CITY OF MARINA, CALIFORNIA

PART I: STANDARD SPECIFICATIONS

PART II: DESIGN STANDARDS

PART III: STANDARD PLANS

2006 EDITION

ISSUED BY:
COMMUNITY DEVELOPMENT DEPARTMENT, PUBLIC WORKS DIVISION

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PART I

STANDARD SPECIFICATIONS

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CITY OF MARINA, CALIFORNIA

COMMUNITY DEVELOPMENT DEPARTMENT, PUBLIC WORKS DIVISION

PART I: STANDARD SPECIFICATIONS

CITY OF MARINA
COMMUNITY DEVELOPMENT DEPARTMENT, PUBLIC WORKS DIVISION
STANDARD SPECIFICATIONS
2006 EDITION

These Standard Specifications shall be used in conjunction with the State of California, Department of Transportation, Standard Specifications (For Construction of Local Streets and Roads) July 2002 Edition, which shall be referred to as State Standard Specifications. In case of conflict between the State Standard Specifications and the City of Marina Standard Specifications, the City of Marina Standard Specifications shall apply.

Sections 2 and 9 and portions of all other sections pertaining to payment shall be applicable only to work contracted for by the City of Marina.

Attention is directed to Section 1-1.02, "Abbreviations," of these Standard Specifications. Delete the paragraph on the backside of State Standard Specifications title page regarding measurement units.

SECTION I: DEFINITIONS AND TERMS

Definitions and terms shall be as defined in Section 1 of the State Standard Specifications except as herein modified.

Department of Transportation, Department, Director of Transportation, Director, State of California, State, Division of Highways or Chief Engineer when referred to in the State Standard Specifications shall mean the City of Marina (see Section 1-1.56).

1-1 Abbreviations

Delete the first two paragraphs following "Units of Measurements" and insert the following paragraph:

These "City of Marina Standard Specifications" contain units in two systems of measurement. The standards units established by the City are shown in the International System of Units (SI or "metric"). Units in the United States Standard Measures are shown in brackets "[USSM]." The measurements expressed in the two systems are not necessarily

equal, and items constructed or fabricated in one system are not necessarily interchangeable with items constructed or fabricated in the other system. The Contractor, Permittee or Developer shall be responsible to insure construction of the work in the units of measurement shown on the Project Plans and Specifications.

1-2 Contractor

The person or persons, firms, partnership, corporation, or combination thereof, private or municipal, who have either entered into a contract with the City of Marina, as party or parties of the second part of his/her or their representatives, Permittees authorized or given permission to perform work in, under or about City of Marina streets, alleys or easements, or Developers authorized to construct improvements that will be accepted by the City of Marina and will become part of the public property or right-of-way.

1-3 Engineer

Shall mean the Engineer duly and officially appointed by the City to supervise and direct the work of construction acting personally or through agents or assistants duly authorized by him/her, such agents or assistants acting within the scope of the particular duties entrusted to them.

1-4 Engineer's Estimate

The list of estimated quantities of work to be performed as contained in the "Notice to Bidders" and/or contract "Proposal" form.

1-5 Laboratory

Shall mean the designated laboratory approved by the City of Marina to test the materials and work involved in a contract.

1-6 Legal Holidays

Those designated and adopted as official City holidays by the Marina City Council.

1-7 Special Provisions

The Special Provisions are specified clauses setting forth conditions or requirements peculiar to the work and supplementary to these Standard Specifications. The State Department of Transportation's publications entitled Labor Surcharge and Equipment Rental Rates, and General Prevailing Wage Rates are to be interpreted to mean the list of rental rates approved by the City Engineer and on file in the office of the City Engineer, and the list of prevailing wage rates as adopted by the City of Marina and on file in the office of the City Engineer, and shall be considered as a part of the Special Provisions. Copy of the Labor Surcharge and Equipment Rental Rates can be found at http://www.dot.ca.gov/hq/construc/book_2002.pdf; and copy of General Prevailing Wage Determinations can be found at http://www.dir.ca.gov/dlsr/pwd/index.htm.

1-8 Right-of-Way

That area delineated on the plans or defined in the Special Provisions, which is available to the Contractor.

1-9 Attorney

The person or persons, firm partnership, or combination thereof duly and officially appointed by the City to act as its legal Counsel.

1-10 State Highway Engineer
Shall be the Engineer as defined above.

1-11 Local Public Agency
Shall be the City of Marina.

1-12 Owner
Shall be the City of Marina.

1-13 Provide
The term "provide" shall mean furnish, install and connect.

1-14 Site
Shall be as defined in Section 1-1.24, "Highway" and Section 1-1.49, "Right-of-way."

1-15 City of Marina or City
Shall mean the City of Marina, Monterey County, California, acting through the City Council or any board, body, official or officials, which or to whom the power belonging to the Council shall by virtue of any act or acts hereafter passed to be held to appertain.

Where the State Standard Specifications refer to "these specifications" or to sections within the State Standard Specifications, the reference shall be interpreted as referring to the City of Marina, Development and Engineering Services Department, Standard Specifications, 2004 or to sections therein.

Where the State Standard Specifications refer to "Notice to Contractors" it shall be understood to be "Notice to Bidders."

SECTION 2: PROPOSAL REQUIREMENTS AND CONDITIONS

Proposal requirements and conditions shall be as specified in Section 2 of the State Standard Specifications, except as herein modified.

2-1 Contents of Proposal Forms
Prospective bidders will be furnished with proposal forms, which will state the official designation for the job and will show the estimate of the various quantities and kinds of work to be performed, or materials to be furnished, as a schedule of items for which bid prices are asked.

2-2 Examination of Plans, Specifications, Contract and Site of Work
The Bidder shall examine carefully the site of work contemplated, the Plans and Specifications, the Proposal and contract forms thereof. The submission of a bid shall be conclusive evidence that the bidder has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and scope of work to be performed, the quantities of materials to be furnished, and as to the requirements of the Proposal, Plans, Specifications, and the Contract.

All requests for information (RFI) about the meaning or intent of the Contract Documents shall be submitted to the City Engineer in writing. Replies will be issued by Addenda mailed, faxed or delivered to all parties recorded by the City Engineer as having received the bidding documents. Requests for information (RFIs) received less than ten (10) days prior to the date of the opening

of bids will not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

Where the City has made investigations of subsurface conditions in areas where work is to be performed under the Contract, or in other areas, some of which may constitute possible local material sources, bidders or Contractors may, upon written request, inspect the records of the City as to such investigations subject to and upon the conditions hereinafter set forth. Such inspections of records may be made at the office of the City Engineer, Department of Development and Engineering Services, City of Marina.

The records of such investigations are not a part of the Contract and are shown solely for the convenience of the bidder or Contractor. It is expressly understood and agreed that the City assumes no responsibility whatsoever in respect to the sufficiency or accuracy of the investigations thus made, the records thereof, or of the interpretations set forth therein or made by the City in its use thereof and there is no warranty or guaranty, either expressed or implied, that the conditions indicated by such investigations or records thereof, or that existing throughout such areas, or any part thereof, that materials other than, or in proportion different from those indicated may not be encountered. Cross-sections and soils investigation report if performed are available at the Development and Engineering Services counter for review. When a log of test borings or other record of geotechnical data obtained by the City's investigation of the subsurface conditions is included with the Contract Plans, it is expressly understood and agreed that said record does not constitute a part of the Contract, represents only the opinion of the City as to the character of the materials or the conditions encountered by it in its investigations, is included in the Plans only for the convenience of bidders and its use is subject to all of the conditions and limitations set forth in this section.

In some instances, the information from such subsurface investigations considered by the City to be of possible interest to bidders or contractors has been compiled as "Materials Information" is not a part of the Contract and is furnished solely for the convenience of bidders and contractors. It is understood and agreed that the fact that the City has compiled the information from such investigations as "Materials Information" and has exhibited or furnished to the bidders or contractors such "Materials Information shall not be construed as a warranty or guaranty, express or implied as to the completeness or accuracy of such compilations and the use of such "Materials Information" shall be subject to all the conditions and limitations set forth in this Section 2-1.03 and Section 6-2 "Local Materials," of these Standard Specifications.

When contour maps were used in the design of the project, the bidders may inspect such maps, and if available may obtain copies for their use, at their expense.

The availability or use of information described in this Section 2-1.03 is not to be construed in any way as a waiver of the provisions of the first paragraph in this Section 2-1.03 and a bidder or Contractor is cautioned to make such independent investigation and examination as he/she deems necessary to satisfy himself/herself as to conditions to be encountered in the performance of the work and with respect to possible local material sources, the quality and quantity of material available from such property and the type and extent of processing that may be required in order to produce material conforming to the requirements of the Specifications.

No information derived from such inspection of records of investigation or compilation thereof made by the City or from the City Engineer, or his/her assistants, will in any way relieve the bidder or Contractor from any risk or from properly fulfilling the terms of the Contract.

2-3 Proposal Forms

All proposal forms shall be obtained from the Development and Engineering Services Department of the City of Marina, City Hall, Marina, California.

2-4 Proposal Guaranty

The proposal guaranty shall be in the form of a certified check or a bidder's bond executed by an insurance company that is an "Authorized" carrier by the Insurance Commissioner of the California State Department of Insurance to transact the business of insurance in the State of California, and shall be written by insurers with a current A.M. Best Rating of "A-" or better, and a financial size of "VII" or greater.

2-5 Withdrawal of Proposals

Any bid may be withdrawn at any time prior to the time fixed in the public notice for the opening of bids only by a written request for the withdrawal of the bid filed with the City Clerk for the City of Marina.

2-6 Compliance with Local Hiring for Public Works

Pursuant to Marina City Code Chapter 12, Article III, the Contractor and Subcontractor(s) shall submit the Local Hiring Residency Compliance Documentation with the Bid Documents or be declared by the City to be a nonresponsive bidder. Once the contract is awarded, a Contractor or Subcontractor who fails to comply with local hiring practices and is declared an irresponsible Contractor or Subcontractor after an investigation may be disqualified from future projects.

The Contractor and Subcontractor(s) attention is directed to Section 7-1.01A(3), Payroll Records. In addition to the "Certified Payroll" and "Statement of Compliance" that are required weekly, the Contractor and Subcontractor(s) shall submit the "Statement of Good Faith Effort" as required by the Code or be found by the City to be in noncompliance and face disqualification pursuant to the Code.

Full compensation for conforming to the requirements of this section shall be considered as included in the contract prices paid for the various items of work and no additional payment will be allowed therefore.

2-7 Material Guaranty

Unless otherwise specified in the Special Provisions, all work shall be required to carry a guaranty against defective material or defective workmanship for a period of one (1) year from the date of formal acceptance by City Council. The signing of the contract shall be considered as the same as the signing of the guaranty. Upon completion of the contract and upon the expiration of thirty-five (35) days after formal acceptance of the work, the amounts of the Faithful Performance Bond required in Section 3 may at the Contractor's option be reduced to an amount equal to ten (10) percent of the total amount of the contract bid price.

If within one (1) year after the date of formal acceptance any of the work is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the City to do so unless the City has previously given the Contractor a written acceptance of such condition. \

Should the Contractor neglect to carry out the work in accordance with the Contract Documents, the City shall, after forty-eight (48) hours, not including Saturdays, Sundays and legal holidays, provide written notice or facsimile to the Contractor and without prejudice to any other remedy

he/she may have, make good such deficiencies, and the Contractor shall pay all cost involved including the cost of any necessary engineering expenses. The Contractor shall submit the facsimile phone number.

SECTION 3: AWARD AND EXECUTION OF CONTRACT

Award and execution of contracts shall be as specified in Section 3 of the State Standard Specifications, except as herein modified.

3-1 Contract Bonds

In lieu of Section 3-1.02 of the State Standard Specifications the Contractor shall furnish two good and sufficient bonds, each of the said bonds to be executed in a sum equal to 100% of the contract price each of said bonds. One of the said bonds, the "Performance Bond", shall guarantee the faithful performance of the said contract by the Contractor. The other said bond, the "Labor and Material Bond" shall be furnished as required by the Public Contract Code to satisfy claims of material suppliers, mechanics and/or laborers employed by it on the Work.

Other than requests for reduction of retention funds, all alterations, extensions of time, extra and additional work, and other changes authorized by these specifications or any part of the contract may be made without securing the consent of the surety or sureties on the contract bonds.

3-2 Execution of Contract

In lieu of Section 3-1.03 of the State Standard Specifications the contract shall be signed by the successful bidder and returned, together with the contract bonds and furnished Certificates of Insurance within ten (10) calendar days after receipt. The City will not issue the "Notice to Proceed" for the work until all such documents are received and approved. Unless otherwise specified in the Special Provisions, work shall not begin before receipt of the "Notice to Proceed."

3-3 Failure to Execute Contract

Change "eight (8) days, not including Saturdays, Sundays and legal holidays" to ten (10) calendar days.

SECTION 4: SCOPE OF WORK

Scope of work shall be as specified in Section 4 of the State Standard Specifications.

4-1 Detours

Delete any reference to "will be paid for as extra work as provided in Section 4-1.03D" and insert, "if no pay item is provided in the contract for this work, full compensation for such work shall be considered as included in the prices paid for the various items of work and no additional compensation will be allowed therefore."

SECTION 5: CONTROL OF WORK

Control of work shall be as specified in Section 5 of the State Standard Specifications, except as herein modified.

5-1 Authority of the Engineer

Add the following paragraph:

In prosecuting the provisions of this section or in exercising any power or authority granted to the Engineer by the contract, there shall be no liability upon the Engineer or the Engineer's authorized representative(s), either personally or as an official of the City and its subsidiary agencies, it being understood that in such matters the Engineer acts as a representative of the City and its subsidiary agencies.

5-2 Open Trench Excavation Deeper than 1.2 Meters (4 Feet) Below the Surface

The Contractor is reminded that an approved "Trench Safety" plan is required for all excavations with a depth of 1.5 meters (5 feet) or greater. The "Trench Safety" plan shall meet the requirements of OSHA and the Standard Specifications. An approved "Trench Safety" plan shall be submitted to the City prior to beginning any excavations.

The Contractor shall promptly, and before the following conditions are disturbed, notify the City in writing of any:

1. Materials that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II or Class III disposal site in accordance with the existing law.

2. Subsurface or latent physical conditions at the site differing from those indicated.

3. Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract.

Should the conditions materially differ or do involve hazardous waste, the removal and disposal of such material will be paid for as extra work as provided in Section 4- 1.03D.

Your attention is directed to Section 9-1.10, "Arbitration," of these Standard Specifications. In the event of a dispute as to whether the conditions materially differ or do involve hazardous waste, the Contractor shall continue to proceed with all work to be performed under the contract and shall retain all rights provided either by contract or by law which pertain to the resolution of any dispute or protest.

5-3 Coordination and Interpretation of Plans, Standard Specifications and Special Provisions

Delete the second paragraph and insert the following:

If there is a conflict within the Contract Documents, the document highest in precedence shall govern. The precedence shall be:

1. Permits or Codes from other agencies as may be required by law or Ordinance.
2. Special Provisions.

3. Plans
4. Technical Provisions
5. Standard Plans.
6. Standard Specifications
7. Reference Specifications

Plan notes, Change Orders, Supplemental Agreements, and approved revisions to Plans and Specifications will take precedence over items 2 through 6 above.

5-4 Superintendence

Add the following to this subsection:

The Contractor's representative shall not be changed without the consent of the Engineer and shall notify the Engineer daily of the following day's proposed work schedule in order to plan for appropriate inspections. The Contractor's Representative shall also submit a Daily Report of the day's construction activity for review and approval. The daily report shall contain the name of all personnel and equipment, including all subcontractors, and their time working on the various items of work on that day and shall be submitted within twenty-four (24) hours of that report date. Payment for submitting the Contractor's daily report and notification of the next day work schedule under this section shall be considered included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

5-5 Lines and Grades

The Engineer shall establish lines and grades necessary to permit satisfactory completion of the contract work. The following controls will be placed for the work under this contract, at the offset indicated by the Contractor on the construction staking request:

1. Pipes – One reference point will be set at each end of mains and laterals and at 50-feet intervals for pipe centerline. Each point will be for both horizontal and vertical control. The centerline of proposed manholes will be staked with two referenced points with cuts to inlets and outlets.

2. Curb lines and curb grades – The curb line and curb grades for new curb and gutter will be provided at 25-feet intervals, at grade brakes, and at 10 or 20-feet intervals on vertical curves and on curb returns.
   The Engineer will provide no additional reference for this described work.
3. Street structural sections – Control points will be provided for the centerline of the roadway at 50-feet intervals, at curves and grade breaks, and at 10 or 25-feet intervals on vertical curves.

These points will be for control of subgrade and proposed centerline grade as shown on the plans. The Contractor shall use the completed section for control to construct the remaining roadway section. The Engineer will provide no additional reference points for the described work.

The Contractor shall preserve and maintain these lines, grades, and benchmarks, and shall lay out therefrom the work he/she is to perform under the contract. The Contractor shall be held

responsible for the conformance of the completed work to the lines, grades and benchmarks established by the Engineer.

City may withhold the whole or any part of the final payment to such an extent as may be reasonably necessary to protect City from loss resulting from Contractor's failure to provide "Record Drawings" Grade Certificates to City.

5-6 Inspection

Delete the third paragraph and insert the following paragraphs:

Projects financed in whole or in part with Federal Funds, State Funds, or County Funds, shall be subject to inspection at all times by the agency involved.

In all cases where inspection of the work is required and/or where portions of the work are specified to be performed under the direction and/or inspection of the City Engineer, the Contractor shall notify the City Engineer at least forty-eight (48) hours in advance of the time such inspection and/or direction is required. The Contractor shall not allow nor cause any of his/her work to be covered or enclosed until the City Engineer has inspected it. Should any of his/her work be enclosed or covered before such inspection, the Contractor shall uncover the work at his/her expense and, after inspection, make all repairs necessary to restore his/her work to its original condition at his/her expense.

5-7 Work Done by Others

The City reserves the right to do other work and to let other contracts for work contiguous to the work set forth in the contract.

In the event work is done by the City or by other contractors or utilities contiguous to work covered by the contract, the respective rights of the various interests involved will be established by the Engineer, and the Contractor shall afford the City and other contractors or utilities reasonable opportunity for the introduction and storage of their materials and for the execution of their work, and the Contractor shall properly connect and coordinate the Contractors' work with theirs.

If any part of the work under the contract depends on proper execution or results upon any other work, the Contractor shall inspect such work and promptly report to the Engineer any condition which might adversely affect the Contractor's work. The Contractor's failure to so inspect and report shall constitute an acceptance of the other work as fit and proper for the reception of the Contractor's work, except as to deficiencies, which may develop in the other work after the execution of the Contractor's, work.

Should this Section 5-1.09 affect the Contractor's progress schedule, time extensions shall be approved. However, that time extension shall include payment for all impacts as a result of this Section 5-1.09. Should there not be a time extension for all impacts as a result of this Section 5-1.09, then no additional compensation will be allowed therefore.

SECTION 6: CONTROL OF MATERIALS

Control of materials shall be as specified in Section 6 of the State Standard Specifications except as herein modified.

6-1 Testing by Contractor

Delete this subsection in its entirety and insert the following:

> The Contractor shall be responsible for controlling the quality of the material entering the work and of the work performed, and shall perform testing as necessary to insure control. The City Engineer shall approve the testing laboratory and methods used for quality control testing. Frequency of testing shall be in accordance Section 8-01, "Sample Types and Frequencies," in the California State Department of Transportation Construction Manual. The results of the quality control tests shall be certified by an Engineer of the testing laboratory and submitted to the City Engineer. These tests are for the use of the Contractor and may be accepted for use as acceptance tests. The Contractor's attention is directed to Section 7-1.04, "Permits and Licenses," of these Standard Specifications concerning "Specialty Testing."

If no pay item is provided in the contract for the work required under this Section 6-3.02, then full compensation for performing quality control tests, making the certified results available to the Engineer and Specialty Testing shall be considered as included in the contract prices paid for the various items of work and no additional compensation will be allowed therefore.

SECTION 7: LEGAL RELATIONS AND RESPONSIBILITY

Legal Relations and responsibility shall be as specified in Section 7 of the State Standard Specifications, except as herein modified.

7-1 Payroll Records

Reference the next to last sentence of the second paragraph on page 45: Delete the sentence; 'The "Statement of Compliance" shall be on forms furnished by the Department or on any form with identical wording…' and substitute the following sentences: 'The "Statement of Compliance" and "Payroll Report" shall be on forms furnished by the City. A copy of this form is attached to the Special Provisions.'

7-2 Air Pollution Control

Add the following sentences: The Contractor's attention is directed to Section 10 of these Standard Specifications regarding dust control requirements. The Contractor shall abate dust nuisance by cleaning, sweeping, and sprinkling with water, or other means as necessary during all phases of construction including weekends, holidays and any other times as directed by the Engineer. The use of water or other materials that results in mud on the public streets will not be permitted as a substitute for sweeping. The Contractor shall respond to dust control abatement requests within four (4) hours of receiving a facsimile notice. The Contractor shall submit the facsimile phone number. Should the Contractor fail to respond to such notice, the City shall cause to have the abatement completed by any available construction force and deduct that cost

from any funds due the Contractor. Payment for dust control abatement shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefore.

7-3 Water Pollution

Add to Provision 6 on page 53 of this section the following: No mud, asphalt concrete or cement slurry resulting from saw cutting is allowed to drain into catch basins.

Add the following paragraphs:

In compliance with the Clean Water Act (CWA) and its National Pollutant Discharge Elimination System (NPDES) permit requirements, the Contractor shall submit a Storm Water Pollution Prevention Plan (SWPPP) including the filing of "Notice of Intent" (NOI) to the State Water Resources Control Boards (SWRCB) Regional Water Quality Control Board (RWQCB) and the City for review. The SWPPP shall contain Best Management Practices (BMPs) for the Contractor's construction activities in accordance with the NPDES permit requirements.

If no pay item is provided in the contract for work required under this Section 7- 1.01G then payment for the NPDES permit and implementation of the SWPPP shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefore.

7-4 Sound Control Requirements

Add the following: Unless otherwise specified in the Special Provisions or Encroachment Permit, construction work and related activities including equipment startup shall desist before seven a.m. and after seven p.m. and when daylight savings time is in effect the hours of permitted operation shall be extended one hour to eight p.m. in accordance with Sec. 9.24.040 of the City Code.

The Contractor's attention is directed to Section 12-3.03, "Flashing Arrow Signs" regarding electrical energy.

7-5 Permits and Licenses

Add the following paragraphs:

The Contractor and approved subcontractor(s) shall obtain all necessary licenses (a valid City of Marina business license), permits and City of Marina Transportation permit (including State Permit) prior to beginning of construction.

A "no fee" building permit may be issued. The Contractor shall obtain the permit from the City Permit Services Division. However, should the permit require "specialty testing", the Contractor shall, at his/her expense, provide a certified laboratory that will submit written test results together with necessary reports to the Engineer for review and approval.

If no pay item is provided in the contract for the work required under this Section 7-1.04, then specialty testing including results and reports shall be considered included in contract prices paid for the various items of work involved and no additional compensation will be allowed therefore.

7-6 Public Convenience

All items listed under this section, including "extra work as provided in Section 4-1.03D" and "flagging costs," shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore. If the Special Provisions call for the erection, within or adjacent to the limits of the contract, of warning and directional signs or information signs furnished by the City, and no bid item is included for such erection and return of said signs to the storage location, then the work shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

7-7 Public Safety

All items listed under this section, including "flagging costs," and the payment therefore shall be considered as included in the prices for the various contract items of work and no additional compensation will be allowed therefore. If the Special Provisions call for the erection within or adjacent to the limits of the contract, of warning and directional signs or information signs furnished by the City, and no bid item is included for such erection and return of said signs to the storage location, then the work shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

Whenever immediate action is required to prevent impending injury, death, or property damage, and precautions which are the Contractor's responsibility have not been taken and are not expected to be taken, the City may, after reasonable attempts to notify the Contractor, cause such precautions to be taken and shall charge the cost thereof against the Contractor, or may deduct, such cost from any amount due or becoming due from the City. City action or inaction under such circumstances shall not be constructed as relieving the Contractor or his/her surety from liability.

Unless otherwise provided by the Engineer, the Special Provisions, or the Permit, the Contractor's construction activities daily work time shall be between the hours of 8:30 a.m. and 4:30 p.m. on all City streets and alleyways. Should the Special Provisions or Permit allow for working hours other than listed above and unless otherwise specified in the Special Provisions or permit, construction work and related activities shall desist between the hours of 9:00 p.m. and the following 7:00 a.m. and, all Saturdays, Sundays, and legal Holidays.

7-8 Street Closures

Unless otherwise provided in the Special Provisions or Encroachment Permit, street closures shall not be allowed. Should street closure be allowed, the Contractor shall comply with all applicable State, County and City requirements for closure of streets. No street closure shall be allowed without an approved plan showing barricading, signing and necessary detour signing in accordance with the latest edition of the "Manual of Warning Signs, Lights and Devices for Use in Performance of Work Upon Highways" as published by the California Department of Transportation.

The Contractor shall notify the Police, Fire, Ambulance Service, Disposal Service, affected School Districts, Monterey-Salinas Transit, Engineering Department of jurisdictional agencies involved, affected property owners and businesses, and news media (radio, TV, newspaper) at least seventy-two hours in advance of any work that will delay traffic on any street, alley or other public thoroughfare. The Contractor shall cooperate with local authorities relative to handling

traffic through the area and shall make his/her own arrangements relative to keeping the working area clear of parked vehicles.

The Contractor's attention is directed to Section 7-1.09, "Public Safety." The Contractor shall also be responsible for compliance with additional public safety requirements that may arise during construction. He/she shall furnish, install, and maintain, and upon completion of the work, promptly remove all signs and warning devices. Payment for this work shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

7-9 Responsibility for Damage

Section 7-1.12 of the State Standard Specifications shall apply, except that retention of money due the Contractor under and by virtue of the contract will be made by the City of Marina pending disposition of suits or claims for damages brought against the City.

The Contractor shall indemnify and hold harmless the City of Marina and all officers and employees thereof connected with the work, including but not limited to the City Engineer, from all claims, suits or actions of every name, kind and description, brought for, or on account of, injuries to or death of any person or damage to property resulting from the construction of the work or by or in consequence of any negligence guarding the work; use of improper materials in construction of the work; or by or on account of any act or omission by the Contractor or his/her agents during the progress of the work or at any time before its completion and final acceptance.

The duty of the Contractor to indemnify and save harmless, as set forth herein, shall include the duty to defend, as set forth in Section 2778 of the Civil Code, provided, however, that nothing herein shall be construed to require the Contractor to indemnify the City against any responsibility or liability in contravention of Section 2782 of the Civil Code, including any loss from a design defect which is the sole negligence of the City.

The Contractor shall, at his/her own expense, procure and at all times during the prosecution of the work and until final completion thereof, maintain in full force and effect Workmen's Compensation Insurance, public liability insurance, and property damage insurance conforming with Section 7-1.12 of the State Standard Specifications with the following provisions:

1. A policy covering the full liability of the Contractor to any and all persons employed by him/her directly or indirectly in or upon the work or their dependents in accordance with the provisions of the Labor Code of the State of California relating to Workmen's Compensation Insurance.
2. A policy of public liability and property damage insurance having limits of not less than the limits specified in the State Standard Specifications.

The policies mentioned in this section shall be issued by an insurance carrier satisfactory to the City and shall be delivered to the City at the time of the delivery of such contract. In lieu of actual delivery of such policies, a certificate issued by the insurance carrier showing such policies to be in force for the period covered by the contract will be accepted. Such policies or certificate shall be on the form included in the contract documents or approved by the City Attorney. Should any policy be cancelled before the final completion of the work herein contemplated and the Contractor should fail to immediately procure other insurance as herein required, then the City may procure such insurance and deduct the cost thereof from the amount due the Contractor. The policies shall by proof of an endorsement include as additional insured the City of Marina, its officers, agents and employees.

7-10 Relief from Maintenance and Responsibility

Add to the last sentence of the last paragraph…"or during the warranty period."

SECTION 8: PROSECUTION AND PROGRESS

Prosecution and progress shall be as specified in Section 8 of the State Standard Specifications, except as herein modified.

8-1 Subcontracting

Delete paragraph 5 of this section and insert the following:

> Enclosed with his/her bid, the Contractor shall file with the City Engineer at his/her office, City Hall, Marina, California, a written statement showing the work to be subcontracted giving the names of the subcontractors and the description of each portion of the work to be so subcontracted. Requests for substitution or addition of subcontractors from the list shall be in accordance with Public Contracts Code Section 4107 and all cost will be borne by the Contractor.

8-2 Beginning of Work

Add the following to this subsection:

> Before work may begin and the Notice to Proceed issued, a pre-construction conference will be held at the office of the City Engineer for the purpose of discussing with the Contractor the scope of work, contract drawings, specifications, existing conditions, materials to be ordered, equipment to be used, and all essential matters pertaining to the prosecution of and the satisfactory completion of the project as required. The Contractor's representative(s) at this conference shall include all major superintendents for the work including major subcontractors. The Contractor shall submit at the preconstruction conference a Progress Schedule in accordance with Section 8-1.04 and any other item required by the Special Provisions for review and/or approval.
>
> At the project pre-construction meeting, the City will furnish two (2) sets of the Plans and Specifications to the Contractor and one (1) additional set for each of the listed subcontractors. If additional sets are requested, the Contractor will be charged for the extra sets at the rate specified in the Notice to Bidders.
>
> On or before the date of final inspection, the Contractor shall deliver the corrected and completed "Record Drawings" to the City Engineer. Contractor shall furnish in duplicate two (2) binders of all manufacturers' brochures, manuals, parts list, instructions, etc., for all electrical and mechanical equipment furnished and installed by the Contractor. Submissions of the binder contents in a haphazard method will not be acceptable. Failure to submit the "Record Drawings" shall be cause to withhold final payment and not accept the project.

8-3 Progress Schedule

Shall be as specified in Section 8-1.04 of the State Standard Specification, except as herein modified. Delete the first paragraph and insert the following:

> The Contractor shall submit to the Engineer a practicable progress schedule at the beginning of the pre-construction conference, and within five (5) working days of the Engineer's request at any other time.

8-3.1 Schedule Review

Once every week, on a date mutually agreed upon, a jobsite meeting will be held to review the Construction Schedule, job progress, subsequent work, coordination with public agencies or other contractors as required and allow the Engineer to plan his/her activities for testing, inspection, etc.

8-4 Time of Completion

Shall be as specified in Section 8-1.06 of State Standard Specification, except as herein modified.

Working days will be counted beginning on the first working day after the day specified on the notice to proceed with the work. Numbered working days will be in accordance with Caltrans Construction Workday Calendar.

8-5 Termination of Control

If at any time the City Council shall find that the Contractor has failed to supply an adequate working force or material of proper quality or has failed in any other respect to prosecute the work with diligence as specified in and by the terms of the contract, notice thereof in writing shall be served upon him/her, and should he/she neglect or refuse to provide means for satisfactory compliance with the contract as directed by the Engineer within the time specified in such notice, the City Council shall have a grounds for termination of the Contractor's control over the work and for taking over the work by the City. Upon receiving notice of such suspension, the Contractor's control shall terminate and thereupon the City Council or its duly authorized representative may take possession of the work or such designated part thereof, and may use any or all of the Contractor's plant, tools, equipment, materials or other property on the work, none of which shall be removed by the Contractor so long as they may be required for the work, and the Engineer may contract or otherwise provide the superintendents, workmen, materials, appliances and equipment necessary for the completion of and may complete the work, or such designated part thereof. The whole of the expense so incurred for the completion of the work or part thereof, together with all damages, liquidated or otherwise, sustained or to be sustained by the City, shall be deducted from the fund or appropriation set aside for the purpose of the contract and shall be charged to the Contractor as if paid to him/her. In case the amount of such expenses and damages shall exceed the sum which would have been payable under the contract if completed entirely by the Contractor, the amount of such excess shall be paid to the City by the Contractor and both he/she and his/her sureties shall be liable to the City therefore, and in case the amount of such expense and damages shall be less than the sum which would have been payable under the contract if completed entirely by the Contractor, he/she shall be entitled to the amount of the difference subject to all the terms of the contract.

The Contractor shall continue to prosecute to completion all the work from which he/she has not, as above provided, been ordered to desist and he/she shall cooperate with and in no way hinder

or interfere with the forces employed by the City or contract otherwise to do any designated part of the work as above specified.

Upon completion of all the work included under the contract, the Contractor shall be entitled to the return of all his/her materials which have not been used in the work, of his/her plant, tools, and equipment, provided however that he/she shall have no claim on account of usual and ordinary depreciation, loss, wear and tear.

In the determination of the question whether there has been any such noncompliance with the contract as to warrant the suspension or annulment thereof, the decision of the City Council shall be binding on all parties to the contract.

8-6 Utility and Non-Highway Facilities

Delete the Subsection in its entirety and insert the following:

(a) *Location* - The City and the Permittee (in the case of Private Contracts) will search known substructure records and furnish the Contractor with copies of documents which describe the location of utility substructures, or will indicate on the Plans for the project those substructures (except for service connections) which may affect the work.

Where underground main distribution conduits such as water, gas, sewer, electric power, telephone, or cable television are shown on the Plans, the Contractor shall assume that every property parcel will be served by a service connection for each type of utility.
As provided in Section 4216 of the California Government Code, the Contractor shall coordinate with the utility companies to locate and mark all utility mains and service laterals within the project area. Contractor shall make full determination of all underground utilities, including pot holing, in order to prevent damage or disruption to the existing services during construction. At least two (2) working days prior to commencing any excavation, the Contractor shall contact the regional notification center, Underground Service Alert (USA), and obtain an inquiry identification number. The toll free number to call is: 1-800-642-2444 or 1-800-227-2600. Contractor shall utilize a utility locating company for all work outside the public right of way.

The California Department of Transportation is not required by Section 4216 to become a member of the regional notification center. The Contractor shall contact their local office at 850 Elvee Drive, Salinas, CA or call at (831) 783-3000 for location of its subsurface installations.

The Contractor shall determine the location and depth of all utilities, including service connections, which have been marked by the respective owners and which may affect or be affected by its operations. If no pay item is provided in the Contract for this work, full compensation for such work shall be considered as included in the prices paid for various contract items of work and no additional compensation will be allowed therefore.

(b) *Protection* - The Contractor shall not interrupt the service function or disturb the support of any utility without authority from the owner or order from the City. All valves, switches, vaults, and meters shall be maintained readily accessible for emergency shutoff.

Where protection is required to ensure support of utilities located as shown on the Plans or in accordance with 8-1.10, the Contractor shall, unless otherwise provided, furnish and place the necessary protection at his/her expense.

Upon learning of the existence and location of any utility omitted from or shown incorrectly on the Plans, the Contractor shall immediately notify the Engineer in writing. When authorized by the Engineer, support or protection of the utility will be paid for as provided in Section 4-1.03.

The Contractor shall immediately notify the Engineer and the utility owner if any utility is disturbed or damaged. The Contractor shall bear the cost of repair or replacement of any utility damaged if located as noted in Section 8-1.10(a).

When placing concrete around or contiguous to any non-metallic utility installation, the Contractor shall at his/her expense:

1. Furnish and install a 50 mm [2-inch] cushion of expansion joint material or other similar resilient material; or
2. Provide a sleeve or other opening which will result in a 50 mm [2-inch]- minimum-clear annular space between the concrete and the utility; or
3. Provide other acceptable means to prevent embedment in or bonding to the concrete.

Where concrete is used for backfill or for structures which would result in embedment, or partial embedment, of a metallic utility installation; or where the coating, bedding or other cathodic protection system is exposed or damaged by the Contractor's operations, the Contractor shall notify the Engineer and arrange to secure the advice of the affected utility owner regarding the procedures required to maintain or restore the integrity of the system. Cost for such procedures shall be borne by the Contractor at his/her expense.
(c) *Removal* - Unless otherwise specified, the Contractor shall remove all conflicting portions of utilities shown on the Plans or indicated in the Bid documents as "abandoned" or "to be abandoned-in-place." Before starting removal operations, the Contractor shall ascertain from the City whether the abandonment is complete. If no pay item is provided in the Contractor for this work, full compensation for such work shall be considered as included in the prices paid for various items of work and no additional compensation will be allowed therefore.

(d) *Relocation* - When feasible, the owners responsible for utilities within the area affected by the Work will complete their necessary installations, relocations, repairs, or replacements before commencement of work by the Contractor. When the Plans or Specifications indicate that a utility installation is to be relocated, altered, or constructed by others, the City will conduct all negotiations with the owners and work will be done at no cost to the Contractor, except as provided in Section 15-2.05A. Utilities that are relocated in order to avoid conflicts shall be protected in their position. If no pay item is provided in the Contract for protection, full compensation for such work shall be considered as included in the prices paid for various items of work and no additional compensation will be allowed therefore.

After award of the Contract, portions of utilities that are found to conflict with the work will be re-arranged by the utility owners, or the Engineer may order changes in the work to avoid the conflict. Such changes will be paid for in accordance with Section 4-1.03.

When the Plans or Specifications provide for the Contractor to alter, relocate, or reconstruct a utility, all cost for such work shall be included in the Bid for the items of work necessitating such work. Temporary or permanent relocation or alteration of utilities requested by the Contractor for Contractor's convenience shall be the Contractor's responsibility and the Contractor at his/her cost shall make all arrangements.

The utility owner will relocate service connections as necessary within the limits of the Work or within temporary construction or slope easements. When directed by the Engineer, the Contractor shall arrange for the relocation of service connections as necessary between the meter and property service line, or between a meter and the limits of temporary construction or slope easements. The relocation of such service connections will be paid for in accordance with provisions of Section 4-1.03. Payment will include the restoration of all existing improvements, including landscaping, which may be affected thereby. The Contractor may agree with the owner of any utility to disconnect and reconnect interfering service connections and shall notify the City of any such agreement.

(e) *Delays* - The Contractor shall notify the Engineer of its construction schedule insofar as it affects the protection, removal, or relocation of utilities. Said notification shall be included as a part of the construction progress schedule required in Section 8-1.04. The Contractor shall notify the Engineer in writing of any subsequent changes in the construction schedule that will affect the time available for protection, removal, or relocation of utilities.

The Contractor will not be entitled to damages or additional payment for delays attributable to utility relocations or alterations if correctly located, noted, and completed in accordance with Section 5-1.09 and Section 8-1.10(a).

The City will assume responsibility for the timely removal, relocation, or protection of existing main or trunkline utility facilities within the area affected by the work if such utilities are not identified in the Contract Documents. The Contractor will not be assessed liquidated damages for any delay caused by failure of the City to provide for the timely removal, relocation, or protection of such existing facilities.
If the Contractor sustains loss due to delays attributable to conflicts, relocations, or alterations not covered by Section 8-1.10(a), which could not have been avoided by the judicious handling of forces, equipment, or plant, there shall be paid to the Contractor such amount as the Engineer may find to be fair and reasonable compensation for such part of the Contractor's actual loss as was unavoidable and the Contractor may be granted an extension of time.

(f) *Cooperation* - When necessary, the Contractor shall so conduct its operations as to permit access to the work site and provide time for utility work to be accomplished during the progress of the work. Cost as a result of cooperation shall be included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

(g) *Payment* - If no pay item is provided in the Contract for work required under this Section 8-1.10, full compensation for such work shall be considered as included in the prices paid for various contract items of work and no additional compensation will be allowed therefore.

SECTION 9: MEASUREMENT AND PAYMENT

9-1 Measurement of Quantities

Shall be as specified in Section 9 of the State Standard Specifications except as herein modified. In lieu of the portion of Section 9-1.01 of the State Standard Specifications which provides that roadway material, except imported borrow and imported topsoil, shall have the mass [weight] of the water deducted from the mass [weight] of the material delivered to the work, the complete

mass [weight] of the material shall be the measurement upon which payment will be based, provided, however, that the moisture content does not exceed the optimum moisture for compaction of the material.

Add the following to this section: The Contractor's attention is directed to Section 1-1.02. In addition to the units of measurement, insert the following:

UNITS OF MEASURE AND THEIR ABBREVIATIONS

U.S. Customary Unit	Equal to	SI Unit (abbreviations)
1 mil (-0.0001 in)		*25.4 micrometer (µm)*
1 inch (in)		*25.4 millimeter (mm)*
1 inch (in)		*2.54 centimeter (cm)*
1 foot (ft)		*0.3048 meter (m)*
1 yard (yd)		*0.9144 meter (m)*
1 mile (mi)		*1.6093 kilometer (km)*
1 square foot (ft^2)		*0.0929 square meter (m^2)*
1 square yard (yd^2)		*0.8361 square meter (m^2)*
1 cubic foot (ft^3)		*0.0283 cubic meter (m^3)*
1 cubic yard (yd^3)		*0.7646 cubic meter (m^3)*
1 acre		*0.4047 hectare*
1 U.S. gallon (gal)		*3.7854 Liter (L)*
1 fluid ounce (fl. oz.)		*29,5735 milliliter (mL)*
1 pound mass (lb)(avoirdupois)		*0.4536 Kilogram (kg)*
1 ounce mass (oz)		*28,3495 gram (g)*
1 ton (=2000 lb avoirdupois)		*0.9072 Tonne*
1 Poise		*0.1 pascal - second (Pa-s)*
1 centistoke (cs)		*1 sq. millimeters per second (mm^2/s)*
1 pound force (lbf)		*4.4482 Newton (N)*
1 pounds per square inch (psi)		*6.8948 Kilopacal (kPa)*
1 pound force per foot (lbf/ft)		*1.4595 Newton per Meter (N/m)*
1 foot-pound force (ft-lbf)		*1.3558 Joules (J)*
1 foot-pound force per second ([ft-lbf]/s)		*1.3558 Watt (W)*
1 part per million (ppm)		*1 milligram/liter (mg/L)*

TEMPERATURE UNIT AND ABBREVIATIONS

Degree Fahrenheit (ºF):	Degree Celsius (ºC)
ºF = (1.8 x ºC) + 32	ºC = (ºF - 32)/1.8

SI UNITS (ABBREVIATION) COMMONLY USED IN BOTH SYSTEMS

1 Ampere (A)
1 Volt (V)
1 Candela (cd)
1 Lumen (lm)
1 second (s)

COMMON METRIC PREFIXES

Kilo (k)	10^{3}
*centi (c)	10^{-2}
milli (m)	10^{-3}
micro (μ)	10^{-6}
nano (n)	10^{-9}
Pico (p)	10^{-12}

*Note: To be avoided where practical, except in certain uses.

9-2 Scope of Payment

In addition to this subsection, add the following paragraph:

Items of labor and materials which are not specifically listed in the Proposal and the Special Provisions as pay items, but which are shown and/or mentioned on the Plans or are required to be done to complete the overall project, shall be considered included in 19 prices paid in the various contract items of work and no additional compensation will be allowed therefore.

9-3 Partial Payments

Delete the third paragraph of this subsection and insert the following paragraphs:

> The Department shall retain ten (10) percent of such estimated value of the work done and ten (10) percent of the value of materials so estimated to have been furnished and delivered and unused or furnished and stored as aforesaid as part security for the fulfillment of the Contract by the Contractor, except that at any time after fifty (50) percent of the work has been completed, if the City Engineer finds that satisfactory progress is being made, the City Engineer may reduce the total amount being retained from payment pursuant to the above requirements to five (5) percent of the total estimated value of said work and materials and may also reduce the amount retained from any of the remaining partial payments to five (5) percent of the total estimated value of said work and materials and may also reduce the amount retained from any of the remaining partial payment to five (5) percent of the estimated value of such work and materials. The request to lower the retention must be made in writing by the Contractor, along with a written approval by the surety of the performance and payment bonds. The retained security shall be paid to the Contractor thirty-five (35) days after the work has been formally accepted by the City Council.

The Contractor shall submit subcontractor(s) and/or supplier(s) waiver of liens as required by Civil Code Article 3262. The waiver shall be "conditional" before payment and "unconditional" after payment on forms set forth in the statute.

9-4 Beneficial Use

As a condition to partial payments made to the Contractor, the City shall have the right to make beneficial use of completed portions of the work prior to total project completion without prejudice to completion and final acceptance of the project.

9-5 Payment of Withheld Funds

Delete the second paragraph of this subsection and insert the following paragraph:

As provided in Section 22300 of the Public Contract Code and Section 10263 of the Government Code, Contractor within ten (10) days after award of the Contract may request that any retention to be withheld during the course of a project is paid to an escrow agent at the Contractor's expense. Should the Contractor make such request, it will be required that an appropriate Escrow Agreement as provided in said Government Code be fully executed prior to any payment of retention withheld, and in keeping with the City's Local Hire policy, the Escrow Agent shall be from a local Marina bank or agency. The City Engineer, or his/her delegate, is authorized to execute said Escrow Agreement on behalf of the City.

9-6 Final Payment and Claims

In lieu of the portions of Section 9-1.07 of the State Standard Specifications, which provide thirty (30) days for the Contractor to submit written approval of the proposed final estimate to the Engineer or thirty (30) days to file a claim, ten (10) calendar days time shall be permitted in these specifications.

On the Contractor's approval or if he/she files no claim within said period of ten (10) days, the Engineer will issue a final estimate in writing in accordance with the proposed final estimates submitted to the Contractor and within thirty-five (35) days thereafter, the City will pay the entire sum so found to be due.

Such final estimate and payment thereon shall be conclusive and binding against both parties to the contract and all questions relating to the amount of work done and any compensation payable therefore.

If the Contractor within said period of ten (10) days files a claim(s), the Engineer will issue a semifinal estimate in accordance with the proposed final estimates submitted to the Contractor and within thirty-five (35) days thereafter, the City would pay the sum so found to be due. Such semifinal estimate and payment thereon shall be conclusive and binding against both parties to the contract as they relate to the amount of work done and the compensation payable therefore except items affected by the claim(s) filed within the time and the manner required hereunder.

Delete the fourth paragraph on page 105 and insert the following paragraph:

The City Council will make the final determination of any claim(s), which remain in dispute after completion of claim review by the Division administering the Contract. The City Engineer will review such claims and make a written recommendation thereon to the City Council. The Contractor may meet with the City Engineer to make a presentation in support of such claim(s).

9-7 Satisfactions of Liens

Prior to judicial determination of any claim(s) or in accordance therewith, the City may apply any amount withheld to the payment and satisfaction of recorded liens or just claim(s) against the Contractor or any subcontractors for labor and services rendered and materials furnished. In so doing, the City shall be deemed the agent of the Contractor and any payment so made by the City shall be considered as a payment made under the contract by the City to the Contractor, and the City shall not be liable to the Contractor for any payment made in good faith; provided that such payment will not be made except by court order if the Contractor furnishes a bond satisfactory to the City to indemnify it against any lien or claim(s).

For timely Stop Notices, City will withhold funds from Contractor's payment in compliance with State Law.

9-8 Adjustment of Overhead Costs

The provisions in the State Standard Specifications shall not apply.

SECTION 10: DUST CONTROL

Dust control shall be as specified in Section 10 of the State Standard Specifications, except as herein modified.

10-1 Cleanup

Throughout all phases of construction including suspension of work, and until receiving relief from maintenance and responsibility for the project, the Contractor shall keep the work site clean and free from rubbish, debris and graffiti. The Contractor shall also abate dust nuisance by cleaning, sweeping, and sprinkling with water, or other means as necessary. The use of water resulting in mud on public streets will not be permitted as a substitute for sweeping or other methods. The Contractor shall respond to dust control abatement requests within four (4) hours of receiving a facsimile notice. The Contractor shall submit the facsimile phone number. Should the Contractor fail to respond to such notice, the City shall cause to have the abatement completed by any available construction force and deduct that cost from any funds due the Contractor.

Failure of the Contractor to comply with the Engineer's clean up orders may result in an order to suspend the work until the condition is corrected. No additional compensation will be allowed as a result of such suspension.

10-2 Payment

In lieu of Section 10-1.04 of the State Standard Specifications, full compensation for all expense involved in conforming to the above cleanup requirements or for applying either water or dust palliative shall be considered as included in the unit prices paid for the various items of work and no additional compensation will be allowed therefore.

SECTION 11: MOBILIZATION

Mobilization shall be as specified in Section 11 of the State Standard Specifications.

SECTION 12: CONSTRUCTION AREA TRAFFIC CONTROL DEVICES

Construction Area Traffic Control Devices shall be as specified in Section 12 of the State Standard Specifications except as herein modified.

Contractor must submit a traffic control pan to the City Engineer for approval prior to beginning work.

Flaggers shall be issued proper communication devices (radios, cell phones) as dictated by site conditions or upon request by the City Engineer.

12-1 Flagging Costs

Delete the first paragraph and insert the following:

> The cost of furnishing all flaggers, including transporting flaggers, to provide for passage of public traffic through the work under provisions in sections 7-1.08, "Public Convenience," and 7-1.09, "Public Safety," and for providing stands or towers for use of flaggers shall be considered included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

12-2 Flashing Arrow Signs

Unless otherwise provided in the Special Provisions, a generating plant onsite to provide electrical energy shall not be allowed.

12-3 Temporary Railing (Type K)

Delete the last sentence of the first paragraph and insert the following sentence: Payment for repainting of the units when ordered by the Engineer shall be included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

12-4 Portable Changeable Message Signs

Unless otherwise provided in the Special Provisions, a generating plant onsite to provide electrical energy shall not be allowed.

12-5 Measurement and Payment

Delete all reference to "will be paid for as extra work as provided in Section 4-1.03D…" and substitute, shall be included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

SECTIONS 13 AND 14: (BLANK)

SECTION 15: EXISTING HIGHWAY FACILITIES

Existing highway facilities shall be as specified in Section 15 of the State Standard Specifications, except as herein modified.

15-1 Obliterating Roads and Detours

Unless otherwise specified in the Special Provisions, obliterating shall consist of removal of all asphalt, concrete or Portland cement concrete pavement and rooting, plowing, pulverizing or scarifying to a minimum depth of 150 mm [0.5 feet] or to the bottom of the base material, whichever is less. The loosened material shall be shaped to provide a presentable and well-drained area.

15-2 Frames, Covers, Grates and Manholes

Structures located in the pavement area may be constructed to final grade prior to completion of the pavement or surfacing.

Manholes that are to be lowered to a degree that the frame will be supported with existing structure on more than fifty (50) percent of its base width at any point, may be lowered without removal of the cone as required in Section 15-2.05A of the State Standard Specifications.

15-3 Payment

Delete the last two paragraphs and insert the following:

> When the contract does not include a separate item(s) for removing any of the existing highway facilities encountered within or outside the project limits, then payment for removing such facilities shall be included in the contract prices paid for the various contract items of work and no additional compensation will be allowed therefore.

15-4 Concrete Removal Methods

In addition to the specifications in Section 15-3.02 of the State Standard Specifications, existing concrete shall be cut to a true line where new concrete is to join existing concrete using a concrete saw cutting to a minimum depth of 38 mm [1-½ inches] or to a depth as shown on the plans or as specified in the Special Provisions.

15-5 Removing Concrete Payment

When the contract does not include a separate bid item for removal of concrete, then payment for removing concrete shall be included in the contract prices paid for the various contract items of work and no additional compensation will be allowed therefore.

SECTION 16: CLEARING AND GRUBBING

Clearing and grubbing shall be as specified in Section 16 of the State Standard Specifications.

SECTION 17: WATERING

Contractor shall obtain a construction water meter from Marina Coast Water District (MCWD). All construction water shall be metered.

Watering shall be as specified in Section 17 of the State Standard Specifications, except as herein modified.

17-1 Payment

In lieu of Section 17-1.04 of the State Standard Specifications, full compensation for developing the water supply for all water required for the work and for furnishing and applying all water shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

SECTION 18: DUST PALLIATIVE

Dust Palliative shall be as specified in Section 18 of the State Standard Specifications, except as herein modified.

18-1 Payment

Delete the provisions of the State Standard Specifications in its entirety and insert the following paragraph:

> If no pay item is provided in the Contract for work required under this Section 18, then full compensation for such work shall be considered as included in the prices paid for in the various items of work and no additional compensation will be allowed therefore.

SECTION 19: EARTHWORK

Earthwork shall be as specified in Section 19 of the State Standard Specifications, except as herein modified.

19-1 Grade Tolerance

In lieu of the applicable provisions in Section 19-1.03 of the State Standard Specifications, the grading plane shall not vary more than 10 mm [0.03 feet] above or below the grade established by the Engineer.

19-2 Preparation of Subgrade

Scarifying, subsoiling and discing will be required under the following conditions as determined by the Engineer:

1. For dry soils which are impervious to the penetration of water.
2. For soils that may contain excessive amounts of moisture, which may result in unstable foundations.
3. For soils, which are non-uniform in character, which may result in non-uniform compactions and may result in differential settlements of finished surfaces.
4. When pavement is to be placed directly on the roadbed subgrade.

After rough grading has been completed and scarifying and discing are required, the roadbed subgrade shall be loosened to a depth of at least 150 mm [6 inches]. The loosened material shall then be worked to a finely divided condition and all rocks larger than 75 mm [3 inches] in diameter removed. The moisture content shall be brought to optimum by the addition of water,

by the addition and blending of dry suitable material or by the drying of existing material. The material shall then be compacted by approved equipment to the specified relative compaction. If no pay item is provided in the Contract for this work, then full compensation for such work shall be considered as included in the prices paid for various items of work and no additional compensation will be allowed therefore.

19-3 Surplus Material

Delete the first paragraph of this subsection and insert the following paragraph:

> Unless otherwise shown on the Plans or specified in the Special Provisions, surplus excavated material shall become the property of the Contractor and shall be disposed of off the site of the work in a manner approved by the Engineer. If no pay item is provided in the Contract for this work, the full compensation for such work shall be considered as included in the prices paid for various items of work and no additional compensation will be allowed therefore.

19-4 Structure Excavation and Backfill

Reference to this section in the State Specifications Sections 61, 62, 64, 65, 66 and 68 that apply to culverts, pipes, rods and deadmen shall be in accordance with Section 19-4, "Open Trench Operations" of these Standard Specifications.

19-5 Structure Backfill

Delete the first ten (10) paragraphs of this subsection and insert the following:

Except when used at certain locations hereinafter described, material for use as structure backfill shall have a sand equivalent value of not less than 30. The percentage composition by mass [weight] as determined by laboratory sieves shall conform to the following grading:

SIEVE SIZES	PERCENTAGE PASSING SIEVE SIZES
75 mm [3"]	100
4.75 mm [No. 4]	35-100

Structure backfill shall not be placed until the structure footings or other portions of the structure or facility have been inspected by the Engineer and approved for backfilling. No backfill material shall be deposited against the back of concrete abutments, concrete retaining wall, or outside walls of cast-in-place concrete structures until the concrete has developed a strength of not less than 17 MPa [2,500 psi] of compressive strength as determined by test cylinders cured under conditions similar to those prevailing at the site and tested in accordance with Test Method No. Calif. 521.

Backfill material shall be placed in horizontal, uniform layers not exceeding 200 mm [0.67 feet] in thickness, before compaction, and shall be brought up uniformly on all sides of the structure or facility. Each layer of backfill shall be compacted to a relative compaction of not less than ninety (90) percent.

Compaction equipment or methods that produce horizontal or vertical earth pressures, which may cause excessive displacement or may damage structures shall not be used.

At the option of the Contractor, backfill material conforming to the requirements hereinafter specified may be used at the following locations:

1. Footings outside of slope lines and not beneath any roadbed.
2. Footings for slope protection, slope paving, and aprons.
3. All headwalls, endwalls, and culvert wingwalls.
4. Retaining walls, except for portions under any roadbed.
5. Inlets in median areas or in traffic interchange loops.

The backfill material at the above locations may consist of material from excavation, free from stones or lumps exceeding 75 mm [3 inch] in greatest dimension, vegetable matter, or other unsatisfactory material and shall be compacted to a relative compaction of not less than ninety (90) percent. When the material from excavation is unsuitable for use as backfill it shall be disposed of as directed by the Engineer, and the Contractor at his/her expense for the backfill shall furnish suitable material approved by the Engineer.

Compaction of structure backfill by jetting will be permitted when, as determined by the Engineer, the backfill material is of such character that it will be self-draining when compacted and that foundation material will not soften or be otherwise damaged by the applied water and no damage from hydrostatic pressure will result to the structure. Jetting of the upper four feet, below finished grade will not be permitted. When jetting is permitted, material for use as structure backfill shall be placed and compacted in layers not exceeding 120 cm [4 feet] in thickness. The work shall be performed without damage to the structure and embankment, and in such a manner that water will not be impounded. Jetting methods shall be supplemented with the use of vibratory or other compaction equipment when necessary to obtain the required compaction. Water used for jetting shall be furnished and applied by the Contractor at his/her expense.

19-5.1 Slurry Cement Backfill

Delete item (1) in paragraph 6 of this subsection.

19-6 Open Trench Operations

Delete Section 19-4, Ditch Excavation, in the State Standard Specifications and insert the following:

19-6.1.1 Trench Excavation

For the purpose of shoring or bracing a trench is defined as an excavation in which the depth is greater than the width of the bottom of the excavation. The Contractors attention is directed to Section 5-1.02B regarding hazardous material encountered during excavation.

Excavations for appurtenant structures, such as but not limited to manholes, transition structures, junction structures vaults, valve boxes, catch basins, thrust blocks, and boring pits shall, for the purpose of shoring and bracing, be deemed to be in the category of trench excavation.

Excavation shall include the removal of all water and materials of any nature, which interfere with the construction work. Appropriate dewatering techniques may be utilized if necessary to lower the ground water levels and to stabilize excavation. Methods used must be such that there is no danger of pumping soil from excavation, or adjacent areas, during dewatering. The water level shall be lowered at least to an elevation 300 mm [1 foot] below the bottom of the pipe. This level shall be maintained continuous during construction until after backfilling has been completed up to the original groundwater elevation.

19-6.1.2 Maximum and Minimum Width of Trench

For pipe (except corrugated steel pipe), the minimum and maximum width of trench permitted shall be as indicated on the Plans or Standard Plans.

For corrugated steel pipe, the trench shall be at least 400 mm [16 inches] wider than the outside diameter of the pipe to be installed.

If the maximum trench width is exceeded, the Contractor at his/her expense shall provide additional bedding, another type of bedding, or a higher strength of pipe, as shown on Plans or approved by the Engineer.

Additional payments or deductions from the Contract Unit Price per trench excavation for conduits will be based upon a calculated volume. The width used in calculating the volume of excavation for prefabricated conduit will be the maximum width of trench shown on the Plan and measured at the top of the pipe. In case of sewers or storm drains formed and cast in place, such volume will be based upon the outside width of the structure being constructed plus 0.9 m [3 feet].

Additional payment or deductions from Contract Price for trench resurfacing will be based upon an area determined by the maximum width of trench as specified herein.

19-6.1.3 Access to Trenches

Safe and suitable ladders, which project above the top of the trench shall be provided for all trenches over 1.2 m [4 feet] in depth in conformance with current OSHA requirements. One ladder shall be provided for each 15 m [50 feet] of open trench, or fraction thereof, and be so located that workers in the trench need not move more than 7.5 m [25 feet] to a ladder.

19-6.1.4 Removal and Replacement of Surface Improvements

Bituminous pavement, concrete pavement, curbs, sidewalks, or driveways removed in connection with construction shall be removed in accordance with Section 16-1.04 and reconstructed in accordance with Sections 39, 40, or 73.

19-6.1.5 Bracing Excavations

The manner of bracing excavations shall be as set forth in the rules, orders, and regulations of the Division of Industrial Safety of the State of California.

Prior to commencing the excavation of a trench 1.5 m [5 feet] in depth or greater and into which a person will be required to descend, the Contractor shall first obtain a permit to do so from the Division of Industrial Safety pursuant to Section 7-1.01E.

Should the bracing system utilize steel H-beams or piles or other similar vertical supports, driving of said vertical supports will not be permitted except for the last 1.2 m [4 feet]. The vertical support shall be placed in holes drilled to a depth of 1.2 m [4 feet] above the proposed bottom of pile, except where this procedure is impracticable. The vertical support may then be driven to the required depth, not to operations, the Contractors shall take care to avoid damage to utilities.

At locations where the drilling of such holes is impracticable because of the existence of rocks, running sand or other similar conditions, and provided said impracticability is demonstrated to the satisfaction of the Engineer by actual drilling operations by the Contractor, the Engineer may, upon request of the Contractor, approve the use of means other than drilling for the purpose of

placing the vertical support. Such other means, however, must be of nature, which will accomplish, as nearly as possible, the purpose of the drilling, namely, the prevention of damage to existing surface or subsurface improvements, both public and private. All cost for this work shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

If sheeting is used to support the excavated trench, the Contractor shall remove the sheeting, and no such sheeting will be permitted to remain in the trench. When field conditions, the type of sheeting, or methods of construction used by the Contractor are such as to make the removal of sheeting impracticable, the Engineer may permit portions of the sheeting to be cut off to a specified depth and remain in the trench.

19-6.1.6 Bedding

Bedding shall be defined as that material supporting, surrounding, and extending from the trench subgrade to the springline of the pipe. Bedding material shall meet the requirements of Section 19-4.022a of these Standard Specifications.

Where it becomes necessary to remove boulders or other interfering objects at subgrade for bedding, any void below such subgrade shall be filled with the bedding material. Where concrete is specified to cover the pipe, the top of the concrete shall be considered as the top of the bedding.

If soft, spongy, unstable, or other similar material is encountered upon which the bedding material or pipe is to be placed, this unsuitable material shall be removed to a depth of 150 mm [6 inches] and replaced with bedding material suitably densified. Payment for such removal and replacement shall be considered included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore. Additional bedding if so ordered by the Engineer, over the amount required by the Plans or Specifications, will be paid for as extra work as provided in Section 4-103D. If the necessity for such additional bedding material has been caused by an act or failure to act on the part of the Contractor or is required for the control of groundwater, the Contractor shall at his/her expense provide for the additional excavation and bedding.

Bedding material shall first be placed on a firm and unyielding subgrade so that the pipe is supported for the full length of the barrel. Unless otherwise specified on the Plans or Special Provisions, there shall be 100 mm [4 inches] minimum of bedding below the pipe barrel and 25 mm [1-inch] minimum clearance below a projecting bell. There shall be a minimum side clearance of 150 mm [6 inches] on each side of the pipe barrel. The bedding shall be placed, and densified by mechanical means to ninety-five (95) percent relative compaction. Unless the sheeting or shoring is to be cut off and left in place, densification of bedding for pipe shall be accomplished after the sheeting or shoring has been removed from the bedding zone, and prior to the placement of backfill.

Except where otherwise specified, bedding material shall be gravel or crushed aggregate material having a sand equivalent of not less than 30 or having a coefficient of permeability greater than 35 mm per hour [1.4 inches/hour], or other material approved by the Engineer.

In cases where native free-draining granular material is suitable for use as bedding, the trench may be excavated to a point above the invert grade and the trench bottom hand shaped so that the bottom segment of the pipe is firmly supported on undisturbed material.

Unless otherwise specified, special pipe bedding will not be required for steel or cast iron water pipe, and the trench bottom need not be shaped to the outside diameter of the pipe. However, the trench bottom shall provide firm and uniform bearing.

19-6.1.7 Pipe Laying

Pipe will be inspected in the field before and after laying. If any cause for rejection is discovered in a pipe after it has been laid, it shall be subject to rejection. Any corrective work shall be approved by the Engineer and shall be at no cost to the City.

When connections are to be made to any existing pipe, conduit, or other appurtenances, the actual elevation or position of which cannot be determined without excavation, the Contractor shall excavate for, and expose, the existing improvement before laying any pipe or conduit. The Engineer shall be given the opportunity to inspect the existing pipe or conduit before connection is made. Any adjustments in line or grade which may be necessary to accomplish the intent of the Plans will be made, and the Contractor will be paid for any additional work resulting from such change in line or grade in the manner provided in Section 4-1.03D.

Pipe shall be laid up-grade with the bell, socket or collar ends of the pipe up-grade unless otherwise authorized by the Engineer.

Concrete pipe with elliptical reinforcement shall be laid with the minor axis of the reinforcement cage in a vertical position.

Corrugated metal pipe shall be laid with external laps of the circumferential seams toward the inlet end. Corrugated pipe shall be shipped and handled in such a manner as to prevent damage to protective coatings.

When specified, circular corrugated steel pipe shall be elongated in the shop or in the field before backfilling. The pipe shall be vertically elongated from a true circle to provide an increase in the diameter of approximately five (5) percent for the full length.

Installation of slotted corrugated steel pipe shall not start until after paving of the traffic lanes adjacent to the pipe has been completed at the locations where the pipe is to be placed. The slot shall be covered with roofing paper or other approved covering during backfilling operations to prevent infiltration of material into the pipe.

Pipe shall be laid to Plan line and grade, with uniform bearing under the full length of the barrel of the pipe. Suitable excavation shall be made to receive the bell, socket or collar, which shall not bear upon the subgrade or bedding. Any pipe that is not in true alignment or shows any undue settlement after laying shall be taken up and re-laid by the Contractor's at his/her expense.

Pipe sections shall be laid and jointed in such a manner that the offset of the inside of the pipe at any joint will be held to a minimum at the invert. The maximum offset at the invert of pipe shall be one (1) percent of the inside diameter of the pipe or 10 mm [3/8 inch], whichever is smaller.

In joining socket-and-spigot pipe, the spigot of each pipe shall be so seated in the socket of the adjacent pipe as to give a minimum of 10 mm [3/8-inch] annular space all around the pipe in the socket. Unavailable offsets shall be distributed around the circumference of the pipe in such a manner that the minimum offset occurs at the invert.

When pipe is laid in a sheeted trench, all sheeting against which concrete cradle is to be placed shall be faced with at least one thickness of building paper and the sheeting shall be withdrawn without displacing or damaging the cradle, except as otherwise provided in Section 19-4.015.

After the joints have been made, the pipe shall not be disturbed in any manner.

At the close of work each day, or whenever the work ceases for any reason, the end of the pipe shall be securely closed.

19-6.1.8 Trenching in Improved Areas

Trenching in improved areas shall be considered to be in any previously paved area, either Portland cement concrete or asphaltic concrete, on public property or right-of-way, subject to vehicular traffic.

19-6.1.9 Trench Excavation

Except when this requirement is specifically waived by the Engineer, the trench, at the end of the day, shall not be excavated for more that 15 m [50 feet] in advance of the pipe laying, or left unfilled for more that 15 m [50 feet] where the pipe has been laid. At no time shall the trench be open further than 60 m [200 feet] in advance of the pipe laying or 30 m [100 feet] to the rear thereof, without specific approval of the Engineer. At the end of the day the exposed trench shall be backfilled to finished grade or covered by a method approved by the Engineer. These restrictions do not apply to cast-in-place pipe. The finished grade surface shall be either temporary bituminous surfacing or permanent pavement.

Trenches shall be dug in such a manner so as to assure that the bottom of the trench shall be true to line and grade and be free of rocks, organic material, and any other deleterious substance. The trench walls shall be cut in such a manner as to provide the proper clearance, in accordance with Standard Plan 13.

When excavating for pipes, conduits, ducts, or lines of any kind, and solid rock or other unyielding material is encountered, additional material shall be removed below the normal trench bottom to a minimum depth of 150 mm [6 inches] or as directed by the Engineer. The resulting subtrench shall be backfilled with pipe bedding material and shall be compacted, by mechanical means, to a relative compaction of ninety (90) percent and shall be true to the designed line and grade for the normal trench bottom.

When excavating for pipes, conduits, ducts, or lines of any kind and a firm foundation is not encountered due to soft, spongy, or other unsuitable material, additional material shall be removed below the normal trench bottom to a minimum depth of 300 mm [1 foot] or as directed by the Engineer. The resulting subtrench shall be backfilled with 37.5 mm to 64 mm [1-½ to 2-½ inch] rock, the size of which is to be selected by the Engineer and shall be true to the designed line and grade.

Unless otherwise provided in the Special Provisions, any additional bedding material ordered over the amount required above will be paid for in accordance with Section 4-1.03D, “Extra Work.” If the necessity for such additional bedding material has been caused by an act or failure to act on the part of the Contractor, or is required for the control of ground water, the Contractor at his/her expense shall provide the additional excavation and bedding material.

19-6.1.10 Trench Backfill

After the pipe, conduit, duct, line, or the various plastic pipe in Section 71 of these Standard Specifications, hereinafter called pipe, except for cast-in-place concrete pipe, has been properly laid, bedded, and approved, material meeting the following specifications for initial backfill shall be deposited by hand to the springline of the pipe, and in such a manner as to prevent disturbing

the pipe or altering its line or grade. Said initial backfill material shall be thoroughly compacted by mechanical means in combination with jetting to obtain a density of ninety-five (95) percent relative compaction. This backfill material shall be place in horizontal uniform layers and shall be brought up uniformly on all sides of the pipe.

Initial backfill material shall then be placed in uniform layers on all sides of the pipe to a level at least 300 mm [12 inches] above the top of the pipe. Said initial backfill material shall be compacted by mechanical means in combination with jetting to obtain a relative compaction of ninety-five (95) percent.

The trench, from a depth of 300 mm [12 inches] over the top of the pipe to the bottom of the structural section of the pavement, as shown on Standard Plan 13, shall be backfilled with material conforming to the following specification for intermediate backfill. The Contractor at his/her expense may use initial backfill material in lieu of intermediate backfill.

Intermediate backfill shall be placed in such a manner as to prevent disturbing the pipe or altering its line or grade and shall be thoroughly compacted to a relative compaction of ninety-five (95) percent.

When heavy machinery tamping of backfill material is employed, uniform layer thickness of backfill material shall be as stipulated by the manufacturer of such equipment to produce the relative compaction specified.

Jetting of intermediate backfill that meets the grading requirements for initial backfill material as specified in Section 19-4.022a will be allowed unless otherwise specified in the Special Provisions or shown on the Plans. Horizontal layers shall not exceed 1.2 m [4 feet] in depth and no jetting will be allowed on the upper 1 m [40 in] of trench.

Jetting shall be accomplished only by inserting the water pipe, equipped with an approved jetting head, to the lowest portion of the fill to be compacted, and continuously running water until the water rises to the surface. Insertion of jet pipes shall be at 1.2 m [4 feet] maximum intervals.

Trenches too narrow for mechanical compaction shall be backfilled and compacted with cement slurry in accordance with Section 19-3.062.

19-6.1.11 Backfill Material

Backfill material shall be clean and free from decomposed materials, vegetable matter and other deleterious substances. Bedding material, initial backfill, and intermediate backfills all consist of material, which conforms to the following grading requirements:

BACKFILL GRADING REQUIREMENTS
PERCENTAGE PASSING

Sieve Sizes	Bedding Material	Initial Backfill	Intermediate Backfill
75 mm [3”]	---------	---------	100
63 mm [2 ½”]	---------	---------	90-100
38 mm [1 ½”]			
25 mm [1”]	100	---------	---------
19 mm [3/4”]	65-90	100	---------
12.5 mm [1/2”]	30-45	90-100	---------
9.5 mm [3/8”]	5-25	---------	---------
4.75 mm [#4}	0-10	35-100	35-100
75 µm [#200]	---------	0-10	---------

Initial backfill material shall have a sand equivalent of not less than 30 as determined by test method California 217.

Intermediate backfill material shall be non-plastic, shall not be designated in the CH or MH soils classification as determined by ASTM Test D-4319-00 and shall have a sand equivalent of not less than 20.

At the option of the Contractor and at his/her expense, slurry cement backfill in accordance with Section 19-3.062 may be used in lieu of initial and/or intermediate backfill.

19-6.1.12 Backfill for Cast-In-Place Concrete Pipe

Initial backfill material shall be placed to 300 mm [12 inches] over the top of the pipe. Depth of backfill over the top of pipe shall not exceed 150 mm [6 inches] until concrete compressive strength has reached 4.8 MPa [700 psi] and pipe has been in place twenty-four (24) hours. Backfill may be completed when concrete strength reaches 6.9 MPa [1000 psi] and pipe has been in place forty-eight (48) hours. No backfill other than an initial 150 mm [6 inch] layer may be placed until the specified compressive strength is attained and permission in writing has been obtained from the Engineer. All other backfill methods and materials and requirements shall be as specified above.

19-6.1.13 Trench Requirements

Unless permanent pavement is placed immediately, temporary bituminous surfacing 50 mm [2] inches thick shall be placed and maintained at locations determined by the Engineer wherever excavation is made through pavement, sidewalk, or driveways.

19-6.2.1 Trenches in Unimproved Areas

Trenches in unimproved areas shall be considered any trench in an area not considered an improved area under Section 19-4.02 or any area as defined in Section 19-4.04, "Subdivisions and Unimproved Streets."

19-6.2.2 Trench Excavation

In all areas used for farming purposes or when designed on the plans or in the Special Provisions, the existing topsoil shall be removed to a depth of 600 mm [two (2) feet], for the entire width of the excavated area, and stockpiled for subsequent replacement. The removed topsoil shall be protected and preserved from mixture with other soils and deleterious substances until it is replaced to its former location. All other conditions shall be as specified in Section 19-4.021.

19-6.2.3 Trench Backfill

After the pipe, conduit, duct, line or the various plastic pipe in Section 71 of these Standard Specifications, hereinafter called pipe, except for cast-inplace concrete pipe, has been properly laid and approved, material meeting the specification for bedding material, as shown in Section 19-4.022a, shall be deposited by hand as shown on Standard Plan No. 13. Initial backfill material shall be thoroughly compacted by mechanical means in combination with jetting to obtain a density of ninety-five (95) percent relative compaction. Initial backfill material shall then be placed in uniform layers on all sides of the pipe to a level at least 300 mm [12 inches] above the top of the pipe. Said initial backfill material shall be compacted by mechanical means or jetting to a relative compaction of ninety-five (95) percent.

The trench, from 300 mm [12 inches] over the top of the pipe to an even plane 600 mm [2 feet] below final finished grade, may be backfilled with native material from excavation, free from stones or lumps exceeding 75 mm [3 inches] in greatest diameter, vegetable matter, other unsatisfactory material and shall be compacted to a relative compaction of eighty-five (85) percent or to a density equal to that of surrounding soils, whichever is more.

Compaction of trench backfill by jetting will be permitted to a point 600 mm [24 inches] below finished grade except when, as determined by the Engineer, the backfill material is of such character that it will not be self-draining when compacted. Ponding will not be permitted.

When jetting is permitted, material for use as trench backfill shall be placed and compacted in layers not exceeding 1.2 m [4 feet] in thickness. The work shall be performed without damage to the pipe and embankment and in such a manner that water will not be ponding. Jetting methods shall be supplemented by the use of other compaction equipment when necessary to obtain the required compaction. Water used for jetting shall be furnished and applied by the Contractor at his/her expense.

Jetting shall be accomplished only by inserting the water pipe, equipped with an approved jetting head, to the lowest portion of the fill to be compacted, and continuously running water until the water rises to the surface. Insertion of jet pipes shall be at 1.2 m [4-foot] maximum intervals.

When heavy machine tamping of backfill material is employed, layer thickness of backfill material may be modified to depths stipulated by the manufacturer of such equipment to produce the relative compaction specified. Such equipment shall be equipped with impact regulator valves which will permit the rams to strike more gently blows against the first course of material and as otherwise required.

19-6.2.4 Backfill for Cast-In-Place Concrete Pipe

Initial backfill material in accordance with Section 19-4.02a, "Backfill Material" shall be placed by hand to a depth of 300 mm [12 inches] over the top of the pipe.

Said initial backfill material shall be thoroughly compacted by tamping or jetting to obtain a density of ninety-five (95) percent relative compaction. Intermediate backfill material may consist of native material from excavation, free from stones or lumps exceeding 75 mm [3 inches] in greatest diameter, vegetable matter, or other unsatisfactory material. In accordance with the curing procedures specified in Section 63, a 150 mm [6- inch] uniform layer of moist, loose initial backfill material may be placed on the pipe, by hand, as soon as possible after pipe placement without damage to the pipe.

Depth of backfill over the top of pipe shall not exceed 150 mm [6 inches] until concrete compressive strength reaches 4.8 MPa [700 psi] and pipe has been in place twenty-four (24) hours. Backfill may be completed when concrete strength reaches 6.9 MPa [1000 psi] and pipe has been in place forty-eight (48) hours. No backfill other than the 150 mm [6-inch] layer permitted for curing purposes shall be placed until the tests designated have been made and permission in writing has been obtained from the Engineer.

Backfill material shall be compacted to a density equal to that of the surrounding soils or to a relative compaction of eighty-five (85) percent, whichever is less except in improved areas.

19-6.3.1 Subdivision and Unimproved Streets

Trenching in subdivisions and unimproved streets shall be considered any area, which will be improved, and the improvements will be accepted by the City and will become part of the public property or right-of-way.

19-6.3.2 Trench Excavation

Shall be as specified in Section 19-4.021 of these Specifications.

19-6.3.3 Trench Backfill

Shall be as specified in Section 19-4.032 of these Specifications except as herein modified.

The trench, from 300 mm [1-foot] over the top of the pipe to the bottom of the structural section may be filled with native material from the excavation, free from stones or lumps exceeding 75 mm [3 inches] in diameter, vegetable matter or other unsatisfactory material, and shall be compacted to a relative compaction of ninety-five (95) percent.

19-6.4 Payment

Payment for trench excavation and backfill and addition of water for any reason are considered to be included in the payment for the pipe and no additional compensation will be allowed therefore.

A proposal item may be included for removal of unsuitable material and imported select material to be paid for on a cubic meter [cubic yard] basis. Such payment shall include the necessary excavation and select material in place and the City shall have the right to increase or decrease the proposal quantity by more than twenty-five (25) percent with no adjustment of the contract unit price.

19-6.5 Ditch Excavation

Ditch excavation shall consist of excavating ditches within or outside the right-of-way, including channels for changing the course of streams, all as shown on the plans or specifications.

The excavation required constructing a ditch or channel designated with a bottom width of less than 4 m [13 feet] would be classed as ditch excavation. The excavation required to construct a ditch or channel designated with a bottom width of 4 m [13 feet] or more will be classed as roadway excavation.

Material resulting from excavating ditches or channels shall be used to construct roadway embankments, dikes, other purposes, or disposed of, unless directed otherwise by the Engineer.

Care shall be exercised to prevent excavating below the grade for the bottom of the ditch or water channel, and areas excavated below grade shall be filled with suitable material and thoroughly compacted in accordance with Section 19-5.03 by the Contractor at his/her expense.

19-6.6 Measurement

Quantities of ditch excavation to be paid for will be computed by means of average areas and the distances between these areas.

19-6.7 Payment

The excavation of ditches and channels which have a bottom width of less than 4 m [13 feet], gutters within the median area of a divided highway, gutters between the roadbed shoulder and an adjacent excavation slope, gutters in excavation benches, and side gutters contiguous to embankment slopes, all as shown on the plans, will be paid for as roadway excavation. If no

roadway excavation item is provided in the contract, full compensation for this work shall be considered as included in the other items of work and no further compensation will be allowed therefore.

The above price and payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in excavating ditches completely, as shown on the plans, and as specified in these specifications and the Special Provisions.

SECTION 20: LANDSCAPE AND IRRIGATION

Landscaping, functional planting and irrigation shall be as specified herein in lieu of the State Standard Specifications.

20-1 General

This section shall govern the preparation, planting and irrigation system construction for landscaping areas required by the plans or Special Provisions.

Existing utilities and improvements not designated for removal or relocation shall be protected in place. Removals shall be performed in accordance with applicable provisions of Section 8 of the State Standard Specifications. Use of existing City utility services is permitted upon approval of cost reimbursement.

Cost of temporary utility services, metering and its removal that is necessary to complete the work required by the Plans and/or Specifications shall be borne by the Contractor.

Cost of new utility services and its metering that is necessary to complete the work required by the Plans and Specifications shall be borne by the Contractor until the Project is accepted, relief from maintenance and responsibility granted, or when the Plant Establishment period ends.

Unless otherwise provided, walls, curbs, planter boxes, walks, irrigation system and similar improvements required by the plans and/or Special Provisions shall be constructed following rough grading and before landscaping.

20-2 Landscape Materials

20-2.1 Topsoil

Topsoil shall be designated as Class A (imported), Class B (selected) or Class C (unclassified) as specified herein. The Engineer shall determine the suitability of topsoil prior to use. Topsoil shall be transported from the source to its final position unless stockpiling is specified.

20-2.1.1 Class "A" Topsoil

Class "A" topsoil shall be from a source outside the limits of the project selected by the Contractor and in compliance with the requirements specified herein. The Engineer may make such inspections and perform such tests as deemed necessary to determine that the material meets the requirements.

At least fifteen (15) days before scheduled use, the proposed source of topsoil must be submitted to the Engineer for approval. The Contractor shall submit a written request for approval, which shall be accompanied by a written report of a testing agency registered by the State for

agricultural soil evaluation, which states that the proposed source complies with these specifications. Class "A" topsoil shall have the same relative composition and structure, a friable sandy loam character, and be free of roots, clods and stones larger than 25 mm [1 inch] in greatest dimension, pockets of coarse sand, noxious weeds, sticks, brush and other litter. It shall not be infested with nematodes or other undesirable insects and plant disease organisms. Class "A" topsoil shall meet the following additional requirements:

20-2.1.1A Gradation Limits

Sand, fifty to eighty (50-80) percent, clay, twenty (20) percent maximum, and silt, thirty (30) percent maximum. The sand, clay and silt gradation limits shall be as defined in ASTM D-422.

20-2.1.1B Permeability Rate

Not less than 13 mm [0.5"] per hour nor more than 50 mm [2"] per hour when tested in accordance with ASTM D-2434, Calif. Test 220 or other approved methods.

20-2.1.1C Agricultural Suitability

The topsoil shall be suitable to sustain the growth of the plants specified.

20-2.1.2 Class "B" Topsoil

Class "B" topsoil is defined as material which is obtained from sources and in the quantities designated on the Plans or in the Specifications and which requires transport to the designated landscape areas. Such designated sources of the Class B topsoil may be within or outside the project limits. The cost of stripping the surface of vegetation and debris at the designated locations and processing of the material to a finely divided state, before it is spread, shall be included in the price bid for hauling and placing.

20-2.1.3 Class "C" Topsoil

Class C topsoil is defined as soil found in place in the designated landscape area, including soil compacted in place as part of the earthwork specified for the project.

20-2.1.3A Soil Fertilizing and Conditioning Materials

Fertilizing materials shall comply with the applicable requirements of the State Food and Agricultural Code. All fertilizing materials shall be packaged first grade, commercial quality products identified as to source, type of material, mass [weight] and manufacturer's guaranteed analysis. Fertilizing material shall not contain toxic ingredients or fillers in quantities harmful to human life, animals or plants. When required by the Engineer, the Contractor shall furnish a Certificate of Compliance stating that the material substantially meets the specifications

20-2.1.3B Commercial Fertilizer

Commercial fertilizer shall be a palletized or granular product having a chemical analysis as specified on the plans or in the Specifications. Commercial fertilizer shall be free-flowing material delivered in unopened sacks. Material that becomes caked or otherwise damaged shall not be used.

20-2.1.3C Organic Soil Amendment

Soil testing needs to be completed before amendments are incorporated into the project soils. The results of a certified laboratory soil test will identify the deficiencies in the soil. The soil test will specify the amendments and volumes to be added to the project soils. Amendments lacking in the soil will be added per the recommendation of the certified laboratory soil test.

Organic soil amendment shall be selected from Type 1 or 2 products as described herein.

Type 1 organic soil amendment shall be a ground or processed wood product derived from redwood, fir or cedar sawdust, or from the bark of fir or pine, treated with a non-toxic agent to absorb water quickly, and shall comply with the following requirements:

GRADATION: SIEVE SIZE	**PERCENT PASSING**
6.3 mm [1/4"]	95% minimum
2.36 mm [#8]	80% minimum
500 μm [#35]	30% minimum

NITROGEN CONTENT (%, DRY MASS [WEIGHT])

Redwood	0.4 - 0.6%
Fir	0.56 - 0.84%
Cedar	0.56 - 0.84%
Fir bark	0.8 - 1.2%
Pine bark	0.8 - 1.2%

SALINITY

Maximum saturation extract conductivity: 2.50 millisiemens per centimeter [6.35 milliomhs/inch] at 25±C [77±F].

WETTABILITY

When 1 cm ≥ of tap water is applied to 15 ≥ [one teaspoon of tap water is applied to 4 in ≥] (volumetric ratio of 1:15) of the air-dry product, the material shall become completely damp in a period not exceeding two (2) minutes. Any wetting agent added shall be guaranteed non-photo-toxic at the rate used.

Type 2 organic soil amendments shall be a relatively dry friable organic composite derived from sewage sludge processed for agricultural use. It shall contain at least one (1) percent nitrogen by dry mass [weight] and comply substantially with the gradation for Type 1 soil amendment.

20-2.1.3D Mulch

It is not to be placed immediately at the base of plants. When mulch is added to planted beds, the mulch shall be placed inside the drip line of planted material. Mulch may be installed up to the trunk of trees. Mulch shall be designated by Type in accordance with the requirements herein. Mulch shall be packaged in bales or bags unless the engineer approves a bulk source in advance of delivery to the site of the work:

Type 1: mulch (ground wood product), shall comply with the requirements for Type 1 organic soil amendment.

Type 2: mulch (sewage sludge product), shall comply with the requirements for Type 2 organic soil amendment.

Type 3: mulch (peat), shall be brown compressed sphagnum or hypnum.

Type 4: mulch (fir bark chips), shall be fir bark chips in the gradation specified.

Type 5: mulch (straw), shall be either threshed new straw or stable bedding material derived from rice, oats or barley. Straw in an advanced state of decomposition will not be acceptable.

20-2.2 Seed

Seed shall be fresh, clean, new crop seed, mechanically premixed to specified proportions.

Seed shall be delivered to the site in original unopened containers bearing the dealer's guaranteed analysis and germination percentage, and a certificate or stamp or release by a County agriculture commissioner. Any seed tagged "warning, hold for inspection" shall be inspected and released by the agriculture commissioner of the County within which the seeds are to be planted.

20-2.3 Plants

Unless otherwise specified in the Special Provisions, plants shall be inspected and approved at the nursery by the Engineer prior to shipment to the planting site. The Contractor at his/her expense shall arrange for the necessary inspection. The Engineer prior to planting shall also inspect all plants at the planting site.

All plants shall have a growth habit normal to the species and shall be sound, healthy, vigorous, and free from insect pests, plant diseases, sunscalds, fresh bark abrasions, excessive abrasions, or other objectionable disfigurements. Tree trunks shall be sturdy and well "hardened off." All plants shall have normal well-developed branch systems, and vigorous and fibrous root systems which are neither root nor pot-bound and are free of kinked or girdling roots.

Other than the normal side pruning during the growth period, no pruning shall be done prior to inspection at the nursery

20-2.3A Trees

Unless otherwise specified in the Special Provisions, trees shall be inspected and approved at the nursery by the Engineer prior to shipment to the planting site. The Contractor at his/her expense shall arrange for the necessary inspection. Nursery stock shall be in accordance with Urban Tree Foundation "Guideline Specifications for Nursery Tree Quality" which can be found on the website: http://urbantree.org/specs.asp. All trees shall be of the specified height and crown to the last division of the terminal leader and diameter. The height shall be measured from the root crown. The diameter shall be measured 155 mm [6 inches] above the root crown. The height of palm trees shall be measured from the groundline to the base of the fronds except in the case of Canary type, which shall be measured to the bottom of the "pineapple." The tree shall stand reasonably erect without support.

20-2.3B Shrubs

Shrubs shall be of the specified type and size, selected from high quality well-shaped nursery stock.

20-2.3C Flatted Plants

Ground cover plants and other flatted plants shall be well grown and remain in the flats until transplanted at the site. The soil and spacing of the plants in the flat shall insure the minimum disturbance of the root system at time of transplanting.

20-2.3D Sod and Stolons (turf grass)

Unless otherwise specified in the Special Provisions, turf grass sod shall be fresh, clean, living sections of runners of hybrid grass. Replacement sod shall match the existing grass that was removed. Sod shall be free of turf disease, insects, or weeds, and capable of healthy vigorous growth and shall be approved by the Engineer prior to placement. Sod shall be placed in accordance with Section 20-4.082. Nursery sod production shall be in accordance with the Nursery Sod Growers Association of Ontario (NSGA) website:

http://www.gov.on.ca/OMAFRA/english/crops/facts/top

For mechanical or hand spreading, turf grass stolons shall be 25 mm to 100 mm [1 to 4 inches] long and bent grass 100 mm to 200 mm [4 to 8 inches] long. Stolons to be planted in a slurry mixture as described in Section 20-4.083 shall be supplied in shorter sections as required.

20-2.3E Cuttings

Cuttings shall be fresh stock cut with a sharp hand tool from the stems of healthy vigorous plants of the species specified. If not otherwise specified, the length of cuttings shall be in accordance with the best horticultural practice.

20-2.4 Headers, Stakes and Ties

Lumber for landscape work shall be construction heart rough redwood in the sizes specified. Galvanized steel pipe shall be as specified in Section 20-3.01.1. Nails, lag screws and miscellaneous hardware shall be "hot dipped" galvanized commercial quality material. Miscellaneous fabricated metal items shall be made from steel conforming to ASATM A-36.

20-2.4A Headers and Stakes

Headers shall be 50 mm-by-100 mm [2" x 4"] except that two 25 mm-by-100 mm [1" x 4"] boards shall be supplied for laminations on turns and curves. Header stock shall be supplied in lengths at least 3 m [10 feet]. Stakes for headers shall be pointed 50 mm-by-100 mm [2" x 4"], at least 450 mm [18 inches] long. Joint splicing lumber shall be 25 mm-by-100 mm [1" x 4"], 600 mm [2 feet] long.

20-2.4B Tree Stakes

The type of tree stake shall be as designated in the Special Provisions. The length of tree support stakes shall be 3 m [10 feet].

Guy ties shall be reinforced rubber tire tree straps 600 mm [24 inches] long and 25 mm [1- inch] wide. Plastic ribbon tie material shall be 25 mm [one inch] wide with a minimum tensile strength of 2*kN* [500 pounds].

Deadman stakes shall be either 50 mm-by-100-mm [2" x 4"] redwood or 19 mm [3/4 inch] diameter steel pipie 900 mm [3 feet] long.

20-3 Irrigation System Materials

20-3.1 Pipe and Fittings

The type of pipe materials and fittings shall be as designated on the Plans or in the Special Provisions and shall comply with the following:

Galvanized steel pipe may only be used when approved by the Engineer.

20-3.1A Plastic Pipe for use with Solvent Weld Socket or Threaded Fittings

Plastic pipe shall be rigid unplasticized polyvinyl chloride PVC 1220. (Type 1, Grade 2), conforming to ASTM D-1785. Plastic pipe marked with product standard PS-21-70 conforms to the ASTM requirements. The minimum pressure rating shall not be less than the working pressures indicated therein for the schedule and sizes listed.

Schedule 80 pipe shall be used for installation on the discharge side of control valves and Schedule 80 pipe shall be used for continuously pressurized pipe on the supply side of control valves. Schedule 80, only, shall be supplied when threaded joints are specified or otherwise permitted by the Engineer.

Fittings and couplings for plastic pipe shall be threaded or slip-fitting tapered socket solvent weld type. Threaded adapters shall be provided with socket pipe for connections to threaded pipe. Plastic pipefittings and couplings shall be PVC I or PVC I/II material supplied in the same schedule size specified for the pipe. The type of plastic material and schedule size shall be indicated on each fitting or coupling. Fittings and couplings shall comply with the following specifications:

SOCKET FITTINGS

Schedule 80	ASTM D-2464

THREADED FITTINGS

Schedule 80	ASTM D-2464

20-3.1B Plastic Pipe for Use With Rubber Ring Gaskets

Plastic pipe for use with rubber ring gaskets shall be rigid unplasticized polyvinyl chloride PVC 1120 (Type 1, Grade 1), manufactured in accordance with ASTM D-2241. Plastic pipe marked with product standard PS 22-70 conforms to the ASTM requirements. Pipe shall be supplied with plain ends or with an integral thickened expanded bell with rubber ring groove. Couplings for plain end pipe shall be of the single rubber ring type with solvent weld socket on one end or shall be of the double rubber ring type.

Rubber ring gaskets shall be of a synthetic rubber supplied in accordance with the requirements of ASTM D-1869.

Pipe shall be furnished in the following Standard Dimension Ratios (SDR) and Pressure Ratings:

1100 kPa [160 psi]	SDR 26
1380 kPa [200 psi]	SDR 21

20-3.1C Copper Pipe

Copper pipe shall be Type K in accordance with ASTM B-88M (ASTM B-88). Copper pipe shall be jointed with the appropriate solder type wrought copper fittings for 64 mm [2-1/2"] and smaller sizes. Cast brass fittings shall be used for sizes over 64 mm [2-1/2"].

20-3.2 Valves and Valve Boxes

Valves shall be of the size, type and capacity designed on the Plans or in the Special Provisions and shall comply with the requirements specified herein.

All valves except garden valves shall be capable of satisfactory performance at a working pressure of 1380 kPa [200 psi]. Valves shall be designed to permit disassembly to replace sealing components without removal of the valve body from the pipeline. All valves shall be fully ported to match the size of its inlet pipeline.

20-3.2A Gate and Ball Valves

Gate valves in sizes 50 mm [2 inches] and smaller shall be all bronze double disc wedge type with integral taper seats and non-rising stem. Sizes 64 mm [2-1/2 inches] and larger shall be iron body, brass trimmed with other features the same as for 50 mm [2 inches]. When ball valve is installed, the handle needs to be parallel to the side of pipe. When the valve is shut off the handle should be facing straight up.

20-3.2B Manual Control Valves

Manual control valves shall be brass or bronze, and shall be straight or angle pattern globe valves, full opening, key operated with replaceable compression disc and ground joint union on the discharge end. Unions shall be installed on both sides of manual control valves.

20-3.2C Remote Control Valves

Remote control valves shall be electrically or hydraulically operated. They shall be brass, bronze or plastic body with accurately machined valve seat surfaces, equipped with flow control adjustment and capability for manual operation. They shall be made so that they may be readily disassembled for servicing. Unions shall be installed on both sides of remote control valves. Install ball valve before valve and unions (inflow side).

20-3.2D Garden Valves

Garden valves shall be brass or bronze except for the handle. They shall have a replaceable compression disc, and shall be 20 mm [3/4 inch] straightnosed, key operated and pressure rated for operation at 1035 kPa [150 psi].

20-3.2E Quick Coupling Valves and Assemblies

Quick-coupling valves shall be brass or bronze with built-in flow control and self-closing valve and supplied in 25 mm [1 inch] size unless otherwise required. When a quick-coupler assembly is specified, it shall consist of the valve, quick coupler connection and hose swivel. All quick-coupling valves and assemblies shall be installed with a Schedule 80 triple swing joint.

Install a Master Valve and a flow meter in all services to irrigation systems. The master valve and flow meter should be installed within 6 m [20 feet] of backflow. The master valve needs to be installed in a valve box that meets City Standards. The flow meter should meet the Data Industrial 200 series Plastic Tee Type Meter (Model 220PV) standard or industry equal. It should include the "IR" sensor not the standard sensor. The wire for the flow meter needs to be installed in conduit from the controller to the flow meter. A valve box needs to be installed over the flow

meter that meets City Standards. The wires need to be at least 2 conduit- ICEA, Class "B" 16 gauge-2/C, 7 strand. The pressure for the flow meter needs to be set at 56 lpm [15 gpm] higher than the highest lpm [gpm] in the irrigation system design.

20-3.2F Valve Boxes

Valve boxes and covers shall be precast Portland cement concrete sized as necessary and in accordance with the "Dimension Tables" in Caltrans Standard Plan ES-8 with precast concrete cover marked "WATER" in cast-in letters not less than 25 mm [1-inch] high. The box shall be set to finished grade on a 150 mm [6-inch] layer of 19 mm [¾-inch] crushed rock. A continuous piece of 5 mm to 15 mm [¼ in to ½ in] mesh, 1.0 mm [19 gage] minimum galvanized woven wire cloth shall be between the box and crushed rock.

Valve boxes need to be installed 304 mm [12"] from all walkways, curbs, header boards, buildings and soundwalls. There needs to be a 304 mm [12"] separation between valve boxes when more then one is required.

Irrigation valve box covers need to have controller identification and valve number identification permanently inscribed on top of lid.

Valve box and cover for remote control valves may be plastic as manufactured by Carson-Brooks, National Diversified Sales (NDS), or approved equal.

20-3.3 Backflow Preventer Assembly

The backflow preventer assembly shall consist of a backflow preventer unit and related components conforming to the governing code requirements.

Its assemblies need to be tested by a licensed and Certified Backflow Tester before final acceptance will be given. It shall be one of the approved reduced pressure principle devices listed by the California Department of Health Services, Division of Drinking Water and Environmental Management, 601 North 7th Street, Mailing Station (MS) 92, P.O. Box 942732, Sacramento, CA 94234-7320.

Backflow Preventer Assembly needs to have ball type test cocks with covers installed to allow for standard backflow tester unit equipment connection on all 4- test cocks. All its assemblies need to have an insulated aluminum or stainless steel cover installed over them.

Install Y-strainer with 20-mesh filter on the inflow side before all backflow preventer assemblies.

Install ball valve or gate valve depending on pipe size of the inflow side before all backflow preventer assemblies. For PVC shut-off, ball valve shall be installed in the ground within several meters [feet] of the backflow preventer assembly, a valve box installed over it per City standards.

Backflow preventer shall be factory assembled and shall include 2 check valves, one pressure differential relief valve, 2 shut-off valves and 4 test cocks. Backflow preventer and valves shall be the same size as the pipeline in which they are installed, unless otherwise shown on the Plans.

Backflow preventer shut-off valves shall be manufactured from iron or bronze and shall be resilient seated and fully ported ball valves. Threaded type shut-off valves shall be with a union on one side of each valve. Unions shall be brass or malleable iron.

Backflow cage shall be factory insulated made of stainless steel. Backflow blankets will not be accepted as insulation.

The backflow cage shall include an option to lock cage to concrete pad. The backflow cage pad shall consist of: six (6) inches thick Class "B" concrete pad for enclosure support and shall extend six (6) inches beyond enclosure on all sides. Concrete pad shall have a brushed finish. All forms are to be removed before completion of project.

20-3.4 Sprinkler Equipment

Sprinkler heads, bubbler heads and spray nozzles shall be of the types and sizes shown on the Plans. Such equipment shall be brass, bronze and stainless steel, except for minor components. Equipment of one type and flow characteristic shall be from the same manufacturer and all equipment shall bear the manufacture's name and identification code in a position where they can be identified in the installed position.

All pop-ups and rotary heads used in planted areas need to be installed to final grade and "NOT" flush to the curb or sidewalk. All irrigation heads need to be installed perpendicular to final grade. All irrigation heads need to be installed with Schedule 80, triple swing joints (preassembled Schedule 80 swing joints are okay).

Fixed head sprinklers shall have a one-piece housing with provision for interior parts replacement. Pop-up sprinklers shall be designated to rise at least 150 mm [6 inches] during operation. Full or part circle sprinklers shall be interchangeable in the same housing.

All sprinkler heads shall have an in-stem pressure regulator that will maintain a constant pressure of 207 kPa [30 psi] and reduce water loss by sixty (60) percent should the nozzle be removed or damaged. All sprinkler heads shall have an in-stem check valve that will hold a minimum 35 kPa [5 psi] of head to prevent leakage upon shutoff.

Shrubbery and bubbler heads shall be adjustable from full flow to shut off.

20-3.5 Electrical Materials

The Contractor shall furnish and install all electrical equipment and materials required for a complete electrical system. All equipment and materials shall comply with the requirements of the governing code and the serving utility and shall be approved and identified by Underwriters Laboratories, Inc. (UL).

20-3.5A Conduit

Conduit above ground and within buildings shall be galvanized steel conforming to the applicable provisions of Section 86-2.05 or as specified in the Special Provisions. Conduits below ground and direct burial may be schedule 40 PVC and contain a minimum #12 grounded bare copper conductor.

20-3.5B Conductors

Line voltage conductors shall be supplied in the sizes and types shown on the Plan and shall be THW or THWN, 600-volt insulation rating, conforming to the applicable provisions to ASTM D-2219 and D-2220.

Low voltage control conductors shall be Type UF and supplied in the sizes shown on the plans or in accordance with the control equipment manufacturer's recommendation, and shall be UL approved for direct burial installation.

20-3.5C Controller Unit

The type of control unit shall be as called for on the plans. It shall be fully automatic, with provisions for manual operation, sized to accommodate the number of stations or control valves included in the system. Outdoor models shall be housed in a vandal-proof and weatherproof enclosure with locking cover.

All irrigation controllers need to have a telephone wire installed in conduit from controller box to phone source. The controller is not required to have a modem installed. The wire shall be, installed for future use.

A permanent receiver card shal1 be installed in each controller. This will allow the controller to be operated from several miles away.

20-3.5D Pull Boxes

Pull boxes shall be No. 5 in accordance with the "Dimension Tables" in Caltrans Standard Plan ES-8 or larger unless otherwise shown on the Plans and shall conform to the provisions in Section 86-2.0A, "Materials." Pull box covers for pull boxes used solely for electrical service shall be marked in accordance with the provisions in Section 86-2.0B, "Cover Marking." All other irrigation system pull box covers shall be marked "SPRINKLER CONTROL" in accordance with the provisions in said Section 86- 2.0B. The box shall be set to finished grade on a 150 mm [6-inch] layer of 19 mm [¾-inch] crushed rock. A continuous piece of 5 mm to 15 mm [¼ inch to ½ inch] mesh, 1.0 mm [19 gage] minimum galvanized woven wire cloth shall be between the box and crushed rock.

20-4 Landscape and Irrigation Installation

The Contractor shall construct the complete landscape and irrigation work specified.

All work on the irrigation system, including hydrostatic and coverage tests, preliminary operational tests of the automatic control system, and the backfill and densification of trenches and other excavations shall be performed after topsoil work and before planting.

20-4.1 Earthwork and Topsoil Placement

Earthwork and topsoil placement shall include excavation and backfill for the irrigation system and the preparation for and the spreading, densification, cultivation and raking of topsoil, including fertilization and conditioning. Planting holes and backfill shall be accomplished in accordance with Section 20- 4.05, "Planting."

Preliminary rough grading and related work to prepare areas for landscaping work to within 30 mm [0.1-foot] of finished grade, or to subgrade for Class A or Class B topsoil, shall be completed in accordance with Section 19, "Earthwork."

20-4.2 Trench Excavation and Backfill

Trench excavation and backfill shall be in accordance with the Section 19-4 of these Standard Specifications.

Trenches and other excavations shall be sized to accommodate the irrigation system components, conduit, and other required facilities. Additional space shall be provided to assure proper installation and access for inspection. Unless otherwise specified, the minimum depth of cover over pipelines and conduits shall be as follows:

1. Electrical conduit – 450 mm [18 inches]. 750 mm [30 inches] under roadways.
2. Water lines continuously pressurized – 600 mm [24 inches]. 900 mm [36”] under roadways.
3. Lateral sprinkler lines – 450 mm [18 inches].

The bottom of trenches shall be true to grade and free of protruding stones, roots or other matter, which would prevent proper bedding of pipe or other facilities. Trenches and excavations shall be backfilled so that the specified thickness of topsoil is restored to the upper part of the trench.

20-4.3 Topsoil Preparation and Conditioning

The type and thickness of topsoil shall be as shown on the plans, or if not shown shall be Class A, 150 mm [6 inches] thick. Planting areas shall be free of weeds and other extraneous materials to a depth of 300 mm [12 inches] below finished grade before topsoil is spread.

Soil shall not be worked when it is so wet or so dry as to cause excessive compaction or the forming of hard clods or dust.

The existing soil below subgrade for Class “A” topsoil shall be scarified to a depth of 150 mm [6 inches] prior to spreading topsoil.

Class C topsoil shall be scarified and cultivated to finely divided condition to a depth of 200 mm [8 inches] minimum below finished grade. During this operation, all stones over 25 mm [one inch] in greatest dimension shall be removed.

20-4.3A Fertilizing and Conditioning Procedures

The planting area shall be brought to finished grade before spreading the fertilizers or conditioning materials specified.

Fertilizing and conditioning materials shall be mechanically spread at a uniform rate. The quantities of materials necessary for the planting area shall be at the site and shall be verified by delivery tickets furnished to the Engineer before spreading.

After spreading, the fertilizing and conditioning materials shall be uniformly cultivated into the upper 150 mm [6 inches] of soil by suitable equipment operated in at least two directions approximately at right angles. The resulting soil shall be in a friable condition.

20-4.3B Finished Grading

The finished grade shall be smooth, uniform, and free of abrupt grade changes and depressions to insure surface drainage.

The finished grade below adjacent paving, curbs or headers shall be 25 mm [1 inch] in lawn areas and 50 mm [2 inches] in shrub or ground cover areas.

After fertilizing and conditioning, the soil shall be watered and allowed to settle to provide a stable surface, not overly densified to the extent that it will prevent aeration and water infiltration. After the soil has dried out to a workable condition, the planting areas shall be regraded, raked, and smoothed to the required grades and contours. Finished surfaces shall be clean and suitable for planting.

20-4.4 Header Installation

Headers shall be installed at the location and grades shown on the Plans prior to planting.

Stakes shall be located at splices, corners, and at intervals not to exceed 1.5 m [5 feet] and driven slightly below the top of the header. Splice plates shall be used at butt joints. Headers shall be nailed to stakes with two nails, clinched 13 mm [1/2 inch]. Splice plates shall be centered on the joint and nailed to each header with four 10d box nails.

20-4.5 Planting

The types, sizes and quantities of plant materials shall be as called for in the Plans and Specifications.

All plants will be inspected prior to planting, including plants previously approved at the nursery. The Contractor shall be responsible for the condition of all plants, planted or otherwise, until acceptance. Planting shall be performed with materials, equipment and procedures favorable to the optimum growth of the plants and in compliance with these procedures.

Except as noted for specimen planting, all planting shall follow the completion of the irrigation system.

20-4.5A Protection and Storage

The Contractor shall keep all plant material delivered to the site in a healthy condition for planting. Plants shall not be allowed to dry out. Bare rootstock must be separated and "heeled in" in moist earth or other suitable material. Balled and burlapped plants shall have the root ball covered with moist sawdust, wood chips, or other approved material.

20-4.5B Layout and Plant Location

Staking for planting areas and detailed layout within the planting areas shall be performed by the Contractor and approved by the Engineer prior to planting. Parkway trees will be located in the field by the Contractor and approved by the Engineer before planting. The first row of plants in areas designated for center-to-center spacing of plants shall be located at one-half of designated spacing from the edge of the area.

20-4.5C Specimen Planting

Plants in boxes 600 mm [24 inches] and larger shall be planted before the installation of lateral irrigation lines.

Irrigation lines conflicting with specimen plant locations shall be re-routed to clear the root ball.

20-4.5D Tree and Shrub Planting

Planting holes shall be the depth of the planting container, approximately square with vertical sides twice the width of the plant container or ball, and shall be larger if necessary to permit handling and planting without injury or breakage of the root ball or root system. Any plant with a broken or cracked root ball before or during planted shall not be planted.

Containers shall be opened and removed in such a manner that the plant root is not injured. Balled plant wrappings shall be loosened or cut back after plant is positioned in the planting hole and shall be backfilled and covered with soil mix.

The native soil at the bottom of planting holes shall be scarified to a depth of 150 mm [6 inches].

No soil amendment is to be added when backfilling any tree or shrub. Native soil shall be used only. Care should be taken not to plant shrubs directly in front of irrigation heads.

After planting, the plant shall be plumb, with the root crown at its natural growing depth with respect to finished grade. Planting shall be governed by the following requirements:

1. A layer of native soil shall be deposited in the planting hole.
2. The plant shall be set approximately at the center of the hole.
3. Native soil shall be deposited in the remainder of the hold to finished grade.
4. The backfill shall be thoroughly water-settled and additional prepared soil mix added to fill any remaining void below finished grade.
5. A circular watering basin slightly larger than the planting hole, 100 mm [4 inches] high for trees and 50 mm [2 inches] high for shrubs, shall be left around the plant.
    a. The bottom of the basin shall be at the approximate finished grade or slightly lower. Type 1, 2, or 3 mulch shall be spread at least 50 mm [2 inches] thick in the basin.
6. The plant shall be guyed and staked as specified in Section 20-4.6B of these Standard Specifications.
7. The area around the plants shall be regraded to finished grade. The Contractor shall dispose of the excess soil.

20-4.6 Plant Staking and Guying

Plant staking and guying shall be installed as follows:

20-4.6A Tree Staking

The tree shall be staked with two 50 mm [2-inch] x 3.1 m [10- foot] Lodge Pole Pine stakes in accordance with Standard Plan 46. Ties shall be reinforced rubber tire tree straps 600 mm [24 inches] long and 25 mm [1-inch] wide. The loop shall be 25 mm [1 inch] greater in diameter than the trunk and attached to the lodge pole with a figure eight at the locations as shown on the Standard Plan.

20-4.6B Guying

Trees and other plants, except specimen plants, to be guyed shall be designated in the Contract Documents. Guying shall be done immediately after planting. Three guys per plant shall be installed in accordance with the following:

1. Each guy shall be secured to the appropriate main branch by a twisted loop of No. 12 AWG zinc-coated iron wire housed in garden hose.
2. Each guy shall be anchored to a driven stake located at a horizontal distance from the tree equal to the vertical distance from ground to the connection of guy wire on the tree branch.
3. Each guy shall be covered with highly visible garden hose or plastic tubing to a height of 1.8 m [6 feet] above grade.
4. Slack in each guy shall be removed by hand so as not to bend or twist the plant.

20-4.7 Ground Cover and Vine Planting

Soil preparation and fine grading shall be completed prior to ground cover planting.

Ground cover and vines shall be planted in moist soil and spaced as indicated on the Plans. Each plant shall be planted with its proportionate amount of flat soil to minimize root disturbance. Soil moisture shall be such that the soil does not crumble when removing plants.

Following planting, ground cover and vine areas shall be regraded to restore smooth finished grade and to insure proper surface drainage. A 25 mm [1-inch] layer of Type 1, 2, or 3 mulch shall be spread over the planted areas. Watering shall begin immediately following mulching.

When necessary to prevent plant damage from pedestrian traffic during the initial growing stage, the Contractor at his/her expense shall erect temporary protective fencing to be removed at the end of the plant establishment period.

Vines shall be tied to walls, fences, etc. in the manner prescribed on the Plans. Temporary staking shall be removed at the end of the plant establishment period.

20-4.8 Lawn Planting

Before planting lawn, all specified soil preparation and fine grading shall be completed.

20-4.8A Seed Lawn Planting

Seed lawn planting may be accomplished by Method A (dry method) or Method B (hydraulic method). Seeding shall not be performed when the wind velocity exceeds 8 km/h [5 miles per hour], or is detrimental to the uniform distribution of the seed.

1. *Method A* - The area to be seeded shall be lightly raked to provide a seedbed.

   The required seed mixture shall be sown uniformly at the specified rate. Seeding shall be done in two operations with the spreader set to sow one-half the specified amount in each operation. The second sowing shall be at right angles to the first. After sowing, the area shall be rolled and then be evenly covered to a depth of 6 mm to 13 mm [1/4 to ½ inch] with approved mulch.

   The lawn area shall be watered in a manner so as not to cause surface erosion.

   Newly seeded surfaces shall be kept moist continuously throughout the germination period.

2. *Method B* - The seed, fertilizer, fiber and other materials in the slurry mixture shall be as specified. All materials shall be of such character that they will disperse into uniform slurry when mixed with water. The mixture shall be such that an absorbent porous mat will be formed.

All materials must be available for inspection prior to application. Masses [weights] and contents of containers shall be clearly identified. A green coloring additive shall be used in the slurry for visual inspection purposes.

The slurry shall be applied under pressure at the specified rates.

20-4.8B Sod Lawn Planting

The type and thickness of sod and the areas to be sodded shall be in accordance with the Contract Documents.

Subgrade for sod shall be the specified thickness of the sod below finished grades. Soil conditioning, fine grading and rolling shall be completed before sodding. No heavy equipment shall operate over the subgrade after grading is completed.

The subgrade shall be moist but not wet when sod is laid. Sod shall be laid with closely fitted joints, and the ends of the strips shall be staggered. Openings shall be plugged with sod or topsoil.

Within two (2) hours after installing sod and before rolling, the sod shall be lightly irrigated. All seams and joints shall then be rolled until the sod is well bonded to the subgrade.

The area shall then be watered thoroughly to penetrate the subsoil at least 200 mm [8 inches]. Watering shall be repeated as necessary to keep the sod moist until rooted into the subgrade. Sodded areas shall be protected against foot traffic until the sod is well established.

20-4.8C Stolon Planting

Topsoil preparation, conditioning and finished grading shall be completed in accordance with Section 20-4.03 and 20-4.032 before stolon planting.

The area to be planted in stolons shall be thoroughly irrigated to a depth of at least 200 mm [8 inches]. As soon as the soil can be worked, the specified commercial fertilizer shall be worked into the top 25 mm [1 inch] of soil.

At the time of planting, the top 50 mm [2 inches] of soil shall be friable and contain enough moisture to prevent stolons from drying out during the planting operation. The stolons shall be worked into the soil to a depth of 10 mm to 40 mm [1/2 to 1-1/2 inches] by a mechanical or hand planter, or broadcast by hand and covered with 6 mm [1/4 inch] of mulch.

When the area to be planted exceeds 1000 square meters [10,000 square feet], a mechanical spreader shall be used. When less than 1000 square meters [10,000 square feet] and more than 200 square meters [2,000 square feet], the use of a hand planter or mechanical planter is optional; and when less than 200 square meters [2,000 square feet], hand planting or broadcasting with mulch is optional.

The planted stolons shall not be allowed to dry out. Watering shall begin immediately after planting and the stolons kept moist at all times until the plants are well established.

When overseeding is required, the seed shall be spread in accordance with Section 20-4.081, Method A, immediately after planting stolons.

20-4.9 Erosion Control Planting

Erosion control planting shall be for slope protection. Topsoil grading and conditioning shall be in accordance with Section 20-4.03.

20-4.9A Straw Stabilization

When straw stabilization is specified, Type 5 mulch shall be incorporated into the slope topsoil either by discing or with a steel plate studded roller. The steel plate studs shall be at least 150 mm [6 inches] long, not more than 150 mm [6 inches] wide, and approximately 25 mm [1 inch]

thick with rounded edges. The roller shall be capable of forcing the straw into the soil a sufficient depth to tie down the surface soils.

20-4.9B Seeding and Mulching

Seed, fertilizer, mulch, and other specified materials may be applied on slopes by Method A or Method B described in Section 20-4.8A.

20-4.10 Sprigging

Sprigging shall consist of planting turf grasses, cut stems of plants, and plants with attached root system but without adhering soil.

Sprigs shall normally be harvested and planted within a (twenty-four) 24-hour period. Ice plant sprigs shall be harvested between forty-eight (48) and ninety-six (96) hours before planting so that a thin callus is formed over the cut surface of each sprig. Sprigs shall be shaded during callusing, but shall not be moistened.

Turf grasses shall be planted in accordance with Section 20-4.8A.

Ice plant sprigs shall be planted in moist soil in holes or furrows 100 mm [4 inches] deep and the hole or furrow refilled with soil and made firm around the plant in such a manner that the plant is not damaged.

Sprigs shall be planted individually at specified spacing. When row sprigging is specified, planting shall be in furrows cut along the contour of the slope.

If mulching of sprigged areas is required, it shall immediately follow planting.

20-4.11 Watering

All seeded and planted areas shall be kept moist during the establishment period.

Areas containing ice plants shall be maintained in a barely moist condition to a depth of 25 mm [1 inch] below the planted root depth.

When a permanent irrigation system is not available, the Contractor, at his/her expense, shall provide whatever temporary system is necessary to provide adequate watering during the establishment period without erosion detrimental to the planting.

20-5 Irrigation System Installation

The Contractor shall furnish all necessary materials, labor and equipment required to complete the work of installing the irrigation system in accordance with the Contract Documents.

Large specimen plants shall be planted before installing the irrigation system, as required by Section 20-4.5C.

Unless otherwise provided, irrigation system layout shown on the Plans shall be considered schematic. With the Engineer's approval, the Contractor may make adjustments where necessary to conform to actual field conditions. The irrigation system shall be operational, with uniforms and adequate coverage of the areas to be irrigated, prior to planting.

An accurate pressure test needs to be completed after backflow device is installed. This will help insure the water pressure matches what is specified in the original irrigation design.

All backflow preventers shall be assembled with pipe and fittings of brass and bronze up to 63 mm [2.5 inches]. Over 63 mm [2.5 inches] use cast iron pipe, spools and flanges.

Utility service connections shall be as shown on the Plans and/or designated by the utility company. The Contractor shall include in his/her bid all costs for such utility connections shown on the plans or designated by the utility company. The Contractor at his/her expense shall be responsible for furnishing the labor and materials to connect to the service connection.

Trenches through paved areas shall be resurfaced in accordance with Section 19-4.

After completing the irrigation system, the Contractor shall submit Record-Drawings showing the location of pipe, valves, tubing, wiring, controllers, and electrical services. Such drawings shall be submitted before relief from maintenance and responsibility is granted.

20-5.1 Irrigation Pipeline Installation

Trench excavation and backfill including the depth of cover over the pipeline shall be in accordance with requirements of Section 20-4.2.

Pipefitting shall be installed in accordance with the manufacturer's recommendations and these specifications. When requested by the Engineer, the Contractor shall furnish the manufacturer's printed installation instructions before pipe installation.

Pipe shall be bedded in at least 50 mm [2 inches] of finely divided material to provide a firm, uniform bearing. After laying, the pipe shall be surrounded with additional finely divided material to at least 50 mm [2 inches] over the top of the pipe. Trench backfill, sufficient to anchor the pipe, may be deposited before the pipeline pressure testing, except that joints shall remain exposed until satisfactory completion of testing.

When two or more pipelines are installed in the same trench, they shall be separated by a minimum horizontal clear distance of 100 mm [4 inches] and they shall be installed so that each pipeline, valve, or other pipeline component may be serviced or replaced without disturbing the other.

All assemblies shall be assembled as specified and in accordance with manufacturer's directions. During installation of pipe, fittings, valves, and other pipeline components, foreign matter shall be prevented from entering the system. All open ends shall be temporarily capped or plugged during cessation of installation operations.

Changes in pipeline size shall be accomplished with reducer fittings.

20-5.1A Steel Pipeline

Ends of pipe shall be cut square and reamed to full size with a long taper reamer.

Threads shall be cut with clean sharp dies and conform to American Standard Association Specification B2.

Joints shall be made with a non-toxic non-hardening joint compound applied to the male threads only.

When wrapped pipe is specified, joints and any remaining unwrapped portion of the pipeline shall be similarly wrapped after pressure testing.

20-5.1B Plastic Pipeline

Plastic pipe to be jointed shall be primed and then joined by socket type solvent welded fittings, threaded fittings, rubber ring fittings or by other means specified. When plastic pipe is jointed to

steel pipe, the steel pipe shall be installed first. Plastic pipe shall be cut square, externally chamfered approximately 10-15 degrees, and all burrs and fins removed.

Primer/solvent welded joints shall be made in accordance with ASTM D-2855. The primer/solvent recommended by the manufacturer shall be used.

Plastic pipe installation shall be in accordance with ASTM D-2774 and the requirements herein.

Care shall be exercised in assembling a pipeline with solvent welded joints so that stress on previously constructed joints is avoided. Handling of the pipe following jointing, such as lowering the assembled pipeline into the trench, shall not occur prior to the set times specified in ASTM D-2855.

Primer/solvent shall be applied to pipe ends in such a manner that no material is deposited on the interior surface of the pipe or extruded into the interior of the pipe during jointing. Excess primer/cement on the exterior of the joint shall be wiped clean immediately after assembly.

Threads for plastic pipe shall be as specified in Section 20-5.1A above. A plug shall be installed in the bore of the pipe to prevent distortion prior to threading.

Threaded pipe joints shall be made using teflon tape or other approved jointing material. Solvent shall not be used with threaded joints.

Pipe shall be protected from tool damage during assembly. Vices shall have padded jaws and strap wrenches shall be used for installation of fittings and nipples.

Plastic pipe that has been nicked, scarred, or otherwise damaged shall be removed and replaced. Plastic pipe shall be snaked from side to side in the trench to allow 1 meter of expansion and contraction per 100 meters [1 foot per 100 feet] of straight run.

The pipeline shall not be exposed to water for twenty-four (24) hours after the last solvent welded joint is made.

20-5.1C Copper Pipeline

Copper pipeline shall be made with sweated solder joints.

Before jointing, the end of the pipe for the depth of the fitting, and the interior of the fitting shall be buffed to a bright finish and coated with solder flux. The assembled joint shall be made with a 50-50 tin-lead solder. A continuous solder bead shall show around the joint circumference after soldering.

Copper pipe shall be jointed to steel or cast iron pipe with a dielectric union.

20-5.2 Installation of Valves, Valve Boxes and Special Equipments

Valves, backflow preventer, pressure regulators and related accessories shall be furnished and installed as specified.

All valves and other equipment shall be installed in a normal upright position unless otherwise recommended by the manufacturer, and shall be readily accessible for operation, maintenance and replacement. Sectional control valves shall not be located within range of sprinklers they control.

Valves shall be the same size as the pipeline in which they are installed. Valves 50 mm [2 inches] or smaller shall be ball valves. Valves larger than 50 mm [2 inches] shall be gate valves. Gate valves and sectional control valves shall be installed below ground.

Gate valves shall be housed in a covered concrete box that will permit access for servicing. Sectional control valves shall be equipped with a sleeve and cap centered on the valve stem.

Quick-coupler valves and garden valves projecting above grade shall be installed 0.9 m [3 feet] from the curbs, pavement and walks. In lawn areas, such equipment shall be installed in a covered concrete box set to finished grade.

In ground cover and shrubbery areas, quick-coupler valves shall be set to finished grade, and garden valves shall be set between 300 mm and 375 mm [12 inches and 15 inches] above finished grade. Quick-coupler valves and garden valves shall be installed on a triple-swing-joint riser assembly as described in Section 20-5.3B and secured to a driven No. 13 [#4] reinforcing steel rod as described in Section 20-5.3B.

All valve boxes, pipe sleeves, and caps shall be set to finished grade, and valves shall be set at sufficient depth to provide clearance between the cover and the cap, valve handle, or key when the valve is in the fully open position.

Valve boxes shall be set to finished grade on a 150 mm [6-inch] layer of 19 mm [¾-inch] crushed rock. A continuous piece of 5 mm to 15 mm [¼ inch to ½ inch] mesh, 1.0 mm [19 gage] minimum galvanized woven wire cloth between the box and crushed rock.

Backflow preventers shall be provided with pipe supports and the accessories necessary to properly secure the assembly.

20-5.3 Sprinkler Head Installation and Adjustment

In accordance with the requirements of Section 20-5.5, all mains and laterals, including risers, shall be flushed and pressure tested before installing sprinkler heads, after which a water coverage test shall be performed.

20-5.3A Location, Elevation and Spacing

Sprinkler head spacing shall not exceed the maximum shown on the drawings or recommended by the manufacturer.

In new lawn areas, sprinkler heads shall be installed 75 mm [3 inches] above grade and then reset flush with the finished surface just prior to the first mowing. Lawn sprinklers shall be installed 50 mm [2 inches] clear of adjacent walks, curbs, paving, header and similar improvements.

Sprinkler heads shall be installed 100 mm [4 inches] from adjacent vertical elements projecting above grade such as walls, planter boxes, curbs and fences.

Fixed shrub heads, bubbler heads and oscillating sprinklers shall be installed 150 mm [6 inches] above finished grade.

Nozzles shall be installed at least 300 mm [12 inches] above finished grade. Sprinkler heads projecting above finished grade shall be at least 300 mm [12 inches] from adjacent curbs, walks, paving and similar improvements.

20-5.3B Riser and Nozzle Line Installation

To obtain optimum coverage of the area, risers shall be oriented perpendicular to finished grade.

Risers for oscillating sprinklers and nozzle lines shall be galvanized steel pipes. All other risers shall be Schedule 80 PVC. All pipe between the connection to the lateral or main and the sprinkler head shall be threaded.

Sprinkler head riser assembly shall be top outlet, triple-swing joint as specified herein.

Sprinkler head risers and nozzle risers installed above grade within 600 mm [24 inches] of roadway paving, curbs, walks and similar improvements shall be of the triple swing joint type.

Double-swing joint and triple-swing joint riser assemblies shall utilize a minimum horizontal 150 mm [6-inch] pipe nipple threaded into a side outlet ell or tee installed in the lateral supply line. For a triple-swing joint, three ells shall be used in the remaining assembly ahead of the vertical riser pipe. For a double-swing joint, two ells shall be used.

Risers for nozzle lines, oscillating sprinklers, and other sprinkler heads installed above grade within 600 mm [24 inches] of curbs, walks, roadways and similar improvements shall be supported by a No. 13 [#4] reinforcing steel rod driven into the ground, secured with two stainless steel clamps. The upper end of the rod shall be at finished grade and be of such length that it extends 600 mm [24 inches] below the lateral supply line.

Where nozzle lines cannot be supported on adjacent fences, guardrails and the like, they shall be supported on driven 13 mm [1/2 inch] pipe stakes 1.2 m [4 feet] long at 2.4m [8-foot] centers. The nozzle line shall be secured to the top of the stake with 9 mm [3/8-inch] anchor rings, and 300 mm [12 inches] long.

20-5.3C Sprinkler Head Adjustment

When all sprinkler heads are installed and the irrigation system is operating, each section or unit shall be adjusted and balanced, with all section control valves fully open to obtain uniform and adequate coverage.

Sprinkler heads having adjustable pin nozzles or orifices shall have the pins adjusted to provide adequate distribution of water over the coverage pattern. The Contractor shall substitute larger or smaller nozzle cores in nonadjustable sprinkler heads as necessary. Relocation of the sprinkler head to a maximum distance of 3.0 m [10 feet] if necessary shall be required.

If additional work other than the prescribed above is necessary to correct a deficiency in the system installed as specified, such work will be paid for in accordance with Section 4-1.03 of the Standard Specifications.

20-5.4 Automatic Control System Installation

The Contractor shall install a complete automatic irrigation control system including the automatic controller, remote control valves and wiring, and all necessary accessories and utility service connection.

The automatic controller shall be installed outside of the coverage pattern of the irrigation system at the location designated in the Contract Documents. The foundation for the controller shall be concrete of the size shown on the Plan or recommended by the manufacturer. The control components in the controller shall be fused and the chassis shall be grounded.

Remote control valves shall be compatible with the automatic controller. When the valve is to be housed in a valve box, it shall be installed with at least a 150 mm [6-inch] clearance below the cover. The box shall be set to finished grade on a 150 mm [6-inch] layer of 19 mm [¾-inch] crushed rock with a continuous piece of 5 mm to 15 mm [¼ in to ½ in] mesh, 1.0 mm [19 gage] minimum galvanized woven wire cloth between the box and crushed rock.

All service wiring shall be installed at the minimum depth specified in Section 20-4.2 in schedule 40 PVC conduit from the service point to the controller. Above ground conduit shall be schedule 40 galvanized steel. A separate disconnect switch or combination meter socket, as required, shall be installed between the source of power and the controller. The minimum service wire shall be No. 12 AWG copper 600 volt type TW, THW or THWN or larger as required by the Contract Documents or controller manufacturer. Wire splices shall be located only in specified pull boxes and shall be made with a packaged kit approved for underground use or as specified in the Special Provisions. Pull boxes shall be concrete, set to grade on a 150 mm [6-inch] layer of 19 mm [¾-inch] crushed rock with a continuous piece of 5 mm to 15 mm [¼ in to ½ in] mesh, 1.0 mm [19 gage] minimum galvanized woven wire cloth between the box and crushed rock.

Control wiring shall be housed in conduit between the controller and a concrete pull box installed at least 300 mm [12 inches] outside the limits of the controller foundation, or the structure foundation where the controller is housed.

All other wiring issuing from the pull box shall be direct burial installed in main or lateral waterline trenches wherever practicable.

The wiring shall be bundled and secured to the lower quadrant of the irrigation pipeline at 3 m [10-foot] intervals with plastic electrical tape. Sufficient slack shall be left in the wiring or tubing to provide for expansion and contraction. When the control wiring or tubing cannot be installed in a pipe trench, it shall be installed a minimum of 450 mm [18 inches] below finished grade and a bright colored plastic ribbon with suitable markings shall be installed in the trench 150 mm [6 inches] below grade directly over the wire or tubing.

Control wiring shall be suitably color coded as necessary for identification. All common wire shall be white. Unless otherwise required, all control wiring shall be direct burial Type UF, No. 14 AWG copper. Splices in control wire shall be made in accordance with the requirements for service wire. At least 914 mm [3 feet] of slack shall be left at each splice and point of connection in pull boxes and valve boxes.

A spare irrigation blue wire needs to be installed in any trench that runs from the irrigation controller to the last valve of each trench. A 300 mm [1 foot] loop shall be left in each valve box.

After the final inspection at the end of the ninety (90-day) maintenance period, Contractor/Developer will need to turn over the utility meter numbers and utility account numbers to the City of Marina upon final acceptance.

All wiring shall be tested for continuity, open circuits, and unintentional grounds prior to connecting to equipment.

Upon completion of the work, the control system shall be in operating condition with a complete operational chart mounted within the controller cabinet. Also include a color-coded map of all irrigated areas and systems.

20-5.5 Flushing and Testing

After completion and prior to the installation of any terminal fittings, the entire pipeline system shall be thoroughly flushed to remove dirt, scale, or other material. After flushing, the following tests shall be conducted in the sequence listed below. The Contractor shall furnish all equipment, materials, and labor necessary to perform the tests and all tests shall be conducted in the presence of the Engineer.

1. *Pipeline Pressure Test* - A water pressure test shall be performed on all pressure mains before any couplings, fittings, valves and the like are concealed. All open ends shall be capped after the water is turned into the line in such a manner that all air will be expelled. Pressure mains shall be tested with all control valves to lateral lines closed. The constant test pressure and the duration of the test shall be six (6) hours at 860 kPa [125 psi].
2. *Sprinkler Coverage Test* - The coverage test shall be performed after sprinkler heads have been installed and shall demonstrate that each section or unit in the irrigation system is balanced to provide uniform and adequate coverage of the areas serviced. The Contractor shall correct any deficiencies in the system in accordance with the requirements of Section 20-5.03.
3. *Operational Test* - The performance of all components of the automatic control system shall be evaluated for manual and automatic operation.

During the maintenance period and at least fifteen (15) days prior to final inspection, the Contractor shall set the controller on automatic operation and the system shall operate satisfactorily during such period. All necessary repairs, replacements and adjustments shall be made until all equipment; electrical work, controls, and instrumentation are functioning in accordance with the Contract Documents, Plans and the Special Provisions. Contractor shall provide complete set of "As Built" drawings upon completion of work.

20-6 Plant Establishment Work

Plant establishment work shall consist of caring for the landscape planting as specified in this Section 20-6 and in the Special Provisions.

The Engineer will notify the Contractor in writing of the start of the following plant establishment periods and will furnish statements regarding days credited to the plant establishment work after said notification:

Type 1 Plant establishment period shall be the number of working days specified for plant establishment in the Special Provisions and shall begin after all work has been completed, except plant establishment work.

Type 2 Plant establishment period shall be the time between completion of all planting work (except plant establishment work) and acceptance of the contract, provided however, that the contract will not be accepted unless the plant establishment work has been satisfactorily performed for at least the number of working days specified for plant establishment in the Special Provisions.

If relief from maintenance and responsibility is granted for a completed portion of the work, as provided in Section 7-1.15, "Relief from Maintenance and Responsibility," Type 2 plant establishment period for the completed portion shall be the time between completion of all planting work (except plant establishment work) and the granting of relief from maintenance and responsibility, provided however, that the relief will not be granted unless the plant establishment work in the completed portion of the work has been satisfactorily performed for at least the number of working days specified for plant establishment in the Special Provisions.

The time required for plant establishment work shall be considered as included in the total time limit specified for the contract.

The Contractor will be required to adequately water plants, replace unsuitable plants, do weed, rodent and other pest control and other work, as determined necessary by the Engineer, every calendar day during the plant establishment period.

During the plant establishment period, damage caused by erosion shall be repaired as provided in Section 7-1.16, "Contractor's Responsibility for the Work and Materials."

Working days upon which no work will be required, as determined by the Engineer, will be credited as one of the plant establishment working days, regardless of whether or not the Contractor performs plant establishment work.

Working days when the Contractor fails to adequately perform plant establishment work including but not limited to watering plants replacing unsuitable plants, do weed, rodent and other pest control, determined to be necessary by the Engineer, will not be credited as plant establishment working days.

When ground cover plant growth extends onto sidewalks, curbs or dikes, all ground cover plant growth within 150 mm [6 inches] of the sidewalk, curb, or dike shall be removed. Ground cover plant growth within 150 mm [6 inches] of shoulders, walls, or fences shall be removed.

Ground cover shall be kept removed from within planting basins, including the basin walls, and from planting areas within header boards.

Commercial fertilizer shall be applied to trees, shrubs, vines and ground cover areas as specified in the Special Provisions and shall be watered into the soil after each application. The Contractor shall notify the Engineer at least two (2) days prior to applying each application of commercial fertilizer.

Plants shall be kept watered as provided in Section 20-4.11, "Watering." Basins and basin walls shall be kept well formed and free from weeds. Weeds shall be kept removed from planting areas within header boards.

Plants that show signs of failure to grow at any time, or which are so injured or damaged as to render them unsuitable for the purpose intended, as determined by the Engineer, shall be removed and replaced within one (1) week after the Engineer marks or otherwise indicates that the plants shall be replaced. Replacement plants shall be furnished and planted by the Contractor at his/her expense.

Vines next to fences shall be kept tied to the fences as provided in Section 20-4.7, "Ground Cover and Vine Planting."

Weeds, which appear in, asphalt concrete or rock sealed areas shall be killed before they exceed 50 mm [2 inches] in height or width by spraying with a chemical weed killer, which will not stain the surfacing.

All planted areas shall be kept free of debris and shall be weeded and cultivated at intervals not to exceed seven (7) days or as specified in the Special Provisions. The first mowing of lawn areas shall be performed when the grass is 75 mm [3 inches] high and shall be repeated as often as is necessary to maintain the lawn at a height of 75 mm [3 inches]. In no case shall the lawn be cut lower than 38 mm [1-1/2 inches] in height.

The Engineer will designate any required pruning of plants at the start of the plant establishment period and the Contractor shall perform the pruning as part of the plant establishment work.

Where the Special Provisions or the Engineer permits chemical weed control, weeds shall be killed before they exceed 50 mm [2 inches] in height.

Where weed control is permitted by the Special Provisions, they shall be mowed as close to the ground as possible before they exceed 150 mm [6 inches] in height.

Where weeds are to be pulled by hand as specified in the Special Provisions, they shall be pulled before they exceed 100 mm [4 inches] in height or width.

Weed control, as specified in this Section 20-6, shall be performed as often as required to maintain the project in a neat and uniform condition at all times.

At the time of acceptance of the project all planted areas shall be in a weed free or neatly mowed condition.

Surplus earth, papers, trash and debris, which accumulate in the planted areas shall be removed and disposed of in accordance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right-of-way", and the planted areas shall be so cared for as to present a neat and clean condition at all times.

During the plant establishment period, trees, shrubs and ground cover plants shall be pruned or headed back by the Contractor at his/her expense when directed by the Engineer.

In order to carry out the plant establishment work, the Contractor shall furnish sufficient workers and adequate equipment to perform the work during the plant establishment period.

20-7 Guarantee

The entire irrigation control system shall be guaranteed against defects in materials and workmanship for a period of one (1) year from the date of acceptance of the work. Such defects shall include but is not limited to settlement of trenches, re-adjustment of sprinkler heads or valve boxes and replacement of unhealthy trees and plants. The Contractor shall furnish a faithful performance bond in the amount specified in the contract documents to cover the guarantee.

20-8 Measurement and Payment

The lump sum or unit prices set forth in the contract documents shall include full compensation for furnishing all labor, materials, tools and equipment and performing all work necessary to complete and maintain the landscape and irrigation work described or specified in the contract documents.

When the contract does not include a separate item(s) for work required under this Section 20, then payment for the required work shall be considered included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

SECTION 21: (BLANK)

SECTION 22: FINISHING ROADWAY

Finishing roadway shall be as specified in Section 22 of the State Standard Specifications.

SECTION 23: (BLANK)

SECTION 24: LIME STABILIZATION

Lime stabilization shall be as specified in Section 24 of the State Standard Specifications.

SECTION 25: AGGREGATE SUBBASES

Aggregate subbases shall be as specified in Section 25 of the State Standard Specifications except as herein modified.

25-1 Class 6, Class 7 and Class 8 Aggregate Subbases

Aggregate for Class 6, Class 7 and Class 8 Aggregate Subbases shall be clean and free from vegetable matter and other deleterious substances, and shall be of such nature that it can be compacted readily under watering and rolling to form a firm stable base.

The percentage composition by mass [weight] of Class 6, Class 7 and Class 8 aggregate subbases shall conform to the grading shown in the following table for the class specified when determined by Test Method No. Calif. 202:

PERCENTAGE PASSING

Sieve Sizes	**Class 6**	**Class 7**	**Classes 8**
100 mm [4”]	100	----------	---------
75 mm [3”]	90-100	----------	---------
64 mm [2-1/2”]	---------	100	100
4.75 mm [No. 4]	35-90	35-70	35-70
75 µm [No. 200]	0-20	5-20	5-20

Class 6, Class 7 and Class 8 aggregate subbases shall also conform to the quality requirements shown in the following table for the class specified.

Tests	**Test Method No. Calif.**	**Class 6**	**Class 7**	**Class 8**
Sand Equivalent	217	55	30	25
Resistance (R Value)	301	70	70	30

All values listed are minimum values acceptable.

25-2 Measurement

Quantities of aggregate subbase are computed from the areas on which subbase material is to be placed as shown on the Contract Drawings. The quantity as set forth in the proposal shall be considered as final unless the Engineer modifies the typical sections or limits of work as shown on the Contract Drawings. Excepting that the Contractor may, at his/her own expense, have the material weighed by a Public Weightmaster on scales inspected and sealed by the State of California Bureau of Weights and Measures, in which event a unit wet density of 2403 kg/m□ [150 lbs/ft□] of compacted material will be used to convert the tonnes to cubic meters [tons to cy] of material in place as evidence by mass [weight] tickets furnished to the Engineer.

25-3 Payment

Aggregate subbase will be paid for as specified in the State Standard Specifications except that the cost of furnishing and applying water will be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

SECTION 26: AGGREGATE BASES

Aggregate bases shall conform to Section 26 of the State Standard Specifications, except as herein modified.

26-1 Description

Delete the second paragraph and insert the following: Aggregate bases are designated as Class 2, Class 3 and Class 4. The class of aggregate base will be shown on the plans or specified in the Special Provisions.

26-2 Class 4 Aggregate Base

Aggregate furnished for Class 4 aggregate base shall be free from vegetable matter and other deleterious substances and shall be of such nature that it can be compacted readily under watering and rolling to form a firm stable base.

The aggregate shall consist of any one or a mixture of the following materials:

1. Broken stone or crushed grave.
2. Natural material having essentially the same qualities of angularity or surface irregularity and roughness as broken stone.
3. Natural rough surface gravel.

The percentage composition by mass [weight] of Class 4 aggregate base shall conform to the following grading when determined by Test Method No. Calif. 202:

Sieve Sizes	**Percentage Passing Sieves**
50 mm [2”]	100
37.5 mm [1-1/2”]	90-100
19 mm [3/4”]	50-100
4.75 mm [No. 4]	25-90
75 μm [No. 200]	3-15

The Class 4 Aggregate Base Shall Conform to the Following Quality Requirements:

Test	**Test Method No. Calif.**	**Requirements**
Loss in Wet Shot Rattler	210	55% max
Loss in Los Angeles Rattler (after 500revolutions)	11	50% max
Resistance (R-value)	301	75% min
Sand Equivalent	217	26 min
Plasticity Index	202	6 max

26-3 Spreading

The provisions of the State Standard Specifications shall be modified as follows:

Water shall be introduced into the aggregate base, except for Class 4, prior to spreading in sufficient quantity to prevent segregation and non-uniform thickness of spread.

The use of bottom dump trucks is not precluded if the desired final results can be satisfactorily obtained. New and approved spreading equipment, which will produce the desired results, may be used. If methods can be developed whereby material can be successfully spread working from windrows, this is satisfactory.

Class 4 aggregate base shall be spread as specified in the State Standard Specifications, except that it may be spread with the use of a motor grader or other equipment that will provide the uniform layer conforming to the planned section both transversely and longitudinally within the thickness tolerance specified hereafter, without causing segregation of the material.

26-4 Compacting

Shall be as specified, except that the surface of the finished grade, shall not vary more than 8 mm [5/16 inch] above or below the grade established by the Engineer. The Contractor shall furnish to the Engineer all necessary equipment to check the grade variations. Such equipment shall be returned to the Contractor upon completion of checking the work.

26-5 Payment

Payment for furnishing and applying water after weighing and furnishing equipment to check the grade shall be considered to be included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

SECTION 27: CEMENT TREATED BASES

Cement Treated Bases shall be as specified in Section 27 of the State Standard Specifications.

SECTION 28: LEAN CONCRETE BASE

Lean Concrete Base shall be as specified in Section 28 of the State Standard Specifications.

SECTION 29: TREATED PERMEABLE BASES

Treated Permeable Bases shall be as specified in Section 29 of the State Standard Specifications.

SECTIONS 30 THROUGH 36: (BLANK)

SECTION 37: BITUMINOUS SEALS

Bituminous seal shall be as specified in Section 37 of the State Standard Specifications, except as herein modified.

37-1 Preparation for Seal Coat

Add the following to this subsection:

> When seal coats are to be applied to asphalt concrete or cut-back pavements (repairs) that are trench resurfacing of less than five (5) years old, the patches shall be fog sealed with a slowsetting type asphaltic emulsion conforming to the provisions in Section 94, "Asphaltic Emulsions", at the rate of 0.5 L/m² [0.10 gallon/square yard]. If no pay item is provided in the contract for this work, full compensation for such work shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

37-2 Applying Asphaltic Emulsion

Delete the fourth paragraph of this subsection and insert the following:

> Asphaltic emulsion shall not be applied when weather conditions are unsuitable. Seal coats requiring screenings shall not be applied until sufficient screenings are on hand to immediately cover the asphaltic emulsion, or when the atmospheric temperature is below 13°C [55°F], or if the atmospheric temperature will be below 10°C [50°F] during any time of the (twenty-four) 24- hour day, or when the pavement temperature is below 18°C [65°F]. Fog Seal coat shall not be applied when the atmospheric temperature is below 5°C [40°F].

37-3 Finishing

Finishing shall be as specified in the subsection except that the pneumatic-tired rollers shall have a minimum mass [weight] of 10 Tonne [11 Tons].

37-4 Payment

Add to this section the following paragraph:

> The cost of traffic control and flagmen and the cost of salvaging the stockpiling of excess screenings will be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

SECTION 38: (BLANK)

SECTION 39: ASPHALT CONCRETE

Asphalt concrete shall be as specified in Section 39 of the State Standard Specifications, except as herein modified.

39-1 Prime Coat and Paint Binder (Tack Coat)

Delete the first paragraph and insert the following:

A prime coat of liquid asphalt shall be applied to all areas to be surfaced. The roadway or shoulder to be oiled shall be prepared in accordance with the Specifications following that it shall be uniformly watered sufficiently to eliminate dust, but not to such extent as to form mud or pools of water. The application of oil to the roadway or shoulder shall be scheduled to commence after 7:00 a.m. and shall be completed prior to 1:00 p.m., and it is further specified that no oil shall be applied when the air temperature is less the 5ºC [40ºF].

During all oiling operations, precautions shall be exercised to prevent marring or discoloring adjacent improvements and adequate protection against such possibility shall be provided.

After the applied oil has dried, or penetrated to such extent that no free oil remains on the surface, and the condition of the oiled area will otherwise permit, the roadway or shoulder shall be opened to traffic.

If no pay item is provided in the contract for this work, full compensation for such work shall be considered as included in the prices paid for the various items of work and no additional compensation will be allowed therefore.

39-2 General Requirements

Delete the first paragraph entirely and insert the following:

Unless otherwise provided in the Special Provisions or approved by the City Engineer, placing material in a windrow and then picking it up and placing it in the asphalt paver with loading equipment shall not be allowed except with a Material Transfer Vehicle (MTV).

The Contractor may use a MTV when placing all asphalt concrete plant mix pavements, including open-graded asphalt concrete course, and when placing all full width travel lanes, including shoulders, collector lanes, ramps, and loops.

The MTV shall receive mixture from the hauling equipment and shall independently deliver the mixture from the hauling equipment to the paving equipment. The MTV shall be capable of transferring the material from the haul vehicle to the paver hopper at a uniform and continuous rate and will allow continuous movement of the paver. A paver hopper insert with a minimum capacity of 12.7 tonne [14 tons] in the hopper of conventional paving equipment shall be used when utilizing a MTV. The MTV shall be capable of remixing the material prior to discharge into the paver conveyor system. The MTV remixing system shall contain a minimum 12.7 tonne [14 tons] capacity storage bin or a dual pugmill system with two full-length transversely mounted paddle mixers located in the paver hopper insert.

The MTV shall deliver to the paver a homogeneous, non-segregated mixture that is of uniform temperature that will be less than a 11ºC [20ºF] difference between the highest and lowest temperatures when measured transversely across the width of the mat in a straight line at a distance of 0.3 m [1-foot] to 0.9 m [3-foot] from the screed while the paver is operating. The temperature measurements shall be taken approximately 0.3 m [1-foot] from each edge and at least once in the middle of the mat.

The MTV shall be empty when crossing a bridge and move across without any other Contractor vehicles or equipment being on the bridge. The MTV shall move across the bridge in a travel lane and not on the shoulder. While crossing the bridge, the speed of the MTV shall be no greater than 8 km per hour [5 miles/hr] and shall not abruptly accelerate or decelerate. The Contractor at his/her expense shall provide approved signing and flagging during the crossing.

In the event the MTV malfunctions during paving operations, plant operations shall immediately discontinue and shall not resume until the MTV malfunctions have been remedied, unless otherwise directed due to safety concerns. The Contractor may continue placement of the mix until any additional mix in transit has been placed, provided satisfactory results are achieved. This procedure will not alleviate the Contractor from meeting contract requirements.

Compensation for providing and using the materials transfer vehicle or any associated equipment, shall be considered as included in the contract unit bid price per tonne [ton] for asphalt concrete to be placed. If no pay item is provided in the contract for asphalt concrete, full compensation for providing and using such equipment shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

39-3 Compacting

Add the following paragraphs: The Contractor shall furnish to the Engineer a straightedge that meets the requirements of this subsection to check the pavement surface. Such straightedge shall be returned to the Contractor upon completion of checking the work.

Should the pavement surface not meet the tolerances required under this subsection and the temperature of the pavement material be below 65°C [150°F], the surface of the pavement shall be brought to a true grade cross section by removing the paving material in the area to be repaired, by an approved method, that will provide a minimum layer depth of 25 mm [1 inch] of the new pavement at the join line. Repairs shall not be made to pavement surfaces by feather edging at joins.

Compaction after rolling shall be ninety-five (95) percent of the density obtained with the California Kneading Compactor per Calif. Test 304. The field density of compacted asphalt concrete shall be determined by:

1. A properly calibrated nuclear asphalt testing device in the field, or
2. ASTM D-1188 when slabs or cores are taken for laboratory testing. Zinc stearate may be substituted for paraffin.

In case of dispute, method 1 shall be used.

39-4 Payment

Add the following paragraph to this subsection:

The Contractors attention is directed to Section 6-3.02, testing by Contractor. If no pay item is provided in the contract for furnishing straightedge, repairs and compaction testing, then payment for furnishing straightedge, repairs and compaction testing shall be considered as included in the prices paid for in the various contract items of work and no additional compensation will be allowed therefore.

SECTION 40: PORTLAND CEMENT CONCRETE PAVEMENT

Portland cement concrete pavement shall be as specified in Section 40 of the State Standard Specifications.

SECTION 41: PAVEMENT SUBSEALING AND JACKING

Pavement subsealing and jacking shall be as specified in Section 41 of the State Standard Specifications.

SECTION 42: GROOVE AND GRIND PAVEMENT

Groove and grind pavement shall be as specified in Section 42 of the State Standard Specifications.

SECTIONS 43 THROUGH 48: (BLANK)

SECTION 49: PILING

Piling shall be as specified in Section 49 of the State Standard Specifications.

SECTION 50: PRESTRESSING CONCRETE

Prestressed concrete members shall be as specified in Section 50 of the State Standard Specifications.

SECTION 51: CONCRETE STRUCTURES

Concrete structures shall be as specified in Section 51 of the State Standard Specifications, except as herein modified:

Minor Structures - In lieu of the provisions of Section 51-1.02, 51-1.05, 51-1.22, and 51-1.23 of the State Standard Specifications, such pipe headwalls, drop inlets, catch basins and such other miscellaneous concrete structures that are identified on the plans and/or in the Special Provisions as minor structures and are listed in the proposal as separate items will be paid for at the contract price for each structure so listed which price shall include full compensation for all excavation, backfill, reinforcing steel, stops, metal frames, covers, grates, unused pipe stubs, and pipe connections into the structures as provided for in the Special Provisions or as shown on the plans. Minor structures, at the option of the

Contractor, may be furnished and installed as precast units provided the structures in place are equal in all respects to cast in place construction as specified herein.

51-1 Premolded Expansion Joint Fillers

In lieu of the requirements of the State Standard Specifications, insert the following:

Unless otherwise provided in the Special Provisions, premolded joint fillers shall have a minimum content of thirty-five (35) percent and a maximum of fifty (50) percent air-blown asphalt by mass [weight]. The thickness shall be 9.5 mm [3/8 inch]. The basic material shall be cane fiber.

SECTION 52: REINFORCEMENT

Reinforcement shall be as specified in Section 52 of the State Standard Specifications.

SECTION 53: SHOTCRETE

Shotcrete shall be as specified in Section 53 of the State Standard Specifications, except as herein modified:

53-1 Description

Add the following paragraph:

Shotcrete proposed or approved for use, as structural concrete shall be in accordance with American Concrete Institute (ACI) Shotcrete Guide 506R-90. The Contractor's attention is directed to that section of the Guide for placement of steel reinforcing bars to be used in shotcrete.

SECTION 54: WATERPROOFING

Waterproofing shall be as specified in Section 54 of the State Standard Specifications.

SECTION 55: STEEL STRUCTURES

Steel structures shall be as specified in Section 55 of the State Standard Specifications.

SECTION 56: SIGNS

Sign structures and roadside signs shall be as specified in Section 56 of the State Standard Specifications, except as herein modified.

56-1 Description

Add the following paragraph:

Street name signs and traffic signs shall be as specified in the Special Provisions and per City Standard Plans.

SECTION 57: TIMBER STRUCTURES

Timber structures shall be as specified in Section 57 of the State Standard Specifications.

SECTION 58: PRESERVATIVE TREATMENT OF LUMBER, TIMBER AND PILING

Preservative treatment of lumber, timber, and piling shall be as specified in Section 58 of the State Standard Specifications.

SECTION 59: PAINTING

Painting shall be as specified in Section 59 of the State Standard Specifications.

SECTION 60: (BLANK)

SECTION 61: CULVERT AND DRAINAGE PIPE JOINTS

Culvert and drainage pipe joint shall be as specified in Section 61 of State Standard Specifications. Storm Drain line shall be televise per Section 71-3.03 of these specifications.

SECTION 62: ALTERNATIVE CULVERTS

Alternative culverts shall be as specified in Section 62 of the State Standard Specifications.

SECTION 63: CAST-IN-PLACE

Cast-In-Place concrete pipe shall be as specified in Section 63 of the State Standard Specifications except as herein modified.

63-1 Construction

Delete this subsection in its entirety and insert the following paragraphs:

An approved method or device shall be used when placing invert concrete to insure that thickness is maintained at not less than minimum wall thickness at any point. Approval of this

method or device must be obtained from the Engineer prior to commencement of work. Flow line elevation must not vary more than 16 mm [0.05 feet] from the design grade line.

A starter section shall be used at the beginning of each run of cast-in-place concrete pipe unless indicated otherwise on the plans or approved by the Engineer.

A closing section shall be used where indicated on the plans or as directed by the Engineer, where it is not possible to complete a run of cast-in-place concrete pipe because of lack of clearance ahead in the trench.

If construction of the pipe stops short of a manhole, or for a period of time exceeding twenty (20) minutes, the resulting construction joint must be reinforced with a concrete collar, which may be either precast or cast-in-place. This collar must extend one foot either side of the joint, and must be of a minimum thickness equal to that of the pipe.

When using a total periphery, metal form process, care shall be exercised to keep the machine vertical. A deflection of more than five degrees from vertical will not be allowed.

When metal slip forms are used to form the invert of the pipe, the invert shall be hand troweled to a smooth and even finish immediately after placement.

Variations in the internal diameter shall not exceed 0.8mm [1/32 inch] per diameter inch. Offsets at form laps shall not exceed the limits specified in the following:

PIPE DIAMETER	**MAXIMUM OFFSET**
600 mm [24”]	9.5 mm [3/8”]
750 mm [30”]	9.5 mm [3/8”]
900 mm [36”]	12.5 mm [1/2”]
1050 mm [42”]	12.5 mm [1/2”]
1200 mm [48”]	16 mm [5/8”]
1350 mm [54”]	16 mm [5/8”]
1500 mm [60”]	16 mm [5/8”]
1800 mm [72”]	22 mm [7/8”]

Forms shall be strong enough to withstand the vibrating of the concrete and to permit workmen to place the concrete without causing distortion at any point, and form support system shall be constructed so that previously placed concrete shall not be damaged.

Form structure bearing plate indentations shall not exceed 3 mm [1/8 inch] and the remaining interior surface of the pipe shall be equivalent to a steel screened finish. All extraneous concrete shall be removed from the interior surfaces as soon as possible after placing.

Care shall be taken when removing the forms to prevent damage to the pipe. After removal of the forms, the inside of the pipe shall be inspected and any repairs made promptly. If obvious segregation, rock pockets, honeycombing or inadequate wall thickness is encountered during inspection the pipe may be rejected by the Engineer.

63-2 Curing and Protecting Concrete

Delete this subsection in its entirety and insert the following paragraphs:

Immediately after the exposed exterior surfaces are finished, the exposed surface will be covered with a polyethylene film, at least 50 μm [0.002 inch] in thickness, or other approved waterproof

mat for curing purposes. The sole use of a liquid sealing or curing compound will not be allowed. As soon as it is possible, without causing damage to the fresh concrete pipe, a loose, moist layer of initial backfill material, 150 mm [6 inches] in thickness, may be hand placed on the concrete in accordance with Section 19-4 of these Specifications.

Unrestricted traffic may be permitted over the pipe when concrete strength reaches 10.34 MPa [1500 psi] and pipe has been in place seventy-two (72) hours. In all cases, the Contractor shall be responsible for correcting any damage to cast-in-place concrete pipe caused by premature or excessive loading prior to the end of a (seven) 7-day curing period.

All openings into the pipe shall be kept tightly closed at all times during construction, except where work is in progress and for a minimum time of seven (7) days after placement.

63-3 Reinforced Cast-In-Place Pipe

In lieu of the "Blank" section of the State Standard Specifications insert the following paragraphs:

The specification for cast-in-place concrete pipe shall apply in full force for the construction of reinforced cast-in-place concrete pipe except that the minimum thickness of walls shall not be less than 100 mm [4 inches]. Reinforcement must equal or exceed ASTM Designation: C- 76 and must be lapped 250 mm [10 inches] where spliced.

Any obvious segregation, rock pockets, honeycombing, cracks, inadequate wall thickness or any other indications of failure or inadequacy that are observed may be considered as cause for rejection of any portion or all of the pipe.

Prior to final acceptance, small diameter pipe shall be checked by viewing with television equipment in accordance with Section 71-3.03 of these Standard Specifications.

Pressure test will be required on any section of cast-in-place concrete pipe designed to operate under head.

63-4 Measurement

Delete this subsection in its entirety and insert the following paragraphs:

The length of pipe to be paid for will be the slope length measured between centers of manholes or other end of the pipe in other structures. Pipe placed in excess of the length designated will not be paid for.

Structure excavation and backfill, trench excavation and backfill, all material, including concrete and reinforcing steel, pavement cutting and replacement, and all other items of work required to install the pipe complete-in-place will be considered as part of the item for casti-n-place pipe and no additional payment will be made therefore.

63-5 Payment

Delete this subsection in its entirety and insert the following paragraphs:

Items of work measured as specified above will be paid for at the contract price per linear foot for the various sizes of cast-in-place pipe as described in these specifications.

The contract price paid per linear foot for cast-in-place pipe shall include full compensation for all labor, materials, tools, equipment and incidentals and for doing all

the work involved in installing the pipe, complete-in-place as shown on the plans and as specified in these specifications and the Special Provisions.

SECTION 64: PLASTIC PIPE

Plastic pipe shall be as specified in Section 64 of the State Standard Specifications; except as herein modified.

64-1 Description

Add the following paragraph:

Plastic Pipe specified for use as storm sewer and structures shall be HDPE in accordance with Section 64 of the State Standard Specifications.

SECTION 65: REINFORCED CONCRETE PIPE

Reinforced concrete pipe shall be as specified in Section 65 of the State Standard Specifications, except as herein modified.

65-1 Payment

In lieu of the portions of this section pertaining to structure excavation and structure backfill, those items shall be considered as included in the price paid for other items, as well as pavement cutting and replacement, and no additional compensation will be allowed therefore.

SECTION 66: CORRUGATED METAL PIPE

Corrugated metal pipe shall be as specified in Section 66 of the State Standard Specifications.

SECTION 67: STRUCTURAL STEEL PLATE PIPE

Structural metal plate pipe shall be as specified in Section 67 of the State Standard Specifications.

SECTION 68: SUBSURFACE DRAINS

Subsurface drains shall be as specified in Section 68 of the State Standard Specifications.

SECTION 69: OVERSIDE DRAINS

Overside drains shall be as specified in Section 69 of the State Standard Specifications.

SECTION 70: MISCELLANEOUS FACILITIES

Miscellaneous facilities shall be as specified in Section 70 of the State Standard Specifications.

SECTION 71: SEWERS

Sewers shall be as specified by Marina Coast Water District Standard Specifications.

SECTION 72: SLOPE PROTECTION

Slope protection shall be as specified in Section 72 of the State Standard Specifications.

SECTION 73: CONCRETE CURBS AND SIDEWALKS

Concrete curbs and sidewalks shall be as specified in Section 73 of the State Standard Specifications except as modified herein.

73-1 Description

This work shall consist of constructing curbs, gutters, sidewalks, island paving, and driveways of the form and dimensions shown on the plans, on the City of Marina Standard Plans, or as specified in these specifications and the Special Provisions. They shall be constructed of Class "2A" concrete conforming to the provisions in Section 90 with a maximum slump of 100 mm [4 inches] as determined by the slump cone method, and reinforcement shall conform to the provisions of Section 52, "Reinforcement."

73-2 Subgrade Preparation

The subgrade shall be constructed true to grade and cross section, as shown on the plans or as directed by the Engineer. It shall be watered and thoroughly compacted by mechanical means before placing the concrete. All soft and spongy material shall be removed to a depth of not less than 150 mm [0.5 foot] below subgrade elevation for curbs, island paving and driveways and 100 mm [0.25 foot] below for sidewalks, and the resulting space filled with earth, sand or gravel of a quality that when moistened and compacted will form a stable foundation. The subgrade for all driveways shall be compacted to a relative compaction of not less than ninety (90) percent.

Base material as called for in the City of Marina Standard Plans shall be placed, compacted, wetted and tested for grade and cross section by means of a template supported on the side forms. The base material and forms shall be wet immediately in advance of placing concrete.

73-1.3 Existing Curbs, Gutters, Driveways and Sidewalks

Where the plans provide for the reconstruction of a portion of an existing curb, gutter, driveway or sidewalk, the existing section shall be cut to a minimum depth of 40 mm [1 ½ inches] with an abrasive type saw at the first scoring line at or beyond the planned joint or as designated by the engineer. The entire section to be reconstructed shall be removed. Remnants of asphalt concrete ramps on the remaining walkways shall also be removed from the concrete. The new curb, gutter, driveway or sidewalk shall join the old work at this line. No sawing is necessary along an existing construction joint where an area designated for removal abuts such a joint.

73-1.4 Forms

Forms shall be true and shall have a smooth straight upper edge.

Timber forms shall be surfaced on the side placed next to the concrete and shall have a true surfaced upper edge and shall not be less than 40 mm [1 ½"] thick after being surfaced, except on curves.

All forms shall be thoroughly cleaned and coated with form oil to prevent the concrete from adhering to them.

Nominal dimension back forms may be used for Type "B" and Type "C" and roll type curb. All face of gutter forms shall be full dimension.

Forms shall be carefully set to alignment and grade and shall conform to the required dimensions. Forms shall be held rigidly in place by iron or wooden stakes placed at intervals not to exceed 1.20 m [4 feet]. Clamps, spreaders, and braces shall be used where required to insure rigidity in the forms.

Benders or thin plank forms may be used on curves, grade changes, or for curb returns. Back forms for curb returns may be made of 13 mm [1/2-inch] thick benders created together for the full depth of the curb.

The form on the front of curbs shall not be removed while the concrete is sufficiently plastic to slump. Side forms for sidewalks, island paving and curbs, except for the face, shall not be removed in less than twelve (12) hours after the finishing has been completed.

73-1.5 Curb Construction

In constructing curbs, entrances shall be provided for driveways as shown on the plans or designated by the Engineer.

Concrete curbs to be constructed over an existing pavement shall be anchored to the pavement by means of steel dowels firmly grouted with 1:1 Portland cement and sand grout in holes drilled in the pavement except as provided in Section 73-1.06, "Extruded Curb Construction." Dowels shall conform to the provisions for bar reinforcing steel in Section 52, "Reinforcement," and shall be spaced and sized as shown on the Plans, or City of Marina Standard Plans. Approved anchor bolts may be used in lieu of dowels at the option of the Contractor.

Expansion joints 10 mm [3/8 inch] wide shall be constructed in curbs at 7.2 m [24 feet] intervals except for extruded curb, which shall be at 18.0 m [60 feet] intervals and at the ends of curb returns, except that expansion joints shall not be constructed within 7.2 m [24 feet] of an island nose. Expansion joints shall be filled with premolded joint filler conforming to the provisions of Section 51, "Concrete Structures." Expansion joint filler shall be shaped to the cross section of the curb. Weakened plane joints (deep score) shall be constructed at 3.6 m [12 feet] intervals.

Concrete shall be placed and compacted in forms without segregation.

Immediately after removing the front curb forms, the face of the curb shall be troweled smooth to a depth of not less than 50 mm [0.17 foot] below the flow line or to the flow line of integral curb and gutter, and then finished with a steel trowel. The top shall be finished and the front and back edges rounded as shown on the Plans or the City of Marina Standard Plans. Concrete placed next to expansion joints shall be finished with an edge tool.

The face of the finished curb shall be true, straight and the top surface of curbs shall be of uniform width, free from humps, sags, or other irregularities. When a straight edge 3.0 m [10 feet] long is laid on top of face of the curb or on the surface of gutters, the surface shall not very more than 7 mm [0.02 foot] from the edge of the straight edge, except at grade changes or curves. The top of finished curb shall not vary more than 7 mm [0.02 foot] above or below the grade established by the Engineer. The Contractor at his/her expense shall furnish the straight edge to the Engineer to check the surfaces and the straight edge shall be returned upon completion of the check.

Exposed surfaces of curbs shall be cured by the pigmented curing compound resin type method as provided in Section 90-7.01B, except that the curbs may be sprinkled with water as soon after finishing as possible without pitting the surface and shall in that case be kept moist in this manner for a period of seven (7) days between the hours of sunrise and sunset.

Curbs and gutters shall be water tested for flow line characteristics.

The Contractor shall at his/her expense clean all discolored concrete and repair or remove graffiti on the concrete. Abrasive blast cleaning may clean the concrete.

Unless otherwise approved by the Engineer, removing and replacing the entire unit between scoring lines or joints shall make repairs.

73-1.5A Extruded or Slip-Formed Curb Construction

Any curb, except on structures, may be placed by using an extrusion machine or slip-form paver provided the finished curb is true to line and grade and the concrete is dense and of the required surface texture.

The concrete shall comply with the requirements in Section 73-1.01, "Description," except that the aggregate grading limits proposed by the Contractor shall be further restricted if necessary to produce concrete that has well defined web marks of water on the surface and is free from surface pits larger than 5 mm [3/16"] in diameter.

The concrete shall be of such consistency that it will maintain the shape of the curb section without support. It shall contain the maximum amount of water that will permit this result.

At the Contractor's option, concrete curbs to be constructed over an existing pavement shall be anchored to existing pavement either by placing steel dowels and reinforcing steel, as provided in Section 73-1.05, "Curb Construction," or by using an adhesive. If an adhesive is used, in advance of extruding or slip forming the curbs on the existing pavement, the surface of the pavement shall be thoroughly cleaned including removing any existing traffic stripping and the adhesive shall be applied. The pavement shall be cleaned either by wire brushing or by blast cleaning, except that blast cleaning shall be used only if directed by the Engineer. The cleaned surface shall be free from dust, loose material, or oil.

The adhesive shall consist of two components that shall be mixed together at the site of the work and shall conform to the requirements in Section 95-2.03, "Epoxy Resin Adhesive for Bonding New Concrete to Old Concrete."

The grade for the top of extruded curb shall be indicated by an offset guideline set by the Contractor from survey marks established by the Engineer. The forming tube portion of the extrusion machine shall be readily adjustable vertically during the forward motion of the machine to provide, when necessary, a variable height of curb confirming to the predetermined

curb grade. A grade line gage or pointer shall be attached to the machine in such manner that a continual comparison can be made between the curb being placed and the established curb grade as indicated by the offset guideline.

In lieu of the above method for maintaining the curb grade, the extrusion machine may be operated on rails or forms set at uniform depth below the predetermined finished top of the curb grade.

Concrete shall be fed into the extrusion machine at a uniform rate. The machine shall be operated under sufficient uniform restraint to forward motion to produce a well compacted mass of concrete free from surface pits larger than 5 mm [3/16"] in diameter and requiring no further finishing, other than light brushing with a brush filled with water only. Finishing with a brush application of grout will not be permitted.

Equipment for slip-forming curbs shall be controlled automatically for alignment, grade, and cross slope by sensing from preset string lines, or by string line control of alignment and grade and automatic cross-slope control. Equipment for slip-forming curbs shall have traveling forms of dimension, shape and strength necessary to produce the required cross section of the curb. The equipment shall spread, consolidate and finish the concrete so that a minimum of handwork will be required to produce dense, homogeneous concrete true to grade and cross section. Concrete shall be consolidated effectively by internal vibrators, or by other means approved by the Engineer.

Expansion joints shall be constructed as specified in Section 73-1.05, "Curb Construction," or shall be constructed by sawing through the curb section to its full depth. The width of the cut shall be such as to admit the joint filler with a snug fit. Premolded joint filler for sawed joints shall be inserted and mortared in place.

If sawing is performed after the concrete has hardened, the adjacent portions of the curb shall be supported firmly with close fitting shields. The operations of sawing and inserting the joint filler shall be completed before curing the concrete.

If sawing is performed before the concrete has hardened, the joint filler shall be mortared in place with heavy trowel pressure. After sawing is performed, all exposed portions of the curb in the vicinity of the joint shall be covered with another application of curing compound.

At the conclusion of the curing period, the filler in each sawed joint shall be checked for tightness of fit. The loose filler in any sawed joint shall again be mortared in place and cured.

73-1.5B Drainage Outlets Through Curb

The Contractor will be required to provide suitable outlets through new curb for all existing building drains along the line of the work. Where sidewalk will be higher than adjacent property, the Contractor shall provide curb drains per City Standard ST-23.

73-1.6 Sidewalk, Gutter Depression, Island Paving, Curb Ramp (ADA) and Driveway Construction

Fresh concrete shall be struck off and compacted until a layer of mortar has been brought to the surface. The surface shall be finished to grade and cross-sections with a float, troweled smooth and finished with a broom. Brooming shall be transverse to the line of traffic and if water is necessary, it shall be applied to the surface immediately in advance of brooming.

The surface of sidewalks shall be scored at intervals not more than 1200 mm [4 feet] and shall correspond with the weakened plane and expansion joints of the curbs, unless otherwise directed by the Engineer. Sidewalk with width greater than 1675 mm [5.5 feet], it shall have a centered score line and parallel to the curb. ADA ramps shall be scored in accordance with the Standard Plans. A scoring tool shall be used which will leave the edges rounded.

On straight work, the scoring lines shall be perpendicular to the line of the work; at curves, the scoring lines shall be radial to the curb; when longitudinal scoring lines are required, they shall be parallel to, or concentric with the line of the work. When sidewalk is constructed adjacent to the curb, dowels in accordance with the Standard Plans shall be installed.

Expansion joints 10 mm [3/8 inch] wide shall be constructed at all returns and opposite expansion joints in adjacent curb. Where curb is not adjacent, expansion joints shall be constructed at intervals of 7 m [24 feet]. Expansion joints shall be filled with premolded joint filler conforming to the provisions of Section 51-1.12C of these specifications. Expansion joint filler shall be shaped to fit the concrete that is being placed, with the edge placed 3 mm [1/8 inch] below the top of the finished concrete surface. Concrete placed next to an expansion joint shall be finished with an edge tool. Weakened plane joints shall be constructed at 3.6 m [12 feet] intervals.

The surface shall not vary more than 7 mm [0.02 foot] from a 3.0 m [10 feet] straightedge, except at grade changes, and the finished surface shall be free from blemishes. The Contractor at his/her expense shall furnish the straight edge to the Engineer to check the surfaces and the straight edge shall be returned upon completion of the check.

Concrete sidewalks, island paving, driveways, and gutters, shall be cured as provided in Section 90 of these specifications. If the pigmented curing compound method is used, the manual operation of an unshielded spray nozzle will be permitted.

73-1.7 Measurement

Quantities of curbs, sidewalk, gutter depression, island paving, gutters and driveways will be measured in linear foot or square foot, as indicated in the proposal.

All base material, reinforcing steel, expansion joint material, shall be considered as included in the unit price paid for other items, except as noted below.

73-1.8 Payment

Quantities of curbs, gutters, sidewalks, gutter depressions, island paving, and driveways will be paid for at the contract price per linear foot or square foot as indicated in the proposal, which prices shall include full compensation for any necessary excavation, subgrade preparation and backfill, for furnishing and applying water, curb dowels, reinforcing steel, base material and expansion material, and no separate payment will be made therefore, unless otherwise specified in the Special Provisions or shown on the Plans.

Payment for curb, or curb and gutter, constructed as part of a catch basin, as shown on the Standard Plans, shall be included in the contract price for each catch basin and no other compensation shall be allowed.

Payment for depressed curbs at driveways or ADA ramps shall be at the contract unit price for type of curbs specified and no additional compensation will be allowed therefore.

The above prices and payments shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing curbs gutters, sidewalks, island paving and driveways, complete-in-place, as shown on the Plans, as specified in these Specifications, the Special Provisions, and as directed by the Engineer.

SECTION 74: PUMPING PLANT EQUIPMENT

Pumping plant equipment shall be as specified in Section 74 of the State Standard Specifications.

SECTION 75: MISCELLANEOUS METAL

Miscellaneous metal shall be as specified in Section 75 of the State Standard Specifications.

SECTION 76 THROUGH 79: (BLANK)

SECTION 80: FENCES

Fences shall be as specified in Section 80 of the State Standard Specifications.

SECTION 81: MONUMENTS

Monuments shall be as specified in the State Standard Specifications, except as herein modified.

81-1 Description

This work shall consist of furnishing and installing Portland cement concrete survey monuments at the locations shown on the Plans or as directed by the Engineer, and as specified in the Specifications and the Special Provisions.

Concrete shall be Class "3B" Concrete in accordance with Section 90 of these specifications using 20 mm [¾ inch] maximum size aggregate.

Bronze plates shall be punched with the precise monument location point at a minimum depth of 3 mm [3/32 inch], shall contain the registration number of the licensed surveyor or registered civil engineer that set the point and shall be as shown on the Standard Plans.

Elevations and State Plane Coordinates for set points shall be provided to the City of Marina on electronic media by a licensed surveyor or registered civil engineer certified to do land surveying for inclusion in the City's Benchmark Records.

The upper portion of the survey monuments shall consist of a cast steel valve box top, constructed and marked as shown on the standard plans.

81-2 Construction

The concrete portion of the monuments shall be cast-in-place using the adjacent earth for exterior forms. The holes forming such monuments shall be neat and true according to the Standard Plan.

The bronze marker shall be placed in survey monuments before the concrete block has acquired its initial set, and shall be firmly bedded in the concrete. When the plate is inserted, the reference point shall fall within a 25 mm [1"] diameter circle in the center of the plate, and the plate shall fall within a 75 mm [3"] diameter circle in the center of the concrete block.

81-3 Installation

Survey monument shall be installed as shown on the Standard Plan ST-9. The top of the steel valve box cap shall be flush with the finished pavement grade.

81-4 Measurement

The quantity of monuments furnished and installed will be paid for as units determined from actual count.

81-5 Payment

The unit price paid for survey monuments shall include full compensation for furnishing all labor, materials including bronze marker, tools, equipment and incidentals, and for doing all the work involved in furnishing and installing the monuments complete-in-place, including necessary excavation and backfill a shown on the plans and specified in these Specifications, the Special Provisions and as directed and located by the Engineer.

SECTION 82: MARKERS AND DELINEATORS

Markers shall be as specified in Section 82 of the State Standard Specifications.

SECTION 83: RAILING AND BARRIERS

Guard railings and barriers shall be as specified in Section 83 of the State Standard Specifications.

SECTION 84: TRAFFIC STRIPES AND PAVEMENT MARKINGS

Traffic stripes and pavement markings shall be as specified in Section 84-1 and 84-2 of the State Standard Specification and City of Marina Standard Plans 39 and 40, except as modified herein.

Delete Section 84-3 of the State Standard Specifications.

84-1 Control of Alignment and Layout

Add the following paragraphs to this subsection:

> Cat tracking is required before permanent striping, markings and markers are placed and must be approved by the Engineer before final striping, markings and markers are constructed. All additional work necessary to establish satisfactory lines for striping shall be performed by the Contractor at his/her expense, including correction of irregularities

in the alignment of cat tracks or dribble lines and removal of the cat tracks upon completion of the work.

For traffic safety, the Contractor shall submit a plan, for approval, that will provide for temporary safety striping after removal of existing pavement striping, markings and markers before resurfacing is completed. The plan shall include temporary safety striping after resurfacing is completed until construction of cat tracking for final striping, markings and markers. The Contractor, at his/her expense, shall maintain the approved plan, until final striping, markings and markers are constructed.

Cat tracking shall consist of placing spots of paint not more than 50 mm [2 inches] in width and not more than 1500 mm [5 feet] apart. Paint for cat tracks shall be the same color as the one used for the new thermoplastic traffic striping for which it is placed. The paint use for cat tracking shall be fast dry solvent borne yellow, white and black, and shall conform to State Specification No. 8010-51K-04. Temporary adhesive type cat tracking may be used upon approval by the City Engineer but must be removed by Contractor at his/her expense prior to placing permanent striping, legends or markings.

84-2 Tolerances and Appearance

Add the following to the first paragraph of the State Standard Specification: Traffic striping, legends or pavement markings shall be installed on the pavement in a professional manner at the locations specified on the Plans or as directed by the Engineer.

84-3 Materials

Delete this section in the State Standard Specifications and insert the following:

The City of Marina uses alkyd thermoplastic material and glass beads in the application and maintenance of pavement striping, legends or markings. The white, yellow and black thermoplastic material shall be "lead free."

Glass Beads (Pre-Mix) shall be uncoated and conform to AASHTO M247-81 Type 1.

The Thermoplastic material shall be homogeneously composed of pigment, filler, resins and glass reflecting spheres. The vendor shall have the option of formulating the material according to his/her own specifications. However, the solid resin shall be "maleic-modified glycerol ester resin" (alkyd binder). The physical and chemical properties as specified below shall apply regardless of the type of formulation.

The thermoplastic material shall not deteriorate on contact with sodium chloride, calcium chloride or other de-icing chemicals, or because of oil content of paving materials, or oil droppings.

The thermoplastic mixture specific gravity of the white and yellow thermoplastic traffic line material shall not exceed 2.20 and the composition shall have pigment, beads and filler uniformly dispersed in the resin. The composition shall be free from all skins, dirt and foreign objects and shall comply with the following requirements:

COMPOSITION (percent by mass [weight])

Component	**White**	**Yellow**	**Black**
Binder See Note (b)	18.0 min.	18.0 min.	18.0 min.
Glass Beads	30-40	30-40	0.0 max.
Titanium Dioxide	10.0 min.	----------	0.0 max.
Calcium Carbonate & Inert Fillers	42.0 max	50.0 max.	52.0 max.
Yellow and Black Pigments	----------	See note (a)	See note (a) --

Note (a): Amount of yellow and black pigment, calcium carbonate and inert filler shall be at the option of the manufacturer, providing all other requirements of these Specifications are met.

Note (b): Alkyd binder shall consist of a mixture of synthetic resin, at least one of which is solid at room temperature, and high boiling point plasticizers. At least one third of the binder composition shall be solid maleic-modified glycerol ester resin and shall be no less than eight (8) percent by mass [weight] of the entire material formulation. The binder shall not contain petroleum based hydrocarbon resins.

84-4 Characteristics

The thermoplastic mixture shall contain the following physical characteristics:

1. *Color* - The thermoplastic material after heating for four (4) hours plus/minus five (± 5) minutes at 210 ± 2ºC [425 ± 3ºF] under agitation shall meet the following:

   White: Daylight reflectance at 45 to 0 degrees -- 75% minimum

   Yellow: Daylight reflectance at 45 to 0 degrees -- 45% minimum

   For highway use, the yellow color shall reasonably match color chip No. 13538 of Federal Standard Number 595. [Test performed at 25ºC [77oF]].

2. *Set Time* - When applied at a temperature range of 210 ± 7ºC [412.5 ± 12ºF] and thickness of 1.5 mm to 3.2 mm [0.060 to 0.125 inch] the material shall set to bear traffic in not more than two (2) minutes when the air temperature is 10 ± 1ºC [50 ± 3ºF] and not more than ten (10) minutes when the air temperature is 32 ± 1ºC [90 ± 3oF] and not more than ten (10) minutes when the air temperature is 32 ± 1ºC [90 ± 3ºF].

3. *Bond Strength* - After heating the thermoplastic material for four (4) hours plus/minus five minutes at 218ºC [425oF], the bond strength to Portland cement concrete shall exceed 1240 kPa [180 psi.].

4. *Cracking Resistance at Low Temperature* - After heating the thermoplastic material for four (4) hours plus/minus five (± 5) minutes at 218 ± 2ºC [425 ± 3ºF], applying to concrete blocks, and cooling 8 ± 1ºC [15 ± 3ºF], the material shall show no cracks.

5. *Impact* Resistance - After heating the thermoplastic material for four (4) hours plus/minus five minutes at 218 ± 1ºC [425 ± 3ºF] and forming test specimens, the impact resistance shall be minimum of 1.13J [10 inch-pounds].

6. *Softening Point* - After heating the thermoplastic material for four (4) hours plus/minus five (± 5) minutes at 218 ± 1ºC [425 ± 3ºoF] and testing the accordance with ASTM D-36, the materials shall have a softening point of 101 ± 8ºC [215 ±15ºF].

7. *Flowability* - After heating the thermoplastic material for four (4) hours plus/minus five (± 5) minutes at 218 ± 1ºC [425 ± 3ºF] and testing for flowability, the white thermoplastic material shall have a maximum residue of eighteen (18) percent and the yellow thermoplastic material shall have a maximum residue of twenty-one (21) percent.

8. *Yellowness, Extended Heating* - After heating and stirring the thermoplastic material for eight and one-half (8½) hours at 218 ± 1ºC [425 ± 3ºoF] the thermoplastic material shall not exceed a yellowness index of 0.15.

9. *Flowability, Extended Heating* - After heating and stirring the thermoplastic material for eight and one-half (8½) hours at 218 ± 1ºC [425 ± 3ºoF] and tested for flowability, the thermoplastic material shall have a minimum residue of twenty-eight (28) percent.

10. *Storage Life* - Thermoplastic material furnished in granular and block form shall meet the above requirements for a minimum period of one (1) year. The thermoplastic must melt uniformly with no evidence of skins or unmelted particles during this one (1) year period. The Contractor at his/her expense shall replace material not meeting the above requirements.

84-5 Packaging

The thermoplastic material shall be packaged in suitable containers to which it will not adhere during shipment and storage. Each container shall designate the color, alkyd binder, extrude, user information, manufacturer's name and address, batch number and date of manufacturer. Each batch manufactured shall have its own separate number. The label shall warn the user that the material shall be heated in the range of 204-227ºC [400-440ºF]. The container shall be so constructed as to allow easy removal of the material from the lining.

84-6 Application

Delete this section in the state standards in its entirety and insert the following:

Existing surfaces that are to receive the thermoplastic material shall be mechanically wire brushed to remove all dirt and contaminants. Surfaces of new Portland cement concrete pavement to receive the thermoplastic material shall be mechanically wire brushed or abrasive blast cleaned to remove all laitance and curing compound.

A primer, of the type recommended by the manufacturer of the thermoplastic material, shall be applied to all asphaltic surfaces over six (6) months old and to all Portland cement concrete surfaces. The primer shall be applied immediately in advance of, but concurrent with, the application of the thermoplastic material. The primer shall be applied at the application rate recommended by the manufacturer and shall not be thinned.

The Contractor shall meet all requirements and tests that may be imposed by the Monterey Bay Unified Air Pollution Control District and the California Air Resources Board for control over thermoplastic fumes or other emissions into the air, in accordance with the schedules established by those authorities.

The thermoplastic material shall readily apply to the pavement at temperatures of 204-227ºC [400-440oF] from approved equipment to produce an extruded line that shall be continuous and uniform in shape having clear and sharp dimensions 3.2 mm [0.125 inch] for screen extrusion or 2.3 mm [0.090 inch] for ribbon extrusion.

The material shall not exude fumes, which are toxic, obnoxious or injurious to persons or property when it is heated during applications. The manufacturer shall provide product safety data sheets for their product.

The application of additional glass beads by drop-on or pressure spray methods shall be at an approximate uniform rate of 4.50 kg [10 pounds] of glass spheres every 9 m² [100 ft.²] of line. The glass spheres shall conform to AASHTO M247-81 (1986) Type 1 except that the beads must be moisture resistant coated as meet the requirement of 4.4.2 (AASHTO M247- 41) and a maximum of five (5) percent shall pass the number 80 screen; glass spheres shall have a minimum of seventy (70) percent true spheres on each sieve.

Application of the thermoplastic and beads shall be at the following rates and in conformance with the following requirements:

1. All pavement striping, legends and/or markings shall comply with the Standard Specifications and Special Provisions. The Contractor shall furnish templates, stencils that will match the stencil set currently used by City of Marina, or other devices approved by the City Engineer to provide straight uniform lines, to provide uniform and neat letters/symbols, pavement messages contained in the bid document and additions as may be required by the City Engineer. Contractor shall furnish to the City all stencils that were used upon completion of the project.
2. All letters, symbols and pavement messages are to be installed to current Federal Standards, unless otherwise specified or directed by the City Engineer.
3. Immediately following the application of the thermoplastic material, glass beads shall be applied to the surface of the molten material at a minimum rate of 3.6 kg [8 pounds] per 9.3 m² [100 square feet].
4. The thermoplastic may be applied by either ribbon gun or shoe methods providing the specified thickness, in a single uniform layer, is obtained. The road surfaces must be completely coated and the voids in the road surface filled. For refurbishment of existing thermoplastic striping, the material shall be applied by the spray method. The widths of markings must conform to the limits specified on the Plans, and these Special Provisions. It must have clear and sharp dimensions without running or deformation of the edges.

5.

Description of Surface	**Thickness - µm [mil]**
• New thermoplastic traffic striping installed on new pavement or over existing painted striping	*2275-2540* [90-100]
• Refurbishment of existing thermoplastic striping	*760-1270* [30-50]
• Thermoplastic Cross-Walks & Legends	*3048-3810* [120-150]

6. The Contractor shall take all reasonable precautions to protect the thermoplastic material during drying time and shall be required to remove and correct all objectionable tracking and deformation of the thermoplastic markings.

84-7 Testing

In lieu of the "Blank" section of the State Standards, insert the following:

The Contractor's attention is directed to Section 6-3.02, "Testing," of these Standard Specifications. The material shall be tested in accordance with AASHTO T250 and M-249 or with the appropriate method in Federal Test Method Standard No. 141 or ASTM designation.

The material supplier shall secure the services of a certified independent testing laboratory to obtain samples of material during production and test the material for compliance with the Specifications. The Engineer will determine the frequency of testing depending on the results of previous compliance tests.

When requested by the Engineer, the independent testing laboratory will sample one or all of the production batches to be supplied to the City. The testing laboratory shall mark each box in the batch(s) tested for subsequent retesting by the City, and supply the test results to the Engineer.

The costs for all testing by the independent testing laboratory shall be borne by the Contractor.

84-8 Traffic Control

The Contractor's attention is directed to Section 7-1.08, "Public Convenience" and Section 7-1.09, "Public Safety" of the Standard Specifications. The Contractor shall strictly adhere to the use of traffic warning and control devices as set forth in Section 12 of the Standard Specifications. The Contractor shall furnish and install all necessary traffic control devices called for in Section 12 of these Standard Specifications. The Contractor shall furnish the following additional control devices:

1. Rotating amber lights of a type specified by the State of California as approved lights and devices shall be prominently mounted on each piece of equipment and shall be in use at all times when the equipment is at the job site as prescribed in Sections 25256 and 25268 of the California Vehicle Code and Title 13 of the California Administrative Code.
2. A follow vehicle with a Type II sequential arrow board shall travel behind slow moving striping equipment complete with crash cushions.

The City Engineer may provide specific instructions in the use and placement of traffic control devices in any instance not covered in Section 7 and 12 of these Standard specifications, or under subsections A and B above.

The Contractor shall notify the City Engineer forty (48) hours in advance of the actual work date to request the posting of signs, if required for performance of work per under the Special Provisions.

84-9 Application Equipment

The striping Contractor shall own or have under Contractor direct control a minimum pre-melter capacity of 3630 kg [8,000 lbs.], two hand liners, a full set of work message stencils, and one 340 kg [750 lbs.] capacity self propelled long line striper.

The striping machine shall be maneuverable to the extent that straight lines can be followed and normal curves can be made in true arcs.

The application equipment used for this Contract work shall be inspected by the City Engineer prior to award of contract and shall conform to the following minimum requirements:

1. The applicators shall have a bead dispenser capable of uniformly applying beads on the thermoplastic material immediately after its application. Since bead deposition width, quantity and placement location are all operator adjustable the bead dispenser should be capable of consistent application regardless of operator application speed.

2. This applicator shall ensure that drop-on beads are firmly anchored in the thermoplastic for improved lifetime retro-reflectivity. It will eliminate the blackout period often caused when applied drop-on beads improperly penetrate molten thermoplastic and are thereby easily dislodged by traffic.

3. The long line striper shall be equipped with an automatic on-off device to produce slip lines, with adjustment to match previous painting. It shall be capable of presetting accurate application thickness that is indicated by a gauge.

4. The long line striper shall be capable of installing edge lines within 300 mm [1 foot] of a curb or berm.

5. The long line striper shall be capable of installing a double yellow centerline at the rate of 6.5 km/hr [4 MPH].

84-10 Curb Painting

Painting of tops and faces of existing and new curbs and asphaltic concrete dike shall be as shown on the Plans or in the Special Provisions.

Paint for existing A.C. dike shall be color white, reflective paint for application without primer to the A.C. dike surface. The paint shall conform to State Specification No. 8010- 51K-04 fast dry solvent borne white paint. Immediately after painting, apply Type II Reflective Glass Beads conforming to State Standard Specification No. 8010-71L-22, at a rate of 2.7 to 3.6 kg [6 to 8 lbs.] of glass spheres per 3.8 L [1 gal.] of traffic paint.

84-11 Alignment

On all work, such as a crosswalk, limit lines and locations of work messages/arrows, Contractor shall install new markings such that it will match all existing lines in such a manner as to present a uniform, pleasing appearance, and misalignment or disregard for previous markings will not be permitted. Abrupt breaks in alignment between broken segments will not be permitted. The City Engineer shall be the sole judge of the accuracy and acceptability of the alignment of the work.

84-12 Changes in the Work

In general the quantities indicated on the proposal are estimates only and are subject to increases or decreases. The City reserves the right to modify by adding or deleting work on work orders, maps or other instructions provided to the Contractor.

84-13 Correction of Work

The Engineer shall be the sole judge as to the acceptability of the work and shall inspect the completed work, informing the Contractor of any faulty methods or unsatisfactory results. It shall be the Contractor's responsibility at his/her expense, to correct the work upon notification and provide proper interim traffic control in hazardous conditions.

84-14 Warranty

The Contractor's/Applicant's attention is directed to Section 2- 1.12, "Material Guaranty," of these Standard Specifications. The Contractor/Applicant agrees to immediately repair and replace all defective material and workmanship discovered within one (1) year after acceptance by the City and to indemnify said City of Marina against all loss and damage occasioned by any such defect, discovered within said year, even though the damage or loss may not be ascertained until after the expiration thereof. Provided, however, that if such failure of the Contractor to perform should not, by reasonable diligence, be discoverable or discovered within said one (1) year, then the obligation of the Contractor to repair and replace said defective material or workmanship shall continue until one (1) year after the actual discovery thereof.

A failure is defined as chipping, peeling or separation of thermoplastic striping, legends, pavement marking or parts thereof from the road surface. It shall be the Contractor's responsibility at his/her expense to restore the work upon notification and provide proper interim traffic control in hazardous conditions.

84-15 Thermoplastic Removals

The removal of existing striping as necessary to meet new striping shall be in accordance with Section 15-2.02B, "Traffic Stripes and Pavement Markings," of these Standard Specifications and the following requirements:

Thermoplastic removals, if necessary, shall be performed by the wet sandblasting technique, shot blasting or grinding, meeting the latest requirements and restrictions by the State Pollution Control Agency.

Where sandblast cleaning is used for the removal of pavement markings or for removal of objectionable material, and such removal operation is being performed within 3 m [10 feet] of a lane occupied by public traffic, the residue including dust shall be removed immediately after contact between sand and the surface being treated. Such removal shall be by a vacuum attachment operating concurrently with the blast cleaning operation, mechanical street sweeping devices, or by other methods approved by the City Engineer, as provided under "Alternative Equipment," of these Standard Specifications.

Alternate methods of removal require prior approval of the City Engineer. Obliteration of striping or markings with black paint shall be done only with prior approval of the City Engineer and shall be only a temporary measure requiring later removal as specified.

Existing yellow thermoplastic striping shall be tested for lead before removal. Removal of striping containing lead shall be done in accordance with City, State and Federal requirements for disposal of lead containing materials.

84-16 Payment

Add the following paragraphs to this section:

Unless otherwise specified in the Special Provisions, curb painting as shown on the Plans and as specified in Section 84-2.043 shall be considered as included in the prices paid for the various contract items of work and no separate payment will be made therefore.

The contract unit prices for painted traffic stripes and pavement markings shall also include full compensation for cat tracking, traffic control and furnishing paint and glass beads.

SECTION 85: PAVEMENT MARKERS

Pavement markers shall be as specified in Section 85 of the State Standard Specifications, except as herein modified, and Standard Plan No. 39.

85-1 Placement

Add to this section, the following paragraphs:

Unless otherwise specified, existing pavement markers shall be removed in accordance with Section 15- 2.02C, "Pavement Markers," of the Standard specifications before pavement resurfacing or if they conflict with new pavement delineation.

Cat tracking for layout of marker alignment is required and shall be in accordance with Section 84-1.02, "Control of Alignment," of these Standard Specifications. Upon completion of pavement marker installation, the cat tracking shall be removed.

85-2 Payment

Add to the first paragraph of this section the following:

Unless otherwise specified in the Special Provisions or on the Plans, the contract unit prices paid for reflective or non-reflective pavement markers shall include full compensation for cat tracking with necessary removal after installation of the markers and, for removal of existing pavement markers with any necessary repair to the pavement due to the removal.

SECTION 86: SIGNALS, LIGHTING AND ELECTRICAL SYSTEMS

Signals, lighting and electrical systems shall be as specified in Section 86 of the State Standard Specifications.

SECTION 87: (BLANK)

SECTION 88: ENGINEERING FABRICS

Engineering fabrics shall be as specified in Section 88 of the State Standard Specifications.

SECTION 89: LIGHTWEIGHT PORTLAND CEMENT CONCRETE

Lightweight Portland cement concrete shall be as specified in Section 89 of the State Standard Specifications.

SECTION 90: PORTLAND CEMENT CONCRETE

Portland cement concrete shall be as specified in Section 90 of the State Standard Specifications as amended.

SECTION 91: PAINT

Paint shall be as specified in Section 91 of the State Standard Specifications.

SECTION 92: ASPHALTS

Asphalts shall be as specified in Section 92 of the State Standard Specifications.

SECTION 93: LIQUID ASPHALTS

Liquid asphalt shall be as specified in Section 94 of the State Standard Specifications.

SECTION 94: ASPHALTIC EMULSIONS

Asphaltic Emulsions shall be as specified in Section 94 of the State Standard Specifications.

SECTION 95: EPOXY

Epoxy hall be as specified in Section 95 of the State Standard Specifications.

CITY OF MARINA, CALIFORNIA

COMMUNITY DEVELOPMENT DEPARTMENT, PUBLIC WORKS DIVISION

PART II: DESIGN STANDARDS

CITY OF MARINA
COMMUNITY DEVELOPMENT DEPARTMENT, PUBLIC WORKS DIVISION
STANDARD SPECIFICATIONS
2006 EDITION

I. IMPROVEMENT POLICY FOR SUBDIVISIONS AND UNIMPROVED STREETS

A. GENERAL

It is the City's policy to require all developers and subdividers to construct the public improvements within and adjacent to their property to City Standards. Unless specified otherwise, such improvements shall have appearance and characteristics compatible with those of the neighborhood in which they are installed.

All public improvements shall be designed and constructed according to these Design Standards and the Standard Plans and Specifications adopted by the City Council, of the City of Marina, unless the City Engineer approves specific modifications to such standards.

Part II Design Standards contain only units in the United State Standard Measures (USSM). The measurements expressed in this Part II are to be used for design calculations only. If required by the City, a direct *International System of Units* (*SI* or "*metric*") equivalent to the units indicated in this Part II shall be used. Final plans and specification shall be in USSM unless directed by the City.

B. ROADWAY PAVING

Design procedures for rigid and flexible roadway pavements shall be based on Caltrans Methodology in accordance with Section 7 of the California State Design Manual, Traffic Index per Section 16 (Subdivisions) of Marina Municipal code, City Standard Plan No. ST-3 and these following requirements.

Basement soil "R" value tests will be required for roadway pavement designs by qualified laboratories in accordance with testing procedures of Caltrans. Soil samples for R-Value tests shall be of sufficient number and at appropriate intervals to reflect R-Values representative of the entire development. Pavement structural section designs shall be governed by the lowest of obtained R-Values, with a minimum section as identified on Standard Plan No. ST-3. Private parking areas shall be paved in accordance with R-Value tests with minimum three (3) inches asphalt concrete over six (6) inches of Class 2 Aggregate base. Asphalt section shall be paved

with a half (1/2) inch maximum aggregate sized final course, and three-quarter (3/4) inch maximum aggregate sized base course(s).

C. CURBS

Unless permitted otherwise, concrete vertical curbs with integral gutters shall be constructed throughout the City. In blocks where streets have already been improved with roll-type curbs, curbs shall match existing.

D. SIDEWALKS

Concrete sidewalks shall be constructed in all residential, industrial and commercial developments, unless designated otherwise by separate agreement. Sidewalks in commercial areas shall extend from the curb to a line not more than 1' from the property line, or with six (6) feet wide (min.) meandering sidewalk as approved by the City Engineer. Residential sidewalks shall be minimum four (4) feet in width and shall be located one (1) foot (minimum) from the property line, except where permitted per Standard Plan No. ST-2 or approved by the City Engineer. When the property line is less than nine (9) feet from face of curb, the sidewalk shall be increased to five and one-half (5.5) feet wide, and located adjacent to the curb, providing four (4) feet (minimum) clearance around obstructions. Sidewalks fronting schools, churches, and similar locations within residential areas with high pedestrian traffic may be constructed to either residential or commercial standards. Unless otherwise approved by the City Engineer, five and one-half (5.5) feet sidewalks adjacent to the curb shall be installed in industrial areas.

Pedestrian access ramps shall be constructed within sidewalk areas at curb returns and other locations per City requirements.

E. DRIVEWAYS

Driveways shall be constructed only at locations where access from private property is required. The design of driveways shall be as detailed on Design Standard Plan No. ST-7.

Commercial type driveways with heavy-duty curbs shall be constructed for all commercial, industrial applications, and multiple residential developments of three or more units. The concrete thickness of disabled access ramps and commercial driveways approaches shall be increased an additional two (2) inches (minimum) more than said standard plans in heavier truck traffic areas to withstand the heavier traffic loads.

F. STREET LIGHTING

A street lighting system shall be required of new developments, with service design and connection coordinated with the Utility Company. Street lighting designs including fixture wattage, pole locations and spacing, and conduit shall be subject to review and approval of the City Engineer.

All Electrical work, materials, equipment, and incidentals including conduit, wiring, connections, and testing shall be in full accordance with the latest editions of the following:

1. National Electrical Code
2. C.A.C., Title 24, Part 3: Basic Electrical Regulations
3. California Occupational Safety and Health Act (CAL/OSHA): Low Wattage Electrical Orders
4. All applicable local laws, regulations, and/or ordinances
5. CAL/OSHA: Construction Safety Orders

Electroliers and appurtenances shall be in accordance with City Standard Plans (E1 through E5) unless otherwise approved by the City Engineer. These installations shall be City-owned upon completion of the development.

City standard street light poles shall be Type 15 in accordance with Standard Plan E-4, and spacing for residential shall be two hundred (200) feet maximum. For collector streets, spacing shall be two hundred (200) feet maximum alternating, and Arterials one hundred fifty (150) feet maximum alternating. Street lighting wattage shall be: 100W HPS for Residential, 150W HPS for Industrial, and Commercial. The street light service and conduit run shall be one and one-half (1.5) inch Schedule 40 P.V.C. (typical). Streetlights shall be placed where pedestrians cross the street.

G. MONUMENTS

Standard survey monuments, stamped with the license number of an RCE certified to do land surveying or PLS of a State of California licensed land surveyor, shall be installed in accordance with Standard Plan ST-9 on the centerlines of streets at the following locations:

1. All intersections of street centerlines, and
2. All points of curves.

Lot corners and subdivision corners shall be located as specified in the Subdivision Ordinance, and must be at least a one-half (1/2) inch diameter steel bar or three-quarter (3/4) inch diameter iron pipe, eighteen (18) inches long, installed six (6) inches below finished grade, with brass tag or plastic plug-in. Brass tag shall be stamped with RCE or PLS number of RCE or LS performing the survey. Section 8771 of the Land Surveyors Act requires that all existing monuments shall be resurveyed and reestablished when disturbed by new construction.

H. STREET SIGNS

Street name signs shall be installed at each intersection. Roadways of four (4) or more travel lanes shall be furnished with a minimum of two (2) street name signs. Traffic signs, together with appropriate pavement markings, striping and/or raised pavement markers, shall be installed as directed by the City Engineer and in accordance with Standard Plans ST-12 and ST-13.

I. STORM DRAINS

Storm drains shall be designed and constructed to serve the development including any areas that will ultimately drain through the development. All intersections requiring drainage improvements shall be served with underground pipes and appropriate drainage facilities. “T” intersections with low traffic volumes may use cross-gutters on the minor leg of the “T,” but only as approved by the City Engineer. Siphons are not acceptable. A discharge/design storm calculations submittal is required. The minimum pipe sizes shall be twelve (12) inches minimum for laterals with a slope of one (1) percent or greater, and fifteen (15) inches minimum for mains with a slope of four-tenths (0.4) of a percent or greater. Pipe strength shall be minimum Class III RCP. Catch basins shall have a minimum depth of three (3) feet and a maximum depth of six (6) feet.

J. WATER, RECYCLED WATER, AND SANITARY SEWERS

Shall be constructed per Marina Coast Water District Standards.

K. FIRE PROTECTION

When required by local fire protection regulations, the development shall include fire protection systems including all necessary fire hydrants, valves, mains, and appurtenances, together with fire access lanes and equipment turn-arounds as applicable. Materials, equipment, and installation shall conform to the requirements of the Marina Coast Water District, City, State, and Federal agencies.

L. RIGHT-OF-WAYS AND EASEMENTS

As a condition for development, street right-of-ways, and/or easements for publicly owned and maintained facilities shall be conveyed to the City in accordance with current policy and shall include a plat and legal description.

All plats and deed descriptions necessary for recordation of such conveyances shall be prepared/submitted by the developer. Said documents must be stamped and signed by a land surveyor or professional Civil Engineer licensed to do said work.

M. PARKING AND TRAFFIC CIRCULATION

Access roadways, on-site parking and interior vehicular circulation designs shall be in accordance with current City policies, and the Marina Zoning Code requirements for parking facilities.

Entrances/driveways to developments shall be located and designed with appropriate signing, striping and markings, divider strips, signalization and other traffic control devices as necessary to minimize conflicts with or disruptions to through traffic using the public street.

Parking layouts, stall and aisle dimensions shall be in accordance the Marina Municipal Code. For high-turnover rate parking, recommended stall dimensions are minimum nine (9) feet in width and nineteen (19) feet in length as measured along the angle of parking.

All parking areas shall be graded and paved to drain and delineated by painted lines and/or raised markers; as approve by the City Engineer. Individual stalls adjacent to buildings, pedestrian walks or other similar structures shall be separated by raised concrete curbs, sidewalks, planters or other type of barrier. Where parking spaces abut pedestrian or landscape planters, the walkways and planters shall be of adequate width to provide for three (3) feet vehicle overhang, where such improvements are used for wheel stops. A minimum four (4) feet clearance for pedestrian traffic shall always be provided. Planted areas adjacent to paved parking or roadway area shall be separated by vertical type curbs (Type B or Type C) as shown on Standard Plans ST-1.

Provisions for handicapped parking stalls, with applicable ramps, shall be included in the parking design, in accordance with latest State Standards.

On-site vehicular roadways shall include provisions for emergency vehicle corridors and turn-arounds in accordance with Fire Department regulations. Such corridors shall be adequately marked and/or signed to prohibit unauthorized parking.

II. STORM DRAIN DESIGN

A. GENERAL

Storm drainage facilities shall be designed to retain runoff water within the boundaries of the project and shall conform to the City's Standard Specifications. The determination of storm runoff and required facilities shall be as outlined herein. The storm drainage system shall follow natural drainage patterns as much as possible, within the constraints of the development needs and City requirements. All channels shall be maintained in their natural state to the maximum extent practical.

Storm drainage facilities for new development retention areas shall typically be reinforced concrete with pipe strength of Class III RCP or high density polyethylene pipe HDPE-DR25. Drainage ditches or open channel conveyance shall only be used if approved by the City Engineer.

Retention of storm water runoff from new development or redevelopment shall be implemented as specified herein.

The design of storm drainage facilities is subject to final determination and approval of the City Engineer.

B. STORM DESIGN CRITERIA

A ten (10) year design storm shall be used for design of conduits and inlets. A hundred (100) year storm design shall be used for all channels, retention facilities, surface structures and underground structures. Rainfall intensities shall be based on the Monterey County Standard Details "Rainfall Intensities." Storm Calculations used to design storm facilities shall be submitted with improvement plans. Calculations shall include HGL and EGL elevations.

C. HYDROLOGY-SURFACE RUNOFF

Two methods are described in this section to estimate peak runoff for storm drainage facility sizing:

C.1 Rational Method for drainage areas of three hundred twenty (320) acres of less. At the option of the City Engineer, the Rational Method may be used for larger areas.

C.2 Computer simulation method for drainage areas of any size, but generally required for developments larger than three hundred twenty (320) acres.

C.1 Rational Method:

The "Rational Method" can be used to determine peak discharges for drainage areas up to three hundred twenty (320) acres in size. At the option of the City Engineer, use of the Rational Method may be approved for larger drainage areas.

The Rational Method approach is represented by the formula:

$$Q=CiA$$

Where:

Q: Design peak runoff/discharge I cubic feet per second (cfs)

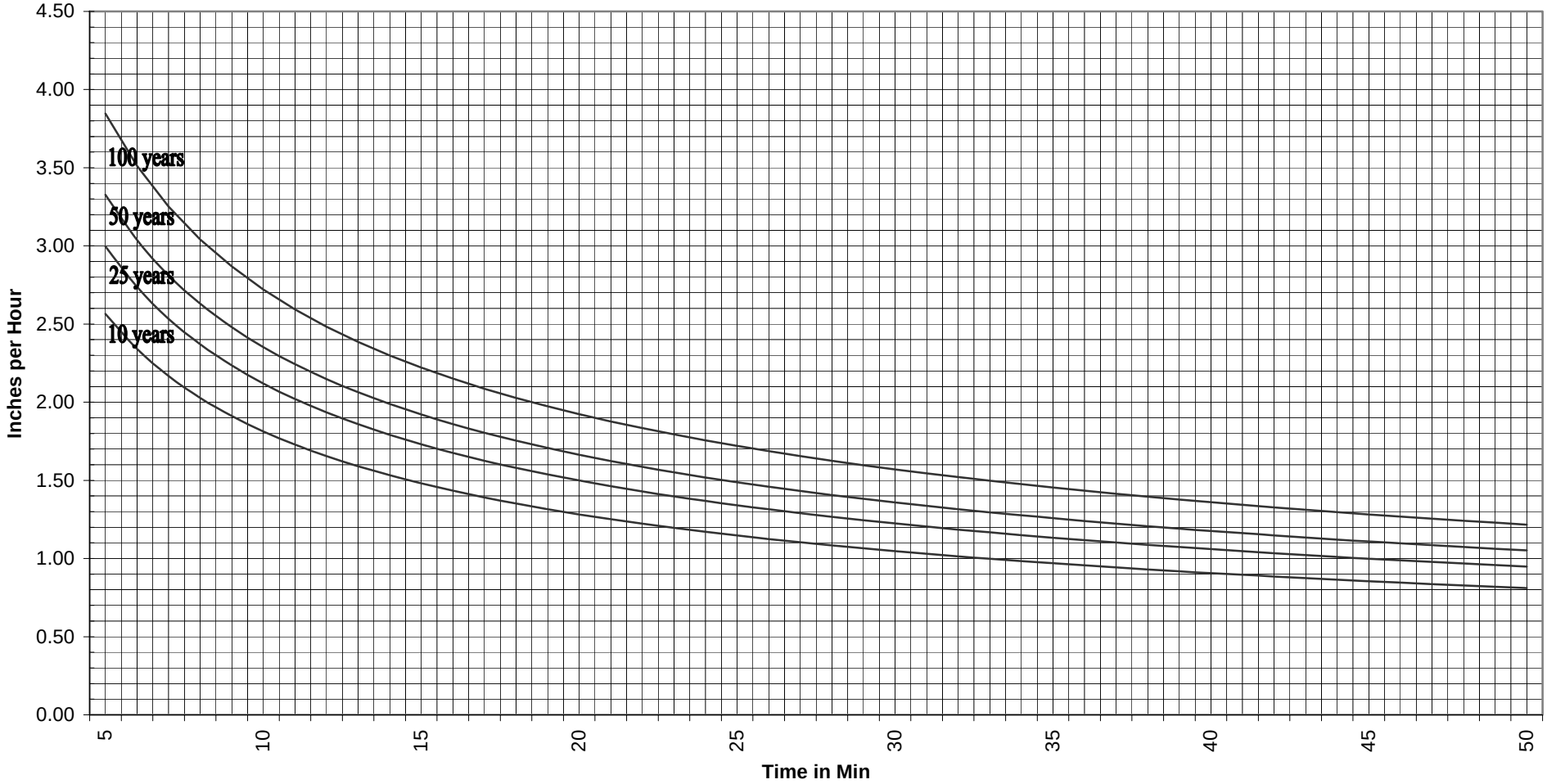
C: Coefficient of runoff, representing the ratio of runoff to rainfall

i: Average rainfall intensity expressed in inches per hour for a duration equal to the time of concentration*

A: Size of the tributary drainage area in acres

*The time of concentration is considered as the time required for water to flow overland to reach established surface drainage channels such as street gutters, and channel flow time required for water to flow through established drainage channels to the point of inlet of the City's storm drain system. A minimum inlet time of fifteen (15) minutes is used. Subsequent time of concentration in the drainage system shall be determined by the time of flow in the conduit.

Rain Fall Intensities For Marina



Intensities (inches per hour)				
Min	**10 yr**	**25 yr**	**50 yr**	**100 yr**
5	2.56	3.00	3.33	3.85
6	2.34	2.74	3.04	3.51
7	2.17	2.53	2.81	3.25
8	2.03	2.37	2.63	3.04
9	1.91	2.23	2.48	2.87
10	1.81	2.12	2.35	2.72
11	1.73	2.02	2.24	2.59
12	1.66	1.94	2.15	2.48
13	1.59	1.86	2.06	2.39
14	1.53	1.79	1.99	2.30
15	1.48	1.73	1.92	2.22
16	1.43	1.68	1.86	2.15
17	1.39	1.63	1.80	2.09
18	1.35	1.58	1.75	2.03
19	1.32	1.54	1.71	1.97
20	1.28	1.50	1.66	1.92
21	1.25	1.46	1.62	1.88
22	1.22	1.43	1.59	1.83
23	1.20	1.40	1.55	1.79
24	1.17	1.37	1.52	1.76
25	1.15	1.34	1.49	1.72
26	1.12	1.31	1.46	1.69
27	1.10	1.29	1.43	1.66
28	1.08	1.27	1.41	1.63
29	1.06	1.24	1.38	1.60
30	1.05	1.22	1.36	1.57
31	1.03	1.20	1.34	1.55
32	1.01	1.19	1.32	1.52
33	1.00	1.17	1.30	1.50
34	0.98	1.15	1.28	1.48
35	0.97	1.13	1.26	1.45
36	0.96	1.12	1.24	1.43
37	0.94	1.10	1.22	1.41
38	0.93	1.09	1.21	1.40
39	0.92	1.07	1.19	1.38
40	0.91	1.06	1.18	1.36
41	0.90	1.05	1.16	1.34
42	0.88	1.03	1.15	1.33
43	0.87	1.02	1.13	1.31
44	0.86	1.01	1.12	1.30
45	0.85	1.00	1.11	1.28
46	0.85	0.99	1.10	1.27
47	0.84	0.98	1.09	1.25
48	0.83	0.97	1.07	1.24
49	0.82	0.96	1.06	1.23
50	0.81	0.95	1.05	1.22
51	0.80	0.94	1.04	1.20
52	0.80	0.93	1.03	1.19
53	0.79	0.92	1.02	1.18
54	0.78	0.91	1.01	1.17
55	0.77	0.90	1.00	1.16
56	0.77	0.90	0.99	1.15
57	0.76	0.89	0.99	1.14
58	0.75	0.88	0.98	1.13
59	0.75	0.87	0.97	1.12
60	0.74	0.87	0.96	1.11
61	0.73	0.86	0.95	1.10
62	0.73	0.85	0.94	1.09
63	0.72	0.84	0.94	1.08
64	0.72	0.84	0.93	1.08
65	0.71	0.83	0.92	1.07

Intensities (inches per hour)				
Min	**10 yr**	**25 yr**	**50 yr**	**100 yr**
66	0.71	0.83	0.92	1.06
67	0.70	0.82	0.91	1.05
68	0.70	0.81	0.90	1.04
69	0.69	0.81	0.90	1.04
70	0.69	0.80	0.89	1.03
71	0.68	0.80	0.88	1.02
72	0.68	0.79	0.88	1.01
73	0.67	0.78	0.87	1.01
74	0.67	0.78	0.86	1.00
75	0.66	0.77	0.86	0.99
76	0.66	0.77	0.85	0.99
77	0.65	0.76	0.85	0.98
78	0.65	0.76	0.84	0.97
79	0.65	0.75	0.84	0.97
80	0.64	0.75	0.83	0.96
81	0.64	0.74	0.83	0.96
82	0.63	0.74	0.82	0.95
83	0.63	0.74	0.82	0.94
84	0.63	0.73	0.81	0.94
85	0.62	0.73	0.81	0.93
86	0.62	0.72	0.80	0.93
87	0.61	0.72	0.80	0.92
88	0.61	0.71	0.79	0.92
89	0.61	0.71	0.79	0.91
90	0.60	0.71	0.78	0.91
91	0.60	0.70	0.78	0.90
92	0.60	0.70	0.78	0.90
93	0.59	0.70	0.77	0.89
94	0.59	0.69	0.77	0.89
95	0.59	0.69	0.76	0.88
96	0.59	0.68	0.76	0.88
97	0.58	0.68	0.76	0.87
98	0.58	0.68	0.75	0.87
99	0.58	0.67	0.75	0.86
100	0.57	0.67	0.74	0.86
105	0.56	0.65	0.73	0.84
110	0.55	0.64	0.71	0.82
115	0.53	0.63	0.69	0.80
120	0.52	0.61	0.68	0.79
125	0.51	0.60	0.67	0.77
130	0.50	0.59	0.65	0.75
135	0.49	0.58	0.64	0.74
140	0.48	0.57	0.63	0.73
145	0.48	0.56	0.62	0.71
150	0.47	0.55	0.61	0.70
155	0.46	0.54	0.60	0.69
160	0.45	0.53	0.59	0.68
165	0.45	0.52	0.58	0.67
170	0.44	0.51	0.57	0.66
175	0.43	0.51	0.56	0.65
180	0.43	0.50	0.55	0.64

DESIGN OF STORM WATER DRAINAGE FACILITIES IN MARINA, CALIFORNIA

Hydraulic Design Factors:

A. The 10-year design storm shall be a rainfall expressed by the following formula:

$$i = 5.68 / \sqrt{t}$$

Where: i = intensity of rainfall in inches per hour
t = duration of storm in minutes

B. Runoff Coefficients (for estimation purposes only):

Residential:	
Single Family Areas	0.30-0.60
Multi Family/Apt. Areas	0.50-0.80
Industrial:	
Light	0.50-0.80
Heavy	0.60-0.90
Parks:	0.10-0.25
Playgrounds:	0.20-0.35
Streets:	0.70-0.95
Roofs:	0.75-0.95
Landscaped Areas:	0.05-0.10
Undeveloped Areas:	0.05-0.30

Notes:

1. The area to by used in runoff calculation shall include the proposed development and all developed and undeveloped areas draining into the proposed development.
2. Runoff coefficients shall be calculated based on actual pervious and impervious areas.

C. Infiltration rate for percolation pond is 12 inches per hour.

STANDARDS

OPEN PONDS:

- Pond shall be excavated below natural ground with no levees.
- Excavation slopes shall be 3:1 or flatter. If retaining walls are proposed, the design shall be approved by the City Engineer.
- Ponds maintained by the City shall be enclosed with a six (6) foot high chain link fence. The fence shall be located in conformance with subdivision setback lines.
- A six (6) foot wide access path shall be provided around the pond perimeter within the fenced area.
- A sixteen (16) foot wide access gate and paved driveway shall be provided.
- An equipment access ramp eight (8) feet wide and not steeper than 5:1 shall be provided for access to bottom of pond.
- Pond design shall incorporate erosion control measures.

D. HYRAULIC CONSIDERATIONS

A minimum pipe size of fifteen (15) inch diameter is required for all storm drains. A twelve (12) inch diameter may be used for catch basin laterals, provided it has adequate capacity and will have a one (1) percent minimum slope.

Gradients of pipes shall be sufficient to provide a velocity no less than two (2) feet per second or more than eight (8) feet per second when flowing full. End lines serving a single inlet shall have a one (1) percent minimum slope, although slope should be maximized to minimize maintenance efforts.

Drainage inlet type and spacing shall be governed by the capacity of the drainage channel/gutter as well as the capacity of the inlet itself. Generally, channel flow lengths between inlets should be less than one thousand (1,000) feet, with a flowline grade of not less than .0050 of a percent. In designing a structure, the inlet capacity of the pipe draining the inlet structure shall be considered with a minimum of 0.2 of a foot fall around returns.

Manholes or structures providing access to the pipe should be constructed at all changes in pipe size and angle points. Manhole spacings should not exceed six hundred (600) feet. Manholes are required at all lateral pipe junctions with new and existing mains, unless the main pipeline is three times or greater in diameter than the joining pipe. Where grades permit, one-tenth (0.1) of a foot drop in manholes should be included where there is no appreciable change in direction, and two-tenth (0.2) foot drop where turns occur.

Pipelines may be laid on curves by using beveled pipe sections and/or by deflections of straight pipe in accordance with pipe manufacturers recommendations.

Siphons shall not be used at any location within the storm drainage system.

Special consideration shall be given to the design criteria for storm facilities in areas that are historically subject to flooding. Design criteria for flood prone lands shall be in accordance with these standards and specifications, and with the standards of the Monterey County Water Resources Agency. Requirements for storm water retention are discussed in Section E.

For the protection of properties under flooding conditions, flood relief structures, channels or other drainage facilities shall be constructed to accommodate floodwater depths exceeding nine (9) inches above gutter flowlines.

E. RETENTION REQUIREMENTS

New development and redevelopment shall provide storm water retention to mitigate increases in storm water discharges. The post-project runoff shall not leave the site.

F. STORMWATER QUALITY CONSIDERATIONS

Storm drainage system design shall be in compliance with the storm water quality requirements of the City's NPDES Municipal Storm Water Permit and Storm Water Management and Discharge Control Ordinance. Storm water quality best management practices (quality control measures) shall be incorporated as part of all new and redevelopment projects.

The California Stormwater Best Management Practice Handbook for New Development and Redevelopment (2003 or current version) shall be used as the bases for selection and design of

best management practices for storm water quality. This handbook is accessible at www.cabmphandbooks.com.

All catch basins and inlets shall be clearly marked with the message "NO DUMPING," using City-approved methods.

Source control best management practices (BMP), as described in the California Stormwater Best Management Practice Handbook for New Development and Redevelopment and indicated below, shall be incorporated into the design as needed to control sources of potential pollutants.

G. DESIGN SUBMITTAL REQUIREMENTS

The design engineer shall submit a design report on the proposed storm drainage system improvements. This report shall include:

The hydrologic calculations, facility sizing, and hydraulic gradeline calculations for proposed facilities. Hydrologic and hydraulic calculations shall meet the requirements specified in this section. If a computer model is used, a description of the model, the hydrologic and hydraulic parameters used for the analysis findings, and printouts of the computer input and output files for the proposed improvements shall be documented and provided to the City Engineer.

Profiles of each existing and proposed storm drain shall be submitted with the calculations. The profile shall show the following information: beginning water surface elevation and location for hydraulic calculations; storm drain invert and soffit; diameter; design flow; design hydraulic gradeline; existing ground line; proposed ground line if applicable; and locations of street intersections and connections with other storm drains or channels. A plan view map shall also be provided for off-site profiles.

For retention basins, the storage volume calculations, a plan view map showing the location of the basin, a conceptual cross-section showing the depth, and a description of the storm water quality features to be incorporated into the basin design shall be provided.

III. SANITARY SEWER DESIGN

Marina Coast Water District

IV. DEVELOPMENT PLANS

A. GENERAL

Project development plans shall contain sufficient detailed drawings of required public improvements including streets, drainage and sewer facilities, street lighting systems, utilities and related street improvements. Construction details shall include: typical roadway structural sections and curve data; locations, invert elevations, slopes, type and sizes of storm and sanitary sewer mains, laterals, manholes and appurtenant facilities; locations and depths of new and existing utilities; electrical and street lighting service points with light pole and conduit locations and conductor schedule; easements; curbs and gutters, sidewalks, driveways and other street improvements; and information of improvements/facilities located on adjacent properties showing they are not negatively impacted.

Plan and Profile drawings shall be furnished on standard twenty-four (24) inch by thirty-six (36) inch sheets with originals of legible, reproducible quality. Review plans shall be prepared and submitted in accordance with the current policies. Where filing of plans is required for public record, the completed, signed originals or reproducible mylar sheets shall be furnished to the Development and Engineering Services Department.

Profiles of curbs and gutters, storm and sanitary sewers, and/or street centerlines (as applicable), shall be included on the plans. Where practicable, such profiles shall be shown directly above or below the plan views and of the same scale.

Typical dimensioned design sections shall be furnished for roadways, special sewer and drainage structures and shall contain details of thickness and type of materials, special bedding or reinforcement and relative locations and depths of utilities or other underground facilities requiring special consideration.

A site grading plan shall also be furnished, together with the development plans for review.

Standard construction details may be referenced by note to specific City Standard Plans and Special Provisions Sections.

The developer/owner shall conform to Section "V." Development Plan Checklist for requirements with the initial submittal package.

CONSTRUCTION PLANS (TO INCLUDE THE FOLLWING):

A. *Concrete Work:*
___Sidewalks (show location and size)
___Driveways (show type and width) (special transitions or slopes)
___Curb and gutter (type, limits, and design slope)
___Pedestrian access ramps (City and ADA requirements met)
___Cross gutters/alleys/approaches
___Special design considerations

B. Drainage/Grading Plan:
___Master plan conformance
___Special flood hazard zones identified
___Discharge/design storm (calculations required)
___Pipe sizes [twelve (12) inch min. laterals, fifteen (15) inch min. mains]
___Pipe strength (C III,IV, and V RCP, HDPE ADS N-12)
___Pipe grades [min. twelve (12) inch laterals, s = one (1) percent min.]
[min. main s = 0.4%; greater than twenty-four (24) inch pipe]
___Catch basins [min. depth = three (3) feet; max. depth = six (6) feet] (specify Bike Safe and Type A or better)
___Surface runoff contours/flows
___Affect on adjacent properties
___Manholes (type and invert information) (specify Ram-Nek Joints and Thoro-Seal Finish)
___Curb drain (per City Standards); not for SFR
___Conflict structures
___Pump stations

C. Sanitary Sewer Plans and Water System Plans
___Submitted to Marina Coast Water District

VI. CITY OF MARINA-SUBDIVISION PROCESSING CHECKLIST

SUBDIVISION:

Date tentative map approved: _____
Date tentative map expires: _____
Date initial submittal received: _____
Date final submittal received: _____
Subdivision agreement date: _____

1. *INITIAL SUBMITTAL:* Before the City accepts a map for an initial submittal check, it must include all of the following items:

___Two (2) copies of the Subdivision Map signed by the engineer or surveyor. (3-1/2" floppy disk/s or CD/s or DVD/s required at final submittal with mylar),
___A current title report,
___A full set of boundary, lot, and area calculations signed by the PE of LS,
___Complete documentation (all pertinent deeds and record maps),
___Two (2) sets of signed blueline construction plans including the Grading Plan, Street Improvement Plan, Storm Drain, Sanitary Sewer, Water/Fire Safety Improvement Plan, Traffic Signing and Striping Plan, and Landscape Plans (3-1/2" floppy disk/s or CD/s or DVD/s requested at final submittal),
___Earthwork calculations (section or quadrants),
___Pavement design calculations (conform to Standard Plan 3),
___Two (2) copies of a geotechnical report,
___Two (2) copies of any geological investigation, which includes the area encompassed by this subdivision,
___Two (2) sets of hydrology calculations and hydrology map,
___Two (2) sets of hydraulic calculations,
___Two (2) copies of an engineer's cost estimate for all construction encompassed on the plans based on the City construction costs,
___Map checking fee for the subdivision, and
___Non-refundable deposit of fifty (50) percent of the engineering and inspection fee for construction plan checking.

2. *SUBSEQUENT SUBMITTAL:* The second and all subsequent submittals should include the following items:

___Two (2) copies of the revised Subdivision Map,
___All waiver letters required by Section 66436 of the Subdivision Map Act,
___Two (2) copies of the revised improvement plans,
___Two (2) sets of revised hydrology and hydraulic calculation,
___Two (2) sets of retaining wall design and calculations,
___Written notarized permission from any property owner where grading or drainage is proposed on adjacent property not owned by the applicant,
___Previous Map and Improvement Plan checkprints, and
___Previous hydrology and hydraulic calculation checksets.

3. *FINAL SUBMITTAL:* The following items must be in the City Engineer's Office at least two (2) weeks prior to the City Council meeting at which action is expected:

___Original signed/sealed Subdivision Map on mylar or vellum (provide information in Autocad .DWG format on a 3-1/2" disk/s or CD/s or DVD/s);

___Floppy disk/s or CD/s or DVD/s and other items listed on note “a;”
___Original tracing of all improvement plan and grading plan, along with one (1) mylar copy and two (2) blueline prints;
___Three (3) copies of the Improvement Contract;
___Bond or other approved form of improvement security;
___Monumentation Bond or letter of waiver from Subdividers, Engineer/Surveyor;
___Tax clearance certificates;
___Letter from County Assessor;
___Recording fee: check to be made payable to Monterey County Recorder;
___Preliminary Subdivision Guarantee (Final Subdivision Guarantee required by County Recorder at time of recordation);
___Engineering and inspection fees; and
___Prior to acceptance of subdivision improvements, benchmark elevations and State Plane coordinates for set points shall be provided to the City on electronic media by licensed surveyor or civil engineer (licensed to practice surveying) for inclusion in the City’s Benchmark Records.
___Prior to approval of Improvement Plans, submit signed plans by Marina Coast Water District.

CITY OF MARINA, CALIFORNIA

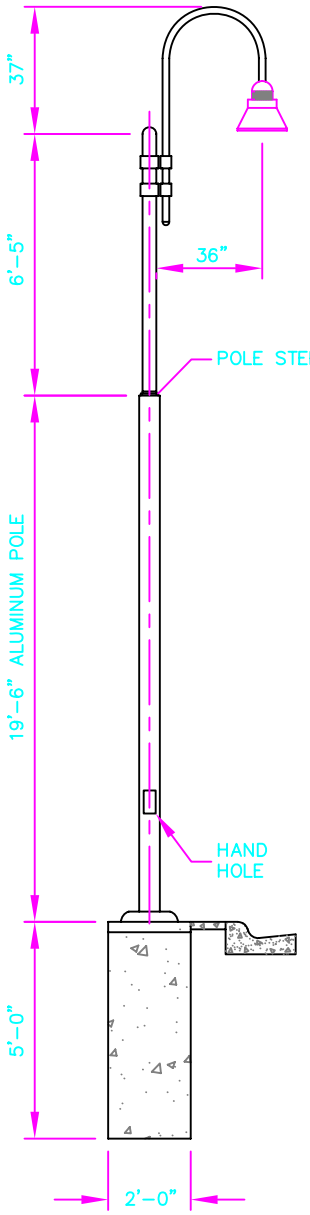
COMMUNITY DEVELOPMENT DEPARTMENT, PUBLIC WORKS DIVISION

PART III: STANDARD PLANS

CITY OF MARINA
COMMUNITY DEVELOPMENT DEPARTMENT, PUBLIC WORKS DIVISION
STANDARD SPECIFICATIONS
2006 EDITION

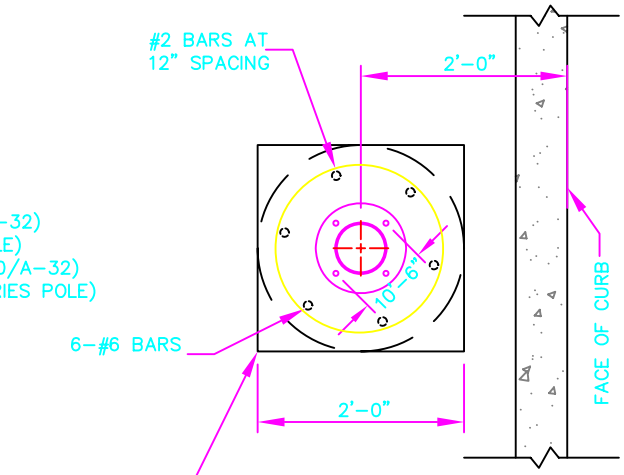
The standard plans and provisions contained in this manual have been prepared for the purpose of establishing the minimum and uniform requirements to be used by engineers, contractors and developers for the preparation of plans and the construction of public improvements under the jurisdiction of the City of Marina. These standards shall be used in conjunction with the State of California Department of Transportation (Caltrans) Standard Specifications and Plans dated July 2002. In case of conflict between Caltrans Specifications and the City of Marina Standard Details and provisions, the City of Marina Standard Details and Provisions shall apply.

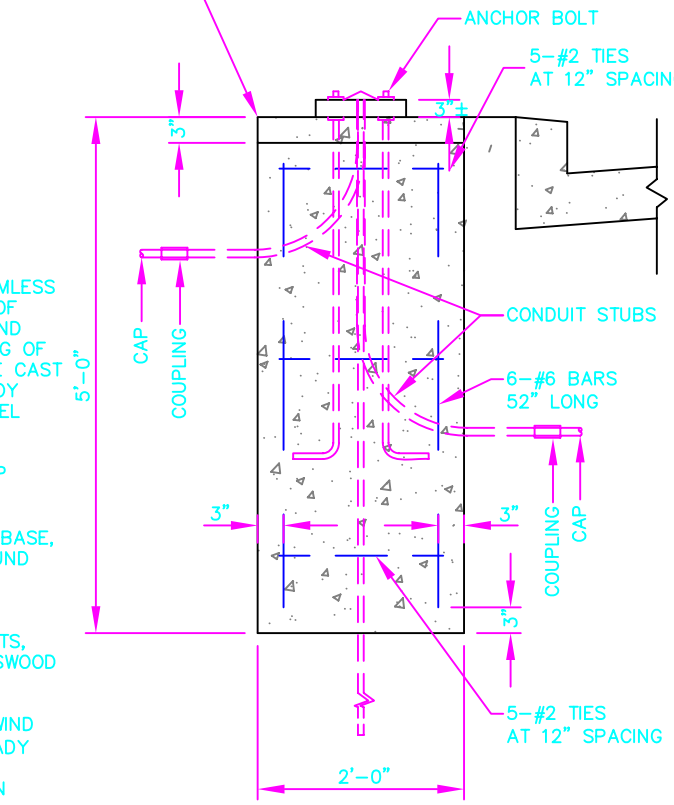
Any deviation from the Standard Details or the Standard Specifications must be approved in writing by the City Engineer of the City of Marina, California.



KIM LIGHTING
MODEL NUMBER:

1. CAL20-64188
   (GABARDINE GREEN)
2. RA25 (1A/RA253/150HPS240/A-32)
   (GABARDINE GREEN FOR CAL POLE)
3. RA25 (33/2B/RA253/150HPS240/A-32)
   (GABARDINE GREEN FOR CAL SERIES POLE)





NOTES

1. DRAWING NOT TO SCALE.
2. POLE CONSTRUCTION SHALL BE SEAMLESS ROUND EXTRUDED ALUMINUM TUBE OF ALLOY 6063-T6, WELDED TO TOP AND BOTTOM OF ALUMINUM BASE CASTING OF ALLOY 356. BASE HAS A TWO PIECE CAST ALUMINUM FULL COVER OF 319 ALLOY AND IS SECURED BY STAINLESS STEEL SCREWS.
3. A DOMED CAST ALUMINUM POLE CAP SHALL BE PROVIDED.
4. HANDHOLE SHALL BE 18" UP FROM BASE, WITH A GASKETED COVER AND GROUND LUG AND VANDAL PROOF SCREWS.
5. FOUR GALVANIZED ANCHOR BOLTS PROVIDED COMPLETE WITH EIGHT NUTS, EIGHT FLAT WASHERS, AND A PRESSWOOD TEMPLATE.
6. POLES SHALL WITHSTAND GUSTING WIND EQUIVALENT OF 143/WIND MAP STEADY WIND OF 110 WHEN LUMINARES ARE MOUNTED PER FIXTURE INSTALLATION INSTRUCTIONS.
7. SUPER TGIC THERMOSET POLYESTER POWDER COAT PAINT APPLIED OVER A CHROMATE CONVERSION COATING. STANDARD COLOR SHALL BE GABARDINE GREEN.
8. ELECTRICAL DETAILS FROM E-1 AND E-2 APPLIES TO THIS STREET LIGHT.

APPROVED:

Acting City Engineer — Date

REVISION:

Date

COMMUNITY DEVELOPMENT DEPARTMENT
PUBLIC WORKS DIVISION — CITY OF MARINA

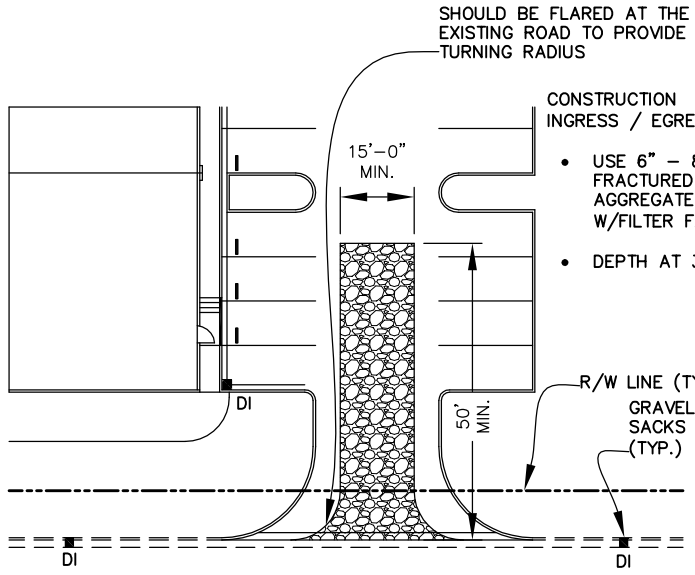
TITLE

DECORATIVE STREET LIGHT

STANDARD PLAN

E-5

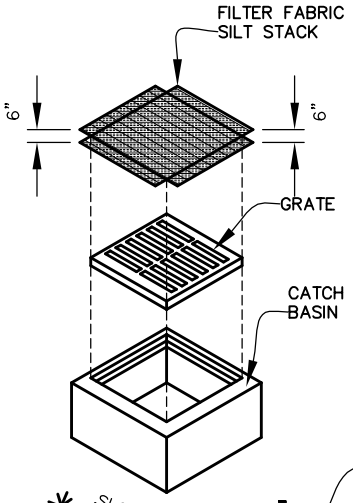
EROSION CONTROL
STANDARD PLANS

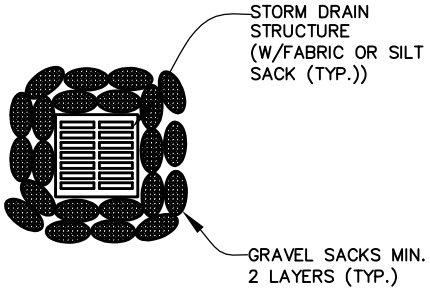


TYPICAL CONSTRUCTION ENTRY REQUIREMENT

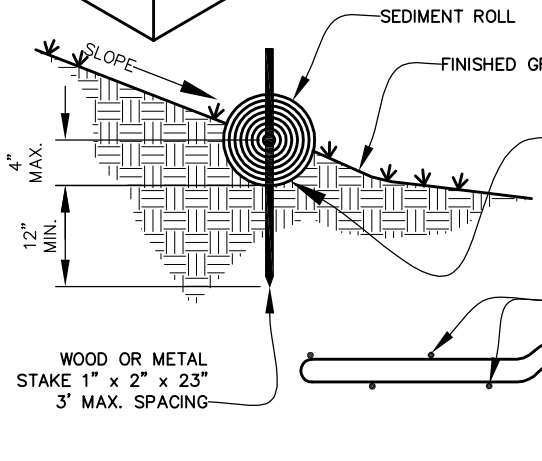
NOTE:

1. DRAWING NOT TO SCALE.
2. GRAVEL BAGS SHALL BE USED ON ALL DRAINAGE INLETS, ON–SITE TOP OPENINGS AND SIDE OPENINGS.
3. GRAVEL BAGS SHALL BE USED ON ALL DRAINAGE INLETS IN CITY OF MARINA RIGHT–OF–WAY IMPACTED BY THE PROJECT (DOWN STREAM INLETS AND FIRST INLET UP STREAM).
4. PLACE TYPE I BARRICADE OVER DRAINAGE INLET WHEN FILTER FABRIC AND GRAVEL SACKS ARE UTILIZED.
5. INSPECT (AND DOCUMENT EACH INSPECTION) ALL INLET PROTECTION DEVICES BEFORE AND AFTER RAINFALL EVENTS, AND WEEKLY THROUGHOUT RAINY SEASON. DURING EXTENDED RAINFALL EVENTS, INSPECT INLET PROTECTION DEVICES AT LEAST ONCE EVERY 24 HOURS.
6. REMOVE ALL INLET PROTECTION DEVICES WITHIN 30 DAYS AFTER THE SITE IS STABILIZED, OR WHEN INLET PROTECTION IS NO LONGER REQUIRED.
7. PRIOR TO ROLL INSTALLATION, CONTOUR A CONCAVE KEY TRENCH 3" MINIMUM TO 4" MAXIMUM DEPTH ALONG THE PROPOSED INSTALLATION ROUTE.
8. SOIL EXCAVATED IN TRENCHING SHOULD BE PLACED ON THE UPHILL OR FLOW SIDE OF THE ROLL TO PREVENT WATER FROM UNDER CUTTING THE ROLL.
9. PLACE SEDIMENT ROLL INTO KEY TRENCH AND STAKE ON BOTH SIDES OF THE ROLL TO WITHIN 3' OF EACH END AND THEN EVERY 3' WITH 1" x 2" x 23" WOOD OR METAL STAKES.
10. STAKES ARE TYPICALLY DRIVEN IN ON ALTERNATING SIDES OF THE ROLL. WHEN MORE THAN ONE SEDIMENT ROLL IS PLACED IN A ROW, THE ROLLS SHOULD BE OVERLAPPED 12" MIN. TO PROVIDE A TIGHT JOINT, NOT ABUTTED TO ONE ANOTHER.

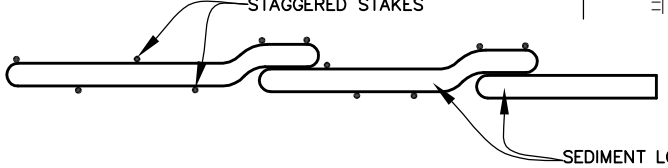




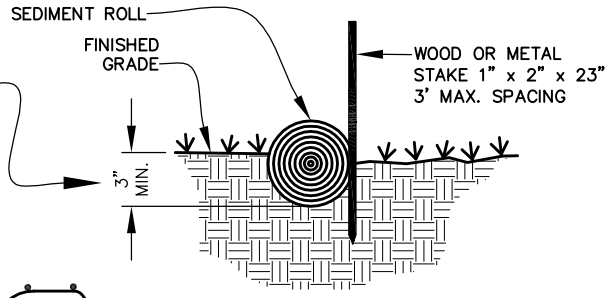
TYPICAL STORM DRAIN STRUCTURE REQUIREMENTS



ENTRENCHMENT DETAIL IN SLOPE AREA
(FOR SHORT SLOPES OR SLOPES FLATTER THAN 3:1)

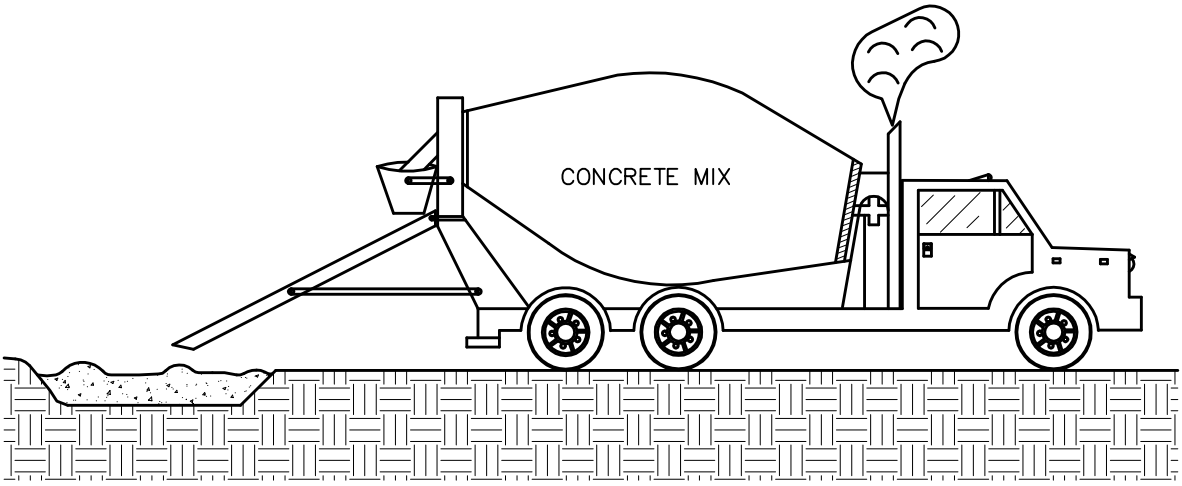


SEDIMENT LOG DETAIL
(TO BE USED ON SLOPES AT PROPERTY PERIMETER)



ENTRENCHMENT DETAIL IN FLAT AREA

APPROVED: Acting City Engineer Date REVISION: Date		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE BEST MANAGEMENT PRACTICES	STANDARD PLAN EC-1



NOT TO SCALE

DESCRIPTION

PREVENT OR REDUCE THE DISCHARGE OF POLLUTANTS TO STORM WATER FROM CONCRETE WASTE BY CONDUCTING WASHOUT OFF-SITE, PERFORMING ON-SITE WASHOUT IN A DESIGNATED AREA, AND TRAINING EMPLOYEES AND SUBCONTRACTORS.

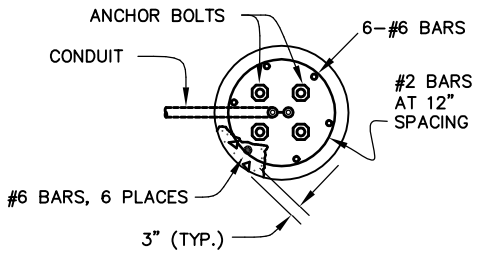
APPROACH

THE FOLLOWING STEPS WILL HELP REDUCE STORM WATER POLLUTION FROM CONCRETE WASTES:

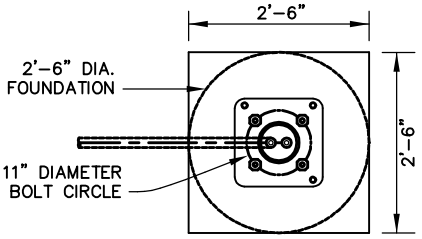
- STORE DRY AND WET MATERIALS UNDER COVER, AWAY FROM DRAINAGE AREAS.
- AVOID MIXING EXCESS AMOUNTS OF FRESH CONCRETE OR CEMENT ON-SITE.
- PERFORM WASHOUT OF CONCRETE TRUCKS OFF SITE OR IN DESIGNATED AREAS ONLY.
- DO NOT WASH OUT CONCRETE TRUCKS INTO STORM DRAINS, OPEN DITCHES, STREETS, OR STREAMS.
- DO NOT ALLOW EXCESS CONCRETE TO BE DUMPED ON-SITE, EXCEPT IN DESIGNATED AREAS.
- FOR ON-SITE WASHOUT:
  - LOCATE WASHOUT AREA AT LEAST 50' FROM STORM DRAINS, OPEN DITCHES, OR WATER BODIES. DO NOT ALLOW RUNOFF FROM THIS AREA BY CONSTRUCTING A TEMPORARY PIT OR BERMED AREA LARGE ENOUGH FOR LIQUID AND SOLID WASTE.
  - WASH OUT WASTES INTO THE TEMPORARY PIT WHERE THE CONCRETE CAN SET, BE BROKEN UP, AND THEN DISPOSED OF PROPERLY.
- WHEN WASHING CONCRETE TO REMOVE FINE PARTICLES AND EXPOSE THE AGGREGATE, AVOID CREATING RUNOFF BY DRAINING THE WATER TO A BERMED OR LEVEL AREA.
- DO NOT WASH SWEEPINGS FROM EXPOSED AGGREGATE CONCRETE INTO THE STREET OR STORM DRAIN. COLLECT AND RETURN SWEEPINGS TO AGGREGATE BASE STOCK PILE, OR DISPOSE IN THE TRASH.

APPROVED: Acting City Engineer Date REVISION: Date	Marina 1975	COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE CONCRETE WASTE WASHOUT MANAGEMENT PLAN	STANDARD PLAN EC-2

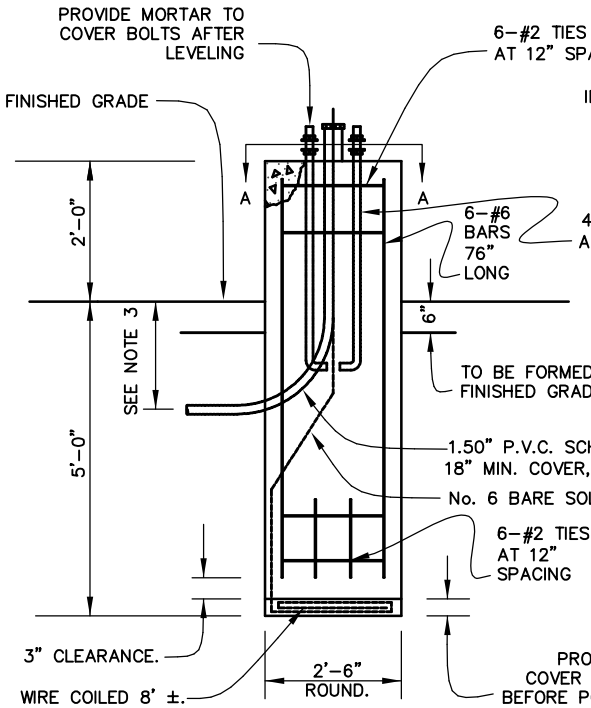
ELECTRICAL STANDARD PLANS



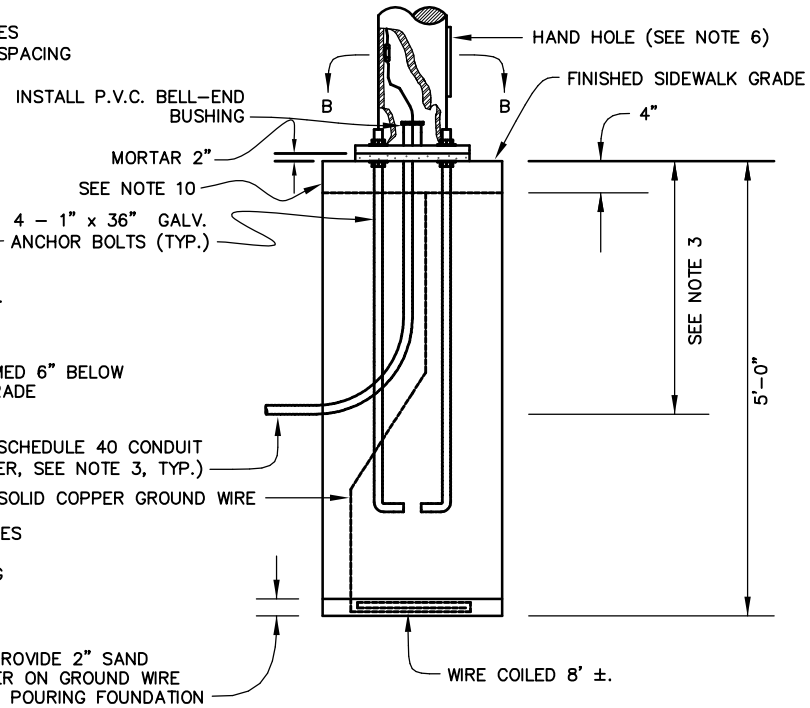
SECTION A-A



SECTION B-B



PARKING AREA LIGHT FOUNDATION

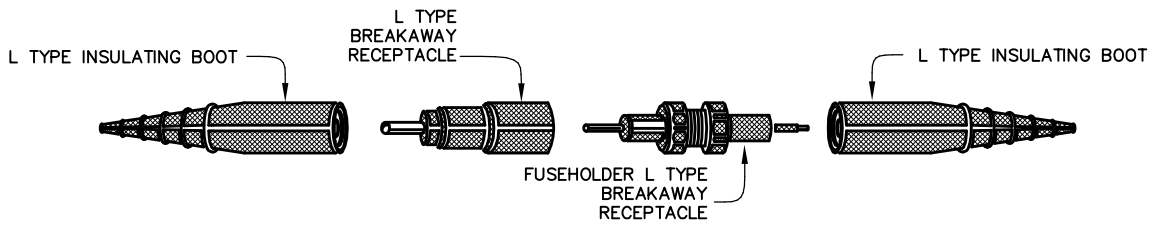


STREET LIGHT FOUNDATION

GENERAL NOTES

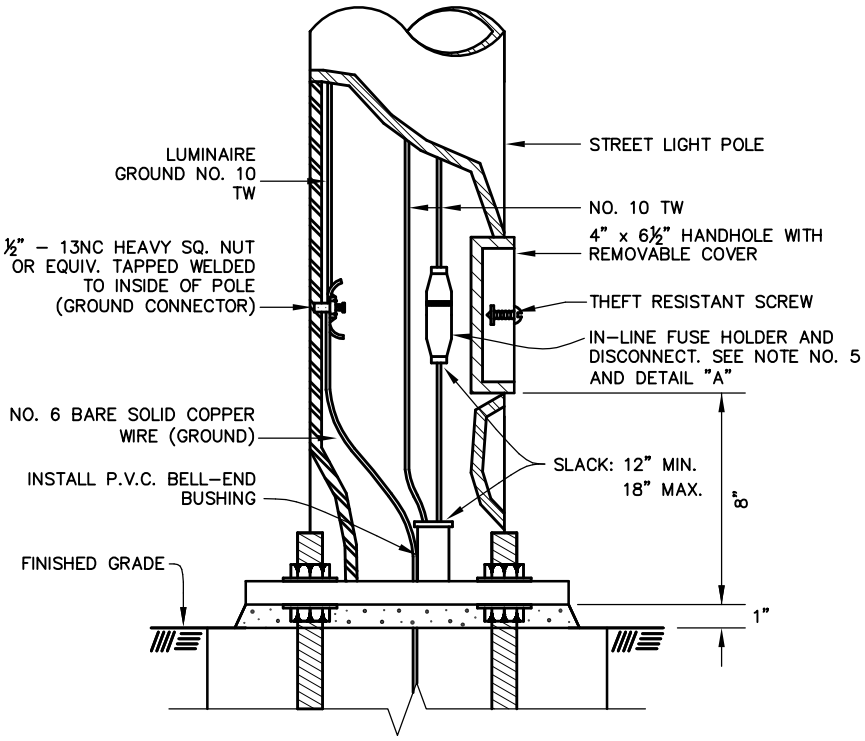
1. DRAWING NOT TO SCALE.
2. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE CITY STANDARD SPECIFICATIONS, ELECTRIC CODE AND P.U.C.'S G.O. 95A.
3. CONDUIT COVER SHALL BE 18" MINIMUM IN SIDEWALK PARKWAY STRIP AND MEDIAN ISLAND AREAS AND 30" MINIMUM UNDER STREETS OR PROPERTY EASEMENTS.
4. ALL CONCRETE SHALL BE CLASS "3" PER CITY STANDARD SPECIFICATIONS.
5. FURNISH AND INSTALL ALL MATERIALS.
6. FOR BASE DETAILS, SEE CITY STANDARD PLAN E–3.
7. FOR STREET LIGHT POLE AND NUMBER LOCATION DETAIL, SEE CITY STANDARD PLAN E–4.
8. FOR FUSE CONNECTOR, SEE CITY STANDARD PLAN E–2.
9. FOR TYPICAL SERVICE POLE DETAIL AND UNDERGROUND SERVICE, SEE CITY STANDARD PLAN E–4.
10. COMPLETE THIS SQUARE LEVELING PORTION OF FOUNDATION AFTER ERECTING AND LEVELING POLE.

APPROVED: Acting City Engineer — Date REVISION: Date	Marina 1975	COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION — CITY OF MARINA TITLE P.C.C. LIGHTING FOUNDATION	STANDARD PLAN E–1



DETAIL "A"

BUSSMANN HEB SERIES (WATER RESISTANT) OR APPROVED EQUAL



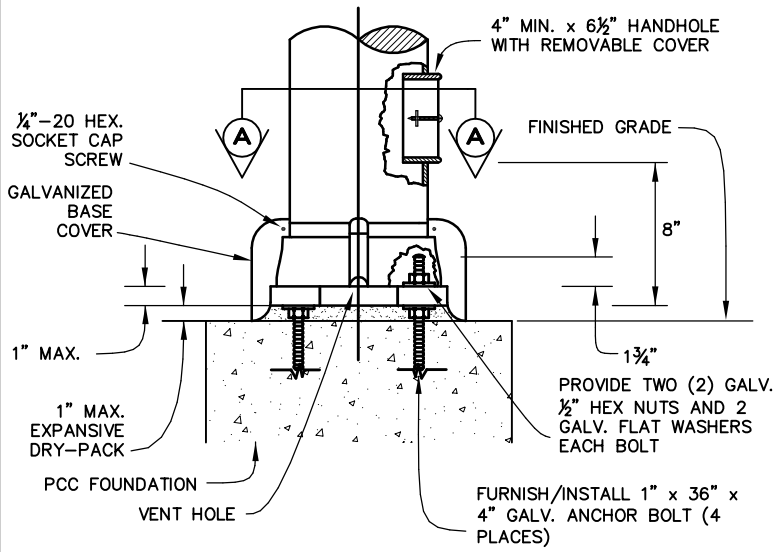
FUSE CONNECTOR

GENERAL NOTES

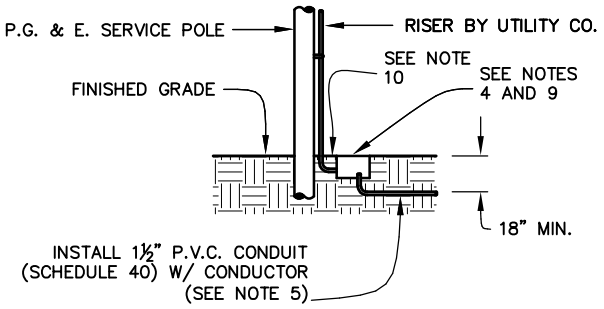
1. DRAWING NOT TO SCALE.
2. ALL CONSTRUCTION AND MATERIAL SHALL CONFORM TO THE CITY STANDARD SPECIFICATIONS, ELECTRIC CODE AND P.U.C.'S G.O. 95A.
3. CONDUIT COVER SHALL BE 18" MINIMUM IN SIDEWALK AREAS AND 30" MINIMUM UNDER STREETS OR PROPERTY EASEMENTS.
4. ALL CONCRETE SHALL BE CLASS "3" PER CITY STANDARD SPECIFICATIONS.
5. INSTALL WATERPROOF IN–LINE FUSE HOLDER BUSSMANN HEB SERIES (WATER RESISTANT) OR APPROVED EQUAL, UNDERGROUND LEG WITH MIDGET 10A FUSE * OR AS DIRECTED BY CITY ENGINEER.

   * FUSE
   1 – HEAD 100W = 5 AMP
   2 – HEAD 100W = 7 AMP
   1 – HEAD 200W = 5 AMP
   2 – HEAD 200W = 10 AMP
6. FURNISH AND INSTALL ALL MATERIALS.
7. FOR STREET LIGHT POLE AND NUMBER LOCATION DETAIL, SEE CITY STANDARD PLAN E–4.
8. FOR BASE DETAIL, SEE CITY STANDARD PLAN E–3.
9. FOR TYPICAL SERVICE POLE DETAIL AND UNDERGROUND SERVICE, SEE CITY STANDARD PLAN E–3.
10. FOR FOUNDATION DETAIL, SEE CITY STANDARD PLAN E–1.
11. FOR OVERHEAD POWER FEED, FUSE SHALL BE LOCATED INSIDE THE LUMINAIRE HEAD.

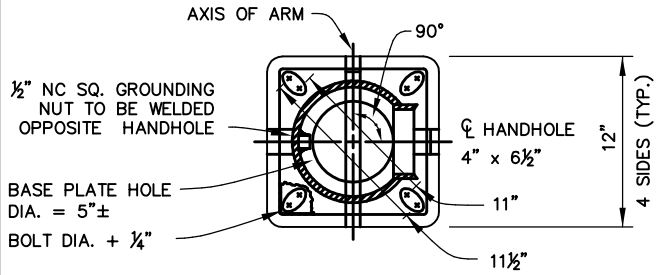
APPROVED: Acting City Engineer Date REVISION: Date		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE FUSE CONNECTOR	STANDARD PLAN E–2



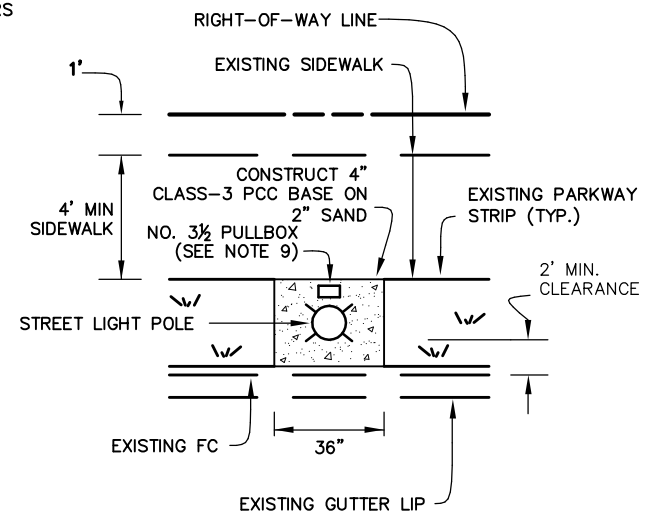
BASE DETAIL



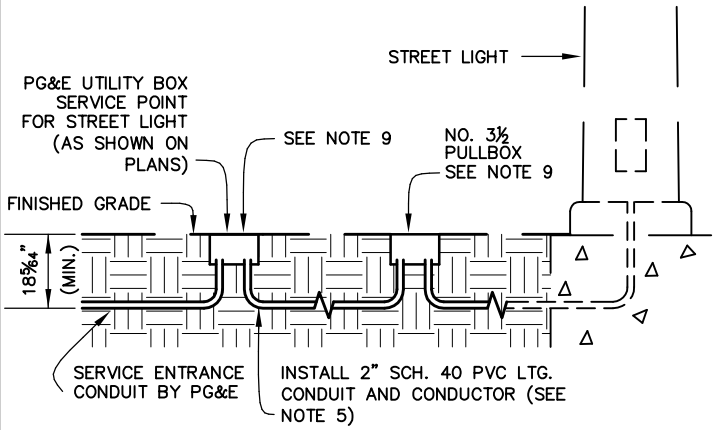
TYPICAL SERVICE POLE DETAIL



SECTION A-A



ELECTROLIER BASE DETAIL IN PARKWAY



TYPICAL UNDERGROUND DETAIL

GENERAL NOTES

1. DRAWING NOT TO SCALE.
2. ALL CONCRETE SHALL BE CLASS "3" PER CITY STANDARD SPECIFICATIONS, EXCEPT AS OTHERWISE SPECIFIED.
3. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATIONS, ELECTRIC CODE AND P.U.C.'S G.O. 95A.
4. INSTALL NO. 3½ PULLBOX AT BASE OF ALL EXISTING SERVICE POLES, VAULTS, AND STREET LIGHTS UNLESS OTHERWISE SPECIFIED ON THE PLANS. USE NO. 5 PULLBOX IF 4 OR MORE CONDUITS TERMINATE INTO THE BOX.
5. CONDUIT COVER: 18" MINIMUM IN SIDEWALK, PARKWAY AND ISLAND MEDIAN, 30" MINIMUM UNDER STREET OR PROPERTY EASEMENT.
6. FOR FOUNDATION DETAIL, SEE CITY STANDARD PLAN E–1. FOR LIGHTING POLE DETAIL, SEE CITY STANDARD PLAN E–4.
7. FOR FUSE CONNECTOR, SEE CITY STANDARD PLAN E–2.
8. THE STREET LIGHT POLE NUMBER IT SERVES (LABEL SHALL BE PERMANENT/WATER PROOF RESISTANCE).
9. ALL STREET LIGHT PULLBOX COVERS SHALL BE LABLED "STREET LIGHTING".
10. CONTRACTOR SHALL INSTALL 2" SCH. 40 PVC CONDUIT RISER TO PULLBOX (TWO 90°LONG SWEEP PLUS COUPLING).

APPROVED:

Acting City Engineer — Date

REVISION:

Date

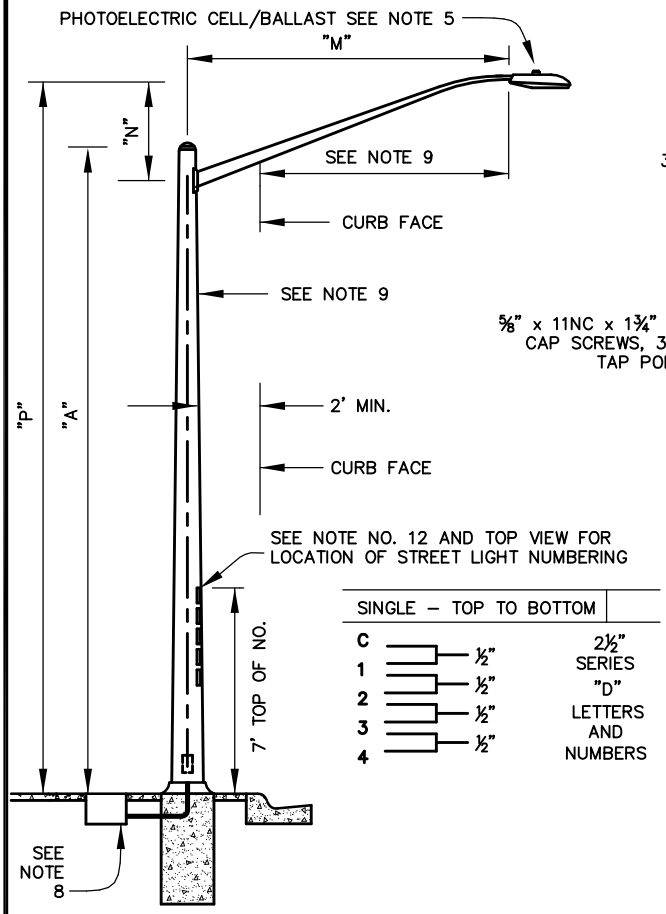
COMMUNITY DEVELOPMENT DEPARTMENT
PUBLIC WORKS DIVISION — CITY OF MARINA

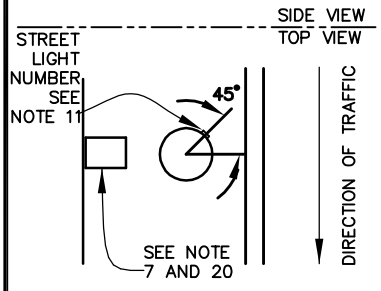
TITLE

STREET LIGHT BASE DETAILS AND PULLBOX INSTALLATION

STANDARD PLAN

E–3

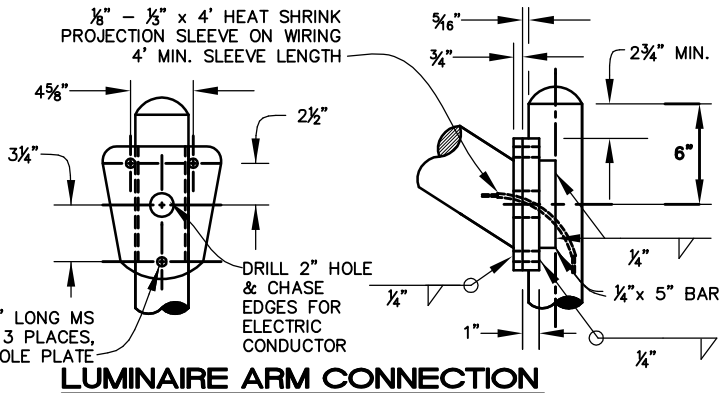




STREET LIGHT AND LIGHT POLE LETTER DETAIL

MAST ARM DATA			
"M" PROJECTED LENGTH (MIN.)	"N" RISE	MIN. O.D. AT POLE	"P" MOUNTING HEIGHT TYPE 15
10' – 0"	3' – 3"±	3⅞"	32' – 9"±
12' – 0"	4' – 3"±	3⅞"	33' – 9"±
15' – 0"	4' – 9"±	4¼"	34' – 3"±

POLE DATA				
POLE TYPE	"A" HEIGHT	MIN. O.D. BASE	MIN. O.D. TOP	THICKNESS
15	30' – 0"	8"	3⅞"	0 .1196"



LUMINAIRE ARM CONNECTION

GENERAL NOTES

1. DRAWING NOT TO SCALE.
2. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE CITY STANDARD SPECIFICATIONS, ELECTRIC CODE AND P.U.C.'S G.O. 95A.
3. LUMINAIRES AT 4–WAY (NON–SIGNALIZED) STREET INTERSECTIONS SHALL HAVE TYPE II 4–WAY I.E.S. DISTRIBUTION. TYPE III I.E.S. DISTRIBUTION ON OTHER LOCATIONS UNLESS OTHERWISE NOTED ON PLANS.
4. POLES SHALL BE STEEL WITH HOT DIP GALVANIZED FINISH.
5. PHOTOELECTRIC CELLS SHALL BE INTEGRALLY MOUNTED ON THE HOOD OF THE LIGHTING FIXTURE (DARK TO LIGHT MODEL # D120–1.0–S) OR APPROVED EQUAL. STARTER / IGNITOR SHALL BE SSI (STARTER SYSTEMS INCORPORATED) * STARTER TRANSIENT SUPPRESSOR, OR APPROVED EQUAL.
   * MODEL SCT03515 (35w TO 150w)
   * MODEL SCT1540 (150w TO 400w)
   * MODEL SCT40150 (400w TO 1500w)
6. ALTERNATE DESIGN POLES, MOUNTING HEIGHTS AND LIGHTING FIXTURES, WHEN APPROVED BY THE CITY ENGINEER, MAY BE INSTALLED IN SUBDIVISIONS. SUCH INSTALLATIONS SHALL BE OF A UNIFORM DESIGN THROUGHOUT THE SUBDIVISION.
7. INSTALL NO. 3½ PULLBOX AT BASE OF ALL EXISTING SERVICE POLE, VAULTS AND STREET LIGHTS, UNLESS OTHERWISE SPECIFIED. USE NO. 5 PULLBOX IF 4 OR MORE CONDUITS CONNECT TO PULLBOX.
8. PROJECTION LENGTHS ARE 8' MIN. FOR RESIDENTIAL AND 10' MIN. FOR COMMERCIAL, THICKNESS SHALL BE MIN. 0.1196" (11 GA. 55,000 PSI).
9. STREET LIGHT POLE SHALL BE STATE TYPE 15, GALVANIZED: UNION METAL, AMERON, VALMONT OR APPROVED EQUAL.
10. ALL CONCRETE SHALL BE CLASS "3" PER CITY STANDARD SPECIFICATIONS. CONTRACTOR SHALL INSTALL STREET LIGHT NUMBER (LETTER AND NUMBER).
11. CONTRACTOR SHALL INSTALL STREET LIGHT NUMBER (LETTER AND NUMBER) ON STREET LIGHT AND SHALL FACE PERPENDICULAR TO STREET IN RESIDENTIAL AREAS ONLY AND FACE ONCOMING TRAFFIC AT A 45° ANGLE ON OTHER STREETS. STREET NUMBERING LEGEND SHALL BE 2½" HIGH, YELLOW WITH BLACK BACKGROUND REFLECTIVE VINYL, ADHESIVELY BACKED LETTER (PANDUIT PRL 250 YB–C) AND NUMBER (PANDUIT PRL 250 YB 0 TO 9); OR APPROVED EQUAL. STREET LIGHT NUMBERS TO BE ASSIGNED AFTER ALL STREET LIGHT FOUNDATIONS ARE POURED IN PLACE. THE CITY ENGINEER SHALL SUBMIT REQUEST TO PG&E FOR STREET LIGHT NUMBERS AT THAT TIME. PG&E SHALL RESPOND TO THE CITY ENGINEER WITHIN 10 WORKING DAYS.
12. FOR FUSE CONNECTOR, SEE CITY STANDARD PLAN E–2.
13. FOR FOUNDATION DETAIL, SEE CITY STANDARD PLAN E–1.
14. FOR TYPICAL SERVICE POLE DETAIL, UNDERGROUND SERVICE AND BASE DETAIL, SEE CITY STANDARD PLAN E–3.
15. WATTAGE SHALL BE 150 WATTS FOR RESIDENTIAL AND 200 WATTS ON ALL OTHER ROADS UNLESS OTHERWISE NOTED ON PLANS.
16. SPACING OF STREET LIGHTS SHALL BE DETERMINED BY THE CITY ENGINEER.
17. CONDUIT COVER: 18" MINIMUM IN SIDEWALK, PARKWAY STRIP AND ISLAND MEDIAN, 30" MINIMUM UNDER STREET OR PROPERTY EASEMENT.
18. LUMINARIES SHALL BE CUT–OFF LENSE (EXCEPT TYPE III 4–WAY LUMINAIRE) HIGH PRESSURE SODIUM VAPOR W/ TYPE IV P.E. CELL AND REGULATOR TYPE BALLAST. WATTAGE AND 120V AS SHOWN ON PLANS. AMERICAN ELECTRIC, G.E., OR APPROVED EQUAL.
19. ALL STREET LIGHT PULLBOX COVERS SHALL BE LABLED "STREET LIGHTING".

APPROVED:

Acting City Engineer — Date

REVISION:

Date

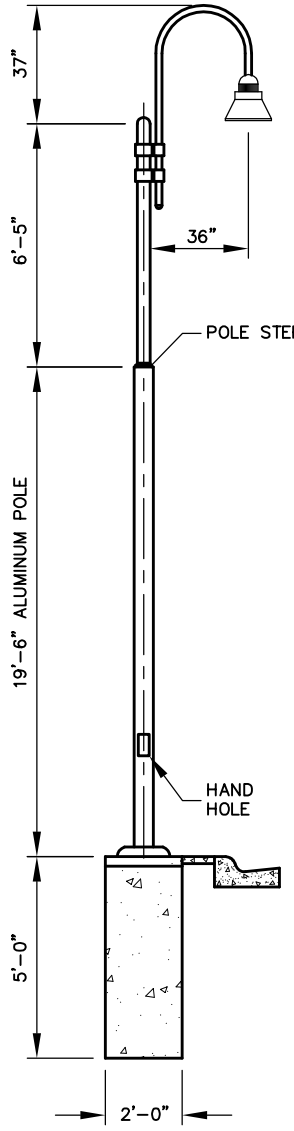
COMMUNITY DEVELOPMENT DEPARTMENT
PUBLIC WORKS DIVISION — CITY OF MARINA

STANDARD PLAN

TITLE

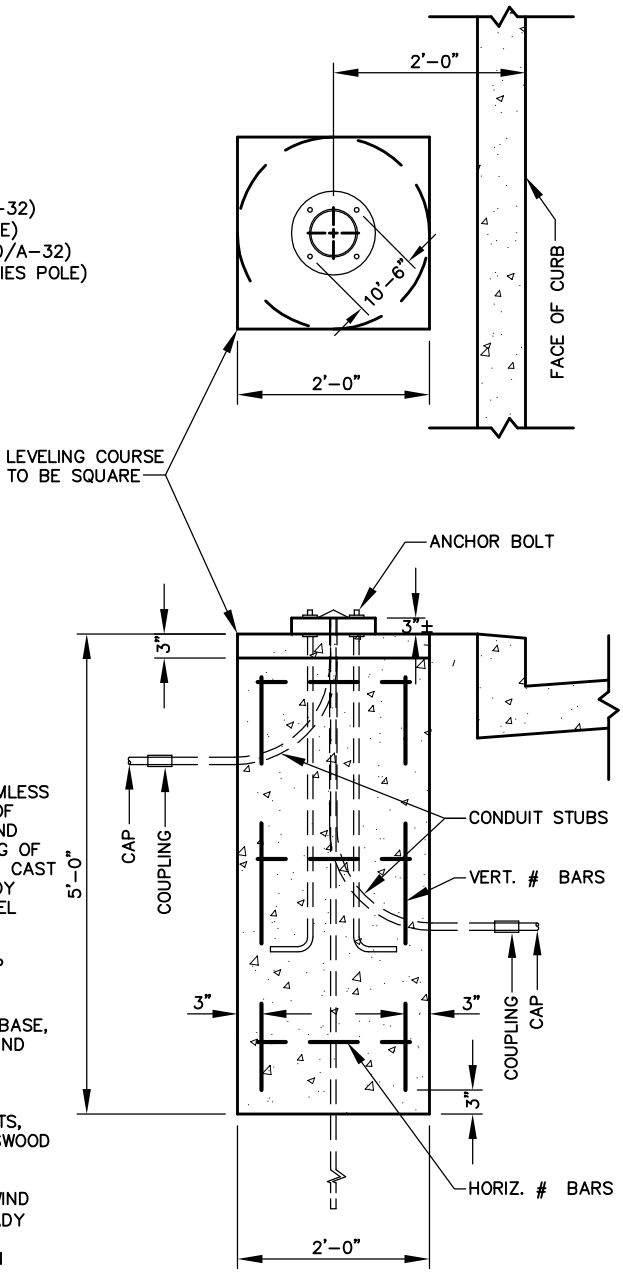
STREET LIGHT POLE AND NUMBER LOCATION

E–4



KIM LIGHTING
MODEL NUMBER:

1. CAL20-64188
   (GABARDINE GREEN)
2. RA25 (1A/RA253/150HPS240/A-32)
   (GABARDINE GREEN FOR CAL POLE)
3. RA25 (33/2B/RA253/150HPS240/A-32)
   (GABARDINE GREEN FOR CAL SERIES POLE)



NOTES

1. DRAWING NOT TO SCALE.
2. POLE CONSTRUCTION SHALL BE SEAMLESS ROUND EXTRUDED ALUMINUM TUBE OF ALLOY 6063-T6, WELDED TO TOP AND BOTTOM OF ALUMINUM BASE CASTING OF ALLOY 356. BASE HAS A TWO PIECE CAST ALUMINUM FULL COVER OF 319 ALLOY AND IS SECURED BY STAINLESS STEEL SCREWS.
3. A DOMED CAST ALUMINUM POLE CAP SHALL BE PROVIDED.
4. HANDHOLE SHALL BE 18" UP FROM BASE, WITH A GASKETED COVER AND GROUND LUG AND VANDAL PROOF SCREWS.
5. FOUR GALVANIZED ANCHOR BOLTS PROVIDED COMPLETE WITH EIGHT NUTS, EIGHT FLAT WASHERS, AND A PRESSWOOD TEMPLATE.
6. POLES SHALL WITHSTAND GUSTING WIND EQUIVALENT OF 143/WIND MAP STEADY WIND OF 110 WHEN LUMINARES ARE MOUNTED PER FIXTURE INSTALLATION INSTRUCTIONS.
7. SUPER TGIC THERMOSET POLYESTER POWDER COAT PAINT APPLIED OVER A CHROMATE CONVERSION COATING. STANDARD COLOR SHALL BE GABARDINE GREEN.
8. ELECTRICAL DETAILS FROM E-1 AND E-2 APPLIES TO THIS STREET LIGHT.

APPROVED:

Acting City Engineer _____ Date _____

REVISION:

_____ Date _____

COMMUNITY DEVELOPMENT DEPARTMENT
PUBLIC WORKS DIVISION CITY OF MARINA

TITLE

DECORATIVE STREET LIGHT

STANDARD PLAN

E-5

GRADING STANDARD PLANS

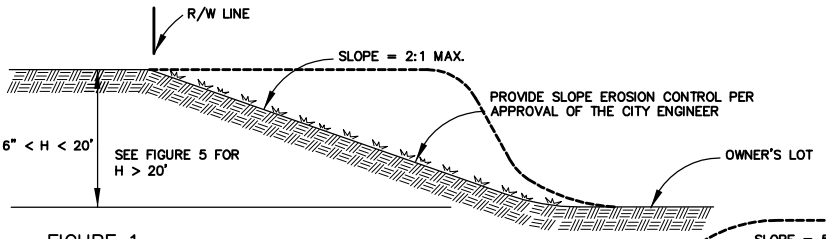


FIGURE 1
CUT SLOPE WITH EROSION CONTROL

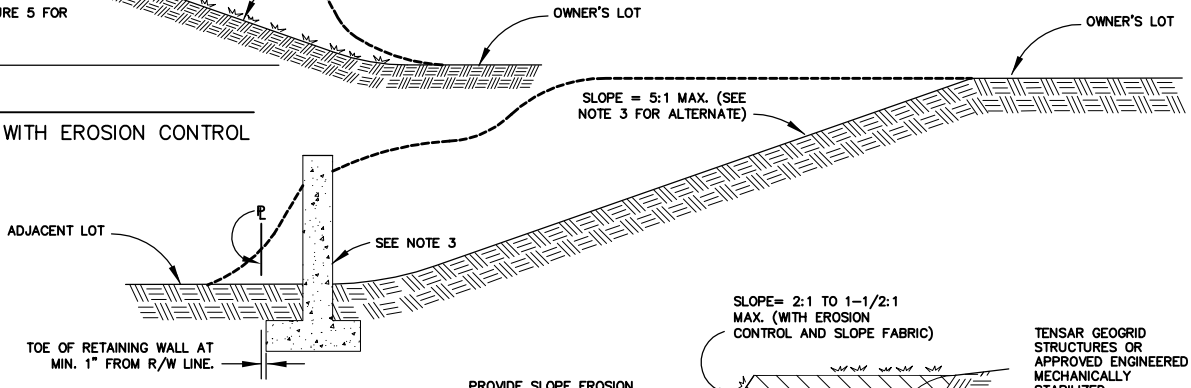


FIGURE 2
OWNER'S LOT ON HIGH SIDE

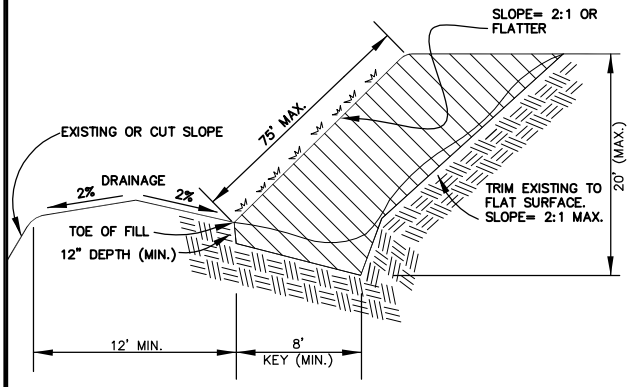


FIGURE 3
FILL SLOPE

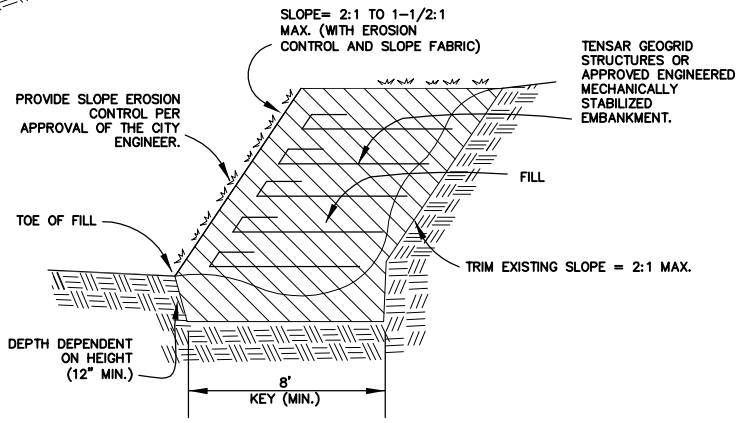


FIGURE 4
STEEP FILL SLOPE

HEIGHT, H	a	b	c	d
0'-10'	3'	2'	5'	5'
11'-30'	(H/2)'	3'	(H/2)'	7'
OVER 30'	15'	3'	15'	10'

CUT AND FILL SETBACKS

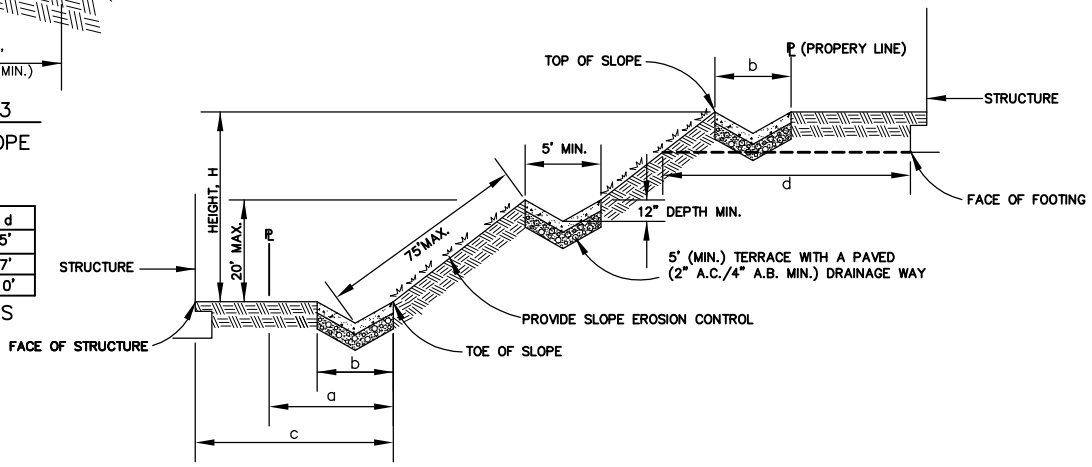


FIGURE 5

NOTES

1. DRAWING NOT TO SCALE.
2. ALL WORK SHALL CONFORM TO ALL REQUIREMENTS OF CITY OF MARINA.
3. CUT SLOPES SHALL BE ROUNDED OFF AT THE TOP AND TOE TO BLEND IN WITH THE NATURAL TERRAIN.
4. OWNER/DEVELOPER MAY, AT HIS/HER OPTION, CONSTRUCT A VERTICAL RETAINING WALL ADJACENT TO THE PROPERTY LINE OR RIGHT-OF-WAY LINE TO CONTAIN THE DIFERENCE IN ELEVATION. A DESIGN OF THE WALL, COMPLETE WITH CALCULATIONS, SHALL BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL AND BUILDING OFFICIAL FOR PERMIT.

APPROVED:

Acting City Engineer Date

REVISION:

Date

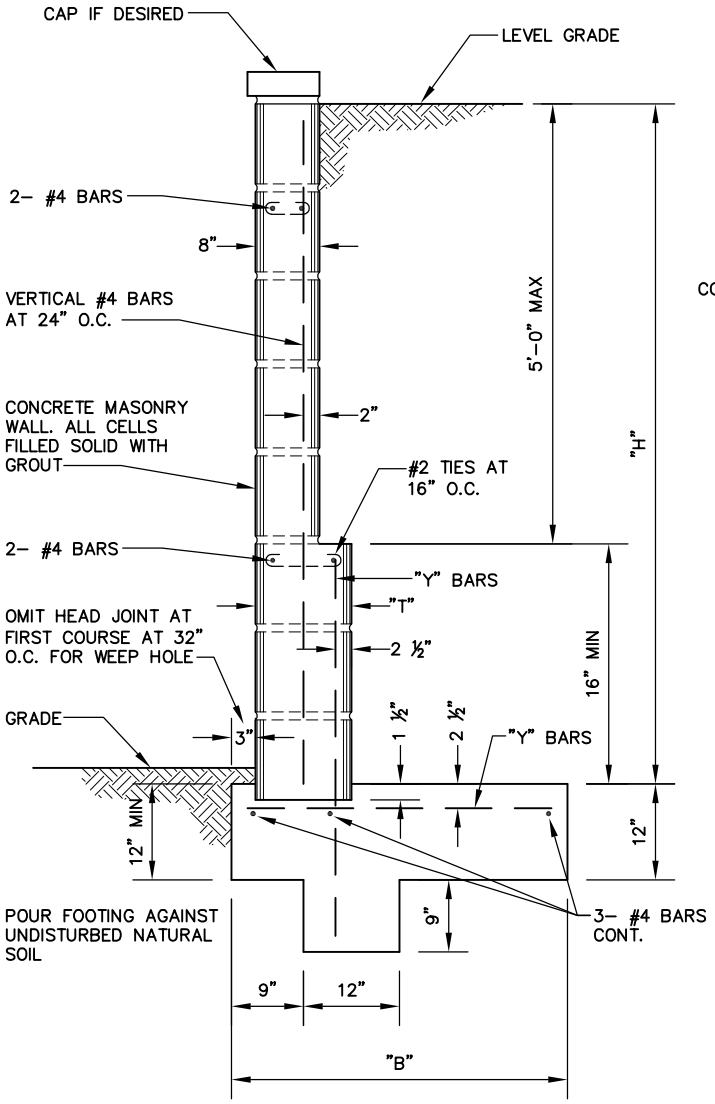
COMMUNITY DEVELOPMENT DEPARTMENT
PUBLIC WORKS DIVISION **CITY OF MARINA**

TITLE

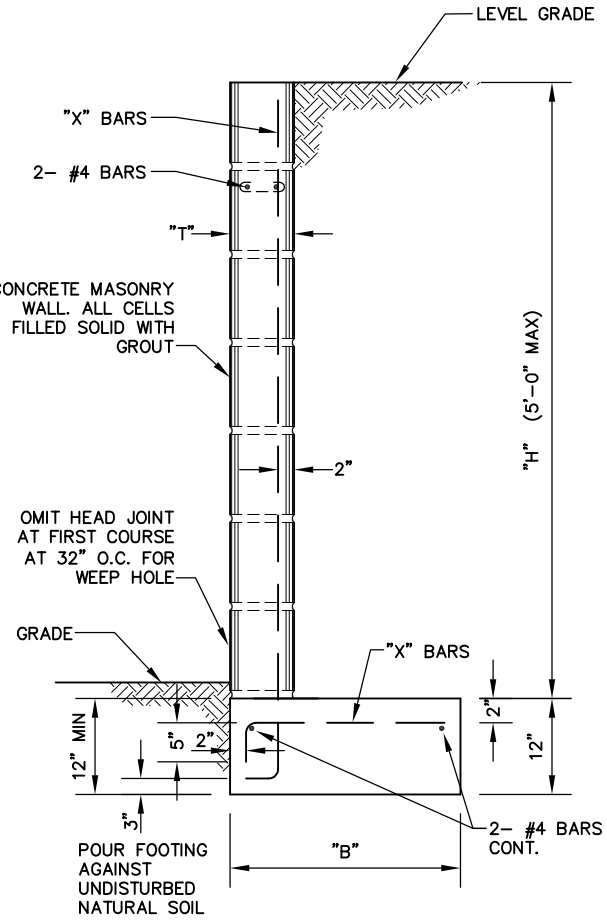
SLOPE GRADING

STANDARD PLAN

G-1



TYPICAL SECTION OVER 5'–0"
NOT TO SCALE



"H"	"T"	"B"	"X" BARS	"Y" BARS
3'	6"	1'–10"	#3 AT 32" O.C.	–
4'	8"	2'–6"	#4 AT 48" O.C.	–
5'	8"	3'–0"	#4 AT 24" O.C.	–
6'	12"	3'–8"	–	#4 AT 24" O.C.
7'	12"	4'–6"	–	#4 AT 16" O.C.
8'	12"	5'–3"	–	#3 AT 18" O.C.

DESIGN FOR LEVEL GRADE ABOVE WALL

NOTE – CONCRETE IN FOOTING TO TEST
2000 LBS PER SQ. IN. AT 28 DAYS
CONCRETE BLOCK – GRADE "A" UNITS
A.S.T.M. C–90
GROUT – 1 PART CEMENT. 3 PARTS SAND,
2 PARTS PEA GRAVEL
MORTAR – 1 PART CEMENT, ½ PART LIME PUTTY,
4 ½ PARTS SAND

MAXIMUM STRESSES

fs = 20,000 P.S.I.
fm = 225 P.S.I.
SHEAR v = 15 P.S.I.
BOND u = 100 P.S.I.
SOIL PESSURE = 1,000 LBS PER SQ. FT.

APPROVED:

Acting City Engineer Date

REVISION:

Date

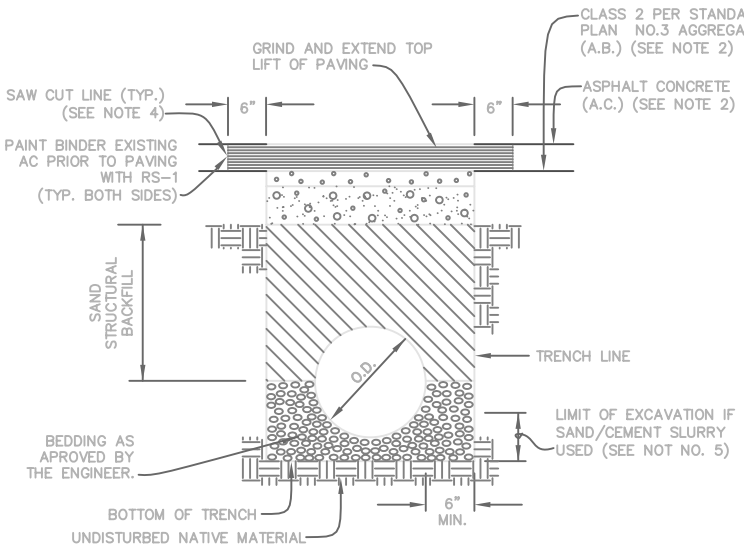
COMMUNITY DEVELOPMENT DEPARTMENT
PUBLIC WORKS DIVISION CITY OF MARINA

STANDARD PLAN

TITLE

CONCRETE MASONRY RETAINING WALLS

G–2



A.C. IMPROVED AREAS

GENERAL NOTES

1. DRAWING NOT TO SCALE.
2. THE STRUCTURAL SECTION MUST MATCH THE EXISTING STRUCTURAL SECTION OF THE ROADWAY INCLUDING AC, AB, ASB, AND ANY OTHER EXISTING COMPOUND.
3. FOR BACKFILL MATERIALS AND COMPACTION METHODS SEE SECTION 19-4 OF THE CITY STANDARD SPECIFICATIONS. BACKFILL SHALL BE COMPACTED TO 95% RELATIVE COMPACTION.
4. ALL STREET CUTS SHALL BE NEATLY SAWCUT ON TRUE LINE TO 1½" MINIMUM DEPTH.
5. TWO SACK CEMENT SLURRY BACKFILL SHALL BE USED AS BACKFILL IF TRENCH IS LESS THAN 18" WIDE OR IN PATCH AREAS LESS THAN 100 SQ FT.
6. TRENCH WIDTH SHOWN ON PLANS FOR PAVEMENT RESTORATION MAY VARY FROM ACTUAL WIDTH REQUIRED TO PERFORM NECESSARY WORK DEPENDING UPON METHOD FOR TRENCH SHORING/PROTECTION USED BY CONTRACTOR.
7. ALL PAVEMENT MARKINGS AND RAISED PAVEMENT MARKERS OBLITERATED DURING CONSTRUCTION SHALL BE REPAINTED AND OR REPLACED BY THE CONTRACTOR.
8. IN CASE OF WATER OR SEWER REFER TO MCWD STANDARD PLANS EXCEPT FOR STREET RESTORATION.

APPROVED:

Acting City Engineer Date

REVISION:

Date

COMMUNITY DEVELOPMENT DEPARTMENT
PUBLIC WORKS DIVISION CITY OF MARINA

TITLE

TRENCH BACKFILL AND SURFACE RESTORATION

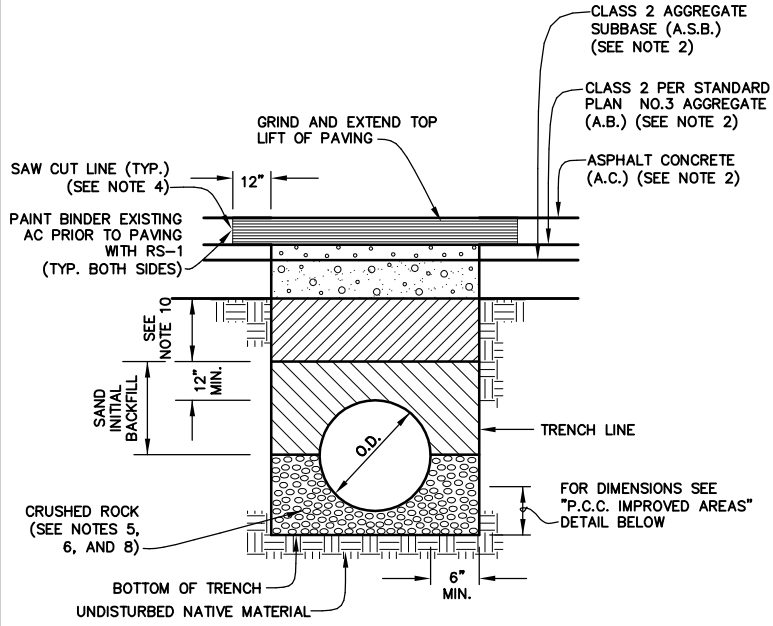
STANDARD PLAN

JT-1

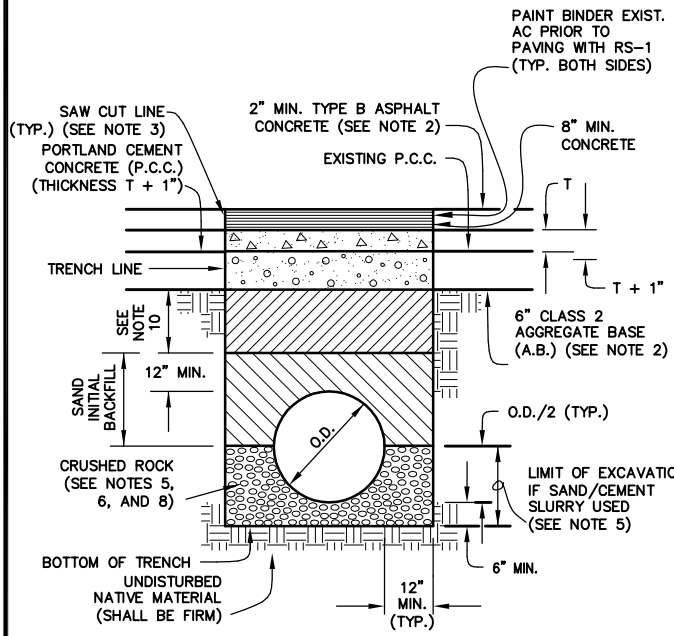
STORM DRAIN
STANDARD PLANS

GENERAL NOTES

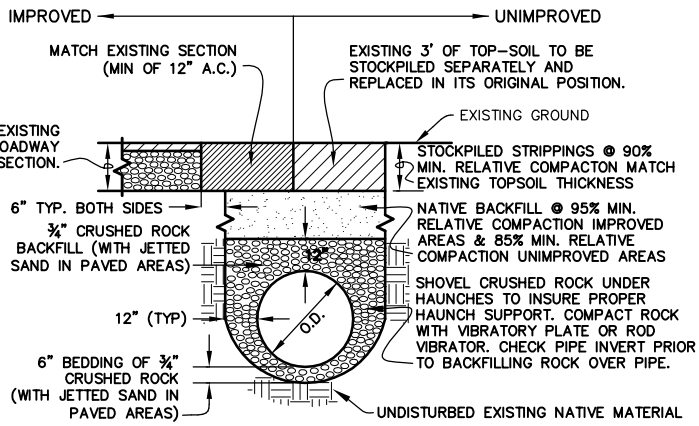
1. DRAWING NOT TO SCALE.
2. ON IMPROVED STREETS THE THICKNESS OF THE A.C., A.B. AND A.S.B. SHALL BE EQUIVALENT TO THE EXISTING ON A.C. PAVEMENT, A MINIMUM OF 6" A.C. OVER 8" A.B. IS REQUIRED.
3. FOR BACKFILL MATERIALS AND COMPACTION METHODS SEE SECTION 19-3 OF THE CITY STANDARD SPECIFICATIONS. INTERMEDIATE BACKFILL SHALL BE COMPACTED TO 95% RELATIVE COMPACTION IN UNIMPROVED AREAS.
4. ALL STREET CUTS SHALL BE NEATLY SAWCUT ON TRUE LINE TO 1½" MINIMUM DEPTH.
5. TWO SACK CEMENT SLURRY BACKFILL SHALL BE USED AS INTERMEDIATED BACKFILL IF TRENCH IS LESS THAN 18" WIDE OR IN PATCH AREAS LESS THAN 100 SQ FT.
6. CRUSHED ROCK BEDDING SHALL CONFORM WITH AGGREGATE GRADATIONS OF SECTION 19-4.022A (1) OF THE CITY STANDARD SPECIFICATIONS. CRUSHED ROCK BACKFILL SHALL BE PROVIDED WITH JETTED SAND IN PAVED AREAS.
7. STRUCTURAL SECTION REQUIREMENTS SHALL NOT APPLY TO UNIMPROVED AREAS.
8. CRUSHED ROCK MAY BE REPLACED WITH INTERMEDIATE BACKFILL MATERIAL FOR ALL PIPE INSTALLATIONS OTHER THAN STORM DRAIN LINES AND SANITARY SEWER LINES PROVIDED NOTE 5 DOES NOT APPLY.
9. CRUSHED ROCK OR SLURRY CEMENT BACKFILL WILL NOT BE REQUIRED IF MONOLITHIC CONCRETE PIPE IS INSTALLED.
10. COMPACTED INTERMEDIATE BACKFILL (SEE NOTES 2 AND 5).
11. TRENCH WIDTH SHOWN ON PLANS FOR PAVEMENT RESTORATION MAY VARY FROM ACTUAL WIDTH REQUIRED TO PERFORM NECESSARY WORK DEPENDING UPON METHOD FOR TRENCH SHORING/PROTECTION USED BY CONTRACTOR.
12. ALL PAVEMENT MARKINGS AND RAISED PAVEMENT MARKERS OBLITERATED DURING CONSTRUCTION SHALL BE REPAINTED AND OR REPLACED BY THE CONTRACTOR.
13. TRENCH DIMENSION FOR ROUNDED BOTTOM CAN BE ADJUSTED SUBJECT TO CITY ENGINEER'S APPROVAL.



A.C. IMPROVED AREAS



P.C.C. IMPROVED AREAS

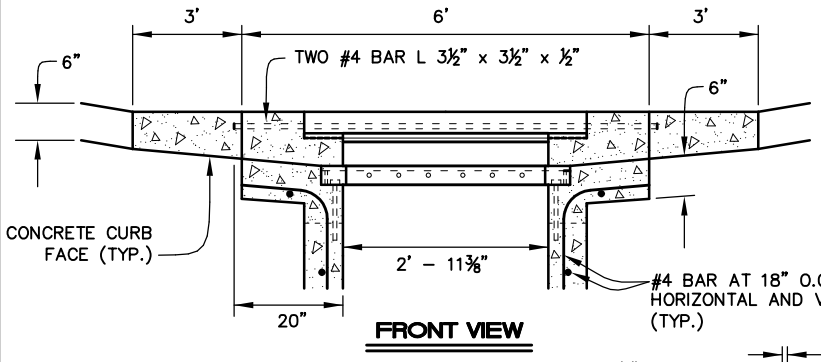


TYPICAL TRENCH/BACKFILL SECTION FOR P.V.C. AND H.D.P.E. PIPE

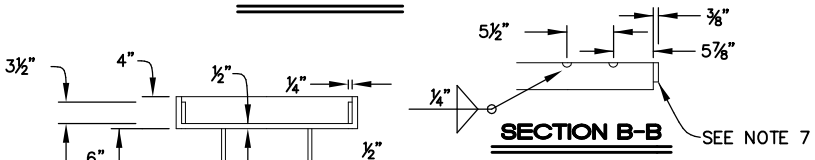
APPROVED: Acting City Engineer _____ Date _____ REVISION: _____ _____ Date		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE STORM DRAIN TRENCH BACKFILL AND SURFACE RESTORATION
		STANDARD PLAN SD-1

REFER TO
STANDARD PLAN ST-25

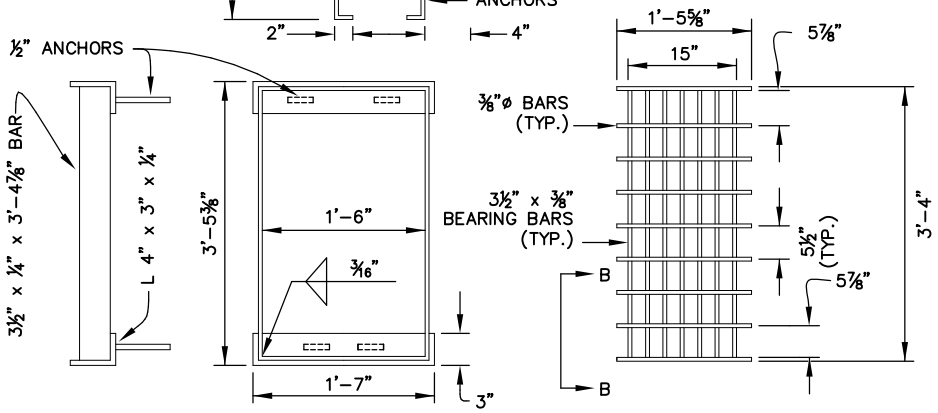
APPROVED: Acting City Engineer Date REVISION: Date		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE STORM DRAIN TRENCH BACKFILL AND SURFACE RESTORATION	STANDARD PLAN SD-1



FRONT VIEW



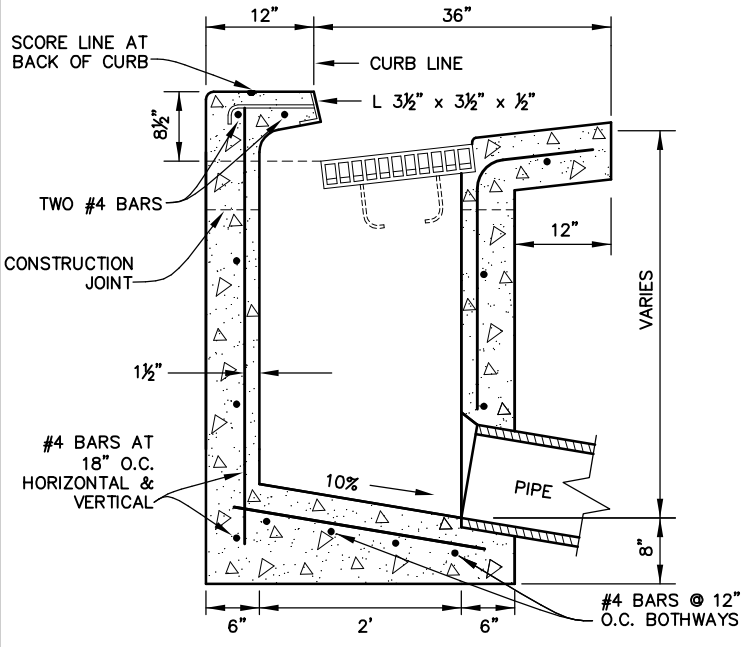
SECTION B-B



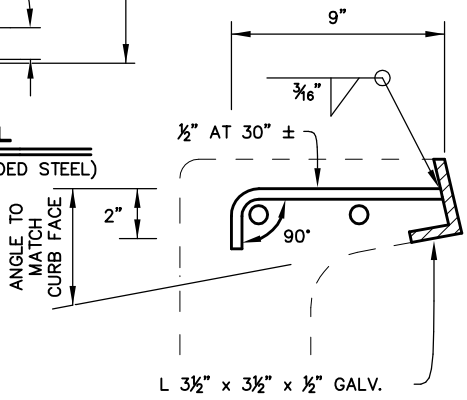
FRAME DETAIL

GRATE DETAIL

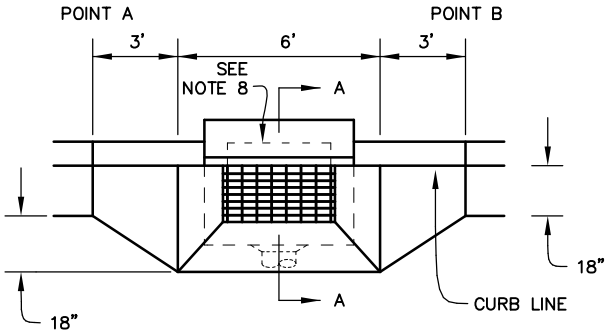
TYPE 450-9x (GALV. WELDED STEEL)



SECTION A-A



FACE ANGLE ANCHOR DETAIL



PLAN VIEW

GENERAL NOTES

1. DRAWING NOT TO SCALE.
2. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH SECTION 73 OF THE CITY STANDARD SPECIFICATIONS.
3. ALL CONCRETE SHALL BE CLASS "2" P.C.C. PER THE CITY STANDARD SPECIFICATIONS.
4. FRAME AND GRATE SHALL CONFORM TO CALTRANS TYPE 450-9X GALVANIZED WELDED STEEL FRAME AND GRATE AND RATED FOR H-20 LOADING.
5. CURB AND GUTTER FROM POINT "A" TO POINT "B" SHALL BE INCLUDED IN THE CATCH BASIN FOR PAYMENT PURPOSES.
6. CONTRACTOR MAY SUBSTITUTE APPROVED PRECAST CATCH BASIN FOR THE CAST-IN-PLACE AS SHOWN.
7. END BAR SHALL BE 2½" x ⅜" x 1'-5⅝".
8. "NO DUMPING" MUST BE STENCILED ON TOP OF CATCH BASINS.

APPROVED:

Acting City Engineer — Date

REVISION:

Date

COMMUNITY DEVELOPMENT DEPARTMENT

PUBLIC WORKS DIVISION — CITY OF MARINA

STANDARD PLAN

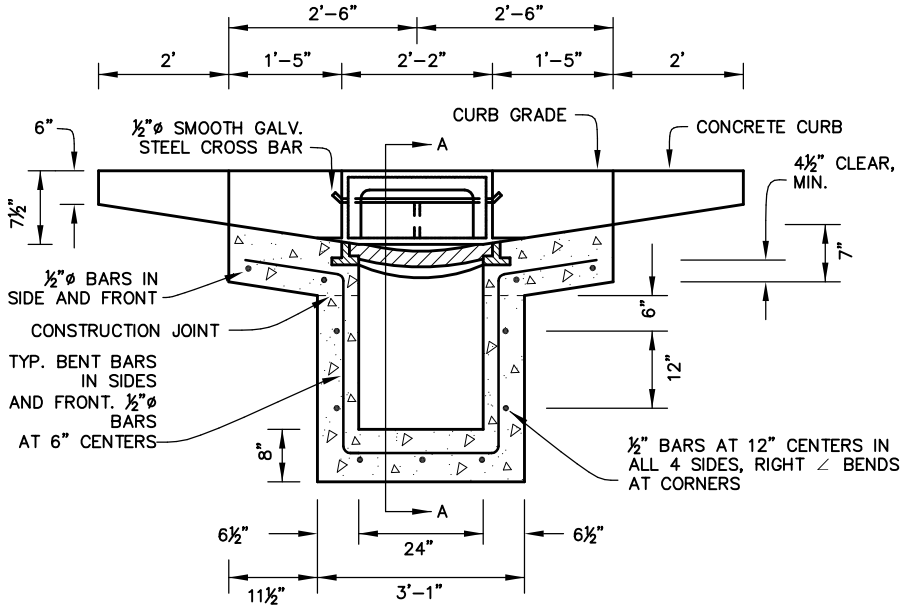
TITLE

TYPE "A" CATCH BASIN

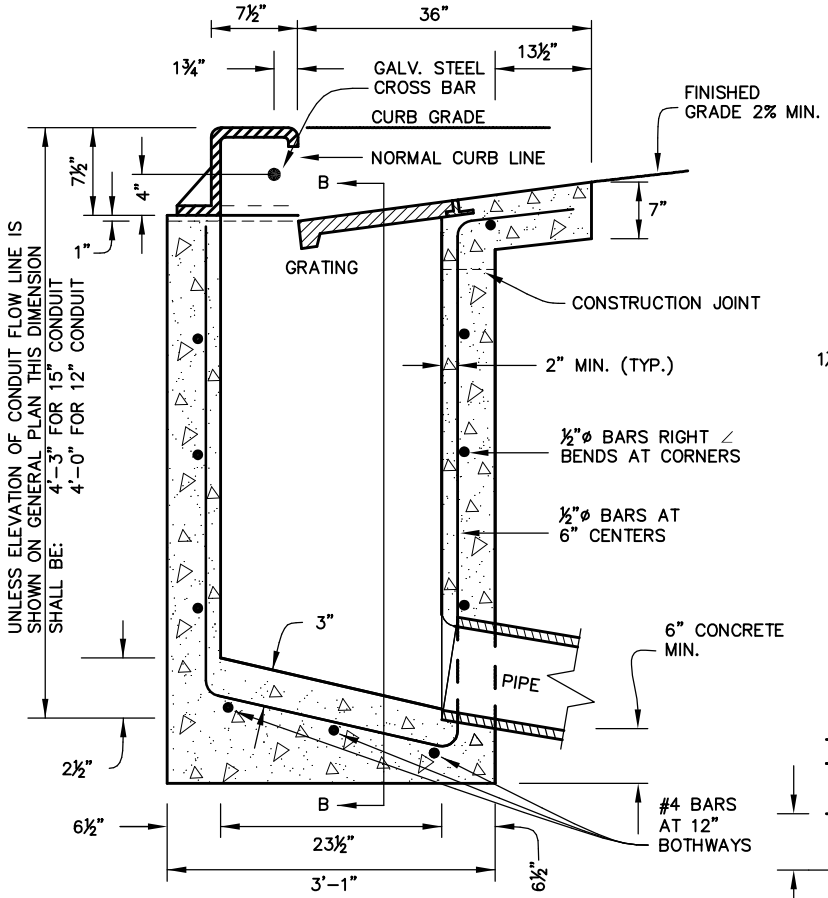
SD-2

GENERAL NOTES

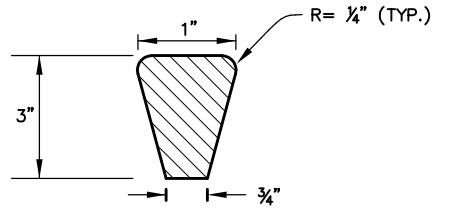
1. DRAWING NOT TO SCALE.
2. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH SECTION 73 OF THE CITY STANDARD SPECIFICATIONS.
3. ALL CONCRETE SHALL BE CLASS "2" P.C.C. PER THE CITY STANDARD SPECIFICATIONS.
4. FRAME AND GRATE SHALL BE PHOENIX IRON WORKS MODEL P-6001 OR APPROVED EQUAL.
5. CASTING FOR CATCH BASIN FRAME AND GRATES SHALL BE OF TOUGH GRAY IRON FREE FROM CRACKS, HOLES, SWELLS AND COLD SHUTS.
6. DIMENSIONS MAY BE ADJUSTED TO FIT ANY SIMILAR GRATE.
7. "NO DUMPING" MUST BE STENCILED ON TOP OF CATCH BASINS.



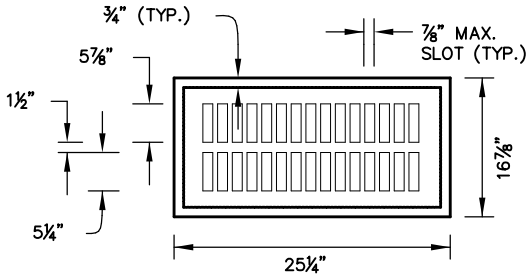
SECTION B-B



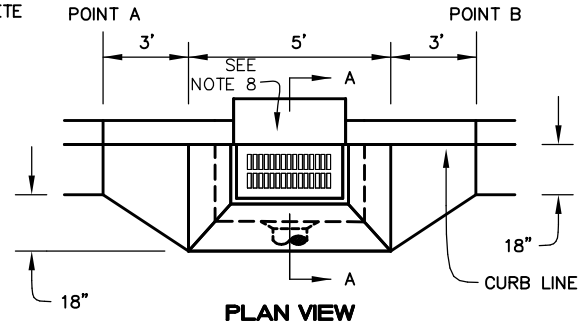
SECTION A-A



TYPICAL GRATING BAR



GRATING DETAIL

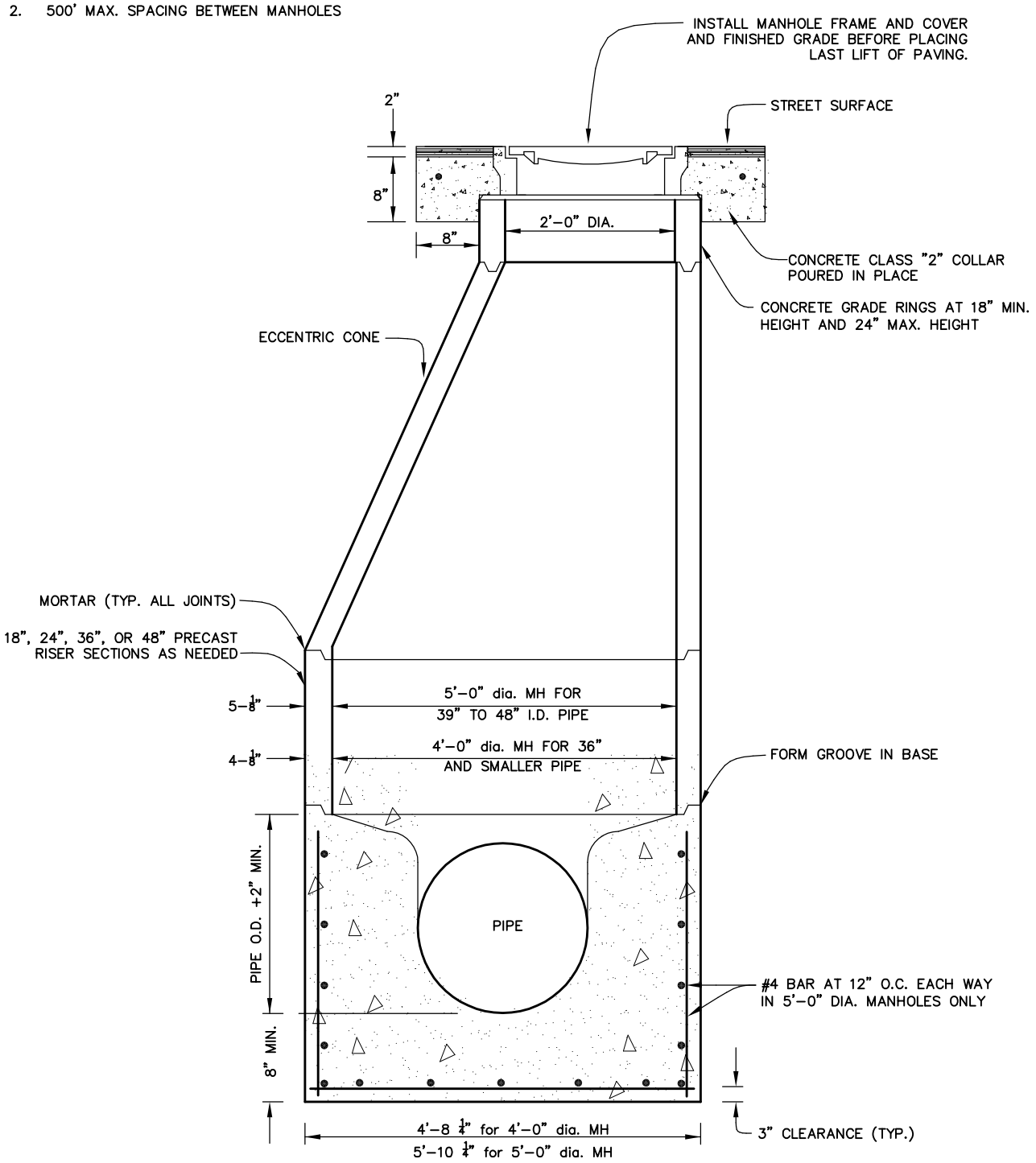


PLAN VIEW

APPROVED: Acting City Engineer / Date		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION — CITY OF MARINA TITLE: TYPE "B" CATCH BASIN	STANDARD PLAN SD-3
REVISION: / Date			

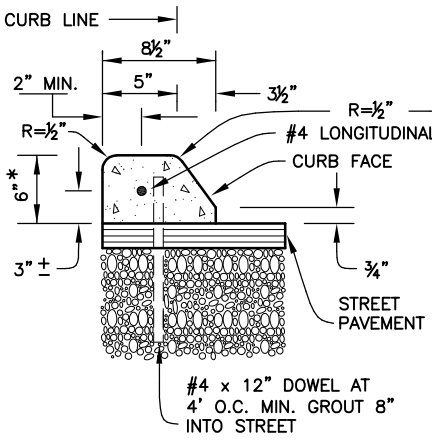
GENERAL NOTES

1. DRAWING NOT TO SCALE.
1. MANHOLE STEPS ARE NOT REQUIRED.
2. 500' MAX. SPACING BETWEEN MANHOLES

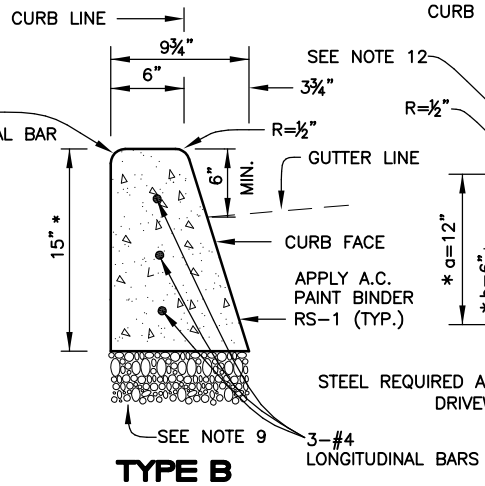


APPROVED: Acting City Engineer Date REVISION: Date		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE STANDARD STORM DRAIN MANHOLE	STANDARD PLAN SD-4

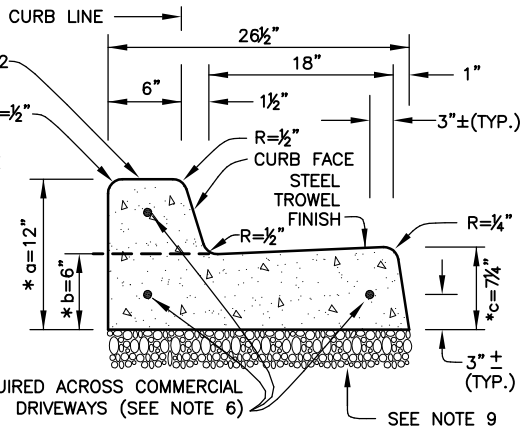
STREET STANDARD PLANS



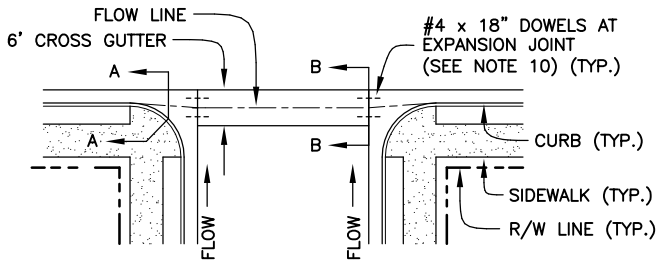
TYPE A



TYPE B

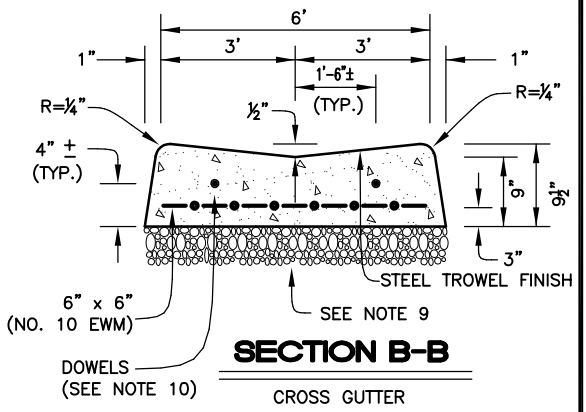


TYPE C



TYPICAL CROSS GUTTER DETAIL

* NOMINAL DIMENSION BACK-FORM MAY BE USED EXCEPT IN INDUSTRIAL AREAS

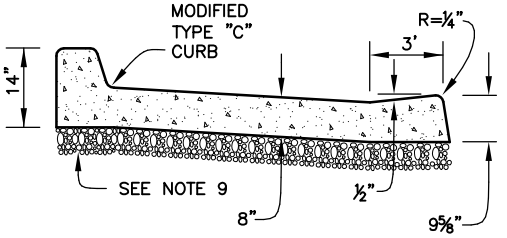


SECTION B-B

CROSS GUTTER

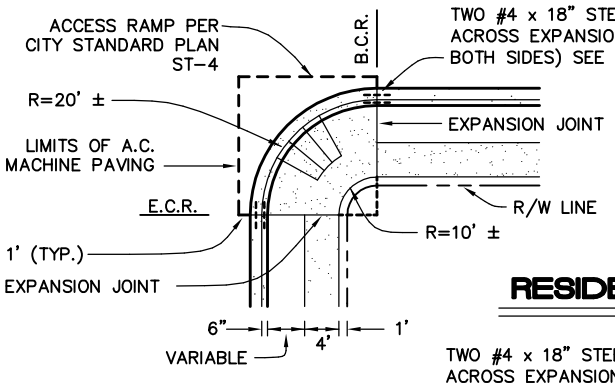
GENERAL NOTES

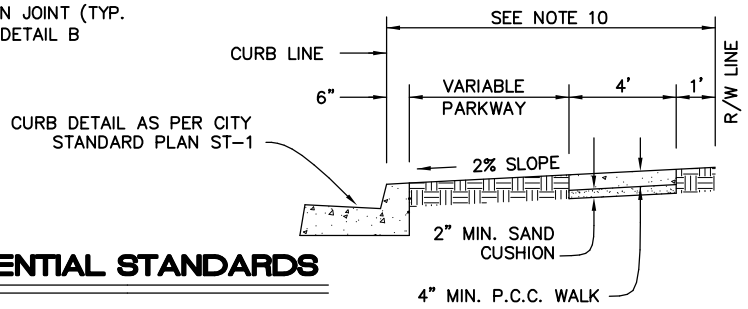
1. DRAWING NOT TO SCALE.
2. ALL WORK SHALL BE DONE IN ACCORDANCE WITH SECTION 73 OF THE CITY STANDARD SPECIFICATIONS.
3. EXPANSION JOINTS SHALL BE SLIP DOWELED AT CURB RETURNS (SEE STANDARD PLAN ST-2).
4. TOP AND FRONT OF ALL CURBS SHALL BE FINE BROOM FINISHED.
5. CURB RETURNS SHALL BE TYPE "C" EXCEPT ADJACENT TO CROSS GUTTERS, WHERE MODIFIED TYPE "C" CURB AND APRON SHALL BE USED.
6. CURB AND GUTTER AT COMMERCIAL DRIVEWAYS SHALL HAVE 2-#4 BARS INSTALLED FOR THE WIDTH OF THE DRIVEWAY (HEAVY DUTY TYPE "C" CURB AND GUTTER).
7. INSTALL ⅜" EXPANSION JOINTS AT 56-FOOT INTERVALS MAX. ON TYPE "C" CURB. PROVIDE WEAKENED PLANE JOINTS, 1" DEEP AT 8-FOOT INTERVALS WITH EXPANSION AT 56-FOOT INTERVALS ON EXTRUDED CURB (SEE STANDARD PLAN ST-2).
8. CLASS "2" PCC PER THE CITY STANDARD SPECIFICATIONS, SECTION 73, SHALL BE USED.
9. 6" MINIMUM CLASS "2" A.B. OR HIGHER TYPE BASE MATERIALS.
10. CROSS GUTTERS SHALL HAVE 2-#4 x 18" LONG STEEL DOWELS AT MID-DEPTH CENTERED AT EXPANSION JOINT. FOR SLIP DOWEL DETAIL SEE STANDARD PLAN ST-2.
11. AN ADHESIVE APPROVED BY THE CITY ENGINEER MAY BE USED IN LIEU OF DOWELS IN TYPE "A" EXTRUDED CURB FOR PLACEMENT ON EXISTING PAVEMENT. OMIT LONGITUDINAL STEEL IN EXTRUDED CURB (EXCEPT ACROSS COMMERCIAL DRIVEWAYS).
12. CONTRACTOR SHALL STAMP FACE OF CURB WITH THE LETTERS "S" (SEWER), "R" (RECYCLED) AND/OR "W" (WATER) TO IDENTIFY UTILITY SERVICE LOCATIONS.
13. *WITHIN INDUSTRIAL AREAS SUBJECT TO HEAVY TRUCK TRAFFIC, THE CONCRETE THICKNESS SHALL BE a=14", b=8", AND c=9¼".



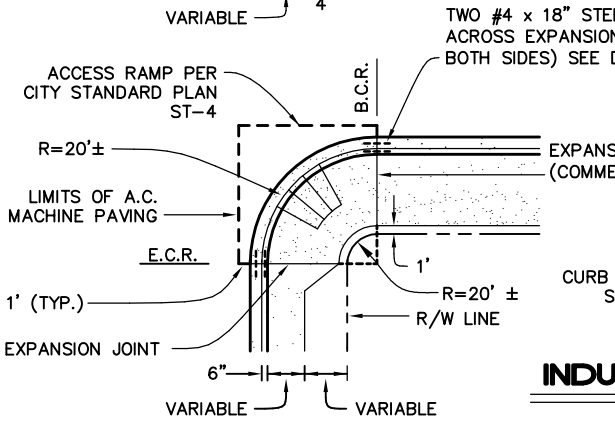
SECTION A-A

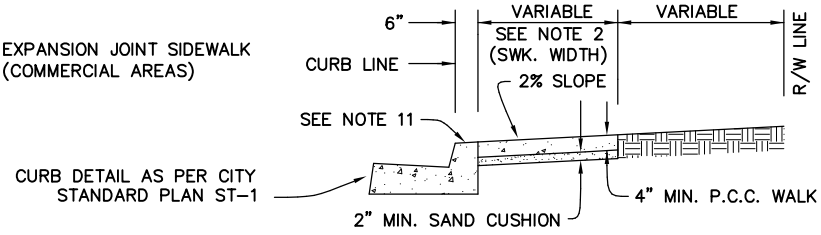
APPROVED: Acting City Engineer Date REVISION: Date		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE CURB AND GUTTER	STANDARD PLAN ST-1





RESIDENTIAL STANDARDS

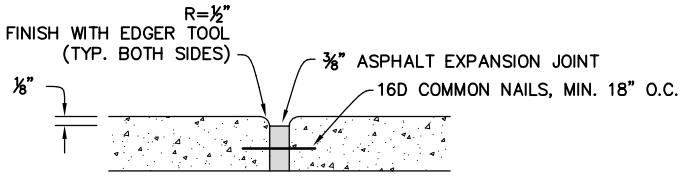




INDUSTRIAL-COMMERCIAL STANDARDS

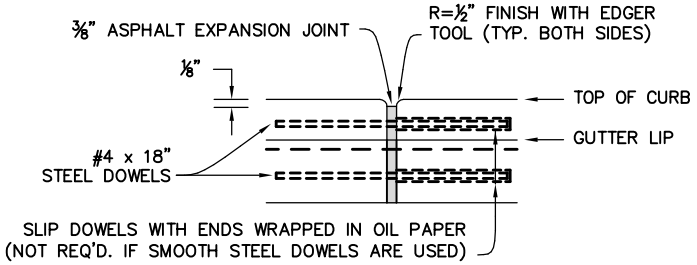
GENERAL NOTES

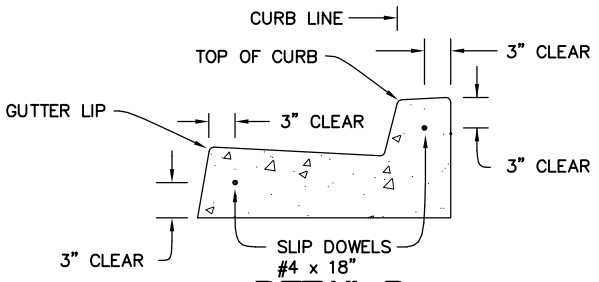
1. DRAWING NOT TO SCALE.
2. CONCRETE SIDEWALK WIDTHS SHALL BE 8½' MINIMUM IN COMMERCIAL AREAS AND 5½' MINIMUM FOR INDUSTRIAL AREAS. A 6' SIDEWALK CAN BE USED IN COMMERCIAL AREAS UPON APPROVAL OF THE CITY ENGINEER.
3. ALL SIDEWALK IS TO BE ONE COURSE, CLASS "2" P.C.C. PER SECTION 73 OF CITY STANDARD SPEC. AND FINE BROOM FINISHED.
4. ASPHALT EXPANSION JOINTS SHALL BE PLACED WITH MAXIMUM SPACING OF 56 FEET AND WHEREVER SIDEWALK ADJOINS EXISTING BUILDING OR SIDEWALK. SCORE LINES SHALL BE PROVIDED AT 4' INTERVALS AND PROPORTIONAL OR AS DIRECTED BY THE CITY ENGINEER. PROVIDE WEAKENED PLANE 1" DEEP AT 8' INTERVALS.
5. ASPHALT EXPANSION JOINT SHALL BE COMPOSED OF ASPHALT, FIBER AND MINERAL FILLER PREMOULDED INTO SHEETS WITH ASPHALT IMPREGNATED LINERS ON BOTH SIDES AND SHALL CONFORM WITH ASTM 1751 AND AASHTO M-33-48 SPECIFICATIONS.
6. SLIP DOWELS SHALL BE INSTALLED PER DETAIL "B" AT B.C.R. AND E.C.R.
7. CONTRACTOR SHALL STAMP HIS/HER NAME, MONTH AND YEAR OF CONSTRUCTION ON SIDEWALK A MINIMUM OF ONCE PER CONSTRUCTION PHASE AND ONCE PER EACH 500 S.F. MONTH AND YEAR MAY BE STAMPED IN NUMBERS.
8. ALL DIMENSIONS AS SHOWN UNLESS OTHERWISE SPECIFIED ON PLANS.
9. ACCESS RAMP PER CITY STANDARD PLANS ST-4, ST-5 AND ST-6.
10. 5.5 FOOT WIDE SIDEWALKS, LOCATED ADJACENT TO CURB, PERMITTED ON RESIDENTIAL (MINOR AND CUL-DE-SAC) STREETS; ON STREETS HAVING SIDEWALK SCHEDULES OF 9 FEET OR LESS; AND ON STREETS ADJOINING PORTIONS OR SUBDIVISIONS WHERE AT LEAST 50% OF THE LOTS HAVE AN AREA OF 5,000 S.F. OR LESS.
11. DOWELS BETWEEN CURB AND SIDEWALK REQUIRED AT 4' CENTER.
12. CONTRACTOR SHALL STAMP FACE OF CURB WITH THE LETTERS "S" (SEWER), "R" (RECYCLED) AND/OR "W" (WATER) TO IDENTIFY UTILITY SERVICE LOCATIONS.



DETAIL A

TYPICAL SIDEWALK EXPANSION JOINT





DETAIL B

TYPICAL DOWEL DETAIL AT CURB RETURNS

APPROVED:

Acting City Engineer — Date

REVISION:

Date

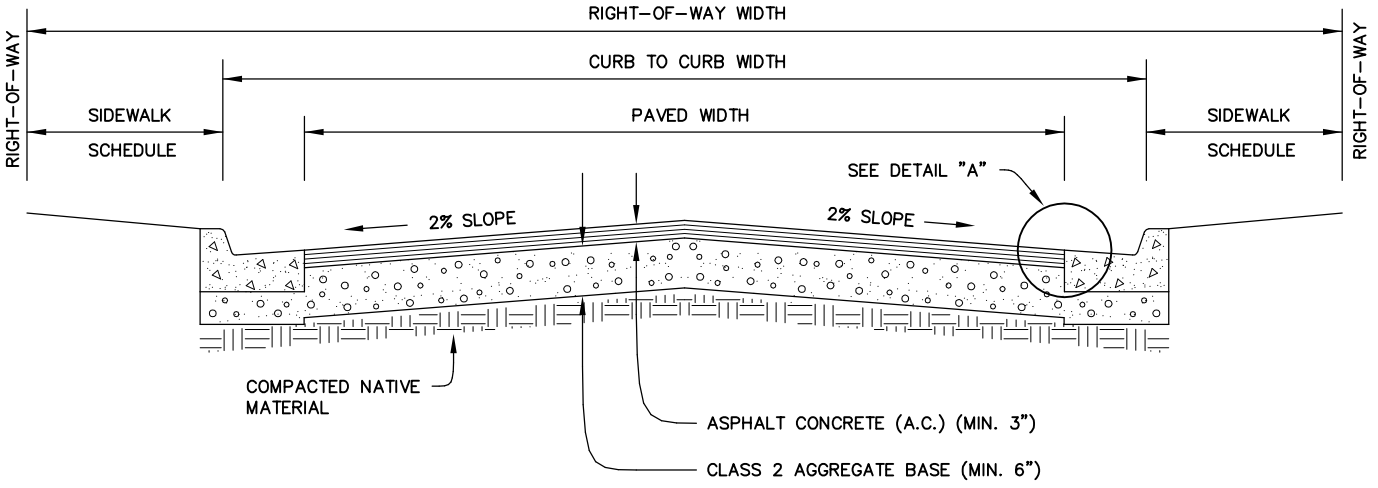
COMMUNITY DEVELOPMENT DEPARTMENT
PUBLIC WORKS DIVISION **CITY OF MARINA**

TITLE

SIDEWALKS AND CURB RETURNS

STANDARD PLAN

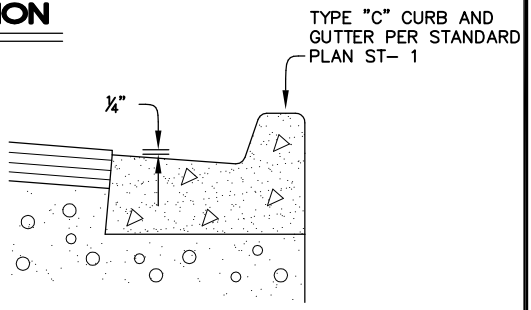
ST-2



TYPICAL CROSS SECTION

FLEXIBLE PAVEMENT

STANDARD PAVEMENT SECTIONS			
TI	AC	AB	A S B
5	3.0"	6"	SHALL MEET SUBGRADE R-VALUE SECTION REQUIREMENTS PER CALTRANS HIGHWAY DESIGN MANUAL BASED ON SOILS TEST.
6	3.0"	6"	
7	4.0"	8"	
8	4.5"	8"	
9	5.5"	10"	
10	6.5"	10"	



DETAIL "A"

GENERAL NOTES

1 DRAWING NOT TO SCALE.

2. STREET RIGHT-OF-WAY WIDTHS AND SIDEWALK SCHEDULES SHALL BE BASED UPON CURRENT CITY STANDARDS FOR DESIGNATION OF STREET CLASSIFICATIONS.

3. PAVEMENT STRUCTURAL SECTIONS SHALL BE DETERMINED BY THE CALTRANS FLEXIBLE PAVEMENT DESIGN METHODS BASED UPON THE R-VALUES OF SUBGRADE MATERIALS AND THE TRAFFIC INDEX. IN NO CASE SHALL FLEXIBLE PAVEMENT SECTIONS BE LESS THAN 3 INCHES OF ASPHALT CONCRETE OVER 6 INCHES OF AGGREGATE BASE.

4. R-VALUE TESTS ON SUBGRADE MATERIALS SHALL BE PERFORMED BY THE DEVELOPER'S SOIL ENGINEER; THE RESULTS AND PAVING SECTIONS SHALL BE APPROVED BY THE CITY ENGINEER.

5. TRAFFIC INDEX (TI) VALUES FOR COLLECTOR, INDUSTRIAL AND ARTERIAL STREETS SHALL BE BASED UPON PROJECTED 20-YEAR VOLUMES AND SHALL BE IN ACCORDANCE WITH THE CITY SUBDIVISION ORDINANCE FOR THE VARIOUS STREET CLASSIFICATIONS.

   a. CUL-DE-SACS OR OTHER SINGLE ENTRANCE STREETS WHICH PROVIDE ACCESS TO A MAXIMUM 16 DWELLING UNITS (AT FULL DEVELOPMENT) SHALL BE ASSIGNED A MINIMUM TRAFFIC INDEX OF 5.

   b. A MINIMUM TRAFFIC INDEX OF 5 SHALL BE ASSIGNED TO OTHER STANDARD RESIDENTIAL STREETS WITH 2 OR MORE ENTRANCES.

   c. OTHER STREETS WHICH SERVE AS A COLLECTOR STREET, ARTERIAL STREET OR OTHER STANDARD STREET DESIGNATION SHALL BE ASSIGNED TRAFFIC INDEX VALUES BY THE CITY ENGINEER.

6. FLEXIBLE PAVEMENT DESIGNS WITH ALTERNATIVE MATERIALS AND THICKNESS OR RIGID PAVEMENT DESIGNS MAY BE SUBMITTED FOR CONSIDERATION AND POSSIBLE APPROVAL OF THE CITY ENGINEER.

APPROVED:

Acting City Engineer Date

REVISION:

Date

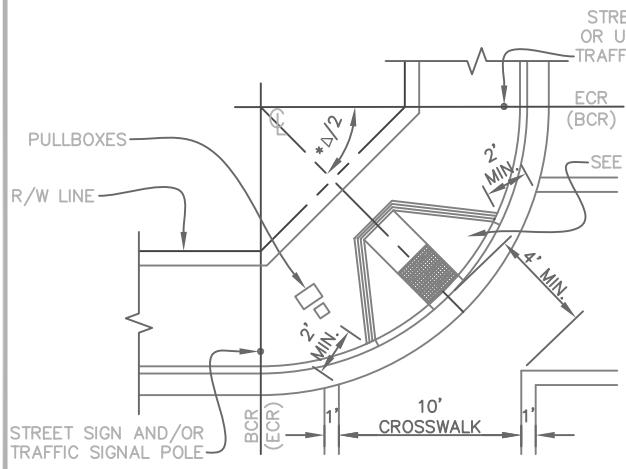
COMMUNITY DEVELOPMENT DEPARTMENT
PUBLIC WORKS DIVISION CITY OF MARINA

TITLE

STREET STRUCTURAL SECTIONS

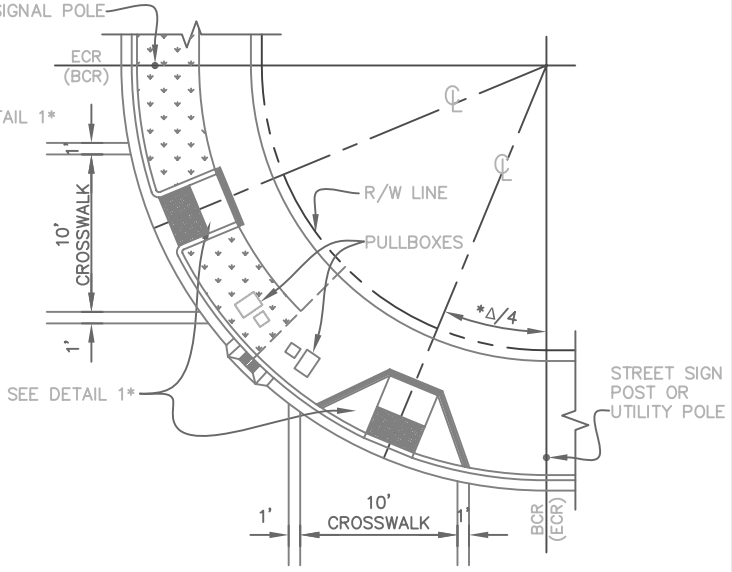
STANDARD PLAN

ST-3



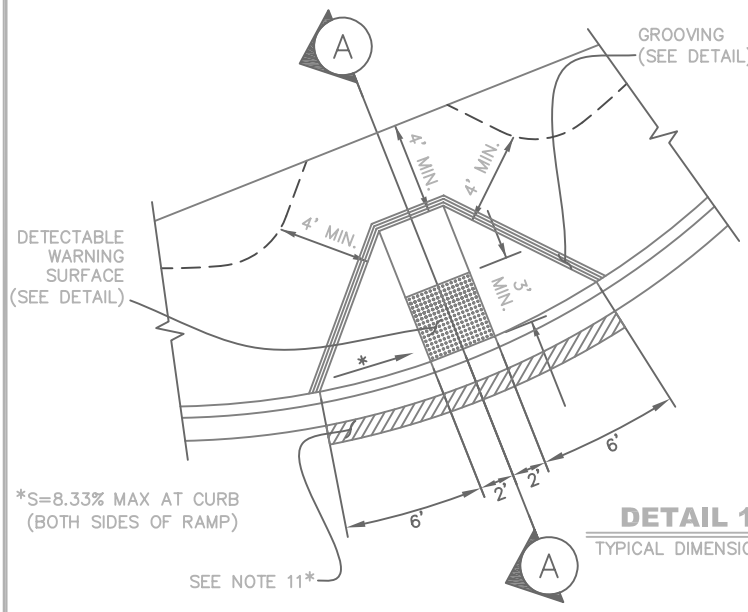
TYPE A CURB RAMP

TYPICAL LOCATION



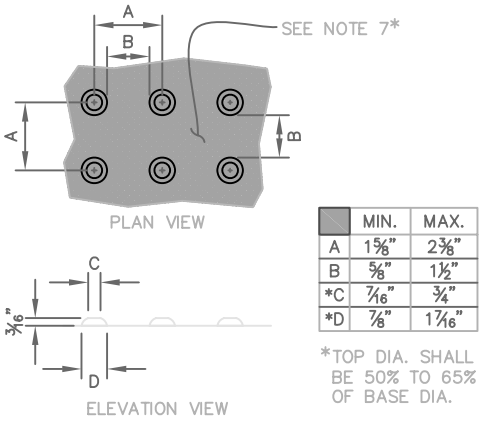
TYPE A CURB RAMP

ALTERNATE LOCATIONS



DETAIL 1

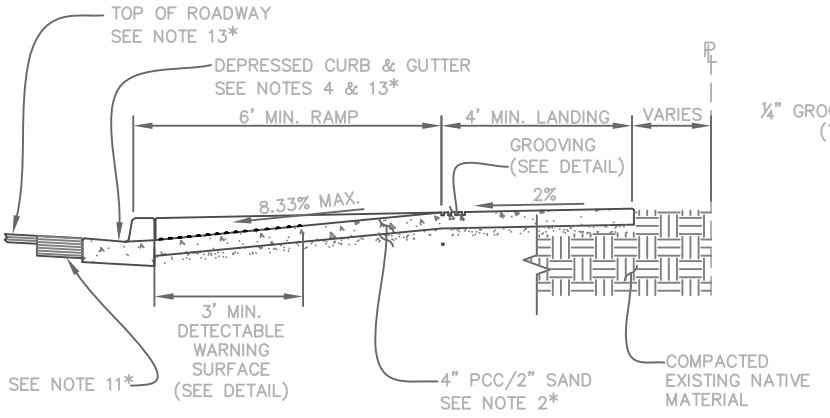
TYPICAL DIMENSIONS



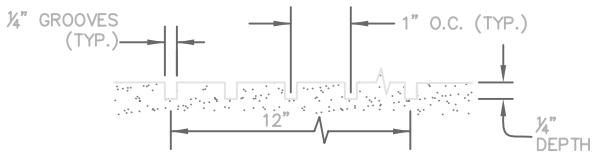
	MIN.	MAX.
A	1⅝"	2⅜"
B	⅝"	1½"
*C	7/16"	¾"
*D	⅞"	1 7/16"

*TOP DIA. SHALL BE 50% TO 65% OF BASE DIA.

DETECTABLE WARNING SURFACE DETAIL



SECTION A-A

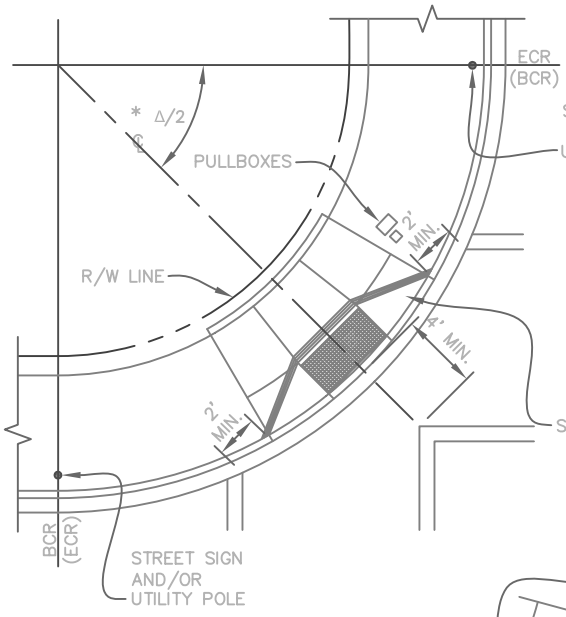


GROOVING DETAIL

GENERAL NOTES

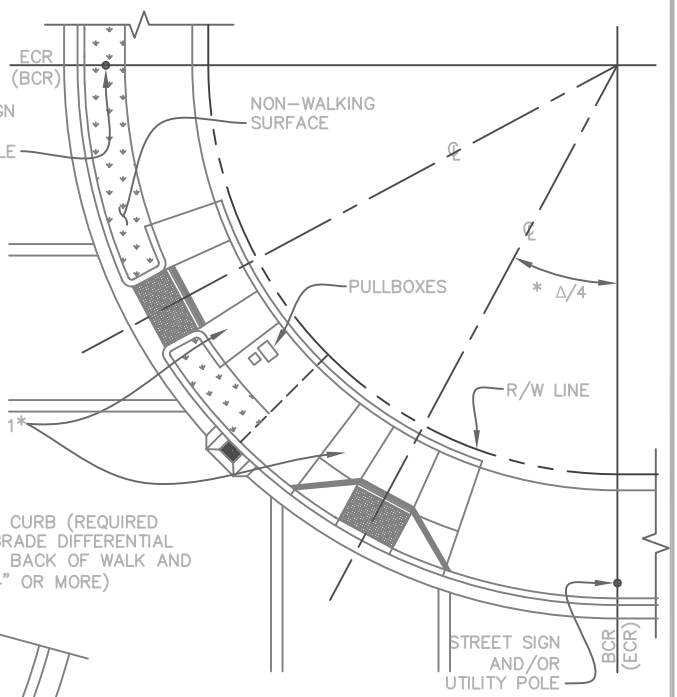
* SEE STANDARD PLAN ST-6 FOR GENERAL NOTES REFERENCED TO ON THIS PLAN.

APPROVED: Acting City Engineer Date REVISION: Date		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE TYPE A CURB RAMP (SIDEWALK SCHEDULES 10' AND OVER)
		STANDARD PLAN ST-4



TYPE B CURB RAMP

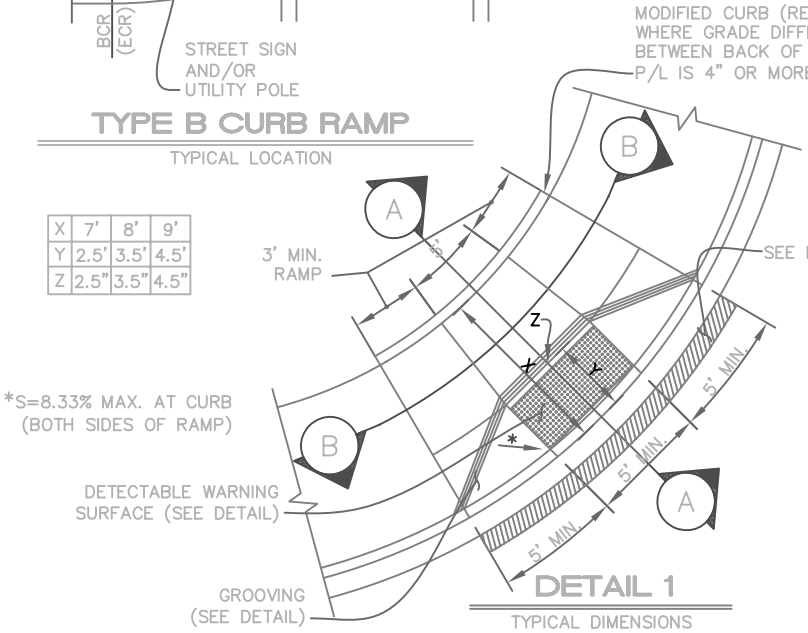
TYPICAL LOCATION



TYPE B CURB RAMP

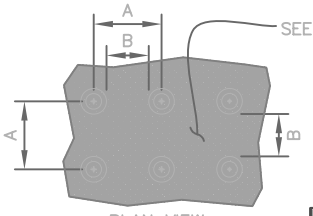
ALTERNATE LOCATION

X	7'	8'	9'
Y	2.5'	3.5'	4.5'
Z	2.5"	3.5"	4.5"



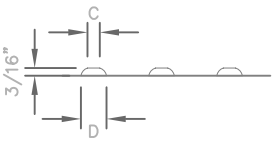
DETAIL 1

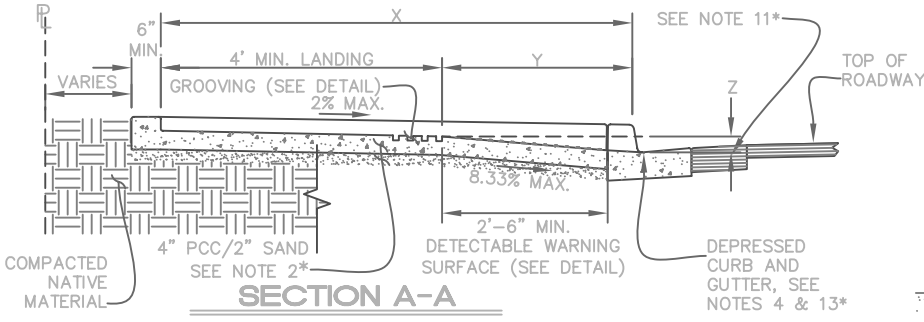
TYPICAL DIMENSIONS



	MIN.	MAX.
A	1⅝"	2⅜"
B	⅝"	1½"
*C	7/16"	¾"
*D	⅞"	1 7/16"

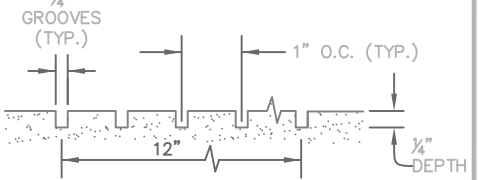
*TOP DIA. SHALL BE 50% TO 65% OF BASE DIA.



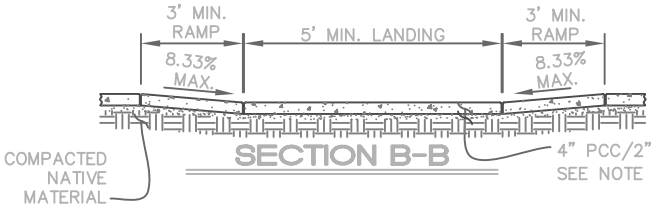


SECTION A-A

DETECTABLE WARNING SURFACE DETAIL



GROOVING DETAIL



SECTION B-B

GENERAL NOTES

* SEE STANDARD PLAN ST-6 FOR GENERAL NOTES REFERENCE ON THIS PLAN.

APPROVED:

Acting City Engineer — Date

REVISION:

Date

COMMUNITY DEVELOPMENT DEPARTMENT

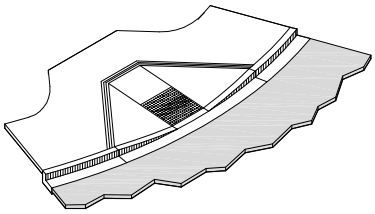
PUBLIC WORKS DIVISION — CITY OF MARINA

TITLE

TYPE B CURB RAMP
(SIDEWALK SCHEDULES 7'-9')

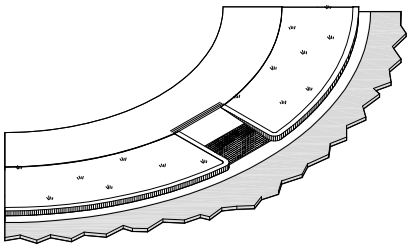
STANDARD PLAN

ST-5



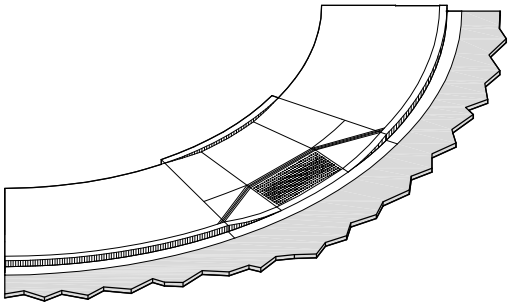
TYPE A CURB RAMP

SEE STANDARD PLAN ST-4



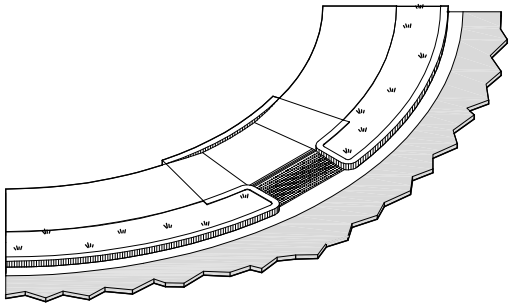
TYPE A CURB RAMP

SEE STANDARD PLAN ST-4
(ALTERNATE LOCATION)



TYPE B CURB RAMP

SEE STANDARD PLAN ST-5
(TYPICAL LOCATION)



TYPE B CURB RAMP

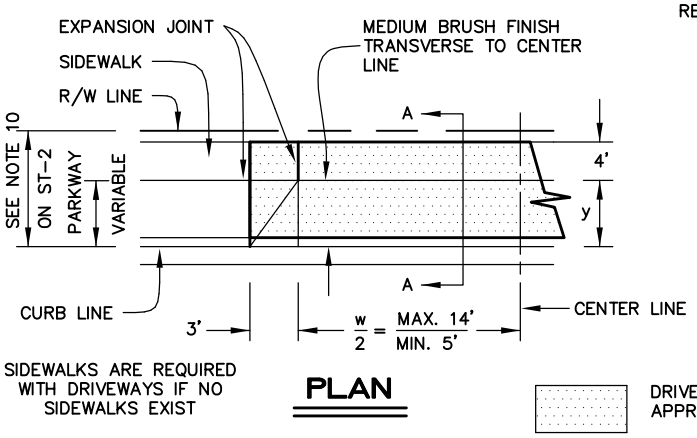
SEE STANDARD PLAN ST-5
(ALTERNATE LOCATION)

GENERAL NOTES

1. DRAWINGS NOT TO SCALE.
2. ACCESS RAMP SHALL BE MONOLITHIC, CLASS "2" P.C.C. PER SECTION 73 OF THE STANDARD SPECIFICATIONS, 4" THICK AND 2" SAND CUSHION, AND WITH A COARSE BROOM FINISH.
3. WIDTH OF SIDEWALK AND RADIUS OF CURB RETURN SHALL BE PER CONSTRUCTION PLANS.
4. CURB AND GUTTER CONSTRUCTION SHALL BE PER CITY OF MARINA STANDARD PLAN ST-1.
5. SIDEWALK CONSTRUCTION SHALL BE PER CITY OF MARINA STANDARD PLAN ST-2.
6. ANY ALTERNATIVE LOCATIONS/CONFIGURATIONS ARE SUBJECT TO PRIOR APPROVAL BY THE CITY ENGINEER.
7. CURB RAMPS SHALL HAVE A DETECTABLE WARNING SURFACE THAT EXTENDS THE FULL/WIDTH DEPTH OF THE CURB RAMP. THE EDGE OF THE DETECTABLE WARNING SURFACE NEAREST THE STREET SHALL BE BETWEEN 6" AND 8" FROM THE BACK OF CURB LINE. ALL UTILITY AND CITY PULLBOXES, MANHOLES, VAULTS, AND ALL OTHER FACILITIES SHALL BE INSTALLED OUTSIDE THE DETECTABLE WARNING SURFACE BOUNDARY. THE DETECTABLE WARNING SURFACE COLOR SHALL BE CONTRASTING TO THE CONCRETE, CONFORMING TO FEDERAL STANDARD 595B. THE DETECTABLE WARNING SURFACE SHALL BE ARMORE TILE OR APPROVED EQUAL.
8. SCORE LINES SHALL BE PROVIDED AND NOT EXCEED 22 S.F. OF CONCRETE SURFACE.
9. FLOWLINE SLOPE ALONG CURB RETURN SHALL BE A MIN. OF 0.50% OR AS APPROVED BY THE CITY ENGINEER.
10. FOR CURBS HIGHER THAN 6", RAMP WING SHALL EXTEND 1' FOR EVERY 1" OF CURB HEIGHT (8.33% GRADE).
11. REMOVE/REPLACE 1' WIDE AC PAVEMENT (6" THICK SECTION) ALONG GUTTER LIP FOR NEW PEDESTRIAN ACCESS RAMP INSTALLATION ON EXISTING CURB RETURNS.
12. MODIFIED CURB SHALL BE PROVIDED AT BACK OF SIDEWALK WHERE GRADE DIFFERENTIAL BETWEEN BACK OF WALK AND PROPERTY LINE IS 4" OR MORE.
13. COUNTER SLOPES OF ADJOINING GUTTERS AND ROAD SURFACES IMMEDIATELY ADJACENT TO THE CURB RAMP SHALL NOT BE STEEPER THAN 5%. THE ADJACENT SURFACES AT TRANSITIONS AT CURB RAMPS TO WALKS, GUTTERS, AND STREETS SHALL BE AT THE SAME LEVEL.
14. GROOVED BORDER MUST BE ON THE LEVEL SURFACE AT THE TOP OF THE RAMP.

APPROVED: Acting City Engineer _____ Date _____ REVISION: _____ Date _____	Marina 1975	COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE GENERAL NOTES (ST-4 - ST-5)/ ISOMETRIC VIEWS	STANDARD PLAN ST-6

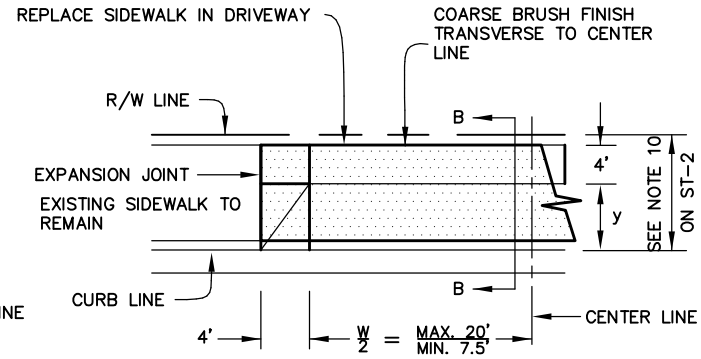
RESIDENTIAL DRIVEWAY APPROACH



SIDEWALKS ARE REQUIRED WITH DRIVEWAYS IF NO SIDEWALKS EXIST

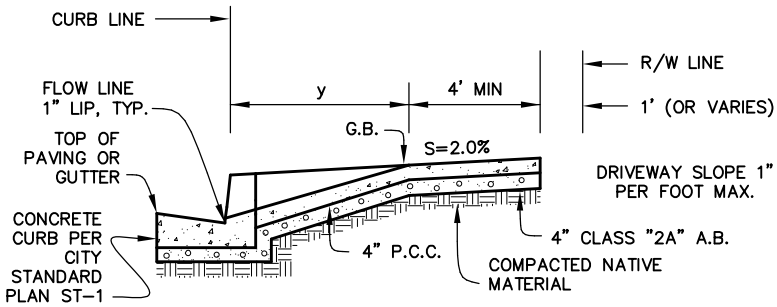
PLAN

COMMERCIAL DRIVEWAY APPROACH

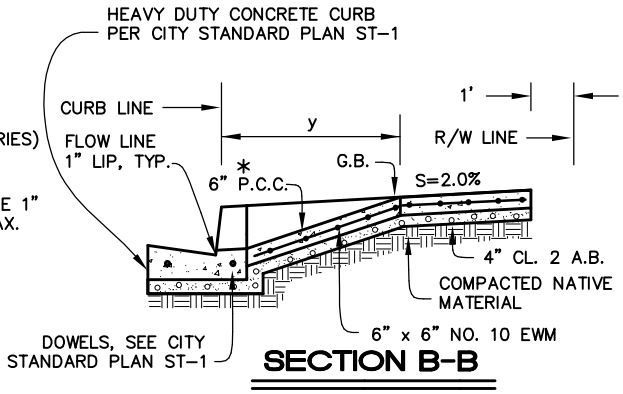


PLAN

DRIVEWAY APPROACH LIMITS



SECTION A-A



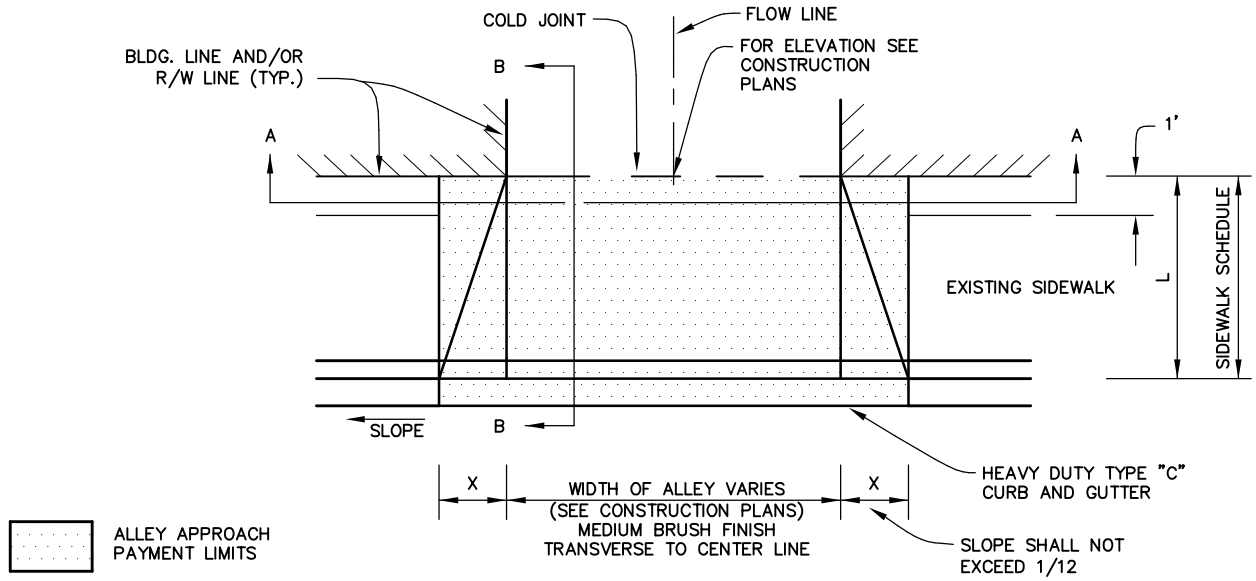
SECTION B-B

GENERAL NOTES

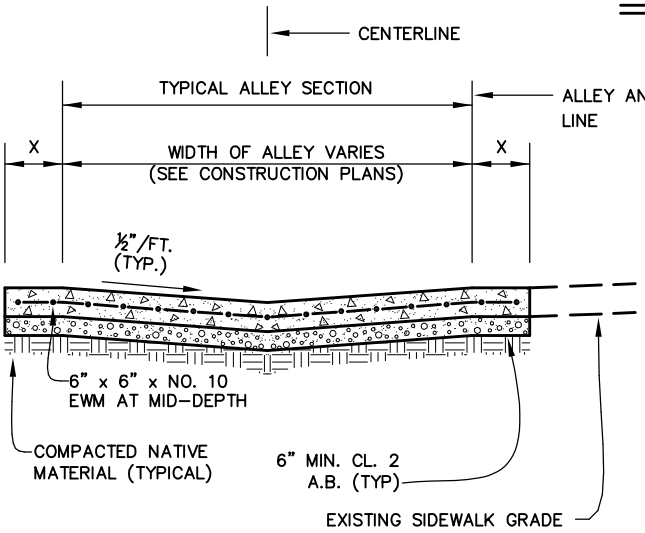
1. DRAWING NOT TO SCALE.
2. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST ADOPTED CITY STANDARD SPECIFICATIONS.
3. THE AREA INCLUDED WITHIN THE "y" SLOPES SHALL BE MEDIUM BRUSH FINISHED. THE BALANCE OF THE DRIVEWAY SHALL BE FINE BROOM FINISHED TO MATCH THE ADJOINING SIDEWALK. SCORING LINES SHALL BE SPACED TO EVENLY DIVIDE THE AREA INTO BLOCKS OF NOT LESS THAN 3 FEET NOR MORE THAN 4 FEET OR TO MATCH THE EXISTING.
4. RESIDENTIAL DRIVEWAYS SHALL HAVE 4" MINIMUM CLASS "2 A.B." (OR BETTER). COMMERCIAL DRIVEWAYS SHALL HAVE 4" MINIMUM CLASS "2 A.B." (OR BETTER) AND 6" x 6" NO. 10 EWM PLACED AT MID-DEPTH.
5. P.C.C. SHALL BE CLASS "2" PER CITY STANDARD SPECIFICATIONS.
6. ON RESIDENTIAL DRIVEWAY CONSTRUCTION ONLY, CONTRACTOR MAY REMOVE VERTICAL CURB AND CONSTRUCT DRIVEWAY AGAINST REMAINING GUTTER. AN APPROVED BONDING AGENT OR EPOXY SHALL BE APPLIED TO JOIN CONCRETE SURFACES.
7. CURB HEIGHT HIGHER THAN 6½" SHALL BE APPROVED BY THE CITY ENGINEER.
8. * INCREASE CONCRETE THICKNESS BY 2" FOR DRIVEWAYS SERVING INDUSTRIAL SITES OR SITES SUBJECT TO HEAVY TRUCK TRAFFIC.

* CONTRACTOR MUST BE LICENSED WITH STATE OF CALIFORNIA AND CITY BUSINESS LICENSE.

APPROVED: Acting City Engineer _____ Date _____ REVISION: _____ Date _____		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE DRIVEWAY APPROACH	STANDARD PLAN ST-7

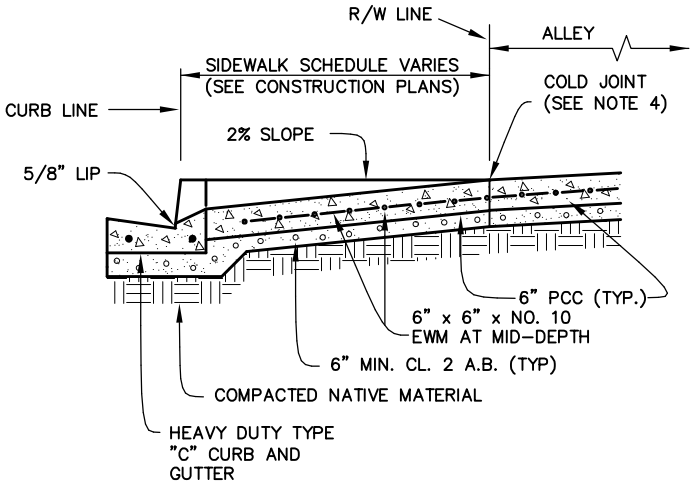


PLAN



SECTION A-A

(ALLEY APPROACH AND ALLEY)

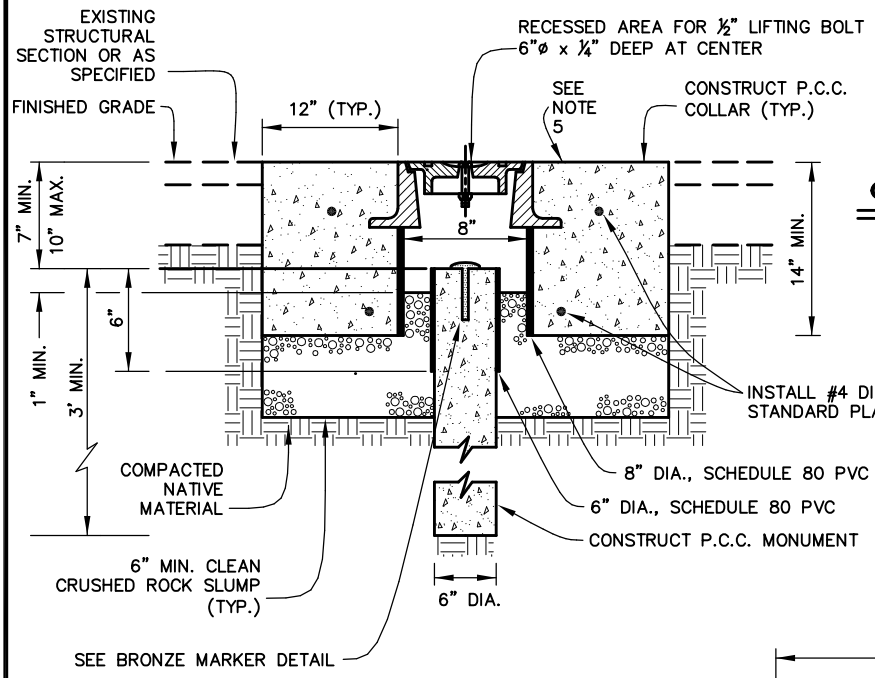


SECTION B-B

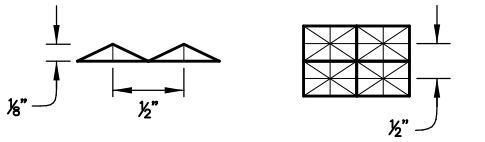
GENERAL NOTES

1. DRAWING NOT TO SCALE.
2. ALL WORK AND MATERIALS SHALL CONFORM TO SECTION 73 OF THE CITY STANDARD SPECIFICATIONS.
3. SEE STANDARD PLAN NO. 1 FOR CURB AND GUTTER CONSTRUCTION.
4. THE "X" DIMENSION SHALL BE 3 FT. UNLESS OTHERWISE INDICATED ON PLANS.
5. PROVIDE COLD JOINT AT BACK OF ALLEY APPROACH (OMIT STEEL ACROSS THIS JOINT).
6. P.C.C. SHALL BE CLASS "2" PER SECTION 73 OF THE CITY STANDARD SPECIFICATIONS.

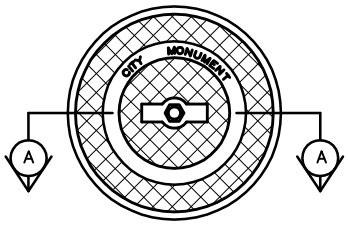
APPROVED: Acting City Engineer Date REVISION: Date		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE ALLEY APPROACH AND SECTION	STANDARD PLAN ST-8



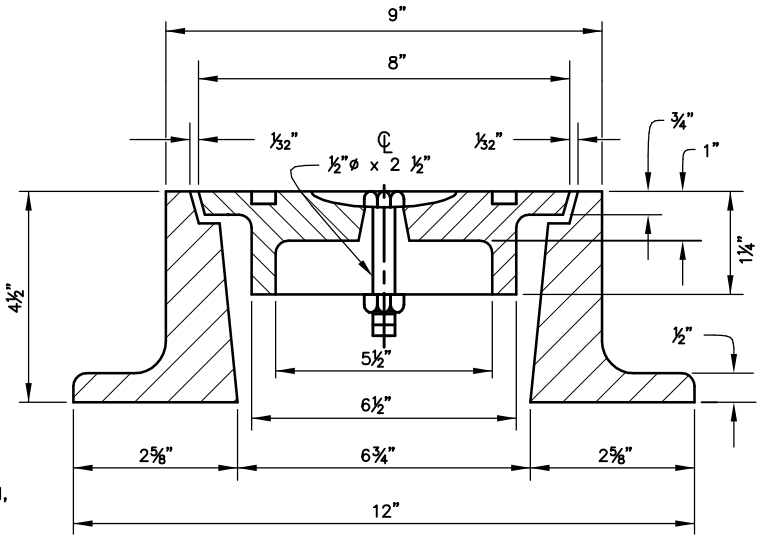
SECTION A-A



CHECKERED PATTERN DETAIL



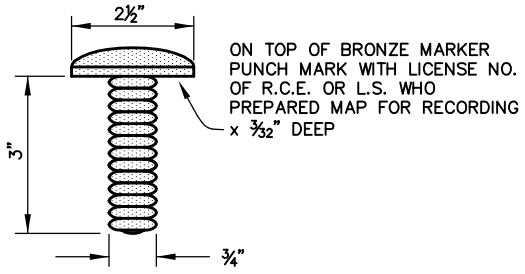
PLAN



FRAME AND COVER SECTION

GENERAL NOTES

1. DRAWING NOT TO SCALE.
2. MONUMENT FRAME AND COVER SHALL BE GRAY CAST IRON, FREE OF BLISTERS, BLOWHOLES, AND COLD SHUNTS.
3. MONUMENT SHALL BE FURNISHED AND INSTALLED AS PER PLANS AND SECTION 81 OF THE CITY STANDARD SPECIFICATIONS, COMPLETE WITH MARKER. CONTRACTOR SHALL PROVIDE BRONZE MARKER.
4. BEARING SURFACES OF FRAME AND COVER SHALL FIT WITH POSITIVE PRESSURE ON ALL SURFACES AND SHALL BE NON-ROCKING.
5. P.C.C. SHALL BE CLASS "2" PER SECTION 73 OF THE CITY STANDARD SPECIFICATIONS. MIX CONCRETE WITH BLACK PIGMENT MATERIAL.
6. FRAME AND COVER SHALL BE AMERICAN BRASS AND FOUNDRY 5020-21 OR APPROVED EQUAL.
7. CONTRACTOR MUST PROVIDE SURVEY OF CENTERLINE CONTROL AND FINAL PUNCH MARK WITH R.C.E. OR L.S. REGISTRATION NUMBER PER BRONZE MARKER DETAIL.
8. MONUMENTS SHALL BE PROPERLY DOCUMENTED IN THE PUBLIC RECORDS IN ACCORDANCE WITH THE REQUIREMENTS OF THE "BUSINESS AND PROFESSIONAL CODE" OF THE STATE OF CALIFORNIA CHAPTER 15, "LAND SURVEYORS" ARTICLE 5, "SURVEYING PRACTICE," AND SECTION 8762, "RECORD OF SURVEY" WHEN REQUIRED.



BRONZE MARKER DETAIL

APPROVED:

Acting City Engineer — Date

REVISION:

Date

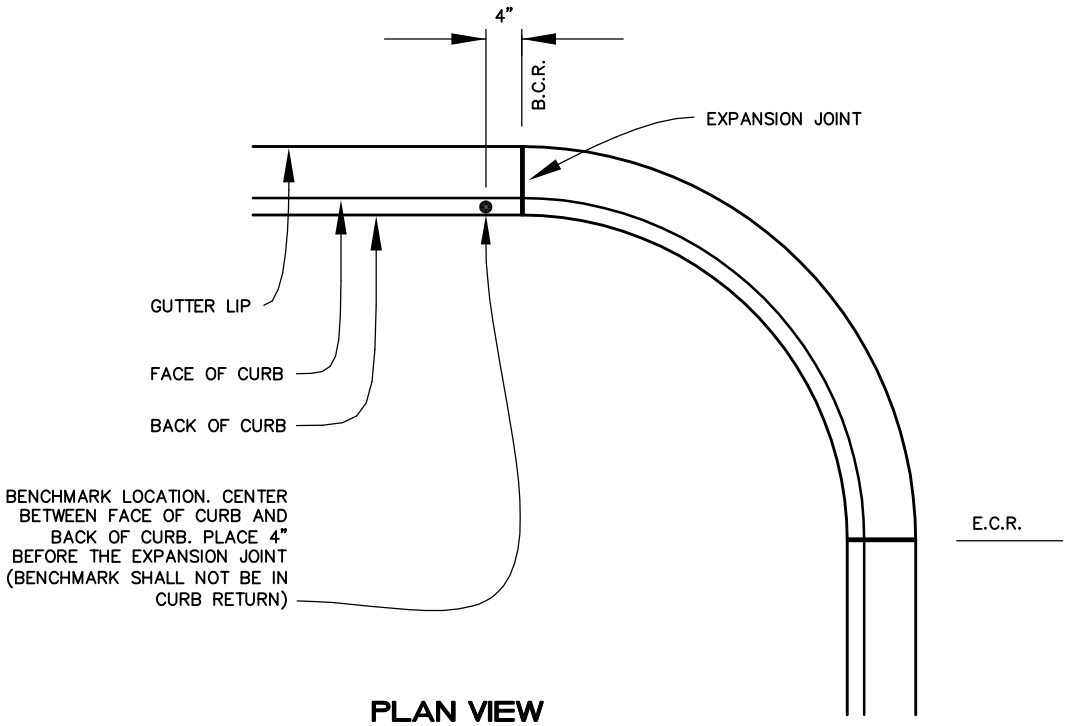
COMMUNITY DEVELOPMENT DEPARTMENT
PUBLIC WORKS DIVISION — CITY OF MARINA

TITLE

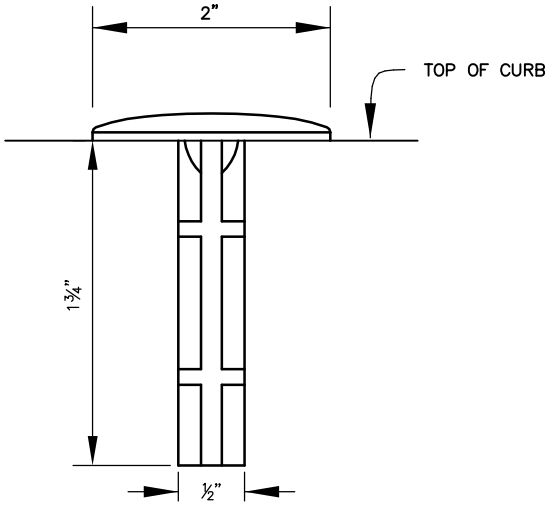
CITY MONUMENT

STANDARD PLAN

ST-9



PLAN VIEW



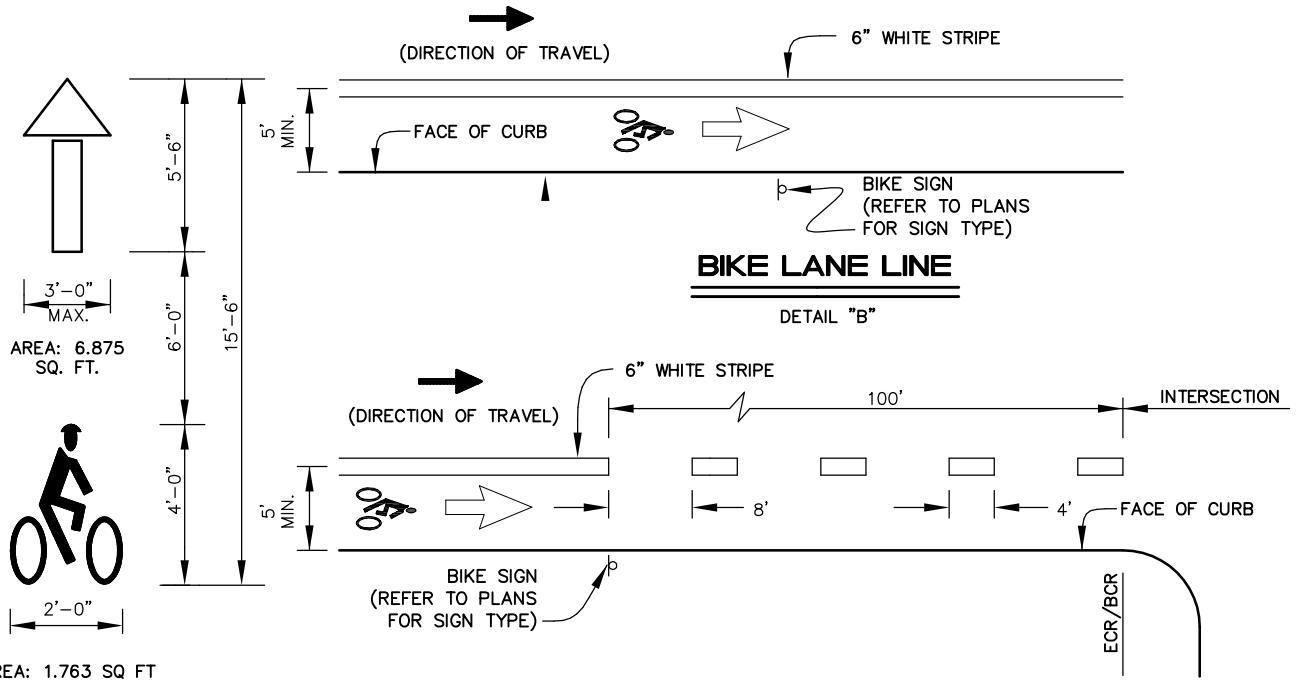
ELEVATION VIEW

SOLID BRASS DOMED SURVEY MARKER

GENERAL NOTES

1. DRAWING NOT TO SCALE.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR RE-ESTABLISHING AND SETTING THE NEW CITY BENCHMARK.
3. BENCHMARK LOCATION SHALL BE CENTERED AT THE TOP OF CURB AND 4" BEFORE THE EXPANSION JOINT. THE CITY ENGINEER SHALL APPROVE EXACT LOCATION PRIOR TO INSTALLATION.
4. BENCHMARK SHALL BE A 2" DIAMETER SOLID BRASS DOMED SURVEY MARKER. BENCHMARK SHALL BE INSTALLED AT THE TIME OF CONSTRUCTION (IN WET CONCRETE).
5. VERTICAL ELEVATION, WHICH WILL BE DERIVED FROM A KNOWN VICINITY BENCHMARK, SHALL BE ESTABLISHED BY A CONTRACTOR, HIRED REGISTERED CIVIL ENGINEER, OR PROFESSIONAL LAND SURVEYOR. THE NEW BENCHMARK SHALL THEN BE VERIFIED BY THE CONTRACTOR'S SURVEYOR BY USING ANOTHER KNOWN CITY BENCHMARK AS A DOUBLE CHECK. THE HIRED REGISTERED C.E. OR P.L.S. SHALL PUNCH MARK THE DOMED MARKER WITH THE NEW VERTICAL ELEVATION. THE CONTRACTOR SHALL THEN PROVIDE IN WRITING TO THE CITY ENGINEER THE NEW VERTICAL ELEVATION WITHIN TWO DAYS OF THE BENCHMARK INSTALLATION.

APPROVED: Acting City Engineer _____ Date _____ REVISION: _____ Date _____	Marina 1975	COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE BENCHMARK FOR ELEVATION CONTROL	STANDARD PLAN ST-10



BIKE LANE LINE

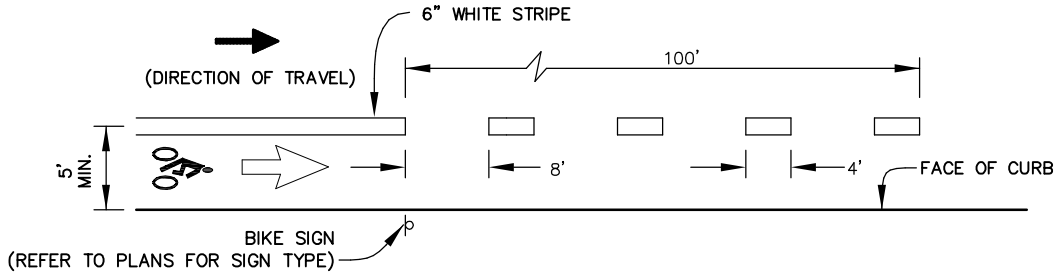
DETAIL "B"

BIKE SYMBOL WITH ARROW

DETAIL "A"

BIKE LANE LINE AT INTERSECTION

DETAIL "C"



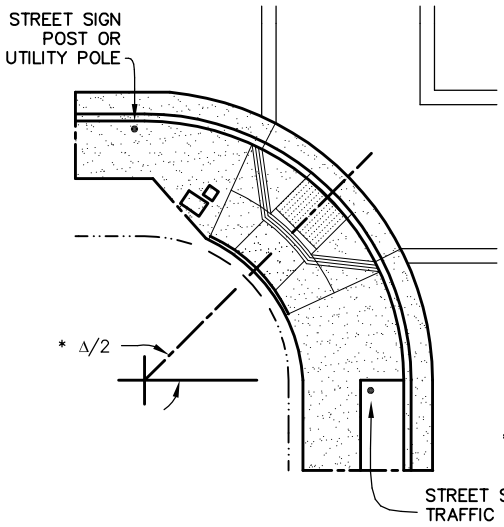
BIKE LANE DROP

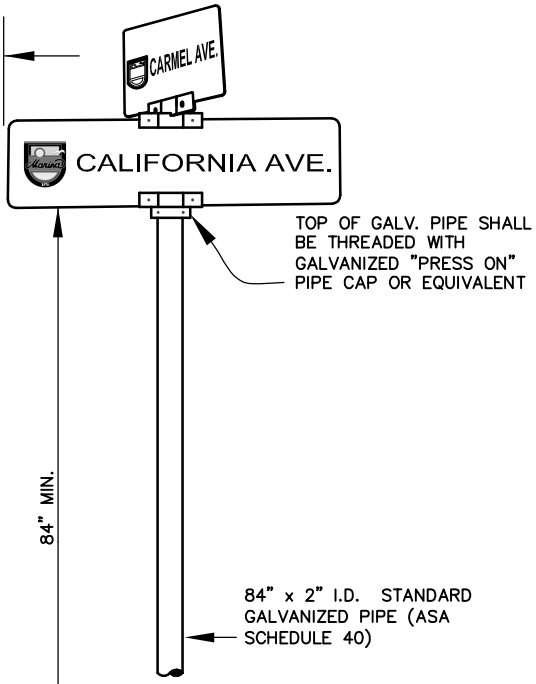
DETAIL "D"

NOTES

1. DRAWING NOT TO SCALE.
2. LOCATION AND PLACEMENT OF CONTROL POINTS AND PRELIMINARY MARKINGS ARE SUBJECT TO APPROVAL BY THE CITY ENGINEER (SEE MARINA BIKEWAYS PLAN FOR GUIDING POLICY).
3. ALL WHITE STRIPES, ARROWS, AND SYMBOLS SHALL BE THERMOPLASTIC. 120 MIL FOR MAJOR STREETS AND 90 MIL FOR MINOR/RESIDENTIAL STREETS. THERMOPLASTIC PREFABRICATED BIKE SYMBOL AND ARROW SHALL BE FURNISHED AND INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
4. BIKE SYMBOL WITH ARROW SHOULD READ "UP". THE BIKE SYMBOL SHOULD BE NEAREST THE DRIVER.
5. BIKE SYMBOL LEGEND AND ARROW SHALL BE WHITE THERMOPLASTIC.
6. MINOR VARIATIONS IN DIMENSIONS ARE SUBJECT TO APPROVAL BY THE CITY ENGINEER.

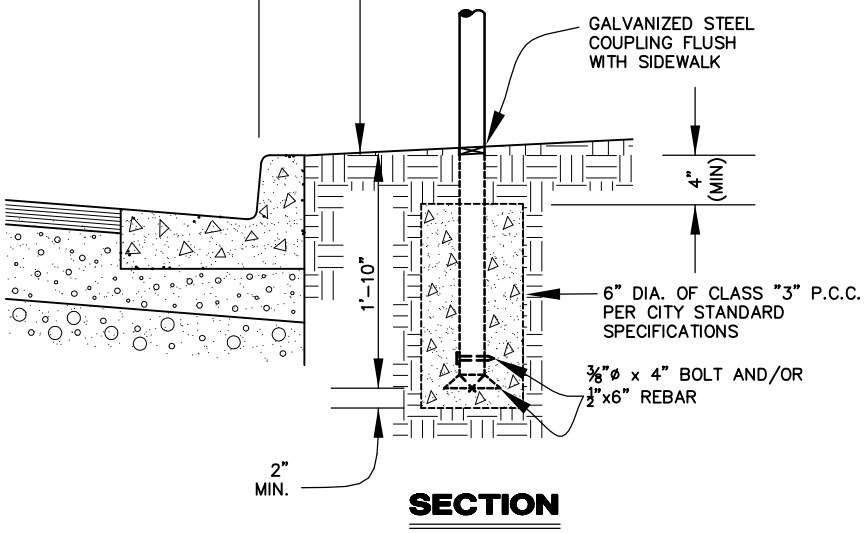
APPROVED: Acting City Engineer Date REVISION: Date		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE BIKE LANE	STANDARD PLAN ST-11





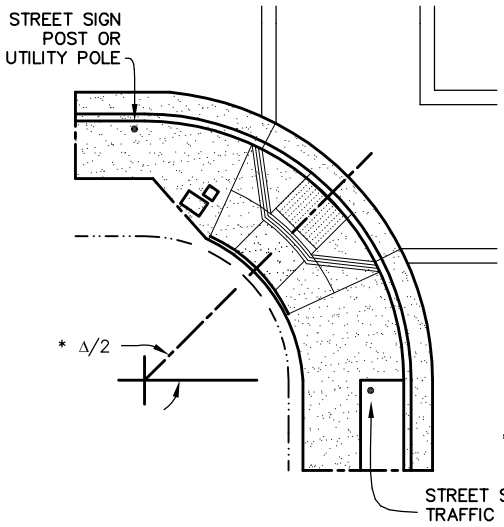
NOTES

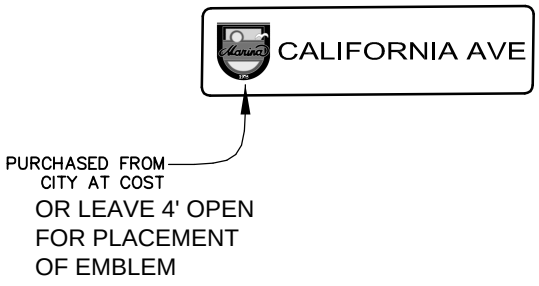
1. DRAWING NOT TO SCALE.
2. STREET NAME SIGNS SHALL BE CONSTRUCTED OF 0.08 INCH THICK ALUMINUM ALLOY.
3. SIGN FINISH SHALL BE 3M REFLECTIVE SHEETING–DIAMOND GRADE OR APPROVED EQUAL WITH INTERSTATE BLUE BACKGROUND AND WITH WHITE REFLECTORIZED LETTERS. THE REFLECTIVE SHEETING SHALL CONFORM WITH THE FEDERAL SPECIFICATIONS L–S300A.
4. DIMENSION "X" SHALL BE SUCH THAT THE MINIMUM CLEARANCE BETWEEN CURB LINE AND THE PORTION OF THE SIGN CLOSEST THE STREET SHALL BE NOT LESS THAN 12".
5. SIGN SHALL BE 9" HIGH x 0.08" THICK AND THE LENGTH VARIES.
6. STREET NAME LETTERS SHALL BE CLAREDON BOLD FONT, 5" UPPER CASE, 3¾" LOWER CASE, ABBREVIATIONS SHALL BE 2½" UPPER CASE, 1⅞" LOWER CASE.
7. MINOR VARIATIONS IN DIMENSIONS ARE SUBJECT TO APPROVAL BY THE CITY ENGINEER.
8. STREET NAME SIGN SHALL BE DOUBLE SIDED.

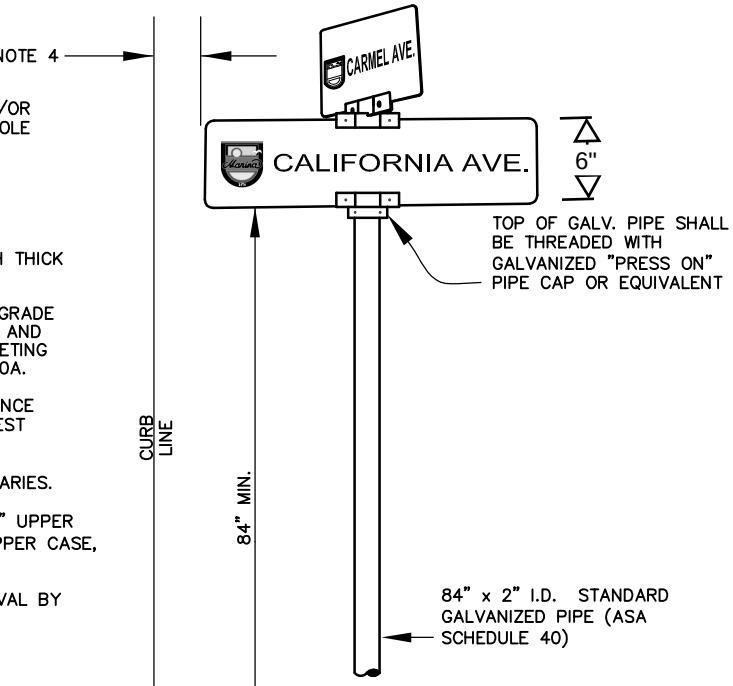


SECTION

APPROVED: Acting City Engineer Date REVISION: Date		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE STREET NAME SIGN	STANDARD PLAN ST-12

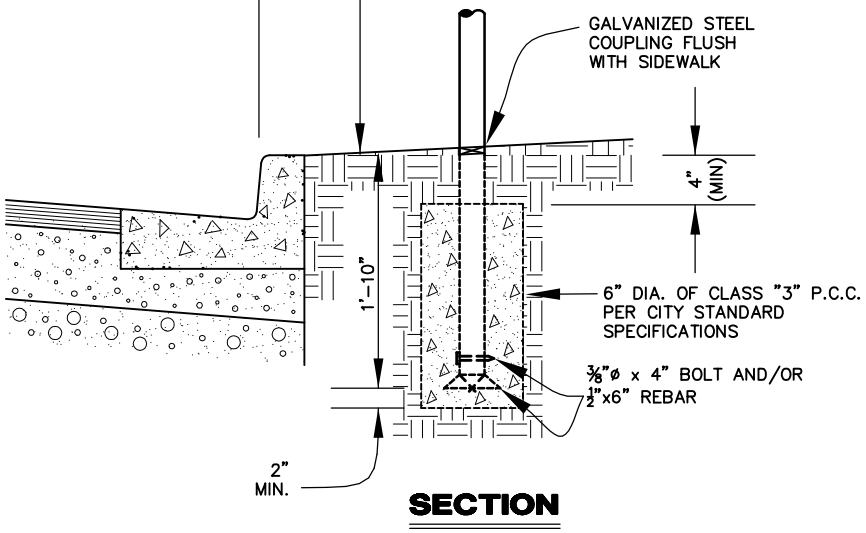






NOTES

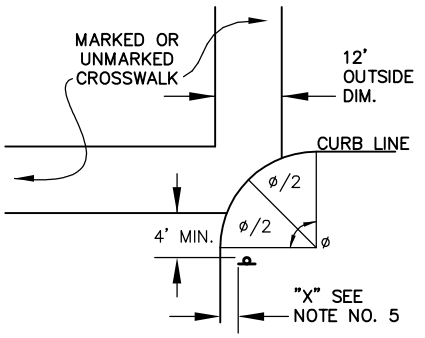
1. DRAWING NOT TO SCALE.
2. STREET NAME SIGNS SHALL BE CONSTRUCTED OF 0.08 INCH THICK ALUMINUM ALLOY.
3. SIGN FINISH SHALL BE 3M REFLECTIVE SHEETING–DIAMOND GRADE OR APPROVED EQUAL WITH INTERSTATE BLUE BACKGROUND AND WITH WHITE REFLECTORIZED LETTERS. THE REFLECTIVE SHEETING SHALL CONFORM WITH THE FEDERAL SPECIFICATIONS L–S300A.
4. DIMENSION "X" SHALL BE SUCH THAT THE MINIMUM CLEARANCE BETWEEN CURB LINE AND THE PORTION OF THE SIGN CLOSEST THE STREET SHALL BE NOT LESS THAN 12".
5. SIGN SHALL BE 6' HIGH x 0.08" THICK AND THE LENGTH VARIES.
6. STREET NAME LETTERS SHALL BE CLAREDON BOLD FONT, 5" UPPER CASE, 3¾" LOWER CASE, ABBREVIATIONS SHALL BE 2½" UPPER CASE, 1⅞" LOWER CASE.
7. MINOR VARIATIONS IN DIMENSIONS ARE SUBJECT TO APPROVAL BY THE CITY ENGINEER.
8. STREET NAME SIGN SHALL BE DOUBLE SIDED.



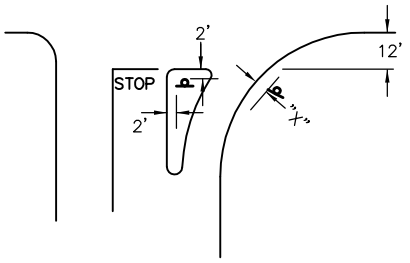
SECTION

APPROVED: Acting City Engineer / Date		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION — CITY OF MARINA TITLE: STREET NAME SIGN	STANDARD PLAN ST-12
REVISION: / Date			

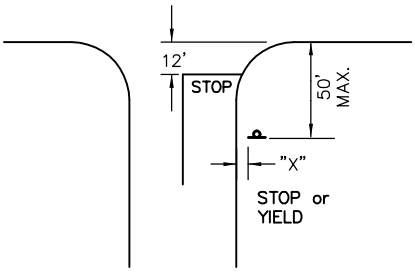
TYPICAL LOCATIONS



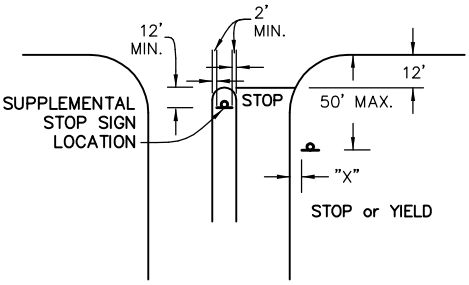
URBAN INTERSECTION



CHANNELIZED INTERSECTION



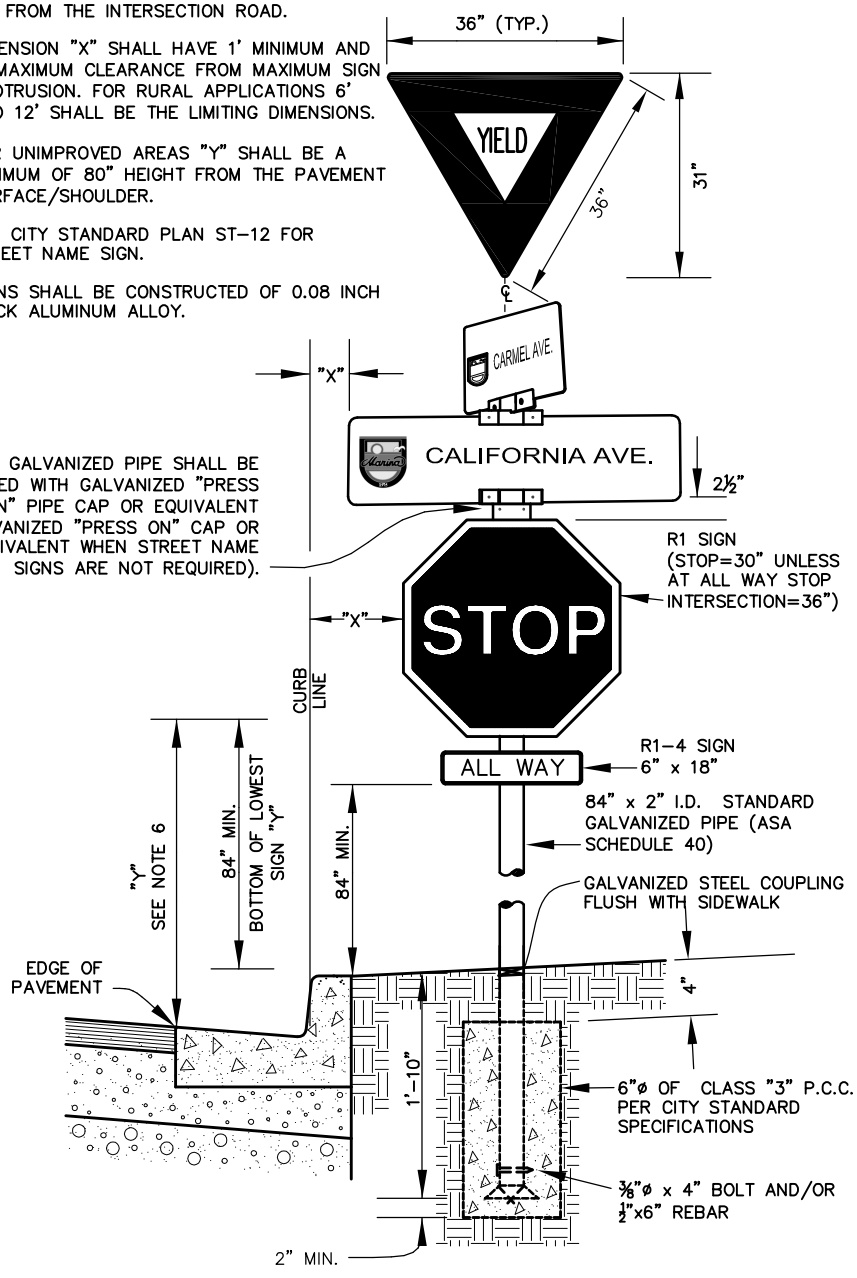
WIDE THROAT INTERSECTION



DIVISIONAL ISLAND

NOTES

1. DRAWING NOT TO SCALE.
2. STOP SIGN SHALL BE MINIMUM 30", 36" FOR ALL-WAY WITH R1-4 (ALL WAY). THE SIGN SHALL HAVE DIAMOND GRADE 3-M REFLECTIVE SHEETING OR APPROVED EQUAL. THE REFLECTIVE SHEETING SHALL CONFORM WITH FEDERAL SPECIFICATIONS L-S300A. THE BACKGROUND OF THE SIGN SHALL BE RED WITH A WHITE BORDER AND LEGEND ALL REFLECTIVE.
3. YIELD SIGN SHALL BE 36". THE SIGN SHALL HAVE DIAMOND GRADE 3-M REFLECTIVE SHEETING OR APPROVED EQUAL. THE REFLECTIVE SHEETING SHALL CONFORM WITH FEDERAL SPECIFICATIONS L-S300-A. THE BACKGROUND OF THE SIGN SHALL BE RED, RED TEXT, WITHIN A WHITE TRIANGLE.
4. SIGNS SHALL ALWAYS BE ERECTED AT THE POINT WHERE THE VEHICLE IS TO STOP OR AS NEAR THERETO AS POSSIBLE. IN NO CASE SHALL EITHER SIGN BE PLACED IN EXCESS OF 50' FROM THE INTERSECTION ROAD.
5. DIMENSION "X" SHALL HAVE 1' MINIMUM AND 2' MAXIMUM CLEARANCE FROM MAXIMUM SIGN PROTRUSION. FOR RURAL APPLICATIONS 6' AND 12' SHALL BE THE LIMITING DIMENSIONS.
6. FOR UNIMPROVED AREAS "Y" SHALL BE A MINIMUM OF 80" HEIGHT FROM THE PAVEMENT SURFACE/SHOULDER.
7. SEE CITY STANDARD PLAN ST-12 FOR STREET NAME SIGN.
8. SIGNS SHALL BE CONSTRUCTED OF 0.08 INCH THICK ALUMINUM ALLOY.



SIGN INSTALLATION DETAIL

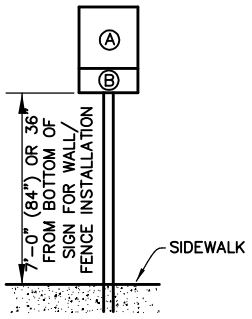
APPROVED: Acting City Engineer — Date REVISION: Date	COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION — CITY OF MARINA TITLE TRAFFIC SIGNS (STOP/YEILD)	STANDARD PLAN ST-13

Ⓐ

STATE STANDARD R99 SIGN
12" x 18" WHITE ON BLUE
3" SERIES "B" LETTERS

Ⓑ

STATE STANDARD R99A
SIGN 12" x 8" WHITE ON
BLUE 1½" SERIES "B"
LETTERS



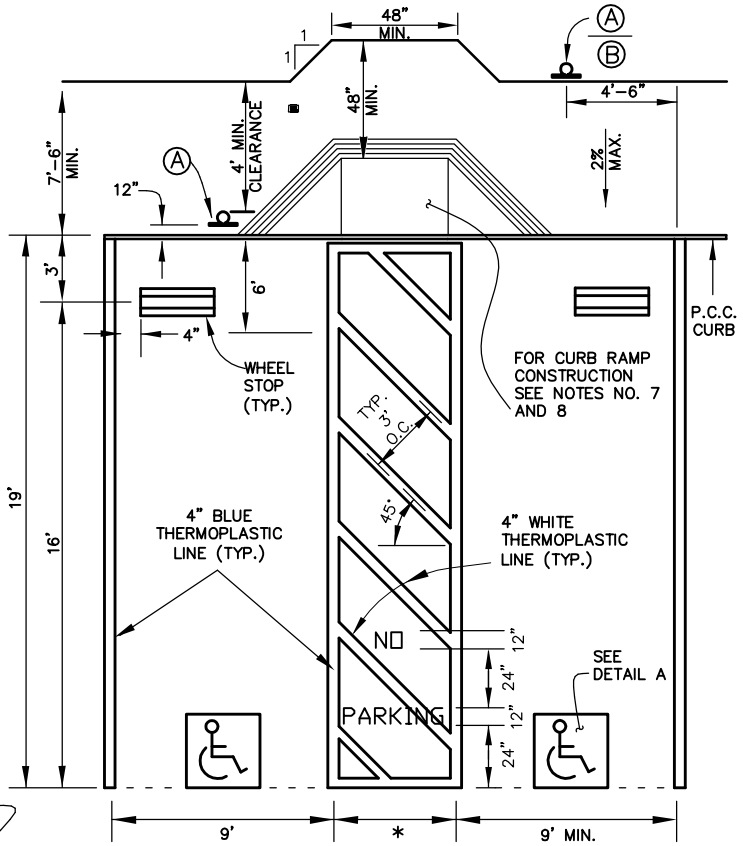
SIGN AND POST DETAIL

Ⓒ **DISABLED PARKING ENTRY SIGN**

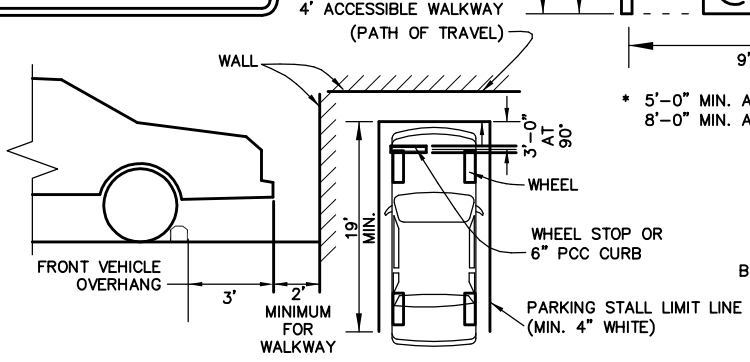
UNAUTHORIZED VEHICLES PARKED IN DESIGNATED ACCESSIBLE SPACES NOT DISPLAYING DISTINGUISHING PLACARDS OR LICENSE PLATES ISSUED FOR PERSONS WITH DISABILITIES MAY BE TOWED AWAY AT OWNER'S EXPENSE. TOWED VEHICLES MAY BE RECLAIMED AT THE **MARINA POLICE DEPT.** OR BY TELEPHONING **(831) 384-7575**

3/8"

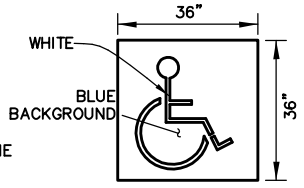
1. POSTED IN A CONSPICUOUS PLACE AT EACH ENTRANCE TO A PARKING FACILITY
2. CITY STANDARD SIGN WHITE LETTERS ON ON BLUE BACKGROUND. MINIMUM SIGN SIZE 22" x 17", MINIMUM 1" LETTER SIZE BOARDER IS 5/8" THICK WHITE



* 5'-0" MIN. AT TYP. STANDARD ACCESSIBLE PARKING STALL, OR 8'-0" MIN. AT VAN ACCESSIBLE PARKING STALL.



WHEEL STOP LOCATION



STALL PAVEMENT MARKING FOR ACCESSIBLE PARKING SPACE

DETAIL A

NOTES

1. DRAWING NOT TO SCALE.
2. PAVEMENT AND STRIPING SHALL BE IN THERMOPLASTIC.
3. TRAFFIC SIGN SHALL BE CONSTRUCTED OF 0.078 INCH THICK ALUMINUM ALLOY. SIGN MATIERIAL SHALL BE DIAMOND GRADE 3-M REFLECTIVE SHEETING OR APPROVED EQUAL. THE REFLECTIVE SHEETING SHALL CONFORM WITH THE FEDERAL SPECIFICATIONS L-S300A.
4. PARKING STALLS SHALL HAVE A MINIMUM OF SIDE CLEARANCE OF 1' FROM COLUMNS AND OTHER STRUCTURES. A 4' ACCESS WALKWAY IS REQUIRED UNDER TITLE 24 OF STATE REG.
5. ANGLED PARKING STALLS SHALL BE CONSTRUCTED ONLY AS APPROVED BY THE CITY ENGINEER.
6. LOCATION AND PLACEMENT OF CONTROL POINTS AND PRELIMINARY MARKINGS ARE SUBJECT TO APPROVAL BY THE CITY ENGINEER. SIGNS SHALL BE IN ACCORDANCE WITH SECTION 56-2 OF THE CITY STANDARD SPECIFICATIONS AND PLANS.
7. FOR ON-STREET PARKING, PEDESTRIAN ACCESSIBLE RAMPS SHALL CONFORM TO THE CITY OF MARINA'S STANDARD PLAN ST-4 OR ST-5.
8. FOR OFF-STREET PARKING, PEDESTRIAN ACCESSIBLE RAMPS SHALL CONFORM TO THE CITY OF MARINA'S STANDARD PLAN ST-4 OR ST-5. DETECTABLE WARNING SURFACE SHALL ONLY APPLY WHERE RAMP IS PROVIDED FOR A PEDESTRIAN TO CROSS A VEHICULAR WAY.

OFF STREET PARKING

(PARKING LOT OR GARAGE)

TABLE A

TOTAL NUMBER OF PARKING SPACES OR STALLS	MINIMUM NUMBER OF DISABLED ACCESSIBLE PARKING SPACES OR STALLS
1-25	1
26-50	2
51-75	3
76-100	4
101-150	5
151-200	6
201-300	7
301-400	8
401-500	9
501-1000	2 PERCENT OF TOTAL
GREATER THAN 1001	20 PLUS 1 FOR EACH 100 OR FRACTION THEREOF OVER 1001

APPROVED:

Acting City Engineer — Date

REVISION:

Date

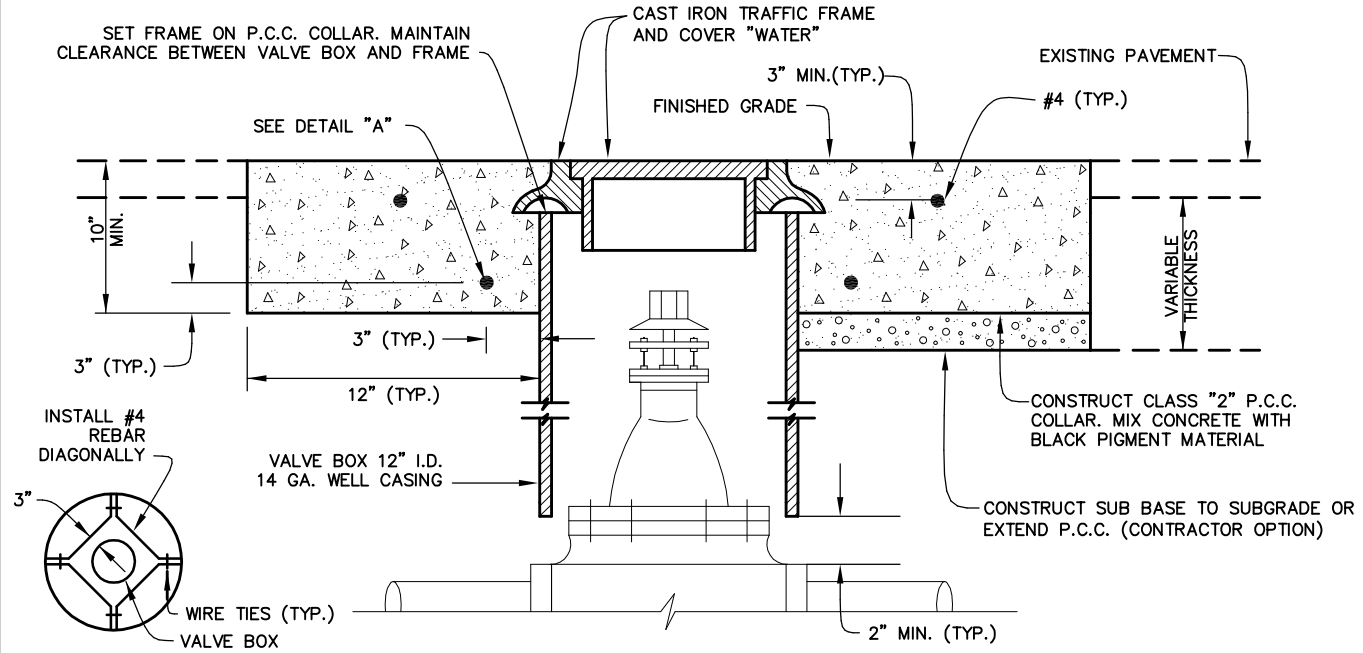
COMMUNITY DEVELOPMENT DEPARTMENT
PUBLIC WORKS DIVISION — CITY OF MARINA

TITLE

OFF STREET AND ON STREET ACCESSIBLE PARKING

STANDARD PLAN

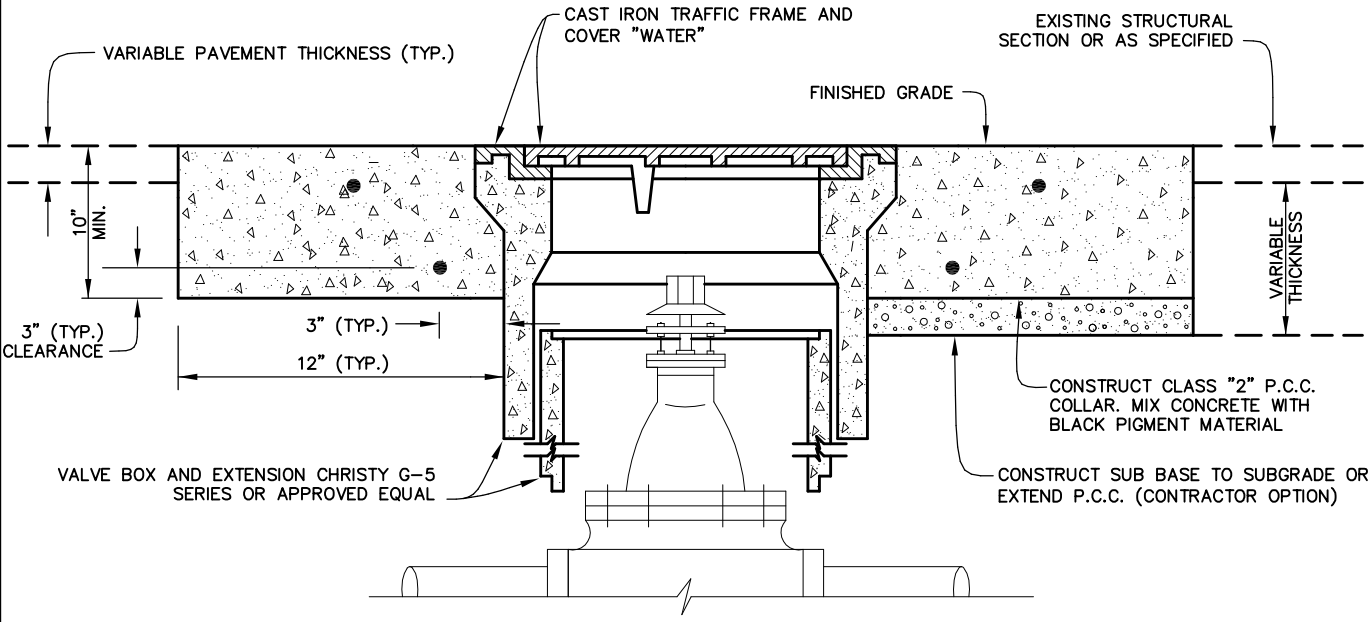
ST-14



DETAIL "A"

PLAN – (REINFORCED STEEL)

STEEL VALVE BOX DETAIL

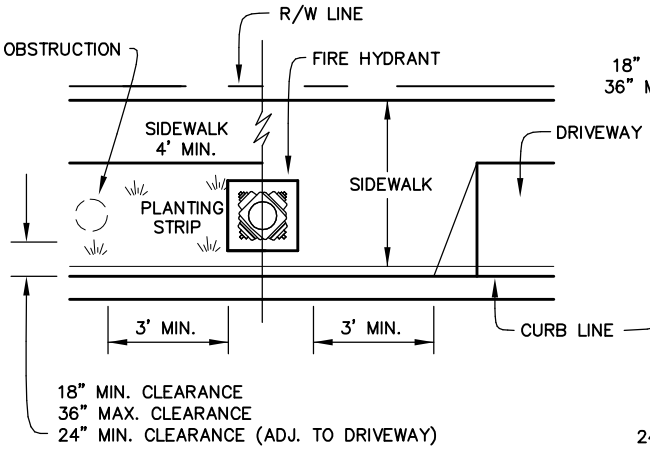


CONCRETE VALVE BOX DETAIL

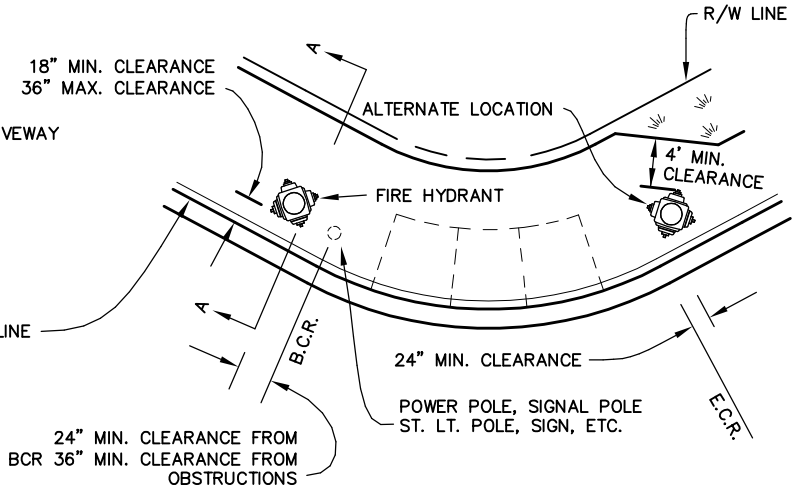
GENERAL NOTES

1. DRAWING NOT TO SCALE.
2. P.C.C. SHALL BE CLASS "2" PER SECTION 73 OF THE CITY STANDARD SPECIFICATIONS. MIX CONCRETE WITH BLACK PIGMENT MATIERIAL.
3. ALL CASTINGS SHALL BE GRAY CAST IRON CONFORMING TO ASTM A-48, CLASS 30 FREE FROM CRACKS, HOLES, SWELLS AND OTHER DEFECTS. ALL BEARING SURFACES SHALL BE MACHINED.

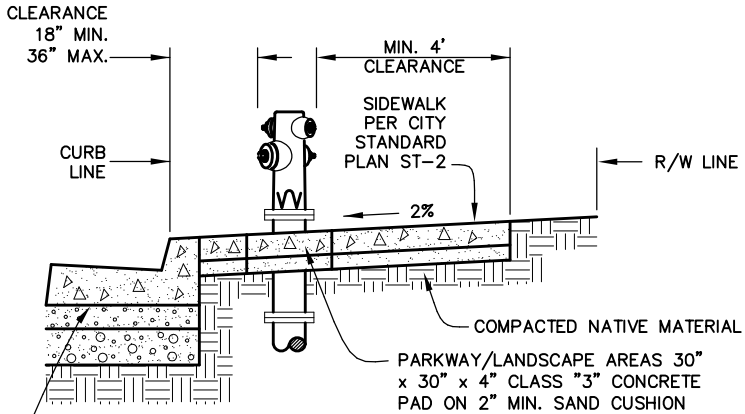
APPROVED: Acting City Engineer Date REVISION: Date		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE VALVE BOX INSTALLATION	STANDARD PLAN ST-15



CASE A: IN PARKWAY STRIP OR SIDEWALK

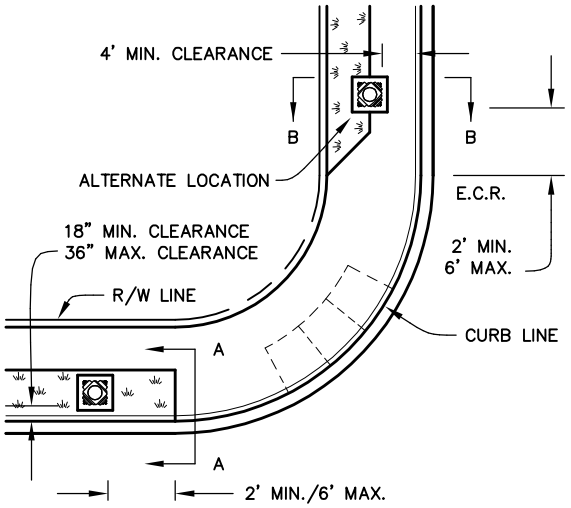


CASE B: IN SIDEWALK AT CURB RETURN

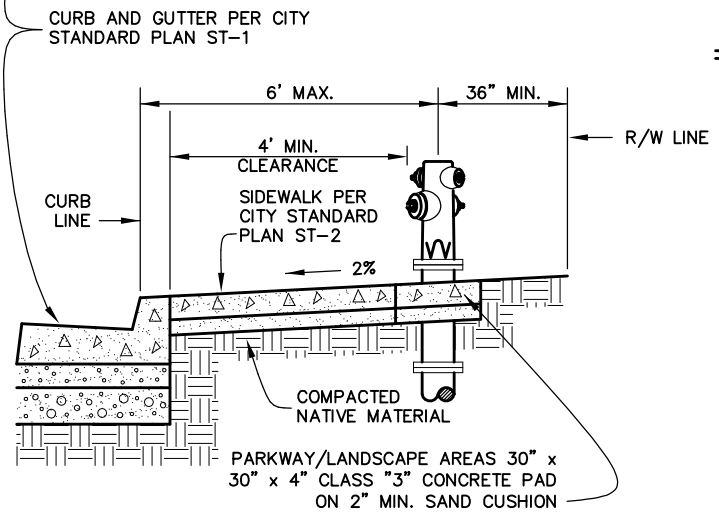


SECTION A-A

AT CURB RETURN AND MID BLOCK



CASE C: IN PARKWAY/PLANTER AT CURB RETURN



SECTION B-B

ALTERNATE LOCATION

GENERAL NOTES

1. DRAWING NOT TO SCALE.
2. SIDEWALKS ADJACENT TO FIRE HYDRANT LOCATIONS SHALL BE A MINIMUM 4' WIDE (CLEARANCE) FOR PEDESTRIAN TRAFFIC.
3. DETAILS SHOW PREFERRED HYDRANT LOCATIONS. NO DIMENSIONS OR DETAIL HEREON SHALL PRECLUDE THE FINAL LOCATION OF FIRE HYDRANT IN THE FIELD BY THE MARINA FIRE DEPARTMENT.
4. SEE CITY STANDARD PLAN ST-17 FOR FIRE HYDRANT PAVEMENT MARKER LOCATION.
5. LOCATION AND QUANTITY OF BLUE RAISED PAVEMENT MARKERS (TYPE BB RPM) SHALL BE PER CITY STANDARD PLAN ST-17 AND AS REQUIRED BY THE MARINA FIRE DEPARTMENT.

APPROVED:

Acting City Engineer — Date

REVISION:

Date

COMMUNITY DEVELOPMENT DEPARTMENT
PUBLIC WORKS DIVISION — CITY OF MARINA

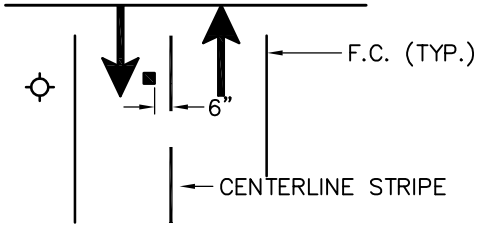
TITLE

FIRE HYDRANT LOCATION

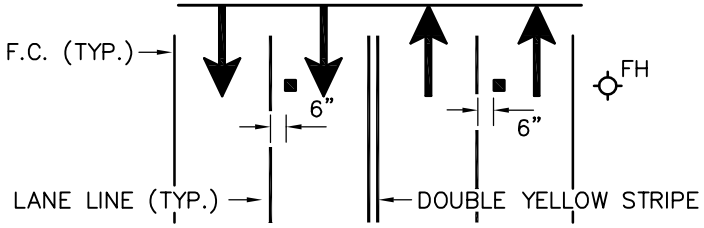
STANDARD PLAN

ST-16

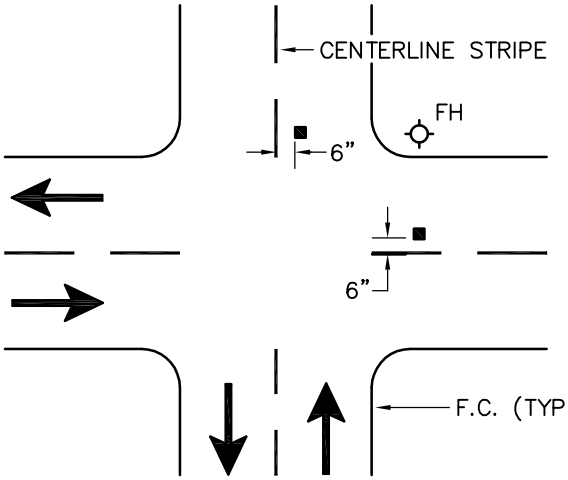
TWO LANE STREET



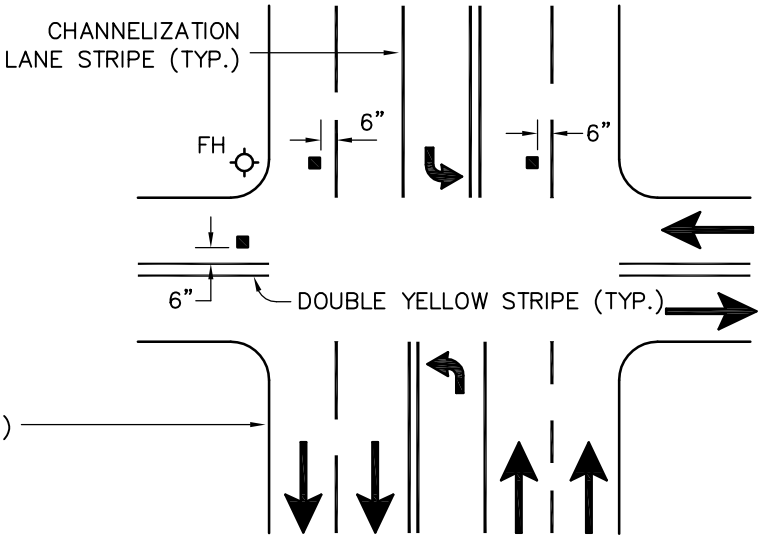
MULTI-LANE STREET



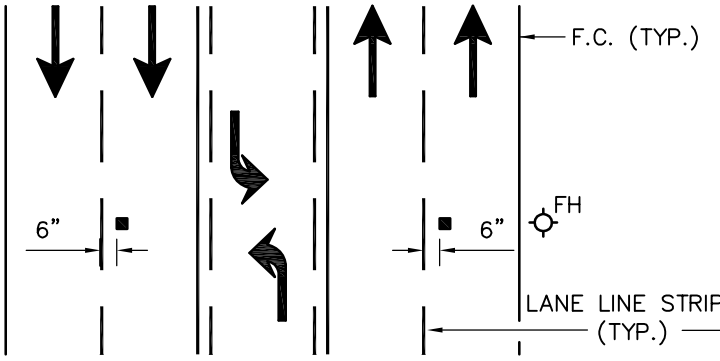
TWO LANE STREET AT INTERSECTION



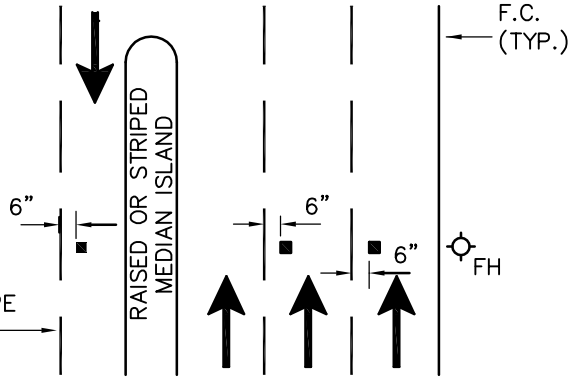
FOUR LANE STREET WITH TURN LANE AT INTERSECTION



MULTI-LANE STREET WITH TWO WAY LEFT TURN LANE



MULTI-LANE STREET WITH MEDIAN ISLAND



NOTES:

1. DRAWING NOT TO SCALE.

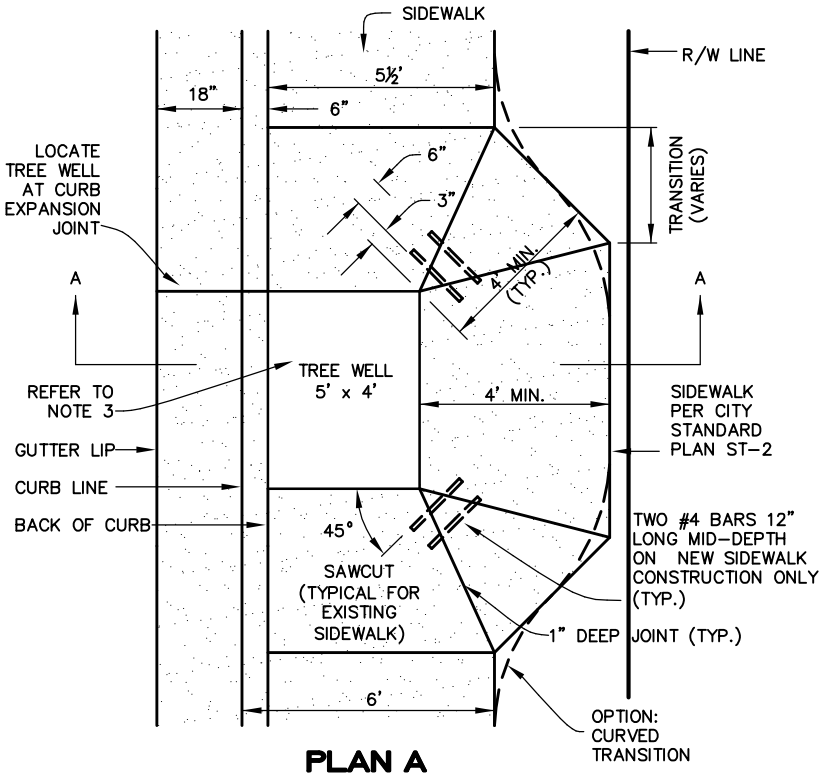
LEGEND

FH FIRE HYDRANT

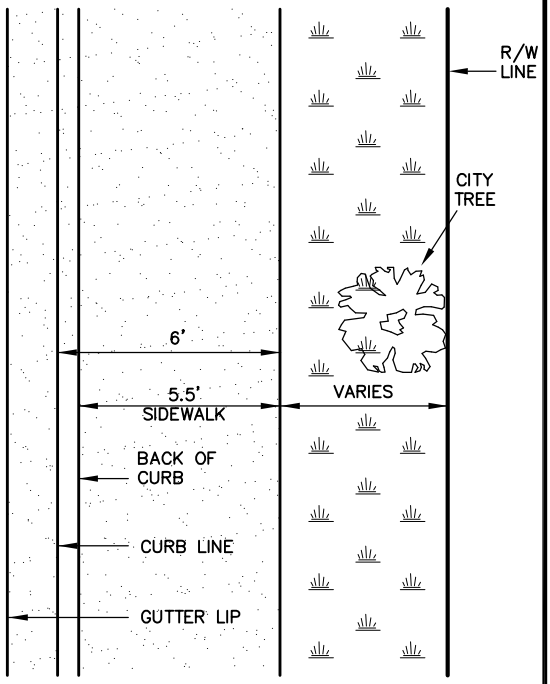
DIRECTION OF TRAVEL

TYPE BB: TWO WAY BLUE REFLECTIVE (HIGH INTENSITY) RAISED PAVEMENT MARKER HAWKINS VIEC – 88AB STIMSONITE OR EQUAL

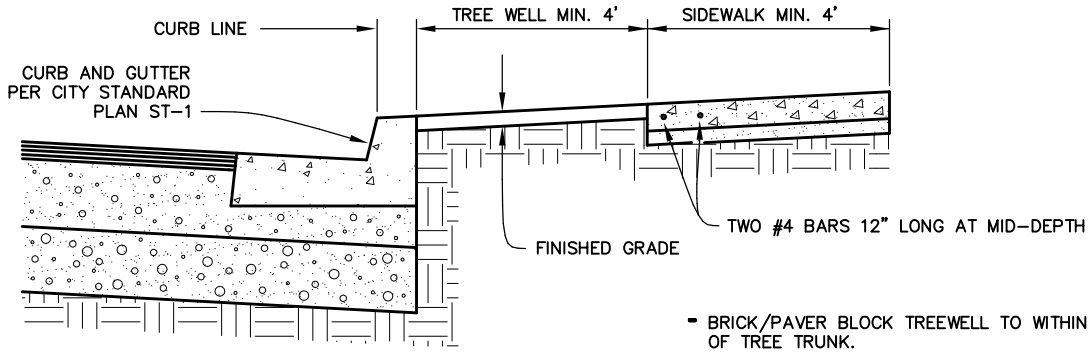
APPROVED: Acting City Engineer Date REVISION: Date		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE FIRE HYDRANT PAVEMENT MARKER LOCATION	STANDARD PLAN ST-17



PLAN A



ALTERNATE PLAN B



SECTION A-A

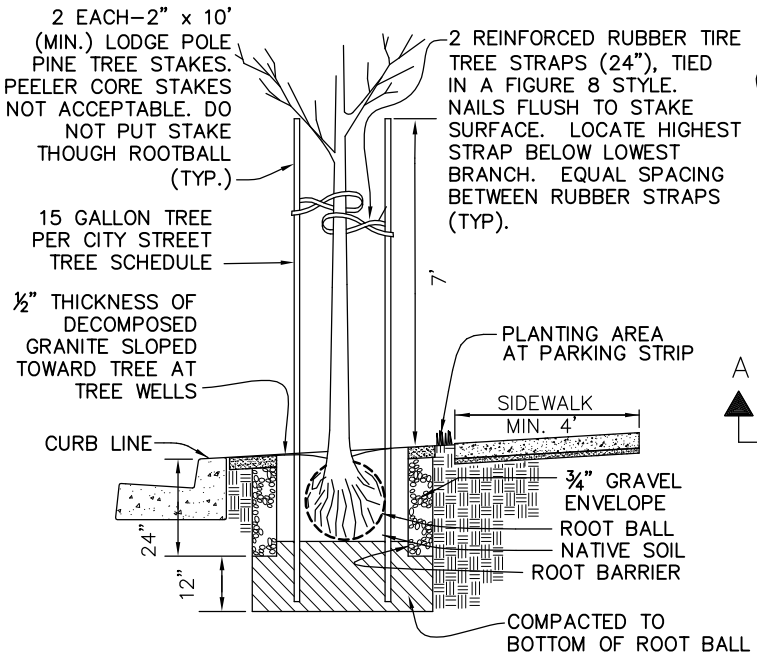
- BRICK/PAVER BLOCK TREEWELL TO WITHIN 6" OF TREE TRUNK.

OR - PROVIDE FRAME AND GRATE (GALV. STEEL) OR AS OTHERWISE INDICATED ON PLANS.

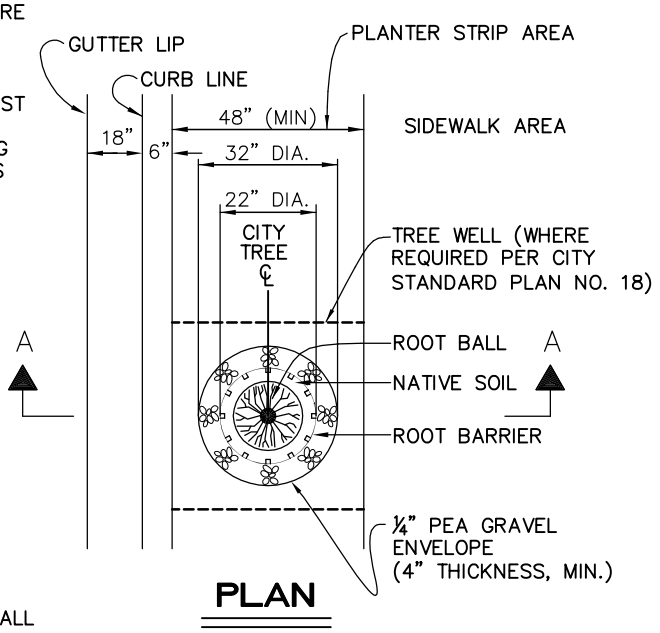
GENERAL NOTES

1. DRAWING NOT TO SCALE.
2. FOR STREET TREE PLANTING SEE CITY STANDARD PLAN ST-19.
3. TREE WELL SHALL BE 5' x 4' MINIMUM RECTANGLE.
4. UNLESS OTHERWISE SPECIFIED IN THE SPECIFICATIONS AND/OR PLANS ALL PLACEMENT OF TREE WELL LOCATIONS SHALL BE AS FOLLOWS:
   a. MINIMUM OF 40' FROM THE POINT OF INTERSECTION OF CURB LINE (P.I.).
   b. MINIMUM OF 40' FROM THE TRAFFIC SIGNAL POLES.
   c. MINIMUM OF 15' FROM COMMERCIAL DRIVEWAYS AND 10' FROM RESIDENTIAL DRIVEWAYS.
   d. MINIMUM OF 25' FROM CATCHBASINS, SANITARY SEWER MAINS AND LATERALS, AND MANHOLES.
   e. MINIMUM OF 5' FROM WATER METERS, WATER LINES, GAS LINES, STORM DRAIN LINES, AND UNDERGROUND ELECTRICAL LINES.
   f. MINIMUM OF 10' FROM FIRE HYDRANTS.
   g. MINIMUM OF 20' FROM STREET LIGHT POLES.
   h. MINIMUM OF 10' FROM UTILITY POLES.
   i. MINIMUM OF 40' TO 80' (AVERAGE SPACING IS 60' APART) OR ONE TREE PER LOT. SPECIES OF TREE WILL DETERMINE SPACING.

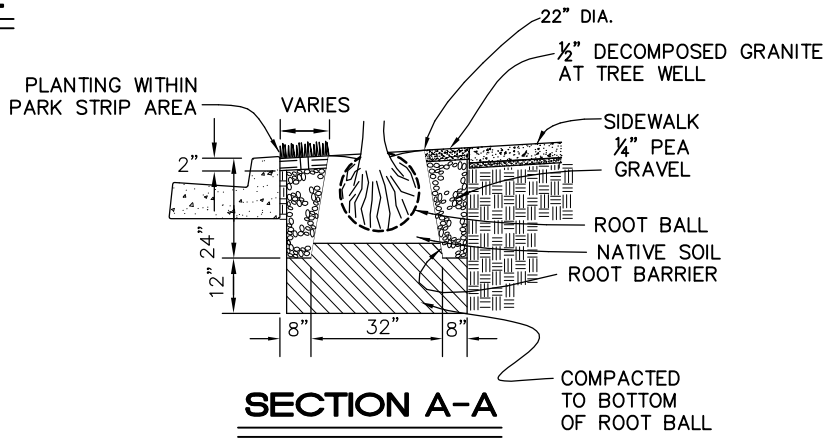
APPROVED: Acting City Engineer _____ Date _____ REVISION: _____ Date _____		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE TREE WELL	STANDARD PLAN ST-18



STAKING DETAIL



PLAN

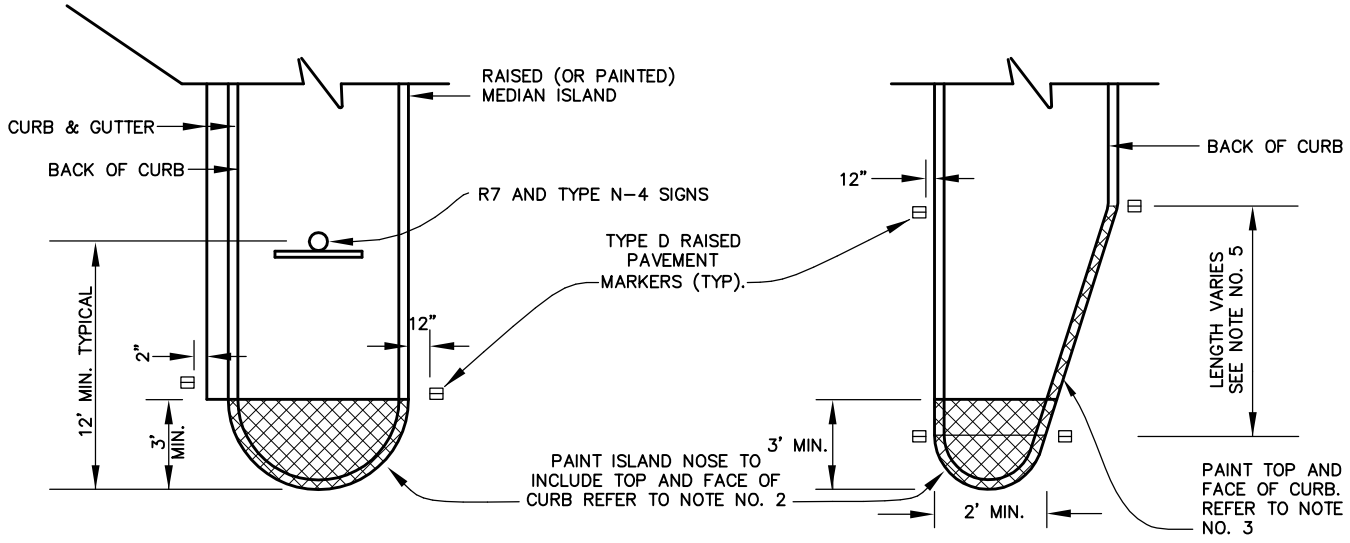


SECTION A-A

PLANTING NOTES

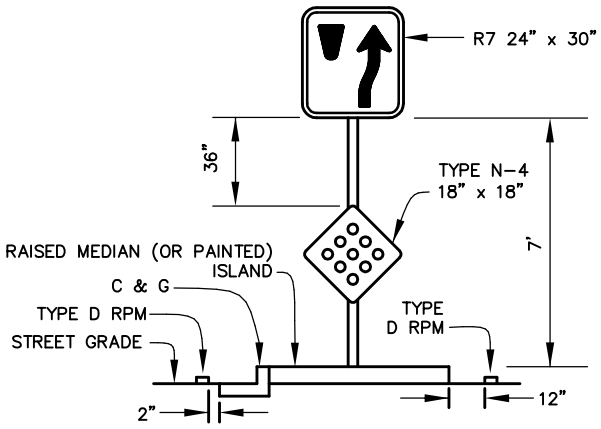
1. DRAWING NOT TO SCALE.
2. ALL STREET TREES SHALL BE 15 GALLON AND MEET THE AMERICAN STANDARD FOR NURSERY, OR AS DIRECTED BY THE CITY ENGINEER. TREE SHOULD STAND UPRIGHT W/OUT STAKES.
3. ROOT BARRIERS SHALL BE THE "SHAWTOWN" NO. FI–15, THE "DEEP ROOT" NO. UB 24–2, OR APPROVED EQUAL. THE ONE PIECE BARRIER SHALL HAVE TAPERED SIDES AND BE CONSTRUCTED OF .085 IN. MINIMUM THICKNESS HIGH IMPACT POLYPROPYLENE PLASTIC (HIPP) WITH ADDED ULATRAVIOLET INHIBITORS.
4. THE LOWER 12" OF THE EXCAVATION SHALL BE BACKFILLED AND COMPACTED WITH NATIVE SOIL. PRIOR TO PLACING THE ROOT DEFLECTOR, BACKFILL ¼" PEA GRAVEL ENVELOPE AROUND DEFLECTOR AFTER TREE PLANTING.
5. NATIVE SOIL SHALL BE PLACED IN THE PLANTING HOLE AND COMPACTED TO THE BOTTOM OF THE ROOT BALL ELEVATION. PLANT TREE IN PLANTER, BACKFILL WITH NATIVE SOIL AND COMPACT.
6. AFTER PLANTING, TREE SHALL BE WATERED WITH 20 GALLONS OF WATER. REPEAT WATERING TWICE IN THE NEXT 7 DAYS, AT 48 HOUR INTERVALS.
7. CITY STREET TREE PLANTING SHALL INCLUDE TREE PLANTING IN TREE WELLS OR WITHIN PARKING STRIPS. PAYMENT FOR TREE PLANTING SHALL INCLUDE EXCAVATION, SOIL PREPARATION, ROOT DEFLECTOR AND INSTALLATION, BACKFILL, TREE, AND THE ITEMS DESCRIBED ON THIS PLAN.
8. UPON APPROVAL OF THE CITY ENGINEER AND THE DIRECTOR OF MAINTENANCE SERVICES, ROOT CONTROL BARRIER MAY BE DELETED DUE TO SPECIAL CIRCUMSTANCES WHICH MAKE THE ROOT CONTROL BARRIER UNUSABLE OR UNNECESSARY.
9. PLANTING SPACING 40'–60'. SEE CITY STANDARD PLAN ST–18 FOR CLEARANCE STANDARDS.

APPROVED: Acting City Engineer _____ Date _____ REVISION: _____ Date _____		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE STREET TREE PLANTING	STANDARD PLAN ST–19

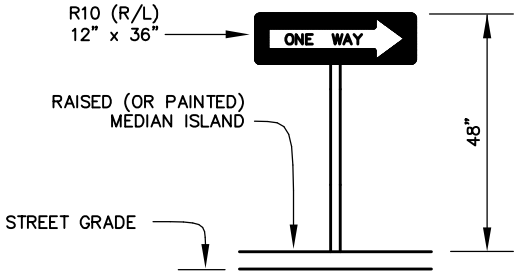


EXISTING OR NEW ISLAND NOSE

EXISTING OR NEW TAPERED ISLAND



TYPICAL INSTALLATION AT MEDIAN ISLAND NOSE

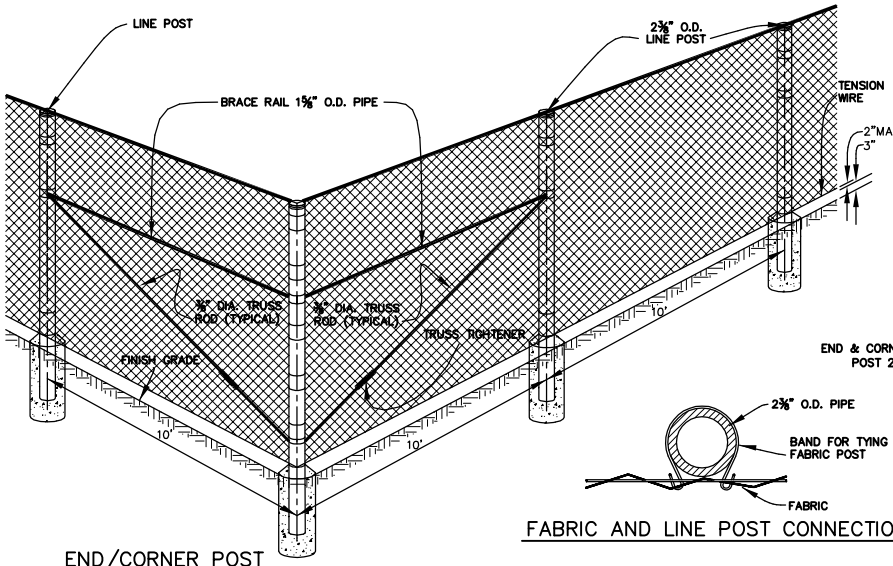


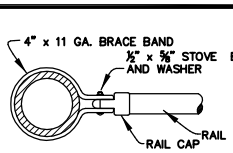
TYPICAL INSTALLATION AT MEDIAN FOR COMMERCIAL DRIVEWAY EXIT

NOTES

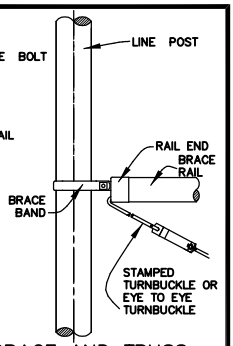
1. DRAWING NOT TO SCALE.
2. PAINT ISLAND NOSE (TO INCLUDE FACE AND TOP OF CURB) WITH YELLOW REFLECTIVE PAINT WITH GLASS BEADS. DO NOT PAINT BEYOND FULL WIDTH OF ISLAND.
3. FOR TAPER AT ISLAND, PAINT TOP AND FACE OF CURB WITH YELLOW REFLECTIVE PAINT WITH GLASS BEADS. DO NOT PAINT BEYOND FULL WIDTH OF ISLAND.
4. FOR ADDITIONAL STRIPING AND RAISED PAVEMENT MARKING REQUIREMENTS AT MEDIAN ISLAND REFER TO CALTRANS STANDARD DETAILS.
5. TAPER LENGTH ON THE TAPERED ISLAND SHALL BE DETERMINED BY THE CITY ENGINEER.
6. INSTALL TYPE D, TWO WAY YELLOW REFLECTIVE (HIGH INTENSITY) RAISED PAVEMENT MARKERS.
7. TRAFFIC SIGNS SHALL BE CONSTRUCTED OF 0.08 INCH THICK ALUMINUM ALLOY.
8. TRAFFIC SIGNS SHALL HAVE DIAMOND GRADE 3-M REFLECTIVE SHEETING OR EQUAL. THE REFLECTIVE SHEETING SHALL CONFORM WITH THE FEDERAL SPECIFICATIONS L-S300A.
9. R7 SIGN SHALL HAVE A WHITE BACKGROUND WITH A BLACK BORDER AND LEGENDS ALL REFLECTIVE.
10. TYPE N-4 SIGN SHALL BE BLACK UNREFLECTIVE BACKGROUND WITH NINE 3" YELLOW DIAMOND GRADE 3-M REFLECTIVE SHEETING REFLECTORS AFFIXED.
11. R10 SIGN SHALL HAVE A BLACK BACKGROUND WITH A WHITE ARROW AND BLACK LETTERS ALL REFLECTIVE.

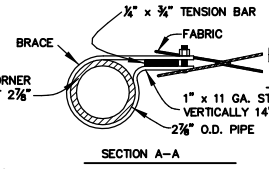
APPROVED: Acting City Engineer _____ Date _____ REVISION: _____ Date _____		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE MEDIAN ISLAND DETAILS	STANDARD PLAN ST-20





RAIL CLAMP DETAIL



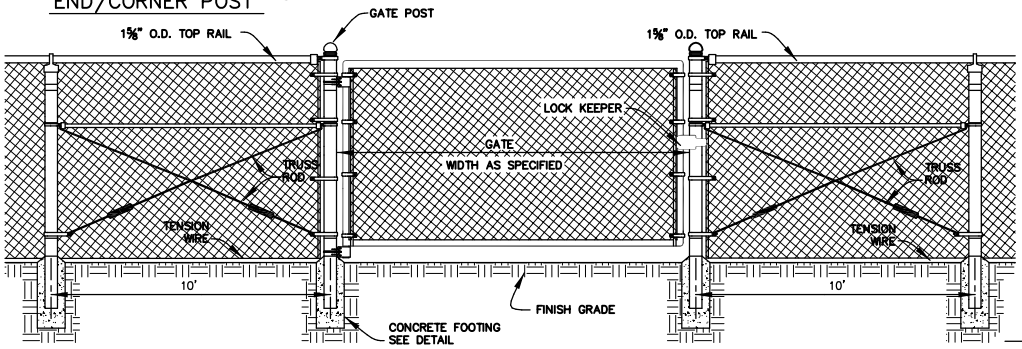


BRACE AND TRUSS CONNECTION

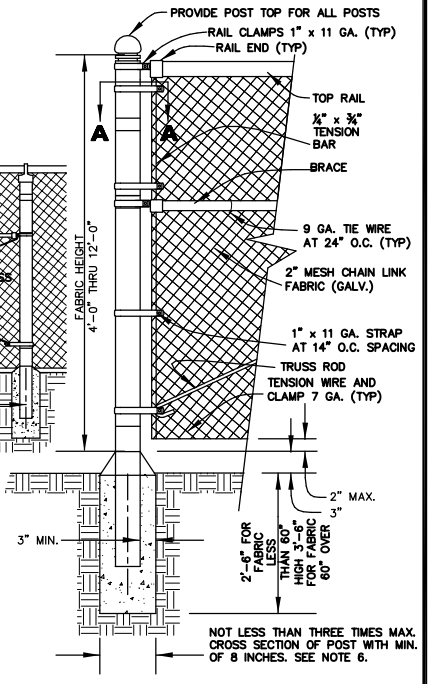
SECTION A–A

FABRIC AND LINE POST CONNECTION

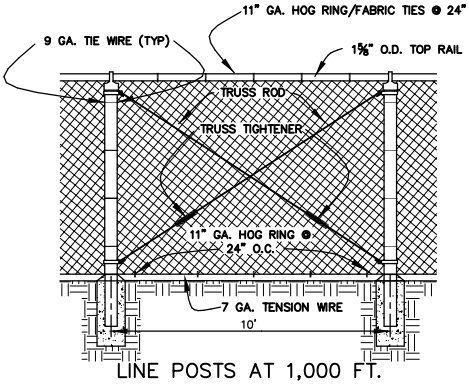
END/CORNER POST



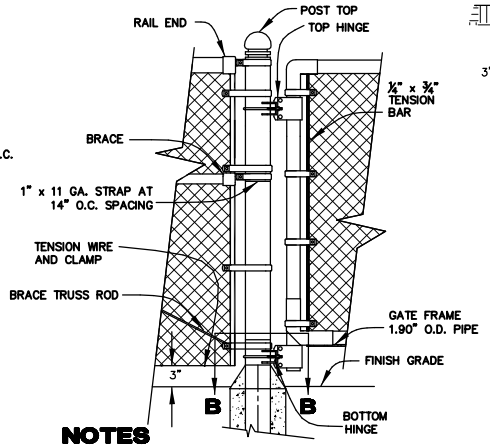
TYPE CL–4=48" FABRIC
TYPE CL–6=72" FABRIC
TYPE CL–8=96" FABRIC

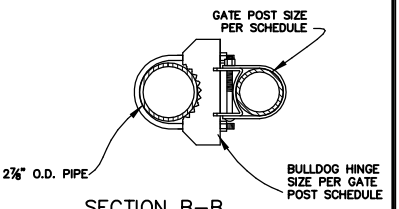


END & CORNER POST ASSEMBLY



LINE POSTS AT 1,000 FT. MAXIMUM INTERVALS TRUSSED IN BOTH DIRECTIONS





SECTION B–B

NOTES

1. DRAWING NOT TO SCALE.
2. CHAIN LINK FABRIC SHALL BE 11–GAUGE FOR ALL FENCES 60 INCHES OR LESS IN HEIGHT AND SHALL BE 9–GAUGE FOR ALL FENCES OVER 60 INCHES IN HEIGHT, UNLESS OTHERWISE SPECIFIED.
3. IN BALL PARK AREA, CHAIN LINK FENCE FABRIC SHALL BE 9–GAUGE FOR ALL HEIGHTS UNLESS OTHERWISE SPECIFIED.
4. TRUSS RODS SHALL HAVE TRUSS TIGHTENERS OR ADJUSTABLE TAKE–UP APPROVED BY THE CITY ENGINEER.
5. GATE SHALL BE PROVIDED WITH LOCK KEEPER. IF BEAM TYPE POST IS TO BE USED, TYPE AND SIZES SHALL BE APPROVED BY THE CITY ENGINEER BEFORE CONSTRUCTION.
6. ALL CONCRETE SHALL BE CLASS "3" PER STANDARD SPECIFICATIONS.
7. ALL PIPE SHALL BE SCHEDULE 40 GALVANIZED STEEL.
8. TOP RAIL SHALL BE 1⅝" O.D. PIPE.

GATE POST SCHEDULE

HEIGHT	GATE WIDTH	SIZE O. D.
6 FEET AND LESS	UP TO 6'	2⅞"
	7' TO 13'	4"
	14' TO 18'	6⅝"
	OVER 18'	8⅝"
OVER 6 FEET	UP TO 6'	3½"
	7' TO 13'	4½"
	14' TO 18'	6⅝"
	OVER 18'	8⅝"

APPROVED:

Acting City Engineer — Date

REVISION:

Date

COMMUNITY DEVELOPMENT DEPARTMENT
PUBLIC WORKS DIVISION — CITY OF MARINA

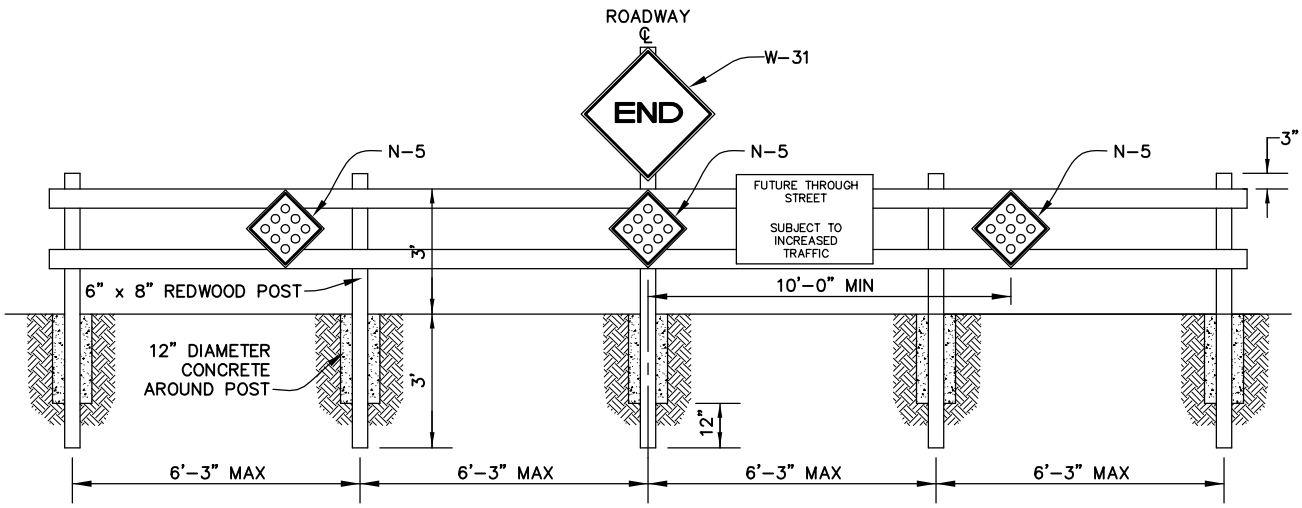
TITLE

CHAIN LINK FENCE

STANDARD PLAN

ST–21

SIGNS
THREE TYPE N–5 = N81–5 RED 9 DOT
ONE TYPE W–31

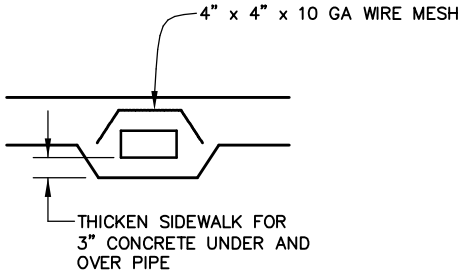


WOODEN RAIL BARRICADE

NOT TO SCALE

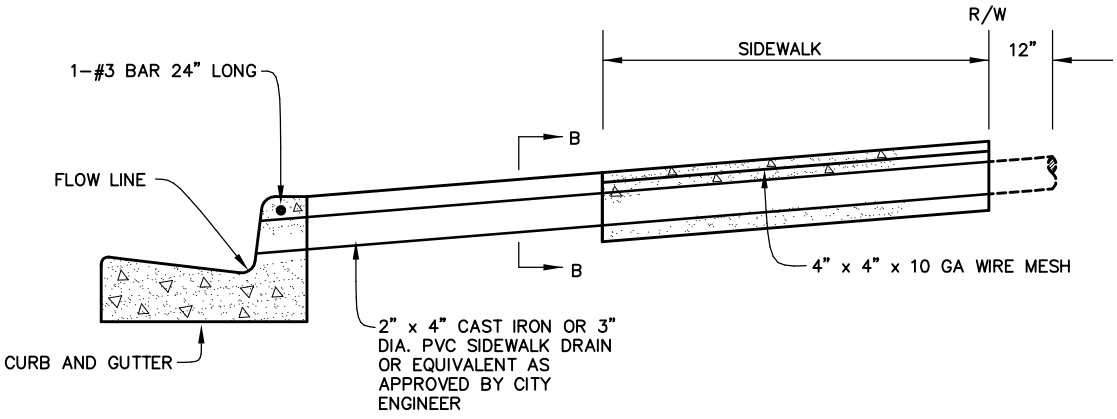
1. DRAWING NOT TO SCALE.
2. INSTALL 6" x 8" REDWOOD OR PRESSURE TREATED DOUGLAS FIR POST NO MORE THAN 6'–3" APART AND NO LESS THAN 3' INTO THE GROUND.
3. POUR A 12" DIAMETER CONCRETE COLLAR AROUND EACH POST TO A DEPTH OF 12" ABOVE THE POST BASE.
4. CROSSBARS SHALL BE 2" x 6" DOUGLAS FIR SELECT, WITH A MINIMUM LENGHT OF 16'.
5. ATTACH CROSSBAR WITH $\frac{1}{2}$" x 8" GALVANIZED BOLTS. 2 MINIMUM AT EACH POST. USE 4 BOLTS AT SPLICE.
6. PAINT WITH NO LESS THAN 2 COATS OF OUTSIDE WHITE HI–GLOSS ENAMEL PAINT.
7. INSTALL THREE 18" (TYPE N–5) REFLECTORS WITH 9–3" SCOTCHLITE CIRCLETS. INSTALL ONE W–31 AS SHOWN. MOUNT SIGNS ON 18" x 18" x 3/4" PLYWOOD BACKING ALSO PAINTED WITH 2 COATS OF OUTSIDE WHITE ENAMEL. ADDITIONAL REFLECTOR SIGNS MAY BE REQUIRED FOR WIDE STREETS.
8. BARRICADE TO EXTEND TO BACK OF SIDEWALK WHEN SIDEWALK IS PRESENT.
9. AT THE DIRECTION OF THE CITY INSTALL 24" x 36" REFLECTORIZED SIGN WITH 4" BLACK LETTERS ON WHITE BACKGROUND STATING "FUTURE THROUGH STREET SUBJECT TO INCREASED TRAFFIC".

APPROVED: Acting City Engineer Date REVISION: Date	Marina 1975	COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE WOODEN BARRICADE	STANDARD PLAN ST–22



SECTION B-B

NOT TO SCALE



CURB DRAIN

NOT TO SCALE

APPROVED: Acting City Engineer Date REVISION: Date		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE CURB DRAIN	STANDARD PLAN ST-23

This sign shall be posted at all entrances to commercial or residential areas that have designated fire lanes.

1. The words FIRE LANE shall be white reflective on red background and no smaller than 4 inches in height.

2. Lettering shall be red on white reflective background, no smaller than 2 inches in height. For areas with Fire Lane signs only and no red curbing. It may read “NO PARKING IN MARKED ZONES”.

3. Lettering shall be red on white reflective background, no smaller than 1 inch in height.

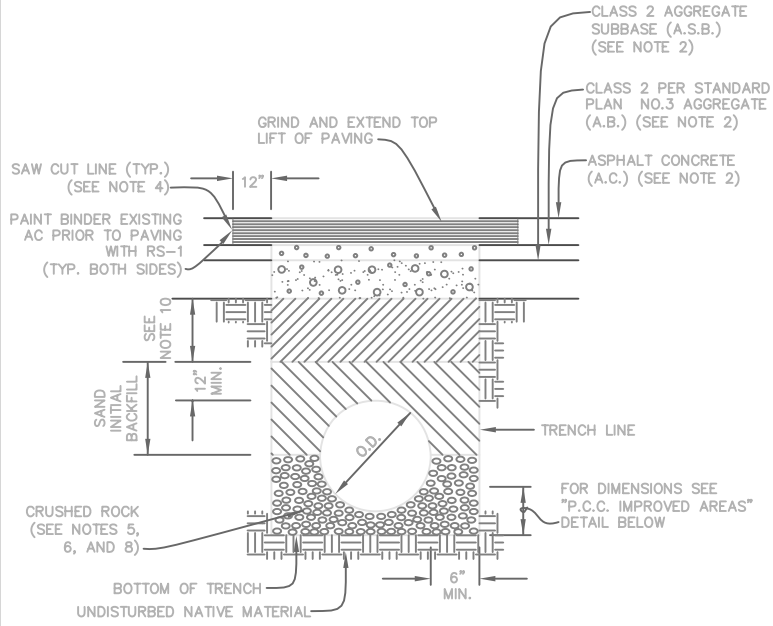
4. The sign shall be no smaller than 18 inches wide by 30 inches high.

5. The sign shall be securely mounted facing the direction of travel and clearly visible to oncoming traffic entering the designated area. Signs shall be of durable material and installed per Guidelines for Sign Mounting.

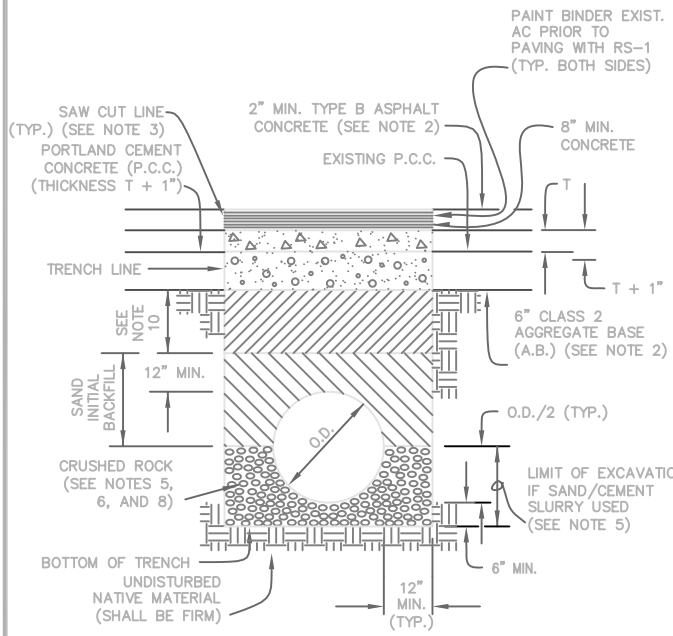
APPROVED: Acting City Engineer Date REVISION: Date		COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE FIRE LANE ENTRANCE SIGN	STANDARD PLAN ST-24

GENERAL NOTES

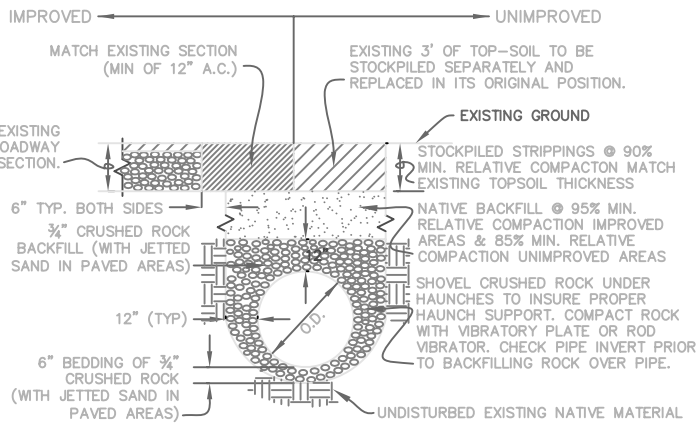
1. DRAWING NOT TO SCALE.
2. THE STRUCTURAL SECTION MUST MATCH THE EXISTING STRUCTURAL SECTION OF THE ROADWAY AC, AB, ASB, AND ANY OTHER EXISTING COMPOUND.
3. FOR BACKFILL MATERIALS AND COMPACTION METHODS SEE SECTION 19-3 OF THE CITY STANDARD SPECIFICATIONS. INTERMEDIATE BACKFILL SHALL BE COMPACTED TO 95% RELATIVE COMPACTION IN UNIMPROVED AREAS.
4. ALL STREET CUTS SHALL BE NEATLY SAWCUT ON TRUE LINE TO 1½" MINIMUM DEPTH.
5. TWO SACK CEMENT SLURRY BACKFILL SHALL BE USED AS INTERMEDIATED BACKFILL IF TRENCH IS LESS THAN 18" WIDE OR IN PATCH AREAS LESS THAN 100 SQ FT.
6. CRUSHED ROCK BEDDING SHALL CONFORM WITH AGGREGATE GRADATIONS OF SECTION 19-4.022A (1) OF THE CITY STANDARD SPECIFICATIONS. CRUSHED ROCK BACKFILL SHALL BE PROVIDED WITH JETTED SAND IN PAVED AREAS.
7. STRUCTURAL SECTION REQUIREMENTS SHALL NOT APPLY TO UNIMPROVED AREAS.
8. CRUSHED ROCK MAY BE REPLACED WITH INTERMEDIATE BACKFILL MATERIAL FOR ALL PIPE INSTALLATIONS OTHER THAN STORM DRAIN LINES AND SANITARY SEWER LINES PROVIDED NOTE 5 DOES NOT APPLY.
9. CRUSHED ROCK OR SLURRY CEMENT BACKFILL WILL NOT BE REQUIRED IF MONOLITHIC CONCRETE PIPE IS INSTALLED.
10. COMPACTED INTERMEDIATE BACKFILL (SEE NOTES 2 AND 5).
11. TRENCH WIDTH SHOWN ON PLANS FOR PAVEMENT RESTORATION MAY VARY FROM ACTUAL WIDTH REQUIRED TO PERFORM NECESSARY WORK DEPENDING UPON METHOD FOR TRENCH SHORING/PROTECTION USED BY CONTRACTOR.
12. ALL PAVEMENT MARKINGS AND RAISED PAVEMENT MARKERS OBLITERATED DURING CONSTRUCTION SHALL BE REPAINTED AND OR REPLACED BY THE CONTRACTOR.
13. TRENCH DIMENSION FOR ROUNDED BOTTOM CAN BE ADJUSTED SUBJECT TO CITY ENGINEER'S APPROVAL.



A.C. IMPROVED AREAS

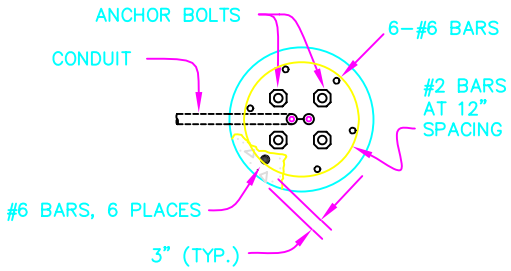


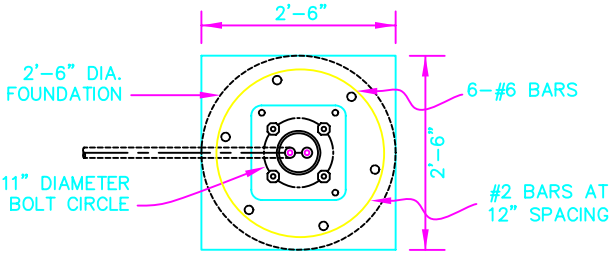
P.C.C. IMPROVED AREAS



TYPICAL TRENCH/BACKFILL SECTION FOR P.V.C. AND H.D.P.E. PIPE

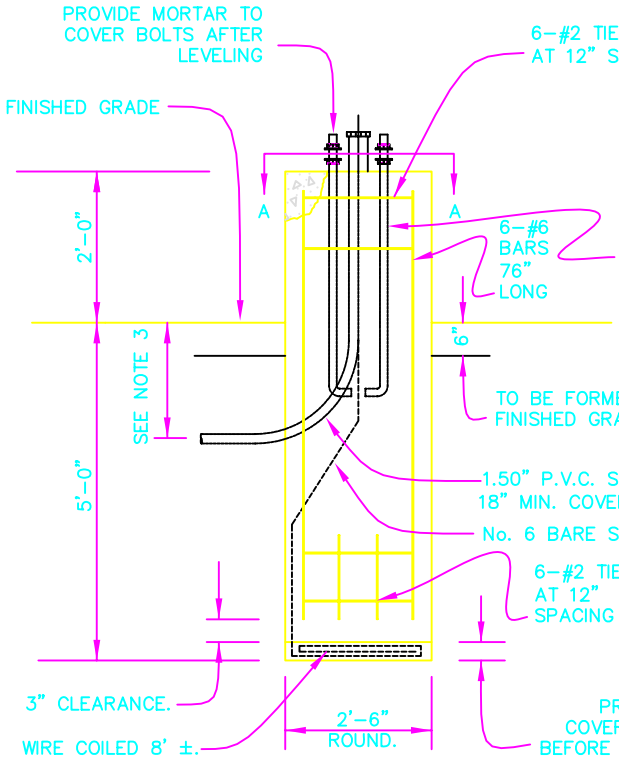
APPROVED: Acting City Engineer Date REVISION: Date	COMMUNITY DEVELOPMENT DEPARTMENT PUBLIC WORKS DIVISION CITY OF MARINA TITLE TRENCH BACKFILL AND SURFACE RESTORATION	STANDARD PLAN ST-25



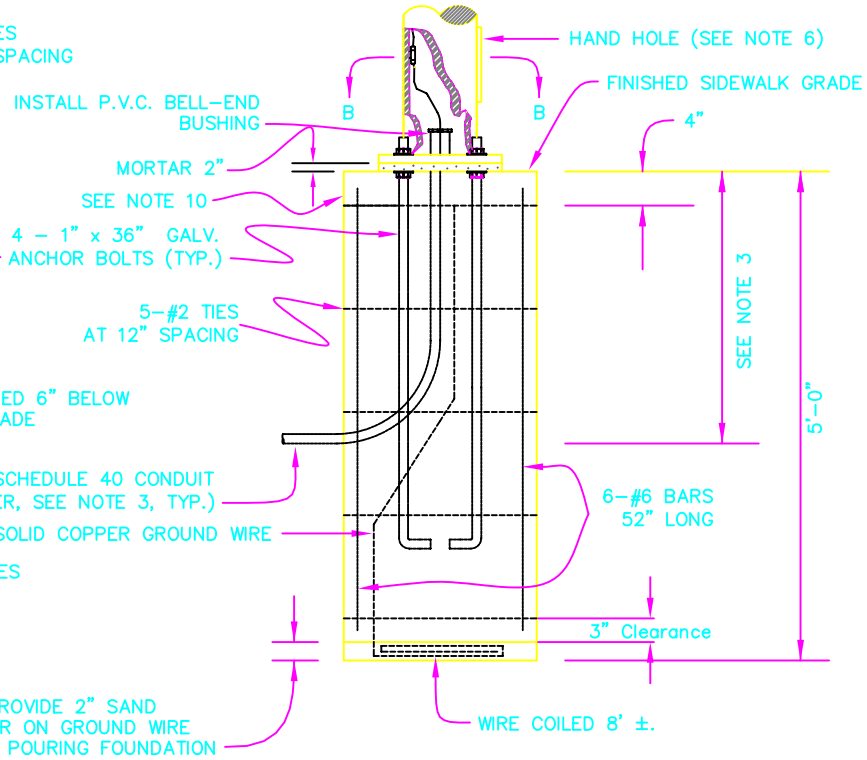


SECTION A-A

SECTION B-B



PARKING AREA LIGHT FOUNDATION



STREET LIGHT FOUNDATION

GENERAL NOTES

1. DRAWING NOT TO SCALE.
2. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE CITY STANDARD SPECIFICATIONS, ELECTRIC CODE AND P.U.C.'S G.O. 95A.
3. CONDUIT COVER SHALL BE 18" MINIMUM IN SIDEWALK PARKWAY STRIP AND MEDIAN ISLAND AREAS AND 30" MINIMUM UNDER STREETS OR PROPERTY EASEMENTS.
4. ALL CONCRETE SHALL BE CLASS "3" PER CITY STANDARD SPECIFICATIONS.
5. FURNISH AND INSTALL ALL MATERIALS.
6. FOR BASE DETAILS, SEE CITY STANDARD PLAN E–3.
7. FOR STREET LIGHT POLE AND NUMBER LOCATION DETAIL, SEE CITY STANDARD PLAN E–4.
8. FOR FUSE CONNECTOR, SEE CITY STANDARD PLAN E–2.
9. FOR TYPICAL SERVICE POLE DETAIL AND UNDERGROUND SERVICE, SEE CITY STANDARD PLAN E–4.
10. COMPLETE THIS SQUARE LEVELING PORTION OF FOUNDATION AFTER ERECTING AND LEVELING POLE.

APPROVED:

Acting City Engineer Date

REVISION:

Date

COMMUNITY DEVELOPMENT DEPARTMENT
PUBLIC WORKS DIVISION CITY OF MARINA

TITLE

P.C.C. LIGHTING FOUNDATION

STANDARD PLAN

E–1

2006 City of Marina Standard Plans
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