

PROCEDURES GUIDELINES AND DESIGN REQUIREMENTS



Revised: December 2009

Marina Coast Water District
11 Reservation Road
Marina, CA 92933
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FOREWORD

The Marina Coast Water District adopted the *Procedures Guidelines and Design Requirements* and the *Standard Plans and Specifications for Construction of Domestic Water, Sewer and Recycled Water Facilities* on September 24, 2003. This revision is consistent with Board Action which anticipated periodic updates and modifications. The purpose of these documents is to ensure that construction of all facilities to be operated and maintained by the District is standardized wherever possible. Sections 100–600 were revised in 2007 and replace the previous versions dated August 2005. Section 700 was revised in 2009.

These documents may contain minor errors, discrepancies or omissions. The District reserves the right to make changes to these documents at any time. If users of these documents identify recommended changes, we ask you to please notify the Marina Coast Water District in writing at the following address:

Marina Coast Water District
Deputy General Manager / District Engineer
11 Reservation Road
Marina, CA 93933

REVISIONS

The *Procedures Guidelines and Design Requirements* and the *Standard Plans and Specifications for Construction of Domestic Water, Sewer and Recycled Water Facilities* will be reviewed and may be revised periodically, as needed. Each revision will bear the date of the revision and that data shall be considered the latest edition as referred to the herein and in all subsequent advertisements, permits, and Contract Documents.

MCWD will no longer provide hardcopies or CDs of these standards. They will remain posted at the MCWD Website: www.mcwd.org.

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SECTION 100

**GENERAL STEPS FOR PROCURING DOMESTIC WATER, SEWER
AND RECYCLED WATER SERVICE FROM
MARINA COAST WATER DISTRICT**

100.1 PURPOSE

The purpose of the Procedures Guidelines and General Design Requirements (Guidelines) is to provide Marina Coast Water District (District) customers with a guide to the District procedures. These Guidelines also provide a listing of the general design criteria for each of the three types of systems the District operates or plans to operate and maintain; domestic water, sewer, and recycled water. These guidelines are to be used in conjunction with the District's Code, and the "MCWD Standard Plans and Specifications".

100.2 WATER AND SEWER SERVICE

If the applicant or his/her agent is applying for a business license, a building permit, or seeking approval of any planning documents and maps from a land use agency, then the applicant must apply for water and sewer service. The applicant must complete the Residential Connection Form and Permit Application (See Appendix 1); the Commercial Connection Form and Permit Application (See Appendix 2); or enter into a Construction and Transfer of Water, Sewer, and Recycled Water Infrastructure Agreement (See Appendix 3) with the District. This includes all entities that may or may not propose structural improvements to its business, structure, or property. This includes all applicants with or without an existing water meter or sewer lateral to its business, structure, or property. The applicant must pay all applicable fees and charges, and if required, capacity charges prior to receiving service. The applicant must also comply with all other applicable design, construction and District Code requirements prior to receiving service.

100.3 ANNEXATION TO EXISTING DISTRICT AREA

If the proposed development is not included within the existing MCWD service area, the developer must file a formal application for annexation to the District. The request for annexation must be submitted to the District's General Manager for action by the District's Board of Directors. The request must be accompanied by a complete legal description of the property to be annexed, three (3) copies of the property map, and the appropriate fees as determined by the District. The applicant should allow a minimum of 180 days for processing the annexation request.

100.4 WILL SERVE LETTERS

For proposed developments within the District's boundaries, the developer must request a "Will Serve" letter from the District. These documents are required by the local jurisdictional agencies for processing Tentative Tract Maps or development reviews. For a copy of a sample letter, see Appendix 4.

100.5 APPLICATION PROCESSING

The approval process prior to receiving water and sewer service varies slightly. There are generally three categories of projects. The first category is for subdivisions. The second category is for projects which are limited to a single lot, like the construction or modification of residential and/or commercial units.

The third category is for existing structures where *no* or only minor structural or plumbing fixture changes are proposed. The application review process for each category is shown on the flow chart referenced as Figure 100-1.

The specific information required for each submittal is included in Section 200. For a more detailed application process flow chart that contains appropriate references for each sub-section, please see Figures 100-2 through 100-4.

100.6 SUBDIVISION APPROVAL PROCESS

For subdivisions, the developer must design water and sewer improvements to comply with the District design standards prior to submitting the improvement plans and other required information to the Engineer for his/her processing. The Plan Check Engineer, District Engineer or his/her designee will review all water and sewer conceptual plans or construction plans and specifications and may require revision, modifications, or redesign of any concepts, drawings, details or specifications submitted. **Construction must begin within one year of the approved water and/or sewer construction drawings.** If more than one year has elapsed, the project must go through plan check procedure again before starting construction. The steps to obtain plan or project site map approval are as follows:

100.6.1 Preliminary Planning Meetings.

The developer must schedule a meeting with District staff to discuss the proposed project. The developer must provide the District preliminary planning documents for review and comment. Planning documents include but, are not necessarily limited to the Conceptual Plans, Subdivision Water Master Plans, Subdivision Sewer Master Plans, Tentative Maps, a project site map with water and sewer facilities shown and any other maps or drawings as may be required by the District Engineer or his/her. The developer must also enter into the District's Construction and Transfer of Infrastructure Agreement prior to submitting its first plan check.

100.6.2 First Plan Check

After review and approval of any planning documents and execution of the District's Construction and Transfer of Infrastructure Agreement, the developer may submit his first plan check. ***The District will attempt to complete the first plan check within thirty (30) working days of the submittal date, providing that the submittal meets the First Plan Check Requirements (See Section 300) and all fees have been paid.*** There may be variances in this schedule due to a number of factors, the District cannot guarantee these processing intervals, but they are general guidelines. See Appendix 5 for the Plan Check Checklist. For a discussion of the first plan check, please see Section 200.3.

Each submittal shall include a transmittal listing all items submitted. Details regarding design criteria are included in Section 400 for water and Section 500 for sewer.

After District staff reviews the first plan check submittal for completeness, the plans may be sent to District's consultants for detailed review. The developer shall be responsible for consultant fees and will address all District comments.

100.6.3 Submit Subsequent Plan Checks

For each subsequent plan check, the developer must submit the following: Previous District plan check, two copies of revised construction drawings and specifications, and any additional material requested. If the submittal is incomplete, they will be returned for revisions. This procedure will be repeated as necessary until drawings are complete. The District should complete the second plan check within fifteen (15) working days, and any subsequent check, without significant changes, should take no more than seven (7) working days each. There may be variances in this schedule due to a number of factors, the District cannot guarantee these processing intervals, but they are general guidelines.

100.6.4 Bond Estimates and Agreements

At the completion of the second plan check, the plans should be complete enough that the Bond Worksheet (See Appendix 6) can be completed to determine the required bond estimates. The completed bond estimate will be sent to the applicant for execution. The bonds and required fees must all be executed and endorsed properly by the developer and returned to the District before the final plans can be signed by the District. All corrections must be made on the final plans before approval. Should the required corrections after second plan check be extensive enough to affect the total quantities of the facilities to be constructed, the District reserves the right to postpone the preparation of the agreements and bonds until such time as the quantity of work to be done is finalized.

100.6.5 Final Plan Approval

After all plan checks are completed, bond estimates, and the plans are acceptable to the District staff, the original Mylar's will be signed. Prior to final approval of the construction drawings, the developer must pay the outstanding balance for the plan check work and meet the requirements on the "Developer's Required Items Checklist" (See Appendix 7).

100.6.6 District Signs Plans

The developer is required to obtain signatures from all other agencies. Original water and sewer plan Mylar's become the property of the District. After the District approves the plans they will be returned to the developer. After all signatures are received, the developer or their engineer must provide the District with the approved plans and a digital copy of the plans per the submission criteria described in Section 300.15.2.1. After the blueprints, Mylar's and the submittal items are received by the District the project will be released for construction, and the inspection by the District can be coordinated by the District Engineer or his/her designate.

100.6.7 Construction Acceptance

When construction has been successfully completed and the final inspections have been performed, the District's Plan Check Engineer will notify the developer. Following final inspection, the developer will be required to prepare the Bills of Sale, and Statements of Construction Cost, to provide for the transferring of the facilities to the District. Details of this procedure are included in Section 100.11, herewith.

The developer shall be responsible for the cost of installation and the installation of all water, sewer, and recycled water facilities within and/or adjacent to his development to serve his/her development. All construction must comply with the District's standards. The developer shall be responsible for any and all repairs or replacements required to the installed systems as required in section 100.10 "Guarantees"

100.6.8 Record Drawings

Record drawings should be submitted in accordance with Section 300.20.

100.7 SINGLE LOT PROJECTS

Single lot developments are handled in a manner similar to Section 100.6, and may not include the transferring of facilities to MCWD. Single lot projects principally involve the submittal of a Residential Connection Form and Permit Application, or the Commercial Connection Form and Permit Application be accompanied by the appropriate plans and required fees. When the plans depicting the service connections are approved, the Construction Permit Application (See Appendix 8) will be prepared in preparation for construction inspection. In addition, the developer will receive a statement of all applicable connection fees, meter fees, capacity charges, plan review, inspection fees and any other required fees and charges, including, if applicable, bonds and insurance.

Once the Residential Connection Form and Permit Application, or the Commercial Connection Form and Permit Application is approved and the installation cost has been estimated by the District and paid by the applicant, the meter request is forwarded to the District's Customer Service Desk for installation of the meter. The District will inspect the completed installation and, if satisfactory, the District Engineer or his/her designate Plan Review section and Customer Services will be notified that the job is complete.

100.8 ADDITIONS OR RENNOVATIONS TO EXISTING STRUCTURES

This includes all applicants with or without an existing water meter or sewer lateral to its business, structure, or property. Prior to receiving water and sewer service, all customers must complete either the Residential Connection Form and Permit Application, or the Commercial Connection Form and Permit Application. The applicant must pay all applicable fees and charges, and if required, capacity charges prior to receiving service. The applicant must also comply with all other applicable design, construction and District Code requirements prior to receiving service.

100.9 RESPONSIBILITY FOR FURNISHING MATERIAL AND INSTALLATION

Installation of a development's domestic water, sewer and/or recycled water facilities and any other required off-site facilities will be the obligation of, and constructed at, the developer's expense. The applicant shall cause all installation work to meet the District's "Standard Plans and Specifications," and upon final acceptance, transfer ownership of the off-site facilities to the District.

100.10 WARRANTIES

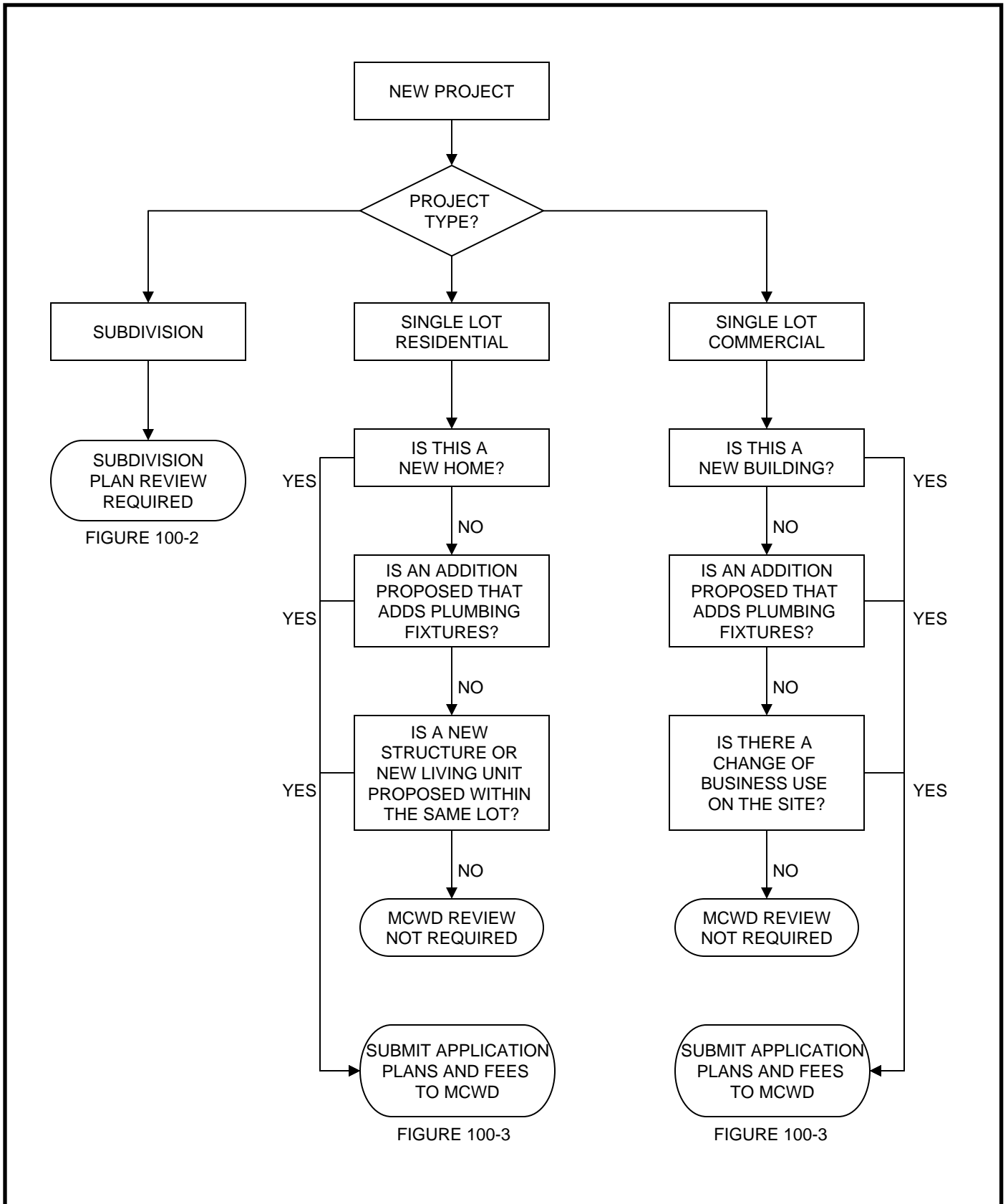
As set forth in the Agreement, the applicant shall be responsible for any and all repairs and replacements for a period of one year from the date of acceptance by the District Board of Directors (see section 300.25 for more details) without expense whatsoever to the District; ordinary wear and tear and unusual abuse or neglect excepted. In the event of failure to comply with the aforementioned conditions, the District will use securities posted by the developer to have the defects repaired and made good. The cost and charges shall include attorney fees, staff time, and other incidental costs involved thereof.

100.11 DEDICATION OF FACILITIES

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Upon completion and final inspection of all work, the applicant shall file a request at least thirty days prior to a regular Board of Directors meeting for dedication and formal acceptances. The applicant shall also furnish the District a report of actual costs (Appendices 9A, 9B and 9C) of said facilities, a proper bill of sale (Appendices 10A, 10B and 10C), and record drawings ("as-builts") of the facilities upon compliance with these requirements. Upon said acceptance, the District will give approval for the release of bonds held by the District or posted to the city or county for the construction of domestic water, sewer and recycled water facilities.

END OF SECTION



APPROVED
BY DISTRICT
ENGINEER
DATE
10/2007



MARINA COAST WATER DISTRICT
**GENERAL APPLICATION
PROCESSING FLOW CHART**

FIGURE
100-1
SHEET 1 OF 1

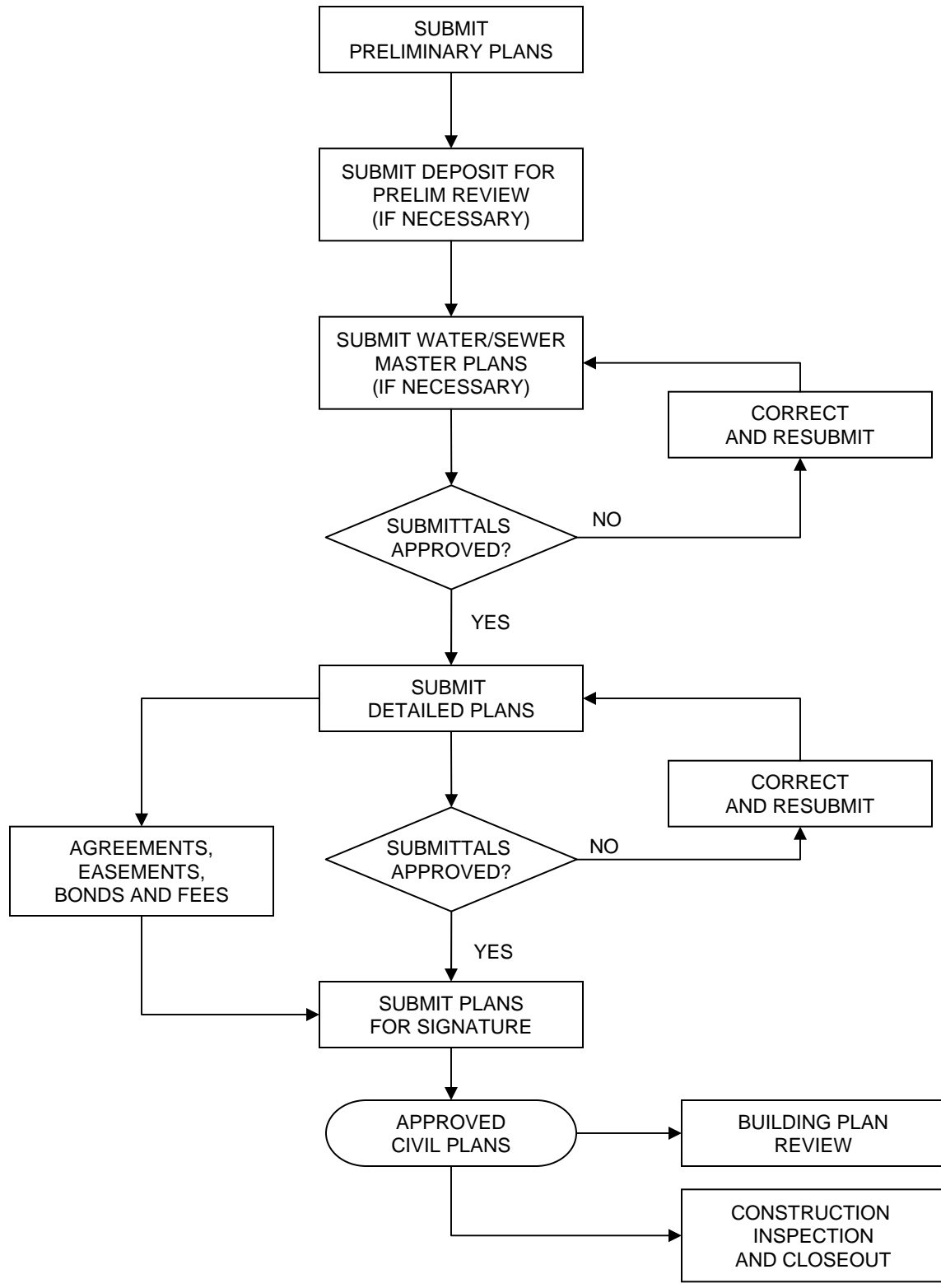


FIGURE 100-4

FIGURE 100-3

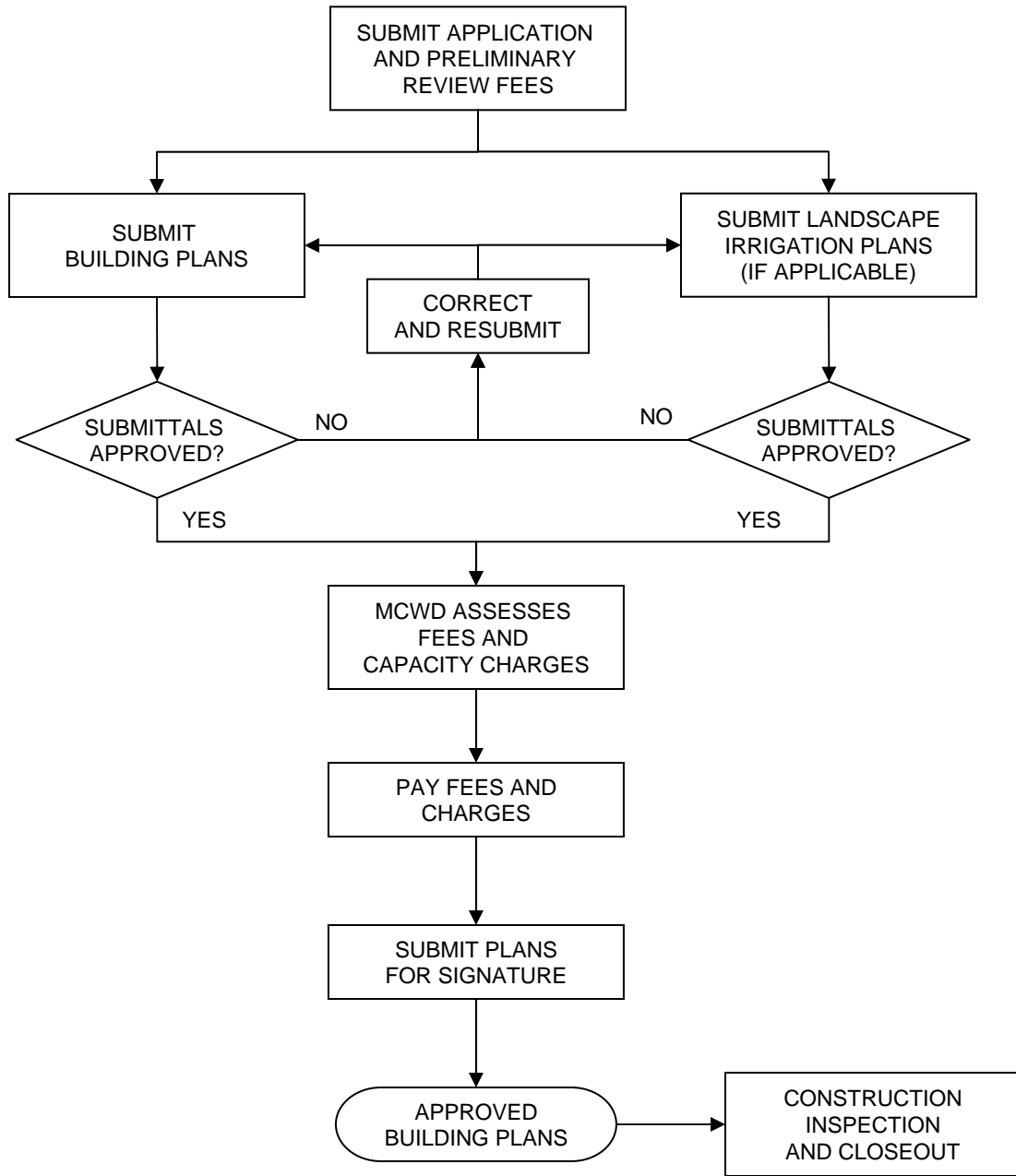
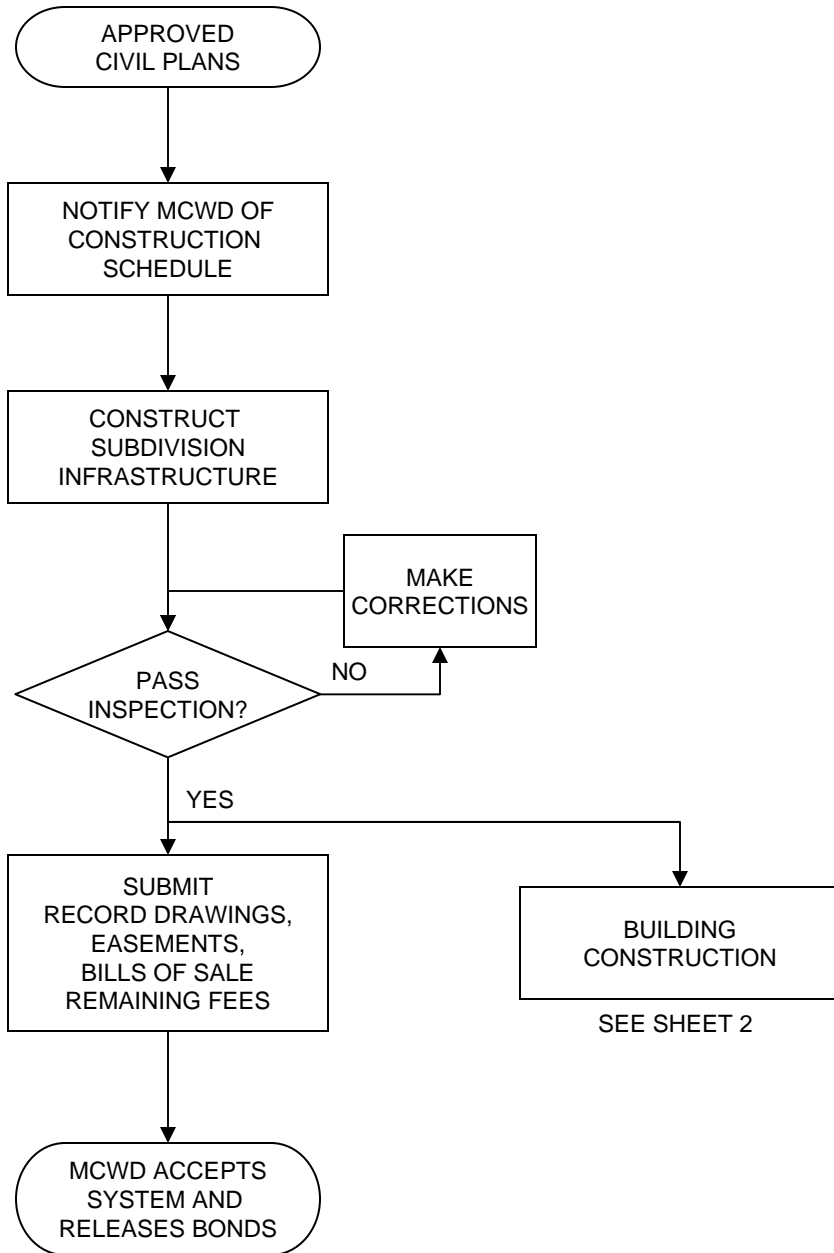


FIGURE 100-4

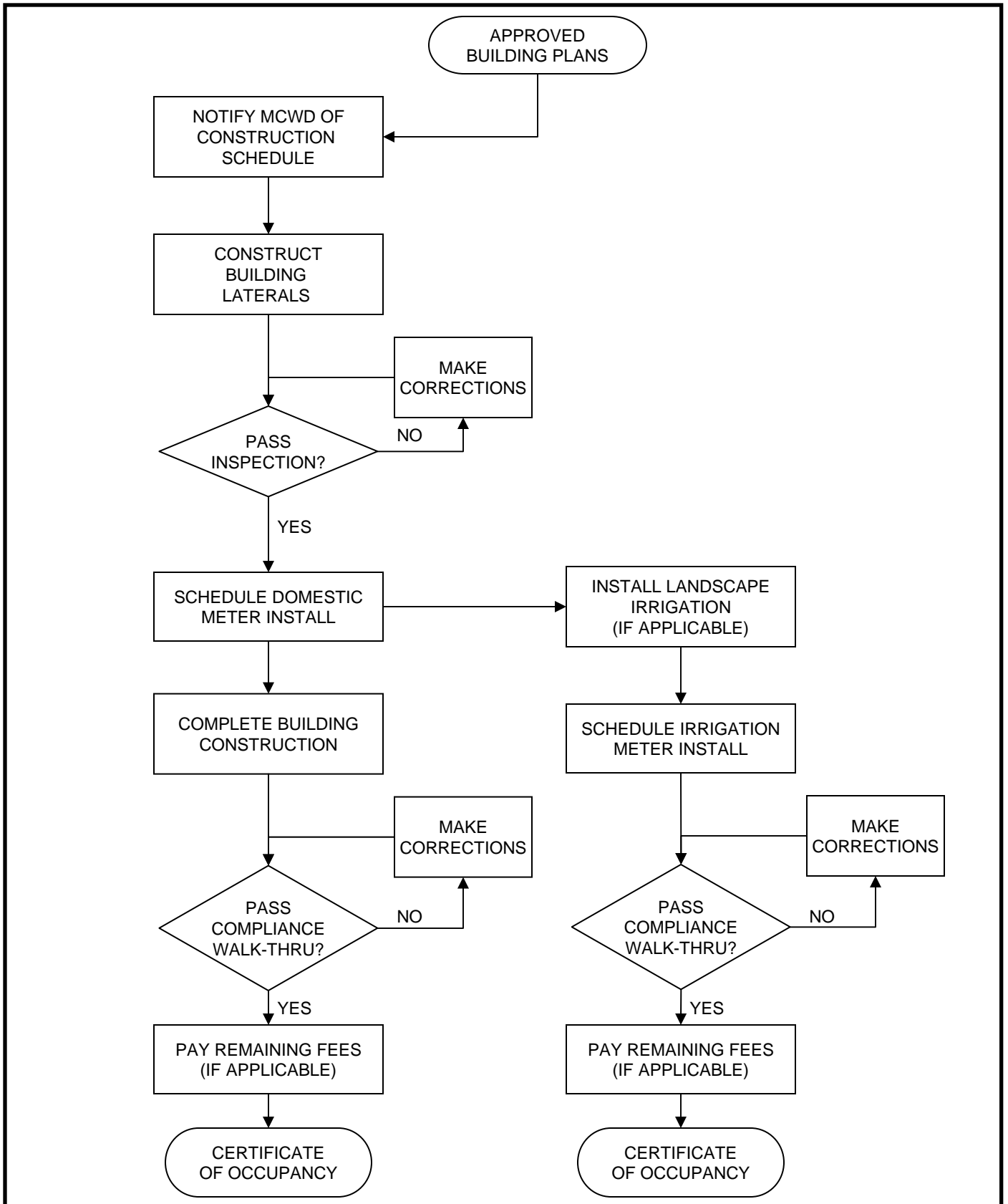


APPROVED
BY DISTRICT
ENGINEER
DATE
10/2007



MARINA COAST WATER DISTRICT
**CONSTRUCTION INSPECTION
AND CLOSEOUT PROCESS**

FIGURE
100-4
SHEET 1 OF 2



SECTION 200

DISTRICT CHARGES
CONNECTION FEES, AND OTHER COSTS

200.1 GENERAL

Fees and charges for connection to District facilities are detailed in Appendix 11. All applicable fees and charges shall be paid by the applicant prior to the approval of plans, installation of individual services, or at other times as requested by the District. A worksheet to assist with the determination of fees and charges is provided for in Appendix 12. Some examples are noted in Appendix 13.

The District will send a draft copy of the final fee and charge estimate to the developer.

200.2 WATER AND SEWER RATES

These charges will be billed for water, sewer, construction water and meter use as listed in the District's schedule of rates and charges available for review at the District office.

200.3 PLAN REVIEW AND CONSTRUCTION INSPECTION FEES

Plan review fees are determined based on the type and size of the proposed project. The plan check and construction inspection fees are as determined by the District and subject to confirmation and adjustment prior to meter installation.

200.3.1 Submit Preliminary Plan Review Fees (if required)

Depending on the extent of preliminary plan review required, District staff may require a fee to cover staff time and or costs for consultant review of plans before preliminary level or concept level plan check begins. In any case, the Plan Review Fee must be submitted prior to District's staff reviewing any preliminary planning documents.

200.3.2 Plan Review Fees

The following fees are in addition to other fees discussed in this section and shall be submitted with first Plan Check.

Plan review is performed at-cost, with an initial base fee and additional fees assessed to meet the actual cost of the review. For single lot projects, which include renovations; the fee is \$200 per residential unit and \$400 per commercial unit. For small single lot projects that include new residential or commercial structures, the fee is \$500 per unit. For large projects that include large residential or commercial structures and subdivisions, the fee is \$500. For subdivisions and large projects, the minimum plan check fee is two percent (2%) based on the preliminary plan submittal information and the District's Bond Worksheets (See Appendix 6). Additional plan review fees are determined by the District Engineer and are subject to change pending the District Board of Director's annual approval of the budget.

200.4 Construction Inspection Fees

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Inspection is performed at-cost, with an initial base fee and additional fees assessed to meet the actual cost of the inspection. For small residential or commercial single lot projects, the construction inspection fee is \$400 per unit. For large residential or commercial single lot projects and subdivisions, the construction fee is \$500 per unit plus three percent (3%) of water, recycled water and sewer construction costs. In no case shall construction inspection fees be less than actual construction inspection cost. These fees are subject to change pending District Board of Director's annual approval of the budget.

200.5 METER CHARGES

The Applicant of all residential or commercial/industrial properties shall be required to connect to the District's infrastructure and utilize District water meters.

The developer will pay for and the District will furnish all meters up to and including 3-inch in size. All meters must be applied for through the District's Customer Service Department. The schedule and cost of these meters is available upon request at the District office.

200.6 FINAL ESTIMATE OF FEES AND CHARGES

Upon receiving the corrected utility plans for a second plan check, quantities for the bond worksheet and the applicant's letter requesting domestic water, sewer and recycled water service, the Plan Check Engineer will compute the required development fees, based on the then governing District Code.

The District will send a draft copy of the final fee and charge estimate to the developer.

200.7 TEMPORARY WATER SERVICE PERMITS

Construction water may be used provided the Applicant provided completes the Temporary Water Service Application (See Appendix 14) and complies with Section 300.20.4.

The location of the fire hydrant must be approved by the District Engineer.

200.8 OTHER FEES AND CHARGES

Other fees and charges include, but are not limited to, meter connection fees, capacity charges, private fire hydrant charges, temporary water service, hydrant meter charges, bulk water service charges, equalization fees, fire flow testing and backflow/cross connection control, and inspection fees.

END OF SECTION

SECTION 300

DESIGN AND INSPECTION PROCEDURES

300.1 GENERAL

The District reviews plans for developments that generally include a single lot development, i.e. like a residence or a commercial building, or a sub-division development, or modifications to existing structures. All proposed developments may include the need to review conceptual or preliminary plans. This section outlines the submittal requirements for various plans.

300.2 CONCEPTUAL PLANS

Two sets of Water/Sewer Conceptual Plans are to be submitted to the District Engineer or his/her designee by the applicant or the applicant's engineer at least thirty days before filing any Tentative Map.

It is the recommendation of the District, but not a requirement, that the local Fire Authority review a copy of the Conceptual Plan.

300.3 SUBDIVISION MASTER PLANS

Subdivision Master Plans include the Subdivision Water and Sewer Master Plans as noted below. These plans are required for all projects that require use of existing or proposed infrastructure.

300.3.1 Subdivision Water Master Plan

Subdivision Water Master Plan Approval: The District Engineer or his/her designee will review for approval the water system master plan for the tentatively planned development. The major elements to the Subdivision Water Master Plan shall include, but not limited to:

1. Condition Assessment. This is applicable if existing water and sewer infrastructure is planned for continued use. This Assessment must identify the useful life of the existing infrastructure and propose corrective action to extend the useful life of the infrastructure. Applicant should also refer to Marina Coast Water District's In-Tract Policy.
2. Existing transmission main locations and sizes
3. District's design criteria (Section 400)
4. In-tract Hydraulic Model for potable and recycled systems in format acceptable to the District.
5. City and/or County fire flow requirements. Whether or not general Fire Authority criteria have been met. It is the responsibility of the developer to meet with the Fire Authority separately, to determine specific Fire Authority concerns
6. Improvement Plans. These plans describe the improvements necessary as a result of the project requirements and may address both in-tract and off-site improvements.
7. Construction Phasing Plan , if applicable.

The District reserves the right to change proposed domestic water main sizes after considering the above criteria. The developer will be required to improve the existing distribution system, if necessary, to support the proposed project

300.3.2 Subdivision Sewer Master Plan

Subdivision Sewer Master Plan Approval: The District Engineer or his/her designee will review for approval the sewer system master plan for the tentatively planned development. The major elements of the subdivision sewer master plan are:

1. Condition Assessment. This is applicable if existing water and sewer infrastructure is planned for continued use. This Assessment must identify the useful life of the existing infrastructure and propose corrective action to extend the useful life of the infrastructure. Applicant should also refer to Marina Coast Water District's In-Tract Policy.
2. Existing trunk sewer locations
3. District's design criteria (Section 500)
4. Slope and size of sewer collection mains and number of lots to be served
5. In-tract Hydraulic Model in format acceptable to the District.
6. Improvement Plans. These plans describe the improvements necessary as a result of the project requirements and may address both in-tract and off-site improvements.
7. Construction Phasing Plan, if applicable.

300.3.3 Recycled Water System Conceptual Development Plan

See Section 600.

300.3.4 Landscape Irrigation Plan Information

See Section 700.

300.4 SUBDIVISION CONSTRUCTION PLANS

300.4.1 First Plan Check Requirements

The Applicant/Engineer shall submit the following items for first review of residential/ commercial/industrial subdivisions:

1. 2 sets of water/sewer/recycled water utility improvement plans with job specific specifications.
2. 2 sets of Tract/Parcel Map showing gross acreage.
3. 1 set of grading plans.
4. Engineer's quantity estimate for water, sewer and recycled water system. Each system shall be listed separately.
5. Transmittal from applicant's engineer requesting the commencement of District plan check procedure. The transmittal shall be signed by the responsible engineer in charge, showing his/her Professional Engineers registration number. Attach plan check fee and deposit.
6. Improvement plans shall be prepared for domestic water, sewer, and recycled water

facilities. Sheet size shall be ANSI-D (22-inch by 34-inch) or ARCH-D (24-inch by 36-inch), no exceptions.

7. Plan Review Checklist initially completed by the Designer (see Appendix 5).

The improvement plans will be checked against the tentatively approved subdivision water master plan and subdivision sewer master plans, recycled water system conceptual development plan, and the minimum design standards. Tract maps and parcel maps will be checked against improvement plans for the required easements. After the first plan check, District will return one red-lined set each of the utility improvement plan and the tract/parcel map. The returned sets will note any specific variations from the basic requirements. Applicant/Engineer shall return the District's red-line set.

300.4.2 Detailed Plan Requirements

All plans submitted to the District Engineer or his/her designee Review section for plan checking and approval of domestic water, sewer and/or recycled water facilities will be submitted on ANSI-D or ARCH-D size. These plans shall also conform to the jurisdiction having authority over the project; and the following requirements.

1. Title Sheet:
 - A. Project Title or Development Tract
 - B. Index Maps
 - 1) Scale - 1" = 100'
 - 2) Show: Water mains - size, fire hydrant, and valves and existing facilities
Sewer mains -size, flow direction, manholes, (number M.H.) and existing facilities, building/D.U./lots/"footprints."
 - 3) North arrow
 - 4) Street names
 - 5) Legend of symbols and lines
 - 6) Show easements for water, sewer and irrigation facilities
 - C. Location map; showing general area with project noted
 - D. Signature block - the District's approval of facilities (form as provided by the District).
 - E. Fire Marshal approval
 - F. Bench Mark; description and latest elevations
 - G. City Engineer signature block
 - H. Survey horizontal control
 - I. Name, address, and phone number of engineering firm
Name, address, and phone number. of developer
Legal description of property (Tract/Lot, Parcel Map No.)

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- J. Quantity estimates may appear on Title Sheet. Water, sewer and recycled water facilities to be called out separately. Labeled and not mixed together.
 - K. Index of sheets
 - L. Revision block
 - M. General notes
 - N. Utility, addresses, and phone numbers, including but not limited to - Gas, Telephone, Power, Cable T.V., Water, Sewer, and Storm Drain
 - O. U.S.A. Dig Alert notice per Section 4212/5217 of the Government code
2. Second Sheet (Normally Sheet 2 includes):
- A. Quantity estimates (if not shown on Title Sheet)
 - B. MCWD Standard Notes (See Sections 400.12, 500.18 and 600.5.7)
 - C. Construction notes
 - D. Detail drawings
3. Plan and Profile Sheets:

In addition to MCWD standard plan S-13, plan and profile sheets are required for all water, sewer and recycled water pipelines, as follows:

- A. Scale –1-inch = 40-feet
- B. The plan and profile should be on same sheet if possible and aligned. Sewer profile may appear on a separate sheet.
- C. Existing domestic water, sewer and recycled water facilities adjacent to development must be shown
- D. Easements dedicated to the District for domestic water, sewer and recycled water facilities must appear on plans
- E. Building/D.U. pad elevation
- F. Water, sewer, recycled water system and storm drain crossing elevations
- G. Provide a key map on each sheet at a scale of 1-inch = 400 feet

300.4.3 Survey Datum

Prepare drawings using the California Coordinate System of 1983 (CCS83), Zone 4. Vertical datum shall be identified on the plans as NGVD 29 or NAVD 88. When connecting to existing District facilities, be aware that most record drawings are on NGVD 29.

300.4.4 CAD Requirements

1. Drawings submitted to the District shall be prepared in AutoCAD, version 2000 or later.
2. Water, sewer and recycled water systems shall be drawn using the following layer naming convention.
 - a. Pipe layers shall be named as “(use)_(material)_(pipe diameter)”. For example, label an 8-inch PVC water main as “W_C900_8”, and label an 8-inch PVC sewer main as “SS_SDR35_8”.
 - b. Appurtenance layers shall be named as “(system)_(item type)”. For example, label a gate valve on a potable water main as “W_GV”, and label a sewer manhole as “SS_MH”.
 - c. Place line work in the appropriate layers.
 - d. Refer to the table below for abbreviations.

Systems	
Sanitary Sewer	SS
Reclaimed Water	RW
Potable Water	W
Abandoned	ABANDONED
Pipeline Materials	
High Density Polyethylene	HDPE
Ductile Iron	DI
Polyvinyl chloride	PVC
C900 PVC Water Main	C900
SDR 35 PVC Sewer Main	SDR35
Copper Service Lateral	CU
Polyethylene Service Lateral	PE
Force Main	FM
Appurtenances	
Fire Hydrant	FH
Manhole	MH
Meter	METER
Valve	
Check Valve	CV
Pressure Reducing Valve	PRV
Pressure Staining Valve	PSV
Butterfly Valve	BV
Gate Valve	GV
Blowoff Valve	BOV
Normally Closed	NC

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3. Appurtenances shall be inserted as blocks with attributes. Standard attribute tables are as follows:

a. Manhole/Cleanout

Block Name	Use layer name (i.e., SS_MH)
Rim	Elevation
Invert 1	(Elevation)(Direction)
Invert2	(Elevation)(Direction)
Invert3	(Elevation)(Direction)
Invert4	(Elevation)(Direction)
Invert5	(Elevation)(Direction)
Installation Date	dd.mm.yyyy
Comments	

Elevation is in feet.

Direction is defined as: N, S, E, W, NE, NW, SE, OR SW.

b. Valve or Meter

Block Name	Use layer name (i.e., W_GV)
Size	Inches
Installation Date	dd.mm.yyyy
Comments	

300.5 COMMERCIAL/INDUSTRIAL CONSTRUCTION PLANS.

In addition to the requirements described in Section 300.4, the following is required for all commercial or industrial developments:

300.5.1 Domestic Water Services

1. Site Utility Plans Showing:

A. Property lines

B. "Footprint" of building

C. All on-site public and private fire hydrants

D. Stamped/signed by the local agency Fire Marshal

1) Services for other than residential development, may be required to have back flow prevention devices (minimum double check valve), as determined by the District.

2) Items required to make application for domestic service.

E. Either two complete sets of Plumbing Plans stamped by the city having jurisdiction, or two complete sets of Plumbing Plans, along with a letter from the developer or his/her agent requesting a _____ meter, not to exceed ____ gpm, to serve _____ (Company Name) at _____ (Address) .

- F. Domestic irrigation requires a site utility plan and a letter similar to above. It may be included in letter for domestic service.
- G. Address to be served
- H. All fees, stipulated in the agreement, must have been paid.

300.5.2 Fire Service Requirements

- 1. All fire services will require an approved backflow prevention assembly per MCWD Standard Plan W-4, 5 & 6.

300.5.3 Recycled Water Service Requirements

- 1. Landscape plans must be reviewed and approved by District.
- 2. MUST have an address for each service
- 3. One approved landscape plan -- showing each service's point-of-connection to District main
- 4. All fees, stipulated in the agreement, must have been paid.
- 5. The use of recycled water is mandatory per Section 4.28 of the District Code. It is the policy of the District that non-domestic water must be used within the District whenever it is available in conformance with Sections 13550 and 13551 of the Water Code of the State of California.

300.5.4 Grease Traps, Grease Interceptors or Other Devices

A food service establishment or any other business discharging grease, oil or other similar material shall have an operable grease trap, grease interceptor or other comparable device(s) as determined by the District Engineer.

The requirements for design, installation, and maintenance of grease traps, grease interceptors, or other devices are found in Appendix 15. A properly sized interceptor or trap shall be considered first, in conformity with the sizing chart set forth in the Appendix 15. Should space limitations or other exceptional circumstances prevent their installation, the District may grant exceptions to the requirement of grease traps or grease interceptors in this section.

All drains from food preparation and clean up areas including, but not limited to, pre-wash sinks, floor drains, food waste disposal units, pots and pans sinks, scullery sinks, and garbage can wash areas shall be connected to such trap or interceptor. Toilets, lavatories, and other sanitary fixtures shall not be connected to any grease trap, grease interceptor, or comparable device.

Suspension or Termination of Health Permit. The District shall have the discretion to request the Monterey County Health Department to terminate or cause to be terminated the health permit of any user if a violation of any provision of this chapter is found to cause a condition of contamination, pollution, nuisance, or other threat to public health or safety.

300.6 ADDITIONAL REQUIREMENTS AND STANDARDS

300.6.1 District's Regulation Regarding Cross Connection

All domestic water services shall be subject to the provisions of section 3.28 of the District's Code of Ordinances. See section 400.11 for detailed requirements.

300.6.2 Domestic Water Facilities

See Section 400 for detailed specifications regarding the design and construction of domestic water facilities.

300.6.3 Sanitary Sewer Facilities

See Section 5600 for detailed specifications regarding the design and construction of sanitary sewer facilities.

300.6.4 Recycled Water Facilities

See Section 600 for detailed specifications regarding the design and construction of recycled water facilities.

300.6.5 On-Site Irrigation Systems

See Sections 700 for the design criteria and detailed specifications regarding the construction of on-site potable or recycled water irrigation systems.

300.7 PROVIDING REQUIRED EASEMENTS

For water and recycled water facilities outside of the public right-of-way, an easement is required for construction and/or maintenance of water facilities, including but not limited to, water mains, hydrants, meter vaults, and detector check vaults. Minimum easement width shall be twenty-feet for water mains, and five-feet on all sides for meters, fire hydrants, meter vaults, detector check vaults, and other appurtenances, unless otherwise determined by the District. Actual width shall be twice the average pipe depth, rounded up to the nearest 10 feet.

For sewer facilities outside of the public right-of-way, an easement is required for construction and/or maintenance of sewer facilities, including but not limited to, sewer lines, manholes, and lift stations. Minimum easement width shall be twenty-feet for sewer lines, preferably crossing a lettered (non-residential) lot. Wider easements may be necessary if sewer depths are greater than eight feet. Actual width shall be twice the average pipe depth, rounded up to the nearest 10 feet.

An easement running parallel with a lot line shall not be split so as to occur on two lots. The easement, title report, and legal descriptions with accompanying sketch and plans shall be prepared by the applicant's engineer, two copies of which shall be sent to the District Engineer, or easements for the District shall be shown on a tract or parcel map. Easement descriptions shall be in a form acceptable to the District and will be checked by the District Engineer. Easements shall also be shown on the construction plans. The District will approve the plans only after all required easements have been granted to the District together with any necessary partial reconveyance or subordination agreements. Exhibits will be 8-1/2-inch by 11-inch, no exceptions.

Along public streets a three or five foot utility parallel easement on private property for District may be

required depending upon public right-of-way widths and sidewalk locations.

Applicant shall submit two copies of the easement description and sketch to the District for review. If acceptable, the applicant shall furnish two additional copies of the description and sketch, signed by a registered Professional Engineer or Surveyor along with a completed "Grant of Easement to Marina Coast Water District" form (see Appendix 13 for sample), a current (within 30 days) title report of the property reflecting all deeds of trust and encumbrances, and subordinations signed by the trustees shown on the title report. If not acceptable, the District will return the documents with the required corrections noted.

All blanks in the documents, such as project identifications, title report number, map and book numbers and pages, dates, etc., must be filled in. The easement sketch must contain a vicinity map showing the location of the easement in relation to major streets and highways, as well as a sketch depicting the easement boundaries with bearings, distances, points of beginning, north arrow, and any other information required by the District.

NOTE: Approval by the District will not be given for the in-tract water or sewerage systems until all easements have been obtained.

300.8 COST ESTIMATE

The developer's engineer shall provide the quantities, to allow the District to project costs for the water, sewer and recycled water facilities to be dedicated to the District per the Bond Worksheet (Appendix 6). The items listed will include, but will not be limited to pipes, valves, meters & appurtenances, connections, hot taps, and facilities construction.

300.9 FIRE AUTHORITY APPROVAL

After the First Plan Check by the District, it will become the responsibility of the applicant's engineer to have the local Fire Authority approval before submitting them for a second plan check. Fire flow requirements for the development shall be submitted with the second plan check submitted. The District reserves the right to require additional fire protection or modify water facility sizes as deemed necessary.

300.10 VARIANCES

If the site or project conditions require a deviation from these design requirements, a variance must be requested using the form at Appendix 18. Provide a detailed explanation of why the variance is being requested and how the proposed change meets the intent of the District standards. Most design variances may be approved by the District Engineer. Variances to standards set out in the District Ordinances must be approved by the Board of Directors.

300.11 SECOND PLAN CHECK

Upon satisfactory completion of items 300.1 through 300.9 the developer's engineer shall submit plans for the second plan check along with the District's red-line set from the first plan check. This submittal will be checked against the corrections requested in the first plan check and the District's minimum design standards. Failure to return the district's red-line set will result in additional review and fees, and time to complete this review.

300.11.1 Corrected Plans Returned To Developer's Engineer

Upon review of the improvement plans for the total development, one red-lined copy will be returned to the applicant's engineer, showing any corrections and/or comments.

Upon receiving the corrected utility plans for a second plan check, final fees will be collected based on Section 200.5.

300.12 SURETY

The Developer will provide a surety bond, a letter of credit, a certificate of deposit, or other form of surety acceptable to the District. This surety shall be of a type which is automatically renewed every year, at the developer's expense, until released by the District.

300.13 FINAL PLANS

Upon completion of any remaining items noted in the plan check, the developer's engineer shall submit two bond or blue line sets of improvement plans, along with the red line mark up, for final verification.

300.14 FINAL EASEMENTS

300.14.1 Submittal

The developer shall submit easement documents, which incorporate all changes caused by the review process, in accordance with Section 300.3.

300.14.2 Verification

The developer's engineer will verify that the easements as listed in the easement documents remain valid. The engineer will then submit the final easement documents and the final title report for recordation.

300.15 FEES

The developer shall pay all fees as determined in the Construction and Transfer of Water, Sewer, and Recycled Water "Infrastructure Agreement" between the developer and the District and as specified in the District's Water Code and in Section 200 herein.

300.16 PLAN APPROVAL

Utility improvement plans must have the District Engineer or his/her designee signature before any construction by the applicant begins.

300.16.1 Prerequisites for Signing Plans

1. "Infrastructure Agreement" must be signed by developer, and approved by the District's Board of Directors.
2. Required signed easement documents or the Tract/Parcel map must have been accepted for dedication by the District. The District will prepare an easement Certificate of Acceptance (Appendix 13B). The easement documents must have been recorded.

3. All fees and charges must be paid in full by the applicant.
4. Signatures of City Engineer and Fire Marshall, when required.

300.16.2 District Signing Plans.

Submittal for Signature: Once the requirements detailed in Sections 300.1 through 300.14 are satisfied, the applicant shall submit to the District the following:

1. One Master Copy of the utility plan on Bond or Mylar, as required by the applicable land use jurisdiction, which will be signed and returned, and two bond or blue-line sets for District use, shall be delivered to the District Engineer.
2. One set of final development plans including:
 - A. Horizontal control plot plan
 - B. Street improvement plans
3. An electronic copy of the drawings in AutoCAD on a CD-R.

Notification: District will notify applicant's engineer once the plans have been signed.

300.16.3 Signed Utility Plans Both District And City / County

Obtain approvals of the applicable land use jurisdiction prior to construction. Two copies of Utility Plans signed by all applicable agencies shall be furnished to District at least two working days before the preconstruction conference and commencing work.

300.16.4 Permit Expiration

Plans will be valid for two (2) years from the date of District approval. If construction has not started within one year from date of approval, the signed plans shall become "null and void." The District will require rechecking of the plans and it reserves the right to charge additional plan check fees.

300.16.5 Re-permit Letter

In the event that construction does not start, and the approval could become null and void, as described in Section 300.15.3; the letter shown in Appendix 17 may be submitted by the developer's engineer, by registered mail, to request a one-year extension of the approval.

300.17 ORDER OF PRECEDENCE OF STANDARDS

In the case of conflict between the specifications, drawings, and permit requirements, with regard to construction of facilities, the following order of precedence will apply: The permit requirements of other agencies, special details, plans, special conditions, District standard plans, technical specifications, general conditions, the *Standard Specifications for Public Works Construction* and the Cal Trans Manual.

Figured dimensions of the drawings shall govern, but work not dimensioned shall be as directed. Work not

particularly shown or specified shall be the same as similar parts that are shown or specified or as directed. Full-size details shall take precedence over scale drawings as to shape and details to construction. Scale drawings, full-size details, and specifications are intended to be fully cooperative and to agree; but should any discrepancy or apparent difference occur between plans and specifications, or should errors occur in projects being constructed by others affecting the work, and the contractor proceeds with the work affected without instruction from the District, the contractor shall be fully responsible for any resultant damage or defect.

300.17.1 Permit Requirements

The permit requirements, as approved by the agency having jurisdiction, will take precedence over the following details and standards with regard to the construction of water facilities.

300.17.2 Special Details

The special details, as approved by the signature of the District Engineer, will take precedence over the below listed details and standards with regard to the construction of water facilities.

300.17.3 Plans

The plans, as approved by the signature of the District Engineer, will take precedence over the below listed details and standards with regard to the construction of water facilities.

300.17.4 Special Conditions

The special conditions, for the specific project and incorporated into the project contract documents, as approved by the Districts Board of Directors, will take precedence over the below listed standards with regard to the construction of water facilities.

300.17.5 District Standard Plans

Districts' standard plans, as approved by the signature of the District Engineer, will take precedence over the below listed details and standards with regard to the construction of water facilities.

300.17.6 District Standard Specifications

Districts' standard specifications, detailed below, as approved by the Board of Directors, will take precedence over the below listed standards with regard to the construction of water facilities.

The "Standard Plans and Specifications for the Construction of Domestic Water, Sewer and Recycled Water Facilities" are incorporated herein by this reference. Copies may be obtained from the Marina Coast Water District, website at www.mcwd.org

300.17.7 Technical Specifications

The technical specifications of the District's "Standard Plans and Specifications of the Construction of Domestic Water, Sewer and Recycled Water Facilities," of the contract documents, as approved by the District's Board of Directors, will take precedence over the below listed standards with regard to the construction of water facilities.

300.17.8 The Caltrans Manual

The Caltrans Manual, as referenced by the District's details, standards and specifications, will take precedence over other standards, other than the District's standards, with regard to the construction of water facilities.

The "Standard Specifications," CALTRANS, are incorporated herein by this reference, copies of which may be purchased from the State of California, Department of Transportation, Central Publications Distribution Unit, P.O. Box 1015, North Highlands, California 95660.

300.17.9 Standard Specifications for Public Works Construction

The Standard Specifications for Public Works Construction as reference by the District's details, standards and specifications, will take precedence over other standards, other than the District's standards and Caltrans standards, with regard to the construction of water facilities.

The "Standard Specifications for Public Works Construction," (Green Book), are incorporated herein by this reference. Copies may be purchased from Building News, Inc., 3055 Overland Avenue, Los Angeles, California 90034.

300.18 USE OF DISTRICT SEWERAGE FACILITIES

The District and the State of California have regulations on the types of wastes that are allowed to be discharged into its sewers in order to protect the facilities of the District and its operations to meet its discharge requirements. The section on the use of District sewerage facilities in the District's Code, including a separate supplement, sets forth these requirements. These provisions establish conditions under which certain users are required to obtain permits for use of District sewerage facilities. Applicants whose sewage discharges qualify them for a permit shall not be allowed to connect the building sewer to the District lateral sewer or sewer main until a written notification is provided by the District allowing the hookup. All users must comply with the discharge prohibitions established in the District's Code.

300.19 PROJECT CONSTRUCTION

300.19.1 Notification

Signed Utility Plans and notices shall be given to the District Engineer at least 48-hours before starting construction. Applicant shall also notify the city, and/or County inspector's prior to work within public right-of-way. For a complete review of the construction inspection requirements, please refer to the District's Construction Manual.

300.19.2 License Requirements

1. The applicant's contractor shall have a Class A or C-34 license.
2. The applicant's contractor shall have a business license to operate within the city having jurisdiction.

300.19.3 Preconstruction Meeting

A preconstruction conference is to be held no sooner than 24-hours before starting construction, at which will

be present the applicant's contractor's working foremen and/or job superintendent, the applicant's engineer, the District inspector, and a representative from the District's O&M Department. The purpose of this meeting will be to answer any questions on District specification requirements, to obtain the contractor's construction schedule, and to discuss any known circumstances that might affect job installation.

Preconstruction Meeting Agenda: Without relieving the developer of responsibilities outlined elsewhere in the specifications; the District will present to the developer a list of requirements that may contain, but will not be limited to, the following items:

1. Order of work
2. Working hours
3. Site Accessibility
4. District facilities that will be taken off-line for construction
5. Startup operations of new facilities and other District facilities affected by the project results.
6. Pressure test procedures and startup operations of new facilities and other District facilities affected by the project results.
7. Bacterial test results.
8. Record Drawings
9. Order of Precedence: The order of precedence as defined in Section 300.16 will be reviewed in the pre-construction meeting.

300.19.4 Curbs Installed Before Starting Water Facilities

It is a basic requirement of the District that the curbs be installed in-tract prior to starting the installation of water facilities. They act as positive grade control for setting services and fire hydrants. The District may approve an exception if the developer complies with the following requirements:

1. All requirements shall be met before the excavation of pipeline trenches.
2. The owner is to submit engineered drawings showing both the plan and profile of the proposed pipelines for District review and acceptance.
3. The owner is to provide survey staking. The proposed pipelines per the profile with cuts to flow line at a maximum of 25-foot stationing showing all horizontal and vertical grades breaks, tees, and valves, fire hydrant, blow-offs, air vacs, services, and all other appurtenances indicated on the plans.
4. Prior to backfill, the engineer shall certify line and grade of the pipeline and all the appurtenances and provide the District inspector with a copy of the certification.
5. In the event that a portion or any part of the pipeline and its appurtenances is not installed to the satisfaction of the District inspector, the owner agrees to expose and re-lay the pipeline accordingly.

300.19.5 Construction Water

Water for construction purposes is the temporary use of water from a connection to the District's water

system. Connections could be from a fire hydrant or other direct connection as approved by the District Engineer or his/her designee. Below is the District's process to respond to and provide to requests for temporary water service from a fire hydrant.

Any customer that requires use of water from a fire hydrant must fill out the Temporary Service Application (See Appendix 14). That application will be processed by customer service. If the application is acceptable, then a fire hydrant meter will be provided to the applicant. The District may install the fire hydrant meter, but the security of the hydrant meter is the applicant's responsibility. The District will inspect the installation of the hydrant meter to assure it is both installed correctly and that it has the proper backflow device. The water shall be taken through a metered delivery and the developer shall pay all costs related thereto, including (but not limited to) District's standard deposit for temporary meter and actual costs of water used, pumping costs, loading, hauling and the use thereof. The developer shall make all arrangements for transporting the water to the construction site. Recycled water shall be used for construction purposes when possible.

The District will read the hydrant meters. The District will inspect the fire hydrant meter installation. If the installation is acceptable, the O&M Department will place a "lock-out" tag on the hydrant. This "lock-out" tag indicates to the meter reader that the fire hydrant meter is properly installed with the correct backflow device. If the District finds uninspected fire hydrant meters, it shall immediately remove the hydrant meter from the hydrant.

At the conclusion of the temporary water service, the applicant must return the fire hydrant meter and the gate valve. Once the District inspects the fire hydrant to make sure it is in good working order, the hydrant meter and any other pertinent appurtenance and has received all payments for temporary water service fees and charges, then deposits may be returned to the applicant.

300.19.6 Inspection of Work

Access: All work shall be subject to inspection by the District and shall be left open and uncovered until approved by the District Engineer.

Domestic Water, Sewer and/or Recycled Water System Inspections: The Contractor shall not proceed with any subsequent phase of work until the previous phase has been inspected and approved by the District Engineer. Inspection may also be made at the following intervals of work. See District Construction Manual for more details.

1. Domestic and Recycled Water System:
 - A. Submit material list to District for approval.
 - B. Delivery of materials to job site and provide certificate of compliance to District.
 - C. Trench excavation and bedding.
 - D. Placing of pipe, fittings, and structures, including warning tape on recycled irrigation water main and service lines.
 - E. Pouring all concrete anchors and thrust blocks.

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- F. Placing and compacting the pipe zone back fill.
 - G. Backfilling balance of trench to grade. Compaction tests are to be performed by governing agency road departments in public right-of-way or by private soils consultant retained by the applicant and acceptable to the District in private streets and easements. Copies of test results shall be given to the District, and the governing agency, by the applicant for approval before final acceptance of the work. Backfilling and repaving shall be in accordance with the requirements of the city having jurisdiction.
 - H. Pressure testing all mains and services.
 - I. Disinfecting and flushing.
 - J. Health samples.
 - K. Repaving trench cuts.
 - L. Raising valve boxes to finish grade and paint to District standards.
 - M. Fire hydrants painted and pads poured.
 - N. Installation of service lines, appurtenances meter boxes, and customer service valves.
 - O. Connection to the existing system.
2. Sewer Inspections:
- A. Trench excavation and bedding.
 - B. Placing of pipe, fittings, and structures.
 - C. Placing and compacting of the pipe zone backfill.
 - D. Backfilling of the balance of the trench to grade. Compaction tests to be taken by the city and/or county road departments in public right-of-way and by private soils consultant retained by the applicant and acceptable to the District in private streets and easements. Copies of test results shall be given to the District by the applicant for approval before final acceptance of the work.
 - E. Testing after backfill compaction of all utilities is approved by the city and/or county road departments and must be obtained before paving.

300.19.7 District Authority

Access: The District shall at all times have access to the work during construction and shall be furnished with every reasonable facility for ascertaining full knowledge respecting the progress, quality of labor, and character of materials used and employed in the work. No pipe, fittings, or other materials shall be installed or backfilled until inspected and approved by the District Engineer. The contractor shall give at least 72-

hours notice prior to backfilling to the District inspector so that proper inspection may be provided.

Obligation: Inspection of the work shall not relieve the contractor of any obligations to complete the work as prescribed by the Standard Specifications. Any known defective work shall be corrected before testing or final inspection will be permitted. Unsuitable materials may be rejected at any time.

Suspension of Work: The District Engineer shall have the authority to suspend the work wholly or in part for such time as it may deem necessary if the contractor fails to carry out orders given by the District's inspector, or to perform any required provisions of the plans and specifications. The contractor shall immediately comply with a written order of the District to suspend the work wholly or in part. The work shall be resumed when methods or defective work are corrected as ordered and approved in writing by the District Engineer.

300.19.8 Existing Facilities

Connection and Shut Downs: Schedule connection to existing water and sewer facilities with the District Operations Staff. Contractors are not permitted to operate District valves. Coordinate shut-downs a minimum of 2-days in advance of the work.

Repairs: Any and all damage to existing facilities occurring as a result of new construction must be repaired to the District's satisfaction at the Developer's expense. Repairs may be performed by the Developer's contractor or by District staff, at the discretion of the District Engineer.

Removals: Per the District's In-Tract Policy, new developments require the removal of existing facilities at or beyond their useful service life, and the installation of new infrastructure to serve the development. Excavate and remove all existing pipes, valves, manholes and appurtenances as indicated on the approved construction plans.

Abandonment: Where it is impractical to remove an existing facility (for example, a pipeline crossing a street not otherwise being reconstructed), existing facilities may be abandoned in place with the approval of the District Engineer. Follow the procedures of Standard Specification Section 02222.

300.19.9 Pressure Test

A pressure test of the newly constructed domestic and recycled water lines shall be conducted as detailed in Section 15042 "Hydrostatic Testing of Pressure Pipelines" of the District's Standard Specifications.

300.19.10 Water for Flushing, Testing and Disinfection

Domestic water for flushing, testing and sterilization of the completed pipelines or sections thereof will be available from the District at the point, or points, of connection with the existing domestic water mains via the construction water connection.

The developer shall make all arrangements for this water with the District Engineer, which shall designate the exact location of the outlet or outlets, and the time periods these connections may be used. Special limitations may be imposed by the District Engineer for filing of larger infrastructures, such as large tanks or long distribution mains. The contractor shall be required to work within these limitations and pay for all activities required to comply. Estimate quantity of water flushed in gallons to the District for tracking of unmetered water use.

If, due to construction problems or for any other reason, the developer desires to use water from some other source for testing, flushing, or chlorination, it shall be the responsibility of the developer to obtain the source of water, which water shall be tested and approved by the County Health Department prior to the use thereof. All expenses for obtaining and using another source of water shall be paid by the developer.

Cannon flushing operations shall be conducted with a residual line pressure not less than 30 psi and a District representative will be present. Adequate connections to conduct the flushing, testing and disinfection operations shall be furnished by the contractor and reviewed by the engineer, at no added cost to the District, and the developer shall pay for any and all costs for flushing, testing and disinfection.

300.19.11 Chlorination and Bacteriological Testing

After a passing pressure test, the domestic water lines shall be chlorinated and tested for bacteria as detailed in Section 15041 "Chlorination of Domestic Mains and Services for Disinfection" of the District's Standard Specifications.

300.19.12 Final Domestic Water and Recycled Water Facilities Inspection

Before final acceptance, the District Engineer will make a final inspection of all work, accompanied by the contractor's superintendent or representative, to verify that:

1. All phases of the job are complete in accordance with plans and specifications
2. All valve boxes are raised to finish grade and that all repairs are completed
3. All valves are referenced and the inspector has been given all reference measurements. Valves shall be located by a 2-inch "V" chiseled in the adjacent curb face
4. All right-angle meter stops, and the meters, are properly positioned and all meter boxes are positioned and raised to proper grade
5. Fire hydrants are raised to proper grade, are in a vertical position, painted; and its concrete pad is poured
6. Backfill has passed all compaction testing
7. All system valves are turned and left open (except those specifically required to be normally closed), direction and turns required for complete open/close cycle are recorded on the record drawings
8. Domestic water lines have been chlorinated and disinfected
9. Water line pressure testing and flushing have been completed
10. The job site is clean and cleared of all the contractor's equipment and materials
11. All service lateral locations have been marked on curbs
12. Certified test results have been provided for all backflow prevention devices
13. "RECORD DRAWINGS" with the "As-Built" revisions have been delivered to the District (See section 400.13)
14. Digital submittal of plan information in a format acceptable to the District

300.19.13 Final Sewer Inspection

Before final acceptance, the District, even though the sewers have been balled once, will require the contractor to flush and ball all sewer mains again. The District, accompanied by the contractor's foreman or superintendent, will make a final inspection of all work to check the following items:

1. That all bulkheads and plugs have been removed
2. The concrete base and channels in manholes are smooth
3. That manhole interiors are clean of all debris and excess concrete mortar
4. That all manhole concrete grade rings are adequately grouted and properly set
5. That pavement around manhole cover has been properly blacktopped to correct grade
6. That proper field tests have been made on all sewer main sections and manholes, particularly where sections of manholes had to be repaired
7. That backfill has passed all compaction requirements
8. That lateral locations have been mark with a "S" on curb

300.19.14 Raising of Valve Boxes and Manhole Rims

For paved areas in the applicant's development, and/or out-of-tract resulting from the developer's project, the developer/contractor will raise all valve boxes and manhole rims for District constructed facilities for each lift of pavement.

300.20 RECORD "AS-BUILT" DRAWINGS

300.20.1 Record Drawings

Record drawings shall be based on an "as built" review and shall show all changes in the work constituting departures from the original contract drawings.

Upon completion of each increment of work, all required information and dimensions shall be transferred to the record drawings. Facilities and items to be located and verified on the record drawings shall include the following:

1. Point of connection
2. Location and elevation of all valves, bends and tees
3. Location of all services
4. Type, mfg., and model of valves & fire hydrant. Turns required for complete open/close cycle shall be provided for all valves.
5. Location of buried conduit and sensor line assemblies
6. Items located and constructed as called out in the plans need not be noted as such.
7. Final settings of instrumentation and control equipment.

Prior to submission of the record mylars, *two sets of bond or blue lines will be submitted* for review by the District. One set will be returned with comments if necessary. Final 4-mil Mylar record drawings are to be

submitted only upon incorporation of the District's comments.

300.20.2 “As-Built” Survey

An "as-built" survey of the completed water line and appurtenances shall be made by the developer's engineer prior to placement of final paving. Markers or monuments shall be set during the placement of backfill so that all connection points, horizontal and vertical angle points, utility crossings, service connections and any other features and/or appurtenances designated by the engineer may be located. The contractor shall submit to the engineer for review, prior to the start of construction of the project, a program for installing the markers or monuments and shall comply with any recommendations of the engineer to modify such a program. It shall be the responsibility of the contractor to re-establish any lost markers or monuments.

300.20.3 Record Drawings Requirements

General Requirements: Keep accurate and legible records on a single set of full size project blue line prints of the drawings.

1. Make the record drawings available for review by District's representative in contractor's field office.
2. Maintain record drawings on an up-to-date basis with all entries reviewed by District's representative.
3. Protect the record set from damage or loss.

Detailed Requirements:

1. Mark on the drawings all changes in the work which occur during construction, including adding approved changes.
2. Show locations by key dimensions, depths, elevations of all underground lines, conduit runs, sensor lines, valves, capped ends, branch fittings, pull boxes, etc.
3. Record information on maintenance access and/or concealed work..
4. Make a record of finalized hydraulic and electrical equipment control settings in the tables and spaces provided on the drawings.
5. Following District review of record drawings, a complete and final set of photo 4–mil mylar as-built plans and AutoCAD Digitized files for the water, sewer and recycled water systems, satisfactory to District Engineer, together with a copy of the specifications used for Owner’s work on the water and sewer system and any recycled water system in connection with the Project.
6. A complete, detailed statement of account, satisfactory to District Auditor, of the Amounts expended for Owner’s work on the water and sewer system, with values applicable to the various components thereof, together with a list of any other materials and equipment (and their values) being transferred.

300.20.4 Electronic File Requirements

Text Files:

1. Specifications may be submitted in Microsoft Word (.doc) or Adobe Acrobat (.pdf) format.
2. Tables may be submitted in Microsoft Excel (.xls) or Adobe Acrobat (.pdf) format.

Drawing Files:

1. Record Drawings shall be submitted as scanned images and as Computer Aided Design (CAD) files.
2. Scanned images may be submitted in standard image format (tif, or .jpg), or in Adobe Acrobat (.pdf) format.
3. CAD files shall be submitted in AutoCAD, version 2000 or later.

300.21 EASEMENT VERIFICATION

The developer's engineer will verify in writing that the facilities to be accepted by the District Engineer were constructed within the easements as listed in the easement documents. In the event the facilities were not constructed within the designated easement, the engineer will submit revised easement documents, quitclaim documents, and a final title report for recordation.

300.22 METER USE AND FEE VERIFICATION

With the record drawings, the applicant is to furnish the District Engineer a cost breakdown of the newly installed facilities for District accounting purposes (refer to Appendices 9A, 9B and 9C). This is to be furnished to the District Engineer before an acceptance letter- releasing bond will be written (refer to Appendices 10A, 10B and 10C). The District Engineer will verify the quantities used in the calculation of the fees for the "Infrastructure Agreement." Any adjustments to the fees will be made at this time.

300.23 BOARD ACCEPTANCE

After satisfactory completion of the items in Section 300.1 through 300.22, the District Engineer will, upon the request of the developer, petition the District's Board of Directors for acceptance of the project, and the commencement of the one year warranty period.

The District will also re-evaluate the plans for compliance with the "Infrastructure Agreement" and reserves the right to re-assess the development impact fees if deviations from the originally approved plans have been made. Changes include, but are not limited to: the number of service connections, meter sizes, building square footage, the irrigated area, the number of dwelling units, and any other measure used to calculate the original impact fees.

300.24 RELEASE GIVEN TO CITY AND/OR COUNTY

300.24.1 Bond Release

All final inspection requirements shall be fulfilled before the District will give its final acceptance notice to the City and/or County for release of the applicant's bond to those agencies. The applicant's bond with the District shall remain in effect in accordance with Section 100.5 and the Agreement.

300.24.2 Domestic Water, Sewer and Recycled Water Service in service prior to Acceptance

District Engineer may approve putting newly installed domestic water, sewer and recycled water system into service prior to District Board acceptance after compaction has been approved by the governing agency and the portions have been pressure tested, chlorinated, flushed, and have passed the bacteriological test and inspection for domestic water mains. This partial acceptance shall be granted only upon written request from the applicant and subsequent approval by the District Engineer. Upon this written approval for partial acceptance of facilities, the applicant shall be relieved of the duty to maintain the portions so used or place into operation provided, however, that nothing in this section shall be construed as relieving the applicant of full responsibility for completing the work in its entirety, for making good any defective work and materials, for protecting the work from damage, and for being responsible for damage and for work as set forth in the agreement and other contractual documents; nor shall such action by the District be deemed completion and acceptance, and such action shall not relieve the applicant of the guarantee provision of the Agreement with the District. One-year guarantee period shall not start until acceptance by the District Board of Directors has assessed. (See section 300.24)

300.25 SECURITY RELEASE

If in the time period of one-year from the date of District Board Directors acceptance, no failure of the system has occurred, which has gone unrepaired by the developer, to the satisfaction of the District Engineer: the developer may petition the District Engineer to request final acceptance of the project by the District Board and release of the surety.

END OF SECTION

SECTION 400

**DESIGN CRITERIA
DOMESTIC WATER FACILITIES**

400.1 DESIGN FLOW AND PIPE VELOCITY CRITERIA

The criteria for velocity shall be as described herein. The maximum velocity in a line shall not exceed 5 fps (feet per second) during the peak hour condition. The peak hour is defined as 4 times the average day demand. The maximum velocity in a line shall not exceed 7 fps during the maximum day plus fire demand condition. The maximum day is defined as 2 times the average day demand. Residential design flows shall be based on 130 gallons per capita per day. Commercial/Industrial design flows shall be calculated based on the developer's estimated water demands for the proposed development.

400.2 ALLOWABLE SIZE FOR WATER MAINS

The normal minimum diameter for a water line shall be 8-inches for distribution mains, short street configurations, and dead-end streets. The next allowable water line diameter is 12-inches for distribution mains. The applicant must determine the pipe diameter requirements above 12-inches, which shall be approved by the District Engineer.

400.3 TYPE OF MAIN PIPE

Only AWWA C-900 PVC pipe, pressure class 350 is to be used for distribution mains of 6 inches in diameter or less, or as directed by the District. Either C900 PVC or C151 Ductile Iron Pipe (DIP), pressure class 350, may be used for 8-inch to 12-inch diameter mains. Water mains greater than 12-inches in diameter are considered engineered systems and require specific approval by the District Engineer (DIP is preferred but not mandated).

Flanged pipe, when required, shall be DIP, thickness Class 53 unless a higher-pressure class is required for special installations. DIP shall be provided and installed per Section 15056 of the District's Standard Specifications. Fully restrained DIP shall be used within easements with restricted access and slopes exceeding 10%.

400.4 MINIMUM DEPTH TO TOP OF WATER MAIN PIPE

400.4.1 Residential Areas (Usually 12-Inch and Smaller)

The top of the pipe is to be a minimum of 36 inches below finish grade, unless indicated otherwise on project plans or directed otherwise by the District inspector because of unusual field conditions. The top of pipe is to be a minimum of 36 inches below finish grade in unpaved areas.

400.4.2 Transmission Mains. (Usually Larger than 12-Inch)

The top of the pipe is to be a minimum of 42 inches below finish grade, unless indicated otherwise on job plans or directed otherwise by the District inspector because of unusual field conditions. The top of pipe is to be a minimum of 60 inches below finish grade in unpaved areas.

400.5 STANDARD LOCATION

Domestic water main centerlines shall normally be located 6 feet from the outside travel lane line and may be deflected to avoid cross gutters, concrete bus lanes or other interferences. Water lines will not be allowed within easements in residential lots. There must be dedicated utility easement, minimum width 20 feet, if a water line needs to go outside streets from cul-de-sac to cul-de-sac.

400.5.1 Water Main Deflection

Water mains may be deflected at the joints to reduce the number of angled fittings required. Comply with Sections 15056, Ductile Iron Pipe and Fittings, or Section 15064, PVC Pressure Distribution Pipe, as applicable.

400.6 WATER VALVE SPACING

As a general rule, there should be three (3) isolation valves where one main ties into another (i.e. at tees). Where two mains intersect (i.e. at a cross) there should be four valves. On long blocks, intermediate valves should be installed so that a maximum of 500 feet would have to be shut off at any one time.

Valves should also be spaced so that not more than two fire hydrants should be out of service at any one time.

In most cases where water mains pass through easements outside traveled streets, a valve shall be located at each end of the easement. The final determination of valves and locations shall be per the District Engineer.

400.7 SEPARATION OF DOMESTIC WATER, SEWER, AND RECYCLED WATER LINES

400.7.1 Horizontal Separation

State Health Department regulations require new water mains and supply lines shall be installed at least ten foot horizontal separation from and one foot minimum vertical separation above any parallel pipelines conveying untreated sewer, disinfected secondary-23 recycled water or sludge. New water mains and new supply lines shall be installed at least four feet horizontally from, and one foot vertically above any parallel pipeline conveying disinfected tertiary recycled water or storm drainage. However, in special situations where there is no alternative but to install the mains with less than the required separation, special construction will be considered by a permit action with the Department of Health Services and on an individual basis by the District Engineer (See Standard Plan W-16). Domestic water lines are normally located on the opposite side of the street from the recycled water line.

400.7.2 Vertical Separation

Normally, water, sewer, and recycled water shall be located vertically from the street surface in order of the higher quality, i.e., domestic water shall be above recycled water and recycled water shall be above sewer. Whenever a crossing must occur where a sewer main passes within 1 foot of a domestic water main or where a sewer main passes within 1 foot of a recycled water main, special construction will be required as shown on MCWD Standard Plan W-16.

If the conditions of Standard Plan W-16 cannot be met, then one of the following types of alternates may be required:

1. Reinforced concrete encasement, a minimum thickness of 6 inches.
2. Piping within a continuous steel casing, per Standard Plan W-16, which shall have a thickness of not less than 1/4 inch.

If a sewer is above a water main, the special construction shall extend a sufficient distance on both sides of the crossing to provide a minimum of 10 feet of horizontal clearance. If a sewer is located below a water main, and within a vertical distance of a 1-foot clearance distance, the special construction shall extend a sufficient distance on both sides of the crossing to provide 4 feet of horizontal clearance. These construction requirements shall not apply to house laterals that cross perpendicular less than 1 foot below a pressure water main.

400.7.3 Storm Drains

Storm drain systems must be designed with sufficient cover so that the water mains and service laterals can be built over the top of the storm drain mainline and laterals with a minimum 12-inch clearance, in compliance with California Department of Health Services (DHS) requirements and standards.

400.8 FIRE FLOW DEMAND

The design criteria to be used for determining fire flow requirements shall be as determined by the local fire authority. Before designing the domestic water system for a project, the applicant shall obtain the local fire authority's fire flow requirements for the project. These requirements, plus written indication of the Fire Marshal's approval, are required to be on the improvement plans prior to District's approval. All fire flow tests shall be performed by the District. District shall charge a fee to perform this fire flow test. As a general guide, the following shall be considered:

400.8.1 Residential Dwelling Units

The water system shall be capable of providing a residential fire flow minimum of 2,000 gpm, combined flow, for a 4-hour duration from any two adjacent hydrants at a minimum 30 pounds of residual pressure (psi) at the main. For residences 3,600 square feet and under, the minimum requirement shall be 1,500 gpm per hydrant at 20 psi regardless of the relative location to open space areas. For residences over 3,600 square feet, the Fire Marshal shall be consulted. The open space area is defined as any area bordering an undeveloped open space with no fire control mechanism.

400.8.2 Schools and Commercial Areas

The system shall be capable of providing a fire flow of at least 3,000 gpm for 3 hours duration (or as required by the Fire Marshal of the local fire authority) out of any two adjacent hydrants at a minimum 20 pounds of residual pressure at the main.

400.8.3 Industrial Areas

In industrial developments requiring a high fire flow, the applicant shall consult with the Fire Department to discuss options for upgrading the domestic water system to deliver the fire flow or provide built-in sprinkler protection for the structures.

400.9 FIRE HYDRANTS

The location of fire hydrants shall be as determined by the local fire authority, and per the guidelines set herein. The exact location with respect to the curb and sidewalk shall be as shown in District Standard Plan W-8.

400.9.1 Fire Hydrant Spacing

The maximum fire hydrant separation shall be 300 feet from fire hydrant to fire hydrant. The only exceptions will be at the discretion of the Fire Marshal. Bollards to protect the hydrant may be required at the discretion of the District.

Fire hydrants shall be located near the beginning of curb return (BCR) or lot lines. No fire hydrant shall be located within 3 feet of a driveway, or closer than 40 feet to any structure unless approved by the Fire Marshal. Bollards to protect the hydrant may be required at the discretion of the District Engineer. Refer to section 400.6 regarding main valves and their affect to fire hydrant service.

400.9.2 Hydrant Laterals

In situations where the fire hydrant run is over 20 feet, the size of the hydrant lateral shall be 8-inches. Shorter laterals may be 6-inch in diameter.

400.9.3 Types of Hydrants

Fire Hydrants shall be provided in accordance with District Specifications Section 15139 "Fire Hydrants"

400.9.4 Plan Requirements

Fire hydrants shall be shown on the plans where the hydrant is to be located with respect to the property line, and what easements will be provided. The building foot prints or building pad areas are also to be shown. Developer shall follow the hydrant numbering system established by the Fire Marshall.

400.10 SERVICE MATERIALS AND MINIMUM SERVICE SIZE

400.10.1 General

Approved materials and manufacturers for various service material tubing and connections are as listed in District's Standard Specifications, herein.

Service laterals shall tap into a water main (Standard Plan W-1 or W-2) or a manifold lateral (Standard Plan W-3). Laterals may not tap into other service or hydrant laterals.

400.10.2 Minimum Domestic Service Size

Minimum domestic service line size shall be 1-inch with a 5/8 x 3/4-inch meter. The sizing of the service shall be specified on the plans designated by lot numbers. Services for commercial or industrial developments are to be as shown on plans or as directed by the District Engineer.

For industrial, commercial, private-street residential, and other nonresidential development, the District may require a detail on the plans of the location of the proposed service.

400.10.3 Type of Service Line

Acceptable service line material is as described below:

1. 1-inch and 2-inch service line shall be copper tubing per Section 15057 or copper tubing size (CTS) polyethylene per Section 15058.
2. 4 inches and larger, use DIP per Section 15056, or PVC per Section 15064 of the District's Standard Specifications, as determined by the District Engineer. (3-inch is not permitted).

400.10.4 Meters

Per District ordinance, all newly constructed dwelling units shall be individually metered. All water meters will be furnished by the District, subsequent to payment of all applicable charges and posting of all required bonds and insurance. The District will install all meters up to 2 inches. All water meters 3-inch and larger will be installed by the applicant.

The developer shall identify the meter size required for its project. The District Engineer shall review and accept, or propose a revised meter size based on information provided by the developer. All calculations, worksheets, figures, correspondence with the local Fire Authority, must be submitted to the District Engineer or his/her designee. A worksheet to assist with the determination of a meter size is available at the District offices. Below are the District's flow criteria for various meter sizes.

<u>Meter Size</u>	-	<u>GPM - MAXIMUM</u>
5/8" X 3/4"	-	15
1"	-	37
1½"	-	75
2" Disc	-	120
2" Turbine	-	160
2" Compound	-	160
3" Turbine	-	350
3" Compound	-	320
4" Turbine	-	1000
4" Compound	-	500
6" Turbine	-	2000
6" Compound	-	1000
8" Turbine	-	3500
10" Turbine	-	5500

District reserves the right to size meters at any time.

Types of meter:

1. A turbine meter and strainer shall be used on all irrigation services 2-inch and larger and as determined by the District.
2. A compound meter and strainer may be used on all master metered domestic multi-unit developments and as approved by the District.

A by-pass line shall be installed on all meter assemblies, 3 inches and larger, as shown on Standard Plans W-24 and W-25. A by-pass line is not required for the following conditions, as determined by the District Engineer:

1. Multiple metered connections for a single building
2. Irrigation services

A lockable corporation stop or valve shall be installed on all by-pass lines. A by-pass line may be required on smaller installations, which require continuous service.

400.10.5 Pressure Reducing Valves

When system pressure is above 80 psi then all residential lots shall be provided with approved pressure regulators set at 80 psi and shall be installed per the appropriate governing agency's standards.

400.11 CROSS CONNECTION CONTROL

All domestic water services shall be subject to the provisions of section 3.28 of the District's Code. The following summarizes these provisions:

Cross connections of any type that permit a back flow condition from any source or system other than that of the District's domestic water mains are prohibited. A connection constituting a potential or actual back flow hazard is not permissible unless a back flow device or air gap, which is approved by the California State Department of Health and complies with Title 17 of the California State Administrative Code, is installed. Such an installation shall at all times be subject to inspection and regulation by the District for the purpose of avoiding possibility of back flow.

The District will not provide any water service to any premises unless the public domestic water supply is protected as required by State and District regulations. Except in special situations, it is now required to have back-flow devices installed for:

- All commercial domestic water services
- All industrial domestic water services
- All fire lines where the commercial or industrial buildings are over two stories in height
- All domestic systems or fire line systems having two, or more, points of connection to District mains
- All irrigation services on the domestic water system
- All domestic services to sites with recycled water irrigation service

The customer shall have the device regularly tested (at least once a year) by a tester certified by the AWWA California-Nevada and the California Department of Health Services and service such devices to maintain them in satisfactory operating condition and shall overhaul or replace such devices if they are found defective. Test results shall be provided before District will accept service as complete.

Records of such annual tests, repairs, and overhauling shall be kept by the customer and copies forwarded to

the District's Cross Connection Program Specialist.

Service of water to any premises may be discontinued by the District if a back-flow prevention device required by the District ordinance is not installed, tested, and maintained; or if any defect is found in an installed back-flow prevention device; or if it is found that a back-flow prevention device has been removed or bypassed; or if unprotected cross-connections exist on the premises. Services will be restored only when such conditions or defects are corrected to the satisfaction of the District.

The District will further define how water lines must be marked where multiple water systems are in use and outline the duties and responsibilities of a property's water supervisor.

Additional reference for guidelines regarding selections and installation of back-flow and cross-connection control devices are approved may be found in:

1. Marina Coast Water District Water Code, Chapter 3.28, Cross Control and Appendix A, and section 15112 "Backflow Prevention" of the District's Standard Specifications.
2. Regulations Relating to Cross-Connections, California Administrative Code - Title 17 - Public Health.
3. Manual of Procedures and Practices for Public Water Suppliers (California Department of Health Services - Public Water Supply Branch
3. Manual of Cross-Connection Control, published by Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California, University Park, Los Angeles, California 90007.

400.12 STANDARD WATER NOTES

The following standard water notes shall be included on all water system construction plans.

Applicant is also referred to Section 300.4.2.

1. The water system as shown on these plans shall be constructed in accordance with the standard plans and specifications of the Marina Coast Water District. Contractor shall keep a copy of the standard specifications and drawings on the jobsite at all times.
2. The Marina Coast Water District shall be notified at least 48 hours prior to commencing work on the water system. Phone (831) 384-6131 for inspection. A preconstruction meeting shall be held at least 24 hours before starting construction.
3. The water system is to be installed by the applicant. All water system work shall conform to the District's "Standard Plans and Specifications," as last revised. The contractor shall have a copy of these plans and standard specifications on the job at all times.
4. The District shall be furnished with three (3) copies of approved construction plans prior to starting construction. A preconstruction conference of representatives from affected agencies and the contractor shall be held on the job site 24 hours prior to start of work.
5. Domestic water mains shall be installed after the installation of curb and gutter at six feet off of curb ace, or as staked by the applicant's surveyor at a minimum 50-foot stationing, if there are no existing

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curbs.

6. All nuts and bolts, shall be grade 316 stainless steel. All buried flanges, valves and fittings shall be wrapped with 10-mil polyethylene sheet.
7. Any water service found to be within a driveway or sidewalk shall be removed at corporation valve and reinstalled at the proper location, at no cost to the District.
8. All main line valves shall be maintained so as to be accessible during tract development, and all valve stem tops having over 48 inches of cover may require an extension as per MCWD Standard Plan W-7.
9. The top of the pipe shall be a minimum of 42 inches of cover from the finished grade in paved sections, unless indicated otherwise on the job plans or directed otherwise by the District because of unusual conditions. Pipe shall be bedded and backfilled per MCWD Standard Plan W-12.
10. Fire hydrants shall be installed in accordance with the appropriate details herein and installed behind curbs and sidewalks where the sidewalks are adjacent to the curbs. Fire hydrants shall be per the District's specifications and shall have a concrete pad poured around them. All fire hydrants shall be set with the bottom flange 4 inches above the concrete pad or sidewalk.
11. No facility is to be backfilled until inspected by the District.
12. Shut down or tapping of existing domestic waterlines to facilitate connection to existing facilities shall be coordinated with the District at least 24 hours in advance. Any relocation of existing facilities is subject to approval of the District Engineer.
13. No taps or other connections shall be made to existing District water mains prior to conducting an approved pressure and bacteriological test on the new water distribution system. Tapping sleeves shall be pressure tested in an approved manner in the field in the presence of the District inspector, prior to tapping the main line. Tapping of the main line shall not proceed unless a District inspector is present.
14. All water services shall be installed per the District's standard specifications. All meters shall be installed in grass or planter areas and accessible by vehicle. Any services located in sidewalks are subject to the appropriate governing agency and District approval. Any meters located in banks of 4 shall be manifolded per MCWD Standard Plan W-3. All meter registers and lids shall be marked with address identification.
15. Where meters and meter boxes are located within slopes, the angle meter stops shall be so located that the meters and boxes will be parallel and flush, respectively, with the finished street surface. A retaining wall may be required around the meter box.
16. The applicant shall furnish and install the service connections between water mains and meters and meter boxes. Water services shall be installed to the property line prior to paving of the street.
17. Curb face shall be inscribed with "W" indicating locations of all domestic water services.
18. Water low-flow devices shall be provided for all units within this development in accordance with rules and regulations of the District.

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19. All valves shall be located off the tee unless otherwise approved by the District. At intersections and bus stops with concrete pads, the main line shall be roped to avoid cross gutter conflict.
20. Individual pressure regulators will be required by the plumbing codes of the city having jurisdiction if static pressure reaches 80 psi or more.
21. All water meters will be furnished by the Marina Coast Water District following receipt of application and deposit. The District will install water meters up to 2 inches. The Contractor shall install water meters 3 inches and greater. The contractor shall place all piping per District plans and properly locate the meter boxes to grade prior to installation of the meters by the District.
22. Any District water used for construction shall be metered with a construction meter obtained from the District.
23. An Encroachment Permit from the County or city having jurisdiction is required prior to any work within public right-of-way or easement.
24. The existence and location of any underground utilities or structures shown on these plans were obtained by a search of the available records. Approval of these plans by the District does not guarantee the accuracy, completeness, location, or the existence or non-existence of any utility pipe or structure within the limits of this project. The contractor is required to take all due precautionary means necessary to protect those utility lines not shown on these plans.
25. The applicant shall remove to the satisfaction of the MCWD inspector all unused water stubs and/or services that was provided to the project site.

400.13 MISCELLANEOUS STANDARD GUIDELINES

1. Quantity estimates, for the domestic water systems, are to be included on the plans indicating quantity of pipe, valves, fire hydrants, domestic water services, etc.
2. The drawing shall show on plan and profile the position of all other known underground utilities or proposed underground utilities. (Top and bottom of pipe elevations may be required in addition.).
3. Manual air-release assembly shall be installed at service stub-outs for testing and flushing purposes.
4. Air and vacuum valves are to be installed at all high points in the line for 12-inch size pipe and larger, or as directed by the District.
5. The vacuum release shall be sized to accommodate 100% of the pipeline flow (as CFM of air).
6. Air release shall be sized to accommodate the release of the maximum amount of entrained air that could be released in the system, as a function of the maximum differential in temperature and pressure which could result in air entrainment, or 2% of the volume of water passing through the system; whichever is greater.
7. Generally the District requires all fittings and valves to have "push-on" type ends, except at tees and crosses where valves are required. Valve and fitting are to be joined by a flange.

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8. The contractor shall restore or replace all removed or damaged or otherwise disturbed existing surfaces or structures not otherwise noted on the plans or specified herein to a condition equal to that before the work began and to the satisfaction of District's Engineer, and the underlying jurisdictional authority. All excess earth and all other debris shall be removed and disposed of by the Contractor and the entire site of the work shall be left in a condition acceptable to the District Engineer prior to final acceptance of the work. All restoration and cleanup shall be performed in accordance with the District's Standard Specifications.
9. Blow-offs are required at the ends and low point of all mains.
10. Dead-end water mains are limited to 600-feet or 28 service connections, whichever is most restrictive.

400.14 Water Conserving Fixtures

In all new construction and/or renovations that include plumbing work, the following water efficient equipment is mandated by District ordinance. Additional equipment specifications are in Standard Specification 21000.

1. Only High Efficiency Toilets (HET) or Dual Flush Toilets may be installed. HET toilets are defined as 1.28 gallons per flush or less.
2. Each showerhead shall be 2.5 gallons per minute (gpm) and have it's own control valve or set of hot and cold control valves (i.e., showers with multiple heads require separate valves for each head).
3. A hot water recirculation system or point of use hot water heater shall be installed if hot water fixtures are more than 10 linear feet away from the hot water heater.
4. All urinals shall be zero water use (i.e., flushless or waterless).
5. Clothes washers in new residential units shall be high efficiency (HE). HE clothes washers use a maximum 8.5 gallons per cubic foot of wash load.

END OF SECTION

SECTION 500

DESIGN CRITERIA
SEWER FACILITIES

500.1 DESIGN CRITERIA FOR GRAVITY SEWERS

500.1.1 Flow Rate Generation

The design peak flow rate for residential sewer mains shall be calculated using a base generation rate of 90 gallons per capita day (gpcd), the density and peaking factors contained in Figure 500-1, and an Infiltration and Inflow (I/I) factor. The following formulas are used to define the calculations:

Design Peak Flow Rate = Peak Wet Weather Flow Rate (PWWF)

PWWF = Peak Dry Weather Flow + [Average Dry Weather Flow x I/I factor]
= PDWF + (ADWF x I/I)

PDWF = ADWF x Peaking Factor from the graph in Figure 500-1.

ADWF is calculated using a base generation rate of 90 gallons per capita day (gpcd) multiplied by the proposed population of the development. Population may be estimated using the table in Figure 500-1. ADWF generation rate projections for specific commercial/industrial developments proposed are required and should be calculated by the developer's engineer.

I/I factors are the following:

I/I factor = .44, when designing new sanitary sewers.

I/I factor = .67, when designing sanitary sewers that utilize existing sewers installed prior to 1997.

500.1.2 Peak Flow Limitation (Based on d/D Ratio)

The design peak flow rate allowed within a pipeline of any given diameter will be limited by the resulting depth-to-diameter ratio (d/D ratio) where 'd' is the calculated flow depth in the pipe and 'D' is the inside diameter of the pipe. For pipes 12-inches in diameter and smaller, the maximum allowed d/D ratio is 0.67. For pipes 15-inches to 24-inches in diameter, the maximum allowed d/D ratio is 0.80. For pipes 27-inches in diameter and larger, the maximum allowed d/D ratio is 0.90.

500.1.3 Minimum and Maximum Velocity

All sewers shall be designed and constructed to yield mean velocities within the pipeline, at peak dry weather flow (PDWF), of at least 2.0-fps while not allowing velocities to exceed 8.0-fps. Flow velocities will be determined by the utilization of Manning's formula for open-channel flow and will use an "n" value of 0.013. Variance from the requirements in this section will be allowed only with approval by the District Engineer.

500.1.4 Minimum Pipe Diameter

Sanitary sewer mains shall generally be 8-inch diameter or larger. 6-inch sewer mains are only allowed for top-of-line segments (dead-end lines, alleys and cul-de-sacs). When two or more sewers flow into a manhole, the sewer out shall be a minimum of 8-inches.

500.1.5 Minimum Slopes

The following are minimum slopes; however, slopes greater than these are desirable:

<u>Sewer Size (inches)</u>	<u>Minimum Slope in Feet per 100 Feet</u>
6	0.60
8	0.40
10	0.32
12	0.28
15	0.15
18	0.12
21	0.10

These are absolute minimum slopes. Sewers should be designed to provide steeper slopes whenever possible so that the 2.0-fps minimum flow velocity is exceeded and pipeline invert scouring is improved. The maximum allowable slope shall be the slope that generates a maximum flow velocity of 8.0-fps at the peak dry weather flow rate.

Under special conditions, the developer's engineer may request slopes of less than the minimums stated. The developer's engineer must submit this request along with back-up data and calculations to show that the depth of flow at design average dry weather flow will be 0.3 of the pipe diameter or greater. The developer's engineer must also submit computations to show the depths of flow within the pipeline at minimum and average flow rates. The request shall detail the reasons why the normal minimum slopes cannot be achieved. The request and supporting data will be reviewed by the District Engineer and his decision will be conveyed to the applicant.

500.2 STANDARD LOCATION, ALIGNMENT, AND STATIONING

500.2.1 Location

Wherever possible, in local residential and industrial streets, pipe is to be located 5-feet from the street centerline. In major, primary, and secondary highways, pipe will be located in the center of the driving lane nearest to the center of the street. Pipe should not be located in median strips or parking lanes. On curvilinear streets, pipe shall parallel as nearly as possible the street centerline by means of horizontal curves.

500.2.2 Alignment

Barring other limiting design and construction considerations, a maximum separation between sewer and domestic water mains in new subdivisions shall be achieved by the following construction procedures:

1. On curvilinear streets, the sewers shall parallel as nearly as possible the street centerline by means of horizontal curves.
2. Sewer mains should be installed on the opposite side of the centerline from the domestic water mains.

500.2.3 Radius of Curvature

Minimum radius of curvature shall comply with Section 02701, Installation of Gravity Sewer Pipelines, or the pipe manufacturer's recommendation, whichever is more restrictive.

500.2.4 Stationing

Sewer centerline stationing shall be shown (example: 00+00.00) with the stationing starting at the most downstream manhole or connection to existing sewer and the stationing increasing upstream to the last manhole on a sewer line. Intersecting sewer lines shall be independently stationing from their downstream point of connection and increase upstream to the last manhole or clean-out. Each line shall be independently labeled for identification as "Sewer Line A", "Sewer Line B", etc. Sewer stationing may be independent of street stationing.

500.2.5 Minimum Cover

Minimum cover from finish street grade to top of sewer main pipe is to be 4 feet or 12-inches below any potable water main in the right-of-way, whichever is deeper, unless approved otherwise by the District Engineer. Sewers shall be deep enough to allow lateral connections meeting minimum depth at curb.

500.2.6 Separation Between Waterlines And Sewers

Adequate horizontal and vertical spacing shall be maintained in accordance with Section 400.7 and District Standard Plan W-16.

500.3 SEWER PIPE MATERIAL

All gravity sewers and laterals 15-inch diameter and smaller shall be SDR-35 PVC as described in the District's Standard Specification Section 02715. Gravity sewers 18-inch diameter and larger shall be DIP with polyethylene lining (per Standard Specification Section 15056) or PVC with a suitable size dimension ratio for the installation conditions. Exceptions must be pre-approved by the District Engineer. All sewer force mains shall be PVC pipe meeting District Standard Specification Section 15064, AWWA C-900, and Class 150 pipe standards.

500.4 FORCE MAIN CRITERIA

The size of sewer force mains shall be determined during the design phase of the project and only after a comparative study of the construction cost and pumping costs for several alternative sizes. In no case shall a force main be less than 6-inches in diameter. The capacity of the force main shall be the design peak flow from the pump station calculated from Manning's equation using "n" = 0.013. The nominal design velocity for a force main should be 3.0-fps, with minimum velocity of 2.0-fps, and maximum allowed 8.0-fps. The discharge shall be into a manhole with a smooth flow transition to a gravity sewer. The manhole shall be epoxy coated on the interior or PVC lined for corrosion protection.

500.5 MANHOLES

Refer to District Standard Specification Section 03461, Precast Reinforced Concrete Manholes and Manhole Bases for additional information.

500.5.1 Manhole Spacing and Location

Manholes shall be installed at the end of each line; at all changes in grade, size, or alignment; at all intersections; and at distances not greater than 300 feet for 6-inch sewers, 400 feet for 8- through 15-inch sewers and 500 feet for 18- to 30-inch sewers. If a sewer is curved, closer spacing of manholes will be required. Greater spacing may be permitted in larger sewers. Only one curve (horizontal or vertical) shall be allowed between any two manholes.

500.5.2 Manhole Type, Size, and Depth

Manhole depth is calculated from finish grade to lowest pipe invert. Minimum manhole depth is to be 5 feet unless approved otherwise by the District Engineer. Manholes shall typically be from 7 feet to 12 feet deep. Manholes over 20-ft deep must be approved by the District Engineer. Depth of manhole shall be measured from the pipe invert to the finished surface of the street with a tolerance of ± 1 -inch.

Manholes shall be pre-cast reinforced concrete with an eccentric cone. The minimum internal diameter shall be 48-inches. Pipe penetrations shall not exceed 30% of the internal circumference. Large or numerous pipe penetrations may require the installation of larger diameter manholes. Manholes over 20-ft deep may require larger diameters, at the direction of the District Engineer.

For larger sized sewer mains or special circumstances, the manhole size will be as shown on plans.

500.5.3 Minimum Assumed Head Losses Thru Manholes

Minimum head loss in manholes shall be as follows:

1. Straight run through manholes based on 0.20 foot loss.
2. Right angle turn in manholes based on 0.5 velocity head loss (i.e. $(0.5)(V^2/2g)$), or 0.30 foot, whichever is greater.

500.5.4 T-Lock Lined Manholes

The District has been experiencing substantial deterioration in manholes at some locations due to hydrogen sulfide gases released from sewage flow. In order to mitigate the problem on future sewers, the District requires manholes that meet certain criteria be constructed with an integral PVC liner. The District-approved PVC liner material/process is Ameron T-Lock™ liner. The District has established the following criterion to govern the requirement for lining manholes with a PVC liner:

1. If the sewer has a slope of 7% or greater, then all manholes will be PVC-lined.
2. Where there is a change in slope, from steep to flat (relative to the direction of flow), of 5% or greater, the manhole at the grade change and the next manhole upstream will be PVC-lined.
3. All drop manholes, including force main terminal (i.e. the transition from forced flow to gravity flow) manholes, will be PVC-lined.

4. When required by the District Engineer.

500.5.5 Manhole Covers

Cast-iron covers and frames shall be provided in accordance with District Standard Specification Section 03461 and Standard Plan S-3.

At the completion of final paving, the manholes shall be raised to final grade by using the necessary sized grade rings.

500.5.6 Access to Manholes

All sewer manholes shall be designed and constructed with a direct access to them. Manhole steps shall not be installed. Unpaved access may be allowed as determined by the District Engineer

500.6 CLEAN-OUTS

Use of clean-outs (as shown in District Standard Plan S-6) on service laterals and sewer mainlines shall be required in the following instances unless otherwise approved by the District Engineer.

1. At the point of connection to the building drain.
2. At any single turn greater than forty-five degrees.
3. At intervals not to exceed one hundred (100) feet along the side sewer system.
4. Short sections of sewer main, less than 250-feet that will be extended.
5. All commercial and industrial sewer lateral installations at the property line.
6. Between manholes, if there is a reverse curve in the sewer main, to facilitate cleaning of the main line.
7. Special instances such as on a sewer lateral to a single family residential lot where the dwelling unit is set back more than 100-feet from the property line, where there is a large slope up to the building pad from the property line and a grade change in the lateral is necessary, or where the sewer lateral enters the rear of the lot from a public right-of-way.
8. On a lateral where the overflow level of the lowest wastewater fixture in the building is below the rim elevation of the uphill sewer manhole on the main line. In this situation the rim elevation of the clean-out installed at the property line shall be at least 6-inches below the overflow elevation of the lowest wastewater fixture on the lateral. A backflow prevention device is required on the lateral per Section 4.11 of the District's Code.

500.7 HOUSE LATERALS AND MINIMUM DEPTH AT CURB

All sewer laterals shall be located by the applicant and shown (with stationing) on the improvement plans.

House connections shall be constructed to the property line. There shall be one house sewer lateral constructed for each individually owned dwelling unit and it shall have a minimum diameter of 4 inches.

Four-inch sewer house connections shall be laid to the grade as established by the applicant so that the 4-inch house connection will have a minimum cover of 3 feet from the top of the curb to the top of the pipe per Standard Plan S-7. The sewer laterals from the main to the building, and inside the buildings are governed by the Uniform Plumbing Code and enforced by the local building authority.

500.8 TOWNHOUSES AND CONDOMINIUM LATERALS

For buildings containing two to four units, either one 4-inch diameter lateral to each unit or one 6-inch or larger diameter lateral to the building shall be used. For buildings containing more than four units, either one 4-inch diameter lateral to each unit or one 8-inch or larger diameter lateral to the building shall be used. A lateral shall serve only one building regardless of number of units per building.

500.9 BACKWATER PREVENTION

Backwater prevention devices are required on sewer laterals connecting to all buildings. Variances may be considered by the District Engineer on a case by case basis. Exceptions cannot be granted for laterals to buildings where the building ground floor elevation is below the rim elevation of the uphill sewer manhole on the main line.

500.10 INDUSTRIAL PRETREATMENT

Requirements for industrial pretreatment of sewage will be determined by the Monterey Regional Water Pollution Control Agency (MRWPCA). Design requirements will be dependent upon those industrial pretreatment requirements.

500.11 GREASE INTERCEPTORS

All restaurants and other facilities which discharge grease into the District's sewers shall be required to use grease traps or grease interceptors to minimize grease problems in collection systems and treatment plants. The minimum interceptor size shall be 750 gallons. All interceptors shall be equipped with automatic draw-off devices for easier removal of accumulated grease. Small kitchens may install grease traps instead of interceptors, with the approval of the District Engineer. Comply with Appendix 15 and the Uniform Plumbing Code for sizing.

It will be the responsibility of the owner of each facility to maintain proper operating order of the interceptor unit and to remove accumulated grease at suitable intervals to avoid excessive buildup in the unit. The Marina Coast Water District approves the location and design of the interceptor unit.

500.12 STANDARD SEWER NOTES

Standard sewer notes to be included on all sewer system construction plans shall be as follows:

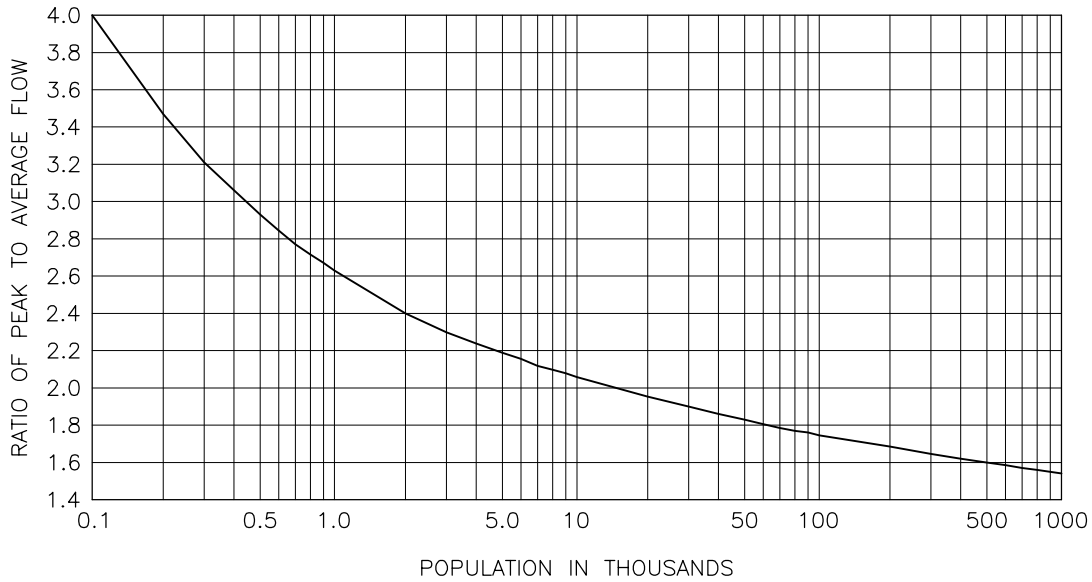
1. The sewer system as shown on these plans shall be constructed in accordance with the standard plans and specifications of the Marina Coast Water District. Contractor shall keep a copy of the standard specifications and drawings on the jobsite at all times.
2. The Marina Coast Water District shall be notified at least 48 hours prior to commencing work on the

MARINA COAST WATER DISTRICT

sewers. Phone (831) 384-6131 for inspection. A preconstruction meeting shall be held at least 24 hours before starting construction.

3. Sewer Connection: 4-inch house connection is to be constructed from the sewer main to the property line for each lot.
4. All sewer house connections shall be placed prior to surfacing of streets.
5. All sewer lengths are calculated on horizontal distances along the centerline of the sewer.
6. Pressure testing of sewers shall be in accordance with the standard specifications of the Marina Coast Water District.
7. 00+00.00 shown on sewer profile denotes stationing along centerline sewer from downstream manhole.
8. In order to prevent accidental use of the new sewer prior to completion and acceptance, the outlet or inlet to existing tie-in manhole(s) shall be sealed with broken brick and mortar. Installation of these plugs shall be approved by the District. Plugs shall be removed at the time of final acceptance.
9. Contractor shall verify the horizontal and vertical location of all utility crossings before constructing any sewers in this project.
10. Contractor's surveyor shall stake the location of all wye fittings. All house laterals not normal to street sewer to have end of lateral at property line staked and tied to a property corner as shown on the plans.
11. The Marina Coast Water District will inspect and maintain all manholes and main line sewers. The District will inspect laterals from the main to the building line, but maintain only to the property line/clean-out. The local building department or appropriate governing agency will inspect and verify building connections to the laterals.
12. The Contractor shall conduct all tests as required in the presence of the District representative.
13. Any work to be performed inside a live manhole shall be done in accordance with Cal OSHA "Confined Spaces" and District manhole entry regulations. Manhole entry without District personnel present is not allowed.
14. All sewer manhole lids are to have "MCWD" cast thereon as shown in Standard Plan S-3 of Marina Coast Water District's "Standard Plans and Specifications for Construction of Domestic Water, Sewer and Recycled Water Facilities."
15. The applicant is to provide the Marina Coast Water District with a record drawings set of job prints with tie-down measurements for all laterals and manholes.
16. Curb face shall be inscribed with an "S" indicating location of all sewer laterals.

END OF SECTION



RATIO OF PEAK TO AVERAGE DOMESTIC SEWAGE FLOW

RESIDENTIAL LAND USE CATEGORY	DWELLING UNITS PER GROSS ACRE	POPULATION PER DWELLING UNIT
LOWEST DENSITY	1.6	3.6
LOW DENSITY	3.5	3.6
MEDIUM DENSITY	6.5	2.3
MEDIUM-HIGH DENSITY	18.0	1.8
HIGH DENSITY	40.0	1.5

DWELLING UNITS AND POPULATION DENSITIES

NOTE:

USE FACTOR PER PERSON
 - 90 GALLONS PER DAY

APPROVED BY
 DISTRICT
 ENGINEER

DATE
 09/2003



MARINA COAST WATER DISTRICT

DESIGN FACTORS FOR
 DESIGN OF SUBDIVISION SEWERS

FIGURE

500-1

SHEET 1 OF 1

SECTION 600

DESIGN CRITERIA
RECYCLED WATER FACILITIES

600.1 GENERAL

All potential uses of recycled water, including, but not limited to, uses for landscape irrigation systems, agricultural irrigation systems, systems used for industrial process or construction purposes, or recreational impoundment systems, or flushing toilets and urinals in non-residential buildings shall be reviewed by the District. If recycled water is to be used, (Refer to the MCWD Code, Title 4.28.080) the facilities shall be constructed in accordance with the procedures and requirements set forth below.

This section is generally divided into seven sub-sections. The sections are:

- Section 600.1 General
- Section 600.2 Off-Site Recycled Water Facilities Design and Construction Standards
- Section 600.3 Recycled Water for Construction Grading or Other Temporary Use
- Section 600.4 General Requirements for On-Site Recycled Water Facilities
- Section 600.5 Design Requirements for On-Site Recycled Water Facilities
- Section 600.6 Inspection Requirements for On-Site Recycled Water Facilities
- Section 600.7 Interior Use of Recycled Water in Non-Residential Buildings

The Marina Coast Water District (MCWD) recycled water program is regulated by the California Department of Health Services and the Monterey County Health Agency and permitted by the RWQCB. As set forth in the District's "Water Code for Water, Sewer, and Recycled Water Service," the District shall determine whether a given service will be furnished with recycled water or potable water. The determination shall be in accordance with the standards of treatment and water quality requirements set forth in Title 22, Chapter 4 of the California Administrative Code, with the intent of the District to work in conjunction with the health agencies to protect the public health, and with the availability and/or feasibility of making available recycled water facilities. All on-site facilities using recycled water will have an annual cross connection test and annual backflow prevention certification unless otherwise approved by the state and county health agencies based on a case by case basis. Details of specific cross connection tests can be found in subsequent sections. All inspections and any cross connection found are reportable to both state and county health agencies.

600.1.1 Recycled Water Site Categories

Recycled water facilities are separated into two categories.

Off-site recycled water facilities typically consist of those recycled water facilities, which are, or will be, owned, operated, and maintained by the District such as transmission or distribution mains in public rights of way. Typically these are facilities on the upstream side of the water meter and include the meter.

On-site recycled water facilities typically consist of facilities, which will be owner, operated, and maintained by the customer, and is downstream of the water meter. The District typically constructs, operates, and maintains recycled water facilities, upstream of the water meter, which are 4" and larger. There are two types of on-site recycled water facilities; non-residential on-site recycled water facilities and residential dual plumbed homes.

600.1.2 Recycled Water System Monitoring

Authorized representatives of MCWD shall monitor and inspect the entire recycled water system including both On-site and off-site facilities. MCWD shall conduct monitoring programs, maintain a record as deemed necessary, and provide reports as requested by regulatory agencies. The Manager or authorized representatives of MCWD, in carrying out these functions, shall have the right to enter the customer's premises during reasonable hours for the purpose of inspecting On-site recycled water facilities and areas of recycled water use and to ensure compliance with the Water Code. This shall include the provision that runoff shall be controlled and limited and the provision that cross-connections between potable water facilities and recycled water facilities do not exist.

For single-family residences receiving recycled water, the permit holder shall be responsible for providing access and cooperation to MCWD's representative so that MCWD's representative can perform an annual cross-connection inspection. This inspection shall include pressure testing of the recycled water system to verify that no cross-connections have been made. The permit holder will be responsible for correcting any work which violates MCWD regulations at their expense including any costs associated with repairing and testing the backflow device. In addition, if the permit holder changes, an AWWA certified cross-connection specialist from the Water Quality Dept. of MCWD will perform a cross-connection survey to verify that no cross-connections exist.

600.2 OFF-SITE RECYCLED WATER FACILITIES DESIGN AND CONSTRUCTION STANDARDS

600.2.1 Minimum Size

The typical minimum size distribution main shall be a 4-inch looped line. Smaller diameter mains may be individually approved by the District Engineer on dead-end mains or the possibility of future tie-ins with other mains. These mains shall be sized so that sufficient water is regularly drawn to prevent stagnation. Only 1-inch and 2-inch copper or polyethylene and 4-inch, Class 150 PVC are approved for service lines.

Developer facilities will be those recycled water mains of any diameter found interior to the developer's project, refer to MCWD In-Tract Policy.

Developer facilities designed by the developer shall be approved by the District and transferred to the District upon satisfactory completion of final inspection. Capital facilities will be designed and constructed by the District in most cases. The facilities found on the private parcels downstream of the meter shall remain in the ownership of the developer.

600.2.2 Approved Pipe Materials

C-900 PVC pipe Class 150 shall be used for recycled water mains up to 12-inch in diameter. The pipe shall be purple in color and shall be marked in accordance with District standards to warn anyone who sees it that there is recycled water in the pipe. A purple polyethylene sleeve may be provided in lieu of a purple pipe. DIP may be used if properly sleeved and marked with purple marking tape.

600.2.3 Minimum cover requirements

The top of all recycled water distribution mains shall be a minimum of 48 inches below the finished street grade unless indicated otherwise on job plans or directed otherwise by the District Inspector because of unusual field conditions.

600.2.4 Separation between Water, Sewer, and Recycled Water Lines

See Section 400 and District Standard Plan W-17.

600.2.5 Standard location

Recycled water pipes shall typically be located either four (4) feet, or eight (8) feet from the curb face on the opposite side of the street from the potable water mains.

600.2.6 Standard Off-Site Recycled Water Notes

The following notes must appear on all plans for construction of off-site recycled water facilities and be identified as "Recycled Water Notes". In addition the Standard Water Notes shown in Section 400 of these Guidelines must appear on the plan as well.

1. Recycled water systems shall be constructed in accordance with the requirements of the Districts potable water system design requirements.
2. Recycled water pipe shall be purple PVC C-900 pipe, Class 150, marked as required by District standards to identify it as recycled water. DIP may be used with the approval of the District, marked with purple sleeve and marking tape.
3. All 1-inch and 2-inch copper or polyethylene services shall be wrapped continuously with purple marking tape or sleeve from end to end.

600.3 RECYCLED WATER FOR CONSTRUCTION GRADING OR OTHER TEMPORARY WATER USE.

The following are MCWD procedures and guidelines for the specific use of recycled water for construction grading, dust control, compaction and temporary reservoirs.

Recycled water is to be used only for the above mentioned uses and may not be used for any other purpose than stated above. There are no exceptions. If there is a need for water other than the above approved uses, i.e.: water to construction trailers, hand washes, hose bibs, and temporary sprinklers etc., one must obtain an approved potable connection from MCWD.

1. All construction connections shall be tagged with warning tags, as follows:

**"Warning - Recycled Water, Do Not Drink"
"Aviso - Agua Impura, No Tomar"**

Use tags as manufactured by T. Christy Enterprises or approved equal. Tags shall be affixed to stationary tanks, water trucks, and all service points or any other inlet or outlet using recycled water.

2. Water trucks, water tanks, or any other receptacle, including but not limited to pipe or hose used for storage or conveyance of recycled water, shall be dedicated solely to that use. Any use other than recycled water must be approved through MCWD and the cognizant health agencies.
3. No fittings, hose or pipe, or any other appurtenance using recycled water shall connect to a potable water source.
4. All PVC pipe extending from the point of connection shall be purple, and read:

“Warning - Recycled Water, Do Not Drink”

The PVC piping shall conform to all material specifications as set forth by MCWD.

5. Any water truck, water tank, or other storage receptacle to be converted from recycled water to potable water shall be thoroughly cleaned and disinfected to the satisfaction of MCWD and the jurisdictional health agencies.
6. Contact MCWD prior to connection at (831) 384-6131 and arrange for an inspection to ensure compliance with District standards.

Failure to comply with any or all of the above requirements places your construction site in violation of District Water Code, and will result in termination of service until the appropriate corrective steps have been taken.

600.4 GENERAL REQUIREMENTS FOR ON-SITE RECYCLED WATER FACILITIES

Plan check procedures shall follow the guidelines outlined in Section 100.5, Application Processing.

600.4.1 Scope

Design and construction standards for sites using recycled water are provided for non-residential and residential dual plumbed home sites.

- Non-residential on-site recycled water facilities include, but are not limited to: landscape irrigation systems, systems used for industrial processes, construction purposes, and toilet and urinal flushing in non-residential buildings. Users shall comply with these standards, the On-Site Recycled Water User Plan, and to any conditions, standards, and requirements set forth by the District in addition to these standard specifications.
- Residential dual plumbed homes using recycled water for landscape irrigation systems shall comply with these standards set forth herein, the Engineer’s Report, and to any conditions, standards, and requirements set forth by the District in addition to these standard specifications. Residential indoor water use of Recycled Water is prohibited.

600.4.2 Interpretation

The District Engineer shall decide all questions of interpretation of “good engineering practice,” guided by the various standards and manuals.

600.4.3 Applicable Codes and Policies

Ordinances, requirements, and applicable standards of governmental agencies having jurisdiction within the District's service area shall be observed in the design and construction of on-site recycled water systems. Such requirements include but are not limited to current revisions of the following:

- The Uniform Plumbing Code.
- Marina Coast Water District Water Code, as applicable.
- State of California, Department of Health Services, Title 22.
- Regional Water Quality Control Board Regulations.

600.4.4 Marina Coast Water District Jurisdiction

The District is responsible for the approval of plans and inspection of all on-site recycled water systems within the District's service area. Where repairs or replacement of a service line on the upstream side of the meter is required, it shall be the responsibility of the District, unless it is a system upgrade, in which case the owner or customer will be billed for the work. Conversely, the cost of repairs or replacement of the on-site facilities shall be the responsibility of the property owner.

600.4.5 Developer's Engineer/Landscape Architect Responsibility

These standards establish uniform policies and procedures for the design and construction of on-site recycled water facilities. They are not intended to be a substitute for knowledge, judgment, or experience. The contained procedures shall be reviewed by the engineer/landscape architect and shall be applied as necessary to the project. Proposed deviations to these standards shall be submitted in writing in conjunction with the plan review submittal. The plans shall be revised or supplemented at any time it is determined that the District's requirements have not been met.

Before design, the developer should obtain the following from the District:

1. Approval to use recycled water for the proposed system, as stated in the previous section.
2. Verification of locations and size of proposed points of connection (meter facilities).
3. Design pressures for the proposed facilities.

600.4.6 Reference Specifications

References to standards such as the Standard Drawings of the District, AWWA, ASTM, UBC, UPC, and UFC shall refer to the latest edition or revision of such standards unless otherwise specified.

600.4.7 Guidelines For Landscape Irrigation with Recycled Water

The following guidelines have been established by the Marina Coast Water District in conjunction with the Monterey County Health Department and the Central Coast Regional Water Quality Control Board. They are intended to provide the basic parameters for the use of recycled water in landscape irrigation. To operate your system in compliance with these guidelines you must:

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1. Irrigate between the hours of 9:00 p.m. and 6:00 a.m. only. Watering outside this time frame must be done manually with qualified supervisory personnel on-site. No system shall at any time be left unattended during use outside the normal schedule.
2. Irrigate in a manner that will minimize runoff pooling and ponding. The application rate shall not exceed the infiltration rate of the soil. Timers must be adjusted so as to be compatible with the lowest soil infiltration rate present. This procedure may be facilitated by the efficient scheduling of the automatic control clocks, (i.e., employing the repeat function to break up the total irrigation time into cycles that will promote maximum soil absorption).
3. Adjust spray heads to eliminate overspray onto areas not under the control of the customer. For example, pool decks, private patios, streets and sidewalks.
4. Monitor and maintain the system to minimize equipment and material failure. Broken sprinkler heads, leaks, unreliable valves, etc., should be repaired as soon as they become apparent.
5. Educate all maintenance personnel, on a continuous basis, of the presence of recycled water, and the fact that it is not approved for drinking purposes. Given the high turnover rate of employees in the landscape industry, it is important that this information be disseminated on an almost daily basis. It is you, the landscape contractor, who is responsible for educating each and every one of your employees.
6. Obtain prior approval for all proposed changes and modifications to any on-site facilities. Such changes must be submitted to, and approved by, the Engineering office and designed in accordance with District standards.

Failure to comply with any or all of the above guidelines puts your system in violation of the District's Water Code, and will result in termination of service until the appropriate corrective steps have been taken.

600.4.8 Prohibitions and Limitations

Design of on-site recycled water facilities shall conform to the following:

- The recycled water system shall be separate and independent of any potable water system. Cross connections between potable water facilities and recycled water facilities are prohibited.
- Hose bibs on recycled water facilities are prohibited. Quick couplers are prohibited for residential dual plumbed homes. Where potable and recycled water is used on-site, potable water hose bibs must be attached to the building.
- Drinking fountains shall be protected from the spray of recycled water in a manner approved by the On-Site Recycled Water User Plan, prior to installation.
- Patios, swimming pools, and spas, etc. shall be protected from the spray of recycled water.
- Overspray and run-off shall be limited or prevented.

- Potable and recycled water lines must maintain proper separation at all times.
- Recycled water shall not be used for any purpose other than the approved uses as set forth in the On-Site Recycled Water User Plan.
- The system shall be designed to irrigate the on-site area within the allowable time periods as set forth in the On-Site Recycled Water User Plan.

600.4.9 Backflow Prevention and Cross Connection

Backflow prevention devices will not be required on the recycled water service connected to a recycled water main. However, in accordance with Section 400, District's Regulation Regarding Cross Connection, reduced pressure backflow prevention devices will be required on the potable water service, when a parcel receives potable and recycled water service. No connection between the recycled waterline and the potable waterline is allowed.

600.4.10 Conversion from Potable to Recycled Water System

In general, all irrigation facilities converting from a potable to a recycled water supply shall conform to the District's construction specifications and the On-Site Recycled Water User Plan. The District will notify the required state agencies of the intent to convert and solicit their involvement through out the process. The facilities to be converted shall be investigated in detail including review of any record drawings, preparation of the required On-Site Recycled Water User Plans, potholing of existing facilities, and determinations by the District of measures necessary to bring the system into full compliance with these standard specifications. The applicant, owner, or customer shall pay all costs to convert the system.

600.4.11 Conversion from Recycled to Potable Water System

If due to any system failure, use violations, or other reasons as determined by the District, it becomes necessary to convert from a recycled water supply to a potable water supply, it shall be the responsibility of the owner, applicant, or customer to pay all costs for such conversion. After notifying state and county health agencies of the intent of the conversion, the recycled water service shall be removed and plugged at the District main or abandoned in a manner approved by the District and State Agencies. The on-site non-residential facilities shall be modified, as required by the District and State Agencies, for use as a potable water system. The onsite system will then be disinfected in accordance with the following procedures.

1. Disinfect the water line following AWWA Standard C651 and District Standard Specification 15041. The final test results must be acceptable to MCWD before recharging the system.
2. Install approved backflow devices on any and all meter connections.
3. Remove the special recycled water quick couplers and their replacement with approved quick coupler valves for potable water systems.
4. Notify all personnel involved.
5. Remove all warning labels.

Installation of all potable water lines and payment of all connection fees due, as provided for in the Summary of Fees and Charges, Appendix 11.

600.4.12 Recycled Water Facilities with Temporary Potable Water Service

As set forth in the MCWD Water Code, where recycled water is not immediately available for use when the design area is ready for construction, and if the District has determined that recycled water will be supplied in the future, the on-site facilities shall be designated to use recycled water. The on-site system shall be designed and constructed to the District's construction specifications as set forth herein. Provisions shall be made as directed by the District and these specifications to allow for connection to the recycled water facilities when they become available. In the interim, potable water will be supplied to the recycled water facilities through a temporary potable water connection. Until recycled water is available, potable water rates will be charged as set forth in the District's published rate schedule..

A backflow prevention device acceptable to the local Health Department and the District will be required on all non-potable systems served from a potable water main. If a recycled water distribution system is constructed as part of a subdivision development, the backflow prevention device may be installed at the point where the recycled main is connected to the potable system, instead of installing devices at every irrigation meter.

Reduced pressure backflow prevention devices are required on all potable water services to sites served with recycled water. The backflow prevention device shall be downstream of the meter and a part of the on-site facilities. If recycled water is not available at the time of construction and potable water is used for irrigation as described above, backflow prevention devices will not be required on the potable services, but sites must be plumbed to allow the addition of these devices at the time recycled water becomes available.

600.4.13 On-Site Recycled Water User Plan Preparation

Upon receipt of a request for recycled water service and irrigation or building plans, an On-Site Recycled Water User Plan will be prepared. The On-Site Recycled Water User Plan (URP) may be prepared by a Registered Engineer of the Owner's choice or by the District staff, at the Owner's expense. The District has available a sample copy of a URP which may be used in preparation.

600.4.13.1 Owner Responsibilities

The applicant, owner, or customer shall have the following responsibilities in relation to operation of On-Site facilities:

1. To make sure that all operations personnel are informed and familiarized with the use of recycled water.
2. To furnish their operations personnel with maintenance instructions, controller charts, and record drawings to ensure proper operation in accordance with the On-site facilities design and these Water Code.
3. To notify MCWD of any and all updates or proposed changes, modifications, or additions to the On-site facilities, which changes shall require approval by MCWD and shall be designed and constructed according to these requirements and standards and in the Water Code. In accordance with the above, changes must be submitted to MCWD for plan review and approval prior to construction. The construction shall be inspected by MCWD, and revised record drawings shall be approved by MCWD. MCWD may, if it deems such to be in the best interest of MCWD, waive or modify any of the foregoing.

4. The recycled water facilities must be maintained in accordance with the Water Code including MCWD's requirements and standards.
5. The operation and control of the on-site system shall prevent direct human consumption of recycled water and control and limit runoff. The applicant, owner, or customer shall be responsible for any and all subsequent uses of the recycled water. Operation and control measures to be utilized in this regard shall include, where appropriate, but not be limited to the following:
 - A. On-site recycled water facilities shall be operated to prevent or minimize discharge onto areas not under control of the customer. If sprinklers are used adjacent to sidewalks, roadways, and property lines, they shall be adjusted to confine the discharge from the sprinklers to the design area.
 - B. The operation of the On-site recycled water facilities shall be during the periods of minimal use of the service area. Consideration shall be given to allow a maximum dry-out time before the design area will be used.
 - C. Recycled water shall be applied at a rate that does not exceed the infiltration rate of the soil. Where varying soil types are present, the design and operation of the recycled water facilities shall be compatible with the lowest infiltration rate of the soil present.
 - D. When the application rate exceeds the infiltration rate of the soil, automatic systems shall be utilized and programmed to prevent or minimize the ponding and runoff of recycled water. The sprinkler shall not be allowed to operate for a time longer than the landscape's water requirement. If runoff occurs before the landscape's water requirement is met, the automatic controls shall be reprogrammed with additional watering cycles of shorter duration to meet the requirements. This method of operation is intended to control and limit runoff.
 - E. Report shall be made to MCWD of any and all failures in applicant, owner, or customer's system that cause an unauthorized discharge of recycled water.
6. Project shall comply with any and all applicable Federal, State, and local statutes, ordinances, regulations, contracts, the Water Code, and all requirements prescribed by the District Manager and the Board. In the event of violation, all charges and penalties shall be applied and collected by MCWD.

600.4.13.2 Data Required for On-Site Recycled Water User Plan

Specific information is required to be incorporated in the On-Site Recycled Water User Plan. A list of the required information and an example of the URP can be found in Appendix 19.

General guidelines for the On-Site Recycled Water User Plan should conform to the following:

1. The on-site recycled water irrigation facilities shall be designed to meet the peak moisture demand of all plant materials used within the design area. Comply with the irrigation design requirements of Section 700.

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2. On-site recycled water facilities shall be designed to prevent discharge onto areas not under control of the customer. Part circle sprinklers shall be used adjacent to roadways and property lines to confine the discharge from sprinklers to the design area.
3. On-site recycled water irrigation facilities shall water only between the hours of 9 p.m. and 6 a.m., or as directed by the District Engineer. Consideration shall be given to allow a maximum dry out time before the design area will be used by the public.
4. The total time required to irrigate the design area shall not exceed 9 hours in any 24-hour period. Irrigation systems shall be designed to operate within this time requirement.

Recycled water shall be applied at a rate that does not exceed the infiltration rate of the soil or the ET requirements of the plantings. Where varying soil types are present, the design of the recycled water facilities shall be compatible with the lowest infiltration rate present. Copies of the developer's soils test reports shall be made available to the District upon request. The MCWD water conservation requirements shall apply.

600.4.13.3 User Supervisor

MCWD shall be kept informed of the identity of the person responsible for the water piping systems on all premises covered by these regulations. At each premise a "User Supervisor" shall be designated. This User Supervisor shall be responsible for the installation and use of pipelines and equipment and for the prevention of cross-connections.

In the event of contamination or pollution of the potable water system due to a cross-connection on the premises, the local health officer and District shall be promptly notified by the person responsible for the water system so that appropriate corrective measures may be taken.

1. User Supervisor Training Program - If there is a non-resident owner, a local User Supervisor shall be appointed. For single-family residences which have a recycled water service connection, the owner shall be considered to be the "User Supervisor" unless otherwise indicated on the application for the service connection request. In the event that someone other than the owner is designated as the "User Supervisor" and this person is no longer associated with the property, the owner shall again be considered the "User Supervisor" until written notification is made to MCWD.
2. Water Service Termination - When MCWD determines that water uses or conditions encountered by MCWD represent a clear and immediate hazard to MCWD's water supply that cannot be immediately abated, MCWD shall institute the procedure for discontinuing water use.

Conditions or water uses that create a basis for water service termination shall include, but are not limited to, the following.

- A. Refusal to install a required backflow prevention device.
- B. Refusal to test a backflow prevention device.
- C. Refusal to repair a faulty backflow prevention device.

- D. Refusal to replace a faulty backflow prevention device.
- E. Refusal to install a RPBP on the potable service when recycled water is provided on site.
- F. Direct or indirect connection between the potable water system and a sewer or recycled water system.
- G. Unprotected direct or indirect connection between the potable water system and a system or equipment containing contaminants.
- H. Unprotected direct or indirect connection between the potable water system and an on-site auxiliary water system.
- I. A situation which presents an immediate health hazard to the potable water system, as determined by the health agency or MCWD.
- J. At single-family residences where copper piping is not installed for the water service or purple PVC pipe not meeting District Procedural Guidelines and General Design Requirements is not installed for the recycled water service.

MCWD will terminate service to a customer's premise after written notices have been sent specifying the corrective action needed and the time period in which it must be completed. If no action is taken within the allowed time period, water service may be terminated in accordance with the District Water Code.

MCWD will make reasonable effort to advise the water user of intent to terminate water service. Then, MCWD will terminate the water service and lock the service valve in the closed position. Water service will not be reinstated until correction of all violations has been approved by MCWD. Failure to correct the violations may result in permanent termination of water service in accordance with District Water Code.

600.4.13.4 On-Site Recycled Water User Plan Acceptance

Once the On-Site Recycled Water User Plan has been prepared, it will be submitted to the State of California, Department of Health Services and Regional Water Quality Control Board for review. Once comments have been received from each agency and incorporated into the document, an agreement has been signed by the user, proper signage has been installed, and training in the use of recycled water has been provided, recycled water service can be delivered to the site.

600.4.14 Agreements

Before recycled water can be supplied to a site, a Standard Agreement for Use of Recycled Water must be signed and recorded. The Agreement sets forth the requirements for service and includes guidelines for the use of recycled water.

In a residential dual plumbed subdivision, all homes are required to use recycled water for landscape irrigation. Deed restrictions are detailed in the documents "Declaration of Restrictions Regarding The Use of Recycled Water for Landscape Irrigation" (See Appendix 20) and "Homebuyer Notification, The Use of Recycled Water for Landscape Irrigation" (See Appendix 21).

600.5 DESIGN REQUIREMENTS FOR ON-SITE RECYCLED WATER FACILITIES

The Marina Coast Water District provides the highest quality unrestricted use recycled water for public landscape irrigation as well as residential irrigation. This section provides detailed steps for design review, construction inspection, compliance inspections, and tests for non-residential and residential dual plumbed irrigation systems.

600.5.1 Data Required on Plans

Specific information is required to be included in the plan set as described below.

1. General On-Site Recycled Water Notes - On-site recycled water notes are to be shown on all on-site recycled water system construction plans. The notes shall be as shown in Appendix 22.
2. Water service, meter and piping details, as required for potable systems in Section 400.
3. Irrigation details, as required in Section 700.

600.5.2 Drinking Fountains

Exterior drinking fountains must be shown and called out on the recycled water system plans. For schools, parks and sports fields, if no exterior drinking fountains are present in the design area, it must be specifically stated on the plans that none exist. The potable water line supplying the drinking fountain must have a warning tape and maintain proper separation from recycled water lines. Drinking fountains must be protected from the direct spray of recycled water either by proper placement within the design area or the use of a covered drinking fountain approved for this purpose.

600.5.3 On-Site Materials and Installation Requirements

600.5.3.1 Pipe Selection

All buried on-site piping in the recycled water system shall be purple PVC pipe with stenciling identifying it as recycled water in accordance with the AWWA Guidelines for the Distribution of Nonpotable Water. Stenciling shall include; CAUTION RECYCLED WATER - DO NOT DRINK; nominal pipe size; PVC-1120; pressure rating in pounds per square inch at 73 degrees; and ASTM designations such as 1785, 2241, 2672, or 3139. Stenciling shall be placed continuous on two sides of the pipe. All on-site recycled water piping shall be installed in accordance with the Uniform Plumbing Code and all other local governing codes, rules, and regulations.

For Non-Residential Sites use:

- PVC constant pressure main line piping, 2 inches and larger, shall be rubber-ring joint, PVC Class 160, or solvent weld joint, PVC Class 315.
- PVC constant pressure main line piping, 1-1/2 inches and smaller, shall be solvent weld joint, PVC Schedule 40.

For Residential Dual Plumbed Homes use:

- Irrigation Mainline: Schedule 40 PVC solvent weld purple pipe with bell ends.
- Irrigation Lateral Lines: Class 150 PVC solvent weld purple pipe with bell ends.

- Irrigation Sleeving: Schedule 40 PVC purple pipe.
- All potable water lines in landscapes shall be copper lines. Examples of potable water uses are a pool, fountain, or other uses not designated as acceptable for recycled water.

600.5.3.2 Pipe and Fittings

PVC plastic pipe fittings shall conform to the following:

- PVC plastic pipe fittings shall be installed below grade.
- All PVC plastic pipe fittings shall be rigid PVC virgin Type I, minimum Schedule 40, with working pressure no higher than that of the pipe. Sockets shall be tapered to conform to the outside diameter of the pipe, as recommended by the pipe manufacturer. All Schedule 40 fittings shall conform to ASTM D 2466. Schedule 80 fittings shall conform to ASTM D 2464 and D 2467.
- PVC fittings shall be Schedule 40 solvent weld and factory manufactured, or Schedule 40 with rubber-ring joint.

600.5.3.3 Depth of Piping

For on-site non-residential recycled water piping, the minimum depth from finished grade to top of pipe (minimum cover) shall be eighteen (18) inches. When crossing potable water mains, the recycled pipe shall be under the potable pipe.

600.5.3.4 Separation Requirements

See Section 400 and District Standard Plans W-20.

600.5.3.5 Warning Tape

1. General - Warning tapes shall be installed longitudinally above and centered on all pressurized mains (between the meter and the building or the irrigation control valve). The warning tape shall be installed continuous for the entire length of the pipe. All risers between the main line and control valves shall be installed with warning tape.
2. Recycled Water - Warning tape shall be purple plastic with black printing having the words "CAUTION: RECYCLED WATER LINE BURIED BELOW." See District Standard Specification 15151.
3. Potable Water - Warning tape shall be blue plastic with black printing having the words "CAUTION: DOMESTIC WATER LINE BURIED BELOW." See District Standard Specification 15151.

600.5.3.6 Sprinklers

Sprinklers shall be easily recognized as being used in a recycled water system. All sprinklers shall be purple in color or have purple snap-on caps for easy identification.

600.5.3.7 Quick-Couplers (Permitted for Non-Residential Sites Only)

Recycled Water - Quick-couplers may be used in recycled water systems and shall conform to the following:

- A. Quick-couplers shall be constructed of brass with a purple snap-on cover and shall have a ¾ or 1-inch inlet. All recycled water quick-couplers shall be installed below grade in a purple round box designed for recycled water use.
- B. The box cover shall have a warning with the following information: “RECYCLED WATER – DO NOT DRINK” in English and Spanish and shall be permanently stamped or molded into the cover. Also, the warning must have the international “Do Not Drink” symbol such as a glass of water with a slash through it. Locking covers may be required where accessible by the public.

Potable Water -

- A. Quick-coupling valves used in potable water systems shall have a cover made of brass, metal, or yellow rubber or vinyl.
- B. Quick-coupling valves intended for recycled water use are not to be used on potable water systems.

600.5.3.8 Warning Labels

Warning labels shall be installed on designated facilities, such as controller panels, water trucks, and temporary construction connections where designated by the District. The labels will notify the public that the system contains recycled water that is unsafe to drink. Warning labels shall be constructed of a purple weatherproof material with the warning permanently stamped or molded into the label, per District standard Specification 15151. The warning shall read: “RECYCLED WATER – DO NOT DRINK” in English and Spanish and include the international “Do Not Drink” symbol, such as a glass of water with a slash through it.

Irrigation controllers shall be labeled in English “ATTENTION – CONTROLLER UNIT FOR RECYCLED WATER.” Attach inside controller cabinet door.

600.5.3.9 Valve Boxes

Valves, both above and below grade, shall be housed in an approved lockable purple valve box. A sign reading "CAUTION: RECYCLED WATER – DO NOT DRINK" shall be installed, as approved by the District. Other means of restricting public access may be required by the District.

All gate valves, manual control valves, electrical control valves, and pressure reducing valves for on-site non-residential recycled water systems shall be installed below grade in a purple valve box. Electrical and manual control valve boxes shall have a warning label permanently molded into or affixed onto the lid with rivets, bolts, etc.

600.5.3.10 Warning Tags

Tags shall be weatherproof plastic, 3" by 4", purple in color, with the words "WARNING - RECYCLED WATER - DO NOT DRINK" in English and Spanish, per District Standard Specification 15151.

All recycled water sprinkler control valves, pressure regulators, quick couplers, and isolation valves shall be tagged with purple warning tags.

One tag shall be attached to each appurtenance in one of the following manners:

1. Attach to valve stem directly with plastic tie wrap, or
2. Attach to solenoid wire directly with plastic tie wrap, or
3. Attach to the body of the relative appurtenance with a plastic tie wrap.

600.5.3.11 Signage

All areas where recycled water is used, shall be posted with conspicuous signs in a size no less than 8-inches high by 12-inches wide, that include the following wording: "RECYCLED WATER - DO NOT DRINK " in English and Spanish. Each sign shall also display the international "DO NOT DRINK" symbol, such as a glass of water with a slash through it.

600.5.4 Control of Runoff and Application Areas

On-site recycled water facilities shall be designed to prevent discharge or runoff onto areas not under control of the user.

The design of the on-site non-residential recycled water facilities shall provide for use during the periods of minimal access by the public. This time of day is as set forth in the On-Site Recycled Water User Plan. Consideration shall be given to allow a maximum dry out time before the design area will be used by the public.

Recycled water shall be applied at a rate that does not exceed the infiltration rate of the soil. Where varying soil types are present, the design of the recycled water facilities shall be compatible with the lowest infiltration rate present. Copies of the developer's soils test report shall be submitted with the plan set for District review.

Spray heads shall be adjusted to eliminate overspray onto areas not under the control of the customer, i.e. pool decks, private patios, streets, and sidewalks.

600.5.5 Recycled Water System Design Guidelines for Front Yards – General Requirements

1. Recycled water service and domestic potable water service for each residential lot will be provided by the subdivision developer. The recycled water service is typically provided at the opposite lot end from the potable service.
2. Recycled water shall not be used for any other purpose except for irrigation. Recycled water lines shall not enter the house. Recycled water is prohibited for backyard irrigation.
3. The piping system for the recycled water irrigation system will be constructed and maintained to be easily differentiated from the potable water piping system. The recycled water system piping will be purple plastic pipe. See Recycled Water Irrigation System materials list for more information.
4. Drip irrigation systems are required for shrub plantings and some groundcover plantings. The use of drip systems within the dripline of the canopy of existing oak trees is required. This type of

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irrigation system tends to be more water efficient and water conserving than other systems due to the slow delivery rate of water (low volume) via plastic tubing directly to the rootball of the plant material. Environmental factors such as evaporation and wind tend to have the least effect on this type of irrigation system. Physical maintenance of this type of system is usually higher. Additionally, drip irrigation systems contribute minimally to soil erosion problems on sloped planting areas.

5. It is recommended to install purple irrigation PVC sleeves beneath driveways, walkways or other paved areas. Install the necessary number of sleeves, properly sized, to accommodate the irrigation system mainline, lateral lines, and controller wiring.
6. Sprinkler heads and spray patterns shall be contained within the home lot property line and shall not overlap or overspray into the adjacent property. Adjust sprinkler heads and spray patterns to eliminate overspray onto adjacent hardscapes, patios, decks, pools, fences, etc.
7. Space and install sprinklers and turf rotors no more than 80% of the manufacturer's recommended radius listing for that particular head. Ensure head to head coverage of the spray pattern with no dry spots.
8. The maximum flow for each valve system shall not exceed 15 gallons per minute, nor shall operating flows exceed 15 gallons per minute at any one time.
9. For drip irrigation systems, install an in-line pressure-reducing valve down stream of the remote control valve. The pressure-reducing valve shall be placed below grade in a plastic valve box and adjusted to the proper operating pressure for the drip system.
10. For drip irrigation systems, install an in-line Wye filter down stream of the remote control valve and upstream of the pressure reducing valve. The filter shall be placed below grade in a plastic valve box. Install drip tubing a minimum of four inches below grade.
11. No backflow device is required on recycled water service.
12. A pressure reducing valve will be required by the District downstream of the recycled water meter below grade in a rectangular box of sufficient size to easily allow repair or replacement. Pressure reducing valve shall be pre-set at 40 psi.
13. Hose bibs and quick coupling valves are PROHIBITED on the recycled water systems serving residential front yards.
14. No white PVC piping will be allowed for recycled water irrigation system mainlines and laterals.
15. Overhead irrigation systems for turf will only be operated between the hours of 9:00 p.m. and 6:00 a.m. Drip irrigation systems will be allowed to be operated at anytime.
16. Monitor and maintain the system to minimize equipment and material failure. Broken sprinkler heads, leaks, unreliable valves, etc., should be repaired as soon as they become apparent.
17. Recycled water is not potable water and therefore not suitable for human consumption.

18. Recycled water is highly treated domestic wastewater and its clarity to the human eye is indistinguishable from domestic water. The standards imposed for treatment of recycled water quality are established by various governmental regulatory agencies, including the State of California Department of Health Services, California Code of Regulations, Title 22, and these standards may change from time to time.
19. Irrigate in a manner that will minimize runoff, pooling, and ponding. The application rate shall not exceed the infiltration rate of the soil. Timers will be adjusted so as to be compatible with the lowest soil infiltration rate present. This procedure may be facilitated by the efficient scheduling of the automatic control clocks (i.e., employing the repeat function to break up the total irrigation time into cycles that will promote maximum soil absorption). When using any type of irrigation system, care will be exercised by controlling the delivery rate of water so as not to overcome the soil's water absorption rate. Overwhelming the soil absorption rate may cause water run-off and soil erosion. Proper programming of the automatic irrigation controller, knowing the plant material's water needs, familiarity with the soil's water absorption characteristics and slope aspects are necessary for responsible water resource management and good irrigation practice.
20. All remote control valves shall be set below grade in an appropriate box. Anti-siphon control valves will NOT be allowed.
21. Educate all maintenance personnel, family members, and guests, on a continuous basis, of the presence of recycled water and that it is not approved for drinking purposes.

600.5.6 Potable Water System Design Guidelines – General Requirements

1. The potable water service and the recycled water service for each residential dual plumbed home will be provided by the homebuilder's underground contractor. See Section 400 for information regarding the District's regulations regarding cross connections.
2. The potable water system will be protected by an appropriate backflow prevention device at the potable water meter. An approved backflow prevention (BP) device is required on each residential potable water supply line, where a separate recycled water system will be used to irrigate the landscape. Assemblies will be installed downstream of, but immediately next to, the potable water meter and the pressure-reducing valve.
3. The BP device will be installed above grade and have a minimum clearance of twelve inches between the bottom of the assembly and the finished grade of the surrounding landscape or splash pad. Do not disturb the BP device or modify the grade around the assembly when landscaping the front yard. BP device that do not meet MCWD standards will be corrected at the owner's expense. Neither the owner nor their contractor may remove or modify the water meter or the BP device.
4. Warning tape shall be used on all constant pressure main line piping carrying potable water from the meter to the house. The tape shall start at the meter or pressure regulator, be visible in the valve box, and continue to where the pipe enters the house.
5. The water used within the residence and outside in the yard(s) through hose bibs will be potable water. All hose bibs shall be connected to the house.

6. Fill lines for pools and/or water features of any kind are prohibited on the recycled water system. These uses shall be connected to the potable water system. Copper pipe will be used for all potable lines. The location of the copper lines shall be indicated on the plans. The District requires the inspection of the installation prior to the covering of the pipe.
7. All pressure main line piping from the recycled water system shall be installed to maintain 10 feet minimum horizontal separation from all potable water piping. Where recycled and potable water pressure main line piping cross, the recycled water piping shall be installed below the potable water piping in a Class 200 purple-colored PVC sleeve which extends a minimum of 5 feet on either side of the potable water piping. Provide a minimum vertical clearance of 12 inches

600.6 INSPECTION REQUIREMENTS FOR ON-SITE RECYCLED WATER FACILITIES

600.6.1 General

The District will inspect the construction of on-site non-residential facilities and shall be notified two working days in advance of construction by the applicant, owner, or customer. The District Office shall be called at (831) 384-6131. In no case shall irrigation lines be backfilled before inspection by the District. If the residential dual plumbed on-site irrigation system is installed prior to plan approval and/or inspection, all or any portion of the system must be exposed and corrected as directed by the District in accordance with these standard specifications. Failure to comply will result in termination of service as provided for in the District Water Code.

Subsequent to plan approval, field conditions may dictate modifications to the on-site system either in material or in intended use. If directed by the District Inspector the owner, applicant, or customer shall perform all changes or modify the on-site system to bring the system or use into full compliance with these construction specifications and with the MCWD Water Code. If for any reason the system cannot be corrected or modified to the satisfaction of the District Inspector, the system will be subject to conversion to a potable water supply, as set forth herein.

At the start of construction of each house, MCWD inspectors will verify the following:

- A. A backflow prevention device has been installed prior to any potable water use.
- B. Water used during construction and for pipe testing is potable water and not recycled water.
- C. Curb markings for potable and recycled water services are correct.

600.6.2 Documentation

Forms. All forms completed with regards to review and inspection will be kept on file at the MCWD offices for review by the Regional Water Quality Control Board or the Department of Health Services.

Landscape Record Drawings. MCWD will keep on file a copy of all landscape record drawings for both the front and back yards. The production houses front yard drawings, prepared by the homebuilder will be typical drawings that apply to many houses in the subdivision. Back yard drawings are prepared individually by homeowners or a landscape architect and therefore are individual to each house.

Inspections. MCWD staff will refer to previously completed forms as necessary when performing compliance inspections, cross connection tests, and inspections.

600.6.3 Testing of Backflow Prevention Devices

Backflow prevention assemblies require annual testing in accordance with the MCWD Water Code. See section 400.

600.6.4 Initial Cross Connection Test for Final Approval

If the on-site system is installed prior to plan approval and/or inspection, all or any portion of the system must be exposed and corrected as directed by the District in accordance with these standard specifications. Failure to comply will result in termination of service as provided for in Section 600.14 herein.

Notify in writing the state and county health agencies of the initial test date with intent that both agencies will attend. For the initial cross-connection test, recycled water will be used for the irrigation piping system. A cross connection shut down test form shall be completed (see Appendix 23). The procedures for the initial cross-connection test shall be as follows:

- Verify that the recycled water system is under pressure and operating normally. This is done by manually operating each valve and quick coupler attached to the recycled water system.
- Shut down the recycled water system at the meter service connection.
- Verify that the recycled water system does not have any pressure. This is done by opening a valve downstream of the recycled water connection to relieve pressure, allowing one hour of time to pass, closing the valve, then manually operating each valve and any quick couplers attached to the recycled water system.
- Verify that the potable water system to the lot is under pressure and operating normally. This step is done while the recycled water system is shut off at the meter. The test is accomplished by manually operating all fixtures being supplied by the potable meter, both interior and exterior of the home or buildings.
- Shut down the potable water system at the backflow. Open the recycled system at the meter connection.
- Verify that the recycled water to the lot is under pressure and operating normally.
- Verify that the potable system does not have any pressure. This is accomplished by opening a valve downstream of the potable water backflow to relieve pressure, closing the valve, then manually operating all fixtures on the interior and exterior of the house or building being supplied by the potable water meter.
- Open the potable water system at the backflow. The test is now complete.
- Perform shutdown test on potable and recycled water systems at least once every four years and at change of occupant (rental or sale). Test shall be performed as outlined in Cross Connection Shutdown Test form.

600.6.5 Cross Connection Actions

On suspicion of existence of a cross connection, repeat the shutdown test. If the results confirm a cross connection, then proceed with the following:

- Inform the homeowner and contact MCWD Staff.
- Instruct the homeowner not to drink the tap water in the house.
- Turn off the recycled water to the property at the meter.
- Expedite the testing of the water quality in the house as well as in the supply system in the street.
- Investigate the source of the cross connection and eliminate it.
- If disinfection of the house potable water supply is necessary, it should be expedited with the cooperation of the homeowner.
- MCWD and DHS will determine when it is safe for the homeowner to resume the safe use of the recycled and potable water.

600.6.6 Annual Cross Connection Test for Individual Residential Lots

Annual testing for cross connections will be conducted on the on-site recycled water system by MCWD staff. The state and county health agencies will be notified of the annual test date and again the subsequent outcome of the test(s). The annual cross connection test shall in no case be less than 60 minutes and may be longer if site situations pose complications. The procedures for the annual cross-connection test shall be as follows

1. Verify the recycled water system is under pressure and operating normally. This is done by manually operating a valve or quick coupler attached to the recycled water system.
2. Leaving the valve or quick coupler open and running while shutting down the recycled water meter at the service connection. The recycled water system will be drained and remain inactive for 60 minutes.
3. At the end of the 60 minute shut down period, verify that the pressure in the recycled water system has completely dissipated through the open valve or quick coupler. A cross-connection is detected if the pressure has not completely dissipated, and the valve at the service connection is not leaking.
4. Open the recycled water service connection if a cross-connection was not detected.
5. The potable water shall remain pressured at all times during the annual recycled water shut down.

600.6.7 Coverage Test

The owner, applicant, or customer is responsible for controlling overspray and runoff of new systems. To ensure the limitation of overspray and runoff is in accordance with the On-Site Recycled Water User Plan, an inspection of the completed on-site non-residential system by the District is required. When the sprinkler system is completed and the planting installed, the owner or owner's representative shall contact the District at (831) 384-6131 and arrange for a coverage test walk through. The owner or owner's representative must be in attendance and have persons capable of making system adjustments. If modifications to the system are required, other than minor adjustments, the owner will be notified in writing of the changes required. To avoid termination of service, the modifications must be made in a

timely manner. All modifications to the system are the responsibility of the owner, applicant, or customer and said owner, applicant, or customer shall pay all costs associated with such modifications.

600.6.8 Compliance Inspection and Testing

- A. Testing and inspection of water systems in dual plumbed homes receiving recycled water will be in accordance with these procedures and the on-site Recycle Water User Plan. Random inspections may also occur. Complete Compliance Inspection Form (See Appendix 24)
- B. Initially, before activation of recycled water service, and annually thereafter, MCWD will inspect both the exterior potable and full yard recycled water irrigation systems on the site. MCWD will perform a cross connection shutdown test initially, and thereafter, once every four years, and at changes of ownership. However, cross-connection tests may be performed by MCWD where, when, and if needed.
- C. Backflow prevention assemblies shall be tested annually by the owner, with a copy of the results provided to the District.
- D. For single-family residences receiving recycled water, the owner shall be responsible for providing access and cooperation to the District representative, to perform an annual cross-connection inspection or other system inspections that the District requires. This inspection shall include a visual check of the entire system to verify that no cross-connections have been made. The owner will be responsible for correcting any work, at their sole expense, which violates the District regulations. Complete Front Yard Design Review and Inspection Form (See Appendix 25) and the Back Yard Design Review and Inspection form (See Appendix 26).
- E. No Recycled Water to Back Yard Irrigation. If a back yard irrigation system is installed, verify that it is connected to the potable water system through a backflow prevention device.
- F. Homeowner Information. Provide the homeowner with literature regarding the design and construction and use guidelines of recycled water irrigation systems. (See Appendix 21)
- G. Notice of Violation will be issued if the recycled water system does not comply with MCWD procedures. (See Appendix 27)
- H. Inspect front and back yard annually for proper irrigation system and absence of cross connection.

600.6.9 District Acceptance

Upon completion of construction, final inspection by the District, submission of record drawings, approval of the On-Site Recycled Water User Plan, cross connection test, signing of a recycled water agreement, training, completion of the initial cross-connection test, and payment of any outstanding monies, the project shall be accepted by the District. The on-site Recycle Water Final Inspection Form will be completed. (See Appendix 27) At that time, service connection to the recycled water line may be made. The facilities shall be owned, operated, and maintained by the Owner.

600.6.10 Record Drawings

Record drawings shall be prepared and submitted to the District in accordance with the requirements of

Section 300.

600.6.11 Failure to Comply

Failure to comply with any or all of the standards herein is a violation of the District Code and will result in termination of service until the appropriate corrective steps have been taken. Non-compliance with these standards may result in fines and other remedies available to the District.

600.7 INTERIOR USE OF RECYCLED WATER IN NON-RESIDENTIAL BUILDINGS

This comprehensive section, Interior Use of Recycled Water in Non-Residential Buildings, is written to address the planning, design, construction, operation and maintenance procedures, and responsibilities relative to non-residential buildings equipped with dual-plumbed water systems (potable water and recycled water). The recycled water portion of these dual systems provides water for toilet and urinal flushing, and floor drain trap priming. All other water demands in these buildings will be served from the potable water system.

This section is written in five parts to cover the five phases of development for a dual-plumbed non-residential building. These phases are planning, design, construction, start-up, and ongoing operations/monitoring. This five parts address the following:

1. The responsibilities and procedures of the Marina Coast Water District (MCWD).
2. The involvement of the state and county health agencies and the cognizant building authority.
3. The responsibilities and procedures to be followed by building owners, developers, contractors, and building maintenance personnel.
4. MCWD Water Code for the use of recycled water.

It is the intent of this section to ensure the safe and effective use of recycled water, and thereby conserve potable water resources.

600.7.1 Planning Phase

The planning of dual-plumbed non-residential buildings is a combined effort of MCWD, the cognizant building department, state and county health agency representatives, local building developers, and engineers. The processing of a proposed non-residential building follows the steps listed below.

1. Conceptual Design Phase - During this phase of the project, the developer engages the services of their staff or outside consultant to determine the feasibility of constructing a building in the MCWD service area. An assessment of the available water, and sewer service is made, along with the establishment of the requirements for service. In addition, the associated costs of obtaining building department approval, permits, and development credits are determined.
2. Under the current District Water Code, recycled water must be used for non-potable demands in non-residential sites if it is available, or in the determination of MCWD will be available in the near future. Exterior non-potable demands include construction dust control, watering for soil compaction and landscape irrigation. Interior non-potable demands are toilet and urinal flushing,

and priming floor drain traps. Interior use of recycled water for non-potable demands must be approved by the local building department as well as the District.

3. Preliminary Design/EIR Phase - In conjunction with the preparation of preliminary design drawings for the project, the developer must secure development permits. This may involve a Conditional Use Permit (CUP) from the local regulatory agency, or an Environmental Impact Report (EIR) for the project. During the CUP or EIR process, a Notice of Preparation (NOP) is prepared and distributed to all affected agencies, including MCWD. Upon the determination that the proposed building is in an area currently being served recycled water, scheduled for conversion to recycled water, or master planned for recycled water, MCWD will respond back to the NOP that for the project to be supplied with an adequate water and sewer system, the building must be dual-plumbed. This response is then incorporated into the EIR or CUP as a condition of approval or required mitigation measure.
4. Design Phase - All recycled water dual distribution systems are designed in accordance with the Uniform Plumbing Code, the District Design Guidelines and the local building official's guidelines for non-potable water.

600.7.2 Design Phase

1. Recycled Water Use Specified - Recycled water supplied by MCWD, which complies with water quality requirements of the California Code of Regulations, Title 22, section 60307(a), may be used to supply toilets, urinals, and to prime floor drain sewer traps. Use is limited in these types of fixtures or facilities in non-residential buildings. Residential buildings are explicitly excluded from the list of approved uses. In all other uses and occupancies, potable water supply is required.
2. Determination to Use Recycled Water - Approval for the above uses in lieu of Uniform Plumbing Code requirements shall be considered and determined by MCWD (as set forth in MCWD's "Water Code for Water, Sewer, and Recycled Water Service") and the cognizant building authority (e.g., the City of Marina Administrative Authority) on a case-by-case basis. Ultimate use approval is reserved for the State Department of Health Services (DOHS) and the Monterey County Health Care Agency (MCHCA).
3. Design Criteria: Off-Site Recycled Water Facilities - Design of all off-site recycled water facilities shall be as set forth herein except as modified for specific on-site projects requiring approved engineers reports (See Appendix 22 for Design notes).
4. Off-Site Plan Check and Approval - Off-site recycled water facility design plans shall be reviewed and approved in accordance with the procedures outlined in MCWD's "Procedural Guidelines for the Construction of Water, Sewer, and Recycled Water Facilities," as last revised.
5. Design Criteria: On-Site Recycled Water Facilities - Design of all on-site recycled water facilities shall conform to the Uniform Plumbing Code as adopted by the responsible building authority and the following prohibitions and limitations:
 - The recycled water system shall be separate and independent of any potable water system.
 - Cross-connections between any potable water system and the on-site recycled water system are strictly forbidden.

6. On-Site Plan Check and Approval - The on-site recycled water facility construction plans shall be reviewed and approved in accordance with the procedures outlined in the Procedural Guidelines and General Design Requirements.
7. Service Agreement with MCWD - During MCWD's review of water utility plans for any development, the developer shall enter into a standard water service agreement with MCWD as set forth in MCWD's "Standard Agreement for the Construction of Water, Sewer, and Recycled Water Facilities," latest edition.

600.7.3 Construction Phase

1. Pre-Construction Conference - Before plumbing construction begins, the developer's contractor shall arrange a pre-construction conference at which will be present the developer's contractor's job superintendent, the plumbing contractor, and MCWD's On-Site Water Systems inspector. The purpose of this meeting will be to explain MCWD's inspection process, review MCWD's construction specifications, and discuss the construction schedule and any known circumstances that might affect job installation.
2. Inspection - The on-site recycled water and potable water systems shall be subject to inspection by MCWD and shall be left open and uncovered until approved by MCWD's On-Site Water Systems inspector, who should be contacted at MCWD's offices.
3. If any part of an on-site water system is to be installed and concealed within walls, ceilings, floors, or below grade prior to plan check approval and/or inspection, that part must be exposed for inspection approval by MCWD before closure. If any portion is completed without MCWD's inspection and approval, that portion not inspected will be re-exposed at the sole cost of the developer.
4. MCWD on-site inspection approval be secured subsequent to final approval of the water systems by the responsible building authority, and issuing of a final use approval.
5. Record Log - MCWD's Water Systems inspector will maintain a record log of all inspections for the building project. The record log will become a permanent part of MCWD's file for that project. The record log will consist of:
 - A. Photographs - Photographs will be taken of the completed recycled water facilities on each floor of the building to document proper installation. Each photo will include a sign, which clearly indicates the name of the project, the number of the floor, and the date of the inspection. The developed photographs will be placed in clear plastic sleeves and kept in MCWD's project file.
 - B. Inspection Reports - A written record of each inspection will be kept on a special, triplicate, carbonless-transfer inspection report form prepared by MCWD. All original copies will become a part of MCWD's project file. Copies of all inspection reports will be provided to the contractor's job superintendent, the various health agencies, and the responsible building authority, as requested.

6. Construction Specifications - Construction specifications for all on-site building recycled water systems shall be as set forth in Section 600.17, Appendix Section C, entitled, "Information Required on Plans."

600.7.4 Start-Up Phase

1. Initial Water Service - The on-site building recycled water system shall initially be filled, pressure tested, and operated with potable water.
2. Cross-Connection Testing - The following testing sequence will be followed for buildings that will have the internal recycled water systems connected to MCWD's recycled water supply before the building is occupied, and under certain subsequent circumstances.

Before the building can be occupied, and before the responsible building authority will issue final use approval, the recycled water system must pass a thorough a cross-connection test. This same testing procedure will be used during the building's subsequent operation and maintenance under circumstances discussed in Part 5, Section A. The cross-connection test will be conducted under the supervision of an AWWA-certified Cross-Connection Control Program Specialist from the Water Systems Management Section of MCWD. The test will be performed in the presence of representatives of DOHS and MCHCA, representatives of the responsible building authority, and representatives of the building owner. MCWD will coordinate the scheduling of the test. Procedures for the cross-connection test shall be as set forth below:

- A. The recycled water to the building will be shut off at the recycled water meter. The recycled water riser will be drained, and the recycled water system will remain de-activated for a period of 24 hours.
- B. At the end of the 24-hour shutdown period, test all recycled and potable water fixtures, floor-by-floor, for cross-connection by operating each fixture and checking for flow or no flow in all restrooms, and where there are recycled and potable water supplied fixtures.
- C. If there is no flow detected in any of the fixtures (indicating no cross connection), reactivate the recycled water riser.
- D. The potable water to the building will be shut off at the back-flow device. The potable water riser will be drained, and the potable water system will remain de-activated for a period of 24 hours.
- E. At the end of the 24-hour shutdown period, test all potable and recycled water fixtures, floor-by-floor, for cross connection by operating each fixture and checking for flow or no flow in all restrooms, and where there are potable and recycled water supplied fixtures.
- F. If there is no flow detected in any of the fixtures (indicating no cross connection), reactivate the potable water riser.
- G. For new installations only, disconnect the recycled water riser from the potable water pipeline, remove the reduced-pressure principle backflow prevention assembly (RPPA) at the potable water connection, and connect the recycled water riser to MCWD's recycled water supply.

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- MCWD will provide written verification of successful test results to the state and county health agencies and the cognizant building authority.
3. Response to Confirmed Cross Connection - In the event that a cross connection is discovered, the following procedure will be immediately activated:
 - A. Shut down the recycled water supply to the building at the meter and drain the recycled water riser.
 - B. Shut down potable water to the building at the meter.
 - C. Notify both the state and county health agencies, followed by a written notice within 24 hours. This notice will include an explanation of the nature of the cross connection, the date and time discovered, and the steps that were taken to mitigate the cross connection.
 - D. Uncover and disconnect the cross connection.
 - E. Shock the potable water system with 50 ppm of chlorine for 24 hours.
 - F. Flush the potable system after 24 hours and perform standard bacteriological testing. If test results are acceptable, recharge the potable water system in accordance with MCWD standards.
 - G. Re-test the building following the procedures listed in Section B above.
 - H. Obtain final approval from the state and county health agencies and the building authority and put the recycled water supply back into service.
 4. Final Approval and Activation of Recycled Water Service - When all requirements listed below have been met, the on-site building recycled water system will then be filled and placed into operation with recycled water under the supervision of representatives of MCWD's Water Systems Section.
 - A. Both the potable and recycled on-site systems must have received plan approval, and must have been constructed and passed inspection as set forth in the provisions of this section.
 - B. Both the potable and recycled on-site systems must have passed the initial cross-connection test.
 - C. Final approval to use recycled water must be received from DOHS or MCHCA.
 - D. After health agency approvals, all signs must be posted in restrooms, equipment rooms, and plumber's closets, and all recycled water control valves and appurtenances must be sealed and/or tagged as set forth in this section. Signs, seals, and tags shall be installed under the supervision of MCWD.

- E. Before recycled water is put into service, the MCWD inspector shall meet with the developer's/owner's designated user supervisor for building maintenance to discuss operating procedures and responsibilities.

600.7.5 Operation and Maintenance

- 1. Inspection and Testing Frequencies - Ongoing operation and maintenance of non-residential buildings with interior use of recycled water includes both cross-connection control inspection and testing. Inspections will occur annually, with procedures as described below. Testing will occur as often as annually, but no less often than once every four years upon approval by state and local health agencies, with procedures as described below.

Determination of cross-connection control testing frequency will be based on a combination of factors: particular facility construction and recycled water use features, established facility inspection and testing performance history, cooperation by on-site staff and/or representatives, and ongoing evaluation by MCWD staff in concert with state health agency representatives. The initial testing frequency will not be less than annual. Subsequent lower or higher frequencies will be based on the above-noted factors and mutually declared and documented by MCWD staff and health agency representatives at the close of the previous testing event.

Water system de-activation duration during testing will depend generally on testing frequency. For annual testing frequencies, a 1-hour water system de-activation will generally be adequate. For testing frequencies of greater than one year, a 24-hour water system de-activation will generally be adequate. Alternative water system de-activation duration will be used only by mutual consent of MCWD staff and health agency representatives.

- 2. Cross-Connection Testing - All buildings with interior recycled water systems will undergo a cross-connection test in accordance with the determinations of Section A above. Prior to commencing the cross-connection test, a dual system inspection will be conducted by MCWD's Cross-Connection Control inspector and the cognizant building authority in the presence of representatives of the state health agencies and representatives of the building owner, as follows:
 - A. Check meter location of the recycled water and potable water systems; verify that no modifications have been made, or cross connections are visible.
 - B. Check the potable water RPBP.
 - C. Check all pumps and equipment, equipment room signs, and exposed piping in the equipment room.
 - D. Check all recycled water control valves to make sure that seals are still in place and intact.
 - E. Check all valve control door signs to verify that none has been removed.
 - F. Check all restroom entrance signs to make sure they are in place and visible.
 - G. Check all plumbers' closets and verify that all signs are in place.

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For those circumstances requiring cross-connection testing with a 24-hour system de-activation, the procedures of Section 600 will be followed. For those circumstances requiring a 1-hour de-activation, the following procedures will be used:

The following testing sequence will be followed for buildings that will have the internal recycled water systems connected to MCWD's recycled water supply after the building is occupied, and under certain subsequent circumstances.

After the building can be occupied, but before the internal recycled water system can be connected to MCWD's recycled water supply, the recycled water system must pass a thorough a cross-connection test. Buildings that have been previously approved for internal recycled water use, and have been tested for cross connections will also use this sequence, under circumstances discussed in Section A above. All testing will be conducted under the supervision of an AWWA-certified Cross-Connection Control Program Specialist from the Water Quality Department's Cross-Connection Control Group of MCWD. The test will be performed in the presence of representatives of DOHS and MCWD, representatives of the responsible building authority, and representatives of the building owner. MCWD will coordinate the scheduling of the test. Procedures for the cross-connection test shall be as set forth below:

- A. The recycled water to the building will be shut off at the recycled water meter. The recycled water riser will be drained, and the recycled water system will remain de-activated for a period of 1 hour.
- B. At the end of the 1-hour shutdown period, test all recycled and potable water fixtures, floor-by-floor, for cross connection by operating each fixture and checking for flow or no flow in all restrooms, and where there are recycled and potable water supplied fixtures.
- C. If there is no flow detected in any of the fixtures (indicating no cross connection), reactivate the recycled water riser.
- D. The potable water to the building will be shut off at the back-flow device. The potable water riser will be drained, and the potable water system will remain de-activated for a period of 1 hour.
- E. At the end of the 1-hour shutdown period, test all potable and recycled water fixtures, floor-by-floor, for cross connection by operating each fixture and checking for flow or no flow in all restrooms, and where there are potable and recycled water supplied fixtures.
- F. If there is no flow detected in any of the fixtures (indicating no cross connection), reactivate the potable water riser.
- G. For new installations only, disconnect the recycled water riser from the potable water pipeline, remove the reduced pressure principle backflow prevention assembly (RPPA) at the potable water connection, and connect the recycled water riser to MCWD's recycled water supply.

MCWD will provide written verification of successful test results to the state and county health agencies and the building authority. This verification will be accompanied by the

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declaration, mutually agreed among MCWD and the health agencies, of subsequent testing frequency for the subject site.

3. Emergency Response to Confirmed Cross Connection - In the event that a cross connection is discovered, the procedures detailed in section 600.14.4, START-UP PHASE, Section B, will be immediately followed.
4. Cross-Connection Inspection - In addition to the detailed cross-connection control testing described herein, MCWD's Cross-Connection Control Specialists will perform annual inspection of all buildings with dual-plumbed systems. This will consist of at a minimum, visual inspection of pump rooms, all bathrooms, signs, tags, etc. Other elements of the annual inspection may consist of, but are not necessarily limited to, the following specific items:
 - A. Run random water sample tests (laboratory samples) on recycled water and potable water.
 - B. Check walls for visible repairs that might indicate that plumbing changes may have occurred.
 - C. Check plumber's closets to see if valve seals have been broken.
 - D. Check with the user supervisor to ask whether any routine operations or maintenance work has been performed on plumbing systems.

MCWD personnel will keep a record of all inspections, which will become a part of MCWD's project file for each related building. As a general guideline, MCWD will randomly select and inspect 10 percent of the water related facilities within a building and will consider the results.

5. User Supervisor Responsibilities - Each building provided with recycled water for the flushing of toilets, urinals, and floor drain trap priming shall have a user supervisor designated by the owner/developer to maintain strict control over interior recycled water usage. MCWD will provide the name of this person to the responsible building authority and to the state and county health agencies. The user supervisor is responsible for the following:
 - A. Maintaining strict control over the building's water systems.
 - B. Controlling cross connections.
 - C. Immediately informing MCWD's Engineering Department at (831) 384-6131 of any water system failures or emergency shut downs.
 - D. Informing MCWD's Engineering Department in advance of scheduled shut-downs for system maintenance.
 - E. Informing and providing MCWD's Engineering Department with plans for proposed changes to the plumbing systems.
6. Non-Compliance - Failure to comply with the published "MCWD Water Code," and with the provisions of SECTION 600.17, shall constitute the basis for terminating recycled water service to the building for all approved uses. The specific procedures and conditions for the termination

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of recycled water service are contained in the service agreement, and in the "MCWD Water Code."

7. MCWD Records - MCWD will maintain a database and written records of all dual-plumbed non-residential buildings in the MCWD service area in order to document, track, and schedule all tests. Reports will be provided to the state and county health agencies and the responsible building authority for all dual-plumbed facilities in the MCWD service area.

END OF SECTION

SECTION 700

**DESIGN CRITERIA FOR
LANDSCAPING AND IRRIGATION SYSTEMS**

700.1 DESCRIPTION

These Marina Coast Water District (District) requirements promote efficient water use through landscape design and irrigation management appropriate to the local climate.

700.2 APPLICABILITY

After January 1, 2010, these landscape design criteria apply to:

- New construction and rehabilitated landscapes for public agency projects and private development projects with a landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review;
- New construction and rehabilitated landscapes which are developer-installed in single-family and multi-family residential projects with a landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review;
- New construction landscapes which are homeowner-provided and/or homeowner-hired in single-family and multi-family residential projects with a total project landscape area equal to or greater than 5,000 square feet requiring a building or landscape permit, plan check, or design review;

These design criteria do not apply to:

- Registered local, state, or federal historical sites;
- Ecological restoration projects that do not require a permanent irrigation system;
- Mined-land reclamation projects that do not require a permanent irrigation system; or
- Plant collections, as part of botanical gardens and arboretums open to the public.

There are often other applicable regulations of the local jurisdiction that may apply to particular projects. The more restrictive criteria of all regulatory agencies shall apply. One local agency may designate another agency, such as a city or special district, to implement some or all of the design standards contained in this document. It is important that applicants meet with all their local regulative authorities to verify compliance with various planning and development standards and ordinances.

700.3 DEFINITIONS

The terms used in this document have the meaning set forth below:

Applied Water: The portion of water supplied by the irrigation system to the landscape.

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Automatic Irrigation Controller: An automatic timing device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data.

Backflow Prevention Device: A safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

Certificate of Completion: The document signed by the owner of the landscape project verifying the landscape and irrigation system was installed according to approved plans.

Certified Irrigation Designer: A person certified to design irrigation systems by an accredited academic institution, a professional trade organization, or other program such as the US Environmental Protection Agency's Water Sense Irrigation Designer certification program and Irrigation Association's Certified Irrigation Designer program.

Certified Landscape Irrigation Auditor: A person certified to perform landscape irrigation audits by an accredited academic institution, a professional trade organization, or other program such as the US Environmental Protection Agency's Water Sense Irrigation Auditor certification program and Irrigation Association's Certified Landscape Irrigation Auditor program.

Check Valve or Anti-Drain Valve: A valve located under a sprinkler head or other location in the irrigation system to hold water in the system to prevent drainage from the lower elevation sprinkler heads when the system is off.

Common Interest Developments: Community apartment projects, condominium projects, planned developments, and stock cooperatives per Civil Code Section 1351.

Conversion factor (0.62): The number that converts acre-inches per acre per year to gallons per square foot per year.

Drip Irrigation: Any non-spray low volume irrigation system utilizing emission devices with a flow rate measured in gallons per hour. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

Ecological Restoration Project: A project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

Effective Precipitation or Usable Rainfall (Eppt): The portion of total precipitation which becomes available for plant growth.

Emitter: A drip irrigation emission device that delivers water slowly from the system to the soil.

Established Landscape: The point at which plants in the landscape have developed significant root growth into the soil. Typically, most plants are established after one or two years of growth.

Establishment Period: The first year after installing the plants in the landscape or the first two years if irrigation will be terminated after establishment.

Estimated Total Water Use (ETWU): An estimate of the total water required for the landscape annually.

ET Adjustment Factor (ETAF): A factor of 0.7, that, when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape. A combined plant mix with a site wide average of 0.5 is the basis of the plant factor portion of this calculation. For purposes of the ETAF, the average irrigation efficiency is 0.71. Therefore, the ET Adjustment Factor $(0.7) = (0.5/0.71)$. ETAF for a Special Landscape Area shall not exceed 1.0. ETAF for existing non-rehabilitated landscapes is 0.8.

Evapotranspiration Rate: The quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.

Flow Rate: The rate at which water flows through pipes, and valves and emission devices, measured in gallons per minute, gallons per hour, or cubic feet per second.

Hardscapes: Any durable material (pervious and non-pervious).

Homeowner-provided Landscaping: Any landscaping either installed by a private individual for a single family residence or installed by a licensed contractor hired by a homeowner. A homeowner is a person who occupies the dwelling he or she owns. This excludes speculative homes, which are not owner-occupied dwellings.

Hydrozone: A portion of the landscaped area having plants with similar water needs. A hydrozone may be irrigated or non-irrigated.

Infiltration Rate: The rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).

Invasive Plant Species: Species of plants not historically found in California that spread outside cultivated areas and can cause damage to environmental or economic resources. Invasive species may be regulated by county agricultural agencies as noxious species. "Noxious weeds" means any weed designated by the Weed Control Regulations in the Weed Control Act and identified on a Regional District noxious weed control list. Lists of invasive plants are maintained at the California Invasive Plant Inventory and USDA invasive and noxious weeds database.

Irrigation Audit: An in-depth evaluation of the performance of an irrigation system conducted by a Certified Landscape Irrigation Auditor. An irrigation audit includes, but is not limited to: inspection, system tune-up, system test with distribution uniformity or emission uniformity, reporting overspray or run off that causes overland flow, and preparation of an irrigation schedule.

Irrigation Efficiency (IE): The measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum average irrigation efficiency for purposes of these design standards is 0.71. Greater irrigation efficiency can be expected from well designed and maintained systems.

Irrigation Survey: An evaluation of an irrigation system that is less detailed than an irrigation audit. An irrigation survey includes, but is not limited to: inspection, system test and written

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recommendations to improve performance of the irrigation system.

Irrigation Water Use Analysis: An analysis of water use data based on meter readings and billing data.

Landscape Architect: A person who holds a license to practice landscape architecture in the state of California (Business and Professions Code, Section 5615).

Landscape Area: All of the planting areas, turf areas, and water features in a landscape design plan subject to the Maximum Applied Water Allowance calculation. The landscape area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-pervious hardscapes, and other non-irrigated areas designated for nondevelopment (e.g., open spaces and existing native vegetation).

Landscape Coefficient: A coefficient used in the MCWD ET-based irrigation scheduling spreadsheets to calculate water loss from unique landscape plantings or hydrozones. It is product of three individual factors having an effect on water loss of landscape plantings; plant species, vegetation density, and microclimate. The plant species factor range is 0.1 to 0.9, the range for planting density is 0.5 – 1.3, and the range for individual microclimates is 0.5 – 1.4. More specific information on calculating a landscape coefficient can be found in the Department of Water Resources 1999 publication “Water Use Classification of Landscape Species.”

Landscape Contractor: A person licensed by the state of California to construct, maintain, repair, install, or subcontract the development of landscape systems.

Landscape Documentation Package: Collectively, all the documents required and submitted to the District for plan check procedures and construction documentation.

Landscape Project: The total area of landscape in a project as defined in “Landscape Area” and meeting the requirements of section 700.2.

Lateral Line: The water delivery pipeline that supplies water to the emitters or sprinklers from the valve.

Local Agency: A city or county, including a charter city or charter county, that is responsible for adopting and implementing the ordinance. The local agency is also responsible for the enforcement of this ordinance, including but not limited to, approval of a permit and plan check or design review of a project.”

Local Water Purveyor: Any entity, including a public agency, city, county or private water company that provides retail water service.

Low Volume Irrigation: The application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip, drip lines and bubblers. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

Main Line: The pressurized pipeline that delivers water from the water source to the valve or outlet.

Maximum Applied Water Allowance (MAWA): The upper limit of annual applied water for the established landscaped area. It is based upon the area’s reference evapotranspiration, the ET

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Adjustment Factor and the size of the landscaped area. The Estimated Total Water Use calculated for the same area shall not exceed the Maximum Applied Water Allowance. Special Landscape Areas, including recreational turf areas and areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens are subject to the MAWA but are given an additional allocation of water equal to 30% of the local reference evapotranspiration rate. ETAF for these areas shall not exceed 1.0.

Microclimate: The climate of a small, specific area that may contrast with the climate of the overall landscape area due to factors such as: wind, sun exposure, plant density or proximity to reflective surfaces.

Mined-land Reclamation Projects: Any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.

Mulch: Any organic material such as leaves, bark, straw or inorganic mineral materials such as rocks, gravel, and decomposed granite left loose and applied to the soil surface for the beneficial purposes of reducing evaporation, suppressing weeds, moderating soil temperature and preventing soil erosion.

New Construction: A new building with a landscape or other new landscape, such as a park, playground, or greenbelt without an associated building.

Operating Pressure: The water pressure, at which the parts of an irrigation system are, as designed by the manufacturer, too operate.

Overhead Sprinkler Irrigation Systems: Systems that deliver water through the air (e.g., spray heads and rotors).

Overspray: The irrigation water which is delivered beyond the target area.

Permit: An authorized document issued by local agencies for a new construction or rehabilitated landscapes.

Pervious: Any surface or material that allows the passage of water through the material and into the underlying soil.

Plant Factor or Plant Water Use Factor: A factor, when multiplied by the ETo estimates the amount of water needed by plants. For purposes of these standards, the plant factor shall be the highest of the various plant species coefficients for a specific hydrozone. The plant factor range for a low water use plant grouping is 0 to 0.3, the plant factor range for a moderate water use plant grouping is 0.4 to 0.6, and the plant factor range for a high water use plant grouping is 0.7 to 1.0. More information on calculating plant factors can be found in the Department of Water Resources 2000 publication "Water Use Classification of Landscape Species (WUCOLS)."

Precipitation Rate: The rate of application of water measured in inches per hour.

Project Applicant: The individual or entity submitting a Landscape Documentation Package to request a permit, plan check, or design review from the District. A project applicant may be the property

owner or his/her designee.

Rain Sensor or Rain Sensing Shutoff Device: A component which automatically suspends an irrigation event when it rains.

Record Drawing or As-builts: A set of reproducible drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the contractor.

Recreational Turf: Turf area dedicated to active play such as parks, sports fields and golf courses. These are areas where turf provides a playing surface. Areas of turf used for ornamental purposes, special events, or as preserved open space, and plantings of grasses used to control erosion or used as an ornamental feature are not considered areas of recreational turf.

Recycled Water, Reclaimed Water, or Treated Sewage Effluent Water: Treated or recycled waste water of a quality suitable for non-potable uses such as landscape irrigation and water features. This water is not intended for human consumption.

Reference Evapotranspiration (ET_o): A standard measurement of environmental parameters which affect the water use of plants. ET_o is given in inches per day, month, or year and is an estimate of the evapotranspiration of a large field of four- to seven-inch tall, cool season turf that is well watered. Reference evapotranspiration is used as the basis of determining the Maximum Applied Water Allowances so that regional differences in climate can be accommodated.

Rehabilitated Landscape: Any re-landscaping project that requires a permit, plan check or design review. The modified landscape area is equal to or greater than 2,500 square feet, is 50% of the total landscape area, and the modifications are completed within one year.

Runoff: Water which is not absorbed by the soil or landscape to which it is applied and flows from the landscape area. For example, runoff may result from water that is applied at too great a rate (application rate exceeds infiltration rate) or when there is a slope.

Soil Moisture Sensing Device or Soil Moisture Sensor: A device that measures the amount of water in the soil. The device may also suspend or initiate an irrigation event.

Soil Texture: The classification of soil based on its percentage of sand, silt, and clay.

Special Landscape Area (SLA): An area of the landscape dedicated solely to edible plants, water features, or Recreational Turf.

Sprinkler Head: A device which delivers water through a nozzle.

Static Water Pressure: The pipeline or municipal water supply pressure when water is not flowing.

Station: An area served by one valve or by a set of valves that operate simultaneously.

Swing Joint: An irrigation component that provides a flexible, leak-free connection between the emission device and lateral pipeline to allow movement in any direction and to prevent equipment damage.

Turf: A groundcover surface of mowed grass. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are common cool-season grasses. Bermudagrass, Kikuyugrass, Seashore Paspalum, St. Augustinegrass, Zoysiagrass, and Buffalo grass are common warm season grasses.

Valve: A device used to control the flow of water in the irrigation system.

Water Conserving Plant Species: A plant species identified as having a low plant factor.

Water Feature: A design element where open water performs an aesthetic or recreational function. Water features include ponds, lakes, waterfalls, fountains, artificial streams, spas and swimming pools (where water is artificially supplied). The surface area of water features is included in the MAWA and ETWU calculations. The area of water features is considered as a high water use hydrozone of the landscape area when calculating the ETWU of a metered area. Constructed wetlands used for on-site wastewater treatment or storm water best management practices that are not irrigated and used solely for water treatment or storm water retention are not water features and, therefore, are not subject to the water budget calculation.

Watering Window: The time of day irrigation is allowed.

WUCOLS: Water Use Classification of Landscape Species published by the University of California Cooperative Extension, the Department of Water Resources and the Bureau of Reclamation, 2000.

700.4 PROCEDURES

Prior to construction, the project applicant shall:

- 1) Submit payment to the District for plan check procedures.
- 2) Submit three (3) copies of the Landscape Documentation Package to the District for plan check procedures, the development of comments, and if required, a listing of requested revisions. The Landscape Documentation Package will to be reviewed as many times as needed until the District requirements and standards are satisfied.
- 3) Receive the District's authorization to construct and record the date of the District authorization in the Certificate of Completion.
- 4) Submit a copy of the District approved Landscape Documentation Package to the planning department of the local jurisdiction to facilitate issuance of a permit to construct.
- 5) Submit a copy of the District approved Landscape Documentation Package to the property owner or his/her designee.

Prior to construction, the District shall:

- 1) Provide the project applicant with an outline of the District's procedures for project authorization.
- 2) Provide a receipt for payment of fees, deposits, and charges.
- 3) Review the submitted Landscape Documentation Package, develop comments, and if required, request revisions to the documents submitted by the project applicant.
- 4) Approve or deny the Landscape Documentation Package; and
- 5) Upon approval, provide District authorization to construct.

After completion of the landscape project installation, the applicant shall:

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- 1) Have an irrigation audit performed immediately following the completion of construction or rehabilitation and prior to submission of the Certificate of Completion to the District. The irrigation audit report shall be submitted to the District for acceptance.
- 2) Submit a completed MCWD Certificate of Completion and a set of record drawings (as-built drawings) to the District for acceptance. If the submitted documents are denied, the District shall provide information to the project applicant regarding reapplication, appeal or other assistance.

After all requested documentation is received and compliance with the standards is verified, the District shall:

- 1) Provide a signed copy of the Certificate of Completion to the applicant.
- 2) Keep a record of the documentation for water use evaluation.
- 3) Administer programs that may include, but not be limited to, irrigation water use analysis, irrigation audits, and irrigation surveys for compliance with the Maximum Applied Water Allowance.

700.5 PENALTIES

The District may establish penalties for noncompliance with these standards.

700.6 REQUIRED DESIGN ELEMENTS FOR IRRIGATION SYSTEMS USING RECYCLED WATER.

Local agencies, during development review, shall determine the extent to which developments shall use recycled water for landscape irrigation. As set forth in the District Water Code, where recycled water is not immediately available for use when the design area is ready for construction, and if the District or local jurisdiction has determined that recycled water will be supplied in the future, the on-site facilities shall be designated to use recycled water. The irrigation system shall be designed and constructed to meet all the District's Standards and Specifications. Provisions shall be made as directed by the District and specifications followed to prepare and allow for connection to the recycled water facilities when they become available.

- 1) The installation of recycled water irrigation systems (dual distribution systems) shall be required to allow for the current and future use of recycled water, unless a written exemption has been granted by the District.
- 2) Irrigation systems shall make use of recycled water unless a written exemption has been granted by the District, stating that recycled water meeting all health standards is not available and will not be available in the foreseeable future.
- 3) The recycled water irrigation systems shall be designed and operated in accordance with all local and state rules and regulations.

In preparation for the conversion to recycled water, and as referred to below, an On-Site Recycled Water User Plan shall be prepared by the applicant, owner, developer, or customer and submitted to the District. Required elements of this document are outlined in Appendix 19.

700.7 TEMPORARY IRRIGATION SYSTEM DESIGN

Before design submittals, the developer shall obtain approval from the District for any temporary irrigation system designs.

Please refer to Section 600 of the District's Procedures, Guidelines, and Design Requirements for the specific use of recycled water in temporary irrigation systems.

700.8 WATER METERS FOR IRRIGATION

Points of connection to the water distribution system and meter locations shall be approved by the District. Consideration shall be given to the likelihood that if not already provided, recycled water may become available, and appropriate irrigation system points of connection may change. Provisions shall be made, as directed by the District and these specifications, to design the irrigation system in a manner that allows for connection to the recycled water facilities as these facilities become available. Meters shall be located at the property boundary or in the public utility easement.

Landscape irrigation use, excluding that used around single-family dwellings with landscape area less than 5000 square feet, shall have dedicated landscape water meters.

700.9 LANDSCAPE DOCUMENTATION PACKAGE

The applicant shall submit the following items for review and approval by the District. These submittals are consistent with state guidelines promoting water conservation in landscape projects. The documents below, identified with an asterisk, are available as standard District forms and can be obtained in electronic format at the District website, <http://www.mcwd.org/engr.html>.

The Landscape Documentation Package shall include the following elements:

- 1) On-Site Recycled Water User Plan (not required of single-family residential projects or those projects with granted exemption from the use of recycled water)
- 2) * MCWD Water Efficient Landscape Worksheet
- 3) * MCWD ET-Based Irrigation Schedule for the Establishment Period
- 4) * MCWD ET-Based Irrigation Schedule for the Mature Landscape
- 5) Irrigation System Map
- 6) Individual Station Maps
- 7) Landscape and Irrigation System Maintenance Schedule(s)
- 8) Soil Management Report
- 9) Landscape Design Plan
- 10) Irrigation Design Plan
- 11) Grading Design Plan

- 12) Technical Specifications (if available)
- 13) * MCWD Certificate of Completion (submitted after project completion)
 - a) Landscape Irrigation Audit Report
 - b) Documentation verifying implementation of the soil report recommendations
- 14) Public Information Plan (applicable to development projects consisting of eight or more homes)

700.9.1 On-Site Recycled Water User Plan

Refer to Section 600.4.12 for details on this requirement.

An example of an On-site Recycled Water Users Plan is shown in Appendix 19.

700.9.2 MCWD Water Efficient Landscape Worksheet

A project applicant shall complete the MCWD Water Efficient Landscape Worksheet which contains the following sections:

- 1) Project Information
- 2) Checklist of Submitted Documentation
- 3) Landscape Site Data Table
- 4) Irrigation Station Information Table(s)
- 5) Water Budget Calculations
 - a) Maximum Applied Water Allowance (MAWA)
 - b) Estimated Total Water Use (ETWU)
- 6) Calculation of Effective Precipitation and the Effective Precipitation Disclosure Statement (optional)
- 7) Owners agreement to comply

An example of the MCWD Water Efficient Landscape Worksheet is shown in Appendix 31.

The MCWD Water Efficient Landscape Worksheet is available as a standard District form and can be obtained in electronic format at the District website, <http://www.mcwd.org/engr.html>.

700.9.2.1 Landscape Site Data Table

For each complete project site, each individual lot, and each individual landscape water meter, the applicant shall provide the square footage and acreage for the categories shown in the table below.

Example Landscape Site Data Table

Categories	Site	Typ. Lot	Meter
1) Total project area	acres	acres	N/A
	sq. ft.	sq. ft.	
2) Area of structures, hardscape	acres	acres	N/A
	sq. ft.	sq. ft.	
3) Area of non-irrigated open space	acres	acres	N/A
	sq. ft.	sq. ft.	
4) Landscape area (irrigated planting area)	acres	acres	acres
	sq. ft.	sq. ft.	sq. ft.
A) Landscape plantings	acres	acres	acres
	sq. ft.	sq. ft.	sq. ft.
B) Ornamental turf	acres	acres	acres
	sq. ft.	sq. ft.	sq. ft.
i) Special landscape area	acres	acres	acres
	sq. ft.	sq. ft.	sq. ft.

In some instances, as required, the site data requested may be presented in a format different than the District provided format as shown above and as found in the Water Efficient Landscape Worksheet. It is requested that the document provided to the District be a separate 8.5"x11" attached document(s).

The data requested in the Landscape Site Data Table may also be shown on the landscape plans.

700.9.2.2 Irrigation Station Information Table(s)

Information contained in the Irrigation Station Information Table is to be used to help program the irrigation controller at the landscape site. Each station shall be a unique portion of the landscaped area having plants of similar water needs and/or water application devices. An Irrigation Station Information Table shall be completed for each metered point of connection. Individual stations are to be identified by controller and valve identification numbers or letters. All water features shall be included and identified as a unique station and shall be assigned a plant factor of 1.0.

700.9.2.3 Calculation of Maximum Applied Water Allowance

The Maximum Applied Water Allowance (MAWA) is the upper limit of annual applied water for the established landscaped area. It is based upon the area’s reference evapotranspiration, the ET Adjustment Factor and the size of the landscaped area. Special Landscape Areas, including recreational turf areas and areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens are subject to the MAWA but are given an additional allocation of water equal to 30% of the local reference evapotranspiration rate.

The Maximum Applied Water Allowance calculation shall adhere to the following requirements:

- 1) Where there are multiple service connections at a single project, the MAWA calculation shall be completed for the whole site and each individual landscape meter connection.
- 2) The project applicant shall use a local, historical, reference evapotranspiration (ET_o) value from the table below (Source: California Irrigation Management Information System).

Region	ET Values												Total ET
Castroville	1.4	1.7	3.0	4.2	4.6	4.8	4.0	3.8	3.0	2.6	1.6	1.4	36.2
Monterey	1.7	1.8	2.7	3.5	4.0	4.1	4.3	4.2	3.5	2.8	1.9	1.5	36.0
Salinas	1.6	1.9	2.7	3.8	4.8	4.7	5.0	4.5	4.0	2.9	1.9	1.3	39.1

- 3) The surface area of water features shall be included in the calculation of Landscape Area.
- 4) Special Landscape Area shall be identified. Special Landscape Areas include recreational turf areas and areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens.

The landscape project's Maximum Applied Water Allowance shall be calculated using this equation:
 $MAWA = (ET_o)(0.62)[(0.7 \times LA) + (0.3 \times SLA)]$

where:

MAWA = Maximum Applied Water Allowance (gallons per year)

- ET_o = Local, Historical Reference Evapotranspiration Rate (inches per year)
- 0.7 = ET Adjustment Factor
- LA = Landscaped Area including the designated Special Landscape Area (square feet)
- 0.62 = Conversion factor (to gallons per square foot)
- SLA = Portion of the landscape area identified as Special Landscape Area (square feet)
- 0.3 = the additional ET Adjustment Factor for Special Landscape Area (1.0 - 0.7 = 0.3)

The example calculations below are hypothetical to demonstrate proper uses of the equations and do not represent an existing and/or planned landscape project.

Example MAWA Calculation #1:

A hypothetical landscape project in Fresno, CA with an irrigated landscape area of 50,000 square feet without any Special Landscape Area (SLA= 0, no edible plants or recreational turf areas). To calculate MAWA, the annual reference evapotranspiration value for Fresno is 51.1 inches.

$$\begin{aligned} \text{MAWA} &= (\text{ET}_o)(0.62)[(0.7 \times \text{LA})+(0.3 \times \text{SLA})] \\ \text{MAWA} &= (51.1 \text{ inches})(0.62)[(0.7 \times 50,000 \text{ square feet}) + (0.3 \times 0)] \\ &= 1,108,870 \text{ gallons per year} \end{aligned}$$

To convert from gallons per year to hundred-cubic-feet per year:
= 1,108,870/748 = 1,482 hundred-cubic-feet per year (100 cubic feet = 748 gallons)

Example MAWA Calculation #2:

In this next hypothetical example, the landscape project in Fresno, CA has the same ET_o value of 51.1 inches and a total landscape area of 50,000 square feet. Within the 50,000 square foot project, there is now a 2,000 square foot soccer field. This 2,000 square foot area of recreational turf is considered to be a Special Landscape Area.

$$\begin{aligned} \text{MAWA} &= (\text{ET}_o) (0.62)[(0.7 \times \text{LA})+(0.3 \times \text{SLA})] \\ \text{MAWA} &= (51.1 \text{ inches})(0.62)[(0.7 \times 50,000 \text{ square feet}) + (0.3 \times 2,000 \text{ square feet})] \\ &= 31.68 \times [35,000 +600] \text{ gallons per year} \\ &= 31.68 \times 35,600 \text{ gallons per year} \\ &= 1,127,808 \text{ gallons per year or } 1,508 \text{ hundred-cubic-feet per year} \end{aligned}$$

700.9.2.4 Calculation of Estimated Total Water Use

The Estimated Total Water Use shall be calculated using the equation shown below. Estimated Total Water Use; the sum of the Estimated Water Use for all individual hydrozones within a specific area shall not exceed the MAWA calculation for the same area.

Where there are multiple service connections at a single project, the calculation should be completed for the complete project and each individual landscape meter connection.

- 1) The project applicant shall use a local, historical, reference evapotranspiration (ET_o) value from the table below (Source: California Irrigation Management Information System).

Region	ET Values												Total ET
Castroville	1.4	1.7	3.0	4.2	4.6	4.8	4.0	3.8	3.0	2.6	1.6	1.4	36.2
Monterey	1.7	1.8	2.7	3.5	4.0	4.1	4.3	4.2	3.5	2.8	1.9	1.5	36.0
Salinas	1.6	1.9	2.7	3.8	4.8	4.7	5.0	4.5	4.0	2.9	1.9	1.3	39.1

- 2) The surface area of water features shall be included in the calculation and assigned a high water use plant factor of 1.0.
- 3) Hydrozones classified as Special Landscape Area shall be identified. There is no plant factor multiplier for the Special Landscape Area.
- 4) The plant factor used shall be the highest of the various plant species coefficients for a specific hydrozone. The plant factor range for a low water use plant grouping is 0 to 0.3, the plant factor range for a moderate water use plant grouping is 0.4 to 0.6, and the plant factor range for a high water use plant grouping is 0.7 to 1.0.
- 5) Temporarily irrigated areas shall be included as a low water use hydrozone.

$$ETWU = (ET_o)(0.62)[(PF \times HA/IE) + SLA]$$

Where:

- ETWU = Estimated Total Water Use per year (gallons)
- ET_o = Local, Historical Reference Evapotranspiration Rate (inches per year)
- PF = Highest of a Hydrozone’s Plant Factors. Derived from WUCOLS.
- HA = Hydrozone Area [high, medium, and low water use areas] (square feet)
- SLA = Special Landscape Area (square feet)
- 0.62 = Conversion Factor
- IE = Hydrozone’s Expected Irrigation Efficiency (minimum 0.71)

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Example ETWU Calculation #1:

The total landscape area is 50,000 square feet. The plant water use category, highest plant factor, hydrozone area, and each hydrozone’s expected irrigation efficiency are shown in the table below. The product of these three values equals the Adjusted Area of an individual hydrozone. The ETo value is 51.1 inches per year. There are no Special Landscape Areas (recreational turf area or area permanently and solely dedicated to edible plants).

Hydrozone	Plant Water Use Category	Highest Plant Factor (PF)	Area (square feet)	Irrigation Efficiency (IE)	Adjusted Area PF x Area/IE (square feet)
1	High	0.8	7,000	0.71	7,887
2	High	0.7	10,000	0.71	9,859
3	Medium	0.5	16,000	0.71	11,268
4	Low	0.3	7,000	0.71	2,958
5	Low	0.2	10,000	0.71	2,817
		Sum	50,000		34,789
	SLA		0		0

$$ETWU = (51.1)(0.62)(34,789 + 0)$$

$$= 1,102,185 \text{ gallons per year}$$

Compare ETWU with MAWA. The ETWU (1,102,185 gallons per year) is less than MAWA (1,108,870 gallons per year). In this example, the water budget complies with the MAWA.

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Example ETWU Calculation #2:

The total landscape area is 50,000 square feet, 2,000 square feet of which is a soccer field. The soccer field area is considered to be a Special Landscape Area. The plant water use category, highest plant factor, hydrozone area, and each hydrozone’s expected irrigation efficiency are shown in the table below. The product of these three values equals the Adjusted Area of an individual hydrozone. The reference evapotranspiration value is 51.1 inches per year.

Hydrozone	Plant Water Use Type(s)	Highest Plant Factor (PF)	Area (square feet)	Irrigation Efficiency (IE)	Adjusted Area PF x Area/IE (square feet)
1	High	0.8	7,000	0.71	7,887
2	High	0.7	9,000	0.71	8,873
3	Medium	0.5	15,000	0.71	10,563
4	Low	0.3	7,000	0.71	2,958
5	Low	0.2	10,000	0.71	2,817
		Sum	48,000		33,098
6	SLA		2,000		2,000

$$\begin{aligned} \text{ETWU} &= (51.1)(0.62)(33,098 + 2,000) \\ &= 1,111,975 \text{ gallons per year} \end{aligned}$$

Compare ETWU with MAWA. For this example:

$$\begin{aligned} \text{MAWA} &= (51.1)(0.62)[(0.7 \times 50,000) + (0.3 \times 2000)] \\ &= 31.68 \times [35000 + 600] \\ &= 31.68 \times 35,600 \\ &= 1,127,808 \text{ gallons per year} \end{aligned}$$

The ETWU (1,111,975 gallons per year) is less than MAWA (1,127,808 gallons per year). For this example the water budget complies with the MAWA.

700.9.3 MCWD ET-Based Irrigation Schedule for the Establishment Period

This spreadsheet illustrates how the watering frequency and watering duration change when using an ET-based irrigation controller. The spreadsheet shows that watering frequency and duration change each month of the first year, based upon specific site characteristics, plant water requirements, and historical evapotranspiration data for the region. Typically, the MCWD ET-Based Irrigation Schedule for the Establishment Period shows a more frequent application of water due to the young landscape plantings smaller root depth and/or a desired, lower Maximum Allowable Depletion (MAD) of soil moisture.

Each ET-based irrigation controller at a site will generate its own unique irrigation schedule based on the site data entered or received. Actual irrigation schedules may differ from those produced in the MCWD ET-Based Irrigation Schedules.

Each ET-based irrigation controller installed at a site may operate irrigation valves on only one associated metered connection.

The MCWD ET-Based Irrigation Schedule for the Establishment Period includes an Estimated Applied Water Use calculation. The Estimated Applied Water Use is an estimate of the total annual amount of water that will be applied through the ET-based Irrigation system.

An example MCWD ET-Based Irrigation Schedule for the Establishment Period is shown in Appendix 36.

The MCWD ET-Based Irrigation Schedule for the Establishment Period is available as a standard District form and can be obtained in electronic format at the District website, <http://www.mcwd.org/engr.html>.

700.9.4 MCWD ET-Based Irrigation Schedule for the Mature Landscape

This spreadsheet illustrates how the watering frequency and watering duration change when using an ET-based irrigation controller. The spreadsheet shows that watering frequency and duration change each month, based upon specific site characteristics, plant water requirements, and historical evapotranspiration data for the region. Typically, the MCWD ET-Based Irrigation Schedule for the Mature Landscape shows a more infrequent application of water, when compared to the watering schedule for the establishment period, due to the mature landscape plantings deeper root depth and/or a higher permitted Maximum Allowable Depletion (MAD) of soil moisture.

Each ET-based irrigation controller at a site will generate its own unique irrigation schedule based on the site data entered or received. Actual irrigation schedules may differ from those produced in the MCWD ET-Based Irrigation Schedules.

Each independent ET-based irrigation controller installed at a site may operate irrigation valves on only one associated metered connection.

The MCWD ET-Based Irrigation Schedule for the Mature Landscape includes an Estimated Applied Water Use calculation. The Estimated Applied Water Use is an estimate of the total annual amount of water that will be applied through the ET-based Irrigation system.

An example MCWD ET-Based Irrigation Schedule for the Mature Landscape is shown in Appendix 37.

The MCWD ET-Based Irrigation Schedule for the Mature Landscape is available as a standard District form and can be obtained in electronic format at the District website, <http://www.mcwd.org/engr.html>.

700.9.5 Irrigation System Map

An 8.5 x 11” Irrigation System Map shall be submitted as part of the Landscape Documentation Package. The map shall be provided to the installation contractor for attachment inside each irrigation controller. The map shall illustrate and clearly identify the following:

- 1) Location of the unique site in relation to major roadways, landscape markers, buildings, site features, and/or other adjacent properties.
- 2) Areas of recycled water use shall be clearly delineated from areas of potable water use.
- 3) Location of potable and/or recycled water distribution lines.
- 4) Meter locations
- 5) Controller locations
- 6) Valve locations

An example Irrigation System Map is shown in Appendix 39.

700.9.6 Individual Station Maps

8.5 x 11” Individual Station Maps shall be prepared showing the location of irrigation system control and application components and clearly identifying separate application areas by station. These maps shall be provided to the installation contractor for attachment inside each irrigation controller.

The map shall illustrate, clearly identify and include the following:

- 1) Location of potable and/or recycled water distribution lines.
- 2) Valve location and station number
- 3) Description of area watered
- 4) Illustration of area watered
- 5) Application device used
- 6) Unique station statistics including:
 - a) flow rate
 - b) application rate
 - c) station efficiency

- d) designed operating pressure
- 7) Unique Hydrozone information (used to program the controller) including:
 - a) plant factor
 - b) soil type
 - c) sun exposure
 - d) slope
 - e) allowable water deficiency
 - f) root zone depth

An example Individual Station Map is shown in Appendix 40.

700.9.7 Landscape and Irrigation System Maintenance Schedules

Maintenance schedules satisfying the following conditions shall be submitted as part of the Landscape Documentation Package:

- 1) The designer shall specify the recommended service periods and tasks required to adequately maintain the landscape plant material. The Landscape Maintenance Schedule shall include but not be limited to fertilization, weed control, pruning, mowing, mulching, staking, aerating, de-thatching, and removing litter.
- 2) The Irrigation Maintenance Schedule will specify the recommended service periods and tasks required to adequately maintain the irrigation equipment and monitor water use. The Irrigation Maintenance Schedule shall include but not be limited to checking, cleaning, adjusting, and repairing application devices; checking service laterals and monitoring for leaks, checking and/or adjusting the automatic controls, cleaning strainers, adjusting pressures, and monitoring consumption.

Whenever possible, repair of irrigation equipment shall be done with the originally specified materials or their equivalents. Project applicants are encouraged to implement sustainable or environmentally-friendly practices for overall landscape maintenance.

A sample Landscape and Irrigation System Maintenance Schedule is available in Appendix 41.

700.9.8 Soil Management Report

A Soil Management Report shall be submitted to the District as part of the Landscape Documentation Package. Only when mass grading is planned; and therefore the soil sample collection delayed, will the soil analysis and soil amendment recommendation be submitted separately from the Landscape Documentation Package. In such cases, in addition to the soil analysis and soil amendment recommendation, documentation verifying implementation of the soil amendment recommendations must be submitted with the Certificate of Completion once construction is complete.

The Soil Management Report shall include a laboratory soil analysis and a professional recommendation specifying the quantity and type of soil amendment to be incorporated into the soil to achieve

horticultural suitability. Multiple recommendations may be required for individual hydrozones, plant species, or plant type.

The soil analysis shall include:

- 1) Determination of soil texture, indicating the percentage of organic matter.
- 2) A specification of the type and quantity of soil amendments and fertilizers to be incorporated into each 1000 square feet of planting area.
- 3) An approximate soil infiltration rate (either measured or derived from soil texture/infiltration rate tables.) A range of infiltration rates shall be noted where appropriate.
- 4) Measure of pH, and total soluble salts.
- 5) A specification of the type and quantity of mulch material required to provide at least a two inch deep layer of mulch to all planting areas (except turf).

A sample Soil Analysis and Soil Amendment Recommendation is available in Appendix 42.

700.9.9 Landscape Design Plan

A landscape design plan meeting the following requirements shall be submitted as part of the landscape documentation package.

700.9.9.1 Water Features

- 1) Recirculating water shall be used for water features.
- 2) Pool and spa covers are highly recommended.
- 3) The surface area of water features shall be included in the water use calculations and assigned a high water use plant factor of 1.0.
- 4) Where available, recycled water shall be used in water features.

700.9.9.2 Plant Selection and Grouping

- 1) Any plants may be used in the landscape, providing the Estimated Total Water Use does not exceed the Maximum Applied Water Allowance. The selection of water-conserving plant and turf species is highly recommended.
- 2) Plants having similar water use shall be grouped together in distinct hydrozones that are irrigated by separate valves.
- 3) Avoid invasive plant species.
- 4) Fire prevention needs shall be addressed in areas that are fire prone. Consider and address fire safety and prevention when selecting landscape plants. Avoid fire-prone plant materials and highly

flammable mulch materials. Information about fire prone areas and appropriate landscaping for fire safety is available from local fire departments or the California Department of Forestry.

- 5) Plants should be selected appropriately based upon their pest and disease resistance, and adaptability to the climatic, geologic, and topographical conditions of the site. Protection and preservation of native species and natural areas is encouraged.
- 6) The selection of trees shall be based on applicable local tree ordinances or tree shading guidelines. The planting of appropriate trees is encouraged wherever it is consistent with the other provisions of these design criteria. Consider the solar orientation for plant and tree placement to maximize summer shade and winter solar gain. Avoid underground utilities. Recognize that plantings of considerable size may be limited in rights of ways and easements.
- 7) The use of turf is discouraged where other low water use plants or alternative landscape materials are appropriate. The District recommends that no more than 25% of the irrigated landscape area be planted with low-water demand varieties of turf, providing the Estimated Total Water Use is within the Maximum Applied Water Allowance. Local agency restrictions on turf shall be followed. Large turf areas should be limited to only those approved by the responsible agency as recreational space. Turf areas with overhead irrigation should be bordered by planting beds or alternative permeable landscape materials to prevent the migration of surface runoff outside the target area. Small “pocket lawns” less than 500 square feet in size are not permitted unless low volume irrigation is used. The overhead application of water to these small turf areas is not permitted. Turf is not allowed on slopes greater than 25% where the toe of the slope is adjacent to an impermeable hardscape and where 25% means 1 foot of vertical elevation change for every 4 feet of horizontal length (rise divided by run x 100 = slope percent).

700.9.9.3 Landscape Design Plan Requirements

- 1) The landscape design plan shall contain the following signed statement:

“I have complied with the criteria of the design standards and applied them accordingly for the efficient use of water in the landscape design plan”

The statement shall be signed by a licensed landscape architect, licensed landscape contractor or any other applicable landscape professional, person, licensed or unlicensed, as listed in the Business and Professions Code, California Code of Regulations, or Food and Agriculture Code.

Note: Authority Cited: Section 65595, Gov. Code and Section 1353.8, Civil Code. Reference: Section 65596, Gov. Code and Section 1353.8, Civil Code.

- 2) Delineate and label each hydrozone by number, letter, or other method. Identify each hydrozone as low, medium, or high water use by finding the highest of the various plant species coefficients for a specific hydrozone.
- 3) Landscape materials, trees, shrubs, groundcover, turf, and other vegetation. Planting symbols shall be clearly drawn and plants labeled by botanical name, common name, container size, spacing, and quantities of each group of plants indicated.
- 4) Property lines and street names.
- 5) Streets, driveways, walkways, and other paved areas.

- 6) Pools, ponds, water features, fences, and retaining walls.
- 7) Existing and proposed buildings and structures including elevation if applicable.
- 8) Natural features including but not limited to rock outcroppings, existing trees, shrubs that will remain.
- 9) Tree staking, plant installation, soil preparation details, and any other applicable planting and installation details.
- 10) Clearly delineate Special Landscape Areas including areas permanently and solely dedicated to edible plants and recreational turf areas.
- 11) At least two inches of mulch material on top of the soil surface shall be specified for planting beds.
- 12) Stabilizing mulching products shall be used on slopes.
- 13) Laboratory soil analysis and a professional recommendation shall specify the quantity and type of soil amendment to be incorporated into the soil to achieve horticultural suitability. Multiple recommendations may be required for individual hydrozones, plant species, or plant type.
- 14) Identify the location and installation details of any applicable storm water best management practices that encourage on-site retention and infiltration of storm water. Project applicants shall refer to the local agency or Regional Water Quality Control Board for information on any storm water ordinances and storm water management plans. Storm water best management practices are encouraged in the landscape design plan and examples include, but are not limited to:
 - a) Infiltration beds, swales and basins that allow water to collect and soak into the ground;
 - b) Constructed wetlands and retention ponds that retain water, handle excess flow and filter pollutants;
 - c) Pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff;
 - d) Identify any applicable rain harvesting or catchment technologies (e.g., rain gardens, cisterns, etc.).

700.9.10 Irrigation Design Plan

These irrigation design requirements promote the efficient use of applied water.

An irrigation design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.

- 1) Overhead irrigation is permitted for turf, seeded grass areas, and areas planted with ground covers that spread by rhizomes or runners. Otherwise, low volume irrigation is required to maximize water infiltration into the root zone, reduce evaporative water loss, and prevent runoff.
- 2) Overhead spray irrigation systems are prohibited in roadway median strips, parking islands, roadside planting strips and other narrow areas bordered by hardscape and measuring less than eight feet in width. In these areas where planter width is greater than eight feet, fan-type spray nozzles are not permitted. The use of low trajectory and low precipitation rate stream type nozzles is permitted and encouraged.

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- 3) Overhead irrigation shall not be permitted within 24 inches of any non-permeable surface. Allowable irrigation within the setback from non-permeable surfaces may include drip, drip line, or other low flow non-spray technology. The setback area may be planted or unplanted. The surfacing of the setback may be mulch, gravel, or other porous material. These restrictions may be modified if:
 - a) The landscape area is adjacent to permeable surfacing and no overspray and runoff occurs;
 - b) Or the adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping;
 - c) Or the irrigation designer specifies an alternative design or technology, as part of the Landscape Documentation Package, and clearly demonstrates strict adherence to irrigation system design criteria. Prevention of overspray and runoff must be confirmed during an irrigation audit.
- 4) Slopes greater than 25% shall not be irrigated with an irrigation system having a precipitation rate exceeding 0.75 inches per hour. This restriction may be modified if the landscape designer specifies an alternative design or technology, as part of the Landscape Documentation Package, and clearly demonstrates no runoff or erosion will occur. Prevention of runoff and erosion must be confirmed during irrigation audit.
- 5) The District may require the use of drip irrigation or low volume application devices in certain cases where it is determined during plan check procedures that otherwise permitted overhead spray irrigation may result in waste of water due to excessive runoff or wind drift away from the application target.
- 6) Soil types and water infiltration rates shall be considered when designing irrigation systems. All irrigation systems shall be designed to avoid runoff, low head drainage, overspray, or other similar conditions where applied water could flow outside the Landscape Area, onto adjacent property, into non-irrigated areas, and onto walks, roadways, or structures. Proper irrigation equipment and schedules, including features such as repeat cycles, shall be used to closely match application rates to infiltration rates, therefore minimizing applied water runoff.
- 7) Special attention shall be given to avoid runoff on slopes and to avoid overspray in narrow planting areas with a width less than eight feet, and in median strips over eight feet in width.
- 8) The height of all sprinklers risers shall exceed the height of mature plant material. Appropriate sprinkler offset or height clearance shall be provided when placed adjacent to parking stalls.
- 9) The design of the irrigation system shall conform to the hydrozones of the landscape design plan.
 - a) Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions and plant materials with similar water use.
 - b) Sprinkler heads and other emission devices shall be selected based on what is appropriate for the plant type within that hydrozone.
 - c) Trees shall be placed on separate valves from shrubs, groundcovers and turf.
 - d) Individual hydrozones that mix plants of moderate and low water use or moderate and high water use, may be allowed if:

- i) Plant factor calculation is based on the proportions of the respective plant water uses and their plant factor; or
 - ii) The plant factor of the higher water using plant is used for calculations.
- e) Individual hydrozones that mix high and low water use plants shall not be permitted.
- f) On the landscape design plan and irrigation design plan, hydrozone areas shall be designated by number, letter or other designation. On the irrigation design plan, designate the areas irrigated by each valve, and assign a number to each valve. Use this valve number in the Irrigation Station Information Table (Appendix 31). This table can also assist with pre- and final inspections of the irrigation system, and programming the controller.

700.9.10.1 Irrigation Design Plan Requirements

The irrigation design plan submitted to the local agency shall follow standard industry practices and applicable local agency requirements. The irrigation plans shall include the following:

- 1) The irrigation design plan shall contain the following signed statement:

“I have complied with the criteria of the design standards and applied them accordingly for the efficient use of water in the irrigation design plan”

The statement shall be signed by a licensed landscape architect, licensed landscape contractor or any other applicable landscape professional, person, licensed or unlicensed, as listed in the Business and Professions Code, California Code of Regulations, or Food and Agriculture Code.

Note: Authority Cited: Section 65595, Gov. Code. Reference: Section 65596, Gov. Code.

- 1) The irrigation design plan shall be drawn on project base sheets. It shall be separate from, but use the same format and scale as, the landscape design plan.
- 2) Location, size, area served (square feet), yearly water requirement (acre-feet), and peak flow rate of separate connections and water meters for the landscape.
- 3) Location, type, size, model, manufacturer of all components of the irrigation system, including automatic controllers, main and lateral lines, valves, sprinkler heads, moisture sensing devices, rain switches, quick couplers, filters, and backflow prevention devices.
- 4) Flow, pressure, radius, application rate, sprinkler offset, and sprinkler pattern for specified application devices.
- 5) Static water pressure at the point of connection to the public water supply.
- 6) Expected dynamic pressure and flow rate when designed with booster pumps.
- 7) Flow rate (gallons per minute), valve number, controller number, application rate (inches per hour), and design operating pressure (psi) for each station.
- 8) The irrigation window shall be clearly identified on all schedules and in the irrigation notes. For recycled water, the irrigation window is from 9:00 P.M. to 6:00 A.M. and for potable water, 5:00P.M. to 10:00 A.M..

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- 9) Clear differentiation shall be shown between recycled water irrigation systems and potable water irrigation systems.
- 10) Specifications required of Section 600 – Design Criteria, Recycled Water Facilities. Irrigation system designs for recycled water use shall be prepared to meet all standards required for submission of an On-Site Recycled Water User Plan and the request for recycled water service.
- 11) Pipe separation, trenching, wiring, connection, flow control, backflow prevention, filtration, pipe routing, coverage, and any other applicable irrigation and related electrical installation details.
- 12) Meter Data - The following information shall be provided and shown at each proposed meter location shown on the plans:
 - a) The meter location and size (inches).
 - b) The peak flow through the meter (gpm).
 - c) The (static) design pressure available at the meter (psi).
 - d) The total area served through the irrigation meter (acres).
 - e) An estimate of the yearly water requirement through the meter (acre-feet).
- 13) Irrigation Equipment Legend - For irrigation systems, a legend showing the pertinent data for the materials used in the system shall be recorded on the plans. The legend shall include a pipe schedule listing pipe sizes and materials of construction, a listing of valve types and quick couplers (quick couplers are not permitted for residential dual plumbed homes), and the following information for each type of sprinkler head:
 - a) Manufacturer name and model number.
 - b) Sprinkler radius (feet).
 - c) Operating pressure (psi).
 - d) Flow (gpm).
 - e) Sprinkler pattern.
- 14) Irrigation Details - The following irrigation details and notes shall be provided on each plan set
 - a) Irrigation System Schematic Layout: Potable Water and Recycled Water Services
 - b) Irrigation Plan Legend
 - c) Automatic Controller
 - d) Rain Shut-off Switch
 - e) Buried Electric Remote Control Valve
 - f) Pipe Trenching
 - g) Pipe Trenching Under Pavement

- h) Sprinkler Installation and Offset from Hardscape
- i) Backflow Prevention Unit (when required)
- j) Wye or Basket Strainer
- k) Pressure Reducing Valve
- l) General On-Site Recycled Water Notes

15) Sheets to be Included - The following sheets shall be included in the set:

- a) Cover sheet showing project location and all recycled and potable on-site water lines.
- b) Irrigation application sheet showing coverage areas by individual stations and meters.
- c) Irrigation plans and irrigation details.

700.9.10.2 Irrigation Equipment.

To promote water conservation the following equipment is required.

- 1) District-approved, weather- based irrigation controllers or soil moisture-based irrigation controllers shall be installed by the developer to control watering systems in:
 - a) All parcels and lots with irrigated landscape area equal to or greater than 500 square feet. This includes private residential home sites and lots where irrigated landscaping is probable.
 - b) Multiple parcels and lots served by a single point of connection and having an aggregate landscape area greater than 2,500 square feet.
- 2) All controllers must adjust watering parameters automatically based upon current, local reference evapotranspiration data, provided by a remote or localized weather-based information system, or based upon immediate, automated soil moisture measurements.
- 3) Irrigation controllers shall be capable of utilizing various input data to develop unique irrigation schedules for the plant establishment period and the established landscape. To develop the unique irrigation schedules, each irrigation controller shall consider all of the following that apply:
 - a) Irrigation interval (days between irrigation);
 - b) Irrigation run times (hours or minutes per irrigation event to avoid runoff);
 - c) Number of cycle starts required for each irrigation event;
 - d) Application rate setting;
 - e) Plant type setting;
 - f) Soil type;

- g) Slope factor setting;
 - h) Shade factor setting; and
 - i) Irrigation uniformity or efficiency setting.
- 4) Each independent ET-based irrigation controller installed at a site may operate irrigation valves on only one associated metered connection.
 - 5) All irrigation control systems shall be equipped with rain sensing devices to prevent irrigation during periods of rain unless otherwise specified by the device manufacturer.
 - 6) Sprinkler irrigation systems using potable water shall have a wye strainer located downstream of the meter and on the riser of the backflow prevention device. The backflow device and wye strainer may be replaced with a basket strainer, below grade in a box, when recycled water is used.
 - 7) A pressure-reducing valve must be installed down-stream of the strainer for each system using recycled water, unless otherwise determined to be inappropriate.
 - 8) On irrigation systems using recycled water, strainers and pressure-reducing valves shall be installed below grade in a purple colored rectangular box of sufficient size to easily allow repair or replacement of the unit(s).
 - 9) Bubbler flow rates shall not exceed 1.5 gallons per minute per device. Adjustable bubblers are not permitted.
 - 10) Pop-up sprinklers shall have a minimum riser height of 6-inches.
 - 11) All electronic irrigation control valves shall include design and construction features allowing trouble-free use in harsh conditions including use with non-potable, reclaimed effluent water. These advanced features include brass or industrial-strength nylon housing, flow control, port filtration, captured solenoid plungers, manual external bleeding, and “scrubber” type debris removal.
 - 12) Dedicated landscape water meters shall be installed for all landscape projects except for single family homes.
 - 13) Sprinkler heads and emitters shall have consistent application rates and match precipitation rates within each control valve circuit. Sprinkler heads shall be selected for proper area coverage, application rate, operating pressure, adjustment capability, and ease of maintenance.
 - 14) At a minimum, head to head coverage of sprinkler pattern overlap is required. Greater overlap may be required in windy situations. Sprinkler spacing shall be set to achieve distribution uniformity using the manufacturer’s specifications.
 - 15) Anti-drain (check) valves shall be designed into drip irrigation systems, at strategic points, to minimize or prevent low-head drainage.

- 16) In-head pressure regulation and check valve devices are required in overhead sprinklers when the device is available from the manufacturer.
- 17) It is recommended that soil moisture sensing devices be considered where appropriate.

700.9.10.3 Additional Irrigation Equipment for Large Landscapes

These requirements provide additional protection against water waste in larger landscape projects equal to or greater than 21,780 square feet (0.5 acre) of landscape area as defined in these design criteria. This equipment or equipment features are in addition to the requirements in sub-section 700.9.10.2.

- 1) The District-approved, weather- based irrigation controllers or soil moisture-based irrigation controllers installed in large landscapes must have water use monitoring, recording, and alarm features. The controllers must be capable of:
 - a) shutting off malfunctioning individual stations automatically without disrupting the remaining programs and;
 - b) shutting off the master control valves in the event of a mainline or valve failures.
- 2) Automatically operated master control valves must be installed to protect against water loss due to mainline breaks or system malfunction.
- 3) Flow meters must be installed to allow observation, water loss protection, and recording of irrigation parameters.

700.9.11 Grading Design Plan

For the efficient use of water, grading of a project site shall be designed to minimize soil erosion, runoff, and water waste. A grading design plan shall be drawn on project base sheets. It shall be separate from but use the same format as the landscape design plan. The grading design plan shall indicate finished configurations and elevations of the landscaped area, including the height of graded slopes, drainage patterns, pad elevations, and finish grade. The plan should clearly identify storm water retention improvements. To prevent excessive erosion and runoff, it is highly recommended that project applicants:

- 1) Grade the site so that all irrigation and normal rainfall remains within property lines and does not drain on to non-permeable hardscapes.
- 2) Avoid disruption of natural drainage patterns and undisturbed soil.
- 3) Avoid soil compaction in landscape areas.

The grading design plan shall contain the following signed statement:

“I have complied with the criteria of the design standards and applied them accordingly for the efficient use of water in the grading design plan”

The statement shall be signed by a licensed landscape architect, licensed landscape contractor or any other applicable landscape professional, person, licensed or unlicensed, as listed in the Business and Professions Code, California Code of Regulations, or Food and Agriculture Code.

Note: Authority Cited: Section 65595, Gov. Code and Section 1353.8, Civil Code. Reference: Section 65596, Gov. Code and Section 1353.8, Civil Code.

700.9.12 MCWD Certificate of Completion

The MCWD Certificate of Completion is available as a standard District form and can be obtained in electronic format at the District website, <http://www.mcwd.org/engr.html>.

Upon completion of the landscape and irrigation system installation, the Landscape Contractor and Landscape Architect, Irrigation Designer, Independent Landscape Consultant, or a licensed or certified landscape professional, shall conduct field observations and sign the MCWD Certificate of Substantial Completion verifying the landscape was installed according to the MCWD approved plans and specifications. The document is then signed by the owner or the owner's representative, recognizing that the project has been constructed as planned, the required irrigation audit performed, the soil report recommendations implemented, and that the owner now has responsibility to maintain the site. A copy of the signed Certificate of Completion is then to be delivered to the District, along with the irrigation audit report, for approval or denial. If denied, the District shall provide information to the project applicant regarding reapplication, appeal or other assistance.

This document also includes a statement recognizing the owner's responsibility to conduct an additional irrigation audits, performed by a Certified Landscape Irrigation Auditor, if the sites future water use exceeds the sites Maximum Applied Water Allowance. Water use of all landscapes over 5000 square feet with dedicated irrigation service connections shall be monitored by the District and water use compared to the calculated MAWA for the landscape area served.

An example Certificate of Completion is available in Appendix 43.

700.9.13 Irrigation Audit

For all projects too which these standards apply, and installed after January 1, 2010, the project applicant shall have an irrigation audit performed immediately following the completion of construction or rehabilitation and prior to submission of the Certificate of Completion to the District. The irrigation audit report shall be submitted to the District with the Certificate of Completion. The report may include, but is not limited to: inspection, system tune-up, system test with distribution uniformity, reporting overspray or run off that causes overland flow, and preparation of an irrigation schedule.

All irrigation audits submitted to the District, weather as part of the landscape documentation package or as required by the Water Conservation Ordinance shall:

- 1) Comply with the "Irrigation Association Certified Landscape Irrigation Auditor Training Manual (2004 or most current version).
- 2) All landscape irrigation audits shall be conducted by a Certified Landscape Irrigation Auditor.

The District will administer programs that may include, but not be limited to, irrigation water use analysis, irrigation audits, and irrigation surveys for compliance with the Maximum Applied Water Allowance.

700.9.14 Public Education Plan

Development projects consisting of eight or more homes shall provide documentation to the District outlining a comprehensive plan to provide water conservation education materials and displays to new home owners within the development. The plan shall include the following actions by the developer:

- 1) Provide publications to owners of all new, single family residential homes regarding the design, installation, and maintenance of water efficient landscapes.
- 2) Provide literature about water efficient landscape design and the efficient use of landscape water throughout the community.
- 3) Demonstrate via signs and information the principles of water efficient landscapes in all model homes. The signs shall be used to identify the model as an example of a water efficient landscape and featuring elements such as hydrozones, irrigation equipment and others which contribute to the overall water efficient theme.
- 4) Information shall be provided at the model homes about designing, installing, and maintaining water efficient landscapes.
- 5) The installation of water efficient public demonstration gardens throughout the community is encouraged.

An example document outlining the work by one developer to fulfill this requirement is shown in Appendix 44.

700.10 DISTRICT PROVIDED LANDSCAPE DOCUMENTATION FORMS

Many of the documents mentioned in these design criteria are available as forms from the District staff or can be found on the District website at <http://www.mcwd.org/engr.html>. Examples of completed forms are also available as appendixes of this document and are available for viewing on the District website. Considerable effort has been made to make these application forms and landscape documentation forms simple to understand and easy to complete. These electronic forms provide the District with standard, uniform documents that include all the pertinent information necessary to understand, evaluate, comment, and process your application.

The District provided Landscape Documentation Forms and example landscape documents include the following:

- 1) MCWD Water Efficient Landscape Worksheet (Appendix 31)
 - a) Project Information
 - b) Checklist of Submitted Documentation
 - c) Landscape Site Data Table
 - d) Irrigation Station Information Table(s)
 - e) Water Budget Calculations
 - iii) Maximum Applied Water Allowance (MAWA)
 - iv) Estimated Total Water Use (ETWU)
 - v) Calculation of Effective Precipitation and the Effective Precipitation Disclosure Statement (optional)
 - f) Owners agreement to comply
- 2) On-Site Recycled Water User Plan (Appendix 19).
- 3) MCWD ET-Based Irrigation Schedule for the Establishment Period (Appendix 36)
- 4) MCWD ET-Based Irrigation Schedule for the Mature Landscape (Appendix 37)
- 5) Irrigation System Map (Appendix 39)
- 6) Individual Station Maps (Appendix 40)

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- 7) Landscape and Irrigation System Maintenance Schedule(s) (Appendix 41)
- 8) Soil Management Report (Appendix 42)
- 9) MCWD Certificate of Completion (Appendix 43)
 - a) Landscape Irrigation Audit Report
 - b) Documentation verifying implementation of the soil report recommendations.
- 10) Public Information Plan (Appendix 44)

END OF SECTION