

STANDARD SPECIFICATIONS & ENGINEERING STANDARDS

MAY 2018



PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

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

STANDARD SPECIFICATIONS

MAY 2018

APPROVED BY THE CITY ENGINEER:



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CITY ENGINEER
RCE C63611

ADOPTED BY THE CITY COUNCIL OF SAN LUIS OBISPO
BY RESOLUTION NO. 10889 (2018 SERIES)

**PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION**

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TABLE OF CONTENTS

DIVISION I GENERAL PROVISIONS.....	1
1 GENERAL.....	1
1-1 GENERAL.....	1
1-1.01 GENERAL.....	1
1-1.05 REFERENCES.....	1
1-1.07 DEFINITIONS.....	1
1-1.08 DISTRICTS.....	3
1-1.11 WEB SITES, ADDRESSES, AND TELEPHONE NUMBERS.....	3
1-1.12 MISCELLANY.....	3
2 BIDDING.....	4
2-1 GENERAL.....	4
2-1.06 BID DOCUMENTS.....	4
2-1.12 DISADVANTAGED BUSINESS ENTERPRISES.....	4
2-1.15 DISABLED VETERAN BUSINESS ENTERPRISES.....	4
2-1.18 SMALL BUSINESS AND NON-SMALL BUSINESS SUBCONTRACTOR REFERENCES.....	4
2-1.27 CALIFORNIA COMPANIES.....	4
2-1.31 OPT OUT OF PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS.....	4
2-1.33 BID DOCUMENT COMPLETION AND SUBMITTAL.....	4
2-1.40 BID WITHDRAWAL.....	5
3 CONTRACT AWARD AND EXECUTION.....	6
3-1 GENERAL.....	6
3-1.04 CONTRACT AWARD.....	6
3-1.05 CONTRACT BONDS.....	6
3-1.08 SMALL BUSINESS PARTICIPATION REPORT.....	7
3-1.11 PAYEE DATA RECORD.....	8
3-1.18 CONTRACT EXECUTION.....	8
4 SCOPE OF WORK.....	10
4-1 GENERAL.....	10
4-1.02 INTENT.....	10
4-1.05 CHANGES AND EXTRA WORK.....	10
4-1.07 VALUE ENGINEERING.....	10
4-1.13 CLEANUP.....	10
5 CONTROL OF WORK.....	12
5-1 GENERAL.....	12
5-1.01 GENERAL.....	12
5-1.02 CONTRACT COMPONENTS.....	12
5-1.09 PARTNERING.....	14
5-1.13 SUBCONTRACTING.....	14
5-1.17 CHARACTER OF WORKERS.....	14
5-1.20 COORDINATION WITH OTHER ENTITIES.....	14
5-1.23 SUBMITTALS.....	16
5-1.26 CONSTRUCTION SURVEYS.....	19
5-1.27 RECORDS.....	20
5-1.36 PROPERTY AND FACILITIES PRESERVATION.....	20
5-1.38 MAINTENANCE AND PROTECTION RELIEF.....	22
5-1.39 DAMAGE REPAIR AND RESTORATION.....	22
5-1.43 POTENTIAL CLAIMS AND DISPUTE RESOLUTION.....	22
6 CONTROL OF MATERIALS.....	23
6-1 GENERAL.....	23
6-1.04 BUY AMERICA.....	23
6-1.05 SPECIFIC BRAND OR TRADE NAME AND SUBSTITUTION.....	23

7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC	24
7-1 GENERAL.....	24
7-1.02 LAWS.....	24
7-1.03 PUBLIC CONVENIENCE.....	24
7-1.04 PUBLIC SAFETY	29
7-1.06 INSURANCE.....	29
8 PROSECUTION AND PROGRESS	32
8-1 GENERAL.....	32
8-1.02 SCHEDULE	32
8-1.03 PRECONSTRUCTION CONFERENCE	33
8-1.04 START OF JOB SITE ACTIVITIES.....	33
8-1.05 TIME	34
8-1.10 LIQUIDATED DAMAGES	34
9 PAYMENT	36
9-1 GENERAL.....	36
9-1.02 MEASUREMENT	36
9-1.03 PAYMENT SCOPE	36
9-1.04 FORCE ACCOUNT.....	36
9-1.07 PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS.....	37
9-1.16 PROGRESS PAYMENTS.....	37
9-1.17 PAYMENT AFTER CONTRACT ACCEPTANCE	38
9-1.22 ARBITRATION.....	39
9-1.22 CLAIM RESOLUTION PROCEDURE.....	39
9-1.23 CITY BILLING.....	40
DIVISION II GENERAL CONSTRUCTION	41
12 TEMPORARY TRAFFIC CONTROL.....	41
12-1 GENERAL.....	41
12-1.01 GENERAL.....	41
12-1.03 CONSTRUCTION	41
12-1.04 PAYMENT.....	43
12-4 MAINTAINING TRAFFIC	43
12-4.01 GENERAL.....	43
12-6 TEMPORARY PAVEMENT DELINEATION	43
12-6.01 GENERAL.....	43
12-6.02 MATERIALS.....	43
12-6.03 CONSTRUCTION	44
13 WATER POLLUTION CONTROL	45
13-1 GENERAL.....	45
13-1.01 GENERAL.....	45
13-1.04 PAYMENT.....	46
13-3 STORM WATER POLLUTION PREVENTION PLAN.....	46
13-3.01 GENERAL.....	46
14 ENVIRONMENTAL STEWARDSHIP	47
14-1 GENERAL.....	47
14-1.01 GENERAL.....	47
14-2 CULTURAL RESOURCES	47
14-2.03 ARCHAEOLOGICAL RESOURCES.....	47
14-11 HAZARDOUS WASTE AND CONTAMINATION.....	48
14-11.01 GENERAL.....	48
14-11.03 HAZARDOUS WASTE MANAGEMENT.....	49
14-11.07 CITY – GENERATED HAZARDOUS WASTE	49
15 EXISTING FACILITIES	50

15-1 GENERAL.....	50
15-1.03 CONSTRUCTION	50
15-1.04 PAYMENT.....	51
DIVISION III EARTHWORK AND LANDSCAPE.....	52
17 GENERAL	52
17-1 GENERAL.....	52
17-1.01 GENERAL.....	52
19 EARTHWORK	53
19-1 GENERAL.....	53
19-1.01 GENERAL.....	53
19-1.03 CONSTRUCTION	53
19-1.04 PAYMENT.....	54
19-2 ROADWAY EXCAVATION	54
19-2.04 PAYMENT.....	54
19-3 STRUCTURE EXCAVATION AND BACKFILL.....	54
19-3.03 CONSTRUCTION	54
19-3.04 PAYMENT.....	54
20 LANDSCAPE AND IRRIGATION	55
20-1 GENERAL.....	55
20-1.01 GENERAL.....	55
20-1.02 MATERIALS.....	55
20-1.03 CONSTRUCTION	57
20-2 IRRIGATION	59
20-2.01 GENERAL.....	59
20-2.04 CONTROL AND NEUTRAL CONDUCTORS	65
20-2.06 IRRIGATION CONTROLLERS.....	66
20-2.08 IRRIGATION SUPPLY LINE.....	68
20-2.10 VALVES.....	70
20-3 PLANTING.....	71
20-3.01 GENERAL.....	72
20-3.02 PLANTING WORK.....	73
20-4 PLANT ESTABLISHMENT WORK.....	76
20-4.01 GENERAL.....	76
20-4.03 CONSTRUCTION	77
20-4.04 PAYMENT.....	80
20-5 LANDSCAPE ELEMENTS.....	80
20-5.02 EDGING.....	80
20-5.03 INERT GROUND COVERS AND MULCHES.....	81
21 EROSION CONTROL	82
21-2 EROSION CONTROL WORK	82
21-2.02 MATERIALS.....	82
21-2.03 CONSTRUCTION	82
DIVISION IV SUBBASES AND BASES.....	83
26 AGGREGATE BASES	83
26-1 GENERAL.....	83
26-1.02 MATERIAL.....	83
DIVISION V SURFACING AND PAVEMENTS.....	86
37 BITUMINOUS SEALS	86
37-1 GENERAL.....	86
37-1.01 GENERAL.....	86

37-2 SEAL COATS	86
37-2.01 GENERAL	86
37-2.04 ASPHALTIC EMULSUON SEAL COAT	86
37-3 SLURRY SEAL AND MICRO-SURFACING	86
37-3.01 GENERAL	86
37-3.03 CONSTRUCTION	86
37-3.04 PAYMENT	88
39 HOT MIX ASPHALT	90
39-1 GENERAL	90
39-1.01 GENERAL	90
39-1.02 MATERIALS	90
39-1.03 HOT MIX ASPHALT MIX DESIGN REQUIREMENTS	90
39-1.09 SUBGRADE, TACK COAT, AND GEOSYNTHETIC PAVEMENT INTERLAYER	90
39-2 STANDARD CONSTRUCTION PROCESS	91
39-3 METHOD CONSTRUCTION PROCESS	91
39-3.01 GENERAL	91
39-3.02 ACCEPTANCE CRITERIA	92
39-3.03 SPREADING AND COMPACTING EQUIPMENT	92
39-3.04 TRANSPORTATION, SPREADING AND COMPACTING	92
39-4 QUALITY CONTROL/QUALITY ASSURANCE CONSTRUCTION PROCESS	94
39-6 PAYMENT	94
42 GROOVE AND GRIND CONCRETE	95
42-3 GRINDING	95
42-3.03 CONSTRUCTION	95
DIVISION VI STRUCTURES	97
51 CONCRETE STRUCTURES	97
51-1 GENERAL	97
51-1.02 MATERIALS	97
51-1.04 PAYMENT	97
52 REINFORCEMENT	97
52-1 GENERAL	97
52-1.02 MATERIALS	97
56 OVERHEAD SIGN STRUCTURES, STANDARDS, AND POLES	97
56-2 OVERHEAD SIGN STRUCTURES	97
56-2.01 GENERAL	97
56-2.02 MATERIALS	97
DIVISION VII DRAINAGE FACILITIES	98
64 PLASTIC PIPE	98
64-2 PLASTIC PIPE	98
64-2.02 MATERIALS	98
64-2.03 CONSTRUCTION	98
64-2.04 PAYMENT	98
66 CORRUGATED METAL PIPE	98
67 STRUCTURAL PLATE CULVERTS	98
DIVISION VIII MISCELLANEOUS CONSTRUCTION	99
73 CONCRETE CURBS AND SIDEWALKS	99
73-1 GENERAL	99

73-1.01 GENERAL.....	99
73.1.02 MATERIAL.....	99
73-1.03 CONSTRUCTION.....	99
73-1.04 PAYMENT.....	102
73-4 TEXTURED CONCRETE AND COLORED CONCRETE SURFACES.....	103
73-4.01 GENERAL.....	103
73-4.02 MATERIALS.....	103
73-4.03 CONSTRUCTION.....	104
75 MISCELLANEOUS METAL.....	106
75-1 GENERAL.....	106
75-1.02 MATERIALS.....	106
77 LOCAL INFRASTRUCTURE.....	107
77-1 EXCAVATION AND RESTORATION.....	107
77-1.01 GENERAL.....	107
77-1.02 MATERIALS.....	108
77-1.03 CONSTRUCTION.....	109
77-1.04 PAYMENT.....	117
77-2 WATERLINES.....	118
77-2.01 GENERAL.....	118
77-2.02 MATERIALS.....	118
77-2.03 CONSTRUCTION.....	121
77-2.04 PAYMENT.....	129
77-3 SEWERS.....	131
77-3.01 GENERAL.....	131
77-3.02 MATERIALS.....	131
77-3.03 CONSTRUCTION.....	135
77-3.04 PAYMENT.....	145
77-4 STORM DRAINS.....	146
77-4.01 GENERAL.....	146
77-4.02 MATERIALS.....	146
77-4.04 PAYMENT.....	147
78 INCIDENTAL CONSTRUCTION.....	148
78-2 SURVEY MONUMENTS.....	148
78-2.01 GENERAL.....	148
78-2.02 MATERIALS.....	148
78-2.03 CONSTRUCTION.....	148
78-2.04 PAYMENT.....	148
DIVISION IX TRAFFIC CONTROL DEVICES.....	149
84 MARKINGS.....	149
84-2 TRAFFIC STRIPES AND PAVEMENT MARKINGS.....	149
84-2.01 GENERAL.....	149
84-2.03 CONSTRUCTION.....	149
84-2.04 PAYMENT.....	149
84-9 EXISTING MARKINGS.....	150
84-9.03 CONSTRUCTION.....	150
DIVISION X ELECTRICAL WORK.....	151
86 ELECTRICAL SYSTEMS.....	151
86-1 GENERAL.....	151
86-1.01 SUMMARY.....	151
86-1.03 SCHEDULE OF VALUES.....	151
86-1.04 EQUIPMENT LIST AND DRAWINGS.....	151
86-1.07 SCHEDULING OF WORK.....	152

86-2 MATERIALS AND INSTALLATION	152
86-2.05 CONDUIT.....	152
86-2.06 PULL BOXES.....	153
86-2.08 CONDUCTORS AND CABLES	154
86-2.09 WIRING.....	156
86-2.10 BONDING AND GROUNDING	157
86-2.11 SERVICE	158
86-2.14 TESTING	158
86-2.16 PAINTING	159
86-2.19 SIGNS.....	161
86-3 CONTROLLER ASSEMBLIES	161
86-3.01 CONTROLLER ASSEMBLIES.....	161
86-3.02 BATTERY BACKUP SYSTEM.....	161
86-3.04 CONTROLLER CABINETS	162
86-4 TRAFFIC SIGNAL FACES AND FITTINGS	162
86-4.01 VEHICLE SIGNAL FACES	162
86-4.03 PEDESTRIAN SIGNAL FACES.....	163
86-5 DETECTORS.....	164
86-5.01 VEHICLE DETECTORS	164
86-5.02 PEDESTRIAN PUSH BUTTON ASSEMBLY	167
86-6 LIGHTING.....	167
86-6.01 HIGH-PRESSURE SODIUM LUMINAIRES & 86-6.03 LOW-PRESSURE SODIUM LUMINAIRES	167
86-6.02 LED LUMINAIRES	168
86-6.11 PHOTOELECTRIC CONTROLS	169
86-6.14 TRAIL AND PATH LIGHTING.....	169
86-7 REMOVING, REINSTALLING, OR SALVAGING ELECTRICAL EQUIPMENT	169
86-7.01 REMOVING ELECTRICAL EQUIPMENT.....	169

DIVISION XI MATERIALS **170**

90 CONCRETE.....	170
90-1 GENERAL.....	170
91-1.01 GENERAL.....	170
90-1.02 MATERIALS.....	170

STANDARD SPECIFICATIONS

These Standard Specifications are to be used in conjunction with the State of California, Department of Transportation Standard Specifications and Standard Plans dated 2015. In absence of revision by these Standard Specifications, comply with the State of California Department of Transportation Standard Specifications dated 2015.

DIVISION I GENERAL PROVISIONS 1 GENERAL

1-1 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 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 2015 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:**

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

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 Director or designee.

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

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 duties delegated to them.

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
Presidents Day	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 12 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 or first working day after
Day before New Year's Day	Last working day prior to New Year's Day

If January 1st, July 4th, November 11th, or December 25th falls on a Sunday, the Monday following is a holiday. If November 11th falls on a Saturday, the preceding Friday is a holiday.

Holiday Restriction Area: Defined by the Downtown Association boundary per City Council Resolution 9487. Construction activities which affect City Streets in the Downtown Area shall not occur between Thanksgiving and New Year's Day. Refer to Appendix L for the Holiday Restriction Area map.

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 2015

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 GENERAL

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 REFERENCES

2-1.18A General

Add to Section 2-1.18A:

This Section is applicable only as directed in the Special Provisions.

2-1.27 CALIFORNIA COMPANIES

Delete Section 2-1.27.

2-1.31 OPT OUT OF PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS

Delete Section 2-1.31.

2-1.33 BID DOCUMENT COMPLETION AND SUBMITTAL

2-1.33A General

Add to Section 2-1.33A:

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.

On the Subcontractor List, you must submit:

1. Name under which subcontractor is licensed
2. License number
3. DIR Public Works Registration Number
4. Address
5. Phone number
6. Specific description of subcontracted work
7. Percentage of total base bid amount

with your bid. Failure to do so results in a nonresponsive bid.

Furnish bid using blank forms provided in the Special Provisions. Bid must include all forms and must be signed by the bidder. Subcontractor List and percentage of each item subcontracted must be provided with the bid, on the List of Subcontractors form provided herein.

2-1.33B Electronic Bids

Delete Section 2-1.33B

2-1.33D Bid Form Submittal Schedules

2-1.33D(1) General

Add to Section 2-1.33(D)1:

Submit your bid:

4. Under sealed cover marked outside of the envelope containing the bid in compliance with the instructions contained in the notice to bidders.
5. 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:

6. Names
7. Titles
8. Business addresses

Of the:

9. President
10. Secretary
11. Treasurer

2-1.40 BID WITHDRAWAL

Delete the 2nd paragraph in Section 2-1.40

3 CONTRACT AWARD AND EXECUTION

3-1 GENERAL

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 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" doing 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.

Bond forms, penal sums. Within the time period set forth in the Contract Documents and prior to commencing the Work on the Project, the Contractor shall file with the Agency good and sufficient labor and material payment bond (Payment Bond) and performance bond (Performance Bond) in the amount of one hundred percent (100%) of the Contract Sum covering performance of the Work other than the professional design services portion of the Work. The Performance Bond and Payment Bond shall be in the form required by the Contract Documents. The amounts of the Payment Bond and Performance Bond shall be increased as, when and in the amount of any Change Orders that are executed increasing the Contract Sum, the Contract shall, upon request by the Agency, provide evidence of such increases. Should the Payment Bond or Performance Bond or any Surety on such bond become or be determined by the Agency to be insufficient, it shall be replaced within ten Days by a bond that fully complies with the requirements of this Paragraph. No further payments to the Contract for the Work performed shall be made or due until the Contractor has fully complied with the requirements of this Paragraph.

Duration. The Payment Bond shall remain in effect until Acceptance of the Work and payment of all stop notices and Claims by the Contractor or the Subcontractors, of any Tier, have been satisfied. The Performance Bond shall remain in effect and assure faithful performance of all the Contractor's obligations under the Contract Documents, including, without limitation, all obligations that survive Final Completion or termination, such as, but not limited to, the Contractor's warranty, commissioning and indemnity obligations.

Surety. At the time the Contract is signed and always thereafter until Final Payment has been made by the Agency, the Surety on the Payment Bond shall be an Admitted Surety and the Surety on the Performance Bond shall be a licensed Surety in good standing with the California Department of Insurance and having an A.M. Best's Insurance Rating of not less than A-: VI.

Premiums. The premiums for all bonds are included in the Contract Sum and shall be paid by the Contractor.

Obligee. The Payment Bond and Performance Bond shall each name the Agency as obligee. All bonds purchased by the Subcontractors shall name the Contractor and the Agency as dual obligees.

No exoneration. Changes, Change Orders, Unilateral Change Orders, Field Orders, Modifications and adjustments to the Contract Sum or Contract Time shall in no way release or exonerate the Contractor or its Surety from their obligations, and notice thereof shall be waived by the Surety. The foregoing provision shall be included in the terms of the Payment Bond, Performance Bond and any bonds obtained by the Subcontractors.

Communications. The Agency shall have the right to communicate with the Contractor's sureties with respect to matters that are related to the Contractor's performance of its obligations under the Contract Documents. The Contractor shall be provided with a copy of all such written communications. Such communications shall not create, or be interpreted as creating, any contractual relationship between the Agency and the Surety.

No limitation. The requirements of this Paragraph pertaining to the Performance Bond and the Payment Bond shall be without limitation to any other obligations the Contractor may have under Applicable Law to provide bonding for the benefit of and to assure payment to the Subcontractors or Subconsultants performing the Work for the Project.

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. 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.

3-1.08 SMALL BUSINESS PARTICIPATION REPORT

Delete Section 3-1.08.

3-1.11 PAYEE DATA RECORD

Delete Section 3-1.11.

3-1.18 CONTRACT EXECUTION

Replace Section 3-1.18 with:

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

12. Signed contract
13. Contract bonds
14. 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

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 Standardss
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.

This permit is issued with the understanding that any 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 GENERAL

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 extra work or 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

Both parties daily must sign the agreements. Maintain and submit these records in compliance with Section 5-1.27E and 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 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 later.

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 always.

Prior to the end of each workday you must remove all equipment and construction materials from the public right-of-way. The public right-off-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 GENERAL

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 Department for any work not within normal work hours.

Adjustments to working hours may be imposed, in compliance with section 7-1.03B, because of public traffic impacts.

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:

15. Project plans
16. Engineering Standards
17. Standard plans
18. 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 pacificator 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 Building 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 is not included in the calculation.

A representative of the prime contractor must be on site when any subcontractor is performing contract work. Contract work will not be allowed to continue until prime contractor's representative is on site.

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
4. Regulations regarding:
5. Air pollution
6. Water pollution
7. 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, clearances and approvals from all entities having jurisdiction of the work including:

1. Public Utilities Commission
2. Railroad company
3. OSHA
4. Other public agencies
5. Regulatory authority

Failure to comply is cause to revoke your 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 the Engineering Standards.

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:

19. Materials and equipment not specified by standards, or a trade name and number
20. 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

Comply 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

You must furnish submittals 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 formant:

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 know past and future submittals and 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

6. Differences between the material specified and the material submitted.

5-1.23E Submittal Completeness

Submittals that 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 that are not functionally related must be submitted separately. Submittal packages that 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. Public Works 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. A Licensed Land Surveyor or a Registered Civil Engineer must perform survey work.

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.

If you are working within 24 inches of a survey monument or bench mark you must employ a Licensed Land Surveyor or a Registered Civil Engineer to tie-out the monument or bench mark. Should any existing survey monument be disturbed or destroyed during construction, it must be reset at the previous location. 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. 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. For monuments, a Corner Record must be filed with the County and a copy delivered to the Engineer. For bench marks, documentation of the bench mark and how it was reset 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 your expense.

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. The Engineer will not accept a Change Order Bill 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.

12. Infrastructure
13. Street surfacing
14. Traffic stripes
15. Pavement markings and markers
16. Survey monuments
17. Bench marks
18. Utilities
19. Trees
20. Traffic signal equipment
21. Other public fixtures

Repair to damage must comply with the associated sections of the specifications, standards, and plans.

Monuments and benchmarks must comply with Section 5-1.36E.

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 of any work on the lateral to the property owner, with a copy to the Engineer, prior to any:

1. Modification
2. Repair
3. Replacement

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 (USA) 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, the Engineer may waive field locating of sewer laterals.

5-1.36B Landscape

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 must be replaced with sod.

5-1.36D Nonhighway Facilities

Add to Section 5-1.36D

Existing third party (non City-owned) utilities are shown on project plans for information purposes only. It is your responsibility to contact "Underground Service Alert USA" and have site marked prior to start of excavation or sawcutting. The City of San Luis Obispo is not responsible for any:

1. damages
2. costs
3. delay
4. expenses

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.

5-1.36E Survey Monuments

Replace section 5-1.36E with:

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.

5-1.38 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 immediately repair or install an 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

5-1.43A General

Add to Section 5-1.43A

Potential claim forms are located on the City's website:

www.slocity.org/government/department-directory/public-works/documents-online/construction-documents

5-1.43E Alternative Dispute Resolution

Delete Section 5-1.43E.

6 CONTROL OF MATERIALS

6-1 GENERAL

6-1.04 BUY AMERICA

Add to Section 6-1.04.

This Section is applicable only as directed in the Special Provisions.

6-1.05 SPECIFIC BRAND OR TRADE NAME AND SUBSTITUTION

Replace Section 6-1.05 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.

7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

7-1 GENERAL

7-1.02 LAWS

7-1.02K Labor Code

7-1.02K(1) General

Add to Section 7-1.02K(1).

The project is subject to compliance monitoring and enforcement by the California Department of Industrial Relations.

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

Replace 5th paragraph in Section 7-1.02K(3) with:

You must submit certified payroll records electronically to the Engineer. Engineer's email address is provided at the Project's Pre-Construction Meeting.

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 $\frac{3}{4}$ 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 Core 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 and 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.

Work shall not occur within the downtown area between Thanksgiving and New Year's day per City Council Resolution 9487 (2003 Series). This is defined as the Holiday Restriction Area, the limits of which are defined by the Downtown Association Boundary.

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 that 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 of the street closure to:

1. Police dispatch
2. Bus services
3. Garbage company
4. Affected properties as described above

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 10.16.055 and CVC 22651(m)
- Towed Vehicles Contact SLPD 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. Traffic control plan must comply with the MUTCD. 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 Engineer approves the traffic control plan.

Limited work hours may be imposed at any time. Expect that the Engineer will impose work hour restrictions if the work impacts traffic flow on any:

1. Major route
2. In the vicinity of schools
3. The Downtown

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.

A Traffic Control Plan must be submitted and shall be detailed to show how traffic will be routed through and around the construction operations. The plan shall show:

1. all required equipment
2. barricading
3. flagmen
4. use of pilot vehicles
5. signing
6. tapers
7. other Traffic Control System components

as may be required to maintain traffic circulation. The plan shall show in detail how traffic will be routed through and around the construction site, including traffic from cross streets, alleys, and private driveways. The plan shall also show the location of placement for signs that will provide advance warning to through traffic of street closure.

The proposed scheduling for posting of Parking Restriction shall be included as part of the Traffic Control Plan submitted.

The Engineer may require field alterations of the traffic control plan as necessary to provide for the convenience of public traffic. You must place, relocate or remove components of the traffic control system when directed by the Engineer, at no additional cost. Failure to comply with the approved traffic control plan and any direction of the Engineer will be grounds for suspension of the construction operation until you make the necessary changes.

As an integral part of the Traffic Control Plan, you must designate one person as lead for traffic control, and that person shall be on the job site and available to the Engineer at all times during construction. The traffic lead shall be responsible for the proper placement and operation of all traffic control components and have available a sufficient supply of additional traffic control equipment in order to quickly execute any field changes as directed by the Engineer for the convenience of public traffic.

Furnish the City of San Luis Obispo with the written names and phone numbers of the personnel to be contacted after hours for hazardous conditions to traffic that may require additional protective measures.

7-1.04 PUBLIC SAFETY

Replace 15th 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.

7-1.06 INSURANCE

Replace Section 7-1.06 with:

7-1.06A GENERAL

Procure and maintain for the duration of the contract, insurance against claims for:

1. injuries to persons
2. damages to property

which may arise from or in connection with the performance of the work by your:

1. agents
2. representatives
3. employees
4. subcontractor

Provide:

1. Commercial General Liability Insurance
2. Commercial General Liability Insurance Endorsement
3. Automotive Liability Insurance
4. Automotive Liability Insurance Endorsement
5. Workers' Compensation Insurance

The Contractor agrees to defend, indemnify and hold harmless the City from and against any and all fines or mitigation measures imposed on the City arising out of the Contractor's actual or alleged violation of any local, state or federal regulation, as well as all attorney fees, costs and expenses of any kind which directly or indirectly arise out of or are in any way associated with enforcing this indemnity provision against the Contractor.

7-1.06B Minimum Scope of Insurance

Coverage must be at least as broad as:

1. Insurance Services Office Commercial General Liability coverage:
 - a. CG 20 10 Prior to 1993
 - b. CG 20 10 07 04 with CG 20 37 10 01
2. Insurance Services Office form number CA 0001 (January 1987 Edition) covering Automobile Liability, code 1 (any auto).
3. Workers' Compensation insurance as required by the State of California and Employer's Liability Insurance.

7-1.06C Minimum Limits of Insurance

Maintain insurance limits no less than:

1. General Liability: \$1,000,000 per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability or other form with a general aggregate limit is used, either the general aggregate limit must apply separately to this project/location or the general aggregate limit must be twice the required occurrence limit.
2. Automobile Liability: \$1,000,000 per accident for bodily injury and property damage.
3. Employer's Liability: \$1,000,000 per accident for bodily injury or disease.

7-1.06D Deductibles and Self-Insured Retentions

Any deductibles or self-insured retentions must be declared to and approved by the City. At the option of the City, either:

1. the insurer must reduce or eliminate the deductibles
2. procure a bond guaranteeing payment of:
 - a. losses and related investigations
 - b. claim administration and defense expenses.

7-1.06E Other Insurance Provisions

The general liability and automobile liability policies are to contain, or be endorsed to contain, the following provisions:

1. The City, its officers, officials, employees, agents and volunteers are to be covered as insureds as respects:
2. liability arising out of activities performed by or on behalf of you
3. your products and completed operations
4. premises owned, occupied or used by you
5. automobiles owned, leased, hired or borrowed by you
6. The coverage must not contain special limitations on the scope of protection afforded to the City and its:
 - a. officers
 - b. officials
 - c. employees
 - d. agents
 - e. volunteers
7. For any claims related to this project, your insurance coverage will be the primary insurance for the City and its:
 - a. officers
 - b. officials
 - c. employees
 - d. agents
 - e. volunteers.
8. Any insurance or self-insurance maintained by the City is in excess to your insurance and will not contribute to it.
9. Any failure to comply with reporting or other provisions of the policies including breaches of warranties must not affect coverage provided to the City and its:
 - a. officers
 - b. officials
 - c. employees
 - d. agents
 - e. volunteers

10. Your insurance must apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.
11. Each insurance policy required must be endorsed to state that coverage will not be:
 - a. Suspended
 - b. Voided
 - c. canceled by either party
 - d. reduced in coverage or in limitsexcept after thirty days prior written notice provided by certified mail with return receipt requested has been given to the City.
12. Coverage may not extend to any indemnity coverage for the active negligence of the additional insured in any case where an agreement to indemnify the additional insured would be invalid under Subdivision (b) of section 2782 of the Civil Code.

7-1.06F Acceptability of Insurers

Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A:VII.

7-1.06G Verification of Coverage

Furnish the City with a certificate of insurance showing required insurance coverage. Original endorsements effecting general liability and automobile liability coverage must be provided. The endorsements are to be signed by a person authorized by that insurer to bind coverage on its behalf. All endorsements are to be received and approved by the City before work commences.

7-1.06H Subcontractors

Include all subcontractors as insured under its policies or provide separate certificates and endorsements for each subcontractor. All insurance coverage for subcontractors are subject to same requirements as the prime contractor.

7-1.06I PRIVATE CONTRACT

A certificate of liability insurance with at least \$1 million in general liability coverage and a CG 2012 additional insured endorsement attached to it.

8 PROSECUTION AND PROGRESS

8-1 GENERAL

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 that 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 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

Because of any:

1. Project problem
2. Change orders
3. Delay

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

Monthly 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.

8-1.03 PRECONSTRUCTION CONFERENCE

Add to Section 8-1.03

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.

All listed subcontractors performing contract work must attend the preconstruction meeting.

At a minimum, provide the following submittals at the preconstruction meeting:

1. emergency contact list
2. representative at the site of work authorized to sign extra work tickets
3. representative authorized to sign change orders
4. Caltrans equipment rental rates for equipment used to complete work
5. work schedule
6. traffic control application
7. traffic control plans
8. water pollution control plan
9. location of construction yard
10. location of disposal site
11. evidence construction yard is correctly permitted if construction yard is not your business address
12. evidence disposal yard is correctly permitted.
13. door hanger for notification of adjacent properties

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.

8-1.10 LIQUIDATED DAMAGES

8-1.10A General

Replace 3rd and 4th paragraphs 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, the City and its residents will sustain damage. 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

9-1 GENERAL

9-1.02 MEASUREMENT

9-1-02A General

Add to Section 9-1.02A

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

9-1.03 PAYMENT SCOPE

Delete the 11th through 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. The City pays 7% annually (0.58% monthly) on unpaid claim amounts that are ultimately approved beginning 60 days after claim approval.

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 item 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

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 everyday. 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.

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.

9-1.16 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.

Undisputed portions of a claim will be paid within 60 days after the City issues its written statement. Claim resolution payment after 60 days are subject to additional interest payment in compliance with Section 9-1.03.

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

9-1.16E Withholds

9-1.16E(2) Progress Withholds

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, because of your failure to comply with regulations and permits.

9-1.16E(4) Stop Notice Withholds

Replace the 2nd paragraph in Section 9-1.16E(4) with:

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

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)(d) Waiver

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

13. 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 ARBITRATION

Replace Section 9-1.22 with:

9-1.22 CLAIM RESOLUTION PROCEDURE

Claim Resolution Procedure is as follows:

1. You must submit all claims by registered mail or certified mail with return receipt requested. You shall furnish reasonable documents to support the claim.
2. The Engineer will submit a written response to you for each claim within 45 days after the Engineer's receipt of a claim. The 45-day deadline is extended if mutually agreed by you and the Engineer. If the Engineer needs approval from the City Council to provide you with a written statement identifying the disputed portion and the undisputed portion of the claim, and the City Council does not meet within the 45 days or within the mutually agreed extension of time, the Engineer shall have up to 3 days following the next duly noticed meeting of the City Council after the 45 day period, or extension, expires to provide you with a written statement identifying the disputed portion and the undisputed portion of the claim.
3. 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.

4. Within 10 business days after the informal meeting, the Engineer will submit a written response to you for the claim submitted identifying the portion of the claim that remains in dispute and the portion that is undisputed.
5. Following the informal meeting, if any claim or portion thereof remains in dispute, as identified by you in writing, the claim will be submitted to non-binding mediation, with parties sharing the associated costs equally. Both parties must agree to a mediator within 10 working days. If parties are unable to mutually agree on mediator, each party must select a mediator and those mediators must select a qualified neutral third party to mediate regarding the disputed portion of the claim. Each party is responsible for the fees and costs charged by its respective mediator in connection with selecting the neutral mediator. If mediation is unsuccessful, the portion of the claim remaining in dispute will be subject to any applicable procedure outside of this claim resolution procedure.
6. Failure by the Engineer to respond to a claim from a contractor within the time periods described result in the claim being rejected in its entirety.

Add to Section 9-1

9-1.23 CITY BILLING

After given the opportunity, you fail to complete any of the following:

1. maintain the project site,
2. complete project work,
3. any other cause which requires City staff to complete work at the project site;

you must reimburse the City.

Where City staff and equipment are used for work, billing will be done at the hourly billing rate for City staff. 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

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.

A traffic control system shall consist of signing, flagging, using of pilot vehicles and/or closing traffic lanes or streets in compliance with:

1. the details shown on the Standard Plans,
2. the provisions of Section 7-1.03, Public Convenience of the Standard Specifications
3. the provisions of Section 7-1.04 Public Safety of the Standard Specifications
4. the Manual on Uniform Traffic Control Devices and the California supplement
5. these Special Provisions.

The traffic control system shall provide for the convenience and safety of both vehicles and pedestrians.

Personal vehicles of the Contractor's employees shall not be parked on the traveled way or shoulders of the construction zone, including any section closed to public traffic. Employees' personal vehicles may be parked on adjacent streets within the legal parking areas.

At no time without prior permission of the City of San Luis Obispo shall any roadway be closed to vehicular traffic. Alternative path/walkways shall be provided by the contractor to maintain pedestrian traffic at all times.

All traffic coordination will require the City Engineer's approval seventy-two (72) hours prior to placing of any traffic restrictions.

12-1.03 CONSTRUCTION

Add to Section 12-1.03.

Flaggers may be required for the adequate control of public traffic; the full cost of such flagging is paid for as "Traffic Control". Each flagger shall be equipped with a "Stop/Slow" paddle [C28A/B], a means of communication with other flaggers (radio, hand signals, or pilot car), and a clean bright orange vest, shirt or jacket. A minimum of two flaggers shall be provided for reversible lane control.

Furnishing and operating a pilot car during operations (including driver, radios, and any other equipment and labor required), at the option of the Contractor, and furnishing and operating the flashing arrow sign trucks (including drivers and any other equipment and labor required), is included in the payment for Temporary Traffic Control.

If required in the traffic control plan, and always during one-way traffic control, flagmen will be required to direct traffic during construction. The number and location of flagmen shall be sufficient to allow safe control and passage of traffic through the work zone.

Traffic control devices not placed in accordance with approved plans shall be cause to stop construction by a City inspector.

If any component in the traffic control system is damaged, displaced, or ceases to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair said component to its original condition or replace said component and shall restore the component to its original location. Failure by the Contractor to continuously maintain the approved traffic control devices shall be sufficient cause for the Engineer to stop all work protected by or associated with such approved traffic control devices.

All warning devices used during hours of darkness shall be reflectorized.

The Contractor shall furnish and post signs where necessary to inform the public about closures or restrictions at parking area entrances.

The Contractor shall have a sufficient supply of extra signs available at or near the project site to erect additional signs requested by the Engineer during the course of the work.

Each vehicle used to place, maintain and remove components of a traffic control system on multi-lane roadways shall be equipped with a Type II flashing arrow sign which shall be in operation when the vehicle is used for placing, maintaining or removing said components. The sign shall be controllable by the operator of the vehicle while the vehicle is in motion. The flashing arrow sign shown on the Standard Plans shall not be used on the vehicles which are doing the placing, maintaining, and removing, and shall be in place before a lane closure requiring its use is completed.

When traffic cones or delineators are used to delineate a temporary edge of traveled way, the line of cones or delineators shall be considered to be the edge of the traveled way. However, the Contractor shall not reduce the width of an existing lane to less than ten (10) feet without written approval from the Engineer. The provisions of this paragraph shall not apply to a work area protected by a permanent or temporary railing or barrier.

All traffic control equipment shall be of standard size unless reduced sizes are specifically approved by the Engineer and shall conform to the provision of the Manual on Uniform Traffic Control Devices and the California supplement.

12-1.04 PAYMENT

Replace Section 12-1.04 with:

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.

12-4 MAINTAINING TRAFFIC

12-4.01 GENERAL

12-4.01A General

Add to Section 12-4.01A.

Except as otherwise provided, the full width of the traveled way shall be open for use by public traffic on Saturdays, Sundays, and designated legal holidays and when construction operations are not actively in progress.

Minor deviations from the requirements of this section concerning hours of work which do not significantly change the cost of work may be permitted upon the written request of the Contractor if, in the opinion of the Engineer, public traffic will be better served and the work expedited. Such deviations shall not be adopted until the Engineer has indicated approval.

12-6 TEMPORARY PAVEMENT DELINEATION

12-6.01 GENERAL

Add to Section 12-6.01.

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.

12-6.02 MATERIALS

12-6.02B Temporary Pavement Markers

Add to Section 12-6.02B

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.

12-6.03 CONSTRUCTION

12-6.03A General

Add to Section 12-6.03A

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 stripping 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 (WPCP). A simplified WPCP plan form may be obtained on the City's website:

www.slocity.org/government/department-directory/public-works/documents-online/construction-documents

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.

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.

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

13-1.01D Quality Assurance
13-1.01D(4) Water Pollution Control Manager
13-1.01D(4)(b) General

Add to Section 13-1.01D(4)(b)

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.

13-1.04 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.

13-3 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.

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 RESOURCES

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.) 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. If potentially significant cultural resources are discovered during 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. If 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 14-11.01.

14-11.01A Health And Safety Plan

If contamination exists in the work area, prepare and submit a site-specific Health and Safety Plan (HSP) for the review of 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.

14-11.03 HAZARDOUS WASTE MANAGEMENT
Add to Section 14-11.03

14-11.03A 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

14-11.07 CITY – GENERATED HAZARDOUS WASTE
Add to Section 14-11.07

14-11.07C Payment

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 Section 3-6 and applicable Engineering Standards is included in the payment for other bid items unless a bid item of work is shown on the bid list item. Contaminated material work performed under Section 3-6 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.

15 EXISTING FACILITIES

15-1 GENERAL

15-1.03 CONSTRUCTION

15-1.03A General

Add to Section 15-1.03A.

Locate and protect existing irrigation facilities that are not identified to be removed. Contact Underground Service Alert (1-800-642-2444) for location and identification work. Contact property owner to obtain record information. If existing facilities are damaged by your work, you must repair them immediately at your expense and to the satisfaction of the owner.

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 your operation must be replaced in compliance with section 86 within two working days and as directed by the Engineer.

15-1.03B Removing Concrete

Replace 7th paragraph of Section 15-3.03B with:

Dispose of concrete outside the right-of-way.

15-1.03C Salvaging Facilities

Add to Section 15-1.03C

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

15-1.03D Adjust Frames, Covers, Grates and Manholes

Replace Section 15-1.03D with:

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.

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.

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.

**DIVISION III EARTHWORK AND LANDSCAPE
17 GENERAL**

**17-1 GENERAL
17-1.01 GENERAL**

Add to Section 17-1.01.

Protect trees not marked for removal in compliance with 77-1.03A(2)(j).

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.

19 EARTHWORK

19-1 GENERAL

19-1.01 GENERAL

19-1.01B Definitions

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 Unsuitable Material

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.

19-1.03B Unsuitable Material

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 and for which there is no separate pay item, is paid for in other items 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.

Add to Section 19-1.03

19-1.03E 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

Replace Section 19-1.04 with:

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.

The City does not pay for the volume of excavation occupied by the new improvements or backfill.

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

Add to Section 20-1.01C

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

20-1.02 MATERIALS

Add to section 20-1.02

20-1.02D 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.

20-1.02E 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	
		Quantity	Size
		1 tablet	#1 or #2
		2 tablets	#5
Trees and Plants	Agriform (20-10-5) 21 gram tablet	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 General

Add to Section 20-1.03A

20-1.03A(1) Progress Inspections

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 Cultivate

Replace section 20-1.03D with:

Cultivate 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.

Add to section 20-1.03

20-1.03F 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.

20-1.03G 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

20-1.03H 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 must be one inch below adjacent elevations and, in areas that will receive mulch the finish grade must be two inches below adjacent elevations, when adjacent to:
 - a. paving
 - b. header boards
 - c. concrete mow strips
 - d. curbs, valve boxes
 - e. etc
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.

20-2 IRRIGATION

20-2.01 GENERAL

20-2.01A General

20-2.01A(3) Submittal

Add to section 20-2.01A(3)

20-2.01A(3)(c) Record Drawings

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.

20-2.01A(4) Quality Assurance

20-2.01A(4)(b) Pressure Testing

20-2.01A(4)(b)(i) General

Add to Section 20-2.01A(4)(b)(i)

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 manufacture’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.

Replace Section 20-2.01A(4)(b)(ii) with:

20-2.01A(4)(b)(ii) Cross-Connection Test (Recycled Water Irrigation System Only)

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.

20-2.01A(4)(b)(iii) Method B

Delete Section 20-2.01A(4)(b)(iii)

20-2.01A(4)(c) Sprinkler Coverage Check

Add to Section 20-2.01A(4)(c)

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.

20-2.01A(4)(d) Irrigation System Functional Test

Add to Section 20-2.01A(4)(d)

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.

Add to Section 20-2.04A(4)(d)

20-2.01A(4)(d)(1) Drip Irrigation Operational Test

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 (Schradner 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.

20-2.01B Materials

Add to section 20-2.01B(1)

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.

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

20-2.01B(5) Pull Boxes

Add to Section 20-2.01B(5) 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

20-2.01B(6) Unions

Add to Section 20-2.01B(6)

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

Add to Section 20-2.01B

20-2.01B(9) Sprinklers

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

20-2.01C Construction
20-2.01C(1) General

Add to Section 20-2.01C(1)

Work must comply with section 77-1.

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

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.

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.

20-2.01C(2) Trenching and Backfill

Add to section 20-2.01C(2)

20-2.01C(2)a General

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

20-2.01C(2)b Irrigation

Install water supply lines and irrigation 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 sleeves that are two times larger in diameter than water supply 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.

Install conductors in the same trench as the supply line whenever possible.

20-2.01D Payment

Replace Section 20-2.01D with:

Full compensation for work specified in section 20-2 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.

20-2.04 CONTROL AND NEUTRAL CONDUCTORS

20-2.04C Construction

20-2.04C(1) General

Replace Section 20-2.04C(1) with:

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 any of the following colors:

1. white
2. black
3. green

For control conductor insulation. 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.

20-2.04C(2) Conductors in Open Trench

Add to Section 20-2.04C(2)

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.

20-2.04C(3) Conductors in Conduit

Replace Section 20-2.04C(3) 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.

20-2.04C(4) Splicing

Replace 2nd paragraph in Section 20-2.04C(4) 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

Add to Section 20-2.04C(4)

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.

20-2.06 IRRIGATION CONTROLLERS

20-2.06A General

20-2.06A(3) Maintenance And Operations Manuals

Replace section 20-2.06A(3) 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.

20-2.06B Materials

20-2.06B(2) Irrigation Controllers

20-2.06B(2)(a) General

Replace section 20-2.06B(2)(a) 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).

You must follow all applicable codes and provide a licensed electrician for the work.

Use stainless steel outdoor enclosures.

20-2.08 IRRIGATION SUPPLY LINE

20-2.08B Materials

20-2.08B(2) Copper Pipe Supply Line

Add to section 20-2.08B(2)

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.

20-2.08B(3) Galvanized Steel Pipe Supply Lines

Add to section 20-2.08B(3)

Galvanized steel pipe is not allowed.

20-2.08B(4) Drip Irrigation Tubing

Replace section 20-2.08B(4) 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.

20-2.08C Construction

20-2.08C(1) General

Add to section 20-2.08C(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.

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.

20-2.08C(3) Drip Irrigation Tubing

Add to Section 20-2.08C(3)

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.

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.

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.

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.

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.

20-2.08C(4) Plastic Pipe Supply Line

Add to Section 20-2.08C(4)

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.

Add to Section 20-2.08C

20-2.08C(5) Recycled Water Supply Line

Lay pipe with wording facing up.

20-2.10 Valves

20-2.10A General

Add to Section 20-2.10A

Use precast concrete or plastic valve boxes that are lockable.

20-2.10B Materials

20-2.10B(3) Check Valves

Add to Section 20-2.10B(3)

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

20-2.10B(4) Drip Valve Assemblies

Add to section 20-2.10B(4)

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.

20-2.10B(5) Garden Valves

Replace section 20-2.10B(5) with:

Hose bib valves must be:

1. bronze or brass
2. ¾-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.

20-2.10B(9) Quick Coupling Valves

Add to section 20-2.10B(9)

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.

20-2.10B(10) Remote Control Valves

20-2.10B(10)a General

Replace Section 20-2.10B(10)a with:

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 PLANTING

20-3.01 GENERAL
20-3.01A General
20-3.01A(1) Summary

Add to section 20-3.01A(1)

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.

20-3.01A(4) Quality Assurance

Add to Section 20-3.01A(4)

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.

20-3.01B Materials
20-3.01B(2) Plants
20-3.01B(2)(c) Sod

Add to Section 20-3.01B(2)(c)

Furnish drought tolerant, fine bladed tall fescue sod.

Add to Section 20-3.01B(2)

20-3.01B(2)(d) Hand Seeded Turf

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)

20-3.01B(2)(e) Hydroseeded Lawn Planting

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.

20-3.01B(4) Fertilizers

Add to Section 20-3.01B(4)

20-3.01B(4)(e) Iron Sulfate

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.

20-3.01C Construction

20-3.01C(2) Pruning

Replace section 20-3.01C(2) 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.

20-3.02 Planting Work

20-3.02C Construction

20-3.02C(2) Preparing Planting Areas

Add to section 20-3.02C(2)

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.

20-3.02C(3) Planting Plants

20-3.02C(3)(a) General

Add to Section 20-3.02C(3)(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.

20-3.02C(3)(c) Groundcover Plants

Add to section 20-3.02C(3)(c)

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.

20-3.02C(3)(d) Cuttings, Liners, Plugs, and Seedling Plants

20-3.02C(3)(d)(vi) Plug Planting

Add to Section 20-3.02C(3)(d)(vi)

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.

20-3.02C(3)(e) Sod

Add to Section 20-3.02C(3)(e)

Establish sod subgrade taking into account thickness of sod that will be installed. Sod subgrade is equivalent to finished ground 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.

Add to section 20-3.02C(3)

20-3.02C(3)(f) Hand Seeded Lawn

Mow and remove vegetation from area to be seeded. Loosen the top 2 inches of the soil with verticutting blades or by light cultivation.

After finish grading, rake the soil surface and apply seed. Apply seed in uniform amounts in in two opposite directions.

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. Cover the area with mulch evenly to a depth of ¼ inch. Roll area with an empty roller, then thoroughly water.

Planting must occur in late summer or early fall, before the first rain of the season.

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.

20-3.02C(3)(g) Wildflower Seeding

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.

20-4 PLANT ESTABLISHMENT WORK

20-4.01 GENERAL

20-4.01A Summary

Replace Section 20-4.01A with:

Section 20-4 includes specifications for performing plant establishment workcaring for the planting including: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.

20-4.03 CONSTRUCTION
20-4.03G Watering

Add to Section 20-4.03G

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.

Add to section 20-4.03

20-4.03H Turf Protection

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.

20-4.03I Mowing and Edging

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.

20-4.03J Pruning

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.

20-4.03K Staking and Guying

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.

20-4.03L Pest and Disease Control

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 chlorinated hydrocarbons or organic phosphate-based pesticides.

20-4.03M Weeding

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.

20-4.03N Fertilization

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.

20-4.03O Plant Replacement

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.

20-4.03P Irrigation System

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.

20-4.03Q Damage

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

20-4.04 PAYMENT

Replace Section 20-4.04 with:

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.

20-5 LANDSCAPE ELEMENTS

20-5.02 EDGING

20-5.02B Materials

20-5.02B(2) Heading Board Edging

Replace Section 20-5.02B(2) 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.

20-5.02B(3) Metal Edging

Add to section 20-5.02B(3)

Use metal edging that is a minimum of 1/8" thick.

20-5.03 INERT GROUND COVERS AND MULCHES

20-5.03A General

20-5.03A(3) Construction

20-5.03A(3)(c) Treatment of Soil

Add to section 20-5.03A(3)(c)

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.

21 EROSION CONTROL

21-2 EROSION CONTROL WORK

21-2.02 MATERIALS

21-2.02F Seed

Add to Section 21-2.02F

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

21-2.03 CONSTRUCTION

21-2.03D Hydromulch and Hydroseed

Add to section 21-2.03D

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.

**DIVISION IV SUBBASES AND BASES
26 AGGREGATE BASES**

26-1 GENERAL

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
$\frac{3}{4}$ inch	100
$\frac{1}{2}$ inch	95-100
$\frac{3}{8}$ 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
37-2.01 GENERAL
37-2.01B Materials

Add to Section 37-2.01B

Asphalt Emulsion must comply with Section 94.

37-2.04 ASPHALTIC EMULSION SEAL COAT
37-2.04B Nonpolymer Asphaltic Emulsion Seal Coat
37-2.04B(2) Materials

Add to Section 37-2.04B(2).

Use Fine 1/4" max seal coat gradation.

37-2.04C Polymer Asphaltic Emulsion Seal Coat
37-2.04C(2) Materials

Add to Section 37-2.04C(2).

Use Fine 1/4" max seal coat gradation.

37-3 SLURRY SEAL AND MICRO-SURFACING
37-3.01 GENERAL
37-3.01D Quality 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:

1. 360,000 square yards or
2. 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 contaminates such as grease or oil spots to allow for proper adhesion of seal coat.

If seal coat placement includes locations where a bike lane is located immediately adjacent to a concrete gutter, grind pavement surface flush prior to application of seal coat. 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

Delete Section 39 of the State of California, Department of Transportation Standard Specifications dated 2015.

Add Section 39 of the State of California, Department of Transportation Standard Specifications dated 2010.

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.

39-1.02F Reclaimed Asphalt Pavement (RAP)

Add to Section 39-1.02F

Reclaimed asphalt pavement may be used for paving operations less than 20 tons per day. Paving operations more than 20 tons per day must use virgin asphalt concrete.

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 96-1.02L.

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

Replace section 39-2 with:

Acceptance Criteria, Testing:

HMA Type A, Type B, and RHMA-G shall be placed at 91-97 percent of maximum theoretical density. For percent maximum theoretical density, the Engineer determines a deduction for each test result outside the specifications using the reduced payment factors shown in the following table:

Reduced Payment Factors for Percent of Maximum Theoretical Density

HMA Type A and B and RHMA-G percent of maximum theoretical density	Reduced payment factor	HMA Type A and B and RHMA-G percent of maximum theoretical density	Reduced payment factor
91.0	0.0000	97.0	0.0000
90.9	0.0125	97.1	0.0125
90.8	0.0250	97.2	0.0250
90.7	0.0375	97.3	0.0375
90.6	0.0500	97.4	0.0500
90.5	0.0625	97.5	0.0625
90.4	0.0750	97.6	0.0750
90.3	0.0875	97.7	0.0875
90.2	0.1000	97.8	0.1000
90.1	0.1125	97.9	0.1125
90.0	0.1250	98.0	0.1250
89.9	0.1375	98.1	0.1375
89.8	0.1500	98.2	0.1500
89.7	0.1625	98.3	0.1625
89.6	0.1750	98.4	0.1750
89.5	0.1875	98.5	0.1875
89.4	0.2000	98.6	0.2000
89.3	0.2125	98.7	0.2125
89.2	0.2250	98.8	0.2250
89.1	0.2375	98.9	0.2375
89.0	0.2500	99.0	0.2500
< 89.0	Remove and replace	> 99.0	Remove and replace

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 ¾" 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 ½" aggregate grading.

Provide leveling course conforming to the requirements of type B asphalt concrete ¾" aggregate grading.

39-3.02 ACCEPTANCE CRITERIA

Add to section 39-3.02.

39-3.02B Testing During Placement

Obtain special inspection services of a geotechnical 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.

42 GROOVE AND GRIND CONCRETE

42-3 GRINDING

42-3.03 CONSTRUCTION

42-3.03A General

Add to Section 42-3.03A.

42-3.03A(1) Equipment

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.

42-3.03B Pavement

Add to Section 42-3.03B.

Provide the:

1. Depth
2. Width
3. 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 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.

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.

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.

**DIVISION VI STRUCTURES
51 CONCRETE STRUCTURES**

**51-1 GENERAL
51-1.02 MATERIALS
51-1.02A 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 Reinforcement**

Add to Section 52-1.02B.

Do not substitution reinforcement bars with welded wire reinforcement, unless:

1. Specified,
2. Shown, or
3. Provided for in Engineering Standards.

56 OVERHEAD SIGN STRUCTURES, STANDARDS, AND POLES

56-2 OVERHEAD SIGN STRUCTURES

56-2.01 GENERAL

56-2.01C Submittals

56-2.01C(3) Quality Control Program

Add to Section 56-2.01C(3).

A quality control plan is not required when the total number of signs installed is less than 100.

56-2.02 MATERIALS

56-2.02A General

Add to Section 56-2.02A

Signs must include a graffiti guard coating.

**DIVISION VII DRAINAGE FACILITIES
64 PLASTIC PIPE**

**64-2 PLASTIC PIPE
64-2.02 MATERIALS
64-2.02A General**

Add to Section 64-2.02A.

Solid wall Polyvinyl Chloride (PVC) pipe is an approved plastic pipe. PVC pipe may not be used if exposed to sunlight.

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.

64-2.03 CONSTRUCTION

Delete Section 64-2.03.

64-2.04 PAYMENT

Delete Section 64-2.04.

66 CORRUGATED METAL PIPE

Delete Section 66.

67 STRUCTURAL PLATE CULVERTS

Delete Section 67.

DIVISION VIII MISCELLANEOUS CONSTRUCTION
73 CONCRETE CURBS AND SIDEWALKS

73-1 GENERAL

73-1.01 GENERAL

Add to Section 73-1.01.

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. 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 to provide an acceptable transition between the existing pavement and the new lip of the gutter.

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.

Earthwork must comply with Sections 19 and 77-1.

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.

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 $\frac{1}{4}$ " 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.

When removing existing sidewalk, you may request and the Engineer may approve, a sawcut line at the back of curb when the existing curb and gutter is not cracked, damaged or failed. Replace curb and gutter when required by the Engineer.

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 Curing

Replace Section 73-1.03E with:

Immediately after completing the finishing operations, apply concrete curing compound number 4 in compliance with Section 90-1.03B(3) which is a no pigmented curing compound type 1 class B to all exposed concrete surfaces.

Add to Section 73-1.03.

73-1.03F Expansion and Contraction Joints

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.

73-1.03G 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 Asphalt Concrete 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.

The City does not pay for the volume of excavation occupied by the new improvements or backfill.

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.

73-4.01C Submittals

Add to section 73-4.01C.

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, ½ inch minimum thickness or approved equal.

Add to section 73-4.02.

73-4.02A Mortar

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

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.

Add to section 73-4.03.

73-4.03A Tile

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 GENERAL

75-1.02 MATERIALS

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.

Prior to excavation, sawcut on all sides of:

1. Pavement
2. Curb
3. Gutter
4. Sidewalk

Do not overcut the corners. If corners are overcut, corners must be repaired to the satisfaction of the Engineer.

Earthwork must comply with Section 19.

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.

Concrete must comply with Section 90.

Use Class 2 concrete for thrust blocks and encasement. You may use Class 1, or other approved mix.

Excavation and restoration includes removal of concrete.

Protection and restoration of survey monuments and bench marks must comply with Section 5-1.26 and 5-1.36.

Reinforcement steel must comply with Section 52.

77-1.02 MATERIALS

77-1.02A Base Materials

Unless shown otherwise, concrete street pavement or thickened asphalt concrete pavement 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.

Use Class 2 concrete for thrust blocks and encasement. You may use Class 1, or other approved mix.

77-1.02B Slurry Cement Backfill (One Sack)

Slurry cement backfill must comply with Section 19-3.02E.

Reduce the cement content of slurry specified in Section 19-3.02E 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

Use tracer wire that conforms to #12 AWG, high strength solid copper clad steel conductor, insulated with a 30 mil, high density, high molecular weight polyethylene (HDPE) insulation, rated for direct burial use.

Place tracer wire in trenches as required in the Engineering Standards.

Coil approximately 12 inches inside associated valve wells for easy access for pipeline locating work. Place wire on outside of stacking.

Add G-5 box at each manhole and sewer lift station for separation between locating wire and sewer manhole. Label lid "SEWER".

77-1.02C(3) Tracer Material Testing

Use utility locator to locate all tracer material after backfill and compaction but prior to paving. Repair any discontinuous tracing tap or wire and repeat test until completed successfully.

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

To conduct the work, prevent damage, and interrupted utility service.

Mark out the area to be excavated. Obtain USA markings by calling USA 1-800-642-2444. 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 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.

Pothole 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 trust blocks as needed to complete the work.

77-1.03A(1)(b) Sewerlines

Every property has one or more sewer laterals. Sewer laterals are private owned and will not be marked by Underground Service Alert. 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 must be orange safety fencing secured with steel t-post set at 8 feet on center.

Tree protection fences must:

1. Be installed before any work begins
2. Remain in place
3. Continually maintained
4. 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 emergent 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 clean cut.

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. The Engineer prior to backfilling trench must review pruned or cut roots. 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 that 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 pipeline 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 6-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 bedding 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. Adjust 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. You may only snap cut asbestos cement pipe.

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 required.

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 to 95% compaction.

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

Compact backfill to 95% relative compaction. 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 1 work day,

1. Excavation shoring and
2. 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 35 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 35 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	1/2 inch
18 inches	3/4 inch
24 inches	7/8 inch
36 inches	1 inch
48 inches	1 1/4 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

1. Facility or
2. Improvement

As specified and per Engineering Standards.

77-1.03D(1) Portland Cement Concrete Pavement

Place, consolidate, and finish concrete street pavement.

77-1.03D(2) Asphalt Concrete (AC) Pavement

Asphalt concrete and tack coat must comply with Section 39.

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 any:

1. Overlays
2. Pavement fabrics
3. Grids
4. Prime coat
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

Water system main pipeline may be Ductile Iron, or PVC. Recycled water system main pipeline must be Ductile Iron. Do not use PVC pipe for recycled water system mains.

Furnish complete with all fabricated fittings, and other appurtenances as necessary, for a complete and functional system.

The materials must be free of:

1. Visible cracks
2. Holes
3. Foreign inclusions, or
4. Other defects.

Any materials not meeting these criteria will be rejected.

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 sealcoated- cement lining of 1/16-inch minimum thickness, all conforming to applicable ASA and AWWA Specifications
8. Conform to AWWA C151 exterior coatings with 10mils of coating

77-2.02B(2) Polyvinyl Chloride (PVC) Pipe

Polyvinyl Chloride (PVC) pipe must:

1. Comply with AWWA C900 Standards
2. Be pressure class 235, DR-18
3. Be blue in color.

77-2.02B(3) 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.

77-2.02C Joints and Fittings

All fittings must be cement lined by the centrifugal process in compliance with ANSI AWWA C104/A21.4. Cement lining must be standard thickness.

Joint and fitting types must be:

1. Mechanical
2. Compressed gasket,
3. Flanged, or
4. Flexible coupling type.

Pressure rating for all joints and fittings must be equal to or greater than the connecting pipe.

Flanged and mechanical joint type fittings must be ductile iron and conform to:

1. ANSI/AWWA C110/A21.10
2. ANSI/AWWA C111/A21.11
3. ANSI/AWWA C151/A21.15

Compressed gasket joint type must use a single elongated rubber gasket to seal joint such as Tyton, Fastite, or an approved equal conforming to ANSI/AWWA C111/A21.11.

Flexible coupling type must be either:

1. Dresser,
2. Smith-Blair,
3. Victaulic, or
4. Approved equal.

The couplings must be straight or transition as shown and must conform to ANSI/AWWA C219.

Nuts and bolts for flanged fittings, mechanical fittings and couplings must be coated with a baked-on fluorocarbon resin such as Trumbull Cor-Blue, Romac R-Blue, or an approved equal.

77-2.02C(1) Solid Sleeves

Solid sleeves must be ductile iron with flanged or mechanical joints ends. Minimum sleeve length is 1 foot.

77-2.02D Valves

77-2.02D(1) Gate Valves (3 inch to 12 inch)

All gate valves must be either:

1. AVK
2. Clow F-6100
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 (14 inch to 24 inch)

All butterfly valves must be either:

1. Dresser 450
2. Mueller Line Seal III
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 neck down, 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. When depth of valve operating unit exceeds 36", the operating nut must be extended to within 24" of ground surface.
 - 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

1. Check valves must be either:
2. Renssalaer
3. Mueller
4. 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
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

Hypochlorite must conform to the American Water Works Association Specification B30055 AWWA "Standard for HypoChlorites".

Liquid Chlorine must conform to the American Water Works Association Specification B301-57T, "Tentative AWWA Standard for Liquid Chlorine".

77-2.02G Tapping Sleeves

Tapping sleeve shall be Romac SST or approved equal. Tapping valve shall meet AWW C509 and shall be Mueller T2360 or approved equal.

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 may not be used.

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 that could result in the release of asbestos fibers is prohibited.

Asbestos Cement Pipe, if not either:

1. Broken
2. Crushed
3. Friable

It is not a hazardous waste. Verify with landfill prior to disposal.

77-2.03A(2) Poly Vinyl Chloride (PVC) Pipe Installation

Install PVC water pipe in compliance with AWWA C605 Standards.

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 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 NSF approved pipe joining lubricant 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. Torque 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 enter the pipe.
5. Wipe clean and place in proper alignment the plain beveled end of pipe with the bell of the pipe to be joined.
6. 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.
7. Fit the plain end of the pipe into the socket so that it is in contact with the gasket.
8. Join the pipes by exerting sufficient force on the plain end pipe and is moved past the gasket contacting 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

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-degrees 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 be raised 6 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. The Engineer must approve all tools and equipment used for installation.

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.

Swab the interior of all pipes with a one (1) to five (5) percent hypochlorite disinfecting solution. 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 coordinate the shutdown of the existing water system for new pipeline tie-ins. Notify the Engineer 24 hours in advance of need to shut down the existing waterline. 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.
8. Inspect saddle and replace if needed.

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. Notify property owners with fire sprinklers of fire watch requirements. 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

Fire watch requirements are as follows:

2013 California Fire Code - 901.7 Systems out of service.

Where a required fire protection system is out of service, the fire department and the fire code official shall be notified immediately and, where required by the fire code official, the building shall either be evacuated, or an approved fire watch shall be provided for all occupants left unprotected by the shutdown until the fire protection system has been returned to service.

Where utilized, fire watches shall be provided with at least one approved means for notification of the fire department and their only duty shall be to perform constant patrols of the protected premises and keep watch for fires.

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 notification

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 one working days prior to water shutdown.

Notify the Engineer one working days prior (or with first public notice) to water shutdown to schedule exercising of existing valves to accommodate service interruption.

All service interruption or shutdowns 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 and AWWA Standards.

An RP 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 portions of the new water facility fail testing.

77-2.03J(1) Sampling

Provide sample station. Sampling station may be a threadless 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 another 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 are 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 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 blowoffs 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);
and
2. Maintain pressure for two hours.
3. Evaluate leakage

4. After steps 1 and 2, 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; and
5. Maintain pressure for four hours.
6. 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

New sewer main pipeline material must be HDPE. When repairing existing pipeline, comply with Section 77-3.03F(3).

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:

14. Virgin grade
15. High molecular weight
16. Standard Dimension Ratio (SDR) 17
17. 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 that 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

Pipe joints must be glued or fused.

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.

Joints and Fittings for HDPE must be of the same manufacturer as the pipe and the same SDR rating.

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 that 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 and the same SDR rating, 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

To make mortar, use one part of Type II Portland cement and two parts sharped grained particles that are:

1. Clean
2. Hard
3. All passing a # 4 sieve

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 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 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.

All connections to the sewer pipe must be water tight, flush with the edges of the sewer pipe with clean uniform cuts.

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 always be installed 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 lateral is out of service and not needed. If the lateral is out of service and not needed, the Engineer will direct you to abandon the lateral. In these cases, the pay item for lateral tie over will not be reduced and will be paid to compensate you for all time, equipment, labor, materials for sewer lateral abandonment.

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 a minimum 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:
8. Pipe material specification
9. Nominal size
10. 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 can 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 (Video Inspection)

The City will video inspect (CCTV) all public sewer pipe systems prior to acceptance. Provide the Engineer three weeks notice prior to placement of final paving or surface restoration. Allow one working day per 2,000 linear feet of sewer main to be video inspected. Installations which do not conform to the requirements must be reconstructed and re-video inspected at your expense.

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

Video inspection recordings and reports must be completed for gravity conveyance systems per the following requirements:

1. The pipeline video inspection must be submitted on USB drive.
2. The inspection recording must be of adequate resolution to display pipe, potential pipe defects, and pipe joints.
3. Audio and written notes must be recorded in the video.
4. A 1-inch cylindrical gauge may be required in the video inspection to determine if the pipe segment has a grade deficiency.
5. General convention of the recording will travel downstream and must automatically track the pipeline length (in feet) from the start of the inspection to the end of the inspection.
6. Inspection report must include the project location, a scaled plan of the pipe segment(s), and a summary of inspection findings.

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.

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 more than 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.

Thrust blocks and encasement are measured and paid for as part of the unit price for the size and type of pipe installed.

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 either “Dump No Waste – Drains to Creek” or “Protect Our Watershed – Drains to Creek” and must include a Spanish translation and an image of a fish. Markers are available from the City. Alternative placards may be approved by the Engineer.

77-4.03G Testing
77-4.03G(1) Air Test

Replace Section 77-3.03G(1) with:

Test storm drain pipeline 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.

78 INCIDENTAL CONSTRUCTION

78-2 SURVEY MONUMENTS

78-2.01 GENERAL

Add to Section 78-2.01.

Section 78 includes specifications for:

1. Construction survey
2. Monuments
3. Other control points

78-2.02 MATERIALS

Replace Section 78-2.02 with:

Survey monument materials must conform to the requirement in Engineering Standards. Survey tag must be furnished and set by the Licensed Land Surveyor.

78-2.03 CONSTRUCTION

Add to Section 78-2.03.

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.

78-2.04 PAYMENT

Replace Section 78-2.04 with:

Full compensation for work specified in Section 78 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.

DIVISION IX TRAFFIC CONTROL DEVICES

84 MARKINGS

84-2 TRAFFIC STRIPES AND PAVEMENT MARKINGS

84-2.01 GENERAL

84-2.01A Summary

Add to Section 84-2.01A.

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.

84-2.01B 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.

84-2.03 CONSTRUCTION

84-2.03C Application of Stripes and Markings

Add to Section 84-2.03C.

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.

84-2.04 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 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.

84-9 EXISTING MARKINGS

84-9.03 CONSTRUCTION

84-9.03B REMOVE TRAFFIC STRIPES AND PAVEMENT MARKERS

Add to Section 84-9.03B.

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

Do not paint or seal over existing roadway striping or markings. Existing striping and markings must be obliterated.

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.

DIVISION X ELECTRICAL WORK
86 ELECTRICAL SYSTEMS

Delete Section 39 of the State of California, Department of Transportation Standard Specifications dated 2015.

Add Section 39 of the State of California, Department of Transportation Standard Specifications dated 2010.

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 near 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 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. 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.

- e. 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 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 for:

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 contaminates.

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 must:

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. All pedestrian push buttons must be ADA approved Polara Engineering "Navigator Accessible" with:

1. vibro-tactile
2. locating tone
3. directional messages
4. 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 Luminaries 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
 - a. Provide with:
 - b. Fuse
 - c. Utility Label
 - d. Photocell
 - e. 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 XI 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 or 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.

**90-1.02 Materials
90-1.02A General**

Add to Section 90-1.02A

Volumetric mobile concrete mixers may be used for concrete installations up to 2 cubic yards per day. Concrete installations greater than 2 cubic yards per day must either:

1. Use concrete that is mixed at a batch plant, transported to the construction site, and placed.
2. Provide concrete mix design and Quality Assurance Program (QAP) testing results in compliance with City's QAP.

Do not use bagged concrete or bagged cement within public right-of-way.

ENGINEERING STANDARDS

MAY 2018

APPROVED BY THE CITY ENGINEER:



Approved on: May 15, 2018

Effective: May 31, 2018

MATT HORN
CITY ENGINEER
RCE C63611

ADOPTED BY THE CITY COUNCIL OF SAN LUIS OBISPO
BY RESOLUTION NO. 10889 (2018 SERIES)

**PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION**

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

CITY ENGINEERING STANDARDS

NO.

May 2018 Edition

1000 - GENERAL

UNIFORM DESIGN CRITERIA..... 1010

2000 - PARKING & DRIVEWAY STANDARDS

DRIVEWAYS

DRIVEWAY RAMP - STANDARD 2110
DRIVEWAY RAMP - RIGHT-OF-WAYS LESS THAN 10' 2111
DRIVEWAY RAMP - DETACHED SIDEWALK, STANDARD..... 2115
DRIVEWAY RAMP - DETACHED SIDEWALK, ROWs LESS THAN 10' 2116
DRIVEWAY RAMP - SIZE & LOCATION 2120
STANDARD DRIVEWAY - UPWARD & DOWNWARD..... 2130
UPWARD & DOWNWARD DRIVEWAYS - MAXIMUM RISE & DESCENT (Residential) . 2140

PARKING LOTS

PAVEMENT DESIGN..... 2210
OFF-STREET PARKING STANDARDS 2220
PARKING BAY DIMENSIONS - COMPACT CARS 2230
PARKING BAY DIMENSIONS - AVERAGE CARS 2240
PARKING LOT STRIPING..... 2250
WHEEL STOP..... 2260

3000 - DRAINAGE

CATCH BASINS

CATCH BASIN - SIDE OPENING..... 3350
CATCH BASIN - SIDE OPENING WITH SUMP 3355
CATCH BASIN - EXTENDED SIDE OPENING 3360

UNDERDRAINS

SIDEWALK UNDERDRAIN - CONCRETE 3410
SIDEWALK UNDERDRAIN - WITH PIPES 3415
SIDEWALK UNDERDRAIN - WITH COVER PLATES 3420

STORM DRAIN MANHOLES

STORM DRAIN MANHOLE - 36" PIPE & LARGER 3510
STORM DRAIN MANHOLE - 18" to 36" PIPE 3520
PRECAST STORM DRAIN MANHOLE - UP TO 3' O.D. PIPE SIZE 3530
STORM DRAIN CONNECTIONS 3540

4000 - CURB, GUTTER & SIDEWALK

CURB & GUTTER

CURB 4020
CURB & GUTTER..... 4030

SIDEWALK

SIDEWALK - INTEGRAL & DETACHED 4110
SIDEWALK TRANSITIONS 4120
CONCRETE PAVER SIDEWALK – RAILROAD DISTRICT..... 4150

CITY ENGINEERING STANDARDS**NO.**MISSION STYLE

MISSION STYLE SIDEWALK.....	4220
MISSION STYLE RAILING - HANDRAIL & GUARDRAIL.....	4240

CROSS GUTTERS

CROSS GUTTER.....	4310
-------------------	------

CURB RAMPS

CURB RAMP - CORNERS & MID-BLOCK.....	4440
--------------------------------------	------

MISCELLANEOUS

CUTTING CONCRETE.....	4910
CONCRETE BUS TURNOUT.....	4920
BUS STOP.....	4930
RAISED COBBLESTONE MEDIAN.....	4940

5000 - RETAINING WALLS

RETAINING WALL DRAINAGE.....	5020
SHORT RETAINING WALLS.....	5030

6000 - UTILITIES

UTILITIES LOCATION.....	6010
TRENCH DETAIL #1 - PAVED OR UNPAVED STREETS.....	6020
TRENCH DETAIL #2 - UNPAVED NON-TRAFFIC AREAS.....	6030
TRENCH DETAIL #3 - CONDUIT TRENCH.....	6035
UTILITY COVER - GRADE ADJUSTMENT & P.C.C. COLLAR.....	6040
UTILITY PIPELINE - ABANDONMENT.....	6050

WATER - SEWER

SEPARATION CRITERIA - TEXT.....	6110 (2pp)
SEPARATION CRITERIA - DETAILS.....	6140

WATER SERVICES

WATER SERVICES - NEW & REPLACEMENTS.....	6210
WATER SERVICE - CONNECTIONS.....	6220
WELL METERING.....	6240
WATER METER - WITH UNMETERED BYPASS, 3" & LARGER.....	6250
MANIFOLD - MULTIPLE WATER SERVICES.....	6260

6000 - UTILITIES (CONTINUED)WATER MAINS

FIRE HYDRANT ASSEMBLY.....	6310
RECYCLED WATER HYDRANT ASSEMBLY.....	6315
VALVE TO FITTING RESTRAINT.....	6320
WATERLINE TIE-IN.....	6330
WATER VALVE & WELL.....	6340
BLOW-OFF ASSEMBLY.....	6350
AIR/VAC RELEASE VALVE ASSEMBLY - 1" & 2".....	6360

CITY ENGINEERING STANDARDS**NO.**WATER MISCELLANEOUS

BACKFLOW PREVENTER - 2" to 10"	6420
FIRE SPRINKLER VALVE & WELL - 2"	6520
NEW FIRE SERVICE - 4"	6530
R P BACKFLOW PREVENTER - ¾" to 10"	6550
FIRE MAIN - BUILDING CONNECTION	6590

SEWER MANHOLES

SEWER MANHOLE	6610
SEWER DROP MANHOLE	6620
SEWER MANHOLE SAND TRAP	6650

SEWER MAINS

SEWER CLEANOUT & WELL	6710
-----------------------------	------

SEWER SERVICES

SEWER LATERAL	6810
---------------------	------

7000 - STREETS & TRAFFICGEOMETRY

NEW CUL-DE-SAC REQUIREMENTS	7020
CLASS I BIKEWAY – PATH	7040

PAVEMENT

FLEXIBLE PAVEMENT ELEMENTS	7110
ASPHALT BERM - 6"	7120

SIGNS

METAL SIGN & PARKING METER POSTS	7210
METAL SIGN & PARKING METER POSTS – IN EXISTING SIDEWALK	7215 (<i>new</i>)
STREET NAME SIGN	7250

TRAFFIC CONTROL

ROAD BUMP - CONSTRUCTION DETAILS	7320
ROAD BUMP - LOCATION, STRIPING & SIGNS	7321
SPEED TABLE - LOCATION, STRIPING & SIGNS	7325
STREET BARRICADE	7330
REMOVABLE BOLLARD	7335
BARRICADE - SIDEWALK CLOSURE	7340
HI-VIS CROSSWALKS	7350

7000 - STREETS & TRAFFIC (CONTINUED)PARKING

STREET PARKING	7410
----------------------	------

MISCELLANEOUS

SERVICE & UPS COMBINED ENCLOSURE	7510
LIGHTING CIRCUIT	7520
BIKE PATH LIGHTING	7905

CITY ENGINEERING STANDARDS**NO.**

STREET LIGHTING - EMBEDDED STEEL POLE	7910
DOWNTOWN PEDESTRIAN LIGHTING	7915
HYDRANT REFLECTOR.....	7920
BICYCLE RACK.....	7930

8000 - LANDSCAPING & IRRIGATION**STREET TREES**

STREET TREES - MASTER LIST	8010 (2pp)
STREET TREES - MAJOR STREETS	8020

TREE WELLS

TREE WELL	8130 (2pp)
TREE WELL – RAILROAD DISTRICT.....	8135
TREE WELL COVER - ALTERNATE METHOD.....	8150

PLANTING

STREET TREE PLANTING NOTES	8210
TREE PLANTING & STAKING - ZONES 1, 2 & 3 – 15 GALLON SIZE	8220
TREE PLANTING & STAKING - ZONES 1 & 2 – 24" BOX & LARGER.....	8250
SHRUB PLANTING.....	8410
GROUND COVER PLANTING PATTERN	8420

IRRIGATION

IRRIGATION CONTROLLER	8520
MASTER VALVE & FLOW METER.....	8550
REDUCED PRESSURE BACKFLOW ASSEMBLY.....	8560
TRENCH DETAILS & THRUST BLOCKS	8610
ELECTRIC CONTROL VALVE & BOX.....	8620
QUICK COUPLER VALVE & BOX.....	8630
IN-LINE VALVE.....	8640
POPUH HEAD.....	8650
DRIP IRRIGATION.....	8660
TREE BUBBLER.....	8670
CONCRETE EDGING.....	8710
RECYCLED WATER - WARNING TAGS, LABELS AND DECALS	8810
RECYCLED WATER - WARNING SIGNS.....	8820

CITY ENGINEERING STANDARDS

NO.

9000 - MISCELLANEOUS

MAIL BOX LOCATION.....	9010
MONUMENT & WELL.....	9020
MANHOLE COVER - CITY COMMUNICATIONS	9030
CITY BENCH	9040
RAIL FENCE	9050
TRASH CONTAINER - STANDARD.....	9060

APPENDICES

- A. STATE STANDARD CURB RAMP DETAILS
- B. MISSION STYLE SIDEWALK DISTRICT MAP
- C. RAILROAD DISTRICT PLAN MAP
- 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
- I. GUIDELINE SPECIFICATIONS FOR NURSERY TREE QUALITY
- J. QUALITY ASSURANCE PROGRAM
- K. TEMPORARY INDUSTRIAL WASTE DISCHARGE PERMIT APPLICATION
- L. HOLIDAY RESTRICTION AREA PER CITY COUNCIL RESOLUTION 9784 (2003 SERIES)

TABLE OF CONTENTS

UNIFORM DESIGN CRITERIA 5

1. Improvement Plans 6

 1.1 Preparation of Plans 6

 1.1.1 Plan Review Procedure 6

 1.1.2 Plan and Profile Layout 7

 1.1.3 Plans Format 9

 1.2 Design Exceptions 12

 1.3 Americans with Disability Act Requirements 13

2. Site Preparation & Grading 13

 2.1 Design Standards 13

 2.1.1 Site Preparation 13

 2.1.2 Grading Design 14

 2.2 Construction 17

 2.2.2 Construction Testing 17

3. Roadways 18

 3.1 Design Standards 18

 3.1.1 General 18

 3.1.2 Roadway Classifications 19

 3.1.3 Design Speed and Design Vehicle 19

 3.1.4 Longitudinal Grade 20

 3.1.5 Horizontal and Vertical Alignment 20

 3.1.6 Cross Slope 21

 3.1.7 Intersecting Streets, Roads, Driveways, Alleys – Access Control 21

 3.1.8 Access Management 22

 3.1.9 Roadway Structural Section 23

 3.1.10 Sidewalks 23

 3.1.11 Pedestrian Crossings 25

 3.1.12 Bike Facilities 26

 3.1.13 Multi-Use Paths 27

 3.1.14 Street Parking 28

 3.1.15 Bus Turnouts 28

 3.1.16 Cross Gutters 28

 3.1.17 Sight Distance 28

 3.1.18 Roadway Clearances 29

 3.1.19 Right-of-Way 29

 3.1.20 Barricades, Barriers, and Railings 30

 3.1.21 Street Lighting 31

 3.1.22 Intersection Controls 32

 3.1.23 Streets Trees 32

 3.2 Construction 34

 3.2.1 Testing 34

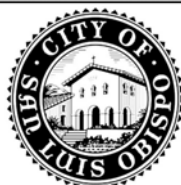
REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF: MAY 2018			



UNIFORM DESIGN CRITERIA

4 Driveways and Off-Street Parking	34
4.1 General.....	34
4.2 Permits.....	34
4.3 Plans.....	34
4.4 Driveways.....	34
4.4.1 Driveways on Arterial and Collector Street	34
4.4.2 Driveway Widths.....	35
4.4.3 Number of Driveways Permitted	35
4.4.4 Abandoned Driveways.....	35
4.4.5 Turnarounds – Deep Driveways.....	35
4.4.6 Turnarounds – Single-Family House Driveways	35
4.4.7 Common-Access Driveways.....	35
4.5 Off-Street Parking	36
4.5.1 General.....	36
5. Drainage	41
5.1 Design Standards	41
5.1.1 Requirements.....	41
5.1.2 Alignment of Drainage Facilities.....	42
5.1.3 Drainage Structures	42
5.1.4 Bioretention Basins.....	43
5.1.5 Bioswales	44
5.1.6 Channel and Swales	45
5.1.7 Culverts and Storm Drains	46
5.1.8 Outfalls.....	47
5.1.9 Bridges	47
5.1.10 Fencing.....	48
5.2 Post Construction Stormwater Compliance	48
5.2.1 Performance Requirements.....	48
5.2.2 Stormwater Control Plan	52
5.2.3 Operations and Maintenance.....	53
5.3 Groundwater.....	54
5.3.1 Subsurface Groundwater Drainage:	54
5.3.2 Source Control:	54
6. Water Supply	55
6.1 Design Standards	55
6.1.1 Quantity of Water.....	55
6.1.2 Distribution System	55
6.1.3 Cross Connections.....	58
7. Wastewater	58
7.1 Design Standards	58
7.1.1 Quantity of Flow	58
7.1.2 Manholes	59

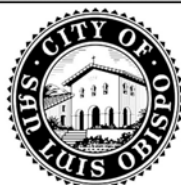
REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF: MAY 2018			



UNIFORM DESIGN CRITERIA

7.1.3 Pipe	60
8. Dry Utilities.....	61
8.1 Design Standards	61
8.1.1 General Provisions	61
9. Survey	62
9.1 Street Monuments.....	62
9.2 Tract Boundary Monuments.....	63
9.3 Lot Stakes.....	63
9.4 Vertical Control (Benchmarks).....	63
10. Landscaping and Irrigation.....	63
10.1 General.....	63
10.2 Submittals	64
10.2.1 Development Review.....	64
10.2.2 Building Application	64
10.2.3 Project Completion	64
10.3 Landscaping Design.....	65
10.3.1 Water Use	65
10.3.2 Irrigation Plan	66
10.3.3 Soils Management Report	67
10.3.4 Grading Plan.....	68
10.4 Miscellaneous City Facility Provisions:	68
10.4.1 Irrigation System Operational Requirements.....	68
10.4.2 Hardscape	68
10.4.3 Median islands.....	68
10.4.4 Playgrounds and Miscellaneous areas.....	69
10.4.5 System Pressure.....	69
10.4.6 Controller	69
11. Subdivision Design Criteria and Improvement Standards.....	69
11.1 General requirement	69
11.2 Improvements.....	70
11.3 Lot Design	71
11.3.1 Multiple frontages	71
11.3.2 Lot lines.....	71
11.3.3 Flag lots (deep lot subdivision)	71
12. Construction of Private Development Projects.....	71
12.1 Before Construction.....	71
12.1.1 Pre-Construction Conference	71
12.1.2 Contractor’s Requirements	72
12.2 During Construction.....	73
12.2.1 Inspection by Engineer of Work	73
12.2.2 Workplace and Worksite Conduct.....	73
12.2.3 Clean Up.....	73

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

12.3 Project Completion 73

 12.3.1 Clean Up..... 74

 12.3.2 Record Drawings..... 74

 12.3.3 Improvements to be Accepted for City Maintenance 74

REVISIONS	BY	APP	DATE
<i>Rewritten</i>	<i>MH</i>	<i>MH</i>	<i>6-17</i>
STANDARD CURRENT AS OF: MAY 2018			



UNIFORM DESIGN CRITERIA

UNIFORM DESIGN CRITERIA

General

The purpose of establishing these Standards is to help provide guidance for design of public facilities to better ensure health, safety, and enhance community quality of life. These standards are not intended to be a substitute for engineering knowledge, experience, or judgment. It is incumbent on the users of these standards to exercise good judgment, and where needed, seek guidance from the appropriate professional.

This document must be used for new or reconstruction of existing facilities. Where deviation from these standards is necessary, the designer must follow the Design Exception process outlined in this document.

These standards are not retroactive, existing facilities constructed prior to these standards are not required to comply with these standards. New construction and reconstruction must comply with these standards unless a design exception has been approved by the City. The applicant is responsible to either ensure facilities are designed in compliance with these standards, or to secure design exception approval.

This document is supported by various publications that comprise the standard references for Public Works projects. In event of conflict, it is the applicant's responsibility to notify the City of that conflict and request clarification. Without that notification, these standards will take precedence.

Reference documents include:

1. City of San Luis Obispo Engineering Standards
2. City of San Luis Obispo Standard Specifications
3. City of San Luis Obispo Community Design Standards
4. City of San Luis Obispo Fire Development Guide
5. American Water Works Association (AWWA) Standards
6. Caltrans State Standard Plans
7. Caltrans State Standard Specifications
8. San Luis Obispo County Public Improvement Standards
9. Caltrans Manual for Uniform Traffic Control Devices (MUTCD)
10. Caltrans Highway Design Manual (HDM)
11. American Association of State Highway and Transportation Officials (AASHTO), A Policy on Geometric Design of Highways and Streets
12. Americans with Disabilities Act Guidelines (ADAG)
13. Pedestrian Right-of-Way Accessibility Guidelines (PROWAG)
14. Caltrans DIB 82-05 Pedestrian Accessibility Guidelines for Highway Projects
15. National Association of City Transportation Officials (NACTO)

The applicant is responsible for obtaining any other required regulatory permits prior to the start of construction. The Regulatory Agencies that may have jurisdiction over the applicant's project include, but are not limited to:

1. California Regional Water Quality Control Board (RWQCB)
2. California Department of Fish and Wildlife
3. U.S. Army Corps of Engineers (ACOE)
4. Air Pollution Control District (APCD)
5. County of San Luis Obispo

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

6. State Department of Transportation (Caltrans)
7. United States Environmental Protection Agency
8. United States Fish and Wildlife Service
9. California Department of Water Resources (DWR)

Approval of any improvements plans for construction by the City does not exempt the applicant/owner/contractor from compliance with regulations from other agencies and obtaining authority to construct improvements from all required agencies.

1. Improvement Plans

Complete plans and specifications for all proposed public improvements that are not initiated by City of San Luis Obispo must conform to these Standards. All improvement plans must be prepared and signed by a registered Civil Engineer. Plans and specifications must be submitted to the City for review and approval prior to the beginning of construction of any such improvements. Each utility company whose facilities are involved must 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 all submittals required have been provided to the City.

1.1 Preparation of Plans

1.1.1 Plan Review Procedure

A. Plan Check Intake at First Submittal

The Project Engineer must schedule an “intake” appointment, at which time the City will determine whether the application package is complete. Checklists for various types of submittals are available on the City’s web site www.slocity.org. Incomplete application packages or plans not conforming to the normal standards of quality and neatness will be rejected. Project approval may be subject to public utility review and approval. It is the responsibility of the Applicant to submit directly to those companies.

B. Plan Revisions

The applicant shall address all plan check comments or redlines prior to resubmittal. The Applicant must provide a plan check response memo outlining the response to the plan check comments. In addition, the applicant shall bubble or delta and number any changes made to the plans not associated with the plan check comments. Failure to supply the required plan check response memo or denote separate plan changes will result in rejection of plans at resubmittal.

When all corrections have been made to the satisfaction of the City, the Applicant must submit original signed, sealed and dated drawings for approval. Plans are not approved until the City signifies approval by signature on the title sheet of the original drawings. Construction is not authorized until the plans are approved and a construction permits have been issued by the City.

Plan revision must be approved by the City prior to being constructed. The Applicant must submit a plan addendum that clearly shows the desired change, and if needed, a request for a variance from City Standards.

C. Phased Improvements

Where the submitted improvement plans cover only a portion of the ultimate development, the plans submitted must be accompanied by the approved overall tentative plan. The tentative plan must demonstrate that the phased improvements are compatible with future phases.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF: MAY 2018			



UNIFORM DESIGN CRITERIA

1.1.2 Plan and Profile Layout

All plans must be prepared on:

1. Mylar;
2. Vellum;
3. Bond; or
4. Approved equal

Measuring 24" x 36" (ARCH D). Plans prepared for minor projects that do not require design professionals may be submitted on letter or tabloid size bond paper. Appropriate plan scales are:

Horizontal	Vertical
1-inch=20-feet	1-inch=2-feet or 1-inch=4-feet
1-inch=30-feet	1-inch=3-feet or 1-inch=6-feet
1-inch=40-feet	1-inch=4-feet or 1-inch=8-feet

The scale may be varied in rough terrain upon approval of the City.

A. Earthwork

If any grading is proposed outside the roadway prism, a grading plan must be submitted with the other required improvement plans. Finished grading must be depicted by contour lines, spot elevations, or by "top/toe" indications, as determined appropriate by the City. The grading plan must include a reference to the project soils report, including its title, date and author. In addition, the applicant shall provide the City with proof of an easement or right of entry when grading occurs on private property. The City may request a slope easement for the offsite improvement.

B. Retaining Walls

For any proposed retaining walls, a separate sheet must be provided which depicts the elevation view and typical section for each wall. The applicant shall provide appropriate easements for walls located on private property. Walls on private property for new improvements shall be maintained by the private landowner, maintenance association or homeowner's association.

C. Roadway Improvements

Roadway plan and profile sheets must be of appropriate scale to clearly show the proposed plan layout, along with existing and proposed profiles of all roadways. The boundaries of lots fronting on the roadway, drainage easements, utility easements, slope easements, section lines and corners, land grant lines and temporary construction easements must be shown on all roadway improvement sheets, including proper dimensions. Each roadway plan and profile sheet must include the typical roadway section. The computed curve data for all centerline curves must be shown on the plans.

Streets may be required to be extended to the boundary of a site proposed for development. In such cases, the plans must include an extension of the street profile for a minimum distance of 200-feet beyond the project limits, depicting both existing grade and a potential design grade that comply with the required design speed.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF: MAY 2018			



UNIFORM DESIGN CRITERIA

D. Cross Sections

Cross sections must be provided for all designs involving existing road widening. The spacing of cross sections must be based on the characteristics of the project, and as determined necessary by the City.

E. Storm Drainage

Plans for minor drainage facilities may be shown on roadway plans. Plans for major drainage facilities must conform to the sheet size and scale shown above for roadway improvements and included in separate sheets. Profiles of all culverts and drainage structures must be provided, along with the hydraulic grade line for the design event.

F. Water Supply and Wastewater Disposal

Plans for water and wastewater disposal system improvement layout may be submitted on the same plans as the roadways. Improvements outside the roadway prism must be drawn on separate sheets and to an appropriate scale.

G. Utilities

A layout for all utilities including water, sewer, electric, telephone, fiber optic, cable television and gas system improvements must be submitted on a composite utility plan in an appropriate scale, unless approved otherwise by the City. Roadway plans must show placement of utilities in the typical section.

The composite utility plan must clearly show existing overhead utilities, utility poles and guy wires. The exhibit must clearly show facilities that are going to be undergrounded and poles removed and those poles and facilities that are to remain overhead. All required easements shall be shown and dimensioned.

A plan completeness checklist is available for download from the Utilities Department’s online documents and files (<http://www.slocity.org/government/department-directory/utilities-department/documents-and-files>). The checklist covers general items that will facilitate the plan check review process.

H. Traffic Control

Plans for work zone traffic control, and for installation of new permanent traffic control devices and roadway striping, must be drawn on sheets and to an appropriate scale. Work zone traffic control must reference and comply with the most current version of the California MUTCD. If new permanent traffic control devices include traffic signals or lighting, the necessary electrical details must be incorporated into the sheets.

I. Erosion Control

Temporary and permanent erosion control measures are to be shown on a separate plan sheet(s).

J. Landscape Plans

Landscape plans must demonstrate that the landscaping, irrigation, and other features within the right-of-way comply with City Standards including sight distance adequacy, lateral clearance from the roadway and sidewalks, and other improvements within the right-of-way. Standards for irrigation facilities are contained in these Engineering Standards.

K. Details

The plans must include one or more sheets entitled “Details,” which show the following as applicable:

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

1. Detail of all concrete or other structures.
2. Details of any element of the plans required for clarity.
3. Miscellaneous details.
4. Other agencies' standard details which are referenced in the design.
5. Temporary and permanent erosion control standards/details referenced in the design.

1.1.3 Plans Format

The following items are to be submitted to the City for review and approval:

A. Title Sheet

On improvement plans exceeding two sheets in the set, a title sheet must be included. The title sheet must include an index of sheets, stormwater Construction General Permit information and Post Construction Stormwater Requirements including:

1. Index of sheets
2. Vicinity Map
3. Stormwater Construction General Permit Information
 - a. WDID
 - b. Area of project disturbance (Plans that disturb one acre or greater must include a SWPPP)
4. Post Construction Stormwater Information
 - a. Area of existing impervious surfaces
 - b. Area of new or reconstructed impervious services
 - c. Stormwater Post Construction Regulation Tier
5. Current version date of City of San Luis Obispo's Engineering Standard and Standard Specification governing work including listing of all requested or approved design standard exceptions.

B. Vicinity Map

The title sheet must include a vicinity map depicting the following:

1. Boundaries of the site with City Limits
2. North arrow and scale reference
3. Street names

C. Title Block

Each sheet of the set of drawings, including the title sheet, must have an approved title block showing:

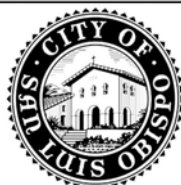
1. Date
2. Name and/or project number.
3. Project Engineer's name, professional registration number, seal and signature, as required by the Professional Engineers' Act.
4. Scale of the drawing.
5. Sheet number and total number of sheets.
6. Sheet title matching the Index of Sheets.
7. Signature blocks for City approval.

D. Right-of-Way

Show and properly dimension on plans:

1. Right-of-way lines

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

2. Boundaries of lots fronting on the roadway
3. Drainage easements
4. Utility easements
5. Slope easements
6. Temporary construction easements (existing and proposed).

E. Survey Monuments

Pursuant to Section 8771(b) of the California Business and Professions Code, existing survey monuments that control the location of:

1. subdivisions,
2. tracts,
3. boundaries,
4. roads,
5. streets,
6. highways, and
7. provide survey control,

that are within or adjacent to the area of work, must be located and referenced by a licensed land surveyor or registered civil engineer. This must occur prior to the time when any:

8. streets,
9. highways,
10. other rights-of-way, and
11. easements,

Are:

12. improved,
13. constructed,
14. reconstructed,
15. maintained,
16. resurfaced, or
17. relocated.

Survey monuments shall be located, tied out, and a corner record filed, by a Professional Land Surveyor, if the construction will disturb the monument. If any existing survey monument is disturbed in any way by the improvement work, as determined by a licensed land surveyor or registered civil engineer licensed prior to 1982, it must be reset accordingly and an appropriate document must be filed with the County, prior to the final acceptance of the work by the City.

F. Topography

All pertinent topographic features which may affect the:

1. design,
2. construction, and
3. operation of the improvements,

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

must be shown on the plans, including but not limited to the following:

4. Curbs, sidewalks, shoulders.
5. Existing structures, fences, trees and other foliage.
6. Existing utility lines and facilities.
7. High water and frequent inundation limits.
8. Roadway lines.
9. Storm drains, drainage ditches.
10. Wastewater Disposal systems.
11. Water lines, fire hydrants.

Full topography must be provided for a minimum of 50-feet in all directions of a development site, to evaluate drainage conditions.

G. Profiles

The plans must clearly show the existing and proposed profiles of all:

1. Roadways
2. Drainage ditches
3. Storm drains
4. Water lines
5. Sanitary sewers
6. Clearances at structures and power lines

Including elevations at 25-foot minimum intervals for warped surfaces.

H. Design Basis

The plans must include the basis for design as follows:

1. Road Plans:
 - a. Design Speed (V)
 - b. Design Volume (ADT)
 - c. Traffic Index (TI)
2. Culverts:
 - a. Slope (S)
 - b. Design Flow
 - c. Storm Interval (QX)
3. Storm Drains:
 - a. Hydraulic Grade Line (HGL)
 - b. Slope (S)
 - c. Design Flow & Storm (QX)
4. Drainage Structures: The numerical quantities flow quantity for the Primary Design Storm
5. Drainage Basins:
 - a. Design Volume,
 - b. Design Inflow (QIN)
 - c. Design Outflow (QOUT)
 - d. Tributary Area (A)

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

- e. Design Infiltration Rate
- 6. Sewer Systems:
 - a. Pre-development design flows
 - b. Post-development design flows
 - c. Average and peak flow rates
 - d. Equivalent Dwelling Units (EDUs)
- 7. Water Systems:
 - a. Pre-development design flows
 - b. Post-development design flows
 - c. Average Daily Demand (ADD)
 - d. Maximum Daily Demand (MDD)
 - e. Peak Hour Flow (PHF)
 - f. Equivalent Dwelling Units (EDUs)

I. Stationing and Orientation

The stationing on plan and profile sheets must read from left to right. Plans must be arranged so that the north arrow is either pointed toward the top or to the right edge of the sheet. Adjustments may be considered when matching existing stations from other plans.

J. Benchmark

The plans datum must be based on published benchmark information from the City of San Luis Obispo. Include a description of the benchmark and the datum for its reference elevation. The plans must reference a durable local benchmark that will be utilized for the construction of the improvements and must include an indication of its location on the Vicinity Map or the plans.

K. Basis of Bearings

The plans must indicate the basis of bearings that will be used for construction of the improvements. The plans must include a description of the points that form the basis of bearings, along with the appropriate reference information.

L. Units of Measurement

The units of measurement on plans submitted to the City must be English Units.

M. Text

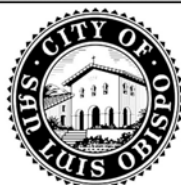
The minimum text size on full size plans must be 3/32" (or 0.1").

1.2 Design Exceptions

Unusual site conditions or matching existing infrastructure may warrant a deviation from these standards. Where such situations occur, the Engineer of Work may request a design exception. The Engineer of Work must demonstrate that the proposed deviation adequately addresses:

1. public health and safety
2. long term maintenance
3. environmental impacts
4. orderly community development.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

Avoiding or reducing project costs is not an adequate justification for design exception approval. As these assessments require professional engineering judgment, all design exception proposals must be prepared by a registered professional engineer and submitted to the City for review and approval prior to construction.

Requests for a design exception must be proposed in writing by the Engineer of Work following the prescribed format. The Engineer of Work must sign and seal the Design Exception Application submitted to the City.

1.3 Americans with Disability Act Requirements

The Americans with Disability Act (ADA) was signed into Federal law in 1990. ADA seeks to provide equal access to public facilities for all Americans regardless of age or physical ability.

Since the ADA and accessibility requirements are contained within Federal and State law, users of these standards are also expected to fully comply with the law. The information included in these standards is provided to assist the user and to help ensure City facilities are also in compliance.

A. Design Requirements

The design and placement of ADA facilities within the public right-of way including curb ramps and designated parking spaces must comply with:

1. Caltrans Design Information Bulletin; DIB 82-05 Pedestrian Accessibility Guidelines for Highway Projects
2. Caltrans Standard Drawing A88A – Curb Ramp Details
3. Caltrans Standard Drawing A88B – Curb Ramp and Island Passageway Details
4. Caltrans Standard Drawings A90A and A90B – Accessible Parking

Curb ramps must be designed and detailed with spot elevations, slopes, dimensions, and profiles of both the existing condition and proposed design.

B. Design Aids

The following are useful design aids for understanding and implementing ADA within the Public Right of Way:

1. CalDAG (California Disabled Accessibility Guidebook)
2. ADAG (Americans with Disabilities Act Guidelines)
3. PROWAG (Pedestrian Right-of-Way Accessibility Guidelines)

C. Design Exceptions

Design exceptions to ADA requirements must be specifically reviewed and approved by the City prior to construction. Requests for an ADA design exception must be proposed in writing by the Engineer of Work. The Engineer of Work must also sign and seal the Design Exception.

2. Site Preparation & Grading

2.1 Design Standards

2.1.1 Site Preparation

This section provides standards for all work that is required to prepare a site for construction of any public improvements, as defined in these Public Improvement Standards.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

A. Verification of Underground Utilities

The location of underground utilities must be verified prior to excavation for all work that is covered by these standards and which also includes excavation or other risk to underground utilities. Potholing for locating utilities, for placing sign posts, or for placing fence posts must also be considered as excavation for the purposes of this section.

1. The person(s) performing the excavation must verify the exact location and depth of all utilities including those not shown on the plan prior to start of work.
2. Contact Underground Service Alert (USA) at (800) 642-2444 at least 48 hours before but not more than 10 days before the excavation.

B. Clearing and Grubbing

Clearing and grubbing activities must conform to the Standard Specifications. Additional requirements must apply if determined necessary by the project soils and geological report.

C. Tree Removal

All trees to be removed or impacted must be depicted on the improvement plans, and must be consistent with the environmental determination which was prepared for the project. Required tree removals must comply with section 12.24 of the City’s Municipal Code.

D. Refuse Management

All projects must provide a plan for the collection, and disposal of solid waste material for both the residential and non-residential uses during construction, and post-construction activities. The plan must be submitted for approval by the City's Utilities Services Manager and the Community Development Director addressing the following codes and standards:

1. Management of refuse generations for waste, recyclables, and organics shall comply with state law, AB 1826, and the local waste management ordinance aimed to reduce greenhouse gas emissions.
2. Access to trash enclosure(s) shall conform to the requirements by the San Luis Garbage Company and refuse bins shall be sized to provide a reasonable level of service.
3. Separate refuse bins shall be accommodated within the site for waste, recycling, and organics.
4. Designs of trash enclosures shall comply with engineering standards, and aesthetic standards set by the Community Development Department.

2.1.2 Grading Design

Where applicable, grading constructed for projects regulated by these City Standards must conform to Sections 4 through 22 of the Standard Specifications and the latest edition of the California Building Code (CBC). In addition, grading activity reviewed by the City will be subject to the requirements listed below.

A. Grading Plan Submittals

All grading plans reviewed by the City must address the following requirements in their submittals:

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF: MAY 2018			



UNIFORM DESIGN CRITERIA

1. Soils and Geological Report

The City may require a foundation and soils investigation and/or an engineering geologic report to substantiate road designs. For any grading, which may or will involve a structure (building pads, retaining wall foundations, etc.) the City will:

- a) require that a foundation and soils investigation and/or engineering geologic report be submitted with the plans, or
- b) documentation that a foundation and soils investigation and/or engineering geologic report is not required, in accordance with CBC Chapter 18, Section 1803.

If a foundation and soils investigation and/or engineering geologic report are required, the preparer of the investigation and/or the report must provide, prior to plan approval, a letter to the City stating that the plans were reviewed by him/her and that the plans conform to the investigation and/or the report.

2. Grading Quantities

The Project Engineer must enumerate the quantity of cut and of fill on the grading plan Title Sheet. When the project site is not anticipated to balance, a note must be provided on the grading plans stating that the earthwork sending/receiving site must secure the necessary permits prior to commencing work. When requested, then engineer of work must demonstrate that the necessary permits have been obtained prior to importing or exporting soil.

3. Erosion/Sedimentation Control Plan

All public improvements involving grading must prepare an Erosion and Sedimentation Control Plan. The grading plans must include a note identifying that proper dust control must be maintained at all times during construction. Dust control must conform to the provisions of Section 10 of the Standard Specifications.

4. Area of Disturbance

The total Area of Disturbance for the project must be shown on the Title Sheet. All projects involving site disturbance great than one acre must comply with the requirements of the National Pollutant Discharge Elimination System (NPDES). The Developer must submit a Notice of intent (NOI) to comply with the General Permit for Construction Activity with the Regional Water Quality Control Board (RWQCB). The Developer must provide the City with the Waste Discharge Identification Number (WDID #).

B. Grading Site Boundaries

Each lot line within a proposed new subdivision must be considered a “grading site boundary” for purposes of implementing grading setbacks as required by the CBC.

C. Foundation Elevations

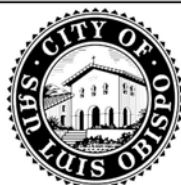
All grading designs must depict on the plans the “point of discharge” which satisfies the requirements of the CBC, Section 1805.

D. Elevation Standards

The following requirements for the relationship between street improvements and building elevations must also apply to the architectural plans for building construction:

- 1. The plans must depict the finish floor elevation at all building entrances fronting a current or future public street.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

2. The plans must depict the back-of-sidewalk elevations at the locations of all building entrances referenced in #1, based on a typical sidewalk cross-slope of 1.5%.
3. The plans must demonstrate compliance with ADA and CBC requirements for pedestrian access to all building entrances.

E. Slope Easements Required

Slope maintenance easements must be required for any excavation or embankment slopes which are steeper than 5:1 (horizontal: vertical) that extend outside the right-of-way. All such easements must also provide for access and working space rights.

F. Retaining Walls

Prior approval is required for the construction of any:

1. reinforced concrete,
2. reinforced concrete masonry unit (CMU), or
3. mortar-less element

retaining wall which would require a building permit. If a proposed wall is below the threshold where a building permit would be required, it must be shown in the grading plan in order to evaluate its relationship to site drainage. Retaining walls must be constructed based on an approved design. Examples of approved designs include:

1. Design Standards from the State Standard Plans.
2. Design Standards from an approved alternate reference.
3. Designs prepared, signed and sealed by a registered civil engineer.

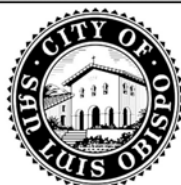
In addition, the following requirements apply to any retaining walls proposed as part of any public improvements:

1. Designs for any retaining wall must include the location in plan view, a typical cross section, and an elevation view of the full length of the proposed wall. The Project Engineer must also provide all design calculations, signed and sealed, to the City for review, along with any applicable foundation and soils investigation or engineering geologic reports.
2. Wood retaining walls may not be greater than 2-feet in exposed height, and may be considered appropriate for landscaping purposes only. Wood retaining walls must not be located within the right-of-way.
3. Any wall greater than 30-inches in exposed height, within 3 feet of walkway, must include a guard (pedestrian railing) as defined in CBC Chapter 10, Section 1013 "Guards," or maintenance worker fence as defined by Cal-OSHA and shown in the State Standard Plans.
4. The Engineer of Work must demonstrate that wall designs are appropriate for the soil and loading conditions.

G. Preservation of Trees

Existing trees within the area of any grading must be preserved as required by the conditions of approval for the subdivision or land use permit. All trees to be removed or impacted must be clearly shown on the grading plan.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

H. Stockpile Requirements

If a project will be stockpiling material from either on-site or off-site sources the following design criteria applies:

1. All stockpile location(s) must be shown on the grading plan and erosion control plan as well as the SWPPP, if a SWPPP is required. Stockpiles must be located a minimum of 50-feet away from drainage structures and water bodies such as creeks, rivers and drainage courses. Stockpiles must not be in environmentally sensitive areas.
2. Stockpiles may not be located on slopes greater than 20%.
3. No stockpile may remain longer than 6 months without prior written approval from the City.
4. All stockpiles must be shaped, not left in an "end dump condition". Stockpiles must have a slope of 3:1 or flatter with the top surface sloped downhill at minimum of 0.5% and a maximum of 5%.
5. Maximum height of any one stock pile may be 20 feet.
6. No one stockpile may exceed 5,000-cubic yards. Adjacent stock piles must not be located closer than 50-feet to each other. Measured from edge to edge.
7. All stockpiles regardless of time of year must have silt fence installed immediately around the perimeter of the stockpile at the toe of slope. This silt fence must be maintained until stockpile is removed.
8. Between April 15th and October 15th stockpiles remaining in-active for longer than one week must be covered with plastic and secured to control dust.
9. Between October 15th and April 15th (rainy season) stockpiles must be stripped of plastic coverings and appropriate Best Management Practices that reduce erosion potential and stabilize the slopes i.e. hydro-seeding, straw, straw wattles etc. be implemented.
10. Once a stockpile is removed, the area below must be returned to the original contours or final project finished grades with established vegetation. This must be done prior to acceptance of improvements.

2.2 Construction

2.2.2 Construction Testing

A. Compaction Standards

The Project Engineer must collect compaction data throughout construction and as required by the CBC. Following completion of the work, the Project Engineer must provide compaction reports to the City, certifying compliance with these requirements, for all the following areas:

1. Each graded lot pad
2. All roadways
3. All roadway shoulders
4. All sidewalk areas
5. All utility trenches

B. Elevation Certification

The Project Engineer must collect elevation data for all graded lot pads. Following completion of the work, the Project Engineer must provide elevation certifications to the City prior to grading permit final, or building foundation pour, whichever occurs first.

C. Inspections

1. The Developer must be responsible for ensuring that all required inspections are requested and performed; the Project Engineer must be responsible for the competency of all required inspections.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

2. The Project Engineer must either: (a) document that no Special Inspections are required, or (b) prepare a Statement of Special Inspections in accordance with CBC Chapter 17, Section 1704.

D. Grading in Open Space Areas

No grading may occur in any Open Space area before the pertinent Open Space Agreement is recorded.

E. Erosion Control During Construction

Follow-up applications of hydro-seeding must be made as needed to maintain adequate soil protection. These applications must avoid over-spray onto the traveled way, sidewalks, lined drainage channels, and existing vegetation. After any rainfall event, the Developer is responsible for maintaining all slopes to prevent erosion.

F. Retaining Walls Inspection

Inspections are required at several phases of wall construction.

1. Footings (prior to pour)
2. Walls:
 - a. Masonry: Pre-grout/reinforcement steel (prior to grouting)
 - b. Reinforced concrete: Forms and reinforcement steel (prior to pouring)
3. Backfill/drainage (prior to backfill)
4. Final

3. Roadways

3.1 Design Standards

3.1.1 General

All roadway cross sections must generally conform with adopted Specific Plans and the Circulation Element of the General Plan, as modified by City direction specific to the area, and circumstances of development.

The design of a subdivision street system must result from an evaluation of topographical conditions, the traffic generated by the types and numbers of planned uses, and the purpose of each street. 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. Minimum clear and passable street widths will be as required by the Fire Department.

A complete street is a street designed and built to accommodate all users of the roadway including:

1. Pedestrians
2. Bicyclists
3. transit riders
4. commercial vehicles
5. general motorists.

A complete street provides access for all users regardless of age or ability.

In sloping terrain, separate one-way travel lanes may be used to reduce cut and fill. Such one-way lanes must have a minimum unobstructed width of twenty feet, a minimum paved width of fourteen feet, and a maximum length of five hundred feet.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

Wet utilities should be placed within the roadway prism for maximum accessibility.

3.1.2 Roadway Classifications

Classification	Maximum ADT	Minimum LOS	Desired Maximum Speed
Local Commercial Streets	5,000	-	25 mph
Local Residential Streets	1,500	-	25 mph
Commercial Collector Streets	10,000	-	25 mph
Residential Collector Streets (Minor)	3,000	-	25 mph
Residential Collector Streets (Major)	5,000	-	25 mph
Residential Arterials	-	LOS D	85 th Percentile
Arterial Streets	-	LOS D LOS E - Downtown	85 th Percentile
Parkway Arterials/ Regional Routes	-	LOS D	85 th Percentile
Highway/Freeway/Ramps	-	LOS D	85 th Percentile

Local Commercial Streets directly serve non-residential development that front them and channel traffic to commercial collector streets.

Local Residential Streets directly serve residential development that front them and channel traffic to residential collector streets.

Commercial Collector Streets collect traffic from commercial areas and channel it to arterials.

Residential Collector Streets collect traffic from residential areas and channel it to arterials.

Residential Arterials are bordered by residential property where preservation of neighborhood character is as important as providing for traffic flow and where speeds should be controlled.

Arterial Streets provide circulation between major activity centers and residential areas.

Parkway Arterials are arterial streets with landscaped medians and roadside areas, where the number of cross streets is limited and direct access from fronting properties is discouraged.

Highway/Regional Routes connect the city with other parts of the county and are used by people traveling throughout the county and state and are designated as primary traffic carriers. Segments of these routes leading into San Luis Obispo should include landscaped medians and roadside areas to better define them as community entryways.

Freeway is a regional route of significance where access is controlled.

3.1.3 Design Speed and Design Vehicle

Speed for City roads is defined as follows:

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF: MAY 2018			



UNIFORM DESIGN CRITERIA

1. Average Speed is the summation of the instantaneous or spot-measured speeds at a specific location of vehicles divided by the number of vehicles observed.
2. Design Speed is used to determine the various geometric design features of a roadway. Design speed is selected in accordance with these standards or as determined by the City.
3. 85th-Percentile Speed is based upon measured field data and is the speed at or below which 85 percent of the motor vehicles travel.
4. Operating Speed is the speed at which a typical vehicle or the overall traffic operates. Operating speed might be defined with speed values such as the average, pace, or 85th percentile speeds.
5. Pace is the 10-mph speed range representing the speeds of the largest percentage of vehicles in the traffic stream.
6. Posted Speed is the speed determined following an engineering and traffic survey (CVC 627).
7. Prevailing Speed is the 85th percentile speed.
8. Running Speed is the average operating speed over a selected road segment. On a straight level road segment, the running speed will typically equal the prevailing speed throughout the road segment. On road segments with varying conditions such as a curving mountain road, the operating speed may vary at different points along the segment. The running speed is typically determined by the measuring average time to travel the full segment.

Roadway design speed for existing roadway must match existing 85th percentile vehicle speeds. Design speed for new streets is shown below:

Classification	Design Speed	Design Vehicle*
Local Commercial Streets	25 mph	SU-40
Local Residential Streets	25 mph	SU-30
Commercial Collector Streets	25 mph	WB-50
Residential Collector Streets	25 mph	SU-30
Residential Arterials	45 mph	WB-50
Arterial Streets	45 mph	WB-50
Parkway Arterials	45 mph	WB-50
Highway/Regional Routes	45 mph	WB-50
Freeway	55 mph	WB-50

*See AASHTO "A Policy on Geometric Design of Highways and Streets" for design vehicle dimensions

All roadways and access driveways must provide necessary turn around space for emergency vehicles as required by the Fire Department.

3.1.4 Longitudinal Grade

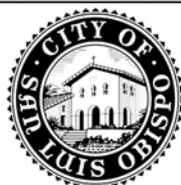
Design of street grades must comply with the most current edition of AASHTO manual "A Policy on Geometric Design of Highways and Streets."

3.1.5 Horizontal and Vertical Alignment

Design of roadway curvature must comply with the most current edition of AASHTO manual "A Policy on Geometric Design of Highways and Streets."

Avoid use of compound curves. Use a minimum of 50-foot separation between horizontal curves.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

Provide curb radii that allows for the design vehicles to turn at an intersection without crossing the centerline and into oncoming traffic. The minimum radii for curb ramps is 20' to allow for street sweeping.

All streets must intersect other streets at right angles, and must 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.

Space for vehicles to turn-around must 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 backing from driveways is provided. Design of terminus streets, such as cul-de-sacs, must be to the satisfaction of the City Fire Department and City Engineer. This requirement may be waived when the City determines the roadway may be extended, within a reasonable timeframe, in the future

3.1.6 Cross Slope

The slope transverse to the profile or flowline of roads or streets must conform to the following:

1. The standard cross-slope to be used for all new construction is 2.0 percent.
2. The minimum cross slope for widening any roads or streets is 1.0 percent, except for superelevated sections or approaches to cross gutters.
3. The maximum cross slope for widening any roads or streets is 5.0 percent, except for superelevated sections.
4. Grade breaks in the cross slope must be minimized where possible and in no case, be greater than 1.0 percent (algebraic difference) within the traveled lanes nor more than 3.0 percent (algebraic difference) within the paved shoulders.

Streets designed with superelevations must comply with the most current version of the HDM.

Slopes for crossings and access points must meet accessibility requirements.

Cross slope must be considered during street construction and rehabilitation design.

3.1.7 Intersecting Streets, Roads, Driveways, Alleys – Access Control

When two streets or roads intersect, neither must have a grade greater than 3.0 percent for a minimum distance of 40-feet measured from the curb line of the intersected street or road to the beginning of the first vertical curve. In unusually rough terrain, the City may allow up to a maximum of 5.0 percent.

Driveway connections to streets must be designed to conform to the sight distance and spacing requirements of the HDM Table 405.1B Application of Sight Distance Requirements and Engineering Standard 2120 and 7410. Driveways may not be located adjacent to intersection’s operational areas.

Block lengths for local, collector, and arterial streets must comply with the latest version of the HDM Table 405.1B Application of Sight Distance Requirements for intersection spacing. For local and collector street block lengths in no case may be less than 150 feet and greater than 600 feet. For arterial streets block lengths in no case may be less than 600 feet. Street systems should be networked to improve connectivity and reduce travel distances for alternative transportation.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

Street intersections must meet at an angle of 90 degrees where possible and in no case, may this angle be less than 85 degrees.

Waiver of access rights from abutting properties to public streets may be required by the City. Waiver of access rights must be approved by the City and clearly shown on the final or parcel map.

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 must be a minimum of twenty feet. Where two alleys intersect, a paved area free of obstructions must be provided for safe visibility and turning.

3.1.8 Access Management

Private access points shall be designed in accordance with the following principles:

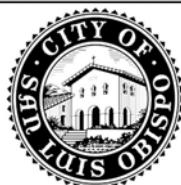
1. Limit and consolidate direct access to streets when possible.
2. Address topographical and geometric limitations that may impact safety & operations
3. Minimize interference with through-traffic operations and accommodate adequate lane capacity for on-site traffic conditions.
4. Promote uniformly and well-spaced full movement intersections to reduce travel delay and crash risk. Secondary or more access points are provided based on necessity, where more than one access point is required or indispensable to the property due to circumstances that cannot be sufficiently mitigated by other means. There should be objective and factual evidence to justify and document necessity for multiple access points.

A. Intersections & Driveways:

Intersections should be well spaced at uniform intervals to help support the smooth and safe flow of traffic. New intersections should not be spaced where functional areas (Figure A-1) overlap. Intersections that would otherwise require all-way stop control or signalization should be controlled by Roundabouts or Neighborhood Traffic Circle. All-way stop or signal control may be used if a roundabout or traffic circle control is determined to be not feasible or operate at unacceptable levels. One-half mile spacing is recommended for traffic signals on major arterials.

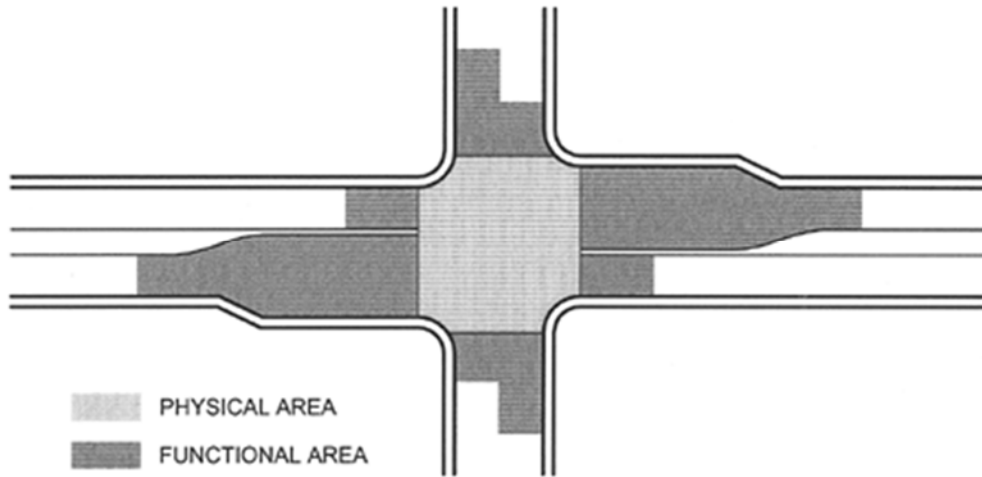
New or modified driveways shall not be allowed within the functional area (Figure A-1) of adjacent signalized intersections with approach speeds of 30 mph or higher. Driveways maybe placed within the functional area when left turns are restricted or the intersection is controlled by a roundabout. New driveways on streets with speeds of 30 mph or higher should be have minimum spacing per the table below. Where property frontage length restricts attainment of minimum driveway spacing, driveways should be placed at the maximum spacing feasible. Closely spaced driveways may require restriction of left turns or application of a shared driveway.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF: MAY 2018			



UNIFORM DESIGN CRITERIA

Figure A-1: Functional Area



Upstream Functional Area		
Speed	Distance	
30 MPH	225'	+ 95th Percentile Queue Length
35 MPH	320'	+ 95th Percentile Queue Length
40 MPH	420'	+ 95th Percentile Queue Length
45 MPH	515'	+ 95th Percentile Queue Length
50 MPH	610'	+ 95th Percentile Queue Length
55 MPH	710'	+ 95th Percentile Queue Length

Downstream Functional Area & Min. Driveway Spacing	
Speed	Distance
25 MPH	150'
30 MPH	200'
35 MPH	250'
40 MPH	300'
45 MPH	360'
50 MPH	430'
55 MPH	500'

See Section 4 "Driveways and Off-Street Parking" for additional requirements.

3.1.9 Roadway Structural Section

Pavement design must follow the HDM, be based on a 20-year design life and the "R-value" of the subgrade material. New local streets must be designed for a 50-year life.

Pavement thickness must be based on Traffic Indices shown in City Engineering Standard 7110. New Roads must be designed to include the Caltrans safety factors of 0.20-foot and 0.10-foot, for flexible pavement with a base layer and for full depth asphalt, respectively. The Empirical Method for calculation of the structural section is discussed in Topic 633 of the HDM.

Variations of the design standards and pavement materials may be approved by the City Engineer to meet individual circumstances.

3.1.10 Sidewalks

A. General

Sidewalks are required on both sides of a roadway and must be designed and constructed per Engineering Standards. In compliance with Municipal Code Section 12.16.020 & 12.16.050 curb, gutter and sidewalk must be installed and maintained along a properties full frontage. In area without curb, gutter and sidewalk new curb, gutter and sidewalk must be installed with any building permit issuance that will:

1. construct or move a new building onto the property, or
2. reconstruct or remodel an existing building increasing the valuation of that building more than 50%.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

In the event a frontage has been previously improved with concrete curbs, gutters, and sidewalks, the installation is subject to inspection by the City prior to the final approval of the building permit. In the event the existing concrete curb, gutter and/or sidewalk is damaged or fails to meet acceptable grades established for the frontage or ADA requirements. The permittee must remove and replace those portions of curb, gutter and sidewalk found unacceptable prior to occupancy of the building improvements or finalization of the permit.

B. Sidewalk

New installations of sidewalk minimum widths must be based on pedestrian demand with an objective LOS of B and minimum LOS C. Exceptions to minimum required sidewalk widths to meet LOS analysis may be granted when the required sidewalk width is not consistent with neighborhood character and existing topography, street design, and density. Within the downtown planning area sidewalks shall have a minimum of 8 feet clear width. Otherwise, the standard minimum sidewalk width is 5 feet for detached and 6 feet when placed integral with curb and gutter. Sidewalk widths for commercial development may be required up to 7 feet detached, 12 feet integral. In areas where these widths cannot be maintained, sidewalk must have a minimum of 5 feet clear width.

New Integral curb, gutter and sidewalk must be constructed without a cold joint between the curb and the sidewalk.

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.

Any existing feature in the sidewalk that is of a special, unique, unusual, or historic nature, as determined by the City, must not be replaced, removed, or altered without specific approval of the City Engineer.

C. Curb Ramps Required

Any installation of concrete curbs, gutters and sidewalks fronting a property at a public road intersection must include the installation of curb ramps that comply with the current Engineering Standards. Curb ramps must be installed at each corner of an intersection. Existing curb ramps fronting the property that do not meet current standards must be repaired or replaced as needed. No curb ramps may be constructed of Hot Mix Asphalt. Locate curb ramps in the most logical place to accommodate pedestrian crossings. Curb extensions or bulb-outs may be required to improve visibility and to reduce pedestrian crossing distances.

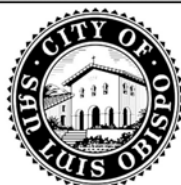
Curb returns must be designed to minimize overly steep grades of curbs through the returns, to the satisfaction of the City Engineer. Generally, the grades of curb returns should not exceed the grades of the adjacent streets, and include accessible curb ramps. Additional landing area may be required at corners that are outside the planned right-of-way to accommodate curb ramps. Curb ramps must 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.

D. 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.

Mission Style Sidewalk, curb and gutter must be constructed per City Engineering Standard 4220.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

All driveways, curb ramps, tree wells and catch basins must conform to Mission Style Sidewalk requirements.

All sign posts and parking meter posts must be relocated behind the tile row and be installed per City Engineering Standards.

All new utility vaults, water meter boxes, and sewer cleanouts must be located behind the tile row or future tile row and must conform to City Standards. Wells, boxes, lids and covers must be stained or coated to match surrounding sidewalk. Stains and coatings must 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 must be traffic rated.

All new installations of Mission Style Sidewalk must include Mission Style Curb and Gutter.

Any existing feature in the sidewalk that is of a special, unique, unusual, or historic nature, as determined by the City, must not be replaced, removed, or altered without specific approval of the City Engineer.

E. Repair and Replacement of Sidewalk

Existing sidewalk fronting the property must be repaired and/or replaced as determined by the following criteria:

1. ADA maximum allowable sidewalk vertical displacement = 1/4-inch
 - a. Vertical displacement of 3/4" or less – grind panel to provide smooth transition
 - b. Vertical displacement greater than 3/4" – remove and replace panel
2. ADA maximum allowable sidewalk horizontal displacement = 1/2-inch
 - a. Horizontal displacement of 1/2" to 3/4" – use appropriate patch filler
 - b. Horizontal displacement greater than 3/4" – remove and replace 5-foot panel
3. Misalignment of curb face of 3/4" or greater – remove and replace section
4. Gutters subject to standing water 1/2" deep or greater and for a distance of 5-feet or more – remove and replace section.

3.1.11 Pedestrian Crossings

A. General

Crosswalks, either marked or unmarked, exist at all intersections of streets unless the local authority has implemented traffic controls to restrict the crossing of pedestrian traffic. For locations not controlled by:

1. traffic signals
2. yield signs
3. stop signs

Marked crosswalks and in-ground lighting systems may only be considered after an engineering study is performed per the City's crosswalk policy.

If determined marked crosswalks are appropriate, installations shall be in conformance with the City's crosswalk policy and Manual on Uniform Traffic Control Devices.

All pedestrian crossing must comply with the Pedestrian Crosswalk Policy.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

B. Re-Installation or Removal of Marked Crosswalks

Re-installation of marked crosswalks may be evaluated as part of roadway resurfacing projects that cover pavement markings. Markings that do not meet the current design guidelines will be recommended for removal.

The California Vehicle Code, Section 21950.5, requires a public hearing 30 days prior to the removal of a crosswalk. Any crosswalk scheduled for removal must be posted at the site ten days prior to the scheduled hearing.

3.1.12 Bike Facilities

Bikeways must be incorporated into the design of any public improvements whenever a street is recommended for bikeway improvements in compliance with the adopted Bicycle Transportation Plan.

Bikeway design must comply with the City’s adopted Bicycle Transportation Plan, Chapter 1000 of the HDM, MUTCD, and these Engineering Standards.

The City may approve alternatives to sidewalks or bicycle lanes incorporated into the roadway section. Such alternate routes must be within a public right-of-way or public easement and must 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 must be logically related to conventional sidewalks or bike lanes to safely divert pedestrian/bicycle travel from roadway sections lacking roadside walks or bike lanes.

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.

Minimum Class I and Multi Use Bikeway Facility Width		
Type	Paved Width	Notes and Additional Guidance
Class 1 or Multi Use Path	12 ft	Include 2 foot shoulders on either side of all Class I or multi-use path facilities.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

Minimum Class II Bikeway Facility Width					
Type	Paved Width	Next to Parking	Vehicles/Day	85% Motor Vehicle Speeds	Longitudinal Slope
Class II	5 ft (default)	No	< 10,000	< 35 mph	< 4%
	6.5 ft (Meet 1 Criterion)	Yes	≥ 10,000	≥ 35 mph	≥ 4%
	8 ft (Meet 2 Criteria)	Yes	≥ 10,000	≥ 45 mph	> 4%
Class II Channelization (Use channelization when bike lane adjoins a right turn lane)	5 ft	yes			

* Facility width is measured from the centerline of stripe.

New class II bikeways should include a 2' buffer. Buffer may be included within the Class II bike lane paved width for widths greater than 6.5 ft.

3.1.13 Multi-Use Paths

A. General

Multi-use paths are multipurpose facilities suitable for serving a combination of:

1. recreational hikers
2. pedestrians
3. equestrians
4. bicyclists
5. other non-motorized vehicle users.

Multi-use paths within the City right-of-way must be designed and constructed in accordance with these standards. Multi use path width must be a minimum of 12 feet wide with 2 foot shoulders on each side.

B. ADA Compliant

Multi-use paths must meet ADA requirements for pedestrian paths including those for surface, width and grade unless a nearby ADA compliant alternate path is readily available.

C. HDM Compliant

Multi-use paths that are reasonably anticipated to convey bicycle traffic must be designed either as a "Class I Bikeway" or as "Trail" and must comply with Chapter 1000 of the HDM.

D. Attached and Detached Paths

Where a multi-use path is to be constructed, it may be attached (i.e., integral with the edge of the roadway pavement) or detached (separated from the roadway by a landscaped parkway).

When paths are attached, adequate space must be provided to accommodate 2' shoulder in addition to space for street furniture and signs as needed.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF: MAY 2018			



UNIFORM DESIGN CRITERIA

E. Crossing Locations

Multi-use paths which cross public streets or roads should only cross at intersections. Midblock crossings may be considered if warrants provide justification.

F. Path Termini

Where Multi-use paths terminate at or cross public streets, paths shall be split with a landscape median or similar to restrict vehicular traffic.

3.1.14 Street Parking

Parking is not allowed on regional highways. Parking on one or both sides is allowed on all other street types with Public Works Director approval. 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 must 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, drainage 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.

3.1.15 Bus Turnouts

Where construction of a bus turnout is required by project conditions of approval, construct bus turnout in compliance with Engineering Standard 4920.

3.1.16 Cross Gutters

Cross gutters are only allowed at intersections. Cross gutters are not allowed to cross highway/regional routes or arterial streets.

3.1.17 Sight Distance

A. General

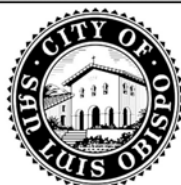
No signs, hedges, shrubbery, vegetation, fence or other sight distance obstruction may be placed within the restricted area at the corner of any public road intersection, inside curve of any knuckle, or within the sight triangle of any common driveway. An obstruction is considered any such item which is higher than 2.5-feet above either the nearest pavement surface or the nearest traveled way.

It is the responsibility of property owners to maintain sidewalks and multiuse paths fronting their property free from all encroachments.

B. Public Road Intersections

Sight distance at street intersections must comply with the Highway Design Manual Topic 405.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

3.1.18 Roadway Clearances

A. Lateral Clearance

Excluding traffic signal equipment, the minimum lateral clearance is 5 feet for local street and 10 feet for all other street types.

Lateral clearance is measure from the edge of travel way to the edge of an un-yielding fixed object. Examples of unyielding fixed objects include, but are not limited to:

1. Trees
2. utility poles
3. transformers or other above-ground facilities
4. sampling stations or other utility installations
5. signs mounted on standards without “break-away” provisions.

Examples of yielding fixed objects which may be permitted within the lateral clearance include:

1. landscaping other than trees,
2. signs mounted on standards with “break-away” provisions
3. fire hydrants with “break-away” provisions.

B. Vertical Clearance

A minimum vertical clearance of not less than 15-feet, 18-feet preferred, must be provided above the travel way and shoulders, and 8-feet above sidewalks.

3.1.19 Right-of-Way

A. General

Right-of-way easement must be offered for dedication to the public and contain all elements of the roadway prism, as depicted in the Engineering Standards. Right-of-way must extend a minimum of 2’ beyond either the edge of:

1. roadway shoulder,
2. back of curb, or
3. back of sidewalk

for the ultimate build out roadway section.

B. Cut and Fill Slopes within the Right of Way

Flatter slopes along the roadway provide:

1. improved appearance
2. reduced erosion
3. reduce maintenance needs
4. increase safety
5. increase public usability.

Therefore, where practical slopes should be 5:1 or flatter within the right-of-way. Where flatter side slopes are not practical the following minimums must apply:

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

1. 4:1 minimum for a minimum distance of 15 feet from the edge of traveled way on roads with a design speed greater than 30 MPH.
2. 3:1 minimum for a minimum distance of 15 feet from the edge of traveled way on roads with a design speed greater than 25 MPH.
3. 2:1 minimum on roads with a design speed equal to or less than 25 MPH.

The City may approve (via the design exception process) steeper slopes when the following conditions are demonstrated:

1. Proposed slopes have been determined to be stable by a geotechnical engineer
2. Adequate lateral clearance from the travel way is provided
3. Adequate erosion control can be established
4. Adequate access for maintenance is provided
5. Adequate sight distance is provided.
6. Adequate setback is provided from adjoining properties or adjoining facilities.
7. Adequate drainage is provided.

Where excavation or fill slopes continue beyond the street right-of-way, easements for the slopes may be required by the City.

3.1.20 Barricades, Barriers, and Railings

Where improvements only cover a portion of the ultimate improvement and where an improved street is proposed to be extended in the future, the improvements must include a barricade at the end to serve as a warning to the public. The barricade must be constructed, erected, painted and signed in compliance with Engineering Standards and in compliance with the most current version of the MUTCD.

Railings and barriers must be placed as needed to address:

1. roadway safety conditions,
2. accommodate pedestrian and bicycle traffic,
3. comply with ADA requirements
4. comply with OSHA requirements.

The Project Engineer must evaluate the need to install such railings and barriers based on the following criteria:

1. Guardrails: Design guardrails in compliance with chapter 7 of Caltrans’ Traffic Manual. The designer must consider the elimination of obstacles prior to proposing the installation of guardrails.
2. Bikeways: Railings must be installed on structures and along the pavement edge where embankment slopes drop off steeper than 2:1 within the lateral clearance requirement. Railings must conform to the Caltrans Bridge Design Specifications Section 2.7.2 “Bicycle Railing”.
3. Pedestrian Railings: Railings are required for sidewalks or multi-use paths when:
 - a. When a drop off exceeds 30-inches in height is within 5 feet.
 - b. The adjacent slope exceeds 3:1.
4. For locations along the back of sidewalk where the drop-off is greater than 6-inches but less than 30-inches, a 6-inch warning curb must be installed along the edge in conformance with CalDAG.
5. Maintenance Work Surfaces: In any road right-of-way with retaining walls greater than 4-feet in height, but not subject to the bikeway or pedestrian requirements listed above, a railing system must be provided pursuant to OSHA Standard 1910.23(b) “Protection for wall opening and holes,” for the safety

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

of maintenance workers. Railing systems must be, at a minimum, a Cable Type railing as detailed in the State Standard Plans.

3.1.21 Street Lighting

A. General

All significant projects including but not limited to:

1. major remodels/substantial remodels: Projects involving the substantial remodel of existing structures that’s estimated construction cost is in excess of 50 percent of the value of the existing building.
2. street widenings
3. multi-unit developments
4. high density residential

are subject to providing lighting per the requirements of this standard. Additionally, any

1. major remodels
2. re-developments, or
3. significant sidewalk replacement projects

in the downtown pedestrian lighting master plan area, must 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.

B. 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.

Double arm poles (Type 15D) must 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.

C. 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.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF: MAY 2018			



UNIFORM DESIGN CRITERIA

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 must 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.

D. Street Light Service

Electrical service points must 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 and will be owned and maintained by the City. Lights to be owned and maintained by a private party must be authorized to energize by that party.

When service points are used for more than one light in series, an electrical design for the lighting circuit must be submitted to the City for approval. Voltage drop between the point of service and the end of each lighting circuit must not exceed 5 percent. All street lighting must be 120VAC.

3.1.22 Intersection Controls

New intersections that would otherwise be controlled by all-way stop or signalization shall be controlled by roundabout or traffic circle except where operational or physical constraints render roundabout control infeasible. Roundabout design shall conform to FHWA roundabout design guidelines.

All-way stop control and signalization shall only be considered if Manual on Uniform Traffic Control Devices warrants are satisfied for the respective control type. Satisfaction of warrants is only a prerequisite for consideration and shall not require the installation of either control. All-way stop control and Traffic Signals must comply with current design standards in the Manual on Uniform Traffic Control Design.

Traffic signal conduit fill must not exceed 25%.

3.1.23 Streets Trees

A. Definitions

Rights of Way

1. Fee title: City owns the land on which the road is constructed.
2. Easement: Adjoining property owners own the land on which the road and sidewalk is constructed.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF: MAY 2018			



UNIFORM DESIGN CRITERIA

3. Street Tree Easement: Easement area adjacent to sidewalk or public utilities easement reserved for street tree installation.
4. Public Utility Easement: Easement area adjacent to sidewalk typically reserved for utilities and street tree installations.
5. Public Right-of-Way: Area reserved for road, curb, gutter, and sidewalk. This area width is typically from back of sidewalk on one side of roadway to back of sidewalk on the other side of the roadway.

Tree Ownership

1. City tree: Any tree partially or wholly based in a “fee title” right-of-way.
2. City tree: Any tree within the public right-of-way, easement or fee title.
3. City tree: Any tree in designated street tree easement or public utility easement, including those trees planted as a condition of approved development.
4. Privately owned tree: Any tree not designated as City tree.

Hazardous Tree – any tree that contains one or more of the following conditions:

1. Split trunk.
2. Cracked main branches.
3. Trunk leaning off vertical by at least 15 degrees.
4. Diseased or damaged trunk or main branches.
5. Over half of main branches have been broken off leaving skeleton or unsightly tree.
6. Any condition that threatens the safety of the public or endangers City facilities.
7. Dead tree.

Install one street tree per 35 feet of street frontage. Street trees may be grouped if necessary to avoid conflict with other improvements.

Parkway areas which include trees must be a minimum of 5 feet wide. Parkways created in existing integral sidewalk areas will be handled on a case-by-case basis.

B. Preservation of Existing Trees

Existing trees within the area of any roadway public improvement must be preserved unless a tree removal permit has been issued. All trees within or near the lateral clearance requirements must be shown on the improvement plans. All trees planned to be removed or impacted by the improvements must be shown on the improvement plans.

C. Responsibility for Trees

1. The City will maintain City trees (those within fee rights-of-way).
2. Privately owned trees must be maintained by the property owner.

D. Procedures for Applying for Tree Removal within City Rights-of-Way

Trees within Street Tree Easement or Public Utilities Easement adjacent to the right-of-way may be removed by the property owner at the property owner’s expense subject to the following the issuance of a Tree Removal Permit from the City.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

3.2 Construction

3.2.1 Testing

A. General

Project testing must conform to the requirements of the City's Quality Assurance Program.

B. Basement Soil

Resistance factor "R" tests must be made by the Project Engineer as required by the City. The location of the tests within the area must be selected so that an average "R" value may be determined for the entire development area.

"R" value tests may be required prior to approval of construction plans in cases where a road is anticipated to have a high forecast traffic volumes and traffic index or known poor quality basement soil.

4 Driveways and Off-Street Parking

4.1 General

Driveways, driveway ramps, parking stalls, and aisles, including pavement, drainage, landscaping, screen fencing, and lighting, must 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 ensure that all specifications are met.

The grade break at the gutter should not exceed 20 percent at a driveway to prevent vehicles from dragging on the ground or sidewalk.

Parking lots and driveways must be paved with an all-weather surface, such as asphaltic concrete (AC) pavement or Portland cement concrete (PCC) pavement.

4.2 Permits

If the parking lot is not a part of a larger project, the builder must 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.

4.3 Plans

Plans for the parking lots must conform to city standards and must show design for grading, paving, striping, signing, curbing, lighting, landscaping, and trash enclosures.

4.4 Driveways

4.4.1 Driveways on Arterial and Collector Street

Driveways on arterial streets must conform to the following requirements:

1. Driveway access may must comply with section 3.1.8 "Access Management "of this standard.
2. Driveways may only be served by a break in a center median when such a break is not detrimental to the traffic flow.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

- Where possible, driveways must be located on cross streets or roads, rather than on arterial or collector streets.

4.4.2 Driveway Widths

Driveways must 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
- 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.

4.4.3 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 must 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.

4.4.4 Abandoned Driveways

As a condition of permit issuance, all abandoned driveways and driveway ramps on the same property must be removed, landscaped and the curb, gutter, and sidewalk properly restored.

4.4.5 Turnarounds – Deep Driveways

Driveways which are over 100 feet long must 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.

4.4.6 Turnarounds – Single-Family House Driveways

Single family residential developments generally do not require turnarounds unless there are extreme grade, fire hazard or alignment problems as determined by the Community Development Director or Fire Marshall.

4.4.7 Common-Access Driveways

Common access driveways may be permitted:

- On lots of record (existing before the effective date of this section) if the Community Development Director approves an administrative use permit; or
- In new subdivisions where a common driveway is proposed as part of subdivision approval.

A common-access driveway must meet all the following criteria:

- The driveway must not be inappropriately located (for example, too close to a dwelling, play area or sloped bank).
- 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.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

Residential common-access driveways, those driveways that serve premises zoned or used for residential purposes must:

1. Provide an easement and covenant filed with the County Recorder setting forth driveway usage rights and responsibilities of each parcel serviced. This instrument must be in place prior to any permit issuance authorizing construction and at a minimum include the following provisions:
2. All affected property owners will be jointly responsible for the improvement and maintenance of all parts of the common-access driveway.
3. All parking on the commonly used portions of the driveway is prohibited.
4. Any affected property owner may use 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 and interferes with entry or access to a parcel it serves.
5. 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 section "c" above.
6. If the easement or covenant is abandoned or dissolved, each lot previously served by the common-access driveway must be provided with standard access as required by these regulations.
7. The driveway must serve no more than four residential units unless special circumstances warrant the grant of an exception by the Community Development Director.
8. The Director or Planning Commission may add other requirements or conditions deemed necessary or appropriate.

Commercial and industrial common access driveways, those that serve premises zoned or used for commercial or industrial purposes, may be subject to all conditions of residential common access driveways in addition to other requirements or conditions the City deems necessary or appropriate.

4.5 Off-Street Parking

4.5.1 General

Location and design must comply with the Community Design Guidelines.

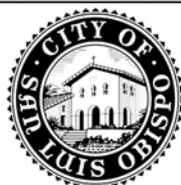
A. Pavement Surfacing

Parking lots and driveways must be paved with an all-weather surface, such as asphaltic concrete (AC) pavement or Portland cement concrete (PCC) pavement. The minimum thickness of pavement must be as specified in these standards. Base material must be compacted to a minimum of 95 percent. Compaction test reports must be submitted to the Community Development Department for verification of proper compaction. All motorcycle spaces within parking lots must be PCC pavement. If surfacing is allowed within the dripline of existing trees, porous pavement surfaces must be used if approved or required by the City Arborist.

Alternative Permanent Paving: The Community Development Director may approve alternatives to AC or PCC paving surfaces on private property. The Director may approve such alternative paving to achieve aesthetic and environmental objectives, such as:

1. improved appearance,
2. increased water percolation,
3. reduced erosion and runoff,
4. increased aeration and water for tree roots,
5. reduced glare,
6. increased area available for landscaping

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

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:

1. public safety,
2. performance,
3. strength,
4. quality
5. durability

Examples of permanent alternative paving surfaces include, but are not limited to:

1. interlocking pavers,
2. eco-block,
3. porous AC paving,
4. cobblestone,
5. or other equivalent material as determined by the Community Development Director.

Alternative paving materials, when installed per manufacturer's specifications, must provide a suitable, all-weather, load-bearing surface to support passenger cars and light-duty trucks. Alternative paving surfaces 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.

B. Geometrics

Turning Radii: The minimum allowable inside vehicle turning radius in parking and driveway areas must be 20 feet unless Fire Apparatus access is necessary, in which case the minimum inside radius must be 30.5 feet and the outside radius must 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.

Spaces Which Back onto Street: Except as noted in Tandem Parking Below, parking spaces which back directly onto the public street must be set back a minimum of 20 feet from the back of the sidewalk, regardless of the zoning of the property. No portion of any parking space or aisle, except driveways for ingress or egress, must be permitted in a required street yard setback area.

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).

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.

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.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

Overhangs/Encroachments: Dimensions shown on the standards must be clear of overhangs or other encroachments which might interfere with vehicular access. Circulation areas must be provided at the ends of aisles.

Maneuvering: Parking lots with more than six spaces must 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 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.

Stall Sizes: All parking stalls must 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 saving a tree or using otherwise unusable space. Compact stalls, if used, must be designed and constructed in accordance with the engineering standard details. Accessible spaces must be designed and constructed in accordance with state and local requirements.

Motorcycle Spaces: All motorcycle spaces must be designed and constructed in compliance with the engineering standards for motorcycle spaces.

Bicycle Parking Standards: Bicycle parking must be provided in accordance with city zoning requirements. Bicycle parking may include racks and/or lockers to the approval of the Community Development Department.

Truck Access: Commercial and industrial parking lots serving loading zones must 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.

Safety Features: Additional requirements and guidelines for parking facility safety including:

1. design,
2. internal layout,
3. acceptable turning radii,
4. pavement slope,
5. vehicular and pedestrian circulation, and
6. other design features

may be required by the Community Development Director. Visibility of and between pedestrians, bicyclists and motorists must be ensured when:

1. entering individual parking spaces,
2. circulating within a parking facility,
3. entering and exiting a parking facility

To the extent possible, the parking facility must be designed so that primary pedestrian access to and from building entrances is along, rather than across parking aisles. Bicycle and automobile parking areas must be separated by a physical barrier or sufficient identification and distance to protect parked bicycles from damage by cars.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

Access for off-street parking facilities: The location and design of all entrances and exits onto public rights-of-way is subject to the approval of the Director of Public Works to ensure minimum interference with the traffic flow and adequate site clearance.

Clearance for off-street parking facilities: All driveways must maintain a vertical clearance of not less than 12 feet. Where fire access is required a vertical clearance of not less than 13.5 feet is required. No encroachment into this vertical clearance may be permitted.

C. Slope

Parking spaces may not slope 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 must 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.

D. Drainage

All parking facilities must be graded and drained to dispose of surface water, subject to the approval of the City Engineer. Oil separation or low impact development stormwater devices are required. Surfacing, curbing and drainage improvements must be sufficient to prevent the free flow of water onto adjacent properties or public streets or alleys, and to avoid standing pools of water within the parking facility.

E. Marking and Signing

Except for R-1 zoned and R-2 zoned property, entrances and exits that are one-way must be marked with an approved sign and pavement marking. Accessible, compact car, and loading spaces must be signed with pavement marking or markings on wheel stops in accordance with state code and local laws. The minimum dimensions of parking bays and maneuvering aisles must comply with Engineering Standard. The number and size of accessible spaces are specified in the California Building Code (part 2 of Title 24) Chapter 11. Each accessible parking space must comply with the most current version of Caltrans Standard Plan A90A or A90B. ADA spaces must be marked and signed to current requirements.

F. Parking Lot Maintenance

It is 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 needs maintenance or repair, to ensure public safety and welfare, the City may pursue enforcement under the authorities of the Municipal Code.

G. Loading Zones

Off-street loading zones must be a minimum of 12 feet wide and 25 feet long. Loading zones must 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 must 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) must 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.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

H. Screening

In Large Parking Lots: Any parking lot with more than six parking spaces adjoining a street must 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 must be landscaped.

Near Residential Development: A parking lot on a site adjacent to a residential development or next to a residential zone must be screened by a solid 6-foot-high wall, fence, or an existing mature hedge.

I. Landscaping

Planting Area Placement: Provide planting areas in all parking lots after each sixth parking space in any row and at the ends of each row of parking spaces. Landscape areas must have a minimum dimension of 4 feet by 4 feet; except, those areas with trees must have a minimum dimension of 8 feet by 8 feet. Landscape areas must be defined by concrete curbs or bands designed to minimize damage to pavement caused by irrigation of landscaping. Landscape areas defining ends of rows must extend to the minimum inside turn radius, must 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.)

Planting Arrangement: To prevent large expanses of pavement, parking lots must 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.

Maintenance: In all zones, required street yard areas must be landscaped and perpetually maintained. All landscape planting must be maintained and dead plants must be replaced as necessary. Drought tolerant planting must be used in accordance with the city's landscape standards for water conservation.

J. Landscape Preservation

Planting areas which may be hit by automobiles or where drainage control is necessary must 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.

K. Temporary Parking Lots

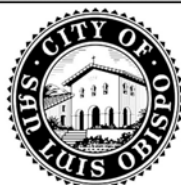
Parking lots and driveways which will be used for one year or less may be developed with Community Development Director approval. The Director may require a recorded agreement and/or cash surety to guarantee:

1. removal of the temporary parking
2. site restoration
3. 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 must meet all other parking and driveway design standards (parking space and driveway dimensions, aisle widths, and so on). Temporary parking lots and driveways must 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:

1. compacted "redrock" or decomposed granite;

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

2. compacted road base over compacted natural grade;
3. 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 must not be used where average cross-slopes exceeds 5 percent.

L. Irrigation

Landscape areas must have a permanent underground irrigation system. Irrigation must 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, and shall be consistent with the City’s water conservation measures.

M. Lighting

Lighting must comply with Community Design Guidelines 2010 Section 6.1.C.

5. Drainage

5.1 Design Standards

5.1.1 Requirements

A. General

All new development or redevelopment must comply with the criteria and standards set forth in the:

1. Waterways Management Plan – Drainage Design Manual,
2. applicable area specific plans,
3. 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 requirement applies.

Stormwater Control Plan, and Operation and Maintenance Plan are required prior to final approvals.

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.

B. Provide for Overland Escape

All components of drainage systems in public improvements must be evaluated to consider the effect of failure of individual components and identify the route of overland escape. The evaluation must identify any necessary measures to prevent erosion or flooding along this route.

C. Conveyance of Drainage in Urban Areas

Drainage must be conveyed in surface facilities such as:

1. bioswales,
2. street gutters
3. cross-gutters
4. basins

to the maximum extent possible. Flows which cannot be conveyed within the capacity of these facilities may be conveyed in culverts or storm drains.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

D. Sidewalk Underdrains

No concentrated flows may be permitted across the surface of any sidewalk. Inlets or under-sidewalk drains must be used in such situations.

5.1.2 Alignment of Drainage Facilities

A. Locate within Road or Public Easement

Drainage facilities accepting runoff from public streets or other public areas must be in a public street or within a public drainage easement. These easements must be offered for dedication to the public.

B. Avoid Combining with Utility Easements

Drainage easements must be used for drainage purposes exclusively and not combined with easements required for other public utility purposes.

C. Easement Width

Easements for culverts and drainage facilities must be a minimum width of 15-feet. All such easements must provide access and future maintenance working areas. Easements must be along or adjacent to property lines and outside areas of proposed or existing structures.

When drainage pipes are 24-inch in diameter or greater, or trenches exceeding 5-feet in depth, provide additional drainage width to accommodate future maintenance needs.

D. Storm Drain Alignment

Storm drain pipes must be parallel with the centerline of streets. The design must avoid:

- 1. Meandering
- 2. Offsetting
- 3. unnecessary angular changes.

No angular changes more than 10 degrees may be made without a junction structure. No single change, even with a junction structure, may exceed 90 degrees.

E. Cross Culvert Alignment

Cross culverts must be aligned with the natural water course and which might not be perpendicular to the road way. The culvert must be sized and sloped to not cause downstream erosion.

5.1.3 Drainage Structures

A. Manholes

Standard precast concrete manholes must be used wherever feasible. When cases arise where special manholes or junction boxes are required, the design must be prepared by a Civil Engineer and submitted to the City for review. Manholes must conform to the following requirements:

- 1. Place manholes, at a minimum, every 500 feet.
- 2. Place manholes at junction points.
- 3. Place manholes at changes in gradient
- 4. Place manholes when pipes change size.
- 5. On curved pipes with radii of 200 feet to 400 feet, place manholes at the BC or EC of the curve and on 300-foot maximum intervals along the curve.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

B. Catch Basin

Catch basins must conform to the following requirements:

1. Design capacity and spacing of drainage inlets so the spread of water roadway design event does not inundate the traveled way see Section 5.1.2.A for design parameters.
2. Sufficient drainage capacity must be provided within the road right-of-way and other drainage facilities to convey a 100-year storm without damage to any structures.
3. No more than 1.0 cubic feet per second may be allowed to “bypass” a midblock inlet. No more than 0.3 cubic feet per second may be allowed to “bypass” a curb return at an intersection.
4. Sheet flow across a road must not exceed 0.1 cubic feet per second.

C. Junction Boxes

Junction boxes must conform to the following requirements:

1. Junction boxes may be construction per:
 - a. Engineering Standard Storm Drain Manholes,
 - b. Caltrans Standard Plans for Junction Boxes, or
 - c. individual design prepared and stamped by a Civil Engineer that includes the design, structural calculations, and design loading.
2. The inside dimension of junction boxes must be such as to provide a minimum of 3-inches clearance on the outside diameter of the largest outfall pipe.
3. Standard manhole entrance.

D. Other Structures

The following requirements apply to drainage structures, as required by the City:

1. Trash racks must be provided where in the opinion of the City they are necessary to prevent clogging of culverts, storm drains, or to provide safety to the public.
2. Guardrail or pedestrian/worker railings may be required by the City at culverts, headwalls, and box culverts and on steep side-slopes.

5.1.4 Bioretention Basins

A. General

In addition to flood control basins, bioretention basins can be used to improve storm water quality and reduce flooding impacts in storms.

B. Design Criteria

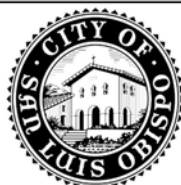
The following must be considered and presented in the design of bioretention basins and bioswales.

1. Lateral distance to vehicle travel lanes, bike lanes, and pedestrian paths
2. Vertical drop offs adjacent to travel lanes, bike lanes, and pedestrian paths
3. Long term percolation rate
4. Landscape establishment and irrigation
5. Maintenance practicality including landscape maintenance and maintenance access
6. Porosity of engineered soil Bioretention Soil Media (BSM)

C. Materials

1. Bioretention Soil Media (BSM). Use a mixture of sand and compost conforming to the post construction handbook or other source approved by the City

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

2. Filter fabric is prone to clogging and may not normally be used within the right-of-way.
3. In lieu of filter fabric, use gravel filter conforming to Caltrans Class 2 Permeable Material per Section 68 of the State standards or approved equal.

D. Maintenance

Perpetual maintenance of bioretention basins and landscaping is the responsibility of the Developer, unless the maintenance responsibility is assumed by a public entity or a property owners’ association.

5.1.5 Bioswales

A. Facility Design and Dimensions

1. Bottom width: Provide 2’ wide minimum flat bottom for facilities with side slopes and longitudinal slope.
2. Allowable standing water duration: 72 hours.
3. Planter minimum widths are typically associated with their application. Considerations influencing minimum widths include: 4’ minimum for planters with trees, 2’ minimum for planters without trees
4. Ponding depth - Min. 6", max. 12"
5. Planter depth – (from adjacent pedestrian walking surface to facility finished elevation/planting surface) is based on desired ponding plus freeboard, but also relates to planter width. Planters can be deeper if they are wider, and need to be shallower as they narrow. This is a pedestrian perception and safety issue. Some recommended width to depth guidelines are:

Planter Width	Max. Planter Depth
Greater than 5 feet	16 inches
4 – 5 feet	12 inches
3 – 4 feet	10 inches
2 – 3 feet	8 inches

B. Slopes and Grades

1. Side slope: 4:1 or 3:1 maximum with a minimum 12-inch-wide shoulder (2% slope toward facility) adjacent to pedestrian use or curb.
2. Longitudinal slope: Maximum 6% longitudinal slope of bottom. Erosion and movement of soil and mulch intensifies with increased longitudinal slope, minimize longitudinal slope. Stair stepping planters on a slope to provide flat bottomed cells separated by check dam/weir overflows can provide more storage and infiltration than a sloped facility.
3. Grades on opposite sides within a facility should be similar to optimize ponding across the entire basin/cell.

C. Infrastructure

1. Inlet curb cut design selection should be based on application considerations:
 - a. Sloped sided or flat/planter facility
 - b. Curb and gutter adjacent to facility or separated by pedestrian sidewalk
2. Sidewalk edge type selection should be based on application considerations:
 - a. New or retrofit
 - b. Sloped sided or flat/planter

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF: MAY 2018			



UNIFORM DESIGN CRITERIA

3. Sidewalk Curb: flat/planter requires 4" min. height curb adjacent to sidewalk for pedestrian safety. Provide 4 to 6-inch-wide sidewalk curb notch when sidewalk drains to planter. Provide as many notches as required to convey flow.
4. Energy dissipation: provide aggregate splash pads at inlets per inlet details. Provide 6" depth, 3" – 6" rounded, washed cobble. For sloped sided facilities where inlet flow velocity is high, extend cobble into facility, but avoid excessive or decorative use.
5. Overflow structure: Provide overflow structure or connect to approved discharge point.

D. Soil, Aggregate and Mulch

1. Aggregate layer: Where an aggregate layer is included in the design use Caltrans Class 2 Permeable. Caltrans Class 2 Permeable does not require an aggregate filter course between the aggregate storage layer and the bioretention soil media above. When Caltrans Class 2 Permeable is not available, substitute Caltrans Class 3 Permeable. Class 3 Permeable requires an overlying 3" deep layer of ¾" (No. 4) open graded aggregate (between Class 3 and bioretention soil media above). Use a minimum depth of 12 inches.
2. Bioretention Soil Media (BSM): use Bay Area Stormwater Management Agencies Association (BASMAA) Specification of Soils for Biotreatment or Bioretention Facilities (Attachment L). Provide pre-mixed BSM, do not mix onsite. Provide a minimum of 24 inches of BSM depth. Where aggregate layer is used and trees are specified, replace aggregate with increased BSM depth in tree planting locations.
3. Filter fabric - do not use fabric between BSM and aggregate layer
4. Provide mulch depth of 2 to 3 inches. Mulch use optional below ponding high water mark. Do not apply mulch in ponding zone just prior to or during rainy season. Mulch non-floating mulch.

E. Planting, Irrigation, and Underdrains

1. Irrigation: Provide irrigation for plant establishment (2-3 years), and supplemental irrigation during periods of prolonged drought. Provide separate zone for connection to water supply
2. Planting: Do not locate plants at inlets. Consider mature growth to determine planting layout and avoid future blockage of inlets by plants.
3. Underdrain: Use 4" diameter, PVC SDR 35 perforated pipe. Install underdrain with holes facing down. Underdrain discharge elevation must be near top of aggregate layer. Underdrain slope may be flat. Provide capped, threaded PVC cleanout for underdrain, 4" min. dia. with sweep bend.

5.1.6 Channel and Swales

No diversion to roadside ditches will be allowed from natural drainage courses.

A. Types

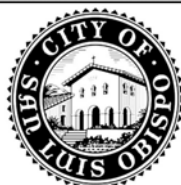
Open channels may be:

1. natural watercourses
2. earthen channels
3. swales
4. bioswales

or channels or swales lined with the materials such as those listed below. Channels lined with impermeable surfaces such as:

1. concrete
2. mortar

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

3. pipe-like materials are discouraged and may only be used where permeable linings are impractical.

Lining materials must be selected that:

1. are non-erosive under velocities calculated in the design storm
2. provide ease of ongoing maintenance

Where linings are required, they must extend to the full height of freeboard, as defined below.

B. Freeboard and Side Slopes Required

Channels or swales may be required to be lined to an elevation of at least 1.0-foot above the design hydraulic gradient. The side slopes for channel or swale must not exceed 2:1 or 3:1 in sandy soils. Provide a minimum of 1-foot of freeboard at design capacity.

C. Improvement Plans

Provide typical sections and profile of the existing and proposed channels for a minimum of 500-feet each side of the development to establish an average profile grade through the development.

D. Velocity Requirements

Channels or swales must comply with the following requirements:

1. Minimum velocity for channels or swales flowing full, with freeboard, must be 2 feet per second.
2. Minimum velocity in bioswales may be less than 2 feet per second but must provide for positive drainage.
3. The maximum velocity in constructed unlined earth channels or swales must not exceed that which would cause erosion; which is typically less than 4 feet per second.
4. The maximum velocity concrete lined channels must not exceed 10 feet per second.

E. Natural Waterways

For natural waterways, the design flow may be allowed in the natural overflow area if a drainage easement is provided, which will include the overflow area, and freeboard as specified above exists between the water surface and adjacent ground.

5.1.7 Culverts and Storm Drains

A. Minimum Diameter

Minimum pipe diameter allowable on any storm drain or culverts that are maintained by the City is 18-inches. A lesser size may be approved for privately maintained facilities.

B. Velocity Requirements

Culverts must comply with the following requirements:

1. Minimum design velocity must be 2 feet per second when conduit is flowing at the 2-year design discharge.
2. Maximum design velocity must not exceed 15 feet per second when culvert is flowing at the Primary Design Storm.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

5.1.8 Outfalls

A. Culvert Energy Dissipaters

Design energy dissipaters in compliance with the HDM Chapter 870, Channel and Shore Protection Erosion Control. Show the following items on the plans:

1. Stable rock size (weight)
2. Rock Slope Protection (RSP) class
3. Dissipater trench dimensions
4. Rock placement method
5. RSP fabric type

Culvert energy dissipaters must be designed for the flow from the Design Storm. Rock slope protection gradation must conform to Section 72 of the State Standard Specifications.

5.1.9 Bridges

A. Design Criteria

Design must 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 must 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:

1. details
2. geotechnical report including log of test borings, corrosivity testing of the soil, and testing for the presence of naturally occurring asbestos
3. scour calculations that indicate adequate structure depth to prevent scour damage or undermining for the life of the structure
4. design calculations including design loads
5. hydrologic and hydraulic calculations

A hard copy and an electronic PDF format copy for archiving must be submitted for documents.

Structures with a required span between 19 feet and 20 feet must be constructed with a minimum span of 20 feet. Clear span bridges must 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 must 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.

B. Materials

Vehicle bridges must 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

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

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 “weathered” steel. The material must be approved prior to the submittal for the structure itself.

New bridge decks may not be overlaid with asphalt unless authorized by the City Engineer. Where the City approves an overlay on the deck, an approved waterproof membrane must be installed between the deck surface and the overlay. Waterproof or sealing membranes such as methacrylate seals may be required prior to acceptance where cracking of the deck is observed.

C. 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 must comply with the most current California Building Code.

D. Bicycle and Pedestrian Facilities

Vehicle bridges must be of adequate width to accommodate, bike lanes and sidewalks on both sides. Bike lanes and sidewalks must be constructed regardless of the presence of those facilities on the abutting roadway.

E. Design Life

All structures must be designed for a minimum 50-year service life.

5.1.10 Fencing

All open channel drainage facilities and drainage basins, must provide fencing as follows:

1. Constructed channels, swales and basins with side slopes five to one (5:1) or flatter and depths less than 3.0-feet do not require fencing.
2. Natural channels do not require fencing.
3. Any required fence must be located no more than 4-inches within the required easement lines and must provide sufficient room for maintenance vehicles.
4. Fencing must be 42 inches tall.

5.2 Post Construction Stormwater Compliance

5.2.1 Performance Requirements

A. Performance Requirement No. 1: Site Design and Runoff Reduction

Projects that create and/or replace 2,500 square feet or more of impervious surface must:

1. Limit disturbance of creeks, wetlands, riparian habitats and provide adequate setback
2. Limit clearing and grading of native vegetation and conserve natural areas, existing trees, and soils. Avoid excessive grading and disturbance of vegetation and soils by conforming the site layout along natural grades.
3. Minimize impervious surfaces by concentrating improvements on the least-sensitive portions of the site, leave the remaining land in a natural undisturbed state. Define the development envelope and

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

protected areas, identifying areas that are most suitable for development and areas to be left undisturbed.

4. Minimize stormwater runoff by implementing one or more of the following site design measures:
 - a. Direct roof runoff into cisterns or rain barrels for reuse
 - b. Direct roof runoff onto vegetated areas
 - c. Direct runoff from sidewalks, walkways, and patios onto vegetated areas
 - d. Direct runoff from driveways and uncovered parking lots onto vegetated areas
 - e. Construct project using permeable surfaces

B. Performance Requirement No. 2: Water Quality Treatment

Projects that create and/or replace 5,000 square feet or more of impervious surface must treat stormwater runoff from existing, new, and replaced impervious surfaces on sites where runoff from existing impervious surfaces which cannot be separated from runoff from new and replaced impervious surfaces. Water Quality Treatment must be treated onsite and designed to treat stormwater runoff equal to the volume of runoff generated by the 85th percentile 24-hour storm event, of 1.1 to 1.3 inches depending on location in the City. Water Quality Treatment may implement a treatment system that use multiple methods to comply with Water Quality Treatment requirements. The Water Quality Treatment system must first implement Low Impact Development Treatment Systems, then may implement Biofiltration Systems, and then finally may implement Non-Retention Based Treatment Systems. Projects subject to Performance Requirement No. 2 must also include design strategies required by Performance Requirement No. 1.

Provide storage for the 85th percentile 24-hour storm event. See Performance Requirement No. 3: Runoff Retention for information to volumetric design water quality volume.

Provide Biofiltration treatment systems that comply with the following design parameters:

1. Must prevent erosion, scour and channeling within the biofiltration treatment system from a rain event of 0.2 inches per hour intensity.
2. Provide a minimum surface water storage volume equal to the biofiltration treatment systems surface area times a depth of 6 inches.
3. Provide a minimum of 24 inches in depth of Bioretention Soil Media (BSM) equivalent to soil media as specified in Attachment L.
4. Proper plant selection for facility.
5. Provide a minimum subsurface gravel storage layer of 12 inches for entire biofiltration systems surface area.
6. Provide underdrain or French drain at the top of gravel layer.
7. Do not compact soils below the biofiltration facility. Rip and loosen soils if previously compacted.
8. Do not use liners or barriers.
9. Hydraulic capacity that collectively achieves at least one of the following criteria:
 - a. Volumetric Design: Provide storage for the 85th percentile 24-hour storm event.
 - b. Flow Based: Provide capacity at a minimum of a rain intensity of 0.2 inches per hour.

C. Performance Requirement No. 3: Runoff Retention

Projects that create and/or replace 15,000 square feet or more of impervious surface must retain runoff for optimal management of watershed processes. Projects subject to Performance Requirement No. 3 must also include design strategies required by Performance Requirement No. 2 and 1.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

Replaced impervious surface, may receive a 50 percent reduction when calculating the volume of runoff subject to Runoff Retention Performance Requirements.

Retention must meet the following performance requirements:

1. Prevent offsite discharge from events up to the 95th percentile 24-hour rainfall event.
2. Achieve retention by:
 - a. optimizing soil infiltration
 - b. storage
 - c. rainwater harvesting
 - d. evapotranspiration.

Provide a site assessment document that identify opportunities and constraints to implement LID Stormwater Control Measures for development site. Site assessment document must review and document the following site characteristics:

1. Site topography
2. Hydrologic features including contiguous natural areas, wetlands, watercourses, seeps, or springs
3. Depth to seasonal high groundwater
4. Locations of groundwater wells used for drinking water
5. Depth to an impervious layer such as bedrock
6. Presence of unique geology
7. Geotechnical hazards
8. Documented soil and/or groundwater contamination
9. Soil types and hydrologic soil groups
10. Vegetative cover/trees
11. Run-on characteristics (source and estimated runoff from offsite which discharges to the project area)
12. Existing drainage infrastructure for the site and nearby areas including the location of municipal storm drains
13. Structures including retaining walls
14. Utilities
15. Easements
16. Covenants
17. Zoning/Land Use
18. Setbacks
19. Open space requirements
20. Other pertinent overlay(s)

Delineation of discrete Drainage Management Areas (DMAs) to support a decentralized approach to stormwater management. Provide a map or diagram dividing the entire project site into discrete DMAs. Account for the drainage from each DMA using measures identified as:

1. Self-treating area
2. Self-retaining area
3. Area draining to self-retaining area
4. Area draining to Stormwater Control Measure (SCM)

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

When the applicant has demonstrated through their Stormwater Control Plans that use of Site Design Measures of Performance Requirement No. 1 have been implemented to the maximum extent practicable, the use of Structural Stormwater Control Measures may be used. The Structural Stormwater Control Measure must be designed for water quality treatment and flow control may be used to comply with Performance Requirement No. 3. Stormwater Control Measures must be designed as to optimize retention and result in Structural Control Measures that are small-scale, decentralized facilities, that are designed to infiltrate, evapotranspire, filter, or capture and use stormwater.

Determine sizing of runoff retention design based on volumetric basis for the 95 percentile 24-hour rainfall event. Retention Tributary Area must be calculated for each individual Drainage Management Areas as follows:

$$Area_{Retention\ Tributary\ Area} = Area_{Entire\ Project\ Area} - Area_{Undisturbed\ or\ Planted\ Areas} - Area_{Impervious\ Surface\ Areas\ that\ Discharge\ to\ Infiltration\ Areas}$$

Calculating the 85th Percentile 24-hour event used for Water Quality Calculations and the 95th Percentile 24-hour event used for Retention Volume is completed as follows:

Compute the Runoff Coefficient “C” for each DMA using the equation:

$$C = 0.858i^3 - 0.78i^2 + 0.774i + 0.04$$

Where “i” is the fraction of the tributary area that is impervious

Calculate the volumetric design quantity as follows (area in square feet, depth in inches):

$$Volume_{Water\ Quality} = C \times Depth_{Rainfall\ Event} \times \frac{1\ foot}{12\ inches} \times Area_{Retention\ Tributary\ Area}$$

Compute the Retention Volume in cubic feet (area in square feet):

$$Volume_{Retention} = C \times 1.8\ inches \times \frac{1\ foot}{12\ inches} \times Area_{Retention\ Tributary\ Area}$$

The County of Santa Barbara has developed a sizing calculator that may be used and downloaded at the following site:

<http://www.sbprojectcleanwater.org/development.aspx?id=76>

D. Performance Requirement No. 4: Peak Management

Projects that create and/or replace 22,500 square feet or more of impervious surface must retain runoff for the optimal management of watershed processes. Projects subject to Performance Requirement No. 4 must also include design strategies required by Performance Requirement No. 3, 2 and 1. Post-development peak flows, discharged from the site, must not exceed pre-project peak flows for the 2 through 10-year storm events.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

E. Impervious Surface Correction Factors

Surface must not broadly be characterized as completely pervious. Use correction factors to calculate equivalent impervious surface area for Post Construction Stormwater Runoff Requirements.

Surface	Equivalent Impervious Surface Factor
Roof	1.0
Concrete	1.0
Asphalt	1.0
Porous Concrete	0.1
Porous Asphalt	0.1
Grouted Paver Unit	1.0
Solid Paver Unit set in Sand	0.5
Crushed Aggregate	0.1
Landscape	0.1

5.2.2 Stormwater Control Plan

The applicant must provide a Stormwater Control Plan that clearly provides engineering analysis of all Water Quality Treatment, Runoff Retention, and Peak Flow Management controls for projects subject to those performance requirements. All reports must be completed by either a Registered Civil Engineer or Qualified Stormwater Pollution Prevention Plan Developer (QSD).

A. Minimum Requirements for Content

1. Project information including:
 - a. project name;
 - b. location;
 - c. parcel numbers;
 - d. applicant contact information;
 - e. land use information;
 - f. site area;
 - g. area of existing impervious surfaces,
 - h. area of new impervious surfaces
 - i. area of replaced impervious surfaces
 - j. applicable PCR Performance Requirements
2. Narrative description of site features, opportunities and constraints for stormwater control.
3. Narrative description of site design characteristics that protect natural resources including endangered species habitat, vegetation, archaeological resources, natural drainage features, and design features that minimize imperviousness of project and manage runoff from impervious areas.
4. Tabulation of proposed pervious and impervious DMAs, showing self-treating areas, self-retaining areas, areas draining to self-retaining areas, and areas tributary to each LID facility.
5. Proposed sizes, including supporting calculations, for each stormwater facility.
6. Narrative description of each DMA and explanation of how runoff is routed from each impervious DMA to a self-retaining DMA or stormwater control facility.
7. Description of site activities and potential sources of pollutants.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF: MAY 2018			



UNIFORM DESIGN CRITERIA

8. Table of pollutant sources and source control measure(s) used to reduce pollutants to the maximum extent practicable.
9. Description of signage for bioretention facilities.
10. General maintenance requirements for bioretention facilities and site design features.
11. Means by which facility maintenance will be financed and implemented in perpetuity.
12. Statement accepting responsibility for interim operation & maintenance of facilities.

B. Exhibits

1. Existing natural hydrologic features (depressions, watercourses, relatively undisturbed areas) and significant natural resources.
2. Proposed design features and surface treatments used to minimize imperviousness and reduce runoff.
3. Existing and proposed site drainage network and connections to drainage off-site.
4. Entire site divided into separate Drainage Management Areas (DMAs). Each DMA has a unique identifier and is characterized as self-retaining (zero-discharge), self-treating, or draining to a LID facility.
5. Proposed locations and footprints of stormwater control facilities.
6. Potential pollutant source areas

5.2.3 Operations and Maintenance

The Applicant must develop, implement and provide the City an Operations and Maintenance Plan and Maintenance Agreements that clearly establish responsibility for all Water Quality Treatment, Runoff Retention, and Peak Flow Management controls for projects subject to those performance requirements.

A. Operations and Maintenance Plan

The Operations and Maintenance Plan must include, at minimum:

1. A site map identifying all Stormwater Control Measures requiring Operations and Maintenance practices to function as designed.
2. Operations and Maintenance Procedures for each structural stormwater control measure including, but not limited to, Low Impact Design facilities, retention and detention basins, and manufactured or propriety devices operations and maintenance.
3. Short-and long-term maintenance requirements, recommended frequency of maintenance, and estimated cost for maintenance.

B. Maintenance Agreement

The Applicant must provide a signed statement accepting responsibility for the Operations and Maintenance of the installed Storm Water Control Measures. The Applicant must include written conditions in the sales, lease agreements, deed, CCRs, HOA, or any other legally enforceable mechanism that require the assumed responsibility for the Operations and Maintenance of Stormwater Control Facilities. Additionally, the signed statement must include the following information:

1. The location and address of Storm Water Control Facilities
2. Completion dates of the following milestones
3. Construction
4. Field verification of Stormwater Control Facilities
5. Final Project approval/occupancy
6. Party responsible for O&M

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

7. Source of funding for O&M
8. Statement indicating the Storm Water Control Facilities are Maintained as required in the Operations and Maintenance Plan and facilities continues to function as designed or have been repaired or replaced
9. Statement describing any vector or nuisance problems.

C. Maintenance Notification

The Owner/Applicant must provide a signed statement notifying the City of all maintenance of the installed Storm Water Control Measures. Additionally, the signed statement must include the following information:

1. The location and address of Storm Water Control Facilities
2. Completion date of the maintenance activities
3. Party responsible for O&M
4. Source of funding for O&M
5. Statement indicating the Storm Water Control Facilities are Maintained as required in the Operations and Maintenance Plan and facilities continues to function as designed or have been repaired or replaced
6. Statement describing any vector or nuisance problems.

5.3 Groundwater

5.3.1 Subsurface Groundwater Drainage:

Underground dewatering improvements (such as retaining wall sub-drains or groundwater collection system) must not deposit collected groundwater or spring water to the gutter or other surface drainage facility. Such systems must be designed to retain the water on-site or deposit the collected water to an approved collection system.

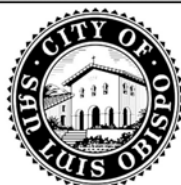
5.3.2 Source Control:

(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:

1. Accidental spills or leaks
2. Interior floor drains
3. Parking / storage areas and maintenance
4. Indoor and structural pest control
5. Landscape / outdoor pesticide use
6. Pools, spas, ponds, decorative fountains and other water features
7. Restaurants, grocery stores, and other food service operations
8. Refuse areas
9. Industrial processes
10. Outdoor storage of equipment or materials
11. Vehicle and equipment cleaning, repair, and maintenance
12. Fuel dispensing areas
13. Loading docks
14. Fire sprinkler test water
15. Drain or wash water from boiler drain lines, condensate drain lines, rooftop equipment, drainage sumps, and other sources

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

- 16. Unauthorized non-stormwater discharges
- 17. Building and grounds maintenance

Design should prevent water from contacting work areas, prevent pollutants from encountering 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.

5.3.3 Groundwater Well Protection Buffers:

Groundwater well protection buffers must follow the standard of practice to meet the minimum horizontal separations and vertical sanitary seal requirements listed by the California Department of Water Resources, and the County of San Luis Obispo Department of Public Health. All new water wells shall be located an adequate horizontal distance from know or potential sources of pollution and contamination. Such sources include, but are not limited to:

- 1. Sanitary, industrial, and storm drainage systems;
- 2. Septic tanks and leach fields;
- 3. Recycled water irrigation systems;
- 4. Sewage and industrial waste ponds;
- 5. Barnyard and stable areas;
- 6. Feedlots;
- 7. Solid waste disposal sites; or
- 8. Above and below ground tanks and pipeline for storage and conveyance of chemicals.

Where a groundwater well exist within the proposed development project, the well will need to be rehabilitated to meet the protection buffers, or may need to be destroyed per County Health Requirements and the California Department of Water Resources Standard Bulletins.

6. Water Supply

6.1 Design Standards

6.1.1 Quantity of Water

The quantity of water delivered to the distribution system from all sources must be sufficient to:

- 1. supply adequately
- 2. dependably
- 3. safely

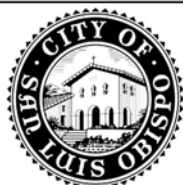
the total requirements of all customers, including fire hydrants, under maximum consumption. The distribution system must be capable of adequately delivering this water supply to all the customers.

6.1.2 Distribution System

A. Operating Pressure

Water distribution system mains must be designed to maintain normal operating pressures, excluding fire flows, of not less than 40 psig at the service connection and may not be more than 80-psig. Residual pressures throughout the entire distribution system under fire flow conditions shall comply with the fire protection standards.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

B. Size of Water Mains

Minimum water main diameter size is 8-inches except:

1. 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.
2. Dead-end mains require special approval of both Fire Dept. and Utilities Dept. For dead-end mains, the minimum size must be:
 - a. 4-inch main if less than 150 feet long and serving less than 10 dwelling units.
 - b. 6-inch main if over 150 feet but less than 350 feet long and serving less than 25 dwelling units.
 - c. 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)
 - d. 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).
3. Recycled water mains must be sized in accordance with the Recycled Water Master Plan, or as determined by the Utilities Department.
4. Recycled water mains design pressure may be reduced, if a lesser pressure class can be justified. Pressure varies in the recycled water system, and shall include a surge allowance per AWWA standards. Designers must contact the Utilities Department to obtain operating pressures, to properly design any extensions to the system.

C. Alignment and Layout of Mains

Water mains must be located per Engineering Standards 6010, 6110 and 6140.

Minimum clearance between mains and street surface must be 3 feet.

Minimum clearance between recycled water mains and street surface must 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.

D. Valves

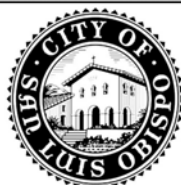
The distribution system must be equipped with enough valves so that no single shutdown will result in shutting down a main, or necessitate the removal from service of a length of pipe greater than 500-feet. Valves must not be in gutters, spandrels or cross-gutters, and shall have 6” clearance between lip of gutter and the outside concrete collar when the valve is in asphalt pavement. Existing valves must be relocated as necessary.

E. Hydrants

Fire hydrants must be installed per the City Fire Code and to the satisfaction of the Fire Marshal and City Engineer. Fire hydrant location and service sizing must meet the requirements of the Fire Department Developer's Guide.

On mains of 12 inches and larger, fire hydrant location and spacing must 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.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

F. Service Lines

Water service must 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 must 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 must be provided. The design and location of the water system serving the proposed subdivision must be provided to the satisfaction of the City Engineer and Utilities Director. Water services may not be required to lots which will be in perpetual open space and will not require irrigation or fire suppression.

All new services must be 1, 2 or 4 inches and larger. All new services 4 inches and larger shall comply with Engineering Standard 6250.

Size of water services must be based on California Plumbing Code (CPC), and adequate for maximum density allowable on each specific lot. Meters must not be larger than service line and must be reasonably sized to maintain flow velocities within the manufacturer’s recommended operating range. In general, the operating range must result in a 95% to 100% meter reading accuracy during average and maximum day demands.

New water services must be installed perpendicular to water main, and must have a minimum of 18” between service points.

New irrigation services must connect to the recycled water system if the project site is within 500-ft from the existing recycled water main and within the masterplan service area. Financing of the mainline extension must be performed by the development and will be eligible for reimbursement agreements in accordance with the City Municipal Code.

G. Thrust Blocks

Concrete thrust blocks must be installed to properly restrain and protect pipeline, as shown in the Standard Drawings. Thrust blocks must be installed at all:

1. bends of 22 ½ degrees or more
2. end of plugged mains
3. behind each tee
4. each cross which is valved in such a manner that they can act as a tee
5. back of fire hydrants.

The thrust block must extend from the fitting to undisturbed soil, and must be of such bearing area as to assure adequate resistance to the force to be encountered per the recommendations of a geotechnical engineer. Prior to pouring concrete, all fittings must be wrapped in minimum 8-mil polyethylene plastic sheet to protect bolts from being covered with concrete. In lieu of the above, movement may be prevented using restraining joints, where thrust blocks are not feasible due to limited space or other reasons, subject to the prior approval of the City.

H. Valve Anchors

Concrete valve anchors must be provided at all in-line valves. Prior to pouring concrete, all fittings must be wrapped in plastic to protect bolts from being covered with concrete.

I. Air and Vacuum Release Valves

Air and vacuum release valves must be installed in the water system at all points where it is indicated that air pockets may form. The design must be such as to ensure the release of air automatically from the water main,

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

and mitigation of surge pressures when warranted. All valves must be designed for a minimum of 150 psi operating pressure. Air and Vacuum release stations must be located in order to provide the minimum lateral clearance from the travel way.

J. Blowoffs

A blowoff or fire hydrant must be installed in the water system at all dead-ends and low points.

K. Sampling Stations

Sampling stations may be required to be installed when directed by the City.

6.1.3 Cross Connections

A. Backflow Prevention Required

Backflow prevention devices must be installed on all service connections that pose a potential threat to health and safety of the community. At a minimum, the following service connections must require backflow prevention:

1. Landscape irrigation
2. Medical and health care facilities
3. Areas served by private wells
4. Restaurants and other food-preparation facilities
5. Private fire-protection lines, including fire sprinkler systems
6. Laboratories
7. Commercial and industrial facilities that use water for other than domestic purposes
8. Areas in a Manufacturing zone
9. Sites that are used or plumbed to use gray water systems.

B. Location of Backflow Prevention Devices

Backflow prevention devices must be located as close as practical to the point of connection. In addition, backflow devices must be located in accordance with Section 7603 of the California Code of Regulations.

C. Ownership and Maintenance

Potable Water Systems: The property owner where any service connection requiring a backflow prevention device is located, must be responsible for operation and maintenance of the device. The City is not responsible for operation and maintenance of these devices.

Recycled Water Systems: The Applicant must develop, implement and provide the City an Operations and Maintenance Plan and Maintenance Agreements that clearly establish responsibility for all Recycled Water Irrigation Systems for projects subject to those performance requirements as listed in the Procedures for Recycled Water Use Manual.

7. Wastewater

7.1 Design Standards

7.1.1 Quantity of Flow

Design flow criteria are summarized as follows (for newly constructed mains only – the Utilities Department will provide data for older mains):

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

Domestic Sewage Generation Factors	
Average dry-weather flow (ADWF):	
Single Family Residential	150 gpd/EDU
Multi-Family Residential	105 gpd/EDU
Industrial / Manufacturing	54 gpd/k-sqft gross floor area
Business Park	54 gpd/k-sqft gross floor area
Commercial	60 gpd/k-sqft gross floor area
Motel / Hotel	70 gpd/room
Peak dry-weather flow (PDWF):	ADWF x Peaking Factor

Reductions in peak flows occur because of storage in the system and diversification of development. The following peaking factor must be used to obtain peak dry-weather flows:

$$\text{Residential Peaking Factor} = 2.6 * (Q^{0.10})$$

Where Q is the cumulative average dry weather flow in the conveyance system calculated in million gallons per day (MGD). Example: PF=2.6*(5.4MGD^{0.10}) equals a peaking factor of 2.19.

Curves may be permitted if 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 must be located as shown in Engineering Standards 6010, 6110, 6140 and 6810.

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.

7.1.2 Manholes

Manholes may not be spaced further than 400 feet apart. Upstream ends of sewer mains must terminate at manholes. Coatings will be required for drop manholes and other locations where gases are expected to accumulate. Drop manholes must be installed where invert transitions are greater than 30 inches.

All inlets must be designed and installed such that the top of pipe elevations match. Where pipelines transition flows within the manhole more than 45 degrees, the flowline of the pipe flowing into the manhole must be a minimum of 0.10-foot above the flowline of the pipe flowing out from the manhole, or an amount necessary to match the top of pipe and hydraulic grade line, whichever is greater.

All manholes must be constructed with precast bases as shown in Engineering Standards 6610 and 6620. Manholes must 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 must 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 must be watertight and pass vacuum test requirements.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

Manholes may not be located at the centerline of intersections.

Where two or more lines enter a manhole, sufficient elevation difference must 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 must be no lower than top of larger pipe(s).

7.1.3 Pipe

A. General

Sewer main size must be determined by designing for flowing half-full, considering the flow generated by the development, the ultimate upstream development, and existing infiltration. New sewer systems shall be provided with pipe materials that eliminate infiltration, and reduce the potential for root intrusion.

Minimum sewer main size is 8-inches diameter; 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 must be sized to be adequate (4 inch minimum) for maximum allowable density on each specific lot.

Pipe material must be fused HDPE unless otherwise required for special conditions such as bridge crossings.

B. Laterals

Sanitary sewer laterals must 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 must be installed as acceptable to the City Engineer. Sewer services are not required for 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 must 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.

New developments planning to re-use an existing lateral shall provide CCTV inspection to confirm the integrity of the pipe preventing infiltration and root intrusion. CCTV requirements listed in the engineering specifications must be used in the video recording and reporting of the lateral condition.

C. Slope and Alignment

Sewer main slopes must be sufficient to provide a minimum velocity of 2 feet per second based on the peak dry-weather flow conveyed in the pipe. Grades must be designed from manhole outlets to inlets. Design velocities for sanitary sewers must not exceed 10 fps at peak flow, and must remain in a sub-critical flow.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF: MAY 2018			



UNIFORM DESIGN CRITERIA

Minimum Slope for Sanitary Sewer	
Diameter	Slope (%)
6 inch	0.50%
8 inch	0.35%
10 inch	0.25%
12 inch	0.20%
15 inch	0.15%
18 inch	0.12%
Lateral	2.00%

Sewer mains and laterals must be designed 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. Sewer main depth must accommodate all lateral connections and allow a 12-inch minimum vertical clearance between laterals and other utility conduits.

Sewerage systems must be designed to have a minimum of curvature, both horizontal and vertical. Whenever possible, sewer lines must be laid out in a straight line between structures. Curved sewer lines will be allowed only under the following conditions:

1. All curve data must be shown on the plans.
2. Minimum radius of curvature must be as recommended by the pipe manufacturer and approved by the City.
3. No deflections may be made at the pipe joints.

D. Sewer Lines Within Easements

All sewers must 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 must not exceed 20 percent, and a truck turn-around may be required. When required due to terrain or depth of sewer line the required easement width must be increased. All easements must include right of ingress and egress over adjoining property for maintenance, replacement and operation.

8. Dry Utilities

8.1 Design Standards

8.1.1 General Provisions

A. Improvements Required

Subdivision improvements include:

1. Electrical
2. Telephone
3. Gas
4. cable television.

Other public improvements, as defined in this document, must include utility improvements where required by conditions of approval or as determined necessary by the City.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

B. Plan Requirements

The intent of these requirements is that sufficient utility detail be shown to permit the City, or other appropriate agency, to locate all utilities when maintenance to the roads and other utilities in the public right-of-way or easements becomes necessary. The plans must show the following utility information as a minimum:

1. Show all utilities in detail on the typical street sections. Include trench dimensions, depth, number of lines, and description of lines (line material, size, etc.)
2. Show complete utility layout. Include line location, road crossings, junction boxes, manholes, service connections or stubouts, etc.
3. The following note must be placed on utility improvement plans:

“All wire and gas utility connections, distribution lines, and service locations shown on these plans are for information only and should not be considered final design. Utility purveyors may need to alter their design from what is depicted herein based upon future design modifications or during construction. This may result in additional redesign costs or charges to the owner for this work.

No revisions to what is depicted herein may be constructed without the prior approval of the City. No above-ground facilities may be located where they block the accessible path of travel or intersection or driveway sight distance.

Prior to final project acceptance it will be the owner’s responsibility to verify final utility alignments and ensure that adequate easements for such facilities are provided”

C. Underground Installation Required

All new and remodeled buildings must have service supplied by underground facilities in compliance with the City’s Municipal Code section 13.12.

D. Service Extensions Required

All utilities must be installed with service laterals to serve all new lots being created in any subdivision project.

E. Acceptance by Utility

Utility improvements will not be accepted as complete by the City, until written correspondence has been received from each utility providing service to the subdivision, indicating that their respective facilities are completed to their satisfaction and “ready for service,” or that sufficient financial arrangements have been made to assure same.

9. Survey

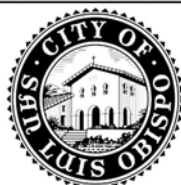
9.1 Street Monuments

Street monuments must 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 may not be set further than 500 feet apart along centerlines, and must be shown on the parcel or final map.

Monuments must be constructed and set per Engineering Standard 9020.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

Set permanent monuments at angle, curve points, and intersections of street centerlines.

Any monument that is disturbed or destroyed must be replaced and corner record filed with County of San Luis Obispo.

Set monuments in streets in compliance with Engineering Standard 9020.

9.2 Tract Boundary Monuments

Tract boundary monuments must be set to reference tract boundary lines at all angle points, beginning and ending of curves, and intersections with street right-of-way lines.

Provide survey monuments for all parcels contained within map.

Tract boundary monuments must be set no further apart than 500 feet along boundary lines, and must be shown on the parcel or final map.

Tract boundary monuments must 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.

9.3 Lot Stakes

Lot stakes must 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 must be constructed of ¾ 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 must be set with a lead plug. All corners must be tagged or marked with either the land surveyor's or registered engineer's number.

All lot stakes must 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.

9.4 Vertical Control (Benchmarks)

Points of known elevation must 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.

10. Landscaping and Irrigation

10.1 General

Landscaping and Irrigation must conform to the provisions in Section 17.87 of the City Municipal Code and Engineering Standards. The provisions of the Engineering Standards apply to the following landscape projects:

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

1. 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.
2. 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.

10.2 Submittals

10.2.1 Development Review

For projects that require development review (tentative parcel map, tentative tract, development plan or conditional use permit), project applicants must submit the following documentation:

1. A completed Maximum Applied Water Allowance (MAWA) for the conceptual landscape design. The MAWA estimate will be used as a maximum allowance for the project’s building permit application.
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.

10.2.2 Building Application

Prior to the issuance of a building permit, project applicants must submit the following:

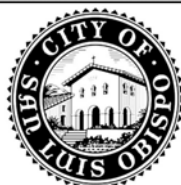
1. A completed Maximum Applied Water Allowance (MAWA) form based on the final landscape design plan. MAWA calculator is available at:
www.slocity.org/government/department-directory/utilities-department/documents-and-files
2. A final landscape design plan that includes all the criteria required in the 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 with a summary of Estimated Total Water Use (ETWU) and the corresponding irrigation window. ETWU calculator is available at:
www.slocity.org/government/department-directory/utilities-department/documents-and-files
7. Plans must comply with City Engineering Drafting Guidelines included in appendix.

10.2.3 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 must 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

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

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 must 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 must meet the criteria in the City Engineering Standards Uniform Design Criteria for Landscaping and Irrigation.
3. A regular maintenance schedule must 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.

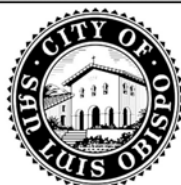
10.3 Landscaping Design

10.3.1 Water Use

For the efficient use of water, a landscape must be designed and planned for the intended function of the project. For each landscape project, applicants must submit a landscape design plan in accordance with the following:

1. 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 (ETWU) must be in accordance with the MAWA calculator.
www.slocity.org/government/department-directory/utilities-department/documents-and-files
2. Plant factors used to calculate the MAWA must be derived from the most recent edition of the Department of Water Resources “Water Use Classification of Landscape Species (WUCOLS)”.
3. Each hydrozone must have plant materials with similar water requirements and be identified as low, moderate or high water use on the plans.
4. Plants must be selected and planted appropriately based upon their adaptability to the climatic, soil, and topographical conditions of the project site, and water attributes.
5. 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.
6. Turf must 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.
7. Low and moderate water-use plants can be mixed, but the entire hydrozone will be classified as moderate water use for MAWA calculations.
8. High water-use plants must not be mixed in the same hydrozone with low or moderate water-use plants.
9. New trees must be clear from sewer and water services per engineering specifications.
10. Invasive plants as listed by the Cal-IPC are prohibited.
11. High use plants, characterized by a plant factor of 0.7 to 1.0, are prohibited in street medians.
12. Recirculating water systems must be used for water features.
13. The surface area of water features, including swimming pools, will be included in a high water-use hydrozone.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

14. A landscape design plan for projects in fire-prone areas must 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.

10.3.2 Irrigation Plan

The irrigation system and its related components must be planned and designed to allow for proper installation, management, and maintenance. Project applicants must submit an irrigation design plan that is designed and installed to meet irrigation efficiency criteria:

1. Landscape water meters must be installed for all non-residential irrigated landscapes of 1,000 square feet or more.
2. Soil types and infiltration rates must be considered when designing irrigation systems. All irrigation systems must 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.
3. Proper irrigation equipment and schedules, including features such as repeat cycles, must be used to closely match application rates to infiltration rates, to minimize or eliminate runoff.
4. Overhead irrigation spray (using manufacturer specified throw distances) is not be permitted within 24 inches of any non-pervious surface, 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.
5. Irrigation systems must 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.
6. Each valve must irrigate a hydrozone with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use. A single valve must not irrigate hydrozones that mix high water-use plants with moderate or low water-use plants.
7. Irrigation systems must 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.
8. Rain sensors, either integral or auxiliary, that suspend or alter irrigation operation during rainy weather conditions is required on all irrigation systems.
9. Head-to-head coverage is required unless otherwise directed by the manufacturer’s specifications.
10. Low volume irrigation is required where plant height at maturity will affect the uniformity of an overhead system.
11. The irrigation system must be designed to ensure that the dynamic pressure at each emission device is within the manufacturer’s recommended pressure range for optimal performance.
12. Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) is 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.
13. Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data is required for irrigation scheduling in irrigation systems for applicable projects in section 17.87.020 (A) (1) of the Municipal Code.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

14. If the project is within the *Recycled Water Master Plan* area, the irrigation system must 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.
15. For City facilities, if the project is within the *Recycled Water 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.
16. For City facilities, pull box spacing must not exceed 200', and conduit fill must not exceed 26%.
17. For City facilities, irrigation boxes must be placed in landscaped areas whenever possible. If irrigation boxes are set in hardscape areas, they must be concrete boxes. The boxes must be traffic rated if the area is open to public traffic or used by maintenance vehicles. Irrigation boxes in playing fields must be buried 4 inches below grade.
18. 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 defined in ASABE/ICC 802-2014.

10.3.3 Soils Management Report

To reduce runoff and encourage healthy plant growth, soil amendment, mulching and soil conditioning recommendations must be prepared by a licensed landscape architect, licensed landscape contractor, licensed civil engineer or licensed architect. Prior to planting of any materials, compacted soils must be transformed to a friable condition.

1. If the characteristics of the project's soil are known, the minimum requirements of the report must include the following:
 2. A minimum of 6 inches of non-mechanically compacted soil must be available for water absorption and root growth in the planted areas.
 3. For landscape installations, compost at a rate of minimum of cubic yards per 1,000 square feet of permeable area must 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.
 4. A minimum of 3 inches of mulch must be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers or direct seeding applications. Plant mulch must be shredded redwood bark unless otherwise approved by the City Engineer.
5. If the characteristics of the project's soil are unknown, the project applicant must submit soil samples to a laboratory for analysis and recommendations.
6. Soil sampling must be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.
7. 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.
8. The soil analysis report must 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.
9. The project applicant must submit documentation verifying implementation of soil analysis report recommendations to the City with Certificate of Completion.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

10.3.4 Grading Plan

For the efficient use of water, grading of a project site must be designed to minimize soil erosion, runoff, and water waste.

1. The project applicant must submit a landscape grading plan that indicates finished configurations and elevations of the landscape area including:
2. Height of graded slopes;
3. Drainage patterns;
4. Pad elevations;
5. Finish grade; and
6. Stormwater retention improvements, if applicable.
7. To prevent excessive erosion and runoff, grading must comply with the following to the maximum extent practicable:
8. Grade so that all irrigation and normal rainfall remains within property lines and does not drain onto non-permeable hardscapes;
9. Avoid disruption of natural drainage patterns and *undisturbed soil*;
10. Avoid soil compaction in landscape areas; and
11. Preserve natural drainage channels.

10.4 Miscellaneous City Facility Provisions:

10.4.1 Irrigation System Operational Requirements

Design must 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, despite proper installation and adjustment of the irrigation, be operated to provide proper coverage, the designer must redesign and direct revised installation at his/her cost until the system can be shown to operate properly via an audit and empirical data.

10.4.2 Hardscape

Walkways and pads for appurtenances in parks must 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, must be round, oval or have rounded edges to allow mowing without damage to mow blades and pads.

10.4.3 Median islands

Median island noses must 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 must be hardscaped. All hardscaped surfaces within median islands, except for pedestrian areas, must be decorative.

Median island irrigation systems must be sized to planned street island build-out (multi-island plans), including mainline sizing, water and control connections, and control systems configuration and capacity.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

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 must be such as to prevent damage to adjacent roadway sections from infiltration, to the satisfaction of the City Engineer.

10.4.4 Playgrounds and Miscellaneous areas

An engineered wood surfacing, meeting accessibility requirements, must be used under play equipment. Alternative surfaces must be submitted to the City Engineer for review and approval.

Benches and picnic tables must be of a low maintenance material such as rubber coated steel. No wood is allowed. Alternative materials must be submitted to the City Engineer for review and approval.

10.4.5 System Pressure

Where an existing meter or irrigation system is present, the designer must obtain the current line pressure to use in design. Where no existing system exists, the City of San Luis Obispo Utilities Department must 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 must consider the pressure in both systems and design the irrigation system so that it will work with either pressure.

The designer must 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 must 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 must be submitted for review and approval. Calculations submitted must clearly show an accounting for system losses and concurrent loading to prevent under-sizing 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 must include a pressure reducer or booster pump to be installed, if needed, based on the actual pressure in the new irrigation system. System must be designed for maximum efficiency.

10.4.6 Controller

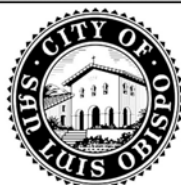
Irrigation designers must contact the Parks Maintenance Supervisor to determine what, if any, telemetry control equipment will be required. Systems are to be designed to current City Standards for Controller equipment where an irrigated area is City owned or to be dedicated. If control is to be via phone line, the designer must coordinate with the City’s telephone system representative or City project manager to arrange for hook up.

11. Subdivision Design Criteria and Improvement Standards

11.1 General requirement

The design criteria for subdivisions and required physical improvements must be in compliance with the City’s grading ordinance, zoning regulations, subdivision standards, City Standard Specifications and Engineering Standards and other applicable regulations.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

11.2 Improvements

Improvement work, including grading, must 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:

1. The full width of each street must 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 must 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.
2. Streets must 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 must be concrete or other accessible surface material approved by the City.
3. The subdivider must complete any railroad crossing necessary for the subdivision, including application to the California Public Utilities Commission.
4. Separate paths or bicycle / pedestrian areas may be required.
5. Bus stops and benches must be provided where the subdivision abuts existing or planned City bus routes and a stop is required for the use of the neighborhood.
6. Durable boundary monuments must be installed and shown on the final map.
7. Street trees must be provided as required by the tree regulations, as set forth in Chapter 12.24 of the City’s Municipal Code.
8. Street name signs, traffic control, and warning signs must be installed. Traffic signals and traffic signal control conduits may be required by the City Engineer.
9. Utilities to be installed by the subdivider must 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 must be placed underground, except accessory facilities such as terminal boxes, meter cabinets, and transformers may be installed aboveground. The subdivider must make all necessary arrangements with the utility companies for the following 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 per the requirements of the responsible utility companies
10. All new utility distribution facilities must be placed underground, except accessory facilities such as terminal boxes, meter cabinets, and transformers may be installed aboveground. The subdivider must make all necessary arrangements with the utility companies for these facilities.
11. The subdivider must 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

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

subdivision. Temporary protective improvements may be required prior to or concurrent with the construction of permanent improvements.

11.3 Lot Design

11.3.1 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 must be noted on the parcel or final map.

11.3.2 Lot lines

Lot lines should be at the top of slope banks.

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.

On corner lots, the lot lines adjacent to streets must be rounded with a radius adequate to provide for street improvements.

11.3.3 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 must conform to Subdivision Regulations, Section 16.18.060 of the Municipal Code.

12. Construction of Private Development Projects

The section generally describes the requirements and responsibilities for all construction and maintenance projects that occur within the right-of-way. However, the following format and procedure are unique to improvements associated with private development projects within the right-of-way.

12.1 Before Construction

12.1.1 Pre-Construction Conference

A Pre-Construction Conference is required prior to commencing the work shown on the approved improvement plans. The Engineer of Work must arrange this, and notify the City. The conference agenda will typically review the following items, as appropriate:

1. Contact information
2. Construction Schedule
3. Potential Utility conflicts
4. Typical and Special Inspection requirements
5. Unique project safety requirements including:
 - a. trench safety
 - b. confined space safety
 - c. Work Zone Safety
6. Traffic Control and accessibility

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

7. Environmental site constraints
8. Regulatory permit requirements
9. Storm water control and requirements
10. Accommodation and coordination with project neighbors
11. Any unique projects constraints

The conference must include the following attendees, as appropriate:

1. The Developer
2. The Engineer of Work
3. The Contractor
4. The Soils Engineer
5. Representatives of the affected utility providers
6. Representatives of the permitting agencies
7. Representatives of City
8. At least five working day advanced notice of the time and location of the conference must be provided to the City.

12.1.2 Contractor’s Requirements

Contractors and subcontractors performing the work under these Standards must possess a valid State license to perform such work. The Contractor or his/her duly authorized representative must be available on the job site during the time when any work is in progress.

A. Trench Safety

All work must be performed in accordance with the requirements of the State of California Department of Industrial Relations. The Contractor must conform to the permit requirements of the Division of Industrial Safety and must obtain any necessary trenching permit directly from the Department of Industrial Relations. The Contractor’s attention is directed to the provisions of Section 6705 of the Labor Code concerning trench excavation safety plans. Excavation for any trench 5-feet or more in depth must not begin until the Contractor has obtained a trenching permit from the California Department of Industrial Relations.

B. Agency Permits

All needed regulatory permits must be obtained by the developer prior to starting any work covered by or impacted by those permit(s). The developer must keep these permits current. Copies of the permit documentation must be kept on site for review by the City. Issuance of an encroachment permit or other permits by the City does not relieve the developer from obtaining these permits.

C. Encroachment Permit

After approval of the improvement plans and prior to starting any work within the City right-of-way, the Developer must obtain an encroachment permit from the City. Copies of the encroachment permit must be kept on site for review by the City or other agency representatives.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

12.2 During Construction

12.2.1 Inspection by Engineer of Work

The Engineer of Work has is responsibility for inspection during the construction of all improvements that are regulated by these Standards. The Engineer of Work, at a minimum, must inspect the following milestones during construction, and provide a written inspection report to the City:

1. Concrete form work
2. Hot Mix Asphalt paving operations
3. Initiating the placement of the roadway base course
4. Substantial completion of roadway base placement and compaction
5. Substantial completion of roadway subgrade excavation/fill placement
6. Trench bedding and compaction

Other required inspections may be determined necessary by the City.

12.2.2 Workplace and Worksite Conduct

1. It is expected that developers and their contractors will promote a businesslike workplace (including work sites) that assures courteous treatment for workers, fellow contractors, City employees, and the public. Harassment or discrimination based on race, religion, national origin, marital status, disability, age, sex or sexual orientation is not to be tolerated.
2. It is expected that the developer and contractors will promote good relations with the neighbors and public affected by a project. This typically requires regulating construction activity to minimize impacts to the neighborhood caused by noise, dust, construction debris, and traffic disruption. When access or traffic will be delayed, advanced notification must be provided to the affected neighbors as well as to local emergency responders.
3. It is incumbent on the contractor to control the work site and provide a safe working environment. Contractor must require employees to wear appropriate personal protective equipment while on the work site.
4. It is incumbent on the contractor to control the work site and ensure all erosion control measures, traffic control devices are in place and properly maintained. The work site must also be kept in clean and orderly.

12.2.3 Clean Up

During the progress of the work, the Contractor must keep the entire job site in a clean and orderly condition. Excess or unsuitable backfill material, broken pipe, or other waste material must be removed from the job site. Spillage resulting from hauling operations along or across existing streets or roads must be removed immediately by the Contractor. All gutters and roadside ditches must be kept clean and free from obstructions. Any deviation from this practice must have prior approval from the City.

12.3 Project Completion

Once the work on the project site is complete, including:

1. site cleanup,
2. dressing and hydroseeding graded slopes,
3. completion of all utility and drainage facilities
4. removal of temporary traffic control devices from public roads

the Project Engineer may initiate the final processing of the improvements.

REVISIONS	BY	APP	DATE
Rewritten	MH	MH	6-17
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA

12.3.1 Clean Up

Before final acceptance of the work, the Contractor must:

- 1. carefully clean up the work and premises
- 2. remove all temporary structures built
- 3. remove all surplus construction materials and rubbish of all kinds
- 4. leave the site in a neat condition.

12.3.2 Record Drawings

During the progress of the work, the Engineer of Work must maintain one set of prints of the improvement plans showing all as-built changes. Each as-built change must be approved by the City before being made. This set must be available on the job for inspection by the City at any time. Upon completion of the work, the Engineer of Work must make as-built changes on the original plans, and return them to the City prior to acceptance of the project.

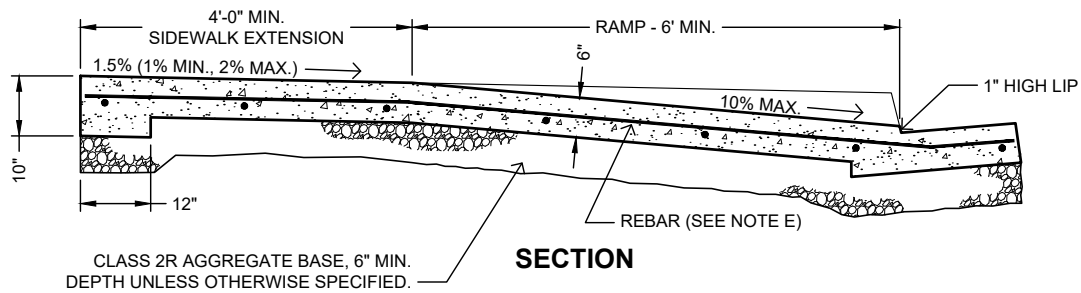
12.3.3 Improvements to be Accepted for City Maintenance

For any public improvement which is to be accepted for City maintenance, the Engineer of Work must submit records of the improvements to be accepted, in AutoCAD and PDF format of all construction drawings.

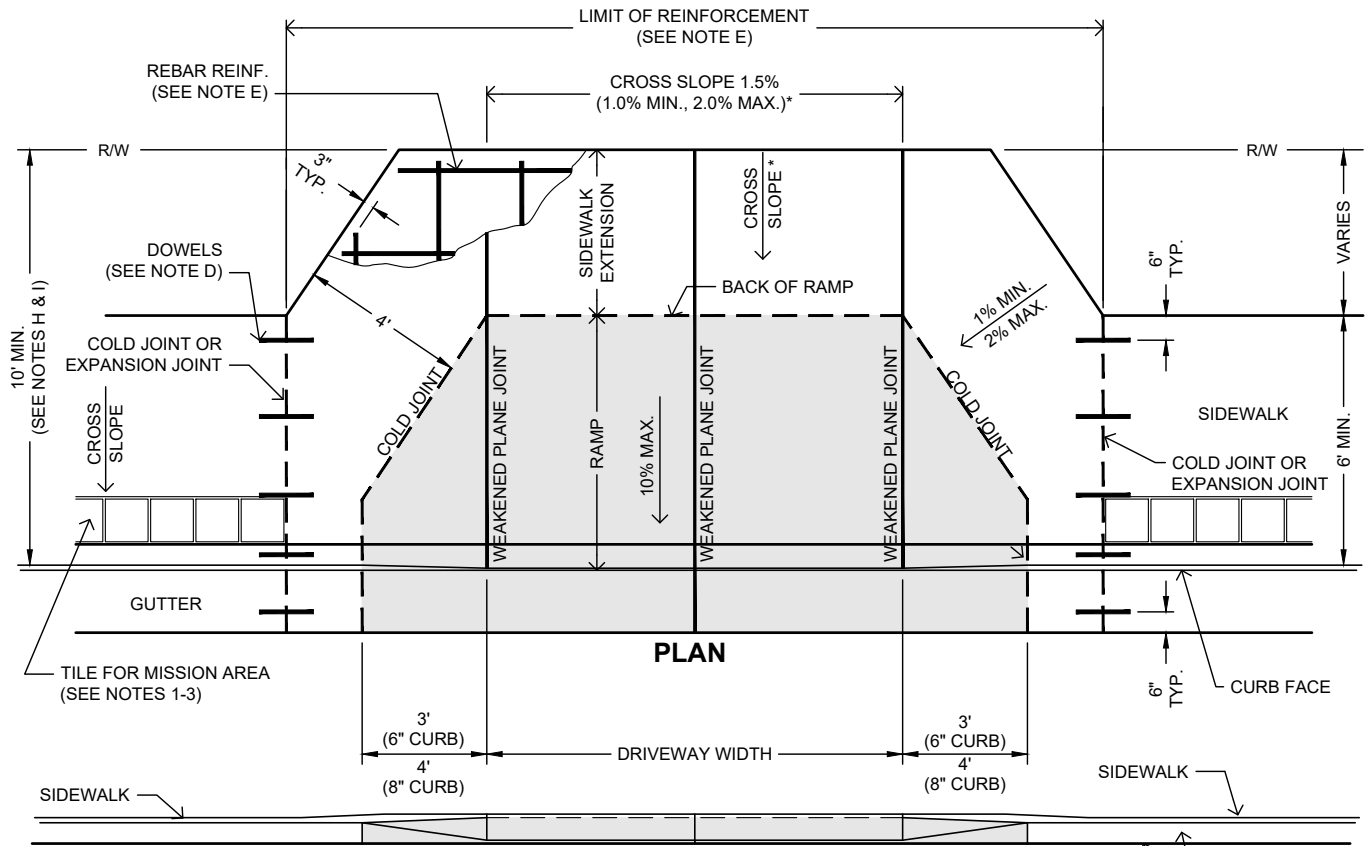
REVISIONS	BY	APP	DATE
<i>Rewritten</i>	<i>MH</i>	<i>MH</i>	<i>6-17</i>
STANDARD CURRENT AS OF:		MAY 2018	



UNIFORM DESIGN CRITERIA



SECTION



PLAN

ELEVATION

GENERAL NOTES:

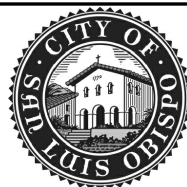
- A. A depression in a new curb and gutter for a driveway will not be permitted unless the ramp and sidewalk extension are constructed also.
- B. Slope of ramp is a straight grade from the top of the back of ramp to the top of the lip at the gutter.
- C. Concrete shall be Class 3.
- D. Dowels at expansion 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*:

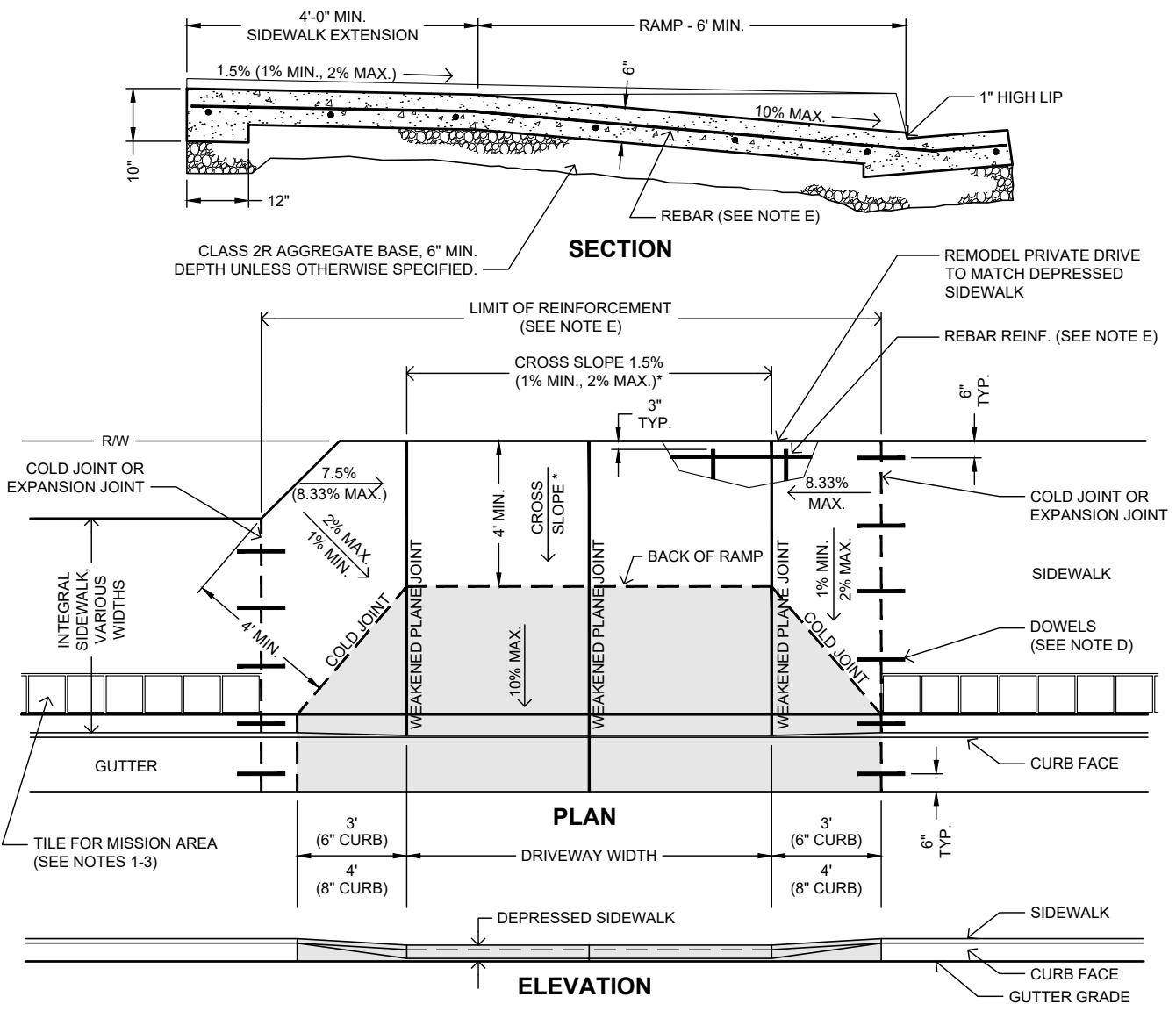
- 1. Comply with Section 73-4 of Standard Specification colored concrete.
- 2. No tile shall be set in mortar prior to approval of tile by City Engineer.
- 3. Tile band shall terminate as shown on either side of driveway.

* 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
Notes revised	KH	MH	1-17
STANDARD CURRENT AS OF:		May 2018	



**DRIVEWAY RAMP
STANDARD**



GENERAL NOTES:

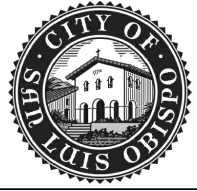
- A. A depression in a new curb and gutter for a driveway will not be permitted unless the ramp and sidewalk extension are constructed also.
- B. Slope of ramp is a straight grade from the top of the back of ramp to the top of the lip at the gutter.
- C. Concrete shall be Class 3.
- D. Dowels at expansion 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*:

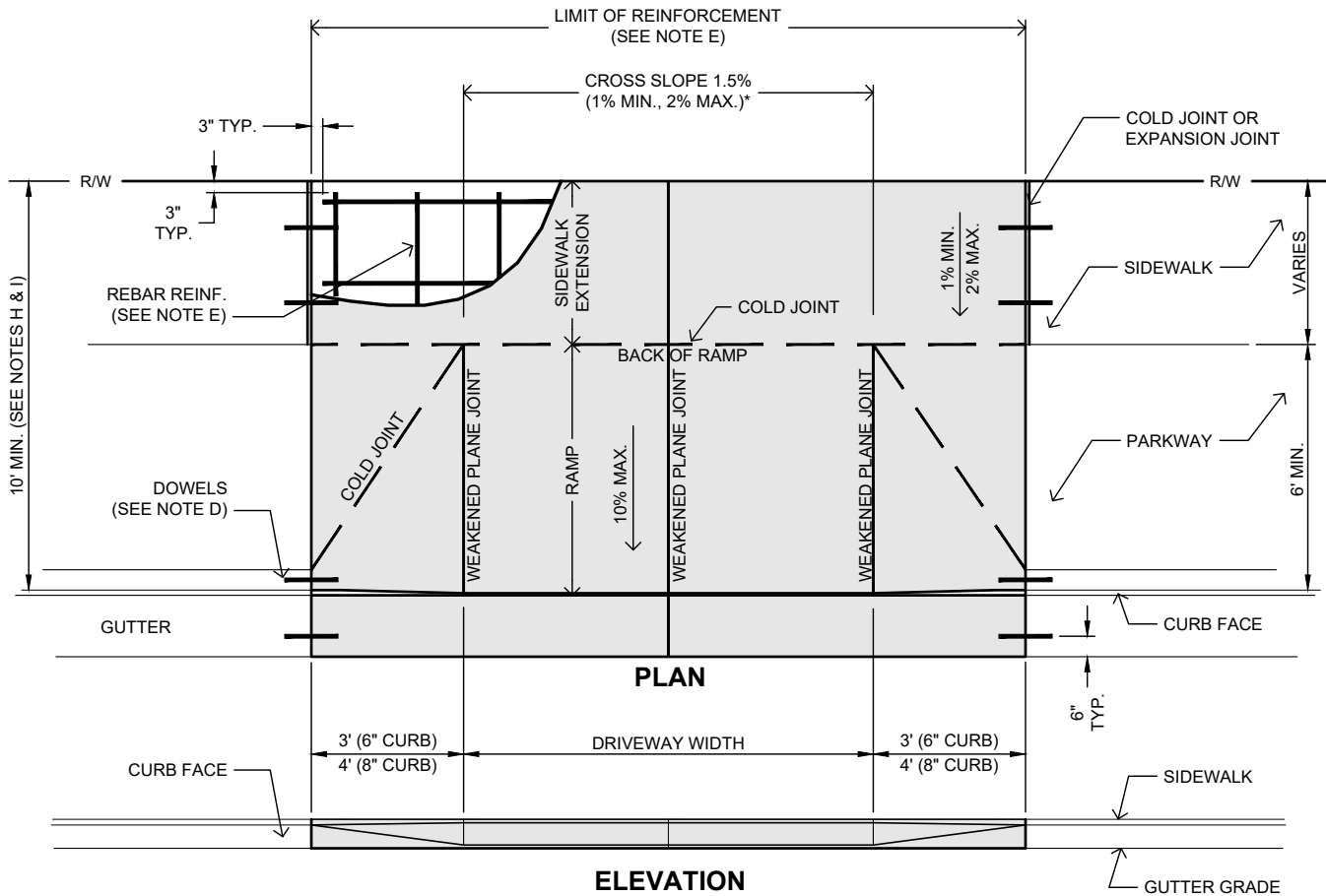
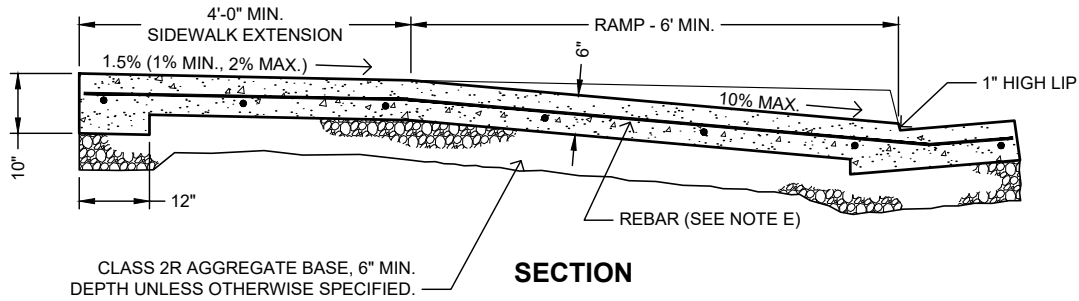
- 1. Comply with Section 73-4 of Standard Specification colored concrete.
- 2. No tile shall be set in mortar prior to approval of tile by City Engineer.
- 3. Tile band shall terminate as shown on either side of driveway.

* Additional notes for Mission Style shall apply in those areas designated as Mission Style Sidewalk area per City Council Resolution.

REVISIONS	BY	APP	DATE
Notes revised	KH	MH	1-17
Update Cross Slope percentages	JDL	MH	2-13
Notes revised	SR	BL	1-14
STANDARD CURRENT AS OF:		May 2018	



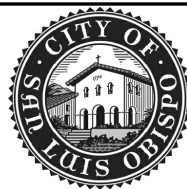
**DRIVEWAY RAMP
RIGHT-OF-WAYS
LESS THAN 10'**



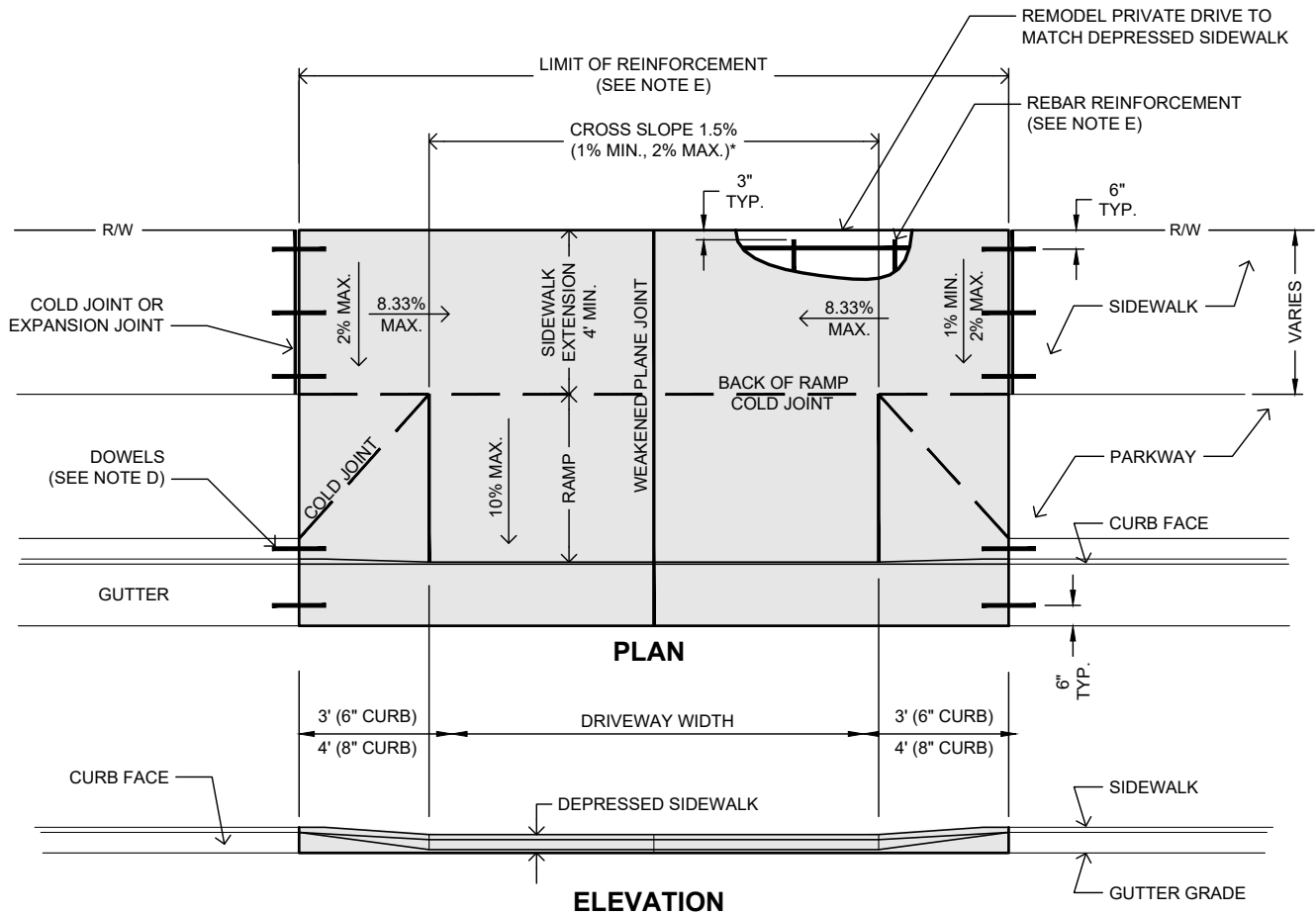
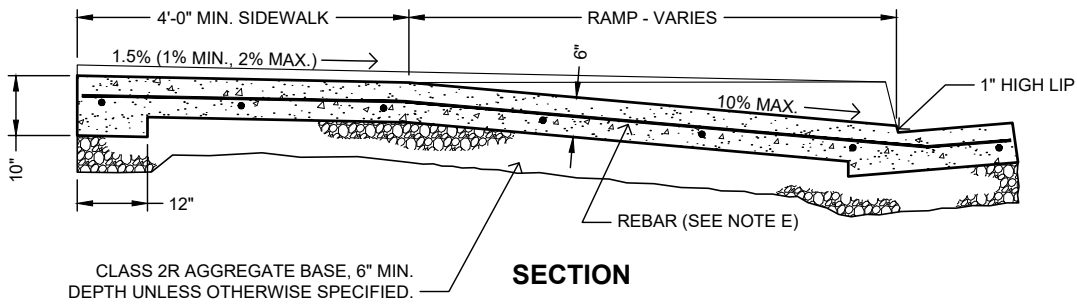
GENERAL NOTES:

- 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
Notes revised	KH	MH	1-17
Update Cross Slope percentages	JDL	MH	2-13
Revised Note C	SR	MH	1-14
STANDARD CURRENT AS OF:		May 2018	



**DRIVEWAY RAMP
DETACHED SIDEWALK
STANDARD**



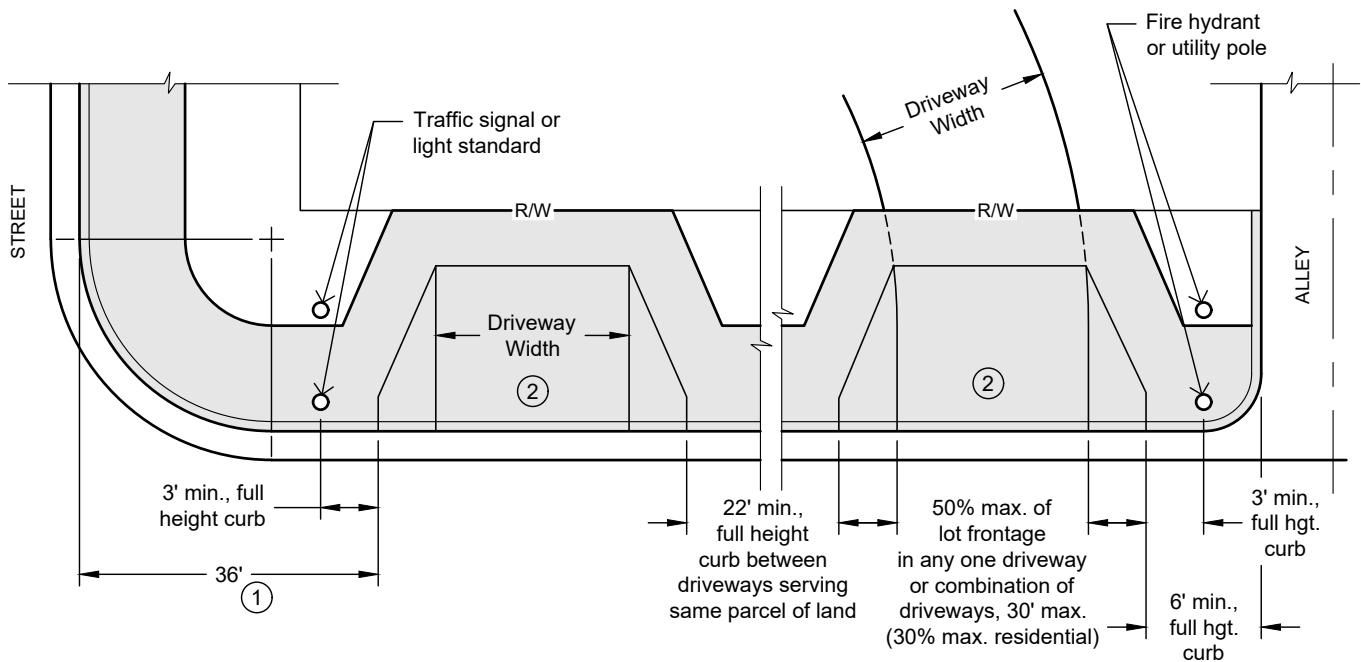
GENERAL NOTES:

- 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; 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:		May 2018	



**DRIVEWAY RAMP
DETACHED SIDEWALK
ROWS LESS THAN 10'**



NOTES:

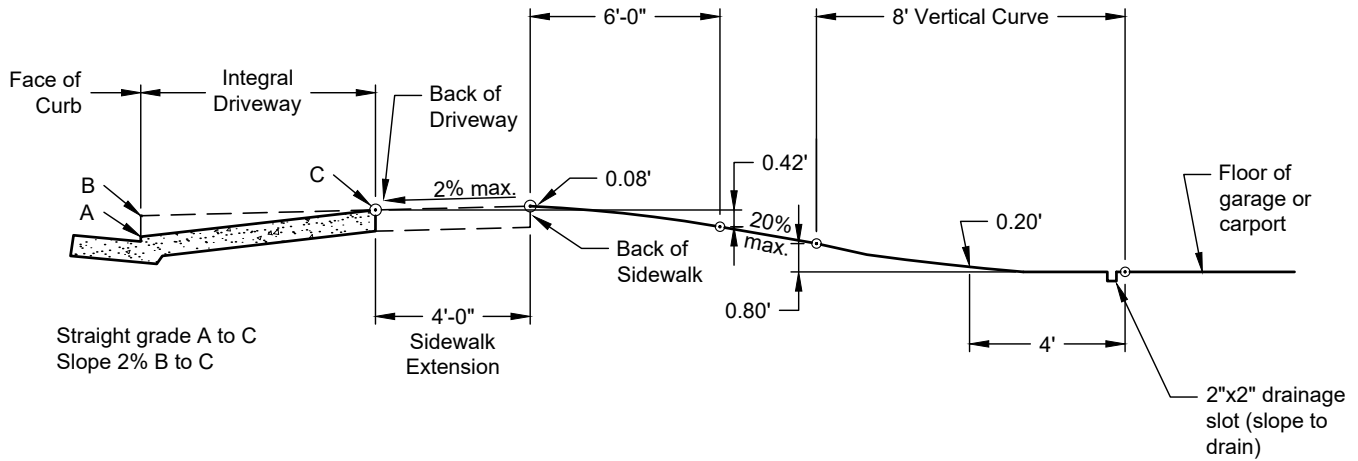
- ① Setback from corner may be shortened with approval of the City Engineer. Minimum distance: Curb return radius + 5'
- ② Construct per Driveway Ramp Standards.

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'

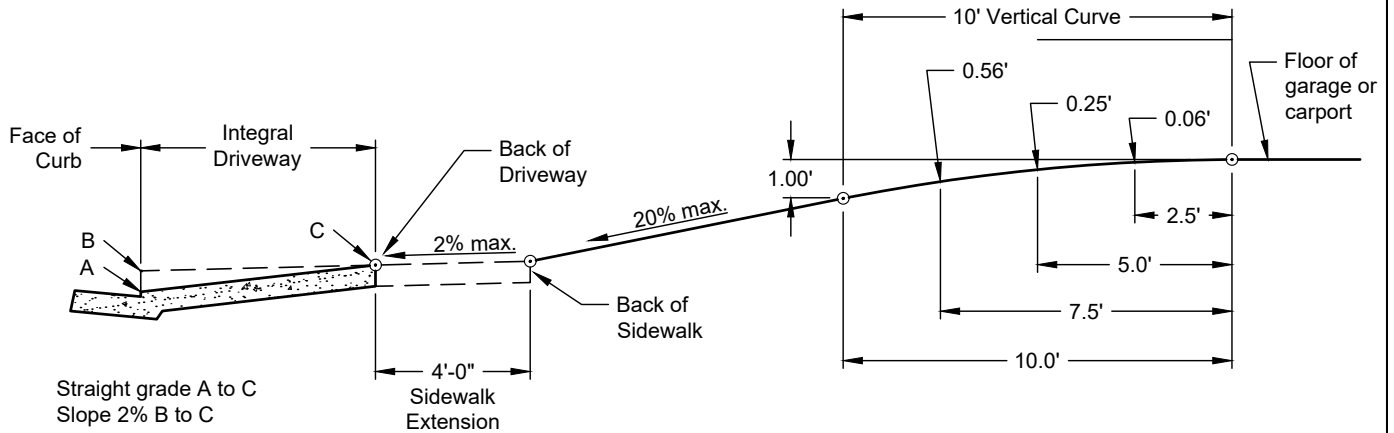
REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	10-12
Revise Note 2	RMH	WAP	1-95
Revise sidewalk location	DVB	BL	10-06
STANDARD CURRENT AS OF:		May 2018	



**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:		May 2018	



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: May 2018			



**UPWARD & DOWNWARD
DRIVEWAYS**
MAXIMUM RISE & DESCENT
(RESIDENTIAL)

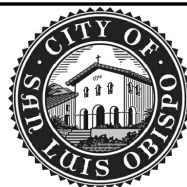
PAVEMENT THICKNESS (in) (Asphalt concrete with no base)				SUBGRADE QUALITY
6"	5"	4"	4"	GOOD TO EXCELLENT Unaffected by moisture or retains a substantial amount of support capacity when wet. Included are well or poorly-graded gravels or sand gravels, silty gravels, and well-graded sands. Minimum Sand 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.

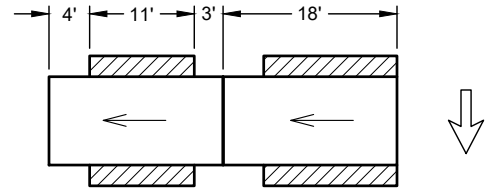
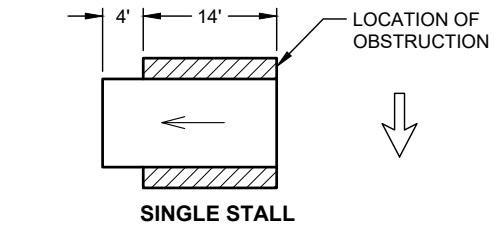
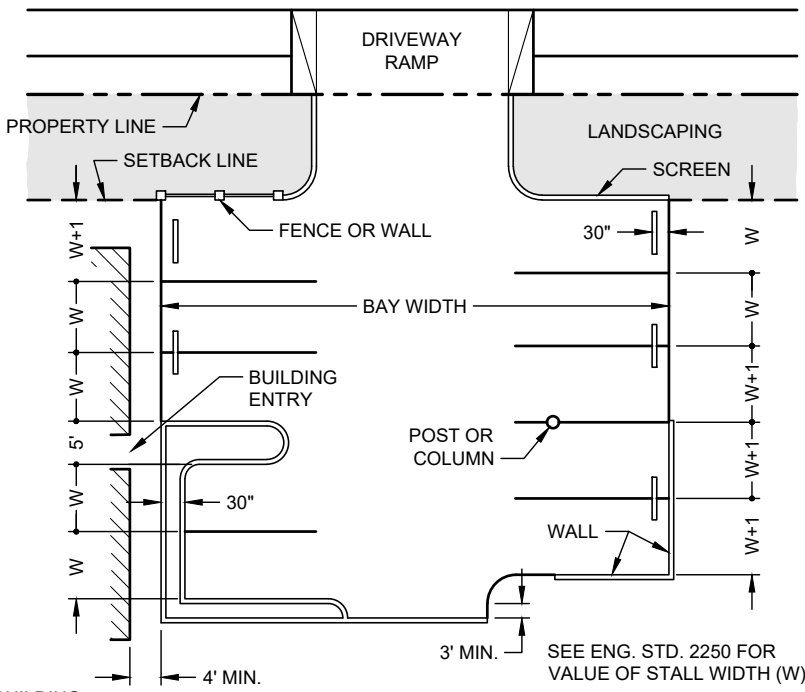
NOTE:
 Each 1" of asphalt may be substituted with 2" of Class 2 base. 2" minimum AC.

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:		May 2018	



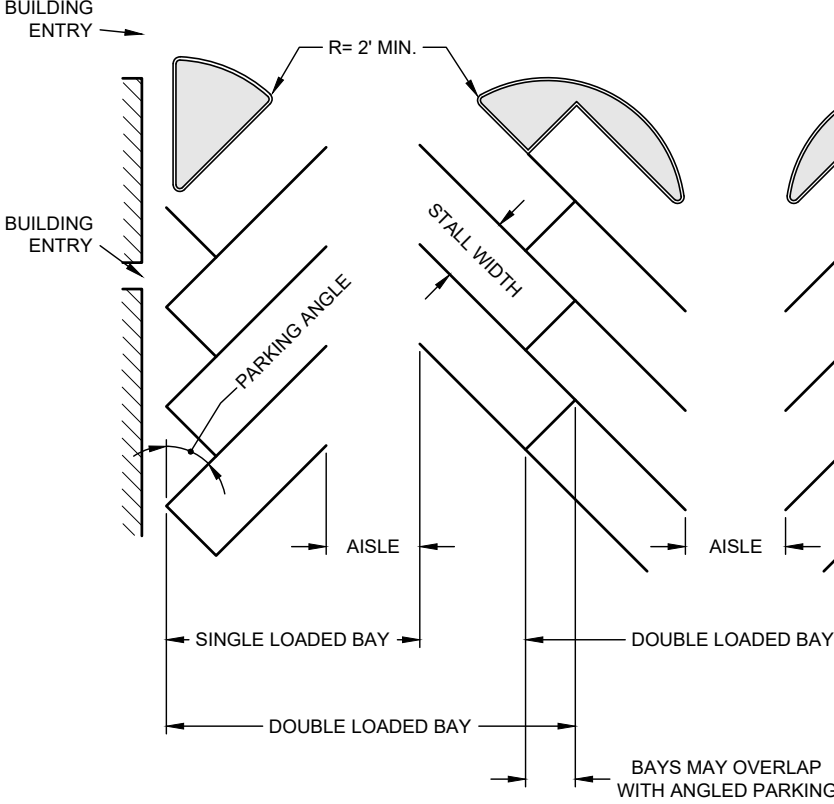
PAVEMENT DESIGN



TANDEM STALLS
 (WITH APPROVAL OF COMMUNITY DEVELOPMENT DIRECTOR AND AS ALLOWED IN E-3 OF ENG. STD. 2010.)

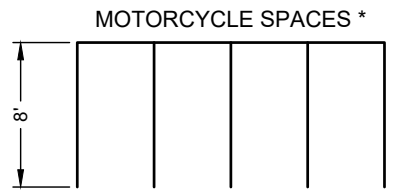
INCREASE STALL WIDTH BY:
 12" IF ON ONE SIDE
 24" IF ON BOTH SIDES

OBSTRUCTIONS



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.



* SET ON 3/2" PCC AND CLASS 3 BASE
 4' TYP.

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:		May 2018	



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

8.0'
STALL WIDTH

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"

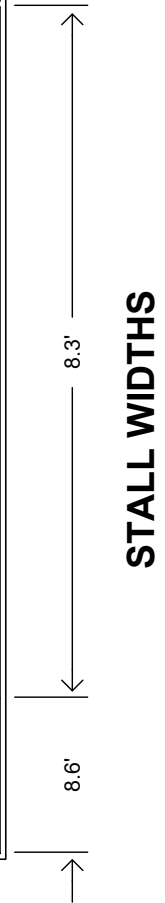
REVISIONS	BY	APP	DATE
Rearrange	RMH	WAP	1-95
New border	JDL	WAP	1-98
Drafting Edits	JDL	MH	10-12
STANDARD CURRENT AS OF:		May 2018	



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.

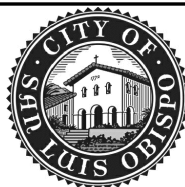
Alternate stall widths may only be used for 82.5° - 90° parking angles and must have special approval of the Community Development Director.

9'-0" width - Subtract 2 feet from bay width

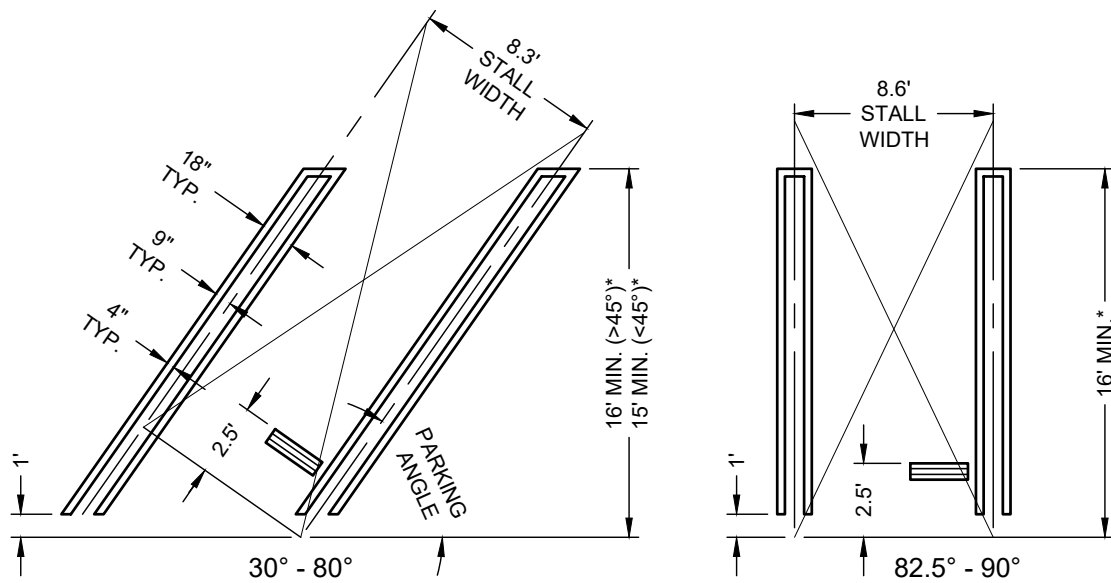
9'-6" width - Subtract 4 feet from bay width

* See Engineering Standard 2220 for clarification of "BAY WIDTH"

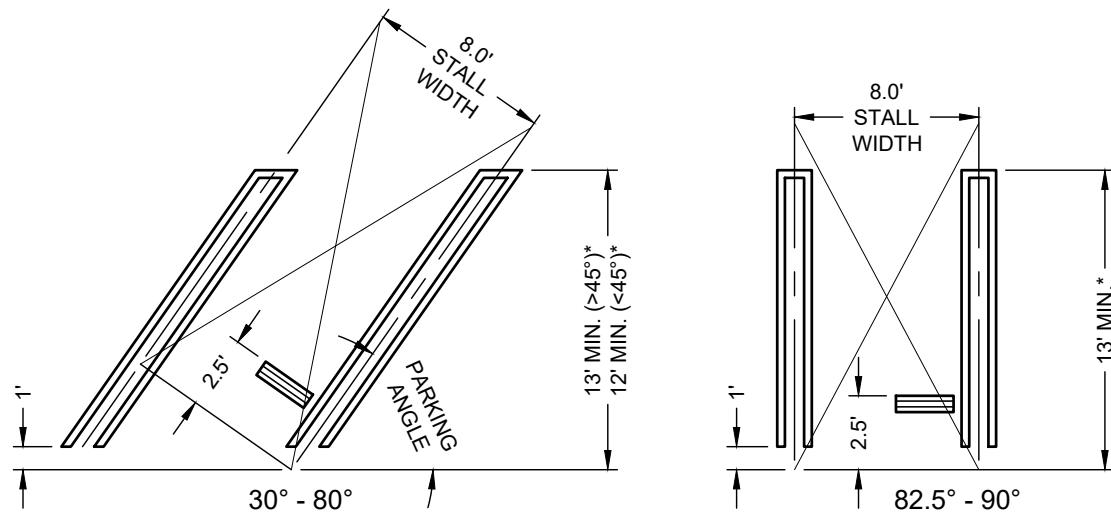
REVISIONS	BY	APP	DATE
Rearrange	RMH	WAP	1-95
New border	JDL	WAP	1-98
Drafting edits	JDL	MH	10-12
STANDARD CURRENT AS OF:		May 2018	



PARKING BAY DIMENSIONS AVERAGE CARS



STRIPING FOR AVERAGE PARKING STALLS



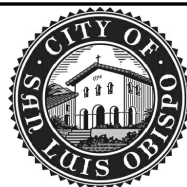
STRIPING FOR COMPACT PARKING STALLS

GENERAL NOTES:

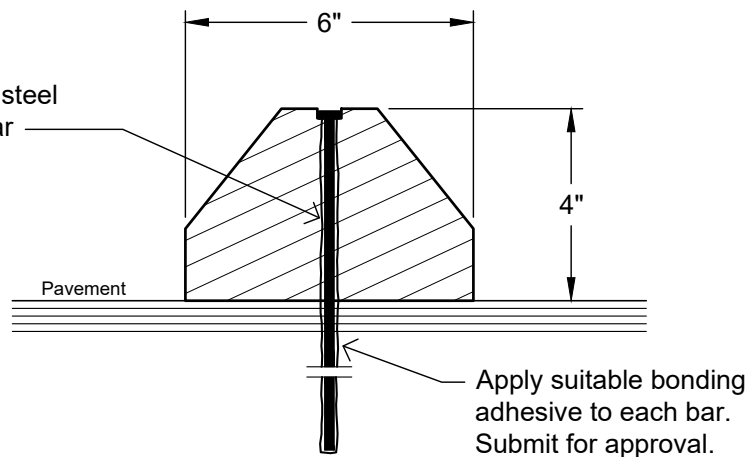
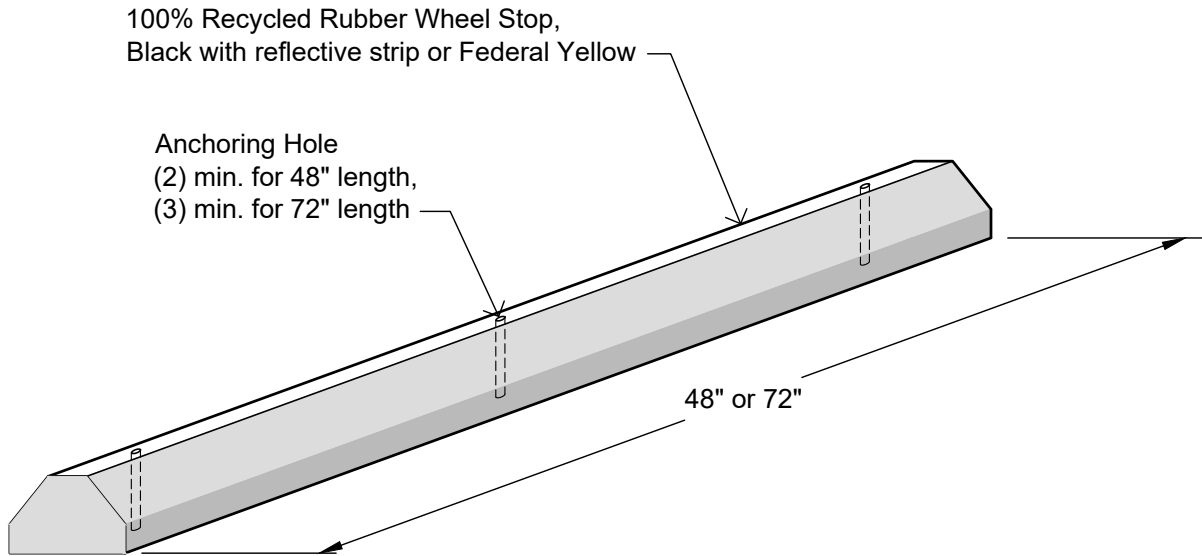
- A. Each compact space must be labeled as such on the pavement or wheelstop.
- B. Single-line marking is approved alternate.
- C. Wheelstop shall be located as shown, if required.

* 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:		May 2018	



PARKING LOT STRIPING



SECTION VIEW

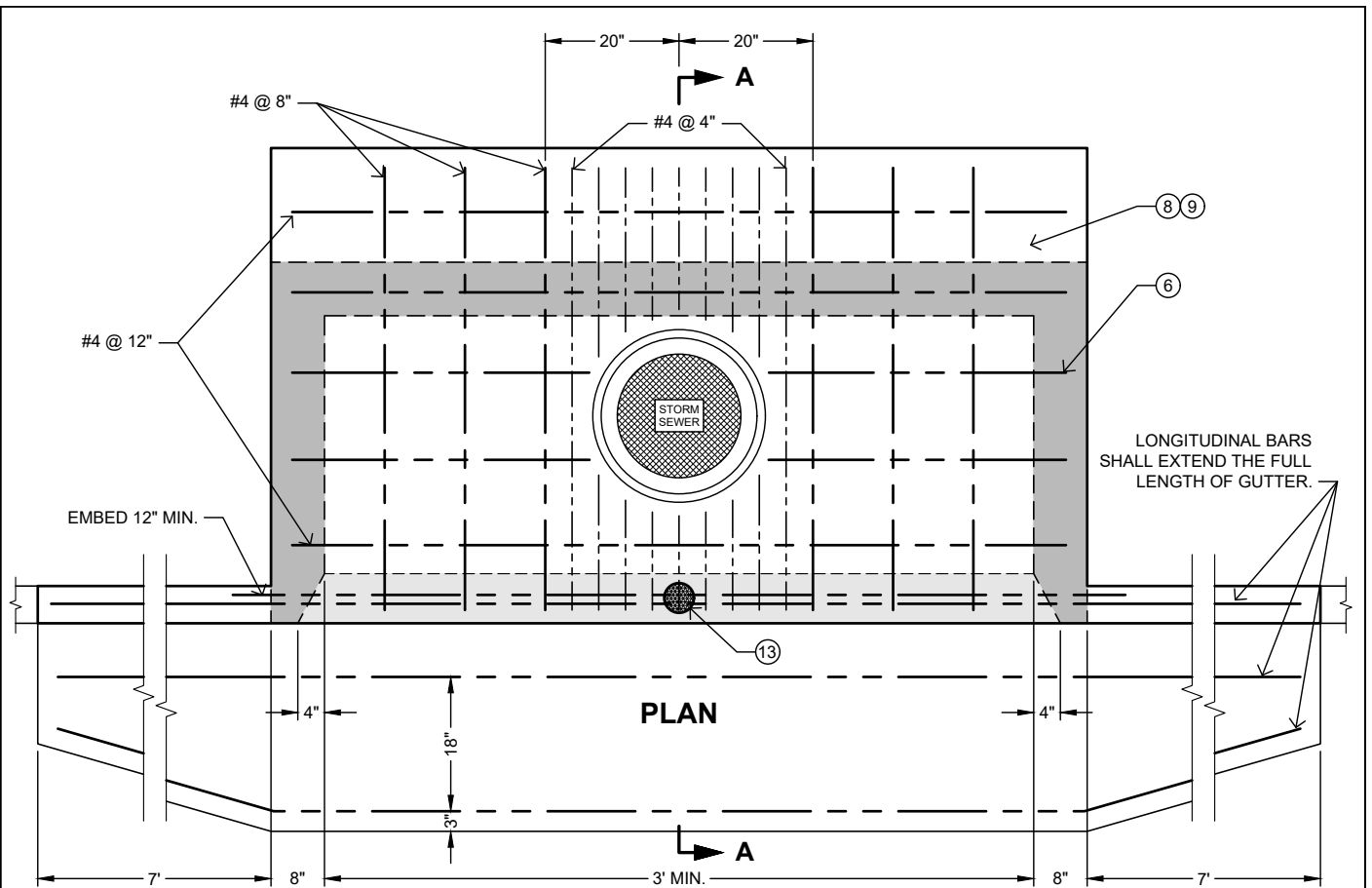
GENERAL NOTES:

- 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:	May 2018		



WHEEL STOP



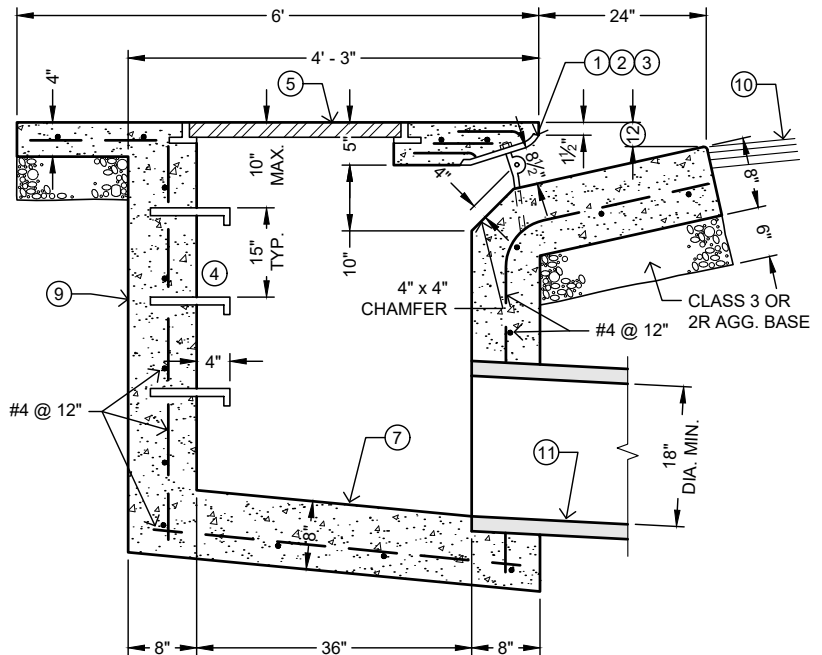
LONGITUDINAL BARS SHALL EXTEND THE FULL LENGTH OF GUTTER.

PLAN

INSTALLATION NOTES:

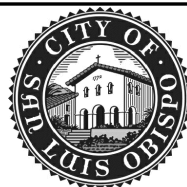
Items 1 through 3 shall be galvanized Alhambra, South Bay Foundry or equal.

- 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 Install Catch Basin Placard per Section 77-4 of the Standard Specifications.

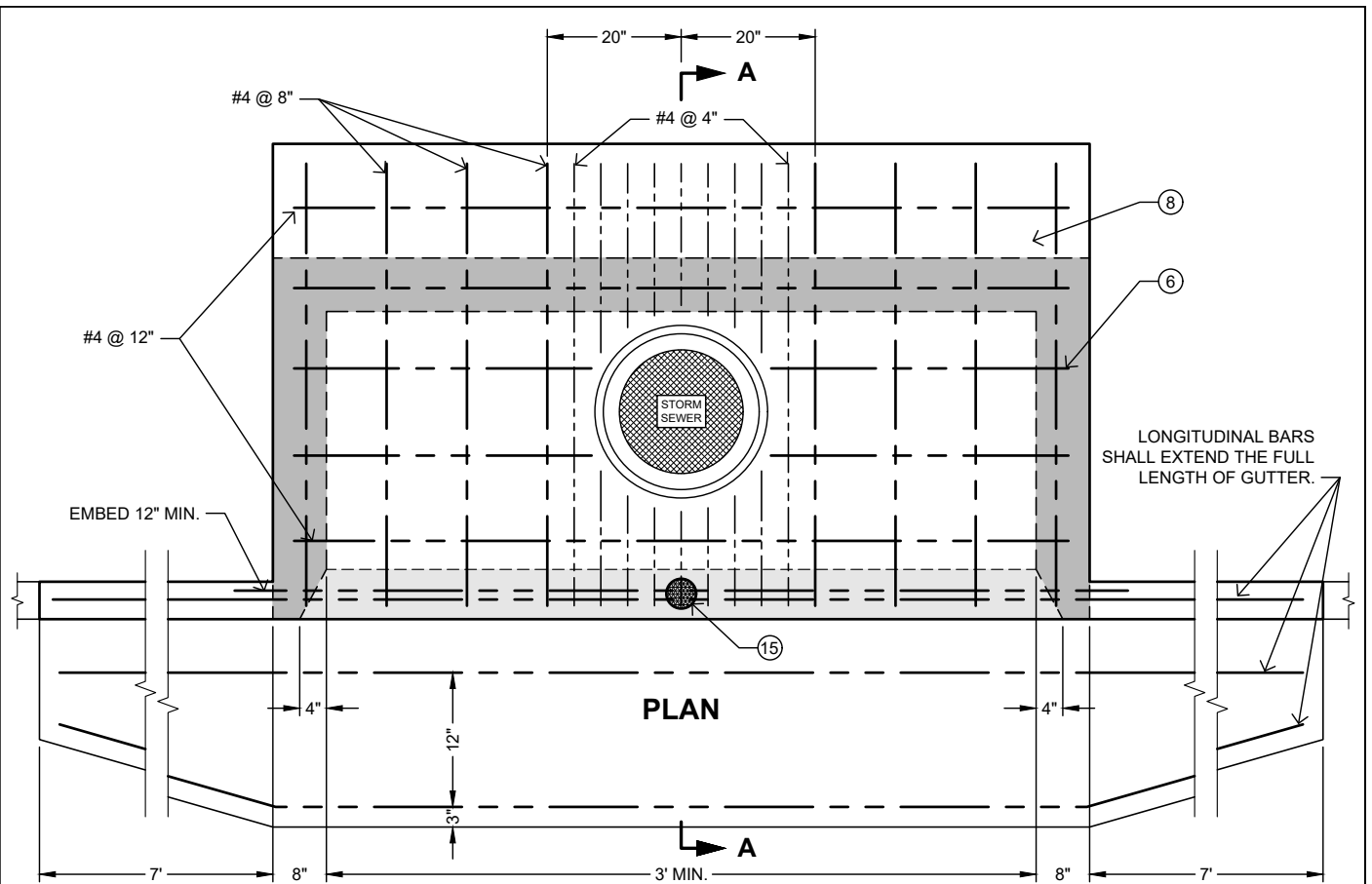


SECTION A-A

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:		May 2018	



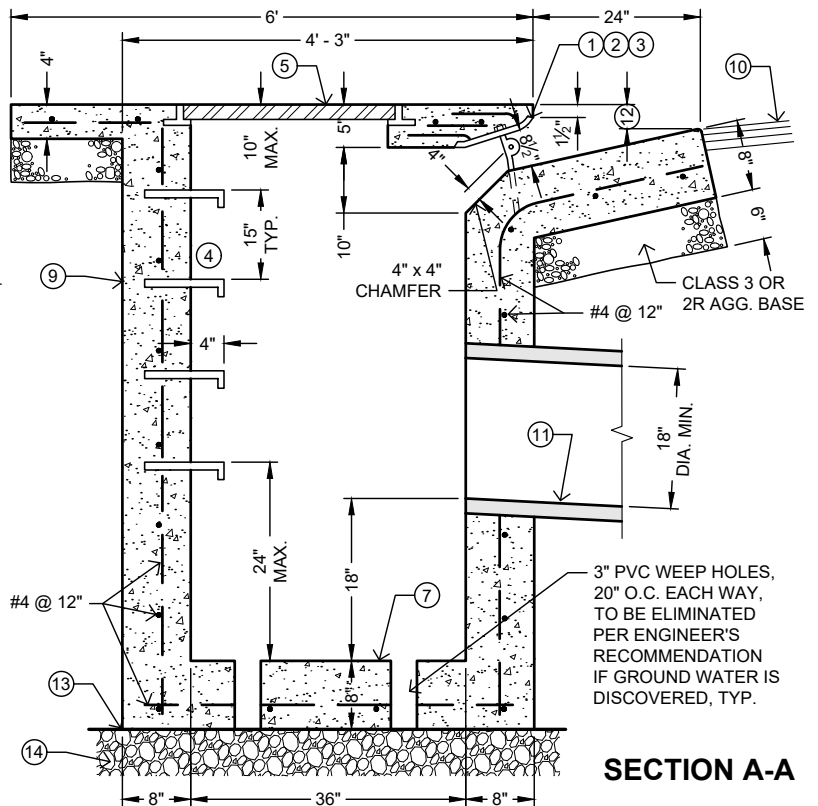
CATCH BASIN
SIDE OPENING



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 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 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 1¹/₂" diameter gravel.
- ⑮ Install Catch Basin Placard per Section 77-4 of the Standard Specifications.



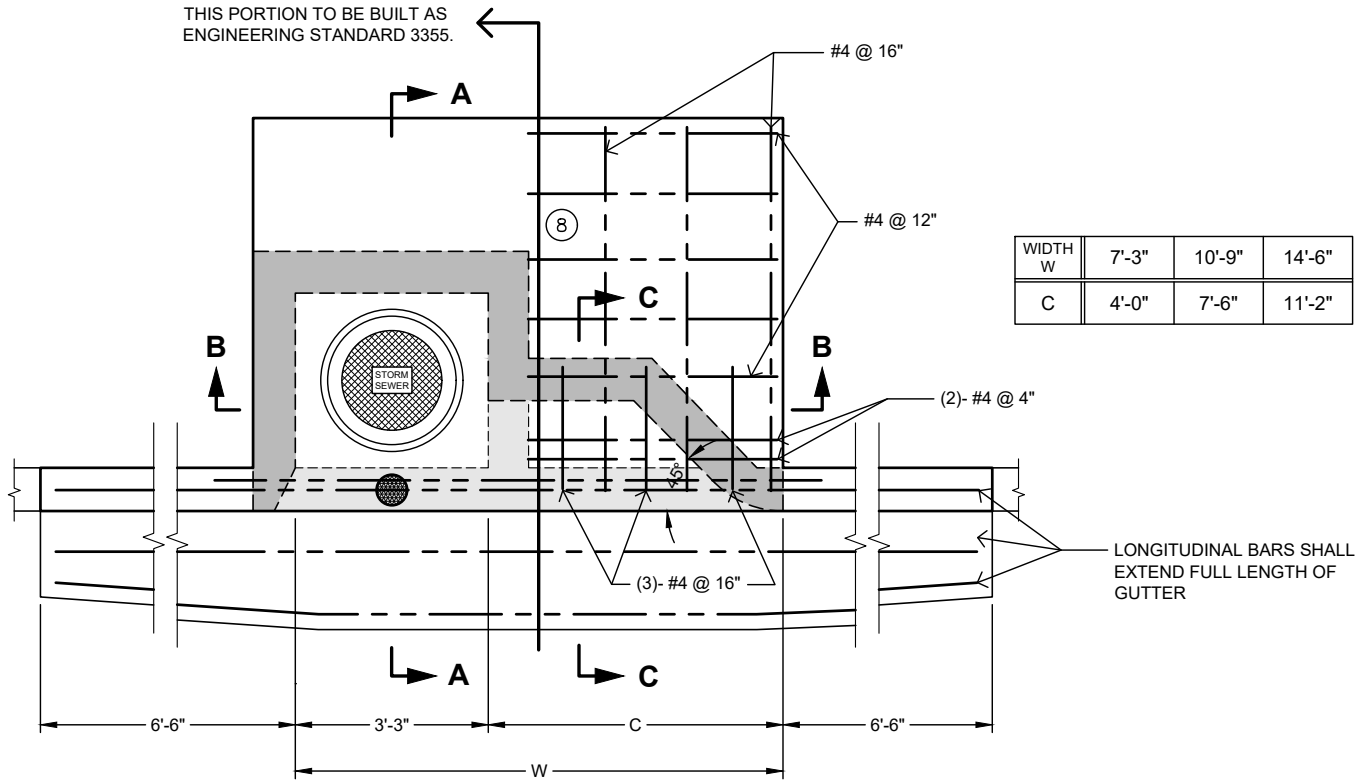
SECTION A-A

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:		May 2018	



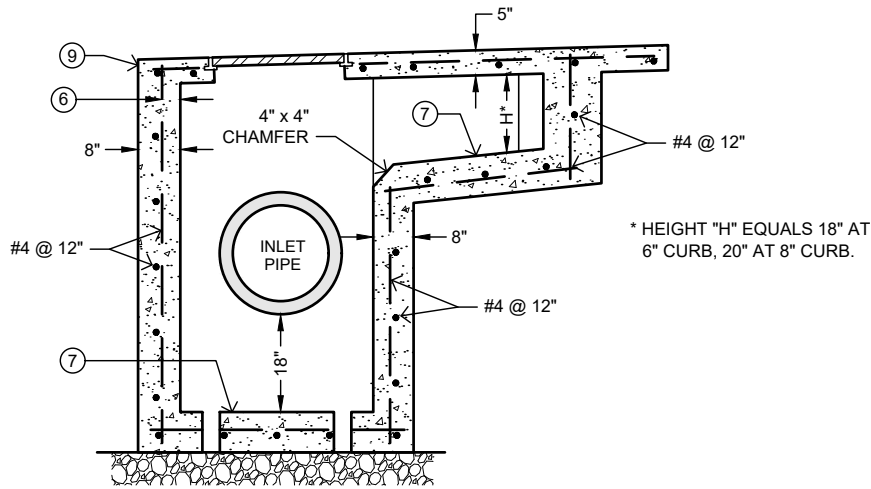
CATCH BASIN
SIDE OPENING WITH SUMP

THIS PORTION TO BE BUILT AS
ENGINEERING STANDARD 3355.

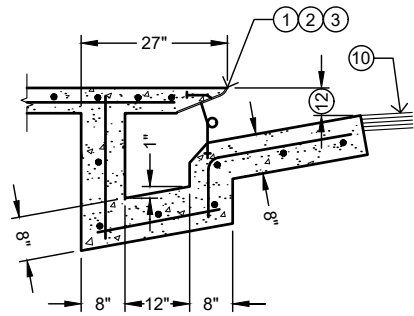


LONGITUDINAL BARS SHALL
EXTEND FULL LENGTH OF
GUTTER

PLAN



SECTION B-B



SECTION C-C

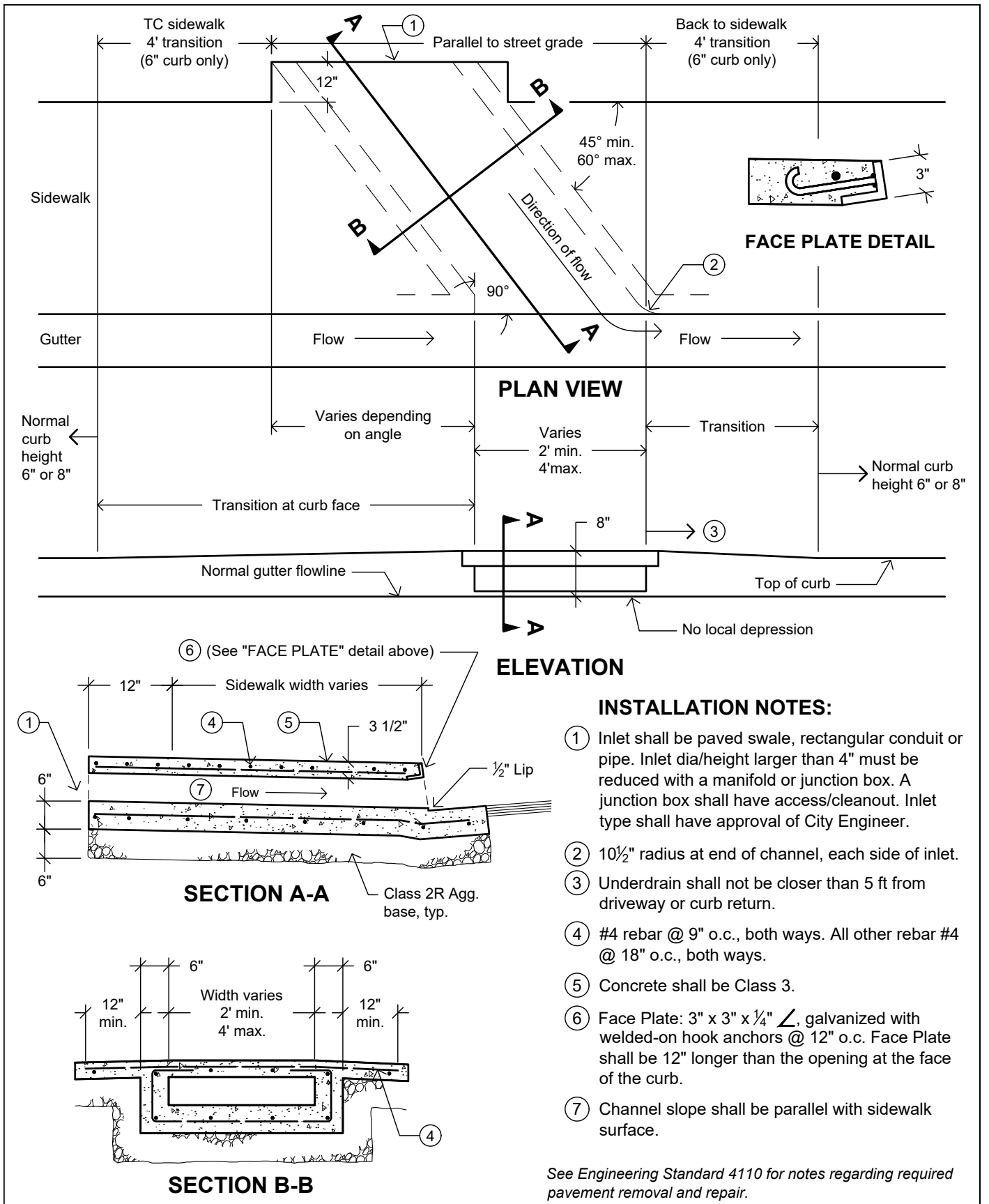
GENERAL NOTES:

- 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:		May 2018	



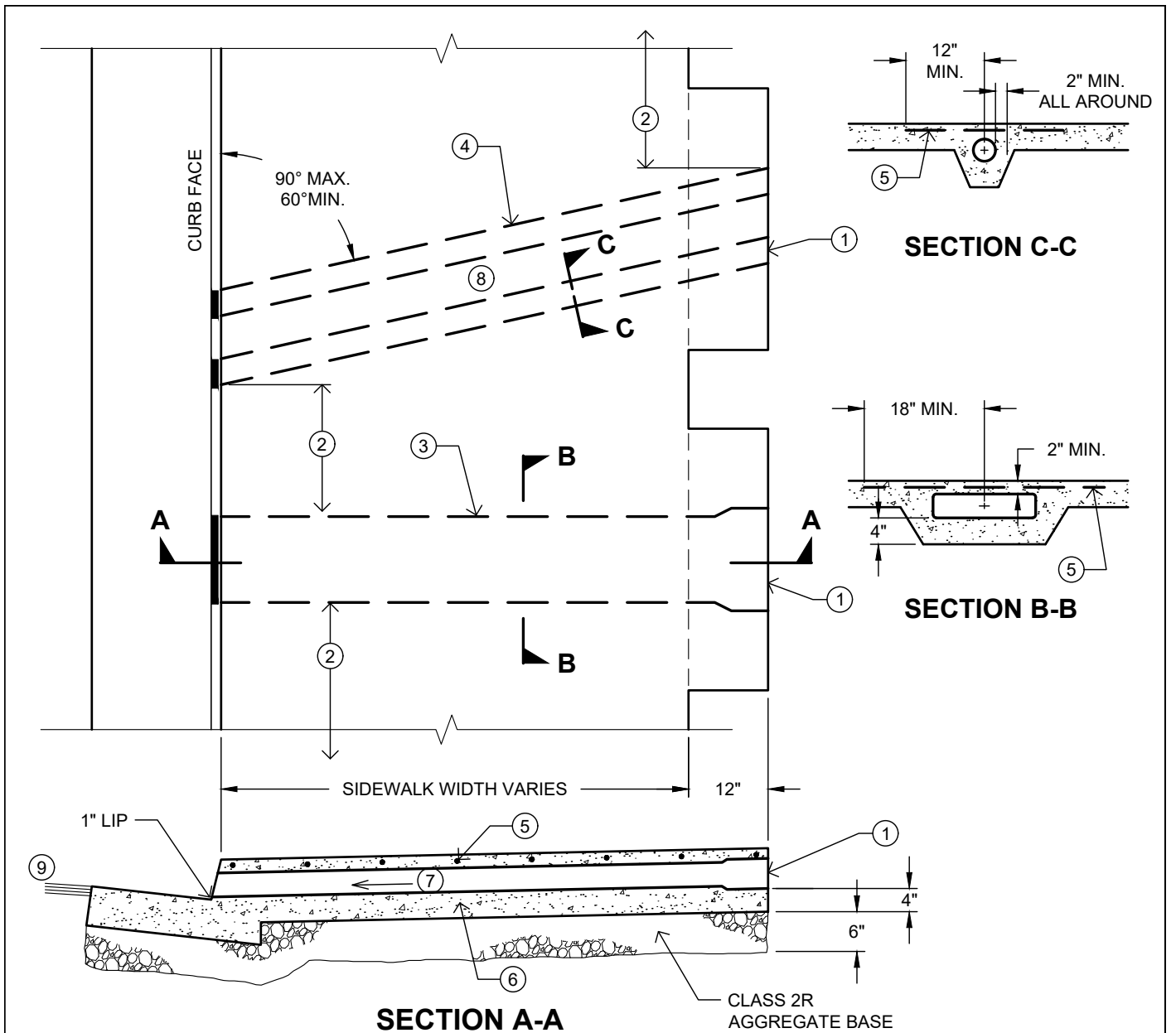
**CATCH BASIN
EXTENDED SIDE OPENING**



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:		May 2018	



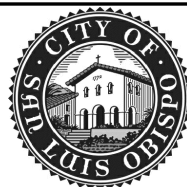
SIDEWALK UNDERDRAIN CONCRETE



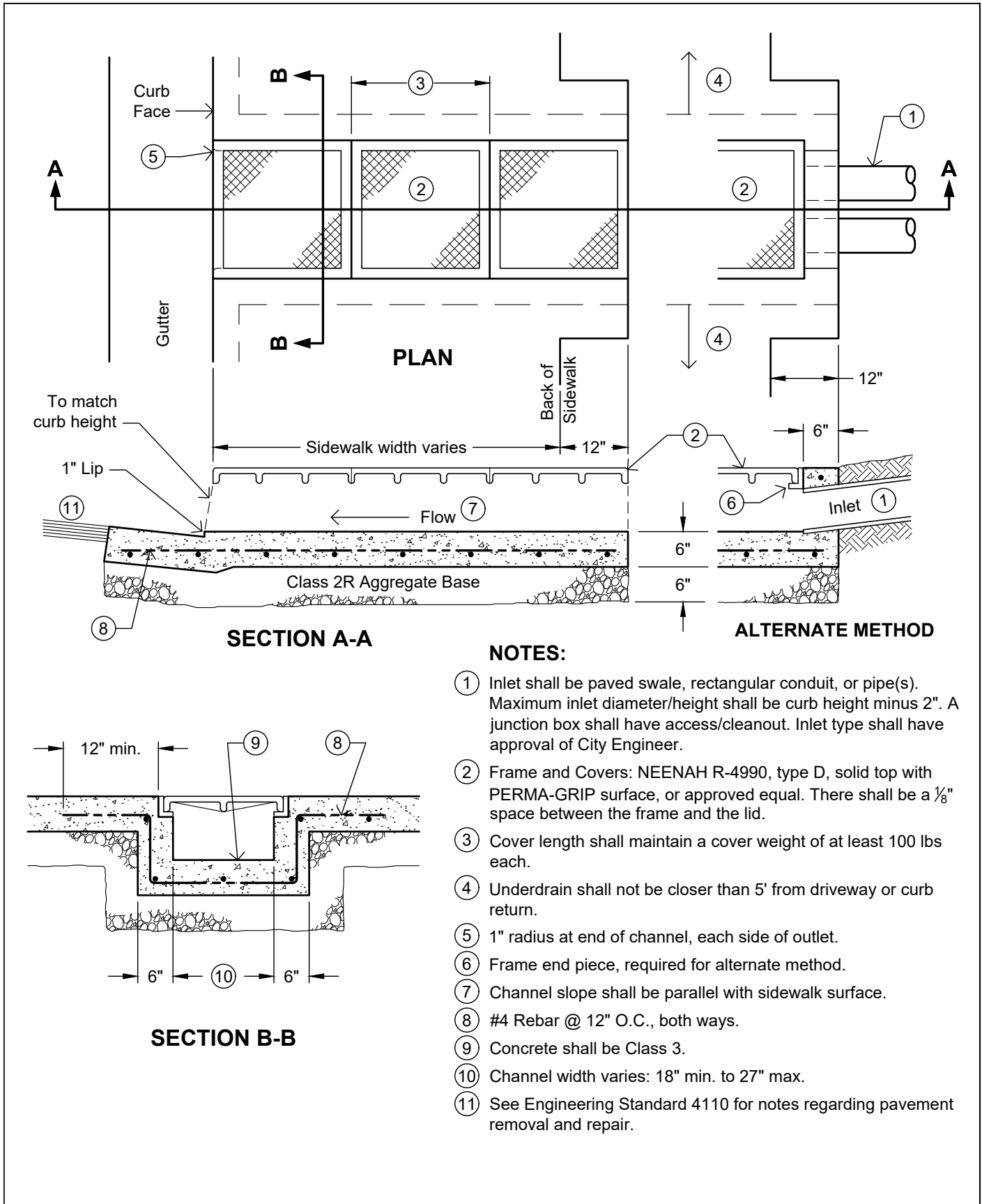
NOTES:

- 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 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:		May 2018	



**SIDEWALK UNDERDRAIN
WITH PIPES**



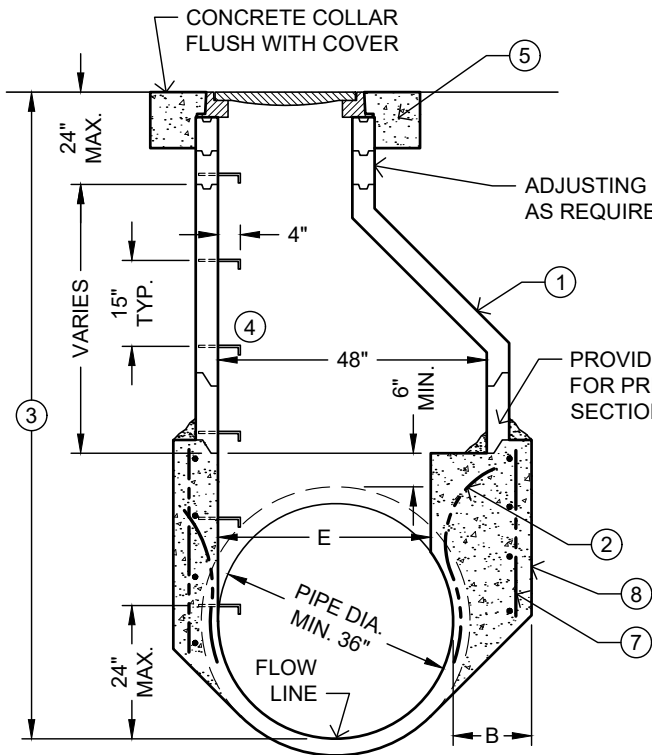
NOTES:

- 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.
- 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 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 27" max.
- ⑪ See Engineering Standard 4110 for notes regarding pavement removal and repair.

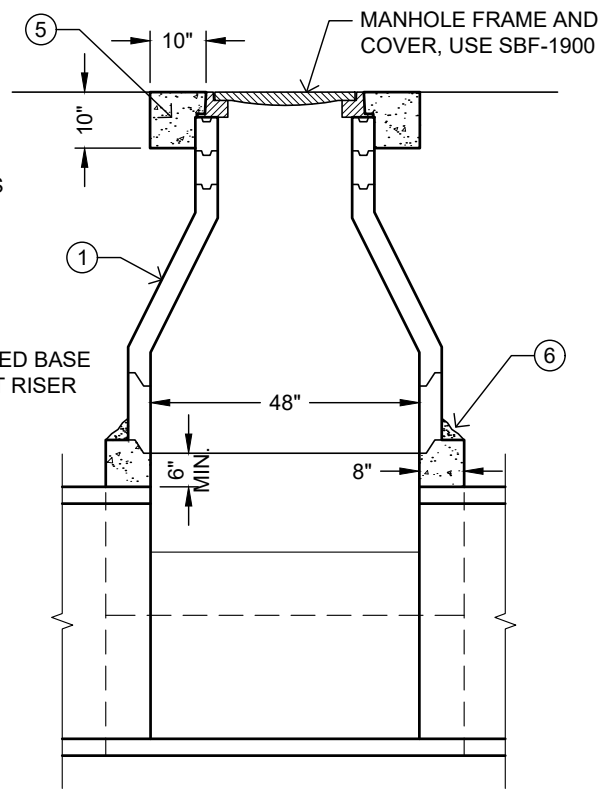
REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	10-12
Revise rebar specs	JDL	WAP	11-98
Revise Note 2; Class 2R Base	DVB	BL	11-08
STANDARD CURRENT AS OF:		May 2018	



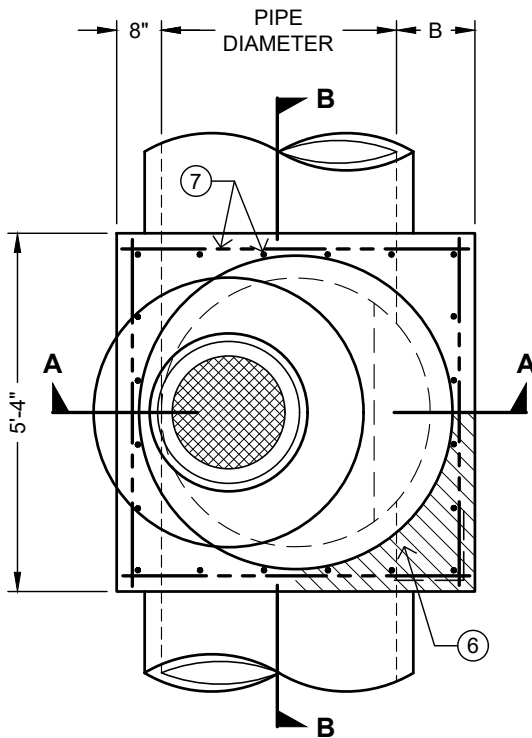
SIDEWALK UNDERDRAIN WITH COVER PLATES



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:

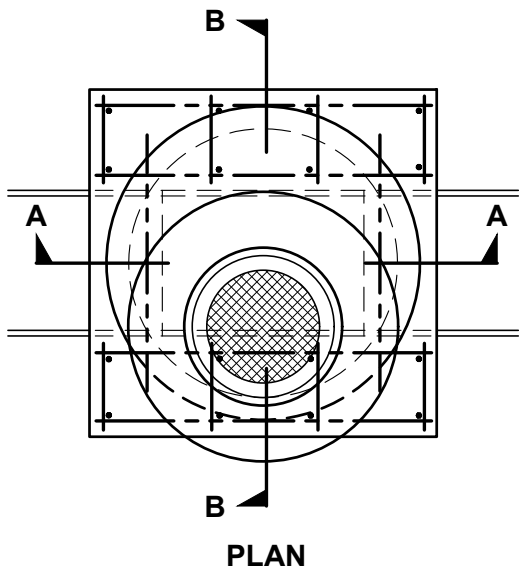
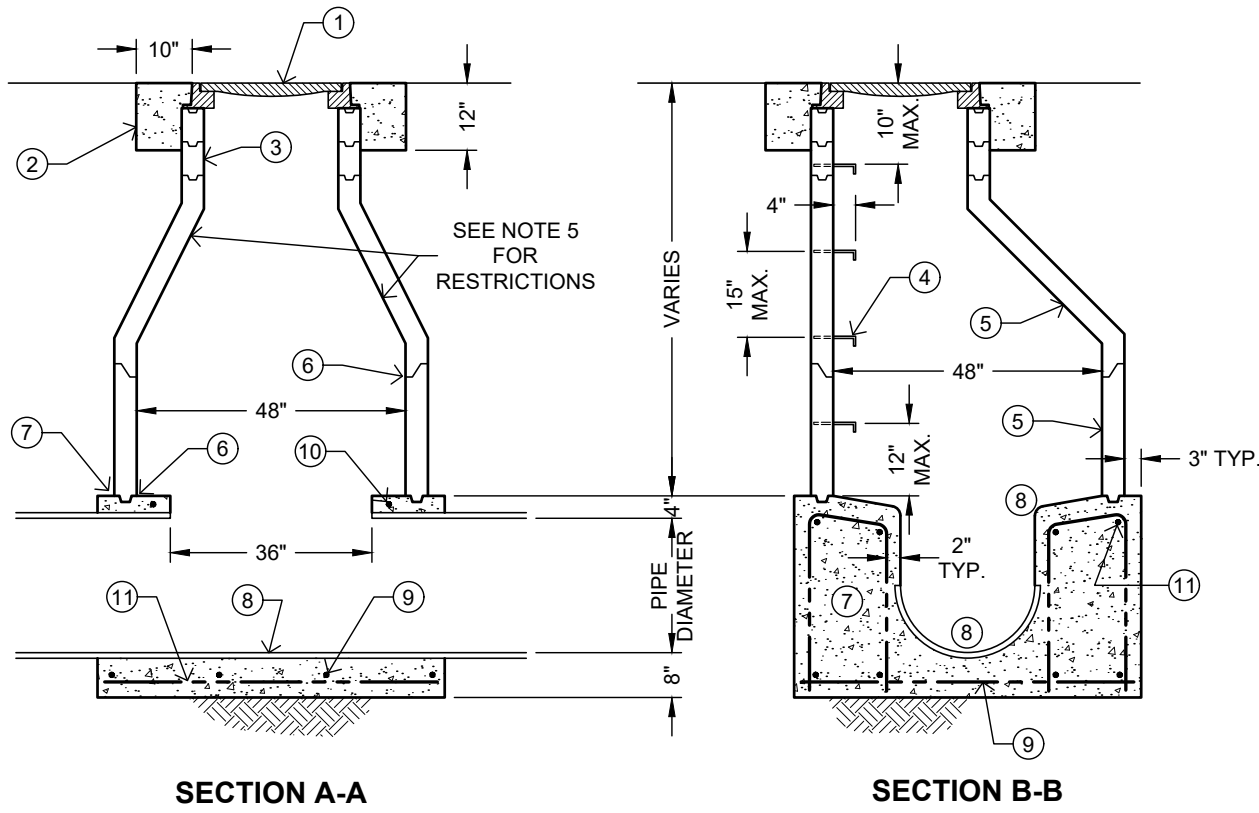
- A. All joints between precast sections shall be mortared.
- B. Manhole interiors shall have a smooth trowelled surface.

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: May 2018



**STORM DRAIN MANHOLE
36" PIPE & LARGER**



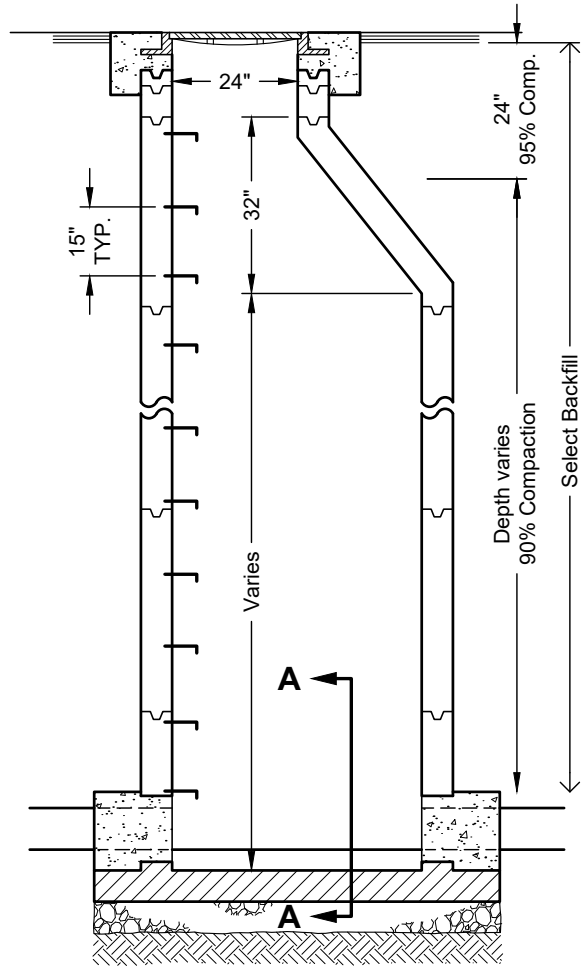
INSTALLATION NOTES:

- 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:		May 2018	



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:

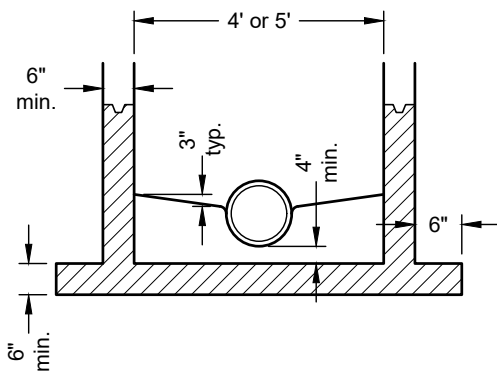
Manhole base shall be precast reinforced Class 2 concrete with extended base and shall conform to the requirements for manhole risers. Base may be square or round with key for risers. All pipe connections shall be cored by the manufacturer to fit the O.D. of the pipe plus 2". The precast base shall be 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.

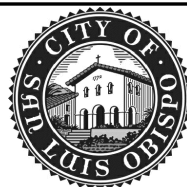
INVERT:

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.



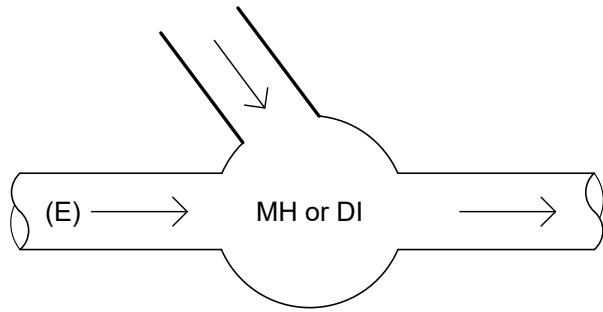
SECTION A-A

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:		May 2018	

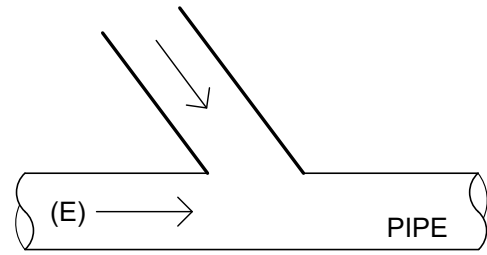


**PRECAST
STORM DRAIN MANHOLE**
UP TO 3' O.D. PIPE SIZE

3530



CASE A



CASE B

CASE A:

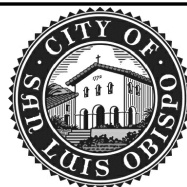
- A1. Chip a hole between 1" and 2" larger than the pipe OD. Salvage the reinforcing from the manhole / catch basin. Steel shall be bent outward from the manhole.
- A2. Concrete the pipe in place using a Class 3, 3/8" concrete mix, incorporating reinforcing steel. Concrete shall completely fill the void 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:

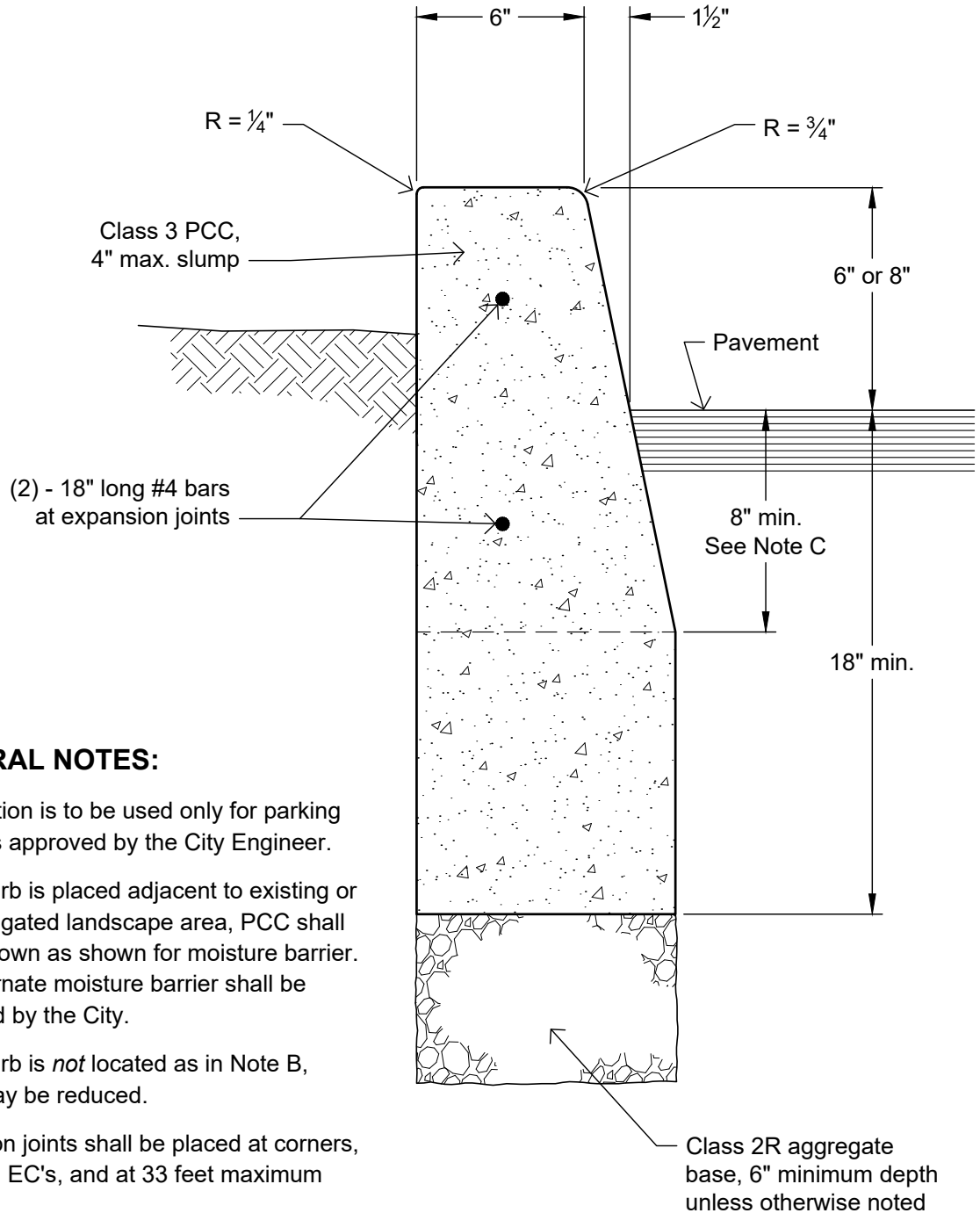
- B1. Where a catch basin or manhole exist within 30' of the proposed connection, or the new pipe is less than 12" in size and serves a private property, the connection may be made without the installation of a manhole at the junction point. In either case, the new pipe must be at least one size smaller 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
Note revision B1 & Last	SR	BL	1-14
Drafting edits	JDL	MH	10-12
Class 3 Concrete	JDL	MH	2-13
STANDARD CURRENT AS OF:		May 2018	



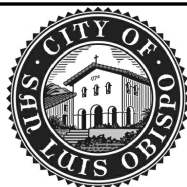
STORM DRAIN CONNECTIONS



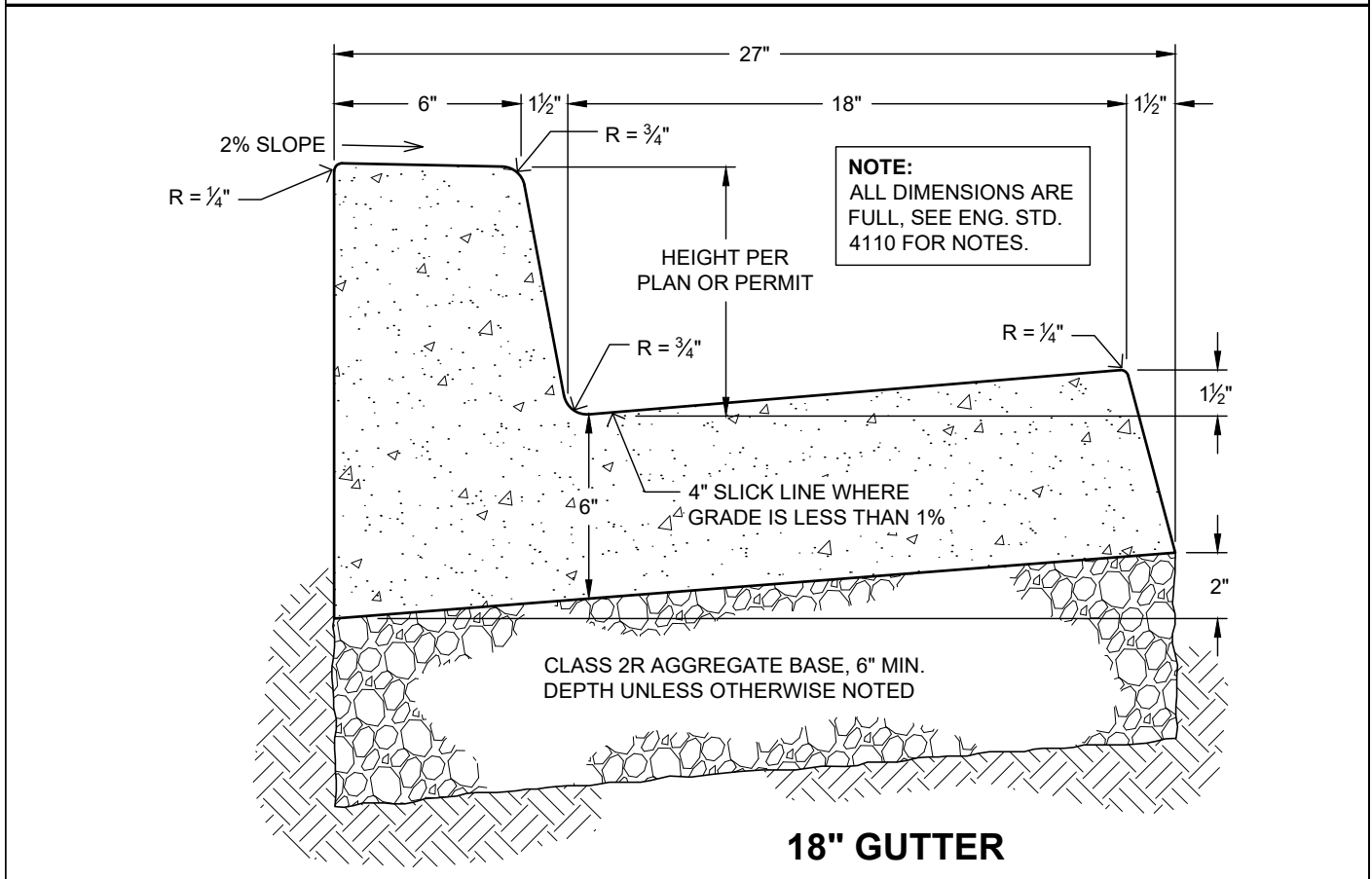
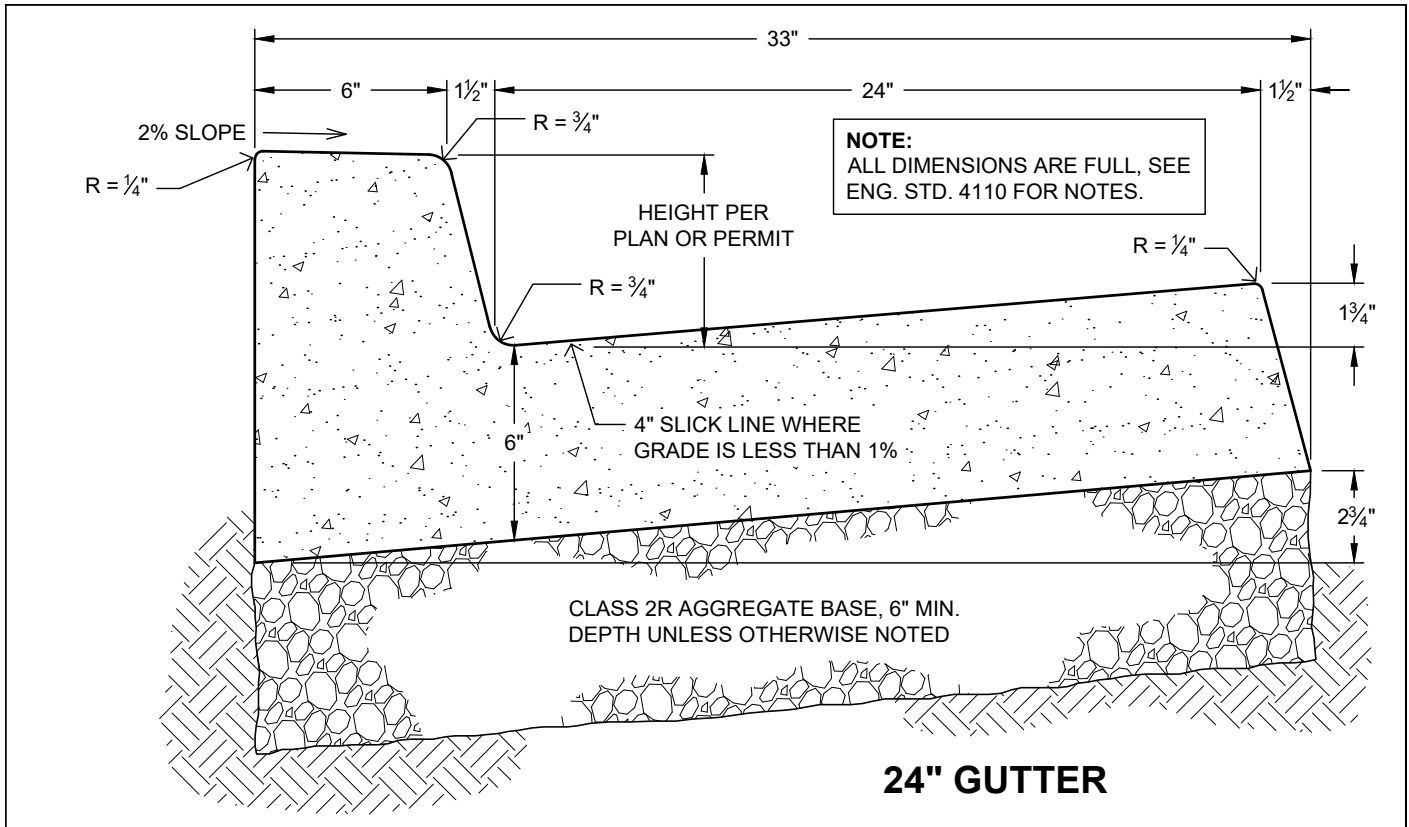
GENERAL NOTES:

- 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:		May 2018	



CURB

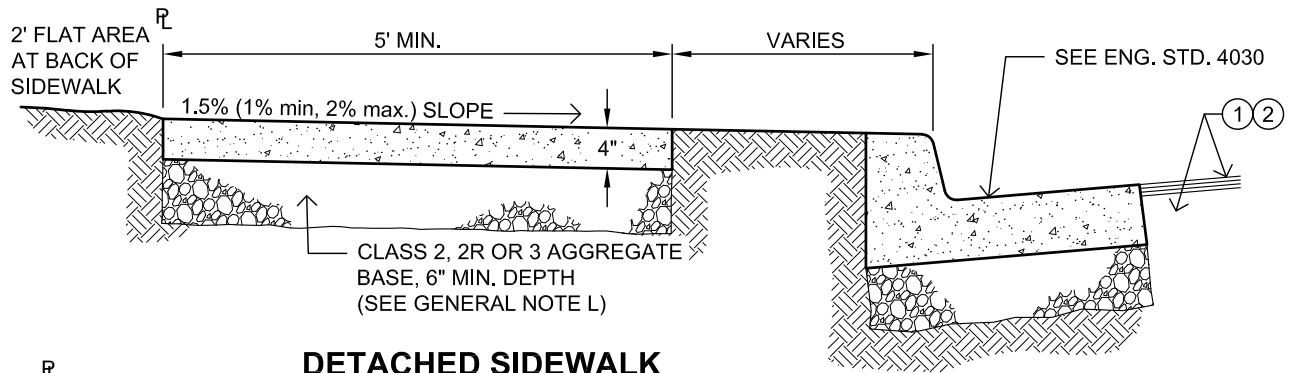


REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	10-12
Overall dimension correction	JDL	MH	9-16
Allow Class 2R Base	DVB	BL	11-08
STANDARD CURRENT AS OF:		May 2018	

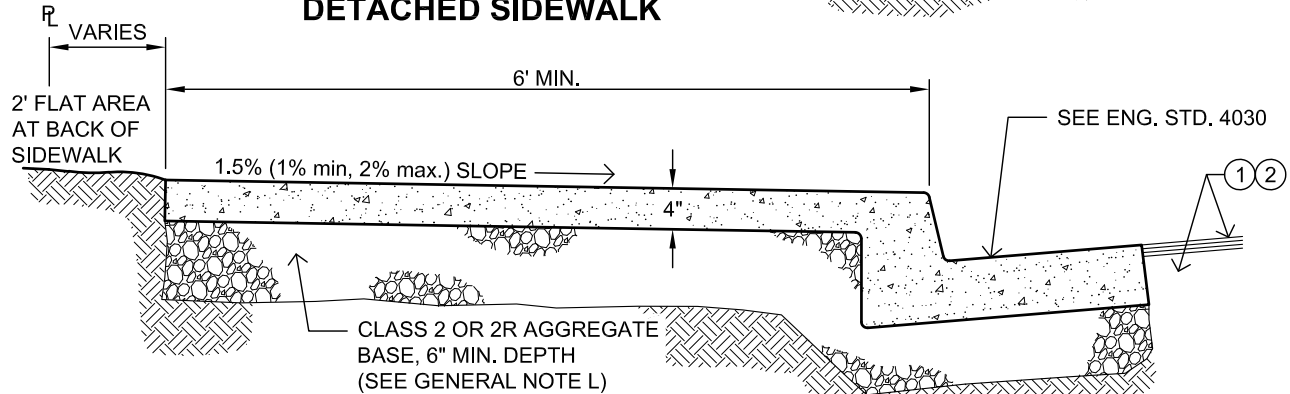


CURB & GUTTER

4030



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.
- L. BASE: Thickness may be reduced to 4" with on-site approval of a geotechnical engineer or if rocky non-expansive material is present.

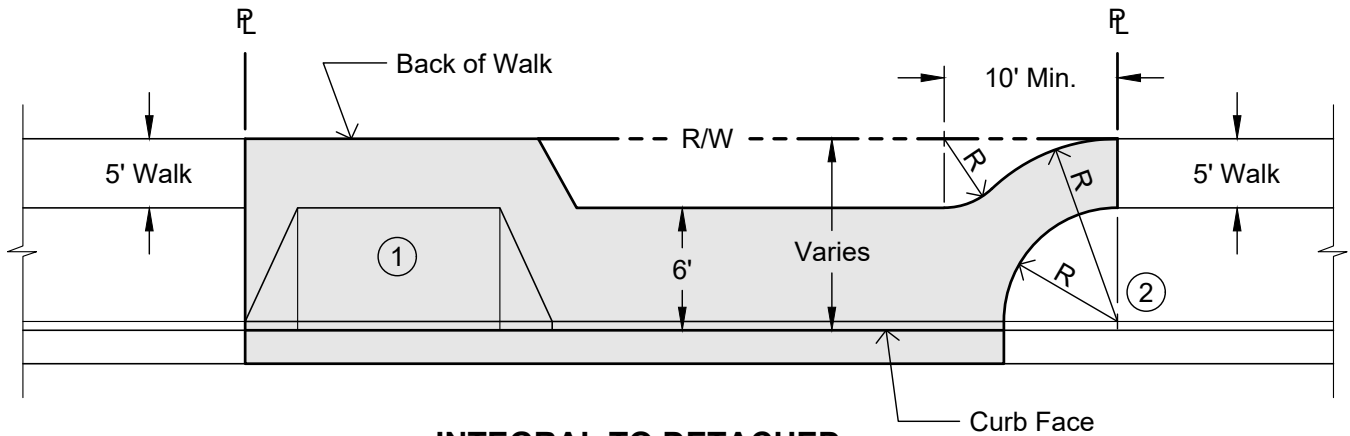
INSTALLATION NOTES:

- 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.

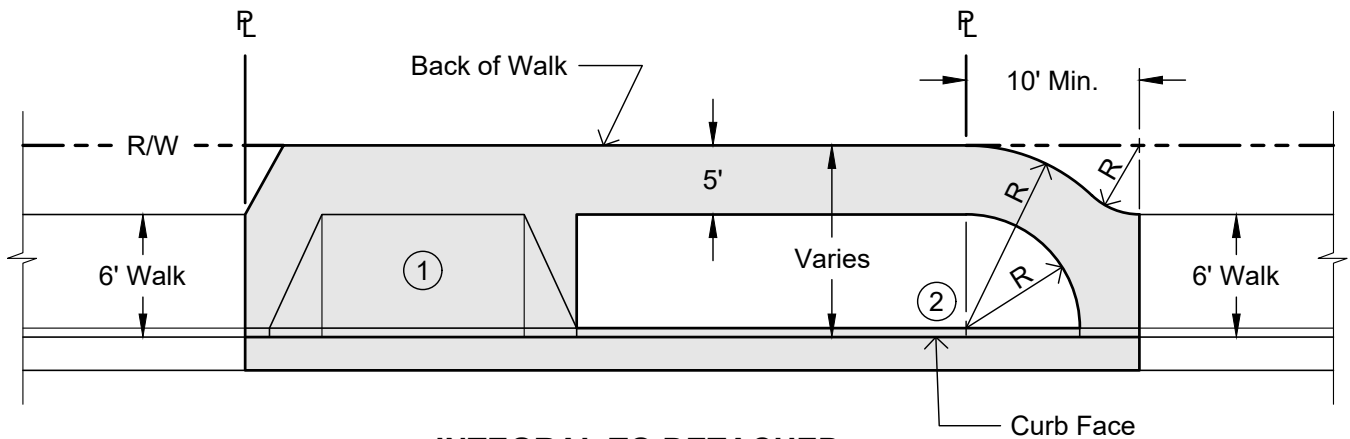
REVISIONS	BY	APP	DATE
Added General Note K	JDL	DA	10-15
AG layer min Note L	KH	MH	07-17
Revised Notes A, C & 1	SR	BL	1-14
STANDARD CURRENT AS OF:		May 2018	



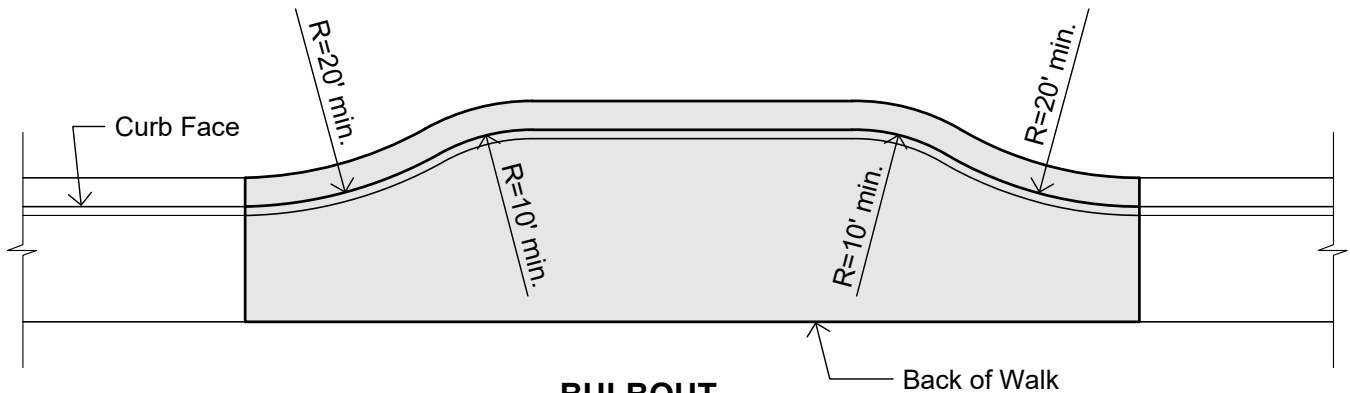
**SIDEWALK
INTEGRAL & DETACHED**



INTEGRAL TO DETACHED



INTEGRAL TO DETACHED



BULBOUT
(SAME FOR INTERSECTIONS AND MID-BLOCK SECTIONS)

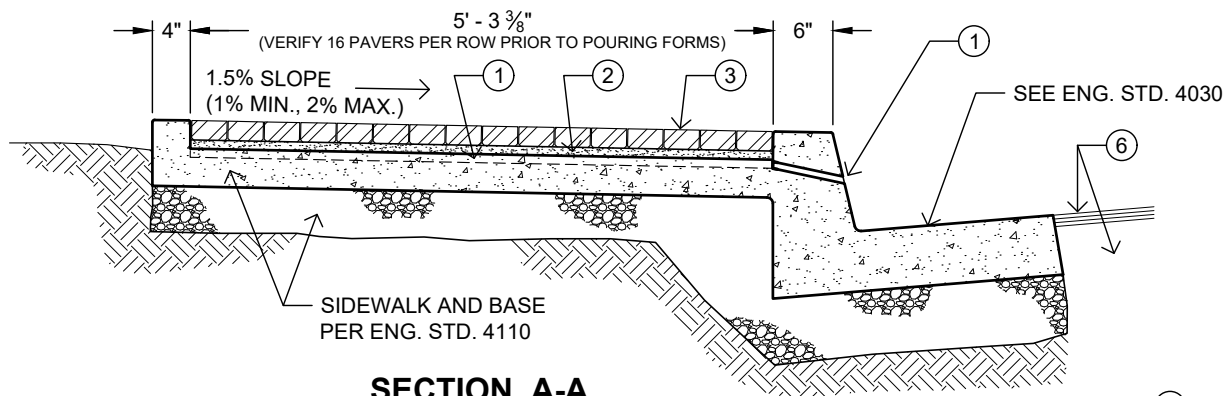
INSTALLATION NOTES:

- 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.

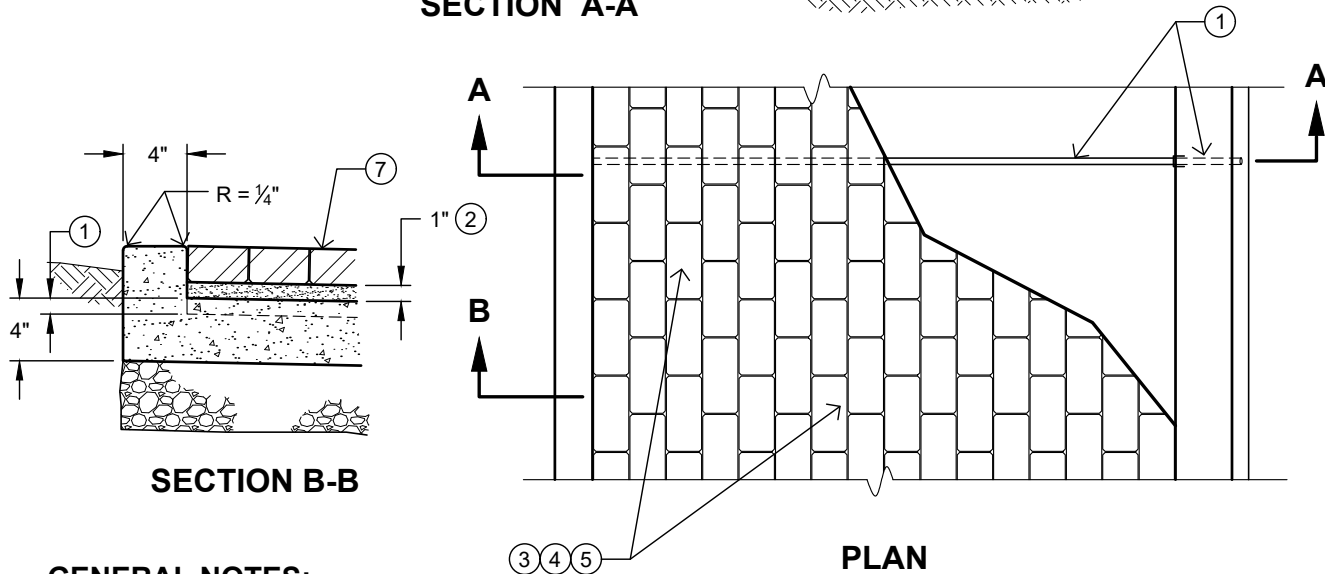
REVISIONS	BY	APP	DATE
Add Bulbout; Rename Standard	JDL	BL	5-13
Revise sidewalk width	DVB	BL	11-08
Added Notes; Drafting edits	JDL	MH	10-12
STANDARD CURRENT AS OF:		May 2018	



SIDEWALK TRANSITIONS



SECTION A-A



SECTION B-B

PLAN

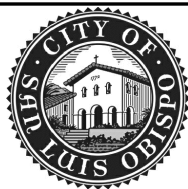
GENERAL NOTES:

- A. For use in Railroad District only.
- B. See Engineering Standard 8135 for Tree Well in Railroad District.

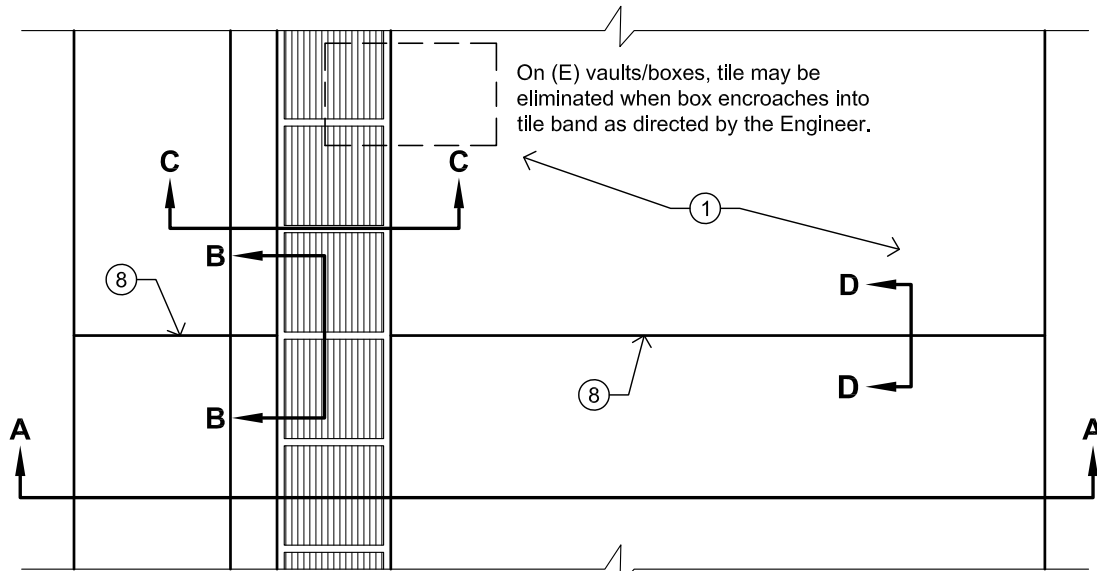
INSTALLATION NOTES:

- ① DRAINAGE: Trowel a 3/4" wide x 1" deep weep slot at 10' O.C. sloping toward the drain outlet. Install a 3/4" diameter PVC drain pipe through curb face, aligned to bottom of troweled weep slots. Cover paver side of pipe with plastic window screen mesh and attach with zip tie. Cover mesh with tape during installation and remove tape after forms are removed. Pipe shall be cut flush with concrete.
- ② BEDDING SAND: 1" min. (2" at weep slots) concrete bedding sand in compliance with ASTM C33 specifications.
- ③ PAVERS: Air Vol Block Holland Pavers, "Railroad Blend" tumbled concrete pavers or approved equal. Pavers shall be Type 1 and meet ASTM C936 specifications. Red brick is not an approved equal.
- ④ PATTERN: Pavers shall be installed in a standard "Running Bond" pattern. Cut pavers shall be no less than 2" long or wide. Surface of paver shall be set flush with curbs.
- ⑤ COMPACTION: After pavers have been laid, sweep surface clean of any debris. ASTM C33 sand shall be swept into joints. Tamp the pavers into bedding sand with a plate compactor and vibrate sand up into joints. Adjust speed of compactor to run with high vibration, low amplitude, to avoid a jumping motion. Start at one edge of the sidewalk and compact the perimeter. Compact remaining area in 4" - 6" overlapping passes. Repeat process, compacting in opposite direction. Tamp pavers with at least two passes of the compactor at 90° angles to each other. Inspect and replace any broken pavers.
- ⑥ PAVEMENT REMOVAL & REPAIR: See Engineering Standard 4110.
- ⑦ INSTALLATION: Pavers shall be installed with the non-beveled side facing up.

REVISIONS	BY	APP	DATE
New (Replaces former Boardwalk)	JDL	DA	3-17
Brick to Concrete Paver	KH	MH	3-18
STANDARD CURRENT AS OF: May 2018			

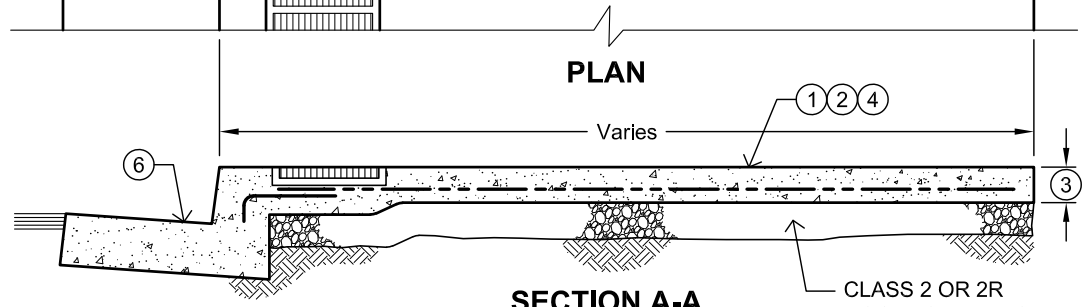


**CONCRETE PAVER
SIDEWALK
RAILROAD DISTRICT**



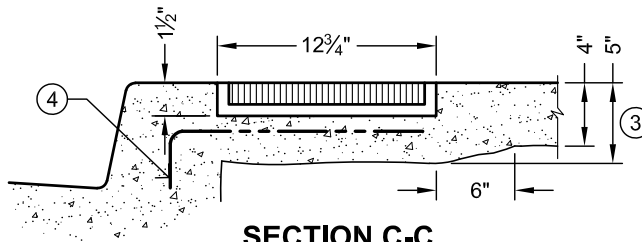
On (E) vaults/boxes, tile may be eliminated when box encroaches into tile band as directed by the Engineer.

PLAN

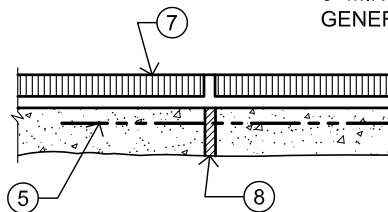


SECTION A-A

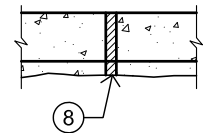
CLASS 2 OR 2R AGGREGATE BASE, 6" MIN. DEPTH (SEE GENERAL NOTE L)



SECTION C-C



SECTION B-B



SECTION D-D

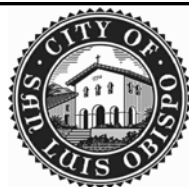
INSTALLATION NOTES:

- 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 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.

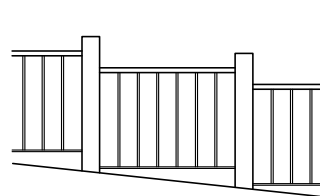
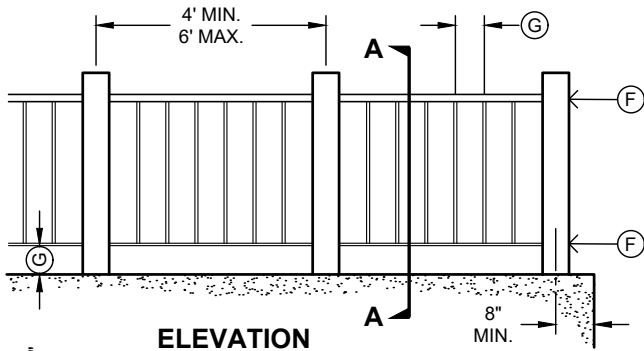
GENERAL NOTES:

- 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.
- L. BASE: Thickness may be reduced to 4" with on-site approval of a geotechnical engineer or if rocky, non-expansive material is present.

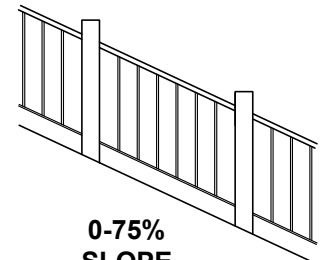
REVISIONS	BY	APP	DATE
Revised G, deleted 2-3, renumbered	SR	MH	1-14
Revised Notes 11 - 18	MH	BL	10-09
Reorganize Notes; Drafting edits	JDL	MH	11-12
STANDARD CURRENT AS OF:		May 2018	



**MISSION STYLE
SIDEWALK**



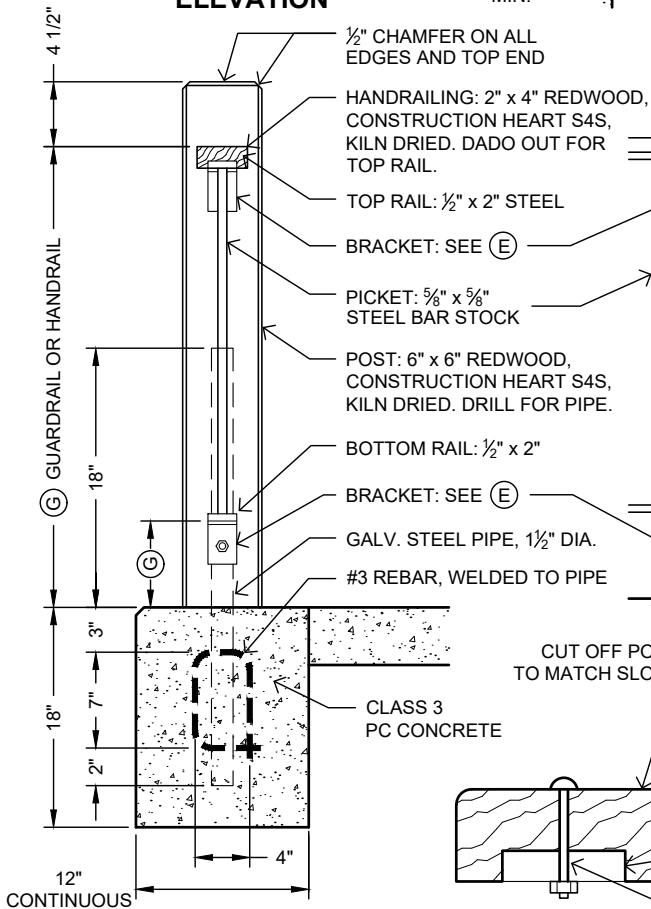
**0-10%
SLOPE**



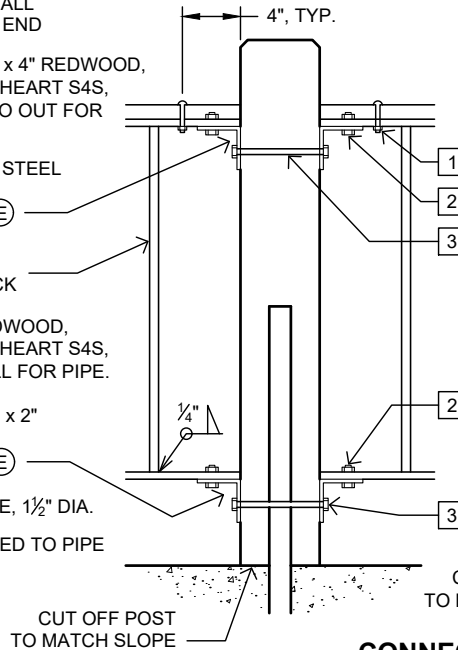
**0-75%
SLOPE**

NOTE: PICKETS, RAILS, AND BRACKETS SHALL BE Q-36 STEEL

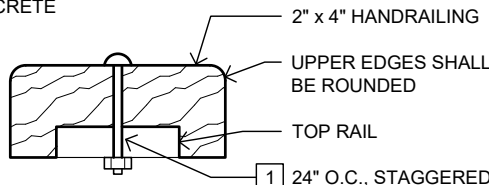
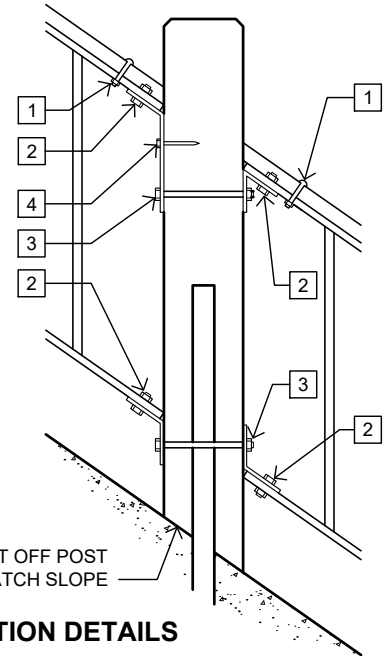
ELEVATION



SECTION A-A



CONNECTION DETAILS



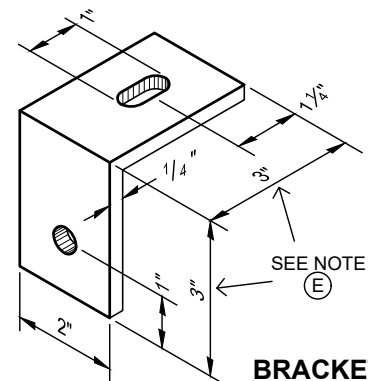
HANDRAILING

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)

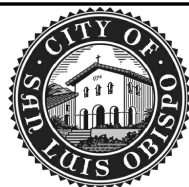
NOTES:

- (A) Redwood posts and handrailing shall be free of splits and splinters, sanded smooth, and stained with two (2) coats of ARBORCOAT solid deck & siding stain 640 or approved equal.
- (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 1/8".
- (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.

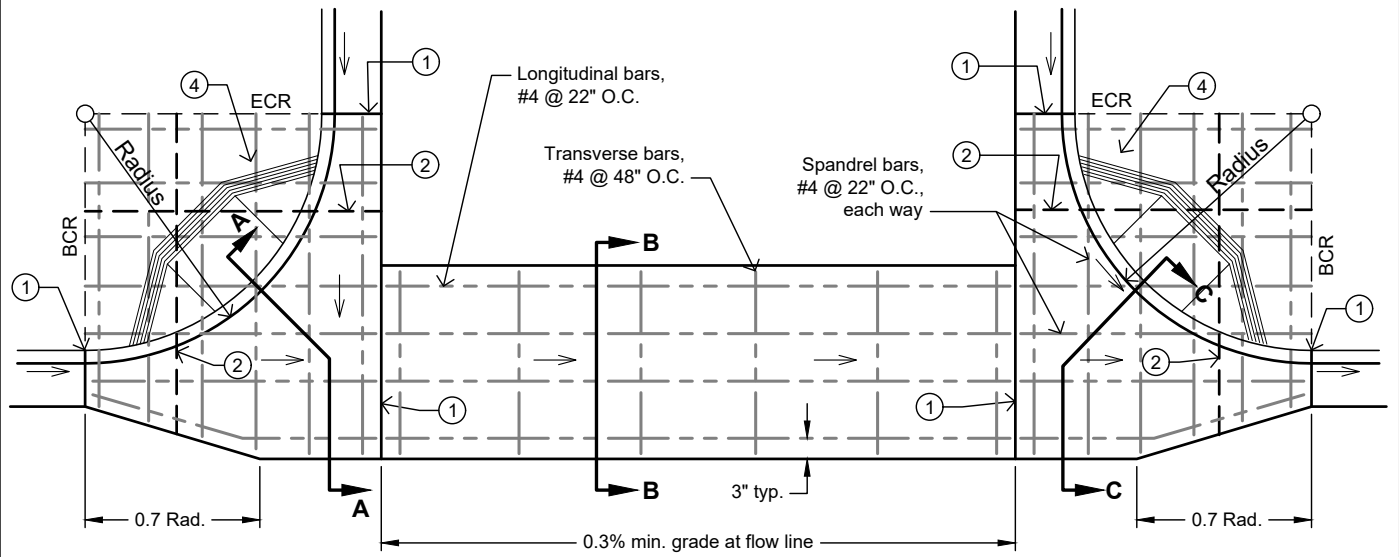


BRACKET

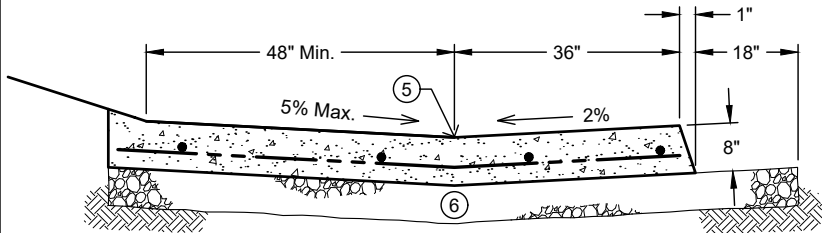
REVISIONS	BY	APP	DATE
Revised Lumber Grade	MH	BL	2-14
Note A, Railing	KH	MH	11-17
Kiln-dried Handrail; Welding	JDL	DA	10-15
STANDARD CURRENT AS OF:		May 2018	



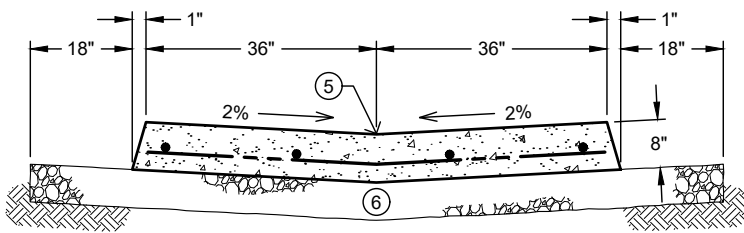
**MISSION STYLE RAILING
HANDRAIL & GUARDRAIL**



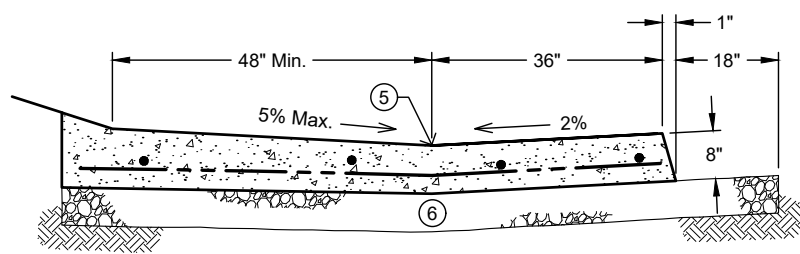
PLAN



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:		May 2018	



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 and flare.
4. ½" X 18" smooth bar dowels shall be provided at expansion joints at 24" O.C.
5. Curb ramp gutter dimensions to match adjacent gutters.
6. See Engineering Standard 4110 for notes regarding pavement removal and repair.

TRUNCATED DOMES:

Truncated domes / Tactile Detectable Warning System shall conform to the following:

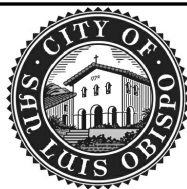
System Type:	Flexible mat with wear-resistant coating.
Material:	Polymer-modified concrete with fiberglass reinforcement.
Coating:	Field-applied system consisting of pigmented acrylic sealer and clear acrylic sealer.
Installation:	Bonded to concrete substrate on 100% of area by flexible acrylic resins.
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 manufacturer's 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.

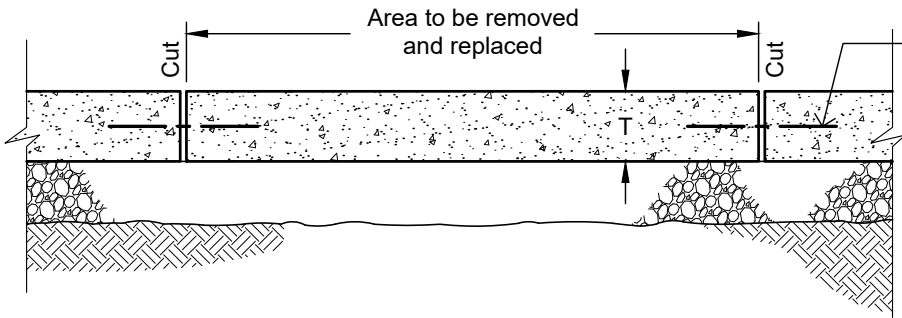
ADDITIONAL NOTES FOR MISSION STYLE AREA:

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
Revised Notes 12 and 14	MH	BL	10-09
Revise notes 4, 6	KH	MH	11-17
Truncated Domes	JDL	BL	06-12
STANDARD CURRENT AS OF:		May 2018	

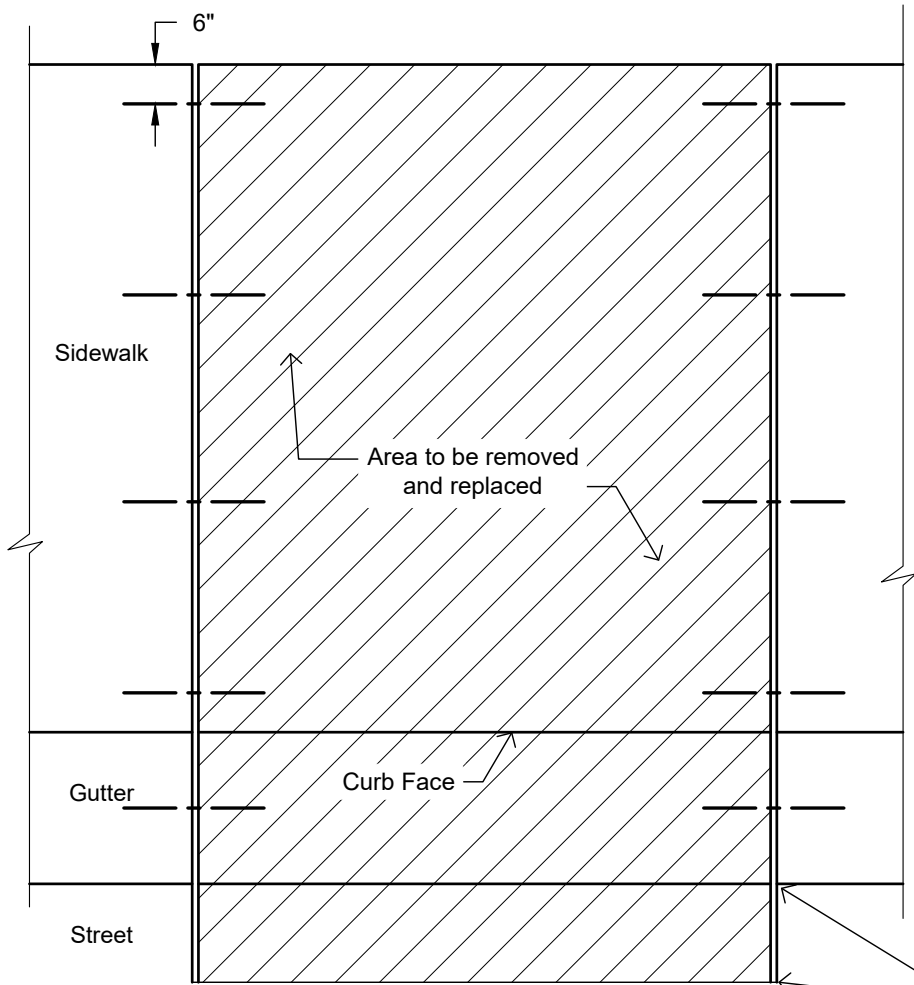


**CURB RAMP
CORNERS & MID-BLOCK**



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.

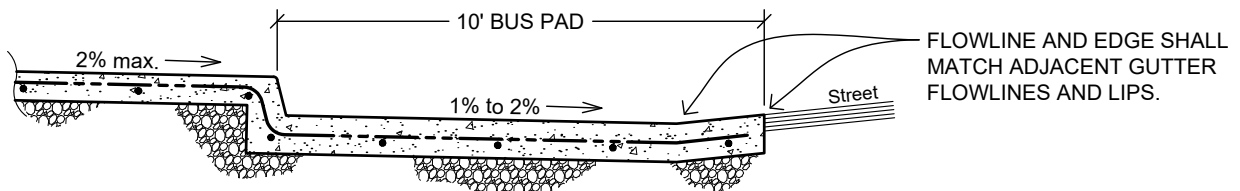
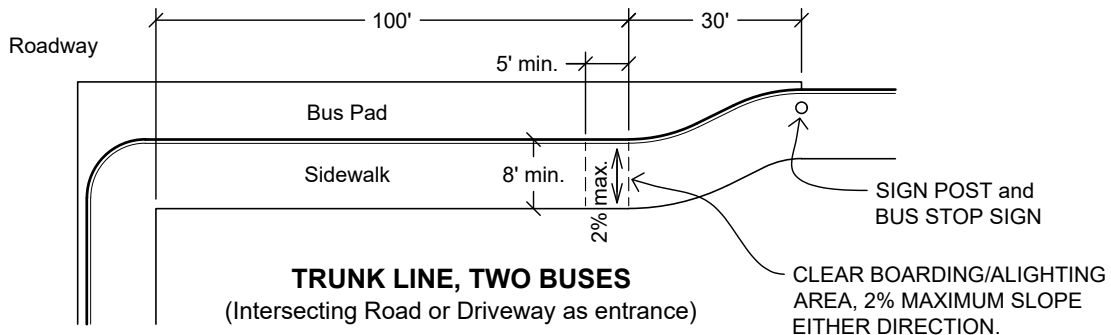
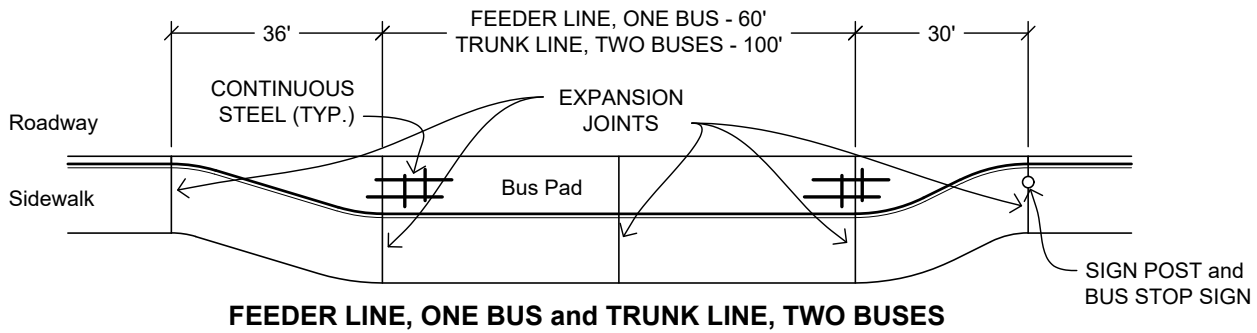
PLAN OF CURB, GUTTER & SIDEWALK

REVISIONS	BY	APP	DATE
<i>Revised General Note</i>	<i>MH</i>	<i>BL</i>	<i>2-14</i>
<i>Removal Cut Detail; Revised Note</i>	<i>SR</i>	<i>BL</i>	<i>1-14</i>
<i>Drafting edits</i>	<i>JDL</i>	<i>MH</i>	<i>11-12</i>
STANDARD CURRENT AS OF:		May 2018	



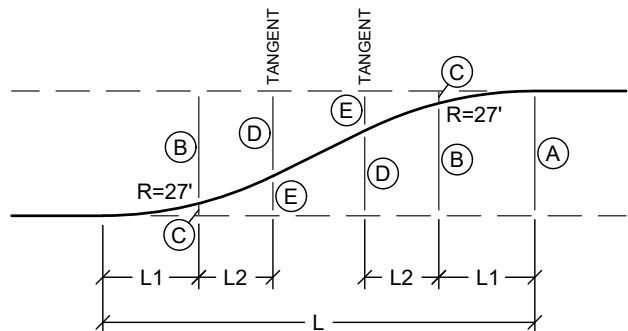
CUTTING CONCRETE

BUS TURNOUT DIMENSIONS FOR BUSES 8'6" WIDE AND THIRTY-SIX (36') TO FORTY (40') LONG



MONOLITHIC POUR NOTES:

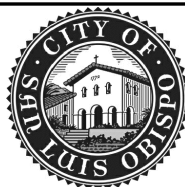
1. Reinforce 10' wide bus pad and sidewalk within turnout. 8" Class 2 concrete with #4 @ 24" o.c. both ways reinforcing over 6" Class 2 Aggregate Base.
2. Curb height 8" maximum
3. See Engineering Standards 4030 and 4110 for Curb, Gutter and Sidewalk.
4. See Engineering Standard 4910 for sawcutting existing PCC.
5. See Engineering Standard 7210 for Sign Post.
6. Score at 10' intervals.



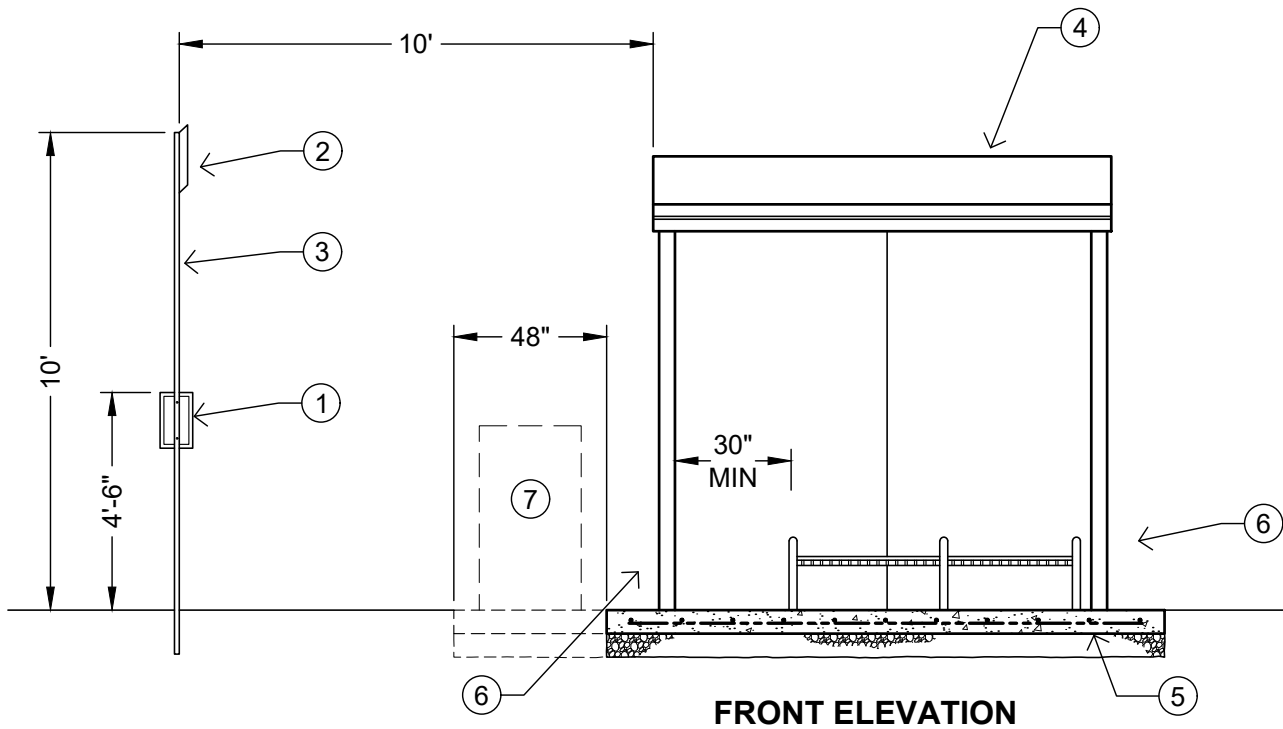
L	L1	L2	A	B	C	D	E
36	4.25	4.00	8.50	8.20	0.30	7.30	1.20
30	6.33	5.87	8.50	7.80	0.70	5.65	2.85

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:		May 2018	



CONCRETE BUS TURNOUT



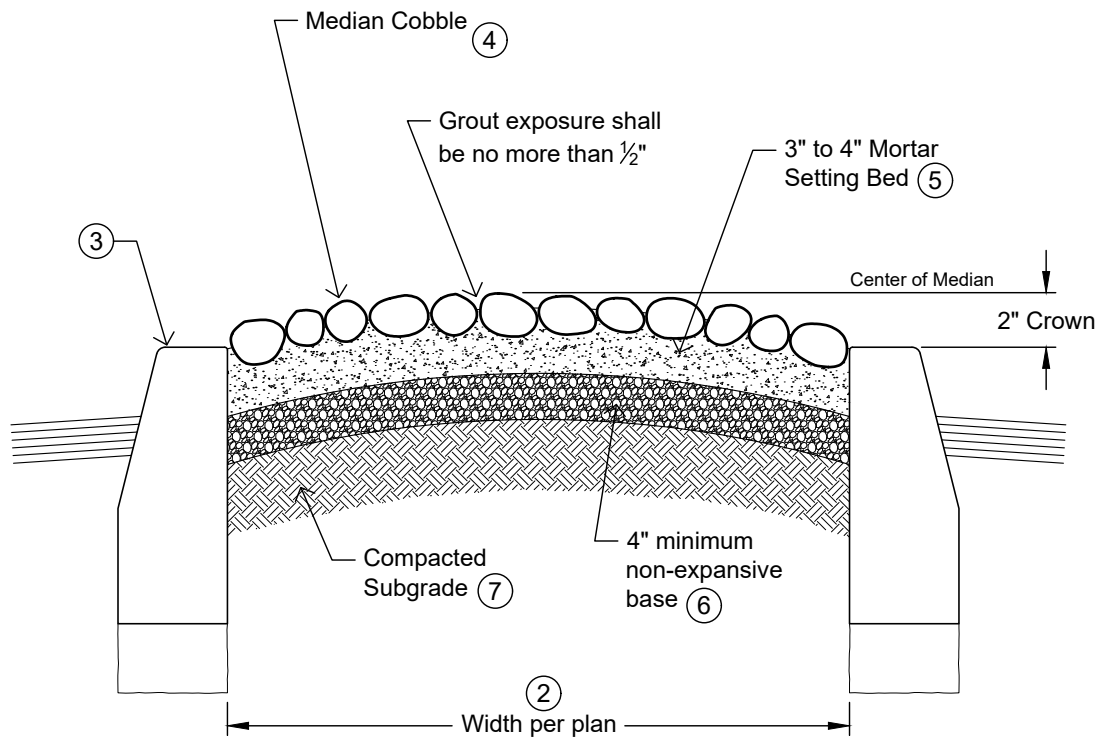
INSTALLATION NOTES:

- 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 13' Dome-roof shelter, Tolar Model #13NALD-PM-SLO-SOL or approved equal. 9' Dome-roof shelter may be substituted for 13' shelter as approved by the Transit Manager, Tolar Model #9NALD-PM-SLO-SOL. NEC 690 Compliant Solar Lighting. 13' shelter shall include a 8' perforated metal bench, no back, and a minimum of one anti-vagrant bar. 9' Shelter, if approved, shall include a 4' perforated metal bench, no back, and one anti-vagrant bar. Color: RAL 5022. Shelter and bench to be bolted to concrete slab per manufacturer's recommendations. Available form 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 @ 24" 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
edit 4 remove back	KH	MH	11-17
STANDARD CURRENT AS OF:		May 2018	



BUS STOP

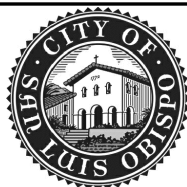


SECTION ①

INSTALLATION NOTES:

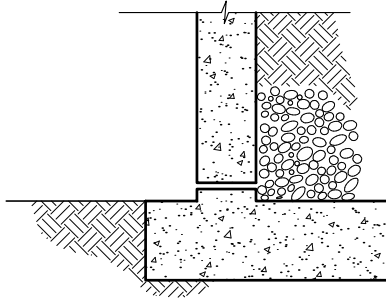
- ① Cobble median work shall conform to to the provisions in Section 73, of the Standard Specifications.
- ② Contractor shall install cobble median in non-pedestrian locations of curb islands as indicated on plans.
- ③ Concrete Curbs shall be installed per Engineering Standard 4020.
- ④ Median Cobble 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: May 2018			



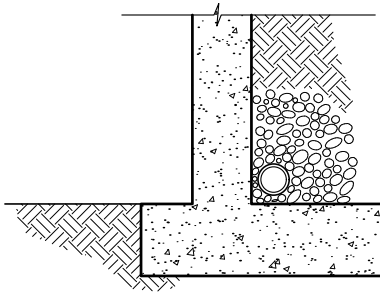
**RAISED
COBBLESTONE MEDIAN**

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:		May 2018	



**RETAINING WALL
DRAINAGE**

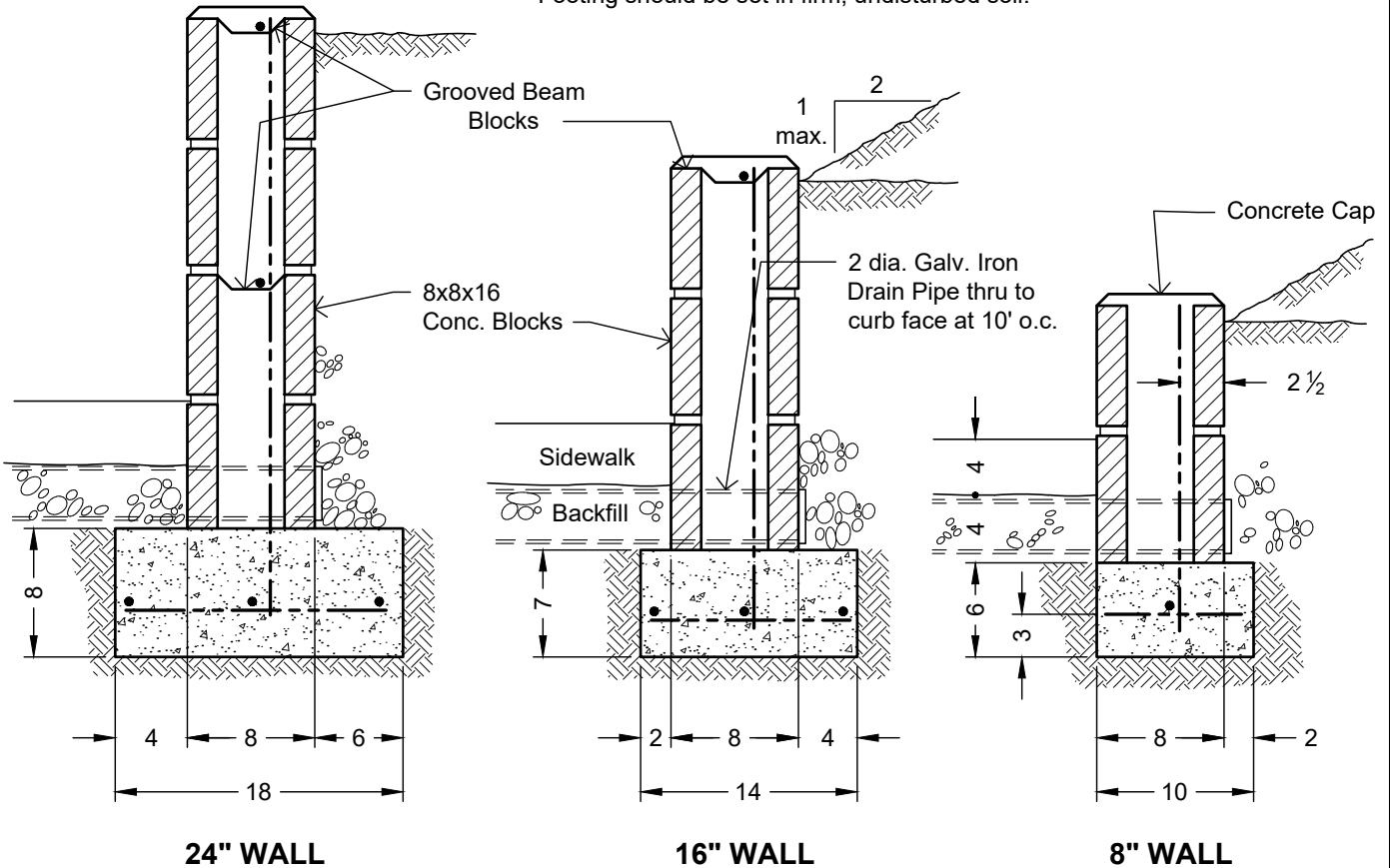
Steel:

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.

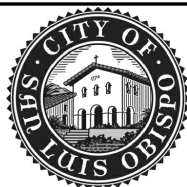


All dimensions in inches unless noted otherwise.

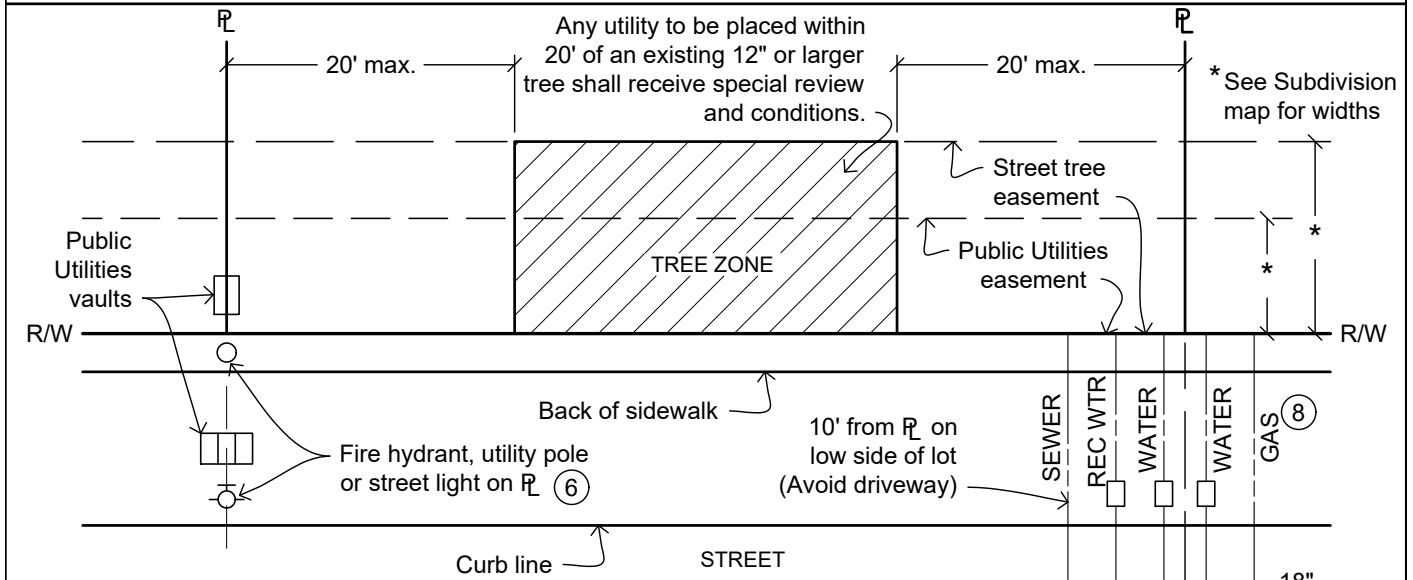
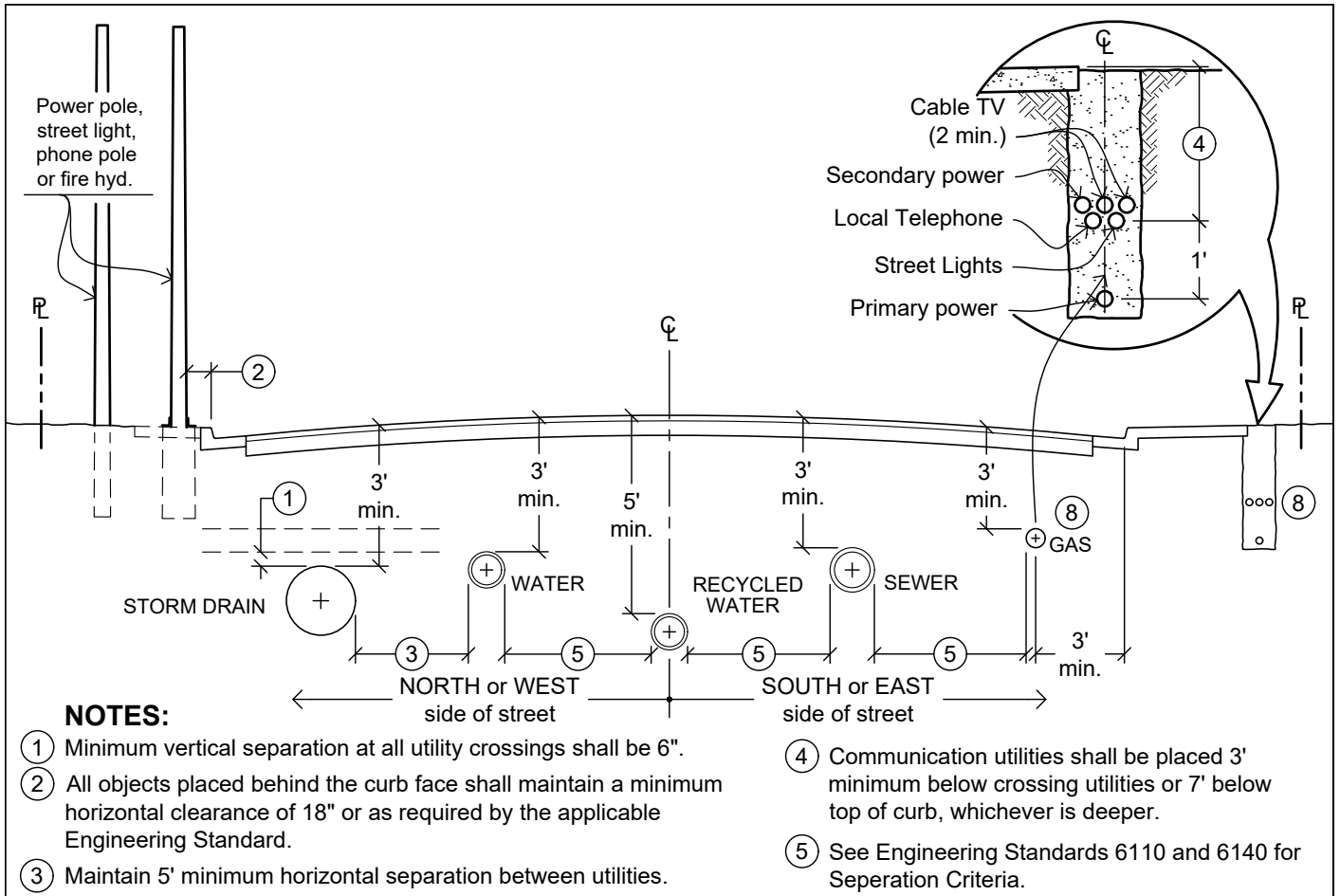
GENERAL NOTES:

- 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:		May 2018	



**SHORT
RETAINING WALLS**



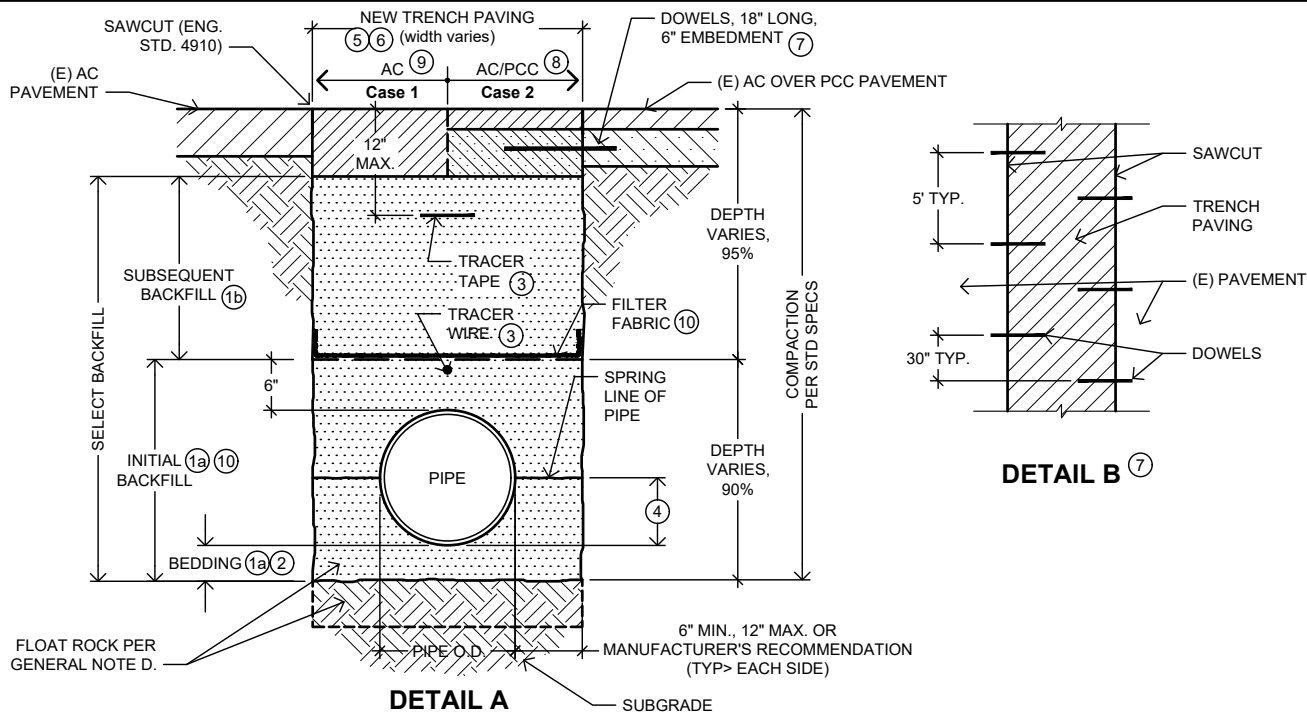
NOTES (cont'd):

- ⑥ Hydrants shall be installed per Engineering Standards 6310 and 6315.
- ⑦ 3' minimum horizontal clearance between unlike utility services.
- ⑧ Gas lines shall share trench with wire utilities per plans or standards approved by all Utilities occupying trench, unless specifically allowed by the City.

REVISIONS	BY	APP	DATE
<i>Revised Depth Reference Point</i>	MH	BL	11-09
<i>Revise Note 4; Drafting edits</i>	JDL	MH	11-12
<i>Notes revised</i>	KH	MH	1-17
STANDARD CURRENT AS OF:		May 2018	



UTILITIES LOCATION



INSTALLATION NOTES:

- ①a Trench backfill sand in compliance with 26-1.02G
- ①b Trench backfill Class 2 aggregate base, trench backfill sand, or slurry in compliance with 26-1.02B, 26-1.02G, or 77-1.02B.
- 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 grid 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.

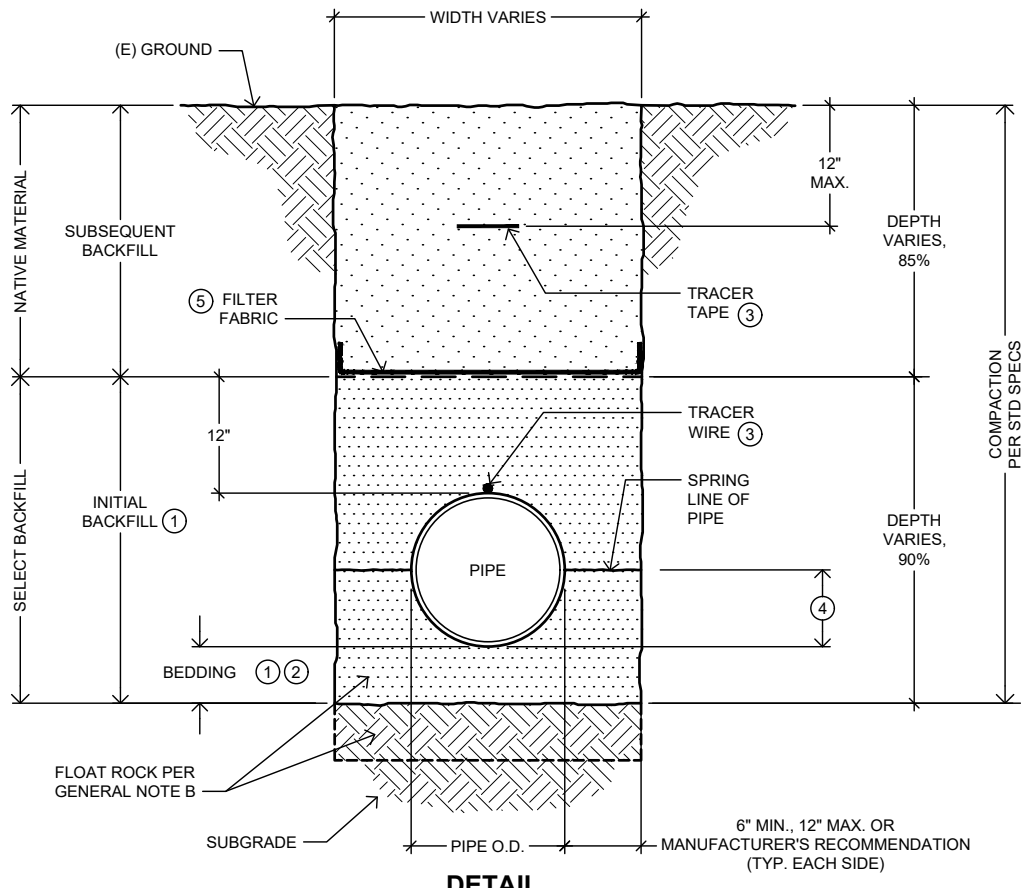
GENERAL NOTES:

- A. Backfill testing is required and results are subject to approval by the City Engineer. Float rock depth shall vary based upon groundwater elevation.
- 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. Float rock depth shall vary based upon groundwater depth.
- 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 1, add float rock note	KH	MH	3-18
Revise Note 1 & 8	SR	BL	1-14
Revise Note 3	JDL	DA	10-15
STANDARD CURRENT AS OF:		May 2018	



TRENCH DETAIL #1
PAVED OR UNPAVED STREETS



DETAIL

NOTES:

- ① Trench backfill sand in compliance with 26-1.02G
- 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:

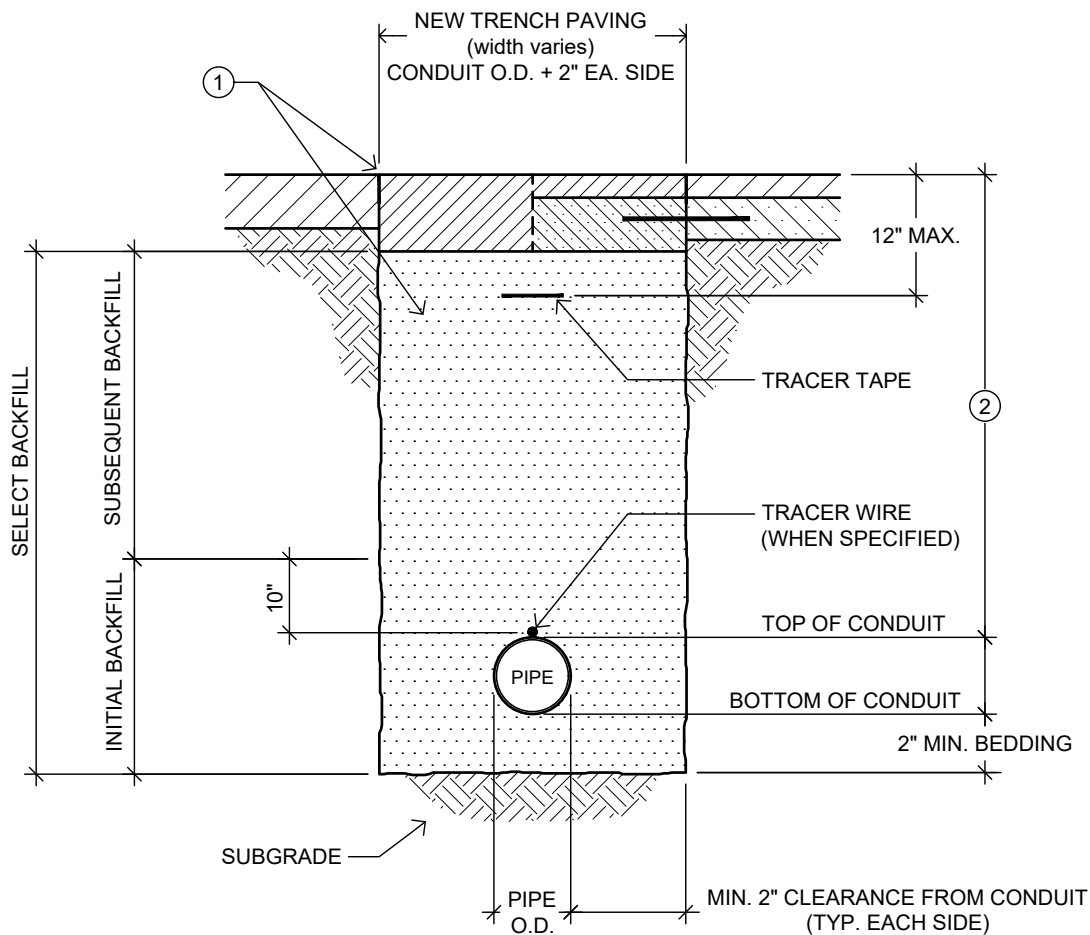
- A. During backfill operations, the the trench shall be backfilled and compacted and tested to the spring line of any utilities crossing the trench before proceeding with further backfill.
- B. Float rock may be substituted for initial backfill when ground water is present as approved by the Engineer. Float rock depth shall vary based upon groundwater elevation.
- 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
Detail 2	KH	MH	1-18
Revise Note 1	MH	SR	1-14
Revise Note 3	JDL	DA	10-15
STANDARD CURRENT AS OF:		May 2018	



TRENCH DETAIL #2
UNPAVED NON-TRAFFIC AREAS



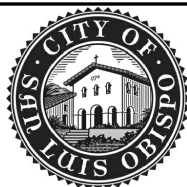
INSTALLATION NOTES:

- ① See Engineering Standards 6020 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

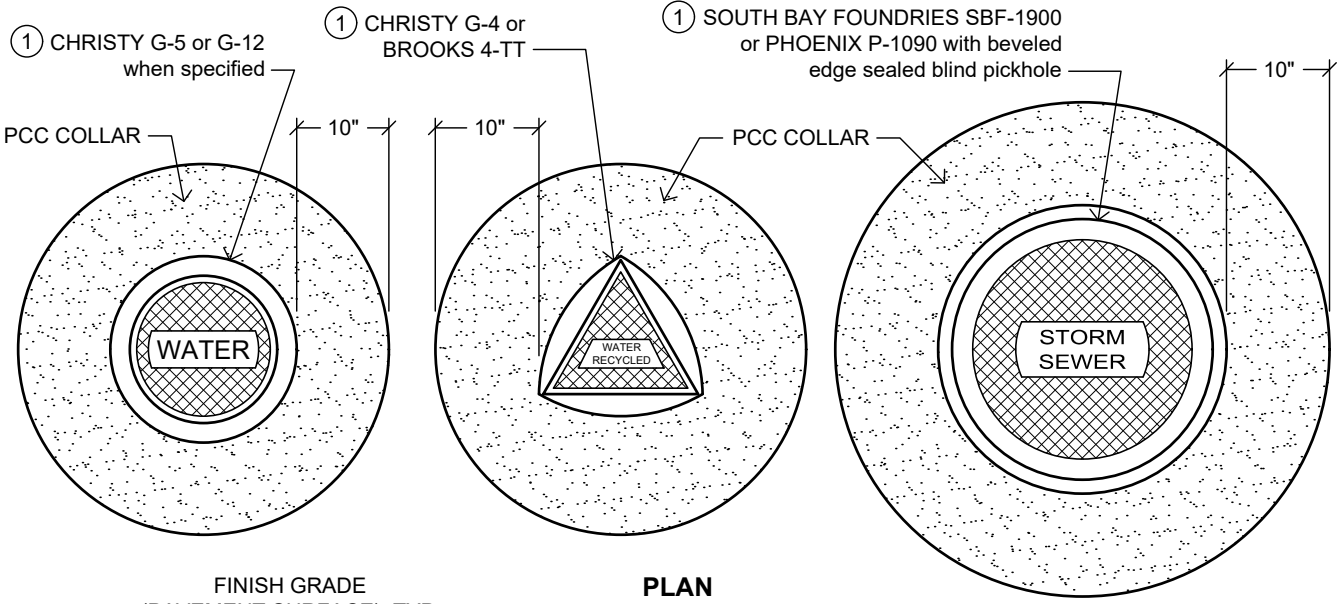
GENERAL NOTE:

- 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
Detail 3	KH	MH	1-18
Revise drawing & Note 1; delete 3	SR	BL	1-14
STANDARD CURRENT AS OF:		May 2018	

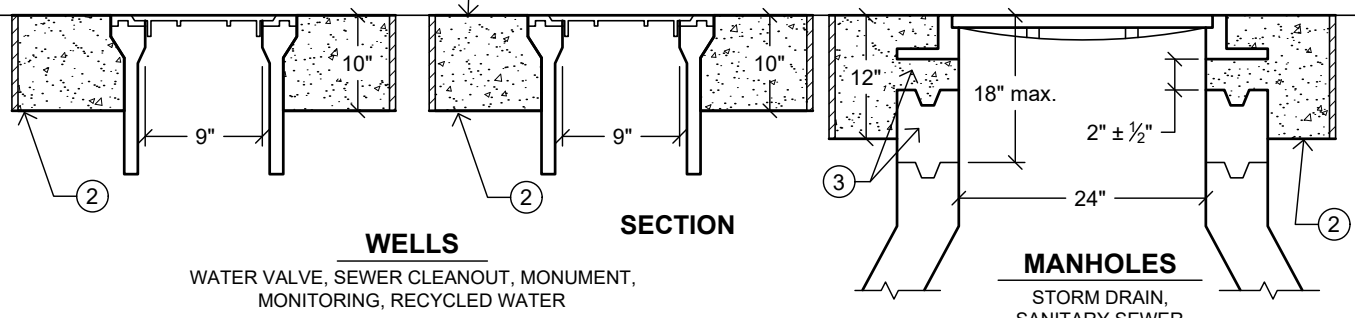


TRENCH DETAIL #3
 CONDUIT TRENCH FOR TRAFFIC SIGNALS, STREET LIGHTS, AND CITY COMMUNICATIONS 6035



FINISH GRADE
(PAVEMENT SURFACE), TYP.

PLAN



WELLS

SECTION

MANHOLES

WATER VALVE, SEWER CLEANOUT, MONUMENT,
MONITORING, RECYCLED WATER

STORM DRAIN,
SANITARY SEWER

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.

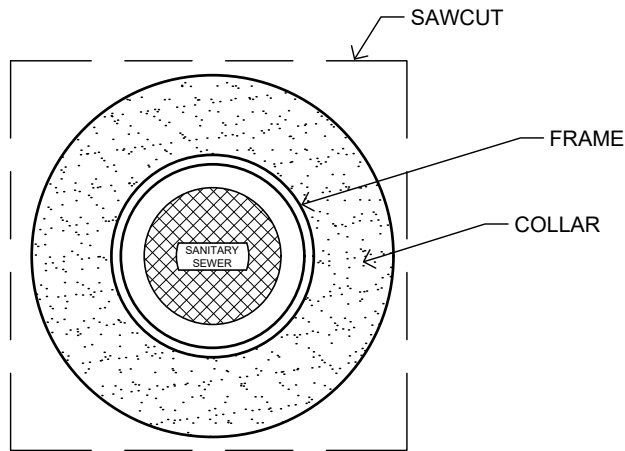
GENERAL NOTES:

- 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.

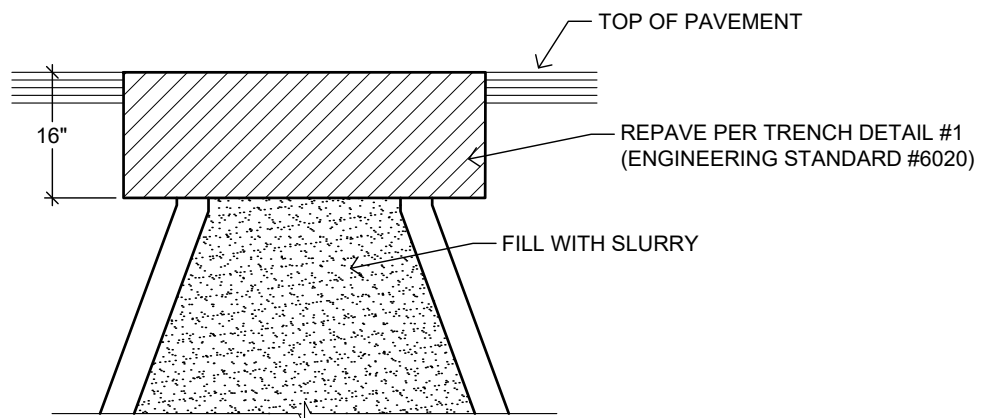
REVISIONS	BY	APP	DATE
Update Note 2	WH	BL	8-11
Add Note 7	DVB	BL	11-08
Reorganize Notes; Add Note E	JDL	BL	6-12
STANDARD CURRENT AS OF:		May 2018	



**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 #1 (Engineering Standard 6020).
- 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:		May 2018	



**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. Crossing Construction: Pressure water main must be at least 12 inches above sanitary sewer lines where these lines cross. Angle of crossing shall be between 45 and 90 degrees.
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 proposed by the water system must be approved by the State Water Resources Control Board, Division of Drinking Water. Alternatives may be proposed pursuant to CCR, Title 22, Section 64557.100.

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.

CONSIDERATION OF STORM DRAINAGE

New water mains and supply lines shall be installed at least 4 feet from and one foot vertically above storm drainage pipes.

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:		May 2018	



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 Division of Drinking Water 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.
X	Requires a waiver from the Division of Drinking Water pursuant to CCR, Title 22, Section 64551.100 <u>Note</u> : Applies to mains only. Supply lines and house laterals are not subject to waiver requirements.

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 Division of Drinking Water and water supplier.
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
X	Requires a waiver from the Division of Drinking Water pursuant to CCR, Title 22, Section 64551.100 <u>Note</u> : Applies to mains only. Supply lines and house laterals are not subject to waiver requirements.
D	If the sewer <u>crossing</u> the is water main is not HDPE with fused joints, then the water main shall have no joints within 8 feet from either side of the sewer and shall be constructed of: 1. Ductile iron pipe 2. Class 200 PVC Pipe

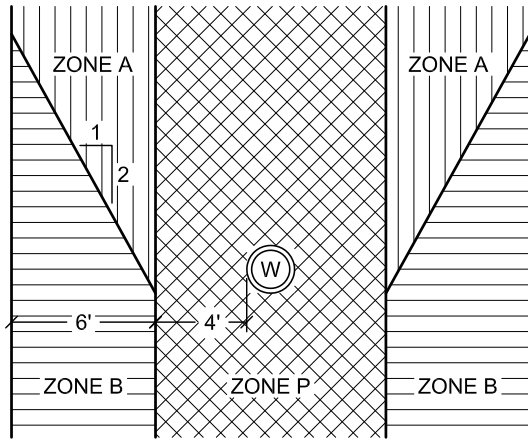
REVISIONS	BY	APP	DATE
Revise notes: B.c2, B.e Add F note	SR	BL	3-06
Revised all Notes	MH	BL	1-14
Consolidate 6110, 6120 & 6130	JDL	JDW	6-02
STANDARD CURRENT AS OF:		May 2018	



WATER – SEWER
SEPARATION CRITERIA
TEXT

CRITERIA FOR THE SEPARATION OF WATER MAINS AND SANITARY SEWERS

Refer to Engineering Standard 6110 for Separation Criteria Text

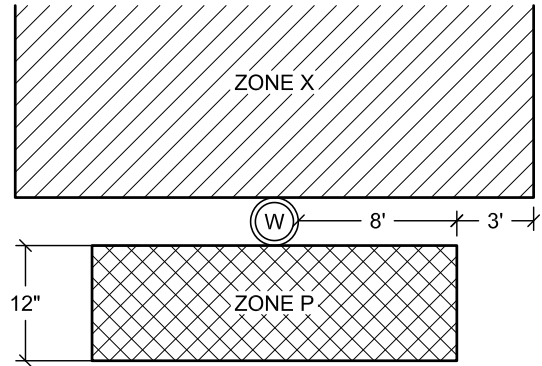


PARALLEL*

*MINIMUM 1' VERTICAL SEPARATION BELOW WATER MAIN WITHIN 10'

NEW SEWER MAIN

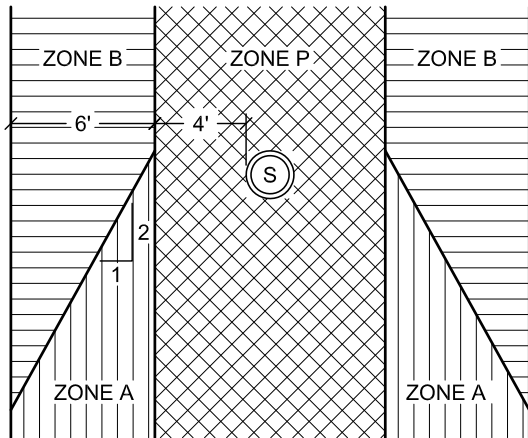
Figure 1



CROSSING

ZONE P is a prohibited zone

ZONE X requires a state waiver

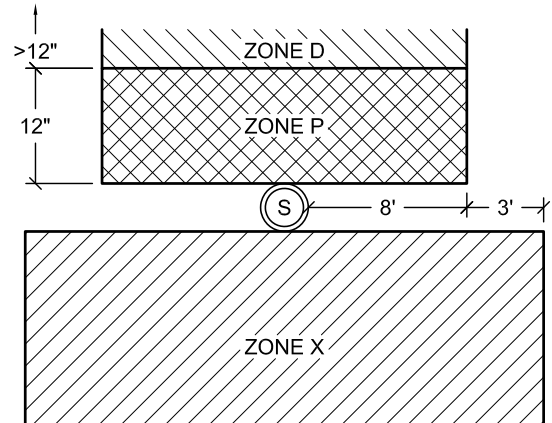


PARALLEL*

*MINIMUM 1' VERTICAL SEPARATION ABOVE SEWER MAIN WITHIN 10'

NEW WATER MAIN

Figure 2

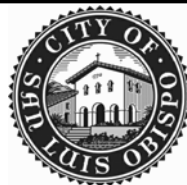


CROSSING

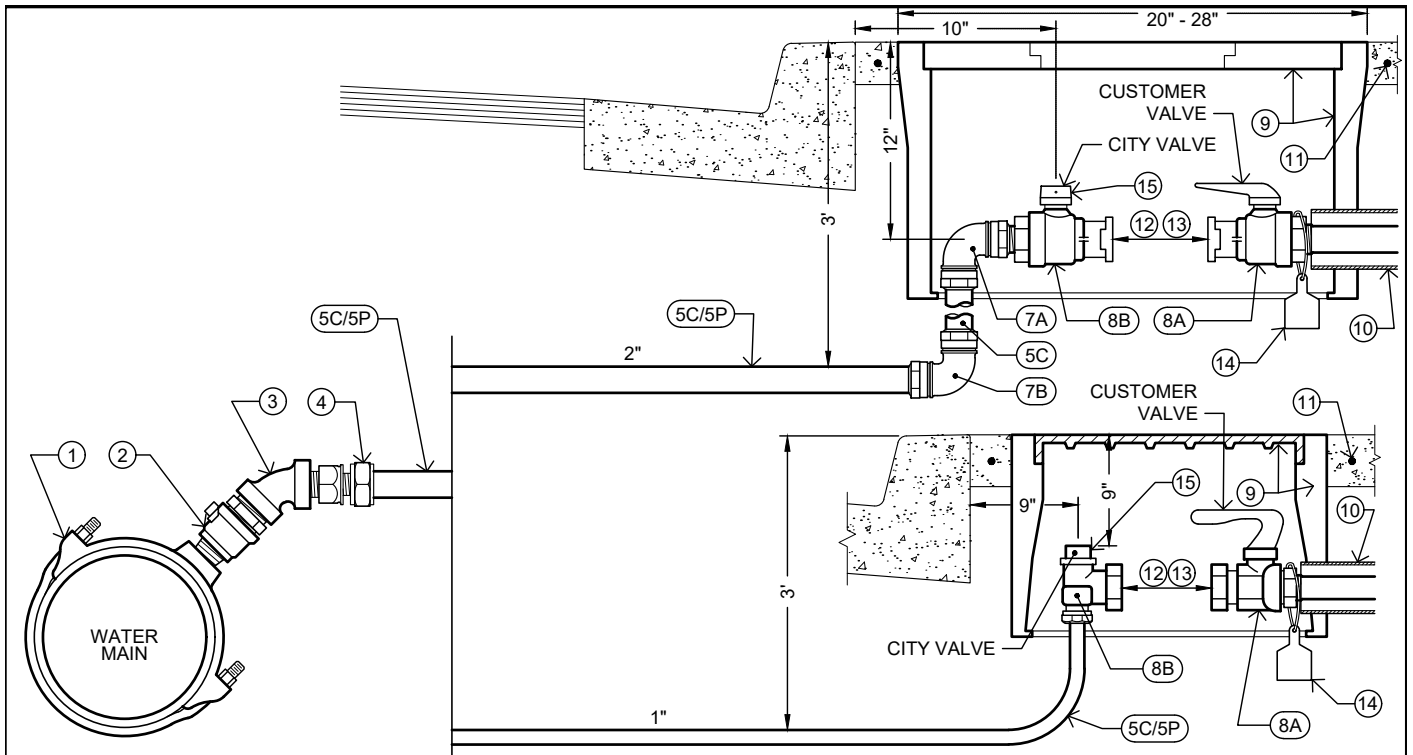
NOTES AND DEFINITIONS

- DIMENSIONS (separation distances) 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	KH	MH	5-18
STANDARD CURRENT AS OF:		May 2018	



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 blue.
- 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 is offset 5' or more from perpendicular.

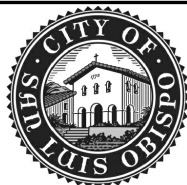
INSTALLATION NOTES:

- 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:
3/4" and 1" water meter use Brooks 37 T Series for traffic areas, Armorcast #A6000485SA for non-traffic areas, and Christy B12 for Mission Style areas. 1 1/2" and 2" water meter use Armorcast #A6001419SA, Armorcast cover (A6001420DEB) 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 1/2" 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:		May 2018	



**WATER SERVICES
NEW & REPLACEMENTS**

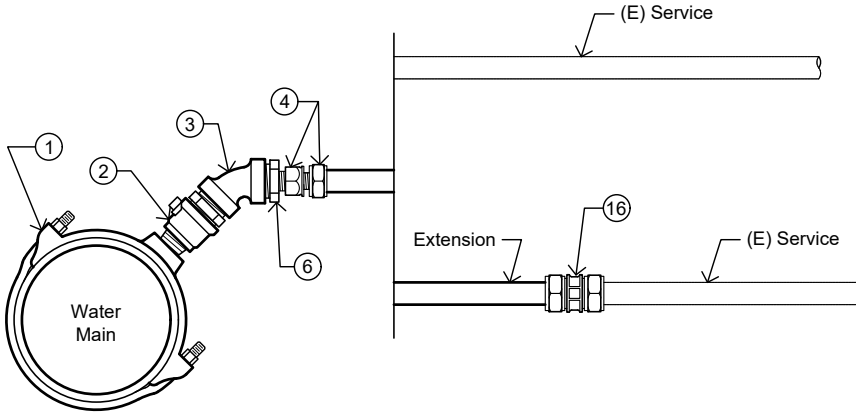
GENERAL NOTES:

- 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)



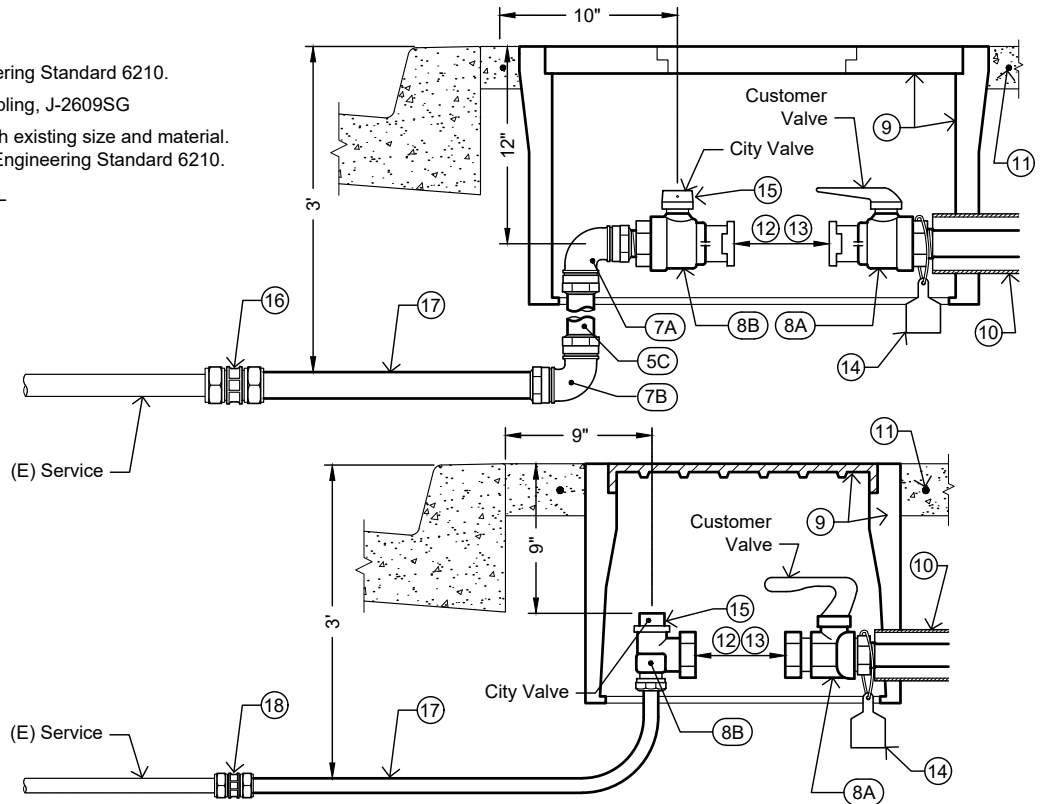
Type	(E) Service	Main
1	PE	Any
1	Copper	Non-metal

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.
- ⑩ 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



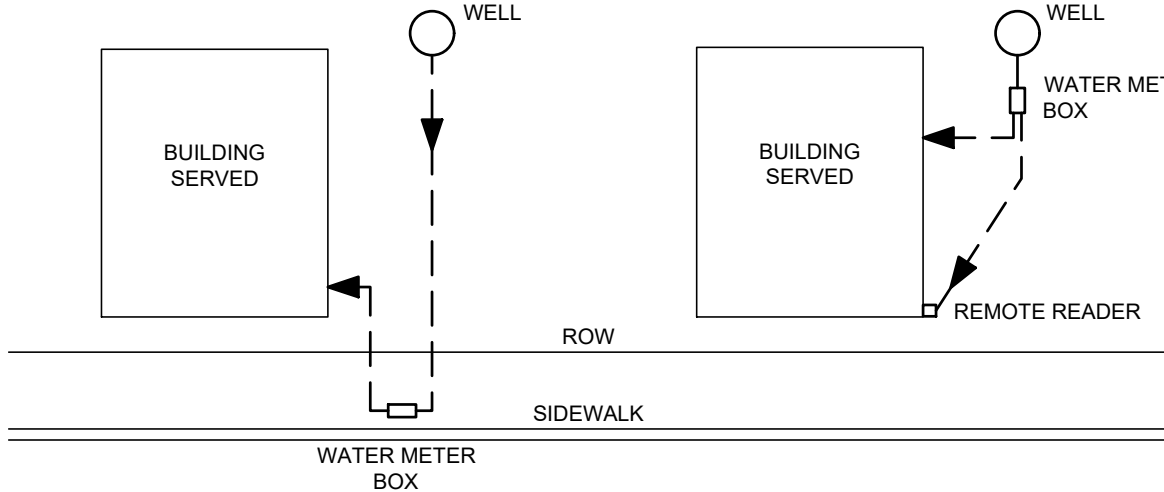
WATER SERVICE METER BOX RELOCATION

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:		May 2018	

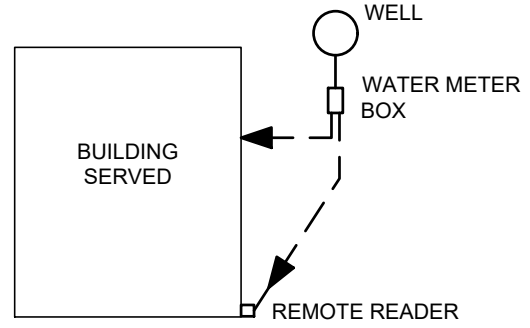


WATER SERVICE CONNECTIONS

STANDARD CONFIGURATION



ALTERNATE CONFIGURATION
(must be approved by the Utilities Department)

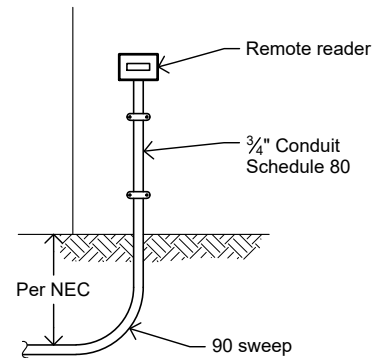
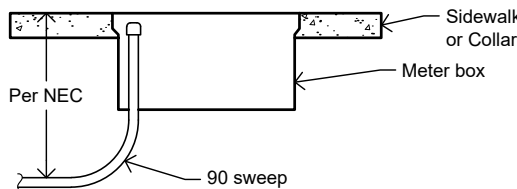
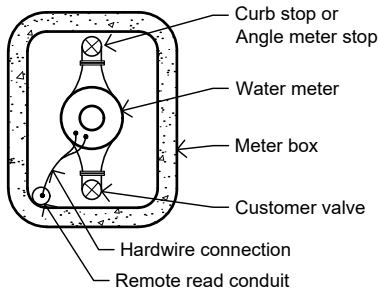


GENERAL NOTES:

- 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.

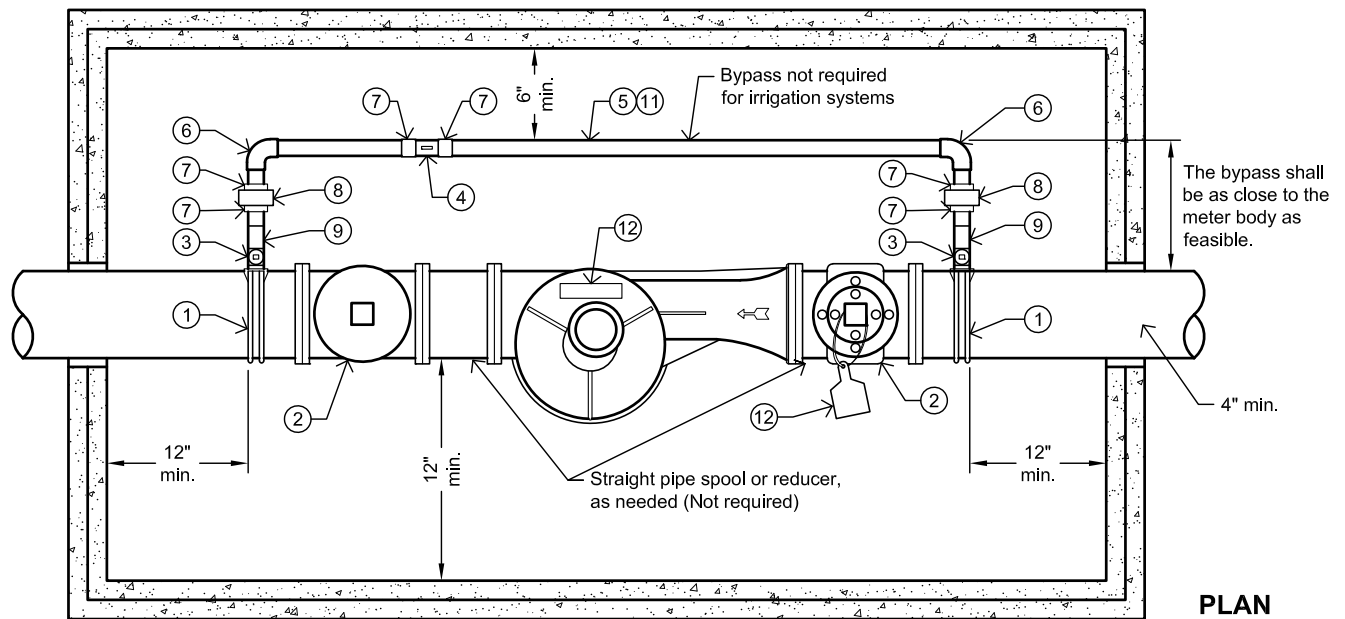


SEE ENGINEERING STANDARD 6210 FOR DETAILS

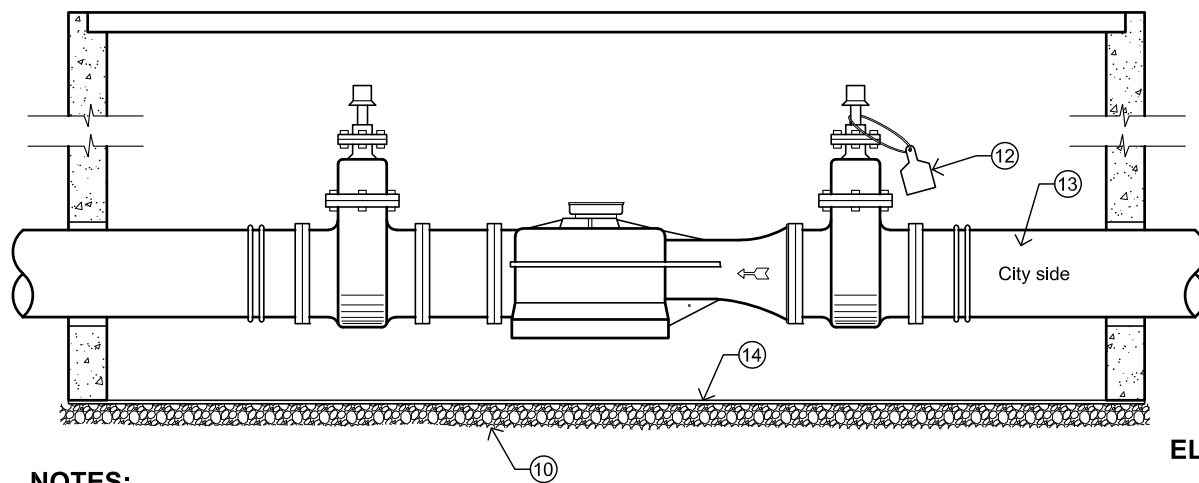
REVISIONS	BY	APP	DATE
New Standard	BL	WAP	4-97
New Border	JDL	WAP	9-97
Drafting edits	JDL	MH	12-12
STANDARD CURRENT AS OF:		May 2018	



WELL METERING



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 with locking ears
- 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.

Vaults 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.

Vaults may be required to be placed 90 degrees to the service to fit the sidewalk width.

Vaults shall be placed a minimum of 12" behind the curb face, or in Mission Style sidewalk, behind the tile row.

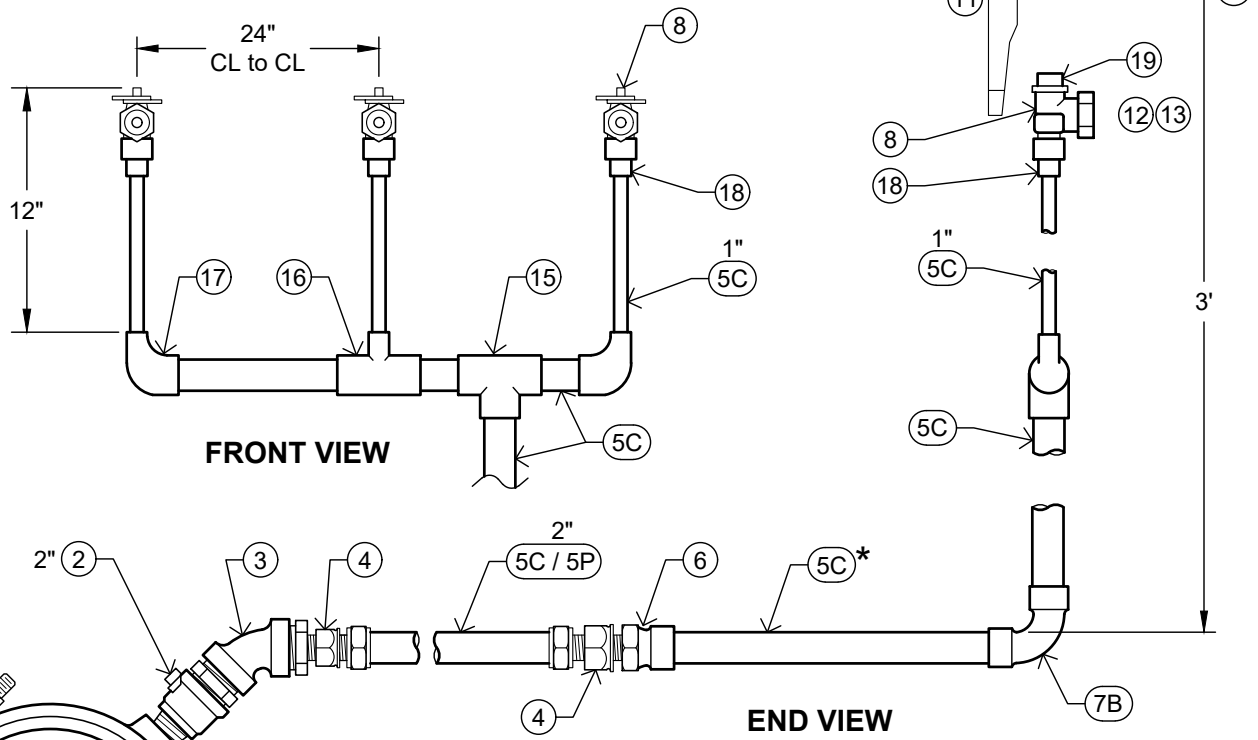
Spring-assisted vault cover lids shall bolt down. Multiple lids shall not be bolted down.

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:		May 2018	



WATER METER
WITH UNMETERED BYPASS
3" to 6" METERS

* 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:		May 2018	



MANIFOLD
MULTIPLE WATER SERVICES

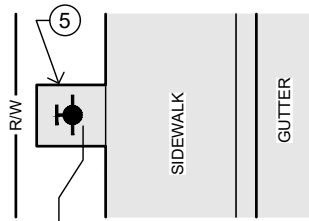


FIG. A

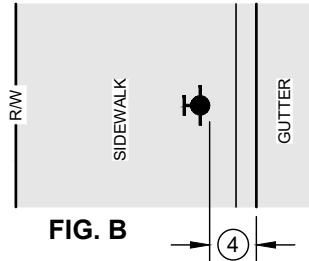


FIG. B

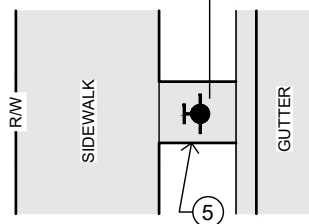
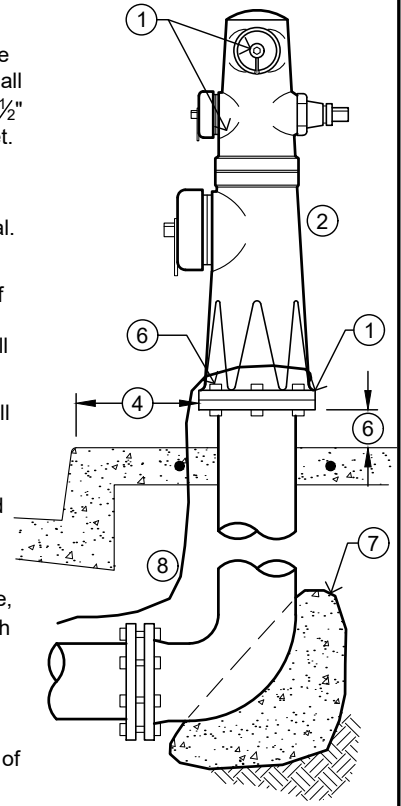


FIG. C

INSTALLATION NOTES:

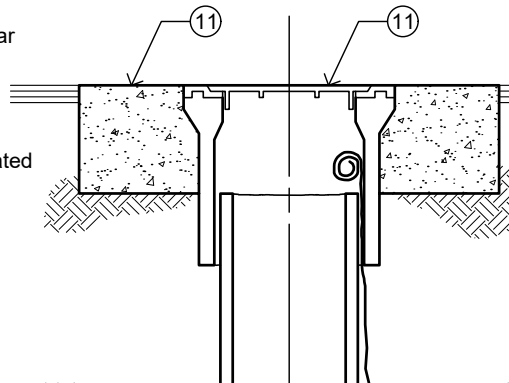
- ① Hydrant shall have 6-hole flange, all bronze body and bronze caps: Jones 3760, Clow 2060 or approved equal. Outlets shall be manufacturer's 2½" National Standard hose thread and 4½" National Standard thread. 4½" outlet shall point toward street. Hydrant shall be bagged until it is available for use.
- 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 5/8" 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.



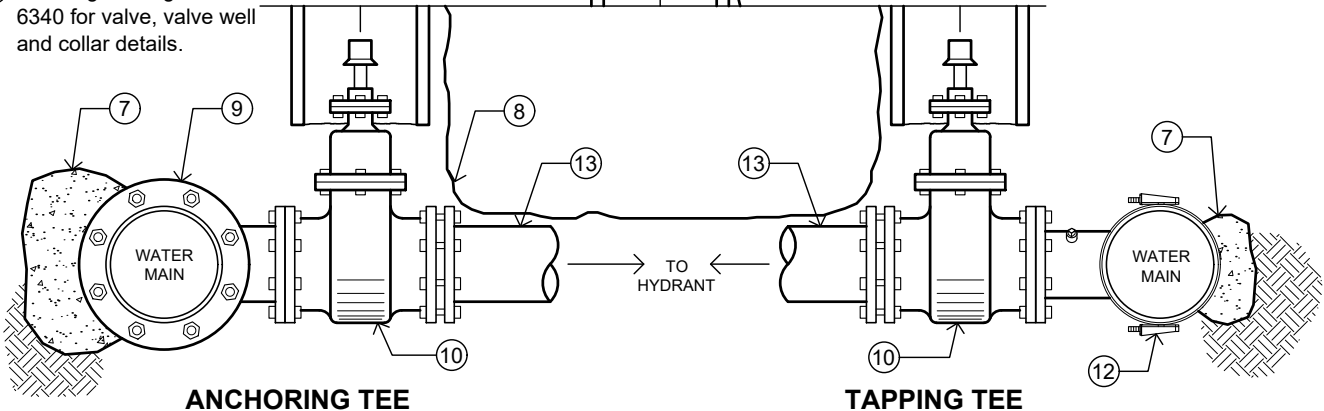
FIRE HYDRANT

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:		May 2018	



FIRE HYDRANT ASSEMBLY

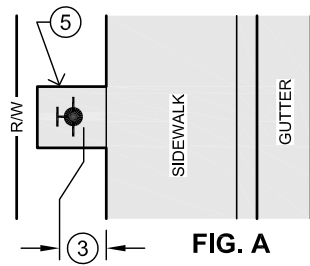


FIG. A

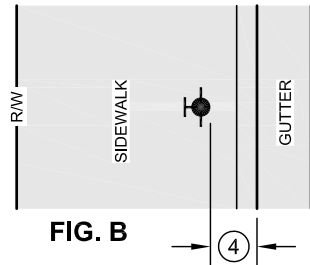


FIG. B

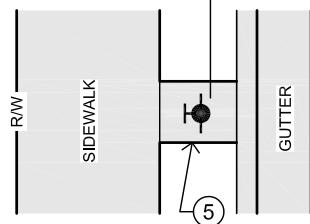
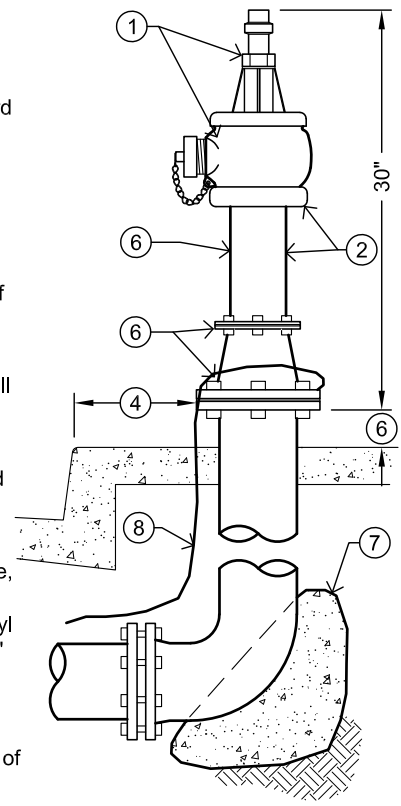


FIG. C

INSTALLATION NOTES:

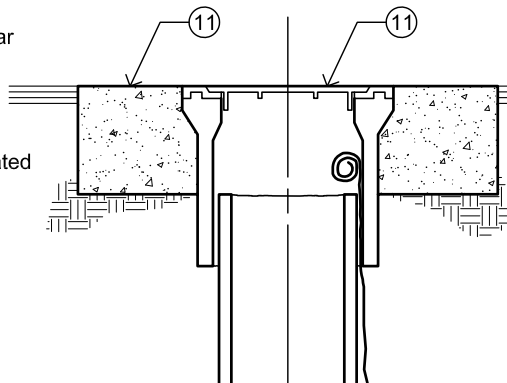
- ① Hydrant shall have 4" inlet, tapered IPT female with one 2½" NSHT male outlet, cap and chain with pentagon stem nut: Jones H.P. or approved equal. Outlet shall be pointed toward street. Hydrant shall be rated for 200 psi design pressure.
- ② Hydrant shall be primed for paint with Sherwin Williams 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.



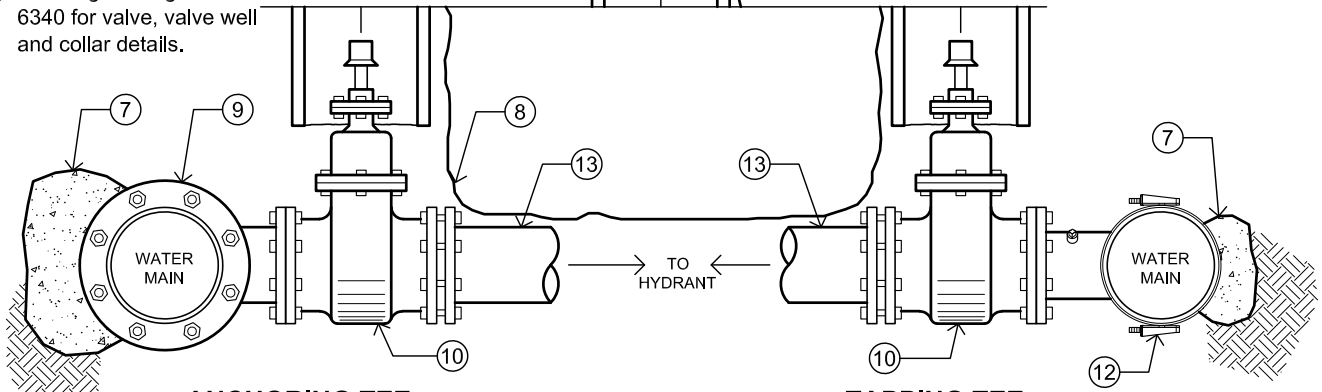
FIRE HYDRANT

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 and 6030.



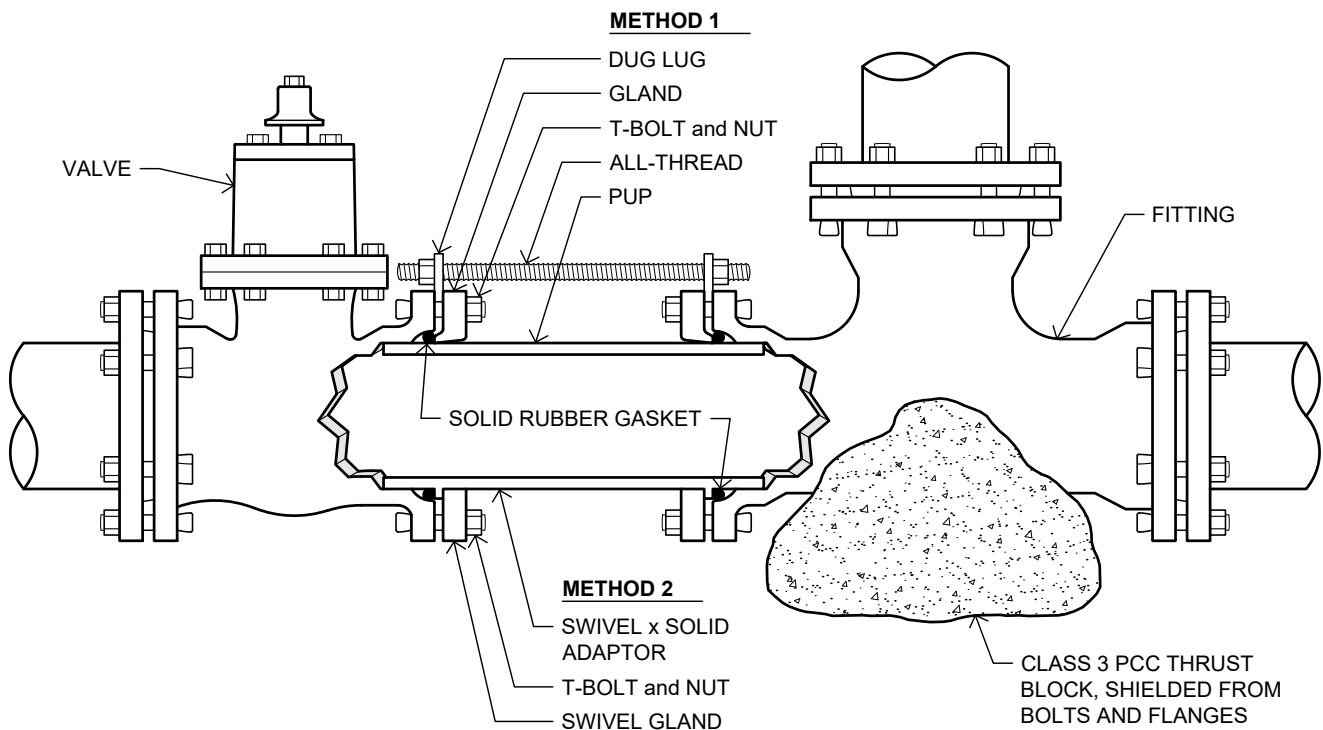
ANCHORING TEE

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:		May 2018	

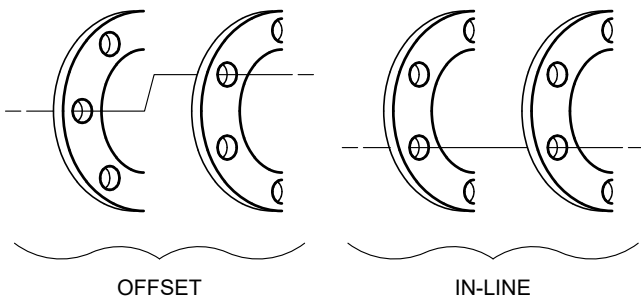


**RECYCLED WATER
HYDRANT ASSEMBLY**



VALVES ADJACENT TO FITTINGS SHALL BE RESTRAINED IN ACCORDANCE WITH ONE OF THE FOLLOWING METHODS LISTED BELOW:

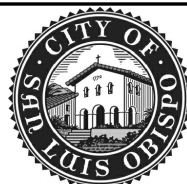
- METHOD 1** - May be used only with in-line bolt alignment of valve and fitting. See chart below for number of all-threads. All-threads and nuts shall be stainless steel and shall be coated with Henry's #204 roof cement, or equal. this method may be used only with approval of the City Utilities Department.
- 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.



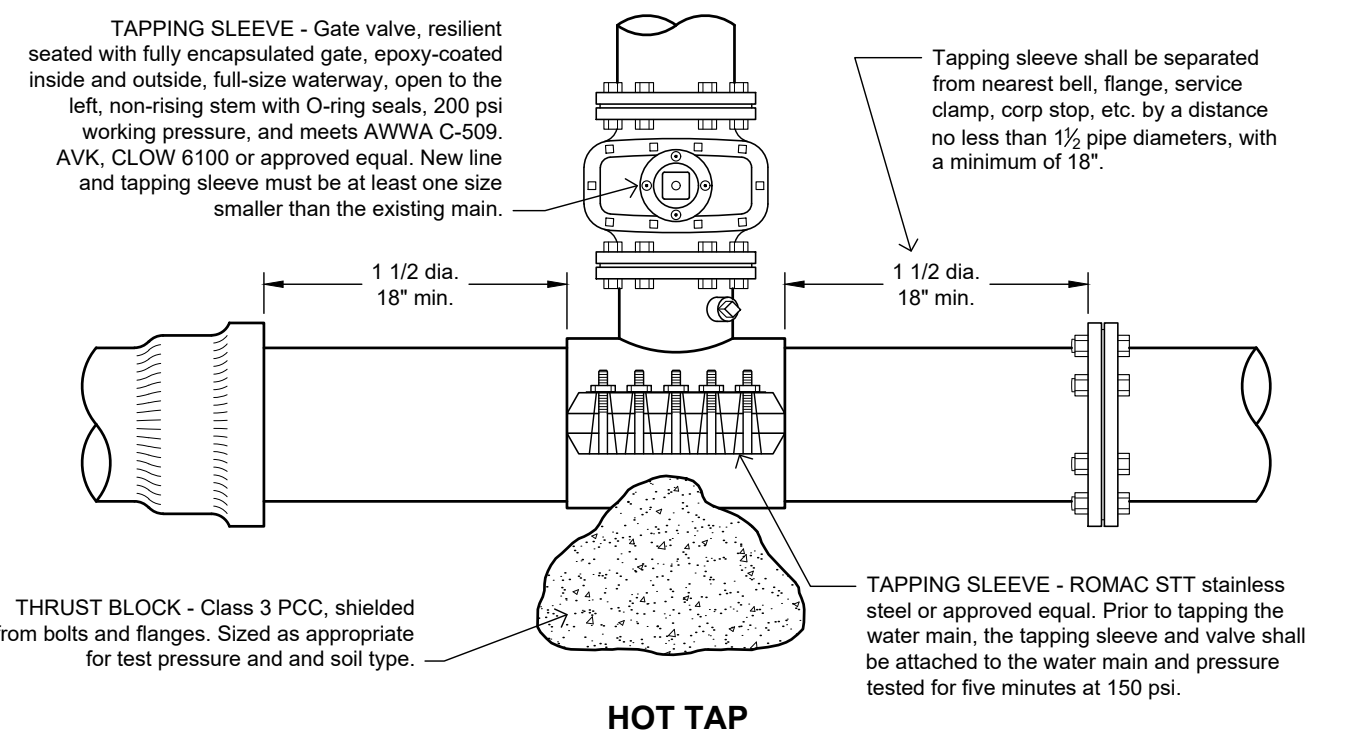
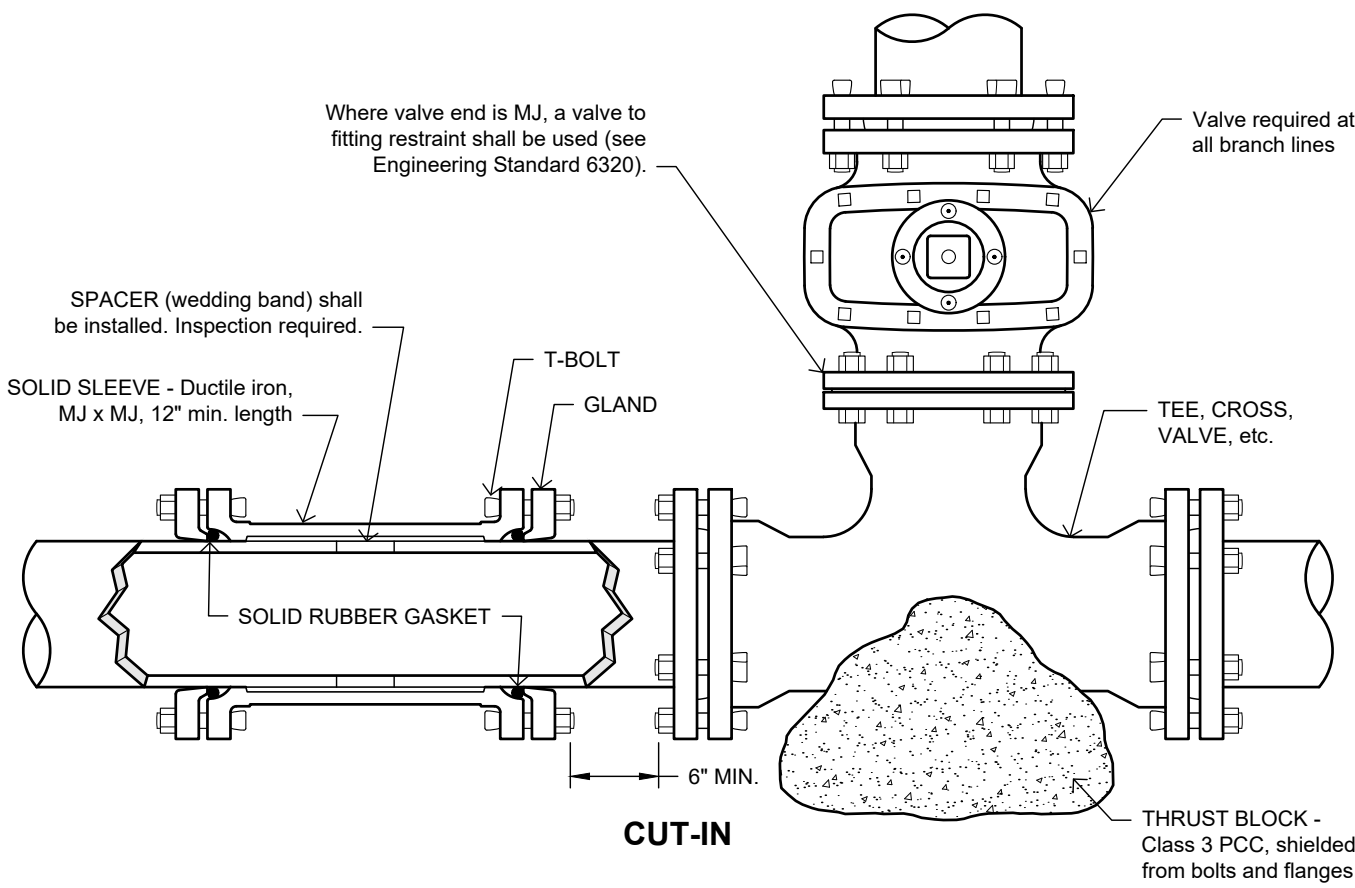
BOLT HOLE ALIGNMENT

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:		May 2018	



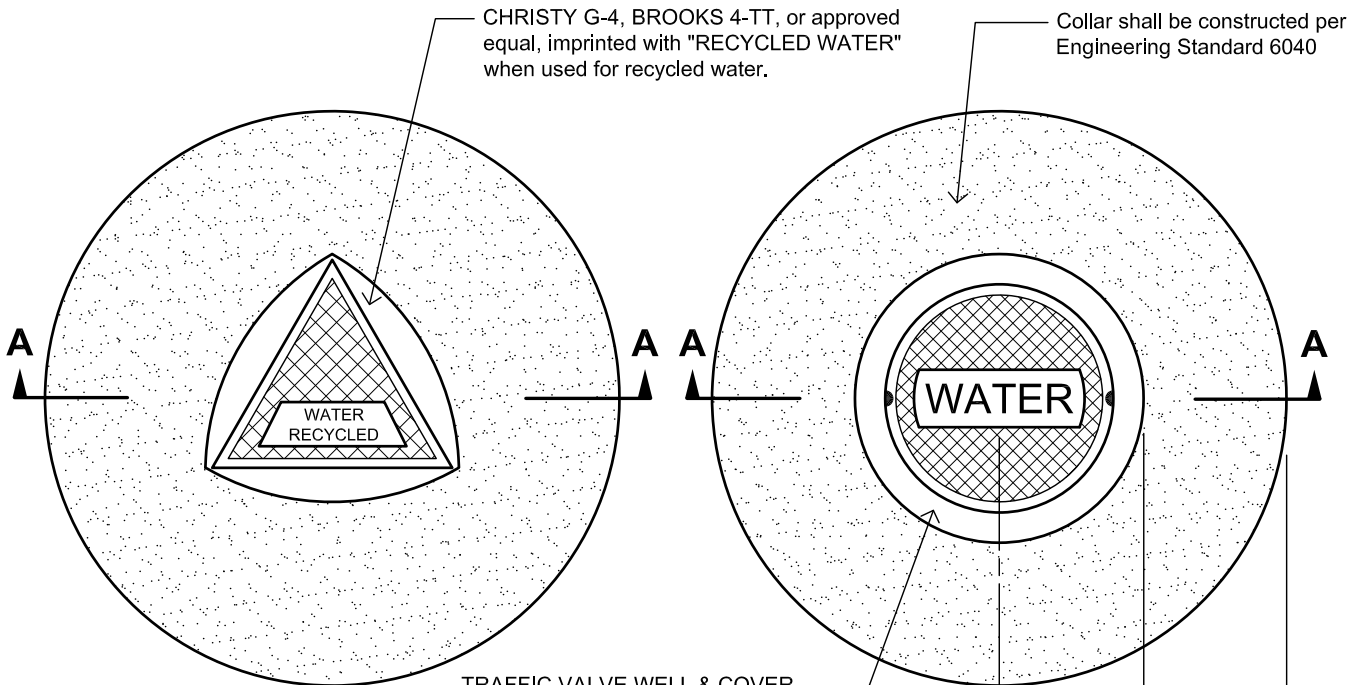
VALVE to FITTING RESTRAINT



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:		May 2018	



WATERLINE TIE-IN



CHRISTY G-4, BROOKS 4-TT, or approved equal, imprinted with "RECYCLED WATER" when used for recycled water.

Collar shall be constructed per Engineering Standard 6040

TRAFFIC VALVE WELL & COVER
CHRISTY G-5 or approved equal.
Cover shall be imprinted with "WATER"

Pavement

10"

10"

WATER VALVE

12" 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.

14" 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

18" of Tracer wire rolled inside utility well

Tracer wire per Eng. Std. 6020

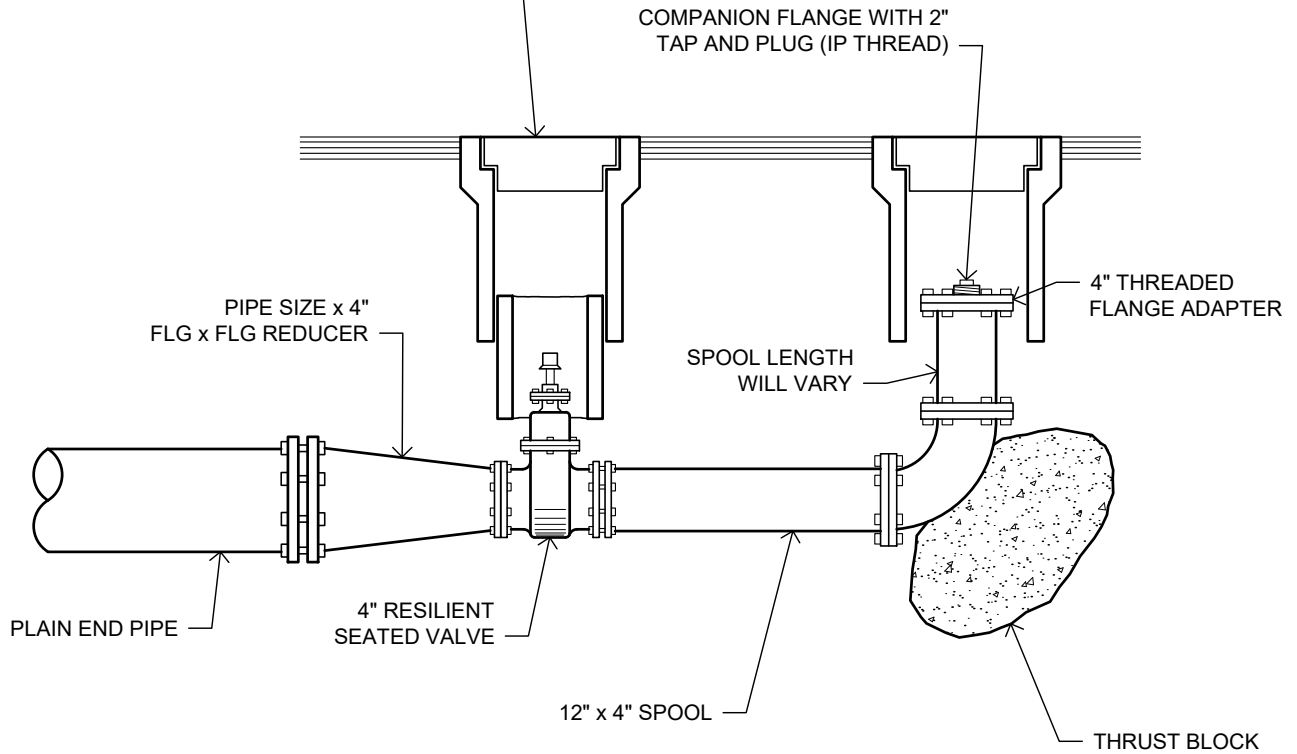
SECTION A-A

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:		May 2018	



WATER VALVE & WELL

SEE ENGINEERING STANDARD 6340
FOR WATER WELL INFORMATION, TYP.



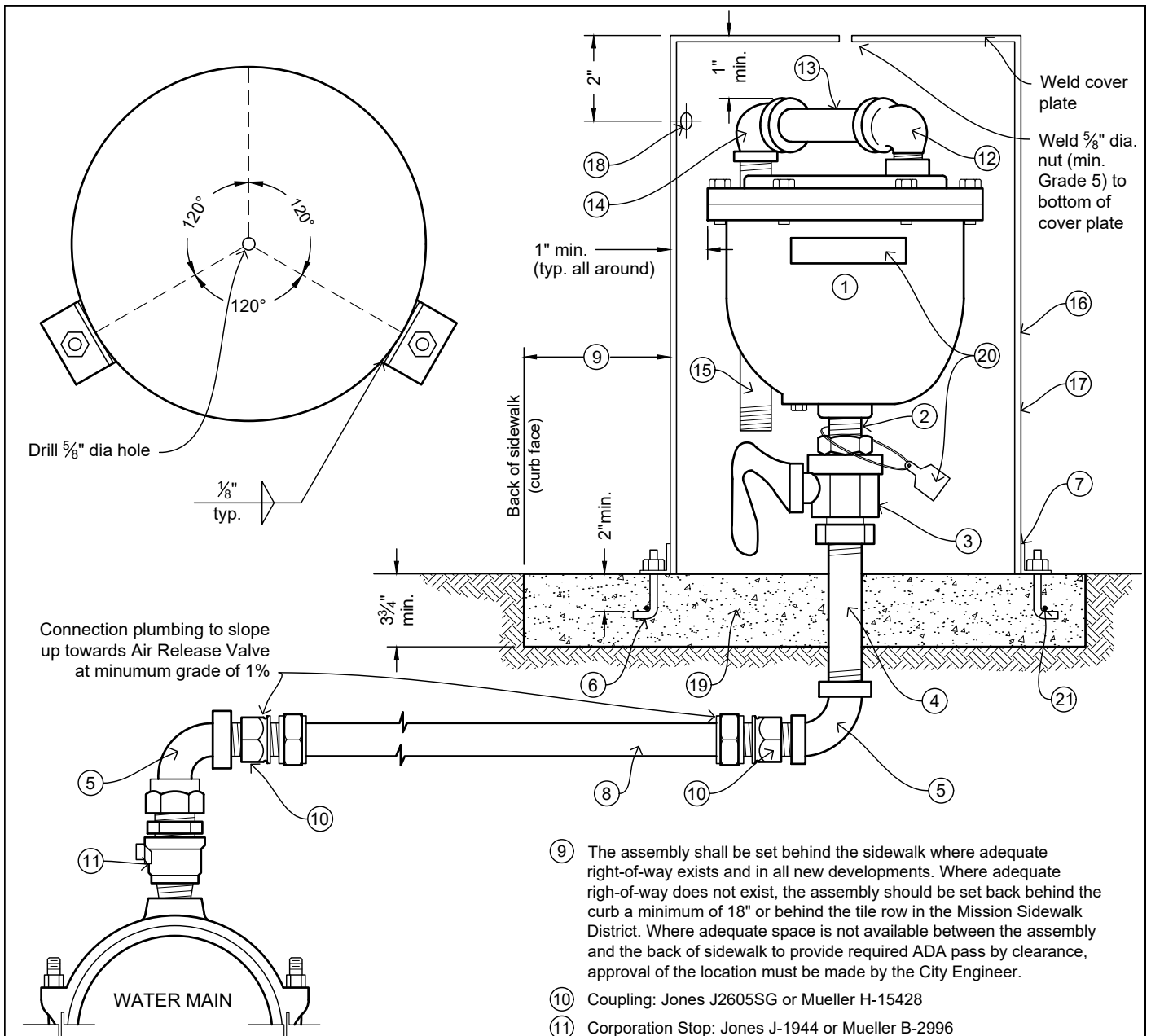
GENERAL NOTE:

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>	<i>JDL</i>	<i>WAP</i>	<i>9-97</i>
<i>Revised Reducer Detail</i>	<i>MH</i>	<i>BL</i>	<i>10-05</i>
<i>Drafting edits</i>	<i>JDL</i>	<i>MH</i>	<i>2-13</i>
STANDARD CURRENT AS OF:		May 2018	



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%

INSTALLATION NOTES :

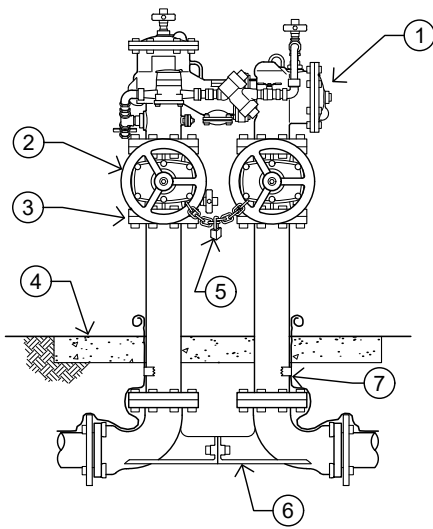
- ① Crispin Universal Air Release Valve: Model UL10.1 (1"), UL20.1 (2"), UL30.1 (3"), UL40.1 (4") or approved equal.
- ② Nipple: Brass, short
- ③ Ball Valve: Jones J-1905
- ④ Nipple: Brass, 10". Protect from contact with two layers of 3-mil tape
- ⑤ Elbow: Brass, 90°
- ⑥ Cadmium plated bent bolts 1/2" 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:		May 2018	

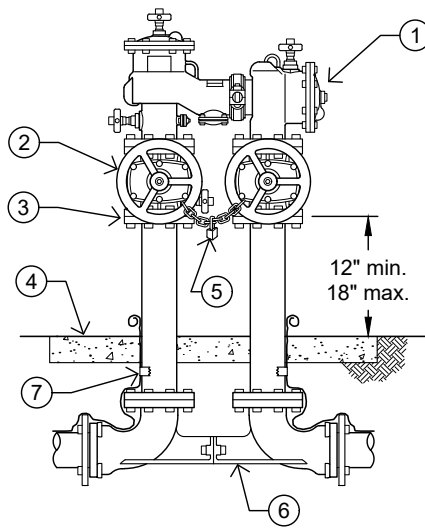


AIR/VAC RELEASE VALVE ASSEMBLY
1" & 2"



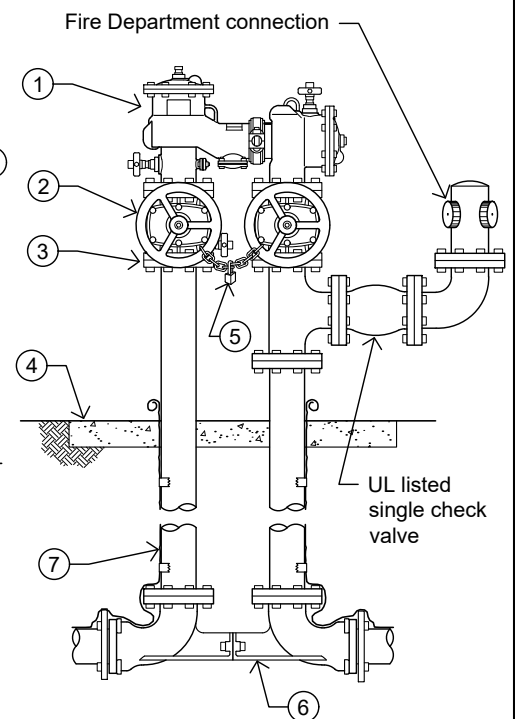
DOUBLE CHECK DETECTOR

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:

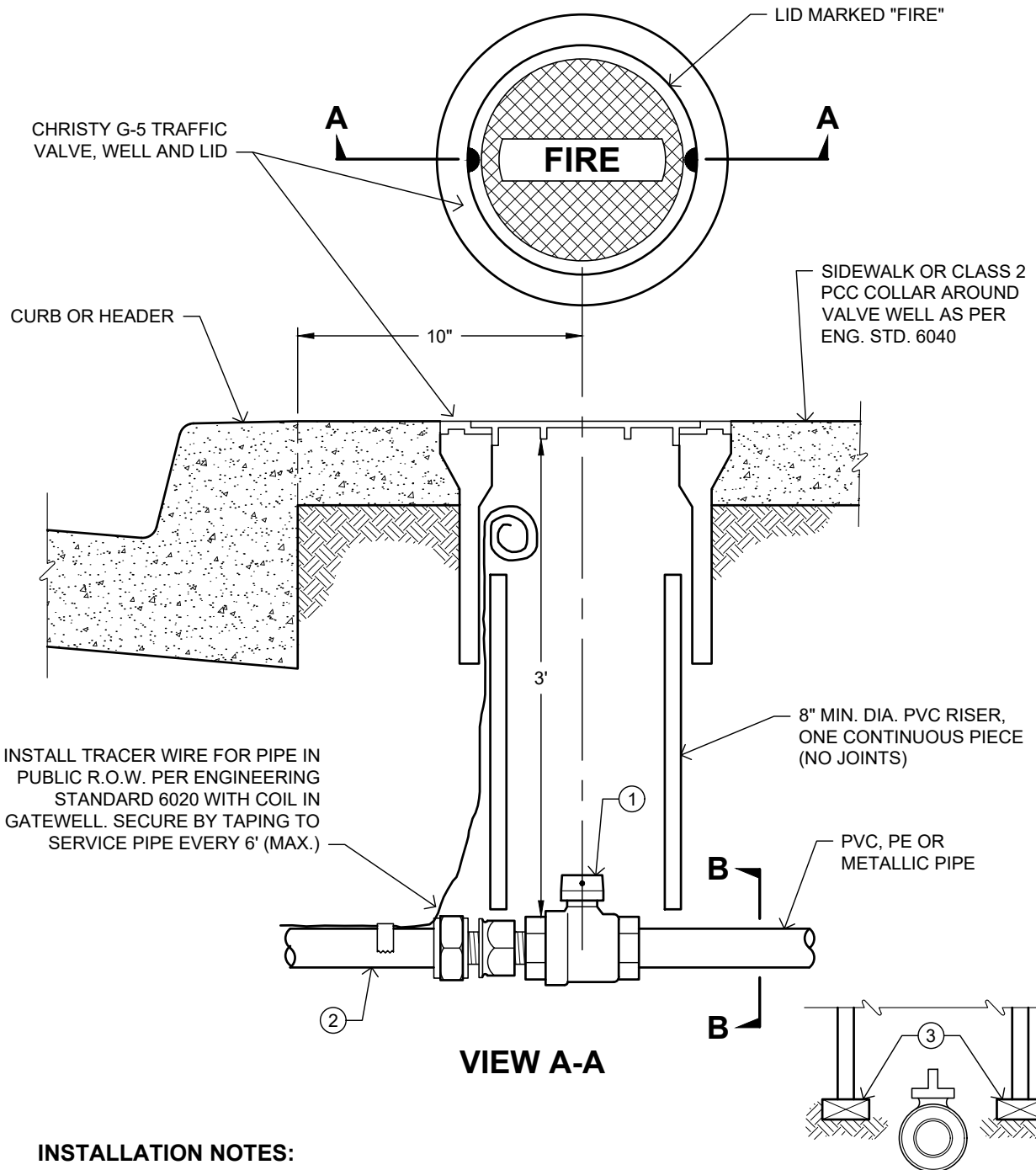
- ① Backflow preventer shall be approved by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research for the proposed application.
- ② Backflow preventer shall include OS&Y valves. Backflow preventers that are USC-approved with butterfly valves may be used 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:		May 2018	



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.)

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.

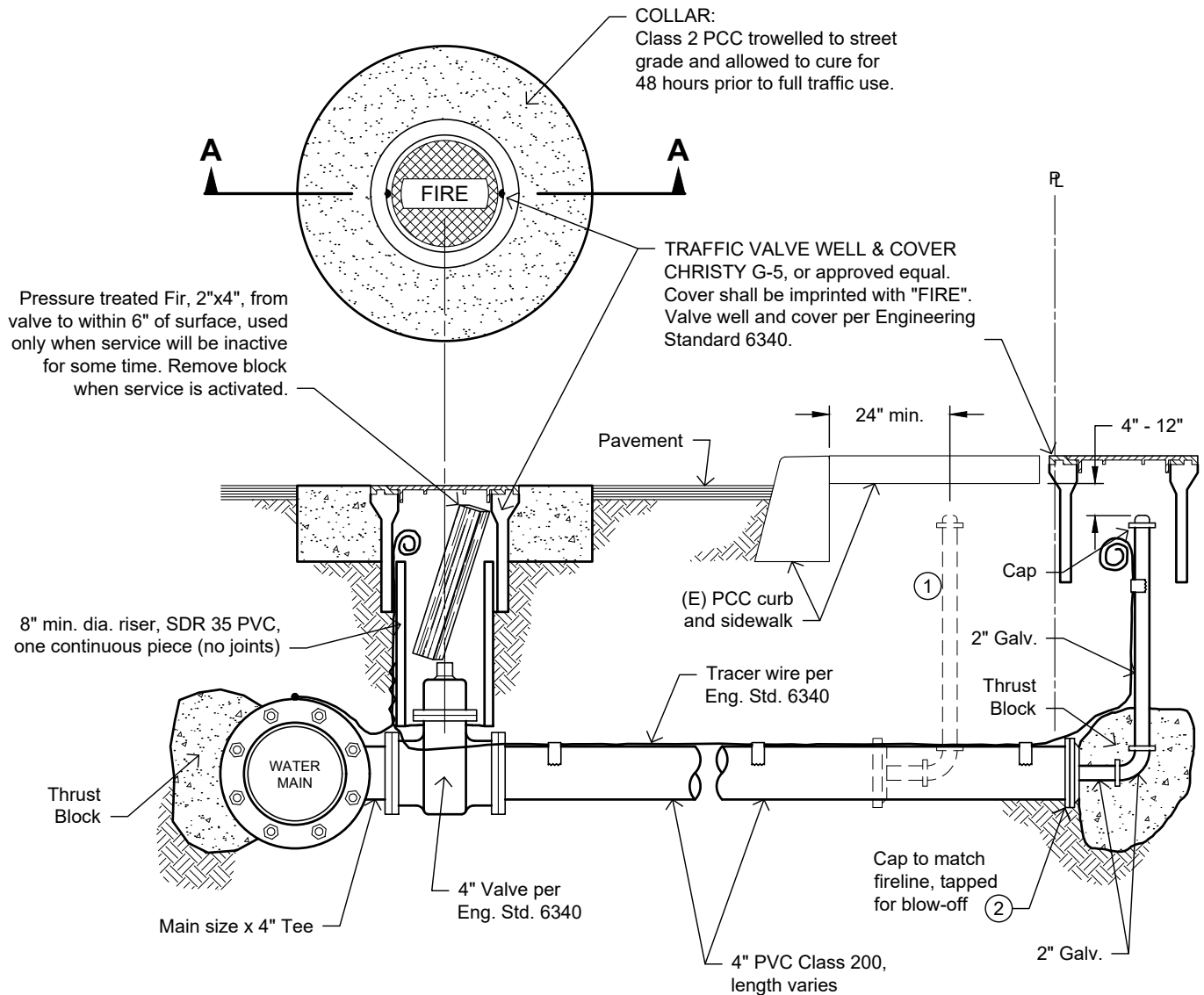
THIS STANDARD TO BE USED ONLY WHERE FIRE DEPARTMENT APPROVED "TELEPHONE LEASE LINE ALARM SYSTEM" IS INSTALLED. OTHERWISE, A DETECTOR CHECK ASSEMBLY IS REQUIRED.

VIEW B-B

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:		May 2018	



**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:

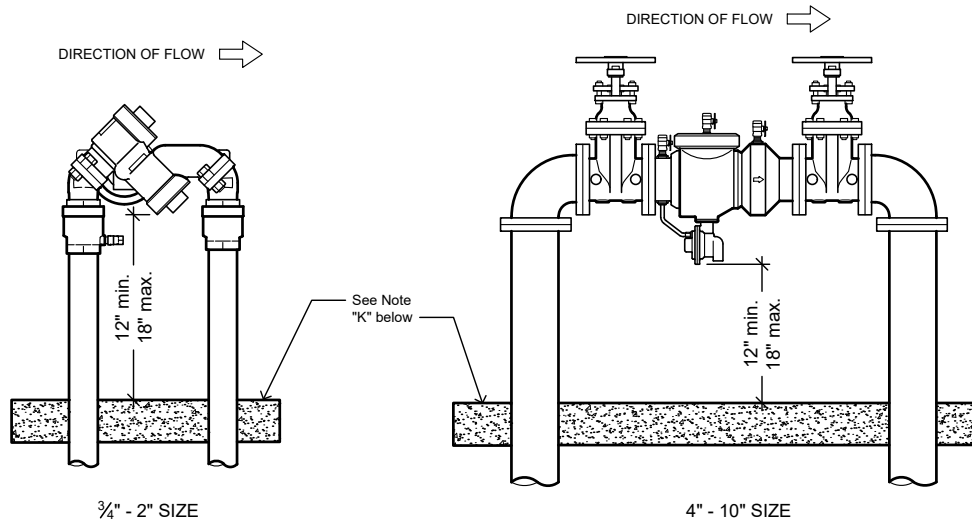
- ① Alternate location where building abuts sidewalk allowed only with written approval of Utilities Department.
- ② Temporary cap shall be removed at the time the service is connected to the fire sprinkler system. USC approved backflow prevention device shall be installed per Engineering Standard 6420.

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:		May 2018	



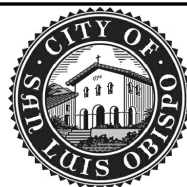
NEW FIRE SERVICE
4"



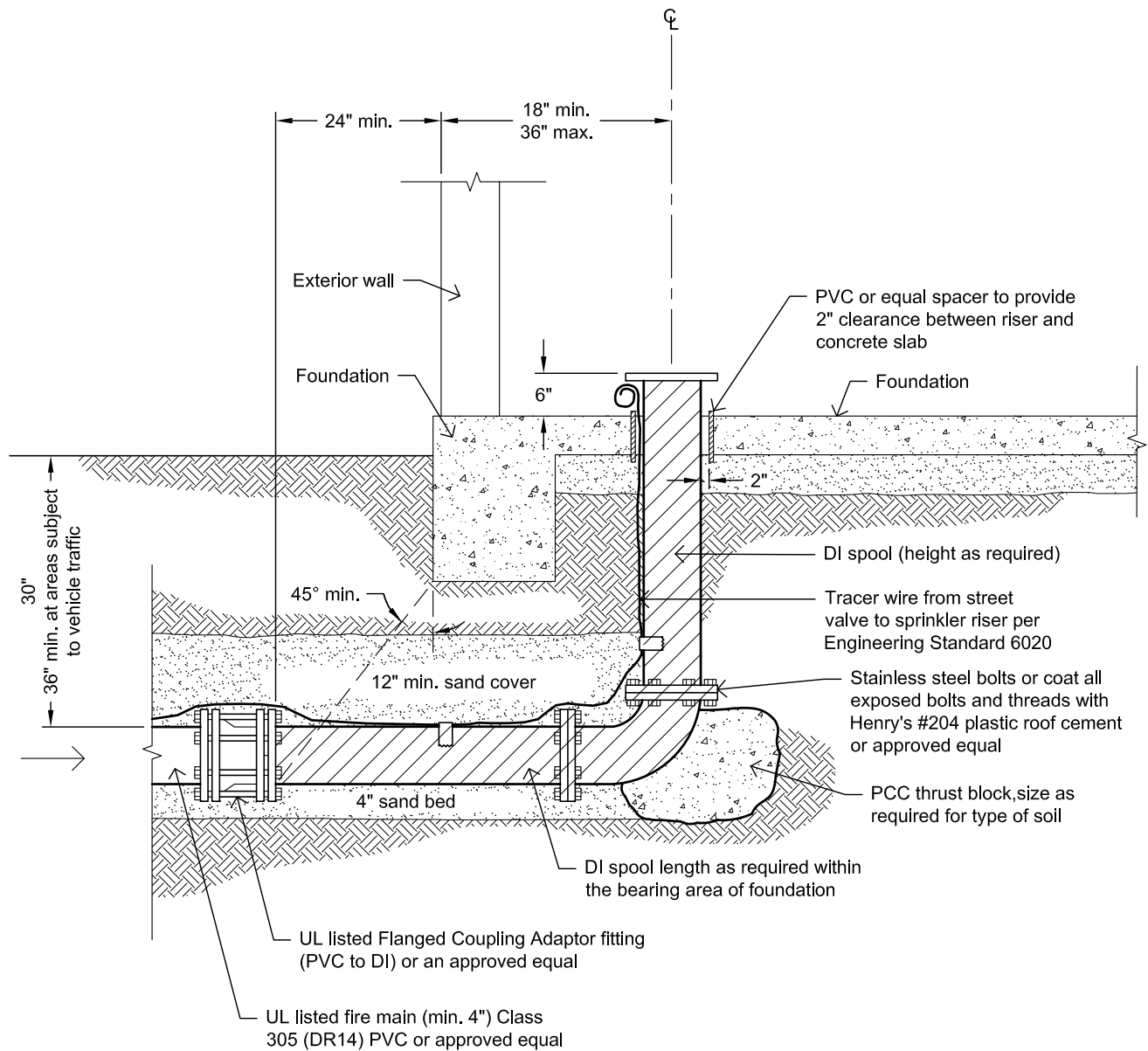
GENERAL NOTES:

- 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.
 - 1. Non-Residential Parcels - All domestic or irrigation services for non-residential parcels shall use a reduced pressure principle (RP) backflow preventer assembly.
 - 2. Multi-Family - Multi-family housing units having greater than 4 units, attached or detached, shall have an RP backflow prevention assembly.
 - 3. Non-Potable Irrigation - Non-potable irrigation systems using a pressure pump, including grey water system, shall install new RP backflow prevention assemblies to all water or irrigation water meters within the parcel.
 - 4. Single Family - Single family units within R1 Zones shall have backflow prevention device in accordance with the plumbing and building code.
- 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 lead free FEBCO 825YA or approved equal. 4" - 10" RPB shall be lead free 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 "E"	KH	MH	11-17
Added Note K	MH	BL	11-09
Drafting edits	JDL	BL	6-12
STANDARD CURRENT AS OF:		May 2018	



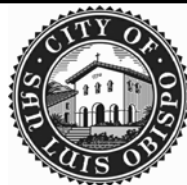
**R.P. BACKFLOW
PREVENTER**
3/4" to 10"



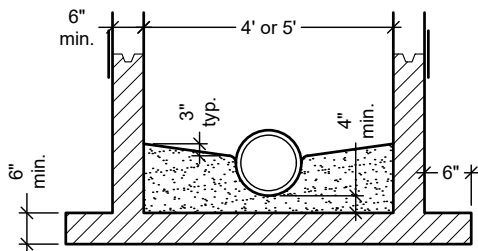
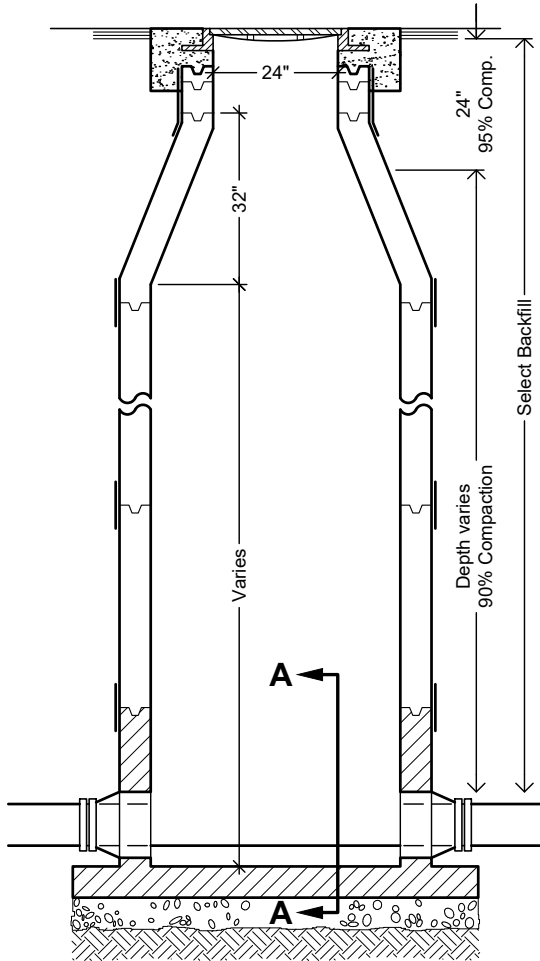
GENERAL NOTES:

- 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:		May 2018	



**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).

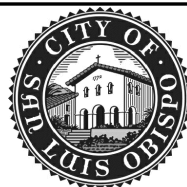
INVERT:

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.

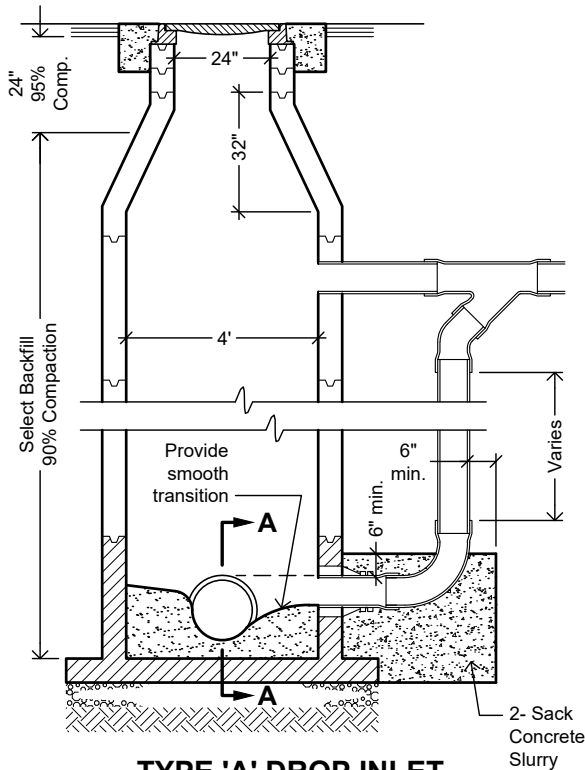
TESTING:

See Standard Specifications Section 77-3.03G for Vacuum Test Requirements.

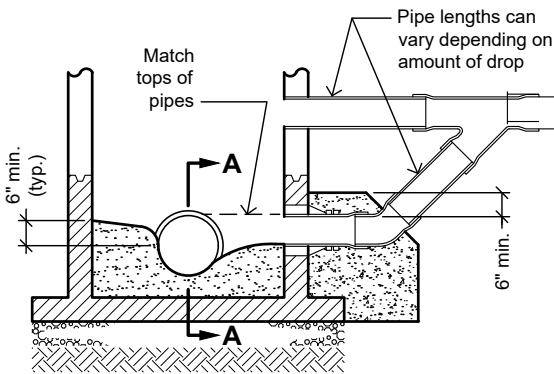
REVISIONS	BY	APP	DATE
Manhole Cover and Joint Sealant	JDL	DA	10-15
Revise Testing, delete tables	SR	MH	1-14
Revised BASE Note	JDL	BL	6-12
STANDARD CURRENT AS OF:		May 2018	



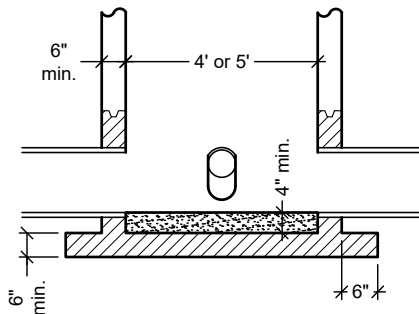
SEWER MANHOLE



TYPE 'A' DROP INLET



TYPE 'B' DROP INLET



SECTION A-A

TYPE "B" SHALL BE USED ONLY WHEN APPROVED BY UTILITIES DEPARTMENT

COVER:

Manhole frame and cover shall have a 24" clear opening and a sealed blind pickhole (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.

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 Section 26-1.02 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.

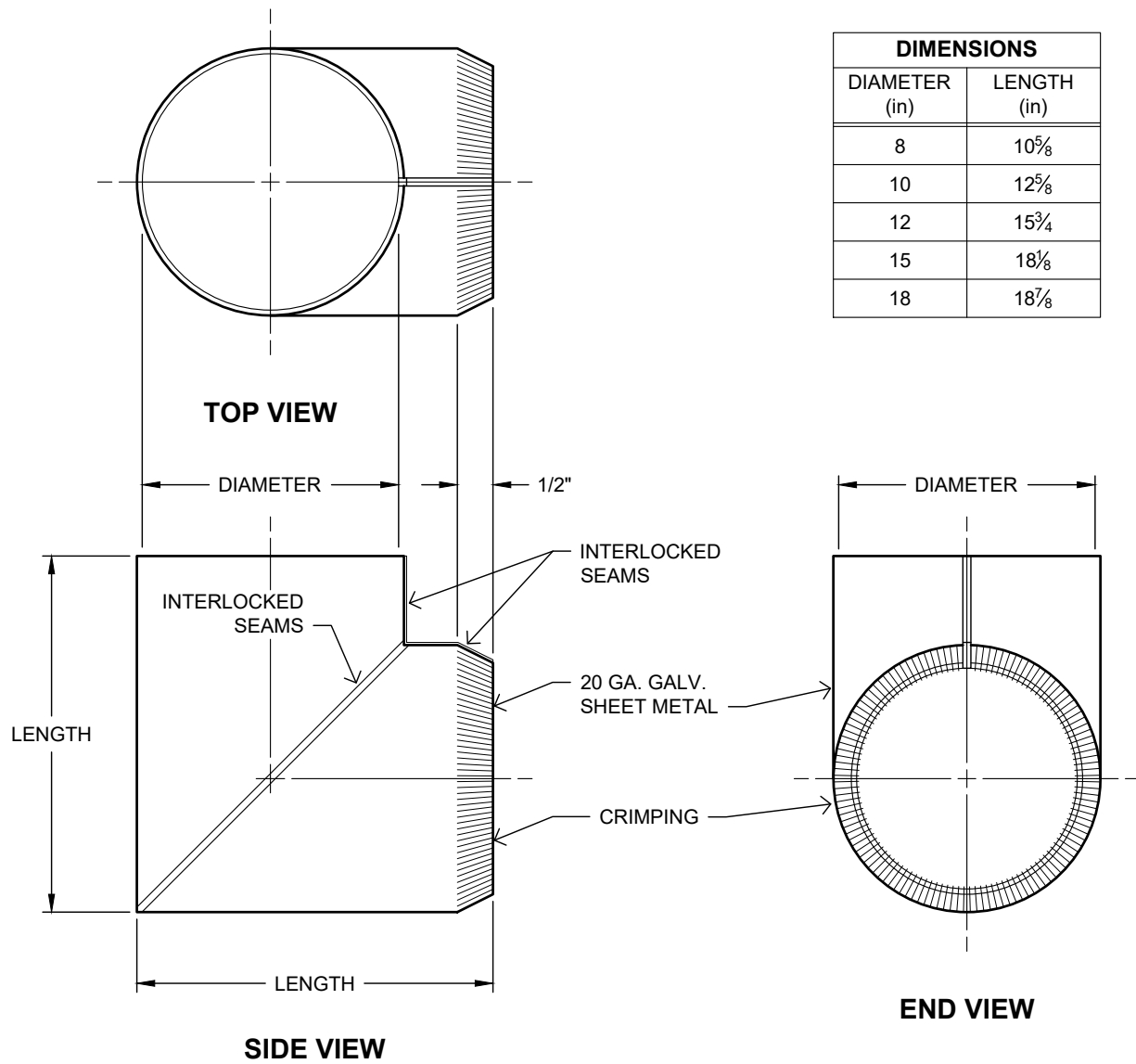
TESTING:

See Section 77-3.03G for Vacuum Test Requirements.

REVISIONS	BY	APP	DATE
Notes revision	KH	MH	1-17
Apprv by Utilities	KH	MH	11-17
Revise Base, Testing; Delete tables	SR	BL	1-14
STANDARD CURRENT AS OF:		May 2018	



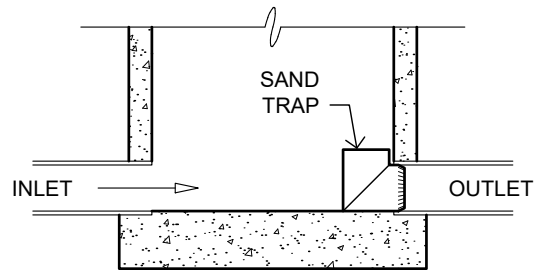
SEWER DROP MANHOLE
(FOR VERTICAL DROPS GREATER THAN 30")



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 sand 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.

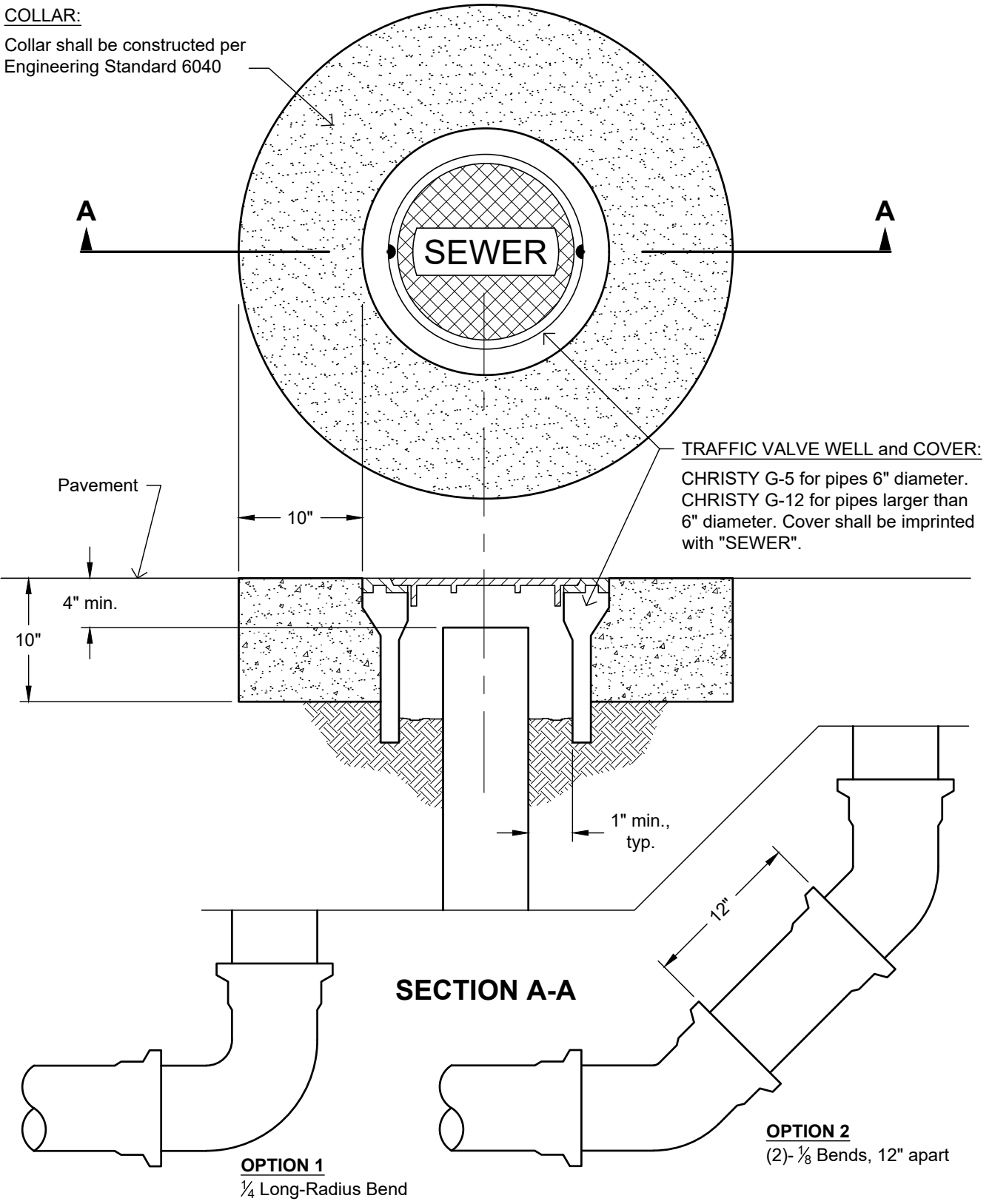
REVISIONS	BY	APP	DATE
<i>New Border</i>	<i>JDL</i>	<i>WAP</i>	<i>9-97</i>
<i>Redrawn to CAD</i>	<i>JDL</i>	<i>WAP</i>	<i>12-93</i>
<i>Drafting edits</i>	<i>JDL</i>	<i>MH</i>	<i>2-13</i>
STANDARD CURRENT AS OF:		May 2018	



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

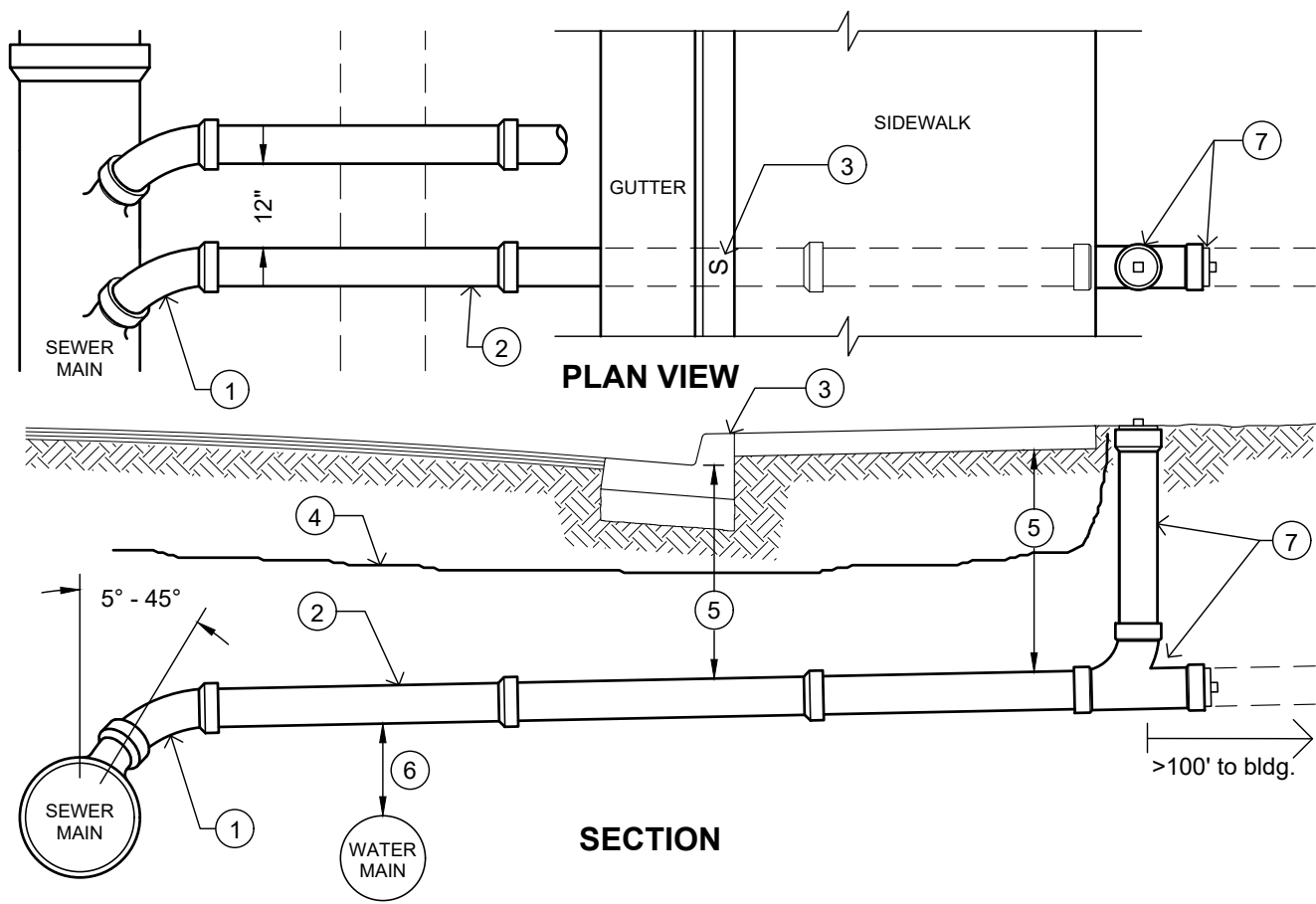
OPTION 2
 (2)- 1/8 Bends, 12" apart

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:		May 2018	



SEWER CLEANOUT & WELL



GENERAL NOTES:

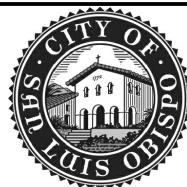
- A. City Utilities Department will install all new wyes on existing sewer mainlines.
- B. Sewer lateral repair must comply with section 77-3.03F(3) of the Standard Specifications.
- C. Install backwater trap or backwater valve in compliance with municipal code section 13.08.200.

INSTALLATION NOTES:

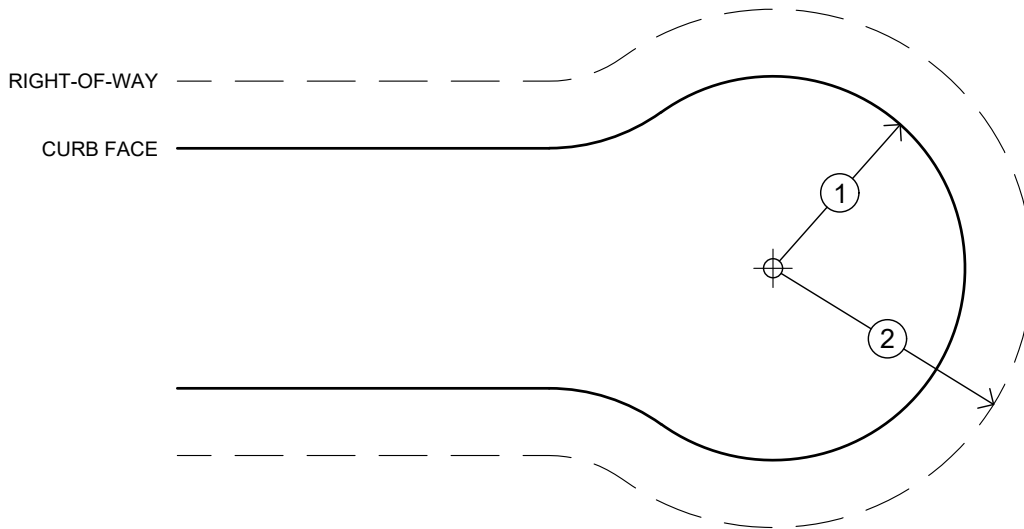
- ① Factory-fabricated wye in sewer main, with 1/8 bend. Bend shall point downstream and enter main at a vertical angle of not less than 5° or more than 45°.
- ② Sewer lateral pipe and fittings must comply with sections 77-3.02A(5) and 77-3.02B(5) of the Standard Specifications.
- ③ Top of curb shall 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:		May 2018	



SEWER LATERAL



CUL-DE-SAC

INSTALLATION NOTES:

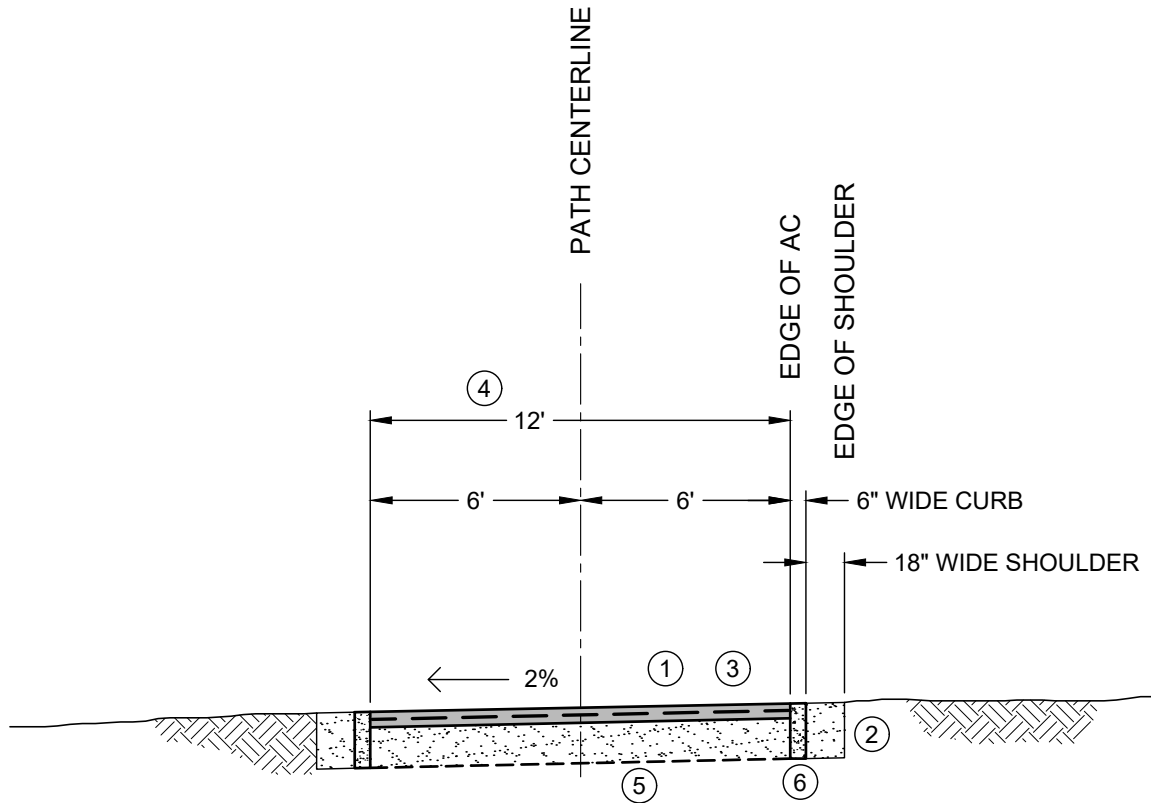
- ① Radius to curb face: Residential Areas = 40'; Commercial Areas = 45'
- ② Radius to right-of-way shall conform to the ROW requirements in Engineering Standard 1010.
- ③ Cul-de-sac lengths shall be as restricted by Engineering Standard 1010.

**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:		May 2018	



**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 1/2" 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.

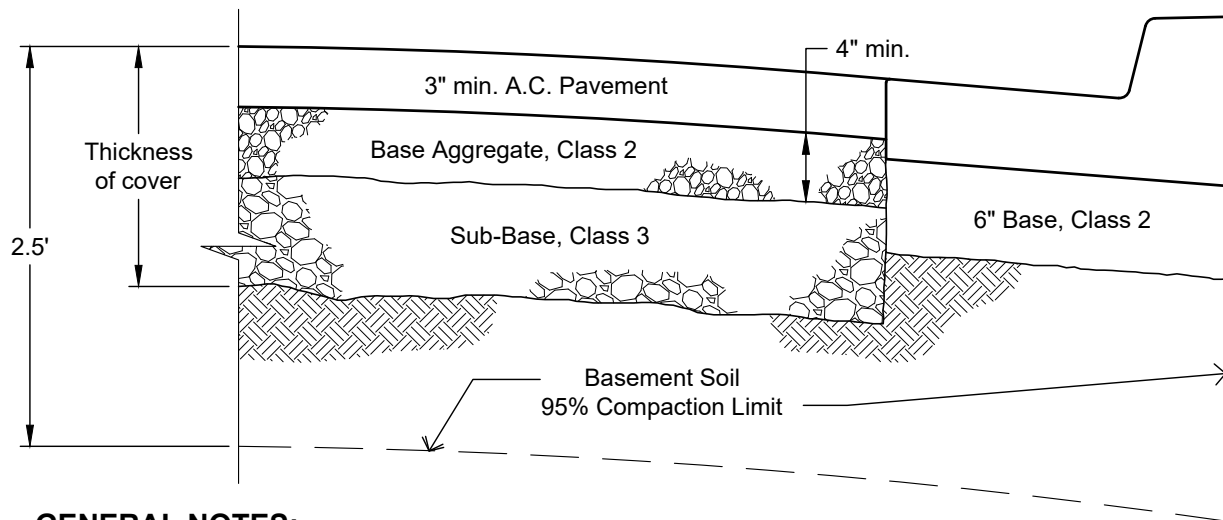
GENERAL NOTES:

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:		May 2018	



**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.

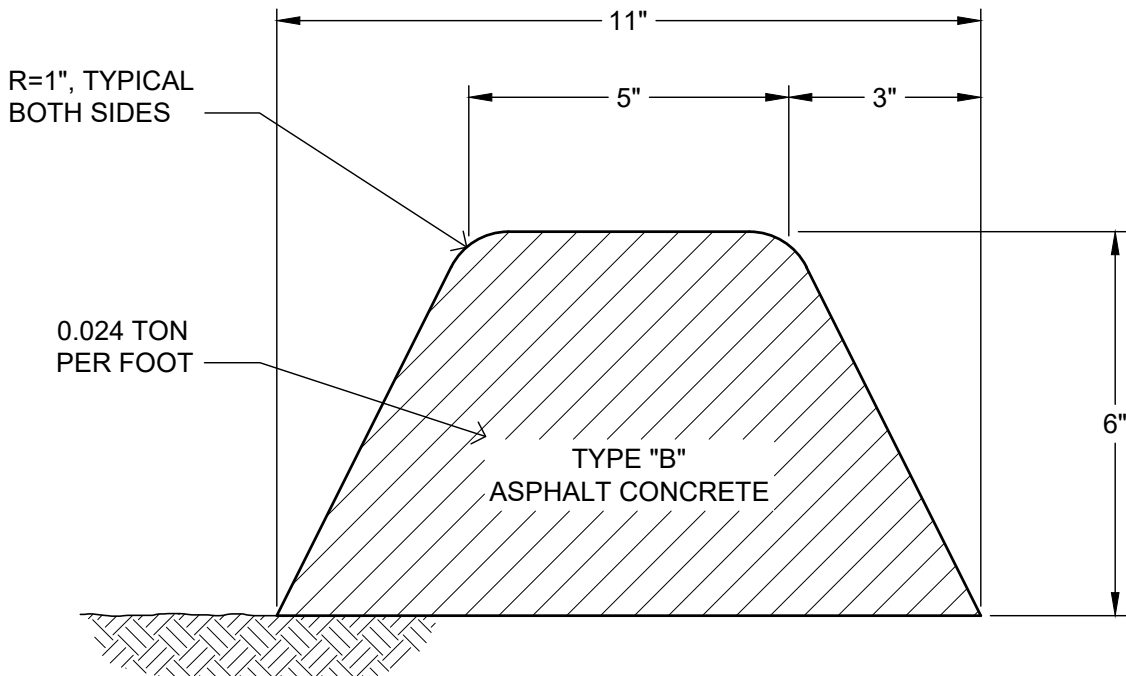
A street shall be designed as a new street when existing utilities have been constructed within the past 5 years.

*Adopted by Resolution No. 9006

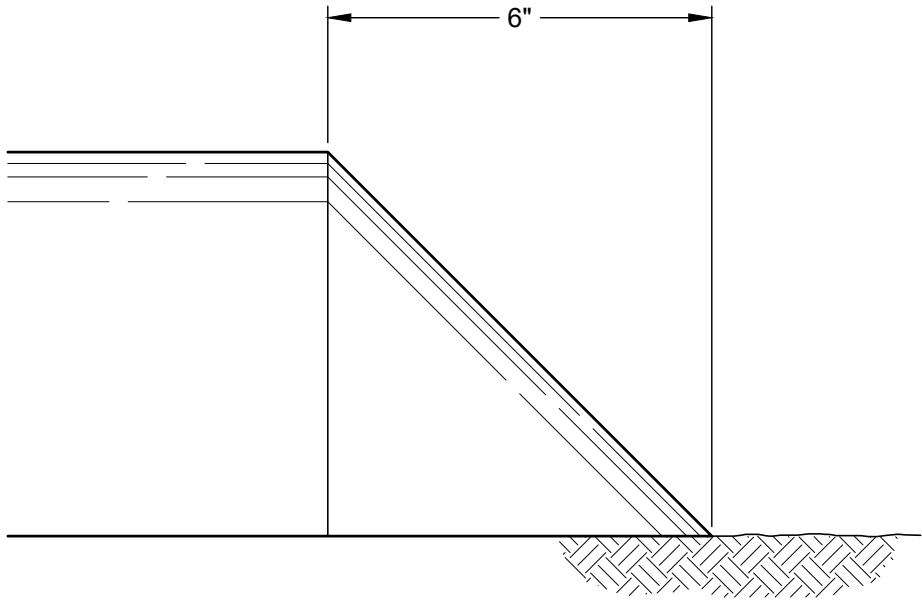
REVISIONS	BY	APP	DATE
Prime coat/fog seal revision	JDL	MH	12-12
Revise 95% compaction depth	DVB	BL	10-06
Class 2 base	KH	MH	01-18
STANDARD CURRENT AS OF:		May 2018	



FLEXIBLE PAVEMENT ELEMENTS



SECTION

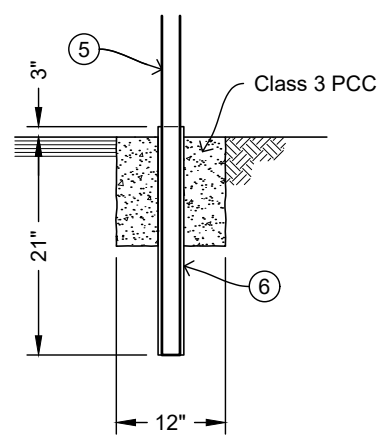
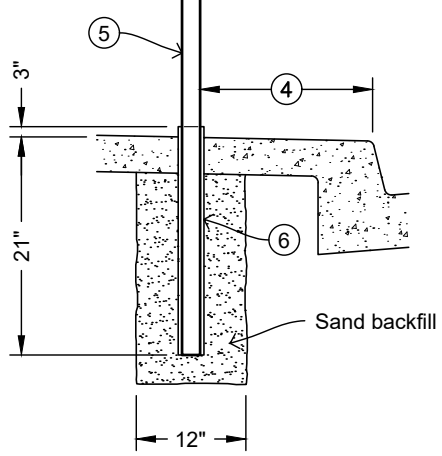
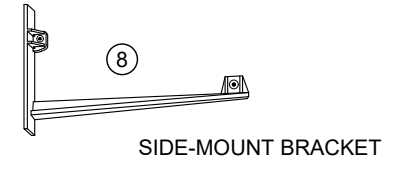
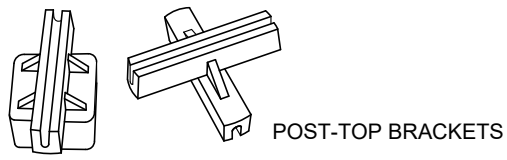
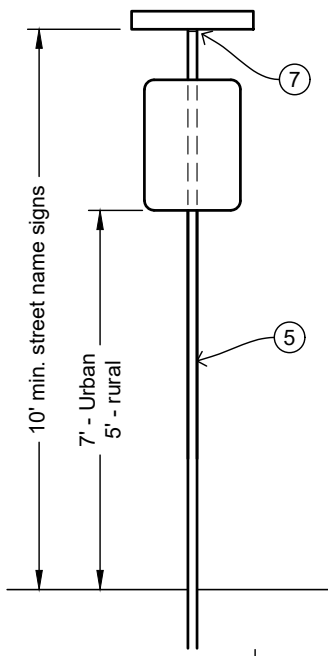


SIDE VIEW OF END

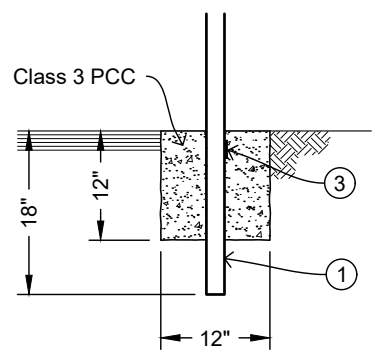
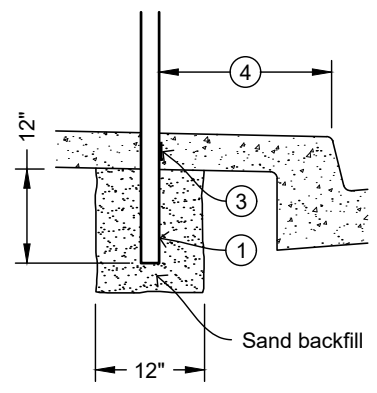
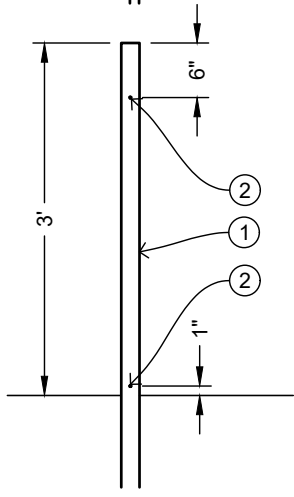
REVISIONS	BY	APP	DATE
<i>New Border</i>	JDL	WAP	9-97
<i>Drafting edits</i>	JDL	MH	2-13
<i>Type "3" to Type "B"</i>	JDL	WAP	7-98
STANDARD CURRENT AS OF:		May 2018	



ASPHALT BERM
6"



METAL SIGN POST



PARKING METER POST

INSTALLATION NOTES:

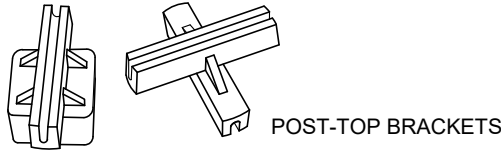
- ① 2" O.D. galvanized steel pipe
- ② Drain hole, 1/4" diameter, on one side only
- ③ #4 rebar, 2" long, welded to pipe 10" from bottom
- ④ 15" standard setback, 22" if sign is more than 15" wide or if post is in Mission Tile sidewalk
- ⑤ 2" galvanized metal post, FHWA (Breakaway) approved such as 14g, 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.

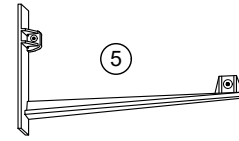
REVISIONS	BY	APP	DATE
Galvanized Sleeve Specs.	SR	JDW	10-03
Sleeve depth; Drafting edits	JDL	MH	9-12
Revise Note 6	DVB	BL	11-08
STANDARD CURRENT AS OF:		May 2018	



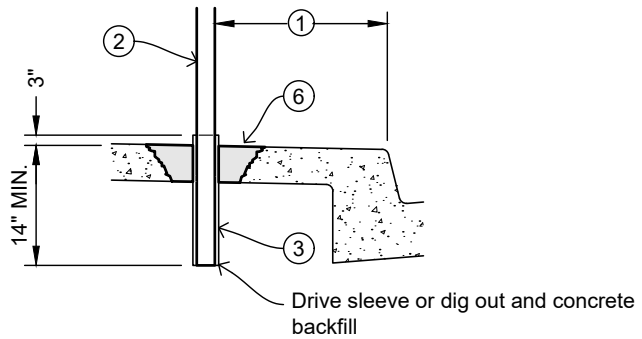
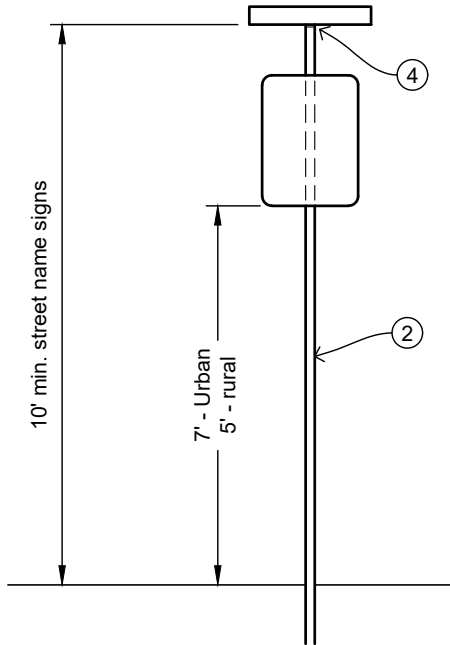
METAL SIGN & PARKING METER POSTS



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
 - 1/16" 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.

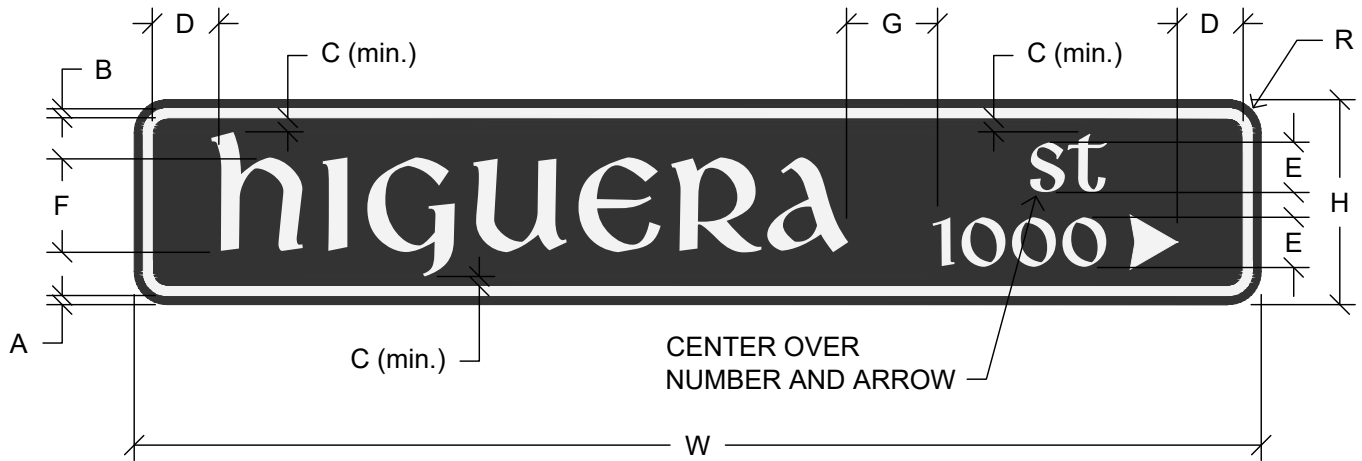
Standard may be used where City Engineer authorizes retrofit, in lieu of full panel removal & restoration per Eng. Std. 7210.

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:		May 2018	



**METAL SIGN &
PARKING METER POSTS**
(IN EXISTING SIDEWALK)

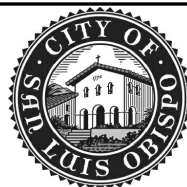


DIMENSIONS	SIGNALIZED WITH MAST ARM MOUNTS	POLE MOUNTS
A	1/2"	None
B	1/2"	3/8"
C	Center name in frame	3/8"
D	3"	2" - 3"
E	NA	2"
F	8"	4"
H	18"	8"
W	30" - 100" max.	30" - 100" max.
R	2"	1"
G	NA	3"

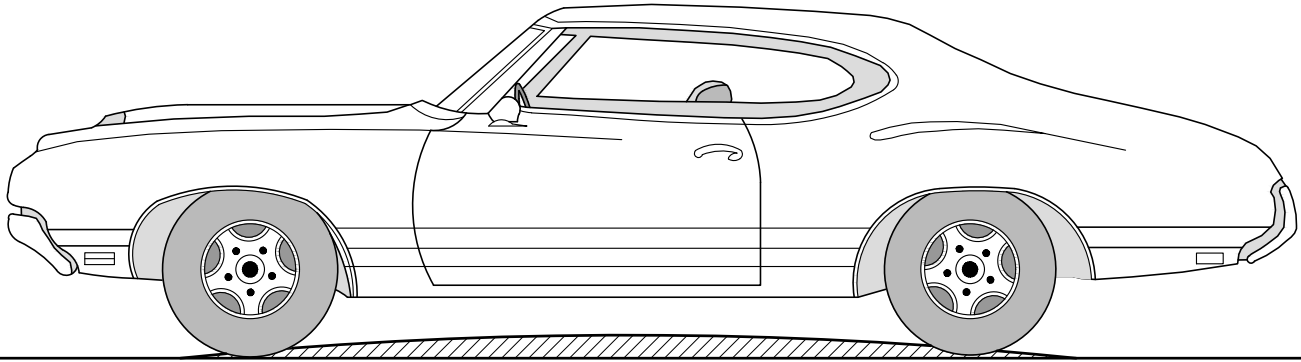
NOTES:

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:		May 2018	

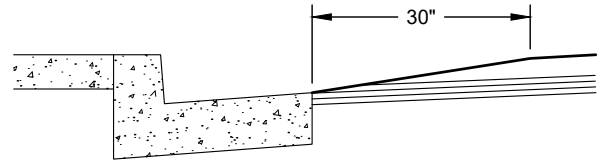


STREET NAME SIGN

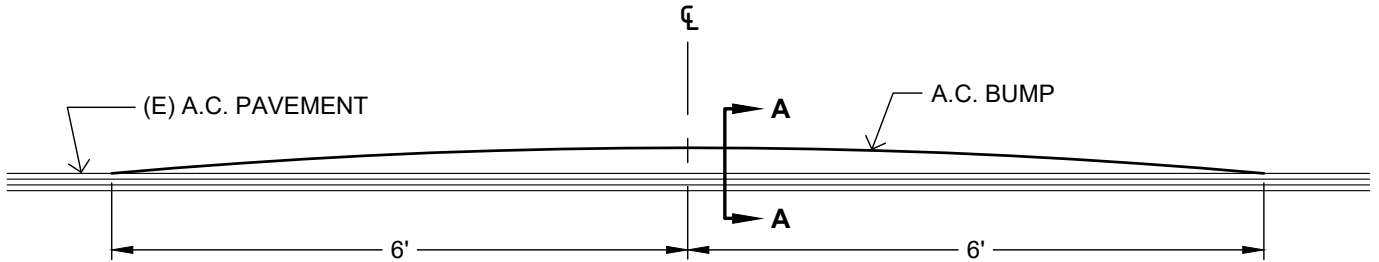


GENERAL NOTES:

- 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 $\frac{3}{8}$ " 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 $\frac{3}{4}$	2 $\frac{1}{2}$	3	2 $\frac{1}{2}$	1 $\frac{3}{4}$	0

DEPTH OF A.C. BUMP (TYPE 2)

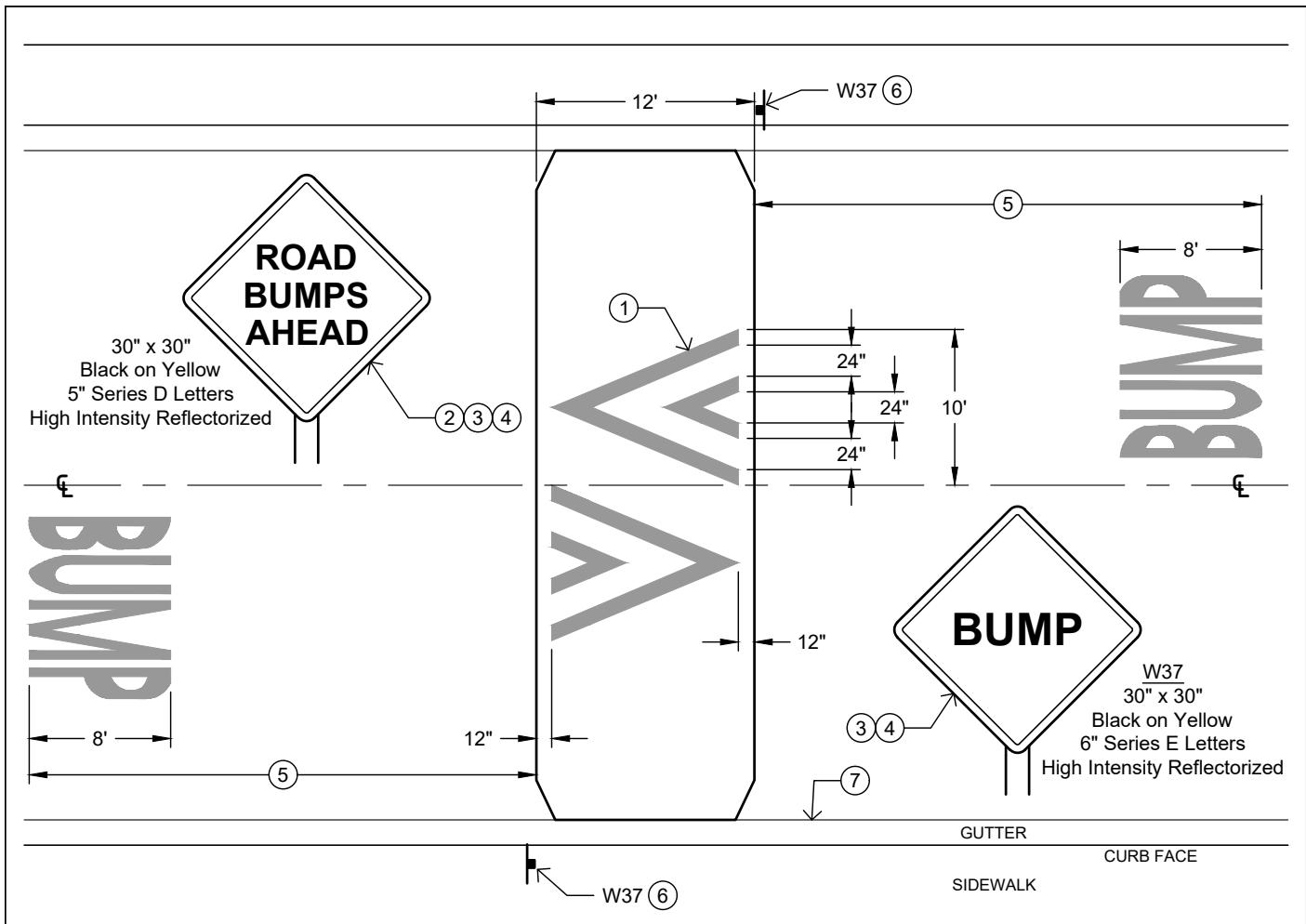
Distance from Edge (ft)	0	2	4	6	4	2	0
Depth of A.C. (in)	0	1 $\frac{3}{8}$	2 $\frac{3}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{8}$	1 $\frac{3}{8}$	0

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**

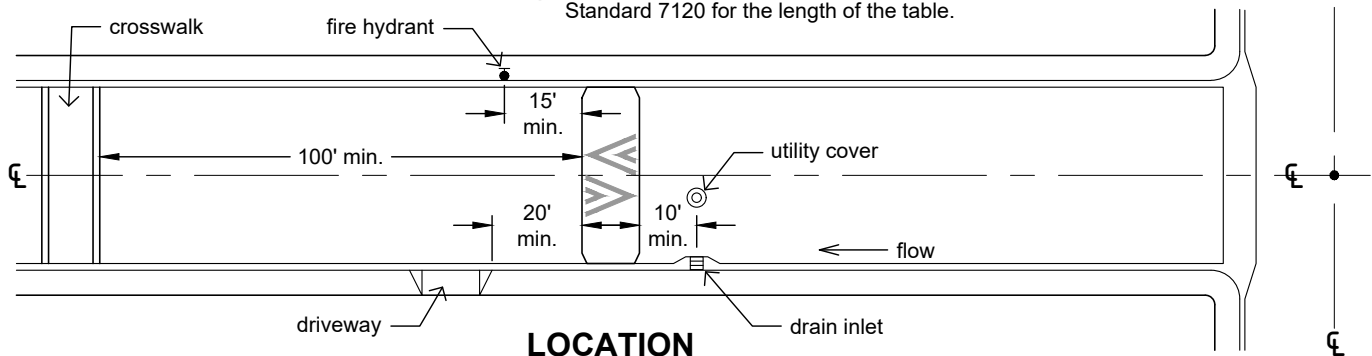
STANDARD CURRENT AS OF: May 2018



STRIPING & SIGNS

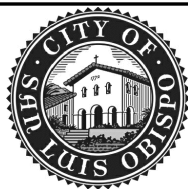
INSTALLATION NOTES:

- 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.

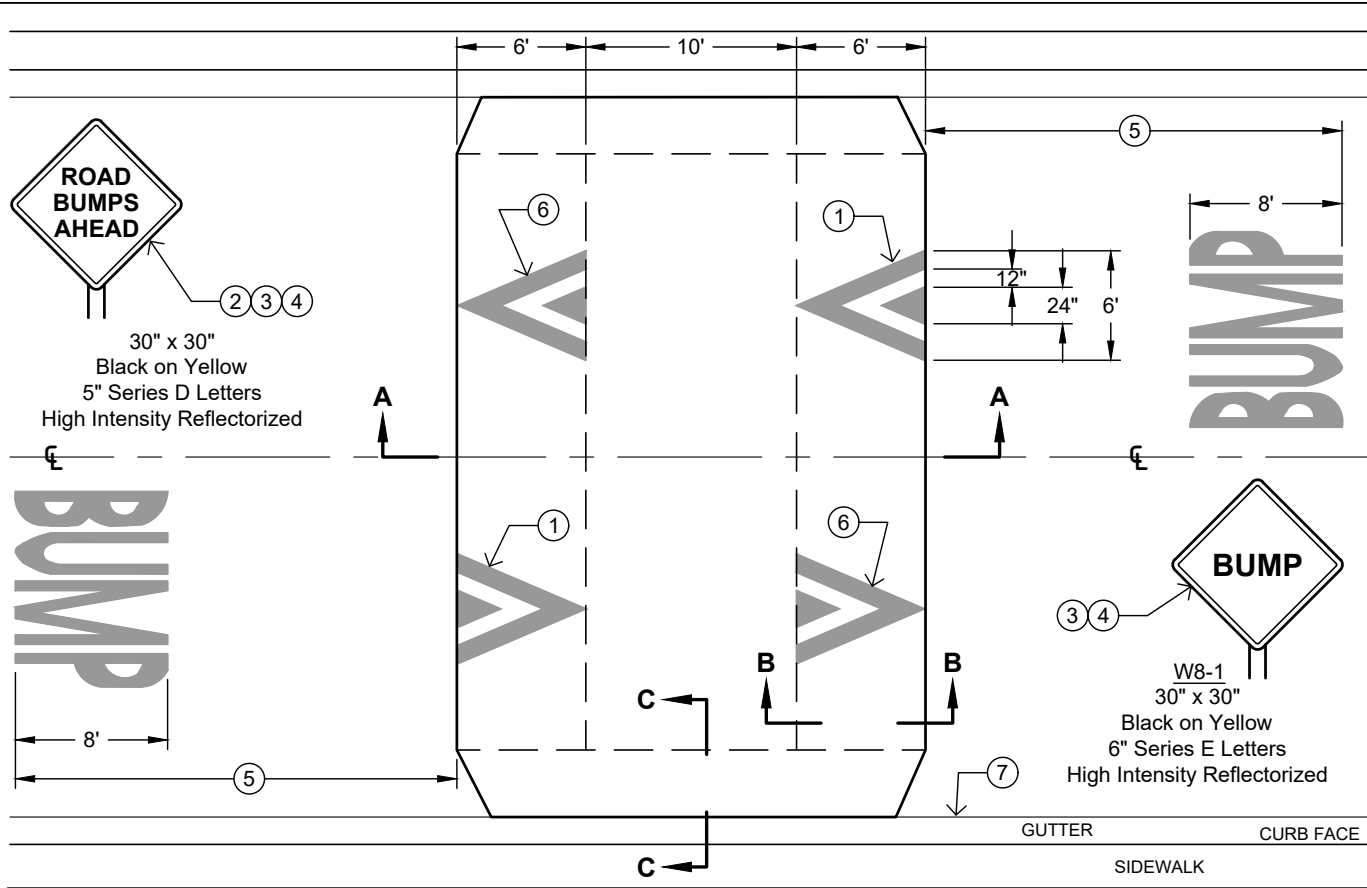


REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	4-13
Revised Note 3, added Note 7	DVB	BL	11-06
Striping revision	SR	WAP	12-96

STANDARD CURRENT AS OF: May 2018



**ROAD BUMP
LOCATION, STRIPING & SIGNS**

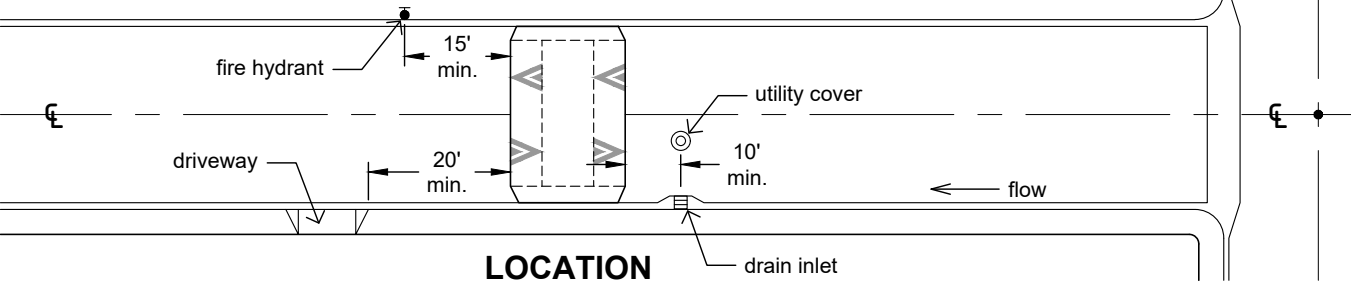
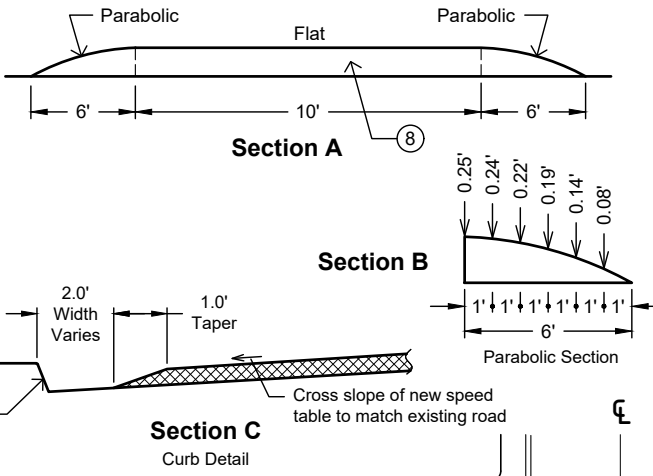


STRIPING & SIGNS

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.

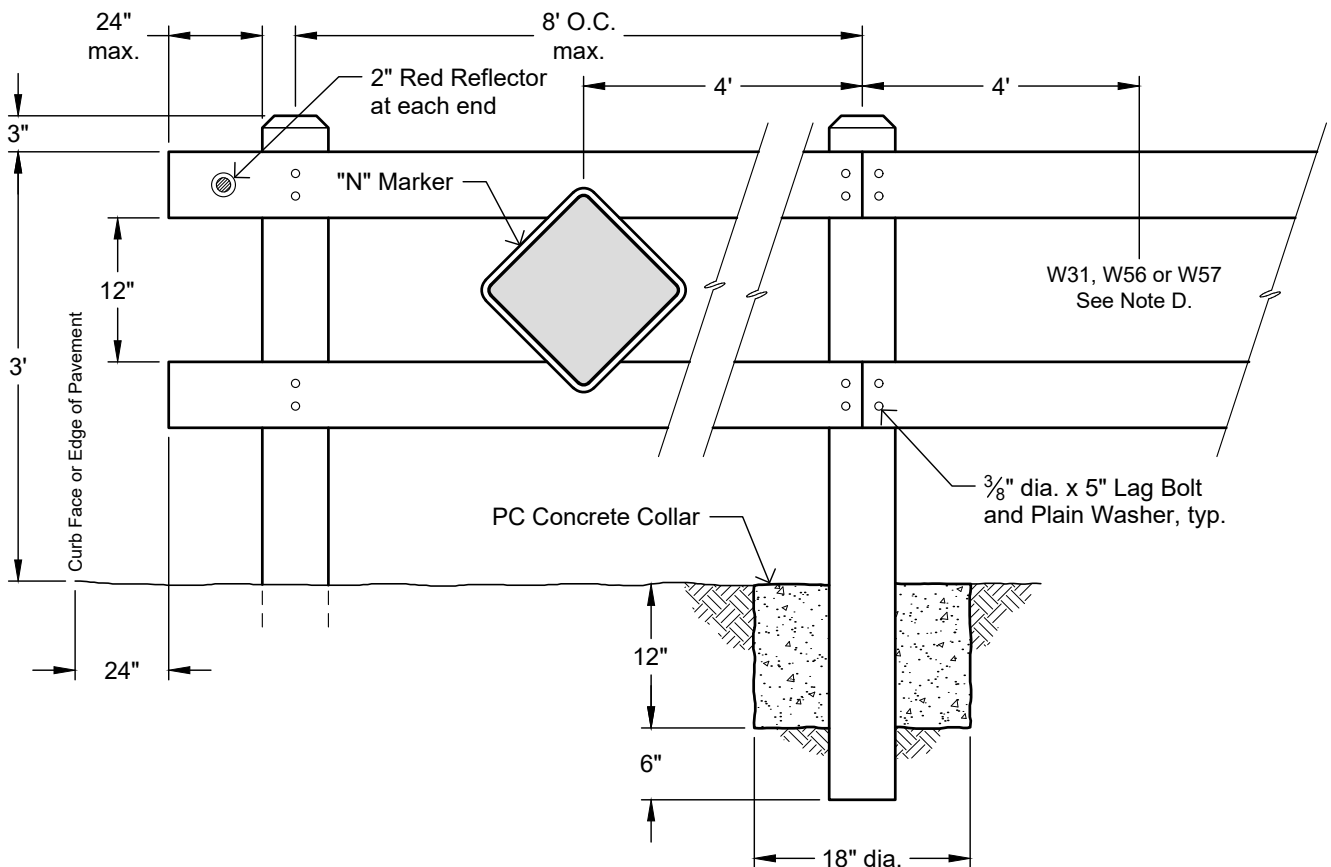


LOCATION

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:		May 2018	

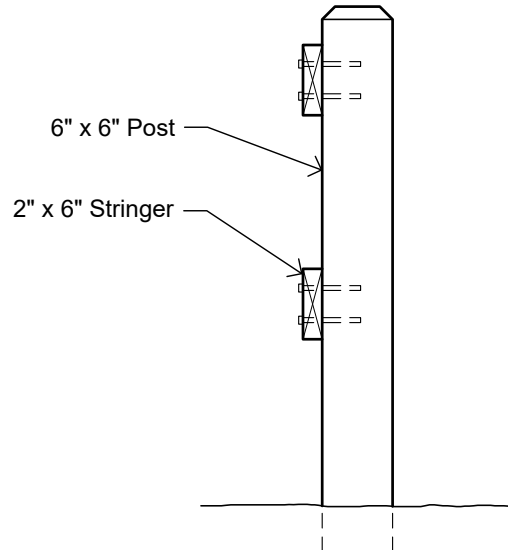


**SPEED TABLE
LOCATION, STRIPING & SIGNS**



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.



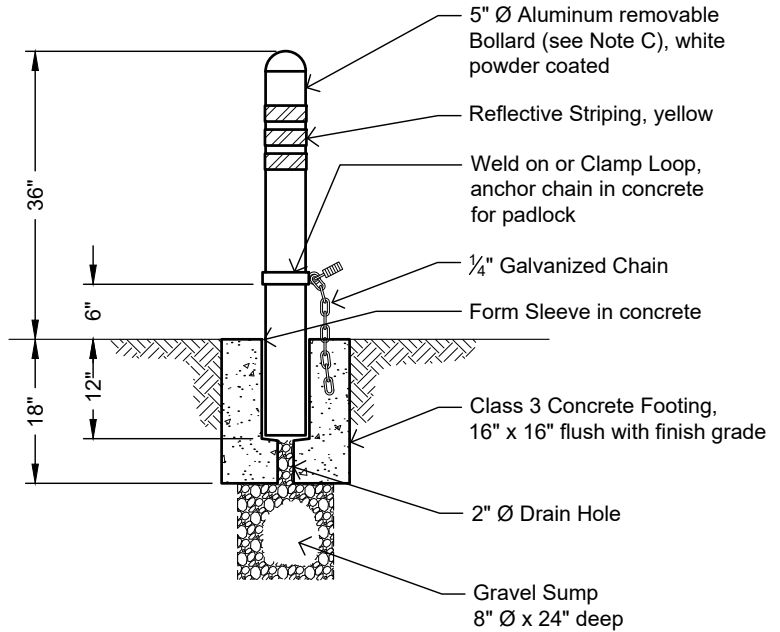
REVISIONS	BY	APP	DATE
New Border	JDL	WAP	1-98
Drafting edits	JDL	MH	5-13
Revised Notes	MH	JDW	10-04
STANDARD CURRENT AS OF:		May 2018	



STREET BARRICADE

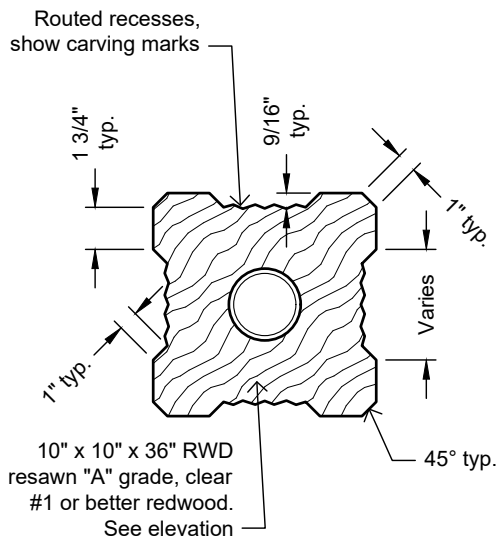
GENERAL NOTES:

- 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.

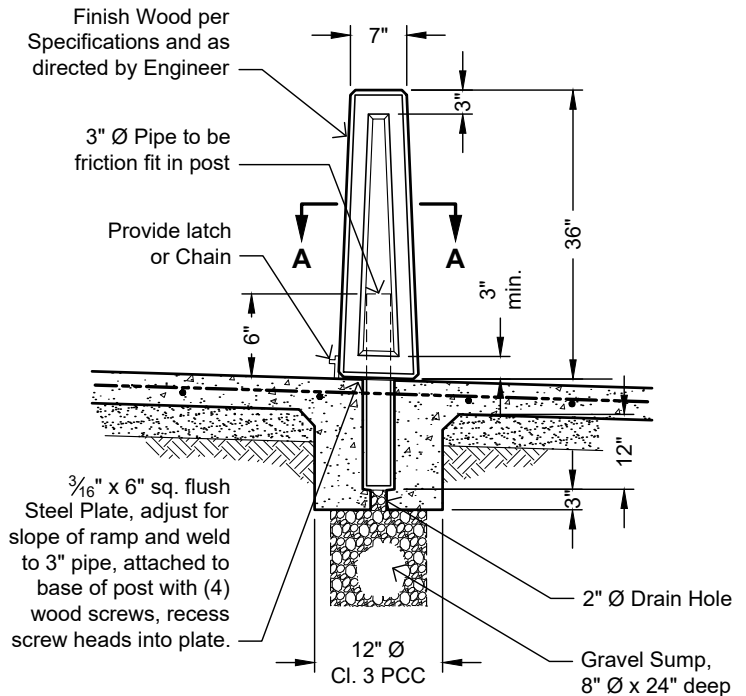


ALTERNATE NO. 1

NOTE: All steel to be double coated galvanized.



SECTION A-A

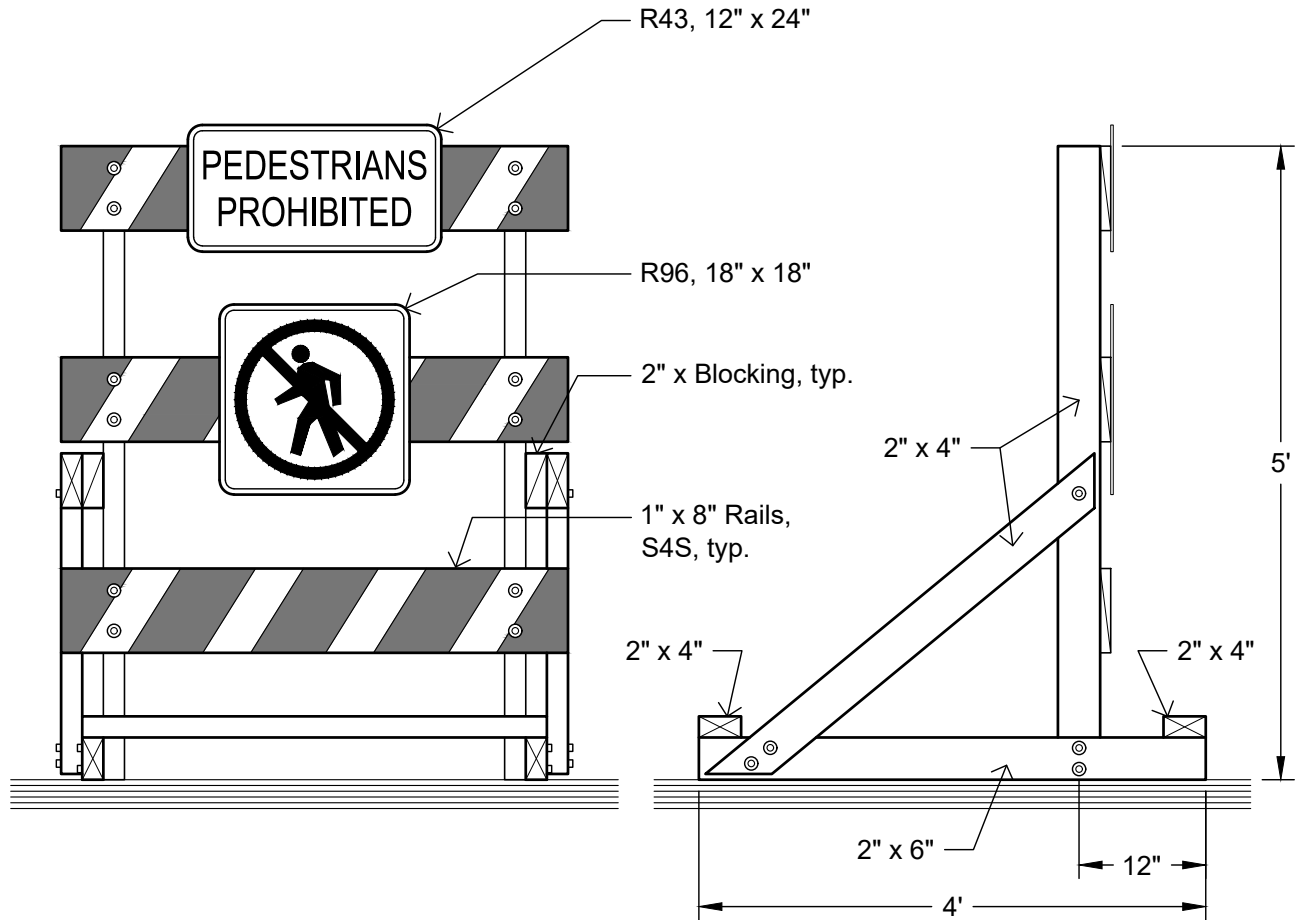


ALTERNATE NO. 2

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:		May 2018	



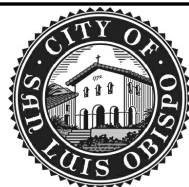
REMOVABLE BOLLARD



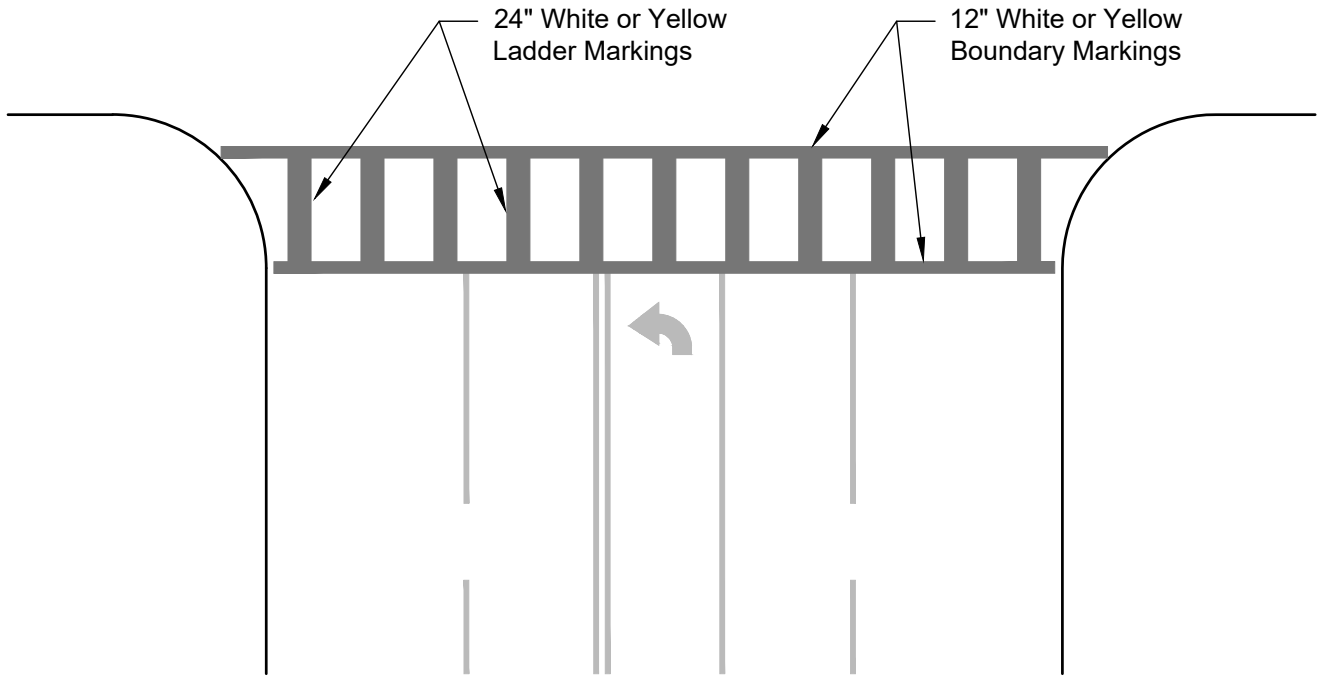
GENERAL NOTES:

- 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:		May 2018	



**BARRICADE
SIDEWALK CLOSURE**



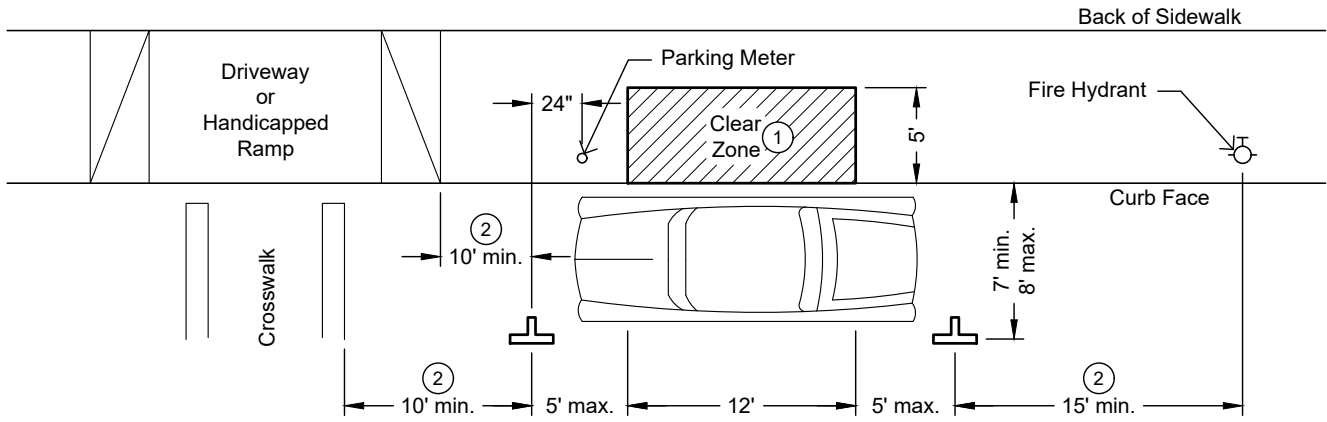
GENERAL NOTES:

- 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.

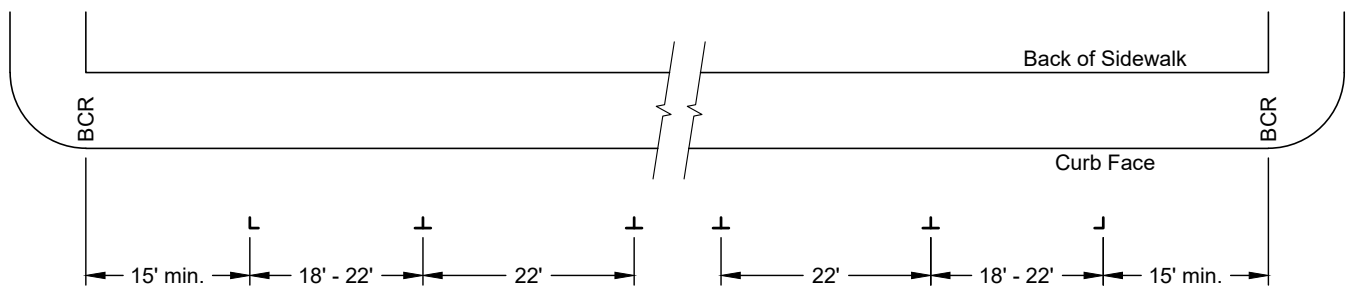
REVISIONS	BY	APP	DATE
<i>New Standard</i>	<i>MH</i>	<i>BL</i>	<i>11-05</i>
<i>Rev. Ladder width to 24"</i>	<i>DVB</i>	<i>BL</i>	<i>10-06</i>
<i>Ladder Marking note</i>	<i>JDL</i>	<i>MH</i>	<i>9-12</i>
STANDARD CURRENT AS OF:		May 2018	



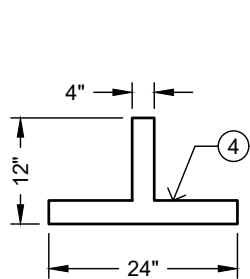
HI-VIS CROSSWALKS



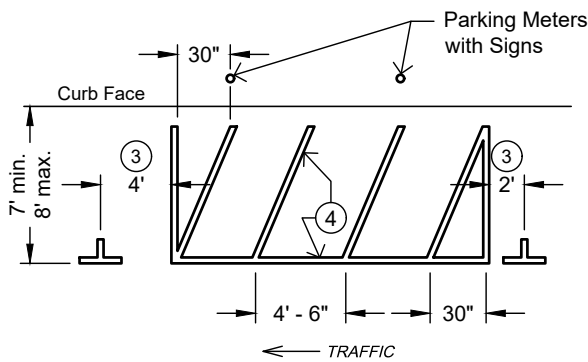
CLEARANCES



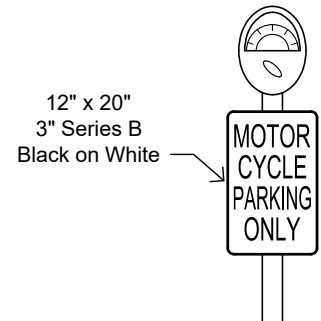
SPACE LENGTH



TEE



MOTORCYCLE SPACES ⑤

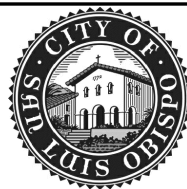


SIGN

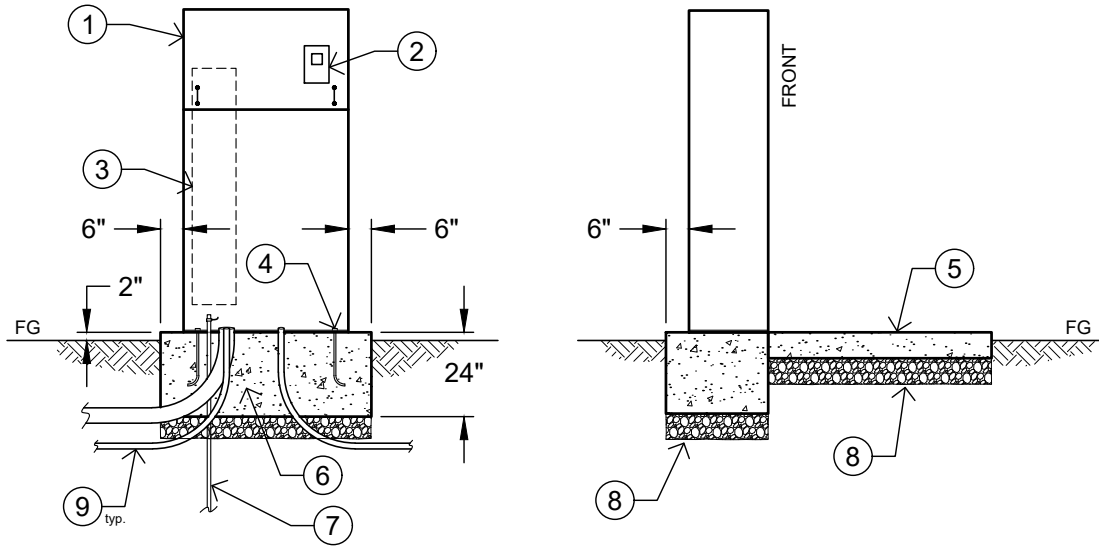
INSTALLATION NOTES:

- 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:		May 2018	



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

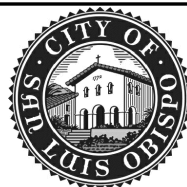
- Features in addition to Standard Features
 2000VA Output Power
 4 x 65Ah Batteries
 12 Gauge Stainless Steel Cabinet
 PE Cell Test Switch, Lighting Relay
 1500 Watts total power required
 Generator Kit

- Breakers on Unmetered Side
 2 Pole 30 amp - Street Lights

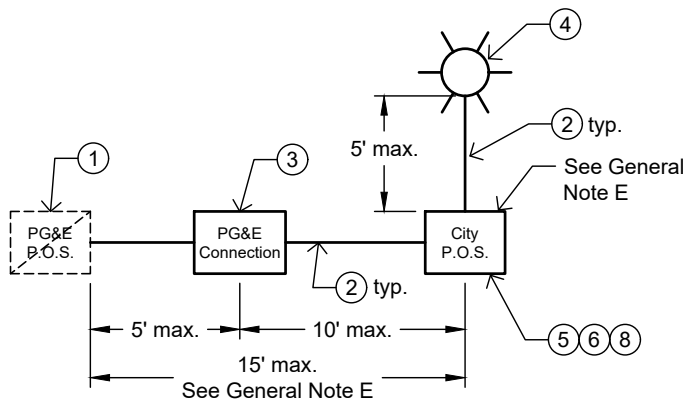
INSTALLATION NOTES:

- 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

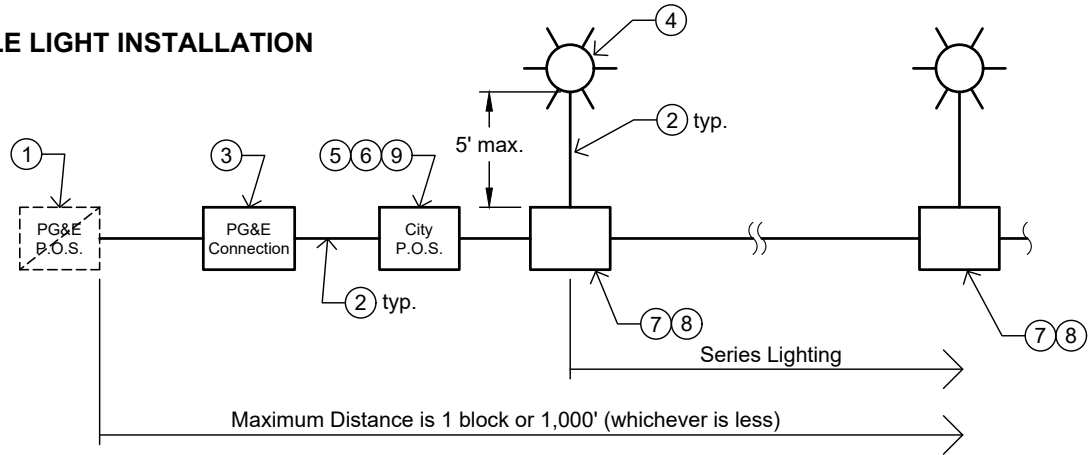
REVISIONS	BY	APP	DATE
Revise General Notes	SR	BL	1-14
Revise General Note A	DVB	BL	12-07
Drafting edits	JDL	MH	5-13
STANDARD CURRENT AS OF:		May 2018	



**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:		May 2018	



LIGHTING CIRCUIT

MANUFACTURER & MODEL NO:

LUMINAIRE: LUMINIS SR135-L1W30r1-R2/APA-PAA518

POLE: LUMINIS PAA518-BKT (Confirm with City the latest luminaire and pole model no. before ordering)

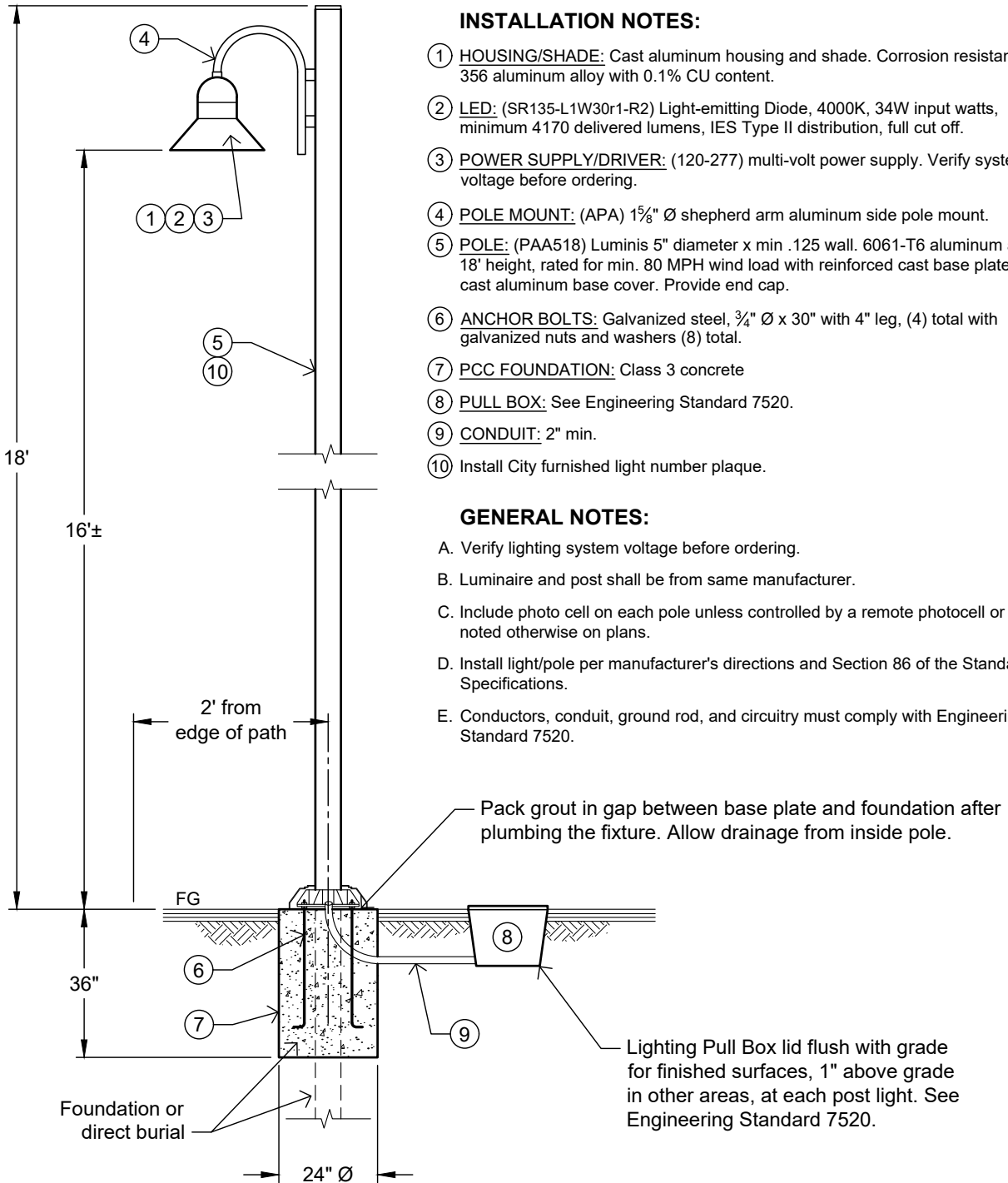
COLOR: Jet Black Marine grade powder coat (BKT).

INSTALLATION NOTES:

- ① HOUSING/SHADE: Cast aluminum housing and shade. Corrosion resistant 356 aluminum alloy with 0.1% CU content.
- ② LED: (SR135-L1W30r1-R2) Light-emitting Diode, 4000K, 34W input watts, minimum 4170 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) 1 $\frac{5}{8}$ " \varnothing 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, $\frac{3}{4}$ " \varnothing 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:		May 2018	



PATH LIGHTING

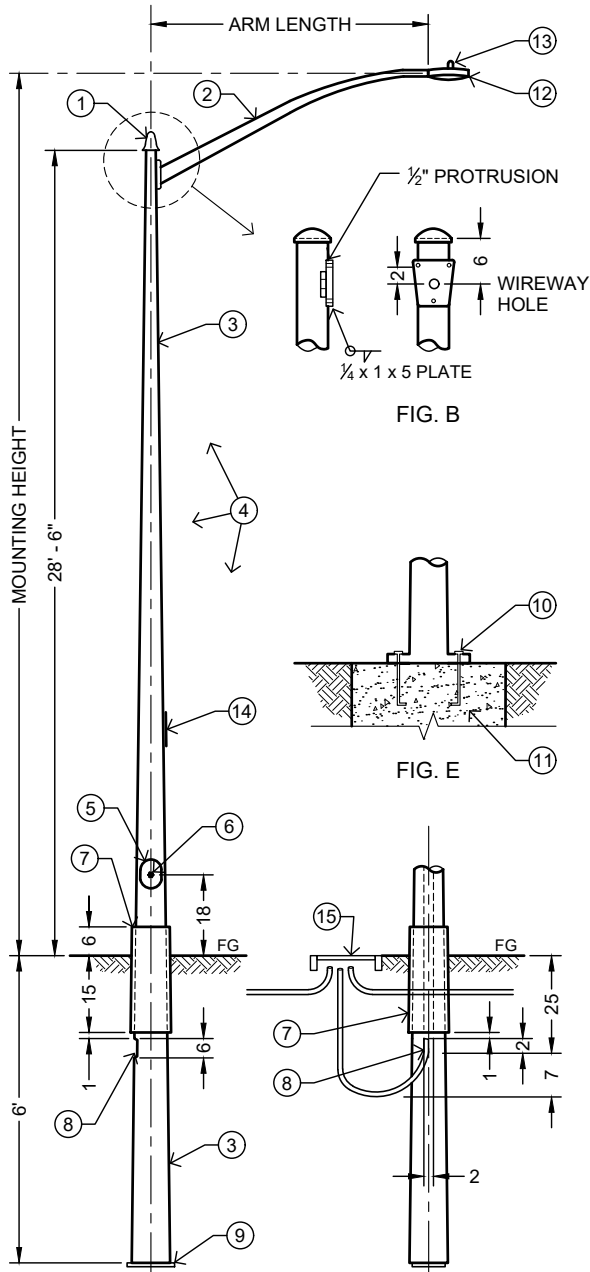


FIG. A

FIG. C

FIG. D

EMBEDDED STEEL POLE

(units in inches unless otherwise noted)

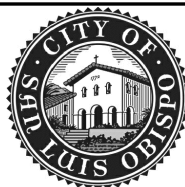
INSTALLATION NOTES:

- 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.
- ⑮ **PULLBOX:** See Engineering Standard 7520.

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:		May 2018	



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)

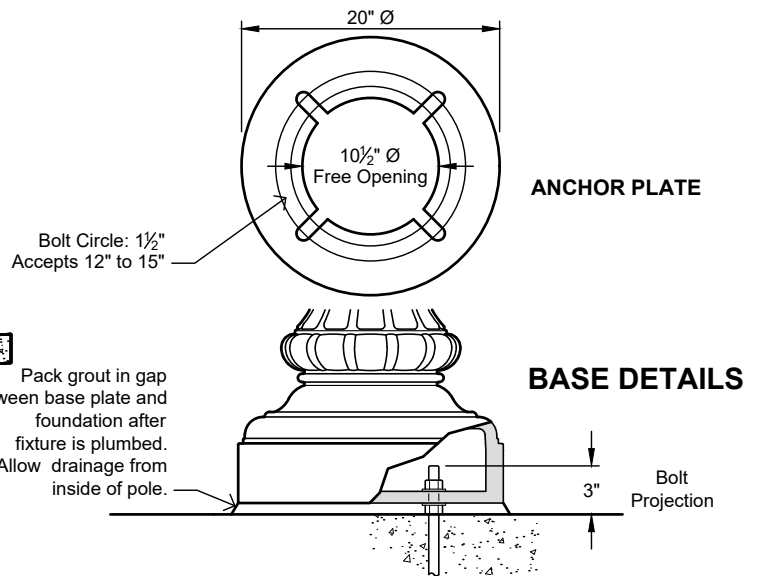
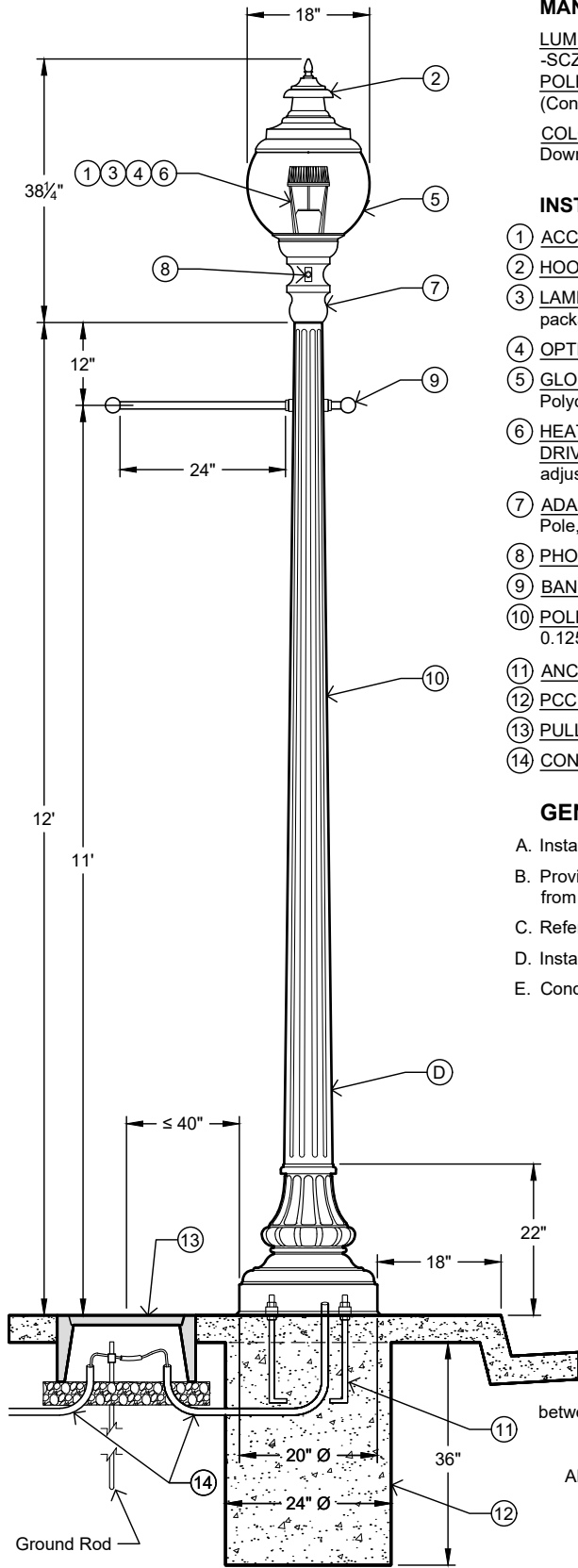
COLOR: Special order Powder Coat color with textured finish to comply with adopted Downtown color scheme (Dark Forest Green) RAL6009

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:**
- 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.

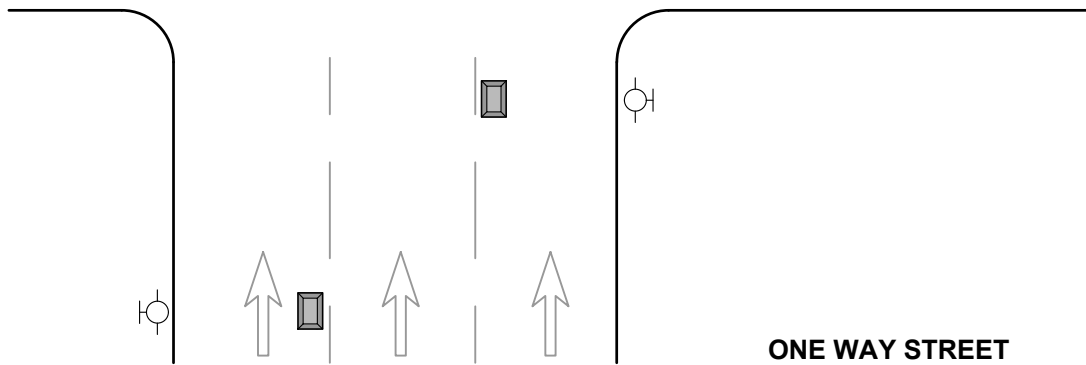
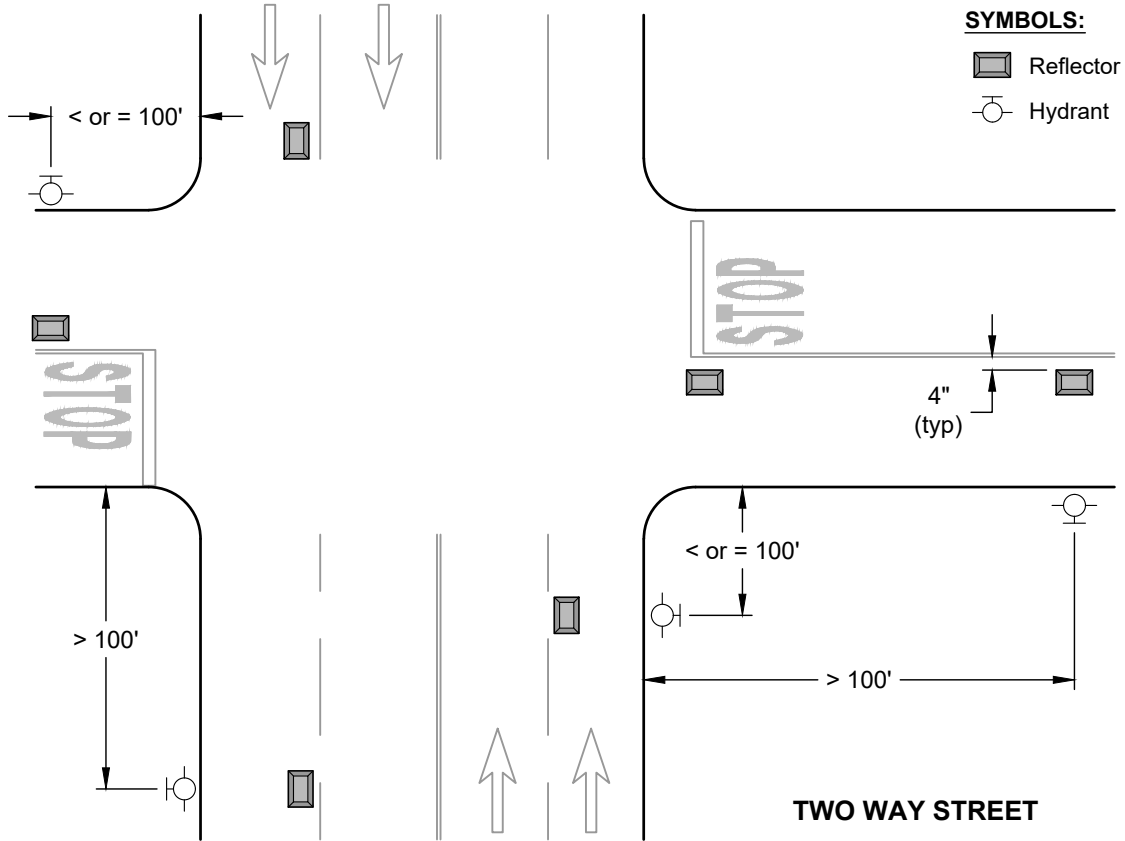


REVISIONS	BY	APP	DATE
LED Conversions; Drafting edits	JDL	MH	6-13
Revise E, 5 add Access & 13, F	SR	BL	1-14
Revised Note 9	KH	MH	4-18
STANDARD CURRENT AS OF:		May 2018	



**DOWNTOWN
PEDESTRIAN LIGHTING**

7915



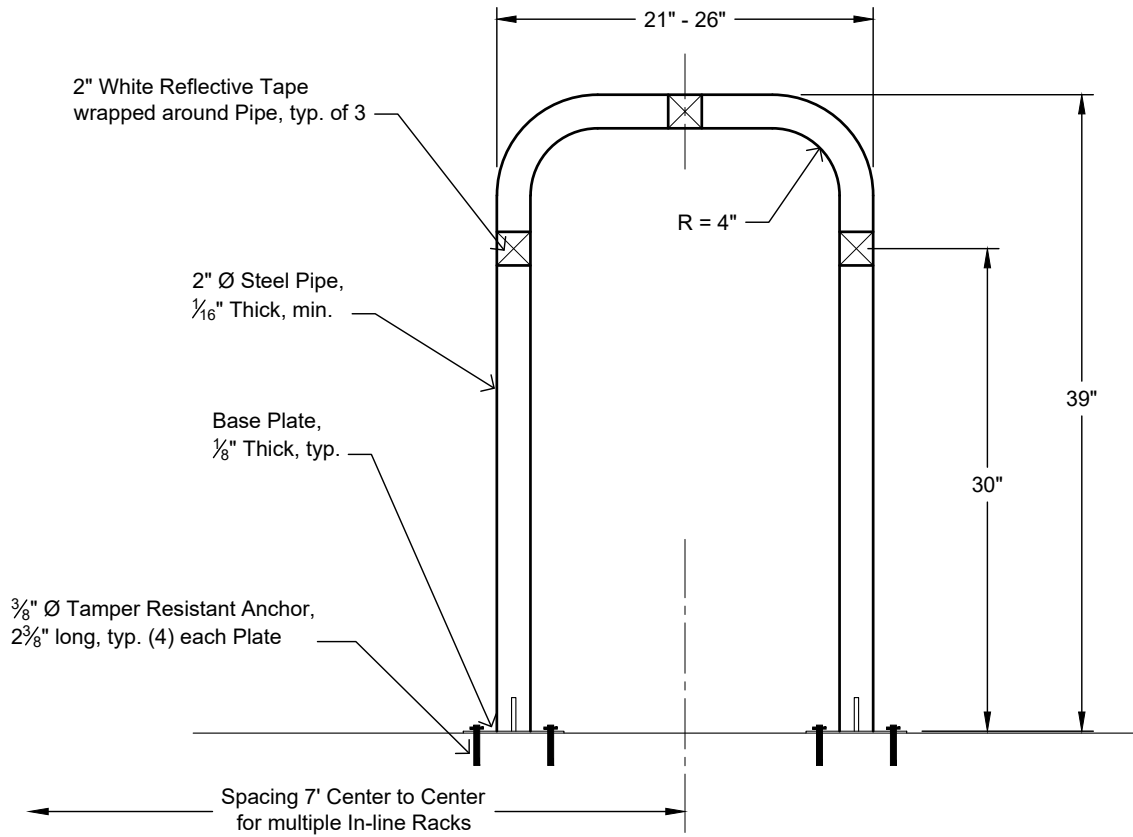
GENERAL NOTES:

- 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.

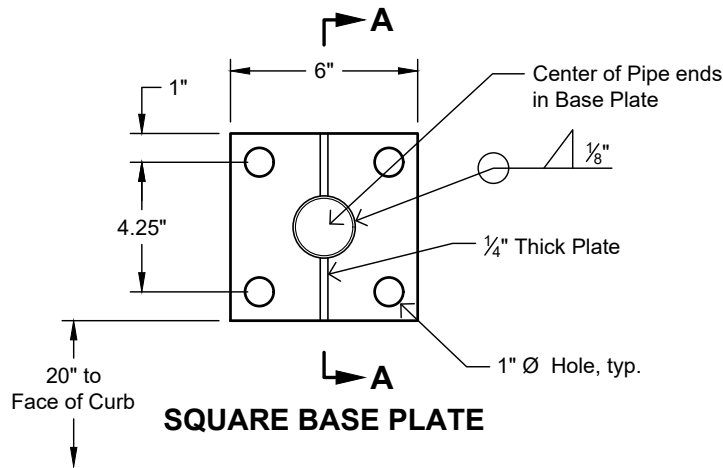
REVISIONS	BY	APP	DATE
Drafting edits	JDL	MH	5-13
Reflector locations	MH	JDW	10-04
Revise Note C	MH	JDW	10-04
STANDARD CURRENT AS OF:		May 2018	



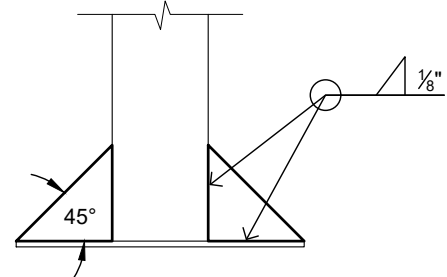
HYDRANT REFLECTOR



PROFILE



SQUARE BASE PLATE

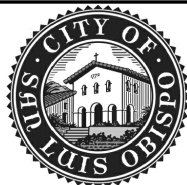


SECTION A-A

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:		May 2018	



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
Lophostemon confertus	Brisbane Box		E		F		45	25	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
Koelreuteria bipinnata	Chinese Flame Tree		E	C	F		30	30	2
Chionanthus retusus	Chinese Fringe Tree	D		C	F		20	20	1-3
Pistacia chinensis	Chinese Pistache	D		C		G	60	40	2-3
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
Ficus microcarpa	Indian Laurel Fig		E				60	70	3
Quercus tomentella	Island Oak		E				30	30	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		E				25	15	1-2

REVISIONS	BY	APP	DATE
Revised List	JDL	MH	6-13
List update	KH	MH	1-18
List update	BL	JDW	1-12

STANDARD CURRENT AS OF:

MAY 2018



STREET TREES MASTER LIST

Magnolia grandiflora 'Little Gem'	Little Gem Magnolia		E		F		25	15	1-3
Platanus x hispanica	London Plane Tree	D					80	40	2-3
Ginkgo biloba	Maidenhair Tree	D		C			50	30	1-3
Maytenus boaria	Mayten Tree		E				50	20	1-3
Hesperocyparis macrocarpa	Monterey cypress		E				55	60	3
Metrosideros excelsus	New Zealand Christmas Tree		E		F		30	30	1-3
Agonis flexouosa	Peppermint Willow		E		F		40	30	1-2
Quercus palustris	Pin Oak	D		C			60	60	3
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
Quercus rubra (Q. coccinea)	Red Oak	D		C			60	60	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
Quercus virginiana	Southern Live Oak		E				60	60	3
Magnolia grandiflora	Southern Magnolia		E		F		80	60	3
Arbutus 'Marina'	Strawberry Tree		E		F	G	40	40	1-3
Michelia doltsopa	Sweet Michelia		E		F		30	25	1-2
Hymenosporum flavum	Sweetshade		E		F		40	20	1-2
Gleditsia triacanthos 'Inermis'	Thornless Honey Locust	D		C			70	35	1-3
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		E		F		45	25	2-3
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>	JDL	MH	6-13
<i>List update</i>	KH	MH	1-18
<i>List update</i>	BL	JDW	1-12
STANDARD CURRENT AS OF:		MAY 2018	



STREET TREES MASTER LIST

Note: Percentages refer to mixture of tree types in project area

<u>DOWNTOWN DISTRICT</u>	%
Ficus microcarpa	10
Quercus ilex	20
Quercus rubra (Q. coccinea)	30
Ginkgo biloba 'Fairmont'	30
Olea europaea 'Swan Hill'-grafted fruitless	10

<u>Downtown Accent Trees</u>	
Jacaranda mimosifolia	
Magnolia grandiflora 'Little Gem'	
Corymbia ficifolia	
Cassia leptophylla	
Metrosideros excelsa	
Lagerstroemia hybrid*	

<u>BROAD STREET</u>	%
<u>Monterey St. to Pacific St.</u>	
Lophostemon confertus	60
Ginkgo biloba 'Fairmont'	40
<u>Pacific St. to High St.</u>	
Platanus x hispanica	40
Pistacia chinensis	40
Ginkgo biloba 'Fairmont'	20

<u>High St. to City Limits</u>	
Platanus x hispanica	30
Quercus palustris	20
Pistacia chinensis*	20
Quercus rubra (Q. coccinea)	15
Lophostemon confertus	15
*Substitute-south of Orcutt	

<u>At creek crossings</u>	
Platanus x hispanica	100

<u>CALIFORNIA BLVD.</u>	%
<u>Cal Poly to Mill St.</u>	
Koelreutaria bipinnata	25
Quercus rubra (Q. coccinea)	25
Cinnamomum camphora	30
Ulmus parvifolia	20

<u>Mill St. to San Luis Dr.</u>	
Ulmus parvifolia	30
Metrosideros excelsus	40
Lophostemon confertus	30

<u>San Luis Dr. to Johnson Ave.</u>	
Quercus agrifolia	60
Ulmus parvifolia	40

<u>At creek crossings</u>	
Platanus x hispanica	100

<u>FOOTHILL BLVD.</u>	%
Magnolia "Majestic Beauty"	30
Koelreutaria bipinnata	30
Platanus x hispanica	40

<u>At creek crossings</u>	
---------------------------	--

Platanus x hispanica	100
----------------------	-----

<u>GRAND AVENUE</u>	%
Magnolia 'Majestic Beauty'	50
Platanus x hispanica	50

<u>HIGUERA STREET (east end)</u>	%
<u>California Blvd. to Santa Rosa St.</u>	
Use Downtown Accent Trees	

<u>HIGUERA STREET (Downtown)</u>	%
<u>Santa Rosa St. to Nipomo St.</u>	
Use Downtown District	

<u>HIGUERA STREET (west end)</u>	%
<u>Nipomo St. to Madonna Rd.</u>	
Use Downtown Accent Trees	

<u>Madonna Rd. to City Limit</u>	
Pinus canariensis	30
Hesperocyparis macrocarpa	30
Hymenosporum flavum	20
Quercus (Red Oak subgenus)1	20

<u>JOHNSON AVENUE</u>	%
<u>Hwy. 101 to SPRR underpass</u>	
Magnolia 'Majestic Beauty'	20
Pistacia chinensis	30
Quercus palustris	30
Hymenosporum flavum	20

<u>UPRR underpass to Laurel Lane</u>	
Quercus agrifolia	20
Pistacia chinensis	20
Ulmus parvifolia	20
Hymenosporum flavum	20
Quercus rubra (Q. coccinea)	20

<u>Laurel Lane to Orcutt Rd.</u>	
Koelreutaria bipinnata	20
Quercus rubra (Q. coccinea)	20
Ulmus parvifolia	20
Jacaranda mimosifolia	20
Hymenosporum flavum	20

<u>LAUREL LANE</u>	%
Platanus x hispanica	50
Quercus suber	20
Jacaranda mimosifolia	15
Ginkgo biloba	15

<u>LOS OSOS VALLEY ROAD</u>	%
Lophostemon confertus	20
Quercus tomentella	20
Fagus sylvatica	20
Quercus agrifolia	20
Pinus canariensis	20

<u>MADONNA ROAD</u>	%
Pinus canariensis	25
Pistacia chinensis	25

Quercus agrifolia	25
Quercus rubra (Q. coccinea)	25

<u>MARSH STREET</u>	%
Use Downtown District	

<u>MARGARITA AVENUE</u>	%
Platanus x hispanica	30
Hymenosporum flavum	30
Quercus palustris	40

<u>MONTEREY STREET</u>	%
Use Downtown District	

<u>ORCUTT ROAD</u>	%
Pistacia chinensis	60
Lophostemon confertus	20
Quercus agrifolia	20

<u>At creek crossings</u>	
Platanus x hispanica	100

<u>PRADO ROAD</u>	%
Platanus x hispanica	40
Pinus canariensis	30
Quercus palustris	30

<u>SANTA ROSA STREET</u>	%
<u>Highland St. to Murray St.</u>	
Quercus agrifolia	80
Pistacia chinensis	20

<u>Murray St. to Marsh St.</u>	
Pistacia chinensis	30
Koelreutaria bipinnata	20
Ficus microcarpa	10
Lophostemon confertus	30
Jacaranda mimosifolia	10

<u>At Creek intersections</u>	
Platanus x hispanica	100

<u>SOUTH STREET</u>	%
Tristaniopsis laurina	20
Jacaranda mimosifolia	20
Ginkgo biloba 'Fairmont'	20
Platanus x hispanica	20
Quercus palustris	20

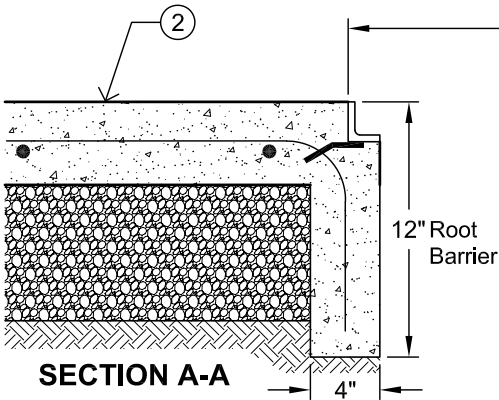
<u>TANKFARM ROAD</u>	%
<u>East of Broad St.</u>	
Platanus x hispanica	50
Lophostemon confertus	20
Eucalyptus torquata	30

<u>West of Broad St.</u>	
Platanus x hispanica	25
Cinnamomum camphora	25
Quercus agrifolia	25
Quercus rubra (Q. coccinea)	25

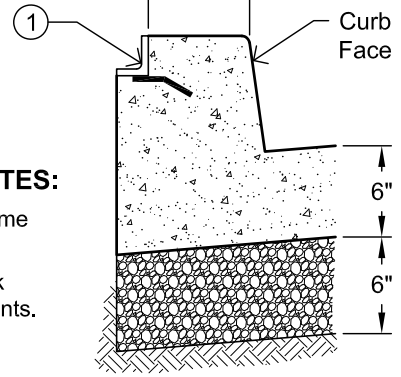
REVISIONS	BY	APP	DATE
Revised List	KH	MH	1-18
Revised List	BL	BL	11-06
New Border	JDL	WAP	1-98
STANDARD CURRENT AS OF:		MAY 2018	



STREET TREES
MAJOR STREETS



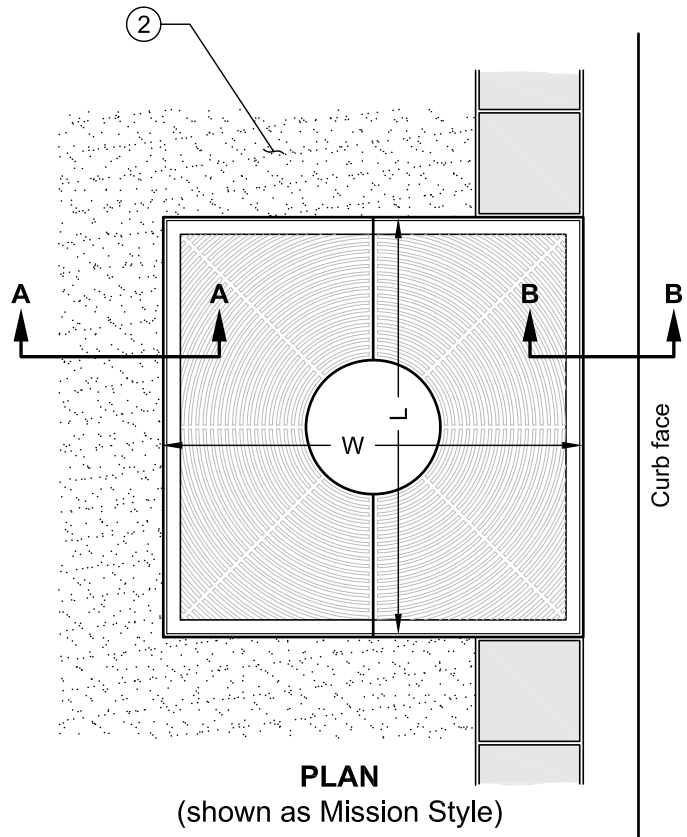
- INSTALLATION NOTES:**
- ① See Tree Grate and Frame Size Chart.
 - ② See Page 2 for Sidewalk Construction Requirements.



GENERAL NOTES:

- A. Concrete shall be Class 1 and shall be monolithic with curb, gutter, root barrier, 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
- N. Diameter of grate opening shall allow a minimum of 4 inches of tree expansion.

SECTION B-B



PLAN

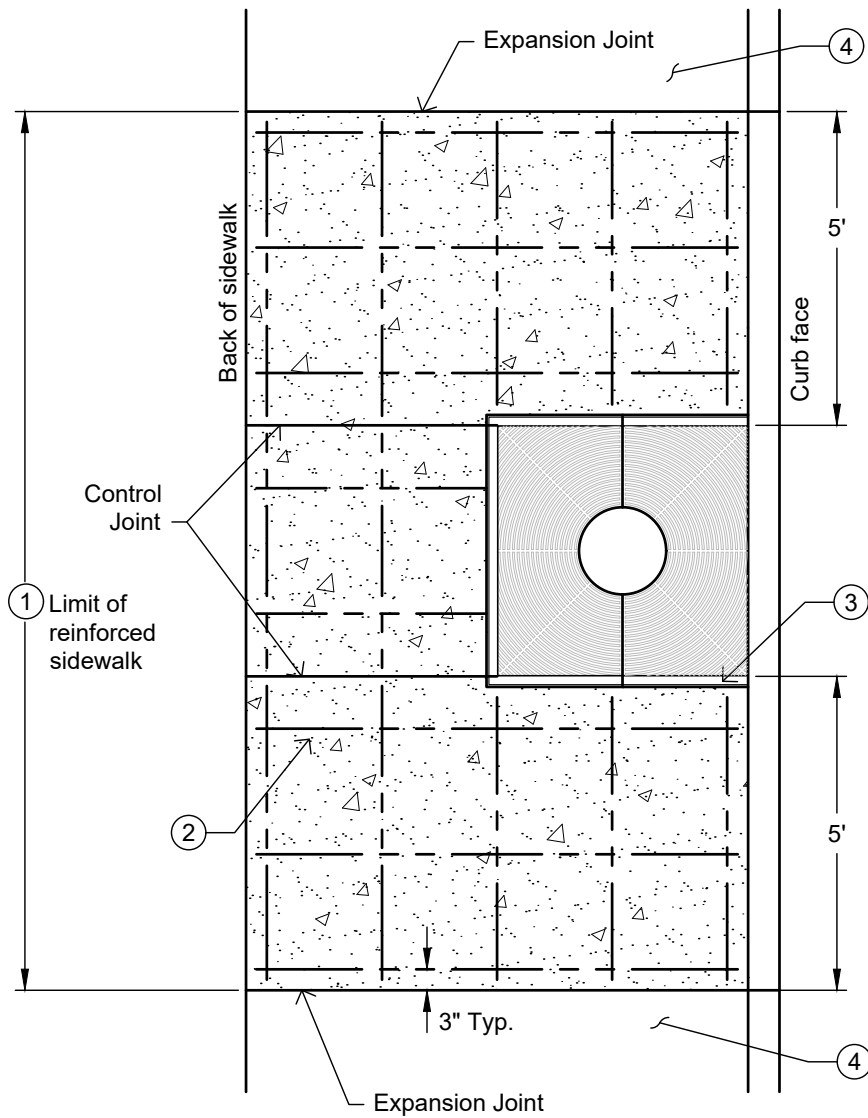
(shown as Mission Style)

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 notes	KH	MH	1-18
Revised Grate and Frame	MH	BL	11-09
Note H; Drafting edits	JDL	MH	10-12
STANDARD CURRENT AS OF:		May 2018	



TREE WELL

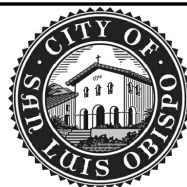


PLAN

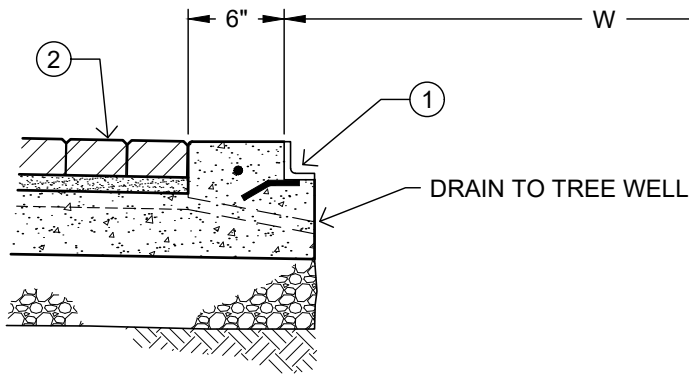
GENERAL NOTES:

- ① Construct reinforced sidewalk with Class 1 concrete, monolithic to curb, gutter, and root barrier. All other construction requirements of Engineering Standard 4110 or 4220 must be met.
- ② Install No. 4 bars @ 24" O.C. each way within reinforced sidewalk area.
- ③ 12" deep root barrier monolithic to sidewalk, per Section A-A, Page 1 of 2.
- ④ Construct sidewalk per Engineering Standard 4110. Sidewalks within the Mission Style Sidewalk District shall be constructed per Engineering Standard 4220.
- ⑤ See Engineering Standard 8210 for street tree planting requirements.

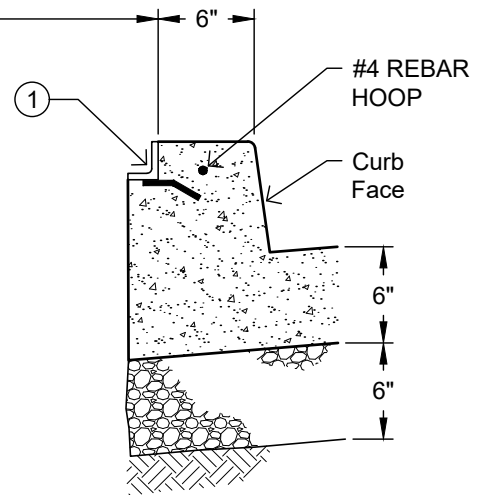
REVISIONS	BY	APP	DATE
<i>New Page Sidewalk Const.</i>	<i>KH</i>	<i>MH</i>	<i>4-18</i>
STANDARD CURRENT AS OF:		May 2018	



TREE WELL



SECTION A-A



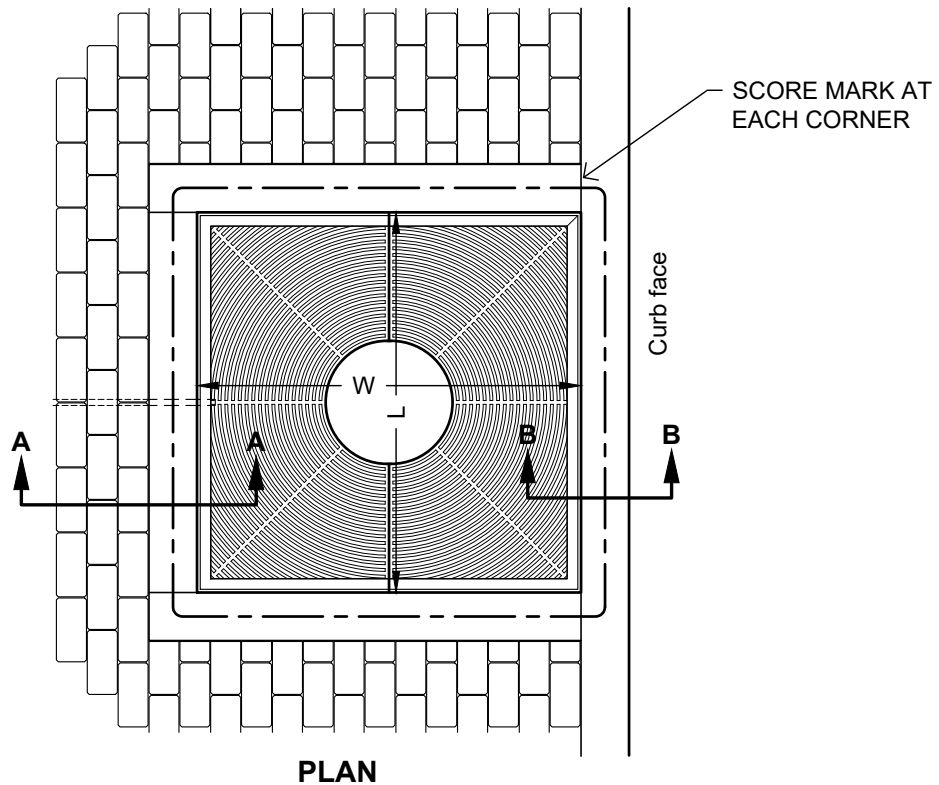
SECTION B-B

GENERAL NOTES:

A. See Engineering Standard 8130 for General Notes.

INSTALLATION NOTES:

- ① See Engineering Standard 8130 for Tree Grate and Frame Size Chart .
- ② Construct sidewalk per Engineering Standard 4150.

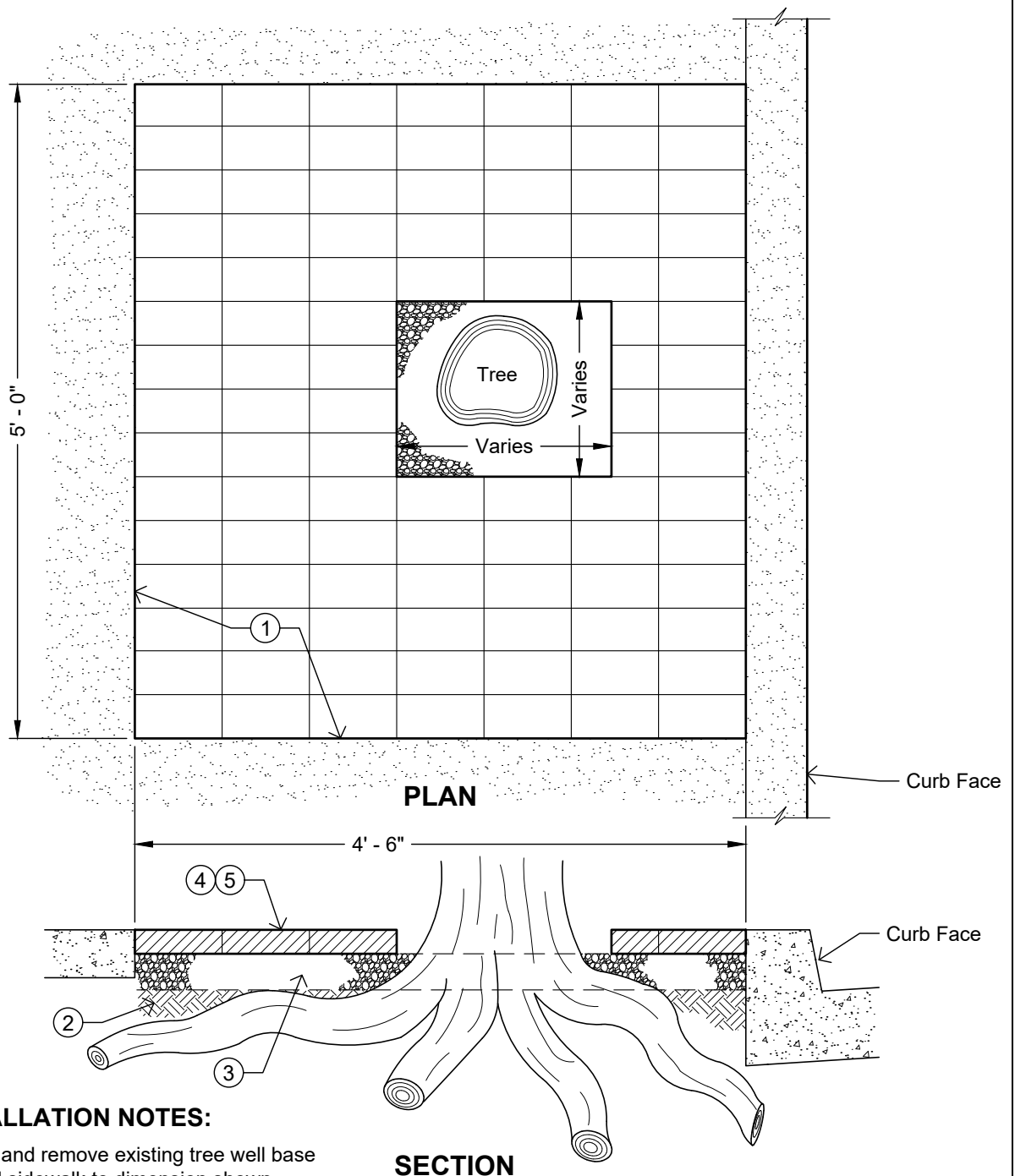


PLAN

REVISIONS	BY	APP	DATE
<i>New Standard</i>	<i>JDL</i>	<i>DA</i>	<i>3-17</i>
STANDARD CURRENT AS OF:		May 2018	



TREE WELL
RAILROAD DISTRICT



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:		May 2018	



**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 planting and tree quality after 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. TREE QUALITY:

Tree quality must conform to the requirements of guideline specifications for nursery tree quality included in Appendix I.

C. BACKFILL MATERIAL:

The backfill material shall be free of construction spoils/debris and 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 bottom of 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 and 4 inches below the bottom of grate. 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.

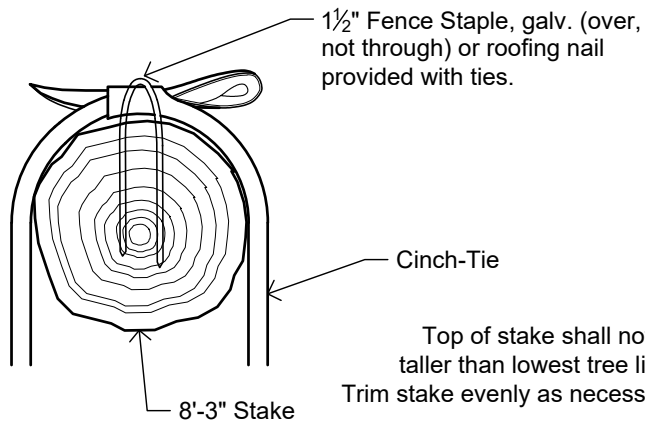
G. GUARDS:

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.

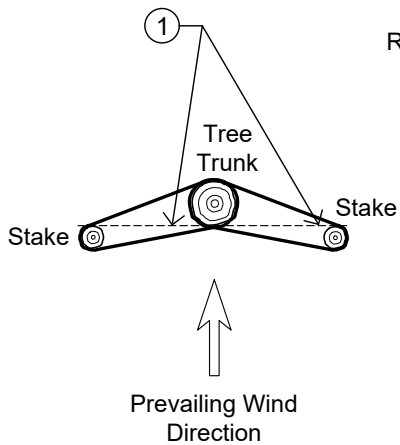
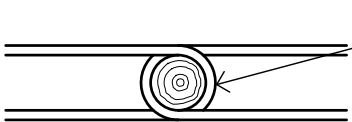
REVISIONS	BY	APP	DATE
<i>Revised Notes A, D, & G</i>	<i>MH</i>	<i>BL</i>	<i>11-09</i>
<i>Modified A, B, C, D</i>	<i>KH</i>	<i>MH</i>	<i>1-18</i>
<i>Drafting edits</i>	<i>JDL</i>	<i>MH</i>	<i>5-13</i>
STANDARD CURRENT AS OF:		May 2018	



STREET TREE PLANTING NOTES



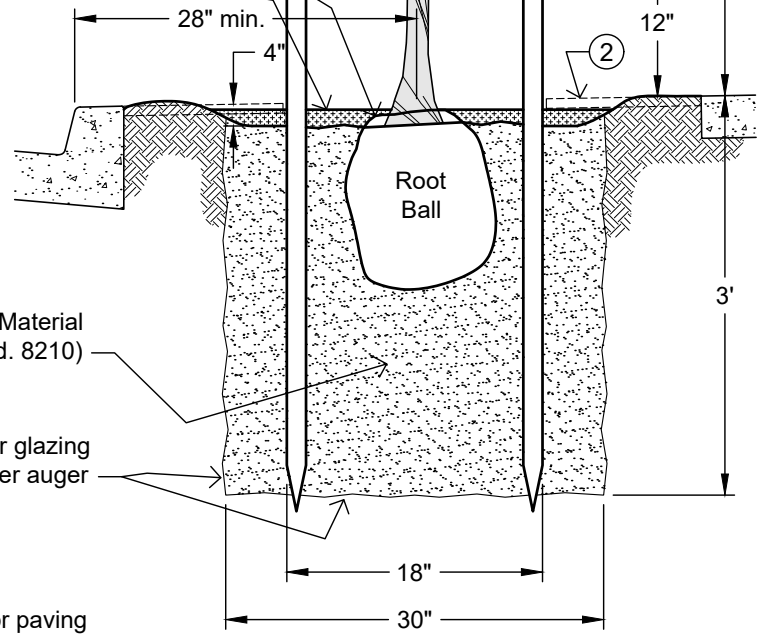
Top of stake shall not be taller than lowest tree limb. Trim stake evenly as necessary.



Remove nursery stake(s) and backfill hole with soil after planting. Install (2) 8'-3" Lodgepole Pine Stakes.

Top of Root Ball 1/2" above finished grade

Mulch Wood Chips, 2" deep



Backfill Material (See Eng. Std. 8210)

Remove clay slick or glazing if dug by power auger

INSTALLATION NOTES:

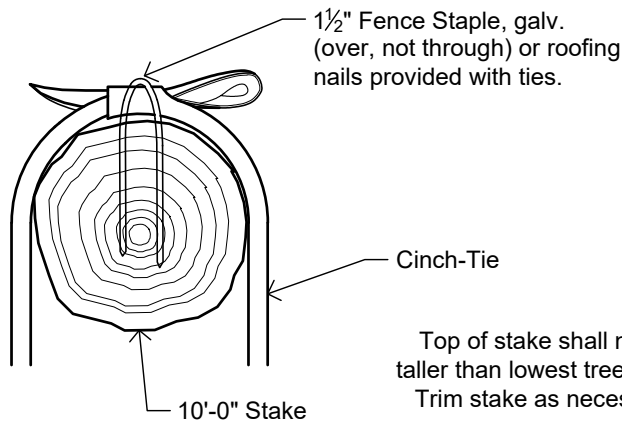
- ① Align face of tree trunk with face of stake.
- ② At Zone 1, tree grate shall be installed per Engineering Standard 8130, 4" clear from top of grate to top of backfill material.

- 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

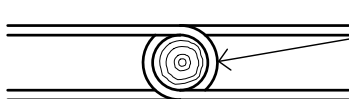
REVISIONS	BY	APP	DATE
Combined Stds 8830 and 8840	JDL	MH	6-13
Drafting edits	JDL	MH	6-13
Remove crossbrace & tubes	KH	MH	01-16
STANDARD CURRENT AS OF:		May 2018	



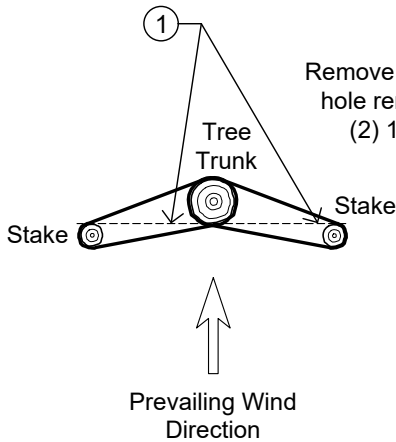
TREE PLANTING and STAKING
ZONES 1, 2 and 3
15 Gallon Size



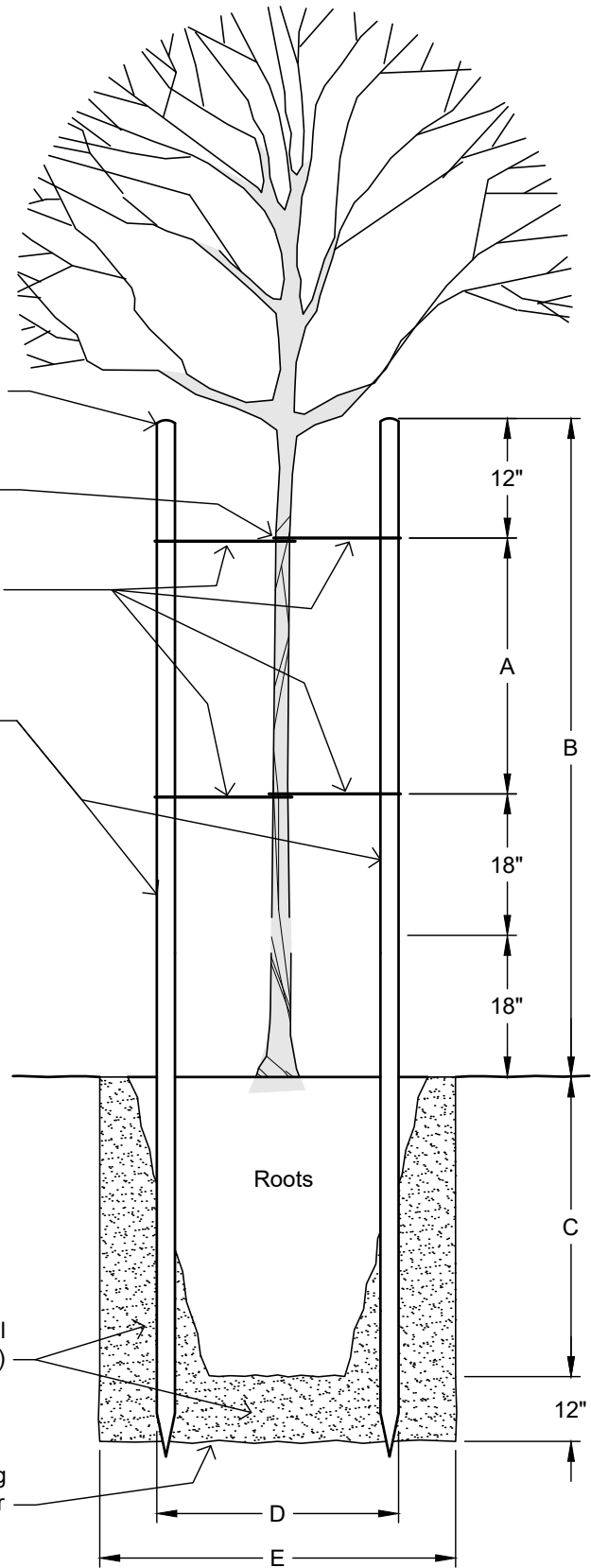
Top of stake shall not be taller than lowest tree limb. Trim stake as necessary.



24" Cinch-ties (4 ea.) shall be snug, not tight



Remove nursery stake(s) and backfill hole remaining after planting. Install (2) 10'-0" Lodgepole Pine Stakes.



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.

Backfill Material (See Eng. Std. 8210)

Remove clay slick or glazing if dug by power auger

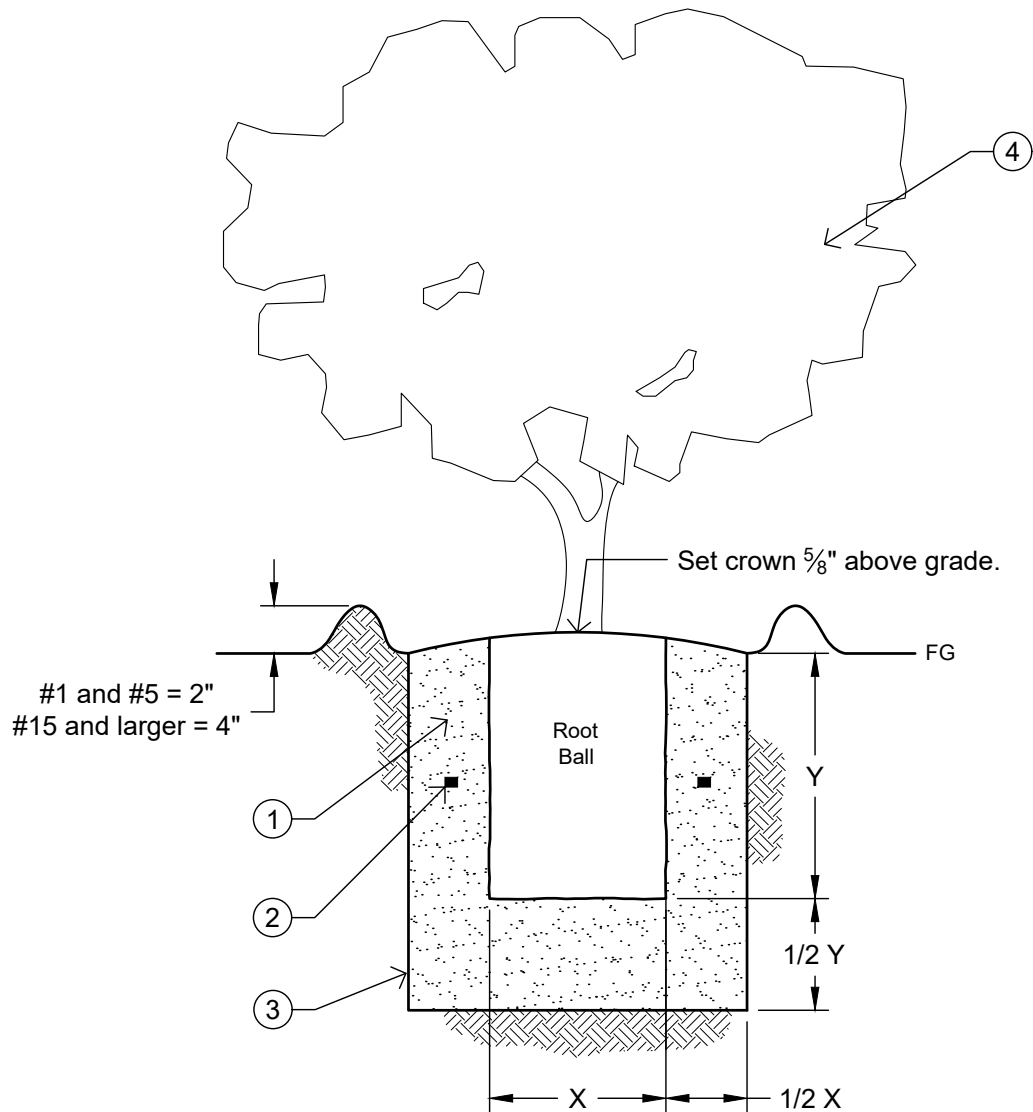
ZONE 1: Trees planted in tree wells or parkway
 ZONE 2: Trees planted within 7'-6" of curb, sidewalk, or paving

REVISIONS	BY	APP	DATE
Removed crossbrace	KH	MH	01-18
Revised Tube Length	MH	BL	11-09
Drafting edits	JDL	MH	6-13

STANDARD CURRENT AS OF: May 2018



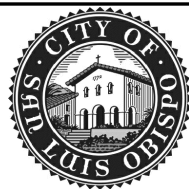
TREE PLANTING and STAKING
 ZONES 1 and 2
 24" Box and Larger



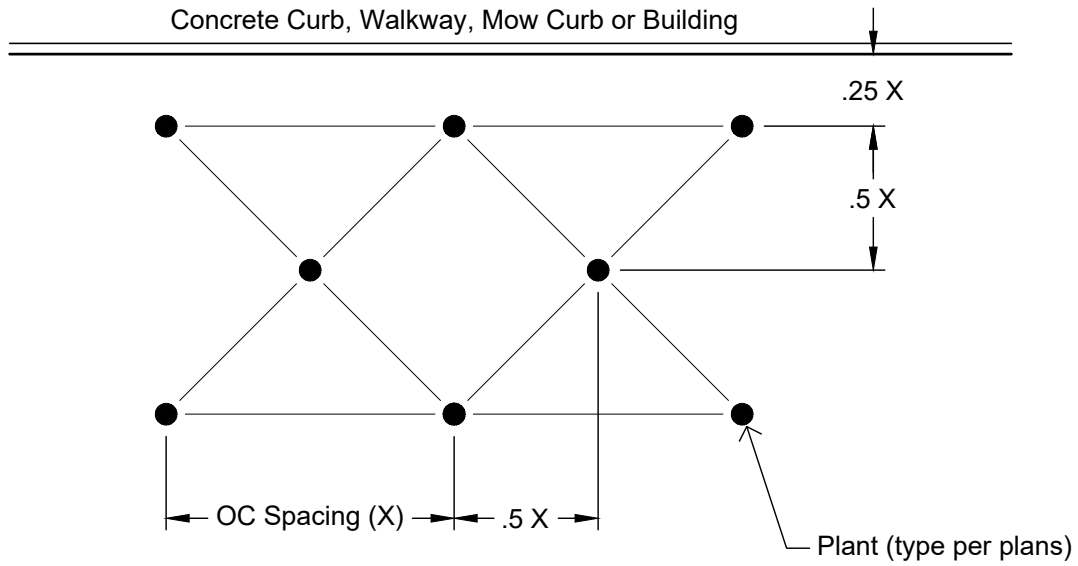
NOTES:

- 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
<i>New Standard</i>	<i>BL</i>	<i>JDW</i>	<i>1-04</i>
<i>Revise Note 2; Add Notes 3 and 4</i>	<i>JDL</i>	<i>BL</i>	<i>5-12</i>
<i>Drafting edits</i>	<i>JDL</i>	<i>MH</i>	<i>5-13</i>
STANDARD CURRENT AS OF:		May 2018	



SHRUB PLANTING



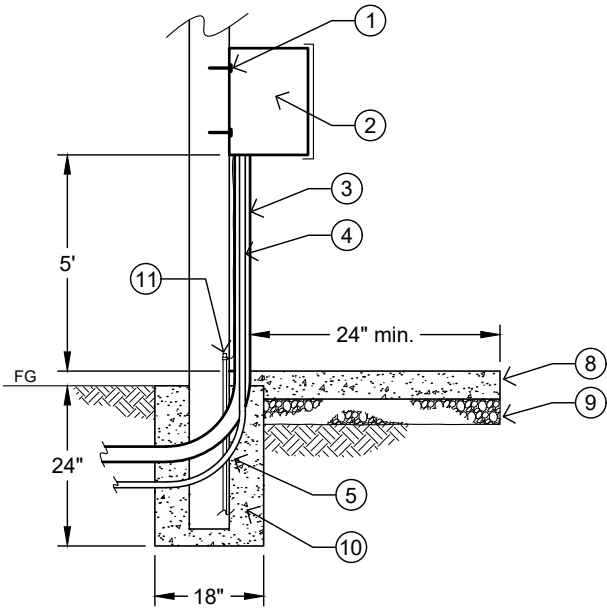
GENERAL NOTE:

- 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".

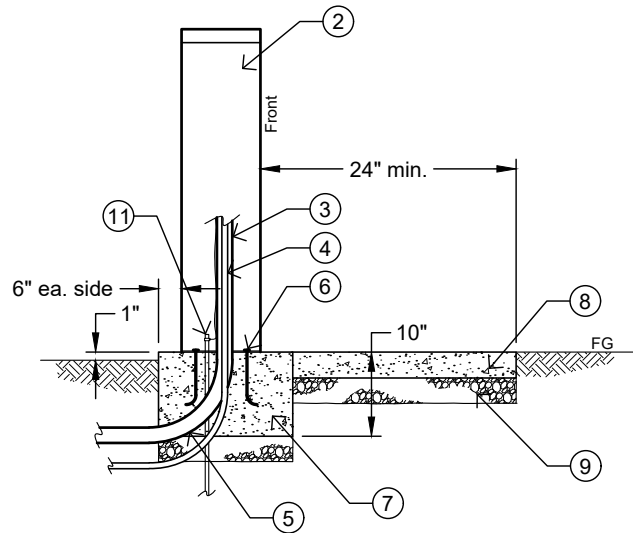
REVISIONS	BY	APP	DATE
<i>New Standard</i>	<i>BL</i>	<i>JDW</i>	<i>1-04</i>
<i>Remove chart; Drafting edits</i>	<i>JDL</i>	<i>MH</i>	<i>6-13</i>
STANDARD CURRENT AS OF:	May 2018		



**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.

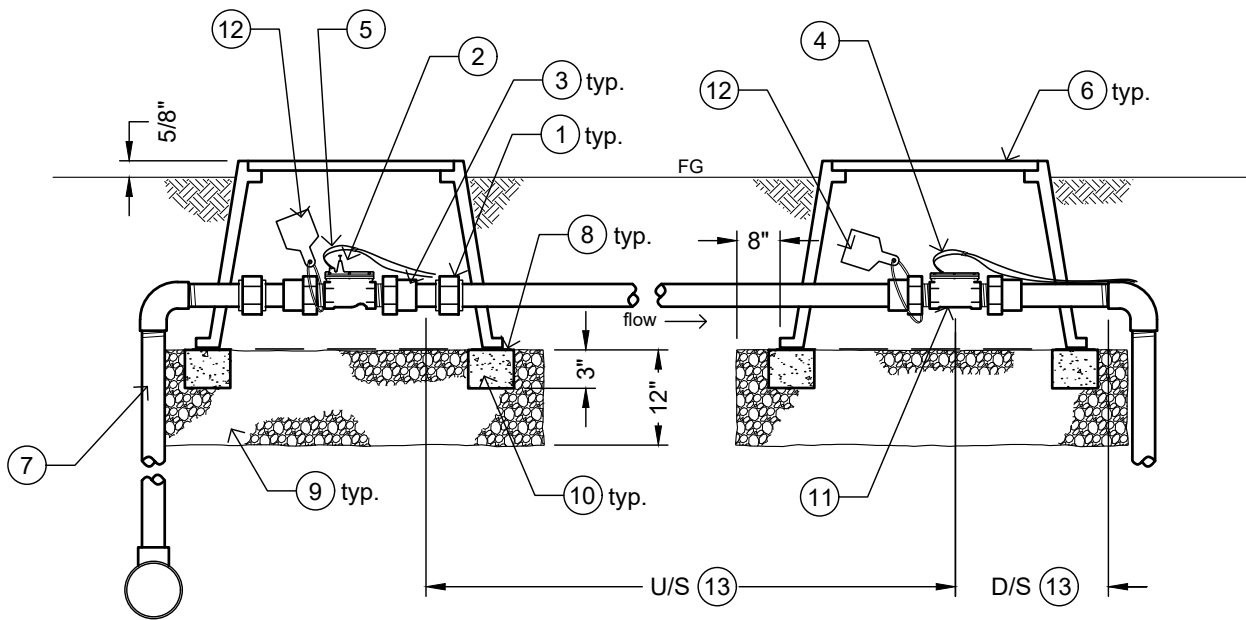
NOTES:

- 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:		May 2018	



**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.)

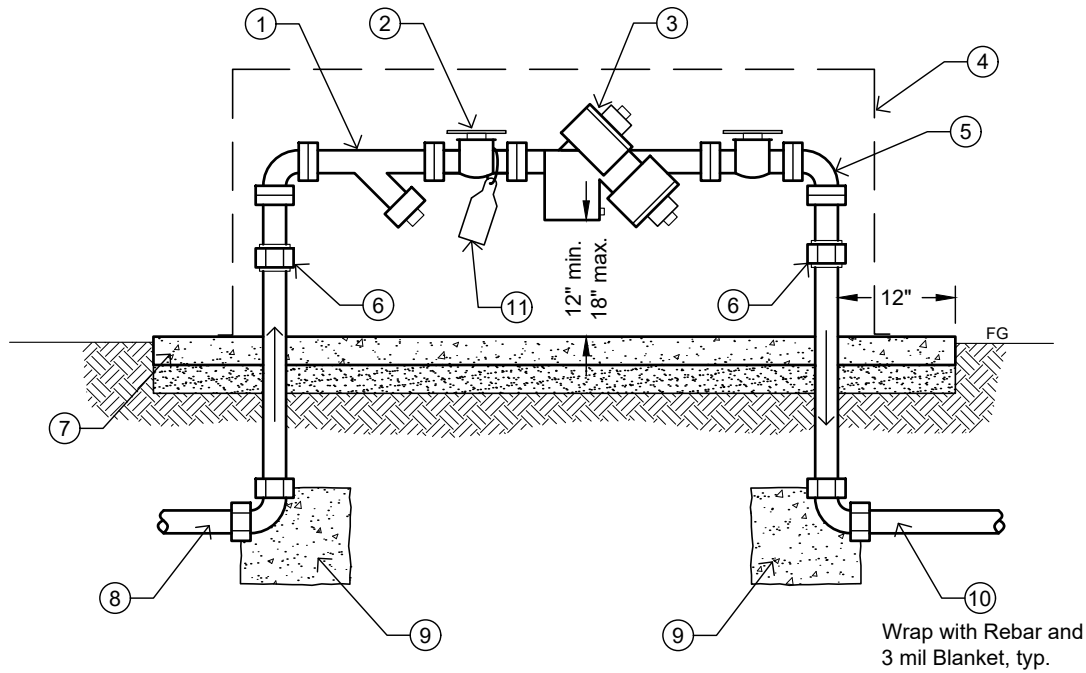
INSTALLATION NOTES:

- 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:		May 2018	



MASTER VALVE & FLOW SENSOR



GENERAL NOTES:

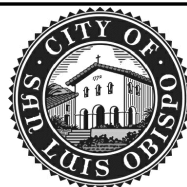
- A. All pipe shall be schedule copper or brass unless otherwise specified.
- B. Dissimilar metals shall be separated by an approved dielectric coupling.
- C. Service assembly shall be installed as the first assembly after the meter.
- D. Device shall be located within 10' of water meter and no connection or tees are allowed between the meter and the assembly.

INSTALLATION NOTES:

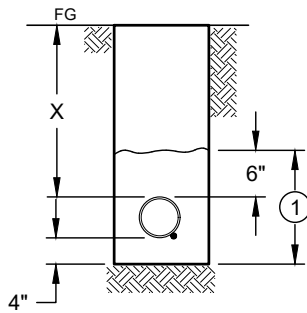
- ① WYE STRAINER: Barrel position 45° from horizontal for below ground installations
- ② BALL VALVE: Brass
- ③ FOR POTABLE SERVICE: Backflow Assembly (reduced pressure type), FEBCO/WILKINS
FOR RECYCLED SERVICE: Pressure Regulator. Where there is no backflow assembly, place wye strainer and regulator 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****

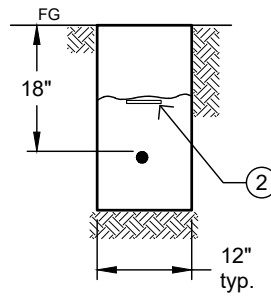
REVISIONS	BY	APP	DATE
Revised Note 1	MH	BL	11-09
Revised title; Drafting edits	JDL	MH	10-12
Revised Notes 3, 4 & 5	DVB	BL	10-07
STANDARD CURRENT AS OF:		May 2018	



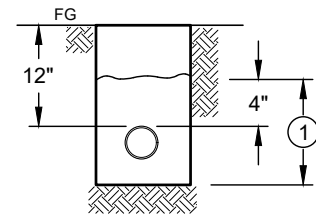
IRRIGATION SERVICE ASSEMBLY



PRESSURE LINE & CONTROL WIRES



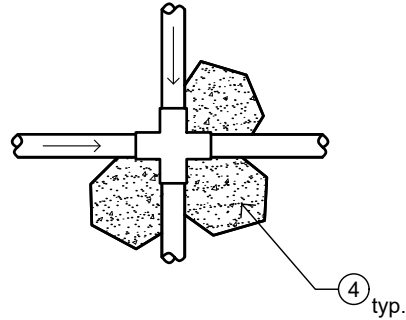
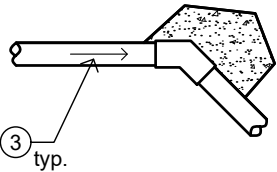
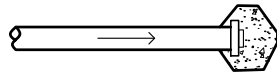
CONTROL WIRES & COMPUTER CONTROL CABLE



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



THRUST BLOCKS

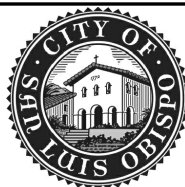
GENERAL NOTES:

- 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.

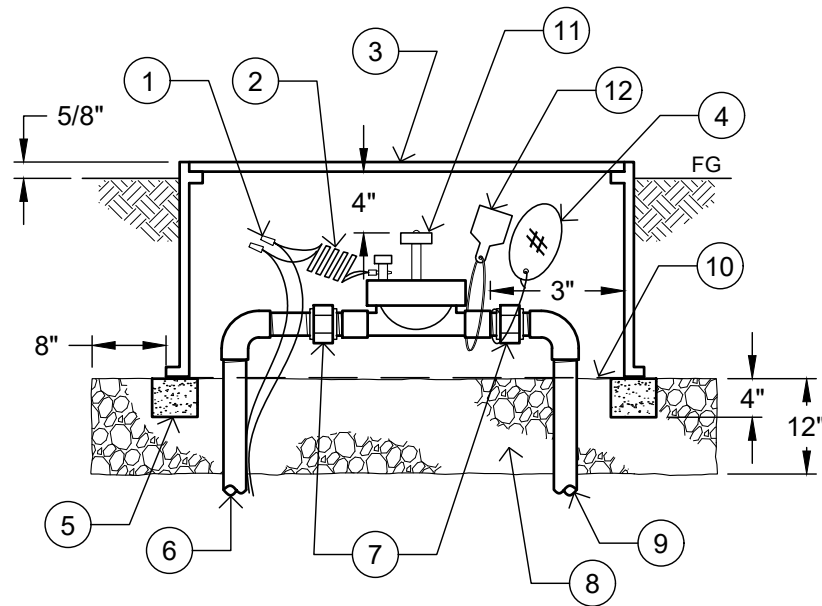
INSTALLATION NOTES:

- 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
New Standard	BL	JDW	1-04
Revise Lateral Line detail	DVB	BL	11-08
Revise Installation Note 1	JDL	BL	5-12
STANDARD CURRENT AS OF:		May 2018	



TRENCH DETAIL & THRUST BLOCKS



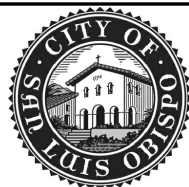
GENERAL NOTES:

- 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.

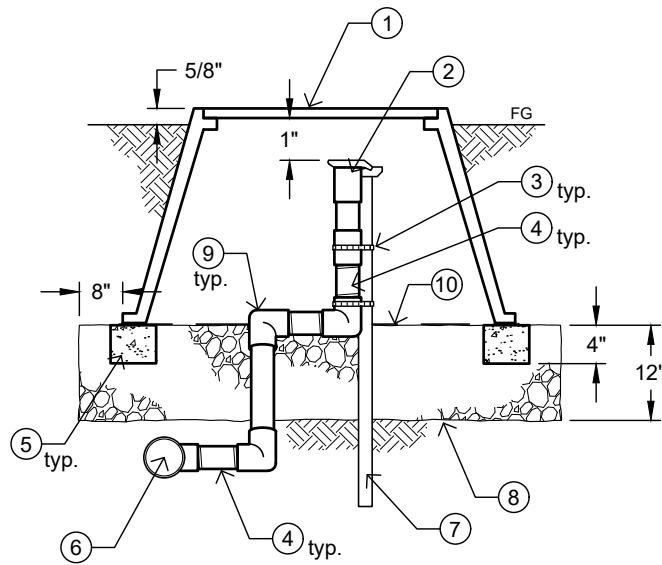
INSTALLATION NOTES:

- 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:		May 2018	



**ELECTRIC CONTROL
VALVE & BOX**



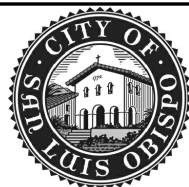
GENERAL NOTES:

- 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.

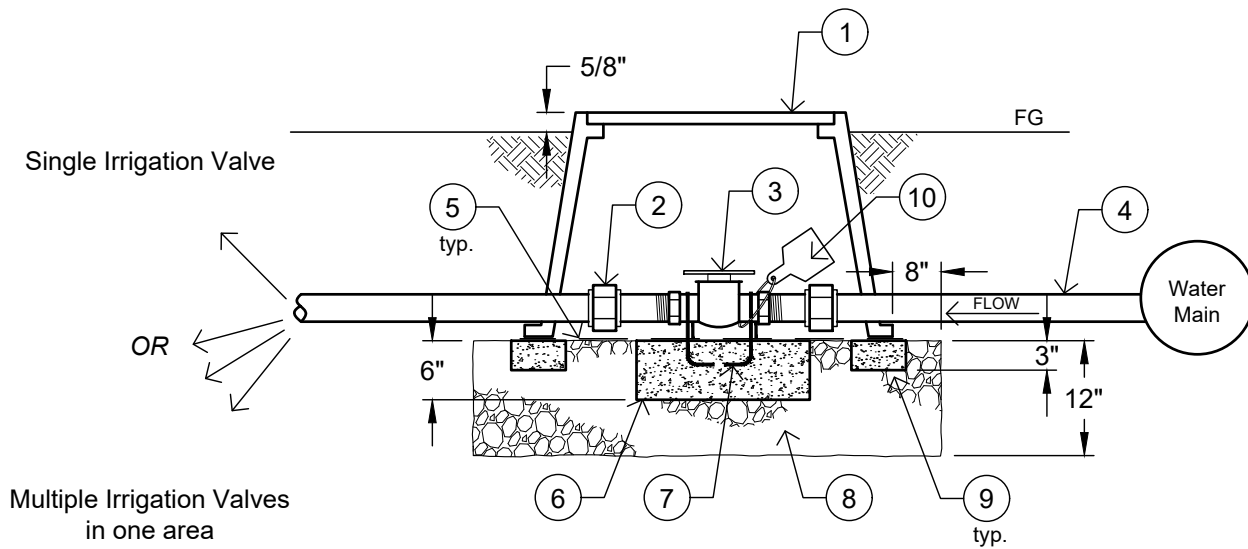
INSTALLATION NOTES:

- 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
New Standard	BL	JDW	1-04
Revise Notes E and 2	SR	BL	3-06
Drafting edits	JDL	MH	6-13
STANDARD CURRENT AS OF:		May 2018	



**QUICK COUPLER
VALVE and BOX**



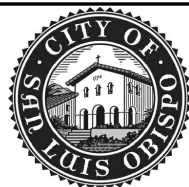
GENERAL NOTES:

- 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.

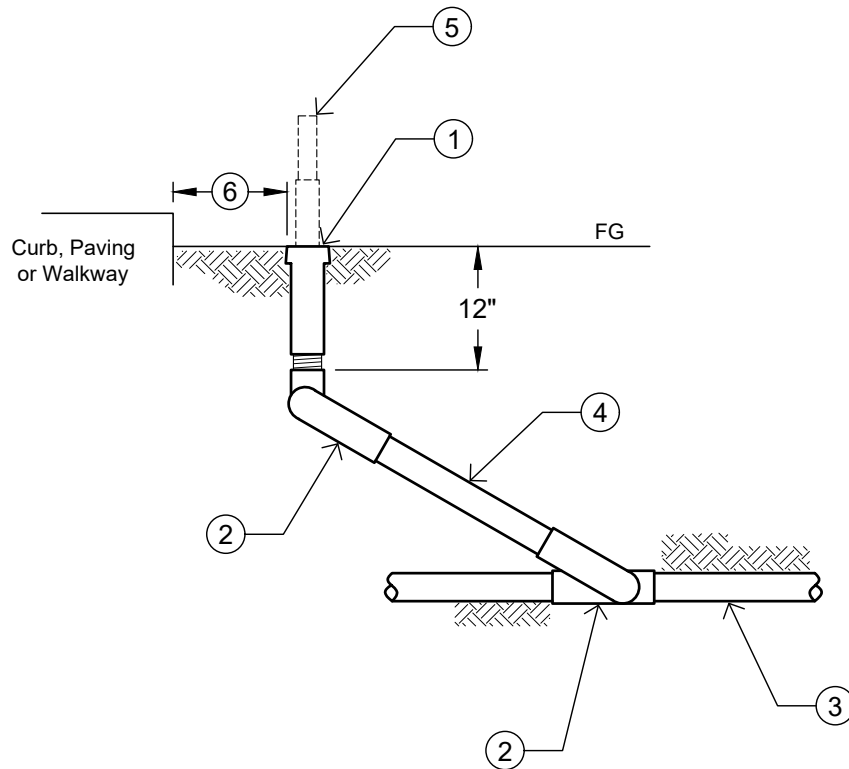
INSTALLATION NOTES:

- 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:		May 2018	



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.

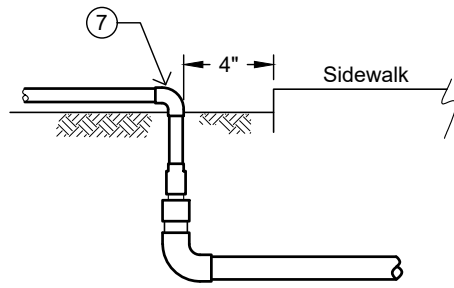
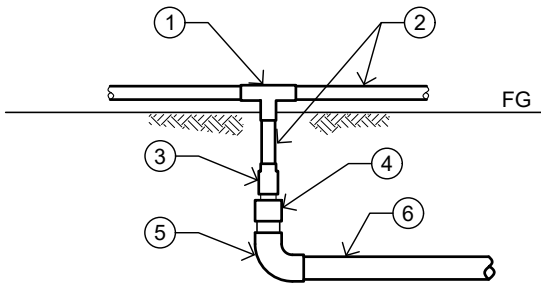
INSTALLATION NOTES:

- 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.

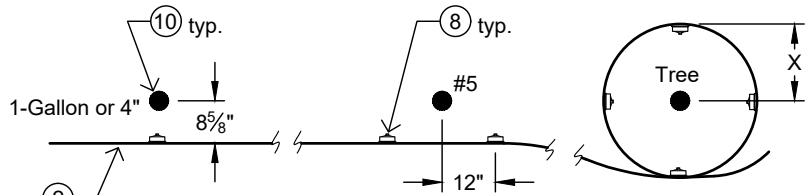
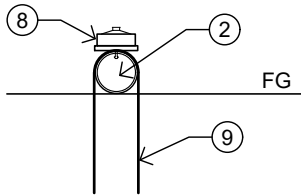
REVISIONS	BY	APP	DATE
Added note 6	MH	BL	1-14
Revise offset from curb	DVB	BL	11-07
Pop-up height (Note 5)	JDL	BL	6-12
STANDARD CURRENT AS OF:		May 2018	



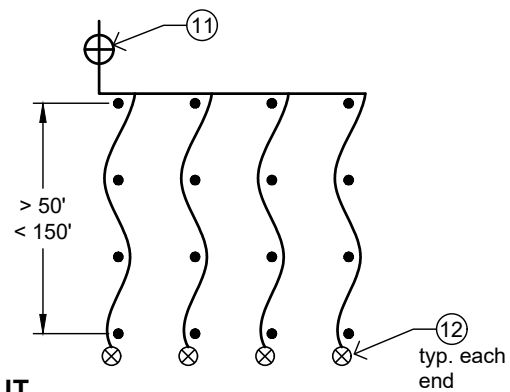
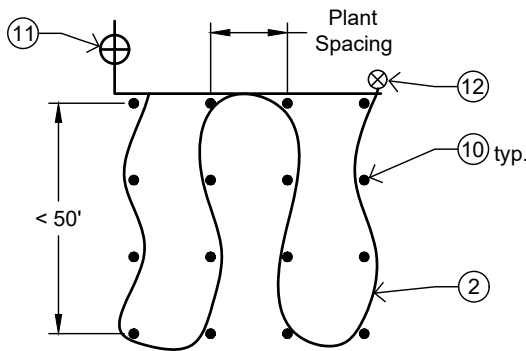
POP-UP HEAD



RISER DETAILS



EMITTERS



DRIP LAYOUT

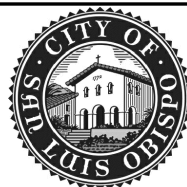
GENERAL NOTES:

- 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.

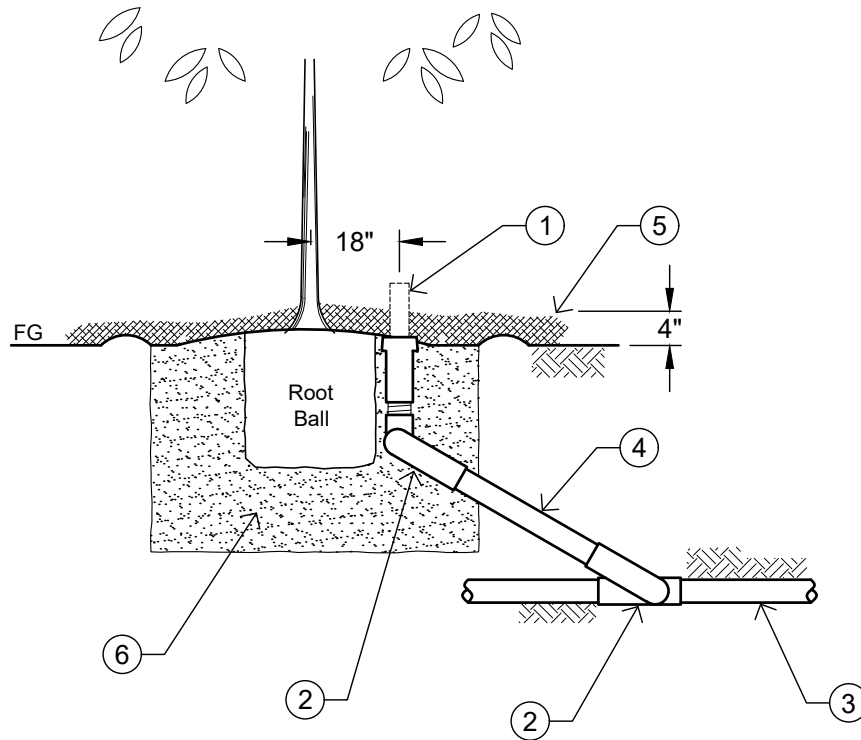
INSTALLATION NOTES:

- | | | |
|------------------------------|--|-------------------------------------|
| 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 Ell | 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:		May 2018	



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.

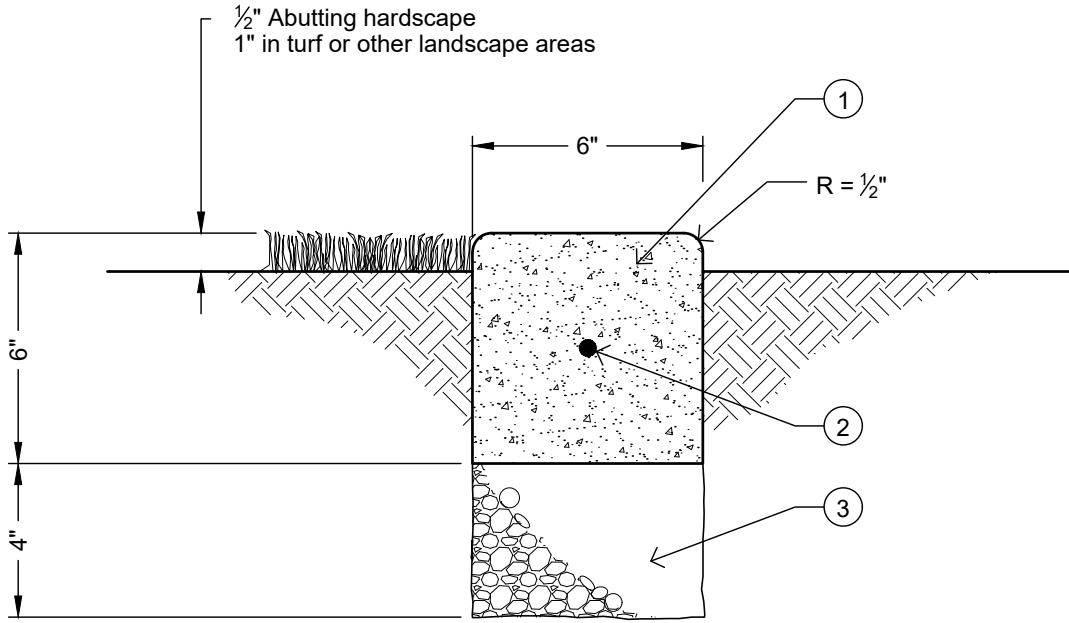
INSTALLATION NOTES:

- 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:		May 2018	



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:		May 2018	



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:

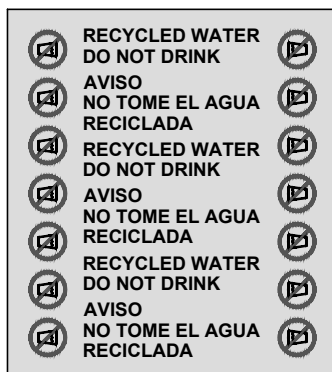
- Shall be Christy's #3800 or equal.
- Warning Plates shall be made of purple UV resistant co-polymer plastic, and installed with tamper-proof rivets.



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:		May 2018	



**RECYCLED WATER
WARNING TAGS,
LABELS and DECALS**

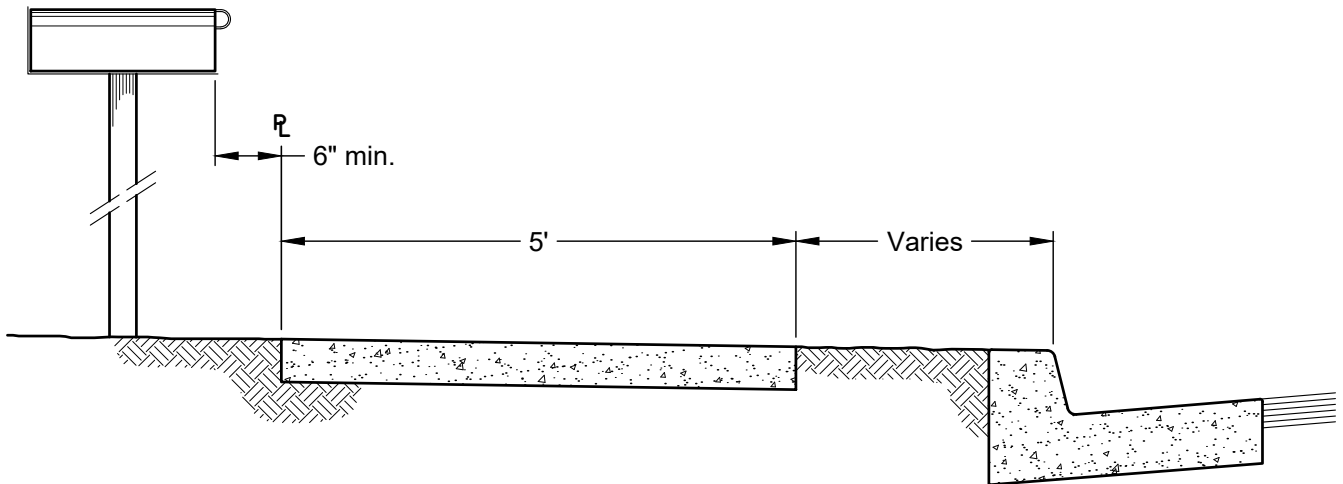
GENERAL NOTES:

- 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.

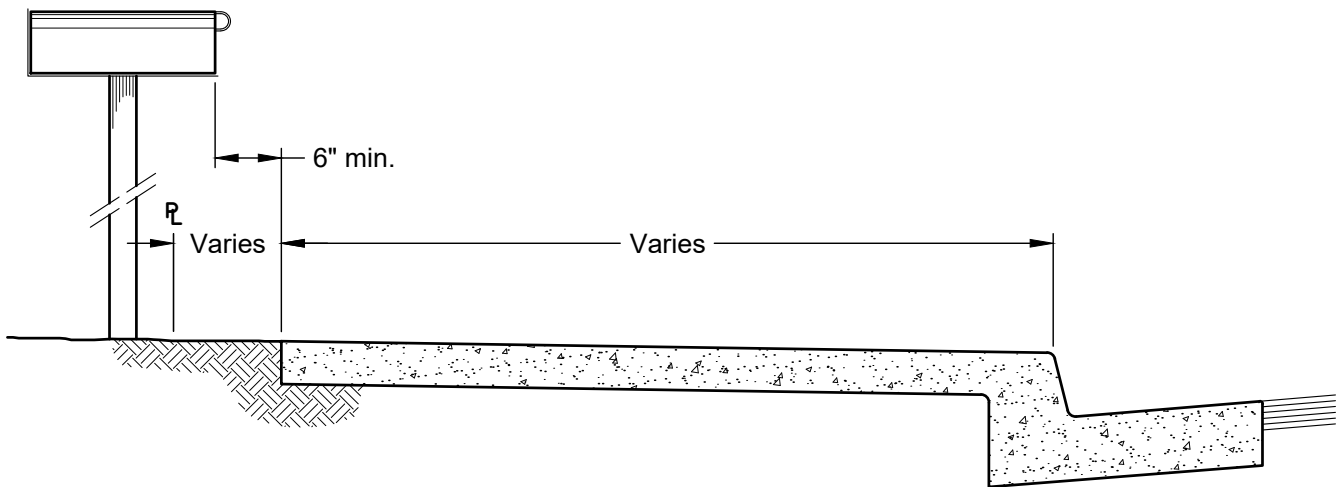
REVISIONS	BY	APP	DATE
<i>New Standard</i>	<i>SR</i>	<i>BL</i>	<i>3-06</i>
<i>Revise Notes for standard signs</i>	<i>DVB</i>	<i>BL</i>	<i>10-07</i>
<i>Drafting edits</i>	<i>JDL</i>	<i>MH</i>	<i>6-13</i>
STANDARD CURRENT AS OF:		May 2018	



**RECYCLED WATER
WARNING SIGNS**



DETACHED SIDEWALK

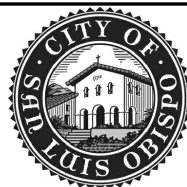


INTEGRAL SIDEWALK

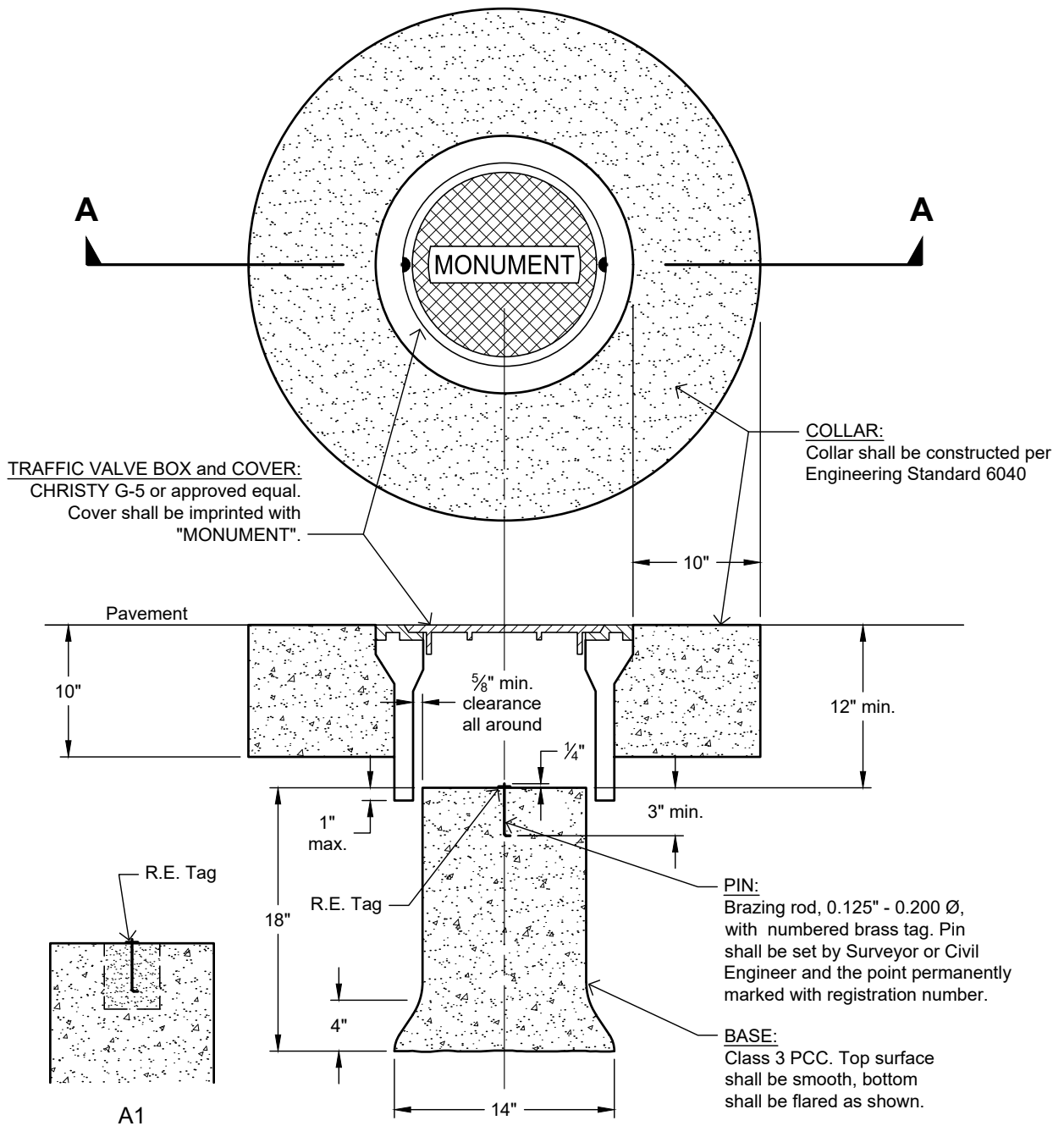
Municipal Code Section 12.40.040

(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 purposes 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>	<i>JDL</i>	<i>WAP</i>	<i>1-98</i>
<i>Revise Code Section</i>	<i>JDL</i>	<i>WAP</i>	<i>10-93</i>
<i>Drafting edits</i>	<i>JDL</i>	<i>MH</i>	<i>6-13</i>
STANDARD CURRENT AS OF:		May 2018	



MAIL BOX LOCATION



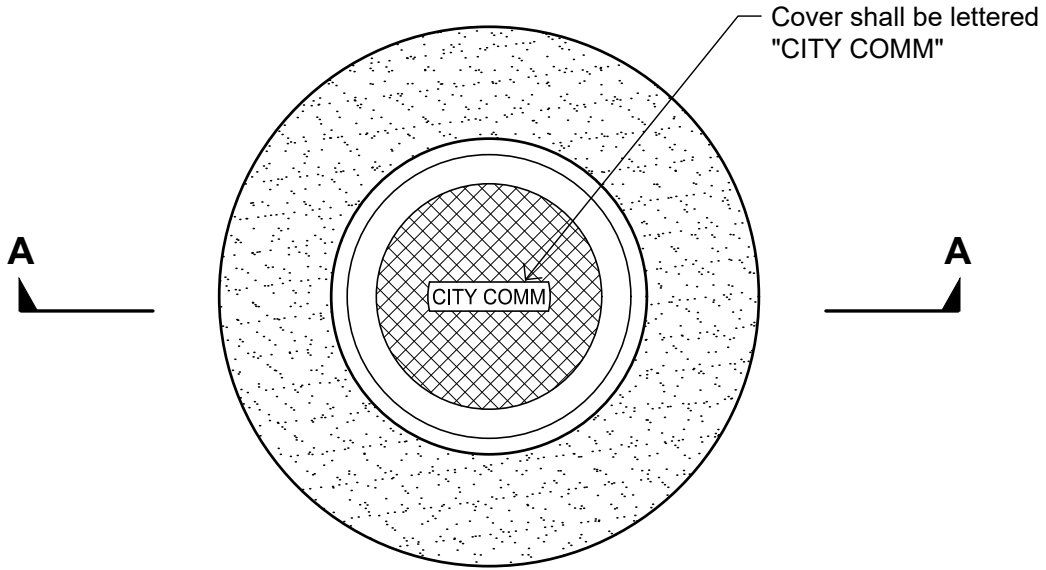
ALTERNATE METHODS

- 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 $\frac{5}{8}$ " of the monument point. Point shall be marked with a cross, etched a minimum of $\frac{1}{16}$ " 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:		May 2018	

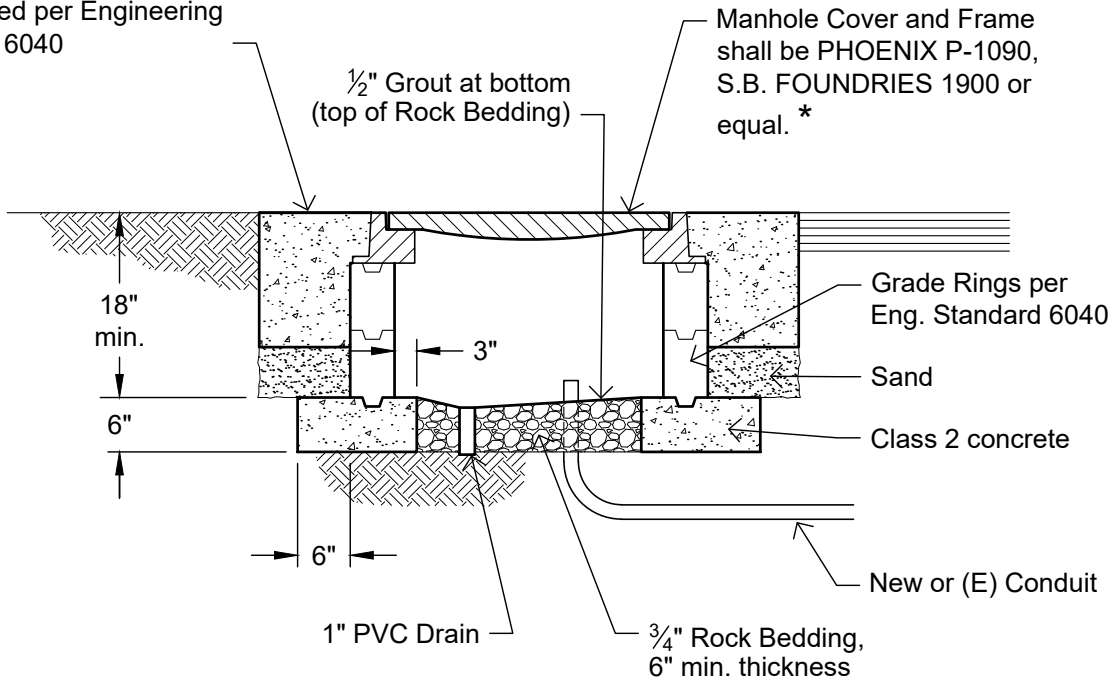


MONUMENT and WELL



PLAN

Manhole Collar shall be constructed per Engineering Standard 6040



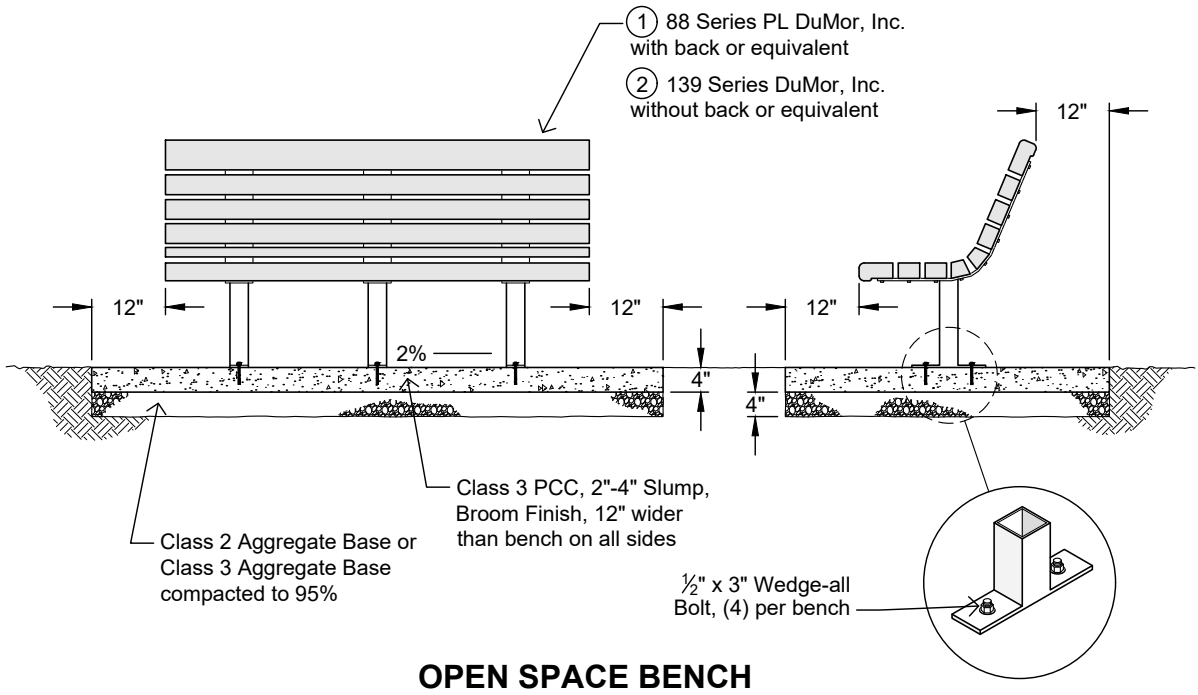
SECTION A - A

* 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:		May 2018	



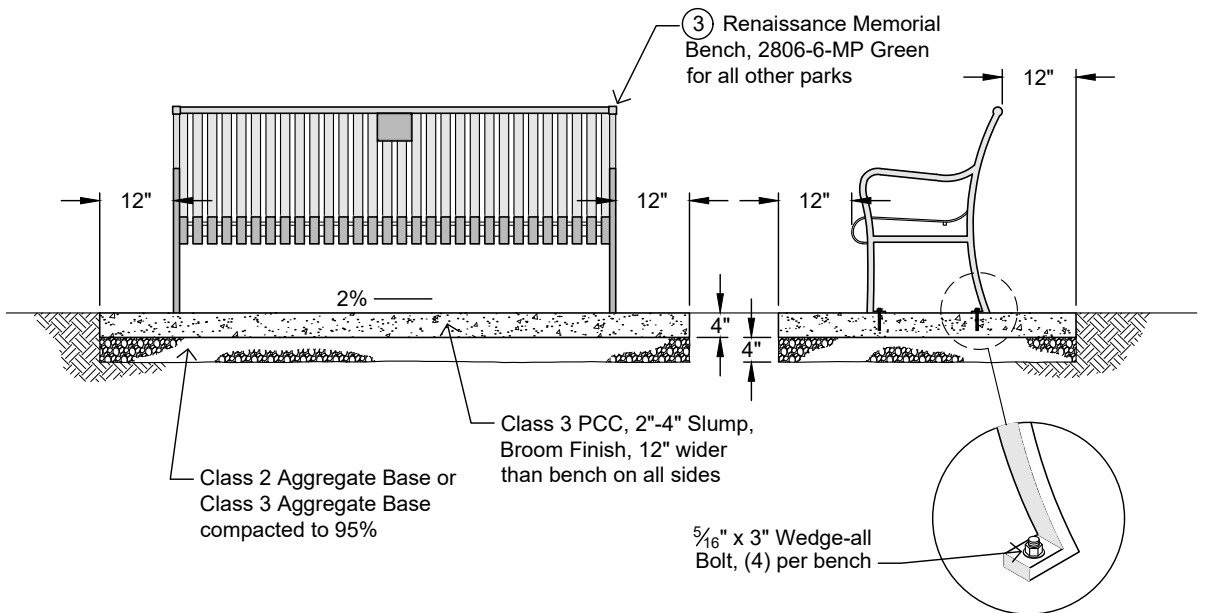
**MANHOLE COVER
& ACCESS BOX**
CITY COMMUNICATIONS



OPEN SPACE BENCH

NOTES:

- ① Style for Damon-Garcia and Laguna Lake Parks
- ② Style for Open Space
- ③ Style for all other parks

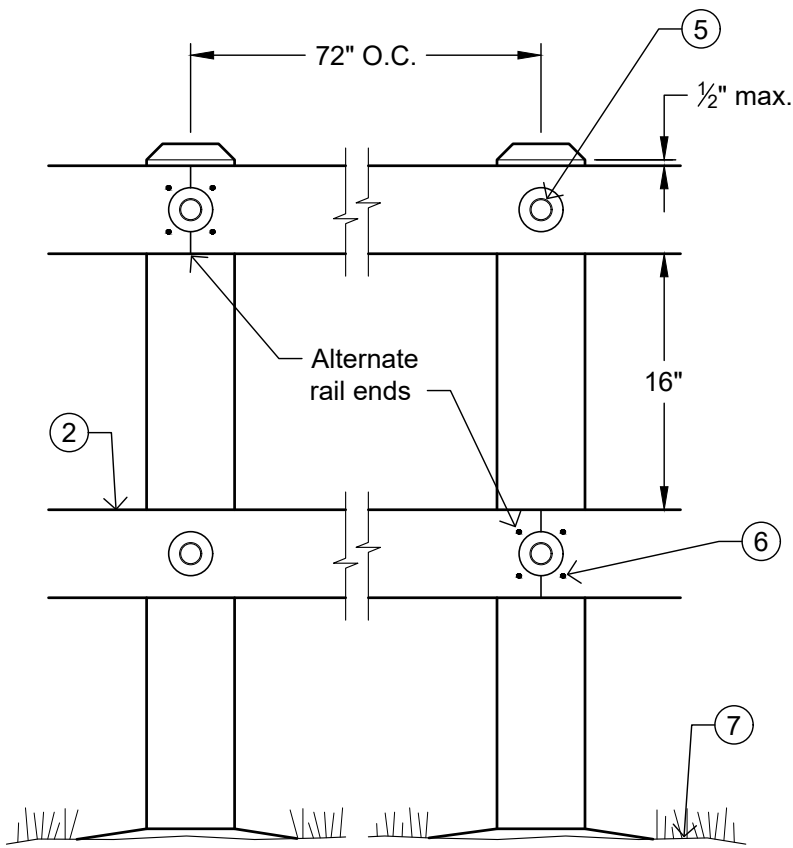


PARKS and PUBLIC RIGHT OF WAY BENCH

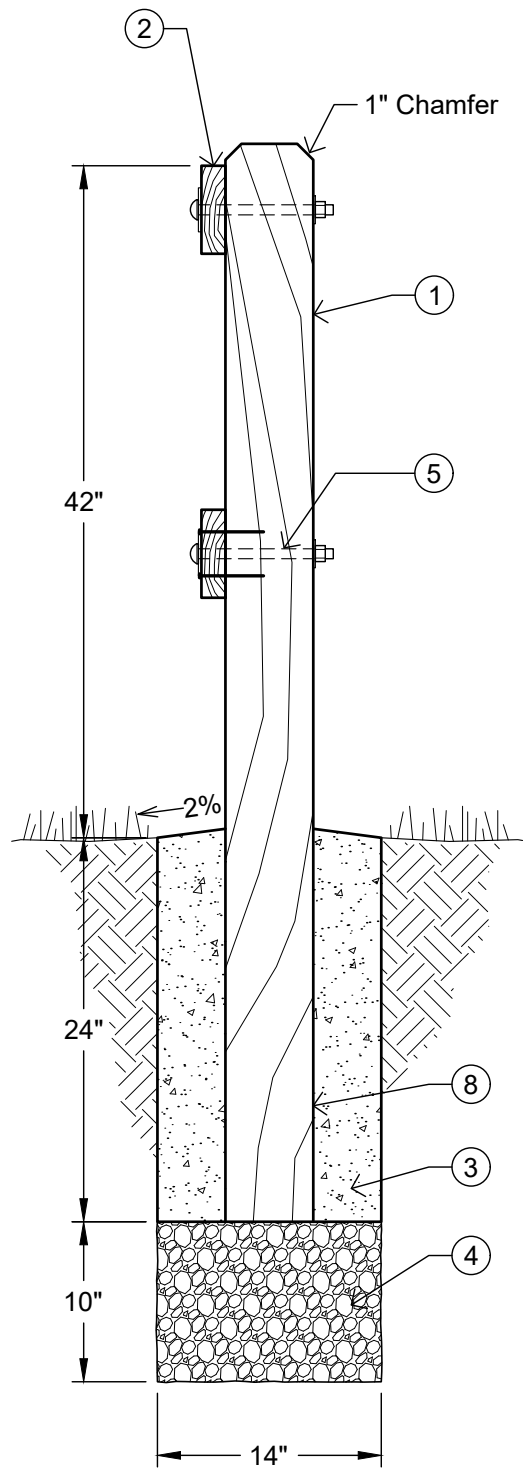
REVISIONS	BY	APP	DATE
New Standard	SR	BL	11-08
Drafting edits	JDL	MH	6-13
STANDARD CURRENT AS OF: May 2018			



CITY BENCH



ELEVATION



SECTION

INSTALLATION NOTES:

- ① 6" x 6" Pressure Treated Douglas Fir Post, re-treat all cuts
- ② 2" x 6" (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: May 2018			



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.

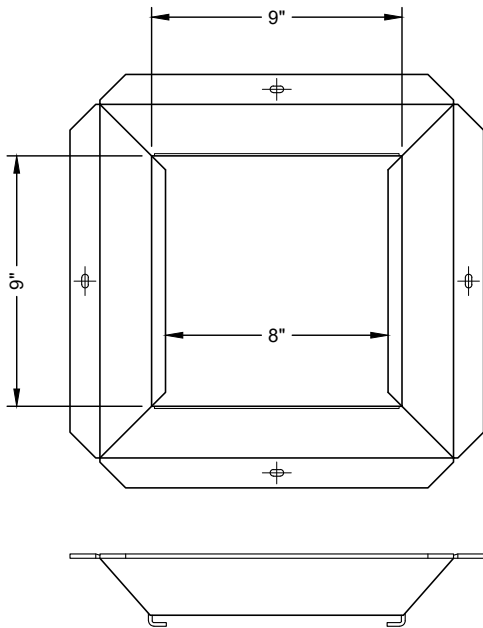
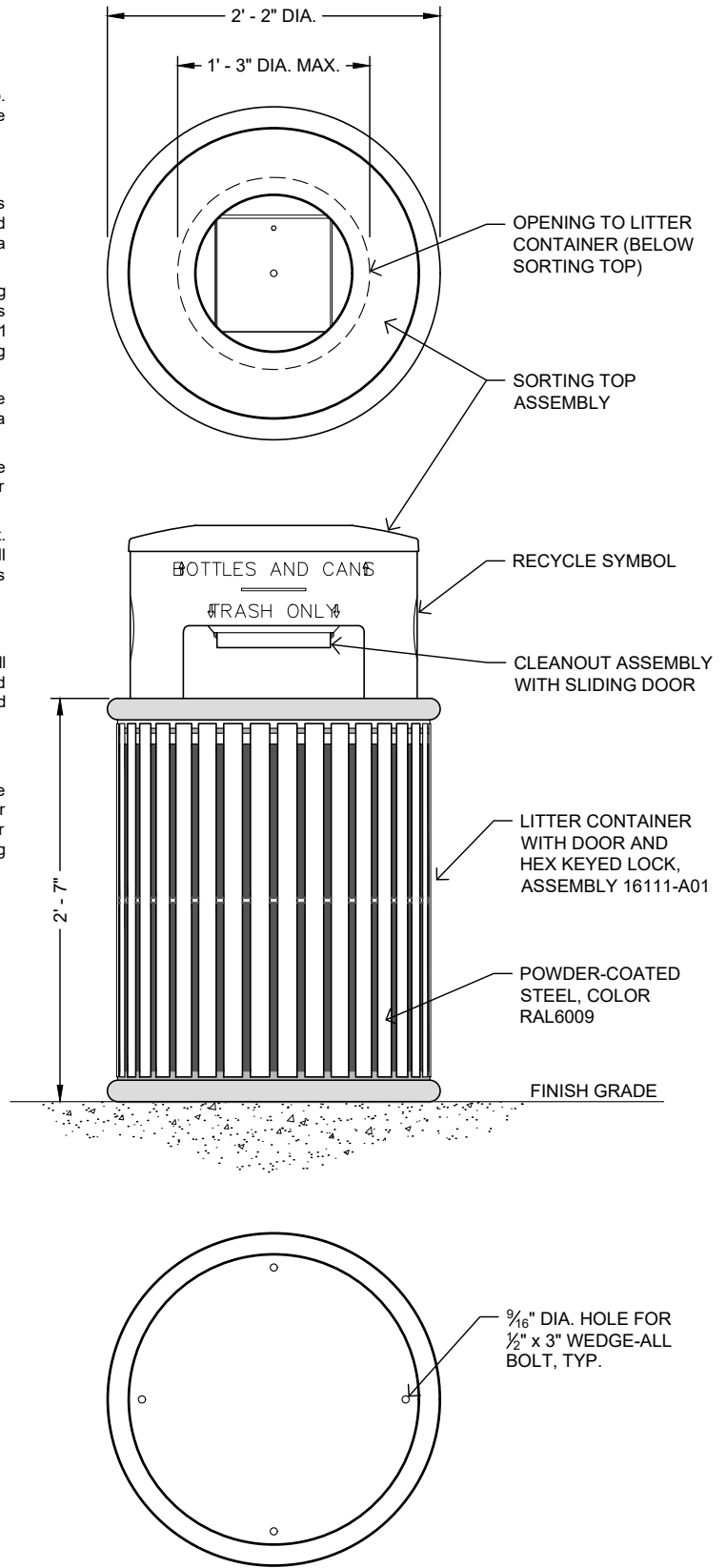
Overall dimensions shall be approximately 26" diameter and 45" in height. Container shall be surface mounted flush with the sidewalk surface and will have built in leveling capability in accordance with manufactures recommendations.

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:		May 2018	



**TRASH CONTAINER
STANDARD**

9060

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
- I. GUIDELINE SPECIFICATIONS FOR NURSERY TREE QUALITY
- J. QUALITY ASSURANCE PROGRAM
- K. TEMPORARY INDUSTRIAL WASTE DISCHARGE PERMIT APPLICATION
- L. ENCROACHMENT PERMIT / CIP HOLIDAY RESTRICTION AREA

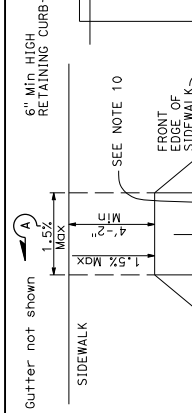
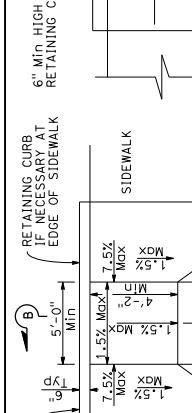
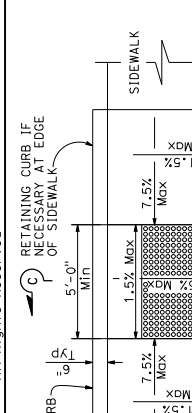
DIST.	COUNTY	ROUTE	POST MILE TOTAL PROJECT	SHEET TOTAL SHEETS

David Cardona
REGISTERED CIVIL ENGINEER
No. C41957
Exp. 3-31-19

July 21, 2017
DATE OF APPROVAL
DATE OF EXPIRATION

THE STATE OF CALIFORNIA
FOR AGENCIES SHALL NOT BE RESPONSIBLE FOR
COMPLETION OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED _____



RAISED TRUNCATED DOME PATTERN (IN-LINE) DETECTABLE WARNING SURFACE

See Note 10

1. As site conditions dictate, Case A through Case G curb ramps may be used. 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. For specific site condition configuration, including the conform to existing sidewalk, see Project Plans.

2. If distance from curb to back of sidewalk is too short to accommodate ramp and 4'-2" platform (landing) 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.

3. When ramp is located in center of curb return, crosswalk configuration must be similar to that shown for Detail B.

4. As site conditions dictate, the retaining curb side and the flared side of the Case G ramp shall be constructed in reversed position.

5. The ramp portion of the curb ramp is a typical rectangle, unless modified in the Project Plans.

6. 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.

7. The adjacent surfaces at transitions at curb ramps to walks, gutters, and streets shall be at the same level.

8. Counter slopes of adjoining gutters and road surfaces immediately adjacent to and within 24 inches of the curb ramp shall not be steeper than 1V:20H (5.0%). Gutter pan slope shall not exceed 1" of depth for each 2'-0" of width.

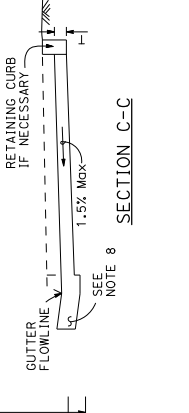
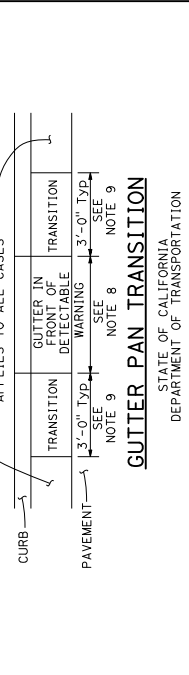
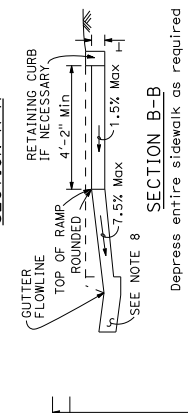
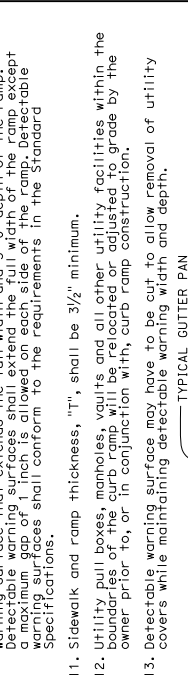
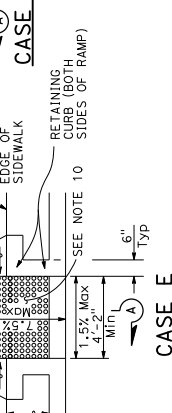
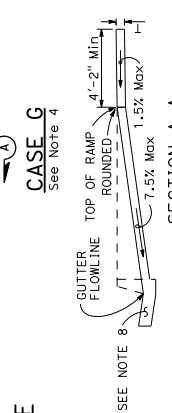
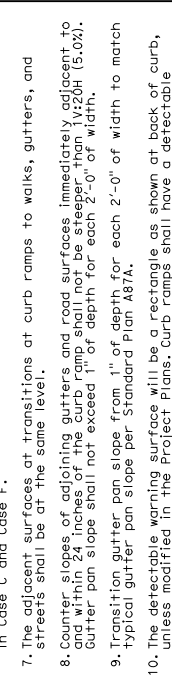
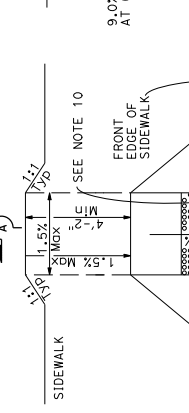
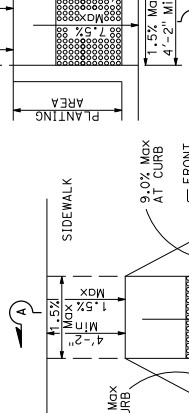
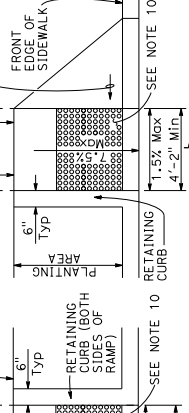
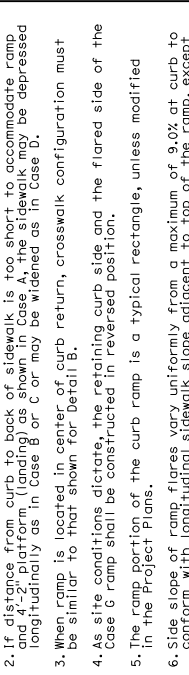
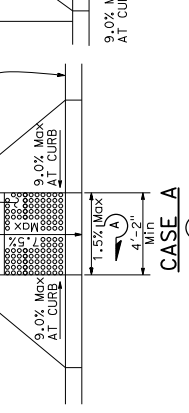
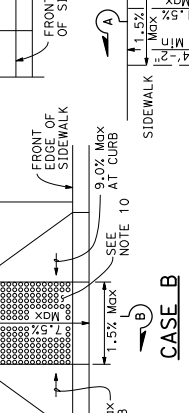
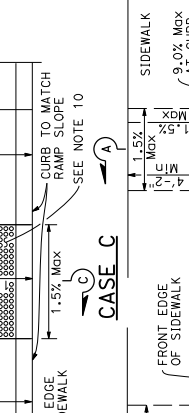
9. Transition gutter pan slope from 1" of depth for each 2'-0" of width to match typical gutter pan slope per Standard Plan A87A.

10. The detectable warning surface will be a rectangle as shown at back of curb, unless modified in the Project Plans. Curb ramps shall have a detectable warning surface that extends the full width and 3'-0" depth of the ramp. Detectable warning surfaces shall extend the full width of the ramp except where a maximum gap of 1/4 inch is allowed on each side of the ramp. Detectable warning surfaces shall conform to the requirements in the Standard Specifications.

11. Sidewalk and ramp thickness, "T", shall be 3 1/2" minimum.

12. 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.

13. Detectable warning surface may have to be cut to allow removal of utility covers while maintaining detectable warning width and depth.



RAISED TRUNCATED DOME PATTERN (IN-LINE) DETECTABLE WARNING SURFACE

See Note 10

1. As site conditions dictate, Case A through Case G curb ramps may be used. 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. For specific site condition configuration, including the conform to existing sidewalk, see Project Plans.

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8. Counter slopes of adjoining gutters and road surfaces immediately adjacent to and within 24 inches of the curb ramp shall not be steeper than 1V:20H (5.0%). Gutter pan slope shall not exceed 1" of depth for each 2'-0" of width.

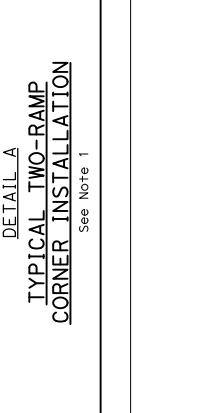
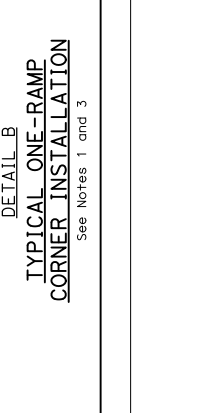
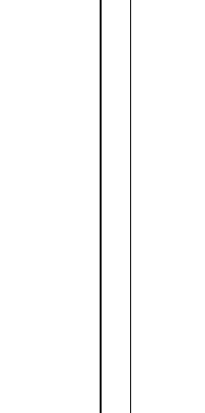
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12. Utility pull boxes, manholes, vaults and all other utility facilities within the boundaries of the curb ramp will be relocated or adjusted to grade by the owner prior to, or in conjunction with, curb ramp construction.

13. Detectable warning surface may have to be cut to allow removal of utility covers while maintaining detectable warning width and depth.



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DIS#	COUNTY	ROUTE	POST MILE TOTAL PROJECT	SHEET TOTAL
				NO. SHEETS

David Cardona
REGISTERED CIVIL ENGINEER

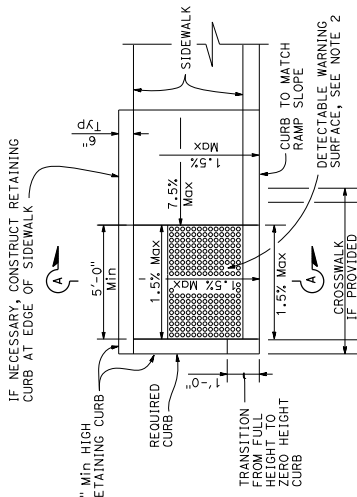
JULY 21, 2017
PROJECT DATE
DATE OF THIS SHEET

PROFESSIONAL ENGINEER
No. C41957
Exp. 3-31-19
STATE OF CALIFORNIA

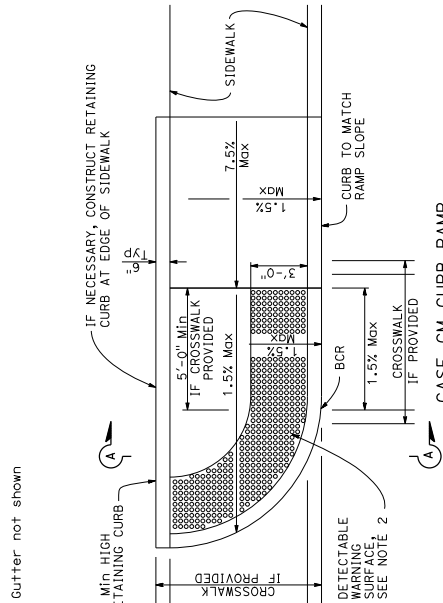
THIS STATE OF CALIFORNIA LICENSE IS VALID FOR THE STATE OF CALIFORNIA ONLY. THIS LICENSE IS NOT VALID FOR ANY OTHER JURISDICTION. THIS LICENSE IS NOT VALID FOR ANY OTHER JURISDICTION. THIS LICENSE IS NOT VALID FOR ANY OTHER JURISDICTION.

NOTES:

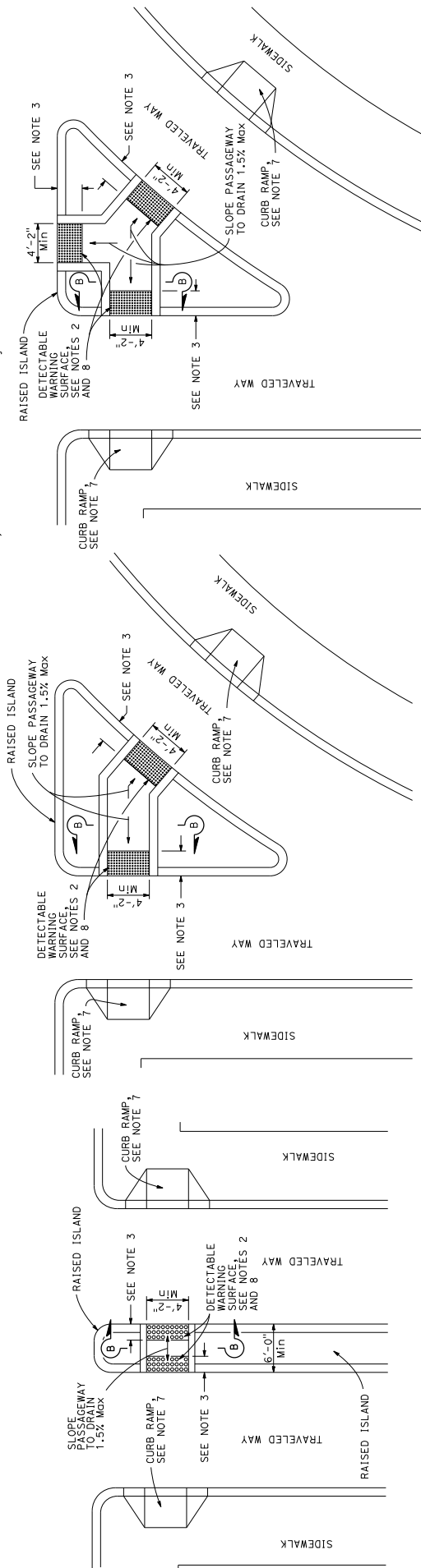
1. Sidewalk, ramp, and passageway thickness, T , shall be $\frac{3}{4}$ " minimum.
2. For details of detectable warning surfaces, see Revised Standard Plan RSP A88A.
3. Where an island passageway length is greater than or equal to 8'-0", each detectable warning surface shall extend the full width and 2'-0" depth of the passageway length. Where an island passageway length is greater than or equal to 8'-0", each detectable warning surface shall extend the full width of the island passageway except a maximum gap of 1 inch is allowed on each side of the passageway.
4. The adjacent surfaces at transitions at curb ramps to walks, gutters, and streets shall be at the same level.
5. Utility pull boxes, manholes, vaults and all other utility facilities within the boundaries of the curb ramp will be cut to grade to be flush with the curb ramp construction, or in conjunction with, curb ramp construction.
6. Detectable warning surface may have to be cut to allow removal of utility covers while maintaining detectable warning width and depth.
7. For additional curb ramp details, see Revised Standard Plan RSP A88A.
8. The detectable warning surface will be a rectangle as shown at the face of curb, unless modified in the Project Plans.



CASE CH CURB RAMP



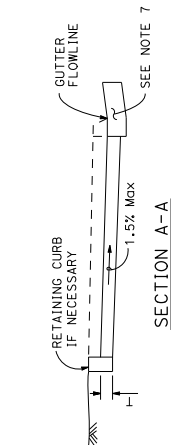
CASE CM CURB RAMP



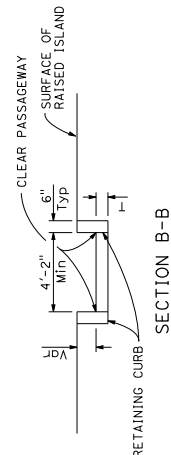
TYPE A PASSAGEWAY

TYPE B PASSAGEWAY

TYPE C PASSAGEWAY



SECTION A-A



SECTION B-B



SECTION C-C

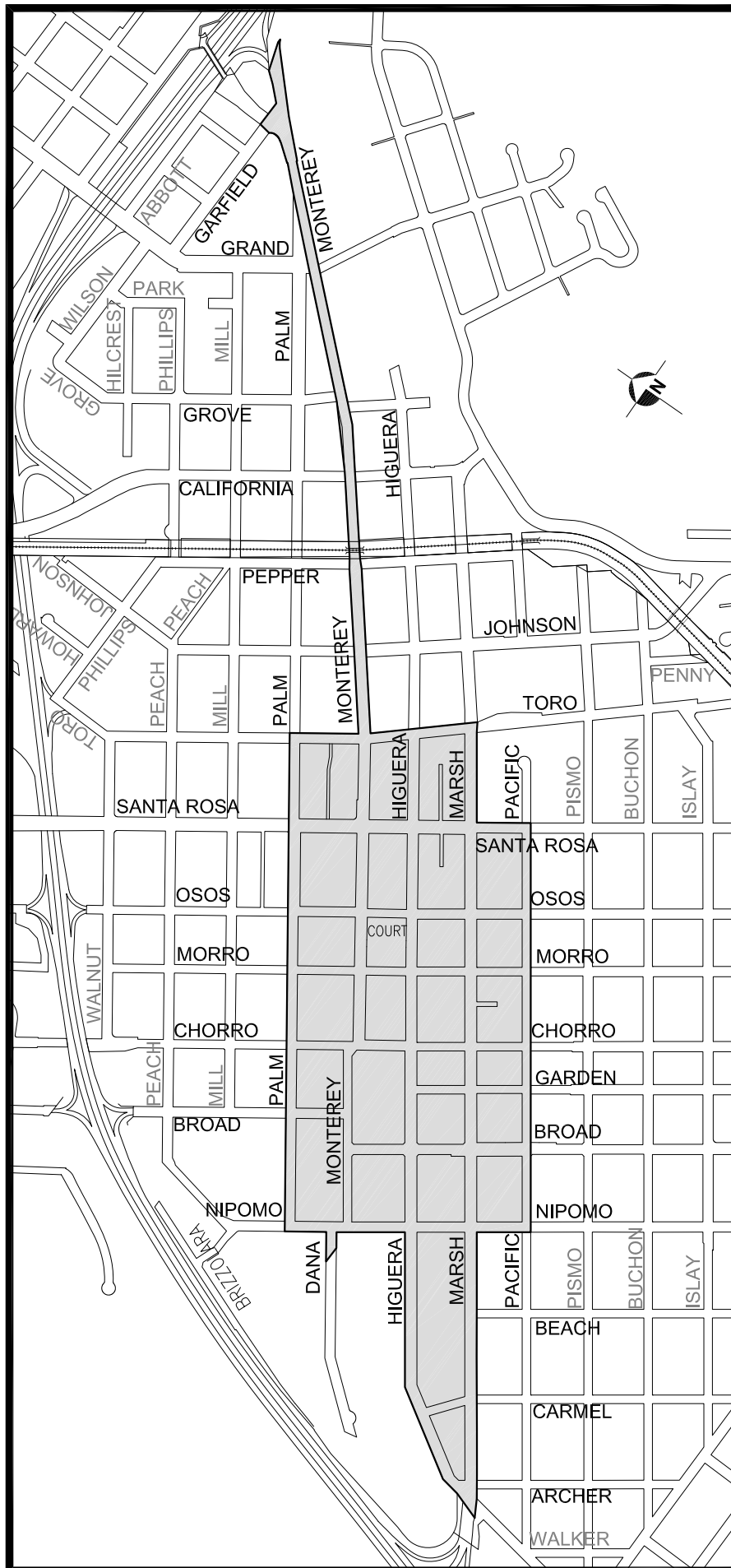
NO SCALE

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

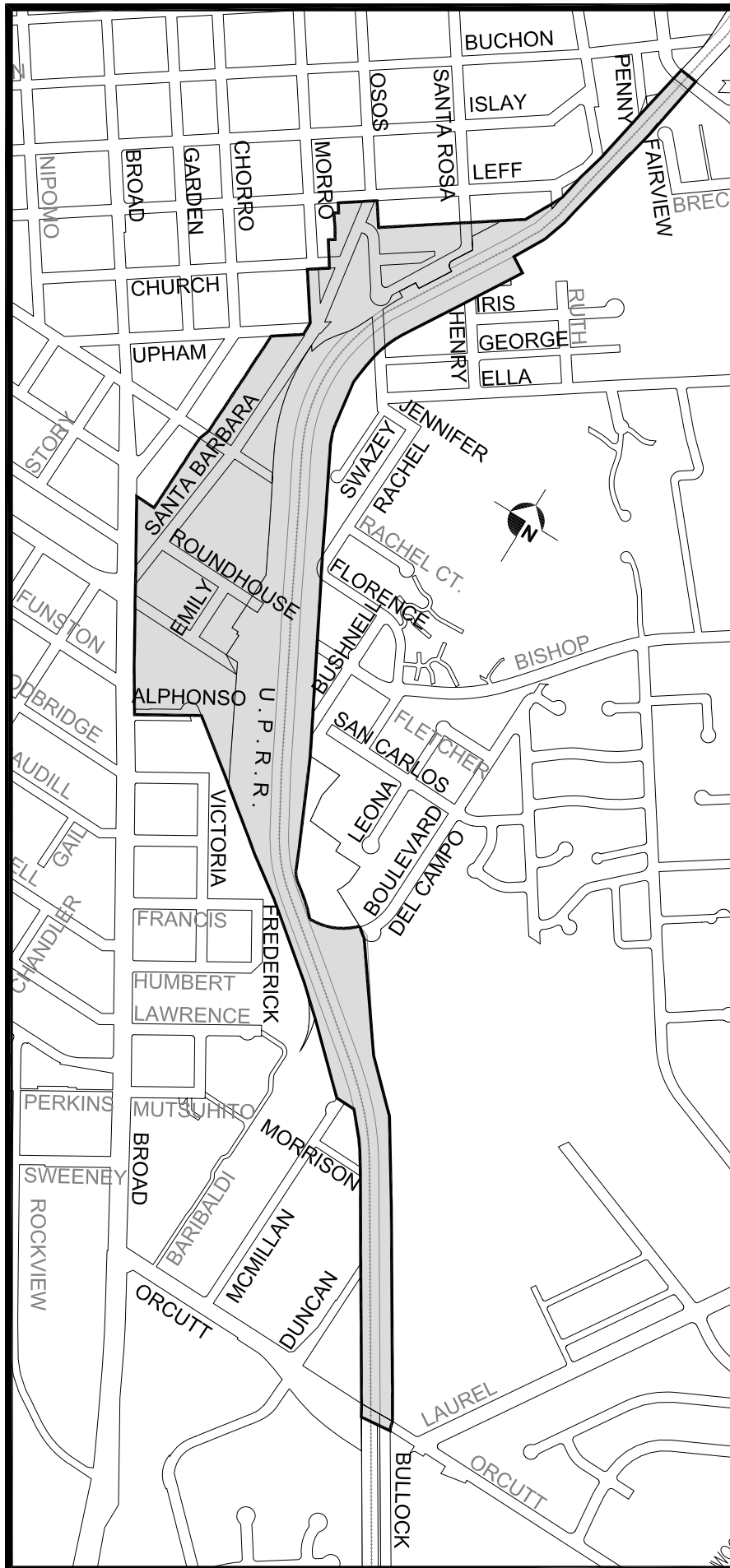
ISLAND PASSAGEWAY DETAILS
CURB RAMP AND

REVISED STANDARD PLAN RSP A88B

MISSION STYLE SIDEWALK DISTRICT - RESOLUTION 9114 (2000 SERIES)



RAILROAD DISTRICT PLAN - RESOLUTION 8817 (1998) 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'

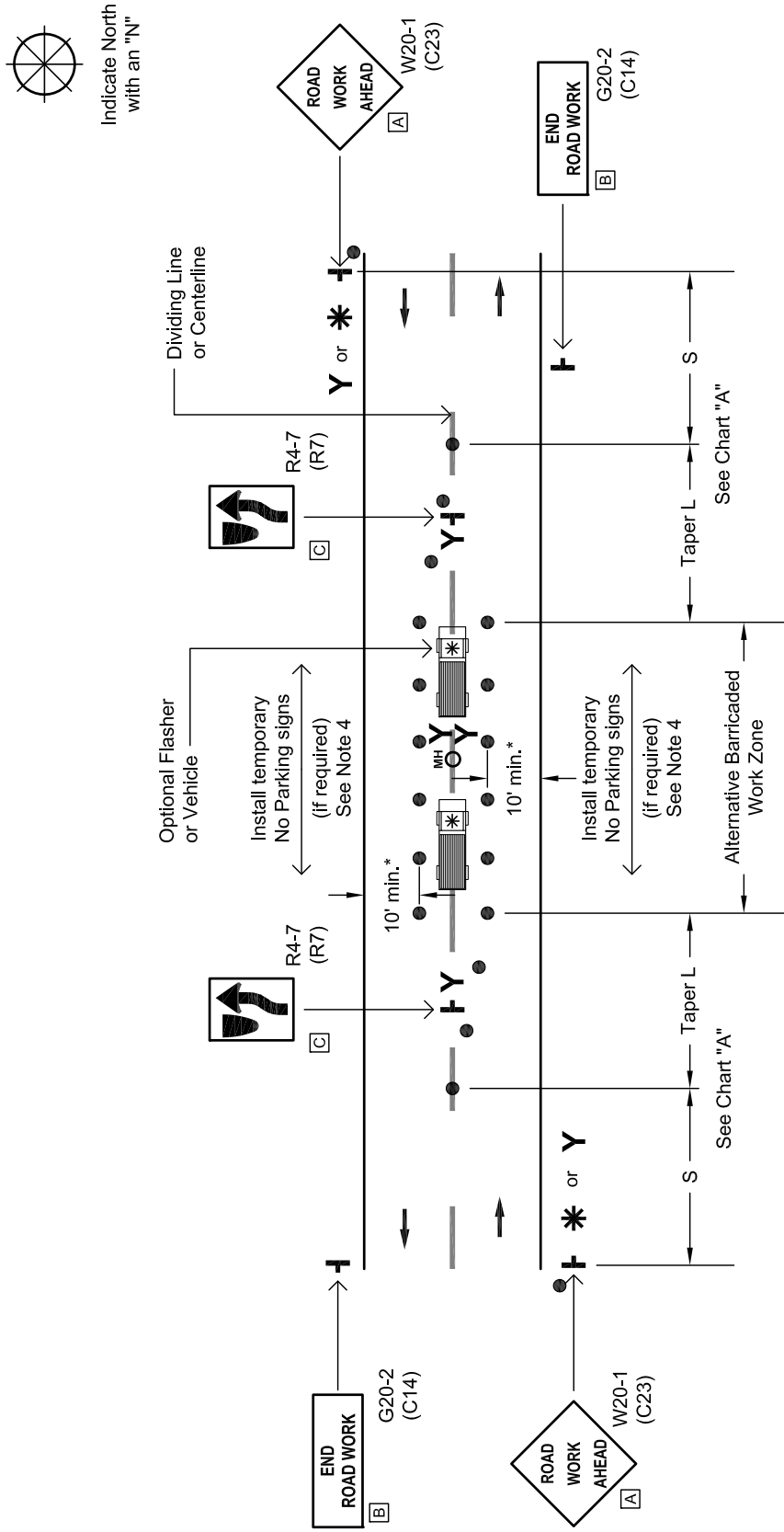
*12' STANDARD LANE WIDTH FOR CALCULATION PURPOSES. WIDER LANES REQUIRE ADDITIONAL LENGTH

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

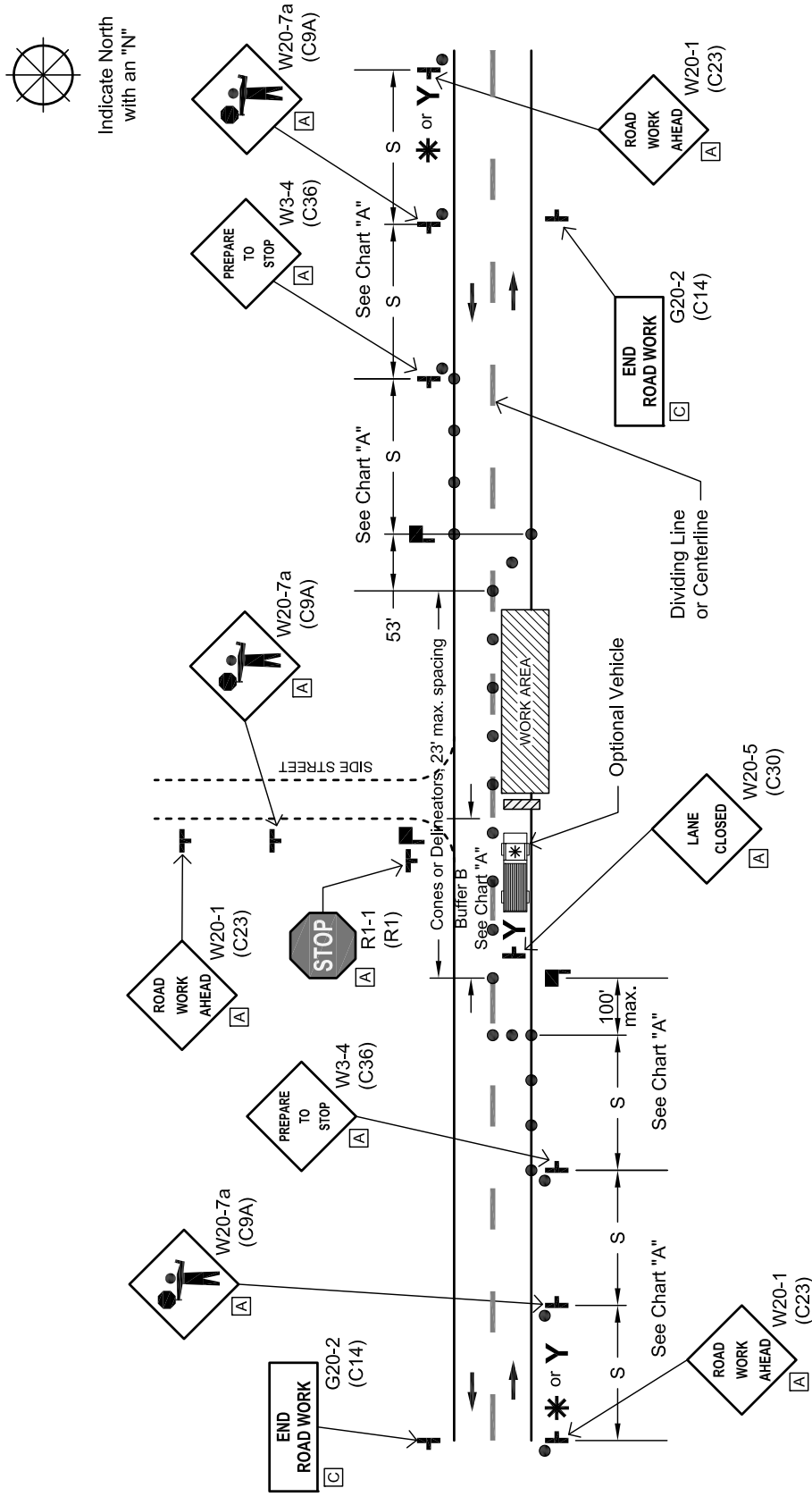


SIGN PANEL SIZE (min.)	
A	36" x 36"
B	36" x 18"
C	24" x 18"

* 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 B TWO-LANE ONE WAY CLOSURE WITH FLAGGERS

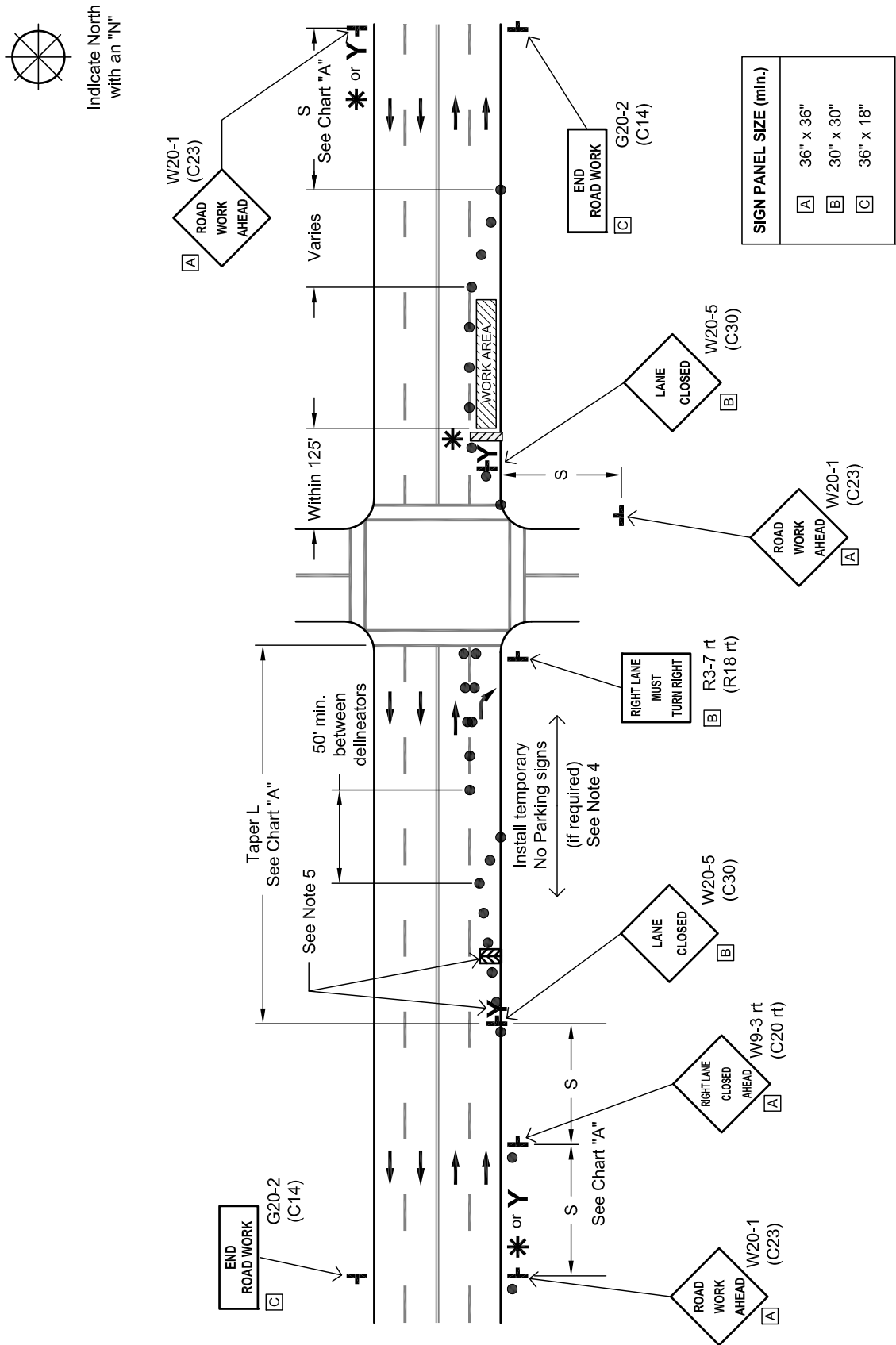


SIGN PANEL SIZE (min.)	
A	36" X 36"
B	30" X 30"
C	36" X 18"

* 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; Taper dist.	JDL	MH	4-13

FIGURE C MULTI-LANE OUTSIDE LANE CLOSURE BEYOND INTERSECTION

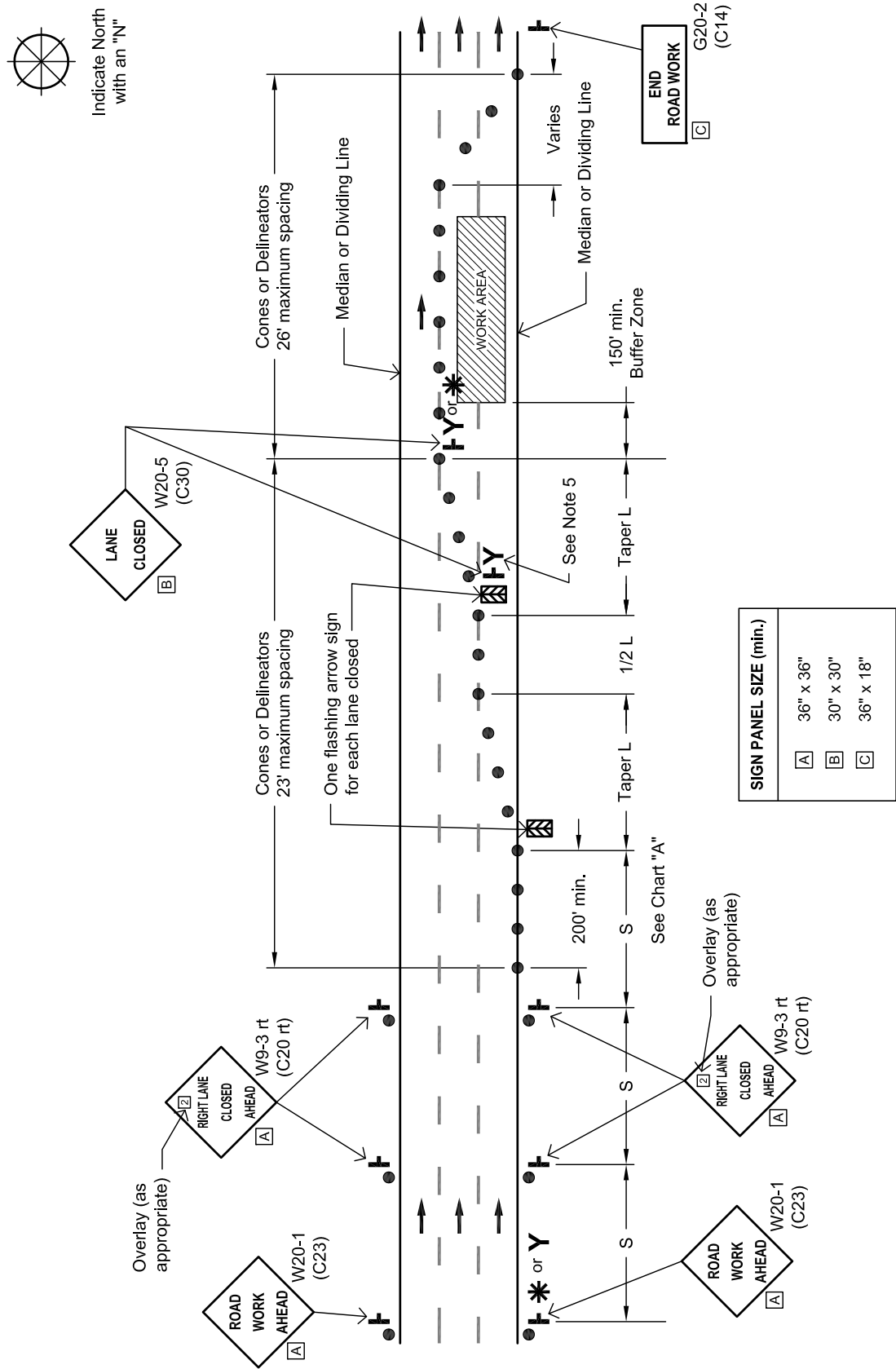


* SEE PAGE 1 THIS APPENDIX FOR LEGEND, NOTES AND SPACING REQUIREMENTS.

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)



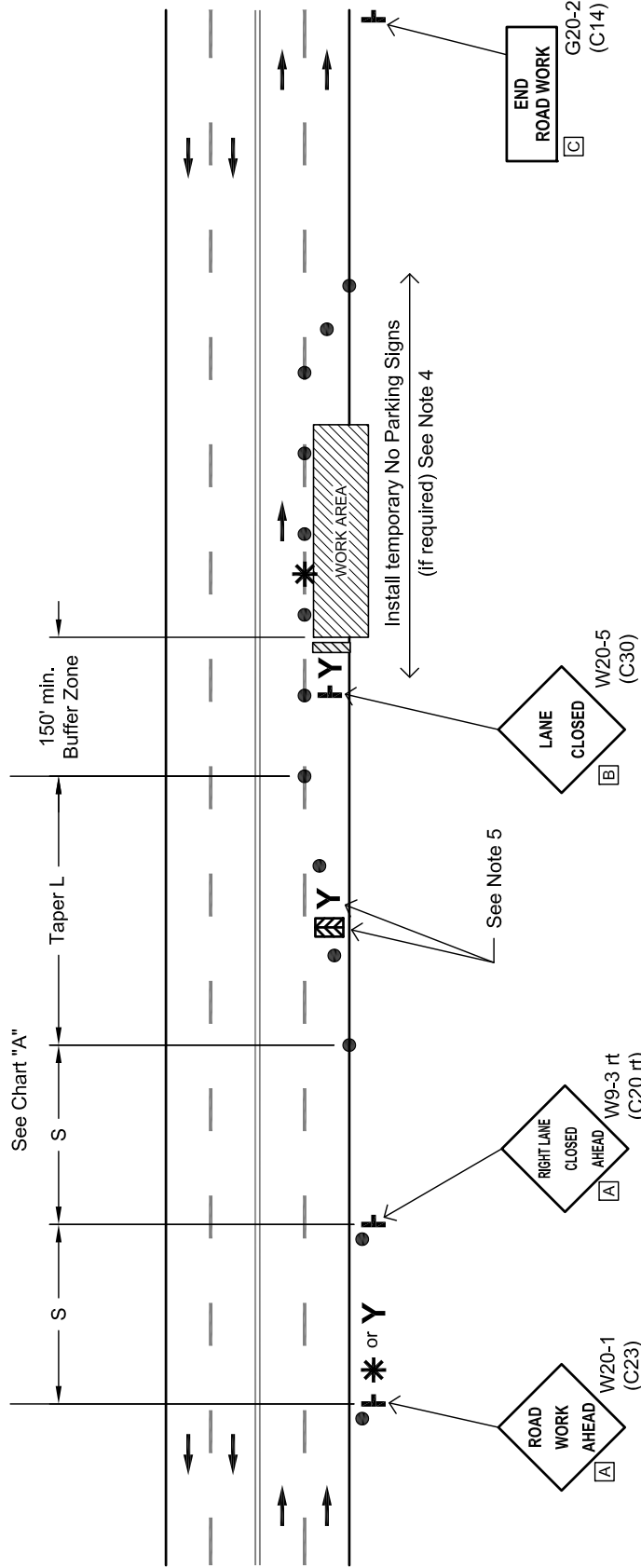
* SEE PAGE 1 THIS APPENDIX FOR LEGEND, NOTES AND SPACING REQUIREMENTS.

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"

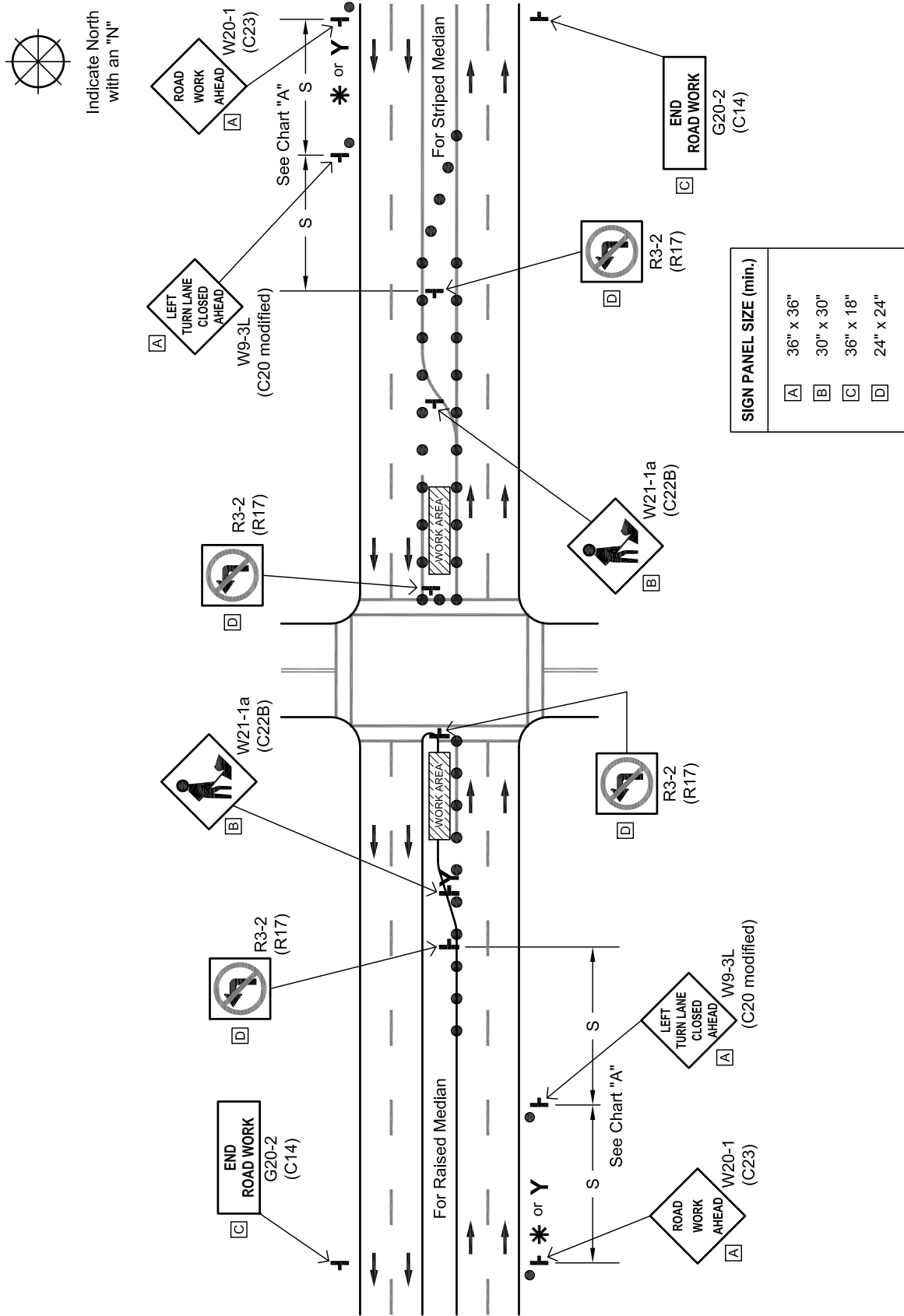


SIGN PANEL SIZE (min.)	
A	36" x 36"
B	30" x 30"
C	36" x 18"

* 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

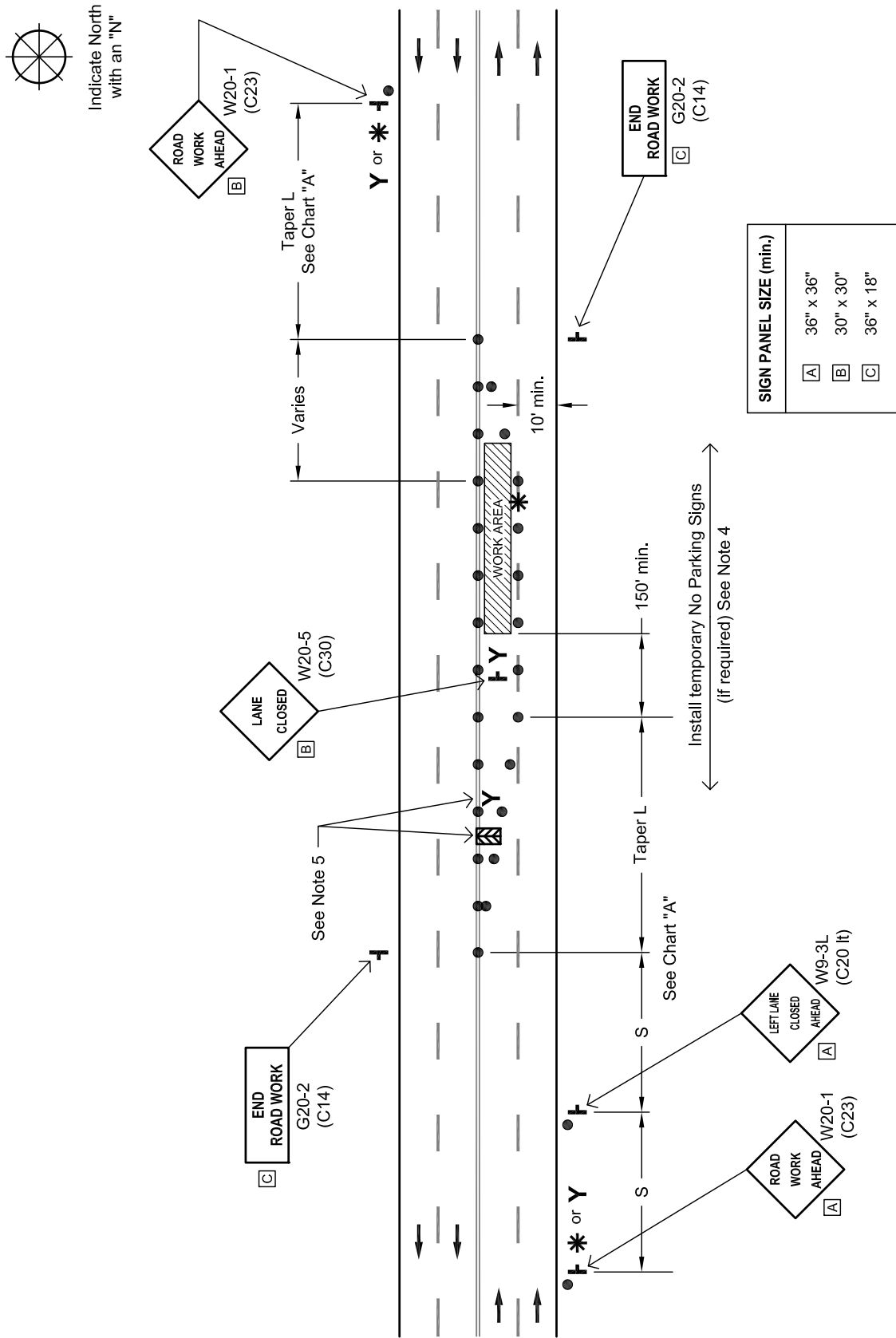
FIGURE F MULTI-LANE LEFT LANE CLOSURE BEYOND INTERSECTION



* 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

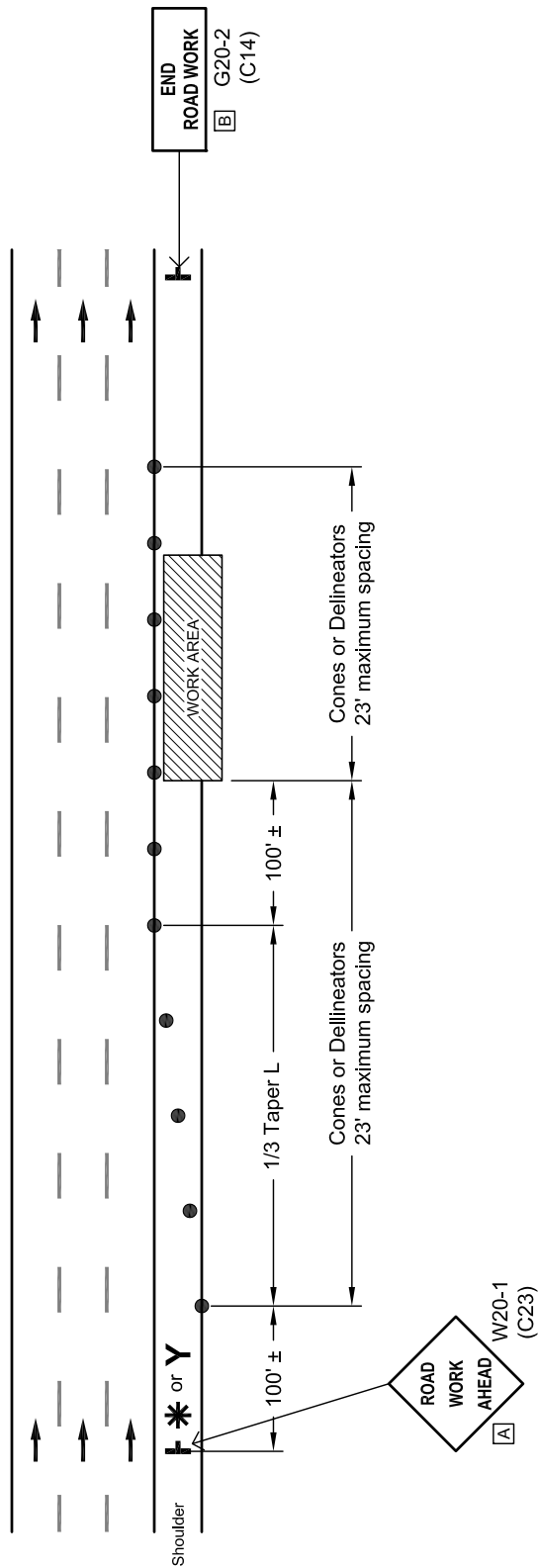
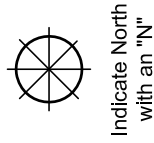
**FIGURE G
MULTI-LANE
INSIDE LANE CLOSURE**



* 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

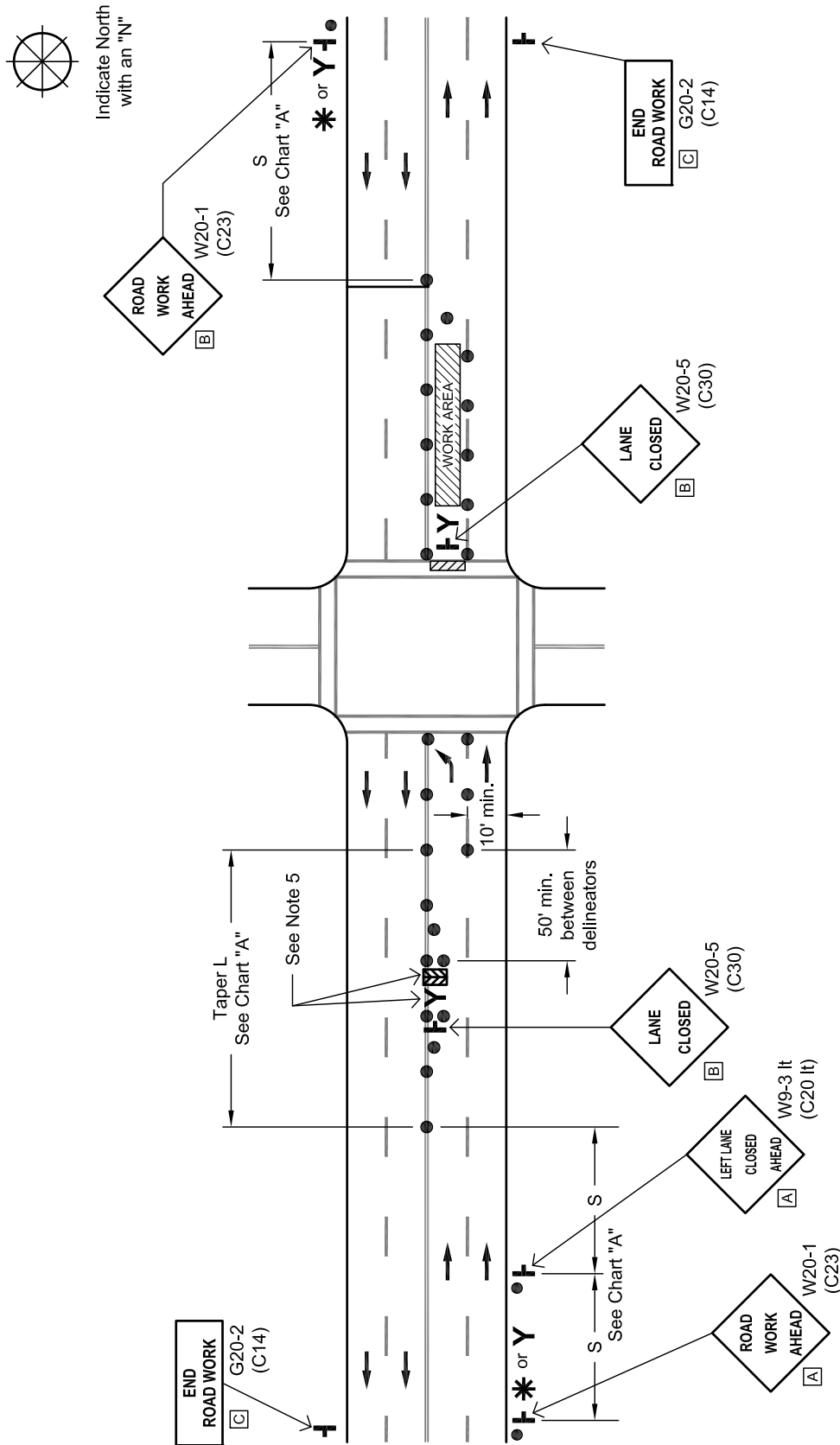


SIGN PANEL SIZE (min.)	
A	36" x 36"
B	36" x 18"

* 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	3-13

FIGURE I MULTI-LANE INSIDE LANE CLOSURE BEYOND INTERSECTION

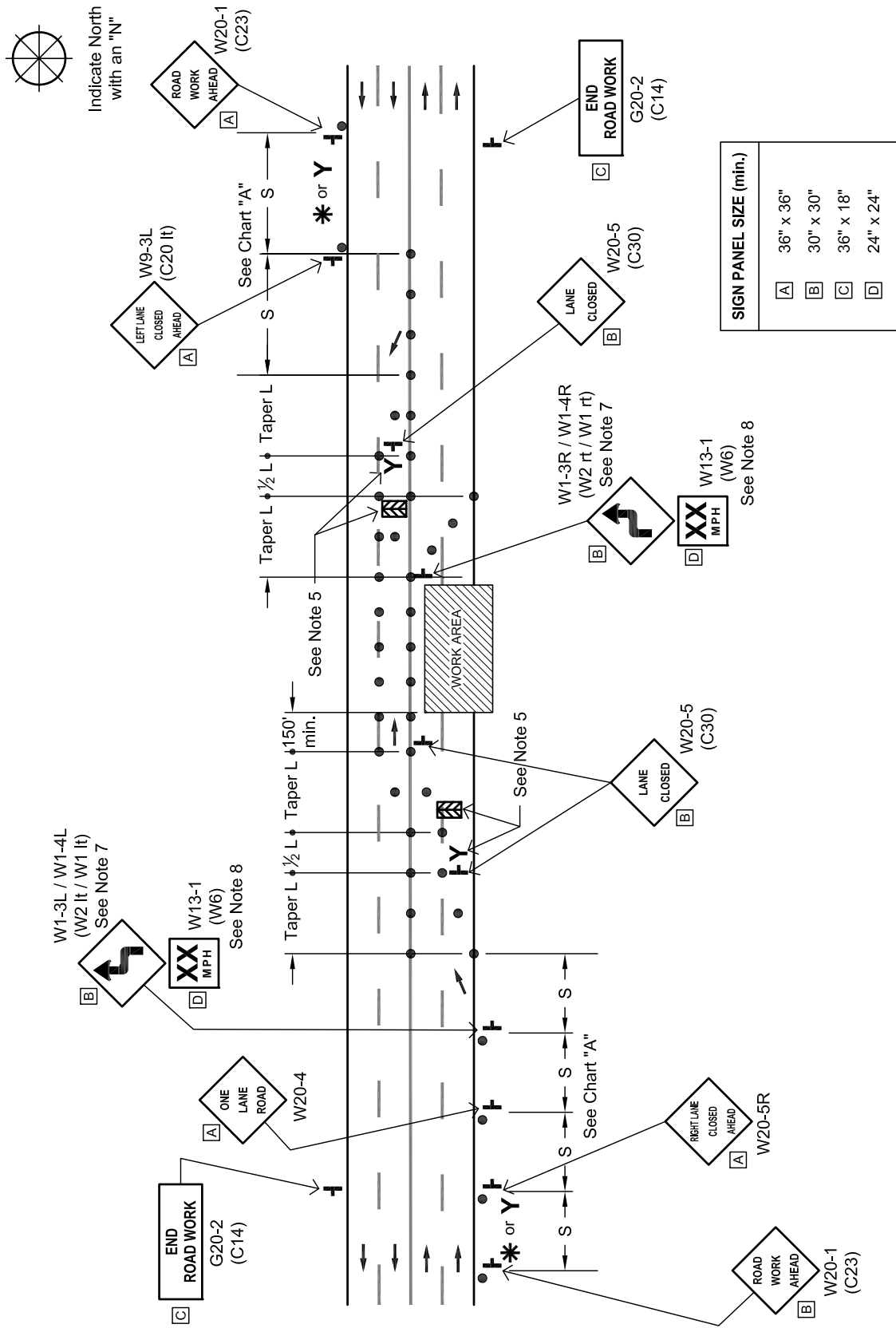


SIGN PANEL SIZE (min.)	
A	36" x 36"
B	30" x 30"
C	36" x 18"

* 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 K MULTI-LANE CLOSING OF HALF ROAD



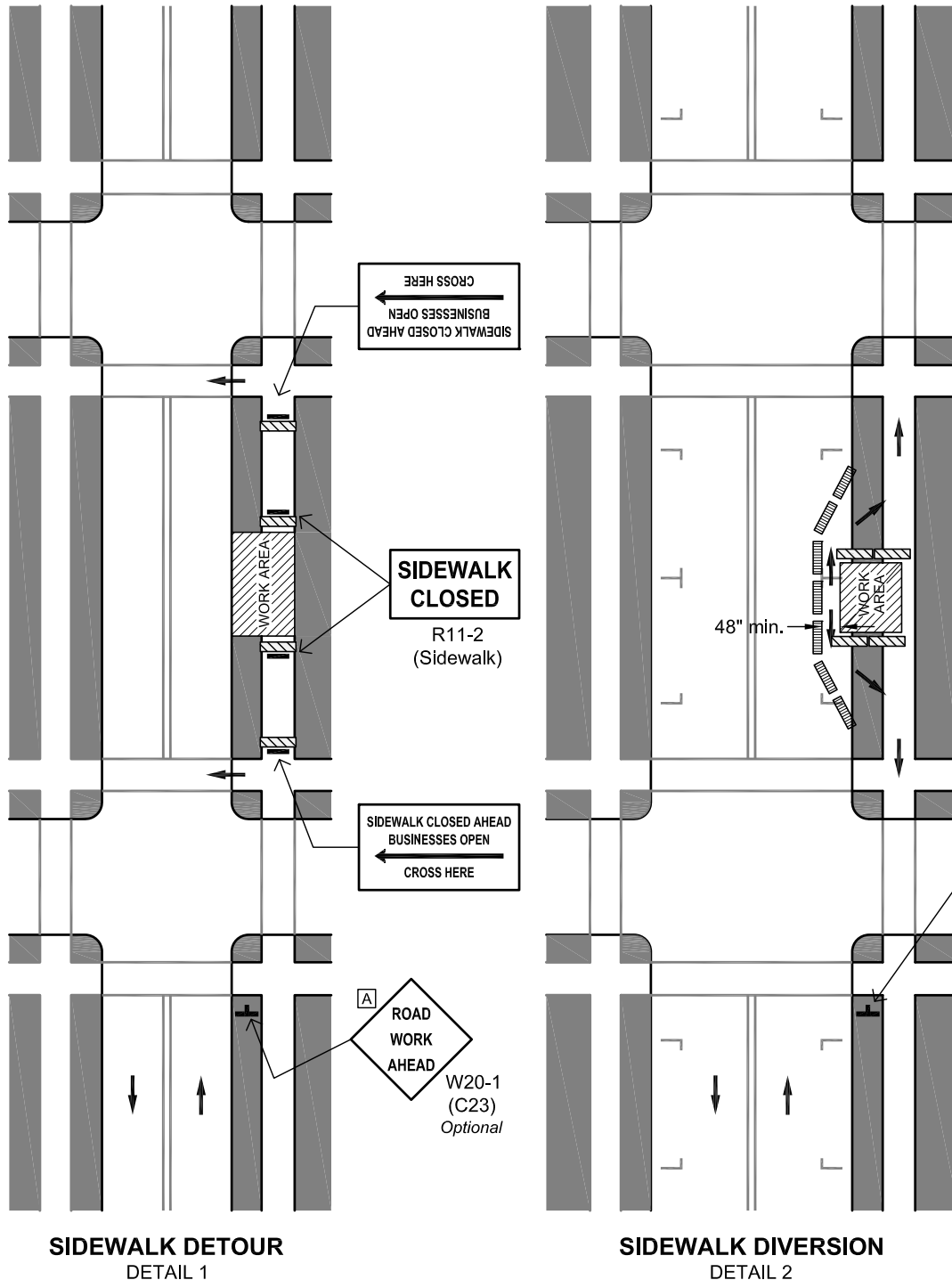
* SEE PAGE 1 THIS APPENDIX FOR LEGEND, NOTES AND SPACING REQUIREMENTS.

REVISIONS	BY	APP	DATE
New Figure	MH	JDW	11-04
Right Lane Closed sign; 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

 A handwritten signature in black ink, appearing to read "Gary E. Willey", is written over the typed name and title.

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

Appendix H



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



Air Pollution Control District
San Luis Obispo County

INVOICE
15484

MAKE ALL CHECKS PAYABLE TO SAN LUIS OBISPO AIR POLLUTION CONTROL DISTRICT

TO: City of San Luis Obispo Public Works
919 Palm St.
San Luis Obispo CA 93401

DATE: 7/11/13

Payment due in 30 days.

ATTN: Matt Horn

Account: 4683

NOTE: Fees not paid by due date are subject to a 50% penalty fee along with any applicable late payment processing fees.

TO ENSURE PROPER CREDIT PLEASE REFERENCE INVOICE NUMBER ON CHECK.

Action Date	App #	A/R #	Description	Amount
07/09/13	5772	32531	Renewal of Equipment Under Permit #1850-2 Operating Fee to July 2014 Miscellaneous Equipment	\$824.00

Equipment Location: Various Locations within the City of San Luis Obispo County

TOTAL DUE **\$824.00**

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.



Guideline Specifications for Nursery Tree Quality

Selecting Quality Nursery Stock

A committee comprised of municipal arborists, urban foresters, nurserymen, U.C. Cooperative Extension horticultural advisors, landscape architects, non-profit tree groups, horticultural consultants, etc., developed the attached specifications to ensure high quality landscape trees. After more than a year of work, they succeeded in drafting a document entitled Specification Guidelines for Container-grown Trees for California. This document will be published and the guidelines promoted throughout the nursery and landscape industry. Its intent is to help landscape professionals develop their own comprehensive and detailed specifications to ensure that they obtain high quality container-grown nursery trees. The document is also intended to help nursery professionals in their efforts to improve the quality of trees grown in California. These specifications can be modified for specific simulations.

The following people worked on the **Guideline Specifications for Nursery Tree Quality**:

David Burger	UC Davis, Department of Environmental Horticulture, Davis
Barrie Coate	Consulting Arborist, Los Gatos
Larry Costello	UC Cooperative Extension, Half Moon Bay
Robert Crudup	Valley Crest Tree Company, Sunol
Jim Geiger	Center for Urban Forest Research UC Davis, Davis
Bruce Hagen	California Dept. of Forestry & Fire Protection, Santa Rosa
Richard Harris	UC Davis Department of Environmental Horticulture, Davis
Brian Kempf	Urban Tree Foundation, Visalia
Jerry Koch	City of Berkeley Division of Urban Forestry, Berkeley
Bob Ludekens	L. E. Cooke Company, Visalia
Greg McPherson	Center for Urban Forest Research, UC Davis, Davis
Martha Ozonoff	California ReLeaf, Sacramento
Ed Perry	UC Cooperative Extension, Stanislaus County
Markio Roberts	Caltrans, LDA Maintenance Division, Oakland

Illustrations:

Front page, c) temporary branches C. Trunk Taper Illustration by Edward F. Gilman, Professor, Environmental Horticulture Department, IFAS, University of Florida.

All other Illustrations adapted from Integrated Management of Landscape Trees, Shrubs and Vines, Fourth Edition, 2003, Harris, Clark, Matheny

Photos: Brian Kempf

For more information contact Brian Kempf 559-713-0631 or brian@urbantree.org

Guideline Specifications for Nursery Tree Quality

I. PROPER IDENTIFICATION

All trees shall be true to name as ordered or shown on the planting plans and shall be labeled individually or in groups by species and cultivar (*where appropriate*).

II. COMPLIANCE

All trees shall comply with federal and state laws and regulations requiring inspection for plant disease, pests and weeds. Inspection certificates required by law shall accompany each shipment of plants. Clearance from the County Agricultural Commissioner, if required, shall be obtained before planting trees originating outside the county in which they are to be planted. Even though trees may conform to county, state, and federal laws, the buyer may impose additional requirements.

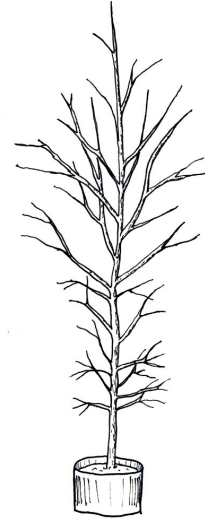


Illustration by Edward F. Gilman, Professor, Environmental Horticulture Department, IFAS, University of Florida.

III. TREE CHARACTERISTICS AT THE TIME OF SALE OR DELIVERY

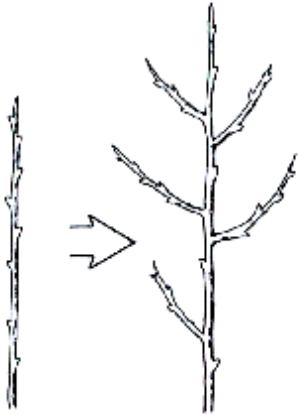
A. TREE HEALTH

As typical for the species/cultivar, trees shall be healthy and vigorous, as indicated by an inspection for the following:

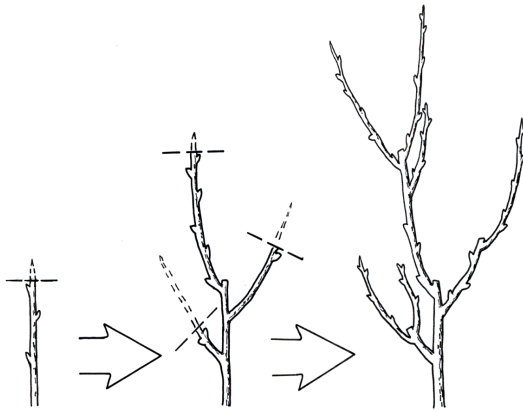
1. Trees shall be relatively free of pests (*insects, pathogens, nematodes or other injurious organisms*).
2. An inspection of the crown, trunk, and roots shall find the following characteristics:
 - a. **Crown Form:** The form or shape of the crown is typical for a young specimen of the species/cultivar. The crown is not significantly deformed by wind, pruning practices, pests or other factors.
 - b. **Leaves:** The size, color and appearance of leaves are typical for the time of year and stage of growth of the species/cultivar. Leaves are not stunted, misshapen, tattered, discolored (*chlorotic or necrotic*) or otherwise atypical.
 - c. **Branches:** Shoot growth (*length and diameter*) throughout the crown is typical for the age/size of the species/cultivar. Trees do not have dead, diseased, broken, distorted or other serious branch injuries.
 - d. **Trunk:** The tree trunk should be fairly straight, vertical and free of wounds (*except properly-made pruning cuts*), sunburned areas, conks (*fungal fruiting bodies*), wood cracks, bleeding areas, signs of boring insects, galls, cankers/lesions and girdling ties.
 - e. **Tree height and trunk diameter** are typical for the age, species/cultivar and container size.
 - f. **Roots:** The root system is free of injury from biotic (*insects, pathogens, etc.*) and abiotic agents (*herbicide toxicity, salt injury, excess irrigation, etc.*). Root distribution is uniform throughout the soil mix or growth media and growth is typical for the species/cultivar.

B. CROWN

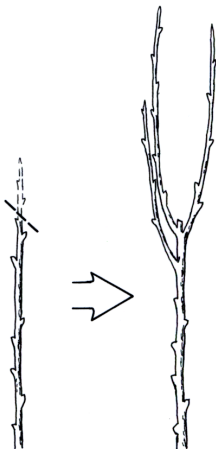
1. Central Leader: Trees shall have a single, relatively straight central leader and tapered trunk, free of codominant stems and vigorous, upright branches that compete with the central leader. If the original leader has been headed, a new leader at least $\frac{1}{2}$ (*one-half*) the diameter of the original leader shall be present.



Maintaining a single, central leader is preferable.



Heading and retaining a leader is acceptable.



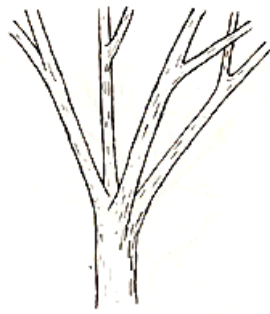
Heading without retaining a leader is unacceptable.

2. Main Branches (scaffolds): Branches should be distributed radially around and vertically along the trunk, forming a generally symmetrical crown typical for the species.

a) **Main branches**, for the most part, shall be well spaced.



preferable



unacceptable

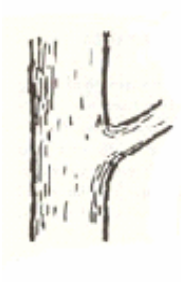


preferable



unacceptable

b) **Branch diameter** shall be no greater than $\frac{2}{3}$ (*two thirds*) the diameter of the trunk, measured 1" (*one inch*) above the branch.



preferable



unacceptable

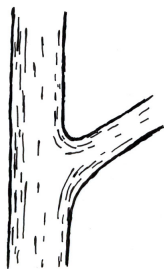


preferable



unacceptable

c) The attachment of scaffold branches shall be free of **included bark**.



preferable



unacceptable



preferable

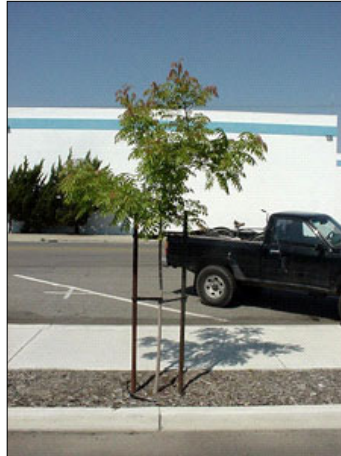


unacceptable

3. Temporary branches: Temporary branches should be present along the lower trunk, particularly for trees less than 1-1/2" (*one and one-half inches*) in trunk diameter. They should be no greater than 3/8" (*three-eighths inch*) in diameter. Heading of temporary branches is often necessary to limit their growth.



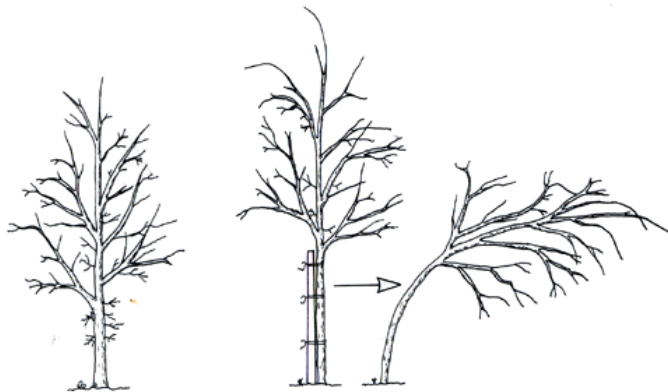
Good



Not as Good

C. TRUNK

1. **Trunk diameter and taper** shall be sufficient so that the tree will remain vertical without the support of a nursery stake.



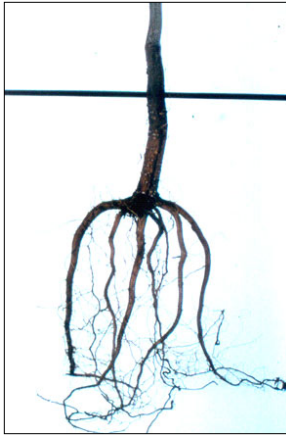
2. The **trunk shall be free of wounds** (*except properly-made pruning cuts*), sunburned areas, conks (*fungal fruiting-bodies*), wood cracks, bleeding areas, signs of boring insects, galls, cankers and/or lesions.

3. **Trunk diameter** at 6" (*six inches*) above the soil surface shall be within the diameter range shown for each container size below:

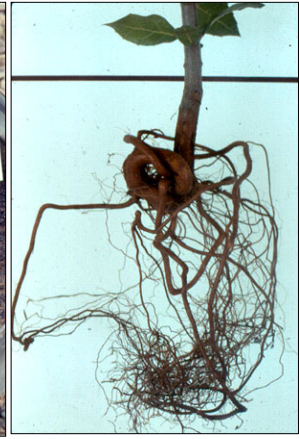
Container Size	Trunk Diameter (<i>inches</i>)
# 15 (gallon)	0.75" to 1.5"
24 inch box	1.5" to 2.5"
36 inch box	2.5" to 3.5"
48 inch box	3.5" to 4.5"

D. ROOTS

1. The trunk, **root collar** (*root crown*) and large roots shall be free of circling and/or kinked roots. Soil removal near the root collar may be necessary to inspect for circling and/or kinked roots.



preferable



unacceptable

2. The tree shall be **well rooted** in the soil mix. When the container is removed, the rootball shall remain intact. When the trunk is carefully lifted both the trunk and root system shall move as one.



preferable



unacceptable

3. The **upper-most roots** or root collar shall be within 1" (*one inch*) above or below the soil surface.



preferable



unacceptable

4. The **rootball periphery** should be free of large circling and bottom-matted roots. The acceptable diameter of circling peripheral roots depends on species and size of rootball. The maximum acceptable size should be indicated for the species (*if necessary*).



preferable



unacceptable

E. MOISTURE STATUS

At time of inspection and delivery, the rootball shall be moist throughout. The crown shall show no signs of moisture stress as indicated by wilted, shriveled or dead leaves or branch dieback. The roots shall show no signs of excess soil moisture conditions as indicated by poor root growth, root discoloration, distortion, death or foul odor.

V. INSPECTION

The buyer reserves the right to reject trees that do not meet specifications as set forth in these guidelines or as specified by the buyer. If a particular defect or substandard element or characteristic can be easily corrected, appropriate remedies shall be required. If destructive inspection of a rootball(s) is to be done, the buyer and seller should have a prior agreement as to the time and place of inspection, minimum number of trees or percentage of a species or cultivar to be inspected and financial responsibility for the inspected trees.

DELIVERY

The buyer should stipulate how many days prior to delivery that notification is needed.

GLOSSARY:

Codominant – Two or more vigorous and upright branches of relatively equal size that originate from a common point, usually where the leader has been lost or removed.

Crown – The aboveground part of the tree including the trunk.

Cultivar – A named plant selection from which identical or nearly identical plants can be produced, usually by vegetative propagation or cloning.

Girdling root – A root that partially or entirely encircles the trunk and/or buttress roots, which could restrict growth and downward movement of photosynthate and/or water and nutrients up.

Included bark – Bark embedded within the crotch between a branch and the trunk or between two or more stems that prevents the formation of a normal branch bark ridge. This often occurs in branches with narrow-angled attachments or branches resulting from the loss of the leader. Such attachments are weakly attached and subject to splitting out.

Kinked root – A primary root(s), which is sharply bent, causing a restriction to water, nutrient, and photosynthate movement. Kinked roots may compromise the structural stability of root systems.

Leader – The dominant stem which usually develops into the main trunk.

Photosynthate – Pertains to sugar and other carbohydrates that are produced by the foliage during photosynthesis, an energy trapping process.

Root collar – The flared area at the base of a tree where the roots and trunk merge. Also referred to as the "root crown" or "root flare".

Shall – Used to denote a practice that is mandatory.

Should – Used to denote a practice that is recommended.

Scaffold branches – Large, main branches that form the main structure of the tree.

Temporary branch – A small branch that is retained temporarily along the lower trunk of young trees. Temporary branches provide photosynthate to increase trunk caliper and taper and help protect it from sunburn damage and mechanical injury. Such branches should be kept small and gradually removed as the trunk develops.

Trunk – The main stem or axis of a tree that is supported and nourished by the roots and to which branches are attached.



CITY OF SAN LUIS OBISPO
PUBLIC WORKS

QUALITY ASSURANCE PROGRAM

Approved By:

Matt Horn

Date:

March 16, 2018

QUALITY ASSURANCE PROGRAM

City of San Luis Obispo Quality Assurance Program for Construction

1. GENERAL

The City of San Luis Obispo's (City) Quality Assurance Program (QAP) has been developed by the City to provide guidelines for testing of construction materials and assurance that the materials incorporated into the construction projects are in conformance with the contract specifications. The City's QAP is updated approximately every five years to address changes to project specifications, materials, and updates to the testing methods.

The City's QAP will be used on all City projects off of the National Highway System including those projects which receive federal funds. Regardless of project funding, City projects on the National Highway System will use the QAP developed by the California Department of Transportation (Caltrans).

2. ACCEPTANCE TESTING PROGRAM

City staff will typically perform inspection duties on a project. Those duties include verification of compliance with the project's plans, special provisions, City Standard Specifications and Engineering Standards, and State Standard Specifications and Standard Plans. When testing of construction materials is required, a materials testing consultant is typically used to perform acceptance testing on City projects.

2.1 Materials Laboratory

The consultant's materials laboratory is required to be under the responsibility of a California-registered Civil Engineer with experience in sampling, inspection and testing of construction materials. The laboratory shall certify the results of all tests performed by its personnel under the Engineer's supervision. The laboratory is required to contain certified test equipment capable of performing the tests conforming to the provisions of this Quality Assurance Program (QAP).

The materials laboratory is required to provide documentation that it complies with the following procedures:

- Correlation Testing Program – The materials laboratory shall be a participant in one or more of the following testing programs:
 - a. AASHTO Materials Reference Laboratory
 - b. Cement and Concrete Reference Laboratory
 - c. Caltrans' Reference Samples Program
- Certification of Personnel – The materials laboratory shall employ personnel who are certified by one or more of the following:
 - a. Caltrans District Materials Engineer and/or Caltrans METS IA Representative
 - b. Nationally recognized non-Caltrans organizations such as the American Concrete Institute, National Institute of Certification of Engineering Technologies, etc.
 - c. Other recognized organizations approved by the State of California and/or Recognized by local governments or private associations.

- Laboratory and Testing Equipment – The materials laboratory shall only use laboratory and testing equipment that is in good working order. All such equipment shall be calibrated at least once each year. All testing equipment must be calibrated by impartial means using devices of accuracy traceable to the National Institute of Standards and Technology. A decal shall be firmly affixed to each piece of equipment showing the date of the last calibration. Testing equipment calibration decals shall be checked as part of the Independent Assurance Program (IAP).

2.2 Acceptance Testing

Acceptance Testing will be performed by certified materials testing personnel utilizing an accredited materials laboratory. The certifications and accreditations shall be specific to the tests being performed. The test results will be used to ensure that all materials incorporated into the project are in compliance with the contract specifications.

The City requires compliance with its Standard Specifications on all projects located within the City right-of-way, or on City-owned property.

Testing must be in accordance with the Caltrans test methods whenever applicable. When Caltrans test methods are not feasible for a certain test, a national recognized standard (i.e., AASHTO, ASTM, etc.) test method may be utilized. Testing frequencies are to be in accordance with the contract specifications. If not specified in the contract specifications, samples shall be taken at the frequencies specified in the following table:

Material	Test for:	Test		Sample Location	Frequency
		CTM	ASTM		
PCC-Major structures	Slump/Penetration	533	C143/C360	Site	1 per day
	Cylinders	539/540/521	C31	Site	1 set of 3 per day
PCC-Curb, Gutter, Sidewalk & Pavement	Slump/Penetration	533	C143/C360	Site	1 per day
	Cylinders	539/540/521	C31	Site	1 set of 3 per project
Asphalt Concrete	Sieve	202	C136	Site or Plant	1 per project
	Compaction	375	D2950	Site	1 per 1500 tons
Aggregate Base	Sieve	202	C136	Site or Plant	1 per project
	Sand Equivalent	217	-	Site or Plant	1 per project
	Maximum Density	216	D1557	Site or Plant	1 per project
	Compaction	231	D2922	Site	1 per 500 cu. yds.
Disturbed Basement Soil or Embankment	Maximum Density	216	D1557	Site	1 per project
	Compaction	231	D2922	Site	1 per 500 cu. yds.
Structure Backfill	Sieve	202	C136	Site or Plant	1 per project
	Maximum Density	216	D1557	Site or Plant	1 per project
	Compaction	231	D2922	Site	1 per 500 cu. yds.
Chain Link Fencing	Compliance with Specifications	gage check	-	Site	300 feet
Bridge Profilograph	Compliance with Specifications	547	-	Site	1 per bridge Repeat until pass

Note: All tests must be performed at a minimum of one test per project, unless otherwise addressed in the in the “Acceptance of Minor Quantities of Materials” sections of this QAP.

The following are time periods for reporting material test results to the Resident Engineer:

- When the aggregate is sampled at material plants, test results for Sieve Analysis, Sand Equivalent and Cleanness Value should be submitted to the Resident Engineer within 24 hours after sampling.
- When materials are sampled at the job site, test results for compaction and maximum density should be submitted to the Resident Engineer within 24 hours after sampling.
- When soils and aggregates are sampled at the job site:

1. Test results for Sieve Analysis, Sand Equivalent and Cleanness Value should be submitted to the Resident Engineer within 72 hours after sampling.
2. Test results for “R” Value and asphalt concrete extraction should be submitted to the Resident Engineer within 96 hours after sampling.

When sampling products such as Portland Cement Concrete (PCC), cement-treated base (CTB), hot mix asphalt (HMA), and other such materials; the time of such sampling will be varied with respect to the time of the day insofar as possible, in order to avoid a predictable sampling routine. The reporting of Acceptance Testing results, if not performed by the Resident Engineer’s staff, shall be done on an expedited basis such as by email or telephone.

2.3 Certificates of Compliance

A Certificate of Compliance will also be accepted in lieu of sampling and testing for the following materials, regardless of the quantity of material used on a project.

Aluminum Pipe	Portland Cement
Asphalt Oil	PCC Admixtures & Curing Compounds
Asphaltic Emulsion	Prefabricated Bridges
Concrete Admixtures and Curing Compounds	Preformed Elastomeric Joint Seal
Corrugated Steel Pipe Arches	Reinforced Concrete Pipe
Culvert and Drainage Pipe Joints	Reinforcing Steel
Electrical Conductors/components	Roofing Shingles
Engineering Fabric	Soil Amendments
Epoxy	Stabilizing Emulsion
Epoxy Coated Rebar	Steel Piles
Fiber	Structural Steel
Lime	Structural Timber and Lumber
Lumber and Timber	Temporary Railing (Type K)
Metal Target Plates	Timber and Lumber
Minor Concrete	Traffic Signs
Mulch	Treated Timber and Lumber
Paint used for Traffic Striping	Structural Metal Plate Pipe and Pipe Arches
Pavement Reinforcing Grid	Steel Entrance Tapers, Pipe Down Drains,
Perforated Steel Pipe	Reducers, and Coupling Bands
Plastic Pipe and Tubing	Water Valves & Stops

Certificates of Compliance shall conform to the requirements of the contract specifications, and shall include the following information:

- Project number
- Lot number, mill marking, or other identifying information which can trace the material to the precise location of manufacturing.
- Statement that the material complies with the contract specification
- Signature of the Manufacturer

2.4 Acceptance of Minor Quantities of Materials

Minor quantities of construction materials may be accepted based on visual inspection by the Engineer if the source of the material has recently furnished similar materials found to be satisfactory using normal sampling and testing requirements, or if the supplier provided a Certificate of Compliance indicating conformance with the project specifications. The following list provides maximum quantities of materials that may be accepted under these conditions:

- Aggregates other than for use in Portland Cement Concrete, not to exceed 100 tons per day nor more than 500 tons per project
- Bituminous mixtures, not to exceed 50 tons per day nor more than 500 tons per project.
- Paint, not to exceed 50 gallons per project.
- Masonry items, based on verification of dimensions and uniformity of manufacture.
- Grout, not to exceed 1 cubic yard per project.
- Mortar, not to exceed 1 cubic yard per project.
- Portland Cement Concrete, not to exceed:
 - 8 cubic yards per project when concrete is provided by batch plant.
 - 2 cubic yards per day when concrete is provided by volumetric mixer.
- Asphalt Concrete, not to exceed 50 tons per project.

2.5 Testing of Manufactured Materials

For those materials manufactured and prefabricated at locations other than the jobsite (generally at the manufacturer’s location) that require testing or inspection, City staff or the City’s materials consultant will perform Source Inspection on such materials.

2.6 City-Owned Testing Equipment

The City maintains the following testing equipment for use by City staff:

Equipment	Maintenance	Frequency
Slump Cone	Visual Check for Damage	Annually
Kelly Ball	Visual Check for Damage	Annually

3. PROJECT CLOSEOUT

3.1 Project Certification

Upon completion of a Federal-aid project, a “Materials Certificate” will be completed and signed by the Resident Engineer utilizing Exhibit 17-G in the Local Assistance Procedures Manual. The Agency will include this “Materials Certificate” in the Report of Expenditures submitted to the Caltrans District Director, Attention: District Local Assistance Engineer. A copy of the “Materials Certificate” shall also be included in the City’s project files. All materials incorporated into the work which did not conform to specifications must be explained and justified on the “Materials Certification”.

3.2 Records

Project construction files shall be organized and indexed, and will include the following items:

1. Copy of Quality Assurance Plan
2. Independent Assurance
 - Certs. of Proficiency-Testers and Samplers (Ex. 16-D TL-0111)
 - Cert. of Accreditation of Testing Lab (TL-0113)
 - Equipment Calibration Verifications (Nuclear Gauge, etc...)
3. Notice of Material to be Used (Ex. 16-I)
4. Acceptance Testing Results and Initial Tests: *(Make a Category for each material)*
 - Summary Log of Acceptance Testing
 - Test Results/Reports
5. Certificates of Compliance
6. Records for Source Inspection of structural pre-manufactured material. (collected inspection tags)
7. Buy America Certifications
8. Materials Certification (Ex. 17-G)

The project files shall be available for at least three years following the date of final project voucher.

The use of a “Testing Summary Log” facilitates reviews of material sampling and testing by Caltrans and FHWA, and assists the Resident Engineer in tracking the frequency of testing.



Public Utilities

879 Morro Street, San Luis Obispo, CA 93401-2710
805.781.7215
slocity.org

Temporary Industrial Waste Discharge Permit Application

SITE INFORMATION			
Site Name (DBA)			
Site Address			
Site Owner/Contact		Phone	
PROPERTY OWNER			
Property Owner		Phone	
CONTRACTOR/CONSULTANT INFORMATION			
Contractor/Consultant			
Mailing Address			
Contact		Title	
Phone	Office		Fax
	Cell		
Address (if different than above)			
Emergency contact		Emergency Phone	
DISCHARGE INFORMATION			
Discharge Description			
Location/Description of point of Discharge			

DISCHARGE INFORMATION (Continued)

Estimated Discharge Amount (gallons per hour)	Total		Daily	
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Note: If daily discharge is over 10,000 gallons, a Significant Industrial User Permit will be required. This permit may have Federal requirements. Contact this office for more information.

Flow Rate		Method of Flow Regulation	
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Time of Discharge	Days of Operation		Hours	
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PRETREATMENT

Description of Pretreatment (attach diagram of pretreatment unit)			

Pollutants of Concern (attach additional sheets as needed)			

Batch Treatment or Continuous	
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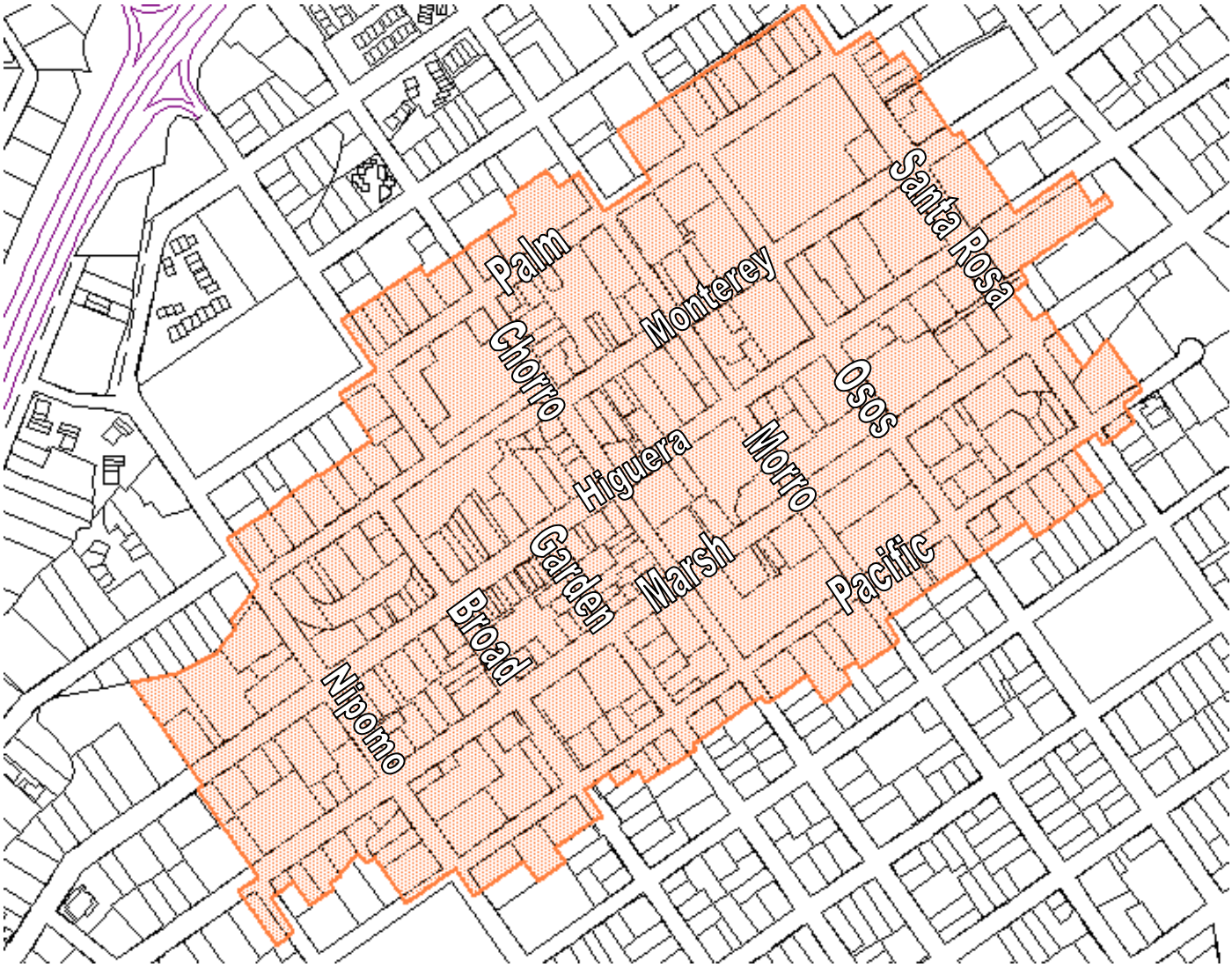
- | | |
|-----------------------------|---|
| Required attachments | <ul style="list-style-type: none"> • Site map (show all buildings, streets, pretreatment unit, discharge location). • Diagram of pretreatment unit. • Lab analysis of wastewater to be treated and discharged may be required. |
|-----------------------------|---|

Signature		Date	
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CONSTITUENT	LIMIT (mg/L)
Ammonia	32
Biochemical Oxygen Demand (BOD)	226
Chloride	1523
Sodium	1200
Total Dissolved Solids (TDS)	2215
Total Suspended Solids (TSS)	2346
Copper	0.14
Zinc	0.17



Encroachment Permit/CIP Holiday Restriction Area Per City Council Resolution 9487 (2003 Series)



RESOLUTION NO. 9487 (2003 SERIES)

**A RESOLUTION OF THE COUNCIL OF THE CITY OF
SAN LUIS OBISPO APPROVING POLICY REGARDING CITY CAPITAL
IMPROVEMENT PROJECTS AND RIGHT OF WAY ENCROACHMENT IN THE
DOWNTOWN AREA**

WHEREAS, it is essential to maintain and upgrade City infrastructure in order to provide reliable municipal services and to maintain a healthy local economy; and

WHEREAS, construction impacts associated with vehicular lane closures, traffic detours, or materials delivery can be disruptive to the flow of traffic in the downtown area and affect access for consumers to the downtown retail core, and

WHEREAS, most businesses and residents are willing to accept a level of inconvenience, provided that projects are coordinated and managed carefully, and that the need for a project is understood; and

WHEREAS, the Downtown Association (DA) has requested certain enhancements in the coordination of capital projects in the downtown core, and in the level of communication between the City and the DA regarding project purpose and status; and

WHEREAS, there exists a time period between Thanksgiving and New Year's Day that is critical to the success of Downtown merchants and businesses; and

WHEREAS, the City Council for the City of San Luis Obispo adopted City Council Resolution 7068 (1992 Series), titled: *POLICY FOR THE IMPROVED COORDINATION AND COMMUNICATION IN THE COMPLETION OF CITY CAPITAL IMPROVEMENT PROJECTS*.

NOW, THEREFORE, BE IT RESOLVED, that the City Council of the City of San Luis Obispo does hereby rescind Resolution 7068 (1992 Series) and sets forth the following policy to be followed in the completion of capital improvement projects and the issuance of Encroachment Permits in the downtown area and, as appropriate, elsewhere in the community:

- 1) Unless necessary for emergency access or maintenance, construction activities which affects City Streets in the Downtown area shall not occur between Thanksgiving and New Year's Day and shall be restricted by the Public Works Department through the project specifications and through the Encroachment Permit Process.
- 2) For purposes of this policy the Downtown area shall be defined as the area defined by the Downtown Association boundary.

R 9487

- 3) The Public Works Director shall have discretion in allowing long-term permanent construction equipment to remain during this period (such as pedestrian barricades or long-term lane closures as part of large scale projects) when it is not feasible to remove such equipment or its removal is considered more disruptive than allowance in the public right-of-way.
- 4) Capital Improvement Projects Specific Requirements:
 - a) The City will provide ample notification to businesses and residents, either directly or through its contractors, regarding planned capital improvement projects, particularly those planned in the downtown area; and
 - b) All reasonable steps will be taken by the City staff to ensure ample communication and coordination relative to planned City projects (non—emergency) in the downtown, including:
 - i) A minimum of 30 day notification to the DA prior to construction;
 - ii) The preparation of project “fact sheets” for the DA to fully explain project purpose and other important information;
 - iii) Participation in quarterly “project coordination meetings” with the DA and the utility companies;
 - iv) Attending or conducting community meetings and/or forums and making presentations for larger complex projects when requested by the DA, or as determined by staff;
 - v) Assurance that project specifications require adequate contractor responsibility for notification, signage, and procedures to minimize impacts on affected businesses to the extent feasible; and
 - c) DA shall be responsible for communicating with its membership regarding project plans and status following receipt of project information from the City; and
 - d) The City staff will make every effort to ensure that:
 - i) All involved staff members share and communicate accurate information; and
 - ii) That projects managed by different departments are properly coordinated.


On motion of Council Member Settle, seconded by Vice Mayor Mulholland and on the following roll call vote:

AYES: Council Members Ewan, Schwartz and Settle, Vice Mayor Mulholland and Mayor Romero
NOES: None
ABSENT: None

the foregoing Resolution was passed and adopted this 7th day of October, 2003.


Mayor David F. Romero

ATTEST



Lee Price, C.M.C.
City Clerk

APPROVED AS TO FORM:



Jonathan P. Lowell, City Attorney