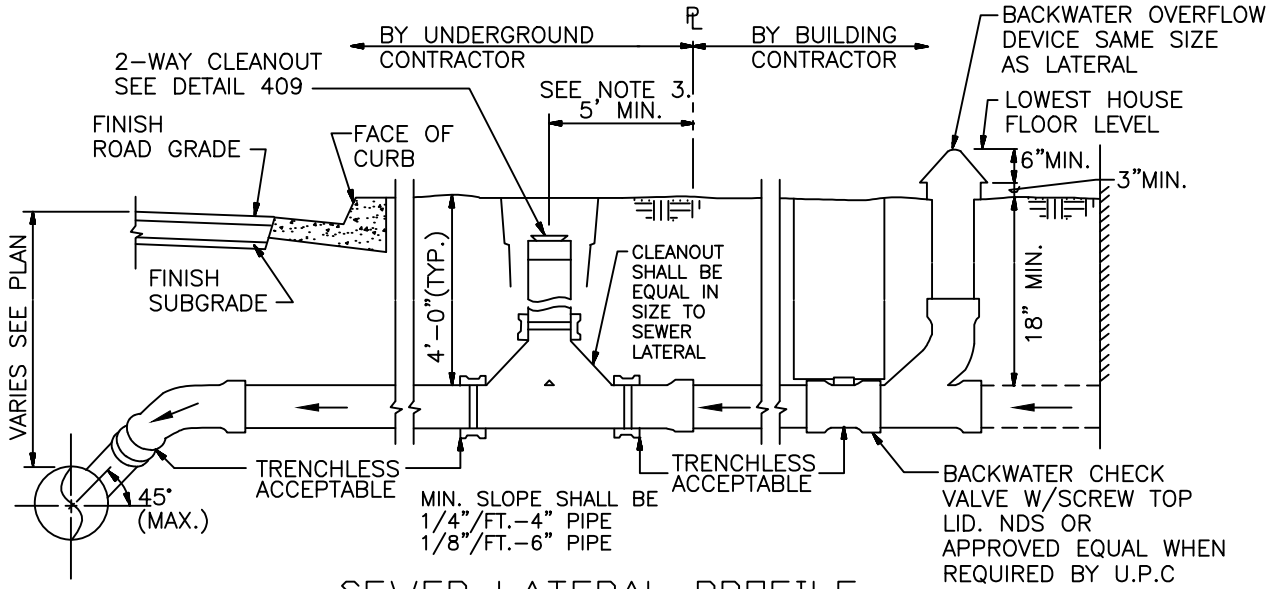
SANITARY SEWER DROP MANHOLE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELSEN
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

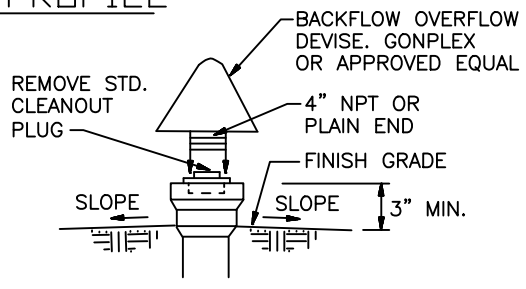
DATE : 7/24 | DWG NO. 407



SEWER LATERAL PLAN



SEWER LATERAL PROFILE



BACKFLOW OVERFLOW DEVICE

NOTES:

1. CONTRACTOR TO STAKE LATERAL WITH 2"X4" @ BACK OF LATERAL (MARK- SAN. LAT.)
2. CHRISTY BOX - SIZE BOX TO PROVIDE WORKABLE ACCESS TO BACKWATER VALVE.
3. LATERAL SHALL EXTEND 5' BEYOND THE TWO-WAY CLEANOUT OR TO BACK OF RIGHT-OF-WAY, WHICHEVER, IS FARTHER FROM SEWER MAIN.
4. EXISTING LINE SHALL BE TVed BEFORE APPROVAL FOR TRENCHLESS

DRAWN BY:	STAFF
CHECKED BY:	AN
SCALE:	N.T.S.

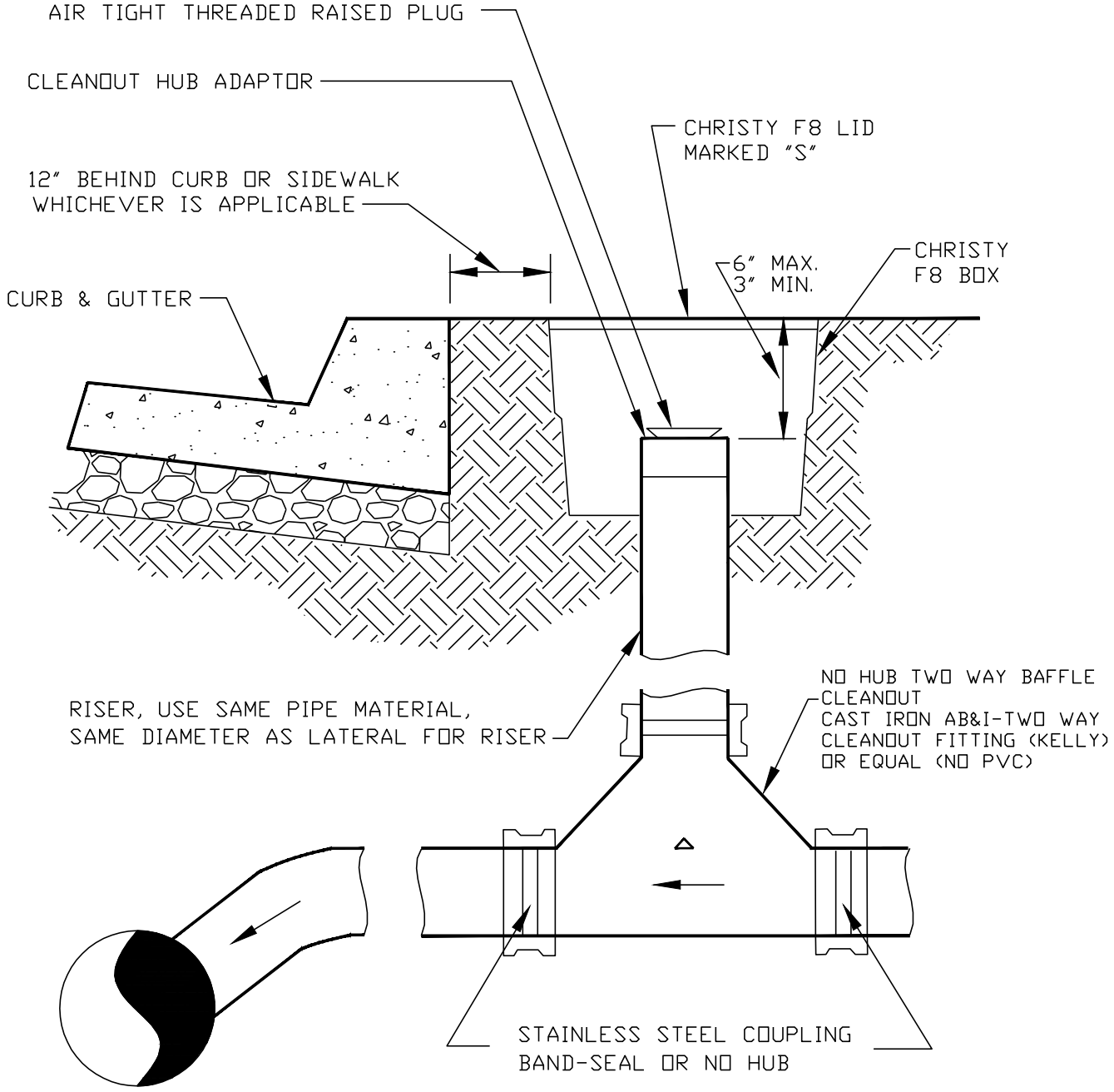
CITY OF PLEASANTON

STANDARD DETAILS

STANDARD SEWER LATERAL

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 408



CONTRACTOR SHALL USE 4" MIN. PLEASANTON FINE FILL FOR CLEAN-OUT BEDDING.

DRAWN BY:	STAFF
CHECKED BY:	AN
SCALE:	N.T.S.

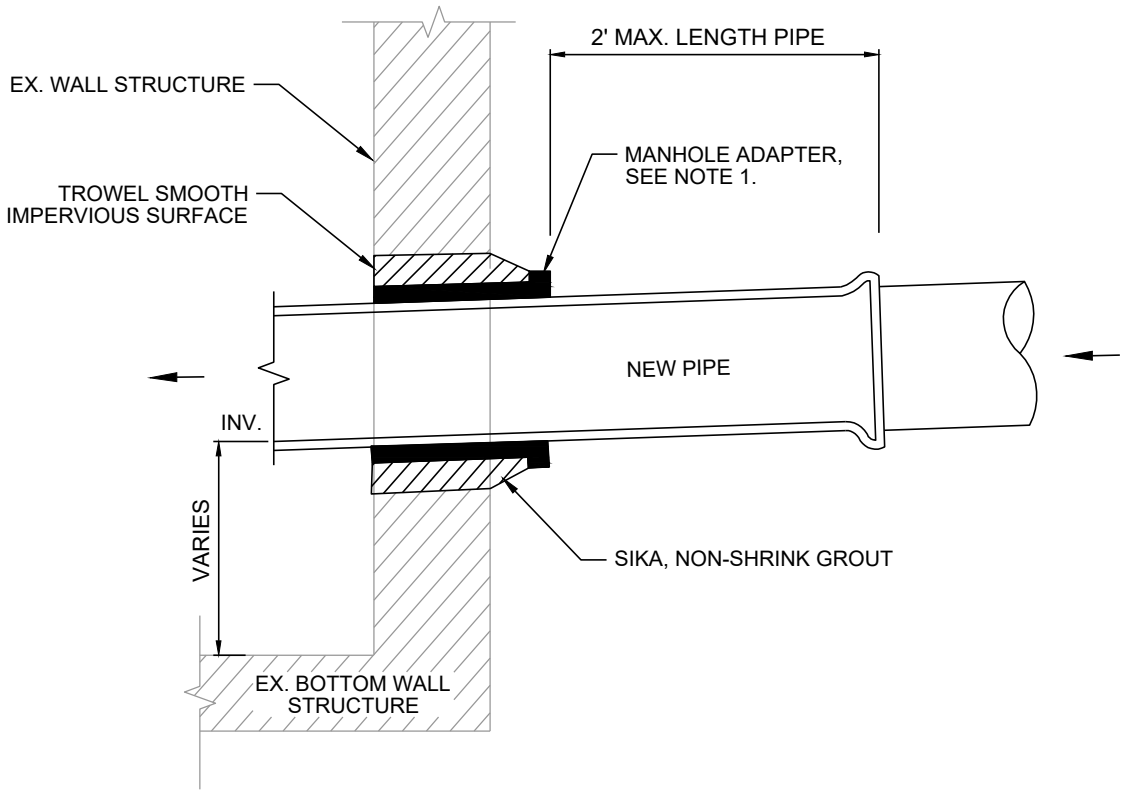
CITY OF PLEASANTON

STANDARD DETAILS

CLEAN-OUT

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELSEN
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 409



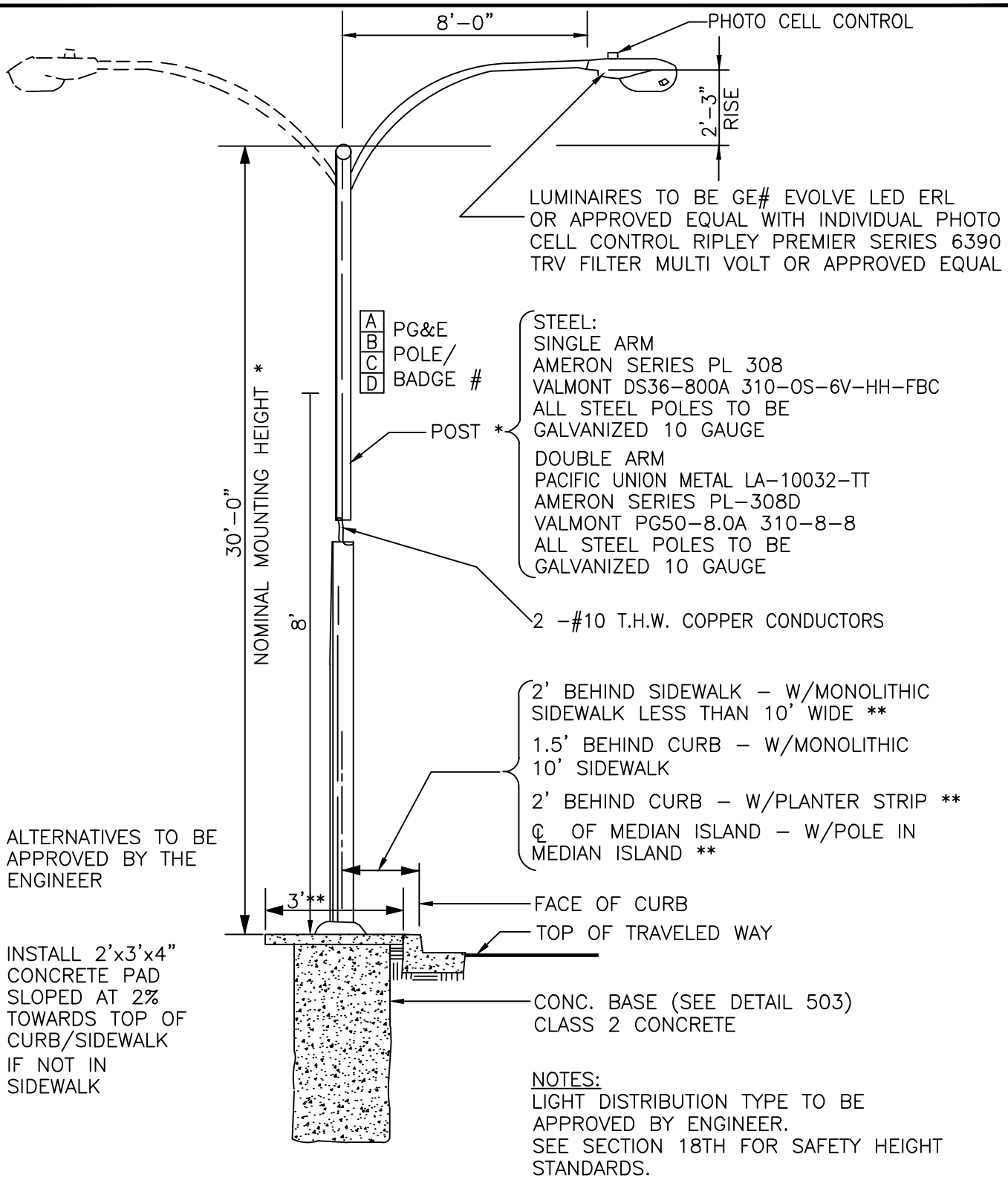
NOTES:
1. USE PVC MANHOLE ADAPTER OR APPROVED EQUAL AS MANUFACTURED BY GPK PRODUCTS, INC. FOR NEW PLASTIC PIPE.
2. PIPE CONNECTION WITHIN EXISTING STRUCTURES.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON
STANDARD DETAILS
PIPE CONNECTION TO EXISTING STRUCTURE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 410



CITY OF PLEASANTON

STANDARD DETAILS

STREET LIGHT STANDARD MAJOR STREET

DRAWN BY: STAFF

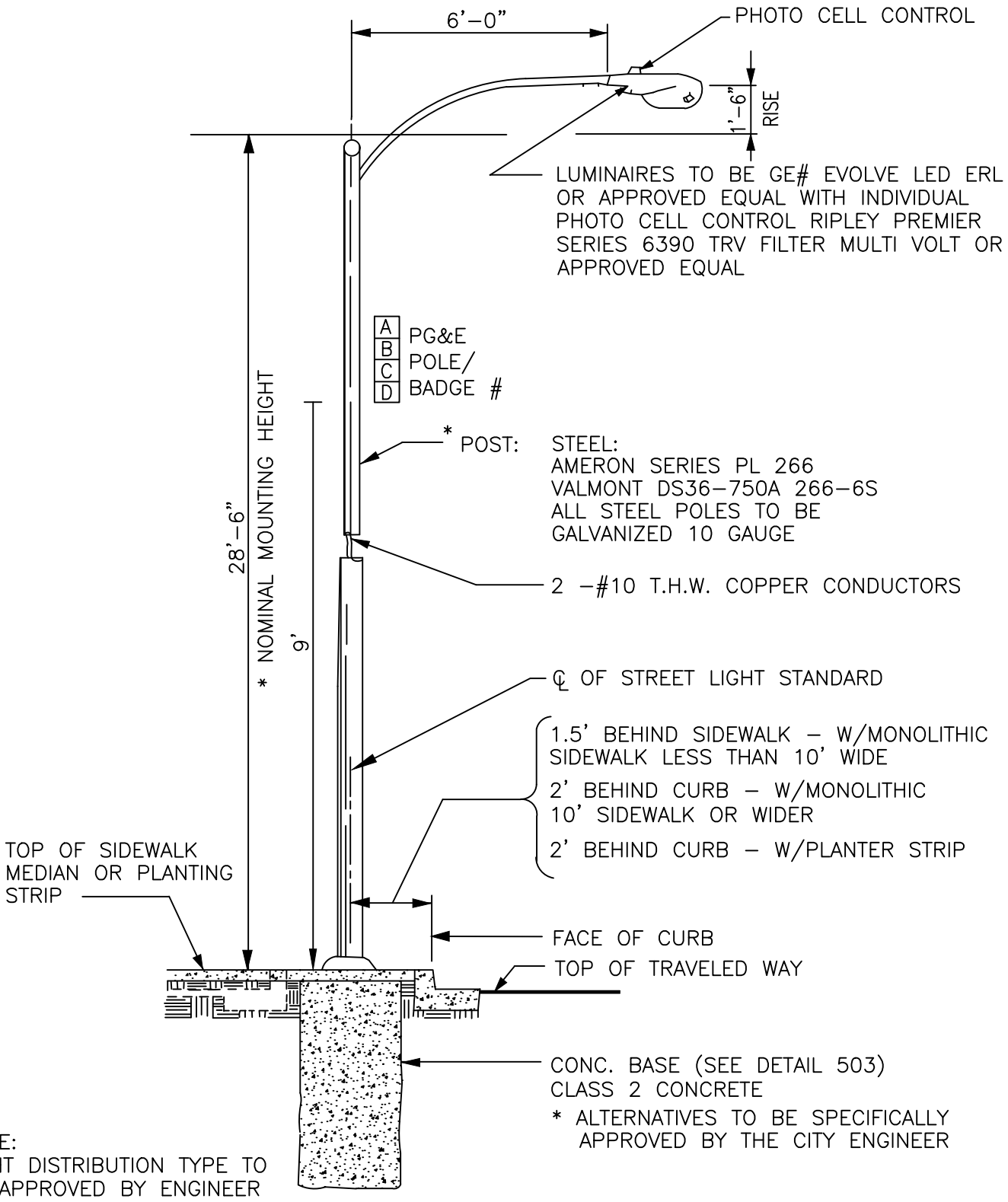
CHECKED BY: AN

SCALE: N.T.S.

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24

DWG NO. 501



CITY OF PLEASANTON

STANDARD DETAILS

STREET LIGHT STANDARD MINOR STREET

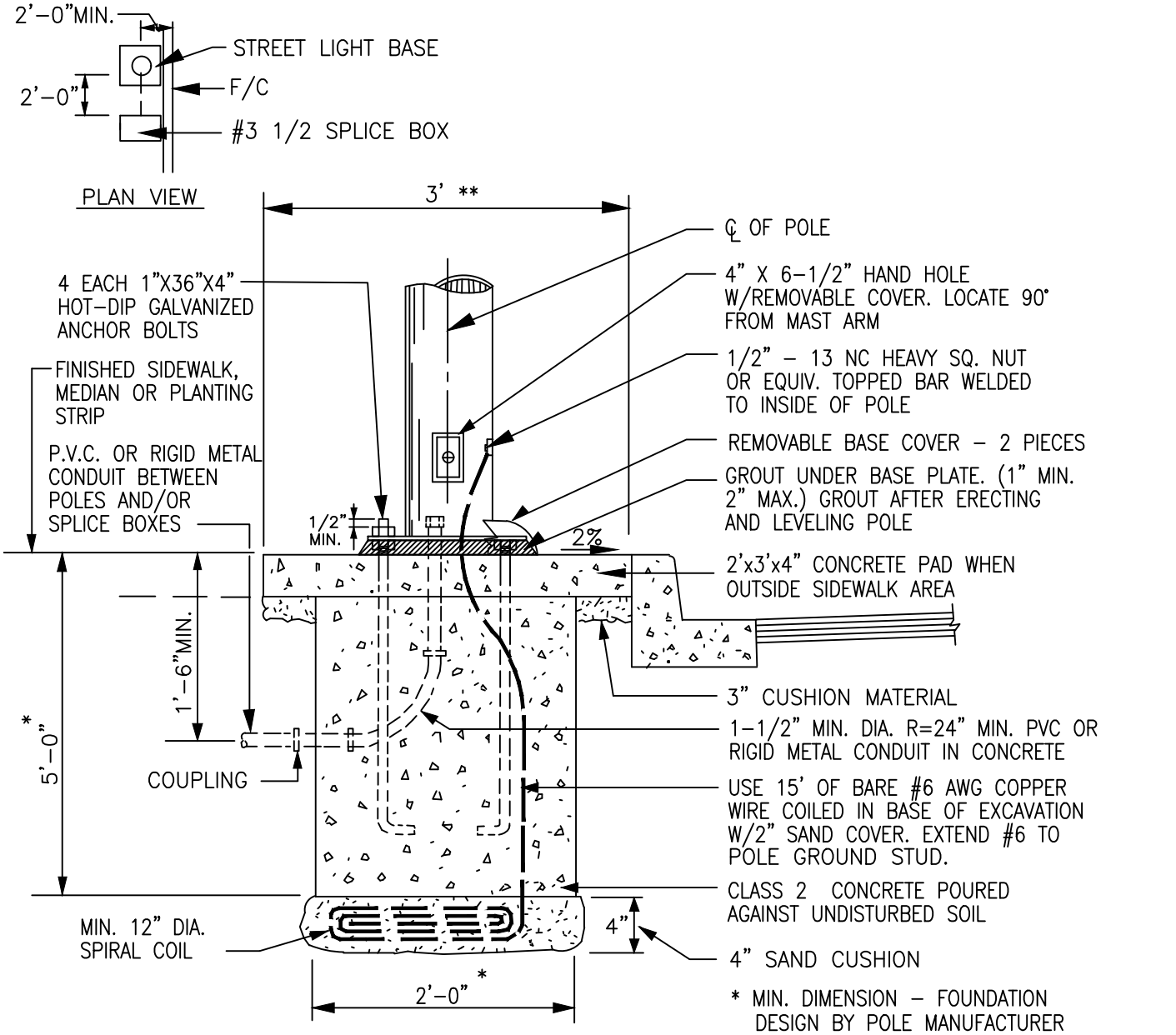
DRAWN BY: STAFF

CHECKED BY: AN

SCALE: N.T.S.

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 502



NOTES:

1. CONCRETE SHALL BE CLASS 2 P.C.C. POURED AGAINST UNDISTURBED SOIL.
2. GROUT IN BOTTOM OF SPLICE BOXES WILL NOT BE REQUIRED. DEPTH OF CRUSHED ROCK SUMP AT BOTTOM OF PULL BOXES SHALL BE A MIN. DEPTH OF 12".
3. ALL CONDUIT SHALL ENTER THE SPLICE BOX FROM THE BOTTOM. SIDE ACCESS WILL NOT BE ALLOWED.
4. COVER OF SPLICE BOX SHALL BE MARKED "STREET LIGHTING". PLACE TOP OF SPLICE BOX 0.10' ABOVE SURROUNDING GRADE.
5. STREET LIGHT WITH SIGN SHALL HAVE FOUNDATION APPROVE BY ENGINEER.
6. POLE SHALL BE FACTORY CERTIFIED.
7. ADJUST IRRIGATION TO PREVENT SPRAY ON TO THE POLE.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

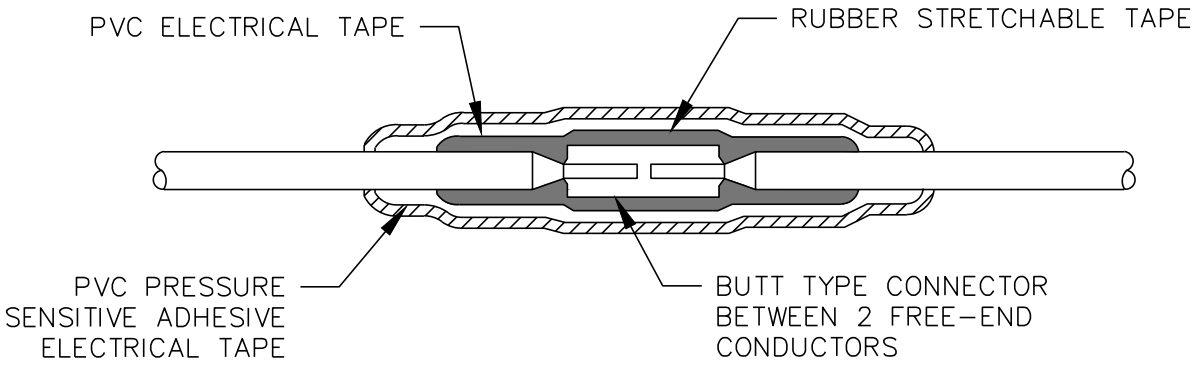
CITY OF PLEASANTON

STANDARD DETAILS

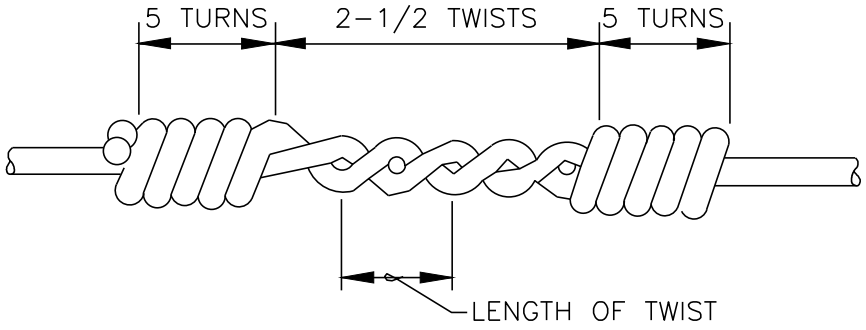
STREET LIGHT STANDARD CONCRETE FOOTING DETAIL

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 503



DETECTOR LEAD-IN WIRE SPLICE DETAIL



CAUTION: BE SURE BOTH WIRES ARE TWISTED EQUALLY.

TWISTED CONDUCTOR SPLICE

NOTES:

LEAD IN CABLE: INSULATED WITH 20 MILS OF HIGH-DENSITY POLYETHYLENE. CONDUCTORS MUST BE TWISTED TOGETHER WITH AT LEAST 2 TURN PER FOOT, AND THE TWISTED PAIR MUST BE PROTECTED WITH COPPER OR ALUMINUM POLYESTER SHIELD. A MINIMUM NO. 20 COPPER DRAIN WIRE MUST BE CONNECTED TO THE EQUIPMENT GROUND WITHIN THE CABINET. CABLE MUST HAVE HIGH-DENSITY POLYETHYLENE OR HIGH-DENSITY POLYPROPYLENE OUTER JACKET WITH A NOMINAL THICKNESS OF 32 MILS. INCLUDE AN AMORPHOUS, INTERIOR, MOISTURE PENETRATION BARRIER OF NONHYDROSCOPIC POLYETHYLENE OR POLYPROPYLENE FILLERS.

TYPE 2 LOOP WIRE: TYPE THWN OR TYPE XHHW, NO.14, STRANDED COPPER WIRE IN A PLASTIC TUBING. THE PLASTIC TUBING MUST BE POLYETHYLENE OR VINYL RATED FOR USE AT 105 DEGREES C AND RESISTANT TO OIL AND GASOLINE. THE OUTSIDE DIAMETER OF THE TUBING MUST BE AT MOST 0.27 INCH WITH A WALL THICKNESS OF AT LEAST 0.028 INCH.

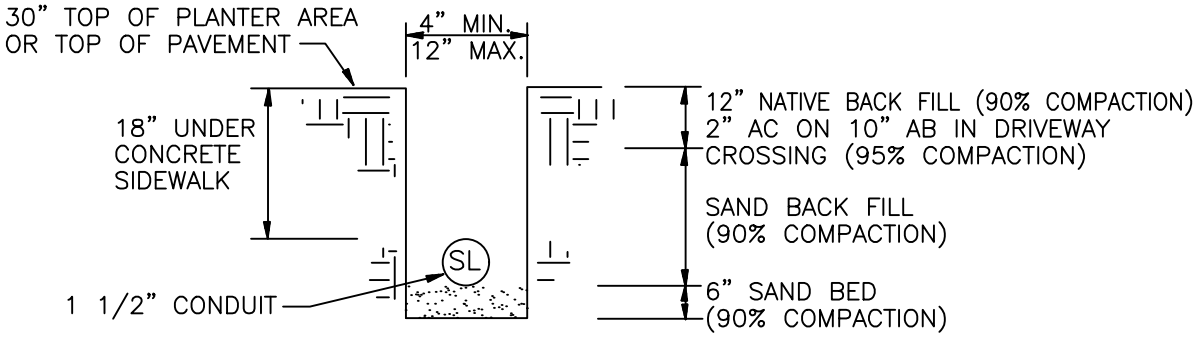
DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

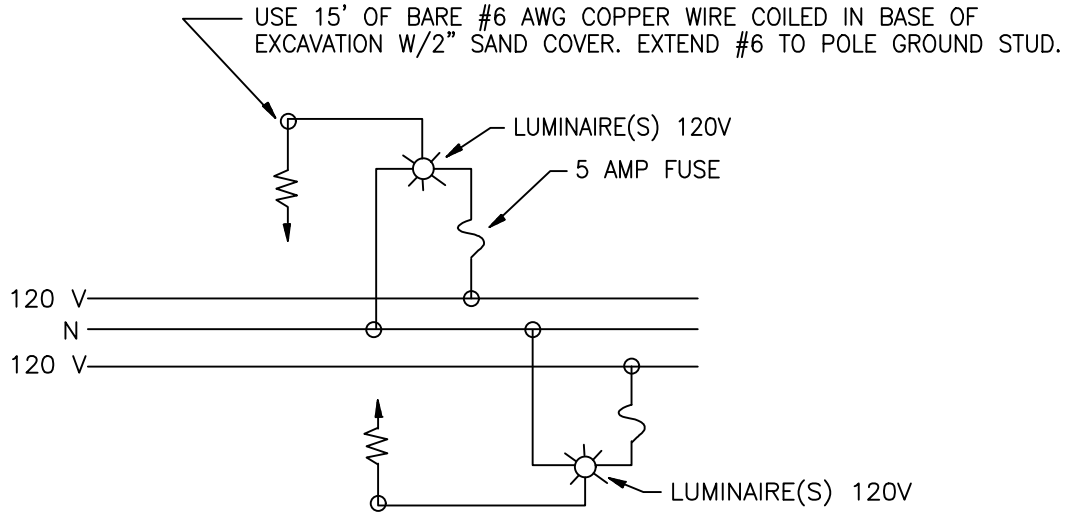
STANDARD DETAILS

DETECTOR LOOP WIRE SPLICE

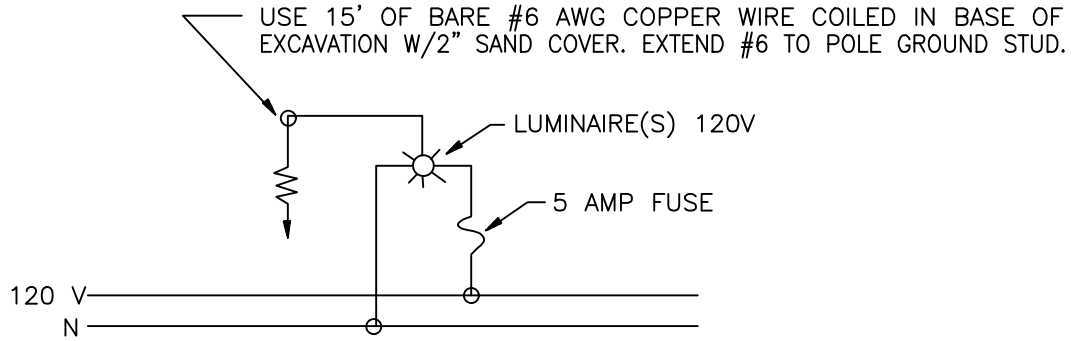
DATE : 7/24 | DWG NO. 505



TRENCH DETAIL



SYSTEM CONNECTION DIAGRAM 120V/3–WIRE



SYSTEM CONNECTION DIAGRAM 120V

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

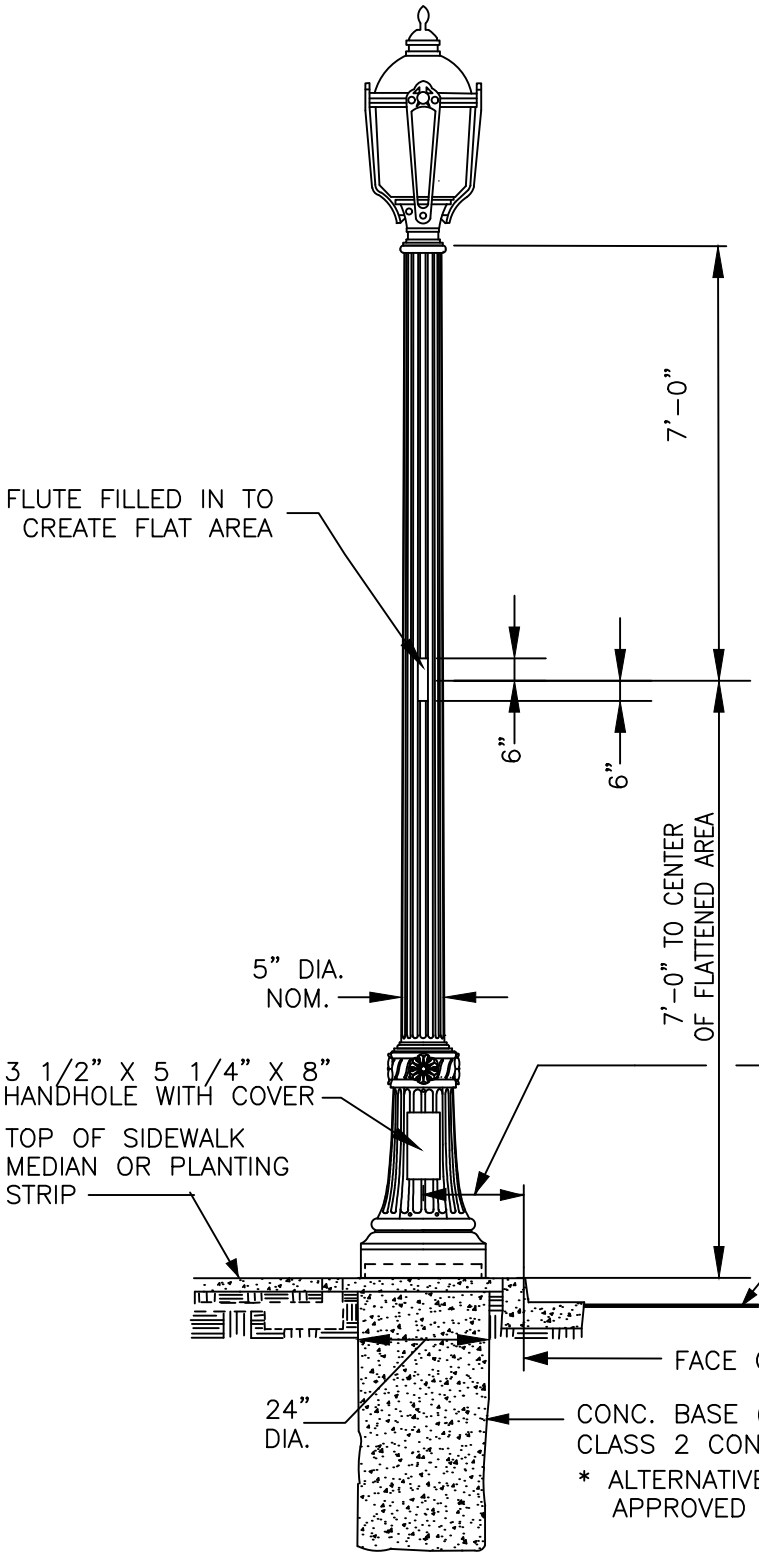
CITY OF PLEASANTON

STANDARD DETAILS

STREET LIGHT STANDARD TRENCH DETAIL & SYSTEM CONNECTION DIAGRAMS

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 506



NOTES:

1. COLOR – BLACK
2. FINISH – POWDER COAT
3. MATERIAL – FLUTED EXTRUDED ALUMINUM
4. LUMEC Z40 OR GE EVOLVE EPAM OR APPROVED LED EQUAL
5. POLE–HAPCO #79246–003–BK OR APPROVED EQUAL
6. USE ONLY UPON APPROVAL OF PLANNING AND ENGINEERING

1.5' BEHIND SIDEWALK–W/MONOLITHIC SIDEWALK LESS THAN 10' WIDE

2' BEHIND CURB–W/MONOLITHIC 10' SIDEWALK OR GREATER

2' BEHIND CURB–W/PLANTER STRIP

CONC. BASE (SEE DETAIL 503) CLASS 2 CONCRETE

* ALTERNATIVES TO BE SPECIFICALLY APPROVED BY THE CITY ENGINEER

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

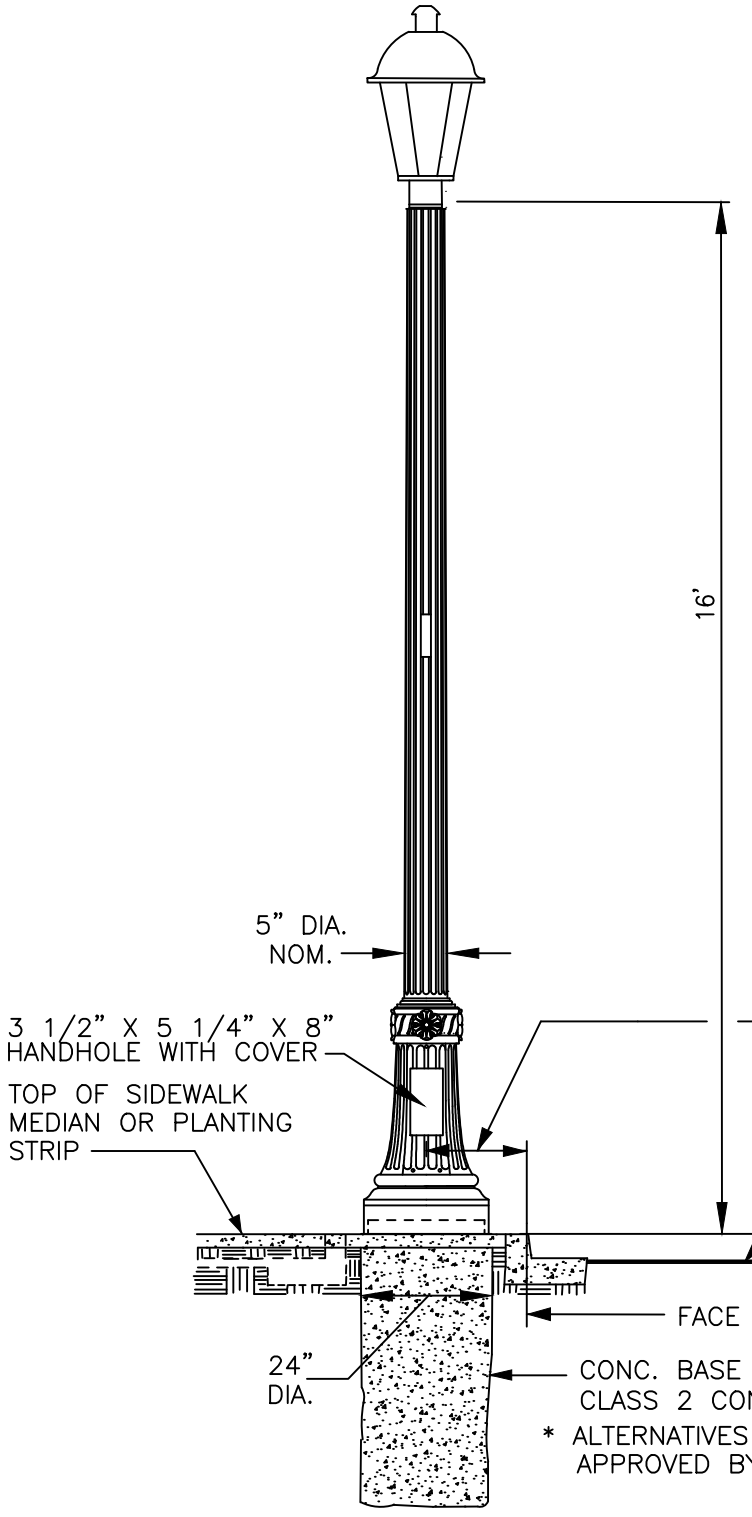
CITY OF PLEASANTON

STANDARD DETAILS

STREET LIGHT STANDARD POST TOP ELECTROLIER

REGISTERED PROFESSIONAL ENGINEER
ANN MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 507



NOTE:
USE ONLY UPON APPROVAL OF PLANNING AND ENGINEERING

LUMEC Z40 OR GE EVOLVE EPAM OR APPROVED LED EQUAL

POLE
BLACK ANODIZED ROUND TAPERED ALUMINUM ANODIZING TO BE ARCHITECTURE CLASS I PROCESS MATCHING BASE COVER SHAFT DIMENSIONS 5'x3'x16'x0.0125'
NOMINAL MOUNTING HEIGHT = 16'

DRAWN BY:	STAFF
CHECKED BY:	AN
SCALE:	N.T.S.

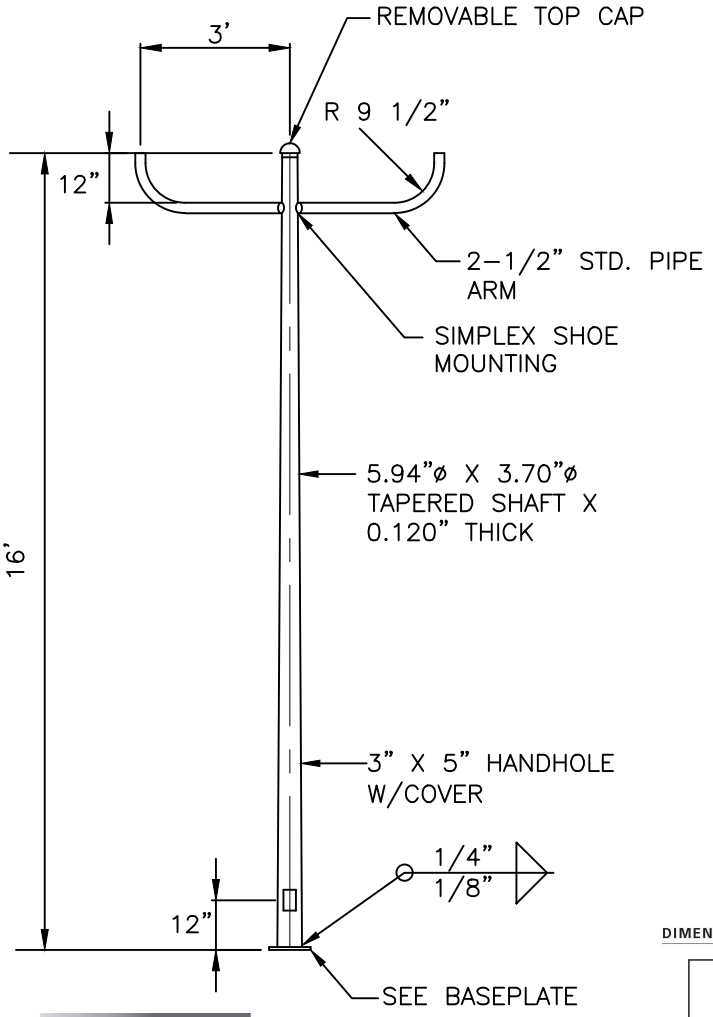
CITY OF PLEASANTON

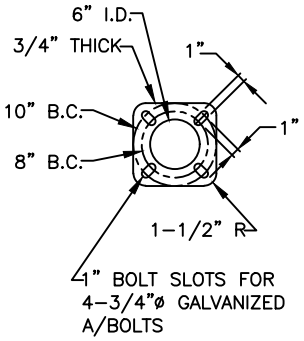
STANDARD DETAILS

STREET LIGHT STANDARD
POST TOP ELECTROLIER
FOR RESIDENTIAL STREETS

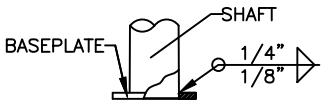
REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 508

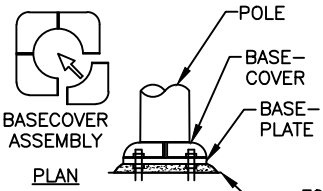




BASEPLATE



BASE DETAIL



FOUNDATION SHALL BE PER CITY OF PLEASANTON'S STANDARD DETAIL DRAWING NO. 503

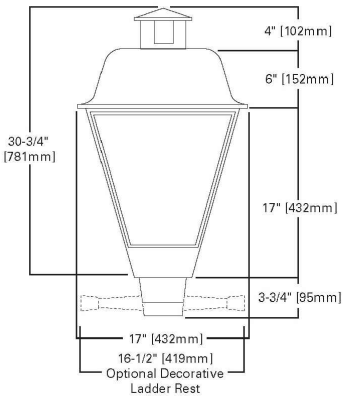
BASE COVER

UTLD
TRADITIONAIRE
LED DOWNLIGHT

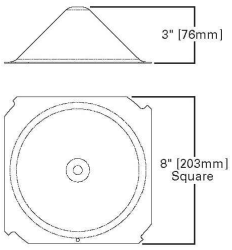
1 - 3 LightBARs
Solid State LED

DECORATIVE POST TOP LUMINAIRE

DIMENSIONS



OPTIONAL BIRD CONE



EATON
Powering Business Worldwide

NOTES:
1. LUMINAIRE SHALL BE UTLD–E01–LED–E–U–T3
2. INSTALL ACRYLIC LENS
3. USE ONLY UPON APPROVAL OF PLANNING AND ENGINEERING

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

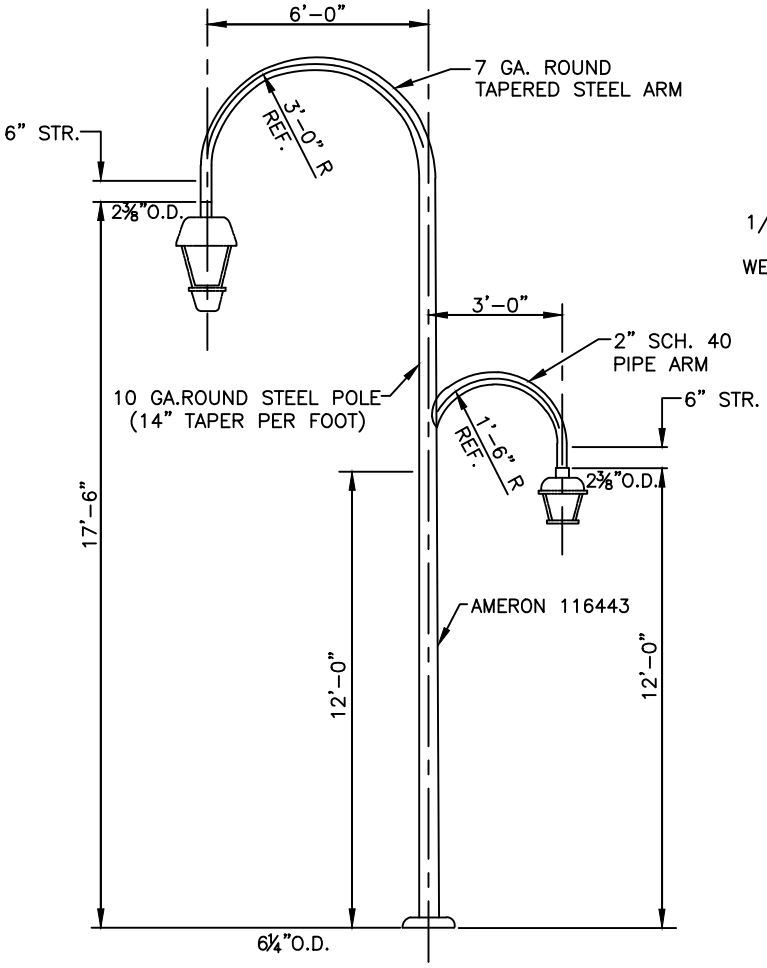
CITY OF PLEASANTON

STANDARD DETAILS

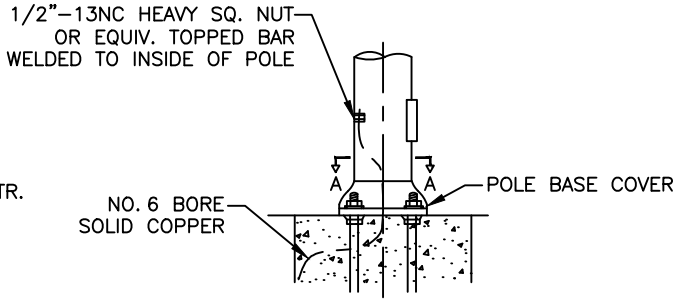
DOWNTOWN STREET LIGHT POLE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

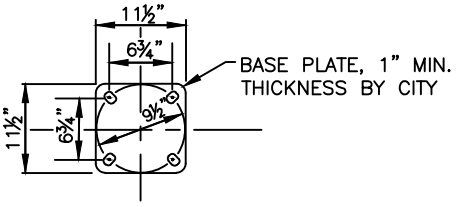
DATE: 7/24 | DWG NO. 509



LIGHTING STANDARD
NTS



BASE DETAIL
NTS



SECTION A-A
(COVER REMOVED)

NOTE:
1. FOUNDATION SHALL BE PER CITY OF PLEASANTON'S STANDARD DETAIL DRAWING NO. 503
2. USE ONLY UPON APPROVAL OF PLANNING AND ENGINEERING

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

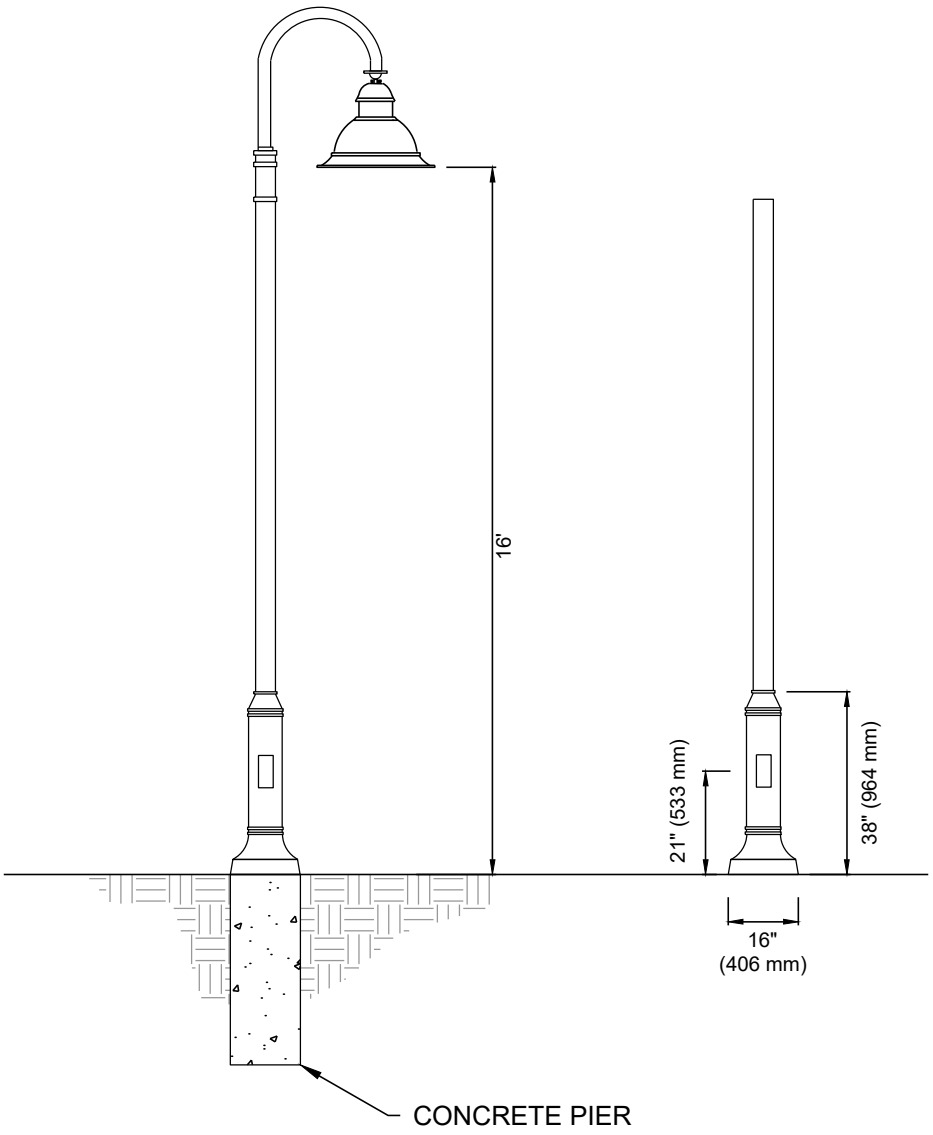
CITY OF PLEASANTON

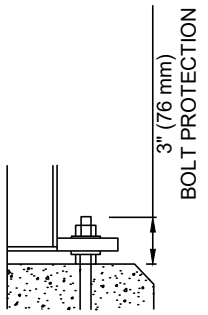
STANDARD DETAILS

DOWNTOWN CANDY CANE STREET POLE

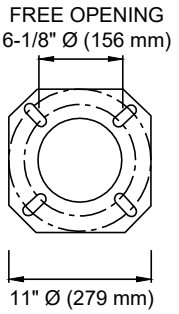
REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 510

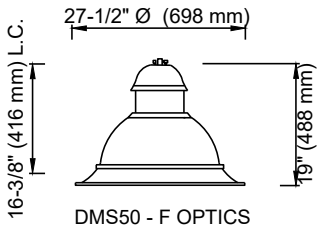




BASE AND BOLT
NTS



ANCHOR PLATE
NTS



DMS50 - F OPTICS
FLAT LENDS

LIGHT DOME
NTS

NOTES:

1. PRODUCTS BY SIGNIFY CLASSIFIED - INTERNAL.
2. INSTALLATION SHALL BE PER MANUFACTURER'S GUIDELINES.

MATERIALS INFORMATION	
POLE AND ANCHOR PLATE	SM6V-16-MPL-11.5-BKTX
BRACKET	SM-1A-BKTX
LIGHT DOME	DMS50-70W64LED4K-T-LEAF-120-DMG-BKTX

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CHECKED BY: AN
SCALE: N.T.S.

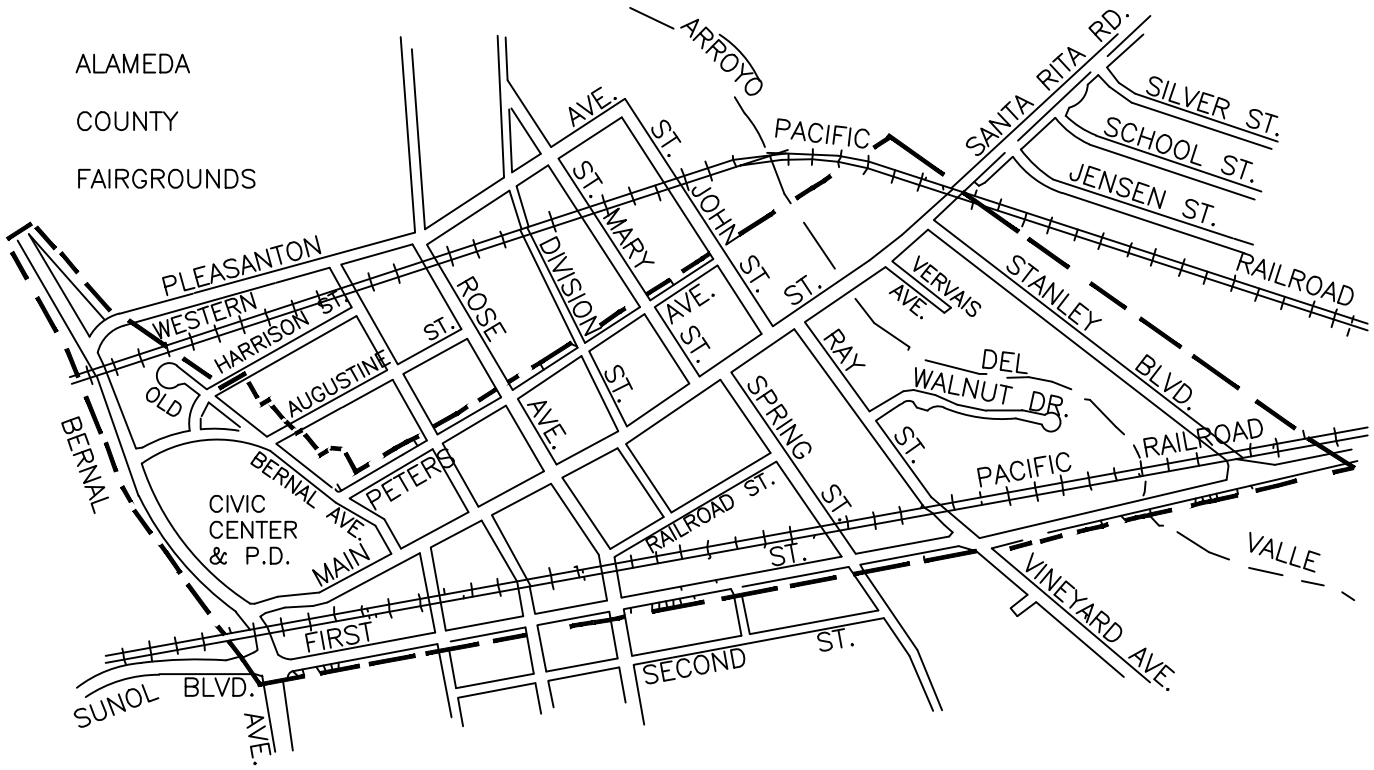
CITY OF PLEASANTON

STANDARD DETAILS

DOWNTOWN TRANSPORTATION CORRIDOR LIGHT POLE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELSON
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 511



DOWN TOWN SPECIFIC PLAN

GENERAL NOTES

1. AN ENCROACHMENT PERMIT IS REQUIRED FOR ALL NEWSPAPER RACKS, PERMANENT OR TEMPORARY. (ORD. NO. 1103, SEC. 5–9.09)
2. ALL NEWSPAPER RACKS WITHIN THE HISTORICAL BUSINESS DISTRICT SHALL BE OF A MULTI–UNIT CONFIGURATION PERMANENTLY AFFIXED TO THE GROUND UNLESS OTHERWISE PERMITTED BY THE ENGINEER, (SEC. 5–9.09A) SEE ABOVE MAP.
3. SINGLE–UNIT NEWSPAPER RACKS SHALL NOT BE CHAINED, BOLTED OR OTHERWISE ATTACHED TO ANY PROPERTY WITHOUT PERMISSION OF THE OWNER; NOR SHALL THEY BE ATTACHED TO ANY TREE, SHRUB OR OTHER PLANT OR SITUATED UPON ANY LANDSCAPED AREA AT ANY TIME.
4. NEWSPAPER RACK UNITS WILL NOT BE PERMITTED AT THE FOLLOWING LOCATIONS:
   A. WITHIN 3' OF ANY CROSSWALK, DRIVEWAY, BUILDING ENTRANCE, OR NO PARKING/STOPPING ZONES.
   B. WITHIN 5' RADIUS OF ANY FIRE HYDRANT, FIRE CALL BOX, POLICE CALL BOX OR OTHER EMERGENCY FACILITY.
   C. WITHIN 150' RADIUS OF ANOTHER NEWSPAPER RACK UNIT IF NOT SEPARATED BY THE STREET.
   D. AS DETERMINED UNSUITABLE BY THE ENGINEER.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

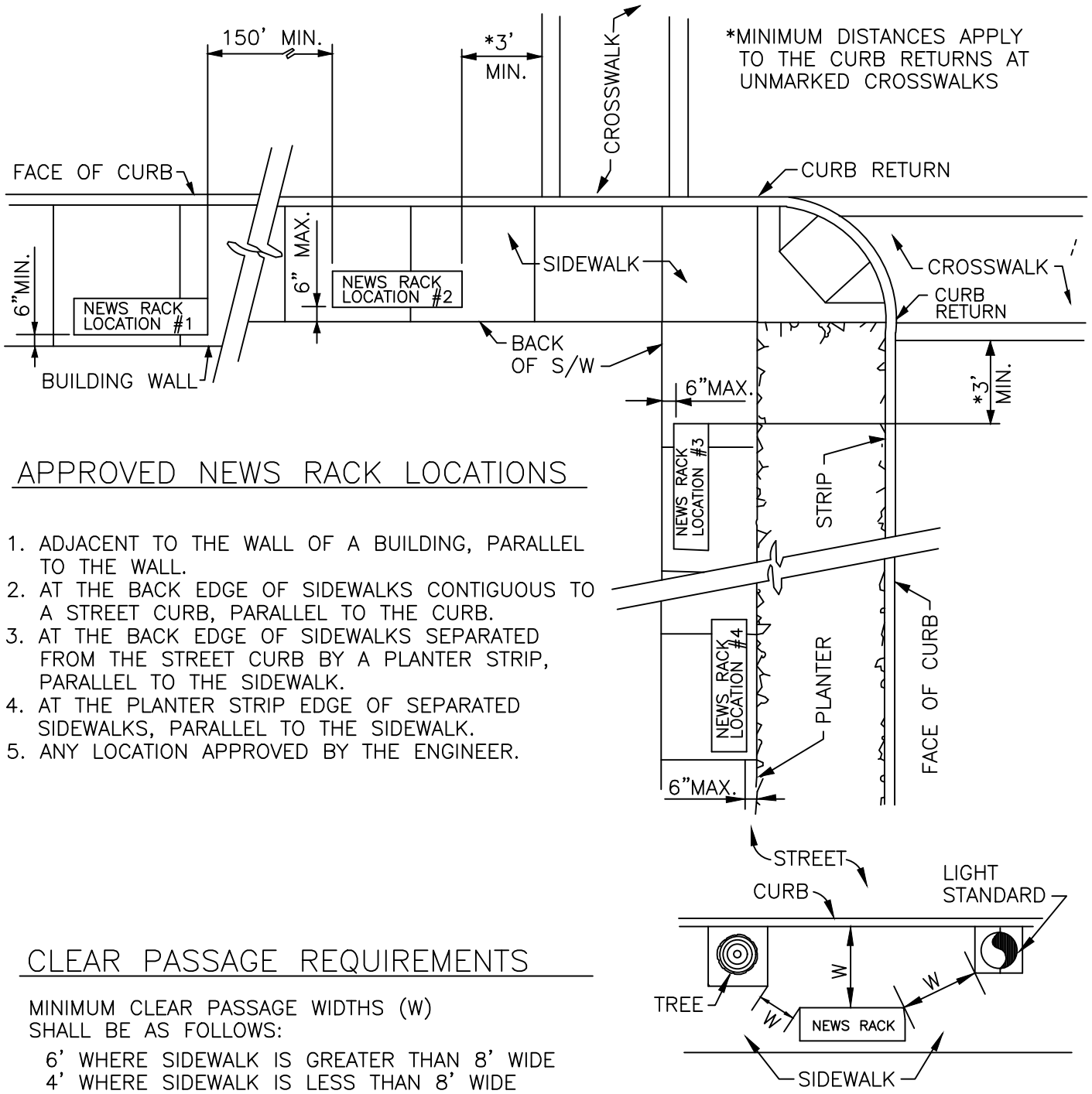
CITY OF PLEASANTON

STANDARD DETAILS

NEWSPAPER RACKS AND SIMILAR DISPENSERS

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW WELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 601A



APPROVED NEWS RACK LOCATIONS

1. ADJACENT TO THE WALL OF A BUILDING, PARALLEL TO THE WALL.
2. AT THE BACK EDGE OF SIDEWALKS CONTIGUOUS TO A STREET CURB, PARALLEL TO THE CURB.
3. AT THE BACK EDGE OF SIDEWALKS SEPARATED FROM THE STREET CURB BY A PLANTER STRIP, PARALLEL TO THE SIDEWALK.
4. AT THE PLANTER STRIP EDGE OF SEPARATED SIDEWALKS, PARALLEL TO THE SIDEWALK.
5. ANY LOCATION APPROVED BY THE ENGINEER.

CLEAR PASSAGE REQUIREMENTS

MINIMUM CLEAR PASSAGE WIDTHS (W) SHALL BE AS FOLLOWS:

6' WHERE SIDEWALK IS GREATER THAN 8' WIDE
4' WHERE SIDEWALK IS LESS THAN 8' WIDE
8' AT ANY BICYCLE/PEDESTRIAN PATH

DRAWN BY: STAFF	
CHECKED BY: AN	
SCALE: N.T.S.	

CITY OF PLEASANTON

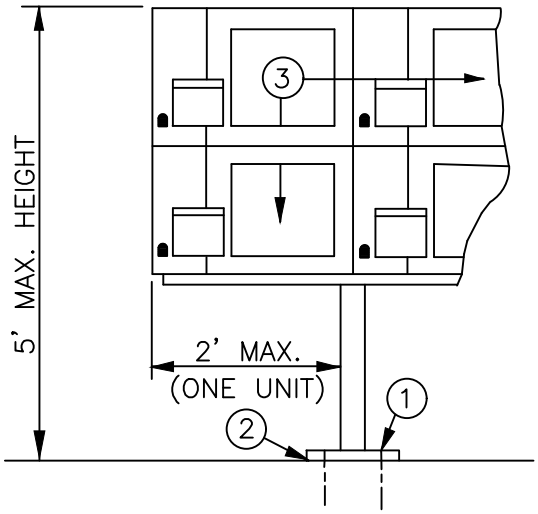
STANDARD DETAILS

NEWSPAPER RACKS AND SIMILAR DISPENSERS

REGISTERED PROFESSIONAL ENGINEER
ANN MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

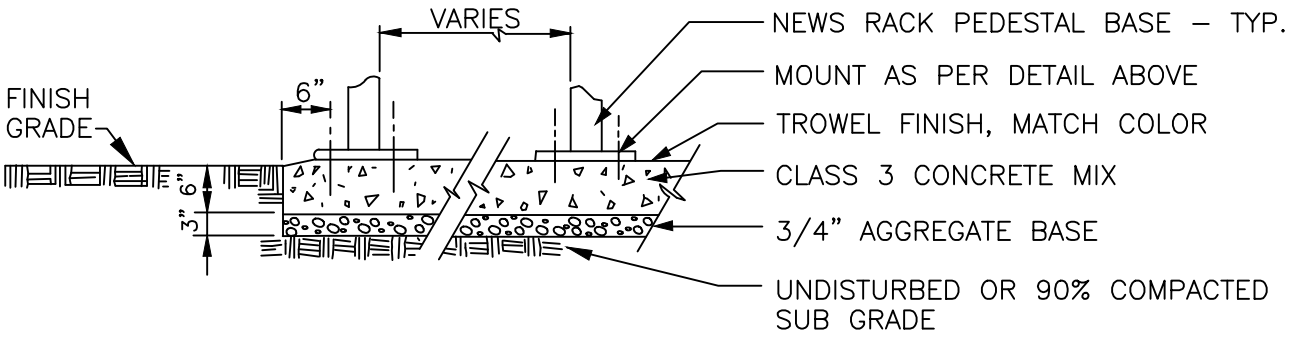
DATE: 7/24 | DWG NO. 601B

MULTI–UNIT INSTALLATIONS

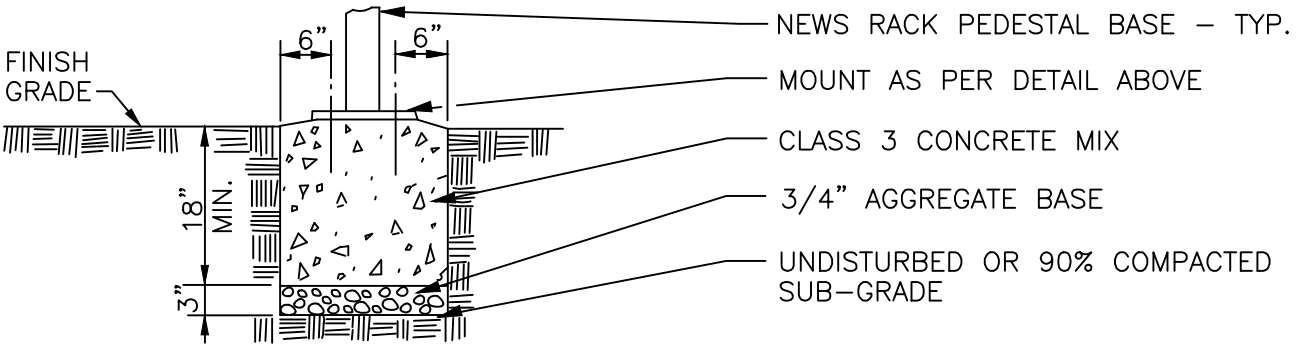


1. FOR INSTALLATIONS IN EXISTING SIDEWALK AREAS, DRILL INTO CONCRETE AND BOLT NEWS RACK BASE TO SURFACE WITH 4–3/8" 0 X 2 1/2" MOLLY BOLTS. DRILL SIZE AND DEPTH AS PER MANUFACTURER'S SPECIFICATIONS.
2. GROUT ALL GAPS, IF ANY, AT NEWS RACK BASE.
3. MULTI–UNIT CONFIGURATIONS SHALL BE LIMITED TO 2 ROWS OF UNITS IN HEIGHT, 6 UNITS PER ROW.
4. NEWS RACKS SHALL BE INSTALLED AS PLUMB AND LEVEL AS PRACTICABLE.
5. FOR INSTALLATIONS WHERE THERE IS NO EXISTING CONCRETE SURFACE REFER TO DETAILS BELOW.
6. MOUNTING SURFACES ARE TO BE RESTORED UPON REMOVAL OF UNIT BY THE DISTRIBUTOR.

MULTIPLE BASE CONCRETE PAD



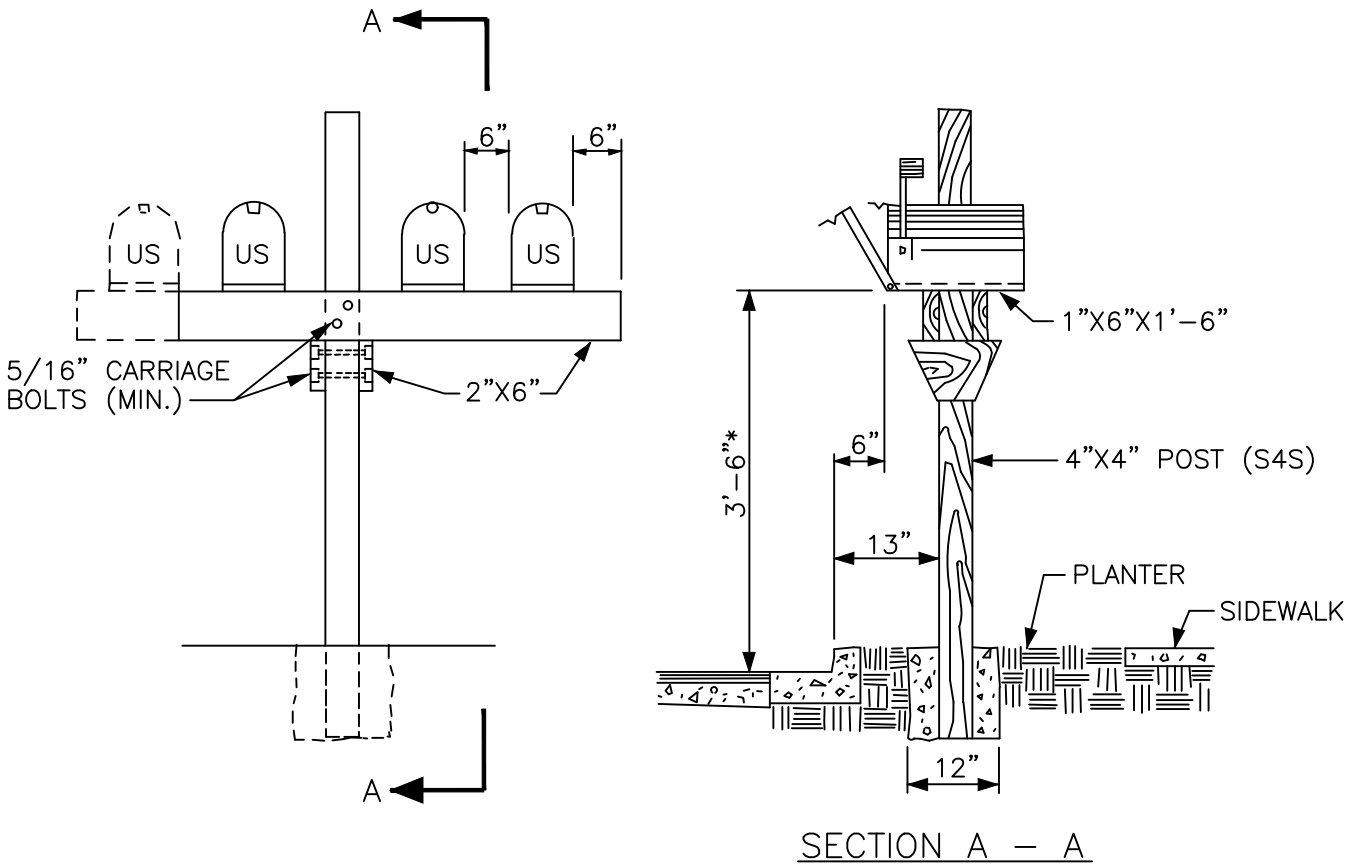
SINGLE BASE CONCRETE PIER



DRAWN BY: STAFF	CITY OF PLEASANTON
CHECKED BY: AN	STANDARD DETAILS
SCALE: N.T.S.	NEWSPAPER RACKS AND SIMILAR DISPENSERS

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELSEN
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 601C



SECTION A – A

CLUSTERED MAILBOX

NOTES:

1. ALL LUMBER SHALL CONFORM TO STATE STANDARD SPECIFICATION 56-2.02B "WOOD POSTS."
2. ALL HARDWARE SHALL BE HOT DIP GALVANIZED.
3. CONCRETE SHALL BE CLASS 4.
4. SEE IMPROVEMENT PLANS FOR LOCATION OF MAIL BOXES AND NUMBER OF BOXES CLUSTERED AT EACH LOCATION.
5. THE MAILBOX DETAIL IS A MINIMUM STANDARD AND MAY BE UPGRADED ON A PER TRACT BASIS. A DETAIL SKETCH OF ANY MODIFICATION TO THIS DETAIL SHALL BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

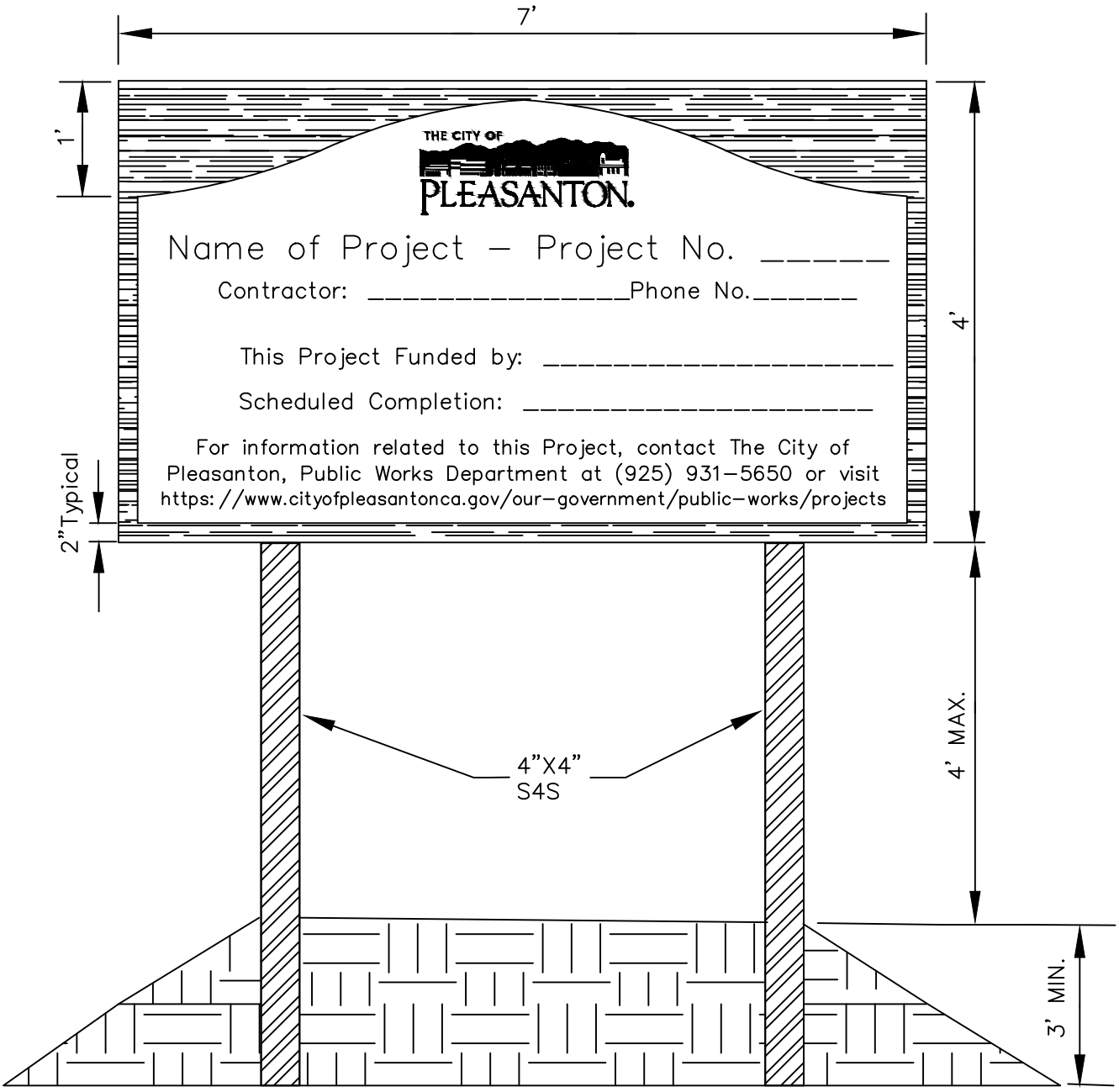
CITY OF PLEASANTON

STANDARD DETAILS

MAILBOX DETAILS

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 602



NOTES:

1. THE SIGN MAY BE PURCHASED FROM SIGN PRO, DUBLIN, CA 925–829–5000; AT THE CONTRACTORS' OPTION, OTHER FABRICATORS MAY BE SUBMITTED FOR APPROVAL.
2. ATTACH POSTS TO 1/2" EXTERIOR PLYWOOD SIGN FACE WITH FOUR 1/2" STOVE BOLTS.
3. POSTS SHALL BE PRESURE TREATED DOUGLAS FIR OR DENSE, STRUCTURAL GRADE REDWOOD.
4. POSTS SHALL BE SET 3' DEEP IN FIRMLY COMPACTED SOIL OR CONCRETE.
5. SIGN COLORS SHALL BE: SIGN BACKGROUND–PANTONE 5545C; SIGN BODY– PANTONE 155C. PAINT SHALL BE EXTERIOR ENAMEL.
6. SIGN TO BE PLACED IN A NON–WALKWAY AREA.

DRAWN BY: STAFF	
CHECKED BY: AN	
SCALE: N.T.S.	

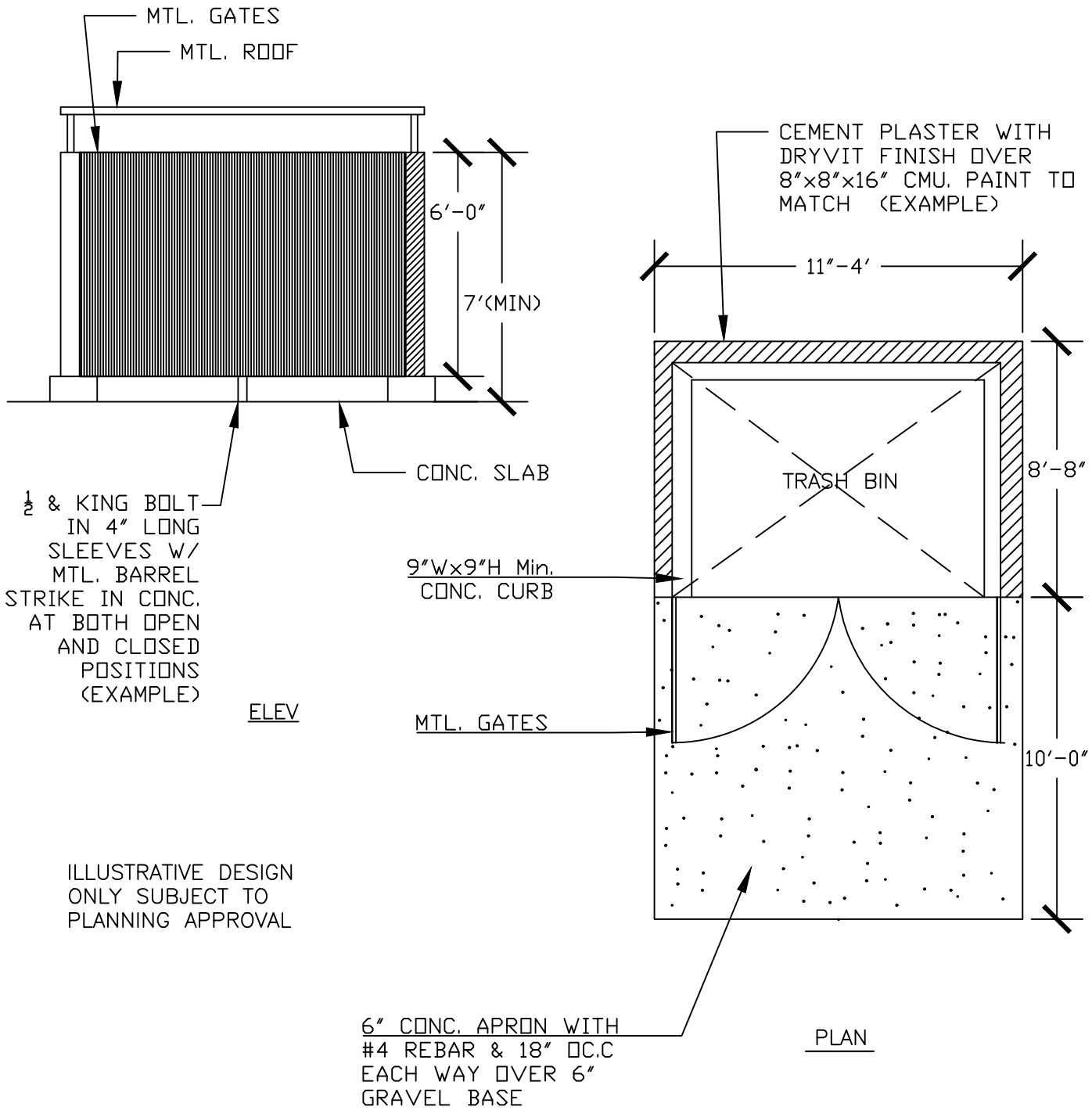
CITY OF PLEASANTON

STANDARD DETAILS

PROJECT IDENTIFICATION SIGN

REGISTERED PROFESSIONAL ENGINEER
ANN MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 603



DRAWN BY:	STAFF
CHECKED BY:	
SCALE:	N.T.S.

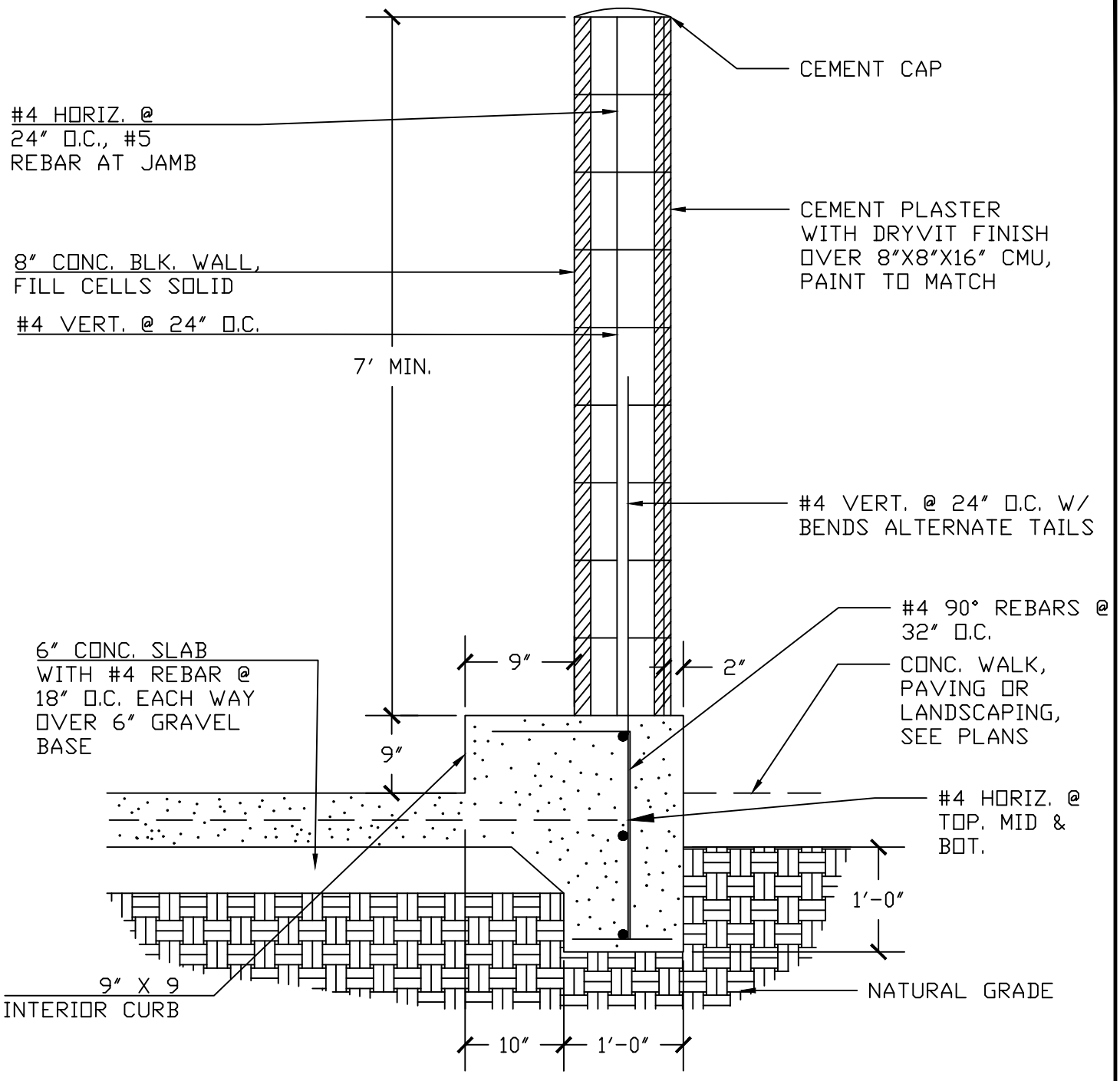
CITY OF PLEASANTON

STANDARD DETAILS

TRASH ENCLOSURE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 604A



DRAWN BY: STAFF		
CHECKED BY:		
SCALE: N.T.S.		

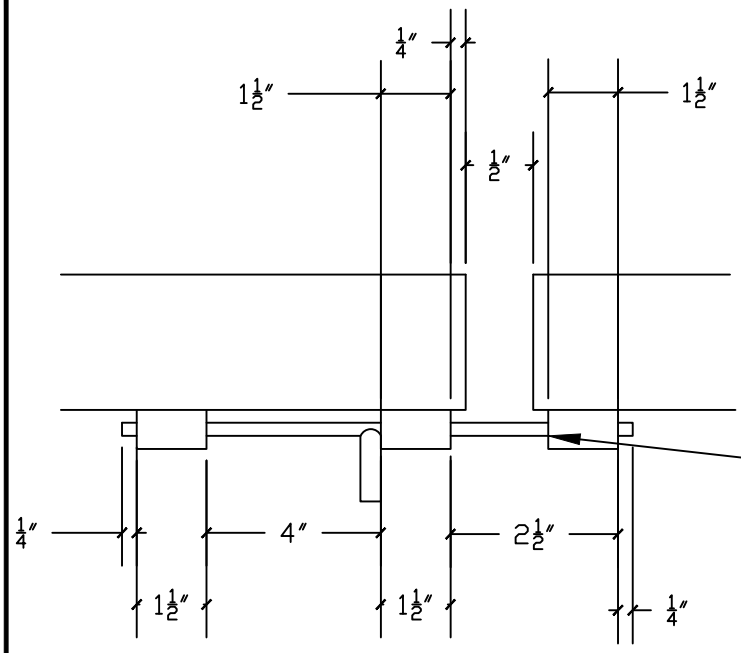
CITY OF PLEASANTON

STANDARD DETAILS

TRASH ENCLOSURE

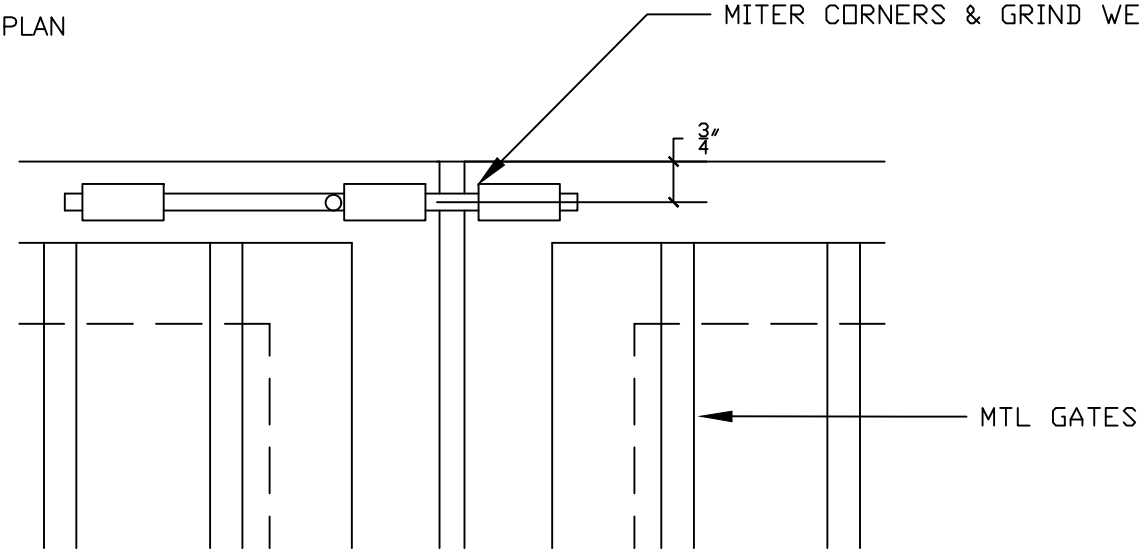
REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24	DWG NO. 604B



ILLUSTRATIVE DESIGN ONLY SUBJECT TO PLANNING APPROVAL

PLAN



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DRAWN BY: STAFF	
CHECKED BY:	
SCALE: N.T.S.	

CITY OF PLEASANTON

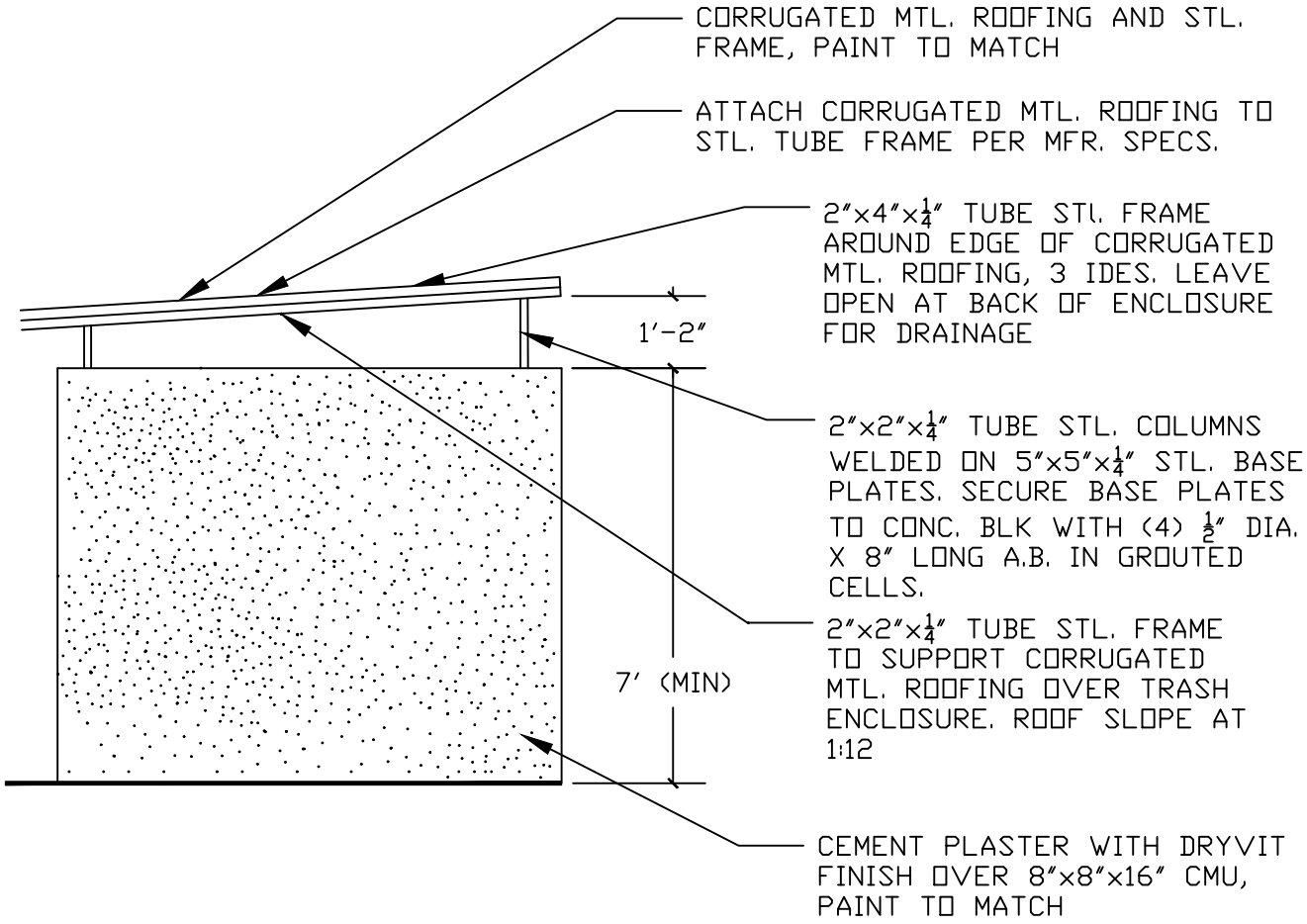
STANDARD DETAILS

TRASH ENCLOSURE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 604C

ILLUSTRATIVE DESIGN
ONLY SUBJECT TO
PLANNING APPROVAL



DRAWN BY: STAFF		
CHECKED BY:		
SCALE: N.T.S.		

CITY OF PLEASANTON

STANDARD DETAILS

TRASH ENCLOSURE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW WELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24	DWG NO. 604D

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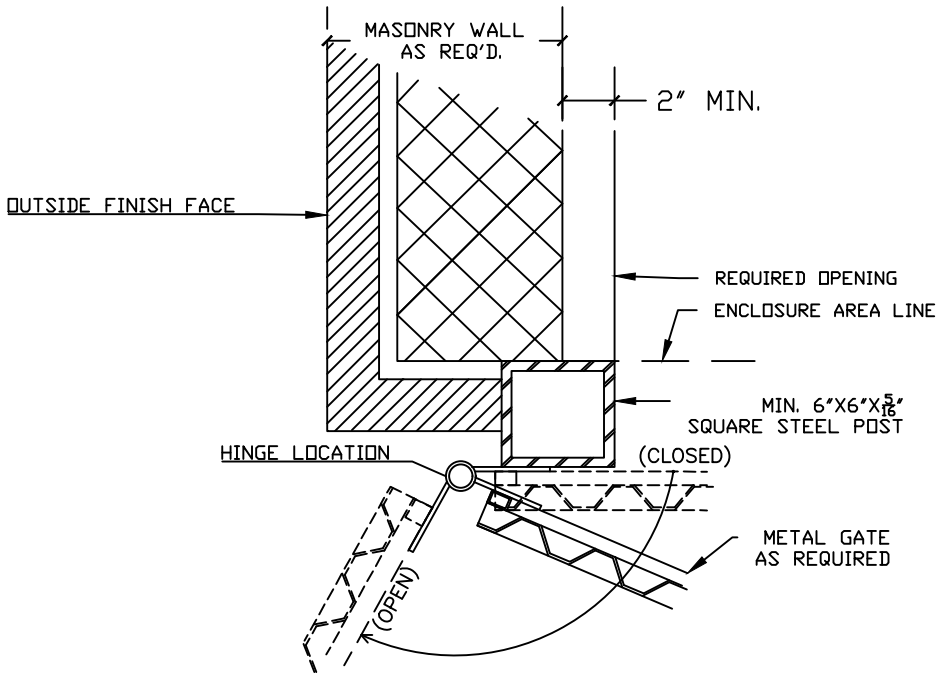
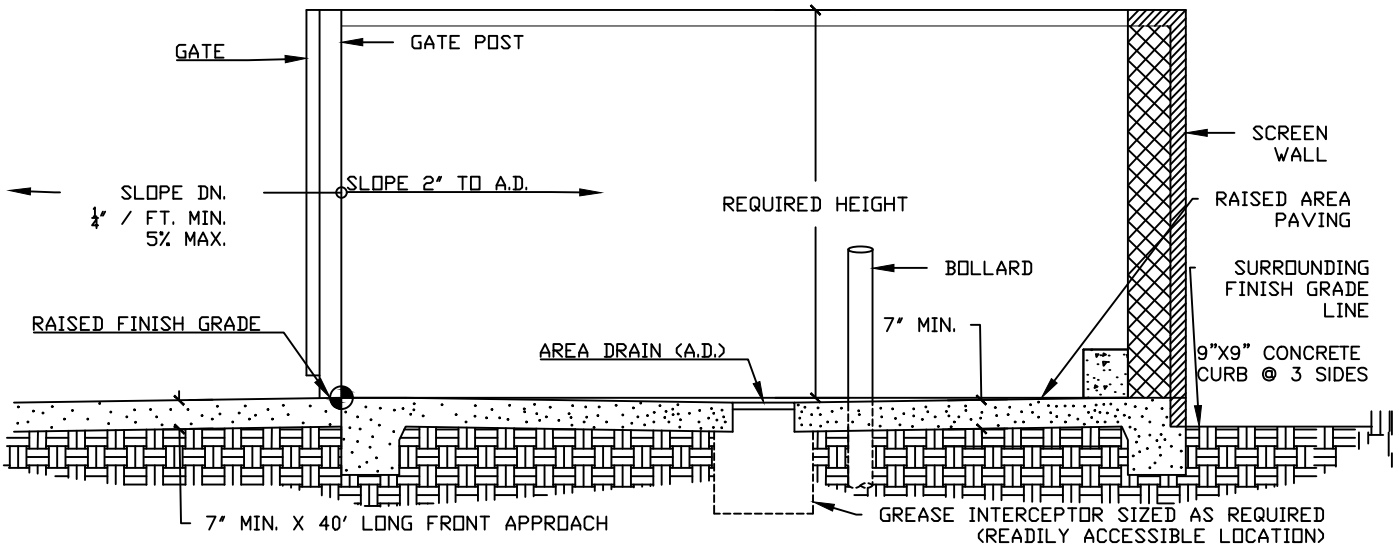
ONLY SUBJECT TO
PLANNING APPROVAL



GATE POST PLAN DETAIL

SCALE: 1 1/2" = 1'-0"



ENCLOSED AREA CROSS SECTION

DRAWN BY:	STAFF
CHECKED BY:	
SCALE:	N.T.S.

CITY OF PLEASANTON

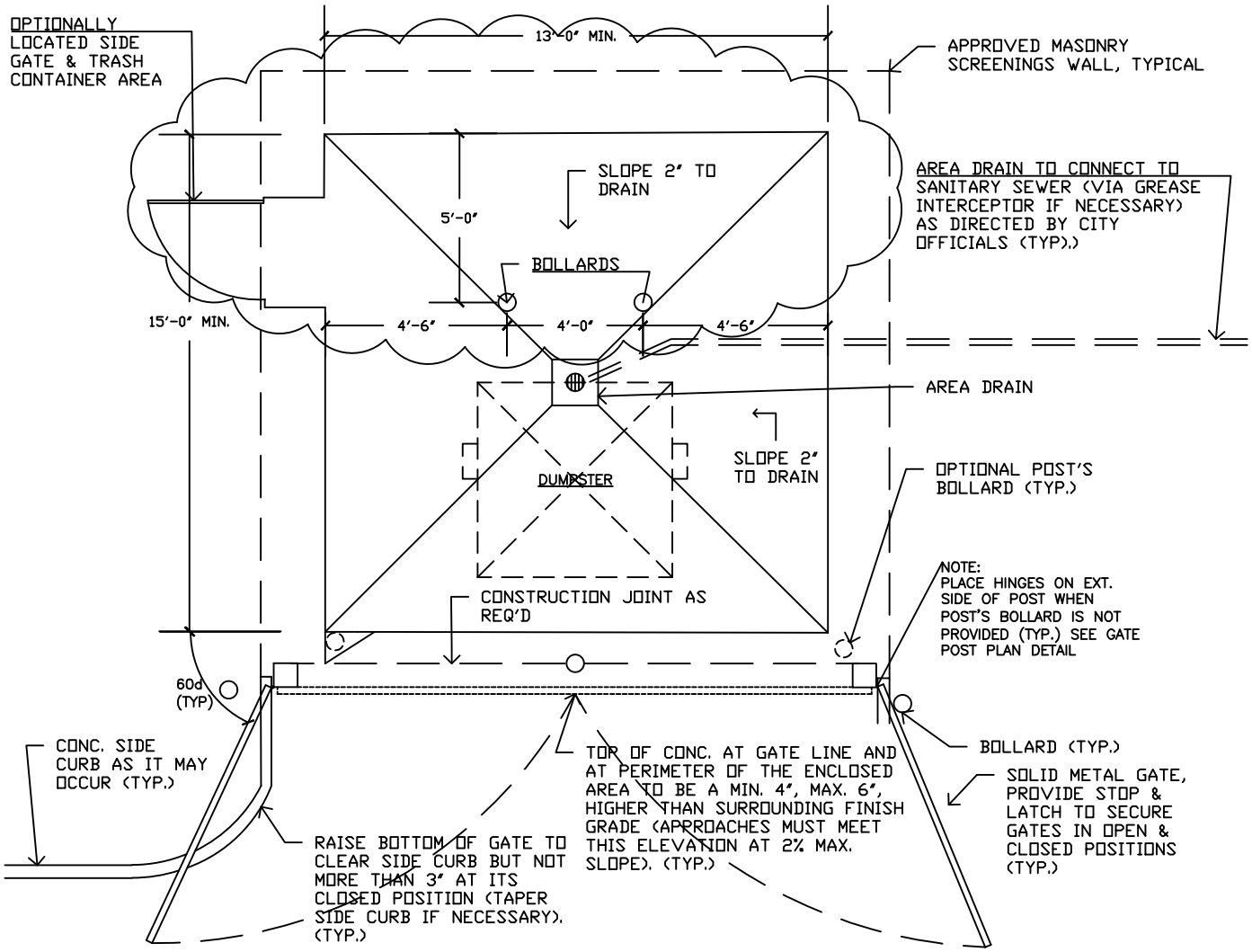
STANDARD DETAILS

TRASH ENCLOSURE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 604E

ILLUSTRATIVE DESIGN
ONLY SUBJECT TO
PLANNING APPROVAL



SINGLE CONTAINER

(WHERE PERMITTED)
NTS

DRAWN BY: STAFF		
CHECKED BY:		
SCALE: N.T.S.		

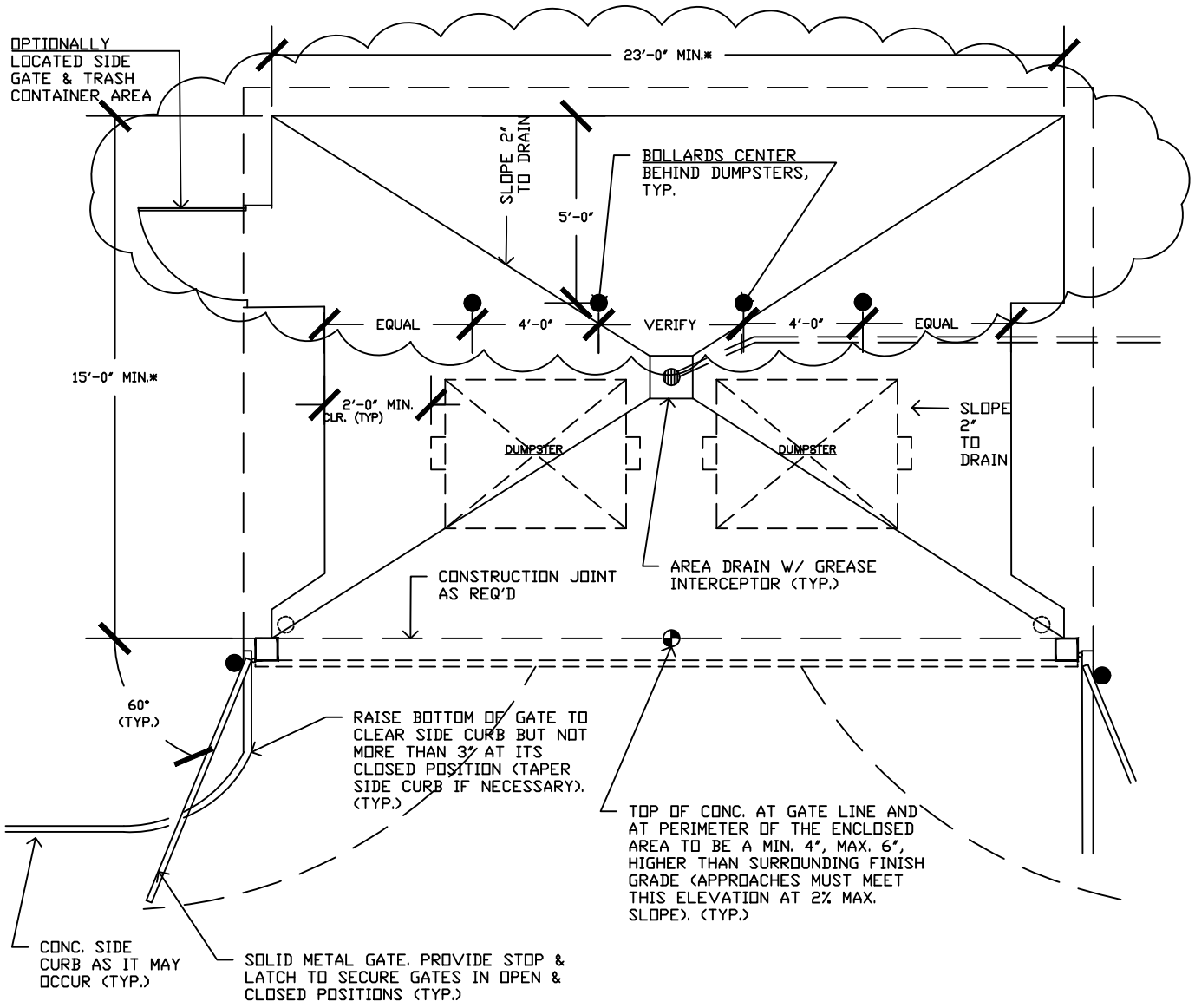
CITY OF PLEASANTON

STANDARD DETAILS

TRASH ENCLOSURE SINGLE CONTAINER

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW WELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 604F



LARGE TRASH ENCLOSURE

(SCHEMES MAY COMBINE FOR LARGER SYSTEMS)

NTS

SEE GENERAL NOTES FOR ALL ENCLOSURES ON THE SMALL CONTAINER SPEC SHEET

FOR REFERENCE ONLY.

* ASSURE REQUIRED DIMENSIONS ACCOMMODATE THE NUMBER OF DUMPSTERS/BINS REQUIRED BY THE TRASH COLLECTION COMPANY.

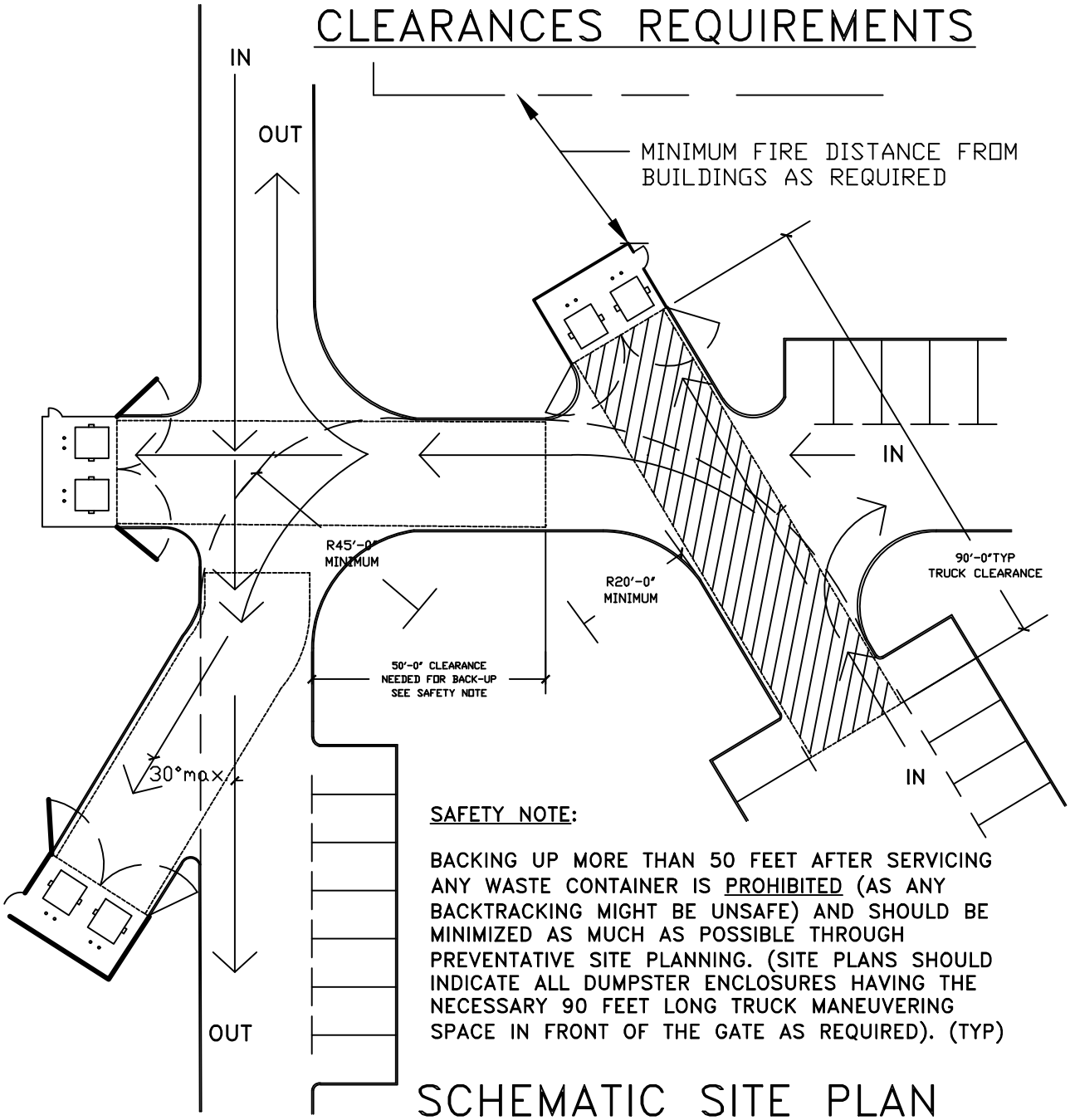
DRAWN BY: STAFF	CITY OF PLEASANTON
CHECKED BY:	STANDARD DETAILS
SCALE: N.T.S.	TRASH ENCLOSURE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 604G

FOR REFERENCE ONLY:

SOLID WASTE VEHICLE OPERATION SCHEMATIC TYPICAL ROUTE CONDITIONS AND TRUCK MANEUVERING SPACE CLEARANCES REQUIREMENTS



SAFETY NOTE:

BACKING UP MORE THAN 50 FEET AFTER SERVICING ANY WASTE CONTAINER IS PROHIBITED (AS ANY BACKTRACKING MIGHT BE UNSAFE) AND SHOULD BE MINIMIZED AS MUCH AS POSSIBLE THROUGH PREVENTATIVE SITE PLANNING. (SITE PLANS SHOULD INDICATE ALL DUMPSTER ENCLOSURES HAVING THE NECESSARY 90 FEET LONG TRUCK MANEUVERING SPACE IN FRONT OF THE GATE AS REQUIRED). (TYP)

SCHEMATIC SITE PLAN

DRAWN BY: STAFF	CITY OF PLEASANTON
CHECKED BY:	STANDARD DETAILS
SCALE: N.T.S.	TRASH ENCLOSURE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 604H

SOLID WASTE VEHICLE OPERATION SCHEMATIC TYPICAL ROUTE CONDITIONS AND TRUCK MANEUVERING SPACE CLEARANCES REQUIREMENTS

GENERAL NOTES:

1. ALL CURBS ARE TO BE ALIGNED ON THE OUTSIDE OF ENCLOSURE WALLS. THE CURBS SHALL NOT INTERFERE WITH THE ROUTE OF THE SOLID WASTE COLLECTION VEHICLE.
2. ALL SOLID WASTE COLLECTION ROUTES SHALL MEET ENGINEERING DESIGN CRITERIA (WIDTHS TURNING RADII, ETC.), SITE SHALL BE DESIGNED TO PROVIDE SOLID WASTE COLLECTION VEHICLES WITH SAFE APPROACH TO DUMPSTER ENCLOSURES AND LIFT EACH CONTAINER WITHOUT GROUND LEVEL OR AERIAL OBSTRUCTIONS AS REQUIRED.
3. FOR THE SAFETY OF OTHERS, ROUTE LAYOUT AND OPERATION CLEARANCES SHALL BE SUCH THAT SOLID WASTE VEHICLES WILL NOT NEED TO BACK UP MORE THAN 50 FEET TO EXIT THE SITE AFTER SERVICING A DUMPSTER.
4. NO AWNING OR BUILDING PROJECTIONS ARE TO ENCROACH THE SOLID WASTE COLLECTION VEHICLE'S OPERATION AREA AND/OR SPACE. MINIMUM OVERHEAD CLEARANCE OF 14 FEET IS REQUIRED IN DRIVE AND 25 FEET OVER AND ABOUT THE DUMPSTER ENCLOSURE AREA FROM STEEL SAFETY BOLLARDS BACK TO 50 FEET.
5. ROUTES SHALL BE CLEAR OF ALL OBSTRUCTIONS (CURBS, WALLS, OVERHEAD WIRES, AWNINGS, ROOF PROJECTIONS, ETC.) TO PREVENT DAMAGE FROM THE COLLECTION VEHICLE.
6. IDEALLY, THE MOST DESIRED SITE PLANNING SHALL BE WHENEVER IS POSSIBLE TO SELECT A ROUTE FOR THE COLLECTION VEHICLE TO TRAVEL THE SITE WITHOUT BACKTRACKING, MULTIPLE FACILITIES SHOULD BE LOCATED IN SEQUENCE TO ALLOW CONSECUTIVE SERVICING ON ONE-WAY TRUCK ROUTE AS MUCH AS POSSIBLE (TYPICAL, UNLESS OTHERWISE APPROVED BY ENVIRONMENTAL SERVICES).
7. ALL DUMPSTER ENCLOSURES MUST BE ORIENTED TO FACE 90 FEET LONG OF OPEN SPACE, THE ONLY EXCEPTION IS FOR DUMPSTER ENCLOSURES PLACED ALONG A STRAIGHT COLLECTION VEHICLE ROUTE WHERE THE ENCLOSURES NEED TO BE ANGLED WITH NOT MORE THAN 30 DEGREES DEVIATION FROM THE ROUTE DIRECTION LINE AND PLACED DEEP ENOUGH TO ALLOW THE TYPICAL 50 FEET BACK UP FOR THE VEHICLE TO RESUME ITS ROUTE.
8. DUMPSTER ENCLOSURES SHALL BE LOCATED AWAY FROM ENTRANCES AND EXISTS SO SOLID WASTE COLLECTION VEHICLES DO NOT CREATE A SAFETY HAZARD BY BLOCKING INCOMING OR OUR-GOING TRAFFIC.

FOR REFERENCE ONLY:

DRAWN BY: STAFF		
CHECKED BY:		
SCALE: N.T.S.		

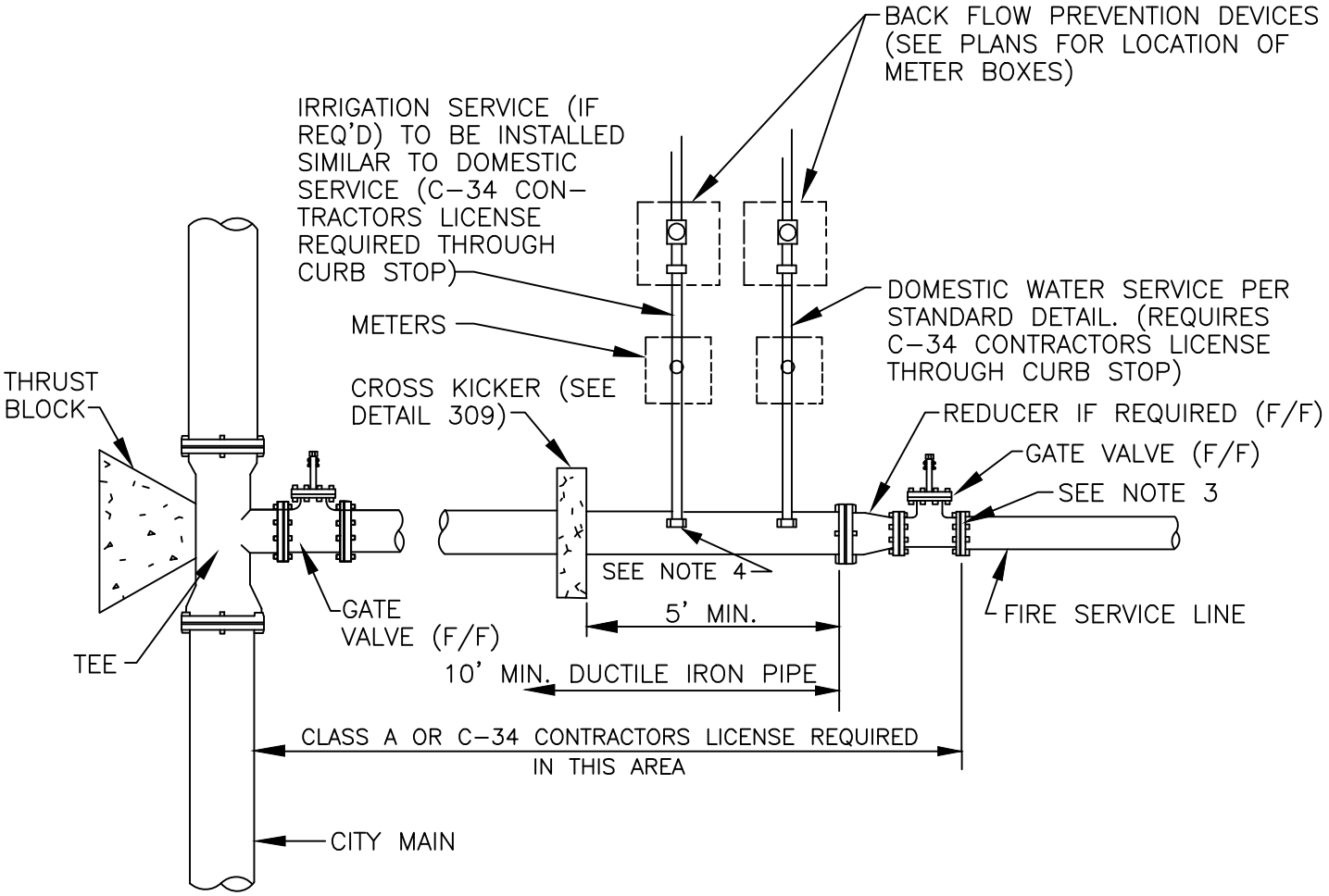
CITY OF PLEASANTON

STANDARD DETAILS

TRASH ENCLOSURE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW WELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 604I



NOTES:

1. CLASS A OR C-34 CONTRACTORS LICENSE REQUIRED FOR WORK FROM THE CITY MAIN THROUGH THE FIRST ON-SITE CONTROL APPARATUS.
2. CLASS A OR C-34 CONTRACTORS LICENSE REQUIRED TO MAKE ALL TAPS AND SERVICE RUNS THROUGH METER.
3. ALL PIPES AND/OR VALVES SHALL BE TERMINATED WITH A BLIND FLANGE AND BLOW-OFF PER CITY STD 310.
4. SEE DETAIL 301 FOR APPROVED REQUIREMENTS.
5. ALL BACK FLOW PREVENTION DEVICES SHALL BE PLACED WITHIN 12" OF METER LOCATION.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

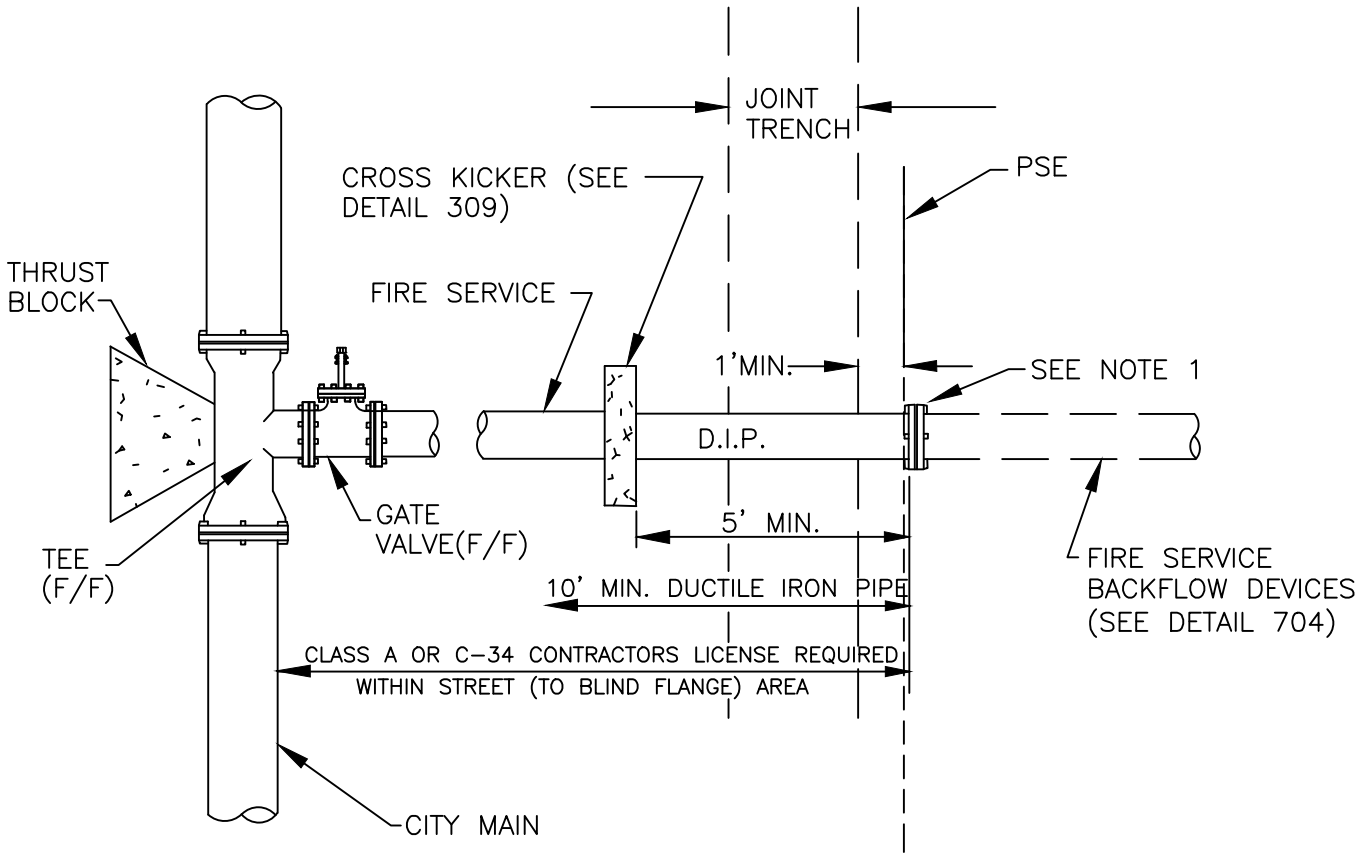
CITY OF PLEASANTON

STANDARD DETAILS

BACK FLOW PREVENTION COMMERCIAL AND INDUSTRIAL WATER SERVICE WITH FIRE SERVICE SYSTEM

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 701



NOTES:

1. ALL PIPES AND/OR VALVES SHALL BE TERMINATED WITH A BLIND FLANGE AND 4" GALVANIZED BLOW-OFF UNTIL BACKFLOW DEVICE IS INSTALLED. (SEE DETAIL 309)
2. CLASS A OR C-34 CONTRACTORS LICENSE REQUIRED THROUGH BACKFLOW DEVICE.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

STANDARD DETAILS

BACKFLOW PREVENTION FIRE SERVICE SYSTEM ONLY (NO DOMESTIC)

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

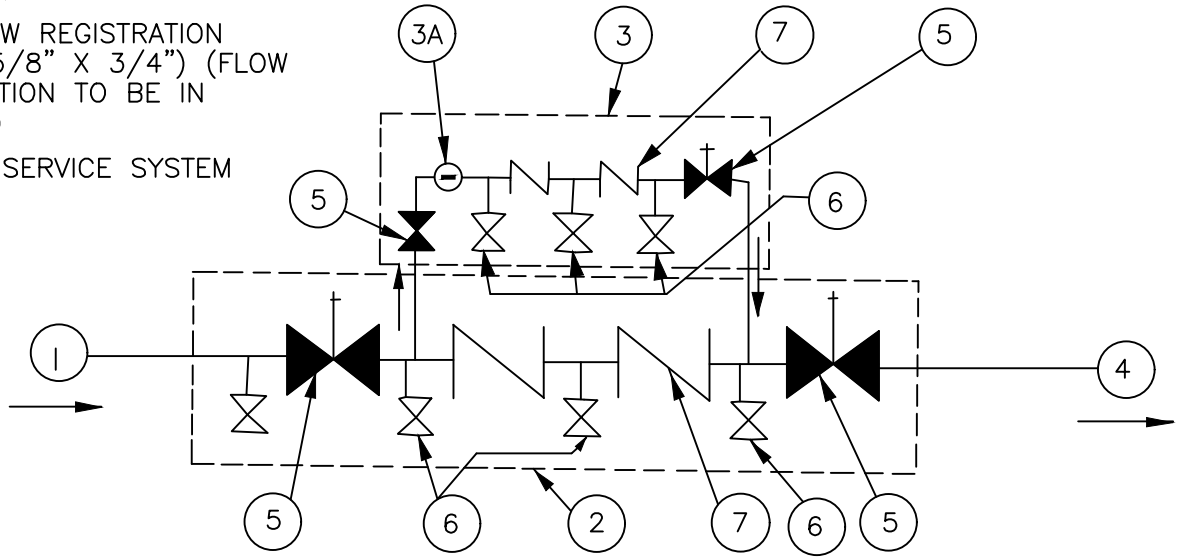
DATE : 7/24 | DWG NO. 702

TYPICAL INSTALLATION

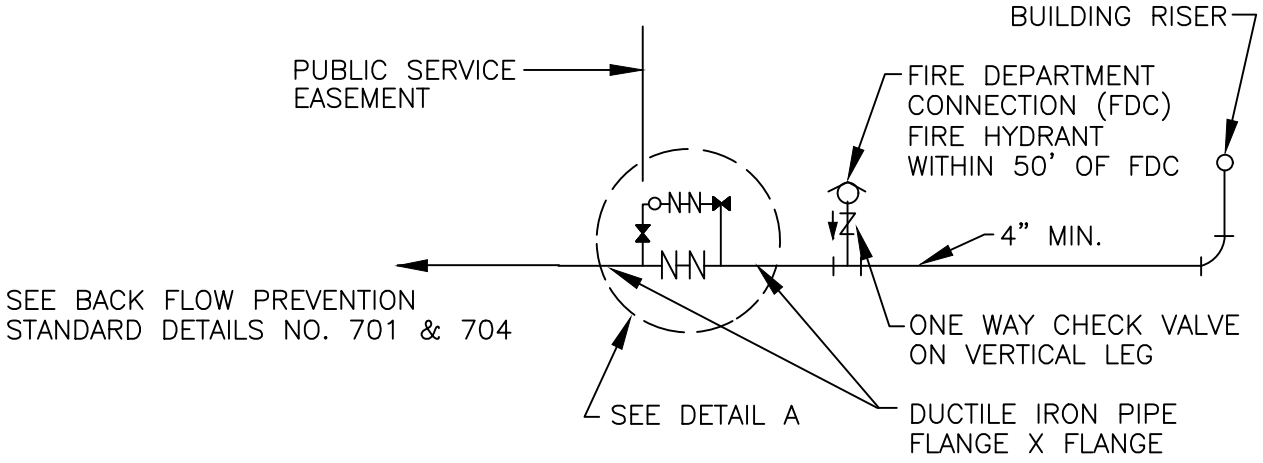
1. FROM SYSTEM WATER SUPPLY
2. MAINLINE DOUBLE CHECK ASSEMBLY
3. BY–PASS LINE DOUBLE CHECK ASSEMBLY

3A. LOW–FLOW REGISTRATION METER (5/8" X 3/4") (FLOW REGISTRATION TO BE IN GALLONS)

4. TO FIRE SERVICE SYSTEM
5. SHUTOFF VALVES SHALL BE ELECTRONICALLY MONITORED
6. TEST COCKS (TYPICAL)
7. CHECK VALVES (TYPICAL)



DETAIL A
TYPICAL DOUBLE CHECK DETECTOR CHECK ASSEMBLY
(SEE SHEET 704)



NOTE:
THE ENTIRE ASSEMBLY SHALL BE FACTORY ASSEMBLED.

TYPICAL FIRE SPRINKLER SYSTEM

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

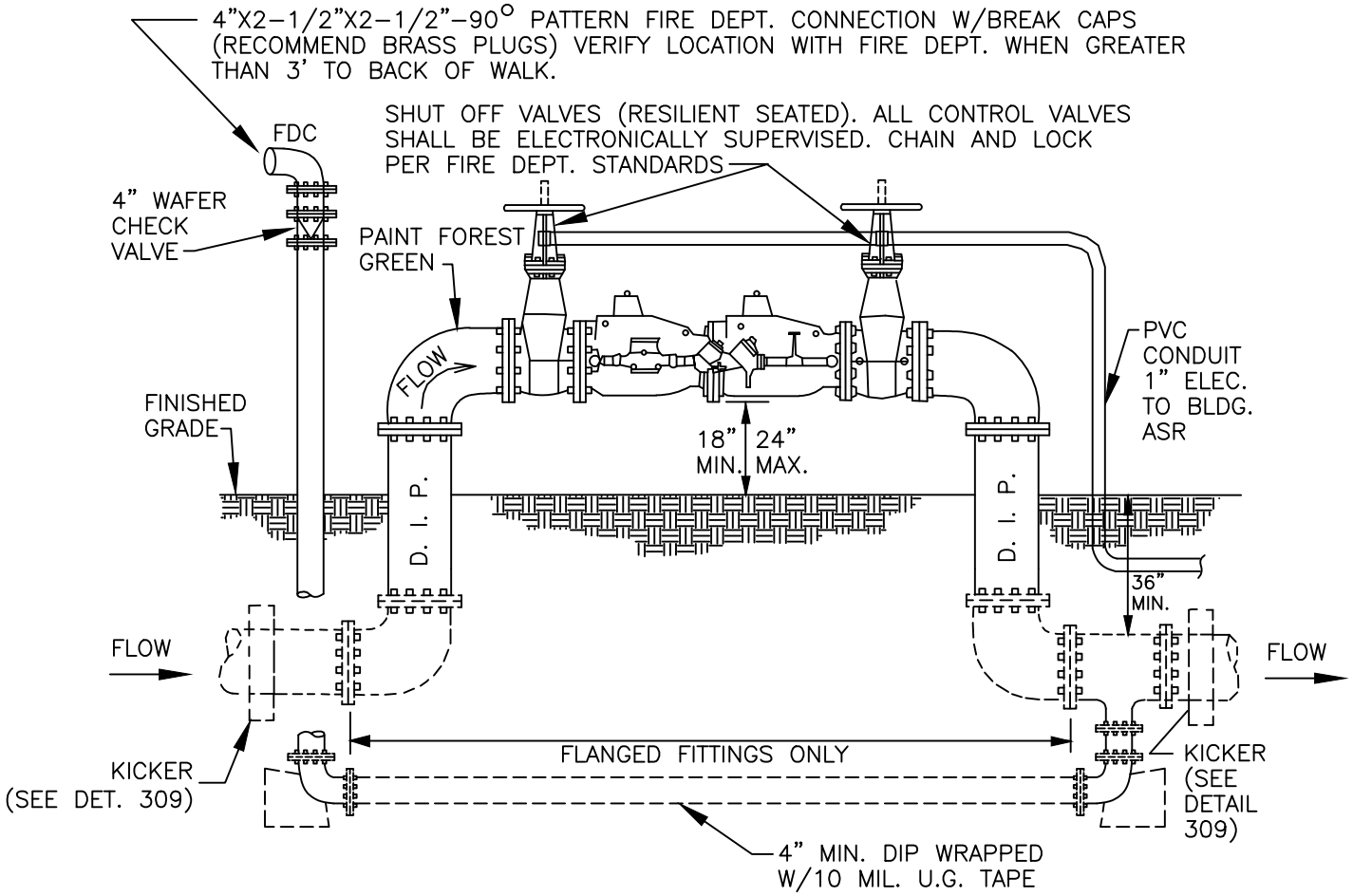
CITY OF PLEASANTON

STANDARD DETAILS

BACKFLOW PREVENTION FIRE SERVICE CONNECTION TO SPRINKLERED BUILDINGS

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 703



TYPICAL DOUBLE CHECK DETECTOR CHECK SIDE VIEW
TYPICAL REDUCED PRESSURE DETECTOR ASSEMBLY SIDE VIEW

NOTES:

1. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE ON THE APPROVED LIST OF THE USCFCCCHR.
2. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE INSTALLED ABOVE FINISHED GRADE AT BACK OF PSE.
3. MAXIMUM DISTANCE BETWEEN FIRE DEPARTMENT CONNECTION (FDC) AND PUBLIC FIRE HYDRANT SHALL BE 50', UNLESS SPECIFICALLY APPROVED BY FIRE DEPT.
4. FDC TO REMAIN ACCESSIBLE AND FIRE APPARATUS ACCESS ROAD MARKED PER VEHICLE CODE.
5. DIP BELOW GROUND SHALL BE ENCASED IN POLYETHYLENE TUBING. SEE SPEC. 14-03B.
6. ALL CONNECTIONS TO BE FLANGED.
7. ALL TRIM HARDWARE TO BE BRASS OR BRONZE.
8. METER TO REGISTER IN GALLONS.
9. BY-PASS METER PIPING TO BE INSULATED AGAINST FREEZING.
10. MASTIC ALL BOLTS/NUTS OR USE STAINLESS STEEL COMPONENTS.
11. BACKFLOW PREVENTION ASSEMBLIES SHALL BE RETESTED AT THE TIME THE VALVE TO THE STREET IS OPENED.

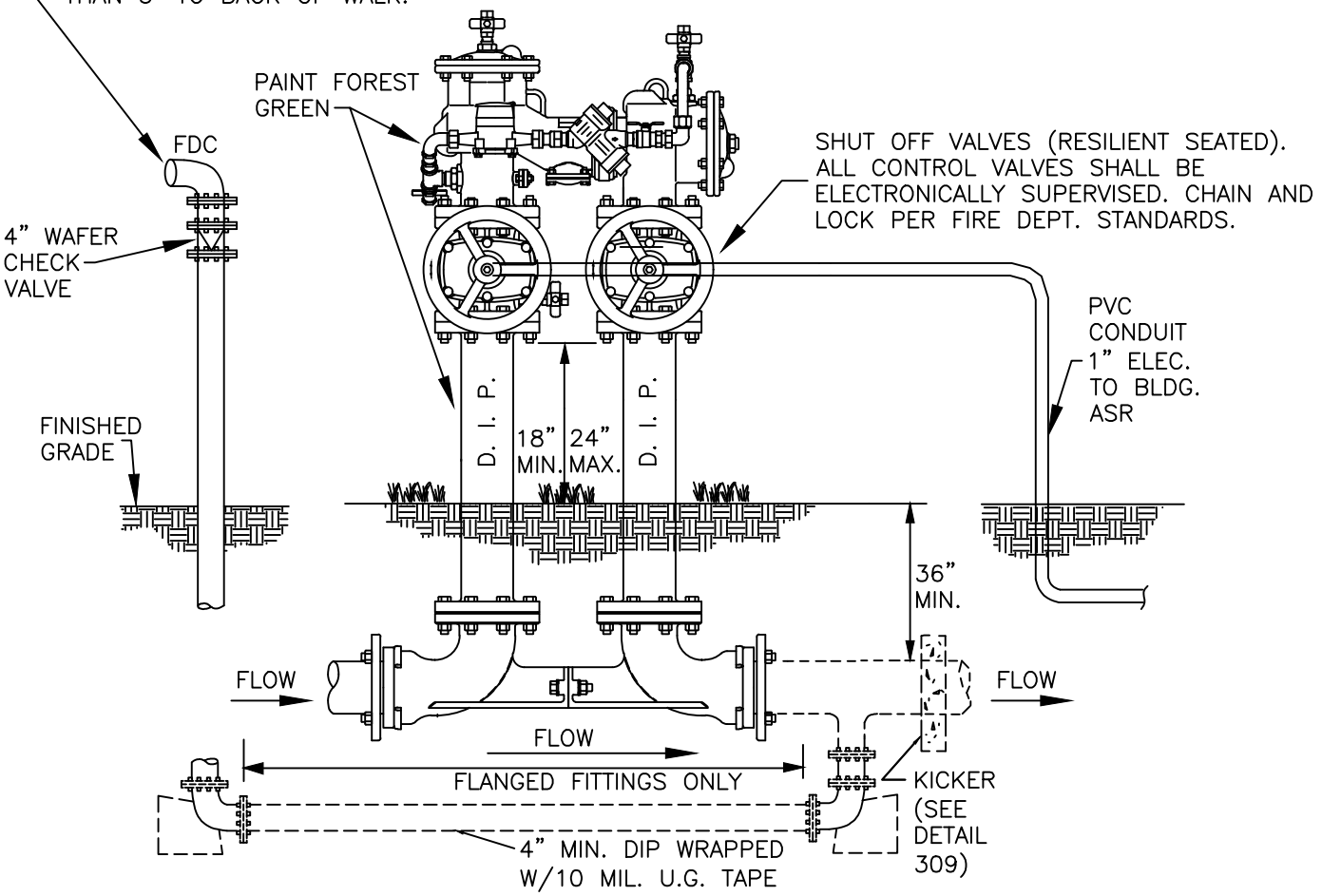
DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON
STANDARD DETAILS

BACK FLOW PREVENTION
FIRE SERVICE CONNECTION TYPE 1
TO SPRINKLERED BUILDINGS

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 704



TYPICAL DOUBLE CHECK DETECTOR CHECK SIDE VIEW
TYPICAL REDUCED PRESSURE DETECTOR ASSEMBLY SIDE VIEW

NOTES:

1. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE ON THE USC FCCCHR APPROVED LIST.
2. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE INSTALLED ABOVE FINISHED GRADE AT BACK OF PSE.
3. MAXIMUM DISTANCE BETWEEN FIRE DEPARTMENT CONNECTION (FDC) AND PUBLIC FIRE HYDRANT SHALL BE 50', UNLESS SPECIFICALLY APPROVED BY FIRE DEPT.
4. FDC TO REMAIN ACCESSIBLE AND FIRE APPARATUS ACCESS ROAD MARKED PER VEHICLE CODE.
5. DIP BELOW GROUND SHALL BE ENCASED IN POLYETHYLENE TUBING. SEE SPEC. 14-03B.
6. ALL CONNECTIONS TO BE FLANGED.
7. ALL TRIM HARDWARE TO BE BRASS OR BRONZE.
8. METER TO REGISTER IN GALLONS.
9. BY-PASS METER PIPING TO BE INSULATED AGAINST FREEZING.
10. MASTIC ALL BOLTS/NUTS OR USE STAINLESS STEEL COMPONENTS.
11. BACKFLOW PREVENTION ASSEMBLIES SHALL BE RETESTED AT THE TIME THE VALVE TO THE STREET IS OPENED.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

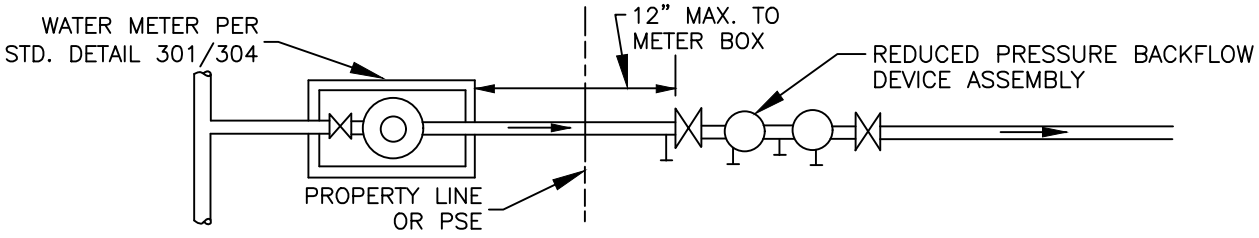
STANDARD DETAILS

BACK FLOW PREVENTION
FIRE SERVICE CONNECTION TYPE 2
TO SPRINKLERED BUILDINGS

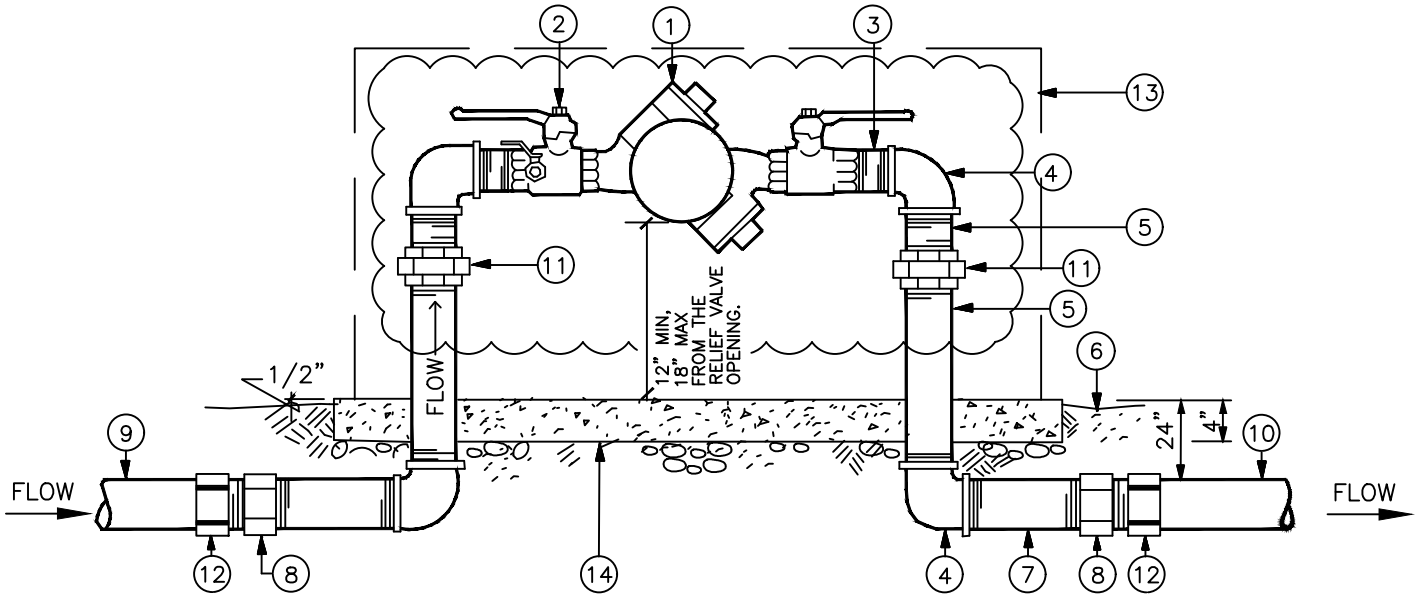
REGISTERED PROFESSIONAL ENGINEER
JOHN MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24

DWG NO. 705



TOP VIEW



1. REDUCED PRESSURE BACKFLOW PREVENTER DEVICE
2. SHUTOFF VALVE, BALL TYPE
3. SHORT NIPPLE; RED BRASS
4. ELBOW; BRONZE
5. NIPPLE; LENGTH AS REQUIRED, RED BRASS
6. FINISH GRADE
7. SHORT NIPPLE; RED BRASS
8. COUPLING; RED BRASS
9. PRESSURE LINE FROM WATER METER
10. MAIN LINE; SIZE PER PLAN
11. UNION; BRONZE OR BRASS
12. SCH 80 PVC MALE ADAPTER (SXT)
13. PROVIDE INSULATED BAG INSIDE "STRONG BOX" (SEE NOTE 4)
14. CONCRETE PAD AS REQ'D FOR "STRONG BOX" (SEE NOTE 4)

NOTES:

1. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE ON THE USC FCCCHR APPROVED LIST.
2. IF MAX. DISTANCE BETWEEN WATER METER BOX AND REDUCED PRESSURE PRINCIPAL ASSEMBLY EXCEEDS 12", A CONCRETE CAP SHALL BE PLACED OVER THE WATER LINE.
3. ALL PIPING SHALL CONFORM WITH THE LATEST EDITION OF THE UNIFORM PLUMBING CODE.
4. WEATHER PROTECTION DEVICES TO PROTECT PIPES FROM FREEZING SHALL REQUIRE APPROVAL BY THE PLANNING DIVISION PRIOR TO INSTALLATION. SUCH MATERIAL SHALL BE REPLACED AS THEY BECOME WORN OUT. CITY MAINTAINED SYSTEMS SHALL HAVE "STRONG BOX" AND INSULATED BAGS UNLESS NOTED OTHERWISE.
5. TYPE "L" COPPER CAN BE USED FOR ALL FITTINGS ONLY WITH THE APPROVAL OF THE ENGINEER.
6. FITTINGS SHALL HAVE CLASSIFICATION OF 125 LBS.

DRAWN BY: STAFF
CHECKED BY: AN
SCALE: N.T.S.

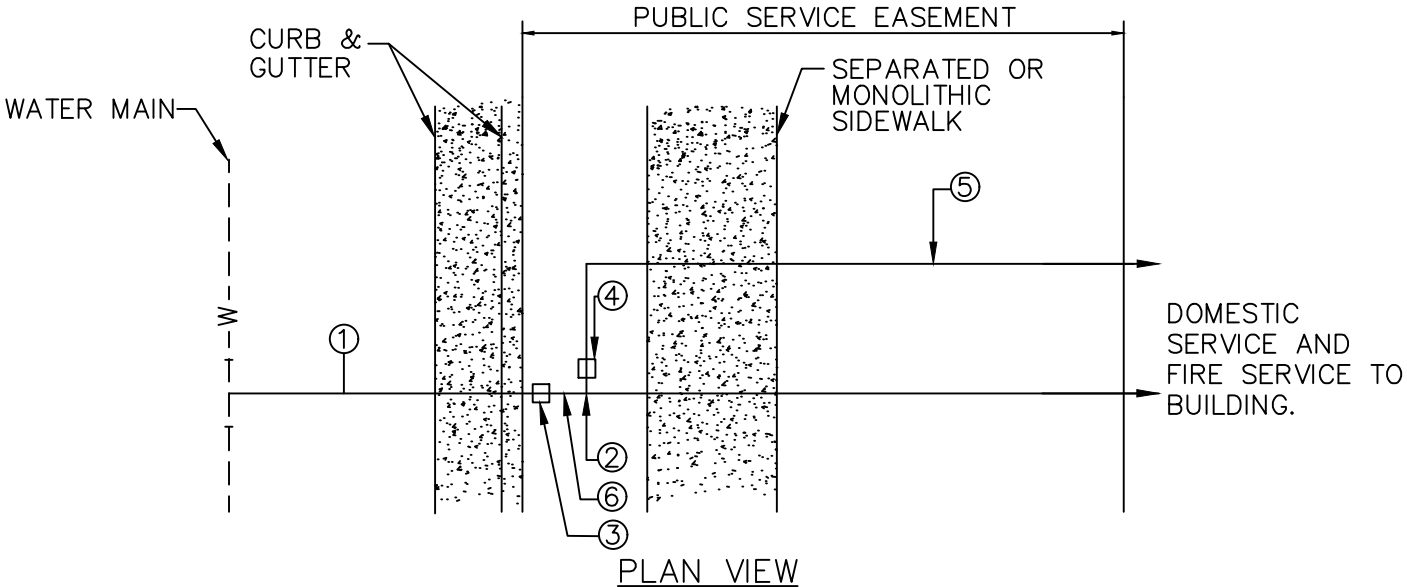
CITY OF PLEASANTON

STANDARD DETAILS

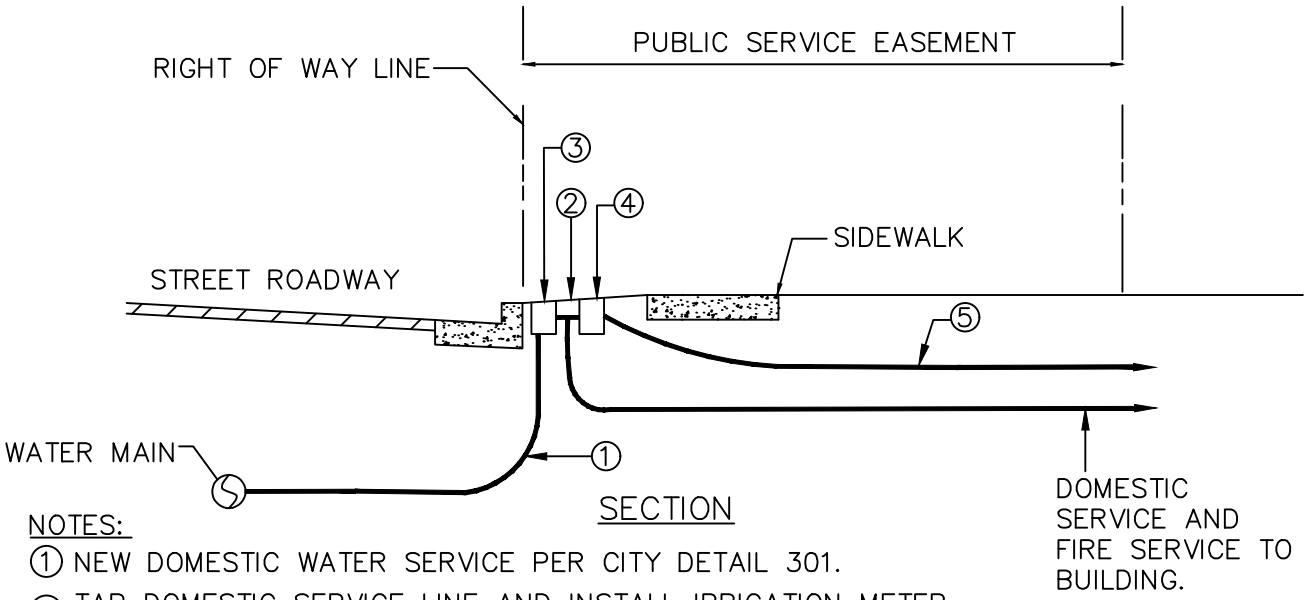
BACKFLOW PREVENTER FOR DOMESTIC OR IRRIGATION SERVICE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 706



PLAN VIEW



SECTION

NOTES:

① NEW DOMESTIC WATER SERVICE PER CITY DETAIL 301.

② TAP DOMESTIC SERVICE LINE AND INSTALL IRRIGATION METER BOX FOR IRRIGATION SERVICE PER DETAIL 301.

*③ NEW DOMESTIC WATER METER PER DETAIL 301.

*④ IRRIGATION SUB METER. (OWNER/DEVELOPER PAYS FOR METER COST ONLY)

⑤ IRRIGATION SERVICE AS PER CITY BUILDING DEPARTMENT AND UPC REQUIREMENTS.

*⑥ PRESSURE REDUCER AND/OR REDUCED PRESSURE BACK FLOW DEVICE ON DOMESTIC AND IRRIGATION SERVICE IF REQUIRED.

* METER BOXES AND PRESSURE REDUCER AND/OR REDUCED PRESSURE BACK FLOW DEVICE SHALL BE PLACED OUTSIDE OF SIDEWALK.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

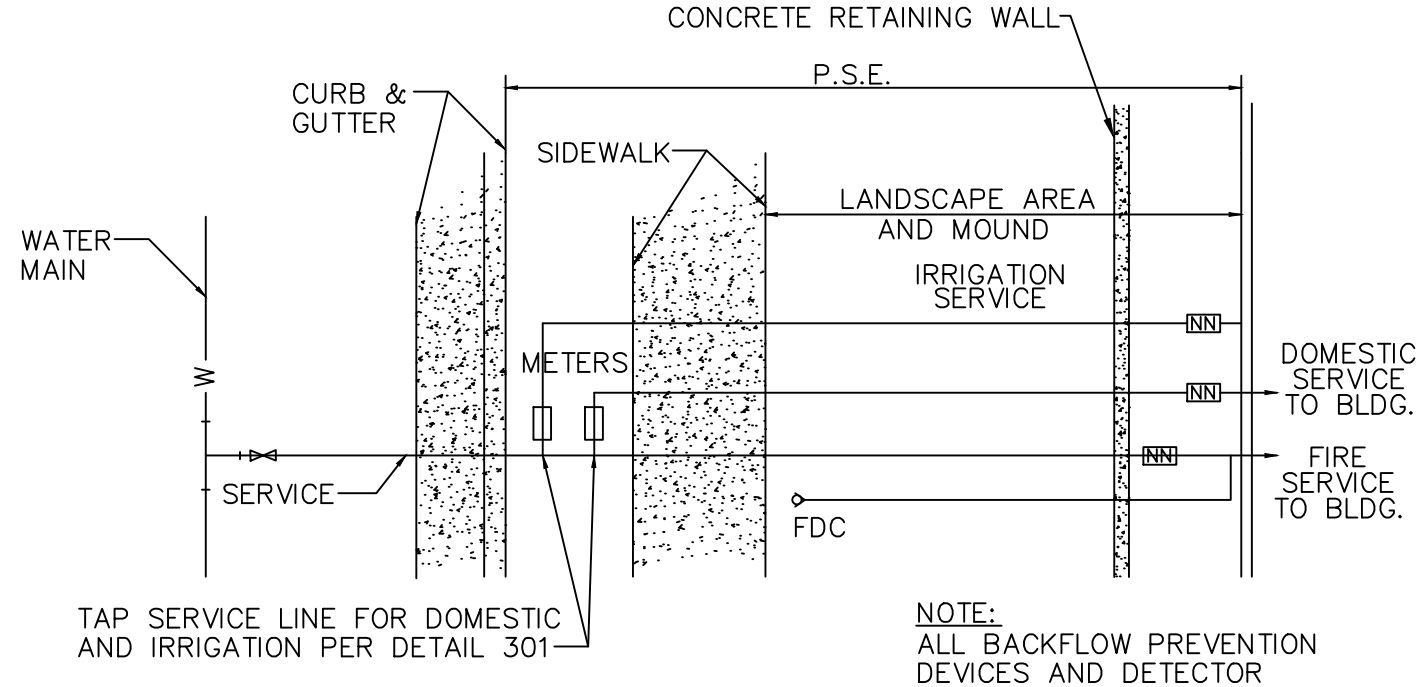
CITY OF PLEASANTON

STANDARD DETAILS

RESIDENTIAL DOMESTIC WATER SERVICE AND IRRIGATION SERVICE

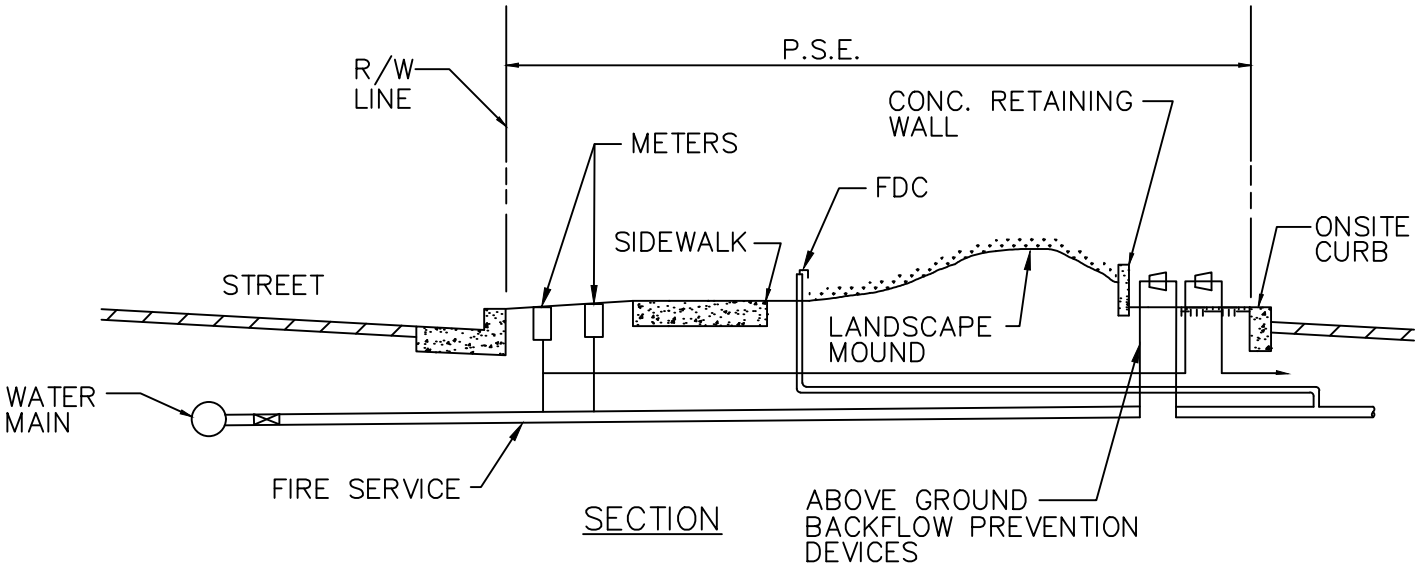
REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NEENIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 707



PLAN VIEW

NOTE:
ALL BACKFLOW PREVENTION DEVICES AND DETECTOR CHECKS TO BE ON THE BACKSIDE OF LANDSCAPE BERM, AWAY FROM STREET, WITHIN PUBLIC SERVICE EASEMENT.



SECTION

NOTE:
WHERE DISTANCE FROM METER TO BACKFLOW DEVICE EXCEEDS 12 INCHES, SERVICE LINE FROM METER TO BACKFLOW DEVICE SHALL HAVE A 4 INCH THICK CONCRETE CAP.

DRAWN BY:	STAFF
CHECKED BY:	AN
SCALE:	N.T.S.

CITY OF PLEASANTON

STANDARD DETAILS

COMMERCIAL AND INDUSTRIAL FIRE AND WATER SERVICES BUSINESS PARKS

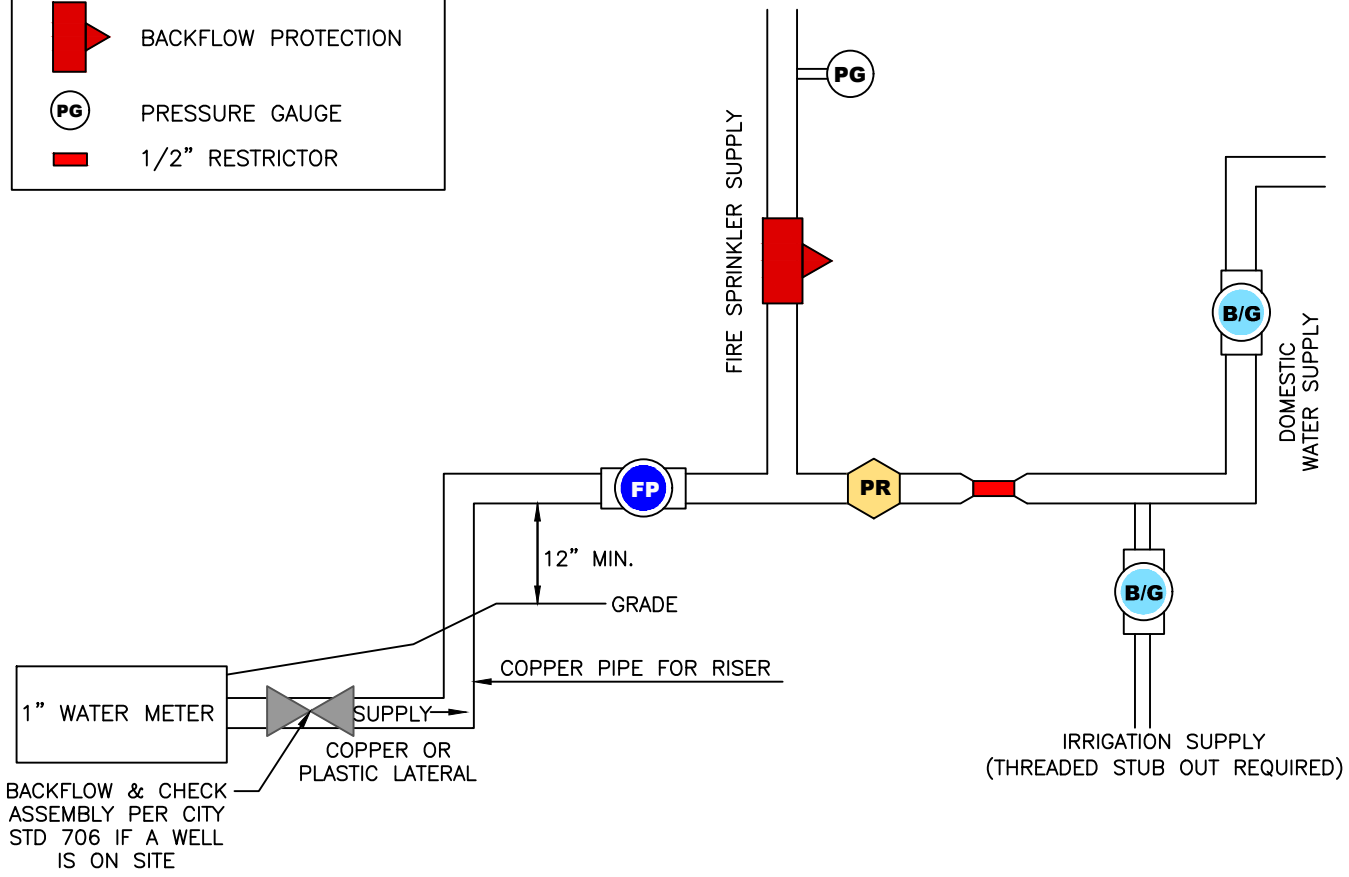
REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 708

LEGEND

- FP — FULL PORT BALL VALVE
- B/G — BALL OR GATE VALVE
- PR — PRESSURE REGULATOR
- BACKFLOW PROTECTION
- PG — PRESSURE GAUGE
- 1/2" RESTRICTOR

(HOUSES WITH FIRE SPRINKLERS)



NOTES: ALL PIPING SHALL FOLLOW THIS SEQUENCE

1. 1" WATER METER
2. SUPPLY LINE (SIZED FOR DEMAND)
3. FULL PORT BALL VALVE
4. FIRE SPRINKLER BRANCH
5. PRESSURE REGULATOR (WHEN REQUIRED–80LBSMAX.)
6. 1/2" RESTRICTOR BRANCH
7. IRRIGATION AND HOUSE WITH BALL OR GATE VALVES

ATTENTION: ONLY FIRE SPRINKLER SUPPLY MAY BE CONNECTED BEFORE 1/2" REDUCER!

DRAWN BY: STAFF
CHECKED BY: AN
SCALE: N.T.S.

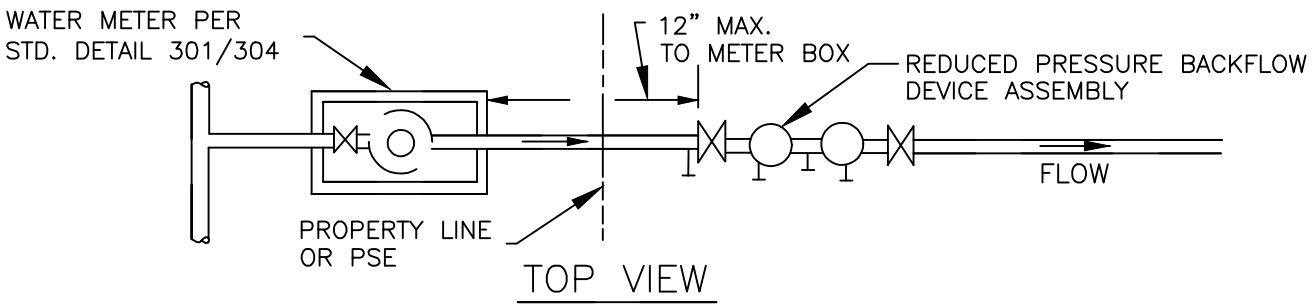
CITY OF PLEASANTON

STANDARD DETAILS

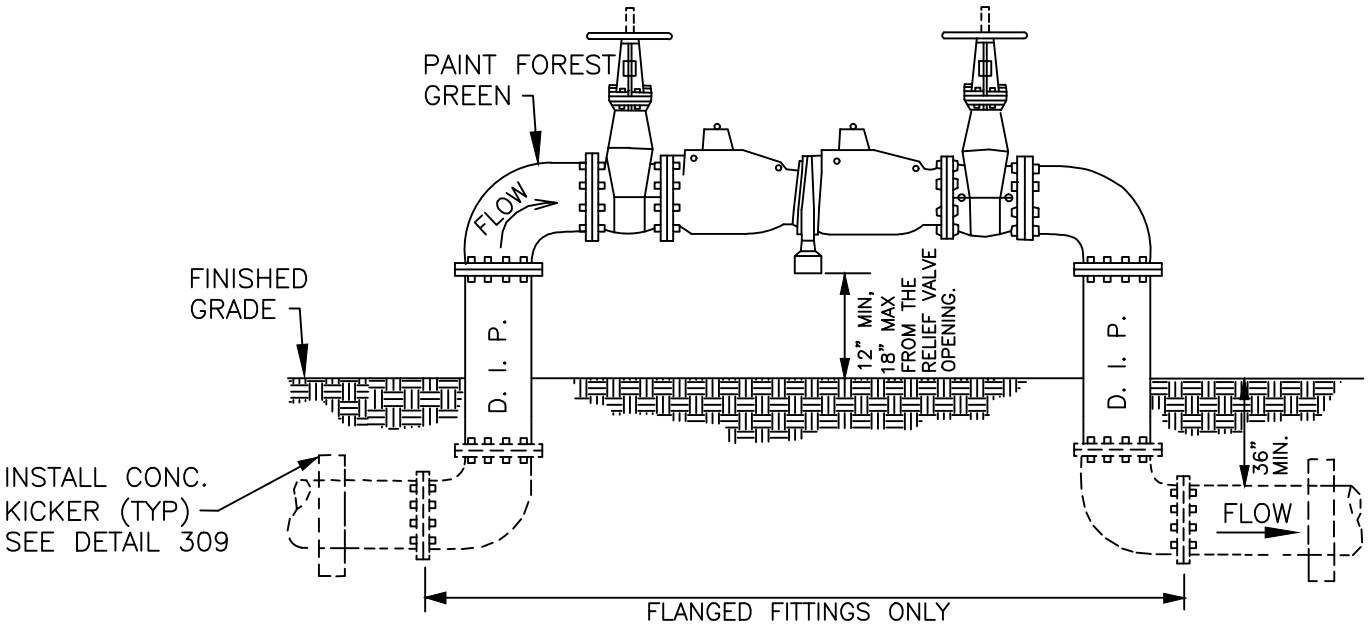
WATER SERVICE RISER REQUIREMENTS

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 709



TOP VIEW



NOTES:

1. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE ON THE USC FCCCHR APPROVED LIST, SEE SPECIFICATIONS 14–02J.
2. THE BOTTOM OF THE RELIEF VALVE ON REDUCED PRESSURE PRINCIPAL ASSEMBLY SHALL BE INSTALLED A MINIMUM OF 12" OR MAXIMUM OF 18" ABOVE FINISHED GRADE.
3. DIP BELOW GROUND SHALL BE ENCASED IN POLYETHYLENE TUBING. SEE SPEC. 14–03B.
4. ALL CONNECTIONS TO BE FLANGED.
5. ALL TRIM HARDWARE TO BE BRASS OR BRONZE.
6. MASTIC ALL BOLTS AND NUTS UNDERGROUND OR USE STAINLESS STEEL COMPONENTS.
7. BACKFLOW PREVENTION ASSEMBLIES SHALL BE TESTED WITHIN 14 DAYS AFTER THE VALVE IN THE STREET IS OPENED.
8. IF MAX. DISTANCE BETWEEN WATER METER BOX AND REDUCED PRESSURE PRINCIPAL ASSEMBLY EXCEEDS 12", A CONCRETE CAP SHALL BE PLACED OVER THE WATER LINE, SEE DET. NO. 114.
9. WEATHER PROTECTION DEVICES TO PROTECT PIPES FROM FREEZING SHALL REQUIRE APPROVAL BY THE PLANNING DIVISION PRIOR TO INSTALLATION. SUCH MATERIAL SHALL BE REPLACED AS THEY BECOME WORN OUT.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

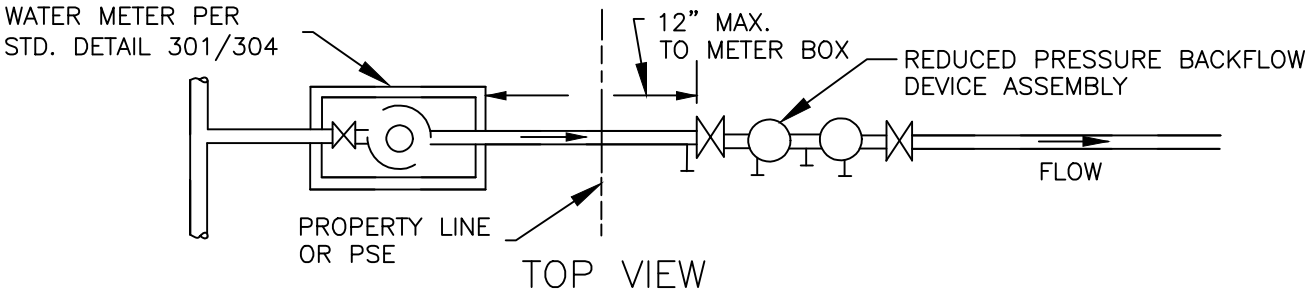
CITY OF PLEASANTON

STANDARD DETAILS

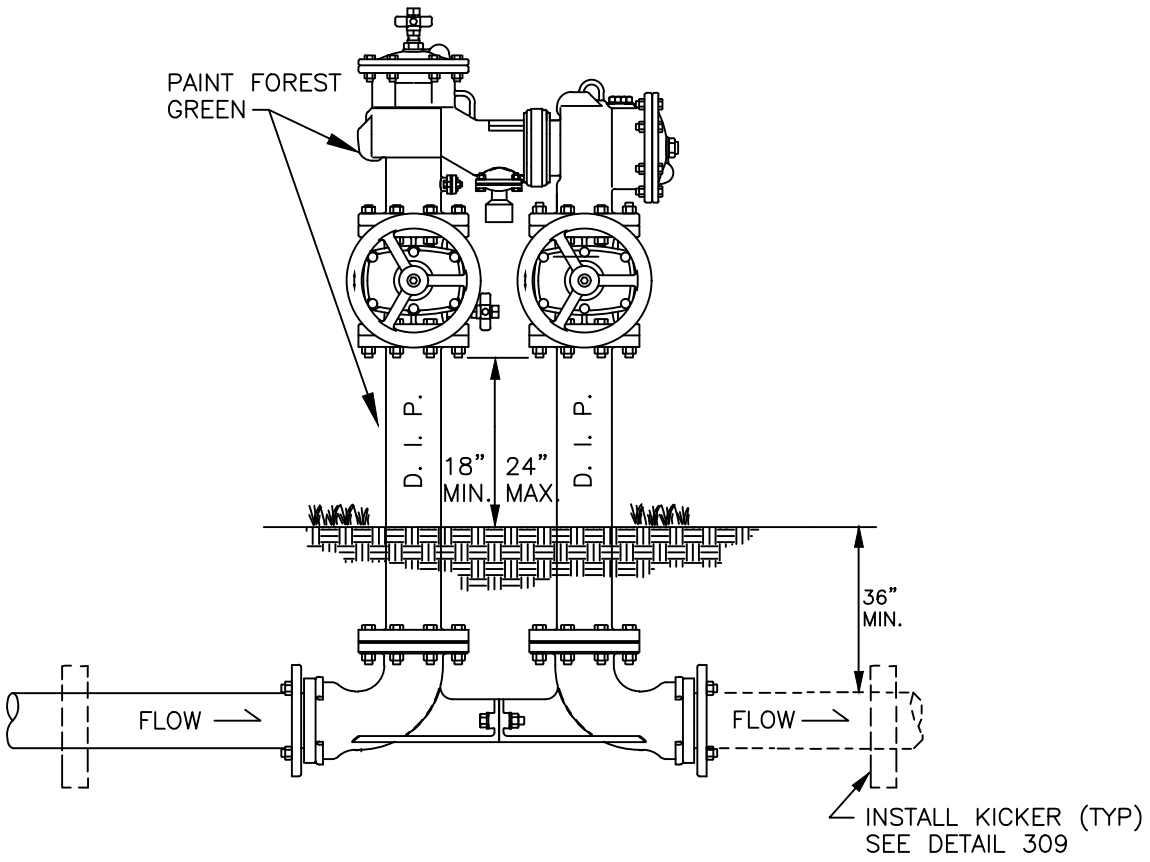
BACK FLOW PREVENTER
INSTALLATION FOR 3" & LARGER

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 710



TOP VIEW



NOTES:

1. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE ON THE USCFCCCHR APPROVED LIST, SEE SPEC. 14–02J.
2. DIP BELOW GROUND SHALL BE ENCASED IN POLYETHYLENE TUBING. SEE SPEC. 14–03B.
3. ALL TRIM HARDWARE TO BE BRASS OR BRONZE.
4. MASTIC ALL BOLTS AND NUTS UNDERGROUND OR USE STAINLESS STEEL COMPONENTS.
5. BACKFLOW PREVENTION ASSEMBLIES SHALL BE TESTED WITHIN 14 DAYS AFTER THE VALVE IN THE STREET IS OPENED.
6. IF MAX. DISTANCE BETWEEN WATER METER BOX AND REDUCED PRESSURE PRINCIPAL ASSEMBLY EXCEEDS 12", A CONCRETE CAP SHALL BE PLACED OVER THE WATER LINE, SEE DETAIL NO. 114.
7. WEATHER PROTECTION DEVICES TO PROTECT PIPES FROM FREEZING SHALL REQUIRE APPROVAL BY THE PLANNING DIVISION PRIOR TO INSTALLATION. SUCH MATERIAL SHALL BE REPLACED AS THEY BECOME WORN OUT.

DRAWN BY:	STAFF
CHECKED BY:	AN
SCALE:	N.T.S.

CITY OF PLEASANTON

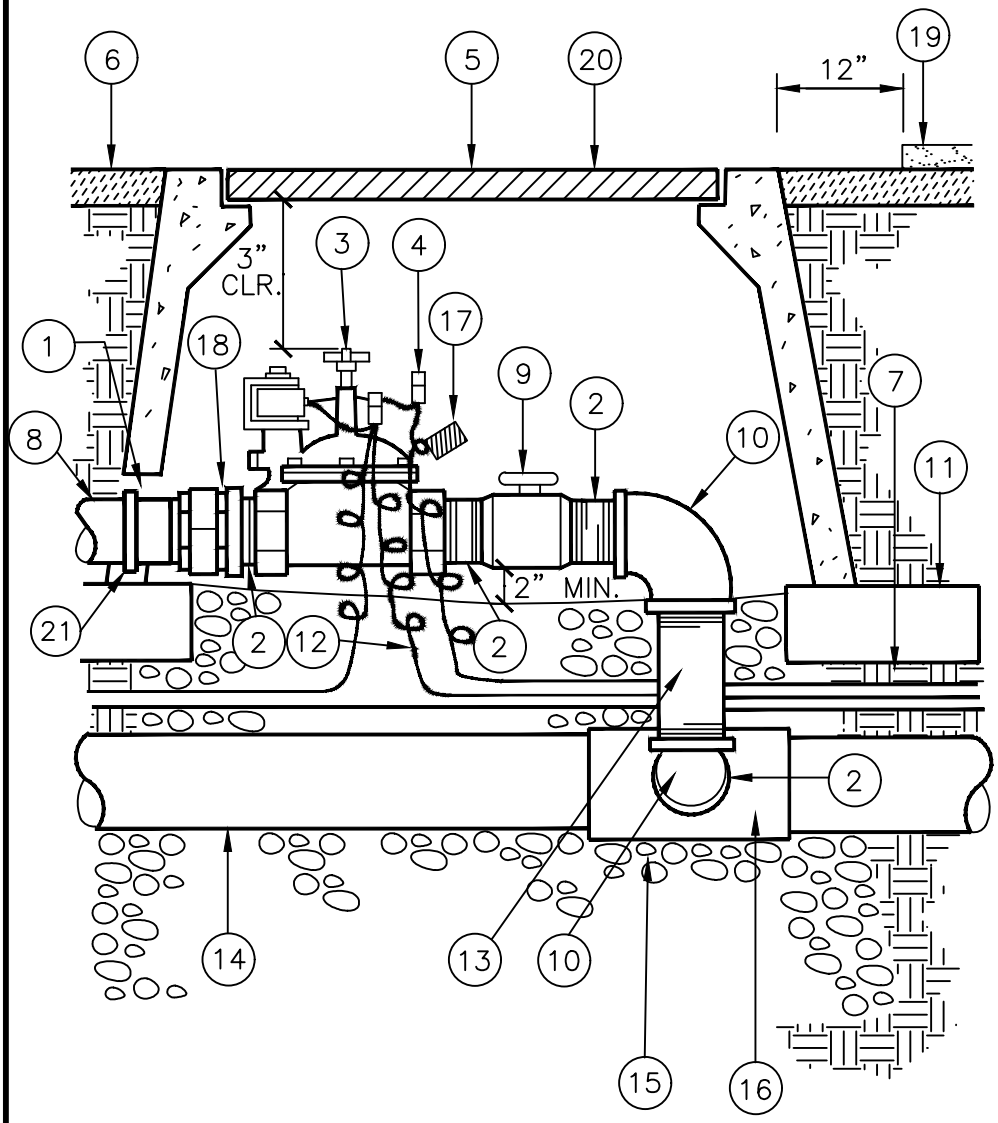
STANDARD DETAILS

BACK FLOW PREVENTER COMPACT INSTALLATION FOR 3" & LARGER

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 711

VALVE BOX SIZING TABLE	
VALVE SIZE	BOX SIZE
<2-INCHES	STANDARD
≥ 2-INCHES	JUMBO



1. 1" CLEARANCE OVER PIPE
2. SCHEDULE 80 PVC SHORT NIPPLE
3. REMOTE CONTROL VALVE
4. 3M DBY DIRECT BURY WATERPROOF SPLICE KIT
5. LOCKING VALVE BOX WITH LID WITH ID PER SPECS
6. BOX SHALL BE FLUSH WITH GRADE IN TURF AREAS, 1" ABOVE GRADE IN MULCH AREA
7. COMPACTED SUB GRADE
8. LATERAL LINE; 8" LENGTH PRIOR TO FIRST FITTING
9. LINE SIZE FORD BRASS BALL VALVE
10. SCHEDULE 80 PVC/TxT 90° EL.
11. COMMON BRICK, TYPICAL ALL FOUR CORNERS OF VALVE BOX
12. CONTROL AND COMMON WIRES, PROVIDE MIN. 18" COILED EXTRA
13. SCHEDULE 80 PVC NIPPLE; LENGTH AS REQUIRED
14. SOLVENT WELDED SCHEDULE 40 MAINLINE; 24" MIN. COVER
15. PEA GRAVEL; 6" MIN. DEPTH
16. SCHEDULE 80 PVC TEE SxSxT
17. PLASTIC VALVE I.D. TAG
18. PVC THREADED UNION
19. EDGE OF PAVING OR HEADER BOARD
20. VALVE NUMBER MELTED OR WELDED TO LID
21. SCH. 40 PVC MALE ADAPTER

NOTES:

1. USE MIN. 3 WRAPS OF TEFLON TAPE AT EACH THREADED CONNECTION OR PIPE THREAD SEALANT.
2. VALVES ARE PARALLEL TO THE MAINLINE.
3. PROVIDE RECYCLED WATER I.D. TAG IF NON-POTABLE WATER.
4. IF IRRIGATION USES RECYCLED WATER, DETAIL SHALL CONFORM WITH RECYCLED WATER USE GUIDELINES.

DRAWN BY: STAFF

CHECKED BY: AN

SCALE: NTS

CITY OF PLEASANTON

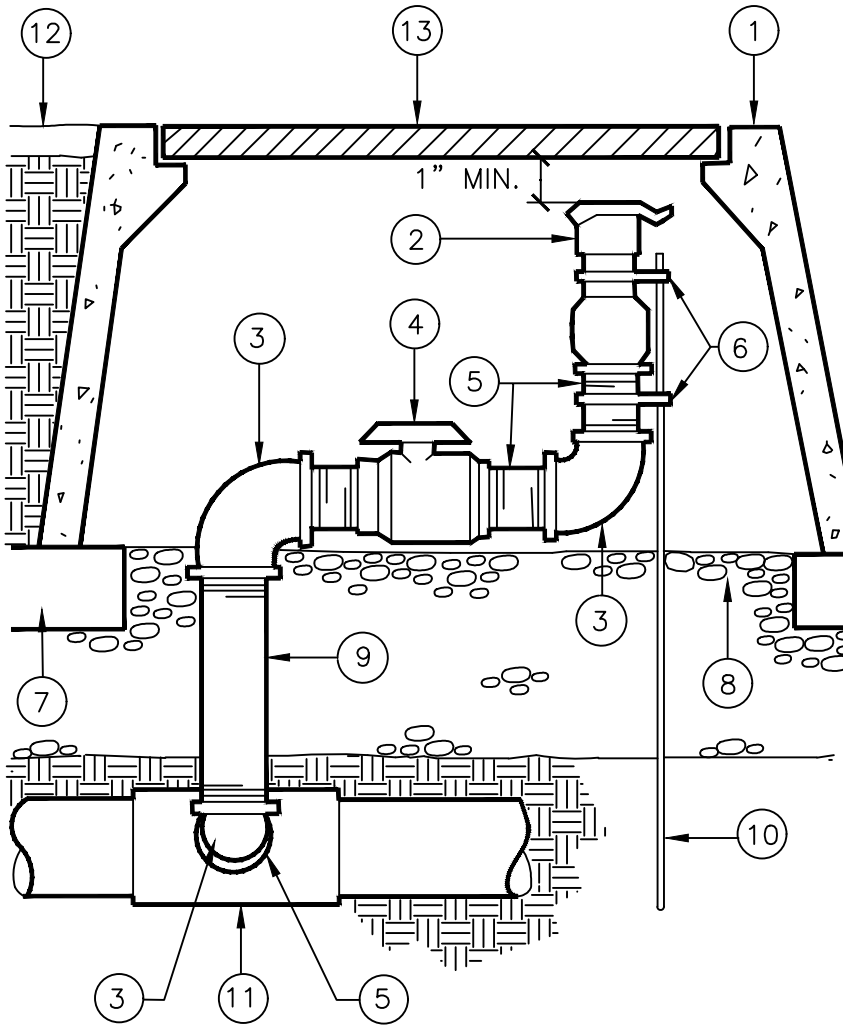
STANDARD DETAILS
LANDSCAPE

REMOTE CONTROL VALVE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24

DWG NO. 801



1. ROUND VALVE BOX WITH LOCKING LID PER SPECIFICATIONS.
2. QUICK COUPLING VALVE WITH LOCKING RUBBER COVER; RAINBIRD 44–LRC OR APPROVED EQUAL
3. SCHEDULE 80 PVC TxT 90° EL.
4. LINE SIZE PVC BALL VALVE
5. SCHEDULE 80 PVC SHORT NIPPLE
6. STAINLESS STEEL HOSE CLAMPS
7. COMMON RED BRICK, ONE AT EACH CORNER OF VALVE BOX, TYPICAL
8. PEA GRAVEL MINIMUM 6" DEPTH
9. SCHEDULE 80 PVC NIPPLE; LENGTH AS REQUIRED
10. #4 REBAR STAKE; 36" MINIMUM LENGTH
11. SCHEDULE 80 PVC TEE SxSxT
12. SET BOX FLUSH WITH FINISH GRADE OF TURF, 1" HIGH IN MULCH
13. LID WITH "QC" MELTED OR WELDED INTO LID

NOTES:

1. ALL THREADED CONNECTIONS SHALL RECEIVE MIN. 3 WRAPS OF TEFLON TAPE.
2. PROVIDE RECYCLED WATER I.D. TAG IF NON–POTABLE WATER.
3. IF IRRIGATION USES RECYCLED WATER, DETAIL SHALL CONFORM WITH RECYCLED WATER USE GUIDELINES.

DRAWN BY: STAFF
CHECKED BY: AN
SCALE: NTS

CITY OF PLEASANTON

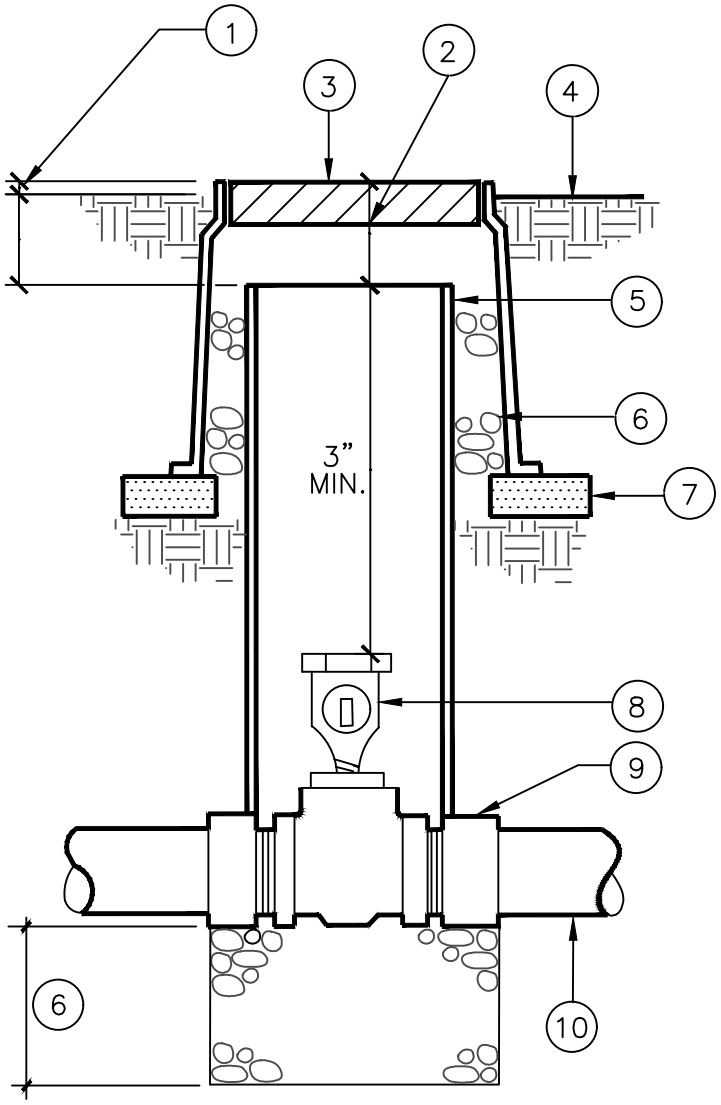
STANDARD DETAILS

LANDSCAPE

QUICK COUPLER IN LOCKING BOX

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 802



1. 1" ABOVE FINISH GRADE OF MULCH OR FLUSH WITH FINISH GRADE IN TURF AREAS
2. ALLOW 3" BETWEEN TOP OF VALVE BOX AND PVC PIPE
3. LOCKING VALVE BOX WITH LID PER SPECS WITH "GV" MELTED OR WELDED TO LID
4. FINISH GRADE
5. 6" DIAMETER SDR 26 OR SCHEDULE 40 PVC VERTICLE PIPE, LENGTH AS REQUIRED
6. PEA GRAVEL, 6 INCH MIN. DEPTH
7. COMMON RED BRICK, 4" MINIMUM.
8. LINE SIZE FORD BRASS BALL VALVE
9. SCHEDULE 80 MALE ADAPTER
10. PRESSURE LINE; 24" MINIMUM COVER

NOTES:

1. IF IRRIGATION USES RECYCLED WATER, DETAIL SHALL CONFORM WITH RECYCLED WATER USE GUIDELINES.
2. INSTALL THRUST BLOCK PER CITY STANDARD DETAILS FOR ANY VALVES SIZED 4" OR GREATER.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: NTS		

CITY OF PLEASANTON

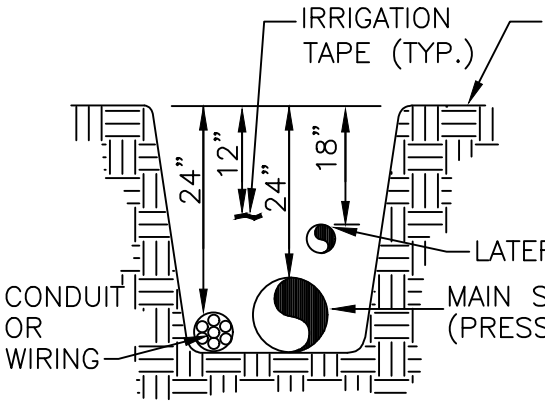
STANDARD DETAILS

LANDSCAPE

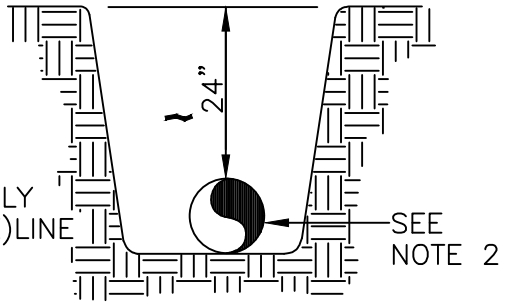
ISOLATION VALVE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

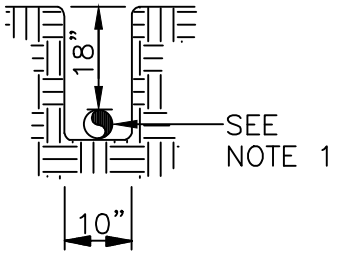
DATE: 7/24 | DWG NO. 803



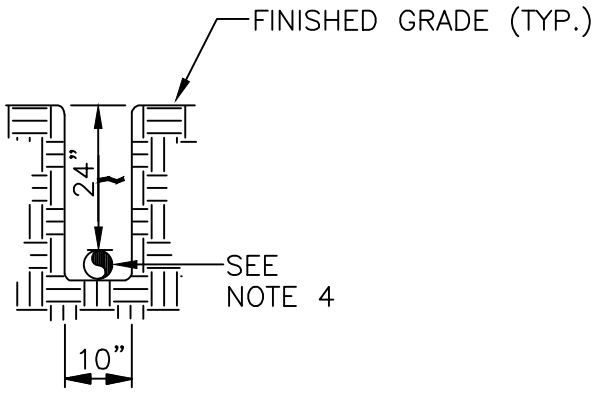
JOINT TRENCH



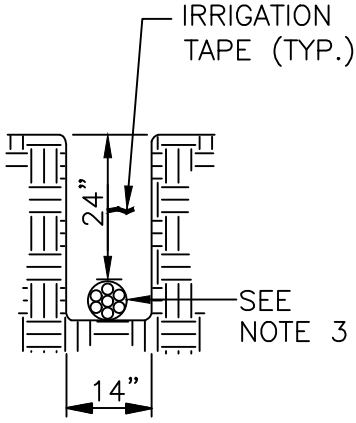
MAIN SUPPLY
PRESSURE LINE



PLASTIC LATERAL



120 VOLT IN CONDUIT



TUBING OR WIRING

NOTES:

1. ALL PLASTIC PIPING SHALL BE INSTALLED IN THE TRENCH IN A SERPENTINE MANNER AS PER THE MANUFACTURER'S SPECIFICATIONS.
2. ALL MAIN SUPPLY LINES TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
3. TAPE AND BUNDLE TUBING OR WIRING AT 10 FT INTERVALS.
4. ALL 120 VOLT WIRING IN CONDUIT TO BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE CODES.
5. INSTALL IRRIGATION TAPE AT 12" FOR ALL MAINLINE OR WIRING.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: NTS		

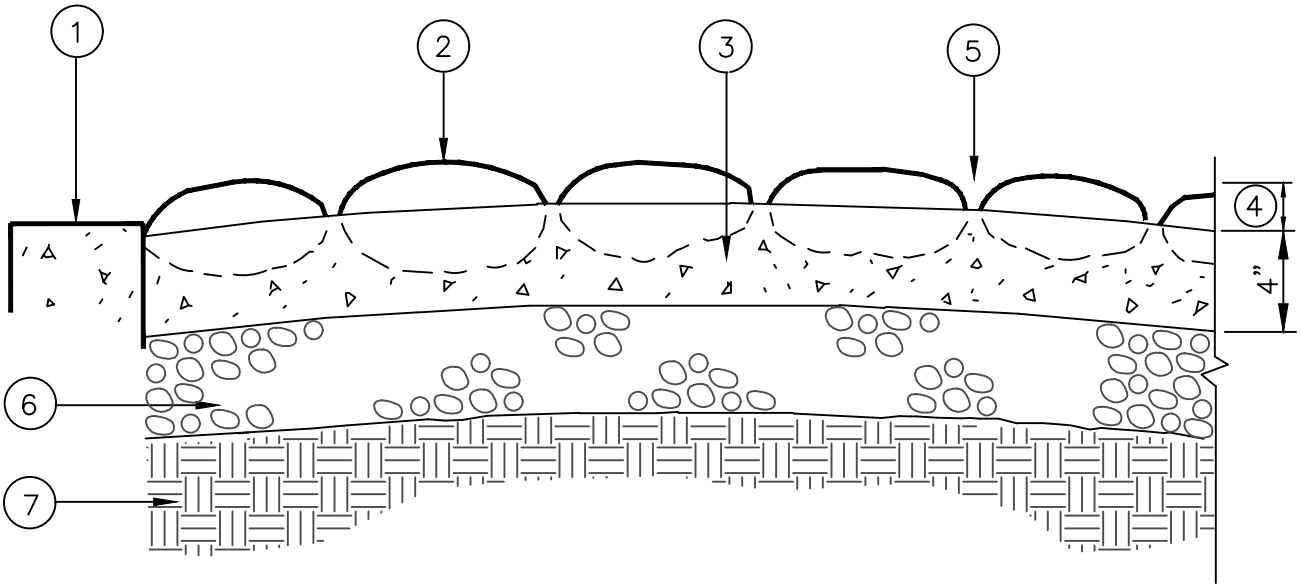
CITY OF PLEASANTON

STANDARD DETAILS
LANDSCAPE

IRRIGATION TRENCHING

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 804



1. FINISH SURFACE CURB OR SIDEWALK FLUSH WITH MORTAR BED
2. SMOOTH ROUNDED RIVER COBBLES NOYO OR APPROVED EQUAL, 4"–6" SIZE. SELECTED COBBLES SHALL BE BUFF TO GRAY COLOR WITH NO JAGGED OR SHARP EDGES EXPOSED
3. CONCRETE MORTAR BED; CLASS 2 CONCRETE USING SAND AGGREGATE ONLY
4. HAND–SET COBBLES TO AT LEAST HALF THEIR DEPTH
5. SET COBBLES APPROXIMATELY FINGER–WIDTH APART; ALL JOINTS TO BE CONCAVED
6. 3" DEPTH CLASS II AGGREGATE BASE, COMPACT TO 90%
7. COMPACT SUB GRADE TO 85%

NOTE:

1. AFTER COBBLE IN CONCRETE IS SET, WASH ALL DIRT AND CONCRETE FROM COBBLES AND APPLY 2 COATS OF CLEAR MASONRY SEALER (BURKE'S OR EQUAL).

DRAWN BY:	STAFF
CHECKED BY:	AN
SCALE:	NTS

CITY OF PLEASANTON

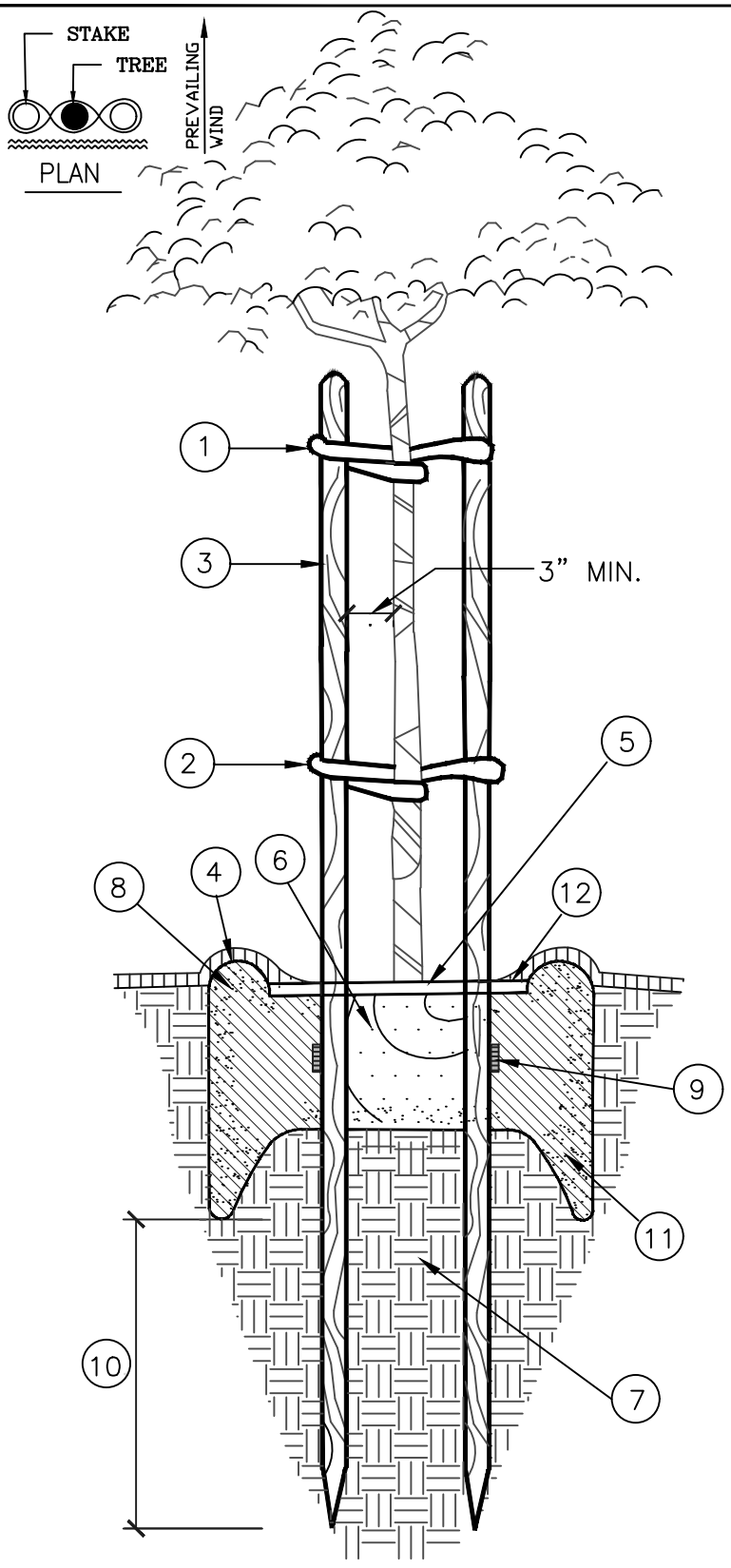
STANDARD DETAILS

LANDSCAPE

COBBLE PAVING

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 805



1. ATTACH TREE TIE TO STAKE WITH 2 GALVANIZED SCREWS OR ROOFING NAILS
2. (2) 1" WIDE X 30" RECYCLED TIRE RUBBER TREE TIE IN FIGURE 8 PATTERN; 2 PER TREE
3. 3" DIAMETER X 10' TREATED LODGE POLE PINE STAKE. STAKE TO PLUMB
4. TEMPORARY WATERING BASIN: 4" HIGH BERM X MINIMUM 3' DIAMETER. (NOT TO BE USED IN TURF AREAS)
5. SET TOP OF ROOT BALL 2" ABOVE FINISH GRADE TO ALLOW FOR SETTLEMENT
6. WELL DEVELOPED TREE ROOT BALL
7. NATIVE SOIL, COMPACTED TO 85% OR UNDISTURBED
8. BACKFILL MIX PER SPECIFICATIONS OR SOILS REPORT
9. FERTILIZER TABLETS PER SPECIFICATIONS
10. DRIVE STAKE 2'–0" MINIMUM INTO UNDISTURBED SOIL. INSTALLED STAKE SHOULD SUSTAIN 50 POUNDS DEFLECTION AT TOP OF STAKE AND RETURN TO PLUMB POSITION WHEN RELEASED
11. PLANTING HOLE SHALL BE TWICE DIAMETER OF TREE ROOT BALL; SCARIFY SIDES AND BOTTOM OF HOLE
12. 3" LAYER OF WOOD MULCH, HOLD MULCH BACK A MINIMUM OF 3" FROM TRUNK
13. TREES MAY REQUIRE ROOT BARRIER IF PLANTED WITHIN 8 FT. OF PAVED AREAS, SUBJECT TO CITY LANDSCAPE ARCHITECT

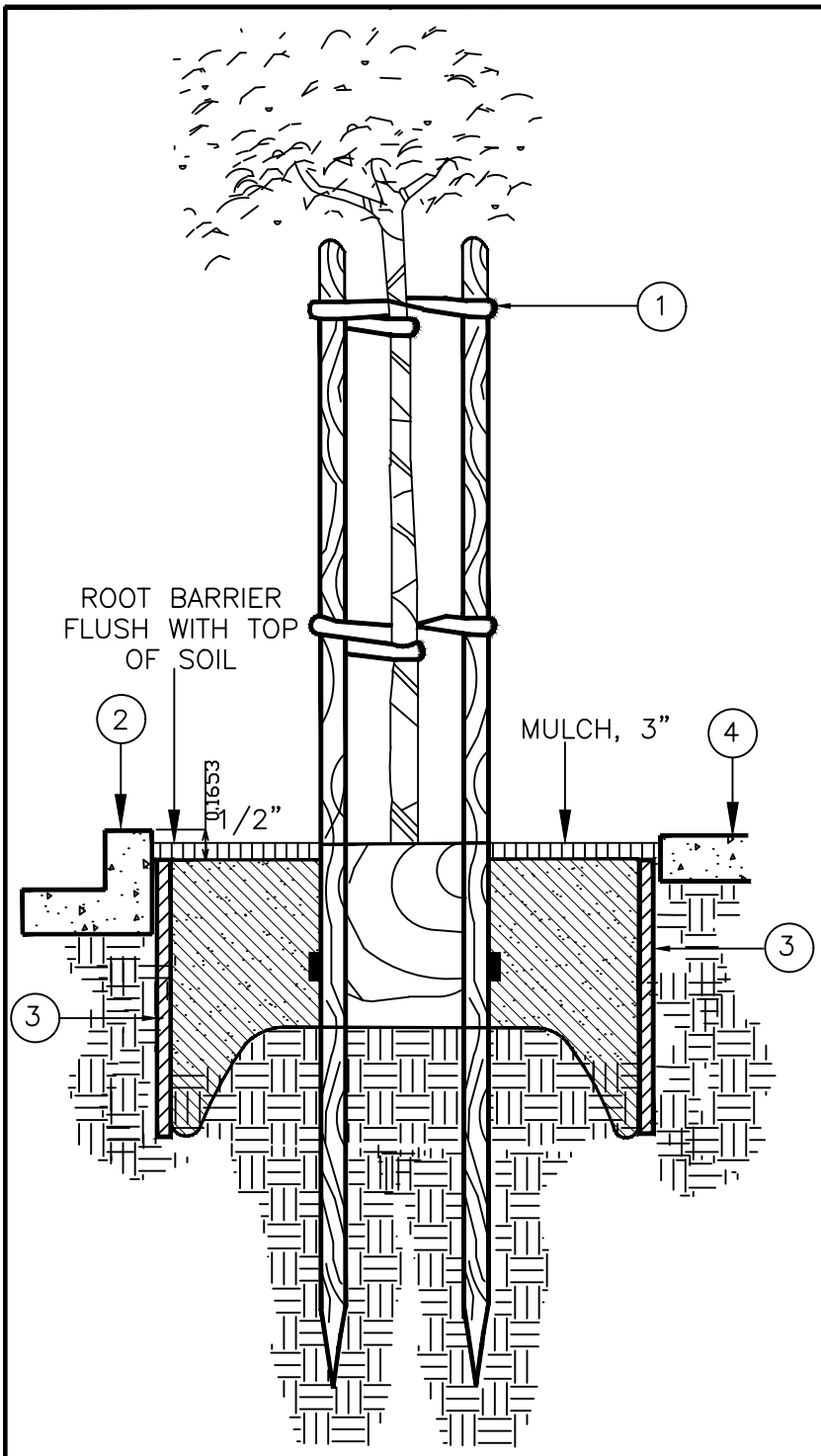
DRAWN BY: STAFF
CHECKED BY: AN
SCALE: NTS

CITY OF PLEASANTON

STANDARD DETAILS
LANDSCAPE
TREE PLANTING DETAIL

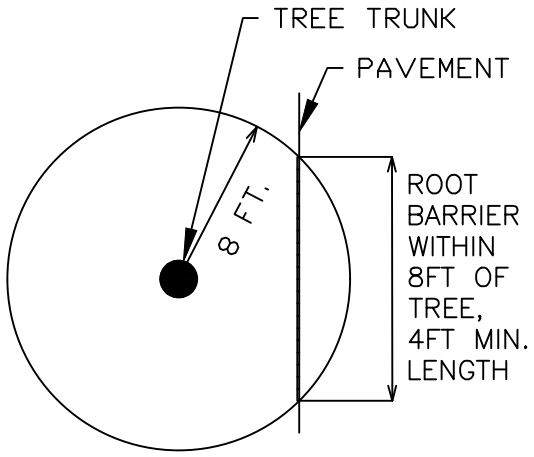
REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24
DWG NO. 806



SECTION

1. TREE, REFER TO CITY STANDARD DETAIL 806
2. CURB AND GUTTER OR OTHER PAVING
3. UB–24" PANEL TYPE" ROOT CONTROL BARRIER BY "DEEP ROOT CORP." OR APPROV. EQ.
4. SIDEWALK
5. TREES MAY REQUIRE ROOT BARRIER IF PLANTED WITHIN 8 FT. OF PAVED AREAS SUBJECT TO CITY LANDSCAPE ARCHITECT



PLAN

DRAWN BY:	STAFF
CHECKED BY:	AN
SCALE:	NTS

CITY OF PLEASANTON

STANDARD DETAILS

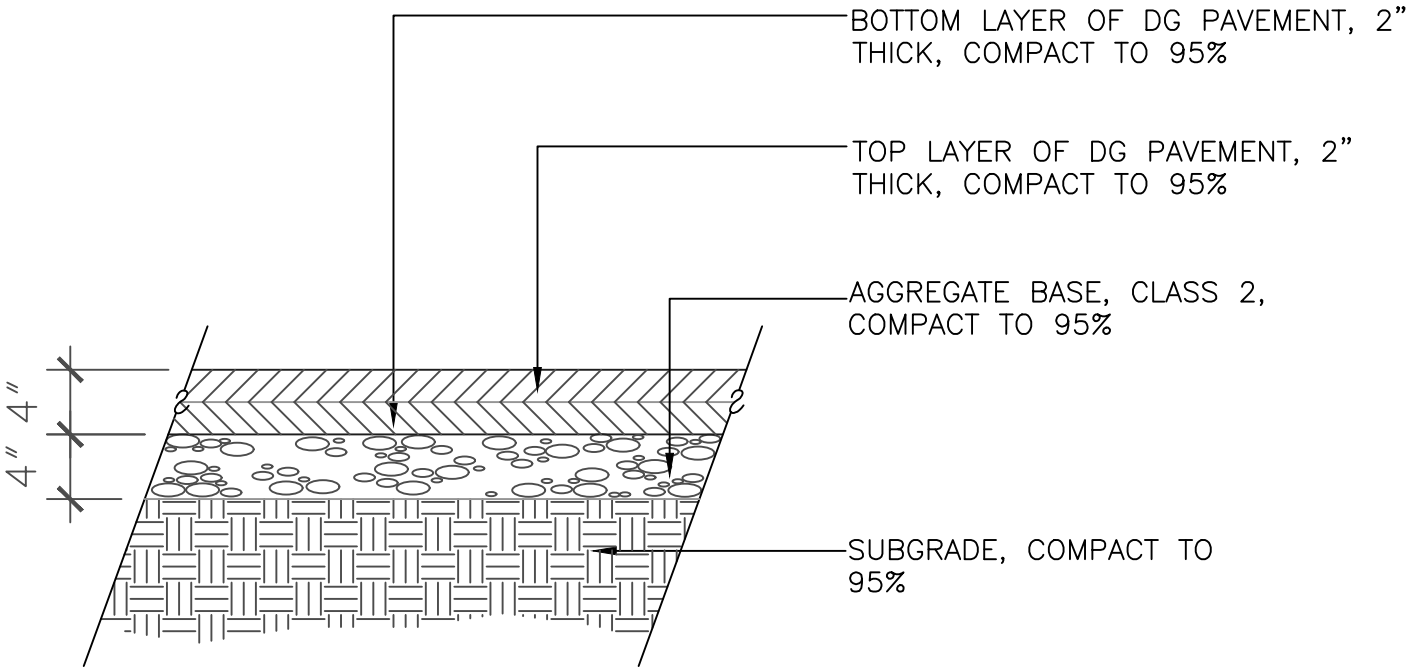
LANDSCAPE

ROOT BARRIER DETAIL

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24

DWG NO. 807



NOTES:
1. BOTTOM LAYER OF DG PAVING SHALL BE COMPACTED BEFORE INSTALLATION OF TOP LAYER.
2. INSTALL HEADERBOARD PER CITY STANDARD DETAIL 813 ON ALL EDGES OF DG THAT ARE NOT ADJACENT TO PAVING OR CURBS. DG SHALL BE FLUSH WITH ADJACENT PAVEMENT AND CURB.

DRAWN BY: STAFF
CHECKED BY: AN
SCALE: NTS

CITY OF PLEASANTON

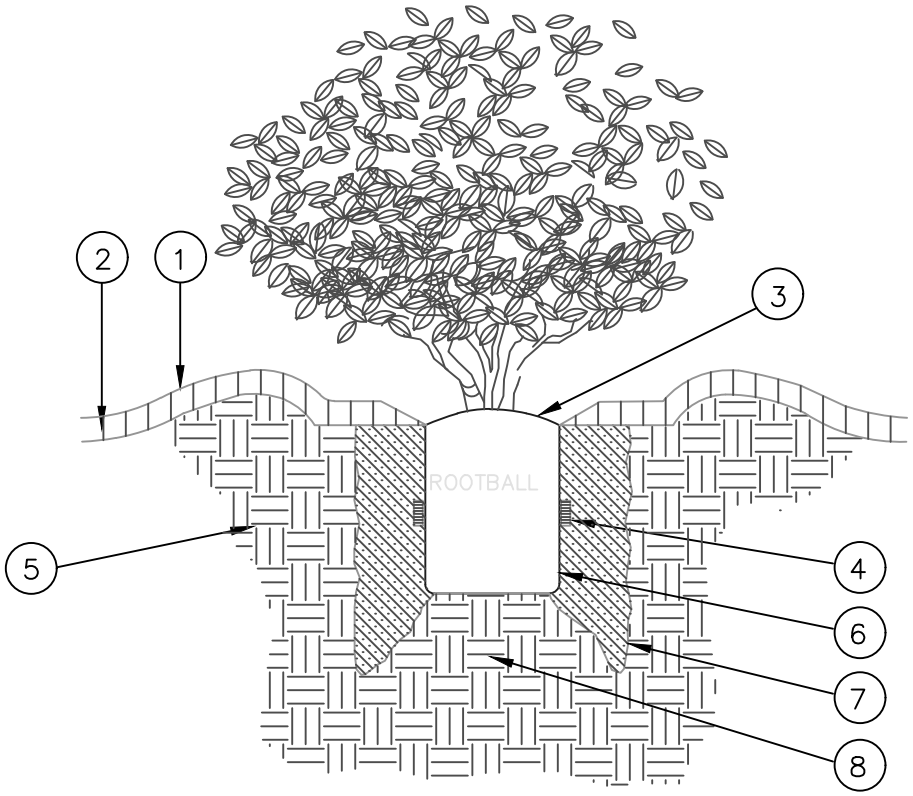
STANDARD DETAILS

LANDSCAPE

DECOMPOSED GRANITE PAVING

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 808



1. TEMPORARY WATERING BASIN; 4" HIGH BERM X 3' DIAMETER.
2. MULCH PER SPECIFICATIONS. ROOT CROWN SHALL BE KEPT 3" CLEAR OF MULCH
3. SET CROWN OF PLANT 1/2" ABOVE FINISH GRADE SOIL. SIDES OF ROOT BALL SHALL NOT BE EXPOSED.
4. FERTILIZER TABLET(S) PER SPECIFICATIONS.
5. BACK FILL MIXTURE PER SPECIFICATIONS.
6. WELL DEVELOPED SHRUB ROOTBALL.
7. PLANTING HOLE SHALL BE TWICE DIAMETER OF SHRUB ROOT BALL; SCARIFY SIDES AND BOTTOM OF HOLE.
8. NATIVE SOIL, COMPACTED TO 85% OR UNDISTURBED

DRAWN BY: STAFF

CHECKED BY: AN

SCALE: NTS

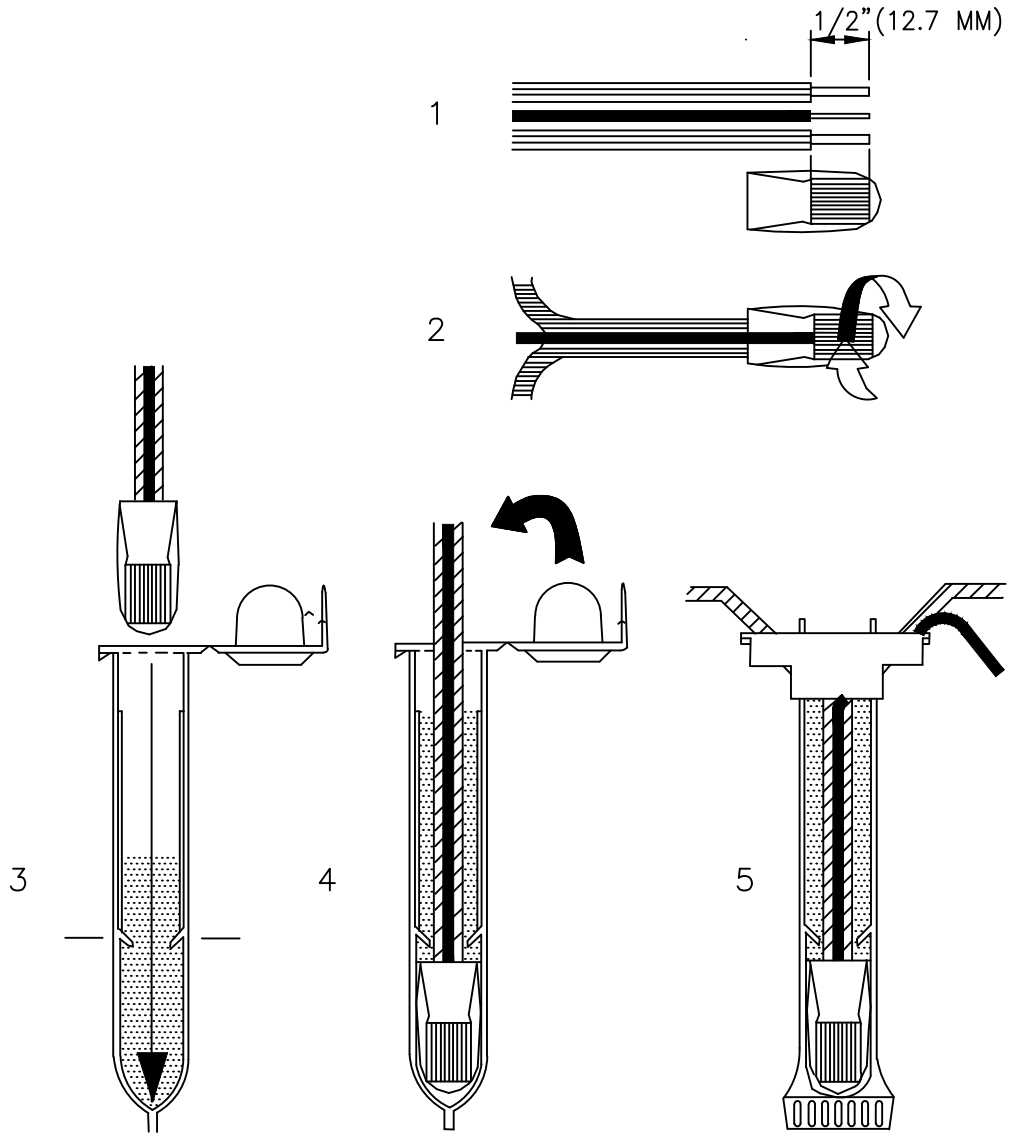
CITY OF PLEASANTON

STANDARD DETAILS
LANDSCAPE

SHRUB PLANTING DETAIL

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW WELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 809



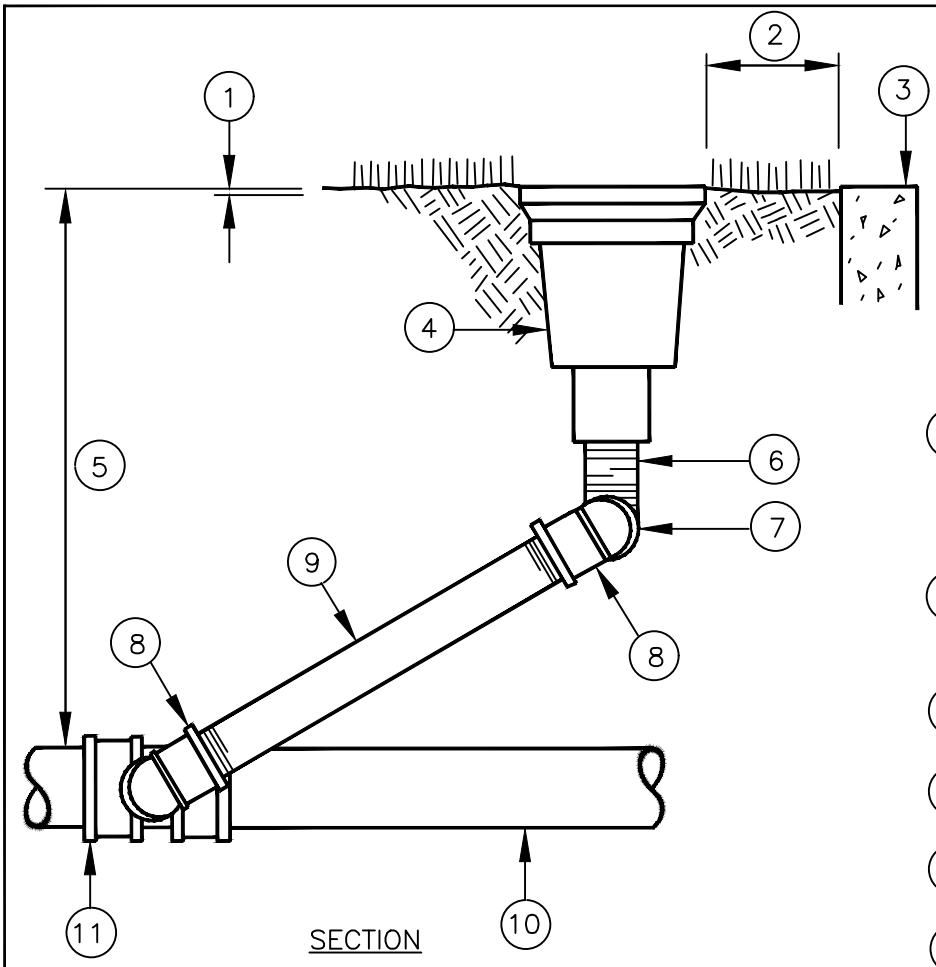
NOTES.

1. STRIP WIRES APPROXIMATELY 1/2" FROM ENDS.
2. TWIST ENDS TOGETHER WITH CAP.
3. PUSH WIRES TO END OF BASE SOCKET TO ASSURE SEALING.
4. CLIP TOP OVER FINISHED ASSEMBLY
5. FINISHED ASSEMBLY

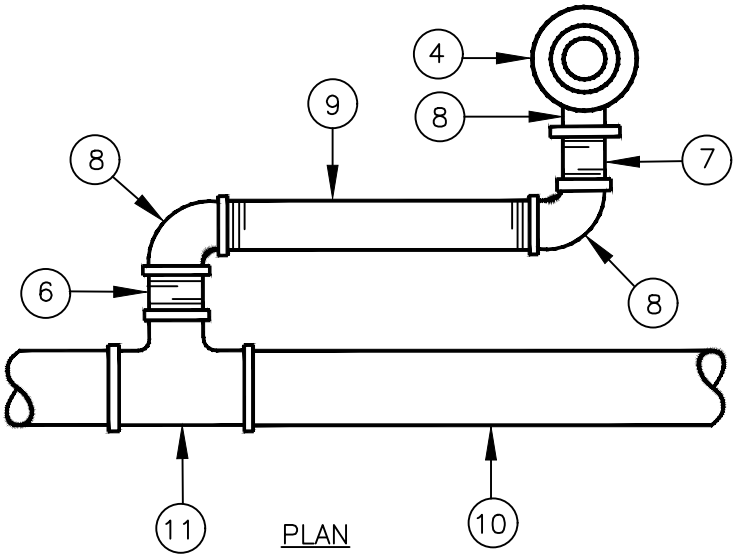
DRAWN BY: STAFF	CITY OF PLEASANTON
CHECKED BY: AN	STANDARD DETAILS
SCALE: N.T.S.	LANDSCAPE
	IRRIGATION SPLICE ASSEMBLY

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 810



SECTION



PLAN

1. SET SPRINKLER HEAD FLUSH WITH FINISH GRADE IN MULCH OR 1/8" BELOW FINISH GRADE IN TURF AREAS
2. SET HEADS 2" FROM CURB, HEADER OR EDGE OF PAVING
3. CURB, HEADER OR EDGE OF PAVING
4. SHRUB OR TURF POP-UP SPRINKLER
5. MIN. 18" COVER FOR LATERAL LINE
6. SCHEDULE 80 PVC NIPPLE; LENGTH AS REQUIRED
7. SCHEDULE 80 PVC SHORT NIPPLE
8. SCHEDULE 80 TxT 90° ELL
9. SCHEDULE 80 PVC NIPPLE; MIN. 6" LENGTH
10. LATERAL LINE
11. SCHEDULE 80 PVC TEE SxSxT 90°

NOTE:

1. ALL THREADED CONNECTIONS SHALL RECEIVE MIN. 3 WRAPS OF TEFLON TAPE.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

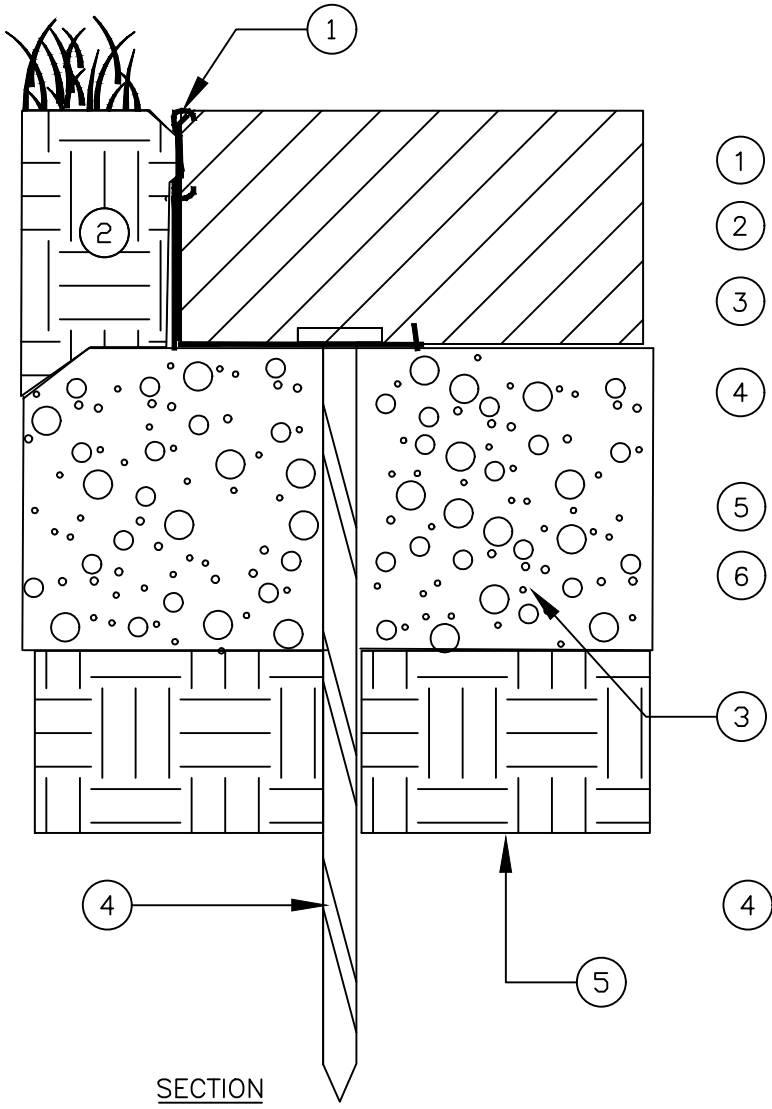
CITY OF PLEASANTON

STANDARD DETAILS
LANDSCAPE

POP-UP SPRINKLER ON TRIPLE SWING ASSEMBLY

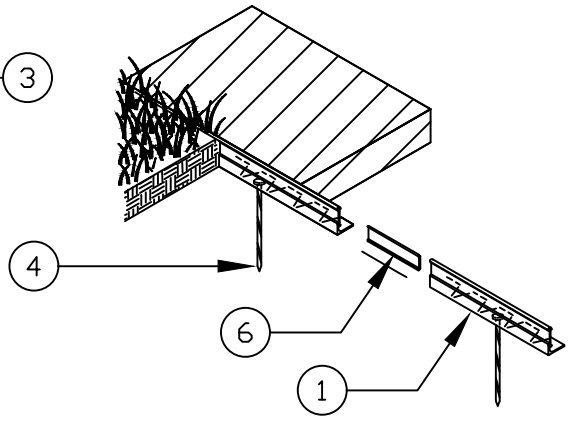
REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 811



SECTION

1. METAL HEADER
2. COMPACT SOIL ADJACENT TO RESTRAINT TO 85% MINIMUM
3. CLASS 2 AB, COMPACT TO 90% MIN, EXTEND 6" BEYOND RESTRAINT
4. 3/8" X 10" SPIRAL STEEL SPIKE AT 12" O.C. (TYP.)
5. SUBGRADE, UNDISTURBED OR COMPACTED TO 90% MIN
6. METAL HEADER CONNECTOR



ISOMETRIC

NOTES:

1. INSTALL PER MANUFACTURER'S RECOMMENDATION.
2. CONNECT 8'–0" SECTIONS WITH 4" SLIDING CONNECTOR.
3. CORNERS: NOTCH BASE ONLY AND FORM A CONTINUOUS CORNER.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

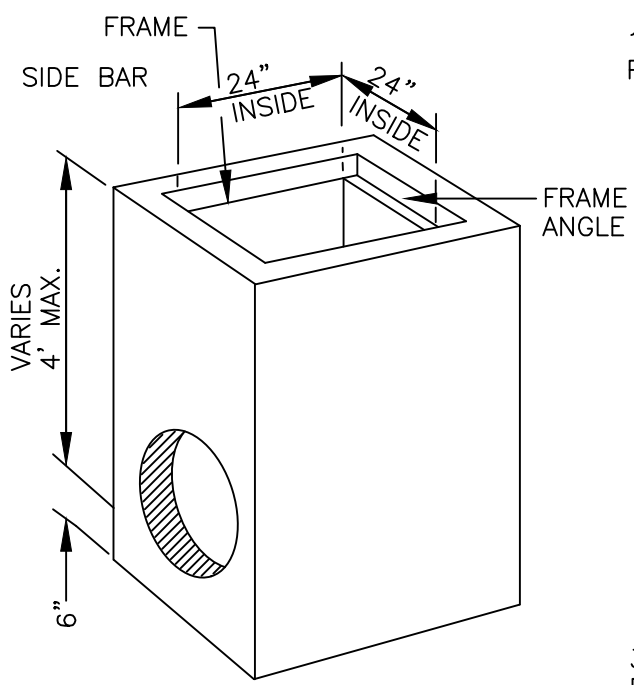
STANDARD DETAILS

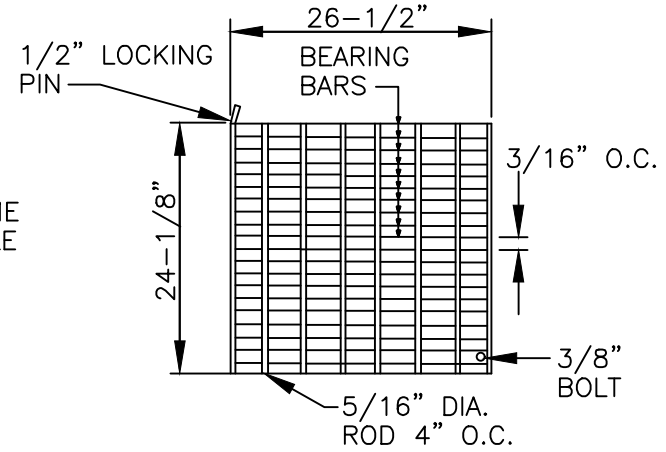
LANDSCAPE

METAL HEADERBOARD

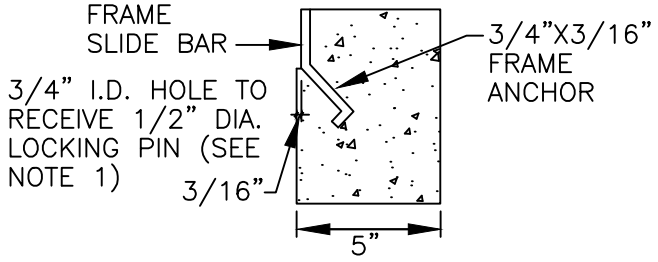
REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 813

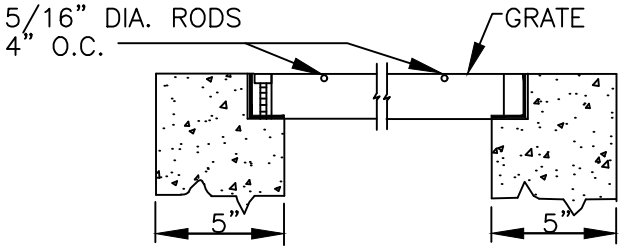




GRATE DETAIL



FRAME ANCHORAGE DETAIL



TYPICAL SECTION

NOTES:

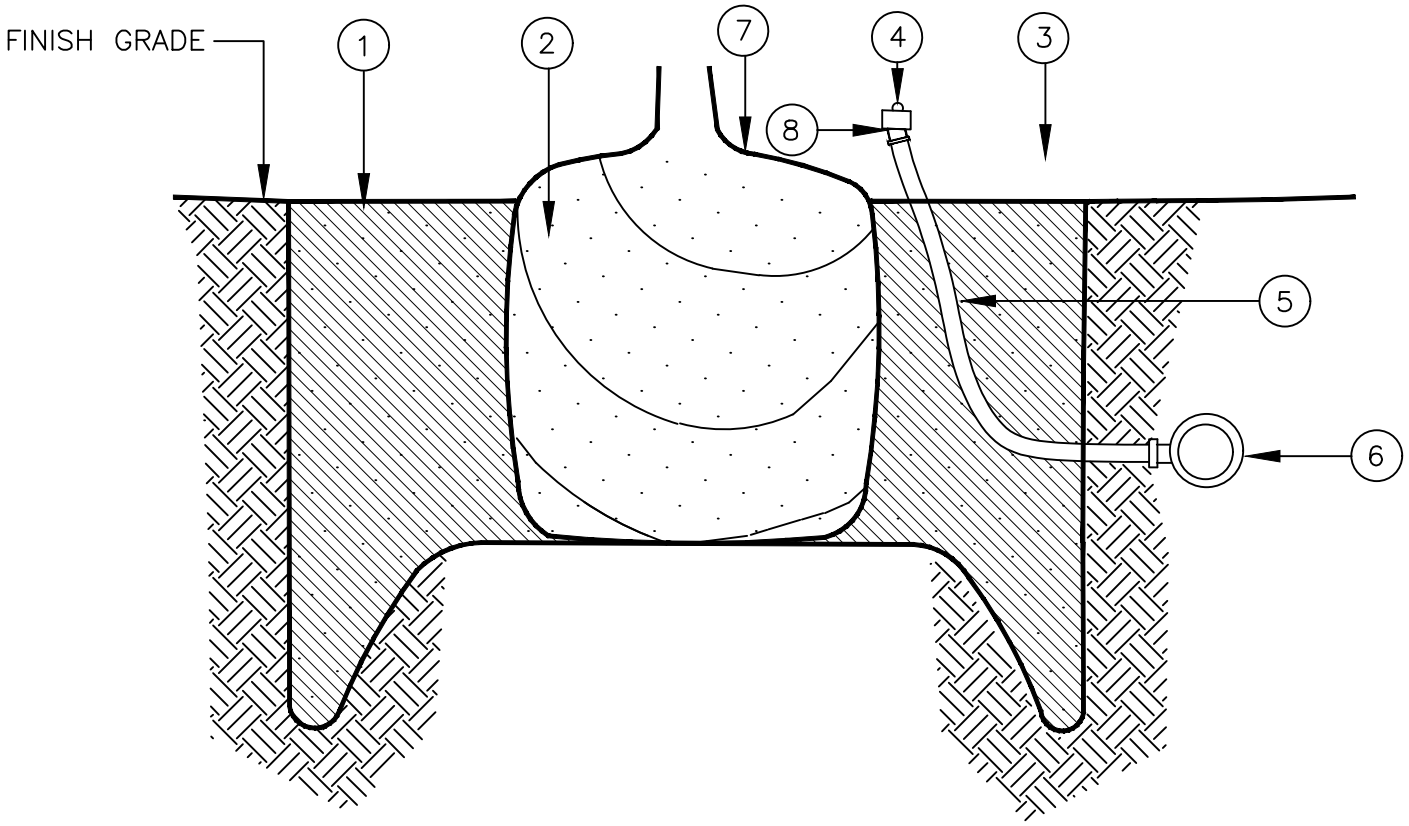
1. GRATE SHALL BE SECURED TO DROP INLET FRAME WITH TWO 3/8" DIA. UNC. STAINLESS STEEL MACHINE BOLT. USE REQUIRED IN ALL CASES.
2. OPENINGS SHALL BE CAST AS REQUIRED TO MEET CONNECTING STORM DRAIN PIPING.
3. DEFLECTED OPENINGS MAY BE CHIPPED IN GREEN CONCRETE.
4. CONCRETE SHALL BE 3000 P.S.I. AT 28 DAYS.
5. WALLS ARE REINFORCED WITH 4"X4"-10-10 WELDED WIRE MESH.
6. WALLS ARE 5" THICK AND BASE IS 6" THICK. METAL FRAME AND GRATE SHALL BE GALVANIZED.
7. AFTER FABRICATION PER ASTM SPECIFICATION A123-59.
8. CLEAR GRATE OPENING IS 3.12 SQUARE FEET.
9. BASE SHALL BE 34"X34"X6".
10. GRATE SHALL BE HEAVY DUTY: 21 BEARING BARS, 2-1/4"X3/16" 2 BANDING BARS, 2"X3/16".
11. FRAME SHALL BE HEAVY DUTY: 2-1/2"X1-1/2"X1/4" ANGLES 2-1/2"X3/8" SIDE BARS.
12. DEPTHS GREATER THAN 4" REQUIRE APPROVAL OF THE ENGINEER.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON
STANDARD DETAILS
LANDSCAPE
DROP INLET FOR PARK AND PARKWAY USE ONLY
4' MAX. DEPTH

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 814



1. BACKFILL MIX PER SPECIFICATIONS
2. WELL DEVELOPED TREE ROOT BALL
3. FINISH GRADE
4. LOW FLOW BUBBLER, SEE PLANS FOR MANUFACTURER AND MODEL; SET TOP OF BUBBLER 2" ABOVE FINISH SOIL GRADE. 2 BUBBLERS PER TREE
5. 1/2" FLEXIBLE PVC PIPE
6. IRRIGATION LATERAL LINE
7. ROOT BALL 2" HIGH; SIDES OF ROOT BALL ARE NOT TO BE EXPOSED.
8. SCH. 40 PVC MALE ADAPTER

NOTE:
REFER ALSO TO STANDARD DETAIL #806, TREE PLANTING DETAIL.

DRAWN BY: STAFF	
CHECKED BY: AN	
SCALE: N.T.S.	

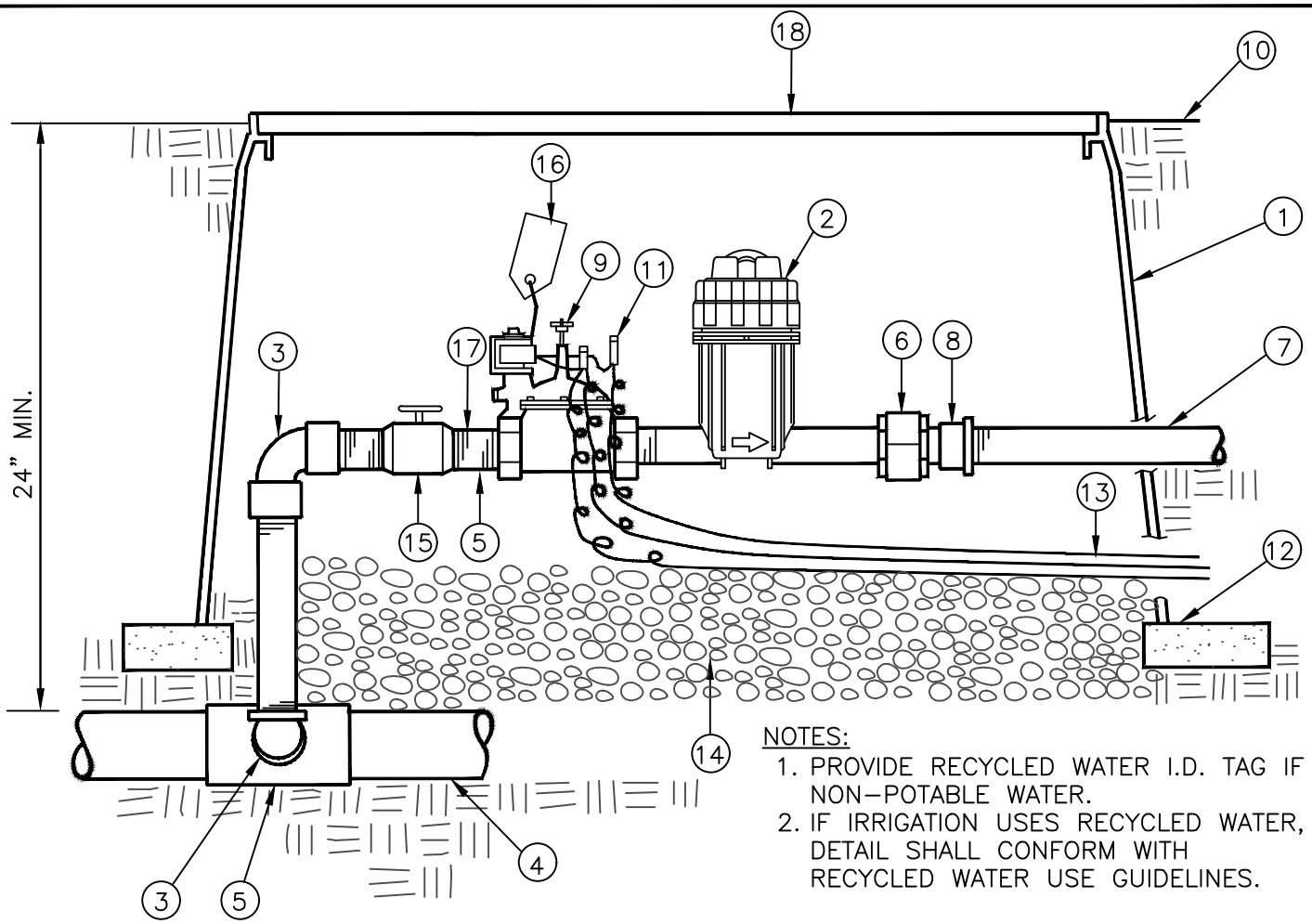
CITY OF PLEASANTON

STANDARD DETAILS
LANDSCAPE

TREE/PLANTING
BUBBLER DETAIL

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 815



NOTES:

1. PROVIDE RECYCLED WATER I.D. TAG IF NON-POTABLE WATER.
2. IF IRRIGATION USES RECYCLED WATER, DETAIL SHALL CONFORM WITH RECYCLED WATER USE GUIDELINES.

1. LOCKING VALVE BOX WITH LID WITH I.D. PER SPECS.
2. PRESSURE REGULATING BASKET FILTER COMMERCIAL GRADE, RAINBIRD OR EQUAL
3. SCH. 80 PVC TxT 90° ELL
4. PRESSURE LINE
5. SCH. 80 PVC TEE (SIZE AS REQUIRED) SxSxT
6. SCH. 80 PVC THREADED UNION
7. DRIP LATERAL LINE
8. SCH. 40 PVC MALE ADAPTER
9. GRISWOLD 2000 SERIES 1" REMOTE CONTROL VALVE, OR APPROVED EQUAL
10. FINISH GRADE, 1" IN MULCH AREA AND FLUSH IN TURF AREA
11. DBY, PENTITE OR OTHER CITY APPROVED SPLICE
12. COMMON BRICK, TYPICAL ALL FOUR CORNERS OF VALVE BOX
13. CONTROL AND COMMON WIRES, PROVIDE MINIMUM 18" COILED EXTRA
14. PEA GRAVEL; 6" MIN. BELOW BOTTOM OF VALVE
15. BALL VALVE, FORD, LINE SIZE
16. PLASTIC VALVE ID TAG
17. SCH. 80 PVC SHORT NIPPLE
18. VALVE NUMBER MELTED OR WELDED TO LID

DRAWN BY: STAFF

CHECKED BY: AN

SCALE: N.T.S.

CITY OF PLEASANTON

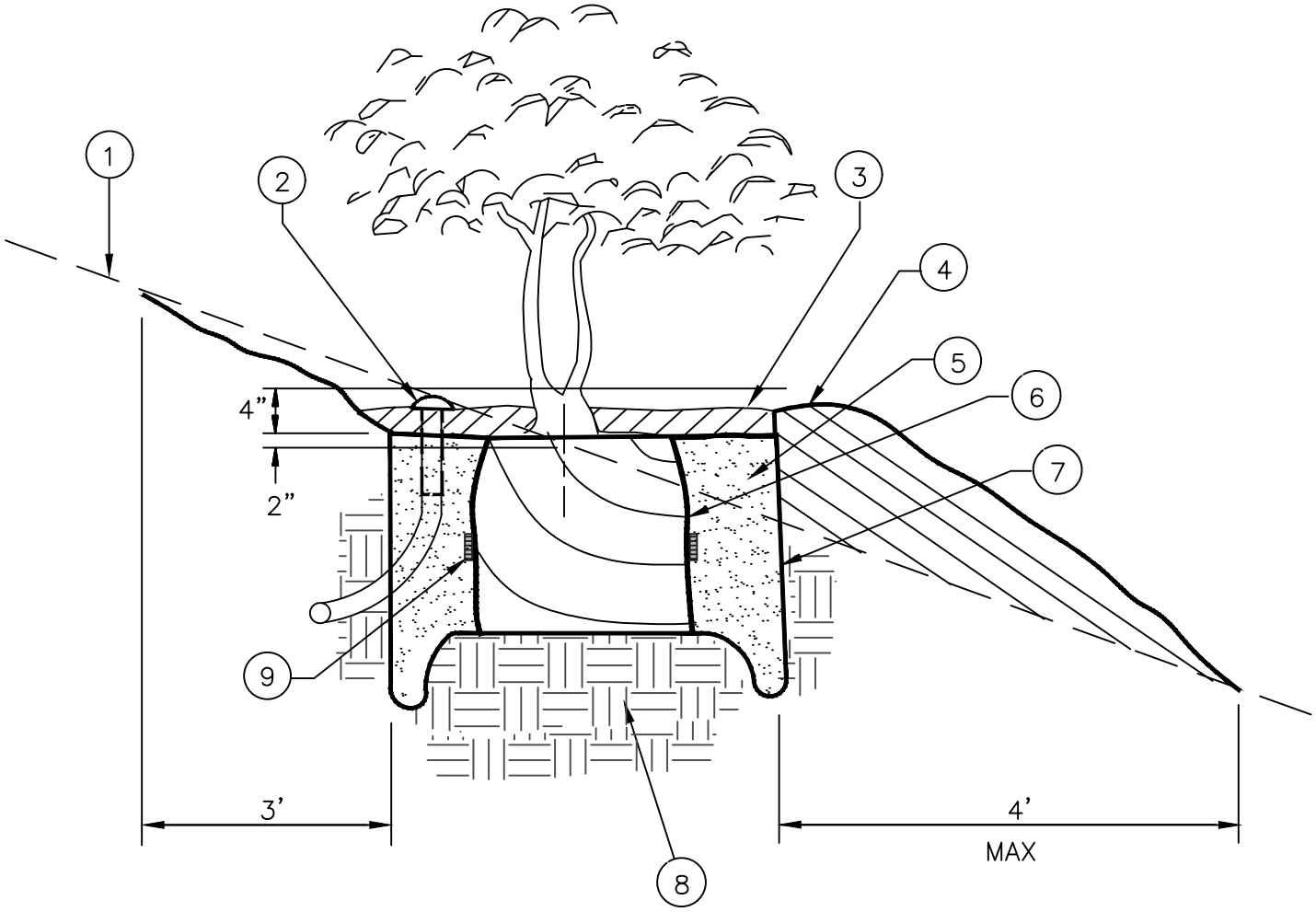
STANDARD DETAILS

LANDSCAPE

DRIP IRRIGATION VALVE ASSEMBLY

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 816



1. EXISTING SLOPE
2. IRRIGATION, INSTALL ON UPHILL SIDE OF PLANT
3. MULCH, 3” DEPTH. KEEP ROOT CROWN 3” CLEAR OF MULCH.
4. EARTH BERM. OMIT IN LAWN.
5. BACKFILL MIX. SEE SPECIFICATIONS.
6. SHRUB ROOTBALL.
7. PLANTING HOLE – SCARIFY WALLS
8. NATIVE SOIL, UNDISTURBED
9. FERTILIZER TABLETS. SEE SPECIFICATIONS.
10. SET CROWN OF PLANT 1/2” ABOVE FINISH GRADE OF SOIL.

DRAWN BY: STAFF

CHECKED BY: AN

SCALE: N.T.S.

CITY OF PLEASANTON

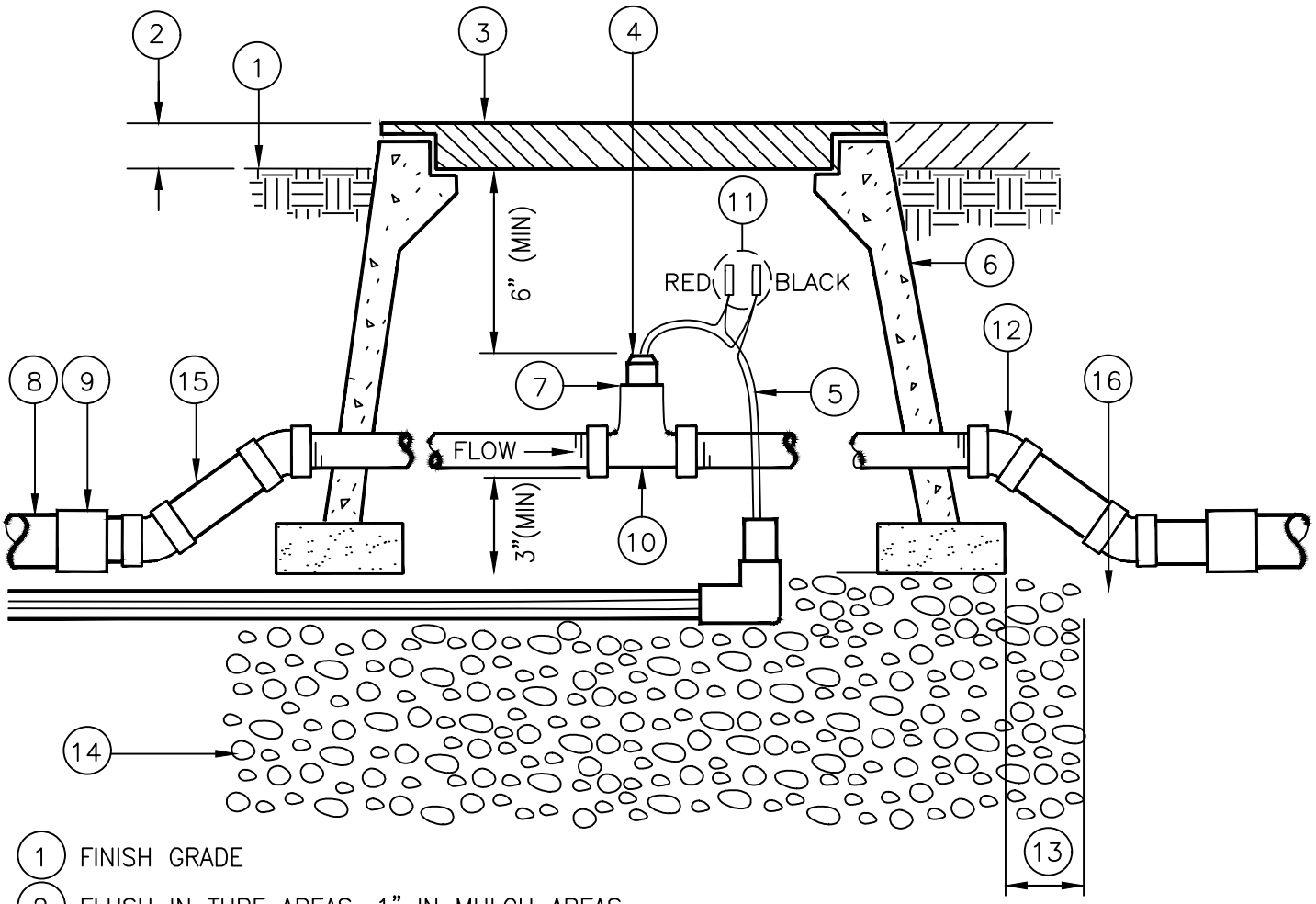
STANDARD DETAILS
LANDSCAPE

SHRUB PLANTING ON SLOPES

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24

DWG NO. 818



1. FINISH GRADE
2. FLUSH IN TURF AREAS, 1" IN MULCH AREAS
3. LOCKING LID PER SPECS
4. FLOW SENSOR, PER PLANS.
5. SENSOR CABLE TO CONTROLLER
6. VALVE BOX (14" X 19") OR LARGER
7. FLOW SENSOR INSERT
8. IRRIGATION MAIN LINE FROM BACKFLOW–UPSTREAM
9. REDUCING COUPLING (SxS), SCH 80 PVC (TYP)
10. FLOW SENSOR BODY
11. WATERPROOF CONNECTIONS. NOTE POLARITY ON SENSOR TO SENSOR CABLE HOOKUP
12. PVC SCHEDULE 80 45° ELL (TYP.)
13. INSTALL PEA GRAVEL 2" MIN. BEYOND PERIMETER OF BOX
14. PEA GRAVEL, 6" MIN. DEPTH
15. NIPPLE, SCH 80 PVC (TYP)
16. CONDUIT, 3/4" PVC, SCH. 40
16. BRICK TO SUPPORT VALVE BOX (TYP)

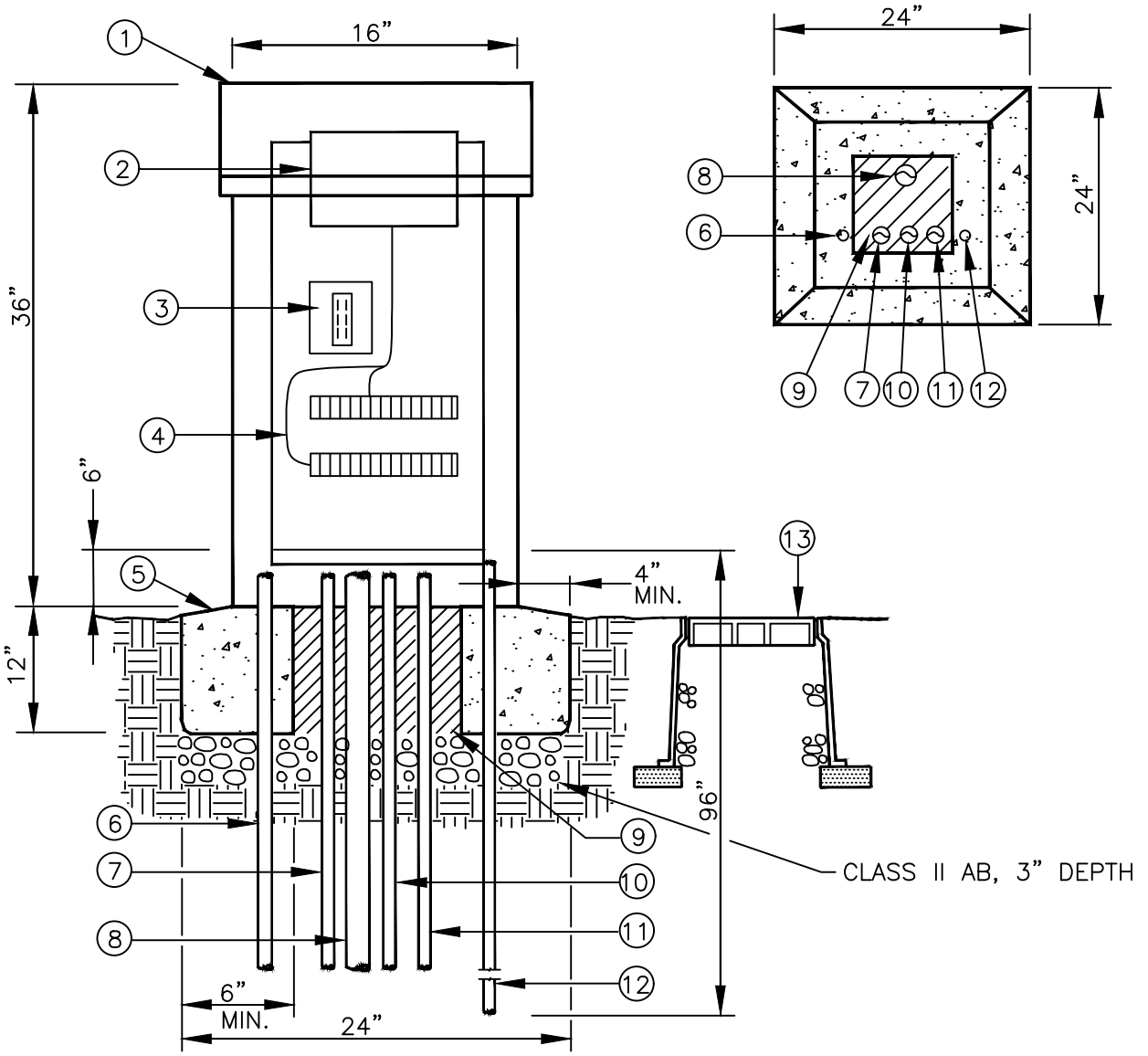
NOTES:
1. PROVIDE RECYCLED WATER I.D. TAG IF NON–POTABLE WATER.
2. IF IRRIGATION USES RECYCLED WATER, DETAIL SHALL CONFORM WITH RECYCLED WATER USE GUIDELINES.

DRAWN BY: STAFF
CHECKED BY: AN
SCALE: N.T.S.

CITY OF PLEASANTON
STANDARD DETAILS
LANDSCAPE
FLOW SENSOR INSTALLATION

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 819



1. ENCLOSURE PER IRRIGATION CONTROLLER MANUFACTURER SPECIFICATIONS
2. SATELLITE IRRIGATION CONTROLLER
3. POWER SWITCH/GFI RECEPTACLE
4. TERMINAL STRIP FOR VALVES
5. CONCRETE FOOTING 1" ABOVE FINISH GRADE
6. 1" PVC CONDUIT FOR 120 VAC FROM METERED POWER SUPPLY
7. 1" RADIO CONDUIT IF REQUIRED
8. PVC CONDUIT FOR CONTROL WIRES, SIZE AS REQUIRED
9. FILL VOIDS WITH CONCRETE
10. 1" PVC CONDUIT FOR FLOW & MOISTURE SENSING CABLE(S)
11. 1" SPARE CONDUIT
12. 5/8" DIA. X 8' GROUND ROD W/#8 BONDING WIRE AND CLAMP
13. ROUND PLASTIC LOCKING SPLICE BOX

DRAWN BY: STAFF

CHECKED BY: AN

SCALE: N.T.S.

CITY OF PLEASANTON

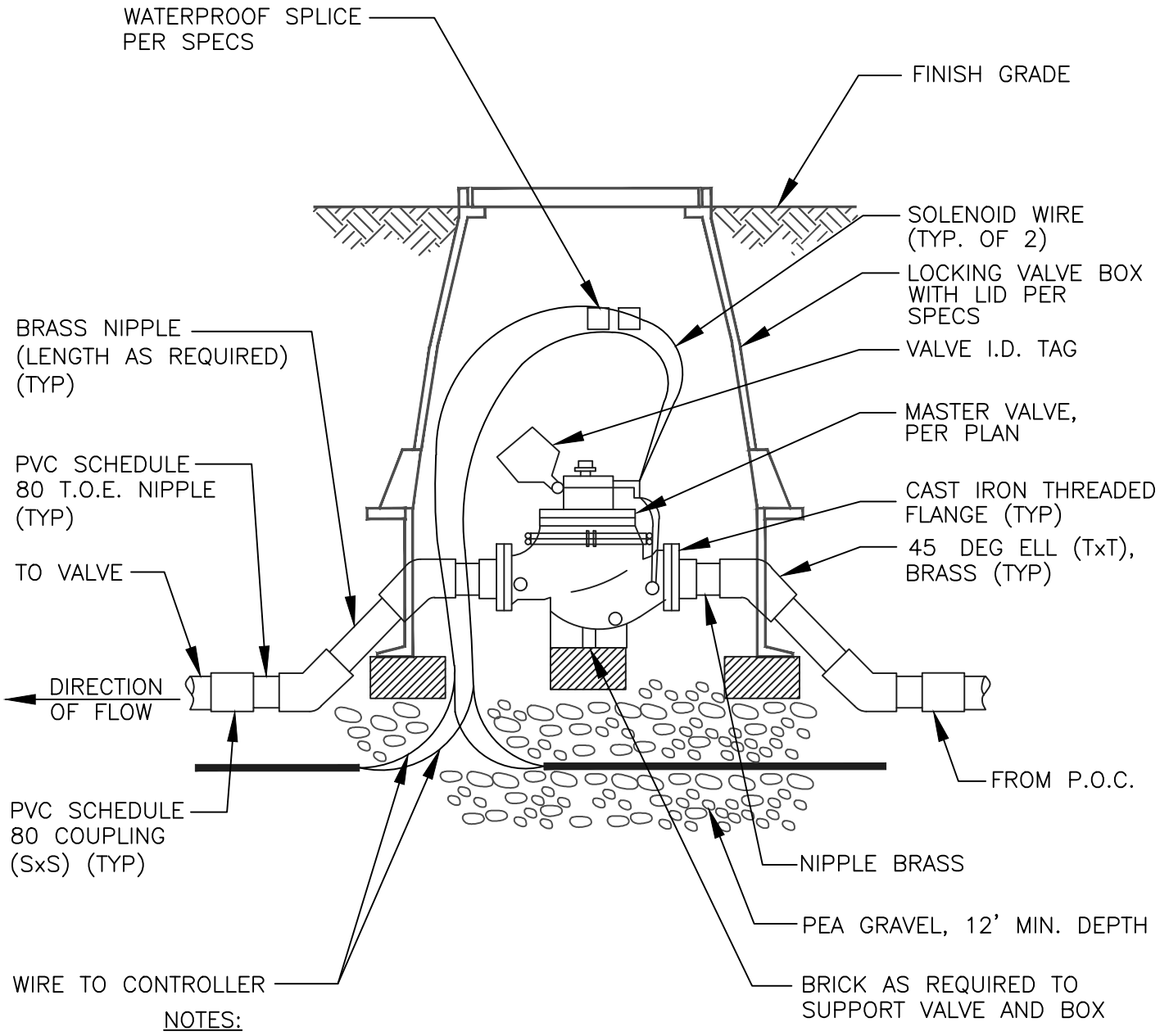
STANDARD DETAILS
LANDSCAPE

IRRIGATION CONTROLLER ASSEMBLY

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24

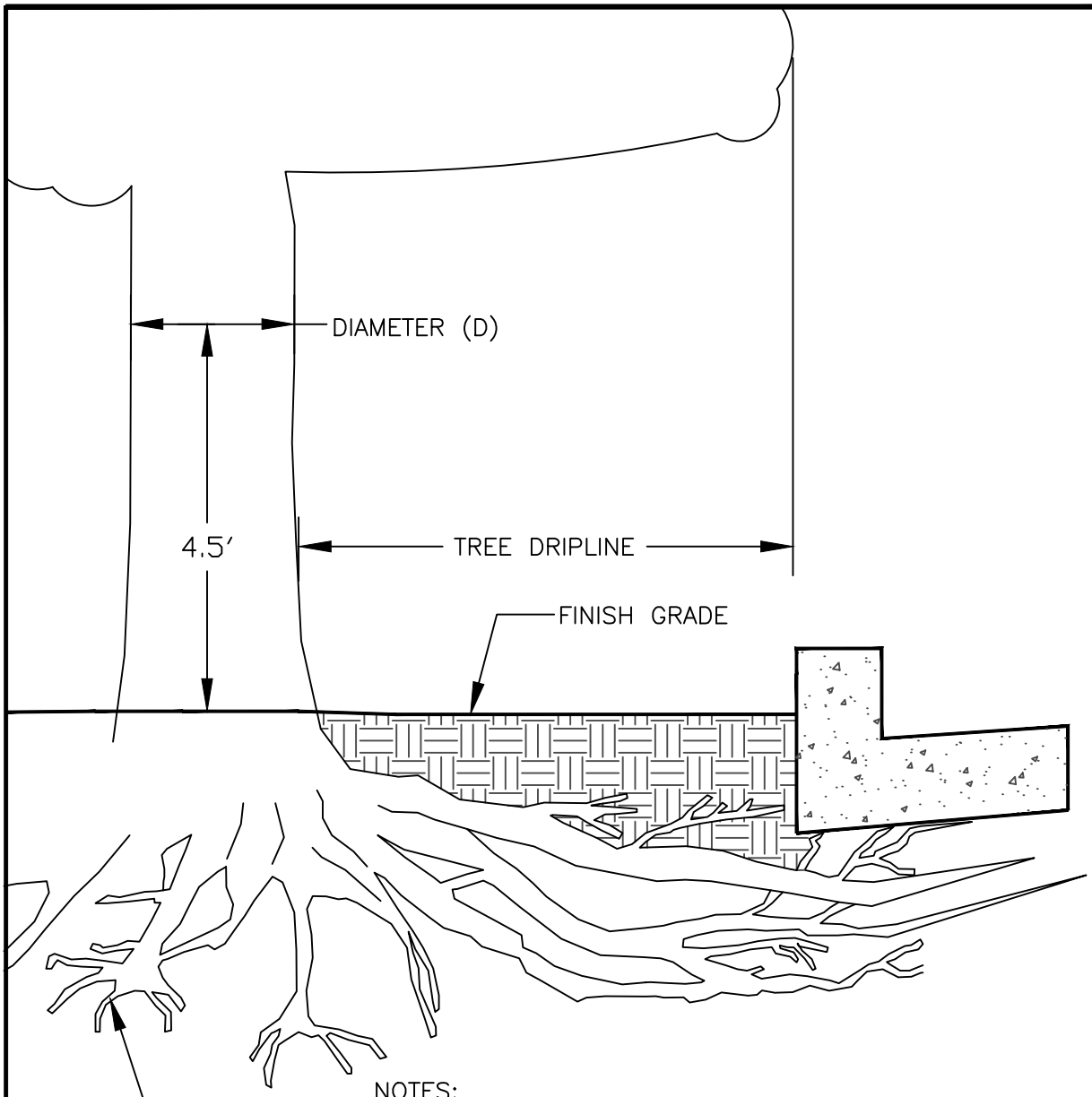
DWG NO. 821



NOTES:

1. PROVIDE RECYCLED WATER I.D. TAG IF NON–POTABLE WATER.
2. IF IRRIGATION USES RECYCLED WATER, DETAIL SHALL CONFORM WITH RECYCLED WATER USE GUIDELINES.

DRAWN BY: STAFF	CITY OF PLEASANTON STANDARD DETAILS LANDSCAPE MASTER VALVE DETAIL	REGISTERED PROFESSIONAL ENGINEER ADAM MATTHEW NELKIE No. 78830 Exp. 9/30/2025 CIVIL STATE OF CALIFORNIA
CHECKED BY: AN		
SCALE: N.T.S.		DATE : 7/24 DWG NO. 822



NOTES:

1. ALL ROOTS 1–INCH IN DIA. OR LARGER THAT ARE TO BE REMOVED SHALL BE CLEANLY CUT WITH A SHARP SAW OR LOPPER.
2. WITHIN THE TREE DRIPLINE, ROOTS 3–INCHES IN DIA. OR LARGER SHALL NOT BE CUT OR GROUND WITHOUT THE APPROVAL OF THE PROJECT ARBORIST.
3. OUTSIDE THE TREE DRIPLINE, ROOTS UP TO 6–INCHES IN DIA. MAY BE REMOVED IF THEY ARE IN CONFLICT WITH THE PROPOSED WORK. CONSULT WITH THE PROJECT ARBORIST.
4. REMOVAL OF ROOTS LARGER THAN 6–INCHES REQUIRES APPROVAL BY THE PROJECT ARBORIST.
5. SEE CITY STANDARD SPECIFICATIONS FOR FURTHER INFORMATION.

DRAWN BY: STAFF

CHECKED BY: AN

SCALE: N.T.S.

CITY OF PLEASANTON

STANDARD DETAILS

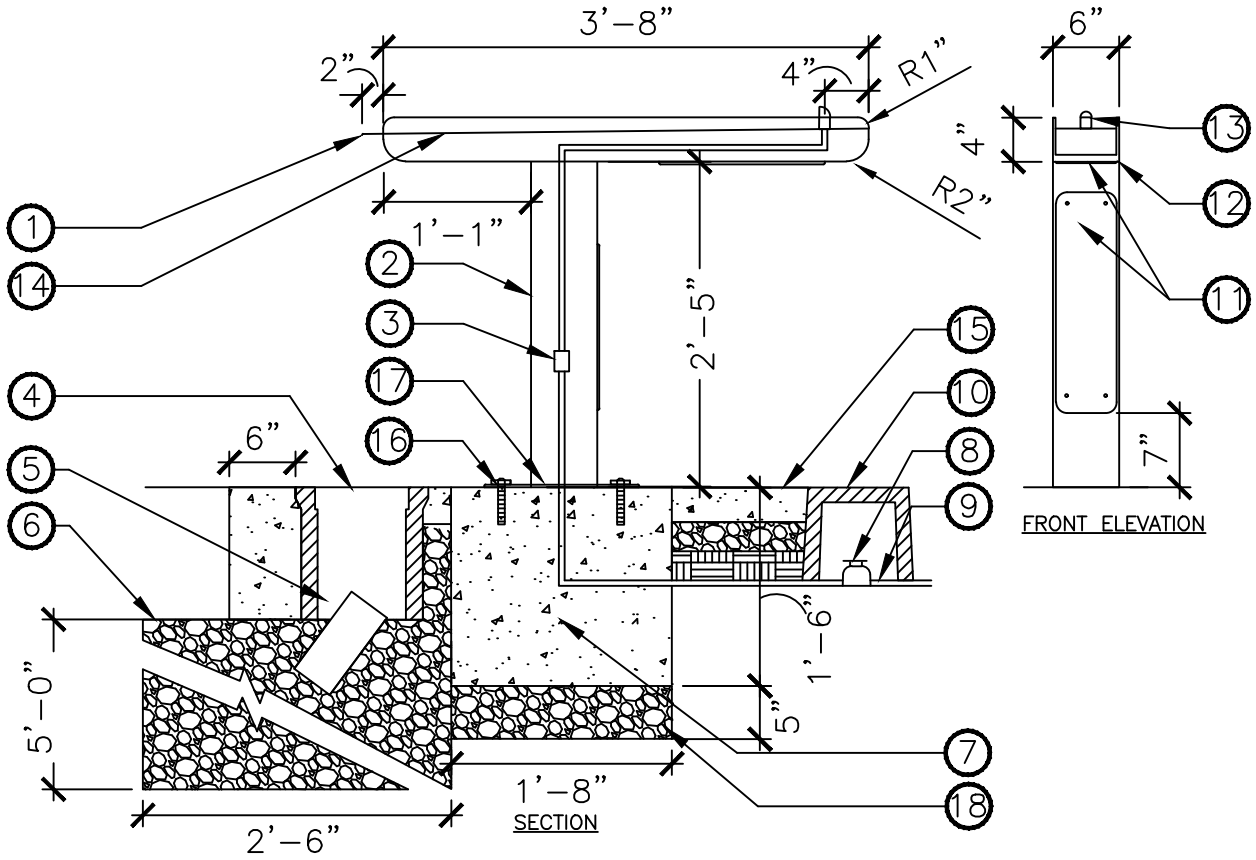
LANDSCAPE

ROOT CUTTING DETAIL

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 824

NOTES:
1. BUBBLER SHALL BE MODEL 5010 BY HAWS DRINKING FAUCET CO., BERKELEY, CA 510-525-5801.
2. METAL SHALL BE 304 STAINLESS STEEL, BRUSHED FINISH.



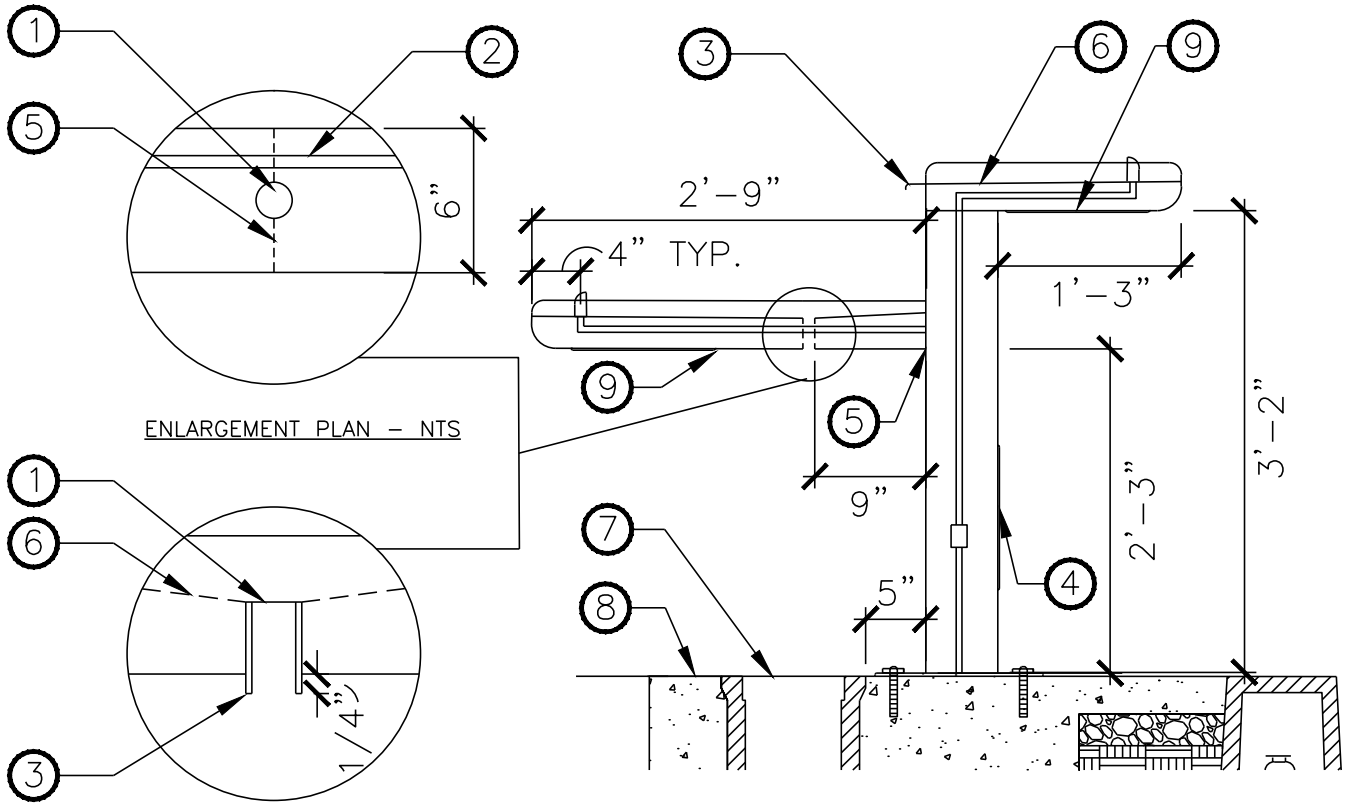
1. DRIP EDGE, 1/8" THICK SS W/ 1/4"ø BEND
2. RISER, 6" X 6"
3. MALE ADAPTER TO BRAIDED SS TUBING
4. DRAIN INLET CHRISTY V-9 SET PERPEN. TO TROUGH, CENTER ON DRIP EDGE
5. PIPE, SCHEDULE 40 PVC, 4"
6. DRY WELL, WRAPPED IN FILTER FABRIC, BACKFILL WITH 3/4" CRUSHED DRAIN ROCK
7. CONCRETE FOOTING, CENTERED ON FOUNTAIN
8. BALL VALVE, FORD B-11, LINE SIZE
9. SUPPLY LINE, TYPE K COPPER, 1/2"
10. VALVE BOX, 10"ø (BROOKS OR EQ.) CAST IRON LID, CHRISTY F8C OR EQ.
11. ACCESS PANEL, 1/8" STAINLESS STEEL, 5.5" X 20", VANDAL RESISTANT SCREWS AT CORNERS, TYP., 2 TOTAL
12. CONTINUOUS BEAD WELD, GRIND SMOOTH
13. BUBBLER
14. TROUGH, SLOPE TO DRAIN
15. ADJACENT CONCRETE PAVEMENT
16. NUT & BOLT ASSEMBLY, VANDAL RESISTANT, 4" LENGTH X 5/8"ø, 4 TOTAL
17. PLATE, 14" SQ. 4 BOLT HOLES 1" FROM CORNERS
18. PERMEABLE MATERIAL, CLASS 2, COMPACTED TO 90% MIN.

DRAWN BY: STAFF
CHECKED BY: AN
SCALE: N.T.S.

CITY OF PLEASANTON
STANDARD DETAILS
LANDSCAPE
STANDARD DRINKING FOUNTAIN

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 825



1. 1–1/2" ROUND DRAIN HOLE, CENTERED IN TROUGH
2. SUPPLY LINE, TYPE K COPPER, 1/2"ø
3. DRIP EDGE, GRIND SMOOTH
4. ACCESS PANEL, 1/8" STAINLESS STEEL, 5.5" X 20", VANDAL RESISTANT SCREWS AT CORNERS
5. CONTINUOUS BEAD WELD, GRIND SMOOTH
6. TROUGH, SLOPE TO DRAIN HOLE
7. DRAIN INLET, CENTER ON TROUGH
8. FOR BELOW GRADE IMPROVEMENTS REFER TO DETAIL 830A
9. ACCESS PANEL, 1/8" SS, 5.5" X 12", VANDAL RESISTANT SCREWS AT CORNERS

NOTE:
ALL DIMENSIONS, MATERIALS AND NOTES NOT SHOWN ON THIS DETAIL SHALL BE CONSISTENT WITH THE STANDARD DRINKING FOUNTAIN. REFER TO DETAIL 825.

DRAWN BY: SH
CHECKED BY: MG
SCALE: NTS

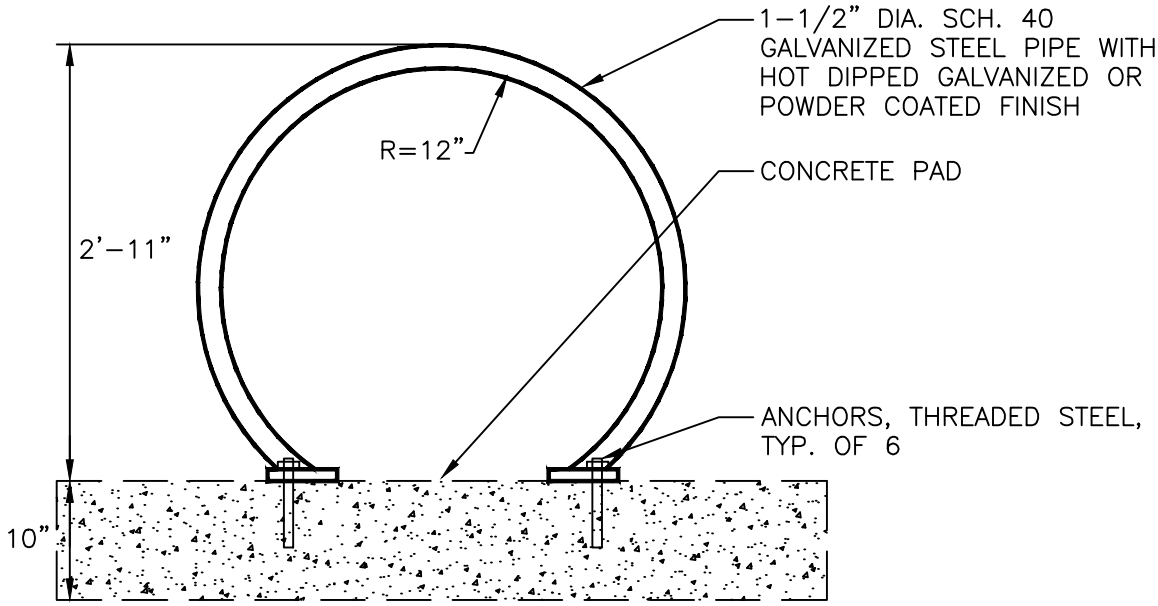
CITY OF PLEASANTON

STANDARD DETAILS
LANDSCAPE

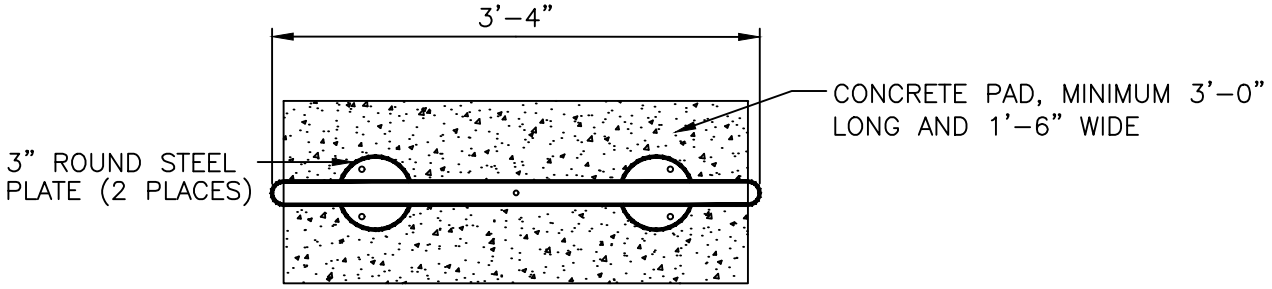
HI–LO DRINKING FOUNTAIN

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24
DWG NO. 826



PROFILE



PLAN

NOTES:
1. BIKE RACK SHALL BE SURFACE MOUNT.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

STANDARD DETAILS

BICYCLE RACK

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NEEKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 828

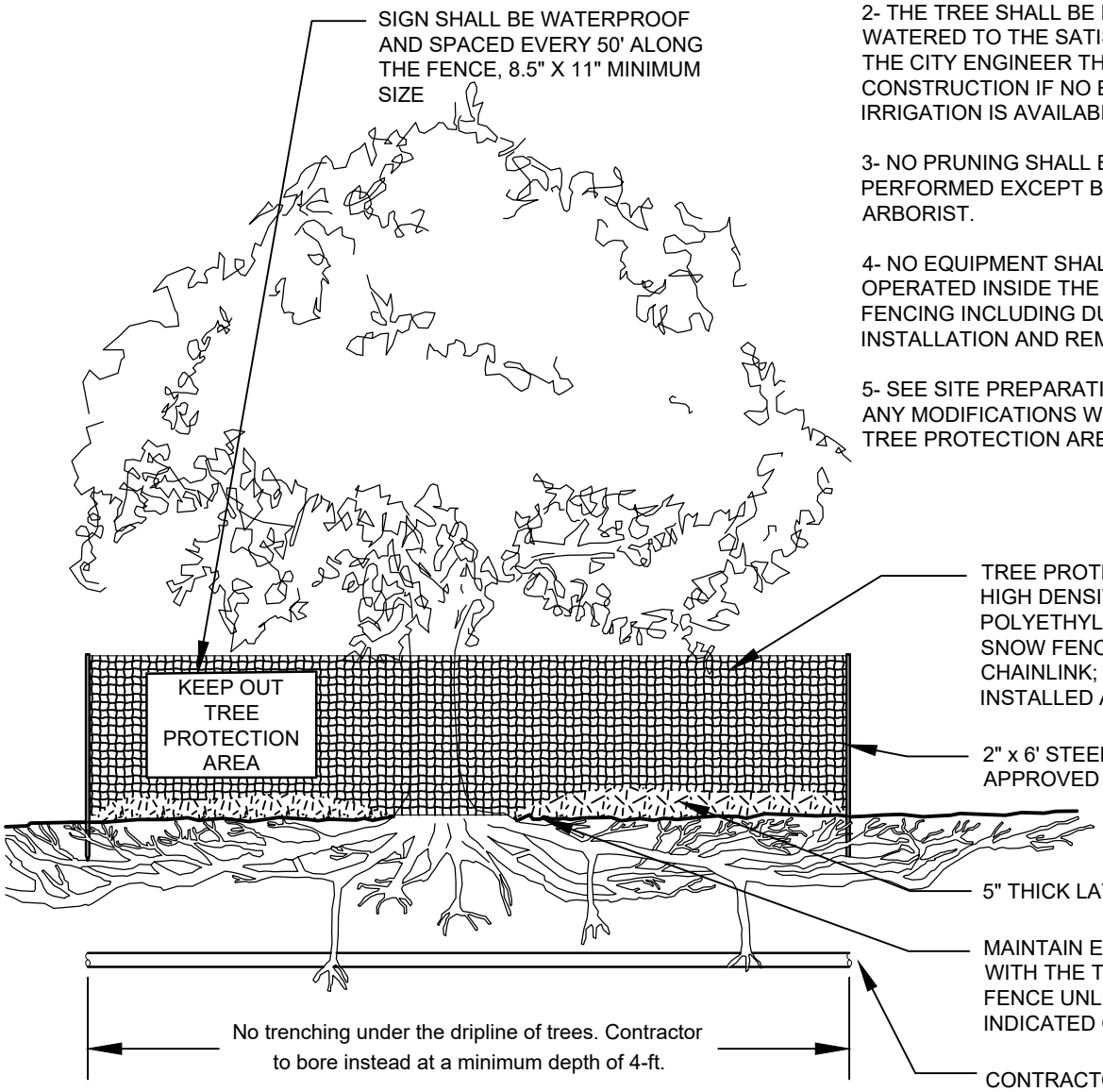
Notes:
1- SEE CITY STANDARD SPECIFICATIONS FOR ADDITIONAL TREE PROTECTION REQUIREMENTS.

2- THE TREE SHALL BE HAND WATERED TO THE SATISFACTION OF THE CITY ENGINEER THROUGH CONSTRUCTION IF NO EXISTING IRRIGATION IS AVAILABLE.

3- NO PRUNING SHALL BE PERFORMED EXCEPT BY APPROVED ARBORIST.

4- NO EQUIPMENT SHALL BE OPERATED INSIDE THE PROTECTIVE FENCING INCLUDING DURING FENCE INSTALLATION AND REMOVAL.

5- SEE SITE PREPARATION PLAN FOR ANY MODIFICATIONS WITHIN THE TREE PROTECTION AREA.



SECTION VIEW

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

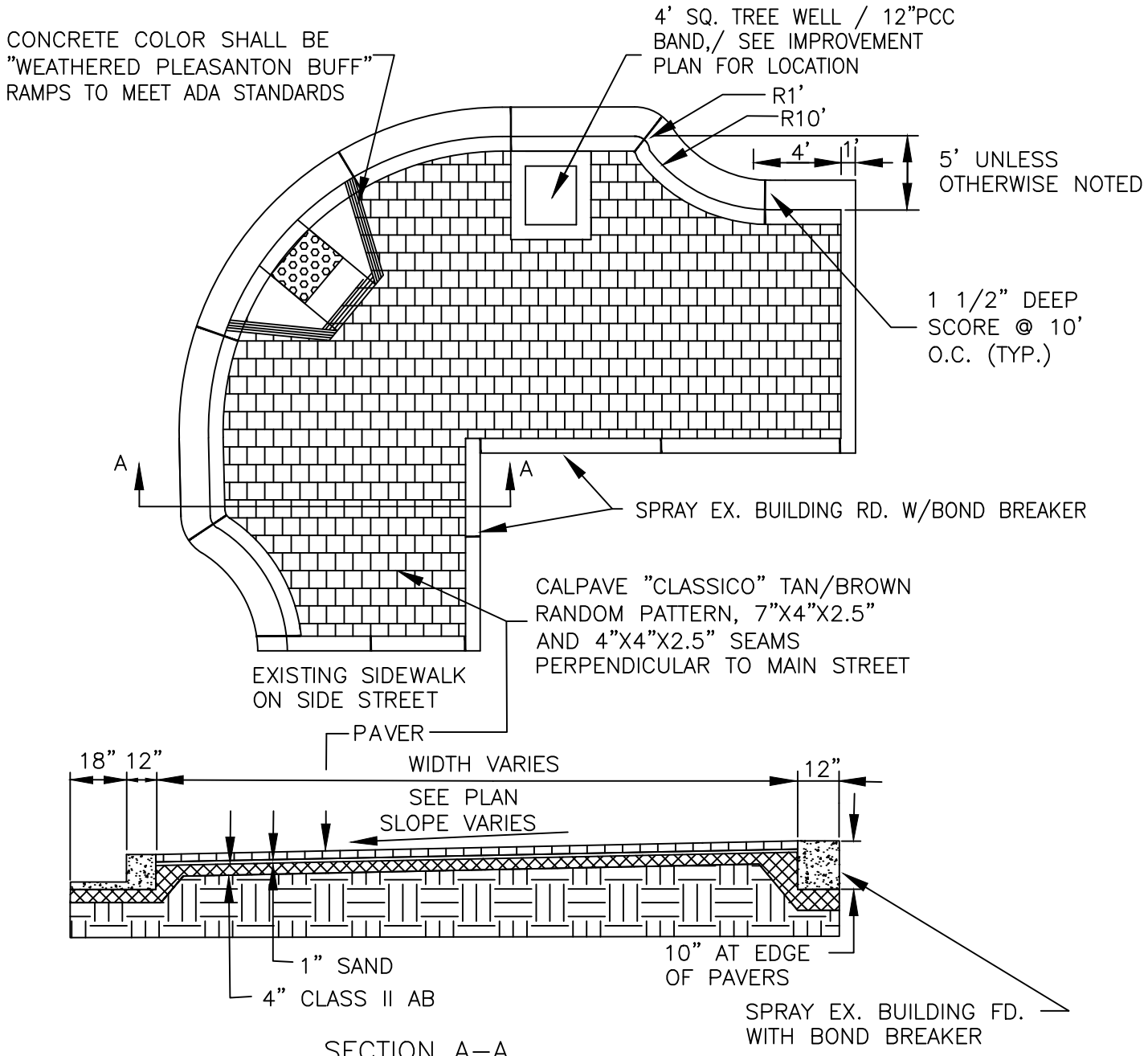
STANDARD DETAILS

LANDSCAPE

TREE PROTECTION

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 829



SECTION A–A

NOTES:

1. INSTALL TRENCH DRAIN WHEN INDICATED ON PLANS OR AS DIRECTED BY THE ENGINEER.
2. SEE PLAN AND PROFILE FOR LOCATION. SEE DRAWINGS 911 & 115C FOR TREE WELL AND CURB RAMP DETAILS.
3. TRENCH GRATE SHALL BE URBAN ACCESSORIES MODEL T 24 OR EQUAL.
4. VOIDS BETWEEN PAVERS TO BE SANDED & VIBRATED WITH KILN DRIED, MONTEREY SAND, 30 MESH.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

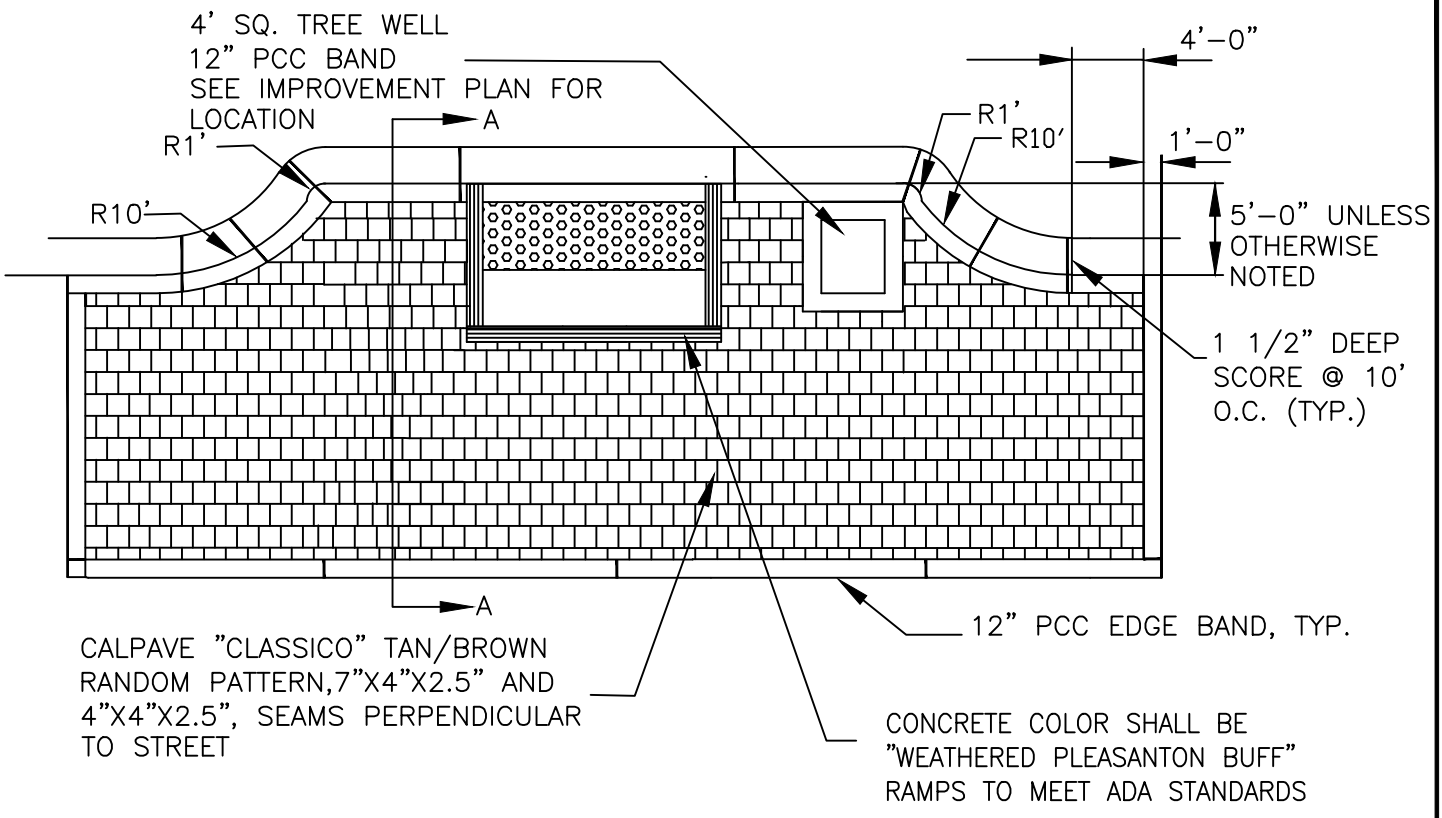
CITY OF PLEASANTON

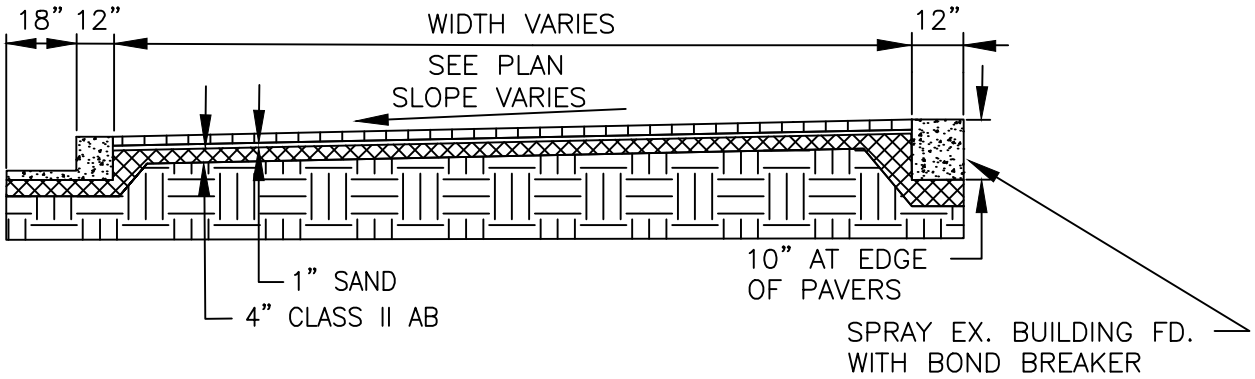
STANDARD DETAILS

CURB RETURN AND DECORATIVE WALK SECTION

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 910





SECTION A–A

NOTES:

1. BACKFILL COMPACTION SHALL BE CERTIFIED BY THE SOILS ENGINEER.
2. SEE DRAWING 911 FOR TREE WELL AND DRAWING 115C FOR CURB RAMP DETAILS.
3. CEMENT TREATED BASE MAY BE REQUIRED INSTEAD OF AB WHEN SPECIFIED BY THE CITY ENGINEER.
4. VOIDS BETWEEN PAVERS SHALL BE SANDED & VIBRATED WITH KILN DRIED MONTEREY SAND, 30 MESH.

DRAWN BY:	STAFF
CHECKED BY:	AN
SCALE:	N.T.S.

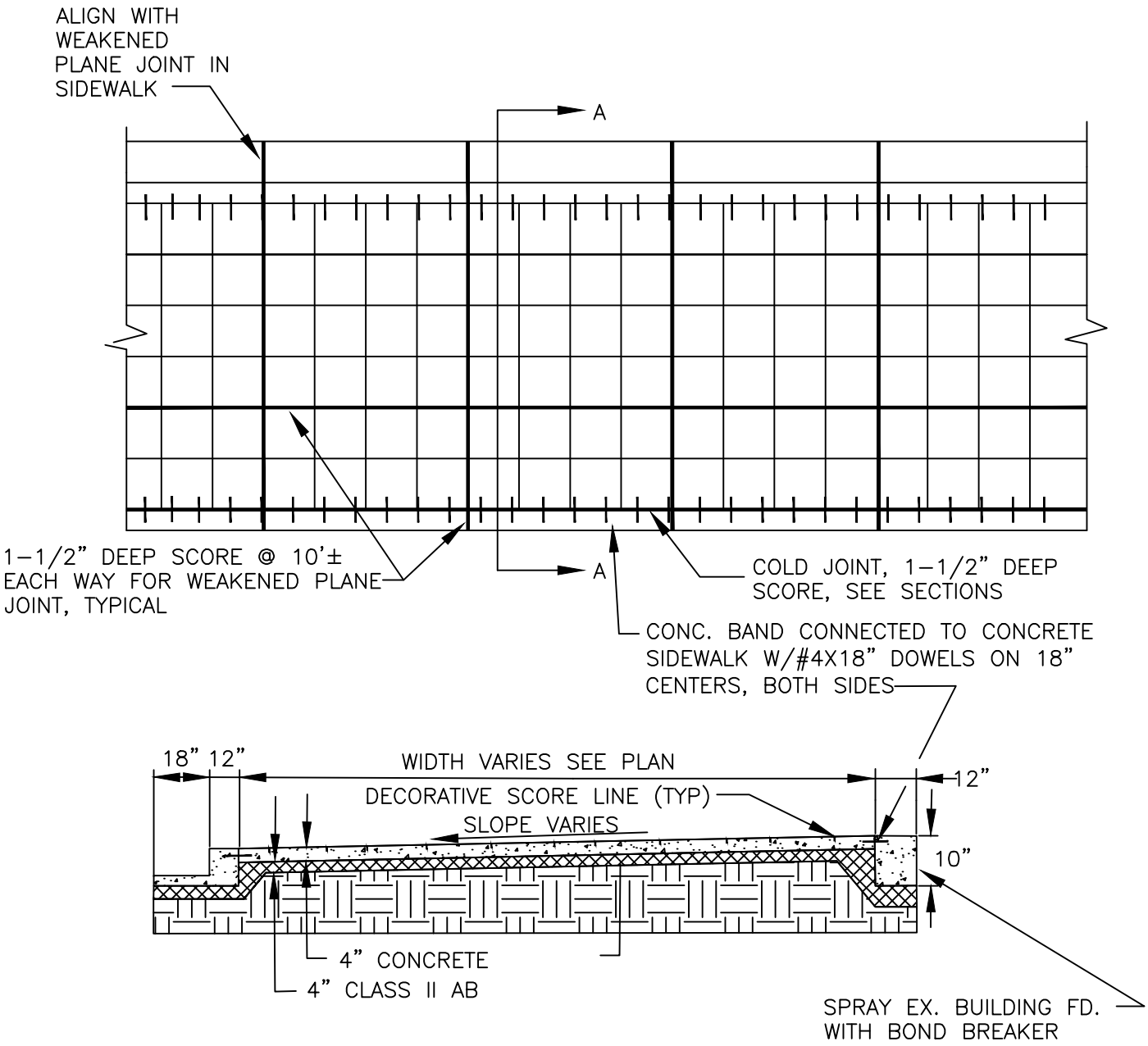
CITY OF PLEASANTON

STANDARD DETAILS

CROSSWALK AND CURB & GUTTER TYPICAL PLAN

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO. 910A



SECTION A–A

NOTES:

1. MAINTAIN SAME SCORE SPACING FOR ADJACENT BUILDINGS AND ENTIRE BLOCK IF PRACTICAL.
2. ADJUST SCORE MARKS AT BUILDING COLUMNS TO BE NO CLOSER THAN 2' TO EDGE OF COLUMN BASE.
3. POURED IN–PLACE SIDEWALK, COLOR "WEATHERED PLEASANTON BUFF", 1/2" DEEP SCORE @ 30" EACH WAY. 1–1/2" DEEP SCORE @ 10' EACH WAY.

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

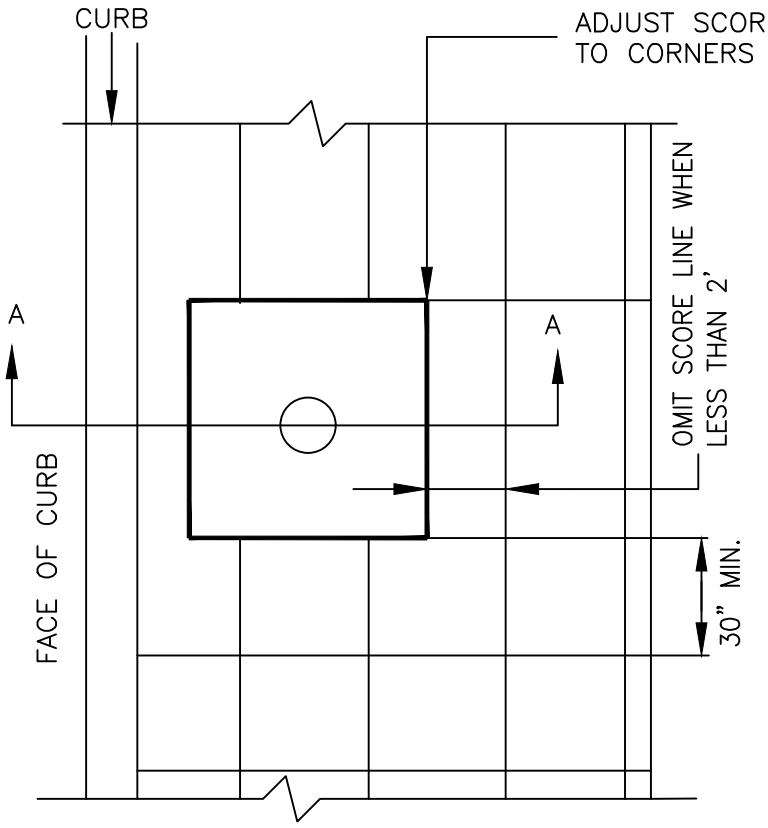
CITY OF PLEASANTON

STANDARD DETAILS

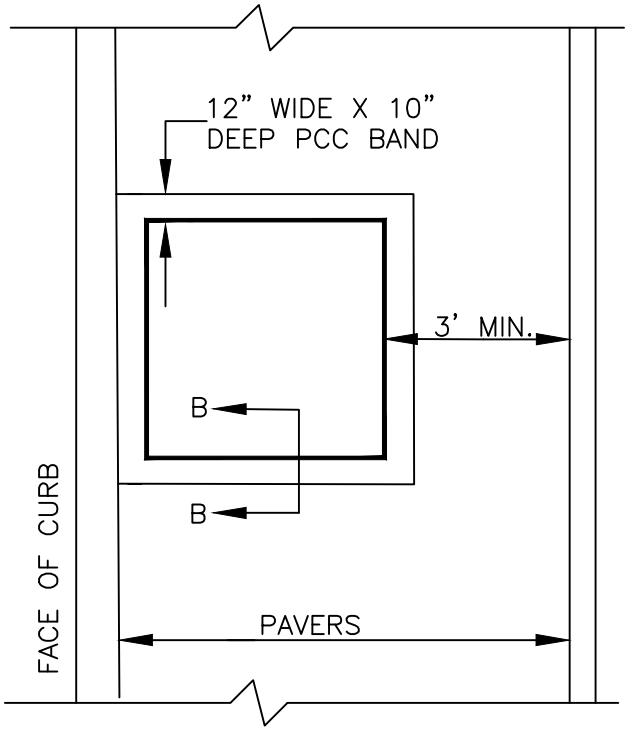
TYPICAL CURB, GUTTER AND SIDEWALK PLAN

REGISTERED PROFESSIONAL ENGINEER
ANN MATTHEW NEIKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

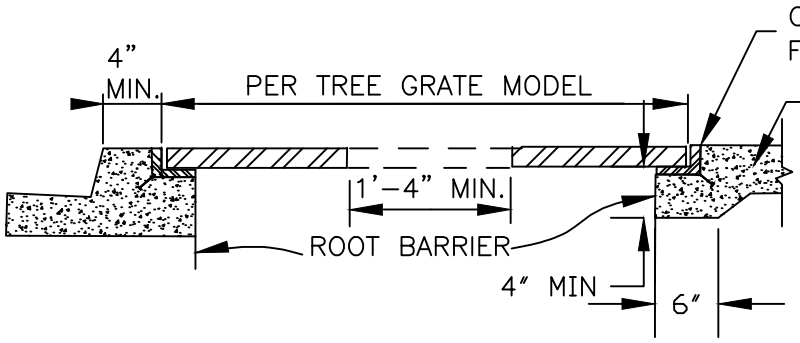
DATE : 7/24 | DWG NO. 910B



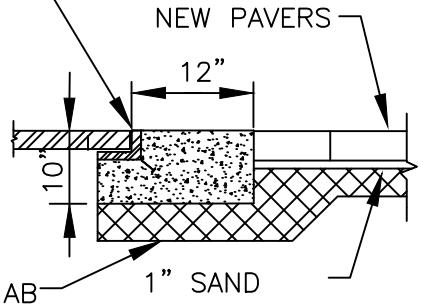
WITHIN SIDEWALK



WITHIN PAVERS



SECTION A–A



SECTION B–B

NOTES:

1. 4'X4' TREE WELLS AT NEW TREES.
2. 6'X6' TREE WELLS AT EXISTING TREES, NO TREE WELL REQ'D. PLACE 2" DECOMPOSED GRANITE.
3. TREE GRATE SHALL BE IRONSMITH, STARBURST SERIES, MODELS 4814–1 OR 6018–1 SLOT OPENING OR APPROVED EQUAL.

DRAWN BY:	STAFF
CHECKED BY:	AN
SCALE:	N.T.S.

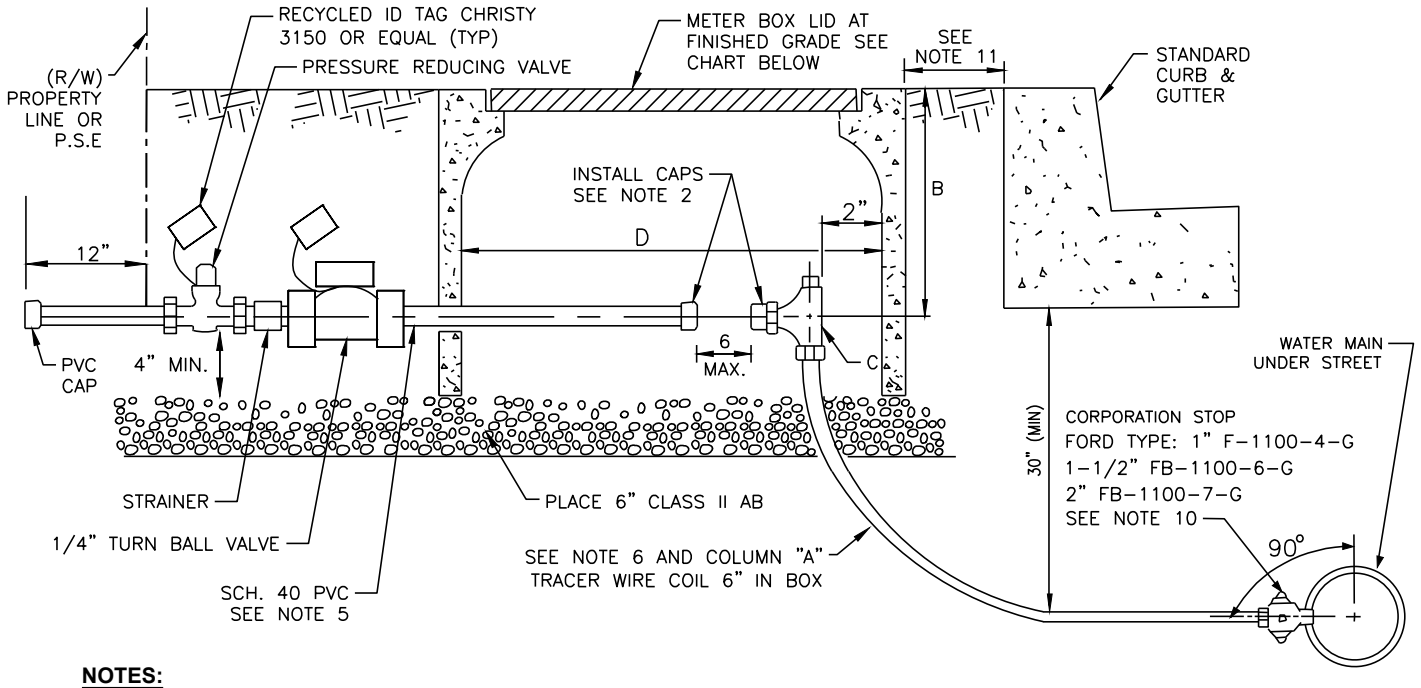
CITY OF PLEASANTON

STANDARD DETAILS

TREE WELL WITHIN PAVERS AND SIDEWALK

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24	DWG NO. 911



NOTES:

1. WATER METERS SHALL BE PURCHASED FROM AND SET BY THE CITY OF PLEASANTON UTILITY DEPT.
2. NO CONNECTION TO THE CITY WATER SYSTEM SHALL BE MADE WITHOUT A WATER METER AND ACTIVE ACCOUNT.
3. 5/8" BRASS BOLTS SHALL BE INSTALLED AT METER OR ADAPTER.
4. SERVICE LINE SHALL BE INSTALLED IN A STRAIGHT LINE PERPENDICULAR FROM MAIN TO PROPERTY LINE
5. 3/4" SCH. 40 PVC FOR 5/8" AND 3/4" METERS. 1" PVC FOR 1" METER. 1-1/2" PVC FOR 1-1/2" METER. 2" PVC FOR 2" METER.
6. FOR 1", 1-1/2" AND 2", USE CLASS 200 PURPLE POLYETHYLENE, TUBING SHALL CONFORM TO ASTM D-2737 AND AWWA C-901 WITH A PRESSURE RATING OF 200 PSI AND SHALL BE "INTERSTATE POLY TUBING" OR APPROVED EQUAL. ALL FITTINGS SHALL BE COMPRESSION TYPE. TRACER WIRE TO BE INSTALLED WITH SERVICE.
7. WARNING TAPE MARKED "CAUTION" WATER LINE BURIED BELOW ''SHALL BE INSTALLED 2" ABOVE THE WATER SERVICE. SEE SPEC. 14-03J.
8. IF METER AND SERVICE SIZE ARE OTHER THAN THOSE LISTED BELOW, PROVIDE A DETAIL DRAWING.
9. TAPS ABOVE 1''REQUIRES A SADDLE (1-1/2" AND 2")
    1. ACP - FORD MODEL S912
    2. C.I.P./D.I.P. - FORD MODEL FSD202
    3. P.V.C.- FORD MODEL S912
10. STUB PVC LINE:
    1. 12" OUTSIDE OF METER BOX OR 12" BEHIND PROPERTY LINE.
    2. 4" BEHIND CURB, WHERE PLANTER AREA EXIST BETWEEN CURB AND SIDEWALK.
    3. 4" BEHIND SIDEWALK, WHERE SIDEWALK IS MONOLITHIC TO CURB.
11. JOINT TRENCH DEPTH SHALL BE DETERMINED BEFORE WATER SERVICE IS INSTALLED.
12. THE 1/4 TURN BALL VALVE, PRESSURE REDUCING VALVE AND STRAINER SHALL BE INSTALLED WITHIN 5' OF METER AND BEFORE ANY BRANCH LINES.

METER SIZE	A	B	C*	D*	INSIDE DIMENSIONS	ARMORCAST LID
3/4"	1"	8"	FORD BA—43—442W—G	CHRISTY B12	12"X20"	A6000484T-PUR-PLEASANTON
1"	1"	8"	FORD BA-43-444W-G	CHRISTY B12	12"X20"	A6000484T-PUR-PLEASANTON
1"	1 1/2"	8"	FORD BFA— 43 — 666W —G	CHRISTY B30	13— 1/4"X24"	A6001969--PUR-PLEASANTON
1 1/2"	1 1/2"	8"	FORD BFA— 43 — 666W —G	CHRISTY B36	13— 1/4"X24"	A6001947 T-PUR-PLEASANTON
2"	2"	8"	FORD BFA— 43 — 777W —G	CHRISTY B36	17— 1/4"X30"	A6001947 T-PUR-PLEASANTON

DRAWN BY: STAFF

CHECKED BY: AN

SCALE: N.T.S.

CITY OF PLEASANTON

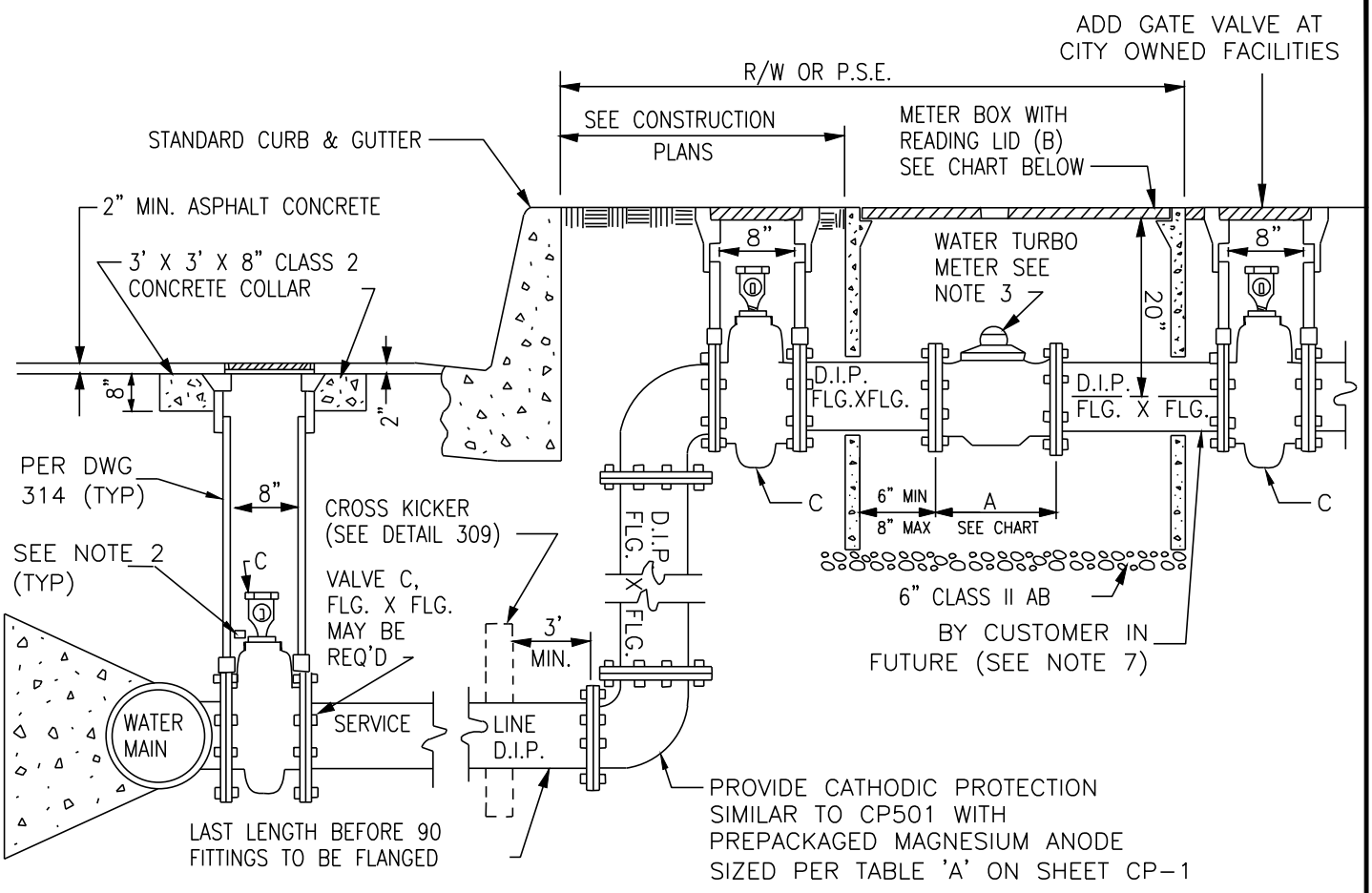
STANDARD DETAILS

RECYCLED WATER SERVICE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24

DWG NO. 1001



METER SIZE	A (NOTE 8)	B*	C
3"	17"	CHRISTY PURPLE FL36	GATE VALVE
4"	20"	CHRISTY PURPLE FL36	GATE VALVE
6"	24"	CONTACT ENGINEERING B48	GATE VALVE
		* OR APPROVED EQUAL	

NOTES:

1. ADDITIONAL VALVES SHALL BE REQUIRED TO ISOLATE ADDITIONAL METERS OR WATER SERVICES.
2. SEE VALVE TAG REQUIREMENTS, DETAIL 1007.
3. WATER METER SHALL BE FURNISHED AND SET BY THE CITY OF PLEASANTON.
4. ALL THRUST BLOCKS TO BE POURED AGAINST UNDISTURBED SOIL.
5. WARNING TAPE MARKED "CAUTTION" RECYCLED WATER LINE BURIED BELOW" SHALL BE INSTALLED 2' ABOVE THE WATER THE WATER SERVICE. SEE SPEC. 22-01B.7
6. SERVICE LINE SHALL BE INSTALLED IN A STRAIGHT LINE PERPENDICULAR FROM MAIN TO PROPERTY LINE.
7. IF CUSTOMER PIPE IS METALLIC, INSTALL PVC SPOOL PIECE BETWEEN CITY'S PIPE AND CUSTOMER PIPE.
8. SPACER PROVIDED BY CITY UTILITY DEPARTMENT.
9. 3", 4", 6" AND 8" METERS SHOULD BE INSTALLED SUCH THAT 5 PIPE DIAMETERS OF STRAIGHT PIPE THE SAME SIZE OF THE METER UPSTREAM AND 3 PIPE DIAMETERS THE SAME SIZE AS THE METER DOWNSTREAM PREVENT TURBULENT JETTING.
10. REDUCING CAN BE DONE AFTER GATE VALVE. 3" OR LARGER ADD FCA.

DRAWN BY: STAFF

CHECKED BY: AN

SCALE: N.T.S.

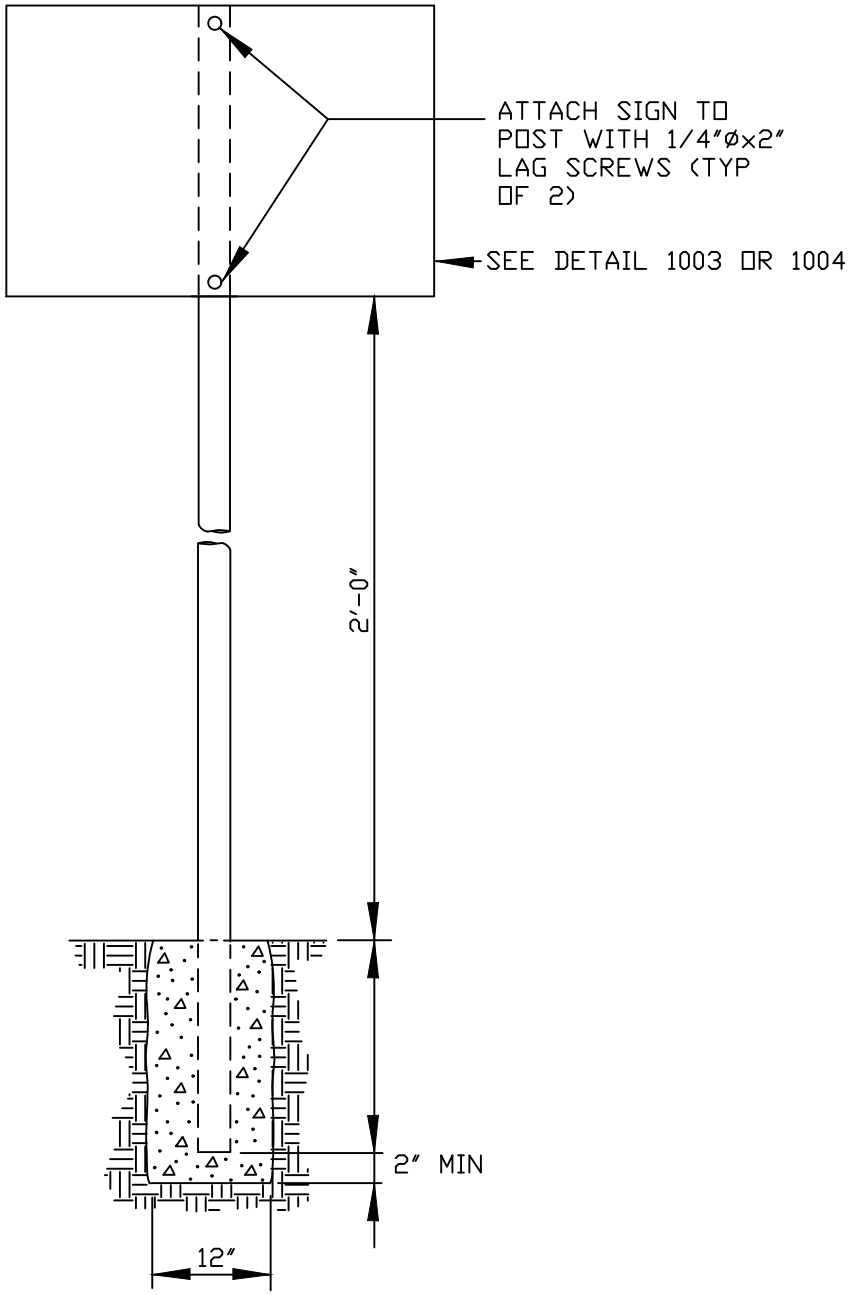
CITY OF PLEASANTON

STANDARD DETAILS
RECYCLED WATER
COMMERCIAL AND INDUSTRIAL
WATER SERVICE

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELSON
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24

DWG NO.1003



NOTES:

1) RECYCLED WATER NOTIFICATION SIGN POST TO BE PROVIDE.
2) 4"X4" POST AND STIFFENERS SHALL BE REDWOOD OR TREATED DOUGLAS FIR (STATE OF CALIFORNIA NO. 56-2.02B).
3) FOOTING SHALL BE 24" IN DEPTH, IN CONCRETE.
4) SIGNS SHALL BE PURCHASED FROM CITY OF PLEASANTON.

DRAWN BY: STAFF	
CHECKED BY: AN	
SCALE: N.T.S.	

CITY OF PLEASANTON

STANDARD DETAILS

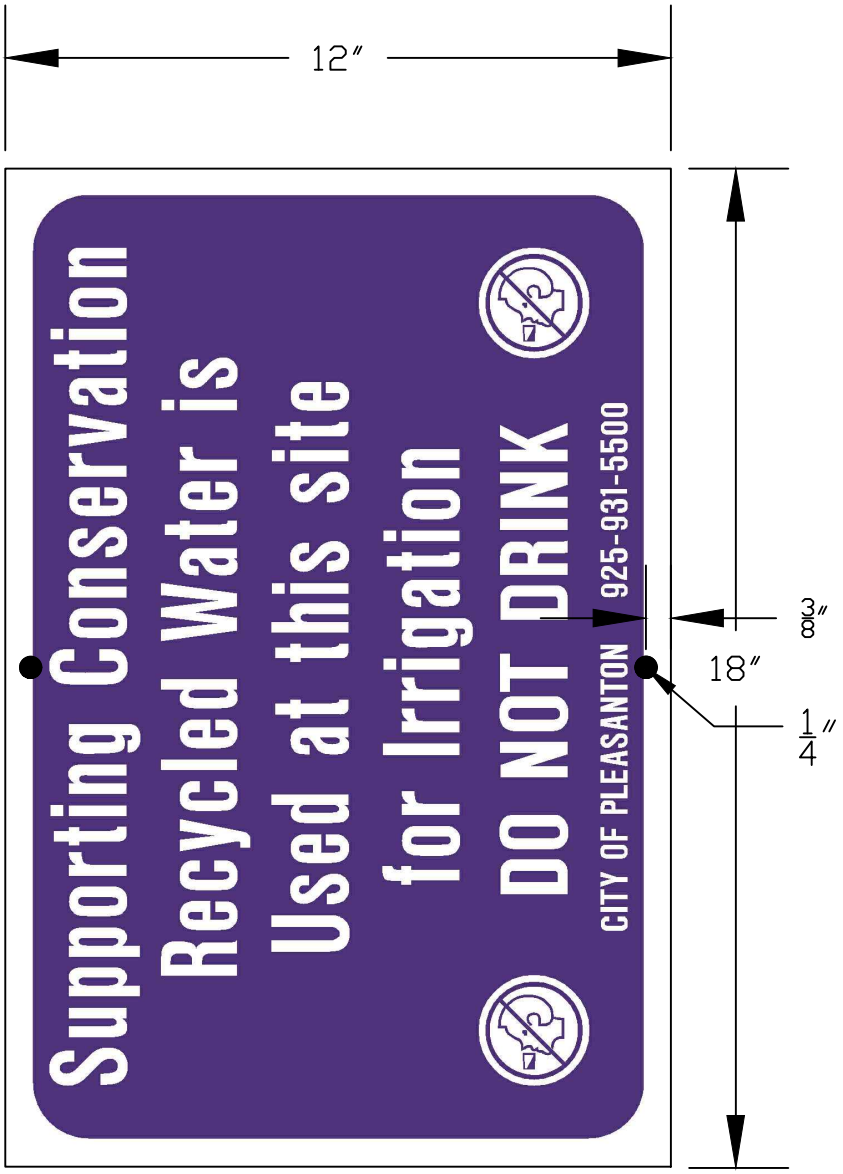
RECYCLED WATER SIGN POST

REGISTERED PROFESSIONAL ENGINEER
ANN MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 1004

NOTES

1. RECYCLED WATER NOTIFICATION DECAL TO BE OBTAINED BY DEVELOPER. DECAL AVAILABLE FOR SALE AT CITY OFFICE, 3333 BUSCH ROAD.
2. WARNING SIGN SHALL BE 0.63 GAUGE ALUMINUM PURPLE (PMS#2587) IN COLOR WITH WHITE TEXT AND SHALL BE AFFIXED TO THE GROUND BY A WOODEN POST.
3. SEE DETAIL 1004 SIGN POST DETAILS.
4. SIGN SHALL STATE "RECYCLED WATER DO NOT DRINK" ACCORDING TO TITLE 22, ARTICLE 4, SECTION 60310(G) OF THE STATEWIDE REGULATION.
5. $\frac{1}{4}$" MOUNTING HOLES SHALL BE DRILLED ON CENTER LINE AS SHOWN.
6. EDGES SHALL BE ROUNDED WITH $\frac{1}{2}$" RADIUS



DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

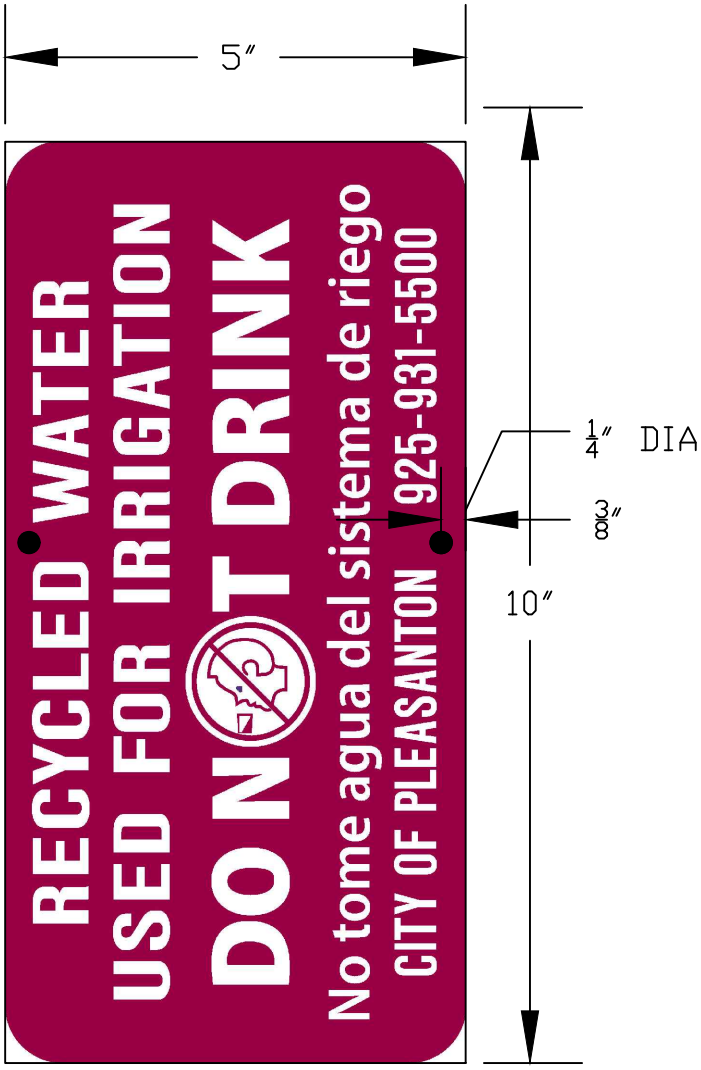
STANDARD DETAILS
RECYCLED WATER
ALUMINUM SIGN

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 1005

NOTES

1. RECYCLED WATER NOTIFICATION DECAL TO BE OBTAINED BY DEVELOPER. DECAL AVAILABLE FOR SALE AT CITY OFFICE, 3333 BUSCH ROAD.
2. WARNING SIGN SHALL BE 0.63 GAUGE ALUMINUM PURPLE (PMS#2587) IN COLOR WITH WHITE TEXT AND SHALL BE AFFIXED TO THE GROUND BY A WOODEN POST.
3. SEE DETAIL 1004 SIGN POST DETAILS.
4. SIGN SHALL STATE "RECYCLED WATER DO NOT DRINK" ACCORDING TO TITLE 22, ARTICLE 4, SECTION 60310(G) OF THE STATEWIDE REGULATION.
5. $\frac{1}{4}$" MOUNTING HOLES SHALL BE DRILLED ON CENTER LINE AS SHOWN.
6. EDGES SHALL BE ROUNDED WITH $\frac{1}{2}$" RADIUS



DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

STANDARD DETAILS
RECYCLED WATER
ALUMINUM SMALL SIGN

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 1006

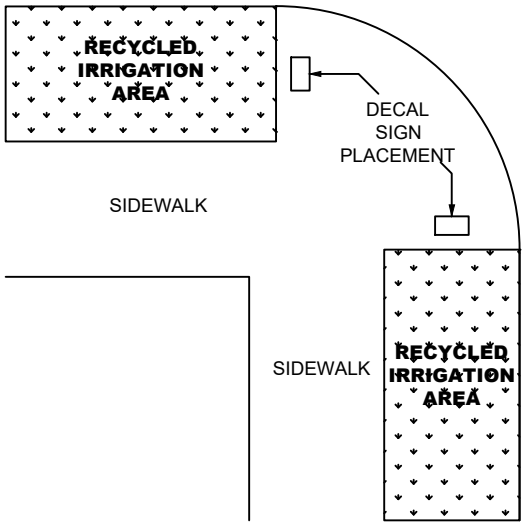


Fig. 1 Corner Pedestrian Crossing

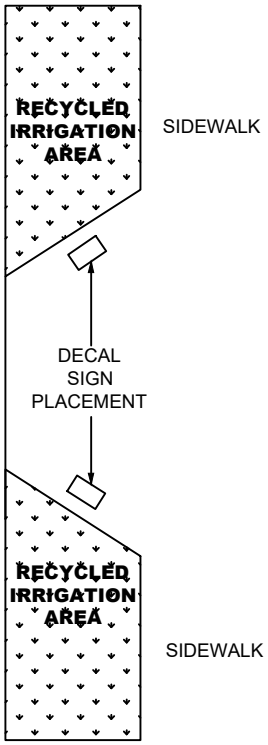


Fig. 2 MID-STREET PEDESTRIAN CROSSING

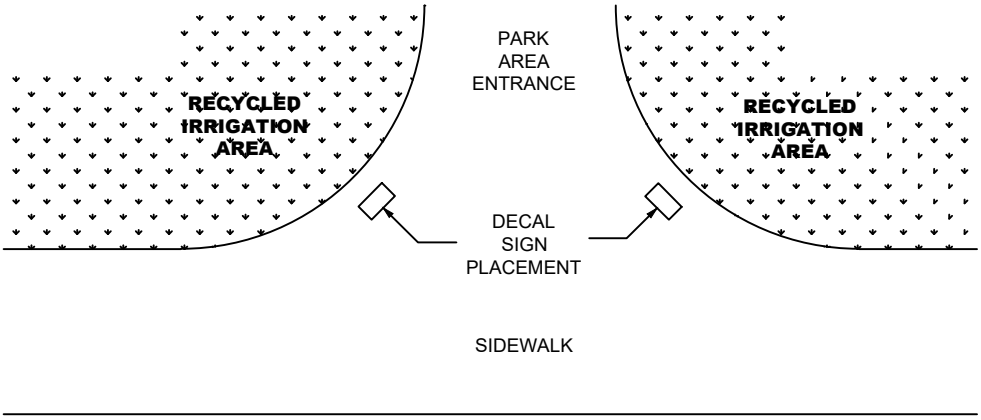


Fig. 3 PARK AREA ENTRANCE PLACEMENT

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

STANDARD DETAILS

RECYCLED WATER IRRIGATION DECAL SIGNS

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 1007

NOTES

1. RECYCLED WATER NOTIFICATION DECAL TO BE OBTAINED BY DEVELOPER. DECAL AVAILABLE FOR SALE AT CITY OFFICE, 3333 BUSCH ROAD.

2. WARNING SIGN DECALS SHALL BE UV FADE RESISTANT das CURB MARKER (www.dasmanufacturing.com) OR APPROVED EQUAL DURACAST STYLE MARKERS PURPLE (PMS #2587) IN COLOR WITH WHITE TEXT. SIGN DECALS SHALL BE ALL-WEATHER, SLIP RESISTANT, AND PERMANENTLY AFFIXED TO THE GROUND AND SHALL HAVE ROUNDED CORNERS (1/2 " RADIUS).

3. SEE DETAIL 1007 FOR PLACEMENT.

4. SIGN SHALL STATE "RECYCLED WATER DO NOT DRINK" ACCORDING TO TITLE 22, ARTICLE 4, SECTION 60310(G) OF THE STATEWIDE REGULATION.

5. INSTALLATION:
   SURFACE MUST BE DRY AND FREE OF ANY LOOSE DEBRIS. FOLLOW THE ADHESIVE GUIDE. A BEAD OF ADHESIVE SHOULD BE SHOWN AROUND THE ENTIRE EDGE.

6. ADHESIVE SHALL BE *das* CURB MARKER ADHESIVE OR APPROVED EQUAL.

7. FOR USE IN HACIENDA BUSINESS PARK ONLY.

8. DO NOT PLACE NEAR ADA RAMPS.

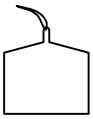
DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

STANDARD DETAILS
RECYCLED WATER
DECAL SIGN

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELSEN
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 1008

	CHRISTY "NO". 3150 MAXI-I.D. TAG IN BOTH ENGLISH AND SPANISH. USE IN ALL VALVE BOXES. USE PURPLE TAGS FOR RECYCLED WATER.
WARNING TAPE	CHRISTY "NO". 3 ND PRW NON-DETECTABLE PURPLE TAPE LABLED "CAUTION" RECYCLED WATER BELOW" LOCATE ABOVE ALL MAINLINE.
WARNING LABEL	CHRISTY "NO". 4100 CONTROLLER UNIT LABEL - 3.5 MIL VINTL BASE (PURPLE) - ATTACH TO FACE OF CONTROLLER ENCL.
RISER LABEL	CHRISTY "NO". 5100 CONTROLLER UNIT LABEL - 3.5 MIL VINYL BASE (PURPLE) - ATTACH TO IRRIGATION RISERS.

NOTES:
THE CONTRACTOR MAY OFFER ANY MATERIAL CONSIDERED TO BE EQUIVALENT TO THAT INDICATED. THE SUBSTITUTION OF MATERIAL SHALL BE SUBMITTED IN WRITING AND APPROVED IN WRITING BY THE CITY ENGINEER.

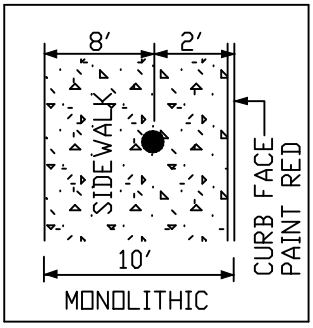
DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

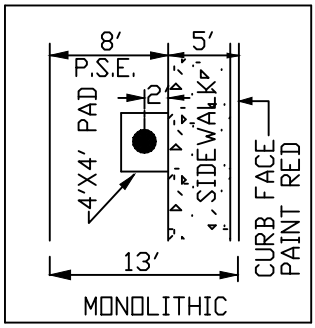
CITY OF PLEASANTON

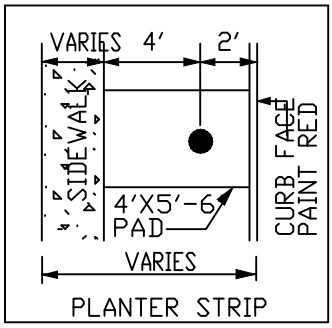
STANDARD DETAILS
RECYCLED WATER TAG

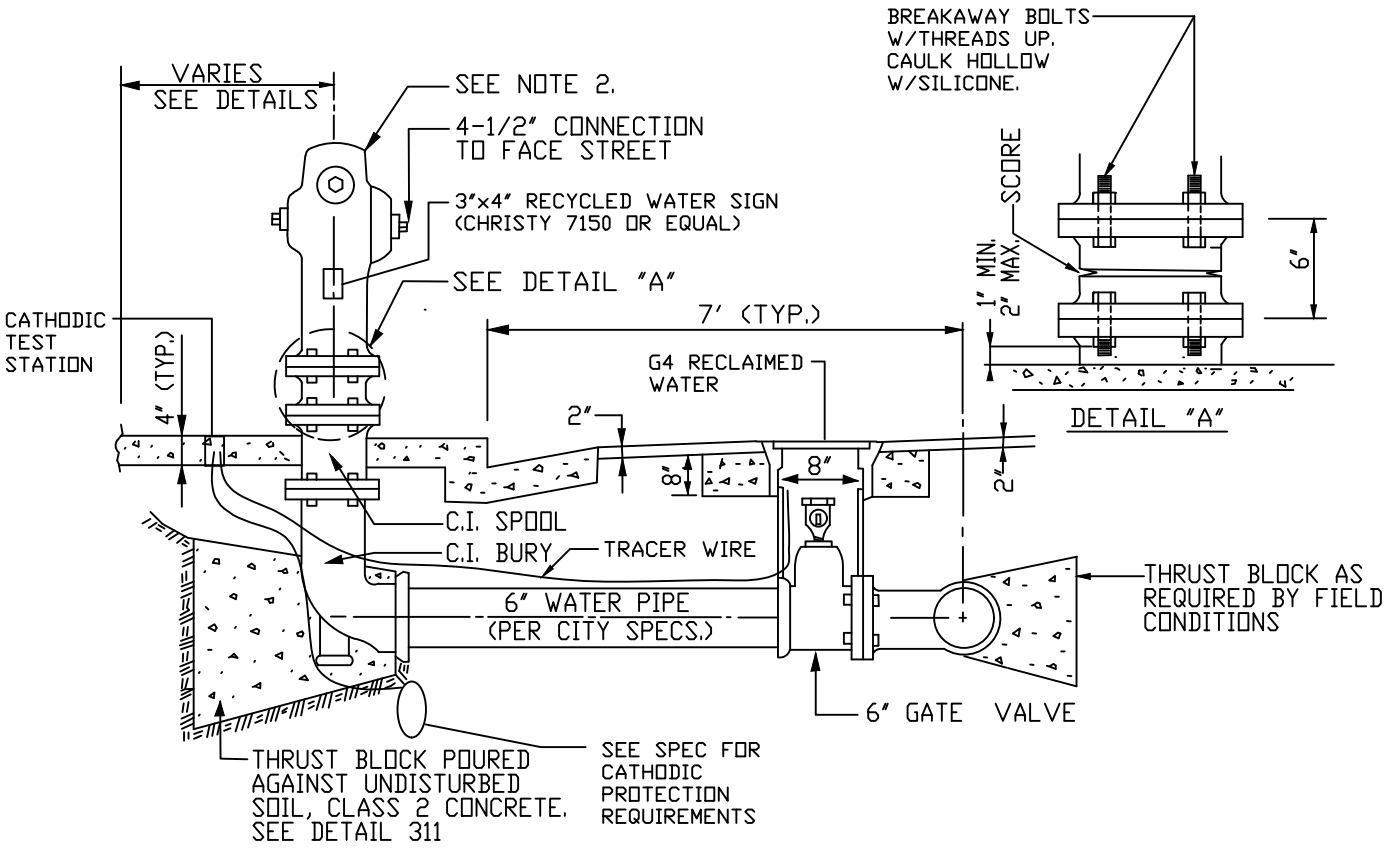
REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 1009









NOTES:

1. WHEN THE HYDRANT IS ON THE SAME SIDE OF THE STREET AS THE JOINT TRENCH, SEE DETAIL 1011.
2. CLOW F900 SERIES WET BARREL HYDRANT WITH HYDRA-SHIELD HYDRANT SECURITY CAP.
3. ALL FITTINGS SHALL BE FACTORY CEMENT LINED OR FUSION EPOXY COATED.
4. THE FACE AND TOP OF CURB SHALL BE PAINTED RED FOR 4.5' ON BOTH SIDES OF THE HYDRANT, UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. HYDRANT EXTERIOR PAINT TO BE "PURPLE" KELLEY-MORE DURA-POXY COLOR # 70251-0608 OR APPROVED EQUAL.

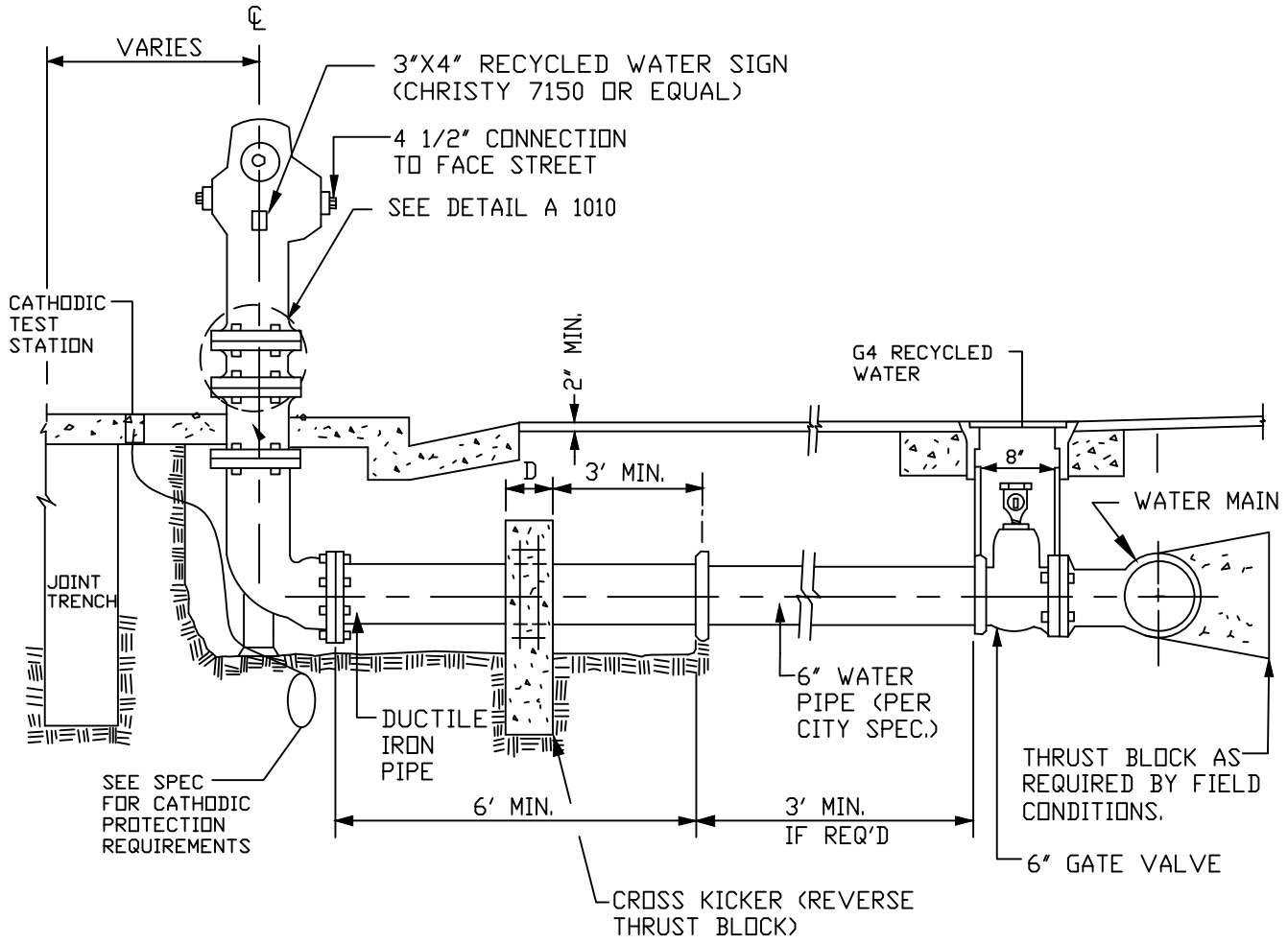
DRAWN BY: STAFF	
CHECKED BY: AN	
SCALE: N.T.S.	

CITY OF PLEASANTON

STANDARD DETAILS
RECYCLED WATER FLUSHING HYDRANT CONNECTION

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24	DWG NO. 1010



NOTES:
1. SEE DETAIL 1010 FOR GENERAL FIRE HYDRANT NOTES AND DETAILS.
2. AT THE CONTRACTORS OPTION THE CROSS KICKER MAY BE ELIMINATED IF THE PIPE IS FLANGED FROM THE MAIN TO THE HYDRANT.
3. DUCTILE IRON PIPE SHALL ALSO BE USED IF THE JOINT TRENCH IS IN FRONT OF THE HYDRANT.
4. TRACER WIRE SHALL BE INSTALLED IF PVC PIPE IS USED

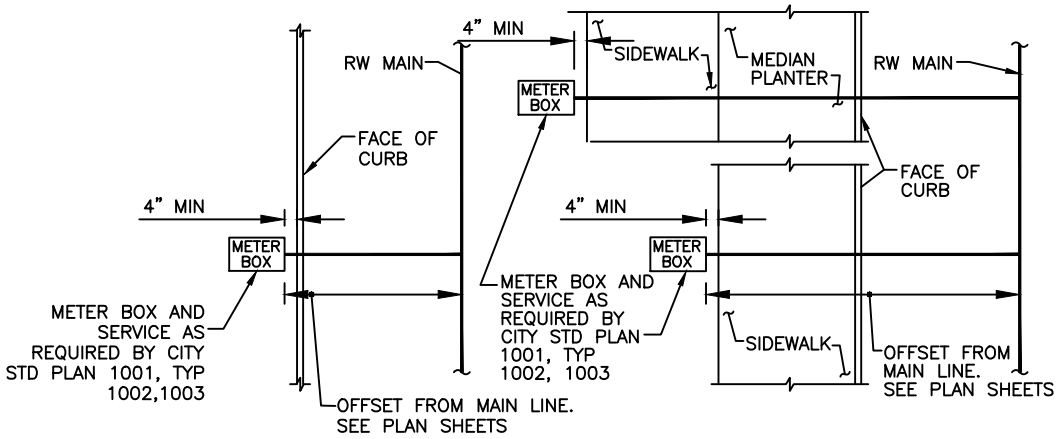
DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

STANDARD DETAILS
RECYCLED WATER FLUSHING CONNECTION (WITH HYDRANT ON SAME SIDE OF STREET AS JOINT TRENCH)

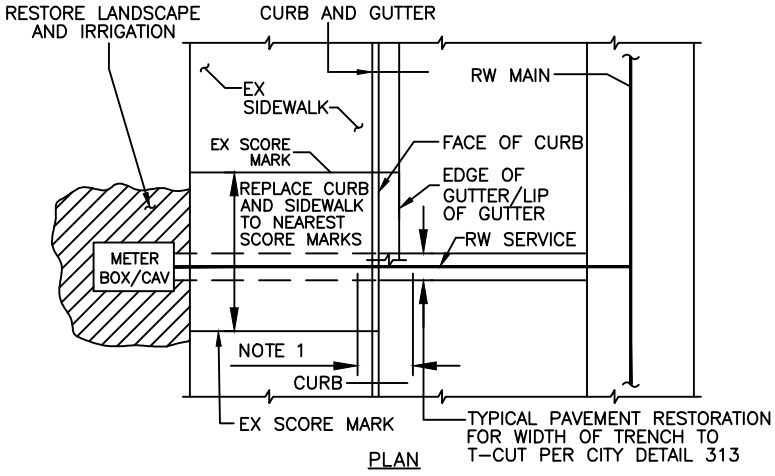
REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24	DWG NO. 1011



PLAN AT CURB – NO SIDEWALK

PLAN AT BACK OF SIDEWALK



PLAN

NOTE:

1. CONTRACTOR SHALL BORE UNDER CURB AND GUTTER UNLESS NOTED OTHERWISE. IF CURB AND GUTTER IS DAMAGED BY CONTRACTOR CURB AND GUTTER SHALL BE REPLACED TO NEAREST SCORE JOINTS AT NO ADDITIONAL COST.

STANDARD LOCATIONS FOR RECYCLED WATER IRRIGATION METER BOX/CAV PLACEMENT

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

STANDARD DETAILS

RECYCLED WATER METER BOX REPLACEMENT

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NECKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE: 7/24 | DWG NO. 1012

MINIMUM RESTRAINED JOINT LENGTHS FOR RECYCLED WATER SYSTEM

Fitting	Size (in)	Minimum Restrained Length (ft) (Note 3) DI	PVC
Horizontal Bend			
11.25° bend	6"	3 ft	3 ft
	8"	4 ft	3 ft
	10"	4 ft	4 ft
	12"	5 ft	5 ft
	16"	6 ft	6 ft
	20"	7 ft	7 ft
22.5° bend	6"	6 ft	5 ft
	8"	7 ft	6 ft
	10"	8 ft	7 ft
	12"	10 ft	9 ft
	16"	12 ft	11 ft
	20"	14 ft	13 ft
45° bend	6"	11 ft	10 ft
	8"	14 ft	13 ft
	10"	17 ft	15 ft
	12"	19 ft	18 ft
	16"	25 ft	22 ft
	20"	29 ft	26 ft
90° bend	6"	26 ft	23 ft
	8"	33 ft	30 ft
	10"	40 ft	36 ft
	12"	46 ft	42 ft
	16"	59 ft	53 ft
	20"	70 ft	63 ft
Vertical Down Bend			
11.25° bend	6"	9 ft	6 ft
	8"	11 ft	8 ft
	10"	13 ft	10 ft
	12"	15 ft	11 ft
	16"	19 ft	14 ft
	20"	23 ft	17 ft
22.5° bend	6"	17 ft	12 ft
	8"	21 ft	16 ft
	10"	26 ft	19 ft
	12"	30 ft	22 ft
	16"	38 ft	28 ft
	20"	46 ft	34 ft

Fitting	Size (in)	Minimum Restrained Length (ft) (Note 3) DI	PVC
Vertical Down Bend			
45° bend	6"	34 ft	25 ft
	8"	44 ft	32 ft
	10"	53 ft	39 ft
	12"	62 ft	45 ft
	16"	79 ft	58 ft
	20"	96 ft	70 ft
90° bend	6"	82 ft	59 ft
	8"	105 ft	77 ft
	10"	128 ft	93 ft
	12"	149 ft	108 ft
	16"	191 ft	139 ft
	20"	231 ft	168 ft
Vertical Up Bend			
11.25° bend	6"	3 ft	3 ft
	8"	4 ft	3 ft
	10"	4 ft	4 ft
	12"	5 ft	5 ft
	16"	6 ft	6 ft
	20"	7 ft	7 ft
22.5° bend	6"	6 ft	5 ft
	8"	7 ft	6 ft
	10"	8 ft	7 ft
	12"	10 ft	9 ft
	16"	12 ft	11 ft
	20"	14 ft	13 ft
45° bend	6"	11 ft	10 ft
	8"	14 ft	13 ft
	10"	17 ft	15 ft
	12"	19 ft	18 ft
	16"	25 ft	22 ft
	20"	29 ft	26 ft
90° bend	6"	26 ft	23 ft
	8"	33 ft	30 ft
	10"	40 ft	36 ft
	12"	46 ft	42 ft
	16"	59 ft	53 ft
	20"	70 ft	63 ft

Fitting	Size (in)	Minimum Restrained Length (ft) (Note 3) DI	PVC
DI Tee (Branch Restrained Length assuming 8' of Restrained Pipe each side of Tee main run)			
	6"x6"	0 ft	24 ft
	8"x8"	11 ft	49 ft
	12"x6"	0 ft	9 ft
	12"x8"	0 ft	39 ft
	12"x12"	55 ft	80 ft
	16"x6"	0 ft	0 ft
	16"x12"	25 ft	72 ft
	16"x16"	89 ft	111 ft
	20"x6"	0 ft	0 ft
	20"x8"	0 ft	17 ft
	20"x12"	0 ft	64 ft
	20"x16"	64 ft	105 ft
DI Dead End & Valves			
	6"	82 ft	59 ft
	8"	105 ft	77 ft
	10"	128 ft	93 ft
	12"	149 ft	108 ft
	16"	191 ft	139 ft
	20"	231 ft	168 ft
DI Reducer			
	8" to 6"	L8"=42 ft	L8"=32 ft
		L6"=56 ft	L6"=43 ft
	10" to 6"	L10"=79 ft	L10"=57 ft
		L6"=129 ft	L6"=94 ft
	10" to 8"	L10"=45 ft	L10"=31 ft
		L8"=57 ft	L8"=39 ft
	12" to 6"	L12"=108 ft	L12"=76 ft
		L6"=213 ft	L6"=145 ft
	12" to 8"	L12"=80 ft	L12"=56 ft
		L8"=121 ft	L8"=82 ft
	12" to 10"	L12"=43 ft	L12"=31 ft
		L10"=52 ft	L10"=37 ft
	16" to 12"	L16"= 81 ft	L16"= 58 ft
		L12"=110 ft	L12"=78 ft
	20" to 12"	L20"= 145 ft	L20"=105 ft
		L12"=250 ft	L12"=176 ft
	20" to 16"	L20"= 81 ft	L20"=59 ft
		L16"=104 ft	L16"=74 ft

NOTE:

1. THE RESTRAINED LENGTHS SHOWN SHALL APPLY TO BOTH SIDES OF A FITTING. FOR EXAMPLE, IF A 6" VALVE (DEAD END) IS ADDED TO A PVC PIPELINE, THE TOTAL RESTRAINED LENGTH IS 59 FT UP STATON AND 59 FT DOWN STATION FOR A TOTAL OF 118 FT.
2. ONLY USED WHEN APPROVED BY ENGINEER.
3. BASED ON 100 PSI WORKING PRESSURE.

DRAWN BY: STAFF

CHECKED BY: AN

SCALE: N.T.S.

CITY OF PLEASANTON

STANDARD DETAILS

RECYCLED WATER MINIMUM RESTRAINED JOINT LENGTHS

DATE: 7/24

DWG NO. 1013

CORROSION CONTROL GENERAL NOTES:

1. FOR RECYCLED WATER SYSTEM ONLY WITH PVC MAINS. ALL OTHERS SHALL BE DESIGNED BY ENGINEER.

2. SOIL SHALL BE TESTED FOR CORROSION EVERY 500 FEET AND TURNED INTO CITY TO DETERMNE IF CATHODIC PDROTECTION IS REQUIRED.

3. ALL METALLIC PIPE AND FITTINGS SHALL BE ELECTRICALLY ISOLATED FROM REBAR, GROUNDING WIRES, TRACER WIRES, FOREIGN PIPELINES, EXISTING PIPELINES, AND OTHER ABOVE GRADE METALLIC STRUCTURES. INSTALL INSULATING FLANGES OR INSULATING UNIONS ON RISERS TO ISOLATE BELOW GRADE PIPE FROM ABOVE GRADE STRUCTURES.

4. CORROSION MONITORING AND CORROSION CONTROL SYSTEMS FOR THE VARIOUS PIPE OPTIONS SHALL CONSIST OF THE FOLLOWING:

PVC PIPE WITH DUCTILE IRON FITTINGS

5. ALL CONTINUOUS SECTIONS OF BURIED DUCTILE IRON PIPE, VALVES, AND FITTINGS, INCLUDING BLOWOFFS, AND COMBINATION AIR VALVES SHALL HAVE BOND CABLES INSTALLED ACROSS ALL METALLIC JOINTS PER DETAIL (CP5) ON DRAWING 1105. THE DUCTILE IRON FITTINGS AND/OR VALVES SHALL BE POLYETHYLENE ENCASED AND CATHODICALLY PROTECTED WITH ANODES. ALL ANODES, SHALL BE DIRECTLY CONNECTED TO THE PIPE/FITTINGS/VALVES. ALL BURIED DUCTILE IRON FITTINGS SHALL BE WRAPPED IN 8-MIL POLYETHYLENE PER AWWA C-105. ALL BURIED BOLTS & NUTS SHALL BE STAINLESS STEEL AND SHALL BE COATED WITH BITUMASTIC AFTER INSTALLATION. THE FITTINGS SHALL BE CATHODICALLY PROTECTED UTILIZING H-1 ALLOY MAGNESIUM ANODES IN ACCORDANCE WITH THE ANODE TABLE 'A' ON DRAWING 1102, AND DETAIL (CP3) ON DRAWING 1104. AT WITHIN 10 FEET OF CROSSINGS OF METALLIC NATURAL GAS PIPE, ENCASE THE THRUST RESTRAINT HARNESSES OR DUCTILE IRON FITTINGS AT THE CROSSINGS IN A DOUBLE LAYER OF POLYETHYLENE PER NOTE 3. OF DETAIL (CP4) .

6. THE DUCTILE IRON PIPE & FITTINGS OF THE UTILITY CROSSINGS PER DETAIL (CP2) .

7. FOR ALL THRUST RESTRAINT HARNESSES, CONTRACTOR SHALL INCLUDE FULL CATHODIC PROTECTION AS INDICATED IN THE ANODE SCHEDULE IN TABLE 'A' IN CONJUNCTION WITH DETAIL (CP4) .

8. ALL BURIED INSULATING JOINTS SHALL NOT BE BACKFILLED UNTIL FIELD TESTING BY CITY OF INSULATING FLANGE VERIFIES ELECTRICAL ISOLATION.

9. THE ANODE SIZES LISTED IN TABLE 'A' ARE THE MINIMUM SIZES THAT ARE REQUIRED. THE CONTRACTOR MAY AT THEIR CONVENIENCE INSTALL LARGER SIZED ANODES THAN THOSE LISTED IN THE TABLES.

GATE VALVES & BUTTERFLY VALVES

10. CONNECTED TO DUCTILE IRON PIPE OR FITTINGS:
ALL BURIED STEEL OR DUCTILE IRON PIPE, VALVES AND FITTINGS ASSOCIATED WITH THE COMBINATION AIR VALVES AND/OR GATE VALVES THAT ARE CONNECTED TO DUCTILE IRON PIPE SHALL BE ENCASED IN POLYETHYLENE. ALL BURIED, NON-WELDED, NON-INSULATING DUCTILE IRON PIPE JOINTS OF THE COMBINATION AIR VALVE PIPING, AND GATE VALVES CONNECTED TO DUCTILE IRON PIPE SHALL BE BONDED PER DETAIL (CP5) ON DRAWING 1105.

11. DUCTILE IRON PIPE MAINLINE INSTALLATION SHALL BE PROJECT SPECIFIC DESIGN. CATHODIC DETAILS ONLY FOR PVC PIPE MAINLINE INSTALLATION WITH DUCTILE IRON FITTINGS.

12. CATHODIC PROTECTION REQUIRED ON ALL EXISTING RECYCLED WATER LINE INSTALLATIONS.

ABBREVIATIONS

AG	ABOVE GRADE	FH	FIRE HYDRANT	PVC	POLYVINYL CHLORIDE
AMP	AMPERE	FT	FEET	RED	REDUCER
AN	ANODE	GV	GATE VALVE	RT	RIGHT
AWG	AMERICAN WIRE GAUGE	HMWPE	HIGH MOLECULAR WEIGHT POLYETHYLENE	RW	RECYCLED WATER
AWWA	AMERICAN WATER WORKS ASSOCIATION	ID	IDENTIFICATION	S	SOUTH
BO	BLOW OFF	IJ	INSULATING JOINT	SCH	SCHEDULE
BV	BUTTERFLY VALVE	L	LENGTH	SD	STORM DRAIN PIPE
CC	CORROSION CONTROL	LB	POUND	SS	SANITARY SEWER PIPE
CDF	CONTROLLED DENSITY FILL	LF	LINEAR FEET	STA	STATION
CL	CENTERLINE	LFT	LEFT	THHN	THERMOPLASTIC HIGH HEAT RESISTANT NYLON COATED
CP	CATHODIC PROTECTION	MAX	MAXIMUM		
DC	DRAIN CABLE	MIN	MINIMUM	TT	TEST CABLE
DIA	DIAMETER	MLCSP	MORTAR LINED & COATED STEEL PIPE	TYP	TYPICAL
DW	DOMESTIC WATER	MRJ	MECHANICALLY RESTRAINED JOINT	V	VALVE
DIP	DUCTILE IRON PIPE	N	NORTH	W	WATER
EX.	EXISTING	NW	NORTHWEST	W/	WITH
FCS	FLOW CONTROL STATION	O.D.	OUTER DIAMETER	ø	DIAMETER
FG	FINISHED GRADE	PSI	POUNDS PER SQUARE INCH	"	INCH(ES)

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

STANDARD DETAILS

CATHODIC PROTECTION SYSTEM DETAILS – 1

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO.1101

TABLE 'A': CATHODIC PROTECTION ANODE SCHEDULE
PIPE OPTION: PVC PIPE WITH DUCTILE IRON FITTINGS

PIPE FITTING	NO. OF FITTINGS	ANODE SIZE
2"–8" CROSS, TEE, ELBOW OR MRJ	1	5–LBS
10"–12" CROSS, TEE, ELBOW OR MRJ	1	9–LBS
16"–24" CROSS, TEE, ELBOW OR MRJ	1	17–LBS
2"–8" CROSS, TEE, ELBOW OR MRJ	2–3	9–LBS
10"–12" CROSS, TEE, ELBOW OR MRJ	2–3	17–LBS
16"–24" CROSS, TEE, ELBOW OR MRJ	2–3	32–LBS
2"–8" CROSS, TEE, ELBOW OR MRJ	4–6	17–LBS
10"–12" CROSS, TEE, ELBOW OR MRJ	4–6	32–LBS
16"–24" CROSS, TEE, ELBOW OR MRJ	4–6	(TWO) 32–LBS
PIPE FITTING	NO. OF FITTINGS	ANODE SIZE
2"–8" VALVE	1	9–LBS
10"–12" VALVE	1	17–LBS
16"–24" VALVE	1	9–LBS
2"–8" VALVE	2–3	17–LBS
10"–12" VALVE	2–3	32–LBS
16"–24" VALVE	2–3	(TWO) 32–LBS
2"–8" VALVE	4–6	32–LBS
10"–12" VALVE	4–6	(TWO) 32–LBS
16"–24" VALVE	4–6	(3) 32–LBS

* MRJ = MECHANICALLY RESTRAINED JOINT

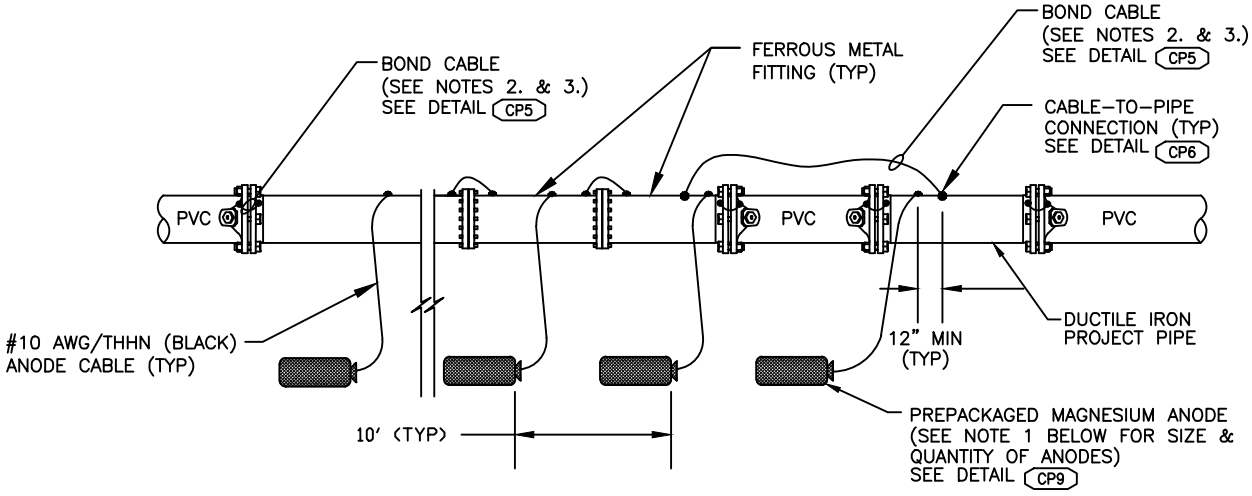
DRAWN BY: STAFF
CHECKED BY: AN
SCALE: N.T.S.

CITY OF PLEASANTON
STANDARD DETAILS

CATHODIC PROTECTION SYSTEM DETAILS – 2

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO.1102



NOTES:

1. INSTALL THE SIZE AND NUMBER OF MAGNESIUM ANODES AS SHOWN IN TABLE 'A ON DWG 1102.
2. FOR ALL BURIED NON–WELDED, (NON–INSULATING), JOINTS OF THE DUCTILE IRON PIPE & FITTINGS, INSTALL BOND CABLE(S) ON EACH JOINT PER DETAIL CP5 ON DWG 1105. ENCASE ALL DUCTILE IRON PIPE & FITTINGS, INCLUDING THRUST RESTRAINTS, IN 8 MIL THICK POLYETHYLENE PER AWWA C–105.
3. FOR ALL BURIED MORTAR COATED STEEL PIPE NON–WELDED, (NON–INSULATING), JOINTS INSTALL BOND CABLE(S) ON EACH JOINT PER DETAIL CP5 ON DWG 1105. BACKFILL ALL EPOXY COATED VALVES WITH CDF.

FITTINGS – MULTIPLE ANODE INSTALLATION — CP1

NTS

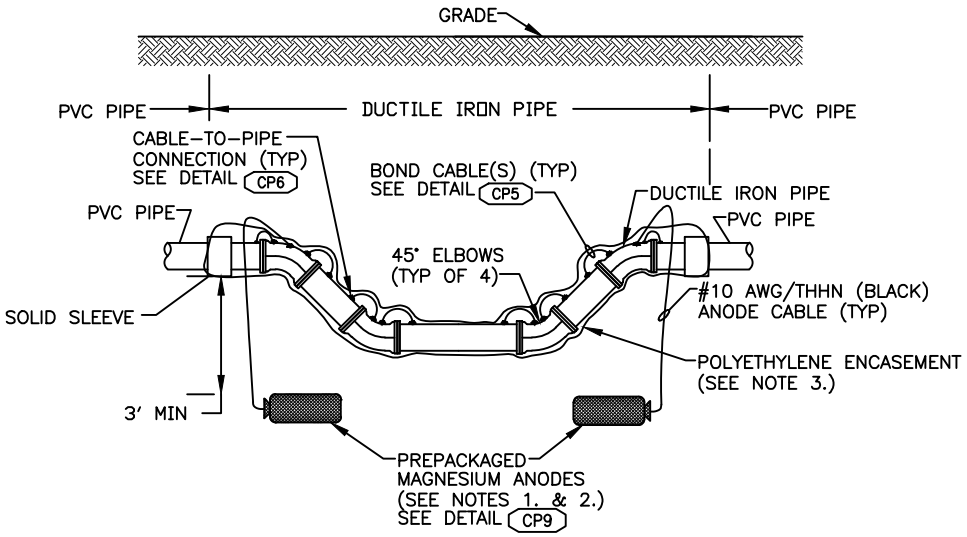


TABLE 'B'
UTILITY CROSSING
CATHODIC PROTECTION ANODE SCHEDULE

PIPE SIZE	ANODE SIZE
8" TO 10" UTILITY CROSSING	(TWO) 17–LBS
12" TO 20" UTILITY CROSSING	(TWO) 32–LBS

NOTES:

1. INSTALL TWO 17 POUND ANODES SHALL BE INSTALLED FOR EVERY 50 FEET OF 8–INCH TO 10–INCH PIPE.
2. INSTALL TWO 32 POUND ANODES SHALL BE INSTALLED FOR EVERY 50 FEET OF 12–INCH TO 20–INCH PIPE.
3. ENCASE ALL DUCTILE IRON PIPE & FITTINGS IN 8 MIL THICK POLYETHYLENE PER AWWA C–105. AT WITHIN 10' OF CROSSINGS OF THE PROJECT PIPELINE BY NATURAL GAS PIPE, ENCASE THRUST RESTRAINT HARNESSES IN TWO LAYERS OF 8 MIL THICK POLYETHYLENE PER AWWA C–105.

UTILITY CROSSING –– DUCTILE IRON PIPE & FITTINGS –– ANODE INSTALLATION — CP2

NTS

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

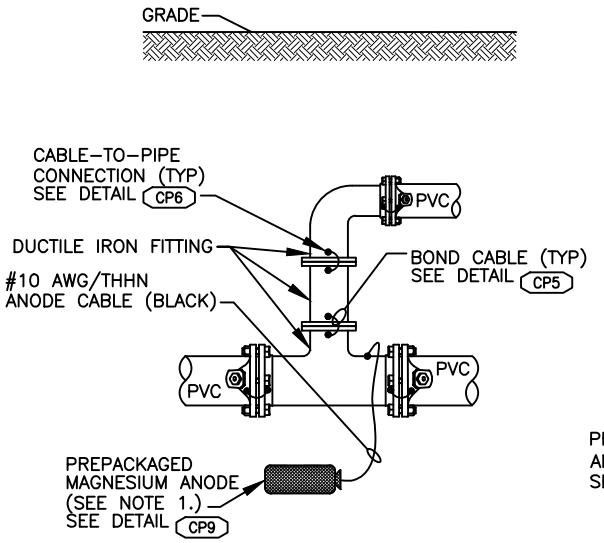
CITY OF PLEASANTON

STANDARD DETAILS

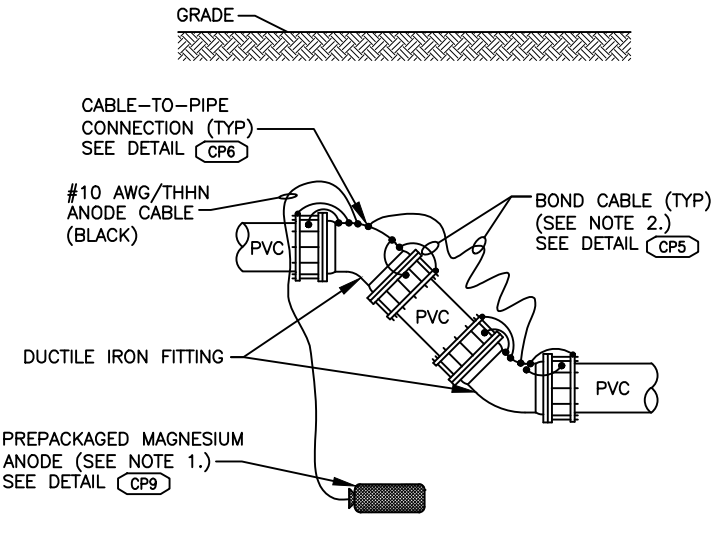
PVC PIPE WITH DUCTILE IRON FITINGS CATHODIC PROTECTION SYSTEM DETAILS – 3

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO.1103



MULTIPLE CONTIGUOUS DI FITTINGS

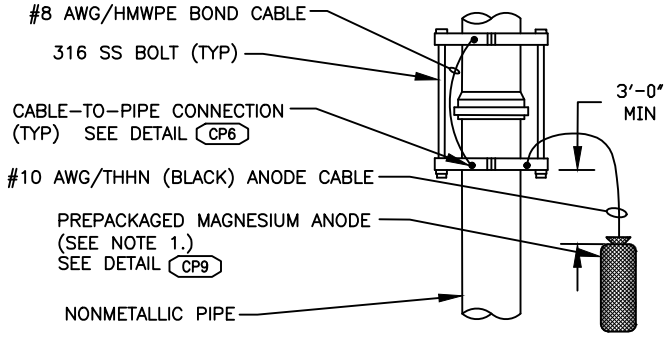


MULTIPLE NON–CONTIGUOUS DI FITTINGS

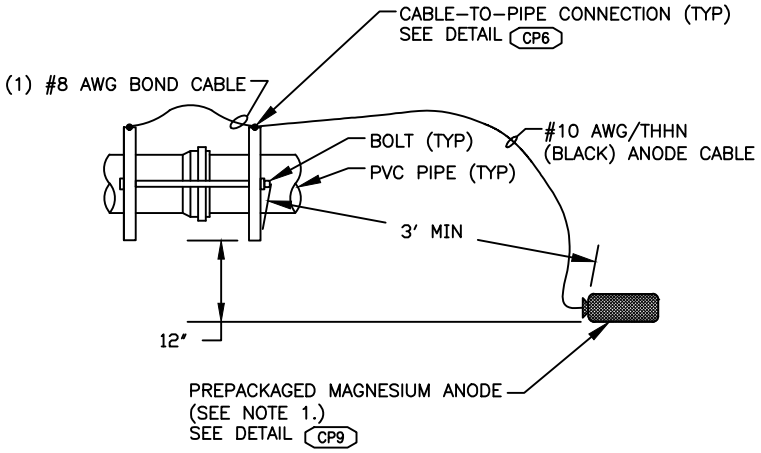
NOTES:
1. INSTALL THE SIZE AND NUMBER OF MAGNESIUM ANODES AT EACH FITTING OR OTHER APPURTENANCES AS SHOWN IN ANODE TABLE 'A' ON DRAWING 1102.
2. INSTALL BOND CABLE(S) ON ALL BURIED PIPE JOINTS PER DETAIL CP5 . THE LENGTH OF THE BOND CABLES BETWEEN FITTINGS SHALL BE OF SUFFICIENT LENGTH TO ALLOW FOR ANY SOIL CONTRACTION OR PIPE MOVEMENT.
3. ENCASE ALL DUCTILE IRON PIPE & FITTINGS IN 8 MIL THICK POLYETHYLENE PER AWWA C–105. AT WITHIN 10' OF CROSSINGS OF THE PROJECT PIPELINE BY NATURAL GAS PIPE, ENCASE THRUST RESTRAINT HARNESSES IN TWO LAYERS OF 8 MIL THICK POLYETHYLENE PER AWWA C–105.

FITTING – ANODE INSTALLATION — CP3

NTS



PLAN VIEW



ELEVATION VIEW

NOTES:
1. INSTALL THE SIZE AND NUMBER OF MAGNESIUM ANODES AT EACH FITTING OR OTHER APPURTENANCES AS SHOWN IN THE ANODE TABLE 'A' ON DRAWING 1102. INSTALL THE MAGNESIUM ANODE 1'–0" BELOW BOTTOM OF TRENCH IN 1 FOOT OF NATIVE BACKFILL. ATTACH ANODE CABLE DIRECTLY TO THRUST RESTRAINT FITTING.
2. INSTALL ONE #8 AWG HMWPE BOND CABLE PER DETAIL CP5 . ENCASE ALL THRUST RESTRAINTS, IN 8 MIL THICK POLYETHYLENE PER AWWA C–105.
3. AT WITHIN 10' OF CROSSINGS OF THE PROJECT PIPELINE BY NATURAL GAS PIPE, ENCASE THRUST RESTRAINT HARNESSES IN TWO LAYERS OF 8 MIL THICK POLYETHYLENE PER AWWA C–105.

THRUST RESTRAINT HARNESS – ANODE INSTALLATION – PVC PIPE — CP4

NTS

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

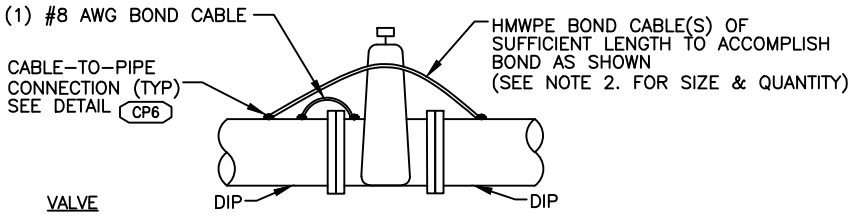
CITY OF PLEASANTON

STANDARD DETAILS

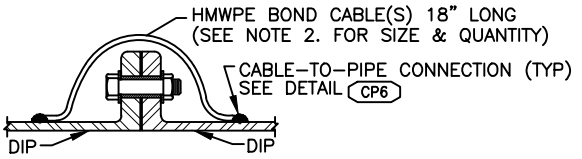
PVC PIPE WITH DUCTILE IRON FITINGS CATHODIC PROTECTION SYSTEM DETAILS – 4

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

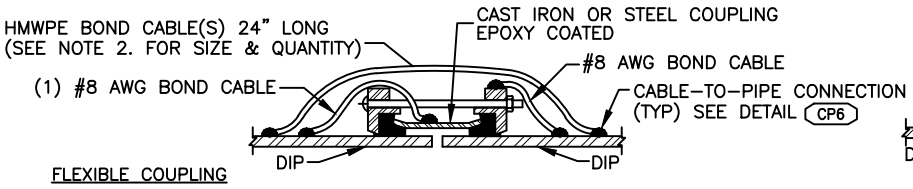
DATE : 7/24 | DWG NO.1104



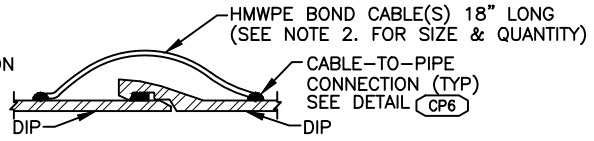
VALVE



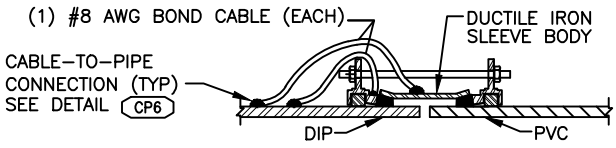
FLANGED JOINT



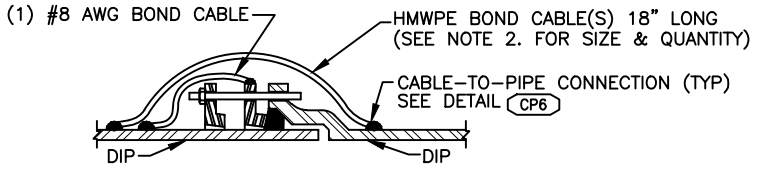
FLEXIBLE COUPLING



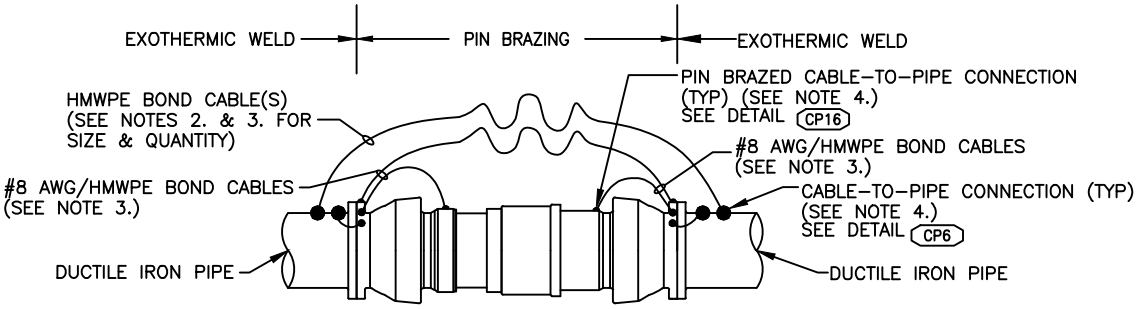
PUSH–ON JOINT



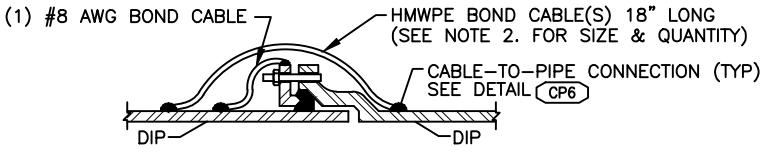
RESTRAINED COUPLING – DIP–TO–PVC



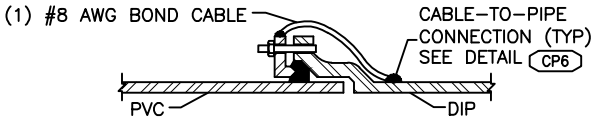
TANDEM MEGALUG MECHANICAL JOINT RESTRAINT



FORCE BALANCED EXPANSION JOINT CONNECTED TO DUCTILE IRON PIPE



MECHANICAL JOINT



MECHANICAL JOINT – DIP–TO–PVC

NOTES:
1. INSTALL BOND CABLES ACROSS ALL BURIED, NON–WELDED (NON–INSULATING) METALLIC PIPE FERROUS METAL PIPE JOINTS.
2. PVC PIPE W/DI FITTINGS OPTION: INSTALL ONE #4 AWG BOND CABLES ACROSS 14–INCH THROUGH 24–INCH ø PIPE JOINTS. INSTALL ONE #8 AWG BOND CABLES ACROSS 4–INCH THROUGH 12–INCH ø PIPE JOINTS.
3. PROVIDE ENOUGH SLACK IN THE BOND CABLES SHALL BE OF SUFFICIENT LENGTH TO ALLOW FOR SIGNIFICANT SOIL SUBSIDENCE AND PIPE JOINT MOVEMENT.

BOND CABLES – METALLIC PIPE JOINTS

CP5

NTS

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

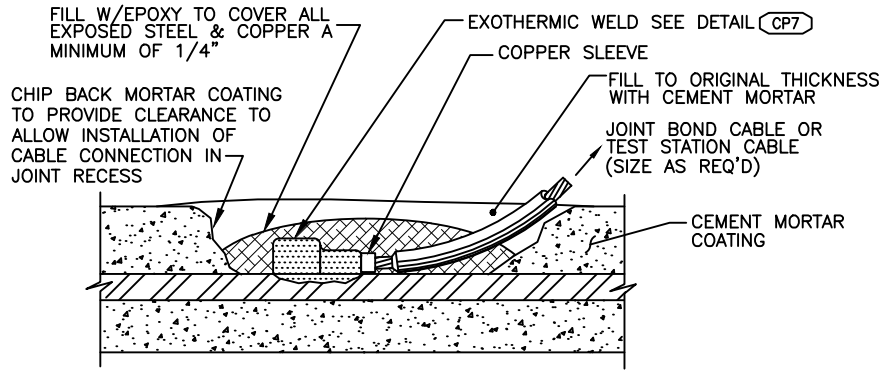
CITY OF PLEASANTON

STANDARD DETAILS

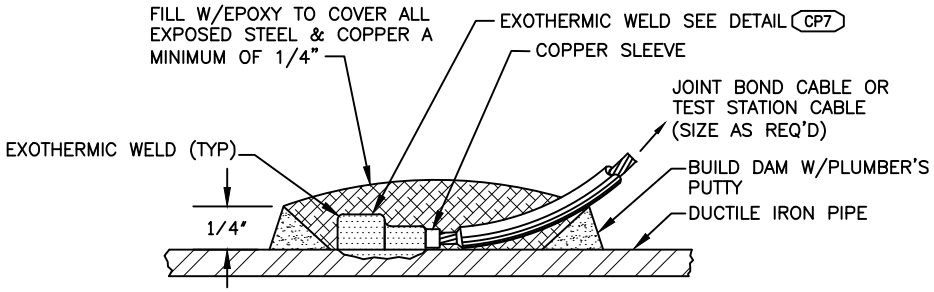
PVC PIPE WITH DUCTILE IRON FITINGS
CATHODIC PROTECTION SYSTEM
DETAILS – 5

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO.1105



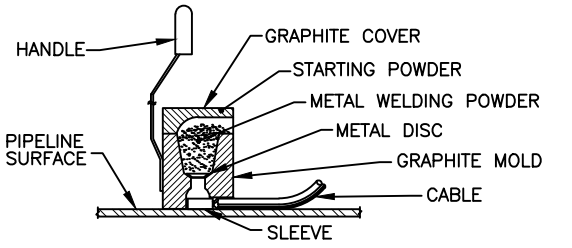
MORTAR COATED PIPE



DUCTILE IRON PIPE/FITTING

CABLE–TO–PIPE CONNECTION CP6

NTS



STEP 1. FILE STRUCTURE CONNECTION AREA TO BARE SHINY METAL AND CLEAN.

STEP 2. STRIP INSULATION FROM WIRE. ATTACH SLEEVE REQUIRED ON #6 AWG WIRE OR SMALLER

STEP 3. HOLD MOLD FIRMLY WITH OPENING AWAY FROM OPERATOR AND IGNITE WITH FLINT GUN.

STEP 4. REMOVE SLAG FROM CONNECTION AND PEEN WELD FOR SOUNDNESS.

STEP 5. COVER CONNECTION AND EXPOSED STRUCTURE SURFACE WITH EPOXY COATING COMPOUND OR MORTAR PER DETAIL CP6.

NOTE:
PROCEDURE SHOWN ABOVE IS TO BE USED AS A GENERAL GUIDE ONLY. CONSULT MANUFACTURER'S LITERATURE FOR SPECIFIC INSTALLATION INSTRUCTIONS.

EXOTHERMIC WELD PROCEDURE CP7

NTS

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CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

STANDARD DETAILS

PVC PIPE WITH DUCTILE IRON FITINGS
CATHODIC PROTECTION SYSTEM
DETAILS – 6

REGISTERED PROFESSIONAL ENGINEER
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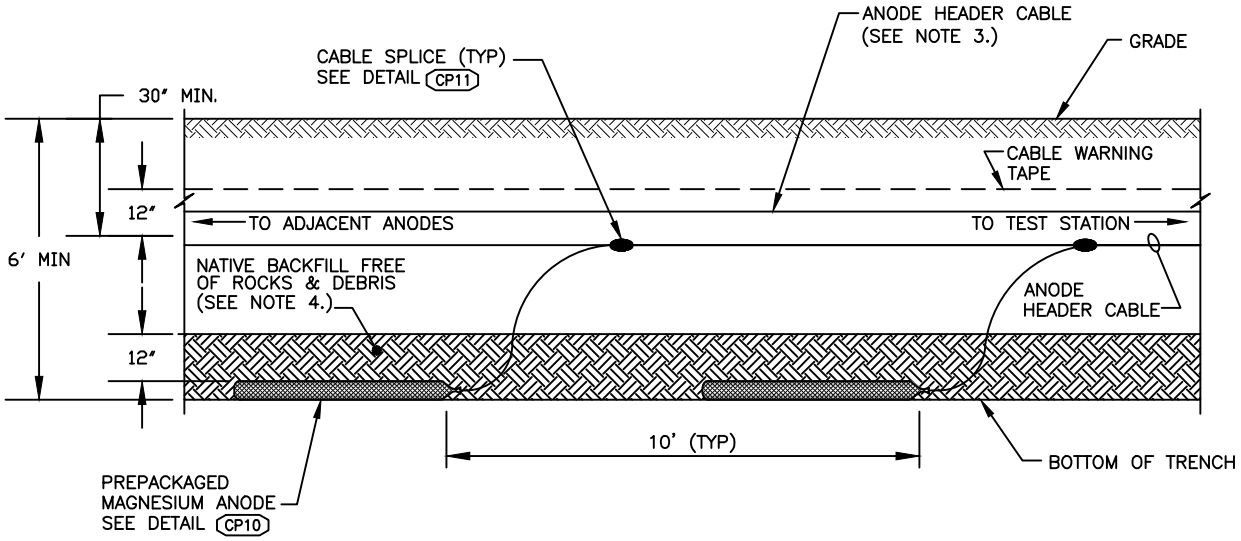
DATE : 7/24 | DWG NO.1106



NOTES:
1. INSTALL ANODES 5 FEET HORIZONTALLY OFF THE PIPELINE IN NATIVE SOIL. EACH ANODE ITSELF MAY BE POSITIONED PERPENDICULAR TO THE PIPELINE, AS THE STRING OF ANODES PARALLELS THE PIPELINE.
2. MAINTAIN A MINIMUM DISTANCE OF 10 FT FROM FRONT TO FRONT OF ANODES.
3. LOOP BACK ANODE HEADER CABLE FROM LAST ANODE TO TEST STATION.
4. AFTER BACKFILL REACHES ONE FOOT ABOVE THE ANODE, FLOOD THE ANODE HOLE WITH 5 GALLONS OF FRESH WATER.
5. IF ANODES ARE INSTALLED NEAR A METALLIC NATURAL GAS PIPELINE, MAINTAIN A MINIMUM 5 FOOT DISTANCE FROM THE NATURAL GAS PIPELINE.

PROFILE – MULTIPLE ANODE INSTALLATION CP8

NTS

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

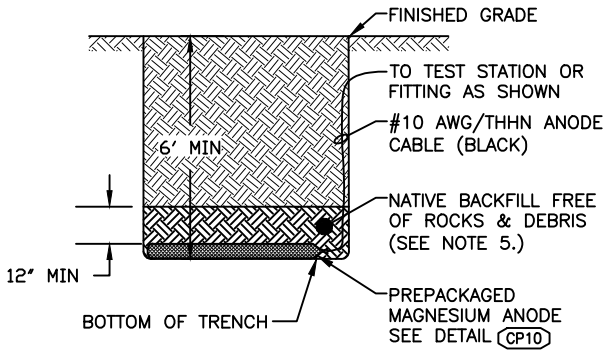
CITY OF PLEASANTON

STANDARD DETAILS

PVC PIPE WITH DUCTILE IRON FITINGS CATHODIC PROTECTION SYSTEM DETAILS – 7

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO.1107



NOTES:
1. INSTALL ANODES 3 FEET OFF THE PIPE/FITTING IN NATIVE SOIL.
2. FOR SACRIFICIAL ANODES PROTECTING DUCTILE IRON VALVES, FITTINGS & RISERS OF C900 PVC PIPELINES, ANODES MAY BE INSTALLED SUCH THAT THE TOP OF THE ANODE IS PLACED BELOW THE BOTTOM OF THE VALVE OR FITTING. FOR DUCTILE IRON PIPELINE INSTALLATIONS, ANODE SHALL BE INSTALLED TO A MINIMUM DEPTH OF 6 FEET AS INDICATED IN THIS DETAIL. A MINIMUM OF A 3 FEET DISTANCE SHALL BE MAINTAINED BETWEEN EACH ANODE AND THE DUCTILE IRON STRUCTURE IT PROTECTS IN ALL CASES.
3. MAINTAIN A MIN. DISTANCE OF 10 FEET BETWEEN ANODES IF MULTIPLE ANODES ARE INSTALLED.
4. CONNECT ANODE CABLE TO TEST STATION OR DIRECTLY TO PIPE OR FITTING AS SHOWN IN THE DRAWINGS.
5. AFTER BACKFILL REACHES ONE FOOT ABOVE THE ANODE, FLOOD THE ANODE HOLE WITH 5 GALLONS OF FRESH WATER.
6. IF ANODE IS INSTALLED IN THE VICINITY OF A METALLIC NATURAL GAS PIPELINE, MAINTAIN A MINIMUM 5 FOOT DISTANCE FROM THE NATURAL GAS PIPELINE.

ANODE INSTALLATION — CP9

NTS

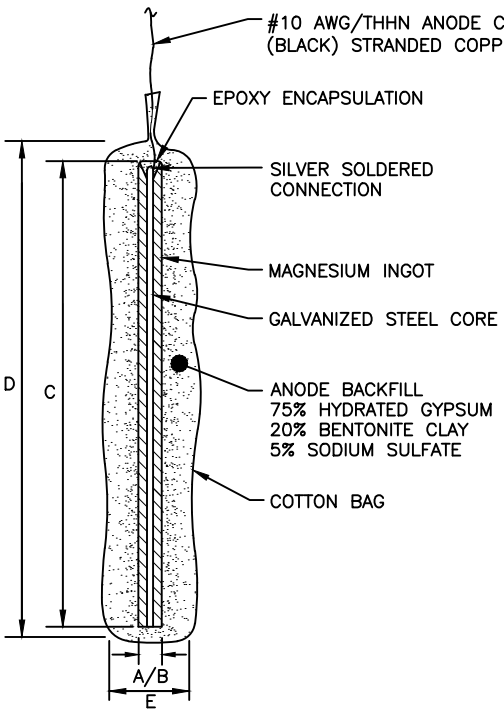


TABLE 1

H-1 ALLOY MAGNESIUM ANODES				
SIZE (LB)	A/B (INCH)	C (INCH)	D (INCH)	E (INCH)
5	3	7.5	13.5	6
9	3	13.5	17	6
17	4	17	19	6.5
32	5	21	30	8
50	8ø	15	18	10

PREPACKAGED MAGNESIUM ANODE — CP10

NTS

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

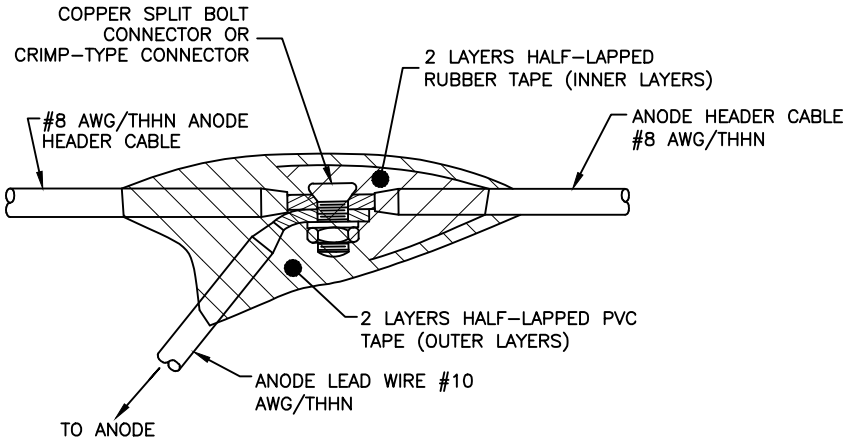
CITY OF PLEASANTON

STANDARD DETAILS

PVC PIPE WITH DUCTILE IRON FITINGS CATHODIC PROTECTION SYSTEM DETAILS – 8

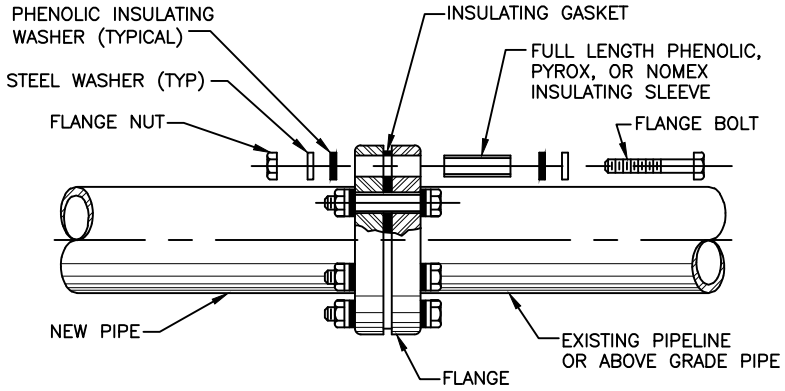
REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO.1108

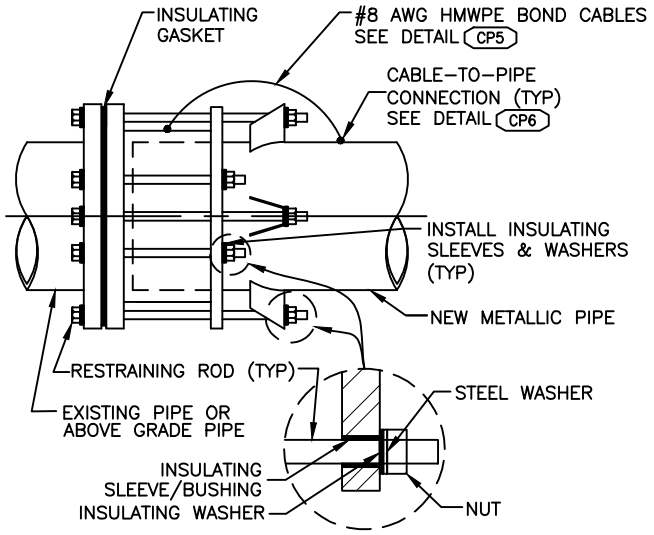


CABLE SPLICE CP11

NTS



INSULATING FLANGE



INSULATING FLANGED COUPLING ADAPTER

NOTES:
1. THE INSULATING FLANGE KIT SHALL BE FOR WATER SERVICE, SUITABLE FOR WET & DRY LOCATIONS, AND BE OF SAME PRESSURE RATING AS THE FLANGE.
2. THIS DETAIL IS TYPICAL FOR STEEL AND DUCTILE IRON PIPE FLANGES, AND ALSO FOR STEEL PIPE INSULATING FLEXIBLE COUPLINGS AND INSULATED RESTRAINED FLEXIBLE COUPLINGS.
3. THE ALLOY OF THE STEEL WASHERS SHALL BE THE SAME AS IS SPECIFIED FOR THE FLANGE BOLTS.
4. ALL INSULATING JOINTS SHALL BE TESTED AND APPROVED PRIOR TO BACKFILL.

INSULATING JOINT CP12

NTS

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

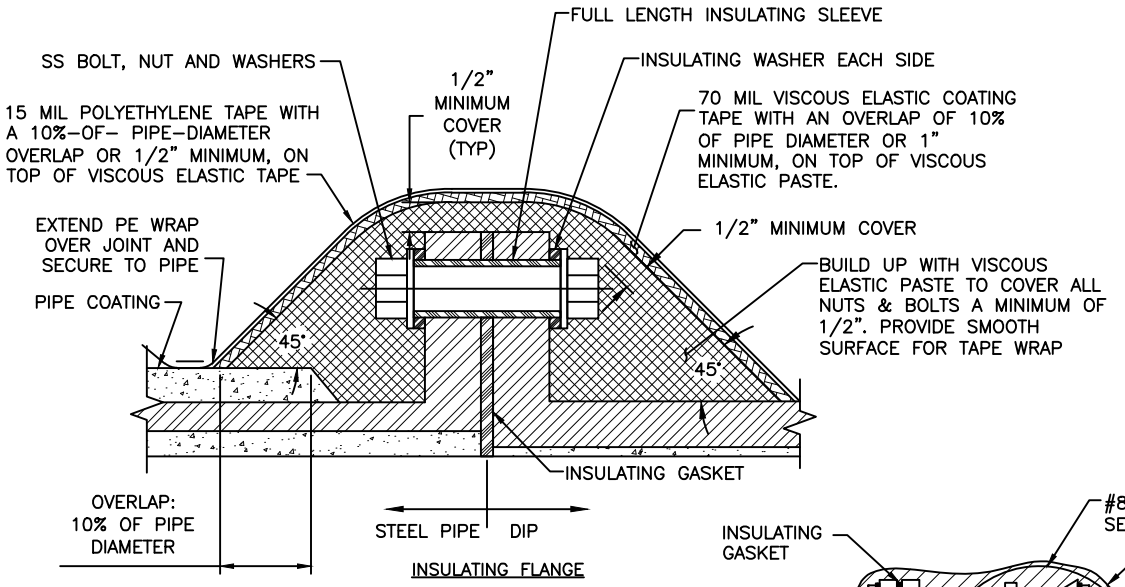
CITY OF PLEASANTON

STANDARD DETAILS

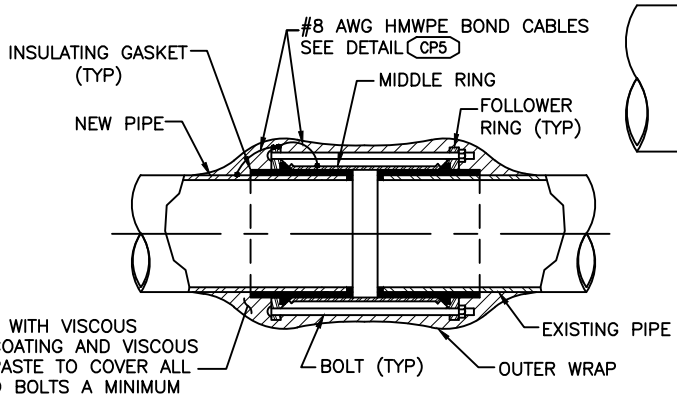
PVC PIPE WITH DUCTILE IRON FITINGS CATHODIC PROTECTION SYSTEM DETAILS – 9

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

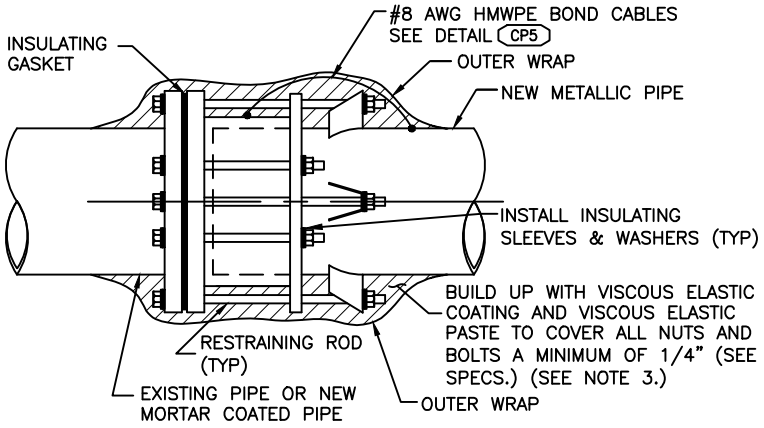
DATE : 7/24 | DWG NO.1109



INSULATING FLANGE



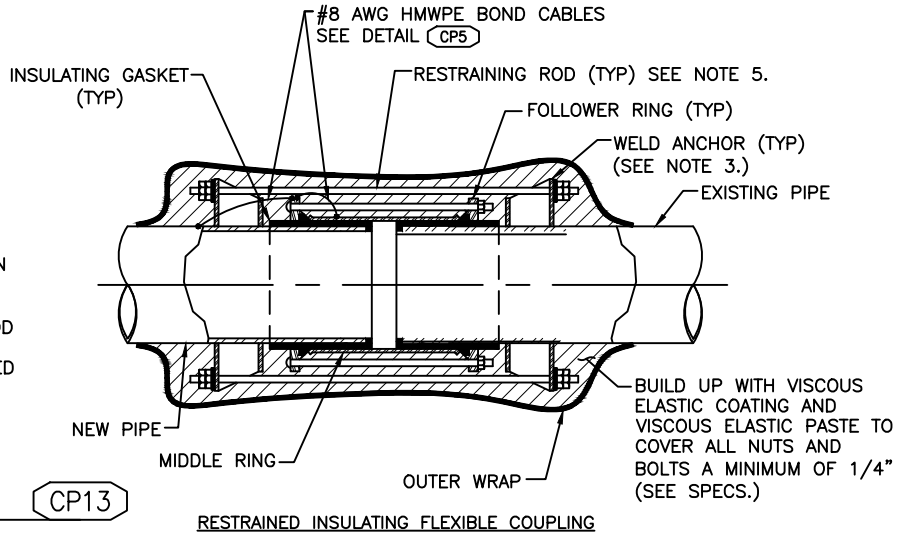
INSULATING FLEXIBLE COUPLING



INSULATING FLANGED COUPLING ADAPTER

NOTES:

1. OMIT COATING IF INSULATING JOINT IS LOCATED ABOVE GRADE OR IN VAULTS.
2. THIS DETAIL IS TYPICAL FOR STEEL AND DUCTILE IRON PIPE FLANGES, AND ALSO FOR STEEL PIPE INSULATING FLEXIBLE COUPLINGS AND INSULATED RESTRAINED FLEXIBLE COUPLINGS. THE INSULATING FLANGE IS SHOWN FOR STEEL/DIP JOINT; DIP/DIP JOINT IS SIMILAR.
3. ENSURE APPLICATION OF VISCOUS ELASTIC COATING AND VISCOUS ELASTIC PASTE TO COVER ALL RESTRAINING ROD ASSEMBLIES.
4. ALL INSULATING JOINTS SHALL BE TESTED AND APPROVED PRIOR TO BACKFILL.
5. INSTALL STAINLESS STEEL RODS, BOLTS, NUTS, AND WASHERS.



RESTRAINED INSULATING FLEXIBLE COUPLING

BELOW GRADE,
DIELECTRIC INSULATING JOINT COATING (CP13)

NTS

CITY OF PLEASANTON

STANDARD DETAILS

PVC PIPE WITH DUCTILE IRON FITINGS CATHODIC PROTECTION SYSTEM DETAILS – 10

DRAWN BY: STAFF

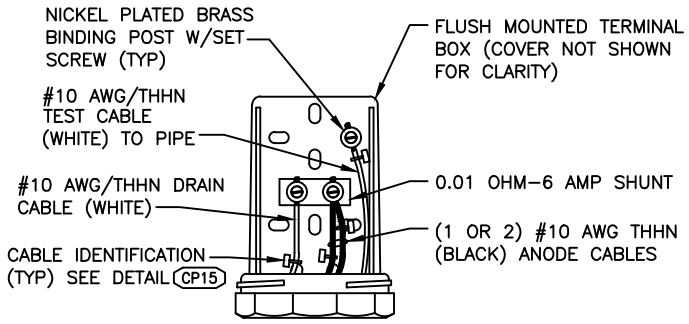
CHECKED BY: AN

SCALE: N.T.S.

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24

DWG NO.1110

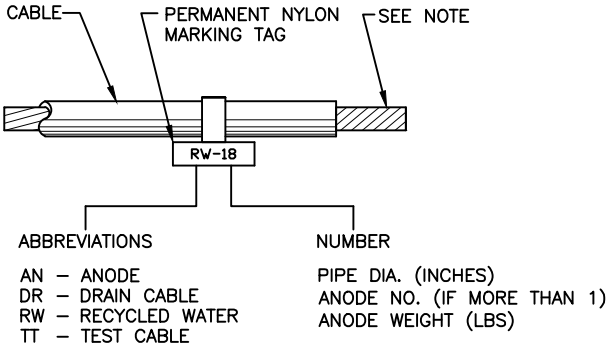


VATS TERMINAL BOX

NOTE:
FOR IJTS & IJTSA TERMINAL BOX, SEE DETAIL CP20 .
FOR ATS TERMINAL BOX, SEE DETAIL CP1 .
FOR FPTS TERMINAL BOX, SEE DETAIL CP21 .

TERMINAL BOX CP14

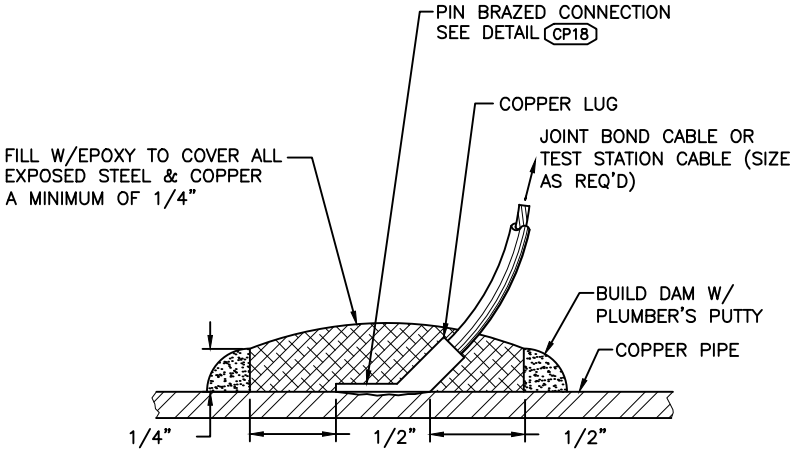
NTS



NOTE:
REMOVE INSULATION PRIOR TO FASTENING CABLE WITH SET SCREW.

CABLE IDENTIFICATION CP15

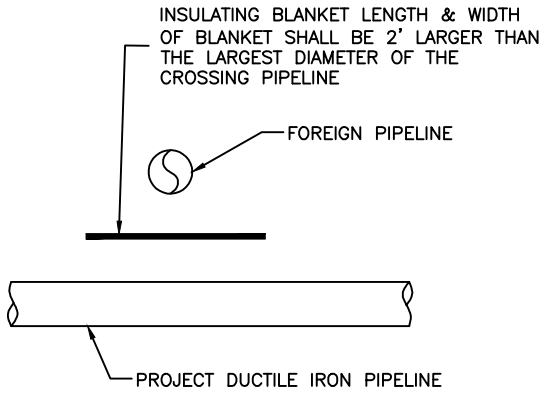
NTS



DUCTILE IRON FORCE BALANCED EXPANSION JOINT

PIN–BRAZED CABLE–TO–PIPE CONNECTION CP16

NTS



NOTES:
1. INSTALL INSULATING BLANKETS ON ALL PIPE CROSSING EXCEPT WHEN EITHER THE PROJECT PIPELINE OR THE FOREIGN PIPELINE IS NONMETALLIC.
2. DIELECTRIC BLANKET SHALL BE 1/8" THICK SHEET OF BUTYL RUBBER, PVC, HDPE, MICARTA OR NEOPRENE.
3. DIELECTRIC BLANKET SHALL BE INSTALLED AS CLOSE TO THE MIDPOINT BETWEEN THE TWO LINES AS POSSIBLE.
4. AT LOCATIONS WHERE A REFERENCE ELECTRODE IS INSTALLED BETWEEN THE TWO PIPES, POSITION THE REFERENCE ELECTRODE MIDWAY BETWEEN THE INSULATING BLANKET AND THE PROJECT PIPE.

INSULATING BLANKET CP17

NTS

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

STANDARD DETAILS

PVC PIPE WITH DUCTILE IRON FITINGS CATHODIC PROTECTION SYSTEM DETAILS – 11

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
Exp. 9/30/2025
CIVIL
STATE OF CALIFORNIA

DATE : 7/24 | DWG NO.1111

STEP 1. FILE STRUCTURE CONNECTION AREA TO BARE SHINY METAL AND CLEAN.

STEP 2. STRIP INSULATION FROM WIRE. ATTACH LUG TO CABLE BY CRIMPING.

STEP 3. LOAD GUN WITH THE LUG AND FERRULE. ADJUST AS NECESSARY. BRAZE.

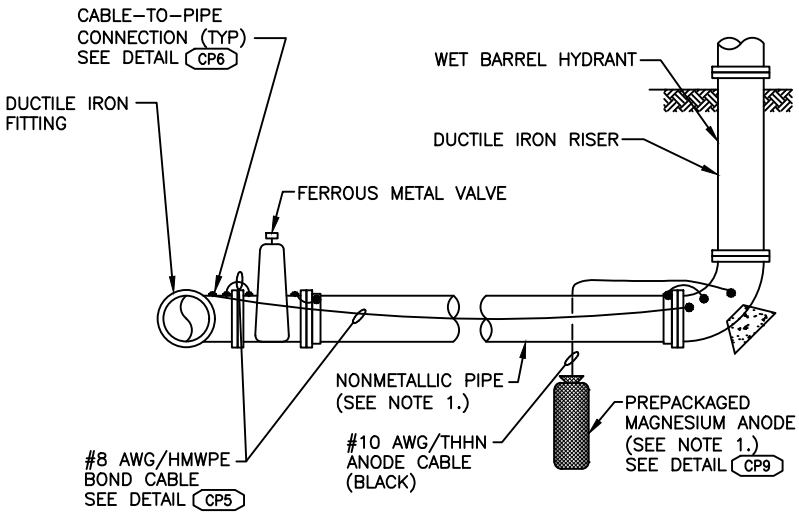
STEP 4. PEEN CONNECTION WITH A HAMMER TO TEST CONNECTION FOR SOUNDNESS.

STEP 5. COVER CONNECTION AND EXPOSED STRUCTURE SURFACE WITH EPOXY COATING COMPOUND PER DETAIL CP16.

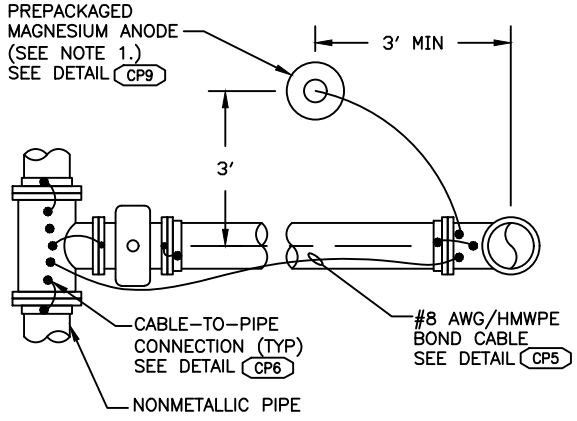
NOTE:
PROCEDURE SHOWN ABOVE IS TO BE USED AS A GENERAL GUIDE ONLY.
CONSULT MANUFACTURER'S LITERATURE FOR SPECIFIC INSTALLATION INSTRUCTIONS.

PIN–BRAZED CONNECTION — CP18

NTS



ELEVATION VIEW



PLAN VIEW

NOTE:
1. INSTALL THE SIZE AND NUMBER OF MAGNESIUM ANODES AT EACH FITTING OR OTHER APPURTENANCES AS SHOWN IN THE (FUTURE) ANODE TABLE.
2. INSTALL ADDITIONAL BOND CABLES FOR ANY ADDITIONAL METALLIC PIPING, FITTINGS, OR MECHANICAL RESTRAINT JOINTS ASSOCIATED WITH FIRE HYDRANT INSTALLATION.
3. COAT ALL BURIED BOLTS & NUTS WITH BITUMASTIC AND ENCASE ALL DUCTILE IRON PIPE AND FITTINGS IN POLYETHYLENE PER CORROSION CONTROL GENERAL NOTES.

FIRE HYDRANT – ANODE INSTALLATION — CP19

NTS

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON

STANDARD DETAILS

PVC PIPE WITH DUCTILE IRON FITINGS
CATHODIC PROTECTION SYSTEM
DETAILS – 12

REGISTERED PROFESSIONAL ENGINEER
ADAM MATTHEW NELKIE
No. 78830
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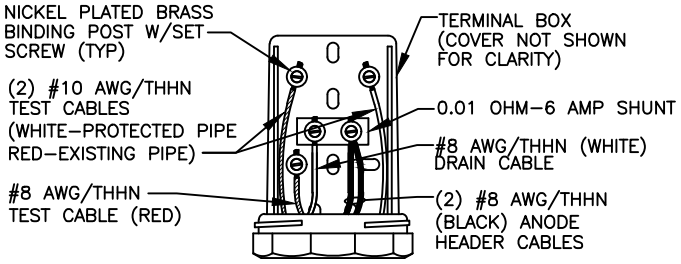
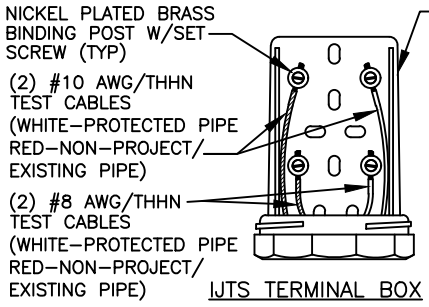
STATE OF CALIFORNIA

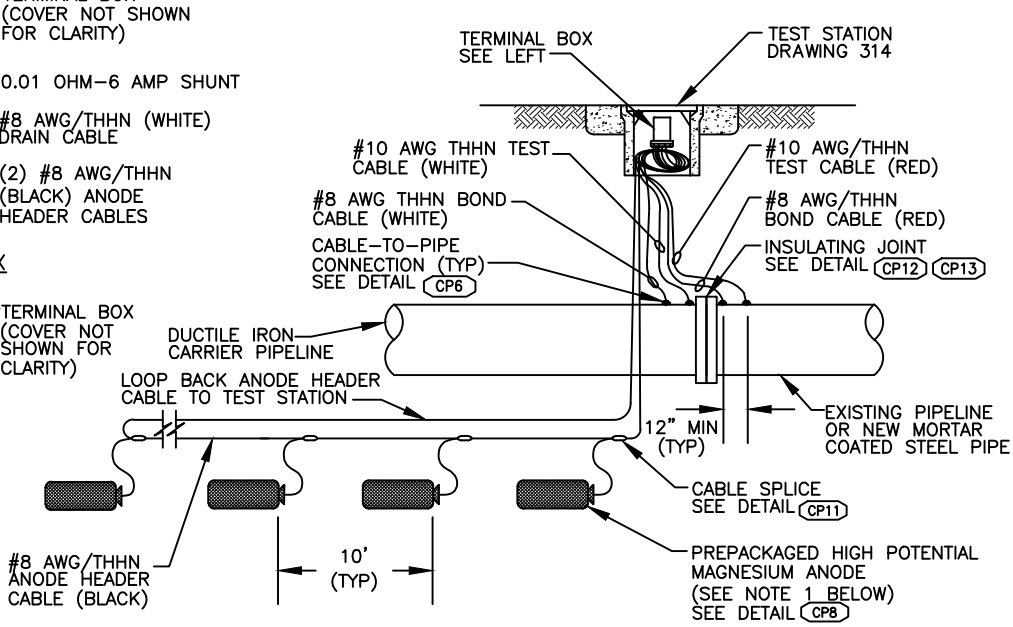
DATE : 7/24 | DWG NO.1112



IJTSA TERMINAL BOX



IJTS TERMINAL BOX

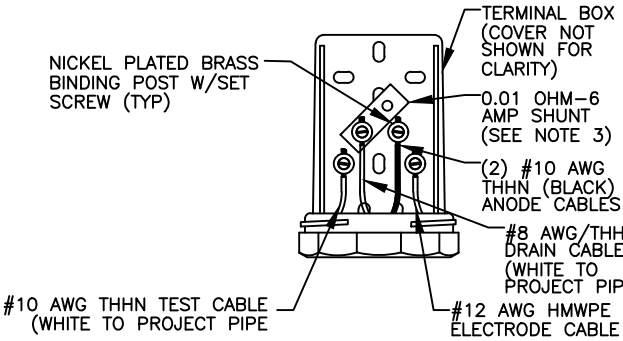


NOTES:
1. INSTALL THE SIZE AND NUMBER OF MAGNESIUM ANODES AT EACH ATS AS SHOWN IN TABLE 'A' ON DRAWING 1102.
2. IF NO ANODES ARE CALLED FOR, AS FOR AN IJTS IN TABLE 'A', UTILIZE THE IJTS TERMINAL BOX.
3. ENCASE ALL DUCTILE IRON PIPE & FITTINGS, INCLUDING THRUST RESTRAINTS, IN 8 MIL THICK POLYETHYLENE PER AWWA C–105.
4. IDENTIFY CABLES PER DETAIL CP15 ON DRAWING 1111.

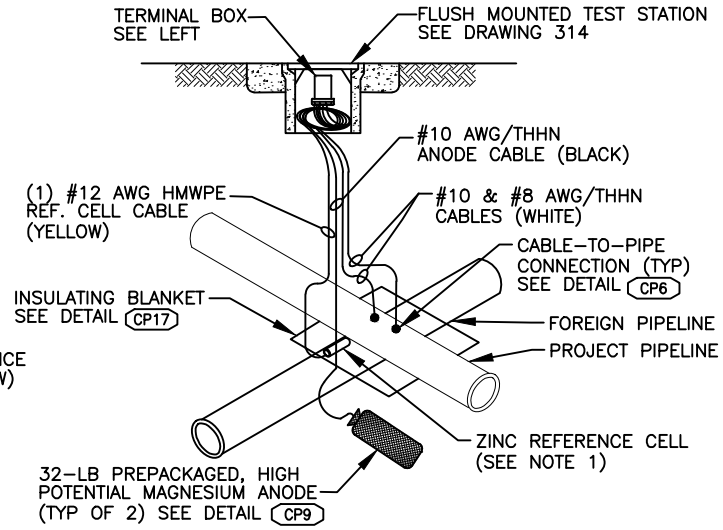
OPTION: DUCTILE IRON PIPE (TO BE APPROVED BY ENGINEER)
IJTSA – INSULATING JOINT TEST STATION W/ANODES

CP20

NTS



FPTS TERMINAL BOX



NOTE:
1. INSTALL THE REFERENCE CELL BETWEEN THE PIPELINES AND MIDWAY BETWEEN THE PROJECT PIPELINE AND THE INSULATING BLANKET.
2. IDENTIFY ALL CABLES IN THE TERMINAL BOX PER DETAIL CP15.
3. INSTALL SHUNT IN POSITION SHOWN.
4. THE CONTRACTOR SHALL CONFIRM WITH PG&E WHETHER OR NOT THE NATURAL GAS PIPELINES THAT CROSS THE PROJECT PIPELINE ARE METALLIC OR NON–METALLIC PIPELINES. OMIT THE FPTS IF FOREIGN (NATURAL GAS) PIPELINE IS NONMETALLIC.

OPTION: DUCTILE IRON PIPE (TO BE APPROVED BY ENGINEER)
FPTS – FOREIGN PIPELINE TEST STATION

CP21

NTS

DRAWN BY: STAFF		
CHECKED BY: AN		
SCALE: N.T.S.		

CITY OF PLEASANTON
STANDARD DETAILS

CATHODIC PROTECTION SYSTEM DETAILS – 13

REGISTERED PROFESSIONAL ENGINEER
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STATE OF CALIFORNIA

DATE : 7/24 | DWG NO.1113