

STANDARD SPECIFICATIONS & ENGINEERING STANDARDS

JANUARY 2016



PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

919 Palm Street
San Luis Obispo, CA 93401
(805) 781-7200

STANDARD SPECIFICATIONS

JANUARY 2016

APPROVED BY THE CITY ENGINEER:



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CITY ENGINEER
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**PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION**

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City of San Luis Obispo

Standard Specifications

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**CITY OF SAN LUIS OBISPO
DEPARTMENT OF PUBLIC WORKS
STANDARD SPECIFICATIONS
January 2016**

These Standard Specifications are to be used in conjunction with the State of California, Department of Transportation Standard Specifications and Standard Plans dated 2010. In absence of revision by these Standard Specifications, comply with the State of California Department of Transportation Standard Specifications dated 2010.

DIVISION I GENERAL PROVISIONS

1 GENERAL

1-1.01 GENERAL

Add to 1st paragraph in section 1-1.01.

When counting paragraphs, individually numbered items and tables are part of the preceding paragraph.

Replace the 8th paragraph of section 1-1.01 with:

The Engineer will number bid items consecutively and uniquely for each contract.

1-1.05 REFERENCES

Replace the 2nd paragraph of section 1-1.05 with: *(RSS Revision)*

Where the version of a referenced document is not specified, use the most recent version in effect on the date of the Notice to Bidders.

Replace the 4th paragraph of section 1-1.05 with:

Where a section number is referenced without a reference to a document, the reference is to a section of the 2010 State Standard Specifications as revised by the City Standard Specifications and Special Provisions.

1-1.07 DEFINITIONS

1-1.07B Glossary

Add to section 1-1.07B or

Replace if defined in section 1-1.07B with: *(RSS Revision)*

Architect: The Engineer as defined in this section.

Bid Item List: The bid item list is found in the bid forms.

City: City of San Luis Obispo

Contract Completion Date: Current extended date for completion of the Contract shown on the progress payment or encroachment permit.

Contract time: Number of original working days as adjusted by any time adjustment.

Critical Delay: Excusable delay that extends the scheduled completion date

Concurrent Delay: Occurrence of at least 2 of the following events in the same period of time, either partially or entirely:

1. critical delay
2. delay to controlling activity caused by you

3. non-working day

Delay: Event that extends the completion of an activity.

Department of Transportation: The City of San Luis Obispo Public Works Department.

Department: The City of San Luis Obispo Public Works Department.

Director: The City of San Luis Obispo Public Works Department Director or designee.

Disadvantaged Business Enterprise: Disadvantaged Business Enterprise as defined in 49 CFR 26.5.

Downtown Core: The downtown core is that area bounded by and including Nipomo, Marsh, Palm and Santa Rosa streets.

Early Completion Time: Difference in time between an early scheduled completion date and the work completion date.

Engineering Standards: The current City of San Luis Obispo engineering standards.

Engineer: The City Engineer, City of San Luis Obispo, acting either directly or through properly authorized agents, the agents acting within the scope of the particular duties delegated to them.

Excusable Delay: Delay caused by the City and not reasonably foreseeable when the work began such as:

1. Change in the work
2. City action that is not part of the Contract
3. Described facility rearrangement not rearranged as described, by the utility owner by the date specified, unless:
 - a. the rearrangement is solely for the Contractor's convenience, or
 - b. as a result of a Contractor proposed construction method or detail
4. City's failure to obtain timely access to the right-of-way
5. City's failure to review a submittal or provide notification in the time specified

Federal Aid Contract: A project that is identified within the Special Specifications as being financed with Federal funding and for which you and the City must follow unique Federal requirement.

Highway: Highway or Highway Right of Way means the work site(s) as identified in the contract or the area of work within the City right-of-way for privately funded projects.

Holiday: Holiday shown in the following table:

Holiday	Date Observed
Sunday	Every Sunday
New Year's Day	January 1 st
Birthday of Martin Luther King, Jr.	3 rd Monday in January
Washington's Birthday	3 rd Monday in February
Memorial Day	Last Monday in May
Independence Day	July 4 th
Labor Day	1 st Monday in September
Veterans Day	November 11 th
Thanksgiving Day	4 th Thursday in November
Day after Thanksgiving	Day after Thanksgiving Day
Day before Christmas Day	Last working day prior to Christmas Day
Christmas Day	December 25 th
Day before New Year's Day	Last working day prior to New Year's Day

If the holiday falls on a Sunday, the Monday following is a holiday. If the holiday falls on a Saturday, the preceding Friday is a holiday.

Laboratory: The City or a designated laboratory authorized by the City to test materials and work involved in the contract.

Landscape Architect: The Engineer as defined in this section.

Mission Style Sidewalk District: That area of the downtown and gateways specified to have Mission Style Sidewalk along frontages. Resolution 9114 (2000 Series)

MUTCD: The most current version of the California Manual on Uniform Traffic Control Devices.

Office of Structure Design: The Office of the City Engineer at the address located in the special provisions for the submission of bids.

Plans:

1. Project Plans: Drawings specific to the project, including authorized shop drawings.
2. Engineering Standards: Drawing standard to City of San Luis Obispo.
3. Standard Plans: Drawing standard to Caltrans.

Scheduled Completion Date: Planned work completion date shown on the current schedule.

Specifications: The directions, provisions and requirements contained in the City of San Luis Obispo, Standard Specifications and engineering standards as supplemented by the special provisions. Whenever the term “these specifications” or “these Standard Specifications” is used in this book, it means the provisions set forth in this book, in conjunction with, by reference, the edition of the State Standard Specifications as referenced in the beginning of this book. The Department of Transportation publications entitled Labor Surcharge and Equipment Rental Rates and General Prevailing Wage Rates are to be considered as a part of the special provisions.

State: The City of San Luis Obispo Public Works Department.

State of California: The City of San Luis Obispo Public Works Department.

State Standard Specifications: Means the Standard Specifications of the California Department of Transportation, Business and Transportation Agency, dated 2010

1-1.08 DISTRICTS

Delete section 1-1.08.

1-1.11 WEB SITES, ADDRESSES, AND TELEPHONE NUMBERS

Add to section 1-1.11:

Reference	Web Site	Address	Telephone Number
City of San Luis Obispo	www.slocity.org	919 Palm Street San Luis Obispo, CA 93401	(805) 781-7200

1-1.12 MISCELLANY

Replace 1st paragraph of section 1-1.12 with:

Make checks and bonds payable to the City of San Luis Obispo.

2 BIDDING

2-1.06 BID DOCUMENTS

2-1.06A General

Replace section 2-1.06A with:

Standard Specifications and Standard Plans are available for review on the City's web site or at the City Public Works Office. Obtain bid packages including plans and specifications at the City Public Works Office.

2-1.06B Supplemental Project Information

Replace section 2-1.06B with:

Your attention is directed to the special provisions for the specific project regarding additional information that may be available.

2-1.12 DISADVANTAGED BUSINESS ENTERPRISES

2-1.12A General

Add to section 2-1.12A:

This section is applicable to federally funded projects and only as directed in the special provisions.

2-1.15 DISABLED VETERAN BUSINESS ENTERPRISES

2-1.15A General

Add to section 2-1.15A:

This section is applicable only as directed in the special provisions.

2-1.18 SMALL BUSINESS AND NON-SMALL BUSINESS SUBCONTRACTOR PREFERENCES

2-1.18A General

Add to section 2-1.18A:

This section is applicable only as directed in the special provisions.

2-1.24 TIED BID RESOLUTION

Delete section 2-1.24.

2-1.27 CALIFORNIA COMPANIES

Delete section 2-1.27.

2-1.33 BID DOCUMENT COMPLETION

2-1.33A General

Replace section 2-1.33A with:

Furnish bid using blank forms provided in the special provisions. Bid must include all forms and must be signed by the bidder and each page must be initialed.

2-1.33B Bid Item List and Bid Comparison

Add to section 2-1.33B:

Any items of work that do not have a distinct pay item are included in other items of work paid and no additional compensation will be allowed.

Bids must have all spaces for bid prices and totals filled in. In the case of arithmetic discrepancy between item prices and total prices, item prices prevail over total prices.

Submit bid as directed in the notice to bidders.

2-1.33C Subcontractor List
Add to section 2-1.33C.

On the Subcontractor List, you must submit each subcontracted bid item number and corresponding percentage with your bid. Failure to do so results in a nonresponsive bid.

2-1.33D Opt out of Payment Adjustments for Price Index Fluctuations
Delete section 2-1.33D.

2-1.34 BIDDER'S SECURITY

Replace 2nd paragraph of section 2-1.37 with:

The bidder's bond must conform to the bond form shown in special provisions for the project and must be properly filled out and executed.

2-1.37 BID SUBMITTAL

Replace section 2-1.37 with:

Submit your bid:

1. Under sealed cover marked outside of the envelope containing the bid in compliance with the instructions contained in the notice to bidders.
2. No bid will be considered unless accompanied by one of the following:
 - a. certified check
 - b. cashier's check
 - c. bidder's bond must comply with section 2-1.34

If the bid is made by an individual, the individual's name and mailing address must be shown. If made by a firm or a partnership, the name and mailing address of each member of the firm or partnership must be shown. If made by a corporation, the bid must show the name of the state under the laws of which the corporation was chartered, and the:

1. names
2. titles
3. business addresses

of the:

1. president
2. secretary
3. treasurer

3 CONTRACT AWARD AND EXECUTION

3-1.04 CONTRACT AWARD

Replace section 3-1.04 with:

If the City awards the contract, the award will be made to the lowest responsive bid submitted by a responsible bidder within 60 calendar days.

3-1.04A Bid Protest

Bid protest procedure is defined in the notice to bidders.

3-1.04B Additive/Deductive Contract Award

When the bid form includes additive or deductive alternates, the Engineer will determine the lowest bid as defined in the special provisions. If no method is defined in the special provisions, the lowest bid is determined on the base price without consideration for the prices of the additive or deductive alternates in compliance with section 20103.8 of the Public Contract Code.

The City reserves the right to award or not award the contract including or omitting the alternates. Determination as to whether or not the alternates are included in the contract will be made by the City.

All requirements in the contract apply to the work required to complete the alternates.

3-1.05 CONTRACT BONDS

Replace section 3-1.05 with:

Furnish two good and sufficient bonds to the City of San Luis Obispo, California. Each bond must be in the amount equal to one hundred percent of the total contract price. One bond is for payment of claims for labor and materials, and the other bond for faithful performance.

Only bonds from companies that are "Admitted" to do business in California will be acceptable to the City. Bonding companies must be on the Department of Treasuries approved list in Circular 570. Bonds must remain in full force during the guaranty period.

3-1.05A Encroachment Permit Bond

Encroachment Permits issued by the City are not effective for any purpose until the permittee files with the City a surety bond, when required by the Engineer, in the form and amount required by the City's Municipal Code Section 12.04.050. A surety bond is not ordinarily required of any public corporation or utility but will be required of any utility that fails to meet any obligation arising out of the work permitted or done under an Encroachment Permit or fails to maintain its plant, work, or facilities. The surety bond must remain in force for a period of one (1) year after acceptance of the work by the City.

3-1.07 INSURANCE POLICIES

Replace section 3-1.07 with:

Submit insurance as required by the special provisions or permit. Your attention is directed to the insurance requirements in the special provisions. It is highly recommended that bidders confer with their insurance carriers or brokers to determine in advance of bid submission the availability of insurance certificates and endorsements as required in the special provisions or permit. Failure of the bidder to comply with the insurance requirements within 8 working days after receiving the contract for execution is cause for forfeiture of the bidder's bond and considered failure to execute the contract.

Procure and maintain, for the duration of the contract, insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work. The cost of insurance is included in your bid.

All certificates and endorsements are to be:

1. received
2. reviewed
3. approved

by the Engineer before the City will execute the contract. The City reserves the right to require complete, certified copies of all required insurance policies, at any time.

3-1.08 SMALL BUSINESS PARTICIPATION REPORT

Delete section 3-1.08.

3-1.11 PAYEE DATA RECORD

Delete section 3-1.11.

3-1.18 EXECUTION OF CONTRACT

Replace section 3-1.18 with:

The successful bidder must sign the contract and deliver to the Engineer:

1. signed contract
2. contract bonds
3. insurance policies

The Engineer must receive these documents before the 10th business day after the bidder receives the contract.

The bidder's security may be forfeited for failure to execute the contract and provide the Engineer with all documents within the time specified

3-1.18A Encroachment Permit

In compliance with Municipal Code Section 12.04.033, any encroachment permit application can be denied and once issued can be:

1. modified
2. revised
3. revoked

at any time, without prejudice, to prior rights including those evidenced by:

1. joint use agreements
2. franchise rights
3. reserved rights
4. any other agreements for operating purposes in the public right-of-way

If, in the opinion of the Engineer, you have violated any of the conditions of the permit, including but not limited to:

1. work hours
2. traffic control
3. time of completion
4. air pollution control
5. water pollution control
6. engineering standards
7. Engineer's directive

the permit will be revoked. You are responsible to obtain a new permit including repayment of fees. You are responsible to reimburse the City for any costs incurred to maintain the work site until a new permit can be obtained and the work completed. If you violate any condition of any permit twice within any five-year period you will be prohibited from working within the right-of-way for a period of two years following the completion of the project during which the second violation occurred.

No party other than the named permittee or their agents may work under any permit.

Excavations must be restored to the applicable engineering standard within 4 weeks of removal of the existing surface improvement or after one week where no work is completed within excavation, whichever is less.

If any:

1. street
2. sidewalk or
3. driveway

is not reconstructed within the time limit set forth in this section the City reserves the right to complete the repair with its own or contract forces and obtain reimbursement from you in compliance with section 9-1.23. Temporary paving must comply with section 77-1.03C.

Unless otherwise stated on the permit or other separate written agreement, all costs incurred for work within the public right-of-way pursuant to this Encroachment Permit are borne by the permittee, and permittee hereby waives all claims for indemnification or contribution from the City for such work.

This permit is not in effect for any purpose until the permittee files with the City a surety bond when required by the Engineer in the form and amount required by the City's Municipal Code. The bond must remain in force for a period of one year after acceptance of the work by the City (See Municipal Code Section 12.04.050).

This permit is issued with the understanding that any particular action is not to be considered as establishing any precedent:

1. on the question of the expediency of permitting any certain kind of encroachment to be erected within the public right-of-way; or
2. as to any utility of the acceptability of any such permits as to any other or future situation.

Permittee understands and agrees that whenever permitted facilities conflicts with future City:

1. improvements
2. projects
3. new construction
4. reconstruction
5. maintenance

in the public right-of-way, the facilities must be:

1. relocated
2. removed
3. modified
4. adjusted
5. as directed by the City

at permittee's sole expense.

4 SCOPE OF WORK

4-1.02 INTENT

Add to section 4-1.02.

You are responsible to obtain a copy of the plans and current applicable standards and specifications and keep them at the job site for reference.

You must maintain on the job site information on the manufacturer's recommendation for installation or application when that information exists.

4-1.05 CHANGES AND EXTRA WORK

4-1.05A General Add to section 4-1.05A.

In instances where you and the City dispute that certain work is:

1. extra work or
2. a change in the character of the work

You are responsible to obtain, from the Engineer, for the disputed work daily agreement on:

1. labor
2. materials
3. equipment

The agreements must be signed by both parties daily. Maintain and submit these records in compliance with:

1. section 5-1.27E
2. section 5-1.43

Daily agreement by the Engineer for disputed work items does not constitute agreement to pay for disputed work.

4-1.05A(1) Cost Request Bulletin (CRB)

The Engineer may during the course of the work, issue Cost Request Bulletin (CRB) describing work that may increase or delete work from the contract. Respond to the CRB in a thorough and timely manner identifying separately and fully all costs of the proposed addition or deleted work as described in the CRB and how the work change impacts critical path and contract completion date. Failure to respond within two weeks to CRB will not constitute justification for a time extension to the project. Failure to adequately describe the full cost associated with the CRB will not be justification for additional compensation at a later date.

4-1.07 VALUE ENGINEERING

Add to section 4-1.07.

This section is applicable only as directed in the special provisions.

4-1.13 CLEANUP

Add to section 4-1.13.

4-1.13A Work Site Maintenance

You agree, by acceptance of a contract or issuance of permit, to properly maintain the work site in a:

1. safe
2. clean
3. neat

condition at all times.

Prior to the end of each workday you must remove all equipment and construction materials from the public right-of-way. The public right-of-way must be clean of any construction materials including but not limited to:

1. concrete
2. oils
3. asphalt
4. sand
5. aggregate
6. base

At the direction of the Engineer, use a self-loading motor street sweeper with spray nozzles to clean the right-of-way. Do not use street sweepers or blowers that use high velocity air to disperse or blow contaminants out of project area. Clean project area and surrounding perimeter including any other area impacted by this work.

Any traffic stripes or pavement markings that are removed or obliterated during work must be replaced with temporary tape, markers, or paint prior to opening the area to traffic. This maintenance and repair responsibility will run for the life of the encroachment and guarantee period. Replace with permanent striping and pavement markings in compliance with section 84-1.03E.

4-1.13B Stockpiles

Keep stockpile materials in the street to a minimum and remove by the end of each work day. Sweeping is required to remove stockpile residue either by hand, or at the direction of the Engineer, by mechanical street sweeper.

Provisions must be made for controlling dust, arising for whatever reason, from stockpile materials. You are responsible for maintaining all stockpile areas in a neat and dust-free condition, with adequate stormwater controls.

5 CONTROL OF WORK

5-1.01 GENERAL

Replace the 9th paragraph in section 5-1.01 with:

Whenever you change the normal agreed-to hours of work you must provide 24-hour notice to the Engineer. The Engineer may or may not approve such a change. If the change is not approved or work is allowed but no inspection will be available any work you perform outside the normal hours of work and in the absence of the Engineer will be subject to rejection.

Normal hours of work fall between 7:00 A.M. and 4:00 P.M. Monday through Friday excluding City holidays. Obtain approval from the Engineer and Community Development Director for any work between the hours of 4 P.M. and 7 A.M.

5-1.02 CONTRACT COMPONENTS

Replace section 5-1.02 with:

A component in one contract part applies as if appearing in each. The parts are complementary and describe and provide for complete work. These standard specifications work in conjunction with:

1. project plans
2. engineering standards
3. standard plans
4. manufacturer's recommendations

Where materials and methods are specified, details in plans and standards are to be consulted to provide full information needed to complete installations.

If a discrepancy exists, the governing ranking of contract parts in descending order is:

1. project special provisions
2. project plans
3. City engineering standards
4. City standard specifications
5. State standard specifications
6. State standard plans
7. Written numbers and notes on a drawing govern over graphics
8. A detail drawing governs over a general drawing
9. A detail specification governs over a general specification
10. A Specification in a section governs over a specification referenced by that section

Where manufacturer's recommendations for installation are more stringent than those prescribed in the standard specifications or the special provisions, the manufacturer's recommendations will take precedence. This condition may be waived at the discretion of the Engineer.

Working drawings must be submitted in compliance with the provisions in section 5-1.23.

5-1.02A Private Construction Projects Coordination and Interpretation of Plans

When private construction:

1. project plans, or
2. project special provisions

conflict with:

1. City engineering standards, or
2. City standard specifications

In these cases:

1. City engineering standards
2. City standard specifications

govern unless an approved exception is noted on the cover sheet of the approved plans or listed on the encroachment permit.

5-1.02B Encroachment Permit Plans

For installation of all:

1. underground facilities
2. all surface work
3. other activity of consequence

the permittee must furnish three (3) sets of plans showing:

1. location
2. construction
3. other activity

For underground mainline facilities work, the permittee must submit a complete set of "record drawings", prepared by a registered civil engineer, for review and approval prior to placing facility into operation and signing of the final inspection Blue Card or Encroachment Permit.

Any change to the approved plan must be reviewed and approved by the design engineer and the Engineer and the change will not be authorized without the written concurrence of the owner for which the facility is being constructed.

Place facility line markers or notification markers flush with the finished surface. Do not create a pedestrian trip or slip hazard. Markers are the responsibility of the owner of the facility to maintain.

New facilities must maintain a clearance of five feet to existing City facilities unless otherwise authorized in writing by the Engineer. Failure to comply with this condition will result in a revocation of the encroachment permit at the time it is discovered by the Engineer. You are responsible to remove or relocate the facility at no cost to the City.

5-1.02C Inspection for Encroachment into Public Right-of-Way

Before starting work notify the Engineer two working days prior to initial start of work. When work has been interrupted for more than five working days, provide the Engineer with one working day notification before restarting work. Unless otherwise specified, all work requiring inspection must be performed on weekdays, excluding holidays, during the normal working hours in compliance with section 5-1.01.

Work is subject to:

1. monitoring
2. inspection
3. approval

by the Engineer. The Engineer must receive all inspection requests at least one working day prior to the need for inspection. You must request a final inspection and acceptance of the work. The Engineer reserves the right to require work completed without inspection to be removed and reconstructed with inspection.

5-1.02D Sequencing

Work within any block must be finished and the right-of-way completely restored (including finished pavement) prior to commencing work at any other permitted location or along any other portion of a permitted route. The Engineer may grant exceptions for permitted activities with low impacts to traffic (e.g. directional bore).

5-1.09 PARTNERING

Delete section 5-1.09.

5-1.13 SUBCONTRACTING

5-1.13A General

Replace 5th paragraph in section 5-1.13A with:

Perform work equaling at least 50 percent of the value of the original total bid with your:

1. employees
2. equipment
3. rental equipment with operator
4. rental equipment without operators

Excluding items designated with an "S" on the bid item list. "S" indicates specialty items of work. The value of specialty items of work are not included in the calculation.

5-1.13B Disadvantaged Business Enterprises

5-1.13B(1) General

Replace the 7th paragraph in section 5-1.13B(1) with: (RSS Revision)

If a DBE is decertified before completing its work, the DBE must notify you in writing of the decertification date. If a business becomes a certified DBE before completing its work, the business must notify you in writing of the certification date. Submit the notifications. On work completion, complete a *Disadvantaged Business Enterprises (DBE) Certification Status Change* form. Submit the form within 30 days of Contract acceptance.

5-1.13B(2) Performance of Disadvantaged Business Enterprises

Replace section 5-1.13B(2) with: (RSS Revision)

Section 5-1.13(B)(2) applies if a DBE goal is shown on the Notice to Bidders.

DBEs must perform work or supply materials as listed in the Caltrans Bidder - DBE - Commitment form.

Do not terminate or substitute a listed DBE for convenience and perform the work with your own forces or obtain materials from other sources without authorization from the City.

The City authorizes a request to use other forces or sources of materials if it shows any of the following justifications:

1. Listed DBE fails or refuses to execute a written contract based on the plans and specifications for the project.
2. You stipulated that a bond is a condition of executing the subcontract and the listed DBE fails to meet your bond requirements.
3. Work requires a contractor's license and the listed DBE does not have a valid license under Contractors License Law.
4. Listed DBE fails or refuses to perform the work or furnish the listed materials.
5. Listed DBE's work is unsatisfactory and not in compliance with the Contract.
6. Listed DBE is ineligible to work on the project because of suspension or debarment.
7. Listed DBE becomes bankrupt or insolvent.
8. Listed DBE voluntarily withdraws with written notice from the Contract.
9. Listed DBE is ineligible to receive credit for the type of work required.
10. Listed DBE owner dies or becomes disabled resulting in the inability to perform the work on the Contract.
11. City determines other documented good cause.

Notify the original DBE of your intent to use other forces or material sources and provide the reasons. Provide the DBE with 5 days to respond to your notice and advise you and the City of the reasons why the use of other forces or sources of materials should not occur. Your request to use other forces or material sources must include:

1. 1 or more of the reasons listed in the preceding paragraph
2. Notices from you to the DBE regarding the request
3. Notices from the DBE to you regarding the request

If a listed DBE is terminated or substitute, you must make good faith efforts to find another DBE to substitute for the original DBE. The substitute DBE must perform at least the same amount of work as the original DBE under the Contract to the extent needed to meet the DBE goal.

The substitute DBE must be certified as a DBE at the time of request for substitution.

Unless the City authorizes (1) a request to use other forces or sources of materials or (2) a good faith effort for a substitution of a terminated DBE, the City does not pay for work listed on the Caltrans Bidder - DBE - Commitment form unless it is performed or supplied by the listed DBE or an authorized substitute.

5-1.13C Disabled Veteran Business Enterprises

Delete section 5-1.13C.

5-1.13D Non-Small Businesses

Delete section 5-1.13D.

5-1.17 CHARACTER OF WORKERS

Add to section 5-1.17.

If in the opinion of the Engineer, you or an employee fail to comply with contract provisions after receiving either written or oral direction, at the discretion of the Engineer, that person must not again be employed on the work or project.

5-1.20 COORDINATION WITH OTHER ENTITIES

5-1.20B Permits, Licenses, Agreements, and Certifications

5-1.20B(4) Contractor–Property Owner Agreement

Add to section 5-1.20B(4).

Review the City of San Luis Obispo's Construction Code and Municipal Code dealing with the stockpiling of materials in the City. Dispose of all materials in a legal manner.

Prior to use, furnish the Engineer evidence that properties have required:

1. permits
2. licenses
3. clearances

to be a construction yard and a temporary storage site for stockpiling.

5-1.20B(5) Comply with Local, State and Federal Regulations

Add to section 5-1.20B.

You are responsible to comply with:

1. Local
2. State
3. Federal

regulations regarding:

1. air pollution
2. water pollution
3. proper disposal of materials

in compliance with the standard specifications.

Should you fail to meet the requirements of a permit or regulation as it pertains to work for the City, and the City has notice of an impending fine or mitigation measure against the City, the City will withhold payment or portions of payment in compliance with section 9-1.16E in an amount sufficient to satisfy any fine or mitigation measure that may be imposed on the City in addition to any other retention held.

Encroachment permittees are required to obtain all necessary permits and clearances including authorizations required from:

1. Public Utilities Commission
2. railroad company
3. OSHA
4. other public agency
5. regulatory authority

having jurisdiction. Failure to comply is cause to revoke encroachment permit.

5-1.20C Railroad Relations **Replace section 5-1.20C with:**

If the Contract includes an agreement with a railroad company, the City makes the provisions of the agreement available in the Information Handout in the document titled "Railroad Relations and Insurance Requirements." Comply with the requirements in the document.

5-1.20G City Authorizations and Permits **Add to section 5-1.20.**

If you desire to discharge to the sanitary sewer, you must receive prior permission from the Wastewater Collection Supervisor and the Environmental Programs Manager. Flushing waterlines must comply with section 77-3.

If permission to discharge requires an Industrial User Discharge Permit, you must submit an Industrial User Discharge Permit Application to the Environmental Programs Manager. You must comply with all conditions of the issued permit and pay all applicable fees. Maintain proof of authorization to discharge at the job site at all times and provide that information to Engineer upon request. The application is available in the appendix to these standard specifications.

A City of San Luis Obispo Fire Department permit is required prior to crossing any liquid petroleum or high pressure gas main. If a prior encroachment conflicts with the proposed work, you must arrange for any necessary removal or relocation with the prior permittee. Any such removal or relocation will be at no expense to the City.

Before using explosives in work, you must receive authorization from the Engineer and obtain a permit for use from the City of San Luis Obispo Fire Department. You may also be required to increase the amount of insurance coverage if, in the opinion of the Engineer, your insurance does not include sufficient coverage for use of explosives.

5-1.23 SUBMITTALS

Replace section 5-1.23 with:

5-1.23A General

Submittals are required for:

1. materials and equipment not specified by standards, or a trade name and number
2. for working drawings.

Submittals are also required when specified in the contract documents. Where products are clearly identified by standards or trade names and no substitution is proposed, no submittal is required.

Submit adequate descriptive information, from which the Engineer can determine if the proposed:

1. materials
2. equipment
3. working drawings

are in compliance to the design concept and in compliance with the contract documents. Submittal must consist of:

1. drawings
2. specifications
3. calculations
4. descriptive data
5. certificates
6. samples
7. MSDS sheets
8. test results
9. information required in the specifications.

Submittal will be reviewed for general compliance with the design concept and general compliance with the information given in the contract documents. Submittals will not be review for:

1. quantities
2. dimensions
3. coordination with the work of other trades
4. construction safety precautions

all of which are your sole responsibility. Review of a specific item does not indicate acceptance of an assembly of which the item is a component. The Engineer and contract designer are not required to review and will not be responsible for any deviations from the contract documents not clearly noted. Partial submittals and partial grouped submittals will not be reviewed.

5-1.23B Coordination

Submittals must be furnished by you to the Engineer. You must:

1. coordinate
2. compile

3. submit

all required submittals from suppliers and subcontractors to the Engineer. All communications between you and a contract designer must be written and submitted to the Engineer to furnish to contract designer.

5-1.23C Organization

Submittals must be accompanied with a transmittal. Transmittal must include:

1. submittal number
2. brief description of the submittal
3. submittal log

The submittal number is a unique number in the following format:

XXXXX-YY-ZZ

X is equal the project's specification number. Project specification number can be found in the project's special provisions.

Y is equal to the submittal item number. The submittal item number is a unique number and sequentially assigned for each specific:

1. item
2. class of material
3. equipment
4. items specified in separate sections

Z is equal to the number of times the submittal item has been furnished to the Engineer for review. Start at 01 for the initial review and increment 1 integer larger for each subsequent resubmittal.

A submittal log must accompany each submittal showing all known past and future submittals and current status.

5-1.23D Deviation from Contract

If you propose to provide any:

1. material
2. equipment
3. working drawings

which deviates from the contract requirements, indicate this on the transmittal form accompanying the submittal. In the transmittal provide a brief description of submittal and why the deviation is requested and compare the:

1. material
2. coatings
3. mechanical functions
4. energy efficiency
5. warranty

differences between the material specified and the material submitted.

5-1.23E Submittal Completeness

Submittals which do not contain all the information required to allow the Engineer to make a determination as to the submittals acceptability and compliance with the project documents, will be returned without a complete review. A resubmittal must be made.

5-1.23F Submittal Package

Group submittal to expedite the review process and to reduce the likelihood of conflicts among submittals. Submittals for various items must be made as a single submittal when the items taken together constitute a manufacturer's package or are so functionally related that expediency indicates checking or review of the group or package as a whole. Conversely, various items which are not functionally related must be submitted separately. Submittal packages which are not appropriately grouped will be returned without review. Provide one complete portable document format (PDF) file of each submittal to the Engineer. If you are unable to provide electronic documents, provide two complete copies of each submittal to the Engineer. The Engineer will retain two copies of the submittal and return one package to you within three weeks. Submittals that require review by:

1. agency
2. Community Development Department
3. utility
4. consultant designer

will require one additional copy of the submittal as well as three additional weeks of review time.

5-1.23G Returned Submittals

Returned submittals will indicate one of the following actions.

1. No Exceptions Taken – The review indicates that the material, equipment, or work method is in compliance with the design concept and complies with the contract documents. You may begin to the work method or incorporate the material or equipment covered by the submittal.
2. Make Corrections Noted – The review indicates limited corrections are required to the submittal in order for the material, equipment, or work method to be in compliance with the design concept and to comply with the contract documents. You may begin implementing the work method or incorporating the material and equipment covered by the submittal in compliance with the noted corrections. Where submittal information will be incorporated in Operation and Maintenance data, a corrected copy must be provided.
3. Revise and Resubmit – The review indicates that the submittal is insufficient or contains incorrect data. Except at your own risk, you may not undertake work covered by this submittal until it has been revised, resubmitted and returned marked either "No exceptions taken" or "Make corrections noted."
4. Rejected – The review indicates that the material, equipment, or work method is not in compliance with the design concept and not in compliance with the contract documents. Except at your own risk, you may not undertake the work covered by such submittals until a new submittal is made and returned marked either "No exceptions taken" or "Make corrections noted."
5. Information Only – The review indicates that the submittal contains contract required information.

5-1.23H Responsibility

Review of working drawings or submittals does not relieve you of responsibility for errors and does not indicate an assumption of risks or liability by the:

1. City, or by any officer or employee of or
2. by any engineering firm conducting the review on behalf of the City and

you have no claim under the contract on account of the failure, or partial failure, of the method of:

1. work
2. material or
3. equipment

reviewed. A mark of "No exceptions taken" or "Make corrections noted" means that the City has no objection to you using the:

1. plan
2. method of work proposed or
3. providing the materials or
4. equipment proposed.

5-1.23I Charges for Third Party Submittal Review

The Engineer will allow up to two reviews of each submittal. If you are required to make a third submittal for any item, then the costs of the third review will be at your expense. The cost of the review will be deducted from payments due. The cost of the review by contract professional services will be on a time and materials basis at standard company billing rates. Billing for this expense will be in compliance with section 9-1.23.

5-1.26 CONSTRUCTION SURVEYS

Replace section 5-1.26 with:

5-1.26A General

You must provide the necessary horizontal and vertical survey control for the completion of the work. Survey work must be performed by a Licensed Land Surveyor or a Registered Civil Engineer.

Control must be provided for site grading, significant layout, or as directed by the Engineer. Control must be provided in the same system of units as shown. You must provide surface grade control every 50 feet and at grade breaks and begin and end of curves. You must mark the control points in the field and provide a printed sheet with the point information, site layout, and control point layout to the Engineer.

5-1.26B Payment

Full compensation for work specified in section 5-1.26 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

5-1.27 RECORDS

5-1.27E Change Order Bills Replace section 5-1.27E with:

You must deliver all Change Order Bills and support documents in writing to the Engineer. A Change Order Bill will not be accepted by the Engineer unless prior approval for the work has been given. A change order is approved when both you and the Engineer have approved it in writing.

5-1.36 PROPERTY AND FACILITIES PRESERVATION

5-1.36A General Add to section 5-1.36A.

10. infrastructure
11. street surfacing
12. traffic stripes
13. pavement markings and markers
14. survey monuments
15. bench marks
16. utilities
17. trees
18. traffic signal equipment
19. other public fixtures

| Restore facilities in kind in compliance with appropriate specifications, standards, and plans.

| Monuments and bench marks must comply with section 5-1.36.

Where trees or tree roots are present in the work area, tree protection must comply with section 77-1.03A(2)(g).

The Engineer reserves the right to require you to video inspect any service line or mainline suspected of damage by your operation. If the Engineer requires a video inspection on a sewer lateral, you must install a sewer clean out on the lateral in compliance with engineering standards. Provide written notification to the property owner, with a copy to the Engineer, prior to any:

1. modification
2. repair
3. replacement

of the lateral.

Damage to property and facilities must be reported immediately to the Engineer.

Prior to beginning work determine the location of any underground facilities. Contact Underground Service Alert at 811 and request all utility lines to be marked.

5-1.36A(1) Trenchless Operations

When any trenchless method is used to install or repair a utility, all pressurized utility lines and sewer laterals that will be crossed must be pot-holed. Other State or Federal requirements may apply. When completing work by a directional bore, you must field locate and verify the:

1. condition
2. type of material
3. depth of all service lines and mainlines to be crossed

If the bore will provide at least 3 feet of clearance from sewer laterals, field locating of sewer laterals may be waived by the Engineer.

Add to Section 5-1.36B

Repair minor damage to turf by top dressing to create an even grade with amended topsoil and seeding with an approved seed mix. Damage to turf in excess of 100 square feet may be required to be replaced with sod.

5-1.36C Railroad Property

Add to section 5-1.36C. (RSS Revision)

If the Contract does not include an agreement with a railroad company, do not allow personnel or equipment on railroad property. Prevent material, equipment, and debris from falling onto railroad property.

Add to section 5-1.36 (RSS Revision)

5-1.36E Survey Monuments

Protect survey monuments on and off the highway.

All survey and construction, maintenance or other work must be performed consistent with Section 8725 and 8771 of the California Business & Professions Code. Monuments and bench marks must be set by a Licensed Land Surveyor or a Registered Civil Engineer properly licensed to complete survey work. The City reserves the right to review the Land Surveyor or Engineer's license to determine its validity.

Sufficient controlling monuments shall be retained or replaced in their original positions to enable property, right-of-way and easement lines, property corners, and subdivision and tract boundaries to be reestablished. Anything that appears to be a monument or benchmark must be reported to the Engineer prior to construction or disturbance. A Licensed Land Surveyor must locate and reference known monuments or benchmarks that will be disturbed by construction activities. A corner record shall be filed with the County prior to construction for any monument or benchmark that will be disturbed by construction. The corner record must detail the location of the monument and any tie-outs. Should the existing survey monument be disturbed or destroyed during construction, it must be reset at the previous location. All tie-outs must be removed after the original monument is re-established. Should any existing bench mark be disturbed or destroyed during construction, a new one must be set at a nearby, but different, location than the existing, as determined by the Engineer prior to construction. For monuments, a corner record must be filed with the County and a copy delivered to the Engineer before and after construction. For bench marks, documentation of the transferred bench mark, including a location map, field notes and surveyor certification, must be delivered to the Engineer prior the project acceptance or sign off of the Encroachment Permit. Damaged or disturbed property corners must be replaced by a Land Surveyor at the contractor's or owner's expense.

Upon discovery of a survey monument not identified and located immediately:

1. Stop work near the monument
2. Notify the Engineer

Do not resume work near the monument until authorized.

5-1.37 MAINTENANCE AND PROTECTION

5-1.37A General

Replace section 5-1.37A with: (RSS Revision)

Maintain and protect work until the City has granted relief from maintenance or accepted the Contract.

Do not remove any padlock used to secure a portion of the work until the Engineer is present to replace it. Notify the Engineer at least 3 days before removing the lock.

Prevent construction equipment that exceeds the maximum weight limits in Veh Code Div 15 from operating on completed or existing treated base, pavement, or structures.

5-1.38 MAINTENANCE AND PROTECTION RELIEF

Add to section 5-1.38.

However, nothing in this Section 5-1.38 providing for relief from maintenance and responsibility will be construed as relieving you of full responsibility for correcting any defective work or materials found at any time.

5-1.39 DAMAGE REPAIR AND RESTORATION

5-1.39A General
Add to section 5-1.39A.

You must immediate repair or install approved alternate to any facility missing, damaged or non-operational as a result of your work, prior to continuing with the other contract work. If the repairs are not made as required, you agree to the cost of those repairs made by others at the City's direction in compliance with section 9-1.23.

5-1.43 POTENTIAL CLAIMS AND DISPUTE RESOLUTION

5-1.43E Alternative Dispute Resolution
Delete section 5-1.43E.

6 CONTROL OF MATERIALS

6-2 MATERIAL SOURCE

6-2.05 BUY AMERICA

Add to section 6-2.05.

This section is applicable only as directed in the special provisions.

6-3 QUALITY

6-3.02 SPECIFIC BRAND OR TRADE NAME AND SUBSTITUTION

Replace section 6-3.02 with:

Whenever the specifications permit the substitution of a similar or equivalent material or article, no tests or action relating to the approval of the substitute material will be made until you request for substitution is made in writing accompanied by complete data as to the equality of the material or article proposed. The request must be made a minimum of ten working days prior to the bid opening date identified in the Notice to Bidders.

Substitutions requested after bid opening must be made in ample time to permit approval without delaying the work. Requests for substitutions must comply with section 5-1.23.

Any substitutions that are approved must be furnished without additional cost to the City. If any changes are required for the proper installation and fit of alternative materials or equipment, or because of deviations from the contract plans and specifications, such changes must not be made without the consent of the Engineer and must be made without additional cost to the City.

6-3.03 AUTHORIZED LABORATORY LIST

Delete section 6-3.03.

6-3.05 QUALITY ASSURANCE

6-3.05A General

Replace paragraph 7, 8, 9 in section 6-3.05A with:

Testing method for Relative Compaction is:

1. ASTM D-1557
2. ASTM D-2922
3. ASTM D-3017

Delete section 6-3.05B.

Delete section 6-3.05C.

Delete section 6-3.05I.

Delete section 6-3.05K.

Delete section 6-3.05L.

7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

7-1.02 LAWS

7-1.02K Labor Code

7-1.02K(2) Wages

Replace 6th paragraph in section 7-1.02K(2) with: (RSS Revision)

The Contractor and any subcontractor must forfeit to the City not more than \$200 per day or part of a day for each worker paid less than the prevailing wage rate and pay the worker the difference between the prevailing wage rate and the rate paid (Labor Code § 1775). The Labor Commissioner determines the amount of this penalty and bases the amount on:

1. Whether the failure to pay the correct prevailing wage rate was a good-faith mistake that the Contractor or subcontractor promptly and voluntarily corrected upon notice
2. The prior record of the Contractor or subcontractor in meeting its prevailing wage obligations
3. The Contractor or subcontractor's willful failure to pay the correct rate of prevailing wages

7-1.02K(3) Certified Payroll Records (Labor Code 1776)

**Delete paragraphs 5, 6, 7, 8 in section 7-1.02K(3)
Replace 13th paragraphs in section 7-1.02K(3) with: (RSS Revision)**

Comply with a request for the records within 10 days after you receive a written request. If you do not comply within this period, the City withholds from progress payments a \$100 penalty for each day or part of a day for each worker until you comply. You are not assessed this penalty for a subcontractor's failure to comply with Labor Code § 1776.

Add to section 7-1.02K(3).

Weekly payrolls must include the base pay rate and the fringe benefits or you may submit a statement of fringe benefits, clearly defining which benefits are paid directly to the employee as part of the hourly rate, and which benefits are paid into an approved program. Fringe benefit statements must be signed by the employer or the employer's agent certifying the fringe benefit statement is correct and the employer has been authorized to make any payments on behalf of the employee to approved programs. Submit certified payrolls to the Engineer.

Furnish the Engineer one Portable Document Format (PDF) file which contains all certified payroll records for the prior month's work. Redact the PDF file making the employee's social security number and name illegible. Failure to submit PDF file with other monthly payroll records is considered an incomplete payroll submission and penalties will be assessed.

7-1.02K(6) Occupational Safety and Health Standards

7-1.02K(6)(b) Excavation Safety

Add to section 7-1.02K(6)(b).

Comply with Labor Code 6705 and 6707. Comply with Public Contracts Code 7104.

7-1.03 PUBLIC CONVENIENCE

Add to section 7-1.03.

Public traffic includes all:

1. motorized vehicles
2. bicycles
3. pedestrian traffic
4. personal mobility devices

Areas modified by you for use by pedestrians must provide adequate accessibility to meet Americans with Disabilities Act (ADA) requirements. Where walkways are damaged, alternate walkways must be placed around the work site or other materials may be used to allow use of the area. Where plywood is used it must be a minimum of ¾ inch in thickness and beveled at the ends to prevent tripping, fastened down to prevent shifting and supported

underneath as needed to prevent bowing. The Engineer may require cold mix to be placed to transition walkway to plywood.

Sidewalks must not be blocked. Where excavations in pedestrian walkways are minor and do not restrict pedestrian walking area or create a hazard to the pedestrian, structurally sound walkways with safety railings must be provided over or around the excavated area. All walkway areas must comply with the Americans with Disabilities Act. In the Downtown Business District or other high pedestrian traffic areas, temporary walkways must be a minimum of five feet in width.

Where sidewalk and bike path facilities exist, a minimum width of four feet must be maintained at all times a must provide for a safe passage through the work area. At no time will pedestrians be diverted into a portion of the street used concurrently for motorized traffic. At locations where adjacent alternate walkways are not practical, the Engineer may approve sidewalk closures. Appropriate signs and barricades must be installed at the limits of construction and in advance of the closure at the nearest crosswalk or intersection to divert pedestrians across the street.

Provisions must be made to accommodate existing transit routes and stops. You must notify the Engineer at least 72 hours in advance of any work that will require rerouting or delay of a transit line or school bus. You must post any transit stop affected by the rerouting at least 48 hours in advance at the affected transit stop identifying the affected routes, days, and times.

Furnish the Engineer and utility companies with the

1. names
2. addresses
3. telephone numbers

of two individuals in San Luis Obispo, before starting work that can be reached in case of emergency, 24 hours a day, throughout the duration of the job. These emergency contacts must be able to provide on-site response within one hour.

Do not close streets to traffic without written permission from the Engineer. However, in the absence of the Engineer, if the necessity for closing a street is absolute to prevent immediate danger to the public, you must immediately notify the:

1. Engineer
2. Police Department
3. Fire Department

Provide access to and from all property adjacent to the work area where normal access existed prior to your work. All:

1. traffic lanes
2. driveways
3. sidewalks
4. street crossings

must be usable at the end of the work day.

7-1.03A Public Notification

Supply and deliver notices of the work to all properties adjacent to and within 100 feet of the work area. The notice must include:

1. a briefly describe the work
2. date the work will start
3. date the work will end
4. potential impacts on the adjacent property
5. company representative's name
6. company representative's phone number where they can be reached or a message can be left

Company representative must respond to all phone calls received within 18 hours of receipt with the requested information. Provide notices at least 48 hours in advance of the work. The dates in the notice must represent only those dates when work is anticipated at the specific address. The project duration must not be used as a substitute for actual site dates. Hangers without proper dates must be reissued to adjacent property owners at your expense. The Engineer must review and approve notice wording prior to distribution. Do not place notices

inside mailboxes. Notices must be hand delivered or made up as a door hanger. This notice is in addition to notice required for water service interruptions.

7-1.03A(1) Street Maintenance

Street maintenance activities, including:

1. overlays
2. reconstruction
3. slurry seal
4. micro-surfacing
5. other surfacing or seal coats

require you notify all residents and businesses within 300 feet or one block (whichever is a greater distance) of the work areas between three and five days in advance of the work. This notification must be in the form of a door hanger which is to be hand-delivered or placed on the front door of each business or residence. A sample door hanger is included in the appendix of the engineering standards.

7-1.03A(2) Street Closure

Where street closures are allowed either under the conditions of the special provisions or by separate authority of the Engineer, comply with the following conditions.

By noon Monday, submit a written schedule of planned closures for the following week period, defined as Friday noon through the following Friday noon.

The street closure schedule must show the:

1. locations
2. dates
3. times

of the proposed street closures. Street closure schedules submitted to the Engineer with any:

1. incomplete
2. unintelligible
3. inaccurate information

will be returned for correction and resubmittal. The Engineer will review and approve or return for corrections the street closure schedule. You may be required to coordinate with other parties as a condition of approval of the street closure schedule.

Provide notification to:

1. police dispatch
2. bus services
3. garbage company
4. affected properties as described above

of the street closure.

Immediately notify the Engineer if a scheduled street closure will not take place. Amendments to the street closure schedule, including adding additional closures, must be submitted to the Engineer for review and approval, and must be done in writing at least three working days in advance of a planned street closure. Approval of amendments to the street closure schedule will be at the discretion of the Engineer. Approved closures that are cancelled due to unsuitable weather may be rescheduled at the discretion of the Engineer for the following working day.

Public traffic may only be restricted during those times when work is actually underway.

7-1.03A(3) No Parking

Place "No Parking" signs at least 24 hours before beginning of work. In areas where vehicles may be in the way of construction, place and request Police Department verify "No Parking" signs at least 30 hours prior to the beginning of work to allow for the legal time required for notification prior to removing a vehicle..

Do not place "No Parking" signs more than five days in advance of the anticipated work without prior approval from the Engineer.

If no work is performed for five consecutive days, remove the "No Parking" signs and reposted as stated above prior to the start of work.

"No Parking" signs must specify the following:

No Parking
Construction Zone
Tow Away
Per Municipal Code 10.36.040 and CVC 22651(m)
Towed Vehicles Contact SLOPD 781-7312
Date: XXXXX to XXXXXX
Time: XXXXX to XXXXXX
Contractor:
Contractor Office Number:

7-1.03B Traffic Control Plan

Submit to the Engineer a traffic control plan for review and approval by the Engineer prior to any construction activities starting and prior to issuance of an encroachment permit. Submit separate traffic control plans for each phase of the work requiring a change in traffic control. Allow a minimum of five working days for review of the submitted traffic control plan and five working days for review of any resubmitted plans. Do not begin work until the traffic control plan is approved by the Engineer.

Limited work hours may be imposed at any time. If the work impacts traffic flow on any:

1. major route, or
2. in the vicinity of schools, or
3. the downtown,

expect that work hour restrictions will be imposed by the Engineer.

Do not restrict the public right-of-way roadway without an approved traffic control plan. The Engineer must review the implemented traffic control for compliance with the approved traffic control plan, prior to the start of any work.

Provide adequate width to allow a bike lane adjacent to the travel lane or provide clear posting that the bicycle lane is closed.

Do not place traffic control devices or construction equipment in bike lanes or in sidewalk such that they are blocked, as determined by the Engineer, when these facilities are open for use.

7-1.04 PUBLIC SAFETY

Replace 14th paragraph of section 7-1.04 with:

Notify the Engineer not less than five days and not more than 40 days before the anticipated start of an activity that will change the vertical or horizontal clearance available to traffic, including shoulders.

Add between the 18th and 19th paragraphs of section 7-1.04: *(RSS Revision)*

Temporary facilities that could be a hazard to public safety if improperly designed must comply with design requirements described in the Contract for those facilities or, if none are described, with standard design criteria or codes appropriate for the facility involved. Submit shop drawings and design calculations for the temporary facilities and show the standard design criteria or codes used. Shop drawings and supplemental calculations must be sealed and signed by an engineer who is registered as a civil engineer in the State.

8 PROSECUTION AND PROGRESS

8-1.02 SCHEDULE

Replace section 8-1.02A with:

8-1.02A General

Submit the type of schedule specified in the special provisions. If no type is specified, submit a Level 1.

Acceptance of the schedule will not relieve you of the responsibility for accomplishing the all the work in compliance with the contract.

You agree by submission of a bid, that the work can be completed within contract duration and working hour restrictions.

The Engineer will not accept a schedule which shows a project completion date in excess of the contract time duration. No progress payments will be paid until the Engineer has approved the project schedule.

Float time shown on the approved project schedule is not for exclusive use or benefit of either you or the Engineer. Float time is available for use by either you or the Engineer whoever needs it first in order to:

1. minimize the impact of project problems
2. delays
3. changes in the work

You agree that float time may be used by the Engineer to resolve project problems. You agree that there will be no basis for any modification of the

1. project milestone dates
2. an extension of the contract time
3. a claim for additional compensation

as a result of any:

1. project problem
2. change orders
3. delay

that only results in the loss of available float on the project schedule.

On a monthly basis prior to application for payment, you must arrange a meeting with the Engineer to review your updated project schedule. Updates must include accurate progress data and be based upon your best judgment. Updates must be made to the project schedule in consultation with all subcontractors and suppliers.

8-1.02A(1) Privately Funded Encroachment Permits, Projects, Tracts and Subdivisions

For privately funded projects, submit a copy of the project schedule prior to the start of work. The schedule must be a Level 1 schedule and at a minimum show:

1. the start of work
2. all major phases of the project
3. the project completion date

Schedule updates must be submitted when prepared or as requested by the Engineer.

8-1.02B Level 1 Critical Path Method Schedule

8-1.02B(1) General

Replace 1st paragraph in section 8-1.02B(1) with:

Section 8-1.02B applies to a contract with a total bid less than \$1 million and less than 100 original working days.

Add to section 8-1.02B

8-1.02B(4) Payment

Full compensation for work specified in section 8-1.02A and 8-1.02B is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

8-1.02C Level 2 Critical Path Method Schedule

8-1.02C(1) General

Replace 1st paragraph in section 8-1.02C(1) with: *(RSS Revision)*

Section 8-1.02C applies to a contract with:

1. a total bid less than \$1 million and 100 or more original working days
2. a total bid from \$1 to \$5 million or
3. a total bid over \$5 million and less than 100 original working days.

8-1.03 PRECONSTRUCTION CONFERENCE

Replace section 8-1.03 with:

The Engineer will execute the contract with the successful bidder upon receipt of:

1. bonds
2. insurance
3. signed agreement

The Engineer will set a date for the pre-construction conference. The pre-construction conference will take place within 15 working days of the execution of the contract by the Engineer. Attendance by your representative is required.

The pre-construction conference will generally be held on a Thursday or Friday.

8-1.04 START OF JOB SITE ACTIVITIES

8-1.04B Standard Start

Replace section 8-1.04B with:

The contract time, as stated in the special provisions, will begin on the date specified in the notice to proceed, generally the second Monday following the pre-construction conference. Work must commence within ten working days from the start of contract time. Failure to start work within the allotted time period, without written approval of the Engineer, is considered abandonment of the work and the Engineer may terminate your control over the work in compliance with section 8-1.13.

Work must be diligently prosecuted to completion before the expiration of the contract time provided in the special provisions, beginning on, and including, the start date given in the notice to proceed.

Private projects may begin following receipt of required approvals and noticing for inspection staff.

8-1.05 TIME

Replace section 8-1.05 with:

You must complete all of the work called for under the contract within the time set forth in the special provisions.

You must complete any designated portion of the project within the time as shown or specified.

Determination that a day is a non-working day by reason of inclement weather or conditions resulting from, will be made by the Engineer.

The Engineer will provide the status of working days on the monthly progress payment, including:

1. total days
2. days used
3. days remaining

You are responsible to verify the days are correctly shown on the pay estimate. If you believe an error has been made, notify the Engineer in writing within 15 days of receipt of the pay estimate, or the status of days is deemed accepted as correct.

Complete all work including punch list items before the expiration of the contract time.

Monthly status of working days will only be provided when working days are being charged and monthly payment is due to you.

8-1.06 SUSPENSIONS

Replace headings and paragraphs in section 8-1.06 with: (RSS Revision)

The Engineer may suspend work wholly or in part due to conditions unsuitable for work progress. Provide for public safety and a smooth and unobstructed passageway through the work zone during the suspension in compliance with sections 7-1.03 and 7-1.04.

The Engineer may suspend work wholly or in part due to your failure to:

1. fulfill the Engineer's orders
2. fulfill a Contract part
3. perform weather-dependent work when conditions are favorable so that weather-related unsuitable conditions are avoided or do not occur.

The Engineer may provide for a smooth and unobstructed passageway through the work during the suspension and deduct the cost from payments. No time adjustment will be made for the suspension.

Upon the Engineer's order of suspension, suspend work immediately. Resume work when ordered.

8-1.07 DELAYS

8-1.07B Time Adjustments

Replace 1st paragraph in section 8-1.07B with: (RSS Revision)

For a critical delay, the City may make a time adjustment. The Engineer uses information from the schedule to evaluate requests for time adjustments.

8-1.07C Payment Adjustments

Replace 1st paragraph in section 8-1.07C with: (RSS Revision)

For an excusable delay that affects your costs, the City may make a payment adjustment.

The City does not make a payment adjustment for overhead incurred during non-working days that extend the Contract into an additional construction season.

8-1.10 LIQUIDATED DAMAGES

8-1.10A General

Replace 1st paragraph in section 8-1.10A with: (RSS Revision)

The City specifies liquidated damages (Pub Cont Code § 10226). Liquidated damages, if any, accrue starting on the 1st day after the expiration of the working days through the day of Contract acceptance except as specified in sections 8-1.10B and 8-1.10C.

Replace 3rd paragraph in section 8-1.10A with:

Liquidated damages per day amount are as directed in the special provisions.

8-1.10B Failure to Complete Work Parts within Specified Times

Add to section 8-1.10B.

8-1.10B(1) Failure To Coordinate Signal Turn-Ons, Striping And Signing

If signal turn-on, road striping, and signing are not coordinated as required by the project specifications, damage will be sustained by the City and its residents. Since it is and will be impractical to determine the actual damage which the City and its residents will sustain by reason of your failure to comply with the project specifications, it is agreed that you will pay to the City the sum of \$500 per day for each:

1. day that you fail to stripe the road
2. day that you fail to install required signs after the third day after a signal is turned on

3. day that you fail to turn on a signal after the second day after striping the road
4. day that you fail to remove signs which conflict with new striping
5. day that you fail to install signs as shown or specified

9 PAYMENT

Add to Section 9-1.02

Final pay item quantities are designated with an "(F)" in the bid item list.

9-1.03 PAYMENT SCOPE

Add to list in 1st paragraph in section 9-1.03: (RSS Revision)

Any royalties and costs arising from patents, trademarks, and copyrights involved in the work

Replace 1st item in 3rd paragraph in section 9-1.03 with: (RSS Revision)

Full compensation for all work involved in each bid item shown on the Bid Item List by the unit of measure shown for that bid item

Delete the 11th and 12th paragraphs in section 9-1.03.

Add to section 9-1.03.

When the Engineer does not retain a portion of the funds during the prosecution of the work, as required on federally funded projects, you may not retain a portion of the funds due to subcontractors when making progress payments.

The City does not pay interest on progress payment retentions.

Your bid prices includes all items of work and materials as shown and called out in the project special provisions necessary to complete all the work. The contract prices for doing the work include full compensation for furnishing all:

1. labor
2. materials
3. tools
4. equipment
5. incidentals

to complete the work.

Any items of work that does not have a separate pay item is considered included in other items cost of work and no additional compensation will be paid.

9-1.04 FORCE ACCOUNT

9-1.04A General

Replace 3rd paragraph in section 9-1.04A with: (RSS Revision)

The markups specified for labor, materials, and equipment include compensation for all delay costs, overhead costs, and profit.

Add to section 9-1.04A.

When force account or extra work is in dispute, you must still review your daily work report for the disputed work with the Engineer every day. The daily work must be signed by the Engineer daily to verify that your report has been reviewed. Final determination as to whether the work is included in the contract work or is extra work, may be decided after the work is completed.

Add to section 9-1.04A. (RSS Revision)

For non-subcontracted work paid by force account for a contract with a Time Related Overhead (TRO) bid item, the markups are those shown in the following table instead of those specified in sections 9-1.04B–D:

Cost	Percent markup
Labor	30
Materials	10
Equipment rental	10

9-1.04B Labor
Add to section 9-1.04B.

For the purposes of calculating the cost of extra work or force account payment:

1. owner
2. superintendents
3. other salaried employees

performing work on the project must be billed at the prevailing wage corresponding to the type of work performed as shown in the current labor rate publication.

9-1.04D Equipment Rental

9-1.04D(1) General

Add to section 9-1.04D(1).

You must submit a list of equipment anticipated to be used on the project and the associated Caltrans equipment rental rate. If there is no established rate for equipment planned to be used, furnish that information to the Engineer. Provide equipment submittal with Caltrans rates at the pre-construction conference. The most current Caltrans equipment rental rate publication at the date of contract award will be used for the entire project.

9-1.07 PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS

Delete section 9-1.07.

9-1.11 TIME RELATED OVERHEAD

Replace section 9-1.11 with: *(RSS Revision)*

9-1.11A General

Section 9-1.11 applies if a bid item for time-related overhead is included in the Contract. If a bid item for time-related overhead is included, you must exclude the time-related overhead from every other bid item price.

9-1.11B Payment Quantity

The TRO quantity does not include the number of working days to complete plant establishment work.

For a contract with a TRO lump sum quantity on the Bid Item List, the City pays you based on the following conversions:

1. LS unit of measure is replaced with WDAY
2. Lump sum quantity is replaced with the number of working days bid
3. Lump sum unit price is replaced with the item total divided by the number of working days bid

9-1.11C Payment Inclusions

Payment for the TRO bid item includes payment for time-related field- and home-office overhead for the time required to complete the work.

The field office overhead includes time-related expenses associated with the normal and recurring construction activities not directly attributed to the work, including:

1. Salaries, benefits, and equipment costs of:
 - a. Project managers
 - b. General superintendents
 - c. Field office managers
 - d. Field office staff assigned to the project
2. Rent
3. Utilities

4. Maintenance
5. Security
6. Supplies
7. Office equipment costs for the project's field office

The home-office overhead includes the fixed general and administrative expenses for operating your business, including:

1. General administration
2. Insurance
3. Personnel and subcontract administration
4. Purchasing
5. Accounting
6. Project engineering and estimating

Payment for the TRO bid item does not include payment for:

1. The home-office overhead expenses specifically related to:
 - a. Your other contracts or other businesses
 - b. Equipment coordination
 - c. Material deliveries
 - d. Consultant and legal fees
2. Non-time-related costs and expenses such as mobilization, licenses, permits, and other charges incurred once during the Contract
3. Additional overhead involved in incentive/disincentive provisions to satisfy an internal milestone or multiple calendar requirements
4. Additional overhead involved in performing additional work that is not a controlling activity
5. Overhead costs incurred by your subcontractors of any tier or suppliers

9-1.11D Payment Schedule

For progress payments, the total work completed for the TRO bid item is the number of working days shown for the pay period on the progress payment.

For progress payments, the City pays a unit price equal to the lesser of the following amounts:

1. Price per working day as bid or as converted in compliance with section 9-1.11B.
2. 20 percent of the total bid divided by the number of original working days

For a contract without plant establishment work, the City pays you the balance due of the TRO item total in compliance with section 9-1.17B

For a contract with plant establishment work, the City pays you the balance due of the TRO item total in the 1st progress payment after all non-plant establishment work is completed.

9-1.11E Payment Adjustments

The 3rd paragraph of section 9-1.17C does not apply.

The City does not adjust the unit price for an increase or decrease in the TRO quantity except as specified in section 9-1.11E.

Section 9-1.17D(2)(b) does not apply except as specified for the audit report below.

If the TRO bid item quantity exceeds 149 percent of the quantity shown on the Bid Item List or as converted under section 9-1.11B, the Engineer may adjust or you may request an adjustment of the unit price for the excess quantity. For the adjustment, submit an audit report within 60 days of the Engineer's request. The report must be prepared as specified for an audit report for an overhead claim in section 9-1.17D(2)(b).

Within 20 days of the Engineer's request, make your financial records available for an audit by the State for the purpose of verifying the actual rate of TRO described in your audit. The actual rate of TRO described is subject to the Engineer's authorization.

The City pays the authorized actual rate for TRO in excess of 149 percent of the quantity shown on the Bid Item List or as converted under section 9-1.11B.

The City pays for 1/2 the cost of the report; the Contractor pays for the other 1/2. The cost is determined under section 9-1.05.

9-1.16 PROGRESS PAYMENTS

**9-1.16A General
Add to section 9-1.16A**

Progress payments will provide you compensation for work and eligible materials through the last day of the month. No progress payment will be made when the work is not proceeding in compliance with the contract or when the total value of the work done since the last progress payment is less than \$300, as determined by the Engineer. Payment will be made within 30 days of the last day of the month.

**9-1.16C Materials on Hand
Replace section 9-1.16C with:**

Materials on hand but not incorporated into the work are eligible for progress payment of fifty percent (50%) of the value of the materials furnished and delivered and unused. For materials to be eligible for progress payment:

1. the cost of the materials must be greater than \$20,000
2. an invoice is provided for the material clearly showing the material is for this current work and cost
3. the material is stored in a secure yard and made available to the Engineer for inspection
4. a request for partial payment is made

**Replace section 9-1.16D with: (RSS Revision)
9-1.16D Mobilization**

9-1.16D(1) General

Section 9-1.16D applies if a bid item for mobilization is shown on the Bid Item List.

Payments for mobilization made under section 9-1.16D are in addition to the partial payments made under Pub Cont Code § 10261.

Section 9-1.16D(2) applies unless the Contract includes a special provision for section 9-1.16D(1) that specifies section 9-1.16D(3) applies.

9-1.16D(2) Mobilization for Projects Except for Those Over Water Requiring Marine Access

The City makes partial payments for mobilization under Pub Cont Code § 10264(a) except the amount of work completed does not include the amount earned for mobilization. The partial payment amount is reduced by a prorated amount bid in excess of the maximum allowed under Pub Cont Code § 10264(a)(5).

The City pays the item total for mobilization in excess of the maximum allowed under Pub Cont Code § 10264(a)(5) in the 1st payment after Contract acceptance.

9-1.16E Withholds

9-1.16E(2) Progress Withholds

Replace 1st paragraph in section 9-1.16E(2) with: (RSS Revision)

The City withholds 10 percent of a progress payment for noncompliant progress. Noncompliant progress occurs when:

1. Total days to date exceed 75 percent of the working days
2. Percent of working days elapsed exceeds the percent of value of work completed by more than 15 percent

Add to section 9-1.16E(2).

The City may withhold a portion of your payment for fines and mitigation imposed by outside regulatory authorities, as a result of your failure to comply with regulations and permits.

9-1.16E(4) Stop Notice Withholds

Add to section 9-1.16E(4).

The City will withhold 125 percent of the value of all Stop Notices, pursuant to Section 3179 et seq. of the Civil Code.

9-1.16F Retentions

Replace section 9-1.16F with:

Public Contract Code 7202 does not apply to the City.

Unless defined differently in the special provisions the Engineer will withhold and retain five percent of the estimated value of the work done from each progress payment.

9-1.17 PAYMENT AFTER CONTRACT ACCEPTANCE

9-1.17C Proposed Final Estimate

Replace 2nd paragraph in section 9-1.17C with: *(RSS Revision)*

Submit either a written acceptance of the proposed final estimate or a claim statement postmarked or hand delivered before the 31st day after receiving the proposed final estimate.

Delete 3rd paragraph in section 9-1.17C.

9-1.17D Final Payment and Claims

9-1.17D(1) General

Replace section 9-1.17D(1) with:

If you accept the proposed final estimate or do not submit a claim statement within 30 days of receiving the proposed final estimate, the Engineer will process the proposed final estimate for payment. The final payment will not be due and payable until the expiration of 40 days from the date the notice of completion is filed with the County of San Luis Obispo. The Notice of Completion will be filed within five days of formal acceptance of the work by the City Council or its designated representative, upon the recommendations of the Engineer. This final estimate and payment is conclusive except as specified in sections 5-1.27, 6-3.06, and 9-1.21.

If you submit a claim statement within 30 days of receiving the Engineer's proposed final estimate, the Engineer will process for payment the proposed final pay estimate for payment of the uncontested amount due. The Engineer will pay the uncontested amount due within 40 days from the date the notice of completion is filed with the County of San Luis Obispo. The uncontested amount due estimate is conclusive as to the amount of work completed and the amount payable except as affected by the claims or as specified in sections 5-1.27, 6-3.06, and 9-1.21.

9-1.17D(2) Claim Statement

9-1.17D(2)(a) General

Add to section 9-1.17D(2)(a).

For each claim, submit a claim statement showing:

1. The identification number
2. Date the Initial Potential Claim was furnished to the Engineer
3. Date the Supplemental Potential Claim was furnished to the Engineer
4. The final amount of additional payment requested
5. Attach a copy of the Full and Final Potential Claim Record

Submit claims to:

City Engineer
City of San Luis Obispo – Public Works Department
919 Palm Street
San Luis Obispo, CA 93401

9-1.17D(2)(b) Overhead Claims

Replace 6th paragraph in section 9-1.17D(2)(b) with: (RSS Revision)

The CPA's audit must be performed as an examination-level engagement under the attestation engagements in the *Government Auditing Standards* published by the Comptroller General of the United States. The CPA's audit report must express an opinion whether or not your calculations of your actual field and home office overhead daily rates comply with section 9-1.17D(2)(b). The attest documentation prepared by the CPA in connection with the audit must be reproduced and submitted for review with the audit report.

9-1.17D(2)(d) Waiver

Add to 1st paragraph in section 9-1.17D(2)(d).

6. You did not comply with applicable notice or protest requirements including but not limited to:
 - a. section 4-1.06
 - b. section 5-1.06
 - c. section 5-1.42
 - d. section 8-1.07

9-1.17D(3) Final Determination of Claims

Delete 6th paragraph in section 9-1.17D(3)

9-1.22 CLAIM RESOLUTION PROCEDURE

Replace section 9-1.22 with:

Claim Resolution Procedure is substituted for arbitration provisions and is as follows:

1. For all claims contested by the Engineer and not included in the semifinal estimate, the Engineer may request additional information within 30 days of submittal of the semifinal estimate. A proof of mailing or delivery must be retained.
2. You must submit to the Engineer the information requested for each claim within 30 days of the date of mailing of the Engineer's request. Proof of mailing or Engineer's receipt will be retained for the submittal. Failure to timely submit the information requested is deemed a waiver of the claim.
3. The Engineer will submit a written response to you for each claim within 30 days after the date of mailing of your submittal, or if the Engineer did not request additional information, within 30 days of submittal of the semifinal estimate.
4. If you dispute the Engineer's written response to any claim, or the Engineer fails to respond within the time specified, you must notify the Engineer in writing, either within 15 days of the Engineer's response or the Engineer's failure to respond within the specified time period, and demand an informal meeting to discuss and attempt to settle the issues remaining in dispute. Upon receipt of such a demand, the Engineer will schedule such a meeting within 30 days.
5. Following the meeting if any claim or portion thereof remains in dispute, you may file a claim as provided in Government Code 910 and following.
6. Either party may request non-binding mediation at any time following the informal meeting in an attempt to settle any issues remaining in dispute. If both sides agree to mediation and agree on a mediator, the parties must pay equally the fees and expenses of the mediator.
7. If either party initiates litigation against the other, within 60 days, but no earlier than 30 days, following the filing of the responsive pleading, the court may submit the matter to nonbinding mediation unless both parties stipulate to waive this requirement. The parties must select a disinterested third person as mediator within 15 days following the 60th day after the filing of the responsive pleading, and the mediation must commence within 30 days of selection of the mediator, unless the parties stipulate otherwise, or the court, on a showing of good cause, orders a time extension. If the parties fail to select a mediator within the 15 day period, any party may petition the court to appoint the mediator. The parties must pay equally the fees and expenses of the mediator. The court may, upon either party's request, order any witnesses to participate in the mediation process. The party requesting the appearance of any witness must pay the costs and expenses of the witness.

9-1.23 CITY BILLING

Add to section 9-1

Where City staff and equipment are used for work, billing will be done at the hourly billing rate for City staff in compliance with the City's Revenue Management Manual. City materials and equipment will be billed in compliance with section 9-1.04. Work performed by a third party will be billed at the amount charged to the City for the work plus an additional five percent markup. The total cost plus markup may be retained from contract or for private work billed to permittee.

DIVISION II GENERAL CONSTRUCTION

10 GENERAL

Replace section 10 with: *(RSS Revision)*

10-1 GENERAL

10-1.01 GENERAL

Section 10 includes general specifications for general construction work.

10-1.02 WORK SEQUENCING

Before obliterating any traffic stripes, pavement markings, and pavement markers to be replaced at the same location, reference the stripes, markings, and markers. Include limits and transitions with control points to reestablish the new stripes, markings, and markers.

10-1.03 TIME CONSTRAINTS

Reserved

10-1.04 TRAINING AND MEETINGS

Training and meetings are held at times and locations you and the Engineer agree to.

10-6 JOB SITE WATER CONTROL

10-6.01 GENERAL

Section 10-6 includes specifications for controlling water to provide a dry working area at the job site.

10-6.02 WATER-FILLED COFFERDAM

Reserved

11 QUALITY CONTROL AND ASSURANCE

11-2 RESERVED

Replace section 11-2 with: *(RSS Revision)*

Reserved

11-3 WELDING

11-3.01 GENERAL

11-3.01A General

Replace 3rd paragraph in section 11-3.01A with: *(RSS Revision)*

Wherever reference is made to the following AWS welding codes in the Contract, the year of adoption for these codes is shown in the following table:

AWS code	Year of adoption
D1.1	2010
D1.3	2008
D1.4	2011
D1.5	2010
D1.6	2007
D1.8	2009

11-3.01B Definitions

Replace section 11-3.01B with: *(RSS Revision)*

continuous inspection: QC Inspector must be within close proximity of all welders or welding operators so that inspections by the QC Inspector of each welding activity at each welding location do not lapse for a period exceeding 30 minutes.

gross nonconformance: Rejectable indications are present in more than 20 percent of the tested weld length.

11-3.01C Quality Control Inspector

Replace 1st paragraph in section 11-3.01C with: *(RSS Revision)*

Replace clause 6.1.3 of AWS D1.1, the 1st paragraph of clause 7.1.2 of AWS D1.4, and clause 6.1.2 of AWS D1.5 with:

1. The QC Inspector must be the duly assigned person who acts for and on your behalf for inspection, testing, and quality related matters for all welding.
2. Quality assurance is the prerogative of the Engineer. The QA Inspector is the duly designated person who acts for and on behalf of the Engineer.
3. The QC Inspector must be responsible for QC acceptance or rejection of materials and workmanship.
4. Where the term "Inspector" is used without further qualification, it refers to the QC Inspector.

Replace 3rd paragraph of section 11-3.01C with: *(RSS Revision)*

For each inspection, including fit-up, WPS verification, and final weld inspection, the QC Inspector must confirm and document compliance with the specifications, AWS welding codes, and any referenced drawings.

11-3.01D Personnel Qualifications and Certifications

Replace section 11-3.01D with: *(RSS Revision)*

The Engineer has the authority to verify the qualifications or certifications of any welder, QC Inspector, or NDT personnel to specified levels by retests or other means determined by the Engineer. If welding will be performed without gas shielding, then qualification must also include welding without gas shielding.

Replace clause 6.14.6.1 of AWS D1.1, clause 7.8 of AWS D1.4, and clause 6.1.3.4 of AWS D1.5 with:

Personnel performing NDT must be qualified and certified under American Society for Nondestructive Testing (ASNT) Recommended Practice No. SNT-TC-1A and the written practice of the NDT firm. The written practice of the NDT firm must comply with or exceed the guidelines of the ASNT Recommended Practice No. SNT-TC-1A. Individuals who perform NDT, review the results, and prepare the written reports must be one of the following:

1. Certified NDT Level II technicians
2. Level III technicians certified to perform the work of Level II technicians

11-3.01E Weld Joint Details

Replace section 11-3.01E with: (RSS Revision)

If weld joint details proposed for use in the work are not prequalified under clause 3 of AWS D1.1 or figure 2.4 or 2.5 of AWS D1.5, submit the proposed WPS and the intended weld joint locations.

Upon authorization of the proposed joint detail locations and qualification of the proposed joint details, welders and welding operators using these details must weld an additional qualification test plate using the WPS variables and the weld joint detail to be used in production. The test plate must:

1. Have the maximum thickness to be used in production and a minimum length of 18 inches.
2. Be mechanically and radiographically tested. Mechanical and radiographic testing and acceptance criteria must comply with the applicable AWS codes.

If a nonprequalified weld joint configuration is proposed using a combination of WPSs for work welded under AWS D1.1, you may conduct a single test combining the WPSs to be used in production, if the essential variables, including weld bead placement, of each process are limited to those established in table 4.5 of AWS D1.1.

The Engineer will witness all procedure qualification tests for WPSs that were not previously authorized by the City.

Submit an inspection request form to METS at least 7 days before performing any procedure qualification tests. Notify the Engineer of your submittal. Witnessing of qualification tests by the Engineer does not constitute authorization of the intended joint locations, welding parameters, or essential variables.

11-3.01F Nondestructive Testing

Replace 1st and 2nd paragraph in section 11-3.01F with: (RSS Revision)

Replace paragraph 3 of clause 6.26.3.2 of AWS D1.5 with:

3. If indications that exhibit these planar characteristics are present at scanning sensitivity, or other evidence exists to suggest the presence of transverse cracks, a more detailed evaluation of the discontinuity by other means must be performed (e.g., alternate UT techniques, RT, grinding, or gouging for visual inspection or MT of the excavated areas.). For welds that have transverse cracks, excavate the full length of the crack plus 2 inches of weld metal on each side adjacent to the crack and reweld.

Clause 6.6.5 of AWS D1.1, clause 7.6.5 of AWS D1.4, and clause 6.6.5 of AWS D1.5 do not apply.

11-3.02 WELDING QUALITY CONTROL

11-3.02A General

Replace 1st paragraph in section 11-3.02A with: (RSS Revision)

Except for stud welding, section 11-3.02 applies to (1) work welded under sections 49, 52, 55, and 75-1.03E and (2) work in section 99 that must comply with an AWS welding code.

11-3.02C Submittals

11-3.02C(2) Welding Quality Control Plan

Replace 4th, 5th, and 6th paragraphs in section 11-3.02C(2) with: (RSS Revision)

Submit an amended welding QC plan or an addendum to the welding QC plan for any changes to:

1. WPSs
2. NDT firms
3. QC personnel or procedures
4. NDT personnel or procedures
5. Systems for tracking and identifying welds
6. Welding personnel

Allow 15 days for the Engineer's review of an amended welding QC plan or an addendum to the welding QC plan.

Submit 7 copies of each authorized QC plan and any authorized addendums. Make 1 copy available at each location where work is performed.

11-3.02C(3) Welding Report

Replace 1st paragraph in section 11-3.02C(3) with: (RSS Revision)

Submit a welding report within 7 days following the performance of any welding. The welding report must include:

1. Daily production log for welding for each day that welding is performed
2. Reports of all visual weld inspections and NDT performed, whether specified, additional, or informational
3. Radiographs and radiographic reports, and other required NDT reports
4. Summary of welding and NDT activities that occurred during the reporting period
5. Reports of each application of heat straightening
6. Summarized log listing the rejected lengths of weld by welder, position, process, joint configuration, and piece number
7. Documentation that you have:
8. Evaluated all radiographs and radiograph reports and NDT and NDT reports
9. Corrected all rejectable deficiencies and that all repaired welds have been reexamined using the required NDT and found acceptable
10. Reports or chart recordings of each application of any stress relieving used
11. Reports and chart recordings for any electroslag welding used

Replace 3rd paragraph in section 11-3.02C(3) with: (RSS Revision)

Clearly write the following information on the outside of radiographic film envelopes:

1. Name of the QC manager
2. Name of the NDT firm
3. Name of the radiographer
4. Date
5. Contract number
6. Complete part description
7. All included weld numbers, report numbers, and station markers or views as detailed in the welding QC plan

Replace 5th paragraph in section 11-3.02C(3) with: (RSS Revision)

The QC Inspector or certified technician must sign all visual inspection and NDT reports and submit them daily to the welding QC manager for review and signature before submittal to the Engineer. Corresponding names must be clearly printed or typewritten next to all signatures.

11-3.02D Personnel Qualifications and Certifications
Replace section 11-3.02D with: (RSS Revision)

Clauses 6.1.4.1 and 6.1.4.3 of AWS D1.1, the 2nd paragraph of clause 7.1.2 of AWS D1.4, clauses 6.1.3.1 through 6.1.3.3 of AWS D1.5, and clause 7.2.3 of AWS D1.8 are replaced with:

The QC Inspector must be currently certified as an AWS Certified Welding Inspector under AWS QC1. The QC Inspector may be assisted by an Assistant QC Inspector provided that this individual is currently certified as an AWS Certified Associate Welding Inspector under AWS QC1. The Assistant QC Inspector may perform inspection under the direct supervision of the QC Inspector provided the assistant is always within visible and audible range of the QC Inspector. The QC Inspector must be responsible for signing all reports and for determining if welded materials comply with the workmanship and acceptance criteria. The ratio of QC Assistants to QC Inspectors must not exceed 5 to 1.

Welding inspection personnel or NDT firms to be used in the work must not be employed or compensated by any subcontractor or by other persons or entities hired by subcontractors who will provide other services or materials for the Contract, unless one of the following conditions is met:

1. Work is welded at a permanent fabrication or manufacturing plant that is certified under the AISC Certification Program for Steel Bridge Fabricators, Intermediate Bridges, and Fracture-Critical Member endorsement if required.
2. Structural steel for building construction work is performed at a permanent fabrication or manufacturing plant that is certified under the AISC Quality Certification Program, Category STD, Standard for Steel Building Structures.

Except for the exempt facilities identified above, an authorized independent third party must witness the qualification tests for welders or welding operators. The independent 3rd party must be currently certified as a CWI and must not be an employee of the Contractor performing the welding. Allow 15 days for the Engineer to review the qualifications and copy of the current certification of the independent 3rd party.

11-3.02F Welding Procedures Qualification
Replace section 11-3.02F with: (RSS Revision)

Welding procedures qualification for work welded under AWS D1.5 must comply with clause 5.12 or 5.12.4 of AWS D1.5 and the following:

1. Unless considered prequalified, qualify fillet welds in each position. Conduct the fillet weld soundness test using the essential variables of the WPS as established by the PQR.
2. For qualifying joints that do not comply with figures 2.4 and 2.5 of AWS D1.5, conduct the test complying with figure 5.3 using the welding parameters that were established for the test conducted complying with figure 5.1.
3. Macroetch tests are required for WPS qualification tests, and acceptance must comply with clause 5.19.3 of AWS D1.5.
4. If a nonstandard weld joint is to be made using a combination of WPSs, you may conduct a test under figure 5.3, combining the qualified or prequalified WPSs to be used in production, if the essential variables, including weld bead placement, of each process are limited to those established in table 5.3 of AWS D1.5.
5. Before preparing mechanical test specimens, inspect the PQR welds by visual and radiographic tests. The backing bar must be 3 inches in width and must remain in place during NDT. Results of the visual and radiographic tests must comply with clause 6.26.2 of AWS D1.5 excluding clause 6.26.2.2. All other requirements for clause 5.17 are applicable.

11-3.02G Repair Work
Replace section 11-3.02G with: (RSS Revision)

Notify the Engineer immediately when you discover welding problems, deficiencies, base metal repairs, or any other type of repairs not included in the welding QC plan. Submit the proposed repair procedures to correct them.

Allow the Engineer 7 days to review the repair procedures.

You must receive authorization before performing:

1. 3rd-time excavations of welds or base metal to repair unacceptable discontinuities, regardless of NDT method
2. Repairs of cracks
3. Repairs not included in the welding QC plan

Requests to perform 3rd-time excavations, repairs of cracks, or repairs not included in the welding QC plan must include an engineering evaluation. At a minimum, the engineering evaluation must address:

1. Cause of each defect
2. Why the repair will not degrade the material properties
3. What steps are being taken to prevent similar defects from happening again

12 TEMPORARY TRAFFIC CONTROL

12-1 GENERAL

12-1.01 GENERAL

Replace 1st paragraph in section 12-1.01 with:

Section 12-1 includes general specifications for:

1. flagging
2. placing and installing temporary traffic-handling equipment and devices
3. maintaining traffic
4. placing and installing temporary traffic control systems
5. placing temporary pavement delineation

in compliance with approved traffic control plan and Engineer authorized field adjustments.

You must provide all:

1. signs
2. lights
3. barricades
4. programmable message boards
5. other facilities

to provide protection and warning for public traffic. Traffic cones must be used to delineate detoured lanes.

12-1.03 FLAGGING COSTS

Replace section 12-1.03 with:

Full compensation for work specified in section 12-1.03 in compliance with sections 7-1.03 and 7-1.04 is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

12-1.04 TEMPORARY TRAFFIC CONTROL COSTS

Add section 12-1.04.

Full compensation for work specified in section 12 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

12-3 TRAFFIC-HANDLING EQUIPMENT AND DEVICES

12-3.01 GENERAL

12-3.01A General

12-3.01A(4) Quality Control And Assurance

Replace 1st paragraph in section 12-3.01A(4) with: *(RSS Revision)*

Category 2 temporary traffic control devices must be on FHWA's list of acceptable, crashworthy Category 2 hardware for work zones. This list is available on FHWA's Safety Program Web site.

12-3.02 BARRICADES

12-3.02C Construction

Replace 4th 4th paragraph in section 12-3.02C with: *(RSS Revision)*

If barricades are required after sunset, lights and flashing beacons are required. Do not remove barricades that are shown to be left in place at the time of work completion.

12-3.03 FLASHING ARROW SIGNS

12-3.03B Materials

Replace 2nd paragraph in section 12-3.03B with: *(RSS Revision)*

Flashing arrow signs must be capable of being operated in the following display modes:

1. Pass Left Display
2. Pass Right Display
3. Simultaneous Display
4. Caution Display or Alternating Diamond

12-3.07 CHANNELIZERS

12-3.07C Construction

Replace 3rd paragraph in section 12-3.07C with: *(RSS Revision)*

Do not remove channelizers that are shown to be left in place at the time of work completion.

Add to section 12.

12-8 TEMPORARY PAVEMENT DELINEATION

12-8.01 GENERAL

Furnish and install:

1. raised reflective pavement markers
2. paint for lane lines
3. legends

Install temporary lane lines and legends using paint. Install temporary striping, prior to opening the travel lanes to traffic and prior to installation of permanent delineation, under the following conditions:

1. after removal of existing striping
2. after new surface applications
3. if your operation has either removed or obliterated the existing striping or markings
4. at the direction of the Engineer

Maintain temporary delineation and striping in good condition at all times. Install temporary delineation before the end of the work day in which the existing delineation is removed.

Reflective tape and raised reflective pavement markers may be used instead of temporary paint when allowed by the Engineer.

12-8.02 MATERIALS

Temporary raised reflective pavement markers must be one of the temporary pavement markers listed below:

1. Apex Universal, Model 932
2. Pexco LLC, Models TOM, TRPM and "HH" (High Heat)
3. Hi-Way Safety, Inc., Model 1280/1281
4. Glowlite, Inc., Model 932

or approved equal.

12-8.03 CONSTRUCTION

Paint must comply with section 84-3.03.

Place temporary raised reflective pavement markers per the manufacturer's instructions at an interval of 15-foot or less. Place, a minimum of six, temporary raised reflective pavement markers at all stop bars that are removed, or as directed by the Engineer. Completely remove all temporary road marker tabs prior to the application of thermoplastic striping and pavement markings.

13 WATER POLLUTION CONTROL

13-1 GENERAL

13-1.01 GENERAL

13-1.01A Summary

Add before 1st paragraph in section 13-1.01A.

All work must comply with the following requirements:

1. You must comply with City Storm Water Ordinance, Chapter 12.08 of the Municipal Code.
2. As part of the Water Pollution Control Plan (WPCP) or Storm Water Pollution Prevention Plan (SWPPP), you are required to keep enough gravel bags, sand bags, filter bags, and filtering material at the job site at all times to protect all drainage inlets within the work area.
3. All drainage inlets are considered as flowing to a waterway protected under this section. You must not allow anything but clean rainwater into the drainage inlet. Cover all drainage inlets within and adjacent to work area.
4. Approval of the WPCP or SWPPP by the Engineer does not release you from the responsibility to only allow clean rainwater to leave the site. You must make immediate changes in the control system as needed to ensure that only clean rainwater leaves the site.
5. If your work interferes with established drainage patterns, ample provisions must be made to provide for drainage. The Engineer may direct additional provisions if needed.

For projects less than one acre in size and not regulated by the Regional Water Quality Control Board's General Construction Permit you must complete and comply with a simplified City Water Pollution Control Plan.

For private projects one acre and larger in size, you must additionally comply with all requirements in the Regional Water Quality Control Board's General Construction Permit.

Add to 1st paragraph in section 13-1.01A.

Information on:

1. form
2. reports
3. manuals
4. other documents

referenced in the 2nd and 3rd paragraph of this section refer to Caltrans maintained documents and web sites. A simplified City Water Pollution Control Plan (WPCP) form is available for use in the special provisions or may be furnished by the Engineer.

Add to 2nd paragraph in section 13-1.01A.

WPCP may be either City's WPCP or Caltrans forms.

13-1.01D Quality Control and Assurance

13-1.01D(3) Water Pollution Control Manager

13-1.01D(3)(a) General

Replace 2nd paragraph in section 13-1.01D(3)(a) with:

Assign one Water Pollution Control Manager to implement SWPPP.

Assign one Water Pollution Control Manager to implement WPCP. Water Pollution Control Manager is not required to be QSP for WPCP implementation unless:

1. WPCP is not being implemented as required
2. work area discharge is unacceptable
3. required by the engineer

Provide QSP for Water Pollution Control Manager at no additional cost to City.

13-1.01D(3)(b) Qualifications

Replace section 13-1.01D(3)(b) with: (RSS Revision)

The QSD must:

1. Have completed the stormwater management training described on Caltrans' Web site for the Division of Construction, Storm Water and Water Pollution Control Information
2. Be registered or certified for at least one of the following:
 - a. California registered civil engineer
 - b. California registered professional geologist or engineering geologist
 - c. California licensed landscape architect
 - d. Professional hydrologist registered through the American Institute of Hydrology
 - e. Certified Professional in Erosion and Sediment Control (CPESC)TM registered through Enviro Cert International, Inc.
 - f. Certified Professional in Storm Water Quality (CPSWQ)TM registered through Enviro Cert International, Inc.
 - g. Professional in erosion and sediment control registered through the National Institute for Certification in Engineering Technologies (NICET)
 - h. Have completed SWRCB approved QSD training and passed the QSD exam

The QSP must comply with the qualifications for a QSD or must:

1. Have completed the storm water management training described on Caltrans' Web site for the Division of Construction, Storm Water and Water Pollution Control Information
2. Be certified for at least one of the following:
 - a. Certified Erosion, Sediment and Storm Water Inspector (CESSWI)TM registered through Enviro Cert International, Inc.
 - b. Certified Inspector of Sediment and Erosion Control (CISEC) registered through CISEC, Inc.
 - c. Have completed SWRCB approved QSP training and passed the QSP exam

13-1.01D(3)(c) Responsibilities

Replace section 13-1.01D(3)(c) with: (RSS Revision)

The WPC manager must:

1. Be responsible for water pollution control work
2. Be the primary contact for water pollution control work
3. Oversee:
 - a. Maintenance of water pollution control practices
 - b. Inspections of water pollution control practices identified in the SWPPP or WPCP
 - c. Inspections and reports for visual monitoring
 - d. Preparation and implementation of REAPs
 - e. Sampling and analysis
4. Preparation and submittal of:
 - a. NAL exceedance reports
 - b. Receiving water monitoring trigger reports
 - c. SWPPP annual certification
 - d. Annual reports
 - e. BMP status reports
5. Oversee and enforce hazardous waste management practices in compliance with section 14-11, including spill prevention and control measures
6. Have authority to mobilize crews to make immediate repairs to water pollution control practices
7. Ensure that all employees have current water pollution control training
8. Implement the authorized SWPPP or WPCP
9. Amend the SWPPP or WPCP if required
10. Be at the job site within 2 hours of being contacted
11. Have the authority to stop construction activities damaging water pollution control practices or causing water pollution

13-1.04 PAYMENT

Replace section 13-1.04 with:

Full compensation for work specified in section 13 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

13-2 WATER POLLUTION CONTROL PROGRAM

13-2.01 GENERAL

Replace 1st paragraph in section 13-2.01B with: (RSS Revision)

Within seven days after Contract approval, submit one copies of your WPCP for review. Allow five business days for review.

If the RWQCB requires review of the authorized WPCP, the Engineer submits the authorized WPCP to the RWQCB for its review and comment. If the Engineer orders changes to the WPCP based on the RWQCB's comments, amend the WPCP within three business days.

13-3 STORM WATER POLLUTION PREVENTION PLAN

13-3.01 GENERAL

Add to section 13-3.01.

Section 13-3 is only applicable if required in the special provisions or if required due to work's area of disturbance.

13-3.01B Submittals

13-3.01B(2) Storm Water Pollution Prevention Plan

13-3.01B(2)(a) General

Replace 1st paragraph in section 13-3.01B(2)(a) with: (RSS Revision)

Within 15 days of Contract approval, submit one copy of your SWPPP for review. The Engineer provides comments and specifies the date when the review stopped if revisions are required. Change and resubmit a revised SWPPP within 15 days of receiving the Engineer's comments. The City's review resumes when a complete SWPPP has been resubmitted.

When the Engineer authorizes the SWPPP, submit an electronic copy and two printed copies of the authorized SWPPP.

If the RWQCB requires review of the authorized SWPPP, the Engineer submits the authorized SWPPP to the RWQCB for its review and comment. If the Engineer requests changes to the SWPPP based on the RWQCB's comments, amend the SWPPP within 10 days.

Replace 3rd paragraph in section 13-3.01B(2)(a) with: (RSS Revision)

Include the following items in the SWPPP:

1. For all projects:
 - a. Schedule
 - b. CSMP
2. For risk level 2 projects add:
 - a. Adherence to effluent standards for NALs
 - b. REAP
3. For risk level 3 projects add:
 - a. Adherence to effluent standards for NALs and receiving water monitoring triggers
 - b. REAP

13-3.01B(6) Sampling And Analysis Day

13-3.01B(6)(c) Receiving Water Monitoring Report

Replace section 13-3.01B(6)(c) with: (RSS Revision)

Whenever a receiving water monitoring trigger is exceeded, notify the Engineer and submit a receiving water monitoring trigger report within 48 hours after conclusion of a storm event. The report must include:

1. Field sampling results and inspections, including:
 - a. Analytical methods, reporting units, and detection limits
 - b. Date, location, time of sampling, visual observation and measurements
 - c. Quantity of precipitation from the storm event
2. Description of BMPs and corrective actions

13-3.01C Quality Control And Assurance

13-3.01C(1) General

Replace 6th paragraph in section 13-3.01C(1) with: (RSS Revision)

For a risk level three project, obtain samples and analyze the suspended sediment concentration whenever the turbidity receiving water monitoring trigger is exceeded as shown in the following table:

Parameter	Test method	Detection limit (min)	Unit
Suspended sediment concentration	ASTM D 3977	5	Mg/L

13-3.01C(3) Receiving Water Monitoring Trigger

Replace section 13-3.01C(3) with: (RSS Revision)

For a risk level 3 project, receiving water monitoring triggers must comply with the values shown in the following table:

Receiving Water Monitoring Trigger

Parameter	Test method	Detection limit (min)	Unit	Value
pH	Field test with calibrated portable instrument	0.2	pH	Lower limit = 6.0 Upper limit = 9.0
Turbidity	Field test with calibrated portable instrument	1	NTU	500 NTU max

The storm event daily average for storms up to the 5-year, 24-hour storm must not exceed the receiving water monitoring trigger for turbidity.

The daily average sampling results must not exceed the receiving water monitoring trigger for pH.

13-3.03 CONSTRUCTION

13-3.03C Sampling And Analysis Day

Replace the 3rd paragraph in section 13-3.03C with: (RSS Revision)

Collect receiving-water samples for a risk level 3 project and whenever a direct discharge to receiving waters occurs.

13-3.04 PAYMENT

Replace section 13-3.04 with: (RSS Revision)

Full compensation for work specified in section 13 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list. Storm water pollution prevention plan work if included in the bid item list will be paid as follows:

1. For projects with 60 original working days or less, the City pays you for prepare stormwater pollution prevention plan as follows:

- a. A total of 75 percent of the item total upon authorization of the SWPPP
- b. A total of 100 percent of the item total upon Contract acceptance
- 2. For projects with more than 60 original working days, the City pays you for prepare stormwater pollution prevention plan as follows:
 - a. A total of 50 percent of the item total upon authorization of the SWPPP
 - b. A total of 90 percent of the item total over the life of the Contract
 - c. A total of 100 percent of the item total upon Contract acceptance
- 3. The City pays \$500 for each rain event action plan submitted.
- 4. The City does not adjust the unit price for an increase or decrease in the rain event action plan quantity.
- 5. The City does not adjust the unit price for an increase or decrease in the storm water sampling and analysis day quantity.
- 6. The City pays \$2,000 for each storm water annual report submitted.
- 7. The City does not adjust the unit price for an increase or decrease in the storm water annual report quantity.
- 8. For each failure to submit a completed storm water annual report, the City withholds \$10,000. This withhold is in addition to other performance failure withholds.

13-4 JOB SITE MANAGEMENT

13-4.03 CONSTRUCTION

13-4.03C Material Management

13-4.03C(3) Stockpile Management

Replace 2nd paragraph in section 13-4.03C(3) with: (RSS Revision)

If stockpiles are being used, do not allow soil, sediment, or other debris to enter storm drains, open drainages, and watercourses.

Manage stockpiles by implementing water pollution control practices on:

- 1. Active stockpiles before a forecasted storm event
- 2. Inactive stockpiles according to the WPCP or SWPPP schedule

13-4.04 PAYMENT

Replace section 13-4.04 with: (RSS Revision)

Not Used.

13-5 TEMPORARY SOIL STABILIZATION

13-5.03 CONSTRUCTION

13-5.03F Temporary Hydraulic Mulch (Polymer-Stabilized Fiber Matrix)

Replace section 13-5.03F with: (RSS Revision)

Reserved

13-5.03K Temporary Covers

Replace 1st paragraph in section 13-5.03K with: (RSS Revision)

Install temporary cover fabric as follows:

- 1. Place fabric loosely on the slope with the longitudinal edges perpendicular to the slope contours.
- 2. Place fabric on the upper portion of the slope to overlap the fabric on the lower portion of the slope.
- 3. Place fabric on the side facing the prevailing wind to overlap the fabric on the downwind side of the slope.
- 4. Anchor the perimeter edge of the fabric in key trenches.
- 5. Overlap edges of the fabric by at least 2 feet.
- 6. Place restrainers at the overlap area and along the toe of the slope. Space the restrainers a maximum of 8 feet on center between the overlaps.
- 7. If anchor restraints are used, ensure that the leg of the steel reinforcing bar pierces the fabric and holds the wooden lath firmly against the surface of the slope or stockpile.

Delete 3rd paragraph in section 13-5.03K. (RSS Revision)

13-9 TEMPORARY CONCRETE WASHOUTS

13-9.01 GENERAL

13-9.01A Summary

Replace 1st paragraph in section 19-9.01A with: (RSS Revision)

Section 13-9 includes specifications for installing temporary concrete washouts. You may use any of the following systems for temporary concrete washout:

1. Temporary concrete washout facility
2. Portable temporary concrete washout
3. Temporary concrete washout bin

13-9.01B Submittals

Replace 2nd paragraph in section 19-9.01B with: (RSS Revision)

Retain and submit an informational submittal for records of disposed concrete waste.

Delete 4th paragraph in section 19-9.01B. (RSS Revision)

13-9.02 MATERIALS

13-9.02A General

Replace 1st paragraph in section 19-9.01B with: (RSS Revision)

The sign for a concrete washout must comply with section 12-3.06B(3), except the sign panel may be plywood. The sign panel must be at least 2 by 4 feet in size. The sign legend must read "Concrete Washout" in at least 6-inch high black letters on a white background.

14 ENVIRONMENTAL STEWARDSHIP

14-1 GENERAL

14-1.01 GENERAL

Add to section 14-1.01.

When an environmental stewardship monitor is required for construction operations that are being conducted under City contract, the monitor will be retained by the City and work together with you. Environmental stewardship monitors do not eliminate your responsibility for compliance. The monitor has no authority to direct your work unless this authority is granted by the project's special provisions. Any costs incurred by you resulting from work done at the direction of the monitor without proper authorization must be borne entirely by you.

You must give the Engineer written notice 14 calendar days in advance of the need for environmental stewardship monitor. The Engineer will coordinate environmental stewardship monitor to be at the work-site in compliance with your notification. Once the environmental stewardship monitor is at the work-site, you must work consistently to complete task requiring environmental stewardship monitor. If you fail to provide the proper notification or fail to work consistently to complete task requiring environmental stewardship monitor, you will be responsible for any additional cost for the monitors work.

14-2 CULTURAL RESOURCES

14-2.03 ARCHAEOLOGICAL MONITORING AREA

14-2.03A General

Add to section 14-2.03A.

When archaeological monitoring is required by the Engineer the following apply:

1. Your attention is directed to Section 15064.5 of the Guidelines for the California Environmental Quality Act (Public Resources Code Section 21000 et seq.) and the City of San Luis Obispo Archaeological Resource Preservation Guidelines that provide for the protection and preservation of historical and archaeological resources (hereinafter called "cultural resources"). You must conform to the applicable requirements of these statutes and guidelines as they relate to the protection and preservation of cultural resources.
2. You must exercise care to protect significant cultural resources from being damaged. In addition to other notifications in this section, you are required to notify the Engineer forty-eight (48) hours prior to entering areas that require cultural resource monitoring to allow time for monitors to be mobilized. You must not start activities that require cultural resource monitoring until the cultural resource monitor arrives to work-site and the Engineer authorizes the start of work.
3. You must work with the cultural resource monitor to ensure systematic removal of excavation sediments, allow examination of trench spoils and sidewalls as they are removed and exposed, and permit documentation and evaluation of cultural resources remains according to the terms of the Cultural Resources Monitoring Plan. If potentially significant remains are encountered, you may be requested to alter excavation methods to accommodate cultural resource requirements, or use a smooth-bladed backhoe bucket to avoid cutting into intact cultural deposits.
4. You are strictly prohibited from collecting prehistoric or historical artifacts from project site.
5. In the event that potentially significant cultural resources are discovered during the course of construction, you must follow the procedures for the treatment of such discoveries as established in the Cultural Resource Monitoring Plan. In addition, the following procedures must be instituted:
 - a. You must immediately cease all construction operations at the location of the discovery. The work may be redirected to a location beyond the cultural resource discovery site.
 - b. You must immediately notify the Engineer.
 - c. You may not resume work in the area until given clearance by the Engineer.
6. In the event that human remains are uncovered, work within the vicinity of the find must be halted immediately. You may not resume work in the area until given clearance by the Engineer.

14-11 HAZARDOUS WASTE AND CONTAMINATION

14-11.01 GENERAL

Add to section 14-11.01A

Should the you or any of your subcontractors, while performing work on or in the vicinity of the project area, unexpectedly encounter any material you have reason to believe may be a hazard to human health and safety and/or the environment, you must stop the work, cordon off the affected area and notify the Engineer in writing immediately. Secure the work area such that the public and employees are not exposed to the contaminated materials or potentially contaminated materials. This shall be accomplished through temporary backfilling, trench plating, covering exposed areas with plastic sheeting, or other means.

The Engineer will order tests to determine the level of contamination and work in the immediate area will be suspended until the Engineer authorizes the work to resume. In the event that the work is delayed in the completion of the Contract solely because of such materials or conditions not previously identified in the Special Provisions, you are entitled to an extension of time in accordance with the provisions of Section 8-1.07 "Delays".

The City reserves the right to use other forces for exploratory work to identify and determine the extent of such material and for removing contaminated material from such area.

14-11.01B Hazardous Waste Management Practices

Add to section 14-11.01B.

14-11.01B(3) Health And Safety Plan

If contamination exists in the work area, prepare and submit a site specific Health and Safety Plan (HSP) if directed by the Engineer.

HSP must include requirements to protect workers while working in the presence of contaminate. Provide HSP that has been:

1. prepared
2. signed
3. stamped

by a Certified Industrial Hygienist. The HSP must comply with all:

1. local
2. state
3. federal
4. ordinances
5. rules
6. regulations
7. guidelines

for occupational health and safety.

Provide a copy of the HSP to all personnel working in the contaminated area. All personnel working in or overseeing work in the contaminated areas must read the HSP and sign an acknowledgment that stating that they have:

1. been furnished a copy of the HSP
2. read the HSP

Maintain acknowledgements on file and furnish to the Engineer upon request.

Submit two copies of the HSP to the Engineer prior to the start of work. Revise the HSP as required by the progress of work. Submit two copies of the revised HSP to the Engineer prior to proceeding with the work.

HSP must require the implementation of ongoing monitoring of the work by you for contaminated materials. All personnel must have appropriate equipment and training.

If you are not prepared to work in the area of contamination, you must stop work in that area until preparation is complete. No additional working days will be granted for failure to be prepared for contaminate working conditions.

14-11.02 CONSTRUCTION

14-11.02B Hazardous Waste Management Practices

Add to section 14-11.02B.

14-11.02B(1) Groundwater

Ground water containing hazardous or contaminated materials may be encountered. If encountered and if you choose to remove the water from the excavation, you may dispose of the ground water in the sanitary sewer system once a no fee discharge permit is obtained. Provide the type of contaminate and levels of contamination with permit application.

Under no conditions may contaminated groundwater be discharged to the:

1. street
2. storm drains
3. waterways

14-11.02F City – Generated Hazardous Waste

Add to section 14-11.02F.

14-11.02F(4) Payment

Costs resulting from unanticipated hazardous or contaminated materials in the work area for:

1. preparation of specialized documents
2. changed hauling and disposal

will be considered Extra Work.

Measurement for removal of contaminated material will be taken daily. The Engineer will measure the trench in the area affected by the contamination. You must verify the measurement. If you fail to verify measure to confirm the findings of the Engineer is interpreted as an agreement with the Engineer's measurements.

Full compensation for work specified in this section, is included in the payment for other bid items unless a bid item of work is shown on the bid list item. Contaminated material work performed under this section is designated in the contract by:

1. size
2. type
3. quantity, or
4. whatever information is necessary for identifying the work.

HSP preparation is paid by lump sum.

HSP implementation and work area monitoring is paid by the day.

The excavation of contaminated soils is paid by the cubic foot.

Costs for special disposal or hauling, when paid for as extra work, will be reimbursement for costs of the work only, together with a reasonable markup for overhead, but in no event, will the contractor be paid for other delay damages including but not limited to lost productivity or unallocated overhead.

If directed by the Engineer, you will stop work in the area of contamination and move to another work area. This shall be considered as part of the work and no additional compensation shall be allowed therefor.

15 EXISTING FACILITIES

15-1 GENERAL

15-1.03 CONSTRUCTION

15-1.03C Loop Detectors

Replace section 15-1.03C with:

Traffic Signal Detection Loops may exist as far as 300 feet from a signalized intersection. If working within such an area you must meet with the Engineer at the project site to physically locate all detection loops. Loops are typically within 2 inches of the top of the pavement surface and are not repairable. Any loops damaged by the your operation must be replaced in compliance with section 86 within two working days and as directed by the Engineer.

15-1.03D Highway Irrigation Facilities

Replace the 1st paragraph of section 15-1.03D with:

Locate and protect existing irrigation facilities that are not identified to be removed. Contact Underground Service Alert (811) for location and identification work. Contact property owner to obtain record information. If existing facilities are damaged you must repair them immediately at your expense and to the satisfaction of the owner.

15-1.04 PAYMENT

Replace section 15-1.04 with:

Full compensation for work specified in section 15 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

15-2 MISCELLANEOUS FACILITIES

15-2.01 GENERAL

15-2.01C Construction

Replace section 15-2.01C with: *(RSS Revision)*

If a portion of the guard railing or barrier is to remain in place, removing, salvaging, reconstructing, relocating, or resetting work includes:

1. Resetting end caps, return caps, terminal sections, and buried post anchors
2. Providing connections to existing and new facilities, including connections to concrete

15-2.02 REMOVE

15-2.02B Remove Pavement

15-2.02B(1) General

Replace section 15-2.02B(1) with: *(RSS Revision)*

Section 15-2.02B includes specifications for removing pavement, base, subbase, and subgrade.

If only a portion of the pavement is removed, saw-cut the outline of the removal area on a neat line and with a power-driven saw before removing.

For asphalt concrete pavement, saw cuts must be at least 2 inches deep unless otherwise described.

15-2.02B(2) Obliterate Roads, Detours, And Surfacing

Delete 3rd and 4th paragraph in section 15-2.02B(2).

Add to section 15-2.02B(3).

Grind with abrasive grinding equipment designed for grinding asphalt in the longitudinal direction of the traveled way. Cutter head for asphalt concrete grinding machines must not less than 6 feet in width and must be operated without producing fumes or smoke. The grinding machine must be capable of cold plane grinding without the need to soften pavement. Streets may contain areas of concrete below the asphalt concrete surface; grinding equipment must be capable of grinding through these areas.

Provide the depth, width, and shape of the grind as shown or as directed by the Engineer. The final grind must result in a uniform longitudinal and transverse surface conforming to the new cross section as shown. The outer limits of the grind area must be neat and uniform. Do not damage remainder surface.

Provide a continuous grind width. You may grind around corners and through conform lines at intersections.

Remove grind spoils and deposit in:

1. gutters
2. driveways
3. around structures
4. on adjacent lanes

concurrently with grinding operations. Furnish and operate a self-loading motor sweeper with spray nozzles to clean and maintain ground areas at all times until final lift of paving.

15-2.02B(3)(a) Temporary Transitions

Where transverse joints are ground in the pavement at conform lines, no drop-off may remain between the existing pavement and the ground area when the pavement is opened to public traffic. Provide an asphalt concrete temporary taper, if permanent asphalt concrete has not been placed to the level the pavement prior to opening to public traffic. Any joints must occur at lane lines.

Provide the following temporary tapers at locations shown below if difference in elevation between adjacent surfaces is more than $\frac{3}{4}$ inch:

Location	Ratio (horizontal: vertical)
Transverse joints	30:1
Sidewalk ramps	20:1
Driveway / Access Point	12:1
Longitudinal joints *	12:1

* Required only for streets with existing bike lanes where joint will remain more than 2 calendar days

Use commercial quality asphalt concrete for temporary tapers. Spread and compact asphalt concrete for temporary tapers by any method that will produce a smooth riding surface. Completely remove, including all loose material from the underlying surface, temporary tapers before placing the permanent surfacing.

15-2.02B(5) Remove Concrete Pavement

Add to section 15-2.02B: (RSS Revision)

15-2.02B(5)(a) General

Remove only the portion of pavement to be replaced or repaired during the same lane closure. If there is overlying material on the concrete pavement, remove it with the pavement.

Do not impact the surface within 18 inches of the pavement to remain in place. Use removal methods that do not damage the remaining pavement and base. Slab-lifting equipment must attach to the pavement.

15-2.02B(5)(b) Saw Cuts

Saw cut using a diamond blade and make cuts perpendicular to the pavement surface. Saw cutting is not required where concrete pavement is adjacent to asphalt concrete pavement, with no continuous overlay.

Saw cut:

1. no more than 2 days before removing pavement
2. such that traffic will not dislodge any pavement piece or segment.

Saw cut perpendicular to the traveled way except you may cut parallel or diagonal to the traveled way when removing the pavement during the same lane closure as the saw cutting.

You may make additional saw cuts within the sawed outline.

Saw cuts must be the full depth of the pavement unless otherwise shown.

Saw cut at longitudinal and transverse joints to remove entire slabs. For partial-slab areas, the Engineer determines the exact saw-cut locations.

15-2.02B(5)(c) Reserved

15-2.02B(6) Reserved

15-2.02B(7) Payment

Reserved

15-2.02C Remove Traffic Stripes and Pavement Markings

15-2.02C(1) General

Add to section 15-2.02C(1).

Not more than five days before the start of roadway surfacing or paving, you must remove existing paint and thermoplastic:

1. striping
2. pavement marking
3. pavement markers

Extra caution is required at locations with traffic signal loops where pavement markings or striping must be removed. Loops are located just below surface grade. Tie-out bicycle detector symbols prior to removal and coordinate the reinstallation with the Engineer.

15-2.02C(3) Payment

Delete section 15-2.02C(3).

Reserved

Replace section 15-2.02G with: *(RSS Revision)*

15-2.02G Remove Guardrail

Where removing guardrail, remove any concrete anchors and steel foundation tubes.

15-2.02K Remove Drainage Facilities

Replace the 1st paragraph in section 15-2.02K with: *(RSS Revision)*

Box culverts, concrete pipes, inlets, headwalls, and endwalls must be completely removed if any portion of these structures is (1) within 3 feet of the grading plane in excavation areas, (2) within 1 foot of original ground in embankment areas, or (3) shown to be removed.

15-2.03 SALVAGE

15-2.03A General

15-2.03A(2) Materials

15-2.03A(2)(a) General

Replace 1st and 2nd paragraphs in section 15-2.03A(2)(a) with: *(RSS Revision)*

Cleaning includes removing earth, foreign materials, and concrete.

Comply with the requirements for bundles and packages shown in the following table:

Material or item	Component	Bundle or package
Guardrail	Rail	25/bundle
	Wood posts, 6 by 8 inches	30/bundle
	Wood posts, 10 by 10 inches	20/bundle
	Steel posts	10/bundle
	Blocks	50/bundle
Fences	Chain link fabric	50 ft/pallet
	Corner posts and end posts	One assembly/bundle
Manholes, Inlets, or other facilities	Frames and covers	Match marked pairs
	Frames and grates	Match marked pairs
Single sheet aluminum signs	--	Banded on a pallet with a total weight of not more than 500 lb/pallet

15-2.03A(2)(b) Department Salvage Location

Replace section 15-2.03A(2)(b) with:

Deliver material to be salvaged to the City Corporation Yard at 25 Prado Road.

Replace section 15-2.03B with: (RSS Revision)

15-2.03B Salvage GuardRail

Reserved

15-2.04 RECONSTRUCT

Replace section 15-2.04D with: (RSS Revision)

15-2.04D Reconstruct GuardRail

Reserved

15-2.10 ADJUST

15-2.10B Adjust Frames, Covers, Grates and Manholes

Replace 4th paragraph in section 15-2.10B with: (RSS Add)

Instead of using new materials similar in character to those in the existing structure, you may use raising devices to adjust a manhole to grade. Before starting paving work:

1. measure
2. fabricate
3. install

raising devices. Raising devices must:

1. Comply with section 75 except that galvanizing is not required
2. Have a shape and size that matches the existing frame
3. Be match marked by painting identification numbers on the device and corresponding structure
4. Result in an installation that is equal to or better than the existing one in stability, support, and nonrocking characteristics
5. Be fastened securely to the existing frame without projections above the surface of the road or into the clear opening
6. Receive thermoplastic surround marking approved by the Engineer.

Add to section 15-2.10B.

Lower existing utility surface facilities within the paving area prior to grinding and paving. Furnish the Engineer with a copy of the utility surface facility reference point documentation in the event of a utility emergency. Do not start lowering utilities sooner than ten working days before paving. Within two working days after final paving, mark locations of all:

1. water valves
2. sewer manholes
3. storm drain manholes

4. survey monuments
within project area. All utilities must be raised within ten working days of final paving. The Engineer may direct the order in which utilities must be raised. Replace all:

1. frames
2. covers
3. wells

as needed to meet current engineering standards.

Set metal lids over lowered wells and manholes to keep them clean and to assist with future locating work. Coat utility covers with sand or fabric that will be paved over to prevent the adhesion of new asphalt to the metal lid. Cut fabric neatly around the utility covers prior to placement.

Attention is directed to the replacement of City Communication boxes and wells with manhole cover and access box as shown in City of San Luis Obispo Engineering Standard 9030.

Prior to the application of a slurry seal or other bituminous seal coat, locate and protect all existing utility covers and concrete collars. Cover all utility covers and surrounding collars prior to the application of the seal. Place a vertical tab on each cover for future locating after the seal application is complete. The vertical tab must extend at least 3 inches above the existing pavement surface.

Upon completion of any reconstruction work within two feet of a survey monument, verify the monument has not been disturbed.

Replace section 15-2.10D with: (RSS Revision)

15-2.10D Adjust Guardrail

Reserved

15-3 CONCRETE REMOVAL

15-3.01 GENERAL

Replace 6th paragraph of section 15-3.01 with:

Dispose of concrete outside the right-of-way, in compliance with section 5-1.20B(4).

15-3.03 CONSTRUCTION

Add to section 15-3.03.

Concrete removal in sidewalk areas must be sawcut to the nearest score mark in either direction in compliance with section 73.

15-4 BRIDGE REMOVAL

15-4.01 GENERAL

15-4.01A General

15-4.01A(2) Submittals

Add to section 15-4.01A(2): (RSS Revisions)

Allow 20 days for review of the bridge removal work plan.

15-5 BRIDGE REHABILITATION

15-5.01 GENERAL

15-5.01C Construction

15-5.01C(1) General

Replace 1st paragraph in section 15-5.01C(1) with: (RSS Revision)

Before starting deck rehabilitation activities, complete the removal of any traffic stripes, pavement markings, and pavement markers.

15-5.01C(4) Remove Asphalt Concrete Surfacing

Replace 2nd and 3rd paragraph in section 15-5.01C(4) with: (RSS Revision)

Before removing asphalt concrete surfacing, verify the depth of the surfacing at the supports and midspans of each structure:

1. in each shoulder
2. in the traveled way
3. at the roadway crown

if a crown is present.

Remove asphalt concrete surfacing by cold milling. At least ½ inch of asphalt concrete surfacing must remain after milling activities.

15-5.03 REPAIR SPALLED SURFACE AREA

15-5.03B Materials

Replace section 15-5.03B with: (RSS Revision)

Mortar must comply with section 51-1.02F.

Shotcrete must comply with section 53.

Alternative filler materials and bonding agents must have the values for the material properties shown in the following table:

Property	Test method	Value
Abrasion resistance, 28 days	California Test 550	25 grams, maximum
Modulus of elasticity, 28 days	California Test 551	10.3 to 24.1 GPa
Water soluble chlorides	California Test 422	500 mg/kg, maximum
Water soluble sulfates	California Test 417	2,500 mg/kg, maximum

For a contract with less than 60 original working days, alternative materials must be authorized before use.

15-5.03C Construction

Replace section 15-5.03C with: (RSS Revision)

Remove unsound concrete in compliance with section 15-5.01C(5).

Clean concrete surfaces and existing reinforcing steel by abrasive blasting before placing filler material. Place reinforcing steel where shown.

Fill spalled surface areas in compliance with section 51-1.03F(2) or you may use an alternative filler material and bonding agent.

If using an alternative filler material, apply bonding epoxy before placing the filler material. Place the filler material under the manufacturer's instructions.

If using shotcrete, you may apply the shotcrete using a dry mix process with a hydration liquid applied immediately after placing the shotcrete.

The final surface finish of the patched concrete surface must comply with section 51-1.03F.

Patched concrete must emit a ringing sound similar to adjacent sound concrete when struck with a metal tool 14 days after placement.

Removing and patching spalled concrete more than 4 inches deep is change order work.

15-5.06 POLYESTER CONCRETE OVERLAY

15-5.06C Construction

15-5.06C(1) General

Replace 3rd paragraph in section 15-5.06C(1) with: (RSS Revision)

The Engineer tests existing deck surface smoothness in compliance with section 51-1.01D(4)(b) and may require you to modify the existing deck smoothness in compliance with section 42-3. Modifying the existing deck smoothness is change order work.

Replace 5th paragraph in section 15-5.06C(1) with: (RSS Revision)

New concrete deck surfaces must comply with section 51-1.03F(5) before starting overlay work.

Delete 9th and 15th paragraph in section 15-5.06C(1) with: (RSS Revision)

Add between 18th and 19th paragraph in section 15-5.06C(1). (RSS Revision)

Texture the polyester concrete surface before gelling occurs by longitudinal tining in compliance with section 51-1.03F(5)(b)(iii), except do not perform initial texturing.

Replace section 15-5.06C(2) with: (RSS Revision)

15-5.06C(2) Reserved

15-5.06D Payment

Delete 3rd paragraph in section 15-5.06D. (RSS Revision)

15-5.07 CORE CONCRETE

15-5.07B Core and Pressure Grout Dowels

15-5.07B(4) Payment

Replace 1st paragraph in section 15-5.07B(4) with: (RSS Revision)

Payment for furnishing dowels is not included in the payment for core and pressure grout dowel.

Replace section 15-5.09 with: (RSS Revision)

15-5.09 POLYESTER CONCRETE EXPANSION DAMS

15-5.09A General

Section 15-5.09 includes specifications for constructing polyester concrete expansion dams.

Polyester concrete expansion dams must comply with the specifications for polyester concrete overlays in section 15-5.06, except a trial slab is not required.

Reinforcement must comply with section 52.

15-5.09B Materials

Not Used

15-5.09C Construction

For new asphalt concrete overlays, place the asphalt concrete overlay before starting polyester concrete activities. Saw cut and remove asphalt concrete at expansion dam locations.

For existing asphalt concrete overlays, remove expansion dams and asphalt concrete to the limits shown. Removing expansion dams must comply with section 15-4 except a bridge removal work plan is not required.

Where a portion of the asphalt concrete overlay is to remain, saw cut a 2-inch-deep neat line along the edge to remain in place before removing the asphalt concrete. Do not damage the existing surfacing to remain in place.

Prepare the deck surface in compliance with section 15-5.01C(2).

You may use a mechanical mixer to mix the polyester concrete for expansion dams. The mixer capacity must not exceed 9 cu ft unless authorized. Initiate the resin and thoroughly blend it immediately before mixing it with the aggregate. Mix the polyester concrete for at least 2 minutes before placing.

The application rate of methacrylate resin must be approximately 100 sq ft/gal.

You may place and finish expansion dams using hand methods.

Protect expansion dams from moisture, traffic, and equipment for at least 4 hours after finishing.

For expansion dams over 6 feet long, install 1/4-inch-wide joint material at 6-foot intervals across the width of the expansion dam. Joint material must be either expanded polyurethane or expanded polyethylene.

15-5.09D Payment

Not Used

15-6 CULVERT REHABILITATION

15-6.01 GENERAL

15-6.01A General

15-6.01A(3) Submittals

15-6.01A(3)(a) General

Add to section 15-6.01A(3)(a). (RSS Revision)

Within 5 days of completing annular space grouting at a culvert, submit the grouting records.

15-6.01A(3)(d) Contract Grouting Plan

Replace 2nd in section 15-6.01A(3)(d) with: (RSS Revision)

The grouting plan must include:

1. Order of work
2. Maximum injection pressures
3. Details and data for drilling and grouting equipment
4. Plans for controlling groundwater and existing culvert stream flows
5. Pressure gage, recorder, and field equipment certifications, including calibrations by an independent testing agency
6. Sample printout of the form for recording grouting operations. Form must show the following tabulated information for each grout port:
 - a. port location
 - b. pressure
 - c. volume
 - d. start and end time
7. Schedule of grout port installations and method for obtaining probe depth dimensions at grout ports; tabulation of locations and dimensions
8. Culvert strut details as necessary
9. Method for monitoring deformation of culvert or concrete lining
10. Grout mix design, including:
 - a. Densities and viscosity
 - b. Initial set time
 - c. Materials and the independent testing agency's test data as specified in section 41-2.
 - d. Grout working time before 15 percent change in density or viscosity occurs

15-6.01B Materials

15-6.01B(2) Contact Grout

Replace 1st paragraph in section 15-6.01B(2) with: (RSS Revision)

Grout for contact grouting must comply with section 41-1.02 and contain:

1. Not more than 2 percent bentonite by weight of cement and water
2. Not less than 590 lb of cement per cubic yard

DIVISION III GRADING
16 CLEARING AND GRUBBING

16-1.01 GENERAL

Add to section 16-1.01.

Protect trees not marked for removal, in compliance with section 14-1.03C(1) and 77-1.03A(2).

17 WATERING

17-1 GENERAL

17-1.01 GENERAL

17-1.01A General

Replace section 17-1.01A with:

Use of potable water from City water mains and fire hydrants is not allowed. Recycled water is available by permit for use at the recycled-water hydrants located within the City limits at various locations. Use of the recycled water is subject to the conditions of the Recycled-Water program, completion of required training, and payment of the permit fee.

18 DUST PALLIATIVE

18-1.04 PAYMENT

Replace section 18-1.04 with:

Full compensation for work specified in section 18 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

19 EARTHWORK

19-1 GENERAL

Add to Section 19-1.01B:

hard bedrock: Firm, hard bedrock which when tested under ASTM D1586, yields a blow count of 50 blows or greater per 3 inches of penetration.

19-1.03 CONSTRUCTION

19-1.03A General

Replace section 19-1.03A with:

Unless otherwise specified in section 14-11, and subject to the approval of the Engineer, native and base material resulting from any excavation may be used to construct:

1. embankments
2. dikes
3. landscape mounds
4. backfill structures

where details specify the use of native backfill. In all other cases, remove and dispose of excess material.

Use suitable fill for plant growth for landscape mounds in compliance with section 20. Prior to filling, clear and till all areas to a depth of 4 inches. Compact all fills to 90 percent relative compaction in compliance with section 19-5.03C. Fill beyond the indicated areas then cut back to the required finish grade.

Replace Section 19-1.03B with:

Notify the Engineer prior to removal of unsuitable material. Excavate unsuitable material. Ensure that unsuitable material is separated from other suitable construction materials or removed from the work area.

Removal of unsuitable material, including rock, within contract work area and limits will be paid as described on the Bid Item List. Removal of unsuitable material outside contract work area and limits, as directed by the Engineer, will be paid by force account.

19-1.03F Rock Excavation

Notify the Engineer if hard bedrock is encountered during excavation. To receive payment for rock excavation, coordinate the testing by a Cal-trans certified materials testing company equipment with a drill rig capable of testing per ASTM D1586 to perform testing of the encountered bedrock. If ASTM D1586 testing yields a blow count of 50 blows or greater per three inches of penetration, you will be paid the contract unit price for Rock Excavation for the removal of the hard bedrock, and will be reimbursed for the cost for the testing. If the tests show fewer than 50 blows per three inches, then the testing will be at Contractor's expense and no additional payment will be provided. A separate test must be performed for each increment of 50 cubic yards of hard bedrock removed, or as determined by the Engineer to be eligible for payment under the rock excavation pay item.

Where no contract item exists for Rock Excavation, hard bedrock excavation will be paid for as extra work.

19-1.04 PAYMENT

Add to section 19-1.04.

Full compensation for applying water is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

Full compensation for work specified in section 19-1 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

19-2 ROADWAY EXCAVATION

19-2.04 PAYMENT
Add to section 19-2.04.

Full compensation for applying water is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

Full compensation for work specified in section 19-2 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

19-3 STRUCTURE EXCAVATION AND BACKFILL

19-3.03 CONSTRUCTION

19-3.04 PAYMENT

Add to section 19-3.04.

Full compensation for removing water or dewatering excavations is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

Full compensation for work specified in section 19-3 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

20 LANDSCAPE AND IRRIGATION

20-1 GENERAL

20-1.01 GENERAL

20-1.01A Summary

Add to section 20-1.01A.

Whenever section 20 refers to required informational forms, ask the Engineer to provide the form. The Engineer may direct you to produce your own form providing all the required data.

20-1.01A(1) Plans And Site Conditions

Plans are schematic. Provide all offsets and other fittings required. Equipment is not drawn to scale, but is shown in its proper location, unless otherwise stated.

All dimensions or spacing's are approximate, before proceeding with the work, check and verify all dimensions and report any variations to the Engineer. Do not install the irrigation system when discrepancies exist between the plans and the site conditions. Bring discrepancies to the attention of the Engineer before work starts.

Since the plans are schematic, with approval of the Engineer, make minor adjustments to the system layout to compensate for variations in the site. Verify that adjustments in irrigation do not result in conflicts with plant materials.

20-1.01C Submittals

20-1.01C(2) Notification

Replace item 3 in 1st paragraph in section 20-1.01C(2) with:

3. Provide written approval from property owner prior to taking cuttings.

20-1.02 MATERIALS

Add to section 20-1.02.

20-1.02C Organic Soil Amendments

Use organic soil amendment made from ground or processed wood product derived from:

1. Redwood sawdust
2. Pine sawdust
3. Cedar sawdust
4. Pine bark

that complies with the following requirements:

Gradation: Sieve Size	Percent Passing
1/4"	95% min.
#8	80% min.
#30	30% min.
Nitrogen content (percent, dry weight)	
Redwood sawdust	0.40% - 0.60%
Pine & Cedar sawdust	0.56% - 0.84%
Pine bark	0.80% - 1.20%
Treated with a non-toxic agent to absorb water quickly	

Apply organic soil amendments in a uniform thickness of 1 inch.

20-1.02D Fertilizer

Application Type	Fertilizer Type ⁽¹⁾	Application Rate	
Mulched Ground Cover, initial planting	Grow-Power Plus (5-3-1)	200 pounds per 1000 square feet	
Mulched Ground Cover, establishment period	Grow-Power Plus (5-3-1)	20 pounds per 1000 square feet Every 30 days	
Turf / Lawn Area – Sod	Agriform Turf Mix (34-0-7) 8 month formula	10 pounds per 1000 square feet	
Turf / Lawn Area – Hydroseed	Grow-Power (5-3-1)	12.5 pounds per 1000 square feet	
Turf / Lawn Area – Stolonized Plantings	Grow-Power (5-3-1)	25 pounds per 1000 square feet	
Trees and Plants	Agriform (20-10-5) 21 gram tablet	Quantity	Size
		1 tablet	#1 or #2
		2 tablets	#5
		4 tablets	#7 or #10
		5 tablets	#15
		7 tablets	24" box
		8 tablets	36" box
		9 tablets	48" box

(1) Or equal as determined by the Engineer

20-1.03 CONSTRUCTION

20-1.03A Progress Inspections

Replace section 21-1.03A with:

The following inspections and testing is required as the work progresses. Provide the Engineer with two working day notice of the need for inspection. Correct all work that does not pass inspection or testing and request re-inspection or re-testing. Do not proceed with the next order of work until the inspection or testing passed and the Engineer gives direction to proceed with the next order of work. The Engineer may reject any work done without necessary pre-approvals.

1. Existing irrigation - preexisting damage check
2. Tree protection
3. Erosion control
4. Site clearance
5. Finish Grading
6. Mow strip and header boards - chalk layout
7. Mow strip formwork
8. Header board -chalk layout
9. Soil conditioning materials
10. Soil conditioning
11. Irrigation mainline, valve, controller and heads - flag layout
12. Backflow device inspection by the County Health Department
13. Irrigation audit / Coverage test
14. Full irrigation system test
15. Re-test of existing irrigation
16. Drip Irrigation distribution tubing run - chalk layout
17. Plant delivery
18. Plant layout (excluding ground cover) - actual or flagged
19. Planting completion
20. Drip Irrigation spray heads - flag layout
21. Drip installation micro tubing, emitter placement and flow test
22. Controller operation test, manual and automatic
23. Existing irrigation - damage check
24. Final Submittals and Record Drawings
25. Completion of establishment maintenance period

20-1.03D Pruning

Replace section 20-1.03D with:

Do not prune limbs of trees except as approved by the Engineer. If the Engineer allow pruning of trees, provide a certified arborist to prune trees in compliance with American National Standard Institute:

1. ANSI A300 - Pruning Standards and
2. ANSI Z133.1 - Safety Requirements

Provide tree care compliant with the International Society of Arboriculture Best Management Practices.

Add to section 20-1.03.

20-1.03E Site Clearance and Grading

You must kill-off, clear, and remove from the work area all undesired:

1. surface growth
2. grass
3. roots
4. shrubs
5. tree stumps
6. weeds.

Remove from the project site all:

1. existing construction
2. paving materials
3. asphalt-stabilized earth
4. rubbish
5. other debris

Prior to finish grading and planting, remove site growth. Spray the entire area with a systemic non-selective herbicide. Repeat spraying as necessity until growth is eradicated to the satisfaction of the Engineer. Completely remove, including root system, all:

1. weeds
2. existing turf
3. other undesired growth.

Apply herbicide in absolute compliance with the manufacturer's recommendations of use.

20-1.03F General Installation Requirements

After rough grading and before landscaping, construct:

1. walls
2. curbs
3. planter boxes
4. walks
5. irrigation system
6. similar improvements

20-1.03G Grade Tolerance

Finished grades must meet the following requirements:

1. You must adjust the soil surface as required to achieve even, continuous contours capable of facilitating surface run-off.
2. Finish grades in planting areas adjacent to:
 - a. paving
 - b. header boards
 - c. concrete mow strips
 - d. curbs, valve boxes
 - e. etc

must be one inch below adjacent elevations. In areas of mulch, the finish grade must be two inches below adjacent elevations.

3. When grades are not shown on the plans, slopes must be uniform and constant between given or set elevations.

4. Grades must slope away from buildings at two percent slope for a distance of three feet, unless drainage structures are present, and then slopes must be graded towards these structures.
5. Maintain a minimum six inches vertical separation between wood used on the exterior of structures, including wall framing, and grading.
6. Finished grading in areas of hardscaping must be done to allow for base course and paving material thickness.
7. Finished grading in areas of landscape must not deviate more than ¼” in ten feet in grade or straightness.
8. Finished grade must be maintained through the entire establishment, maintenance and warranty periods. Any subsidence must be repaired by you and returned to the finished grade at no cost to the City.

20-3 IRRIGATION

20-3.01 GENERAL

20-3.01C Submittals

20-3.01C(4) Wiring Plans And Diagrams

Add to section 20-3.01C(4).

Obtain a set of the project plans of the irrigation system before the start of work. Use this set of plans for the sole purpose of generating and preparing record drawings. Draw the actual locations and installation depths of irrigation system onto project plans as work proceeds, including:

1. pipes
2. valves
3. heads
4. wiring
5. controllers
6. electrical service
7. miscellaneous irrigation components

Show the location by dimensioning from two permanent references points all:

1. Point of connection (POC)
2. Mainline pipe and electrical conduit routing at all changes in direction and at 150-foot intervals on long straight runs.
3. Low voltage wiring that does not parallel the mainline.
4. Any direct burial equipment that does not have a utility box access from grade.
5. All moisture sensor locations and their exact depth from grade.
6. Other related items as may be directed by the Engineer.

Trees are not considered permanent reference points. Transfer all information about the location of the appliances and equipment onto the record drawings in a neat and clear manner. Sign and date record drawings and provide a statement on record drawings indicating:

“Record Drawings are complete and accurate”

Submit record drawings to the Engineer for review and approval. Complete and accurate record drawings are a condition of project acceptance and authorization for final payment.

20-3.01C(7) Notifications

Add to section 20-3.01C(7).

5. At least 48 hours before testing static water pressure at the Point of Connection (POC) of the irrigation system.

20-3.01C(8) Maintenance And Operations Manuals

Replace section 20-3.01C(8) with:

Provide the Engineer one bound plastic covered 3-ring notebook detailing the operation and maintenance requirements of the system prior to project acceptance. All pages within the notebook must be in clear plastic

sleeves, of a type to withstand field conditions without warping and yellowing and protect pages during field use. Include the following information in the manual on letter size sheets:

1. Title sheet
2. Table of contents
3. Irrigation zone map, one for each controller
 - a. The map must be a small scaled drawing showing the area covered by each remote control valve, and laminated.
 - b. Each zone must be numbered to correspond to the controller number and color code.
 - c. The map cannot be a reproduction of the irrigation plan. No equipment is to be shown, only the irrigated areas. If soil sensors are specified, show these locations with "S".
4. Maintenance checklist by week, month and year.
5. Copy of material list.
6. Parts breakdown sheets for all equipment.
7. Equipment list with replacement cycles, including all irrigation.
8. Copy of your guarantee statement.
9. Copy of the manufacturer's equipment warranties.
10. One folded copy of the Record Drawings included in the back of the manual.

Provide two copies, in plastic bound three ring binders, of manufactures:

1. operations
2. maintenance
3. parts manuals

for:

1. controllers
2. valves
3. quick couplers
4. rotary heads
5. pumps and related pump station equipment
6. other equipment as specified in the special provisions.

Provide two controller charts showing the operational areas and zones of each valve and how the controller schedules these stations. Provide black line drawing for controller chart using color to denote the valve station areas and be of a size that can be attached to the door of the controller cabinet. Laminate controller charters between sheets of 20-mil plastic. Furnish one chart to the Engineer and attach one to the door of the controller cabinet.

Supply the Engineer with the following tools and equipment:

1. Two wrenches for each type of sprinkler head installed.
2. One quick coupler key for each four or less valves installed.
3. One loose key for each hose bib installed.
4. Two keys for each controller cabinet door.
5. One key for each four units of:
 - a. valve boxes,
 - b. quick coupler lock covers, or
 - c. other items as required.

20-3.02 MATERIALS

20-3.02A General

Add to section 20-3.02A.

Furnish equipment from the same manufacturer for all drip irrigation elements and for all sprinkler irrigation elements. The manufacturer may be different for the two irrigation types.

20-3.02D Concrete

Replace section 20-3.02D with:

Concrete must comply with section 90 requirements. Hand mixing of concrete is not allowed.

20-3.02E Conductors, Electrical Conduit, and Pull Boxes
Add to section 20-3.02E.

20-3.02E(5) Splices

Where splices are permitted, splices must be water-proofed as follows:

1. 18-16 gauge: Spears brand Dri-splice connectors.
2. 16-14 gauge: as above or with 3M's DBY #054007-09053.
3. 12-10 gauge: 3M's DBR #054007-09964.

20-3.02H Irrigation Controller Systems

20-3.02H(1) Irrigation Controllers

Replace section 20-3.02H(1) with:

Supply controller unit as shown that is compatible with the City's existing central irrigation control system.

You are also responsible to provide:

1. 120 volt power supply connection
2. electrical grounding
3. power surge protection
4. communication equipment
5. communication connection (telephone or radio).

Follow all applicable codes. Use a licensed electrician.

20-3.02I Irrigation Controller Enclosure Cabinets

Add to 2nd paragraph of section 20-3.02I.

Use stainless steel outdoor enclosures.

20-3.02M Pipe

20-3.02M(1) Copper Pipe

Add to section 20-3.02M(1).

Join copper pipe with the appropriate solder type wrought copper fittings for 2½-inch and smaller pipe diameter. Use cast brass fittings for copper pipe sizes greater than 2½ inches in diameter.

20-3.02M(2) Galvanized Steel Pipe Supply Lines

Delete section 20-3.02M(1).

20-3.02M(3) Plastic Pipe

20-3.02M(3)(b) Plastic Pipe Irrigation Lines (Drip Irrigation)

Replace section 20-3.02M(3)(b) with:

Use polyethylene tubing made of:

1. extruded
2. linear
3. low density polyethylene resin
4. ½ inch diameter (0.61" I.D. x 0.70" O.D.)
5. suitable for compression fittings
6. ultraviolet light resistant.

20-3.02P Sprinklers

Replace section 20-3.02P with:

20-3.02P(1) General

Furnish sprinkler heads of the type and sizes as shown. Mount sprinkler heads on triple swing joint assemblies.

20-3.02Q Unions

Replace section 20-3.02Q with:

Use brass unions. Unions must withstand working pressure range for adjacent pipes.

20-3.02R Valves

20-3.02R(2) Check Valves

Replace section 20-3.02R(2) with:

Use line size check valves for "low head drainage".

20-3.03R(3) Control Valves

20-3.02R(3)(b) Remote Control Valves

Add to section 20-3.02R(3)(b).

Use remote control valves that are normally closed.

Use master remote control mainline valves that are normally open.

Use remote control valves in recycled water irrigation systems that are designed for such use.

20-3.02R(8) Quick Coupling Valves

Add to section 20-3.02R(8).

Use quick coupling valves made of:

1. heavy duty brass
2. two-piece construction
3. with locking rubber cover.

Provide rubber cover marked with:

"NON-POTABLE, DO NOT DRINK"

for quick coupling valves connected to non-potable irrigation systems.

20-3.02R(9) Garden Valves

Replace section 20-3.02R(9) with:

Hose bib valves must be:

1. bronze or brass
2. 3/4-inch straight-nosed
3. loose key operated
4. pressure rated at 150 psi.

Provide permanent sign marked with:

"NON-POTABLE, DO NOT DRINK".

For hose bibs connected to non-potable irrigation systems.

20-3.02U Valve Boxes and Covers

Replace 1st paragraph of section 20-3.02U with:

Use precast concrete or plastic valve boxes that are lockable.

20-3.03 CONSTRUCTION

20-3.03A General

Replace 2nd paragraph of section 20-3.03A with:

Work must comply with section 77-1.

Replace 2nd paragraph of section 20-3.03A with:

The entire sprinkler layout is diagrammatic. Place sprinklers as required to provide proper coverage. Do not place mainlines within 20 feet of trees.

Replace 9th paragraph of section 20-3.03A with:

Prevent foreign material from entering the irrigation system during installation. Prior to assembly clean all:

1. pipes
2. valves
3. fittings

Plug or cap all ends of:

1. pipe
2. valves
3. fittings

until connection of next pipe or fittings.

Upon completion of installation of all distribution tubing, remove all end caps and flush the system until water runs clear through all ends of tubing, then cap. Flush out all lines before attachment of:

1. sprinklers
2. emitters
3. other terminal fittings.

Add to section 20-3.03A.

Install sprinkler heads elevated above grade in seeded areas when shown or as directed by the Engineer. Lower sprinkler heads to their proper position upon the establishment of seeded areas.

Adjust all sprinkler heads to their proper height after completion of finished grading.

Place controllers and enclosures at locations approved by the Engineer.

Attach identification number tag at each valve as shown or as directed by the Engineer.

20-3.03D Irrigation Sleeves

Replace section 20-3.03D with:

Install irrigation lines and control wire in PVC schedule 40 sleeve when placed under:

1. class 2 aggregate base / gravel access paths and roads
2. driveways
3. parking lots
4. walkways
5. hardscape
6. other paved areas

Use irrigation sleeves that are two times larger in diameter than irrigation line.

Use control wire sleeves that allow for ease of pulling wires without damage that have a minimum diameter of 2 inches.

Use separate sleeves for control wire and irrigation piping.

Minimum sleeve depth is 18 inches below finished grade.

Extend sleeves 12 inches beyond hardscape edge.

Cap end of sleeves until used. Place a galvanized nail or other suitable marker at the edge of pavement on each side to indicate the location of sleeves.

20-3.03E Trenching and Backfilling
20-3.03E(1) General

Add to section 20-3.03E(1).

After approval of layout, trench for:

1. pipe
2. tubing
3. control wire
4. conduit
5. sleeve runs

Provide trenches that have uniform vertical sides and uniform flat bottoms.

Remove or cut to the width and depth of the trench all:

1. boulders
2. rocks
3. other debris

Fill any voids resulting from the removal of such material with compacted native soil or sand. Dig trenches six inches deeper and fill with six inches of compacted sand all trenches in:

1. soft
2. spongy
3. solid rock areas

Provide a trench with an appropriate width and depth for the number of:

1. pipes
2. fittings
3. valve boxes
4. swing joint assemblies
5. final surface improvements

After all test and inspections are passed, as determined by the Engineer, you may backfill:

1. piping
2. heads
3. valves
4. wiring
5. thrust blocking
6. valve boxes
7. pull or splice boxes
8. sleeves
9. other equipment installed

20-3.03E(4) Open Trenching In Existing Surfacing

Delete section 20-3.03E(4).

20-3.03F Pipe

20-3.03F(1) General

Add to section 20-3.03F(1).

Provide training, or evidence of training, by manufacture that installers for solvent and rubber gasket joints are knowledgeable in the techniques for making the correct joints.

Pipe must be continuously supported during installation and placement into trench.

Separate pipes placed into common trench a minimum of six inches horizontal distance.

20-3.03F(2) Galvanized Steel Pipe Supply Lines

Add to section 20-3.03F(2).

Galvanized steel pipe is not allowed.

Wrap with a protective covering all metal pipe and fittings placed below grade or set in concrete with three layers of polyvinyl chloride tape, overlapping until the total thickness is a minimum of 40 mils.

20-3.03F(3) Plastic Pipe Supply Lines

Add to section 20-3.03F(3).

Install PVC tubing following manufacturer's instructions. Use solvent welded fittings for PVC tubing. Use a solvent weld that consists of an application of primer and then an application of cement. Keep PVC tubing temperature below 110°F during installation of fittings by means of:

1. shading,
2. damp rags, or
3. working when temperatures are cooler.

20-3.03F(6) Recycled Water Supply Line

Add to section 20-3.03F(6).

Lay pipe with wording facing up.

20-3.03H Electric Installation for Electric Automatic Irrigation Systems

20-3.03H(2) Conductors, Electrical Conduit, And Pull Boxes

20-3.03H(2)(a) Conductors

Delete 14th paragraph in section 20-3.03H(2).

Replace 5th paragraph in section 20-3.03H(2) with:

If multiple conductors are installed in a trench and not in a conduit, wrap conductors together with electrical tape at 10 foot intervals. If piping is present in trench with conductors, tape conductors to the pipe at the 4 or 8 o'clock position at 20 foot intervals. Install conductors not run in common trenches with pipes, along:

1. walks
2. curbs
3. building edges

wherever possible.

Replace 7th paragraph in section 20-3.03H(2) with:

Provide two feet of slack at each valve box for each conductor that is:

1. connected to other facilities within the box
2. spliced within the box
3. at changes in direction
4. splice boxes
5. at 500 foot intervals of straight runs
6. at each controller

Replace 13th paragraph in section 20-3.03H(2) with:

Install conductors in the same trench as the supply line whenever possible.

Replace 16th paragraph in section 20-3.03H(2) with:

Install conductors in non-metallic electrical conduit when:

1. surfaced mounted,
2. installed in or on structures,
3. installed under hardscape areas,
4. installed in irrigation crossovers,
5. placed in concrete,
6. gopher protection is required,
7. if conductor is computer control cable, or
8. if conductors is high voltage wire.

Add to section 20-3.03H(2)

Use dedicated common conductor for master valves.

Share common conductor for control valves that are served by a common trench.

Use separate dedicated control conductor for each control valve and master valve. Use different color insulation or color pattern insulation from that of the other conductors for each control conductor. Do not use:

1. white,
2. black; or
3. green.

conductor insulation colors for control conductors. Connect control conductor to controller in sequential order according the valve station numbers as shown.

Use dedicated conductors for flow sensors.

Install two spare black insulation conductors for all wiring runs.

20-3.03H(2)(c) Pull Boxes

Replace 2nd paragraph in section 20-3.03H(2)(c) with:

Install pull boxes at the following locations:

1. At all conductors splices except splices made in valve boxes
2. Within 5 feet of irrigation controllers
3. At ends of electrical conduits
4. At other locations shown
5. At 500 foot intervals of runs

20-3.03K Sprinklers Type D

Replace section 20-3.03K with:

20-3.03K Plastic Pipe Irrigation Lines (drip irrigation) Installation.

After the supply system is determined to be water tight, install drip irrigation system.

Use fittings to prevent kinking for any tight turns in the drip irrigation tubing.

Square cut all tubing ends with a sharp tool. Install tubing-to-compression fittings using full depth of fitting for seating.

Remove any:

1. Sharp stones
2. Aggregate, or
3. Debris

for distribution tubing runs on soil surface.

20-3.03K(1) End Caps

Add to section 20-3.03K.

Temporarily cap all free ends of tubing with tape to prevent dirt contamination. Use removable or flushable end caps at all ends of distribution tubing.

20-3.03K(2) Hose Stakes

Add to section 20-3.03K.

Use hose stakes that have:

1. 9 gauge wire or greater for distribution tubing
2. 12 gauge wire or greater for the micro tubing
3. six inch leg length, minimum

Size and gauge may vary with soil conditions and as direct by the Engineer.

Secure all surface runs of distribution tubing and micro tubing to the finish grade with stakes.

Stake distribution tubing at six foot intervals and at terminus.

Stake micro tubing at three foot intervals and at terminus.

20-3.03K(3) Control Valve, Drip Filter, And Pressure Regulator
Add to section 20-3.03K.

Install a drip filter and pressure regulator at each control valve in drip irrigation system.

Use a drip filter that is a wye-strainer type with 140 to 155 mesh filtering screen.

Use inline pressure regulator that is designed for use in low flow irrigation systems and allow drip emitters to run at a pressure range of 10 to 50 psi.

Install:

1. control valve
2. drip filter
3. pressure regulator

as close to the first emitter as possible. Place drip filter between the control valve and pressure regulator with the pressure regulator placed on the outflow side of the valve.

Place the:

1. control valve
2. drip filter
3. pressure regulator

in one valve box of sufficient size to allow 6 inches of clear space in all direction.

20-3.03K(4) Drip Emitters, Micro Spray Heads, And Bug Caps
Add to section 20-3.03K.

After installation of all:

1. underground components
2. backfilling
3. surface run distribution tubing
4. plant materials

install:

1. drip emitters
2. micro tubing
3. micro spray heads or bug caps

Allow low pressure (5 psi) water to flow during emitter installation.

Use an appropriate hole punch for the installation of the emitters and micro spray heads.

Use the appropriate size micro tubing for the drip emitter. The ends of this tubing must be:

1. above grade
2. outside the planting pit
3. fitted with a micro spray heads or bug caps.

Adjust spray heads:

1. spacing
2. pattern
3. riser height

to achieve full and uniform coverage with minimum overthrow.

20-3.03K(5) Access Sleeves

Add to section 20-3.03K.

Place all underground drip emitters and end caps in access sleeves.

Place a one inch layer of pea gravel in the bottom of access sleeves.

20-3.03L Valves and Valve Boxes

Delete section 20-3.03L.

20-3.03N Pressure Testing

Replace section 20-3.03N with:

Use only potable water with all pressure testing work. Only pressure test newly installed irrigation system components. Provide all necessary:

1. capping
2. temporary connections
3. air release devices

to isolate existing irrigation system components

Pressure testing sequence:

1. Install all pressure irrigation components.
2. Flush the irrigation system.
3. Isolate newly installed irrigation system from existing system.
4. Cap all sprinkler heads (before swing joints) and other non-pressure connections.
5. Bleed all air from the irrigation system.
6. Ensure that the manufacturer's recommended cure time has elapsed for solvent welded joints.
7. Pressurize the irrigation system to 110 psi with water for a period of four (4) hours.
8. If any leaks are found, repair leak and repeat pressure test. The irrigation system has failed the pressure test.

Once pressure test has passed, install sprinkler heads and backfill.

20-3.03N(1) Cross-Connection Test (Recycled Water Irrigation System Only)

Add to section 20-3.03N.

The irrigation system must pass a required cross-connection test performed by a certified AWWA cross-connection specialist. Use potable water for the cross-connection test. If potable water is not present on the site, this testing may be waived at the discretion of the Engineer.

Notify the Engineer five working days prior to testing. The Engineer will provide the certified AWWA cross-connection specialist. You must provide all personal required to pressurize and depressurize irrigation system.

20-3.03O Repairs and Sprinkler Coverage

Replace 3rd paragraph of section 20-3.03O with:

Complete sprinkler operation and coverage testing using the permanent water supply system, recycled water or potable water.

Irrigation Audit / Coverage test sequence:

1. Verify that the entire system has been flushed and cleaned.
2. Verify that all main line shut-off valves are fully open.
3. If plans show a mainline pressure regulator, set the pressure to the required pressure as called out on the plans, then proceed downstream to zone adjustments.
4. Using pressure gauges and pilot tubes, adjust remote control valve flow controls and/or pressure regulators to the zone setting as called out on the plans. The set pressure is the operating pressure of the sprinkler head furthest or highest from the valve. All other heads will have slightly higher pressures.
5. After zone pressures have been set, adjust arc patterns to achieve full and uniform coverage with minimum overthrow to avoid overspray onto non-planted areas.

6. Arrange for an irrigation audit by a certified irrigation auditor or other qualified person acceptable to the Engineer to determine the distribution uniformity.
7. Adjust the system to maximize uniform coverage and minimize overthrow as determined by the Engineer, at no additional cost.

20-3.03P Irrigation System Functional Test

Add to section 20-3.03P.

Remove all construction:

1. barricades
2. equipment
3. tools

prior to testing.

Evaluate the performance of all components of the system for proper:

1. working order
2. function
3. coverage

Run the irrigation system in both manual and automatic mode, testing each station operation through the entire cycle.

20-3.03P(1) Drip Irrigation Operational Test

Add to section 20-3.03P.

Complete drip irrigation operational testing using the permanent water supply system (recycled water or potable water.)

At the completion of the drip irrigation installation, the Engineer will inspect the system installation and at the same time have an operational test run.

Testing will allow the evaluation of the system for proper:

1. working order
2. function
3. coverage
4. emitter flow

Each plant will be inspected for:

1. proper number of emitters
2. correct location
3. required bug caps

The Engineer will spot check the emitters for correct flow rate by discharging water into a container for a calculated time period.

Check for desired minimum pressure at points located at the system lowest hydraulic condition with pressure testing equipment supplied by you (Schrader pressure testing valve).

The system must be run in its manual mode and its automatic mode, testing each valve station operation through its entire cycle.

20-3.04 PAYMENT

Replace section 20-3.04 with:

Full compensation for work specified in section 20-3 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

20-7 HIGHWAY PLANTING

20-07.01 GENERAL

20-7.01A Summary

Add to section 20-7.01A.

Numerical quantities and totals are provided on the plans for convenience only. You are responsible verify all quantities prior to bid and to supply all plants called out by symbols or spacing.

20-7.01B Submittals

Delete section 20-7.01B.

20-7.02 MATERIALS

20-7.02A General

Replace section 20-7.02A with:

Plant names shown on the plans refer to botanical names (genus, species and variety) of each plant. Common names, when shown, are for convenience only and must not be used when ordering plants.

All plants must be No. 1 grade and conforming to the State of California Grading Code of Nursery Stock.

Plants furnished must be:

1. healthy
2. shapely
3. well rooted
4. well grown
5. free from pest and disease
6. show no evidence of having been restricted or deformed at any time
7. grown in nurseries that have been inspected by the State of California's Department of Food and Health.

Where height or spread are shown, they are measured with branches in their normal position. Where caliper is noted, they are measured 4 feet above finish grade. Where only container size is noted, it is understood that these plants be of accepted industry size

All plants furnished must be true to the type as shown and must be tagged identifying the plants by:

1. genus
2. species
3. variety

However verification of the plant species or variety will be made by the Engineer. Tag plants individually or be group. The Engineer reserves the right to reject any plants.

20-7.02C Plants

20-7.02C(5) Turf Sod

Add to section 20-7.02C(5).

Furnish drought tolerant, fine bladed tall fescue sod.

20-7.02C(6) Hand Seeded Turf

Add to section 20-7.02C.

Seed must be:

1. fresh
2. clean
3. mechanically pre-mixed to the specified proportions.

Deliver the seed to the site in the original unopened containers bearing the dealers:

1. guarantee
2. analysis
3. germination (90 percent pure with 85 percent germination)

20-7-.02C(7) Hydroseeded Lawn Planting

Add to section 20-7.02C.

Use Weyerhaeuser's Silva-Fiber or equal fiber that is 100 percent virgin wood fiber mulch (dyed green). Add organic tackifier, M-Binder by Ecology Controls or equal, when slopes exceed five percent.

20-7.02D Miscellaneous

20-7.02D(1) Fertilizer

Replace section 20-7.02D(1) with section 20-1.02D.

20-7.02D(4) Iron Sulfate

Replace section 20-7D(4) with:

Use iron sulfate that is ferrous sulfate in pelleted or granular form containing not less than 18.5 percent iron expressed as metallic iron. Use Iron sulfate that complies with the Food & Agri Code. Add sulfur at 1 pound per 1000 square feet and gypsum at 2 pounds per 1000 square feet, both finely broken up.

20-7.02D(5) Edging

20-7.02D(5)(a) Header Board Edging

Replace section 20-7.02D(5)(a) with:

Boards, Laminate Boards (bender-board), and stakes must be one of the following types:

1. construction grade cedar
2. pressure treated Douglas fir
3. construction heart grade redwood complying with 57-2.01B(2)
4. an approved composite of equal strength and durability

Boards must be:

1. rough cut from sound timber
2. straight. Sweep must not exceed 1 inch in 6 feet
3. free from loose or unsound knots. Knots must be sound, tight, well-spaced, and not to exceed 2 inches in size on any face
4. free of shakes in excess of 1/3 the thickness of the lumber
5. free of splits longer than the thickness of the lumber
6. free of other defects that would render the lumber unfit structurally for the purpose intended
7. nominal size 2 inch x 4 inch

Bender-board must be:

1. of an appropriate thickness, that when bent, does not kink or cracking
2. a nominal 4 inches

Anchor edging with stakes. Stakes must be:

1. a nominal size of 1 inch x 2 inches with a length of 18 inches
2. secured to headers with six penny (6d) galvanized common nails or screws two per stake
3. driven ¼ inch lower than top of header and back cut at a forty-five (45) degree angle, with the acute part facing stake
4. placed at no more than 5 foot on center and within 1 foot of the ends when placed in a straight line
5. placed at no more than 3 foot on center and alternating on either side of header board when placed on curve. Staking interval may be reduced in order to maintain smooth radius
6. placed on the planter side of header's or as directed by the Engineer

Trench and set the header boards after location is approved by the Engineer. Set the boards on firmly compacted subgrade. Stake the headers, backfill and compact. Finish grade the soil on each side of the headers to the required elevation.

20-7.02D(5)(b) Metal Edging

Add to section 20-7.02D5(b).

Use metal edging that is a minimum of 1/8" thick.

20-7.02D(6) Mulch

20-7.02D(6)(a) General

Add to section 20-7.02D(6)(a).

Mulch all disturbed areas using shredded bark mulch (gorilla hair) except for:

1. turf or
2. any other areas that have been specifically addressed in compliance with Section 21 for erosion control.

20-7.03 CONSTRUCTION

20-7.03F Cultivate

Replace section 20-7.03F with:

Cultivate by mechanical methods and repeat until the soil is loose to a minimum depth of 6 inches and soil clods are less than 1 inch maximum dimension.

The use of rubber-tired equipment will be permitted for cultivating operations provided the equipment used cultivates any compaction caused by the tires. Do not use rubber-tired equipment on areas once cultivated.

Extend one foot beyond the outer row of plants requiring cultivation for cultivation area.

Cultivate areas before adding soil amendment and fertilizer. Add soil amendment and fertilizer at the rates shown. Re-cultivate to thoroughly mix soil amendment and fertilizer with the soil.

Re-cultivate planting areas that have been compacted.

Bring to the surface encountered rocks or debris during soil preparation work in planting areas. Remove rocks or debris larger than 1 inch in maximum dimension.

Remove existing pavement prior to cultivation.

20-7.03I Planting

20-7.03I(1) General

Add to section 20.7.03I(1)

The backfill mixture must be composed of:

1. Native, rock free soil - 75% by volume
2. Soil amendments - 25% by volume
3. "Grow-power" - 15 pounds per cubic yard of mix
4. Sulfur - 6 ounces per cubic yard of mix

Install plants in boxed containers, which are 24 inches or larger, prior to installation of the irrigation system. Reroute irrigation lines which conflict with these plant locations to clear the root ball.

Cut back wrapping of balled and burlapped plants at the root crown after the plant is positioned in the plant pit.

Fill with backfill mixture up to the finish grade and water thoroughly. Add additional backfill mixture to fill voids or settlement below finish grade. Construct a mound of backfill mixture around each plant forming a watering basin the same diameter of the drip line of the plant, except for:

1. ground covers planted from flats
2. trees and shrubs in grass areas;

Attach vines to supports as follows:

1. Trellis - After planting, carefully cut vine from nursery stake and spread branches. Spread and attach branches to trellis with green, plastic tie ribbon.

2. Walls - Same procedure as trellis, but secure branches with adhesive masonry vine ties. The Engineer will have final approval of placement of vine on supports.

Add a 2 inch layer of mulch in a neat even layer:

1. around
2. under
3. between

all plants in newly planted areas. Clear the mulch away from the root crowns.

Do not place mulch in newly planted ground cover areas that are expected to fill in the first year.

20-7.03I(9) Ground Cover

Add to section 20-7.03I(9).

Plant trees and shrubs prior to planting ground cover. Plant ground cover:

1. under
2. around
3. between shrubs and trees

Plant ground cover in moist soil with a proportionate amount of soil from the flat. Soil must not crumble and fall away from the plant when removed from the flat.

Apply a pre-emergent herbicide to the ground cover planting area for weed control.

20-7.03I(14) Turf Sod

Add to section 20-7.03I(14).

Establish sod subgrade taking into account thickness of sod that will be installed. Sod subgrade is equivalent to finished grade minus sod thickness. Sod subgrade must be:

1. firm
2. raked smooth
3. no depressions or undulations
4. moist but not wet when sod is laid

Lay sod parallel with staggered ends and offsetting adjacent rows. Butt sod tightly against each other and all construction.

Within two hours after installing sod and before rolling, lightly water sod. Roll all seams and joints with a half filled roller.

After rolling, thoroughly water area to a depth of at least 6 inches into soil. Repeat watering as necessary to keep the sod moist until rooted.

20-7.03I(14)(a) Hand Seeded Lawn

Add to section 20-7.03I(14).

After finish grading, rake the soil surface and apply seed. Apply seed in uniform amounts in in two opposite directions.

After seeding, cover the area with mulch evenly to a depth of ¼ inch. Roll area with an empty roller, then thoroughly water.

Keep seeded area continuously moist throughout the germination period, as specified by the seed company.

Any seed that germinates outside of the designated grass area must be immediately removed, including roots.

20-7.03(14)(b)Stolonized Planted Lawn

Add to section 20-7.03I(14).

After finish grading, thoroughly water area to a depth of at least 6 inches into soil. As soon as the soil can be worked, add fertilizer into the top 1 inch of soil.

When the top two inches of soil is friable but contains enough moisture to prevent the stolons from drying out, plant stolons.

Work stolons into the soil to depth of ½ inch to 1½ inches and cover with mulch.

Plant stolons by:

Turf Area	Stolon Planting Means
Less than 2,000 square feet	Hand Planting Only
2,000 to 10,000 square feet	Hand or Mechanical Planting
Greater than 10,000 square feet	Mechanical Planting Only

Hydroseeding of stolon grass area is allowed, if approved by the Engineer.

Do not allow stolons to dry out. Water stolons immediately after planting and keep stolons moist at all times until plants are well established.

20-7-03(14)(c) Hydroseeding

Add to section 20-7.03I(14).

After finish grading, thoroughly water area to a depth of at least 6 inches into soil. As soon as the soil can be worked, cultivate top 2 inches of soil and level. Keep area moist to a depth of 6 inches into soil.

Prepare slurry at the site by an experienced hydroseeding company. Commence spraying within five minutes after all materials have been mixed into the slurry.

Clean overspray areas immediately. Remove any seed that germinates outside of the hydroseed area.

20-7.03I(14)(d) Turf Protection

Add to section 20-7.03I(14).

Protect planted turf areas, at a minimum, with fencing until established. Provide stake that are three feet long. Embed stakes one foot into soil at eight foot on center around the perimeter of turf area. Connect stake with two strands of orange plastic ribbon. Place one strand at the top of the stake and one strand six inches above turf. Provide signs stating:

“KEEP OFF GRASS”

placed at every change in direction. Protect and maintain area until the grass is well rooted and has 2½ inches of top growth.

20-7.03I(17) Pre-Emergent Herbicide

Add to section 20-7.03I.

Apply pre-emergent herbicide for weed control prior to the application of mulch. Determine which herbicide is safe for adjacent plants. Notify the Engineer if detrimental compatibility exists between the herbicide and the plants prior to application.

Apply only granular forms of pre-emergent herbicide, and do not apply it if the foliage is wet or the wind is more than five miles per hour. Wash all foliage of pre-emergent herbicide residue after application. Apply the pre-emergent herbicide in strict compliance with manufacture’s recommendations.

20-8 WILDFLOWER SEEDING

Replace section 20-8 with:

20-8.01 GENERAL Add to section 20-8.

Hydroseeding of wildflower must conform to the requirements of 21-1.02L.

20-8.02 MATERIAL Add to section 20-8.

Apply wildflower seed to natural areas. Seed must be:

1. fresh
2. clean
3. new crop seed
4. delivered to the site in labeled, un-opened containers

Seed containers must be labeled with:

1. germination rate
2. germination test date
3. quantity of seed supplied

For seed mixtures, supply an itemized list citing percent composition and minimum germination standard for each component in the mixture.

20-8.03 PLANTING Add to section 20-8.

Mow and remove vegetation from area to be seeded. Loosen the top 2 inches of the soil with verticutting blades or by light cultivation.

Apply seed with a cyclone seeder and use sand as a proportioner (2:1 sand to seed) to help ensure even distribution.

After seed application, lightly rake area to achieve a seed cover using hand rake or a drag mat behind a tractor.

Planting must occur in late summer or early fall, before the first rain of the season.

20-9 PLANT ESTABLISHMENT WORK

Replace section 20-9 with:

20-9.01 GENERAL Add to section 20-9.

Section 20-9 includes specifications for performing plant establishment work that consists of caring for the planting including:

1. watering plants
2. pruning plants
3. replacing damaged plants
4. weeding
5. rodent and pest control
6. operation and repair of irrigation facilities.

Prior to project acceptance, establish and continually maintain all newly planted areas for one year starting the day after the date of project acceptance. The remainder of the contract, excluding the work involved in the maintenance period, will be finalized in compliance with section 9-1.17C.

Before the maintenance period begins, an agreed upon a maintenance schedule indicating the days that maintenance are planned to be performed.

20-9.02 MATERIAL
Add to section 20-9.

Not used.

20-9.03 MAINTENANCE

20-9.03A Mowing and Edging

Add to section 20-9.03.

Once the seeded lawn grass has ninety percent coverage, mow the lawn for the first time. Cut the lawn to one half (1/2) its height the first mowing, then to its normal height thereafter. Catch, collect and remove all lawn clippings.

Mow the lawn, at a minimum, every seven calendar days to the following heights:

Grass Type	Mow Height
bluegrass & rye grass	2 inches
Bermuda grass	1 inch
Dichondra	1 inch
tall fescue	2½ inches

Trim edges of lawn, at a minimum, every 14 calendar days.

20-9.03B Watering

Add to section 20-9.03.

Apply water lightly and frequently until roots begin to grow.

Once plants are established, water as required to maximize plant growth. Schedule lawn water one day prior to wilting and then water until surface run off begins.

Complete watering during rising temperature. Start automated systems to begin watering at 5:00 A.M. or as directed by the Engineer.

20-9.03C Pruning

Add to section 20-9.03.

Prune lateral branches and buds flush with trunk.

Do not prune young trees until they are able to support themselves without stakes or other supports. Pruning will be allowed to remove:

1. dead,
2. diseased, or
3. damaged portions

of young trees.

Do not shear shrubs unless directed by the Engineer.

Complete pruning to maintain growth within space limitations or to maintain a proper leaf-to-root relationship.

20-9.03D Staking and Guying

Add to section 20-9.03.

Replace all broken support materials.

Remove support materials prior to disfiguring of plant. Remove support system or replace support system if still required as directed by the Engineer.

Review supported plants monthly and remove support system as soon as they are no longer needed.

20-9.03E Pest and Disease Control

Add to section 20-9.03.

Identify pest and immediately control by mechanical or chemical means. Complete control work in strict compliance with the manufacturer's recommendations without harming any other plant or animal life. Do not use:

1. chlorinated hydrocarbons, or
2. organic phosphate based pesticides.

20-9.03F Weeding

Add to section 20-9.03.

Remove all weeds by mechanical or chemical means once a week. Complete control work in strict compliance with manufacturer's recommendations without harming any other plant or animal life.

20-9.03G Fertilization

Add to section 20-9.03.

Fertilize:

1. ground cover
 2. planted areas
 3. planted mulch beds
- every 30 calendar days.

Fertilize turf area 30 calendar days after maintenance period has begun and at intervals recommended by the fertilizer manufacture. Send a letter to the Engineer stating that fertilization has taken place documenting dates and enclose copies of invoices showing amount of fertilizer applied.

20-9.03H Plant Replacement

Add to section 20-9.03.

Replace all dead plant materials with the originally planted type and size within two weeks of the plant dying or when notified by the Engineer.

Should a potted plant die, the pot must be immediately relocated out of view until the plant can be replaced. Complete replacement within five working days.

Obtain written consent from the Engineer for any substitute plant type.

20-9.03I Irrigation System

Add to section 20-9.03.

Maintain the irrigation system in proper operating condition at all times; repairing:

1. broken heads
2. valves
3. pipes
4. controllers
5. etc.

within two days of failure. Isolate, cap or turn off zones that will cause a loss of water or damage due to excess flows.

Set, monitor, and adjust station run times to supply adequate watering for plant growth without causing:

1. overwatering,
2. standing water,
3. wet muddy conditions, or
4. run off of water.

Should failure occur, hand water to ensure healthy plant growth.

Seasonally adjust automatic irrigation systems to appropriate watering. Inspect irrigation heads weekly for proper coverage and to eliminate overthrow.

On a monthly basis:

1. flush and clean filters for drip irrigation system
2. test pressure at the worst hydraulic points for correct pressure and adjust as needed

On a weekly basis check for proper flow for all micro tube emitters. Clean and replace as needed or as directed by the Engineer.

20-9.03J Damage

Add to section 20-9.03.

Immediately repair all damage to planting areas. Keep all planting areas and adjacent paved areas neat and clean.

Fill depressions caused by:

1. vehicles
2. equipment
3. foot traffic

with lightly compacted and leveled soil.

Rebuild, replant, and re-compact eroded or washed out sections of slopes.

Remove deposits of silt on:

1. walkways
2. planting
3. lawn areas

20-9.04 PAYMENT

Establish and continually maintain all newly planted areas until final project acceptance by City Council or designated representative. Costs for continued maintenance until project acceptance is included in other bid items of work.

After final project acceptance, continually maintain planted areas during the one year maintenance period which begins the day after final project acceptance. Maintenance period compensation will be withheld from the final payment and paid in even monthly payments over the maintenance period. The remainder of the contract, excluding the work involved in the maintenance period, will be finalized in compliance with section 9-1.17C.

Submit a maintenance schedule indicating the day you will perform maintenance work to the Engineer for review and approval. If you fail to perform the maintenance within one week of the pre-determined schedule, payment will be forfeited for that month. If you fail to perform maintenance per the pre-determined schedule three times, the Engineer will put you on notice for violation of the contract and notify your bonding company. The Engineer reserves the right to continue maintenance in compliance with section 9-1.23 and to start legal proceedings to recapture costs required to maintain planted areas during the maintenance period.

Full compensation for work specified in section 20-9 and applicable engineering standards is included in the payment shown on the bid item list. No plant establishment and maintenance period is required unless specified and included in the bid item list.

If no plant establishment and maintenance period is required, plant material and irrigation repairs are covered for the duration of the guaranty period in compliance with section 5-1.39C(2). Replace plant material in compliance with section 20-7.

21 EROSION CONTROL

21-1.02 MATERIALS

21-1.02G Seed Add to section 21-1.02G

Seed (% minimum purity, % minimum germination)	pounds per acre
Bromus carinatus - California Brome (95%, 85%)	22
Festuca megalura - Zorro Fescue (85%, 80%)	10
Trifolium hirtum "Hykon" - Rose Clover (95%, 90%)	30
inoculated with appropriate bacteria	5
Eschscholzia californica - California Poppy (95%, 75%)	5
Lupinus nanus - Sky Lupine (95%, 75%)	5

21-1.02L Hydraulically Applied Erosion Control Products Replace section 21-.02L with:

Hydraulically applied erosion control slurry mix must be in compliance with:

Material	Pounds per acre
100% Wood fiber mulch (green)	1800
Commercial fertilizer (16-20-0)	400
"M-binder" (stabilizing emulsion) or equal	130
Water	*
Seed per special provision or section 21-1.02G	
* Quantity of water as needed for the application as specified by the manufacturer of stabilizing emulsion.	

Application of Hydraulically applied erosion control must be:

1. completed by an experienced hydraulically applied erosion control company
2. started within five minutes after materials have been mixed thoroughly
3. applied in the presence of the Engineer

21-1.03 CONSTRUCTION

21-1.03A General Add to section 21-1.03A.

Apply hydromulch and hydroseed to all slopes in excess of 10 percent gradient.

In addition to hydromulch and hydroseed, apply:

1. erosion control mats,
2. blankets, or
3. jute mesh

to all slope in excess of 25 percent gradient.

Apply nylon mesh reinforced visqueen to all temporary construction slopes equal to or greater than 50 percent gradient. Visqueen must be anchored at the top of slope using a 6 inch deep backfilled trench

Apply all erosion control devices as first order of work or as soon as practical, as determined by the Engineer. From October 15 to April 15, erosion control must be:

1. installed,
2. applied, or
3. reinstalled

after area is:

1. graded
2. prior to any rain event

3. no later than five working days after disturbance.

Employ appropriate best management practices to contain all sediment on site and do not allow sediment to enter:

1. adjacent properties,
2. City right-of-way,
3. storm drains, or
4. creeks.

21-1.03B Site Preparation
Add to section 21-1.03B.

Surfaces left smooth and compacted by grading operations must be loosened to a depth of 1 inch by:

1. raking,
2. tilling, or
3. other methods.

DIVISION IV SUBBASES AND BASES

26 AGGREGATE BASES

26-1.02 MATERIAL

26-1.02A General

Replace the 1st and 2nd paragraph of section 26-1.02A with:

Aggregate for base must be clean and consist of any combination of the following:

1. Broken stone
2. Crushed gravel
3. Natural rough surfaced gravel
4. Sand
5. reclaimed portland cement concrete
6. lean concrete base
7. cement treated base

Recycled or reclaimed asphalt concrete may only be used in class 2R aggregate base.

Use ¾ inch maximum grading aggregate for class 2 and 2R aggregate base.

All aggregate base must be free from organic matter and other deleterious substances.

Add to section 26-1.02.

26-1.02D Class 2R Aggregate Base (Recycled)

Class 2R aggregate base material use is limited to the City right-of-way unless authorized by the Engineer. Do not use class 2R aggregate base material within the creek areas or creek setback areas as described in the Municipal Code.

Class 2R aggregate base must conform to the following grading and quality requirements:

Aggregate Grading Requirements		
	Percentage Passing ¾" Maximum	
Sieve Sizes	Operating Range	Compliance Range
1 inch	100	100
¾ inch	90-100	87-100
No. 4	35-62	30-65
No. 30	10-30	5-35
No. 200	2-9	0-12
Quality Requirements		
Test	Operating Range	Compliance Range
Resistance (R-Value)	----	70 Min.
Sand Equivalent	25 Min.	22 Min.
Durability Index	----	30 Min.

Furnish a laboratory report, not more than 3 months old, verifying the material's compliance with this section's requirements prior to material being delivered to site. Material is still subject to testing and acceptance after it is delivered and placed.

Class 2R aggregate base must be encapsulated by placing it below another material such as asphalt concrete or Portland cement concrete, where it will not be exposed to wearing and cause it to enter the air or drainage system. Use of class 2R aggregate base with an R value below that of Class 2 aggregate base will only be allowed when the structural section has been designed for that value.

26-1.02E Class 3 Aggregate Base (Sand)

Class 3 aggregate base must be of a nature that can be compacted readily under watering and rolling to form a firm, stable base. Aggregate must conform to the grading and quality requirements shown in the following tables:

Grading Requirements (Percent Passing)		
Sieve Size	Operating Range	Contract Compliance
1 inch	100	100
#4	80-95	75-95
#30	35-70	30-75
#200	15 Max.	10 Max.
Quality Requirements		
Test	Operating Range	Compliance Range
Sand Equivalent	---	30 Min.

26-1.02F Crushed Rock

Crushed rock must be of a nature that can be compacted readily to form a firm, stable base. Crushed rock must conform to the grading and quality requirements shown in the following table.

Grading Requirements	
Sieve Size	Percent Passing
1 inch	100
¾ inch	90-100
⅜ inch	20-55
#4	0-10
#8	0-5
Quality Requirements	
Sand Equivalent	30 Min.

26-1.02G Select Backfill Material (Trench Backfill Sand)

Select Backfill Material must be of a nature that it can be compacted readily to 90 percent relative compaction. The following materials are not acceptable for use as select backfill material:

1. material with corrosive properties
2. marine or beach sand
3. recycled / reclaimed material

Select Backfill Material must conform to the grading and quality requirements shown in the following table:

Grading Requirements	
Sieve Size	Percent Passing
1 inch	100
#4	80-95
#30	35-70
#200	15 Max.
Quality Requirements	
Sand Equivalent	30 Min.

26-1.02H Float Rock (Trench Backfill)

Float rock must be of a nature that it can be compacted readily to 90 percent relative compaction. The following materials are not acceptable for use as Float Rock:

1. material with corrosive properties
2. local "Red Rock"

Float rock must conform to the grading requirements shown in the following table:

Grading Requirements	
Sieve Size	Percent Passing
¾ inch	100
½ inch	95-100
3/8 inch	70-80
#4	15-25
#8	0-5

DIVISION V SURFACING AND PAVEMENTS

37 BITUMINOUS SEALS

37-1 GENERAL

37-1.01 GENERAL Add to section 37-1.01.

Notification and operational requirements must comply with sections 7-1.03 and 7-1.04.

37-2 SEAL COATS

37-2.02 MATERIALS

Add to section 37-2.02

Asphalt Emulsion must comply with Section 94.

37-2.02H Screenings

37-2.02H(2) Asphaltic Emulsion Seal Coat

Add to section 37-2.02H(2).

Use Fine ¼" max seal coat gradation.

37-2.02H(3) Polymer Modified Asphaltic Emulsion Seal Coat

Add to section 37-2.02H(3).

Use Fine ¼" max seal coat gradation.

37-3 SLURRY SEAL AND MICRO-SURFACING

37-3.01 GENERAL

37-3.01D Quality Control and Assurance

37-3.01D(1) General

Add to section 37-3.01D(1).

No single:

1. aggregate grading, or
2. sand equivalent test

may represent more than:

3. 360,000 square yards or
4. one day's production,

whichever is smaller.

37-3.03 CONSTRUCTION

37-3.03D Placing

37-3.03D(1) General

Add to section 37-3.03D(1).

Seal coat placed adjacent to concrete gutter must be placed up to, but not on, concrete gutter. Seal coat material extending more than 1 inch into adjacent concrete gutter must be removed within 24 hours of seal coat application. Seal coat placement may not continue until previous days gutters have been cleaned.

37-3.03D(2) Surface Preparation

37-3.03D(2)(a) General

Add to section 37-3.03D(2)(a).

Protecting existing utility collars and concrete collars must comply with section 15.

Provide to the Engineer, a written herbicide recommendation by a Licensed Pest Control Adviser with material safety data sheets of recommended products. Spray the approved herbicide, which leaves behind a visible blue marker dye, on vegetation. The herbicide must be applied under dry condition and at 48 hours prior to

vegetation removal. Before placing the seal coat, vegetation in pavement cracks and between pavement and curb/gutter must be removed. You must assume full responsibility for the proper application of the herbicide governed by Federal, State and Local laws.

Remove surface contaminants such as grease or oil spots to allow for proper adhesion of slurry seal.

If slurry seal placement includes locations where a bike lane is located immediately adjacent to a concrete gutter, grind pavement surface flush prior to application of slurry seal. The width of the grind must be a minimum of one foot and up to five feet, as necessary to leave the cross slope of the pavement surface less than 5%. The finish surface adjacent to the seal coat must not be more than ¼ inch above the surface of the gutter where a bike lane abuts the gutter.

In areas where concrete pavement is exposed, apply a tack coat consisting of one part emulsified asphalt and three parts water at a rate of 0.10 gallons to 0.15 gallons per square yard, or as directed by the Engineer. Use CSS1H emulsion grade emulsified asphalt.

37-3.03D(3) Test Strip

37-3.03D(3)(b) Slurry Seal

Replace section 37-3.03D(3)(b) with 37-3.03D(3)(c).

37-3.03D(3)(c) Micro-Surfacing

Replace section 37-3.03D(3)(c) with:

Calibration of each truck that will be used on the project within 20 miles of the City of San Luis Obispo and must be calibrated specifically for the City's project. Calibrate per California Test 109, Monday through Friday between the hours of 7:00 AM and 4:00 PM.

You must construct a test strip for evaluation by and at a location provided by the Engineer. A test strip must:

1. be placed under similar conditions of the contract work
2. Be placed at the same time of day or night that contract application will occur
3. use the approved project mix design
4. use the same laydown procedures and equipment that will be used for contract work
5. have a minimum length of one hundred feet
6. be completed and accepted as satisfactory by the Engineer two working days prior to the first contract application day
7. curing properly to allow normal traffic on the surfaced roadway within three hours
8. have edge lines that are straight and remain straight
9. have no lumping, balling or unmixed aggregate
10. have a uniform surface texture that is free of streaks, slick spots or excessive drag marks

You must propose adjustments in the mixture to compensate for sudden changes in weather conditions or night application. All adjustments to the in the mixture must be lab approved prior to placement of the mix.

If the mix design or the placement procedure is determined by the Engineer to be unacceptable, the test strip will be rejected and not measured as part of the completed work. You must remove and replace the test strip at no additional cost or overlay the test strip with material that conforms to the project specifications, at the Engineer's discretion. The edges and ends of overlaid material must be feathered to conform to the longitudinal and transverse joint requirements in these specifications.

Accepted test strips, when placed within project contract area, will remain in place and be measured as part of the completed work.

A new test strip will be performed when there is field evidence that the system is not performing as specified.

37-3.03D(4) Placement

37-3.03D(4)(a) General

37-3.03D(4)(a)(i) General

Add to section 37-3.03D(4)(a)(i).

Roll all seal material with a rubber-tired roller, a minimum of three passes, prior to allowing traffic on the surfaced roads. After placement of seal material surfaced roads must be opened to traffic no later than 3 hours after the seal material has been placed and no later than 4:00 p.m. in the evening. Quantities of seal placed daily must be adjusted to accommodate road opening schedule.

37-3.03D(4)(c) Micro-Surfacing

37-3.03D(4)(c)(iii) Finished Surface

Add to section 37-3.03D(4)(c)(iii).

Micro-surfacing must cure to allow turning truck traffic within 3 hours. Adequate cure must be verified through actual traffic conditions. Micro-surfacing that exhibits large aggregate displacement after 3 hours from actual traffic must be removed and replaced at no cost to the City. At the expiration of the time allowed for closure of lanes, the micro-surfacing mixture must be sufficiently cured to support unrestricted traffic.

37-3.04 PAYMENT

Replace section 37-3.04A and 37-3.04B with:

Full compensation for work specified in section 37 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

If test results for slurry seal or micro-surfacing indicate that the material does not comply with the requirements, you may remove the installed material represented by the failing test results or request it remain in place with a payment deduction in the amount of \$0.50 per square yard.

39 HOT MIX ASPHALT

39-1 GENERAL

39-1.01 GENERAL

39-1.01A Summary

Add to section 39-1.01A.

Asphalt grinding and removal must comply with section 15.

Temporary transitions must comply with section 42-3.03C(1).

39-1.02 MATERIALS

39-1.02B Tack Coat

Add to section 39-1.02B.

Use RS-1 asphaltic emulsion for tack coat. See section 94 for requirements.

39-1.02C Asphalt Binder

Replace section 39-1.02C with:

Use asphalt binder for Hot Mix Asphalt (HMA) in compliance with section 39-1.02D.

Use PG 64-10, in compliance with section 92, for asphalt binder unless otherwise directed by the Engineer.

39-1.03 HOT MIX ASPHALT MIX DESIGN REQUIREMENTS

39-1.03A General

Replace section 39-1.03A with:

Submit asphalt mix design prepared by an independent laboratory in compliance with section 39-1.03B. Submit mix design, a minimum of 7 days, prior to any paving for review and approval of the Engineer.

39-1.09 SUBGRADE, TACK COAT, AND GEOSYNTHETIC PAVEMENT INTERLAYER

39-1.09D Geosynthetic Pavement Interlayer

Add to section 39-1.09D.

Pavement reinforcing fabric and paving grid must comply sections 88-1.02J and 88-1.02M.

Provide a certificate of compliance for pavement fabric used to the Engineer.

Place fabric into the asphalt binder with a minimum of wrinkles. The placed fabric must be broomed or squeegeed to remove any bubbles prior to the binder cooling to the point that fabric will not adhere. The equipment for placing the fabric must be mechanized and capable of handling full rolls of material and be capable of laying the fabric without forming excess wrinkles or folds. The equipment to be used is subject to the approval of the Engineer.

39-2 STANDARD CONSTRUCTION PROCESS

Delete section 39-2.

39-3 METHOD CONSTRUCTION PROCESS

39-3.01 GENERAL

Add to section 39-3.01.

Asphalt concrete must be type B conforming to the requirements for $\frac{3}{4}$ " aggregate grading except as noted below.

Provide final lift of multi-lift paving, when thickness is less than 2 inches, conforming to the requirements of type B asphalt concrete $\frac{1}{2}$ " aggregate grading.

Provide leveling course conforming to the requirements of type B asphalt concrete $\frac{3}{8}$ " aggregate grading.

39-3.02 ACCEPTANCE CRITERIA
Add to section 39-3.02.

39-3.02B Acceptance of Private Construction

Obtain special inspection services of a geotechnical engineer, if required by the Engineer, to provide density testing during paving operations to determine that the work effort is sufficient to achieve a minimum of 95 percent relative compaction. Where 95 percent compaction is not achieved, you must work with the geotechnical engineer to modify the operations to achieve the required compaction of 95 percent.

Obtain special inspection services, if required by the Engineer, in order to verify compliance with section 39-1.12. Cease paving operations until the necessary adjustments are made to provide a smooth surface.

39-3.03 SPREADING AND COMPACTING EQUIPMENT
Add to section 39-3.03.

Areas inaccessible to the rollers may be compacted using a high impact power compactor capable of attaining the same compaction as the rolled areas.

The Engineer may allow the number of rollers to be reduced depending on the size of the paving operation.

39-3.04 TRANSPORTATION, SPREADING AND COMPACTING
Add to section 39-3.04.

Prior to placing asphalt paving over an existing surface, the surface must be cleaned by vacuum sweeping, or other means necessary to remove all surface contaminants, to the satisfaction of the Engineer, including:

1. loose particles of paving
2. dirt
3. grease
4. oil spots
5. other extraneous material

Prior to vegetation removal spray an approved herbicide, which leaves behind a visible blue marker dye, a minimum of 48 hours in advance of vegetation removal. Submit to the Engineer a written recommendation, for herbicide intended to be used, by a Licensed Pest Control Adviser along with material safety data sheets of recommended products. Apply herbicide in strict compliance with all:

1. Federal Law
2. State Law
3. Local Law
4. Manufacture's recommendations

Remove vegetation in pavement

1. cracks
2. between pavement and gutter
3. between pavement and curb

prior to cleaning and placing asphalt concrete.

When placing asphalt concrete to established lines and grades, the automatic screed controls must provide the longitudinal grade and transverse slope. You must:

1. furnish
2. install
3. maintain

grade and slope. Place screed with automatic controls adjacent to existing pavement to provide grade and slope of new pavement and transitions between new and existing pavement in strict compliance with section 39-1.12B. All screeds must be controlled in the same manner.

Asphalt concrete must not be placed during rain or other unsuitable weather. At no time is the soil beneath the existing pavement material to be exposed to rain or other adverse weather conditions.

If vibratory rollers are used as finish rollers, turn off vibratory unit.

On streets receiving an asphalt concrete overlay, you must spread a leveling course in all:

1. dip areas
2. depressions
3. voids greater than two inches
4. as directed by the Engineer

Spreading and compacting must be performed by methods that will produce a surfacing of uniform:

1. smoothness
2. texture
3. density

Place asphalt concrete adjacent to curb ramps in compliance engineering standards for curb ramp landing slope requirements. Submit grade and slope information for curb ramp landings to the Engineer prior to placing asphalt concrete. Submit a variance request if curb ramp landing slope requirements are unattainable prior to placing asphalt concrete.

Schedule paving operations so that the entire width of the street is available to public traffic by the end of each working day. At no time may a vertical drop-off exist on a surface open to public traffic.

Do not place new asphalt concrete pavement on a portion of a travel lane.

Asphalt concrete may not be placed after 3:00 P.M. unless authorized by the Engineer.

Compact asphalt concrete to a relative compaction not less than 95 percent. Place and compact asphalt concrete to the required finished lines and grades and cross-section as shown.

Should the methods and equipment furnished fail to produce a layer of asphalt concrete conforming to all requirements, including compaction and smoothness, discontinue paving operations and modify operation or equipment.

39-4 QUALITY CONTROL/QUALITY ASSURANCE CONSTRUCTION PROCESS

Delete section 39-4.

39-6 PAYMENT

Add to section 39-6.

Full compensation for work specified in section 39 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

40-7 CONCRETE PAVERS

Reserved

40 CONCRETE PAVEMENT

40-7.01 GENERAL

42 GROOVE AND GRIND CONCRETE

42-3 GRINDING

42-3.03 CONSTRUCTION

42-3.03B Equipment

|

DIVISION VI STRUCTURES
51 CONCRETE STRUCTURES

51-01 GENERAL

51-01.02 MATERIALS

51-01.02A General

Replace section 51-01.02A with:

Drainage inlet basins may be precast units. For precast basins requiring weep holes, weep holes must be part of the casting and may not be drilled. The gutter, opening and deck portion of the drainage inlet must be cast in place to conform to required grades.

51-1.04 PAYMENT

Add to section 51.04.

Full compensation for work specified in section 51 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list. Minor concrete structures including:

1. pipe headwalls
2. drop inlets
3. catch basins
4. other miscellaneous concrete structures

that are identified in the bid item list as separate items, will be paid for at the contract price for each structure listed.

52 REINFORCEMENT

52-1 GENERAL

52-1.02 MATERIALS

52-1.02B Bar Reinforcing

Add to section 52-1.02B.

Do not substitute reinforcement bars with welded wire reinforcement, unless:

1. specified,
2. shown, or
3. provided for in engineering standards.

56 SIGNS

56-2 FURNISH SIGN PANELS

56-2.01 GENERAL

56-2.01A General

56-2.01A(3) Submittals

Add to section 56-2.01A(3).

A quality control plan is not required when the total number of signs installed is less than 100.

56-2.01B Materials

Add to section 56-2.01B.

Signs must include a graffiti guard coating.

Replace Item 1, paragraph 7 in section 56-2.01B(2)

1. Phrase "Property of the City of San Luis Obispo"

DIVISION VII DRAINAGE

64 PLASTIC PIPE

64-1 GENERAL

64-1.02 MATERIALS

64-1.02A General

Add to section 64-1.02A.

Solid wall Polyvinyl Chloride (PVC) pipe is an approved plastic pipe.

High Density Polyethylene (HDPE) corrugated type c pipe (corrugation on interior and exterior of pipe) is not an approved plastic pipe and may not be used.

Plastic pipe must comply with section 77.

64-1.03 CONSTRUCTION

Delete section 64-1.03.

64-1.04 PAYMENT

Delete section 64-1.04.

65 CONCRETE PIPE

65-2 REINFORCED CONCRETE PIPE

65-2.02 MATERIALS

65-2.02E Joints

Replace 3rd paragraph of section 65-2.02E with:

Seal each joint to prevent leakage and infiltration. Sealing joint must be rubber gasketed or as directed by the Engineer.

66 CORRUGATED METAL PIPE

Delete section 66.

72 SLOPE PROTECTION

Add to section 72-2

72-2.03D Boulder Clusters

Reserved

DIVISION VIII MISCELLANEOUS CONSTRUCTION

73 CONCRETE CURBS AND SIDEWALKS

73-1 GENERAL

73-1.01 GENERAL

73-1.01A Summary

Add to section 73-1.01A.

Provide a construction plan, including plan and profile information, when installing new:

1. curb
2. gutter
3. spandrels
4. cross gutters
5. curb ramp or
6. other surface concrete

where none currently exist.

If a plan has not been furnished, you are responsible to provide that plan to the Engineer at least 10 working days prior to construction. The plan must conform with:

1. uniform design criteria
2. engineering standards
3. standard specifications
4. as directed by the Engineer.

The Engineer will make a determination as to how much of the existing street must be removed and replaced in order to provide an acceptable transition between the existing pavement and the new lip of the gutter. For private construction, the cost of removing the existing street, up to 3 feet from the future gutter lip, and installing new pavement is to be borne by the permittee. The portion of any required removal and replacement beyond 3 feet will be paid for by the City.

73-1.01D Quality Control and Assurance

Add to section 73-1.01D.

This section is applicable only as directed in the special provisions.

73-1.02 MATERIAL

73-1.02A General

**Delete 1st paragraph in section 73-1.02A.
Add to section 73-1.02A.**

Concrete must comply with section 90.

Aggregate base must comply with section 26.

73-1.02B Detectable Warning Surface

Replace section 73-1.02B with:

Truncated domes or detectable warning surfaces must comply with engineering standard 4440.

73-1.03 CONSTRUCTION

73-1.03A General

Add to section 73-1.03A.

Excavation and restoration must comply with sections 19 and 77-1.

Concrete removal must comply with section 15-3.

Pour:

1. Mow curbs
2. spandrels

3. cross gutters
4. other surface concrete

as a complete unit. Stop concrete pours at expansion or cold joints as approved by the Engineer.

Pour integral sidewalks monolithic with curb and gutter.

Complete the discharge within 1 hour or before 250 revolutions of the drum or blades, whichever occurs first, after the introduction of cement materials to aggregates from batch plant.

Install and finish concrete per the lines and grades shown. Finished concrete may not deviate more than 1/4" in 10 feet from the design grade, plane or curvature as shown. Finished concrete that does not meet this requirement must be removed and replaced at your expense.

Use a clean hair broom drawn lightly and transversely across to finish sidewalk and driveway ramps.

Finish all edges with an edger.

Do not backfill and restore other improvements until the placed concrete reaches sufficient strength to support the other improvements. Repair or replace all adjacent improvements to a condition equal to that before the work began.

Sawcut, at the nearest score mark, concrete:

1. sidewalks
2. curb
3. gutters
4. driveways

which must be removed to pursue the work.

When the nearest score mark is greater than five feet in distance from the work area, you may request to establish a sawcut line at a distance of:

1. five
2. ten or
3. fifteen

feet from the nearest score mark. Distance is measured parallel to the curb face. The Engineer may approve the request at their discretion. In all cases, concrete replacements must be equal in dimensions to that removed with new score marks at the same location as previously existing score marks. Make every effort to protect existing concrete improvements and to match the existing improvements color and surface texture.

In the Mission Sidewalk District, restore sidewalk as described below.

Existing Gray Sidewalks Removed (distance is measured parallel to the curb face):	
Removal Amount	Restoration Requirements
Less than 5 feet removed.	Restore in gray concrete.
More than 5 feet removed.	Restore with Mission Style Sidewalk. Area of restoration includes the entire width and depth of sidewalk, including curb and gutter.
Existing Mission Style Sidewalk Removed (distance is measured parallel to the curb face):	
Required Removal Amount	Restoration Amount
Remove in five foot increments.*	Restore in Mission Style. Restore to match surrounding Mission Style Sidewalk. Area of removal and restoration includes the entire width and depth of the sidewalk, including curb and gutter, with only full tiles removed and replaced.

* Remove concrete from the back of tile to the back of sidewalk or nearest score mark in even five foot increments. If your work disturbs tile, then remove concrete from back of curb to back of sidewalk or nearest score mark in even five foot increments. Replace curb and gutter when required by the Engineer.

Any existing feature in the concrete that is:

1. special
2. unique
3. unusual or
4. historic nature

must not be

1. replaced
2. removed or
3. altered

without approval of the Engineer.

73-1.03B Subgrade Preparation

Add to section 73-1.03B.

See engineering standards for typical sections and depth of subgrade. Fill any excavation made below the base subgrade with imported base material approved by the Engineer.

Prepare subgrade to optimum moisture content and compacted to a relative compaction of ninety percent maximum density. Use mechanical compacting equipment.

At time of concrete placement, subgrade must be at optimum moisture.

73-1.03C Fixed Forms

Add to section 73-1.03C.

The depth of the curb face form must be equal to the full face height of the curb. Curb forms must be held in place with iron stakes or clamps. Construct forms to be clear of the concrete finishing operations.

73-1.03E Expansion and Contraction Joints

Add to section 73-1.03E.

See engineering standards for locations of expansion and contraction joints.

Expansion joints may not be cut into concrete without prior approval of the Engineer.

Use dowels when:

1. new concrete street pavement meets existing concrete street pavement
2. new sidewalk, curb and gutter meets existing sidewalk, curb and gutter
3. between concrete cross gutters and curb and gutter

Do not dowel curb and gutter into concrete street pavement.

73-1.03F Curing

Replace section 73-1.03F with:

Immediately after completing the finishing operations, apply concrete curing compound number 4 in compliance with section 90-1.03B(3) which is a non-pigmented curing compound type 1 class B to all exposed concrete surfaces.

Add to section 73-1.03.

73-1.03G Backfill and Cleanup

Remove all form and construction debris. Backfill all excavations to grade. Backfill all landscape areas with clean native soil. The area adjacent to back of sidewalk must be:

1. level
2. properly sloped or
3. retaining wall constructed.

73-1.03H Pavement

Where new curb and gutter or cross gutter abut an existing street, pavement removal and replacement is required as shown in the engineering standards.

73-1.04 PAYMENT

Replace section 73-1.04 with:

Full compensation for work specified in section 73 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list. Quantities of:

1. curbs
2. gutters
3. sidewalks
4. gutter depressions
5. cross gutters
6. driveways
7. curb ramps
8. island paving

will be measured as indicated in the bid item list. Quantities will be determined by the count, from the dimensions shown, or as ordered in writing by the Engineer.

You will not be paid for concrete placed in excess of these dimensions or for the cost of restoration improvements damaged by your operations.

Concrete curb and gutter will be measured by the linear foot.

Driveway ramps will be measured by the square foot area between the expansion joint at each side of the ramp, and between the outer lip of the gutter and the back of the driveway.

Sidewalk will be measured by the square foot, measured behind the curb line score mark on integral construction.

Detectable warning surface is included in the payment for curb ramps. When detectable warning surfaces are placed on an existing curb ramp, the detectable warning surfaces are measured by the square foot.

73-2 CURBS

Delete section 73-2.

73-3 SIDEWALKS

Delete section 73-3.

73-4 TEXTURED CONCRETE AND COLORED CONCRETE SURFACES

73-4.01 GENERAL

73-4.01A Summary

Add to section 73-4.01A.

Section 73-4 includes specifications for mission style sidewalk.

73-4.01B Submittals

Add to section 73-4.01B.

Provide submittals to the Engineer for the following:

1. concrete mix design
2. concrete color
3. curing compound
4. tile
5. grout
6. mortar
7. stain or coating

prior to construction.

73-4.02 MATERIALS
Replace section 73-4.02 with:

Use class 3 concrete. Use Type II ASTM, C-150 low alkali cement conforming to the latest standard.

For Mission Style sidewalk mix the concrete with DAVIS "Adobe" #5964, or approved alternative, added to the concrete in the amount of 5 pounds of color per 100 pounds of cement or the equivalent amount of liquid color to produce an equal quality of color in the finished surface.

Lids and covers may be cast iron or dark galvanized slip resistant diamond plate. Lids and covers in traffic areas must be traffic rated.

Use Terracal unglazed ceramic tile, mission red, one foot squares or approved equal.

73-4.02A Mortar

Add to section 73-4.02.

Use:

1. one part waterproof cement
2. four parts sand
3. no more than one part hydrated lime

for Mission Style sidewalk tile.

73-4.02B Grout

Add to section 73-4.02.

Grout for Mission Style sidewalk tile color to match sidewalk.

73-4.03 CONSTRUCTION
Replace section 73-4.03 with:

For mission style sidewalk:

1. tamp
2. screed
3. float

concrete to the required surface grade prior to placement of salt on the surface.

Apply the salt, with the proper gradation, in the amount and coverage as shown in the engineering standards.

After the salt has been placed:

1. roll or trowel into the surface
2. spray the curing compound in compliance with section 73-1.03F.

Protect channels formed for tiles from the application of the sealing compound.

Set tile in a mortar bed flush with adjacent surface.

Place all:

1. sign posts
2. parking meter posts
3. utility vaults
4. water meter vaults
5. sewer cleanouts

behind the tile row and install according to engineering standards.

Stain or coat all:

1. wells
2. boxes
3. lids

4. covers
to match surrounding sidewalk.

73-4.03A Tile

Add to section 73-4.03.

Set the tile in a full mortar bed.

Place damp cloth fabric over grouted tile joints immediately after completion and leave overnight.

Clean tile with HILLYARD'S 777, or approved equal and seal with *AQUA MIX "Grout Sealer"* or approved equal.

75 MISCELLANEOUS METAL

75-1.02 MISCELLANEOUS IRON AND STEEL

75-1.02A General

Replace last paragraph in section 75-1.02A with:

Galvanize only metal materials specified to be galvanized as shown or as required in the engineering standards.

77 LOCAL INFRASTRUCTURE

Replace section 77 with:

77-1 EXCAVATION AND RESTORATION

77-1.01 GENERAL

Excavation and restoration consists of all necessary:

1. clearing and grubbing
2. sawcutting
3. removal and disposal of asphalt concrete
4. removal and disposal of concrete
5. removal and disposal of excavated material
6. backfill and compaction of excavation
7. surface restoration

City streets are typically constructed of Asphalt Concrete or Portland Cement Concrete or a combination of the two. Unless clearly indicated on the plans or the project's special provisions, it is your responsibility to determine the nature and depth of the street paving material.

Sawcut on all sides of:

1. pavement,
2. curb,
3. gutter
4. sidewalk

prior to excavation. If there is the possibility of a section of pavement breaking out between the excavation and a nearby crack or joint, remove pavement up to the crack or joint and the true-up the edges. Additional sawcutting may be required prior to paving operations if surroundings are damaged during work. Where the pavement edges have raveled or broken out in an irregular fashion due to work, you must "true-up" and square off the pavement edges to provide a neat and regular appearance, as directed by the Engineer. All trimmed edges must have a straight and vertical face at least 1½ inches deep prior to resurfacing.

When asphalt roadway sections are removed by a sawcutting, do not overcut the corners.

Asphalt concrete may be:

1. sawcut,
2. wheel-cut, or
3. cut with a spade,

except that if the cuts are not satisfactory, you will be required to "cleanup" or "true-up" excavation at the direction of the Engineer.

Survey markers must be protected or restored in compliance with section 5.

Earthwork must comply with section 19.

Reinforcement steel must comply with section 52.

Concrete must comply with section 90.

77-1.02 MATERIALS

77-1.02A Base Materials

Unless shown otherwise, concrete street pavement or a thickened asphalt concrete section pavement base section may be one of the following:

1. slurry cement backfill
2. class 2 aggregate base
3. class 2R aggregate base (in public right-of-way only)
4. class 3 aggregate base
5. select backfill material

provided the base is brought to pavement subgrade and meets all specified requirements for compaction.

77-1.02B Slurry Cement Backfill (One Sack)

Slurry cement backfill must comply with section 19-3.02D.

Reduce the cement content of slurry specified in section 19-3.02D from 188 pounds per cubic yard to 94 pounds per cubic yard.

Vibrate slurry into place.

Do not allow slurry to be placed in contact with pipes.

77-1.02C Tracer Material**77-1.02C(1) Tape**

Use "Terra Tape Green Sewer" as manufactured by Griffolyn Company, Inc., Houston, Texas or an approved equal for tracing tape material.

Place tracing tape material in trenches over underground pipe lines.

77-1.02C(2) Wire

Place tracer wire in trenches as required in the engineering standards.

Add G-5 box at each manhole and sewer lift station for separation between locating wire and sewer manhole. Label lid "SEWER".

Coil approximately 12 inches inside associated valve wells and sewer G-5 boxes for easy access for pipeline locating work.

77-1.02D Concrete

Concrete must comply with section 90.

77-1.02E Steel

Reinforcement steel must comply with section 52.

77-1.02F Asphalt

Asphalt concrete and tack must comply with section 39.

77-1.03 CONSTRUCTION**77-1.03A Excavation****77-1.03A(1) Utilities**

Underground facilities may or may not be shown, take precautions to preserve and protect any facility whether shown or not. You must determine the grade and location of the public utility facilities such as:

1. telephone poles
2. telephone conduit
3. fiber lines
4. underground conduit
5. sewer mains
6. sewer laterals
7. water mains
8. water services
9. electrical lines
10. storm drains
11. gas mains
12. gas services

in order to conduct the work, prevent damage, and interrupted utility service.

Mark out the area to be excavated. Obtain USA markings. Notify the Engineer that the site is ready for review.

The City is not responsible for any

1. damages

2. costs
3. delay
4. expenses

to the you resulting from a third party underground facility operator's failure to comply with stipulations as set forth in 4216.7.(c) of California Government Code.

Pot hole existing utilities in advance of pipe installation work to allow for adjustment in elevation of the new pipe and provide required clearance between the new pipe and the existing utility. Pothole and expose all utility lines as required by utility owner. Protect existing public facilities and private improvements from damage.

If, in the opinion of the Engineer, you are not taking all possible precautions to prevent damage to underground improvements, the Engineer may stop any and all operations. Operations will remain stopped until a determination is made as to the procedure to follow to protect and reduce the possibility of damage to the improvement.

If any damage is done to an underground facility caused by your negligence, as determined by the Engineer, repair the damage or have the damage repaired at no cost to the City.

Any and all expenses that the City incurs having damage repaired will be deducted from the last payment for the project. Payment amount will be determined in compliance with section 9-1.23.

77-1.03A(1)(a) Waterlines

You should expect to find thrust blocks at:

1. existing bends
2. tees
3. crosses
4. line ends

Restore required thrusting as directed by the Engineer. No additional payment will be made for the removal and restoration of existing thrust blocks as needed to complete the work.

77-1.03A(1)(b) Sewerlines

Every property has one or more sewer laterals and the location of the sewer laterals cannot be exactly pinpointed. You must make an effort to locate and protect the lateral. If you damage a sewer lateral you must repair the damage.

When sewer mains or sewer laterals are encountered in the trench and they interfere with the laying of the pipeline, you must excavate the trench to such a depth and length to permit the installation of the new pipeline. If in the opinion of the Engineer, a larger excavation will not allow for installation of the new pipeline you may:

1. remove the sewer main or sewer lateral
2. lay the new pipeline
3. repair the section of removed sewer facility in compliance with section 77-3.03F(3)

77-1.03A(2) Tree Protection

77-1.03A(2)(a) Protection Fences

Install a 5-foot tall fence around drip-line of trees to be saved, or as directed by the Engineer, before any work starts on the site.

The tree protection fence may be chain link fabric or orange safety fencing secured with steel fence poles set at 8 feet on center. The poles must be 6 feet long and 1.5 inches in diameter, driven into the ground 12 inches.

Tree protection fences must:

1. remain in place
2. continually maintained
3. removed as the last item of contract work.

77-1.03A(2)(b) Pruning

Pruning of tree limbs will only be allowed if approved by the Engineer. Tree pruning must be done by a certified arborist per International Society of Arboriculture (ISA) standards.

77-1.03A(2)(c) Parking And Storage Of Building Materials

Do not:

1. park vehicles
2. park construction equipment or
3. stockpile

within the drip-line of trees to be saved.

77-1.03A(2)(d) Dumping

Do not deposit:

1. water
2. waste or
3. construction materials

within 20 feet of drip-line of trees to be saved.

77-1.03A(2)(e) Herbicide Use

Do not use herbicide including pre and post emergents within 20 feet of drip-line of trees to be saved.

77-1.03A(2)(f) Trunk Protection

Do not attach anything to any portion of trees to be saved. If you wound a tree to be saved, immediately expand tree protective fencing and treat tree wound to the satisfaction of the Engineer. If severe tree damage occurs you may be fined in compliance with the City's tree ordinance.

77-1.03A(2)(g) Excavation, Grading, Trenching And Boring

No trenching of any depth will be allowed within the drip-line of trees or shrubs to be saved, unless approved by the Engineer. If you plan to trench within 20 feet of the drip-line of tree to be saved, layout trench location with chalk or paint, and notify the Engineer for review and approval before trenching work begins. If the Engineer approves trenching within the drip-line of trees or shrubs to be saved, trenching excavation must be done by hand. Trenching outside the drip-line of trees to be saved and within 20 feet of drip-line of trees to be saved is not required to be completed by hand.

No grading cuts or fills will be allowed within the drip-line of trees to be saved, unless approved by the Engineer.

During excavation if any roots are encountered less than 1 inch in diameter, the root may be cut by hand leaving a square end.

During excavation if any roots are encountered greater than 1 inch in diameter, the root must be protected from:

1. scarring
2. drying
3. then tunneled under.

If the root cannot be protected, you must schedule the Engineer and City Arborist to review excavation and give direction.

Shade roots from direct sunlight when exposed in open trench. Pruned or cut roots must be reviewed by the Engineer prior to backfilling trench. Trench must be backfilled within 24 hours of encountering roots.

All directional boring within drip-line trees to be saved must maintain a minimum depth of 5 feet.

If severe tree or root damage occurs you may be fined in compliance with the City's tree ordinance.

77-1.03A(2)(i) Tree Removals

Trees not shown and identified on the plans to be removed, but are required to be removed in order to complete the work, are subject to the City's tree removal policies and procedures. Coordinate tree removal policy compliance with Engineer.

77-1.03A(2)(j) Tree Protection Plan

If the approved project plans preclude compliance with all requirements of section 77-1.03A(2), you must provide the services of a Certified Arborist to develop a tree protection and monitoring plan and implement the plan. The tree protection plan must include:

1. establishment zones of protection for each tree

2. provide pre-construction worker training
3. site monitoring during construction
4. recommended treatments for tree wounds if damaged
5. identify post construction inspection and maintenance requirements.

Submit plan to Engineer for review and approval prior to the start of any site work.

77-1.03A(3) Groundwater

Provide and operate pumps or other devices that may be necessary for the removal of water from excavation during construction. Remove groundwater by laying rock or gravel on the bottom of the excavation or by other means which prevents groundwater from softening the bottom of the excavation. At the direction of the Engineer, install trench plugs to prevent ground water from traveling over long distances in a trench.

77-1.03B Trench Construction

77-1.03B(1) General

Increase excavation width to provide for pipe line clearance as require in engineering standard as well as any necessary shoring.

Excavation at least one foot beyond limits of structures.

If you are unable to maintain minimum trench width required in the engineering standards, the Engineer may allow a narrower trench. If the Engineer allows a narrower trench, the Engineer may require crushed rock bedding and different backfill materials in order to compensate for additional loading on the pipe.

During excavation for underground utilities, if solid rock or other unyielding materials is encountered, excavate an additional six inches minimum trench depth. Backfill additional excavation with pipe bedding material and compact by mechanical means to a relative compaction of 90 percent. Pipe bedding must be true to the design line and grade.

During excavation for underground utilities, if soft or unsuitable materials are encountered, excavate an additional 12 inches minimum trench depth. Backfill additional excavation with float rock material or as directed by the Engineer. Float rock bedding must be true to the design line and grade for the normal trench bottom.

Methods of excavation and the shoring must be in compliance with the
STATE CONSTRUCTION SAFETY ORDERS
issued by the Division of Industrial Safety. Failure to comply with any of these:

1. rules,
2. orders
3. regulations

is sufficient cause for the Engineer to immediately suspend all work. Compensations for losses incurred by you due to an suspension will not be paid. During backfilling operations the bottom of the shoring must be kept above the level of the backfill at all times.

Coordinate with the Engineer and provide 24 hours notice for the following:

1. backfill material samples
2. pipe inspection
3. backfill of trenches
4. compaction testing
5. excavating testing holes

77-1.03B(2) Trench Bedding

Use select backfill material in compliance with section 26 and applicable engineering standards for bedding and backfill of pipes.

Place bedding in the bottom of the trench in compliance with engineering standards and mechanically compact up to the grade of the bottom of the pipe. Excavate by hand the area for:

1. bells
2. collars
3. valves
4. fittings

A firm and compacted uniform bearing is required throughout the entire length of the pipe.

77-1.03B(3) Pipe Laying

After the bedding has been properly placed in the bottom of the trench, the pipe may be laid and inspected. Do not:

1. block
2. wedge or
3. supporting the pipe on earth mounds in the trench.

Lay pipe at the design line and grade. Lay pipe on a firm bed and have a true bearing of its entire length. Make adjustments to line and grade by scraping away or filling the bedding under the body of the pipe.

Inspect all pipes for defects prior to installation. Visually inspect the spigot end of pipe and true up and remove any lumps or ridges. Do not install any pipe this is cracked or has any other defect. Wipe and clean all:

1. pipes
2. valves
3. fittings

as they are installed. Remove any earth or rubbish lodged inside before laying pipe. Plug or cover all pipe ends before work stops for any reason. The interior of the pipe must be free from all dirt and foreign matter as the work progresses and left clean at its completion.

Cut all pipes completely through with an approved pipe cutting disk or saw. Do not:

1. break
2. chip or
3. use cutting torches

to cut pipe. Bevel pipe ends, 1/8 of inch at 30 degree angle, removing all sharp edges. Use course file or portable grinder to make bevel. Cutting of asbestos cement pipe must comply with section 77-3.03A(1).

Length of pipe may not be used to drive the spigot of one pipe into the bell of another pipe.

In general, the pipe must be installed in compliance with the manufacturer's recommendations.

Place concrete thrust blocks and collars where called for.

77-1.03B(4) Initial Backfill

Use select backfill material in compliance with section 26 and applicable engineering standards for bedding and backfill of pipes. Upon approval of the Engineer, place backfill material on both sides and over the top of the pipe per the engineering standards. By mechanical means, thoroughly compact backfill.

Jetting may be used when recommended by an independent soils engineer. Take proper precautions when jetting to prevent floating of the pipe or other damage. You are responsible for all damage caused by jetting.

77-1.03B(5) Subsequent Backfill

After the initial backfill has been completed, place select backfill material in the trench and thoroughly compact, in compliance with engineering standards, to grade and elevations as shown.

77-1.03B(6) Compaction

Compaction testing requirements must comply with section 6-3.05A. If compaction does not meet requirements, excavated and re-compact until necessary compaction is achieved. Compaction will be retested, at your expense.

77-1.03C Temporary Paving and Steel Plates

77-1.03C(1) Temporary Paving

Provide temporary cold mix paving or steel plates to cover excavated areas within the public right-of-way:

1. after excavation is backfilled and compacted, or
2. at the end of the work day.

When excavation restricts driveway access steel plates must be on-site and available to bridge excavation and provide access to driveways.

Excavation must be backfilled, compacted and tested at the end of each day. Place a minimum of 1½ inches of cold mix at the top of excavation, flush with adjacent surfaces, and maintain smooth temporary cold mix paving at all times. Replace temporary cold mix paving with permanent restoration of:

1. pavement
2. curb
3. gutter
4. sidewalk

within:

1. four weeks of the initial excavation, or
2. after one week where no work is completed within excavation, or
3. as directed by the Engineer.

77-1.03C(2) Steel Plates

When excavation cannot be:

1. backfilled
2. compacted
3. temporarily paved

within one work day,

4. excavation shoring and
5. steel plates

must be installed in and over excavation.

Steel plates may not cover excavation for more than 48 hours without approval of the Engineer. Steel plates must conform to the following minimum requirements:

1. Steel plates used for bridging must extend a minimum of 12 inches beyond the limits of excavation.
2. Steel plates must be non-skid.
3. The excavation must be adequately shored to support traffic loads.
4. Use temporary cold mix paving to feather the edges of the steel plates for method 2 installations.
5. Secure steel plate against displacement with adjustable cleats, shims or other devices.
6. Steel plates must not make noise or rock when driven over.
7. Steel plates may not be used in the downtown core after 3:00 P.M. on Thursdays.
8. For street with a posted speed limit of 45 mph or greater, cold plane the pavement to a depth equal to the thickness of the steel plate for the length and width of the steel plate.
9. For streets with a posted speed limit less than 45 mph, pin steel plate with 2 dowels per plate a minimum of 2 inches into pavement. Provide ramp to steel plate using temporary cold mix paving at a maximum slope of 8.5 percent with a minimum taper length of 12 inches. Once plates are removed fill dowel holes in pavement with asphalt concrete fines, concrete slurry or equivalent as approved by the Engineer.
10. If required by the Engineer, provide a rough road sign (MUTCD W8-8) in advance of steel plates.

The following are the required minimum thicknesses for steel plate bridging required for a given trench width:

Trench Width	Minimum Plate Thickness
12 inches	½ inch
18 inches	¾ inch
24 inches	7⁄8 inch
36 inches	1 inch
48 inches	1¼ inches

For spans greater than 48 inches, steel plate design must be prepared by a registered civil engineer and submitted to the Engineer for review and approval. Steel plate design loading must conform to HS20-44 truck loading per Caltrans Bridge Design Specifications Manual.

Failure to:

1. maintain temporary cold mix pavement,
2. maintain steel plates, or
3. complete permanent restorations in required timeframe to the satisfaction of the Engineer,

is cause for the Engineer to stop other work until repairs or permanent restorations are completed.

77-1.03D Surface Restoration

Restore any damaged

1. facilities or
2. improvement

and provide new finished

3. facility or
4. improvement

as specified and per engineering standards.

77-1.03D(1) Portland Cement Concrete Pavement

Place, consolidate, and finish concrete street pavement per section 40.

77-1.03D(2) Asphalt Concrete (AC) Pavement

Tack pavement subgrade and all sides of trench or excavation.

Remove any temporary cold mix paving and backfill as required to construct new asphalt concrete pavement section.

Cored excavation up to 8 inches in diameter may be repaired:

1. in compliance with Engineering Standard 6050, or
2. by backfilling void with slurry in compliance with section 77-1.02B vibrated into place. Pave back with 6 inches of hot mix asphalt concrete. This repair may only be completed in streets without concrete pavement.

Prior to placement of:

1. overlays,
2. pavement fabrics,
3. grids,
4. prime coat, or
5. tack coat,

repairs must be made to the existing roadway. This work consists of the removal existing pavement in areas marked in the field, on the plans, or as directed by the Engineer.

Roadway repair activities must be scheduled and performed on rain-free days. At no time is the soil beneath the existing pavement material to be exposed to rain or other adverse weather conditions.

Remove existing asphalt concrete pavement areas by sawcutting or by grinding. Import class 2 aggregate base as necessary and compact to ninety-five percent relative compaction. Class 2 aggregate base must comply with section 26. Compact the top 6 inches of base materials.

Apply a tack coat to the edges of the existing asphalt pavement prior to new asphalt placement.

Pave all excavated areas with asphalt concrete. Place and compact asphalt concrete to a minimum of ninety five percent density and match the grades of the existing pavement. Areas inaccessible to rollers must be compacted with a high impact power compactor capable of attaining the same compaction as the rolled areas. Relative compaction will be determined by California Test 375. Laboratory specimens will be compacted in compliance with California Test 304.

If the corners are overcut, fill the overcut voids with asphalt fines.

Seal trench edges using Henry's 532 Driveway Asphalt Resurfacer or equal as directed by the Engineer.

Cover road repair with steel plate if adequate time for asphalt cooling is not available prior to opening roadway for public traffic.

77-1.03D(3) Sidewalk, Curb And Gutter Restoration

Sidewalk, curb and gutter restoration must comply with section 73.

77-1.03D(4) Traffic Stripes, Pavement Markings, And Pavement Markers

Traffic stripes, pavement markings, and pavement markers must comply with section 84.

77-1.04 PAYMENT

Full compensation for work specified in 77-1 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list. Additional trench bedding material directed by the Engineer is paid per section 9-1.06.

Full compensation for extra cutting and trimming to true-up and square off the pavement edges is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

77-2 WATERLINES

77-2.01 GENERAL

Section 77-2 includes general specification for:

1. potable water pipelines
2. recycled water pipelines
3. appurtenances.

Potable and recycled water pipeline installation must conform to these specifications and the American Water Works Association (AWWA) requirements.

Do not turn any valves in the City water system. Contact the Engineer at least 48 hours in advance of the need, and the Engineer will coordinate that work.

Work must comply with section 77-1.

77-2.02 MATERIALS

77-2.02A General

Recycled water system main pipe must be ductile iron pipe. Do not use PVC pipe for recycled water system mains.

77-2.02B Pipe

77-2.02B(1) Ductile Iron Pipe

Ductile iron pipe must:

1. be centrifugally cast
2. be ductile iron pipe
3. have end joint which employs a single elongated rubber gasket such as Tyton Joint or an approved equal.
4. have a pressure class 150 minimum for potable water systems
5. have a pressure class 350 minimum for recycled water systems
6. have coated outside
7. be lined inside with seal-coated cement lining of 1/16 inch minimum thickness, all conforming to applicable ASA and AWWA Specifications.

Ductile iron pipe must be encased in polyethylene casing material. Casing material must be:

1. tube type
2. conforming to the latest ANSI/AWWA C105 Standard.

Polyethylene casing must extend over:

1. tees
2. bends
3. couplers at the end of a section of ductile iron where it connects to a different type of pipe
4. close casing at the end (dead end) of pipe

Exposure to air and sunlight must be kept to a minimum for either type "A" or type "C" encasement material. Encasement material for recycled water systems must comply with section 77-2.02H,

77-2.02B(2) Polyvinyl Chloride (PVC) Pipe

Polyvinyl Chloride (PVC) pipe must:

1. be unplasticized Poly Vinyl Chloride (PVC) plastic class water pipe
2. have an integral bell and spigot joints or plain-end designed for joint assembly using elastomeric-gasket standard PVC couplings
3. have an integral bell wall section with a solid cross-section elastomeric ring which meets the requirements of ASTM D-1869 and E-477

4. have a bell section that is at least as strong as the pipe wall
5. be class 200
6. meet the requirements of AWWA C900 Poly Vinyl Chloride (PVC) Pipe
7. be cast iron (CI) pipe equivalent outside diameters (OD)
8. be blue in color

77-2.02b(3) Copper Tubing

Use type K, soft temper copper tubing.

77-2.02B(4) Polyethylene Tubing

Polyethylene tubing must:

1. be pressure rated for 200 psi
2. SDR-9 conforming to ASTM D-2737 and AWWA C901 standards
3. copper tube size for diameters greater than 1 inch
4. iron pipe size for diameters 1" and smaller
5. be manufactured for use with standard compression fittings
6. clearly marked showing:
 - a. manufacturer's trade name
 - b. nominal size
 - c. type of material
 - d. pressure rating
 - e. seal of approval of an accredited testing laboratory.

77-2.02B(5) Solid Sleeves

Solid sleeves must be ductile iron with mechanical joints ends. Minimum sleeve length is 1 foot.

77-2.02C Joints and Fittings

All joints and fittings must be made in the U.S.A., or approved equal. All fittings must be cement lined by the centrifugal process in compliance with USA Standard A21.4, as amended to date. Cement lining must be standard thickness. Joint and fitting types must be:

1. mechanical
2. compressed gasket,
3. flanged, or
4. flexible coupling type.

Mechanical joint type fitting, gasket, gland and bolts must class 250 ductile iron and conform to:

1. USA Standard A21.10
2. USA Standards A21.11 (AWWA C111)
3. USA Standard A21.12 (AWWA C112)
4. WW-P-421c
5. WW-P-360b

Compressed gasket joint type must use a single elongated rubber gasket to seal joint such as Tyton Joint, or an approved equal.

Flange joint type:

1. gaskets must use best quality cloth inserted rubber composition
2. gaskets must use full width of the flanges to which they are applied
3. bolts must be of the size and number determined by the size and classification of pipe

conform with USA Standard A21.10.

Flexible coupling type must be:

1. Dresser,
2. Smith-Blair,
3. Victaulic, or
4. approved equal.

The couplings must be straight or transition as shown.

77-2.02D Valves

77-2.02D(1) Gate Valves

All gate valves must be:

1. AVK,
2. Clow F-6100, or
3. approved equal meeting the following requirements:
 - a. mechanical joint or flange
 - b. resilient seated with fully encapsulated gate
 - c. epoxy coated inside and outside
 - d. full-size waterway.
 - e. open to the left
 - f. non-rising stems with o-ring seals
 - g. complete with cast iron glands
 - h. high strength cast iron tee-head bolts and hex nuts
 - i. plain rubber gaskets conforming to ASA specification A21.11.
 - j. 200-psi working pressure rating
 - k. tested to 400 psi
 - l. meet the requirements of AWWA C-509.

77-2.02D(2) Butterfly Valves

All butterfly valves must be:

1. Dresser 450,
2. Mueller Line Seal III, or
3. approved equal meeting the following requirements:
 - a. rubber-seated, tight-closing type.
 - b. valves to have mechanical joint per AWWA Specification C111.
 - c. accessories (bolts, glands, and gaskets) must be supplied by the valve manufacturer.
 - d. valves must use full AWWA C504 Class 1500 valve-shaft diameter
 - e. valve must use full Class 150B underground-service-operator torque rating throughout entire travel.
 - f. valve body must be high strength Cast Iron ASTM A126 Class B with 18-8 Type 304 stainless steel body seat.
 - g. valve must be high strength cast iron ASTM A48 Class 40
 - h. valve must have a rubber seat mechanical secured with an integral 18-8 stainless steel clamp ring and 18-8 stainless steel nylon locked screws.
 - i. valve rubber seat must be full circle 360o seat not penetrated by the valve shaft.
 - j. valve shaft must be one piece, extending full size through the entire valve operator with no neckdown, keyways or holes to weaken.
 - k. valve operator must be of the traveling-nut type, sealed, gasketed, and lubricated for underground service.
 - l. All valves must be open left, and be equipped with a 2-inch AWWA operating nut.
 - m. Valve must meet or exceed performance requirements of AWWA Specification C504.
 - n. Buried service valve must be equipped with extension stem with AWWA Standard operating nut for tee wrench operation.
 - o. Valve with operator and extension stems must be totally enclosed, watertight, grease packed, 30-turn minimum, and be Henry Pratt Co. "Groundhog" assembly or an approved equal.
 - p. protective coating that is suitable for buried service.

77-2.02D(3) Check Valves

Gate valves must be:

1. Renssalaer
2. Mueller, or
3. approved equal meeting the following requirements.
 - a. iron body
 - b. bronze mounted
 - c. swing check valves with outside spring and lever.
 - d. bronze valve seat ring must be back-faced and screwed into an accurately machined body
 - e. cast iron gate mounted with a bronze gate ring.
 - f. gate rings machined to provide a water-tight surface.
 - g. gate must be hung solid bronze hinges and stainless steel hinge pins

h. minimum working pressure of 150 psi.

77-2.02D(4) Air Release Valves

Air release must be a combined air release and vacuum in compliance with engineering standards.

77-2.02E Recycled Water Pipe Identification

Any:

1. pipe,
2. valve,
3. fitting, or
4. other apparatus

which is connected to the City's recycled water system must be properly labeled as such. Components must be painted with Pentone-522 (purple) paint, purple encasement material, or wrapped with purple marking tape and labeled:

Recycled Water – Do Not Drink

and subject to the approval of the engineer.

77-2.02F Chlorine

Hypochlorites must conform to the American Water Works Association Specification B300-55 AWWA "Standard for HypoChlorites".

Liquid Chlorine must conform to the American Water Works Association Specification B301-57T, "Tentative AWWA Standard for Liquid Chlorine".

77-2.03 CONSTRUCTION

77-2.03A Pipe Laying

Any deflection must be taken up in the length of pipe and not the joint. In all cases deflection must not exceed the manufacturer's recommendation.

Standard laying lengths for pipe is 20 feet \pm 0.3 feet for all pipe diameters. Random lengths of pipe must not be less than 10 feet long. At least 85 percent of the pipe installed must be the standard laying length.

77-2.03A(1) Asbestos Cement Pipe

Asbestos Cement Pipe must not be used for new installations. When working with asbestos cement pipe, provide documentation that employees have received required training per OSHA.

Methods of work must comply with OSHA and other legal guidelines to prevent the release of fibers. Asbestos cement pipe may be cut only by an approved method and in compliance with OSHA guidelines. Sawing, grinding, drilling or any other activity which could result in the release of asbestos fibers is prohibited.

77-2.03A(2) Poly Vinyl Chloride (PVC) Pipe Installation

Install PVC water pipe in compliance with the Uni-Bell Plastic Pipe Association guide for installation of polyvinyl chloride plastic pressure pipe for municipal water main distribution systems.

77-2.03B Joints and Fittings

Install joints and fitting in compliance with manufacture's recommendations and this section. Provision must be made for expansion and contraction at each joint with an elastomeric ring.

77-2.03B(1) Mechanical Joints

Clean 8 inch length of ends of pipe of all

1. oil
2. grit
3. other foreign material

by brushing with a wire brush and then painted with a soap solution made by dissolving 1/2 cup of granular soap in one gallon of water.

Install mechanical joint by:

1. Place the gland on the pipe with lip extension of the gland toward the socket or bell end of the joint.
2. Paint the rubber with the soap solution and place on the pipe with the thick edge toward the gland.

3. Push the pipe into the bell to seat the spigot and gasket into place.
4. Gasket must be evenly located around the entire joint.
5. Place the gland against the gasket.
6. Insert the bolts and place the nuts and tighten with torque wrench.
7. Tighten nuts one hundred eighty degrees (180°) apart alternately, to produce an equal pressure on all parts of the gasket.
8. The range of torque for 3/4-inch bolts is 60 foot-pounds to 90 foot-pounds.

77-2.03B(2) Compressed Gasket Joints

Install compressed gasket joint by:

1. Wipe gasket and gasket socket clean with a cloth or brush.
2. Insert gasket into socket with thickened edge entering first.
3. Gasket groove must fit over bead in socket.
4. Apply a thin film of lubricant on portion of gasket that will come in contact with the entering pipe.
5. Apply a ½ teaspoon of Pittchlor powder behind each gasket before jointing.
6. Wipe clean and place in proper alignment the plain beveled end of pipe with the bell of the pipe to be joined.
7. Apply a film of lubricant to the outside of the plain end for a 2 inch length. No foreign materials on lubricant will be allowed.
8. Fit the plain end of the pipe into the socket so that it is in contact with the gasket.
9. Join the pipes by exerting sufficient force on the plain end pipe and is moved past the gasket making contact with the socket.

77-2.03B(3) Flanged Joints

Tighten nuts one hundred eighty degrees (180°) apart alternately to produce an equal pressure on all parts of the flange and gasket.

77-2.03B(4) Flexible Couplings

Reserved.

77-2.03C Fire Hydrant

Set hydrant plumb and make connection to water supply per engineering standards.

Clean hydrant of all:

1. oil
2. grease
3. concrete splatters
4. all deleterious materials

in compliance with manufacturer's recommendations. Prepare hydrant surface using wire brush and appropriate solvent. Clean the hydrant of solvent residue prior to painting.

Surface of hydrant must be clean and dry prior to painting. During painting work relative humidity must be less than 85 percent and surface temperature of hydrant must be between 40 and 120 degree Fahrenheit.

77-2.03D Valves and Valve Wells

Construct valve wells in compliance with engineering standards. Install valves in compliance with manufacturer's recommendation. Visually inspect the interior edge of the pipe that it is fitted to by turning the valve to ensure the rubber seal of the valve does not come into contact with the pipe. The interior edge of the pipe may need to be beveled to avoid contact and tearing of the rubber seal.

Complete paving work and construct valve well to final finished street grade.

Valve wells located outside of paved area must not be raised more than 3 inches above finished grade. Construct concrete collar sloped away from valve well.

77-2.02E Hand Wheels

Furnish and install all hand wheels as shown and in compliance engineering standards.

77-2.03F Water Services

Construct water service pipeline to convey water from the water main to the water meter using new water tubing.

Use restrained fitting and valves for water services 3 inches in diameter and larger.

Install water services in compliance with engineering standards. All tools and equipment used for installation must be approved by the Engineer.

77-2.02G Tapping Sleeves

Furnish and install tapping sleeves with all necessary gaskets in compliance with engineering standards.

77-2.03H Existing Water Pipes

All new water pipe must be tested in compliance with section 77-2.03J, and approved by the Engineer, prior to connection to the existing water system.

At a minimum, 24 hours in advance of connection to existing water pipe, pothole and verify existing pipe:

1. depth
2. diameter
3. fitting needs.

Connect new water pipe to existing water pipe as shown. The connection detail as shown represents the approved connection detail and location. If you wish to make an alternate connection to the existing water system, provide a detailed drawing to the Engineer for review and approval.

Do not shutdown the existing water system. The Engineer will shutdown the existing water system for new pipe line tie-ins. In all cases an effective shut down may not be possible, and you must work in wet conditions. Anticipate working in wet conditions. No payment will be made for delays or additional cost for inability to shutdown the existing water system.

When installing new water pipe in replacement of existing water pipe, the new water pipe must be brought into service and existing water pipe abandoned prior to moving into the next segment of new water pipe installation.

77-2.03H(1) Abandonment Of Waterlines

Abandon existing water system facilities taken out of service in compliance with engineering standards.

To abandon existing water services:

1. Excavate to existing water pipe at water service tube location.
2. Turn off corporation stop.
3. Disconnect existing water service tube from corporation stop.
4. Cap existing corporation stop.
5. Remove, cap or plug existing water service tube.
6. Remove existing water meter box.
7. Remove, cap or plug existing water service tube.

77-2.03H(2) Coordination And Notification

Coordinate water service disruptions to take place during the least impactful times to facility operations, day or night, for the following facilities:

1. schools
2. senior living complexes
3. commercial business properties
4. motels
5. hotels
6. restaurants
7. hospitals.

The Engineer will provide you with a map showing the affected area of a water shutdown. You must notify all affected water users.

Water shutdown will disrupt fire sprinkler systems. Building owners are responsible to provide Fire Watch per the City's Municipal Code. Additional information may be found on the City's website:

www.slocity.org/government/department-directory/public-works/documents-online

Public notification must comply with section 7-1.03A. Include in the notification:

1. construction company name
2. contact phone number
3. date of shutdown
4. time of shutdown
5. fire watch information and web site link

Five working days and again two working days, prior to water shutdown notify:

1. schools
2. senior living complexes
3. commercial business properties
4. motels
5. hotels
6. restaurants
7. hospitals

Notify all affected users two working days prior to water shutdown.

Notify the Engineer two working days prior (or with first public notice) to water shutdown in order to schedule exercising of existing valves in order to accommodate service interruption.

All service interruption or shut downs are limited to four hours without prior approval of the Engineer.

77-2.03I Compliance with Public Health Code

Pipeline installation must comply with Section 64630, Title 22, of the California Administrative Code.

Backflow preventer must be installed and tested on potable water service supply lines for parcels that are additionally served by recycled water or well.

77-2.03J Testing

All new:

1. water pipe
2. water tubes
3. valves
4. joints and fittings
5. fire lines
6. services
7. other water facilities

must be tested prior to service.

Testing procedure for new water facility installations are:

1. install water sampling station and temporary blow-offs – see section 77-2.03J(1)
2. flush new water facility – see section 77-2.03J(2)
3. disinfect new water facility – see section 77-2.03J(3)
4. 30 hour chlorine test – see section 77-2.03J(3)
5. flush new water facility – see section 77-2.03J(2)
6. 24 hour bacteria and chlorine test – see section 77-2.03J(3)
7. two hour pressure test – see section 77-2.03J(4)
8. four hour pressure test – see section 77-2.03J(4)
9. Remove sampling station and temporary facilities

Provide the Engineer proposed testing and flushing methods as well as schedule for review and approval prior to starting testing work. Repeat testing procedure as directed by the Engineer if any portion of the new water facility fail testing.

77-2.03J(1) Sampling

Provide sample station. Sampling station may be a hose bib or other flow controlling valve connected to the new water facility at either:

1. Fire hydrant
2. Blow-off
3. Backflow, or
4. Corporation stop

located at the most remote point of the facility to be tested. Hose bib or other flow controlling valve must be a minimum of 1 foot above grade.

Notify the Engineer, at a minimum, two working days in advance of each sample need. Samples will only be taken between 8:00 A.M. and 1:00 P.M. Monday through Friday, excluding City holidays.

77-2.03J(2) Flushing

Flush new water facilities as shown in table below in order to provide two cubic feet per second flush flow.

New Facility Diameter (inches)	Flush with (inches)
4	2½ hose
6 to 8	4 inch blow-off or 4½ hydrant
Larger than 8	6 inch blow-off

Install temporary blow-off per engineering standards as needed to load or flush new water facilities. Submit temporary blow-off locations to the Engineer for review and approval prior to installation.

Remove water and debris from new water facility by flushing and place into nearest sanitary sewer manhole, if chlorine concentration of water is less than one hundred parts per million; otherwise place into truck. Continue to flush new water facility until residual chlorine is one part per million or less. Provide air gap between sanitary sewer manhole and discharge hose.

Do not allow any water or chlorine solution into the street and storm drains.

77-2.03J(3) Disinfection

Disinfect all new water facilities with chlorine. Introduce a uniform distribution of chlorine solution throughout the new water facility. Allow chlorine solution to remain in new water facilities for at least thirty hours.

After thirty (30) hours, test chlorine levels. Chlorine levels must be greater than fifty parts per million in the most remote portion of the line.

Flush water in compliance with section 73-3.03J(2).

Load water facility with water. Wait at least twenty four (24) hours and test water for:

1. chlorine level which must be less than one (1) part per million
2. bacteria contamination (non-spore forming)

Repeat flushing and disinfection until all requirements of this section are achieved.

77-2.03J(4) Pressure

All new water facilities must be pressure tested, after water facilities:

1. have been placed and isolated from the existing water system
2. trenches have been backfilled
3. concrete thrust blocks have cured for a minimum of 36 hours
4. have passed disinfection testing

You may pressure test a new water facility against an existing valve that is closed at your own risk. The existing valve cannot be guaranteed not to leak. If the valve leaks, resulting in a failed test, you are responsible to modify the new pipe work by adding temporary blow-offs or other method, approved by the Engineer, to allow the testing to occur at no additional cost to the City.

If hydrants or blow-offs are not available for expelling air, taps must be made at points of highest elevation before any tests are made. After tests have been completed, insert plugs in the pipe taps.

Pressure test new water and recycled water facilities as follows:

1. Pressurize new water facility to 225 psi (minimum of 215 psi and maximum of 235 psi)
2. Maintain pressure for two hours.
3. Pressurize new water facility to 150 psi (minimum of 145 psi and maximum of 155 psi) for potable facilities and 200 psi (minimum of 195 psi and maximum of 205 psi) for recycled water facilities
4. Maintain pressure for four hour.
5. Evaluate leakage.

New potable and recycled water facility will not be accepted until the leakage is less than the number of gallons as determined by the following table:

Allowable Leakage per Joint in Gallons per Hour										
Diameter (inches)	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
PVC	0.0067	0.0100	0.0133	0.0167	0.0200	0.0233	0.0267	0.0300	0.0333	0.0400
Ductile Iron	0.0075	0.0110	0.0148	0.0184	0.0220	0.0258	0.0294	0.0332	0.0368	0.0442

The total allowable leakage is calculated by multiplying the leakage per hour per 100 joints for the diameter of the pipe tested as obtained from the above table, by the duration of the test in hours and the total number of joints.

$$Total\ Allowable\ Leakage = Allowable\ Leakage\ per\ Joint * Number\ of\ Hours * Number\ of\ Joints$$

The total allowable leakage must be less than or equal to the measured leakage.

$$Measured\ Leakage \leq Total\ Allowable\ Leakage$$

If the section under test contains joints of various diameters, the allowable leakage will be the sum of the computed leakage for each size joint.

Remove and replace any defective:

1. pipes
2. fittings
3. valves
4. hydrants, or
5. consumer water services

discovered during pressure test and repeat test.

77-2.04 PAYMENT

Full compensation for work specified in section 77-2 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list. Waterline work performed under Section 77-2 is designated in the contract by:

1. size
2. type
3. quantity, or
4. whatever information is necessary for identifying waterline work.

The length of water pipe is measured by the slope length designated by the Engineer. Pipe is measured through fittings with the final measurement rounded off to the next foot increment. Measurement will be to the inner edge of other structures to which the water is connected.

Pipe:

1. bends
2. tees
3. crosses
4. valves (except tapping valves and sleeves)

5. other branches
are measured and paid for by the linear foot for the sizes of pipes involved. Bends will be measured along the centerline to the point of intersection.

Quantities of:

1. fire hydrants
2. services
3. intersection tie-ins

are determined as units from actual count.

77-3 SEWERS

77-3.01 GENERAL

Section 77-3 includes general specification for sewers and appurtenances.

Work must comply with section 77-1.

77-3.02 MATERIALS

77-3.02A Pipe

77-3.02A(1) General

Provide documents or certified test results indicating the pipe furnished meets all specified requirements. Satisfactory documents include pipe manufacturer certificate indicating that the pipe has been:

1. sampled
2. tested
3. inspected

in compliance with the ASTM specifications.

77-3.02A(2) High Density Polyethylene (HDPE)

Use:

1. virgin grade
2. high molecular weight
3. Standard Dimension Ration (SDR) 17
4. Iron Pipe Size (IPS)

High Density Polyethylene (HDPE) pipe made in diameter and tolerances in compliance with the latest version of ASTM D3035.

Furnish complete with all fabricated fittings, and other appurtenances as necessary, for a complete and functional system.

The pipe must be free of:

1. visible cracks
2. holes
3. foreign inclusions, or
4. other defects.

Any pipe not meeting these criteria will be rejected.

The pipe must be clearly marked with the following:

1. name and trademark of manufacturer
2. nominal pipe size
3. dimension ratio
4. the letters PE followed by the polyethylene grade per the latest version ASTM D1248
5. hydrostatic design basis in psi
6. manufacturing standard reference
7. a production code from which the date and place of manufacture can be determined.

The material must be listed by the Plastic Pipe Institute (PPI) with a designation of PE 3408 and have a minimum cell classification of:

1. 345434C
2. D, or
3. E

as described in latest version of ASTM D3350.

Pipe material must meet the requirements for:

1. Type III
2. Class B or C
3. Category 5
4. Grade P34

material as described in latest version of ASTM D1248.

Provide pipe with interior wall color of:

1. white
2. gray or
3. light green.

Provide pipe with exterior wall color of:

1. black
2. gray or
3. light green.

Provide submittals on furnished pipe from manufacturer certifying pipe is in compliance with:

1. specifications
2. codes
3. standards

Any pipe segment which has cut in the pipe wall exceeding 10 percent of the wall thickness must be cut out and removed from the site.

Store pipe so that it is not deformed.

77-3.02A(3) Polyvinyl Chloride (PVC) Pipe

Furnish pipe in 20 foot lengths with integral wall belled ends and elastomeric joint and solid wall. Pipe and fittings must be free of imperfections and clearly marked with name of manufacturer.

Minimum pipe stiffness (F/y) at 5 percent deflection is 46 psi for all sizes when calculated in compliance with ASTM Designation D 2412.

Pipe must have minimum Standard Dimension Ratio (SDR) of 35 and pipe stiffness of 46 psi.

Pipe color must be green.

77-3.02A(3)(a) PVC Pipe 4 To 15 Inch Diameter

PVC Pipe must conform to the requirement of latest version of ASTM specification D 3034.

77-3.02A(3)(b) PVC Pipe 18 To 27 Inch Diameter

PVC Pipe must conform to the requirement of latest version of ASTM standard specifications F 679.

77-3.02A(3)(c) PVC Pipe 30 To 48 Inch Diameter

PVC Pipe must conform to the requirement of latest version of ASTM standard specifications F 794.

77-3.02A(4) Ductile Iron Pipe

Ductile iron pipe must be:

1. centrifugally cast.
2. ductile iron pipe.
3. gasketed push on joints appropriate for use in a wastewater environment such as Polychloroprene, Ethylene Propylene Diene Monomer, or an approved equal.
4. a pressure class 150 for pipe with 3 feet or more of cover.
5. a pressure class of 350 for pipes with 3 feet or less of cover or exposed above grade.
6. coated on exterior.
7. lined with fusion bonded epoxy, polyurethane or approved equal.

Ductile iron pipe must be encased in polyethylene casing material. Casing material must be:

1. tube type
2. conform to the latest ANSI/AWWA C105 Standard.

Polyethylene casing must extend over:

1. tees
2. bends
3. couplers at the end of a section of ductile iron where it connects to a different type of pipe
4. close casing at the end (dead end) of pipe

Exposure to air and sunlight must be kept to a minimum for either type "A" or type "C" encasement material.

77-3.02A(5) Sewer Lateral Pipe

New and repaired sewer lateral pipe may be:

1. PVC SDR 35
2. PVC Schedule 40
3. HDPE SDR 17
4. ABS Schedule 40

77-3.02B Joints and Fittings

77-3.02B(1) HDPE

HDPE Pipe and fittings must be in compliance with the latest version of:

1. ASTM F714
2. ASTM D3261.

77-3.02B(2) PVC

PVC pipe must have a rubber ring bell and spigot joints providing a water tight seal and allowing for contraction and expansion. The bell must consist of an integral wall section stiffened with two PVC retainer rings which securely lock the solid cross section rubber ring into position.

All fittings and accessories must be as manufactured and furnished by the pipe supplier, or approved equal, and have bell and/or spigot configurations identical to that of the pipe. All fittings must be of the same material as the pipe, unless specified otherwise.

77-3.02B(3) Ductile Iron

Use restrained fittings for exposed ductile iron pipe, such as bridge crossings. Restrained fittings must be Flex-Ring by American Ductile Iron, TR FLEX by U.S. Pipe, or approved equal which use a factory weld as part of the restraining system.

77-3.02B(4) Repair Joint

Use strong back RC couplings or equal meeting the following requirements:

1. flexible sewer couplings and transition couplings
2. comprised of an elastomeric sealing component
3. type 316 series stainless steel tension components (end clamps and shear rings).
4. shear rings must have a minimum thickness of 0.012 inches
5. end clamps must have "bolts" as their means of tightening (not worm gears).

Couplings must be appropriately sized for the pipe materials being joined, without the need for bushings.

HDPE Pipe with fused ends must be repaired with HDPE pipe with fused joints. Strong back couplings must not be used.

77-3.02B(5) Sewer Lateral Joints (New And Replacement)

Sewer lateral pipe must be joined using glued joints and fittings or fused.

77-3.02C Concrete

Use class 2 concrete.

Use minor concrete for:

1. manholes

2. pipe junctions
3. jacketing.

Use fifteen percent approved pozzolan replacement for manhole construction.

Precast concrete manhole sections must comply with the most current version of ASTM specification C-478-61T or AASHTO-M170.

All manholes must be watertight and the floor sloped for a smooth monolithic trowel finish. The interior finish of the manholes must be smooth.

77-3.02D Mortar

Use one part of Type II Portland cement and two parts of:

1. clean
2. hard
3. sharp grained particles
4. all passing a # 4 sieve

to make mortar.

Mix mortar in a machine or water tight box. Accurately measure and thoroughly mix mortar to a uniform consistency. Use mortar immediacy after mixing. Do not remix mortar that begins to harden prior to placement.

77-3.03 CONSTRUCTION

77-3.03A Pipe Installation

Sanitary sewer lines must be water tight. Install pipe to ensure the system is water tight throughout the component parts, particularly at the pipe joint.

Do not:

1. cut
2. gouge
3. score or
4. damage pipes

when

1. unloading
2. handling
3. storing
4. installing

77-3.03A(1) Pipe Laying

Lay the pipe in perfect conformity to the design line and grade obtained for each pipe by measuring down from a tightly stretched line running parallel with the grade.

Lay all pipes continuously uphill.

Install PVC pipe and fittings for underground gravity sewers in compliance with the latest version of ASTM Standard D-2321. Lay bell and spigot pipe, with the bell of the pipe upgrade.

77-3.03A(2) Pipe Bursting And Reaming

Install sewer pipe by pneumatic pipe bursting or pipe reaming. Install pipe in compliance with the pipe manufacturer's recommendations. For pipe busting installation, use pneumatically operated equipment with a pipe bursting head attached to HDPE pipe.

Locate, expose, disconnect and isolate existing sewer laterals from sewer main before pipe installation work begins. When pipe reaming, you must prevent drilling fluid from entering into sewer laterals.

Submit to the Engineer for review and approval a sewer installation plan which includes insertion and reception pit locations.

For pipe bursting work, use a constant tension pneumatic tool used in conjunction with a constant tension hydraulic winch. Size the winch based on the diameter and the depth of the pipe to be replaced. The constant tension winch must be sufficient sized to pull one continuous length of pipe between approved winching points.

The void created by the device must be sufficient in size to accommodate the pipe which is installed immediately after the void is formed. The void must not be so large that pipe displacement or pavement settling occurs. Allow new sewer pipe to relax for twelve hours prior to final connection to manholes.

If you cannot complete pipe bursting or reaming without damage to existing closely placed lines or pavement, you may request authorization from the Engineer to place new pipe with traditional open-cut trenching. If you encounter an obstruction that prevents the bursting or reaming tool from continuing, you must:

1. stop the operation
2. notify the Engineer
3. excavate to the obstruction
4. remove the obstruction.

Any pavement heaving or utility damage caused by pipe bursting or reaming work must be repaired at no additional cost to the City or utility company.

If you use any material or method that is not approved by the Engineer, you must remove the work and replace as directed by the Engineer.

If an obstruction is found during testing, remove the obstruction. Remove and replace section of pipe if damaged.

77-3.03A(3) HDPE Pipe Joint

Join HDPE pipe by:

1. heat fusion welding
2. electrofusion fitting or
3. equal as approved by the Engineer.

Perform heat fusion welding in compliance with the pipe manufacturer's recommendations and ASTM D2657. Fusion equipment used must be capable of meeting all conditions recommended by the pipe manufacturer including, but not limited to:

1. fusion temperature
2. alignment
3. fusion pressure.

Fusion equipment must only be operated by technicians who have been certified by the pipe manufacturer or supplier. Document and furnish to the Engineer technicians certifications in a submittal.

Use a fire retardant bag or suitable enclosure for the heater plate to facilitate control of heating process and to protect the heater plate surfaces from dirt and other debris when not in use. Clean heater plate surfaces regularly to prevent accumulation of fusion welding residues or other substances that may result in faulty pipe joining. The heater plate must be equipped with suitable means to measure the temperature of plate surfaces and to assure uniform heating such as thermometers or pyrometers.

Joint strength must be equal to that of the adjacent pipe. Clean the pipe ends with a cotton or non-synthetic cloth to remove:

1. dirt
2. water
3. grease
4. other foreign materials.

Cut pipe ends square and carefully aligned just prior to heating.

After achieving the proper melt pattern, bring the pipe ends together in a firm, rapid motion applying sufficient pressure to form a pipe bead (1/8 to 3/16 inch in height) around and inside the entire circumference of the pipe. Remove pipe bead before welding the next joint of pipe.

Use only tools designed for and approved by the manufacturer and supplier for joining pipe.

77-3.03B Sand Traps

Furnish and install sand traps or other debris catching measure approved by the Engineer during the work. Debris catching devices must be installed at all times during construction. You assume all costs associated with any damage resulting from construction materials entering the wastewater system or treatment facility.

77-3.03C Bypass Pumping

Submit a bypass pumping plan for approval by Engineer at the pre-construction meeting. At a minimum the plan must include:

1. pump size and type
2. backup pump size and type
3. contingency plan for pump failure to ensure continuous bypass operations.

The bypass system must be free from leaks. The bypass pumping plan must address access to:

1. driveways
2. cross streets
3. pedestrian crossings.

77-3.03D Manholes

Construct manholes per engineering standards.

77-3.03E Sewer Laterals

Sewer laterals must be tied over as shown. Notify the Engineer immediately upon discovering any lateral not shown, or any lateral that appears to be dry and out of service. The Engineer will then determine if it is live or not, and cap it off if dead. Pay item for laterals will not be reduced because of laterals determined to be out of service and capped off by City forces.

77-3.03F Existing Sewer

77-3.03F(1) Existing Manholes

Existing manholes must be:

1. adjusted to grade
2. remodeled or
3. abandoned

as shown and in compliance with engineering standards and section 15.

Existing manholes may have large cast in place concrete bases. No additional payment will be made for the removal of existing bases as needed to complete the work.

Oversize manholes may require a manufactured concrete reduction ring prior to setting the new manhole ring and cover.

77-3.03F(2) Abandonment Of Sewerlines

Sewer facilities taken out of service must be abandoned in compliance with Engineering Standard 6050.

Provide the Engineer 48 hour notice prior to abandoning sewer laterals. Cut off the sewer lateral at the main and plug pipes with class 3 concrete for a distance of 12 inches into the pipe, away from the sewer main pipe. Provide a minimum five foot by five foot excavation with shoring at the sewer main, adequate for City to remove the existing wye and replace it with new section of pipe. Provide:

1. backfill
2. compaction
3. surface restoration

for the excavation.

77-3.03F(3) Repair

Sewer pipeline repair must comply with sections:

1. 77-1.03A(1)(b) preventative excavation requirements
2. 77-3.02A repair pipeline materials
3. 77-3.02B(4) repair pipeline joint

4. 77-1 excavation and restoration

Repair cut sewer facilities using new pipe of material in compliance with section 77-3.02A and the same diameter. If the existing sewer pipe material complies with materials listed in 77-3.02A, use that same pipe material.

Pipe fittings must comply with section 77-3.02B(4). Center a continuous section of new pipe at the repair location. Repair must be water tight and placed at the same grade. Prior to backfilling excavation, place level on repaired portion of sewer, in the presence of the Engineer, to confirm line and grade. Backfill, compact and restore surface improvements in compliance with section 77-1.

Repair must be documented with:

1. Location
2. Repairs made
3. Photos
4. Guarantee letter
5. Interior video inspection of pipeline, when directed by the Engineer

Provide hardcopy of all documents to owner. Provide electronically, all documents to the Engineer.

77-3.03G Testing

77-3.03G(1) Air Test

After the pipeline is in place and the joints made, you must air test the sewer in the presence of the Engineer.

Air test procedure is as follows:

1. A maximum of 400 feet of sewer pipe will be tested at one time.
2. Plug and brace securely all outlets.
3. Introduce air into test section until internal pressure is 4.0 psi. If sewer pipe is placed in ground water, calculate ground water pressure and add that additional pressure to internal pressure used for test.
4. Maintain an internal test pressure by adding air as need for a minimum time of 2 minutes.
5. Measure the time required for pressure to drop from 3.5 psi to 2.5 psi. Do not introduce new air into test section during measurement.

Minimum permissible pressure discharge time as follows in seconds
(time to drop pressure from 3.5 psi to 2.5 psi)

Sewer Main		4 inch Sewer Lateral				
Diameter	Length	Sewer Lateral Length				
Inches	Feet	0 feet	100 feet	200 feet	300 feet	400 feet
6 & 8	0	0 seconds	20 seconds	40 seconds	50 seconds	70 seconds
	50	40 seconds	50 seconds	70 seconds	90 seconds	80 seconds
	100	70 seconds	90 seconds	100 seconds	100 seconds	90 seconds
	150	110 seconds	120 seconds	110 seconds	100 seconds	100 seconds
	200	140 seconds	120 seconds	110 seconds	110 seconds	100 seconds
	300	140 seconds	130 seconds	120 seconds	110 seconds	110 seconds
	400	140 seconds	130 seconds	120 seconds	120 seconds	110 seconds
10	50	50 seconds	70 seconds	90 seconds	100 seconds	90 seconds
	100	110 seconds	130 seconds	120 seconds	110 seconds	110 seconds
	200	170 seconds	150 seconds	140 seconds	130 seconds	120 seconds
	300	170 seconds	160 seconds	150 seconds	140 seconds	130 seconds
	400	170 seconds	160 seconds	150 seconds	150 seconds	140 seconds
12	50	80 seconds	100 seconds	110 seconds	110 seconds	110 seconds
	100	160 seconds	170 seconds	150 seconds	140 seconds	130 seconds
	200	200 seconds	180 seconds	170 seconds	160 seconds	150 seconds
	300	200 seconds	190 seconds	180 seconds	170 seconds	160 seconds
	400	200 seconds	190 seconds	180 seconds	180 seconds	170 seconds
15	50	120 seconds	140 seconds	160 seconds	140 seconds	130 seconds
	100	250 seconds	220 seconds	190 seconds	170 seconds	160 seconds
	200	260 seconds	230 seconds	220 seconds	200 seconds	190 seconds
	300	260 seconds	240 seconds	230 seconds	220 seconds	210 seconds
	400	260 seconds	240 seconds	230 seconds	220 seconds	220 seconds

Sewer Main		6 inch Sewer Lateral				
Diameter	Length	Sewer Lateral Length				
Inches	Feet	0 feet	100 feet	200 feet	300 feet	400 feet
6 & 8	0	0 seconds	40 seconds	80 seconds	100 seconds	100 seconds
	50	40 seconds	70 seconds	110 seconds	110 seconds	110 seconds
	100	70 seconds	110 seconds	120 seconds	110 seconds	110 seconds
	150	110 seconds	120 seconds	120 seconds	120 seconds	110 seconds
	200	140 seconds	130 seconds	120 seconds	120 seconds	120 seconds
	300	140 seconds	130 seconds	120 seconds	120 seconds	120 seconds
	400	140 seconds	130 seconds	130 seconds	120 seconds	120 seconds
10	50	50 seconds	90 seconds	120 seconds	120 seconds	110 seconds
	100	110 seconds	140 seconds	130 seconds	130 seconds	120 seconds
	200	170 seconds	150 seconds	140 seconds	140 seconds	130 seconds
	300	170 seconds	160 seconds	150 seconds	140 seconds	140 seconds
	400	170 seconds	160 seconds	150 seconds	150 seconds	140 seconds
12	50	80 seconds	120 seconds	140 seconds	130 seconds	120 seconds
	100	160 seconds	170 seconds	150 seconds	140 seconds	140 seconds
	200	200 seconds	180 seconds	170 seconds	160 seconds	150 seconds
	300	200 seconds	190 seconds	180 seconds	170 seconds	160 seconds
	400	200 seconds	190 seconds	180 seconds	180 seconds	170 seconds
15	50	120 seconds	160 seconds	160 seconds	150 seconds	140 seconds
	100	20 seconds	210 seconds	190 seconds	170 seconds	160 seconds
	200	260 seconds	230 seconds	210 seconds	200 seconds	190 seconds
	300	260 seconds	240 seconds	220 seconds	210 seconds	200 seconds
	400	260 seconds	240 seconds	230 seconds	220 seconds	210 seconds

77-3.03G(2) Deflection

Following the:

1. placement
2. backfill
3. compaction

prior to permanent pavement, clean and measure pipe for obstruction such as:

1. deflections
2. joint offsets
3. lateral pipe intrusions.

Allowable internal diameter is determined using appropriate size mandrel. Prior to use, the mandrel must be certified by the Engineer or by another entity approved by the Engineer. Use of an:

1. uncertified mandrel or
2. an altered mandrel

will invalidate test. If the mandrel fails to pass, the pipe will be deemed to be over deflected.

The mandrel must:

1. be rigid
2. be nonadjustable
3. have an odd-numbering-leg (9 legs minimum)
4. have an effective length not less than its nominal diameter
5. be fabricated of steel or aluminum
6. be fitted with pulling rings at each end
7. be stamped or engraved indicating the:
 - a. pipe material specification
 - b. nominal size
 - c. mandrel outside diameter.

Using the manufacture's specified internal diameter of pipe, maximum vertical deflection must not exceed:

1. 95 percent - for nominal diameter pipe less than or equal to 12 inches
2. 96 percent - for nominal diameter pipe less than or equal to 30 inches
3. 97 percent – for nominal diameter pipe greater than 40 inches

For pipes equal to or smaller than 24 inches in internal diameter, pull the mandrel through the pipe by hand. For pipes greater than 24 inches in internal diameter, deflections may be determined by mandrel or by a method submitted to and approved by the Engineer. If a mandrel is selected it must conform to the requirements in this section.

Any over deflected pipe must be uncovered to remove the compact soil loading. Once uncovered if the pipe is able to pass the mandrel it may remain. If not, remove and replace the damaged pipe. In all cases, the Engineer will determine whether the pipe may remain or must be replaced. Any pipe subjected to any method or process other than uncovering, even if successful to remove over deflection, must be removed and replaced with a new section of pipe.

All costs incurred by you attributable to:

1. mandrel testing
2. deflection testing
3. repairs
4. any delays

are borne by you at no cost to the City.

77-3.03G(3) Television Inspection

The Engineer may video inspect sewer pipe prior to acceptance. Provide the Engineer three working day notice prior to placement of final paving or surface restoration. Allow one working day in your schedule for the video inspection to occur. Installations which do not conform to the requirements must be reconstructed.

If you are required to submit video inspection to the Engineer for review, furnish video on flash drive. CCTV reports shall be National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification

Program (PACP) certified with no modifications. Every section of sewer (manhole to manhole) shall be identified by audio and alphanumeric on the video display and shall include:

1. project name
2. municipality
3. street name
4. City designated GIS manhole numbers
5. sewer diameter and length
6. date of inspection

77-3.03G(4) PVC Joints

Joint tightness is measured by assembling two sections of pipe in compliance with the manufacturer's recommendations.

Subject the joint to an internal hydrostatic pressure of 25 psi for one hour. Consider any leakage a failure of the test requirements.

77-3.03G(5) Testing Of Force Mains

Test force mains according to the following procedure:

Fill each section of pipe with water and expel all air. Allow pipe to set for a minimum of 24 hours. Refill pipe and pressure pipe to:

1. 150 psi, or
2. service pressure plus an additional 50 psi

whichever is greater. Maintain pressure for two hours. Replace any portion of line that fails and retest. Maximum allowable leakage is 4.17 gallons per hour per mile per nominal inch of diameter.

77-3.03G(6) Manhole Vacuum Testing

Vacuum test all newly constructed manholes prior to placing any backfill around manhole and again after manhole is raised to finish grade. Provide the Engineer 24 hour notice prior to each test.

You must prepare the manhole as follows:

1. plug all inlets to the manhole
2. place a test head in the top of the manhole
3. inflate a seal.

Place a vacuum of 10 inches of mercury on the manhole and measure the time for the vacuum to drop to 9 inches of mercury. The manhole meets requirements if the measured time for the vacuum drop meets or exceeds the value from the following table:

Manhole Depth	Manhole Diameter	
	4 feet	5 feet
4 feet	10 seconds	13 seconds
6 feet	15 seconds	20 seconds
8 feet	20 seconds	26 seconds
10 feet	25 seconds	33 seconds
12 feet	30 seconds	39 seconds
14 feet	35 seconds	46 seconds
16 feet	40 seconds	52 seconds
18 feet	45 seconds	59 seconds
20 feet	50 seconds	65 seconds

If the manhole fails the vacuum test, provide the necessary repairs to make the manhole pass the vacuum test.

77-3.03H Cleaning

After the final air test has been satisfactorily completed, sewer shall be cleaned using High-Velocity (Hydro-cleaning) equipment only. Cleaning shall be with clean water with a minimum 2,000 psi @ 50 gpm standard

cleaning nozzle. Cleaning shall be performed starting at the furthest upstream segment (manhole to manhole) proceeding downstream. Each segment shall be cleaned from its downstream manhole. All debris shall be vacuumed and removed from each set-up location.

All foreign material must be removed from:

1. pipes
2. manholes
3. cleanouts

prior to being placed into service. Remove all material from sand traps or debris catchers in manholes prior to removing the sand trap or debris catcher.

77-3.04 PAYMENT

Full compensation for work specified in section 77-3 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list. Sewer work performed under Section 77-3 is designated in the contract by:

1. size
2. type
3. quantity or
4. whatever information is necessary for identifying sewer work.

The length of sewer pipe is measured by the slope length designated by the Engineer. Pipe placed in excess of the length is not measured. Quantity to be measured will be the length of pipe placed after cutting. The distance of flow through the manhole will not be measured as pipe length, that work is included in the manhole payment.

Pipe:

1. bends
2. tees
3. wyes
4. other branches

are measured and paid for by the linear foot for the sizes of pipes involved. Bends will be measured along the centerline to the point of intersection.

Quantities of:

1. manholes
2. cleanouts
3. sewer laterals connections

are determined as units from actual count.

77-4 STORM DRAINS

77-4.01 GENERAL

Section 77-4 includes general specification for storm drains and appurtenances. Storm drains and sanitary sewers materials and construction are similar. Section 77-4 is as specified in section 77-3 except as modified below.

Culverts must comply with section 61.

Alternative culverts must comply with section 62.

Plastic pipe must comply with section 64.

Concrete pipe must comply with section 65.

77-4.02 MATERIALS **Add to section 77-3.02**

Do not change pipeline size or material between structures unless approved by the Engineer.

Corrugated metal pipe is not approved for use in the storm drain system.

77-4.02A Pipe

77-4.02A(2) High Density Polyethylene (HDPE)

Add to section 77-3.02A(2)

Corrugated HDPE with smooth interior and integral bell / spigot is an approved pipe for storm drain application.

77-4.02B Joints and Fittings

77-4.02B(1) HDPE

Add to section 77-3.02B(1)

Joints for corrugated HDPE smooth interior pipe must use gasket joints. Joint, gasket, and fittings must be of the same type and manufacture as the pipe and installed per manufacture recommendations. HDPE pipe joints must be water tight to 2 psi

77-4.02C Concrete

Add to section 77-3.02C

Storm drain structures must comply with sections 51-1 and 90-2.

77-4.03E Catch Basins

Construct catch basins in compliance with engineering standards. Install a 3½-inch circular marker, such as an ACP International Storm Drain marker on the surface of the concrete above the catch basin opening. The marker must state "Dump No Waste", and "Drains to Creek", and must include a Spanish translation and an image of a fish. Markers are available from the City.

77-4.03G Testing

77-4.03G(1) Air Test

Replace section 77-3.03G(1) with:

Test storm drain pipe line joints in compliance with section 61-1.01D.

77-4.04 PAYMENT

Replace 4th paragraph of section 77-3.04 with:

Quantities of:

1. manholes
2. catch basins
3. junctions

are determined as units from actual count.

77-5 MISCELLANEOUS FACILITIES

77-5.01 GENERAL

Reserved

81 MONUMENTS

81-1.01 GENERAL

Replace section 81-1.02 with:

Section 81 includes specifications for:

1. construction survey
2. monuments
3. other control points

81-1.02 MATERIALS

Replace section 81-1.02 with:

Survey monument materials must conform to the requirement in engineering standards. Survey tag must be furnished by the Licensed Land Surveyor who sets the monument location.

81-1.03 CONSTRUCTION

Replace section 81-1.03 with:

The following:

1. Horizontal monuments
2. vertical benchmarks
3. construction surveying

must comply with section 5-1.26.

Construct monuments per engineering standards. Set survey tag, record documentation with County Recorder, and provide electronic copy of document to the Engineer.

81-1.04 PAYMENT

Replace section 81-1.04 with:

Full compensation for work specified in section 81 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

84 TRAFFIC STRIPES AND PAVEMENT MARKINGS

84-1 GENERAL

84-1.01 GENERAL

84-1.01A Summary

Add to section 84-1.01A.

All permanent traffic stripes and pavement markings must be thermoplastic. Requirements for this section also apply to curb marking.

Any traffic stripes rejected for non-compliance with these specifications, as determined by the Engineer, must be removed before reapplication. All costs incurred for pavement preparation or restoration, including costs for resurfacing the asphalt pavement to a condition equal to that before the initial placement of traffic stripes is at your expense.

Work must comply with sections 10-1.02 and 15-2.02C.

84-1.01B Definitions

Add to section 84-1.01B.

Curb marking: A longitudinal line covering the top and face of a curb. The marking must extend to, but not beyond, curb wick line and flowline, or in the case of an AC dike, covering the top and face to the flowline.

84-1.03 CONSTRUCTION

84-1.03E Application of Stripes and Markings

Add to section 84-1.03E.

Final Stripes and Pavement Markings must not begin before 5 calendar days, and completed no later than 15 calendar days after placement of asphalt concrete or bituminous seals. You must provide the Engineer a minimum two working day notice to review, modify and approve striping layout prior placing the final striping. You will be assessed Liquidated Damages in the amount of \$300 per calendar day for each day's failure to complete striping and pavement markings within this specified time. The use of preformed thermoplastic is acceptable for work where the total length of thermoplastic traffic stripes is not greater than 30 feet, and the total area of pavement markings is not greater than 30 square feet.

New stripes and markings must be protected from damage until completely dry.

Curb markings must be paint not thermoplastic.

84-1.04 PAYMENT

Replace section 84-1.04 with:

Full compensation for work specified in section 84 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list. Traffic stripes are measured by the linear foot along the direction of the traffic stripes, without deductions for gaps in broken traffic stripes. Each type of traffic stripe or striping detail will be measured as a single length regardless of:

1. number
2. widths
3. patterns
4. markers

of the stripes involved in the striping details.

Pavement markings included in the various striping details, or called out separately, will be measured by the square foot.

Curb markings are measured by the lineal foot along the curb wick line.

When traffic stripes, legends or markings are damaged and replaced due to the your operations and there is no pay item for replacement, payment for work is included in other items of work and no additional compensation will be paid.

84-2 THERMOPLASTIC TRAFFIC STRIPES AND PAVEMENT MARKINGS

84-2.04 PAYMENT

Replace section 84-2.04 with 84-1.04.

84-3 PAINTED TRAFFIC STRIPES AND PAVEMENT MARKINGS

84-3.02 MATERIALS

84-3.02A General

Add to section 84-3.02A.

Curb marking material must be high solids, lead-free paint specifically formulated for traffic and / or parking lot applications, meeting all Federal, State, and local regulations. Material must be dry to the touch within 15 minutes of application. Do not apply glass beads to curb markings.

84-3.02C Application Equipment

Add to section 84-3.02C.

Curb markings may be applied by either roller or airless sprayer to obtain a uniform thickness and complete coverage with no overspray. Curb marking must not be applied to new concrete. New concrete must cure a minimum 7 days or as recommended by the manufacturer before painting.

84-3.03 CONSTRUCTION

Add to section 84-3.03.

Prepare curb area to be painted in compliance with this section. Remove residual curing compound prior to painting. Apply traffic stripes and pavement markings only on dry surfaces during periods of favorable weather. Do not paint surfaces when freshly painted surfaces may become damaged by rain, fog, or condensation. Clean all dirt and loose material from areas to receive traffic stripes and pavement markings. Apply curb markings in a single coat applied at a minimum thickness of 15 mils. Protect painted surfaces from the public until they are completely dry.

84-3.04 PAYMENT

Replace section 84-3.04 with 84-1.04.

84-6 SPECIALIZED SURFACE TREATMENTS

84-6.01 GENERAL

Reserved

85 PAVEMENT MARKERS

85-1 GENERAL

85-1.04 PAYMENT

Replace section 85-1.04 with:

Payment must comply with section 84-1.04.

86 ELECTRICAL SYSTEMS

86-1 GENERAL

86-1.01 SUMMARY

86-1.015 DEFINITIONS

Add to section 86-1.015.

Future conductors: Includes signal, lighting, interconnect, and fiber optic lines.

Add to section 86-1.015. (RSS Revision)

Pull box: A box with a cover that is installed in an accessible place in a run of conduit to facilitate the pulling in of wires or cables.

86-1.03 SCHEDULE OF VALUES

Add to section 86-1.03. (RSS Revision)

Submit a schedule of values within 15 days after Contract approval.

86-1.04 EQUIPMENT LIST AND DRAWINGS

Add to section 86-1.04.

Submit the following in bound and labeled book.

1. materials lists
2. manufacturer's data
3. brochures
4. technical data
5. recommended replacement cycles

Provide one drawing which includes diagram of controller cabinet schematic diagram and intersection diagram. Place drawing in plastic pouch on controller cabinet door so that when cabinet doors are fully open the drawing is oriented with the intersection. Prior to signal turn on the drawing must be attached at cabinet door. Provide one spare drawing to the Engineer.

86-1.04A Maintenance and Operations Manuals

Furnish maintenance and operation manuals for each:

1. Controller unit
2. Auxiliary equipment
3. Vehicle detection
4. Live video systems

At a minimum the manual must include the following:

1. specifications
2. design characteristics
3. general operation theory
4. function of all controls
5. trouble-shooting procedures
6. block circuit diagram
7. geographical layout of components
8. schematic layout of components
9. replacement components parts including stock numbers

Include complete instruction for implementation of all operator programmable functions in operational manual. The maintenance manual and operation manual may be combined into one manual. When the controllers are submitted to the Engineer, submit manuals. The Engineer may require manuals prior to purchase from manufacture.

86-1.07 SCHEDULING OF WORK

Add to section 86-1.07.

Place order for new equipment. Provide to the Engineer a written manufacture confirmed delivery date for equipment within 10 working days from execution of contract.

Contract time will commence 5 working days prior to manufacture provided delivery date of equipment. Provide work schedule based on the delivery date of equipment and start of contract time that ensures that work will continue to completion without interruption. At a minimum the work schedule must show:

1. work start date
2. confirmed delivery equipment date
3. critical path of construction activities.

86-2 MATERIALS AND INSTALLATION

86-2.05 CONDUIT

86-2.05A Material

Add to section 86-2.05A.

45 and 90 degree conduit bends must have:

1. a radius of 6 times the inside diameter of the conduit
2. a minimum 18 inches radius or
3. for fiber optic a minimum radius of 36 inches.

Install conduit into pull box having bell end of conduit penetrating pull box.

Use continuous tracer tape with no splices between pull boxes.

86-2.05C Installation

Add to section 86-2.05C.

Excavation and restoration must comply with section 77-1.

Install conduit per engineering standards. Conduit depth minimum is measured from new finished surface elevations. Conduit must not be within 24 inches of any detector loop wire.

86-2.06 PULL BOXES

Replace the 1st paragraph of section 86-2.06 with:

You may use a larger standard size pull box than described with approval of the Engineer.

86-2.06A Material

Use gray nonconcrete boxes for standard gray sidewalk

Use brown nonconcrete boxes for Mission Style sidewalk.

Lid must be flush with the box.

86-2.06B Cover Marking

Add to section 86-2.06B.

Use the following cover markings for:

1. "Traffic Signal" for signals and associated lighting and interconnect
2. "Lighting" for street light only circuits
3. "City Comm" for fiber communication conduits

86-2.06C Installation and Use

Replace the 1st paragraph of section 86-2.06C with:

Space pull boxes no more than 180 feet apart. You may install additional pull boxes to facilitate the work, with the approval of the Engineer.

Add to section 86-2.06C.

Mission style sidewalk must comply with section 73-4.

Place a ring of #4 rebar around the entire perimeter of all pull boxes set in concrete.

Place pull boxes for conduit containing fiber optics at each intersection of fiber conduit runs.

Place communication manhole per Engineering Standard 9030 at:

1. street intersections
2. 500 foot intervals
3. as necessary to facilitate work at your expense.

Place manholes in sidewalk area.

Do not place pull boxes or manholes within one foot of any sidewalk ramp.

Add to section 86-2.06C. (RSS Revision)

The top of the pull box must be flush with the surrounding grade or the top of an adjacent curb, except in unpaved areas where the pull box is not immediately adjacent to and protected by a:

1. concrete foundation
2. pole
3. other protective construction

Place the pull box 1-1/4 inches above the surrounding grade. Where practical, place a pull box shown in the vicinity of curbs or adjacent to a standard on the side of the foundation facing away from traffic. If a pull box is installed in a sidewalk area, adjust the depth of the pull box so that the top of the pull box and the lid is flush with the sidewalk.

Reconstruct the sump of an existing pull box if disturbed by your activities. Remove old grout and replace with new if the sump was grouted.

86-2.08 CONDUCTORS AND CABLES

86-2.08B Conductor Identification

Add to section 86-2.08B.

Circuit	Insulation	Function	Color
Dedicated Street Lighting Circuits	THHN/THWN	Ungrounded	Black
		(Neutral) Grounding	White
		Grounded	Green
	None	Ground	Bare*

* Use soft drawn copper from adjacent pull box to the street light grounding lug inside the hand hole on the pole.

86-2.08C Installation and Use

Replace 1st sentence in 1st paragraph in section 86-2.08C with: (RSS Revision)

Use UL or NRTL listed and rated for 600 V(ac) operation for

1. Circuit conductors
2. Connectors
3. Terminals

86-2.08D Signal Cable

Add to section 86-2.08D.

Use signal cable and not individual conductors.

Use three conductor signal cable for each pedestrian phase pedestrian push buttons.

Use twelve conductor signal cable for no more than two phases in a signal pole. For poles with more than two phases, use twenty-eight conductor cable. Provide a minimum of three spares per pole.

Do not splice signal cable in pull boxes. Feed signal cable from one conduit to the next with 24 inches of extra signal cable coiled in the pull box. At the last pull box in run, prior to feeding into controller cabinet, coil 36 inches of extra signal cable in the pull box.

Label all wiring in controller cabinet with phase identification. Label all signal cables and wiring in pull boxes with pole location id as shown. All labeling materials must be approved by the Engineer prior to work.

86-2.08E Signal Interconnect Cable (SIC)

Replace section 86-2.08E with:

Signal interconnect cable must be a 9-pair with stranded tinned copper No. 20 conductors and include a drain wire. Each conductor's insulation must be 13 mils minimum nominal thickness, color-coded, polypropylene material. Conductors must be in twisted pairs. Color coding distinguishes each pair. Each pair must be wrapped with an aluminum polyester shield and must have a No. 22 or larger stranded tinned copper drain wire inside the shielded pair.

Pair twist must have a minimum of 4 twists per foot. The pair twist lays and the relative placement of the pairs must be designed to minimize crosstalk and meet capacitance unbalance limits for quality communications cable. The pairs must be combined in one cylindrical core identified by color-coded non-hygroscopic binders.

Provide the following colors paired with black to facilitate identification:

Black paired with:

1. red
2. white
3. green
4. blue
5. yellow
6. brown
7. orange

Red paired with:

1. white
2. green

A complete covering of non-hygroscopic dielectric material must protect the core. The shield must be corrugated copolymer-coated 8-mil aluminum tape to be applied longitudinally over the core wrap. The copolymer coating must bond the shield to the jacket.

Cable jacket must be black, HDPE, rated for a minimum of 300 V(ac) and 60 degrees C, and must have a minimum nominal wall thickness of 40 mils. Cable jacket or moisture-resistant tape directly under the outer jacket must be marked in compliance with section 86-2.08. The cable jacket must provide a:

1. tough
2. flexible
3. protective covering that withstands:
 - a. exposure to sunlight
 - b. atmospheric temperatures
 - c. ground chemicals
 - d. stresses expected in standard installations.

Sequential footage markings must be printed on the jacket at 2' intervals.

Signal interconnect cable must meet the requirements of ANSI/ICEA S-85-625-1989 and Rural Electrification Administration, REA PE-22.

Use EDCO TBLK-12 or equal as approved by the Engineer for signal interconnect terminal blocks splice cabinets.

Land all twisted pair of interconnect cable at the terminal block of each controller cabinet in a neat manner. Provide additional terminal blocks as needed to accommodate excess twisted pairs of interconnect cable.

Use two pair of the signal interconnect cable for the interconnect between local and field master controller. The Engineer will provide the field master controller grouping. Assign or attach all controllers to the same field master and same twisted pair.

Terminate the signal interconnect cable as follows:

1. Remove enough of the outer jacket to provide the proper length of the individual conductors in a manner that does not damage the shield's protective coating.
2. Separate the shields from the conductor.
3. Thoroughly clean the cable from each cable conductor, the cable shield and the cable jacket.
4. Provide a minimum of 6 inches of slack between the termination block and cable outer jacket opening for all conductors.
5. Twist each pair a minimum of one full twist per inch. Do not twist cable pairs or pair conductors with any other pairs or pair conductors.
6. Permanently attach bonding wire to the shield in compliance with REA splicing Standard PC-2.
7. Cover the cable to approximately 1 inch beyond each end of the shield with three half-lapped layers of heavy-duty self-fusing insulating tape. Cover the self-fusing tape to approximately 1 inch beyond each end of the self-fusing tape with two half-lapped layers of electrical tape.

You must have a minimum of five feet of slack at each pull box and ten feet at controller cabinet. Splicing is allowed only if shown.

Insulate conductor splice with heat-shrink tubing and overlap at least 0.6 inch. Cover overall cable splice with heat-shrink tubing and overlap the cable jacket at least 1½ inches.

For all intersections which include the installation of interconnect cable, the controller must be equipped with a Model 400 Modem and a C2 connector and hardness.

Prior to start of construction; verify communications between the traffic signal controller and the QuicNet system. After testing cabling and being re-landed in cabinet, verify communications between the traffic signal controller and the QuicNet system.

86-2.09 WIRING

86-2.09A Circuitry

Add to section 86-2.09A. (RSS Revision)

Provide enough traffic signal light conductors for functional operation of the signal. Provide a minimum of 3 spare conductors in all conduits containing traffic signal light conductors or more if shown.

86-2.09B Installation

Add to section 86-2.09B.

Blow out all conduits using 90 psi air pressure before pulling cable or wire.

For dedicated street lighting circuits, coil 18 inches of slack in each pull box.

Wrap conductors around projecting end of conduit in pull boxes. Secure cables and wires to conduit at pull boxes to prevent pulling of cables without removing the securing device.

86-2.09C Connectors and Terminals

Replace section 86-2.09C with: (RSS Revision)

Connectors must be crimp type. Use a manufacturer-recommended tool for connectors and terminals to join conductors. Comply with SAE-AS7928.

Terminate stranded conductors smaller than no. 14 in crimp style terminal lugs.

Terminate field conductors no. 12 and smaller with spade type terminals. Terminate field conductors no. 10 and larger with spade type or ring type terminals.

86-2.09D Splicing and TERMINATIONS

Add to section 86-2.09D.

Provide 12 individual "EDCO" COHP-030 surge protector modules to fit into the "EDCO" TBLK-12 assembly.

Provide "EDCO" lightning protector or approved equal as determined by the Engineer. Connect lightning protection unit to the controller cabinet ground bus using an insulated heavy copper braid #6 AWG size or larger. Install lightning protection unit at controller cabinet.

86-2.09E Splice Insulation

Replace value for resistivity in 6th paragraph table in section 86-2.09E with: (RSS Revision)

25 x 10¹³ Ω per inch, minimum

86-2.10 BONDING AND GROUNDING

Add to section 86-2.10.

Install a ground rod driven in the pull box adjacent to the controller and ground the controller to it.

86-2.11 SERVICE

Add to section 86-2.11.

You are responsible to contact and coordinate electrical service connection. Supply a connection date to PG&E that allows PG&E a reasonable time period to schedule the work. Notice must be written and provided to PG&E and the Engineer. During the course of work, provide PG&E and the Engineer updates of any potential service connection delays.

Provide a combined service pedestal and UPS enclosure in compliance with engineering standards.

Do not splice service connection between:

1. the point of service and the service pedestal
2. the service pedestal and facility housing.

86-2.11C Electrical Service for Booster Pumps

Replace section 86-2.11C with: (RSS Revision)

Provide electrical service from the service point to the booster pump.

Furnish:

1. Conductors
2. Conduit
3. pull boxes

from the service point to the booster pump.

Do not use Type 3 conduit unless shown otherwise.

86-2.14 TESTING

86-2.14C Functional Testing

Add to beginning of section 86-2.14C.

Perform the following tests on each cable circuit furnished and installed:

1. Flash test for each vehicle and pedestrian indication at signal turn on
2. Conduct "Meg" test at 250 volts. "Meg" test each conductor:
 - a. within cable to ground.
 - b. to all other conductors in the cable.

Complete tests and provide test results and test data to the Engineer. Where test results fail to meet specified limits:

1. identify
2. correct
3. retest

at your expense.

Replace 4th paragraph in section 86-2.14C with:

Functional test for each lighting and sign illumination system is seven days of continuous satisfactory operation in compliance with lighting schedule. If unsatisfactory performance of the system develops, correct the system. Repeat test until seven days of continuous satisfactory operation is achieved.

Damaged caused by public traffic resulting in a system failure is not considered a functional test failure.

86-2.16 PAINTING

Replace section 86-2.16 with:

86-2.16A General

Section 86-2.16 provides specifications for coating traffic signal equipment that is to be installed within the downtown core, or where equipment is specified to be color coated.

Provide equipment that is coated from the manufacture.

Provide the Engineer a notarized certificate of compliance that guarantees:

1. coating system is in compliance with these specifications
2. that it is an equivalent coating system
3. that it is free of defective workmanship

Galvanized interior surfaces are not required to be coated. All other surfaces must be coated.

86-2.16B Color

Traffic signal equipment including poles within the Downtown Core must be color coated Dark Forest Green, such as:

1. Pantone 5535 or
2. RAL 6009

Provide the Engineer a paint chip for review and approval prior to ordering signal poles and equipment. Coat the following with Dark Forest Green coating:

1. signal heads
2. signal head housings and mountings
3. brackets and fittings
4. outside of hoods
5. pedestrian push buttons housings
6. pedestrian head housings and hoods
7. back faces of back plates
8. luminaire arms
9. standards
10. mast arms
11. controller cabinets

12. service equipment cabinets

Coat the following with "Enamel; Traffic Signal, Lusterless, Black":

1. Interior of signal hoods
2. louvers
3. front faces of back plates.

86-2.16C Preparation

Remove all:

1. loose rust
2. dirt
3. moisture
4. grease
5. contaminants
6. weld splatter
7. flux
8. slag

from the surface.

Power tool clean in compliance with:

1. Steel Structures Painting Council Specifications SSPC-SP3 or
2. Brush Blast clean in compliance with SSPC-SP7

prior to coating.

All necessary drilling and welding must be done prior to abrasive blasting. Abrasive blast all exterior surfaces that will be coated including:

1. Shaft
2. arm(s)
3. and interior surface of shaft, from the base plate to the top of the hand-hole opening

in compliance with coating manufacture's recommendations. Round and smooth all sharp or rough edges.

Keep all surfaces free of:

1. moisture
2. oil
3. grease
4. other organic matter until coated.

Failure to do will require the abrasive blast procedure to be repeated. Solvent wiping is not satisfactory to remove contaminants.

86-2.16D Coating System

Coating system must include a primer coat and a two coat color topcoat for exterior application that ensures resistance from:

1. corrosion
2. abrasion
3. impact
4. delamination

Apply a heavy duty corrosion resistant protective primer coating of:

1. Amerlock 400
2. Tnemec 66 or
3. equal as determined by the Engineer

at a minimum of 5 mils dry film thickness. Apply primer coat in strict compliance with manufacturer's recommendations.

Color topcoat must be composed of acrylic resins and modifiers in suitable organic solvents forming a:

1. satin finish with lasting color
2. resistance to fumes
3. splash and spillage of acids and alkalies
4. adhesion resistant to removal by application of tape.

Color topcoat must consist of two coats a minimum 2.5 mils thickness. Total topcoat thickness must be a minimum 5 mils thick.

86-2.19 SIGNS
Add to section 86-2.

Signs must comply with section 56.

86-3 CONTROLLER ASSEMBLIES

86-3.01 CONTROLLER ASSEMBLIES

86-3.01A General

Replace section 86-3.01A with:

Furnish a Model 170E controller unit with:

1. C2S connectors and cables
2. a type 170E auxiliary board
3. a Model 400 Modem and a C2 connector and harness
4. Type 412C prom module that is:
5. pre-programmed with a BI Tran type 233 program
6. configured for a type 27256 EPROM
7. include one blank 27256 EPROM
8. one 6264 RAM chip
9. one 1230 Dallas chip.

Deliver controller to the Engineer a minimum of 30 days before the scheduled turn on for programing and operational inspection.

You must arrange to have a signal technician,

1. qualified to work on the controller unit
2. employed by the controller unit manufacturer or his representative present at the time the equipment is turned on.

Detector sensors must be type 222 two-channel sensors. Type 222 requirements are modified as follows:

1. thumb wheel switches for sensitivity settings.
2. nine levels of sensitivity per channel.
3. a built-in loop monitor (Winky Blink) that remembers intermittent loop failure.
4. ability to resume normal operation following intermittent loop failure.

86-3.01B Department-Furnished Controller Assemblies

Delete section 86-3.01B.

86-3.02 BATTERY BACKUP SYSTEM

86-3.02A General

86-3.02A(1) Summary

Replace section 86-3.02A(1) with:

This work includes:

1. furnishing
2. assembling
3. installing

battery backup system (BBS). Comply with transportation electrical equipment specifications (TEES).

86-3.02B Materials

Replace 1st paragraph in section 86-3.02B with:

Batteries must be Unigy 24HR 3000 batteries (79ah) or approved equal.

86-3.04 CONTROLLER CABINETS

Add to section 86-3.04.

All Type 332 Cabinets must be equipped with a

1. PDA2, Power Distribution Assembly
2. drawer assembly.

86-4 TRAFFIC SIGNAL FACES AND FITTINGS

86-4.01 VEHICLE SIGNAL FACES

Add to section 86-4.01.

All vehicular indications must use:

1. 12 inch lenses
2. tunnel visors
3. louvered back plates

Signal heads must be aluminum alloy, McCain or approved equal. Plastic housings, visors and back plates will not be permitted.

All vehicle signal faces and lenses installed but not in use must be covered and remain covered until the traffic signal system is put into use.

86-4.01A Signal Sections

Add to section 86-4.01A.

Where plastic or metal components are specified, use only metal components.

86-4.01A(2) Plastic Signal Sections

Delete section 86-4.01A(2)

86-4.01C Visors

Add to section 86-4.01C.

Where plastic or metal components are specified, use only metal components.

86-4.01D Light Emitting Diode Signal Module

86-4.01D(1) General

86-4.01D(1)(a) Summary

Add to section 86-4.01D(1)(a).

Use only Light Emitting Diode (LED) for signal faces for:

1. Red
2. Yellow
3. Green

All LED signals must be:

1. Model 433 Series Dialight
2. GE-DR6 or
3. approved equal.

All arrows must be Model 433 Series Dialight or approved equal. Provide submittal for review and approval by the Engineer prior to purchase.

86-4.01D(1)(c) Quality Control And Assurance

86-4.01D(1)(c)(i) General

Replace section 86-4.01D(1)(c)(i) with: (RSS Revision)

LED signal modules must be on the Authorized Material List for LED traffic signals.

Ensure modules have been tested under:

1. ANSI/ASQ Z1.4
2. California Test 604 for LED and circular LED signal modules
3. California Test 3001 for arrow, U-turn, and bicycle LED signal modules

LEDs must be spread evenly across the module.

86-4.01E Backplates

Add to section 86-4.01E.

Where plastic or metal components are specified, use only metal components.

86-4.03 PEDESTRIAN SIGNAL FACES

Add to section 86-4.03.

Use only GE PS7-CFF1--26A, or approved equal LED countdown pedestrian signal module.

Cover pedestrian signal faces until they are put into use.

86-4.03I Light Emitting Diode Pedestrian Signal Modules

86-4.03I(1) General

86-4.03I(1)(c) Quality Control And Assurance

86-4.03I(1)(c)(i) General

Replace section 86-4.03I(1)(c)(i) with: *(RSS Revisions)*

The LED PSF module must be on the Authorized Material List for LED traffic signals.

Ensure LED PSF modules have been tested under:

1. ANSI/ASQ Z1.4
2. California Test 606

86-5 DETECTORS

86-5.01 VEHICLE DETECTORS

86-5.01A Inductive Loop Detectors

86-5.01A(3) Construction Materials

Add to section 86-5.01A(3).

Use Type C lead-in cable.

86-5.01A(3)(c) Hot-Melt Rubberized Asphalt Sealant

Replace viscosity in 2nd paragraph table in section 86-5.01A(3)(c) with: *(RSS Revision)*

Viscosity, Brookfield Thermosel, no. 27 Spindle, 20 rpm, 190 °C	D 4402	2.5–3.5 Pa·s
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86-5.01A(4) Installation Details

Add to section 86-5.01A(4).

After conductors are installed in the slots, but prior to placement of sealant, secure conductors in the slot with foam tubing manufactured for this purpose and compatible with the sealant.

86-5.01D Emergency Vehicle Pre-emption Equipment

Replace 86-5.01D with:

Traffic Signal Pre-emptive equipment must be a 3M Opticom System or approved equal. Use one Model 752 Discriminator Module for every two channels of pre-emption and necessary Optical Detectors to provide the directional input as shown. Install equipment in compliance manufacturer's requirements.

Mount optical detector as shown using an approved mast arm clamp. Do not mount on the signal head unless directed by the Engineer.

Provide manufacturer representative knowledgeable of the pre-emption equipment to be present for the first day of the traffic signal function test. Provide a vehicle equipped with an emitter to test and verify satisfactory operation of the equipment.

86-5.01E Video Detection

Add to section 86-5.01.

86-5.01E(1) General

Install video detection devices for all new or replacement detectors unless directed to install new loops by the Engineer. Loops must comply with section 86-5.01. When loops are installed, replace the loop detector card.

Work includes provisions of a fully functional video detection system including:

1. control units
2. cameras
3. camera mountings
4. power cables
5. video cables
6. monitor

86-5.01E(2) Cameras And Brackets

Provide one camera for each approach as shown. Use the most current version of Iteris color cameras or equal, approved by the Engineer. Install cameras as required in "Iteris Vantage Edge Installation and Users Guide". Depending upon the configuration of an intersection, the Engineer may require that either an:

1. Iteris Universal Camera Bracket
2. Pelco Extended Camera Bracket or
3. approved equal

be used for mounting the cameras. Camera locations must be approved by the Engineer prior to installation.

86-5.01E(3) Detectors

Install the most current version of the following video detection equipment for each intersection using video detection:

The interface device hardware shall be Iteris Edge Connect.

The interface device shall;

1. be specifically designed to mount in a standard TS-1, TS-2, and 170 type detector rack using the edge connector to obtain power. No adapters shall be required to mount the interface device in a standard detector rack.
2. occupy no more than two slots in the detector rack and shall provide a loop-type handle for easy installation and removal.
3. be powered by 12 or 24 volts DC and shall not consume more than 6.25 watts. The unit shall automatically compensate for the different input voltages and shall be hot-swappable.
4. operate in a temperature range from -35°C to +74°C and a humidity range from 0% RH to 95% RH, non-condensing.
5. accommodate either monochrome or color video signals conforming to NTSC or PAL video standards.
6. automatically sense the video input signal and configure the video output port to either NTSC or PAL standards. Each video input signal shall be separately sensed to allow mixed video signals.
7. interface with up to four video detection processors using RJ-45 interface connectors.

Video Ports: The interface unit shall accommodate a maximum of four composite video inputs and one video output.

Video inputs and video output shall be made via BNC connectors to ensure secure connections. RCA or other straight friction plug-in type connections shall not be allowed. Video inputs shall use a vendor supplied "octopus" cable to accommodate the four video inputs. Provisions shall be made to accommodate the mating cable to utilize jack screws for securing the octopus cable.

An EIA-232 communications port shall be provided for local and remote access. The connector for this port shall be a 9-pin "D" subminiature connector on the front of the interface device. Provisions shall be made to accommodate mating cables to utilize jack screws for securing cables.

Hi-intensity LED status lights shall be provided to facilitate system monitoring. Indicators shall be provided to show the status of the internal processor, video lock and indication of which video input is being monitored.

An Ethernet port shall be integrated within the interface device. The Ethernet port shall conform to 802.3 Ethernet specifications and shall auto-sense between 10 and 100 Mbps data rates. Industry standard TCP/IP (UDP and TCP packets) protocol shall be supported. The Ethernet connection shall be made through a RJ-45 connector.

In addition to the Edge Connect, the following is also required:

1. One Iteris Edge 2 processor per camera.
2. One Iteris Extension Module or approved equal for each intersection approach. Additional extension modules may be required if intersection configuration requires installation.
3. One 10" LCD shelf mounted monitor.
4. One track ball style pointing device.
5. A minimum 15 amp power strip with sockets oriented horizontally for controller cabinet equipment.

Provide submittal to Engineer for review and approval prior to purchase. -Items 3, 4, 5 above may be eliminated if already existing at intersection. Contact the Engineer prior to bidding to determine what existing equipment is available at intersection.

86-5.01E(4) Video Transmission Equipment

Install live video equipment as shown.

Provide the most current version of Encom COMMPAK BB 5.8 INT radio antennas. Mount antennas on poles or mast arms with Pelco ASTRO MINI-BRAC AB-0121-42 with McCain antenna pipework M1046. Where multiple antennae are installed at the same intersection, install a Garretcom ES42P-PD four port ethernet switch.

Provide 5 working day notice for video transmission equipment to the Engineer.

86-5.01E(5) Installation

Provide a factory certified representative of the supplier of the video detection system to supervise the installation and testing of the video and computer equipment.

86-5.01E(6) Warranty, Maintenance And, Support

Provide the following written documentation from equipment suppliers:

1. A three year warranty on video detection system for hardware and software failures. Warranty must include repair or replacement including shipping and handling expenses during the warranty period.
2. Onsite technical support as requested by the Engineer for one year after the last purchase made under this contract.
3. Ongoing software support including updates of all software. Software must be updated free of charge during the warranty period.
4. Technical support and software updates maintenance program available after expiration of the warranty period. Supplier must make available to Engineer this service in a separate agreement for continuing support.
5. On site adjustments of video detection zone programming due to false calls or missed detections as requested by the Engineer within 60 days following initial setup. Supplier must provide additional adjustments as required following the initial 60-day period for any problem identified in the initial 60-day period and recurring for up to one year.

86-5.02 PEDESTRIAN PUSH BUTTON ASSEMBLY

Replace section 86-5.02 with: (RSS Revision)

Where a push button is mounted on top of a 2-1/2-inch-diameter post, fit the housing with a slip fitter and use screws to rigidly secure it to the post.

Install the push button and the sign on the crosswalk side of the pole.

Attach the sign on a Type B push button assembly.

For a Type C push button assembly, mount the instruction sign on the same standard as the assembly using 2 straps and saddle brackets.

Add to section 86-5.02.

Pedestrian push button assemblies must comply with the June 20, 1994, "Architectural and Transportation Barriers Compliance Board, Interim Final Ruling," on the Americans with Disabilities Act Accessibility Guidelines and the following requirements:

1. All pedestrian push buttons must be ADA approved Polara Engineering "Navigator Accessible" with:
 - a. vibro-tactile
 - b. locating tone
 - c. directional messages
 - d. or equal as approved by the Engineer

The message and symbol must conform to State Standard Plan ES-5C.

Provide a signal technician, qualified to work on the pedestrian push buttons and processor units, employed by push button manufacturer or representative, present at the time the equipment is turned on.

Fill out order forms and audible message forms and submit to the Engineer for review and approval within two weeks of contract execution. Allow for five working days for review.

86-6 LIGHTING

86-6.01 HIGH-PRESSURE SODIUM LUMINAIRES & 86-6.03 LOW-PRESSURE SODIUM LUMINAIRES

Replace section 86-6.02 with: 86-6.02 LED LUMINAIRES

86-6.02A General

Section includes information for LED luminaires for street and intersection lighting.

See engineering standard 7910 for pole requirements.

See engineering standard 7520 for lighting circuit requirements.

86-6.02B Material

All luminaires must be LED. LED Luminaires must be the most current version of Cree XSP LED. Provide submittal to Engineer prior to purchase of luminaires.

Application of type 1 and 2 luminaires must comply with engineering standard 1010 section G.

Type 1 LED Luminaires must be:

1. Cree XSP LED most current version
2. Type 2 Optics
3. 4,806 initial lumens delivered
4. 4000k High Efficacy Module
5. 120-277V Voltage
6. Silver Color
7. Provide with:
 - a. Fuse
 - b. Utility Label
 - c. Photocell
 - d. exterior wattage label.

Type 2 LED Luminaires must be:

1. Cree XSP LED most current version

- 2. Type 3 Optics
- 3. 9,612 initial lumens delivered
- 4. 4000k High Efficacy Module
- 5. 120-277V Voltage
- 6. Silver Color
- 7. Provide with:
 - a. Fuse
 - b. Utility Label
 - c. Photocell
 - d. exterior wattage label.

86-6.02C Construction

Reserved.

86-6.02D Payment

Full compensation for work specified in section 86-6 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

86-6.11 PHOTOELECTRIC CONTROLS

86-6.11B Equipment Details

86-6.11B(1) Photoelectric Unit

Add to section 86-6.11B(1).

Photocells must be:

- 1. Lumatrol by Precision, Model # ECDV-AP-TD105-300V or
- 2. approved equal.

Provide one photoelectric control of Type V for each luminaire.

Add to section 86-6
86-6.14 TRAIL AND PATH LIGHTING

Reserved

86-7 REMOVING, REINSTALLING, OR SALVAGING ELECTRICAL EQUIPMENT

86-7.01 REMOVING ELECTRICAL EQUIPMENT

Add to section 86-7.01.

All material shown to be salvaged must be delivered to the:

City of San Luis Obispo Corporation Yard
 25 Prado Road
 San Luis Obispo, CA

Salvaged material includes mounting and fastening hardware and hand-hole covers.

DIVISION X MATERIALS

90 CONCRETE

90-1 GENERAL

91-1.01 GENERAL

90-1.01B Definitions

Class of Concrete: The City identifies concrete for miscellaneous uses, curb, gutter, sidewalk, drainage structures, etc. as being specified by class. The class of the concrete as shown or in compliance with engineering standards. The class of concrete is defined as follows:

Class	Cement Content lb/cy	Cement Content Sack (94 lb per sack per cy)	28 day strength	7 day strength	Slump
1	675 lb/cy	7.2	5000	3500	2-4 in
2	590 lb/cy	6.3	3000	2100	2-4 in
3 / Minor	550 lb/cy	5.9	2500	1750	2-4 in

High Early Strength: Concrete requiring a high early strength such as that where traffic is expected within 24 hours after placement must comply with section 90-3 meeting 2500 psi prior to traffic loading.

94 ASPHALTIC EMULSIONS

94-1 GENERAL

94-1.04 PAYMENT

Delete section 94-1.04.

APPENDICES

- A. QUALITY ASSURANCE PROGRAM FOR CONSTRUCTION
- B. REQUEST FOR DISCHARGE TO SANITARY SEWERS

APPENDIX A

CITY OF SAN LUIS OBISPO QUALITY ASSURANCE PROGRAM FOR CONSTRUCTION

1. GENERAL

This program has been developed by the City of San Luis Obispo Public Works Department. The program is required by the Local Assistance Procedures developed by the California Department of Transportation for use on Local Federally Funded projects.

This program is for use on City of San Luis Obispo projects off the National Highway System. For City projects on the National Highway System managed by the City, the California Department of Transportation Quality Assurance Program will be used.

For purposes of this document, the Resident Engineer is the Engineering Project Manager or other certified or registered person as required.

2. ACCEPTANCE TESTING PROGRAM

2.1 Qualifying Testing Personnel

2.1.1 Laboratories

Laboratories performing acceptance testing for City projects must meet the following criteria:

- The laboratory operates under the supervision of Registered Civil Engineer with experience in inspection and testing of construction materials
- The Engineer certifies the testing results
- The laboratory maintains a regular program of equipment calibration
- The laboratory is able to provide one day turn around on sampling if needed
- The laboratory routinely performs and documents split sampling for in house quality assurance.

2.1.2 City Staff

City staff will be individually certified for each project or once a year whichever is least. City testing personnel will be certified by the City's Resident Engineer for the project.

The Resident Engineer must keep a log with the project file of the date of certification of all testing personnel working on the project. (form QAP-SC)

2.1.3 Testing by another Agency

A federal agency may test material at any time.

2.2 Pre-construction Sampling

The Contractor hired for construction is responsible through the submittal process to provide documentation that materials proposed to be used on the project will meet the specifications. The documentation must be furnished through the Contractor to the City from the various material suppliers to be used by the Contractor.

2.3 Test Methods

The City or contract laboratory will use the California Tests or the equivalent ASTM test.

2.4 Testing Equipment Calibration

The City will maintain the following testing equipment. The equipment will be calibrated as shown:

Equipment	Method	Frequency
Slump Cone	Visual Check for damage	Annually
Kelly Ball	Visual Check for damage	Annually

2.5 Certificate of Compliance Acceptance

2.5.1 Materials accepted with Certificate of Compliance

The City will accept the following materials with a certificate of compliance. The City reserves the right to sample any of the following materials and submit them for testing at a laboratory for any reason to confirm compliance.

Aluminum Pipe	PCC Curing Compounds
Aluminum Pipe Arch	Plastic Pipe
Asphalt Oil	Polyethylene Pipe
Asphaltic Emulsion	Portland Cement
Conductors	Prefabricated Bridges
Corrugated Steel Pipe Arch	Preformed Elastomeric Joint Seal
Ductile Iron Pipe	Reinforced Concrete Pipe
Electrical Equipment	Reinforcing Steel
Engineering Fabrics	Roofing Shingles
Epoxy	Soil Amendment
Epoxy Coated Bar Reinforcement	Steel Piles
Fiber	Structural Steel
Gabion Baskets	Structural Lumber and Timber
Liquid Asphalt	Traffic Paint
Lumber and timber	Traffic Signs
Minor Concrete	Treated Lumber and Timber
Mulch	Water Valves
PCC Admixtures	Waterstops

2.5.2 Acceptance of Certificates for non-listed materials

The City may accept a Certificate of Compliance for materials not listed above when the testing of the materials shows the material consistently meets the specifications. The City may also accept a Certificate of Compliance where there is a minor amount of material to be used on the project.

2.6 Sampling

2.6.1 Start of Sampling

Materials arriving on site will be logged in as to the day of arrival, including batch numbers, manufacturer and any other identifiers. Sampling must begin the same day. (form QAP-ML)

2.6.2 Frequency of Sampling

Materials should be sampled at the frequency identified in the table and the results logged, including any re-sampling for failed tests. (form QAP-SL)

Sampling Frequency Table

Material	Test for:	Test #		Location of Sample	Frequency	Comments
		CTM	ASTM			
PCC - Major structures or Pavement	Slump/Penetration Cylinders	533 539/540	C143/C360 C31	Site	2/day 1set of 3/day	None for < 200 ft ³
AC	Sieve Compaction	202 375	C136 D2950	Site or Plant	1/project	
Aggregate Base	Sieve Sand Equivalent Maximum Density Compaction	202 217 216 231	C136 ----- D1556-7 D2922	Site	3000 tons 2000 yds ³	Minimum of 1 per project
Disturbed Basement Soil	Compaction	216/231	D1556-7 D2922	Site	10,000 ft ²	Minimum of 1 per project
Disturbed Embankment	Compaction	216/231	D1556-7 D2922	Site	10,000 ft ²	Minimum of 1 per project
Structure Backfill	Sieve Compaction	202 216/231	C136 D1556-7 D2922	Site	1/project	
Select Backfill	Sieve Sand Equivalent Compaction	202 217 216/231	C136 ----- D1556-7 D2922	Site	1/project	
Chain Link Fencing	Compliance with Specifications	gage ck	_____	Site	300 ft	Minimum of 1 per project
Bridge Profilograph	Compliance with Specifications	547	_____	Site	1/bridge minimum	Repeated until satisfactory results are obtained
Grout	Compressive strength	515	_____	Site	1/project	None for < 10 ft ³

2.6.3 Deviations from Frequency Sampling

Frequency may vary from the table under the following guidelines. All deviations from the frequency will be documented and justified. (form QAP-SL)

The frequency of sampling may be reduced where sample test results show a high consistency rate. Sampling may be eliminated where the project requires only minor quantities. Where sampling is not done, a visual examination will be made and where possible a certificate of compliance obtained. The frequency of sampling may be increased where material is borderline passing.

2.7 Filing

2.7.1 Contents

The filing system will include copies of this Quality Assurance Program, City staff testing personnel certifications, equipment calibrations, material logs and sampling frequency logs.

2.7.2 Approvals

The Resident Engineer will see and approve all material and sampling logs. Logs will be turned in for approval no later than the following working day from the day of the sampling.

2.8 Manufactured Materials

2.8.1 Source Inspection

The City will request source inspection from the California Department of Transportation in compliance with their policies. When the California Department of Transportation is unable to provide source inspection, the City will use alternate means to approve the affected materials.

2.8.2 Alternate Inspection

When source inspection is unavailable, the City will do one or more of the following as appropriate to the specific material.

- A portion of the material will be taken to a laboratory for inspection.
- The Assistant Resident Engineer will make a site inspection of the material.
- A Certificate of Compliance will be required.

2.9 Quality Assurance and Control

Quality assurance and control are the responsibility of the Contractor.

2.10 Deviation of Materials from Specifications

Any accepted material which deviates from the specifications for the project will be identified and justified. (form QAP-MD)

2.11 Project Completion

The Resident Engineer will complete the Materials Certification form and Statement of Materials and Labor Used, for project close out.

**CITY OF SAN LUIS OBISPO
LOG OF MATERIALS ON SITE**

Material	Arrival Date	Lot # or other ID	Certificate of Compliance	Sample taken	Notes
			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
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			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
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			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	

Log prepared by: _____

Approved by: City Inspector _____

**CITY OF SAN LUIS OBISPO
LOG OF MATERIAL SAMPLING**

Material / Test	Lot# or other ID	Testing Location	Testing Date	Results ¹	Notes ^{2 3}
		_ Site _ Lab	_ Test _____ _ Retest _____		_ Pass _ Fail
		_ Site _ Lab	_ Test _____ _ Retest _____		_ Pass _ Fail
		_ Site _ Lab	_ Test _____ _ Retest _____		_ Pass _ Fail
		_ Site _ Lab	_ Test _____ _ Retest _____		_ Pass _ Fail
		_ Site _ Lab	_ Test _____ _ Retest _____		_ Pass _ Fail
		_ Site _ Lab	_ Test _____ _ Retest _____		_ Pass _ Fail
		_ Site _ Lab	_ Test _____ _ Retest _____		_ Pass _ Fail
		_ Site _ Lab	_ Test _____ _ Retest _____		_ Pass _ Fail
		_ Site _ Lab	_ Test _____ _ Retest _____		_ Pass _ Fail
		_ Site _ Lab	_ Test _____ _ Retest _____		_ Pass _ Fail

1. Attach laboratory results. 2. Reference failed test corrective action. 3. Justification for deviation from established frequencies.

Log prepared by: _____

Approved by: City Inspector _____

**CITY OF SAN LUIS OBISPO
JUSTIFICATION FOR MATERIAL DEVIATIONS**

Material: _____

Justification: _____

Prepared by: _____

Approved by: City Inspector _____

**PROJECT
MATERIALS CERTIFICATE**

Date: _____
Project: _____

Subject: Materials Certification

This is to certify that:

The results of the tests on acceptance samples indicate that the materials incorporated in the construction work and the construction operations controlled by sampling and testing were in conformity with the approved plans and specifications.

_____ Exceptions to the plans and specifications are explained on an attached sheet.
_____ No exceptions to the plans and specifications were found.

Signature of Engineer in responsible charge of project

Title

Distribution (all projects): (1) Original City Project Files (2) Engineer

APPENDIX B

REQUEST FOR DISCHARGE TO SANITARY SEWERS

(Note: No discharge is allowed to Storm sewer inlets or creeks)

Refer to Section **5-1.20G City authorizations and permits** for conditions for discharge.

Request to Wastewater Collection Supervisor and Industrial Waste Coordinator for Discharge to Sanitary Sewers

Company Name:	
Site Contact:	
Site Location (address):	
Source:	
Discharge point:	
Volume:	
Duration:	
Characteristics of Discharge:	

Approved:

Wastewater Collection Supervisor

Industrial Waste Coordinator

Request not approved – submit an Industrial User Discharge Permit Application

ENGINEERING STANDARDS

JANUARY 2016

APPROVED BY THE CITY ENGINEER:



Approved on: December 15, 2015

Effective: January 1, 2016

BARBARA LYNCH
CITY ENGINEER
RCE C53418

ADOPTED BY THE CITY COUNCIL OF SAN LUIS OBISPO
BY RESOLUTION NO. 10680 (2015 SERIES)

PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
919 Palm Street
San Luis Obispo, CA 93401
(805) 781-7200

January 2016 Edition

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UNIFORM DESIGN CRITERIA

Refer to the Community Design Standards and Fire Development Guide for additional information and guidance.

A. STREETS

The design of a subdivision street system should result from an evaluation of topographical conditions, the traffic likely to be generated by the types and numbers of planned uses, and the purpose of each street. The street system must allow an acceptable pattern of lots (see Sections 17.36.150 through 17.36.230 of the City's Municipal Code).

Street systems should be built to naturally encourage walking, community, safety and environmental stewardship. The City supports concepts such as Complete Streets, Green Streets, and Living Streets. Special approvals by the City Engineer will be needed for alternative street widths and elements.

Wet utilities should be placed within the roadway prism for maximum accessibility.

Geometrics:

All regional highways and arterial streets shall have cross sections generally conforming with adopted Specific Plans and the Circulation Element, as modified by City direction specific to the area, and circumstances of development.

Minimum clear and passable street widths will be as required by the Fire Department.

All streets shall intersect other streets at right angles, and shall have at least 50 feet of centerline tangent, as measured from the prolongation of the cross-street property line to the angle point or beginning of curve. Roundabouts should be considered in lieu of traditional intersections where level of service thresholds can be accomplished.

Block lengths for local and collector streets should be a minimum of 150 feet and a maximum of 600 feet. Block lengths for arterial streets should be a minimum of 600 feet. Street systems should be networked to improve connectivity and reduce travel distances for alternative transportation.

The minimum outside corner radius is 10' for local residential streets, with larger radii for commercial or industrial areas where large vehicle use is frequent. Frequently used areas shall provide radii that allow for a large vehicle to turn at an intersection without crossing the centerline into oncoming traffic. Inside corners, such as on a street with a ninety degree turn, shall have a minimum radius of 20' to allow for sweeping.

Streets with a regular cross section and no special provision for turn-around shall be provided at the edges of a subdivision when the City determines they may be extended in the future.

Space for turning vehicles shall be provided at the ends of access streets with no outlet. A cul-de-sac may include landscaping or parking within a central island so long as space for turning and

REVISIONS	BY	APP	DATE
<i>Revised Lot Stake Rebar Size</i>	<i>MH</i>	<i>BL</i>	<i>5-14</i>
<i>Revised Sections A,B,E,G,H,J</i>	<i>MH</i>	<i>BL</i>	<i>2-14</i>
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UNIFORM DESIGN CRITERIA

backing from driveways is provided. Design of terminus streets, such as cul-de-sacs, shall be to the satisfaction of the City Fire Department and City Engineer.

Alleys may be required in industrial, commercial and residential subdivisions where necessary to provide alternative, controlled access to arterial and thoroughfare streets. Alley right-of-way and pavement width shall be a minimum of twenty feet. Where two alleys intersect, a paved area free of obstructions shall be provided for safe visibility and turning.

Parkway areas which include trees shall be a minimum of 5 feet wide. Parkways created in existing integral sidewalk areas will be handled on a case-by-case basis.

Grades and Cross Slope:

Street grades on other than arterials and thoroughfares, shall not exceed fifteen percent. Grades on arterial streets and thoroughfares shall not exceed ten percent, unless the City Engineer approves a steeper grade, which shall not exceed fifteen percent. The grade on switchbacks or curbs of less than fifty-foot centerline radius shall not exceed five percent.

The minimum street grade shall be one percent, except that where topographical conditions do not allow any feasible alternative, and with the approval of the City Engineer, grades not less than 0.3 percent may be allowed.

Design of street grades at intersections shall follow the principles indicated in the most current edition of AASHTO manual "A Policy on Geometric Design of Highways and Streets."

In sloping terrain, separate one-way travel lanes may be used in order to reduce cut and fill. Such one-way lanes shall have a minimum unobstructed width of twenty feet, a minimum paved width of fourteen feet, and a maximum length of five hundred feet.

Where excavation or fill slopes extend beyond the street right-of-way, easements for the slopes may be required by the City.

Cross slope shall be considered during street construction and rehabilitation design. Cross slope is typically 2 percent but may range from 1.5 percent to 3 percent to accommodate terrain.

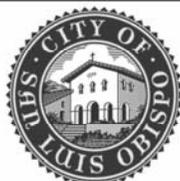
For streets where roadway pavement edges are at different heights, a quarter crown point is typical.

The grade break at the gutter should not exceed 20 percent at a driveway to prevent vehicles from dragging on the ground or sidewalk.

Streets designed with super elevation shall be designed in accordance with current California Department of Transportation Highway Design Manual guidelines.

Slopes for crossings and access points shall meet accessibility requirements.

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**UNIFORM DESIGN
CRITERIA**

Pavement:

Pavement design shall follow the California Department of Transportation Highway Design Manual, be based on a 20-year design life and the "R-value" of the subgrade material. New local streets shall be designed for a 50-year life.

Pavement thickness shall be based on Traffic Indices shown in City Engineering Standard 7110.

Variations of the design standards and pavement materials may be approved by the City Engineer to meet individual circumstances.

See also Section B and Engineering Standard 7110 for other requirements affecting street design.

Sidewalks and Bicycle Lanes:

Sidewalks are required on both sides and shall be designed and constructed per Engineering Standards. Alternative surface materials may be approved on a case-by-case basis by the City Engineer to facilitate infiltration; however, ADA access requirements must be met. Sidewalks must slope to drainage facilities, either planting areas or gutters.

Standard minimum sidewalk width is 5 feet detached, 6 feet integral. Sidewalk widths for commercial development may be required up to 7 feet detached, 12 feet integral, depending on the location of the commercial development and anticipated pedestrian traffic. In areas where these widths cannot be maintained, sidewalk shall have a minimum of 5 feet clear width.

Integral curb, gutter and sidewalk shall be constructed without a cold joint between the curb and the sidewalk.

Curb returns shall be designed to minimize overly steep grades of curbs through the returns, to the satisfaction of the City Engineer. Generally, the grades of curb returns should not exceed the grades of the adjacent streets, and include accessible curb ramps. Additional landing area may be needed at corners, outside the planned right-of-way, to accommodate ramps.

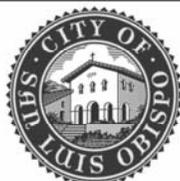
Curb extensions may be required to restrict parking at intersections for visibility and to reduce pedestrian crossing distances.

Provisions for bike facilities shall be in accordance with the adopted Bicycle Transportation Plan.

The City may approve alternatives to sidewalks or bicycle lanes incorporated into the roadway section. Such alternate routes shall be within a public right-of-way or public easement and shall provide a level of access and pedestrian/cyclist safety equivalent to or better than provided by conventional locations. Where alternative pedestrian paths or bicycle paths are provided to the satisfaction of the City, the conventional sidewalks or bicycle lanes may be eliminated. Where curbside parking is provided, there must be safe pedestrian access to it.

The alternative pedestrian path or bicycle paths shall be logically related to conventional sidewalks or bike lanes in order to safely divert pedestrian/bicycle travel from roadway sections lacking roadside walks or bike lanes.

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**UNIFORM DESIGN
CRITERIA**

The City may require improved walkways, in addition to sidewalks, through blocks more than nine hundred feet long to provide access to parks or public facilities.

Any existing feature in the sidewalk that is of a special, unique, unusual, or historic nature, as determined by the City, shall not be replaced, removed, or altered without specific approval of the City Engineer.

Curb Ramps:

Curb ramps shall be installed at all intersections where sidewalks are to be built.

Curb ramps should be located in the most logical place to accommodate pedestrian crossings.

Curb ramps shall comply with the provisions and standards required by the City, State, and Federal Government. Any deviation from standards requires a signed design exception, approved by the City Engineer.

Street Trees:

Install one street tree per 35 feet of street frontage. Street trees may be grouped if necessary to avoid conflict with other improvements.

Mission Style Sidewalk District:

The following requirements apply to construction in the Mission Style Sidewalk District, which is defined in Resolution No. 9114 (2000 Series). See map in appendix.

- a. Mission Style Sidewalk, curb and gutter shall be constructed per City Engineering Standard 4220.
- b. All driveways, curb ramps, tree wells and catch basins shall conform to Mission Style Sidewalk requirements.
- c. All sign posts and parking meter posts shall be relocated behind the tile row and be installed per City Engineering Standards.
- d. All new utility vaults, water meter boxes, and sewer cleanouts shall be located behind the tile row or future tile row and shall conform to City Standards. Wells, boxes, lids and covers shall be stained or coated to match surrounding sidewalk. Stains and coatings shall be submitted to the City for approval prior to application. Lids and covers may be cast iron or dark galvanized slip-resistant diamond-plate. Lids and covers in traffic areas shall be traffic rated.
- e. All new installations of Mission Style Sidewalk shall include Mission Style Curb and Gutter.
- f. Any existing feature in the sidewalk that is of a special, unique, unusual, or historic nature, as determined by the City, shall not be replaced, removed, or altered without specific approval of the City Engineer.

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**UNIFORM DESIGN
CRITERIA**

Street Parking:

Parking is not allowed on regional highways and arterial streets. Parking on one or both sides is allowed on all other street types. Where the proposed design allows parking in only certain areas, parking pockets, extended gutter construction, or other methods of clearly defining legal parking, are required.

Parking areas may be used for infiltration of stormwater where suited to the site conditions. Design shall be such as to prevent damage to adjacent roadway sections from infiltration, to the satisfaction of the City Engineer.

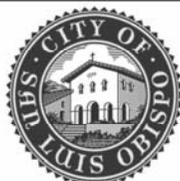
The City may approve alternatives to the provision of curbside parking. Alternate parking may be allowed where the City determines the resulting street design is adequate for the type and extent of planned uses. Curbside parking reductions are encouraged in hillside developments to reduce grading and in all other areas to reduce run-off volumes and pavement maintenance costs.

If curbside parking is not provided, alternate parking on-site may be required depending on the development type and anticipated parking demand.

Access Restrictions:

Reserve strips of land to control access from adjoining property to public streets may be required by the City. Such reserve strips shall be at least one foot wide and shall be deeded in fee to the City. They shall be shown and clearly labeled on the final map. Access restrictions may also be incorporated by note on the map.

REVISIONS	BY	APP	DATE
<i>Revised Lot Stake Rebar Size</i>	<i>MH</i>	<i>BL</i>	<i>5-14</i>
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<i>Revised Section H</i>	<i>JDL</i>	<i>DA</i>	<i>10-15</i>
STANDARD CURRENT AS OF:		January 2016	



**UNIFORM DESIGN
CRITERIA**

Street Types and Requirements:

The following is a chart of street types and the requirements for each type of street.

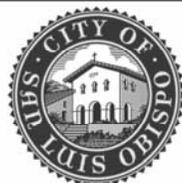
Notes

- (A) Right-of-way shall extend a minimum of 2' beyond edge of roadway, back of curb, or back of sidewalk, as the case may be.
- (B) Additional right-of-way may be required for noise-attenuation, drainage features, shoulders, and curb ramps.
- (C) In determining function, maximum development allowed by zoning will be used.
- (D) See Bicycle Transportation Plan for details

STREET REQUIREMENTS

Street Type	Function (C)	Total R/W Width (A & B)	
Cul-De-Sac (access court)	Low speed access to 8 or fewer dwellings	26' to 42'	Min. centerline curve radius 75'; maximum length 300'; those serving 4 or fewer dwellings may exceed 300' but not 600' Must have turning space as required by the Fire Department Design vehicle P20
Hillside Cul-de-Sac	Low-speed access to 10 or fewer dwellings where the prevailing land slope is more than 15%	26' to 34'	Min. centerline curve radius 75'; maximum length 300'; those serving 6 or fewer dwellings may exceed 300' but not 600' Must have turning space as required by the Fire Department Design vehicle P20
Residential Local	Low-speed access to about 50 dwellings	40' to 56'	Min. centerline curve radius 150' Design vehicle P20
Hillside Residential Local	Low-speed access to about 50 dwellings where the prevailing land slope exceeds 15%	36' to 52'	Min. centerline curve radius 100' Design vehicle P20
Residential Collector	Moderate-speed circulation within a neighborhood of 300 to 500 dwellings	44' to 60' (D)	Min. centerline curve radius 250' Design vehicle SU 30
Commercial/ Industrial Collector	Access and circulation within commercial and industrial areas	44' to 68' (D)	Min. centerline curve radius 300' Cul-de-sacs shall provide 40' minimum radius Design vehicle SU 40
Arterial	Convenient, moderate-speed circulation between neighborhoods and between different land use areas	86' to 94' (D)	Min. centerline curve radius 500' Median and dedicated left-turn lanes, 12' wide Limited driveway access Designed for safe stopping speed of 45 mph Design vehicle WB 50
Regional Highway	Unencumbered, moderate to high-speed travel between communities	84' to 104' (D)	Min. centerline curve radius 500' Median and dedicated left-turn lane 14' wide No driveway access Access from streets, particularly minors and collectors, may be limited Safe stopping speed of 55 mph

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B. DRAINAGE AND EROSION CONTROL

General:

All new development or redevelopment shall comply with the criteria and standards set forth in the Waterways Management Plan – Drainage Design Manual, applicable area specific plans, and the Post-Construction Stormwater Management Requirements for Development Projects in the Central Coast Region, adopted by the Central Coast Regional Water Quality Control Board, and included in their appendices. Where requirements conflict, the stricter shall apply.

Stormwater Control Plan, and Operation and Maintenance Plan are required prior to final approvals.

Streets:

Cross gutters are only allowed at intersections. Cross gutters are not allowed to cross highway/regional routes or arterial streets.

Stormwater management facilities may be built into the right-of-way, including medians, traffic circles, and parkways, subject to approval by the City Engineer. Where stormwater management features are built into the right-of-way, water must be managed to prevent damage to the roadway structural integrity.

Subsurface Groundwater Drainage:

Underground dewatering improvements (such as retaining wall sub-drains or groundwater collection system) shall not deposit collected groundwater or spring water to the gutter or other surface drainage facility. Such systems shall be designed to retain the water on-site or deposit the collected water to an approved collection system.

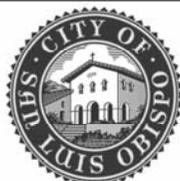
Source Control:

(per 2013 State General Stormwater Permit Section E.12.d)

Projects with pollution generating activities and sources must be designed to implement operation or source control measures consistent with recommendations from the California Stormwater Quality Association Handbook for New Development and Redevelopment or equivalent, including:

- a) Accidental spills or leaks
- b) Interior floor drains
- c) Parking / storage areas and maintenance
- d) Indoor and structural pest control
- e) Landscape / outdoor pesticide use
- f) Pools, spas, ponds, decorative fountains and other water features
- g) Restaurants, grocery stores, and other food service operations
- h) Refuse areas
- i) Industrial processes
- j) Outdoor storage of equipment or materials
- k) Vehicle and equipment cleaning, repair, and maintenance
- l) Fuel dispensing areas

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- m) Loading docks
- n) Fire sprinkler test water
- o) Drain or wash water from boiler drain lines, condensate drain lines, rooftop equipment, drainage sumps, and other sources
- p) Unauthorized non-stormwater discharges
- q) Building and grounds maintenance

Design should prevent water from contacting work areas, prevent pollutants from coming in contact with surfaces used by stormwater runoff, or where contact is unavoidable, treat stormwater to remove pollutants.

Operations and maintenance activities required to achieve Source Control are to be included in the Operation and Maintenance Plan submitted for approvals and recorded with the property as required by ordinance.

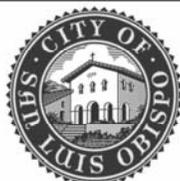
C. WATERLINES

Main Size:

Minimum water main size shall be 8 inches except:

- a. A 6-inch main may be used in normal gridded street patterns where two 8-inch looped mains in adjacent streets are to be connected if the length is less than 350 feet and it will not have to support a fire hydrant.
- b. Dead-end mains require special approval of both Fire Dept. and Utilities Dept. For dead-end mains the minimum size shall be:
 - 4-inch main if less than 150 feet long and serving less than 10 dwelling units.
 - 6-inch main if over 150 feet but less than 350 feet long and serving less than 25 dwelling units.
 - 8-inch main if over 350 feet but less than 700 feet long and serving less than 50 R-1 dwelling units (with triple valve at intersection)
 - 10-inch main if over 700 feet but less than 1500 feet long and serving less than 75 R-1 dwelling units (with triple valve at intersection and 250-foot maximum fire hydrant spacing).
- c. Recycled water mains shall be sized in accordance with the Recycled Water Master Plan, or as determined by the Utilities Department.
- d. Recycled water mains design pressure may be reduced, if a lesser pressure class can be justified. Pressure does vary in the recycled water system. Designers must contact the Utilities Department to obtain operating pressures, in order to properly design any extensions to the system.

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Location:

Water mains shall be located per Engineering Standards 6010, 6110 and 6140.

Minimum clearance between mains and street surface shall be 3 feet.

Minimum clearance between recycled water mains and street surface shall be 5 feet.

Clearance between waterlines and other fluid pipelines must comply with California Code of Regulations Title 22, Division 4, Chapter 16, Article 4, section 64572; Installations in existing developed areas must comply with current State guidance memorandums on separation.

Services:

Water service shall include all facilities necessary for the transmission of water from the nearest point of adequate supply to a meter vault at the front of each lot. For condominium projects, a separate meter vault shall be provided for each condominium unit at the street frontage or as approved by the City Engineer. Pumping and storage equipment to provide sufficient volume and duration of flow of water shall be provided. The design and location of the water system serving the proposed subdivision shall be provided to the satisfaction of the City Engineer and Utilities Director. Water lines need not be provided to lots which will be in perpetual open space and which will not require irrigation or fire suppression.

All new services shall be 1, 2 or 4 inches or larger. All new services greater than 2 inches shall have a bypass per Engineering Standard 6250.

Size of water services shall be based on California Plumbing Code (CPC), and adequate for maximum density allowable on each specific lot. Meters shall not be larger than service line.

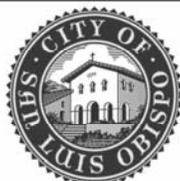
New water services shall be installed perpendicular to water main, and must have a minimum of 18" between service points.

Fire Protection:

Fire hydrants shall be installed according to the City Fire Code and to the satisfaction of the Fire Marshal and City Engineer. Fire hydrant location and service sizing shall meet the requirements of the Fire Department Developer's Guide.

On mains of 12 inches and larger, fire hydrant location and spacing shall allow, whenever possible, for the placement of a fire hydrant instead of a blow-off assembly at low points and at the ends of water mains, as appropriate.

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D. SEWER

Design:

Sewer main size shall be determined by designing for flowing half-full, considering the flow generated by the development, the ultimate upstream development, and infiltration.

Minimum sewer main size shall be 8 inches; except a 6 inch minimum size main may be allowed for the last run which ends in a manhole and cannot be later extended to serve other properties. Laterals shall be sized to be adequate (4 inch minimum) for maximum allowable density on each specific lot.

Sewer main slope shall be sufficient to provide 3 feet per second minimum velocity flowing half-full. Grades shall be designed from manhole outlets to inlets.

Sewer main depth shall accommodate all lateral connections and allow a 12 inch minimum vertical clearance between laterals and other utility conduits.

Design flow criteria are summarized as follows (for newly constructed mains only – the Utilities Department will provide data for older mains):

Domestic Sewage (Gallons / Person / Day)	
Average dry-weather flow (ADWF)	84
Peak dry-weather flow (PDWF)	210 x peak reduction factor

Reductions in peak flows occur because of storage in the system and diversification of development. The estimated factors which should be applied to obtain peak dry-weather flows are summarized as follows:

Population Range	Peak Reduction Factor
0 - 1,800	1.00
1,800 - 2,600	0.96
2,600 - 3,500	0.92
3,500 - 5,000	0.88
5,000 - 7,000	0.84
7,000 - 9,800	0.80
9,800 - 15,000	0.76
15,000 - 35,000	0.72
35,000 - 50,000	0.68

Where two or more lines enter a manhole, sufficient elevation difference shall be provided in the trough elevations, whenever possible, to prevent the smaller of the lines from being surcharged by the larger line(s) under normal operating conditions. Top of smaller pipe shall be no lower than top of larger pipe(s).

Sewer mains and laterals shall be designed so as to be usable by each lot without the need for an ejector pump. Exceptions may be granted on a case-by-case basis by the City Engineer.

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Curves may be permitted provided that pipe deflection is limited to manufacturer's recommendations, with a minimum radius of 100 feet, and the curves are only in one plane (either horizontal or vertical) between adjacent manholes. Sewer mains and laterals shall be located as shown in Engineering Standards 6010, 6110, 6140 and 6810.

All sewers shall be located within a dedicated city street or alley or within a recorded easement. Sewer main and manholes not within a street or paved drive must be within an all-weather dust free access road at least 12 feet wide and must provide access to all manholes for maintenance with truck-mounted equipment. The access road grade shall not exceed 20 percent, and a truck turn-around may be required.

Clearance between waterlines and other fluid pipelines must comply with California Code of Regulations Title 22, Division 4, Chapter 16, Article 4, section 64572, Installations in existing developed areas must comply with current State guidance memorandums on separation.

Manholes:

Manholes shall be spaced no further than 400 feet apart. Upstream ends of sewer mains shall terminate at manholes. Coatings will be required for drop manholes and other locations where gases are expected to accumulate.

All inlets shall be designed and installed such that the top of pipe elevations match, as much as possible.

All manholes shall be constructed with precast bases as shown in Engineering Standards 6610 and 6620. Manholes shall be 4 feet in diameter unless the size and/or number of inlet(s) and outlet(s) warrant the use of a 5-foot diameter manhole. Brick or block manholes will not be allowed. Cast-in-place manholes may be allowed under special circumstances where it is not feasible to construct pre-cast manholes.

Concentric cones shall be used. Eccentric cones may be used only in special cases, and only with approval of the City Utilities Department. Steps will not be allowed in manholes. Manholes shall be watertight and pass vacuum test requirements.

Manholes shall not be located at the centerline of intersections.

Pipe:

Pipe material shall be fused HDPE unless otherwise required for special conditions such as bridge crossings.

Laterals:

Sanitary sewer laterals shall be stubbed to the front property line of each lot. All facilities for the transmission of sewage from each of the lots to the nearest adequate point of connection to the City's sewer system shall be installed as acceptable to the City Engineer. Sewer lines need not be

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provided to lots which will be in perpetual open space use. The requirement for a sewer lateral may be waived upon a finding by the City that an alternative waste disposal system, which will provide a level of protection for public health and natural resources at least equivalent to public sewer, will be installed and maintained.

Sewer laterals shall have backwater valves installed whenever the flood level rim of the lowest fixture in the building (including basements) is less than adjacent upper or lower manhole, whichever controls, as determined by the City Engineer. See municipal code section 13.08.200.

E. SURVEY

Street Monuments:

Street monuments shall be set to reference street centerlines at all intersections, angle points, beginning and ending of curves, radius point of cul-de-sacs, and at tract boundary as required by the City Engineer.

Monuments shall be set no further apart than 500 feet along centerlines, and shall be shown on the final subdivision map.

Monuments shall be constructed and set per Engineering Standard 9020.

Tract Boundary Monuments:

Tract boundary monuments shall be set to reference tract boundary lines at all angle points, beginning and ending of curves, and intersections with street right-of-way lines.

Tract boundary monuments shall be set no further apart than 500 feet along boundary lines, and shall be shown on the final subdivision map.

Tract boundary monuments shall be constructed of iron pipe, no smaller than 1.5 inches in diameter, no shorter than 30 inches in length, capped and stamped with either the land surveyor's or registered engineer's number, and indicated by a marker stake extending above the ground surface.

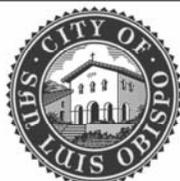
Lot Stakes:

Lot stakes shall be set to reference lot lines at all angle points, and beginning and ending of curves, except where said point is to be set with a tract boundary monument.

Lot stakes shall be constructed of 3/4 inch plugged galvanized pipe at least 18 inches in length, or a #5 rebar with plastic cap. If a lot corner falls on concrete or rock, the corner shall be set with a lead plug. All corners shall be tagged or marked with either the land surveyor's or registered engineer's number.

All lot stakes shall be set at ground surface, with white marker stakes located immediately adjacent. Offset staking or alternative staking will not be allowed without prior approval of the City Engineer.

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Vertical Control (Benchmarks):

Points of known elevation shall be set at approximately every 1000 to 1200 feet horizontally in new street systems, minimum of one point.

Points are to be set in curbs or other concrete facilities near street corners or ends of cul-de-sacs, where they can be easily located by description. A nail and tag or copper disc, or brass cap labeled "Benchmark" with the surveyor's license number, is to be set in the concrete.

Provide record showing the location, elevation, and elevation basis to the City Engineer for inclusion in the City's published Benchmarks.

F. PROJECT PLANS

All improvement plans shall be prepared and signed by a registered Civil Engineer. The public improvement plans shall use the standards set forth in Engineering Standard 9910. Each utility company whose facilities are involved shall sign the original plans indicating they have reviewed and approved the plans. Construction may not begin until the plans are signed by the City, and submittals required by the Standard provided to the City at no charge.

G. STREET LIGHTING & TRAFFIC SIGNALS

Street Lighting

All significant projects (ex: major remodels, street widenings, multi-unit developments, high density residential) are subject to providing lighting per the requirements of this standard.

All major remodels, re-developments, or significant sidewalk replacement projects in the downtown pedestrian lighting master plan area, shall provide new pedestrian level lighting.

See section 86-6.01 of the Standard Specifications for Luminaire information.

See Engineering Standard 7520 for lighting circuit requirements.

See Engineering Standard 7910 for pole requirements.

Street Light Pole

Foundation mounted steel poles are only allowed for replacement of an existing foundation mounted pole on the existing foundation or as approved by the City Engineer. Embedded steel poles are preferred and must be used for all other conditions.

Street Lights installed in certain areas, such as the Downtown, may be required to be a specialized pole, as determined by the City.

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Double arm poles (Type 15D) shall be used only in parking lots or areas where a maintenance vehicle can readily access the pole without traffic control. Otherwise use of double arm poles will only be allowed upon approval of the City Engineer and will only be authorized when no other option exists.

Street Light Pole Placement Guidelines

Residential Street Light Poles are to be placed on lot lines whenever possible. Street Lights Poles and trees should have a 20-foot minimum horizontal separation. Street Light Poles and shrubs should have a 5-foot minimum horizontal separation.

Street / Intersection Width (1)	Street Light Pole Spacing	Pole Type and Location(3)	Pole Arm Length (2)(3)	Luminaire (4)
Less than or equal to 40 feet	Every 200 to 250 feet. Only one side of street. One light per intersection.	Embedded Pole 18 inches behind curb face	8 feet	Type 1
Greater than 40 feet	Every 200 to 250 feet. Alternating sides of street. Two lights (min.) per intersection.	Embedded Pole 18 inches behind curb face	8 feet	Type 2

- (1) Curb to Curb distance
- (2) Not including luminaire
- (3) Intersection lighting shall be placed to minimize the likelihood of the pole being struck by turning traffic and may be set back from the curb face if needed and a longer arm installed to meet light placement requirements.
- (4) Refer to Section 86-6.01 "LED LUMINAIRES" of the Standard Specifications for Luminaire information.

Street Light Service

Service point shall be obtained from PG&E. When the lighting has been installed in conformance with the City's requirements, the City will authorize PG&E to energize those lights installed as part of public improvements for ownership and maintenance by the City. Lights to be maintained and paid for by a private party must be authorized by that party.

When service points are used for more than one light in series, an electrical design for the lighting circuit shall be submitted to the City for approval. Voltage drop between the point of service and the end of each lighting circuit shall not exceed 5 percent. All street lighting shall be 120VAC.

Traffic Signals

Traffic Signals must comply with current design standards in the Manual on Uniform Traffic Control Design.

Conduit fill must not exceed 25%.

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H. LANDSCAPING & IRRIGATION

Landscaping and Irrigation shall conform to the provisions in Section 13.20 of the City Municipal Code and Engineering Standards.

The provisions of the Engineering Standards apply to the following landscape projects:

- New residential, commercial, institutional and multi-family development projects with an aggregate landscape area equal to or greater than 500 square feet subject to a building permit or development review.
- Rehabilitated landscapes for residential, institutional, commercial and multi-family development projects with a landscape area equal to or greater than 2,500 square feet which are otherwise subject to a building permit or development review.

Submittals

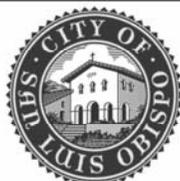
Development Review. For projects that require development review (tentative parcel map, tentative tract, development plan or conditional use permit), project applicants shall submit the following documentation:

1. A completed Maximum Applied Water Allowance for the conceptual landscape design.
2. A conceptual landscape design plan which demonstrates that the landscape will meet the landscape design specifications of the City Engineering Standards Uniform Design Criteria for Landscaping and Irrigation.
3. A conceptual irrigation design plan which notes the irrigation methods and design actions that will be employed to meet the irrigation specifications of the City Engineering Standards Uniform Design Criteria for Landscaping and Irrigation.
4. A grading plan which demonstrates the landscape will meet the specifications of the City Engineering Standards Uniform Design Criteria for Landscaping and Irrigation.

Building Application. Prior to the issuance of a building permit, project applicants shall submit the following:

1. A completed Maximum Applied Water Allowance form based on the final landscape design plan.
www.slocity.org/government/department-directory/utilities-department/documents-and-files
2. A final landscape design plan that includes all the criteria required in the City Engineering Standards Uniform Design Criteria for Landscaping and Irrigation.
3. A final irrigation plan that includes all the criteria required in the City Engineering Standards Uniform Design Criteria for Landscaping and Irrigation.
4. A soils management report that includes at a minimum the criteria required in the City Engineering Standards Uniform Design Criteria for Landscaping and Irrigation.
5. A final grading plan that includes all the criteria required in the City Engineering Standards Uniform Design Criteria for Landscaping and Irrigation.
6. A hydrozone table
www.slocity.org/government/department-directory/utilities-department/documents-and-files
7. Plans must comply with City Engineering Drafting Guidelines included in appendix.

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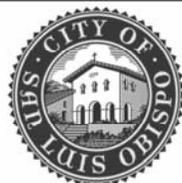
Project Completion. Upon completion of the installation of the landscape and irrigation system and prior to the issuance of the Certificate of Occupancy, the project applicant shall submit the following:

1. A Certification of Completion signed by the professional of record for the landscape and irrigation design certifying that the project was installed per the City approved landscape design, irrigation and grading plans and meets or exceeds an average landscape irrigation efficiency of 0.75. The City reserves the right to inspect and audit any irrigation system which has received an approval through the provisions of this chapter.
www.slocity.org/government/department-directory/utilities-department/documents-and-files
2. A project applicant shall develop and provide to the owner or owner representative and the City an irrigation schedule that assists in the water management of the project and utilizes the minimum amount of water required to maintain plant health. Irrigation schedules shall meet the criteria in the City Engineering Standards Uniform Design Criteria for Landscaping and Irrigation.
3. A regular maintenance schedule shall be submitted by the project applicant with the Certificate of Completion that includes: routine inspections, adjustment and repairs to the irrigation system, aerating and dethatching turf areas, replenishing mulch, fertilizing, pruning and weeding. The maintenance schedule will be provided to the owner or owner representative.

Landscaping Plan. For the efficient use of water, a landscape shall be designed and planned for the intended function of the project. For each landscape project, applicants shall submit a landscape design plan in accordance with the following:

- Any combination of plant materials that do not exceed the Maximum Applied Water Allowance (MAWA). The method to calculate the Maximum Applied Water Allowance and Estimated Total Water Use shall be in accordance with the MAWA calculator.
www.slocity.org/government/department-directory/utilities-department/documents-and-files
- Plant factors used to calculate the MAWA shall be derived from the most recent edition of the Department of Water Resources “Water Use Classification of Landscape Species (WUCOLS)”.
- Each hydrozone shall have plant materials with similar water requirements and be identified as low, moderate or high water use on the plans.
- Plants shall be selected and planted appropriately based upon their adaptability to the climatic, soil, and topographical conditions of the project site, and water attributes.
- Turf is not allowed on slopes greater than 25% (1 foot rise for every 4 feet of horizontal distance) where the toe of the slope is adjacent to an impermeable hardscape.
- Turf shall not be used in areas less than 8 feet by 8 feet in size, irregularly shaped areas, street medians, traffic islands, planter strips, bulbouts of any size or raised beds for maximum water efficiency and ease of maintenance.
- Low and moderate water-use plants can be mixed, but the entire hydrozone will be classified as moderate water use for MAWA calculations.
- High water-use plants shall not be mixed in the same hydrozone with low or moderate water-use plants.
- Invasive plants as listed by the Cal-IPC are prohibited.
- High use plants, characterized by a plant factor of 0.7 to 1.0, are prohibited in street medians.
- Recirculating water systems shall be used for water features.
- The surface area of water features, including swimming pools, will be included in a high water-use hydrozone.

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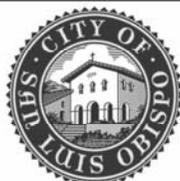
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- A landscape design plan for projects in fire-prone areas shall address fire safety and prevention. A defensible space or zone around a building or structure is required per Public Resources Code Section 4219 (a) and (b). Avoid fire-prone plant materials and highly flammable mulches.

Irrigation Plan. The irrigation system and its related components shall be planned and designed to allow for proper installation, management, and maintenance. Project applicants shall submit an irrigation design plan that is designed and installed to meet irrigation efficiency criteria:

- Landscape water meters shall be installed for all non-residential irrigated landscapes of 1,000 square feet or more.
- Soil types and infiltration rates shall be considered when designing irrigation systems. All irrigation systems shall be designed to avoid runoff, low-head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, or structures.
- Proper irrigation equipment and schedules, including features such as repeat cycles, shall be used to closely match application rates to infiltration rates, to minimize or eliminate runoff.
- Overhead irrigation spray (using manufacturer specified throw distances) shall not be permitted within 24 inches of any non-pervious surface, so as to prevent runoff and overspray. Allowable irrigation within the setback from non-pervious surfaces may include drip, drip line, or other low flow or non-spray technology. These restrictions may be modified if the adjacent non-pervious surfaces are designed and constructed to drain entirely to landscaping.
- Irrigation systems shall be designed, maintained, and managed using such techniques as low-precipitation heads, drip irrigation, moisture sensors, check valves, matched precipitation rates of sprinkler heads and other emission devices, and other water-conserving techniques where appropriate.
- Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use. A single valve shall not irrigate hydrozones that mix high water-use plants with moderate or low water-use plants.
- Irrigation systems shall be designed, maintained, and managed to meet or exceed an average landscape irrigation efficiency of 0.75 where irrigation efficiency means the measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices.
- Rain sensors, either integral or auxiliary, that suspend or alter irrigation operation during rainy weather conditions shall be required on all irrigation systems.
- Head-to-head coverage is required unless otherwise directed by the manufacturer's specifications.
- Low volume irrigation is required where plant height at maturity will affect the uniformity of an overhead system.
- The irrigation system shall be designed to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.
- Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be required, as close as possible to the point of connection of the water supply, to minimize water loss in case of an emergency (such as a main line break) or routine repair.

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- Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data shall be required for irrigation scheduling in irrigation systems for applicable projects in section 17.87.020 (A) (1) of the Municipal Code.
- If the project is within the *Water Reuse Master Plan* area, the irrigation system shall be designed and operated consistent with recycled water standards described in the City's *Procedures for Recycled Water Use*, including the requirement that sites utilizing recycled water include backflow protection on all potable service connections.
- For City facilities, if the project is within the *Water Reuse Master Plan* area, drip irrigation and small pop-up sprayers may not be used in the irrigation system unless authorized by the Parks Maintenance Supervisor.
- For City facilities, pull box spacing shall not exceed 200', and conduit fill shall not exceed 26%.
- For City facilities, irrigation boxes shall be placed in landscaped areas whenever possible. If irrigation boxes are set in hardscape areas, they shall be concrete boxes. The boxes shall be traffic rated if the area is open to public traffic or used by maintenance vehicles. Irrigation boxes in playing fields shall be buried 4 inches below grade.
- All irrigation emission devices must meet the requirements set in the American National Standards Institute (ANSI) standards, American society of Agricultural and biological Engineers/International code Council's (ASABE/ICC) 802-2014 "Landscape Irrigation Sprinkler and Emitter Standard. All sprinkler heads installed in the landscape must document a distribution uniformity low quarter of 0.65 or high using the protocol devfied in ASABE/ICC 802-2014.

Soils Management Report. In order to reduce runoff and encourage healthy plant growth, soil amendment, mulching and soil conditioning recommendations shall be prepared by a licensed landscape architect, licensed landscape contractor, licensed civil engineer or licensed architect. Prior to planting of any materials, compacted soils shall be transformed to a friable condition.

- If the characteristics of the project's soil are known, the minimum requirements of the report shall include the following:
 - a. A minimum of 6 inches of non-mechanically compacted soil shall be available for water absorption and root growth in the planted areas.
 - b. For landscape installations, compost at a rate of minimum of cubic yards per 1,000 square feet of permeable area shall be incorporated to the depth of six inches into the soil. Soils with greater than 6% organic matter in the top six inches of soil are exempt from this requirement.
 - c. A minimum of 3 inches of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers or direct seeding applications. Plant mulch shall be shredded redwood bark unless otherwise approved by the City Engineer.
- If the characteristics of the project's soil are unknown, the project applicant shall submit soil samples to a laboratory for analysis and recommendations.
 - a. Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.
 - b. The soil analysis may include: soil texture; infiltration rate determined by laboratory test or soil texture infiltration rate table; pH; total soluble salts; sodium; percent organic matter; and recommendations.

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- The soil analysis report shall be made available, in a timely manner, to the professionals preparing the landscape design plans and irrigation design plans to make any necessary adjustments to the design plans.
- The project applicant shall submit documentation verifying implementation of soil analysis report recommendations to the City with Certificate of Completion.

Grading Plan. For the efficient use of water, grading of a project site shall be designed to minimize soil erosion, runoff, and water waste.

- The project applicant shall submit a landscape grading plan that indicates finished configurations and elevations of the landscape area including:
 - a. Height of graded slopes;
 - b. Drainage patterns;
 - c. Pad elevations;
 - d. Finish grade; and
 - e. Stormwater retention improvements, if applicable.
- To prevent excessive erosion and runoff, grading shall comply with the following to the maximum extent practicable:
 - a. Grade so that all irrigation and normal rainfall remains within property lines and does not drain onto non-permeable hardscapes;
 - b. Avoid disruption of natural drainage patterns and *undisturbed soil*;
 - c. Avoid soil compaction in landscape areas; and
 - d. Preserve natural drainage channels.

Miscellaneous City Facility Provisions:

Irrigation System Operational Requirements

Design shall ensure areas of turf are not under watered, relative to the rest of the turf, resulting in brown patches. The designer may review the irrigation installation and make recommendations for corrective action on the part of the installer; however, if the system cannot, in spite of proper installation and adjustment of the irrigation, be operated to provide proper coverage, the designer shall redesign and direct revised installation at his/her cost until the system can be shown to operate properly via an audit and empirical data.

Hardscape

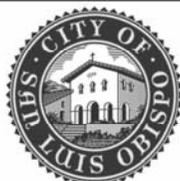
Walkways and pads for appurtenances in parks shall be concrete or pervious concrete built in accordance with City Standards for sidewalk construction and graded to prevent water from ponding on the walkway or pad. Unless variances are justified and approved by the City Engineer, walkways must meet current ADA accessibility requirements.

Pads in sod areas, such as picnic table pads, shall be round, oval or have rounded edges to allow mowing without damage to mow blades and pads.

Median islands

Median island noses shall have a 5-foot section of standard sidewalk concrete at intersections as a pedestrian refuge. Island noses should not extend into intersection crosswalk areas. Island areas 4 feet or less shall be hardscaped. All hardscaped surfaces within median islands, except for pedestrian areas, shall be decorative.

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Median island irrigation systems shall be sized to planned street island build-out (multi-island plans), including mainline sizing, water and control connections, and control systems configuration and capacity.

Median islands, including traffic circles, and center cul-de-sac landscaping may be used for infiltration of stormwater where suited to the site conditions. Design shall be such as to prevent damage to adjacent roadway sections from infiltration, to the satisfaction of the City Engineer.

Playgrounds and Miscellaneous areas

An engineered wood surfacing, meeting accessibility requirements, shall be used under play equipment. Alternative surfaces shall be submitted to the City Engineer for review and approval.

Benches and picnic tables shall be of a low maintenance material such as rubber coated steel. No wood is allowed. Alternative materials shall be submitted to the City Engineer for review and approval.

System Pressure

Where an existing meter or irrigation system is present, the designer shall obtain the current line pressure to use in design. Where no existing system exists, the City of San Luis Obispo Utilities Department shall be contacted to determine approximate existing system pressures.

For systems that will be temporarily connected to the potable water system and eventually connected to the recycled water system, or for areas that may be set up to use both systems, the designer shall consider the pressure in both systems and design the irrigation system so that it will work with either pressure.

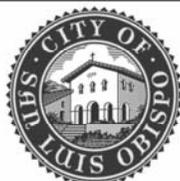
The designer shall contact the responsible maintenance division for the landscaped area (City of San Luis Obispo Public Works for City projects or areas to be dedicated) to determine the watering window to be used for the area. The designer shall use that window in determining the number of valves turned on at any given time and the resulting load on the system. Calculations of system capacities and any assumptions made about the system shall be submitted for review and approval. Calculations submitted shall clearly show an accounting for system losses and concurrent loading to prevent undersizing of the system. Where systems do not operate as needed to provide even distribution of water, including problems resulting from an undersized service, the designer will be responsible to provide any needed redesign and to pay for necessary field corrections.

The irrigation design shall include a pressure reducer or booster pump to be installed, if needed, based on the actual pressure in the new irrigation system. System shall be designed for maximum efficiency.

Controller

Irrigation designers must contact the Parks Maintenance Supervisor to determine what, if any, telemetry control equipment will be required. Systems are to be designed to current City Standards for Controller equipment where an irrigated area is City owned or to be dedicated. If control is to be via phone line, the designer must coordinate with the City's telephone system representative or City project manager to arrange for hook up.

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UNIFORM DESIGN CRITERIA

I. BRIDGES AND CULVERTS

Design Criteria:

Design shall conform to the requirements of current California Department of Transportation and AASHTO guidelines and standards. Any variation from standards must be approved in writing by the City Engineer. Bridges shall be clear spans.

All bridge designs require approval by the City's Architectural Review Commission.

Bridge design must account for impacts of future development considering areas within the City's adopted urban reserve line.

Submittals must include the full construction plans for the bridge including details, a copy of the geotechnical report, scour calculations, and design calculations. A hard copy and an electronic PDF format copy for archiving shall be submitted for documents. The design loads, hydraulic information, and a log of test borings must be included in the plans.

Scour calculations must show adequate structure depth to prevent scour damage or undermining for the life of the structure. Geotechnical investigations shall include corrosivity testing of the soil for consideration in pile design and testing for the presence of naturally occurring asbestos, where rock types indicate a potential.

Structures with a required span between 19 feet and 20 feet shall be constructed with a minimum span of 20 feet. Clear span bridges shall be constructed in lieu of closed culverts whenever possible and a natural channel maintained. Closed culverts will be allowed where site constraints prevent a bridge from being constructed with enough clearance to allow for required storm passage with 12 inches of freeboard. Authorization to build culverts in lieu of clear span bridges must be approved by the City Engineer and regulatory agencies. Closed culverts shall be upsized to increase the depth of the culvert to allow the placement of 12 inches of natural gravels in the bottom of the culvert.

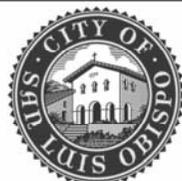
Materials:

Vehicle bridges shall be constructed of a material which requires no maintenance for the first 30 years of its life. Concrete is the preferred material for construction; however, alternative materials may be approved by application in writing to the City Engineer with sufficient documentation to support an alternative including information showing the alternative is a superior material, or that concrete will not provide the desired life or freedom from maintenance in the given conditions. Vehicle bridges may use a pre-approved prefabricated structure.

Pedestrian and bicycle bridges may be furnished as prefabricated structures, including "rusted" steel. The material must be approved prior to the submittal for the structure itself.

New bridge decks will not be overlaid with asphalt unless authorized by the City Engineer. Where the City approves an overlay on the deck, an approved waterproof membrane shall be installed between the deck surface and the overlay. Waterproof / sealing membranes such as methacrylate seals may be required prior to acceptance where cracking of the deck is observed.

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Barrier Rails:

Barrier rails for vehicle crossings must meet current AASHTO guidelines for crash ratings. Barrier rails for pedestrians on private property adjacent to the Right of Way shall comply with the most current California Building Code.

Bicycle and Pedestrian Facilities:

Vehicle bridges must be of adequate width to accommodate, at a minimum, a 5-foot bike lane and 5-foot sidewalk on both sides or match the width of the abutting bicycle and sidewalk facilities, whichever is greater. Bike lanes and sidewalks shall be constructed regardless of the presence of those facilities on the abutting roadway.

Design Life:

All structures shall be designed for a minimum 50-year service life.

J. SUBDIVISION DESIGN CRITERIA AND IMPROVEMENT STANDARDS

General requirement.

The design criteria for subdivisions and the required physical improvements for them shall be in compliance with the City’s grading ordinance, zoning regulations, subdivision standards, City Standard Specifications and Engineering Standards and other applicable regulations.

Improvements.

Improvement work, including grading, shall not commence until plans for all such work have been approved and permitted by the City, including required stormwater related plans and submittals.

Improvements to be installed by the subdivider, in accordance with these standards, include the following:

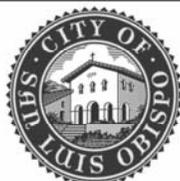
A. The full width of each street shall be improved by grading, base preparation, and paving. If a street constitutes a boundary of the subdivision or connects the subdivision with the rest of the City’s street system, even though it is not within the area to be subdivided, the full width of the roadway shall be improved. The City may, depending on individual circumstances, require full right-of-way improvements, including curb, gutter, and sidewalk, on the side opposite the subdivision.

B. Streets shall include any required curb, gutter, sidewalk, driveway ramps, curb ramps and associated landscaping (street trees, parkway, and medians) along both sides. Alternative pedestrian walkways and bikeways shall be concrete or other accessible surface material approved by the City.

C. The subdivider shall complete any railroad crossing necessary for the subdivision, including application to the California Public Utilities Commission.

D. Separate paths or bicycle / pedestrian areas may be required.

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E. Bus stops and benches shall be provided where the subdivision abuts existing or planned City bus routes and a stop is required for the use of the neighborhood.

F. Durable boundary monuments shall be installed and shown on the final map.

G. Street trees shall be provided as required by the tree regulations, as set forth in Chapter 12.24 of the City's Municipal Code.

H. Street name signs and traffic control and warning signs shall be installed. Traffic signals and traffic signal control conduits may be required by the City Engineer.

I. Utilities to be installed by the subdivider shall include those listed in this standard. The development of these facilities may require financial contribution for previous improvements to the systems, as provided in Chapter 13.04 of the City's Municipal Code, in the most recent council resolution on utility connection charges, or in any agreement affecting a particular portion of a system.

All new utility distribution facilities shall be placed underground, except accessory facilities such as terminal boxes, meter cabinets, and transformers may be installed aboveground. The subdivider shall make all necessary arrangements with the utility companies for these facilities.

- a) A water system for domestic service and fire protection provided to each lot of the proposed subdivision or, for condominium projects, to each condominium unit
- b) Where identified as a recycled water service area in the Recycled Water Master Plan, recycled water lines installed to serve those areas
- c) A sewer system for domestic use provided to each lot of the proposed subdivision
- d) Stormwater management and drainage, water quality, erosion and flood control facilities
- e) Street lights and signals
- f) Electric power, gas, cable, and telephone services stubbed to each lot or, for condominium projects, to each condominium unit; and all facilities to distribute such services provided according to the requirements of the responsible utility companies

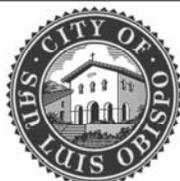
J. All new utility distribution facilities shall be placed underground, except accessory facilities such as terminal boxes, meter cabinets, and transformers may be installed aboveground. The subdivider shall make all necessary arrangements with the utility companies for these facilities.

K. The subdivider shall carry out protective measures as required by the City to assure the proper functioning and maintenance of other required improvements and properties adjacent to the subdivision. Temporary protective improvements may be required prior to or concurrent with the construction of permanent improvements.

Multiple frontages.

Single-family residential lots with frontage on more than one street are discouraged, except for corner lots or where topography makes a single frontage impractical. The City may require the release of access rights on one frontage which shall be noted on the subdivision map.

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Lot lines.

A. Lot lines should be at the top of slope banks.

B. Side lot lines should be perpendicular to the street on straight streets, or radial to the street on curved streets, unless another angle would provide better building orientation as documented in the submittal.

C. On corner lots, the lot lines adjacent to streets shall be rounded with a radius adequate to provide for street improvements.

Flag lots (deep lot subdivision).

Flag lots may be approved for subdividing deep lots where development would not be feasible with the installation of a standard street, either alone or in conjunction with neighboring properties, or where justified by topographical conditions. Such subdivision shall conform to Subdivision Regulations, Section 16.18.060 of the Municipal Code.

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PARKING AND DRIVEWAY STANDARDS

A. General

Driveways, driveway ramps, parking stalls, and aisles, including pavement, drainage, landscaping, screen fencing, and lighting, shall conform to these standards and all requirements of the Municipal Code. All spaces and driveways must be designed to function properly. City inspection is required at appropriate times to insure that all specifications are met.

B. Permits

If the parking lot is not a part of a larger project, the builder shall obtain a parking lot permit from the Community Development Department prior to constructing a new or modifying an existing parking lot. To obtain a permit, a plan for the project must be submitted to the Community Development Department.

Any restriping or improvements, other than for maintenance purposes, to a parking lot also requires approval of a parking lot permit by the Community Development Department.

C. Plans

Plans for the parking lots shall conform to city standards and shall show design for grading, paving, striping, signing, curbing, lighting, landscaping, and trash enclosures.

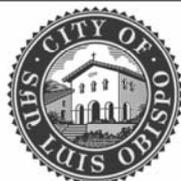
D. Pavement

1. Parking lots and driveways shall be paved with an all-weather surface, such as asphaltic concrete (AC) or Portland cement concrete (PCC). The minimum thickness of pavement shall be as specified in these standards. Base material shall be compacted to a minimum of 95 percent. Compaction test reports shall be submitted to the Community Development Department for verification of proper compaction. All motorcycle spaces within parking lots shall be PCC pads. Porous pavement surface methods approved by the City Arborist shall be provided within the drip line of existing trees in or near parking lots. All spaces shall be marked, with disabled spaces having special pavement marking in each space. Directional entrances and exits and aisles shall be signed and marked on the pavement.

2. Alternative Permanent Paving:

The Community Development Director may approve alternatives to AC or PCC paving on private property. Alternative paving materials, when installed according to manufacturer's specifications, shall provide a suitable, all-weather, load-bearing surface to support passenger cars and light-duty trucks. Alternative paving surfaces

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for driveways or parking lots serving large commercial vehicles or fire trucks must be designed to accommodate a maximum vehicle weight of 45,000 lbs. Alternative paving materials over City utility easements will not be repaired or maintained by the City.

The Director may approve such alternative paving to achieve aesthetic and environmental objectives, such as improved appearance, increased water percolation, reduced erosion and runoff, increased aeration and water for tree roots, reduced glare, and increased area available for landscaping, upon finding that the alternative paving will provide public aesthetic or environmental benefits, and is equal to or better than AC or PCC paving in terms of public safety, performance, strength, quality and durability. Examples of permanent alternative paving surfaces include, but are not limited to: interlocking pavers, eco-block, porous AC paving, cobblestone, or other material judged by the Community Development Director to be of equivalent performance, strength, quality and durability.

3. Temporary parking lots and driveways shall have an all-weather, dust-free surface with sufficient compacted base material or undisturbed grade to safely accommodate the intended use.

Examples of temporary paving surfaces include, but are not limited to: compacted "redrock" or decomposed granite; compacted road base over compacted natural grade; or other temporary surface which the Director determines to provide an all-weather load-bearing surface equivalent to the above materials in terms of safety, maintenance, and appearance. Gravel or similar materials shall not be used where average cross-slopes exceeds 5 percent. (See Paragraph O.)

E. Geometrics.

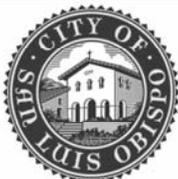
1. Turning Radii:

The minimum allowable inside vehicle turning radius in parking and driveway areas shall be 20 feet unless Fire Apparatus access is necessary, in which case the minimum inside radius shall be 30.5 feet and the outside radius shall be 46 feet or as required by the Fire Department. (Turning radii are not necessarily the radii of curbs around islands and other improvements.) Additional details are as shown on the standard drawing.

2. Spaces Which Back Onto Street:

Except as noted in No. 3, parking spaces which back directly onto the public street shall be set back a minimum of 20 feet from the back of the sidewalk, regardless of the zoning of the property.

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Except as noted in No. 3, no portion of any parking space or aisle, except driveways for ingress or egress, shall be permitted in a required street yard setback area.

3. Tandem Parking:

Residential uses may have required spaces arranged in tandem subject to the approval of the Community Development Director. Single dwellings where tandem parking is approved may have one unenclosed parking space within the street yard (refer to Section 17.16.020 - Yards in the city's Zoning Regulations).

4. Walls/Walkways/Entrances:

A parking space facing a wall containing entrances and abutting a walkway to those entrances must be at least 4 feet clear of such a wall.

5. Wheel Stops:

Wheel stops are required if the space is headed into a wall, fence, landscaped area, building, walkway, or side of another auto. Additional wheel stops may be required by the Community Development Department. Concrete curbing may be substituted for wheel stops with the approval of the Community Development Director.

6. Overhangs/Encroachments:

Dimensions shown on the standards must be clear of overhangs or other encroachments which might interfere with vehicular access. Circulation areas shall be provided at the ends of aisles.

7. Maneuvering:

Parking lots with more than six spaces shall be designed so that automobiles will exit onto a public street in a forward direction and with no more than two maneuvers. A maneuver is defined as each motion in either a forward or backward direction. No space may be allowed that requires a vehicle to be maneuvered on the public sidewalk in order to exit. All spaces must be designed to be entered in one maneuver. A turnaround may be required if it's considered unsafe for a vehicle to back into the street by the Community Development Department and/or Public Works Director.

8. Stall Sizes:

All parking stalls shall comply with the parking bay dimension standards for average sized cars as provided in the engineering standard details. Upon approval of an exception by the Community Development Director or Architectural Review Commission, a limited number of compact parking spaces may be allowed if justified by unusual circumstances such as

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PARKING AND DRIVEWAY STANDARDS

saving a tree or using otherwise unusable space. Compact stalls, if used, shall be designed and constructed in accordance with the engineering standard details. Accessible spaces shall be designed and constructed in accordance with state and local requirements.

9. Motorcycle Spaces:

All motorcycle spaces shall be designed and constructed in compliance with the engineering standards for motorcycle spaces.

10. Bicycle Parking Standards:

Bicycle parking shall be provided in accordance with city zoning requirements. Bicycle parking may include racks and/or lockers to the approval of the Community Development Department.

11. Truck Access:

Commercial and industrial parking lots serving loading zones shall be designed to accommodate access and circulation movement for on-site truck circulation. The Community Development Director or Public Works Director may require wider driveways and aisles as determined warranted.

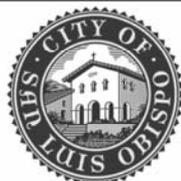
F. Slope

Parking spaces shall slope no more than 5 percent in any direction and no less than 0.5 percent in the direction of drainage. A maximum of 10 percent slope in aisle and turn-around areas may be allowed. Swales of less than 1 percent slope shall be concrete. Variations of these standards may be allowed by the Community Development Director for hardship situations providing safety and convenience concerns have been met.

G. Loading Zones

Off-street loading zones shall be a minimum of 12 feet wide and 25 feet long. Loading zones shall be designed so that trucks parking in them will not encroach onto the public right-of-way or into required parking spaces or driveways. Loading spaces designed for large trucks shall have appropriately larger access to allow maneuvering without encroaching into landscape areas. Loading zones or areas may not encroach into fire lanes. Loading zones (spaces) shall be provided in accordance with the city's zoning regulations (refer to sections 17.46.020 and 17.48.010). Additional loading zones may be required by the Community Development Department or Fire Department.

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"Handicapped" to "Disabled"	JDL	WAP	2-99
STANDARD CURRENT AS OF:		January 2016	



PARKING AND DRIVEWAY STANDARDS

H. Screening

1. In Large Parking Lots:

Any parking lot with more than six parking spaces adjoining a street shall have the street frontage screened with a 3-foot (minimum) high wall, fence, and hedge consisting of 5-gallon or larger plants, or landscaped berm. The area between such screen and the street shall be landscaped.

2. Near Residential Development:

A parking lot on a site adjacent to a residential development or next to a residential zone shall be screened by a solid 6-foot-high wall, fence, or an existing mature hedge.

I. Landscaping

1. Planting Area Placement:

In all parking lots planting areas shall generally be provided after each six parking spaces in any row and at the ends of each row of parking spaces in order to encourage the use of trees in parking areas. Landscape areas shall have a minimum dimension of 4 feet; except, those areas with trees shall have a minimum dimension of 8 feet. Landscape areas shall be defined by concrete curbs or bands designed to minimize damage to pavement caused by irrigation of landscaping. Landscape areas defining ends of rows shall extend to the minimum inside turn radius, shall not conflict with an aisle or back-up area, nor be less than 4 feet in width. (Exceptions to this provision may be granted by the Community Development Department or the Architectural Review Commission.)

2. Planting Arrangement:

In order to prevent large expanses of pavement, parking lots shall have at least 5 percent of their surface devoted to landscaping (exclusive of setbacks) arranged in an appropriate and effective manner. Additional landscape area may be required by the Community Development Department or the Architectural Review Commission.

3. Maintenance:

In all zones, required street yard areas shall be landscaped and perpetually maintained. All landscape planting shall be maintained and dead plants shall be replaced as necessary. Drought tolerant planting must be used in accordance with the city's landscape standards for water conservation.

REVISIONS	BY	APP	DATE
Drafting edits	JDL	BL	2-14
"City Engr." approval to "PW Dir."	JDL	WAP	2-99
"Handicapped" to "Disabled"	JDL	WAP	2-99
STANDARD CURRENT AS OF: January 2016			



PARKING AND DRIVEWAY STANDARDS

4. Irrigation:

Landscape areas shall have a permanent underground irrigation system.

Irrigation shall provide uniform precipitation for overhead areas and adequate water to maintain healthy plants. Check valves are required at the toe of all slopes to prevent low head drainage. Overspray must be minimized to prevent runoff,

5. Landscape Preservation:

Planting areas which may be hit by automobiles or where drainage control is necessary shall be defined by a 6 inch curb or berm of reinforced concrete, brick, or block. A header-board protected by parking bumpers or other suitable permanent material may be approved by the Community Development Department. Header boards, walls or berms must also be provided between the back of a City sidewalk and a planting area to prevent soil from washing onto the sidewalk. Porous pavement surface methods approved by the City Arborist shall be provided within the drip line of existing trees in or near parking lots.

J. Accessible Parking

All accessible parking spaces shall be constructed and signed in accordance with state and local laws, and shall be located conveniently for use by disabled persons, as approved by the Community Development Department.

K. Driveways and Driveway Ramps

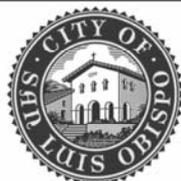
1. Driveway Widths:

Driveways shall be the same width as the curb opening (not including the transitions). They must be within the width limitations noted on Engineering Standard 2120. Exceptions may be granted in special circumstances by the Public Works Director or Community Development Director. Unless authorized by the Public Works Director, property owner, adjacent property owner, and the Community Development Director, the driveway ramp and transition must lie entirely in front of the property served. The Fire Department may require greater driveway widths to allow for proper emergency vehicle access.

2. Number of Driveways Permitted:

Only one driveway is allowed per street frontage for residential property unless the frontage exceeds 70 feet; then a maximum of 30 percent of the frontage may be in driveways. The total width of all driveways to commercial or industrial property shall not exceed 50 percent of the frontage of the property. Additional restrictions may be placed on driveways entering arterial streets in order to minimize the disruption to traffic.

REVISIONS	BY	APP	DATE
Drafting edits	JDL	BL	2-14
"City Engr." approval to "PW Dir."	JDL	WAP	2-99
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STANDARD CURRENT AS OF:		January 2016	



PARKING AND DRIVEWAY STANDARDS

3. Abandoned Driveways:

As a condition of issuance of any driveway permit, all abandoned driveways and driveway ramps on the same property shall be removed, landscaped and the curb, gutter, and sidewalk properly restored.

L. Turnarounds

1. Deep Driveways:

Driveways which are over 100 feet long shall have a turnaround at the end allowing cars to safely exit in a forward direction. In some instances the Community Development Director may require turnarounds for shorter driveways.

2. Single-Family House Driveways:

Single family residential developments generally do not need to conform with this requirement unless there are extreme grade, fire hazard and/or alignment problems determined by the Community Development Director or Fire Marshall.

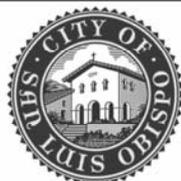
M. Signing

Except for R-1 zoned and R-2 zoned property, entrances and exits that are one-way shall be marked with an approved sign and pavement marking. Accessible, compact car, and loading spaces shall be signed with pavement marking or markings on wheel stops in accordance with state code and local laws. All pavement markings, striping, and signs shall be approved by the Community Development Department.

N. Parking Lot Maintenance

It shall be the duty of the property owner to maintain and repair the parking lot and related improvements in accordance with the above standards and any other conditions imposed at the time of approval. If the Community Development Department finds that the lot is in need of maintenance or repair, to ensure public safety and welfare, the City may pursue enforcement under the authorities of the Municipal Code.

REVISIONS	BY	APP	DATE
Drafting edits	JDL	BL	2-14
"City Engr." approval to "PW Dir."	JDL	WAP	2-99
"Handicapped" to "Disabled"	JDL	WAP	2-99
STANDARD CURRENT AS OF:		January 2016	



**PARKING AND DRIVEWAY
STANDARDS**

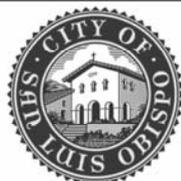
O. Temporary Parking Lots

Parking lots and driveways which will be used for one year or less may be developed with Community Development Director approval. The Director may require a recorded agreement and/or cash surety to guarantee removal of the temporary parking, site restoration, and clean-up and/or repair of City streets. Such temporary facilities need not provide landscaping, striping and wheel stops as would otherwise be required for permanent facilities, but they shall meet all other parking and driveway design standards (parking space and driveway dimensions, aisle widths, and so on).

P. Common-Access Driveways

1. Where permitted: Common access driveways may be permitted in either of the following cases:
 - a. On lots of record (existing before the effective date of this section) if the Community Development Director approves an administrative use permit; or
 - b. In new subdivisions where a common driveway is proposed as part of subdivision approval.
2. Basic criteria: A common-access driveway must meet all of the following criteria:
 - a. The driveway must not be inappropriately located (for example, too close to a dwelling, play area or sloped bank).
 - b. It must be determined that there is no significant potential for conflict between the parties sharing the driveway because of its location, length, grade, usage, or other characteristics.
3. For residential uses: The following provisions apply to common-access driveways to serve premises zoned or used for residential purposes:
 - a. Before granting any permit authorizing construction of a common-access driveway or structures to be served by said driveway, the City shall require an easement and covenant to be filed with the County Recorder setting forth driveway usage rights and responsibilities for each parcel served. At minimum, the required easement or covenant shall include the following statements:
 - 1) All affected property owners will be jointly responsible for the improvement and maintenance of all parts of the common-access driveway.
 - 2) All parking on the commonly used portions of the driveway is prohibited.

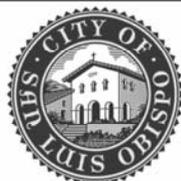
REVISIONS	BY	APP	DATE
Drafting edits	JDL	BL	2-14
"City Engr." approval to "PW Dir."	JDL	WAP	2-99
"Handicapped" to "Disabled"	JDL	WAP	2-99
STANDARD CURRENT AS OF:		January 2016	



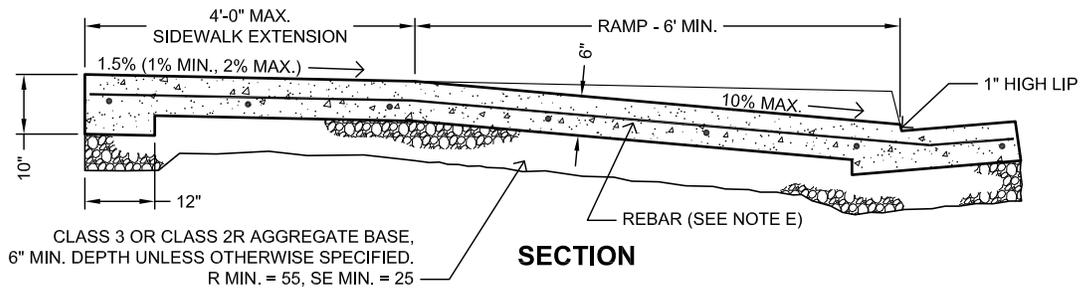
**PARKING AND DRIVEWAY
STANDARDS**

- 3) Any affected property owner may avail himself of the vehicle-removing authority granted private property owners in Section 22658 of the California Vehicle Code when any vehicle is parked in the common-access driveway so as to interfere with entry or access to a parcel it serves.
 - 4) Property owners agree to hold the City harmless from all claims of damages or liability arising from any action to tow away vehicles pursuant to subsection (3) immediately above.
 - 5) If the easement or covenant is abandoned or dissolved, each lot previously served by the common-access driveway shall be provided with standard access as required by these regulations.
- b. The driveway shall serve no more than four residential units unless special circumstances warrant the grant of an exception by the Community Development Director.
 - c. The Director or Planning Commission may add other requirements or conditions deemed necessary or appropriate.
4. For commercial and industrial uses: Before granting any permit authorizing the construction of any common-access driveway to serve premises zoned or used for commercial or industrial purposes, the City may impose the requirements listed above for residential uses as well as any additional requirements or conditions it deems necessary or appropriate.

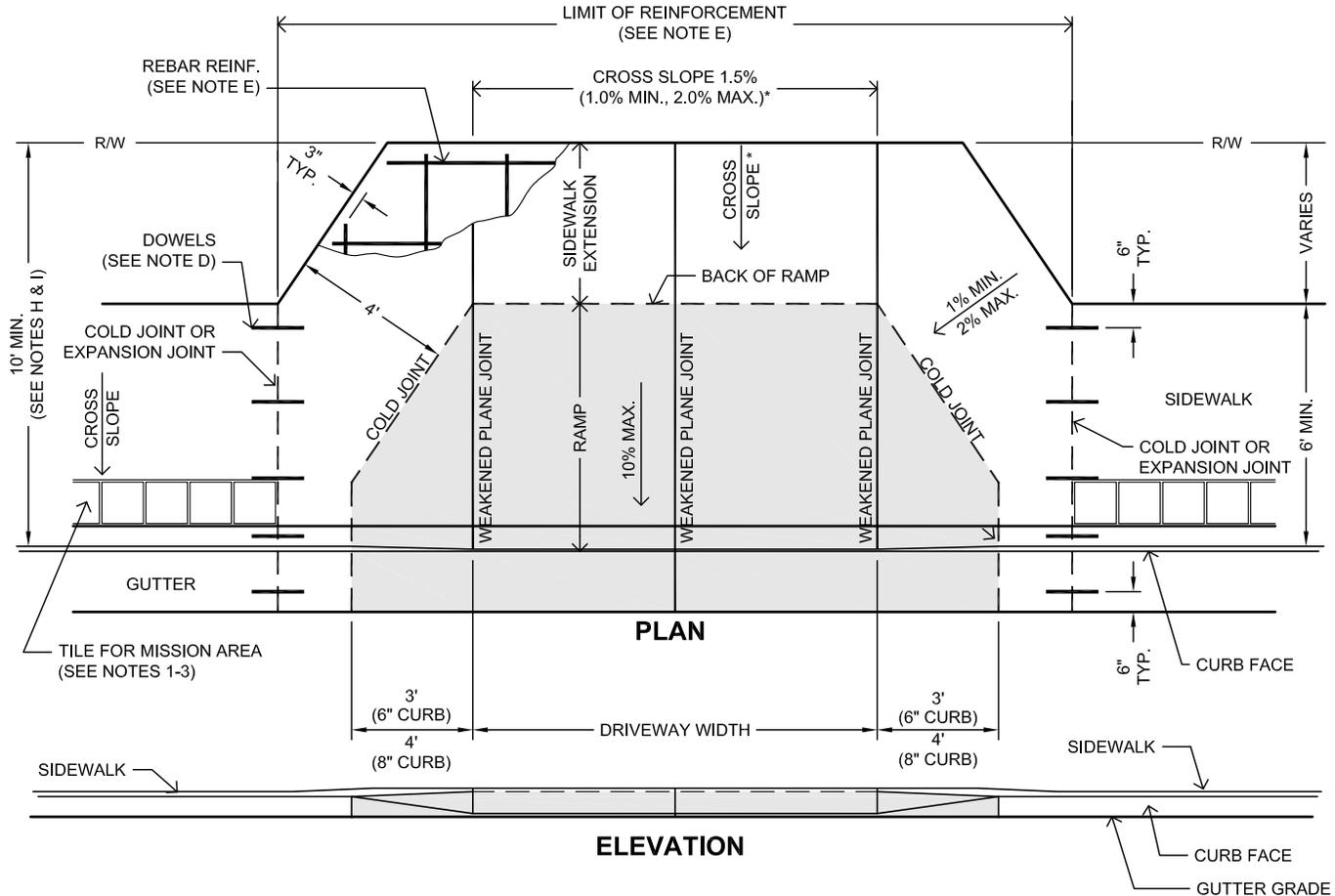
REVISIONS	BY	APP	DATE
Drafting edits	JDL	BL	2-14
"City Engr." approval to "PW Dir."	JDL	WAP	2-99
"Handicapped" to "Disabled"	JDL	WAP	2-99
STANDARD CURRENT AS OF:		January 2016	



PARKING AND DRIVEWAY STANDARDS



SECTION



PLAN

ELEVATION

GENERAL NOTES:

- A. A depression in a new curb and gutter for a driveway will not be permitted unless the ramp and sidewalk extension are constructed also.
- B. Slope of ramp is a straight grade from the top of the back of ramp to the top of the lip at the gutter.
- C. Concrete shall be Class 3.
- D. Dowels at expansion or cold joint with new construction shall be 1/2" smooth bars, 15" long at 24" O.C., one end shall be sleeved or greased.
- E. All ramps and sidewalk shall be reinforced with rebar, #4 @ 24" O.C., continuous both ways. Rebar shall run continuous through cold or expansion joints.
- F. Commercial and industrial driveways ramps serving more than six (6) parking spaces shall be 10' deep (long) unless otherwise approved by the City Engineer.
- G. See Engineering Standard 4110 for notes regarding required pavement removal and repair.
- H. If design will not fit within right-of-way, use Engineering Standard 2111, with approval of City Engineer.
- I. If right-of-way is more than 10' from curb face, back of sidewalk extension shall not extend beyond 10' from curb face.

ADD'L NOTES FOR MISSION STYLE AREA*:

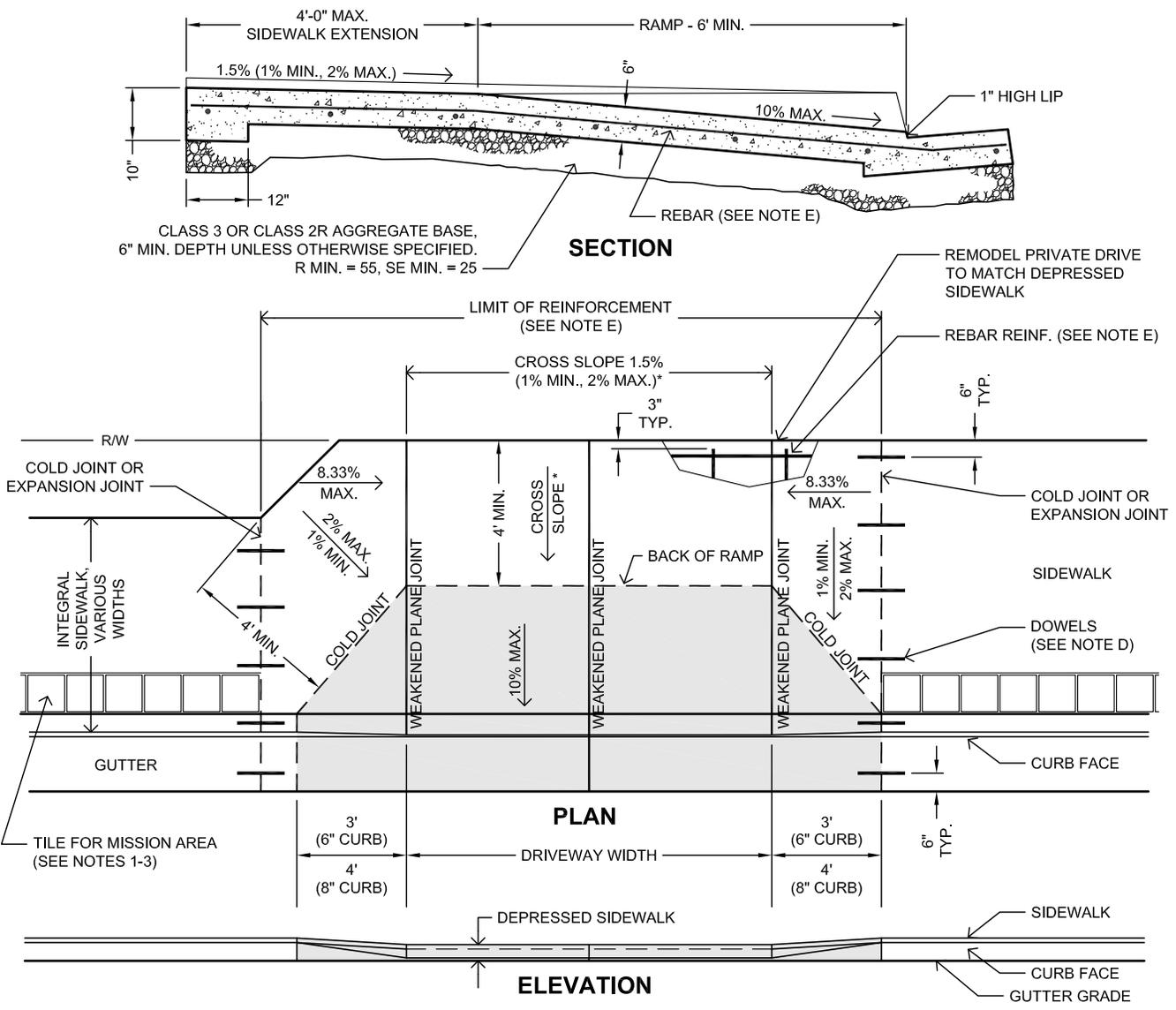
- 1. Comply with Section 73-4 of Standard Specification colored concrete.
- 2. No tile shall be set in mortar prior to approval of tile by City Engineer.
- 3. Tile band shall terminate as shown on either side of driveway.

* Additional notes for Mission Style shall apply in those areas designated as Mission Style Sidewalk area per City Council Resolution.

REVISIONS	BY	APP	DATE
Notes revised	SR	BL	1-14
Drafting edits	JDL	MH	10-12
Revise Cross Slope percentages	JDL	MH	2-13
STANDARD CURRENT AS OF:		January 2016	



**DRIVEWAY RAMP
STANDARD**



GENERAL NOTES:

- A. A depression in a new curb and gutter for a driveway will not be permitted unless the ramp and sidewalk extension are constructed also.
- B. Slope of ramp is a straight grade from the top of the back of ramp to the top of the lip at the gutter.
- C. Concrete shall be Class 3.
- D. Dowels at expansion or cold joint with new construction shall be 1/2" smooth bars, 15" long at 24" O.C., one end shall be sleeved or greased.
- E. All ramps and sidewalk shall be reinforced with rebar, #4 @ 24" O.C., continuous both ways. Rebar shall run continuous through cold or expansion joints.
- F. Commercial and industrial driveways ramps serving more than six (6) parking spaces shall be 10' deep (long) unless otherwise approved by the City Engineer.
- G. See Engineering Standard 4110 for notes regarding required pavement removal and repair.
- H. This design must be approved for use by Engineer.

ADD'L NOTES FOR MISSION STYLE AREA*:

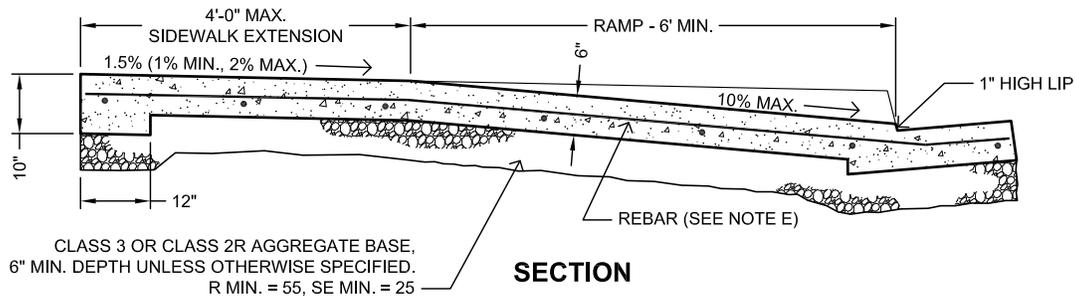
- 1. Comply with Section 73-4 of Standard Specification colored concrete.
- 2. No tile shall be set in mortar prior to approval of tile by City Engineer.
- 3. Tile band shall terminate as shown on either side of driveway.

* Additional notes for Mission Style shall apply in those areas designated as Mission Style Sidewalk area per City Council Resolution.

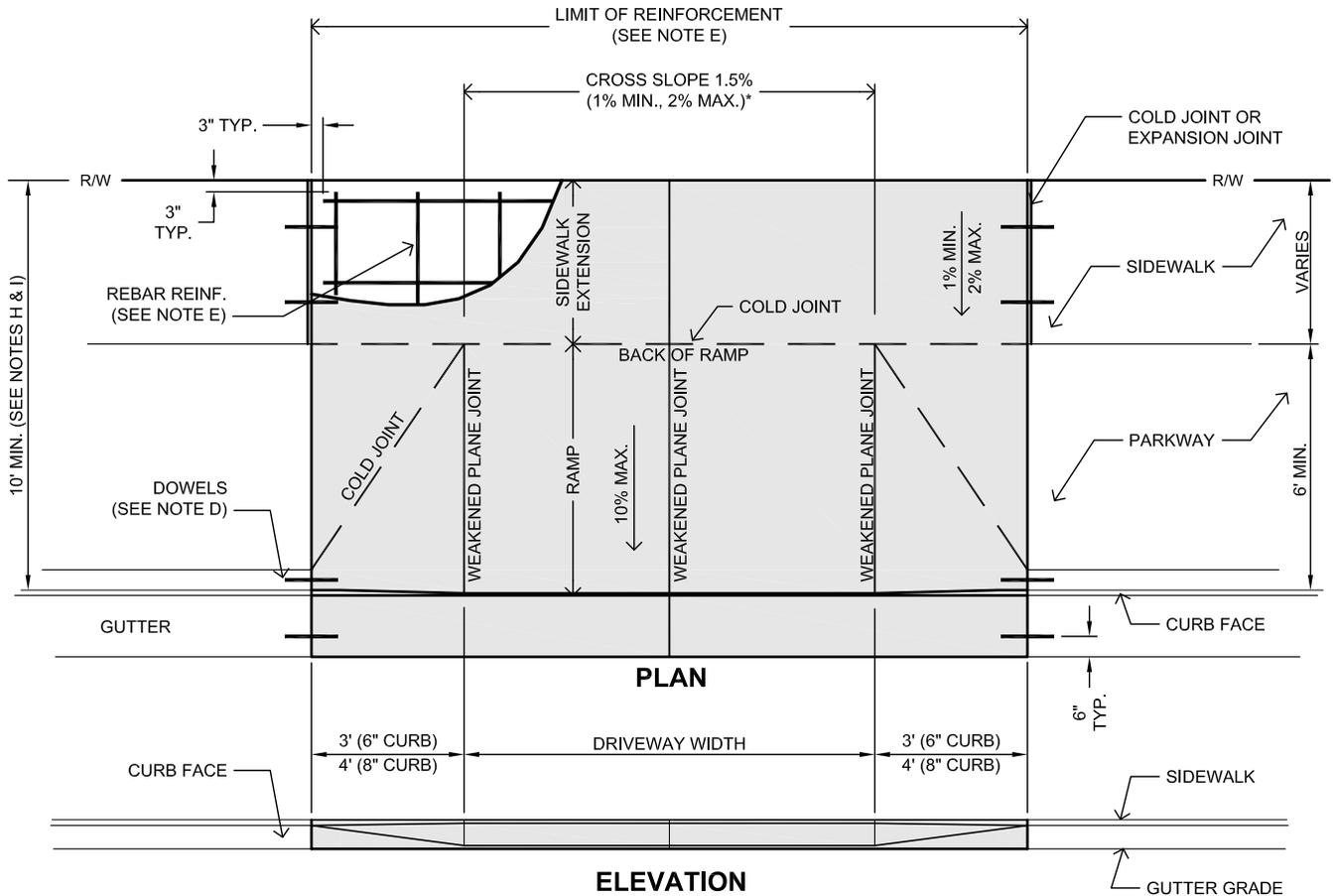
REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	10-12
Update Cross Slope percentages	JDL	MH	2-13
Notes revised	SR	BL	1-14
STANDARD CURRENT AS OF:		January 2016	



**DRIVEWAY RAMP
RIGHT-OF-WAYS
LESS THAN 10'**



SECTION



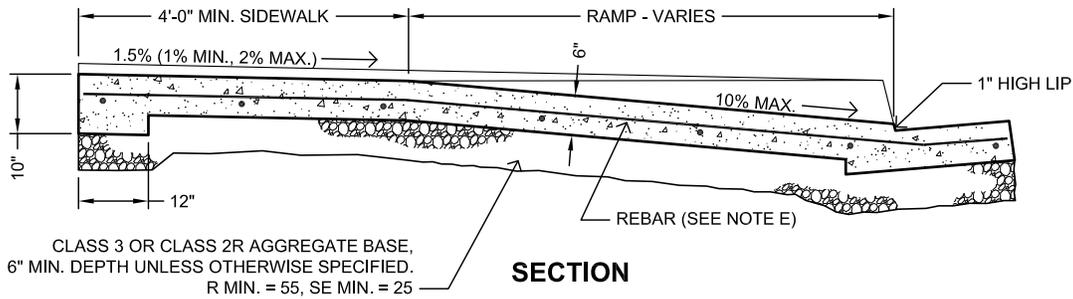
GENERAL NOTES:

- A. A depression in a new curb and gutter for a driveway will not be permitted unless the ramp and sidewalk extension are constructed also.
- B. Slope of ramp is a straight grade from the top of the back of ramp to the top of the lip at the gutter.
- C. Concrete shall be Class 3; and comply with Section 90 of the Standard Specification.
- D. Dowels at expansion or cold joint with new construction shall be 1/2" smooth bars, 15" long at 24" O.C., one end shall be sleeved or greased.
- E. All ramps and sidewalk shall be reinforced with rebar, #4 @ 24" O.C., continuous both ways. Rebar shall run continuous through cold or expansion joints.
- F. Commercial and industrial driveways ramps serving more than six (6) parking spaces shall be 10' deep (long) unless otherwise approved by the City Engineer.
- G. See Engineering Standard 4110 for notes regarding required pavement removal and repair.
- H. If design will not fit within right-of-way, use Engineering Standard 2116, if applicable, with approval of City Engineer.
- I. If right-of-way is more than 10' from curb face, back of sidewalk extension shall not extend beyond 10' from curb face.

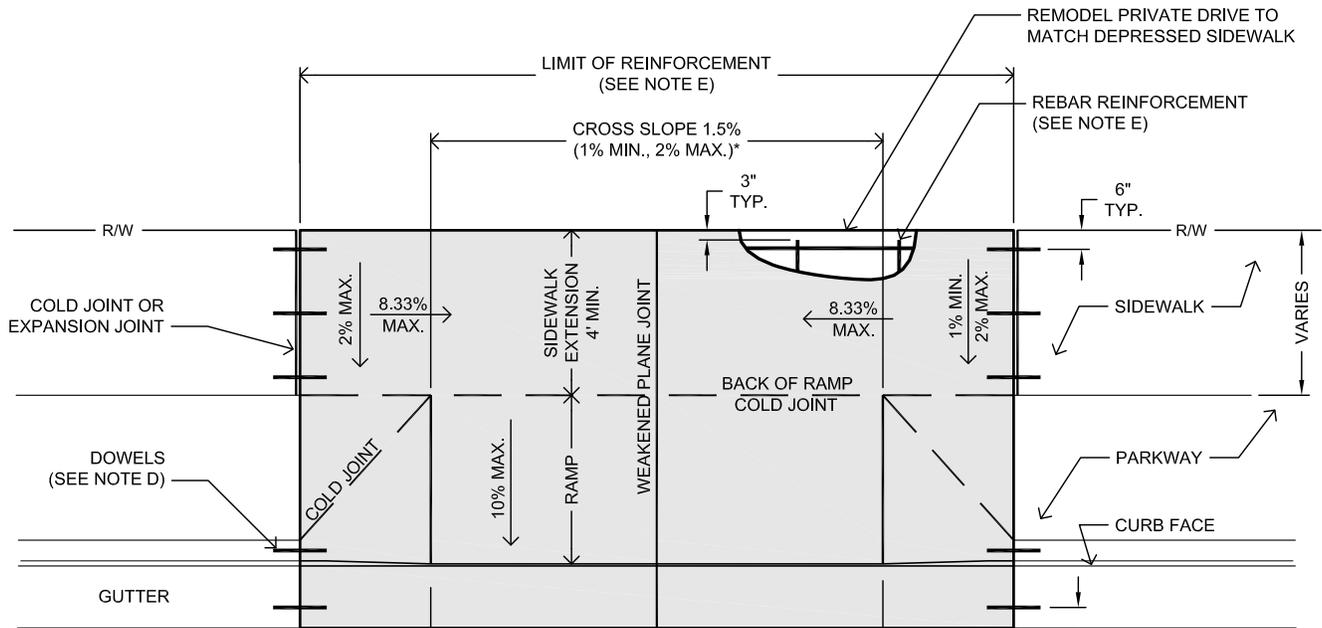
REVISIONS	BY	APP	DATE
New Standard	JDL	JDW	1-03
Update Cross Slope percentages	JDL	MH	2-13
Revised Note C	SR	MH	1-14
STANDARD CURRENT AS OF:		January 2016	



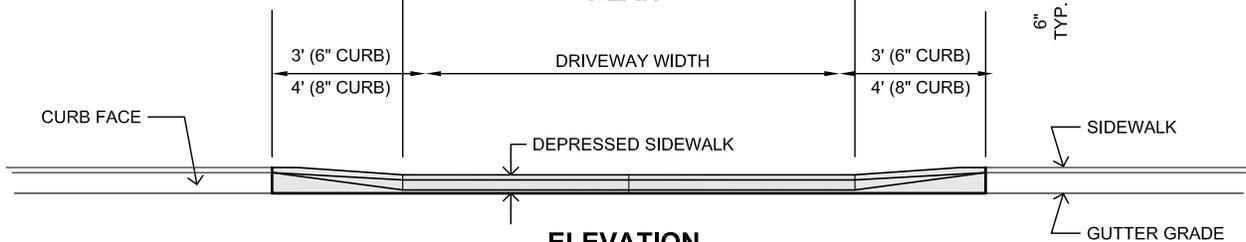
**DRIVEWAY RAMP
DETACHED SIDEWALK
STANDARD**



SECTION



PLAN



ELEVATION

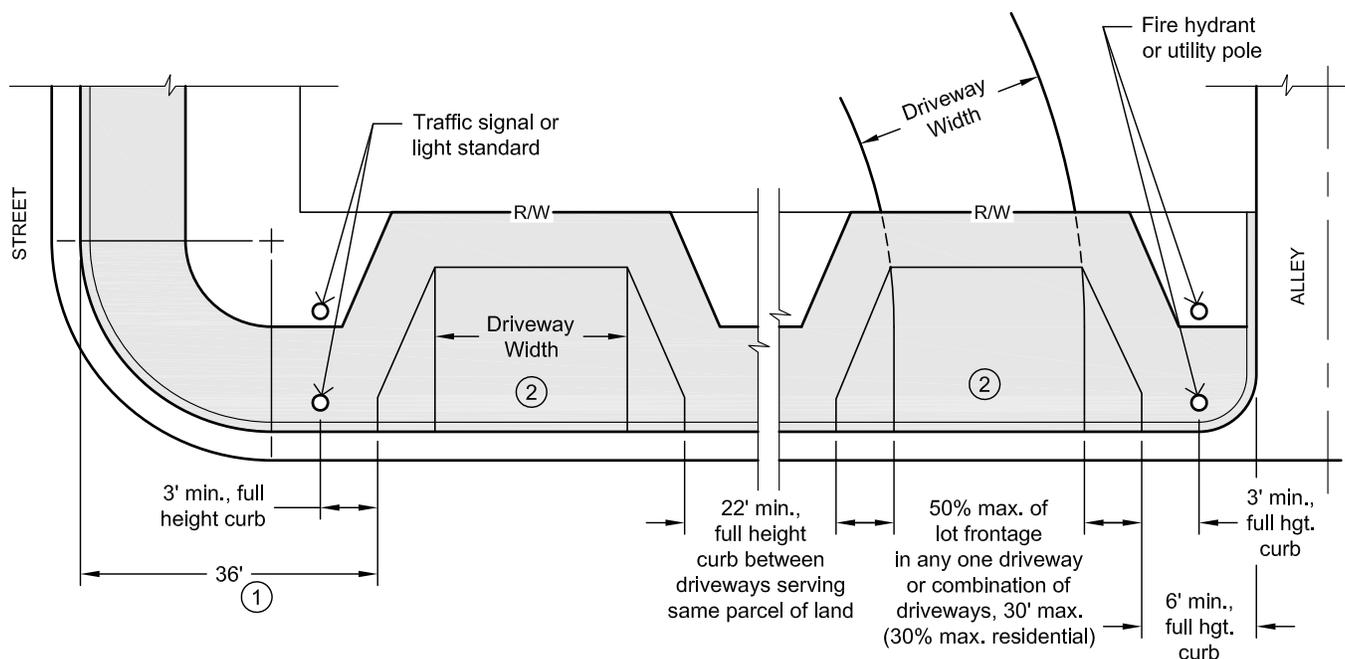
GENERAL NOTES:

- A. A depression in a new curb and gutter for a driveway will not be permitted unless the ramp and sidewalk extension are constructed also.
- B. Slope of ramp is a straight grade from the top of the back of ramp to the top of the lip at the gutter.
- C. Concrete shall be Class 3; and comply with Section 90 of the Standard Specifications.
- D. Dowels at expansion or cold joint with new construction shall be 1/2" smooth bars, 15" long at 24" O.C., one end shall be sleeved or greased.
- E. All ramps and sidewalk shall be reinforced with rebar, #4 @ 24" O.C., continuous both ways. Rebar shall run continuous through cold or expansion joints.
- F. Commercial and industrial driveways ramps serving more than six (6) parking spaces shall be 10' deep (long) unless otherwise approved by the City Engineer.
- G. See Engineering Standard 4110 for notes regarding required pavement removal and repair.
- H. This design must be approved for use by City Engineer.

REVISIONS	BY	APP	DATE
New Standard	JDL	JDW	1-03
Update Cross Slope percentages	JDL	MH	2-13
Revised Note C	SR	MH	1-14
STANDARD CURRENT AS OF:		January 2016	



**DRIVEWAY RAMP
DETACHED SIDEWALK
ROWS LESS THAN 10'**



NOTES:

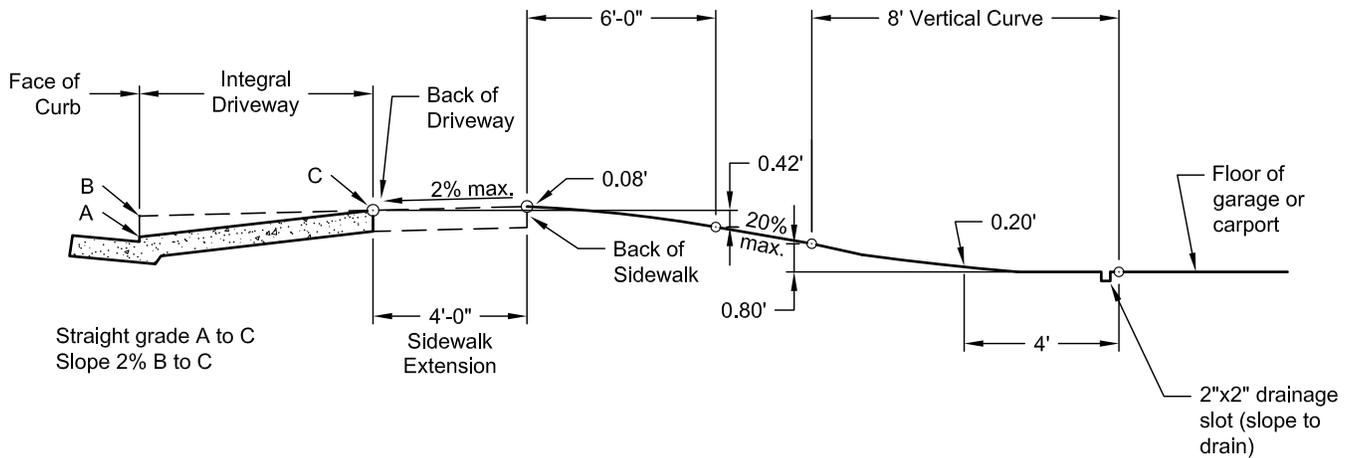
- ① Setback from corner may be shortened with approval of the City Engineer. Minimum distance: Curb return radius + 5'
- ② Construct per Driveway Ramp Standards.

APPLICATION	MIN. WIDTH	MAX. WIDTH
Lots with six (6) or fewer spaces serving residential uses, existing structures converted to office use, and newly constructed offices.	10'	16'
Lots with six (6) or fewer spaces serving commercial and industrial uses and where any building to be served is more than 148' from the street right-of-way.	12'	16'
Lots with more than six (6) spaces but fewer than twenty (20) spaces and with separate entrances and exits (one-way driveways).	12'	30'
Lots with more than six (6) spaces but fewer than twenty (20) spaces and with only one point of entrance and exit (two-way driveways) and lots with twenty (20) or more spaces serving office and residential uses.	16'	30'
Lots with twenty (20) or more spaces serving commercial and industrial uses.	20'	30'
Lots where any type of use requires fire truck access by driveway.	20'	30'

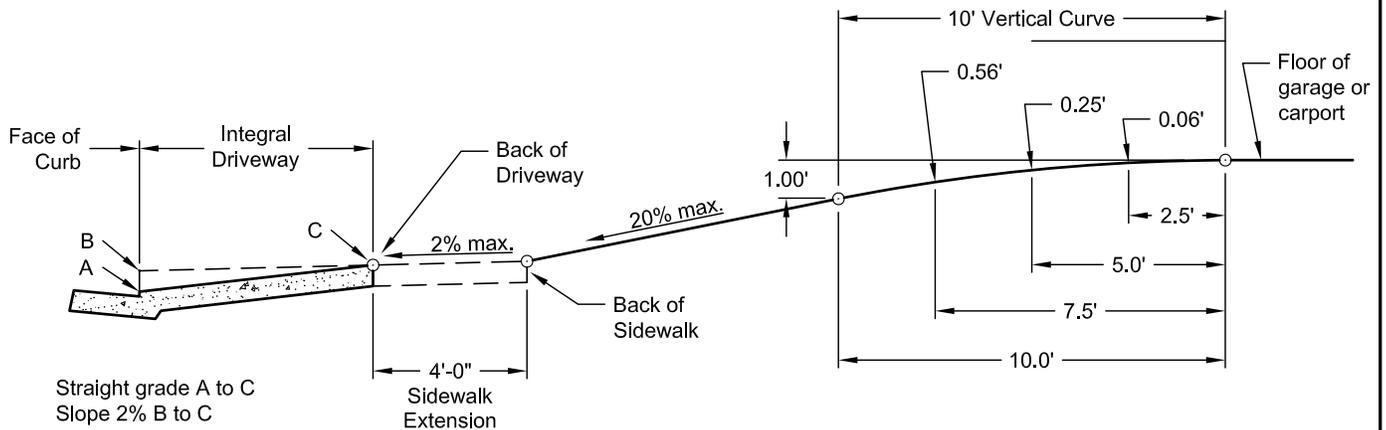
REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	10-12
Revise Note 2	RMH	WAP	1-95
Revise sidewalk location	DVB	BL	10-06
STANDARD CURRENT AS OF:		January 2016	



**DRIVEWAY RAMP
SIZE & LOCATION**



DOWNWARD DRIVEWAY

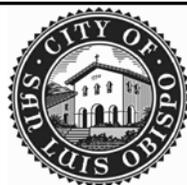


UPWARD DRIVEWAY

GENERAL NOTES:

- A. Twenty percent (20%) maximum slope for residential uses. Ten percent (10%) maximum slope for commercial and industrial uses. Five percent (5%) deviation allowed with special construction techniques if approved by the City Engineer. Where Fire Department access is required, the maximum slope shall not exceed fifteen percent (15%).
- B. Maximum rise and descent, and the run, shall be measured for the WORST condition between the back of the sidewalk extension and the finished floor at the garage or carport entrance.
- C. Sidewalk extension cross-slope may not exceed two percent (2%) and must slope toward the street.

REVISIONS	BY	APP	DATE
<i>New Border</i>	JDL	WAP	9-97
<i>Sidewalk Extension</i>	RMH	WAP	7-95
<i>Drafting edits</i>	JDL	MH	10-12
STANDARD CURRENT AS OF:		January 2016	



STANDARD DRIVEWAY UPWARD & DOWNWARD

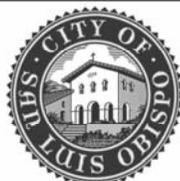
MAXIMUM RISE & DESCENT PERMITTED ON STANDARD DRIVEWAYS

UPWARD DRIVEWAY MAXIMUM RISE				DOWNWARD DRIVEWAY MAXIMUM DESCENT			
Maximum		Maximum		Maximum		Maximum	
Run	Rise	Run	Rise	Run	Descent	Run	Descent
10'	1.0'	39'	6.8'	6'	0.4'	35'	5.4'
11'	1.2'	40'	7.0'	7'	0.5'	36'	5.6'
12'	1.4'	41'	7.2'	8'	0.6'	37'	5.8'
13'	1.6'	42'	7.4'	9'	0.7'	38'	6.0'
14'	1.8'	43'	7.6'	10'	0.8'	39'	6.2'
15'	2.0'	44'	7.8'	11'	0.9'	40'	6.4'
16'	2.2'	45'	8.0'	12'	1.0'	41'	6.6'
17'	2.4'	46'	8.2'	13'	1.2'	42'	6.8'
18'	2.6'	47'	8.4'	14'	1.3'	43'	7.0'
19'	2.8'	48'	8.6'	15'	1.4'	44'	7.2'
20'	3.0'	49'	8.8'	16'	1.6'	45'	7.4'
21'	3.2'	50'	9.0'	17'	1.8'	46'	7.6'
22'	3.4'	51'	9.2'	18'	2.0'	47'	7.8'
23'	3.6'	52'	9.4'	19'	2.2'	48'	8.0'
24'	3.8'	53'	9.6'	20'	2.4'	49'	8.2'
25'	4.0'	54'	9.8'	21'	2.6'	50'	8.4'
26'	4.2'	55'	10.0'	22'	2.8'	51'	8.6'
27'	4.4'	56'	10.2'	23'	3.0'	52'	8.8'
28'	4.6'	57'	10.4'	24'	3.2'	53'	9.0'
29'	4.8'	58'	10.6'	25'	3.4'	54'	9.2'
30'	5.0'	59'	10.8'	26'	3.6'	55'	9.4'
31'	5.2'	60'	11.0'	27'	3.8'	56'	9.6'
32'	5.4'	61'	11.2'	28'	4.0'	57'	9.8'
33'	5.6'	62'	11.4'	29'	4.2'	58'	10.0'
34'	5.8'	63'	11.6'	30'	4.4'	59'	10.2'
35'	6.0'	64'	11.8'	31'	4.6'	60'	10.4'
36'	6.2'	65'	12.0'	32'	4.8'	65'	11.4'
37'	6.4'	70'	13.0'	33'	5.0'	70'	12.4'
38'	6.6'	80'	15.0'	34'	5.2'	80'	14.4'

GENERAL NOTES:

- A. All values shown in feet unless otherwise noted.
- B. Maximum rise and descent and run shall be measured for the WORST condition between the back of the sidewalk extension and the finished floor grade at the garage entrance.

REVISIONS	BY	APP	DATE
Revise General Notes	DVB	BL	11-06
New border	BL	MH	1-14
STANDARD CURRENT AS OF: January 2016			



**UPWARD & DOWNWARD
DRIVEWAYS**
MAXIMUM RISE & DESCENT
(RESIDENTIAL)

PAVEMENT THICKNESS (in) (Asphalt concrete with no base)				SUBGRADE QUALITY
6"	5"	4"	4"	GOOD TO EXCELLENT Unaffected by moisture or retains a substantial amount of support capacity when wet. Included are well or poorly-graded gravels or sand gravels, silty gravels, and well-graded sands. Minimum Sand Equivalent = 30
7"	5 1/2"	4 1/2"	4"	FAIR TO GOOD Retains a moderate degree of firmness under adverse moisture conditions. Included are poorly-graded sands or gravelly sands with little or no fines, and silty sands. Minimum Sand Equivalent = 25
8"	6"	5"	4"	POOR TO FAIR Some softness and plasticity appears when wet. Included are clayey sands, inorganic silts, very fine sands, inorganic clays of low, medium or high plasticity, and gravelly to silty clays.
9"	8"	6"	4 1/2"	POOR Becomes extremely soft and plastic when wet. Included are organic silts or silt-clays of low plasticity, inorganic silts, and organic clays of medium to high plasticity.

TRAFFIC TYPE	
	LIGHT PARKING General parking areas for autos and light trucks.
	MEDIUM PARKING Access roads and drives, store frontage traffic and service stations. Shopping center roads serving only autos and light trucks.
	HEAVY PARKING Warehouse approaches, warehouse parking areas, ramps, all heavy-duty truck loadings, or parking areas. Up to 20 heavy truck and trailer units per day. (To be used in areas where garbage trucks will park to load dumpsters.) Shopping center roads serving truck access to loading areas.
	EXTRA HEAVY PARKING Heavy industrial types of pavement loadings. Areas for use by 20-400 heavy truck and trailer units per day.

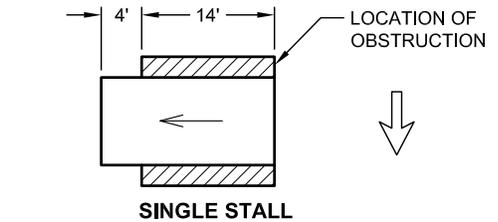
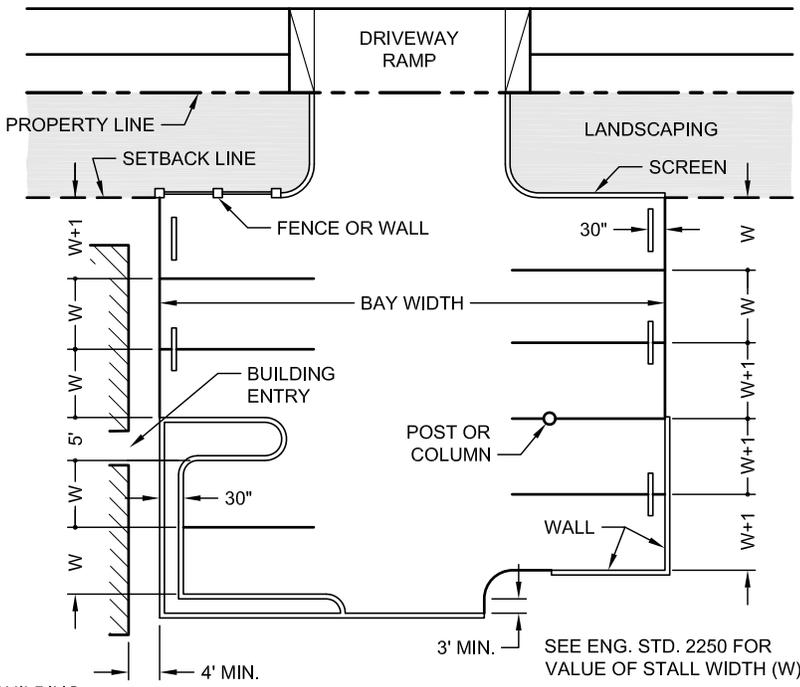
NOTE:
 Each 1" of asphalt may be substituted with 2" of Class 2 base. 2" minimum AC.

REF: Pamphlet No. PCD-3, distributed by
 THE ASPHALT INSTITUTE

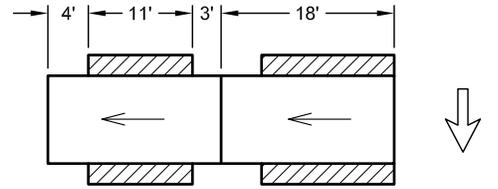
REVISIONS	BY	APP	DATE
New border	JDL	WAP	1-98
Change Class "III" to "2"	JDL	JDW	9-02
Drafting edits	JDL	MH	10-12
STANDARD CURRENT AS OF:		January 2016	



PAVEMENT DESIGN



SINGLE STALL

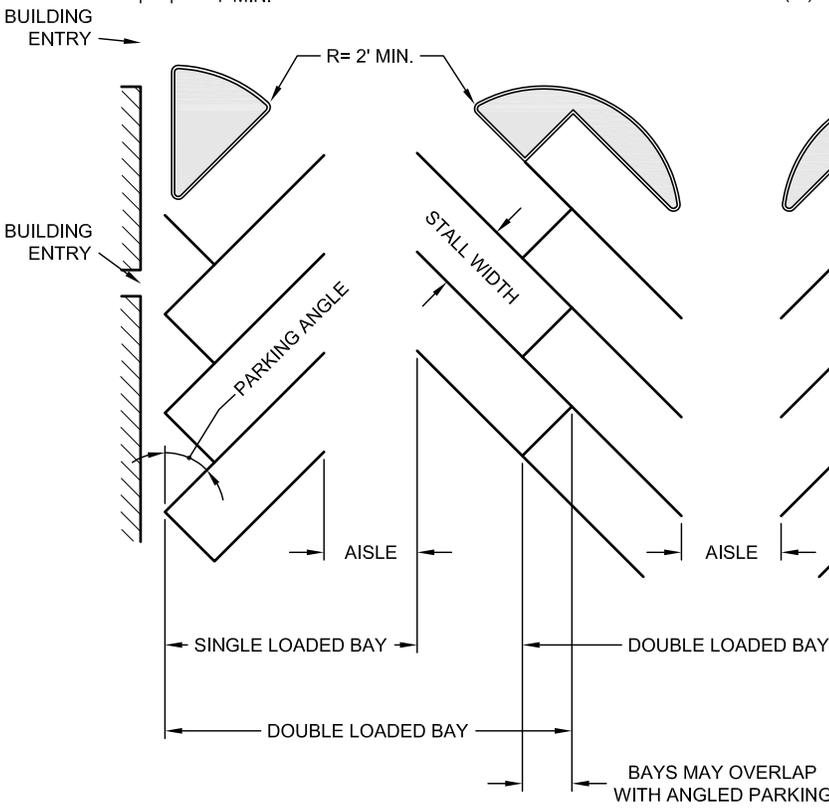


TANDEM STALLS

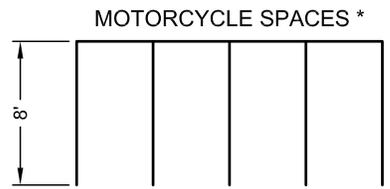
(WITH APPROVAL OF COMMUNITY DEVELOPMENT DIRECTOR AND AS ALLOWED IN E-3 OF ENG. STD. 2010.)

INCREASE STALL WIDTH BY:
 12" IF ON ONE SIDE
 24" IF ON BOTH SIDES

OBSTRUCTIONS



WHEELSTOPS SHALL BE LOCATED ON SIDE OF STALL CLOSEST TO BAY WIDTH LIMIT LINE, AS SHOWN.



MOTORCYCLE SPACES *

* SET ON 3/2" PCC AND CLASS 3 BASE

GENERAL NOTES:

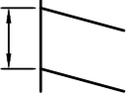
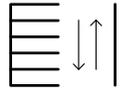
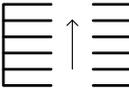
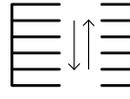
- A. Curbing may be substituted for wheel stops.
- B. Handicap spaces shall meet State of California requirements.
- C. See Engineering Standards 2230 and 2240 for bay widths.

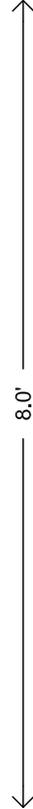
REVISIONS	BY	APP	DATE
New border	JDL	WAP	1-98
Tandem Stall reference correction	JDL	MH	10-12
Drafting edits	JDL	MH	10-12
STANDARD CURRENT AS OF:		January 2016	



OFF-STREET PARKING STANDARDS

COMPACT CARS

PARKING ANGLE	WIDTH AT CURB	SINGLE LOADED AISLES		DOUBLE LOADED AISLES	
		ONE-WAY TRAFFIC	TWO-WAY TRAFFIC	ONE-WAY TRAFFIC	TWO-WAY TRAFFIC
					
BAY WIDTH * (feet)					
30°	16.01	26.0	34.0	40.0	48.2
32.5°	14.90	26.5	34.4	40.9	49.1
35°	13.95	26.8	34.7	41.8	49.8
37.5°	13.15	27.3	35.2	42.6	50.5
40°	12.45	27.6	35.5	43.2	50.9
42.5°	11.85	27.8	35.8	43.6	51.5
45°	11.32	28.2	36.3	44.3	52.1
47.5°	10.85	29.0	36.5	45.4	52.6
50°	10.45	29.8	36.8	46.4	52.9
52.5°	10.09	30.5	37.2	47.2	53.3
55°	9.77	31.3	37.3	48.0	53.6
57.5°	9.49	31.9	37.7	48.6	53.8
60°	9.24	32.7	37.9	49.3	54.1
62.5°	9.02	33.3	38.2	50.0	54.3
65°	8.83	33.9	38.4	50.8	54.5
67.5°	8.66	34.6	38.8	51.3	54.7
70°	8.52	35.2	38.9	51.8	54.8
72.5°	8.39	35.8	39.2	52.3	54.8
75°	8.28	36.5	39.3	52.8	54.9
77.5°	8.20	37.2	39.6	53.3	55.1
80°	8.12	37.8	39.8	53.9	55.2
82.5°	8.07	38.3	39.9	54.3	55.3
85°	8.03	39.0	40.1	54.7	55.3
87.5°	8.01	39.7	40.2	55.0	55.3
90°	8.00	40.3	40.3	55.3	55.3



Use of Compact Spaces requires approval of an exception by the Community Development Director or the Architectural Review commission. Compact spaces are allowed only if justified by unusual circumstances such as saving a tree or using otherwise unusable space.

Bay widths are based on 16' stall lengths. A maximum of 40% of the stalls in a parking lot may be compact. (In residential apartment projects involving ten or more units, 50% of spaces may be compact.)

Compact parking spaces shall be clustered.

* See Engineering Standard 2220 for clarification of "BAY WIDTH"

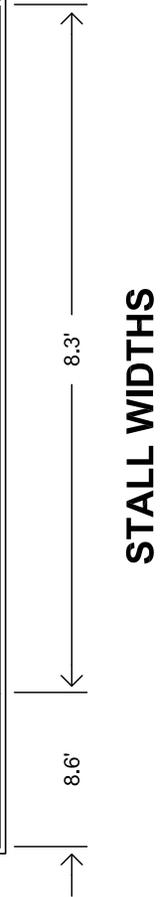
REVISIONS	BY	APP	DATE
Rearrange	RMH	WAP	1-95
New border	JDL	WAP	1-98
Drafting Edits	JDL	MH	10-12
STANDARD CURRENT AS OF:		January 2016	



PARKING BAY DIMENSIONS COMPACT CAR

AVERAGE CARS

PARKING ANGLE	WIDTH AT CURB	SINGLE LOADED AISLES		DOUBLE LOADED AISLES	
		ONE-WAY TRAFFIC	TWO-WAY TRAFFIC	ONE-WAY TRAFFIC	TWO-WAY TRAFFIC
BAY WIDTH * (feet)					
30°	16.61	26.9	34.9	41.9	50.0
32.5°	15.45	27.5	35.4	42.9	51.0
35°	14.48	27.9	35.8	43.9	51.9
37.5°	13.64	28.4	36.3	44.8	52.7
40°	12.92	28.7	36.7	45.5	53.3
42.5°	12.29	29.4	37.1	46.4	53.9
45°	11.74	30.2	37.6	47.6	54.6
47.5°	11.26	31.1	38.0	48.8	55.2
50°	10.84	32.0	38.3	49.9	55.8
52.5°	10.47	32.7	38.7	50.9	56.3
55°	10.14	33.6	39.0	51.7	56.7
57.5°	9.84	34.3	39.4	52.4	57.1
60°	9.59	35.1	39.7	53.3	57.5
62.5°	9.36	35.8	40.1	54.1	57.8
65°	9.16	36.5	40.4	54.9	58.2
67.5°	8.99	37.2	40.8	55.5	58.5
70°	8.83	37.9	41.1	56.1	58.8
72.5°	8.70	38.5	41.4	56.7	59.0
75°	8.59	39.2	41.7	57.3	59.2
77.5°	8.50	40.0	42.0	57.9	59.5
80°	8.43	40.6	42.3	58.5	59.7
82.5°	8.67	41.3	42.6	58.9	59.8
85°	8.63	42.0	42.9	59.4	59.9
87.5°	8.61	42.6	43.1	59.7	60.0
90°	8.60	43.3	43.3	60.1	60.1



Bay widths are based on 18.4' stall lengths. Stall widths as noted.

Alternate stall widths may only be used for 82.5° - 90° parking angles and must have special approval of the Community Development Director.

9'-0" width - Subtract 2 feet from bay width

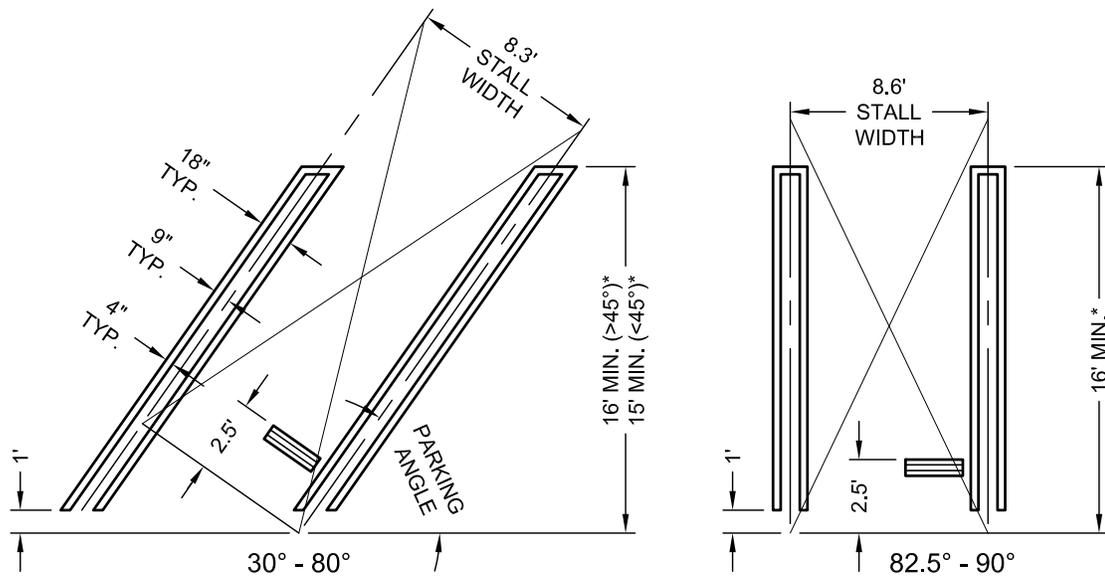
9'-6" width - Subtract 4 feet from bay width

* See Engineering Standard 2220 for clarification of "BAY WIDTH"

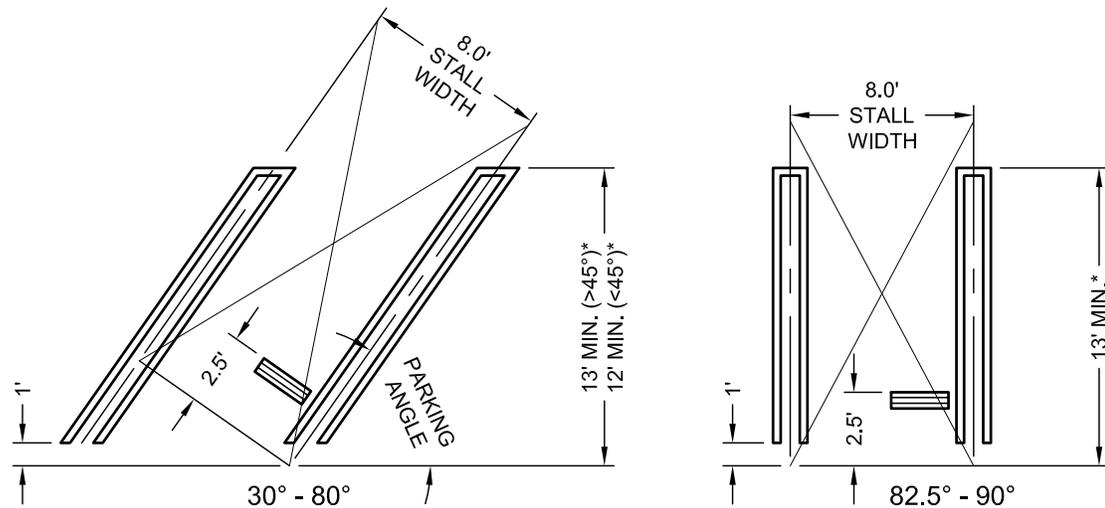
REVISIONS	BY	APP	DATE
Rearrange	RMH	WAP	1-95
New border	JDL	WAP	1-98
Drafting edits	JDL	MH	10-12
STANDARD CURRENT AS OF:		January 2016	



PARKING BAY DIMENSIONS AVERAGE CARS



STRIPING FOR AVERAGE PARKING STALLS



STRIPING FOR COMPACT PARKING STALLS

GENERAL NOTES:

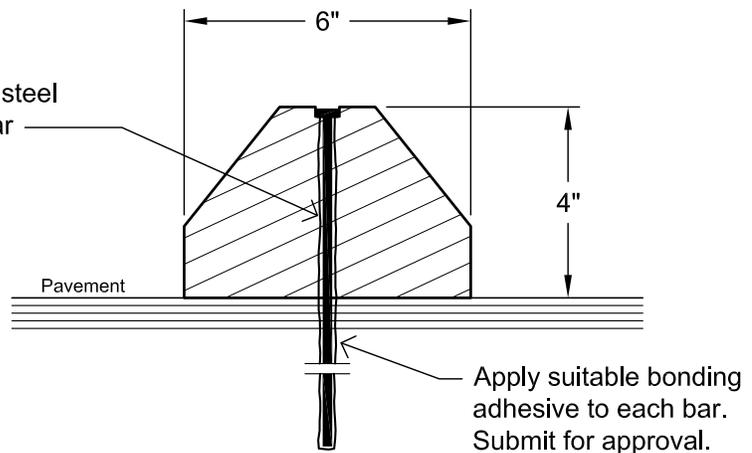
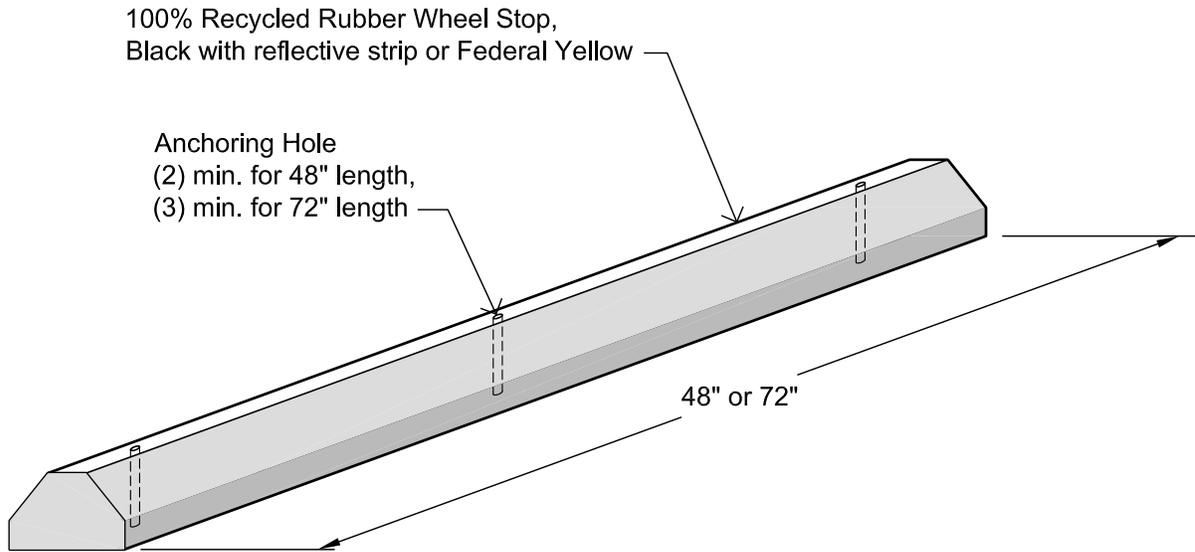
- A. Each compact space must be labeled as such on the pavement or wheelstop.
- B. Single-line marking is approved alternate.
- C. Wheelstop shall be located as shown, if required.

* THESE DIMENSIONS ARE TO BE USED ONLY FOR STRIPING AND NOT FOR PARKING LOT LAYOUT.

REVISIONS	BY	APP	DATE
General Note B	MH	BL	2-14
Drafting edits	JDL	MH	10-12
Modified Stall Width	MH	BL	10-09
STANDARD CURRENT AS OF:		January 2016	



PARKING LOT STRIPING

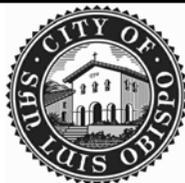


SECTION VIEW

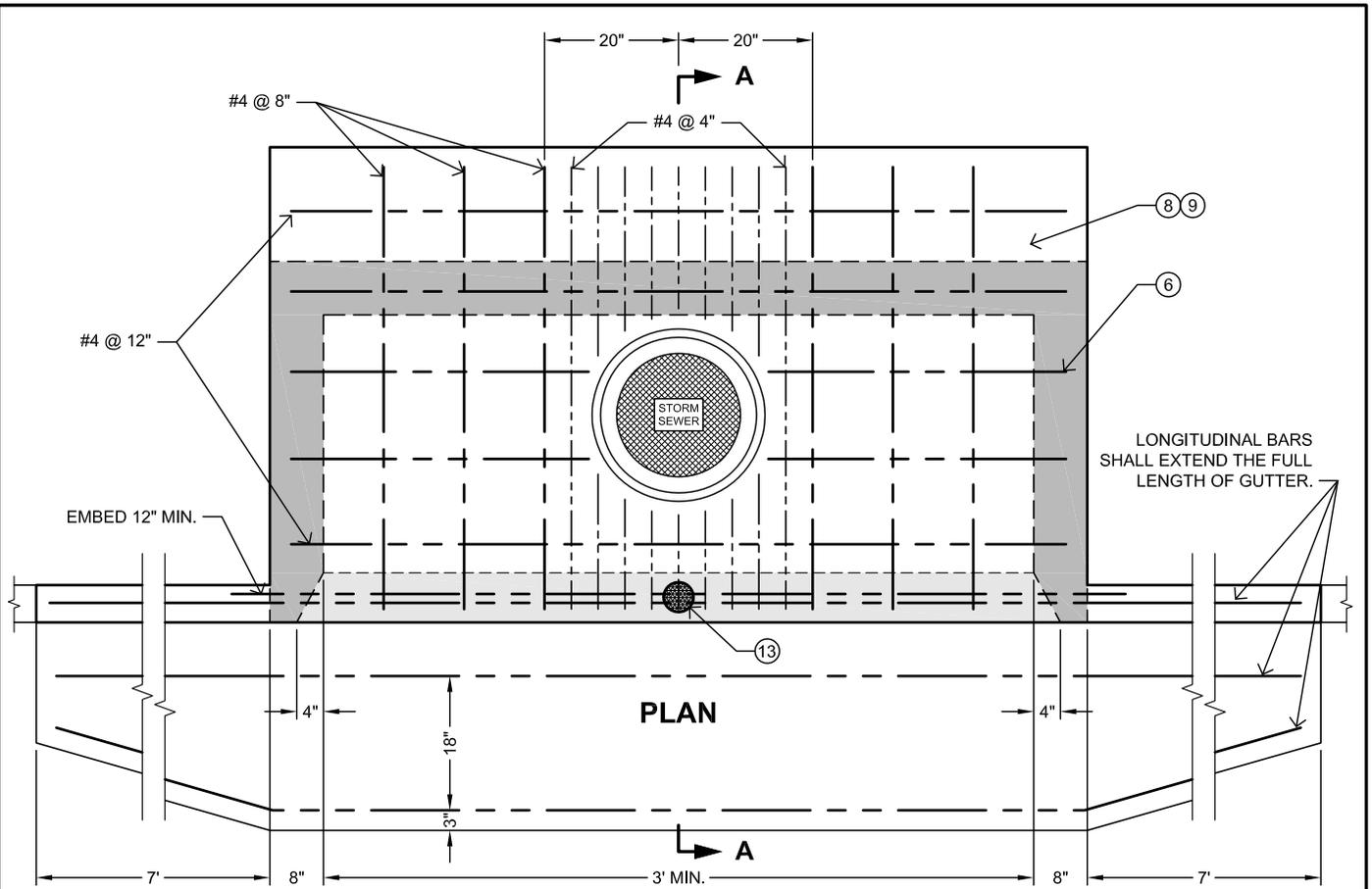
GENERAL NOTES:

- A. Wheel stop shall be installed at location where wheeled vehicles may roll into pedestrian, structures, or hazardous area. Wheel stop location shall not create a barrier for pedestrians.
- B. Wheel stop shall be securely attached onto at-grade concrete and at-grade asphalt pavement with #4 deformed steel reinforcing bars embedded in holes cast into wheel stops. At concrete pavement, drill holes in pavement for dowels. At parking structure slabs, epoxy to slab.

REVISIONS	BY	APP	DATE
<i>New Standard</i>	<i>JDL</i>	<i>BL</i>	<i>4-13</i>
<i>Revision Note A</i>	<i>SR</i>	<i>BL</i>	<i>1-14</i>
STANDARD CURRENT AS OF:		January 2016	



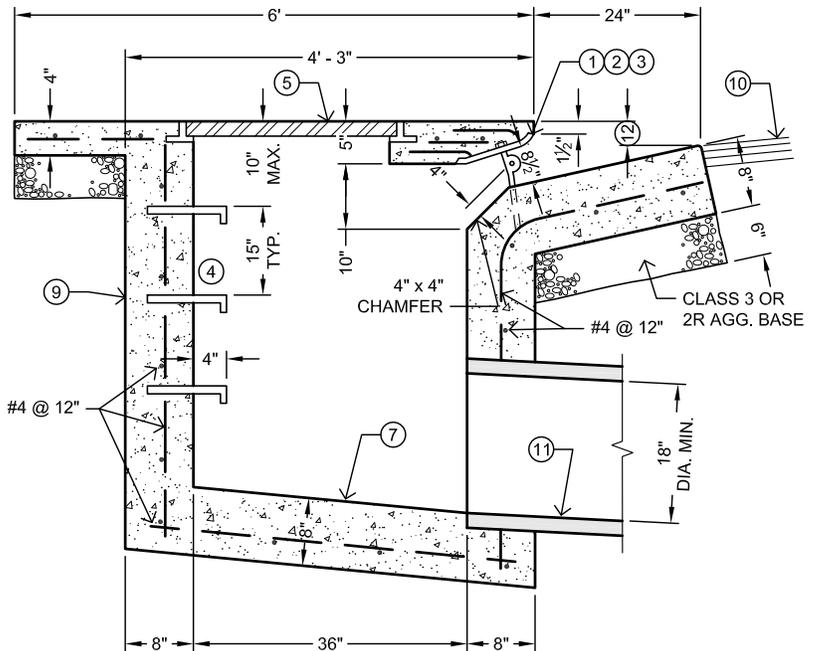
WHEEL STOP



INSTALLATION NOTES:

Items 1 through 3 shall be galvanized Alhambra, South Bay Foundry or equal.

- ① Formed steel face plate: A-3911, with factory installed anchors. Face plate shall be 6" longer on each side of the opening at the face of the curb.
- ② Protection bar: A-1565; bar and anchors, A-1577
- ③ Protection bar support bolt(s): A-1574, spaced 20⁷/₈" apart.
- ④ Steps are required when depth exceeds 4' and shall be steel reinforced polypropylene, M-A Industries PS2-PFS or equal.
- ⑤ Manhole frame and cover, South Bay Foundry 1530, Alhambra A-1530 or approved equal, placed adjacent to the back wall in the center of the basin. Where the horizontal dimension of the basin equals or exceeds 8', a second lid shall be installed. One lid over the outlet and a second lid centered in the remaining area or as directed by the Engineer.
- ⑥ Reinforcing steel shall be covered by no less than 1¹/₂" of concrete in the top and no less than 2" in the rest of the structure.
- ⑦ Floor of the basin (including extended opening for Engineering Standard 3360) shall be smooth and shall slope 8.3% toward the outlet.
- ⑧ Top of catch basin shall slope 2% toward curb.
- ⑨ Concrete shall be Class 3.
- ⑩ See Engineering Standard 4110 for notes regarding required pavement removal and repair.
- ⑪ Inlet and outlet pipe(s) may be placed in any wall.
- ⑫ Height equals 4" for a 6" curb and 6" for an 8" curb.
- ⑬ Install Catch Basin Placard per Section 77-4 of the Standard Specifications.

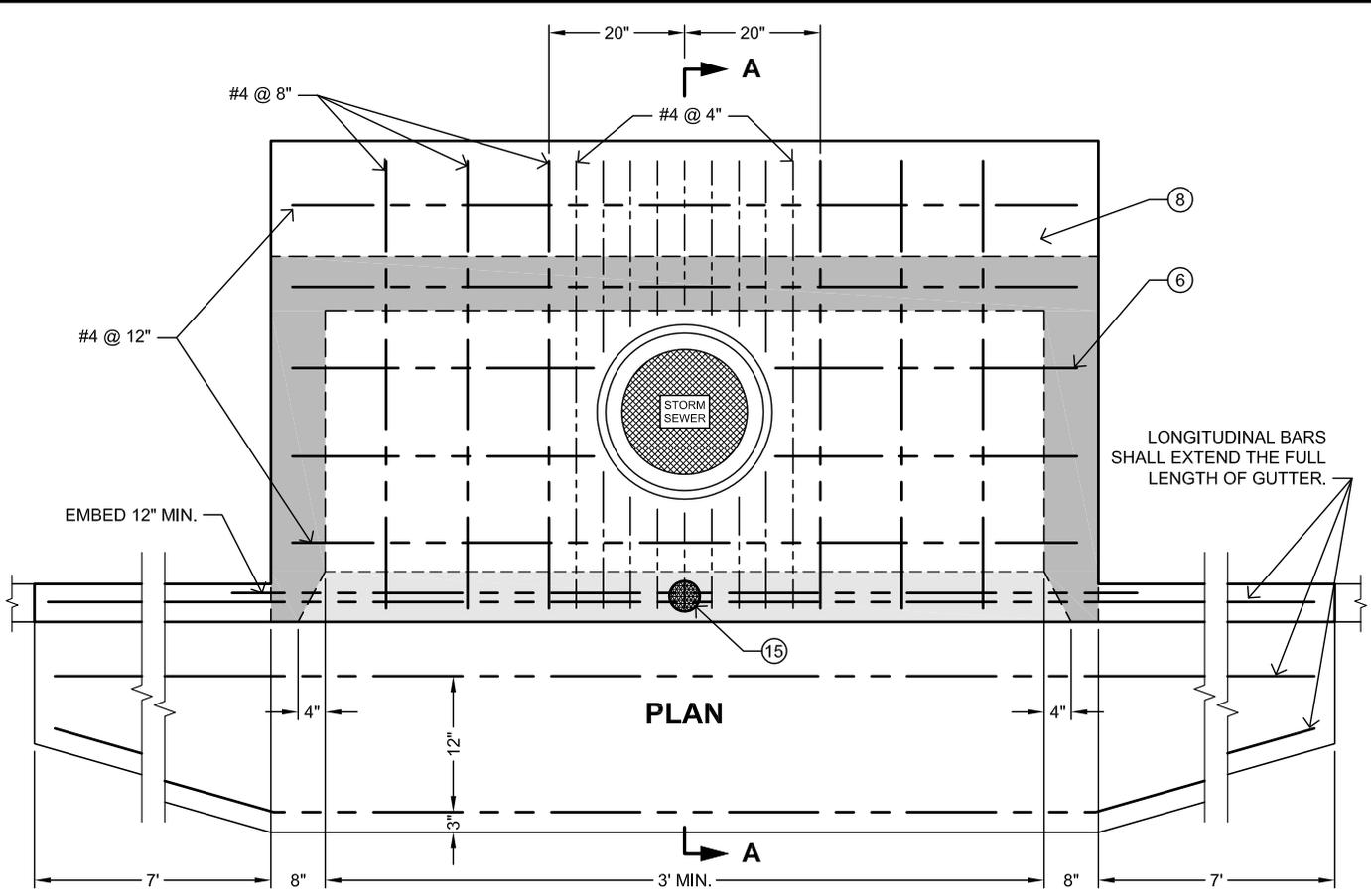


SECTION A-A

REVISIONS	BY	APP	DATE
Revised Note 5	MH	BL	12-09
Drafting edits	JDL	MH	8-12
Revised Note 13	SR	MH	1-14
STANDARD CURRENT AS OF:		January 2016	



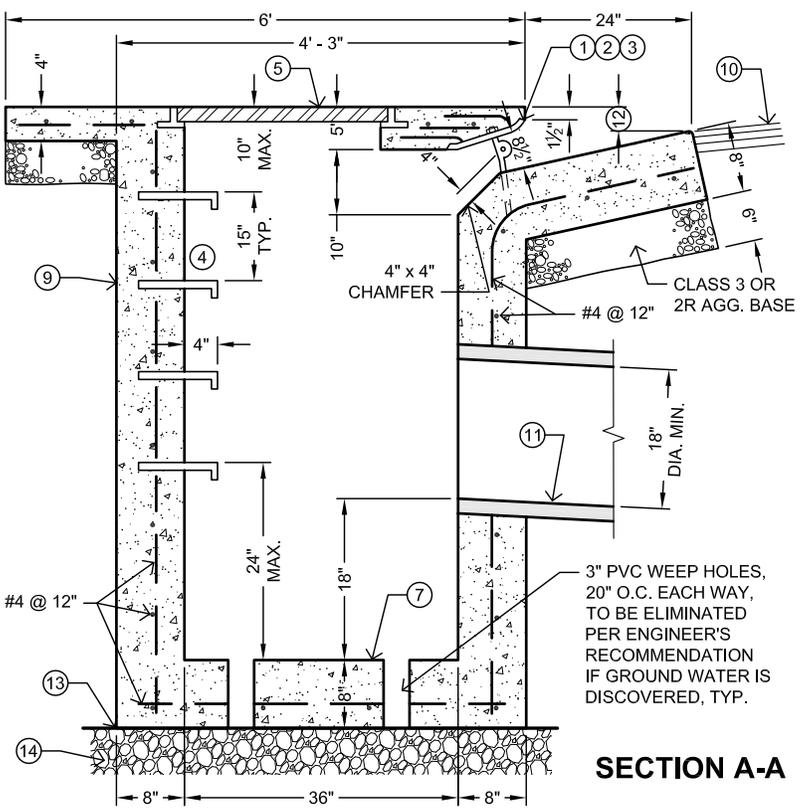
**CATCH BASIN
SIDE OPENING**



INSTALLATION NOTES:

Items 1 through 3 shall be galvanized Alhambra, South Bay Foundry or equal.

- ① Formed steel face plate: A-3911, with factory installed anchors. Face plate shall be 6" longer on each side of the opening at the face of the curb.
- ② Protection bar: A-1565; bar and anchors, A-1577
- ③ Protection bar support bolt(s): A-1574, spaced 20 7/8" apart.
- ④ Steps are required when depth exceeds 4' and shall be steel reinforced polypropylene, M-A Industries PS2-PFS or equal.
- ⑤ Manhole frame and cover, South Bay Foundry 1530, Alhambra A-1530 or approved equal, placed adjacent to the back wall in the center of the basin. Where the horizontal dimension of the basin equals or exceeds 8', a second lid shall be installed. One lid over the outlet and a second lid centered in the remaining area or as directed by the Engineer.
- ⑥ Reinforcing steel shall be covered by no less than 1 1/2" of concrete in the top and no less than 2" in the rest of the structure.
- ⑦ Floor of the basin (including extended opening for Engineering Standard 3360) shall be smooth and shall slope 8.3% toward the outlet.
- ⑧ Top of catch basin shall slope 2% toward curb.
- ⑨ Concrete shall be Class 3.
- ⑩ See Engineering Standard 4110 for notes regarding required pavement removal and repair.
- ⑪ Inlet and outlet pipe(s) may be placed in any wall.
- ⑫ Height equals 4" for a 6" curb and 6" for an 8" curb.
- ⑬ Filter fabric shall be placed between concrete and gravel. Overlap sheet of fabric 6". Filter fabric shall conform to the requirements in Section 88 of the Standard Specifications and shall be permeable and non-woven. Filter fabric shall be MIRAFI 140 or equal.
- ⑭ 6" of 1/2" diameter gravel.
- ⑮ Install Catch Basin Placard per Section 77-4 of the Standard Specifications.



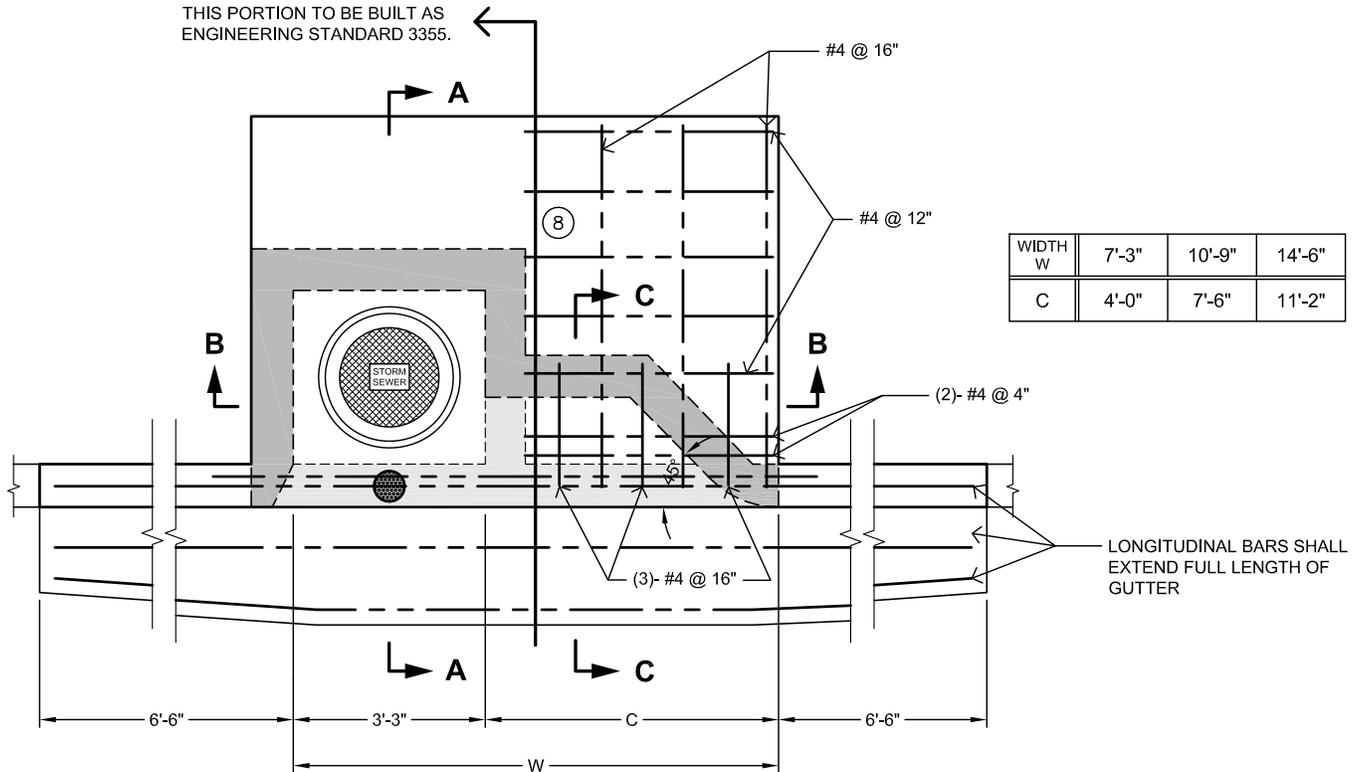
SECTION A-A

REVISIONS	BY	APP	DATE
Revised Note 15	SR	BL	1-14
Revised Note 13; Weep hole depth	JDL	MH	8-12
Rebar dim. at gutter; Drafting edits	JDL	MH	10-12
STANDARD CURRENT AS OF:		January 2016	

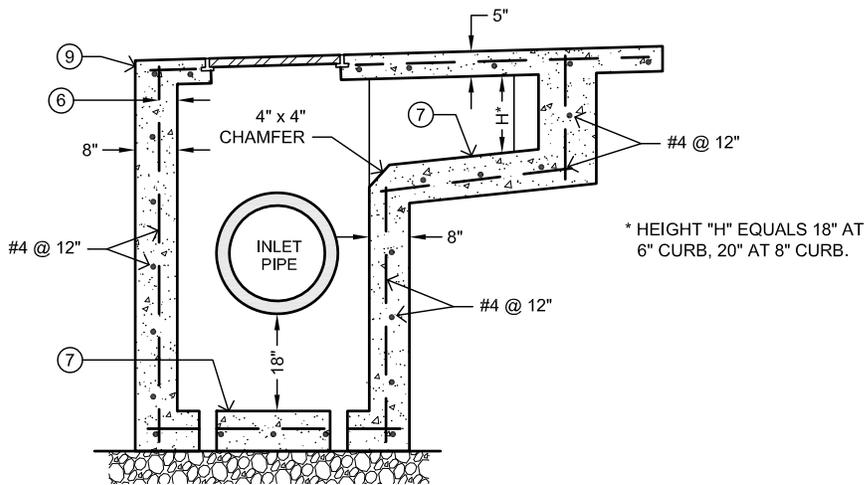


CATCH BASIN
SIDE OPENING WITH SUMP

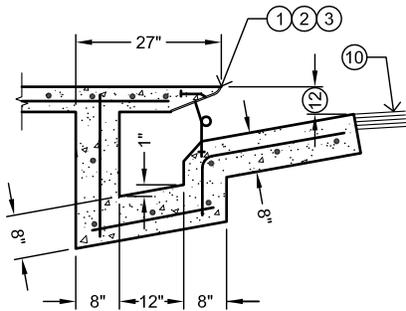
THIS PORTION TO BE BUILT AS
ENGINEERING STANDARD 3355.



PLAN



SECTION B-B

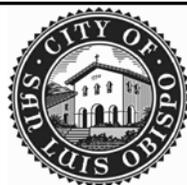


SECTION C-C

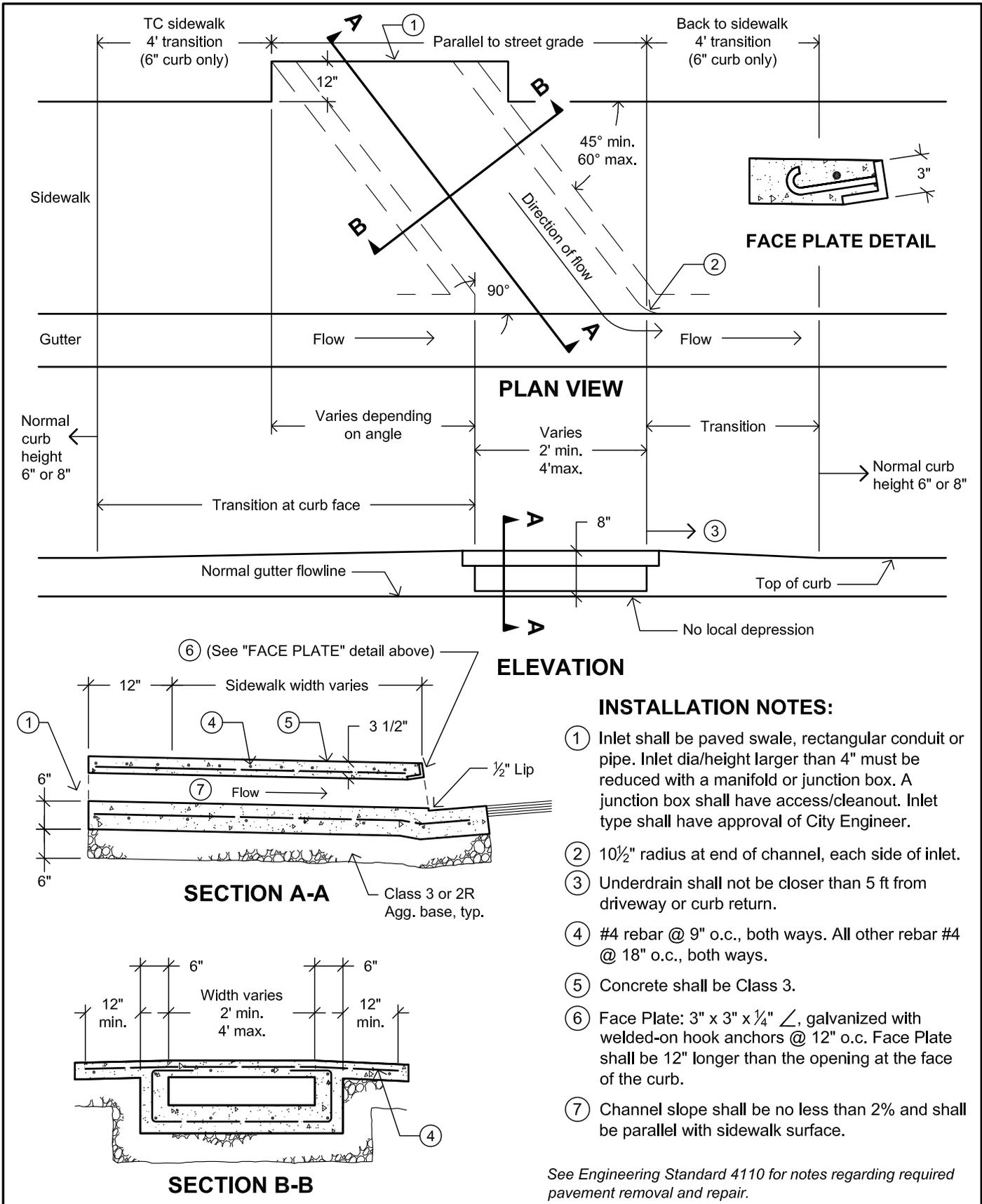
GENERAL NOTES:

- A. See Engineering Standards 3350 and 3355 for Notes and Section A-A.
- B. Install Catch Basin Placard per Section 77-4 of the Standard Specifications.

REVISIONS	BY	APP	DATE
Remove "D" at plan; Drafting edits	JDL	MH	10-12
"H" Dimension at Section B-B	JDL	MH	7-14
Revised Note B	SR	BL	1-14
STANDARD CURRENT AS OF:		January 2016	



**CATCH BASIN
EXTENDED SIDE OPENING**



INSTALLATION NOTES:

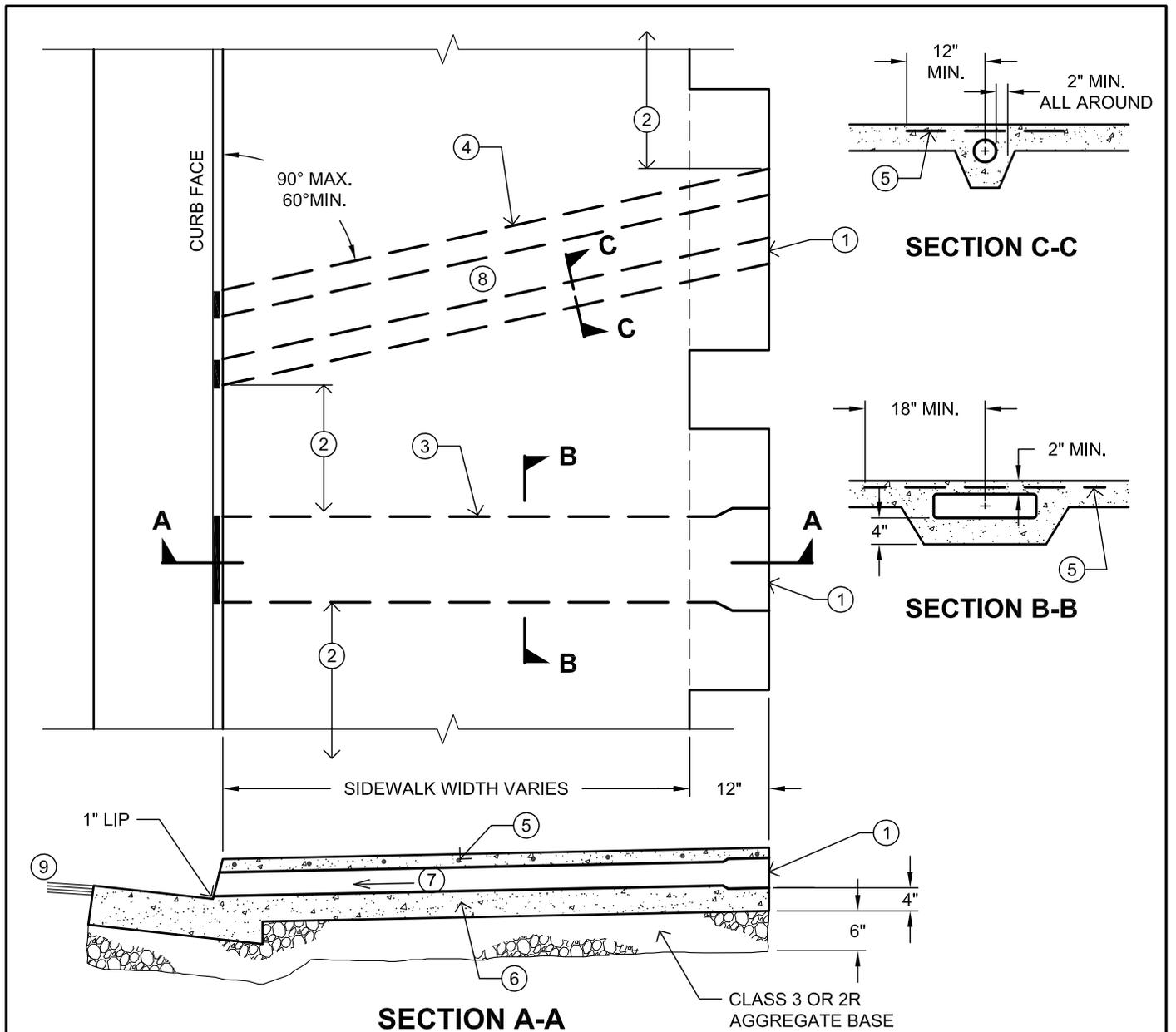
- ① Inlet shall be paved swale, rectangular conduit or pipe. Inlet dia/height larger than 4" must be reduced with a manifold or junction box. A junction box shall have access/cleanout. Inlet type shall have approval of City Engineer.
- ② 10 1/2" radius at end of channel, each side of inlet.
- ③ Underdrain shall not be closer than 5 ft from driveway or curb return.
- ④ #4 rebar @ 9" o.c., both ways. All other rebar #4 @ 18" o.c., both ways.
- ⑤ Concrete shall be Class 3.
- ⑥ Face Plate: 3" x 3" x 1/4" ∠, galvanized with welded-on hook anchors @ 12" o.c. Face Plate shall be 12" longer than the opening at the face of the curb.
- ⑦ Channel slope shall be no less than 2% and shall be parallel with sidewalk surface.

See Engineering Standard 4110 for notes regarding required pavement removal and repair.

REVISIONS	BY	APP	DATE
Allow Class 2R Base	DVB	BL	11-08
Revised Note 6; Metric conv.	JDL	MH	9-12
Revise Note 6	DVB	BL	10-06
STANDARD CURRENT AS OF:		January 2016	



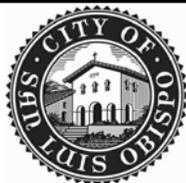
**SIDEWALK UNDERDRAIN
CONCRETE**



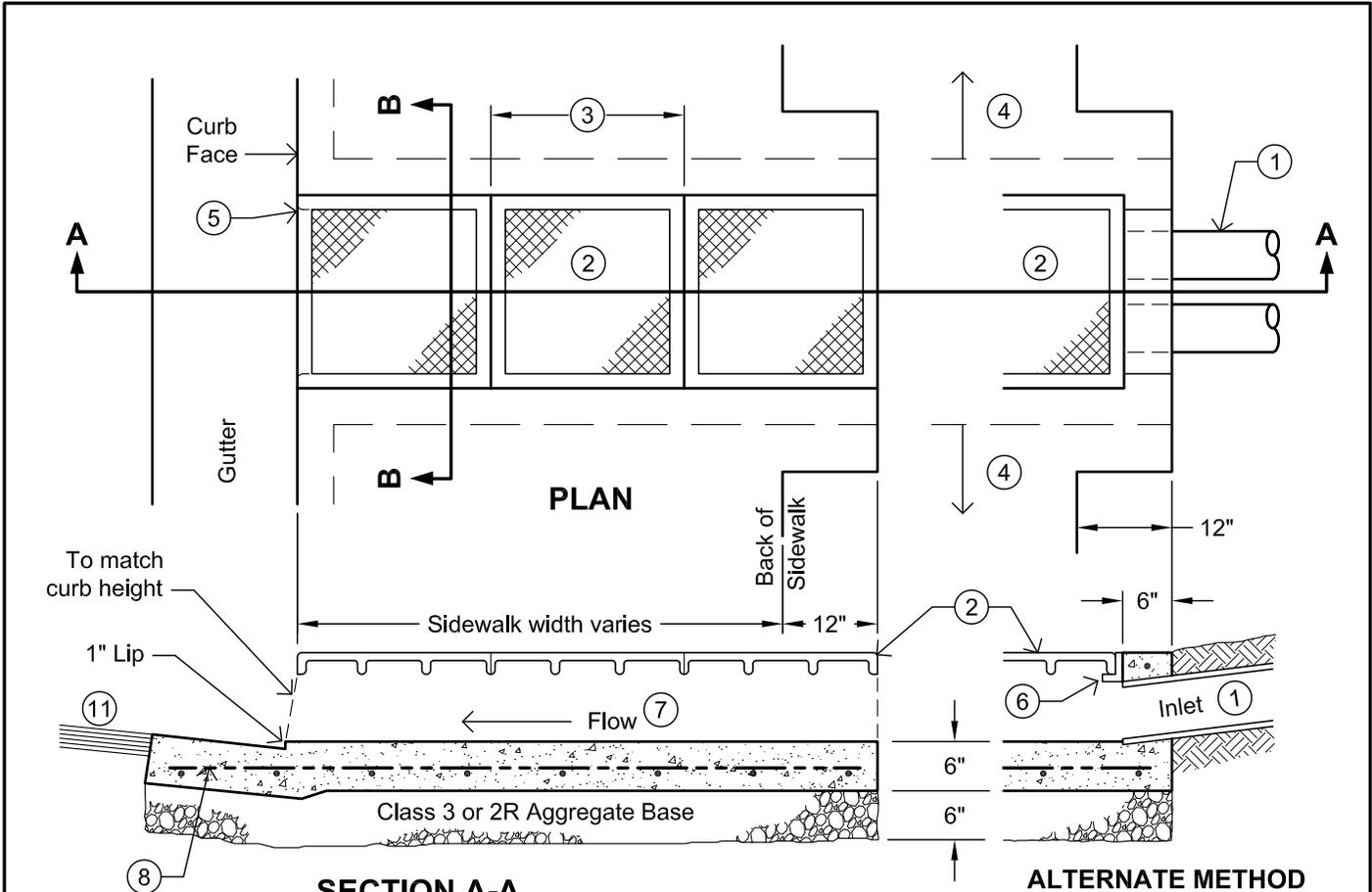
NOTES:

- ① Inlet shall be paved swale, rectangular conduit or pipe(s). Maximum inlet diameter/height shall be curb height minus 2". Inlet conduits larger than 4" diameter/height must be reduced with a manifold or junction box. A junction box shall have access/cleanout. Inlet shall be approved by the City Engineer.
- ② Underdrain shall not be installed in driveway wings or curb return.
- ③ Rectangular cast iron pipe: Alhambra A-470, South Bay Foundry A9000 or approved equal.
- ④ Cast iron pipe: 3" max. diameter (6" curb) or 4" max. diameter (8" curb).
- ⑤ #4 Rebar @ 12" O.C.
- ⑥ Concrete shall be Class 3.
- ⑦ Channel slope shall be no less than 2% and shall be parallel with sidewalk surface.
- ⑧ Multiple drains shall have 3" minimum to 6" maximum clearance with maximum of 3 drains per 10' of sidewalk. Drains shall not extend beyond curb face into gutter.
- ⑨ See Engineering Standard 4110 for notes regarding required pavement removal and repair.

REVISIONS	BY	APP	DATE
Revised Note 2	MH	BL	11-09
Revised Note 3	MH	BL	12-09
Misc. drafting edits	JDL	MH	10-12
STANDARD CURRENT AS OF:		January 2016	



**SIDEWALK UNDERDRAIN
WITH PIPES**

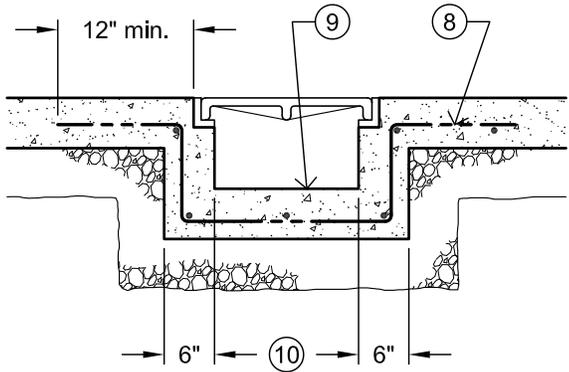


SECTION A-A

ALTERNATE METHOD

NOTES:

- ① Inlet shall be paved swale, rectangular conduit, or pipe(s). Maximum inlet diameter/height shall be curb height minus 2". A junction box shall have access/cleanout. Inlet type shall have approval of City Engineer.
- ② Frame and Covers: NEENAH R-4990, type D, solid top with PERMA-GRIP surface, or approved equal. There shall be a 1/8" space between the frame and the lid. When underdrain is located in Mission Style sidewalk, covers shall be coated with epoxy paint colored to match sidewalk color.
- ③ Cover length shall maintain a cover weight of at least 100 lbs each.
- ④ Underdrain shall not be closer than 5' from driveway or curb return.
- ⑤ 1" radius at end of channel, each side of outlet.
- ⑥ Frame end piece, required for alternate method.
- ⑦ Channel slope shall be no less than 2% and shall be parallel with sidewalk surface.
- ⑧ #4 Rebar @ 12" O.C., both ways.
- ⑨ Concrete shall be Class 3.
- ⑩ Channel width varies: 18" min. to 3' max.
- ⑪ See Engineering Standard 4110 for notes regarding pavement removal and repair.

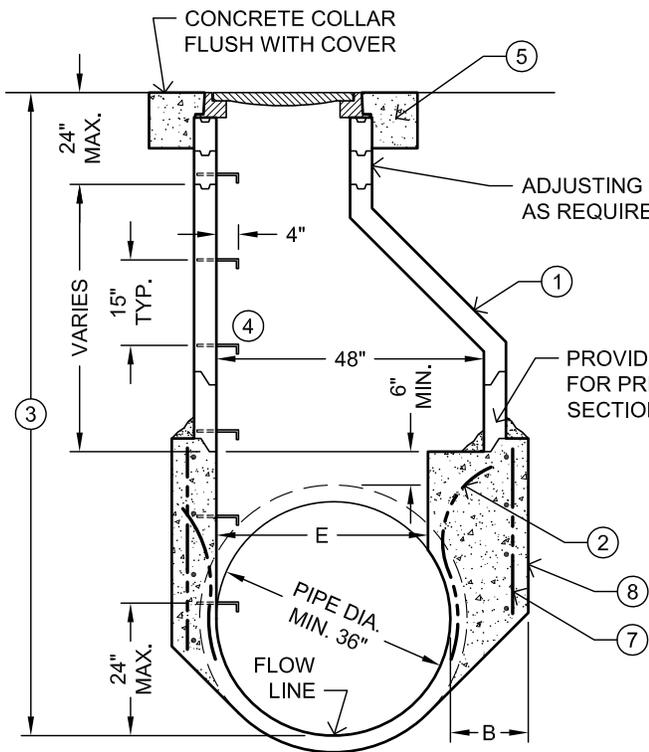


SECTION B-B

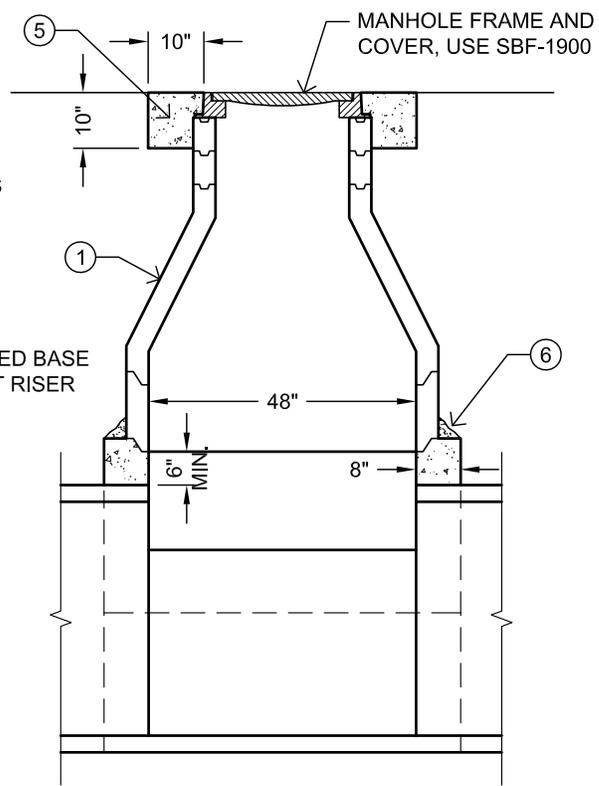
REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	10-12
Revise rebar specs	JDL	WAP	11-98
Revise Note 2; Class 2R Base	DVB	BL	11-08
STANDARD CURRENT AS OF:		January 2016	



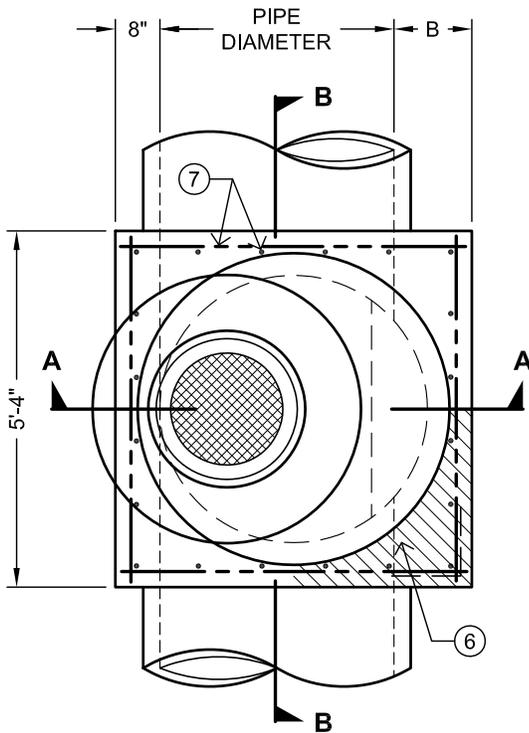
SIDEWALK UNDERDRAIN WITH COVER PLATES



SECTION A - A



SECTION B - B



PLAN

DIMENSIONS (in)				
Pipe Dia.	36	42	48	54 and greater
B	20	14	8	Equals pipe wall thickness
E	32	38	44	48

INSTALLATION NOTES:

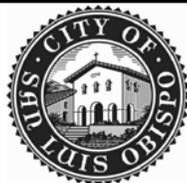
- ① Precast pipe, adjusting rings, and tapered sections shall be constructed as per ASTM C-478 using Type II cement.
- ② For RCP, cut and bend rebar into cast-in-place concrete.
- ③ Steps shall be included if manhole depth exceeds 4'. Steps shall be steel-reinforced polypropylene M-A Industries PS2-PFS or equal.
- ④ In manholes with lateral connections the steps shall be placed in the wall with no laterals or the wall with the least diameter lateral such that a continuous vertical alignment of steps may be achieved.
- ⑤ Collar shall be constructed per City Engineering Standard 6040.
- ⑥ Provide PCC fillets as needed to support manhole shaft, 4 each.
- ⑦ #4 bar @ 12" O.C. each way, 3" clear, typical.
- ⑧ Construct Class 3 PCC base to dimensions shown above. It shall rest on undisturbed material and bottom shaft shall be wet-set or set in formed groove.

GENERAL NOTES:

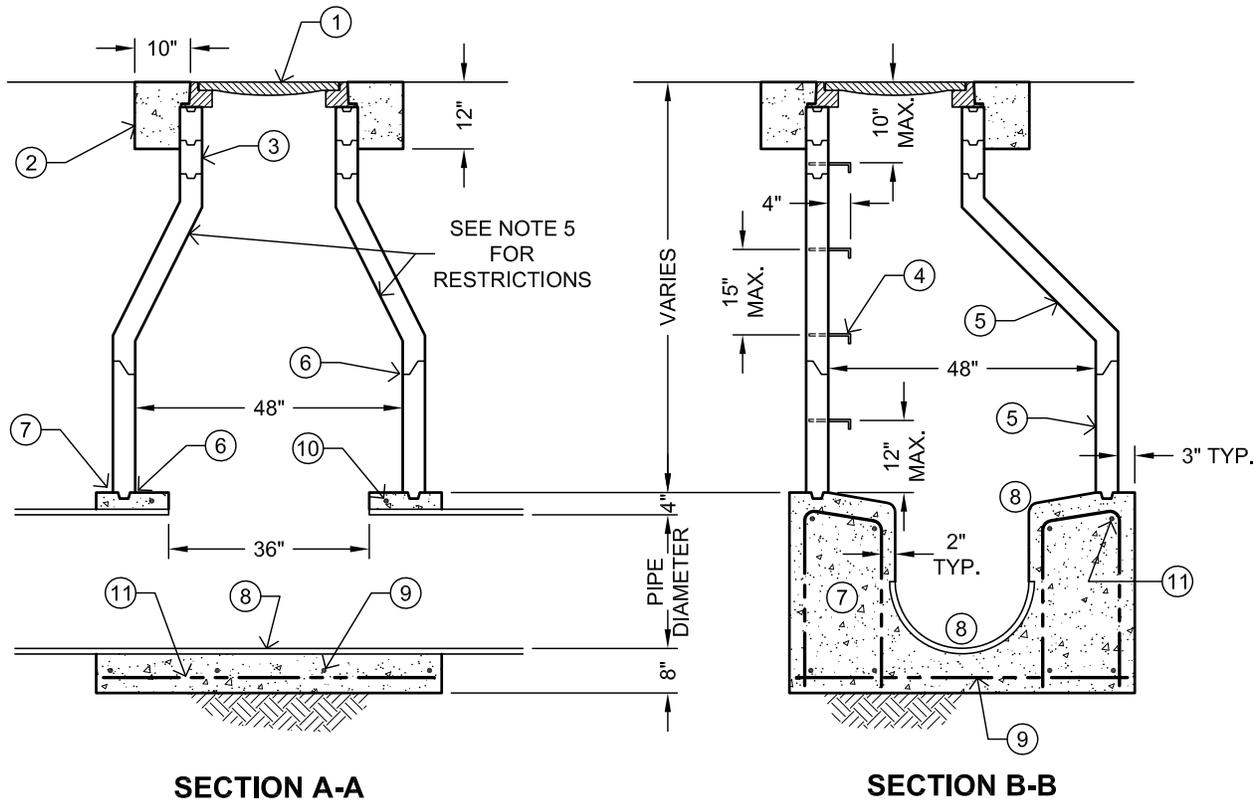
- A. All joints between precast sections shall be mortared.
- B. Manhole interiors shall have a smooth trowelled surface.

REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	10-12
Add Note 10	JDL	WAP	7-00
Class 3 Concrete	JDL	MH	2-13

STANDARD CURRENT AS OF: January 2016

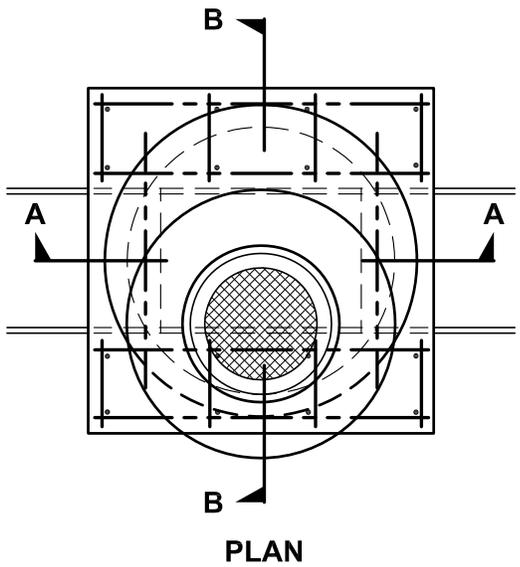


STORM DRAIN MANHOLE
36" PIPE & LARGER



SECTION A-A

SECTION B-B

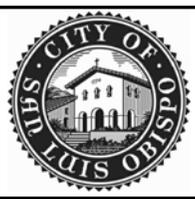


PLAN

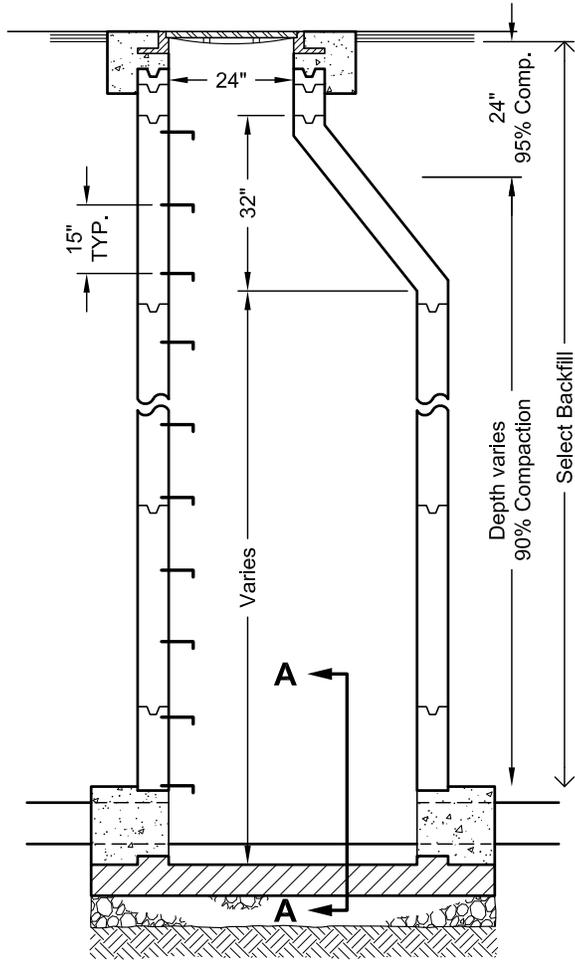
INSTALLATION NOTES:

- ① Manhole cover and frame shall be Phoenix P-1090, S.B. Foundries 1900, or equal, lettered "Storm Sewer".
- ② Collar shall be constructed per Engineering Standard 6040.
- ③ Adjusting rings as needed, grouted on the inside.
- ④ Steps are required when depth exceeds 4' and shall be steel-reinforced polypropylene per ASTM C-478, MA Industries PS-2-PFS, or equal.
- ⑤ Precast shaft(s) and eccentric cone per ASTM C-478. Straight side of cone shall be positioned over shelf. *Concentric cone may be used only with written approval of City Engineer.*
- ⑥ Joints shall be set with butyl rubber sealant - (RUB'R-NEK).
- ⑦ Manhole base shall be Class 2 PCC and rest on undisturbed material. Bottom shaft shall be wet-set or set in formed groove.
- ⑧ Pipe shall be laid through manhole and top portion shall be removed after base is poured. Trough shall have steel-trowel finish, vertical sides, and rounded corners. Top surface shall have 8.33% slope toward trough.
- ⑨ #4 @ 18" O.C.
- ⑩ #4 x 4' (2 total)
- ⑪ #4 x 5' (8 total)

REVISIONS	BY	APP	DATE
Class 3 Concrete	JDL	MH	2-13
Revised Note 7	SR	BL	1-14
Drafting edits	JDL	MH	10-12
STANDARD CURRENT AS OF:		January 2016	



STORM DRAIN MANHOLE
18" to 36" PIPE



COVER:

Manhole frame and cover shall have a 24" clear opening and a sealed blind pickhole (SBF-1900 or approved equal). The cover shall be lettered "STORM SEWER". The inside of the frame shall be grouted with non-shrink grout.

ADJUSTMENT TO GRADE:

Adjust to grade per Engineering Standard 6040.

COLLAR:

Collar shall be constructed per Engineering Standard 6040.

CONE:

Cone shall be eccentric and conform to the requirements for risers.

MANHOLE RISERS:

Manhole risers shall be precast concrete conforming to ASTM C-478 and shall have a 6" minimum wall thickness with minimal reinforcements. Manholes shall be 4' in diameter unless the size and/or number of inlet(s) and outlet(s) warrants the use of a 5' diameter manhole.

JOINTS:

Joints shall be set with butyl rubber sealant (RUB'R-NEK). Inside of joints shall be grouted with non-shrink grout.

BASE:

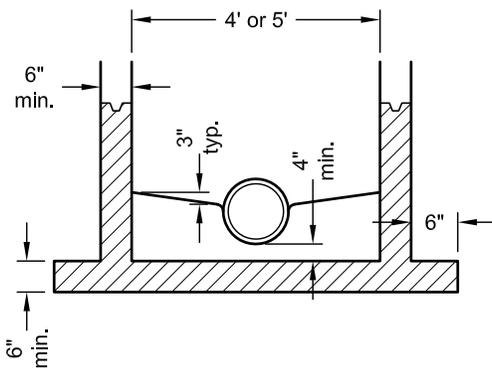
Manhole base shall be precast reinforced Class 2 concrete with extended base and shall conform to the requirements for manhole risers. Base may be square or round with key for risers. All pipe connections shall be cored by the manufacturer to fit the O.D. of the pipe plus 2". The precast base shall be bedded on a minimum of 6" of well graded crushed rock (see Standard Specifications) over native material that is either undisturbed or compacted to 95%. Pipe is to be centered in the core and concrete collars poured around pipe. Concrete shall be worked into the voids around the pipe and smoothed on the interior.

STEPS:

Steps shall be included if manhole depth exceeds 4'. Steps shall be steel reinforced polypropylene. Steps shall be placed in the wall with no laterals, or the wall with the smallest lateral such that a continuous vertical alignment of steps may be achieved. The cone shall also align to this end.

INVERT:

Invert shall be completed in a single pour using Class 3 concrete with steel trowel finish. Any change in direction shall be a fixed radius curve extending from the inlet wall to the outlet wall. Inside surface of invert and area between pipe connection and channel shall be free from gaps, holes and sharp edges. All inlets shall be designed and installed such that the top of pipe elevations match as much as possible.



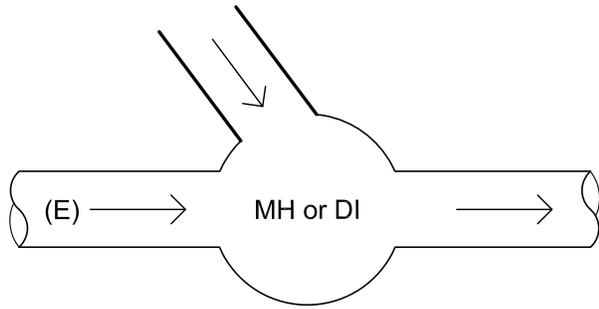
SECTION A-A

REVISIONS	BY	APP	DATE
Revised Base Note	SR	BL	1-14
Drafting edits	JDL	MH	10-12
Class 3 Concrete	JDL	MH	2-13
STANDARD CURRENT AS OF:		January 2016	

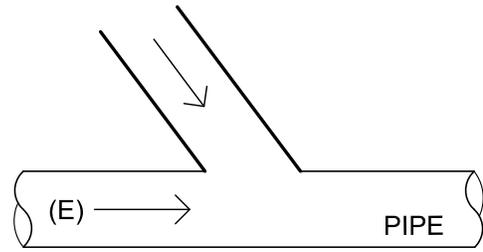


**PRECAST
STORM DRAIN MANHOLE
UP TO 3' O.D. PIPE SIZE**

3530



CASE A



CASE B

CASE A:

- A1. Chip a hole between 1" and 2" larger than the pipe OD. Salvage the reinforcing from the manhole / catch basin. Steel shall be bent outward from the manhole.
- A2. Concrete the pipe in place using a Class 3, $\frac{3}{8}$ " concrete mix, incorporating reinforcing steel. Concrete shall completely fill the void between the pipe and the manhole and form a collar around the pipe behind the manhole of sufficient length and thickness to cover the reinforcing steel with 2" of concrete. Concrete shall be flush with interior of existing facility. Any voids that appear in the seal between the manhole and the pipe after setting shall be patched with a non-shrink grout.
- A3. Pipe shall be flush cut with the manhole inside wall.
- A4. Whenever possible, the new pipe should enter the manhole at an angle, pointing the flow downstream.
- A5. The manhole shall be replaced and enlarged when the penetration from the new line will result in an inadequate section of the manhole remaining between the new penetration and existing penetrations to properly support the structure.

CASE B:

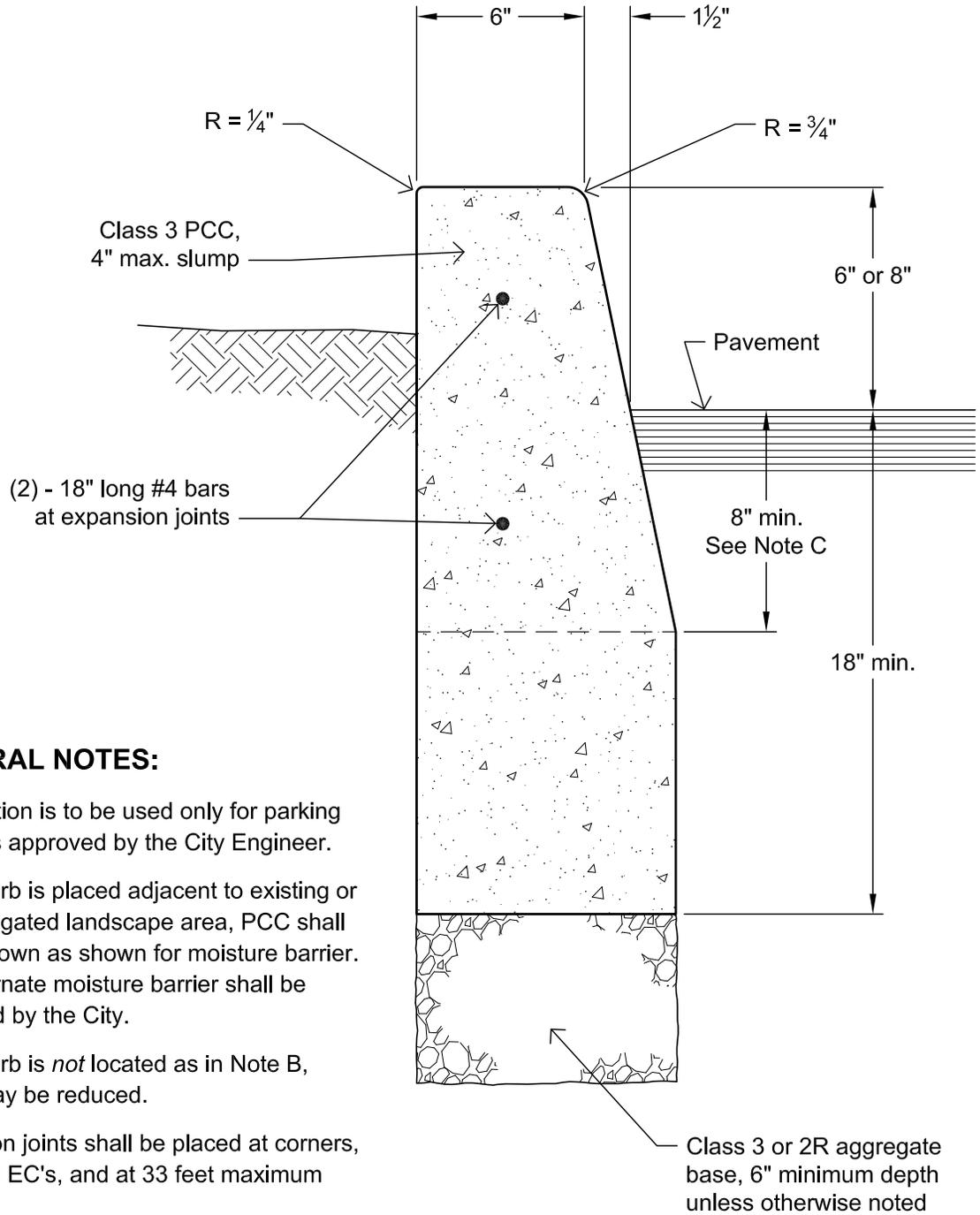
- B1. Where a catch basin or manhole exist within 30' of the proposed connection, or the new pipe is less than 12" in size and serves a private property, the connection may be made without the installation of a manhole at the junction point. In either case, the new pipe must be at least one size smaller than the existing pipe. In all other cases a manhole shall be installed.
- B2. Connection to an existing HDPE line shall be made using a manufactured wye connection cut into the existing line with connection of the wye to the line made in accordance with the manufacturer's recommendation.
- B3. Connection to an existing RCP line shall be made in the manner described above for connection to an existing manhole. New penetrations must be made a minimum of 3 feet from any existing penetrations.
- B4. Connection to an existing CMP line shall be done by replacing the portion of the CMP at the junction point with a City approved pipe material and completing the connection as specified above and constructing a collar to connect the new section to the existing CMP.

In all cases connections shall not be made to the City's storm drain system until calculations have been received and approved by the City showing the existing system is capable of handling the additional water for the required design storm per the City's Waterway Management Plan and Drainage Design Manual, and for private systems, that an encroachment permit has been obtained.

REVISIONS	BY	APP	DATE
<i>Note revision B1 & Last</i>	<i>SR</i>	<i>BL</i>	<i>1-14</i>
<i>Drafting edits</i>	<i>JDL</i>	<i>MH</i>	<i>10-12</i>
<i>Class 3 Concrete</i>	<i>JDL</i>	<i>MH</i>	<i>2-13</i>
STANDARD CURRENT AS OF:		January 2016	



STORM DRAIN CONNECTIONS



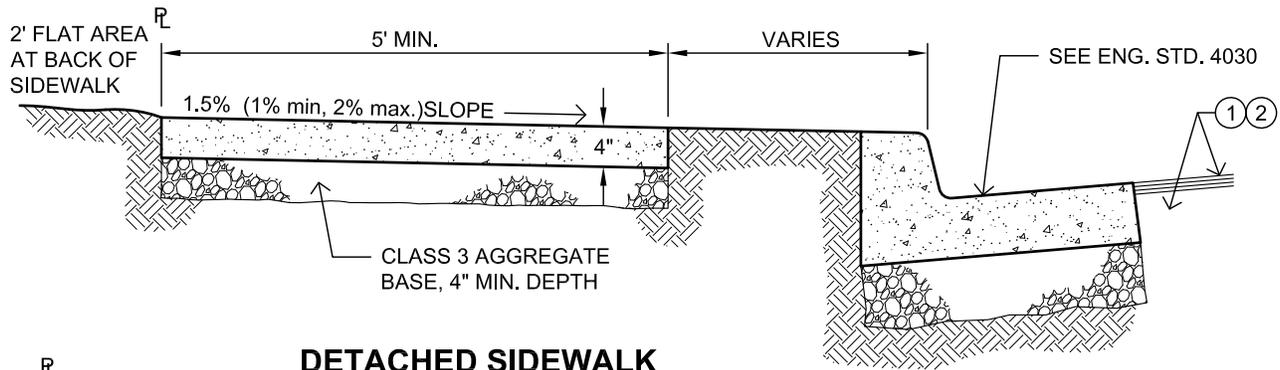
GENERAL NOTES:

- A. This section is to be used only for parking lots or as approved by the City Engineer.
- B. When curb is placed adjacent to existing or future irrigated landscape area, PCC shall extend down as shown for moisture barrier. Any alternate moisture barrier shall be approved by the City.
- C. When curb is *not* located as in Note B, depth may be reduced.
- D. Expansion joints shall be placed at corners, BC's and EC's, and at 33 feet maximum spacing.
- E. See Engineering Standard 4110 for notes regarding required pavement removal and repair.

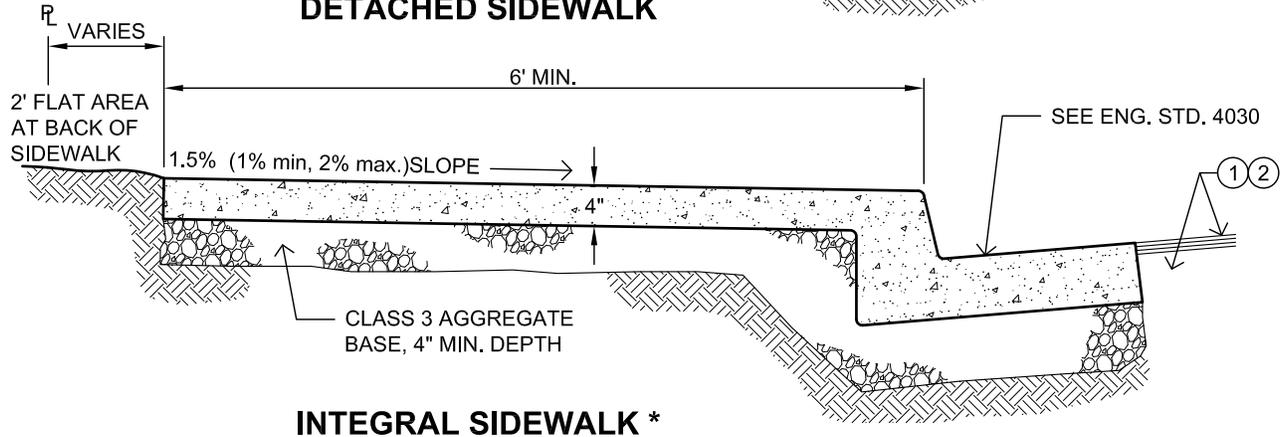
REVISIONS	BY	APP	DATE
Allow Class 2R Base	DVB	BL	11-08
Revise rebar specs	JDL	WAP	11-98
Drafting edits	JDL	MH	10-12
STANDARD CURRENT AS OF:		January 2016	



CURB



DETACHED SIDEWALK



INTEGRAL SIDEWALK *

GENERAL NOTES:

* Detached sidewalk is the City standard. Integral sidewalk shall not be used without approval of City Engineer.

- A. CONCRETE: Class 3.
- B. FINISH: PCC sidewalk shall be given a broom finish.
- C. SEAL and CURE: Apply curing compound in compliance with section 73-1.03F of the Standard Specifications.
- D. DOWELS: 1/2" smooth bar dowels, 18" long at 24" O.C. at expansion joints and cold joints, to be greased or sleeved at one end.
- E. EXPANSION JOINTS: 1/4" expansion material shall be placed at driveways, BCRs, and at 100' intervals.
- F. WEAKENED PLANE JOINTS: Plastic pulltop quickjoint strips, or approved equal, shall be at 20' O.C. and 1 1/2" deep.
- G. SCORE MARKS: Sidewalks shall be scored at least 1/4" deep, perpendicular to the curb face at 5' intervals. Sidewalks with a width of 8' or more shall have one score mark parallel to the curb face evenly spaced in the concrete surface.
- H. AT COLD JOINTS BETWEEN SIDEWALK AND CURB: #3 x 6" dowels shall be drilled in back of curb at 24" O.C.
- I. REBAR: When a utility box is located within the sidewalk area, the concrete surrounding the box shall be reinforced with continuous #4 rebar.
- J. JOINTS: Expansion joints and weakened plane joints shall extend through sidewalk into curb and gutter.
- K. CUTTING: See Engineering Standard 4910.

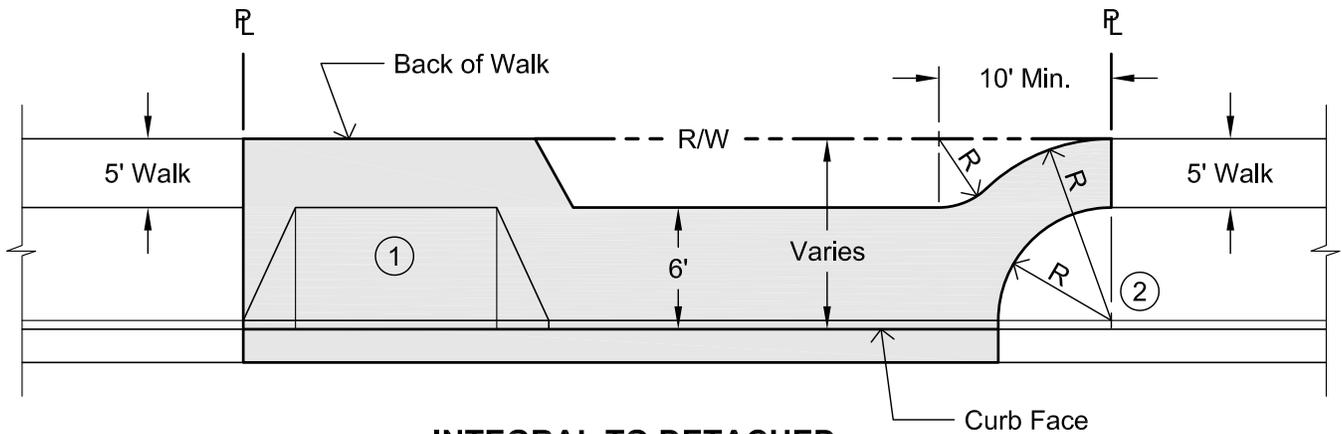
INSTALLATION NOTES:

- ① PAVEMENT REMOVAL and REPAIR: Sawcut, remove and replace AC paving 18" minimum from gutter, 6" thick (local) or 10" minimum thick (collector and arterial). If pavement is PCC, sawcut existing PCC paving at gutter lip do not dowel. If existing PCC pavement has an AC cap, sawcut and remove AC cap 18" minimum (except as required in Note 2) from gutter lip and 3' up and downstream and replace AC to provide a smooth, uniform surface to match existing surfaces. New gutter lip to be at finished A.C. elevation.
- ② BIKE LANES: No longitudinal joints or seams are allowed in bike lanes. If a longitudinal joint results due to the contractor's work or the above requirements in Note 1, the contractor shall remove a minimum of 2" of asphalt from the pavement across the entire bike lane using a method approved by the City and resurface the bike lane to the satisfaction of the City.

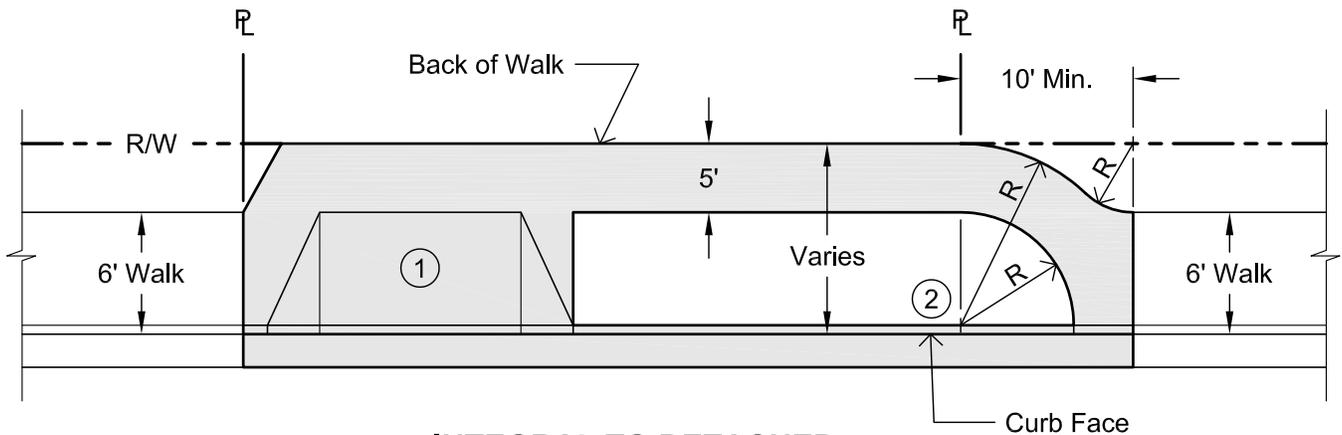
REVISIONS	BY	APP	DATE
Added General Note K	JDL	DA	10-15
Metric conversion; Drafting edits	JDL	MH	10-12
Revised Notes A, C & 1	SR	BL	1-14
STANDARD CURRENT AS OF:		January 2016	



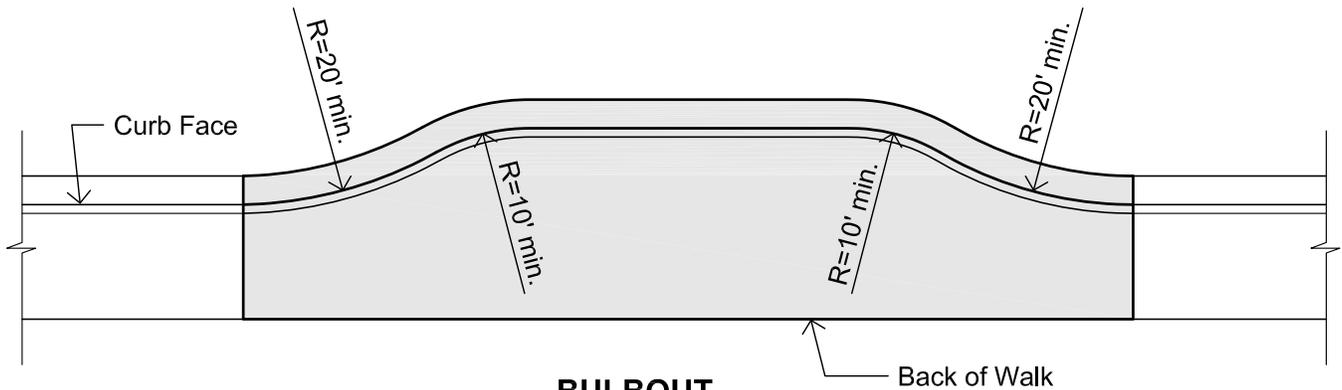
**SIDEWALK
INTEGRAL & DETACHED**



INTEGRAL TO DETACHED



INTEGRAL TO DETACHED



BULBOUT

(SAME FOR INTERSECTIONS AND MID-BLOCK SECTIONS)

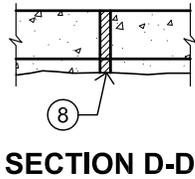
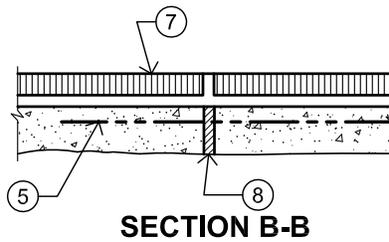
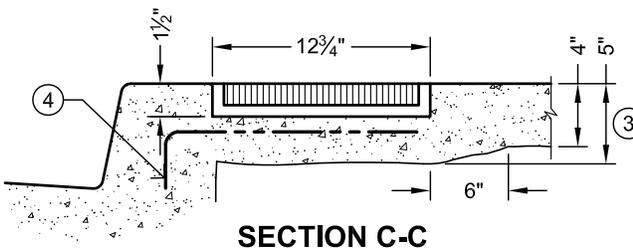
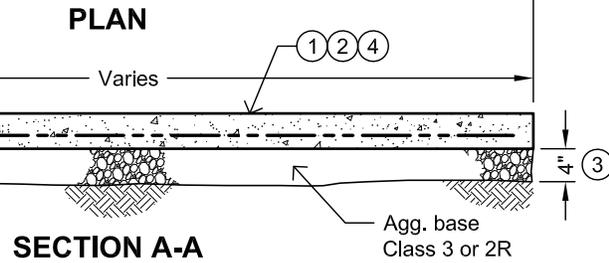
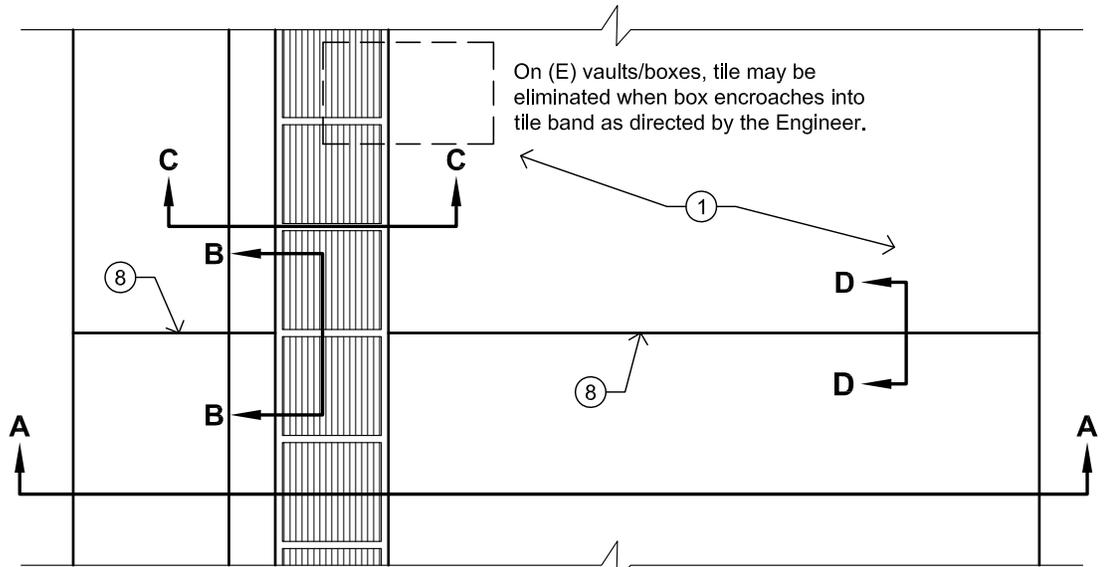
INSTALLATION NOTES:

- ① Driveway location may vary. See Engineering Standards 2110 thru 2116 for construction notes as appropriate for conditions.
- ② Radius point is the intersection of the prolongation of the property line with the back of curb. "R" varies with sidewalk width and parkway width.

REVISIONS	BY	APP	DATE
Add Bulbout; Rename Standard	JDL	BL	5-13
Revise sidewalk width	DVB	BL	11-08
Added Notes; Drafting edits	JDL	MH	10-12
STANDARD CURRENT AS OF:		January 2016	



SIDEWALK TRANSITIONS



INSTALLATION NOTES:

- ① PCC shall be Class 3, colored concrete with salt finish. Salt shall be course water softener salt spread at a rate of 1/2 lb per 100 square feet. Salt finish shall be applied to sidewalk area only. Salt finish shall not be applied to curbs, gutters, or ramps.
- ② Surface of sidewalk to slope 1.5% (1% min., 2% max.) toward curb.
- ③ For driveways, increase aggregate base thickness to 6" and concrete thickness to 6" minimum, exclude tile.
- ④ Rebar: #4 @ 24" O.C., full width of sidewalk, curb end bent 4" x 90°.
- ⑤ Smooth steel dowels 1/2" @ 24" O.C., 18" long, to be sleeved or greased.
- ⑥ For curb and gutter, see Engineering Standard 4030.
- ⑦ No tile shall be set in mortar prior to approval of tile by City Engineer.
- ⑧ Expansion joints and weakened plane joints shall be per Engineering Standard 4110.

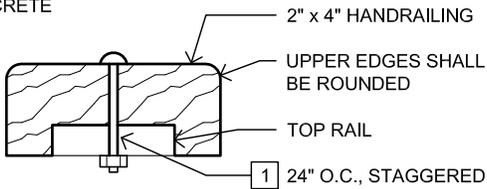
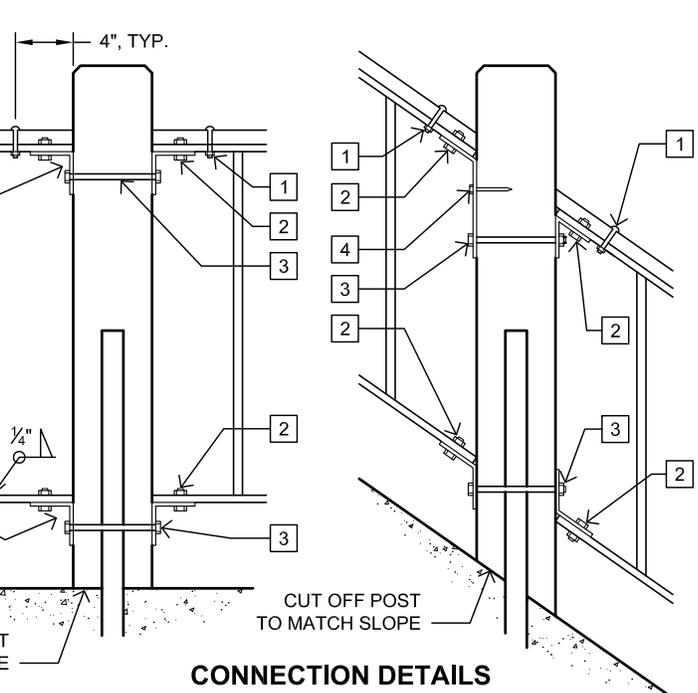
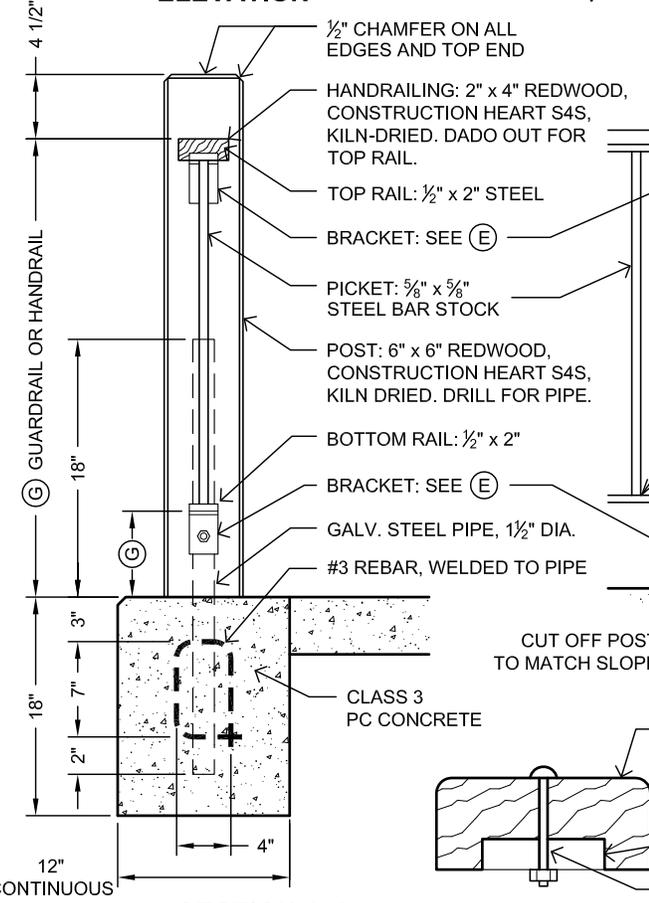
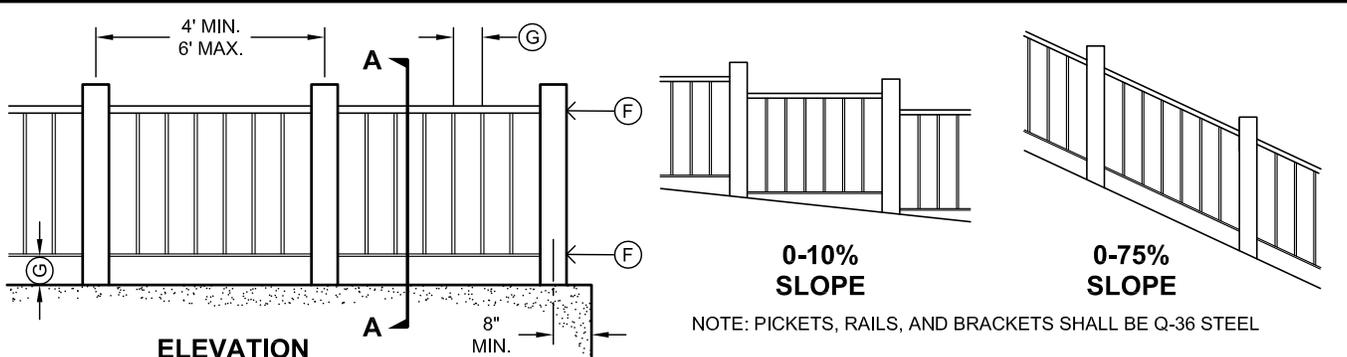
GENERAL NOTES:

- A. Mission Style Sidewalk may only be installed in the Mission Style Sidewalk District unless specifically authorized by the City Engineer.
- B. All new installations shall include curb and gutter.
- C. Tiles shall be trimmed or arranged to allow mortar joints to coincide with expansion joints, tree wells, etc. Tiles adjacent to curb ramps shall come up to, but terminate, at the grooved curb ramp border. Flush ramps without grooves, tile shall terminate at truncated domes.
- D. All sign posts, parking meter posts, and new utility vaults shall be located behind the tile row and shall be installed per City Engineering Standards.
- E. All new and existing wells, boxes, lids and covers shall be stained or coated to match surrounding sidewalk. Stains and coatings shall be submitted to the Engineer for approval prior to application. Lids and covers may be cast iron or dark galvanized slip-resistant diamond-plate. Lids and covers in traffic areas shall be traffic rated.
- F. Pavement removal and repair shall be per Engineering Standard 4110.
- G. See Standard Specifications 73-1, 73-4 and 90.

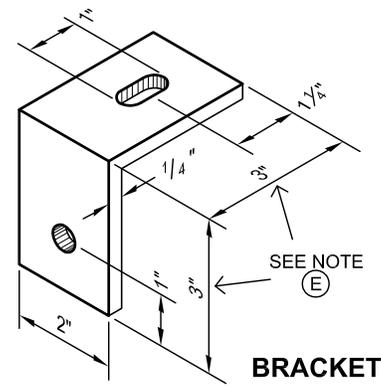
REVISIONS	BY	APP	DATE
Revised G, deleted 2-3, renumbered	SR	MH	1-14
Revised Notes 11 - 18	MH	BL	10-09
Reorganize Notes; Drafting edits	JDL	MH	11-12
STANDARD CURRENT AS OF:		January 2016	



**MISSION STYLE
SIDEWALK**



- HARDWARE NOTES:**
- 1 MACHINE SCREW: 3/8" X 4" ROUNDED HEAD WITH SLOT
 - 2 BOLT: 1/2" X 1 1/8"
 - 3 BOLT: 1/2" X 7/8"
 - 4 LAG SCREW: 3/8" X 3 3/8" (PRE-DRILL)

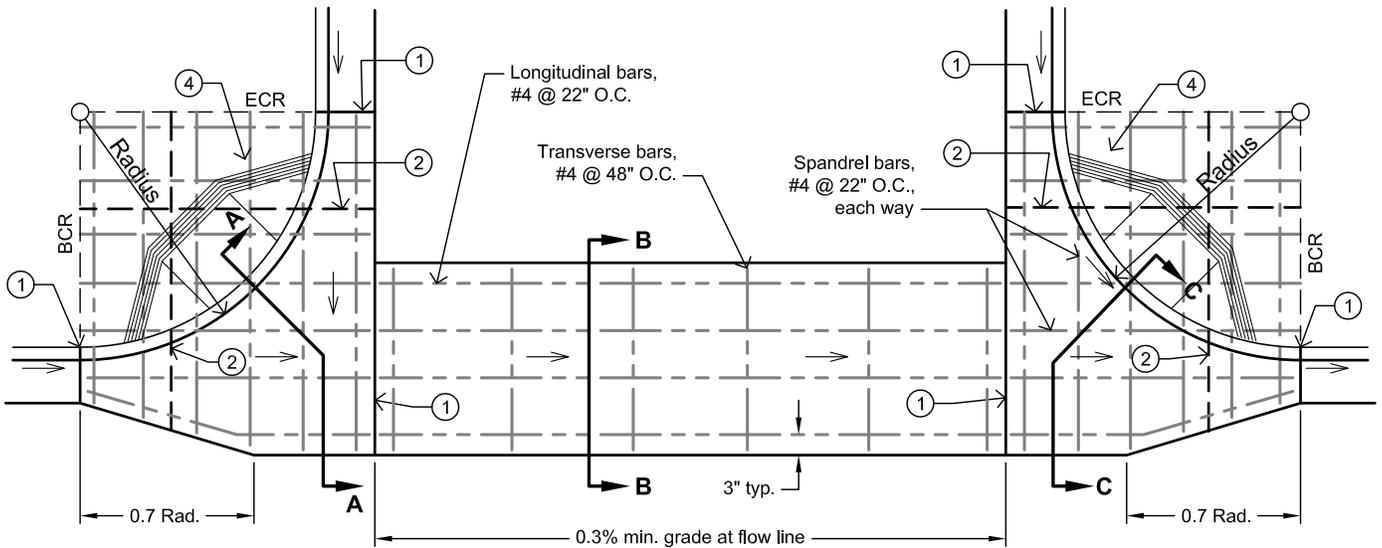


- NOTES:**
- (A) Redwood posts and handrailing shall be free of splits and splinters, sanded smooth, and stained with two (2) coats of Benjamin Moore acrylic deck stain 4 base or approved equal. Color: OY-2X25, BK-4X23, OG-1X22
 - (B) Railing may be stepped on slopes of 10% or less but must be parallel to steeper slopes.
 - (C) All welds shall be free of slag and wire brushed. All edges and corners of pickets, rails, and brackets shall be ground smooth, and assembly shall be sand blasted and primed with a shop-applied primer (such as rustoleum damp-proof primer) and then shall be given two (2) coats of shop-applied semi-gloss black enamel.
 - (D) Each through connection shall have a bolt/machine screw, nut, and lock washer. All fasteners shall have a black finish and meet ASTM A307 standards.
 - (E) Brackets shall be fabricated as shown and have an oblong hole on one arm for field adjustment. Bracket arm length and angles may vary depending on slope. Brackets shall be arranged to minimize use of long bolts, and top rail brackets shall only point down. Lag screws shall be used if bracket arm length exceeds 5 3/8".
 - (F) At ends and corners use large washer and nut, countersink, plug, and finish to match.
 - (G) Height and spacing shall conform to current CBC requirements.

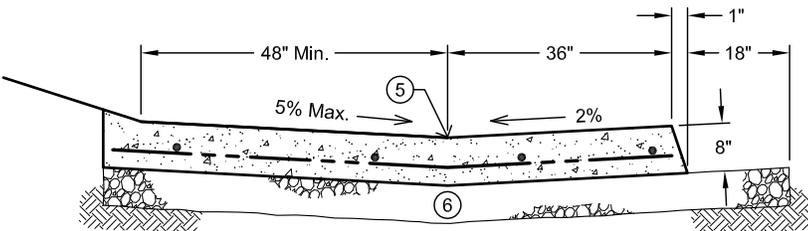
REVISIONS	BY	APP	DATE
Revised Lumber Grade	MH	BL	2-14
Revise Note G (CBC)	JDL	MH	9-12
Kiln-dried Handrail; Welding	JDL	DA	10-15
STANDARD CURRENT AS OF:	January 2016		



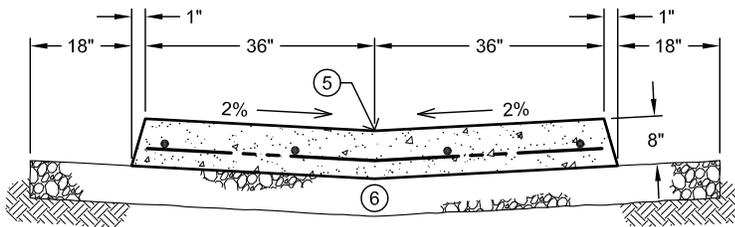
MISSION STYLE RAILING HANDRAIL & GUARDRAIL



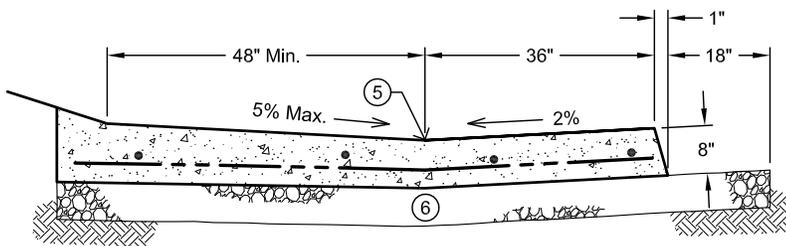
PLAN



**SECTION A-A
(UPHILL SIDE)**



SECTION B-B



**SECTION C-C
(DOWNHILL SIDE)**

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" x 18" smooth dowels @ 22" O.C., wrapped or greased.
- ④ See Engineering Standard 4440 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 Engineering Standard 4110 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.

REVISIONS	BY	APP	DATE
Revised section A&C ramp	SR	BL	1-14
Modified for ADA requirements	MG	MH	1-13
Drafting edits	JDL	MH	10-12
STANDARD CURRENT AS OF:		January 2016	



CROSS GUTTER

GENERAL NOTES:

Curb ramps shall be constructed per Engineering Standard 4440 in conjunction with current California Department of Transportation Standard Plans RSP A88A and RSP A88B with the following exceptions (a copy of the standard current at the time of this printing is included in the appendices):

1. Dimension "T" for the thickness of the concrete shall be 4" in the curb ramp area and 6" in the curb and gutter area in accordance with Engineering Standards 4030 and 4110. Concrete shall be Class 3.
2. Curb ramps shall include 4" of Class 3 aggregate base under the sidewalk area of the curb ramp and 6" of Class 3 aggregate base under the curb and gutter area of the curb ramp.
3. Curb ramp shall be reinforced (#3 @ 18" O.C. or #4 @ 24" O.C.) both ways the full width and depth of the curb ramp. For corner curb ramps reinforcement shall be installed throughout the curb ramp beginning at the BCR and end at the ECR. For mid-block curb ramps reinforcement shall be installed throughout ramp, flare and end at grooving.
4. Grooving shall be tooled, not cut.
5. ½" X 18" smooth bar dowels shall be provided at expansion joints at 24" O.C.
6. Street surface within 4' of curb ramp bottom may not slope greater than 5% in any direction.
7. Curb ramp gutter dimensions to match adjacent gutters.
8. See Engineering Standard 4110 for notes regarding pavement removal and repair.

TRUNCATED DOMES:

Truncated domes / Tactile Detectable Warning System shall conform to the following:

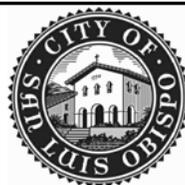
System Type:	Flexible mat with wear-resistant coating.
Material:	Polymer-modified concrete with fiberglass reinforcement.
Coating:	Field-applied system consisting of pigmented acrylic sealer and clear acrylic sealer.
Installation:	Bonded to concrete substrate on 100% of area by flexible acrylic resins.
Fitting:	Mats can be abutted with visually seamless result.
Field Cutting:	Can be trimmed to size and shape with razor-knife.
Water Absorption:	ASTM D570 Water Absorptions of Plastics: 6.5%
Water Vapor Transmission:	ASTM E69 Test Methods for Water Vapor Transmission of Materials: PERM = 0.958
Non-Slip Surface:	Bonded application of #30 or #20 silver silica sand of entire field and domes.
Slip Resistance:	In addition to dome, system incorporates medium (#20 mesh) or fine (#30 mesh) graded silver silica sand into top coating.
Compressive Strength:	ASTM C109 compressive Strength of Hydraulic Cement Mortars: 5690 PSI
Tensile Strength:	ASTM C190-85 Tensile Strength of Hydraulic Cement Mortars: 855 PSI
ADA Compliance:	Conformance with Department of General Services, Division of State Architect.
Flexural Strength:	1835 PSI
Warranty:	5 years
Color:	Yellow conforming to Federal Standard 595B, color No. 33538.

1. Truncated domes / Tactile Detectable Warning Systems shall be SafetyStep TD Traditional or approved equal and installed in accordance with manufactures recommendations.
2. The finished surface of the detectable warning mat shall be free from blemishes.
3. Dome pattern shall be aligned with the path of travel.
4. When installing Detectable Warning Material on an existing curb ramp all cracks with elevation differences shall be ground smooth. Cracks with width or depth greater than ¼" shall be patched with a non-shrink grout to a surface even with existing sidewalk prior to installation. Any elevation differences shall be ground smooth prior to installing domes.
5. Detectable warning material at all curb ramp locations shall be installed to a depth of 3' and to a width equal to that of the ramp width.

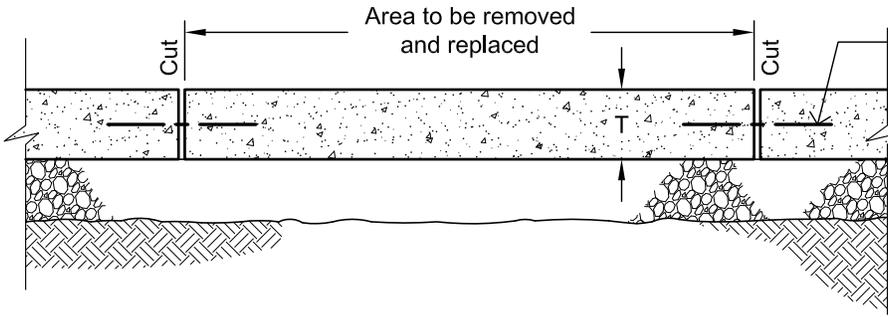
ADDITIONAL NOTES FOR MISSION STYLE AREA:

1. Additional notes for Mission Style Sidewalk Areas shall apply to those areas designated as Mission Style Sidewalk Areas per City Council Resolution (Mission Style Sidewalk District Map included in the appendices).
2. Ramp and adjoining sidewalks shall be constructed in accordance with Engineering Standard 4220 for color, finish and tile placement.

REVISIONS	BY	APP	DATE
<i>Revised Notes 12 and 14</i>	<i>MH</i>	<i>BL</i>	<i>10-09</i>
<i>Revised Notes 11 and 14</i>	<i>DVB</i>	<i>BL</i>	<i>12-08</i>
<i>Truncated Domes</i>	<i>JDL</i>	<i>BL</i>	<i>06-12</i>
STANDARD CURRENT AS OF:	January 2016		

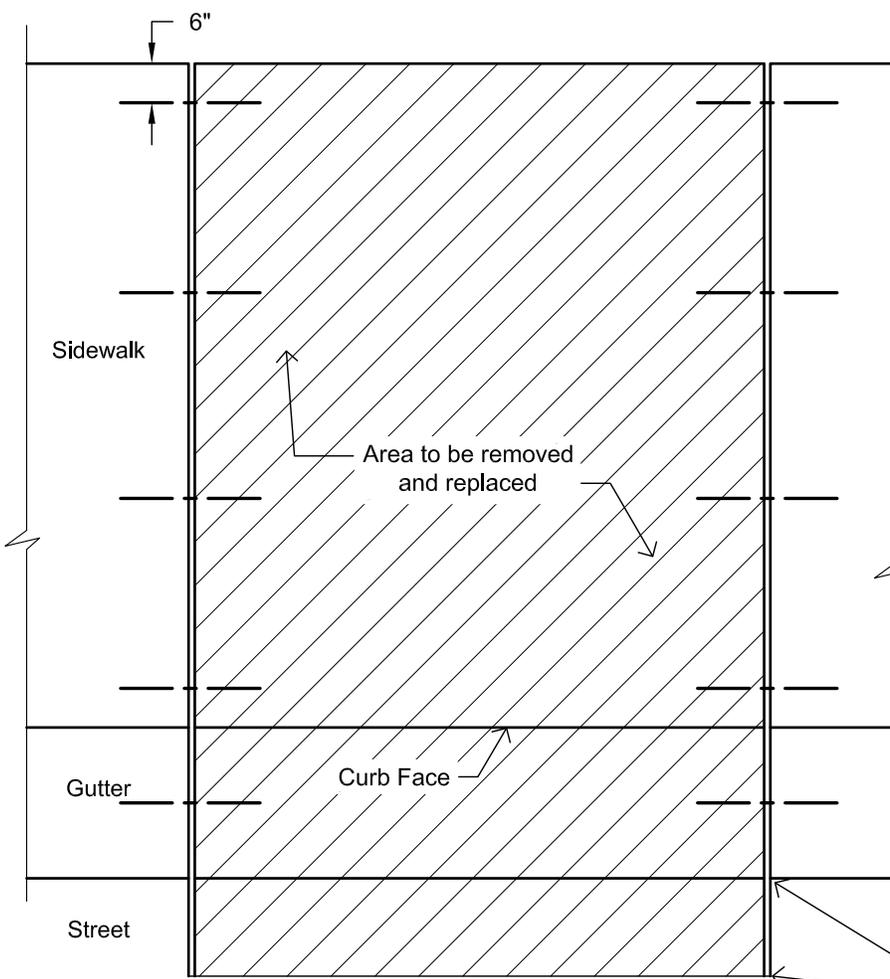


**CURB RAMP
CORNERS & MID-BLOCK**



1/2" x 18" smooth bars @ 24" O.C. in sidewalk, one each in curb and gutter, one end to be sleeved or greased.

SIDEWALK SECTION



NOTE: Remove complete sections of curb, gutter and sidewalk in compliance with section 73-1.03 of the standard specifications.

See Engineering Standard 4110 for notes regarding required pavement removal and repair.

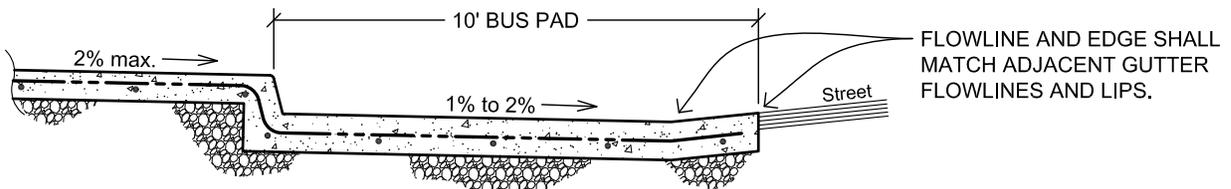
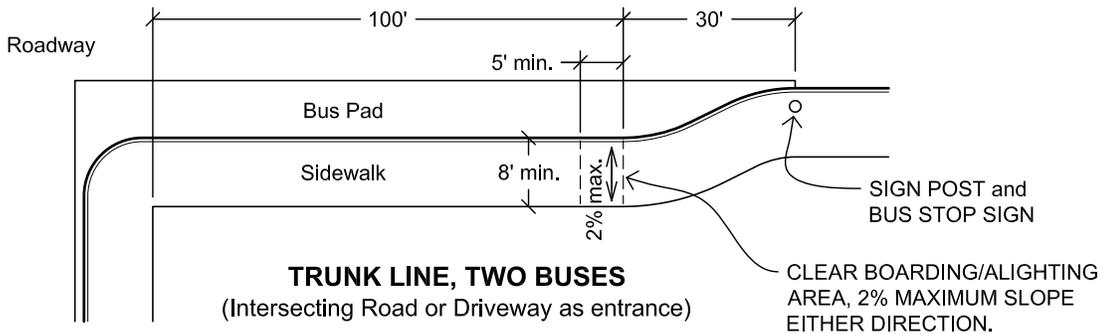
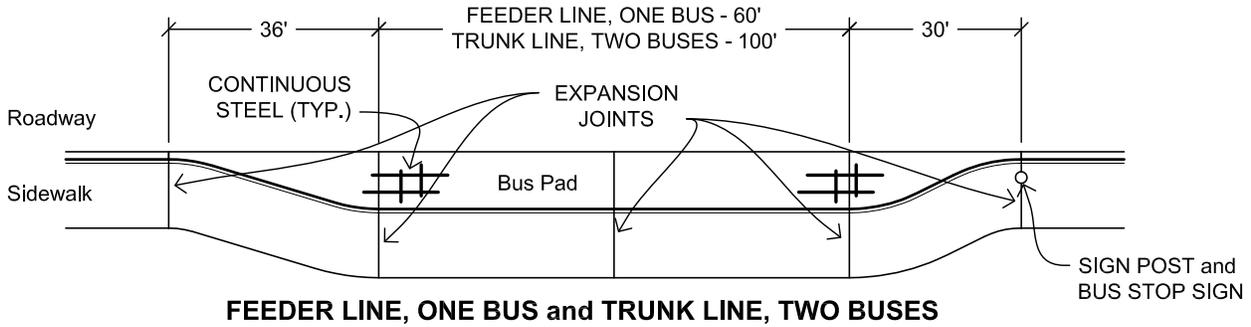
PLAN OF CURB, GUTTER & SIDEWALK

REVISIONS	BY	APP	DATE
<i>Revised General Note</i>	MH	BL	2-14
<i>Removal Cut Detail; Revised Note</i>	SR	BL	1-14
<i>Drafting edits</i>	JDL	MH	11-12
STANDARD CURRENT AS OF:		January 2016	



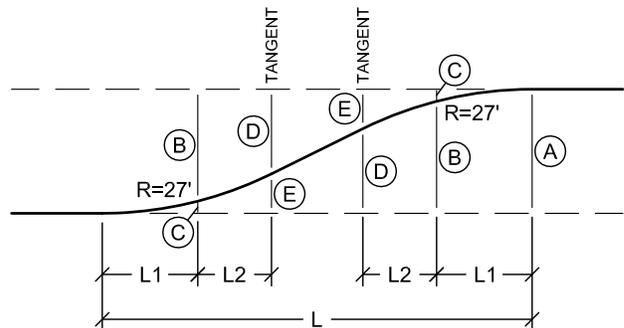
CUTTING CONCRETE

BUS TURNOUT DIMENSIONS FOR BUSES 8'6" WIDE AND THIRTY-SIX (36') TO FORTY (40') LONG



MONOLITHIC POUR NOTES:

1. Reinforce 10' wide bus pad and sidewalk within turnout. 8" Class 2 concrete with #4 @ 24" o.c. both ways reinforcing over 6" Class 2 Aggregate Base.
2. Curb height 8" maximum
3. See Engineering Standards 4030 and 4110 for Curb, Gutter and Sidewalk.
4. See Engineering Standard 4910 for sawcutting existing PCC.
5. See Engineering Standard 7210 for Sign Post.
6. Score at 10' intervals.



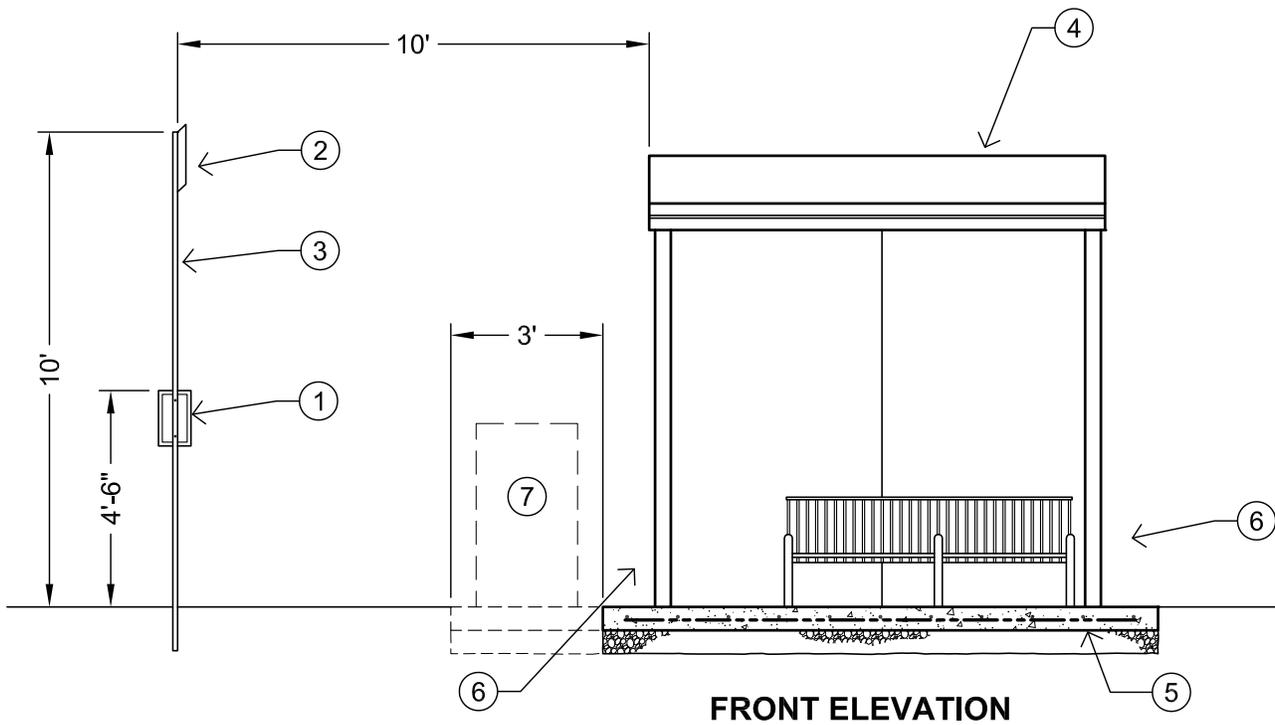
L	L1	L2	A	B	C	D	E
36	4.25	4.00	8.50	8.20	0.30	7.30	1.20
30	6.33	5.87	8.50	7.80	0.70	5.65	2.85

REVERSE TAPER - GEOMETRICS

REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	12-12
Add boarding/alighting area	JDL	DA	10-15
Revise rebar specs	JDL	WAP	11-98
STANDARD CURRENT AS OF:		January 2016	



CONCRETE BUS TURNOUT



FRONT ELEVATION

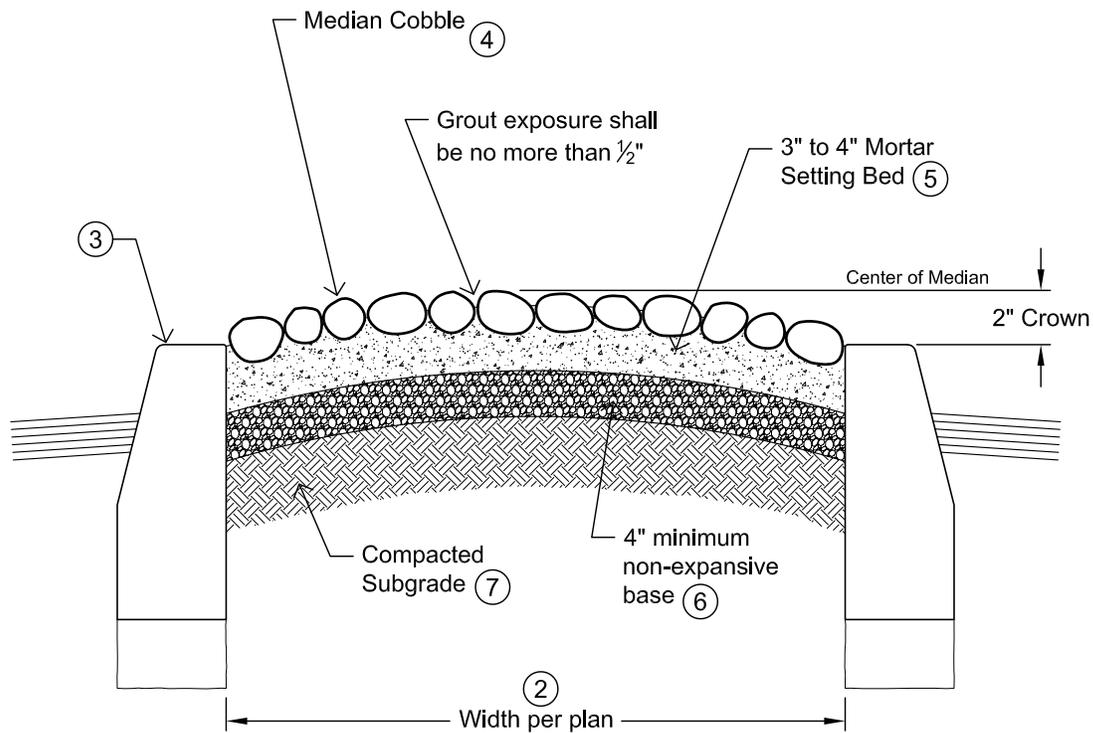
INSTALLATION NOTES:

- ① "AT-STOP" schedule holder. Model RCH-14, color RAL 5010 or approved equal. Install per manufacturer's recommendations.
- ② 12" x 18" Side-bracket mounted Route Sign with Route Block silk-screened route sticker. These are available from the City at pre-purchased cost.
- ③ See Engineering Standard 7210 for Metal Sign Post.
- ④ 9' Dome-Roof Shelter. Tolar Model #9NALD-PM or approved equal. NEC 690 Compliant Solar Lighting. 5' bench with back and one anti-vagrant bar. Color: RAL 5022. Shelter and bench to be bolted to concrete slab per manufacturer's recommendations. Available from Tolar Shelters (800) 339-6165 or approved equal. City may waive the requirement for the bus shelter if it is determined that the average number of boardings will be less than 8 riders per day.
- ⑤ Shelter to be installed on a 4" thick reinforced Class 3 concrete slab over 4" Class 3 base. Width of slab shall extend beyond the edges of the shelter a minimum of 12". Reinforce with #4 rebar @ 12" O.C. each way. Shelter to be centered on slab, exclusive of trash container area, unless adjustment required to meet Note 6 or other site circumstance.
- ⑥ Maintain a minimum sidewalk clearance of 4' from the face of curb to the front edge of the shelter and bench.
- ⑦ Where trash container is required, provide and mount trash can container per Engineering Standard 9060.

REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	11-12
Add Trash Can note; Revise #5	JDL	MH	5-13
Reduce bench size	DVB	BL	11-08
STANDARD CURRENT AS OF:		January 2016	



BUS STOP



SECTION ①

INSTALLATION NOTES:

- ① Cobble median work shall conform to to the provisions in Section 73, of the Standard Specifications.
- ② Contractor shall install cobble median in non-pedestrian locations of curb islands as indicated on plans.
- ③ Concrete Curbs shall be installed per Engineering Standard 4020.
- ④ Median Cobble shall be 2" to 6" Sound River Worn Granite cobbles, or approved equal, and shall not be of uniform diameter.
- ⑤ Mortar shall comply with SECTION 51-1.02F "Mortar" of the Standard Specifications.
- ⑥ Cobble base material shall be Class II aggregate base compacted to a relative compaction of 95%.
- ⑦ Subgrade material shall be compacted to 90% relative compaction.

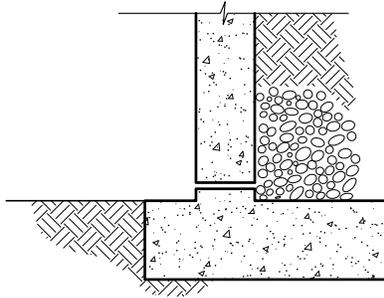
REVISIONS	BY	APP	DATE
<i>New Standard</i>	<i>JDL</i>	<i>MH</i>	<i>5-13</i>
<i>Revised Note 1</i>	<i>SR</i>	<i>BL</i>	<i>1-14</i>
STANDARD CURRENT AS OF:	January 2016		



RAISED COBBLESTONE MEDIAN

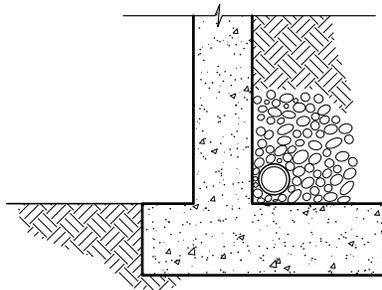
4940

WALL DRAINAGE:



Place a 12" layer of coarse gravel against the back of the wall and provide a $\frac{3}{4}$ " weep hole (or omit the mortar from the vertical joint in block walls) just above the ground level at 32" o.c. No weep holes are to drain across a public sidewalk.

OR



Place a 3" diameter perforated pipe along the back of the wall with a 12" layer of gravel around it, set to drain at intermittent collection points. When a wall is constructed at back of a sidewalk, drainage must be directed underground to a new or existing conveyance system. Drainage can not outlet through curb face.

REVISIONS	BY	APP	DATE
<i>Redrawn to CAD</i>	<i>RMH</i>	<i>WAP</i>	<i>1-95</i>
<i>New border</i>	<i>JDL</i>	<i>WAP</i>	<i>9-97</i>
<i>Rem. General Notes; Drafting edits</i>	<i>JDL</i>	<i>MH</i>	<i>4-13</i>
STANDARD CURRENT AS OF:		January 2016	



**RETAINING WALL
DRAINAGE**

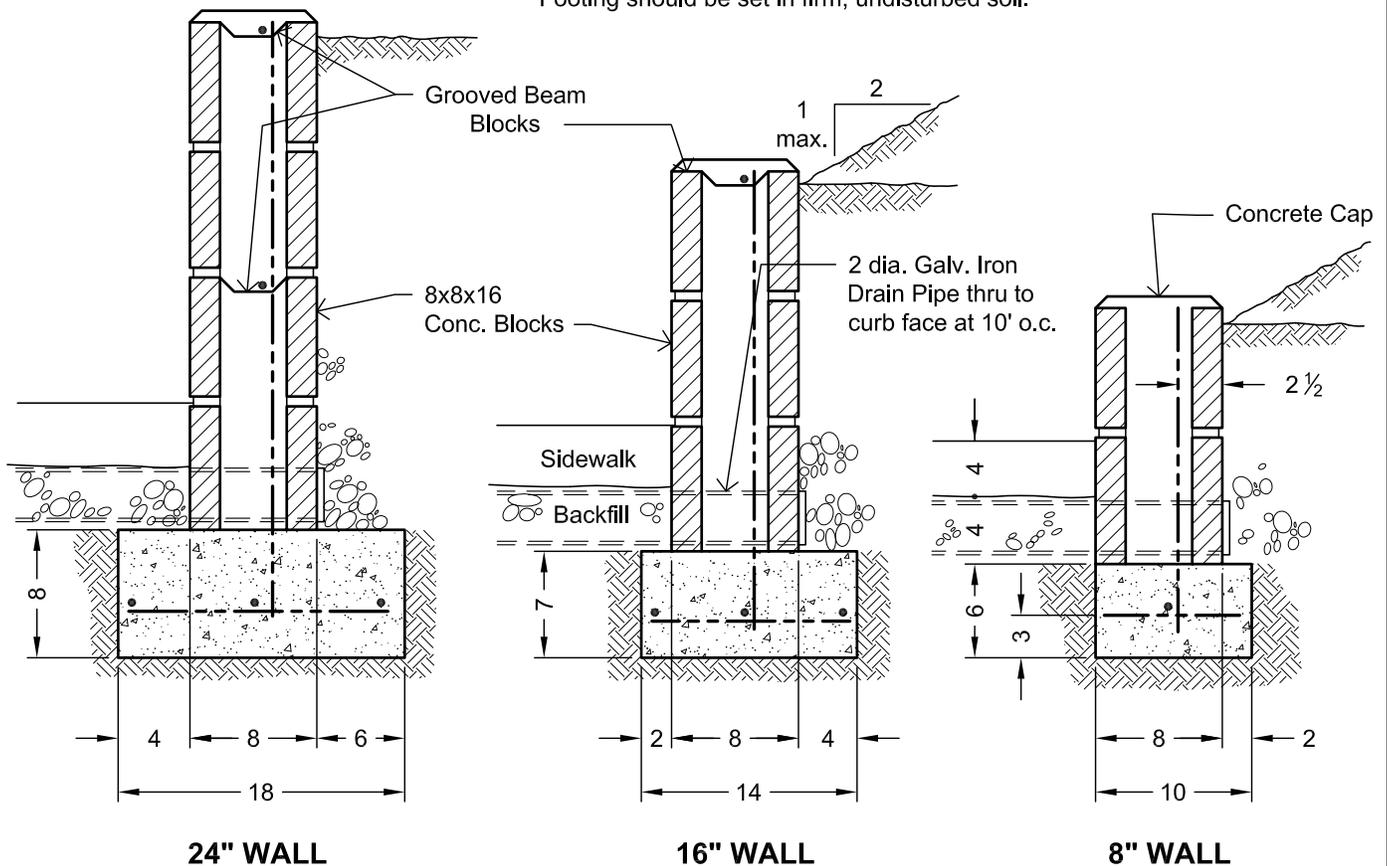
Steel:

Vertical and Transverse - #3 @ 32" o.c.
 Longitudinal - #3 as shown

Minimum Soil Bearing: 2000 psi (firm, dry soil of any type)

Minimum Concrete Strength: Class 3

Footing should be set in firm, undisturbed soil.

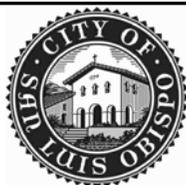


All dimensions in inches unless noted otherwise.

GENERAL NOTES:

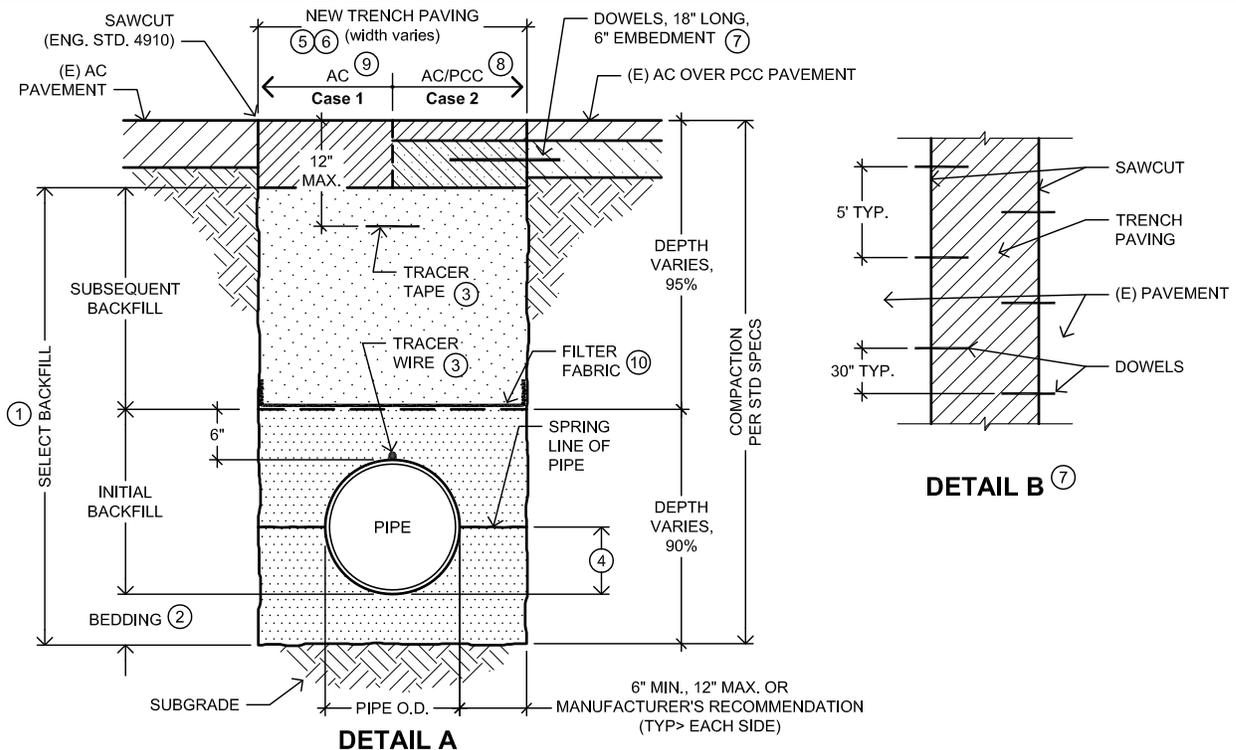
- A. Height of wall is vertical difference between finished grades.
- B. All cells must be filled with grout.
- C. First block may be embedded in footing.
- D. Place a layer of coarse gravel against the back of the wall and at least 1 ft³ of gravel around each drain.
- E. These walls are designed to be used at the back of sidewalks but may be used elsewhere if the bottom of footing is at least 12" below finish grade.
- F. These walls may be made of Reinforced Concrete with a wall thickness of 6".
- G. Omit mortar from the vertical joints in first course above the ground at 32" on center for weep holes, except walls adjacent to back of public sidewalk where drain pipes must be installed as shown above. (See Engineering Standard 5020).
- H. For walls higher than 24", construction shall conform to the Department of Transportation Standard Plans for retaining walls for either concrete or masonry construction.

REVISIONS	BY	APP	DATE
Revise title block; Concrete strength	SR	BL	1-14
New border	JDL	WAP	9-97
Drafting edits	JDL	MH	12-12
STANDARD CURRENT AS OF:		January 2016	



**SHORT
RETAINING WALLS**

5030



INSTALLATION NOTES:

- ① See City Standard Specifications, Section 26-1 & 77-1, for backfill material and bedding requirements.
- ② Bedding shall be 4" thick except as otherwise noted in the Standard Specifications.
- ③ All waterlines and sewer force mains shall be installed with tracer tape and a magnetic tracer wire as shown above. Gravity Pipes shall be installed with underground tracer tape only. Tracer wire shall be 14-gauge insulated solid copper with white or other approved light color insulator. Tracer wire shall be secured to the center of the top of the pipe with tape at 6 foot intervals. Adjacent to each manhole and lift station, a G-5 utility well shall be installed per Engineering Standard 6040 for access to tracer wire. Tracer wire shall be continuous and shall be tested for continuity. Wire to services, fire lines, etc. shall be joined to wire on main. Tracer wire joints shall be soldered and wrapped with electrical tape.
- ④ When flexible pipe (PVC, HDPE, etc.) is used, pipe shall be backfilled to the spring line, compacted and backfill tested prior to completing initial backfill.
- ⑤ The streets of San Luis Obispo are generally paved with either AC, PCC, or a combination of the two. Unless clearly indicated on the plans, it is the contractor's responsibility to determine the nature of the paving material. (Case 1 - AC only, Case 2 - AC over PCC)
- ⑥ Replacement pavement shall be "in kind." Concrete streets which contain a reinforcement fabric or grid shall be "tee cut" with the width of the AC cut extending one foot beyond each side of the trench. A new layer of pavement reinforcing fabric shall be installed above the new PCC and beneath the new AC.
- ⑦ All concrete street sections require 1/2" smooth steel dowels per Detail B above.
- ⑧ New PCC shall not be brought above existing PCC, shall be Class 2, and shall be 8" thick.
- ⑨ When only AC is used, new AC shall be 6" thick on local streets, and 10" thick on collector or arterial streets.
- ⑩ Filter fabric shall be required when initial backfill is float rock. Filter fabric shall be placed between initial and subsequent backfill and wrapped up trench sides 6". Filter fabric shall conform to the requirements in Section 88 and shall be permeable and non-woven. Filter fabric shall be Mirafi 140 NC or equal.

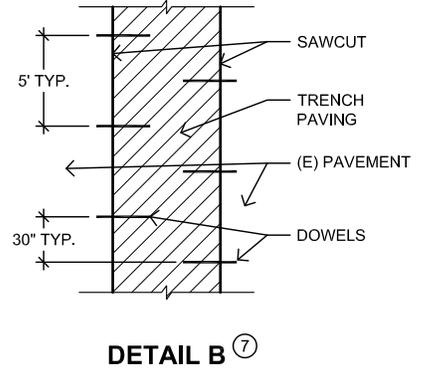
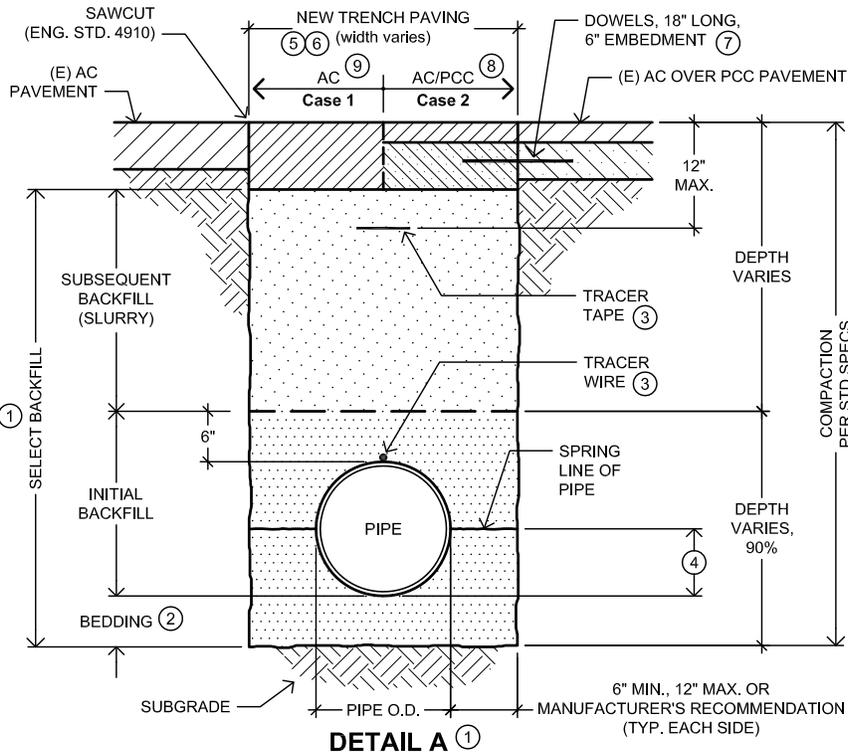
GENERAL NOTES:

- A. Backfill testing is required and results are subject to approval by the City Engineer.
- B. No longitudinal joints or seams are allowed in bike lanes. If a longitudinal joint may result due to the contractor's work, or this requirement, the contractor shall remove a minimum of 2" of asphalt from the pavement across the entire bike lane using a method approved by the City and resurface the bike lane to the satisfaction of the City.
- C. During backfill operations, the trench shall be backfilled and compacted and tested to the spring line of any utilities crossing the trench before proceeding with further backfill.
- D. Float rock may be substituted for initial backfill when ground water is present as approved by the Engineer.
- E. Concrete plug maybe required by the Engineer where groundwater is anticipated. Location and frequency shall be determined by the Engineer.

REVISIONS	BY	APP	DATE
Revise Note 3, drafting edits	MH	BL	6-12
Revise Note 1 & 8	SR	BL	1-14
Revise Note 3	JDL	DA	10-15
STANDARD CURRENT AS OF:		January 2016	



TRENCH DETAIL #1
PAVED OR UNPAVED STREETS



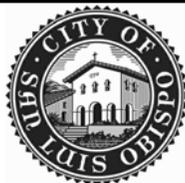
INSTALLATION NOTES:

- ① See Standard Specifications, Section 26-1 & 77-1, for backfill material and bedding requirements. The remainder (subsequent backfill) shall be a plant-mixed slurry, vibrated with 1" minimum stinger. (Slurry to contain 94 lbs. cement per cubic yard.)
- ② Bedding shall be 4" thick except as otherwise noted in the Standard Specifications.
- ③ All waterlines and sewer force mains shall be installed with tracer tape and a magnetic tracer wire as shown above. Gravity Pipes shall be installed with underground tracer tape only. Tracer wire shall be 14-gauge insulated solid copper with white or other approved light color insulator. Tracer wire shall be secured to the center of the top of the pipe with tape at 6 foot intervals. Adjacent to each manhole and lift station, a G-5 utility well shall be installed per Engineering Standard 6040 for access to tracer wire. Tracer wire shall be continuous and shall be tested for continuity. Wire to services, fire lines, etc. shall be joined to wire on main. Tracer wire joints shall be soldered and wrapped with electrical tape.
- ④ When flexible pipe (PVC, HDPE, etc.) is used, pipe shall be backfilled to the spring line, compacted and backfill tested prior to completing initial backfill.
- ⑤ The streets of San Luis Obispo are generally paved with either AC, PCC, or a combination of the two. Unless clearly indicated on the plans, it is the contractor's responsibility to determine the nature of the paving material. (Case 1 - AC only, Case 2 - AC over PCC)
- ⑥ Replacement pavement shall be "in kind." Concrete streets which contain a reinforcement fabric or grid shall be "tee cut" with the width of the AC cut extending one foot beyond each side of the trench. A new layer of pavement reinforcing fabric shall be installed above the new PCC and beneath the new AC.
- ⑦ All concrete street sections require 1/2" smooth steel dowels per Detail B above.
- ⑧ New PCC shall not be brought above existing PCC, shall be Class 2, and shall be 8" thick.
- ⑨ When only AC is used, new AC shall be 6" thick on local streets, and 10" thick on collector or arterial streets.

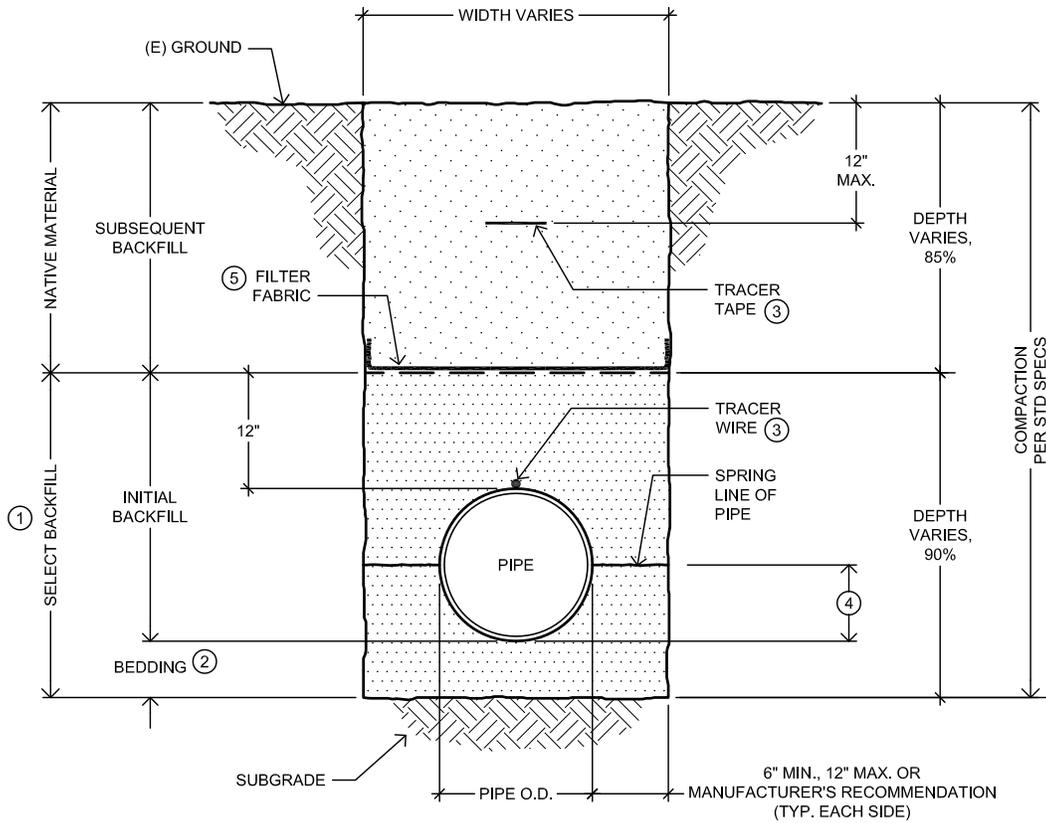
GENERAL NOTES:

A. No longitudinal joints or seams are allowed in bike lanes. If a longitudinal joint may result due to the contractor's work, or this requirement, the contractor shall remove a minimum of 2" of asphalt from the pavement across the entire bike lane using a method approved by the City and resurface the bike lane to the satisfaction of the City.

REVISIONS	BY	APP	DATE
Revise Note 3	MH	MH	6-12
Revise Note 3	JDL	DA	10-15
Revise Note 1 & 8	SR	BL	1-14
STANDARD CURRENT AS OF:		January 2016	



TRENCH DETAIL #2
PAVED OR UNPAVED STREETS



DETAIL

NOTES:

- ① See City Standard Specifications, Section 26-1 & 77-1, for backfill material and bedding requirements.
- ② Bedding shall be 4" thick except as otherwise noted in the Standard Specifications.
- ③ All waterlines and sewer force mains shall be installed with tracer tape and a magnetic tracer wire as shown above. Gravity Pipes shall be installed with underground tracer tape only. Tracer wire shall be 14-gauge insulated solid copper with white or other approved light color insulator. Tracer wire shall be secured to the center of the top of the pipe with tape at 6 foot intervals. Adjacent to each manhole and lift station, a G-5 utility well shall be installed per Engineering Standard 6040 for access to tracer wire. Tracer wire shall be continuous and shall be tested for continuity. Wire to services, fire lines, etc. shall be joined to wire on main. Tracer wire joints shall be soldered and wrapped with electrical tape.
- ④ When flexible pipe (PVC, HDPE, etc.) is used, pipe shall be backfilled to the spring line, compacted and backfill tested prior to completing initial backfill.
- ⑤ Filter fabric shall be required when initial backfill is float rock. Filter fabric shall be placed between initial and subsequent backfill and wrapped up trench sides 6". Filter fabric shall conform to the requirements in Section 88 and shall be permeable and non-woven. Filter fabric shall be Mirafi 140 NC or equal.

GENERAL NOTES:

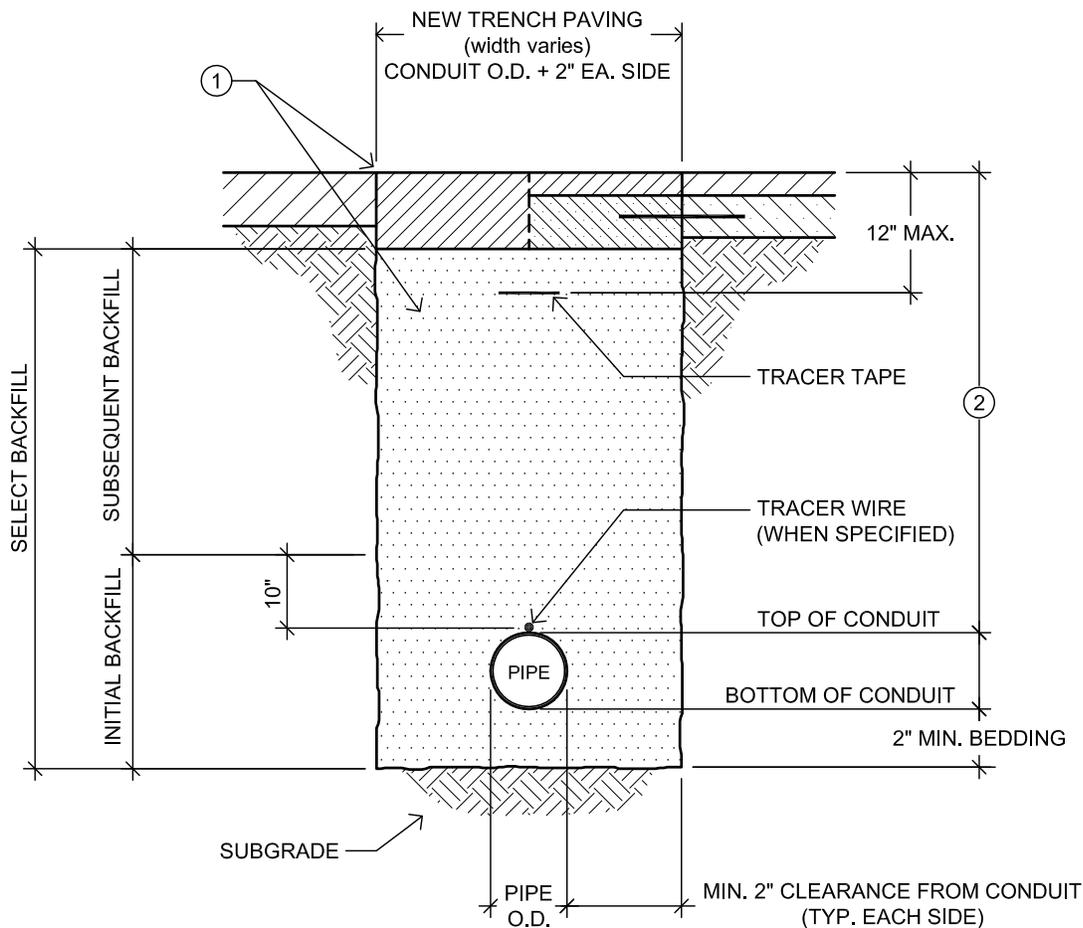
- A. During backfill operations, the the trench shall be backfilled and compacted and tested to the spring line of any utilities crossing the trench before proceeding with further backfill.
- B. Float rock may be substituted for initial backfill when ground water is present as approved by the Engineer.
- C. Concrete plug maybe required by the Engineer where groundwater is anticipated. Location and frequency shall be determined by the Engineer.

THIS STANDARD APPLIES ONLY TO AREAS THAT ARE NON-TRAFFIC, NOT IN STREETS OR PARKING LOTS.

REVISIONS	BY	APP	DATE
Revise Note 3	MH	BL	6-12
Revise Note 1	MH	SR	1-14
Revise Note 3	JDL	DA	10-16
STANDARD CURRENT AS OF:		January 2016	



TRENCH DETAIL #3
UNPAVED NON-TRAFFIC AREAS



INSTALLATION NOTES:

- ① See Engineering Standards 6020, 6025, and 6030, and Section 26-1 & 77-1, of the Standard Specifications for requirements regarding trench backfill and restoration of surface improvements.
- ② Depth of Conduit shall conform to the following:
 - Min. 18" for Traffic Signal wire
 - Min. 24" for Electrical service and Fiber-optic wire
 - Min. 30" for all other wire types

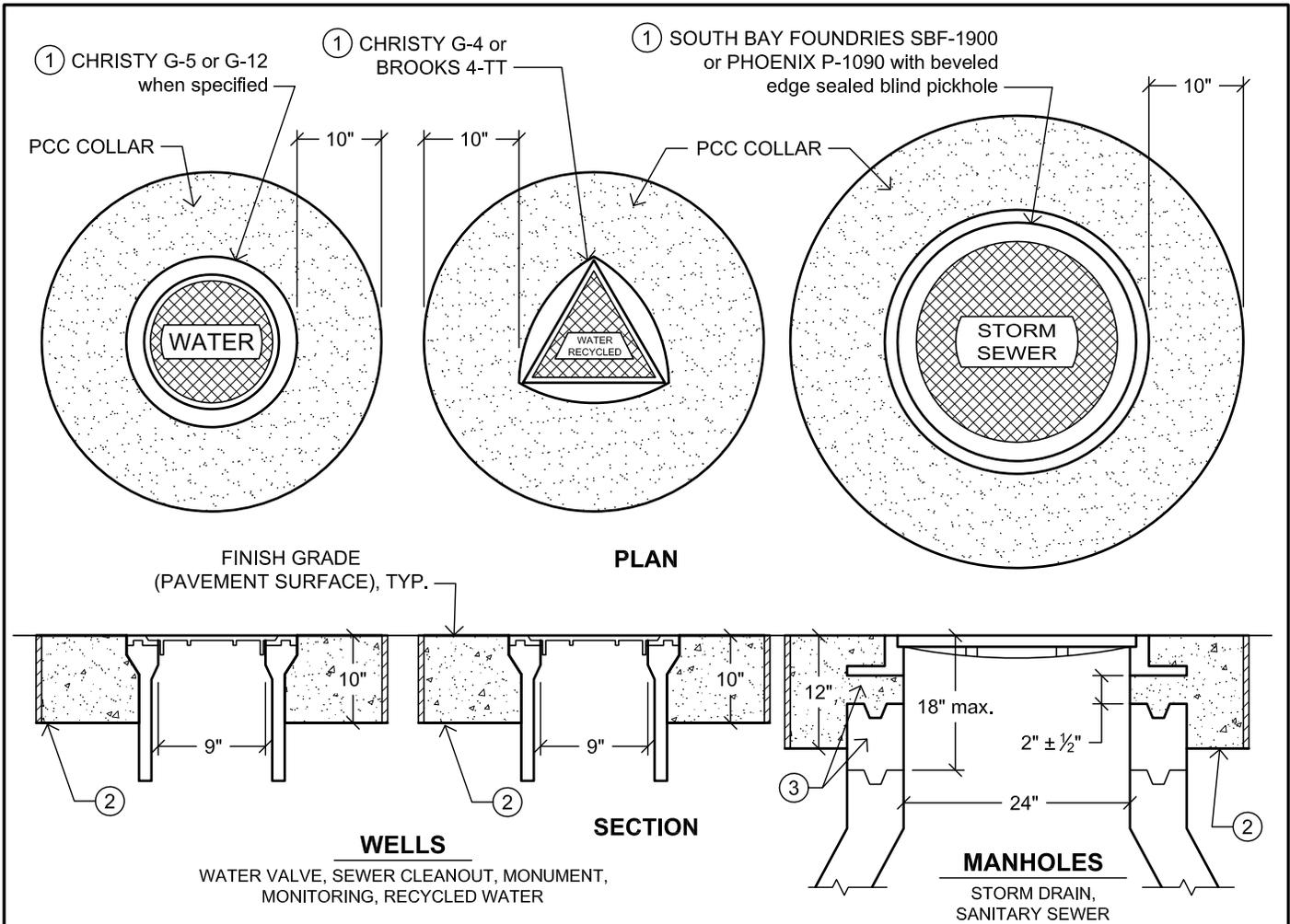
GENERAL NOTE:

A. See Standard Specification 86-2.05 for information regarding conduit materials, use and installation.

REVISIONS	BY	APP	DATE
"Tracer wire when specified"	JDL	DA	10-15
Revise conduit note, title	JDL	MH	9-12
Revise drawing & Note 1; delete 3	SR	BL	1-14
STANDARD CURRENT AS OF:		January 2016	



TRENCH DETAIL #4
 CONDUIT TRENCH FOR TRAFFIC SIGNALS, STREET LIGHTS, AND CITY COMMUNICATIONS 6035



INSTALLATION NOTES:

- ① All utility covers to be raised shall be replaced as needed to conform to covers specified above. Covers shall be imprinted with the appropriate utility name.
- ② Collars constructed in P.C.C. streets shall be circular in shape and shall be separated from the adjacent P.C.C. street by either a cold joint or a tin form.
- ③ **MANHOLES:** Rings shall be 3" or 6". Top of cone to top of frame shall not exceed 18". Grade rings and manhole frame shall be sealed at every joint with butyl rubber (CONSEAL CS-102 or equal). When proper grade cannot be achieved with standard grade rings, the manhole frame shall be suspended in position over the last grade ring, the inside of the frame and shaft shall be formed with tube or monoform system, and the concrete collar shall be poured to provide the joint between the manhole frame and the grade ring stack. Inside of rings shall be grouted with non-shrink grout to obtain a smooth surface free from gaps, holes and sharp edges. 2" clearance applies to the low side of the frame. Clearance may be greater on the high side as dictated by the street grades and as directed by the City Engineer. Use 6" concrete reducing rings in cases where existing manhole opening must be reduced to accommodate the new frame and cover.

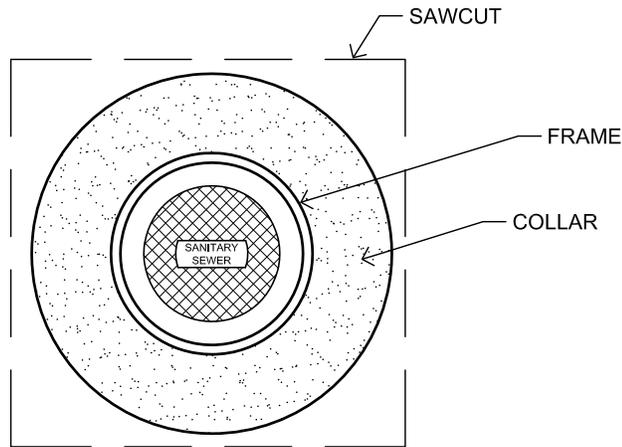
GENERAL NOTES:

- A. Completely remove existing concrete collar prior to pouring new concrete collar. The diameter of the new collar shall be equal to the existing collar or the minimum diameter specified in the above detail, whichever is larger.
- B. Concrete shall be Class 2 concrete, troweled to street grade, and allowed to cure for 24 hours prior to any traffic use. Class 1 concrete with 2% non-corrosive polar set may be required to allow expedited traffic use following 4 hour cure time.
- C. Depth and radius dimensions shown apply to similar covers that are not shown.
- D. When a roadway is overlaid with asphalt concrete, the contractor may use extension rings to adjust utility covers to the new surface elevation. When extension rings are used to adjust grade, a preformed thermoplastic ring shall be applied around the perimeter of the concrete. Extension ring shall be compatible with the existing cover. Thermoplastic ring width shall be a minimum of 6 inches.
- E. Utility frame and cover shall be installed so that cover does not rock or rattle and is flush with adjacent surface.

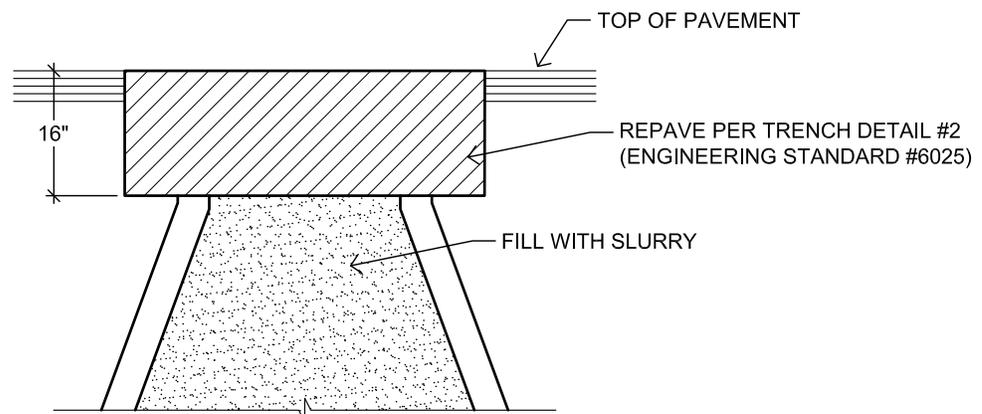
REVISIONS	BY	APP	DATE
Update Note 2	WH	BL	8-11
Add Note 7	DVB	BL	11-08
Reorganize Notes; Add Note E	JDL	BL	6-12
STANDARD CURRENT AS OF:		January 2016	



**UTILITY COVER
GRADE ADJUSTMENT
& P.C.C. COLLAR**



STRUCTURES, WELLS & COLLARS



STRUCTURES

GENERAL NOTES:

- A. All storm drains, waterlines and sewerlines that are taken out of service shall be abandoned by disconnecting the pipeline from the active system, plugging all openings, and removing all related surface features, such as: Blow-offs, Air Release Valves, Valve Wells, Vaults, Boxes, Frames, Covers and Collars, Manholes, and Cleanout Wells. All openings shall be capped with approved fittings, such as: Expandable plugs for sewerlines, Caps, Blind Flanges, Dresser Couplings with Plug, and Valves.
- B. All water services from abandoned mains shall be pinched off, capped or plugged with approved fittings, or closed with the corp stops. If the water services are being abandoned and the main is to remain live, services shall be shut off at the corp stop and capped or plugged with a threaded brass fitting.
- C. Water valves that are determined by the Utilities Department to be redundant or otherwise unnecessary shall be removed.
- D. Valve well and cleanout risers shall be removed, backfilled with sand, and compacted to 95%. The tops of all manholes and other structures to be abandoned shall be removed by sawcutting using square cuts in accordance with Engineering Standard 4910. The structure shall be removed to a depth of 16" below street grade and filled with slurry backfill to the top of the remaining structure see section 77-1.02B of the Standard Specifications. Pavement replacement shall be per Trench Detail #2 (Engineering Standard 6025).
- E. All sewer laterals from the abandoned sewer main shall be capped or plugged with approved fittings. If the sewer laterals are being abandoned and the main is to remain live, the laterals shall be excavated at the main by the contractor and the actual abandonment will be performed by the City. A 48-hour notice shall be given to the City to schedule these abandonments.

REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	2-13
Revise Note D	SR	BL	1-14
Revised Note "C"	MH	BL	10-09
STANDARD CURRENT AS OF:		January 2016	



**UTILITY PIPELINE
ABANDONMENT**

CRITERIA FOR THE SEPARATION OF WATER MAINS AND SANITARY SEWERS

NEW FACILITIES SEPARATION STANDARDS

New water mains and sewer lines must comply with most recent version of the California Code of Regulations Section 64572 Title 22 Chapter 16.

1. Parallel Construction: The horizontal distance between pressure water mains and sewer must be at least 10 feet.
2. Perpendicular Construction (Crossing): Pressure water main must be at least 12 inches above sanitary sewer lines where these lines cross.
3. Separation distance is measured from the nearest edge of the facilities.
4. Water mains and sewer lines must not be installed in the same trench.

EXCEPTIONS TO BASIC SEPARATION STANDARDS

When local conditions or existing facilities create a situation where there is no alternative but to install water mains or sewer lines at a distance less than that required by the new facilities separation standards. In such cases, alternative construction criteria must be followed as allowed in the Department of Health Services Memorandum for Guidance Criteria for separation of water mains and non-potable pipelines.

ALTERNATIVE CRITERIA FOR CONSTRUCTION

The construction criteria for sewer lines or water mains where the Basic Separation Standards cannot be attained are shown in Figures 1 and 2, Engineering Standard 6140. There are two situations encountered:

Case 1 -- New sewer line -- new or existing water main.

Case 2 -- New water main -- existing sewer line.

For Case 1, the alternate construction criteria apply to the sewer line.

For Case 2, the alternate construction criteria may apply to either or both the water main and sewer line.

The construction criteria apply to the house laterals that cross above a pressure water main. House laterals crossing below water main must have 4 inches of separation between water main and lateral.

CONSIDERATION OF RECYCLED WATER

Recycled water mains must be treated as sewer mains when considering their separation from potable water.

Recycled water mains must be treated as potable water mains when considering their separation from sewers.

REVISIONS	BY	APP	DATE
Revise notes: B.c2, B.e Add F note	SR	BL	3-06
Revised all Notes	MH	BL	1-14
Consolidate 6110, 6120 & 6130	JDL	JDW	6-02
STANDARD CURRENT AS OF:		January 2016	



WATER – SEWER SEPARATION CRITERIA TEXT

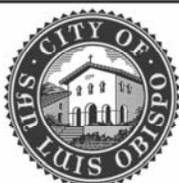
CASE 1
NEW SEWER MAIN BEING INSTALLED
(See Figure 1, Engineering Standard 6140)

ZONE	SPECIAL CONSTRUCTION REQUIRED FOR SEWER
A	Sewer lines parallel to water mains shall not be permitted in this zone without approval from the responsible health agency and water supplier.
B	A sewer line placed <u>parallel</u> to a water line shall be constructed of: 1. Use HDPE pipe with fused joints.
C	A sewer line <u>crossing</u> a water main shall be constructed of: 1. Use HDPE pipe with fused joints.
D	A sewer line <u>crossing</u> a water main shall be constructed of: 1. User HDPE pipe with fused joints.

CASE 2
NEW WATER MAIN BEING INSTALLED
(See Figure 2, Engineering Standard 6140)

ZONE	SPECIAL CONSTRUCTION REQUIRED FOR WATER
A	No water mains parallel to sewers shall be constructed without approval from the health agency.
B	If the sewer <u>paralleling</u> the water main does not meet the Case 1, Zone B requirements, the water main shall be constructed of: 1. Ductile iron pipe 2. Class 200 PVC Pipe
C	If the sewer <u>crossing</u> the water main does not meet the Case 1, Zone C requirements, the water main shall have no joints in Zone C and be constructed of: 1. Ductile iron pipe 2. Class 200 PVC Pipe
D	If the sewer <u>crossing</u> the water main does not meet the Case 1, Zone D requirements, the water main shall have no joints within 4 feet from either side of the sewer and shall be constructed of: 1. Ductile iron pipe 2. Class 200 PVC Pipe

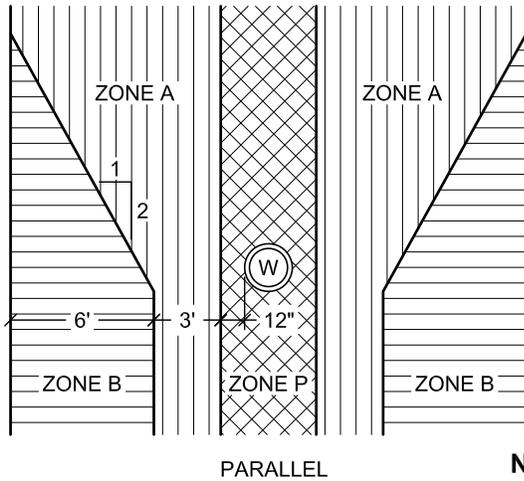
REVISIONS	BY	APP	DATE
Revise notes: B.c2, B.e Add F note	SR	BL	3-06
Revised all Notes	MH	BL	1-14
Consolidate 6110, 6120 & 6130	JDL	JDW	6-02
STANDARD CURRENT AS OF:		January 2016	



**WATER – SEWER
SEPARATION CRITERIA
TEXT**

CRITERIA FOR THE SEPARATION OF WATER MAINS AND SANITARY SEWERS

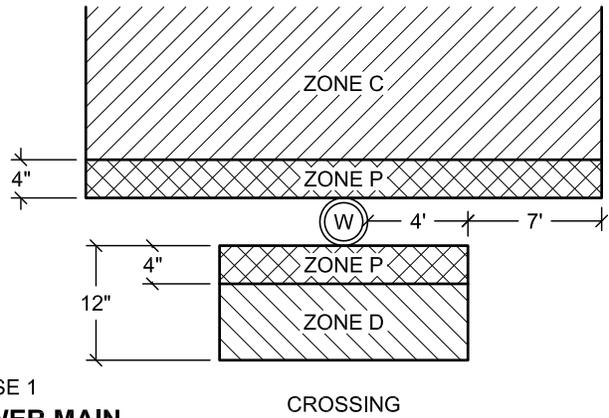
Refer to Engineering Standard 6110 for Separation Criteria Text



PARALLEL

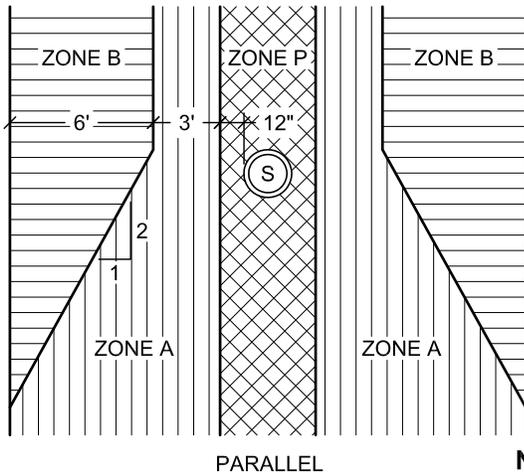
NEW SEWER MAIN

Figure 1



CROSSING

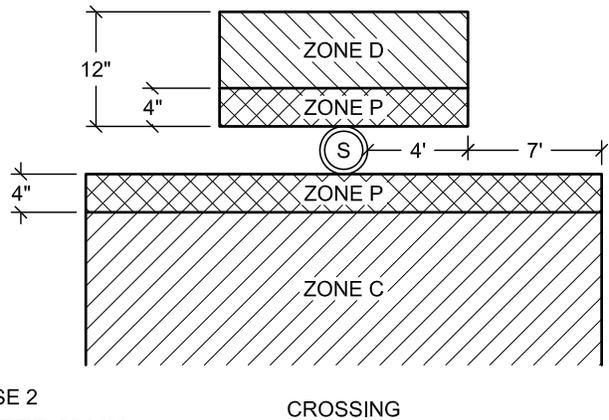
ZONE P is a prohibited zone



PARALLEL

NEW WATER MAIN

Figure 2



CROSSING

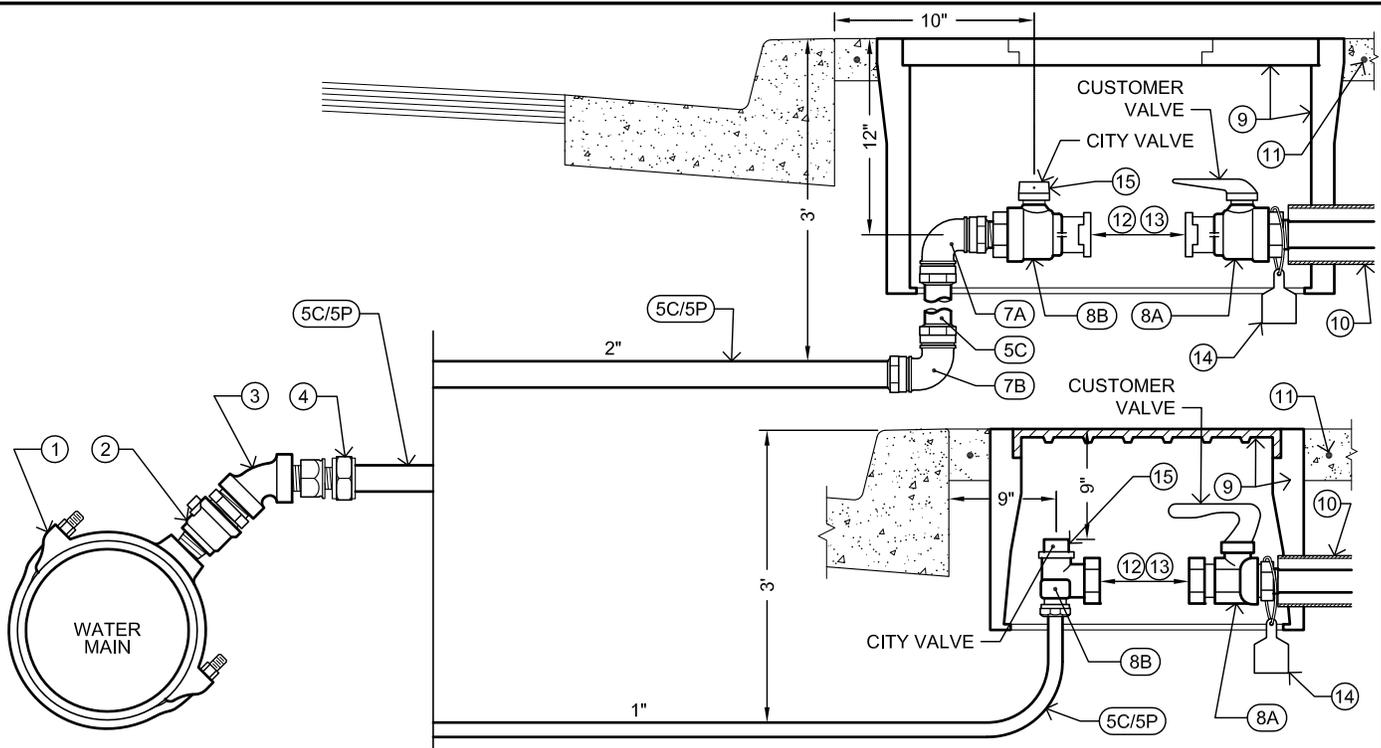
NOTES AND DEFINITIONS

- DIMENSIONS are from the outside of water main to outside of sewer line or manhole.
- FUSED JOINT: The joining of sections of pipe using thermal or chemical bonding processes.
- HEALTH AGENCY: The State Department of Health Services. For those water systems supplying less than 200 service connections, the local health officer shall act for the Department of Health Services.
- HOUSE LATERAL: A sewer pipe connecting the building drain and the main sewer line.
- WATER SUPPLIER: Any person who owns or operates a public water system.

REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	2-13
Reference to Std. #6110	JDL	JDW	1-03
Revised Separation Note	MH	BL	8-07
STANDARD CURRENT AS OF:		January 2016	



WATER - SEWER SEPARATION CRITERIA DETAILS



GENERAL NOTES:

- A. If service line is lead, galvanized steel or polybutylene, the entire service shall be replaced from the main.
- B. Households shall be notified at least one hour prior to water shut-off to make a connection.
- C. A 14 gauge (min.) insulated copper tracer wire shall be soldered and taped to locator wire on main line, looped around corp stop and run up to the meter box. The wire shall be taped to the service line at 7' intervals and 3' of wire shall be coiled in the meter box. Tracer wire color shall be light.
- D. All mains shall use a service saddle. CI and DI mains may be direct tap only with the written permission of the City Utilities Department.
- E. New/Replacement 1" water service shall be copper or iron pipe size (IPS). New/Replacement 2" water service shall be copper or copper tubing size (CTS) polyethylene.
- F. All new services or service replacements shall be 1" or 2". Any 3/4" or 1/2" services shall be upgraded to the next size (1" or 2") and an adaptor installed at the meter.
- G. If service replacement includes the tap at the main, the new connection shall be made 12" from the old connection. The old corp stop shall be closed and a threaded brass plug or cap installed.
- H. Any boxes which do not meet the current standards listed below shall be upgraded to those standards.
- I. Contractor shall ensure tubing is "bottomed out" in all Super Grip (SG) fittings while tightening.
- J. When recycled water is used on any parcel, a backflow preventer shall be installed on the potable water service line.
- K. When replacing an existing service line, the customer valve is not required to be replaced.
- L. Open trench water service replacements shall be installed perpendicular to the existing water main, when as measured along the main, the existing water service offset 5' or more from perpendicular.

INSTALLATION NOTES:

- ① Service saddle, double strap, CC threads: Installed per manufacturer's recommendations.
AC, CI and DIP main: Ford F202B Series
PVC Main: Ford F202BS Series
- ② Corporation Stop, ball type, CCxMIP:
1" - Ford FB400-4-NL
2" - Ford FB400-7-NL
- ③ 45° Bend, brass, FIPxFIP
- ④ Adaptor with sleeve:
1" for CTS tubing - Ford C84-44-Q-NL and 52 Insert
1" for IPS tubing - Ford C84-44-Q-NL and 5272 Insert
2" - Ford C84-77-Q-NL and 55 Insert

- ⑤ Service Tubing:
5C - Copper, type K, soft
5P - Polyethylene, 200 psi, AWWA C901 Centennial, Driscopipe or approved equal.
Service tubing for recycled water shall be purple or have a purple stripe or be wrapped in purple polyethylene sleeve conforming to AWWA A21.5 and shall be clearly labeled as non-potable.
- ⑥ Coupling 2": Ford C44-77-Q-NL, compression x compression, tube size.
- ⑦ 7A - 2" 90° bend, brass 2" MIP x Comp 90, Ford L84-77-Q-NL, tube size
7B - 90° bend, 2" Comp x Comp 90, Ford L44-77-Q-NL, tube size
- ⑧ Meter Box Valves:
8A (Customer side):
3/4" service - Ford B13-332-HT34-NL
1" service - Ford B13-444-HT34-NL
1 1/2" service - Ford B13-666-HT67S-NL
2" service - Ford B13-777-HT67S-NL
8B (City side):
1" service - Compression meter stop: CTS tubing - Ford KV43-444W-Q-NL; IPS tubing - Ford KV43-444W-NL and C86-44-Q-NL adaptor
2" service - 2" Curb stop, ball valve: Ford BF13-777W-NL, inlet FIP x outlet Meter Flange
- ⑨ Meter box and lid:
5/8", 3/4" and 1" water meter use Brooks 37 T Series for traffic areas, Armorcast #A6000485 for non-traffic areas, and Christy B12 for Mission Style areas. 1 1/2" and 2" water meter use Armorcast #A6001419, Armorcast cover (A6001420TDEB) with drop-in read lid (A6000481T-EB), 20K traffic rating, and Christy B36 for Mission Area. IN MISSION STYLE SIDEWALK AREA as defined by City Council Resolution 4183, concrete boxes shall be per Engineering Standard 1010, Section A. WHEN USED FOR RECYCLED WATER, all lids shall be integrally cast with the words "Recycled Water" or "Reclaimed Water".
- ⑩ Install PVC sleeve to 12" behind back of sidewalk. 5/8", 3/4", or 1" water meter use 2" sleeve. 1 1/2" or 2" water meter use 3" sleeve.
- ⑪ #4 rebar all around the meter box
- ⑫ Meter adaptor (as needed): 1" City valve to 3/4" Customer valve use Jones J-128H or Ford A24. 2" City valve to 3/4" Customer valve use Ford A67.
- ⑬ When meter box is to be installed in landscaped area, a 4" thick concrete apron shall be placed for a minimum of 12" around the box.
- ⑭ Install Recycled Water warning tags per Engineering Standard 8810 when used for recycled water.
- ⑮ Water services serving corner lots or services serving units behind other units shall be designated to an address and/or unit by attaching a 1 1/2" brass tag with 3/4" minimum letters/numbers to the curb stop with a non-ferrous wire.

APPROVED EQUAL ACCEPTED FOR ALL FITTINGS

REVISIONS	BY	APP	DATE
Modify parts manufacturer	JDL	MH	3-13
New Note 17; Revised Note 8	SR	BL	6-12
Drafting edits; Renumber Notes	JDL	MH	11-12
STANDARD CURRENT AS OF:		January 2016	



**WATER SERVICES
NEW & REPLACEMENTS**

GENERAL NOTES:

- A. If service line is lead, galvanized steel, or polybutylene, the entire service shall be replaced from the main to the meter per Engineering Standard 6210.
- B. Any meter boxes which do not meet current standards per Engineering Standard 6210 shall be upgraded to those standards.
- C. Households shall be notified at least one hour prior to water being shut off to make a connection.
- D. A 14 gauge insulated copper tracer wire shall be tied to the corp stop and taped to the service line at 7' intervals. The wire shall be soldered to the existing tracer wire or existing copper service.

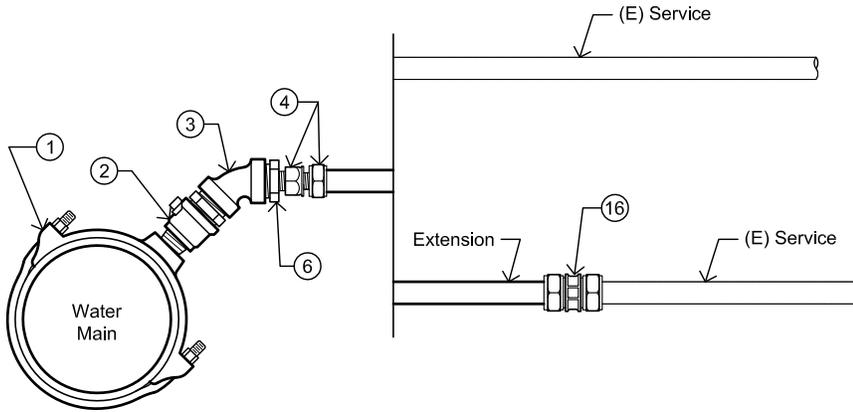
INSTALLATION NOTES:

- ① through ④ - See Engineering Standard 6210.
- ⑥ Add bell reducer and close nipple for existing 3/4" and 1 1/2" service lines.
- ⑩ Compression to compression coupling, J-2609SG

Type 1 - New main is closer to curb than existing main.

Type 2 - New main is further from curb than existing main.

(PE = Polyethylene)



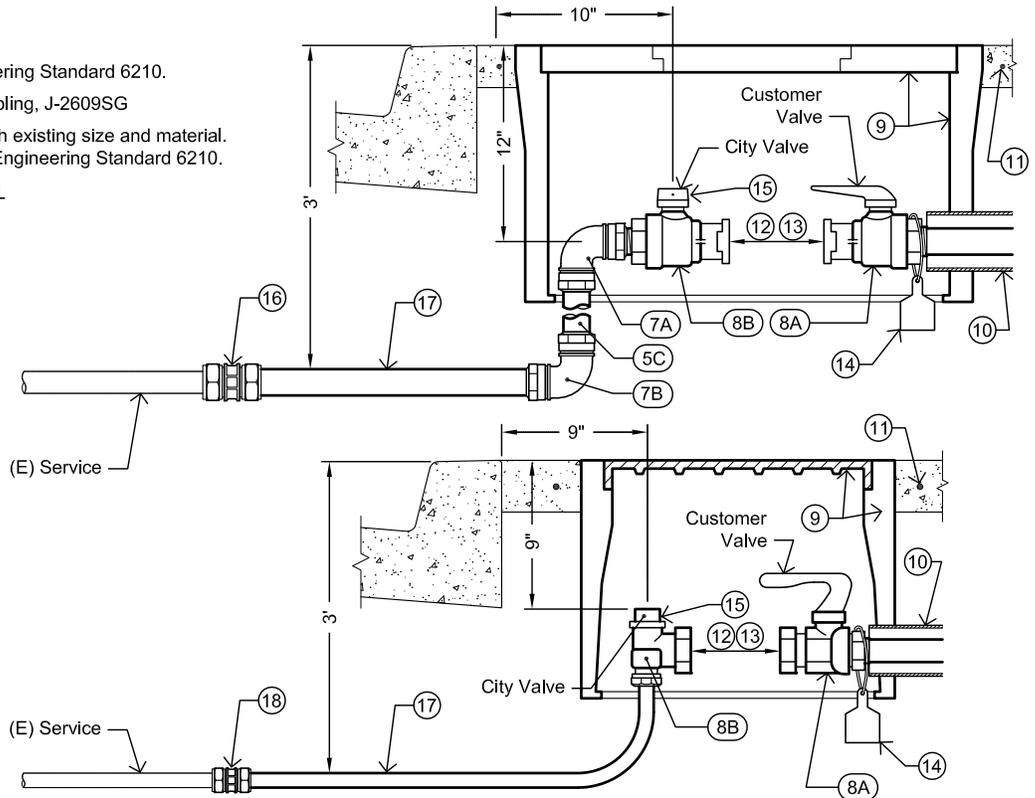
Type	(E) Service	Main
1	PE	Any
1	Copper	Non-metal

Type	Extension	(E)Service	Main
2	Copper/PE	PE	Any
2	Copper/PE	Copper	Non-metal
2	PE	Copper	Any

WATER SERVICE CONNECTION TO NEW MAIN

INSTALLATION NOTES:

- ⑤ and ⑦ through ⑮ - See Engineering Standard 6210.
- ⑯ Compression to compression coupling, J-2609SG
- ⑰ Extensions on services shall match existing size and material. service material shall conform to Engineering Standard 6210.
- ⑱ 3/4" CTS tubing: Ford C44-33-Q-NL
1" CTS tubing: Ford C44-44-Q-NL
3/4" IPS tubing: Ford C66-33-Q-NL
1" IPS tubing: Ford C66-44-Q-NL



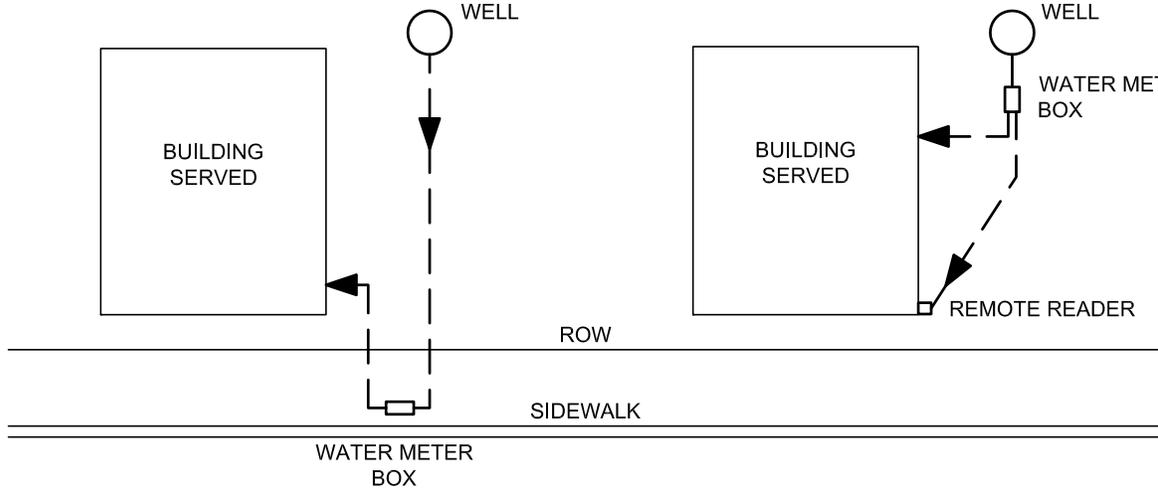
WATER SERVICE METER BOX RELOCATION

REVISIONS	BY	APP	DATE
Renumber Notes	SR	BL	3-06
Renumber Notes; Drafting edits	JDL	MH	12-12
Revised part numbers	JDL	MH	3-13
STANDARD CURRENT AS OF:		January 2016	

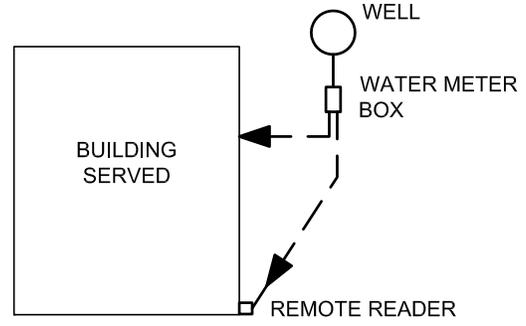


WATER SERVICE CONNECTIONS

STANDARD CONFIGURATION



ALTERNATE CONFIGURATION
(must be approved by the Utilities Department)

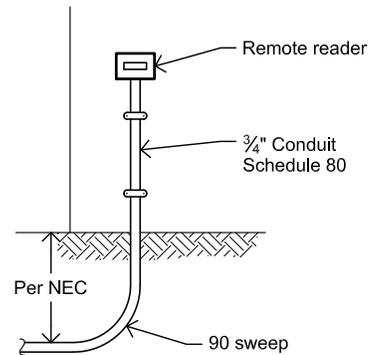
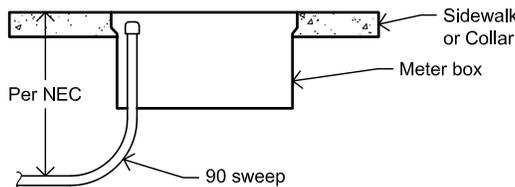
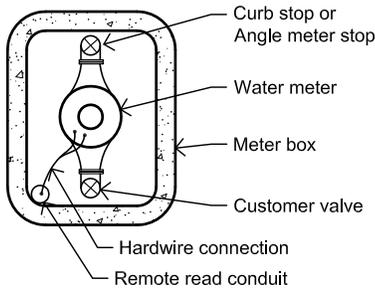


GENERAL NOTES:

- A. All commercial buildings served by public sewer and private well shall have the well metered for the purpose of assessing sewer charges.
- B. The well meter shall consist of a conventional meter set in the public right of way in accordance with City Engineering Standards. With prior written approval of the Utilities Department, a meter set near the well with a remote reader mounted to the building or other permanent structure will be allowed.
- C. The property owner shall pay all fees established for these purposes.
- D. The property owner shall execute a Private Well Metering Agreement with the City for ongoing operation, maintenance, inspection, calibration, and repair or replacement of the well meter and related City facilities.
- E. If a property receives water from both the public system and a private well, the customer will pay a sewer charge based on usage from both meters and a water charge based on usage from the public system meter.
- F. The City shall own, operate and maintain the meter, remote reader and associated wiring. All other facilities shall be the responsibility of the property owner.

CONSTRUCTION NOTES:

- 1. For properties receiving water from both a private well and the public system, an approved backflow prevention device shall be installed on the service connection to the public system.
- 2. The proposed location of the water meter and remote reader shall be approved by the City Utilities Department prior to installation.
- 3. The meter and related facilities shall be installed in accordance with applicable City Standards. The meter box shall be set with the long dimension parallel to the curb to differentiate them from other meters.
- 4. A conduit and pull rope shall be installed in accordance with the NEC and City Specifications and Standards. The conduit shall enter the water meter box in such a manner as to not interfere with the installation, removal, and inspection of the meter. The conduit shall be stubbed up at the building and secured to the building at no less than two locations. Both ends of the conduit shall be capped with a slip cap, not welded or glued.
- 5. A space shall be provided to allow the remote reader to be securely mounted at 5' above grade.
- 6. All work shall be performed by an appropriately licensed contractor with the exception of the meter set, pulling of remote read wires, and installation of a remote read unit which will be completed by City crews with a 48 hour notice.



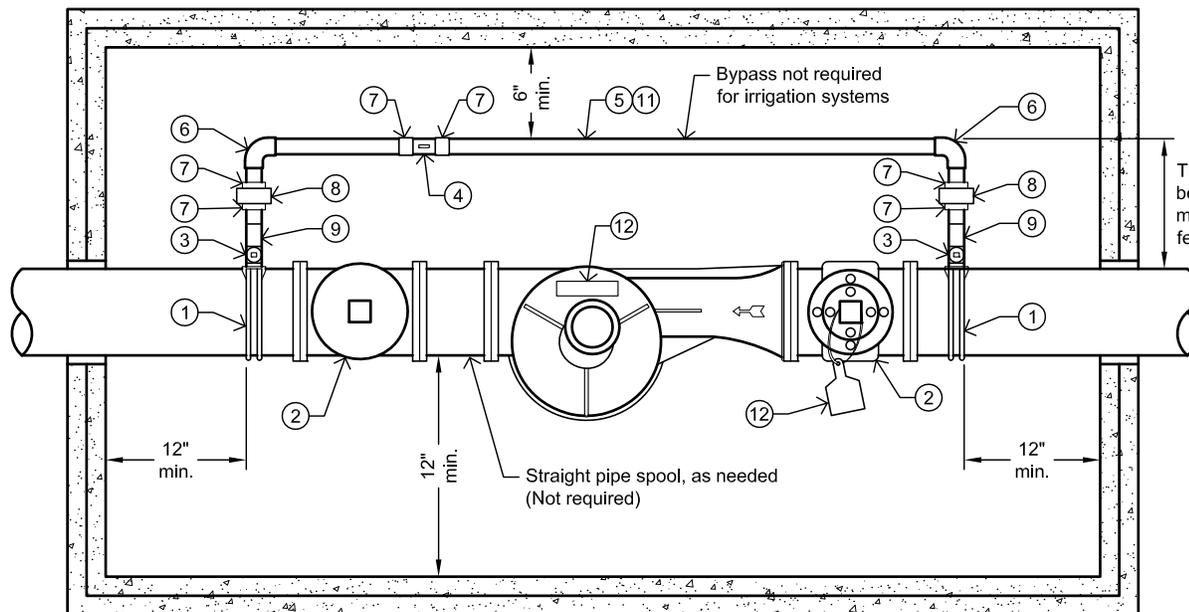
SEE ENGINEERING STANDARD 6210 FOR DETAILS

REVISIONS	BY	APP	DATE
New Standard	BL	WAP	4-97
New Border	JDL	WAP	9-97
Drafting edits	JDL	MH	12-12

STANDARD CURRENT AS OF: January 2016

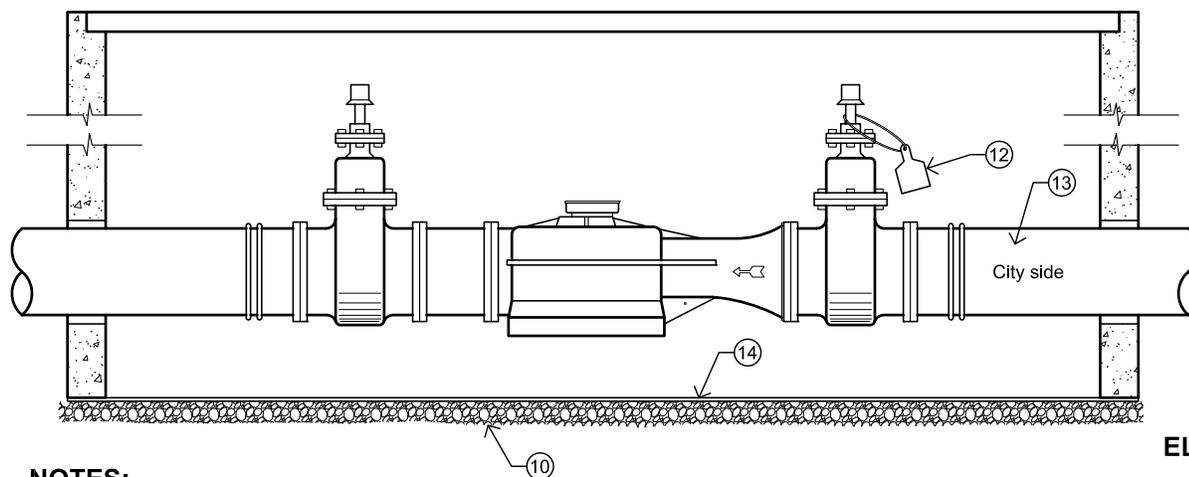


WELL METERING



The bypass shall be as close to the meter body as feasible.

PLAN



ELEVATION

NOTES:

- ① Service Saddle: Ford 202B
- ② Isolation Valve: Gate valve, resilient seated with fully encapsulated gate, FL x MJ
- ③ Corp Stop: 2", Ford FB400-7-NL
- ④ Ball Valve: 2", Ford B11-777-NL
- ⑤ Copper Tubing: 2", Type K, soft, supported at 12" intervals
- ⑥ ¼ Bend: Sweat x Sweat
- ⑦ MIP x Sweat
- ⑧ Union
- ⑨ FIP x Sweat
- ⑩ 6" of ¾" loose aggregate
- ⑪ Unmetered bypass may be omitted when meter serves only irrigation uses.
- ⑫ Attach Recycled Water Warning tag and adhesive warning decal per Engineering Standard 8810 when used for recycled water.
- ⑬ All pipe joints from the water main to the city isolation valve in the meter vault shall be restrained.
- ⑭ Vault base bottom

METERS:

Meters shall be centered in vault and supported per manufacturer's recommendations. Meter model and manufacturer to be approved by the City.

VAULTS:

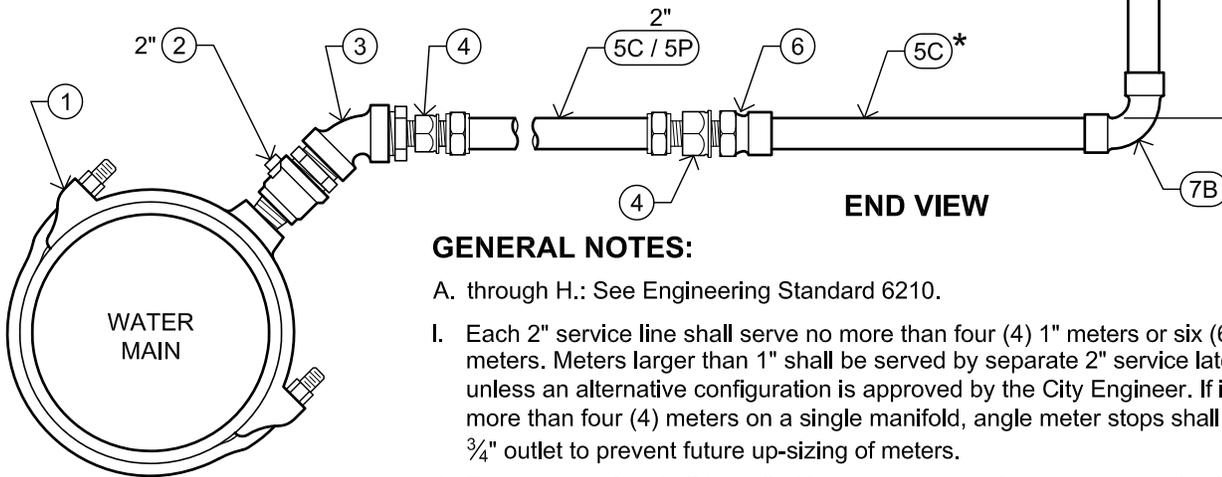
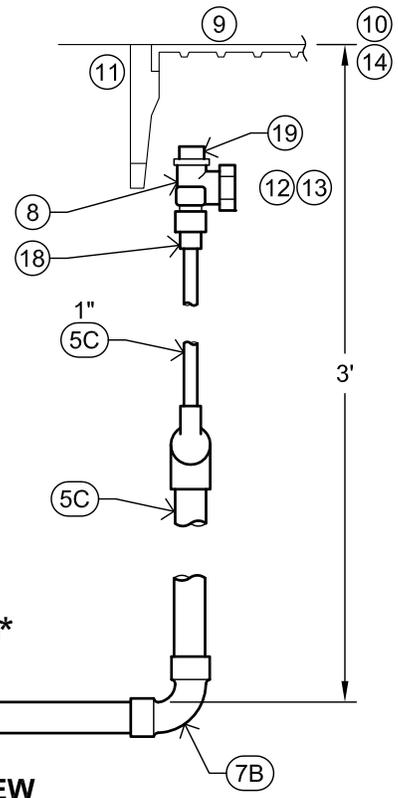
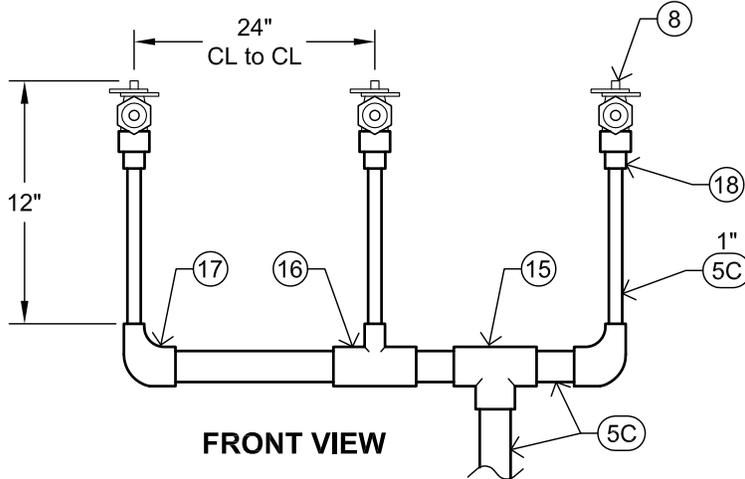
Vaults shall be Armorcast #A6004872TA48SLO. Vault in the Mission Style Sidewalk District shall be of a type to accommodate an iron-diamond plate or cast-iron lid. Vaults proposed for use in the District must be approved by the City Engineer prior to installation. Vault may be required to be placed 90 degrees to the service to fit the sidewalk width. Vault shall be placed a minimum of 12" behind the curb face, or in Mission Style sidewalk, behind the tile row. Spring-assisted vault cover lids shall bolt down. Multiple lids shall not be bolted down.

REVISIONS	BY	APP	DATE
Add Note 13	SR	BL	8-11
Revised part numbers	JDL	MH	3-13
Revised Vault Note; Drafting edits	JDL	MH	12-12
STANDARD CURRENT AS OF:		January 2016	



**WATER METER
WITH UNMETERED BYPASS
2" & LARGER**

* 2" copper shall extend beyond the gutter before transition to polyethylene.
Transition may be omitted if service is all copper.



GENERAL NOTES:

- A. through H.: See Engineering Standard 6210.
- I. Each 2" service line shall serve no more than four (4) 1" meters or six (6) 3/4" meters. Meters larger than 1" shall be served by separate 2" service lateral unless an alternative configuration is approved by the City Engineer. If installing more than four (4) meters on a single manifold, angle meter stops shall be 1" x 3/4" outlet to prevent future up-sizing of meters.
- J. Extra tracer wire shall be coiled in the meter box closest to the service line.
- K. When replacing an existing manifold, the customer side, including valves and laterals, shall be reconstructed as needed to transition to existing lateral. Customer valve shall be replaced with a new valve in these cases.
- L. Open trench water service replacements shall be installed perpendicular to the existing water main, when as measured along the main, the existing water service is offset 5' or more from perpendicular.

INSTALLATION NOTES:

- ① through ⑦ and ⑨ through ⑭: See Engineering Standard 6210.
- ⑧ 1" angle meter stop: FORD KV13-444W-NL
- ⑮ Copper tee, all sweat: 2" x 2", Service line shall be at or near center of manifold.
- ⑯ Copper tee, all sweat: 2" x 1"
- ⑰ Copper reducing ell, sweat x sweat: 2" x 1"
- ⑱ Adaptor, sweat x MIP
- ⑲ Each service shall be designated to an address and/or unit by attaching a 1/2" brass tag with 1/4" minimum letters/numbers to the curb stop with a non-ferrous wire. Meter boxes shall be in alphabetical or numerical order with respect to address, reading left to right when facing the structure.

APPROVED EQUAL ACCEPTED FOR ALL FITTINGS

REVISIONS	BY	APP	DATE
Renumber Notes	SR	BL	3-06
Drafting edits; Renumber Notes	JDL	MH	12-12
Add Note K	DVB	BL	11-07
STANDARD CURRENT AS OF:		January 2016	



MANIFOLD
MULTIPLE WATER SERVICES

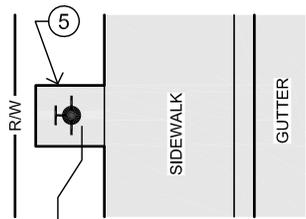


FIG. A

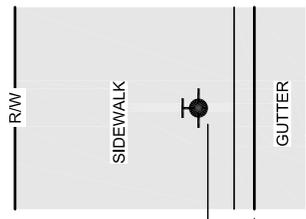


FIG. B

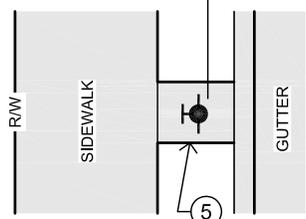
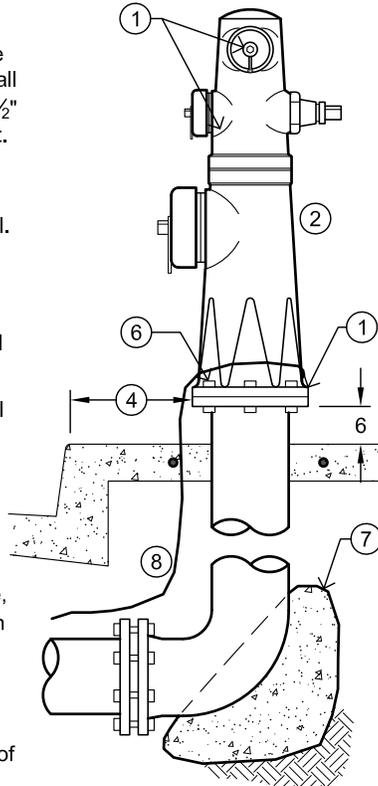


FIG. C

INSTALLATION NOTES:

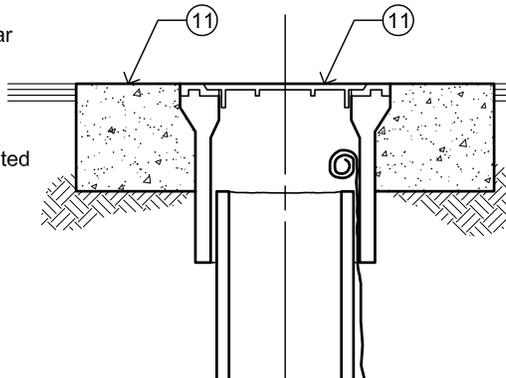
- ① Hydrant shall have 6-hole flange, all bronze body and bronze caps: Jones 3760, Clow 2060 or approved equal. Outlets shall be manufacturer's 2½" National Standard hose thread and 4½" National Standard thread. 4½" outlet shall point toward street. Hydrant shall be bagged until it is available for use.
- ② Hydrant shall be painted with Sherwin Williams ALLY 237 Industrial Enamel - Safety Yellow Base or an approved equal.
- ③ Hydrant shall be located behind sidewalk if sufficient right-of-way exists (Fig. A), or behind curb (Figs. B and C). If located behind sidewalk, 12" minimum clearance shall be provided between back of sidewalk and outlet cap nut. Install hydrant reflector(s) per Engineering Standard 7920.
- ④ Standard setback from curb face is 18" to 21". Sidewalk shall have a minimum of 42" of clearance.
- ⑤ When located in unpaved area, hydrant installation shall include 4' x 4' x 6" minimum PCC pad doweled into curb and sidewalk with #4 @ 18" o.c and one #4 rebar hoop.
- ⑥ Hydrant shall be installed to provide 3" min. to 4" max. clearance between underside of flange and sidewalk surface, and shall have ⅝" x 3" drilled break-away bolts installed, with nuts on top of flange and bolts filled with silicone or butyl caulk.
- ⑦ Thrust block, Class 3 PCC, shielded from flanges and bolts.
- ⑧ Tracer wire shall be brought to the surface with a minimum of 18" above finished grade. See Engineering Standard 6340 and Trench Details.



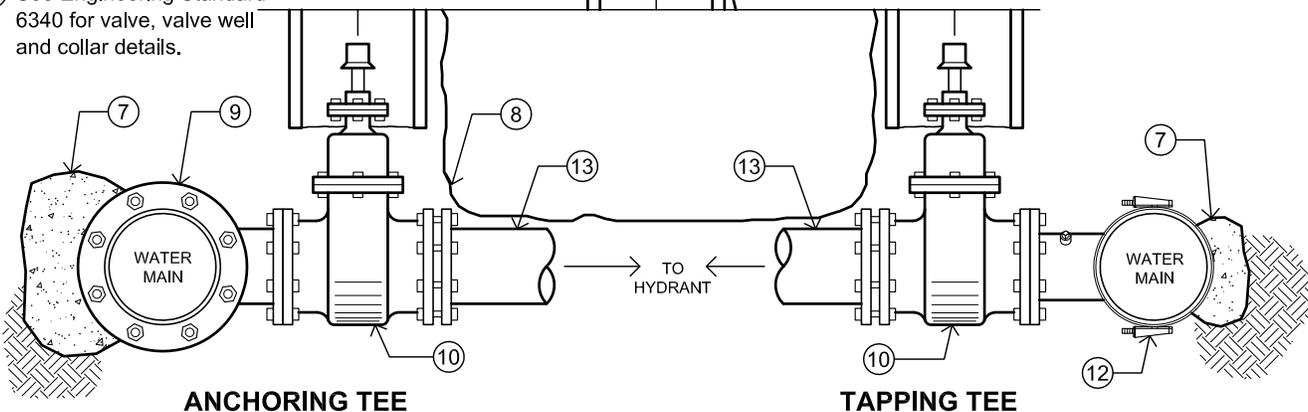
FIRE HYDRANT

NOTES (cont'd):

- ⑨ Cut-in tee, MJ x MJ x Flange. If regular line run tee is used, a swivel x solid adapter (pup) shall be used. See Engineering Standard 6320.
- ⑩ Gate valve, Flange x MJ, resilient seated with fully-encapsulated gate, epoxy-coated inside and outside, full-size waterway, open to the left, non-rising stem with O-ring seals, AVK, CLOW F-6100, or approved equal, and shall conform to AWWA Standard C-509.
- ⑪ See Engineering Standard 6340 for valve, valve well and collar details.



- ⑫ Tapping sleeve, ROMAC SST - stainless steel, or approved equal.
- ⑬ Laterals shall be Class 200 PVC or ductile iron, 6" min. diameter.



ANCHORING TEE

TAPPING TEE

REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	2-13
Revised Notes 2 & 5	DVB	BL	10-06
Revised Note 8	MH	BL	11-09
STANDARD CURRENT AS OF:		January 2016	



FIRE HYDRANT ASSEMBLY

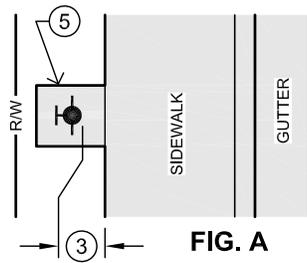


FIG. A

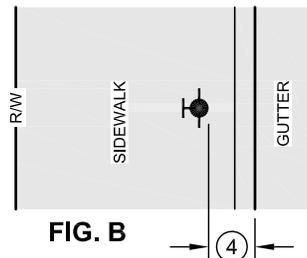


FIG. B

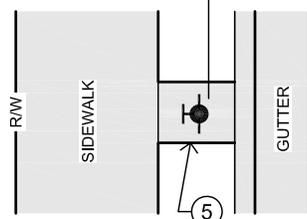
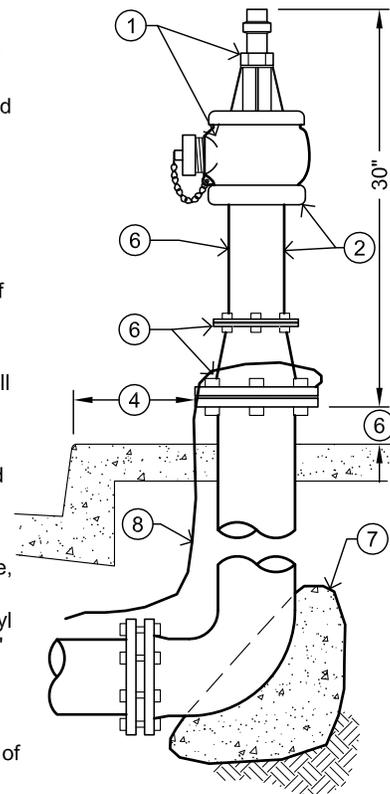


FIG. C

INSTALLATION NOTES:

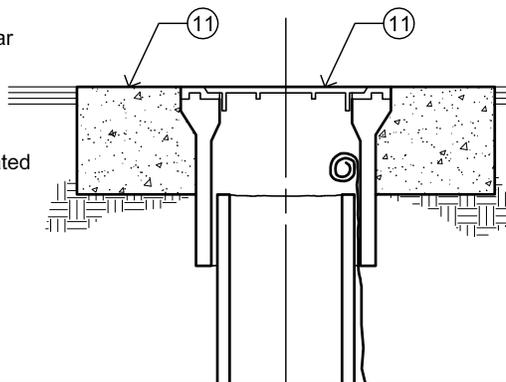
- ① Hydrant shall have 4" inlet, tapered IPT female with one 2½" NSHT male outlet, cap and chain with pentagon stem nut: Jones H.P. or approved equal. Outlet shall be pointed toward street. Hydrant shall be rated for 200 psi design pressure.
- ② Hydrant shall be primed for paint with Sherwin Williams B54-Y38 011 base or an approved equal. Hydrant shall be painted with Sherwin-Williams Verve Violet (SW 6979).
- ③ Hydrant shall be located behind sidewalk if sufficient right-of-way exists (Fig. A), or behind curb (Figs. B and C). If located behind sidewalk, 12" minimum clearance shall be provided between back of sidewalk and outlet cap nut.
- ④ Standard setback from curb face is 18" to 21". Sidewalk shall have a minimum of 42" of clearspace.
- ⑤ When located in unpaved area, hydrant installation shall include 4' x 4' x 6" minimum PCC pad doweled into curb and sidewalk with #4 @ 18" o.c.
- ⑥ Hydrant shall be installed to provide 3" min. to 4" max. clearance between underside of flange and sidewalk surface, and shall have ⅝" x 3½" drilled break-away bolts installed, with nuts on top of flange and bolts filled with silicone or butyl caulk. Hydrant assembly shall include 6" x 4" reducer and 4" DIP spool FLG x 4" IPT male.
- ⑦ Thrust block, Class 3 PCC, shielded from flanges and bolts.
- ⑧ Tracer wire shall be brought to the surface with a minimum of 18" above finished grade. See Engineering Standard 6340 and Trench Details.



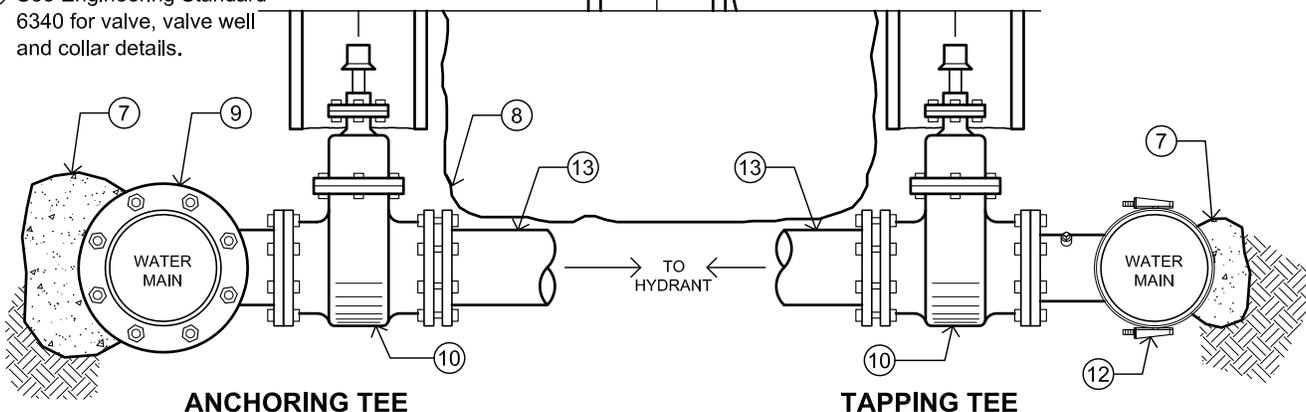
FIRE HYDRANT

NOTES (cont'd):

- ⑨ Cut-in tee, MJ x MJ x Flange. If regular line run tee is used, a swivel x solid adapter (pup) shall be used. See Engineering Standard 6320.
- ⑩ Gate valve, Flange x MJ, resilient seated with fully-encapsulated gate, epoxy-coated inside and outside, full-size waterway, open to the left, non-rising stem with O-ring seals, AVK, CLOW F-6100, or approved equal, and shall conform to AWWA Standard C-509.
- ⑪ See Engineering Standard 6340 for valve, valve well and collar details.



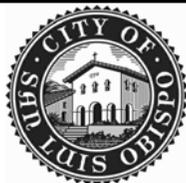
- ⑫ Tapping sleeve, ROMAC SST - stainless steel, or approved equal.
- ⑬ Laterals shall be ductile iron pipe, 6" dia., Class 52, sleeved with purple polyethylene warning encasement (Christy's Polywrap or equal).
- ⑭ Plastic warning tape, 3" min. width, with black printing on a purple field having the words "CAUTION: RECYCLED WATER - DO NOT DRINK", installed in trench backfill per Engineering Standards 6020, 6025 and 6030.



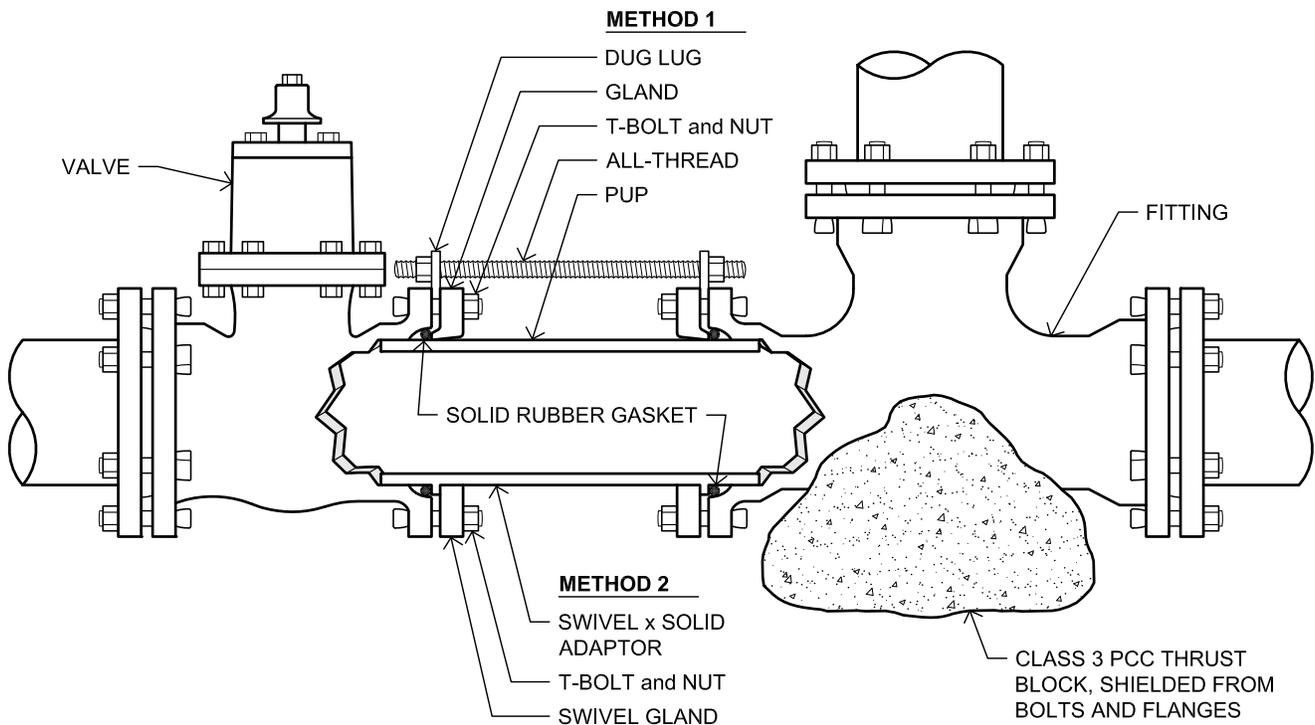
ANCHORING TEE

TAPPING TEE

REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	2-13
Revised Note 8	MH	BL	11-09
Revised Note 2 (color)	JDL	MH	9-12
STANDARD CURRENT AS OF:		January 2016	

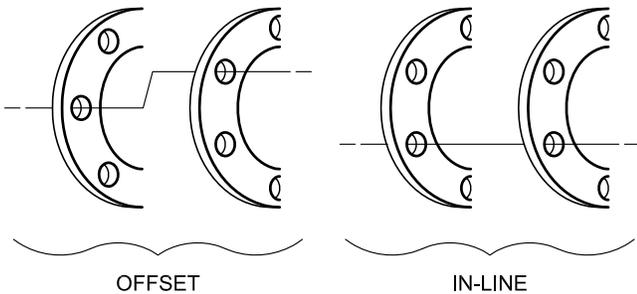


**RECYCLED WATER
HYDRANT ASSEMBLY**



VALVES ADJACENT TO FITTINGS SHALL BE RESTRAINED IN ACCORDANCE WITH ONE OF THE FOLLOWING METHODS LISTED BELOW:

- METHOD 1** - May be used only with in-line bolt alignment of valve and fitting. See chart below for number of all-threads. All-threads and nuts shall be stainless steel and shall be coated with Henry's #204 roof cement, or equal. this method may be used only with approval of the City Utilities Department.
- METHOD 2** - May be used with either offset or in-line bolt alignment.
- METHOD 3** - Flange-to-flange bolted connection may be used.
- METHOD 4** - Retainer glands may be used with ductile iron pipe only, subject to City approval. Retainer glands may NOT be used on fire hydrant laterals.
- METHOD 5** - Swivel gland and integral retaining lip connections may be used.



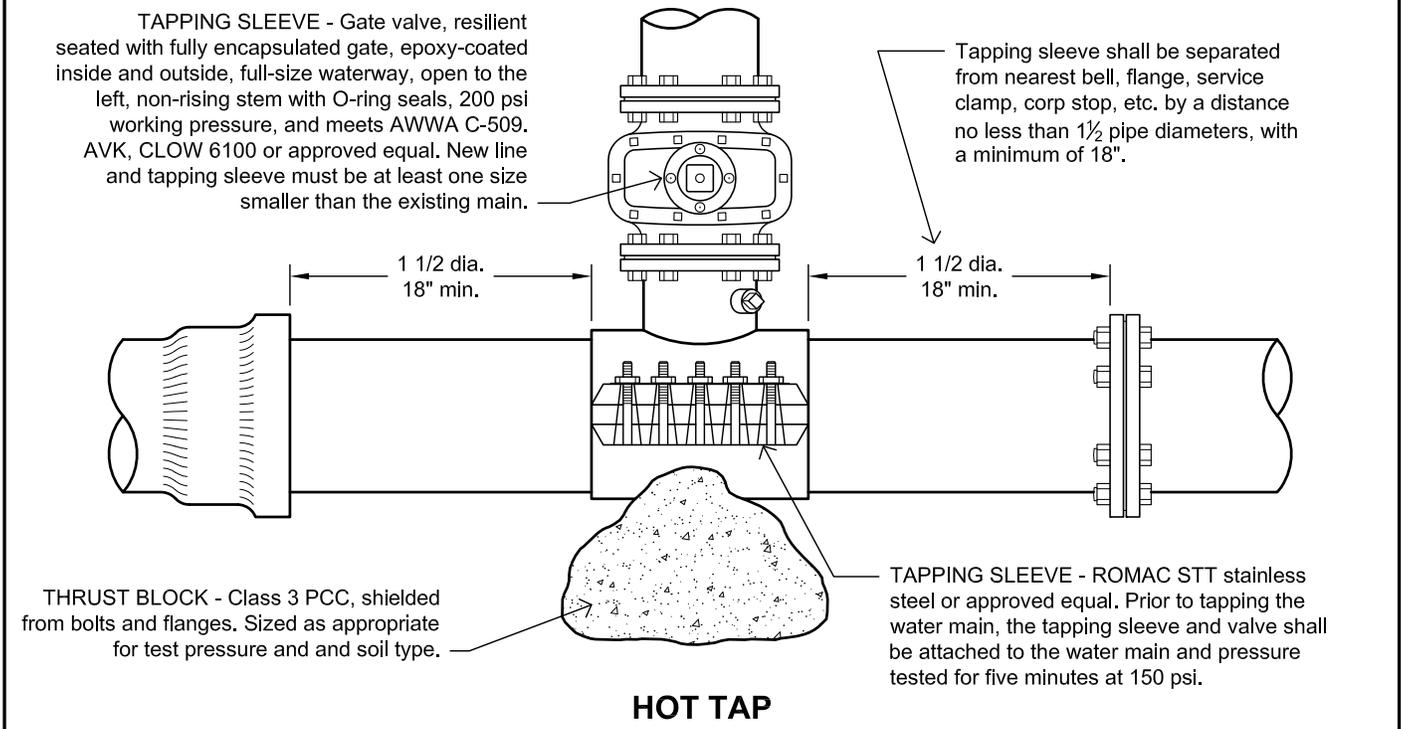
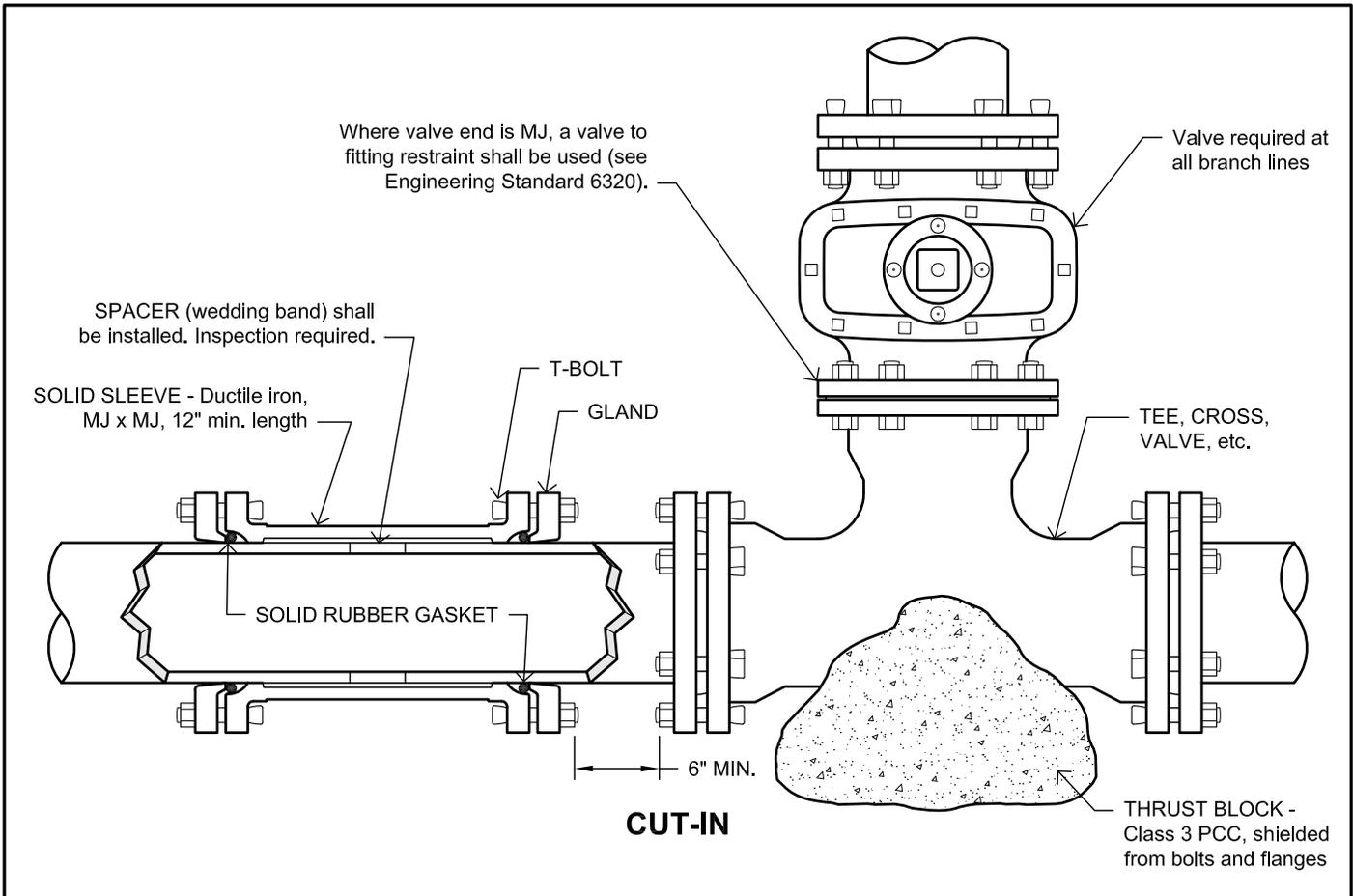
BOLT HOLE ALIGNMENT

METHOD 1	
PIPE SIZE (inches)	No. of ALL-THREADS (min.)
4	2
6, 8, 10	4
12, 14	6
over 14	TO BE DETERMINED IN FIELD

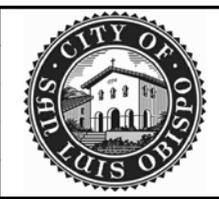
REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	2-13
Method 1, thrust block	MDW	WAP	10-93
Revised Note in Method #1	DVB	BL	11-06
STANDARD CURRENT AS OF:		January 2016	



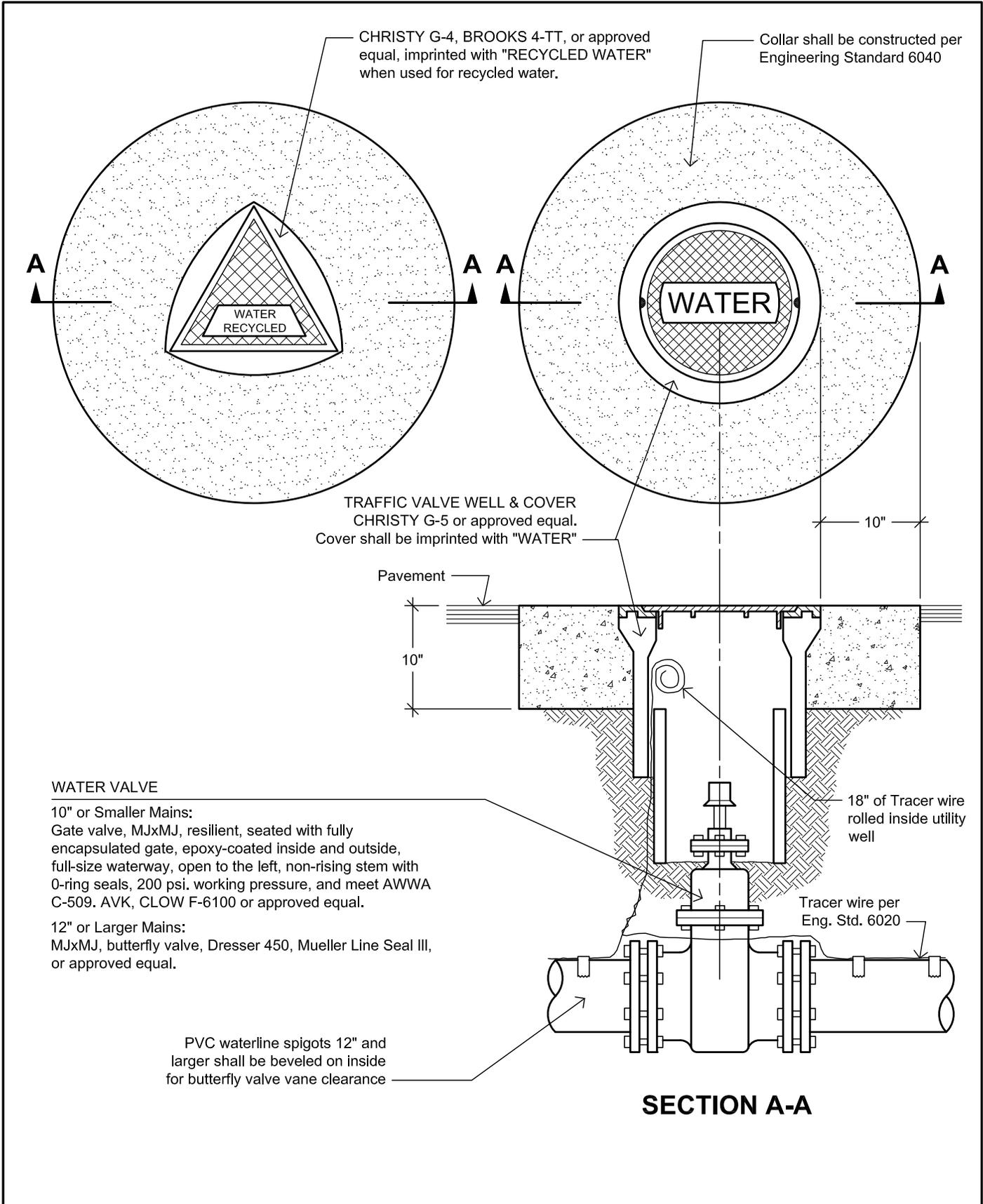
VALVE to FITTING RESTRAINT



REVISIONS	BY	APP	DATE
Rev. Tapping Sleeve Romac Note	SR	BL	1-14
Change Cast iron to Ductile iron	JDL	MH	2-14
Drafting edits	JDL	MH	2-13
STANDARD CURRENT AS OF:		January 2016	



WATERLINE TIE-IN



WATER VALVE

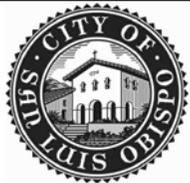
10" or Smaller Mains:
 Gate valve, MJxMJ, resilient, seated with fully encapsulated gate, epoxy-coated inside and outside, full-size waterway, open to the left, non-rising stem with O-ring seals, 200 psi. working pressure, and meet AWWA C-509. AVK, CLOW F-6100 or approved equal.

12" or Larger Mains:
 MJxMJ, butterfly valve, Dresser 450, Mueller Line Seal III, or approved equal.

PVC waterline spigots 12" and larger shall be beveled on inside for butterfly valve vane clearance

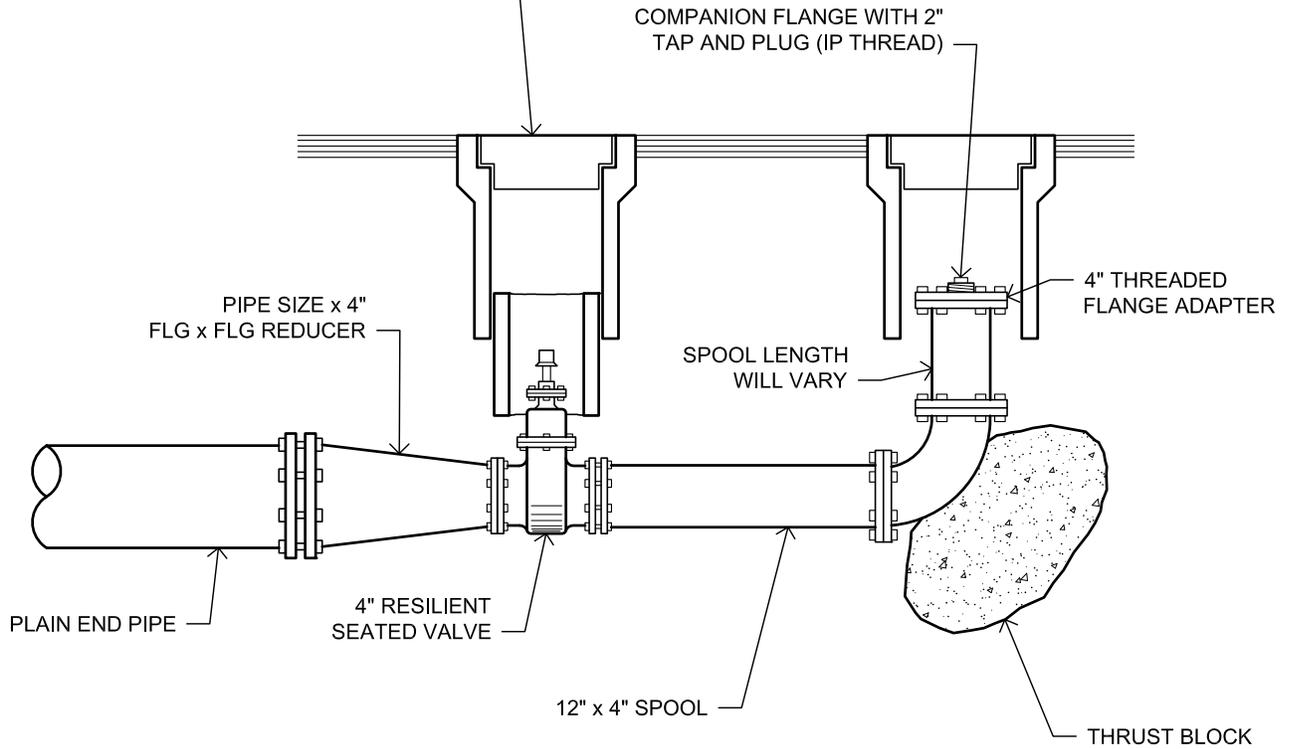
SECTION A-A

REVISIONS	BY	APP	DATE
Add recycled water cover	SR	BL	3-06
Drafting edits	JDL	MH	2-13
Fabric type	JDL	MH	9-12
STANDARD CURRENT AS OF:		January 2016	



WATER VALVE & WELL

SEE ENGINEERING STANDARD 6340
FOR WATER WELL INFORMATION, TYP.

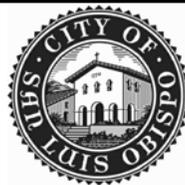


GENERAL NOTE:

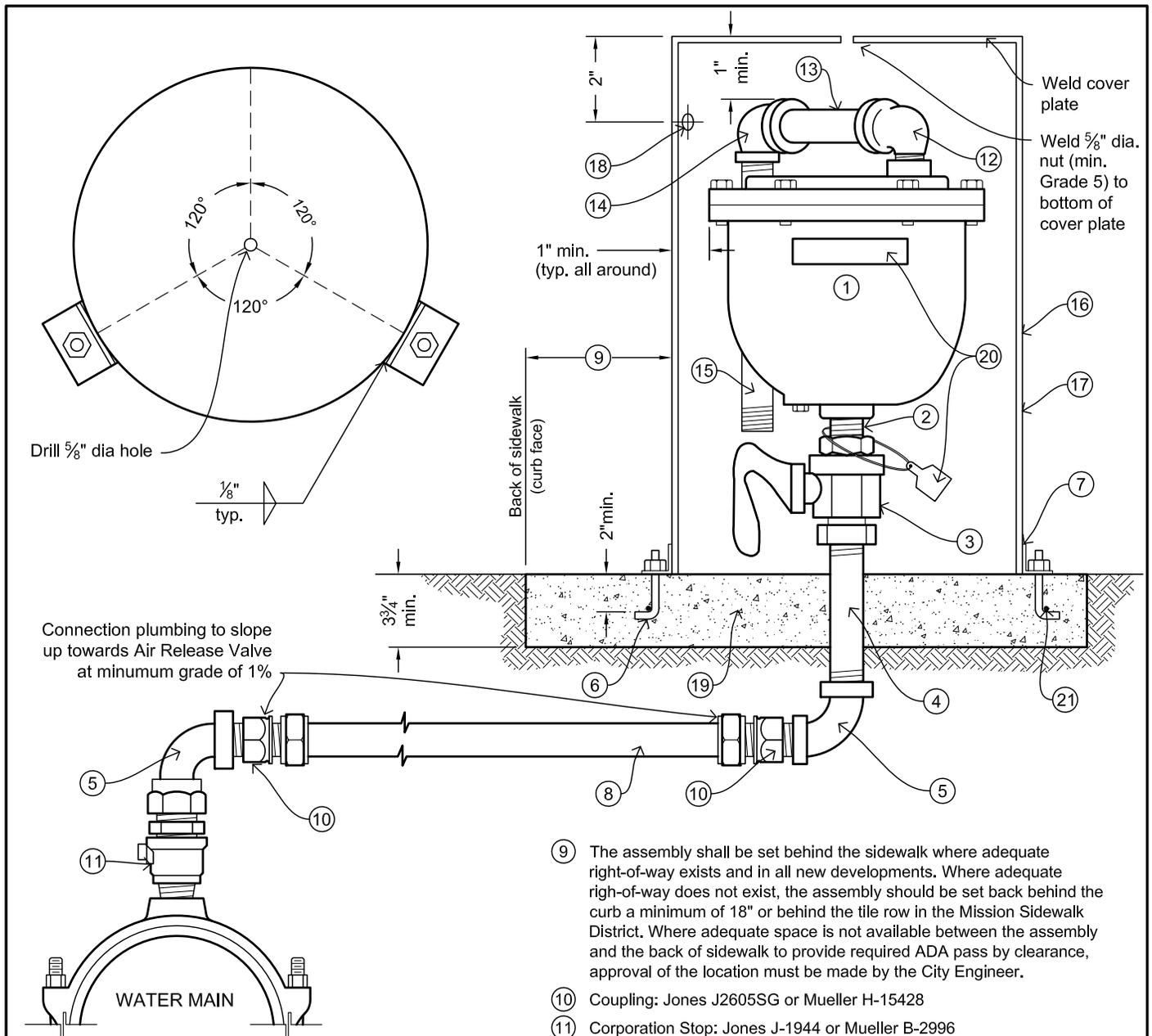
Protect all fittings with plastic and pour thrust block at end of street main, shape and location to be determined in field.

REVISIONS	BY	APP	DATE
<i>New Border</i>	JDL	WAP	9-97
<i>Revised Reducer Detail</i>	MH	BL	10-05
<i>Drafting edits</i>	JDL	MH	2-13

STANDARD CURRENT AS OF: January 2016



BLOW-OFF ASSEMBLY



Weld cover plate
Weld 5/8" dia. nut (min. Grade 5) to bottom of cover plate

Drill 5/8" dia hole

1/8" typ.

Connection plumbing to slope up towards Air Release Valve at minimum grade of 1%

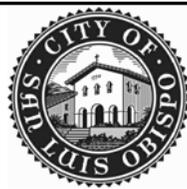
WATER MAIN

INSTALLATION NOTES :

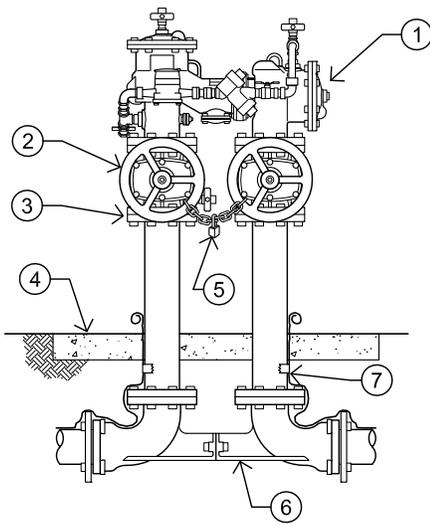
- ① Crispin Universal Air Release Valve: Model UL10.1 (1"), UL20.1 (2"), UL30.1 (3"), UL40.1 (4") or approved equal.
- ② Nipple: Brass, short
- ③ Ball Valve: Jones J-1905
- ④ Nipple: Brass, 10". Protect from contact with two layers of 3-mil tape
- ⑤ Elbow: Brass, 90°
- ⑥ Cadmium plated bent bolts 1/2" dia. (typ. 3 places) with nuts
- ⑦ Angle: Galvanized steel 1 1/2" x 1 1/2" x 1/4", 2" long (typ. 3 places)
- ⑧ Copper Tubing: Type K, soft. Encase in purple recycled water polyethylene warning sleeve when used for recycled water.

- ⑨ The assembly shall be set behind the sidewalk where adequate right-of-way exists and in all new developments. Where adequate right-of-way does not exist, the assembly should be set back behind the curb a minimum of 18" or behind the tile row in the Mission Sidewalk District. Where adequate space is not available between the assembly and the back of sidewalk to provide required ADA pass by clearance, approval of the location must be made by the City Engineer.
- ⑩ Coupling: Jones J2605SG or Mueller H-15428
- ⑪ Corporation Stop: Jones J-1944 or Mueller B-2996
- ⑫ Street Elbow: Galvanized
- ⑬ Nipple: 10" galvanized
- ⑭ Elbow: Galvanized
- ⑮ Nipple: 10" galvanized
- ⑯ 10 ga. steel, minimum wall thickness of tubing
- ⑰ Paint with zinc-oxide primer and 2 coats of Sherwin Williams Emerald Ice (SW 4069). Use Sherwin Williams Verve Violet (SW 6979) for recycled water.
- ⑱ Drill minimum of six (6) 1/2" diameter holes on circumference evenly spaced.
- ⑲ PCC Slab: 30" x 30" x 4" thick on a 4" Class 3 base
- ⑳ Attach Recycled Water Warning Tag and adhesive decal per Engineering Standard 8810 when used for recycled water.
- ㉑ One (1) #4 rebar hoop

REVISIONS	BY	APP	DATE
Update Note 1	SR	BL	8-11
Drafting edits	JDL	MH	2-13
Revise Note 17	JDL	MH	9-12
STANDARD CURRENT AS OF:		January 2016	

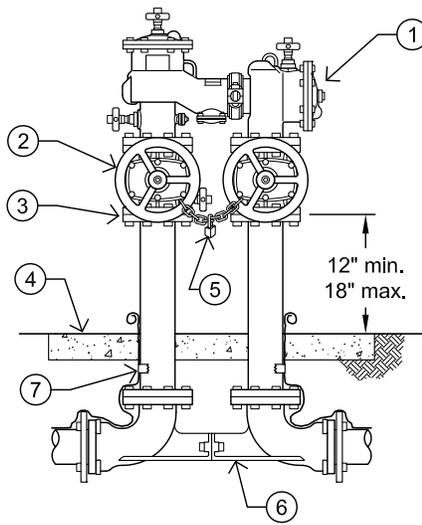


AIR/VAC RELEASE VALVE ASSEMBLY
1" & 2"



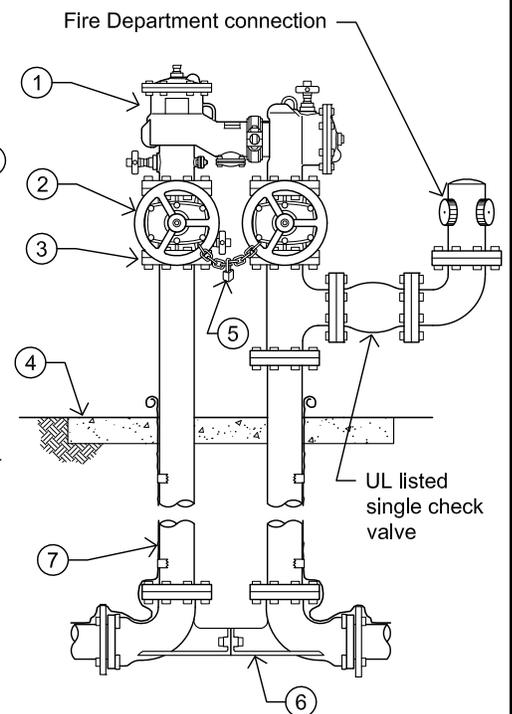
DOUBLE CHECK DETECTOR

Use when on-site system includes fire hydrants (4" - 10" only)



DOUBLE CHECK

No on-site hydrants (2" - 10")



DOUBLE CHECK W/ FDC

When requested by Fire Department (4" - 10" only)

GENERAL NOTES:

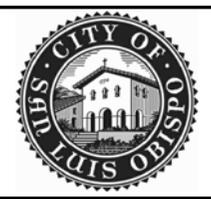
- A. All fittings and risers smaller than 3" diameter shall be copper or brass. Fittings and risers larger than 3" shall be ductile iron pipe internally cement lined for fire service and wrapped with two layers of UPC listed plastic tape minimum 1½" or coated with Henry's #204 plastic roof cement or an approved equal.
- B. Materials shall be UL listed for fire service.
- C. Materials shall be inspected by Fire Department prior to installation.
- D. Fire line shall be tested in accordance with Section 76, "Waterlines" of the City Standard Specifications. No connections may be made until water samples have been tested and approved.
- E. Location of double check and FDC shall be approved by Fire Department prior to placement.
- F. Wrap bolts with ¼" plastic sheathing prior to placement of thrust blocks.
- G. Provide clearances around device per manufacturer's recommendations and adequate access for testing.
- H. When adequate space does not exist between the public right-of-way and the building face, the USC approved backflow prevention device may be installed inside the building on the fire sprinkler riser (refer to Engineering Standard 6590 for underground portion.) The backflow preventer shall be located no further than 20' from the street side property line. Other USC-approved devices may appear different than those shown. Exterior installations shall have OS&Y valves. Devices installed inside buildings may have indicating butterfly valves.
- I. Double Check Detector meters shall be supplied with registers that measure in "units" (100 cu.ft.)

INSTALLATION NOTES:

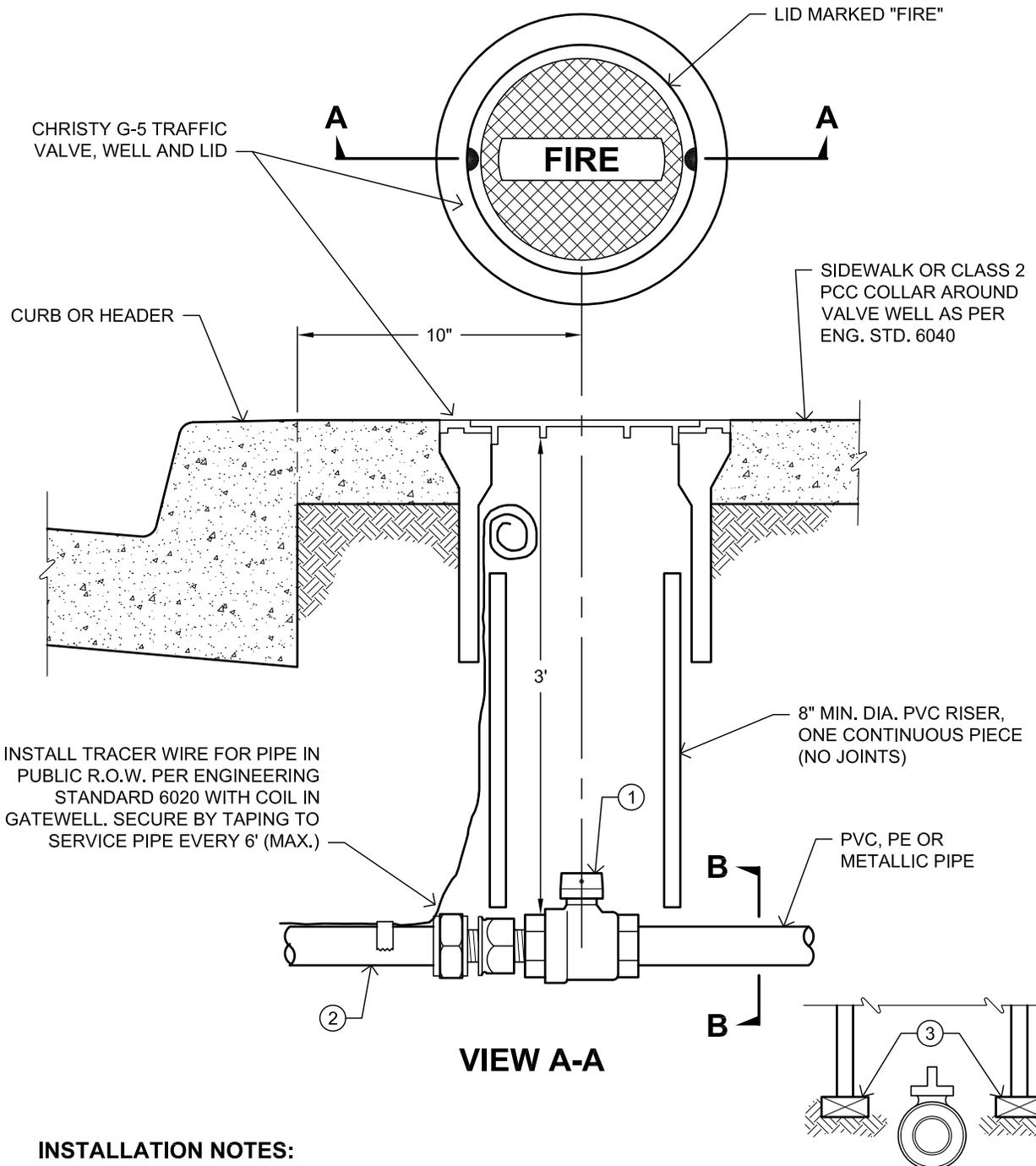
- ① Backflow preventer shall be approved by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research for the proposed application.
- ② Backflow preventer shall include OS&Y valves. Backflow preventers that are USC-approved with butterfly valves may be used with prior written approval of the Fire Marshall when installed inside a building. Each valve shall include a tamper device for electronic monitoring. Junction boxes shall have tamper-proof screws.
- ③ All risers and above ground mainline fittings shall be flange type, epoxy coated inside or cement mortar lined.
- ④ Class 3 PCC pad, 4" thick, 12" minimum around risers, on 4" Class 3 base.
- ⑤ Break-away padlock and chain between OS&Y valves, locked in open position.
- ⑥ Valve setter or PCC thrust blocks, Class 3, size as required for type of soil.
- ⑦ Tracer wire from street valve or double check assembly to hydrant and/or building sprinkler riser per Engineering Standard 6020.

ANY MODIFICATION TO FIRE DEPARTMENT REQUIREMENTS MUST HAVE WRITTEN APPROVAL FROM THE FIRE DEPARTMENT.

REVISIONS	BY	APP	DATE
Add Note 8	DVB	BL	10-07
Drafting edits	JDL	MH	2-13
Revised Note H and 1	DVB	BL	11-06
STANDARD CURRENT AS OF:		January 2016	



DOUBLE CHECK BACKFLOW PREVENTER
2" to 10"



INSTALL TRACER WIRE FOR PIPE IN PUBLIC R.O.W. PER ENGINEERING STANDARD 6020 WITH COIL IN GATEWELL. SECURE BY TAPING TO SERVICE PIPE EVERY 6' (MAX.)

VIEW A-A

VIEW B-B

INSTALLATION NOTES:

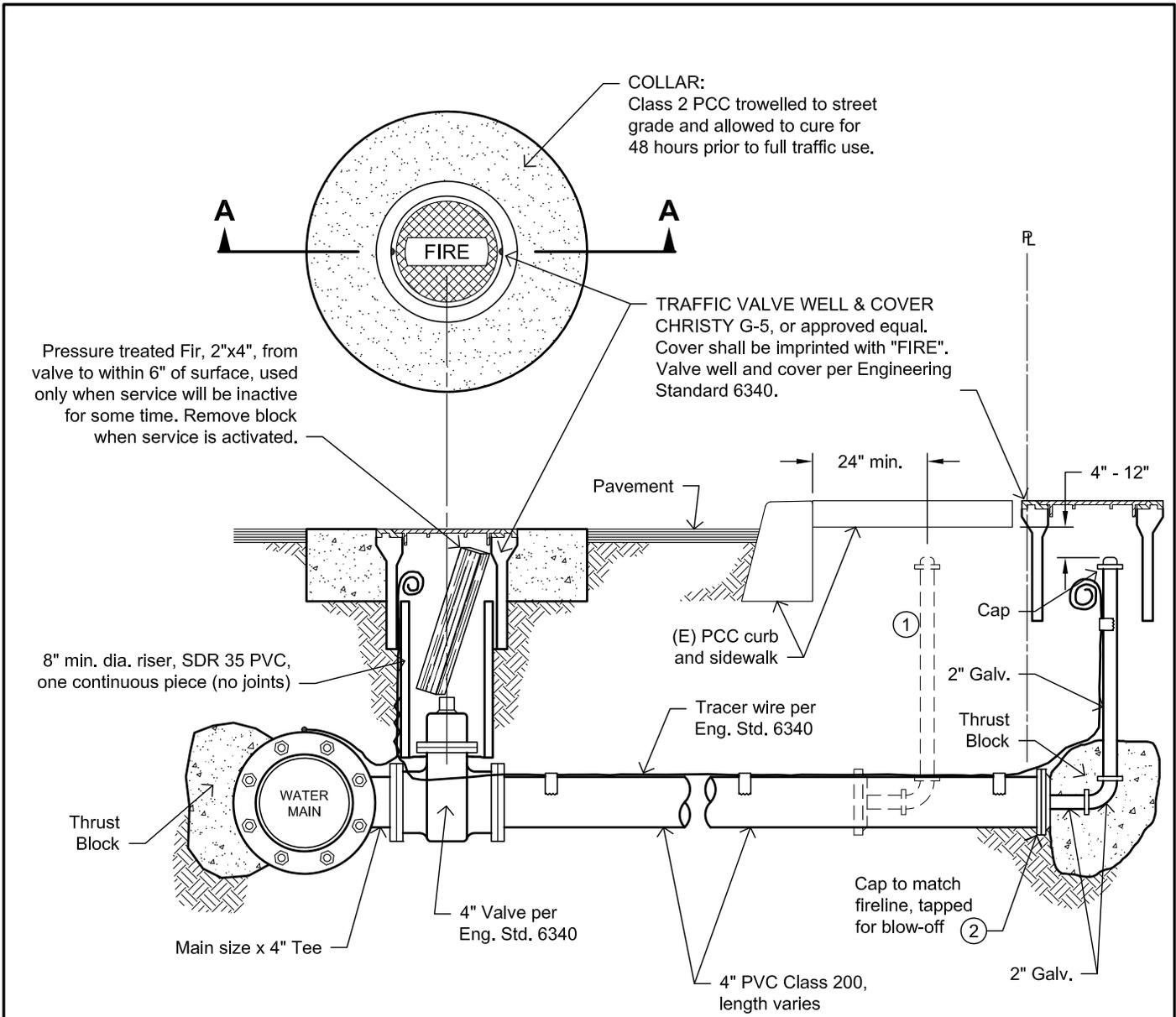
- ① 2" BALL VALVE, JONES J-1921 SG OR FORD B41-777G, OR APPROVED EQUAL WITH MINIMUM 300 PSI WORKING PRESSURE RATING.
- ② POLYETHYLENE TUBING, SDR-9, 200 PSI WESFLEX OR EQUAL.
- ③ 2 EACH, 2" x 4" x 12" REDWOOD RISER SUPPORTS.

THIS STANDARD TO BE USED ONLY WHERE FIRE DEPARTMENT APPROVED "TELEPHONE LEASE LINE ALARM SYSTEM" IS INSTALLED. OTHERWISE, A DETECTOR CHECK ASSEMBLY IS REQUIRED.

REVISIONS	BY	APP	DATE
Tracing Wire note	MH	BL	11-09
Note 1; Drafting edits	JDL	MH	2-13
Compression fitting	SR	JDW	10-03
STANDARD CURRENT AS OF:		January 2016	



**FIRE SPRINKLER
VALVE AND WELL
2"**



SECTION A-A

GENERAL NOTES:

- A. All work, including trenching, backfill, compaction, and testing of materials shall be performed per Project Specifications and as shown on this detail.
- B. After completion of testing, valve shall be closed, temporary blow-off capped and the area resurfaced.
- C. G-5 box in/behind sidewalk shall be removed at time of fire line connection to building.

INSTALLATION NOTES:

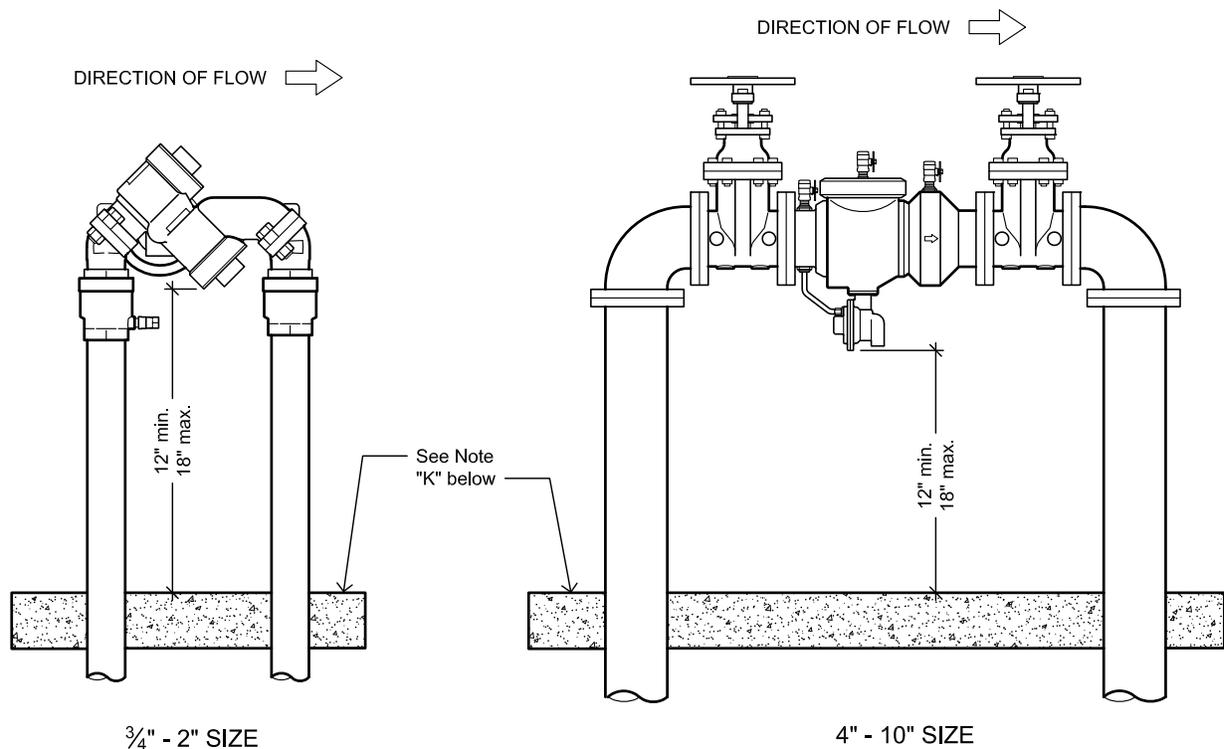
- ① Alternate location where building abuts sidewalk allowed only with written approval of Utilities Department.
- ② Temporary cap shall be removed at the time the service is connected to the fire sprinkler system. USC approved backflow prevention device shall be installed per Engineering Standard 6420.

THIS DETAIL APPLIES TO NEW FIRE SERVICE ON NEW OR EXISTING WATER MAIN.

REVISIONS	BY	APP	DATE
Temp G-5 box to BOW	JDL	JDW	1-03
Larger riser	MH	BL	12-08
Drafting edits	JDL	MH	2-13
STANDARD CURRENT AS OF:		January 2016	



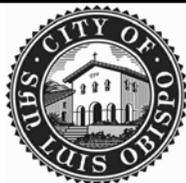
NEW FIRE SERVICE
4"



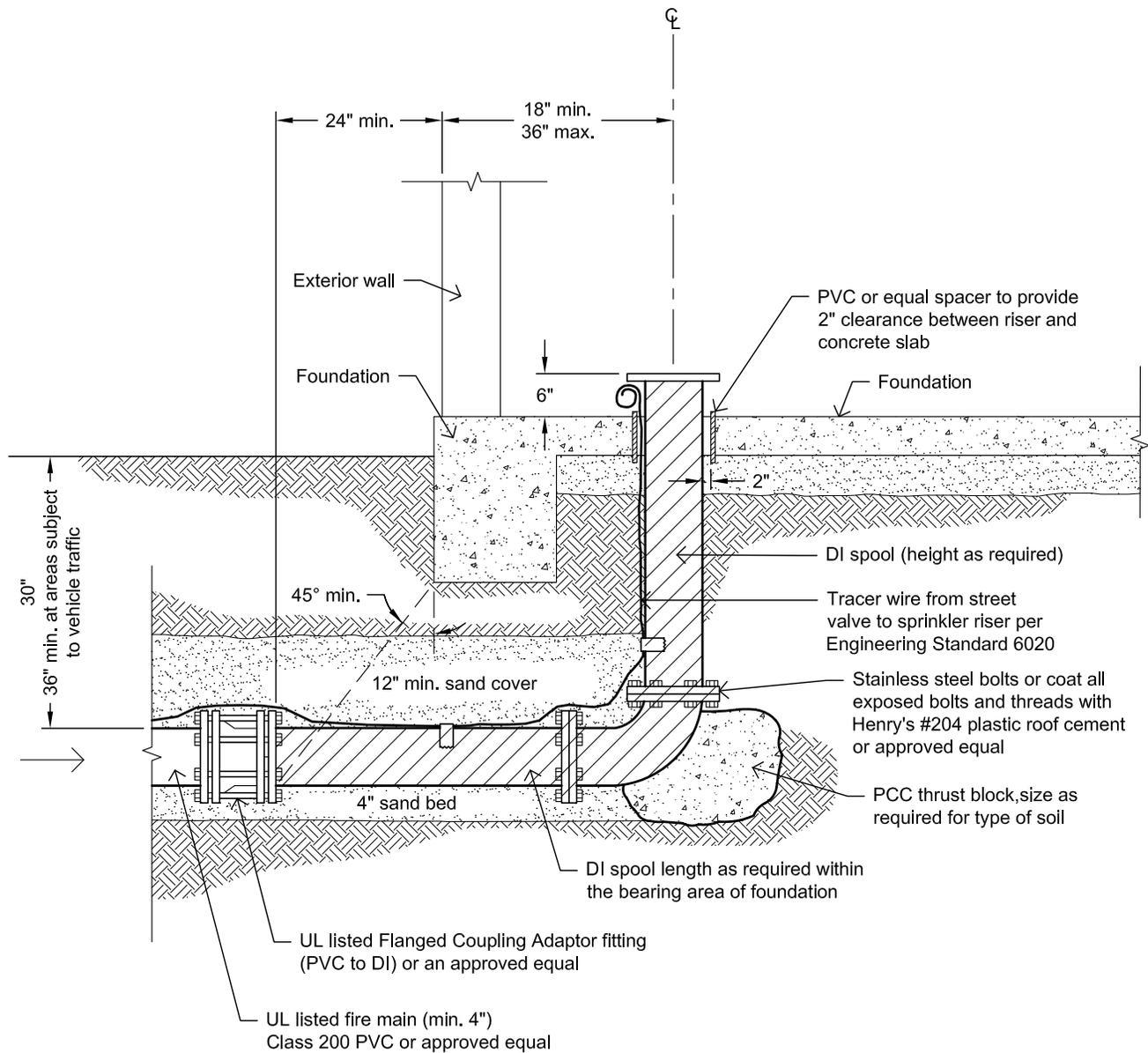
GENERAL NOTES:

- A. Pipe and fittings shall be brass or copper when diameter is between 3/4" and 3" and DI for pipe larger than 3". DI pipe shall be wrapped with two layers of UPC listed plastic tape minimum 40 mil or coated with Henry's #204 plastic roof cement or approved equal. Resilient seated shut off valves and test cocks are required.
- B. For 3/4" through 2" lines, the customer valve in the water meter box shall be eliminated.
- C. The mechanical backflow prevention assembly shall be installed subject to the approval of the County of San Luis Obispo Cross-Connection Inspector. Any deviation from this standard must receive approval prior to installation.
- D. All mechanical backflow prevention assemblies approved by the County Cross-Connection Inspector for installation at the service connection have been evaluated and approved by the Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California. These assemblies are only approved for the horizontal orientation, unless specifically evaluated and approved by the local Health Department for other orientations. Check with the local Health Department.
- E. Choice of type of backflow prevention assembly, i.e. reduced pressure principle or double check valve assembly, will be based on the degree of hazard as evaluated by the County Cross-Connection Inspector.
- F. Backflow preventer shall be located within 10' of water meter and no connections or tees are allowed between the meter and the assembly.
- G. No wye strainers are allowed before the No. 2 shut off valve.
- H. See Engineering Standard 6210 for meter and service details up to 2".
- I. Riser pipes shall include unions for sizes 3/4" through 2".
- J. 3/4" - 2" RPB shall be FEBCO 825YA or approved equal. 4" - 10" RPB shall be Wilkins model 375 or approved equal.
- K. Class 3 PCC pad, 4" thick, 12" minimum surrounding backflow preventer, on 4" class 3 base.
- L. Backflow preventer shall have 24" of separation from other devices perpendicular to the flow direction.

REVISIONS	BY	APP	DATE
Rev Note "F"; Drafting	DVB	BL	11-06
Added Note K	MH	BL	11-09
Drafting edits	JDL	BL	6-12
STANDARD CURRENT AS OF:		January 2016	



**R.P. BACKFLOW
PREVENTER**
3/4" to 10"



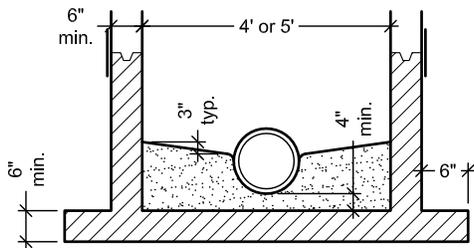
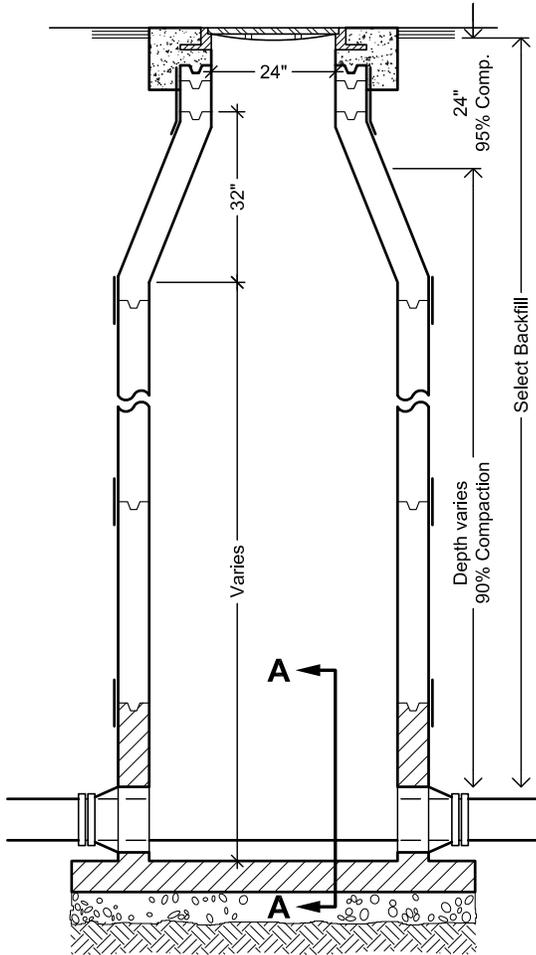
GENERAL NOTES:

- A. Fire line shall be tested in accordance with Section 76, "WATERLINES" of the City Standard Specifications. NO CONNECTION MAY BE MADE UNTIL WATER SAMPLES HAVE BEEN TESTED AND APPROVED.
- B. Location of fire sprinkler riser shall be approved by the Fire Department.
- C. Materials shall be UL listed for fire service.
- D. Wrap bolts with 6 mil plastic sheathing prior to placement of thrust block(s).
- E. All fittings and risers shall be ductile iron, internally cement lined for fire service, and wrapped with two layers of UPC listed plastic tape (minimum 40 mil) or coated with Henry's #204 plastic roof cement or an approved equal.

REVISIONS	BY	APP	DATE
Use of tracer wire	JDL	WAP	1-00
Drafting edits	JDL	MH	2-13
Note revisions per Fire Department	JDL	WAP	9-97
STANDARD CURRENT AS OF:		January 2016	



**FIRE MAIN
BUILDING CONNECTION**



SECTION A-A

COVER:

Manhole frame and cover shall have a 24" clear opening and a sealed blind pick hole and no side pick hole. (Phoenix Iron works P-1090 or approved equal). Frame and cover shall be a 10.5% machined matched fit. The cover shall be lettered "SANITARY SEWER". The inside of the frame shall be grouted with non-shrink grout.

ADJUSTMENT TO GRADE:

Adjust to grade per Engineering Standard 6040.

COLLAR:

Collar shall be constructed per Engineering Standard 6040.

CONE:

Cone shall be concentric and conform to the requirements for risers. Eccentric cone may be used only in special cases with the prior written approval of the Utilities Department.

MANHOLE RISERS:

Manhole risers shall be precast concrete conforming to ASTM C-478 and shall have a 6" minimum wall thickness with minimal reinforcements. Manholes shall be 4' in diameter unless the size and/or number of inlet(s) and outlet(s) warrants the use of a 5' diameter manhole.

JOINTS:

Joints shall be set with butyl rubber sealant (RUB-R-NEK). Inside of joints shall be grouted with non-shrink grout. Manhole shall be sealed with an external rubber sleeve (9" Infi-Shield Gator Wrap or approved equal). The application shall form a continuous seal that applies inward pressure on the protected joint for the life of the application.

BASE:

Manhole base shall be precast reinforced Class 3 concrete with extended base and conform to the requirements for manhole risers. All pipe connections' size, angle, depth and quantity shall be field verified and measured prior to ordering precast base. All pipe connections shall be cored to fit flexible connectors (KOR-N-SEAL or equal) either by manufacturer or contractor using approved equipment. Gaps and holes between manhole base and pipe connections shall be filled with non-shrink grout. The precast base shall be bedded on a minimum of 6" of well graded crushed rock over native material that is either undisturbed or compacted to 95%. (See Standard Specification Section 26-1.02F for crush rock requirements).

INVERT:

Invert shall be completed in a single pour using Class 3 concrete with steel trowel finish. Any change in direction shall be a fixed radius curve extending from the inlet wall to the outlet wall. Inside surface of invert and area between pipe connection and channel shall be free from gaps, holes and sharp edges. All inlets shall be designed and installed such that the top of pipe elevations match as much as possible.

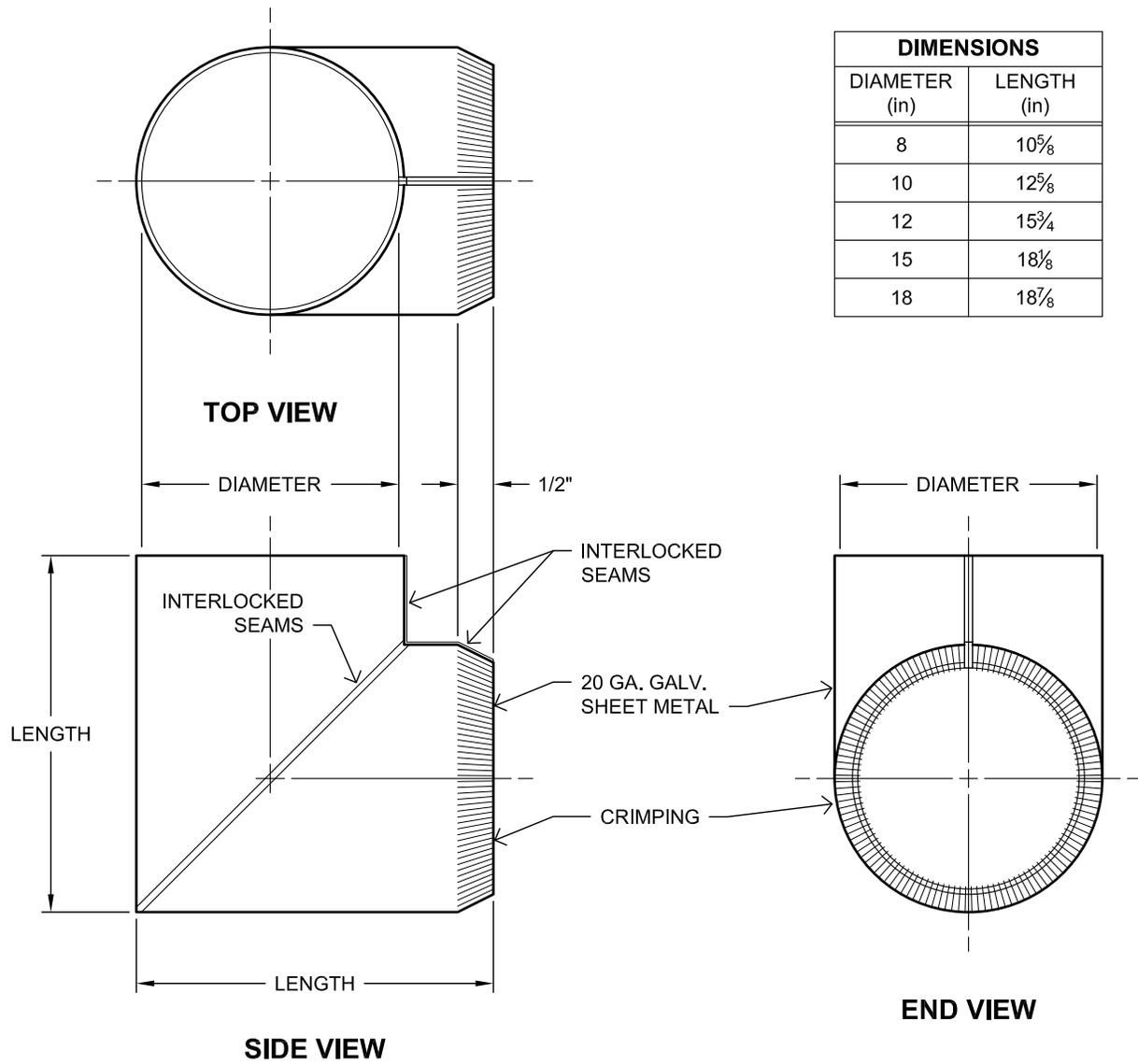
TESTING:

See Standard Specifications Section 77-3.03G for Vacuum Test Requirements.

REVISIONS	BY	APP	DATE
Manhole Cover and Joint Sealant	JDL	DA	10-15
Revise Testing, delete tables	SR	MH	1-14
Revised BASE Note	JDL	BL	6-12
STANDARD CURRENT AS OF:		January 2016	



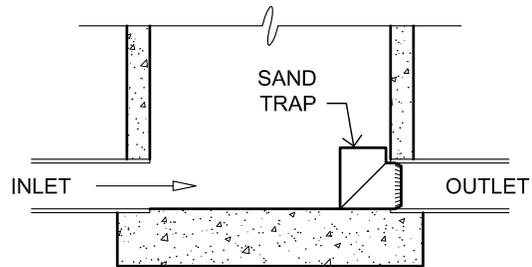
SEWER MANHOLE



DIMENSIONS	
DIAMETER (in)	LENGTH (in)
8	10 ⁵ / ₈
10	12 ⁵ / ₈
12	15 ³ / ₄
15	18 ⁵ / ₈
18	18 ⁷ / ₈

GENERAL NOTES:

- A. Sand traps shall be used in all manholes where manhole tops are adjusted due to street grade changes or paving operations and where sewerline is being constructed.
- B. Sand traps shall be in place throughout construction and shall be removed only after sand and all non-sewage debris have been removed from affected sewerline(s), subject to inspection of Utilities Department.
- C. Use of any other type of san trap shall have prior approval of the Utilities Department.



MANHOLE INSTALLATION

Sand trap to be inserted into outlet pipe of designated manhole(s), or the nearest manhole downstream from construction.

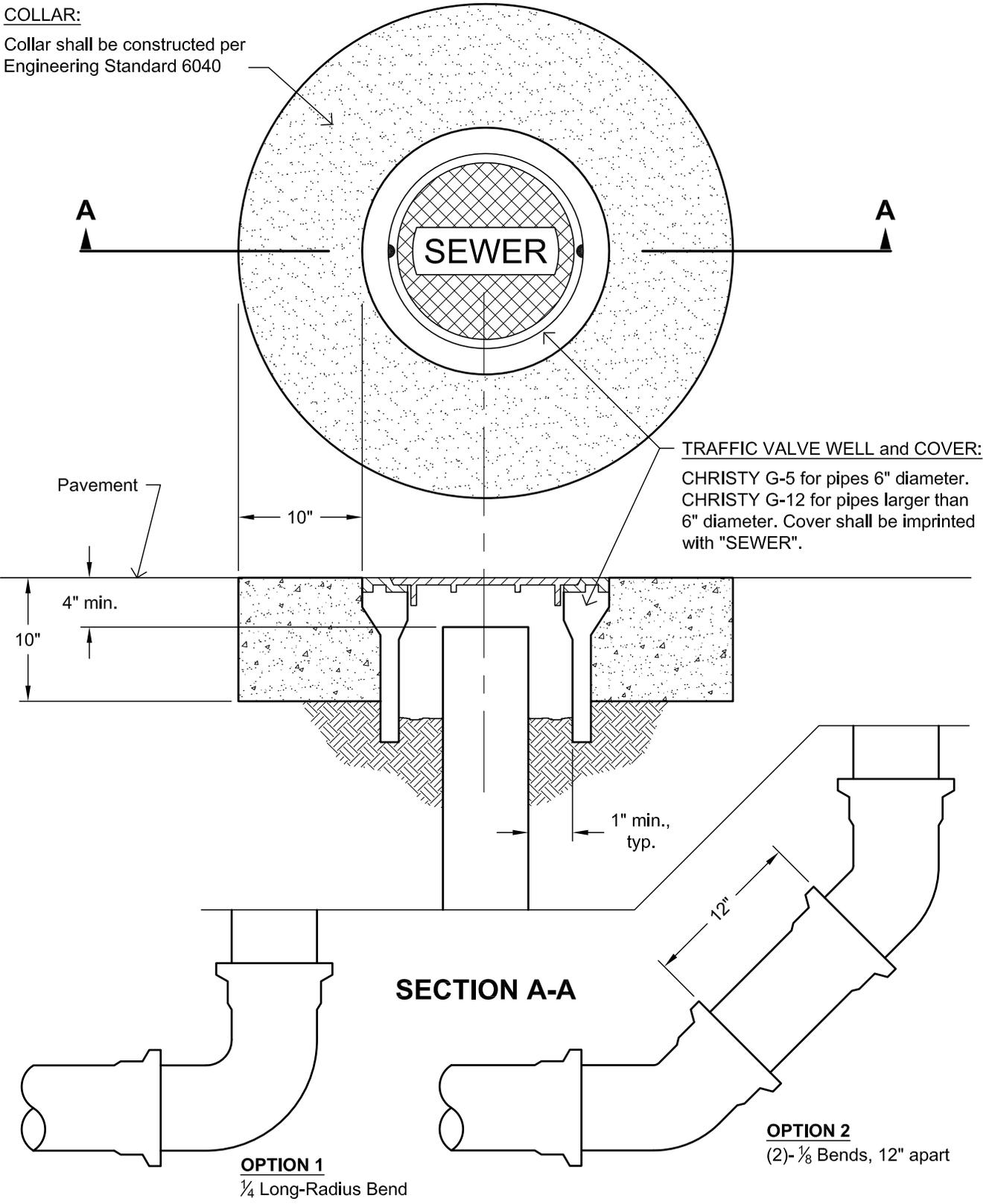
REVISIONS	BY	APP	DATE
<i>New Border</i>	JDL	WAP	9-97
<i>Redrawn to CAD</i>	JDL	WAP	12-93
<i>Drafting edits</i>	JDL	MH	2-13
STANDARD CURRENT AS OF:		January 2016	



SEWER MANHOLE SAND TRAP

COLLAR:

Collar shall be constructed per Engineering Standard 6040



TRAFFIC VALVE WELL and COVER:
 CHRISTY G-5 for pipes 6" diameter.
 CHRISTY G-12 for pipes larger than 6" diameter. Cover shall be imprinted with "SEWER".

SECTION A-A

OPTION 1
 1/4 Long-Radius Bend

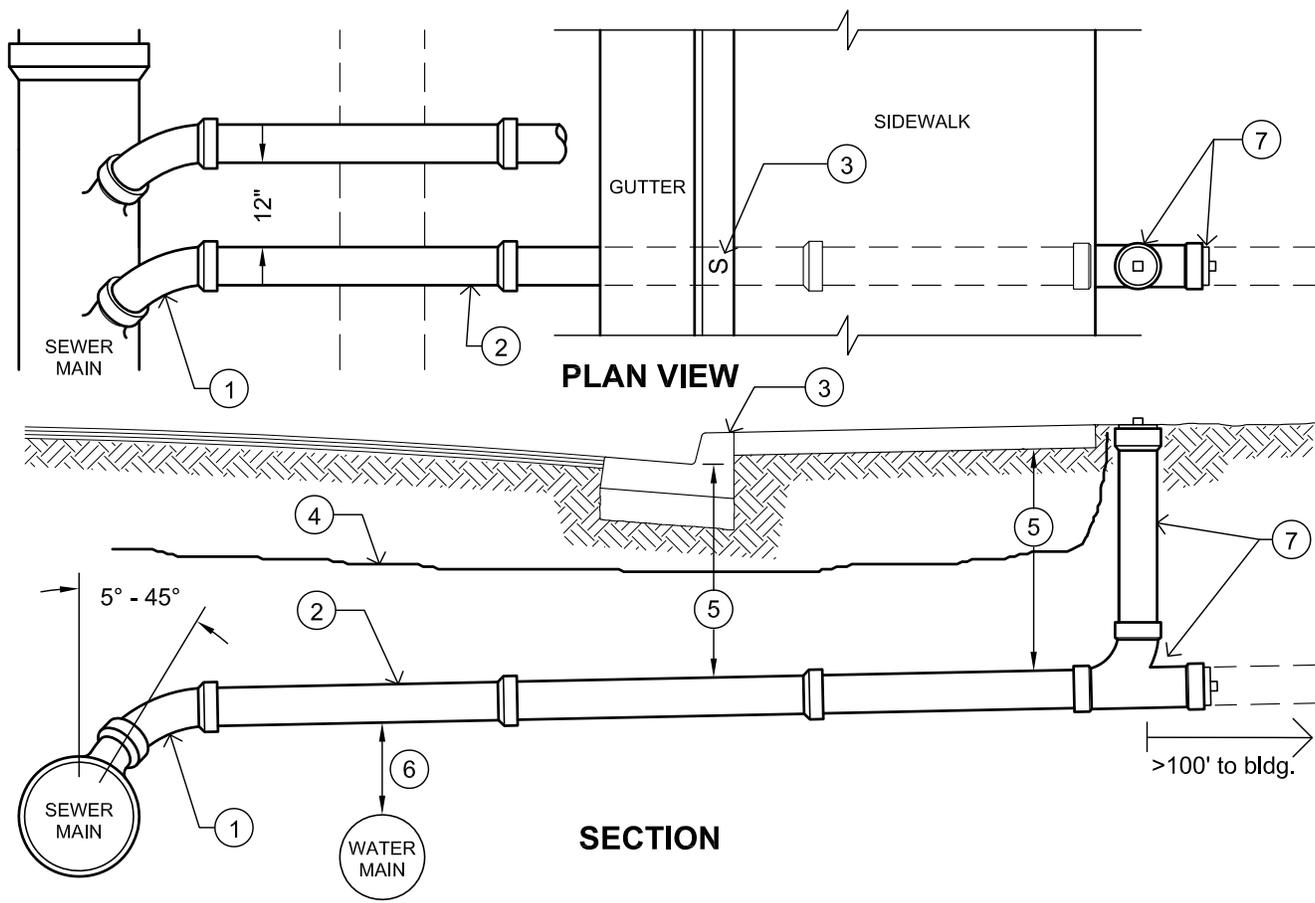
OPTION 2
 (2)- 1/8 Bends, 12" apart

CLEANOUTS ARE NOT ALLOWED ON NEW MAIN CONSTRUCTION.

REVISIONS	BY	APP	DATE
Plug removed	JDL	DA	10-15
Revise bottom Note	SR	BL	1-14
Drafting edits	JDL	MH	2-13
STANDARD CURRENT AS OF:		January 2016	



SEWER CLEANOUT & WELL



GENERAL NOTES:

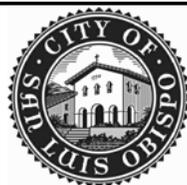
- A. City Utilities Department will install all new wyes on existing sewer mainlines.
- B. Sewer lateral repair must comply with section 77-3.03F(3) of the Standard Specifications.
- C. Install backwater trap or backwater valve in compliance with municipal code section 13.08.200.

INSTALLATION NOTES:

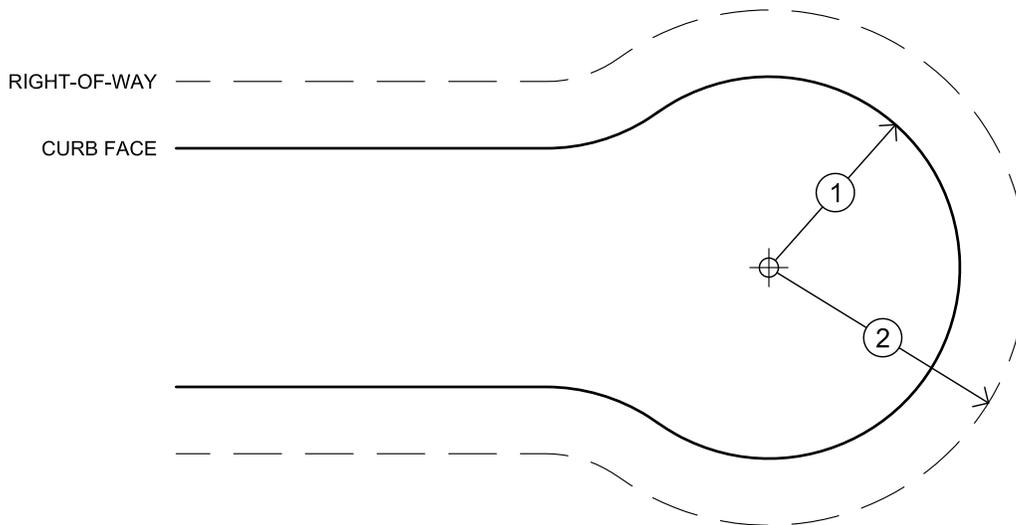
- ① Factory-fabricated wye in sewer main, with 1/8 bend. Bend shall point downstream and enter main at a vertical angle of not less than 5° or more than 45°.
- ② Sewer lateral pipe and fittings must comply with sections 77-3.02A(5) and 77-3.02B(5) of the Standard Specifications.
- ③ Top of curb shall be marked with an "S" directly over lateral. The "S" shall be stamped in new concrete or chiseled into existing concrete and shall not be less than 3" long, 2" wide and 3/16" deep.
- ④ When non-metallic pipe is used, magnetic tracer tape must be placed in trench over lateral from sewer main to cleanout at a depth of 12".
- ⑤ Depth of lateral must not be less than 3' or greater than 5' deep from top of pipe to finished surface unless alternate stronger pipe material is used.
- ⑥ Refer to Engineering Standards 6110 and 6140 for separation requirements with waterlines.
- ⑦ A cleanout shall be installed if called for on the plans or for new laterals where the distance between the right-of-way and the building is greater than 100' or where no cleanout exists at the building. The cleanout shall consist of one-way cleanout wye, riser, and cleanout fitting with plug. Tee shall be plugged at night during construction and left plugged when backfilled if not tied to user.

THIS STANDARD APPLIES TO NEW AND MODIFIED LATERALS. THE ABOVE REQUIREMENTS MAY BE MODIFIED OR WAIVED ONLY WITH THE APPROVAL OF THE CITY UTILITIES DEPARTMENT.

REVISIONS	BY	APP	DATE
Revise all notes	MH	BL	1-14
Rev Note 2, Plan View	SR	MH	3-12
Tracer tape depth	JDL	MH	9-12
STANDARD CURRENT AS OF:		January 2016	



SEWER LATERAL



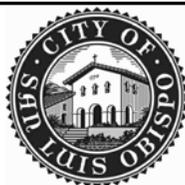
CUL-DE-SAC

INSTALLATION NOTES:

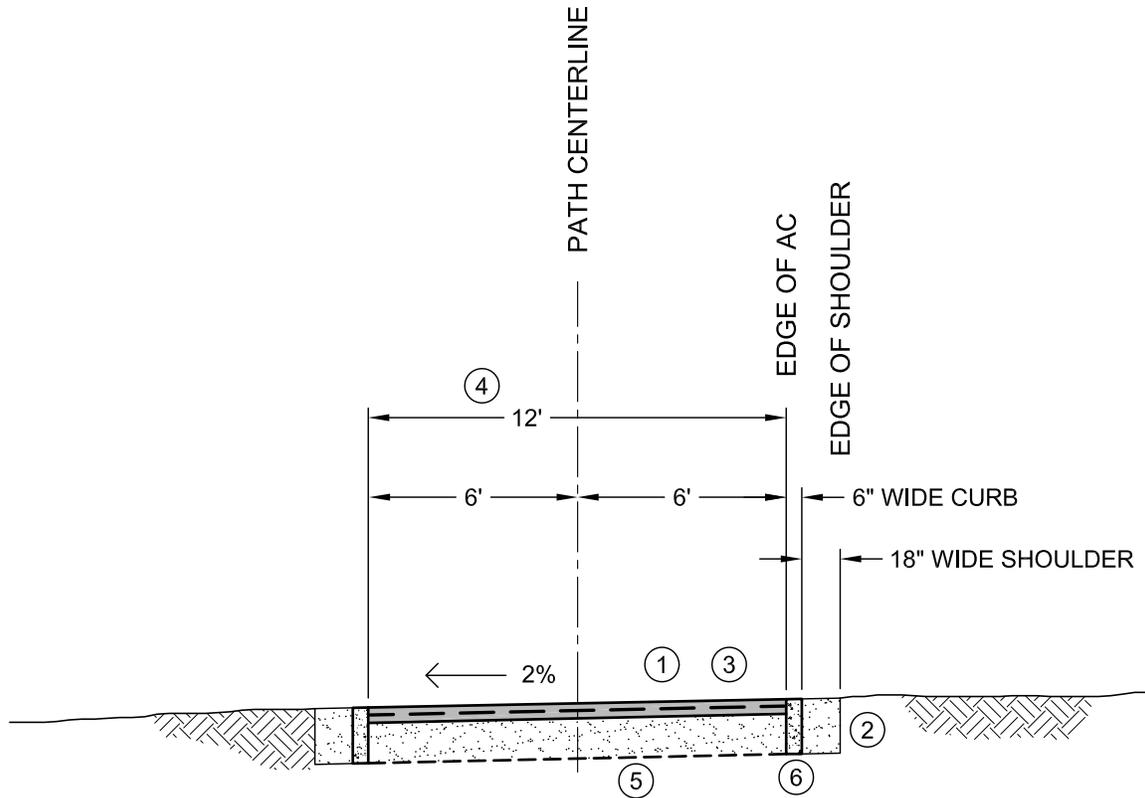
- ① Radius to curb face: Residential Areas = 40'; Commercial Areas = 45'
- ② Radius to right-of-way shall conform to the ROW requirements in Engineering Standard 1010.
- ③ Cul-de-sac lengths shall be as restricted by Engineering Standard 1010.

**DEVIATIONS FROM THESE STANDARDS MUST BE APPROVED BY THE CITY.*

REVISIONS	BY	APP	DATE
<i>New Standard</i>	<i>JDL</i>	<i>JDW</i>	<i>1-05</i>
<i>Modify Curb Radius</i>	<i>DVB</i>	<i>BL</i>	<i>10-06</i>
<i>Drafting edits</i>	<i>JDL</i>	<i>MH</i>	<i>2-13</i>
STANDARD CURRENT AS OF:		January 2016	



**NEW CUL-DE-SAC
REQUIREMENTS***



INSTALLATION NOTES:

- ① Bicycle path shall be constructed with 4" AC over 12" Class 2 base. AC aggregate to be ½" maximum, medium gradation installed in two 2" lifts. Pavement reinforcing grid (Glasgrid 8502, STARgrid G-PS 200-100, or approved equal) to be installed full width of pathway between lifts. Pathway to contain a uniform cross slope of 2%.
- ② Thickness of shoulder to match bottom of Class 2 base under pathway.
- ③ Pathway to contain a 4" dashed yellow centerline stripe and two 4" solid white stripes centered 6" from each edge of the pathway.
- ④ 12' paved width is typical. See the City of San Luis Obispo Bicycle Transportation Plan for additional design standards.
- ⑤ 13' wide triaxial geogrid (Tensar TX 140, or approved equal) shall be installed at the bottom of the Class 2 base and the concrete flush curb.
- ⑥ 6" wide x 16" deep reinforced concrete flush curb. See Engineering Standard 4020 for items not shown or noted.

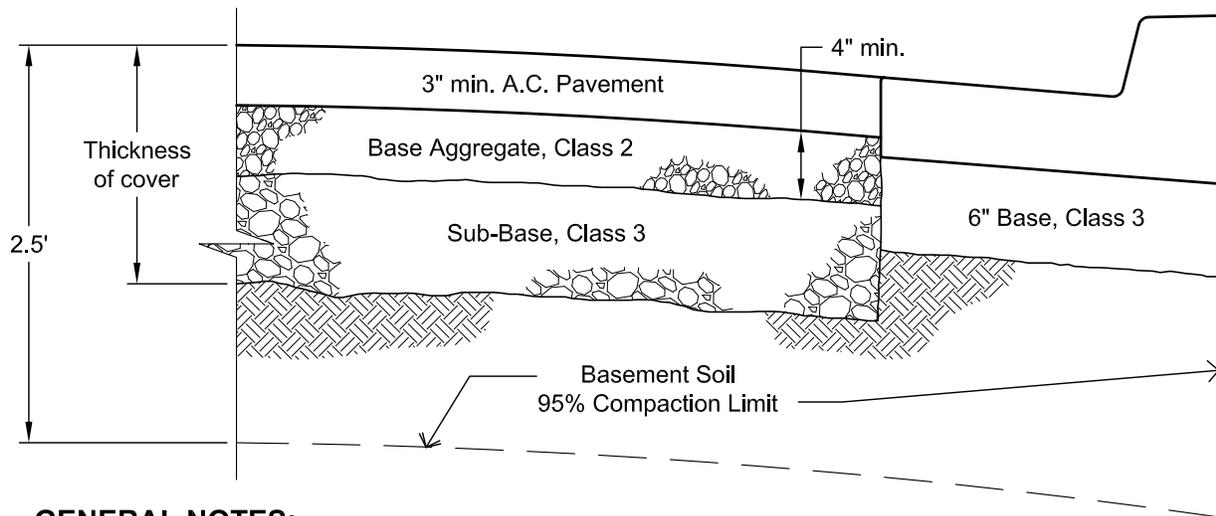
GENERAL NOTES:

- A. For items not shown or noted, refer to Chapter 1000 of the Caltrans Highway Design Manual, the California MUTCD, and the City of San Luis Obispo 2013 Bicycle Transportation Plan.

REVISIONS	BY	APP	DATE
Modify Section & Add Paving Grid	DVB	BL	1-14
Add Note 5	DVB	MH	11-08
Drafting edits	JDL	MH	2-13
STANDARD CURRENT AS OF:		January 2016	



**CLASS I BIKEWAY
(PATH)**



GENERAL NOTES:

- A. Total thickness of cover depends on R-value of basement soil as well as the Traffic Index assigned to the street. All street sections shall be designed according to the Cal Trans method which is outlined in Chapter 600 of the Cal Trans Highway Design Manual.
- B. Pavement design shall be based on the traffic indexes shown below, which are based on a 20-year design life for reconstruction or resurfaced streets, and a 50-year design life for new streets.
- C. For paving in new subdivisions that is placed prior to construction of buildings, the pavement will be subjected to traffic and wear associated with the on-site construction. In order to accommodate this additional usage, the A.C. thickness shall be increased from that which is derived from Cal Trans method by either:
 - a. 1/2" if total section is placed prior to building construction (unphased).
 - b. 1" if pavement construction is phased.

THE FOLLOWING IS AN EXAMPLE USING AN R-VALUE OF 5:

STREET CLASSIFICATION	T.I.*	STREET SECTION THICKNESS IN INCHES									
		EXISTING BUILDINGS			UNPHASED CONST.			PHASED CONSTRUCTION			
		AC	BASE	SUBBASE	AC	BASE	SUBBASE	FINISH	AC	BASE	SUBBASE
NEW LOCAL	6.5	3 1/2"	7"	9"	4"	7"	9"	1 1/2"	3"	7"	9"
RECONSTRUCTED LOCAL	5.5	3"	5"	8"	3 1/2"	5"	8"	1 1/2"	2 1/2"	5"	8"
LOCAL W/ BUS ROUTES	7.0	4"	7"	10"	4 1/2"	7"	10"	1 1/2"	3 1/2"	7"	10"
NEW COLLECTOR/ ARTERIAL	9.5	6"	11"	12"	6 1/2"	11"	12"	1 1/2"	5 1/2"	11"	12"
RECONSTRUCTED COLLECTOR/ARTERIAL	8.5	5"	10"	11"	5 1/2"	10"	11"	1 1/2"	4 1/2"	10"	11"

The pavement section for street widening shall be based on the T.I. of a reconstructed street, and the thickness of the new A.C. shall at a minimum match the thickness of the existing A.C.

New streets and road widening where asphalt surface is increased 10 feet or more shall be fog sealed no more than 60 days prior to request for final acceptance by the City. New streets shall be fog sealed the entire length and width of asphalt surface. Road widening shall be fog sealed to the centerline of the widened roadway for the entire widened length, at a minimum.

Variation of these design standards may be approved by the City Engineer to meet individual circumstances.

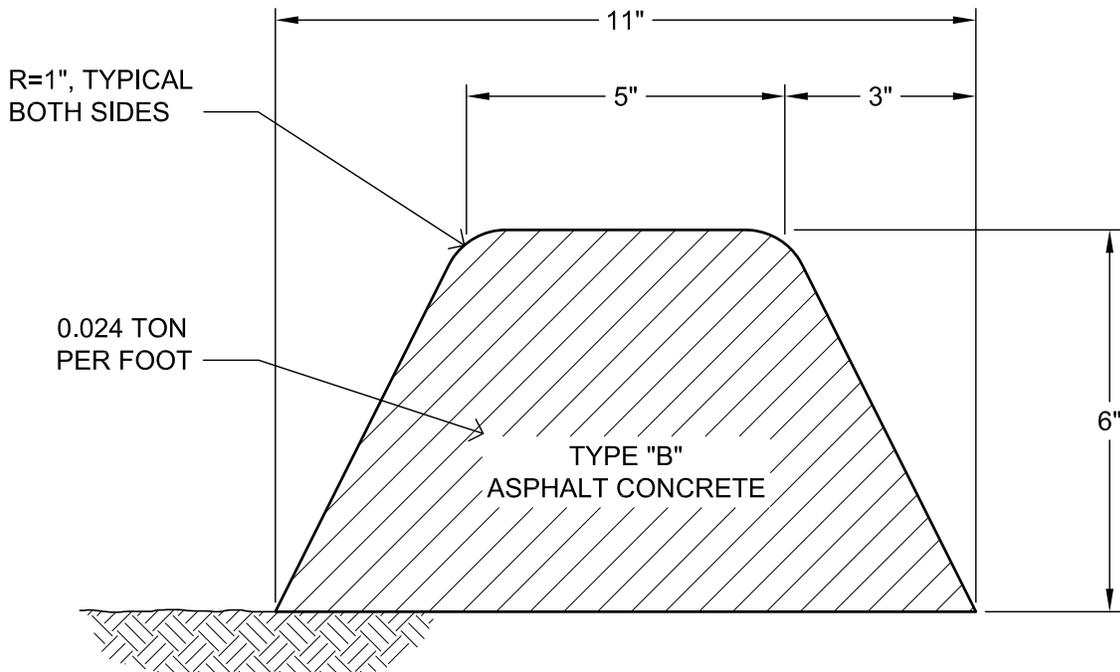
A street shall be designed as a new street when existing utilities have been constructed within the past 5 years.

*Adopted by Resolution No. 9006

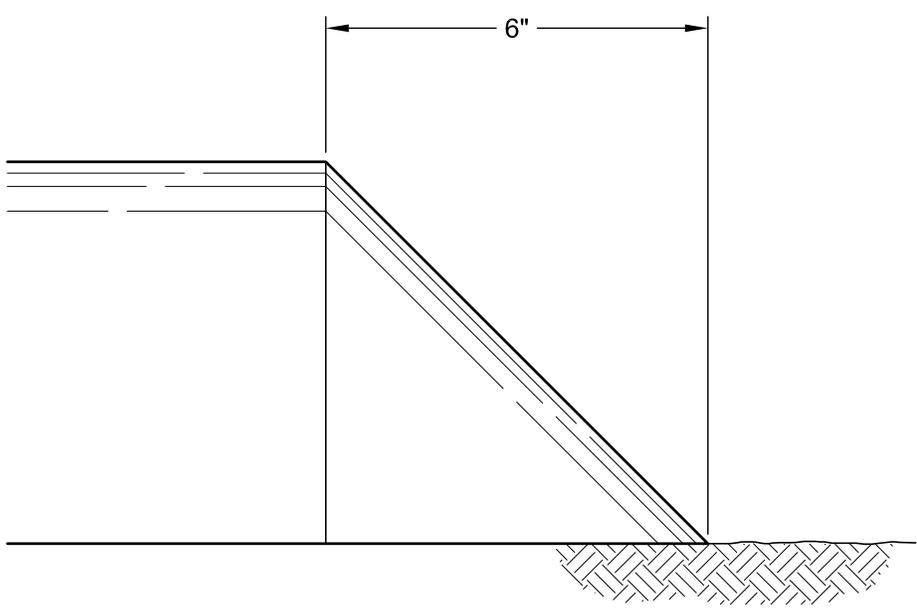
REVISIONS	BY	APP	DATE
Prime coat/fog seal revision	JDL	MH	12-12
Revise 95% compaction depth	DVB	BL	10-06
Revised text	MH	JDW	10-04
STANDARD CURRENT AS OF: January 2016			



FLEXIBLE PAVEMENT ELEMENTS



SECTION

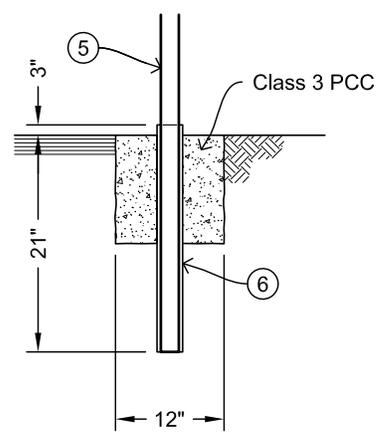
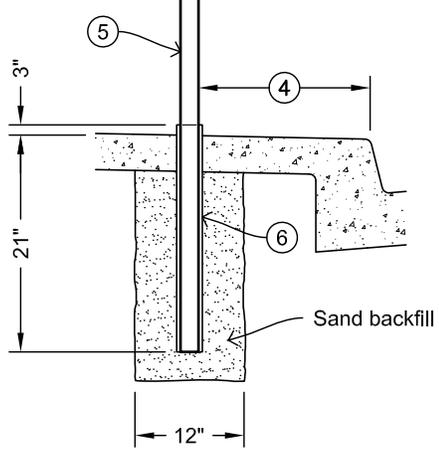
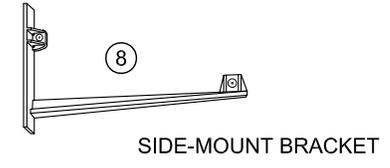
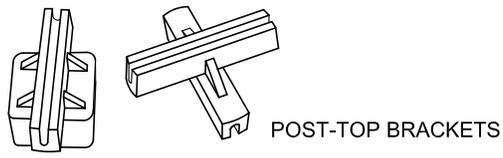
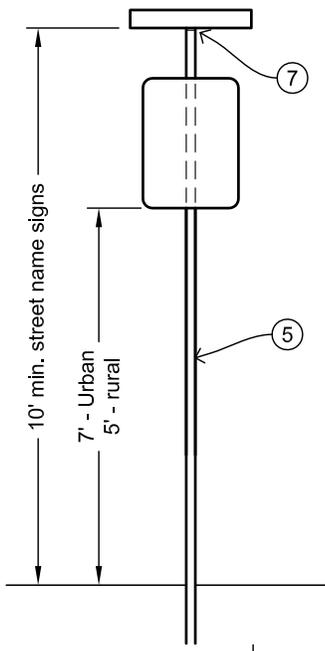


SIDE VIEW OF END

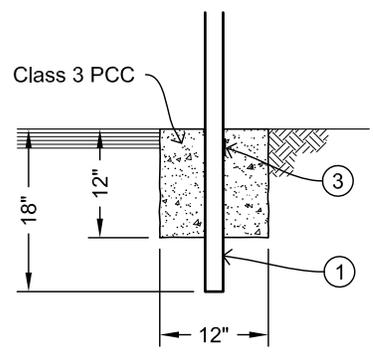
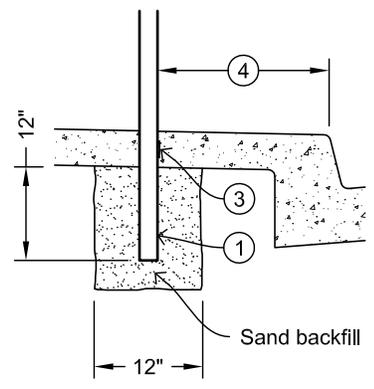
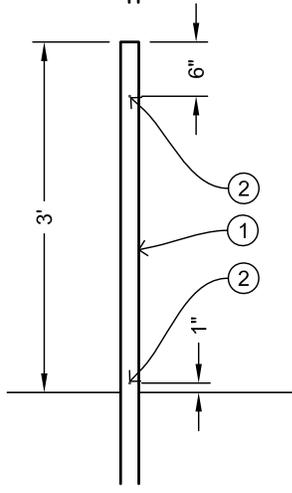
REVISIONS	BY	APP	DATE
<i>New Border</i>	JDL	WAP	9-97
<i>Drafting edits</i>	JDL	MH	2-13
<i>Type "3" to Type "B"</i>	JDL	WAP	7-98
STANDARD CURRENT AS OF:		January 2016	



ASPHALT BERM
6"



METAL SIGN POST



PARKING METER POST

INSTALLATION NOTES:

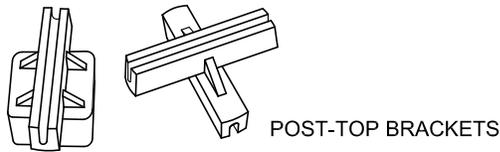
- ① 2" O.D. galvanized steel pipe
- ② Drain hole, 1/4" diameter, on one side only
- ③ #4 rebar, 2" long, welded to pipe 10" from bottom
- ④ 15" standard setback, 22" if sign is more than 15" wide or if post is in Mission Tile sidewalk
- ⑤ 2" galvanized metal post, FHWA (Breakaway) approved such as 14g, Qwik-Punch or equal. Posts shall be industrial powder-coated only under the following conditions:
 - Downtown, no street name sign located at post: Forest Green RAL 6009 or equal
 - Downtown, street name sign located at post: Brown RAL 8024 or equal
 - Railroad District: Red-Brown RAL 8016 or equal
- ⑥ Heavy duty galvanized steel sleeve such as Pacific Products or approved equal
 - Steel: ASTM A500 Grade B; Galvanizing: ASTM 123
 - 2 1/2" x 2 1/2" x 24" one-piece anchor with pointed end, 3/16" minimum wall thickness
 - 7/16" holes, all 4 sides at 1" below top. No holes are allowed in the underground portion of sleeve
 - Attach sign post to sleeve with a 3/8" drive rivet with a 1" washer, or approved equal
- ⑦ Brackets: 2" square, 12" length, post top mounted sign bracket, bolted to post and sign with vandal proof bolts. Safeway Sign style 812 or approved equal
- ⑧ Side mounting bracket: Standoff bracket Safeway Sign style 1010 or approved equal

When sign or parking meter is to be located in sidewalk, see Engineering Standard 7410 for "clear zone" restrictions.

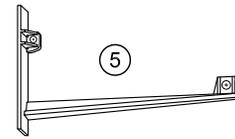
REVISIONS	BY	APP	DATE
Galvanized Sleeve Specs.	SR	JDW	10-03
Sleeve depth; Drafting edits	JDL	MH	9-12
Revise Note 6	DVB	BL	11-08
STANDARD CURRENT AS OF:		January 2016	



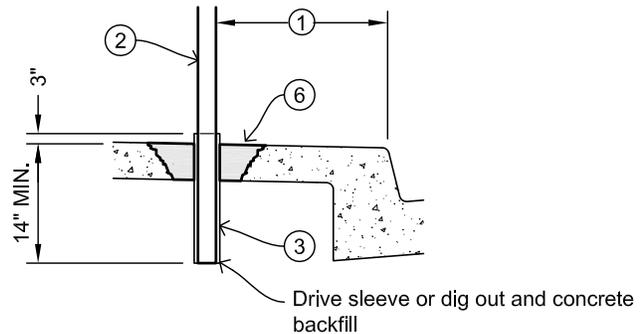
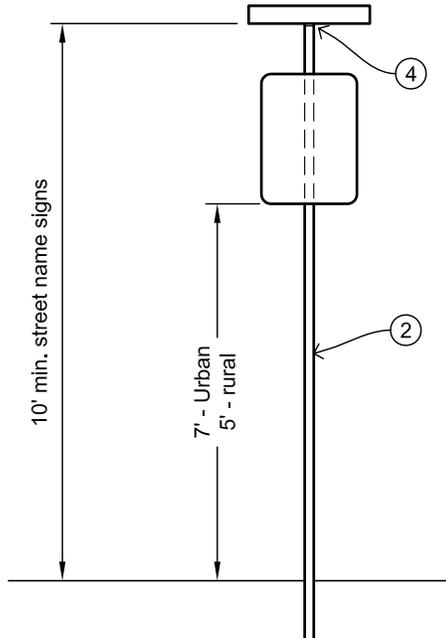
METAL SIGN & PARKING METER POSTS



POST-TOP BRACKETS



SIDE-MOUNT BRACKET



METAL SIGN POST ON EXISTING SIDEWALK

INSTALLATION NOTES:

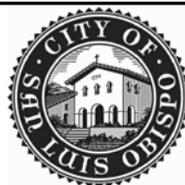
- ① 15" standard setback, 22" if sign is more than 15" wide or if post is in Mission Style sidewalk.
- ② 2" galvanized metal post, FHWA (Breakaway) approved such as 14g, Qwik-Punch or equal. Posts shall be industrial powder-coated only under the following conditions:
 - Downtown, no street name sign located at post: Forest Green RAL 6009 or equal.
 - Downtown, street name sign located at post: Brown RAL 8024 or equal.
 - Railroad District: Red-Brown RAL 8016 or equal.
- ③ Heavy duty galvanized steel sleeve such as Pacific Products or approved equal.
 - Steel: ASTM A500 Grade B; Galvanizing: ASTM 123
 - 2½" x 2½" x 24" one-piece anchor with pointed end, 3/16" minimum wall thickness
 - 7/16" holes, all 4 sides at 1" below top. No holes are allowed in the underground portion of sleeve.
 - Attach sign post to sleeve with a 3/8" drive rivet with a 1" washer, or approved equal.

- ④ Brackets: 2" square, 12" length, post top mounted sign bracket, bolted to post and sign with vandal proof bolts. Safeway Sign style 812 or approved equal.
- ⑤ Side mounting bracket: Standoff bracket Safeway Sign style 1010 or approved equal.
- ⑥ Cored or chipped hole. Minimize size to install sleeve. Finish - Smooth, paste worked into joint to blend. Mission - Colored and lightly salted.

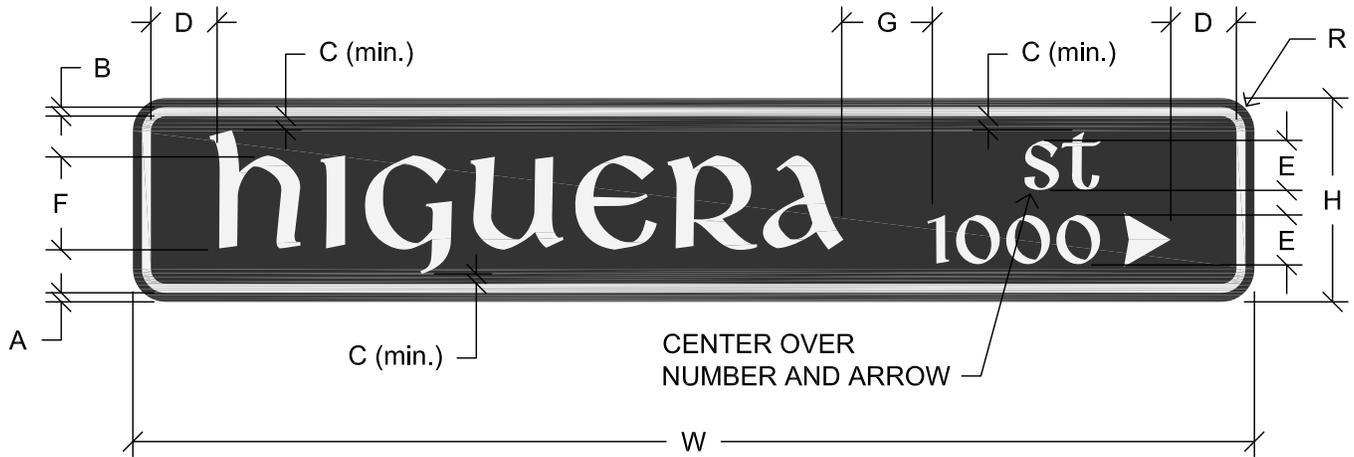
Standard may be used where City Engineer authorizes retrofit, in lieu of full panel removal & restoration per Eng. Std. 7210.

When sign or parking meter is to be located in sidewalk, see Engineering Standard 7410 for "clear zone" restrictions.

REVISIONS	BY	APP	DATE
New Standard	SR	BL	5-14
STANDARD CURRENT AS OF:		January 2016	



METAL SIGN & PARKING METER POSTS
(IN EXISTING SIDEWALK)



DIMENSIONS	SIGNALIZED WITH MAST ARM MOUNTS	POLE MOUNTS
A	1/2"	None
B	1/2"	3/8"
C	Center name in frame	3/8"
D	3"	2" - 3"
E	NA	2"
F	8"	4"
H	18"	8"
W	30" - 100" max.	30" - 100" max.
R	2"	1"
G	NA	3"

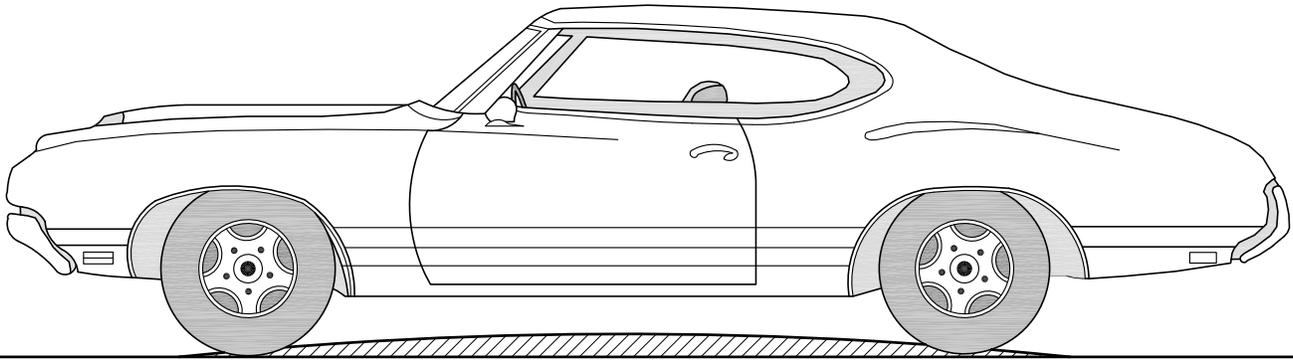
NOTES:

1. Signs are single blade aluminum - 5052 H38 0.125 double-faced.
2. Mast Arm signs display street name only, one sign per travel direction.
3. Color: 3M-887I Brown background, reflective white letters and arrow. All non-internally illuminated signs to be prepared with reverse screening. Reflective white lettering shall be 700-candle power, "VIP" sheeting. All pole mounted signs shall have anti-graffiti clear coating. (Avery AL 1000 or approved equal). Street name signs for private roadways shall reverse colors, white background and brown lettering.
4. Font: Libra (letter height = tall letters / short letters)
5. Arrow on pole mount signs points in the direction that addresses increase.
6. Mounting: See Engineering Standard 7210 for mounting on poles. See Caltrans Standards ES 70 and ES 7D for mast arm mounting.
7. Sign width "W" to be 30" min. and increased as required in 6" increments to 100" max.
8. "C" is measured to top and/or bottom of tall letters.
9. Mast arm signs are additive to pole mount signs at signalized locations.
10. One set of pole mounts per intersection except two in central business district when no signal present.
11. "st", block number and arrow are deleted for mast arm mounted signs.

REVISIONS	BY	APP	DATE
Modified Table	MH	BL	1-09
Revised Notes	MH	BL	10-09
Added Note 11	MH	JDW	10-04
STANDARD CURRENT AS OF: January 2016			

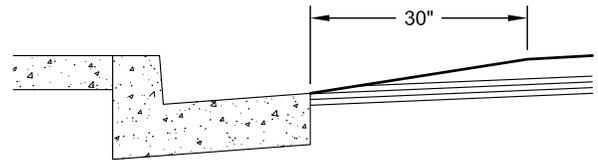


STREET NAME SIGN

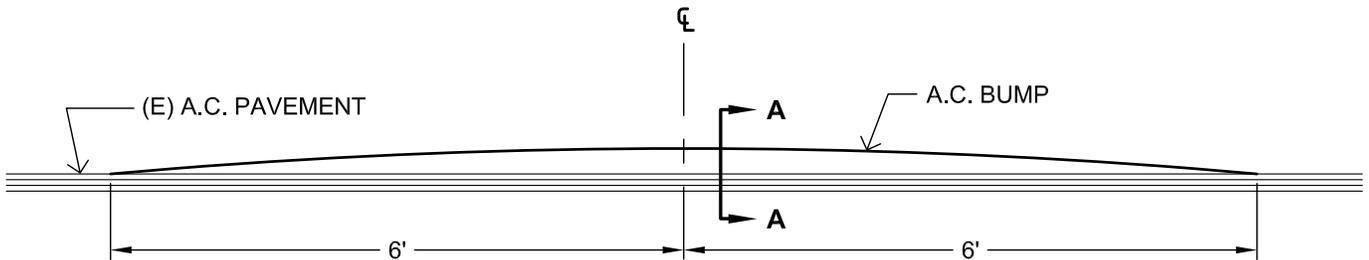


GENERAL NOTES:

- A. Bumps shall be placed on good, sound asphalt surface. Structural section shall be repaired or replaced, as needed, prior to placing bump.
- B. A tack coat shall be applied prior to placing the bump paving.
- C. Bump shall be constructed of asphalt concrete, Type "B", with 3/8" maximum aggregate.
- D. For location, striping, and signs, see Engineering Standard 7321.
- E. Bump type shall be determined by the City Engineer.



GUTTER SECTION A-A



PROFILE

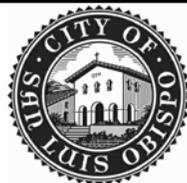
DEPTH OF A.C. BUMP (TYPE 1)

Distance from Edge (ft)	0	2	4	6	4	2	0
Depth of A.C. (in)	0	1 3/4	2 1/2	3	2 1/2	1 3/4	0

DEPTH OF A.C. BUMP (TYPE 2)

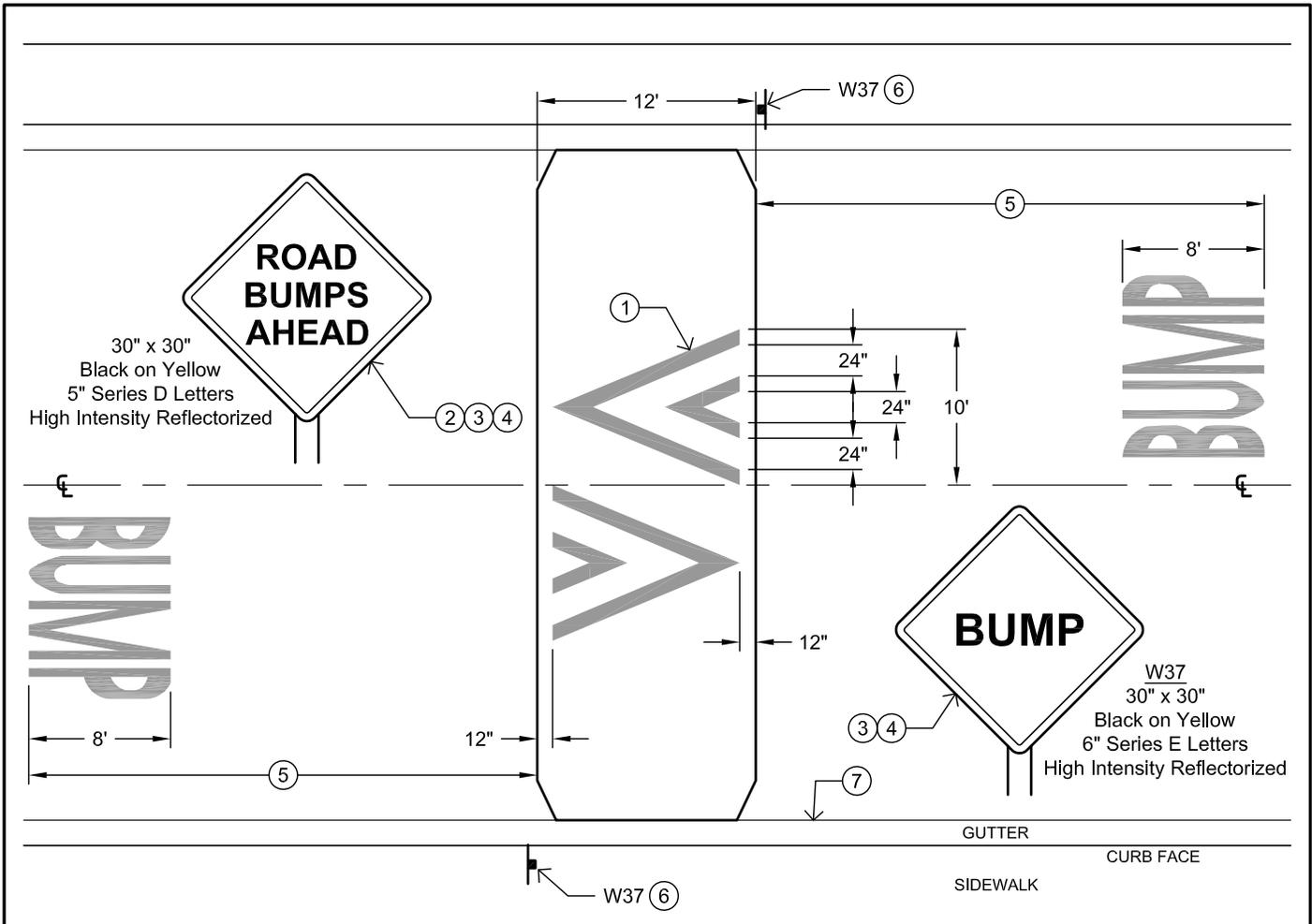
Distance from Edge (ft)	0	2	4	6	4	2	0
Depth of A.C. (in)	0	1 3/8	2 3/8	2 1/2	2 3/8	1 3/8	0

REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	4-13
Metric conversion	SR	WAP	12-96
Add Type 2	SR	WAP	12-96



**ROAD BUMP
CONSTRUCTION DETAILS**

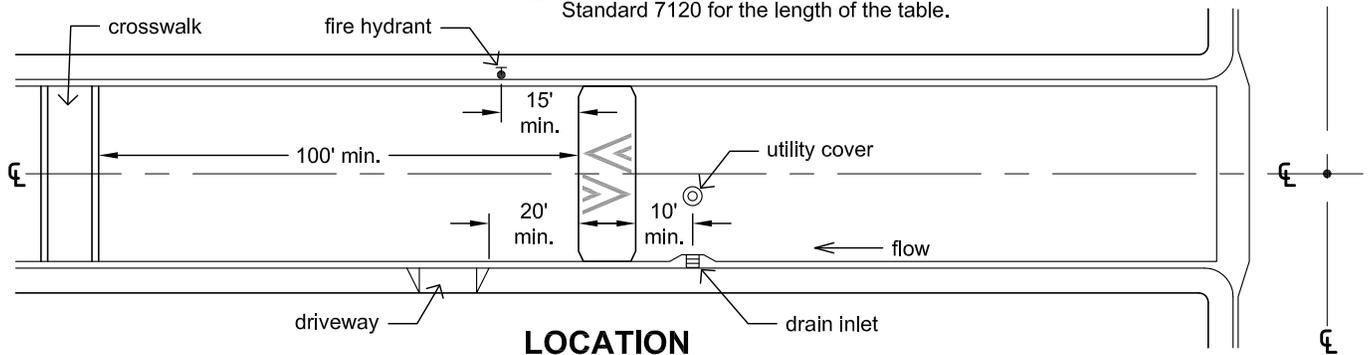
STANDARD CURRENT AS OF: January 2016



STRIPING & SIGNS

INSTALLATION NOTES:

- ① 12" wide reflective white thermoplastic pavement markings.
- ② "ROAD BUMPS AHEAD" signs shall be located only as directed by the City Engineer.
- ③ For sign post details, see Engineering Standard 7210.
- ④ Signs shall conform to State Specifications.
- ⑤ To be determined in field. One sign shall be installed in advance of a series of bumps.
- ⑥ Sign to be posted at the road bump but may be posted up to 50' in advance as directed by the City Engineer.
- ⑦ Where no curb and gutter exist, add AC berm per Engineering Standard 7120 for the length of the table.



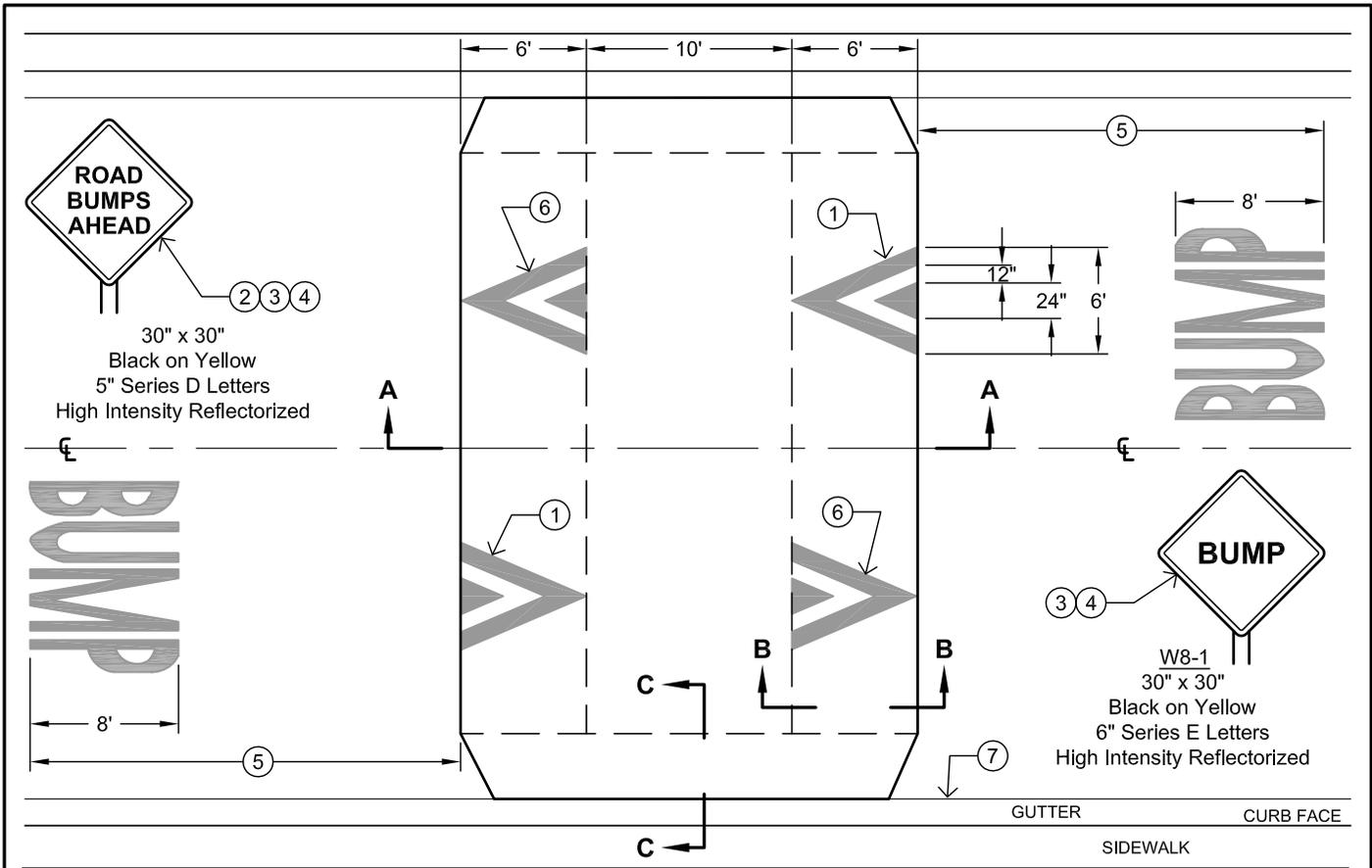
LOCATION

REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	4-13
Revised Note 3, added Note 7	DVB	BL	11-06
Striping revision	SR	WAP	12-96

STANDARD CURRENT AS OF: January 2016



**ROAD BUMP
LOCATION, STRIPING & SIGNS**

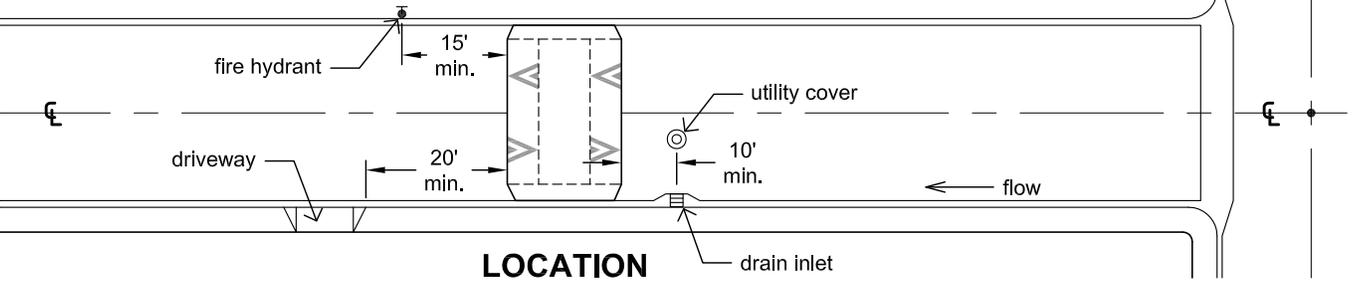
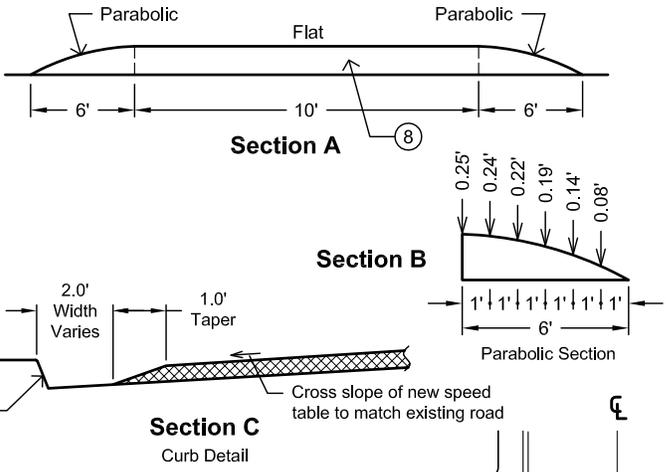


STRIPING & SIGNS

INSTALLATION NOTES:

For General Construction Notes, see Engineering Standard 7320.

- ① 12" wide reflective white thermoplastic pavement markings.
- ② "ROAD BUMPS AHEAD" signs shall be located only as directed by the City Engineer.
- ③ For sign post details, see Engineering Standard 7210.
- ④ Signs shall conform to State Specifications or as approved by the City Traffic Engineer.
- ⑤ To be determined in field. One sign shall be installed in advance of a series of bumps.
- ⑥ Additional 12" wide reflective thermoplastic pavement markings may be installed as directed by the City Traffic Engineer.
- ⑦ Where no curb and gutter exist, add AC berm per Engineering Standard 7120 for the length of the table.
- ⑧ Exceptions may be approved by the City Traffic Engineer.

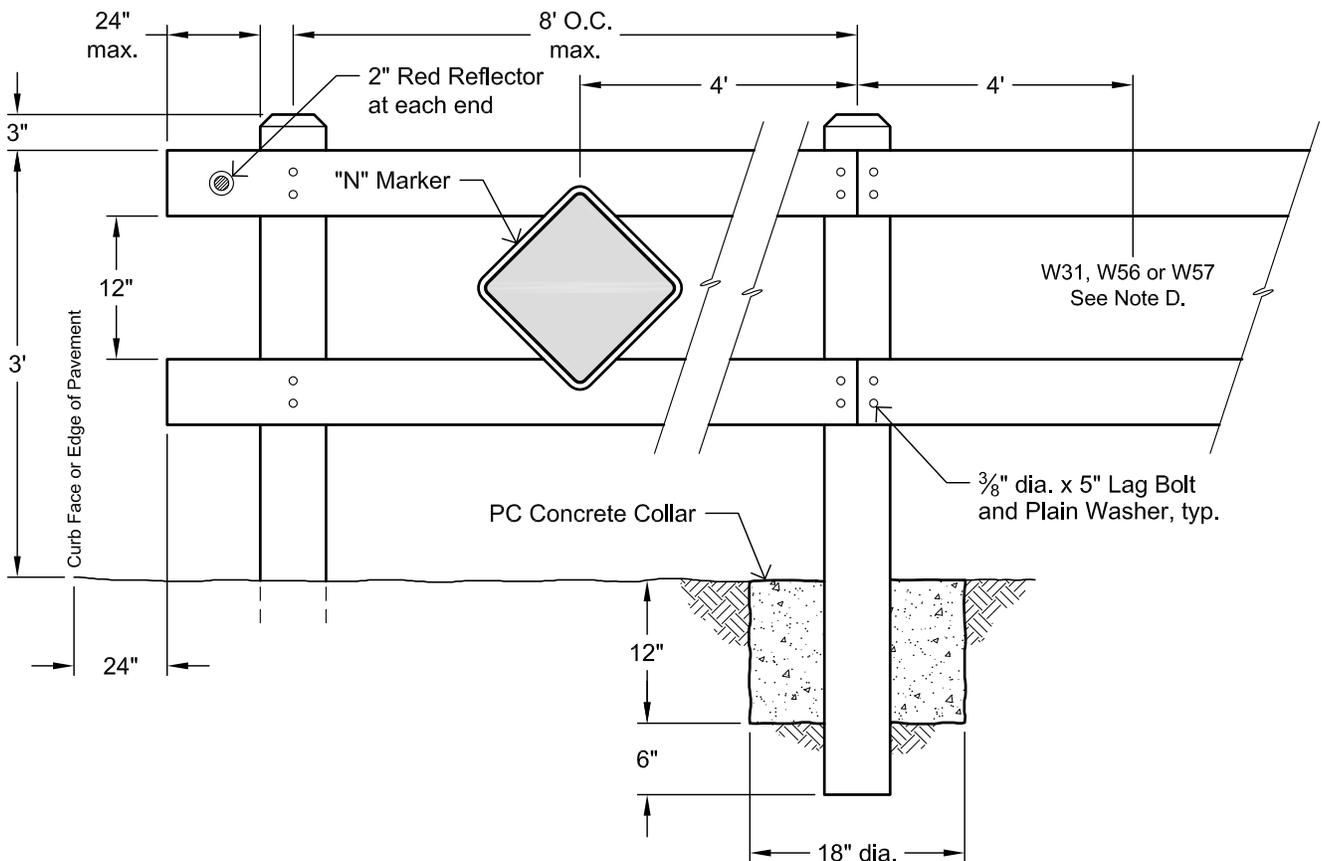


LOCATION

REVISIONS	BY	APP	DATE
New Standard	CO	TB	10-06
Note 9; DW clearance	DVB	BL	11-06
Drafting edits	JDL	MH	5-13
STANDARD CURRENT AS OF:		January 2016	

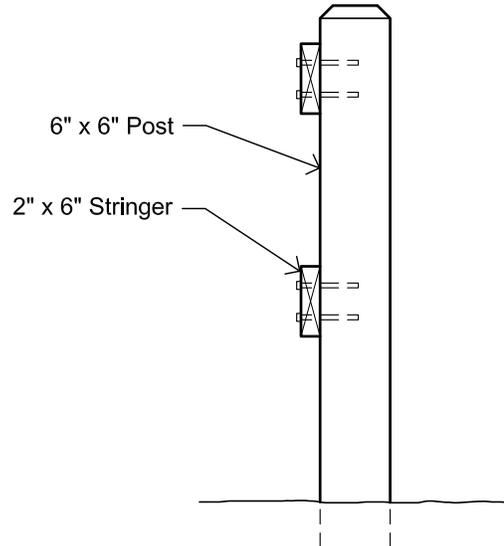


**SPEED TABLE
LOCATION, STRIPING & SIGNS**



GENERAL NOTES:

- A. All lumber shall be Douglas Fir, surfaced four sides (DFS4S).
- B. All lumber shall be painted white as per Caltrans specifications.
- C. Treat portion of post below ground as per Caltrans specifications.
- D. YELLOW 'N' marker is used to warn of an abrupt turn. Background shall be high intensity yellow retro-reflective sheeting. Alternate 'N' marker with W56 (double head arrow) or W57 (single head arrow), one per section.
- E. RED 'N' marker is used to mark the end of a street. Background shall be high intensity red retro-reflective sheeting. Alternate 'N' marker with W31, one per section.
- F. Total length required varies dependent upon street width.



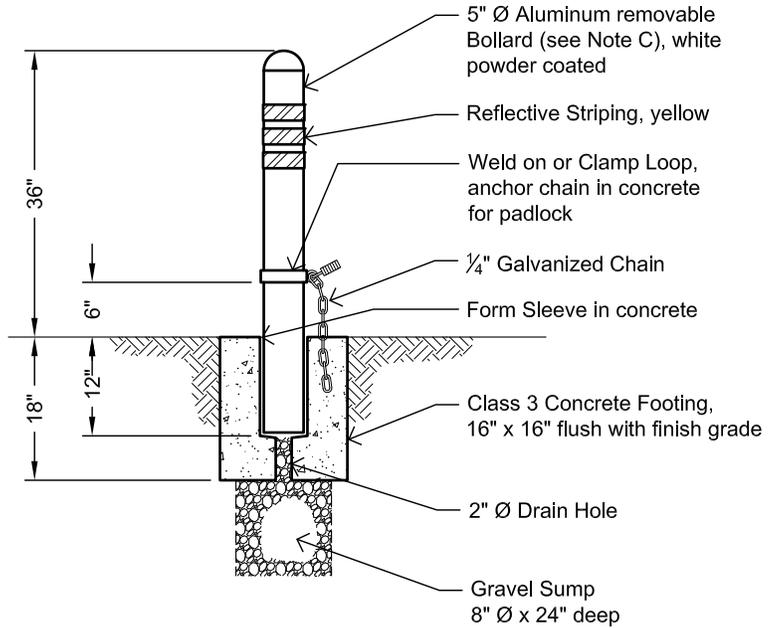
REVISIONS	BY	APP	DATE
New Border	JDL	WAP	1-98
Drafting edits	JDL	MH	5-13
Revised Notes	MH	JDW	10-04
STANDARD CURRENT AS OF:		January 2016	



STREET BARRICADE

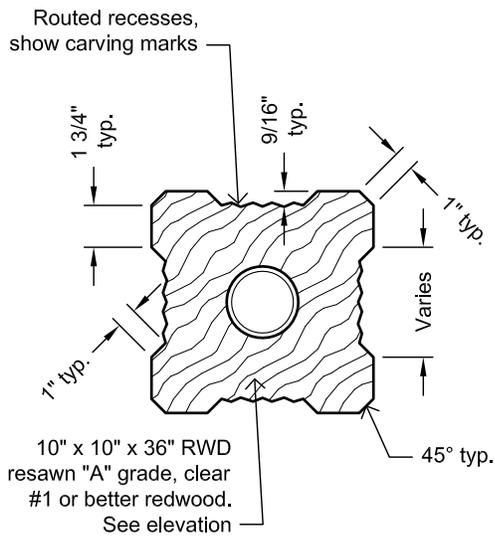
GENERAL NOTES:

- A. Provide Knox-box padlocks per City Fire Department.
- B. Provide 5' clear spacing between bollards (5'-3" O.C.) for bicycling facilities. For all other installations, provide 4' clear spacing between bollards (4'-3" O.C.)
- C. Use play booster by Landscape Structures Inc. distributed by Rec West (818) 735-3838, South Bay Foundry DFB-RA5 or approved equal.
- D. Engineers and architects are encouraged to submit alternate designs that are consistent with these design features, and the projects where the bollards are to be used.
- E. Yellow reflective tape shall be placed on each face of bollard as directed by Engineer.
- F. For bicycling facilities, provide pathway striping that conforms to CA MUTCD.

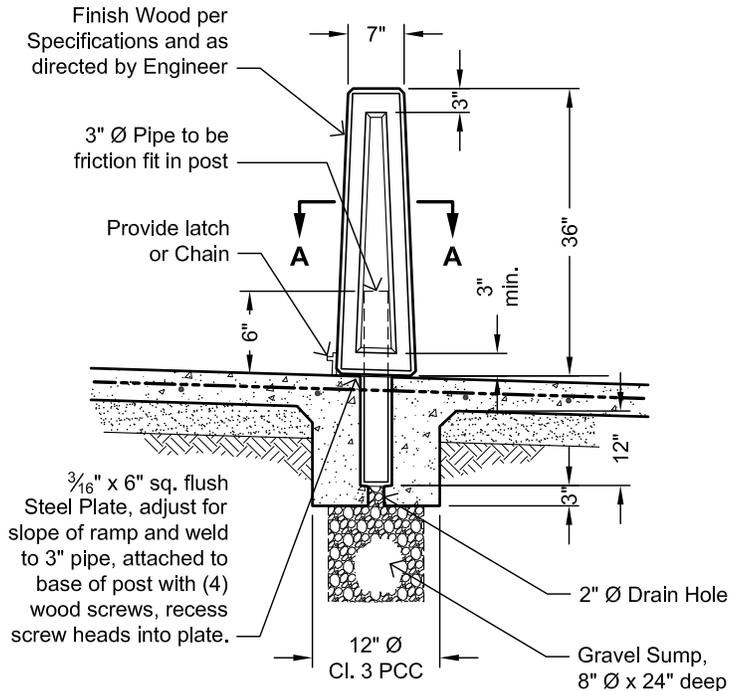


ALTERNATE NO. 1

NOTE: All steel to be double coated galvanized.



SECTION A-A

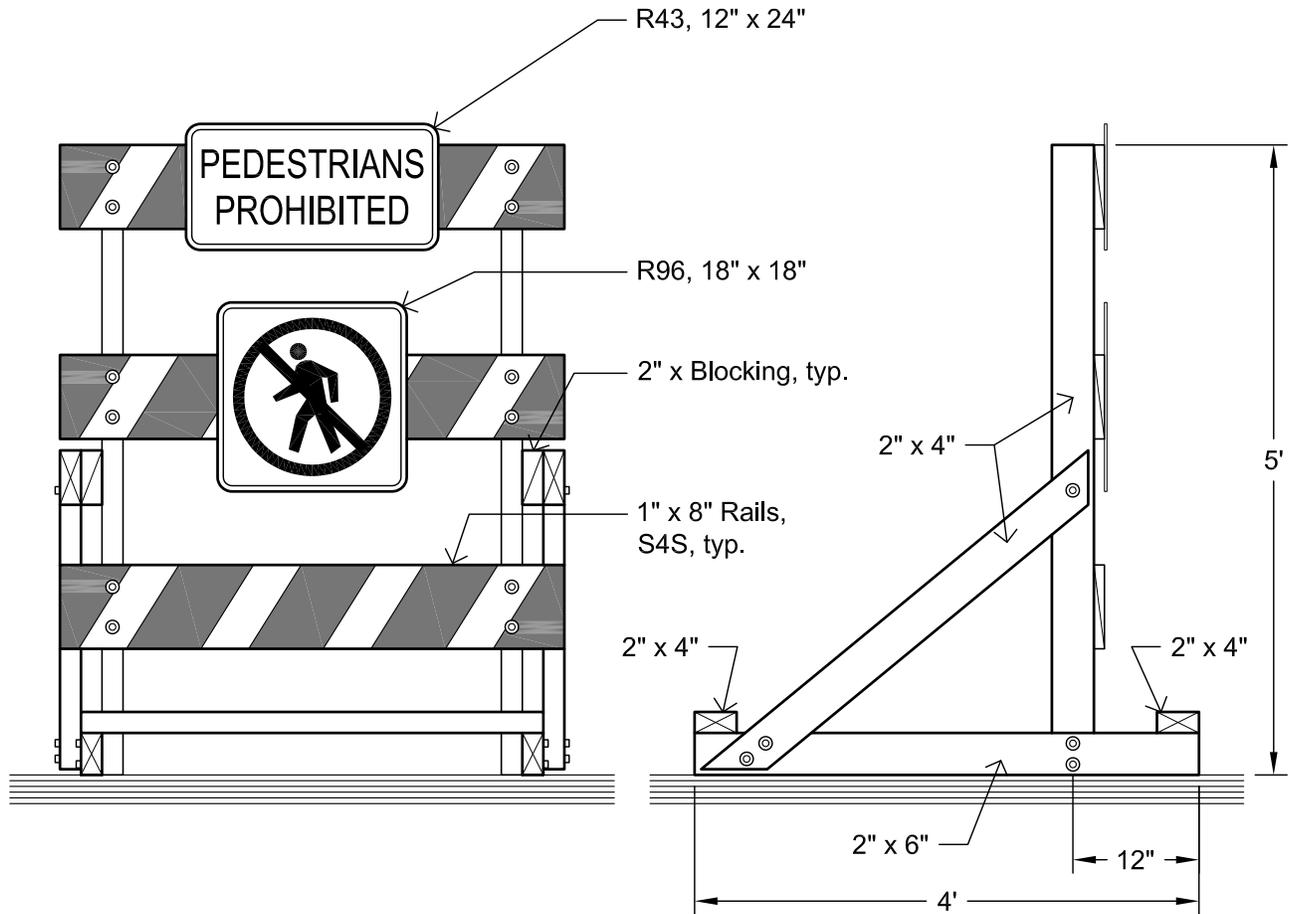


ALTERNATE NO. 2

REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	5-13
Revised Note 3 Alternate 1	MH	BL	12-09
Revised Notes 2 & 6	MH	BL	11-09
STANDARD CURRENT AS OF:		January 2016	



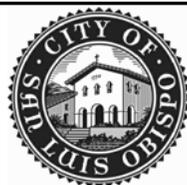
REMOVABLE BOLLARD



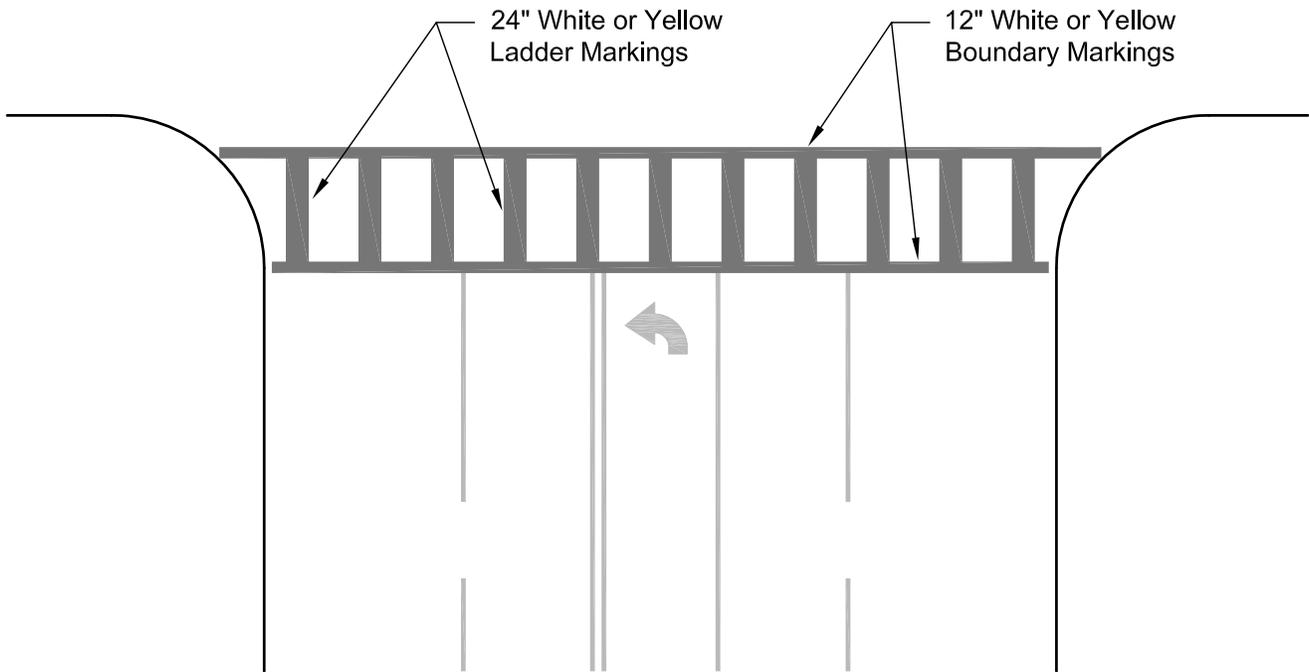
GENERAL NOTES:

- A. Barricade construction shall be per CALTRANS STANDARD PLAN A-73C, "Type III Barricade", except as herein modified.
- B. Caltrans Type III Barricade may be used unmodified (except for addition of signs) with special approval of the City Engineer.
- C. Barricade(s) shall be placed at each end of sidewalk closure and at all other pedestrian access points. If one barricade is not wide enough to block access, additional barricades shall be used to the satisfaction of the City Engineer.
- D. Signs shall conform to the requirements of the California Traffic Control Devices Committee and shall be fastened to rails with bolts, nuts and washers.
- E. Rails shall be fastened to vertical posts with lag bolts and washers as shown.
- F. Additional or alternate signage may be required depending on situation.
- G. Entire barricade shall be painted with two coats of exterior white latex paint prior to installation of reflective bands.

REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	5-13
Add lumber size notes	JDL	JDW	5-02
Add Note G	JDL	JDW	5-02
STANDARD CURRENT AS OF:		January 2016	



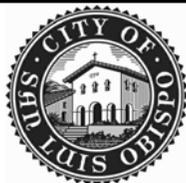
**BARRICADE
SIDEWALK CLOSURE**



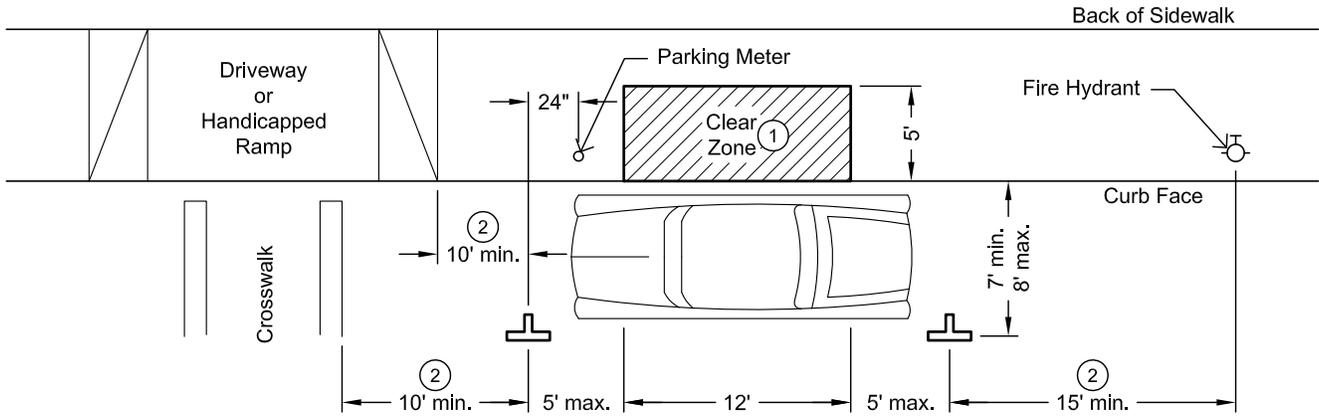
GENERAL NOTES:

- A. Hi-Vis Crosswalks shall include two 12" wide white or yellow boundary markings and 24" wide ladder markings equally spaced on and between vehicular travel lanes. Ladder markings shall be installed parallel to the direction of vehicular traffic. Where Hi-Vis Crosswalks are placed on local roads or streets that contain no traffic control striping, the ladder markings shall be equally spaced at 5' on center across the width of the traveled way.
- B. Where new installations are made, signs as required in the City's Crosswalk Policy shall also be installed.

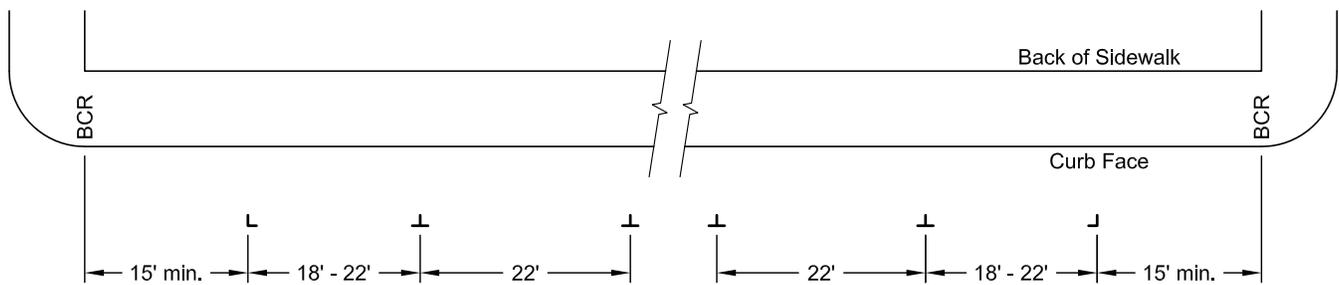
REVISIONS	BY	APP	DATE
<i>New Standard</i>	<i>MH</i>	<i>BL</i>	<i>11-05</i>
<i>Rev. Ladder width to 24"</i>	<i>DVB</i>	<i>BL</i>	<i>10-06</i>
<i>Ladder Marking note</i>	<i>JDL</i>	<i>MH</i>	<i>9-12</i>
STANDARD CURRENT AS OF:		January 2016	



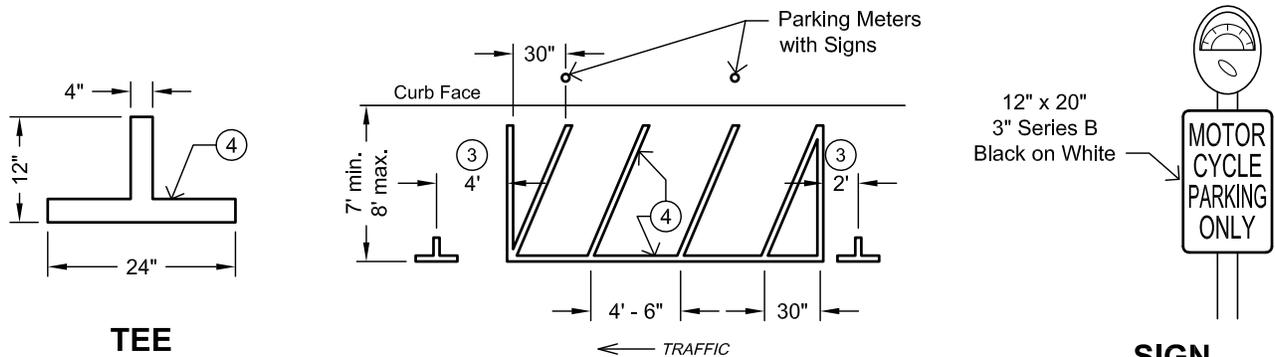
HI-VIS CROSSWALKS



CLEARANCES



SPACE LENGTH



TEE

MOTORCYCLE SPACES ⑤

SIGN

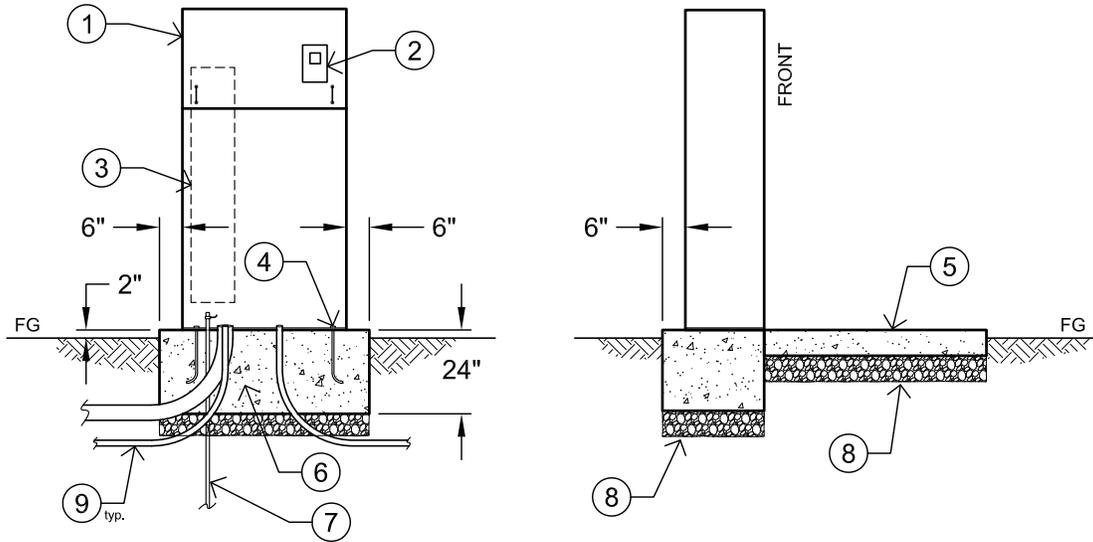
INSTALLATION NOTES:

- ① CLEAR ZONE: Area which shall not contain tree well, sign, bike rack, trash receptacle, mail box, street light, or other obstruction to automobile doors or driver/passenger access.
- ② These clearances apply at both ends of space.
- ③ All other clearance requirements shall be the same as for automobiles.
- ④ 4" White Traffic Paint
- ⑤ Minimum of two spaces, maximum of six spaces.

REVISIONS	BY	APP	DATE
New Border	JDL	WAP	1-98
Metric Conversion	SR	WAP	12-96
Drafting edits	JDL	MH	5-13
STANDARD CURRENT AS OF:		January 2016	



STREET PARKING



GENERAL NOTES:

UPS Unit shall be current and generation MYERS POWERBACK 2000 system with single meter, (MEUG35-PB-SL and PBM-2000), or approved equal with one (1) Photoelectric cell window as follows:

- Breakers on Metered Side
 Single Pole 50 amp - Signals
 Single Pole 20 amp - ILSNS
 Single Pole 15 amp - Controls
 1 x 20 amp - Spare
 1 x 20 amp - Video Equipment

- Features in addition to Standard Features
 2000VA Output Power
 4 x 65Ah Batteries
 12 Gauge Stainless Steel Cabinet
 PE Cell Test Switch, Lighting Relay
 1500 Watts total power required
 Generator Kit

- Breakers on Unmetered Side
 2 Pole 30 amp - Street Lights

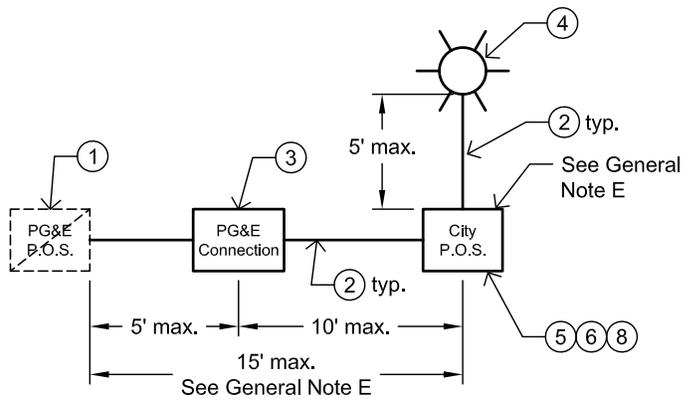
INSTALLATION NOTES:

- ① Stainless Steel UPS / Service
- ② Meter Panel
- ③ Batteries
- ④ (4) - 18" x 5/8" Ø Galvanized Anchor Bolts with 4" 90° Bend
- ⑤ (E) Sidewalk or (N) 4" thick Class 3 PCC Pad, 3' x 3' at the front of the enclosure
- ⑥ Class 3 Concrete Footing
- ⑦ Ground Rod
- ⑧ 4" Class 2 Aggregate Base
- ⑨ Service, Lighting and Controller Conduits

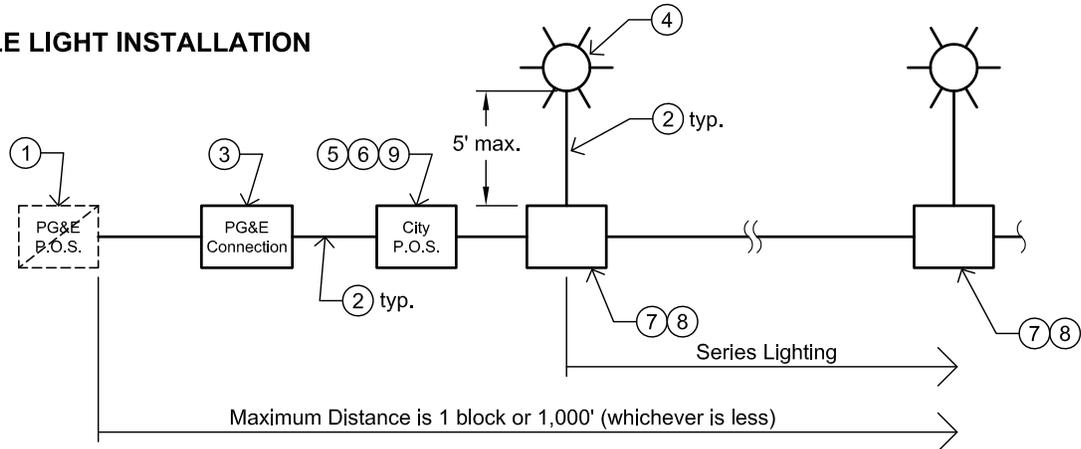
REVISIONS	BY	APP	DATE
Revise General Notes	SR	BL	1-14
Revise General Note A	DVB	BL	12-07
Drafting edits	JDL	MH	5-13
STANDARD CURRENT AS OF:		January 2016	



**SERVICE and UPS
 COMBINED ENCLOSURE**



SINGLE LIGHT INSTALLATION



SERIES LIGHTING INSTALLATION

INSTALLATION NOTES:

- ① PG&E point of service
- ② 2-inch conduit with bell end
- ③ PG&E Connection Box: PG&E #2 box (17" x 30" x 26") marked "PG&E"
- ④ Light: See Engineering Standards 7905, 7910 and 7915. Attach ground conductor to pole grounding lug with a 3/16" or larger brass bolt.
- ⑤ City point of service: #3½ concrete pull box marked "STREET LIGHT"
- ⑥ Ground rod and clamp
- ⑦ #3½ concrete luminaire pull box marked "STREET LIGHT"
- ⑧ 2-amp fuse in advance of light
- ⑨ 10-amp fuse in advance of lights (4 lights max. per 30-amp fuse)

GENERAL NOTES:

- A. Fuses shall be Bussmann HEB-LW-RLA or approved equal with insulating boots. Fuse holder must be installed correctly to match field wiring for line side and load side.
- B. Ground rods shall be Dottie GR5808, Calpico #CP588, Eritech #615880 or approved equal.
- C. Ground rod clamp shall be a brass acorn type clamp, Dottie GR58, Blackburn #JAB 1/2 H, Joslyn #J8591H or approved equal.
- D. Pull boxes shall be placed in sidewalk areas unless otherwise approved by the Engineer in writing.
- E. Where the light location is more than 15' from the PG&E point of service, an additional #3½ pull box will be required at a location identified by the Engineer. An additional fuse is not required in this additional box.
- F. Use 10 gauge solid copper conductors with THWN solid black and solid white insulation color.

REVISIONS	BY	APP	DATE
Revise Notes	BL	MH	1-14
Revise Notes	MH	BL	11-09
Various Note revisions; Draft. edits	JDL	MH	4-13
STANDARD CURRENT AS OF:		January 2016	



LIGHTING CIRCUIT

MANUFACTURER & MODEL NO:

LUMINAIRE: LUMINIS SR135-L21W48-LD2-120/277-BKT-APA

POLE: LUMINIS PAA518-BKT (Confirm with City the latest luminaire and pole model no. before ordering)

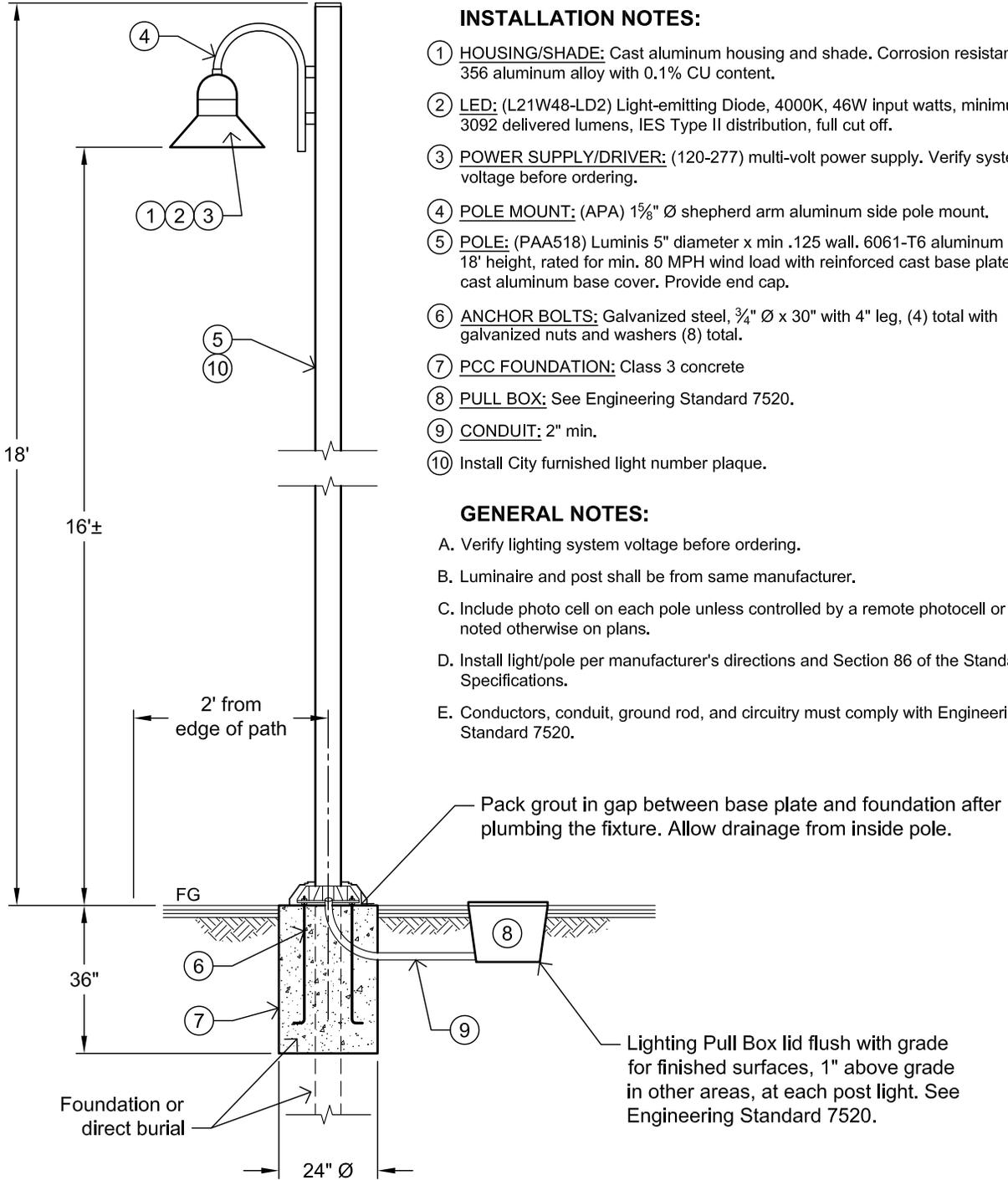
COLOR: Jet Black Marine grade powder coat (BKT).

INSTALLATION NOTES:

- ① HOUSING/SHADE: Cast aluminum housing and shade. Corrosion resistant 356 aluminum alloy with 0.1% CU content.
- ② LED: (L21W48-LD2) Light-emitting Diode, 4000K, 46W input watts, minimum 3092 delivered lumens, IES Type II distribution, full cut off.
- ③ POWER SUPPLY/DRIVER: (120-277) multi-volt power supply. Verify system voltage before ordering.
- ④ POLE MOUNT: (APA) 1½" Ø shepherd arm aluminum side pole mount.
- ⑤ POLE: (PAA518) Luminis 5" diameter x min .125 wall. 6061-T6 aluminum alloy, 18' height, rated for min. 80 MPH wind load with reinforced cast base plate and cast aluminum base cover. Provide end cap.
- ⑥ ANCHOR BOLTS: Galvanized steel, ¾" Ø x 30" with 4" leg, (4) total with galvanized nuts and washers (8) total.
- ⑦ PCC FOUNDATION: Class 3 concrete
- ⑧ PULL BOX: See Engineering Standard 7520.
- ⑨ CONDUIT: 2" min.
- ⑩ Install City furnished light number plaque.

GENERAL NOTES:

- A. Verify lighting system voltage before ordering.
- B. Luminaire and post shall be from same manufacturer.
- C. Include photo cell on each pole unless controlled by a remote photocell or as noted otherwise on plans.
- D. Install light/pole per manufacturer's directions and Section 86 of the Standard Specifications.
- E. Conductors, conduit, ground rod, and circuitry must comply with Engineering Standard 7520.



REVISIONS	BY	APP	DATE
Design / text	SR	BL	1-14
Fixture Model; Drafting edits	JDL	MH	5-13
Drafting edits	JDL	MH	2-14
STANDARD CURRENT AS OF:		January 2016	



PATH LIGHTING

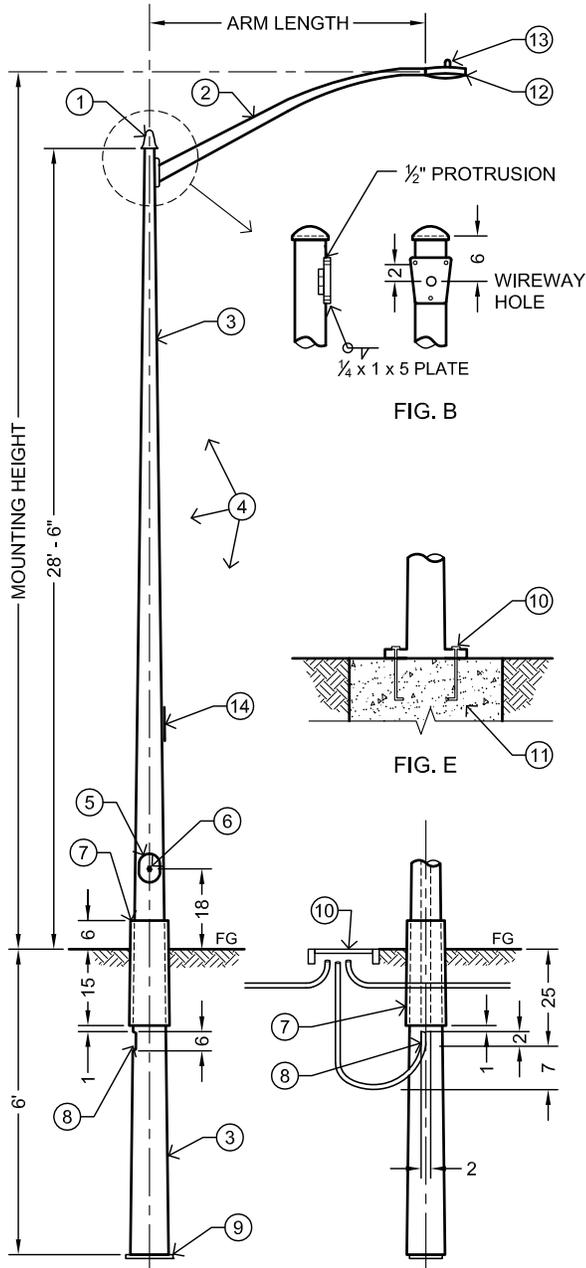


FIG. A

FIG. C

FIG. D

EMBEDDED STEEL POLE

(units in inches unless otherwise noted)

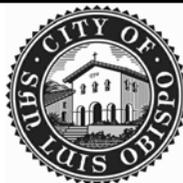
INSTALLATION NOTES:

- ① **CAP:** Steel, attached with set screws.
- ② **ARM:** Formed tapered cylindrical arm of 11 ga. steel, 55 ksi yield strength, with a 3/4" x 6/8" x 7/4" steel mounting plate welded to arm. Hole to be made in pole shaft for 1/2" protrusion of attachment plate. Plate to be bolted to pole, with (3) 5/8" x 2" HHMB (all thread).
- ③ **POLE:** Formed tapered cylindrical pole of 11 ga. steel, 55 ksi yield strength, 9" x 4". Pole shall comply with applicable requirements of EEI-NEMA standards for street lighting poles.
- ④ **ALL PARTS:** Shall be coated: Arm(s) shall be galvanized per ASTM A123 after formed and welded, all removable parts shall be galvanized per ASTM A153. Pole shall be galvanized per ASTM A123 after the holes are cut and items ⑤, ⑥, ⑦, ⑧, ⑨, and arm fixture(s) have been welded on.
- ⑤ **HANDHOLE:** An oblong hole, 4" x 6 1/2", with a welded-on reinforcing frame, minimum A-36 steel cover, and mounting hardware.
- ⑥ **WELDNUT:** A 1/2" square grounding nut, or nut holder, welded to inside of pole just opposite of handhole.
- ⑦ **GROUND LINE SLEEVE (Embedded Pole):** Cylindrical steel sleeve, 7 ga, continuously seal-welded (both ends) to the pole.
- ⑧ **CABLE ENTRANCE (Embedded Pole):** Oval slot, 2" x 6", 180° from luminaire.
- ⑨ **BEARING PLATE (Embedded Pole):** Plate, or angle steel, 1/4" thick, 12" long and 4" - 6" wide, continuously seal-welded (both edges) at bottom of pole.
- ⑩ **FOUNDATION MOUNTED POLE (Fig. E):** Foundation mounted pole must comply with State Standards type 15 (ES-6A) or type 15D (ES-6D) for double heads.
- ⑪ **FOUNDATION (Foundation Mounted Pole):** Construct a State Type 15 foundation, matching bolt placement to base plate configuration.
- ⑫ **LUMINAIRE:** LED Luminaire per Standard Specifications.
- ⑬ **PEU:** Photoelectric unit on luminaire photocell receptacle shall be positioned such that the photoelectric unit faces north.
- ⑭ Install City furnished street number plaque, 8' from ground level.

GENERAL NOTES:

- A. Street lighting construction and wiring must comply with Engineering Standard 1010 and 7520, State Standards and the provisions in Section 86 of the Standard Specifications.
- B. When using embedded steel pole, bottom of pole hole shall be well tamped before installing pole. Judgement based on experience and local soil conditions should be used to determine if "keying" and "rocking-in" of the pole are required.
- C. Protective Tubes: Sonoco No. EL-18 x 48 (PGE & Code: 12-8077), 1/4" thick resin-impregnated paper tubes 18" D x 48" H with entrance hole at mid height are to be used where future embedded street light poles are to be installed. Place the tube in the ground at the proposed pole location, set it to approximately finished grade and fill with native backfill. Auger down through it when setting the pole and abandon tube in place. The street light conductor should be installed on the outside of the tube and on the same side as the entrance hole that is located 24" below the top edge.

REVISIONS	BY	APP	DATE
Revised Foundation Detail/Pole	SR	BL	1-14
Clarify Notes	DVB	BL	11-07
Drafting edits	JDL	MH	5-13
STANDARD CURRENT AS OF:		January 2016	



STREET LIGHTING
EMBEDDED & FOUNDATION MOUNTED

MANUFACTURER & MODEL NO:

LUMINAIRE: LUMEC [L50-003]-40W42LED4K-PC-CPD-RLE3-UNIV-SF3-FN1-[PH7-001]-SCZT311G105TX

POLE: LUMEC -RTA50F-12-3/4X20-G-12 1/2-DEC-SCZT311G105TX

(Confirm with City the latest model numbers for luminaire and pole before ordering)

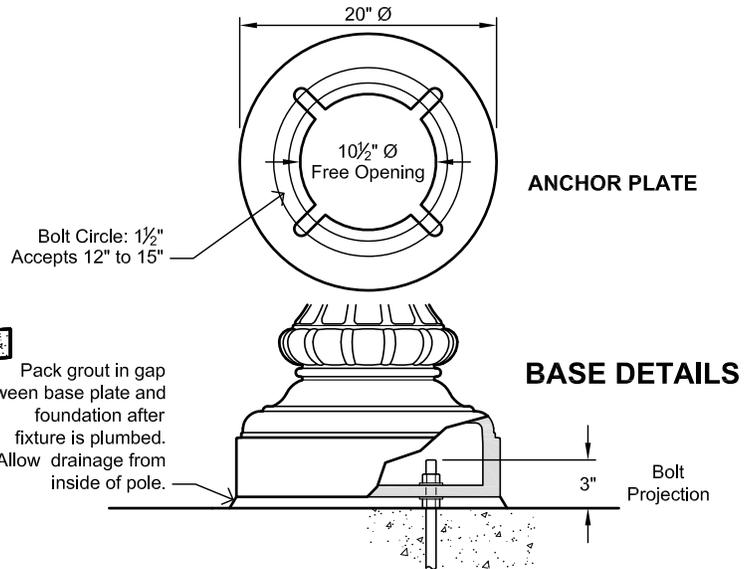
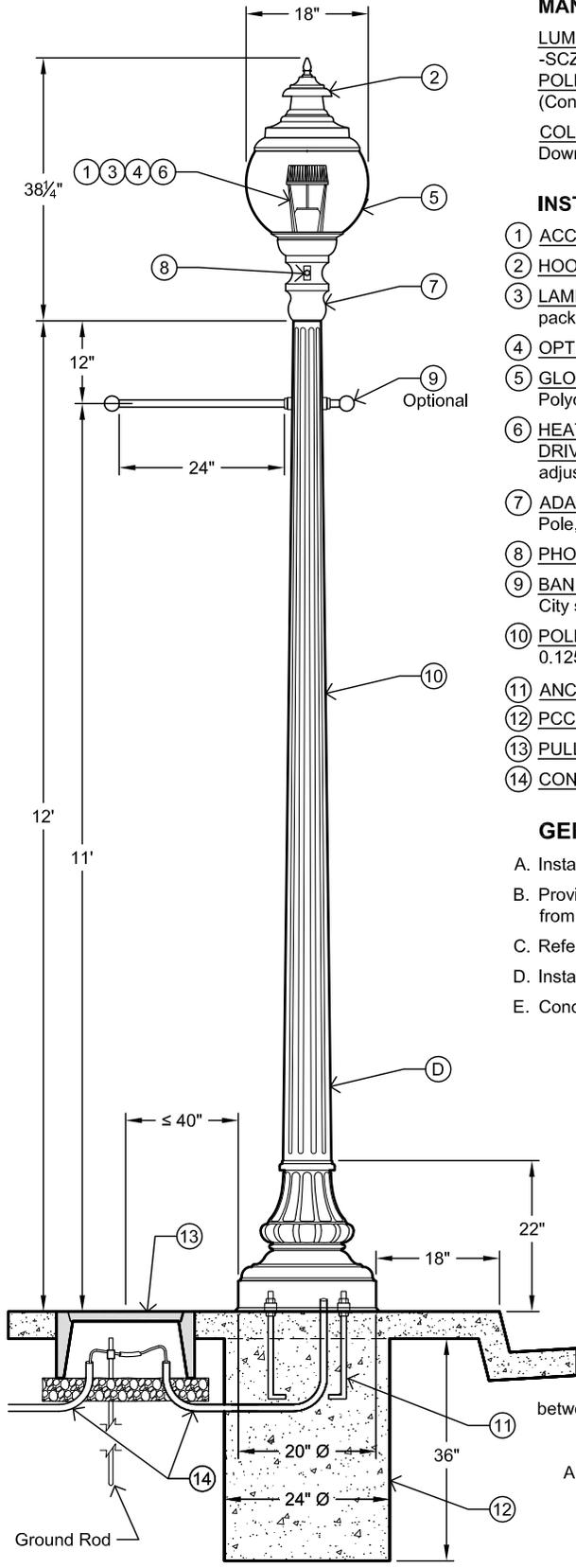
COLOR: Special order Powder Coat color with textured finish to comply with adopted Downtown color scheme (Dark Forest Green) RAL6009

INSTALLATION NOTES:

- ① **ACCESS:** Must have tool free access to inside of Luminaire.
- ② **HOOD:** Spun Aluminum Hood and Cupola with a Cast Aluminum Finial (FN1)
- ③ **LAMP:** Light-emitting Diodes (LED), Lumen output available through IES file, 42 LED package, 400K, CRI 70,
- ④ **OPTICAL SYSTEM:** (RLE3) IES Type III asymmetrical rated as semi-cutoff or better
- ⑤ **GLOBE:** (LL18-PC-CPD) 18" Spherical, clear, partially obscured, non-diffusing (Pond) Polycarbonate Globe
- ⑥ **HEAT SINK:** Cast aluminum with no moving parts
DRIVER: High power factor of 90% min. Electronic driver, operating range 50/60 Hz. Auto adjusting to a voltage between 120 and 277 volt AC.
- ⑦ **ADAPTOR / FITTER:** (SF3) Top Adaptor Slip Filter (L23B/L29 type) for 4" or 4"x4" Round Pole, High Tenon
- ⑧ **PHOTOCELL:** (UNIV/PH7-001) Universal Photoelectric Cell, button type, 120v-227v
- ⑨ **BANNER ARM / PLANT HANGER:** Pole may require an optional banner arm or plant hanger, City shall determine.
- ⑩ **POLE:** (RTA50F-12) 12' high, round tapered fluted mandrel-formed aluminum shaft with 0.125" wall thickness and welded to cast aluminum base with integral cast-in anchor plate
- ⑪ **ANCHOR BOLTS:** Galvanized steel, 3/4"Ø x 17" with 3" hook at bottom of bar, (4) total
- ⑫ **PCC FOUNDATION:** Class 3 Concrete
- ⑬ **PULL BOX:** See Engineering Standard 7520
- ⑭ **CONDUIT:** 2" Min.

GENERAL NOTES:

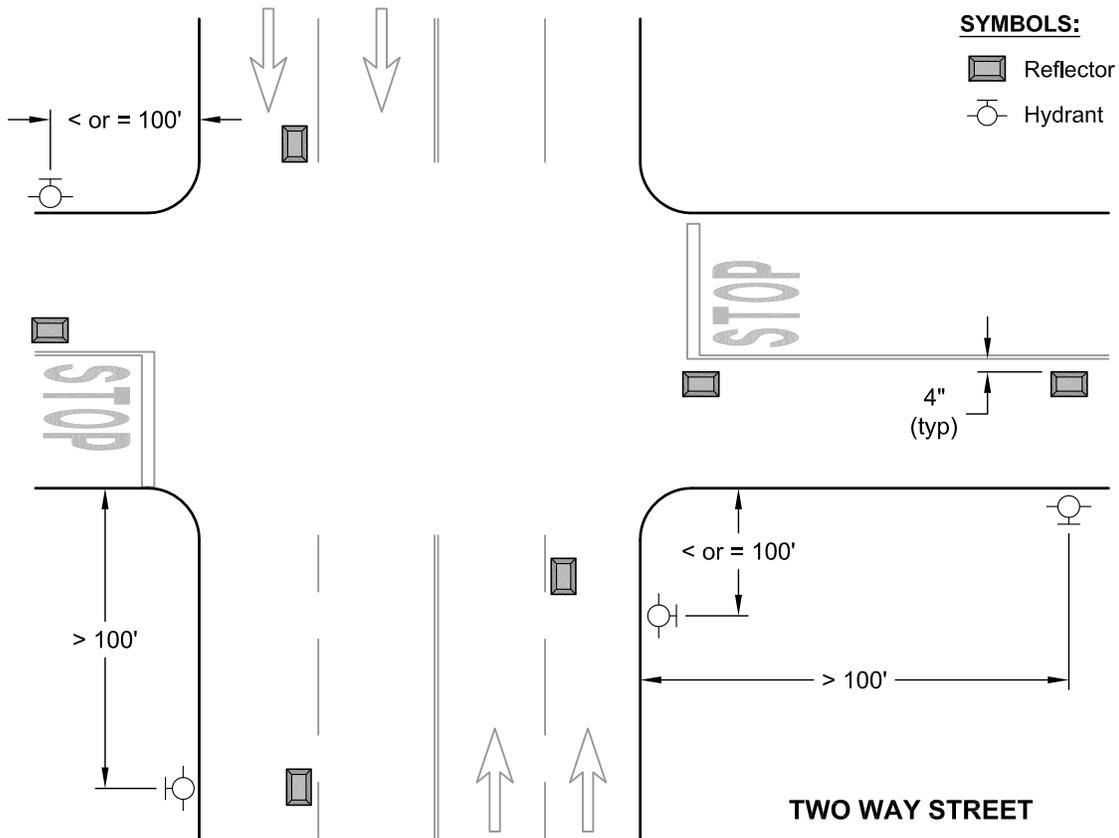
- A. Installation shall conform to the provisions in Section 86 of the Standard Specifications.
- B. Provide photocell on each pole unless controlled by a remote photocell. Orient photocell away from headlights and other lights.
- C. Refer to the Uniform Design Criteria.
- D. Install City furnished light number plaque on base of pole.
- E. Conductors, conduit, ground rods and circuitry must comply with Engineering Standard 7520.



REVISIONS	BY	APP	DATE
LED Conversions; Drafting edits	JDL	MH	6-13
Revise E, 5 add Access & 13, F	SR	BL	1-14
Revised Note 11	MH	BL	11-09
STANDARD CURRENT AS OF:		January 2016	



**DOWNTOWN
PEDESTRIAN LIGHTING**

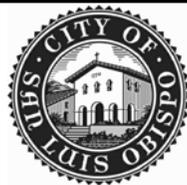


GENERAL NOTES:

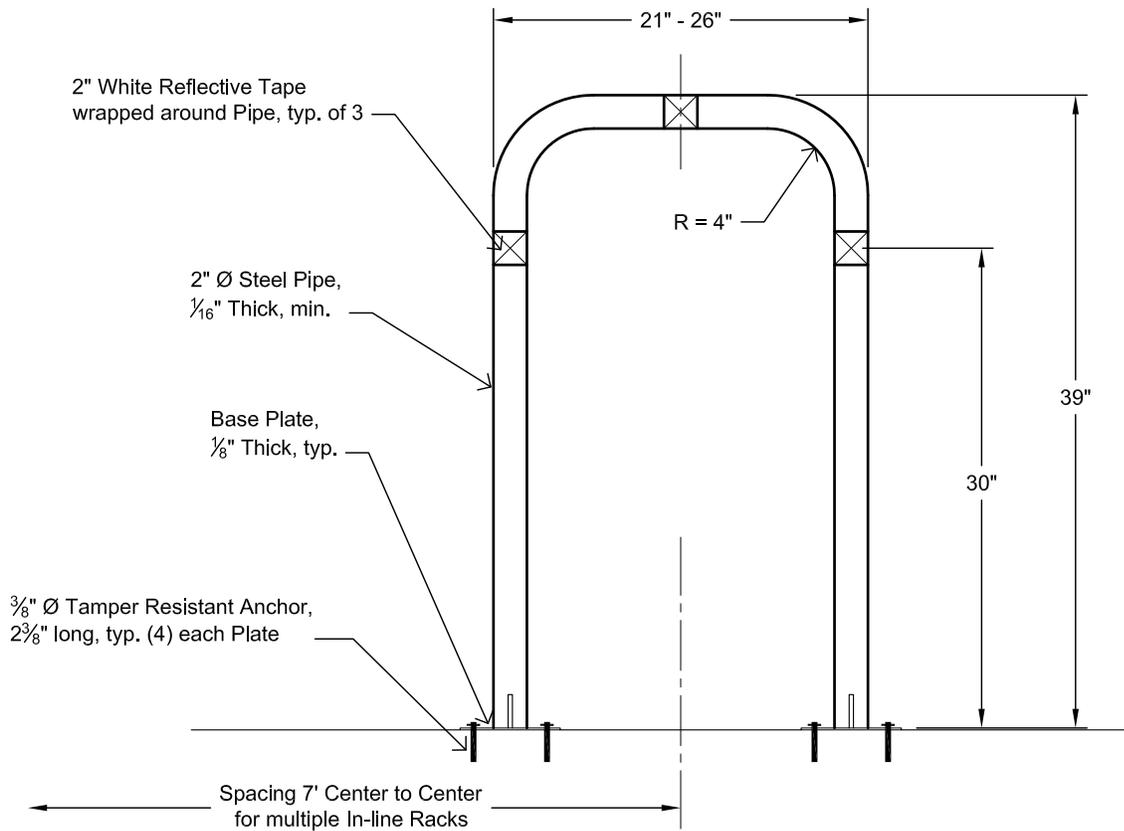
- A. Reflectors shall be 2-way blue reflective markers and shall conform to the standards set forth for reflective markers by the State of California Department of Transportation.
- B. Reflectors shall be set on the hydrant side of the adjacent traffic stripe. Where no stripes exist, reflector should be placed in the center of the pavement.
- C. When hydrants are within 100' of an intersection, a marker shall be placed on the cross street as well.
- D. Reflectors shall be set behind the pedestrian crossing area at an intersection.
- E. Reflectors shall be cemented to the pavement in accordance with the requirements of Section 85, "PAVEMENT MARKERS" of the State of California Department of Transportation Standard Specifications.

ONE WAY STREET

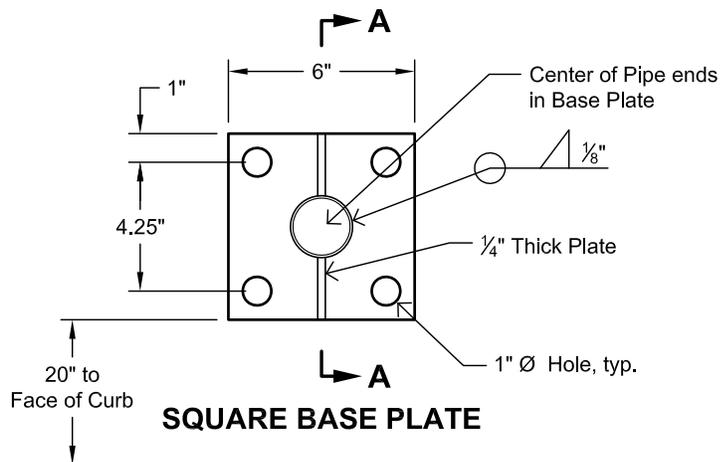
REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	5-13
Reflector locations	MH	JDW	10-04
Revise Note C	MH	JDW	10-04
STANDARD CURRENT AS OF:		January 2016	



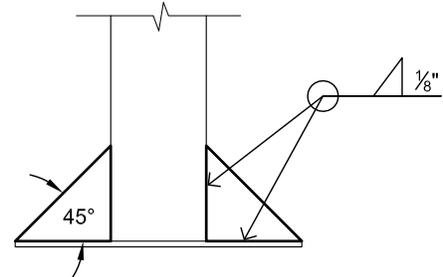
HYDRANT REFLECTOR



PROFILE



SQUARE BASE PLATE



SECTION A-A

GENERAL NOTES:

- A. Entire rack and base plate assembly shall be industrial high gloss powder-coated. Color: Dark Forest Green in Downtown area (match City Standard), black elsewhere.
- B. Manufactured unit may be used in lieu of fabricated rack, Viper 100 or South Bay Foundry DBL300-2239.
- C. Alternate rack style may be approved by the City Engineer. Peak Racks are an approved rack style (see Community Design Guidelines for further information.)
- D. Side by side racks shall have a minimum spacing of 3' between racks. Refer to the Community Design Guidelines for additional information regarding placement and spacing.
- E. When inverted "U" racks are orientated parallel to a wall, there shall be a 24" minimum clearance to the wall. When orientated perpendicular to a wall, there shall be a minimum of 36" between the wall face and the center of rack.

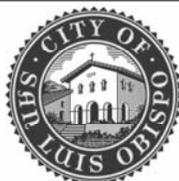
REVISIONS	BY	APP	DATE
Spacing, Tamper-resistant anchors	JDL	MH	4-13
Modified Note C	MH	BL	12-09
Added Notes D and E	DVB	BL	11-08
STANDARD CURRENT AS OF: January 2016			



BICYCLE RACK

ALLOWABLE ZONES		CHARACTERISTICS							
1 - In parkway or tree well		C = Fall Color				D = Deciduous			
2 - 3 to 7.5 feet from curb (or sidewalk if present)		F = Flowering				G = Suggested trees for Commemorative Grove			
3 - 7.5 to 10 feet from the curb (or sidewalk if present)		E = Evergreen							
BOTANICAL NAME	COMMON NAME	CHARACTERISTICS				HEIGHT	WIDTH	ZONE	
Ilex-opaca	American Holly		E			50	40	2-3	
Brachychiton acerifolius	Australian Flame tree		E		F	60	30	3	
Geijera parviflora	Australian Willow		E			30	20	1-3	
Pyrus calleryana	Aristocrat Flowering Pear	D		C	F	40	20	1-3	
Tristaniopsis laurina	Water Gum		E		F	45	25	2-3	
Eriobotrya deflexa	Bronze loquat		E		F	15	10	1-3	
Melaleuca quinquenervia	Cajeput tree		E		F	40	25	2-3	
Platanus racemosa	California Sycamore	D				G	80	50	3
Cinnamomum camphora	Camphor Tree		E			50	60	3	
Pinus canariensis	Canary Island Pine		E			80	35	3	
Calodendrum capense	Cape Chestnut	D			F	40	40	3	
Lyonothamnus floribundus	Catalina Ironwood		E			35	15	1-3	
Ulmus parvifolia	Chinese Evergreen Elm		E			60	60	2-3	
Chionanthus-retusus	Chinese Fringe	D		C	F	20	20	1-3	
Pistacia chinensis	Chinese Pistache	D		C		G	60	40	2-3
Koelreuteria bipinnata	Chinese Flame Tree		E	C	F	30	30	2	
Quercus agrifolia	Coast Live Oak		E			G	70	70	3
Eucalyptus-torquata	Coral Gum		E		F	36	30	1-3	
Quercus suber	Cork Oak		E			G	60	60	3
Metasequoia glyptostroboides	Dawn Redwood	D				90	20	3	
Cedrus deodara	Deodar Cedar		E			G	80	40	3
Cercis-canadensis	Eastern Redbud	D		C	F	35	35	1	
Fagus sylvatica	European Beech	D				70	40	3	
Stenocarpus sinuatus	Firewheel Tree		E		F	30	15	1-3	
Melaleuca linariifolia	Flaxleaf Paperbark		E		F	30	25	2-3	
Ceiba speciosa	Floss Silk Tree		Semi-E		F	50	40	2-3	
Cassia leptophylla	Gold Medallion Tree		Semi-E		F	30	20	1-2	
Koelreuteria paniculata	Goldenrain Tree	D			F	G	35	40	2-3
Brahea edulis	Guadalupe Island Palm		E		F	30	10	1	
Quercus ilex	Holly Oak		E			60	60	3	
Gleditsia triacanthos inermis	Honey Locust	D		C		70	35	1-3	
Ficus microcarpa	Indian Laurel Fig		E			60	70	3	
Jacaranda mimosifolia	Jacaranda	D			F	40	30	2-3	
Lagerstroemia faurei	Japanese Crape Myrtle	D		C	F	30	30	1-3	
Harpephyllum caffrum	Kaffir Plum (Wild Plum)		E			25	15	1-2	
Magnolia grandiflora	Little Gem Magnolia		E		F	25	15	1-3	
Platanus acerifolia	London Plane Tree	D				80	40	2-3	
Arbutus-marina	Marina Madrone		E		F	G	40	40	1-3
Ginkgo biloba	Maidenhair Tree	D		C		50	30	1-3	
Maytenus boaria	Mayten Tree		E			50	20	1-3	
Metrosideros excelsus	New Zealand Christmas Tree		E		F	30	30	1-3	

REVISIONS	BY	APP	DATE
Revised List	JDL	MH	6-13
List update	BL	BL	11-06
List update	BL	JDW	1-12
STANDARD CURRENT AS OF:		January 2016	

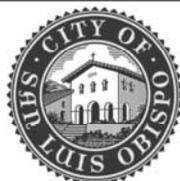


STREET TREES MASTER LIST

Agonis flexouosa	Peppermint Willow		E		F		40	30	1-2
Melaleuca styphelioides	Prickly-leaved Paperbark		E		F		70	40	3
Lagunaria patersonia	Primrose Tree		E	C	F		50	30	2-3
Bauhinia variegata	Purple Orchid Tree	D			F		35	35	2-3
Corymbia ficifolia	Red Flowering Gum		E		F		40	40	2-3
Aesculus x carnea	Red Horse Chestnut	D			F		40	30	2-3
Acer rubrum	Red Maple	D		C			60	40	1-3
Betula nigra	River Birch	D					90	60	3
Zelkova serrata	Sawleaf Elm	D		C			60	60	2-3
Acacia stenophylla	Shoestring Acacia		E		F		30	20	1
Albizia julibrissin	Silk tree	D			F		40	40	2-3
Magnolia grandiflora	Southern Magnolia		E		F		80	60	3
Michelia doltsopa	Sweet Michelia		E		F		30	25	1-2
Hymenosporum flavum	Sweetshade		E		F		40	20	1-2
Tipuana tipu	Tipu Tree	D		C	F		40	50	2-3
Heteromeles-arbutifolia	Toyon		E		F		25	25	1-3
Liriodendron tulipifera	Tulip Tree	D		C	F		70	40	3
Quercus lobata	Valley Oak	D		C			70	70	3
Pittosporum undulatum	Victorian Box		E		F		40	40	2-3
Crataegus phaenopyrum	Washington Hawthorn	D		C	F		25	20	1-3
Tristaniopsis laurina	Water Gum (Kanooka)		E		F		30	20	1-2
Callistemon viminalis	Weeping Bottlebrush		E		F		30	20	1-2
Cercis occidentalis	Western Redbud	D		C	F		18	18	1-3

Trees not included on this list may be used only with prior approval by the City Arborist.

REVISIONS	BY	APP	DATE
<i>Revised List</i>	<i>JDL</i>	<i>MH</i>	<i>6-13</i>
<i>List update</i>	<i>BL</i>	<i>BL</i>	<i>11-06</i>
<i>List update</i>	<i>BL</i>	<i>JDW</i>	<i>1-12</i>
STANDARD CURRENT AS OF:		January 2016	



STREET TREES MASTER LIST

Note: Percentages refer to mixture of tree types in project area

<u>DOWNTOWN DISTRICT</u>	%
Ficus microcarpa	40
Quercus agrifolia	20
Platanus acerifolia 'Bloodgood'	30
Olea europaea – grafted fruitless	10

Downtown Accent Trees

Jacaranda mimosifolia	
Robinia ambigua "Purple Robe"	
Magnolia grandiflora 'Saint Mary's'	
Eucalyptus ficifolia	
Pyrus calleryana 'Aristocrat'	
Calodendrum capense	

<u>BROAD STREET</u>	%
<u>Monterey St. to Pacific St.</u>	
Tristanopsis laurina	60
Pyrus calleryana "Aristocrat"	40

Pacific St. to High St.

Platanus acerifolia	40
Pistacia chinensis	40
Ginkgo biloba	20

High St. to City Limits

Platanus acerifolia	30
Quercus palustris	20
Pistacia chinensis*	20
"Red oak"	15
Tristanopsis laurina	15
*Substitute south of Orcutt:	
"Monterey cypress"	20

At creek crossings

Platanus racemosa	100
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<u>CALIFORNIA BLVD.</u>	%
<u>Cal Poly to Mill St.</u>	
Liquidambar styraciflua	25
Red oak	25
Camphor	30
Agonis flexuosa	20
<u>Mill St. to San Luis Dr.</u>	
Pyrus calleryana "Aristocrat"	40
Agonis flexuosa	30
Metrosideros excelsus	30
<u>San Luis Dr. to Johnson Ave.</u>	
Quercus agrifolia	60
Agonis flexuosa	40
<u>At creek crossings</u>	
Platanus racemosa	100

<u>FOOTHILL BLVD.</u>	%
Magnolia "Majestic Beauty"	60
Pyrus calleryana "Aristocrat"	10
Platanus acerifolia	30
<u>At creek crossings</u>	
Platanus racemosa	100

<u>GRAND AVENUE</u>	%
Magnolia "Majestic Beauty"	50
Platanus acerifolia	50

<u>HIGUERA STREET</u>	%
<u>California Blvd. to Downtown District</u>	
Ficus microcarpa	100

Downtown District to Madonna Rd.

Use Downtown District

Madonna Rd. to City Limit

Pinus canariensis	30
"Monterey cypress"	30
Hymenosporum flavum	20
Red Oak	20

<u>JOHNSON AVENUE</u>	%
<u>Hwy. 101 to SPRR underpass</u>	
Magnolia "Majestic Beauty"	20
Pyrus calleryana "Aristocrat"	20
Pistacia chinensis	20
Pin oak	20
Hymenosporum flavum	20

SPRR underpass to Laurel Lane

Quercus agrifolia	20
Pistacia chinensis	20
Chinese Elm	20
Hymenosporum flavum	20
Red Oak	20

Laurel Lane to Orcutt Rd.

Maytenus boaria	20
Red oak	20
Chinese Elm	20
Jacaranda	20
Hymenosporum flavum	20

<u>LAUREL LANE</u>	%
Platanus acerifolia	50
Quercus suber	20
Jacaranda	15
Ginkgo biloba	15

<u>LOS OSOS VALLEY ROAD</u>	%
Tristanopsis laurina	20
Monterey cypress	20
European beech	20
Quercus agrifolia	20
Pinus canariensis	20

<u>MADONNA ROAD</u>	%
Pinus canariensis	25
Pistacia chinensis	25
Quercus agrifolia	25
Red Oak	25

<u>MARSH STREET</u>	%
Use Downtown District	

<u>MARGARITA AVENUE</u>	%
Platanus acerifolia	33
Sweetshade	33
Pin oak	34

<u>MONTEREY STREET</u>	%
Use Downtown District	

<u>ORCUTT ROAD</u>	%
Pistachia chinensis	60
Crataegus phaenopyrum	20
Quercus agrifolia	20

At creek crossings

Platanus racemosa	100
-------------------	-----

<u>PRADO ROAD</u>	%
Platanus acerifolia	34
Pinus canariensis	33
Pin oak	33

<u>SANTA ROSA STREET</u>	%
<u>Highland St. to Murray St.</u>	
Quercus agrifolia	80
Pistacia chinensis	20

Murray St. to Marsh St.

Pistacia shinensis	20
Pyrus calleryana "Aristocrat"	20
Ficus microcarpa	20
Tristanopsis laurina	10
Pistacia chinensis	20
Jacaranda mimosa	10

At Creek intersections

Platanus racemosa	100
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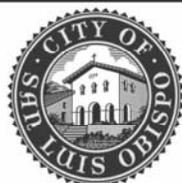
<u>SOUTH STREET</u>	%
Tristanopsis laurina	20
Jacaranda mimosifolia	20
Ginkgo biloba	20
Platanus acerifolia	20
Pin oak	20

<u>TANK FARM ROAD</u>	%
<u>East of Broad St.</u>	
Platanus acerifolia	50
Tristanopsis laurina	20
Eucalyptus torquata	30

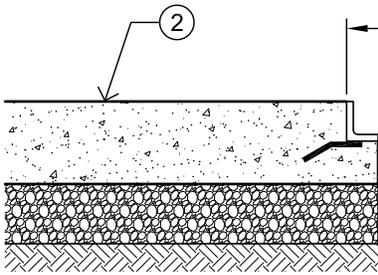
West of Broad St.

Platanus acerifolia	25
Cinnamomum camphora	25
Quercus agrifolia	25
Red oak	25

REVISIONS	BY	APP	DATE
	RMH	WAP	4-95
Revise List	BL	BL	11-06
New Border	JDL	WAP	1-98
STANDARD CURRENT AS OF:		January 2016	



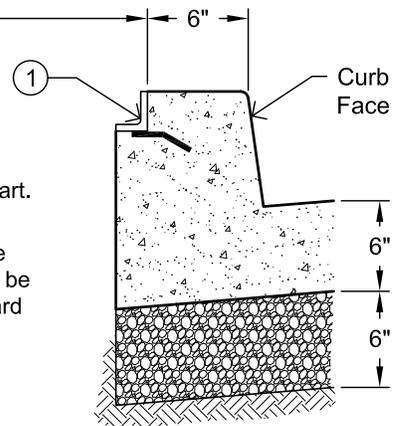
STREET TREES MAJOR STREETS



SECTION A-A

INSTALLATION NOTES:

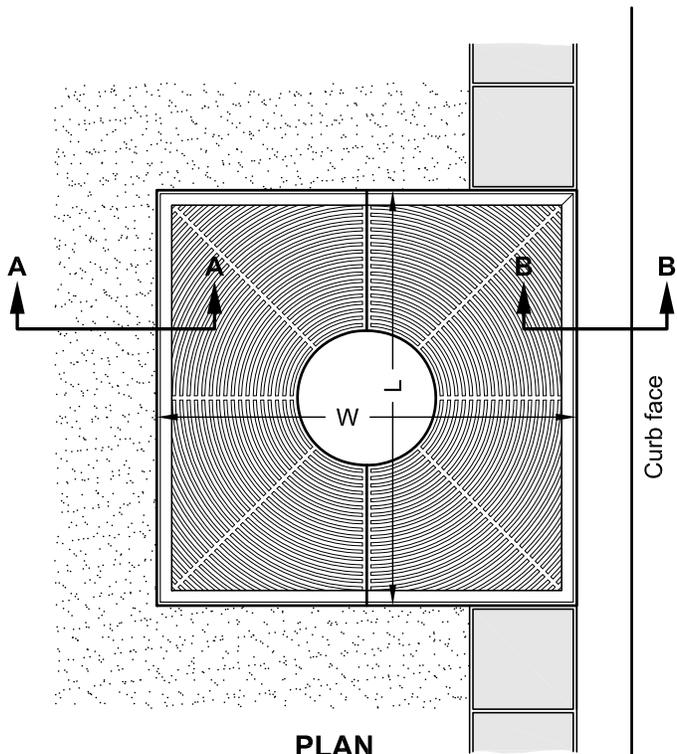
- ① See Tree Grate and Frame Size Chart.
- ② Construct sidewalk per Engineering Standard 4110. Sidewalks within the Mission Style Sidewalk District shall be constructed per Engineering Standard 4220.



SECTION B-B

GENERAL NOTES:

- A. Concrete shall be Class 3 and shall be monolithic with curb, gutter and sidewalk.
- B. Tree well shall have the same slope as the surrounding sidewalk.
- C. Frame shall be pre-manufactured and furnished with the cover by the same manufacturer.
- D. Inspection of tree wells is required. Prior notice of 48 hours shall be given to the City Engineer when requesting inspection.
- E. When constructing tree well around existing tree, tree shall be centered with respect to the "L" dimension.
- F. Tree well shall be square (sides parallel and corners 90°).
- G. Tree grate shall have a radial pattern with openings expandable to accommodate increasing trunk diameter.
- H. Tree grate shall be ductile cast iron and two pieces and set so that the joint is parallel to the curb.
- I. Openings in the tree grate shall be ADA compliant.
- J. See Engineering Standard 8210 for Street Tree Planting Requirements.
- K. Tree guard vertical strips shall remain vertical, not angled at the top, so as to not protrude into the walkway.
- L. Tree guard shall be bolted down to tree grate per manufacturer's recommendation.
- M. Finishes:
 Grate - Bare
 Frame - Clear Powder Coat
 Guard - Black Powder Coat



PLAN
(shown as Mission Style)

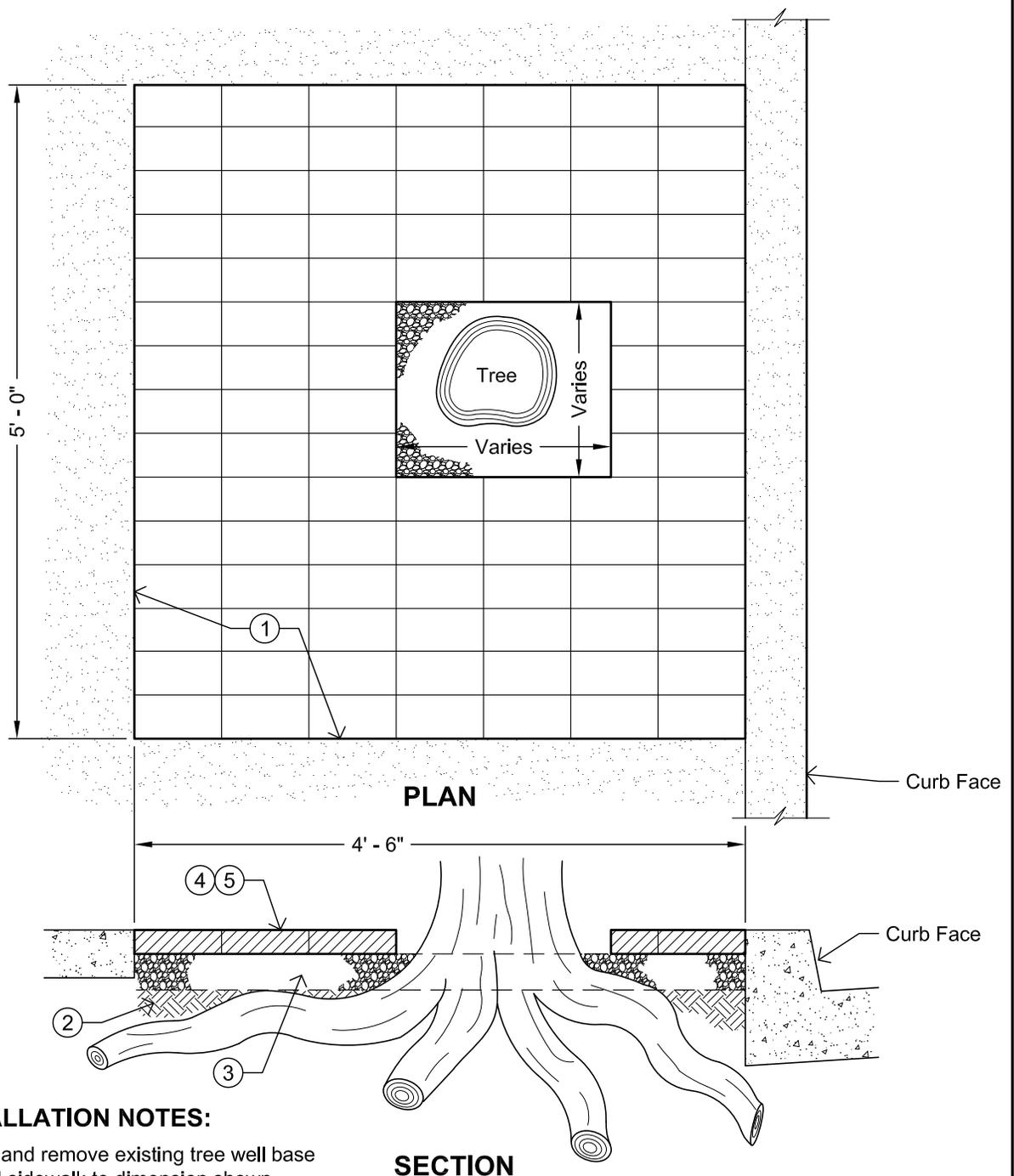
TREE GRATE AND FRAME SIZE CHART

Sidewalk Width	Frame Size	Frame Type	Cover Type	Tree Guard
10' or wider	5' x 5'	Olympic Foundry 82-3000, South Bay Foundry DTF6060, or equivalent	Olympic Foundry SP60 80-3190, South Bay Foundry SP Style D0060SQ, or equivalent	Olympic Foundry GDA 84-5020, South Bay Foundry DTG-A style or equivalent
Less than 10'	4' x 4'	Olympic Foundry 82-2000, South Bay Foundry DTF4848, or equivalent	Olympic Foundry SP48 80-2180, South Bay Foundry SP Style D0048SQ, or equivalent	

REVISIONS	BY	APP	DATE
Revised Sidewalk notes	MH	BL	11-09
Revised Grate and Frame	MH	BL	11-09
Note H; Drafting edits	JDL	MH	10-12
STANDARD CURRENT AS OF:		January 2016	



TREE WELL



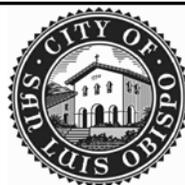
INSTALLATION NOTES:

- ① Sawcut and remove existing tree well base ring and sidewalk to dimension shown.
- ② Backfill well with native material to within 5" to 6" of sidewalk surface.
- ③ Place 3" to 4" of granite chips (or ¼" - ½" aggregate rock).
- ④ Cover with red brick.
- ⑤ Final surface to be level and flush with sidewalk.

**This method to be used only when the root growth of an existing tree will not allow the use of a standard grate and sidewalk does not need repair. Must be approved by the City Engineer.*

REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	5-13
Revised * Note	MH	BL	11-09
Revised Note 4	DVB	BL	11-06

STANDARD CURRENT AS OF: January 2016



**TREE WELL COVER
ALTERNATE METHOD***

STREET TREE PLANTING INSTRUCTIONS AND REQUIREMENTS

A. INSPECTION:

Inspection of tree planting by the City Engineering Inspector or Building Inspector is required.

1. Engineering Inspector or Building Inspector shall approve the hole dimensions prior to planting.
2. City Arborist shall perform inspection of tree quality prior to planting and the final inspection when the tree planting is complete.

Appointments for inspection(s) may be made by calling (805) 781-7220 at least 48 hours in advance of the inspection.

B. {DELETED}

C. BACKFILL MATERIAL:

The backfill material shall be composed of:

- 75% Native Soil (the soil removed from the planting hole)
- 15% Compost Material
- 10% Sand (see Note)

Note: The sand component of the backfill may be deleted if the Arborist determines that the existing native soil will provide adequate aeration for the root system.

D. PLANTING:

Partially fill the excavated hole with backfill material, while tamping and watering, to an elevation equal to the bottom of the root ball. Root crown (top of root ball) shall extend one (1) inch above finish grade when planting is completed. Place the tree to be planted in the center of the hole on tamped backfill. Continue adding backfill while tamping and watering.

Continue adding backfill around root ball to finish grade, while tamping tightly, and add additional water to thoroughly wet root ball and backfill material.

For Street Tree Well installations, finish grade shall be 4" below the sidewalk grade.

E. TREE SIZE and TYPE:

Standard tree size shall be #15. A larger sized 24", 36" or 48" box may be required for some installations. New trees planted in the downtown (within the boundary of the Downtown Association) shall be a minimum of a 24" box.

Tree type shall be from the Master Street Tree list and (if applicable) be in accordance with the selections for major streets.

F. STAKING:

All newly planted street trees shall be staked.

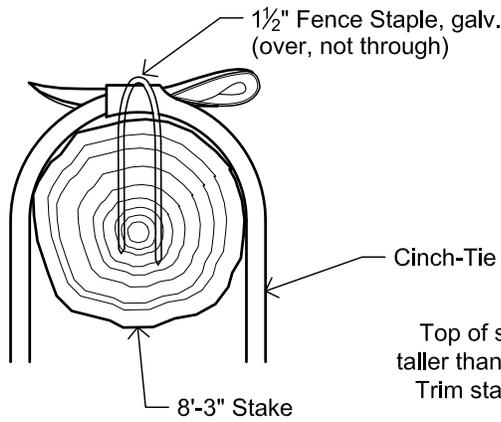
G. GUARDS:

Trees planted within the Mission Style Sidewalk District shall include installation of a tree guard of the same manufacturer as the tree grate, see Engineering Standard 8130.

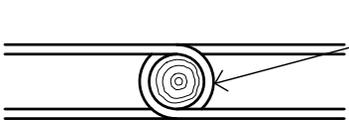
REVISIONS	BY	APP	DATE
<i>Revised Notes A, D, & G</i>	<i>MH</i>	<i>BL</i>	<i>11-09</i>
<i>Modified A & G; Deleted B</i>	<i>DVB</i>	<i>BL</i>	<i>10-08</i>
<i>Drafting edits</i>	<i>JDL</i>	<i>MH</i>	<i>5-13</i>
STANDARD CURRENT AS OF:		January 2016	



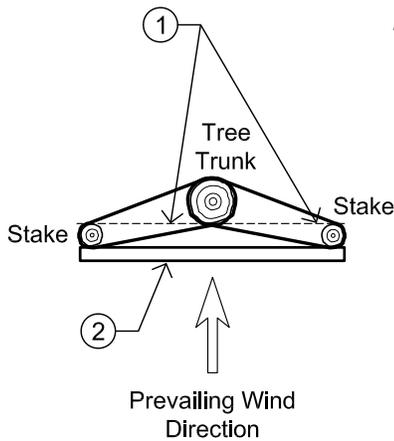
STREET TREE PLANTING NOTES



Top of stake shall not be taller than lowest tree limb. Trim stake as necessary.



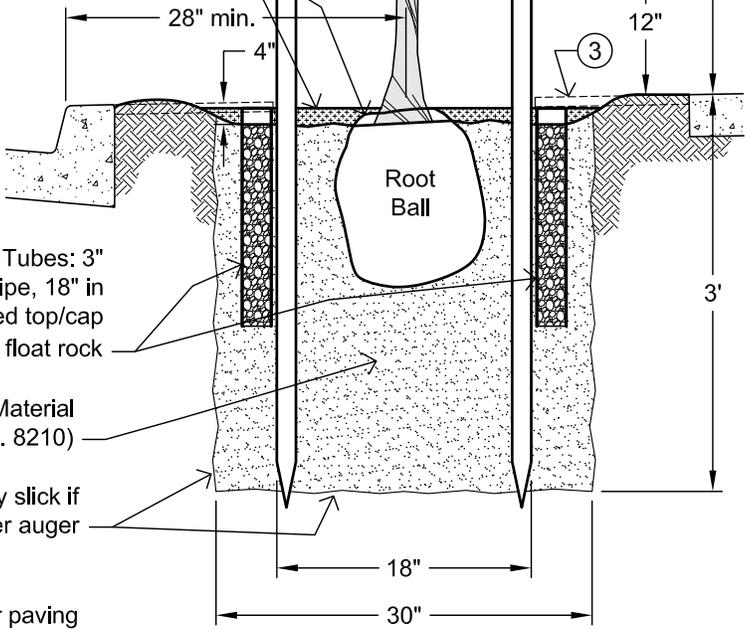
Remove nursery stake(s) after planting. Install (2) 8'-3" Lodgepole Pine Stakes.



1" x 4" x 18" Redwood Cross-brace w/ 6d galvanized nails

Top of Root Ball 1/2" above finished grade

Mulch Wood Chips, 2" deep



(2) Watering Tubes: 3" Perforated Pipe, 18" in length w/ slotted top/cap filled with 1/2" - 3/4" float rock

Backfill Material (See Eng. Std. 8210)

Remove clay slick if dug by power auger

INSTALLATION NOTES:

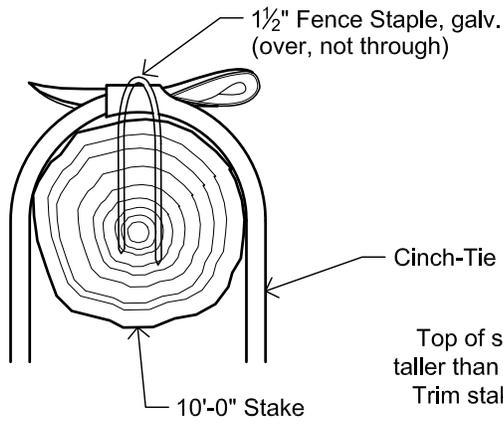
- ① Align face of tree trunk with face of stake.
- ② Cross brace shall be installed for all trees with a trunk diameter of 1" or less at 12" above ground.
- ③ At Zone 1, tree grate shall be installed per Engineering Standard 8130, 4" clear from top of grate to top of backfill material, mulch not required.

ZONE 1: Trees planted in tree wells or parkway
ZONE 2: Trees planted within 7'-6" of curb, sidewalk, or paving
ZONE 3: Trees planted more than 7'-6" of curb, sidewalk, or paving

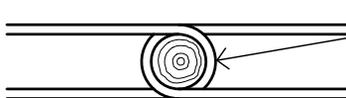
REVISIONS	BY	APP	DATE
Combined Stds 8830 and 8840	JDL	MH	6-13
Drafting edits	JDL	MH	6-13
Rev'd Notes; Watering Tubes, etc.	DVB	BL	11-09
STANDARD CURRENT AS OF:		January 2016	



**TREE PLANTING
and STAKING**
ZONES 1, 2 and 3
15 Gallon Size

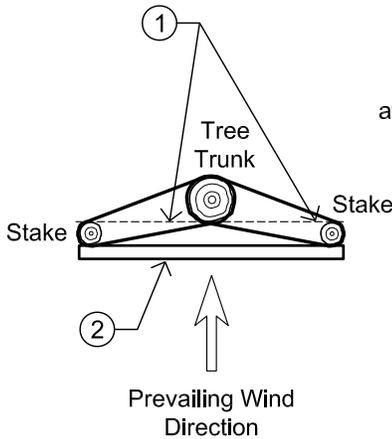


Top of stake shall not be taller than lowest tree limb. Trim stake as necessary.

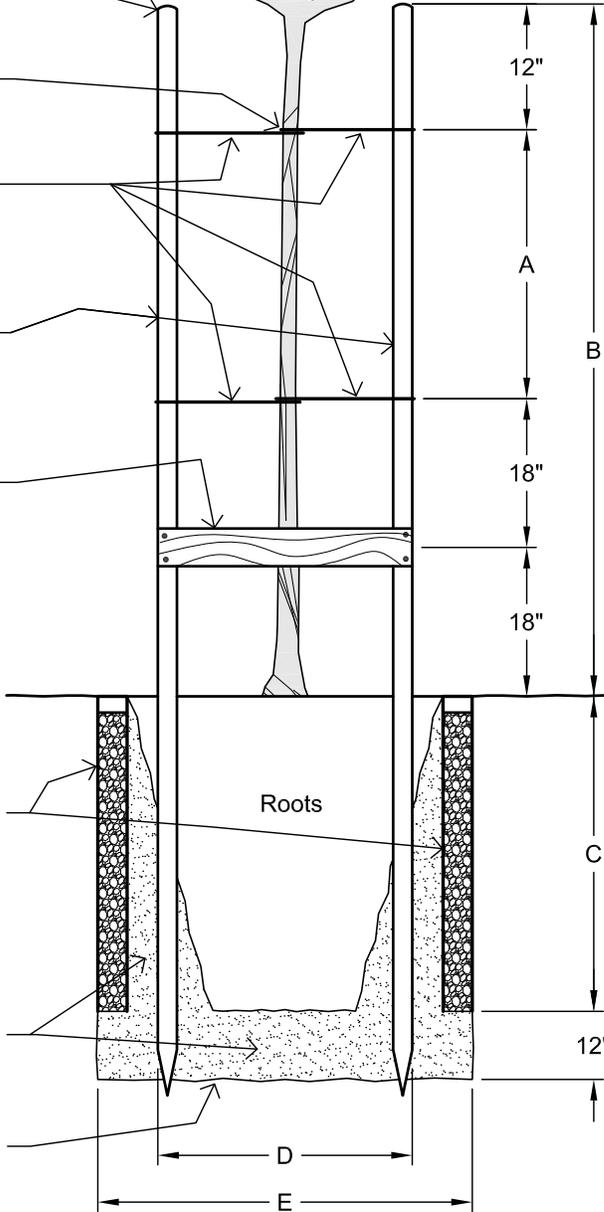
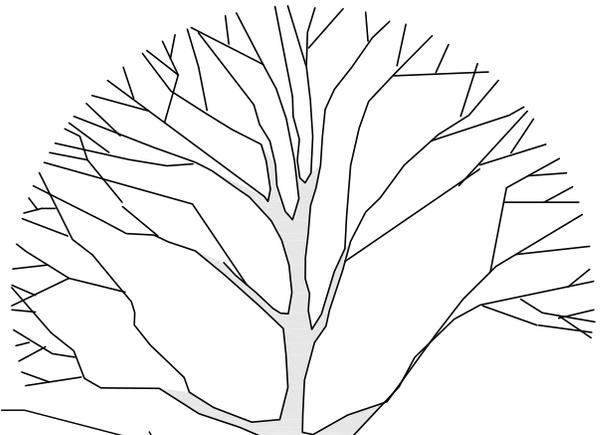


24" Cinch-ties (4 ea.) shall be snug, not tight

Remove nursery stake(s) after planting. Install (2) 10'-0" Lodgepole Pine Stakes.



1" x 4" x 18" Redwood Cross-brace w/ 6d galvanized nails



(2) Watering Tubes: 3" Perforated Pipe w/ slotted top/cap filled with 1/2" - 3/4" float rock

TREE BOX SIZE (in)	DIMENSIONS (in)				
	A	B	C	D	E
24	36	84	24	18	40
36	24	72	36	24	48
48	18	66	42	30	60

INSTALLATION NOTES:

- ① Align face of tree trunk with face of stake.
- ② Cross brace shall be installed for all trees with a trunk diameter of 2" or less at 12" above ground.

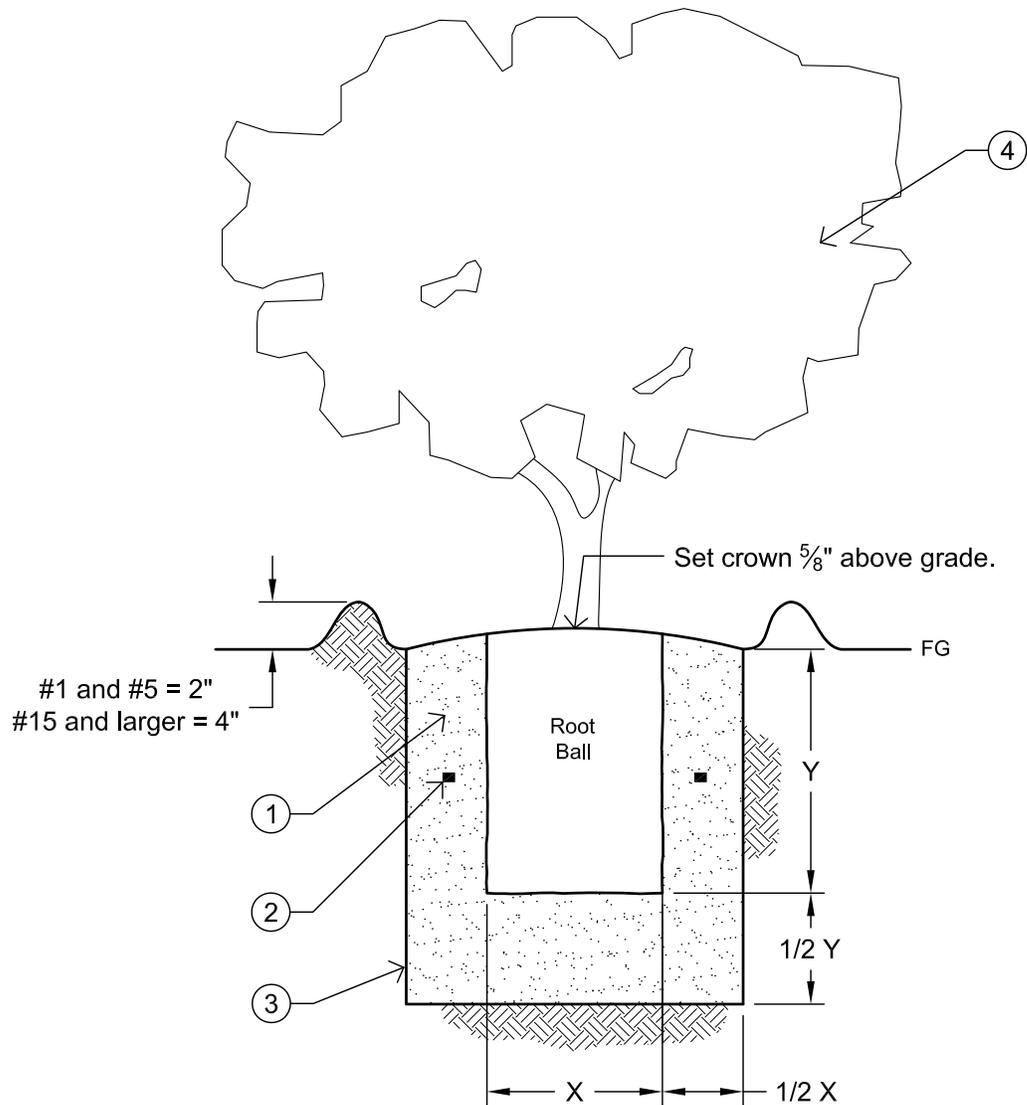
ZONE 1: Trees planted in tree wells or parkway
 ZONE 2: Trees planted within 7'-6" of curb, sidewalk, or paving

REVISIONS	BY	APP	DATE
Added Notes	MH	BL	11-09
Revised Tube Length	MH	BL	11-09
Drafting edits	JDL	MH	6-13

STANDARD CURRENT AS OF: January 2016



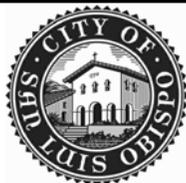
TREE PLANTING and STAKING
 ZONES 1 and 2
 24" Box and Larger



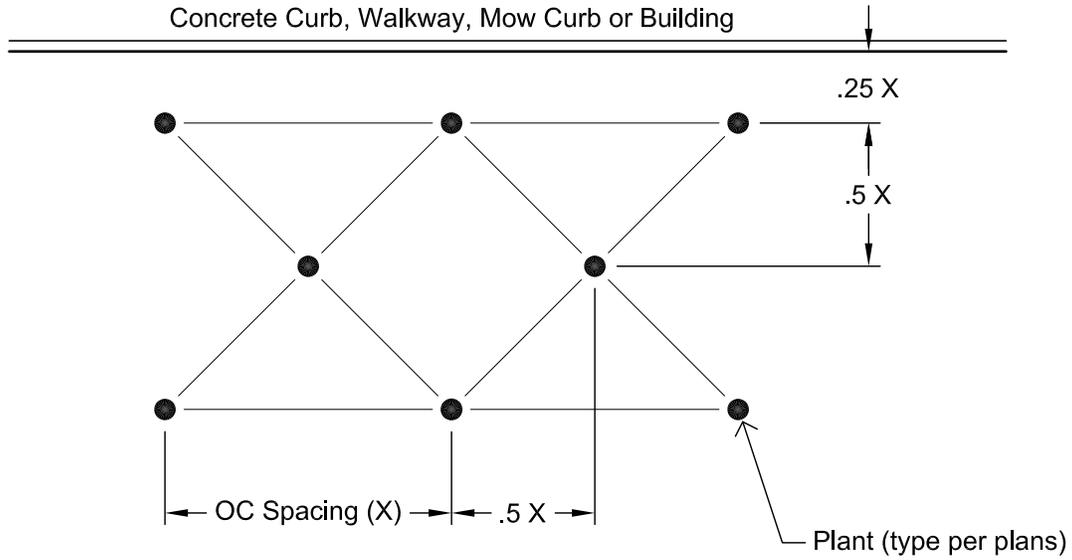
NOTES:

- ① Backfill per Standard Specifications.
- ② Fertilizer tablets per Standard Specifications. Place tablet halfway up root ball and approximately 1 inch from root tips, equally spaced around the root ball.
- ③ Plant pit to have vertical sides. Pit shall be twice the width of root ball or container and one and a half times the height of the root ball or container. Sides and bottom of plant pit are to be scarified to remove shined surfaces.
- ④ Place plant in pit so that it is plumb and straight with best side facing the most viewed angle.

REVISIONS	BY	APP	DATE
New Standard	BL	JDW	1-04
Revise Note 2; Add Notes 3 and 4	JDL	BL	5-12
Drafting edits	JDL	MH	5-13
STANDARD CURRENT AS OF:		January 2016	



SHRUB PLANTING



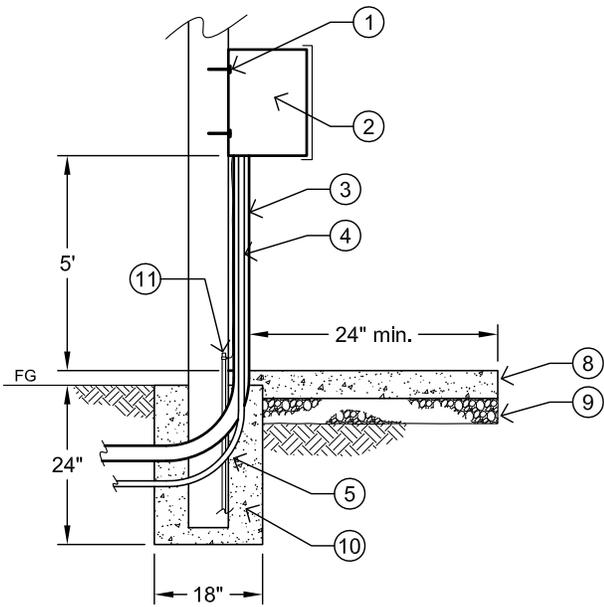
GENERAL NOTE:

- A. Ground cover on center (OC) spacing shall be per plans or Special Provisions by plant type. If not specified, OC spacing shall be 24".

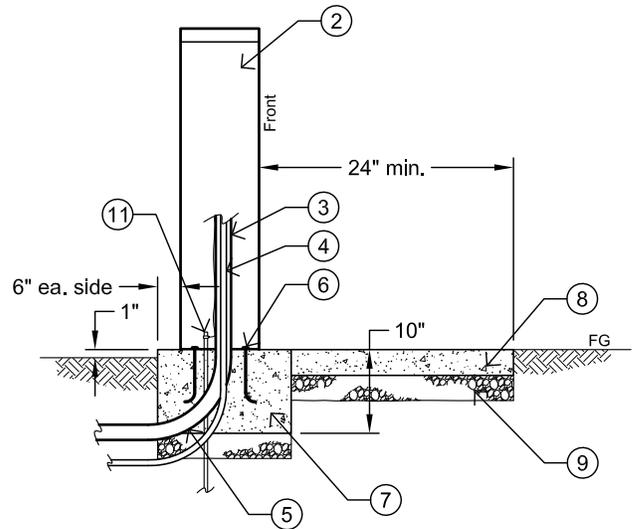
REVISIONS	BY	APP	DATE
<i>New Standard</i>	<i>BL</i>	<i>JDW</i>	<i>1-04</i>
<i>Remove chart; Drafting edits</i>	<i>JDL</i>	<i>MH</i>	<i>6-13</i>
STANDARD CURRENT AS OF:	January 2016		



**GROUND COVER
PLANTING PATTERN**



**CONTROLLER
PEDESTAL MOUNT**



**CONTROLLER
GROUND MOUNT**

GENERAL NOTES:

- A. All exposed conduit shall be Schedule 80.
- B. Install Controller and Telemetry equipment required for the site as specified by the City Parks Maintenance Division.
- C. Attach Recycled Water adhesive warning decal per Engineering Standard 8810 to inside and outside of cabinet door when used to control recycled water.

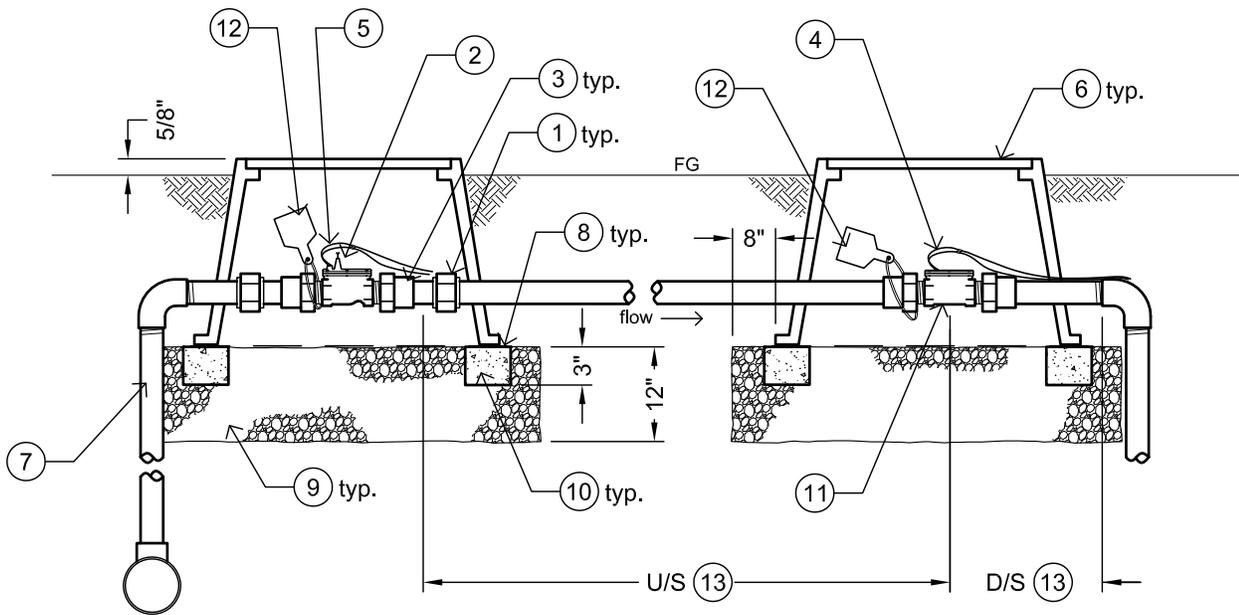
NOTES:

- ① 3/8" Ø x 4" Lag Bolts. Connect to building wall or, where wall is not available, mount to 4" x 6" Pressure Treated Douglas Fir post.
- ② Controller / Stainless Steel Enclosure
- ③ 2" Ø PVC Conduit w/ Irrigation Control Wires
- ④ 3/4" Ø PVC Conduit w/ 120 volt Power Source
- ⑤ PVC Sweep Ells for Conduit
- ⑥ 5/32" - 1/4" Ø Anchor Bolts
- ⑦ Class 3 PCC Footing
- ⑧ 4" Class 3 PCC Pad
- ⑨ 4" Class 2 Aggregate Base
- ⑩ Class 3 PCC Post Footing when Post Mount is used
- ⑪ Ground Rod

REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	6-13
Add Note 12	SR	BL	3-06
Delete Note 12	DVB	BL	11-06
STANDARD CURRENT AS OF:		January 2016	



**IRRIGATION
CONTROLLER**



GENERAL NOTES:

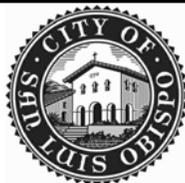
- A. Locate valves in shrub areas whenever possible.
- B. Valve boxes shall be a maximum of 12" from walkways or curbs.
- C. Valve boxes shall be set parallel to walkways or curbs.
- D. Flow meter size and pipe size must be equal.
- E. No splices are allowed in wiring except at connectors shown (in box.)

INSTALLATION NOTES:

- ① PVC Union
- ② Master Valve - normally open
- ③ PVC Male Adapter
- ④ Flow Sensor Specialized Shielded Cable (EV-CAB-SEN) (1-Flow Meter, 1-Common)
- Maximum distance between meter and controller is 2000' -
- ⑤ 14 gauge Master Valve Controller Wires (1-Valve, 1-Common)
- ⑥ Plastic Valve Box with bolt down lid. Bolts to be stainless steel.
Carson Industries 1419-3B (Purple) for Recycled Water Valves up to 2"
Carson Industries 1324-3B (Purple) for Recycled Water Valve 2½" and larger
- ⑦ Irrigation Pressure Mainline
- ⑧ Galvanized Cloth set under box - ½" Grid
- ⑨ Gravel - ¾" to 1½" in size
- ⑩ Cement Blocks or Brick continuous for box support
- ⑪ Flow Sensor - RainMaster
- ⑫ Attach Recycled Water Warning Tab per Engineering Standard 8810 when used in recycled water system.
- ⑬ U/S distance equals ten (10) times the Flow Meter size.
D/S distance equals five (5) times the Flow Meter size.

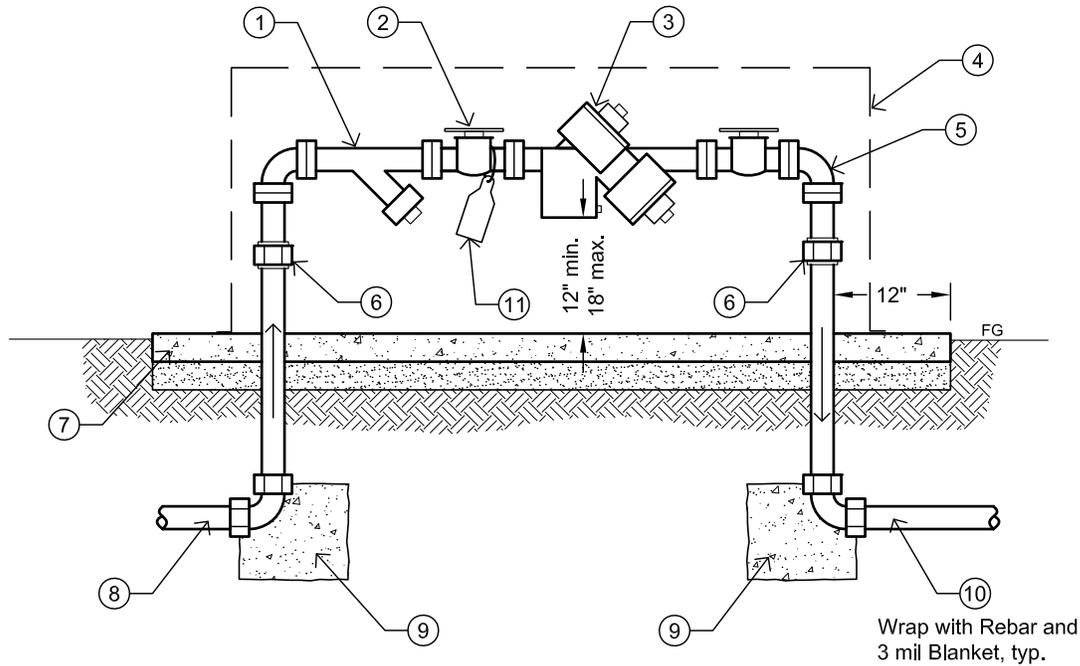
REVISIONS	BY	APP	DATE
Edit Note 11, add PVC Union	JDL	BL	6-12
Revise Notes 2 and 11	MH	BL	11-09
Update Note s 4 and 5	SR	BL	8-11

STANDARD CURRENT AS OF: January 2016



MASTER VALVE & FLOW SENSOR

8550



GENERAL NOTES:

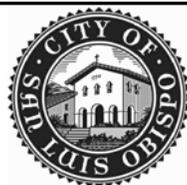
- A. All pipe shall be schedule copper or brass unless otherwise specified.
- B. Dissimilar metals shall be separated by an approved dielectric coupling.
- C. Service assembly shall be installed as the first assembly after the meter.
- D. Device shall be located within 10' of water meter and no connection or tees are allowed between the meter and the assembly.

INSTALLATION NOTES:

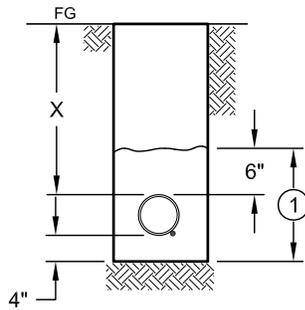
- ① WYE STRAINER: Barrel position 45° from horizontal for below ground installations
- ② BALL VALVE: Brass
- ③ FOR POTABLE SERVICE: Backflow Assembly (reduced pressure type), FEBCO/WILKINS
FOR RECYCLED SERVICE: Pressure Regulator. Where there is no backflow assembly, place wye strainer and regulator in paired boxes installed per Engineering Standard 8550.
- ④ LOCKING ENCLOSURE: Secure to pad per manufacturer's direction. Enclosure shall not be field-painted. All coatings shall be completed by manufacturer. Model: Strongbox #SBBC Series, expanded metal, dark green powder-coated, low profile, smooth touch, vandal resistant
- ⑤ ELBOW
- ⑥ UNION: Brass
- ⑦ CONCRETE PAD: Class 3, 60" x 24" x 4" on 14" Class 3 Base, with 2% cross-slope for drainage
- ⑧ SUPPLY LINE
- ⑨ THRUST BLOCK
- ⑩ IRRIGATION PRESSURE LINE
- ⑪ RECYCLED WATER WARNING TAG: Attach per Engineering Standard 8810 when used for recycled water.

****BACKFLOW DEVICES SHALL BE INSPECTED BY THE LOCAL DEPARTMENT OF HEALTH SERVICES AND THE CITY OF SAN LUIS OBISPO UTILITIES DEPARTMENT****

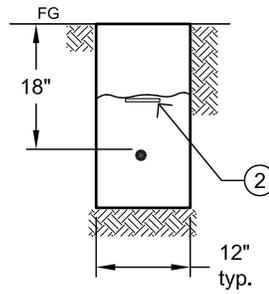
REVISIONS	BY	APP	DATE
Revised Note 1	MH	BL	11-09
Revised title; Drafting edits	JDL	MH	10-12
Revised Notes 3, 4 & 5	DVB	BL	10-07
STANDARD CURRENT AS OF:		January 2016	



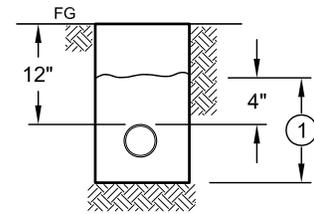
**IRRIGATION
SERVICE ASSEMBLY**



PRESSURE LINE & CONTROL WIRES



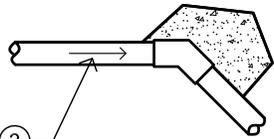
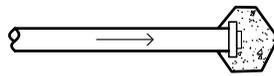
CONTROL WIRES & COMPUTER CONTROL CABLE



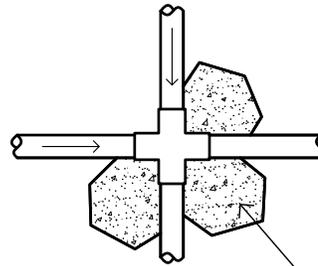
LATERAL LINE

- X = 18" for sizes 2" and smaller in planter areas
- X = 24" for sizes over 2" and conduit under pavement
- X = 24" for conduit for high voltage wiring

TRENCH DETAILS



③ typ.



④ typ.

THRUST BLOCKS

GENERAL NOTES:

- A. Pressure lines shall be per the Standard Specifications unless otherwise noted.
- B. Lateral lines shall be Class 200 unless otherwise noted.
- C. Control wires shall be taped together at 5' intervals. Where control wires share a trench with pressure lines, they shall be placed below the 4 o'clock and 8 o'clock position under the pressure line.
- D. Thrust blocks shall be installed at mainline turns, elbows, tees, caps, plugs, changes in direction, at terminal points of all rubber gasket piping and at any other additional points shown on the plans.

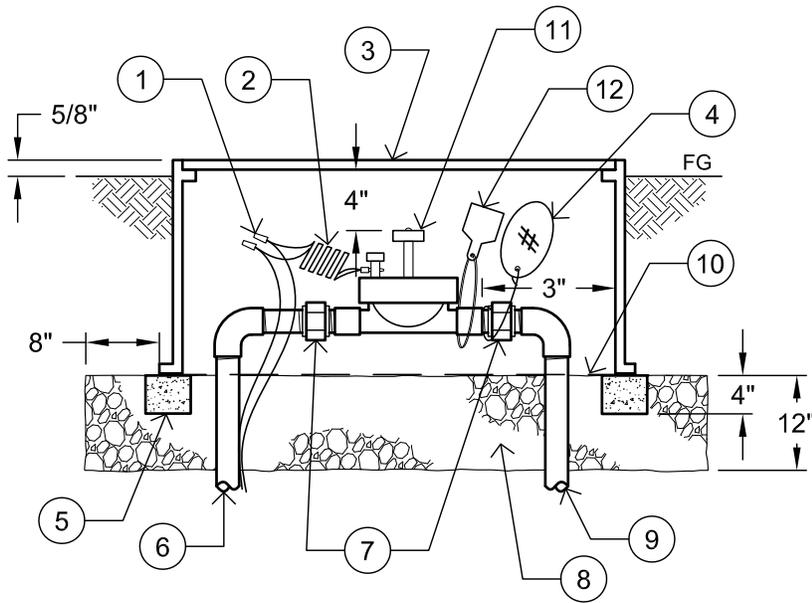
INSTALLATION NOTES:

- ① Select backfill compacted to 90%, with native above to grade compacted to 85%. Native material to be fine earth material free from clods, rocks, and other large matter. If existing soil is not acceptable, the Contractor shall import soil as backfill.
- ② 3" Detectable Marker Tape marked "WATER" or "NON-POTABLE WATER" depending on the irrigation supply source. Thor Enterprises (distributed by T. Christy Enterprises)
- ③ Direction of flow
- ④ Class 3 PCC Thrust Block, sized as needed for pressure.

REVISIONS	BY	APP	DATE
<i>New Standard</i>	<i>BL</i>	<i>JDW</i>	<i>1-04</i>
<i>Revise Lateral Line detail</i>	<i>DVB</i>	<i>BL</i>	<i>11-08</i>
<i>Revise Installation Note 1</i>	<i>JDL</i>	<i>BL</i>	<i>5-12</i>
STANDARD CURRENT AS OF:		January 2016	



TRENCH DETAIL & THRUST BLOCKS



GENERAL NOTES:

- A. Locate valves in shrub areas whenever possible.
- B. Valve boxes shall be a maximum of 12" from walkways or curbs.
- C. Valve boxes shall be set parallel to walkways or curbs.
- D. One valve per box.

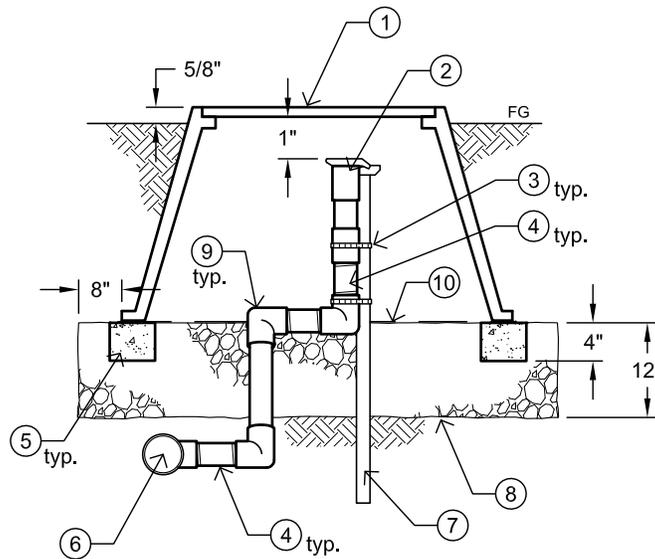
INSTALLATION NOTES:

- ① Connector:
King One Step Model 70-566 30 Volt
Rain Bird Snaptime with sealer #ST-03 Grey PT-S5
- ② 14 gauge Direct Burial Wire with 12" expansion coil (1- valve, 1- common)
- ③ Plastic Valve Box with bolt-down lid, bolts to be stainless steel:
Carson Industries 1419-3B (purple) for Recycled Water Valves up to 2"
Carson Industries 1324-3B (purple) for Recycled Water Valves 2½" and larger
- ④ 2" diameter aluminum or plastic Valve Tag, attach with non-ferrous wire, engrave with valve station number.
- ⑤ Cement Block (4 total) under each box corner
- ⑥ Irrigation Lateral Line
- ⑦ PVC Union
- ⑧ Gravel - ¾" to 1½" in size
- ⑨ Irrigation Pressure Line
- ⑩ Galvanized Cloth set under box - ½" grid
- ⑪ Control Valve: Irritrol 100 Series
- ⑫ Attach Recycled Water Warning Tag per Engineering Standard 8810 when used for recycled water.

REVISIONS	BY	APP	DATE
Edit Note 11, add PVC Union	JDL	BL	6-12
Revise Note 3, Add 12	SR	BL	3-06
Revise Note 2	SR	BL	8-11
STANDARD CURRENT AS OF:		January 2016	



ELECTRIC CONTROL VALVE & BOX



GENERAL NOTES:

- A. Locate valves in shrub areas whenever possible.
- B. Valve boxes shall be a maximum of 12" from walkways or curbs.
- C. Valve boxes shall be set parallel to walkways or curbs.
- D. One valve per box.
- E. Areas where recycled water may be used shall have purple box covers.
- F. Pipe shall be Schedule 40 PVC unless otherwise noted.

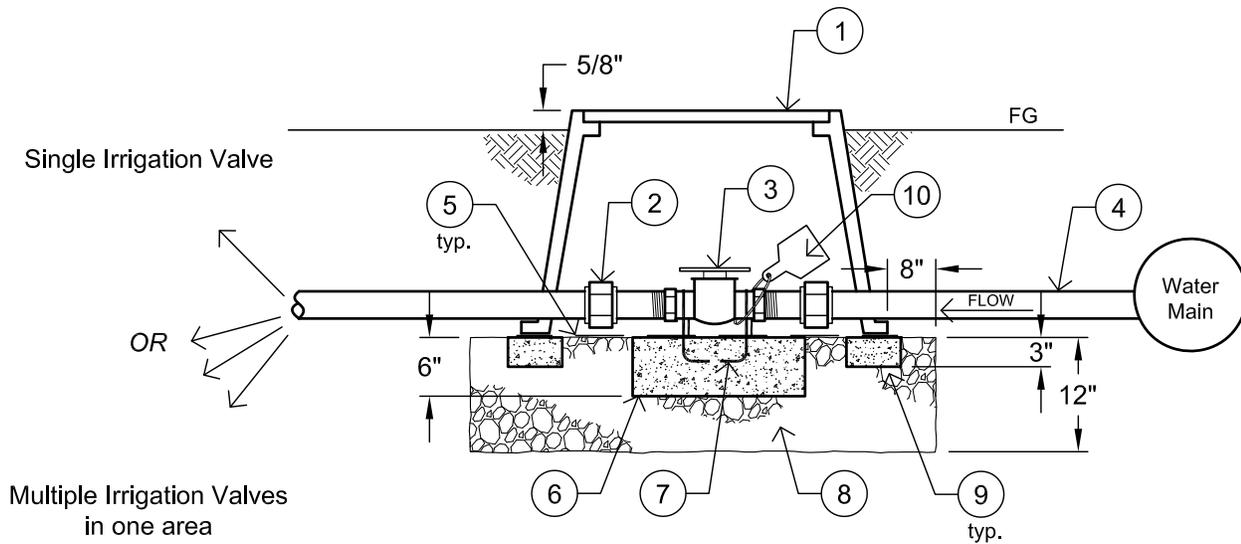
INSTALLATION NOTES:

- ① Round Plastic Valve Box: Carson #910-12B
- ② Quick Coupler Valve: Rain Bird #44, use #44NP for Recycled Water
- ③ Stainless Steel Clamp
- ④ Schedule 80 Nipple
- ⑤ Cement Block (4 total) under each box corner when box is located in turf area
- ⑥ Tee connected to irrigation pressure line
- ⑦ 1/4" x 1" x 30" Angle Iron
- ⑧ Gravel: 3/4" to 1 1/2" in size
- ⑨ Schedule 80 Ell
- ⑩ Galvanized Cloth set under box, 1/2" grid

REVISIONS	BY	APP	DATE
<i>New Standard</i>	<i>BL</i>	<i>JDW</i>	<i>1-04</i>
<i>Revise Notes E and 2</i>	<i>SR</i>	<i>BL</i>	<i>3-06</i>
<i>Drafting edits</i>	<i>JDL</i>	<i>MH</i>	<i>6-13</i>
STANDARD CURRENT AS OF:		January 2016	



**QUICK COUPLER
VALVE and BOX**



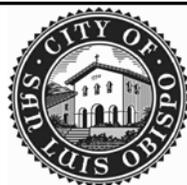
GENERAL NOTES:

- A. Isolation valves shall be installed for all irrigation valves.
- B. Locate valves in shrub areas whenever possible.
- C. Valve boxes shall be a maximum of 12" from walkways or curbs.
- D. Valve boxes shall be set parallel to walkways or curbs.
- E. Valve size and pipe size must be equal.

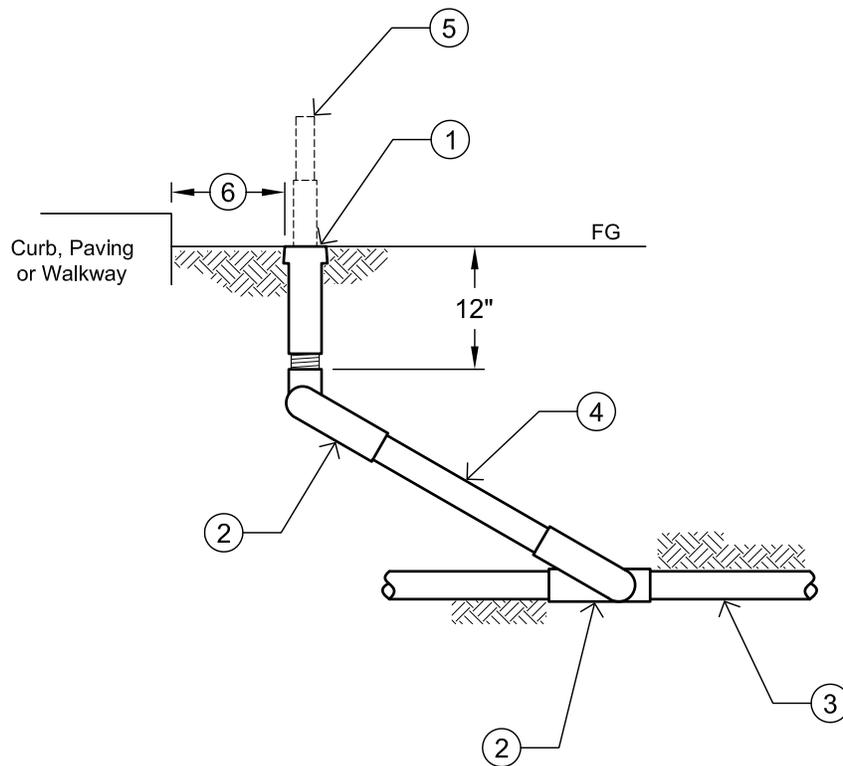
INSTALLATION NOTES:

- ① Plastic Valve Box with bolt-down lid. Bolts to be stainless steel:
Carson Industries 1419-3B (purple) for Recycled Water Valves up to 2"
Carson Industries 1324-3B (purple) for Recycled Water Valves 2½" and larger
- ② PVC Union
- ③ Brass Ball Valve
- ④ Schedule 40 Pressure Line
- ⑤ Galvanized Cloth set under box: ½" grid
- ⑥ Concrete block below valve, extending 6" beyond outside dimensions of valve
- ⑦ #10 Reinforcing Bar looped over valve - Only for valves 2½" and larger
- ⑧ Gravel: ¾" to 1½" in size
- ⑨ Cement Blocks or Brick continuous for box support
- ⑩ Attach Recycled Water Warning Tag per Engineering Standard 8610 when used for recycled water.

REVISIONS	BY	APP	DATE
Add PVC Union; drafting edits	JDL	BL	6-12
Revised Notes and Detail	MH	BL	10-05
Revise Note 1; Add Note 10	SR	BL	3-06
STANDARD CURRENT AS OF:		January 2016	



ISOLATION VALVE



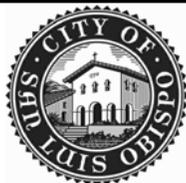
GENERAL NOTES:

- A. Where system is or has the potential to hook up to non-potable water, rotor head shall have a Reclaimed Water cover.
- B. Pipe material shall be Class 200 PVC unless otherwise noted.

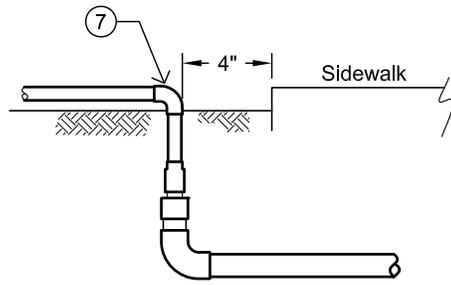
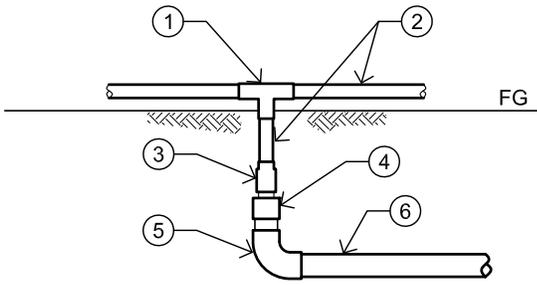
INSTALLATION NOTES:

- ① Rotor or Spray Pop-up or Hi-pop Body, set even with finished grade.
- ② Triple Swing Joint, Marlex (3)
- ③ Irrigation Lateral Line
- ④ Schedule 80 Nipple
- ⑤ Pop-up height to be above matured plant material height.
- ⑥ Distance must be 2 feet but may be reduced to 2 inches where overspray to adjacent impervious surface runs off to vegetated area.

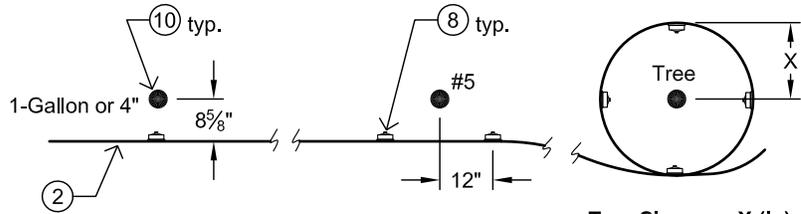
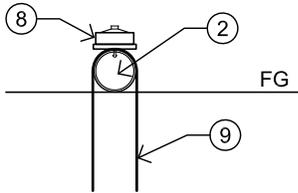
REVISIONS	BY	APP	DATE
Added note 6	MH	BL	1-14
Revise offset from curb	DVB	BL	11-07
Pop-up height (Note 5)	JDL	BL	6-12
STANDARD CURRENT AS OF:		January 2016	



POP-UP HEAD

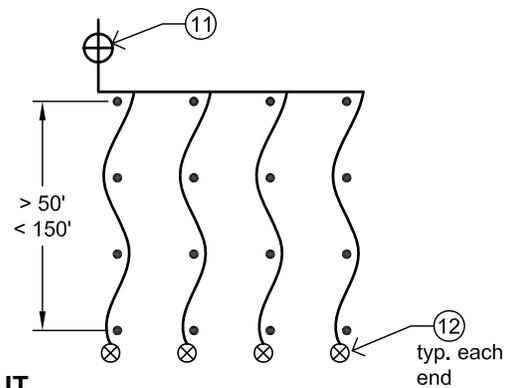
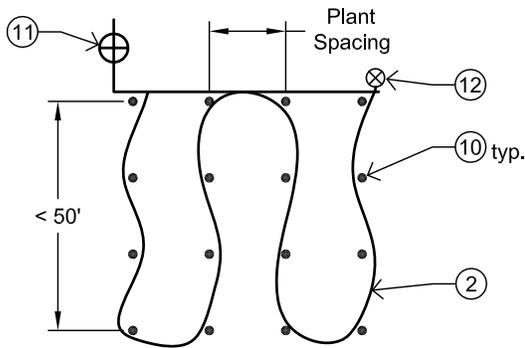


RISER DETAILS



Tree Size	X (in)
15-Gallon	18
24" Box	24
40" Box	40

EMITTERS



DRIP LAYOUT

GENERAL NOTES:

- A. Lateral lines shall be class 200 unless otherwise noted.
- B. All drip irrigation lines and emitters shall be installed below mulch layer.
- C. Total length of drip tubing not to exceed 150'.
- D. Ends of drip tube shall be no more than 3' from edge of hardscape in valve box as shown.
- E. In areas where recycled water will or could be used, all tubing shall be purple for use with recycled water.

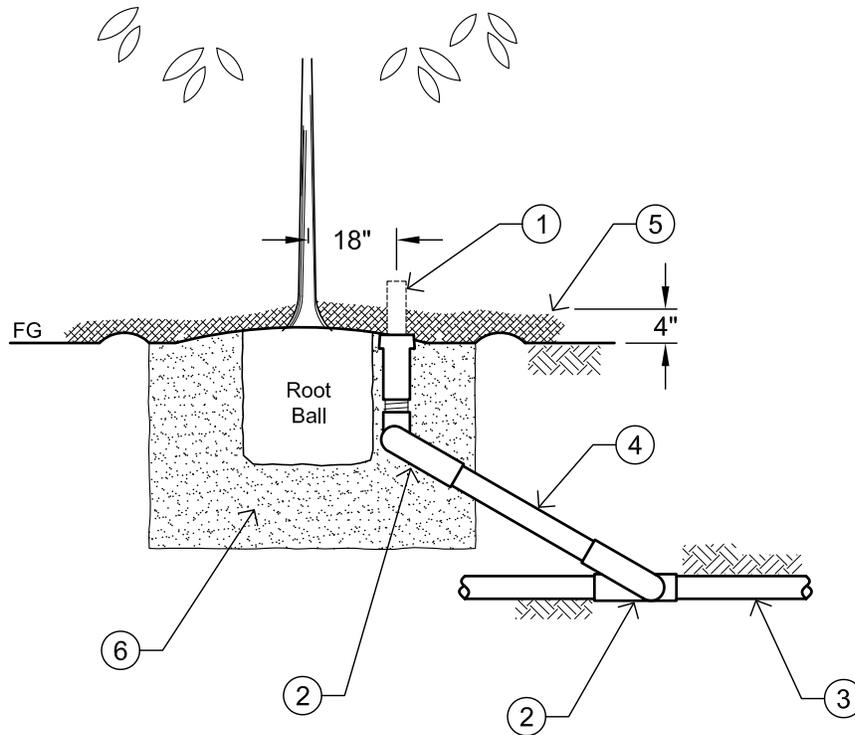
INSTALLATION NOTES:

- | | | |
|------------------------------|--|-------------------------------------|
| ① Drip Tee | ⑤ PVC Eil | ⑨ 12" Staple @ 5' O.C. - Soil Saver |
| ② Drip Tubing - 5/8" | ⑥ PVC Irrigation Lateral Line - 3/4" | ⑩ Center of Plant |
| ③ Drip Thread / Slip Adapter | ⑦ Drip Eil | ⑪ Pressure Line Valve |
| ④ PVC Slip / Thread Adapter | ⑧ Emitter - Pressure compensating, Self-flushing | ⑫ Manual Flush Valve |

REVISIONS	BY	APP	DATE
New Standard	BL	JDW	1-04
Added Note E	SR	BL	3-06
Drafting edits	JDL	MH	6-13
STANDARD CURRENT AS OF:		January 2016	



DRIP IRRIGATION



GENERAL NOTES:

- A. Where system is or has the potential to hook up to non-potable water, rotor head shall have a Reclaimed Water cover.
- B. Pipe material shall be Class 200 PCV.
- C. See Engineering Standards for tree planting.
- D. Minimum of one (1) bubbler per tree or as specified on the plans.

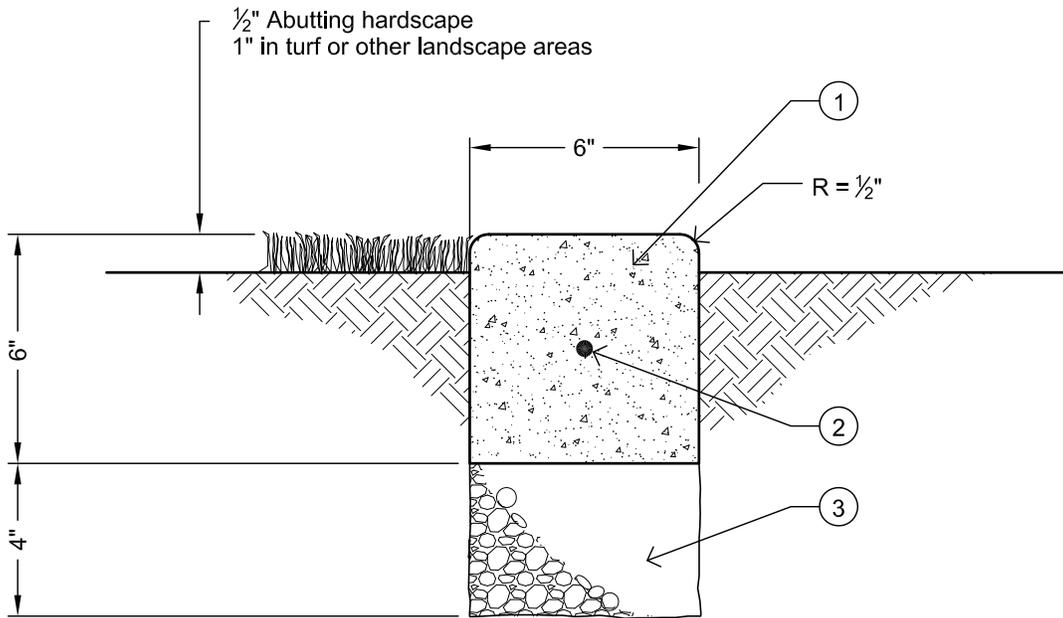
INSTALLATION NOTES:

- ① Bubbler Pop-up, set even with finished grade: Rain Bird
- ② Triple Swing Joint: Marlex (3)
- ③ Irrigation Lateral Line
- ④ Schedule 80 PVC Nipple
- ⑤ 4" deep Mulch
 - 5 gallon tree: 36" diameter around tree
 - 15 gallon tree: 48" diameter around tree
 - 24" box: 72" diameter around tree
- ⑥ Backfill per Standard Specifications

REVISIONS	BY	APP	DATE
New Standard	BL	JDW	1-04
Drafting edits	JDL	MH	6-13
Delete Note 7	SR	BL	
STANDARD CURRENT AS OF:		January 2016	



TREE BUBBLER



SECTION

GENERAL NOTES:

- A. 1/4" Felt expansion joints at 20' intervals, at change in direction, at beginnings/ends of curves, and where mow strip abuts other structures.

INSTALLATION NOTES:

- ① Class 3 Concrete, light broom finish. No color unless specified in contract documents.
- ② #3 Reinforcing bar continuous at center. 18" overlap at splice.
- ③ Class 3 base. No recycled AC base allowed.

REVISIONS	BY	APP	DATE
<i>New Standard</i>	<i>BL</i>	<i>BL</i>	<i>5-12</i>
<i>Drafting edits</i>	<i>JDL</i>	<i>MH</i>	<i>10-12</i>
STANDARD CURRENT AS OF:		January 2016	



CONCRETE EDGING



Front

Back

RECYCLED WATER WARNING TAGS

RECYCLED WATER WARNING TAGS:

- Shall be high durability polyurethane.
- The tag shall be 3" x 4" in size with attachment neck and reinforced attachment hole.
- All lettering shall be hot stamped in black on a purple tag.
- Tags shall be attached with non-ferrous wire.
- Christy's ID-MAX-P2-RC-009 or approved equal, attached as shown in Engineering Standards.



PLASTIC WARNING PLATE

PLASTIC WARNING PLATES:

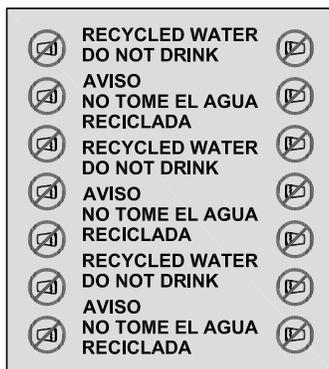
- Shall be Christy's #3800 or equal.
- Warning Plates shall be made of purple UV resistant co-polymer plastic, and installed with tamper-proof rivets.



ADHESIVE WARNING DECAL

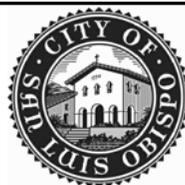
ADHESIVE DECALS:

- Warning Decals shall be Christy's #ID-4200 or equal.
- Warning Decals shall be made on a 3.5 mil flexible vinyl base, with permanent acrylic adhesive backing on a 90# stay-flat liner.
- Riser Decals shall be Christy's #5100 or equal.
- Riser Decals shall be approximately 2½" x 3" and capable of being wrapped around and attached to a sprinkler riser.
- Background shall be printed with a purple UV cured vinyl ink. Legend printing shall be in black with a UV cured vinyl ink.
- The entire decal shall be clear flood over-printed for superior weathering and UV protection.



ADHESIVE RISER DECAL

REVISIONS	BY	APP	DATE
New Standard	SR	BL	3-06
Drafting edits	JDL	MH	6-13
STANDARD CURRENT AS OF: January 2016			

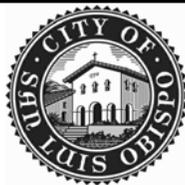


**RECYCLED WATER
WARNING TAGS,
LABELS and DECALS**

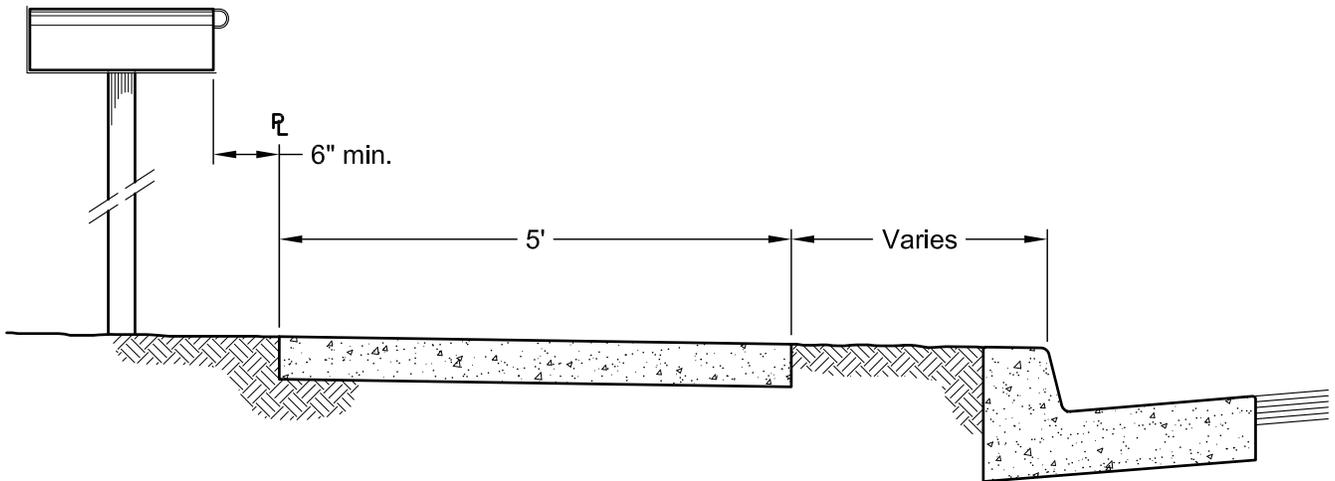
GENERAL NOTES:

- A. All signs shall be sign grade aluminum, .080" thick, with white letters on a purple background. Signs shall include language stating that "Recycled Water" is used for irrigation, shall contain the the warning "DO NOT DRINK", and shall include the industry standard symbol: 
- B. The small signs shall be a minimum of 8" wide and 10" high.
- C. Small signs shall be mounted to U-channel, 2 lbs. hot rolled high tensile rail or billet steel with galvanized finish per ASTM A-123. Sign post shall extend 4'3" below grade.
- D. Large signs shall be a minimum of 18" high and 24" wide.
- E. Large signs shall be mounted to chain link fence in accordance with manufacturer's recommendations.
- F. All mounting hardware shall be stainless steel.
- G. Height of signs will depend on location and surrounding landscape plant types (min. height shall be 3'). In all cases, sign shall be visible to the public.
- H. Sign letters shall be reflective material.
- I. Signs shall be located as shown on the plans. As a minimum, signs shall be placed at each entrance to the area where recycled water will be used. Signs must be placed where they can be easily seen, and no further than 1000' apart unless approved by the Water Reuse Coordinator. For unfenced areas, signs shall be placed at sidewalks and crosswalks, driveway entrances, corners, outdoor eating areas, and as otherwise required. For medians, a sign shall be placed at the beginning and end of the median. Longer medians may require an additional sign be placed near the middle, equidistant from the ends of the median. For fenced areas, signs must be placed at each fence opening.
- J. Post shall be installed per Engineering Standard 7210 mounting height.

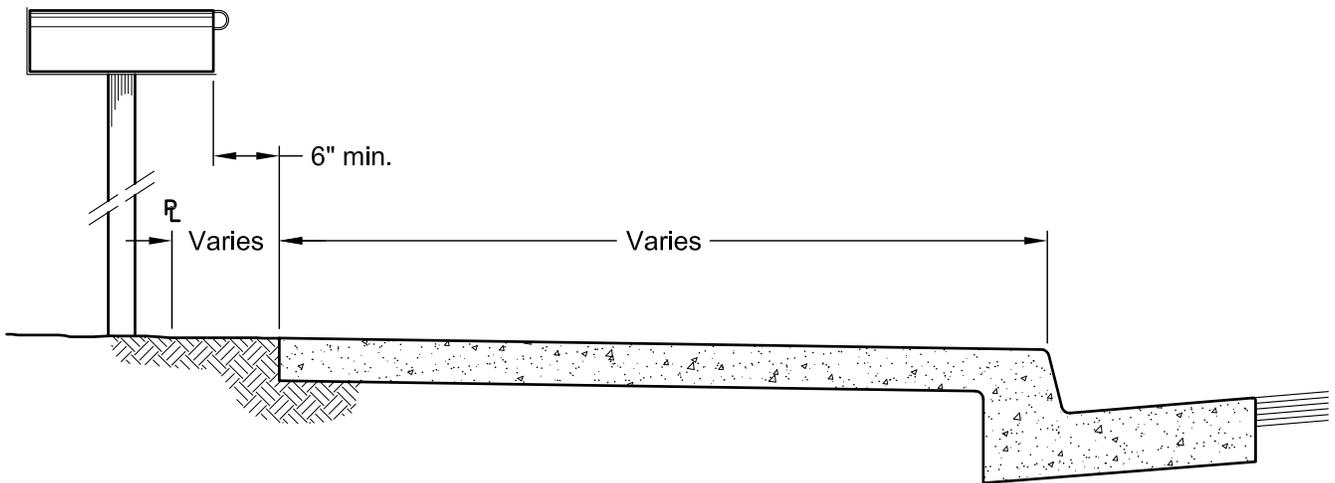
REVISIONS	BY	APP	DATE
<i>New Standard</i>	<i>SR</i>	<i>BL</i>	<i>3-06</i>
<i>Revise Notes for standard signs</i>	<i>DVB</i>	<i>BL</i>	<i>10-07</i>
<i>Drafting edits</i>	<i>JDL</i>	<i>MH</i>	<i>6-13</i>
STANDARD CURRENT AS OF:		January 2016	



**RECYCLED WATER
WARNING SIGNS**



DETACHED SIDEWALK



INTEGRAL SIDEWALK

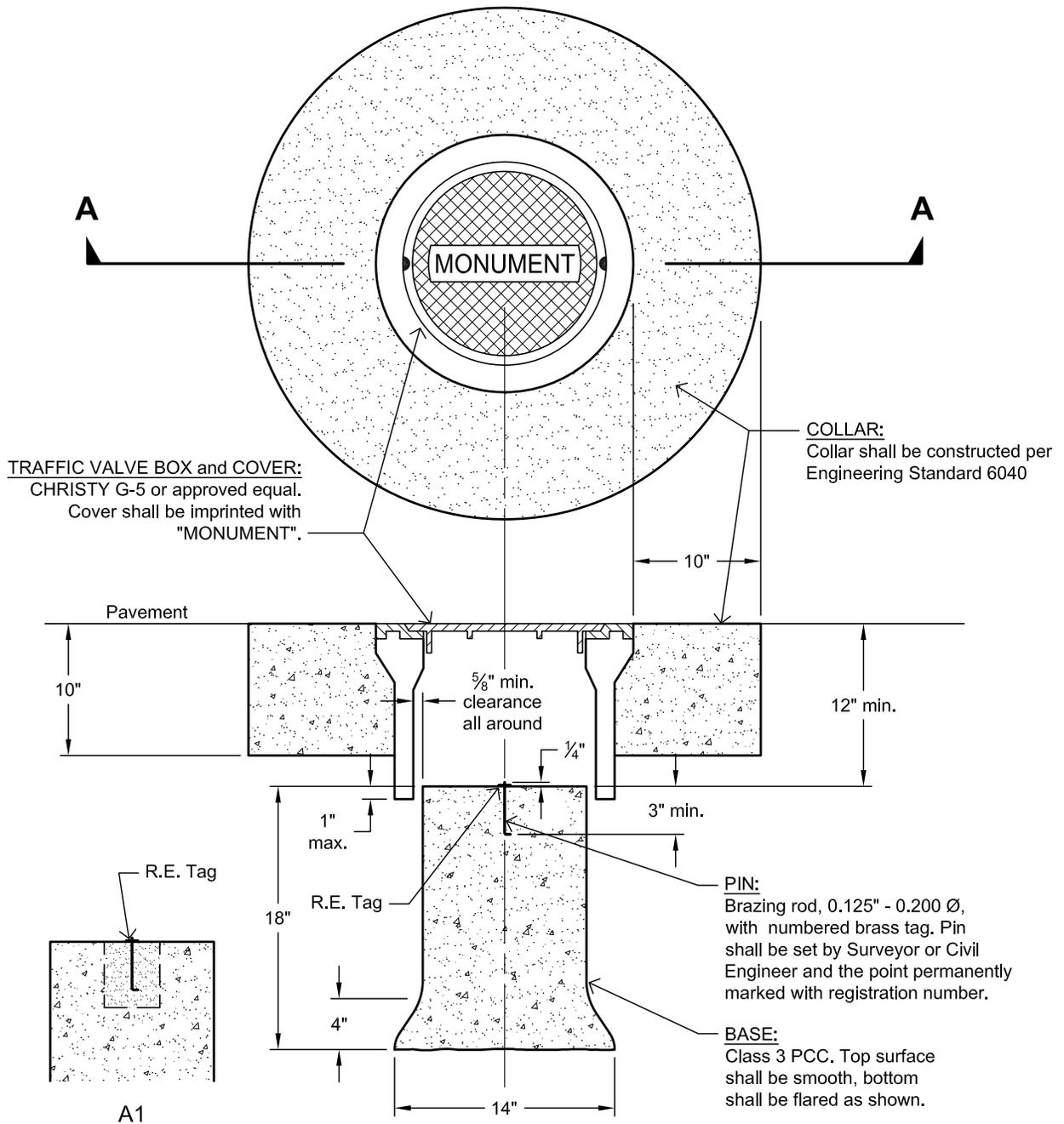
Municipal Code Section 12.40.040

(a) In a residential zone, it is unlawful for any person to install or maintain or to direct, authorize or permit the installation or maintenance of a mail box, a receptacle for newspaper delivery, or any other container to be used for delivery purposed in, upon or over an portion of the space or area between a street curb and the back edge of an improved sidewalk.

REVISIONS	BY	APP	DATE
<i>New border</i>	JDL	WAP	1-98
<i>Revise Code Section</i>	JDL	WAP	10-93
<i>Drafting edits</i>	JDL	MH	6-13
STANDARD CURRENT AS OF:		January 2016	



MAIL BOX LOCATION



SECTION A - A

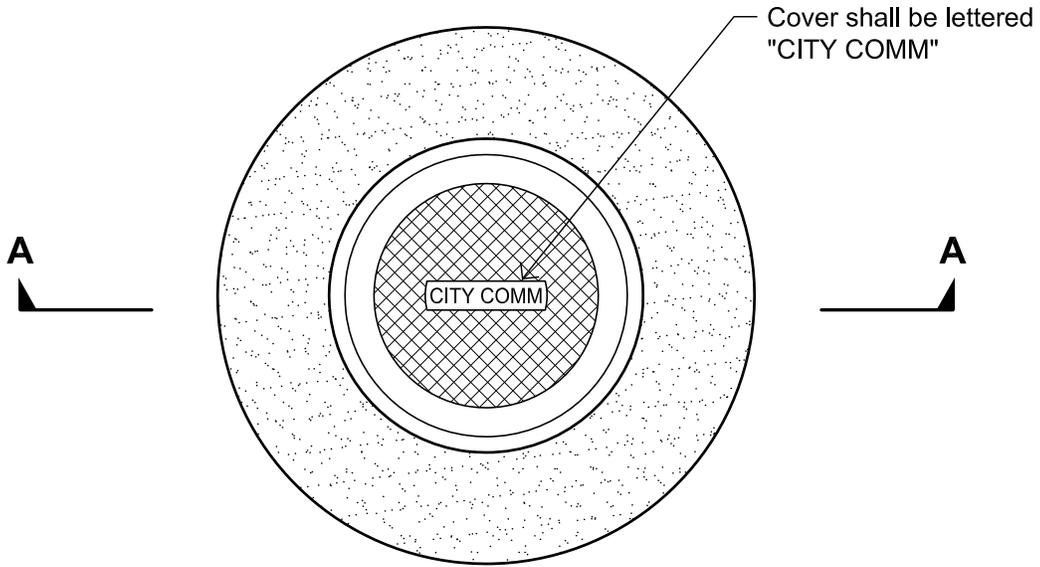
ALTERNATE METHODS

- A1 - Base may be cast with a cylindrical recess which shall later be filled with expansive grout (min. 2500 psi) when pin is set.
- A2 - A brass cap may be set with the base pour so that center of cap is within 5/8" of the monument point. Point shall be marked with a cross, etched a minimum of 1/16" deep into the brass. The cap shall be marked with the License information or a tag with the information shall be attached.

REVISIONS	BY	APP	DATE
New border	JDL	WAP	1-98
Added Alternate A2	BL	JDW	4-02
Drafting edits	JDL	MH	6-13
STANDARD CURRENT AS OF:		January 2016	

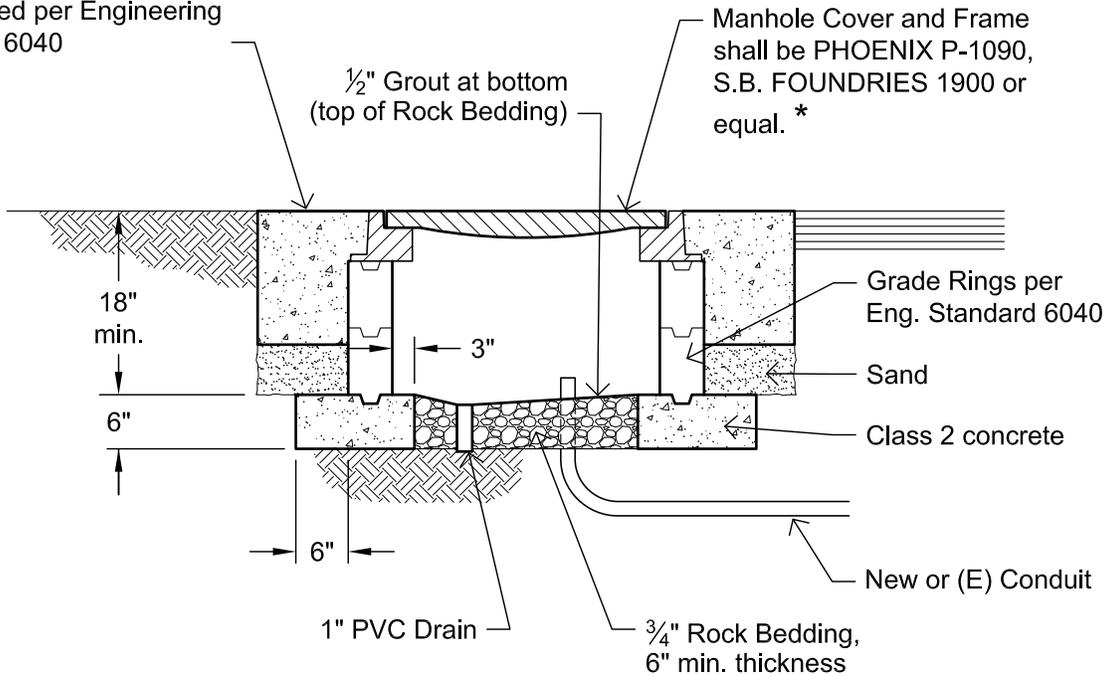


MONUMENT and WELL



PLAN

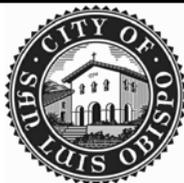
Manhole Collar shall be constructed per Engineering Standard 6040



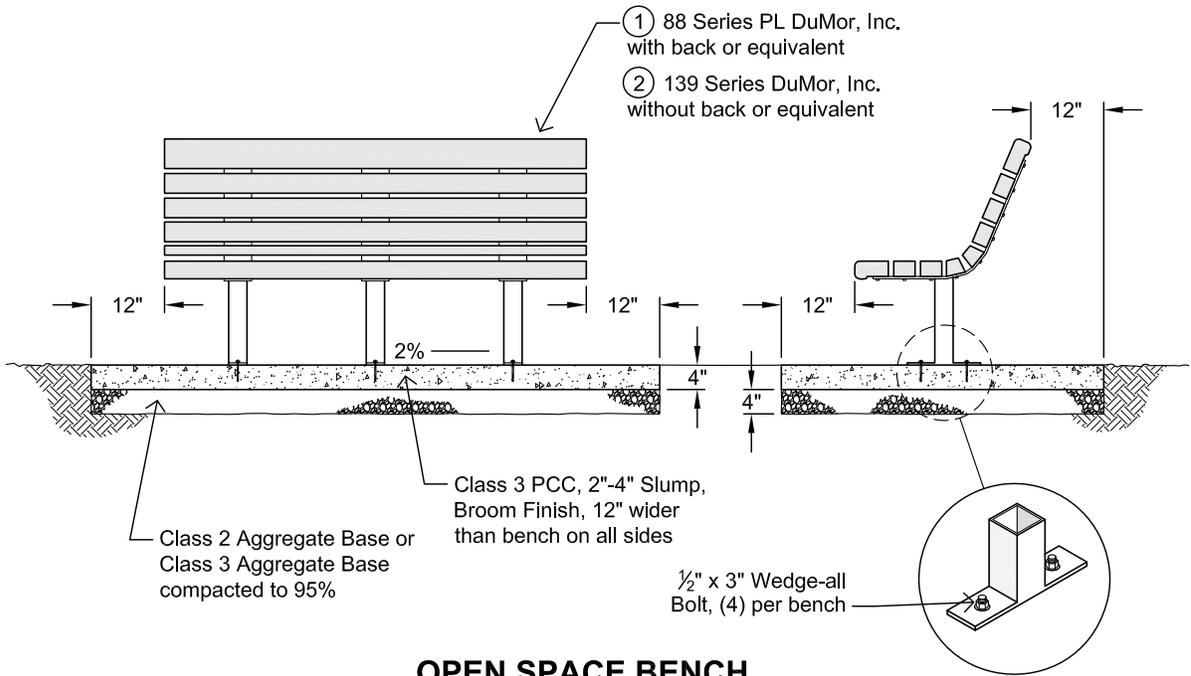
SECTION A - A

* In sidewalk applications, install ring and cover per Engineering Standard 3350.

REVISIONS	BY	APP	DATE
New Standard	JDL	WAP	8-99
Drafting edits	JDL	MH	6-13
Revise Class 2 Note	SR	BL	1-14
STANDARD CURRENT AS OF:		January 2016	



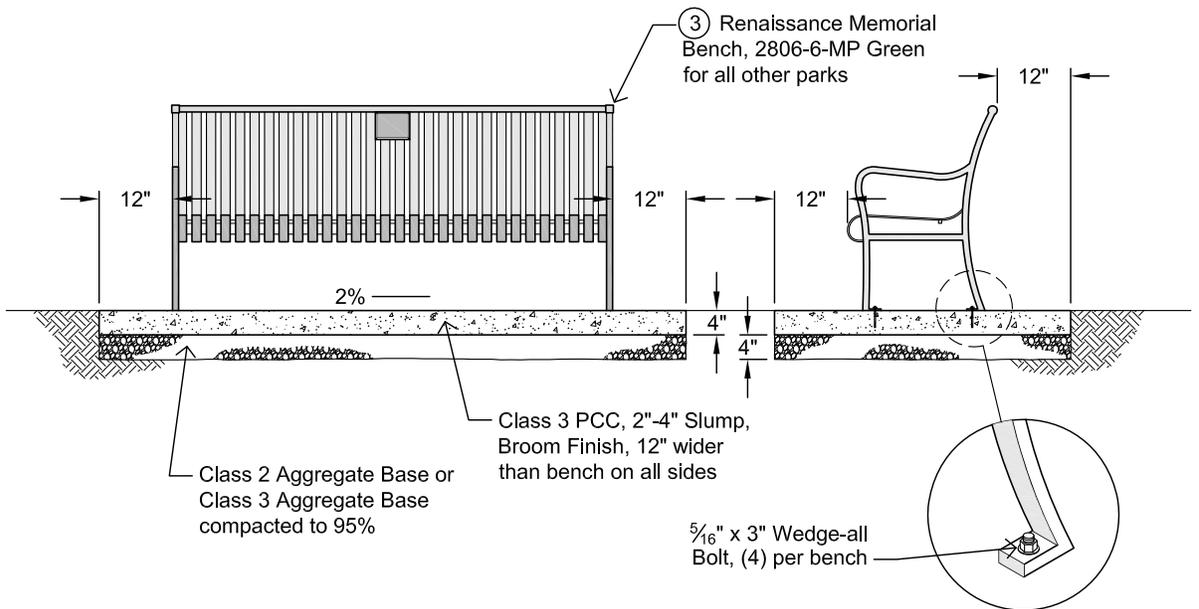
**MANHOLE COVER
& ACCESS BOX**
CITY COMMUNICATIONS



OPEN SPACE BENCH

NOTES:

- ① Style for Damon-Garcia and Laguna Lake Parks
- ② Style for Open Space
- ③ Style for all other parks



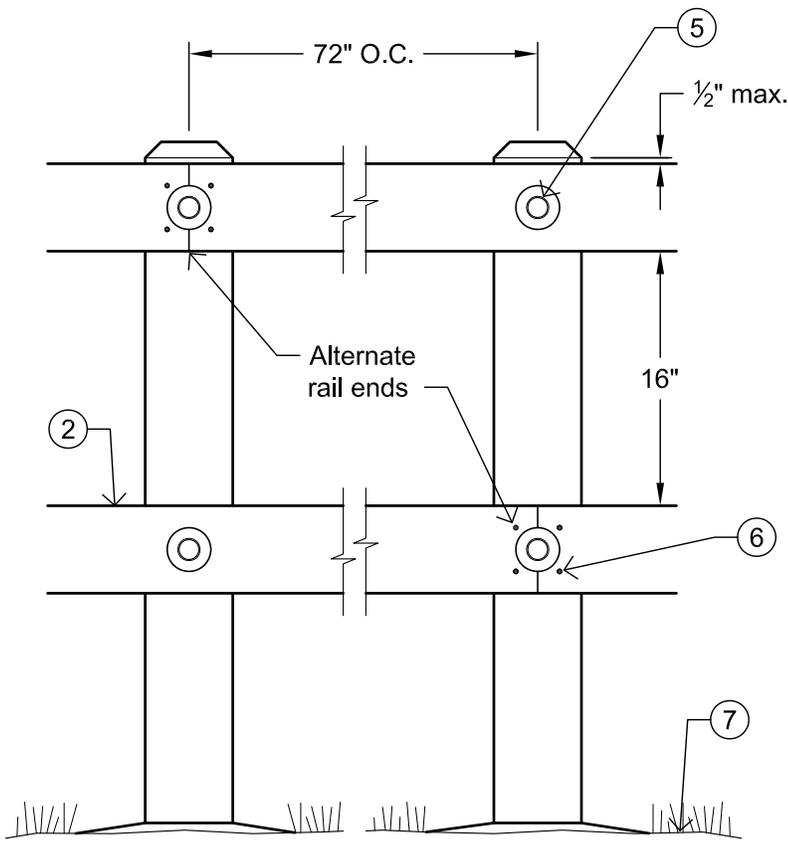
PARKS and PUBLIC RIGHT OF WAY BENCH

REVISIONS	BY	APP	DATE
New Standard	SR	BL	11-08
Drafting edits	JDL	MH	6-13

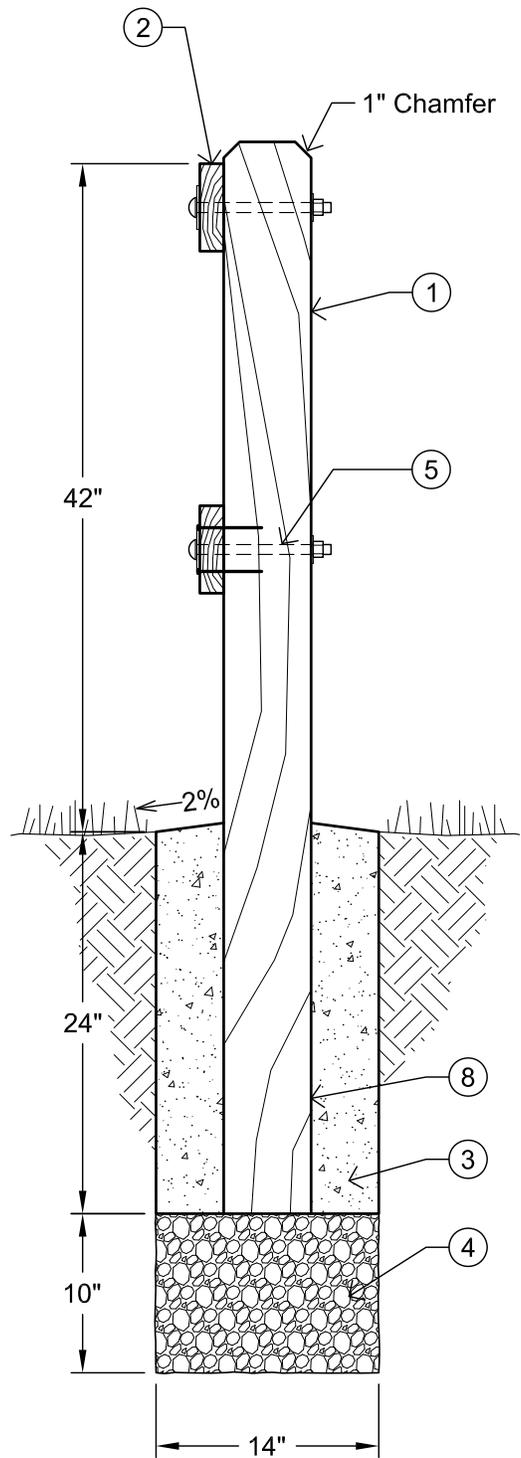


CITY BENCH

STANDARD CURRENT AS OF: January 2016



ELEVATION

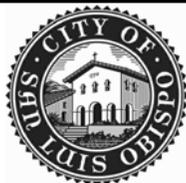


SECTION

INSTALLATION NOTES:

- ① 6" x 6" Pressure Treated Douglas Fir Post, re-treat all cuts
- ② 2" x6" (12 ft length) Pressure Treated Douglas Fir, re-treat all cuts
- ③ Class 3 PCC Footing, slope top 2% in all directions
- ④ 1½" Ø Round Rock
- ⑤ 5/8" Carriage Bolt w/ 3" Torque Washer at front and 2" Timber Washer at rear
- ⑥ Nail board ends with (2)- 4" Galvanized Nails.
- ⑦ Finish Grade
- ⑧ Wrap post, within limits of concrete, with 15 lb Felt Paper.

REVISIONS	BY	APP	DATE
New Standard	JDL	BL	1-10
Drafting edits	JDL	MH	6-13



STANDARD CURRENT AS OF: January 2016

RAIL FENCE

GENERAL NOTES:

Trash containers shall be TimberForm® Renaissance™ series Model No. 2816-ST-M "SLO Litter Container", manufactured by Columbia Cascade Company, or approved equal.

A. MATERIALS and DESIGN

Frame shall be fabricated from 1 inch ID Schedule 40 mild steel seamless pipe. Side slats shall be 0.188 inch thick x 1-1/2 inch wide formed mild steel. Container shall have a side-opening door that locks in place with a thumb latch locking mechanism.

Litter container shall include a separate matching sorting top for recycling bottles and cans and a 32-gallon recycled plastic liner with two hand holds for easy removal and emptying. Sorting top shall be fabricated from 11 gauge steel plate and shall have two side openings for trash, top opening for recyclable materials and a stainless steel sliding trap door.

Top at opposite sides shall have applied clear adhesive graphics with white lettering designating separate openings for bottles/cans and trash and a large recycling logo.

Sorting top shall remain locked in place until released by opening of the side-opening latch locking mechanism that utilizes a removable handle or Allen wrench for unlocking.

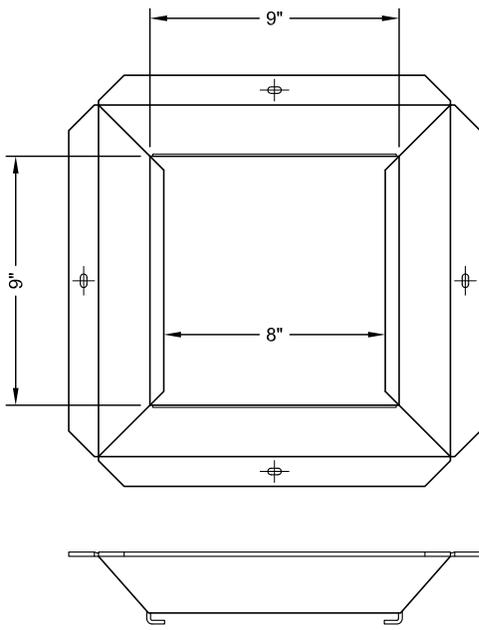
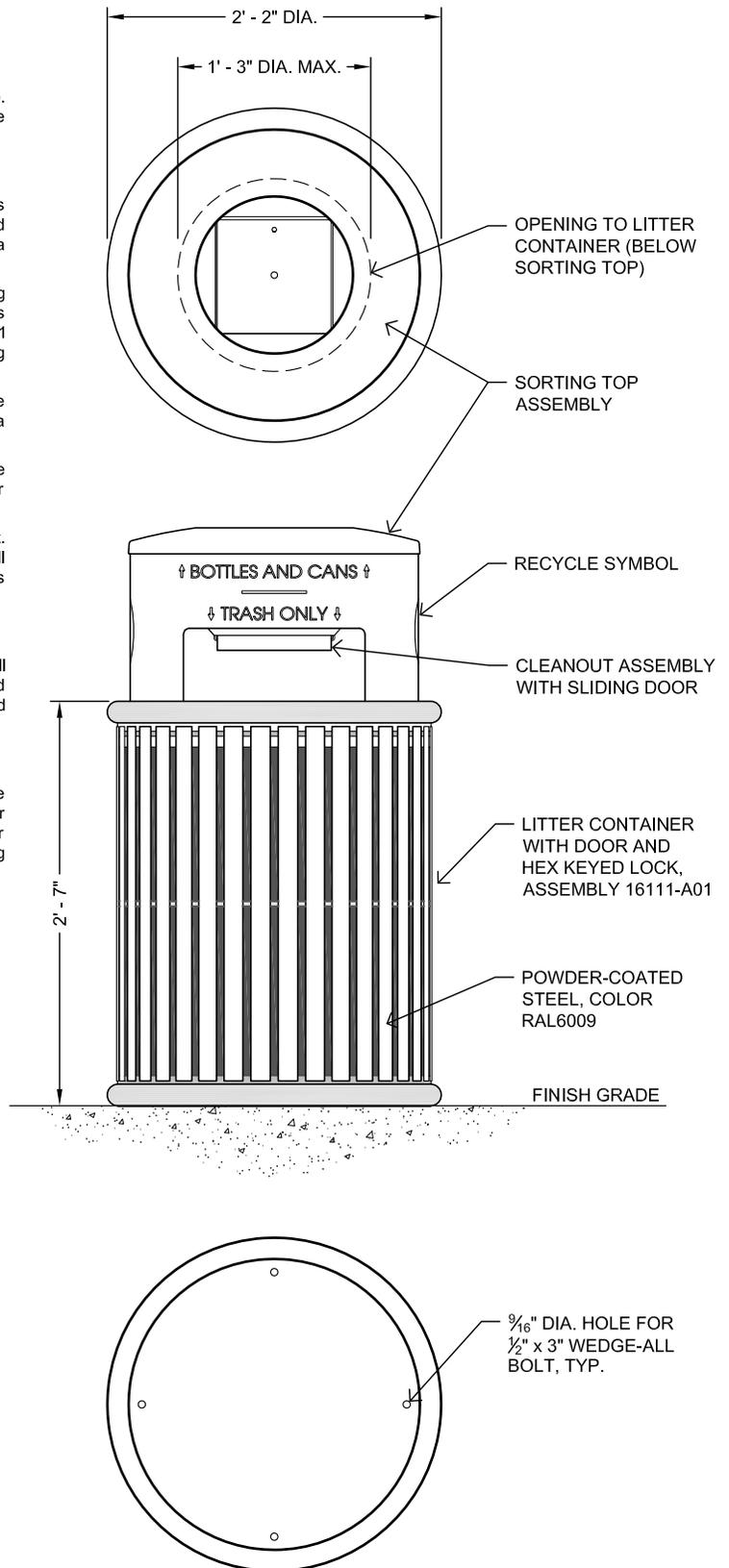
Overall dimensions shall be approximately 26" diameter and 45" in height. Container shall be surface mounted flush with the sidewalk surface and will have built in leveling capability in accordance with manufactures recommendations.

B. CONSTRUCTION

Entire litter container body, except for separate liner, and sorting top shall be assembled and welded into single units. Welds shall be smooth and continuous with no gaps or pin holes. Final product shall be free of weld spatters and burrs.

C. FINISH

Steel and cast iron parts shall be coated with UV resistant exterior grade polyester powder coating applied to a minimum thickness of 6 mils. Color shall be Dark Forest Green (RAL6009) to match City standard colors for downtown and black in all other locations. Liquid, epoxy or lead-containing powder coatings are not acceptable.



CLEAN OUT ASSEMBLY

REVISIONS	BY	APP	DATE
Opening to litter container	JDL	DA	10-15
Drafting edits	JDL	MH	3-13
Revise Note C	SR	BL	1-14
STANDARD CURRENT AS OF:		January 2016	



TRASH CONTAINER STANDARD

APPENDICES

- A. STATE STANDARD CURB RAMP DETAILS
- B. MISSION STYLE SIDEWALK DISTRICT
- C. RAILROAD DISTRICT PLAN
- D. LIST OF ARTERIAL AND COLLECTOR STREETS
- E. SAMPLE NOTICE OF STREET MAINTENANCE (DOOR HANGER)
- F. PLAN DEVELOPMENT STANDARDS
- G. GUIDELINES FOR CONSTRUCTION ZONES
- H. SLO COUNTY APCD: PERMIT TO OPERATE NO. 1850-2

POST MILES	SHEET TOTALS
ROUTE	TOTAL PROJECT
COUNTY	NO. SHEETS

H. Paul Cohen
REGISTERED CIVIL ENGINEER

JULY 19, 2013

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA BY HIS OFFICERS
FOR THE DEPARTMENT OF TRANSPORTATION
IN WITNESS WHEREOF, I HAVE HEREBY SET MY HAND AND SEAL
AT SACRAMENTO, CALIFORNIA, THIS 17th DAY OF JULY, 2013.

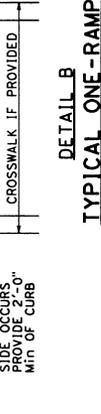
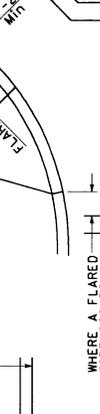
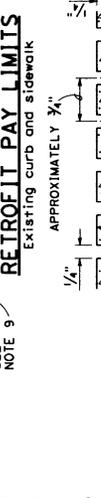
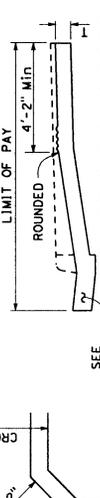
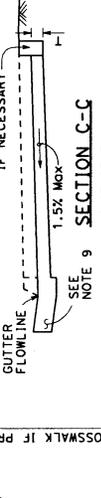
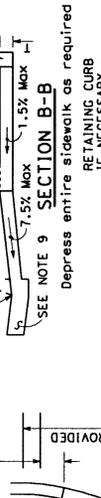
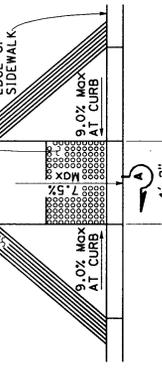
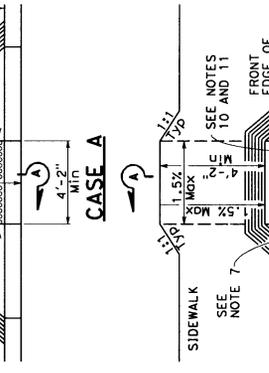
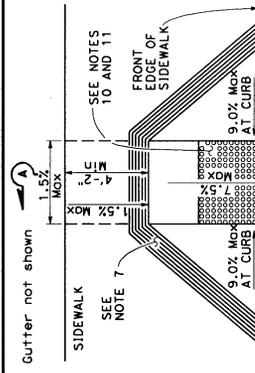
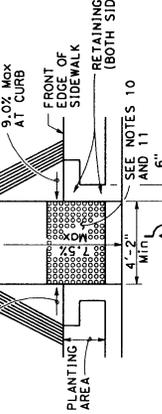
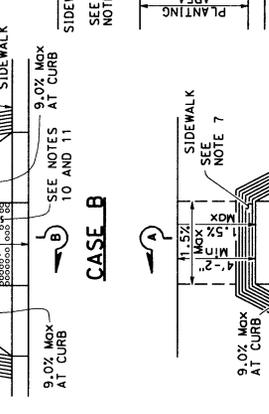
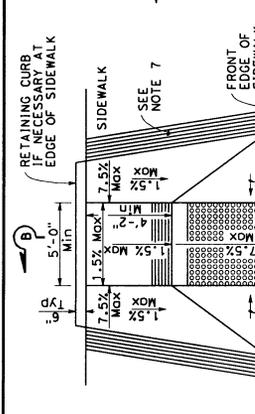
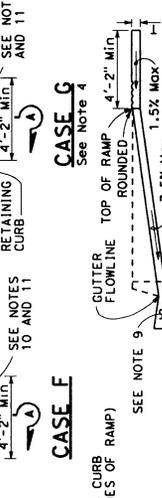
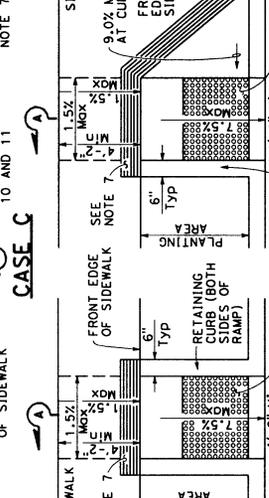
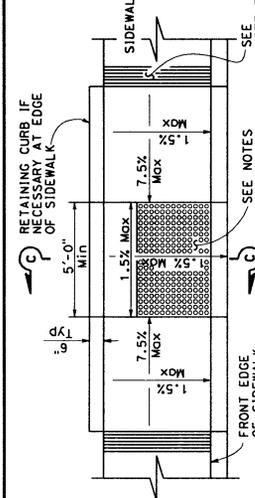
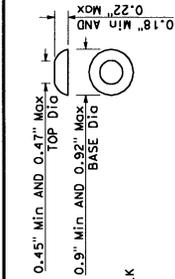
REGISTERED PROFESSIONAL ENGINEER
No. 31714
CIVIL
EXPIRES 12/31/14

TO ACCOMPANY PLANS DATED _____

RAISED TRUNCATED DOME

NOTES:

- As site conditions dictate, Case A through Case G curb ramps may be used for corner installations similar to those shown in Detail A and Detail B. The case of curb ramps used in Detail A do not have to be the same. Case A through Case G curb ramps also may be used at mid block locations, as site conditions dictate.
- If distance from curb to back of sidewalk is too short to accommodate ramp and 4'-2" platform (landings) as shown in Case A, the sidewalk may be depressed longitudinally as in Case B, or C or may be widened as in Case D.
- When ramp is located in center of curb return, crosswalk configuration must be similar to that shown for Detail B.
- As site conditions dictate, the retaining curb side and the flared side of the Case G ramp shall be constructed in reversed position.
- If located on a curve, the sides of the ramp need not be parallel, but the minimum width of the ramp shall be 4'-2".
- Side slope of ramp flares vary uniformly from a maximum of 9.0% at curb to conform with longitudinal sidewalk slope adjacent to top of the ramp, except in Case C and Case F.
- The curb ramp shall be outlined, as shown, with a 1'-0" wide border with 1/4" grooves approximately 3/4" on center. See grooving detail.
- Transitions from ramps and landings to walks, gutters or streets shall be flush (no lip) and free of abrupt changes.
- Counter slopes of adjoining gutters and road surfaces immediately adjacent to any curb shall be 2% minimum. Gutter pan slope shall not exceed 1/8" of depth for each 2'-0" of width.
- Curb ramps shall have a detectable warning surface that extends the full width of the curb ramp and the full depth of the ramp. Surfaces shall conform to the details on this plan and the requirements in the Standard Specifications.
- The edge of the detectable warning surface nearest the street shall be between 6" and 8" from the gutter flanking.
- Sidewalk and ramp thickness, "T", shall be 3 1/2" minimum.
- Utility pull boxes, manholes, vaults and all other utility facilities within the boundaries of the curb ramp will be relocated or adjusted to grade by the owner prior to, or in conjunction with, curb ramp construction.
- Detectable warning surface may have to be cut to allow removal of utility covers while maintaining full detectable warning width and depth.



RAISED TRUNCATED DOME PATTERN (IN-LINE)

See Note 10

CURB RAMP DETAILS

NO SCALE

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

RSP A88A DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN A88A
DATED MAY 20, 2011 - PAGE 121 OF THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A88A

Dist#	COUNTY	ROUTE	POST MILEAGE	SHEET NO.	TOTAL SHEETS

H. David Conner
REGISTERED CIVIL ENGINEER

JULY 19, 2013

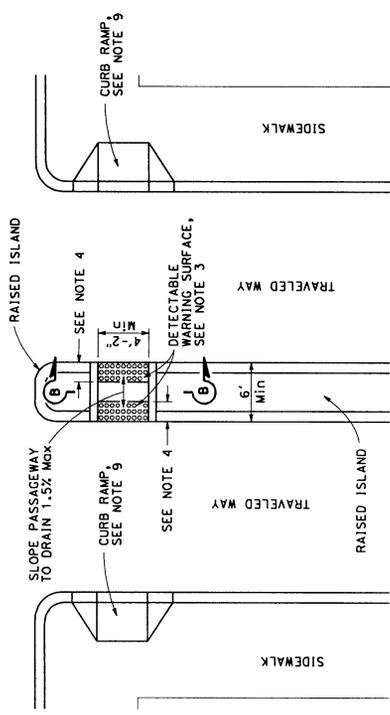
DESIGNED BY: H. DAVID CONNER
DRAWN BY: J. L. WILSON
CHECKED BY: J. L. WILSON
DATE: 3-31-14
SCALE: AS SHOWN
THIS DRAWING IS THE PROPERTY OF H. DAVID CONNER & ASSOCIATES, INC. IT IS TO BE USED ONLY FOR THE PROJECT AND PURPOSES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER
David Conner
No. C41957
Exp. 3-31-14
CIVIL
STATE OF CALIFORNIA

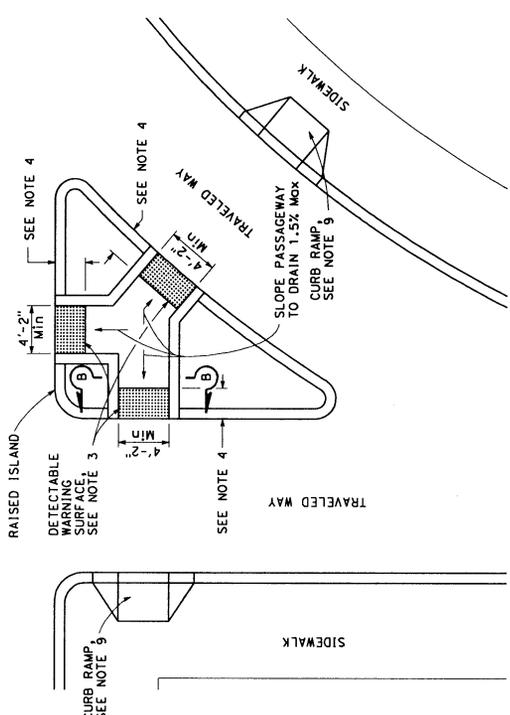
NOTES:

1. Sidewalk, ramp and passageway thickness, "T", shall be 3/2" minimum.
2. For details of grooving used with Case CM curb ramp, see Revised Standard Plan RSP A88A.
3. For details of detectable warning surfaces, see Revised Standard Plan RSP A88A.
4. Where an island passageway length is greater than or equal to 6'-0", but less than 8'-0", each detectable warning surface shall extend the full width and 2'-0" depth of the island. Where the island length is less than 6'-0" but is greater than or equal to 8'-0", each detectable warning surface shall extend the full width and 3'-0" depth of the passageway length.
5. For Case CM curb ramp, the edge of the detectable warning surface nearest the street shall be between 6" and 8" from the gutter flowline.
6. Transitions from ramps to walks, gutters or streets shall be flush (no lip) and free of abrupt changes.
7. Utility pull boxes, manholes, vaults and all other utility facilities within the boundaries of the curb ramp will be relocated or adjusted to grade by the owner prior to, or in conjunction with, curb ramp construction.
8. Detectable warning surface may have to be cut to allow removal of utility covers while maintaining full detectable warning width and depth.
9. For additional curb ramp details, see Revised Standard Plan RSP A88A.

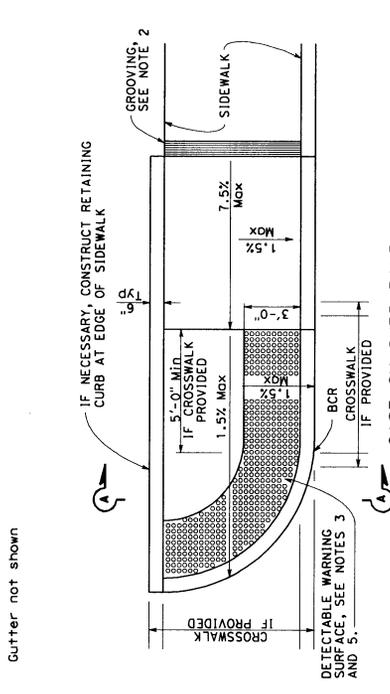
TO ACCOMPANY PLANS DATED _____



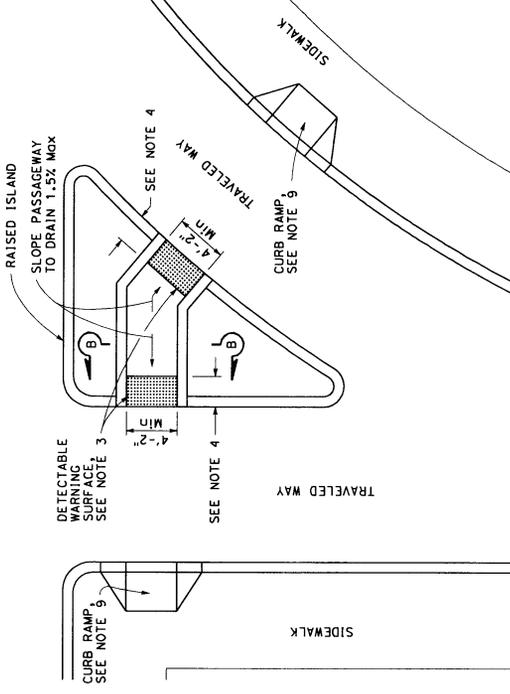
TYPE A PASSAGEWAY



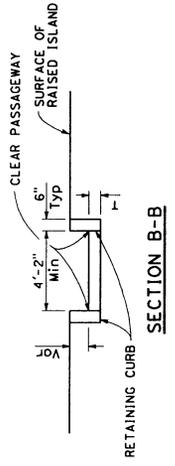
TYPE B PASSAGEWAY



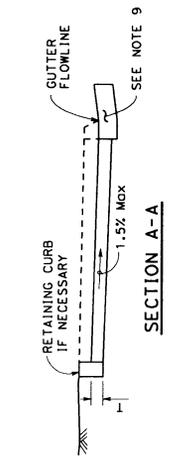
CASE CM CURB RAMP



TYPE C PASSAGEWAY



SECTION B-B



SECTION A-A

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

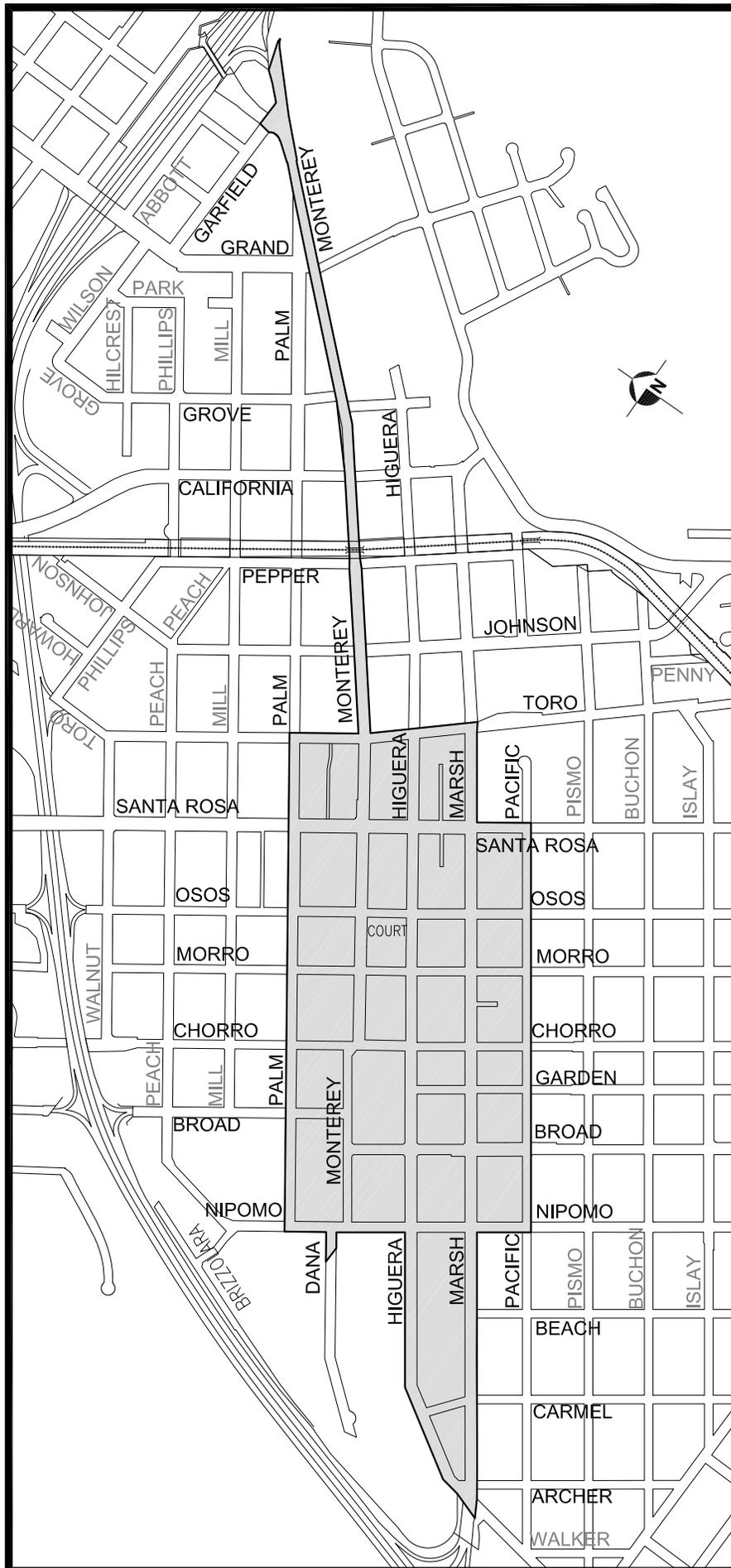
CURB RAMP AND ISLAND PASSAGEWAY DETAILS

NO SCALE

RSP A88B DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN A88B DATED MAY 20, 2011 - PAGE 122 OF THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A88B

MISSION STYLE SIDEWALK DISTRICT - RESOLUTION 9114 (2000 SERIES)



List of Arterial and Collector Streets
For Pavement Restoration Purposes Only

Arterial Streets (for pavement restoration purposes):		
Street	From	To
Broad Street	Higuera Street	south city limit
California Blvd	(all)	
Chorro Street	Lincoln	Pismo Street
Dalidio Drive	(all)	
Foothill Blvd	west city limit	California Blvd
Grand Avenue	Slack Street	Monterey Street
Highland Drive	Chorro	Santa Rosa Street
Higuera Street	south city limit	Johnson Avenue
Johnson Avenue	Monterey	Orcutt Road
Laurel Lane	Johnson Avenue	Orcutt Road
Los Osos Valley Road	(all)	
Madonna Road	Los Osos Valley Road	Higuera Street
Marsh Street	101 freeway	California
Monterey Street	Chorro Street	101 freeway
Nipomo Street	Marsh	Higuera
Orcutt Road	(all)	
Osos Street	Higuera Street	Santa Barbara
Prado Road	(all)	
San Luis Drive	California Blvd	Johnson Avenue
Santa Barbara Avenue	Broad	Osos
Santa Rosa Street	north city limit	Pismo Street
South Street	Higuera	Broad Street
Tank Farm Road	(all)	

Collector Streets (for pavement restoration purposes):		
Street	From	To
Augusta Street	Bishop Street	Laurel Lane
Auto Park Way	Los Osos Valley Road	east end
Bishop Street	Bushnell Street	Johnson Avenue
Broad Street	Foothill Blvd	101 freeway
Buchon Street	High Street	Johnson Avenue
Bullock Lane	(all)	
Casa		Murray
Calle Joaquin	(all)	
Capitolio	Broad	Sacramento
Chorro Street	Highland Drive	Lincoln
Chorro Street	Broad	Pismo
Cross Street	Short Street	Long Street
Cuesta	Foothill	Highland
Del Rio	Descanso	Prefumo Canyon Road
Descanso	Los Osos Valley Road	Del Rio
El Mercado	Madonna Road	south end
Elks Lane	Higuera	Prado
Fredericks Street	Hathway Avenue	Grand Avenue
High Street	Higuera Street	Broad Street
Highland Drive	Patricia Drive	Chorro Street
Industrial Way	Broad Street	Sacramento
Johnson Avenue	Phillips Lane	Mill Street
La Entrada	Foothill	Ramona
Lincoln Avenue	Broad Street	Chorro Street
Long Street	Tank Farm Road	Cross Street
Margarita Avenue	(all)	
Mill Street	Chorro Street	Grand Avenue
Murray	Santa Rosa	Casa

List of Arterial and Collector Streets
For Pavement Restoration Purposes Only

Collector Streets (for pavement restoration purposes):		
Street	From	To
Nipomo	Marsh	Pismo
Oceanaire Drive	(all)	
Osos Street	Peach Street	Monterey Street
Osos Street	Santa Barbara	railroad station parking lot
Palm Street	Chorro Street	Johnson
Patricia Drive	Highland Drive	Foothill Blvd
Peach Street	Osos Street	Santa Rosa
Pepper Street	Phillips Lane	Mill Street
Phillips Lane	Johnson Avenue	Pepper Street
Pismo Street	Higuera Street	Johnson Avenue
Prefumo Canyon Road	west city limit	Los Osos Valley Road
Ramona Drive	La Entrada	Broad Street
Sacramento	Industrial Way	Orcutt
Santa Fe	(all)	
Santa Rosa	Pismo	Railroad
Short Street	Cross Street	Suburban Road
Southwood Drive	Laurel Lane	Johnson Avenue
Suburban Road	South Higuera Street	Short Street
Tassajara Drive	Foothill Blvd	Ramona Drive

Sample Notice of Street Maintenance (Door Hanger)

**CITY OF SAN LUIS OBISPO
NOTICE OF STREET MAINTENANCE
TO AREA BUSINESSES AND RESIDENCES**

Please be advised that, on the dates listed below,
_____, ACTING AS CONTRACTOR FOR THE
City of San Luis Obispo, will be Slurry Sealing your street. Other streets
in your neighborhood may be scheduled for other dates.

The general order of work will be as follows:

1. Positioning of "No Parking" Signs 72 hours in advance of the work.
2. Partial or full closure of the roadway.
3. Placement of slurry seal and four-hour cure time.
4. Reopen the road to public traffic.
5. Replacement of traffic striping and markings will occur at a later date.

The work on your street will be performed on the following dates:

Monday _____
 Tuesday _____
 Wednesday _____
 Thursday _____
 Friday _____

Prior to 8:00 am on the day of work, please park your vehicle on a
nearby street that is not posted with parking restrictions. Driving on a
slurry seal prior to completion of the cure time may cause damage to the
slurry seal and your vehicle.

DELIVERIES AND APPOINTMENTS

In an effort to expedite the slurry process and avoid drive-thru's which
would require closing the street again, please schedule any kind of
delivery or appointment the day before or the day after the street is to be
slurry sealed.

Unfavorable weather conditions may cause delays to the work without
additional notice. If you should have any questions please contact the
following:

Contractor's name Telephone number

PLAN DEVELOPMENT STANDARDS

REQUIRED USE OF STANDARD

Use of this standard is required for use on:

- All projects, including mapping, that are City funded
- All projects which will be turned over to the City for adoption or maintenance
- All Final (Tract) and Parcel Maps (this standard supplements provisions of the Subdivision Map Act)

DATUM

Drawings and maps shall be set into real world coordinates and elevations using the City's horizontal and vertical control networks. The Datum used shall be referenced on the cover sheet.

Plans based on information furnished by the City, from old plans or survey data, shall include references to the City Plan number, file number, field book number, etc.

Any new bench marks and monuments should be shown on the plans with the associated coordinates and / or elevation.

Horizontal Control

The City has established a horizontal control network relative to the California Coordinate System Zone Five, which is defined in Section 8801 through 8819 of the California Public Resources Code. For all projects and maps, two different exterior points or corners shall be tied to at least two different points of the City's horizontal control network for direct import into the Geographic Information System (GIS) database and AutoCAD.

The Horizontal Control Network is available from the Public Works Department.

Vertical Control

The City has established a vertical control network. All projects shall be tied to the nearest bench mark elevation.

The Bench Mark System is available from the Public Works Department.

Grading Plans

Finish and existing grades shall be shown by use of contours on grading plans. Where grades are too flat for contours to be meaningful, grades shall be called out showing existing and final elevations for a number of points reasonable to represent critical grades and drainage. All contours and elevations shall reflect current City Datum.

UNITS OF MEASUREMENT

All project plans and maps shall be prepared in English units unless written permission has been obtained from the Director of Public Works

DRAWINGS

Software

Drawings are to be produced using AutoCAD or Civil 3D compatible with the current version in use by the City. Other programs which produce an AutoCAD drawing may be acceptable; however, if there are incompatibility problems, the project will be rejected until compatible files are produced.

Drawing Sheets

Drawing sheet borders shall be fully contained on a 22" x 34" sheet. The border should reduce 50% to fit completely on an 11" x 17" sheet. Drawings shall be plotted on sheets no larger than 24" x 36". The City recommends use of the electronic files available from the City. These files have already been sized for ease of reduction, contain blocks, typical layers, line types and color assignments.

In lieu of the profile sheet, grids generated by design software may be substituted.

Improvement Plans submitted to the City shall have the standard title block shown in the plan and cover sheets available electronically from the City for privately funded projects.

Map Sheets

Map sheet shall be 18" x 26" with a border 1 inch inside the edge of the sheet in accordance with the Map Act.

Naming Conventions

The following naming convention shall be used to identify the drawings:

For projects developed in ACAD 2000 or higher version:

Complete the drawing in model space and use the layout tabs for sheet layout in paper space:

City Specification No. (Tract No., MS No., Parcel Map No.)_01.dwg Cover Sheet Drawing

City Specification No. (Tract No., MS No., Parcel Map No.)_00.dwg Model and Layout Drawing

Ex: Tract 452_01.dwg

If desired, the cover sheet may be incorporated in the main drawing using the _00 extension for the entire project.

For projects developed in earlier versions (without layout tabs):

City Specification No. (Tract No., MS No., Parcel Map No.)_00.dwg for model space drawing

City Specification No. (Tract No., MS No., Parcel Map No.)_01.dwg for Cover Sheet

City Specification No. (Tract No., MS No., Parcel Map No.)_02.dwg for Sheet 2

(XXXX_00.dwg is to be bound to the sheet drawing.)

Continue numbering (xxxx_xx.dwg) for required number of sheets

If drawing sheets are modified **during construction** and new sheets are printed, they shall use the sheet number and a letter following to designate the change. Ex. Tract

400_05A.dwg

The preferred practice is for page numbers to be sequential for the entire plan set. Where the project contains multiple disciplines, landscaping, electrical, etc., the City will accept multiple drawings named as shown above.

Ex: Tract 452_E00 for the electrical drawing
Tract 452_M00 for the mechanical drawing
Tract 452_L00 for the landscape plan, etc.

Model Space and Paper Space

Drawings are to be generated in model space and then plotted with borders in paper space. Refer to the software manual for additional information.

Drawings shall be done in full scale (one drawing unit = 1 foot,) actual dimensions in model space. All borders and titles shall be done in paper space. Scaling of model space drawing to fit paper size shall be done using viewports and model view scaling.

General Drawing Content

Drawings shall contain the following minimum elements:

Title Block	North Arrow	Creek & Street Names
Vicinity Map	Bar Scale	Centerline Monuments
Dimensions	Date	Lot lines & numbers
Stationing	Legends	Tract Name & number
Bench Marks	Easements	Bearings, radii, etc.
Topography	Elevations	Existing Utilites
Datum Reference	Trees & Driplines	
Engineering Standard with numbers referenced		

Tree diameter shall be accurately represented. Drip lines shall be shown for any tree not permitted for removal.

Grading, utility and landscape plans shall not be combined on the same sheet. Curves shall show radius, delta, curve length and control for BC and EC to allow construction.

External References (xrefs)

Xrefs shall be bound to or inserted in the drawing in which they are needed for printing. Xrefs used during design, but not displayed for printing shall be detached.

User Coordinate System (UCS)

When rotation is necessary for plotting, a UCS shall be used in lieu of rotating the drawing out of the original orientation.

Stationing

Stationing shall be north to south or west to east running left to right on the paper. Beginning stationing shall be tied to an existing centerline intersection. Coordinates for the beginning station and ending station shall be shown on the plans. Alignments and stationing should be on a street centerline when work will occur within a street. Profiles can be generated either on the centerline or offset, as long as their location is clearly defined on the profile.

On City funded projects (Capital Improvement Program) stationing for different streets in the same project shall not have duplicate stationing numbers.

Ex: A Street Waterline – Sta 1+00 to Sta 3+58, B Street Paving – Sta 4+00 to Sta 6+97

North Arrows and Bar Scales

North arrows and bar scales shall be inserted in model space such that a north arrow and bar scale appear in each plan view when plotted. Blocks shall not be so ornate as to obscure their content.

Scales

Plotting scale shall be appropriate to the type of project allowing adequate detail clarity. Bar scales shall be inserted in model space such that a bar scale appears in each plan view when plotted. Scale should appear in the lower right hand corner whenever possible. For sheets containing both plan and profile information, a ratio of the Horizontal to the Vertical scale shall be shown in the title block.

Example of typical scales:

Utility, Grading and Street Improvements Plan	1" = 20'
Paving and Traffic Control Plan	1" = 100'
Signal Plan	1" = 10' or 1" = 20'

Blocks

Blocks shall be created on layer 0 at scale 1:1 with line type and color by layer.

Layering

Drawings shall provide separate layers for the various items shown in the drawings using appropriate layer prefixes to group related layers. See Appendix B for additional information. Where allowed by the program, layer "state" or settings for printing shall be saved and named *print_sheet#*.

Civil 3D defaults may be used for layer naming. Alignment names should be selected to mimic the layering conventions set forth in the appendix to the degree possible, and layer names shall be generated using the alignment prefix option such that all layers related to the alignment begin with the alignment name.

Color and Line Types

All colors and line types shall be **By Layer**. Layer colors and line pen designations shall be those shown in the City prototype drawings. See Appendix C for additional information.

Pen weights shall be those designated in the plot file for those colors associated with standard layers. Polylines shall not have an assigned width, but rather be given weight through pen designation.

Generally, abandoned and existing facilities are shown with a fine line weight or at half tone, with abandoned facilities using hidden or dashed line types, in lieu of the standard

continuous line type. New facilities are shown in bolder line types. Line scale shall be set so that line types, other than continuous, repeat frequently enough to be clearly differentiated.

Dimensions

Dimensions shall have characteristics by layer. The dimensions shall appear on the text layer or a new layer specifically for dimensions. Dimensioning text shall be per this standard.

Text

Accepted fonts are limited to those native to the Windows operating system or furnished with AutoCAD or Civil 3D. Where new text styles are created, they should have the same name as the font used for that style. The use of AutoCAD's predefined "Standard" text style, which defaults to the txt font type, is not encouraged.

Text shall always be on a separate layer. Line labels shall be above the line and not cut into the line.

Plotting

Whenever possible, use the plot file furnished by the City. If this is not possible, save a plot file for the project and submit it with the drawing files. Plot file shall be named using the same naming convention as for drawings, with the default file name extension.

RECORD DRAWINGS

When construction is complete, a record drawing of the project shall be completed as set forth below. Record drawing layers may be added as need to provide proper printing for each sheet. Save the file using the naming convention as for drawings followed by R.

Ex: Tract 452_E00R Record drawing for electrical sheets

- Create a new layer and name it *Record_Drawing*
- Set color to 200 and line type to continuous. Colors 201 & 202 may also be used as needed to address different line weights.
- Record all record drawing information on the Record Drawing layer
- Each sheet is to be "stamped" to note record drawings have been completed for that sheet. If no changes were made, a note to that effect is to be included adjacent to the stamp.
- Each sheet is to be numbered with an "R" after the sheet number. Ex. 2R of 13
- Set all pen colors but pen 200, 201, and 202 to color 253 or use the City standard plot file for record drawings.
- Complete plotting of record drawing set

SUBMITTALS

Drawing files must be completely compatible with the current City AutoCAD standard program. Bond used for submittals shall be a minimum of 20lb.

City funded projects

All electronic files shall be submitted to the City. For projects developed using design software, the entire project folder shall be submitted, including all the sub folders with

drawings and supporting data. The electronic folder shall be submitted in the configuration generated by the software. Drawing file shall be purged of all unused layers, text, etc.

Written specifications shall also be submitted in electronic format.

Submit one original, stamped and signed, ink on bond, set of plans and one original stamped and signed set of specifications along with the electronic files prior to the start of construction. Submittal shall also include a complete *Acrobat Adobe* file bid package (Specifications and Plans.)

Record drawings are to be submitted within 4 weeks of completion of construction and shall include a signed scan (.tif) or adobe file in addition to the drawing files.

Files shall be submitted to the designated Project Manager for Capital Improvement projects.

Privately funded projects

Submit the electronic drawing files (.dwg) and any associated plot files along with one original, stamped and signed, ink on bond, set of plans prior to the start of construction or Map recording.

Record drawings are to be submitted within 4 weeks of completion of construction and prior to City acceptance of the public improvements. Record drawing submittal shall include a hard copy original, stamped and signed, ink on bond; an electronic image copy (.tif or .pdf) of the original approved plans and record drawings interlaced, i.t. page 1, 1R, 2, 2R etc.; and the drawing file (.dwg).

Submit this data either via email (for small projects) or on a CD containing the required data. Files shall be submitted to the Development Review Division Engineer.

CITY DOCUMENTS ON LINE

The following files are available from the City web site slocity.org:

- Standard Cover Sheet for City funded projects
- Standard Cover Sheet for private funded projects
- Standard Plan Sheet for City funded projects
- Standard Plan Sheet for private funded projects
- Standard Profile Sheet for private funded projects
- Standard plot file for draft construction plans –17” x 11”
- Standard plot file for original construction plans –34” x 22”
- Standard plot file for Record Drawings
- Horizontal Control Network
- Bench Mark System

LAYER COLOR AND LINE TYPE CONVENTIONS

Layer Prefixes:

- F** Layers showing future facilities.
- X** Layers showing existing information and facilities.
- XABD** Layers showing abandoned facilities such as water lines, sewer lines, etc.
- N** Layers showing new or proposed information and facilities.
- 0 (zero)** Layers that are in Paper Space, such as borders and border titles.

- ADRS** Layers showing site addresses
- BLDG** Layers showing buildings and other structures
- CCOM** Layers showing City owned communication facilities
- CL** Layers showing centerline information
- CTL** Layers showing monuments, bench marks or other control points
- CLM** Layers showing City Limit lines
- EASE** Layers showing easements or other rights of entry
- ELEC** Layers showing electric facilities and joint electric and phone/cable poles
- EP** Layers showing edge of pavement
- GAS** Layers showing gas facilities
- HATCH** Layers showing hatching
- LTG** Layers showing lighting
- OIL** Layers showing oil facilities
- PL** Layers showing property lines / parcel lines
- PNT** Layers showing survey points and associated data
- ROW** Layers showing right of way lines
- S** Layers showing sanitary sewer facilities
- SD** Layers showing storm drain systems including large culverts and bridges.
- SW** Layers showing sidewalks, curbs and gutter
- TEL** Layers showing telephone & telecommunication facilities
- TC** Layers showing traffic control, including signs and striping
- TS** Layers showing traffic signal facilities
- TV** Layers showing television / cable facilities
- TXT** Layers showing text
- VEG** Layers showing vegetation
- W** Layers showing potable water facilities
- 3W** Layers showing non-potable water facilities including tertiary treated water

Layer prefixes should be combined as appropriate and additional description added as needed.

- Ex: XABD-W-TXT A layer showing abandoned water facilities text
X-SD-County A layer showing existing storm drain facilities under County jurisdiction
N-S A layer showing new sewer facilities

LAYER COLOR AND LINE TYPE CONVENTIONS

<i>Facility Type</i>	<i>Color</i>	<i>Line Type</i>
Model Space		
Abandoned & Future		
All facilities	210	Hidden2
Text	210	Continuous
Existing		
Addressing	12	Continuous
Buildings / Structures	100	Continuous
Cable TV	30	Continuous
City Limits	21	Continuous
Centerlines	1	Center2
City Communication Conduits	20	Dashdot2
Contours – Major	38	Dashed
Contours – Minor	33	Dashed
Curb, gutter & sidewalks	8	Continuous
Easement	44	Continuous
Edge of Pavement	8	Continuous
Electric	11	Phantom
Gas	50	Continuous
Hatch	253	Continuous
Lighting	52	Continuous
Miscellaneous	4	Continuous
Oil	51	Continuous
Parcel lines	30	Continuous
Points for Control – monuments & benchmarks	1	Continuous
Points – other	Any	Continuous
Right of Way	2	Continuous
Railroad	41	Continuous
Sanitary Sewer	3	Continuous
Storm drains	74	Continuous
Telephone & Other Communication Lines	23	Phantom2
Television	30	Continuous
Text	5	Continuous
Traffic Control	10	Continuous
Traffic signals	10	Divide2
Vegetation	72	Continuous
Water	5	Continuous
Water – Reclaimed	212	Continuous

<i>Facility Type</i>	<i>Color</i>	<i>Line Type</i>
<i>Model Space</i>		
<i>New</i>		
All facilities – main plan - heavier line weight	7	Continuous
All facilities – details- lesser line weight	14	Continuous
Text	6	Continuous
Dimensions	105	Continuous
Grid lines – Major	38	Continuous
Grid lines – Minor	33	Continuous
Contours – Major	16	Dashed
Contours – Minor	13	Dashed
Hatch	15	Continuous
North arrow & scale	170	Continuous
<i>Record Drawings</i>		
Record Drawing – heavy line weight	200	Continuous
Record Drawing – medium line weight	203	Continuous
Record Drawing – light line weight	201	Continuous
<i>Paper Space</i>		
Border	174	Continuous
Border Titles & Engineering Stamp	170	Continuous
Viewports	255	Continuous

SORT BY COLOR NUMBER

Facility	Color	Line Type
Centerlines, Points for Control	1	Center2, Continuous
Right of Way, Railroad	2	Continuous
Sanitary Sewer	3	Continuous
Miscellaneous	4	Continuous
Text, Water	5	Continuous
(N) Text	6	Continuous
(N) All facilities – main plan - heavier line weight	7	Continuous
Curb, gutter & sidewalks, Edge of Pavement	8	Continuous
Traffic Control, Traffic signals	10	Continuous, Divide2
Electric	11	Phantom
Addressing	12	Continuous
(N) Contours - minor	13	Dashed
(N) All facilities – details- lesser line weight	14	Continuous
(N) Hatch	15	Continuous
(N) Contours major	16	Dashed
City Communication Conduits	20	Dashdot2
City Limits	21	Continuous
Telephone & Other Communication Lines	23	Phantom2
Cable TV, Parcel lines,	30	Continuous
(N) Grid lines – Minor, (E) Contours – Minor	35	Continuous
(N) Grid lines – Major, (E) Contours – Major	38	Continuous
Easement	44	Continuous
Gas	50	Continuous
Oil	51	Continuous
Lighting	52	Continuous
Vegetation	72	Continuous
Storm drains	74	Continuous
Buildings / Structures	100	Continuous
(N) Dimensions	105	Continuous
Variable Layers & Line Weights *	110-169	
Border Titles & Engineering Stamp	170	Continuous
North arrow & scale, Border	174	Continuous
Variable Layers & Line Weights *	180-199	
Record Drawing – heavy line weight	200	Continuous
Record Drawing – light line weight	201	Continuous
Record Drawing – medium line weight	203	Continuous
Future, (XA) All facilities, (XA) text	210	Hidden2, Continuous
Water – Reclaimed	212	Continuous
Variable Layers & Line Weights *	220-249	
Hatch	253	Continuous
Viewports	255	Continuous

* see next page for line weights

Line Weight (mm)	Unassigned Colors				
0.00	110	111	164	165	
0.05	112	113	166	167	
0.09	114	115	168	169	
0.10	116	117	180	181	250 - 255
0.13	118	119	182	183	
0.15	120	121	184	185	
0.18	122	123	186	187	
0.20	124	125	188	189	
0.25	126	127	190	191	
0.30	128	129	192	193	
0.35	130	131	194	195	
0.40	132	133	196	197	
0.45	134	135	198	199	
0.50	136	137	220	221	
0.53	138	139	222	223	
0.60	140	141	224	225	248 (color250)
0.65	142	143	226	227	
0.70	144	145	228	229	
0.80	146	147	230	231	
0.90	148	149	232	233	
1.00	150	151	234	235	
1.06	152	153	236	237	
1.20	154	155	238	239	249 (color 250)
1.40	156	157	240	241	
1.58	158	159	242	243	
2.00	160	161	244	245	
2.11	162	163	246	247	

GUIDELINES FOR CONSTRUCTION ZONES

Engineering Standards – Appendix G

APPROVED BY:



**PUBLIC WORKS DEPARTMENT
TRAFFIC ENGINEERING DIVISION**

919 Palm Street
San Luis Obispo, CA 93401
(805) 781-7200

GENERAL NOTES:

- A. These distances are guidelines only. Actual distances will be determined on an individual basis by the City. Before any work may be started in the street area:
 - 1. A traffic control plan shall be submitted to, and then approved by the City Engineer.
 - 2. Signs and delineation shall be in place, inspected and approved by a Public Works Inspector.
- B. During construction:
 - 1. A copy of the approved traffic control plan shall be kept on the job site at all times.
 - 2. All workers in the street area shall wear ANSI Class III safety apparel.
 - 3. Flaggers shall be used as required.
 - 4. All traffic control and devices shall comply with the Caltrans Traffic Manual / MUTCD.

FIGURE NOTES:

- 1. All signs and traffic control devices shall conform to the MUTCD and CALTRANS Standards.
- 2. All cones shall be 18" or higher. Cones used for night work shall be 28" or higher and reflectorized by a 6" band located 3" to 4" from the top of the cone and an additional 4" band located 2" below the 6" band.
- 3. Speeds on advisory plate to be determined by the City Engineer.
- 4. Temporary parking sign(s) must be placed a minimum of 30 hours in advance of work when parking removal is required to maintain a 10' minimum travel lane. Contact City of San Luis Obispo Police Department at 781-7312 for verification.
- 5. Use flashing arrow sign on roadways with three lanes or more in speed zones of 35 MPH or greater, or when required in approved Traffic Control Plan. Use high level warning device in speed zones of less than 35 MPH. A single flashing arrow sign (for each direction of travel) may be used in place of flashing beacons.
- 6. Flashing arrow sign (FAS) shall be Type I per Sec. 12-3.03 of the current Caltrans Standard Specifications. Operate FAS in Sequential arrow mode.
- 7. A G20-2 (C14) "END ROAD WORK" sign, as appropriate, shall be placed at the end of the work zone.
- 8. All warning signs for night lane closure shall be illuminated or reflectorized. All advance warning signs shall be supplemented with flashing beacons during night lane closures.
- 9. Provide access for all driveways.
- 10. Where signalized intersections are affected, provide notice to City Traffic Signal Maintenance Technician.
- 11. When construction signage is placed in a open bike lane, a 4' minimum lane for bicycle usage shall be maintained. If 4' minimum is unobtainable, signage shall be pole mounted.

FIGURE LEGEND

(PAGES 2-17)

- Traffic Cone or Delineator
- ⊥ Sign (shown facing left)
- ⚡ Flashing Arrow Sign
- Y High Level Warning Device (Flag Tree)
- * Portable Flashing Beacon (Night Work)
- ← Direction of Travel (Not a Pavement Marking)
- MH O Manhole
- ☑ Maintenance Vehicle w/ Flashing Lights
- ⚑ Flagger
- ▨ Type II Barricade
- ▩ Type III Barricade
- ▤ Longitudinal Channelizing Device

CHART A (All Figures)

MINIMUM DELINEATOR AND SIGN PLACEMENT

TRAFFIC SPEED	TAPER LENGTH (L)	DELINEATOR SPACING		SIGN SPACING (S) (Advance of Taper)	BUFFER SPACE (B)
		(Taper)*	(Tangent)		
25 MPH	125'	26'	53'	100'	155'
30 MPH	190'	33'	66'	100'	200'
35 MPH	276'	39'	79'	100'	250'
40 MPH	328'	43'	85'	100'	305'
45 MPH	525'	46'	92'	328'	360'
50 MPH	600'	53'	105'	328'	425'
55 MPH	663'	59'	118'	328'	495'

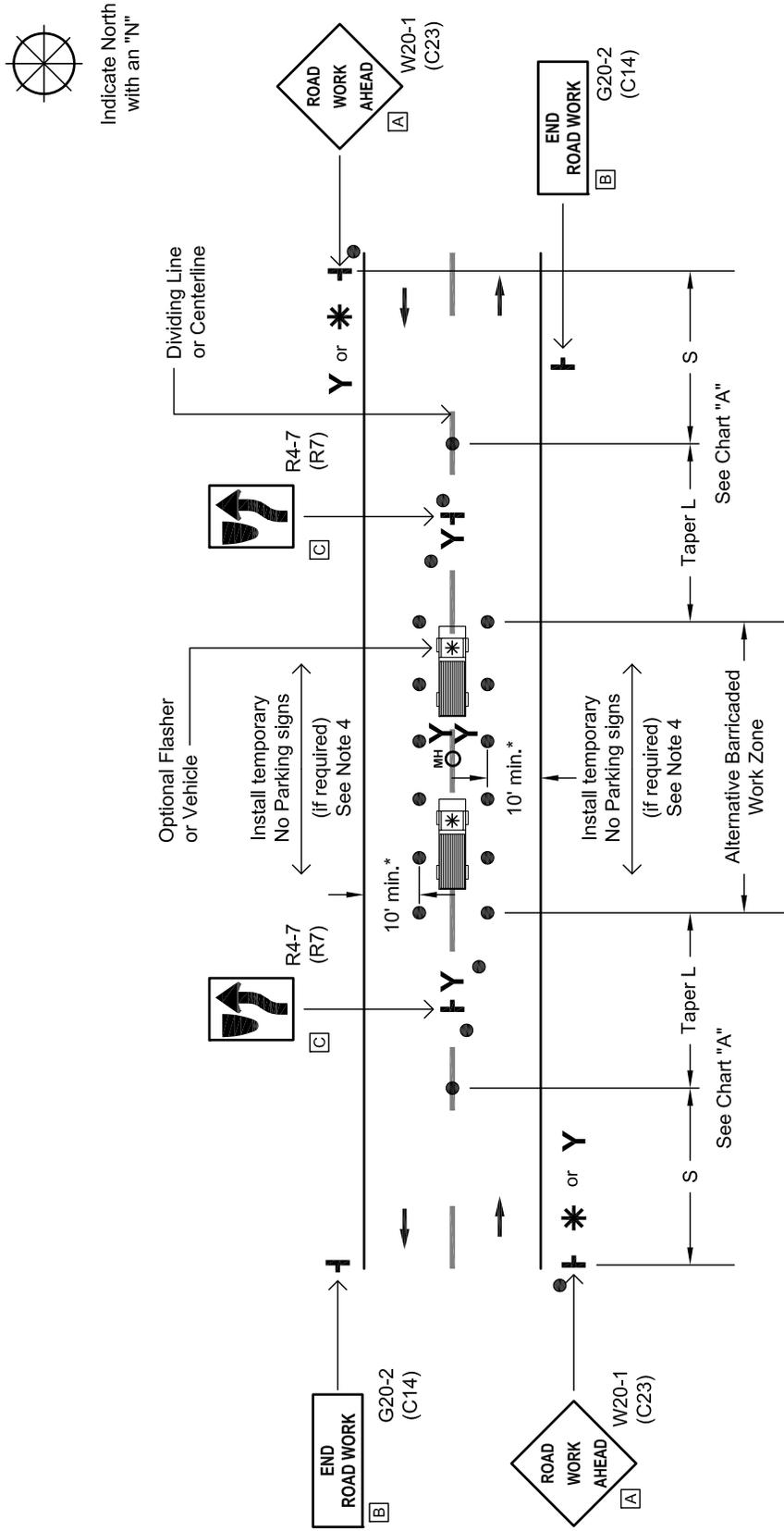
*12' STANDARD LANE WIDTH FOR CALCULATION PURPOSES. WIDER LANES REQUIRE ADDITIONAL LENGTH

REVISIONS	BY	APP	DATE
Figure Notes and Legend; Drafting	JDL	MH	4-13
Added Note 13	MH	BL	11-09

GUIDELINES FOR CONSTRUCTION ZONES

Engineering Standards - Appendix G

FIGURE A TWO-LANE WORK IN CENTER OF ROADWAY

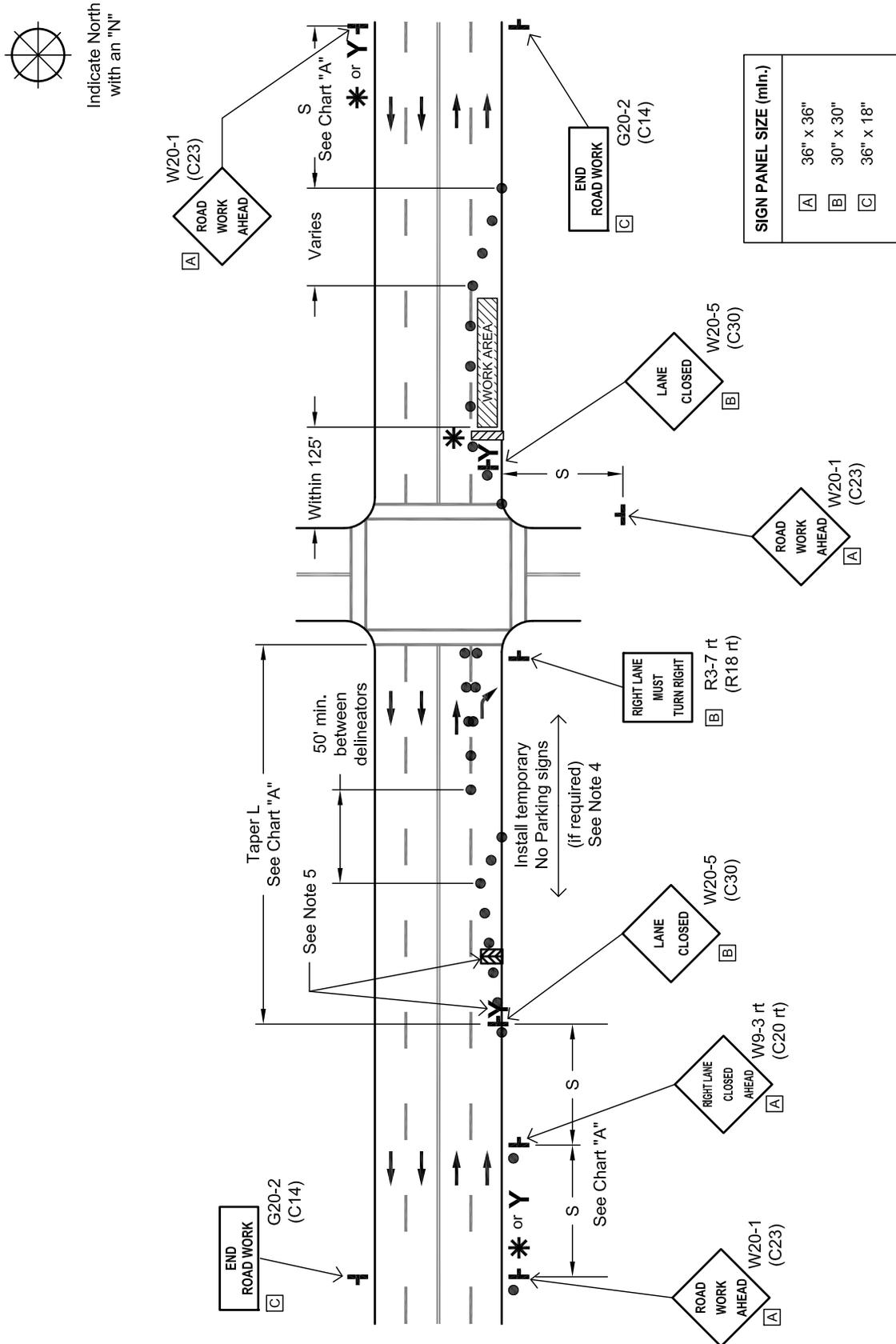


SIGN PANEL SIZE (min.)	
A	36" x 36"
B	36" x 18"
C	24" x 18"

* SEE PAGE 1 THIS APPENDIX FOR LEGEND, NOTES AND SPACING REQUIREMENTS.

REVISIONS	BY	APP	DATE
New Figure	MH	JDW	11-04
Drafting edits	JDL	MH	4-13

FIGURE C MULTI-LANE OUTSIDE LANE CLOSURE BEYOND INTERSECTION

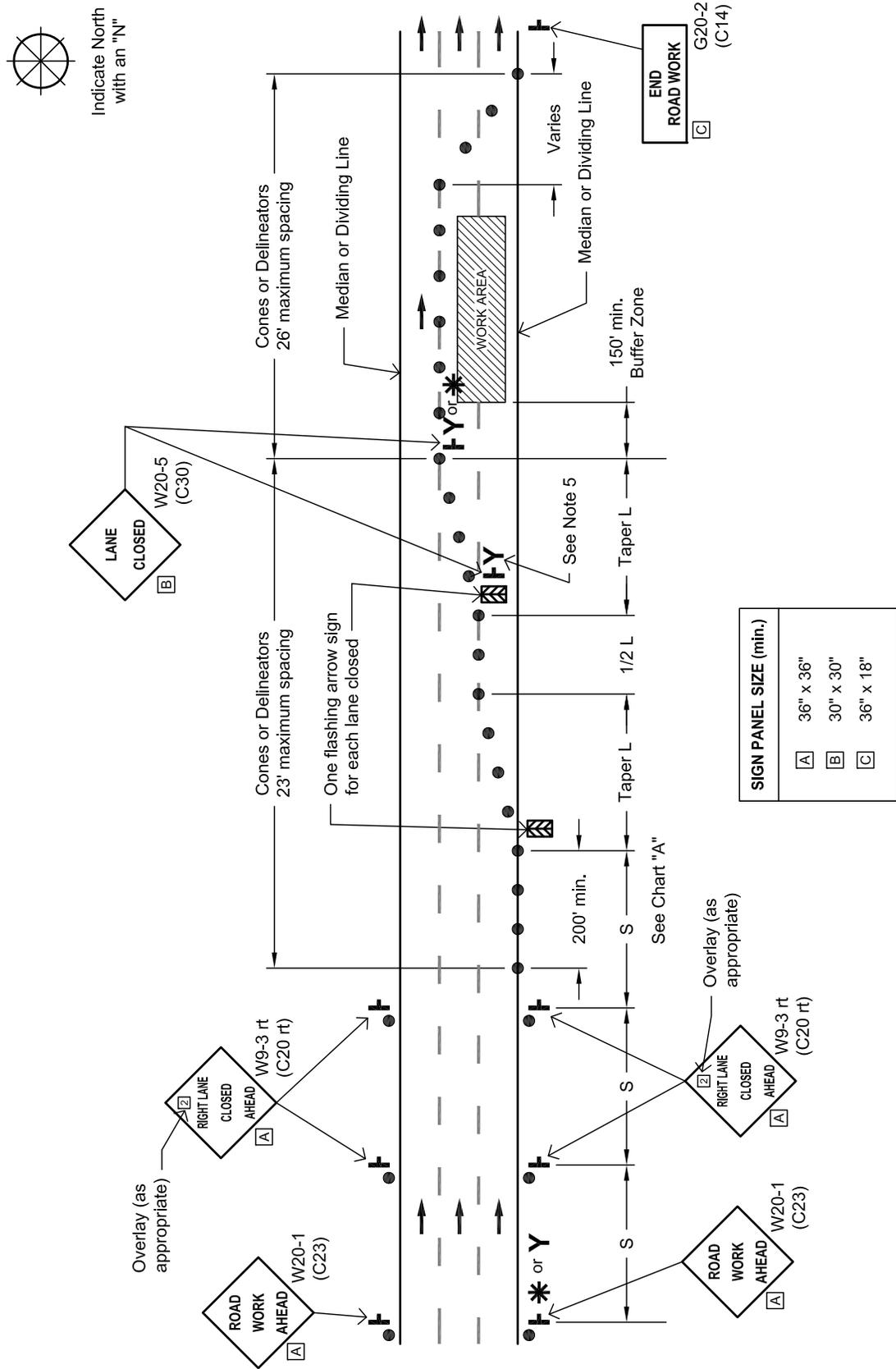


* SEE PAGE 1 THIS APPENDIX FOR LEGEND, NOTES AND SPACING REQUIREMENTS.

REVISIONS	BY	APP	DATE
New Figure	MH	JDW	11-04
Add W20-1, work area dimension	JDL	MH	4-13

FIGURE D MULTI-LANE ONE WAY MULTI-LANE CLOSURE

(LEFT AND RIGHT SIDE CLOSURE TO BE SIMILAR)



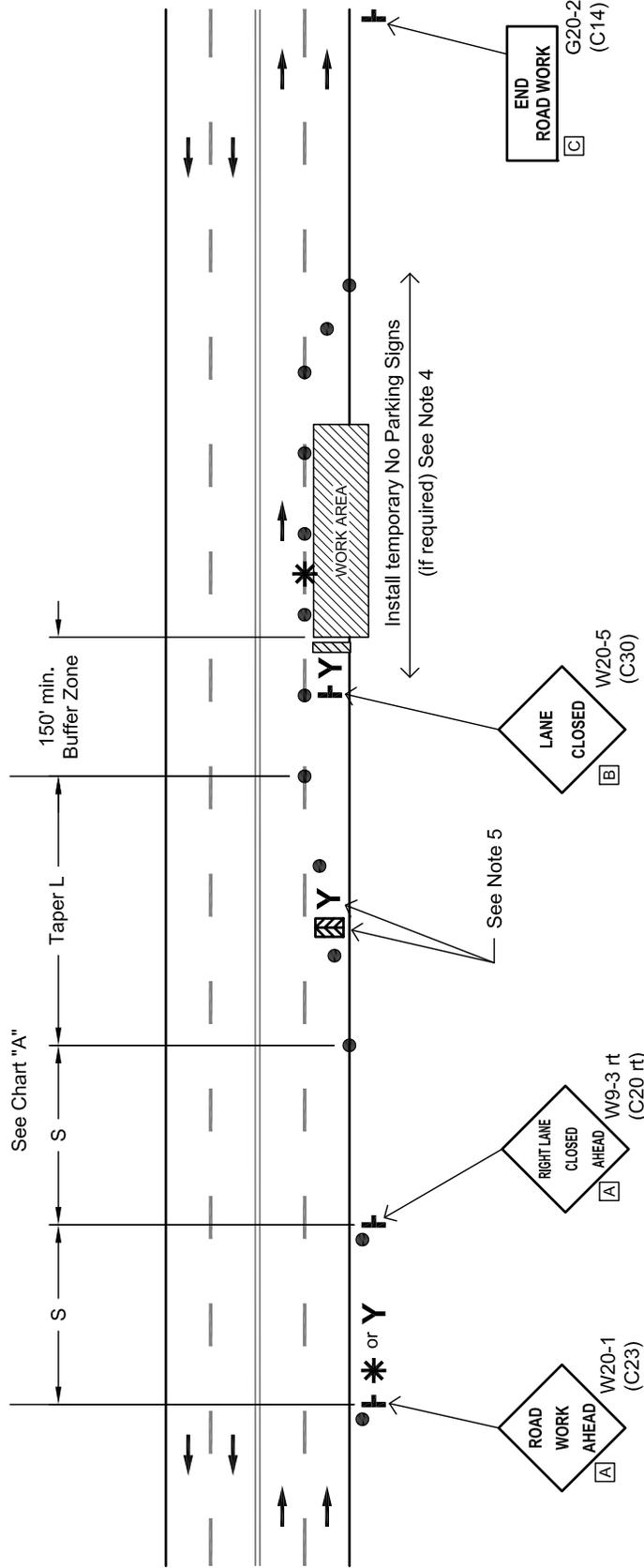
* SEE PAGE 1 THIS APPENDIX FOR LEGEND, NOTES AND SPACING REQUIREMENTS.

REVISIONS	BY	APP	DATE
New Figure	MH	JDW	11-04
Drafting edits	JDL	MH	4-13

FIGURE E MULTI-LANE OUTSIDE LANE CLOSURE



Indicate North
with an "N"

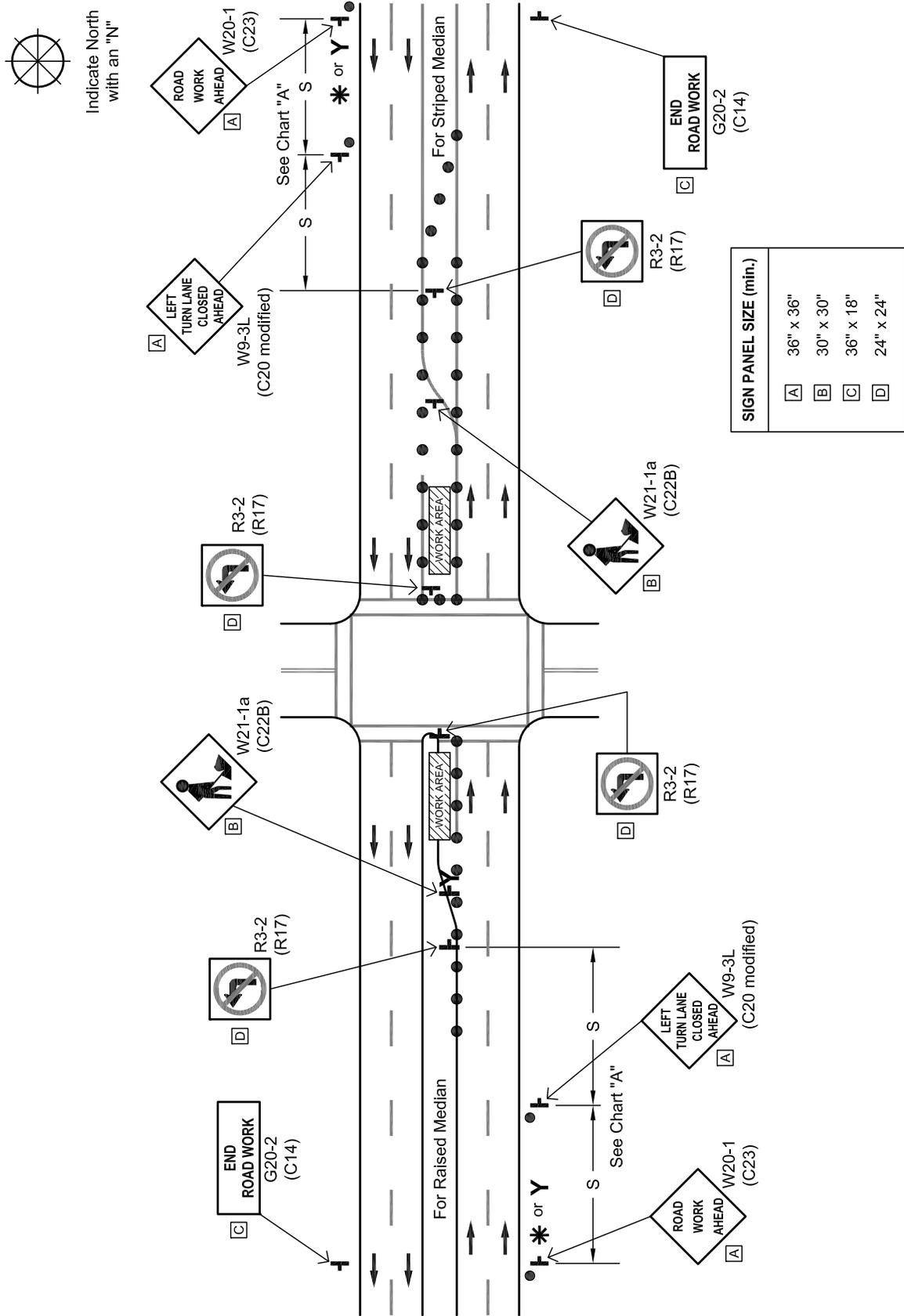


SIGN PANEL SIZE (min.)	
A	36" x 36"
B	30" x 30"
C	36" x 18"

* SEE PAGE 1 THIS APPENDIX FOR LEGEND, NOTES AND SPACING REQUIREMENTS.

REVISIONS	BY	APP	DATE
New Figure	MH	JDW	11-04
Drafting edits	JDL	MH	2-13

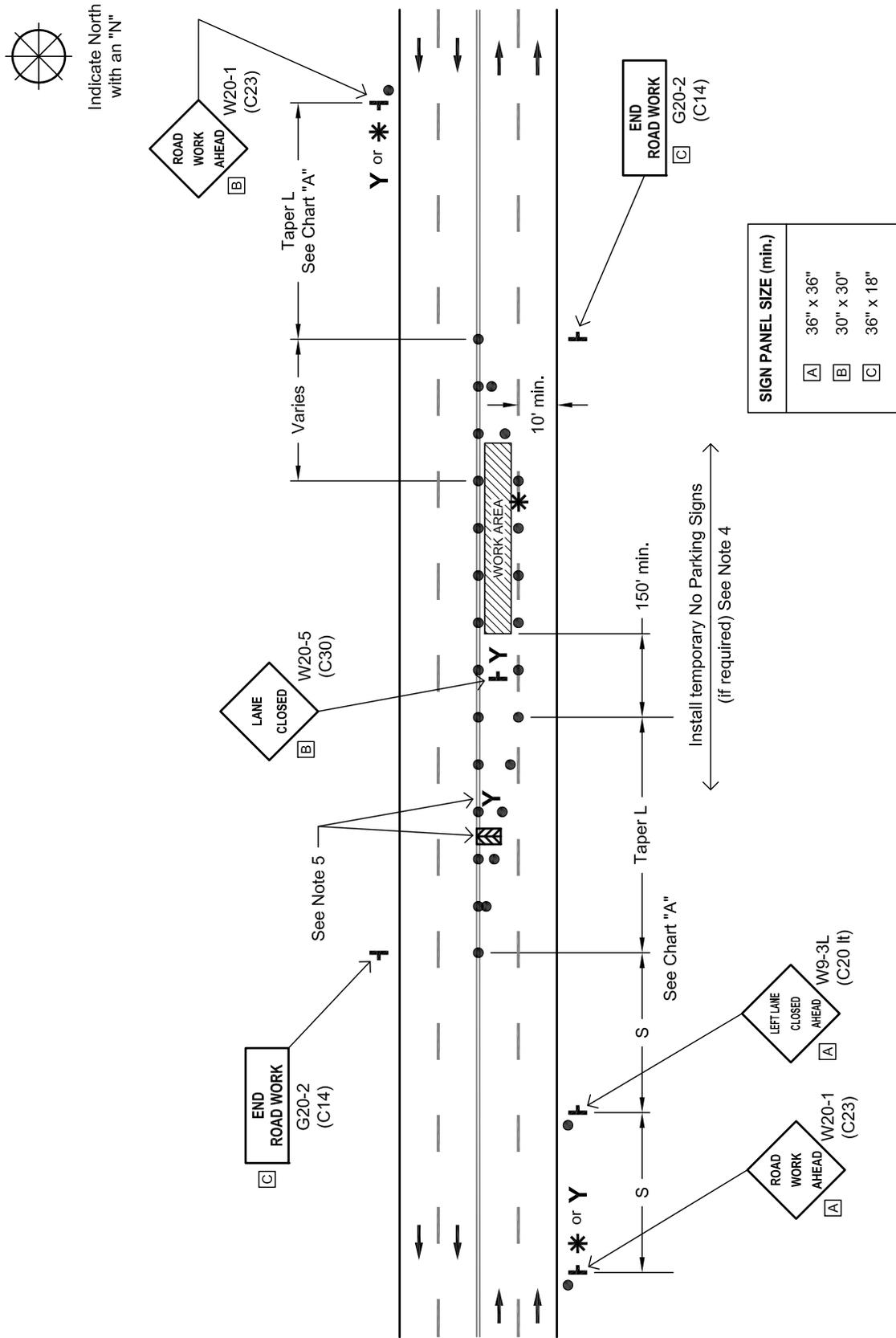
FIGURE F MULTI-LANE LEFT LANE CLOSURE BEYOND INTERSECTION



* SEE PAGE 1 THIS APPENDIX FOR LEGEND, NOTES AND SPACING REQUIREMENTS.

REVISIONS	BY	APP	DATE
New Figure	MH	JDW	11-04
Drafting edits	JDL	MH	2-13

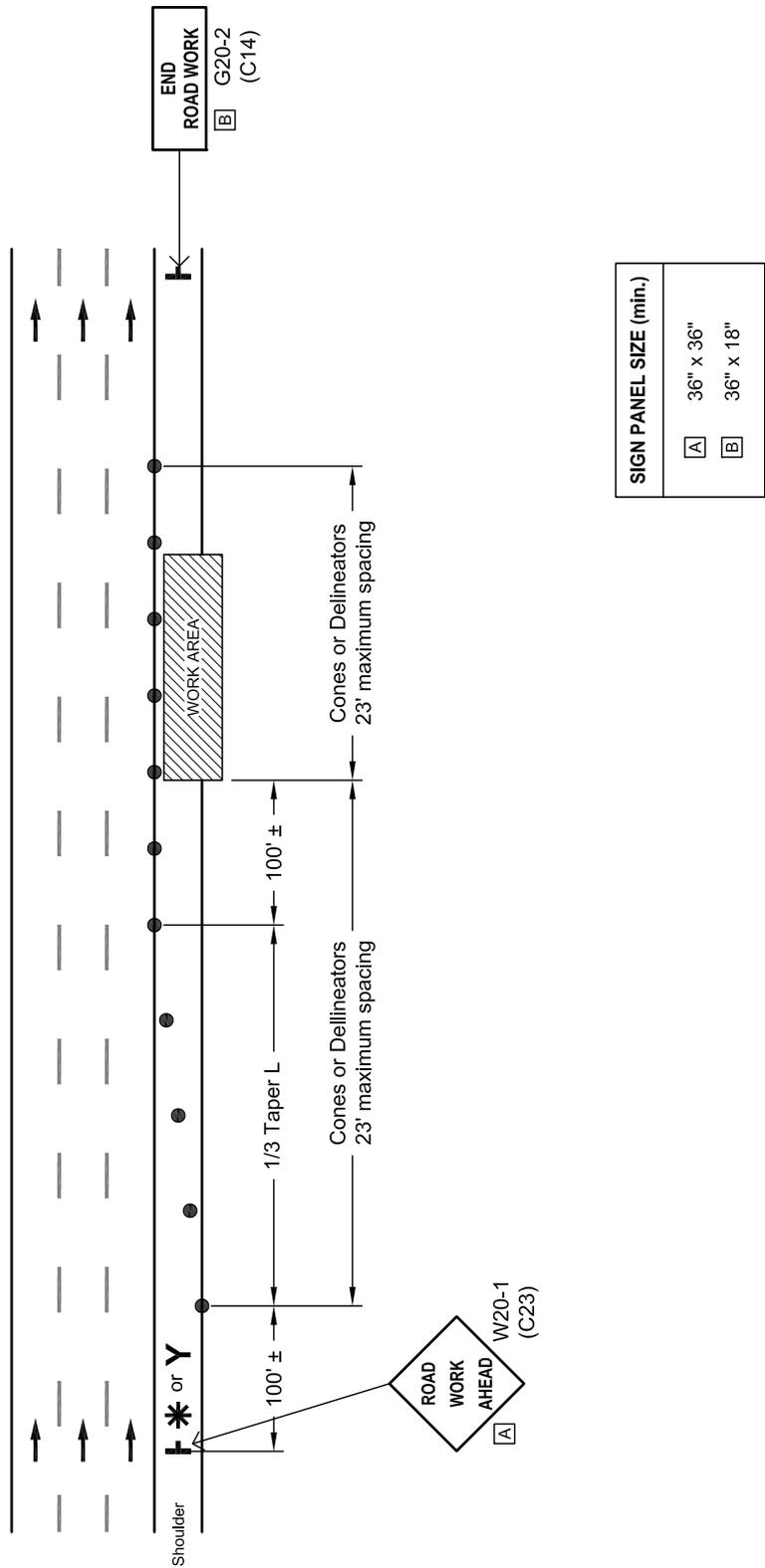
FIGURE G MULTI-LANE INSIDE LANE CLOSURE



* SEE PAGE 1 THIS APPENDIX FOR LEGEND, NOTES AND SPACING REQUIREMENTS.

REVISIONS	BY	APP	DATE
New Figure	MH	JDW	11-04
10' minimum lane; Drafting edits	JDL	MH	4-13

FIGURE H MULTI-LANE WORK WITHIN SHOULDER



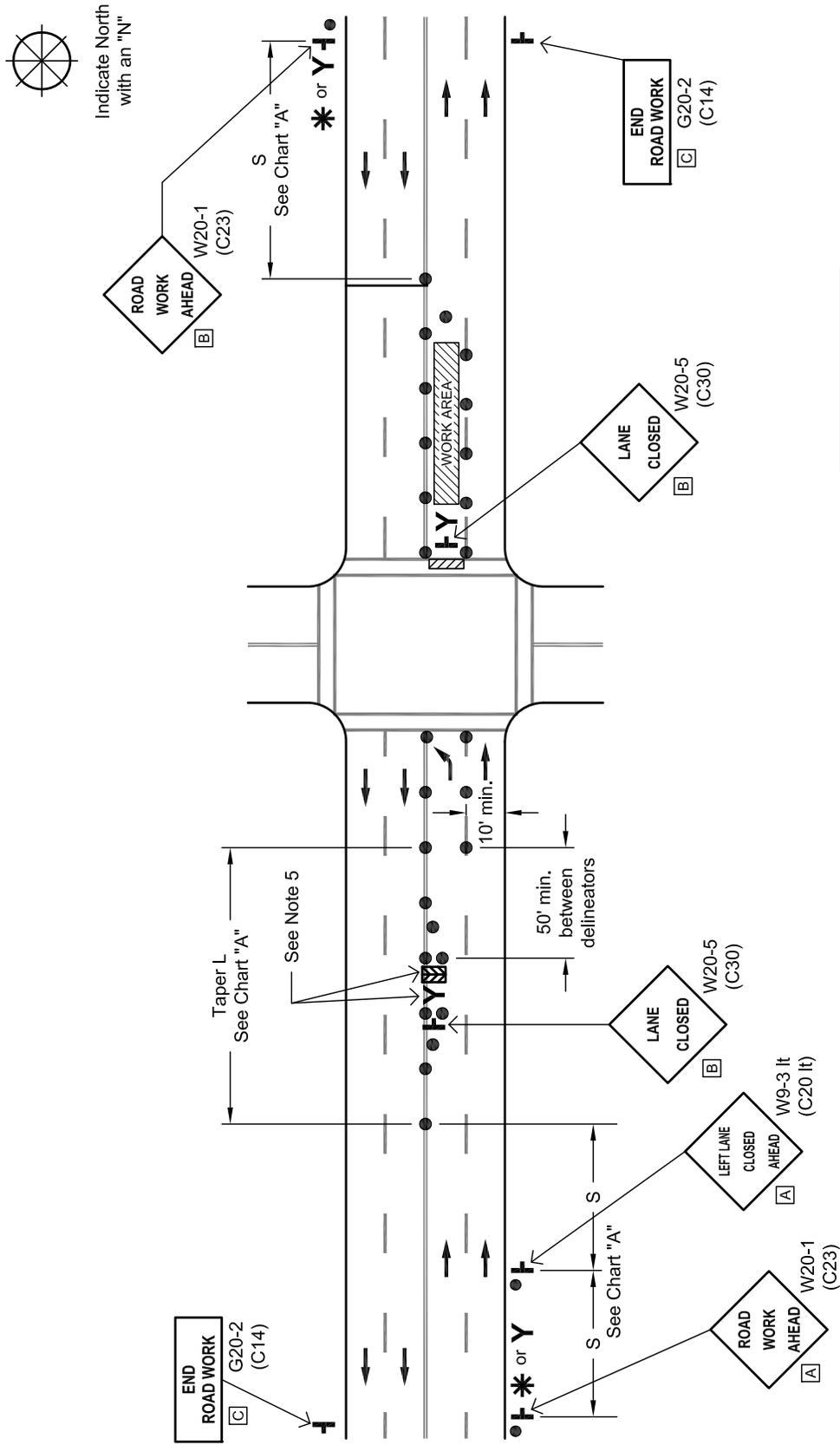
REVISIONS	BY	APP	DATE
New Figure	MH	JDW	11-04
Drafting edits	JDL	MH	3-13

GUIDELINES FOR CONSTRUCTION ZONES

Engineering Standards - Appendix G

* SEE PAGE 1 THIS APPENDIX FOR LEGEND, NOTES AND SPACING REQUIREMENTS.

FIGURE I MULTI-LANE INSIDE LANE CLOSURE BEYOND INTERSECTION



SIGN PANEL SIZE (min.)	
A	36" x 36"
B	30" x 30"
C	36" x 18"

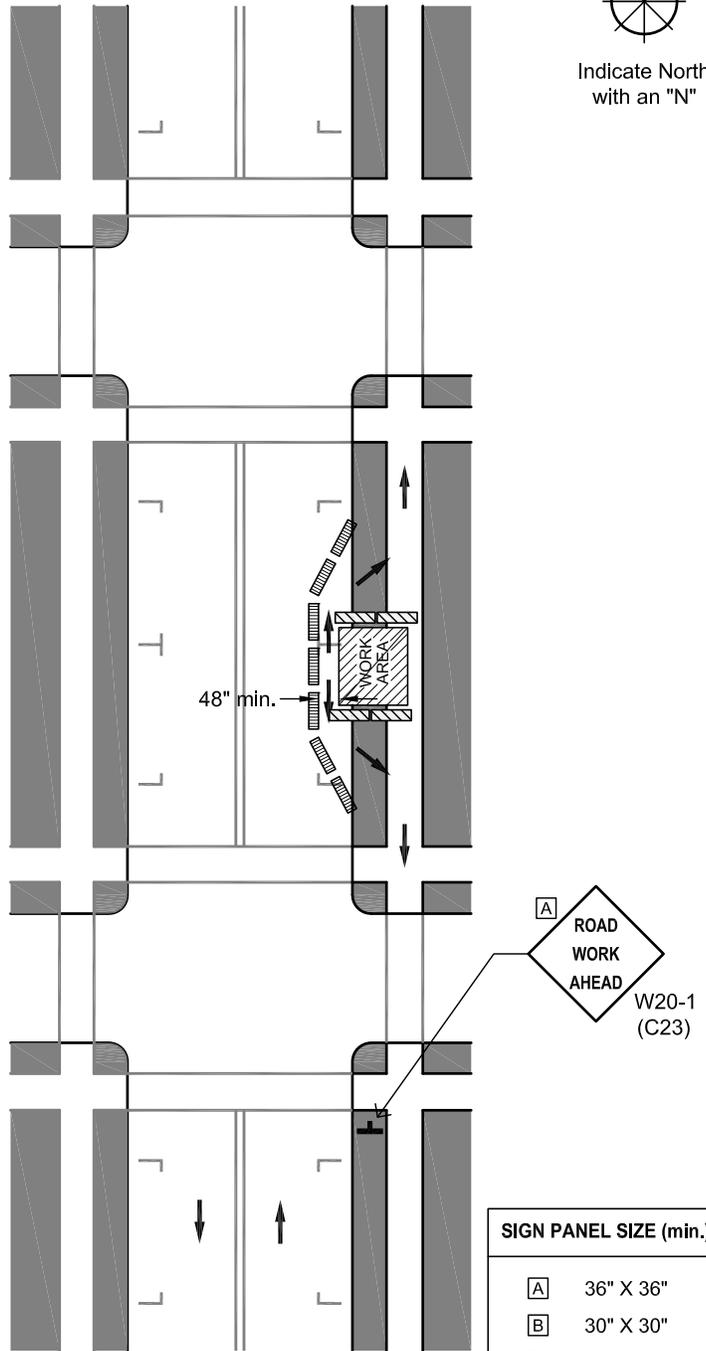
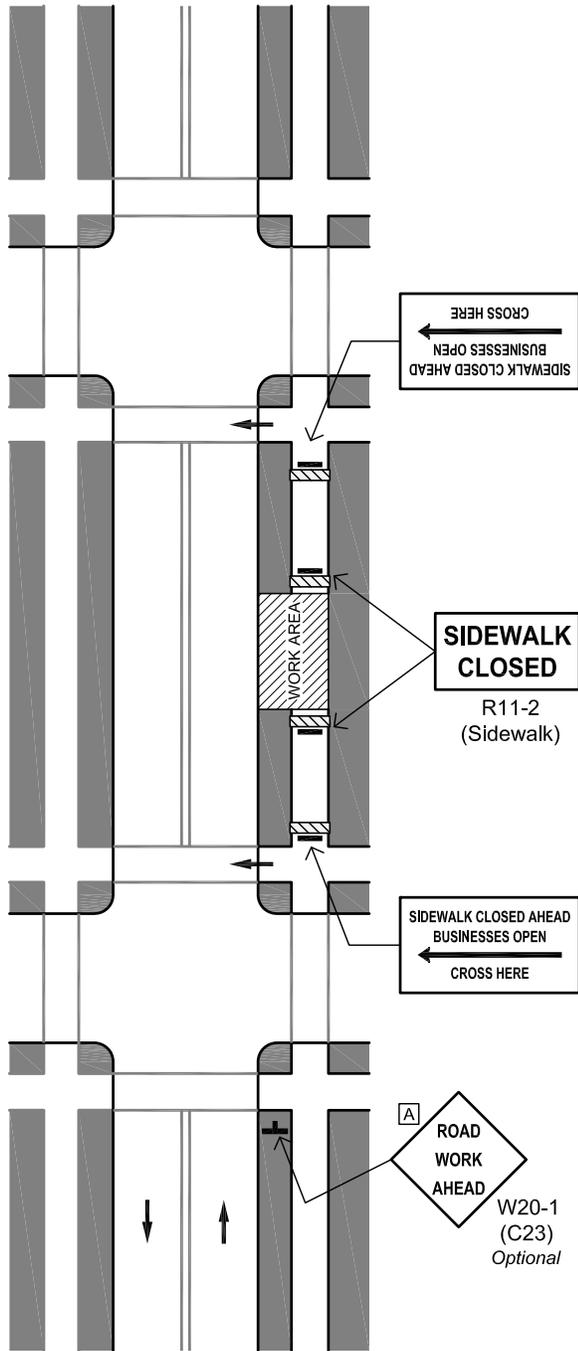
* SEE PAGE 1 THIS APPENDIX FOR LEGEND, NOTES AND SPACING REQUIREMENTS.

REVISIONS	BY	APP	DATE
New Figure	MH	JDW	11-04
Add Type III Barricade; drafting	JDL	MH	4-13

FIGURE P SIDEWALK CLOSURE



Indicate North
with an "N"



SIGN PANEL SIZE (min.)	
A	36" X 36"
B	30" X 30"
C	36" X 18"
D	10" X 24"

NOTE: TEMPORARY PEDESTRIAN ACCESS PATHWAYS SHALL COMPLY WITH ADA AND SHALL INCLUDE RAMPS AND HANDRAILS AS PER THE CALIFORNIA UNIFORM BUILDING CODE REQUIREMENT.

California MUTCD

REVISIONS	BY	APP	DATE
Add Detail Note	MH	BL	11-09
Drafting edits	JDL	MH	4-13



Air Pollution Control District
San Luis Obispo County

July 11, 2013

Matt Horn, Project Engineer
City of San Luis Obispo
919 Palm Street
San Luis Obispo, CA 93401

SUBJECT: Issuance of a Revised Air Pollution Control District Permit to Operate for Excavation of Contaminated Soils at Various Locations within the City of San Luis Obispo

Dear Mr. Horn:

The California Health and Safety Code Section 42301(e) requires the District permit system to include a review of permits during renewal to determine that permit conditions are adequate to ensure compliance with and the enforceability of District Rules and Regulations applicable to the equipment for which the permit was issued.

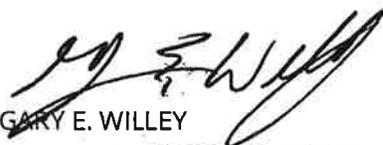
During the annual renewal it was noted that the equipment location description on Permit to Operate Number 1850-1 dated July 20, 2012, should now reference various locations with the City of San Luis Obispo. Enclosed you will find a revised Air Pollution Control District Permit to Operate 1850-2 which better serves the City by having a permit condition set pre-approved. This copy replaces the previous version which may now be recycled. Future renewals are scheduled every year during the month of July to determine if the equipment continues to comply with District Rules and Regulations. Also enclosed is Invoice Number 15484 for the annual renewal fees for Permit Number 1850-2.

You will note that conditions have been placed upon your Permit to Operate. The described equipment must comply with all District Rules and the stated conditions to be deemed in compliance. Appeals to District actions on permits must be made in writing to the Hearing Board within thirty (30) days of receipt of the permit, per District Rule 208.

If you have any questions, please contact Tim Fuhs at (805) 781-5912.

Very truly yours,

LARRY R. ALLEN
Air Pollution Control Officer



GARY E. WILLEY
Manager, Engineering Division

GEW/TJF/lmg

Enclosure

H:\PERMITS\PO\LETTERS\5949POLTJF.docx

t 805.781.5912 f 805.781.1002 w slocleanair.org

3433 Roberto Court, San Luis Obispo, CA 93401



Air Pollution Control District
San Luis Obispo County

PERMIT TO OPERATE

Number 1850-2

EQUIPMENT OWNER-OPERATOR:

City of San Luis Obispo
919 Palm Street
San Luis Obispo, CA 93401

EQUIPMENT LOCATION:

Various Locations within the City of San Luis Obispo

EQUIPMENT DESCRIPTION:

This permit authorizes soil excavation in accordance with an approved San Luis Obispo City Dust Control Plan and excavation of contaminated soil only after:

- a. The contamination has been characterized,
- b. The District has been given notice of the project in accordance with Condition 1 of this permit,
- c. Required Naturally Occurring Asbestos and NESHAP requirements have been met, and
- d. Monitoring, recordkeeping, and District notification procedures are in place for the specific project as described in the project notice.

CONDITIONS:

1. At least two (2) weeks prior to starting any planned excavation project, the permit holder shall submit notice and obtain approval for the project from the Air Pollution Control Officer (APCO) except for emergency repairs lasting less than 48 hours and other exceptions allowed by the APCO. Emergency repairs shall be reported to the APCO within 24 hours of initiation and include the volume of soil excavated and any known contamination levels.

At a minimum, the notice shall include:

- a. An assessment of the soil contamination levels and volumes or a statement that the project work zone contains no known contamination.
- b. Where contamination is present, a project description including:
 1. Specific work zone boundary where public access is restricted during the project,
 2. Estimated volume to be excavated,
 3. Location of nearest residence, business, and schools,
 4. A project specific Site Health and Safety Plan,
 5. Starting date, projected finishing date, and operating hours,

6. A project specific Monitoring, Recordkeeping, and Reporting Plan, and
 7. A screening risk assessment for toxic air contaminants or proof of insignificant emissions.
2. The City of San Luis Obispo, or their contractors, shall notify the District immediately if any soil is discovered that contains contamination previously unidentified including but not limited to: asbestos, hydrocarbons, or metals or if the size or contamination levels of the project described in the initial notice changes. District phone number: (805) 781-5912, fax number (805) 781-1002
3. Any excavation work, including emergency repairs, shall be done in accordance with:
 - a. The APCO approved San Luis Obispo City Dust Control Plan,
 - b. A Site Health and Safety Plan,
 - c. Information presented in the project notice, if applicable,
 - d. Best operating practices for minimizing odors, dust, and soil track out, and
 - e. An APCO approved project specific Monitoring, Recordkeeping, and Reporting Plan.
4. All site workers shall receive training and notification of the potential for discovery of naturally occurring asbestos and man-made asbestos material prior to initial site disturbance. Training shall include visual examples of naturally occurring asbestos and man-made asbestos material and proper procedures for reporting to a supervisor of any discovery.
5. If after project approval the City of San Luis Obispo or their contractors subsequently discover any man-made asbestos materials in the project zone, then:
 - a. All work shall cease in the immediate project area where the discovery was made.
 - b. The District shall be immediately notified.
 - c. Sampling of suspect Regulated Asbestos Containing Materials (RACM) by a Certified Asbestos Contractor (CAC) shall immediately occur, with results submitted to the District.
 - d. The discovery area shall be wetted and covered immediately.
 - e. The material shall be analyzed by Polarized Light Microscopy (PLM) by bulk EPA Method 600/R-93-116, Visual Area Estimation.
 - f. Confirmed quantities of RACM equal to or greater than 35 cubic feet will require the submission of an asbestos notification to the District, and handling and disposal pursuant to 40CFR61.145 and 61.150.
 - g. All RACM shall be handled and disposed of according to Local, State, and Federal regulations.
6. All projects shall comply with Federal and State regulations including the:
 - a. Asbestos Airborne Toxic Control Measure For Construction, Grading, Quarrying, And Surface Mining Operations, Title 17 California Code of Regulations, Section 93105 (17CCR93105) shall be demonstrated to the APCO prior to initial site disturbance.
 - b. National Emission Standard for Asbestos, Title 40, Code of Federal Regulations, Part 61, Subpart M (40CFR61.145, Asbestos NESHAP) shall be demonstrated to the APCO for all aspects of the project.

7. Expiration of the Geologic Exemption:
If City of San Luis Obispo, or their contractors subsequently discover any naturally occurring asbestos, serpentine, or ultramafic rock in the area to be disturbed, then:
 - a. City of San Luis Obispo or their contractors must comply with the requirements of 17CCR93105;
 - b. City of San Luis Obispo, or their contractors must report the discovery of the naturally-occurring asbestos, serpentine, or ultramafic rock to the APCO no later than the next business day; and
 - c. The exemption under 17CCR93105 Subsection (c)(1) shall expire and cease to be effective.

8. Monitoring shall include the following unless otherwise allowed by the APCO:
 - a. During excavation activities, the work zone shall be observed for dust, odors, hydrocarbon and H₂S concentrations by a properly trained technician following the methods in the APCO approved project specific Monitoring, Recordkeeping, and Reporting Plan.
 - b. VOC monitoring shall use a Flame Ionization Detector (FID) instrument maintained at the site at all times during excavation and handling. The FID shall be calibrated appropriate to the range being monitored with certified hexane gas or an alternative gas approved by the APCO in either the range of one hundred (100) parts per million by volume (ppmv) or ten-thousand (10,000) ppmv. The FID shall be in good working order and calibrated using certified calibration gas at the beginning and end of each work day using the procedures specified by the manufacturer
 - c. An instrument capable of measuring hydrogen sulfide gas at 1 ppmv shall be on-site at all times during excavation and handling.
 - d. Air monitoring of stock piled contaminated shall be conducted at a distance of no more than three (3) inches above the soil surface or edge of the covering monitored.
 - e. All air monitoring of the active work zone shall be conducted in the breathing zone, at the work zone downwind boundary.
 - f. Monitoring of the stock piles and work zone boundary shall occur at (1) hour intervals during excavation and soil handling activities unless otherwise allowed by the APCO.

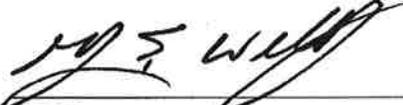
9. Recordkeeping and Reporting shall include the following unless otherwise allowed by the APCO:
 - a. Hourly observations of wind speed and direction,
 - b. Records of the quantity contaminated soil excavated shall be maintained on a daily basis when activities under this permit are underway and shall include the date and the volume transferred.
 - c. A daily calibration log shall be maintained for each monitor device described in the APCO approved project specific Monitoring, Recordkeeping, and Reporting Plan.
 - d. All monitoring and recordkeeping results shall be recorded at the within fifteen (15) minutes of the observation.
 - e. A record of all complaints and follow-up procedures shall be made during the day of the complaint and include: date and time, location of odor, name and phone # of the person reporting the odor, if available, facility responders name, odor type and strength, and remedial actions taken.

- f. All records shall be maintained on-site and made available to the APCO upon request.
- 10. The City of San Luis Obispo Public Works Department may be charged on an hourly basis to determine a project's compliance with these conditions.
- 11. If the APCO determines that this operation is causing a public nuisance by virtue of odor, dust, or health risk, the City of San Luis Obispo and its contractors shall take immediate action and eliminate the nuisance.
- 12. Nuisance odors or dust complaints shall be directed to the on-site representative of City of San Luis Obispo. All complaints and breakdowns shall be reported to the APCO within four (4) hours of receipt or event. Equipment or process breakdowns and upsets shall be reported according to the criteria required under District Rule 107.
- 13. No visible dust shall leave the work zone boundary.
- 14. Hydrocarbon concentrations at the edge of the covered stock piled soils, and at the boundary of the active work zone shall not to exceed 100 ppmv as hexane.
- 15. Contaminated soil stock piles shall be completely covered with an impermeable covering that has a minimum thickness of 10 mils or another APCO-approved barrier. Contaminated soil stock piles shall be completely covered whenever soil is not actively being added or removed.
- 16. Containment or coverage of contaminated soil in the wall of the excavation shall occur as soon as feasible. All excavation sites with contamination shall be covered daily, unless otherwise allowed by the APCO. Contaminated soil, as defined for this permit, shall be soil that must be removed according to plans approved by the San Luis Obispo Certified Unified Program Agency.
- 17. All haul trucks shall be completely covered with tarps or other suitable materials prior to leaving the site.
- 18. All information needed to estimate air pollution emissions shall be provided to the District upon request.
- 19. A copy of this permit shall be in the possession of the on-site representative of the City of San Luis Obispo.

July 11, 2013 (Revised)
ISSUANCE DATE

July (Annually)
ANNIVERSARY

LARRY R. ALLEN
Air Pollution Control Officer


GARY E. WILLEY
Manager, Engineering Division

Application Number: 5949

TO: BARBARA LYNCH
CITY OF SAN LUIS OBISPO
919 PALM STREET
SAN LUIS OBISPO CA 93401

The Air Pollution Control District has received payment of your permit renewal fees. Attached below is your permit renewal. Please detach the bottom portion of this page and affix to your Permit to Operate.



Air Pollution Control District
San Luis Obispo County

PERMIT RENEWAL

DATE: August 4, 2015

Permit Number: 1850-2

A permit renewal inspection was recently conducted at your facility and it has been determined from the inspection that the subject equipment is operated in compliance with the rules and regulations of the Air Pollution Control District. This is a renewal of the permit operating license until **July 2016**.

Please also consider this a receipt for your fees in the amount of **\$824.00**.

Equipment Location: **Various Locations within the City of San Luis Obispo**

San Luis Obispo County Air Pollution Control District

Please affix this note to your Permit to Operate.